

DS8208/DS8288

Digital Scanner



ZEBRA

Product Reference Guide

2025/11/10

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Introduction

The Product Reference Guide provides general instructions for setting up, operating, maintaining, and troubleshooting the scanner.

Some parts of this guide are intended for use by a system engineer/programmer and go into detail concerning programming functions.

Configurations

The tables below contain a complete list of the scanner and accessory configurations.

Scanners

Table 1 Corded DS8208 Configurations

Configuration	Description
DS8208-SR40004VZWW	DS8208: Area Imager, Standard Range, Corded, White Illumination, Midnight Black, Vibration
DS8208-SR40004VCWW	DS8208: Area Imager, Standard Range, Corded, White Illumination, Midnight Black, Vibration, Checkpoint EAS
DS8208-DL40004VZNA	DS8208: Area Imager, DL Parsing, Corded, White Illumination, Midnight Black, Vibration - NA Only
DS8208-SR40004VZY	DS8208: Area Imager, Standard Range, Corded, White Illumination, Midnight Black, Vibration - India Only
DS8208-SR40004VZCN	DS8208: Area Imager, Standard Range, Corded, White Illumination, Midnight Black, Vibration - China Only

Table 2 Cordless DS8288 Configurations

Configuration	Description
DS8288-SR4F004VZWW	DS8288: Area Imager, Standard Range, Cordless, FIPS, White Illumination, Inductive, Midnight Black, Vibration
DS8288-SR4F004VMWW	DS8288: Area Imager, Standard Range, Cordless, FIPS, White Illumination, Inductive, Midnight Black, Vibration, Mfi
DS8288-SRPF004VZWW	DS8288: Area Imager, Standard Range, Cordless, FIPS, White Illumination, Powercap, Inductive, Midnight Black, Vibration

Table 2 Cordless DS8288 Configurations (Continued)

Configuration	Description
DS8288-DL4F004VZNA	DS8288: Area Imager, DL Parsing, Cordless, FIPS, White Illumination, Inductive, Midnight Black, Vibration - NA Only
DS8288-DLPF004VZNA	DS8288: Area Imager, DL Parsing, Cordless, FIPS, White Illumination, Powercap, Inductive, Midnight Black, Vibration - NA Only
DS8288-SR0F004VZY	DS8288: Area Imager, Standard Range, Cordless, FIPS, Inductive, Midnight Black, Vibration - India Only
DS8288-SR0F004VZCN	DS8288: Area Imager, Standard Range, Cordless, FIPS, Inductive, Midnight Black, Vibration - China Only

Cradles**Table 3** Cradle Configurations

Configuration	Description
CR8288-SC100F4WW	DS8288: Standard Cradle, Inductive, Bluetooth, FIPS, Midnight Black
CR8288-SC100F4CN	DS8288: Standard Cradle, Inductive, Bluetooth, FIPS, Midnight Black, China Only
CR8288-PC100F4WW	DS8288: Presentation Cradle, Inductive, Bluetooth, FIPS, Midnight Black
CR8288-PC100F4CN	DS8288: Presentation Cradle, Inductive, Bluetooth, FIPS, Midnight Black, China Only

Accessories**Table 4** Accessory Configurations

Configuration	Description
STND-GS0082C-04	Gooseneck Intellistand – DS8208 (Black)
STND-WS0082C-04	Gooseneck Intellistand, Weighted – DS8208 (Black)
CUP-GS0082C-04	Gooseneck Cup - DS8208 (Black)
BRKT-AP0081W-04	BRACKET - ADAPTER PLATE FOR DS6878 TO DS8178 STANDARD CRADLE (MIDNIGHT BLACK)
Spare batteries	
BTRY-DS82EAB0E-00	Spare Battery, DS8288 Family
BTRY-DS82EAB0E-00Y	Spare Battery, DS8288 Family, India Only
SUPR-DS82EAB0E-00	Spare Powercap Pack, DS8288 Family

Cables

For regional information about cables and cable compatibility, go to the [Zebra Partner Portal](#).

Notational Conventions

The following notational conventions make the content of this document easy to navigate.

- **Bold** text is used to highlight the following:
 - Dialog box, window, and screen names
 - Dropdown list and list box names
 - Checkbox and radio button names
 - Icons on a screen
 - Key names on a keypad
 - Button names on a screen
- Bullets (•) indicate:
 - Action items
 - List of alternatives
 - Lists of required steps that are not necessarily sequential
- Sequential lists (for example, those that describe step-by-step procedures) appear as numbered lists.

Icon Conventions

The documentation set is designed to give the reader more visual clues. The following visual indicators are used throughout the documentation set.



NOTE: The text here indicates information that is supplemental for the user to know and that is not required to complete a task.



IMPORTANT: The text here indicates information that is important for the user to know.



CAUTION: If the precaution is not heeded, the user could receive a minor or moderate injury.



WARNING: If danger is not avoided, the user CAN be seriously injured or killed.



DANGER: If danger is not avoided, the user WILL be seriously injured or killed.

Service Information

If you have a problem with your equipment, contact Zebra Global Customer Support for your region. Contact information is available at: zebra.com/support.

When contacting support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software/firmware type and version number

Zebra responds to calls by email, telephone, or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your Zebra business product from a Zebra business partner, contact that business partner for support.

Getting Started

The scanner combines 1D and 2D omnidirectional barcode scanning performance and advanced ergonomics in a lightweight design. The digital scanner ensures comfort and ease of use for extended periods of time.

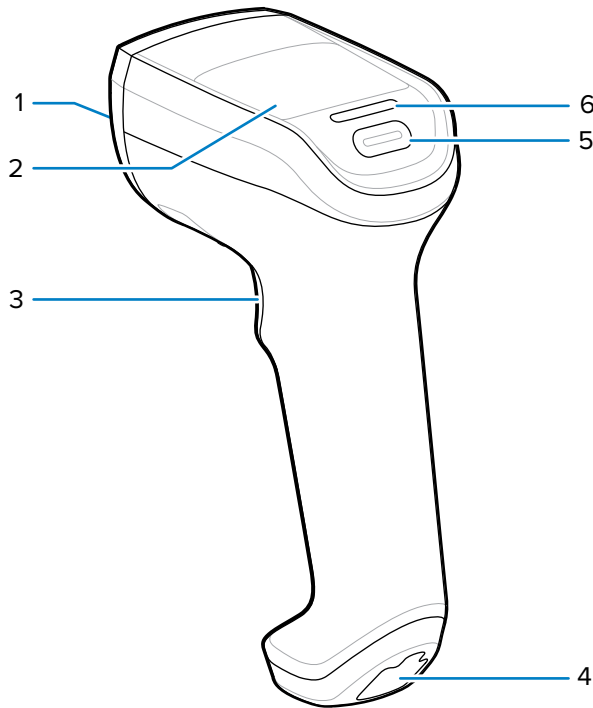
Unpacking the Scanner

Unpack the scanner from the box.

1. Carefully remove all protective material from the scanner and save the container for later storage and shipping.
2. Verify that the following are in the box:
 - Coded DS8208 or cordless DS8288 digital scanner
 - Quick Start Guide
 - Regulatory Guide
3. Inspect the equipment for any damage. If any equipment is missing or damaged, contact the Global Customer Support Center immediately.
4. Before using the device for the first time, remove the protective shipping film from the housing.

Corded DS8208 Scanner Features

Main features of the corded scanner.

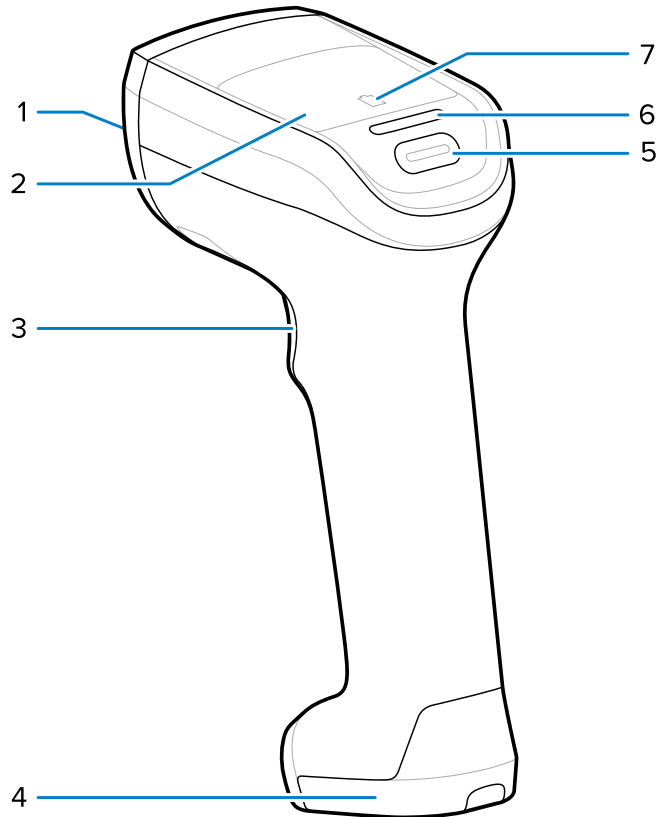


Number	Item	Description
1	Scan window	Point this window at a barcode when capturing data.
2	Speaker	Provides audio output indicating scanner status and activity.
3	Scan trigger	Operates the imager when scanning a barcode.
4	Port	Supports corded connection to host.
5	Programmable button	Programmable trigger. Default behaviors: • SR/DL: Secondary trigger.
6	Scan LED	Indicates scan status.

Cordless DS8288 Scanner Features

Main features of the cordless scanner.

Figure 1 Cordless Scanner Features



Number	Item	Description
1	Scan window	Point this window at a barcode to capture barcode data.
2	Speaker	Provides audio output indicating scanner status and activity.
3	Scan trigger	Initiates a barcode scan.
4	Battery compartment cover	Holds a replaceable battery or PowerCap.
5	Programmable button	Programmable trigger. Default behavior: • SR/DL: Secondary trigger.
6	Scan LED	Indicates scan status.
7	Battery LED	Indicates battery charge level.

Accessories

Scanners ship with a Quick Start Poster and Regulatory Guide. The following accessories are available for purchase on zebra.com.

Cordless Scanner Accessories

- Cradle: Required for charging the battery/PowerCap.
- Document capture stand: Used with the presentation cradle.
- Replacement battery for the scanner.
- Interface cables for the appropriate interface.
- Universal power supply, if the interface requires one.

See [Accessories](#) for the full list of power supplies and part numbers, and Scanner Configurations and Cradle Configurations for product configurations. For additional items, contact a local Zebra representative or business partner.

Corded Scanner Accessories

- Gooseneck Intellistand, for hands-free scanning.
- Cup accessory that attaches to the Gooseneck Intellistand.
- Desktop holder
- Wall mount holder

Cradles Introduction

The cradles serve as a charger, radio communication interface, and host communication interface for the DS8288 cordless digital scanner. There are two versions of the cradle: The standard cradle (CR8288-SC), and presentation cradle (CR8288-PC).

- The CR8288-SC standard cradle sits on a desktop or mounts on a wall and charges the DS8288. This cradle also provides host communication by receiving scanner data via Bluetooth and sending that data to the host through an attached cable. The cable provides power to the cradle from the host or optional power supply (if supported).
- The CR8288-PC presentation cradle sits on a desktop and charges the DS8288 while allowing barcode scanning in presentation mode. This cradle also provides host communication by receiving scanner data via Bluetooth and sending that data to the host through an attached cable. The cable provides power to the cradle from the host or optional power supply (if supported).



NOTE: No other scanner is compatible with the CR8288-SC and CR8288-PC.

Standard Cradle Features

Main features of the CR8288-SC.

Figure 2 CR8288-SC Top Features

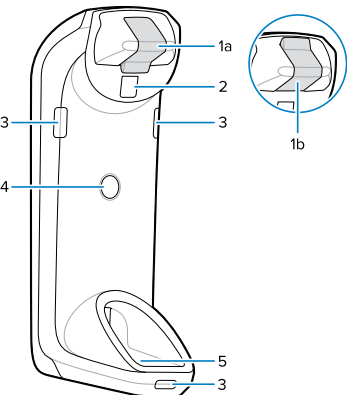


Table 5 CR8288-SC Top Features

	Item	Description
1a	Scanner latch	Removable scanner latch (horizontal desk mount position)
1b ^a		Removable scanner latch (vertical wall mount position)
2	Pairing barcode	Scan to pair scanner with cradle.
3	LED	Indicates charging status.
4	Page button	Press to page connected scanners.
5	Charge pad	Provides charging and communication with a scanner.

^a Go to [Mounting the CR8288-SC Standard Cradle](#) to learn how to reposition the latch.

Figure 3 CR8288-SC Bottom Features

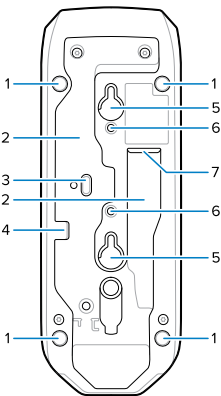
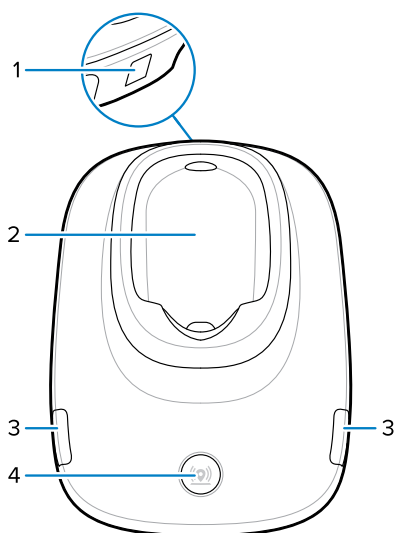


Table 6 CR8288-SC Bottom Features

Number	Item	Description
1	Rubber feet	Prevents the cradle from moving around a desktop.
2	Cable groove	Provides space for cables to exit while the cradle sits flush against a surface.
3	USB-C port	Charges the cradle and facilitates communication with a host device. Can provide additional charging power to a cradle that is also plugged into a host device with the an RJ-50 cable.
4	Interface cable support hook	Guides the cable through the cable groove.
5	Keyhole mounting holes	Mounting holes for fasteners or for the optional bracket accessory BRKT-AP0081W-04.
6	Mounting holes	M4 threaded screw holes.
7	RJ-50 port	Charges the cradle and facilitates communication with a host device.

Presentation Cradle Features

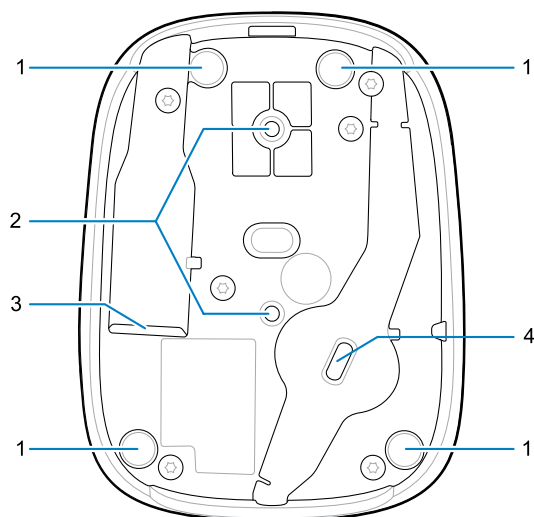
Main features of the CR8288-PC.

Figure 4 CR8288-PC Top Features**Table 7** CR8288-PC Top Features

Number	Item	Description
1	Pairing barcode	Pairs the cradle with a scanner when scanned.
2	Charge pad	Provides charging and communication with a scanner.

Table 7 CR8288-PC Top Features (Continued)

Number	Item	Description
3	LED	Indicates charge status.
4	Page button	Initiates paging status on a paired scanner when pressed.

Figure 5 CR8288-PC Bottom Features**Table 8** CR8288-PC Bottom Features

Number	Item	Description
1	Rubber feet	Provides traction on a horizontal surface.
2	Mounting holes	M4 threaded screw holes.
3	RJ-50 port	Provides charging and communication with a host device.
4	USB-C port	Provides charging and communication with a host device.

Connecting the Cradle

Connect the cradle to a host device or power source to provide charging and/or communication with the host device. Both the USB-C and RJ50 cables provide communication and power.

You can plug in either the RJ-50 or USB-C cable to the cradle. Connect the cable to a power source to charge the scanner, or to a host device to provide both power and communication between the cradle and host device.



NOTE: You can use two cables simultaneously to increase charging speed; connect the RJ-50 cable to a host computer and the USB-C cable to a host or 5 VDC wall adapter.

- When both cables are connected, the RJ50 becomes the active path for all data.

- If the RJ50 does not have a valid host, the data path falls back to USB-C.
- Power is always consumed from the cable that provides faster charging.
- The cradle resets every time a change in cable configuration occurs.
- the USB BC 1.2 detection is supported on both RJ50 and USB-c connectors. Connect to BC 1.2-capable or USB-C host ports for fastest USB charging.

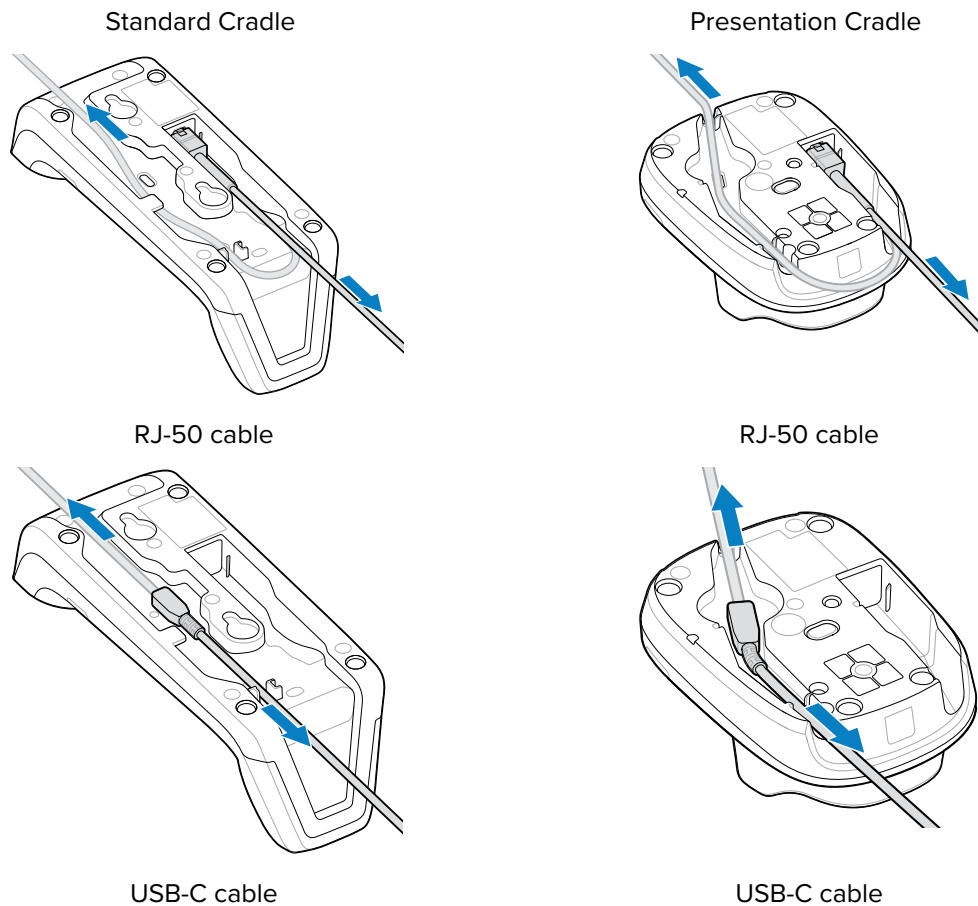
1. Connect the cable to the host computer or power supply.

If you are using the USB-C cable, use the USB-C to USB-A (CBL-U67-S07ZAR) or USB-C to USB-C (CBA-U65-S07ZAR) with a power adaptor or host computer.

2. Insert a cable into the cradle.

The cable should connect to the cradle before the host.

3. Route the cable through the cradle cable grooves, using the tabs to keep the cable in place.



4. Pair the digital scanner to the cradle by inserting it in the cradle or by scanning the pairing code.

The scanner is ready to charge or transmit barcode data to the host device.

Changing the Host Interface

To connect to a different host or to use the same host through a different cable, disconnect from the current host and connect to the new one.

1. Unplug the interface cable from the host.
2. Unplug the power supply from the cradle.
3. Connect the interface cable to the new host or the new interface cable to the existing host.
4. Reconnect the power supply, if required.
5. If necessary, scan the appropriate host barcode (for non-autodetected interfaces).

DC Power Supply

You can connect the cradle to both a host device and a power supply simultaneously. Zebra recommends using 12 VDC power if you require the fastest charging speed.

When a host device does not provide sufficient power to power the cradle and charge the scanner, you can provide additional DC power:

- Use an RJ50 connected to a host and a USB-C cable connected to a DC power supply source.
-
- Use a CBA-U42-S07PAR cable to connect the cradle to both a DC power supply and the host.



CAUTION:

- This product must be connected with a power cord to a socket outlet with an earthing connection.
- Always connect the cradle, then the DC power supply and finally the hosts device.
- Always disconnect the DC power supply first before disconnecting the cable from the host. Disconnecting the host cable first may cause the cradle to not recognize the new host.

Mounting the CR8288-SC Standard Cradle

Mount the cradle on a wall or other vertical surface.

1. Remove the scanner latch.
2. Orient the latch to face upwards and reinsert it in its slot.
3. Position the cradle on the mounting surface and mark the surface on either side of the cradle.
4. Pre-drill holes to accommodate your mounting option

Option	Description
Threaded screw holes	Pre-drill holes to accommodate the two threaded screws. Drill the holes 45.5 (1.8 in.) apart.
Keyhole mounts	Attach the fasteners to the surface 81 mm (3.2 in.) apart.

5. Attach the interface cable.
6. Press the cable into the cable grooves and route it through the cradle.

7. Mount the cradle.

Option	Description
Threaded screw holes	Secure a screw through the wall/vertical surface and into the threaded screw holes.
Keyhole mounts	Secure the fasteners to the wall and hang the cradle on the fasteners.

The cradle is mounted, and you can insert the scanner.

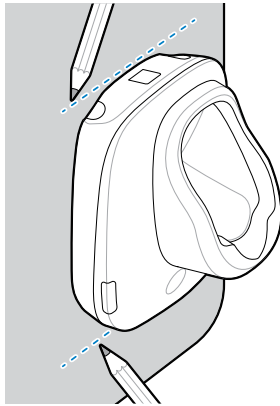
Mounting the CR8288-PC Presentation Cradle

Mount the cradle on a surface angled up to 75°.

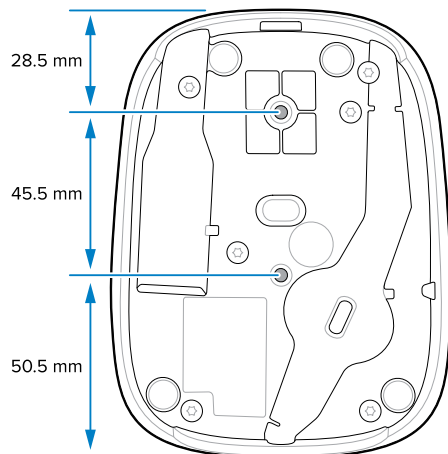


NOTE: You can use the hardware options to mount the cradle or stick the 3M Dual Lock Fasteners on the cradle and surface. Refer to the fastener documentation for more information.

1. Position the cradle on the mounting surface and mark the top and bottom edges.



2. Measure in 28.5 mm (1.1 in.) from the top and 50.5 mm (2.0 in.) from the bottom.



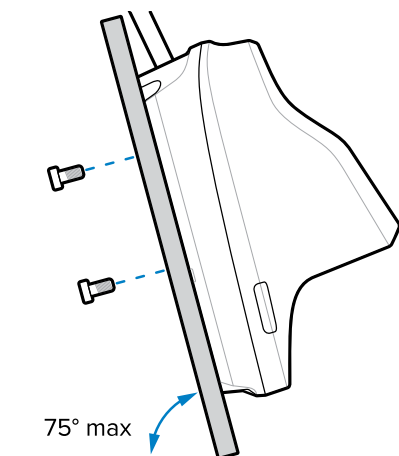
3. Pre-drill holes to accommodate two threaded screws. Drill the holes 45.5 mm (1.8 in.) apart.

4. Attach all required interface and power cables.

5. Press the cables into the cable grooves.

6. Secure the screws through the mounting surface.

7. Use a screwdriver to secure the M4 screws to the cradle. The screws can penetrate a maximum of 5 mm (0.2 in.) into the cradle.

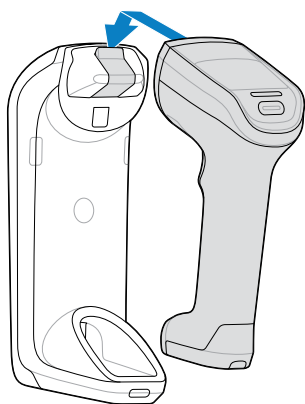


The cradle is mounted, and you can insert the scanner.

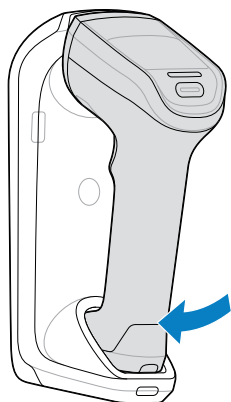
Inserting the DS8288 into the Standard Cradle

The CR8288-SC standard cradle charges the scanner battery. The insertion process is the same for horizontal and mounted cradles.

- For mounted cradles, ensure the latch points upward.
 - For horizontal cradles, ensure the latch points downward.
1. Insert the top of the scanner into the cradle.



2. Press the handle towards the cradle until the bottom of the cradle is secure in the charging pad.



Battery/Power Cap

The scanner includes two power options: a PowerPrecision+ battery and a PowerCap capacitor.



IMPORTANT: We recommend you fully charge the battery before the first use. The PowerCap is fully charged when shipped. The scanner must be inserted into the charging cradle to enable the PowerCap the first time it is used.

The PowerPrecision+ battery and PowerCap capacitor both report their model and serial numbers, which allows the user to always know which power source is in each scanner. The PowerPrecision+ battery is ideal for scanning whether the scanner is near the cradle or away for extended periods. On a single charge, the PowerPrecision+ provides over three around-the-clock days of continuous scanning, plus metrics for better battery management.

The PowerCap capacitor is ideal when the scanner can always be inserted into a charging cradle when not in use. The PowerCap capacitor provides 6,000 scans on a full charge and 100 scans after 35 seconds in the cradle.

Charging the Scanner Battery

Charge a new PowerPrecision+ battery before using the scanner.

1. Insert the battery into the scanner.
2. Place the scanner into a cradle.

The battery begins pre-charging when the cradle LED turns amber. The scanner boots and the cradle LED flashes amber to indicate the start of normal charging.



NOTE:

- If the battery is significantly discharged it may take several minutes for the scanner to boot. During this time the cradle LED remains solid amber, and the scanner's LED shows a solid red. This is normal recovery behavior.

Once the scanner is active, charge time depends on the host type and power source.

- The advanced charging system in the CR8288-XX cradle operates the scanner and charges the battery with as much power as allowed by the host or power supply. Charge times lengthen as scanning activity increases when a scanner operates in presentation mode on

a CR8288-PC cradle. To optimize charge performance, ensure the scanner is oriented to minimize accidental scan activation.



IMPORTANT: While attached to very power-limited hosts, such as a standard USB port, the scanner may slowly discharge the battery during active scanning. In most cases, this is not a problem since the battery charges during breaks in activity. If activation time cannot be reduced, and discharging becomes a problem, it is recommended to attach to a BC1.2 compliant USB port, or use a Zebra USB cable that supports an external power supply.



CAUTION: The battery does not charge when the temperature is below 0°C (32°F) or above 40°C (104°F). Ideally, charge the battery in temperatures between 5 and 35°C (41–95°F).

Shutting Off the Battery

You can shut off the battery or put it into ship mode to preserve the battery level for long-term periods of inactivity such as shipping or storage.

- Battery Ship Mode: Puts the battery into Shipping Mode. Power to the scanner is cut off.



NOTE: Shipping Mode does not apply to PowerCaps.

- Battery Off Mode: Turns off the battery and PowerCap.
- Scan the appropriate barcode



Battery Shipping Mode



Battery Off Mode

Turning the Battery Back On

- Dock the scanner into a cradle to exit Shipping Mode.
- Pull the trigger to exit Battery Off mode.



NOTE: You must dock a scanner with a PowerCap in Battery Off mode to turn the scanner back on.

Battery Statistic Capabilities

The PowerPrecision+ batteries support the following remote management functionality:

- Battery asset information
- Battery manufacture date
- Battery serial number
- Battery model number
- Battery firmware version

- Battery design capacity
- Battery life statistics
- Battery state of health manager
- Battery charge cycles consumed
- Battery status (at time of poll)
- Battery state of charge
- Battery remaining capacity
- Battery charge status
- Remaining time to complete charging battery
- Battery voltage/current
- Battery temperature
- Battery present/highest/lowest

Batter statistic data can be viewed in 123Scan at zebra.com/123Scan, or by using a third-party remote management console.

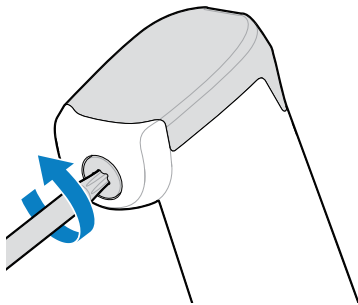
Replacing the Battery

Remove the battery compartment cover to access the rechargeable battery.

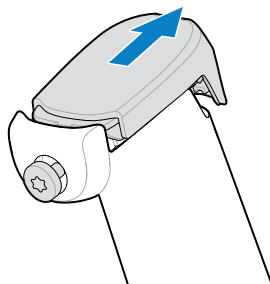


NOTE: Battery replacement instructions apply only to the cordless DS8288 model.

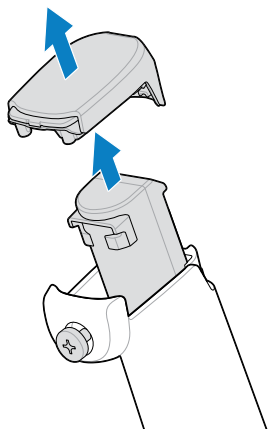
1. Use a T10 screwdriver to remove the screw.



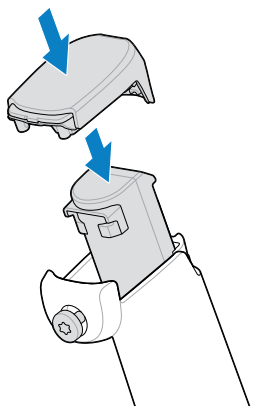
2. Slide the battery compartment cover off.



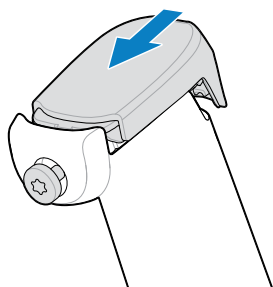
- 3.** Remove the battery from the compartment.



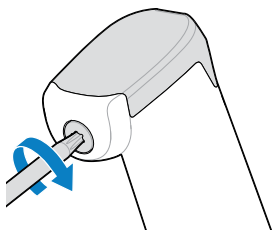
- 4.** Replace the battery and compartment cover.



- 5.** Slide the battery compartment cover into place.



- 6.** Secure the battery compartment cover with a T10 screwdriver to approximately 1.13 N-m (10 lbf-in.).



Host Computer Communication

The digital scanner must pair with the cradle for successful wireless communication.

The cradle receives data from the digital scanner via a wireless radio connection and transmits it to the host computer via the host cable.

Pairing

Pairing registers a scanner to the cradle so that the scanner and cradle can exchange information.

The CR8288-SC and CR8288-PC operate in two modes: Point-to-Point and Multipoint-to-Point. In Point-to-Point mode, pair the digital scanner to the cradle either by inserting it in the cradle (if pair on contacts is enabled) or by scanning the pairing barcode.

In Multipoint-to-Point mode, you can pair up to seven scanners to one cradle.

To pair the scanner with the cradle, insert the scanner in the cradle or scan the pairing barcode. (Pairing on insertion into the cradle is enabled by default.)



NOTE: The pairing barcode that connects the digital scanner to a cradle is unique to each cradle. Do not scan data or parameters until pairing completes.

Reconnecting to the Host

Reestablish a connection with the host computer by disconnecting and reconnecting the cradle.

1. Disconnect the power supply from the cradle.
2. Disconnect the host interface cable from the cradle.
3. Wait 3 seconds.
4. Reconnect the host interface cable to the cradle.
5. Reconnect the power supply to the cradle.
6. Reestablish pairing with the cradle by inserting the scanner in the cradle or scanning the pairing barcode.

Pairing on insertion into the cradle is enabled by default.

Restarting the Cordless DS8288 Scanner

You can power cycle the scanner by pressing the trigger button and programmable button, then placing the DS8288 in its cradle.



NOTE: This process works even if the scanner's programmable button is disabled.

1. Press and hold the trigger and programmable button for at least 12 seconds.
2. Release the buttons.
3. Place the scanner in a cradle.

The scanner reboots.

Data Capture

This section provides beeper and LED definitions, techniques for scanning barcodes, general instructions and tips for scanning, and decode ranges.

Scanner Indications

This section lists the meanings of the scanner's behavior

Table 9 Scanner Beeper and LED Indications

Indication	Beeper Sequence	LED	Haptic Indicator	Illumination
Standard Use				
Powering on	Low, medium, high	Green	Two pulses	
Scanning				
Presentation mode on	None	Green solid		
Presentation mode off	None	No LED; green LED turned off		
Successful barcode decode	Medium ^a	Green flash	One pulse	Flash (disabled by default)
Parity error	Low, low, low, extra low	Red		
Transmission error in a scanned symbol. The data is ignored. This occurs if a unit is not properly configured. Check option setting.	Four long low beeps	Red		
Conversion or format error	Five long low beeps	Red		
Scanner is disabled by a host command to the scanner	None	Red flash on trigger pull		

Table 9 Scanner Beeper and LED Indications (Continued)

Indication	Beeper Sequence	LED	Haptic Indicator	Illumination
A <BEL> character is received over RS-232	High	None		
Entering Night Mode			One short pulse	
Leaving Night Mode	Two short low beeps			
Wireless Operation				
Out of batch storage memory, unable to store new barcode	Low, high, low, high	Red		
Radio Indications				
Scanner inserted into a cradle ^a	Low	None		
Bluetooth connection established	Low, high	Green		
Bluetooth disconnection event	High, low	Red		
Bluetooth page timeout; the remote device is out of range/not powered	Long low, long high	Red		
Bluetooth connection attempt rejected by the remote device	Long low, long high, long low, long high	None		
Bluetooth attempting to reconnect	None	Green flash		
Bluetooth attempting to reconnect (disabled by default)	Five high	None		
Paging	Six high	Blue (fast, fast, slow)	Two short, one long pulses	
Remaining Charge Indications				
Low battery/ PowerCap indication (on trigger release)	Four short high beeps	Red (stays on)		

Table 9 Scanner Beeper and LED Indications (Continued)

Indication	Beeper Sequence	LED	Haptic Indicator	Illumination
Battery/PowerCap charge level: 51-100% Battery/PowerCap charge level: 21-50% Battery/PowerCap charge level: 0-20% Battery/PowerCap charge level indication (state of charge in % of present full charge capacity)	None	Green Amber Red		
The cradle is either not providing current to the scanner, or the scanner is consuming more current than the cradle can supply (go to for more information)	None	Not lit when the scanner sits in the cradle		
Parameter Programming				
Input error, incorrect barcode or Cancel scanned, wrong entry, incorrect barcode programming sequence; remain in program mode	Long low, long high	Red		
Keyboard parameter selected. Enter a value using barcode keypad	High, low	Green		
Successful program exit with a change in the parameter setting	High, low, high, low	Green		
ADF Programming				
ADF transmit error	Low, high, low	None		

Table 9 Scanner Beeper and LED Indications (Continued)

Indication	Beeper Sequence	LED	Haptic Indicator	Illumination
Number expected. Enter another digit. Add leading zeros at the beginning if necessary	High, low	Green		
Alpha expected. Enter another alphabetic character or scan the End of Message barcode	Low, low	Green		
ADF criteria or action is expected. Enter another criteria or action or scan the Save Rule barcode	High, high	Green blinking		
All criteria or actions cleared for current rule, continue entering rule	High low low	Green		
Rule saved. Rule entry mode exited	High, low, high, low	Green (turns off blinking)		
Rule error. Entry error, wrong barcode scanned, or criteria/action list is too long for a rule. Re-enter criteria or action	Long low, long high	Red		
Deleted last saved ruled. The current rule is left intact	Low beep	Green		
All rules deleted	Low, high, high	Green		
Out of rule memory. Erase some existing rules, then try to save the rule again	Long low, long high, long low, long high	Red		
Cancel rule entry. Rule entry mode exited because of an error, or the user asked to exit rule entry	Low low, long high, long low	Green (turns off blinking)		

Table 9 Scanner Beeper and LED Indications (Continued)

Indication	Beeper Sequence	LED	Haptic Indicator	Illumination
Host-Specific				
USB Only				
The scanner has not completed initialization. Wait several seconds and try again	Four high beeps	None		
RS-232 Only				
RS-232 receive error	High, high, high, low	Red		
A <BEL> character is received when Beep on <BEL> is enabled (Point-to-Point mode only)	High	None		
Virtual Tether Alarm				
The scanner disconnects over Bluetooth from the cradle (Virtual Tether Alarm enabled)  NOTE: Virtual Tether Alarm, when enabled, activates on the scanner and cradle	High, low, continuous	Fast blinking alternating green and red	Repeating short pulses	Blinking

^a This setting is configurable.

Cradle LED Indications

This table describes the standard and presentation cradle status LED indications.

Table 10 Cradle LED Indications

LED	Indication
Standard Use	
Green (stays on)	Power Up.

Table 10 Cradle LED Indications (Continued)

LED	Indication
Radio Indications	
Green (off, then on)	Bluetooth connection established.
Blue	Page button pressed.
Blue (fast/fast/slow)	Paging in progress.
Charging Indications	
Amber (stays on)	Pre-charging.
Amber blinking	Charging.
Green (stays on)	Fully charged.
Amber fast blinking	Charging error. See Troubleshooting for more information.
Red blinking	The battery is charging, but it is at end of life. Replace it with a new battery.
Virtual Tether Alarm	
Fast blinking alternating green and red	The scanner disconnects over Bluetooth from the cradle (Virtual Tether Alarm enabled).
Maintenance Indications	
Red blinking	Firmware installation in progress.

Table 11 Host-Controlled Cradle LED Indications

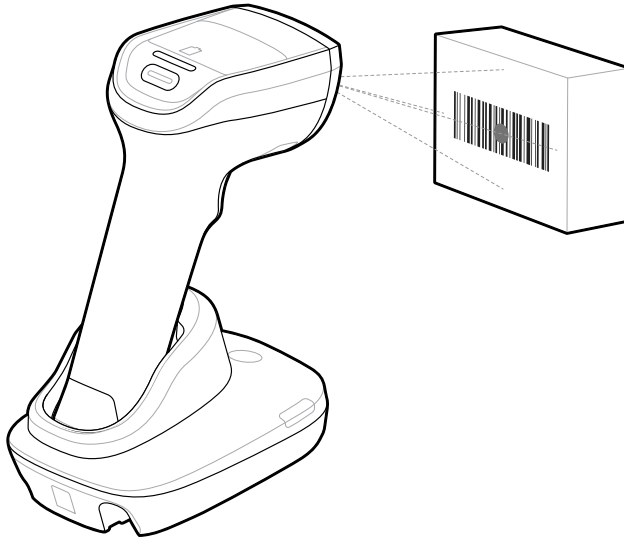
LED	Indication
123Scan	
Green (slow blinking)	Scanner connected to 123Scan.
Red (fast blinking)	File being transferred to the scanner (parameters and firmware).
Red (slow blinking)	Firmware activated on the scanner, loaded into memory.
Green	Programming complete (parameters and firmware).
Red	Error state.
Scanner Management Service (SMS)	
Red blinking (both scanner and cradle)	Loading the SMS package to scanner.

Hands-Free Scanning

The scanner is in hands-free (presentation) mode when it sits in the CR8288-PC cradle. During idle conditions, the scanner operates in object detection mode and automatically wakes up to decode a

barcode presented in the field of view. In object detection mode, it is normal for the illumination LEDs to be dimly lit.

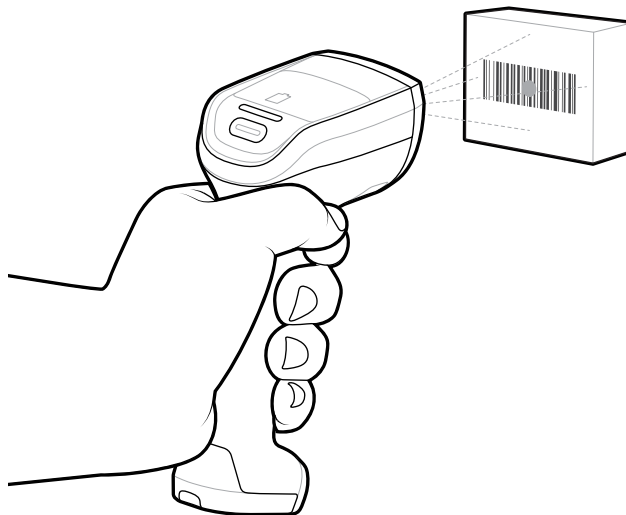
1. Ensure all connections are secure (see appropriate host section).
2. Present the barcode in the scanner's field of view.
3. Upon successful decode, the scanner beeps and the LED flashes green.



Hand-Held Scanning

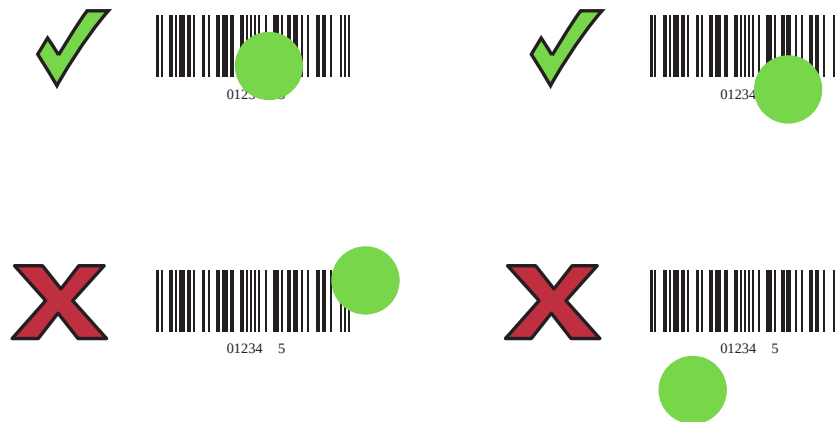
The scanner is in hand-held mode when you pick it up out of a cradle.

1. Pair the scanner with the device. See [Pairing](#) for more information.
2. Point the scanner at a barcode.



3. Press and hold the trigger.

4. Ensure the barcode is within the area formed by the aiming pattern. The aiming dot increases visibility in bright lighting conditions.



5. Upon successful decode, the scanner beeps, and the LED flashes.

Aiming

When scanning, the scanner projects an LED dot, allowing you to position the barcode within the scanner's field of view. Refer to [Decode Ranges](#) for the proper distance between the scanner and a barcode.

If necessary, the scanner turns on its illumination LEDs to illuminate the barcode. The scanner decodes barcodes only when the dot is on the barcode. The first example in [Figure: Scanner Aiming](#) shows an acceptable aiming option, while the second shows an aiming pattern that will not decode.

Figure 6 Scanner Aiming



The aiming dot is smaller when the scanner is closer to the barcode and larger when it is farther away. Scan barcodes with smaller bars or elements (mil size) closer to the scanner and those with larger bars or elements (mil size) farther from the scanner.

The scanner beeps to indicate that it successfully decoded the barcode. For more information on beeper and LED definitions, see the Scanner Indications Table.

Decode Ranges

This section lists the distances at which the scanner can decode various barcode types.

Barcode	Standard Range		
	Module size (mil)	Near limit (inch)	Far limit (inch)
Code 39	3	1.8	6.3
	5	0.6	12.6
	10	0.1	25.5
	20	*0.8	41
100% UPC	13	0.2	27.5
Code 128	3	2.2	6.1
	5	1.3	11
	7.5	0.4	16.3
	15	*3.2	30
PDF-417	4	2.2	6.3
	5	1.9	8
	6.7	1.3	10.5
Data Matrix	5	2.4	6
	7.5	1.6	9.1
	10	0.7	11.8
	20	0	19.8
QR Code	5	2.5	6.4
	10	0.7	12
	20	0	19
*Field of view is limited.			

Maintenance and Troubleshooting

This section provides suggested scanner maintenance and troubleshooting information.

Technical specifications are published on the [zebra.com](#) support page. Go to the [Specifications Page](#).

Maintenance

Keep the DS8208/DS8288 clean and dry to ensure error-free scanning.



IMPORTANT: Use pre-moistened wipes and do not allow liquid cleaner to pool.

- Ensure the following items are addressed when using sodium hypochlorite (bleach)-based cleaners:
 - For scanner only. Do not use on cradle.
 - Always follow the manufacturer's recommended instructions: use gloves during application and remove the residue afterward with a damp cloth to avoid prolonged skin contact while handling the scanner.
 - Due to the powerful oxidizing (corrosion) nature of sodium hypochlorite, any metal surfaces are prone to oxidation (corrosion) when exposed to this chemical in the liquid form (including wipes) and should be avoided. In the event that these types of disinfectants come in contact with metal on the scanner, prompt removal with a dampened cloth after the cleaning step is critical.



REMEMBER: To avoid damage to the device, use only approved cleaning and disinfecting agents listed below. The use of non-approved cleaning or disinfecting agents may void the warranty.

Known Harmful Ingredients

This section lists substances that should be prevented from coming into contact with the device.

- Acetone
- Ammonia solutions
- Aqueous or alcoholic alkaline solutions
- Aromatic and chlorinated hydrocarbons
- Benzene
- Carboic acid

- Compounds of amines or ammonia
- Ethanolamine
- Ethers
- Ketones
- TB-lysoform
- Toluene
- Trichloroethylene

Approved Cleaners for the Scanner and Cradles

Use one of the following cleaners to safely clean your scanner and cradles.

- Isopropyl alcohol 70% (including wipes).
- 10% Bleach (sodium hypochlorite 0.55%) and 90% water solution
- 3% Hydrogen peroxide and 97% water solution.
- Mild dish soap.

Cleaning the Scanner

Routinely cleaning the exit window is required. A dirty window may affect scanning accuracy. Do not allow any abrasive material to touch the window.

1. Dampen a soft cloth with isopropyl alcohol or use pre-moistened alcohol wipes.
2. Gently wipe all surfaces, including the front, back, sides, top, and bottom. Never apply liquid directly to the scanner. Be careful not to let liquid pool around the scanner window, trigger, cable connector or any other area on the device.
3. Be sure to clean the trigger and in between the trigger and the housing (use a cotton-tipped applicator to reach tight or inaccessible areas).
4. Do not spray water or other cleaning liquids directly into the exit window.
5. Wipe the scanner exit window with a lens tissue or other material suitable for cleaning optical material such as eyeglasses.
6. Immediately dry the scanner window after cleaning with a soft, non-abrasive cloth to prevent streaking.
7. Allow the unit to air dry before use.

Troubleshooting

Use this information to troubleshoot the scanner scanner.

Table 12 Troubleshooting

Problem	Possible Causes	Possible Solutions
The aiming dot does not appear when pressing the trigger	No power to the digital scanner	If the configuration requires a power supply, re-connect the power supply.

Table 12 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
	Digital scanner is disabled	For IBM 468x and USB IBM hand-held, IBM tabletop, and OPOS modes, enable the digital scanner via the host interface. Otherwise, see the technical person in charge of scanning.
	If using RS-232 Nixdorf B mode, CTS is not asserted	Assert CTS line.
	Aiming pattern is disabled	Enable the aiming pattern. See Handheld Decode Aiming Pattern .
Scanner emits aiming dot but does not decode barcode	Scanner is not programmed for the barcode type	Program the scanner to read that type of barcode. See Symbolologies .
	Barcode symbol is unreadable	Scan test barcodes of the same barcode type to determine if the barcode is defaced.
	The aiming dot is placed incorrectly on the barcode	Move the barcode so that the aiming dot is within the field of view.
	Distance between scanner and barcode is incorrect	Move the scanner closer to or further from the barcode.
Scanner decodes barcode but does not transmit data to the host	Scanner is not programmed for the correct host type	Scan the appropriate host type programming barcode. See the information corresponding to the host type.
	Interface cable is loose	Reconnect the cable.
	Cradle is not programmed for the correct host type	Check scanner host parameters to edit options.
	Scanner is not paired to host connected interface	Pair scanner to the cradle by scanning the pairing code on the cradle.
	Cradle has lost connection to the host	1. Disconnect power supply 2. Disconnect host cable 3. Wait three seconds 4. Reconnect host cable 5. Reconnect power supply 6. Reestablish pairing

Table 12 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
	If the scanner emits four long low beeps, a transmission error has occurred. This occurs if a unit is not properly configured or connected to the wrong host type	Set the scanner's communication parameters to match the host's setting.
	If the scanner emits five low beeps, a conversion or format error occurred	Configure the scanner's conversion parameters properly.
	If the scanner emits low/high/low beeps, it detected an invalid ADF rule	Program the correct ADF rules. Refer to the Advanced Data Formatting Programmer Guide.
Host displays scanned data incorrectly	Scanner is not programmed to work with the host	Scan appropriate host type programming barcode.
		For RS-232, set the scanner's communication parameters to match the host settings.
		For a Keyboard Wedge configuration, program the system for the correct keyboard type and turn off the CAPS LOCK key.
		Program the proper editing options (for example, UPC-e to UPC-A Conversion).
Scanner emits short low/high/short medium short high beep sequence (power-up beep sequence) more than once	The USB bus may put the scanner in a state where power to the scanner is cycled on and off more than once	Normal during host reset.
Scanner emits four short high beeps during decode attempt	Scanner has not completed USB initialization	Wait several seconds and scan again.
Scanner emits low/low/low/extra low beeps when not in use	RS-232 receive error	Normal during host reset. Otherwise, set the scanner's RS-232 parity to match the host setting.
Scanner emits low/high beeps during programming	Input error, incorrect barcode or Cancel barcode scanned	Scan the correct numeric barcodes within range for the parameter you are programming.
Scanner emits low/high/low beeps during programming	Out of host parameter storage space	Scan the correct number of barcodes within range for the parameter.
	Out of memory for ADF rules	Reduce the number of ADF rules or the number of steps in the ADF rules.
	During programming, indicates out of ADF parameter storage space	Erase all rules and reprogram with shorter rules.

Table 12 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
Scanner emits a power-up beep after changing USB host type	The USB bus re-established power to the digital scanner	Normal when changing USB host type.
Scanner emits one high beep when not in use	In RS-232 mode, a <BEL> character was received, and Beep on <BEL> option is enabled	Normal when Beep on <BEL> is enabled, and the scanner is in RS-232 mode.
Scanner emits frequent beeps	No power to the scanner	Check the system power. If the configuration requires a power supply, reconnect the power supply.
	Incorrect host interface cable connected	Verify that the correct host interface cable is used. If not, connect the correct host interface cable.
	Interface/power cables are loose	Check for loose cable connections and reconnect cables.
Scanner emits five long low beeps after a barcode is decoded	Conversion or format error detected The scanner conversion parameters are not properly configured	Ensure the scanner conversion parameters are properly configured.
	Conversion or format error detected An ADF rule was set up with characters that cannot be sent for the host selected	Change the ADF rule, or change to a host that can support the ADF rule.
	Conversion or format error detected A barcode was scanned with characters that cannot be sent for that host	Change the barcode or change to a host that can support the barcode.
Scanner LED blinks even if the pairing request was canceled from the remote iOS/Android device	If the passkey entry is canceled from the phone/tablet, the scanner remains in the passkey entry mode for 30 sec before timing out	Exit pass key entry mode. Scan Cancel or scan any other barcode.
Scanner emits four short high beeps, and the scanner LED is red	Battery charge is very low	Insert the scanner into a cradle.
Cradle LED blinks amber rapidly, and the scanner LED is not lit	The cradle is not providing current to the scanner	Ensure the scanner is securely seated in the cradle. If the behavior continues, clean and dry the electrical contacts on the scanner and cradle. Then replace the scanner in the cradle and ensure it sits properly on the base.



NOTE: If the scanner still experiences problems after performing these checks, contact the distributor or call support.

Dumping Scanner Parameters

Scan the following barcode to output all the asset tracking and parameter information from the scanner into a text document when troubleshooting a scanner issue.

It may be necessary to first scan <DATA> <SUFFIX 1> (1)



NOTE: If 123Scan is available, use it instead of this feature. 123Scan is the preferred method for reviewing scanner data.

- 1. Connect the scanner to a host computer and open a text program.

Interface	Text Program
USB HID Keyboard Mode	Windows Notepad or Wordpad
RS-232	Windows HyperTerminal

- 2. Scan this barcode to initiate the data transfer from the scanner to the host computer.



See the parameter numbers to interpret the parameter/attribute numbers in the output.

Send Versions

Use the following barcodes to send the specified information.

Send Software Version

Scan the following barcode to send the version of software installed in the scanner.



Software Version

Send Serial Number

Scan the following barcode to send the scanner serial number to the host.



Serial Number

Send Manufacturing Information

Scan the following barcode to send the scanner manufacturing information to the host.



Manufacturing Information

123Scan and Software Tools

This section describes the Zebra software tools available for customizing scanner operation.

123Scan

123Scan is a software tool from Zebra Technologies that simplifies scanner setup and more.

Intuitive enough for first-time users, the 123Scan wizard guides users through a streamlined setup process. Settings are saved in a configuration file that can be printed as a single programming barcode for scanning, emailed to a smart phone for scanning from its screen or downloaded to the scanner using a USB cable.

Through 123Scan a user can:

- Configure a scanner using a wizard.
 - Program the following scanner settings.
 - Beeper tone/volume settings.
 - Enable/disable symbologies.
 - Communication settings.
 - Modify data before transmission to a host using:
 - Advanced Data Formatting (ADF) - Scans one barcode at a time.
 - Preferred Symbol - Single out one barcode on a label of many (select scanners).
- Load parameter settings to a scanner via the following:
 - Barcode scanning.
 - Scan a paper barcode.
 - Scan a barcode from a PC screen.
 - Scan a barcode from a smart phone screen.
 - Download over a USB cable.
 - Load settings to one scanner.
 - Stage up to 10 scanners simultaneously (Powered USB Hub recommended with 0.5 amp / port).

- Validate scanner setup.
 - View scanned data within the utility's Data view screen.
 - Capture an image and save it to a PC within the utility's Data view screen.
 - Review settings using the Parameter Report.
 - Clone settings from an already deployed scanner from the Start screen.
- Upgrade scanner firmware.
 - Load settings to one scanner.
 - Stage up to 10 scanners simultaneously (Powered USB Hub recommended with 0.5 amp/port).
- View statistics, such as:
 - Asset tracking information.
 - Time and usage information.
 - Barcodes scanned by symbology.
- Generate the following reports.
 - Barcode Report - Programming barcode, relevant parameter settings, and supported scanner models.
 - Parameter Report - Parameters programmed within a configuration file.
 - Inventory Report - Scanner asset tracking information.
 - Validation Report - Scanned data from the Data view.
 - Statistics Report - All statistics retrieved from the scanner.

For more information, go to zebra.com/123Scan.

Communication with 123Scan

Use a USB cable to connect the scanner to a Windows host computer running 123Scan.

123Scan Requirements

- Host computer running Windows 10 or 11
- Scanner
- USB cable

123Scan Information

Use these links to learn more about using 123Scan and Zebra software tools.

For more information on 123Scan, go to zebra.com/123Scan

For a one-minute tour of 123Scan, go to [How-to Videos For Zebra Scanners](#)

To see a list of all of our software tools, go to zebra.com/scannersoftware

Scanner SDK, Other Software Tools, and Videos

Tackle all your scanner programming needs with our diversified set of software tools. Whether you need to stage a device or develop a fully featured application with image and data capture and asset management, these tools help you every step of the way.

To download any of the following free tools, go to: zebra.com/scannersoftware.

- 123Scan configuration utility
- SDKs
 - Scanner SDK for Windows
 - Scanner SDK for Linux
 - Scanner SDK for Android
 - Scanner SDK for iOS
- Drivers
 - OPOS driver
 - JPOS driver
 - USB CDC driver
- Scanner Management Service (SMS) for Remote Management
 - Windows
 - Linux
- Mobile Apps
 - Scanner Control App
 - Android
 - iOS
 - Scan-To-Connect Utility
 - Android
 - Windows
- How-To-Videos



NOTE: For a list of SDK-supported scanner functionality by communication protocol, see [Communication Protocol Functionality](#).

Advanced Data Formatting

Advanced Data Formatting (ADF) allows customizing data before transmission to the host device. Use ADF to edit scanned data to suit the host application's requirements. With ADF you scan one barcode per decode session. ADF is programmed using 123Scan.

For a video on Creating an Advanced Data Formatting (ADF) Rule using 123Scan, go to [How-to Videos For Zebra Scanners](#).

For additional information, refer to the Advanced Data Formatting Programmer Guide.

Multicode Data Formatting

Programming options include:

- Output all or specific barcodes.
- Control the barcode output sequence.
- Apply unique multicode data formatting (MDF) to each output barcode.
- Discard scanned data if all required barcodes are not present.

For more information, refer to the Multicode Data Formatting and Preferred Symbol User Guide, p/n MN-002895-xx.

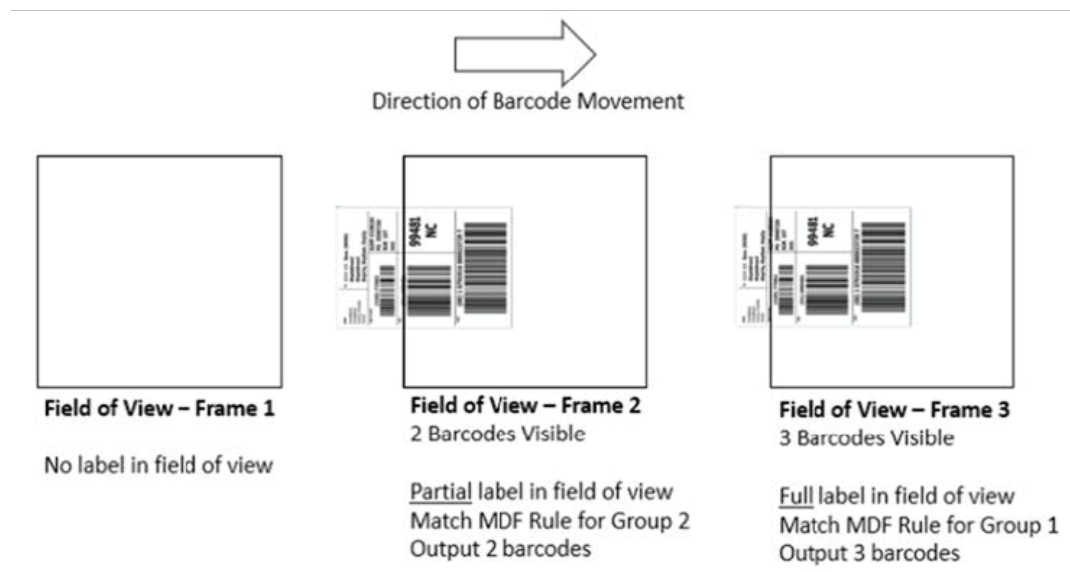
For a video on Creating an Multicode Data Formatting (MDF) Rule using 123Scan, go to [How-to Videos For Zebra Scanners](#).

Multicode Data Formatting Use

Multicode Data Formatting may yield multiple unexpected and undesired outputs when a label (most likely on a complex label) passes through the scanner's field of view. This problem happens when the complex label's barcodes can be matched by more than one group (for example, Group 1 represents all barcodes present, and Group 2 represent some barcodes present).

1. As the label is moving through the field of view, it is first partially read (some of the barcodes in the field of view in Frame 2).
2. Then, the second decode occurs as it is fully read (all the barcodes in the field of view in Frame 3).
3. This yields two different outputs (instead of the expected single output) from the presentation of a label. This problem is driven by a complex label inadvertently matching two different MDF rules/groups, thereby yielding two outputs.

Figure 7 Scanning Label in a Horizontal Orientation

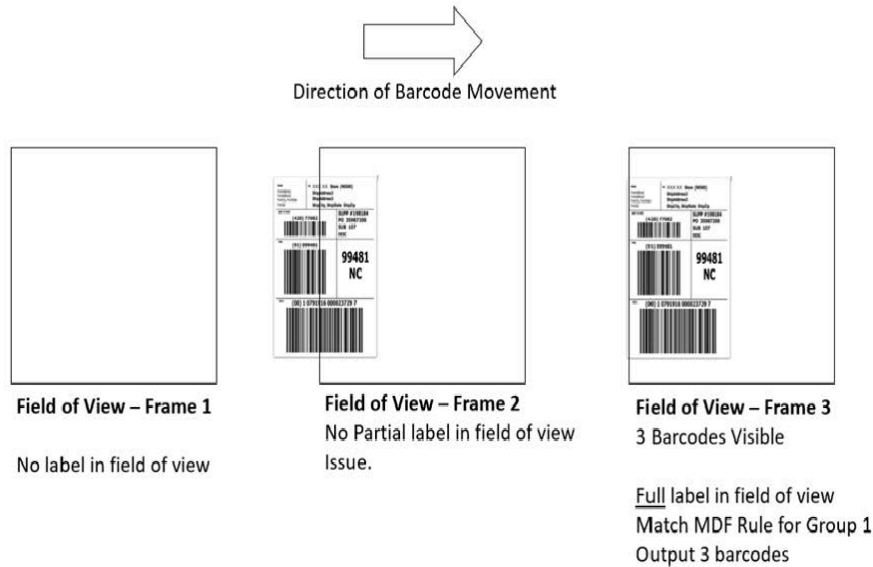


MDF for Best Practices

Suggestions to minimize the undesired multiple outputs when scanning with MDF.

- Scan barcodes in a vertical orientation.

Figure 8 Scanning Label in a Vertical Orientation



- When creating the MDF programming with multiple groups, the Group 1's pattern match should be the most complicated (hardest to match), which equals to the most number of barcodes and criteria. Then Group 2, 3, and so on should be progressively matched more easily.
- When defining criteria, avoid enabling an output when the pattern is not matched. Set **Output if NO pattern match** set as **Discard barcode**.

Figure 9 Figure Match Setting for Output

Pattern Match

A pattern match is the criteria used to determine if a set of scanned bar codes qualify for manipulation with Multicode Data Formatting.
If the pattern match criteria are met, the MDF will be applied to the output of "Output if pattern match".
If the pattern match criteria are not met, the MDF will be applied to the output of "Output if NO pattern match".

Is bar code required for pattern match [What is this?](#)

☒ Required for match
☐ Not part of match

Output if pattern match.
Transmit bar code [What is this?](#)

Output if NO pattern match.
Discard bar code [What is this?](#)

Discard barcode

- Select **Discard barcode(s) NOT within the pattern match** in the 123Scan MDF setting. For more details, select **What is this?** located next to this selection.

- To prevent double decodes of the same symbol, increase the **Timeout Between Same Symbols** setting. See [Timeout Between Decodes, Same Symbol](#) for more details.
- Other reasons a label/barcode may not be decoded while in the field of view are as follows:
 - The label out of focus (too close or too far away).
 - Specular reflection (reflection off a shiny surface).
 - The label is presented at an extreme angle to the scanner.

Preferred Symbol

Preferred Symbol is a barcode prioritization technique that enables favored decoding of high-priority barcode(s). The Preferred Symbol is the only barcode that is decoded and output within the preset Preferred Symbol Timeout. During this time, the scanner attempts to decode the prioritized barcode and reports only this barcode.

For more information, refer to the Multicode Data Formatting and Preferred Symbol User Guide, p/n MN-002895-xx.

To program Preferred Symbol via 123Scan, select **123Scan > Configuration Wizard > Symbologies** screen, and then select **Preferred Symbol** from the drop-down menu. Preferred Symbol programming is saved in the 123Scan configuration file.

Figure 10 Preferred Symbol Programming Options

The screenshot shows the 'Preferred Symbol' programming options. At the top is a dropdown menu labeled 'Preferred Symbol'. Below it is a checkbox labeled 'Preferred Symbol' with a link 'What is this?'. A circular arrow icon indicates expandable options. Under the 'Options' section, there are three main settings:

- Prioritized symbologies:** Includes 'Preferred Symbol Options' with a 'Select codes' button and an 'Edit' link.
- Identify exact bar code:** Includes 'Preferred symbol criteria' with a 'View / Edit' link.
- Prioritization time (ms):** Includes a numeric input field set to '200' with up/down arrows and a 'What is this?' link.

Data Parsing (UDI Scan+, Label Parse+ and Blood Bag Parse+)

Data Parsing allows a Zebra scanner to scan a UDI label, GS1 label, or Blood Bags with one or more barcodes encoded with multiple data fields (such as date of manufacture, expiration date, batch number, GTIN, and SSCC) and transmit select data fields and not others, in a specific order to a host application. Wave the scanner over all the barcodes while holding the trigger.

The scanner finds and transmits only the required data fields, even if they are spread across multiple barcodes and on different sides of the container.

In addition, the scanner can insert field separators (such as tab, enter, and slash) to automate data entry into a host application.

Use 123 Scan to program your scanner. For more information on writing a Data Parsing Rule, refer to the Data Parsing (UDI, GS1 Label, Blood Bag) on Zebra Scanners User Guide at: zebra.com/support. To watch a video on Creating a Data Parsing Rule using 123Scan, go to: zebra.com/ScannerHowToVideos.

Scan a UDI Label using UDI Scan+

Government regulatory agencies (such as the United States Food and Drug Administration (FDA), European Commission, and International Medical Device Regulatory Forum) have established Unique Device Identification (UDI) standards to identify and monitor the distribution and use of medical devices within healthcare environments

These UDI standards identify medical devices from manufacturing through distribution to patient use - enabling complete traceability of the millions of individual medical devices utilized for patient care. To enable UDI compliance, all medical devices must carry a UDI label to enable “track and trace” from the point of production, during shipment, through the product’s use and disposal.

Scan a GS1 Label using Label Parse+

The GS1 Organization, an international standards body, has released specifications used worldwide for generating shipping labels. These labels are used when shipping packages (logistics), raw materials and produce.

Scan a Blood Bag Label using Blood Bag Parse+

The International Council for Commonality in Blood Banking Automation (CCBBA Organization, an international standards body, has released a worldwide specification for generating blood bag labels. These labels are used when shipping, storing, and using blood bags.



NOTE: For more information, go to: isbt128.org/tech-library/iccbba-documents/standards-documents/standard-labeling-blood.

User Preferences and Miscellaneous Options

You can program the scanner to perform various functions or activate different features. This section describes user preference features and provides programming barcodes for selecting these features.

The scanner ships with the settings shown in [Symbology Parameter Defaults](#). If the default values suit requirements, programming is not necessary.

Setting User Preference Parameters

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the scanner powers down.



NOTE: Most computer monitors allow scanning barcodes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the barcode clearly, and bars and/or spaces do not merge.

If not using the default host, select the host type (see each host section for specific host information) after the power-up beeps sound. This is only necessary upon the first power-up when connected to a new host.

To return all features to default values, see [Default Parameters](#). Throughout the programming barcode menus, asterisks indicate (*) default values.

