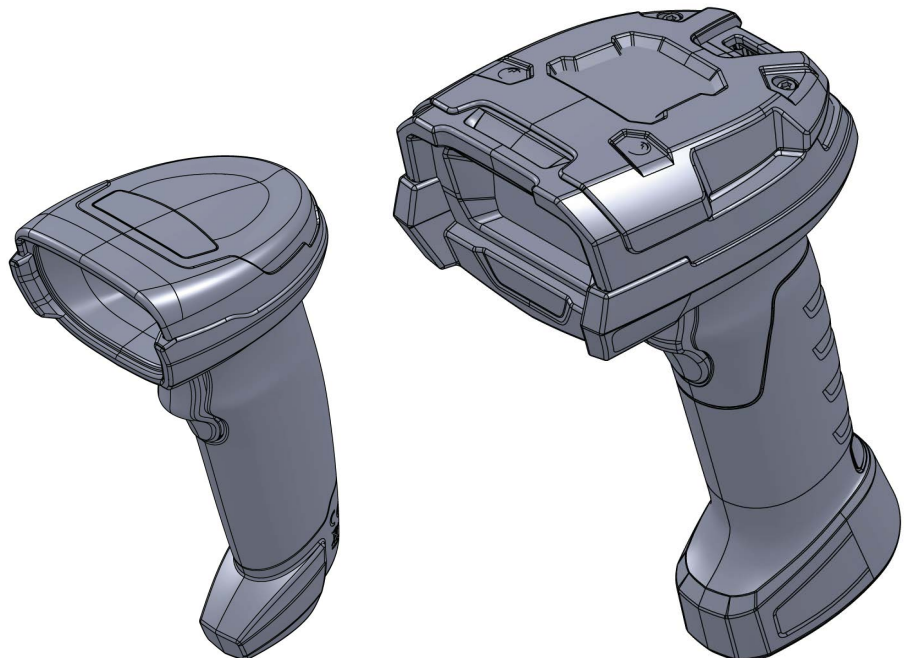


OMRON

V410-H and V450-H Handheld Barcode Reader

User Manual



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Publicly available software list:

Name: Regular Expression Evaluator

Version: 8.3

Description: Compiles and executes regular expressions.

Software Site: <http://www.freebsd.org/cgi/cvsweb.cgi/src/lib/libc/regex/>

Source Code: No Source Distribution Obligations. Seller will not provide nor distribute the Source Code for the Regular Expression Evaluator.

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About This Manual

The *V410-H and V450-H Handheld Barcode Reader User Manual* provides general instructions for setting up, operating, maintaining, and troubleshooting all models of V410-H and V450-H readers.

Notational Conventions

The following conventions are used in this document:

Italics are used to highlight the following:

- Chapters and sections in this and related documents;
- Dialog box, window and screen names;
- Drop-down list and list box names;
- Check box and radio button names.

Bold text is used to highlight the following:

- Key names on a keypad;
- Button names on a screen.

Bullets (•) indicate:

- Action items;
- Lists of alternatives.

Lists of required steps that are not necessarily sequential:

- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.
- Throughout the programming barcode menus, asterisks (*) are used to denote default parameter settings.



* Indicates Default * **HID Keyboard Emulation** — Feature/Option

Related Documents

For the latest versions of all user documentation, visit automation.omron.com.

V410-H and V450-H Configurations

This manual includes the following reader configurations:

Part Number	Description
V410-H	
V410-HDS4608SR	V410-H SR Handheld Reader, Black Grey, Wired
V410-HDS4608XD	V410-H XD Handheld Reader, Black Grey, Wired, with X-Mode
V410-HDS4608HC	V410-H HC Handheld Reader, White, Wired
V450-H	
V450-HDS3608-0001	V450-H Handheld DPM Reader, Wired
V450-HDS3678-0001	V450-H Handheld DPM Reader, Wireless
V450-HDS3608-0002	V450-H Handheld DPM Reader, Wired, for Korea and India
V450-HDS3678-0002	V450-H Handheld DPM Reader, Wireless, for Korea and India

V410-H and V450-H Accessories, Cables, and Power Supplies

Caution: Use only cables designed for the V410-H and V450-H Handheld Readers.

Part Number	Description
V410-H	
Accessories	
V410-AS0	Stand, V410-H
USB Cables	
V410-WUB-2M	Cable, USB, 7 ft., Mod Plug
RS-232 Cables	
V410-WR-2M	Cable, RS-232, DB9F, TXD-2, 7 ft.
Power Supplies	
V410-AC0-1	Kit, V410-H AC Power Supply, 5.2 VDC, 2A
V450-H	
Accessories	
V450-AB0-1	Kit, Battery, Spare, V450-H Wireless
V450-AB1-1	Kit, Battery, Spare, Korea and India, V450-H Wireless
V450-AG0-1	Kit, 4-Slot Battery Charger, V450-H Wireless
V450-AK0	Cradle, Charger, Sealed, V450-H Wireless
V450-AS0-1	Stand, V450-H
USB Cables	
V450-WUX-2M	Cable, USB, Shielded, 2 M, Ext. 12V, V450-H
V450-WUX-4M	Cable, USB, Shielded, 4.6 M, Ext. 12V, V450-H
V450-WUB-2M	Cable, USB, Shielded, 2 M, V450-H
V450-WUB-4M	Cable, USB, Shielded, 4.6 M, V450-H
RS-232 Cables	
V450-WR-2M	Cable, RS-232, DB9 Socket, 2 M, Straight, V450-H
Power Supplies	
V450-AC0-1	Kit, Power Supply for Cradle / Charger, V450-H Wireless
V450-AC1-1	Kit, Power Supply for 4-Slot Battery Charger, V450-H Wireless
V450-WPCN-2M	AC Power Cable, 1.8 M, China, C13 Conn.
V450-WPEU-2M	AC Power Cable, 1.8 M, EU, C13 Conn.
V450-WPGB-2M	AC Power Cable, 1.8 M, UK, C13 Conn.
V450-WPIN-2M	AC Power Cable, 1.9 M, India, C13 Conn.
V450-WPJP-2M	AC Power Cable, 1.8 M, Japan, C13 Conn.
V450-WPUS-2M	AC Power Cable, 1.8 M, U.S., C13 Conn.

Service Information

If you have a problem using the equipment, contact your facility's technical or systems support. If there is a problem with the equipment, you can contact customer service at: www.ia.omron.com.

When contacting support, please have the following information available:

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

Omron Microscan responds to calls by e-mail, telephone or fax within the time limits set forth in service agreements.


If your problem cannot be solved by support, you may need to return your equipment for servicing and will be given specific directions. Omron Microscan 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 product from an Omron Microscan business partner, please contact that partner for support.

Safety Precautions

● Symbols and Safety Precautions in This Manual







In order for the product to be used safely, the following indications are used in this book to draw your attention to the cautions. The cautions with the indications describe the important contents for safety.

 WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
--	---

 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
--	--

● Meanings of Alert Symbols







The following alert symbols are used in this manual.

	General Prohibition Indicates general prohibitions, including warnings, for which there is no specific symbol.
	Do Not Disassemble Never disassemble the equipment. Otherwise, a hazard to personnel, such as electric shock can result.
	General Caution Indicates unspecified general alert.
	Electric Shock Warning Indicates the possible danger of electric shock under specific conditions. The figure to the left indicates a caution for the above possibility (including warnings).
	Caution, Laser Beam Indicates the possibility of the risk of laser beam exposure.
	Caution, explosion Indicates the possibility of explosion under specific conditions.




● **Alert Statements in This Manual**

The following alert statements apply to the products in this manual. Each alert statement also appears at the locations needed in this manual to attract your attention.

1. Common

 WARNING	
This product must be used according to this manual or instruction sheet. Failure to observe this may result in impairment of the functions and performance of the product.	
This product is not designed or rated for ensuring safety of persons. Do not use it for such purposes.	
When using equipment that is connected to an AC power source such as an AC adapter or PoE injector, use it within the rated voltage range. Usage with a voltage higher than what it is rated for may cause serious personal injury due to electric shock, or serious physical damage due to fire or equipment failure. Do not touch any part of the device while in operation, or immediately after turning OFF the power.	
Please take external safety measures so that the system as a whole remains safe even if this product malfunctions, or has an error condition caused by external factors. An abnormal operation may result in serious accident.	
Please take fail-safe measures in preparation for any abnormal signal due to signal conductor disconnection and/ or momentary power interruption. An abnormal operation may result in serious accident.	

2. Laser Device (V450-H)



 WARNING	
Please be very careful that the laser light does not enter a persons eyes either directly, or reflected by a mirror object. Laser light emitted from the laser has high power density, and it may cause blindness if it enters the eyes.	
Do not attempt to dismantle, repair, or modify the product. Laser light emitted from the laser has high power density, and it may cause blindness if it enters the eyes.	

This device is classified as a Class 2 laser product according to IEC standard IEC 60825-1. The following warning label is affixed to the product.

V450-H



3. Models with Lithium Ion Battery (V450-H)

 WARNING	
There is a built-in lithium ion battery, and there is a danger of combustion or explosion that could result in severe personal injury. Never disassemble, pressurize, deform, overheat to 100°C, or incinerate.	

Precautions for Safe Use

Condition of the Fitness of OMRON Products

- Please do not use this product to directly or indirectly use to detect the human body for the purpose of ensuring the safety. In the same application, please use the safety sensor that is published on our sensor catalog.
- Omron products are designed and manufactured as general-purpose products for use in general industrial applications. They are not intended to be used in the following critical applications. If you are using Omron products in the following applications, Omron shall not provide any warranty for such Omron products, unless otherwise specifically agreed or unless the specific applications are intended by Omron.
 - (a) Applications with stringent safety requirements, including but not limited to nuclear power control equipment, combustion equipment, aerospace equipment, railway equipment, elevator/lift equipment, amusement park equipment, medical equipment, safety devices and other applications that could cause danger/harm to people's body and life
 - (b) Applications that require high reliability, including but not limited to supply systems for gas, water and electricity, etc., 24 hour continuous operating systems, financial settlement systems and other applications that handle rights and property
 - (c) Applications under severe condition or in severe environment, including but not limited to outdoor equipment, equipment exposed to chemical contamination, equipment exposed to electromagnetic interference and equipment exposed to vibration and shocks
 - (d) Applications under conditions and environment not described in specifications
 - *1. In addition to the applications listed from (a) to (d) above, Omron products (see definition) are not intended for use in vehicles designed human transport (including two wheel vehicles). Please do NOT use Omron products for vehicles designed human transport. Please contact the Omron sales staff for information on our automotive line of products.
 - *2. The above is part of the Terms and Conditions Agreement. Please use carefully read the contents of the guarantee and disclaimers described in our latest version of the catalog, data sheets and manuals.

Installation Environments

- Do not use the product in areas where flammable or explosive gases are present.
- During unpacking, if this product was to fall on ones feet, it can cause injury.
- Please open the package carefully.
- Do not install the product close to high-voltage devices and power devices in order to secure the safety of operation and maintenance.
- Make sure to tighten all installation screws securely.

Power Supply

● V450-H

- Use ONLY an approved UL LISTED ITE (IEC/EN 60950-1, LPS/SELV) power supply with electrical ratings: Output 5Vdc, min 0.2A, with maximum ambient temperature of at least 50 degrees C. Use of alternative power supply will invalidate any approvals given to this unit and may be dangerous.
- Please follow local regulations to promptly dispose of used rechargeable batteries. Do not dispose of batteries in fire.
- Before turning on the power, check that the batteries are installed correctly.

● V410-H

- Use only an approved, certified LPS power supply rated 5.2Vdc, Min. 1.1A, 50 Deg. C.
- Use of any alternative power supply will invalidate the product warranty and may be dangerous.

Other

- Use only the cables designed specifically for the product. Use of other products may result in malfunction or damage of the product.
- Always turn OFF the power source for this product before connecting or disconnecting a cable. Connecting a cable while power to the product is ON may result in damage to the product or peripheral devices.
- Do not apply torsion stress to the cable. It will damage the cable.
- Please follow local regulations to promptly dispose of used rechargeable batteries. Do not dispose of batteries in fire.
- Before turning on power, check that the batteries are installed correctly.
- Secure the minimum bending radius of the cable. Otherwise the cable may be damaged.
- Do not attempt to dismantle, repair, or modify the product.
- While using this product, if you notice any abnormal condition, such as an unusual smell, excessive heat, discoloration, or deformation, immediately turn off the power and contact one of our branch offices.
- Use of the product in an abnormal state may cause fire, electric shock, or burns.
- While the power is ON or immediately after the power is turned OFF, the surface of the product is hot. Do not touch it.
- To prevent heat generation, please use a special mounting bracket (sold separately) for installation.
- When disposing of the product, treat it as an industrial waste.
- Do not drop the product or apply excessive vibration or shock to the product. Doing so may cause malfunction or burning.

Precautions for Correct Use

Installation and Storage Sites

Install and store the product in a location that meets the following conditions:

- Places where the ambient temperature does not fall outside the operating and storage temperature ranges.
- Places where temperature does not suddenly change. Places where condensation does not occur.
- Places where the relative humidity does not fall outside the operating and storage humidity ranges.
- No presence of corrosive or flammable gases.
- Places free of dust, salts, and iron particles.
- Places free of vibration and shock.
- Places out of direct sunlight.
- Places where it will not come into contact with water, oils, or chemicals.
- Places not affected by strong magnetic or electric fields
- Places with sufficient distance from high voltage equipment and mechanical equipment.

Noise Resistance

- Do not install this product within 200 mm of power cables.
- Keep the power supply wires as short as possible.

Maintenance

- Turn OFF the power and ensure the safety before maintenance.
- Remove dirt on lenses and reading windows with a cloth especially for lenses or with the use of an airbrush.
- Lightly wipe off dirt with a soft cloth.
- Do not use chemicals containing solvents such as thinner, benzene, or alcohol.
- In an environment with high humidity, or extreme temperature changes, the inside of the front window face may become foggy.
- If the read rate performance decreases due to any fogging, please turn on the power and then wait for a period of time before using, allowing time to check that any fogging of the window is gone before use.

Communication with the Host Device

- When initializing operation, clear the reception buffer at the host device or take other suitable methods to clear unwanted signals.

LED Safety

- This product is classified into the IEC 62471-1:2006 Risk-Exempt Group. However, this product does emit a strong visible light that may have an adverse effect on the eyes. Do not stare directly into the light emitted from the LED. If a specular object is used, take care not to allow reflected light to enter your eyes.

Regulations and Standards

Using Product Outside Japan

This regulation applies to code readers and peripheral devices.

If you export (or provide a non-resident with) this product or a part of this product that falls under the category of goods (or technologies) specified by the Foreign Exchange and Foreign Trade Control Law as those which require permission or approval for export, you must obtain permission or approval or service transaction permission) pursuant to the law.

Conformance to EC/EU Directives

This regulation applies to code readers and peripheral devices.

- This product is in compliance with all applicable directives, 2014/30/EU, 2014/35/EU, and 2011/65/EU.
- This product complies with EC/EU Directives. EMC-related performance of the OMRON devices that comply with EC/EU Directives will vary depending on the configuration, wiring, and other conditions of the equipment or control panel on which the OMRON devices are installed.
- The customer must, therefore, perform the final check to confirm that devices and the overall machine conform to EMC standards.

Conformance to UL Standards

This regulation applies to reader and peripheral devices.

This product complies with UL Standards.

- UL60950-1 2nd-edition, 2014 (Class III)

Korean Radio Regulation (KC)

사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Guide for Users

This equipment has been evaluated for conformity in a commercial environment. When used in a residential environment, it may cause radio interference.

Radio Frequency Interference Requirements: FCC



This equipment has been tested for compliance with FCC (Federal Communications Commission) requirements and has been found to conform to applicable FCC standards. To comply with FCC RF exposure compliance requirements, this device must not be co-located with or operate in conjunction with any other antenna or transmitter. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Class A Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Class B Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radio Frequency Interference Requirements: Canada

This device complies with Industry Canada ICES-003. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Cet appareil est conforme à la norme ICES-003 d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Revision History

The manual's part number and revision letter appear on the first and last pages.

Part Number	84-9000362-02 Rev A
--------------------	----------------------------

Revision



Revision	Date	Revised Content
A	April 2020	First publication.
B	June 2020	General improvements.



1

Quick Start

This section provides a product overview, unpacking instructions, and configuration information.

1-1	V410-H Wired Handheld Reader	1-2
1-2	V450-H Handheld DPM Reader	1-5
1-3	Set Up Host Interface	1-18

1-1 V410-H Wired Handheld Reader

Interfaces

The V410-H reader supports:

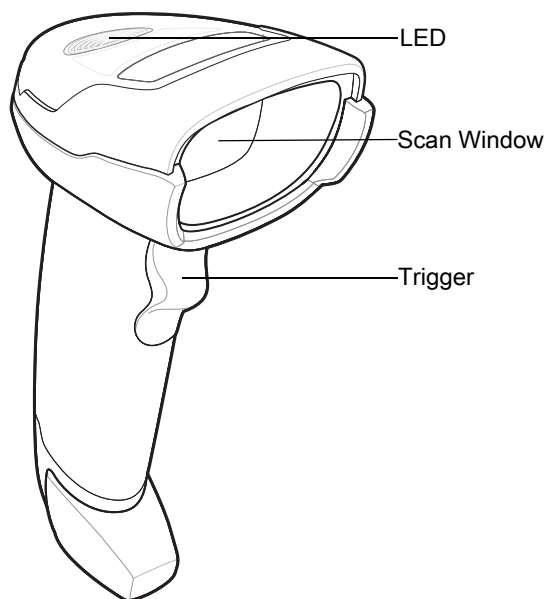
- USB connection to a host. The reader autodetects a USB host and defaults to the HID keyboard interface type. Select other USB interface types by scanning programming barcode menus. This interface supports the international keyboards (for Windows® environment) included in the chapter [Country Codes](#).
- Standard RS-232 connection to a host. Scan barcode menus to set up communication of the reader with the host.

Unpacking

Remove the digital reader from its packing and inspect it for damage. If the reader was damaged in transit, contact support. **KEEP THE PACKING**. It is the approved shipping container; use this to return the equipment for servicing.

Features

Reader Components



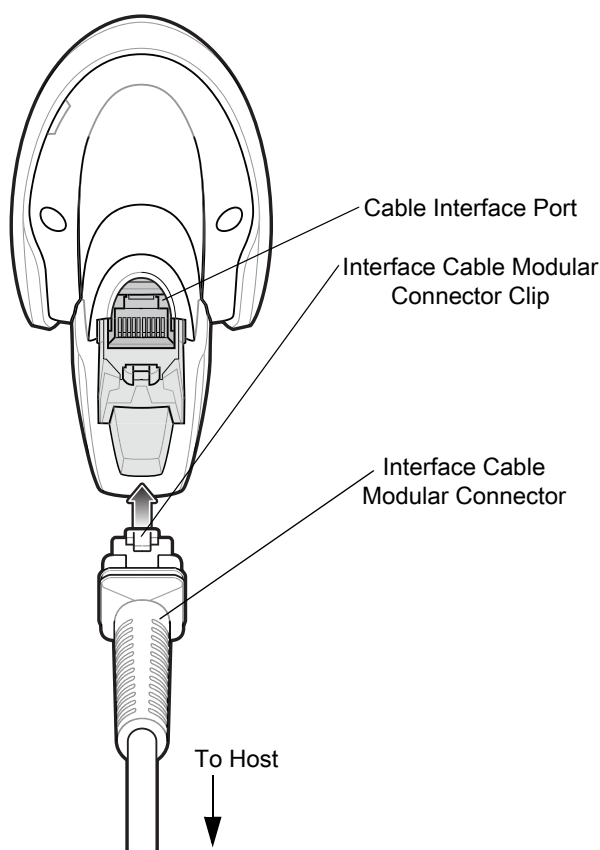
Setting Up the Reader

● Inserting the Interface Cable

Note: Different hosts require different cables. The connectors illustrated in each host chapter are examples only. Connectors vary from those illustrated, but the steps to connect the reader are the same.

- 1** Insert the interface cable modular connector into the interface cable port on the rear of the digital reader until you hear a click. Low/medium/high beeps sound, indicating the reader is operational.

Inserting the Cable

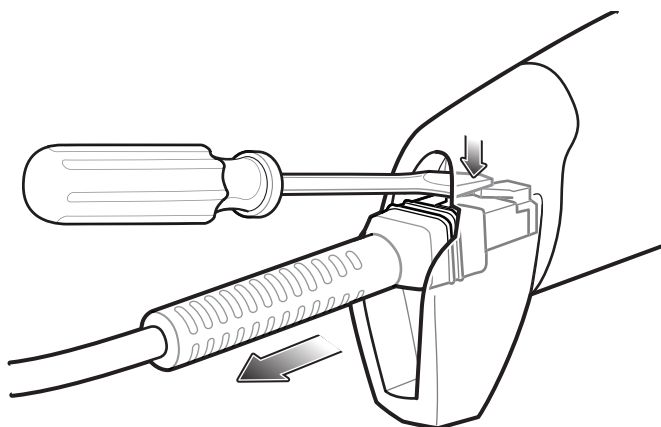


- 2** Gently tug the cable to ensure the connector is secure.
- 3** Connect the other end of the interface cable to the host (see the specific host chapter for information on host connections).

● Removing the Interface Cable

- 1** Press the cable's modular connector clip through the access slot in the digital reader's base.

Removing the Cable



- 2** Carefully slide out the cable.
- 3** Follow the steps for [Inserting the Interface Cable](#) to connect a new cable.

● Connecting Power (If Required)

If the host does not provide power to the digital reader, connect an external power supply.

- 1** Connect the interface cable to the base of the reader, as described in [Inserting the Interface Cable](#).
- 2** Connect the other end of the interface cable to the host (refer to the host manual to locate the correct port).
- 3** Plug the power supply into the power jack on the interface cable. Plug the other end of the power supply into an AC outlet.

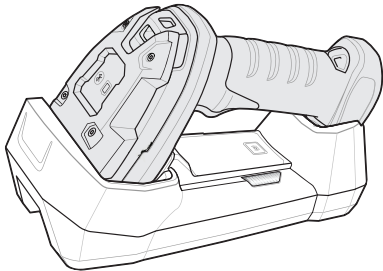
● Configuring the Reader

To configure the reader use the barcodes included in this manual or use the WebLink_{PC} configuration program. See each host-specific chapter to set up a connection to a specific host type.

1-2 V450-H Handheld DPM Reader

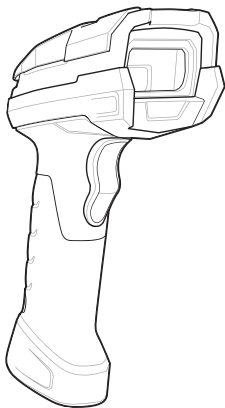
The wireless V450-H combines superior 1D and 2D omnidirectional barcode scanning performance and advanced ergonomics in a lightweight design. The reader design ensures comfort and ease of use over extended periods of time.

Important: A PowerPrecision+ 3100 mAh Li-Ion rechargeable battery is included with wireless versions of the V450-H.



V450-H Wireless Handheld DPM Reader

The wired V450-H combines superior 1D and 2D omnidirectional barcode scanning performance and advanced ergonomics in a lightweight, hands-free / handheld design. The V450-H Stand seamlessly accommodates both countertop and handheld use.



V450-H Wired Handheld DPM Reader

The V450-H Handheld DPM Reader supports:

- **USB connection to a host.** The reader autodetects a USB host and defaults to HID keyboard. Select other USB interface types by scanning programming symbol menus. The USB interface supports the following international keyboards for a Windows® environment: North American English, Japanese, German, French, French Canadian, Spanish, Italian, Swedish, UK English, and Brazilian Portuguese.
- **Standard RS-232 connection to a host.** Scan programming symbol menus to set up communication between the reader with the host.

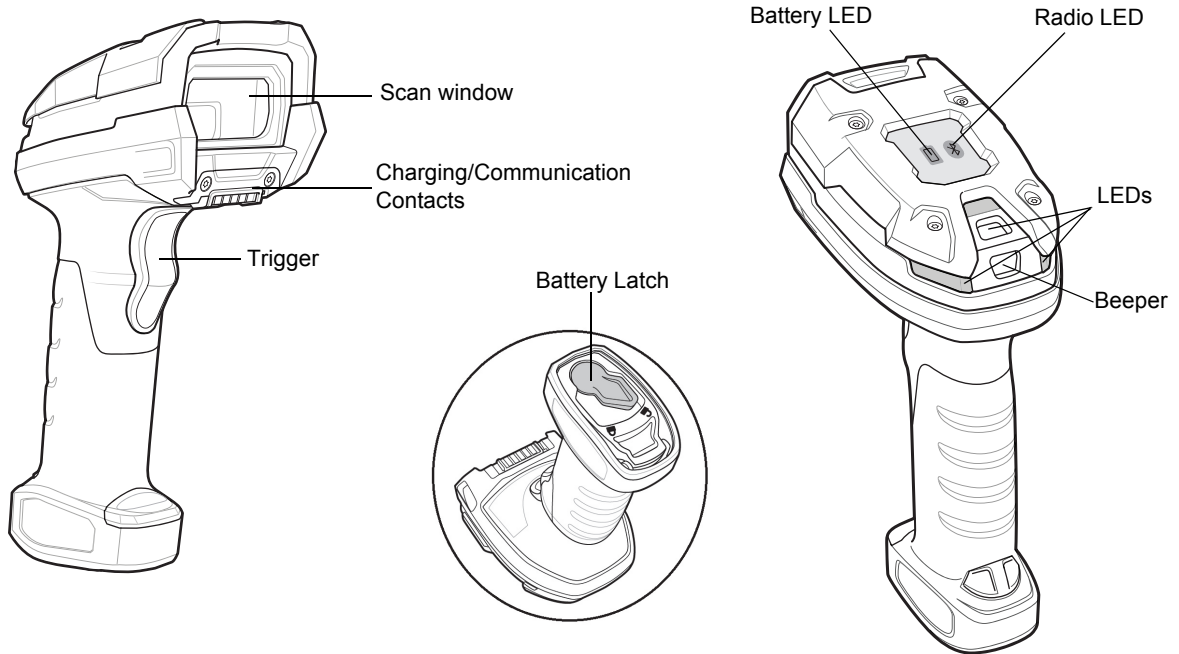
Important: An RS-232 connection is not compatible with WebLink_{PC} configuration software, and offers only limited programming options.

Unpacking

Remove the reader from its packing and inspect it for damage. If the reader was damaged during shipping, contact Omron Microscan support. **KEEP THE PACKING MATERIALS.** They comprise the approved shipping container, which you can use to return the reader for servicing.

1-2-1 V450-H Wireless Handheld DPM Reader

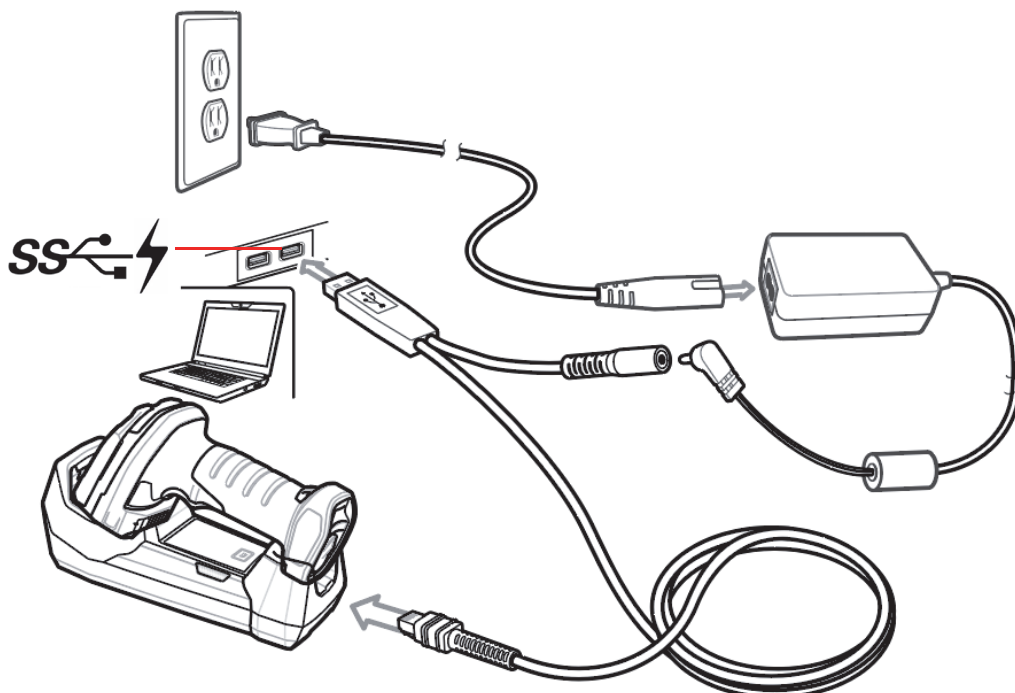
Parts



Hardware Configuration for Wireless V450-H

Note: Cables may vary depending on configuration.

When connecting the V450-H and cradle to a PC, look for a USB port with a lightning bolt icon similar to the one shown here. This icon indicates that the port is higher-powered and is intended for charging USB devices.



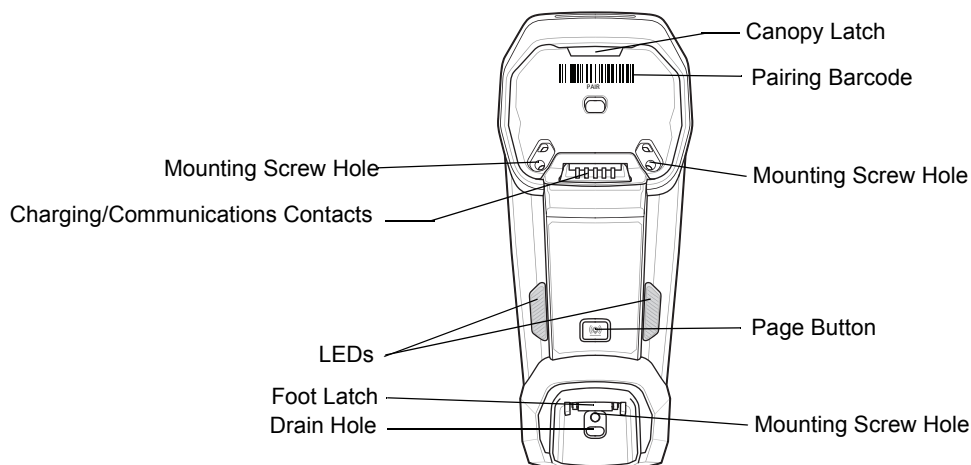
V450-H Wireless Reader USB Host Interface

The V450-H Cradle

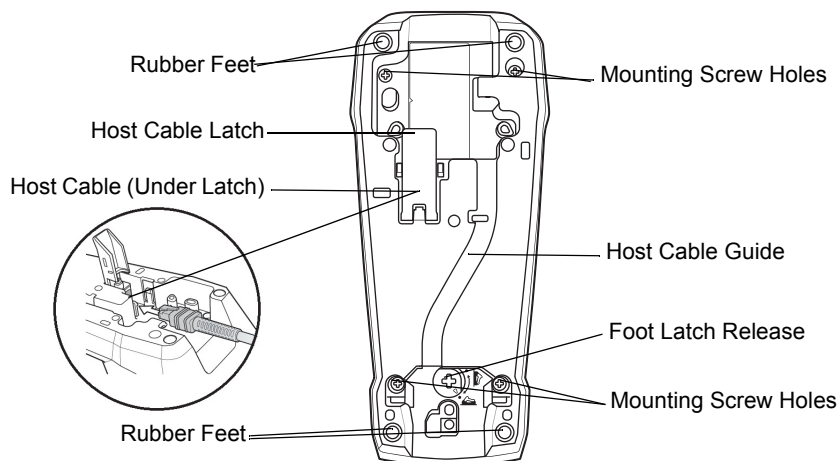
The V450-H Cradle is a charger, radio communication interface, and host communication interface for the V450-H Wireless Reader.

The wireless cradle charges the reader and provides host communication by receiving reader data via Bluetooth radio and sending that data to the host through an attached cable. An external power supply or a powered host cable provides power to the cradle.