User Preference Scanning Sequence Examples

In most cases, scanning one barcode sets the parameter value.

Other parameters require scanning several barcodes. Relevant parameters contain descriptions for this procedure.

User Preference Errors While Scanning

Unless otherwise specified, to correct an error during a scanning sequence, re-scan the correct parameter.

User Preferences/Miscellaneous Options Parameter Defaults

The following table lists defaults for user preferences parameters. Change these values in one of two ways:

- Scan the appropriate barcodes in this chapter. The new value replaces the standard default value in memory. To recall default parameter values, see [Symbology Parameter Defaults](#).

Configure the scanner using the 123Scan configuration program.



NOTE: Standard parameter defaults are available in each chapter of this guide.

Table 13 User Preferences Parameter Defaults

Parameter	Parameter Number ^a	SSI Number ^b	Default
User Preferences			
Set Default Parameter			N/A
Parameter Barcode Scanning	236	ECh	Enable
Beep After Good Decode	56	38h	Enable
Beeper Volume	140	8Ch	High
Scan Tone	145	91h	Medium
Beeper Duration	628	F1h 74h	Medium
Suppress Power-Up Beeps	721	F1h D1h	Do Not Suppress
LED on Good Decode	744	F1h E8h	Enable
Direct Decode Indicator	859	F2h 5Bh	Disable
Decode Pager Motor	613	F1h 65h	Enable
Decode Pager Motor Duration	626	F1h 72h	150 msec
Night Mode Trigger	1215	F8h 04h BFh	Disable
Night Mode Toggle	N/A	N/A	N/A
Night Mode Silence Beeper Parameter Programming Indications	2264	F8h 08h D8	Enable Always
Night Mode Silence Beeper Low Battery Indication	2263	F8h 08h D7	Enable Always
Low Power Mode	128	80h	Cordless DS8288: Enable Cordless DS8208: Disable
Time Delay to Low Power Mode	146	92h	Cordless DS8288: 100 ms Cordless DS8208: 1 Hour
Timeout to Low Power Mode from Auto Aim	729	F1h D9h	100 msec
Lamp Mode	1711	F8h 06h AFh	SR/DL: Disable
Lamp Mode Timeout	1712	F8h 06h B0h	5 minutes
Battery Preservation Mode	1765	F8h 06h E5h	PowerPrecision+ Battery: 9 hours PowerCap: 30 minutes
Trigger Mode	138	8Ah	Cordless DS8288: Standard (Level) Cordless DS8208: Auto-Aim
Hands-free Mode	630	F1h 76h	Enable

Table 13 User Preferences Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Hand-held Decode Aiming Pattern	306	F0h 32h	Enable
Hands-free (Presentation) Decode Aiming Pattern	590	F1h 4Eh	Disable
Picklist Mode	402	F0h 92h	Disable Picklist Mode Always
Continuous Barcode Read	649	F1h 89h	Disable
Unique Barcode Reporting	723	F1h D3h	Enable
Decode Session Timeout	136	88h	9.9 Seconds
Hands-Free Decode Session Timeout	400	F0 90	15
Timeout Between Decodes, Same Symbol	137	89h	0.5 Seconds
Timeout Between Decodes, Different Symbols	144	90h	0.1 Seconds
Triggered Timeout, Same Symbol	724	F1h D4h	Disable
Mobile Phone/Display Mode	716	F1h CCh	Normal
PDF Prioritization	719	F4h F1h CFh	Disable
PDF Prioritization Timeout	720	F1h D0h	200 ms
Presentation Mode Field of View	609	F1h 61h	Full
Decoding Illumination	298	F0h 2Ah	Enable
Illumination Brightness	669	F1h 9Dh	High
Motion Tolerance (Hand-held Trigger Mode Only)	858	F2h 5Ah	Less
Battery Status High Threshold	1367	N/A	50%
Battery Status Medium Threshold	1368	N/A	20%
Battery Status Low Warning Threshold	1369	N/A	10%
Battery Health Low Warning Threshold	1370	N/A	60%
Battery Charging User Indication Enhancement	2255	F8h 08h CFh	Blink Amber
Product ID (PID) Type	1281	F8h 05h 01h	Host Type Unique
Product ID (PID) Value	1725	F8h 06h BDh	0
ECLevel	1710	F8h 06h AEh	0
Decode Range Limit (Hands-free)	1950	F8h 07h 9Eh	Standard
Motion Detect Mode	2377	F8 09 49	IR Detect
Programmable Button Hand-Held	2060	F8h 08h 0Ch	SR/DL: Secondary Trigger
Programmable Button Hands-Free	2500	F8h 09h C4h	SR/DL: Secondary Trigger
Miscellaneous Options			

Table 13 User Preferences Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Enter Key	N/A	N/A	N/A
Tab Key	N/A	N/A	N/A
Transmit Code ID Character	45	2Dh	None
Prefix Value	99, 105	63h, 69h	7013 <CR><LF>
Suffix 1 Value	98, 104	62h, 68h	7013 <CR><LF>
Suffix 2 Value	100, 106	64h, 6Ah	7013 <CR><LF>
Scan Data Transmission Format	235	EBh	Data As Is
FN1 Substitution Values	103, 109	67h, 6Dh	7013 <CR><LF>
Transmit “No Read” Message	94	5E	Disable
Unsolicited Heartbeat Interval	1118	F8h 04h 5Eh	Disable
securPharm Decoding	1752	F8h 06h D8h	Disable
securPharm Output Formatting	1753	F8h 06h D9h	No Formatting

^a Parameter number decimal values are used for programming via RSM commands.

^b SSI number hex values are used for programming via SSI commands.

User Preferences

Set feature values by scanning the desired parameter values.

Default Parameters

Scan one of the following barcodes to reset the scanner to its default settings.

- Restore Defaults resets all default parameters as follows:
 - If you configured custom default parameter values via the Write to Custom Defaults barcode, scanning the Restore Defaults barcode restores these custom values.
 - If you did not configure custom default parameter values, scanning the Restore Defaults barcode restores the factory default values. Default values are available at the beginning of each section.
- Set Factory Defaults clears all custom default values and sets the factory default values. Default values are available at the beginning of each section.
- Write to Custom Defaults configures default parameters to set unique default values for all parameters. After changing all parameters to the desired default values, scan the **Write to Custom Defaults** barcode below to configure custom defaults.



Restore Defaults



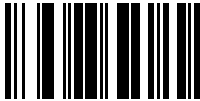
Set Factory Defaults



Write to Custom Defaults

Write to Custom Defaults

To create a set of custom defaults, select the desired parameter values in this guide and then scan Write to Custom Defaults.

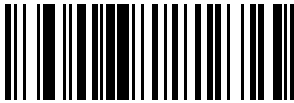


Write to Custom Defaults

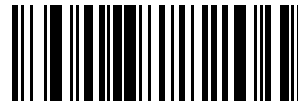
Parameter Barcode Scanning

Parameter # 236 (SSI # ECh)

This parameter selects whether to enable or disable the decoding of parameter barcodes, including the **Set Defaults** barcodes.



*Enable Parameter Barcode Scanning (1)



Disable Parameter Barcode Scanning (0)

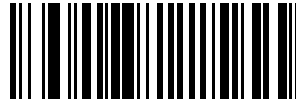
Beep After Good Decode

Parameter # 56 (SSI # 38h)

This parameter selects whether or not the scanner beeps after a good decode. If you select **Disable Beep After Good Decode**, the beeper still operates during parameter menu scanning and to indicate error conditions.



*Enable Beep After Good Decode (1)

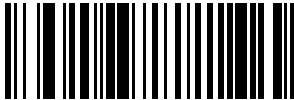


Disable Beep After Good Decode (0)

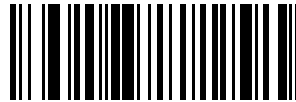
Beeper Volume

Parameter # 140 (SSI # 8Ch)

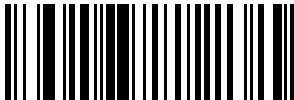
This parameter selects a beeper volume.



Low Volume (2)



Medium Volume (1)



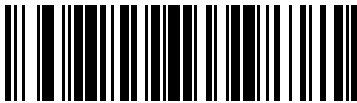
*High Volume (0)

Scan Tone

Parameter # 145 (SSI # 91h)

Use this parameter to select a scan tone. Select one scan tone from the special tones or from the standard tones. Use the Disable Tone option to disable all tones.

Standard Tones



Disable Tone (3)



Low Tone (2)



*Medium Tone (1)



High Tone (0)

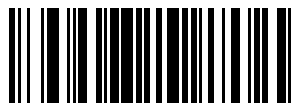


Medium to High Tone (2-tone) (4)

Special Tones



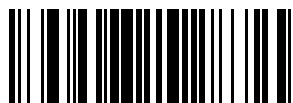
Wood Block / Tone 1 (6)



Pulse / Tone 2 (7)



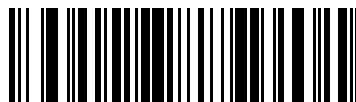
Chime / Tone 3 (8)



Zap / Tone 4 (9)



Triple Beep / Tone 5 (10)



User Programmable / Tone 6 (11)

Note: See Custom Scan Tone to download a custom tone.

Beeper Duration

Parameter # 628 (SSI # F1h 74h)

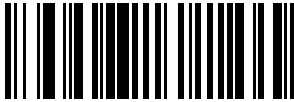
This parameter selects the duration for the good decode beep.



Short Duration (0)



*Medium Duration (1)



Long Duration (2)

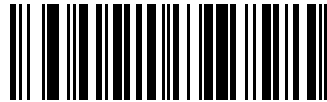
Suppress Power Up Beeps

Parameter # 721 (SSI # F1h D1h)

This parameter selects whether or not to suppress the scanner's power-up beeps.



*Do Not Suppress Power Up Beeps (0)



Suppress Power Up Beeps (1)

LED on Good Decode

Parameter # 744 (SSI # F1h E8h)

This parameter selects whether or not the LED blinks on a good decode.



*Enable LED on Good Decode (2)



Disable LED on Good Decode (0)

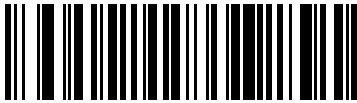
Direct Decode Indicator

Parameter # 859 (SSI # F2h 5Bh)

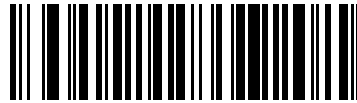
This parameter selects an optional blinking indicator on successful decode if you continue to hold the trigger.

This allows you to choose additional feedback for a successful decode by holding the trigger or continuing to scan as normal.

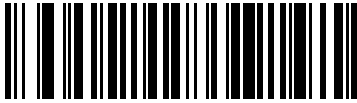
- ***Disable Direct Decode Indicator** - does not blink on a successful decode.
- **1 Blink** - blinks once upon a successful decode.
- **2 Blinks** - blinks twice upon a successful decode.



*Disable Direct Decode Indicator (0)



1 Blink (1)



2 Blinks (2)

Decode Pager Motor

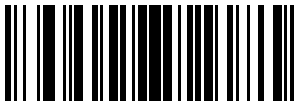
Parameter # 613 (SSI # F1h 65h)

The scanner includes a pager motor, which, when enabled, vibrates the scanner for a period of time when a successful decode occurs. This parameter enables or disables the pager motor.

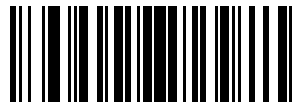


NOTE: While the scanner is docked, the pager motor is disabled.

If enabled, select a [Decode Pager Motor Duration](#) option to set the duration of the pager motor vibration.



*Enable Pager Motor (1)

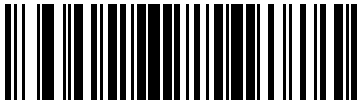


Disable Pager Motor (0)

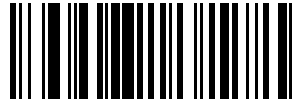
Decode Pager Motor Duration

Parameter # 626 (SSI # F1h 72h)

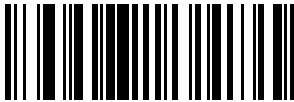
If Decode Pager Motor is enabled, scan one of the following barcodes to set the duration of the pager motor vibration.



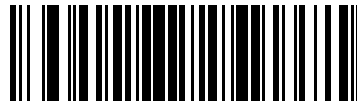
*150 msec (15)



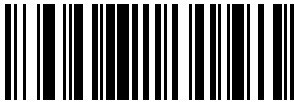
200 msec (20)



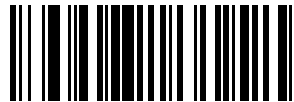
250 msec (25)



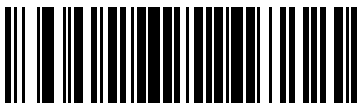
300 msec (30)



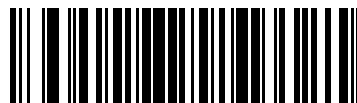
400 msec (40)



500 msec (50)



600 msec (60)



750 msec (75)

Night Mode

This parameter allows you to easily switch to a quiet mode in order to use the pager motor with the beeper off.

Entering Night Mode enables [Decode Pager Motor](#), and disables [Beep After Good Decode](#).

Enter and exit Night Mode in one of two ways:

- If [Night Mode Trigger](#) is enabled, you can use the trigger to toggle between entering and exiting Night Mode. To do this, point the scanner away from a barcode and press the trigger until the beam goes off. Hold the trigger for an additional 5 seconds. Note that after decoding a barcode, holding the trigger for an additional 5 seconds has no effect.
- Use [Night Mode Toggle](#) to enter or exit Night Mode, regardless of the state of the [Night Mode Trigger](#) parameter.

Also, note the following scanner behavior regarding Night Mode:

- The paired cradle dims its LEDs when connected to a scanner in Night Mode. The LEDs remain dimmed until the cradle reboots or when a scanner connects to while not in Night Mode.
- Exiting Night Mode returns the scanner to the previously programmed states for the three parameters changed. For example, if [Beep After Good Decode](#) was enabled before entering Night Mode, it returns to enabled upon exiting Night Mode.
- When entering Night Mode, the pager motor vibrates. When exiting Night Mode, the scanner emits two short beeps.
- Scanning a [Default Parameters](#) barcode causes the scanner to exit Night Mode.
- For scanners that do not use a pager motor, scanning any of the Night Mode parameters or the pager motor parameters results in an error beep.
- If the scanner loses power while in Night Mode because a cable is disconnected, on the next power up the scanner exits Night Mode and resumes normal operation.

Night Mode Trigger

Parameter # 1215 (SSI # F8h 04h BFh)

Enable Night Mode Trigger to use the trigger to toggle between entering and exiting Night Mode. To toggle, point the scanner away from a barcode, press the trigger until the beam goes off, and then hold the trigger for an additional 5 seconds. Note that pressing the trigger an additional 5 seconds after decoding a barcode has no effect.

When entering Night Mode, the pager motor vibrates. When exiting Night Mode, the scanner emits two short beeps.



Enable Night Mode Trigger (1)



*Disable Night Mode Trigger (0)

Night Mode Toggle

Scan this barcode to toggle between entering and exiting Night Mode without using the trigger. This functions regardless of the state of the Night Mode Trigger parameter.

When entering Night Mode, the pager motor vibrates. When exiting Night Mode, the scanner emits two short beeps.



Toggle Night Mode

Night Mode Silence Beeper Parameter Programming Indications

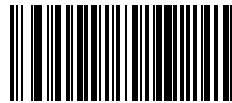
Parameter # 2264 (SSI # F8h 08h D8)

This parameter selects whether to enable or disable this feature.

This parameter enables silencing the beep that occurs when the scanner is being programmed if the parameter is set to Disable in Night Mode or Disable Always.



Disable Always (0)



*Enable Always (1)



Disable in Night Mode (2)

When **Disable in Night Mode** or **Disable Always** is active, the following parameter barcode programming beeper indications are silenced:

Parameter Programming Indication Name	Beeper Sequence	Parameter Programming Indication
Input Error	Long low/long high	Incorrect barcode or Cancel scanned, wrong entry, incorrect barcode programming sequence; remain in program mode.
Keyboard parameter selected	High/low	Enter value using barcode keypad.
Successful programming	High/low/high/low	Successful program exited with change in the parameter setting.
ADF Programming		

Parameter Programming Indication Name	Beeper Sequence	Parameter Programming Indication
Number expected	High/low	Enter another digit. Adding leading zeros to find the front, if necessary.
Alpha expected	Low/low	Enter another alphabetic character or scan the End of Message barcode.
ADF criteria/action expected	High/high	Enter another criteria or action or scan the Save Rule barcode.
ADF criteria/action cleared	High/low/low	All criteria or actions cleared for current rule, continuing entering rule.
Rule saved	High/low/high/low	Rule successfully saved, and rule entry mode exited.
Rule error	Long low/long high	Entry error, wrong barcode scanned, or criteria/action list is too long for a rule. Re-enter criteria or action.
Deleted last saved rule	Low	Deletes the last saved rule but the current rule is left intact.
All rules deleted	Long high/high	All rules entered are deleted.
Out of memory	Long low/long high/long low/long high	Out of ADF memory. Erase some existing rules, then try to erase the rule again.
Cancel rule entry	Long low/long high/long low	Rule entry mode exited because of an error, or the user asked to exit rule entry.

Low Power Mode

Parameter # 128 (SSI # 80h)

This parameter selects whether or not the scanner enters low power mode after a decode attempt or host communication.

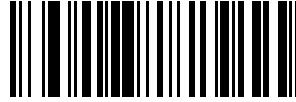
This applies to serial and keyboard wedge connections. If disabled, power remains on after each decode attempt.



NOTE: The Low Power Mode parameter only applies for non-USB and non-RS485 host interfaces, and when [Trigger Mode](#) is set to Level 1 (Standard).



*Enable Low Power Mode (1) is the default setting for the cordless DS8288.



*Disable Low Power Mode (0) is the default setting for the corded DS8208.

Time Delay to Low Power Mode

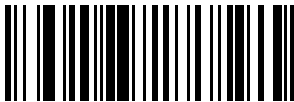
Parameter # 146 (SSI # 92h)

This parameter sets the time the scanner remains active before entering low-power mode. The scanner wakes upon trigger press or when the host attempts to communicate with the scanner.



NOTE: This parameter only applies when [Low Power Mode](#) is enabled.

Corded DS8208 Scanner Options



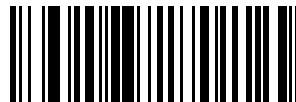
1 Second (17)



10 Seconds (26)



1 Minute (33)



5 Minutes (37)



15 Minutes (43)



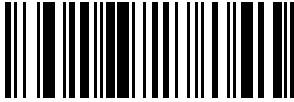
30 Minutes (45)



45 Minutes (46)



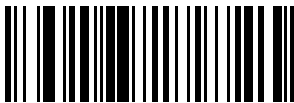
*1 Hour (49)



3 Hours (51)



6 Hours (54)

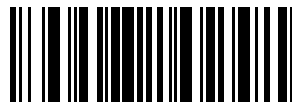


9 Hours (57)

Cordless DS8288 Scanner Options



*100 msec (65)



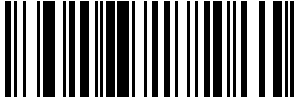
500 msec (69)



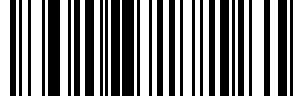
1 sec (17)



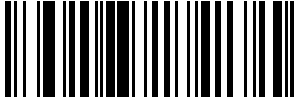
2 sec (18)



3 sec (19)



4 sec (20)



5 sec (21)



10 sec (26)



15 sec (27)

Timeout to Low Power Mode from Auto Aim

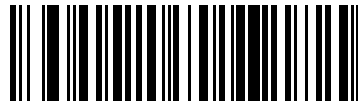
Parameter # 729 (SSI # F1h D9h)

This parameter sets the duration the scanner remains in auto aim before entering low power mode.

See [Trigger Mode](#) for an explanation of auto aim mode.



Disable Timeout to Low Power Mode from Auto Aim (0)



*100 Milliseconds (49)



5 Seconds (5)



15 Seconds (11)



30 Seconds (13)



1 Minute (17)

Lamp Mode

Parameter # 1711 (SSI # F8h 06h AFh)

In Lamp Mode, the scanner provides continuous illumination on-demand to illuminate the surrounding workspace while in the presentation cradle.



NOTE: Applies to presentation cradle (CRxxxx-PC).

Select an option to enable Lamp Mode with or without allowing barcode scanning. After enabling Lamp Mode, press the page button on the presentation cradle to activate and deactivate this mode.



Enable Lamp Mode with Scanning (1)



Enable Lamp Mode without Scanning (2)



*Disable Lamp Mode (0)

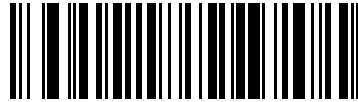
Lamp Mode Timeout

Parameter # 1712 (SSI # F8h 06h B0h)

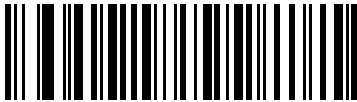
This parameter sets the time the lamp remains on when Lamp Mode is enabled.



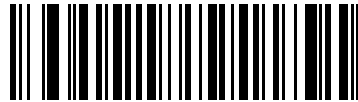
1 Minute (1)



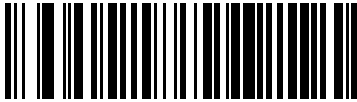
*5 Minutes (5)



10 Minutes (10)



30 Minutes (30)



Always On (0)

Battery Preservation Mode

Parameter # 1765 (SSI # F8h 06h E5h)

Battery Preservation Mode preserves the battery charge when the scanner is not being used for an extended period of time.

Notes

When asleep in Battery Preservation Mode, you cannot access the scanner for remote management.

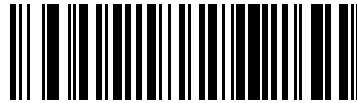
Set the Battery Preservation Timeout Value to change the amount of time before the battery disconnects from the scanner.

- Use Enable Battery Preservation Mode to internally disconnect the battery from the scanner when the scanner is unused and not being charged for nine hours (default). In this mode the scanner completely turns off. This preserves the battery charge and significantly extends battery shelf life. To exit Battery Preservation Mode and return to normal operation, press the scanner trigger or return to charging. The scanner cannot scan until the wake-up process completes. This takes a few seconds.
- Use Disable Battery Preservation Mode to keep the battery connected to the scanner at all times. This prevents the battery from disconnecting from the scanner after nine hours of sitting idle (no scanning) and not charging. Substantial battery shelf life improvements are not gained as when Battery Preservation Mode is enabled.
- Use Battery Preservation Timeout followed by 3 digits in [Numeric Barcodes](#) to select a different battery preservation timeout value (the default for the PowerPrecision+ is nine hours and the default value for

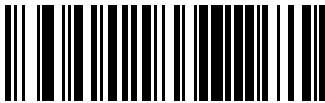
the PowerCap is 30 minutes.). For example, to set the preservation timeout value to 12 hours, scan Battery Preservation Timeout, and then scan 0, 1, and 2 in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).



*Enable Battery Preservation Mode (9)



Disable Battery Preservation Mode (0)



Battery Preservation Timeout Value

Trigger Mode

Parameter # 138 (SSI # 8Ah)

This parameter allows you to change your scanner's behavior to initiate a decode.

Choose one of the following to select a trigger mode for the scanner:

- Standard (Level) - A trigger press activates decode processing. Decode processing continues until the barcode decodes, you release the trigger or the [Decode Session Timeout](#) occurs. If the trigger is released before the timeout expires, the decode session terminates and no decode occurs.

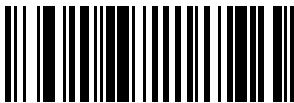


NOTE: Default for cordless DS8288.

- Presentation (Blink) - The scanner activates decode processing when it detects a barcode in its field of view. After a period of non-use, the LEDs turn off until the scanner senses motion.
- Auto Aim - When lifted, the scanner projects the aiming pattern. A trigger press activates decode processing. After a period of inactivity, the aiming pattern shuts off.



NOTE: Default for corded DS8208

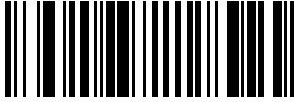


*Presentation (Blink) (7)



Standard (Level) (0)

Cordless DS8288 default



Auto Aim (9)

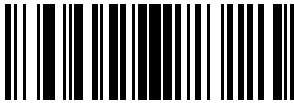
Corded DS8208 default

Hands-free Mode

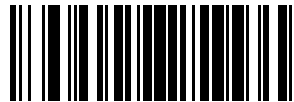
Parameter # 630 (SSI # F1h 76h)

This parameter enables or disables hands-free mode:

- Enable Hands-free Mode - When you place the scanner in Intellistand, it automatically triggers when presented with a barcode. Lifting the scanner or pulling the trigger causes it to behave according to the setting of the [Trigger Mode](#).
- Disable Hands-free Mode - The scanner behaves according to the setting of the [Trigger Mode](#) regardless of whether it is hand-held or in Intellistand.



*Enable Hands-free Mode (1)



Disable Hands-free Mode (0)

Hand-held Decode Aiming Pattern

Parameter # 306 (SSI # F0h 32h)

This parameter selects when to project the aiming pattern in hand-held mode:

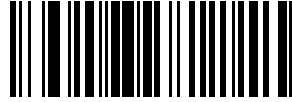
- Enable Hand-held Decode Aiming Pattern - This projects the aiming pattern during barcode capture.
- Disable Hand-held Decode Aiming Pattern - This turns the aiming pattern off.
- Enable Hand-held Decode Aiming Pattern on PDF - This projects the aiming pattern when the scanner detects a PDF barcode.



NOTE: With [Picklist Mode](#) enabled, the decode aiming pattern flashes even if you disable the Hand-held Decode Aiming Pattern.



*Enable Hand-held Decode Aiming Pattern (2)



Disable Hand-held Decode Aiming Pattern (0)



Enable Hand-held Decode Aiming Pattern on PDF
(3)

Hands-free (Presentation) Decode Aiming Pattern

Parameter # 590 (SSI # F1h 4Eh)

This parameter selects when to project the aiming pattern in hands-free mode.

- Enable Hands-free (Presentation) Decode Aiming Pattern - This projects the aiming pattern during barcode capture.
- Disable Hands-free (Presentation) Decode Aiming Pattern - This project turns the aiming pattern off.
- Enable Hands-free (Presentation) Decode Aiming Pattern on PDF - This projects the aiming pattern when the scanner detects a PDF barcode.



NOTE: With [Picklist Mode](#) enabled, the decode aiming pattern flashes even when you have disabled the Hands-free Decode Aiming Pattern.



Enable Hands-free (Presentation) Decode Aiming
Pattern (1)



Disable Hands-free (Presentation) Decode Aiming
Pattern (0)



Enable Hands-free (Presentation) Decode Aiming
Pattern on PDF (2)

Picklist Mode

Parameter # 402 (SSI # F0h 92h)

This parameter selects a Picklist Mode. In this mode, you can pick out and decode a barcode from a group of barcodes that are printed close together by placing the aiming pattern on the barcode you want to decode.

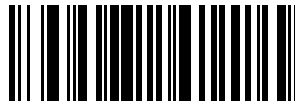


NOTE: Enabling Picklist Mode overrides the Disable Decode Aiming Pattern options. You can not disable the decode aiming pattern when Picklist Mode is enabled. Enabling Picklist Mode can slow decode speed and hinder the ability to decode longer barcodes.

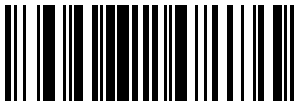
- Enable Picklist Mode Always - Picklist Mode is always enabled.
- Enable Picklist Mode in Hand-held Mode - Picklist Mode is enabled when the scanner is out of hands-free mode and disabled when the scanner is in presentation mode.
- Enable Picklist Mode in Hands-free Mode - Picklist Mode is enabled when the scanner is in hands-free mode only.
- Disable Picklist Mode Always - Picklist Mode is always disabled.



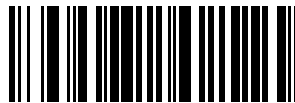
Enable Picklist Mode Always (2)



Enable Picklist Mode in Hand-held Mode (1)



Enable Picklist Mode in Hands-free Mode (3)

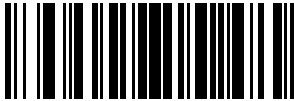


*Disable Picklist Mode Always (0)

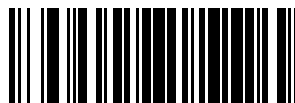
Continuous Barcode Read

Parameter # 649 (SSI # F1h 89h)

Enable this parameter to report every barcode while the trigger is pressed.



Enable Continuous Barcode Read (1)



*Disable Continuous Barcode Read (0)

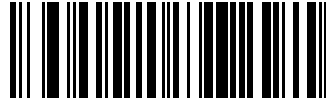
Unique Barcode Reporting

Parameter # 723 (SSI # F1h D3h)

Enable this parameter to report only unique barcodes while the trigger is pressed. This option only applies when Continuous Barcode Read is enabled.



*Enable Unique Barcode Reporting (1)



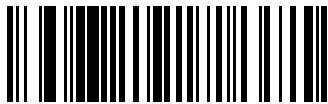
Disable Unique Barcode Reporting (0)

Decode Session Timeout

Parameter # 136 (SSI # 88h)

This parameter sets the maximum time decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds. The default timeout is 9.9 seconds.

To set a Decode Session Timeout, scan the following barcode, and then scan two barcodes from [Numeric Barcodes](#) that correspond to the desired on time. Enter a leading zero for single digit numbers. For example, to set a Decode Session Timeout of 0.5 seconds, scan this barcode, and then scan the 0 and 5 barcodes. To correct an error or change the selection, scan [Cancel](#).



Decode Session Timeout

Hands-Free Decode Session Timeout

Parameter # 400 (SSI # F0 90)

This parameter is the hands-free compliment to the Decode Session Timeout. It configures the minimum and maximum decode processing time during a hands-free scan attempt. It only applies to the hands-free trigger mode or when a scanner is placed in the gooseneck stand.

The range for this parameter is 2-255 with a default value of 15.

The minimum decode processing time is defined as the time in which the scanner stops decoding when an object is removed or left stationary in the imaging field of view.

The maximum decode processing time is defined as the time in which the scanner stops decoding when an object is left in or is moving in the field of view.

Both the maximum and minimum times are configured using a single setting. The relationship of this setting is as follows:

Setting Value ^a	Minimum Time	Maximum Time
X < 25	250 ms	2.5 seconds
X ≥ 25	X * 10 ms	X * 100 ms

^a value must be three digits.

For example, a setting value of 100 results in the scanner turning off approximately 1 second after an object is removed from the field of view or 10 seconds while an object is in the field of view moving.

The default value of the setting is 15, which results in a minimum time of 1500 and a maximum time of 1.5.

Adjust this setting based on your requirements. For example, when doing PDF prioritization, this parameter should be set to a value where the maximum time is above the PDF prioritization timeout.

To set a three-digit value, scan the following barcode and then scan three barcodes from [Numeric Barcodes](#). Enter a leading zero for single-digit numbers. To correct an error or change a selection, scan Cancel.



Hands-Free Decode Session Timeout

Timeout Between Decodes, Same Symbol

Parameter # 137 (SSI # 89h)

Use this option in presentation mode or Continuous Barcode Read mode to prevent the scanner from continuously decoding the same barcode when it is left in the scanner's field of view. The barcode must be out of the field of view for the timeout period before the scanner reads the same consecutive symbol.

Timeout Between Decodes, Same Symbol is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The default interval is 0.5 seconds.

To select the timeout between decodes for the same symbol, scan the following barcode, and then scan two barcodes from [Numeric Barcodes](#) that correspond to the desired interval, in 0.1 second increments.



Timeout Between Decodes, Same Symbol

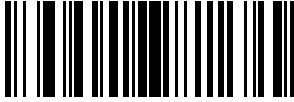
Timeout Between Decodes, Different Symbols

Parameter # 144 (SSI # 90h)

This parameter controls the time the scanner waits before decoding a different symbol. Use this parameter when the scanner is in presentation mode or Continuous Barcode Read.

Timeout Between Decodes, Different Symbols is programmable in 0.1 second increments from 0.1 to 9.9 seconds. The default is 0.1 seconds.

To set the timeout for decoding different symbols, scan the following barcode, and then scan two barcodes from [Numeric Barcodes](#) that correspond to the desired interval, in 0.1 second increments.



Timeout Between Decodes, Different Symbols

Triggered Timeout, Same Symbol

Parameter # 724 (SSI #F1h D4h)

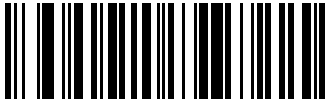
Enable Triggered Timeout, Same Symbol to apply Timeout Between Decodes, Same Symbol in hand-held trigger mode.



NOTE: This feature does not apply to Timeout Between Decodes, Different Symbols.

Timeout Between Decodes, Same Symbol cannot be greater than or equal to [Time Delay to Low Power Mode](#).

Subsequent scans of Enable Triggered Timeout, Same Symbol are ignored until Timeout Between Decodes, Same Symbol expires.



Enable Triggered Timeout, Same Symbol (1)



* Disable Triggered Timeout, Same Symbol (0)

Mobile Phone/Display Mode

Parameter # 716 (SSI # F1h CCh)

This mode improves barcode reading performance off mobile phones and electronic displays. Scan one of the following barcodes to select the desired mode.

Mobile barcodes include barcodes on mobile phone displays, PC displays, or other reflective surfaces such as clear plastic bags or cellophane wrapping. Printed barcodes include barcodes printed on paper or other non-reflective surfaces.

PDF Prioritization

Parameter # 719 (SSI # F4h F1h CFh)

Enable this parameter to delay decoding certain 1D barcodes by the value specified in PDF Prioritization Timeout.

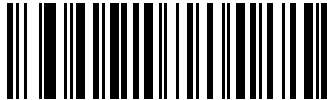
During the [PDF Prioritization Timeout](#) time, the scanner attempts to decode a PDF417 symbol (for example, on a US driver's license), and if successful, reports this only. If it does not decode (cannot find) a PDF417 symbol, it reports the 1D symbol after the timeout. The 1D symbol must be in the device's field of view for the scanner to report it. This parameter does not affect decoding other symbologies.

The 1D Code 128 barcode lengths include the following:

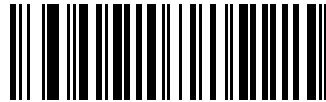
- 7 to 10 characters
- 14 to 22 characters
- 27 to 28 characters

In addition, a Code 39 barcode with the following lengths are considered to potentially be part of a US driver's license:

- 8 characters
- 12 characters



Enable PDF Prioritization (1)



*Disable PDF Prioritization (0)

PDF Prioritization Timeout

Parameter # 720 (SSI # F1h D0h)

If you enabled PDF Prioritization, set this timeout to indicate how long the scanner attempts to decode a PDF417 symbol before reporting the 1D barcode in the field of view.

The PDF Prioritization Timeout range is 0 to 5000 ms, and the default is 200 ms.

Scan the following barcode, and then scan four barcodes from [Numeric Barcodes](#) that specify the timeout in milliseconds. For example, to enter 400 ms, scan the following barcode, and then scan 0400.



PDF Prioritization Timeout

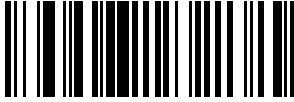
Presentation Mode Field of View

Parameter # 609 (SSI # F1h 61h)

This parameter sets the size of the search area.

In presentation mode, the default setting of Full Field of View allows the scanner to search the entire area of the imaging field of view.

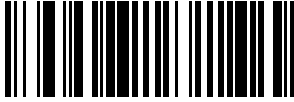
Select Small Field of View or Medium Field of View to search for a barcode in a smaller centered region of the imaging field of view to speed search time.



Small Field of View (0)



Medium Field of View (1)

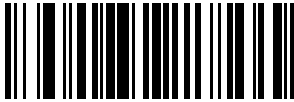


*Full Field of View (2)

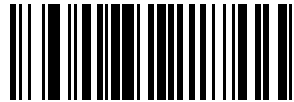
Decoding Illumination

Parameter # 298 (SSI # F0h 2Ah)

This parameter determines whether the scanner turns on illumination to aid decoding. Enabling illumination usually results in superior images and better decode performance. The effectiveness of the illumination decreases as the distance to the target increases.



Enable Decoding Illumination (1)



Disable Decoding Illumination (0)

Illumination Brightness Hand-Held

Parameter # 669 (SSI # F1h 9Dh)

This parameter sets the illumination brightness used during an active decode session. This only applies in hand-held mode (not in presentation mode).



NOTE: Selecting a lower brightness level can affect decode performance.



Low Illumination Brightness (0)



Medium Illumination Brightness (3)



*High Illumination Brightness (10)

Motion Tolerance

Parameter # 858 (SSI # F2h 5Ah)

This parameter selects a motion tolerance option.

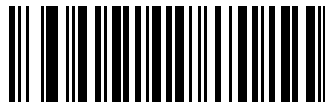


NOTE: Hand-held Trigger modes only.

- *Less Motion Tolerance - This provides optimal decoding performance on 1D barcodes.
- More Motion Tolerance - This increases motion tolerance and speeds decoding when scanning a series of 1D barcodes in rapid progression.



*Less Motion Tolerance (0)



More Motion Tolerance (1)

Decode Range Limit (Hands-free)

Parameter # 1950 (SSI # F8h 07h 9Eh)

In presentation (hands-free) mode only, this parameter limits the range that the scanner decodes or reports UPC/EAN/JAN, Code 128, and QR Code symbologies.

Select the desired range. The default value is Disable.

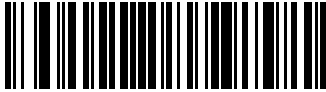
- Near - Range is limited so that only nearby barcodes are reported. Used to reduce the chance of inadvertently scanning surrounding barcodes.
- Standard - Range is limited to fit most applications.
- Far - Range is limited slightly so that farther barcodes are also reported.
- Disable - Range is not limited (maximum range).



*Standard (11)



Disable (0)



Far (7)



Near (22)

Motion Detection Mode

Parameter # 2377 (SSI #F8 09 49)

This parameter selects the method used to detect motion and activate a decode session.

- IR Detect: A decode session is triggered when the infrared proximity sensor detects a barcode.
- Object Detect: A decode session is triggered when the imaging sensor detects a barcode. Illumination increases, and decoding is enabled. Object detection mode requires some illumination to detect an object, such as a barcode.



*IR Detect (3)



Object Detect (1)

Programmable Button

The following parameters control the behavior of the programmable button.

Programmable Button Hand-Held

Parameter # 2060 (SSI #F8h 08h 0Ch)

The programmable button on the scanner can be programmed to one of the following behaviors when the scanner is in Hand-Held Mode.

When the scanner is in Hand-Held mode, the programmable button can be programmed to enact one of the following behaviors.

- Apple Show/Hide Keypad (cordless scanner only): When connecting to an Apple device in HID Keyboard Mode, pressing the programmable button shows or hides the keypad.



NOTE: Apple features must be enabled for this behavior to work.

- Secondary Trigger: Pressing the programmable button initiates a decode session.
- Toggle Lamp Mode: Pressing the programmable button toggles Lamp Mode on and off.



NOTE: [Lamp Mode](#) must be enabled.

- Camera Button: Pressing the programmable button triggers the camera's data capture.



NOTE: [Camera Button](#) must be enabled.

- Toggle Night Mode: Pressing the programmable button toggles Night Mode on and off.



NOTE: [Night Mode](#) must be enabled.

- Disable: Pressing the programmable button does not trigger any behavior.
- Page Cradle: The programmable button pages a connected cradle. Press and hold the programmable button for one second to activate.



NOTE: See Page Mode settings for more information



Apple Show/Hide Keypad (0)



*Secondary Trigger (1)



Toggle Lamp Mode(2)



Camera Button (3)



Toggle Night Mode (4)



Disable (5)



Page Cradle (6)

Programmable Button Hands-Free

Parameter # 2500 (SSI #8h 09h C4h)

The programmable button on the scanner can be programmed to one of the following behaviors when the scanner is in a Hands-Free Mode (in the Presentation Cradle or Intellistand).

When the scanner is in Hands-Free mode, the programmable button can be programmed to enact one of the following behaviors.

- Apple Show/Hide Keypad (cordless scanner only): When connecting to an Apple device in HID Keyboard Mode, pressing the programmable button shows or hides the keypad.



NOTE: Apple features must be enabled for this behavior to work.

- Secondary Trigger: Pressing the programmable button initiates a decode session.
- Toggle Lamp Mode: Pressing the programmable button toggles Lamp Mode on and off.



NOTE: Lamp Mode must be enabled.

- Camera Button: Pressing the programmable button triggers the camera's data capture.



NOTE: Camera Button must be enabled.

- Toggle Night Mode: Pressing the programmable button toggles Night Mode on and off.



NOTE: Night Mode must be enabled.

- Disable: Pressing the programmable button does not trigger any behavior.



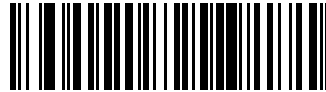
Apple Show/Hide Keypad (0)



*Secondary Trigger (1)



Toggle Lamp Mode(2)



Camera Button (3)



Toggle Night Mode (4)



Disable (5)

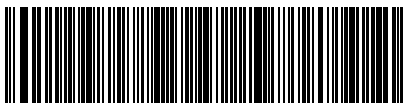
Miscellaneous Scanner Parameters

This section provides additional barcodes and parameters for miscellaneous options.

Enter Key

This parameter adds an Enter key (carriage return or line feed) after scanned data.

To program other prefixes and/or suffixes, see [Prefix/Suffix Values](#).



Add Enter Key (Carriage Return/Line Feed)

Tab Key

This parameter adds a Tab key after scanned data.



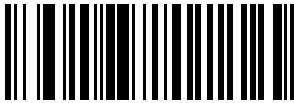
Tab Key

Transmit Code ID Character

Parameter # 45 (SSI # 2Dh)

A Code ID character identifies the code type of a scanned barcode. This is useful when decoding more than one code type. In addition to any single character prefix selected, the Code ID character is inserted between the prefix and the decoded symbol.

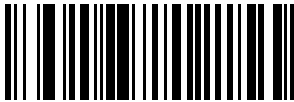
Select no Code ID character, a Symbol Code ID character, or an AIM Code ID character. For Code ID characters, see [Symbol Code Identifiers](#) and [AIM Code Identifiers](#).



Symbol Code ID Character (2)



AIM Code ID Character (1)



*None (0)

Battery Threshold

The following options specify various battery thresholds.

- **Battery Status High Threshold - Parameter #1367** When the battery status is above the High Threshold, the battery indicator is green. The default is 50%.
- **Battery Status Medium Threshold - Parameter #1368** When the battery status is above the Medium Threshold (and below the High Threshold), the battery indicator is amber. When the battery status is below the Medium Threshold, the battery indicator is red. The default is 20%.
- **Battery Status Low Warning Threshold - Parameter #1369** The Low Warning Threshold indicates that the Battery Status is critically low. When the battery status is below this threshold, on every trigger release the scanner issues four short beeps. The default is 10%.
- **Battery Health Low Warning Threshold - Parameter #1370** When the battery health is below the Low Health Threshold, all battery indications alternate between red and the appropriate battery status indication. The default is 60%.

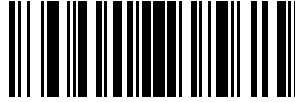


NOTE: When Battery Health is low, consider replacing the battery.

To set each threshold, scan one of the following barcodes, and then scan two barcodes from [Numeric Barcodes](#) that correspond to the desired percentage from 00 to 99.



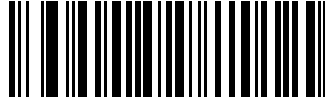
Battery Status High Threshold



Battery Status Medium Threshold



Battery Status Low Warning Threshold



Battery Health Low Warning Threshold

Battery Charging User Indication Enhancement

Parameter # 2255 (SSI # F8h 08h CFh)

This parameter determines if the CR8178 cradle LED blinks green or amber (default) when the battery is charging. The LED also blinks green when connected to 123Scan.



*Blink Amber



Blink Green

Prefix Suffix Values

Key Category Parameter # P = 99

Key Category Parameter # S1 = 98

Key Category Parameter # S2 = 100

Key Category SSI # P = 63h, S1 = 62h, S2 = 64h

Decimal Value Parameter # P =105, S1 =104, S2 =106

Decimal Value SSI # P = 69h, S1 = 68h, S2 = 6Ah

This parameter appends up to one prefix or up to two suffix values to scan data for use in data editing. The default prefix and suffix value is 7013 <CR><LF> (Enter key).

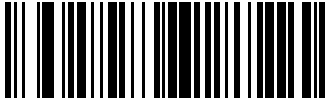


NOTE: To use Prefix/Suffix values, first set the [Scan Data Transmission Format](#).

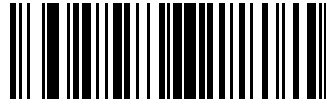
To set a value for a prefix or suffix, scan one of the following barcodes, and then scan four barcodes from [Numeric Barcodes](#) that correspond to that value. See [ASCII Character Sets](#) for the four-digit codes.

When using host commands to set the prefix or suffix, set the key category parameter to 1, and then set the 3-digit decimal value. See [ASCII Character Sets](#) for the four-digit codes.

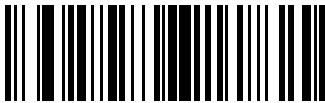
To correct an error or change a selection, scan [Cancel](#).



Scan Prefix (7)



Scan Suffix 1 (6)



Scan Suffix 2 (8)



Data Format Cancel

Scan Data Transmission Format

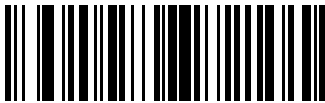
Parameter # 235 (SSI # EBh)

This parameter selects the scan data format.

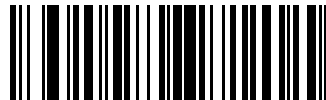


NOTE: If using this parameter do not use ADF rules to set the prefix/suffix.

To set values for the prefix or suffix, see [Prefix Suffix Values](#).



*Data As Is (0)



<DATA> <SUFFIX 1> (1)



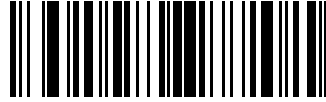
<DATA> <SUFFIX 2> (2)



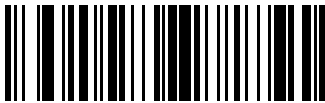
<PREFIX> <DATA > (4)



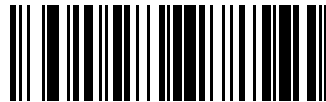
<DATA> <SUFFIX 1> <SUFFIX 2> (3)



<PREFIX> <DATA> <SUFFIX 1> (5)



<PREFIX> <DATA> <SUFFIX 2> (6)



<PREFIX> <DATA> <SUFFIX 1> <SUFFIX 2> (7)

FN1 Substitution Values

Key Category Parameter # 103 (SSI # 67h)

Decimal Value Parameter # 109 (SSI # 6Dh)

Keyboard wedge and USB HID keyboard hosts support a FN1 substitution feature. Enabling this substitutes any FN1 character (0x1b) in an EAN128 barcode with a value. This value defaults to 7013 <CR><LF> (Enter key).

When using host commands to set the FN1 substitution value, set the key category parameter to 1, and then set the 3-digit keystroke value. See the [ASCII Character Sets](#) for the current host interface for the desired value.

Selecting a FN1 Substitution Value

Select a FN1 substitution value via the following barcode menus.

1. Scan the following barcode.



Set FN1 Substitution Value

2. Locate the keystroke desired for FN1 Substitution in the ASCII Character Set table for the current host interface, and enter the 4-digit ASCII value by scanning four barcodes from [Numeric Barcodes](#).

To correct an error or change the selection, scan [Cancel](#).

To enable FN1 substitution for USB HID keyboard, scan the [Enable FN1 Substitution](#) barcode.

Transmit No Read Message

Parameter # 94 (SSI # 5Eh)

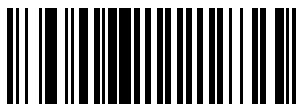
This parameter sets an option for transmitting the No Read (NR) characters.



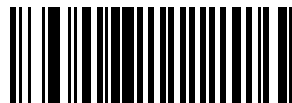
NOTE: If you enable Transmit No Read, and also enable Symbol Code ID Character or AIM Code ID Character for [Transmit Code ID Character](#), the scanner appends the code ID for Code 39 to the NR message.

This does not apply in presentation mode.

- Enable No Read - transmits the characters NR when a successful decode does not occur before trigger release or the expires.
- Disable No Read - sends nothing to the host if a symbol does not decode.



Enable No Read (1)



*Disable No Read (0)

Unsolicited Heartbeat Interval

Parameter # 1118 (SSI # F8h 04h 5Eh)

When this parameter is enabled, the scanner can send unsolicited heartbeat messages to assist in diagnostics. The range is 0 - 9999.

The heartbeat event is sent as decode data (with no decode beep) in the form of:

M0TEVTHB : nnn

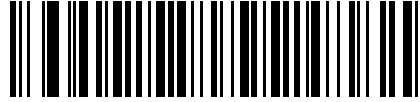
Where: nnn is a three-digit sequence number starting at 001 and wrapping after 100.

To enable this parameter and set the desired unsolicited heartbeat interval, scan one of the following time interval barcodes, or scan Set Another Interval followed by four barcodes from [Numeric Barcodes](#) that correspond to the desired number of seconds.

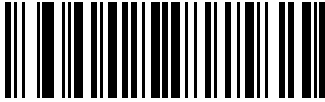
Scan Disable Unsolicited Heartbeat Interval to turn off the feature.



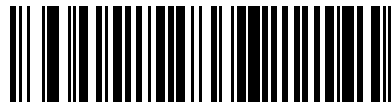
10 Seconds (10)



1 Minute (60)



Set Another Interval



*Disable Unsolicited Heartbeat Interval (0)

securPharm Decoding

Parameter # 1752 (SSI # F8h 06h D8h)

securPharm implements the IFA and GS1 Coding System for the European pharmaceutical industry. securPharm code is used to prevent pharmaceutical counterfeiting. This parameter enables or disables the ability to process pharmaceutical type barcodes.

When this feature is enabled, if a GS1 symbol is decoded and includes any aspects of the Application Identifier associated with the securPharm GS1 specifications, the entire GS1 symbol is processed as a securPharm symbol. For this reason, it is expected that under certain circumstances, a GS1 barcodes that is a securPharm symbol may not be processed properly; if the GS1 symbol is not created as per the specification. The output cannot be guaranteed as valid.

Although the GS1-128 type and the GS1 DataBar family are not specifically indicated in the IFA specification, they are supported.

The securPharm output is in XML format and can include the product number, serial number, lot number, expiration and Date of Manufacturing. The XML tags can be arranged in any order. Tags that are not in the barcode are omitted. For example:

```
<content dfi="value_dfi">
  <Daten_1>value_Daten_1</Daten_1>
  <Daten_2>value_Daten_2</Daten_2>
  <Daten_n>value_Daten_n</Daten_n>
</content>
```

Where:

- value_dfi = IFA or GS1
- Daten_1 to Daten_n is the production number, serial number, etc.



*Disable securPharm Decoding (0)



Enable securPharm Decoding (1)

securPharm Output Formatting

Parameter # 1753 (SSI # F8h 06h D9h)

securPharm Output Formatting parameter options represent bit positions. Therefore, any combination of formatting can be used.

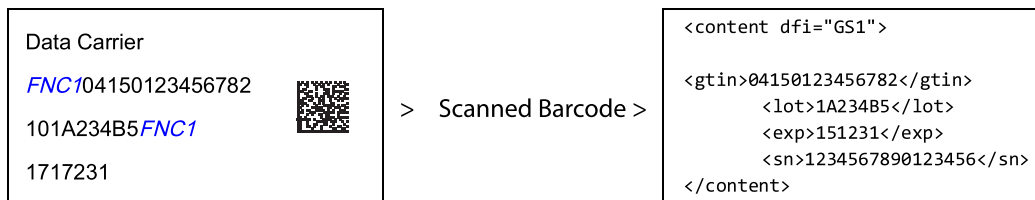


NOTE: securPharm output formatting is effective only when [securPharm Decoding](#) is enabled.

When you scan a securPharm Output Formatting barcode, the securPharm output is formatted in a number of ways.

Sample GS1 Format

Product Number: GTIN Data Identifier DI Data Format Identifier: GS1



Sample GS1 Output - Feature Disabled

The output has no format:

```
0104150123456782101A234B517151231211234567890123456
```

Sample GS1 Output - No Formatting (0)

The output is a single line of characters:

```
<content dfi="GS1"><gtin>04150123456782</gtin><lot>1A234B5</lot><exp>151231</exp><sn>1234567890123456</sn></content>
```

Sample GS1 Output - Insert Tab (1)

The output is a single line of characters with a tab inserted in the XML body:

```
<content dfi="GS1">[tab]<gtin>04150123456782</gtin>[tab]<lot>1A234B5</lot>[tab]<exp>151231</exp>[tab]<sn>1234567890123456</sn></content>
```

Sample GS1 Output - Insert New Line (2)

The output consists of multiple lines of characters with a new line character at the end of each line.

```
<content dfi="GS1">
<gtin>04150123456782</gtin>
<lot>1A234B5</lot>
<exp>151231</exp>
<sn>1234567890123456</sn>
</content>
```

Sample GS1 Output - Insert Tab and New Line (3)

The output consists of multiple lines of characters with tabs and a new line character at the end of each line.

```
<content dfi="GS1">
[tab]    <gtin>04150123456782</gtin>
[tab]    <lot>1A234B5</lot>
[tab]    <exp>151231</exp>
[tab]    <sn>1234567890123456</sn>
</content>
```

Sample IFA Format

Product Number: PPN Data Identifier DI Data Format Identifier: IFA



Sample GS1 Output - Feature Disabled

The output has no format:

```
[ ]>069N1112345678421T1A234B5S1234567890123456
```

Sample GS1 Output - No Formatting (0)

The output is a single line of characters:

```
<content dfi="IFA"><ppn>111234567842</ppn><lot>1A234B5</lot><sn>1234567890123456</sn></content>
```


Sample GS1 Output - Insert Tab (1)

The output is a single line of characters with a tab inserted in the XML body:

```
<content dfi="IFA">[tab]<ppn>111234567842</ppn>[tab]<lot>1A234B5</lot>[tab]<sn>1234567890123456</sn></content>
```

Sample GS1 Output - Insert New Line (2)

The output consists of multiple lines of characters with a new line character at the end of each line.

```
<content dfi="IFA">
<ppn>111234567842</ppn>
<lot>1A234B5</lot>
<sn>1234567890123456</sn>
</content>
```

Sample GS1 Output - Insert Tab and New Line (3)

The output consists of multiple lines of characters with tabs and a new line character at the end of each line.

```
<content dfi="IFA">
[tab]    <ppn>111234567842</ppn>
[tab]    <ppn>111234567842</ppn>
[tab]    <lot>1A234B5</lot>
[tab]    <sn>1234567890123456</sn>
</content>
```

securPharm Output Formatting Barcodes

Scan a barcode below to format the securPharm output.



*No Formatting (0)



Insert Tab (1)



Insert New Line (2)

Radio Communications

This section provides information about the modes of operation and features available for wireless communication between scanners, cradles, and hosts. The section also includes the parameters necessary to configure the scanner.

The scanner ships with the settings shown in the following table. If the default values suit requirements, programming is not necessary.

Radio Communications Parameter Defaults

Use this section to navigate to the scanner's radio parameters or to determine its default parameter values.

Table 14 Radio Communication Defaults

Parameter	Parameter Number	SSI Number	Default
Radio Communications Host Types	N/A	N/A	Cradle Bluetooth Classic (Cradle Host)
Bluetooth Friendly Name	607	F1h 5fh	Scanner name followed by the serial number
Wi-Fi Friendly Mode	1299	F8 05h 13h	Disable
Wi-Fi Friendly Channel Exclusion	1297	F8h 05h 11h	Used All Channels - Standard AFH
Bluetooth Radio Parameters			
Radio Output Power	1324	N/A	High Power Setting
Link Supervision Timeout	1698	F8h 06h A2h	5 seconds
HID Host Parameters			
Apple iOS Virtual Keyboard Toggle	1114	F8h 04h 5Ah	Disable
Keyboard Keystroke Delay	N/A	N/A	No Delay
Caps Lock Override (Radio)	N/A	N/A	Do Not Override
Barcodes with Unknown Characters (Radio)	N/A	N/A	Send Barcodes With Unknown Characters

Table 14 Radio Communication Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
Fast HID Keyboard	1361	F8h 05h 51h	Enable
Numeric Keypad Emulation	N/A	N/A	Enable
Quick Keypad Emulation (Radio)	1362	F8h 05h 52h	Enable
Keyboard FN1 Substitution	N/A	N/A	Disable
Function Key Mapping (Radio)	N/A	N/A	Disable
Simulated Caps Lock (Radio)	N/A	N/A	Disable
Convert Case (Radio)	N/A	N/A	No Case Conversion
Auto-reconnect Parameters			
Beep on Reconnect Attempt	559	F1h F2h	Disable
Reconnect Attempt Interval	558	F1h 2Eh	30 seconds
Auto-reconnect	604	F1h 5Ch	Immediately
Scanner(s) to CradleSupport			
Modes of Operation	538	F1h A1h	Point-to-Point Mode
Pairing Modes	542	F1h 1Eh	Unlocked
Pair on Contacts	545	F1h 21h	Enable
Toggle Pairing	1322	F8h 05h 2Ah	Disable
Beep on insertion	288	F0h 20h	Enable
AutoConfig (Scanner Cloning Through Cradle)	2139	F8 08 5B	Disable
Page Parameters			
Page Button	746	F1h EAh	Enable
Page Mode	1364	F8h 05h 54h	Page Simple
Page State Timeout	1365	F8h 05h 55h	30 Seconds
Bluetooth Security			
Bluetooth Security Level	1393	F8h 05h 71h	Easy Bluetooth Security
FIPS Mode	736	F1h E0h	Disable
Virtual Tether Parameters			
Configure the Alarm on the Scanner	2053	F8h 08h 05h	Disable
Audio Virtual Tether Alarm on Scanner	2246	F8h 08h C6h	Enable except in Night Mode
LED Virtual Tether Alarm on Scanner	2247	F8h 08h C7h	Enable

Table 14 Radio Communication Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
Illumination Virtual Tether Alarm on Scanner	2248	F8h 08h C8h	Enable
Haptic Virtual Tether Alarm on Scanner	2249	Fh8 08h C9h	Enable
Beacon Virtual Tether Distance Options	2476	F8h 09h ACh	Immediate
Virtual Tether Alarm on the Cradle	2124	F8h 4Ch 21h	Disable
Delay Before Virtual Alarm Activates	2054	F8h 08h 06h	30 sec
Virtual Tether Alarm Duration	2055	F8h 08h 07h	5 min
Defeat Virtual Tether Alarm	2119	F8h 08h 47h	Pause Alarm on Trigger Pull/Page Button
Pause Virtual Tether Alarm Duration	2120	F8h 08h 48h	30 sec
General Radio Parameters			
Batch Mode	544	F1h 20h	Normal (Do Not Batch Data)
Persistent Batch Storage	1399	F8h 77h	Disable
Bluetooth SPP Beep on <BEL>	150	96h	Enable

Wireless Beeper Definitions

The definitions lists beep sequences that occur during pairing operations.

Table 15 Wireless Beeper Definitions

Beeper Sequence	Indication
High/low/high/low beeps	Pairing barcode scanned.
Short low/high beeps	Scanner paired with the cradle.
Short high/low beeps	Scanner unpaired with the cradle.  NOTE: When connected to a remote device using SPP or HID, if a disconnect beep sequence sounds immediately after scanning a barcode, check the host device to determine if it received the transmitted data. The scanner may have transmitted the last barcode scanned after losing the connection.
Long low long/high beeps	Unsuccessful pairing attempt. See Auto-reconnect Parameters .
Long low/long high/long low/ long high beeps	Remote device rejected the connection attempt, possibly due to an attempt to pair with a cradle already paired with the maximum number of scanners.
Long high beeps	The Audio Virtual Tether alarm on the scanner is enabled and the scanner is not in Night Mode .

Table 15 Wireless Beeper Definitions (Continued)

Beeper Sequence	Indication
Four long low beeps	A transmission error occurred and the data is ignored, due to an improperly configured scanner. Check option setting.
	During cradle communication, the scanner did not receive acknowledgment of data receipt from the cradle. However, the host may have received the data. Check the host for receipt of the data, and re-scan the barcode if it was not received.
Five high beeps	Beeps emit every five seconds during a reconnection attempt. See Auto-reconnect Parameters .

Radio Communications Host Types

Each host type has Bluetooth Classic and Bluetooth Low Energy options.

Bluetooth Low Energy has better Wi-Fi coexistence, as advertising and connection is performed outside of Wi-Fi channels 1, 6, and 11 (2402, 2426, 2480 MHz). Due to its smaller data rate, Bluetooth Low Energy is up to 7 times slower than Bluetooth Classic (0.27 Mbps versus 0.7-2.1 Mbps), and data-intensive activities such as firmware updates can take significantly longer.

Table 16 Radio Communications Host Type Options

Host Type	Options
Keyboard Emulation (HID)	- HID Bluetooth Classic - HID Bluetooth Low Energy (Discoverable)
Simple Serial SSI (SSI)	- SSI Bluetooth Classic (Non-discoverable) - SSI Bluetooth Classic (Discoverable) - SSI Bluetooth Low Energy
Serial Port Profile (SPP)	- SPP Bluetooth Classic (Non-discoverable) - SPP Bluetooth Classic (Discoverable)

Cradle

Select this host type when connecting a scanner to a communication cradle.



NOTE: The scanner automatically tries to reconnect to a remote device upon a disconnection due to the radio losing communication. See [Auto-reconnect Parameters](#) for more information.

Establishing a Cradle Connection

This procedure is for the initial setup only.

Choose the pairing barcode on the cradle or place the scanner in the cradle.



Cradle Bluetooth Classic

Keyboard Emulation (HID)

Select this host type when connecting to a PC/tablet/phone emulating a Bluetooth keyboard.

HID Bluetooth Classic

This enables the host and scanner to communicate using the Human Interface Device (HID) Keyboard Profile over Bluetooth Classic radio. The scanner(s) support Discoverable (Peripheral) and Non-Discoverable (Central) mode.

To establish a connection (initial setup only), select **HID Bluetooth Classic** and connect to Central or Peripheral mode:

- Central mode - Scan a pairing barcode with the MAC address of the host device.
- Peripheral mode - From the host, discover Bluetooth devices and select the scanner from the discovered device list.



HID Bluetooth Classic

HID Bluetooth Low Energy (Discoverable)

This enables the host to establish an HID (Human Interface Device) Keyboard Profile connection with the scanner over a Bluetooth Low Energy radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the **HID Bluetooth Low Energy (Discoverable)** option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.



HID Bluetooth Low Energy (Discoverable)

Simple Serial Interface (SSI)

Select this host type when connecting to a Zebra mobile device or PC/tablet/phone running a Zebra scanner SDK app.

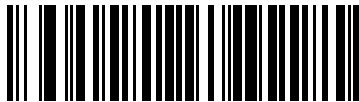
SSI Bluetooth Classic (Non-discoverable)

This enables the scanner(s) to establish a connection with a Zebra mobile computer over a Bluetooth Classic radio. The scanner is not discoverable (Central mode).

To establish a connection (initial setup only), choose the SSI BT Classic (Non-discoverable) option, and then scan a pairing barcode with the host device's MAC address.



NOTE: Additional steps may be necessary depending on host's Bluetooth stack.

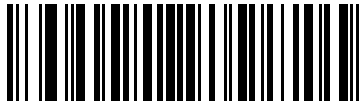


SSI Bluetooth Classic (Non-discoverable)

SSI Bluetooth Classic (Discoverable)

This enables communication with Scanner SDK for Android generated apps, and allows the host to establish a connection with the scanner over Bluetooth Classic radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the SSI Bluetooth Classic (Discoverable) option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.

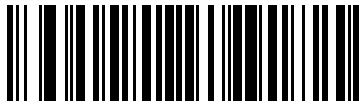


SSI Bluetooth Classic (Discoverable)

SSI Bluetooth Low Energy

This enables communication with Scanner SDK for iOS generated apps, and allows the host to establish a connection with the scanner over Bluetooth Low Energy radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the SSI Bluetooth Low Energy option. From the host application, select the scanner from the discovered device list.



SSI Bluetooth Low Energy

SSI Bluetooth with MFi (iOS Support)

This enables communication with Scanner SDK for iOS generated apps, and allows an Apple device and scanner to communicate over a Bluetooth Classic radio. The scanner is discoverable (Peripheral Mode) and also supports Central Mode. The scanner must be MadeForiOS (MFi) certified.

To establish a connection (for initial setup only), choose the SSI BT with MFi (iOS Support) option, and then:

- If connecting in Central mode, scan a pairing barcode with the host device MAC address.

- If connecting in Peripheral mode, from the host application, discover Bluetooth devices, and then select the scanner from the discovered device list.



SSI BT with MFi (iOS Support)

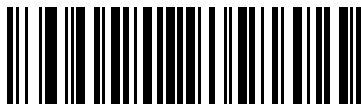
Serial Port Profile (SPP)

Select this host type when connecting to a PC/tablet/phone using a Bluetooth serial connection.

SPP BT Classic (Non-discoverable)

This enables the scanner to establish an SPP connection with the host over Bluetooth Classic radio. The scanner is not discoverable (Central mode).

To establish a connection (initial setup only), choose the SPP BT Classic (Non-discoverable) option, and then scan a pairing barcode with the MAC address of the host device.



SPP Bluetooth Classic (Non-discoverable)

SPP BT Classic (Discoverable)

This enables the host to establish an SPP connection with the scanner over Bluetooth Classic radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the SPP BT Classic (Discoverable) option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.



SPP Bluetooth Classic (Discoverable)

Bluetooth Technology Profile Support

With Bluetooth Technology Profile Support, the scanner communicates directly to the host using Bluetooth technology and does not require the cradle. The scanner supports standard Bluetooth Serial Port Profile (SPP) and HID profiles which enable communication with other Bluetooth devices that support these profiles.

- SPP - The scanner connects to the PC/host via Bluetooth and behaves as if there is a serial connection.
- HID - The scanner connects to the PC/host via Bluetooth and behaves as a keyboard.

Central/Peripheral Modes

The scanner can be set up as Central or Peripheral mode.

When the scanner is set up as Peripheral mode, it is discoverable and connectible to other devices. When the scanner is set up as Central mode, the Bluetooth address of the remote device to which a connection is requested is required. A pairing option with the remote device address must be created and paired to attempt a connection to the remote device. See [Pairing Barcode Format Using the Scan-To-Connect \(STC\) Utility](#).

Central Mode

Setting up the scanner as a Central (SPP) requires the Bluetooth address of the remote (Peripheral) device to which the scanner is connecting.

Create and choose a pairing barcode with the remote device address to connect to the remote device. See [Pairing Barcode Format Using the Scan-To-Connect \(STC\) Utility](#).

Peripheral Mode

If you set up the scanner as Peripheral mode (SPP or HID), it is discoverable and accepts an incoming connection request from a remote device.



NOTE: The number of scanners depends on host capability.

Bluetooth Friendly Name

Parameter # 607 (SSI # F1h 5fh)

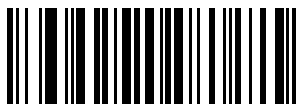
You can set a meaningful name for the scanner that appears in the application during device discovery.

By default this is the scanner family name followed by the serial number, such as DS3578 123456789ABCDEF. Select **Set Defaults** to revert the scanner to this name; use custom defaults to maintain the user-programmed name through a **Set Defaults** operation.