● Cradle — Front View



● Cradle — Back View

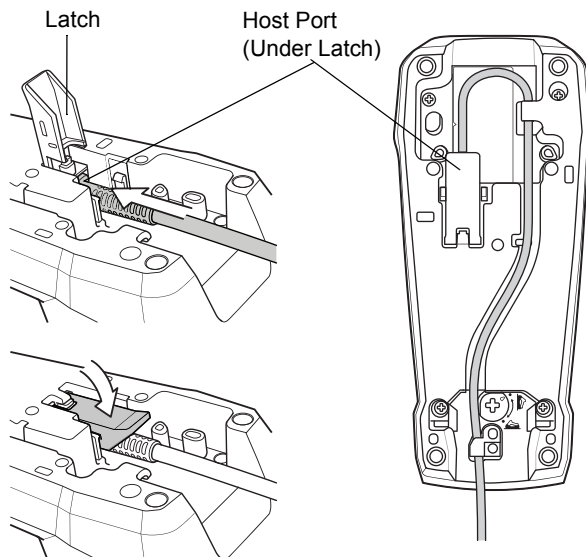


● Connecting the Cradle

Note: The interface cable and power supply (if necessary) in the following order to ensure proper operation of the reader and cradle.

To Connect the V450-H Cradle:

- 1** Connect the appropriate cable to the power supply and an AC power source, if necessary.
- 2** Insert the interface cable into the host port.
- 3** Lift the latch and connect the interface cable into the cradle's host port and then close the latch.
- 4** If applicable, thread the interface cable over the cable support hook and run the host cable into the cable groove.
- 5** Pair the reader to the cradle either by inserting it in the cradle (if pair on contacts is enabled), or by scanning the pairing symbol.
- 6** If necessary, scan the appropriate host symbol (for non-autodetected interfaces). See the specific host chapter.



Important: Be sure that the interface cable is pushed all the way into the host port before you close the latch.

Connecting the Cables to the Cradle

- * **Note:** Always disconnect the DC power supply BEFORE disconnecting the cable to the host end or the cradle may not recognize the new host.
- * **Note:** Different cables are required for different hosts. The connectors illustrated in each host chapter are examples only. The connectors may be different from those illustrated, but the steps to connect the reader remain the same.

● Supplying Power to the Cradle

The cradle receives power from one of two sources:

- An external power supply
- When connected to the host through an interface cable that supplies power.

The cradle detects whether the host or the external supply is supplying power. It always draws power from the external supply when available, regardless of the presence of power from a host.

● Mounting the Cradle

For information on mounting the cradle, refer to the documentation included with the cradle.

Wireless V450-H Battery

● Battery Statistics Capabilities

The V450-H Wireless Reader is equipped with PowerPrecision+ batteries. These intelligent batteries have the integrated technology required to collect the detailed real-time battery metrics needed to maximize useful battery life and ensure every battery is healthy and able to hold a full charge.

PowerPrecision+ batteries support the following remote management functionality:

- Battery Asset Information
 - Manufacture Date of Battery
 - Serial Number of Battery
 - Model Number of Battery
 - Firmware Version of Battery
 - Design Capacity
- Battery Life Statistics
 - State of Health Meter
 - Charge Cycles Consumed
- Battery Status (at Time of Poll)
 - State of Charge
 - Remaining Capacity
 - Charge Status
 - Remaining Time to Complete Charging
 - Battery Voltage / Current
- Battery Temperature
 - Present / Highest / Lowest

Battery statistics can be viewed in WebLink_{PC} by following these steps:

- 1** Select **Wireless Reader** in the **Start** menu.
- 2** From the **Advanced Settings** menu, go to the **Battery** tab.

Hint: **ALT+A** opens the **Advanced Settings** tab for the selected reader.

Inserting the Wireless V450-H Battery

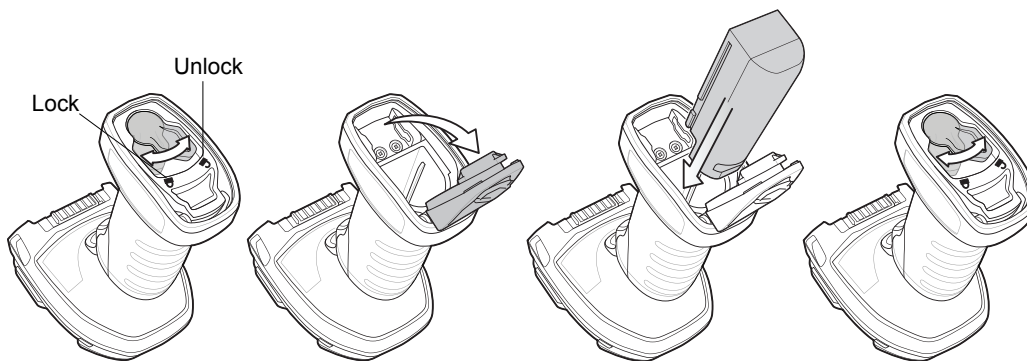
A PowerPrecision+ 3100 mAh Li-Ion rechargeable battery ships with each wireless V450-H. Batteries are shipped in an Off mode and do not power the reader. After inserting a new battery into the V450-H reader, you must insert the reader into a cradle for the battery to turn On.

Alternatively, the battery can be placed in the four slot spare battery charger to charge and then inserted in the reader for immediate use.

The battery resides in a chamber in the reader handle. To insert the battery:

- 1** Lightly press down and slide the locking lever counter-clockwise to unlock and release the battery door.
- 2** Open the battery door.
- 3** If a battery is already installed, turn the reader upright to slide the battery out.

- 4** Slide the new battery into the chamber, with the rounded side toward the back and the contacts facing into the chamber.



Inserting the Battery

- 1** Close the battery door.
- 2** Lightly press down and slide the locking lever clockwise to lock the battery door.
- 3** If using a brand new battery, insert the reader into a cradle to turn the battery on.

Removing the V450-H Battery

To remove the battery:

- 1** Lightly press down and slide the locking lever counterclockwise to unlock the battery door.
- 2** Open the battery door.
- 3** Turn the reader upright to slide the battery out.

Charging the V450-H Battery

When using a new battery in the V450-H, the battery requires a charge to be enabled. Insert the battery in the V450-H and place the V450-H in the cradle.

The battery begins charging when the cradle's LED indicator starts blinking amber. The V450-H's battery has completed a charge when the cradle's LED indicator is solid green. A complete charge of a fully discharged battery can take up to three hours using external power and up to ten hours using USB power over the USB interface cable.

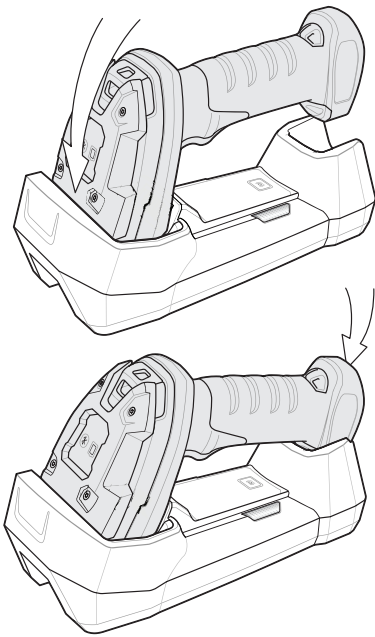
To avoid a battery temperature fault, always charge the battery in the reader within the recommended temperature of 32° to 104° F (0° to 40° C) nominal, 41° to 95° F (5° to 35° C) ideal.

Inserting the V450-H Reader in the Cradle

To insert the reader in the cradle:

- 1** Insert the reader into the cradle top first.

- 2** Push the handle until it clicks into place, engaging the contacts in the cradle and reader.



Inserting the Reader in the Cradle

Sending Data to the Host Computer

The cradle receives data from the reader via a wireless radio connection and transmits it to the host computer via the host cable. The reader and cradle must be paired for successful wireless communication.

Pairing

Pairing registers a reader to the cradle such that the reader and cradle can exchange information. The cradle operates in two modes: Point-to-Point and Multipoint-to-Point. In Point-to-Point mode, pair the reader to the cradle either by inserting it in the cradle (if pair on contacts is enabled), or by scanning the pairing symbol. In Multipoint-to-Point mode, you can pair up to seven readers to one cradle.

To pair the reader with the cradle, scan a pairing symbol. A high-low-high-low beep sequence followed by a low-high beep sequence indicates successful pairing and connection to the remote device. A long low, long high beep sequence indicates unsuccessful pairing.

The pairing symbol that connects the reader to a cradle is unique to each cradle.

Do not scan data or parameters until pairing completes.

Lost Connection to Host

If scanned data does not transmit to the cradle's host, ensure that all cables are firmly inserted and the power supply is connected to an appropriate AC outlet, if applicable. If scanned data still does not transmit to the host, reestablish a connection with the host:

- 1** Disconnect the power supply from the cradle.
- 2** Disconnect the host interface cable from the cradle.
- 3** Wait three seconds.
- 4** Reconnect the host interface cable to the cradle.
- 5** Reconnect the power supply to the cradle, if the host requires.
- 6** Reestablish pairing with the cradle by scanning the pairing symbol.

Configuring the Reader

Use the configuration symbols in this manual or the WebLink_{PC} configuration program to configure the reader.

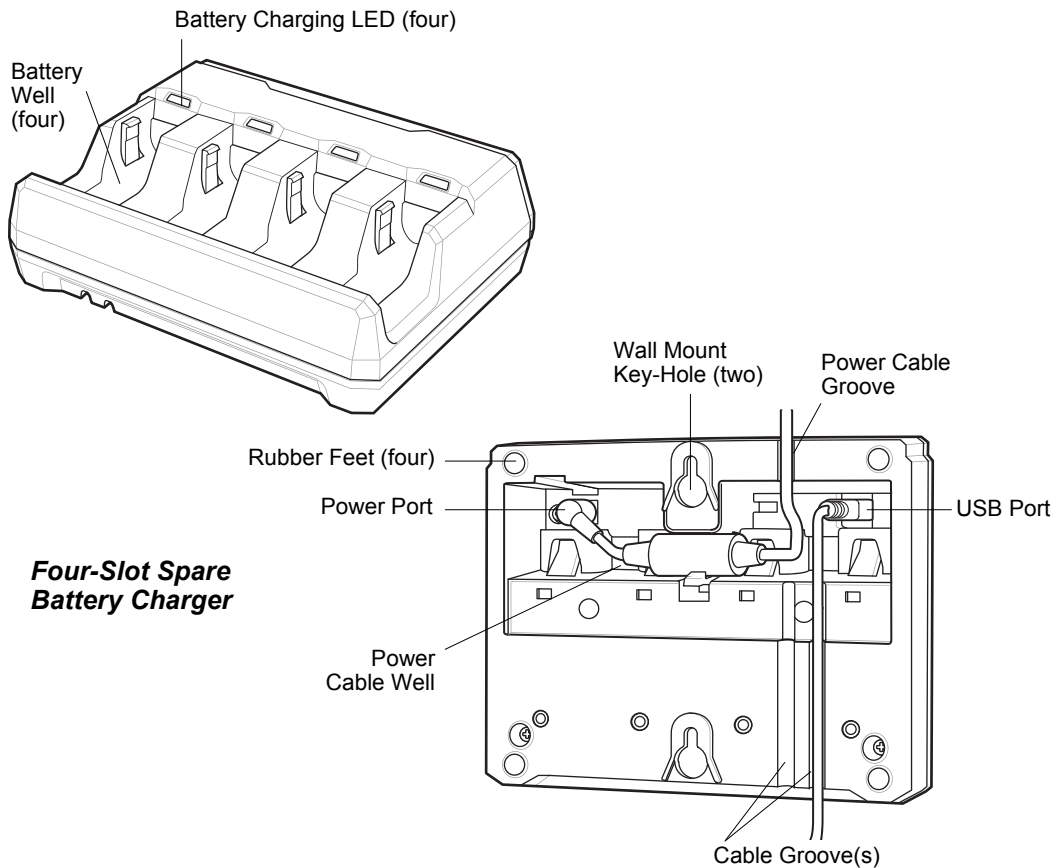
Radio Communications

The reader can communicate with remote devices via Bluetooth, or by pairing with a cradle.

Four-Slot Spare Battery Charger

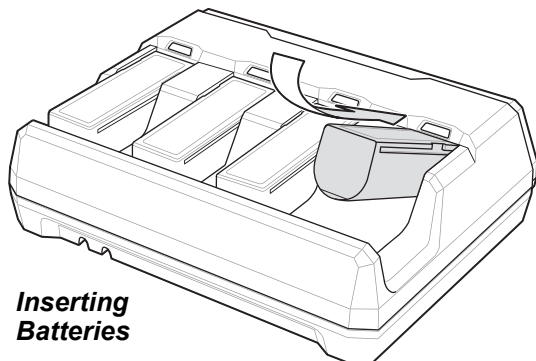
The battery charger can accommodate up to four single spare batteries. The charger can sit on a desktop or be mounted on a wall. This document provides basic instructions for charger set up and use.

For best performance, fully charge the device battery before using the device for the first time. To charge the device battery, insert the battery in the cradle. The battery begins charging when the LED indicator on the battery charger starts flashing amber. A complete charge of a fully discharged battery can take up to five hours. Charge within the recommended temperature of 32° to 104° F (0° C to 40° C) nominal, 41° to 95° F (5° to 35° C) ideal.



Inserting Batteries

To insert batteries in the battery charger, angle the battery with the contacts facing up and slide the contact side of the battery under the LED indicator ledge as shown below. Push down on the label surface of the battery until it clicks in place, engaging the contacts in the battery charger.



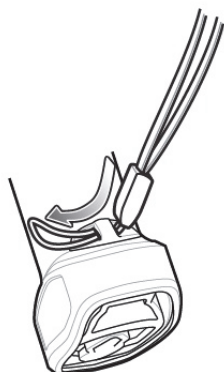
**Inserting
Batteries**

Lanyard

Do not attach the tool balancer to the lanyard slot at the bottom of the device.

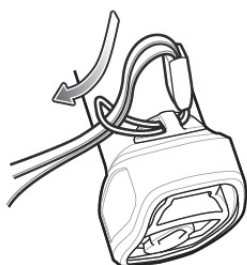
To install the optional lanyard:

- 1** Insert the loop on the lanyard into the slot at the bottom of the device handle.



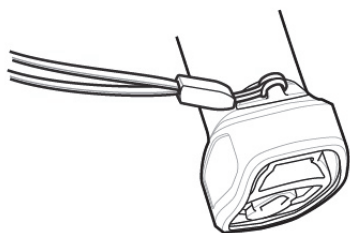
Insert Lanyard Loop

- 2** Thread the upper portion of the lanyard into the loop.



Thread the Loop

- 3** Pull the clip through the loop over the tether point and tighten into place.



Insert Loop into Tether Point

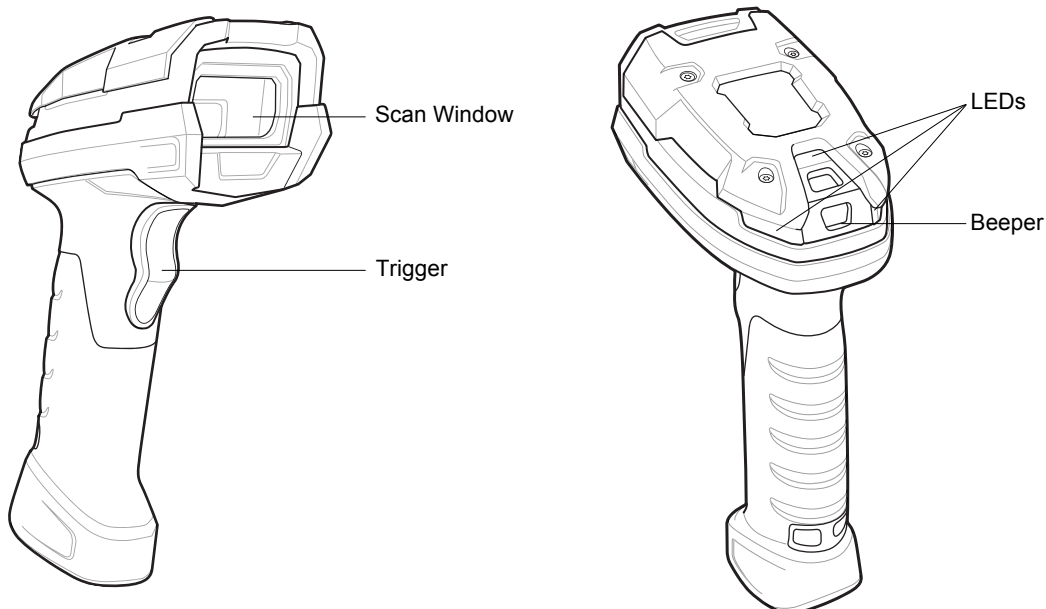
V450-H Accessories

The reader ships with a battery. The following required accessories must be ordered:

- Interface cable for the appropriate interface.
- Universal power supply, if required by the interface.

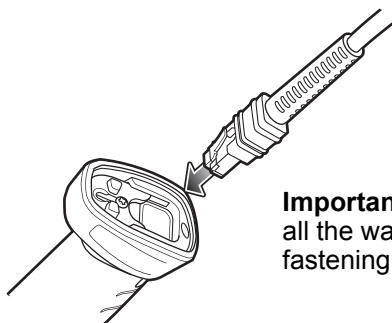
1-2-2 V450-H Wired Handheld DPM Reader

Parts



Installing the V450-H Interface Cable

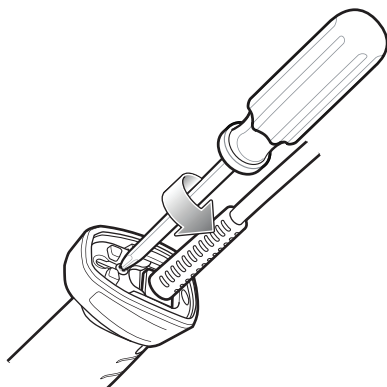
- 1 Insert cable fully so that the connector is flush with the reader surface.



Important: Be sure the interface cable is pushed all the way into the connector before closing and fastening the lock plate.

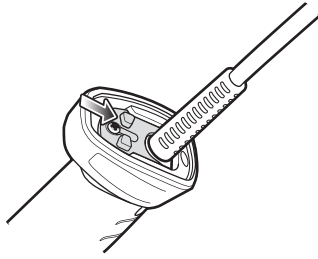
Inserting Cable into V450-H

- 2 Loosen metal lock plate screw using a PH1 driver.



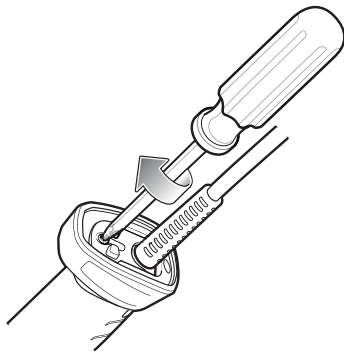
Loosening V450-H Lock Plate Screw

- 3** Slide lock plate to fully locked position.



Sliding Lock Plate into Locked Position

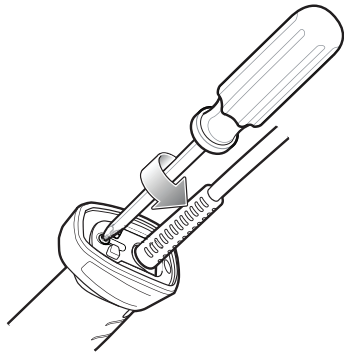
- 4** Tighten lock plate screw using a PH1 driver (recommended Torque: 5 in-lbs).



Tightening Lock Plate

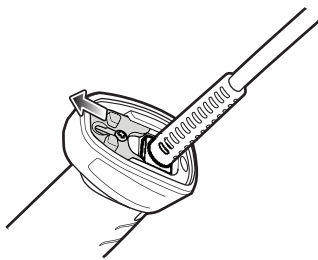
Removing the V450-H Interface Cable

- 1** Loosen lock plate screw using a PH1 driver.



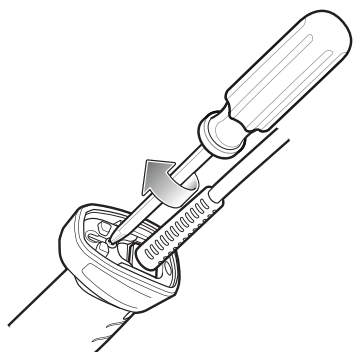
Loosening Lock Plate

- 2** Slide lock plate to fully unlocked position.



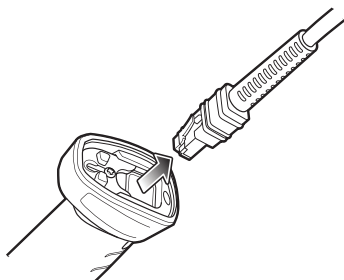
Sliding Lock Plate into Unlocked Position

- 3** Tighten lock plate to fully unlocked position.



Tightening Lock Plate into Unlocked Position

- 4** Remove cable.



Removing Cable from V450-H

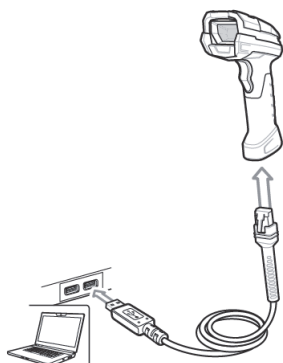
Connecting Power to the V450-H (If Required)

If the host does not provide power to the reader, connect an external power supply.

- 1** Plug the power supply into the power jack on the interface cable.
- 2** Plug the other end of the power supply into an AC outlet.

Configuring the V450-H Reader

Connect the reader. Use the configuration symbols included in this manual, or WebLink_{PC} software, to configure the reader.



V450-H Accessories

The following required accessories must be ordered:

- Interface cable for the appropriate interface.
- Universal power supply, if the interface requires this.
- V450-H Stand for hands-free operation of the reader.

1-3 Set Up Host Interface

Scan one of the symbols below.

The interface cable automatically detects the host interface type and uses the default setting. If the default (*) does not meet your requirements, scan the appropriate host symbol below.



* USB HID Keyboard Emulation



SNAPi with Imaging Interface



USB CDC Host (Virtual COM)



Return to Factory Defaults



Add an Enter Key (Carriage Return / Line Feed)



Add a Tab Key



USB - Override Caps Lock Key (Enable)



USB - Do Not Override Caps Lock Key (Disable)

See [WebLink_{PC}](#) for information about how to set up and use Omron Microscan's configuration software for V410-H and V450-H Handheld Readers.

2

Data Capture

This section provides beeper and LED definitions, techniques involved in scanning barcodes, general instruction and tips about scanning, and decode ranges.

2-1	Wired (V410-H and V450-H) Beeper and LED Definitions	2-2
2-2	Wireless (V450-H) Beeper and LED Definitions	2-3
2-3	V410-H Scanning	2-6
2-4	V450-H Scanning	2-11

2-1 Wired (V410-H and V450-H) Beeper and LED Definitions

In addition to beep sequences, the reader uses a two-color LED to indicate status.

Event	Beeper Sequence	LED Indicator
Standard Use		
Power up.	Low, Medium, High beeps	Green
Decode a barcode.	(as configured)	Green
Hands-free Mode (Presentation Mode On).	None	Green (stays on)
Handheld Mode (Presentation Mode Off).	None	Green (stays off)
Transmission error.	4 Low beeps	Red
Conversion or format error.	5 Low beeps	Red
RS-232 receive error (Parity Error).	Low, Low, Low, Extra-Low beeps	Red
A <BEL> character is received over RS-232.	High beep	None
Parameter Programming		
Input error: Incorrect barcode, programming sequence, or Cancel scanned.	Low, High beeps	Red
Number expected. Enter value using numeric barcodes.	High, Low beeps	Green
Successful program exit with change in parameter setting.	High, Low, High, Low beeps	Green
Maintenance Indications		
Enter Bootloader	High, High beeps	Red (stays on)
Firmware Installation	None	Red Blinking

2-2 Wireless (V450-H) Beeper and LED Definitions

The reader issues different beep sequences/patterns and an LED display to indicate status.

2-2-1 Radio and Beeper LED Definitions

In addition to the System/Decode LEDs, the V450-H Wireless Reader has a Radio and Battery LED gauge.

The Radio and Battery LED gauge is always active when inserted in the cradle. After the reader is removed from the cradle, it is active for four seconds.

After the trigger is held for three seconds the Radio and Battery LED gauge remain active for four seconds after trigger release.

See the following page for a complete list of definitions.

Wireless Reader Beeper and LED Definitions

Event	Beeper Sequence	LED
Standard Use		
Power up.	Low/medium/high beeps	Green
Scanning		
Presentation Mode on.	None	Green solid
Presentation Mode off.	None	No LED; green LED is turned off
A barcode was successfully decoded.	Medium beep (or as configured)	Green flash
Parity error.	Low/low/low/extra low beeps	Red
A transmission error was detected 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
A <BEL> character is received over RS-232.	High	None
Wireless Operation		
Out of batch storage memory, unable to store new barcode.	Low, high, low, high	Red
Radio Indications		
Reader inserted into a cradle (may be disabled).	Low	System LED: None Radio LED: None
Bluetooth connection established.	Low, high	System LED: Green Radio LED: Green (Stays on after trigger hold for 3 seconds)
Bluetooth disconnection event.	High, low	System LED: Red Radio LED: Red (Stays on at trigger pull)
Bluetooth Page timeout; remote device is out of range/not powered.	Long low, long high	System LED: Red Radio LED: Red (Stays on at trigger pull)
Bluetooth connection attempt was rejected by remote device.	Long low, long high, long low, long high	System LED: None Radio LED: Red (Stays on at trigger pull)
Bluetooth attempting reconnection.	None	System LED: None Radio LED: Red blinking
Bluetooth attempting reconnection (default is disable).	Five high	System LED: None Radio LED: Red blinking

Event	Beeper Sequence	LED
Paging state indication	Six high	System LED: Blue (fast, fast, slow)
Battery Indications		
Low battery indication (on trigger release)	Four short high beeps	Red (stays on)
Battery LED status		99-51% Green 21-50% Amber 0-20% Red
Battery end of life		99-51% Green/red alternating 21-50% Amber/red alternating 0-20% Red blinking
Parameter Programming		
Input error, incorrect barcode or Cancel scanned, wrong entry, incorrect barcode programming sequence; remain in program mode.	Long low/long high beeps	Red
Keyboard parameter selected. Enter value using barcode keypad.	High/low beeps	Green
Successful program exit with change in the parameter setting.	High/low/high/low beeps	Green
Cancel rule entry. Rule entry mode exited because of an error or the user asked to exit rule entry.	Long low/long high/long low beeps	Green (turns off blinking)
Host-Specific: USB-Only		
Reader has not completed initialization. Wait several seconds and scan again.	Four high beeps	None
Host-Specific: RS-232-Only		
RS-232 receive error.	High/high/high/low beeps	Red
A <BEL> character is received when Beep on <BEL> is enabled (Point-to-Point mode only).	High beep	None

Cradle LED Definitions

Event	LED
Standard Use	
Power Up	Green (stays on)
Radio Indications	
Bluetooth connection established	Green (off then on)
Page button	Blue
Battery Indications	
Pre-charging	Amber (stays on)
Charging	Amber blinking
Fully charged	Green (stays on)
Charging Error	Amber fast blinking
Battery End of Life Indications	
Charging	Red blinking
Fully charged	Red (stays on)
Charging error	Red fast blinking
Maintenance Indications	
Enter boot loader	Red (stays on)
Firmware installation	Red blinking

Four-Slot Battery Charger Definitions

Event	LED
Standard Use	
Power Up	Red, amber, green, off (all four LEDs)
Idle	Off
Battery Indications	
Pre-charging	Amber (stays on)
Charging	Amber blinking
Fully charged	Green (stays on)
Charging error	Amber fast blinking
Battery End of Life Indications	
Charging	Red blinking
Fully charged	Red (stays on)
Charging error	Red fast blinking
Maintenance Indications	
Enter bootloader	Red (stays on; all four LEDs)
Firmware installation	Red blinking (all four LEDs)

2-3 V410-H Scanning

The V410-H digital reader is in hands-free (presentation) mode when it is placed in the gooseneck Intellistand. In this mode, the digital reader operates in continuous (constant-on) mode, where it automatically decodes a barcode presented in its field of view.

When the digital reader is not used for a user-definable period of time, it enters a low power mode in which the LEDs are turned off or illumination blinks at a low duty cycle until the digital reader detects an image change (e.g. motion).

2-3-1 Scanning in Hands-Free (Presentation) Mode

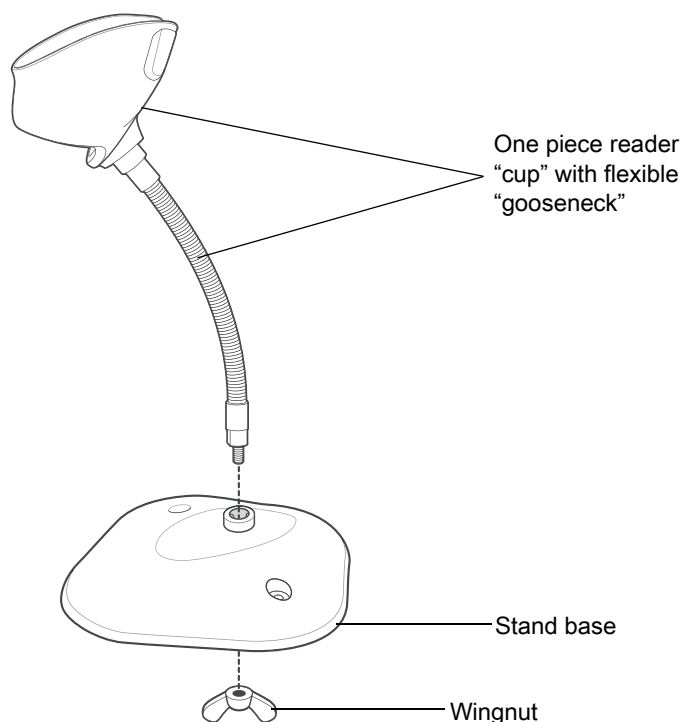
The optional stand adds greater flexibility to V410-H scanning operation. When the reader is seated in the stand's "cup," the reader's built-in sensor places the reader in hands-free (presentation) mode. When the reader is removed from the stand, it automatically switches to its programmed handheld triggered mode.

● Assemble the Stand

To assemble the stand:

- 1** Unscrew the wing nut from the bottom of the one piece reader "cup."

Assembling the Stand

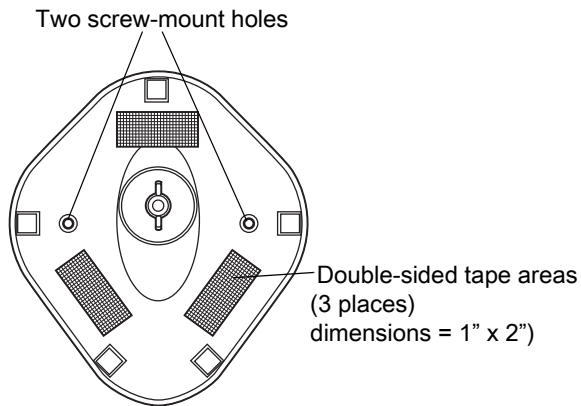


- 2** Fit the bottom of the gooseneck piece into the opening on the top of the stand base.
- 3** Tighten the wing nut underneath the base to secure the cup and neck piece to the base.
- 4** Bend the neck to the desired position for scanning.

● Mounting the Stand (Optional)

You can attach the base of the reader's stand to a flat surface using two screws or double-sided tape (not provided).

Mounting the Stand



Screw Mount

- 1** Position the assembled base on a flat surface.
- 2** Screw one #10 wood screw into each screw-mount hole until the base of the stand is secure.

Tape Mount

- 1** Peel the paper liner off one side of each piece of tape and place the sticky surface over each of the three rectangular tape holders.
- 2** Peel the paper liner off the exposed sides of each piece of tape and press the stand on a flat surface until it is secure.