NOTE: If the application allows setting a device name, this takes precedence over the Bluetooth Friendly Name.

To create a Bluetooth Friendly Name, choose Bluetooth Friendly Name, and then scan up to 23 characters from [Alphanumeric Barcodes](#). If the name contains less than 23 characters, scan the [End of Message](#) barcode after entering the name.



Bluetooth Friendly Name

Wi-Fi Friendly Options

You can set Wi-Fi friendly options.

Wi-Fi Friendly Mode

Parameter # 1299 (SSI # F8h 05h 13h)

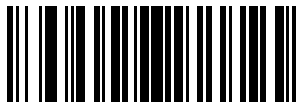
Scanners are configurable for Wi-Fi friendly mode.

Choose an option to enable or disable **Wi-Fi Friendly Mode**, and then see [Wi-Fi Channel Exclusion](#) to select any channels to exclude.

When using this feature, configure all scanners in the area for Wi-Fi friendly mode. By default, no Wi-Fi channels are excluded. Since Bluetooth requires a minimum of 20 channels when Wi-Fi channels 1, 6, and 11 are excluded, a smaller number of channels are cut from the hopping sequence. Updating Wi-Fi friendly settings before Bluetooth connection is recommended.



NOTE: The scanner remains in sniff mode, and exits sniff mode only during firmware update. If a Wi-Fi channel is excluded from the hopping sequence, AFH turns off. Scanner (and cradle) avoid the selected Wi-Fi channels after establishing connection.



Enable Wi-Fi Friendly Mode (1)



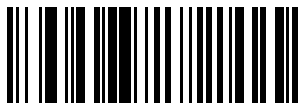
*Disable Wi-Fi Friendly Mode (0)

Wi-Fi Friendly Channel Exclusion

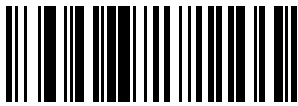
Parameter # 1297 (SSI # F8h 05h 11h)

You can set channels to exclude.

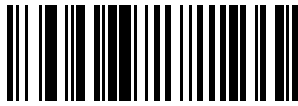
- Exclude Wi-Fi channel 1 - Bluetooth channels 0-21 are excluded from the hopping sequence (2402-2423 MHz).
- Exclude Wi-Fi channel 6 - Bluetooth channels 25-46 are excluded from the hopping sequence (2427 - 2448 MHz).
- Exclude Wi-Fi channel 11 - Bluetooth channels 50-71 are excluded from the hopping sequence (2452 - 2473 MHz).
- Exclude Wi-Fi channel 1, 6 and 11 - Bluetooth channels 2-19 (2404-2421 MHz), 26-45 (2428 - 2447 MHz), and 51-69 (2453 - 2471 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channels 1 and 6 - Bluetooth channels 0-21 (2402-2423 MHz) and 25-46 (2427 - 2448 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channels 1 and 11 - Bluetooth channels 0-21 (2402-2423 MHz) and 50-71 (2452 - 2473 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channel 6 and 11 - Bluetooth channels 25-46 (2427 - 2448 MHz) and 50-71 (2452 - 2473 MHz) are excluded from the hopping sequence.
- Use All Channels (Standard AFH) - Sets all channels to use.



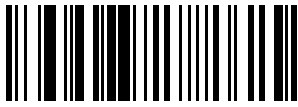
*Use All Channels (Standard AFH) (0)



Exclude Wi-Fi Channel 1 (1)



Exclude Wi-Fi Channel 6 (2)



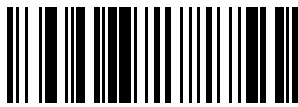
Exclude Wi-Fi Channel 11 (3)



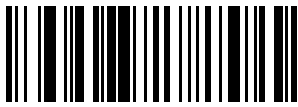
Exclude Wi-Fi Channels 1, 6, and 11 (4)



Exclude Wi-Fi Channels 1 and 6 (5)



Exclude Wi-Fi Channels 1 and 11 (6)



Exclude Wi-Fi Channels 6 and 11 (7)

Bluetooth Radio Parameters

You can set Bluetooth timeout settings, radio power, radio state, and wait for connection options.

Radio Output Power

Parameter # 1324

The scanner uses a configurable radio which can be configured to operate in:

- Low power mode as a Class 2 device.
- High power mode as Class 1 device.

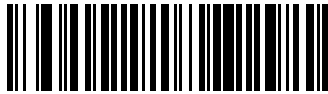
Increase the radio output power to increase range. Scan a barcode to select the desired power mode.



Very Low Power (3)



Low Power (2)



Medium Power (1)



*High Power (0)

Link Supervision Timeout

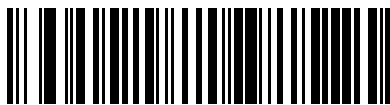
Parameter # 1698 (SSI # F4h 06h A2h)

Select a time interval to set how quickly the scanner senses that the Bluetooth radio loses connection to the remote device.

A lower value minimizes data loss at the edge of the operating range, while a larger value minimizes disconnects due to the remote device not responding in time. If you are experiencing occasional disconnects and the scanner is able to reconnect, increase the link supervision timeout value.



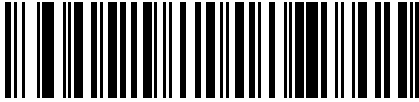
NOTE: The scanner only controls Link Supervision Timeout in Central mode.



0.5 Seconds (800)



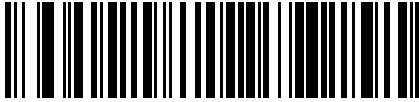
2 Seconds (3200)



*5 Seconds (8000)



10 Seconds (16000)



20 Seconds (32000)

HID Host Parameters

The scanner supports virtual keyboard emulation for the Apple iOS, and keyboard emulation over the Bluetooth HID profile. In this mode the scanner can interact with Bluetooth enabled hosts supporting the HID profile as a Bluetooth keyboard. Scanned data is transmitted to the host as keystrokes.

Apple iOS Virtual Keyboard Toggle

Parameter # 1114 (SSI # F8h 04h 5Ah)



NOTE: When this feature is enabled, the scanner may be incompatible with non-Apple iOS devices.



Enable Apple iOS Virtual Keyboard Toggle (1)



*Disable Apple iOS Virtual Keyboard Toggle (0)

Keyboard Keystroke Delay

This parameter sets the delay, in milliseconds, between emulated keystrokes. Select one of the following barcodes to increase the delay when the HID host requires slower data transmission.



*No Delay (0 msec)



Medium Delay (20 msec)



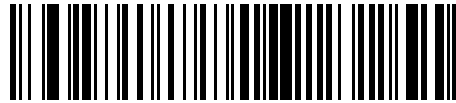
Long Delay (40 msec)

Caps Lock Override (Radio)

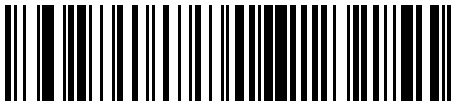
Select **Override Caps Lock Key** to preserve the case of the data regardless of the state of the Caps Lock key.



NOTE: This setting is always enabled for the **Japanese, Windows (ASCII)** keyboard type and cannot be disabled.



Override Caps Lock Key (Enable)

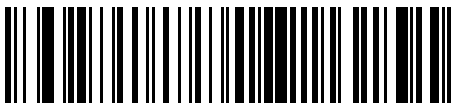


*Do Not Override Caps Lock Key (Disable)

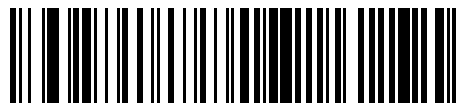
Barcodes with Unknown Characters (Radio)

You can send all barcode data except for unknown characters. The scanner issues no error beeps.

This option applies only to the HID Keyboard Emulation device and IBM device. Unknown characters are characters the host does not recognize.



*Send Barcodes With Unknown Characters

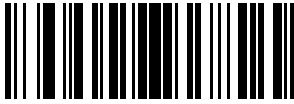


Do Not Send Barcodes With Unknown Characters

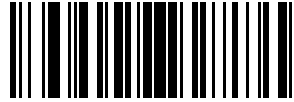
Fast HID Keyboard

Parameter # 1361 (SSI # F8h 05h 51h)

You can set this parameter to transmit Bluetooth HID keyboard data at a faster rate.



*Enable Fast HID Keyboard (1)

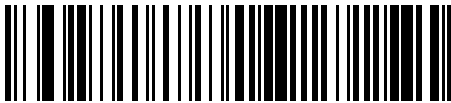


Disable Fast HID Keyboard (0)

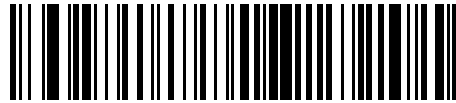
Numeric Keypad Emulation

You can send all characters as ASCII sequences over the numeric keypad.

For example, ASCII A transmits as “ALT make” 0 6 5 “ALT Break”.



*Enable Numeric Keypad Emulation



Disable Numeric Keypad Emulation

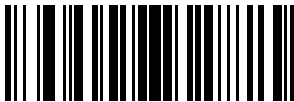
Quick Keypad Emulation (Radio)

Parameter # 1362 (SSI # F8h 05h 52h)

You can set a quicker method of emulation using the numeric keypad where ASCII sequences are only sent for ASCII characters not found on the keyboard.



NOTE: This option applies only to the HID keyboard emulation device when [Keyboard Emulation \(HID\)](#) is enabled.



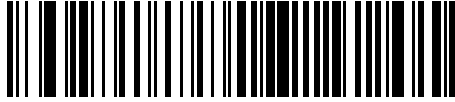
*Enable Quick Keypad Emulation (1)



Disable Quick Keypad Emulation (0)

Keyboard FN1 Substitution

You can replace the FN1 character in an EAN-128 barcode with a user-selected Key Category and value. See [FN1 Substitution Values](#) to set the Key Category and Key Value.



Enable Keyboard FN1 Substitution



*Disable Keyboard FN1 Substitution

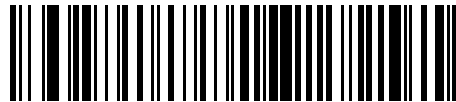
Function Key Mapping (Radio)

You can map the keys in bold listed in [ASCII Character Sets](#) in place of the standard key mapping.

ASCII values under 32 are normally sent as control-key sequences. Keys that do not have a bold entry remain the same regardless of this parameter setting.



Enable Function Key Mapping

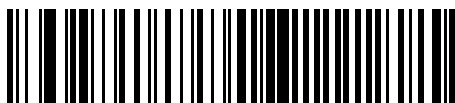


*Disable Function Key Mapping

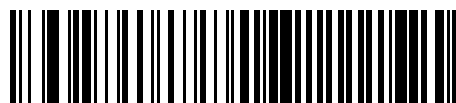
Simulated Caps Lock (Radio)

You can set **Simulate Caps Lock** to invert upper and lower case characters as if the Caps Lock state is enabled on the keyboard.

- Enable - simulates Caps Lock state on keyboard.
- Disabled - does not simulate Caps Lock state on keyboard.



Enable Simulated Caps Lock



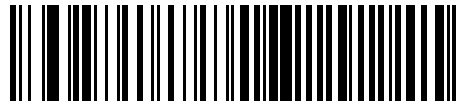
*Disable Simulated Caps Lock

Convert Case (Radio)

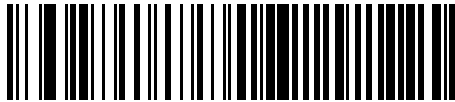
Select an option to convert all data to the selected case.



*No Case Conversion



Convert All to Upper Case



Convert All to Lower Case

Auto-reconnect Parameters

When in SPP Central, Cradle Host mode, or for Bluetooth Keyboard Emulation, the scanner automatically tries to reconnect to a remote device when it disconnects due to losing radio communication.

If auto-reconnect fails due to page timeouts, the scanner lights the red LED, the scanner sounds a page timeout beep (long low/long high), and enters low power mode. To restart the auto-reconnect process, pull the scanner trigger.

If auto-reconnect fails because the remote device rejects the connection attempt, the scanner sounds a connection reject beep sequence (see [Wireless Beeper Definitions](#)) and deletes the remote pairing address. Scan a pairing barcode to attempt a new connection to the remote device.



NOTE: If you scan a barcode during the auto-reconnect sequence, a transmission error beep sequence sounds and the data does not transmit to the host. After re-connection, normal scanning operation returns. For error beep sequence definitions, see [Wireless Beeper Definitions](#).

The scanner has memory available for storing a remote Bluetooth address for each Central mode (SPP, Cradle). When switching between modes, the scanner automatically tries to reconnect to the last connected device in that mode.



NOTE: Scanning a [Radio Communications Host Type](#) to select another Bluetooth host resets the radio which disables scanning. It takes several seconds for the scanner to re-initialize the radio and enable scanning.

Beep on Reconnect Attempt

Parameter # 559 (SSI # F1h F2h)

You can enable audio feedback during a reconnect attempt.

When the scanner disconnects as it moves out of range, it immediately attempts to reconnect. During this time, the green LED blinks. If auto-reconnect fails, the scanner emits a page timeout beep (long low/long high) and the LED stops blinking. Restart the process by pulling the trigger.

- Enabled - the scanner emits 5 short high beeps every 5 seconds during the reconnection attempt, providing an out-of-range indicator.
- Disabled - the scanner does not emit sound during a reconnection attempt.



Enable Beep on Reconnect Attempt (1)



Disable Beep on Reconnect Attempt (0)

Reconnect Attempt Interval

Parameter # 558 (SSI # F1h 2Eh)

You can change this time interval after a scanner disconnects as it moves out of range and then tries to reconnect.



*Attempt to Reconnect for 30 Seconds (6)



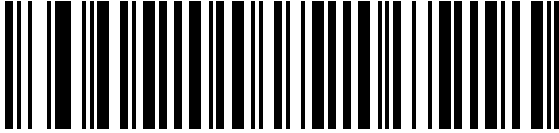
Attempt to Reconnect for 1 Minute (12)



Attempt to Reconnect for 5 Minutes (60)



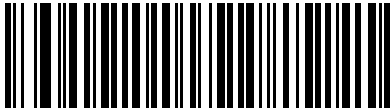
Attempt to Reconnect for 30 Minutes (360)



Attempt to Reconnect for 1 Hour (720)



Attempt to Reconnect Indefinitely (0)



Attempt to Reconnect for 2 Hours (1440)

Auto-reconnect

Parameter # 604 (SSI # F1h 5Ch)

You can select a reconnect option for the scanner when it disconnects from a remote device:

- Auto-reconnect on Barcode Data - The scanner auto-reconnects when you scan a barcode. A delay can occur when transmitting the first characters. The scanner sounds a decode beep upon barcode scan, followed by a connection, a page timeout, a rejection beep, or a transmission error beep. This option optimizes battery life on the scanner and mobile device. Note that auto-reconnect does not occur on rejection and cable unplug commands.
- Auto-reconnect Immediately - When the scanner loses connection, it attempts to reconnect. If a page timeout occurs, the scanner attempts reconnect on a trigger pull **or a wake up event such as picking the scanner up**. Select this option if the scanner's battery life is not an issue and you do not want a delay when transmitting the first barcode.

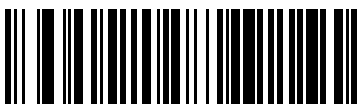


NOTE: Auto-reconnect does not occur on rejection and cable unplug commands.

- Disable Auto-reconnect - When the scanner loses connection, you must re-establish it manually.

Auto-reconnect applies to the following hosts:

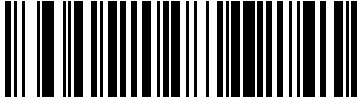
- Cradle Bluetooth Classic
- HID Bluetooth Classic
- SSI Bluetooth Classic (Non-discoverable)
- SPP Bluetooth Classic (Non-discoverable)



Auto-reconnect on Barcode Data (1)



*Auto-reconnect Immediately (2)



Disable Auto-reconnect (0)

Scanner(s) to Cradle Support

You can set different options to pair, unpair, and set different cradle preferences for a scanner.

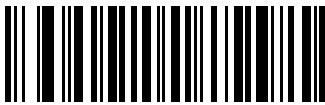
Modes of Operation

Parameter # 538 (SSI # F1h A1h)

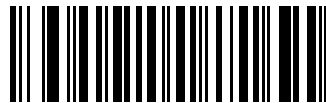
The charging cradle with radio supports two radio communication modes of scanner operation for wireless communication.

Select a mode of operation:

- **Point-to-Point** - Only one scanner can connect to the cradle at a time. Pair the scanner to the cradle either by inserting it into the cradle (if [Pair on Contacts](#) is enabled), or by scanning the PAIR barcode on the cradle. Communication can be locked, unlocked (default), or in a lock override state (see [Pairing Modes](#)). In locked mode, you must set a [Connection Maintenance Interval](#) to set the locking interval.
- **Multipoint-to-Point** - Pair up to seven scanners to one cradle. To set this mode, scan the Multipoint-to-Point barcode using the first scanner to connect to the cradle.



Point-to-Point Mode (0)



Multipoint-to-Point Mode (1)

Pairing

Pairing is the process by which a scanner initiates communication with a cradle.

Scanning Multipoint-to-Point activates multi-scanner-to-cradle operation and allows up to seven scanners to pair.

To pair the scanner with the cradle, scan the pairing barcode on the cradle. The scanner emits a high/low/high/low beep sequence to indicate that it decoded the pairing barcode and then a low/high beep when it establishes a connection with the cradle.



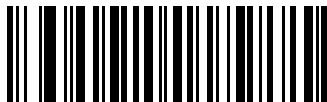
NOTE: Each cradle uses a unique pairing barcode. Do not scan data or parameters until pairing completes. When the scanner pairs with the cradle in SPP Central or Cradle Host mode, it attempts to reconnect to a remote device upon a disconnection due to the radio losing communication. For more information, see [Auto Reconnect Parameters](#).

Pairing Modes

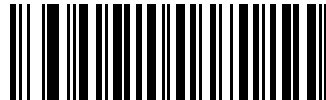
Parameter # 542 (SSI # F1h 1Eh)

The cradle and scanner support two modes of pairing.

- **Unlocked Pairing Mode** - In Point-to-Point mode only, pair (connect) a new scanner to a cradle at any time by either scanning the PAIR barcode on the cradle or by inserting it into the cradle with [Pair on Contacts](#) enabled. This unpairs the previously connected scanner from the cradle.
- **Locked Pairing Mode** - When a cradle is paired (connected) to a scanner (or up to seven scanners in Multipoint-to-Point mode), it rejects any attempt to connect a different scanner. In this mode, you must set a [Pair on Contacts](#).



*Unlocked Pairing Mode (0)



Locked Pairing Mode (1)

Lock Override

Lock Override overrides a locked scanner base pairing and connects a new scanner. In Multipoint-to-Point mode, this unpairs any disconnected (out of range) scanner first to connect the new scanner.

To use Lock Override, scan Lock Override and then pair the scanner.



NOTE: Lock Override is applicable in Point-to-Point mode only (it does not work on scanners in Multipoint-to-Point mode). If seven scanners are connected to a cradle/host device, disconnect them manually before connecting a new scanner.



Lock Override

Pair on Contacts

Parameter # 545 (SSI # F1h 21h)

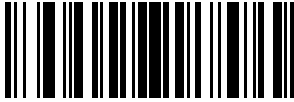
This parameter pairs the scanner and cradle when you insert the scanner in the cradle. You do not need to scan the pairing barcode on the cradle.

Choose the following:

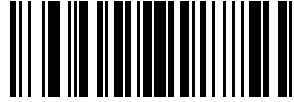
- **Enabled** - Scanner pairs on contact and If pairing is successful, the scanner emits a low/high connection beep sequence.

- Disabled - Scanner does not pair on contact.

See [Wireless Beeper Definitions](#) for other beep sequences.



*Enable Pair On Contacts (1)



Disable Pair on Contacts (0)

Pull Trigger Twice to Re-connect

Upon a double trigger press, the scanner attempts to connect to the last known address.

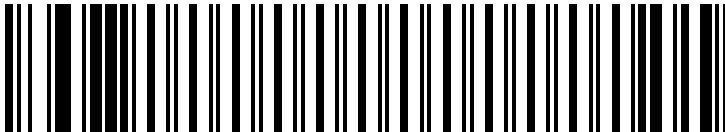
This feature differs from [Auto-reconnect](#) in that the scanner attempts connection only once and keeps the address even on commanded disconnect. The last known address is only cleared upon a reject or with a new successful connection. The address persists over scanner reboot. This feature does not interfere with a double trigger press to open or close an iOS keypad in HID mode.



NOTE: This feature only applies to hosts capable of a commanded connection; SPP Peripheral mode and HID BLE hosts do not support this feature.

Unpairing

Choose Unpair to unpair the scanner, to make the host available for pairing with another scanner.



Unpair

Toggle Pairing

Parameter # 1322 (SSI # F8h 05h 2Ah)

The parameter enables a scanner to switch between being paired to a cradle or host (for example, VC80) to being unpaired from the scanner upon toggle.

Choose the following:

- Enabled - Scanner toggles between being paired and unpaired.
- Disabled - Scanner does not switch pairing on toggle.



Enable Toggle Pairing (1)



*Disable Toggle Pairing (0)

Pairing Barcode Format Using the Scan-To-Connect (STC) Utility

You can use the STC utility to create a pairing barcode in one step by connecting the Zebra Bluetooth scanner to a phone, tablet, or PC by scanning an STC barcode.

The STC utility is available as a standalone utility. Supported operating systems include Windows and Android.

For more information, go to zebra.com/scantoconnect. Source code is also available for easy app integration.

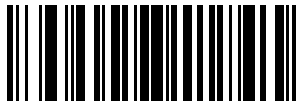
Beep on Insertion

Parameter # 288 (SSI # F0h 20h)

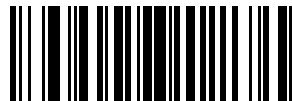
The parameter enables the scanner to emit a short low beep when it is inserted into a cradle and detects power.

Choose the following:

- Enabled - Scanner beeps when inserted in cradle.
- Disabled - Scanner does not beep when inserted in cradle.



*Enable Beep on Insertion (1)



Disable Beep on Insertion (0)

AutoConfig (Scanner Cloning Through Cradle)

Parameter # 2139 (SSI # F8 08 5B) This parameter controls scanner cloning through the cradle.

Choose the following:

- Enabled - The cradle's stored scanner parameters are transmitted upon pairing to the cradle, which configures the scanner with updated parameters. This enables the scanner to be automatically configured for a new host application, use case, or workflow.
- Disabled - Scanner does not auto configure upon pairing to the cradle.

When AutoConfig (Scanner Cloning Through Cradle) is enabled, scanning is disabled for up to 3 to 5 seconds while the configuration is being uploaded to the scanner. The green LED blinks during this period. Any pre-programmed scanner settings listed above are overwritten and lost once AutoConfig (Scanner

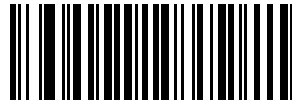
Cloning Through Cradle) is performed by pairing the scanner and cradle. AutoConfig (Scanner Cloning Through Cradle) is not supported in Multi-Point.

The cradle's configuration of the scanner is limited to the following scanner parameters:

- All Symbolologies Parameters
- Advanced Data Formatting rules
- Night Mode Trigger
- Lamp Mode Control and Timeout
- securPharm Decoding and Output Formatting
- Multicode Rules
- Data Parsing (UDI, Blood Bag, GS1 Label) rules
- Picklist Mode
- Digimarc Digital Watermarks
- Reconnect Attempt Beep Feedback



Enable (1)



*Disable (0)

Page Parameters

You can set page button, page mode, and page state timeout options.

Page Button

Parameter # 746 (SSI # F1h EAh)

This parameter enables a cradle with a page button to cause paired scanners to emit a beep sequence when the page button is touched.

Choose the following:

- Enabled - Touching the page button causes a paired scanner to beep.
- Disabled - Touching the page button does not cause a paired scanner to beep.

To use the page button, press the button  for approximately one second. The cradle LED turns blue when the scanner is out of the cradle. The paired scanner beeps five times. If multiple scanners are paired to the cradle, all scanners beep five times.



NOTE: Scanners out of radio range do not beep when paged. For radio range information, refer to Technical Specifications.



NOTE: In the rare case where a scanner is paired to a mobile computer host device but is charging in a cradle, pressing the page button will only cause the light to blink, but the scanner does not beep.



*Enable Page Button (1)



Disable Page Button (0)

Page Mode

Parameter # 1364 (SSI # F8h 05h 54h)

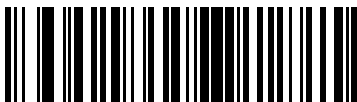
The cradle and scanner support two page modes, Page State and Page Simple.

- Page State
 - Cradle-issued: The cradle sends a Page State request to each scanner. It remains in this state until every scanner sends an acknowledgment. The scanner enters Page State when the LED indicator blinks blue and the vibrator and beeper are enabled. When you press the trigger, insert the scanner into the cradle, or the [Page State Timeout](#) expires, the scanner sends the acknowledgment to the cradle and returns to normal state.
 - Scanner-issued: The scanner sends a page state request to connected cradle. The cradle enters Page State when the LED indicator blinks blue and beeper is enabled. When you press the page button on the cradle, insert the scanner into the cradle (must be paging scanner into the cradle in page state), or the [Page State Timeout](#) expires, the cradle sends the acknowledgment to the scanner and returns to normal state.



NOTE: Note: in multi-point state only one scanner can page the cradle at a time. Other scanners attempting to page the cradle, will not be able to do so until Page State is exited.

- Page Simple
 - Cradle-issued: The cradle sends a page indication request to each scanner, and returns to idle state. Each scanner issues a single Page State indication.
 - Scanner-issued: The scanner sends a page indication request to the connected cradle and returns to Idle State. The cradle emits a single Page Stage indication.



Page State (1)



*Page Simple (0)

Page State Timeout

Parameter # 1365 (SSI # F8h 05h 55h)

This parameter enables you to set a page timeout.

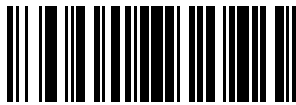
The Page State Timeout is programmable in 1 second increments from 1 to 99 seconds.



NOTE: Page State Timeout only applies to Page State mode.

To set a page timeout, choose Page State Timeout, and then enter the two numeric barcodes from [Numeric Barcodes](#) that correspond to the desired timeout duration. Enter a leading zero for single-digit numbers.

For example, to set a 5-minute duration, enter 0 barcode and then 5. To correct an error or change the selection, [Cancel](#).



Page State Timeout

Bluetooth Security

The Bluetooth security parameters used in the scanner are named easy, medium, and high. This naming convention differs from older scanners.

Bluetooth Security Level

Parameter # 1393 (SSI # F8h 05h 71h)

This parameter sets a Bluetooth security level.

For more information on Bluetooth security, refer to chapter 3 of the [Guide to Bluetooth Security](#).



NOTE: All options use Security Mode 4 with FIPS-approved AES-Counter with CBC-MAC (AES-CCM) encryption. They differ in the generated key types and the use of man-in-the-middle protection.

- Easy Bluetooth Security (default): The easy security setting is designed for ease of connection with most devices and minimal user interaction. Uses “Just Works” secure and simple pairing method with no man in the middle protection. Provides level 2 security (as per “Guide to Bluetooth Security”).
- Medium Bluetooth Security: The medium security setting requires a passkey for the initial connection to pair scanner to remote host. Uses “Passkey Entry” secure and simple pairing method with man in the middle protection. Provides level 3 security (as per “Guide to Bluetooth Security”).
- High Bluetooth Security: The high security setting requires “Secure Connections” between scanner and remote host. Scanning in of a passkey is required. Provides level 4 security (as per “Guide to Bluetooth Security”).



NOTE: For higher security levels, place the scanner in the cradle for an initial pairing to exchange OOB data.



NOTE: The scanner may fall back to a lower security mode when it connects to a legacy device. Setting the security mode to high prevents this behavior.



*Easy (0)



Medium (1)



High (2)

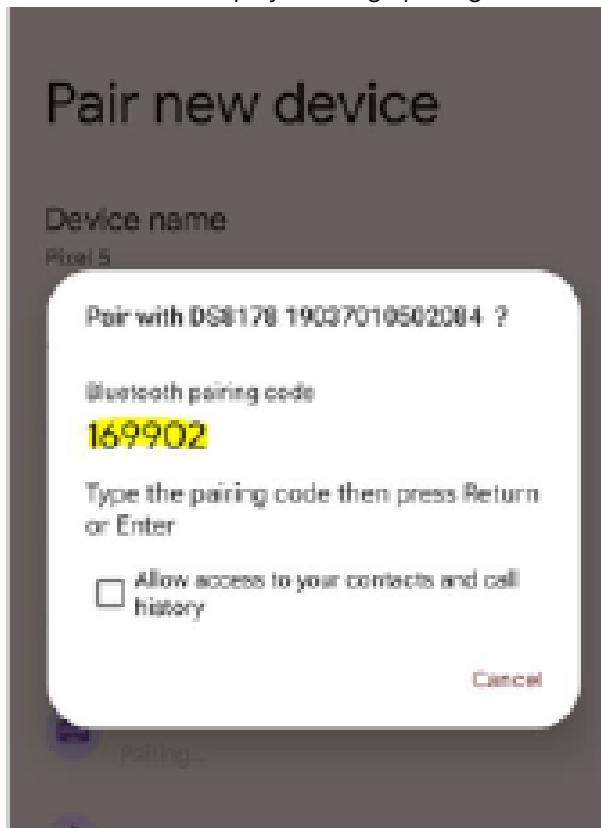
OCR Passcode Entry

If you select a medium or high Bluetooth security mode, you may be required to enter a pairing code. Use the 6-digit code displayed on the host device.

When a scanner's Bluetooth Security Setting is set to medium or high, pair the scanner and host device with a pairing code.

1. The scanner emits an **Alpha expected** auditory beep.

- The host device displays a 6-digit pairing code.



- Point the scanner at the pairing code and press the trigger.
 - The scanner decodes the pairing code and pairs with the host device.

If this fails, you can scan the pairing code one digit at a time using [Alphanumeric Barcodes](#).

FIPS Mode

Parameter # 736 (SSI # F1h E0h)

The Federal Information Processing Standard (FIPS) 140-3 is a U.S. government computer security standard used to accredit cryptographic modules. FIPS enabled scanners and cradles offer this secure mode of operation.

Choose the following:

- Enabled - Establishes a secure session between the scanner and cradle when connected.
- Disabled - FIPS standards are not used.

When enabled, the scanner lights a yellow LED on each trigger pull to indicate that all data is transmitted securely over Bluetooth. On failure, the scanner sounds a transmission error message on each attempt to transmit data.



Enable FIPS (1)



*Disable FIPS (0)

Virtual Tether

The Virtual Tether feature enables the scanner, cradle or host application to alert users when Bluetooth connection is lost.

It works by independently controlling the scanner's illumination, audio, haptics and LEDs. To adjust the range of the scanner and cradle connection, change the radio power (high, medium, low). See [Radio Output Power](#) for more information.

Configure the Alarm on the Scanner

Parameter # 2053 (SSI # F8h 08h 05h)

This parameter enables a virtual tether beacon between the scanner and cradle. After enabling this parameter, select a distance option with the Tether Distance Options parameter.



NOTE: If the paired cradle loses power, the scanner does not sound a tether alarm.

The delay before the alarm activates

Depending on the device, a virtual tether alarm can include audio, LED, illumination, and haptic. Each alarm type can be chosen, allowing for the creation of custom alarms. If the scanner is in [Night Mode](#) The audio beeper does not sound. The scanner vibrates when the alarm activates.

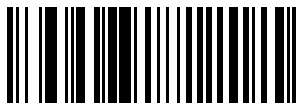
Choose one of the following:

- Enabled: A Virtual Tether alarm can be set on the scanner.
- Disabled: - A Virtual Tether alarm cannot be set on the scanner.
- Beacon Virtual Tether: Enables a beacon between the scanner and cradle.
 - Set the Beacon Virtual Tether Distance parameter when you select this option.
 - The beacon does not activate if the cradle loses power.

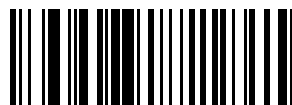


NOTE: The delay before the beacon alarm activation does not apply to this selection.

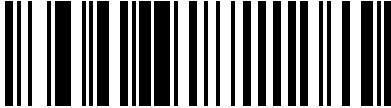
Not compatible with **very low** or **ultra low** [radio power settings](#).



*Disable Virtual Tether Alarm on the Scanner (0)



Enable Virtual Tether Alarm on the Scanner (1)



Beacon Virtual Tether (2)

Audio Virtual Tether Alarm on Scanner

Parameter # 2246 (SSI # F8h 08h C6h)

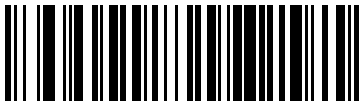
This parameter enables the Audio Virtual Tether alarm on the scanner.

Choose the following:

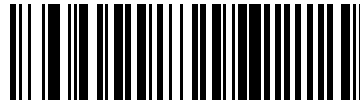
- Enabled - An audio Virtual Tether alarm can be set on the scanner.
- Disabled - An audio Virtual Tether alarm cannot be set on the scanner.



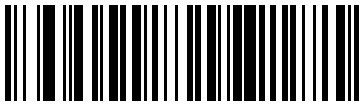
NOTE: When enabled, and the scanner is not in [Night Mode](#), the audio beeper sounds at a high volume..



Disable Audio Virtual Tether Alarm (0)



Enable Audio Virtual Tether Alarm (1)



*Enable Audio Virtual Tether Alarm Except in Night Mode (2)

LED Virtual Tether Alarm on Scanner

Parameter # 2247 (SSI # F8h 08h C7h)

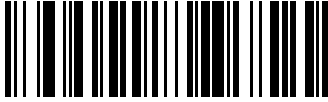
This parameter enables the LED Virtual Tether alarm on the scanner.

Choose the following:

- Enabled - An LED Virtual Tether alarm can be set on the scanner.
- Disabled - An LED Virtual Tether alarm cannot be set on the scanner.



NOTE: When enabled, the scanner LEDs blink green and red..



Disable LED Virtual Tether Alarm (0)



*Enable LED Virtual Tether Alarm (1)

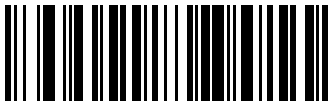
Illumination Virtual Tether Alarm on Scanner

Parameter # 2248 (SSI # F8h 08h C8h)

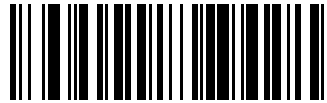
This parameter enables the Illumination Virtual Tether alarm on the scanner.

Choose the following:

- Enabled - An illumination Virtual Tether alarm can be set on the scanner.
- Disabled - An illumination Virtual Tether alarm cannot be set on the scanner.



Disable Illumination Virtual Tether Alarm (0)



*Enable Illumination Virtual Tether Alarm (1)

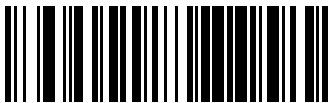
Haptic Virtual Tether Alarm on Scanner

Parameter # 2249 (SSI # F8h 08h C9h)

This parameter enables the Haptic Virtual Tether alarm on the scanner.

Choose the following:

- Enabled - A haptic Virtual Tether alarm can be set on the scanner.
- Disabled - A haptic Virtual Tether alarm cannot be set on the scanner.



Disable Haptic Virtual Tether Alarm (0)



*Enable Haptic Virtual Tether Alarm (1)

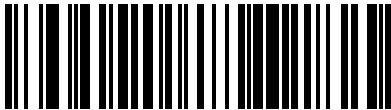
Beacon Virtual Tether Distance Options

Parameter # 2476 (SSI #F8h 09h ACh)

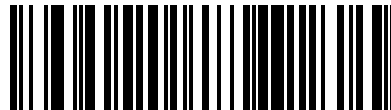
This parameter defines the distance between the scanner and cradle at which the virtual tether alarm activates. All distance values are approximate and differ based on your environment.

Select one of the following options:

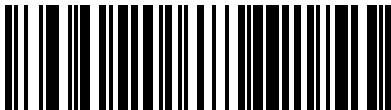
- Immediate: About 1 m
- Near: 1-9 m
- About 10 m



*Immediate (>1 m)



Near (1 — 9 m)



Far (~10 m)

Virtual Tether Alarm on the Cradle

Parameter # 2124 (SSI # F8h 4Ch 21h)

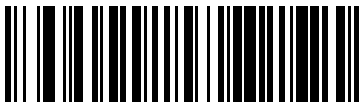
This parameter enables the Virtual Tether alarm on the cradle.

Choose the following:

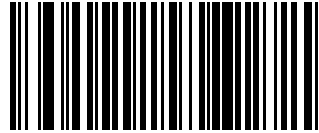
- Enabled - A Virtual Tether alarm can be set on the cradle.
- Disabled - A Virtual Tether alarm cannot be set on the cradle.



NOTE: When enabled, the cradle LEDs blink green and red.



*Disable Virtual Tether Alarm on the Cradle (0)



Enable Audio and Visual Virtual Tether Alarm on the Cradle (1)



Enable Virtual Tether Alarm on the Cradle (No Beeper) (2)

Delay Before Virtual Alarm Activates

Parameter # 2054 (SSI # F8h 08h 06h)

This parameter enables the device, when out of range, to hold off on sounding the Virtual Tether alarm to provide an opportunity to re-establish a connection.

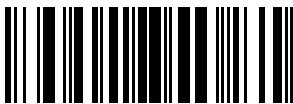
Ensure that this setting is not too short in order to avoid the following:

- If the cradle resets, it causes the scanner to activate the Virtual Tether alarm.
- Noisy RF environments can lead to frequent, momentary disconnect/reconnect sequences.

To set a delay, choose Delay Before Alarm Activates, and then enter the two numeric barcodes from [Numeric Barcodes](#) that correspond to the desired timeout duration. Enter a leading zero for single digit numbers.

For example, to set a 5 second page timeout, enter 0 barcode and then 5. To correct an error or change the selection, scan [Cancel](#).

The default value is 30 seconds.



Delay Before Alarm Activates

Virtual Tether Alarm Duration

Parameter # 2055 (SSI # F8h 08h 07h)

This parameter sets the amount of time for the Virtual Tether Alarm to play in minutes (1-99 minutes).

To set a time duration, choose Alarm Duration, and then enter the two numeric barcodes from [Numeric Barcodes](#) that correspond to the desired alarm duration. Enter a leading zero for single-digit numbers. The value zero sets the duration to infinite.

The default value is 5 minutes.

For example, to set a 5-minute page timeout, enter 0 barcode and then 5. To correct an error or change the selection, scan [Cancel](#).

The alarm stops once the connection is established, the timeout period expires, or the scanner's battery is drained.



NOTE: Any connection stops the alarm. The scanner does not need to connect to the same cradle.



Alarm Duration

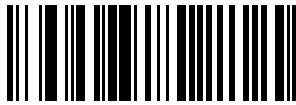
Defeat Virtual Tether Alarm

Parameter # 2119 (SSI # F8h 08h 47h)

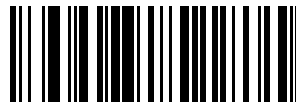
This parameter enables the trigger on the scanner or page button on the cradle to defeat or pause the alarm.

Choose the following:

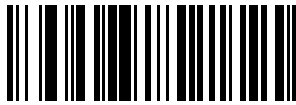
- Do Not Defeat Alarm - The scanner trigger or cradle page button does not pause or stop an alarm.
- *Pause Alarm on Trigger Pull/Page Button - The alarm is paused on a trigger pull or page button touch.
- Stop Alarm on Trigger Pull/Page Button - The alarm is stopped on a trigger pull or page button touch.



Do Not Defeat Alarm (0)



*Pause Alarm on Trigger Pull/Page Button (1)



Stop Alarm on Trigger Pull/Page Button (2)

Pause Virtual Tether Alarm Duration

Parameter # 2120 (SSI # F8h 08h 48h)

This parameter pauses the alarm for a number of seconds (1-99 seconds).

To set a time duration, choose Pause Virtual Tether Alarm Duration, and then enter the two numeric barcodes from [Numeric Barcodes](#) that correspond to the desired alarm duration. Enter a leading zero for single digit numbers. The value zero sets the duration to infinite.

For example, to set a 5 second page timeout, enter 0 barcode and then 5. To correct an error or change the selection, [Cancel](#).



Pause Virtual Tether Alarm Duration

Virtual Tether Alarm Considerations

There are many causes for an alarm to activate or not activate. It is also important to know the effects of Battery Preservation mode and Night mode.

Causes for the alarm to activate

- Device going out of range. Depending on configuration, both scanner and cradle can alarm if connection between them is broken due to one of the devices going out of range.
- If cradle is unpowered, the scanner sounds the alarm. Includes USB suspend of the cradle.
- Removing battery from the scanner will cause the cradle to sound the alarm.

Causes for the alarm to not activate

- Scanner and cradle need to have an existing connection before alarm activates. No alarm on power up.
- If the scanner is charging in or paired to another cradle/host by insertion or by scanning the pairing bar code, since it is presumed that in this case the scanner is not lost.
- If another scanner connects to the cradle and causes the original scanner to disconnect.
- If any of the batch modes are enabled or if auto-reconnect is NOT set to reconnect immediately.
- Virtual Tether does not apply to the hosts that do not support auto-reconnect feature such as HID Bluetooth Low Energy (Discoverable) and SPP BT Classic (Discoverable).
- Alarm is not activated if the disconnection occurs due to firmware update or configuration via 123Scan or SMS.
- If scanner is connected to another cradle/host by insertion or by scanning the pairing barcode.

Battery Preservation Mode

If the scanner disconnects from the cradle due to the activation of the Battery Preservation Mode and the Virtual Tether Alarm on the cradle is enabled, only the LEDs on the cradle blink green and red.



NOTE: If Virtual Tether is enabled and a power outage occurs that causes multiple cradles or Bluetooth hosts to lose power, it activates alarms on the scanners paired to them. A trigger pull can be configured to defeat the alarm (see [Defeat Virtual Tether Alarm](#)). The alarms can also be defeated by either disconnecting the battery from the scanner or by pairing the scanner to another cradle or host that has power if one is available.

General Radio Parameters

You can set Batch Mode, Batch Storage, and Beep alert options.

Batch Mode

Parameter # 544 (SSI # F1h 20h)

This parameter enables the scanner to attempt to store barcode data (excluding parameter barcodes) until transmission is initialized or it stores the maximum number of barcodes.

When the scanner saves a barcode successfully, it emits a good decode beep and flashes the green LED. If the scanner is unable to store a new barcode, it emits a low/high/low/high (out of memory) beep. See [Wireless Beeper Definitions](#) for all definitions.

In all modes, calculate the amount of data (number of barcodes) the scanner can store as follows:

[Number of storable barcodes = 61,440 bytes of memory / (number of characters in the barcode + 3)]



NOTE: If you change the batch mode while there is batched data, the new batch mode takes effect only after the scanner sends all previously batched data.

- Normal (default) - Do not batch data. The scanner transmits each barcode when scanned.
- Out-of-Range Batch Mode - The scanner stores barcode data when it loses connection to a remote device (e.g., when the scanner moves out of range). When the scanner re-establishes connection with the device (e.g., it moves back into range), it transmits the data.
- Standard Batch Mode - The scanner stores barcode data when you scan Enter Batch Mode. Scan Send Batch Data to transmit the data.



NOTE: Transmission stops if the scanner loses connection to the remote device.

- Cradle Contact Batch Mode - The scanner stores barcode data when you scan Enter Batch Mode. Insert the scanner into the cradle to transmit the data.

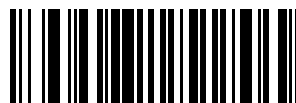


NOTE: If you remove the scanner from the cradle during batch data transfer, transmission stops until you re-insert the scanner in the cradle.

In all modes, transmission stops if the scanner moves out of range and resumes when the scanner moves back in range. If you scan a barcode during batch data transmission, it is appended to the end of the batched data. Parameter barcodes are not stored.



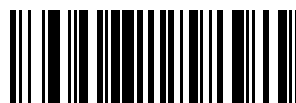
*Normal (Do Not Batch Data) (0)



Out of Range Batch Mode (1)



Standard Batch Mode (2)



Cradle Contact Batch Mode (3)



Send Batch Data



Enter Batch Mode

Persistent Batch Storage

Parameter # 1399 (SSI # F8h 77h)

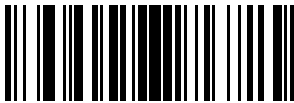
This parameter stores batch data in non-volatile memory and preserves it when the scanner powers down.

Choose the following:

- Enabled - Batch data is stored in memory.
- Disabled - Batch data is not stored in memory.



NOTE: Frequently storing batch data with this setting enabled shortens non-volatile memory life.



Enable Persistent Batch Storage (1)



*Disable Persistent Batch Storage (0)

Bluetooth SPP Beep on <BEL>

Parameter # 150 (SSI # 96h)

This parameter enables the scanner to beep when it detects a <BEL> character on the serial line. <BEL> is issued to alert the user of an illegal entry or other important event.

Choose the following:

- Enabled - Scanner beeps when it detects a <BEL>.
- Disabled - Scanner does not beep when it detects a <BEL>.



NOTE: This parameter only applies to SPP (Serial Port Profile), for example, the serial interface on the cradle. In Multipoint-to-Point mode only, the scanner that beeped last sounds Beep on <Bel>.



*Enable Beep on <BEL> (1)



Disable Beep on <BEL> (0)

Bluetooth Radio, Linking, and Batch Operation

The scanner has a Bluetooth Class 1 radio which achieves a range of at least 100 m / 300 ft (open air, line of sight). The actual range achieved is influenced by the presence of other radios, shelving, and wall materials and which cradle is tested. The environments vary widely and often influence radio ranges.

Image Capture Preferences

You can program the imager to perform various functions, or you can activate different features. This section describes image capture preference features and provides programming barcodes for selecting these features.



NOTE: Only the Symbol Native API (SNAPI) with Imaging interface supports image capture. See [USB Device Type](#) to enable this host.

Setting Image Capture Parameters

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the imager powers down.



NOTE: Most computer monitors allow scanning barcodes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the barcode clearly, and bars and/or spaces do not merge.

Image Capture Scanning Sequence Examples

You can scan a barcode to set a parameter value.

For example, to disable image capture illumination, scan the Disable Image Capture Illumination barcode found in [Image Capture Illumination](#). After enabling this setting, the imager issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several barcodes. See the parameter descriptions for this procedure.

Image Capture Errors While Scanning

Unless otherwise specified, to correct an error during a scanning sequence, just re-scan the correct parameter.

Image Capture Preferences Parameter Defaults

The image capture preferences parameter defaults table lists the default values for the DS4678's image capture preference parameters.

You can change values in one of two ways:

- Scan the appropriate barcodes in this section. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).

Image Capture Preferences

- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).

Table 17 Image Capture Preferences Parameter Defaults

Parameter	Parameter Number ^a	SSI Number ^b	Default
Image Capture Preferences			
Operational Modes	N/A	N/A	N/A
Image Capture Illumination	361	F0h 69h	Enable
Image Capture Autoexposure	360	F0h 68h	Enable
Fixed Exposure	567	F4h F1h 37h	10 ms
Analog Gain	1232	F4h D0h	x2
Gain/Exposure Priority for Snapshot Mode	562	F1h 32h	Autodetect
Snapshot Mode Timeout	323	F0h 43h	0 (30 seconds)
Snapshot Aiming Pattern	300	F0h 2Ch	Enable
Silence Operational Mode Changes	1293	F8h 05h 0Dh	Disable (do not silence)
Image Cropping	301	F0h 2Dh	Disable
Crop to Pixel Addresses	315	F4h F0h 3Bh	0 top
	316	F4h F0h 3Ch	0 left
	317	F4h F0h 3Dh	1199 bottom
	318	F4h F0h 3Eh	1599 right
Image Size (Number of Pixels)	302	F0h 2Eh	Full
Image Brightness (Target White)	390	F0h 86h	180
JPEG Image Options	299	F0h 2Bh	Quality
JPEG Quality Value	305	F0h 31h	65
JPEG Size Value	561	F1h 31h	160 kB
Image Enhancement	564	F1h 34h	Low (1)
Image File Format Selector	304	F0h 30h	JPEG
Image Rotation	665	F1h 99h	0
Bits per Pixel (BPP)	303	F0h 2Fh	8 BPP
Signature Capture	93	5Dh	Disable
Signature Capture Image File Format Selector	313	F0h 39h	JPEG
Signature Capture Bits per Pixel (BPP)	314	F0h 3Ah	8 BPP
Signature Capture Width	366	F4h F0h 6Eh	400
Signature Capture Height	367	F4h F0h 6Fh	100
Signature Capture JPEG Quality	421	F0h A5h	65
Camera Button	1716	F8h 06h B4h	Disable

Table 17 Image Capture Preferences Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Camera Button Delay	1717	F8h 06h B5h	2 seconds
Video View Finder	324	F0h 44h	Disable
Video View Finder Image Size	329	F0h 49h	17

^a Parameter number decimal values are used for programming via RSM commands.

^b SSI number hex values are used for programming via SSI commands.

Image Capture Preferences Modes and Parameters

The parameters in this section control image capture characteristics.

Operational Modes

The scanner can have up to two modes of operation.

- Decode Mode
- Snapshot Mode

Decode Mode

By default, when you press the trigger the imager attempts to locate and decode enabled barcodes within its field of view. The imager remains in this mode until it decodes a barcode or you release the trigger.

Snapshot Mode

Use Snapshot Mode to capture a high-quality image and transmit it to the host. Select the Snapshot Mode option to temporarily enter this mode. While in this mode the imager blinks the green LED at one-second intervals to indicate it is not in standard operating (decode) mode.

In Snapshot Mode, the imager turns on its aiming pattern to highlight the area to capture in the image. The next trigger press instructs the imager to capture a high quality image and transmit it to the host. A short time may pass (less than two seconds) between when the trigger is pressed and the image is captured as the imager adjusts to lighting conditions.

If you do not press the trigger within the Snapshot Mode Timeout period, the imager returns to Decode Mode. Use [Snapshot Mode Timeout](#) to adjust this timeout period. The default timeout period is 30 seconds.



Snapshot Mode

Video Mode

In this mode, the imager behaves as a video camera as long as you press the trigger. Release the trigger to return to Decode Mode. Select this option to temporarily enter Video Capture Mode.



NOTE: This parameter is available only for corded scanners.



Video Mode

Image Capture Illumination

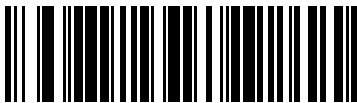
Parameter # 361 (SSI # F0h 69h)

This parameter turns on illumination during every image capture.

- Enabled - Illumination is on during image capture.
- Disabled - Prevents the imager from using illumination.



NOTE: This usually results in superior images. The effectiveness of illumination decreases as the distance to the target increases.



*Enable Image Capture Illumination (1)



Disable Image Capture Illumination (0)

Image Capture Autoexposure

Parameter # 360 (SSI # F0h 68h)

This parameter enables the imager to control gain and exposure (integration time) settings to best capture an image for Snapshot mode.

- Enabled - Allows the imager to control gain and exposure settings to best capture an image.
- Disabled - Manually adjust the gain and exposure time.



NOTE: Disabling Image Capture Autoexposure is only recommended for advanced users with difficult image capture situations.



*Enable Image Capture Autoexposure (1)



Disable Image Capture Autoexposure (0)

Fixed Exposure

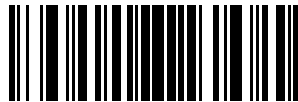
Parameter # 567 (SSI # F4h F1h 37h)

This parameter configures the exposure used in manual mode for Snapshot and Video modes. Each integer value represents 8.5 microseconds of exposure. The default value is 100 which results in an exposure setting of 10 ms.

Type: Word

Range: 5-30,000

To set the exposure, scan the Fixed Exposure barcode, and then scan four numeric barcodes from [Numeric Barcodes](#) representing the value. Leading zeros are required. For example, to set a Fixed Exposure value of 99, scan 0, 0, 9, 9.



Fixed Exposure (4 digits)

Analog Gain

Parameter # 1232 (SSI # F4h D0h)

If you disable Decoding Autoexposure or Image Capture Autoexposure, you can modify the scan engine's analog gain.



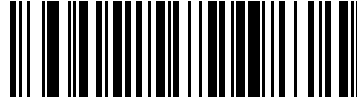
Analog Gain x 1 (0)



*Analog Gain x 2 (1)



Analog Gain x 4 (2)



Analog Gain x 8 (3)

Gain/Exposure Priority for Snapshot Mode

Parameter # 562 (SSI # F1h 32h)

This parameter alters the imager's gain exposure priority when it acquires an image in Snapshot Mode while in autoexposure mode.

- Low Exposure Priority - The imager favors higher gain over exposure to capture an image, resulting in an image that is less susceptible to motion blur at the expense of noise artifacts. However, for most applications, the amount of noise is acceptable.
- Low Gain Priority - The imager favors longer exposure time rather than higher gain to capture an image, ensuring the image is less noisy and produces fewer artifacts during post processing activities like image enhancement (sharpening). This mode is recommended for fixed mount / fixed object image capture since the image acquired is susceptible to motion blur.
- Autodetect - The imager automatically selects Gain Priority or Low Exposure Priority mode for Snapshot Mode. If the imager is in a magnetic reed switch-enabled stand (or it is configured in Blink Mode), it uses Low Gain Priority. Otherwise, it uses the Low Exposure Priority.



Low Gain Priority (0)



Low Exposure Priority (1)



*Autodetect (2)

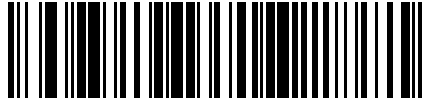
Snapshot Mode Timeout

Parameter # 323 (SSI # F0h 43h)

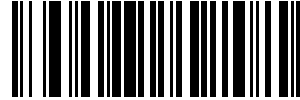
This parameter sets the amount of time the imager remains in Snapshot Mode.

- Set Snapshot Mode Timeout - scan this parameter and then scan a barcode from [Numeric Barcodes](#). Values increment by 30. For example, 1 = 60 seconds, 2 = 90 seconds.
- 30 Seconds - resets timeout to 30 seconds.

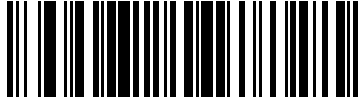
- No Timeout - the imager remains in Snapshot Mode until you initiate a decode session.



Set Snapshot Mode Timeout



*30 Seconds



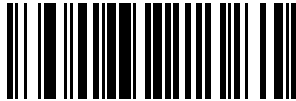
No Timeout

Snapshot Aiming Pattern

Parameter # 300 (SSI # F0h 2Ch)

This parameter determines whether or not to project the aiming pattern when in Snapshot Mode.

- Enabled - The aiming pattern frames the image for aiming purposes and does not appear in the captured image.
- Disabled - The aiming pattern does not frame the image for aiming purposes.



*Enable Snapshot Aiming Pattern (1)



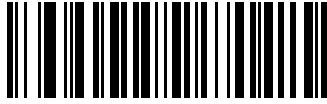
Disable Snapshot Aiming Pattern (0)

Silence Operational Mode Changes

Parameter # 1293 (SSI # F8h 05h 0Dh)

This parameter silences the beeper when switching between operational modes (for example, from Decode Mode to Snapshot Mode).

- Enabled - Silences the beep when switching between operational modes.
- Disabled - Allows the beep when switching between operational modes.



Silence Operational Mode Changes (Enable) (1)



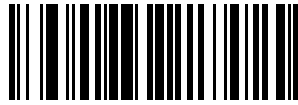
*Do Not Silence Operational Mode Changes (Disable) (0)

Image Cropping

Parameter # 301 (SSI # F0h 2Dh)

This parameter crops a captured image to the pixel addresses set in Crop to Pixel Addresses.

- Enabled - Crops the captured image.
- Disabled - Does not crop the captured image.



Enable Image Cropping (1)



*Disable Image Cropping (Use Full 1600 x 1200 Pixels) (0)

Crop to Pixel Addresses

Parameter # 315 (SSI # F4h F0h 3Bh) (Top)

Parameter # 316 (SSI # F4h F0h 3Ch) (Left)

Parameter # 317 (SSI # F4h F0h 3Dh) (Bottom)

Parameter # 318 (SSI # F4h F0h 3Eh) (Right)

When Image Cropping is enabled, use this parameter to set the pixel addresses.

The pixel addresses value range is (0,0) to 1599 x 1199.

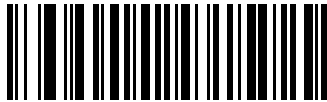
- Top Pixel Address - A value with the left pixel address to begin an image crop.
- Left Pixel Address - A value with the top pixel address to begin an image crop.
- Right Pixel Address - A value with the right pixel address to end an image crop.
- Bottom Pixel Address - A value with the right pixel address to end an image crop.

Columns are numbered from 0 to 1599, rows from 0 to 1199. Specify values for Top, Left, Bottom, and Right, where Top and Bottom correspond to row pixel addresses, and Left and Right correspond to column pixel addresses.

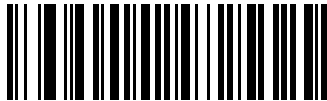


NOTE: The imager has a cropping resolution of 4 pixels. Setting the cropping area to less than 4 pixels (after resolution adjustment, see [Image Size](#)) transfers the entire image.

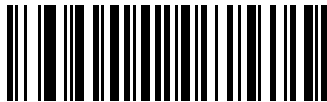
To crop to the pixel addresses, enable Image Cropping, and then scan four numeric barcodes from [Numeric Barcodes](#) representing the value.



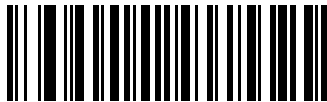
Top Pixel Address (0 - 1199 Decimal)



Left Pixel Address (0 - 1599 Decimal)



Bottom Pixel Address (0 - 1199 Decimal)



Right Pixel Address (0 - 1599 Decimal)

Image Size (Number of Pixels)

Parameter # 302 (SSI # F0h 2Eh)

This option alters image resolution before compression. Multiple pixels are combined into one pixel, resulting in a smaller image containing the original content with reduced resolution.

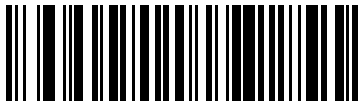
Select a resolution value to produce an image size.

Table 18 Image Size

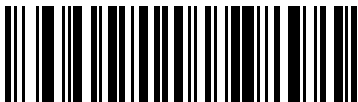
Resolution Value	Uncropped Image Size
Full	1600 x 1200
1/2	800 x 600
1/4	400 x 300



*Full Resolution (0)



1/2 Resolution (1)



1/4 Resolution (3)

Image Brightness (Target White)

Parameter # 390 (SSI # F0h 86h)

This parameter sets the Target White value used in Snapshot and Video Viewfinder modes when using auto exposure.

Type: Byte

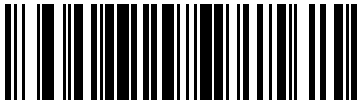
Range: 1 - 240

- Image Brightness (3 digits) - Represents the image brightness value.
- 180 - Sets the white level of the image to ~180.



NOTE: White and black are defined as the maximum value decimal and 1, respectively.

Scan Image Brightness, and then scan three numeric barcodes from [Numeric Barcodes](#) representing the value. Leading zeros are required. For example, to set an Image Brightness value of 99, scan 0, 9, 9.



*180

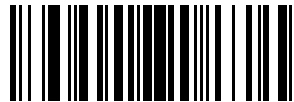


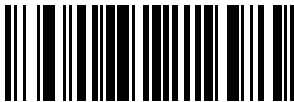
Image Brightness (3 digits)

JPEG Image Options

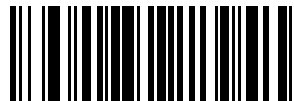
Parameter # 299 (SSI # F0h 2Bh)

This parameter changes the JPEG image quality or size.

- **JPEG Quality Selector** - Enter a quality value via the [JPEG Quality Value](#) parameter; the imager then selects the corresponding image size.
- **JPEG Size Selector** - Enter a size value via the [JPEG Size Value](#) parameter; the imager then selects the best image quality.



*JPEG Quality Selector (1)



JPEG Size Selector (0)

JPEG Quality Value

Parameter # 305 (SSI # F0h 31h)

This parameter adjusts the quality of the JPEG.



NOTE: Use this parameter if you selected **JPEG Quality Selector** as a JPEG Image Option.

Scan **JPEG Quality Value**, and then scan three barcodes from [Numeric Barcodes](#) corresponding to a value from 5 to 100, where 100 represents the highest quality image. Leading zeros are required. For example, to set an image quality value of 55, scan 0, 5, 5.



JPEG Quality Value (Default: 065) (5 - 100 Decimal)

JPEG Size Value

Parameter # 561 (SSI # F1h 31h)

Type: Word

Range: 5-350

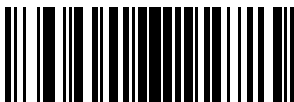
Default:

If you selected **JPEG Size Selector**, use **JPEG Size Value** to set the JPEG size.



CAUTION: JPEG compression may take 10 to 15 seconds based on the amount of information in the target image. Selecting [JPEG Quality Selector](#) produces a compressed image that is consistent in quality and compression time.

To set the JPEG size, scan **JPEG Size Value** and then scan three numeric barcodes from [Numeric Barcodes](#) representing the target JPEG file size in kilobytes (KB). Leading zeros are required. For example, to set an image file size value of 99, scan 0, 9, 9.



JPEG Size Value (Default: 160) (3 digits)

Image Enhancement

Parameter # 564 (SSI # F1h 34h)

This parameter uses a combination of edge sharpening and contrast enhancement to produce an image that is visually pleasing.

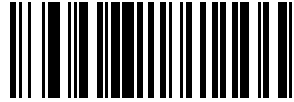
Select the level of image enhancement:

- Off (0)
- Low (1)
- Medium (2)

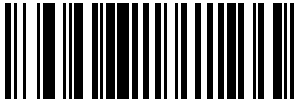
- High (3)



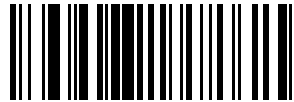
Off (0)



Low (1)



Medium (2)

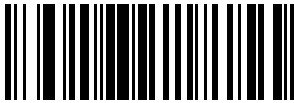


High (3)

Image File Format Selector

Parameter # 304 (SSI # F0h 30h)

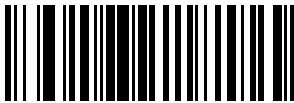
Use this parameter to select an image format appropriate for the system (BMP, TIFF, or JPEG). The imager stores captured images in the selected format.



BMP File Format (3)



*JPEG File Format (1)

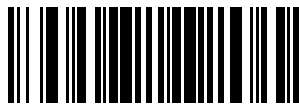


TIFF File Format (4)

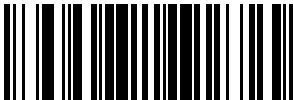
Image Rotation

Parameter # 665 (SSI # F1h 99h)

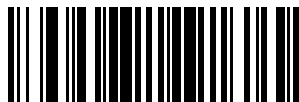
Use this parameter to rotate an image by 90-degree increments (0, 90, 180, or 270).



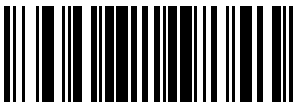
*Rotate 0° (0)



Rotate 90° (1)



Rotate 180° (2)



Rotate 270° (3)

Bits Per Pixel

Parameter # 303 (SSI # F0h 2Fh)

Use this parameter to select the number of significant bits per pixel (BPP) to use when capturing an image.

- 1 BPP - For a black and white image.
- 4 BPP - Assigns 1 of 16 levels of grey to each pixel.
- 8 BPP - Assigns 1 of 256 levels of grey to each pixel.



NOTE: The imager ignores these settings for JPEG file formats, which only support 8 BPP. TIFF file formats only support 4 BPP and 8 BPP. Selecting **1 BPP** for TIFF applies the 4 BPP option.



1 BPP (0)



4 BPP (1)



*8 BPP (2)

Signature Capture

Parameter # 93 (SSI # 5Dh)

Signature capture is a special-purpose symbology that delineates a signature capture area in a document with a machine-readable format.

Output File Format

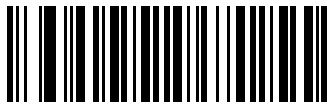
- Enabled - Signature capture is available.
- Disabled - Signature capture is not available.

The recognition pattern is variable so it can optionally provide an index to various signatures. The region inside the barcode pattern is considered the signature capture area. See [Signature Capture Code](#) for more information.

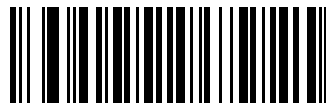
Decoding a signature capture barcode de-skews the signature image and converts the image to a BMP, JPEG, or TIFF file format. The output data includes the file descriptor followed by the formatted signature image.

Table 19 Output File Format

File Descriptor			Signature Image
Output Format (1 byte)	Signature Type (1 byte)	Signature Image Size (4 bytes) (BIG Endian)	
JPEG - 1	1-8	0x00000400	0x00010203....
BMP - 3			
TIFF - 4			



Enable Signature Capture (1)



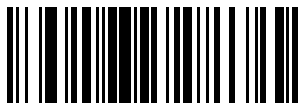
*Disable Signature Capture (0)

Signature Capture File Format Selector

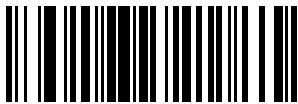
Parameter # 313 (SSI # F0h 39h)

This parameter de-skews the signature image and converts the image to a BMP, JPEG, or TIFF file format.

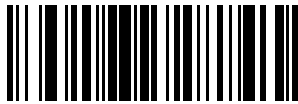
Select a signature file format appropriate for the system (BMP, TIFF, or JPEG). The imager stores captured signatures in the selected format.



BMP Signature Format (3)



*JPEG Signature Format (1)



TIFF Signature Format (4)

Signature Capture Bits Per Pixel

Parameter # 314 (SSI # F0h 3Ah)

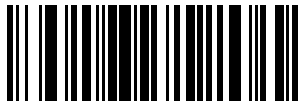
You can adjust the bits per pixel (BPP) when capturing a signature.

Select the number of significant bits per pixel (BPP) to use when capturing a signature:

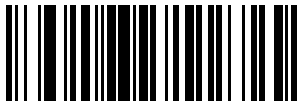
- 1 BPP - For a black and white image.
- 4 BPP - Assigns 1 of 16 levels of grey to each pixel.
- 8 BPP - Assigns 1 of 256 levels of grey to each pixel.



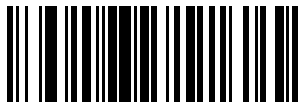
NOTE: The imager ignores these settings for JPEG file formats, which only support 8 BPP.



1 BPP (0)



4 BPP (1)



*8 BPP (2)

Signature Capture Width

Parameter # 366 (SSI # F4h F0h 6Eh)

This parameter adjusts the width of a signature capture box.



NOTE: The aspect ratio of the Signature Capture Width and Signature Capture Height parameters must match that of the signature capture area. For example, a 4 x 1 inch signature capture area requires a 4 to 1 aspect ratio of width to height.

To set the width of the signature capture box, scan Signature Capture Width, and then scan four barcodes from [Numeric Barcodes](#) corresponding to a value in the range of 001 to 1600 decimal.



Signature Capture Width (Default: 400) (001 - 1600 Decimal)

Signature Capture Height

Parameter # 367 (SSI # F4h F0h 6Fh)

This parameter adjusts the height of a signature capture box.

To set the height of the signature capture box, scan Signature Capture Height, and then scan three barcodes from [Numeric Barcodes](#) corresponding to a value in the range of 001 to 1200 decimal.



Signature Capture Height (Default: 100) (001 - 1200 Decimal)

Signature Capture JPEG Quality

Parameter # 421 (SSI # F0h A5h)

This parameter adjusts the image quality for a signature capture JPEG.