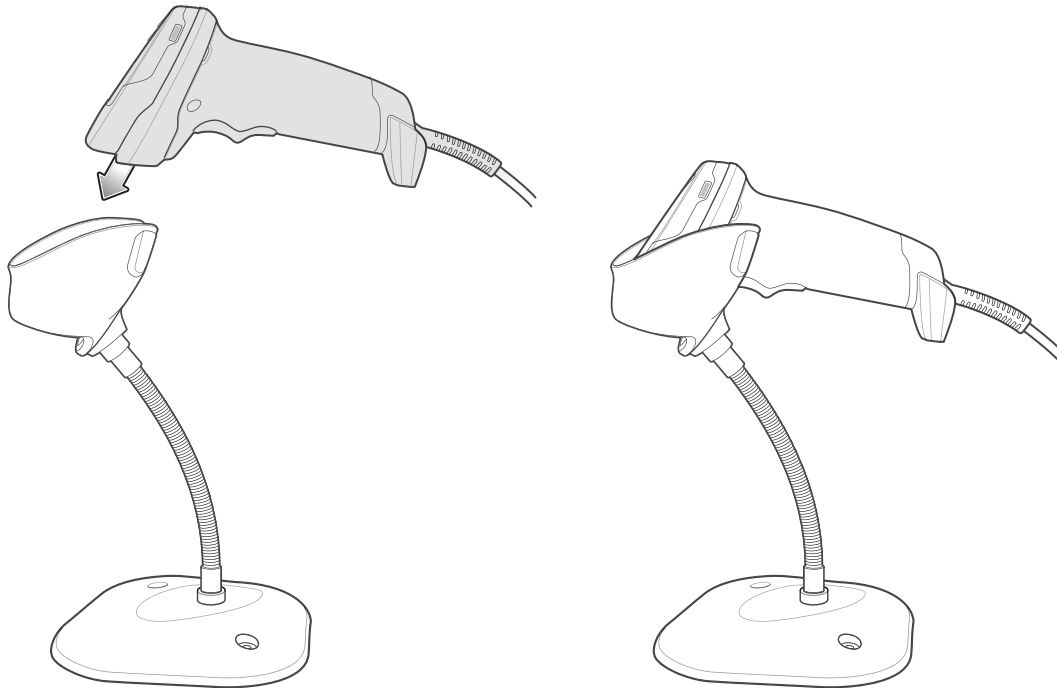
● Scanning with the Stand

When the digital reader is placed in the gooseneck Intellistand it operates in continuous (constant-on) mode, where it automatically decodes a barcode presented in its field of view.

To operate the reader in the stand:

- 1** Ensure the reader is properly connected to the host (see the appropriate host chapter for information on host connections).
- 2** Insert the reader in the gooseneck Intellistand by placing the front of the reader into the stand's "cup."

Inserting the Reader in the Gooseneck Intellistand



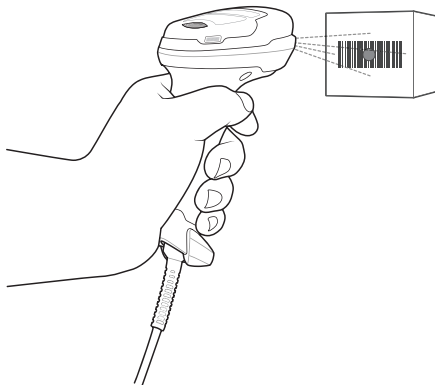
- 1** Adjust the scan angle by bending the stand's flexible "gooseneck" body.
- 2** Present the barcode. Upon successful decode, the reader beeps and the LED momentarily shuts off.

2-3-2 Scanning in Handheld Mode

Pick up the digital reader. The aiming dot displays.

- 1** Ensure the aiming dot is centered on the barcode. See [Aiming](#).

Centering the Aiming Dot on the Barcode

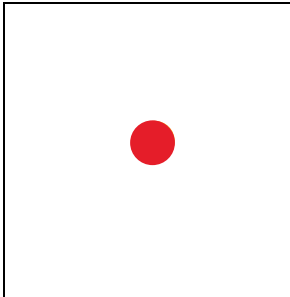


- 2** Press and hold the trigger until either:
 - (a) The digital reader reads the barcode. The digital reader beeps, the LED flashes, and the aiming dot turns off.
 - or**
 - (b) The digital reader does not read the barcode and the aiming dot turns off.
- 3** Release the trigger.

Aiming

When scanning, the digital reader projects an LED dot which allows positioning the barcode within its field of view. See [Decode Ranges](#) for the proper distance to achieve between the digital reader and a barcode.

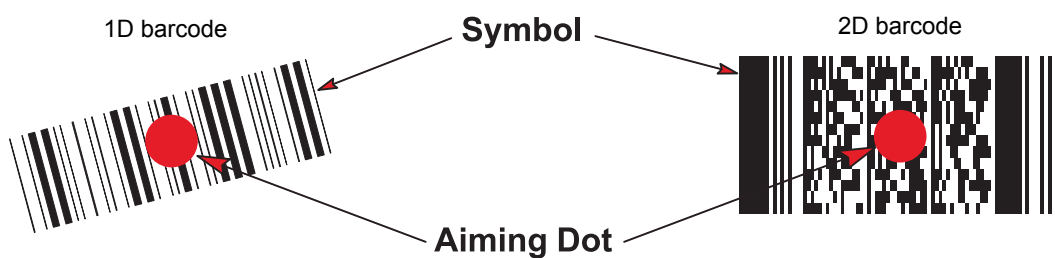
Aiming Dot



If necessary, the digital reader turns on its illumination LEDs to illuminate the target barcode.

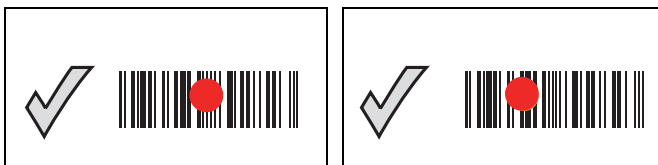
To scan a barcode, center the symbol and ensure the entire symbol is within the rectangular area formed by the illumination LEDs.

Aiming Dot Orientation

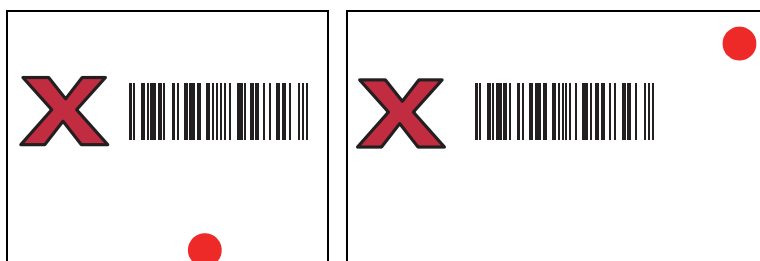


The reader can also read a barcode without the aiming dot being precisely centered. The examples below show **Correct Aiming** and **Incorrect Aiming**.

Correct Aiming



Incorrect Aiming



The aiming dot is smaller when the digital reader is closer to the symbol and larger when it is farther from the symbol. Scan symbols with smaller bars or elements (mil size) closer to the digital reader, and those with larger bars or elements (mil size) farther from the digital reader.

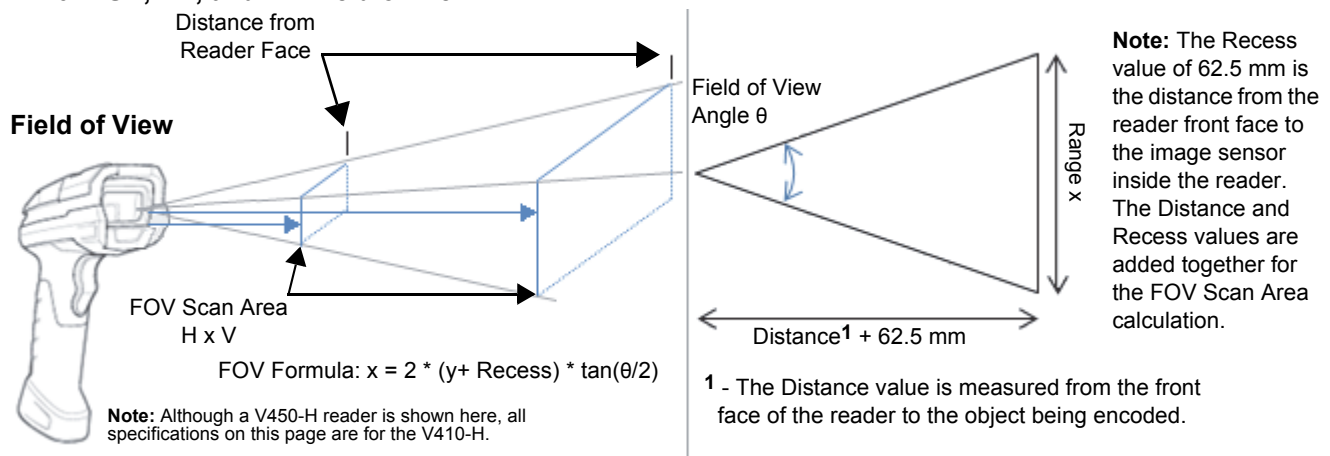
The digital reader beeps to indicate that it successfully decoded the barcode.

Decode Ranges

V410-H Read Ranges

Barcode Type	Symbol Density	V410-H SR Working Ranges		V410-H XD Working Ranges		V410-H HC Working Ranges	
		Near (mm)	Far (mm)	Near (mm)	Far (mm)	Near (mm)	Far (mm)
Code 128	2.0 mil			8.0	58.0		
	3.0 mil	68.0	137.0	0.0	88.0	43.0	127.0
	15.0 mil			107.0	218.0		
Code 39	2.0 mil			5.0	76.0		
	3.0 mil	55.0	137.0	0.0	96.0	33.0	152.0
	5.0 mil	18.0	279.0	0.0	132.0	2.0	292.0
	20.0 mil	0.0	1117.0			15.0	736.0
100% UPC	13.0 mil	0.0	711.0	0.0	215.0	0.0	457.0
PDF417	4.0 mil			0.0	84.0		
	5.0 mil			0.0	96.0		
	6.6 mil	33.0	254.0	0.0	114.0	15.0	236.0
Data Matrix	4.0 mil			5.0	71.0		
	5.0 mil	71.0	127.0	0.0	86.0	45.0	127.0
	7.5 mil	50.0	215.0			25.0	203.0
	10.0 mil	25.0	292.0	0.0	122.0	5.0	241.0
QR Code	10.0 mil	25.0	228.0	0.0	114.0	5.0	215.0
	20.0 mil	0.0	444.0			0.0	343.0

V410-H SR, XD, and HC Field of View



SR: Image Field of View in Degrees = 36.1 (Horizontal) x 22.6 (Vertical)

y (mm)	y + Recess	θ	Range x (mm)	FOV Scan Area H x V (mm)	Distance from Reader Face (mm)	FOV Scan Area H x V (in)	Distance from Reader Face (in)
25	87.5	36.1	57	57 x 35	25	2.2 x 1.4	1.0
25	87.5	22.6	35	-	-	-	-
445	507.5	36.1	331	331 x 203	445	13.0 x 8.0	17.5
445	507.5	22.6	203	-	-	-	-

XD: Image Field of View in Degrees = 34 (Horizontal) x 21.6 (Vertical)

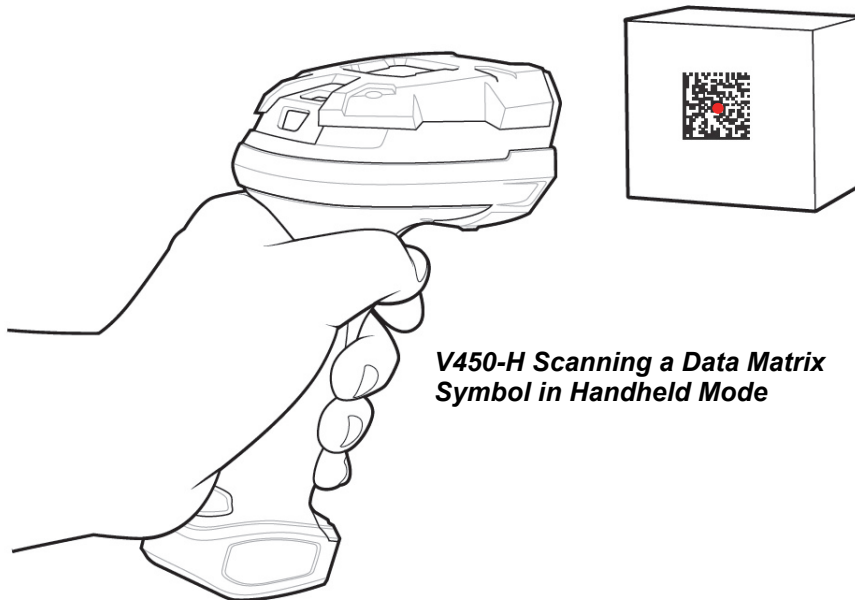
y (mm)	y + Recess	θ	Range x (mm)	FOV Scan Area H x V (mm)	Distance from Reader Face (mm)	FOV Scan Area H x V (in)	Distance from Reader Face (in)
5	67.5	34	41	41 x 26	5	1.6 x 1.0	0.2
5	67.5	21.6	26	-	-	-	-
71	133.5	34	82	82 x 51	71	3.2 x 2.0	2.8
71	133.5	21.6	51	-	-	-	-

HC: Image Field of View in Degrees = 35 (Horizontal) x 22 (Vertical)

y (mm)	y + Recess	θ	Range x (mm)	FOV Scan Area H x V (mm)	Distance from Reader Face (mm)	FOV Scan Area H x V (in)	Distance from Reader Face (in)
3	65.5	35	41	41 x 25	3	1.6 x 1.0	0.1
3	65.5	22	25	-	-	-	-
292	354.5	25	223	223 x 138	292	8.8 x 5.4	11.5
292	354.5	22	138	-	-	-	-

2-4 V450-H Scanning

- 1 Aim the reader at a barcode and pull the trigger to decode. The aiming laser's red dot should fall roughly in the center of the symbol as shown in the image below.
- 2 Pull the trigger until the reader beeps, indicating the barcode is successfully decoded.



V450-H Scanning a Data Matrix Symbol in Handheld Mode

2-4-1 V450-H Wired Reader Hands-Free Mode

The V450-H reader is in Hands-free (presentation) mode when it is placed in the V450-H Stand. In this mode, the reader operates in continuous (constant-on) mode, where it automatically decodes a barcode presented in its field of view.

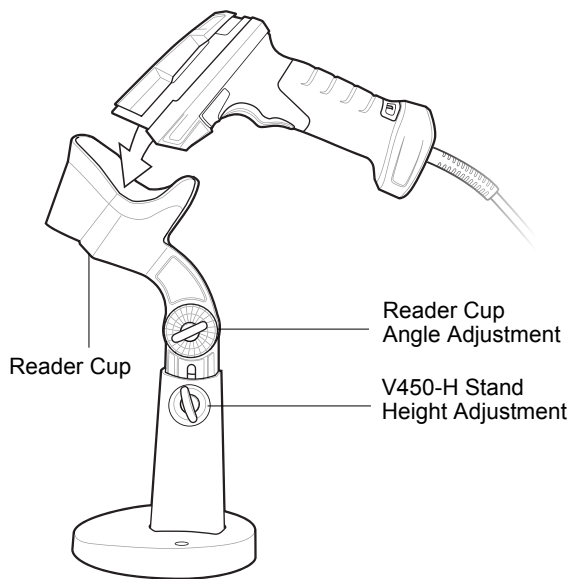
When the reader is not used for a user-definable period of time, it enters a low power mode in which the LEDs are turned off or illumination blinks at a low duty cycle until the reader detects an image change (e.g. motion).

Scanning in Hands-Free (Presentation) Mode

The optional stand adds greater flexibility to V450-H scanning operation. When the reader is seated in the reader cup, the reader's built-in sensor places the reader in hands-free (presentation) mode. When the reader is removed from the stand, it automatically switches to its programmed handheld triggered mode.

● **To Operate the Reader in the V450-H Stand:**

- 1** Connect the reader to the host (see the appropriate host chapter for information on host connections).



V450-H Wired Reader in Hands-Free Mode

- 2** Insert the reader in the V450-H Stand by placing the front of the reader into the reader cup.
- 3** Use the V450-H Stand's adjustment knobs to adjust the height and angle of the reader.
- 4** Center the symbol in the aiming pattern.
- 5** Upon successful decode, the reader beeps and the LED turns green.

2-4-2 Aiming with the V450-H

When scanning, the V450-H projects a red laser aiming dot which allows you to position the symbol within the reader's field of view.



V450-H Reader Aiming Pattern

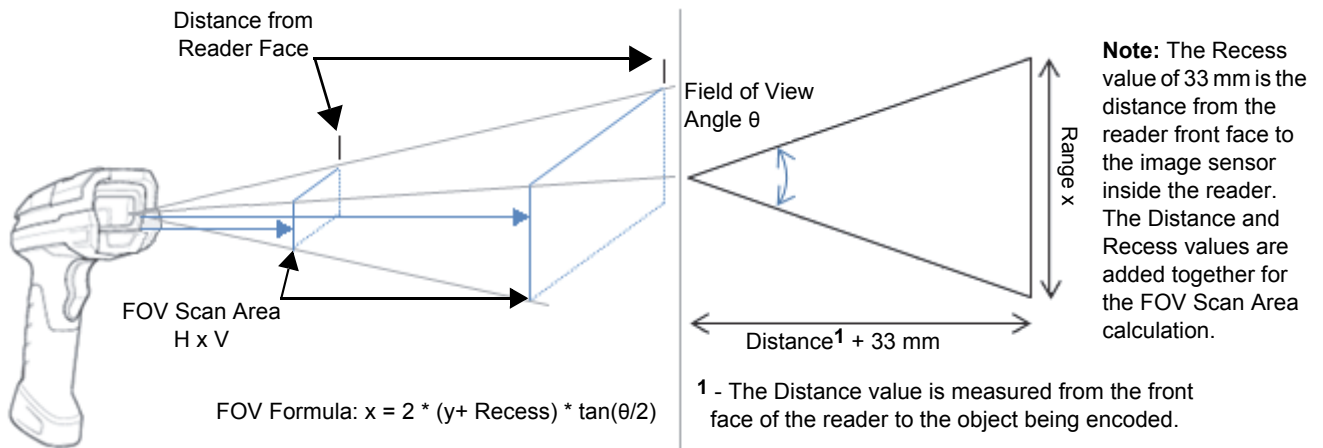
The reader beeps to indicate that it successfully decoded the symbol.

2-4-3 V450-H Read Ranges

V450-H Read Ranges

Symbology	Resolution	Inside Edge	Outside Edge
Code 39	3.0 mil	5.0 mm	71.0 mm
PDF417	5.0 mil	5.0 mm	71.0 mm
	6.6 mil	5.0 mm*	81.0 mm
Data Matrix	5.0 mil	10.0 mm	63.0 mm
	10.0 mil	0.0 mm	86.0 mm
QR Code	5.0 mil	10.0 mm	63.0 mm
	10.0 mil	0.0 mm	86.0 mm
UPC	13.0 mil	25.0 mm*	147.0 mm

Field of View



V450-H: Image Field of View in Degrees = 31 (Horizontal) x 23 (Vertical)

y (mm)	y + Recess	θ	Range x (mm)	FOV Scan Area H x V (mm)	Distance from Reader Face (mm)	FOV Scan Area H x V (in)	Distance from Reader Face (in)
71	104	31	58	58 x 42	71	2.3 x 1.7	2.8
71	104	23	42	-	-	-	-
147	180	31	100	100 x 73	147	3.9 x 2.9	5.8
147	180	23	73	-	-	-	-

3

Maintenance and Technical Specifications

This section describes recommended reader maintenance, troubleshooting, technical specifications, and pin assignments.

3-1	Maintenance	3-2
3-2	Troubleshooting	3-4
3-3	Technical Specifications	3-6
3-4	V410-H / V450-H Wired Reader Signal Descriptions	3-13
3-5	System Configuration	3-14

3-1 Maintenance

Known Harmful Ingredients

The following chemicals are known to damage the plastics on Omron Microscan products and should not come in contact with the device:

- Acetone
- Ammonia solutions
- Aqueous or alcoholic alkaline solutions
- Aromatic and chlorinated hydrocarbons
- Benzene
- Undiluted Bleach
- Carboic acid
- Compounds of amines or ammonia
- Ethanolamine
- Ethers
- Ketones
- TB-lysoform
- Toluene
- Trichloroethylene

Tolerable Industrial Fluids and Chemicals

Not all fluid variants and brands have been tested.

The following industrial fluids and chemicals were evaluated and deemed tolerable for the **V450-H only**:

- Motor/Engine Oil
- Automatic Transmission Fluid (ATF)
- Continuously Variable Transmission Fluid (CVT)
- Industrial De-Greaser (Engine Brite Heavy Duty)
- Brake Fluid (DOT4)

If the reader comes in frequent contact with the fluids and chemicals listed above, Omron Microscan recommends that you clean the outside of the reader daily with the approved cleaning agents listed on this page.

Approved General Cleaning Agents

The following cleaning agents are approved for general cleaning of Omron Microscan products, including the V410-H.

- Pre-moistened towelettes
- Isopropyl alcohol 70%

Approved Disinfectants for V410-H HC Readers Used in Healthcare

When cleaning and disinfecting the V410-H, use only cleaning agents from the following list and follow the manufacturer's instructions.

Cleaning Agents Containing Active Ingredients

- Bleach 10% (sodium hypochlorite 0.55%) and water 90% solution
- Hydrogen peroxide 3% and water 97% solution
- Mild dish soap

Brand-Name Disinfectants

- Formula 409® Glass and Surface Cleaner (Clorox)
- Clorox Healthcare® Bleach Germicidal Wipes
- Dispatch® Hospital Cleaner Disinfectant Towels with Bleach (Clorox)
- Sani-Cloth® Bleach Wipes (PDI)
- Windex® Original Glass Cleaners with Ammonia-D® (SC Johnson)

Cleaning the Reader

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

To clean the reader:

- 1** Dampen a soft cloth with one of the approved cleaning agents listed above or use pre-moistened wipes.
- 2** Gently wipe all surfaces, including the front, back, sides, top and bottom. Never apply liquid directly to the reader. Be careful not to let liquid pool around the reader 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 reader exit window with a lens tissue or other material suitable for cleaning optical material such as eyeglasses.
- 6** Immediately dry the reader window after cleaning with a soft non-abrasive cloth to prevent streaking.
- 7** Allow the unit to air dry before use.
- 8** Reader connectors:
 - (1) Dip the cotton portion of a cotton-tipped applicator in isopropyl alcohol.
 - (2) Rub the cotton portion of the cotton-tipped applicator back-and-forth across the connector on the Omron Microscan reader at least 3 times. Do not leave any cotton residue on the connector.
 - (3) Use the cotton-tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.
 - (4) Use a dry cotton tipped applicator and rub the cotton portion of the cotton-tipped applicator back-and-forth across the connectors at least 3 times. Do not leave any cotton residue on the connectors.

3-2 Troubleshooting

Problem	Possible Causes	Possible Solutions
The aiming pattern does not appear when pressing the trigger.	No power to the reader.	If the configuration requires a power supply, reconnect the power supply.
	Incorrect host interface cable is used.	Connect the correct host interface cable.
	Interface/power cables are loose.	Re-connect cables.
	Aiming pattern is disabled.	Enable the aiming pattern.
Reader emits aiming pattern, but does not decode the barcode.	Reader is not programmed for the correct barcode type.	Program the reader to read that type of barcode.
	Barcode symbol is unreadable.	Scan test symbols of the same barcode type to determine if the barcode is defaced.
	The symbol is not completely inside aiming pattern.	Move the symbol completely within the aiming pattern. Move the symbol completely within the field of view (AIM pattern does NOT define FOV)
	Distance between reader and barcode is incorrect.	Move the reader closer to or further from the barcode.
Reader decodes barcode, but does not transmit the data to the host.	Reader is not programmed for the correct host type.	Scan the appropriate host type programming symbol. See the chapter corresponding to the host type.
	Interface cable is loose.	Re-connect the cable.
	Cradle is not programmed for the correct host type.	Check reader host parameters or edit options.
	Reader is not paired to host connected interface.	Pair reader to the cradle by scanning the PAIR symbol on the cradle.
	Cradle has lost connection to the host.	In this exact order: disconnect power supply; disconnect host cable; wait three seconds; reconnect host cable; reconnect power supply; reestablish pairing.
	If the reader emits 4 long low beeps, a transmission error occurred. This occurs if a unit is not properly configured or connected to the wrong host type.	Set the reader's communication parameters to match the host's setting.
	If the reader emits 5 low beeps, a conversion or format error occurred.	Configure the reader's conversion parameters properly.
	If the reader emits low/high/low beeps, it detected an invalid reader rule.	Program the correct reader rules.
Host displays scanned data incorrectly.	Reader is not programmed to work with the host.	Scan the appropriate host type programming symbol.
		For RS-232, set the reader's communication parameters to match the host's settings.
		Program the proper editing options (e.g., UPC-E to UPC-A Conversion).
Reader emits short low/short medium/short high beep sequence (power-up beep sequence) more than once.	The USB bus may put the reader in a state where power to the reader is cycled on and off more than once.	Normal during host reset.
Reader emits 4 short high beeps during decode attempt.	Reader has not completed USB initialization.	Wait several seconds and scan again.
Reader emits Low/low/low/extra low beeps when not in use.	RS-232 receive error.	Normal during host reset. Otherwise, set the reader's RS-232 parity to match the host setting.
Reader emits low/high beeps during programming.	Input error, incorrect barcode or Cancel barcode was scanned.	Scan the correct numeric barcodes within range for the parameter programmed.
Reader emits low/high/low/high beeps during programming.	Out of host parameter storage space.	Change storage preference.
Reader emits a power-up beep after changing USB host type.	The USB bus re-established power to the reader.	Normal when changing USB host type.

Problem	Possible Causes	Possible Solutions
Reader 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 reader is in RS-232 mode.
Reader emits frequent beeps.	No power to the reader.	Check the system power. If the configuration requires a power supply, re-connect the power supply.
	Incorrect host interface cable is used.	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 re-connect cables.
Reader emits five long low beeps after a barcode is decoded.	Conversion or format error was detected. The reader's conversion parameters are not properly configured.	Ensure the reader's conversion parameters are properly configured.
	Conversion or format error was detected. A barcode was scanned with characters that can't be sent for that host.	Change the barcode, or change to a host that can support the barcode.

Note: If the reader still experiences problems after performing these checks, contact customer support at <http://www.ia.omron.com>.

Report Software Version Barcode

When contacting support, a support representative may ask you to scan the programming symbol below to determine the version of software installed in the reader.



Report Software Version

3-3 Technical Specifications

V410-H Technical Specifications

V410-H XD

Item	Description
Physical Characteristics	
Dimensions	6.5 in. H x 2.6 in. W x 3.9 in. D 16.5 cm H x 6.7 cm W x 9.8 cm D
Weight	5.7 oz. /161.9 g
Input Voltage Range	4.5 to 5.5 VDC Host Powered; 4.5 to 5.5 VDC External Power Supply
Operating Current at Nominal Voltage (5.0V)	375 mA (typical)
Standby Current (Idle) at Nominal Voltage (5.0V)	150 mA (typical)
Color	Twilight Black
Supported Host Interfaces	USB 1.1, RS-232
USB Certification	USB 1.1 Certified
Keyboard Support	Supports over 90 international keyboards
User Indicators	Direct Decode Indicator, Good Decode LEDs, rear view LEDs, beeper (adjustable tone and volume), haptic/vibration
Performance Characteristics	
Light Source	Aiming Pattern: circular 528nm true green LED
Illumination	(2) warm white LEDs
Imager Field of View	34° H x 21.6° V nominal
Image Sensor	1280 x 800 pixels
Minimum Print Contrast	15% minimum reflective difference
Skew Tolerance	+/- 60°
Pitch Tolerance	+/- 60°
Roll Tolerance	0°-360°
Imaging Characteristics	
Graphics Format Support	Images can be exported as Bitmap, JPEG, or TIFF
Environmental	
Operating Temperature	32.0° to 122.0° F / 0.0° to 50.0° C
Storage Temperature	-40.0° to 158.0° F / -40.0° to 70.0° C
Humidity	5% to 95% RH, non-condensing
Drop Specification	Designed to withstand multiple drops at 6.0 ft./1.8 m to concrete
Tumble Specification	Designed to withstand 2,000 tumbles in 1.5 ft./0.5 m tumbler
Environmental Sealing	IP52
Electrostatic Discharge (ESD)	ESD per EN61000-4-2, +/-15 KV Air, +/-8 KV Direct, +/-8 KV Indirect
Ambient Light Immunity	0 to 10,000 foot-candles / 0 to 107,600 lux
Accessories	
Gooseneck Intellistand	
Symbol Decode Capability	
1D	Code 39, Code 128, Code 93, Codabar/NW7, Code 11, MSI Plessey, UPC/EAN, I 2 of 5, Korean 3 of 5, GS1 DataBar, Base 32 (Italian Pharma)

Item	Description
2D	PDF417, Micro PDF417, Composite Codes, TLC-39, Aztec, Data Matrix, QR Code, Micro QR, Han Xin, Postal Codes, SecurPharm, DotCode, Dotted Data Matrix
OCR	OCR-A, OCR-B, MICR, US Currency
Minimum Element Resolution	Code 39 - 2.0 mil
	Data Matrix - 4.0 mil
V410-H XD Decode Ranges (Typical; Printing resolution, contrast, and ambient light-dependent)	
Symbology/Resolution	Near/Far
Code 128: 2 mil	0.3 in. / 0.8 cm to 2.3 in. / 5.8 cm
Code 128: 3 mil	0 in. / 0 cm to 3.5 in. / 8.8 cm
Code 128: 15 mil	4.2 in. / 10.7 cm to 8.6 in. / 21.8 cm
Code 39: 2 mil	0.2 in. / 0.5 cm to 3.0 in. / 7.6 cm
Code 39: 3 mil	0 in. / 0 cm to 3.8 in. / 9.6 cm
Code 39: 5 mil	0 in. / 0 cm to 5.2 in. / 13.2 cm
PDF417: 4 mil	0 in. / 0 cm to 3.3 in. / 8.4 cm
PDF417: 5 mil	0 in. / 0 cm to 3.8 in. / 9.6 cm
PDF417: 6.6 mil	0 in. / 0 cm to 4.5 in. / 11.4 cm
UPC: 13 mil (100%)	0 in. / 0 cm to 8.5 in. / 21.5 cm
Data Matrix: 4 mil	0.2 in. / 0.5 cm to 2.8 in. / 7.1 cm
Data Matrix: 5 mil	0 in. / 0 cm to 3.4 in. / 8.6 cm
Data Matrix: 10 mil	0 in. / 0 cm to 4.8 in. / 12.2 cm
QR Code: 10 mil	0 in. / 0 cm to 4.5 in. / 11.4 cm
Utilities and Device Management	
WebLink_{PC}	Programs reader parameters, upgrades firmware, provides scanned barcode data, allows image-based troubleshooting.
Regulatory Compliance	
LED Safety Standard	IEC 62471 Risk-Exempt Group
EMC Standards	EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 62368-1, EN 62368-1
Certifications	RCM, EAC, BSMI, CE, cULus (KC Pending)

V410-H SR

Item	Description
Physical Characteristics	
Dimensions	6.5 in. H x 2.6 in. W x 3.9 in. D 16.5 cm H x 6.7 cm W x 9.8 cm D
Weight	5.7 oz. /161.9 g
Input Voltage Range	4.5 to 5.5 VDC Host Powered; 4.5 to 5.5 VDC External Power Supply
Operating Current at Nominal Voltage (5.0V)	340 mA (typical)
Standby Current (Idle) at Nominal Voltage (5.0V)	150 mA (typical)
Color	Nova White, Twilight Black
Supported Host Interfaces	USB 1.1, RS-232
USB Certification	USB 1.1 Certified
Keyboard Support	Supports over 90 international keyboards
Electronic Article Surveillance	Compatible with Checkpoint EAS deactivation system
User Indicators	Direct Decode Indicator, Good Decode LEDs, rear view LEDs, beeper (adjustable tone and volume)
Performance Characteristics	
Light Source	Aiming Pattern: circular 617nm amber LED
Illumination	(2) 660nm Red LEDs

Item	Description
Imager Field of View	36.1° H x 22.6° V nominal
Image Sensor	1280 x 800 pixels
Minimum Print Contrast	15% minimum reflective difference
Skew Tolerance	+/- 60°
Pitch Tolerance	+/- 60°
Roll Tolerance	0°-360°
Imaging Characteristics	
Graphics Format Support	Images can be exported as Bitmap, JPEG, or TIFF
Image Quality	96 PPI on an A4 document
Environmental	
Operating Temperature	32.0° to 122.0° F / 0.0° to 50.0° C
Storage Temperature	-40.0° to 158.0° F / -40.0° to 70.0° C
Humidity	5% to 95% RH, non-condensing
Drop Specification	Designed to withstand multiple drops at 6.0 ft./1.8 m to concrete
Tumble Specification	Designed to withstand 2,000 tumbles in 1.5 ft./0.5 m tumbler
Environmental Sealing	IP52
Electrostatic Discharge (ESD)	ESD per EN61000-4-2, +/-15 KV Air, +/-8 KV Direct, +/-8 KV Indirect
Ambient Light Immunity	0 to 10,000 foot-candles / 0 to 107,600 lux
Accessories	
Gooseneck Intellistand	
Symbol Decode Capability	
1D	Code 39, Code 128, Code 93, Codabar/NW7, Code 11, MSI Plessey, UPC/EAN, I 2 of 5, Korean 3 of 5, GS1 DataBar, Base 32 (Italian Pharma)
2D	PDF417, Micro PDF417, Composite Codes, TLC-39, Aztec, Data Matrix, QR Code, Micro QR, Han Xin, Postal Codes, SecurPharm, DotCode, Dotted Data Matrix
OCR	OCR-A, OCR-B, MICR, US Currency
Minimum Element Resolution	Code 39 - 3.0 mil (V410-H SR)
	Data Matrix - 5.0 mil (V410-H SR)
V410-H SR Decode Ranges (Typical; Printing resolution, contrast, and ambient light-dependent)	
Symbology/Resolution	Near/Far
Code 39: 3 mil	2.2 in./5.6 cm to 5.4 in./13.7 cm
Code 39: 5 mil	0.7 in./1.8 cm to 11.0 in./27.9 cm
Code 39: 20 mil	0 in./0 cm to 44.0 in./111.8 cm
Code 128: 5 mil	2.7 in./6.9 cm to 5.4 in./13.7 cm
PDF417: 6.7 mil	1.3 in./3.3 cm to 10.0 in./25.4 cm
UPC: 13 mil (100%)	0 in./0 cm to 28.0 in./71.1 cm
Data Matrix: 10 mil	1.0 in./2.5 cm to 11.5 in./29.2 cm
QR Code: 20 mil	0 in./0 cm to 17.5 in./44.5 cm
Utilities and Device Management	
WebLink_{PC}	Programs reader parameters, upgrades firmware, provides scanned barcode data, allows image-based troubleshooting.
Regulatory Compliance	
LED Safety Standard	IEC 62471 Risk-Exempt Group
EMC Standards	EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 62368-1, EN 62368-1
Certifications	RCM, EAC, BSMI, CE, cULus (KC Pending)

V410-H HC

Item	Description
Physical Characteristics	
Dimensions	6.5 in. H x 2.6 in. W x 3.9 in. D 16.5 cm H x 6.7 cm W x 9.8 cm D
Weight	5.7 oz. /161.9 g
Input Voltage Range	4.5 to 5.5 VDC Host Powered; 4.5 to 5.5 VDC External Power Supply
Operating Current at Nominal Voltage (5.0V)	375 mA (typical)
Standby Current (Idle) at Nominal Voltage (5.0V)	150 mA (typical)
Color	Healthcare White
Supported Host Interfaces	USB 1.1, RS232
USB Certification	USB 1.1 Certified
Keyboard Support	Supports over 90 international keyboards
User Indicators	Direct Decode Indicator, Good Decode LEDs, rear view LEDs, beeper (adjustable tone and volume), haptic/vibration
Performance Characteristics	
Light Source	Aiming Pattern: circular 528nm true green LED
Illumination	(2) Warm White LEDs
Imager Field of View	35° H x 22° V nominal
Image Sensor	1280 x 800 pixels
Minimum Print Contrast	15% minimum reflective difference
Skew Tolerance	+/- 60°
Pitch Tolerance	+/- 60°
Roll Tolerance	0° - 360°
Imaging Characteristics	
Graphics Format Support	Images can be exported as Bitmap, JPEG, or TIFF
Environmental	
Operating Temperature	32.0° to 122.0° F / 0.0° to 50.0° C
Storage Temperature	-40.0° to 158.0° F / -40.0° to 70.0° C
Humidity	5% to 95% RH, non-condensing
Drop Specification	Designed to withstand multiple drops at 6.0 ft./1.8 m to concrete
Tumble Specification	Designed to withstand 2,000 tumbles in 1.5 ft./0.5 m tumbler
Environmental Sealing	IP52
Approved Cleaners	Standard disinfectants
Electrostatic Discharge (ESD)	ESD per EN61000-4-2, +/-15 KV Air, +/-8 KV Direct, +/-8 KV Indirect
Ambient Light Immunity	0 to 10,000 foot-candles / 0 to 107,600 lux

Item	Description
Accessories	
Gooseneck Intellistand	
Symbol Decode Capability	
1D	Code 39, Code 128, Code 93, Codabar/NW7, Code 11, MSI Plessey, UPC/EAN, I 2 of 5, Korean 3 of 5, GS1 DataBar, Base 32 (Italian Pharma)
2D	PDF417, Micro PDF417, Composite Codes, TLC-39, Aztec, Data Matrix, QR Code, Micro QR, Han Xin, Postal Codes, SecurPharm
OCR	OCR-A, OCR-B, MICR, US Currency
Minimum Element Resolution	Code 39 - 2.0 mil Data Matrix - 4.0 mil
V410-H HC Decode Ranges (Typical; Printing resolution, contrast, and ambient light-dependent)	
Symbology/Resolution	Near/Far
Code 39: 3 mil	1.3 in./3.3 cm to 6.0 in./15.2 cm
Code 39: 5 mil	0.1 in./0.3 cm to 11.5 in./29.2 cm
Code 39: 20 mil	0.6 in./1.5 cm to 29.0 in./73.7 cm
Code 128: 5 mil	1.7 in./4.3 cm to 5.0 in./12.7 cm
PDF417: 6.7 mil	0.6 in./1.5 cm to 9.3 in./23.6 cm
UPC: 13 mil (100%)	0 in./0 cm to 18.0 in./45.7 cm
Data Matrix: 10 mil	0.2 in./0.5 cm to 9.5 in./24.1 cm
QR Code: 20 mil	0 in./0 cm to 13.5 in./34.3 cm
Utilities and Device Management	
WebLink_{PC}	Programs reader parameters, upgrades firmware, provides scanned barcode data, allows image-based troubleshooting.
Regulatory Compliance	
LED Safety Standard	IEC 62471 Risk-Exempt Group
EMC Standards	EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 62368-1, EN 62368-1
Certifications	RCM, EAC, BSMI, CE, cULus (KC Pending)

V450-H Technical Specifications

Item	Description
Physical Characteristics	
V450-H Wireless Reader Dimensions	7.3 in. H x 3.0 in. W x 5.6 in. D (18.5 cm H x 7.7 cm W x 14.3 cm D)
V450-H Wired Reader Dimensions	7.3 in. H x 3.0 in. W x 5.2 in. D (18.5 cm H x 7.7 cm W x 13.2 cm D)
V450-H Wireless Reader Weight (with Battery)	Approximately 14.18 oz./402 g
V450-H Wired Reader Weight (without Cable)	Approximately 10.72 oz./304 g
Power	5 VDC +/- 10% @ 360 mA (RMS typical)
Color	Twilight Black
Performance Characteristics	
Light Source	Aiming pattern: 655 nm Laser / Illumination: Warm white and red 634nm LEDs
Field of View (Horizontal x Vertical) Nominal	31° (H) x 23° (V)
Roll	0 - 360°
Pitch	+/- 60°
Skew	+/- 60°
Scans Per Charge	Up to 100,000
Symbologies	
1D	UPC/EAN, UPC/EAN with supplementals, Bookland EAN, ISSN, UCC Coupon Extended Code, Code 128, GS1-128, ISBT 128, ISBT Concatenation, Code 39, Code 39 Full ASCII, Trioptic Code 39, Code 32, Code 93, Code 11, Interleaved 2 of 5, Discrete 2 of 5, Codabar, MSI, Chinese 2 of 5, Matrix 2 of 5, Korean 3 of 5, GS1 DataBar variants
2D	PDF417, MicroPDF417, Composite Codes, TLC-39, Data Matrix, QR Code, MicroQR, Aztec, Han Xin, GS1-QR, GS1-DM, DotCode
Postal	US Postnet, US Planet, UK Postal, Japan Post, Australia Post, Royal Mail 4 State Customer, UPU 4 State Postal FICS (Post US4), USPS 4 State Postal (Post US3)
Typical Working Distance	See Read Ranges .
Interfaces Supported	USB 1.1, RS-232 The reader supports the following protocols over USB 1.1: HID Keyboard (default mode), SNAPI, COM Port Emulation, USB CDC
Minimum Resolution	Code 39: 3 mil PDF417: 4 mil Data Matrix: 4 mil
User Environment	
V450-H Wireless Reader Operating Temperature	- 4° F to 122° F (-20° C to 50° C)
V450-H Wired Reader Operating Temperature	- 22° F to 122° F (-30° C to 50° C)
Storage Temperature	- 40° F to 158° F (-40° C to 70° C)
Humidity	5% to 95% RH, non-condensing
ESD	20 kV air discharge; 10 kV contact discharge
V450-H Wireless Reader Drop Specifications	Withstands multiple 8 ft. / 2.4 m drops to concrete at room temperature.
V450-H Wired Reader Drop Specifications	Withstands multiple 6.5 ft. / 2.0 m drops to concrete at -30° C to 50° C.
Environmental Sealing	Reader: IP65 and IP67; Cradle: IP65
Ambient Light Immunity	0 to 10,037 foot-candles 0 to 108,000 lux
Accessories	
V450-H Wired Reader Hands-Free Option	V450-H Stand
Power Supplies	Power supplies are available for applications that do not supply power over the host cable.

Item	Description
Regulatory Compliance	
LED Safety Standard	IEC 62471 Risk-Exempt Group
EMC Standards	EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 60950-1, EN 60950-1
Certifications	RCM, EAC, BSMI, CE, cULus (KC and BIS Pending for -0002 versions)

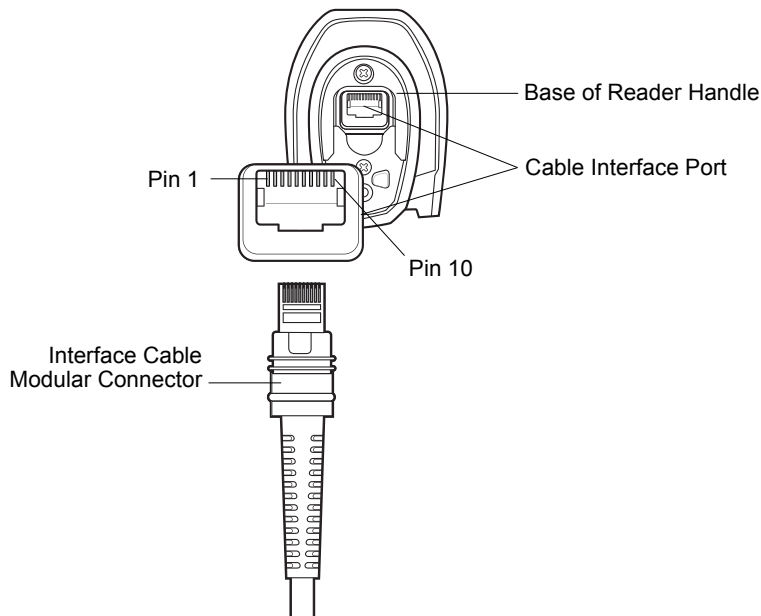
V450-H Cradle (V450-AK0) Technical Specifications

Item	Description
Power Requirements for Host-Powered	Min 4.5 - Max 5.5
Power Requirements for External Power Supply	Min 11.4 - Max 12.6
Typical Current Draw when Not Charging	80mA @ 5V; 30mA @ 12V
Typical Current Draw in Full Charging Mode	1200mA @ 5V (BC 1.2), 475mA (non-BC1.2); 700mA @ 12V
Typical Current Draw in Safe Charging Mode	400mA @ 5V; 200mA @ 12V
Interfaces Supported	USB 1.1, RS-232
Operating Temperature	-4° to 122° F (-20° to 50° C)
Storage Temperature	-40° to 158° F (-40° to 70° C)
Charging Temperature	32° to 104° F (0° to 40° C) nominal, 41° to 95° F (5° to 35° C) ideal
Humidity	5% to 95% (non-condensing)
ESD	25 kV air discharge 10 kV contact discharge
Weight	13.7 oz (390 grams)
Dimensions	W 9.98 x L 22.94 x H 8.26 cm (W 99.8 x L 229.4 x H 82.6 mm)
Radio	Bluetooth, Up to 100 meters/300 ft. in open air range/environment Serial Port and HID Profiles 2.402 to 2.480 GHz Adaptive Frequency Hopping (co-existence with 802.11 wireless networks) 3Mbit/s (2.1Mbit/s) for Classic Bluetooth 1Mbit/s (0.27Mbit/s) for Low Energy
Electrical Safety	Certified to UL/IEC/EN 60950-1 + AM2
Input Transient Protection	IEC 1000-4-(2,3,4,5,6,11)
Regulatory Compliance	
EMC Standards	EN 300 328 V2.1.1, EN 301 489-1 V2.1.1, EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 60950-1, EN 60950-1
Certifications	RCM, KC, EAC, CE, cULus, BIS, CCC, NCC

V450-H Battery Charger (V450-AG0) Regulatory Compliance

Item	Description
EMC Standards	EN 55024, EN 55032, FCC Part 15, Subpart B (Class B)
Safety Standards	UL60950-1, IEC 60950-1, EN 60950-1
Certifications	RCM, KC, EAC, CE, cULus, CCC

3-4 V410-H / V450-H Wired Reader Signal Descriptions



Wired Reader Cable Pinouts

The signal descriptions below apply to the connectors on the V410-H / V450-H Wired Reader and are for reference only.

V410-H

Pin	RS-232	USB
1	Cable ID	Cable ID
2	Power (+5V)	Power (+5V)
3	Ground	Ground
4	TxD	Reserved
5	RxD	D +
6	RTS	Reserved
7	CTS	D -
8	Reserved	Reserved
9	Note: EAS configurations use pins 9 and 10 for an EAS antenna. For other configurations, pins 9 and 10 are open.	
10		

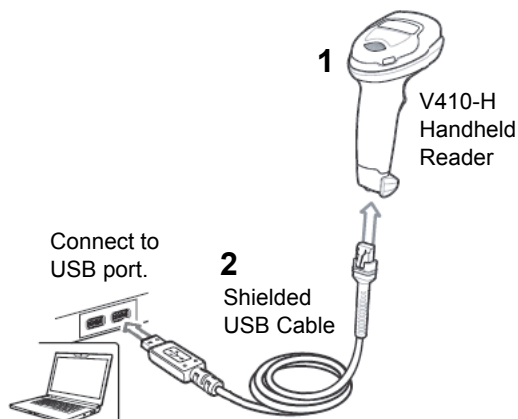
V450-H

Pin	RS-232	USB
1	Cable ID	Cable ID
2	Power (+5V)	Power (+5V)
3	Ground	Ground
4	TxD	Reserved
5	RxD	D +
6	RTS	Reserved
7	CTS	D -
8	Reserved	Reserved
9	Reserved	Reserved
10	Power (+12V)	Power (+12V)

3-5 System Configuration

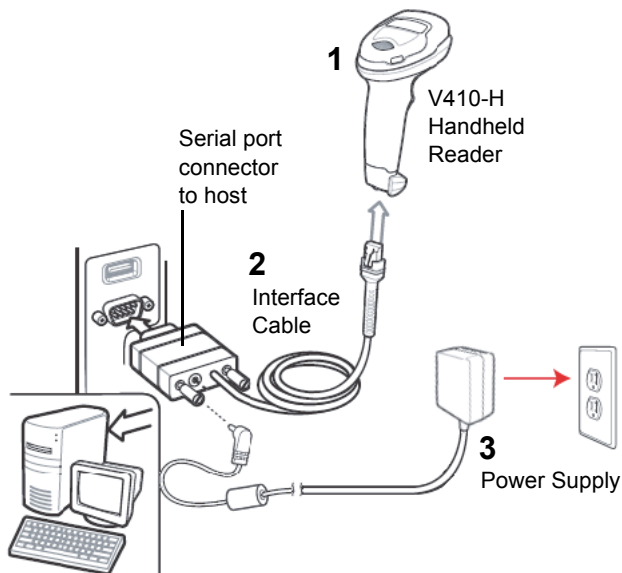
V410-H Configurations

● USB



Part	Description	Part Number
1	V410-H SR Handheld Reader, Black Trigger, Wired	V410-HDS4608SR
	V410-H XD Handheld Reader, Blue Trigger, Wired, with X-Mode	V410-HDS4608XD
	V410-H HC Handheld Reader, White, Wired	V410-HDS4608HC
2	Cable, USB, 7 ft., Mod Plug	V410-WUB-2M

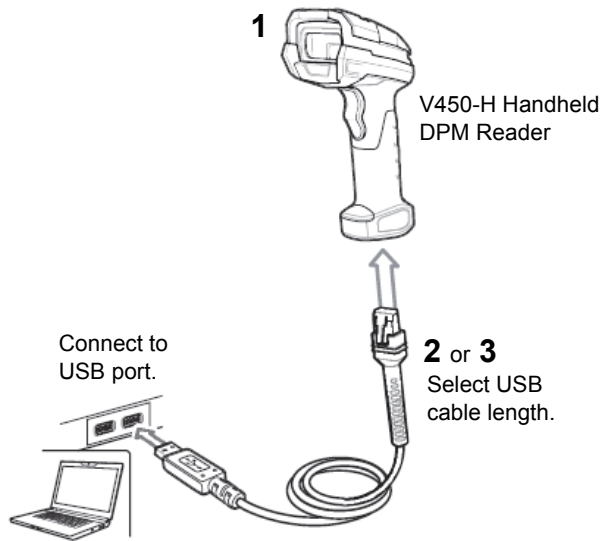
● RS-232



Part	Description	Part Number
1	V410-H SR Handheld Reader, Black Trigger, Wired	V410-HDS4608SR
	V410-H XD Handheld Reader, Blue Trigger, Wired, with X-Mode	V410-HDS4608XD
	V410-H HC Handheld Reader, White, Wired	V410-HDS4608HC
2	Cable, RS-232, DB9F, TXD-2, 7 ft.	V410-WR-2M
3	Kit, V410-H AC Power Supply, 5.2 VDC, 1A	V410-AC0-1

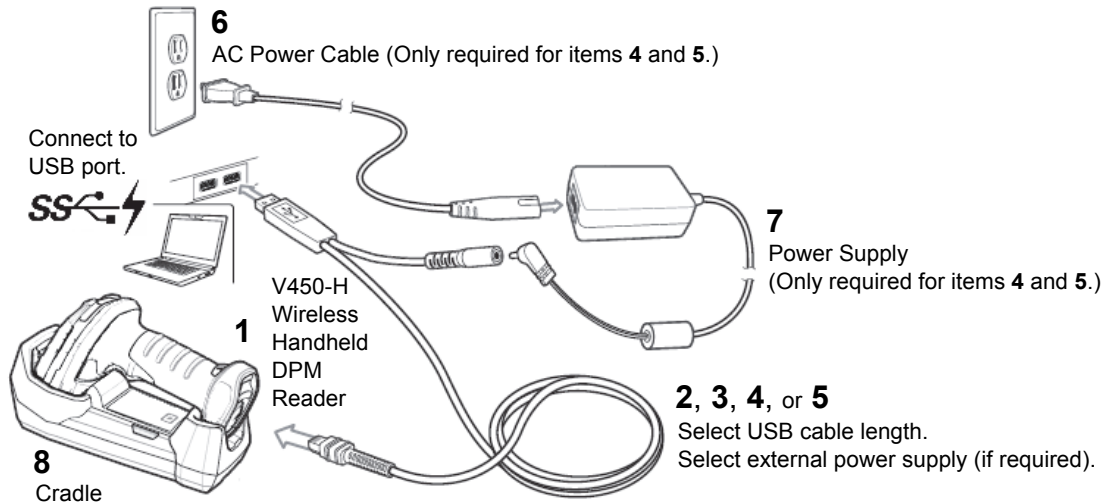
V450-H Configurations

● Wired USB



Part	Description	Part Number
1	V450-H Handheld DPM Reader, Wired	V450-HDS3608-0001
	V450-H Handheld DPM Reader, Wired, for Korea and India	V450-HDS3608-0002
2	Cable, USB, Shielded, 2 M, V450-H	V450-WUB-2M
3	Cable, USB, Shielded, 4.6 M, V450-H	V450-WUB-4M

● Wireless USB

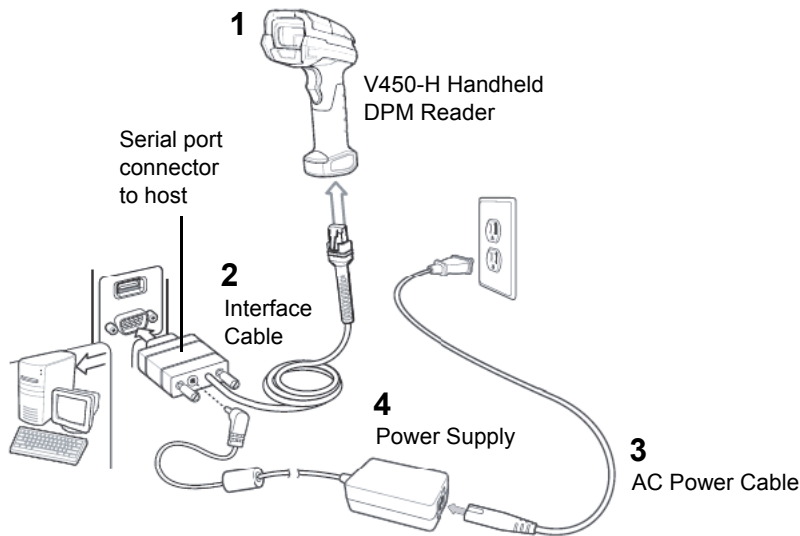


Part	Description	Part Number
1	V450-H Handheld DPM Reader, Wireless	V450-HDS3678-0001
	V450-H Handheld DPM Reader, Wireless, for Korea and India	V450-HDS3678-0002
2	Cable, USB, Shielded, 2 M, V450-H *1	V450-WUB-2M
3	Cable, USB, Shielded, 4.6 M, V450-H *1	V450-WUB-4M
4	Cable, USB, Shielded, 2 M, Ext. 12V, V450-H *1	V450-WUX-2M
5	Cable, USB, Shielded, 4.6 M, Ext. 12V, V450-H *1	V450-WUX-4M
6	AC Power Cable, 1.8 M, C13 Conn. *2	V450-WPXX-2M
7	Kit, Power Supply for Cradle / Charger, V450-H Wireless	V450-AC0-1
8	Cradle, Charger, Sealed, V450-H Wireless	V450-AK0

*1. Charging is faster with external power supply. Time to full charge: up to 10 hours without; only 3 hours with.

*2. AC Power Cables are available for China, EU, UK, India, Japan, U.S. See [V410-H](#) and [V450-H Configurations](#) for details.

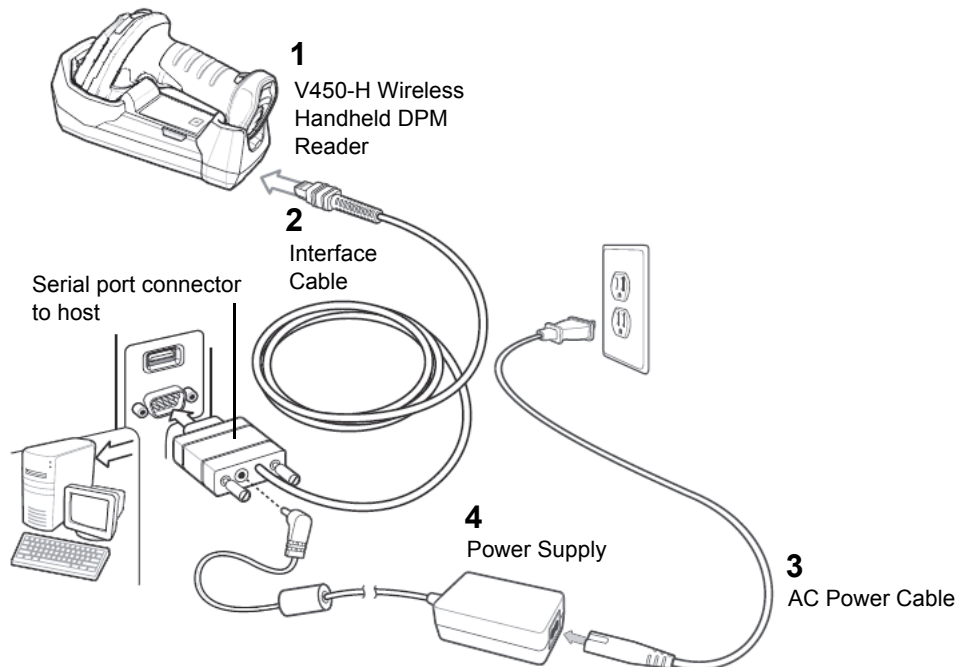
● **Wired RS-232**



Part	Description	Part Number
1	V450-H Handheld DPM Reader, Wired	V450-HDS3608-0001
	V450-H Handheld DPM Reader, Wired, for Korea and India	V450-HDS3608-0002
2	Cable, RS-232, DB9 Socket, 2 M, Straight, V450-H	V450-WR-2M
3	AC Power Cable, 1.8 M, C13 Conn. *1	V450-WPXX-2M
4	Kit, Power Supply for Cradle / Charger, V450-H Wireless	V450-AC0-1

*1. AC Power Cables are available for China, EU, UK, India, Japan, U.S. See [V410-H and V450-H Configurations](#) for details.

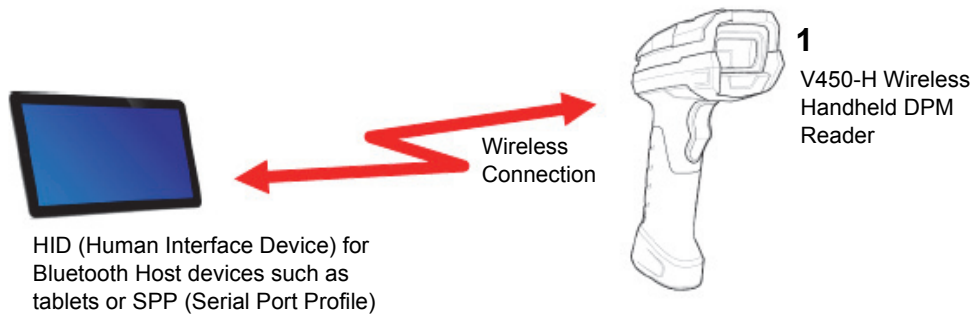
● **Wireless RS-232**



Part	Description	Part Number
1	V450-H Handheld DPM Reader, Wireless	V450-HDS3678-0001
	V450-H Handheld DPM Reader, Wireless, for Korea and India	V450-HDS3678-0002
2	Cable, RS-232, DB9 Socket, 2 M, Straight, V450-H	V450-WR-2M
3	AC Power Cable, 1.8 M, C13 Conn. *1	V450-WPXX-2M
4	Kit, Power Supply for Cradle / Charger, V450-H Wireless	V450-AC0-1
5	Cradle, Charger, Sealed, V450-H Wireless	V450-AK0

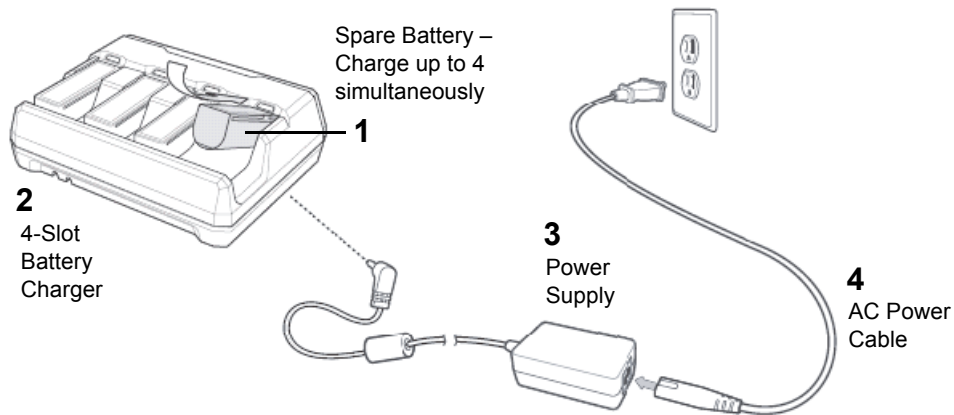
*1. AC Power Cables are available for China, EU, UK, India, Japan, U.S. See [V410-H and V450-H Configurations](#) for details.

● Bluetooth



Part	Description	Part Number
1	V450-H Handheld DPM Reader, Wireless	V450-HDS3678-0001
	V450-H Handheld DPM Reader, Wireless, for Korea and India	V450-HDS3678-0002

● 4-Slot Battery Charger



Part	Description	Part Number
1	Kit, Battery, Spare, V450-H Wireless	V450-AB0-1
	Kit, Battery, Spare, Korea and India, V450-H Wireless	V450-AB1-1
2	Kit, 4-Slot Battery Charger, V450-H Wireless	V450-AG0-1
3	Kit, Power Supply for 4-Slot Battery Charger, V450-H Wireless	V450-AC1-1
4	AC Power Cable, 1.8 M, China, C13 Conn.	V450-WPCN-2M
	AC Power Cable, 1.8 M, EU, C13 Conn.	V450-WPEU-2M
	AC Power Cable, 1.8 M, UK, C13 Conn.	V450-WPGB-2M
	AC Power Cable, 1.9 M, India, C13 Conn.	V450-WPIN-2M
	AC Power Cable, 1.8 M, Japan, C13 Conn.	V450-WPJP-2M
	AC Power Cable, 1.8 M, U.S., C13 Conn.	V450-WPUS-2M

4

Radio Communications (V450-H Only)

This section provides information about the modes of operation and features available for wireless communication between V450-H Wireless Readers, cradles, and hosts. This section also includes reader configuration parameters.

4

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4-1 V450-H Wireless Reader Radio Communications

The reader ships with the settings shown in the **Radio Communications Parameter Defaults**. If the default values suit requirements, programming is not necessary.

To set feature values, scan a single programming symbol or a short sequence of programming symbols. The settings are stored in non-volatile memory and are preserved even when the reader is powered down.

If not using a USB cable with the cradle, select a host type (see each host chapter for specific host information) after the power-up beep. This is only necessary upon the first power-up when connected to a new host.

Scanning Sequence Examples

In most cases, scan one programming symbol to set a specific parameter value.

Errors While Scanning

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

4-2 Radio Communications Parameter Defaults

The table below lists the defaults for radio communication parameters. If you wish to change any option, scan the appropriate programming symbol(s) provided in the Radio Communications Parameters section.

See [Standard Default Parameters](#) for all user preferences, hosts, symbologies, and default parameters.

In this guide, the parameter numbers listed are the same as the attribute numbers for these parameters.

See [Country Codes](#) for Country Keyboard Types.