Scan JPEG Quality Value, and then scan three barcodes from [Numeric Barcodes](#) corresponding to a value from 005 to 100, where 100 represents the highest quality image.



JPEG Quality Value (Default: 065) (5 - 100 Decimal)

Camera Button

Parameter # 1716 (SSI # F8h 06h B4h)

This parameter allows the programmable button to be used as a camera button to capture images.

- Disable - The camera button cannot be used.
- Enable - The camera button is used.



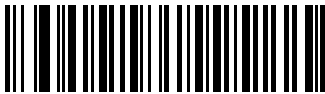
NOTE: The parameter is only valid if the scanner is in USB SNAP! with Imaging mode (see [USB Device Type](#)).

When the Camera Button is enabled, pressing the programmable button enacts the following sequence:



NOTE: You can either press and hold the programmable button for half a second or press it briefly twice.

1. The scanner enters Snapshot Mode.
 - Scanner's LED blinks green in 1-second intervals.
2. The scanner adjusts to the lighting conditions for more than 2 seconds.
3. An image is captured with the camera.
4. The scanner returns to Decode Mode.



*Disable Camera Button (0)



Enable Camera Button (1)

Camera Button Delay

Parameter # 1717 (SSI # F8h 06h B5h)

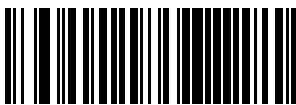
This parameter controls the time delay between pressing the camera button and capturing the image. This parameter is only applicable in Presentation Mode.

This delay allows the user time to place the item into the proper position for capturing the image. Units of time are in increments of 100 ms.

Default: 20 (2 sec).

Range: 0-255 ms.

Scan Camera Shutter Delay to set a time delay value, and then scan three barcodes from [Numeric Barcodes](#). Enter a leading zero for single-digit numbers. To correct an error or change a selection, scan [Cancel](#).



Camera Shutter Delay

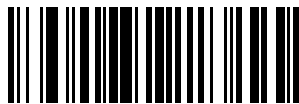
Video View Finder

Parameter # 324 (SSI # F0h 44h)

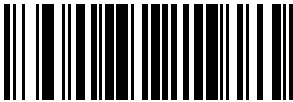
This parameter projects the video viewfinder while in Snapshot mode.

- Enabled - Projects the video viewfinder.

- Disabled - Does not project the video viewfinder.



Enable Video View Finder (1)



*Disable Video View Finder (0)

Video View Finder Image Size

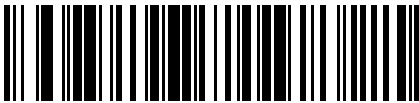
Parameter # 329 (SSI # F0h 49h)

This parameter adjusts the video viewfinder image size by 100-byte block increments.



NOTE: Values range from 800 to 12,000 bytes. A smaller value transmits more frames per second, while a larger value increases video quality.

Scan Video View Finder Image Size and then scan three barcodes from [Numeric Barcodes](#) corresponding to the 100-byte value from 800 to 12,000 bytes. For example, to select 1500 bytes, enter 0, 1, 5. To select 900 bytes, enter 0, 0, 9. The default is 1700 bytes.



Video View Finder Image Size

USB Interface

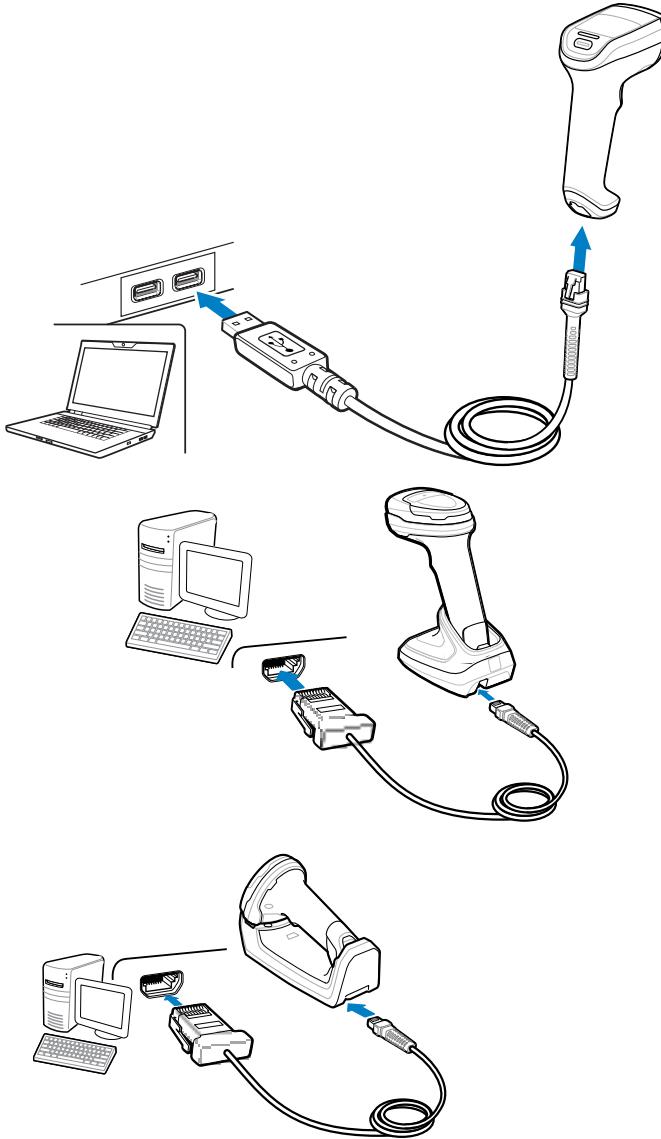
This section describes how to set up the scanner with a USB host. The scanner connects directly to a USB host, or a powered USB hub, which powers it.

The scanner ships with the settings shown in [USB Parameter Defaults](#). If the default values suit requirements, programming is not necessary.

USB Interface Connection

Connect the scanner directly to the host computer.

Figure 11 USB Connection



NOTE: When you connect the USB, use a shielded connector cable (such as the CBA-U21-S072AR). Refer to the Solution Pathway for more information about cables.

The scanner connects to USB-capable hosts including:

- TGCS (IBM) terminals
- Apple™ desktop and notebooks
- Other network computers that support more than one keyboard.

The following operating systems support the scanner through USB:

- Windows® XP, 7, 8, 10, 11
- MacOS 8.5 - MacOS 10.6
- TGCS (IBM) 4690/TCx Sky OS

The scanner also interfaces with other USB hosts that support USB Human Interface Devices (HID).

Connecting a USB Interface

You can connect a device by a USB interface cable.



NOTE: Interface cables vary depending on configuration. Any connectors illustrated are examples only. While connectors might be different than those illustrated, the steps to connect the scanner are the same.

1. Connect the modular connector of the USB interface cable to the cable interface port on the scanner.
2. Plug the series A connector in the USB host or hub, or plug the Plus Power connector in an available port of the IBM Sure POS terminal.
3. If applicable, connect a power supply between the power port on the interface cable and an AC outlet.
4. The scanner automatically detects the host and uses the default USB device type. If the default (*) does not meet your requirements, select another USB device type by scanning the appropriate barcode from [USB Device Type](#).
5. On first installation when using Windows, the software may prompt to select or install the Human Interface Device driver. To install this driver, provided by Windows, click Next at all choices and click Finished on the last choice. The scanner powers up during this installation.
6. To modify any other parameter options, scan the appropriate barcodes in this section.

If problems occur with the system, see [Troubleshooting](#).

USB Parameter Defaults

The following table lists defaults for USB host parameters. You can change default values in one of two ways:

- Scan the appropriate barcodes in this section. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).
- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).

Table 20 USB Interface Parameter Defaults

Parameter	Default
USB Host Parameters	
USB Device Type	USB HID Keyboard
USB CDC Host Variant	Standard
CDC Beep on <BEL>	Enable
4960 Flash Update	Enable
Symbol Native API (SNAPI) Status Handshaking	Enable

Table 20 USB Interface Parameter Defaults (Continued)

Parameter	Default
USB Keystroke Delay	No Delay
USB Caps Lock Override	Do Not Override Caps Lock Key (Disable)
Barcodes with Unknown Characters	Send Barcodes with Unknown Characters
USB Convert Unknown to Code 39	Disable
USB Fast HID	Enable
USB Polling Interval	3 msec
Emulate Keypad	Enable
Quick Keypad Emulation	Enable
Keypad Emulation with Leading Zero	Enable
USB Keyboard FN1 Substitution	Disable
Function Key Mapping	Disable
Simulated Caps Lock	Disable
USB Static CDC	Enable
TGCS (IBM) USB Direct I/O Beep	Honor
TGCS (IBM) USB Beep Directive	Ignore
TGCS (IBM) USB Barcode Configuration Directive	Ignore
TGCS (IBM) USB Specification Version	Version 2.2
Product ID (PID) Type	Host Type Unique
Product ID (PID) Value	None
ECLevel	None

USB Host Parameters

Scan barcodes to set USB host parameters.

USB Interface

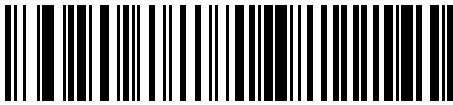
This section describes how to set up the scanner with a USB host. The scanner connects directly to a USB host, or a powered USB hub, which powers it.

The scanner ships with the settings shown in [USB Parameter Defaults](#). If the default values suit requirements, programming is not necessary.

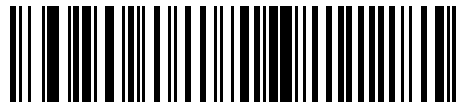
Barcodes with Unknown Characters

Unknown characters are characters the host does not recognize. This parameter determines how to process barcodes containing unknown characters.

- Send Barcodes With Unknown Characters - sends all barcode data except for unknown characters. The scanner issues no error beeps.
- Do Not Send Barcodes With Unknown Characters - sends barcode data up to the first unknown character. The scanner issues an error beep.



*Send Barcodes with Unknown Characters



Do Not Send Barcodes with Unknown Characters

USB Device Type

This parameter defines the type of USB device the scanner communicates with.

- When changing USB device types, the scanner resets and issues the standard startup beep sequences.
- When connecting two scanners to a host, IBM does not allow selecting two of the same device type. If you require two connections, select an IBM Table-top USB for one scanner and an IBM Hand-held USB for the second scanner.
- Select OPOS (IBM Hand-held with Full Disable) to completely shut off the scanner when an IBM register issues a Scan Disable command, including aim, illumination, decoding, and data transmission.
- Before selecting USB CDC Host, ensure your host OS has a USB CDC driver installed. For reference, Windows 11 includes a native (built-in) USB CDC driver. To recover a scanner stalled (non-functional) in USB CDC mode:
 - Install a USB CDC Driver
- Select USB HID POS to communicate over a USB cable with Microsoft's Universal Windows Platform (UWP) applications running on Windows 11 devices.



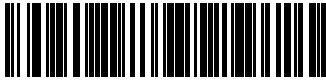
*USB HID Keyboard



IBM Table-top USB



IBM Hand-held USB



USB CDC Host



OPOS (IBM Hand-held with Full Disable)



SSI over USB CDC



Symbol Native API (SNAPI) with Imaging Interface



Symbol Native API (SNAPI) without Imaging Interface



USB HID POS (Windows 10 devices only)

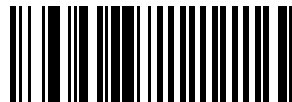
Product ID (PID) Type

Parameter # 1281 (SSI # F8h 05h 01h)

This parameter defines the PID value reported in USB enumeration.



*Host Type Unique (0)



Product Unique (1)



IBM Unique (2)

Product ID (PID) Value

Parameter # 1725 (SSI # F8h 06h BDh)

This parameter sets a Product ID (PID) value.



NOTE: This parameter applies to customers using a Firmware Flash Update per the Toshiba Global Commerce Solutions (TGCS) Universal Serial Bus OEM Point-of-Sale Device Interface.

To set a Product ID value, scan **Set PID Value**, and then scan four numeric barcodes in [Numeric Barcodes](#) that correspond to the value. Enter a leading zero for single-digit numbers. To correct an error, or change a selection, scan [Cancel](#). The range is (0 - 1649). The default is 0.



Set PID Value

ECLevel

Parameter # 1710 (SSI # F8h 06h AEh)

This parameter sets an ECLevel.



NOTE: This parameter applies to customers using a Firmware Flash Update per the Toshiba Global Commerce Solutions (TGCS) Universal Serial Bus OEM Point-of-Sale Device Interface. It allows defining an ECLevel value to manage and control Flash Update operations on the 4690 operating system.

Contact Zebra Support at zebra.com/support for more information.

To set an ECLevel value, scan **Set ECLevel**, and then scan five numeric barcodes in [Numeric Barcodes](#) that correspond to the desired level. Enter a leading zero for single digit numbers. To correct an error, or change a selection, scan [Cancel](#).



Set ECLevel

TGCS (IBM) USB Beep Directive

The host can send a beeper configuration request to the scanner. Scan Ignore Beep Directive to prevent the scanner from processing the host request. All directives are still acknowledged to the USB host as if they were processed.



Honor Beep Directive



*Ignore Beep Directive

TGCS (IBM) USB Barcode Configuration Directive

The host can enable and disable code types. Scan Ignore Barcode Configuration Directive to prevent the scanner from processing the host request. All directives are still acknowledged to the USB host as if they were processed.



Honor Barcode Configuration Directive



*Ignore Barcode Configuration Directive

TGCS (IBM) USB Direct I/O Beep

Parameter # 1360

The host can send a direct I/O beep request to the scanner. If you select Ignore Direct I/O Beep, the scanner does not sound beeps on this command. All directives are still acknowledged to the USB host as if they were processed.



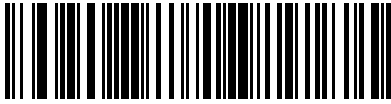
* Honor Direct I/O Beep



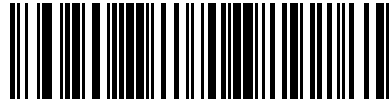
Ignore Direct I/O Beep

USB Convert Unknown to Code 39

This option applies only to the IBM hand-held, IBM table-top, and OPOS devices. Select an option to enable or disable converting unknown barcode type data to Code 39.



Enable Convert Unknown to Code 39



*Disable Convert Unknown to Code 39

TGCS (IBM) USB Specification Version

Parameter # 45026

You can specify code types as unknown or specify the code types with an appropriate IBM identifier.

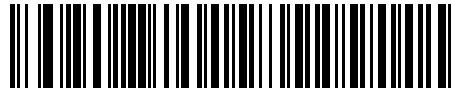
Select IBM Specification Level (Original) to send the following code types as Unknown:

- Data Matrix
- GS1 Data Matrix
- QR Code
- GS1 QR
- MicroQR Code
- Aztec

Select IBM Specification Level Version 2.2 to send the code types with the appropriate IBM identifiers.



IBM Specification Level (Original)



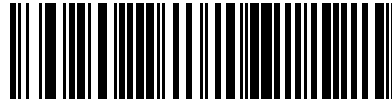
*IBM Specification Level Version 2.2 or higher

USB Keystroke Delay

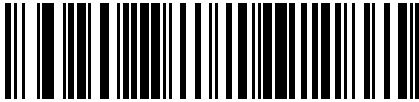
This parameter sets the delay, in milliseconds, between emulated keystrokes. Select a longer delay for hosts that require slower data transmission.



*No Delay



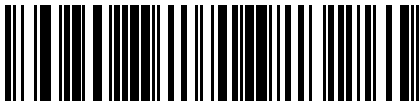
Medium Delay (20 msec)



Long Delay (40 msec)

USB Caps Lock Override

This option applies only to the USB HID Keyboard device. Select Override Caps Lock Key to preserve the case of the data regardless of the state of the Caps Lock key. This setting is always enabled for the Japanese Windows (ASCII) keyboard type and cannot be disabled.



Override Caps Lock Key (Enable)



*Do Not Override Caps Lock Key (Disable)

Keypad Emulation with Leading Zero

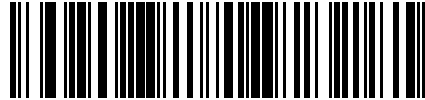
Select Enable Keypad Emulation with Leading Zero to send character sequences sent over the numeric keypad as ISO characters which have a leading zero. For example, ASCII A transmits as “ALT MAKE” 0 0 6 5 “ALT BREAK”.



NOTE: This parameter only applies if [Emulate Keypad](#) is enabled.



*Enable Keypad Emulation with Leading Zero

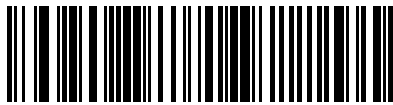


Disable Keypad Emulation with Leading Zero

USB Keyboard FN1 Substitution

This option applies code 128 and ISBT 128 to the USB HID Keyboard device. Scan Enable USB Keyboard FN1 Substitution to replace any FN1 character in a GS1 128 barcode with a user-selected Key Category and value.

See [FN1 Substitution Values](#) to set the Key Category and Key Value.



Enable USB Keyboard FN1 Substitution



*Disable USB Keyboard FN1 Substitution

USB Polling Interval

Select an option to set the polling interval, which is the rate at which data transmits between the scanner and host computer. A lower number indicates a faster data rate.



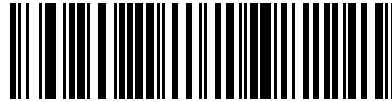
NOTE: When changing the USB polling interval, the scanner restarts and issues a power-up beep sequence.



IMPORTANT: Ensure the host supports the selected data rate.



1 msec



2 msec



*3 msec



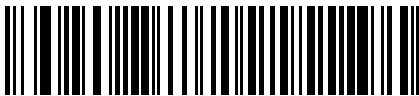
4 msec



5 msec



6 msec



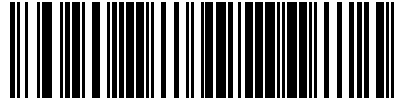
7 msec



8 msec



9 msec



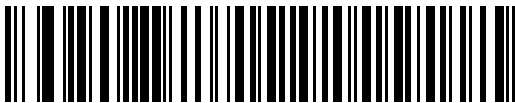
10 msec

Keypad Emulation

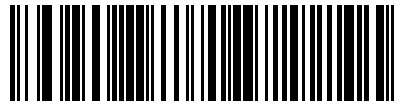
Select Enable Keypad Emulation to send all characters as ASCII sequences over the numeric keypad. For example, ASCII A transmits as ALT make 0 6 5 ALT Break.



NOTE: If your keyboard type is not listed in the country code list (see [Country Codes](#)), disable [Quick Keypad Emulation](#) and enable Keypad Emulation.



*Enable Keypad Emulation



Disable Keypad Emulation

USB Quick Keypad Emulation

Enable Quick Keypad Emulation for a quick method of emulation using the numeric keypad where ASCII sequences are only sent for ASCII characters not found on the keyboard.



NOTE: Quick Keypad Emulation only applies to the USB HID Keyboard device when Keypad Emulation is enabled.



*Enable Quick Keypad Emulation



Disable Quick Keypad Emulation

USB Fast HID

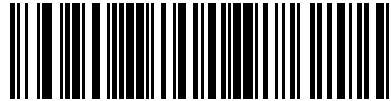
Select Enable USB Fast HID to transmit USB HID data at a faster rate.



NOTE: Disable this if there are problems with transmission.



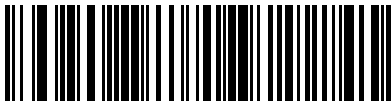
*Enable USB Fast HID



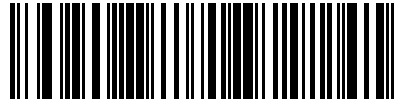
Disable USB Fast HID

Symbol Native API (SNAPI) Status Handshaking

After selecting a SNAPI interface as the USB device type, select an option to enable or disable status handshaking.



*Enable SNAPI Status Handshaking



Disable SNAPI Status Handshaking

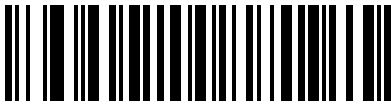
USB Static CDC

Parameter # 670

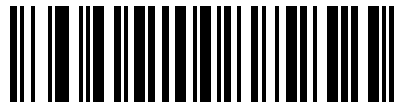
You can connect devices to the same COM port or different COM ports.

When disabled, each device connected consumes another COM port (first device = COM1, second device = COM2, third device = COM3, etc.)

When enabled, each device connects to the same COM port.



*Enable USB Static CDC (1)



Disable USB Static CDC (0)

USB ASCII Character Sets

See [ASCII Character Sets](#) for the following information:

- [ASCII Character Sets](#)
- [ALT Key Character Set](#)
- [GUI Key Character Set](#)
- [F Key Character Set](#)

SSI Interface

This section describes the system requirements of the Simple Serial Interface (SSI), which provides a communications link between Zebra decoders (e.g., scan engines, slot scanners, hand-held scanners, two-dimensional scanners, hands-free scanners, and RF base stations) and a serial host. It provides the means for the host to control the decoder or scanner.

Communication

All communication between the scanner and host occurs over the hardware interface lines using the SSI protocol. Refer to the Simple Serial Interface Programmer's Guide, p/n 72E-40451-xx, for more information on SSI.

The host and the scanner exchange messages in packets. A packet is a collection of bytes framed by the proper SSI protocol formatting bytes. The maximum number of bytes per packet that the SSI protocol allows for any transaction is 257 (255 bytes + 2 byte checksum).

Depending on the configuration, the scanner can send decode data as ASCII data (unpacked), or as part of a larger message (packed).

SSI performs the following functions for the host device:

- Maintains a bi-directional interface with the scanner
- Allows the host to send commands that control the scanner
- Passes data from the scanner to a host device in SSI packet format or straight decode message.

The SSI environment consists of a scanner, a serial cable which attaches to the host device, and if required, a power supply.

SSI transmits all decode data including special formatting (for example, AIM ID). Parameter settings can control the format of the transmitted data.

The scanner can also send parameter information, product identification information, or event codes to the host.

All commands sent between the scanner and host must use the format described in the SSI Message Formats section. [SSI Transactions](#) describes the required sequence of messages in specific cases.

SSI Commands

The following table lists all the SSI opcodes the scanner supports. The host transmits opcodes designated type H. The scanner (decoder) transmits type D opcodes and transmits Host/Decoder (H/D) types.

Table 21 SSI Commands

Name	Type	Opcode	Description
BEEP	H	0xE6	Sound the beeper.
CAPABILITIES_REPLY	D	0xD4	Reply to CAPABILITIES_REQUEST; contains a list of the capabilities and commands the decoder supports.
CAPABILITIES_REQUEST	H	0xD3	Request capabilities report from the decoder.
CMD_ACK	H/D	0xD0	Positive acknowledgment of received packet.
CMD_NAK	H/D	0xD1	Negative acknowledgment of received packet.
DECODE_DATA	D	0xF3	Decode data in SSI packet format.
EVENT	D	0xF6	Event indicated by associated event code.
LED_OFF	H	0xE8	De-activate LED output.
LED_ON	H	0xE7	Activate LED output.
PARAM_DEFAULTS	H	0xC8	Set parameter default values.
PARAM_REQUEST	H	0xC7	Request values of certain parameters.
PARAM_SEND	H/D	0xC6	Send parameter values.
REPLY_REVISION	D	0xA4	Reply to REQUEST_REVISION, contains the decoder's software/hardware configuration.
REQUEST_REVISION	H	0xA3	Request the decoder's configuration.
SCAN_DISABLE	H	0xEA	Prevent the operator from scanning barcodes.
SCAN_ENABLE	H	0xE9	Permit barcode scanning.
SLEEP	H	0xEB	Request to place the decoder into low power.
START_DECODE	H	0xE4	Tell the decoder to attempt to decode a barcode.
STOP_DECODE	H	0xE5	Tell the decoder to abort a decode attempt.
WAKEUP	H	N/A	Wake the decoder from low power mode.

For details of the SSI protocol, refer to the Simple Serial Interface Programmer's Guide.

SSI Transactions

General Data Transactions

This section describes general data transactions between the scanner and a host.

ACK/NAK Handshaking

If you enable ACK/NAK handshaking (the default), all packeted messages must have a CMD_ACK or CMD_NAK response, unless the command description states otherwise. Zebra recommends leaving this handshaking enabled to provide feedback to the host. Raw decode data and WAKEUP do not use ACK/NAK handshaking since they are not packeted data.

Following is an example of a problem which can occur if you disable ACK/NAK handshaking:

- The host sends a PARAM_SEND message to the scanner to change the baud rate from 9600 to 19200.
- The scanner cannot interpret the message.
- The scanner does not implement the change the host requested.
- The host assumes that the parameter change occurred and acts accordingly.
- Communication is lost because the change did not occur on both sides.

If you enable ACK/NAK handshaking, the following occurs:

- The host sends a PARAM_SEND message.
- The scanner cannot interpret the message.
- The scanner CMD_NAKs the message.
- The host resends the message.
- The scanner receives the message successfully, responds with CMD_ACK, and implements parameter changes.

Decoded Data Transmission

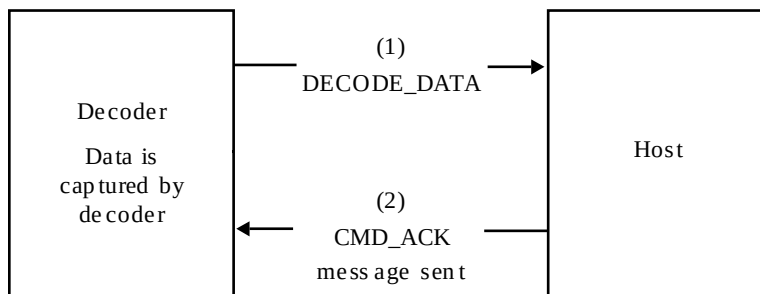
The [Decode Data Packet Format](#) parameter controls how decode data is sent to the host. Set this parameter to send the data in a DECODE_DATA packet. Clear this parameter to transmit the data as raw ASCII data.



NOTE: When transmitting decode data as raw ASCII data, ACK/NAK handshaking does not apply regardless of the state of the ACK/NAK handshaking parameter.

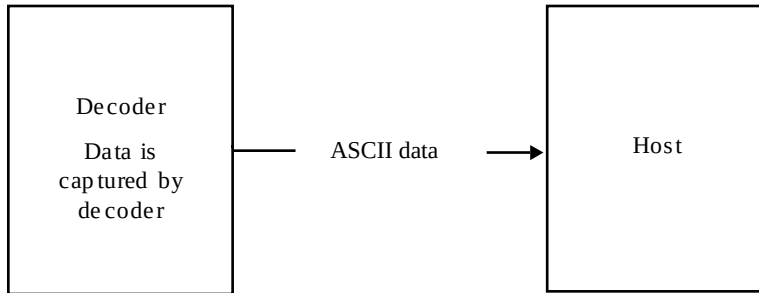
ACK/NAK Enabled and Packeted Data

The scanner sends a DECODE_DATA message after a successful decode. The scanner waits for a programmable timeout for a CMD_ACK response. If it does not receive the response, the scanner tries to send two more times before issuing a host transmission error. If the scanner receives a CMD_NAK from the host, it may attempt a retry depending on the cause field of the CMD_NAK message.



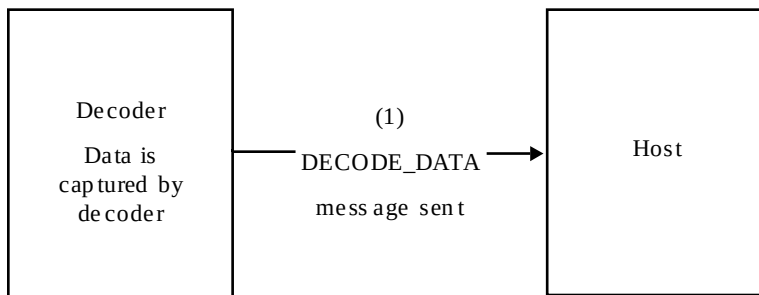
ACK/NAK Enabled and Unpacketed ASCII Data

Even if ACK/NAK handshaking is enabled, no handshaking occurs because handshaking applies only to packeted data. In this example the packeted_decode parameter is disabled.



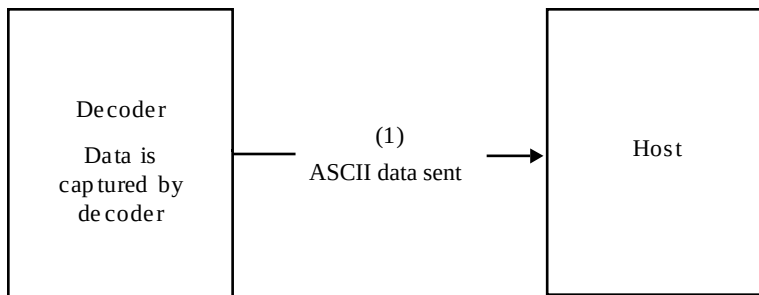
ACK/NAK Disabled and Packeted **DECODE_DATA**

In this example ACK/NAK does not occur even though packeted_decode is enabled because the ACK/NAK handshaking parameter is disabled.



ACK/NAK Disabled and Unpacketed **ASCII Data**

The decoder sends captured data to the host.



Communication Summary

RTS/CTS Lines

All communication must use RTS/CTS handshaking as described in the Simple Serial Interface Programmer's Guide, p/n 72E-40451-xx. If bypassing hardware handshaking, the host must send the WAKEUP command before all other communication or the first byte of a message can be lost during the scanner wakeup sequence. Zebra recommends not bypassing RTS/CTS hardware handshaking.

ACK/NAK Option

ACK/NAK handshaking is enabled by default and Zebra recommends leaving it enabled. Disabling this can cause communication problems, as handshaking is the only acknowledgment that a message was received correctly. ACK/NAK is not used with unpacketed decode data regardless of whether it is enabled.

Number of Data Bits

All communication with the scanner must use 8-bit data.

Serial Response Timeout

The [Host Serial Response Timeout](#) parameter determines how long to wait for a handshaking response before trying again or aborting further attempts. Set the same value for both the host and scanner.



NOTE: You can temporarily change the [Host Serial Response Timeout](#) when the host takes longer to process an ACK or longer data string. Zebra does not recommend frequent permanent changes due to limited write cycles of non-volatile memory.

Retries

The host resends data twice after the initial send if the scanner does not respond with an ACK or NAK (if ACK/NAK handshaking is enabled), or response data (for example, PARAM_SEND, REPLY_REVISION). If the scanner replies with a NAK RESEND, the host resends the data. All resent messages must have the resend bit set in the Status byte.

The scanner resends data two times after the initial send if the host fails to reply with an ACK or NAK (if ACK/NAK handshaking is enabled).

Baud Rate, Stop Bits, Parity, Response Timeout, ACK/NAK Handshaking

If you use PARAM_SEND to change these serial parameters, the ACK response to the PARAM_SEND uses the previous values for these parameters. The new values then take effect for the next transaction.

Errors

When the scanner encounters a communication error, it emits an error beep.

The scanner issues a communication error when:

- The CTS line is asserted when the scanner tries to transmit, and is still asserted on each of two successive retries
- The scanner does not receive an ACK or NAK after initial transmit and two resends.

SSI Communication Notes

Follow these best practices for SSI communication.

- When not using hardware handshaking, space messages sufficiently apart. The host must not communicate with the scanner if the scanner is transmitting.
- When using hardware handshaking, frame each message properly with handshaking signals. Do not try to send two commands within the same handshaking frame.

- There is a permanent/temporary bit in the PARAM_SEND message. Removing power from the scanner discards temporary changes. Permanent changes are written to non-volatile memory. Frequent changes shorten the life of the non-volatile memory.

Using Time Delay to Low Power Mode with SSI

[Time Delay to Low Power Mode](#) provides options to select a general time delay. To program a more specific delay value, use an SSI command according to the following values.

Table 22 Values for Selecting Time Delay to Low Power

Value	Timeout	Value	Timeout	Value	Timeout	Value	Timeout
0x00	15 Min	0x10	1 Sec	0x20	1 Min	0x30	1 Hour
0x01	30 Min	0x11	1 Sec	0x21	1 Min	0x31	1 Hour
0x02	60 Min	0x12	2 Sec	0x22	2 Min	0x32	2 Hours
0x03	90 Min	0x13	3 Sec	0x23	3 Min	0x33	3 Hours
N/A	N/A	0x14	4 Sec	0x24	4 Min	0x34	4 Hours
N/A	N/A	0x15	5 Sec	0x25	5 Min	0x35	5 Hours
N/A	N/A	0x16	6 Sec	0x26	6 Min	0x36	6 Hours
N/A	N/A	0x17	7 Sec	0x27	7 Min	0x37	7 Hours
N/A	N/A	0x18	8 Sec	0x28	8 Min	0x38	8 Hours
N/A	N/A	0x19	9 Sec	0x29	9 Min	0x39	9 Hours
N/A	N/A	0x1A	10 Sec	0x2A	10 Min	0x3A	10 Hours
N/A	N/A	0x1B	15 Sec	0x2B	15 Min	0x3B	15 Hours
N/A	N/A	0x1C	20 Sec	0x2C	20 Min	0x3C	20 Hours
N/A	N/A	0x1D	30 Sec	0x2D	30 Min	0x3D	30 Hours
N/A	N/A	0x1E	45 Sec	0x2E	45 Min	0x3E	45 Hours
N/A	N/A	0x1F	60 Sec	0x2F	60 Min	0x3F	60 Hours



NOTE: With hardware handshaking disabled, the scanner wakes from low power mode upon receiving a character. However, the scanner does not process this character or any others it receives during the period following wakeup. Wait at least after wakeup to send valid characters.

Encapsulation of RSM Commands/Responses over SSI

The SSI protocol allows the host to send a command that is variable in length up to 255 bytes. Although there is a provision in the protocol to multi-packet commands from the host, the scanner does not support this. The host must fragment packets using the provisions in the RSM protocol.

Command Structure

Byte	7	6	5	4	3	2	1	0
0	Length (not including the checksum)							
1	SSI_MGMT_COMMAND (0x80)							
2	Message Source (4 - Host)							
3	Reserved (0)			Reserved (0)		Reserved (0)	Cont'd packet	Retransmit
4	Payload data (see the following example)							
...								
Length -1								
Length	2's complement checksum (MSB)							
Length +1	2's complement checksum (LSB)							

The expected positive response is SSI_MGMT_COMMAND which can be a multi-packet response. Devices that do not support this command respond with the standard SSI_NAK.

Response Structure

Byte	7	6	5	4	3	2	1	0
0	Length (not including the checksum)							
1	SSI_MGMT_COMMAND (0x80)							
2	Message Source (0 - Decoder)							
3	Reserved (0)			Reserved (0)		Reserved (0)	Cont'd packet	Retransmit
4	Payload data (see the following example)							
...								
Length -1								
Length	2's complement checksum (MSB)							
Length +1	2's complement checksum (LSB)							

Example Transaction

The following example illustrates how to retrieve diagnostic information (Diagnostic Testing and Reporting - Attribute #10061- decimal) from the scanner using encapsulation of RSM commands over SSI. Before sending an RSM command, the host must send the RSM Get Packet Size command to query the packet size supported by the device.

Command from Host to Query Packet Size Supported by Device

```
0A 80 04 00 00 06 20 00 FF FF FD 4E
```

Where:

- 0A 80 04 00 is encapsulation of RSM commands over SSI command header
- 00 06 20 00 FF FF is RSM Get Packet Size command
- FD 4E is SSI command checksum

Response from Device with Packet Size Information

```
0C 80 00 00 00 08 20 00 00 F0 00 F0 FD 6C
```

Where:

- 0C 80 00 00 is encapsulation of RSM command over SSI command header
- 00 08 20 00 00 F0 00 F0 is RSM Get Packet Size response
- FD 6C is SSI response checksum

Command from Host to Retrieve Diagnostic Information

```
0C 80 04 00 00 08 02 00 27 4D 42 00 FE B0
```

Where:

- 0C 80 04 00 is encapsulation of RSM commands over SSI command header
- 00 08 02 00 27 4D 42 00 is attribute Get command requesting attribute 10061 decimal
- FE B0 is SSI command checksum

Response from Device with Diagnostic Information

```
21 80 00 00 00 1D 02 00 27 4D 41 01 42 00 0E 00 00 00 00 01 03 02 03 03 03 04  
03 05 03 06 03 FF FF FC 15
```

Where:

- 21 80 00 00 00 1D 02 00 27 4D 41 01 42 00 0E 00 00 is encapsulation of RSM responses over SSI command header
- 00 00 01 03 02 03 03 03 04 03 05 03 06 03 is attribute Get response which includes diagnostic report value
- FF FF is attribute Get response, packet termination
- FC 15 is SSI response checksum

Setting SSI Parameters

You can set up a scanner with an SSI host. When using SSI, program the scanner via barcode menu or SSI hosts commands

The scanner ships with the settings shown in [SSI Interface Defaults](#) (also see for all defaults). If the default values suit requirements, programming is not necessary.

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the scanner powers down.

To return all features to default values, scan [Set Factory Defaults](#). Throughout the programming barcode menus, asterisks (*) indicate default values.

SSI Scanning Sequence Examples

In most cases scanning one barcode sets the parameter value. For example, to set the baud rate to 19,200, scan the **Baud Rate 19,200** barcode under [Baud Rate](#). The scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several barcodes. See the parameter descriptions for this procedure.

SSI Errors While Scanning

Unless otherwise specified, to correct an error during a scanning sequence, just re-scan the correct parameter.

Simple Serial Interface Parameter Defaults

The following table lists defaults for SSI host parameters.

You can change these values in one of two ways:

- Scan the appropriate barcodes in this section. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).
- Download data through the device's serial port using SSI. Hexadecimal parameter numbers appear in this section below the parameter title, and option values display in parentheses beneath the accompanying barcodes. Refer to the Simple Serial Interface (SSI) Programmer's Guide for detailed instructions for changing parameters using this method.

Table 23 SSI Interface Default Table

Parameter	Parameter Number	SSI Number	Default
SSI Host Parameters			
Select SSI Host	N/A	N/A	N/A
Baud Rate	156	9Ch	9600
Parity	158	9Eh	None
Check Parity	151	97h	Do Not Check Parity
Stop Bits	157	9Dh	1
Software Handshaking	159	9Fh	Enable ACK/NAK
Host RTS Line State	154	9Ah	Low
Decode Data Packet Format	238	EEh	Send Raw Decode Data
Host Serial Response Timeout	155	9Bh	2 Seconds
Host Character Timeout	239	EFh	200 msec
Multipacket Option	334	F0h 4Eh	Multipacket Option 1
Interpacket Delay	335	F0h 4Fh	0 msec

Table 23 SSI Interface Default Table (Continued)

Parameter	Parameter Number	SSI Number	Default
Event Reporting			
Decode Event	256	F0h 00h	Disable
Boot Up Event	258	F0h 02h	Disable
Parameter Event	259	F0h 03h	Disable



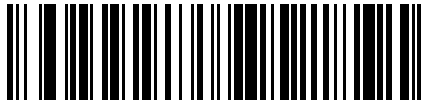
NOTE: SSI interprets Prefix, Suffix1, and Suffix2 values listed in [ASCII Character Sets](#) differently than other interfaces. SSI does not recognize key categories, only the 3-digit decimal value. The default value of 7013 is interpreted as CR only.

SSI Host Parameters

Scan barcodes to set SSI host parameters

Select SSI Host

Use this parameter to select SSI as the host interface.



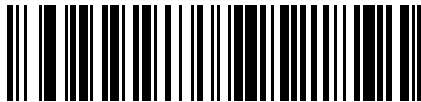
SSI Host

SSI Baud Rate

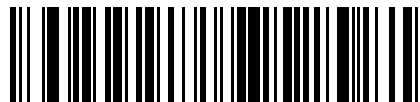
Parameter # 156 (SSI # 9Ch)

Baud rate is the number of bits of data transmitted per second.

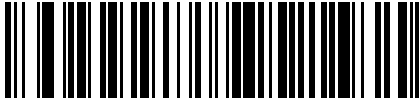
Select an option to set the scanner's baud rate to match the baud rate setting of the host device. Otherwise, data may not reach the host device or may reach it in distorted form.



*Baud Rate 9600 (0)



Baud Rate 19,200 (7)



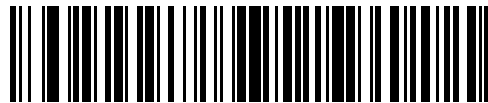
Baud Rate 38,400 (8)



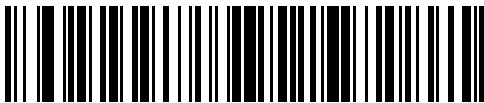
Baud Rate 57,600 (9)



Baud Rate 115,200 (10)



Baud Rate 230,400 (11)



Baud Rate 460,800 (12)



Baud Rate 921,600 (13)

SSI Parity

Parameter # 158 (SSI # 9Eh)

Choose whether code characters contain an odd or even number of 1 bits, or choose that no parity bit is required.

A parity check bit is the most significant bit of each ASCII coded character. Use this parameter to select the parity type according to host device requirements.

- Odd - This sets the parity bit value to 0 or 1, based on data, to ensure that the coded character contains an odd number of 1 bits.
- Even - This sets the parity bit value to 0 or 1, based on data, to ensure that the coded character contains an even number of 1 bits.
- None - No parity bit is required.



Odd (2)



Even (1)



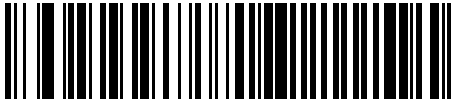
*None (0)

Check Parity

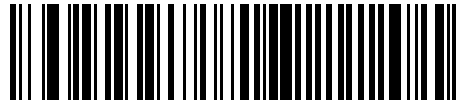
Parameter # 151 (SSI # 97h)

Choose whether to check the parity of received characters.

Use this parameter to select whether to check the parity of received characters. See [SSI Parity](#) to select the type of parity.



*Do Not Check Parity (0)



Check Parity (1)

SSI Stop Bits

Parameter # 157 (SSI # 9Dh)

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream.

Select an option to set the number of stop bits (one or two) based on the number the receiving host can accommodate.



*1 Stop Bit (1)



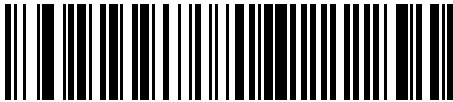
2 Stop Bits (2)

Software Handshaking

Parameter # 159 (SSI # 9Fh)

This parameter offers control of data transmission in addition to the control hardware handshaking offers. Hardware handshaking is always enabled; you cannot disable it.

- Disable ACK/NAK Handshaking - The scanner neither generates nor expects ACK/NAK handshaking packets.
- Enable ACK/NAK Handshaking - After transmitting data, the scanner expects either an ACK or NAK response from the host. The scanner also ACKs or NAKs messages from the host. The scanner waits up to the programmable [Host Serial Response Timeout](#) to receive an ACK or NAK. If the scanner does not get a response in this time, it resends its data up to two times before discarding the data and declaring a transmission error.



Disable ACK/NAK (0)



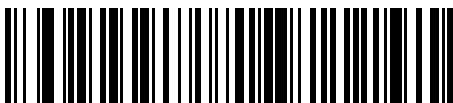
*Enable ACK/NAK (1)

Host RTS Line State

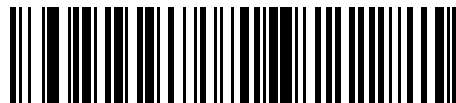
Parameter # 154 (SSI # 9Ah)

This parameter sets the expected idle state of the Serial Host RTS line.

The SSI interface is used with host applications that also implement the SSI protocol. However, you can use the scanner in a "scan-and-transmit" mode to communicate with any standard serial communication software on a host PC (see [Decode Data Packet Format](#)). If transmission errors occur in this mode, the host PC may be asserting hardware handshaking lines that interfere with the SSI protocol. Scan the High barcode to address this problem.



*Low (0)



High (1)

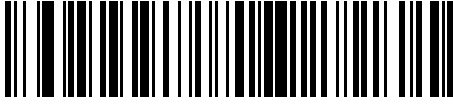
Decode Data Packet Format

Parameter # 238 (SSI # EEh)

Use this parameter to select whether to transmit decoded data in raw format (unpacked), or with the packet format defined by the serial protocol.



NOTE: Selecting the raw format disables ACK/NAK handshaking for decode data.



*Send Raw Decode Data (0)



Send Packeted Decode Data (1)

Host Serial Response Timeout (SSI)

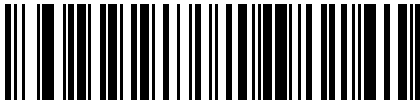
Parameter # 155 (SSI # 9Bh)

This parameter specifies how long a scanner waits for an ACK or NAK before resending.

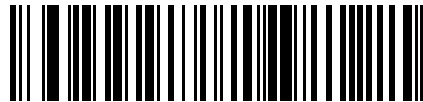
If the scanner wants to send, and the host has already been granted permission to send, the scanner waits for the designated timeout before declaring an error.



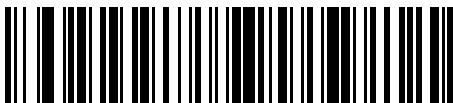
NOTE: Other values are available via SSI command.



*Low - 2 Seconds (20)



Medium - 5 Seconds (50)



High - 7.5 Seconds (75)



Maximum - 9.9 Seconds (99)

Host Character Timeout

Parameter # 239 (SSI # EFh)

This parameter specifies the maximum time a scanner waits between characters transmitted by the host before discarding the received data and declaring an error.

Select an option to specify the maximum time the scanner waits from Low to High.



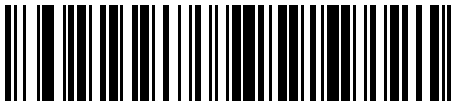
NOTE: Other values are available via SSI command.



*Low - 200 msec (20)



Medium - 500 msec (50)



High - 750 msec (75)



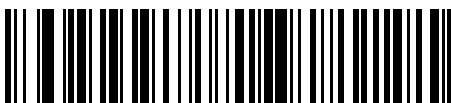
Maximum - 990 msec (99)

Multipacket Option

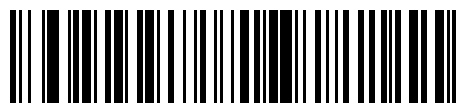
Parameter # 334 (SSI # F0h 4Eh)

This parameter controls ACK/NAK handshaking for multi-packet transmissions.

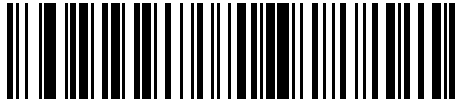
- Multi-Packet Option 1 - The host sends an ACK/NAK for each data packet during a multi-packet transmission.
- Multi-Packet Option 2 - The scanner sends data packets continuously, with no ACK/NAK handshaking to pace the transmission. The host, if overrun, can use hardware handshaking to temporarily delay scanner transmissions. At the end of transmission, the scanner waits for a CMD_ACK or CMD_NAK.
- Multi-Packet Option 3 - This is the same as option 2 with the addition of a programmable interpacket delay. See [Interpacket Delay](#) to set this delay.



*Multipacket Option 1 (0)



Multipacket Option 2 (1)



Multipacket Option 3 (2)

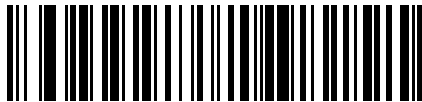
Interpacket Delay

Parameter # 335 (SSI # F0h 4Fh)

This parameter specifies the interpacket delay if you selected Multipacket Option 3.



NOTE: Other values are available via SSI command.



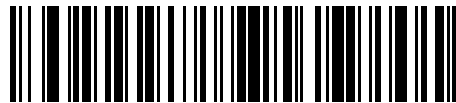
*Minimum - 0 msec (0)



Low - 25 msec (25)



Medium - 50 msec (50)



High - 75 msec (75)



Maximum - 99 msec (99)

Event Reporting

The host can request the scanner to provide certain information (events) relative to scanner behavior.

Scan the following barcodes to enable or disable events.

Table 24 Event Codes

Event Class	Event	Code Reported
Decode Event	Non-parameter decode	0x01

Table 24 Event Codes (Continued)

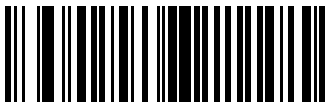
Event Class	Event	Code Reported
Boot Up Event	System power-up	0x03
Parameter Event	Parameter entry error	0x07
	Parameter stored	0x08
	Defaults set (and parameter event is enabled by default)	0x0A
	Number expected	0x0F

Decode Event

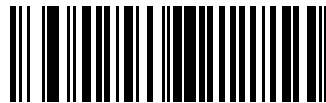
Parameter # 256 (SSI # F0h 00h)

Use this parameter to enable or disable a non-parameter decode event.

- Enable Decode Event - scanner generates a message to the host upon a successful barcode decode.
- Disable Decode Event - no notification is sent.



Enable Decode Event (1)



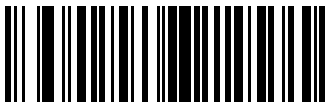
*Disable Decode Event (0)

Boot Up Event

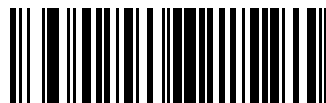
Parameter # 258 (SSI # F0h 02h)

Use this parameter to enable or disable a system power-up event.

- Enable Boot Up Event - scanner generates a message to the host whenever power is applied.
- Disable Boot Up Event - no notification is sent.



Enable Boot Up Event (1)



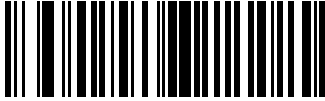
*Disable Boot Up Event (0)

Parameter Event

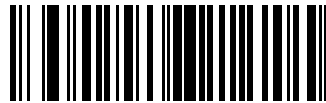
Parameter # 259 (SSI # F0h 03h)

Use this parameter to enable or disable parameter events.

- Enable Parameter Event - scanner generates a message to the host when one of the events specified in [Event Reporting](#) occurs.
- Disable Parameter Event - no notification is sent.



Enable Parameter Event (1)



*Disable Parameter Event (0)

RS-232 Interface

You can set up a scanner with an RS-232 host. The scanner uses the RS-232 interface to connect to point-of-sale devices, host computers, or other devices with an available RS-232 port (for example, com port).

The scanner ships with the settings shown in [RS-232 Parameter Defaults](#). If the default values suit requirements, programming is not necessary.

If your host does not appear in [RS-232 Host-Specific Parameter Settings](#), refer to the documentation for the host device to set communication parameters to match the host.

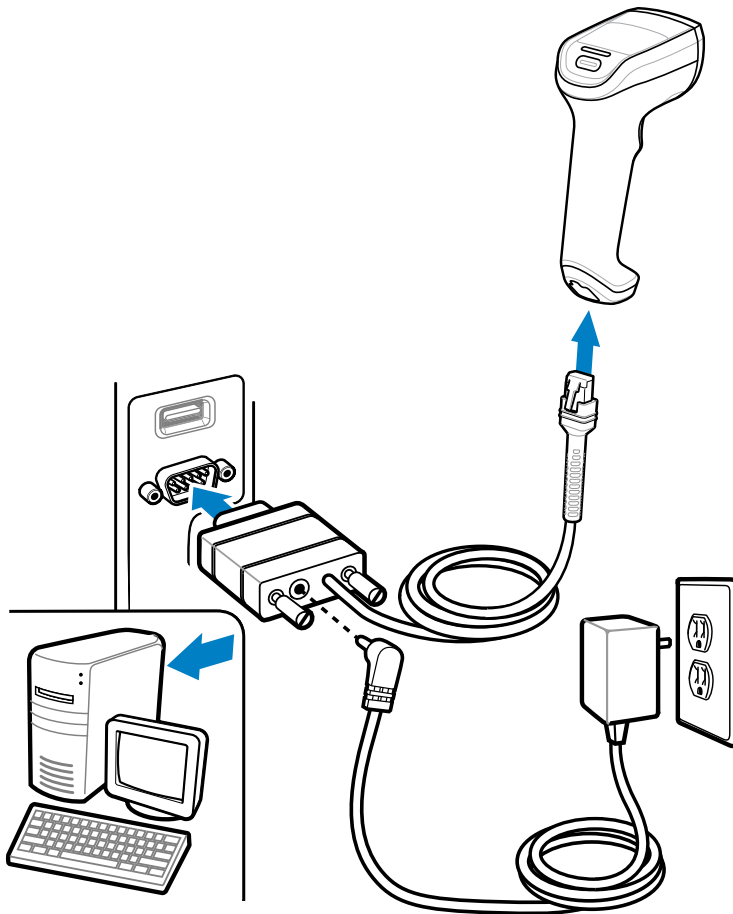


NOTE: The scanner uses TTL RS-232 signal levels, which interface with most system architectures. For system architectures requiring RS-232C signal levels, Zebra offers different cables providing TTL-to-RS-232C conversion. Contact support for more information.

Connecting an RS-232 Interface

Connect the scanner directly to the host computer.

Figure 12 RS-232 Connection



NOTE: Interface cables vary depending on configuration. The connectors can be different than those illustrated, but the steps to connect the scanner are the same.

1. Attach the modular connector of the RS-232 interface cable to the cable interface port on the scanner.
2. Connect the other end of the RS-232 interface cable to the serial port on the host.
3. If required, connect the power supply to the serial connector end of the RS-232 interface cable. Plug the power supply into an appropriate outlet.
4. The scanner automatically detects the host interface type and uses the default setting. If the default (*) does not meet your requirements, select another RS-232 host type by scanning the appropriate barcode from [RS-232 Host Types](#).
5. To modify any other parameter options, scan the appropriate barcodes in this section.

If problems occur with the system, see Troubleshooting.

RS-232 Parameter Defaults

The following table lists defaults for RS-232 host parameters. You can change the default values in one of two ways:

- Scan the appropriate barcodes in this section. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).
- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).

Table 25 RS-232 Interface Parameter Defaults

Parameter	Default
RS-232 Host Parameters	
RS-232 Host Types	Standard
Baud Rate	9600
Parity	None
Stop Bits	1 Stop Bit
Data Bits	8-bit
Check Receive Errors	Enable
Hardware Handshaking	None
Software Handshaking	None
Host Serial Response Timeout	2 Seconds
RTS Line State	Low RTS
Beep on <BEL>	Disable
Intercharacter Delay	0 msec
Nixdorf Beep/LED Options	Normal Operation
Barcodes with Unknown Characters	Send Barcode With Unknown Characters
Datalogic Host Format	Enable
Datalogic Supported Commands	Disable

RS-232 Host-Specific Parameter Settings

Some RS-232 hosts use their own parameter default settings.

You can select standard, ICL, Fujitsu, Wincor-Nixdorf Mode A or B, OPOS/JPOS, Olivetti, Omron, Common Use Terminal Equipment (CUTE-LP/LG barcode readers), or Datalogic and set the appropriate default.

Table 26 RS-232 Host-Specific Settings

Parameter	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/OPOS/JPOS
Baud Rate	9600	9600	9600	9600

Table 26 RS-232 Host-Specific Settings (Continued)

Parameter	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/ OPOS/JPOS
Parity	Even	None	Odd	Odd
Stop Bits	One	One	One	One
Data Bits	8-bit	8-bit	8-bit	8-bit
Hardware Handshaking	RTS/CTS Option 3	None	RTS/CTS Option 3	RTS/CTS Option 3
Software Handshaking	None	None	None	None
Serial Response Timeout	9.9 Seconds	2 Seconds	None	None
RTS Line State	High	Low	Low	Low = No data to send
Beep On <BEL>	Disable	Disable	Disable	Disable
Transmit Code ID	Yes	Yes	Yes	Yes
Data Transmission Format	Data/Suffix	Data/Suffix	Data/Suffix	Data/Suffix
Prefix	None	None	None	None
Suffix	CR (1013)	CR (1013)	CR (1013)	CR (1013)
In the Wincor-Nixdorf Mode A/B, when CTS is low, scanning is disabled and when CTS is high, scanning is enabled. If you scan Wincor-Nixdorf RS-232 Mode A/B without connecting the scanner to the proper host, it may appear unable to scan. In this case, scan a different RS-232 host type within 5 seconds of cycling power to the scanner.				

Table 27 RS-232 Host-Specific Settings

Parameter	Olivetti	Omron	CUTE	Datalogic
Baud Rate	9600	9600	9600	9600
Parity	Even	None	None	Odd
Stop Bits	One	One	0	One
Data Bits	7-bit	8-bit	8-bit	7-bit
Hardware Handshaking	None	None	None	None
Software Handshaking	ACK/NAK	None	None	None
Serial Response Timeout	9.9 Seconds	9.9 Seconds	9.9 Seconds	9.9 Seconds
RTS Line State	Low	High	High	High
Beep On <BEL>	Disable	Disable	Disable	Enable
Transmit Code ID	Yes	Yes	Yes	Yes
Data Transmission Format	Prefix/Data/Suffix	Data/Suffix	Prefix/Data/Suffix	Data/Suffix
Prefix	STX (1002)	None	STX (1002)	None

Table 27 RS-232 Host-Specific Settings (Continued)

Parameter	Olivetti	Omron	CUTE	Datalogic
Suffix	ETX (1003)	CR (1013)	CR (1013) ETX (1003)	CR (1013)
The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan Enable Parameter Barcode Scanning , and then change the host selection.				

RS-232 Host-Specific Code ID Characters

RS-232 hosts have code ID characters that are transmitted automatically.

RS-232 hosts ICL, Fujitsu, Nixdorf Mode A or B, OPOS/JPOS, Olivetti, Omron, CUTE, or Datalogic transmit code ID characters. These characters are not programmable and are separate from the Transmit Code ID feature. Do not enable the Transmit Code ID feature for these hosts.

Table 28 RS-232 Host-Specific Code ID Characters

Code Type	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/OPOS/JPOS
UPC-A	A	A	A	A
UPC-E	E	E	C	C
EAN-8/JAN-8	FF	FF	B	B
EAN-13/JAN-13	F	F	A	A
Bookland EAN	F	F	A	A
Code 128	L <len>	None	K	K
GS1-128	L <len>	None	P	P
Code 39	C <len>	None	M	M
Code 39 Full ASCII	None	None	M	M
Trioptic	None	None	None	None
Code 32	None	None	None	None
Code 93	None	None	L	L
I 2 of 5	I <len>	None	I	I
D 2 of 5	H <len>	None	H	H
IATA	H<len>	None	H	H
Codabar	N <len>	None	N	N
MSI	None	None	O	O
GS1 DataBar Variants	None	None	E	E
PDF417	None	None	Q	Q
MicroPDF417	None	None	S	S
Data Matrix	None	None	R	R

Table 28 RS-232 Host-Specific Code ID Characters (Continued)

Code Type	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/OPOS/JPOS
GS1 Data Matrix	None	None	W	W
Maxicode	None	None	T	T
QR Code	None	None	U	U
GS1 QR	None	None	X	X
Aztec/Aztec Rune	None	None	V	V

Table 29 RS-232 Host-Specific Code ID Characters

Code Type	Olivetti	Omron	CUTE	Datalogic
UPC-A	A	A	A	A
UPC-E	C	E	None	E
EAN-8/JAN-8	B	FF	None	FF
EAN-13/JAN-13	A	F	A	F
Code 128	K <len>	L <len>	5	#
Code 39	M <len>	C <len>	3	*
Code 39 Full ASCII	None	None	3	None
Trioptic	None	None	None	\$T
I 2 of 5	I <len>	I <len>	1	i
D 2 of 5	H <len>	H <len>	2	None
IATA	H<len>	H<len>	2	IA
Codabar	N <len>	N <len>	None	%
MSI	O <len>	None	None	@
GS1 DataBar Variants	None	None	None	DataBar-R4 DataBar Limited: RL DataBar Expanded: RX

RS-232 Host Types

Select an RS-232 host interface using one of the following options.

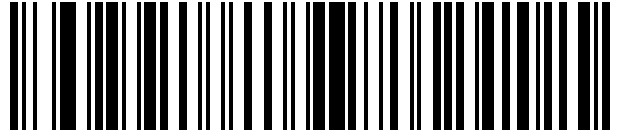
Notes on using RS-232 host types:

- For a list of supported scanner functionality by communication protocol, see [Communication Protocol Functionality](#).
- Scanning Standard RS-232 activates the RS-232 driver, but does not change port settings (for example, parity, data bits, handshaking). Selecting another RS-232 host type barcode changes these settings.

- The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan [Enable Parameter Barcode Scanning](#), and then change the host selection.



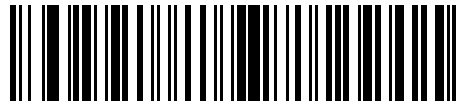
*Standard RS-232



ICL RS-232



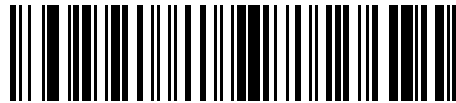
Nixdorf RS-232 Mode A



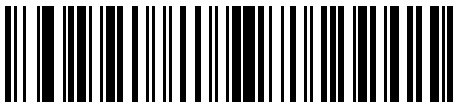
Nixdorf RS-232 Mode B



Olivetti ORS4500



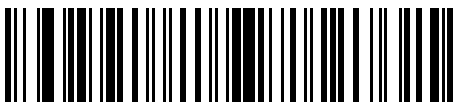
Omron



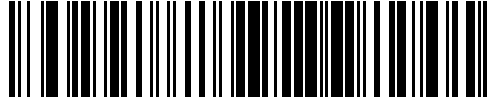
OPOS/JPOS



Fujitsu RS-232



CUTE

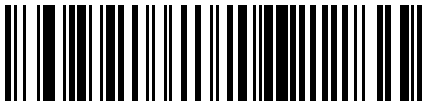


Datalogic Variant

RS-232 Baud Rate

The RS-232 baud rate is the number of bits of data transmitted per second.

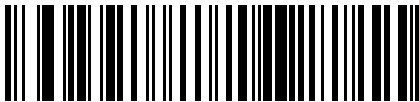
Select an option to set the scanner's baud rate to match the baud rate setting of the host device. Otherwise, data may not reach the host device or may reach it in distorted form.



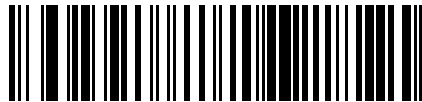
*Baud Rate 9600



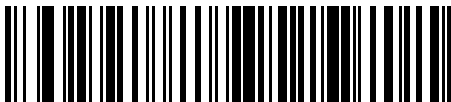
Baud Rate 19,200



Baud Rate 38,400



Baud Rate 57,600

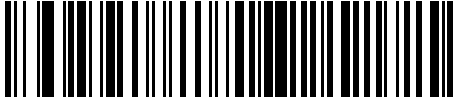


Baud Rate 115,200

RS-232 Parity

A parity check bit is the most significant bit of each ASCII coded character. Choose an option to select the parity type according to host device requirements.

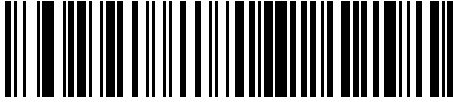
- Odd - This sets the parity bit value to 0 or 1, based on data, to ensure that the coded character contains an odd number of 1 bits.
- Even - This sets the parity bit value to 0 or 1, based on data, to ensure that the coded character contains an even number of 1 bits.
- None - No parity bit is required.



Odd



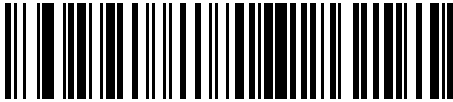
Even



*None

RS-232 Stop Bits

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. Select an option to set the number of stop bits (one or two) based on the number the receiving host can accommodate.



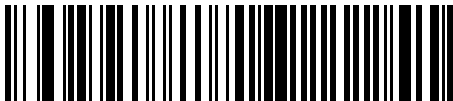
*1 Stop Bit



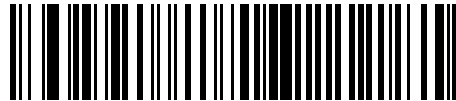
2 Stop Bits

Data Bits

This parameter allows the scanner to interface with devices requiring a 7-bit or 8-bit ASCII protocol.



7-bit



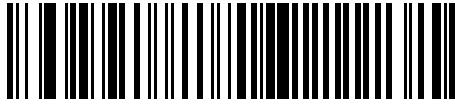
*8-bit

Check Receive Errors

This parameter determines whether to check the parity, framing, and overrun of received characters.



NOTE: The parity value of received characters is verified against the value set for [Parity](#).



*Check For Received Errors



Do Not Check For Received Errors

Hardware Handshaking

The data interface consists of an RS-232 port designed to operate either with or without the hardware handshaking lines Request to Send (RTS) and Clear to Send (CTS).

If hardware handshaking and software handshaking are both enabled, hardware handshaking takes precedence.



NOTE: The DTR signal is jumpered to the active state.

You can choose one of the following options:

None

This disables hardware handshaking and transmits scan data as it becomes available.

Standard RTS/CTS

This sets standard RTS/CTS hardware handshaking and transmits scanned data. The scanner reads the CTS line for activity according to the following sequence:

- If the CTS line is de-asserted, the scanner asserts the RTS line and waits up to [Host Serial Response Timeout](#) for the host to assert CTS, and then transmits data when asserted. If, after the timeout, the CTS line is not asserted, the scanner sounds a transmit error and discards the data.
- If CTS is asserted, the scanner waits up to [Host Serial Response Timeout](#) for the host to de-assert CTS. If after this timeout the CTS line is still asserted, the scanner sounds a transmit error and discards the scanned data.
- The scanner de-asserts RTS after sending the last character of data.
- The host negates CTS. The scanner checks for a de-asserted CTS upon the next data transmission.



NOTE: During data transmission, if CTS is deasserted for more than 50 ms between characters, the scanner sounds a transmit error and discards the data. The data must be re-scanned.

RTS/CTS Option 1

The scanner asserts RTS before transmitting and ignores the state of CTS. The scanner de-asserts RTS when transmission completes.

RTS/CTS Option 2

RTS is always high or low (user-programmed logic level). However, the scanner waits for the host to assert CTS before transmitting data. If CTS is not asserted within the [Host Serial Response Timeout](#), the scanner sounds a transmit error and discards the data. During data transmission, if CTS is deasserted for more than 50 ms between characters, the scanner sounds a transmit error and discards the data.

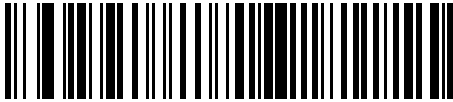
RTS/CTS Option 3

This transmits scanned data according to the following sequence:

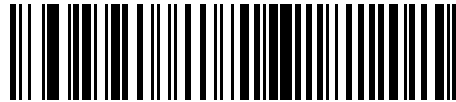
- The scanner asserts RTS before data transmission, regardless of the state of CTS.
- The scanner waits up to the [Host Serial Response Timeout](#) for the host to assert CTS, and then transmits data when asserted. If, after the timeout, the CTS line is not asserted, the scanner sounds a transmit error and discards the data.
- The scanner de-asserts RTS after sending the last character of data.
- The host negates CTS. The scanner checks for a de-asserted CTS upon the next data transmission.



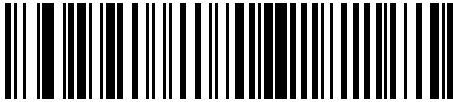
NOTE: During data transmission, if CTS is deasserted for more than 50 ms between characters, the scanner sounds a transmit error and discards the data. The data must be re-scanned.



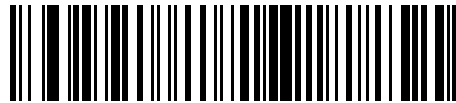
*None



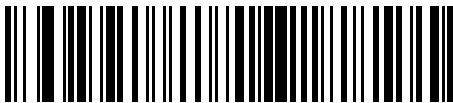
Standard RTS/CTS



RTS/CTS Option 1



RTS/CTS Option 2

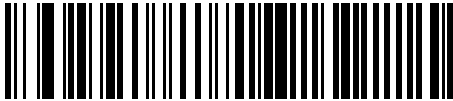


RTS/CTS Option 3

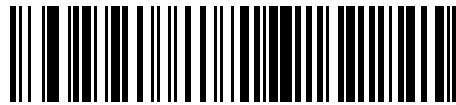
Software Handshaking

This parameter offers control of data transmission in addition to, or instead of, that offered by hardware handshaking. If software handshaking and hardware handshaking are both enabled, hardware handshaking takes precedence.

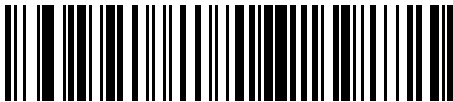
- **None** - This transmits data immediately. The scanner expects no response from the host.
- **ACK/NAK** - After transmitting data, the scanner waits for an ACK or NAK response from the host. If it receives a NAK, the scanner transmits the data again and waits for an ACK or NAK. After three unsuccessful attempts to send data after receiving NAKs, the scanner sounds a transmit error and discards the data. The scanner waits up to the programmable [Host Serial Response Timeout](#) to receive an ACK or NAK. If the scanner does not get a response in this time, it sounds a transmit error and discards the data. There are no reattempts.
- **ENQ** - The scanner waits for an ENQ character from the host before transmitting data. If it does not receive an ENQ within the [Host Serial Response Timeout](#), the scanner sounds a transmit error and discards the data. The host must transmit an ENQ character at least every [Host Serial Response Timeout](#) to prevent transmission errors.
- **ACK/NAK with ENQ** - This combines the two previous options. An additional ENQ is not required to re-transmit data due to a NAK from the host.
- **XON/XOFF** - An XOFF character stops data transmission until the scanner receives an XON character. There are two situations for XON/XOFF:
 - The scanner receives an XOFF before it has data to send. When the scanner has data, it waits up to the [Host Serial Response Timeout](#) for an XON character before transmitting. If it does not receive the XON within this time, the scanner sounds a transmit error and discards the data.
 - The scanner receives an XOFF during data transmission and stops transmission after sending the current byte. When the scanner receives an XON character, it sends the rest of the data. The scanner waits indefinitely for the XON.



*None



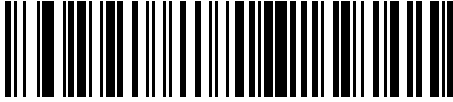
ACK/NAK



ENQ



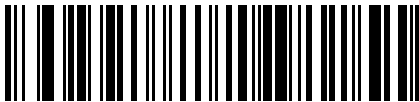
ACK/NAK with ENQ



XON/XOFF

RS-232 Host Serial Response Timeout

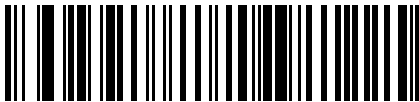
This parameter specifies how long the scanner waits for an ACK, NAK, or CTS before determining that a transmission error occurred. This only applies when in one of the ACK/NAK software handshaking modes, or RTS/CTS hardware handshaking mode.



*Minimum: 2 Seconds



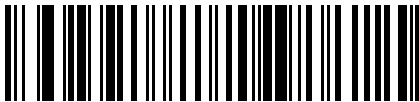
Low: 2.5 Seconds



Medium: 5 Seconds



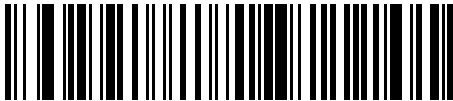
High: 7.5 Seconds



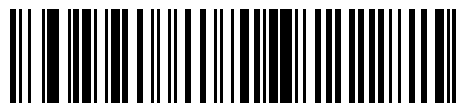
Maximum: 9.9 Seconds

RTS Line State

This parameter sets the idle state of the serial host RTS line to Low RTS or High RTS.



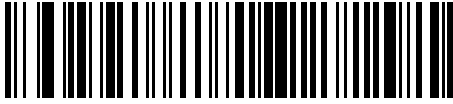
*Host: Low RTS



Host: High RTS

Beep on <BEL>

This parameter sets whether the scanner issues a beep when it detects a <BEL> character on the RS-232 serial line. <BEL> indicates an illegal entry or another important event.



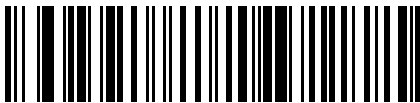
Beep On <BEL> Character (Enable)



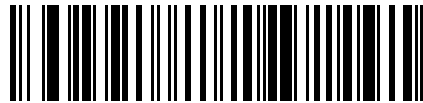
*Do Not Beep On <BEL> Character (Disable)

Intercharacter Delay

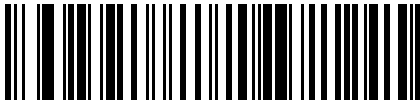
This parameter specifies the intercharacter delay inserted between character transmissions.



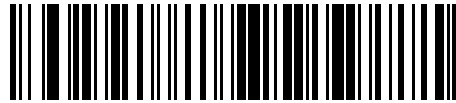
*Minimum: 0 msec



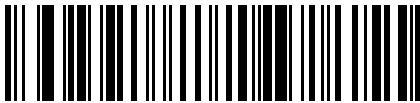
Low: 25 msec



Medium: 50 msec



High: 75 msec

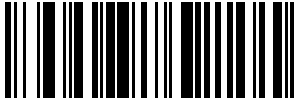


Maximum: 99 msec

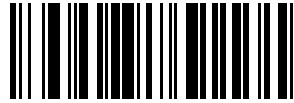
RS-232 Power On Mode

Parameter # 1939

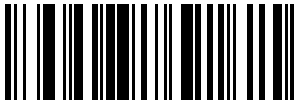
Select the 1-byte, 3-byte, or 13-byte bar code if the first bar code is lost after bootup. The 1-byte bar code consists of one NULL character, 3-byte bar code consists of three NULL characters, and the 13-byte bar code consists of 13 NULL characters. Depending on the bar code type (1-byte, 3-byte, or 13-byte), the scanner sends the bar code data during the bootup process.



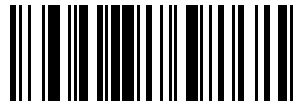
* Disable (0)



1-byte Pseudo Bar Code (1)



3-byte Byte Pseudo Bar Code (2)

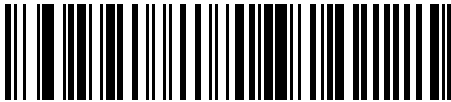


13-byte Byte Pseudo Bar Code (3)

Nixdorf Beep/LED Options

Parameter # 45062 SSI = F8h B0h 06h

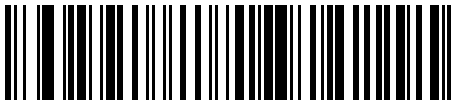
If you selected Nixdorf Mode B, use this parameter to determine when the scanner beeps and turns on its LED after a decode.



*Normal Operation (Beep/LED Immediately After Decode)



Beep/LED After Transmission

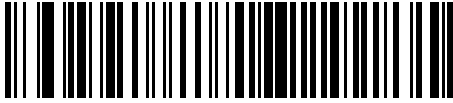


Beep/LED After CTS Pulse

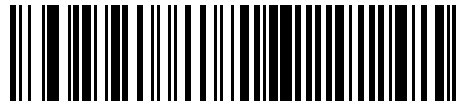
RS-232 Barcodes with Unknown Characters

Unknown characters are characters the host does not recognize. Select Send Barcodes With Unknown Characters to send all barcode data except for unknown characters. The scanner issues no error beeps.

Select Do Not Send Barcodes With Unknown Characters to send barcode data up to the first unknown character. The scanner issues an error beep.



*Send Barcodes With Unknown Characters

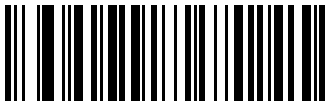


Do Not Send Barcodes With Unknown Characters

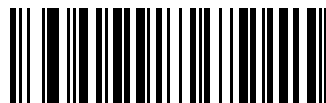
Datalogic Host Format

Parameter # 2253 (SSI # F8 08 CD)

When this parameter is enabled, the Datalogic host variant appends a code ID and a suffix value (CR) to the decoded data. When this parameter is disabled, only the decode data is transmitted. These commands are supported over RS232 or USB CDC.



*Enable (1)



Disable (0)

Datalogic Supported Commands

Parameter # 2260 (SSI # F8 08 D4)

This parameter allows serial scan to enable or disable commands for a standard RS232 host.

- 'E' or 'e' = Enable Scanning
- 'D' or 'd' = Disable Scanning
- 'R' = Reset the scanner
- 'F' = Indicate to the scanner that Datalogic is not on file
- 'B' = Issue a good read beep
- 1 (Not an ASCII Character – This is a decimal number 1) = Force a good read beep
- 7 (Not an ASCII Character – This is a decimal number 7) = Force a good read beep



Enable (1)



*Disable (0)

RS-232 ASCII Character Sets

You can refer to the ASCII Character Sets for prefix and suffix values.

See [ASCII Character Sets](#) for prefix/suffix values.

Symbologies

You can program the scanner to perform various functions or activate different features.

This section describes symbology features and provides programming barcodes for selecting these features.

The scanner ships with the settings shown in the [Symbology Parameter Defaults](#). If the default values suit requirements, programming is not necessary.

Symbology Parameter Defaults

Symbology Parameter Defaults lists the defaults for all symbology parameters.

Change these values in one of two ways:

- Choose the appropriate parameter in this section. The new value replaces the standard default value in memory. To recall the default parameter values, see [Default Parameters](#).
- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).

Table 30 Symbology Parameter Defaults

Parameter	Parameter Number ^a	SSI Number ^b	Default
Enable/Disable All Code Types			
1D Symbologies			
UPC/EAN/JAN			
UPC-A	1	01h	Enable
UPC-E	2	02h	Enable
UPC-E1	12	0Ch	Disable
EAN-8/JAN 8	4	04h	Enable
EAN-13/JAN 13	3	03h	Enable
Bookland EAN	83	53h	Disable
Bookland ISBN Format	576	F1h 40h	ISBN-10
ISSN EAN	617	F1h 69h	Disable
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	10h	Ignore

Table 30 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
User-Programmable Supplementals Supplemental 1: Supplemental 2:	579 580	F4h F1h 43h F4h H1h 44h	000 000
UPC/EAN/JAN Supplemental Redundancy	80	50h	10
UPC/EAN/JAN Supplemental AIM ID	672	F1h A0h	Combined
Transmit UPC-A Check Digit	40	28h	Enable
Transmit UPC-E Check Digit	41	29h	Enable
Transmit UPC-E1 Check Digit	42	2Ah	Enable
UPC-A Preamble	34	22h	System Character
UPC-E Preamble	35	23h	System Character
UPC-E1 Preamble	36	24h	System Character
Convert UPC-E to UPC-A	37	25h	Disable
Convert UPC-E1 to UPC-A	38	26h	Disable
EAN/JAN Zero Extend	39	27h	Disable
UCC Coupon Extended Code	85	55h	Disable
UPC Reduced Quiet Zone	1289	F8h 05h 09h	Disable
Transmit EAN-8 Check Digit	1881	F8h 07h 59h	Enable
Transmit EAN-13 Check Digit	1882	F8h 07h 5Ah	Enable
Code 128			
Code 128	8	08h	Enable
Set Length(s) for Code 128	209, 210	D1h, D2h	Any Length
GS1-128 (formerly UCC/EAN-128)	14	0Eh	Enable
ISBT 128	84	54h	Enable
ISBT Concatenation	577	F1h 41h	Disable
Check ISBT Table	578	F1h 42h	Enable
ISBT Concatenation Redundancy	223	DFh	10
Code 128 <FNC4>	1254	F8h 04h E6h	Honor
Code 128 Security Level	751	F1h EFh	Security Level 1
Code 128 Reduced Quiet Zone	1208	F8h 04h B8h	Disable
Code 39			
Code 39	0	00h	Enable
Trioptic Code 39	13	0Dh	Disable
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	56h	Disable

Table 30 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Code 32 Prefix	231	E7h	Disable
Set Length(s) for Code 39	18, 19	12h, 13	1 to 55
Code 39 Check Digit Verification	48	30h	Disable
Transmit Code 39 Check Digit	43	2Bh	Disable
Code 39 Full ASCII Conversion	17	11h	Disable
Code 39 Security Level	750	F1h EEh	Security Level 1
Code 39 Reduced Quiet Zone	1209	F8h 04h B9h	Disable
Code 93			
Code 93	9	09h	Enable
Set Length(s) for Code 93	26, 27	1Ah, 1Bh	1 to 55
Code 11			
Code 11	10	0Ah	Disable
Set Lengths for Code 11	28, 29	1Ch, 1Dh	4 to 55
Code 11 Check Digit Verification	52	34h	Disable
Transmit Code 11 Check Digit(s)	47	2Fh	Disable
Interleaved 2 of 5 (ITF)			
Interleaved 2 of 5 (ITF)	6	06h	Enable
Set Lengths for I 2 of 5	22, 23	16h, 17h	6 to 55
I 2 of 5 Check Digit Verification	49	31h	Disable
Transmit I 2 of 5 Check Digit	44	2Ch	Disable
Convert I 2 of 5 to EAN 13	82	52h	Disable
Febraban	1750	F8h 06h D6h	Disable
I 2 of 5 Security Level	1121	F8h 04h 61h	Security Level 1
I 2 of 5 Reduced Quiet Zone	1210	F8h 04h BAh	Disable
Discrete 2 of 5 (DTF)			
Discrete 2 of 5	5	05h	Disable
Set Length(s) for D 2 of 5	20, 21	14h 15h	1 to 55
Codabar (NW - 7)			
Codabar	7	07h	Enable
Set Lengths for Codabar	24, 25	18h, 19h	4 to 55
CLSI Editing	54	36h	Disable
NOTIS Editing	55	37h	Disable
Codabar Security Level	1776	F8h 06h F0h	Security Level 1

Table 30 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Codabar Upper or Lower Case Start/ Stop Characters Detection	855	F2h 57h	Upper Case
Codabar Mod 16 Check Digit Verification	1784	F8 06h F8h	Disable
Transmit Codabar Check Digit	704	F1h C0h	Disable
Codabar Reduced Quiet Zone	2425	F8h 79h	Disable
MSI			
MSI	11	0Bh	Disable
Set Length(s) for MSI	30, 31	1Eh, 1Fh	4 to 55
MSI Check Digits	50	32h	One
Transmit MSI Check Digit	46	2Eh	Disable
MSI Check Digit Algorithm	51	33h	Mod 10/Mod 10
MSI Reduced Quiet Zone	1392	F8h 05h 70h	Disable
Chinese 2 of 5			
Chinese 2 of 5	408	F0h 98h	Disable
Matrix 2 of 5			
Matrix 2 of 5	618	F1h 6Ah	Disable
Set Lengths for Matrix 2 of 5	619 620	F1h 6Bh F1h 6Ch	4 to 55
Matrix 2 of 5 Check Digit	622	F1h 6Eh	Disable
Transmit Matrix 2 of 5 Check Digit	623	F1h 6Fh	Disable
Korean 3 of 5			
Korean 3 of 5	581	F1h 45h	Disable
Inverse 1D	586	F1h 4Ah	Regular
GS1 DataBar			
GS1 DataBar Omnidirectional	338	F0h 52h	Enable
GS1 DataBar Limited	339	F0h 53h	Enable
GS1 DataBar Expanded	340	F0h 54h	Enable
Convert GS1 DataBar to UPC/EAN/JAN	397	F0h 8Dh	Disable
GS1 DataBar Security Level	1706	F8h 06h AAh	Level 1
GS1 DataBar Limited Margin Check	728	F1h D8h	Level 3
GS1 Digital Link			
GS1 Digital Link	2373	F8h 09h 45h	Disable
GS1 Digital Link Mode	2374	F8h 09h 46h	Mode 1 (GTIN Only)
GS1 Digital Link Prioritization Timeout	2491	F8h 09h BBh	200 msec

Table 30 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Symbology-Specific Security Features			
Redundancy Level	78	4Eh	1
Security Level	77	4Dh	1
1D Quiet Zone Level	1288	F8h 09h46h	1
Intercharacter Gap Size	381	F0h 7Dh	Normal
Composite Codes			
Composite CC-C	341	F0h 55h	Disable
Composite CC-A/B	342	F0h 56h	SR/DL: Disable HC: Enable
Composite TLC-39	371	F0h 73h	Disable
Composite Inverse	1113	F8h 04h 59h	Regular
UPC Composite Mode	344	F0h 58h	UPC Never Linked
Composite Beep Mode	398	F0h 8Eh	Beep As Each Code Type is Decoded
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	F0h ABh	Disable
2D Symbologies			
PDF417	15	0Fh	Enable
MicroPDF417	227	E3h	Disable
Code 128 Emulation	123	7Bh	Disable
Data Matrix	292	F0h 24h	Enable
GS1 Data Matrix	1336	F8h 05h 38h	Disable
Data Matrix Inverse	588	F1h 4Ch	Inverse Autodetect
Decode Data Matrix Mirror Images	537	F1h 19h	Auto
Maxicode	294	F0h 26h	Disable
QR Code	293	F0h 25h	Enable
Weblink QR	1947	F8 07 9Bh	Enable
GS1 QR	1343	F8h 05h 3Fh	Enable
MicroQR	573	F1h 3Dh	Enable
Linked QR Mode	1847	737h	Linked QR Only
Aztec	574	F1h 3Eh	Enable
Aztec Inverse	589	F1h 4Dh	Inverse Autodetect
Han Xin	1167	F8h 04h 8Fh	Disable
Han Xin Inverse	1168	F8h 04h 90h	Regular

Table 30 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number ^a	SSI Number ^b	Default
Grid Matrix	1718	F8h 06h B6h	Disable
Grid Matrix Inverse	1719	F8h 06h B7h	Regular
Grid Matrix Mirrored	1736	F8h 06h C8h	Regular
DotCode	1906	F8 07 72h	Disable
DotCode Prioritize	1937	F8 07 91h	Enable
DotCode Inverse	1907	F8 07 73h	Inverse Autodetect
DotCode Mirrored	1908	F8 07 74h	Autodetect
DotCode Erasure Limit	2063	F8 08 0F	10
Macro PDF			
Flush Macro PDF Buffer	N/A	N/A	N/A
Abort Macro PDF Entry	N/A	N/A	N/A
Postal Codes			
US Postnet	89	59h	Disable
US Planet	90	5Ah	Disable
Transmit US Postal Check Digit	95	5Fh	Enable
UK Postal	91	5Bh	Disable
Transmit UK Postal Check Digit	96	60h	Enable
Japan Postal	290	F0h 22h	Disable
Australia Post	291	F0h 23h	Disable
Australia Post Format	718	F1h CEh	Autodiscriminate
Netherlands KIX Code	326	F0h 46h	Disable
USPS 4CB/One Code/Intelligent Mail	592	F1h 50h	Disable
UPU FICS Postal	611	F1h 63h	Disable
Mailmark	1337	F8h 05h 39h	Disable
Posti LAPA 4-State Code	2031	F8 07EF	Disable
Digimarc			
Digimarc Digital Watermark	1687	F8h 06h 97h	Disable
Digimarc Barcode	N/A	N/A	Disable
Digimarc Data Mode	2257	F8h 08h D1h	Compatible
Digimarc GIA17 Format	2488	F8h 09h B8h	Disable

^a Parameter number decimal values are used for programming via RSM commands.

^b SSI number hex values are used for programming via SSI commands.

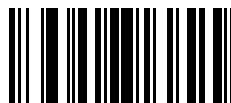
Enable/Disable All Code Types

Scan one of the following barcodes to enable or disable the scanner's ability to decode all barcode types.

- Disable All Code Types - Disable all code types. This is useful when enabling only a few code types.
- Enable All Code Types - Enable all code types. This is useful if you need to disable only a few code types.



Disable All Code Types



Enable All Code Types

UPC/EAN/JAN

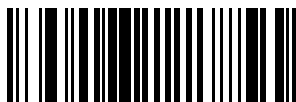
You can choose one of these parameters to enable UPC, EAN, or JAN settings.

UPC-A

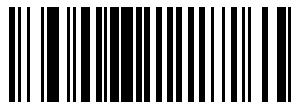
Parameter # 1 (SSI #01h)

This parameter enables or disables the scanner to decode UPC-A barcodes.

- *Enabled - enables UPC-A decoding.
- Disabled - disables UPC-A decoding.



*Enable UPC-A (1)



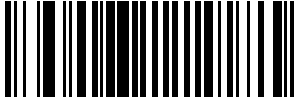
Disable UPC-A (0)

UPC-E

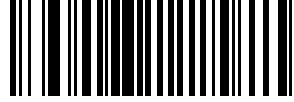
Parameter # 2 (SSI # 02h)

This parameter enables UPC-E.

- *Enabled - this sets UPC-E to use.
- Disabled - UPC-E is no longer in use.



*Enable UPC-E (1)



Disable UPC-E (0)

UPC-E1

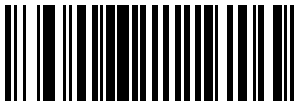
Parameter # 12 (SSI # 0Ch)

This parameter enables UPC-E1.

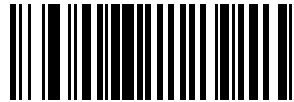
- Enabled - This sets UPC-E1 to use.
- Disabled - UPC-E1 is no longer in use.



NOTE: UPC-E1 is not a UCC (Uniform Code Council) approved symbology.



Enable UPC-E1 (1)



*Disable UPC-E1 (0)

EAN-8/JAN-8

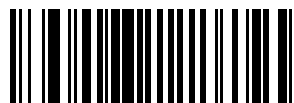
Parameter # 4 (SSI # 04h)

This parameter enables EAN-8/JAN-8.

- Enabled - Sets EAN-8/JAN-8 for use.
- Disabled - EAN-8/JAN-8 is no longer in use.



*Enable EAN-8/JAN-8 (1)



Disable EAN-8/JAN-8 (0)

EAN-13/JAN-13

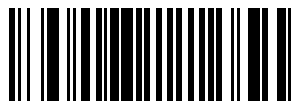
Parameter # 3 (SSI # 03h)

This parameter enables EAN-13/JAN-13.

- Enabled - Sets EAN-13/JAN-13 for use.
- Disabled - EAN-13/JAN-13 is no longer in use.



*Enable EAN-13/JAN-13 (1)



Disable EAN-13/JAN-13 (0)

Bookland EAN

Parameter # 83 (SSI # 53h)

This parameter enables Bookland EAN.

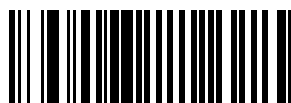
- Enabled - This sets Bookland EAN for use.
- Disabled - Bookland EAN is no longer in use.



NOTE: If you enable Bookland EAN, select a [Bookland ISBN Format](#). Also set [Decode UPC/EAN/JAN Supplementals](#) to either Decode UPC/EAN/JAN with Supplementals Only, Autodiscriminate UPC/EAN/JAN With Supplementals, or Enable 978/979 Supplemental Mode.



Enable Bookland EAN (1)



*Disable Bookland EAN (0)

Bookland ISBN Format

Parameter # 576 (SSI # F1h 40h)

If Bookland EAN is enabled, this parameter allows you to choose a format for Bookland data.

- *Bookland ISBN-10 - The scanner reports Bookland data starting with 978 in traditional 10-digit format with the special Bookland check digit for backward-compatibility. Data starting with 979 is not considered Bookland in this mode.

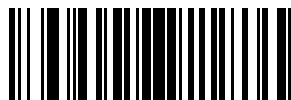
- Bookland ISBN-13 - The scanner reports Bookland data (starting with either 978 or 979) as EAN-13 in 13-digit format to meet the 2007 ISBN-13 protocol.



NOTE: For Bookland EAN to function properly, first enable [Bookland EAN](#) and then set [Decode UPC/EAN/JAN Supplementals](#) to either Decode UPC/EAN/JAN with Supplementals Only, Autodiscriminate UPC/EAN/JAN With Supplementals, or Enable 978/979 Supplemental Mode.



*Bookland ISBN-10 (0)



Bookland ISBN-13 (1)

ISSN EAN

Parameter # 617 (SSI # F1h 69h)

This parameter enables ISSN EAN.

- Enabled - Sets ISSN EAN for use.
- *Disabled - ISSN EAN is no longer in use.



Enable ISSN EAN (1)



*Disable ISSN EAN (0)

Decode UPC/EAN/JAN Supplementals

Parameter # 16 (SSI # 10h)

This parameter decodes supplementals, which are barcodes appended according to specific format conventions (for example, UPC A+2, UPC E+2, EAN 13+2). .

- Decode UPC/EAN/JAN with Supplementals Only - The scanner only decodes UPC/EAN/JAN symbols with supplemental characters, and ignores symbols without supplementals.
- Ignore UPC/EAN/JAN Supplementals - When presented with a UPC/EAN/JAN plus supplemental symbol, the scanner decodes UPC/EAN/JAN and ignores the supplemental characters.
- Autodiscriminate UPC/EAN/JAN with Supplementals - The scanner decodes UPC/EAN/JAN symbols with supplemental characters immediately. If the symbol does not have a supplemental, the scanner

must decode the barcode the number of times set via [UPC/EAN/JAN Supplemental Redundancy](#) before transmitting its data to confirm that there is no supplemental.

- Enable 378/379 Supplemental Mode
- Enable 978/979 Supplemental Mode



NOTE: If you select 978/979 Supplemental Mode and are scanning Bookland EAN barcodes, see [Bookland EAN](#), and select a format using [Bookland ISBN Format](#).

- Enable 977 Supplemental Mode
- Enable 414/419/434/439 Supplemental Mode
- Enable 491 Supplemental Mode
- Enable Smart Supplemental Mode - This applies to EAN-13 barcodes starting with any prefix listed previously.
- Supplemental User-Programmable Type 1 - This applies to EAN-13 barcodes starting with a 3-digit user-defined prefix. Set this using [User Programmable Supplementals](#).
- Supplemental User-Programmable Type 1 and 2 - This applies to EAN-13 barcodes starting with either of two 3-digit user-defined prefixes. Set the prefixes using [User Programmable Supplementals](#).
- Smart Supplemental Plus User-Programmable 1 - This applies to EAN-13 barcodes starting with any prefix listed previously or the prefix set using [User Programmable Supplementals](#).
- Smart Supplemental Plus User-Programmable 1 and 2 - This applies to EAN-13 barcodes starting with any prefix listed previously or one of the two user-defined prefixes set using [User Programmable Supplementals](#).



NOTE: To minimize the risk of invalid data transmission, select either to decode or ignore supplemental characters.



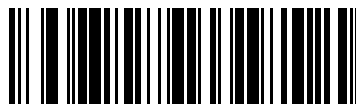
Decode UPC/EAN/JAN With Supplementals Only
(1)



*Ignore UPC/EAN/JAN Supplementals (0)



Autodiscriminate UPC/EAN/JAN with
Supplementals (2)



Enable 378/379 Supplemental Mode (4)



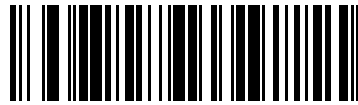
Enable 978/979 Supplemental Mode (5)



Enable 977 Supplemental Mode (7)



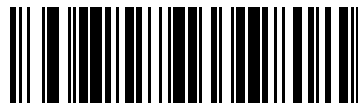
Enable 414/419/434/439 Supplemental Mode (6)



Enable 491 Supplemental Mode (8)



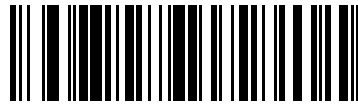
Enable Smart Supplemental Mode (3)



Supplemental User-Programmable Type 1 (9)



Supplemental User-Programmable Type 1 and 2 (10)



Smart Supplemental Plus User-Programmable 1 (11)



Smart Supplemental Plus User-Programmable 1 and 2 (12)

User-Programmable Supplementals

Parameter # 579 (SSI # F4h F1h 43h)

Parameter # 580 (SSI # F4h F1h 44h)

If you selected a Supplemental User-Programmable option, this parameter allows you to set two 3-digit prefixes.

- User-Programmable Supplemental 1 - Sets the first 3-digit prefix. See [Numeric Barcodes](#).
- User-Programmable Supplemental 2 - Sets a 2nd 3-digit prefix, if necessary. See [Numeric Barcodes](#).



User-Programmable Supplemental 1



User-Programmable Supplemental 2

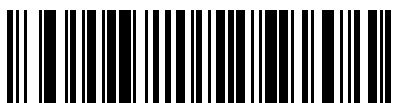
UPC/EAN/JAN Supplemental Redundancy

Parameter # 80 (SSI # 50h)

If you selected Autodiscriminate UPC/EAN/JAN with Supplementals, this option sets the number of times to decode a symbol without supplementals before transmission. You can enable audio feedback during a reconnect attempt.

The range is from 2-30. Five or above is recommended when decoding a mix of UPC/EAN/JAN symbols with and without supplementals. The default is ten.

To set a redundancy value, scan the following barcode, and then scan two barcodes from [Numeric Barcodes](#). Enter a leading zero for single digit numbers. To correct an error or change a selection, scan [Cancel](#).



UPC/EAN/JAN Supplemental Redundancy

UPC/EAN/JAN Supplemental AIM ID Format

Parameter # 672 (SSI # F1h A0h)

If Transmit Code ID Character is set to **AIM Code ID Character**, select an output format when reporting UPC/EAN/JAN barcodes with supplementals.

- Separate - Transmit UPC/EAN/JAN with supplementals with separate AIM IDs but one transmission, for example,

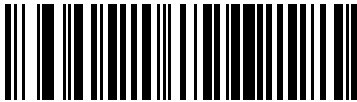
```
]E<0 or 4><data>]E<1 or 2>[supplemental data]
```

- Combined - Transmit UPC/EAN/JAN with supplementals with one AIM ID and one transmission. For example, see below.

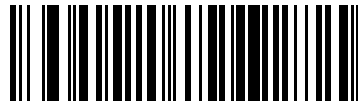
```
]E3<data+supplemental data>
```

- Separate Transmissions - Transmit UPC/EAN/JAN with supplementals with separate AIM IDs and separate transmissions, for example,

```
]E<0 or 4><data>  
]E<1 or 2>[supplemental data]
```



Separate (0)



*Combined (1)



Separate Transmissions (2)

Transmit UPC-A Check Digit

Parameter # 40 (SSI # 28h)

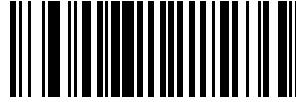
This parameter transmits data with or without the UPC-A check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-A Check Digit - Transmits the data with the UPC-A check digit.
- Do Not Transmit UPC-A Check Digit - Transmits the data without the UPC-A check digit.



*Transmit UPC-A Check Digit (1)



Do Not Transmit UPC-A Check Digit (0)

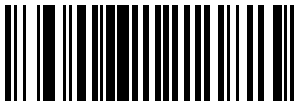
Transmit UPC-E Check Digit

Parameter # 41 (SSI # 29h)

This parameters transmits data with or without the UPC-E check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-E Check Digit - transmits the data with the UPC-E check digit.
- Do Not Transmit UPC-E Check Digit - transmits the data without the UPC-E check digit.



*Transmit UPC-E Check Digit (1)



Do Not Transmit UPC-E Check Digit (0)

Transmit UPC-E1 Check Digit

Parameter # 42 (SSI # 2Ah)

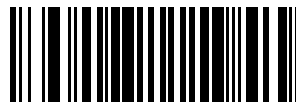
This parameters transmits data with or without the UPC-E1 check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-E1 Check Digit - Transmits the data with the UPC-E1 check digit.
- Do Not Transmit UPC-E1 Check Digit - Transmits the data without the UPC-E1 check digit.



*Transmit UPC-E1 Check Digit (1)



Do Not Transmit UPC-E1 Check Digit (0)

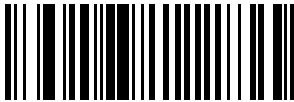
UPC-A Preamble

Parameter # 34 (SSI # 22h)

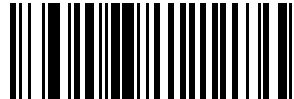
Preamble characters are part of the UPC symbol, and include Country Code and System Character.

Select the appropriate option for transmitting a UPC-A preamble to match the host system:

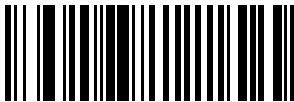
- Transmit System Character only
- Transmit System Character and Country Code ("0" for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)



*System Character (<SYSTEM CHARACTER>
<DATA>) (1)



System Character & Country Code (< COUNTRY
CODE> <SYSTEM CHARACTER> <DATA>) (2)

UPC-E Preamble

Parameter # 35 (SSI # 23h)

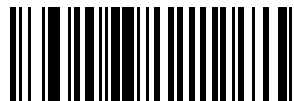
Preamble characters are part of the UPC symbol, and include Country Code and System Character.

Select the appropriate option for transmitting a UPC-E preamble to match the host system:

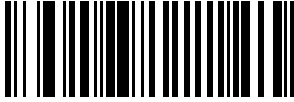
- Transmit System Character only
- Transmit System Character and Country Code ("0" for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)



*System Character (<SYSTEM CHARACTER>
<DATA>) (1)



System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (2)

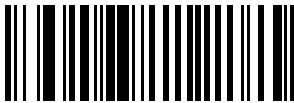
UPC-E1 Preamble

Parameter # 36 (SSI # 24h)

Preamble characters are part of the UPC symbol, and include Country Code and System Character.

Select the appropriate option for transmitting a UPC-E1 preamble to match the host system:

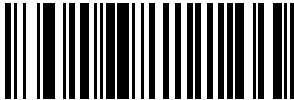
- Transmit System Character only
- Transmit System Character and Country Code ("0" for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)



*System Character (<SYSTEM CHARACTER> <DATA>) (1)



System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (2)

Convert UPC-E to UPC-A

Parameter # 37 (SSI # 25h)

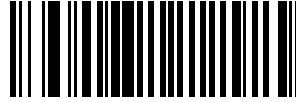
This parameter converts UPC-E (zero suppressed) decoded data to UPC-A format before transmission.

After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (such as, Preamble, Check Digit).

- *Enabled - Converts UPC-E decoded data to UPC-A format.
- Disabled - Transmits UPC-E decoded data without conversion to UPC-A.



Convert UPC-E to UPC-A (Enable) (1)



*Do Not Convert UPC-E to UPC-A (Disable) (0)

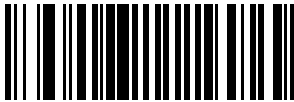
Convert UPC-E1 to UPC-A

Parameter # 38 (SSI # 26h)

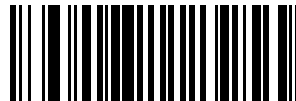
This parameter converts UPC-E1 (zero suppressed) decoded data to UPC-A format before transmission.

After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (for example, Preamble, Check Digit).

- Enabled - converts UPC-E1 decoded data to UPC-A format.
- Disabled - transmits UPC-E1 decoded data without conversion to UPC-A.



Convert UPC-E1 to UPC-A (Enable) (1)



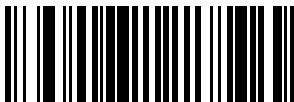
Do Not Convert UPC-E1 to UPC-A (Disable) (0)

EAN/JAN Zero Extend

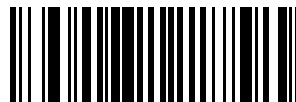
Parameter # 39 (SSI # 27h)

This parameter enables or disables decoded EAN-8 symbols to be compatible in length with EAN-13 symbols.

- Enabled - Adds five leading zeros to decoded EAN-8 symbols to make them compatible in length to EAN-13 symbols
- Disabled - Transmits EAN-8 symbols as-is, without adding zeroes.



Enable EAN/JAN Zero Extend (1)



*Disable EAN/JAN Zero Extend (0)

UCC Coupon Extended Code

Parameter # 85 (SSI # 55h)

This parameter decodes UPC-A barcodes starting with digit '5', EAN-13 barcodes starting with digit '99', and UPC-A/GS1-128 coupon codes.

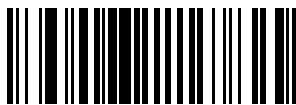
- Enabled - Extends decoding for UPC-A, EAN-13, and GS1-128 coupon codes.
- *Disabled - Does not extend decoding for UPC-A, EAN-13, and GS1-128 coupon codes.



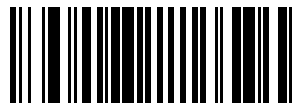
NOTE: UPC-A, EAN-13, and GS1-128 must be enabled to use this feature.



NOTE: See [UPC/EAN/JAN Supplemental Redundancy](#) to control autodiscrimination of the GS1-128 portion (right half) of a coupon code.



Enable UCC Coupon Extended Code (1)



*Disable UCC Coupon Extended Code (0)

UPC Reduced Quiet Zone

Parameter # 1289 (SSI # F8h 05h 09h)

This parameter enables or disables decoding UPC barcodes with reduced quiet zones (the margins on either side of the barcode).

- Enabled - Enables decoding UPC barcodes with reduced quiet zones.
- *Disabled - Disables decoding UPC barcodes with reduced quiet zones.



NOTE: If you select Enable, select a [1D Quiet Zone Level](#).



Enable UPC Reduced Quiet Zone (1)



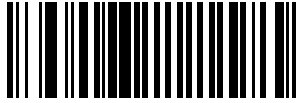
*Disable UPC Reduced Quiet Zone (0)

Code 128

Parameter # 8 (SSI #08h)

You can enable or disable Code 128.

- *Enabled - Enables Code 128.
- Disabled - Disables Code 128.



*Enable Code 128 (1)



Disable Code 128 (0)

Set Lengths for Code 128

Parameter # 209 (SSI #D1h)

Parameter # 210 (SSI #D2h)

This parameter sets lengths for Code 128 to any length, one or two discrete lengths, or lengths within a specific range.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. The default is All Lengths.



NOTE: When setting lengths, enter a leading zero for single digit numbers.

- One Discrete Length - Decode only Code 128 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 128 symbols containing either of two lengths.
- Length Within Range - Decode Code 128 symbols with a length between 0 and 80
- Any Length - Decode Code 128 symbols containing any number of characters within the scanner's capability.

Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only Code 128 symbols with 14 characters, scan Code 128 - One Discrete Length, and then scan 1, 4.
- To decode only Code 128 symbols containing either 2 or 14 characters, scan Code 128 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Code 128 symbols containing between 4 and 12 characters, scan Code 128 - Length Within Range, and then scan 0, 4, 1, 2.



Code 128 - One Discrete Length



Code 128 - Two Discrete Lengths



Code 128 - Length Within Range



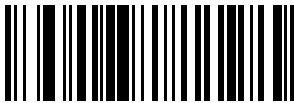
*Code 128 - Any Length

GS1-128 (formerly UCC/EAN-128)

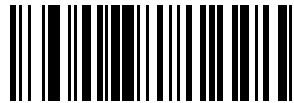
Parameter # 14 (SSI #0Eh)

You can enable or disable GS1-128.

- *Enabled - Enables GS1-128.
- Disabled - Disables GS1-128.



*Enable GS1-128 (1)



Disable GS1-128 (0)

ISBT 128

Parameter # 84 (SSI #54h)

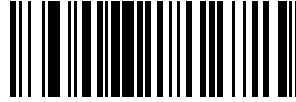
You can enable or disable ISBT 128.

- *Enabled - enables ISBT 128.
- Disabled - disables ISBT 128.

ISBT 128 is a variant of Code 128 used in the blood bank industry.



*Enable ISBT 128 (1)



Disable ISBT 128 (0)

ISBT Concatenation

Parameter # 577 (SSI #F1h 41h)

This parameter enables and disables ISBT concatenation.

Select an option for concatenating pairs of ISBT code types:

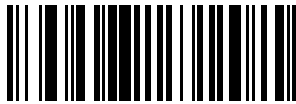
- Enable ISBT Concatenation - There must be two ISBT codes in order for the scanner to decode and perform concatenation. The scanner does not decode single ISBT symbols.
- Disable ISBT Concatenation - The scanner does not concatenate pairs of ISBT codes it encounters.
- Autodiscriminate ISBT Concatenation - The scanner decodes and concatenates pairs of ISBT codes immediately. If only a single ISBT symbol is present, the scanner must decode the symbol the number of times set via [ISBT Concatenation Redundancy](#) before transmitting its data to confirm that there is no additional ISBT symbol.



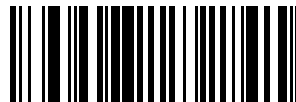
NOTE: For ISBT AutoDetect to operate as expected, both barcodes must be in the field of view simultaneously. This may be difficult to achieve in presentation mode.



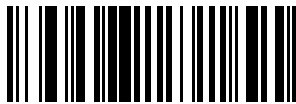
NOTE: When enabling ISBT Concatenation or Autodiscriminate ISBT Concatenation set Code 128 Security Level to Level 2.



Enable ISBT Concatenation (1)



*Disable ISBT Concatenation (0)



Autodiscriminate ISBT Concatenation (2)

Check ISBT Table

Parameter # 578 (SSI #F1h 42h)

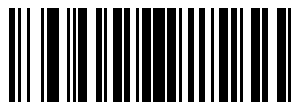
This parameter enables or disables the Check ISBT Table to concatenate only those pairs found in this table. Other types of ISBT codes are not concatenated.

- *Enabled - enables the Check ISBT Table to concatenate only those pairs found in this table.
- Disabled - disables the Check ISBT Table to concatenate only those pairs found in this table.

The ISBT specification includes a table that lists several types of ISBT barcodes that are commonly used in pairs.



*Enable Check ISBT Table (1)



Disable Check ISBT Table (0)

ISBT Concatenation Redundancy

Parameter # 223 (SSI #DFh)

This parameter sets the number of times the scanner must decode an ISBT symbol before determining that there is no additional symbol.

This parameter applies if you set ISBT Concatenation to Autodiscriminate.

Scan the following barcode, and then scan barcodes in [Numeric Barcodes](#) to set a value between 2 and 20. Enter a leading zero for single-digit numbers. To correct an error or change a selection, scan [Cancel](#). The default is 10.



ISBT Concatenation Redundancy

Code 128 <FNC4>

Parameter # 1254 (SSI #F8h 04h E6h)

This parameter processes the Code 128 <FNC4> character, and either ignores (removes) the character or honors (does not remove) the character.

- *Honor Code 128 <FNC4> - The <FNC4> character is processed normally, per Code 128 standard.
- Ignore Code 128 <FNC4> - Strips the <FNC4> character from the decode data. The remaining characters are sent to the host unchanged.



*Honor Code 128 <FNC4> (0)



Ignore Code 128 <FNC4> (1)

Code 128 Security Level

Parameter # 751 (SSI #F1h EFh)

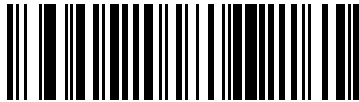
This parameter enables four levels of decode security for Code 128.

Code 128 barcodes are vulnerable to misdecodes, particularly when Code 128 Lengths is set to Any Length. There is an inverse relationship between security and scanner aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- Code 128 Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- Code 128 Security Level 1 - This option eliminates most misdecodes while maintaining reasonable aggressiveness.
- Code 128 Security Level 2 - This option applies greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Code 128 Security Level 3 - If you selected Security Level 2, and misdecodes still occur, select this security level to apply the highest safety requirements.



NOTE: Selecting Code 128 Security Level 3 is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the device. If this level of security is required, try to improve the quality of the barcodes.



Code 128 Security Level 0 (0)



*Code 128 Security Level 1 (1)



Code 128 Security Level 2 (2)



Code 128 Security Level 3 (3)

Code 128 Reduced Quiet Zone

Parameter # 1208 (SSI #F8h 04h B8h)

This parameter enables or disables decoding Code 128 with reduced quiet zones (the margins on either side of the barcode).

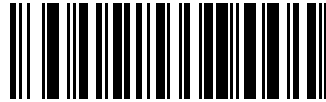
If you select Enable, select a [1D Quiet Zone Level](#).

- Enabled - enables Code 128 with reduced Quiet Zones.

- *Disabled - disables Code 128 with reduced Quiet Zones.



Enable Code 128 Reduced Quiet Zone (1)



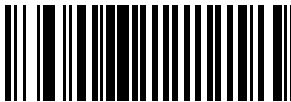
*Disable Code 128 Reduced Quiet Zone (0)

Code 39

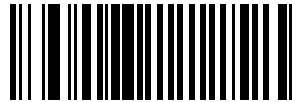
Parameter # 0 (SSI #00h)

This parameter enables or disables the scanner to decode Code 39 barcodes.

- *Enabled - Enables Code 39.
- Disabled - Disables Code 39.



*Enable Code 39 (1)



Disable Code 39 (0)

Trioptic Code 39

Parameter # 13 (SSI #0Dh)

This parameter enables or disables Trioptic Code 39.

Trioptic Code 39 is a variant of Code 39 used in the marking of computer tape cartridges. Trioptic Code 39 symbols always contain six characters.

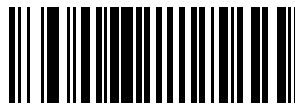
- Enabled - enables Trioptic Code 39.
- *Disabled - disables Trioptic Code 39.



NOTE: You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.



Enable Trioptic Code 39 (1)



*Disable Trioptic Code 39 (0)

Convert Code 39 to Code 32

Parameter # 86 (SSI #5h)

This parameter enables or disables converting Code 39 to Code 32.

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry.

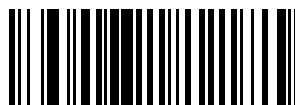


NOTE: Code 39 must be enabled for this parameter to function.

- Enabled - enables Convert Code 39 to Code 32.
- *Disabled - disables Convert Code 39 to Code 32.



Enable Convert Code 39 to Code 32 (1)



*Disable Convert Code 39 to Code 32 (0)

Code 32 Prefix

Parameter # 231 (SSI #E7h)

This parameter enables or disables adding the prefix character “A” to all Code 32 barcodes.

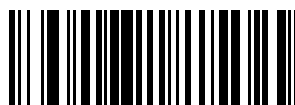
- Enabled - enables Code 32 Prefix.
- *Disabled - disables Code 32 Prefix.



NOTE: [Convert Code 39 to 32](#) must be enabled for this parameter to function.



Enable Code 32 Prefix (1)



*Disable Code 32 Prefix (0)

Set Lengths for Code 39

L1 Parameter # 18 (SSI #12h)

L2 Parameter # 19 (SSI #13h)

This parameter sets lengths for Code 39.

The length of a code refers to the number of characters (for example, human readable characters), including check digit(s) the code contains. Set lengths for Code 39 to any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, Length Within Range or Any Length are the preferred options. The default is Length Within Range, with a default range of 1 to 55.



NOTE: When setting lengths, enter a leading zero for single digit numbers.

- One Discrete Length - Decode only Code 39 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 39 symbols containing either of two lengths.
- Length Within Range - Decode Code 39 symbols with a specific length range.
- Any Length - Decode Code 39 symbols containing any number of characters within the scanner's capability.

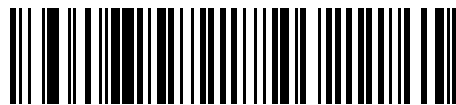
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only Code 39 symbols with 14 characters, scan Code 39 - One Discrete Length, and then scan 1, 4.
- To decode only Code 39 symbols containing either 2 or 14 characters, scan Code 39 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Code 39 symbols containing between 4 and 12 characters, scan Code 39 - Length Within Range, and then scan 0, 4, 1, 2.



Code 39 - One Discrete Length



Code 39 - Two Discrete Lengths



*Code 39 - Length Within Range (Default: Length Within Range)



Code 39 - Any Length

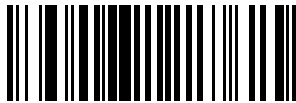
Code 39 Check Digit Verification

Parameter # 48 (SSI #30h)

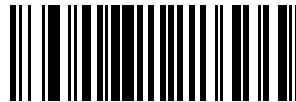
This parameter checks the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm.

Only Code 39 symbols which include a modulo 43 check digit are decoded. Enable this feature if the Code 39 symbols contain a Modulo 43 check digit.

- Enabled - enables Code 39 Check Digit.
- *Disabled - disables Code 39 Check Digit.



Enable Code 39 Check Digit (1)



*Disable Code 39 Check Digit (0)

Code 39 Reduced Quiet Zone

Parameter # 1209 (SSI #F8h 04h B9h)

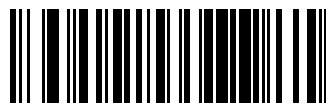
This parameter enables or disables decoding Code 39 with reduced quiet zones. Quiet zones are the margins on either side of the barcode.

If you select Enable, select a [1D Quiet Zone Level](#).

- Enabled - enables Code 39 with reduced Quiet Zones.
- *Disabled - disables Code 39 with reduced Quiet Zones.



Enable Code 39 Reduced Quiet Zone (1)



*Disable Code 39 Reduced Quiet Zone (0)

Transmit Code 39 Check Digit

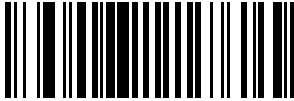
Parameter # 43 (SSI #2Bh)

This parameter transmits Code 39 data with or without the check digit.

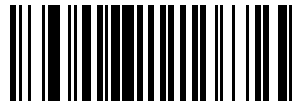
- Enabled - enables Transmit Code 39 Check Digit.
- *Disabled - disables Transmit Code 39 Check Digit.



NOTE: [Code 39 Check Digit Verification](#) must be enabled for this parameter to function.



Transmit Code 39 Check Digit (Enable) (1)



*Do Not Transmit Code 39 Check Digit (Disable) (0)

Code 39 Full ASCII Conversion

Parameter # 17 (SSI #11h)

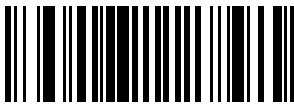
This parameter enables or disables Code 39 Full ASCII.

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set.

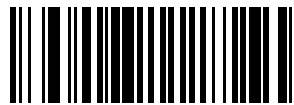
- Enabled - enables Code 39 Full ASCII.
- *Disabled - disables Code 39 Full ASCII.



NOTE: Code 39 Full ASCII to Full ASCII Correlation is host-dependent, and is therefore described in the ASCII character set table for the appropriate interface. See [ASCII Character Sets](#).



Enable Code 39 Full ASCII (1)



*Disable Code 39 Full ASCII (0)

Code 39 Security Level

Parameter # 750 (SSI #F1h EEh)

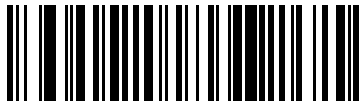
This parameter sets the security level for Code 39.

Select increasing levels of security for decreasing levels of barcode quality. There is an inverse relationship between security, and device aggressiveness, so choose only that level of security necessary for any given application.

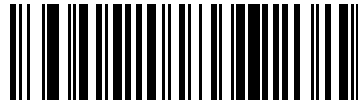
- Code 39 Security Level 0 - Allows the device to operate in its most aggressive state, while providing sufficient security in decoding most "in-spec" barcodes.
- *Code 39 Security Level 1 - This setting eliminates most mis-decodes
- Code 39 Security Level 2 - Select this option if Security Level 1 fails to eliminate mis-decodes.
- Code 39 Security Level 3 - If you selected Security Level 2 and mis-decodes still occur, select this security level.



NOTE: Selecting Security Level 3 is an extreme measure against mis-decoding severely out of spec barcodes. Selecting this level of security significantly impairs the decoding ability of the device. If you need this level of security, try to improve the quality of the barcodes.



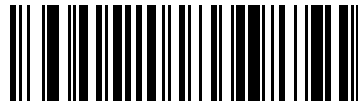
Code 39 Security Level 0 (0)



*Code 39 Security Level 1 (1)



Code 39 Security Level 2 (2)



Code 39 Security Level 3 (3)

Code 93

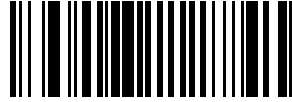
Parameter # 9 (SSI #09h)

This parameter enables or disables the scanner to decode Code 93 barcodes.

- *Enabled - enables Code 93 decoding.
- Disabled - disables Code 93 decoding.



*Enable Code 93 (1)



Disable Code 93 (0)

Set Lengths for Code 93

Parameter # 26 (SSI #1Ah)

Parameter # 27 (SSI #1Bh)

This parameter sets the lengths for Code 93 to any length, one or two discrete lengths, or lengths within a specific range.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. The default is Length Within Range. The maximum range is 1 to 80 digits.



NOTE: When setting lengths, enter a leading zero for single-digit numbers.

- One Discrete Length - Decode only Code 93 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 93 symbols containing either of two lengths.
- Length Within Range - Decode Code 93 symbols with a specific length range.
- Any Length - Decode Code 93 symbols containing any number of characters within the scanner's capability.

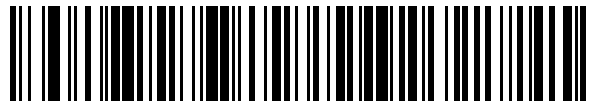
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only Code 93 symbols with 14 characters, scan Code 93 - One Discrete Length, and then scan 1, 4.
- To decode only Code 93 symbols containing either 2 or 14 characters, scan Code 93 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Code 93 symbols containing between 4 and 12 characters, scan Code 93 - Length Within Range, and then scan 0, 4, 1, 2.



Code 93 - One Discrete Length



Code 93 - Two Discrete Lengths



*Code 93 - Length Within Range (Default: 1-55)



Code 93 - Any Length

Code 11

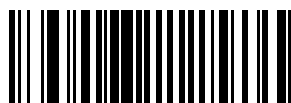
Parameter # 10 (SSI #0Ah)

This parameter enables or disables Code 11.

- Enabled - enables Code 11.
- *Disabled - disables Code 11.



Enable Code 11 (1)



*Disable Code 11 (0)

Set Lengths for Code 11

L1 Parameter # 28 (SSI #1Ch)

L2 Parameter # 29 (SSI #1Dh)

This parameter set lengths for Code 11.

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range. The default is Length Within Range with a default range of 4 to 55



NOTE: When setting lengths, enter a leading zero for single digit numbers.

- One Discrete Length - Decode only Code 11 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 11 symbols containing either of two lengths.
- Length Within Range - Decode Code 11 symbols with a specific length range.
- Any Length - Decode Code 11 symbols containing any number of characters within the scanner's capability.

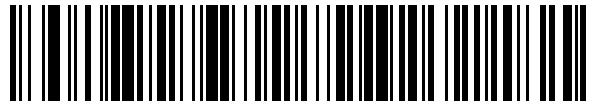
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only Code 11 symbols with 14 characters, scan Code 11 - One Discrete Length, and then scan 1, 4.
- To decode only Code 11 symbols containing either 2 or 14 characters, scan Code 11 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Code 11 symbols containing between 4 and 12 characters, scan Code 11 - Length Within Range, and then scan 0, 4, 1, 2.



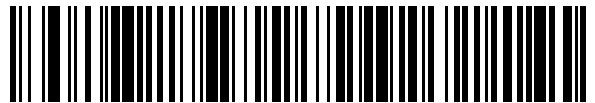
Code 11 - One Discrete Length



Code 11 - Two Discrete Lengths



*Code 11 - Length Within Range (Default: 4 to 55)



Code 11 - Any Length

Code 11 Check Digit Verification

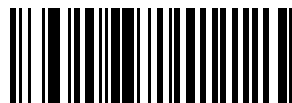
Parameter # 52 (SSI #34h)

This parameter checks the integrity of all Code 11 symbols to verify that the data complies with specified check digit algorithm.

- *Disabled - disables Code 11 Check Digit.
- One Check Digit - enables Code 11 to check one digit.
- Two Check Digits - enables Code 11 to check 2 digits.



*Disable (0)



One Check Digit (1)



Two Check Digits (2)

Transmit Code 11 Check Digits

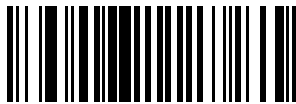
Parameter # 47 (SSI #2Fh)

This parameter transmits Code 11 data with or without the check digit.

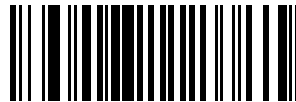
- Enabled - enables Transmit Code 11 Check Digit.
- *Disabled - disables Transmit Code 11 Check Digit.



NOTE: [Code 11 Check Digit Verification](#) must be enabled for this parameter to function.



Transmit Code 11 Check Digit(s) (Enable) (1)



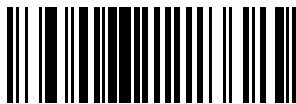
*Do Not Transmit Code 11 Check Digit(s) (Disable)
(0)

Interleaved 2 of 5 (I 2 of 5)

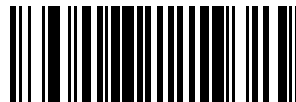
Parameter # 6 (SSI #06h)

This parameter enables or disables I 2 of 5.

- *Enabled - enables I 2 of 5.
- Disabled - disables I 2 of 5.



*Enable Interleaved 2 of 5 (1)



Disable Interleaved 2 of 5 (0)

Set Lengths for Interleaved 2 of 5 (I 2 of 5)

L1 Parameter # 22 (SSI #16h)

L2 Parameter # 23 (SSI #17h)

This parameter sets the length for I 2 of 5.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set the lengths for I 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The default is Length Within Range. The default range is 6 to 55.



NOTE: When setting the lengths, enter a leading zero for single digit numbers.

- One Discrete Length - Decode only I 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only I 2 of 5 symbols containing either of two lengths.
- Length Within Range - Decode I 2 of 5 symbols with a specific length range.
- Any Length - Decode I 2 of 5 symbols containing any number of characters within the scanner's capability.



NOTE: Due to the construction of the I 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (I 2 of 5 - One Discrete Length, Two Discrete Lengths) for I 2 of 5 applications, or increase the [Security Level](#).

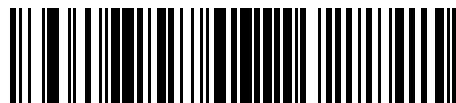
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only I 2 of 5 symbols with 14 characters, scan I 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only I 2 of 5 symbols containing either 2 or 14 characters, scan I 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode I 2 of 5 symbols containing between 4 and 12 characters, scan I 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.



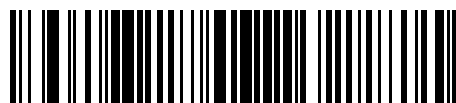
I 2 of 5 - One Discrete Length



I 2 of 5 - Two Discrete Lengths



*I 2 of 5 - Length Within Range



I 2 of 5 - Any Length

Interleaved 2 of 5 (I 2 of 5) Check Digit Verification

Parameter # 49 (SSI #31h)

This parameter enables or disables checking the integrity of all I 2 of 5 symbols to verify the data complies with either the specified Uniform Symbology Specification (USS) or the Optical Product Code Council (OPCC) check digit algorithm.

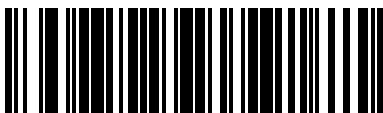
- *Disable - disables checking the integrity of all I 2 of 5 symbols to verify the data complies.
- USS Check Digit - enables checking the integrity of USS.
- OPCC Check Digit - enables checking the integrity of OPCC.



*Disable (0)



USS Check Digit (1)



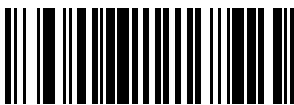
OPCC Check Digit (2)

Transmit I 2 of 5 Check Digit

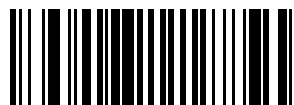
Parameter # 44 (SSI #2Ch)

This parameter enables or disables transmission of I 2 of 5 data with or without the check digit.

- Enabled - enables transmission of check digit.
- *Disabled - disables transmission of check digit.



Transmit I 2 of 5 Check Digit (Enable) (1)



*Do Not Transmit I 2 of 5 Check Digit (Disable) (0)

Convert Interleaved 2 of 5 (I 2 of 5) to EAN-13

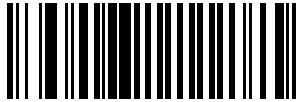
Parameter # 82 (SSI #52h)

This parameter enables or disables converting 14-character I 2 of 5 codes to EAN-13, and then transmitting to the host as EAN-13.

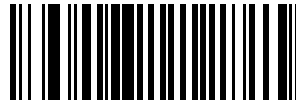
- Enabled - enables converting 14-character I 2 of 5 codes to EAN-13.
- *Disabled - disables converting 14-character I 2 of 5 codes to EAN-13.



NOTE: The I 2 of 5 code must be enabled, and the code must have a leading zero and a valid EAN-13 check digit.



Convert I 2 of 5 to EAN-13 (Enable) (1)



*Do Not Convert I 2 of 5 to EAN-13 (Disable) (0)

Febraban

Parameter # 1750 (SSI #F8h 06h D6h)

This parameter enables or disables the I 2 of 5 internal check digit calculation and transmission.

Febraban is an Interleaved 2 of 5 (I 2 of 5) length 44 that requires inserting special check characters in the transmitted data stream.

- Enabled - enables internal check of digit calculation and transmission.
- *Disabled - disables internal check of digit calculation and transmission.



NOTE: Recommendations for length settings:

- I 2 of 5 Length 1: Larger of the fixed length and the Febraban length (==44).
- I 2 of 5 Length 2: Smaller of the fixed length and the Febraban length (==44).



Enable Febraban (1)



*Disable Febraban (0)

Interleaved 2 of 5 (I 2 of 5) Security Level

Parameter # 1121 (SSI #F8h 04h 61h)

This parameter sets the security level for I 2 of 5.

I 2 of 5 barcodes are vulnerable to misdecodes, particularly when I 2 of 5 Lengths is set to Any Length. The scanner offers four levels of decode security for I 2 of 5 barcodes. There is an inverse relationship between security and scanner aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- I 2 of 5 Security Level 0: The scanner operates in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- I 2 of 5 Security Level 1: A barcode must be successfully read twice, and satisfy certain safety requirements before being decoded. This default setting eliminates most misdecodes.
- I 2 of 5 Security Level 2: This option applies greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- I 2 of 5 Security Level 3: If you selected Security Level 2, and misdecodes still occur, select this security level. The highest safety requirements are applied. A barcode must be successfully read three times before being decoded.



NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the scanner. If this level of security is required, try to improve the quality of the barcodes.



I 2 of 5 Security Level 0 (0)



*I 2 of 5 Security Level 1 (1)



I 2 of 5 Security Level 2 (2)



I 2 of 5 Security Level 3 (3)

Interleaved 2 of 5 (I 2 of 5) Reduced Quiet Zone

Parameter # 1210 (SSI #F8h 04h B9h)

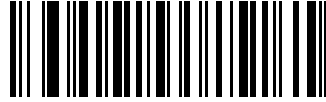
This parameter enables or disables decoding I 2 of 5 with reduced quiet zones (the margins on either side of the barcode).

If you select Enable, select a [1D Quiet Zone Level](#).

- Enabled - enables I 2 of 5 with reduced Quiet Zones.
- *Disabled - disables I 2 of 5 with reduced Quiet Zones.



Enable I 2 of 5 Reduced Quiet Zone (1)



*Disable I 2 of 5 Reduced Quiet Zone (0)

Discrete 2 of 5 (D 2 of 5)

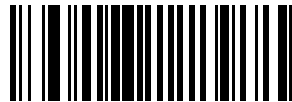
Parameter # 5 (SSI #05h)

This parameter enables or disables D 2 of 5.

- Enabled - enables D 2 of 5.
- *Disabled - disables D 2 of 5.



Enable Discrete 2 of 5 (1)



*Disable Discrete 2 of 5 (0)

Set Lengths for Discrete 2 of 5 (D 2 of 5)

L1 Parameter # 20 (SSI #14h)

L2 Parameter # 21 (SSI #15h)

This parameter sets lengths for D 2 of 5.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for D 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The default behavior is Length Within Range.



NOTE: When setting lengths, enter a leading zero for single digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only D 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only D 2 of 5 symbols containing either of two lengths.
- *Length Within Range - Decode D 2 of 5 symbols with a specific length range.
- Any Length - Decode D 2 of 5 symbols containing any number of characters within the scanner's capability.

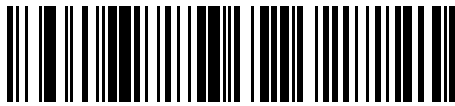


NOTE: Due to the construction of the D 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (D 2 of 5 - One Discrete Length, Two Discrete Lengths) for D 2 of 5 applications.

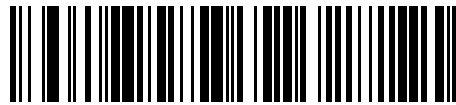
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

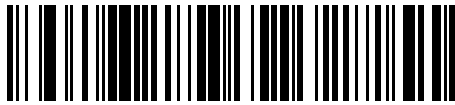
- To decode only D 2 of 5 symbols with 14 characters, scan D 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only D 2 of 5 symbols containing either 2 or 14 characters, scan D 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode D 2 of 5 symbols containing between 4 and 12 characters, scan D 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.



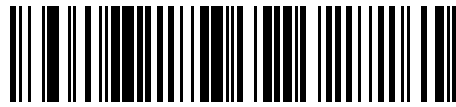
D 2 of 5 - One Discrete Length



D 2 of 5 - Two Discrete Lengths



*D 2 of 5 - Length Within Range



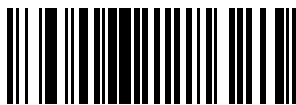
D 2 of 5 - Any Length

Codabar (NW - 7)

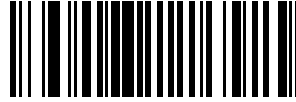
Parameter # 7 (SSI #07h)

This parameter enables or disables the scanner to decode Codabar barcodes.

- *Enabled - enables Codabar decoding.
- Disabled - disables Codabar decoding.



*Enable Codabar (1)



Disable Codabar (0)

Set Lengths for Codabar

L1 Parameter # 24 (SSI #18h)

L2 Parameter # 25 (SSI #19h)

This parameter sets lengths for Codabar.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for Codabar to any length, one or two discrete lengths, or lengths within a specific range. The default behavior is Length Within Range, and the range is 4 to 55



NOTE: When setting lengths, enter a leading zero for single-digit numbers.

- One Discrete Length - Decode only Codabar symbols containing a selected length.
- Two Discrete Lengths - Decode only Codabar symbols containing either of two lengths.
- Length Within Range - Decode Codabar symbols with a specific length range.
- Any Length - Decode Codabar symbols containing any number of characters within the scanner's capability.

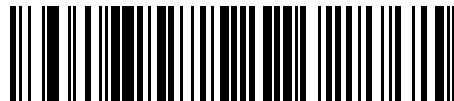
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

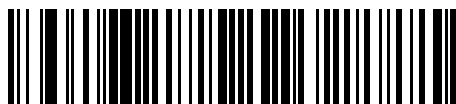
- To decode only Codabar symbols with 14 characters, scan Codabar - One Discrete Length, and then scan 1, 4.
- To decode only Codabar symbols containing either 2 or 14 characters, scan Codabar - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Codabar symbols containing between 4 and 12 characters, scan Codabar - Length Within Range, and then scan 0, 4, 1, 2.



Codabar - One Discrete Length



Codabar - Two Discrete Lengths



*Codabar - Length Within Range (Default: Length Within Range)



Codabar - Any Length

CLSI Editing

Parameter # 54 (SSI #36h)

This parameter enables or disables CLSI editing.

Select Enable CLSI Editing to strip the start and stop characters and insert a space after the first, fifth, and tenth characters of a 14-character Codabar symbol if the host system requires this data format.

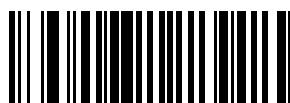
- Enabled - enables CLSI editing.
- *Disabled - disables CLSI editing.



NOTE: Symbol length does not include start and stop characters.