Parameter	Parameter Number ¹	Default
Radio Communications Host Types	383	Cradle Host
BT Friendly Name	607	n/a
Discoverable Mode	610	General
Wi-Fi Friendly Mode	1299	Disable
Wi-Fi Friendly Channel Exclusion	1297	Use All Channels
Radio Output Power	1324	High
Link Supervision Timeout	1698	5 Seconds
Bluetooth Radio State	1354	On
Bluetooth HID - Wait for Connection	1714	Disable
HID Features for Apple iOS	1114	Disable
HID Keyboard Keystroke Delay	N/A	No Delay (0 msec)
CAPS Lock Override	N/A	Disable
Ignore Unknown Characters	N/A	Send Barcodes with Unknown Characters
Emulate Keypad	N/A	Enable
Fast HID Keyboard	1361	Enable
Quick Keypad Emulation	1362	Enable
Keyboard FN1 Substitution	N/A	Disable
Function Key Mapping	N/A	Disable
Simulated Caps Lock	N/A	Disable
Convert Case	N/A	No Case Conversion
Reconnect Attempt Beep Feedback	559	Disable
Reconnect Attempt Interval	558	30 Seconds
Auto-reconnect	604	Auto-reconnect Immediately
Beep on Insertion	288	Enable
Beep on <BEL>	150	Enable
Modes of Operation (Point-to-Point/Multipoint-to-Point)	538	Point-to-Point
Parameter Broadcast (Cradle Host Only)	148	Enable
Pairing Modes	542	Unlocked
Pairing Methods	545	Enable
Toggle Pairing	1322	Disable
Connection Maintenance Interval	5002	15 Minutes
Batch Mode	544	Normal (Do Not Batch Data)
Persistent Batch Storage	1399	Disable
Page Button	746	Enable
Page Options Page Mode Page State Timeout	1364 1365	Page Simple

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

Parameter	Parameter Number¹	Default
Classic and/or Low Energy Bluetooth	1355	Classic and Low Energy
PIN Code (Set and Store)	552	12345
Variable Pin Code	608	Static (Default PIN code is 12345)
Bluetooth Security Levels	1393	Low

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

4-3 Radio Communications Host Types

● Parameter # 383

To set up the reader for communication with a cradle, or to use standard Bluetooth profiles, scan the appropriate host type programming symbol below.

Classic Bluetooth vs. Low Energy Bluetooth

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

4-3-1 Cradle

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

The reader automatically tries to reconnect to a remote device when a disconnection occurs that is due to the radio losing communication.

To establish a connection (for initial setup only):

- 1 Scan the **Cradle-Classic Bluetooth** or **Cradle-Low Energy** programming symbol.
- 2 Scan the pairing symbol on the cradle or place the reader in the cradle.



Cradle-Classic



Cradle-Low Energy

Keyboard Emulation (HID)

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

- **HID BT Classic** - Enables the host and reader to communicate using HID (Human Interface Device) Keyboard Profile over Bluetooth Classic radio. The reader(s) are discoverable (Secondary mode) and also support Primary (Master) mode.

To establish a connection (initial setup only):

- Scan the **HID BT Classic** programming symbol.
- Connect to Primary or Secondary mode.
 - Primary mode - scan a pairing symbol with the MAC address of the host device.
 - Secondary mode - from the host, discover Bluetooth devices and select your reader from the discovered device list.

- **HID BT LE (Discoverable)** - Enables the host to establish a HID (Human Interface Device) Keyboard Profile connection with the reader over Bluetooth Low Energy radio. The reader is discoverable (Secondary mode).

To establish a connection (initial setup only):

- 1** Scan the **HID BT LE (Discoverable)** programming symbol.
- 2** From the host, discover Bluetooth devices.
- 3** Select your reader from your discovered device list.



HID Bluetooth Classic



HID BT LE (Discoverable)

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)** - Enables the reader to establish a Serial Port Profile (SPP) connection with the host over Classic Bluetooth radio. The reader is NOT discoverable (Primary mode). To establish a connection (initial setup only):

- 1** Scan the **SPP BT Classic (Non-discoverable)** programming symbol.
- 2** Scan a pairing symbol with the MAC address of the host device.
- 3** **SPP BT Classic (Discoverable)** - Enables the host to establish a Serial Port Profile (SPP) connection with the reader over Classic Bluetooth radio. The reader is discoverable (Secondary mode).
- 4** To establish a connection (initial setup only):
- 5** Scan the **SPP BT Classic (Discoverable)** programming symbol.
- 6** From the host, discover Bluetooth devices.

- 7** Select your reader from the discovered device list.



SPP BT Classic (Non-Discoverable)



SPP BT Classic (Discoverable)

Bluetooth Technology Profile Support

With Bluetooth Technology Profile Support, the cradle is not required for wireless communication. The reader communicates directly to the host using Bluetooth technology. The reader supports the standard Bluetooth Serial Port Profile (SPP) and HID Profiles which enable the reader to communicate with other Bluetooth devices that support these profiles.

- SPP - the reader connects to the PC/host via Bluetooth and performs like there is a serial connection.
- HID - the reader connects to the PC/host via Bluetooth and performs like a keyboard.

Primary/Secondary Set Up

The reader can be set up as a Primary or Secondary. When the reader is set up as a Secondary, it is discoverable and connectible to other devices. When the reader is set up as a Primary, the Bluetooth address of the remote device to which a connection is requested is required. A pairing symbol with the remote device address must be created and scanned to attempt a connection to the remote device.

● Primary

When the reader is set up as a Primary (SPP), it initiates the radio connection to a secondary device. Initiating the connection is done by scanning a pairing symbol for the remote device.

● Secondary

When the reader is set up as a Secondary device (SPP), the reader accepts an incoming connection request from a remote device. The number of readers is dependent on the host's capability.

4-4 Bluetooth-Friendly Name

● Parameter # 607

You can set a meaningful name for the reader that appears in the application during device discovery. The default name is the reader name followed by its serial number, e.g., V450-H 123456789ABCDEF. Scanning Set Defaults reverts the reader to this name; use custom defaults to maintain the user-programmed name through a Set Defaults operation.

To set a new Bluetooth Friendly Name, scan the following programming symbol, then scan up to 23 characters from [Alphanumeric Keyboard](#).



Bluetooth Friendly Name

Discoverable Mode

● Parameter # 610

Select a discoverable mode based on the device initiating discovery:

- Select **General Discoverable Mode** when initiating connection from a PC.
- Select **Limited Discoverable Mode** when initiating connection from a mobile device (e.g., iPhone), and the device does not appear in General Discoverable Mode. Note that it can take longer to discover the device in this mode.

The device remains in Limited Discoverable Mode for 30 seconds, and green LEDs flash while in this mode. It is then non-discoverable. To re-activate Limited Discoverable Mode, press the trigger.



* General Discoverable Mode
(0)



Limited Discoverable Mode
(1)

4-5 Wi-Fi Friendly Mode

● Parameter # 1299

Readers configured for Wi-Fi friendly mode behave as follows:

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

Notes

- If using this feature, configure all readers 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.

Scan a programming symbol below to enable or disable **Wi-Fi Friendly Mode**.



* Disable Wi-Fi Friendly Mode
(0)



Enable Wi-Fi Friendly Mode
(1)

Wi-Fi Friendly Channel Exclusion

● Parameter # 1297

WiFi Channel Exclusion

Select the channels to exclude:

- **Exclude Wi-Fi channel 1:** Bluetooth channels 0 - 21 are excluded from hopping sequence (2402 - 2423 MHz).
- **Exclude Wi-Fi channel 6:** Bluetooth channels 25 - 46 are excluded from hopping sequence (2427 - 2448 MHz).
- **Exclude Wi-Fi channel 11:** Bluetooth channels 50 - 71 are excluded from 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 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 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 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 hopping sequence.



* Use All Channels (Standard)
(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)**

4-6 Radio Output Power

- **Parameter # 1324**

The V450-H Wireless Reader uses a Class 1 Bluetooth radio. Optionally, reduce the radio's output power to restrict the transmission range and reduce the effect of the radio on neighboring wireless systems.

Bluetooth stack resets on power change and the device loses connection.

Scan a programming symbol to select the desired power mode.



*** High Power Setting
(0)**



**Medium Power Setting
(1)**



**Low Power Setting
(2)**

Link Supervision Timeout

- **Parameter # 1698**

Link supervision timeout controls how quickly the reader senses that the Bluetooth radio lost connection to the remote device. A lower value helps prevent data loss at the edge of the operating range while a larger value helps prevent disconnects due to the remote device not responding in time. If you are experiencing occasional disconnects and the reader is able to reconnect, increase the link supervision timeout value.



0.5 Seconds



2 Seconds



5 Seconds



10 Seconds



20 Seconds

4-7 Bluetooth Radio State

- **Parameter # 1354**

The only option to turn the radio on after it is turned off on the cradle, is through the host.



**Bluetooth Radio Off
(0)**



*** Bluetooth Radio On
(1)**

4-8 HID Host Parameters

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

Bluetooth HID - Wait for Connection

● Parameter # 1714

This setting applies to first time connection only, when reader connects to remote device by scanning a pairing symbol.

When disabled, the reader issues a connection after scanning a pairing symbol. This is the recommended setting for Android devices.

When enabled, the reader waits for a connection request from a remote device, after scanning a pairing symbol and initiating pairing. This is the recommended setting for Windows devices.



* Disable
(0)



Enable
(1)

HID Features for Apple iOS

● Parameter # 1114

This option works with Apple iOS devices to enable the opening and closing of the iOS virtual keyboard by double-pressing the trigger.

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



* Disable
(0)



Enable
(1)

HID Keyboard Keystroke Delay

This parameter sets the delay, in milliseconds (msec), between emulated keystrokes. Scan a programming symbol below to increase the delay when the HID host requires a slower transmission of data.



* No Delay (0 msec)



Medium Delay (20 msec)



Long Delay (40 msec)

HID Caps Lock Override

When enabled, the case of the data is preserved regardless of the state of the caps lock key. This setting is always enabled for the *Japanese, Windows (ASCII)* keyboard type and can not be disabled.



*** Do Not Override Caps Lock Key
(Disable)**



**Override Caps Lock Key
(Enable)**

HID Ignore Unknown Characters

This option applies only to the HID Keyboard Emulation device and IBM device. Unknown characters are characters the host does not recognize. When Send Barcodes With Unknown Characters is selected, all barcode data is sent except for unknown characters, and no error beeps sound. When Do Not Send Barcodes With Unknown Characters is selected, barcode data is sent up to the first unknown character, then the reader issues an error beep.



*** Send Barcodes With Unknown
Characters
(Enable)**



**Do Not Send Barcodes With Unknown
Characters
(Disable)**

Emulate Keypad

When enabled, all characters are sent as ASCII sequences over the numeric keypad. For example, ASCII A is sent as "ALT make" 0 6 5 "ALT Break".



Disable Keypad Emulation



* Enable Keypad Emulation

Fast HID Keyboard

- **Parameter # 1361**

This option transmits Bluetooth HID keyboard data at a faster rate.



Fast HID Disable
(0)



* Fast HID Enable
(1)

Quick Keypad Emulation

● Parameter # 1362

This option applies only to a HID Keyboard Emulation Device which has **Emulate Keypad** enabled.

This parameter enables a quicker method of keypad emulation where ASCII sequences are only sent for ASCII characters not found on the keyboard.



Quick Keypad Emulation Disable
(0)



* Quick Keypad Emulation Enable
(1)

HID Keyboard FN1 Substitution

When enabled, this parameter allows replacement of any FN1 character in an EAN128 barcode with a Key Category and value chosen by the user.



* Disable Keyboard FN1 Substitution



Enable Keyboard FN1 Substitution

HID Function Key Mapping

ASCII values under 32 are normally sent as control-key sequences. When this parameter is enabled, the keys in bold are sent in place of the standard key mapping.

Table entries that do not have a bold entry remain the same whether or not this parameter is enabled.



*** Disable Function Key Mapping**



Enable Function Key Mapping

Simulated Caps Lock

When enabled, the reader inverts upper and lower case characters on the barcode as if the Caps Lock state is enabled on the keyboard. This inversion is done regardless of the current state of the keyboard Caps Lock state.



*** Disable Simulated Caps Lock**



Enable Simulated Caps Lock

Convert Case

When enabled, the reader converts all barcode data to the selected case.



* No Case Conversion



Convert All to Upper Case



Convert All to LowerCase

4-9 Reconnect Attempt Beep Feedback

When in SPP Primary, Cradle Host Mode, and Bluetooth Keyboard Emulation, the reader automatically tries to reconnect to a remote device when a disconnection occurs that is due to the radio losing communication. This can happen if the reader goes out of range with the remote device, or if the remote device powers down. The reader tries to reconnect for the period of time specified by the Reconnect Attempt Interval setting. During that time the green LED continues to blink.

If the auto-reconnect process fails due to page time-outs, the reader sounds a page timeout beep (long low/long high) and enters low power mode. The auto-reconnect process can be re-started by pulling the reader trigger.

If the auto-reconnect process fails because the remote device rejects the connection attempt, the reader sounds a connection reject beep sequence and deletes the remote pairing address. If this happens, a pairing symbol must be scanned to attempt a new connection to the remote device.

If a barcode is scanned while the auto-reconnect sequence is in process, a transmission error beep sequence sounds and the data is not transmitted to the host. After a connection is reestablished, normal scanning operation returns.

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

Switching between Bluetooth host types by scanning a host type programming symbol causes the radio to be reset. Scanning is disabled during this time. It takes several seconds for the reader to re-initialize the radio at which time scanning is enabled.

Reconnect Attempt Beep Feedback

● Parameter # 559

When a reader disconnects as it goes out of range, it immediately attempts to reconnect. While the reader attempts to reconnect, the green LED continues to blink. If the auto-reconnect process fails, the reader emits a page timeout beep (long low/long high) and stops blinking the LED. The process can be restarted by pulling the trigger.

The Beep on Reconnect Attempt feature is disabled by default. When enabled, the reader emits 5 short high beeps every 5 seconds while the re-connection attempt is in progress. Scan a programming symbol below to enable or disable Beep on Reconnect Attempt.



* Disable Beep on Reconnect Attempt
(0)



Enable Beep on Reconnect Attempt
(1)

Reconnect Attempt Interval

● Parameter # 558

When a reader disconnects as it goes out of range, it immediately attempts to reconnect for the default time interval of 30 seconds. This time interval can be changed to one of the options below.

To set the Reconnect Attempt Interval, scan one of the programming symbols below.



* 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)

Auto-Reconnect

● Parameter # 604

In Bluetooth Keyboard Emulation (HID) mode, SPP Primary, and Cradle Host Mode, select a re-connect option for when the reader loses its connection with a remote device:

- **Auto-reconnect on Barcode Data:** The reader auto-reconnects when you scan a barcode. With this option, a delay can occur when transmitting the first characters. The reader sounds a decode beep upon barcode scan, followed by a connection, a page timeout, a rejection beep, or a transmission error beep. Select this option to optimize battery life on the reader and mobile device. Note that auto-reconnect does not occur on rejection and cable unplug commands.
- **Auto-reconnect Immediately:** When the reader loses connection, it attempts to reconnect. If a page timeout occurs, the reader attempts reconnect on a trigger pull. Select this option if the reader's battery life is not an issue and you do not want a delay to occur when the first barcode is transmitted. Note that auto-reconnect does not occur on rejection and cable unplug commands.
- **Disable Auto-reconnect:** When the reader loses connection, you must re-establish it manually.



Auto-Reconnect on Barcode Data
(1)



* Auto-Reconnect Immediately
(2)



Disable Auto-Reconnect
(0)

4-10 Out-of-Range Indicator

An out-of-range indicator can be set by scanning **Beep On Reconnect Attempt** and extending the time using the **Reconnect Attempt Interval**.

For example, with Beep on Reconnect Attempt disabled while the reader loses radio connection when it is taken out of range, the reader attempts to reconnect silently during the time interval set by scanning a Reconnect Attempt Interval.

When Beep on Reconnect Attempt is enabled, the reader emits 5 high beeps every 5 seconds while the re-connection attempt is in progress. If the Reconnect Attempt Interval is adjusted to a longer period of time, such as 30 minutes, the reader emits 5 high beeps every 5 seconds for 30 minutes providing an out-of-range indicator.

4-11 Beep on Insertion

- **Parameter # 288**

When a reader is inserted into a cradle and detects power, it emits a short low beep. This feature is enabled by default.

To enable or disable beeping on insertion, scan the appropriate programming symbol below.



* Enable Beep on Insertion
(1)



Disable Beep on Insertion
(0)

4-12 Beep on <BEL>

● Parameter # 150

When this parameter is enabled, the reader issues a beep when a <BEL> character is detected on the serial line. <BEL> is issued to gain a user's attention to an illegal entry or other important events.

This parameter only applies to SPP (Serial Port Profile). The RS-232 interface on the cradle has this feature when Beep on <BEL> is enabled.

In Multipoint-to-Point mode only, the reader that beeped last sounds Beep on <BEL>.



* Beep on <BEL> Enable
(1)



Beep on <BEL> Disable
(0)

4-13 Reader(s)-to-Cradle Support

Modes of Operation

● Parameter # 538

The charging cradle with radio supports two radio communication modes of operation, allowing the reader to communicate wirelessly:

- Point-to-Point
- Multipoint-to-Point

Point-to-Point Communication

In Point-to-Point communication mode, the cradle allows one reader to connect to it at a time. In this mode, the reader is paired to the cradle either by insertion into the cradle or by scanning the PAIR symbol. Communication can be locked, unlocked (default), or in a lock override state. In locked mode, locking intervals must be set by scanning a connection maintenance interval programming symbol.

To activate this mode of operation, scan Point-to-Point.

Multipoint-to-Point Communication

Multipoint-to-Point communication mode allows up to seven readers to pair to one cradle.

To activate this mode, the first reader connected to the cradle must scan the Multipoint-to-Point programming symbol. This mode allows a parameter broadcast feature that forwards parameter programming symbol settings to all connected readers. In this mode, programming one reader applies the settings to all connected readers.

To select Point-to-Point or Multipoint-to-Point mode, scan the appropriate programming symbol.

Note: Weblink_{PC} is not supported when readers are in Multipoint-to-Point pairing mode. Setup is only supported in Point-to-Point pairing.



Multipoint-to-Point Mode
(1)



* Point-to-Point Mode
(0)

Parameter Broadcast (Cradle Host Only)

● Parameter # 148

When Parameter Broadcast is disabled on one reader in the piconet, **Parameter Broadcast** is disabled on all readers in the piconet.

When in multipoint-to-point mode, enable Parameter Broadcast to broadcast all parameter programming symbols scanned to all other readers in the piconet. If disabled, parameter programming symbols are processed by the individual reader only, and the reader ignores parameters broadcast from other readers or from the cradle.



* Enable Parameter Broadcast
(1)



Disable Parameter Broadcast
(0)

Pairing

Pairing is the process by which a reader initiates communication with a cradle. Scanning Multipoint-to-Point activates multi reader-to-cradle operation and allows up to seven readers to pair to one cradle.

To pair the reader with the cradle, scan the pairing symbol. A high/low/high/low beep sequence indicates that the pairing symbol was decoded. When a connection between the cradle and reader is established, a low/high beep sounds.

- 1** The pairing symbol that connects the reader to a cradle is unique to each cradle.
- 2** Do not scan data or parameters until pairing completes.
- 3** Only when the reader is paired to the cradle, it automatically tries to reconnect to a remote device when a disconnection occurs that is due to the radio losing communication. Pairing Modes

● Parameter # 542

When operating with the cradle, two modes of pairing are supported:

- **Locked Pairing Mode** - When a cradle is paired (connected) to the reader (or up to seven readers in Multipoint-to-Point mode), any attempt to connect a different reader, by either scanning the **PAIR** symbol on the cradle or by inserting it into the cradle with the pairing on contacts feature enabled, is rejected. The currently connected reader(s) maintain connection. In this mode, you must set a **Connection Maintenance Interval**.
- **Unlocked Pairing Mode** - Unlocking works in Point-to-Point mode only. Pair (connect) a new reader to a cradle at any time by either scanning the **PAIR** symbol on the cradle or by inserting it into the cradle with the pairing on contacts feature enabled. This unpairs the previous reader from the cradle.

To set the cradle pairing mode, scan the appropriate programming symbol below.



* **Unlocked Pairing Mode**
(0)



Locked Pairing Mode
(1)

Lock Override

Lock Override is applicable in Point-to-Point mode only (does not apply to Multipoint-to-Point mode). In Multipoint-to-Point mode, if seven readers are connected, the readers must be disconnected for a new reader to connect.

Lock Override overrides a locked reader base pairing and connects a new reader. To use Lock Override, scan the programming symbol below, followed by the pairing barcode on the cradle.



Lock Override

Pairing Methods

● Parameter # 545

There are two pairing methods. The default method allows the reader and cradle to pair (connect) when the pairing symbol on the cradle is scanned. A second method pairs the reader and cradle when the reader is inserted in the cradle. To enable this feature, scan Enable Pair On Contacts below. With this feature enabled it is not necessary to scan the pairing symbol on the cradle. If the pairing is successful, a low/high connection beep sequence sounds a few seconds after the reader is placed in the cradle. To enable or disable pairing on contacts, scan the appropriate programming symbol below.



* Enable Pair On Contacts
(1)



Disable Pair on Contacts
(0)

Unpairing

Unpair the reader from the cradle or PC/host to make the cradle available for pairing with another reader. Scan the programming symbol below to disconnect the reader from its cradle/PC host.

An unpairing symbol is also included in the *V450-H Wireless Reader Quick Start Guide*.



Unpairing

Toggle Pairing

● Parameter # 1322

If the reader is configured for Toggle Pairing, scanning the Toggle Pairing symbol a second time will unpair the reader.



* Toggle Pairing Disable
(0)



Toggle Pairing Enable
(1)

Pairing Barcode Format

When the reader is configured as an SPP Primary, you must create a pairing symbol for the remote Bluetooth device to which the reader can connect. The Bluetooth address of the remote device must be known. Pairing symbols are formatted as follows:

<Fnc 3>Bxxxxxxxxxxx

where:

- **B** (or **LNKB**) is the preamble.
- **xxxxxxxxxxx** represents the 12-character Bluetooth address.

● Pairing Barcode Example

If the remote device to which the reader can connect has a Bluetooth address of 11:22:33:44:55:66, then the pairing symbol is:



Pairing Barcode Content: _____ **B112233445566**
'B' + Bluetooth Address

Connection Maintenance Interval

The Connection Maintenance Interval only applies in locked pairing mode.

When a reader disconnects from a cradle due to a Link Supervision Timeout, the reader immediately attempts to reconnect to the cradle for 30 seconds. If the auto-reconnect process fails, it can be restarted by pulling the reader trigger.

To guarantee that a disconnected reader can reconnect when it comes back in range, the cradle reserves the connection for that reader for a period of time defined by the Connection Maintenance Interval. If the cradle is supporting the maximum three readers and one reader disconnects, a fourth reader cannot pair to the cradle during this interval. To connect another reader: either wait until the connection maintenance interval expires then scan the PAIR symbol on the cradle with the new reader; or, scan Lock Override with the new reader then scan the PAIR symbol on the cradle.

The cradle stores the remote pairing address of each reader in memory regardless of the reader condition (e.g., discharged battery). When you want to change the readers paired to the cradle, unpair each reader currently connected to the cradle by scanning the **Unpairing** symbol prior and reconnect each appropriate reader by scanning the PAIR symbol on the cradle.

● Considerations

The system administrator determines the Connection Maintenance Interval. A shorter interval allows new users to gain access to abandoned connections more quickly, but causes problems if users leave the work area for extended periods. A longer interval allows existing users to leave the work area for longer periods of time, but ties up the system for new users.

To avoid this conflict, users who are going off-shift can scan the **Unpairing** symbol to ignore the Connection Maintenance Interval and make the connection immediately available.

Connection Maintenance Interval (Continued)

To set the Connection Maintenance Interval, scan one of the programming symbols below.



*** Set Interval to 15 Minutes
(0)**



**Set Interval to 30 Minutes
(1)**



**Set Interval to 60 Minutes
(2)**



**Set Interval to 2 Hours
(3)**



**Set Interval to 4 Hours
(4)**



**Set Interval to 8 Hours
(5)**



**Set Interval to 24 Hours
(6)**



**Set Interval to Forever
(7)**

4-14 Batch Mode

● Parameter # 544

Batch mode does not apply to SPP Secondary Mode.

The reader supports five versions of batch mode. When the reader is configured for any of the batch modes, it attempts to store barcode data (not parameter barcodes) until transmission is initialized, or the maximum number of barcodes are stored. When a barcode is saved successfully, a good decode beep sounds and the LED flashes green. If the reader is unable to store a new barcode, a low/high/low/high out-of-memory beep sounds.

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

Number of storable barcodes = 30,720 bytes of memory / (number of characters in the barcode + 3).

If the batch mode selection is changed while there is batched data, the new batch mode takes effect only after all the previously batched data is sent.

Modes of Operation

- **Normal (default)** - Do not batch data. The reader attempts to transmit every scanned barcode.
- **Out of Range Batch Mode** - The reader starts storing barcode data when it loses its connection to a remote device (for example, when a user holding the reader walks out of range). Data transmission is triggered by reestablishing the connection with the remote device (for example, when a user holding the reader walks back into range).
- **Standard Batch Mode** - The reader starts storing barcode data after **Enter Batch Mode** is scanned. Data transmission is triggered by scanning **Send Batch Data**

Transmission is halted if the connection to the remote device is lost.

- **Cradle Contact Batch Mode** - The reader starts storing barcode data when **Enter Batch Mode** is scanned. Data transmission is triggered by insertion of the reader into the cradle.

If the reader is removed from the cradle during batch data transfer, transmission halts until the reader is re-inserted in the cradle.

- **Batch Only Mode** - The reader radio is turned off and the reader stores all barcode data. Data transmission is triggered by insertion of the reader into the cradle.

If the reader is removed from the cradle during batch data transfer, transmission halts until the reader is re-inserted in the cradle.

The radio may be turned off as batch data is transmitted over the cradle contacts.

This mode can only be exited by scanning **Normal** (default) mode.

- **Parameter Batch Mode** - When **Parameter Batch Mode** is entered and no connection to the cradle exists, the reader begins storing parameter programming symbol data intended for the cradle. Parameter transmission is triggered by insertion of the reader into the cradle. Parameter Batch Mode is exited upon the end of the transmission. Alternatively, parameter programming symbol batching may be cancelled prior to insertion of the reader into the cradle by scanning **Exit Parameter Batch Mode**.

Parameter Batch Mode may be used when the cradle and/or reader is configured with its radio turned off or connected to a non-cradle device.



* Normal
(0)



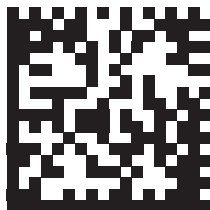
Out of Range Batch Mode
(1)



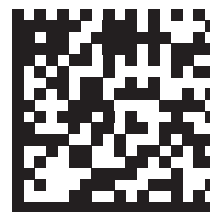
Standard Batch Mode
(2)



Cradle Contact Batch Mode
(3)



Enter Batch Mode



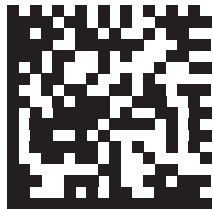
Send Batch Data



Batch Only Mode



Enter Parameter Batch Mode



Exit Parameter Batch Mode

4-15 Persistent Batch Storage

- **Parameter #1399**

When the reader is configured for Persistent Batch Storage, batch data is stored in non-volatile memory and preserved even when the reader is powered down. This parameter is Disabled by default.

Frequently storing batch data with this setting *Enabled* will shorten the life of the non-volatile memory.



* **Persistent Batch Disable**
(0)



Persistent Batch Enable
(1)

4-16 Page Button

● Parameter # 746

The cradle offers a page button. The page button is a sensor that when touched, causes paired readers to emit a beeping sequence. The default is Enable Page Button.

- 1** Place your finger over the page button sensor.
- 2** Press down for approximately 1 second.
- 3** The cradle LED will turn blue when the reader is out of the cradle. The paired reader will beep, blink, and vibrate. If multiple readers are paired to the cradle, all the readers will beep, blink, and vibrate.
- 4** Repeat as necessary.

Readers out of radio range will not beep when paged.

Scan one of the following programming symbols to enable or disable this feature.



**Disable Page Button
(0)**



*** Enable Page Button
(1)**

4-17 Page Options

To select a page option, select one of the programming symbols below.

Page Mode

● Parameter # 1364

- **Page State** - In this mode, the cradle sends a page state request to each reader. It remains in Page State indication until every reader sends an acknowledgment. The reader enters Page State when the LED indicator is blinking blue and the vibrating motor and beeper are activated. When the trigger is pressed, or the reader is inserted into the cradle, or the requested timeout (default is 30 seconds) is reached, the reader sends the acknowledgment to the cradle and returns to its normal state.
- **Page Simple** - In this mode, the cradle sends a page indication request to each reader, and returns to idle state. Each reader issues a single Page State indication.



Page State
(1)



* Page Simple
(0)

Page State Timeout

- **Parameter # 1365**

Page timeout is programmable in 1 second increments from 1 to 99 seconds. The default timeout is 30 seconds.

Page State Timeout only applies to **Page State Mode**.

To set a page timeout:

- 1** Scan the **Page Timeout** programming symbol below.
- 2** Scan two numeric programming symbols that correspond to the desired timeout duration. Enter a leading zero for single digit numbers (for example, for a 5 second page timeout, scan the 0 programming symbol and then the 5 programming symbol).



Page Timeout

4-18 Classic Bluetooth and/or Low Energy (Cradle Host Only)

- **Parameter # 1355**

Set up cradle to accept both Bluetooth Classic and Low Energy connections or Low Energy Only connections. All Classic Bluetooth connections must be terminated before the setting can change to **Low Energy Only**.



* **Classic Bluetooth and Low Energy**
(0)



Low Energy Only
(1)

4-19 Bluetooth Security

The reader supports Bluetooth Authentication. Authentication can be requested by either the remote device or the reader.

A remote device can still request Authentication.

PIN Code

- **Parameter # 552**

To set and store a PIN code (e.g., password) on the reader to connect to the host:

- 1** Scan the **Set and Store PIN Code** programming symbol below.
- 2** Scan five alphanumeric programming symbols using the alphanumeric programming symbols.
- 3** Scan **End of Message** in the *Advanced Data Formatting Guide*, available upon request.

The default PIN code is 12345.

If the reader communicates with a host with enabled, synchronize the PIN codes on the reader and host. To achieve this, connect the reader to the host when setting the PIN codes. If the reader is not connected to a host, the PIN code change only takes affect on the reader. If is required between the reader and host, and the PIN codes do not match, pairing fails.

An extended 16 character PIN code is available for additional with Open Bluetooth (SPP and HID).



Set and Store PIN Code

Variable PIN Code

● Parameter # 608

When switching to Cradle Host mode with authentication enabled, scan Static PIN Code below to avoid entering the PIN code manually. The PIN stored in memory is used. Scan the Variable PIN Code below to manually enter a PIN code with each connection.

The default PIN code is the user-programmed PIN set and stored above. Typically, however, HID connections require entering a Variable PIN Code. If, when attempting connection, the application presents a text box that includes a PIN, scan the Variable PIN Code programming symbol, then re-attempt connection. When you hear a beep indicating the reader is waiting for an alphanumeric entry, enter the provided variable PIN using the **Alphanumeric Programming Barcodes**, then scan **End of Message**. If the code is less than 16 characters. The reader discards the variable PIN code after connection.



* Static PIN Code
(0)



Variable PIN Code
(1)

Bluetooth Security Levels

● **Parameter # 1393**

- **Low Bluetooth Security** - The low security setting is designed for ease of connection with most devices. This setting may be unacceptable to some devices. If connection fails, try re-connecting after increasing security setting on the reader.
If connecting to Bluetooth 2.1 device and above, *Just Works* method for secure and simple pairing is used.

Data is encrypted using the **Low Bluetooth** security setting if connected to a Bluetooth 2.1 and above device.

- **Medium Bluetooth Security** - The medium security setting may require a passkey for the initial connection to pair reader and device.
If connecting to Bluetooth 2.1 device and above, *Passkey Entry* method for secure and simple pairing is used.
- **High Bluetooth Security** - The high security setting enables *Man in the Middle* protection for Bluetooth 2.1 and above. Not all devices are able to support this mode.
- **Legacy Bluetooth Security** (Bluetooth 2.0 and below) - The legacy security setting enables authentication and encryption for legacy pairing.