Enable CLSI Editing (1)



*Disable CLSI Editing (0)

NOTIS Editing

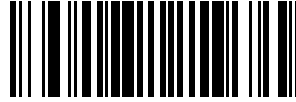
Parameter # 55 (SSI #37h)

This parameter enables or disables NOTIS editing which strips the start and stop characters from a decoded Codabar symbol if the host system requires this data format.

- Enabled - enables NOTIS editing.
- *Disabled - disables NOTIS editing.



Enable NOTIS Editing (1)



*Disable NOTIS Editing (0)

Codabar Security Level

Parameter # 1776 (SSI #F8h 06h F0h)

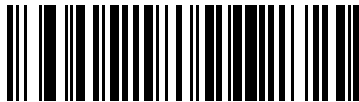
This parameter sets the security level for Codabar 39.

The scanner offers four levels of decode security for Codabar barcodes. There is an inverse relationship between security and scanner aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- Codabar Security Level 0: This setting allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- Codabar Security Level 1: This default setting eliminates most misdecodes.
- Codabar Security Level 2: Select this option with greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Codabar Security Level 3: If you selected Security Level 2, and misdecodes still occur, select this security level to apply the highest safety requirements.



NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the scanner. If this level of security is required, try to improve the quality of the barcodes.



Codabar Security Level 0 (0)



*Codabar Security Level 1 (1)



Codabar Security Level 2 (2)



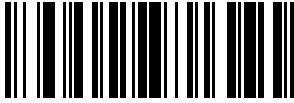
Codabar Security Level 3 (3)

Codabar Upper or Lower Case Start/Stop Characters

Parameter # 855 (SSI #F2h 57h)

This parameter selects whether to transmit upper case or lower case Codabar start/stop characters.

- Lower Case (1) - enables lowercase start/stop characters.
- *Upper Case (0) - enables upper case start/stop characters.



Lower Case (1)



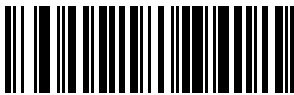
*Upper Case (0)

Codabar Mod 16 Check Digit Verification

Parameter # 1784 (SSI #F8h 06h F8h)

This parameter checks the Codabar Mod 16 check digit to verify that the data complies with the specified check digit algorithm.

- Enabled - enables check digit.
- *Disabled - disables check digit.



Enable Codabar Mod 16 Check digit (1)



*Disable Codabar Mod 16 Check digit (0)

Transmit Codabar Check Digit

Parameter # 704 (SSI #F1h C0h)

This parameter selects whether or not to transmit the Codabar check digit(s).

- Enabled - enables check digit transmission.
- *Disabled - disables check digit transmission.



Enable Codabar Check Digit Transmission (1)



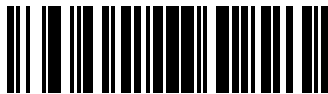
*Disable Codabar Check Digit Transmission (0)

Codabar Reduced Quiet Zone

Parameter # 2425 (SSI #F8h 09h 79h)

This parameter enables or disables Codabar barcode decoding with a reduced quiet zone.

- Enable: Enables to scanner to decode Codabar barcodes with a reduced quiet zone.
- Disable: The scanner will not decode Codabar barcodes with a reduced quiet zone.



Enable (1)



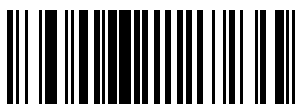
*Disable (0)

MSI

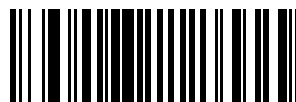
Parameter # 11 (SSI #0Bh)

This parameter enables or disables MSI.

- Enabled - enables MSI.
- *Disabled - disables MSI.



Enable MSI (1)



*Disable MSI (0)

Set Lengths for MSI

L1 Parameter # 30 (SSI #1Eh)

L2 Parameter # 31 (SSI #1Fh)

This parameter sets lengths for MSI.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for MSI to any length, one or two discrete lengths, or lengths within a specific range. The default behavior is Length Within Range, with a maximum range of 4 to 55.



NOTE: When setting lengths, enter a leading zero for single-digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only MSI symbols containing a selected length.
- Two Discrete Lengths - Decode only MSI symbols containing either of two lengths.
- Length Within Range - Decode MSI symbols with a specific length range.
- Any Length - Decode MSI symbols containing any number of characters within the scanner's capability.

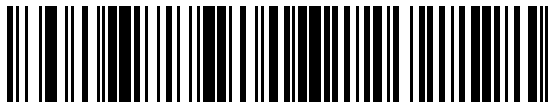


NOTE: Due to the construction of the MSI symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (MSI - One Discrete Length, Two Discrete Lengths) for MSI applications.

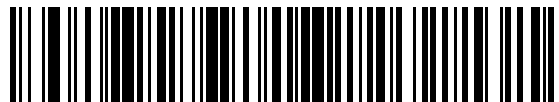
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

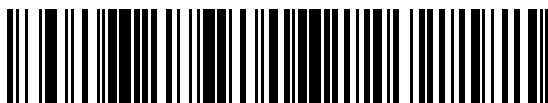
- To decode only MSI symbols with 14 characters, scan MSI - One Discrete Length, and then scan 1, 4.
- To decode only MSI symbols containing either 2 or 14 characters, scan MSI - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode MSI symbols containing between 4 and 12 characters, scan MSI - Length Within Range, and then scan 0, 4, 1, 2.



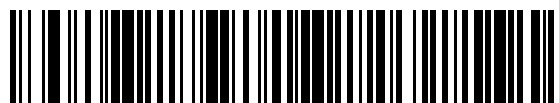
MSI - One Discrete Length



MSI - Two Discrete Lengths



*MSI - Length Within Range (Default: Length Within Range)



MSI - Any Length

MSI Check Digits

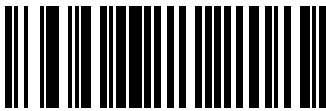
Parameter # 50 (SSI #32h)

This parameter checks the MSI check digit to verify that the data complies with the specified check digit algorithm.

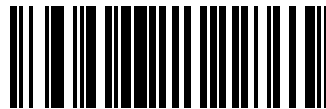
With MSI symbols, one check digit is mandatory and always verified by the reader. The second check digit is optional. If the MSI codes include two check digits, select the Two MSI Check Digits option to enable verification of the second check digit.

- 0 - Does not check the MSI check digit; decodes MSI with no check digit.
- 1 - This is for MSI barcodes with one check digit. This is the default.
- 2 - This is for MSI barcodes with two check digits.

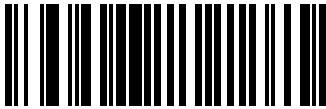
[MSI Check Digit Algorithm](#) to select second digit algorithms.



No MSI Check Digit (0)



*One MSI Check Digits (1)



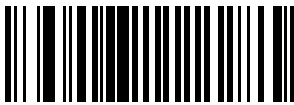
Two MSI Check Digit (2)

Transmit MSI Check Digit(s)

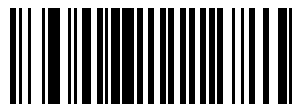
Parameter # 46 (SSI #2Eh)

This parameter transmits MSI data with or without the check digit.

- Enabled - transmits MSI data with check digit.
- *Disabled - does not transmit MSI data check digit.



Transmit MSI Check Digit(s) (Enable) (1)



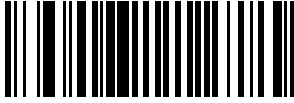
*Do Not Transmit MSI Check Digit(s) (Disable) (0)

MSI Check Digit Algorithm

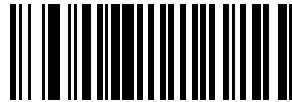
Parameter # 51 (SSI #33h)

This parameter selects the algorithm used to encode the check digit.

Two algorithms are available for verifying the second MSI check digit. Select one of the following options to select the algorithm used to encode the check digit.



MOD 11/MOD 10 (0)



*MOD 10/MOD 10 (1)

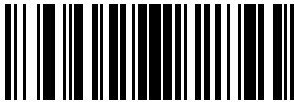
MSI Reduced Quiet Zone

Parameter # 1392 (SSI #F8h 05h 70h)

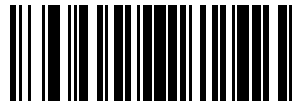
This parameter enables or disables decoding MSI with reduced quiet zones (the margins on either side of the barcode).

If you select Enable, select a [1D Quiet Zone Level](#).

- *Disabled - disables MSI with reduced Quiet Zones.
- Enabled - enables MSI with reduced Quiet Zones.



*Disable MSI Reduced Quiet Zone (0)



Enable MSI Reduced Quiet Zone (1)

Chinese 2 of 5

Parameter # 408 (SSI #98h)

This parameter enables or disables Chinese 2 of 5.

- Enabled - enables Chinese 2 of 5.
- *Disabled - disables Chinese 2 of 5.



Enable Chinese 2 of 5 (1)



*Disable Chinese 2 of 5 (0)

Matrix 2 of 5

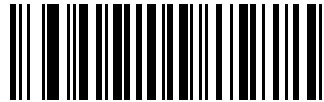
Parameter # 618 (SSI #F1h 6Ah)

This parameter enables or disables Matrix 2 of 5.

- Enabled - enables Matrix 2 of 5.
- *Disabled - disables Matrix 2 of 5.



Enable Matrix 2 of 5 (1)



*Disable Matrix 2 of 5 (0)

Set Lengths for Matrix 2 of 5

L1 Parameter # 619 (SSI #F1h 6Bh)

L2 Parameter # 620 (SSI #F1h 6Ch)

This parameter set lengths for Matrix 2 of 5.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for Matrix 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The default behavior is Length Within Range with a maximum range of 4 to 55



NOTE: When setting lengths, enter a leading zero for single-digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only Matrix 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only Matrix 2 of 5 symbols containing either of two lengths.
- Length Within Range - Decode Matrix 2 of 5 symbols with a specific length range.
- Any Length - Decode Matrix 2 of 5 symbols containing any number of characters within the scanner's capability.

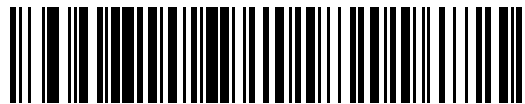
Select lengths using barcodes in [Numeric Barcodes](#). To correct an error or change the selection, scan [Cancel](#).

For example:

- To decode only Matrix 2 of 5 symbols with 14 characters, scan Matrix 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only Matrix 2 of 5 symbols containing either 2 or 14 characters, scan Matrix 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Matrix 2 of 5 symbols containing between 4 and 12 characters, scan Matrix 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.



Matrix 2 of 5 - One Discrete Length



Matrix 2 of 5 - Two Discrete Lengths



*Matrix 2 of 5 - Length Within Range
(Default:Length Within Range)



Matrix 2 of 5 - Any Length

Matrix 2 of 5 Check Digit

Parameter # 622 (SSI #F1h 6Eh)

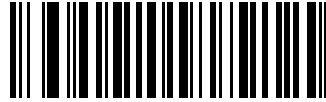
This parameter determines whether to include the Matrix 2 of 5 check digit with the barcode data.

The check digit is the last character of the symbol used to verify the integrity of the data.

- Enabled - enables Matrix 2 of 5 Check Digit.
- *Disabled - disables Matrix 2 of 5 Check Digit.



Enable Matrix 2 of 5 Check Digit (1)



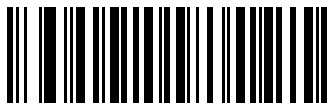
*Disable Matrix 2 of 5 Check Digit (0)

Transmit Matrix 2 of 5 Check Digit

Parameter # 623 (SSI #F1h 6Fh)

This parameter transmits Matrix 2 of 5 data with or without the check digit.

- Transmit - enables Transmit Matrix 2 of 5 Check Digit.
- *Do Not Transmit - does not Transmit Matrix 2 of 5 Check Digit.



Transmit Matrix 2 of 5 Check Digit (1)



*Do Not Transmit Matrix 2 of 5 Check Digit (0)

Korean 3 of 5

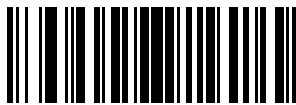
Parameter # 581 (SSI #F1h 45h)

This parameter enables or disables Korean 3 of 5.

- Enabled - enables Korean 3 of 5.
- *Disabled - disables Korean 3 of 5.



NOTE: The length for Korean 3 of 5 is fixed at 6.



Enable Korean 3 of 5 (1)



*Disable Korean 3 of 5 (0)

Inverse 1D

Parameter # 586 (SSI #F1h 4Ah)

This parameter sets the 1D inverse decoder setting.

- Regular Only - The scanner decodes regular 1D barcodes only.
- Inverse Only - The scanner decodes inverse 1D barcodes only.
- Inverse Autodetect - The scanner decodes both regular and inverse 1D barcodes.



NOTE: This parameter does not apply to GS1 DataBarcode types.



NOTE: The Inverse 1D setting may impact Composite or Inverse Composite decoding.



*Regular Only (0)



Inverse Only (1)



Inverse Autodetect (2)

GS1 DataBar

The variants of GS1 DataBar are DataBar Omnidirectional, DataBar Limited, and DataBar Expanded. The limited and expanded versions have stacked variants. Choose to enable or disable each variant of the GS1 DataBar.

GS1 DataBar Omnidirectional (formerly GS1 DataBar-14)

The variants of GS1 DataBar are DataBar Omnidirectional, DataBar Limited, and DataBar Expanded. The limited and expanded versions have stacked variants. Scan the appropriate barcodes to enable or disable each variant of GS1 DataBar.

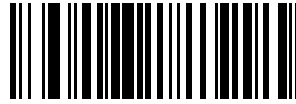
Parameter # 338 (SSI #F0h 52h)

This parameter enables or disables GS1 DataBar Omnidirectional.

- *Enabled - enables GS1 DataBar Omnidirectional.
- Disabled - disables GS1 DataBar Omnidirectional.



*Enable GS1 DataBar Omnidirectional (1)



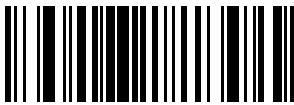
Disable GS1 DataBar Omnidirectional (0)

GS1 DataBar Limited

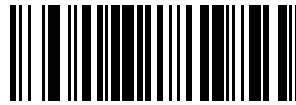
Parameter # 339 (SSI #F0h 53h)

This parameter enables or disables GS1 DataBar Limited.

- *Enabled - enables GS1 DataBar Limited.
- Disabled - disables GS1 DataBar Limited.



*Enable GS1 DataBar Limited (1)



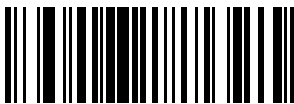
Disable GS1 DataBar Limited (0)

GS1 DataBar Expanded

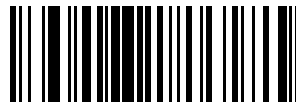
Parameter # 340 (SSI #F0h 54h)

This parameter enables or disables GS1 DataBar Expanded.

- *Enabled - enables GS1 DataBar Expanded.
- Disabled - disables GS1 DataBar Expanded.



*Enable GS1 DataBar Expanded (1)



Disable GS1 DataBar Expanded (0)

Convert GS1 DataBar to UPC/EAN/JAN

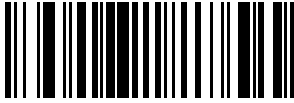
Parameter # 397 (SSI #F0h, 8Dh)

This parameter enables or disables Convert GS1 DataBar to UPC/EAN/JAN.

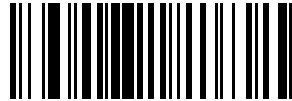
- Enabled - enables Convert GS1 DataBar to UPC/EAN/JAN.
- *Disabled - disables Convert GS1 DataBar to UPC/EAN/JAN.

This parameter only applies to GS1 DataBar Omnidirectional and GS1 DataBar Limited symbols not decoded as part of a Composite symbol. Enable Convert GS1 DataBar to UPC/EAN/JAN strips the leading '010' from DataBar Omnidirectional and DataBar Limited symbols encoding a single zero as the first digit, and then reports as EAN-13.

For barcodes beginning with between two and five zeros, this strips the leading '0100' and reports the barcode as UPC-A. The [UPC-A Preamble](#) option that transmits the system character and country code applies to converted barcodes. Note that neither the system character nor the check digit can be stripped.



Enable Convert GS1 DataBar to UPC/EAN/JAN (1)



*Disable Convert GS1 DataBar to UPC/EAN/JAN (0)

GS1 DataBar Security Level

Parameter # 1706 (SSI #F8h 06h AAh)

This parameter sets the security level for GS1 DataBar.

The scanner offers four levels of decode security for GS1 DataBar (GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded) barcodes.

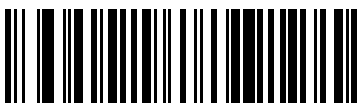
- Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security decoding most in-spec barcodes.
- *Security Level 1 - This setting eliminates most misdecodes while maintaining reasonable aggressiveness.
- Security Level 2 - Select this option with greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Security Level 3 - If you selected Security Level 2 and misdecodes still occur, select this security level to apply the highest safety requirements.



GS1 DataBar Security Level 0 (0)



*GS1 DataBar Security Level 1 (1)



GS1 DataBar Security Level 2 (2)



GS1 DataBar Security Level 3 (3)

GS1 DataBar Limited Margin Check

Parameter # 728 (SSI #F1h D8h)

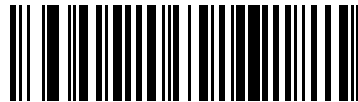
This parameter sets the margin level for GS1 DataBar.

The scanner offers four levels of decode security for GS1 DataBar Limited barcodes. There is an inverse relationship between the level of margin check and scanner aggressiveness. Increasing the level of margin check can reduce scanning aggressiveness, so select only the level of margin check necessary.

- Margin Check Level 1 – No clear margin required. This complies with the original GS1 standard, yet can result in erroneous decoding of a DataBar Limited barcode when scanning some UPC symbols that start with digits 9 and 7.
- Margin Check Level 2 – Automatic risk detection. This level of margin check can result in erroneous decoding of DataBar Limited barcodes when scanning some UPC symbols. If a misdecode is detected, the scanner operates in Level 3 or Level 1.
- *Margin Check Level 3 – Margin check level reflects the newly proposed GS1 standard that requires a five times trailing clear margin.
- Margin Check Level 4 – Margin check level extends beyond the standard required by GS1. This level of margin check requires a five times leading and trailing clear margin.



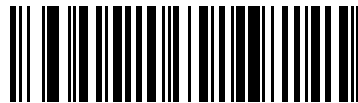
GS1 DataBar Limited Margin Check Level 1 (1)



GS1 DataBar Limited Margin Check Level 2 (2)



*GS1 DataBar Limited Margin Check Level 3 (3)



GS1 DataBar Limited Margin Check Level 4 (4)

GS1 Digital Link Parameters

GS1 Digital Link

Parameter #2373 (SSI #F8h 09h 45h)

This parameter enables or disables GS1 Digital Link.



Enable (1)



*Disable (0)

GS1 Digital Link Mode

Parameter #2374 (SSI #F8h 09h 46h)

This parameter selects the GS1 Digital Link Mode when the GS1 Digital Link is enabled.

- Mode 1 GTIN only: This mode sends either the 1D GTIN or 2D GTIN, whichever is decoded first.
- Mode 2 Prioritize 2D: This mode prioritizes the 2D GS1 Digital Link over 1D barcodes. If it sees the 2D within the GS1 Digital Link Prioritization Timeout, it reports the 2D barcode only. If it does not decode a 2D GS1 Digital Link barcode within the GS1 Digital Link Prioritization Timeout or the trigger is released, it will report the 1D barcode, assuming the 1D was in the field of view and decoded.
- Mode 3 Corroborate 1D and 2D GTINs Match: The 1D barcode is reported if it is decoded before the 2D barcode. If a matching GTIN 2D barcode is seen within the GS1 Digital Link Prioritization Timeout, the 2D is also reported. The matching 1D and 2D barcodes have the same unique 8-digit prefix to indicate they have the same data. If the 2D is decoded first before the 1D, only the 2D is reported.



*Mode 1: GTIN only (1)



Mode 2: Prioritize 2D (2)



Mode 3: Corroborate 1D and 2D GTINs Match (3)

GS1 Digital Link Prioritization Timeout

Parameter #2491 (SSI #F8h 09h BBh)

This parameter defines the maximum amount of time the scanner attempts to decode a 2D GS1 Digital Link barcode.

To set the GS1 Digital Link Prioritization Timeout, scan the barcode below. Then, scan four numeric barcodes from the [Numeric Barcodes](#) corresponding to the desired prioritization time. Enter leading zeroes for times of less than 4 values. For example, to enter 250 msec, scan **0 2 5 0**. To correct an error or change the selection, scan [Cancel](#).

- When the Digital Link Mode is set to Mode 2, this is the amount of time the scanner looks for the 2D GS1 Digital Link barcode. If the timer expires or the trigger is released before finding the 2D GS1 barcode, the 1D barcode is sent.
- When the Digital Link Mode is set to Mode 3, if the 1D barcode is decoded first, this is the amount of time the scanner continues to look for the 2D barcode.



NOTE: This parameter is set in 1 msec increments.



Set Timeout

Symbology-Specific Security Features

These security features are unique to the Symbology section.

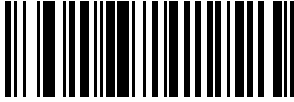
Redundancy Level

Parameter # 78 (SSI #4Eh)

This parameter selects the redundancy level appropriate for the barcode quality.

Select higher redundancy levels for decreasing levels of barcode quality. As redundancy levels increase, the scanner's aggressiveness decreases.

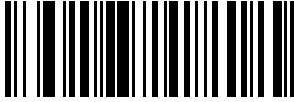
- *Redundancy Level 1 - The scanner must read the following code types twice before decoding:
 - Codabar (8 characters or less)
 - MSI (4 characters or less)
 - D 2 of 5 (8 characters or less)
 - I 2 of 5 (8 characters or less)
- Redundancy Level 2 - The scanner must read all code types twice before decoding.
- Redundancy Level 3 - The scanner must read code types other than the following twice before decoding, but must read the following codes three times:
 - Codabar (8 characters or less)
 - MSI (4 characters or less)
 - D 2 of 5 (8 characters or less)
 - I 2 of 5 (8 characters or less)
- Redundancy Level 4 - The scanner must read all code types three times before decoding.



*Redundancy Level 1 (1)



Redundancy Level 2 (2)



Redundancy Level 3 (3)



Redundancy Level 4 (4)

Security Level

Parameter # 77 (SSI #4Dh)

This parameter sets the security level.

The scanner offers four levels of decode security, which include the Code 128 family, UPC/EAN/JAN, and Code 93. Select increasing levels of security for decreasing levels of scanning quality. There is an inverse relationship between security and scanner aggressiveness, so choose only that level of security necessary for the application.

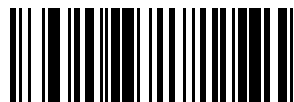
- Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security decoding most in-spec barcodes.
- Security Level 1 - This default setting eliminates most mis-decodes.
- Security Level 2 - Select this option if Security Level 1 fails to eliminate mis-decodes.
- Security Level 3 - If you selected Security Level 2 and mis-decodes still occur, select this security level.



NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the scanner. If this level of security is required, try to improve the quality of the barcodes.



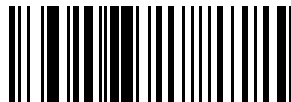
Security Level 0 (0)



*Security Level 1 (1)



Security Level 2 (2)



Security Level 3 (3)

1D Quiet Zone Level

Parameter # 1288 (SSI #F8h 05h 08h)

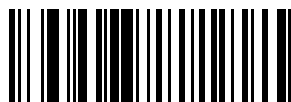
This parameter sets the level of aggressiveness when setting a reduced quiet zone (the margin on either side of a barcode), and applies to symbologies enabled by a Reduced Quiet Zone parameter.

Because higher levels increase the decoding time and risk of mis-decodes, Zebra strongly recommends enabling only the symbologies which require higher quiet zone levels, and leaving Reduced Quiet Zone disabled for all other symbologies. Options are:

- 1D Quiet Zone Level 0 - The scanner performs normally in terms of quiet zone.
- *1D Quiet Zone Level 1 - The scanner performs more aggressively in terms of quiet zone.
- 1D Quiet Zone Level 2 - The scanner only requires a quiet zone at the end of barcode for decoding.
- 1D Quiet Zone Level 3 - The scanner decodes anything in terms of quiet zone or end of barcode.



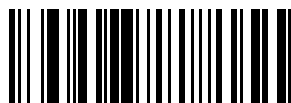
1D Quiet Zone Level 0 (0)



*1D Quiet Zone Level 1 (1)



1D Quiet Zone Level 2 (2)



1D Quiet Zone Level 3 (3)

Intercharacter Gap Size

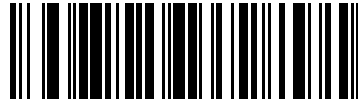
Parameter # 381 (SSI #F0h 7Dh)

This parameter enables a device to tolerate large intercharacter gap sizes.

The Code 39 and Codabar symbologies have an intercharacter gap that is typically quite small. Due to various barcode printing technologies, this gap can grow larger than the maximum size allowed, preventing the scanner from decoding the symbol. If this problem occurs, scan the Large Intercharacter Gaps parameter to tolerate these out-of-specification barcodes.



*Normal Intercharacter Gaps (6)



Large Intercharacter Gaps (10)

Composite

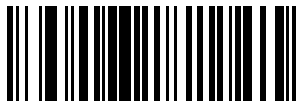
Composites link symbols or barcodes together and they are read by a scanner as one object.

Composite CC-C

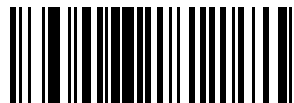
Parameter # 341 (SSI #F0h 55h)

This parameter enables or disables Composite barcodes of type CC-C.

- Enabled - enables CC-C.
- *Disabled - disables CC-C.



Enable CC-C (1)



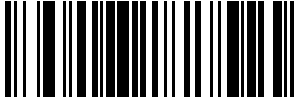
*Disable CC-C (0)

Composite CC-A/B

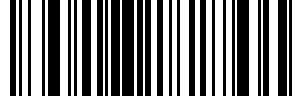
Parameter # 342 (SSI #F0h 56h)

This parameter enables or disables CC-A/B.

- Enabled - enables CC-A/B.
- *Disabled - disables CC-A/B.



Enable CC-A/B (1)



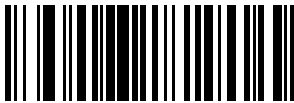
*Disable CC-A/B (0)

Composite TLC-39

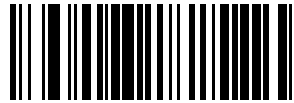
Parameter # 371 (SSI #F0h 73h)

This parameter enables or disables TLC-39.

- Enabled - enables TLC-39.
- *Disabled - disables TLC-39.



Enable TLC39 (1)



*Disable TLC39 (0)

Composite Inverse

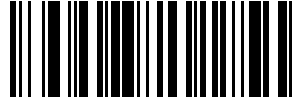
Parameter # 1113 (SSI #F8h 04h 59h)

This parameter sets Composite for either regular decode or inverse decode.

- *Regular Only - The scanner decodes regular Composite barcodes only. Before selecting this, set [Inverse 1D](#) to Regular Only or Inverse Autodetect.
- Inverse Only - The scanner decodes inverse Composite barcodes only. This mode only supports Composite Inverse that includes DataBar combined with CCAB, and does not support other 1D/2D combinations. Before selecting this, first enable [Composite CC-A/B](#), and set [Inverse 1D](#) to Inverse Only or Inverse Autodetect.



*Regular Only (0)



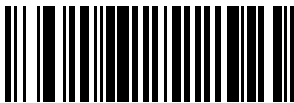
Inverse Only (1)

UPC Composite Mode

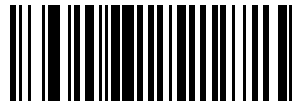
Parameter # 344 (SSI #F0h 58h)

This parameter links UPC symbols with a 2D symbol during transmission as if they were one symbol.

- *UPC Never Linked - Transmit UPC barcodes regardless of whether a 2D symbol is detected.
- UPC Always Linked - Transmit UPC barcodes and the 2D portion. If 2D is not present, do not transmit the barcode.
- Autodiscriminate UPC Composites - The scanner determines if there is a 2D portion, then transmits the UPC, as well as the 2D portion if present.



*UPC Never Linked (0)



UPC Always Linked (1)



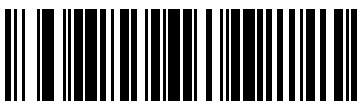
Autodiscriminate UPC Composites (2)

Composite Beep Mode

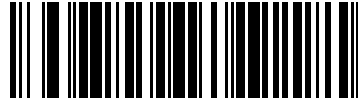
Parameter # 398 (SSI #F0h 8Eh)

This parameter selects the number of decode beeps that sound upon decoding a Composite.

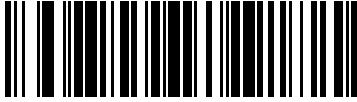
- Single Beep - after both are decoded.
- *Beep for each code type - as each code type is decoded.
- Double Beep - after both are decoded.



Single Beep After Both are Decoded (0)



*Beep as Each Code Type is Decoded (1)



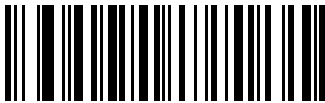
Double Beep After Both are Decoded (2)

GS1-128 Emulation Mode for UCC/EAN Composite Codes

Parameter # 427 (SSI #F0h ABh)

This parameter enables or disables GS1-128 Emulation Mode for UCC/EAN Composite Codes.

- Enabled - enables GS1-128 Emulation Mode for UCC/EAN Composite Codes.
- *Disabled - disables GS1-128 Emulation Mode for UCC/EAN Composite Codes.



Enable GS1-128 Emulation Mode for UCC/EAN Composite Codes (1)



*Disable GS1-128 Emulation Mode for UCC/EAN Composite Codes (0)

2D Symbologies

The following parameters are specific to 2D Symbologies.

PDF417

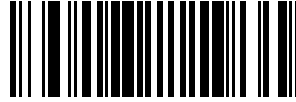
Parameter # 15 (SSI 0Fh)

This parameter enables or disables PDF417.

- *Enabled - enables PDF417.
- Disabled - disables PDF417.



*Enable PDF417 (1)



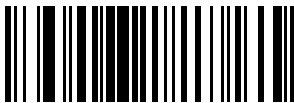
Disable PDF417 (0)

MicroPDF417

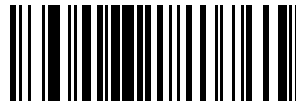
Parameter # 227 (SSI #E3h)

This parameter enables or disables MicroPDF417.

- Enabled - enables MicroPDF417.
- *Disabled - disables MicroPDF417.



Enable MicroPDF417 (1)



*Disable MicroPDF417 (0)

Code 128 Emulation

Parameter # 123 (SSI #7Bh)

This parameter transmits data from certain MicroPDF417 symbols as Code 128.

You must enable [AIM Code Characters](#) for this parameter to work.

Enable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

]C1 if the first codeword is 903-905

]C2 if the first codeword is 908 or 909

]C0 if the first codeword is 910 or 911

Disable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

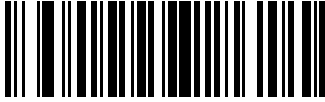
]L3 if the first codeword is 903-905

]L4 if the first codeword is 908 or 909

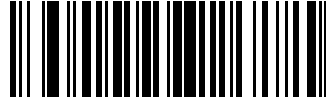
]L5 if the first codeword is 910 or 911



NOTE: Linked MicroPDF codewords 906, 907, 912, 914, and 915 are not supported. Use GS1 Composites instead.



Enable Code 128 Emulation (1)



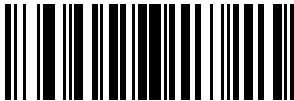
*Disable Code 128 Emulation (0)

Data Matrix

Parameter # 292 (SSI #F0h 24h)

This parameter enables or disables Data Matrix.

- *Enabled - enables Data Matrix.
- Disabled - disables Data Matrix.



*Enable Data Matrix (1)



Disable Data Matrix (0)

GS1 Data Matrix

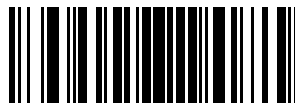
Parameter # 1336 (SSI #F8h 05h 38h)

This parameter enables or disables GS1 Data Matrix.

- Enabled - enables GS1 Data Matrix.
- *Disabled - disables GS1 Data Matrix.



Enable GS1 Data Matrix (1)



*Disable GS1 Data Matrix (0)

Data Matrix Inverse

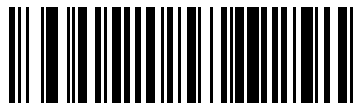
Parameter # 588 (SSI #F1h 4Ch)

This parameter selects the Data Matrix inverse decoder setting.

- Regular Only - The scanner decodes regular Data Matrix barcodes only.
- Inverse Only - The scanner decodes inverse Data Matrix barcodes only.
- *Inverse Autodetect - The scanner decodes both regular and inverse Data Matrix barcodes.



Regular Only (0)



Inverse Only (1)



*Inverse Autodetect (2)

Decode Data Matrix Mirror Images

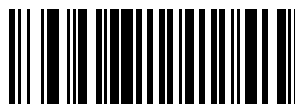
Parameter # 537 (SSI #F1h 19h)

This parameter selects an option for decoding Data Matrix mirror images.

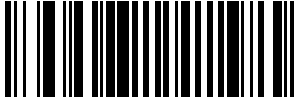
- Never - Do not decode Data Matrix barcodes that are mirror images.
- Always - Decode only Data Matrix barcodes that are mirror images.
- *Auto - Decode both mirrored and unmirrored Data Matrix barcodes.



Never (0)



Always (1)



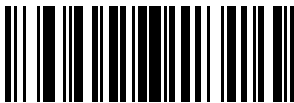
*Auto (2)

Maxicode

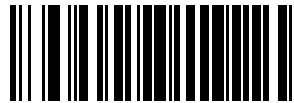
Parameter # 294 (SSI #F0h 26h)

This parameter enables or disables Maxicode.

- Enabled - enables Maxicode.
- *Disabled - disables Maxicode.



Enable Maxicode (1)



*Disable Maxicode (0)

QR Code

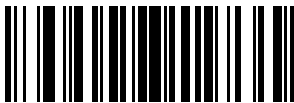
Parameter # 293 (SSI #F0h 25h)

This parameter enables or disables QR Code.

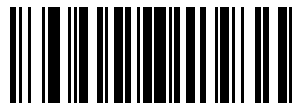
- Enabled - enables QR Code.
- Disabled - disables QR Code.



NOTE: Enabling this also enables QR Mirrored and Linked QR.



Enable QR Code (1)



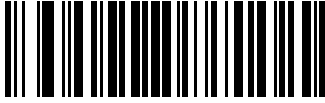
Disable QR Code (0)

Weblink QR

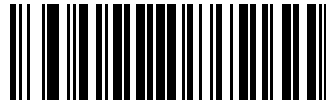
Parameter # 1947 (SSI #F8 07 9Bh)

This parameter enables you to decode or not decode Weblink QR codes.

- Disable Weblink QR Codes - prevents the scanner from decoding Weblink QR codes.
- Enable Weblink QR Codes - enables the scanner to decode Weblink QR codes.



*Enable Weblink QR (1)



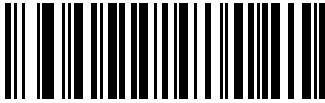
Disable Weblink QR (0)

GS1 QR

Parameter # 1343 (SSI #F8h 05h 3Fh)

This parameter enables or disables GS1 QR.

- *Enabled - enables GS1 QR
- Disabled - disables GS1 QR.



*Enable GS1 QR (1)



Disable GS1 QR (0)

MicroQR

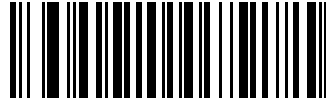
Parameter # 573 (SSI #F1h 3Dh)

This parameter enables or disables MicroQR.

- *Enabled - enables MicroQR.
- Disabled - disables MicroQ.



*Enable MicroQR (1)



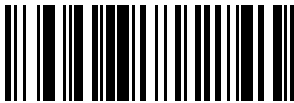
Disable MicroQR (0)

Linked QR Mode

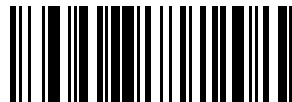
Parameter # 1847 (SSI #737h)

This parameter selects a linked QR mode.

- *Linked QR Only - The scanner does not decode individual QR symbols from a set of linked QR codes.
- Individual QR With Headers - The scanner decodes individual QR symbols from a set of linked QR codes and retains the header information and data.
- Individual QR No Headers - The scanner decodes individual QR symbols from a set of linked QR codes and transmits the data without header information.



*Linked QR Only (0)



Individual QR With Headers (1)



Individual QR No Headers (2)

Aztec

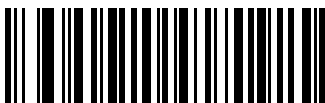
Parameter # 574 (SSI #F1h 3Eh)

This parameter enables or disables Aztec.

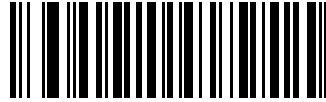
- *Enabled - enables Aztec.
- Disabled - disables Aztec.



NOTE: Enabling this also enables Linked Aztec.



*Enable Aztec (1)



Disable Aztec (0)

Aztec Inverse

Parameter # 589 (SSI #F1h 4Dh)

This parameter selects the Aztec inverse decoder setting.

- Regular Only - The scanner decodes regular Aztec barcodes only.
- Inverse Only - The scanner decodes inverse Aztec barcodes only.
- *Inverse Autodetect - The scanner decodes both regular and inverse Aztec barcodes.



Regular Only (0)



Inverse Only (1)



*Inverse Autodetect (2)

Han Xin

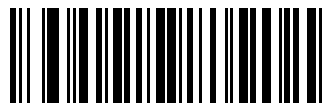
Parameter # 1167 (SSI #F8h 04h 8Fh)

This parameter enables or disables Han Xin.

- Enabled - enables Han Xin.
- *Disabled - disables Han Xin.



Enable Han Xin (1)



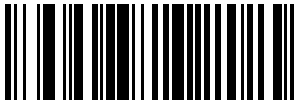
*Disable Han Xin (0)

Han Xin Inverse

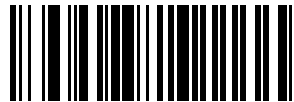
Parameter # 1168 (SSI #F8h 04h 90h)

This parameter selects a Han Xin inverse decoder setting.

- *Regular Only - The scanner decodes Han Xin barcodes with normal reflectance only.
- Inverse Only - The scanner decodes Han Xin barcodes with inverse reflectance only.
- Inverse Autodetect - The scanner decodes both regular and inverse Han Xin barcodes.



*Regular Only (0)



Inverse Only (1)



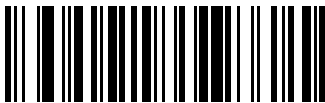
Inverse Autodetect (2)

Grid Matrix

Parameter # 1718 (SSI #F8 06h B6h)

This parameter enables or disables Grid Matrix.

- Enabled - enables Grid Matrix.
- *Disabled - disables Grid Matrix.



Enable Grid Matrix (1)



*Disable Grid Matrix (0)

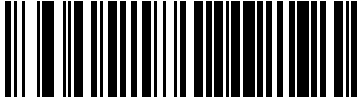
Grid Matrix Inverse

Parameter # 1719 (SSI #F8h 06h B7h)

This parameter selects a Grid Matrix inverse decoder setting.

- *Regular Only - the imager decodes Grid Matrix barcodes with normal reflectance only.

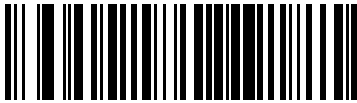
- Inverse Only - the imager decodes Grid Matrix barcodes with inverse reflectance only.
- Inverse Autodetect - the imager decodes both regular and inverse Grid Matrix barcodes.



*Regular (0)



Inverse Only (1)



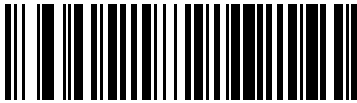
Inverse Autodetect (2)

Grid Matrix Mirrored

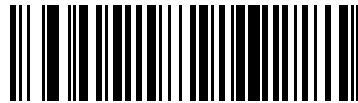
Parameter # 1736 (SSI #F8h 06h C8h)

This parameter selects a mirror image Grid Matrix setting.

- *Never Mirror - the imager decodes non-mirrored Grid Matrix barcodes only.
- Always Mirrored - the imager decodes mirrored Grid Matrix barcodes only.
- Autodetect - the imager decodes both mirrored and non-mirrored Grid Matrix barcodes.



*Never Mirrored Only (0)



Always Mirrored Only (1)



Mirrored Autodetect (2)

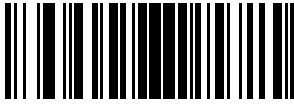
DotCode

Parameter # 1906 (SSI #F8 07 72h)

You can enable or disable DotCode.

- Enabled - enables DotCode.

- *Disabled - disables DotCode.



*Disable DotCode (0)



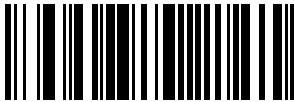
Enable Dotcode (1)

DotCode Prioritize

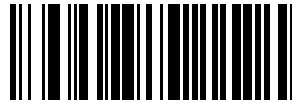
Parameter # 1937 (SSI #F8 07 91h)

This parameter enables or disables giving priority to DotCode decoding versus other symbologies.

- Disabled - disables DotCode as a priority.
- Enabled - enables DotCode as a priority.



Disable DotCode Prioritize (0)



Enable DotCode Prioritize (1)

DotCode Inverse

Parameter # 1907 (SSI #F8 07 73h)

This parameter selects the DotCode Inverse decoder setting.

- Regular Only - the device decodes DotCode Inverse codes with normal reflectance only.
- Inverse Only - the device decodes DotCode Inverse codes with inverse reflectance only.
- Inverse Autodetect - the device decodes DotCode Inverse codes with both normal and inverse reflectance.



Regular (0)



Inverse Only (1)



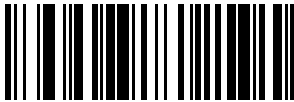
*Inverse Autodetect (2)

DotCode Mirrored

Parameter # 1908 (SSI #F8 07 74h)

This parameter sets a DotCode Mirror decoder setting.

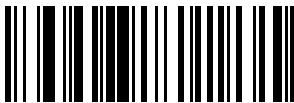
- Never - decodes non-mirrored DotCode codes only.
- Always - decodes mirrored DotCode codes only.
- *Autodetect - decodes both mirrored and non-mirrored DotCode codes.



Never (0)



Always (1)



*Autodetect (2)

DotCode Erasure Limit

Parameter # 2063 (SSI # F8 08 0F)

This parameter sets the maximum number of erasures in DotCode codewords before passing the codewords for error correction.

The value range is from 4 to 20. The default value is 10. A bigger value means that DotCode barcodes are easier to decode, but the chance of getting a decode error is higher.

To set a DotCode Erasure Limit value, scan the following barcode, and then scan two barcodes from [Numeric Barcodes](#) that correspond to the desired value. Enter a leading zero for single digit numbers. For example, to set an erasure value of 4, scan this barcode, and then scan the 0 and 4 barcodes. To correct an error or change the selection, scan Cancel.



DotCode Erasure Limit

Macro PDF Features

Macro PDF is a special feature for combining multiple PDF symbols into one file. The scanner can decode symbols encoded with this feature, and can store more than 64 Kb of decoded data from up to 50 MacroPDF symbols.

When printing, keep each Macro PDF sequence separate, as each sequence has unique identifiers. Do not mix barcodes from several Macro PDF sequences, even if they encode the same data. When scanning a Macro PDF sequence, scan the entire sequence without interruption. When scanning a mixed sequence, two long low beeps (low/low) indicate an inconsistent file ID or inconsistent symbology error.

Macro PDF User Indications

In this mode the scanner provides the following feedback.



NOTE: The beep only sounds if the *BEEPER_ON signal is connected.

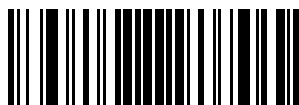


NOTE: The T columns indicate whether the symbol transmitted to the host (N = No transmission).

User Scans	Passthrough All Symbols		Transmit Any Symbol in Set		Buffer All Symbols	
	Beep	T	Beep	T	Beep	T
Last Macro PDF in set	Decode beep	Y	Decode beep	Y	Decode beep	Y
Any Macro PDF in set except last	Decode beep	Y	Decode beep	Y	2 short low	N
Macro PDF is not in current set	Decode beep	Y	2 long low	N	2 long low	N
Invalid Macro PDF formatting	Decode beep	Y	2 long low	N	2 long low	N
Macro PDF from set was already scanned	Decode beep	Y	4 long low	N	4 long low	N
Out of Macro PDF memory	N/A	N/A	3 long low	N	3 long low	N
A non-Macro PDF scanned during a set	N/A	N/A	4 long low	N	4 long low	N
Flush Macro PDF	Low high	N	5 long low	N	5 long low	Y
Abort Macro PDF	High low high low	N	High low high low	N	High low high low	N

Flush Macro PDF Buffer

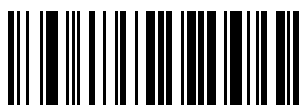
This parameter flushes the buffer of all decoded Macro PDF data stored to that point, transmits it to the host device, and aborts from Macro PDF mode.



Flush Macro PDF Buffer

Abort Macro PDF Entry

This parameter clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.



Abort Macro PDF Entry

Postal Codes

These parameters are regarding postal codes from around the globe.

US Postnet

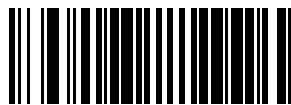
Parameter # 89 (SSI #59h)

This parameter enables or disables US Postnet.

- Enabled - enables US Postnet.
- *Disabled - disables US Postnet.



Enable US Postnet (1)



*Disable US Postnet (0)

US Planet

Parameter # 90 (SSI #5Ah)

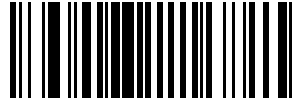
This parameter enables or disables US Planet.

- Enabled - enables US Planet.

- *Disabled - disables US Planet.



Enable US Planet (1)



*Disable US Planet (0)

Transmit US Postal Check Digit

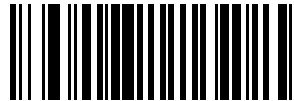
Parameter # 95 (SSI #5Fh)

This parameter selects whether to transmit US Postal data, which includes both US Postnet and US Planet, with or without the check digit.

- *Transmit - transmit US Postal with Check Digit.
- Do Not Transmit - do not transmit US Postal with Check Digit.



*Transmit US Postal Check Digit (1)



Do Not Transmit US Postal Check Digit (0)

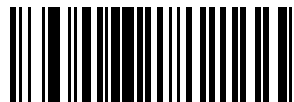
UK Postal

Parameter # 91 (SSI # 5Bh)

This parameter enables or disables UK Postal.



Enable UK Postal (1)



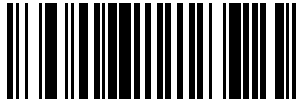
*Disable UK Postal (0)

Transmit UK Postal Check Digit

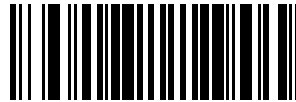
Parameter # 96 (SSI # 60h)

This parameter enables or disables Transmit UK Postal Check Digit.

Scan one of the following barcodes to select whether to transmit UK Postal data with or without the check digit.



*Transmit UK Postal Check Digit (1)

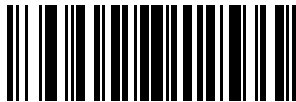


Do Not Transmit UK Postal Check Digit (0)

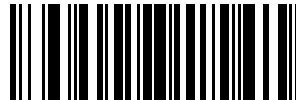
Japan Postal

Parameter # 290 (SSI # F0h, 22h)

This parameter enables or disables Japan Postal.



Enable Japan Postal (1)



*Disable Japan Postal (0)

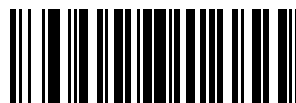
Australia Post

Parameter # 291 (SSI # F0h, 23h)

This parameter enables or disables Australia Post.



Enable Australia Post (1)



*Disable Australia Post (0)

Australia Post Format

Parameter # 718 (SSI # F1h, CEh)

This parameter enables or disables Australia Post Format.

- Autodiscriminate (or Smart mode) - Decode the Customer Information Field using the N and C Encoding Tables.



NOTE: This option increases the risk of misdecodes because the encoded data format does not specify the Encoding Table used for encoding.

- Raw Format - Output raw bar patterns as a series of numbers 0 through 3.
- Alphanumeric Encoding - Decode the Customer Information Field using the C Encoding Table.
- Numeric Encoding - Decode the Customer Information Field using the N Encoding Table.

For more information on Australia Post Encoding Tables, refer to the Australia Post Customer Barcoding Technical Specifications available at auspost.com.au.



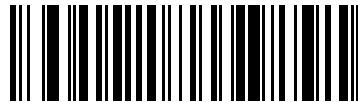
*Autodiscriminate (0)



Raw Format (1)



Alphanumeric Encoding (2)



Numeric Encoding (3)

Netherlands KIX Code

Parameter # 326 (SSI # F0h, 46h)

This parameter enables or disables Netherlands KIX Code.



Enable Netherlands KIX Code (1)



*Disable Netherlands KIX Code (0)

USPS 4CB/One Code/Intelligent Mail

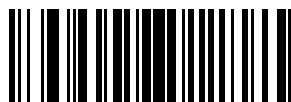
Parameter # 592 (SSI # F1h 50h)

This parameter enables or disables USPS 4CB/One Code/Intelligent Mail.

Scan one of the following barcodes to enable or disable USPS 4CB/One Code/Intelligent Mail.



Enable USPS 4CB/One Code/Intelligent Mail (1)



*Disable USPS 4CB/One Code/Intelligent Mail (0)

UPU FICS Postal

Parameter # 611 (SSI # F1h 63h)

This parameter enables or disables Code 39.

Scan one of the following barcodes to enable or disable UPU FICS Postal.



Enable UPU FICS Postal (1)



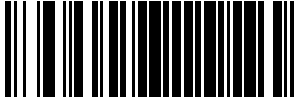
*Disable UPU FICS Postal (0)

Mailmark

Parameter # 1337 (SSI # F8h 05h 39h)

This parameter enables or disables Mailmark.

Scan one of the following barcodes to enable or disable Mailmark.



*Disable Mailmark (0)



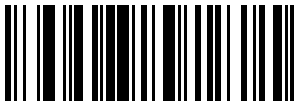
Enable Mailmark (1)

Digimarc Digital Watermarks

Parameter # 1687 (SSI # F8h 0h 97h)

This parameter enables or disables the Digimarc Digital Watermarks.

- Enabled - Enables the Digimarc Digital Watermarks.
- *Disabled - Disables the Digimarc Digital Watermarks.



Enable Digimarc Digital Watermarks/DW (1)



*Disable Digimarc Digital Watermarks/DW (0)

Digimarc Barcode

Digimarc Barcode is an invisible machine-readable code reported as UPC-A, UPC-E, EAN-13, or RSS Expanded.



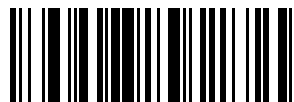
NOTE: Converting the Digimarc reported code types to other barcode types is not supported.

AIM and Symbol code IDs are supported for the reported Digimarc code types.

Scan one of the following barcodes to enable or disable Digimarc Barcode.



Enable Digimarc Barcode



*Disable Digimarc Barcode

Digimarc Data Mode

Parameter #2257 (SSI #F8h 08h D1h)

This parameter selects the output format and type of Digimarc barcode.

Possible Digimarc barcode formats are:

- 1 - *Compatible
- 2 - Enhanced
- 3 - Native



*Compatible (1)



Enhanced (2)



Native (3)

Digimarc GIA17 Format

Parameter # 2488 (SSI #F8h 09h B8h)

This parameter enables or disables Digimarc GIA17 format. Digimarc must be enabled for this parameter to apply.



*Enabled (1)



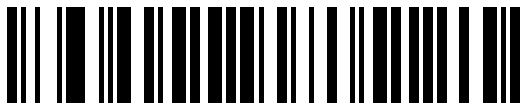
Disabled (0)

Posti LAPA 4-State Code

Parameter # 2031 (SSI #F8 07EF)

This parameter enables or disables Posti LAPA.

- *Disabled - disable Posti LAPA.
- Enabled - enables Posti LAPA.



*Disable Posti LAPA (0)



Enable Posti LAPA (1)

Intelligent Document Capture

Intelligent Document Capture (IDC) is Zebra advanced image processing firmware for select imager based scanners.

This section describes IDC functionality, provides parameter barcodes to control IDC features, and includes a quick start procedure.



NOTE: IDC is for Hand-Held Mode only.

The Intelligent Document Capture (IDC) Process

The IDC process includes the following steps.

1. Verifies a barcode is appropriate to use as an IDC anchor or link. See [Barcode Acceptance Test](#).
2. Determines the rectangular region to capture as an image. See [Capture Region Determination](#).
3. Processes the captured image. See [Image Post Processing](#).
4. Transmits the data. See [Data Transmission](#).

Barcode Acceptance Test

Upon decoding a barcode, the scanner checks that the barcode fits the description of a barcode that anchors or links to an IDC form.

To be accepted as an IDC barcode:

- The symbology must be enabled for decode, and also enabled via [IDC Symbology](#). The IDC firmware allows enabling between zero and eight symbologies simultaneously: Code 128, Code 39, Interleaved 2 of 5, Discrete 2 of 5, Codabar, PDF417, Data Matrix, and EAN-128.
- The decoded data must satisfy the values set in the [IDC Minimum Text Length](#) and [IDC Maximum Text Length](#) parameters. To disable either of these checks, set the value to zero.

If the barcode does not satisfy both requirements, it is sent as a normal (non-IDC) decode.

An IDC barcode is required when [IDC Operating Mode](#) is set to **Anchored** or **Linked**.

Free-Form operating mode does not require a barcode, but transmits decoded data if one is found and satisfies the requirements. If no barcode is decoded, the document capture process starts but may require specifying a non-zero value for the [IDC Delay Time](#). The scanner must wait for at least this amount of time after trigger pull before capturing a document, unless a barcode is decoded before the time expires.

If [Picklist Mode](#) is enabled, the barcode must be directly under the aiming pattern and within the scanner's decode range, and the region to capture must be completely within the scanner's field-of-view.

Capture Region Determination

After accepting an IDC barcode, the firmware establishes the region to capture as an image.

The method used depends on the setting of the [IDC Operating Mode](#).

The IDC firmware emits a single low beep after successfully capturing a region. The scanner is then no longer capturing images and can be moved without disturbing the IDC output. Be sure to hold the trigger button until the decode beep, otherwise the IDC process may be aborted.

IDC Operating Mode (Anchored)

A coordinate system is built based on the barcode in its rectified (de-skewed) form. The origin is the center of the barcode, and the x-axis is set toward the right, from the barcode's point of view. The unit module width of the barcode is the unit for x. Similarly, the y-axis is set toward the up direction. The unit for the y-axis is specified via the parameter [IDC Aspect](#). This is the aspect ratio of a thin bar or space - the barcode's height is divided by this value to get this unit. Set IDC Aspect to zero to automatically calculate the aspect ratio. The barcode can be of different sizes for the same form, as long as the center of the barcode is the same when the barcode's length changes.

From this coordinate system, the IDC area is determined using four parameters: offsets in x and y ([IDC X Coordinate](#), [IDC Y Coordinate](#)) to the region's top-left corner, and width and height ([IDC Width](#), [IDC Height](#)).

If the capture area is relatively large as compared to the barcode area, the calculation to obtain the capture area is prone to significant errors. A recommended solution is to enclose the form with a single black-lined rectangular border (a box), which is not in contact with any other line on the outside of the form (although it can be connected to lines on the inside of the form). When the [IDC Find Box Outline](#) is set, the firmware searches for the box, and does not decode if any edges are broken (such as by a protruding thumb).

The [IDC Zoom Limit](#) parameter controls the quality of the captured form. The IDC firmware rejects capturing a form unless the width is at least the IDC Zoom Limit percentage of the IDC Width parameter. For example, if IDC Zoom Limit is set to 100 and IDC Width Limit is set to 150, the form must be at least 300 pixels wide before it is captured (each unit module is scaled to two pixels).

The [IDC Maximum Rotation](#) parameter controls the maximum rotation any edge of the form can have in relation to the scanner's horizontal or vertical axis.

IDC Operating Mode (Free-Form or Linked)

The document capture region is a rectangular piece of paper, or a portion of it enclosed by a rectangular border.

In either case, all four sides of the capture region must be completely within the scanner's field-of-view, and there must be sufficient contrast at the border of the capture region. For example, if a piece of white paper contains the document to capture, it must be put in front of a dark background.

By default, the scanner captures the largest rectangular region within the field-of-view. To specify a particular border type, use the [IDC Border Type](#) parameter.

The region must contain at least 10% of the field-of-view in two dimensions.

If an IDC barcode is decoded, IDC uses its location to start the search for the capture region. Otherwise, it searches the capture region from the center of the field-of-view. IDC also uses the orientation of a decoded IDC barcode to orient the output image.

Image Post Processing

After determining the document capture region, the firmware de-skews and re-samples the region as follows. Enabling [IDC Captured Image Brighten](#) calls normalization, which makes the brightness of the image uniform, and enhances contrast as a large percent of background pixels is made completely white (a smaller percent of pixels is made completely black if the firmware determines there is no danger of enhancing the contrast of a very bland area). Enabling [IDC Captured Image Sharpen](#) enhances the sharpness of the image.

IDC re-samples the image about one output pixel per input pixel for **Free-Form** or **Linked** modes and two pixels-per-module in **Anchored** mode.

IDC compresses and transmits the image in one of the standard image formats selected by the [IDC File Format Selector](#), [IDC Bits Per Pixel](#), and [IDC JPEG Quality](#) parameters.



NOTE: It might take several seconds for post processing to complete, depending on the size of the captured region, the options enabled, and the scanner model.

Data Transmission

After processing the captured image, IDC assembles the image with the decoded barcode data (if applicable) into an ISO/IEC 15434 style packet and transmits it to the host.

The scanner issues the standard decode beep and the trigger can be released. Be sure to set the [USB Device Type](#) to **Symbol Native API (SNAPI) with Imaging Interface**.

PC Application and Programming Support

This application displays barcode data and/or captured images from Intelligent Document Capture enabled scanners and allows setting and reading IDC parameters.

For a sample application running on the Microsoft Windows operating system, contact your Zebra representative. Complete source code and documentation are also provided for developing custom applications. The application includes documentation for the ISO/IEC 15434 format as used by the IDC firmware and C# code to process it.

Image Document Capture Parameter Defaults

The following table lists defaults for IDC parameters. Change these values in one of two ways:

- Scan the appropriate barcodes in this section. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).
- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).

Alternatively, use the sample application to set parameters using the parameter name. The application provides prompts and error checking to assist in setting the parameters correctly and easily. You must use an application to set a parameter to a negative value, as the [IDC X Coordinate](#) can require.

Table 31 IDC Parameter Defaults

Parameter	Parameter Name	Parameter Number ^a	SSI Number ^b	Default
Intelligent Document Capture (IDC) Parameters				

Table 31 IDC Parameter Defaults (Continued)

Parameter	Parameter Name	Parameter Number ^a	SSI Number ^b	Default
IDC Operating Mode	DocCap_MODE	594	F1h 52h	Off
IDC Symbology	DocCap_SYMBLOGY	655	F1h 8Fh	001
IDC X Coordinate	DocCap_X	596	F4h F1h 54h	-151
IDC Y Coordinate	DocCap_Y	597	F4h F1h 55h	-050
IDC Width	DocCap_WIDTH	598	F1h 56h	0300
IDC Height	DocCap_HEIGHT	599	F1h 57h	0050
IDC Aspect	DocCap_ASPECT	595	F1h 53h	000
IDC File Format Selector	DocCap_FMT	601	F1h 59h	JPEG
IDC Bits Per Pixel	DocCap_BPP	602	F1h 5Ah	8 BPP
IDC JPEG Quality	DocCap_JPEG_Qual	603	F1h 5Bh	065
IDC Find Box Outline	Sig_FINDBOX	727	F1h D7h	Disable
IDC Minimum Text Length	DocCap_MIN_TEXT	656	F1h 90h	00
IDC Maximum Text Length	DocCap_MAX_TEXT	657	F1h 91h	00
IDC Captured Image Brighten	Sig_BRIGHTEN	654	F1h 8Eh	Enable
IDC Captured Image Sharpen	Sig_SHARPEN	658	F1h 92h	Enable
IDC Border Type	DocCap_BORDER	829	F2h 3Dh	None
IDC Delay Time	DocCap_DELAY	830	F2h 3Eh	000
IDC Zoom Limit	Sig_MIN_PERCENT	651	F1h 8Bh	000
IDC Maximum Rotation	Sig_MAX_ROT	652	F1h 8Ch	00

^a Parameter number decimal values are used for programming via RSM commands.

^b SSI number hex values are used for programming via SSI commands.

IDC Operating Mode

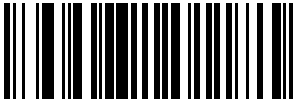
Parameter Name DocCap_MODE # 594 (SSI # F1h 52h)

Select the operating mode of the Intelligent Document Capture firmware.

- Off - Disables the IDC feature.
- Anchored - Requires a barcode decode. The image capture region is based on this barcode.
- Free-Form - A printed border or page edge defines the image capture region. A barcode is optional.
- Linked - A printed border or page edge defines the image capture region. A barcode is required.



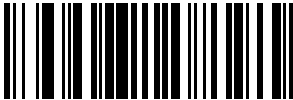
*Off (0)



Anchored (1)



Free-Form (2)



Linked (3)

IDC Symbology

Parameter Name **DocCap_SYMBOLOGY # 655 (SSI # F1h 8Fh)**

Select the option to use when Document Capture mode is not set to **Off**.

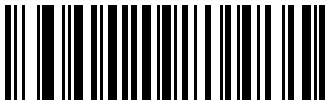


NOTE: To enable more than one symbology at a time, simply add the values together. For example, to enable PDF417, Data Matrix, and Code 39 write a value of 98 (32 + 64 + 2).

Table 32 IDC Symbologies

Symbology	Value (Decimal)
Code 128	1
Code 39	2
I 2 of 5	4
D 2 of 5	8
Codabar	16
PD 417	32
Data Matrix	64
EAN 128	128
Aztec	256

Scan IDC Symbology, and then scan three barcodes from [Numeric Barcodes](#) in the range of 000 to 255 decimal.



IDC Symbology

IDC X Coordinate

Parameter Name DocCap_X # 596 (SSI # F4h F1h 54h)

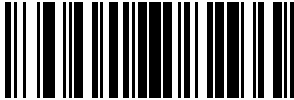
Specify the horizontal offset to the top left corner of the region to capture relative to the center of the barcode. Negative values move toward the left.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to **Anchored**.

You must use an application to set a negative value.

Choose IDC X Coordinate and then scan four barcodes from [Numeric Barcodes](#) in the range of +/- 1279.



IDC X Coordinate

IDC Y Coordinate

Parameter Name DocCap_Y # 597 (SSI # F4h F1h 55h)

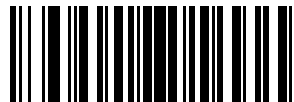
Specify the vertical offset to the top left corner of the region to capture relative to the center of the barcode. Negative values move toward the top.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to **Anchored**.

You must use an application to set a negative value.

Choose IDC Y Coordinate and then scan four barcodes from [Numeric Barcodes](#) in the range of +/- 1023.



IDC Y Coordinate

IDC Width

Parameter Name DocCap_WIDTH # 598 (SSI # F1h 56h)

Specify the width of the region to capture.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to **Anchored**.

Choose IDC Width and then scan four barcodes from [Numeric Barcodes](#) in the range of 0000 to 1279.



IDC Width

IDC Height

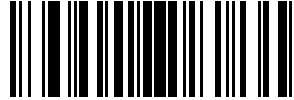
Parameter Name DocCap_HEIGHT # 599 (SSI # F1h 57h)

Specify the height of the region to capture.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to Anchored.

Choose IDC X Coordinate and then scan four barcodes from [Numeric Barcodes](#) in the range of 0000 to 1279.



IDC Height

IDC Aspect

Parameter Name DocCap_ASPECT # 595 (SSI # F1h 53h)

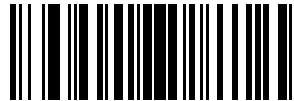
Specify the barcode's aspect ratio of a thin bar or space.

The barcode's height is divided by this value to obtain the unit in the y-axis. Set this parameter to zero to calculate the aspect value automatically.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to **Anchored**.

Choose IDC X Coordinate and then scan three barcodes from [Numeric Barcodes](#) in the range of 000 to 255.

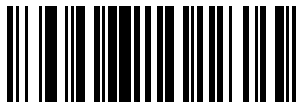


IDC Aspect

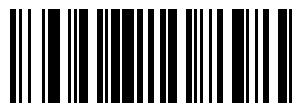
IDC File Format Selector

Parameter Name DocCap_FMT # 601 (SSI # F1h 59h)

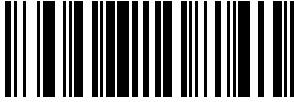
Select a document capture file format appropriate for your system (BMP, TIFF, or JPEG). The scanner stores captured areas in the selected format.



*JPEG (1)



BMP (3)



TIFF (4)

IDC Bits Per Pixel

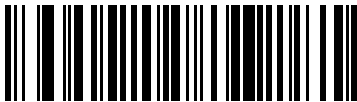
Parameter Name DocCap_BPP # 602 (SSI # F1h 5Ah)

Select the number of significant bits per pixel (BPP) to use when capturing an image.

Select 1 BPP for a black and white image, 4 BPP to assign 1 of 16 levels of grey to each pixel, or 8 BPP to assign 1 of 256 levels of grey to each pixel.



NOTE: The scanner ignores these settings for JPEG file formats, which only support 8 BPP.



1 BPP (0)



4 BPP (1)



*8 BPP (2)

IDC JPEG Quality

Parameter Name DocCap_JPEG_Qual # 603 (SSI # F1h 5Bh)

Set the amount of JPEG compression to perform on the captured image. Higher numbers produce a better quality image but larger files.

Scan IDC JPEG Quality, and then scan three barcodes from [Numeric Barcodes](#) in the range of 005 to 100 decimal.



IDC JPEG Quality

IDC Find Box Outline

Parameter Name Sig_FINDBOX # 727 (SSI # F1h D7h)

Select **Enable Find Box Outline** to search for a rectangular border during document capture.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to Anchored.



Enable Find Box Outline (1)



*Disable Find Box Outline (0)

IDC Minimum Text Length

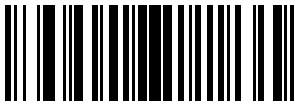
Parameter Name DocCap_MIN_TEXT # 656 (SSI # F1h 90h)

Specify the minimum number of characters encoded in a barcode for the IDC firmware to use it as an anchored or linked barcode.



NOTE: Set this to zero to disable all checking and use all barcodes.

Choose IDC Minimum Text Length and then scan two barcodes from [Numeric Barcodes](#) in the range of 00 to 55 decimal.



IDC Minimum Text Length

IDC Maximum Text Length

Parameter Name DocCap_MAX_TEXT # 657 (SSI # F1h 91h)

Specify the maximum number of characters encoded in a barcode for the IDC firmware to use as an anchored or linked barcode.



NOTE: Set this to zero to disable all checking and use all barcodes.

Choose IDC Maximum Text Length and then scan two barcodes from [Numeric Barcodes](#) in the range of 00 to 55 decimal.