* **Low Bluetooth Security**
(0)



Medium Bluetooth Security
(1)



High Bluetooth Security
(2)



Legacy Bluetooth Security
(3)

4-20 Bluetooth Radio, Linking, and Batch Operation

The V450-H Wireless Reader has a Bluetooth Class 1 radio which achieves a range of at least 135 m / 440 ft. (open air, line of sight). The actual range you achieve is influenced by the presence of other radios, shelving and wall materials as well as which cradle is tested. The environments vary widely and often influence radio ranges.

When the reader goes out of communications range to the base, it can be configured for Batch Mode. The reader has sufficient on board memory to store 500 barcodes of typical size (UPC/EAN).

Setting Up an iOS or Android Product To Work with the Reader

Perform the following steps on each device to establish a link.

HID Keyboard Emulation

- 1** On the V450-H Wireless Reader, scan Keyboard Emulator (HID).
- 2** On an iOS/iPad/iPhone, select *Settings > General > Bluetooth* and turn Bluetooth *On*. Choose the V450-H Wireless Reader from the list of discovered devices. A link should be established allowing scanning into any application with keyboard entry.
- 3** On an Android/ET1/Droid, select *Settings > Wireless and networks > Bluetooth* (to turn Bluetooth on, if not already on). Select *Bluetooth Settings* and choose the V450-H Wireless Reader from the list of discovered devices. (The V450-H Wireless Reader normally displays as V450-H Wireless Reader - xxxxxx, where xxxxxx is the serial number.)

Android devices, specifically the ET1, may require you to scan a PIN to connect. If so, a PIN displays on the device. To enter the required PIN, scan the programming symbol, then re-attempt connection. When a beep sounds, indicating the reader is waiting for PIN entry, scan the PIN using the **Numeric Keyboard**.

5

User Preferences and Miscellaneous Options

This section describes user preferences and provides configuration symbols for those preferences.

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5-1 Introduction

If the default values shown in this section suit your application requirements, programming is not necessary.

To set feature values, scan a single programming symbol or a short programming symbol sequence. The settings are stored in non-volatile memory and are preserved even when the reader is powered down.

Most computer monitors allow scanning the programming symbols directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the programming symbol clearly, and bars and/or spaces are not merging.

If not using a USB cable, select a host type (see each host chapter 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.

5-2 Scanning Sequence Examples

In most cases, scanning one programming symbol sets the parameter value. For example, to set the beeper tone to high, scan the **High Frequency** (beeper tone) programming symbol. The reader issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several programming symbols. See these parameter descriptions for this procedure.

5-3 Errors While Scanning

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

5-4 User Preference Parameter Defaults (V410-H)

This table lists defaults for user preference 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 reader using the WebLink_{PC} configuration program.

Note: See [Standard Parameter Defaults](#) for all user preference, host, symbology, and miscellaneous default parameters.

User Preferences Parameter Defaults

Parameter	Parameter Number 1	SSI Number 2	Default
User Preferences			
Set Default Parameter	N/A	N/A	N/A
Parameter Barcode Scanning	236	ECh	Enable
Beep After Good Decode	56	38h	Enable
Direct Decode Indicator	859	F2h 5Bh	Disable
Beeper Volume	140	8Ch	High
Beeper 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
Decode Pager Motor (V410-H HC Only)	613	F1h 65h	Enable
Decode Pager Motor Duration (V410-H HC Only)	626	F1h 72h	150 msec
Night Mode Trigger (V410-H HC Only)	1215	F8h 04h BFh	Enable
Night Mode Toggle (V410-H HC Only)	N/A	N/A	N/A
Low Power Mode	128	80h	Disable
Time Delay to Low Power Mode	146	92h	1 Hour
Trigger Mode (or Hand-held Trigger Mode)	138	8Ah	Auto Aim
Hand-held Decode Aiming Pattern	306	F0h 32h	Enable
Hands-Free (Presentation) Decode Aiming Pattern	590	F1h 4Eh	Disable Hands-Free (Presentation) Decode Aiming Pattern
Hands-Free Mode	630	F1h 76h	Enable
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
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

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

2. SSI number hex values are used for programming via SSI commands.

User Preferences Parameter Defaults

Parameter	Parameter Number ¹	SSI Number ²	Default
Motion Tolerance (Hand-held Trigger Mode Only)	858	F2h 5Ah	Less
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
Miscellaneous Options			
Enter Key	N/A	N/A	N/A
Tab Key	N/A	N/A	N/A
Transmit Code ID Character	45	2Dh	None
Preamble Value	99, 105	63h, 69h	7013 <CR><LF>
Postamble 1 Value	98, 104	62h, 68h	7013 <CR><LF>
Postamble 2 Value	100, 106	64h, 6Ah	
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

1. Parameter number decimal values are used for programming via RSM commands.
2. SSI number hex values are used for programming via SSI commands.

5-5 User Preference Parameter Defaults (V450-H)

The table below lists defaults for user preference parameters. To change the default values:

- Scan the appropriate programming symbols in this guide. These new values replace the standard default values in memory.
- Configure the reader using WebLink_{PC}.

See [Standard Default Parameters](#) for all user preferences, hosts, symbologies, and default parameters.

Parameter	Parameter Number ¹	Default
User Preferences		
Set Default Parameter		Restore Defaults
Parameter Barcode Scanning	236	Enable
Beep After Good Decode	56	Enable
Direct Decode Indicator	859	Disable
Beeper Volume	140	High
Beeper Tone	145	Medium
Beeper Duration	628	Medium
Suppress Power Up Beeps	721	Do Not Suppress
Decode Pager Motor	613	Enable
Decode Pager Motor Duration	626	150 msec
Low Power Mode	128	Enable (V450-H Wireless Reader) Disable (V450-H Wired Reader)
Time Delay to Low Power Mode	146	100 ms (V450-H Wireless Reader) 1 Hour (V450-H Wired Reader)
Timeout to Low Power Mode from Auto Aim (V450-H Wired Only)	729	15 Seconds
Handheld Trigger Mode	138	Level
Hands-Free Mode	630	Enable
Handheld Decode Aiming Pattern	306	Enable
Hands-Free (Presentation) Decode Aiming Pattern	590	Enable Hands-Free (Presentation) Decode Aiming Pattern on PDF
Picklist Mode	402	Disabled Always
FIPS Mode (V450-H Wired Reader Only)	736	Disable
Continuous Barcode Read	649	Disable
Unique Barcode Reporting	723	Enable
Decode Session Timeout	136	9.9 Seconds
Hands-Free Decode Session Timeout	400	15
Timeout Between Decodes, Same Symbol	137	0.5 Seconds
Timeout Between Decodes, Different Symbols	144	0.5 Seconds
Mobile Phone/Display Mode	716	Normal
PDF Prioritization	719	Disable
PDF Prioritization Timeout	720	200 msec
Presentation Mode Field of View	609	Full
Decoding Illumination	298	Enable
Motion Tolerance (Handheld Trigger Mode Only)	858	Less Motion Tolerance
Ranging Light Immunity	1722	60Hz Immunity

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

Parameter	Parameter Number 1	Default
Battery Threshold		
Battery Status High Threshold	1367	50%
Battery Status Medium Threshold	1368	20%
Battery Status Low Warning Threshold	1369	10%
Battery Health Low Warning Threshold	1370	60%
Add an Enter Key	N/A	N/A
Transmit Code ID Character	45	None
Preamble Value	99, 105	7013 <CR><LF>
Postamble 1 Value	98, 104	7013 <CR><LF>
Postamble 2 Value	100, 106	
Scan Data Transmission Format	235	Data as is
FN1 Substitution Values	103, 109	7013 <CR><LF>
Transmit "No Read" Message	94	Disable
Unsolicited Heartbeat Interval	1118	Disable
UID	740	Disable
UID Error Mode Options	742	UID Error Beep
Decoder Effort Level	1438	Level 3
DPM Illumination Control	429	Cycle Illumination

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

5-6 User Preferences

Default Parameters (V410-H)

Scan one of the following barcodes to reset the reader to its default settings as follows:

- **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. See [Standard Parameter Defaults](#) for these values.
- **Set Factory Defaults** clears all custom default values and sets the factory default values. See [Standard Parameter Defaults](#) for these values.

● 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**.



Restore Defaults



Set Factory Defaults



Write to Custom Defaults

Default Parameters (V450-H)

The reader can be reset to two types of defaults: factory defaults or custom defaults. Scan the appropriate programming symbol below to reset the reader to its default settings and/or set the reader's current settings as the custom default.

Restore Defaults - Resets all default parameters as follows:

- If custom default values were configured (see **Write to Custom Defaults**), the custom default values are set for all parameters each time the **Restore Defaults** programming symbol below is scanned.
- If no custom default values were configured, the factory default values are set for all parameters each time the **Restore Defaults** programming symbol below is scanned. (For factory default values, see [Standard Default Parameters](#).)
- **Set Factory Defaults** - Scan the **Set Factory Defaults** programming symbol below to eliminate all custom default values and set the reader to factory default values (For factory default values, see [Standard Default Parameters](#).)
- **Write to Custom Defaults** - Custom default parameters can be configured to set unique default values for all parameters. After changing all parameters to the desired default values, scan the **Write to Custom Defaults** programming symbol below to configure custom defaults.



* Restore Defaults



Set Factory Defaults



Write to Custom Defaults

Parameter Barcode Scanning

● Parameter # 236

To disable the decoding of parameter programming symbols, including the **Set Defaults** parameter programming symbols, scan the **Disable Parameter Scanning** programming symbol below. To enable decoding of parameter programming symbols, scan **Enable Parameter Scanning**.



* **Enable Parameter Barcode Scanning**
(1)



Disable Parameter Barcode Scanning
(0)

Beep After Good Decode

● Parameter # 56

Scan a programming symbol below to select whether or not the reader beeps after a good decode. If selecting **Do Not Beep After Good Decode**, the beeper still operates during parameter menu scanning and to indicate error conditions.



* **Beep After Good Decode (Enable)**
(1)



Do Not Beep After Good Decode
(Disable)
(0)

Direct Decode Indicator

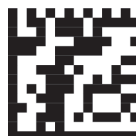
● Parameter # 859

This feature is only supported in Auto Aim and Standard (Level) trigger modes. Scan a programming symbol below to select optional blinking of the illumination on a successful decode:

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



* Disable Direct Decode Indicator
(0)



One Blink
(1)



Two Blinks
(2)

Beeper Volume

- **Parameter # 140**

To select a beeper volume, scan the **Low Volume**, **Medium Volume**, or **High Volume** programming symbol.



Low Volume
(2)



Medium Volume
(1)



*** High Volume**
(0)

Beeper Tone

- **Parameter # 145**

To select a beeper tone, scan one of the following programming symbols.



**Off
(3)**



**Low Tone
(2)**



*** Medium Tone
(1)**



**High Tone
(0)**



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



**Beep on <BEL> Enable
(1)**



**Beep on <BEL> Disable
(0)**

Beeper Duration

- **Parameter # 628**

To select the duration for the beeper, scan one of the following programming symbols.



**Short
(0)**



*** Medium
(1)**



**Long
(2)**

Suppress Power Up Beeps

- **Parameter # 721**

Scan a programming symbol below to select whether or not to suppress the reader's power-up beeps.



*** Do Not Suppress Power Up Beeps
(0)**



**Suppress Power Up Beeps
(1)**

Decode Pager Motor

● Parameter # 613

The reader includes a pager motor which, when enabled, vibrates the reader for a period of time when a successful decode occurs.

When the pager motor is enabled and the V450-H Wired Reader is in the V450-H Stand, the pager motor disables until the reader is removed from the V450-H Stand.

Scan a programming symbol below to enable or disable the pager motor. If enabled, scan the appropriate programming symbol to set the period of time in which to vibrate the reader.



Pager Motor Disable
(0)



*** Pager Motor Enable**
(1)

Picklist Mode

● Parameter # 402

Scan the appropriate symbol below to enable or disable Picklist Mode.



Picklist Mode Always Disabled
(0)



Picklist Mode Always Enabled
(1)

● **Parameter # 626**



*** 150 msec
(15)**



**200 msec
(20)**



**250 msec
(25)**



**300 msec
(30)**



**400 msec
(40)**



**500 msec
(50)**



600 msec
(60)



750 msec
(75)

Low Power Mode

● Parameter # 128

This parameter determines whether or not the reader enters low power mode after a decode attempt. If disabled, power remains on after each decode attempt. The V450-H Wired Reader default is Disable. The V450-H Wireless Reader default is Enable.



Disable Low Power Mode
(0)



Enable Low Power Mode
(1)

Time Delay to Low Power Mode

● Parameter # 146

This parameter only applies when **Lower Power Mode** is enabled.

This parameter sets the time it takes the reader to enter Low Power Mode after any scanning activity. Scan the appropriate programming symbol below to set the time. The V450-H Wired Reader default is 1 Hour. The V450-H Wireless Reader default is 100 msec.



100 msec
(65)



500 msec
(69)



1 Second
(17)



2 sec
(18)



3 sec
(19)



4 Seconds
(20)



5 Seconds
(21)



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)**

Timeout to Low Power Mode from Auto Aim

- **Parameter # 729**

Timeout to Low Power Mode from Auto Aim applies to the V450-H Wired Reader only.

This parameter sets the time the reader remains in auto aim before entering Low Power Mode.



Disabled
(0)



5 Seconds
(5)



*** 15 Seconds**
(11)



30 Seconds
(13)



1 Minute
(17)

Handheld Trigger Mode

● Parameter # 138

Select one of the following trigger modes for the reader.

- **Standard (Level)** - A trigger pull activates decode processing. Decode processing continues until the barcode decodes, you release the trigger, or the Decode Session Timeout occurs.
- **Presentation (Blink)** - The reader activates decode processing when it detects a barcode in its field of view. After a period of non-use, the reader enters a low power mode, in which the LEDs turn off until the reader senses motion.
- **Auto Aim** - The reader projects the aiming pattern when lifted. A trigger pull activates decode processing. After a period of inactivity the aiming pattern shuts off.

The reader uses internal dim illumination when it enters low power mode until motion is detected.



Level (Standard)
(0)



Presentation (Blink)
(7)



Auto Aim (Default)
(9)



Picklist Mode Enabled in Handheld Mode
(7)

Hands-Free Mode

- **Parameter # 630**

If you select **Disable Hands-Free Mode**, the reader behaves according to the setting of the **Handheld Trigger Mode**.



* **Hands-Free Mode Enabled**
(1)



Hands-Free Mode Disabled
(0)



Continuous Read Enabled
(1)



Continuous Read Disabled
(0)



Picklist Mode Enabled in Hands-Free Mode
(1)



Unique Barcode Reporting Enabled
(1)



Unique Barcode Reporting Disabled
(0)

Handheld Decode Aiming Pattern

● Parameter # 306

Select **Enable Handheld Decode Aiming Pattern** to project the aiming dot during barcode capture, **Disable Handheld Decode Aiming Pattern** to turn the aiming dot off, or **Enable Handheld Decode Aiming Pattern on PDF** to project the aiming dot when the reader detects a 2D barcode.

With **Picklist Mode** enabled, the decode aiming dot flashes even when the **Handheld Decode Aiming Pattern** is disabled.



* Decode Aiming Pattern Enabled
(2)



Decode Aiming Pattern Disabled
(0)



Enable Handheld Decode Aiming Pattern
on PDF
(3)

Hands-Free Decode Aiming Pattern

● Parameter # 590

Select **Enable Hands-Free Decode Aiming Pattern** to project the aiming dot during barcode capture, **Disable Hands-Free Decode Aiming Pattern** to turn the aiming dot off, or **Enable Hands-Free Decode Aiming Pattern on PDF** to project the aiming dot when the reader detects a 2D barcode.

With **Picklist Mode** enabled, the decode aiming dot flashes even when the **Decode Aiming Pattern** is disabled.



* **Enable Hands-Free Decode Aiming Pattern**
(1)



Disable Hands-Free Decode Aiming Pattern
(0)



Enable Hands-Free Decode Aiming Pattern on PDF
(2)

FIPS Mode

● **Parameter # 736**

FIPS Mode applies to the V450-H Wired Reader only.

The Federal Information Processing Standard (FIPS) 140-2 is a U.S. government computer security standard used to accredit cryptographic modules. FIPS enabled V450-H Wired Readers and cradles offer this secure mode of operation.

To enable the FIPS mode of operation (disabled by default), scan the **Enable FIPS** programming symbol. The reader attempts to establish a secure session with the cradle to which it is connected. On success, the reader lights an amber LED on every trigger pull to signal that all data will be transmitted over Bluetooth in a secure fashion. On failure, the reader will sound transmission failure error message on every attempt to transmit data.

To disable the FIPS mode, scan the **Disable FIPS** programming symbol at any time.



Enable FIPS
(1)



* Disable FIPS
(0)

Decode Session Timeout

● Parameter # 136

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 programming symbol below. Next, scan two numeric programming symbol from **Numeric Keyboard** 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 the programming symbol below, then scan the **0** and **5** programming symbols.



Decode Session Timeout

Hands-Free Decode Session Timeout

● Parameter # 400

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.

The minimum decode processing time is defined as the time in which the reader 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 reader 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	Minimum Time	Maximum Time
X < 25	250 msec	2.5 Seconds
X >= 25	X * 10 msec	X * 100 msec

For example, a setting value of 100 results in the reader 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 250 msec and Maximum time of 2.5 seconds.

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



Hands-Free Decode Session Timeout

Timeout Between Decodes

● Parameter # 144

Use this option in presentation mode to control the time the reader is inactive between decoding different symbols. It is programmable in 0.1 second increments from 0.1 to 9.9 seconds. The default is 0.5 seconds.

Note: Values below 0.5 seconds result in barcodes being read faster than Weblink_{PC} can process the corresponding images.

To select the timeout between decodes for different symbols, scan the programming symbol below, then scan two numeric programming symbols from [Numeric Keyboard](#) that correspond to the desired interval, in 0.1 second increments.

Timeout Between Decodes cannot be greater than or equal to the **Decode Session Timeout**.



Timeout Between Decodes



Timeout Between Decodes, Same Symbol

Mobile Phone/Display Mode

● Parameter # 716

This mode improves barcode reading performance off mobile phones and electronic displays. Select Enhanced in Handheld, Hands-Free, or both modes, or select Normal Mobile Phone/Display Mode.

The reader restricts **Mobile Phone/Display Mode**.



* Normal Mobile Phone/Display Mode
(0)



Enhanced in Handheld Mode
(1)



Enhanced in Hands-Free Mode
(2)



Enhanced in Both Modes
(3)

PDF Prioritization

● Parameter # 719

Enable this feature to delay decoding a 1D barcode (Code 128) by the value specified in **PDF Prioritization Timeout**. During that time the reader attempts to decode a PDF417 symbol (e.g., on a US driver's license), and if successful, reports this only. If it does not decode (can not 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 reader 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



* **Disable PDF Prioritization**
(0)



Enable PDF Prioritization
(1)

PDF Prioritization Timeout

● **Parameter # 720**

The **Hands-Free Decode Session Timeout** should be set to a longer duration than **PDF Prioritization Timeout** when configured.

When **PDF Prioritization** is enabled, this timeout specifies how long the reader attempts to decode a PDF417 symbol before reporting the 1D barcode in the field of view.

Scan the following programming symbol, then scan four digits from **Numeric Keyboard** that specify the timeout in milliseconds. For example, to enter 400 msec, scan the following programming symbol, then scan 0400. The range is 0 to 5000 msec, and the default is 200 msec.



PDF Prioritization Timeout

Decoding Illumination

● Parameter # 298

Selecting **Enable Decoding Illumination** causes the reader to flash illumination to aid decoding. Select **Disable Decoding Illumination** to prevent the reader from using decoding illumination.

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



* **Enable Decoding Illumination**
(1)



Disable Decoding Illumination
(0)

Motion Tolerance (Handheld Trigger Modes Only)

● Parameter # 858

Less Motion Tolerance provides optimal decoding performance on 1D barcodes.

To increase motion tolerance and speed decoding when scanning a series of 1D barcodes in rapid progression, scan **More Motion Tolerance**.



* **Less Motion Tolerance**
(0)



More Motion Tolerance
(1)

Battery Threshold

Scan the appropriate programming symbol below to select the desired battery status threshold.

- **Battery Status High Threshold - Parameter #1367**

This parameter sets the threshold used to show the Battery Status is High. When the battery status is above the High Threshold, the battery indicator is green. Scan this programming symbol followed by 2 digits from **Numeric Keyboard** that correspond to the desired percentage from 00 to 99. The default is 50%.

- **Battery Status Medium Threshold - Parameter #1368**

This parameter sets the threshold used to show the Battery Status is Medium. 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. Scan this programming symbol followed by 2 digits from **Numeric Keyboard** that correspond to the desired percentage from 00 to 99. The default is 20%.

- **Battery Status Low Warning Threshold - Parameter #1369**

This parameter sets the threshold to indicate Battery Status is Critically Low. When the battery status is below the Low Warning Threshold, on every trigger release the reader issues 4 short beeps. Scan this programming symbol followed by 2 digits from **Numeric Keyboard** that correspond to the desired percentage from 00 to 99. The default is 10%.

- **Battery Health Low Warning Threshold - Parameter #1370**

This parameter sets the threshold to indicate Battery Health is Low. When the battery health is below the Low Health Threshold, all battery indication will alternate between Red and the appropriate Battery Status indication. When Battery Health is Low, you should consider replacing the battery. Scan this programming symbol followed by 2 digits from **Numeric Keyboard** that correspond to the desired percentage from 00 to 99. The default is 60%.



Battery Status High Threshold



Battery Status Medium Threshold



Battery Status Low Warning Threshold



Battery Health Low Warning Threshold

Add an Enter Key

To add an Enter key (carriage return/line feed) after scanned data, scan the following programming symbol.



Add Enter Key (Carriage Return/Line Feed)

Transmit Code ID Character

● Parameter # 45

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 preamble already selected, the Code ID character is inserted between the preamble and the decoded symbol.

Select a **Symbol Code ID Character**, **AIM Code ID Character**, or **None**.

If you enable Symbol Code ID Character or AIM Code ID Character, and enable Transmit “No Read” Message, the reader appends the code ID for Code 39 to the NR message.



Symbol Code ID Character
(2)



AIM Code ID Character
(1)



*** None**
(0)

Preamble / Postamble Values

Key Category Parameter # P = 99, S1 = 98, S2 = 100

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

You can append a Preamble and/or one or two Postambles to scan data for use in data editing. To set a value for a preamble or postamble, scan a four-digit number (i.e., four programming symbols from [Numeric Keyboard](#)) that corresponds to that value. See [ASCII Character Sets](#) for the four-digit codes.

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

The default Preamble and Postamble value is 7013 <CR><LF> (the Enter key).



Scan Preamble
(7)



Scan Postamble 1
(6)



Scan Postamble 2
(8)



Data Format Cancel

Scan Data Transmission Format

● Parameter # 235

To change the scan data format, scan one of the following eight programming symbol corresponding to the desired format.

If using this parameter do not use ADF rules to set the Preamble / Postamble.

To set values for the Preamble and/or Postamble, see **Preamble / Postamble Values**.



* Data As Is
(0)



<DATA> <POSTAMBLE 1>
(1)



<DATA> <POSTAMBLE 2>
(2)



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



<PREAMBLE> <DATA >
(4)



<PREAMBLE> <DATA> <POSTAMBLE 1>
(5)



<PREAMBLE> <DATA> <POSTAMBLE 2>
(6)



<PREAMBLE> <DATA> <POSTAMBLE 1>
<POSTAMBLE 2>
(7)

FN1 Substitution Values

- **Key Category Parameter # 103**
- **Decimal Value Parameter # 109**

The 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 (Enter Key).

When using host commands to set the FN1 substitution value, set the key category parameter to 1, then set the 3-digit keystroke value. See the ASCII Character Set table for the current host interface for the desired value.

To select a FN1 substitution value via programming symbol menus:

- 1 Scan the programming symbol below.



Set FN1 Substitution Value

- 2 Locate the keystroke desired for FN1 Substitution in the ASCII Character Set table for the current host interface. Enter the 4-digit ASCII Value by scanning each digit in **Numeric Keyboard**.

To correct an error or change the selection, scan **Cancel**.

To enable FN1 substitution for USB HID keyboard, scan the **Enable FN1 Substitution** programming symbol.

Transmit “No Read” Message

● Parameter # 94

Scan a programming symbol below to select whether or not to transmit a No Read message. Enable this to transmit the characters NR when a successful decode does not occur before trigger release or the **Decode Session Timeout** expires. Disable this to send nothing to the host if a symbol does not decode.

If you enable **Transmit No Read**, and also enable Symbol Code ID Character or AIM Code ID Character for **Transmit Code ID Character** the reader appends the code ID for Code 39 to the NR message.

Important: When connected to **Setup** in **WebLink_{PC}**, do not use these programming symbols. See the **WebLink_{PC} ReadMe** for further details.



Enable No Read
(1)



*** Disable No Read**
(0)

Unsolicited Heartbeat Interval

● Parameter # 1118

The imager supports sending **Unsolicited Heartbeat Messages** to assist in diagnostics. To enable this feature and set the desired unsolicited heartbeat interval, scan one of the time interval programming symbols below, or scan **Set Another Interval** followed by four numeric programming symbols from **Numeric Keyboard** (scan sequential numbers that correspond to the desired number of seconds). The range is 0 - 9999.

Scan **Disable Unsolicited Heartbeat Interval** to turn off the feature.

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

MOTEVTHB:nnn

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



10 Seconds
(10)



1 Minute
(60)



Set Another Interval



*** Disable Unsolicited Heartbeat Interval**
(0)

UID Parsing

● Parameter # 740

UID parsing is only supported by DP configurations of the reader.

UID constructs are compliant with the US Department of Defense MIL-STD-130N.

A UID, or Unique Identifier, is used to identify and track data (e.g., manufacturer, distribution, lifetime of products and other information) specified by the United States Department of Defense for all imported packages containing merchandise equal to or greater than \$5,000.00. Vendors are required to provide a legible and permanent UID marking, in the form of a Data Matrix symbol, with the contents.

DP configurations of the reader read the Data Matrix symbol, verify it is a valid UID symbol and parse the data into a UID symbol (**Criterion: Parsed UID** symbol type with UID fields). This output can be used at a later date.

To enable/disable UID parsing, scan the appropriate programming symbol below. UID parsing is disabled by default. Scan **Enable Embedded UID Parsing** to start the parsing process.



* **Disable UID Parsing**
(0)



Enable Embedded UID Parsing
(1)

UID Parsing Output

When a UID is successfully parsed, the fields shown below are created. Each field is comma-separated. If data is missing from a field in the UID, a lone comma fills the field.

When a UID successfully parses, a parsed UID symbol type transmits to the host.

When parsing is unsuccessful but data transmits to the host anyway, the data is in the data matrix format.

Field	Description
1	Concatenated UID
2	Construct type (UID1 or UID2)
3	Enterprise ID
4	Serialized part #
5	Original part #
6	Lot #
7	Current part #
8	Scanned data in ASCII mode

● Example Output – Successful Parsed Data

D12345WS51-004041,UID2,12345,041,WS51-004,,,[> rs 06 gs 17V12345 gs 1PWS51-004 gs S041 rs eot

Field	Description
1	D12345WS51-004041
2	UID2
3	12345
4	041
5	WS51-004
6	(no data supplied, comma filled field)
7	(no data supplied, comma filled field)
8	[> rs 06 gs 17V12345 gs 1PWS51-004 gs S041 rs eot

UID Error Mode Options

● Parameter # 742

- **UID Error Beep (default):** Scan **UID Error Beep** to program the reader not to parse the data contained in the UID when the UID is not formatted correctly. An error tone sounds and no data transmits to the host.
- **UID Error Pass Data:** Scan **UID Error Pass Data** to program the reader to transmit data to the host even when parsing fails. The reader reads the incorrectly encoded UID, assumes the host can process the data and transmits the unformatted contents of the barcode. No error tone sounds.
- **UID Error Beep and Pass Data:** Scan **UID Error Pass Data** to program the reader to transmit data to the host even when parsing fails. The reader reads the incorrectly encoded UID, assumes the host can process the data and transmits the unformatted contents of the barcode. An error tone sounds.

Scan the appropriate programming symbol below to program potential error conditions



* UID Error Beep
(0)



UID Error Pass Data
(1)



UID Error Beep and Pass Data
(2)

Sample ADF Rule for UID

To transmit only the concatenated UID field of the parsed UID, scan the programming symbols below, in order.



Begin New Rule



Criterion: Parsed UID



Send Data Up to Character



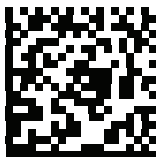
,
(Comma)



Save Rule

UID Sample Barcodes

● 05 Format



WS51-004041,UID2,,041,WS51-004,,[]> rs 05 gs 01WS51-004 gs 21041 rs eot

Field	Description
1 - Concatenated UID	WS51-004041
2 - Construct type (UID1 or UID2)	UID2
3 - Enterprise ID	, (no data supplied)
4 - Serialized part #	041
5 - Original part #	WS51-004
6 - Lot #	, (no data supplied)
7 - Current part #	, (no data supplied)
8 - Scanned data in ASCII mode	[]> rs 05 gs 01WS51-004 gs 21041 rs eot

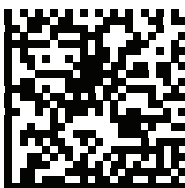
● 06 Format



D12345WS51-004041,UID2,12345,041,WS51-004,,[]> rs 06 gs 17V12345 gs 1PWS51-004 gs S041 rs eot

Field	Description
1 - Concatenated UID	D12345WS51-004041
2 - Construct type (UID1 or UID2)	UID2
3 - Enterprise ID	12345
4 - Serialized part #	041
5 - Original part #	WS51-004
6 - Lot #	, (no data supplied)
7 - Current part #	, (no data supplied)
8 - Scanned data in ASCII mode	[]> rs 06 gs 17V12345 gs 1PWS51-004 gs S041 rs eot

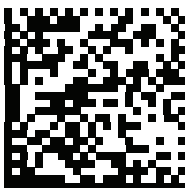
● **12 Format**



D12345WS51-004041,UID2,12345,041,WS51-004,,[]> rs 12 gs MFR 12345 gs PNO WS51-004 gs SEQ 041 rs eot

Field	Description
1 - Concatenated UID	D12345WS51-004041
2 - Construct type (UID1 or UID2)	UID2
3 - Enterprise ID	12345
4 - Serialized part #	041
5 - Original part #	WS51-004
6 - Lot #	, (no data supplied)
7 - Current part #	, (no data supplied)
8 - Scanned data in ASCII mode	[]> rs 12 gs MFR 12345 gs PNO WS51-004 gs SEQ 041 rs eot

● **DD Format**



D12345WS51-004041,UID2,12345,041,WS51-004,,[]> rs DD gs MFR 12345 gs PNO WS51-004 gs SEQ 041 rs eot

Field	Description
1 - Concatenated UID	D12345WS51-004041
2 - Construct type (UID1 or UID2)	UID2
3 - Enterprise ID	12345
4 - Serialized part #	041
5 - Original part #	WS51-004
6 - Lot #	, (no data supplied)
7 - Current part #	, (no data supplied)
8 - Scanned data in ASCII mode	[]> rs DD gs MFR 12345 gs PNO WS51-004 gs SEQ 041 rs eot



**Concatenated Parameter
Barcode Validation Enabled
(1)**



**Concatenated Parameter
Barcode Validation Disabled
(0)**

Decoder Effort Levels (V410-H XD and V450-H Only)

● Parameter # 1438

Note: This parameter is not supported by V410-H HC or V410-H SR models.

Unlike symbols printed on labels, a direct part mark (DPM) is a symbol that is marked directly on an item's surface for permanent identification, using methods such as laser etching, dot-peening, or direct-printing.

Omron Microscan's proprietary **X-Mode decode algorithms** are optimized for difficult-to-read DPMs. The effort levels shown below reflect the powerful capabilities of X-Mode. Scan the X-Mode Algorithms Enabled symbol and then select one of the effort levels below based on the type of symbols you need to decode.