IDC Maximum Text Length

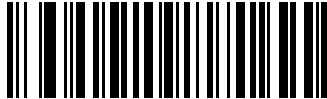
IDC Captured Image Brighten

Parameter Name Sig_BRIGHTEN # 654 (SSI # F1h 8Eh)

Enable Captured Image Brighten to make image brightness uniform and enhance contrast such that a large percent of the background pixels is made completely white (a smaller percent of pixels is made completely black if the program determines there is no danger of enhancing the contrast of a very bland area).



NOTE: This parameter is also used for Signature Capture.



*Enable Captured Image Brighten (1)



Disable Captured Image Brighten (0)

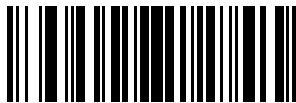
IDC Captured Image Sharpen

Parameter Name Sig_SHARPEN # 658 (SSI # F1h 92h)

Enable this parameter to enhance the sharpness of the image.



NOTE: This parameter is also used for Signature Capture.



*Enable Captured Image Sharpen (1)



Disable Captured Image Sharpen (0)

IDC Border Type

Parameter Name DocCap_BORDER # 829 (SSI # F2h 3Dh)

Select the style of border used to determine the outline of the capture region.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to **Free-Form** or **Linked**.

- None - Capture the largest rectangular region within the field-of-view.
- Black - The border must be black (such as a printed rectangular border).

- White - The border must be white (e.g., paper edge on a dark background).
- Advanced Edge Detection (AED) - Capture a region defined by edges of any color and potentially broken.



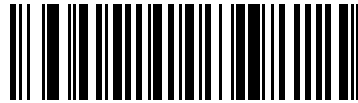
*None (0)



Black (1)



White (2)



Advanced Edge Detection (AED) (3)

IDC Delay Time

Parameter Name DocCap_DELAY # 830 (SSI # F2h 3Eh)

Set the delay for capturing a document after a trigger pull. Decoding a barcode aborts this delay.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to Free-Form.

Choose IDC Delay Time and then scan three barcodes from [Numeric Barcodes](#) in the range of 000 to 200 decimal in units of 10 msec.



IDC Delay Time

IDC Zoom Limit

Parameter Name Sig_MIN_PERCENT # 651 (SSI # F1h 8Bh)

Set the minimal zoom percentage value of a form for it to be considered for capture. This controls the quality of the captured form.

The IDC firmware rejects capturing a form unless the width is at least the IDC Zoom Limit percentage of the [IDC Width](#) parameter. For example, if you set this parameter to 100 and IDC Width to 150, the form must be at least 300 pixels wide before it is captured (each unit module is scaled to two pixels).



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to Anchored.

Choose IDC Zoom Limit and then scan three barcodes from [Numeric Barcodes](#) in the range of 000 to 100 percent. Set this to zero to disable all checking.



IDC Zoom Limit

IDC Maximum Rotation

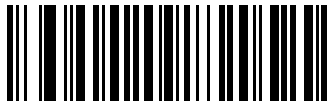
Parameter Name Sig_MAX_ROT # 652 (SSI # F1h 8Ch)

Set the maximum rotation any edge of the form can have in relation to the scanner's horizontal or vertical axis for it to be considered for capture.



NOTE: This parameter only applies when [IDC Operating Mode](#) is set to Anchored.

Choose IDC Maximum Rotation and then scan two barcodes from [Numeric Barcodes](#) in the range of 00 to 45 decimal. Set this to zero to disable all checking.



IDC Maximum Rotation

Quick Start

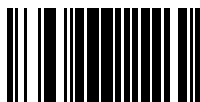
This section familiarizes you with some of the Intelligent Document Capture features.

[IDC Demonstrations](#) includes instructions to demonstrate the Anchored, Free-Form, and Linked modes using a sample form to provide an understanding of how to use IDC. These examples do not illustrate all capabilities of the advanced IDC firmware. Build upon these using different parameter settings and forms.

Sample IDC Setup

To set up IDC:

1. Connect a scanner equipped with IDC to the host computer's USB port.
2. To set the scanner to the default settings and proper USB host type, scan **Set Defaults** followed by the **Symbol Native API (SNAPI) with Imaging Interface** barcode. Allow time for the scanner to reset and the USB connection to remunerate after each scan before continuing.



Set Defaults



Symbol Native API (SNAPI) with Imaging Interface

3. Start the sample application and select the scanner in the **SNAPI Scanners** drop-down menu.
4. Set parameters as specified in [IDC Demonstrations](#) using the sample application or by scanning parameter barcodes in this guide. The barcode in the sample form is Code 128, which is enabled by default for decoding and as a Document Capture symbology. You can change these settings for your IDC application.
5. Perform each demo. When scanning, aim the scanner at the barcode in the center of the rectangle. Pull the scanner back so the rectangle is fully contained in the aiming pattern. When you pull the trigger, the scanner emits a low tone to indicate that the IDC firmware identified and captured an image, then a decode beep to indicate that the data transmitted. There may be several seconds between the two beeps, depending on the size of the captured image and options selected (de-skew, brighten, etc). You can move the scanner after the first beep, but continue to hold the trigger or the scanner may end the session before sending the data.

IDC Demonstrations

This section provides demonstrations of the different IDC modes.

Anchored Mode Demo

Anchored mode captures an image of fixed size and location relative to a barcode on the page. Parameters control the height, width, and location.

The IDC firmware requires that a barcode is present in order to capture an image. It decodes the barcode and uses it to adjust the image to the upright orientation.

- Set [IDC Operating Mode](#) to **Anchored**.
- Set parameters to these values:
 - Set [IDC Height](#) to **100**.
 - Set [IDC Width](#) to **90**.
 - Set [IDC X Coordinate](#) to **-175**.
 - Set [IDC Y Coordinate](#) to **-50**.
- Pull the trigger. The scanner decodes the barcode and captures an image of the text scroll.
- Rotate the form clockwise so the word **Capture** is along the bottom edge, and pull the trigger. The scanner decodes the barcode and captures the same image, including orientation. (This example also works with the form rotated counter-clockwise or upside down).
- Modify the values for height, width, x, and y. Pull the trigger. The captured area changes in size and location.
- Cover the barcode with a small piece of paper (or your finger) and pull the trigger. The scanner does not decode the barcode or capture an image.

Free-Form Mode Demo

Free-Form mode captures an image where a rectangular border on the page determines the size and position. It adjusts the image to the upright orientation if a barcode is found and decoded in the image.

- Set [IDC Operating Mode](#) to **Free-Form**.
- Pull the trigger. The scanner decodes the barcode and captures an image of the entire rectangle, including the contents.
- Modify the values for height, width, x, and y. Pull the trigger. Note that the captured image is not affected.
- Rotate the form clockwise so the word **Capture** is along the bottom edge, and pull the trigger. The scanner decodes the barcode and captures the same image, including orientation. (This example also works with the form rotated counterclockwise or upside down).
- Cover the barcode with a small piece of paper and pull the trigger. The scanner does not decode the barcode and does not re-orient the captured image to the normal position, i.e., with the logo in the upper-left corner.

Linked Mode Demo

Linked mode captures an image where a rectangular border on the page determines the size and position. The IDC firmware requires that a barcode is present in order to capture an image. It decodes the barcode and uses it to adjust the image to the upright orientation.

- Set [IDC Operating Mode](#) to **Linked**.
- Use the examples from the [Free-Form Mode Demo](#), noting that the last item (covering the barcode) does not decode the barcode or capture an image.

Other Suggestions

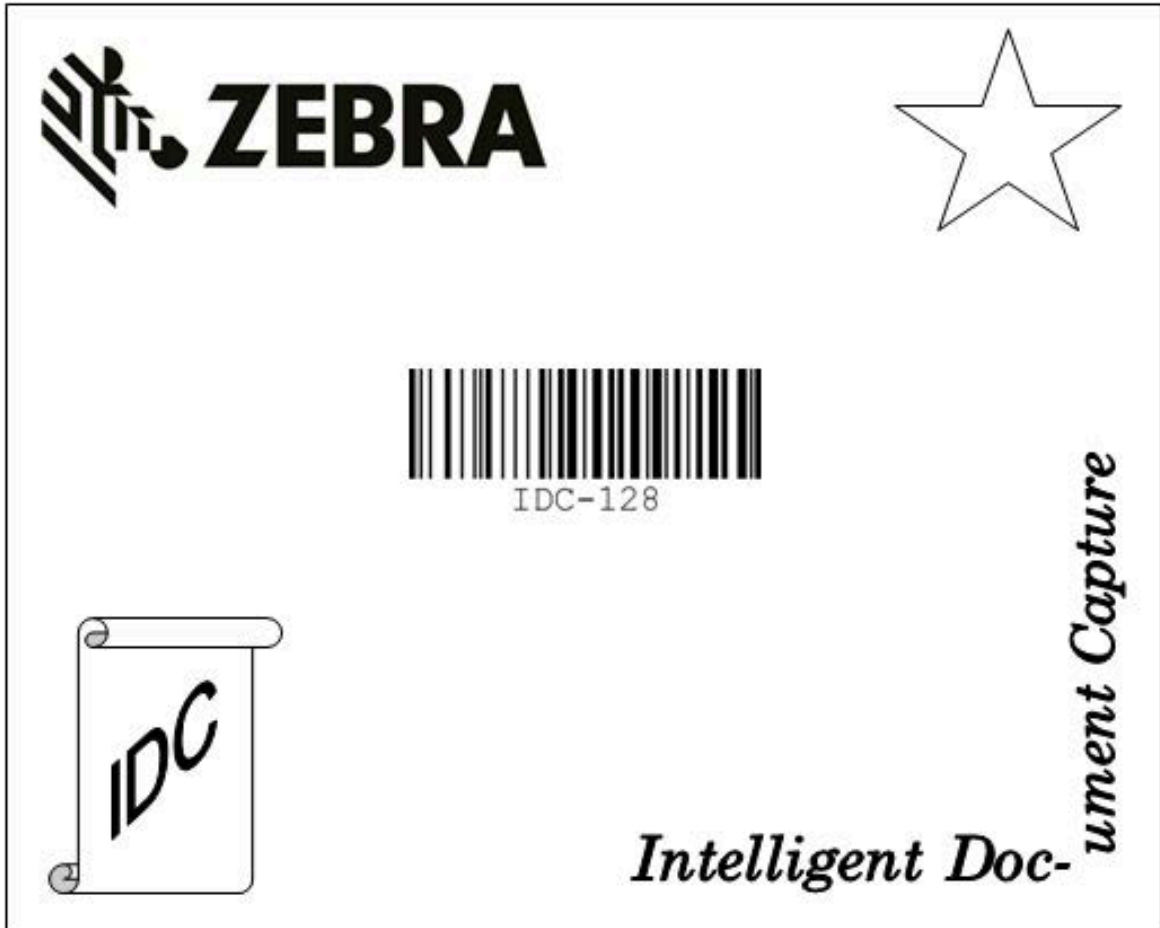
Hold the scanner at an angle (up/down or side to side) to the page instead of perpendicular to it.

The IDC firmware de-skews and adjusts the brightness (enabled by default) to produce a quality image when the scanner is held at less than ideal conditions.

Quick Start Form

Use this form to practice the Quick Start demonstrations.

Figure 13 Quick Start Form



OCR Programming

This section describes how to set up the scanner for OCR programming. The scanner can read 6 to 60-point OCR typeface. It supports font types OCR-A, OCR-B, MICR-E13B, and US Currency Serial Number.

OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit.

All OCR fonts are disabled by default. You can enable OCR-A and OCR-B at the same time but not other combined font types.

OCR Parameter Defaults

OCR Programming Defaults lists the defaults for OCR parameters. Change these values in one of two ways:

- Scan the appropriate barcodes in this chapter. The new value replaces the standard default value in memory. To recall default parameter values, see [Default Parameters](#).
- Configure the scanner using the 123Scan configuration program. See [123Scan and Software Tools](#).



NOTE: See [Standard Parameter Defaults](#) for all user preferences, host, symbology, and miscellaneous default parameters.

Table 33 OCR Programming Defaults

Parameter	Parameter Number	SSI Number	Default
OCR-A	680	F1h A8h	Disable
OCR-A Variant	684	F1h ACh	Full ASCII
OCR-B	681	F1h A9h	Disable
OCR-B Variant	685	F1h ADh	Full ASCII
MICR E13B	682	F1h AAh	Disable
US Currency	683	F1h ABh	Disable
OCR Orientation	687	F1h AFh	0°
OCR Lines	691	F1h B3h	1
OCR Minimum Characters	689	F1h B1h	3
OCR Maximum Characters	690	F1h B2h	100
OCR Subset	686	F1h AEh	Selected font variant

Table 33 OCR Programming Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
OCR Quiet Zone	695	F1h B7h	50
OCR Bright Illumination	701	F1h BDh	Disable
OCR Template	547	F1h 23h	99999999
OCR Check Digit Modulus	688	F1h B0h	1
OCR Check Digit Multiplier	700	F1h BCh	1212121212
OCR Check Digit Validation	694	F1h B6h	None
Inverse OCR	856	F2h 58h	Regular
OCR Redundancy	1770	F8h 06h EAh	Level 1

OCR Programming Parameters

The OCR programming parameters enable scanners to read font types for OCR-A, OCR-B, MICR-E13B, and US Currency Serial Numbers.

OCR-A

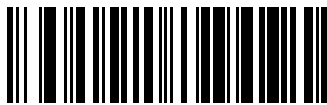
Parameter # 680 (SSI # F1h A8h)

This parameter enables scanners to read OCR-A fonts.

- Enabled - OCR-A can be read by the scanner.
- Disabled - OCR-A fonts will not be read by the scanner.



NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See [OCR Subset](#) and [OCR Template](#).



Enable OCR-A (1)



*Disable OCR-A (0)

OCR-A Variant

Parameter # 684 (SSI # F1 ACh)

This parameter enables scanners to read OCR-A font variants.

The font variant sets a processing algorithm and default character subset for the given font. Select the most appropriate font variant to optimize performance and accuracy.

OCR-A supports the following variants:

- OCR-A Full ASCII

```
!"#$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ\^
```

- OCR-A Reserved 1

```
$*+-. /0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-A Reserved 2

```
$*+-. /0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-A Banking

```
-0123456789<>
```

Special banking characters output as the following representative characters:

-  outputs as f
-  outputs as c
-  outputs as h



NOTE: Enable OCR-A before setting this parameter. If disabling OCR-A, set the variant to OCR-A Full ASCII.



*OCR-A Full ASCII (0)



OCR-A Reserved 1 (1)



OCR-A Reserved 2 (2)



OCR-A Banking (3)

OCR-B

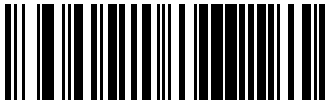
Parameter # 681 (SSI # F1h A9h)

This parameter enables scanners to read OCR-B fonts.

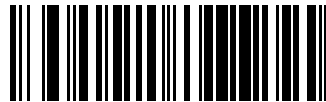
- Enabled - OCR-B can be read by the scanner.
- Disabled - OCR-B fonts will not be read by the scanner..



NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See [OCR Subset](#) and [OCR Template](#).



Enable OCR-B (1)



*Disable OCR-B (0)

OCR-B Variant

Parameter # 685 (SSI # F1h ADh)

This parameter enables scanners to read OCR-A font variants.

OCR-A supports the following variants:

- OCR-B Full ASCII

```
!#$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^|Ñ
```

- OCR-B Banking

```
#+-0123456789<>JNP|
```

- OCR-B Limited

```
+, -./0123456789<>ACENPSTVX
```

- OCR-B ISBN 10-Digit Book Numbers

```
-0123456789>BCEINPSXz
```

- OCR-B ISBN 10 or 13-Digit Book Numbers

-0123456789>BCEINPSXz

- OCR-B Travel Document Version 1 (TD1) 3-Line ID Cards

-0123456789<ABCDEFGHIJKLMN0PQRSTUVWXYZ

- OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards

-0123456789<ABCDEFGHIJKLMN0PQRSTUVWXYZ

- OCR-B Travel Document 2 or 3-Line ID Cards Auto-Detect

!#\$%()*+,-./0123456789<>ABCDEFGHIJKLMN0PQRSTUVWXYZ^|Ñ

- OCR-B Passport

-0123456789<ABCDEFGHIJKLMN0PQRSTUVWXYZÑ

- OCR-B Visa Type A

-0123456789<ABCDEFGHIJKLMN0PQRSTUVWXYZ

- OCR-B Visa Type B

-0123456789<ABCDEFGHIJKLMN0PQRSTUVWXYZÑ

- OCR-B ICAO Travel Documents

This allows reading either TD1, TD2, Passport, Visa Type A, or Visa Type B without switching between these options. It automatically recognizes the travel document read.

Selecting one of the ISBN Book Numbers automatically applies the appropriate ISBN checksum, so setting this is not required.

Selecting the following OCR-B variants automatically sets the appropriate [OCR Lines](#). These five variants invoke extensive special algorithms and checking for that particular document type:

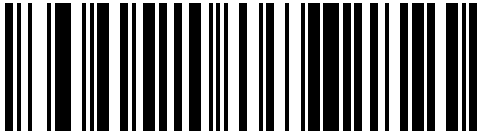
Variant	OCR Lines Setting
Passport	2
TD1 ID Cards	3
TD2 ID Cards	2
Visa Type A	2
Visa Type B	2

If you set one of these variants with both OCR-A and OCR-B enabled, only the specified travel document is read without reading OCR-A. Returning OCR-B variant to its default (Full ASCII) allows reading OCR-A.

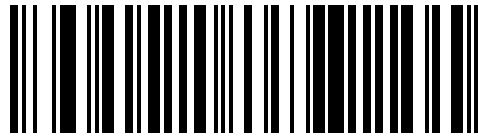
For the best performance in passport reading, fix the target passport and the scanner in place (6.5 - 7.5").



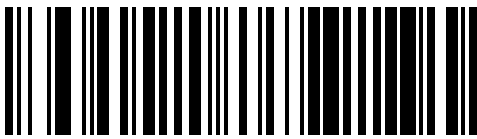
NOTE: Enable OCR-B before setting this parameter. If disabling OCR-B, set the variant to OCR-B Full ASCII.



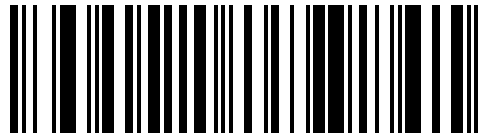
*OCR-B Full ASCII (0)



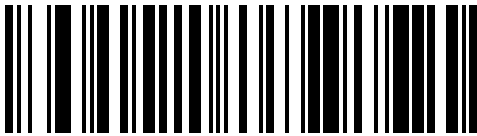
OCR-B Banking (1)



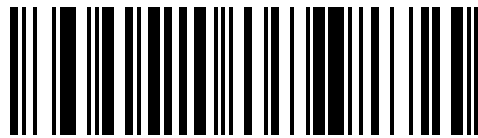
OCR-B Limited (2)



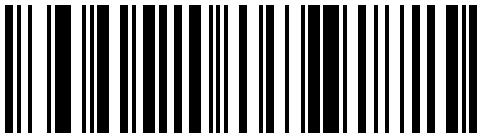
OCR-B ISBN 10-Digit Book Numbers (6)



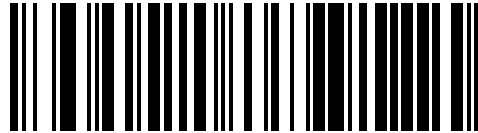
OCR-B ISBN 10 or 13-Digit Book Numbers (7)



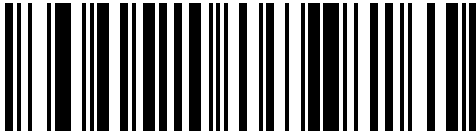
OCR-B Travel Document Version 1 (TD1) 3 Line ID Cards (3)



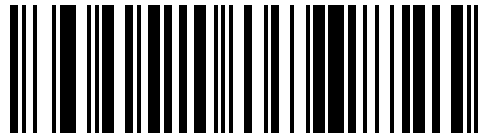
OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards (8)



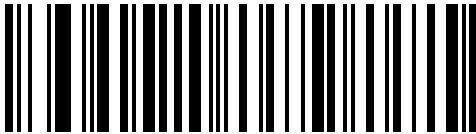
Travel Document 2 or 3-Line ID Cards Auto-Detect (20)



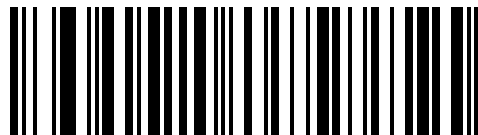
OCR-B Passport (4)



OCR-B Visa Type A (9)



OCR-B Visa Type B (10)



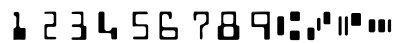
OCR-B ICAO Travel Documents (11)

MICR E13B

Parameter # 682 (SSI # F1h AAh)

This parameter enables scanners to read MICR E13B fonts.

MICR E 13B uses the following characters:



TOAD characters (Transit, On Us, Amount, and Dash) output as the following representative characters:

┌┐ outputs as **t**

┌┐ outputs as **a**

┌┐ outputs as **o**

┌┐ outputs as **d**

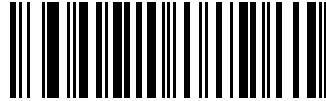
- Enabled - MICR E13B fonts can be read by the scanner.
- Disabled -MICR E13B fonts will not be read by the scanner..



NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See [OCR Subset](#) and [OCR Template](#).



Enable MICR E13B (1)



*Disable MICR E13B (0)

US Currency Serial Number

Parameter # 683 (SSI # F1h ABh)

This parameter enables scanners to read US Currency Serial Numbers.

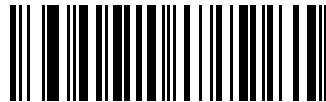
- Enabled - US Currency Serial Numbers can be read by the scanner.
- Disabled - US Currency Serial Numbers will not be read by the scanner..



NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See [OCR Subset](#) and [OCR Template](#).



Enable US Currency (1)



*Disable US Currency (0)

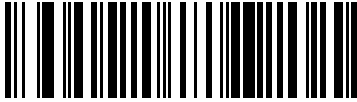
OCR Orientation

Parameter # 687 (SSI # F1h AFh)

This parameter specifies the orientation of the OCR to read to the imaging engine.

- OCR Orientation 0°
- OCR Orientation 270° clockwise (or 90° counterclockwise)
- OCR Orientation 180° (upside down)
- OCR Orientation 90° clockwise
- OCR Orientation Omnidirectional

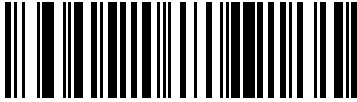
Setting an incorrect orientation can cause misdecodes.



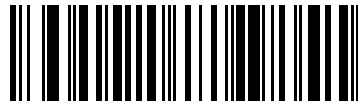
*OCR Orientation 0° (0)



OCR Orientation 270° Clockwise (1)



OCR Orientation 180° Clockwise (2)



OCR Orientation 90° Clockwise (3)



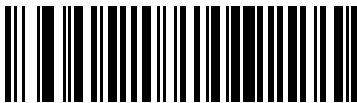
OCR Orientation Omnidirectional (4)

OCR Lines

Parameter # 691 (SSI # F1h B3h)

This parameter selects the number of OCR lines to decode.

Selecting Visas, TD1, or TD2 ID cards automatically sets the appropriate **OCR Lines**. Also see [OCR-B Variant](#).



*OCR 1 Line (1)



OCR 2 Lines (2)



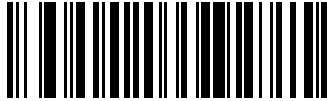
OCR 3 Lines (3)

OCR Minimum Characters

Parameter # 689 (SSI # F1h B1h)

This parameter selects the minimum number of OCR characters (not including spaces) per line to decode.

Scan OCR Minimum Characters, then scan a three-digit number between 003 and 100 using the barcodes in [Numeric Barcodes](#) representing the number of OCR characters to decode. Strings of OCR characters less than the minimum are ignored.



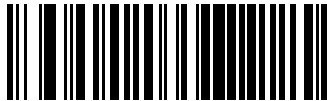
OCR Minimum Characters

OCR Maximum Characters

Parameter # 690 (SSI # F1h B2h)

This parameter selects the maximum number of OCR characters (including spaces) per line to decode.

Scan OCR Maximum Characters, then scan a three-digit number between 003 and 100 using the barcodes in [Numeric Barcodes](#) representing the number of OCR characters to decode. Strings of OCR characters greater than the maximum are ignored.



OCR Maximum Characters

OCR Subset

Parameter # 686 (SSI # F1h AEh)

This parameter creates an OCR subset to define a custom group of characters in place of a preset font variant.

For example, if scanning only numbers and the letters A, B, and C, create a subset of just these characters to speed decoding. This applies a designated OCR Subset across all enabled OCR fonts.

To cancel an OCR subset, for OCR-A or OCR-B, scan OCR-A variant Full ASCII, or OCR-B variant Full ASCII.

For MICR E13B or US Currency Serial Number, create a subset which includes all allowed characters in that character set, or scan an option from the [Default Parameters](#) and re-program the scanner.

Setting or Modifying the OCR Font Subset

To set or modify the OCR Font Subset, follow this procedure.

1. Enable the appropriate OCR font(s).

2. Scan the **OCR Subset** barcode.



OCR Subset

3. Scan numbers and letters from [Alphanumeric Barcodes](#) to form the OCR Subset.
4. Scan [OCR Subset](#).

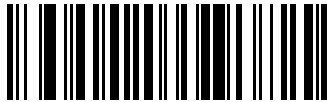
OCR Quiet Zone

Parameter # 695 (SSI # F1h B7h)

This parameter sets the OCR quiet zone.

The scanner stops scanning a field when it detects a sufficiently wide blank space. The width of this space is defined by the End of Field option. Used with parsers that tolerate slanted characters, the End of Field count is approximately a count of 8 for a character width. For example, if set to 15, then two character widths are an end of line indicator for the parser. Larger end of field numbers require bigger quiet zones at each end of text line.

Scan quiet zone, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99.



OCR Quiet Zone

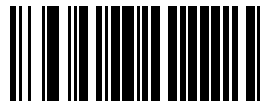
OCR Template

Parameter # 547 (SSI # F1h 23h)

This parameter creates a template for precisely matching scanned OCR characters to a desired input format.

Carefully constructing an OCR template eliminates scanning errors.

To set or modify the OCR decode template, scan [OCR Template](#), and then scan barcodes on the following pages that correspond to numbers and letters to form the template expression. Finally, scan **End of Message**.



OCR Template



End of Message

Required Digit (9)

Only a numeric character is allowed in this position.

Template	Valid data	Valid data	Invalid data
99999	12987	30517	123AB

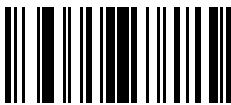


9

Required Alpha (A)

Only an alpha character is allowed in this position.

Template	Valid data	Valid data	Invalid data
AAAAA	ABCDE	UVWXY	12FGH

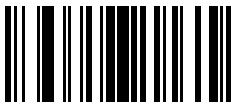


A

Optional Alphanumeric (1)

An alphanumeric character is accepted in this position if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99991	1234A	12345	1234<



1

Optional Alpha (2)

An alpha character is accepted in this position if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
AAAA2	ABCDE	WXYZ	ABCD6

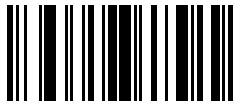


2

Alpha or Digit (3)

An alphanumeric character is required in this position to validate the incoming data.

Template	Valid data	Valid data	Invalid data
33333	12ABC	WXY34	12AB<



3

Any Including Space & Reject (4)

Any character is accepted in this position, including space and reject. An underscore (_) represents rejects in the output. This is a good selection for troubleshooting.

Template	Valid data	Valid data
99499	12\$34	34 98



4

Any except Space & Reject (5)

Any character is accepted in this position, except a space or reject.

Template	Valid data	Valid data	Invalid data
55999	A.123	*Z456	A BCD



5

Optional Digit (7)

A numeric character is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99977	12345	789	789AB

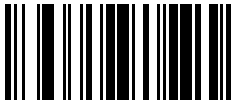


7

Digit or Fill (8)

Any numeric or fill character is accepted in this position.

Template	Valid data	Valid data	Valid data
88899	12345	>>789	<<789

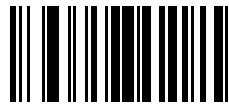


8

Alpha or Fill (F)

Any alpha or fill character is accepted in this position.

Template	Valid data	Valid data	Valid data
AAAFF	ABCXY	LMN>>	ABC<5



F

Optional Space ()

A space is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99 99	12 34	1234	67891



Space

Optional Small Special (.)

A special character is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters. Small special characters are - , and .

Template	Valid data	Valid data	Invalid data
AA.99	MN.35	XY98	XYZ12



.

Other Template Operators

These template operators assist in capturing, delimiting, and formatting scanned OCR data.

Literal String (" and +)

Use either of these delimiting characters surrounding characters from the alphanumeric keyboard in [Alphanumeric Barcodes](#) to define a literal string within a template that must be present in scanned OCR data. There are two characters used to delimit required literal strings; if one of the delimiter characters is present in the desired literal string, use the other delimiter.

Template	Valid data	Invalid data
"35+BC"	35+BC	AB+22



"



+

New Line (E)

To create a template of multiple lines, add **E** between the template of each single line.

Template	Valid data	Valid data	Invalid data
999EAAAA	321	987	XYZW
	BCAD	ZXYW	12



E

String Extract (C)

This operator, combined with others, defines a string of characters to extract from the scanned data. The string extract is structured as follows:

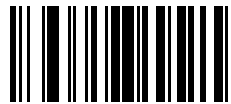
CbPe

Where:

- C is the string extract operator
- b is the string begin delimiter
- P is the category (one or more numeric or alpha characters) describing the string representation
- e is the string end delimiter

Values for b and e can be any scannable character. They are included in the output stream.

Template	Incoming data	Output
C>A>	XQ3>ABCDE>	>ABCDE>
	->ATHRUZ>123	>ATHRUZ>
	1ABCXYZ	No Output



C

Ignore to End of Field (D)

This operator causes all characters after a template to be ignored. Use this as the last character in a template expression. Examples for the template 999D:

Template	Incoming data	Output
999D	123-PED	123
	357298	357
	193	193



D

Skip Until (P1)

This operator skips over characters until a specific character type or a literal string is detected. It can be used in two ways:

P1ct

Where:

- P1 is the Skip Until operator
- c is the type of character that triggers the start of output
- t is one or more template characters

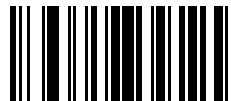
P1"s"t

Where:

- P1 is the Skip Until operator
- "s" is one or more literal string characters (for example, "+") that trigger the start of output
- t is one or more template characters

The trigger character or literal string is included in output from a Skip Until operator, and the first character in the template should accommodate this trigger.

Template	Incoming data	Output
P1"PN"AA9999	123PN9876	PN9876
	PN1234	PN1234
	X-PN3592	PN3592



P



1

Skip Until Not (P0)

This operator skips over characters until a specific character type or a literal string is not matched in the output stream. It can be used in two ways:

P0ct

Where:

- P0 is the Skip Until Not operator
- c is the type of character that triggers the start of output

- t is one or more template characters

P0"s"t

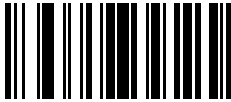
Where:

- P0 is the Skip Until Not operator
- "s" is one or more literal string characters (for example, "+") that trigger the start of output
- t is one or more template characters

The trigger character or literal string is not included in output from a Skip Until Not operator.

Template	Incoming data	Output
POA9999	BPN3456	3456
	PN1234	1234
	5341	No output

Template	Incoming data	Output
P0"PN"9999	PN3456	3456
	5341	No output
	PNPN7654	7654



P

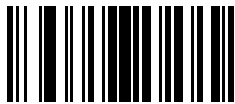


0

Repeat Previous (R)

This operator allows a template character to repeat one or more times, allowing the capture of variable-length scanned data. The following examples capture two required alpha characters followed by one or more required digits:

Template	Incoming data	Output
AA9R	AB3	AB3
	PN12345	PN12345
	32RM52700	No output

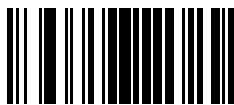


R

Scroll Until Match (S)

This operator steps through scanned data one character at a time until the data matches the template.

Template	Incoming data	Output
S99999	AB3	No Output
	PN12345	12345
	32RM52700	52700



S

Multiple Templates

This feature sets up multiple templates for OCR decoding.

To create multiple templates, see [OCR Template](#), and for each template in the multiple template string, using a capital letter X as a separator between templates.

For example, set the OCR template as **99999XAAAAA** to decode OCR strings of either **12345** or **ABCDE**.

Template Examples

Following are sample templates with descriptions of valid data for each definition.

Field Definition	Description
"M"99977	M followed by three digits and two optional digits.
"X"997777"X"	X followed by two digits, four optional digits, and an X.
9959775599	Two digits followed by any character, a digit, two optional digits, any two characters, and two digits.
A55" - "999" - "99	A letter followed by two characters, a dash, three digits, a dash, and two digits.
33A" . "99	Two alphanumeric characters followed by a letter, a period, and two digits.

999992991

Five digits followed by an optional alpha, two digits, and an optional alphanumeric.

"PN98"

Literal field - **PN98**

OCR Check Digit Modulus

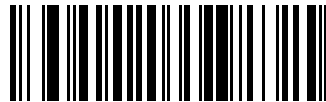
Parameter # 688 (SSI # F1h B0h)

This parameter sets the OCR module check digit calculation.

The check digit is the last digit (in the right-most position) in an OCR string and improves the accuracy of the collected data. The calculation is performed on incoming data to determine this check digit, based on the numeric weight of the alpha and numeric characters. See [OCR Check Digit Multiplier](#). If the incoming data does not match the check digit, the data is considered corrupt.

The selected check digit option does not take effect until you set [OCR Check Digit Validation](#).

To choose the Check Digit Modulus, such as 10 for Modulus 10, scan OCR Check Digit, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in [Numeric Barcodes](#).



OCR Check Digit

OCR Check Digit Multiplier

Parameter # 700 (SSI # F1h BCh)

This parameter sets OCR check digit multipliers for character positions.

For check digit validation, each character in scanned data has an assigned weight to use in calculating the check digit. The scanner OCR ships with the following weight equivalents:

0 = 0	A = 10	K = 20	U = 30
1 = 1	B = 11	L = 21	V = 31
2 = 2	C = 12	M = 22	W = 32
3 = 3	D = 13	N = 23	X = 33
4 = 4	E = 14	O = 24	Y = 34
5 = 5	F = 15	P = 25	Z = 35
6 = 6	G = 16	Q = 26	Space = 0
7 = 7	H = 17	R = 27	
8 = 8	I = 18	S = 28	
9 = 9	J = 19	T = 29	

All other characters are equivalent to one (1).

You can define the multiplier string if it is different from the default.



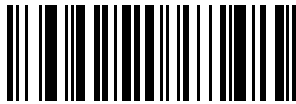
NOTE: 123456789A (for ISBN, Product Add Right to Left. See [OCR Check Digit Validation](#))

For example:

ISBN	0	2	0	1	1	8	3	9	9	4	
Multiplier	10	9	8	7	6	5	4	3	2	1	
Product	0	18	0	7	6	40	12	27	18	4	
Product add	0+	18+	0+	7+	6+	40+	12+	27+	18+	4=	132

ISBN uses Modulus 11 for the check digit. In this case, 132 is divisible by 11, so it passes the check digit.

To set the check digit multiplier, scan OCR Check Digit Multiplier, and then scan numbers and letters to form the multiplier string before scanning End of Message from [Alphanumeric Barcodes](#)



OCR Check Digit Multiplier

OCR Check Digit Validation

Parameter # 694 (SSI # F1h B6h)

This parameter protects against scanning errors by applying a check digit validation scheme.

None

No check digit validation, indicating no check digit is applied.



*No Check Digit (0)

Product Add Left to Right

This parameter helps validate the check digit.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). Each digit representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, and the sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

For example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6
-------	---	---	---	---	---	---

Multiplier	1	2	3	4	5	6	
Product	1	6	6	16	25	36	
Product add	1+	6+	6+	16+	25+	36=	90

The Check Digit Modulus is 10. It passes because 90 is divisible by 10 (the remainder is zero).



Product Add Left to Right (3)

Product Add Right to Left

This parameter changes the order of the numeric values the check digit multiplier uses with the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

For example:

Scanned data numeric value is 132459 (check digit is 9)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	9	
Multiplier	6	5	4	3	2	1	
Product	6	15	8	12	10	9	
Product add	6+	15+	8+	12+	10+	9=	60

The Check Digit Modulus is 10. It passes because 60 is divisible by 10 (the remainder is 0).



Product Add Right to Left (1)

Digit Add Left to Right

This parameter adds individual digits from left to right to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). Each value representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

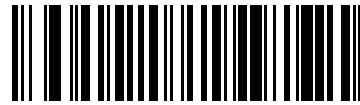
For example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6	
Multiplier	1	2	3	4	5	6	
Product	1	6	6	16	25	36	
Digit add	1+	6+	6+	1+6+	2+5+	3+6=	36

The Check Digit Modulus is 12. It passes because 36 is divisible by 12 (the remainder is 0).



Digit Add Left to Right (4)

Digit Add Right to Left

This parameter adds individual digits from right to left to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

For example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6	
Multiplier	6	5	4	3	2	1	
Product	6	15	8	12	10	6	
Digit add	6+	1+5+	8+	1+2+	1+0+	6=	30

The Check Digit Modulus is 10. It passes because 30 is divisible by 10 (the remainder is 0).



Digit Add Right to Left (2)

Product Add Right to Left Simple Remainder

This parameter reverses the order of the check digit multiplier before adding the product to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products **except for the check digit's product** is computed. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

For example:

Scanned data numeric value is 122456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	2	2	4	5		6
Multiplier	6	5	4	3	2		1
Product	6	10	8	12	10		6
Product add	6+	10+	8+	12+	10=	46	6

The Check Digit Modulus is 10. It passes because 46 divided by 10 leaves a remainder of 6.



Product Add Right to Left Simple Remainder (5)

Digit Add Right To Left Simple Remainder

This parameter reverses the order of the check digit multiplier before adding the product and checking the remainder to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see [OCR Check Digit Multiplier](#)). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products **except for the check digit's product** is then calculated. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

For example:

Scanned data numeric value is 122459 (check digit is 6) Check digit multiplier string is 123456

Digit	1	2	2	4	5		9
Multiplier	6	5	4	3	2		1
Product	6	10	8	12	10		9
Digit add	6+	1+0+	8+	1+2+	1+0=	19	9

The Check Digit Modulus is 10. It passes because 19 divided by 10 leaves a remainder of 9.



Digit Add Right to Left Simple Remainder (6)

Health Industry - HIBCC43

This parameter is the health industry module 43 check digit standard.

The check digit is the modulus 43 sum of all the character values in a given message, and is printed as the last character in a given message.

Example:

Supplier Labelling Data Structure: + A 1 2 3 B J C 5 D 6 E 7 1

Sum of values: $41+10+1+2+3+11+19+12+5+13+6+14+7+1 = 145$

Divide 145 by 43. The quotient is 3 with a remainder of 16. The check digit is the character corresponding to the value of the remainder, which in this example is 16, or G. The complete Supplier Labeling Data Structure, including the check digit, therefore is:

A 1 2 3 B J C 5 D 6 E 7 1 G

Numeric Value Assignments for Computing HIBC LIC Data Format Check Digit

0 = 0	9 = 9	I = 18	R = 27	- = 36
1 = 1	A = 10	J = 19	S = 28	. = 37
2 = 2	B = 11	K = 20	T = 29	Space = 38
3 = 3	C = 12	L = 21	U = 30	\$ = 39
4 = 4	D = 13	M = 22	V = 31	/ = 40
5 = 5	E = 14	N = 23	W = 32	+ = 41
6 = 6	F = 15	O = 24	X = 33	% = 42
7 = 7	G = 16	P = 25	Y = 34	
8 = 8	H = 17	Q = 26	Z = 35	



Health Industry - HIBCC43 (9)

Inverse OCR

Parameter # 856 (SSI # F2h 58h)

This parameter can read white or light words on a black or dark background.

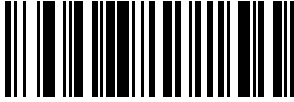
- Regular Only - Decode regular OCR (black on white) strings only.
- Inverse Only - Decode inverse OCR (white on black) strings only.
- Autodiscriminate - Decode both regular and inverse OCR strings.



*Regular Only (0)



Inverse Only (1)



Autodiscriminate (2)

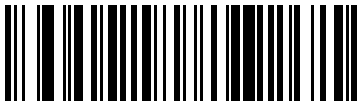
OCR Redundancy

Parameter # 1770 (SSI # F8h 06h EAh)

This parameter adjusts the number of times to decode an OCR text string before transmission.

There are three levels of OCR decode redundancy. There is an inverse relationship between the redundancy level and OCR decoding aggressiveness. Increasing the level of the redundancy can reduce OCR scanning aggressiveness, so select only the level of redundancy necessary.

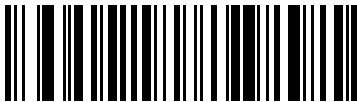
- OCR Redundancy Level 1 - This setting allows the scanner to operate in its most aggressive state while providing sufficient accuracy in decoding most in-spec OCR text strings.
- OCR Redundancy Level 2 - This setting eliminates most misdecodes while maintaining reasonable aggressiveness.
- OCR Redundancy Level 3 - Select this option with greater redundancy requirements if OCR Redundancy Level 2 fails to eliminate misdecodes.



*OCR Redundancy Level 1 (1)



OCR Redundancy Level 2 (2)



OCR Redundancy Level 3 (3)

Driver's License Set Up

The scanner uses internally embedded algorithms to parse out barcode information from standard US driver's licenses and certain other American Association of Motor Vehicle Administrators (AAMVA) compliant ID cards. Scanning these barcodes produces formatted data for use in age verification, credit card application information, and more.



NOTE: Only applies to -DL and -LL model digital scanners. North America configurations only.

This section describes how to program the scanner to read and use the data contained in the 2D barcodes on US driver's licenses and AAMVA compliant ID cards.

Table 34 DL Parsing Parameter Table

Parameter	Default
DL Parsing Parameters	
Driver's License Parsing	No Driver's License Parsing
Parsing Driver's License Data Fields	N/A
Driver's License Parse Rules	N/A
AAMVA Parse Fields	N/A
Set Default Parameter	N/A
Output Gender as M or F	N/A
Date Format	CCYYMMDD
No Separator	N/A
Send Keystroke Control Characters Keyboard Characters	N/A
Parsing Rule Example	N/A
Embedded Driver's License Parsing ADF Example	N/A

Driver's License Parsing

Parameter # 645 (SSI #F1 85)

This parameter enables driver's license parsing on the scanner.



NOTE: This does not require Zebra software (.DLL).

Choose more options in the order indicating the sequence of data fields that the scanner outputs. See [Parsing Driver's License Data Fields](#) for more information.



*No Driver's License Parsing



Embedded Driver's License Parsing

Parsing Driver's License Data Fields (Embedded Driver's License Parsing)

To program a parsing rule:

1. Choose [Begin New Driver's License Parse Rule](#).
2. Choose any of the field options on the following pages, or [Send Keystroke \(Control Characters and Keyboard Characters\)](#).
3. After entering the entire rule, select [Save Driver's License Parse Rule](#) to save the rule.



NOTE: The scanner stores only one driver's license parsing rule in memory at a time. Saving a new rule replaces the prior rule.

To abort the programming sequence at any time during programming, choose [Quit Entering Driver's License Rule](#). Any previously saved rule is retained.

To erase a saved rule, select [Erase Driver's License Parse Rules](#).

Embedded Driver's License Parsing Criteria - Code Type

After specifying the fields and their order for the parsed driver's license, you can also apply standard ADF rules to the parsed data using the **Parsed Driver's License** criterion barcode in the Advanced Data Formatting Programmer Guide.



NOTE: Only create standard ADF rules on parsed driver's license data when configured for Embedded Driver's License Parsing.

See for a sample ADF rule using this code type criterion.

Driver's License Parse Rules

Choose an option to program a parsing rule.



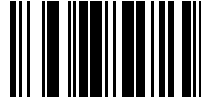
Begin New Driver's License Parse Rule



Save Driver's License Parse Rule



Quit Entering Driver's License Rule



Erase Driver's License Parse Rules

Driver's License Parse Fields

These options are the supported parse fields for driver's license.

Not all IDs present data in the same format. For example, some IDs can have separate fields for first name, last name, and middle initial, while others have a single field with the entire name. Also, some IDs expire on the subject's birth date while the expiration date field only indicates the year. To present data in a consistent format, use the nine options provided in this section to return data calculated from the actual data contained in the ID barcode.



First Name



Middle Name/Initial



Last Name



Name Suffix



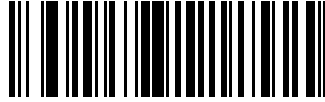
Name Prefix



Expiration Date



Birth Date



Issue Date



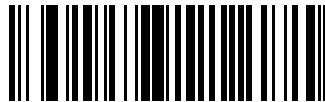
ID Number (Formatted)

AAMVA Parse Fields

The scanner uses the specified fields to parse out information from American Association of Motor Vehicle Administrators (AAMVA) compliant ID cards.



AAMVA Issuer ID



Full Name



Last Name



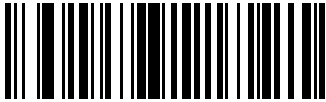
First Name



Middle Name / Initial



Name Suffix



Name Prefix



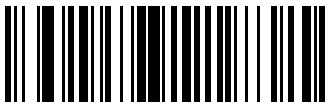
Mailing Address Line 1



Mailing Address Line 2



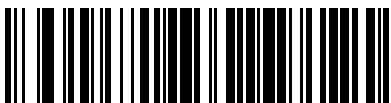
Mailing Address City



Mailing Address State



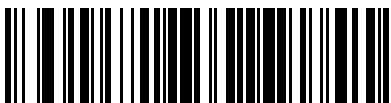
Mailing Address Postal Code



Home Address Line 1



Home Address Line 2



Home Address City

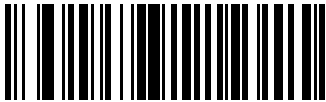
Driver's License Set Up



Home Address Postal Code



License Class



License Endorsements



Height (Centimeters)



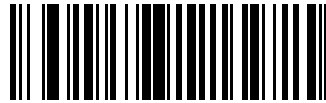
Weight (Kilograms)



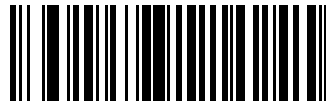
Home Address State



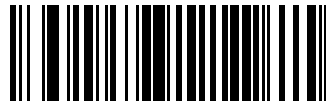
License ID Number



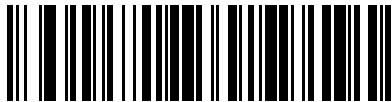
License Restrictions



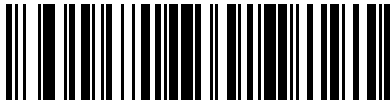
Height (Feet and/or Inches)



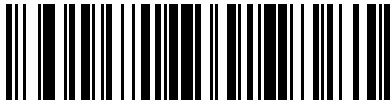
Weight (Pounds)



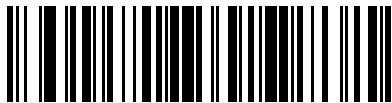
Hair Color



Eye Color



License Expiration Date



Birth Date



Gender



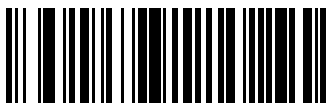
License Issue Date



License Issue State



Social Security Number



Permit Class



Permit Expiration Date

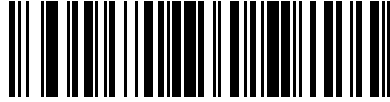
Driver's License Set Up



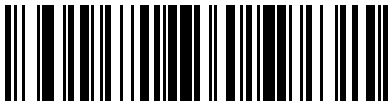
Permit ID Number



Permit Issue Date



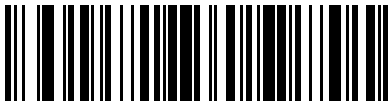
Permit Restrictions



Permit Endorsements



AKA Social Security Name



AKA Full Name



AKA Last Name



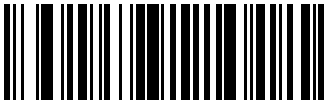
AKA First Name



AKA Middle Name / Initial



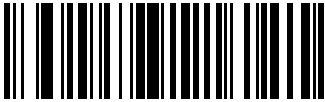
AKA Name Suffix



AKA Name Prefix



AKA Birth Date



Issue Timestamp



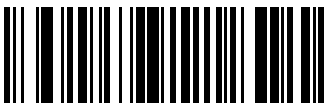
Medical Codes



Organ Donor



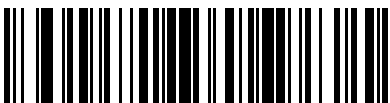
Nonresident



Customer ID



Weight Range



Document Discriminator



Country



Place of Birth



Federal Commission Codes



Audit Information



Inventory Control



Race / Ethnicity



Std Vehicle Class



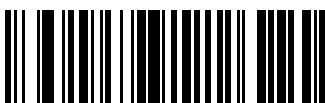
Std Endorsements



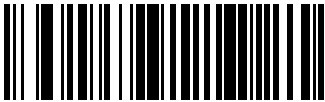
Std Restrictions



Class Description



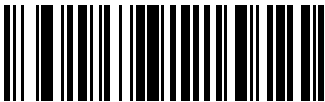
Endorsement Description



Restrictions Description



Height in Inches



Height in Centimeters



Std Endorsements

Parser Version ID Barcode

Include this field to emit embedded parser software version identification.



Parser Version ID

DL Parsing User Preferences

Use the following barcodes to set user preferences.

Set Default Parameter

This parameter returns all parameters to the default values.
See the default value tables in each section.



*Set All Defaults

Output Gender as M or F

Select this parameter to report the gender as M or F instead of a numeric value.



Output gender as M or F

Date Format

Use this parameter to select the date format to display.

Date fields include the following:

- CCYY = 4-digit year (CC=2-digit century [00-99], YY=2-digit year in the century [00-99])
- MM = 2-digit month [01-12]
- DD = 2-digit day of the month [00-31]

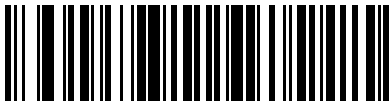
To specify a date separator, for example, a character separating each field of the date, select the Send option that corresponds to the alphanumeric character to use as the date separator immediately following the date format barcode. To select no date separator, select the No Separator DL parsing rule immediately following the date format.



DDMMCCYY



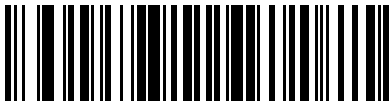
DDCCYYMM



YYMMDD



YYDDMM



MMDDYY



MMYDD



DDMMYY



DDYYMM

No Separator

This parameter immediately follows a date format barcode to use no separator character between the date fields.



No Separator

Send Keystroke (Control Characters and Keyboard Characters)

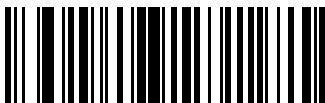
Specify a Control Character or a Keyboard Character to send.

Control Characters

Select a Send Control parameter for the control character to send.



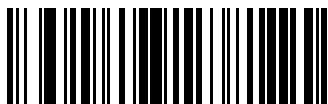
Send Control A



Send Control B



Send Control C



Send Control D



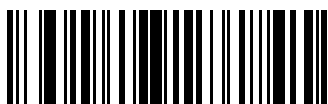
Send Control E



Send Control F



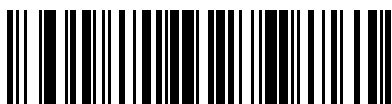
Send Control G



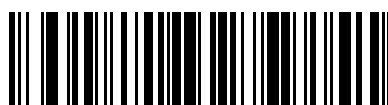
Send Control H



Send Control I



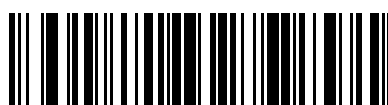
Send Control J



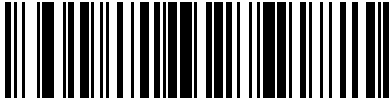
Send Control K



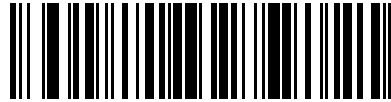
Send Control L



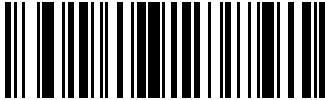
Send Control M



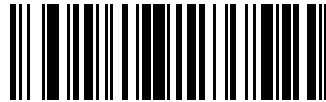
Send Control N



Send Control O



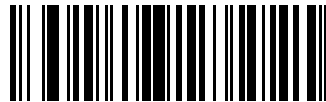
Send Control P



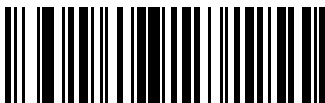
Send Control Q



Send Control R



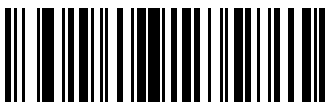
Send Control S



Send Control T



Send Control U



Send Control V



Send Control X



Send Control W



Send Control Y



Send Control Z



Send Control [



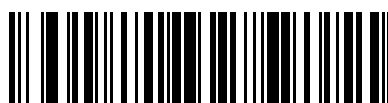
Send Control \



Send Control]



Send Control 6



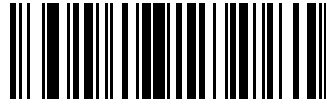
Send Control -

Keyboard Characters

Select a Send parameter for the specific keyboard characters to send.



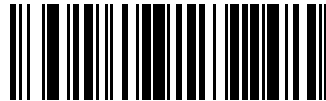
Send Space



Send !



Send "



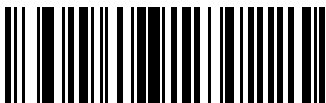
Send #



Send \$



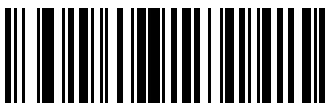
Send %



Send &



Send '



Send (

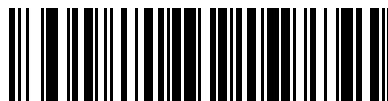
Driver's License Set Up



Send *



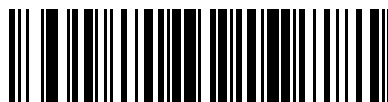
Send)



Send +



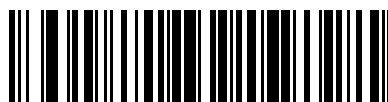
Send ,



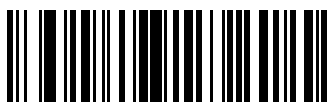
Send -



Send .



Send /



Send 0



Send 1



Send 2



Send 3



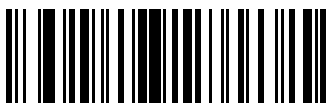
Send 4



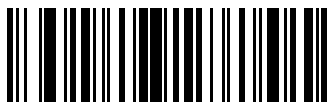
Send 5



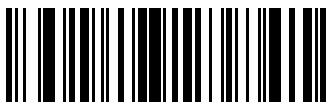
Send 6



Send 7



Send 8



Send 9



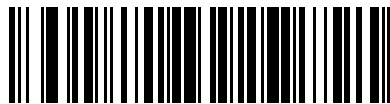
Send :



Send ;



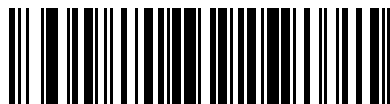
Send <



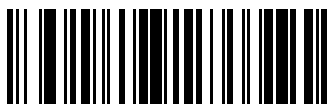
Send =



Send >



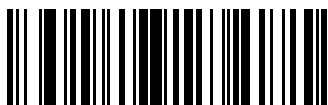
Send ?



Send @



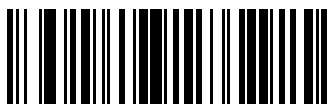
Send A



Send B



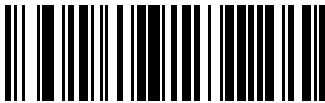
Send C



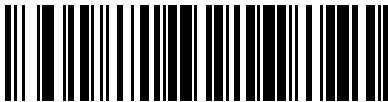
Send D



Send F



Send H



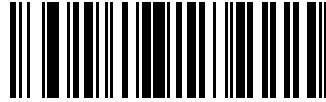
Send J



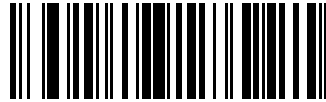
Send L



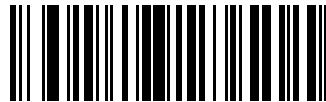
Send N



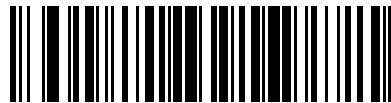
Send E



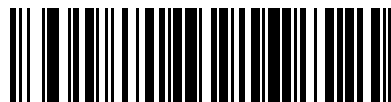
Send G



Send I

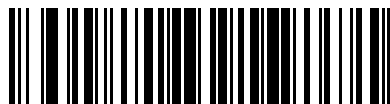


Send K



Send M

Driver's License Set Up



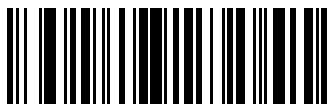
Send O



Send P



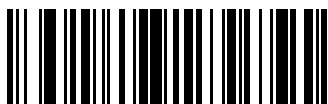
Send Q



Send R



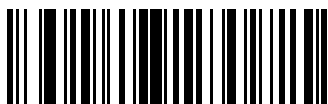
Send S



Send T



Send U



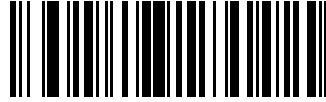
Send V



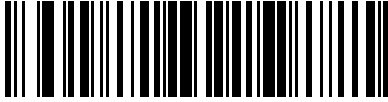
Send W



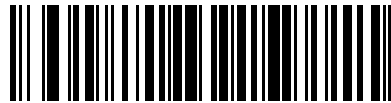
Send X



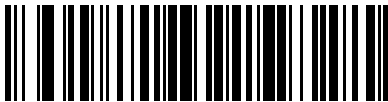
Send Y



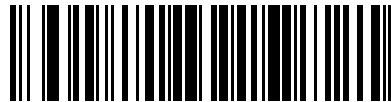
Send Z



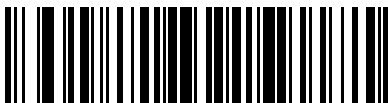
Send [



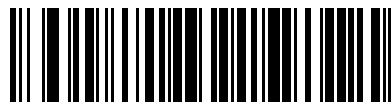
Send \



Send]



Send ^



Send _



Send `



Send a



Send b



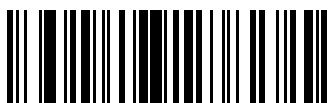
Send c



Send d



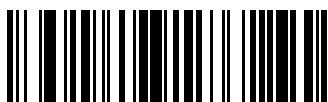
Send e



Send f



Send g



Send h



Send i



Send j



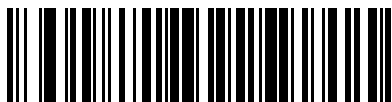
Send k



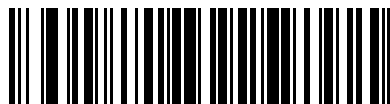
Send l



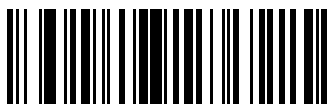
Send m



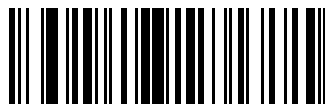
Send n



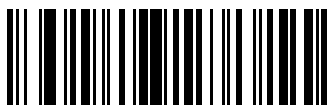
Send o



Send p



Send q



Send r



Send s



Send t



Send v



Send x



Send z



Send l



Send ~



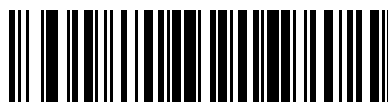
Send u



Send w



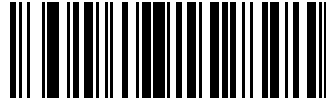
Send y



Send {



Send }



Send Tab Key



Send Enter Key

Parsing Rule Example

Follow the sequence to examine how a parsing rule is created.

Choose the parameters in sequence to program the scanner to extract and transmit:

- first, middle, and last names
- mailing address line 1
- mailing address line 2
- mailing address city
- mailing address state
- mailing address postal code
- date of birth

Then, scan a driver's license barcode.



NOTE: This example applies to RS-232. To use this example with a USB interface, enable [USB Function Key Mapping](#) to send the Enter key properly.



1 - Embedded Driver's License Parsing



2 - Begin New Driver's License Parse Rule



3 - First Name



4 - Send Space



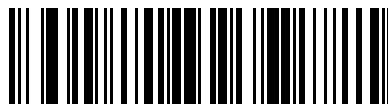
5 - Middle Name / Initial



6 - Send Space



7 - Last Name



8 - Send Enter Key



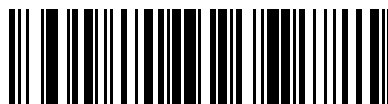
9 - Mailing Address Line 1



10 - Send Space



11 - Mailing Address Line 2



12 - Send Enter Key



13 - Mailing Address City



14 - Send Space



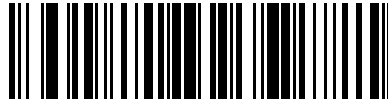
15 - Mailing Address State



16 - Send Space



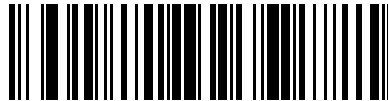
17 - Mailing Address Postal Code



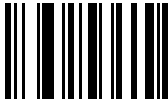
18 - Send Enter Key



19 - Birth Date



20 - Send Enter Key



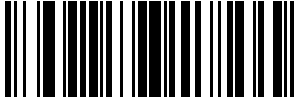
21 - Save Driver's Licence Parse Rule

Embedded Driver's License Parsing ADF Example

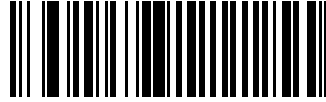
This example creates a parsing rule for parsed data.

The parsing rule configures the data in the following format:

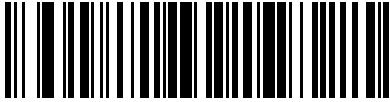
```
Last Name, First Name
```



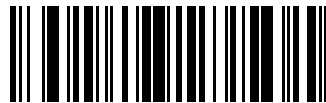
1 - Begin New Driver's License Parse Rule



2 - Last Name



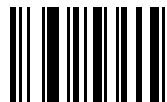
3 - Send ,



4 - Send Space



5 - First Name

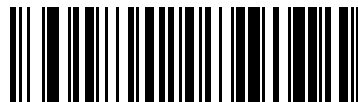


6 - Save Driver's License Parse Rule

Then, in order to limit the full name to 15 characters, create the following ADF rule:



1 - Begin New Rule



2 - Criterion: Parsed Driver's License



3 - Action: Send Next 15 Characters



4 - Save Rule

For a license belonging to Michael Williams, the parsed data is Williams, Michael and Williams, Micha after applying the previous ADF rule.

Country Codes

This section provides instructions for programming the keyboard to interface with a USB host.

The host powers the scanner. For host setup information, see [USB Interface](#).

To select a code page for the country keyboard type, see [Country Code Barcodes](#).

Throughout the programming barcode menus, default values are indicated with asterisks (*).

USB and Keyboard Wedge Country Keyboard Types (Country Codes)

Scan the barcode corresponding to the keyboard type. For a USB host, this setting applies only to the USB Keyboard (HID) device. If the keyboard type is not listed, see [Keypad Emulation](#) for the USB HID host.



NOTE: When changing USB country keyboard types, the scanner automatically resets and issues the standard startup beep sequences.

For best results when using international keyboards, enable [USB Keyboard Emulation](#).



IMPORTANT: Some country keyboard barcode types are specific to certain Windows operating systems (i.e., XP and Windows 7 and above). Barcodes requiring a specific Windows OS are noted in the barcode captions.

Use the French International barcode for Belgian French keyboards.

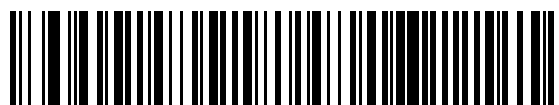
Country Code Barcodes

Parameter # 960

This chapter provides instructions for programming the keyboard to interface with a USB, BT HID, or keyboard wedge host. The host powers the scanner.

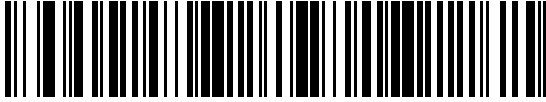


*US English (North American)



US English (Mac)

Country Codes



Albanian



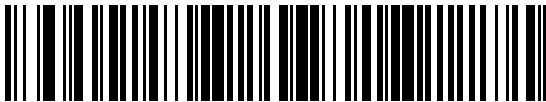
Arabic (101)



Arabic (102)



Arabic (102) AZERTY



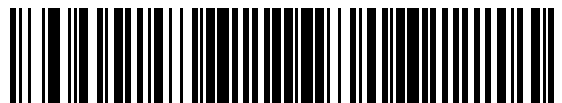
Azeri (Latin)



Azeri (Cyrillic)



Belarusian



Bosnian (Latin)



Bosnian (Cyrillic)



Bulgarian (Latin)



Bulgarian Cyrillic (Typewriter) (Bulgarian -Windows XP Typewriter - Windows 7 or higher)



Canadian French Win7



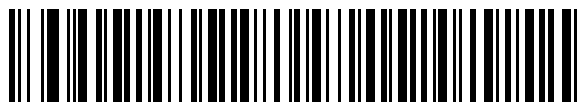
Canadian French (Legacy)



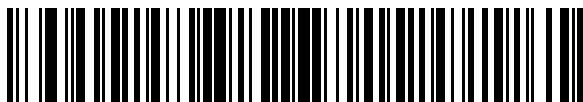
Canadian Multilingual Standard



Chinese (ASCII)



Chinese (Simplified)*



Chinese (Traditional)*

*For CJK keyboard types, see [CJK Decode Control](#).



Croatian

Country Codes



Czech



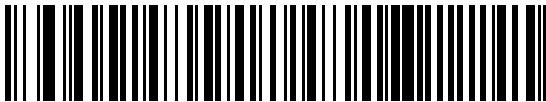
Czech (Programmer)



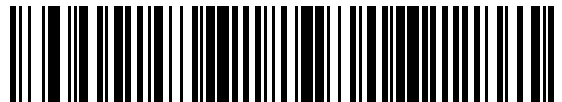
Czech (QWERTY)



Danish



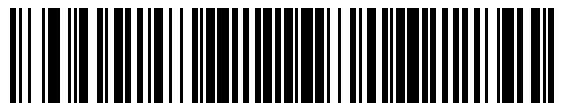
Dutch (Netherlands)



Estonian



Faeroese



Finnish

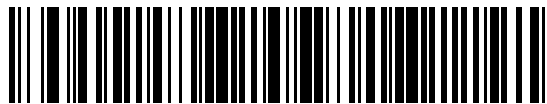


French (France)

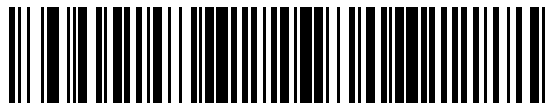
Country Codes



French (Canada) 95/98



French International (Belgian French)

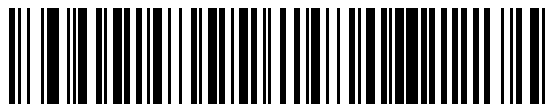


French (Canada) 2000/XP*

*Note that there is also a country code barcode for Canadian Multilingual Standard. Be sure to select the appropriate barcode for your host system.