Important: The performance options described here can also be configured in [WebLink_{PC}](#).

- **Decoder Effort Level 1 – No Special DPM Processing.** Use only on high-contrast symbols printed on labels. This allows the fastest processing time when no DPM reading is required.
- **Decoder Effort Level 2 – Least Aggressive DPM Processing.** Optimized for decoding performance on smaller DPM symbols typically found on electronics and medical instruments, especially on smooth surfaces. These symbols tend to be laser-etched or direct-printed.
- **Decoder Effort Level 3 (Maximum Effort Level for V410-H) – Best Setting for Most DPMs.** Optimizes decoding performance on larger DPM symbols, typically found on industrial parts, especially on rough, grainy, or visibly machined surfaces. These symbols tend to be dot-peened or laser-etched.
- **Decoder Effort Level 4 (Maximum Effort Level for V450-H) – Most Aggressive DPM Processing.** Use only for the most difficult marks, for which additional DPM processing may be necessary.



*X-Mode Algorithms
Enabled*



Level 1 – No Special DPM Processing.



*X-Mode Algorithms
Disabled*



Level 2 – Least Aggressive DPM Processing.



*Level 3 (Maximum Effort Level for V410-H XD) –
Best Setting for Most DPMs.*



*Level 4 (Maximum Effort Level for V450-H) –
Most Aggressive X-Mode DPM Processing.
Note: You can also use the [Decoder Effort](#)
slider in [WebLink_{PC}](#) to set the reader's
Decoder Effort to Level 4.)*

Important: The [BC412](#) and [DotCode](#) symbologies require you to set to **Decoder Effort Level 4**.

Image Pre-Processing with X-Mode

At Maximum decode effort, you can enable X-Mode's **Enhance** functionality, which improves readability by adding an image pre-processing operation (**Shrink Dark** or **Grow Dark**) to improve decode performance on marks whose cells are not properly formed. You can also select the size (**Small**, **Medium**, or **Large**) of the area or "pixel neighborhood" in which the pre-processing operation is performed. Small = 3 x 3 pixels, Medium = 5 x 5 pixels, and Large = 7 x 7 pixels. Image pre-processing can also be configured in [WebLinkPC](#).



Grow Dark – Large



Grow Dark – Medium



Grow Dark – Small



Shrink Dark – Large



Shrink Dark – Medium



Shrink Dark – Small

DPM Illumination Control

● Parameter # 429

In Presentation Mode, the reader uses the internal dim illumination state when it enters low power mode until motion is detected.

This parameter controls the Illumination for DPM symbol reading.

- **Direct Illumination** – reader uses only the direct (white) illumination. Recommended for use with dot-peened symbols. Tilt the part 30 degrees.
- **Indirect Illumination** – reader uses only the (red) illumination. Recommended for use with laser-etched symbols on curved, rough, grainy, highly reflective, visibly machined surfaces or cylinders.
- **Cycle Illumination** – reader cycles alternately between direct and indirect illumination. The reader starts with the illumination used during the last successful decode.



Direct Illumination



Indirect Illumination
(V450-H Only)



* Cycle Illumination



Indirect Illumination
(V410-H XD Only)

DPM Mode

- **Parameter # 1438**
- **SSI # F8h 05h 9Eh**

Unlike barcodes typically printed on labels, a direct part mark (DPM) is a symbol that is marked, using methods such as laser etching and dot peening, directly on an item surface for permanent identification. A DPM reader can scan these types of symbols. Scan one of the following barcodes to select a DPM mode:

- **Disable DPM Mode** – No special processing occurs.
- **Enable DPM Mode** – Activates Omron Microscan's proprietary **X-Mode** decode algorithms optimized for direct part marks.

Note: If you enable a **DPM Mode**, disable **Picklist Mode** when scanning a DPM barcode. Picklist performance is not guaranteed for DPM barcodes.

Note: If you enable a **DPM Mode**, the decoder behaves as if the **Data Matrix Inverse Autodetect** setting is selected. If you disable DPM, the previous (user-selected) **Data Matrix Inverse** setting remains in effect. See **Data Matrix Inverse**.



Disable DPM Mode
(0)



*Enable DPM Mode
(1)



Contrast Enhancement On
(1)

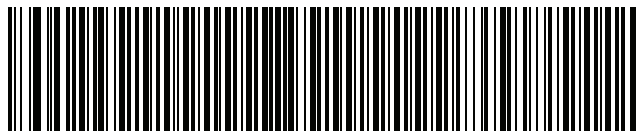


Contrast Enhancement Off
(0)

5-7 Miscellaneous Reader Parameters

Enter Key

Scan the following barcode to add an Enter key (carriage return/line feed) after scanned data. To program other Preambles and/or Postambles, see **Preamble/Postamble Values**.



Add Enter Key (Carriage Return/Line Feed)

Tab Key

Scan the following barcode to add 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 preamble selected, the Code ID character is inserted between the preamble and the decoded symbol.

Select a **Symbol Code ID Character**, **AIM Code ID Character**, or **None**. For Code ID characters, see [Symbology Identifiers](#) and [AIM Code Identifiers](#).

Note: If you enable Symbol Code ID Character or AIM Code ID Character, enable **FN1 Substitution for USB HID Keyboard** by scanning the [Enable FN1 Substitution](#) barcode. The reader appends the Code 39 code ID for to the NR message.



**Symbol Code ID Character
(2)**



**AIM Code ID Character
(1)**



*** None
(0)**

Preamble / Postamble Values

- **Key Category Parameter # P = 99, S1 = 98, S2 = 100**
SSI # P = 63h, S1 = 62h, S2 = 64h
- **Decimal Value Parameter # P = 105, S1 = 104, S2 = 106**
SSI # P = 69h, S1 = 68h, S2 = 6Ah

You can append a preamble and/or one or two postambles to scan data for use in data editing. To set a value for a preamble or postamble, 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 preamble or postamble, set the key category parameter to 1, and then set the 3-digit decimal value. See [ASCII Character Sets](#) for the four-digit codes.

The default preamble and postamble value is 7013 <CR><LF> (Enter key). To correct an error or change a selection, scan [Cancel](#).

Note: To use Preamble / Postamble values, first set the [Data Transmission Format](#).



**Scan Preamble
(7)**



**Scan Postamble 1
(6)**



**Scan Postamble 2
(8)**



Data Format Cancel

Scan Data Transmission Format

- **Parameter # 235**

- **SSI # EBh**

To change the scan data format, scan one of the following barcodes corresponding to the desired format.

Note: If using this parameter do not use ADF rules to set the Preamble or / Postamble.

Note: If you enable **Symbol Code ID Character** or **AIM Code ID Character**, enable **FN1 Substitution for USB HID Keyboard** by scanning the **Enable FN1 Substitution** barcode. The reader appends the Code 39 code ID for to the NR message.



* Data As Is
(0)



<DATA> <POSTAMBLE 1>
(1)



<DATA> <POSTAMBLE 2>
(2)



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



<PREAMBLE> <DATA >
(4)



<PREAMBLE> <DATA> <POSTAMBLE 1>
(5)



<PREAMBLE> <DATA> <POSTAMBLE 2>
(6)



<PREAMBLE> <DATA> <POSTAMBLE 1>
<POSTAMBLE 2>
(7)

FN1 Substitution Values

- **Key Category Parameter # 103**
- **Key Category SSI # 67h**
- **Decimal Value Parameter # 109**
- **Decimal Value 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 Set table for the current host interface for the desired value.

To select a FN1 substitution value via 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**

Scan one of the following barcodes to set 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**, the reader appends the code ID for Code 39 to the NR message.

Note: This does not apply in presentation mode.

- **Enable No Read** - This transmits the characters NR when a successful decode does not occur before trigger release or the **Decode Session Timeout** expires. See [Decode Session Timeout](#).
- **Disable No Read** - This 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**

The reader can send unsolicited heartbeat messages to assist in diagnostics. 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. The range is 0 - 9999.

Scan **Disable Unsolicited Heartbeat Interval** to turn off the feature.

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

MOTEVTHB:nnn

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



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.

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 barcode 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.

Scan a barcode below to enable or disable the ability to process pharmaceutical type barcodes.



***Disable securPharm Decoding
(0)**



**Enable securPharm Decoding
(1)**

securPharm Output Formatting

- **Parameter # 1753**

- **SSI # F8h 06h D9h**

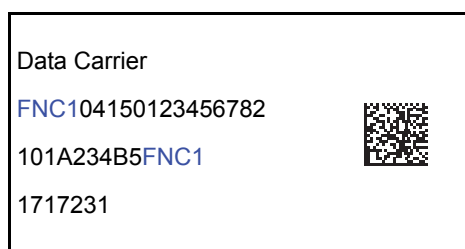
Note: securPharm output formatting is effective only where nnn is a three-digit sequence number starting at 001 and wrapping after 100.

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

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

- **Sample GS1 Format**

Product Number: GTINData Identifier DI Data Format Identifier: GS1



> Scanned Barcode >

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

- **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: PPNData Identifier DI Data Format Identifier: IFA

<p>Data Carrier</p> <p>Mac069N11123456782Gs</p> <p>1T1A234B5Gs</p> <p>D151231Gs</p>		<p>> Scanned Barcode ></p>	<pre><content dfi="IFA"> <ppn>111234567842</ppn> <lot>1A234B5</lot> <sn>1234567890123456</sn> </content></pre>
---	---	----------------------------------	--

● 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]<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)**



**Insert Tab and New Line
(3)**



Imaging Preferences

This section describes image capture preferences and provides configuration symbols for those preferences.

6-1	Introduction	6-2
6-2	Scanning Sequence Examples	6-3
6-3	Errors While Scanning	6-4
6-4	Imaging Preference Parameter Defaults	6-5

6-1 Introduction

Only the Symbol Native API (SNAPI) with Imaging interface supports image capture.

See [Standard Default Parameters](#) for all host device and defaults. If the default values suit application requirements, programming is not necessary.

To set feature values, scan a single programming symbol or a short programming symbol sequence. The settings are stored in non-volatile memory and are preserved even when you power down the reader.

Most computer monitors allow scanning the programming symbols directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the programming symbol clearly, and bars and/or spaces are not merging.

6-2 Scanning Sequence Examples

In most cases scanning one programming symbol sets the parameter value. For example, to disable image capture illumination, scan the **Disable Image Capture Illumination** programming symbol under **Image Capture Illumination**. The reader issues a fast “warble” beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several programming symbols. See these parameter descriptions for this procedure.

6-3 Errors While Scanning

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

6-4 Imaging Preferences Parameter Defaults

6-4-1 V410-H

This table lists defaults for image capture preference 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 reader using WebLink_{PC}.

Note: See [Standard Parameter Defaults](#) for all user preference, host, symbology, and miscellaneous default parameters.

Image Capture Preferences Parameter Defaults

Parameter	Parameter Number ¹	SSI Number ²	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	100
Analog Gain	1232	F4h D0h	Analog Gain x 2
Digital Gain	1233	F4h D1h	32
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	315 316 317 318	F4h F0h 3Bh F4h F0h 3Ch F4h F0h 3Dh F4h F0h 3Eh	0 top 0 left 799 bottom 1279 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 Selection	304	F0h 30h	JPEG
Image Rotation	665	F1h 99h	0
Bits per Pixel (BPP)	303	F0h 2Fh	8 BPP
Video Mode Format Selector	916	F2h 94h	JPEG
Video View Finder	324	F0h 44h	Disable
Target Video Frame Size	328	F0h 48h	2200 bytes
Video View Finder Image Size	329	F0h 49h	1700 bytes
Video Resolution	667	F1h 9Bh	1/4 resolution

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

2. SSI number hex values are used for programming via SSI commands.

Image Capture Preferences

The parameters in this chapter control image capture characteristics.

● Operational Modes

The imager has three modes of operation:

- Decode Mode
- Snapshot Mode
- Video 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. Scan the **Snapshot Mode** barcode 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. Hold the imager steady until a single beep indicates that it captured the image.

If you do not press the trigger within the Snapshot Mode Timeout period, the imager returns to Decode Mode. Use a value of $32 = x \ 1$ digital gain; i.e., $\text{digital gain} = 1/32 \times \text{digital gain parameter value}$ to adjust this timeout period. The default timeout period is 30 seconds.

To disable the aiming pattern during Snapshot Mode, see [Image Capture Illumination](#).



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. Scan this barcode to temporarily enter Video Capture Mode.



Video Mode

Image Capture Illumination

- **Parameter # 361**

- **SSI # F0h 69h**

Scan **Enable Image Capture Illumination** to turn on illumination during every image capture. This usually results in superior images. The effectiveness of illumination decreases as the distance to the target increases.

Scan **Disable Image Capture Illumination** to prevent the imager from using illumination.



*Enable Image Capture Illumination
(1)



Disable Image Capture Illumination
(0)

Image Capture Autoexposure

- **Parameter # 360**

- **SSI # F0h 68h**

Scan **Enable Image Capture Autoexposure** to allow the imager to control gain settings and exposure (integration) time to best capture an image for the selected operation mode.

Scan **Disable Image Capture Autoexposure** to manually adjust the gain and exposure time (see the following pages). This option 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**

Type: Word

Range: 1 - 1000

This parameter configures the exposure used in manual mode for Snapshot and Video modes.

Each integer value represents 100 μ s of exposure. The default value is 100 which results in an exposure setting of 10 ms.

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 and Digital Gain

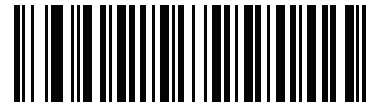
You can modify the engine's analog and digital gain using these parameters. Total gain = analog gain x digital gain.

- **Analog Gain**
- **Parameter # 1232**
- **SSI # F4h D0h**

Select an option to set an analog gain value.



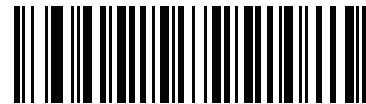
Analog Gain x 1
(00h)



*Analog Gain x 2
(01h)



Analog Gain x 4
(02h)



Analog Gain x 8
(03h)

Digital Gain

- **Parameter # 1233**
- **SSI # F4h D1h**

To set the digital gain, scan the following barcode, then scan two barcodes from [Numeric Barcodes](#) to enter a 2-digit value for the digital gain. The default is 32.

A value of 32 = x 1 digital gain; i.e., digital gain = 1/32 x digital gain parameter value.



Digital Gain

Snapshot Mode Timeout

- **Parameter # 323**

- **SSI # F0h 43h**

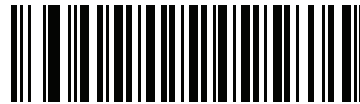
This parameter sets the amount of time the imager remains in Snapshot Mode. The imager exits Snapshot Mode when you press the trigger, or when the Snapshot Mode Timeout elapses. To set this timeout value, scan the **Set Snapshot Mode Timeout** barcode, and then scan a barcode from [Numeric Barcodes](#). The default value is 0 which represents 30 seconds; values increment by 30. For example, 1 = 60 seconds, 2 = 90 seconds.

To quickly re-set the default timeout to 30 seconds, scan the **30 Seconds** barcode.

If you scan **No Timeout**, the imager remains in Snapshot Mode until you press the trigger.



Set Snapshot Mode Timeout



*30 Seconds



No Timeout

Snapshot Aiming Pattern

- **Parameter # 300**

- **SSI # F0h 2Ch**

Scan one of the following barcodes to select whether or not to project the aiming pattern when in Snapshot Mode.

Note: If enabled, the aiming pattern frames the image for aiming purposes and does not appear in the captured image.



*Enable Snapshot Aiming Pattern
(1)



Disable Snapshot Aiming Pattern
(0)

Silence Operational Mode Changes

- **Parameter # 1293**

- **SSI # F8h 05h 0Dh**

Scan **Silence Operational Mode Changes** to silence the beeper when switching between operational modes (e.g., from Decode Mode to Snapshot Mode).



Silence Operational Mode Changes (Enable)
(1)



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

Image Cropping

- **Parameter # 301**

- **SSI # F0h 2Dh**

Scan the **Enable Image Cropping** barcode to crop a captured image. **Scan Disable Image Cropping** to present the full 1280 x 800 pixels.



Enable Image Cropping
(1)



*Disable Image Cropping
(Use Full 1280 x 800 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)

If you enabled **Scan Silence Operational Mode Changes** to silence the beeper when switching between operational modes (e.g., from Decode Mode to Snapshot Mode), set the pixel addresses from (0,0) to (1279 x 799).

Columns are numbered from 0 to 1279, rows from 0 to 799. 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. For example, for a 4 row x 8 column image in the extreme bottom-right section of the image, set the following values:

Top = 796, Bottom = 799, Left = 1272, Right = 1279

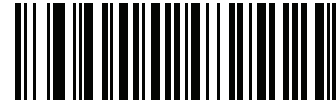
To set the pixel addresses, scan each of the following barcodes, and then scan four numeric barcodes from **Numeric Barcodes** representing the value. Leading zeros are required. For example, to crop the top pixel address to 3, scan 0, 0, 0, 3. The defaults are:

Top = 0, Bottom = 799, Left = 0, Right = 1279

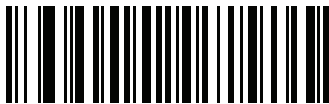
Note: The imager has a cropping resolution of 4 pixels. Setting the cropping area to less than 4 pixels after resolution adjustment transfers the entire image.



Top Pixel Address
(0 - 799 Decimal)



Left Pixel Address
(0 - 1279 Decimal)



Bottom Pixel Address
(0 - 799 Decimal)



Right Pixel Address
(0 - 1279 Decimal)

Image Size (Number of Pixels)

- **Parameter # 302**

- **SSI # F0h 2Eh**

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

Scan one of the following barcodes to select an image size.

Image Size

Resolution Value	Uncropped Image Size
Full	1280 x 800
1/2	640 x 400
1/4	320 x 200



*Full Resolution
(0)



1/2 Resolution
(1)



1/4 Resolution
(3)

Image Brightness (Target White)

- **Parameter # 390**

- **SSI # F0h 86h**

Type: Byte

Range: 1 - 240

This parameter sets the Target White value used in Snapshot and Video Viewfinder modes when using autoexposure. White and black are defined as 240 decimal and 1, respectively. Setting the value to the factory default of 180 sets the white level of the image to ~180.

Scan the **Image Brightness** barcode, 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**

Scan one of the following barcodes to optimize JPEG images for either size or quality:

- **JPEG Quality Selector** - Enter a quality value via the **JPEG Size Selector**. If you selected **JPEG Quality Selector**, scan the **JPEG Quality Value** barcode, and then scan the 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. The imager then selects the best image quality. The imager then selects the corresponding image size.
- **JPEG Size Selector** - Enter a size value. If you selected JPEG Quality Selector, scan the JPEG Quality Value barcode, 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. 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**

If you selected **JPEG Quality Selector**, scan the **JPEG Quality Value** barcode, 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

If you selected **JPEG Size Selector**, scan the **JPEG Size Value** barcode, 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.

Note: JPEG compression may take 10 to 15 seconds based on the amount of information in the target image. Scanning JPEG Quality Selector (default setting) produces a compressed image that is consistent in quality and compression time.



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.

Scan one of the following barcodes to select the level of image enhancement:

- Off (0)
- Low (1) - Default
- Medium (2)
- High (3)



Off
(0)



*Low
(1)



Medium
(2)



High
(3)

Image File Format Selector

- **Parameter # 304**

- **SSI # F0h 30h**

Scan one of the following barcodes 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**

Scan one of the following barcodes to rotate the image 0, 90, 180, or 270 degrees.



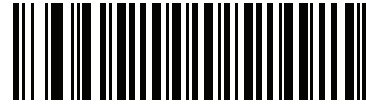
***Rotate 0°**
(0)



Rotate 90°
(1)



Rotate 180°
(2)



Rotate 270°
(3)

Bits Per Pixel

- **Parameter # 303**

- **SSI # F0h 2Fh**

Scan one of the following barcodes 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)

Video Mode Format Selector

- **Parameter # 916**

- **SSI # F2h 94h**

When the imager is in Video Mode, scan one of the following barcodes to select whether to send data in BMP or JPEG format.



**BMP File Format
(3)**



***JPEG File Format
(1)**

Video View Finder

- **Parameter # 324**

- **SSI # F0h 44h**

Scan one of the following barcodes to select whether to project the video view finder while in Snapshot Mode.



**Enable Video View Finder
(1)**



***Disable Video View Finder
(0)**

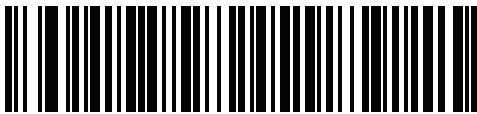
Target Video Frame Size

- **Parameter # 328**

- **SSI # F0h 48h**

This parameter sets the number of 100-byte blocks to transmit per second. A smaller value transmits more frames per second but reduces video quality, while a larger value increases video quality but slows transmission.

Scan the **Target Video Frame Size** barcode, and then scan three barcodes from **Numeric Barcodes** corresponding to the 100-byte value from 800 to 20,000 bytes. For example, to select 1500 bytes, enter 0, 1, 5. To select 900 bytes, enter 0, 0, 9. The default is 2200 bytes.



Target Video Frame Size

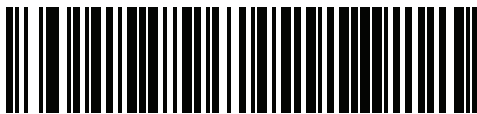
Video View Finder Image Size

- **Parameter # 329**

- **SSI # F0h 49h**

This parameter sets the number of 100-byte blocks. Values range from 800 to 12,000 bytes. A smaller value transmits more frames per second, while a larger value increases video quality.

Scan the **Video View Finder Image Size** barcode, 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

Video Resolution

- **Parameter # 667**

- **SSI # F1h 9Bh**

This parameter alters the video resolution before transmission. Rows and columns are removed from the image, resulting in a smaller video image containing the original content with reduced resolution.

Scan one of the following barcodes to select a value:

Resolution and Video Image Sizes

Resolution Value	Video Image Size
Full	1280 x 800
1/2	640 x 400
1/4	320 x 200



Full Resolution
(0)



1/2 Resolution
(1)



*1/4 Resolution
(3)

6-4-2 V450-H

The table below lists the defaults for imaging preferences parameters. To change the default values, scan the appropriate programming symbols in this guide. These new values replace the standard default values in memory.

See [Standard Default Parameters](#) for all user preferences, hosts, symbologies, and default parameters.

Parameter	Parameter Number	Default
Imaging Preferences		
Image Size (Number of Pixels)	302	Full Resolution
JPEG Image Options	299	JPEG Quality Selector
JPEG File Size	561	160 kb
JPEG Quality and Size Value	305	65
Image File Format	304	JPEG

Image Size (Number of Pixels)

● Parameter # 302

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

Select one of the following values:

Resolution Value	V450-H
Full	1280 x 800
1/2	640 x 400
1/4	320 x 200



* Full Resolution
(0)



1/2 Resolution
(1)



1/4 Resolution
(3)

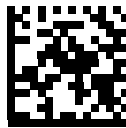
JPEG Image Options

● Parameter # 299

Select an option to optimize JPEG images for either size or for quality. Scan the **JPEG Quality Selector** programming symbol to use a quality value; the reader then selects the corresponding image size. Scan the **JPEG Size Selector** programming symbol to use a size value; the reader then selects the best image quality.



* JPEG Quality Selector
(1)



JPEG Size Selector
(0)

JPEG Target File Size

● Parameter # 561

Type: Word

Range: 5-350

This parameter defines the target JPEG file size in terms 1 Kilobytes (1024 bytes). The default value is 160 kB which represents 160 Kilobytes.

JPEG compress may take 10 to 15 seconds based on the amount of information in the target image. Scanning **JPEG Quality Selector** (default setting) produces a compressed image that is consistent in quality and compression time.

To set the JPEG Target File Size parameter, scan **JPEG Target File Size** below followed by three numeric programming symbols representing the value. Leading zeros are required. For example, to set an image file size value of 99, scan 0, 9, 9 in **Numeric Keyboard**.



JPEG Target File Size
(3 digits)

JPEG Quality and Size Value

- **JPEG Quality = Parameter # 305**

If you selected **JPEG Quality Selector**, scan the **JPEG Quality Value** programming symbol followed by 3 programming symbols from **Numeric Keyboard** corresponding to a value from 5 to 100, where 100 represents the highest quality image.



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

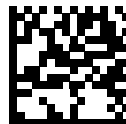
Image File Format Selector

- **Parameter # 304**

Select an image format appropriate for the system (BMP, TIF, or JPG). The reader stores captured images in the selected format.



BMP File Format
(3)



*** JPEG File Format**
(1)



TIFF File Format
(4)

Image Rotation

- **Parameter # 665**

This parameter controls the rotation of the image by 0, 90,180, or 270 degrees.



* Rotate 0°
(0)



Rotate 90°
(1)



Rotate 180°
(2)



Rotate 270°
(3)

Image File Metadata



Image File Metadata On
(1)



Image File Metadata Off
(0)



USB Interface

This section provides instructions for programming the reader to interface with a USB host. The reader connects directly to a USB host or a powered USB hub. The USB host powers the reader.

7-1	Connecting the USB Interface	7-2
7-2	USB Parameter Defaults	7-4
7-3	USB Host Parameters	7-5
7-4	Optional USB Parameters	7-12
7-5	ASCII Character Set for USB	7-16

7-1 Connecting the USB Interface

The reader connects to USB capable hosts including:

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

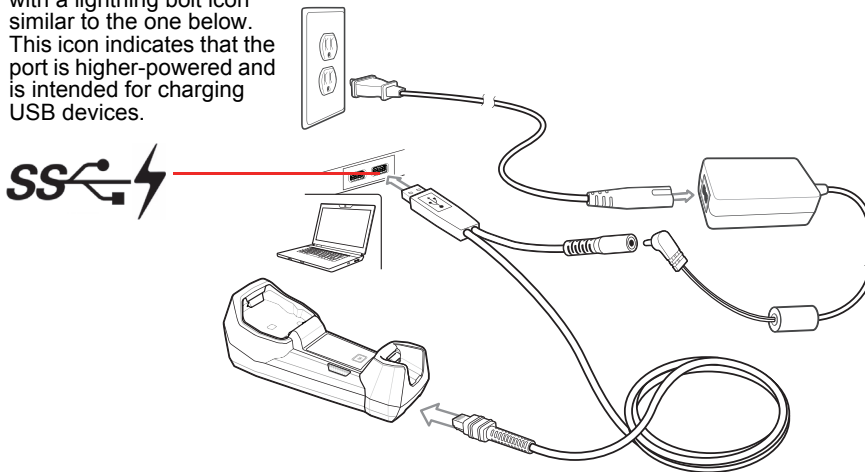
The following operating systems support the reader through USB:

- Windows® XP, 7, 8, 10
- MacOS 8.5 - MacOS 10.6
- IBM 4690 OS.

Connecting the V450-H Wireless Reader to USB Interface

The reader also interfaces with other USB hosts which support USB Human Interface Devices (HID).

Note: When connecting the V450-H and cradle to a PC, look for a USB port with a lightning bolt icon similar to the one below. This icon indicates that the port is higher-powered and is intended for charging USB devices.



USB Connection to V450-H Wireless Reader

To connect the cradle to a USB host:

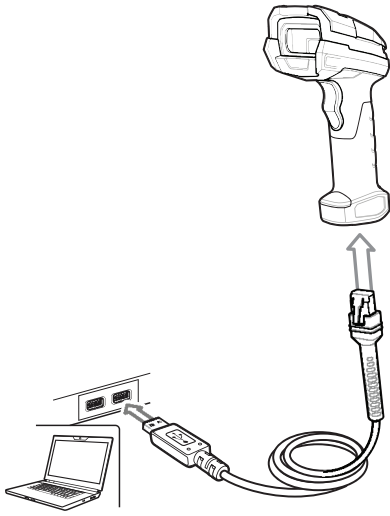
- 1** Attach the modular connector of the USB interface cable to the cable interface port on the cradle.
- 2** Plug the series A connector in the USB host or hub.
- 3** Connect an external power supply if desired.
- 4** Ensure all connections are secure.
- 5** Pair the reader to the cradle by scanning the symbol on the cradle.
- 6** Select the USB device type by scanning the appropriate programming symbol.
- 7** On first installation when using Windows, the software displays a prompt to select or install the **Human Interface Device** driver. To install the Human Interface Device driver provided by Windows, click **Next** through all the choices and click **Finished** on the last choice. The reader powers up during this installation.
- 8** To modify any other parameter options, scan the appropriate programming symbols in this chapter.

Note: Interface cables vary depending on configuration.

Note: Disconnect the host cables before the power supply, or the reader may not recognize the new host.

Connecting Wired Reader to USB Interface

Note: The USB configuration is essentially the same for the V410-H and V450-H.



USB Connection to Wired Reader

To connect the USB interface to a V410-H or V450-H Wired Reader:

- 1** Attach the modular connector of the USB interface cable to the host port on the bottom of the reader.
- 2** Plug the series A connector in the USB host or hub.
- 3** Select the USB device type by scanning the appropriate programming symbol.

Note: The interface cable automatically detects the host type and uses the default setting. If the default (*) does not meet your requirements, scan another host programming symbol.
- 4** On first installation when using Windows, the software prompts to select or install the Human Interface Device driver. To install this driver, provided by Windows, click **Next** through all the choices and click **Finished** on the last choice. The reader powers up during this installation.
- 5** To modify any other parameter options, scan the appropriate programming symbols in this chapter.

7-2 USB Parameter Defaults

The table below lists the defaults for USB host parameters. If any option needs to be changed, scan the appropriate programming symbol(s) provided in the **Parameter Descriptions** section.

Note: The **USB Parameter Defaults** are the same for the V410-H and V450-H.

Parameter	Default
USB Host Parameters	
USB Device Type	HID Keyboard Emulation
Symbol Native API (SNAPI) Status Handshaking	Enable
USB Keystroke Delay	No Delay
USB CAPS Lock Override	Disable
USB Ignore Unknown Characters	Send
USB Convert Unknown to Code 39	Disable
Emulate Keypad	Enable
Emulate Keypad with Leading Zero	Enable
Quick Keypad Emulation	Enable
USB FN1 Substitution	Disable
Function Key Mapping	Disable
Simulated Caps Lock	Disable
Convert Case	No Case Conversion
USB Static CDC	Enable
Ignore Beep	Enable
Ignore Programming Symbol Configuration	Enable
USB Polling Interval	3 msec
USB Fast HID	Enable
IBM Specification Version	Version 2.2

7-3 USB Host Parameters

7-3-1 USB Device Type

Note: USB Host Parameters are the same for the V410-H and V450-H.

Select the desired USB device type.

- 1** When changing USB device types, the reader automatically restarts. The reader issues a power-up beep sequence.
- 2** Before selecting **USB CDC Host**, install the Omron Microscan USB CDC Driver on the host to ensure the reader does not stall during power up (due to a failure to enumerate USB).

To recover a stalled reader:

- Install the CDC Driver.
- or
- For the V450-H Wireless Reader, unplug the USB cable and add power. Connect the reader via Bluetooth and scan **HID Keyboard** or another host.
- For the V450-H Wired Reader, unplug the USB cable, while holding the trigger, re-plug the USB cable. After 5 seconds, the reader temporarily comes up in HID Keyboard, scan another host.



* HID Keyboard Emulation



USB CDC Host
(Note 1)



Symbol Native API (SNAPI) without
Imaging Interface



Symbol Native API (SNAPI) with Imaging
Interface

Symbol Native API (SNAPI) Status Handshaking

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



* Enable SNAPI Status Handshaking



Disable SNAPI Status Handshaking

USB Keystroke Delay

This parameter sets the delay, in milliseconds, between emulated keystrokes. Scan a programming symbol below to increase the delay when hosts require a slower transmission of data.



* No Delay



Medium Delay (20 msec)



Long Delay (40 msec)

USB Caps Lock Override

This option applies only to the HID Keyboard Emulation device. When enabled, the case of the data is preserved regardless of the state of the caps lock key. This setting is always enabled for the “Japanese, Windows (ASCII)” keyboard type and can not be disabled.