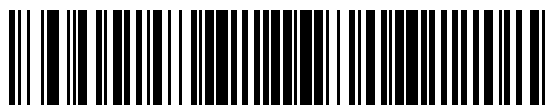
Galician



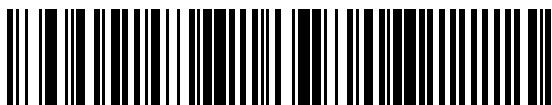
German



Greek Latin



Greek (220) Latin

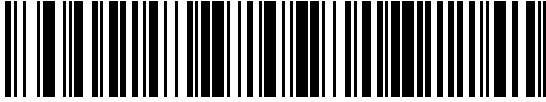


Greek (319) Latin

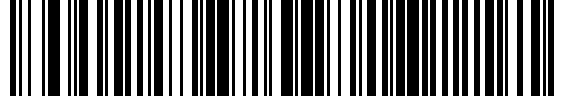


Greek

Country Codes



Greek (220)



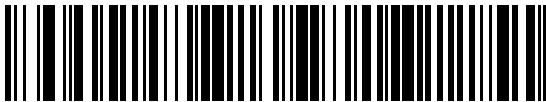
Greek (319)



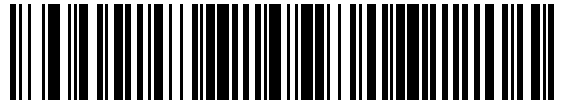
Greek Polytonic



Hebrew Israel



Hungarian



Hungarian_101KEY



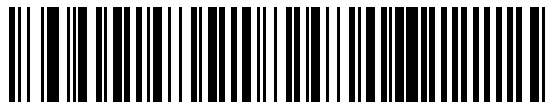
Icelandic



Irish



Italian



Italian (142)



Japanese (ASCII)



Japanese (SHIFT-JIS)*

*For CJK keyboard types, see [CJK Decode Control](#).



Kazakh



Korean (ASCII)



Korean (Hangul)*

*For CJK keyboard types, see [CJK Decode Control](#).



Kyrgyz



Latin American



Latvian

Country Codes



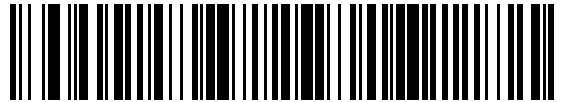
Latvian (QWERTY)



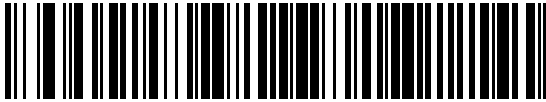
Lithuanian



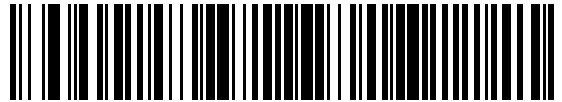
Lithuanian (IBM)



Macedonian (FYROM)



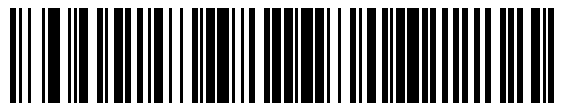
Maltese_47KEY



Mongolian



Norwegian



Polish (214)



Polish (Programmer)



Portuguese (Brazilian ABNT)



Portuguese (Portugal)



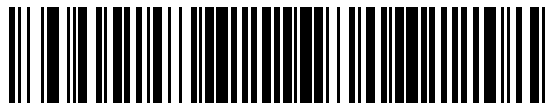
Romanian (Legacy) (Windows 7 or higher)



Romanian (Programmer) (Windows 7 or higher)



Russian (Typewriter)



Portuguese (Brazil) (Windows XP)



Portuguese (Brazilian ABNT2)



Romanian (Windows XP)



Romanian (Standard) (Windows 7 or higher)



Russian

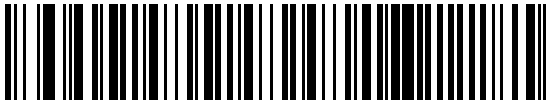
Country Codes



Serbian (Cyrillic)



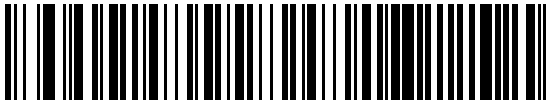
Serbian (Latin)



Slovak (QWERTY)



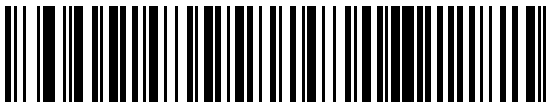
Slovak



Spanish



Slovenian



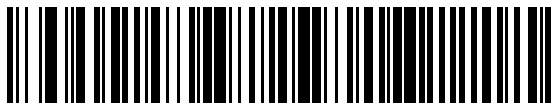
Swedish



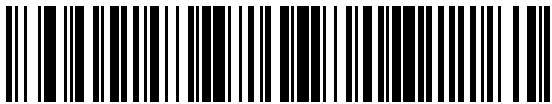
Spanish (Variation)



Swiss French



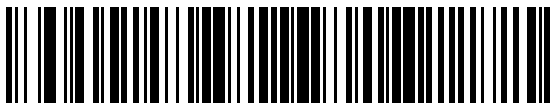
Swiss German



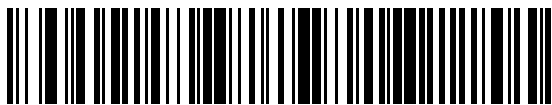
Tatar



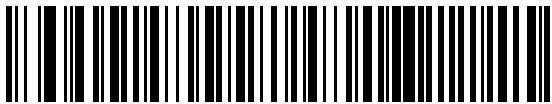
Thai (Kedmanee)



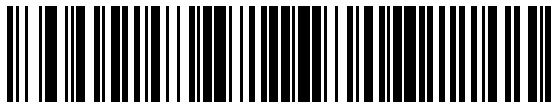
Turkish F



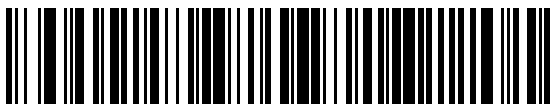
Turkish Q



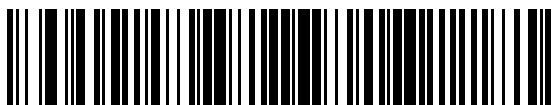
UK English



Ukrainian



US Dvorak



US Dvorak Left

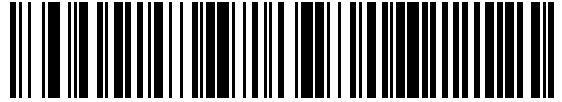


US Dvorak Right

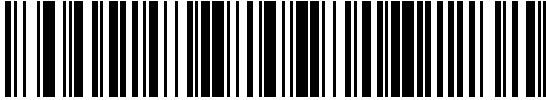
Country Codes



US International



Uzbek



Vietnamese

Country Code Pages

This section provides barcodes for selecting code pages for the country keyboard type selected in Country Codes.

If the default code page in [Country Code Pages](#) is appropriate for your selected country keyboard type, you do not need to scan a country code page barcode.



NOTE: ADF rules can also specify a code page based on the symbology and other ADF criteria. Refer to the Advanced Data Formatting Programmer Guide.

Country Code Page Defaults

The table in this section lists the code page default for each country keyboard.

Table 35 Country Code Page Defaults

Country Keyboard	Code Page Default
US English (North American)	Windows 1252
US English (Mac)	Mac CP10000
Albanian	Windows 1250
Arabic 101	Windows 1256
Arabic 102	Windows 1256
Arabic 102 AZERTY	Windows 1256
Azeri Latin	Windows 1254
Azeri Cyrillic	Windows 1251
Belarusian	Windows 1251
Bosnian Latin	Windows 1250
Bosnian Cyrillic	Windows 1251
Bulgarian Latin	Windows 1250
Bulgarian Cyrillic	Windows 1251
Canadian French Win7	Windows 1252
Canadian French (Legacy)	Windows 1252
Canadian Multilingual	Windows 1252

Table 35 Country Code Page Defaults (Continued)

Country Keyboard	Code Page Default
Croatian	Windows 1250
Chinese ASCII	Windows 1252
Chinese (Simplified)	Windows 936, GBK
Chinese (Traditional)	Windows 950, Big5
Czech	Windows 1250
Czech Programmers	Windows 1250
Czech QWERTY	Windows 1250
Danish	Windows 1252
Dutch Netherland	Windows 1252
Estonian	Windows 1257
Faeroese	Windows 1252
Finnish	Windows 1252
French (France)	Windows 1252
French (Canada) 95/98	Windows 1252
French (Canada) 2000/XP	Windows 1252
French International (Belgian French)	Windows 1252
Galician	Windows 1252
German	Windows 1252
Greek Latin	Windows 1252
Greek220 Latin	Windows 1253
Greek319 Latin	Windows 1252
Greek	Windows 1253
Greek220	Windows 1253
Greek319	Windows 1253
Greek Polytonic	Windows 1253
Hebrew Israel	Windows 1255
Hungarian	Windows 1250
Hungarian_101KEY	Windows 1250
Icelandic	Windows 1252
Irish	Windows 1252
Italian	Windows 1252
Italian_142	Windows 1252
Japanese ASCII	Windows 1252

Table 35 Country Code Page Defaults (Continued)

Country Keyboard	Code Page Default
Japanese (Shift-JIS)	Windows 932, Shift-JIS
Kazakh	Windows 1251
Korean ASCII	Windows 1252
Korean (Hangul)	Windows 949, Hangul
Kyrgyz Cyrillic	Windows 1251
Latin America	Windows 1252
Latvian	Windows 1257
Latvian QWERTY	Windows 1257
Lithuanian	Windows 1257
Lithuanian_IBM	Windows 1257
Macedonian -FYROM	Windows 1251
Maltese_47KEY	Windows 1252
Mongolian-Cyrillic	Windows 1251
Norwegian	Windows 1252
Polish_214	Windows 1250
Polish Programmer	Windows 1250
Portuguese Brazil	Windows 1252
Portuguese Brazilian ABNT	Windows 1252
Portuguese Brazilian ABNT2	Windows 1252
Portuguese Portugal	Windows 1252
Romanian	Windows 1250
Romanian Legacy	Windows 1250
Romanian Standard	Windows 1250
Romanian Programmer	Windows 1250
Russian	Windows 1251
Russian Typewriter	Windows 1251
Serbian Latin	Windows 1250
Serbian Cyrillic	Windows 1251
Slovak	Windows 1250
Slovak QWERTY	Windows 1250
Slovenian	Windows 1250
Spanish	Windows 1252
Spanish Variation	Windows 1252

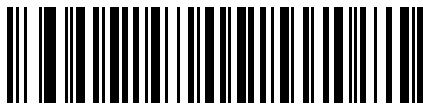
Table 35 Country Code Page Defaults (Continued)

Country Keyboard	Code Page Default
Swedish	Windows 1252
Swiss French	Windows 1252
Swiss German	Windows 1252
Tatar	Windows 1251
Thai-Kedmanee	Windows 874
Turkish F	Windows 1254
Turkish Q	Windows 1254
Ukrainian	Windows 1251
United Kingdom	Windows 1252
United States	Windows 1252
US Dvorak	Windows 1252
US Dvorak Left Hand	Windows 1252
US Dvorak Right Hand	Windows 1252
US International	Windows 1252
Uzbek Cyrillic	Windows 1251
Vietnamese	Windows 1258

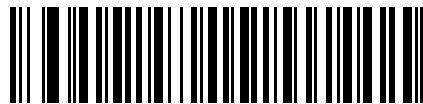
Country Code Page Barcodes

Parameter # 961

Scan the barcode corresponding to the country keyboard code page.



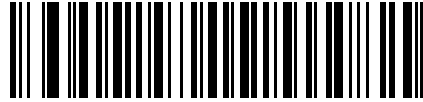
Windows 1250 Latin 2, Central European



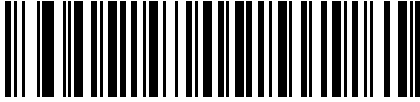
Windows 1251 Cyrillic, Slavic



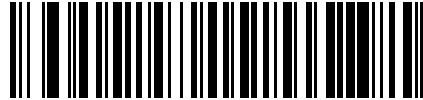
Windows 1252 Latin 1, Western European



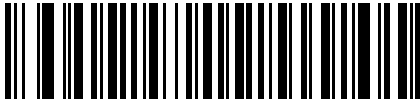
Windows 1253 Greek



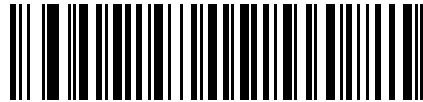
Windows 1254 Latin 5, Turkish



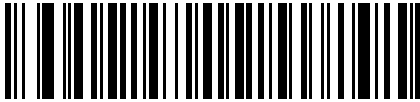
Windows 1255 Hebrew



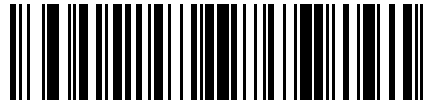
Windows 1256 Arabic



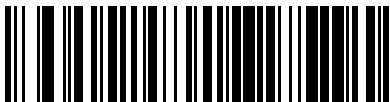
Windows 1257 Baltic



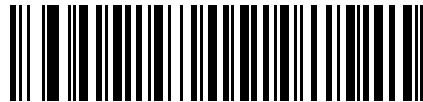
Windows 1258 Vietnamese



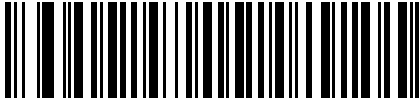
Windows 874 Thai



Windows 20866 Cyrillic KOI8-R



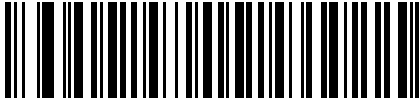
Windows 932 Japanese Shift-JIS



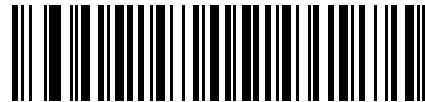
Windows 936 Simplified Chinese GBK



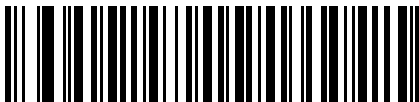
Windows 54936 Simplified Chinese GB18030



Windows 949 Korean Hangul



Windows 950 Traditional Chinese Big5



MS-DOS 437 Latin US



MS-DOS 737 Greek



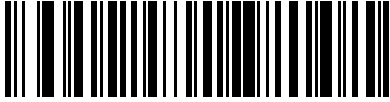
MS-DOS 775 Baltic



MS-DOS 850 Latin 1



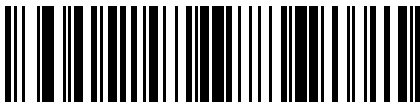
MS-DOS 852 Latin 2



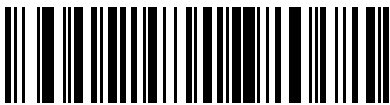
MS-DOS 857 Turkish



MS-DOS 861 Icelandic



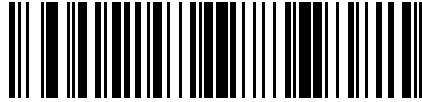
MS-DOS 863 French Canada



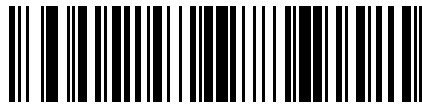
MS-DOS 866 Cyrillic



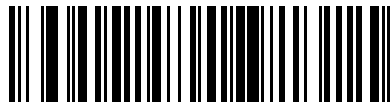
MS-DOS 855 Cyrillic



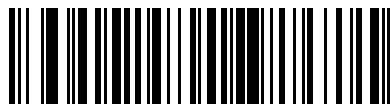
MS-DOS 860 Portuguese



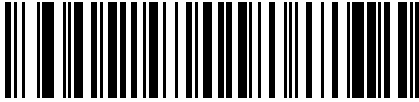
MS-DOS 862 Hebrew



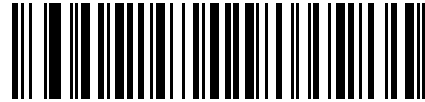
MS-DOS 865 Nordic



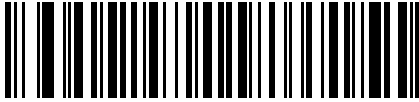
MS-DOS 869 Greek 2



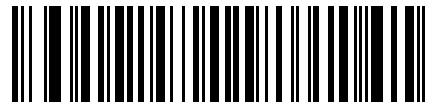
ISO 8859-1 Latin 1, Western European



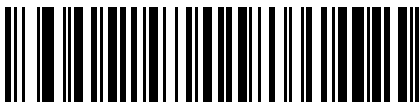
ISO 8859-2 Latin 2, Central European



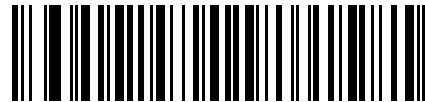
ISO 8859-3 Latin 3, South European



ISO 8859-4 Latin 4, North European



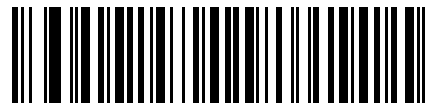
ISO 8859-5 Cyrillic



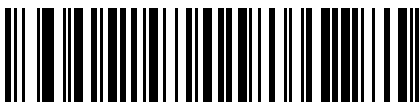
ISO 8859-6 Arabic



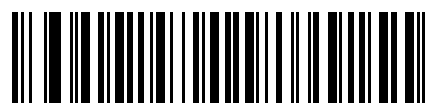
ISO 8859-7 Greek



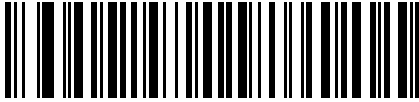
ISO 8859-8 Hebrew



ISO 8859-9 Latin 5, Turkish



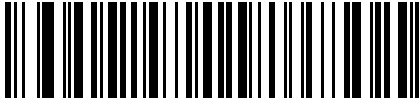
ISO 8859-10 Latin 6, Nordic



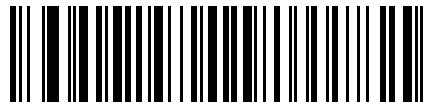
ISO 8859-11 Thai



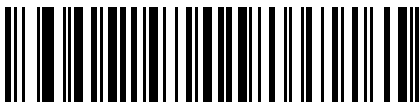
ISO 8859-13 Latin 7, Baltic



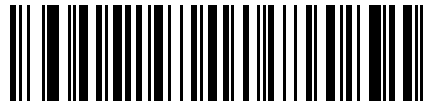
ISO 8859-14 Latin 8, Celtic



ISO 8859-15 Latin 9



ISO 8859-16 Latin 10, South-Eastern European



UTF-8



UTF-16LE UTF-16 Little Endian



UTF-16BE UTF-16 Big Endian



Mac CP10000 Roman

CJK Decode Control

This section describes control parameters for CJK (Chinese, Japanese, Korean) barcode decode through USB HID Keyboard Emulation mode.



NOTE: Because ADF does not support CJK character processing, there is no format manipulation for CJK output.

CJK Control Parameters

Unicode Output Control

Parameter # 973 (SSI # F2h CDh)

For a Unicode encoded CJK barcode, select one of the following options for Unicode output. Universal Output applies to Unicode and MBCS-expected applications, while Unicode Application Only is limited to Unicode-expected applications.

- **Universal Output to Unicode and MBCS Application:** This default method applies to Unicode and MBCS expected applications, such as MS Word and Notepad on a Windows host.

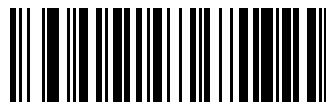


NOTE: To support Unicode universal output, set up the registry table for the Windows host. See [Unicode/CJD Decode Setup with Windows Host](#).

- **Output to Unicode Application Only** - This method applies only to Unicode expected applications, such as MS Word and WordPad, but not Notepad.



*Universal Output (0)



Unicode Application Only (1)

CJK Output Method to Windows Host

Parameter # 972

For a national standard encoded CJK barcode, select one of the following options for CJK output to a Windows host:

- **Universal CJK Output:** This is the default universal CJK output method for US English IME or Chinese/Japanese/Korean ASCII IME on a Windows host. This method converts CJK characters to Unicode and emulates the characters when transmitting to the host. Use the [Unicode Output Control](#) parameter to control Unicode output.

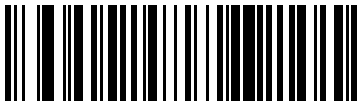


NOTE: To support universal CJK output, set up the registry table for the Windows host. See [Unicode/CJK Decode Setup Windows Host](#).

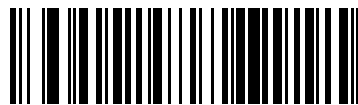
- **Other options for CJK output** - With the following methods, the scanner sends the CJK character hexadecimal internal code (Nei Ma) value to the host, or converts the CJK character to Unicode and sends the hexadecimal Unicode value to the host. When using these methods, the Windows host must select the corresponding IME to accept the CJK character. See [Unicode/CJK Decode Setup Windows Host](#).
- **Japanese Unicode Output**
- **Simplified Chinese GBK Code Output**
- **Simplified Chinese Unicode Output**
- **Korean Unicode Code Output**
- **Traditional Chinese Big5 Code Output** (Windows XP)
- **Traditional Chinese Big5 Code Output** (Windows 7)
- **Traditional Chinese Unicode Code Output** (Windows XP)
- **Traditional Chinese Unicode Code Output** (Windows 7)



NOTE: The Unicode emulate output method depends on the host system (Windows XP or Windows 7).



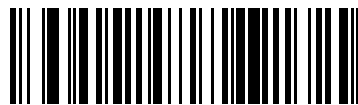
*Universal CJK Output (0)



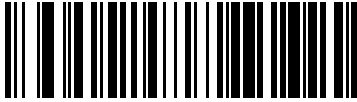
Japanese Unicode Output (34)



Chinese (Simplified) GBK Output (1)

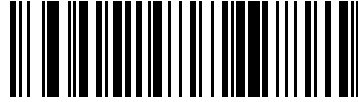


Chinese (Simplified) Unicode Output (2)

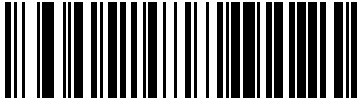


Korean Unicode Output (50)

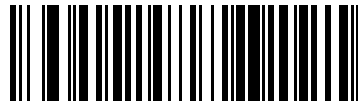
(for Korean Unicode Output, select Simplified Chinese Unicode IME on the Windows host)



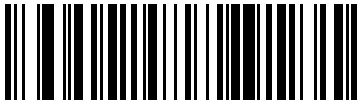
Chinese (Traditional) Big5 Output (Windows XP) (1)



Chinese (Traditional) Big5 Output (Windows 7) (19)



Chinese (Traditional) Unicode Output (Windows XP) (18)



Chinese (Traditional) Unicode Output (Windows 7) (20)

Non-CJK UTF Barcode Output

Parameter # 960

Some country keyboard type layouts contain characters that do not exist in the default code page (see below). Although the default code page can not encode these characters in a barcode, they can be encoded in the UTF-8 barcode.

Scan the following barcode to output the Unicode values by emulation mode.



NOTE: Use this special country keyboard type to decode the non-CJK UTF-8 barcode. After decoding, re-configure the scanner to use the original country keyboard type.

Use US English IME on Windows. See [Unicode Output Control](#).



Non-CJK UTF-8 Emulation Output

Missing Characters for Country Keyboard Type: Tatar, Uzbek, Mongolian, Kyrgyz, Kazakh and Azeri

Default code page: CP1251

Missing characters:

F	F
X	X
K	K
h	h
ə	ə
ə	ə
Y	Y
H	H
Ж	Ж
ƒ	
H	H
Y	Y
K	K
Ч	Ч
К	К

Missing Characters for Country Keyboard Type: Romanian (Standard)

Default code page: CP1250

Missing characters:

Ş	Ş
ţ	ţ

Missing Characters for Country Keyboard Type: Portuguese-Brazilian (ABNT), Portuguese-Brazilian (ABNT2)

Default code page: CP1252

Missing character: €

Missing Characters for Country Keyboard Type: Azeri-Latin

Default code page: CP1254

Missing characters: ə, Ə

Unicode/CJK Decode Setup with Windows Host

This section describes how to set up CJK decode with a Windows host.

Setting Up the Windows Registry Table for Unicode Universal Output

Set up a Windows host registry table in order to support a universal output method for your data.

1. Select **Start > Run > regedt32** to start the registry editor.
2. Under **HKEY_Current_User\Control Panel\Input Method**, set **EnableHexNumpad** to **1** as follows:

```
[HKEY_CURRENT_USER\Control Panel\Input Method]
```

```
"EnableHexNumpad"="1"
```

If this key does not exist, add it as type **REG_SZ** (string value).

3. Reboot the computer to implement the registry change.

Adding CJK IME on Windows

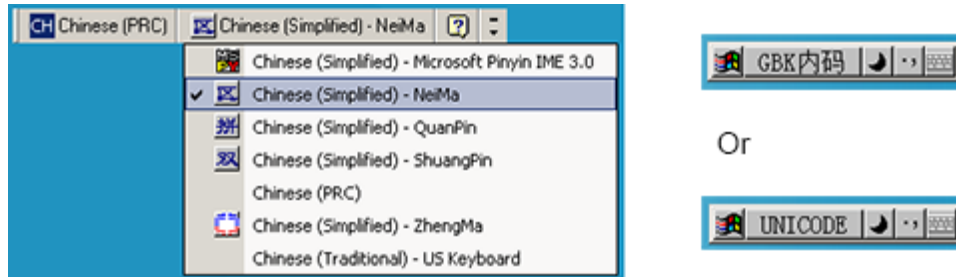
Modify your host device to display a Chinese, Japanese, or Korean keyboard.

1. Click **Start > Control Panel**.
2. If the Control Panel opens in category view, select **Switch to Classic View** in the top left corner.
3. Select **Regional and Language Options**.
4. Click the **Language** tab.
5. Under **Supplemental Language Support**, select the **Install Files for East Asian Languages** check box if not already selected, and click **Apply**. This may require a Windows installation CD to install the required files. This step ensures that the East Asian Languages (CJK) are available.
6. Under **Text Services and Input Language**, click **Details**.
7. Under **Installed Services**, click **Add**.
8. In the **Add Input Language** dialog box, choose the CJK input language and keyboard layout or Input Method Editor (IME) to add.
9. Click **OK** twice. The language indicator appears in the system tray (at bottom right corner of the desktop by default). To switch between input languages (keyboard languages) select the language indicator in the system tray.
10. Select the language indicator in the system tray to select the desired country keyboard type.
11. Verify that the characters displayed on each country's keyboard appear.

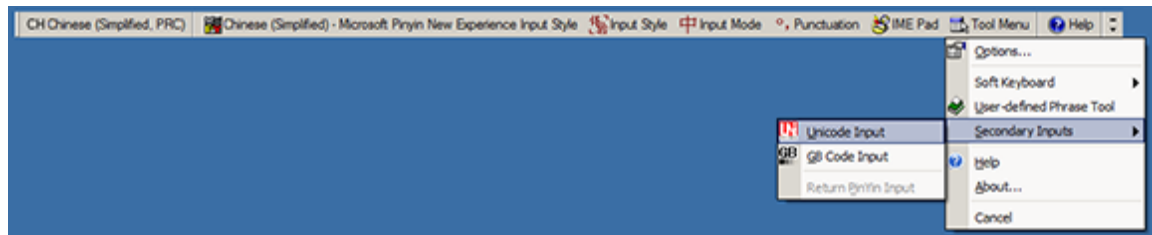
Selecting the Simplified Chinese Input Method on the Host

You can display a Simplified Chinese keyboard as the input method from the DS8208/DS8288 to display on your Windows 7 / Windows XP host device.

- Select Unicode/GBK input on Windows XP: **Chinese (Simplified) - NeiMa**, then click the input bar to select **Unicode** or **GBK NeiMa** input.



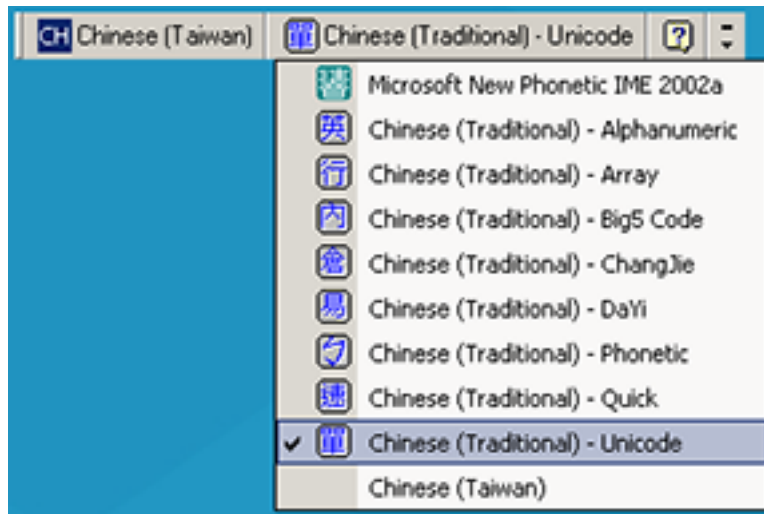
- Select Unicode/GBK input on Windows 7: **Chinese (Simplified) - Microsoft Pinyin New Experience Input Style**, then select **Tool Menu > Secondary Inputs > Unicode Input** or **GB Code Input**.



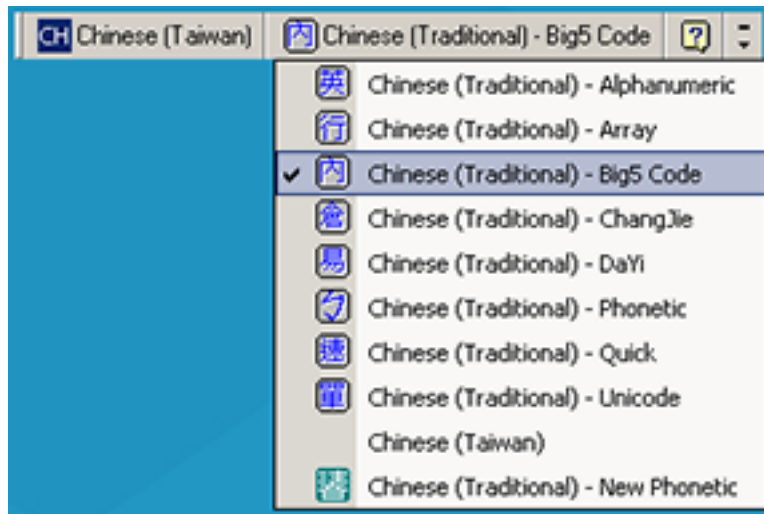
Selecting the Traditional Chinese Input Method on the Host

To select the Traditional Chinese input method:

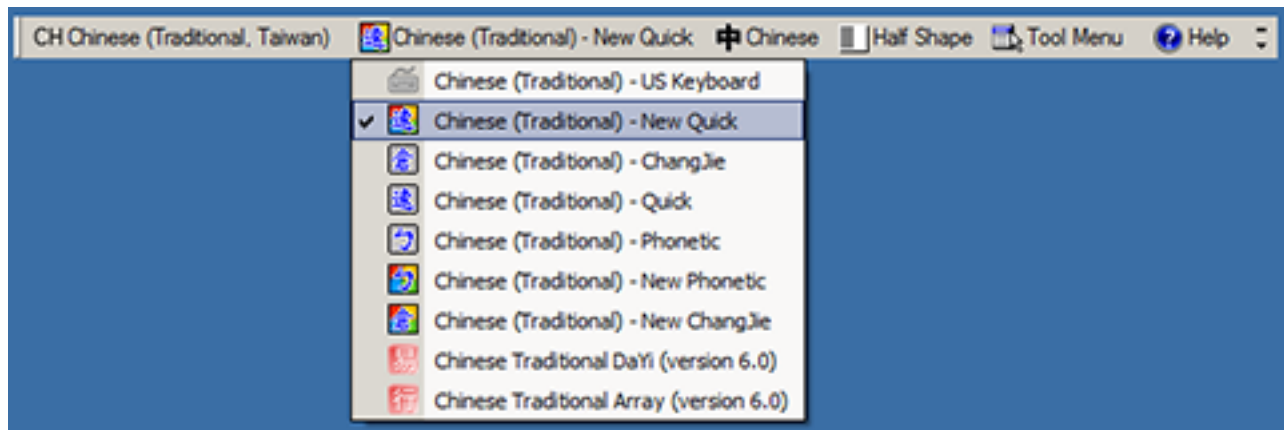
- Select Unicode input on Windows XP: **Chinese (Traditional) - Unicode**



- Select Big5 input on Windows XP: **Chinese (Traditional) - Big5 Code**



- Select Unicode/Big5 input on Windows 7: **Chinese (Traditional) - New Quick**. This option support both Unicode and Big5 input.



Programming Reference

This section provides symbol and AIM code identifiers.

Symbol Code Identifiers

Symbol code identifiers identify the symbology type of decode data. The identifier may be appended to data transmitted to the host, or used in other ways to help identify decode data.

Table 36 Symbol Code Characters

Code Character	Code Type
A	UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13
B	Code 39, Code 32
C	Codabar
D	Code 128, ISBT 128, ISBT 128 Concatenated
E	Code 93
F	Interleaved 2 of 5
G	Discrete 2 of 5, or Discrete 2 of 5 IATA
H	Code 11
J	MSI
K	GS1-128
L	Bookland EAN
M	Trioptic Code 39
N	Coupon Code
R	GS1 DataBar Family
S	Matrix 2 of 5
T	UCC Composite, TLC 39
U	Chinese 2 of 5
X	ISSN EAN, PDF417, Macro PDF417, Micro PDF417
z	Aztec, Aztec Rune

Table 36 Symbol Code Characters (Continued)

Code Character	Code Type
P00	Data Matrix
P01	QR Code, MicroQR
P02	Maxicode
P08	Netherlands KIX Code
P0A	USPS 4CB/One Code/Intelligent Mail
P0C	Mailmark
P0D	Grid Matrix
P0G	GS1 Data Matrix
P0H	Han Xin
P0Q	GS1 QR
P0X	Signature Capture

AIM Code Identifiers

An AIM code identifier identifies the symbology type of decode data. The identifier may be appended to data transmitted to the host, or used in other ways to help identify decode data.

Each AIM Code Identifier contains the three-character string]cm where:

] = Flag Character (ASCII 93)

c = Code Character (see table below)

m = Modifier Character (see table below)

Table 37 AIM Code Characters

Code Character	Code Type
A	Code 39, Code 39 Full ASCII, Code 32
C	Code 128, ISBT 128, ISBT 128 Concatenated, GS1-128, Coupon (Code 128 portion)
d	Data Matrix, GS1 Data Matrix
E	UPC/EAN, Coupon (UPC portion)
e	GS1 DataBar Family
F	Codabar
G	Code 93
g	Grid Matrix

Table 37 AIM Code Characters (Continued)

Code Character	Code Type
H	Code 11
h	Han Xin
I	Interleaved 2 of 5
L	PDF417, Macro PDF417, Micro PDF417
L2	TLC 39
M	MSI
Q	QR Code, MicroQR, GS1 QR
S	Discrete 2 of 5, IATA 2 of 5
U	Maxicode
z	Aztec, Aztec Rune
X	Bookland EAN, ISSN EAN, Trioptic Code 39, Chinese 2 of 5, Matrix 2 of 5, Korean 3 of 5, US Postnet, US Planet, UK Postal, Japan Postal, Australia Post, Netherlands KIX Code, USPS 4CB/One Code/ Intelligent Mail, UPU FICS Postal, Mailmark, Signature Capture

The modifier character is the sum of the applicable option values based on the following table.

Table 38 Modifier Characters

Code Type	Option Value	Option
Code 39	0	No check character or Full ASCII processing.
	1	Reader has checked one check character.
	3	Reader has checked and stripped check character.
	4	Reader has performed Full ASCII character conversion.
	5	Reader has performed Full ASCII character conversion and checked one check character.
	7	Reader has performed Full ASCII character conversion and checked and stripped check character.
	Example: A Full ASCII barcode with check character W, A+I+MI+DW, is transmitted as JA7AIMID where 7 = (3+4).	
Trioptic Code 39	0	No option specified at this time. Always transmit 0.
	Example: A Trioptic barcode 412356 is transmitted as JX0412356	
Code 128	0	Standard data packet, no Function code 1 in first symbol position.
	1	Function code 1 in first symbol character position.
	2	Function code 1 in second symbol character position.
	Example: A Code (EAN) 128 barcode with Function 1 character FNC1 in the first position, AIMID is transmitted as JC1AIMID	
I 2 of 5	0	No check digit processing.

Table 38 Modifier Characters (Continued)

Code Type	Option Value	Option
	1	Reader has validated check digit.
	3	Reader has validated and stripped check digit.
	Example: An I 2 of 5 barcode without check digit, 4123, is transmitted as]I04123	
Codabar	0	No check digit processing.
	1	Reader has checked check digit.
	3	Reader has stripped check digit before transmission.
	Example: A Codabar barcode without check digit, 4123, is transmitted as]F04123	
Code 93	0	No options specified at this time. Always transmit 0.
	Example: A Code 93 barcode 012345678905 is transmitted as]G0012345678905	
MSI	0	Check digits are sent.
	1	No check digit is sent.
	Example: An MSI barcode 4123, with a single check digit checked, is transmitted as]M14123	
D 2 of 5	0	No options specified at this time. Always transmit 0.
	Example: A D 2 of 5 barcode 4123, is transmitted as]S04123	
UPC/EAN	0	Standard data packet in full EAN format, i.e., 13 digits for UPC-A, UPC-E, and EAN-13 (not including supplemental data).
	1	Two digit supplemental data only.
	2	Five digit supplemental data only.
	3	Combined data packet comprising 13 digits from EAN-13, UPC-A or UPC-E symbol and 2 or 5 digits from supplemental symbol.
	4	EAN-8 data packet.
	Example: A UPC-A barcode 012345678905 is transmitted as]E0012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN barcode 123456789X is transmitted as]X0123456789X	
ISSN EAN	0	No options specified at this time. Always transmit 0.
	Example: An ISSN EAN barcode 123456789X is transmitted as]X0123456789X	
Code 11	0	Single check digit
	1	Two check digits
	3	Check characters validated but not transmitted.
GS1 DataBar Family		No option specified at this time. Always transmit 0. GS1 DataBar Omnidirectional and GS1 DataBar Limited transmit with an Application Identifier "01".Note: In GS1-128 emulation mode, GS1 DataBar is transmitted using Code 128 rules (i.e.,]C1).
	Example: A GS1 DataBar Omnidirectional barcode 0110012345678902 is transmitted as]e00110012345678902.	

Table 38 Modifier Characters (Continued)

Code Type	Option Value	Option
EAN.UCC Composites (GS1 DataBar, GS1-128, 2D portion of UPC composite)		Native mode transmission.  NOTE: UPC portion of composite is transmitted using UPC rules.
	0	Standard data packet.
	1	Data packet containing the data following an encoded symbol separator character.
	2	Data packet containing the data following an escape mechanism character. The data packet does not support the ECI protocol.
	3	Data packet containing the data following an escape mechanism character. The data packet supports the ECI protocol.
		GS1-128 emulationNote: UPC portion of composite is transmitted using UPC rules.
	1	Data packet is a GS1-128 symbol (i.e., data is preceded with]JC1).
PDF417, Micro PDF417	0	Reader set to conform to protocol defined in 1994 PDF417 symbology specifications. Note: When this option is transmitted, the receiver cannot reliably determine whether ECIs have been invoked or whether data byte 92DEC has been doubled in transmission.
	1	Reader set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92DEC are doubled.
	2	Reader set for Basic Channel operation (no escape character transmission protocol). Data characters 92DEC are not doubled. Note: When decoders are set to this mode, unbuffered Macro symbols and symbols requiring the decoder to convey ECI escape sequences cannot be transmitted.
	3	The barcode contains a GS1-128 symbol, and the first codeword is 903-907, 912, 914, 915.
	4	The barcode contains a GS1-128 symbol, and the first codeword is in the range 908-909.
	5	The barcode contains a GS1-128 symbol, and the first codeword is in the range 910-911.
		Example: A PDF417 barcode ABCD, with no transmission protocol enabled, is transmitted as]L2ABCD.
Data Matrix	0	ECC 000-140, not supported.
	1	ECC 200.
	2	ECC 200, FNC1 in first or fifth position.
	3	ECC 200, FNC1 in second or sixth position.
	4	ECC 200, ECI protocol implemented.
	5	ECC 200, FNC1 in first or fifth position, ECI protocol implemented.
	6	ECC 200, FNC1 in second or sixth position, ECI protocol implemented.

Table 38 Modifier Characters (Continued)

Code Type	Option Value	Option
GS1 Data Matrix	2	ECC 200, FNC1 in first or fifth position.
MaxiCode	0	Symbol in Mode 4 or 5.
	1	Symbol in Mode 2 or 3.
	2	Symbol in Mode 4 or 5, ECI protocol implemented.
	3	Symbol in Mode 2 or 3, ECI protocol implemented in secondary message.
QR Code	0	Model 1 symbol.
	1	Model 2 / MicroQR symbol, ECI protocol not implemented.
	2	Model 2 symbol, ECI protocol implemented.
	3	Model 2 symbol, ECI protocol not implemented, FNC1 implied in first position.
	4	Model 2 symbol, ECI protocol implemented, FNC1 implied in first position.
	5	Model 2 symbol, ECI protocol not implemented, FNC1 implied in second position.
	6	Model 2 symbol, ECI protocol implemented, FNC1 implied in second position.
GS1 QR	3	Model 2 symbol, ECI protocol not implemented, FNC1 implied in first position.
Aztec	0	Aztec symbol.
	C	Aztec Rune symbol.
Han Xin	0	Generic data, no special features are set. The transmitted data does not follow the AIM ECI protocol.
	1	ECI protocol enabled. There is at least one ECI mode encoded. Transmitted data must follow the AIM ECI protocol.
Mailmark	0	No option specified at this time. Always transmit 0.

Sample Barcodes

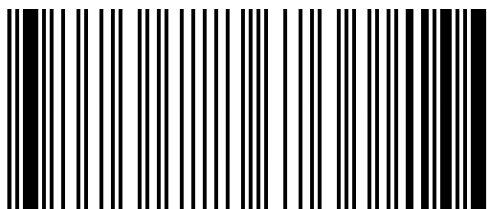
This section provides sample barcodes.

Sample Code 39



123ABC

Sample Code 93



1234567890

Sample UPC/EAN

UPC-A, 100%



0 12345 67890 5

UPC-A Plus 2



0 12345 67890

34

Sample Barcodes

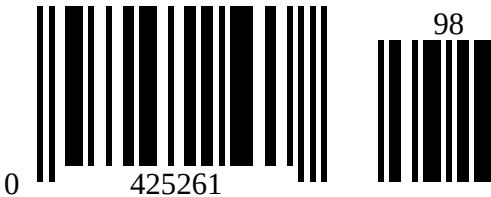
UPC-A Plus 5



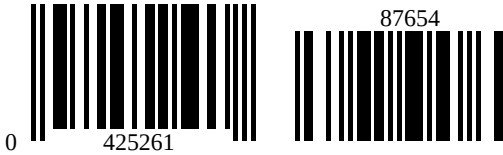
UPC-E



UPC-E Plus 2



UPC-E Plus 5



EAN-8



EAN-13, 100%



EAN-13 Plus 2



EAN-13 Plus 5



Sample Code 128



Sample Interleaved 2 of 5



Sample Chinese 2 of 5



Sample Matrix 2 of 5



Sample Korean 3 of 5



Sample GS1 DataBar

GS1 DataBar Omnidirectional



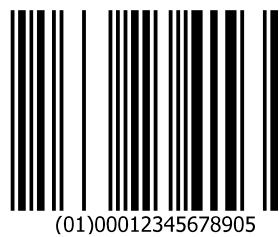
NOTE: GS1 DataBar Omnidirectional must be enabled to read the following barcode (see [GS1 DataBar Omnidirectional \(formerly GS1 DataBar-14\)](#)).



GS1 DataBar Limited



NOTE: DataDataBar Limited must be enabled to read the following barcode (see [GS1 DataBar Limited](#)).



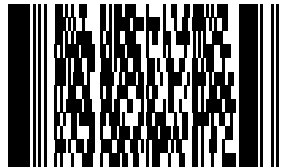
GS1 DataBar Expanded



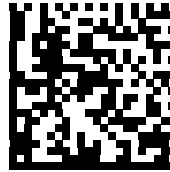
NOTE: DataBar Expanded must be enabled to read the following barcode (see [GS1 DataBar Expanded](#)).



Sample PDF417

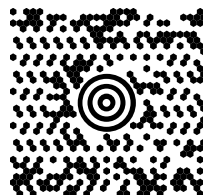


Sample Data Matrix



123456789abcdefghijklmnopqrstuvwxyz

Sample Maxicode



Sample Aztec

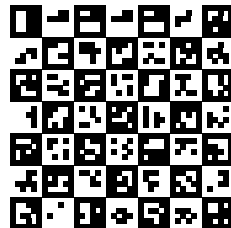


0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
 WXYZ01234567890123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHI
 JKLMNOPQRSTUVWXYZ0123456789

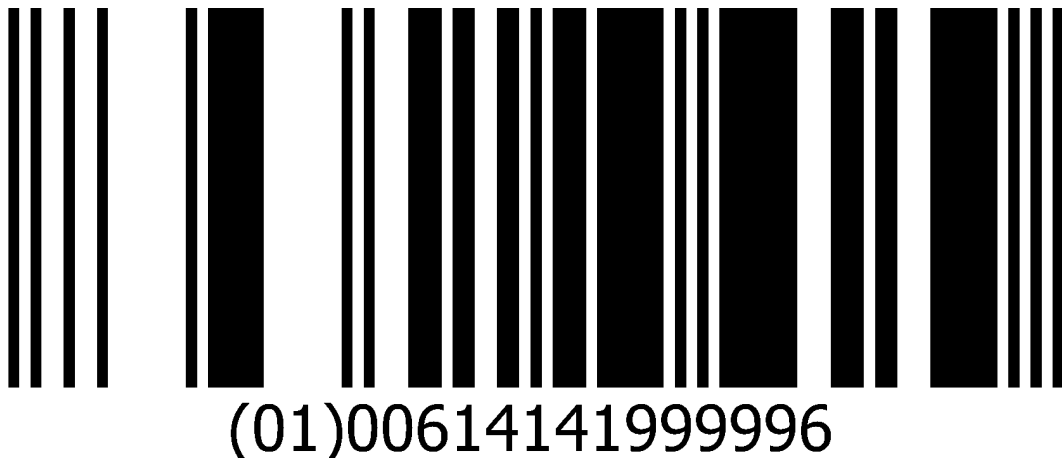
Sample Grid Matrix



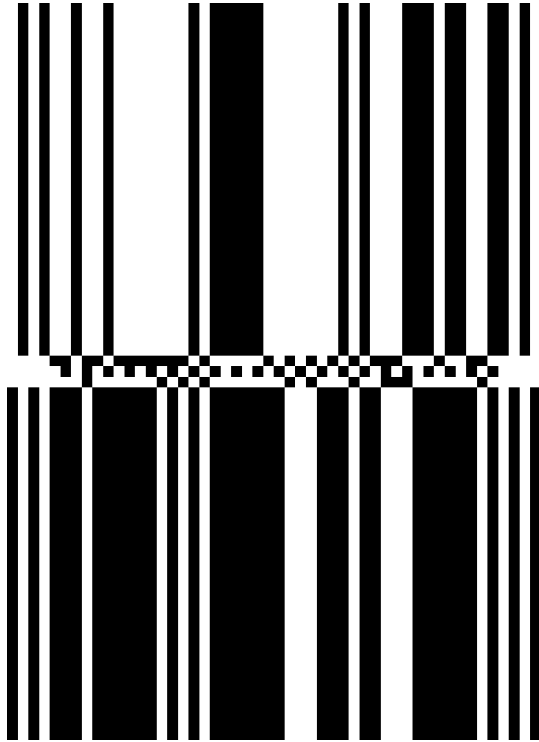
NOTE: Grid Matrix must be enabled to read the following bar code (see [Grid Matrix](#)).



Sample GS1 DataBar Truncated



Sample GS1 DataBar Stacked OmniDirectional



Sample GS1 DataBar Expanded Stacked Barcode



Sample GS1 DataBar Expanded

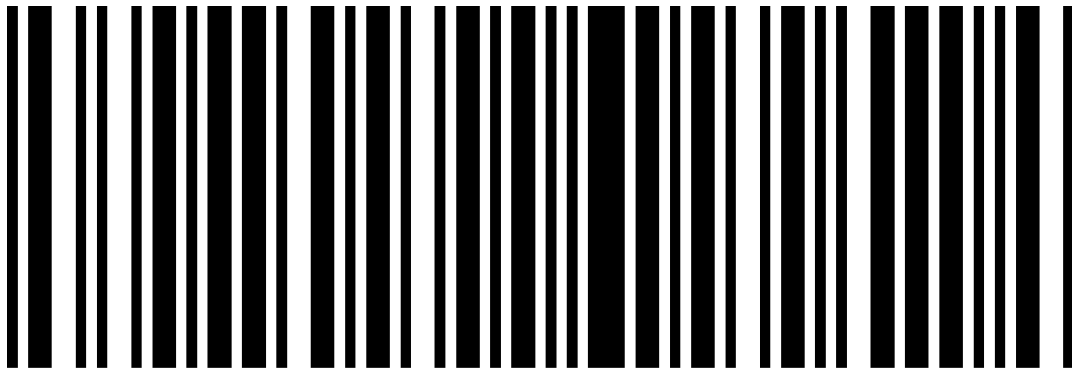


MSI Two Check Digits



123455834

Sample Code 11 with 2 Check Digits



2468101275

Sample GS1-128

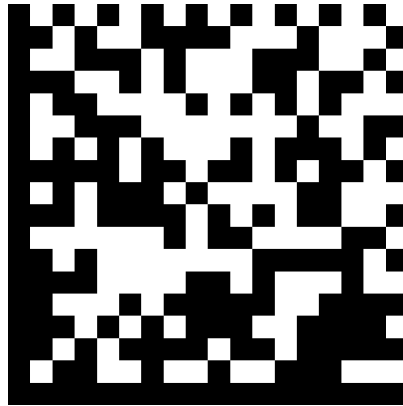


(01)94019097685457(13)170119(30)17

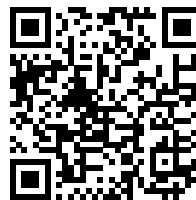
2D Symbologies

The following parameters are specific to 2D Symbologies.

Sample GS1 Data Matrix



Sample QR Code

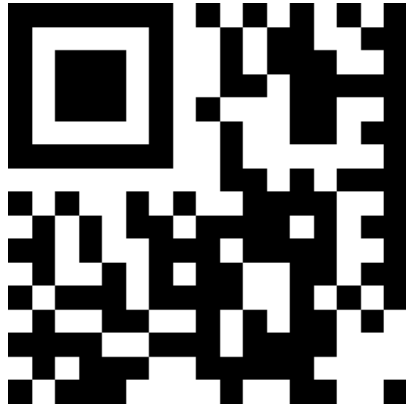


0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ012345
6789

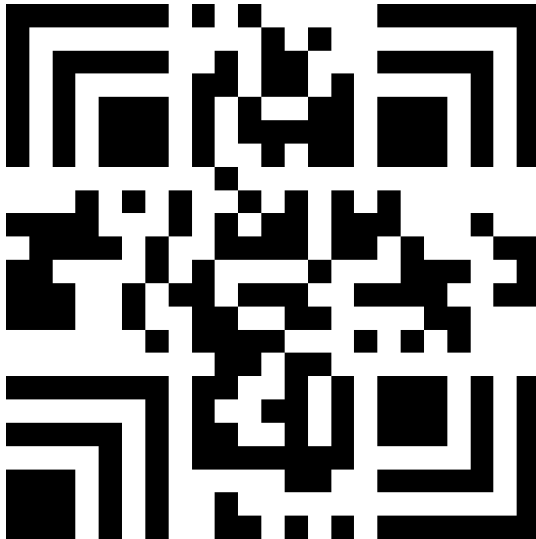
Sample GS1 QR



Sample MicroQR



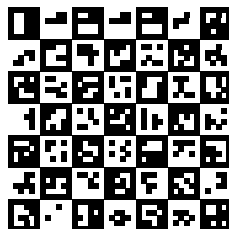
Sample Han Xin



Sample Grid Matrix



NOTE: Grid Matrix must be enabled to read the following bar code (see [Grid Matrix](#)).



Postal Codes

The following parameters are specific to postal code barcodes.

Sample US Postnet



Sample UK Postal



Japan Postal Barcode



Australian Post Barcode



OCR

The following parameters are specific to OCR barcodes.

OCR-A Barcode



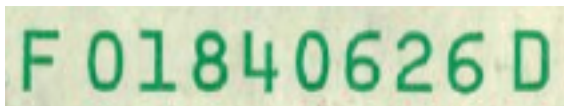
OCR-B Barcode



Sample MICR E13B

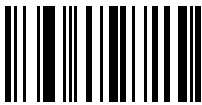


Sample US Currency



Numeric Barcodes

For parameters requiring specific numeric values, scan the appropriately numbered barcode(s).



0



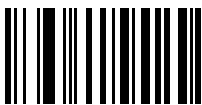
1



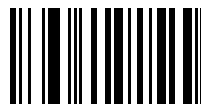
2



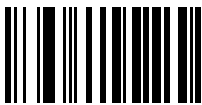
3



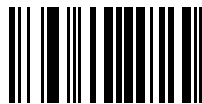
4



5



6



7



8



9

Cancel

To correct an error or change a selection, scan the barcode below.



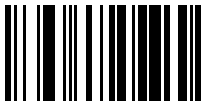
Cancel

Alphanumeric Barcodes

For parameters requiring specific alphanumeric values, scan the appropriately numbered barcode(s).

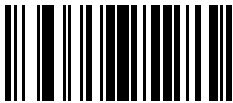
Cancel

To correct an error or change a selection, scan the barcode below.



Cancel

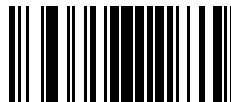
Alphanumeric Barcodes



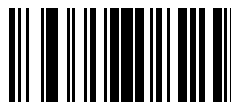
Space



\$



#



%

Alphanumeric Barcodes



*



+



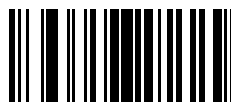
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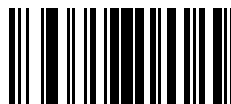
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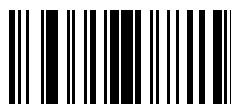
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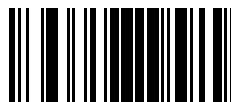
]



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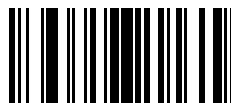
,



NOTE: Do not confuse the following barcodes with those on the numeric keypad.



0



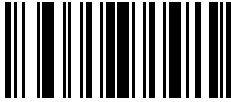
1



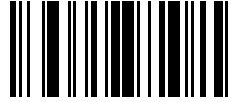
2



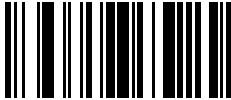
3



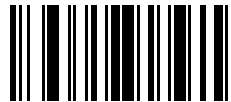
4



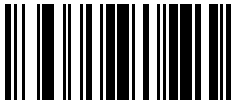
5



6



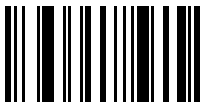
7



8



9



End of Message



Cancel



A



C



E



G



I



K



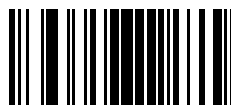
B



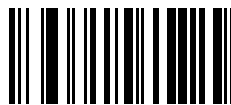
D



F



H



J



M



O



Q



S



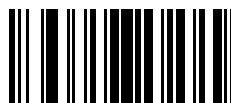
L



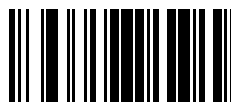
N



P



R



T



U



V



W



X



Y



Z



a



b



c



d



e



f



g



h



i



j



k



l



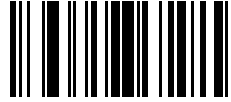
m



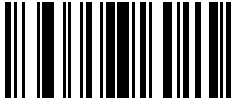
n



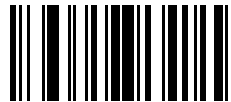
o



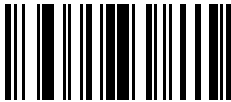
p



q



r



s



t



u



v



w



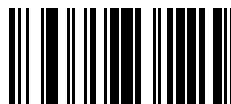
y



{



}



x



z



|



~

Communication Protocol Functionality

This section provides information about functionality supported via communication (cable) interface. The following table lists supported scanner functionality by communication protocol.

Table 39 Communication Interface Functionality

Communication Interfaces	Functionality		
	Data Transmission	Remote Management	Image and Video Transmission
USB			
HID Keyboard Emulation	Supported	Not Available	Not Available
CDC COM Port Emulation	Supported	Not Available	Not Available
SSI over CDC COM Port Emulation	Supported	Supported	Supported
IBM Table-top USB	Supported	Supported	Not Available
IBM Hand-held USB	Supported	Supported	Not Available
USB OPOS Hand-held	Supported	Supported	Not Available
Symbol Native API (SNAPI) without Imaging Interface	Supported	Supported	Not Available
Symbol Native API (SNAPI) with Imaging Interface	Supported	Supported	Supported
RS-232			
Standard RS-232	Supported	Not Available	Not Available
ICL RS-232	Supported	Not Available	Not Available
Fujitsu RS-232	Supported	Not Available	Not Available
Wincor-Nixdorf RS-232 Mode A	Supported	Not Available	Not Available
Wincor-Nixdorf RS-232 Mode B	Supported	Not Available	Not Available
Olivetti ORS4500	Supported	Not Available	Not Available
Omron	Supported	Not Available	Not Available
CUTE	Supported	Not Available	Not Available
OPOS/JPOS	Supported	Not Available	Not Available
SSI	Supported	Supported	Supported

Signature Capture Code

CapCode, a signature capture code, is a special pattern that encloses a signature area on a document and allows a scanner to capture a signature.

There are several accepted patterns that allow automatic identification of different signatures on the same form. For example, on the federal tax return 1040 form there are three signature areas, one each for two joint filers, and one for a professional preparer. By using different patterns, a program can correctly identify all three, so they can be captured in any sequence and still be identified correctly.

Code Structure

This section provides details on CapCode and the signature capture box.

Signature Capture Area

A CapCode is printed as two identical patterns on either side of a signature capture box.

Each pattern extends the full height of the signature capture box. For an example, see [the figure below](#).

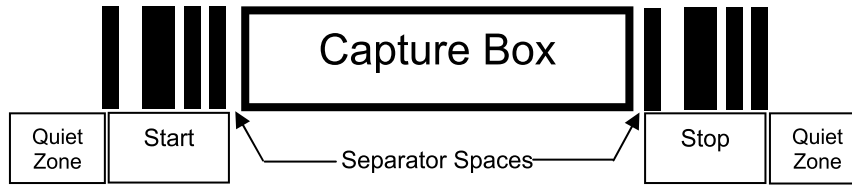
The box is optional, so you can omit it, replace it with a single baseline, or print a baseline with an "X" on top of it towards the left, as is customarily done in the US to indicate a request for signature. However, if an "X" or other markings are added in the signature box area, these are captured with the signature.

Figure 14 CapCode



CapCode Pattern Structure

A CapCode pattern structure consists of a start pattern followed by a separator space, a signature capture box, a second separator space, and then a stop pattern. Assuming that X is the dimension of the thinnest element, the start and stop patterns each contains 9X total width in 4 bars and 3 spaces. A 7X quiet zone is required to the left and to the right of the CapCode pattern.

Figure 15 CapCode Structure

The separator spaces on either side of the signature capture box can be between 1X and 3X wide.

Start / Stop Patterns

This section lists the accepted start / stop patterns. The bar and space widths are expressed as multiples of X.

You must use the same pattern on either side of a signature capture box. The type value is reported with the captured signature to indicate the purpose of the signature captured.

Table 40 Start / Stop Pattern Definitions

Bar/Space Patterns							Type
B	S	B	S	B	S	B	
1	1	2	2	1	1	1	2
1	2	2	1	1	1	1	5
2	1	1	2	1	1	1	7
2	2	1	1	1	1	1	8
3	1	1	1	1	1	1	9

The following table lists selectable parameters used to generate the image of the captured signature.

Table 41 User Defined CapCode Parameters

Parameter	Defined
Width	Number of pixels
Height	Number of pixels
Format	JPEG, BMP, TIFF
JPEG quality	1 (most compression) to 100 (best quality)
Bits Per Pixel (not applicable to JPEG format)	1 (2 levels)
	4 (16 levels)
	8 (256 levels)

BMP format does not use compression, JPEG and TIFF formats do.

Dimensions

The size of the signature capture box is determined by the height and separation of the start and stop patterns. The line width of the signature capture box is insignificant.

The thinnest element width, referred to here as X, is nominally 10 mils (1 mil = 0.0254 mm). Select this as an exact multiple of the pixel pitch of the printer used. For example, when using a 203 DPI (dots-per-inch) printer and printing 2 dots per module, the resulting X dimension is 9.85 mils.

Data Format

Zebra decoders allow different user options to output or inhibit barcode type. Selecting "Symbol ID" as the barcode type for output identifies the CapCode with letter "i".

The decoder output is formatted according to the following table.

Table 42 Data Format

File Format (1 byte)	Type (1 byte)	Image Size (4 bytes, BIG Endian)	Image Data
JPEG - 1 BMP - 3 TIFF - 4	See Start/Stop Pattern Definitions table , last column		(Same bytes as in a data file)

Additional Capabilities

Regardless of how the signature is captured, the output signature image is de-skewed and right-side up.

A scanner that captures signatures automatically determines whether it is scanning a signature or a barcode. You can disable the signature capturing capability in a decoder.

Signature Boxes

This section illustrates the five acceptable signature boxes:

Figure 16 Acceptable Signature Boxes

Type 2:



Type 5:



Type 7:



Type 8:



Type 9:



Non-Parameter Attributes

This section defines the scanner's non-parameter attributes.

Model Number

Attribute #533

The model number of the scanner. This electronic output matches the printout on the physical device label.

Type	S
Size (Bytes)	18
User Mode Access	R
Values	Variable

Serial Number

Attribute #534

The unique serial number assigned in the manufacturing facility. This electronic output matches the printout on the physical device label, for example M1J26F45V.

Type	S
Size (Bytes)	16
User Mode Access	R
Values	Variable

Date of Manufacture

Attribute #535 Date of device manufacture assigned in the manufacturing facility. This electronic output matches the printout on the physical device label, for example, 30APR14 (which reads the 30th of April 2014).

Attribute Property	Property Value
Type	S
Size (Bytes)	7
User Mode Access	R

Attribute Property	Property Value
Values	Variable

Date of First Programming

Attribute #614

This attribute contains the date of first electronic programming represents the first time settings were electronically loaded to the scanner either by 123Scan or via SMS, for example 18MAY14 (which reads the 18th of May 2014).

Attribute Property	Property Value
Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

Configuration Filename

Parameter # 616

Scanning the Set Defaults barcode automatically changes the configuration filename to factory defaults. To indicate the configuration settings loaded to the device were changed, the configuration filename changes to Modified upon scanning any parameter barcode.

Attribute Property	Property Value
Type	S
Size (Bytes)	17
User Mode Access	RW
Values	Variable

Beeper/LED

Attribute #6000

Activates the beeper and/or LED.

Attribute Property	Property Value
Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	See Beeper/LED Values

Table 43 Beeper/LED Values

Beep / LED Action	Value	Beep / LED Action	Value
1 high short beep	0	1 low long beep	15
2 high short beeps	1	2 low long beeps	16
3 high short beeps	2	3 low long beeps	17
4 high short beeps	3	4 low long beeps	18
5 high short beeps	4	5 low long beeps	19
1 low short beep	5	Fast warble beep	20
2 low short beeps	6	Slow warble beep	21
3 low short beeps	7	High-low beep	22
4 low short beeps	8	Low-high beep	23
5 low short beeps	9	High-low-high beep	24
1 high long beep	10	Low-high-low beep	25
2 high long beeps	11	High-high-low-low beep	26
3 high long beeps	12	Green LED off	42
4 high long beeps	13	Green LED on	43
5 high long beeps	14	Red LED on	47
		Red LED off	48

Parameter Defaults

Attribute #6001

This attribute restores all parameters to their factory defaults.

Attribute Property	Property Value
Type	X
Size (Bytes)	N/A
User Mode Access	W

Attribute Property	Property Value
Values	0 = Restore Defaults 1 = Restore Factory Defaults 2 = Write Custom Defaults

Beep on Next Bootup

Attribute #6003

This attribute configures (enables or disables) beep on next boot up of scanner.

Attribute Property	Property Value
Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	0 = Disable beep on next bootup 1 = Enable beep on next bootup

Reboot

Attribute #6004

This attribute initiates a device reboot.

Attribute Property	Property Value
Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	N/A

Host Trigger Session

Attribute #6005

This attribute triggers a decode session.

Attribute Property	Property Value
Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	1 = Start Host Trigger Session 0 = Stop Host Trigger Session

Firmware Version

Parameter # 20004

This parameter returns the scanner's operating system version. For example, NBRFMAAC or PAAAABS00-007-R03D0.

Attribute Property	Property Value
Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

Scankit Version

Attribute #20008

Identifies the 1D decode algorithms resident on the device, for example SKIT4.33T02.

Attribute Property	Property Value
Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

RFID Attributes

The following attributes are provide information about the DS8208/DS8288 RFID behavior.

RFID Last Tag ID

Attribute #35001

The EPC tag ID of the last tag reported (size-encoded binary).

Attribute	Value
Type	A
Size (bytes)	34
User Mode Access	Read
Values	Variable

RFID Tag ID

Attribute #35002

Attribute	Value
Type	A
Size (bytes)	34
User Mode Access	R
Values	Variable

RFID Bank

Attribute #35003.

The desired tag bank

Attribute	Value
Type	B
Size (bytes)	1
User Mode Access	Write
Values	0 = reserved 1 = EPC 2 = TID 3 = User

RFID Data

Attribute #35004

Buffer for read, write, and lock (size-encoded binary).

Attribute	Value
Type	A
Size (bytes)	66
User Mode Access	Read/write
Values	Variable

RFID Offset

Attribute #35005

Word offset into tag buffer.

Attribute	Value
Type	W
Size (bytes)	2
User Mode Access	Write
Values	Variable

RFID Length

Attribute #35006

Words of data to read from tag buffer.

Attribute	Value
Type	W
Size (bytes)	2
User Mode Access	Write

Non-Parameter Attributes

Attribute	Value
Values	Variable

RFID Password

Attribute #35008

Execute command.

Attribute	Value
Type	B
Size (bytes)	1
User Mode Access	Write
Values	1 = Read 2 = Write 3 = Lock 4 = Kill

RFID Password

Attribute #35009

Execute command.

Attribute	Value
Type	W
Size (bytes)	2
User Mode Access	Read
Values	Variable

RFID Tag Cache

Attribute #3010

text describing the Attribute #goes here.

Attribute	Value
Type	
Size (bytes)	
User Mode Access	
Values	

Table 44 RFIDCmdStatus Definitions

Bytes	Definition
0x0000	Success.
0x0001	No RFID module.

Table 44 RFIDCmdStatus Definitions (Continued)

Bytes	Definition
0x0002	Tag not found.
0x0003	Timeout.
0x0004	Tag CRC error.
0x01xx	Tag backscatter error. LSB indicates the error code as per EPC protocol.
0x02xx	Tag access error. LSB indicates the error code.
0x03xx	Bad parameter, the LSB indicates which parameter: 1 = Command 2 = TagID 3 = Bank 4 = Data 5 = Offset 6 = Password 7 = Length