Override Caps Lock Key
(Enable)



* Do Not Override Caps Lock Key
(Disable)

USB Ignore Unknown Characters

This option applies only to the HID Keyboard Emulation device and IBM device. Unknown characters are characters the host does not recognize. When **Send Barcodes With Unknown Characters** is selected, all barcode data is sent except for unknown characters, and no error beeps sound. When **Do Not Send Barcodes With Unknown Characters** is selected, barcode data is sent up to the first unknown character, then the reader issues an error beep.



* Send Barcodes with Unknown
Characters



Do Not Send Barcodes with Unknown
Characters

Emulate Keypad

When enabled, all characters are sent as ASCII sequences over the numeric keypad. For example ASCII A would be sent as “ALT make” 0 6 5 “ALT Break.”



Disable Keypad Emulation



*** Enable Keypad Emulation**

Emulate Keypad with Leading Zero

Enable this 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”.



**Disable Keypad Emulation with Leading
Zero**



*** Enable Keypad Emulation with Leading
Zero**

Quick Keypad Emulation

This option applies only to the HID Keyboard Emulation Device and if Emulate Keypad is enabled. This parameter enables a quicker method of keypad emulation where ASCII sequences are only sent for ASCII characters not found on the keyboard. The default value is **Enable**.



* Enable Quick Keypad Emulation



Disable Quick Keypad Emulation

USB Keyboard FN 1 Substitution

This option applies only to the USB HID Keyboard Emulation device. When enabled, this allows replacement of any FN 1 characters in an EAN-128 barcode with a Key Category and value chosen by the user.



Enable FN1 Substitution



* Disable FN1 Substitution

Function Key Mapping

ASCII values under 32 are normally sent as a control-key sequences. When this parameter is enabled, the keys in bold are sent in place of the standard key mapping. Table entries that do not have a bold entry remain the same whether or not this parameter is enabled.



* **Disable Function Key Mapping**



Enable Function Key Mapping

Simulated Caps Lock

When enabled, the reader inverts upper and lower case characters on the barcode as if the Caps Lock state is enabled on the keyboard. This inversion is done regardless of the current state of the keyboard's Caps Lock state.



* **Disable Simulated Caps Lock**



Enable Simulated Caps Lock

Convert Case

When enabled, the reader converts all barcode data to the selected case.



* No Case Conversion



Convert All to Upper Case



Convert All to Lower Case

USB Static CDC

● Parameter # 670

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)

7-4 Optional USB Parameters

If you configure the reader and find the settings were not saved, or changed, when the system is restarted scan the programming symbols that follow to override USB interface defaults.

Scan a programming symbol below after setting defaults and before configuring the reader.

7-4-1 Ignore Beep

The host can send a beep request to the reader. When this parameter is enabled, the request is not sent to the attached reader. All directives are still acknowledged to the USB host as if it were processed.



Disable Ignore Beep



*** Enable Ignore Beep**

7-4-2 Ignore Barcode Configuration

The host has the ability to enable/disable code types. When this parameter is enabled, the request is not sent to the attached reader. All directives are still acknowledged to the USB host as if it were processed.



Disable Ignore Barcode Configuration



*** Enable Ignore Barcode Configuration**

USB Polling Interval

Scan a programming symbol below to set the polling interval. The polling interval determines the rate at which data can be sent between the reader and host computer. A lower number indicates a faster data rate.

When changing USB Device Types, the reader automatically restarts and issues a disconnect- reconnect beep sequence.

Ensure your host machine can handle the selected data rate.



1 msec



2 msec



* 3 msec



4 msec



5 msec



6 msec



7 msec



8 msec



9 msec



10 msec

USB Fast HID

This option transmits USB HID data at a faster rate.



* Enable USB Fast HID



Disable USB Fast HID

7-5 ASCII Character Set for USB

See [Numeric Keyboard](#) for the following:

- ASCII Character Set;
- ALT Key Character Set;
- GUI Key Character Set;
- F Key Character Set.



RS-232 Interface

This section describes how to set up the reader with an RS-232 host. Use the RS-232 interface to connect the reader to a host computer or COM port.

8-1	Introduction	8-2
8-2	Connecting the RS-232 Interface	8-3
8-3	Parameter Defaults	8-5
8-4	ASCII Character Set for RS-232	8-19

8-1 Introduction

If your host does not appear in the **RS-232 Host Parameters table**, refer to the documentation for the host device to set communication parameters to match the host.

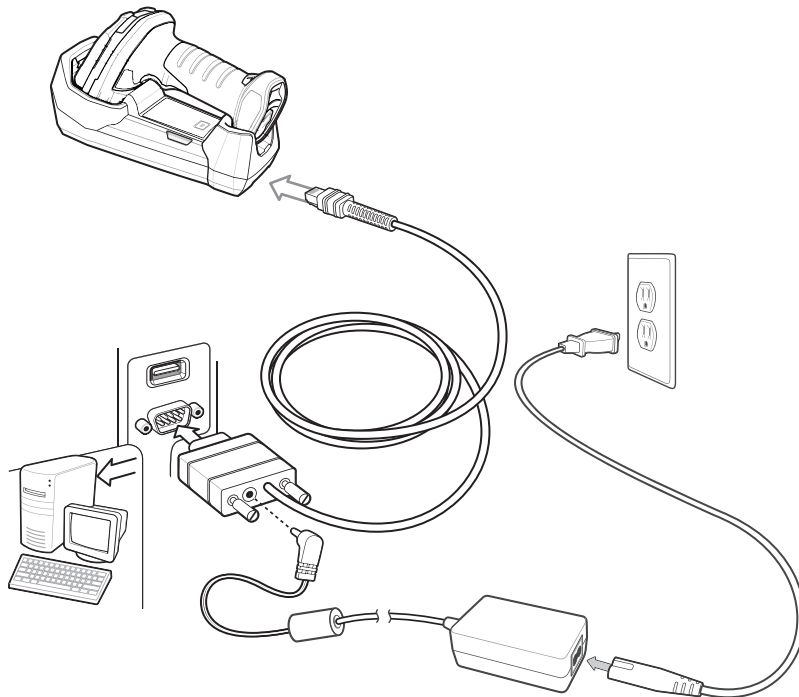
The reader uses TTL RS-232 signal levels, which interface with most system architectures.

Most computer monitors allow scanning the programming symbols directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the programming symbol clearly, and bars and/or spaces are not merging.

8-2 Connecting the RS-232 Interface

8-2-1 Connecting V450-H Wireless Reader to RS-232 Interface

Connect the reader directly to the host computer.



RS-232 Direct Connection to V450-H Wireless Reader

Interface cables vary depending on configuration.

Disconnect the host cables before the power supply, or the reader may not recognize the new host.

To connect the cradle with a RS-232 interface:

- 1** Connect the other end of the RS-232 interface cable to the serial port on the host.
- 2** Attach the modular connector of the RS-232 interface cable to the cable interface port on the cradle.
- 3** If required, connect the power supply.
- 4** Ensure that all connections are secure.
- 5** Pair the reader to the cradle by scanning the symbol on the cradle.
- 6** Select the RS-232 host type by scanning the appropriate programming symbol from **RS-232 Host Types**.

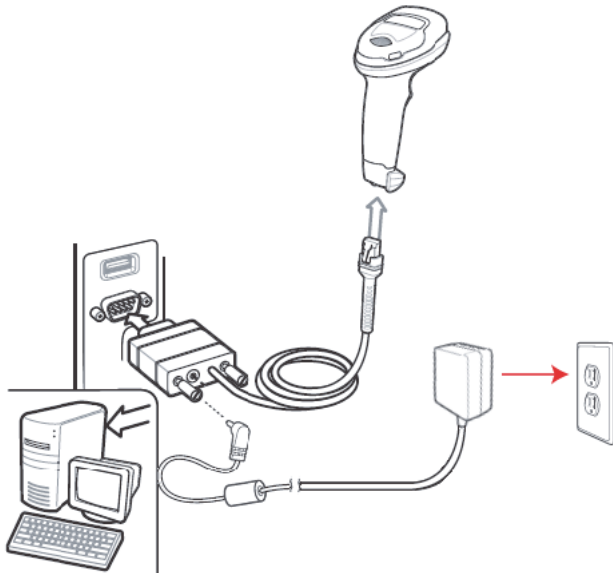
The interface cable automatically detects the host interface type and uses the default setting. If the default (*) does not meet your requirements, scan another host programming symbol.

- 7** To modify any other parameter options, scan the appropriate programming symbols in this chapter.

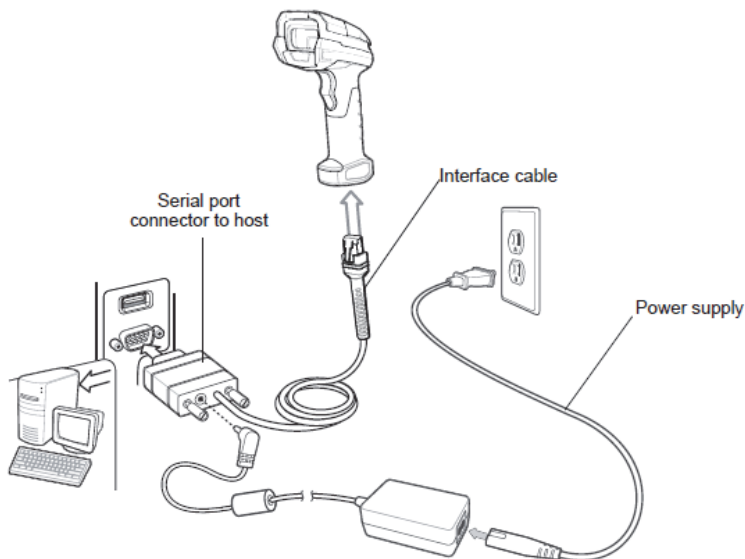
8-2-2 Connecting Wired Reader to RS-232 Interface

Connect the reader directly to the host computer.

Note: The RS-232 configuration is essentially the same for the V410-H and V450-H.



RS-232 Direct Connection to V410-H Wired Reader



RS-232 Direct Connection to V450-H Wired Reader

Interface cables vary depending on configuration.

- 1** Attach the modular connector of the RS-232 interface cable to the cable interface port on the reader.
- 2** Connect the other end of the RS-232 interface cable to the serial port on the host.
- 3** 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 reader 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 programming symbol from **RS-232 Host Types**.
- 5** To modify any other parameter options, scan the appropriate programming symbols in this chapter.

8-3 RS-232 Parameter Defaults

The table below lists the defaults for RS-232 host parameters. To change any option, scan the appropriate programming symbol(s) provided in the RS-232 Host Parameters section.

- 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 reader using WebLink_{PC}.

Note: See [Standard Parameter Defaults](#) for all user preference, host, symbology, and miscellaneous default parameters.

Note: RS-232 parameter defaults are the same for the V410-H and V450-H.

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

8-3-1 RS-232 Host-Specific Parameter Settings

Various RS-232 hosts use their own parameter default settings. Selecting standard, ICL, Fujitsu, Wincor-Nixdorf Mode A or B, OPOS/JPOS, Olivetti, Omron, or Common Use Terminal Equipment (CUTE-LP /LG barcode readers) sets the defaults listed in the tables below.

RS-232 Host-Specific Settings

Parameter	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/ OPOS/JPOS
Baud Rate	9600	9600	9600	9600
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/Postamble	Data/Postamble	Data/Postamble	Data/Postamble
Preamble	None	None	None	None
Postamble	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 reader 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 reader.

RS-232 Host-Specific Settings

Parameter	Olivetti	Omron	CUTE
Baud Rate	9600	9600	9600
Parity	Even	None	None
Stop Bits	One	One	One
Data Bits	7-bit	8-bit	8-bit
Hardware Handshaking	None	None	None
Software Handshaking	ACK/NAK	None	None
Serial Response Timeout	9.9 Seconds	9.9 Seconds	9.9 Seconds

The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan [Enable Parameter Barcode Scanning \(1\)](#), and then change the host selection.

RS-232 Host-Specific Settings

Parameter	Olivetti	Omron	CUTE
RTS Line State	Low	High	High
Beep On <BEL>	Disable	Disable	Disable
Transmit Code ID	Yes	Yes	Yes
Data Transmission Format	Preamble/Data/ Postamble	Data/Postamble	Preamble/Data/ Postamble
Preamble	STX (1003)	None	STX (1002)
Postamble	ETX (1002)	CR (1013)	CR (1013) ETX (1003)

The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan [Enable Parameter Barcode Scanning \(1\)](#), and then change the host selection.

RS-232 Host-Specific Code ID Characters

Selecting ICL, Fujitsu, Wincor-Nixdorf Mode A or B, OPOS/JPOS, Olivetti, Omron, or CUTE transmits the code ID characters listed in the tables below. 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.

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

RS-232 Host-Specific Code ID Characters

Code Type	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/ OPOS/JPOS
PDF417	None	None	Q	Q
MicroPDF417	None	None	S	S
Data Matrix	None	None	R	R
GS1 Data Matrix	None	None	W	W
QR Code	None	None	U	U
GS1 QR	None	None	X	X
Aztec/Aztec Rune	None	None	V	V

RS-232 Host-Specific Code ID Characters

Code Type	Olivetti	Omron	CUTE
UPC-A	A	A	A
UPC-E	C	E	None
EAN-8/JAN-8	B	FF	None
EAN-13/JAN-13	A	F	A
Bookland EAN	A	F	None
Code 128	K <len>	L <len>	5
GS1-128	P <len>	L <len>	5
Code 39	M <len>	C <len>	3
Code 39 Full ASCII	None	None	3
Trioptic	None	None	None
Code 32	None	None	None
Code 93	L <len>	None	None
I 2 of 5	I <len>	I <len>	1
D 2 of 5	H <len>	H <len>	2
IATA	H<len>	H<len>	2
Codabar	N <len>	N <len>	None
MSI	O <len>	None	None
GS1 DataBar Variants	None	None	None
PDF417	None	None	6
MicroPDF417	None	None	6

*This host does not support 2D barcodes.

RS-232 Host-Specific Code ID Characters

Code Type	Olivetti	Omron	CUTE
Data Matrix	None	None	4
QR Code	None	None	7
Aztec/Aztec Rune	None	None	8

*This host does not support 2D barcodes.

RS-232 Host

To select RS-232 Host interface, scan the programming symbol below. Scanning the Standard RS-232 symbol activates the RS-232 driver, but does not change port settings (e.g., parity, data bits, handshaking). Selecting another RS-232 host type programming symbol changes these settings.



* Standard RS-232¹

Baud Rate

Baud rate is the number of bits of data transmitted per second. Set the reader'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.

Note: The reader does not support baud rates below 9600.



* Baud Rate 9600



Baud Rate 19,200



Baud Rate 38,400



Baud Rate 57,600



Baud Rate 115,200

Parity

A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

- Select **Odd** parity to set the parity bit value to 0 or 1, based on data, to ensure that the coded character contains an odd number of 1 bits.
- Select **Even** parity to set the parity bit value is set to 0 or 1, based on data, to ensure that the coded character contains an even number of 1 bits.
- Select **None** when no parity bit is required.



Odd



Even



* None

Stop Bit Select

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 the number of stop bits (one or two) based on the number the receiving terminal is programmed to accommodate. Set the number of stop bits to match host device requirements.



* 1 Stop Bit



2 Stop Bits

Data Bits

This parameter allows the reader to interface with devices requiring a 7-bit or 8-bit ASCII protocol.



7-Bit



* 8-Bit

Check Receive Errors

Select whether or not to check the parity, framing, and overrun of received characters. The parity value of received characters is verified against the parity parameter selected above.



* 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).

Disable Standard RTS/CTS handshaking to transmit scan data as it becomes available. Select Standard RTS/CTS handshaking to transmit scan data according to the following sequence:

- The reader reads the CTS line for activity. If CTS is asserted, the reader waits up to Host Serial Response Time-out for the host to de-assert the CTS line. If, after Host Serial Response Time-out (default), the CTS line is still asserted, the reader sounds a transmit error, and discards any scanned data.
- When the CTS line is de-asserted, the reader asserts the RTS line and waits up to Host Serial Response Time-out for the host to assert CTS. When the host asserts CTS, the reader transmits data. If, after Host Serial Response Time-out (default), the CTS line is not asserted, the reader sounds a transmit error, and discards the data.
- When data transmission completes, the reader de-asserts RTS 10 msec after sending the last character.
- The host should respond by negating CTS. The reader checks for a de-asserted CTS upon the next transmission of data.

During the transmission of data, the CTS line should be asserted. If CTS is deasserted for more than 50 msec between characters, the reader aborts transmission, sounds a transmission error, and discards the data.

If this communication sequence fails, the reader issues an error indication. In this case, the data is lost and must be rescanned.

If hardware handshaking and software handshaking are both enabled, hardware handshaking takes precedence.

- **Note:** The DTR signal is jumpered to the active state.
- **None:** Scan this programming symbol to disable hardware handshaking.
- **Standard RTS/CTS:** Scan this programming symbol to select Standard RTS/CTS Hardware Handshaking.
- **RTS/CTS Option 1:** If you select RTS/CTS Option 1, the reader asserts RTS before transmitting and ignores the state of CTS. The reader de-asserts RTS when the transmission completes.
- **RTS/CTS Option 2:** If you select Option 2, RTS is always high or low (user-programmed logic level). However, the reader waits for CTS to be asserted before transmitting data. If CTS is not asserted within Host Serial Response Time-out (default), the reader issues an error indication and discards the data.

- **RTS/CTS Option 3:** If you select Option 3, the reader asserts RTS prior to any data transmission, regardless of the state of CTS. The reader waits up to Host Serial Response Time-out (default) for CTS to be asserted. If CTS is not asserted during this time, the reader issues an error indication and discards the data. The reader de-asserts RTS when transmission is complete.



* None



Standard RTS/CTS



RTS/CTS Option 1



RTS/CTS Option 2



RTS/CTS Option 3

Software Handshaking

This parameter offers control of the data transmission process in addition to, or instead of, that offered by hardware handshaking. There are five options.

If software handshaking and hardware handshaking are both enabled, hardware handshaking takes precedence.

- **None:** Select this to transmit data immediately. The reader expects no response from the host.
- **ACK/NAK:** If you select this option, after transmitting data, the reader expects either an ACK or NAK response from the host. When it receives a NAK, the reader transmits the same data again and waits for either an ACK or NAK. After three unsuccessful attempts to send data after receiving NAKs, the reader issues an error indication and discards the data.

The reader waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the reader does not get a response in this time, it issues an error indication and discards the data. There are no retries when a time-out occurs.

- **ENQ:** If you select this option, the reader waits for an ENQ character from the host before transmitting data. If it does not receive an ENQ within the Host Serial Response Time-out, the reader issues an error indication and discards the data. The host must transmit an ENQ character at least every Host Serial Response Time-out to prevent transmission errors.
- **ACK/NAK with ENQ:** This combines the two previous options. For re-transmissions of data, due to a NAK from the host, an additional ENQ is not required.
- **XON/XOFF:** An XOFF character turns the reader transmission off until the reader receives an XON character. There are two situations for XON/XOFF:
 - The reader receives an XOFF before has data to send. When the reader has data to send, it waits up to Host Serial Response Time-out for an XON character before transmission. If it does not receive the XON within this time, the reader issues an error indication and discards the data.
 - The reader receives an XOFF during a transmission. Data transmission then stops after sending the current byte. When the reader receives an XON character, it sends the rest of the data message. The reader waits indefinitely for the XON.



* None



ACK/NAK



ENQ



ACK/NAK with ENQ



XON/XOFF

Host Serial Response Timeout

This parameter specifies how long the reader 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. Scan a programming symbol below to select **Low RTS** or **High RTS** line state.



* Host: Low RTS



Host: High RTS

Beep on <BEL>

If you enable this parameter, the reader issues a beep when it detects a <BEL> character on the RS-232 serial line. <BEL> indicates an illegal entry or other 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

Ignore Unknown Characters

Unknown characters are characters the host does not recognize. Select **Send Barcode with Unknown Characters** to send all barcode data except for unknown characters. The reader issues no error beeps.

Select **Do Not Send Barcodes With Unknown Characters** to send barcode data up to the first unknown character. The reader issues an error beep.



* **Send Barcode**
(with unknown characters)



Do Not Send Barcodes
(with unknown characters)

8-4 ASCII Character Set for RS-232

See [ASCII Character Sets](#) for Preamble / Postamble values.

9

Symbologies

This section describes symbology features and provides programming symbols for selecting those features. To set feature parameters, scan a single programming symbol or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the reader powers down.

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9-1 Introduction

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

Select a host type (see each host chapter 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.

9-2 Scanning Sequence Examples

In most cases, scanning one programming symbol sets the parameter value. For example, to transmit barcode data without the UPC-A check digit, simply scan the **Do Not Transmit UPC-A Check Digit** programming symbol under **Transmit UPC-A Check Digit**. The reader issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters, such as **Set Length(s) for D 2 of 5** require scanning several programming symbols. See the individual parameter, such as **Set Length(s) for D 2 of 5**, for this procedure.

9-3 Errors While Scanning

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

9-4 Symbology Parameter Defaults

The table below lists the defaults for all symbology parameters. To change the default values, scan the appropriate programming symbols in this guide. These new values replace the standard default values in memory.

Parameter	Parameter Number	Default
Enable/Disable All Code Types		
1D Symbolologies		
UPC/EAN		
UPC-A	1	Enable
UPC-E	2	Enable
UPC-E1	12	Disable
EAN-8/JAN 8	4	Enable
EAN-13/JAN 13	3	Enable
Bookland EAN	83	Disable
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	Ignore
User-Programmable Supplementals Supplemental 1: Supplemental 2:	579 580	000
UPC/EAN/JAN Supplemental Redundancy	80	10
Decode UPC/EAN/JAN Supplemental AIM ID	672	Combined
UPC Reduced Quiet Zone	1289	Disable
Transmit UPC-A Check Digit	40	Enable
Transmit UPC-E Check Digit	41	Enable
Transmit UPC-E1 Check Digit	42	Enable
UPC-A Preamble	34	System Character
UPC-E Preamble	35	System Character
UPC-E1 Preamble	36	System Character
Convert UPC-E to A	37	Disable
Convert UPC-E1 to A	38	Disable
EAN-8/JAN-8 Extend	39	Disable
Bookland ISBN Format	576	ISBN-10
UCC Coupon Extended Code	85	Disable
Coupon Report	730	New Coupon Format
ISSN EAN	617	Disable
Code 128		
Code 128	8	Enable
Set Length(s) for Code 128	209, 210	1 to 55
GS1-128 (formerly UCC/EAN-128)	14	Enable
ISBT 128	84	Disable
ISBT Concatenation	577	Autodiscriminate
Check ISBT Table	578	Enable
ISBT Concatenation Redundancy	223	10
Code 128 Security Level	751	Security Level 1
Code 128 Reduced Quiet Zone	1208	Disable
Ignore Code 128 <FNC4>	1254	Disable
Code 39		
Code 39	0	Enable
Trioptic Code 39	13	Disable

Parameter	Parameter Number	Default
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	Disable
Code 32 Preamble	231	Disable
Set Length(s) for Code 39	18, 19	1 to 55
Code 39 Check Digit Verification	48	Disable
Transmit Code 39 Check Digit	43	Disable
Code 39 Full ASCII Conversion	17	Disable
Code 39 Security Level	750	Security Level 1
Code 39 Reduced Quiet Zone	1209	Disable
Code 93		
Code 93	9	Enable
Set Length(s) for Code 93	26, 27	1 to 55
Code 11		
Code 11	10	Disable
Set Lengths for Code 11	28, 29	4 to 55
Code 11 Check Digit Verification	52	Disable
Transmit Code 11 Check Digit(s)	47	Disable
Interleaved 2 of 5 (ITF)		
Interleaved 2 of 5 (ITF)	6	Disable
Set Lengths for I 2 of 5	22, 23	6 to 55
I 2 of 5 Check Digit Verification	49	Disable
Transmit I 2 of 5 Check Digit	44	Disable
Convert I 2 of 5 to EAN 13	82	Disable
I 2 of 5 Security Level	1121	Security Level 1
I 2 of 5 Reduced Quiet Zone	1210	Disable
Discrete 2 of 5 (DTF)		
Discrete 2 of 5	5	Disable
Set Length(s) for D 2 of 5	20, 21	1 to 55
Codabar (NW-7)		
Codabar	7	Enable
Set Lengths for Codabar	24, 25	4 to 55
CLSI Editing	54	Disable
NOTIS Editing	55	Disable
Codabar Upper or Lower Case Start/ Stop Characters Detection	855	Upper Case
MSI		
MSI	11	Disable
Set Length(s) for MSI	30, 31	4 to 55
MSI Check Digits	50	One
Transmit MSI Check Digit	46	Disable
MSI Check Digit Algorithm	51	Mod 10/Mod 10
Chinese 2 of 5		
Chinese 2 of 5	408	Disable
Matrix 2 of 5		
Matrix 2 of 5	618	Disable
Matrix 2 of 5 Lengths	619 620	4 to 55
Matrix 2 of 5 Check Digit	622	Disable
Transmit Matrix 2 of 5 Check Digit	623	Disable
Korean 3 of 5		
Korean 3 of 5	581	Disable
Inverse 1D	586	Regular

Parameter	Parameter Number	Default
GS1 DataBar		
GS1 DataBar-14	338	Enable
GS1 DataBar Limited	339	Enable
GS1 DataBar Expanded	340	Enable
Convert GS1 DataBar to UPC/EAN	397	Disable
GS1 DataBar Limited Security Level	728	Level 3
Composite		
Composite CC-C	341	Disable
Composite CC-A/B	342	Disable
Composite TLC-39	371	Disable
UPC Composite Mode	344	UPC Never Linked
Composite Beep Mode	398	Beep As Each Code Type is Decoded
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	Disable
2D Symbolologies		
PDF417	15	Enable
MicroPDF417	227	Disable
Code 128 Emulation	123	Disable
Data Matrix	292	Enable
GS1 Data Matrix	1336	Disable
Data Matrix Inverse	588	Inverse Autodetect
QR Code	293	Enable
GS1 QR	1343	Disable
MicroQR	573	Enable
Aztec	574	Enable
Aztec Inverse	589	Inverse Autodetect
Han Xin	1167	Disable
Han Xin Inverse	1168	Regular
Postal Codes		
US Postnet	89	Disable
US Planet	90	Disable
Transmit US Postal Check Digit	95	Enable
UK Postal	91	Disable
Transmit UK Postal Check Digit	96	Enable
Japan Postal	290	Disable
Australia Post	291	Disable
Australia Post Format	718	Autodiscriminate
USPS 4CB/One Code/Intelligent Mail	592	Disable
UPU FICS Postal	611	Disable
Mailmark	1337	Disable
Symbology-Specific Security Levels		
Redundancy Level	78	1
Security Level	77	1
1D Quiet Zone Level	1288	1
Intercharacter Gap Size	381	Normal
Report Version		
Macro PDF		
Flush Macro PDF Buffer	N/A	N/A
Abort Macro PDF Entry	N/A	N/A

9-5 Enable/Disable All Code Types

To disable all symbologies, scan **Disable All Code Types** below. This is useful when enabling only a few code types.

Scan **Enable All Code Types** turn on (enable) all code types. This is useful when you want to read all codes, or when you want to disable only a few code types.



Disable All Code Types



Enable All Code Types

9-6 UPC/EAN

Enable/Disable UPC-A

- **Parameter # 1**

To enable or disable UPC-A, scan the appropriate programming symbol below.



* Enable UPC-A
(1)

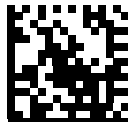


Disable UPC-A
(0)

Enable/Disable UPC-E

- **Parameter # 2**

To enable or disable UPC-E, scan the appropriate programming symbol below.



* Enable UPC-E
(1)



Disable UPC-E
(0)

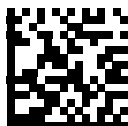
Enable/Disable UPC-E1

- **Parameter # 12**

UPC-E1 is disabled by default.

To enable or disable UPC-E1, scan the appropriate programming symbol below.

UPC-E1 is not a UCC (Uniform Code Council) approved symbology.



Enable UPC-E1
(1)

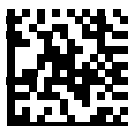


*** Disable UPC-E1**
(0)

Enable/Disable EAN-8/JAN-8

- **Parameter # 4**

To enable or disable EAN-8/JAN-8, scan the appropriate programming symbol below.



*** Enable EAN-8/JAN-8**
(1)



Disable EAN-8/JAN-8
(0)

Enable/Disable EAN-13/JAN-13

● Parameter # 3

To enable or disable EAN-13/JAN-13, scan the appropriate programming symbol below.



* Enable EAN-13/JAN-13
(1)



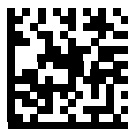
Disable EAN-13/JAN-13
(0)

Enable/Disable Bookland EAN

● Parameter # 83

To enable or disable Bookland EAN, scan the appropriate programming symbol below.

If you enable Bookland EAN, select Bookland ISBN Format. Also select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in Decode UPC/EAN/JAN Supplementals.



Enable Bookland EAN
(1)



* Disable Bookland EAN
(0)

Decode UPC/EAN/JAN Supplementals

● Parameter # 16

Supplementals are appended according to specific format conventions (e.g., UPC A+2, UPC E+2, EAN 13+2). The following options are available:

- If you select **Ignore UPC/EAN with Supplementals**, and the reader is presented with a UPC/EAN plus supplemental symbol, the reader decodes UPC/EAN and ignores the supplemental characters.
- If you select **Decode UPC/EAN with Supplementals**, the reader only decodes UPC/EAN symbols with supplemental characters, and ignores symbols without supplementals.
- If you select **Autodiscriminate UPC/EAN Supplementals**, the reader decodes UPC/EAN symbols with supplemental characters immediately. If the symbol does not have a supplemental, the reader 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.
- If you select one of the following **Supplemental Mode** options, the reader immediately transmits EAN-13 barcodes starting with that preamble that have supplemental characters. If the symbol does not have a supplemental, the reader 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. The reader transmits UPC/EAN barcodes that do not have that preamble immediately.
 - Enable 378/379 Supplemental Mode
 - Enable 978/979 Supplemental Mode
 - Enable 977 Supplemental Mode
 - Enable 414/419/434/439 Supplemental Mode
 - Enable 491 Supplemental Mode
 - Enable Smart Supplemental Mode - applies to EAN-13 barcodes starting with any preamble listed previously.
 - Supplemental User-Programmable Type 1 applies to EAN-13 barcodes starting with a 3-digit user-defined preamble. Set this 3-digit preamble using User-Programmable Supplementals.
 - Supplemental User-Programmable Type 1 and 2 applies to EAN-13 barcodes starting with either of two 3-digit user-defined preambles. Set the 3-digit preambles using User-Programmable Supplementals.
 - Smart Supplemental Plus User-Programmable 1 applies to EAN-13 barcodes starting with any preamble listed previously or the user-defined preamble set using User-Programmable Supplementals.
 - Smart Supplemental Plus User-Programmable 1 and 2 applies to EAN-13 barcodes starting with any preamble listed previously or one of the two user-defined preambles set using User-Programmable Supplementals.

Note: To minimize the risk of invalid data transmission, select either to decode or ignore supplemental characters.



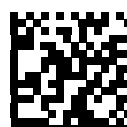
**Decode UPC/EAN/JAN Only With Supplementals
(1)**



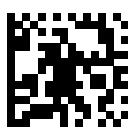
*** Ignore Supplementals
(0)**



**Autodiscriminate UPC/EAN/JAN Supplementals
(2)**



**Enable 378/379 Supplemental Mode
(4)**



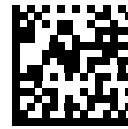
**Enable 978/979 Supplemental Mode
(5)**



**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)**

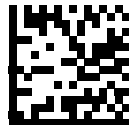
User-Programmable Supplementals

- **Supplemental 1: Parameter # 579**
- **Supplemental 2: Parameter # 580**

If you selected a Supplemental User-Programmable option from **Decode UPC/EAN/JAN Supplementals**, select **User-Programmable Supplemental 1** to set the 3-digit preamble. Then select the 3 digits using the numeric programming symbols. Select **User-Programmable Supplemental 2** to set a second 3-digit preamble. Then select the 3 digits using the numeric programming symbols. The default is 000 (zeroes).



User-Programmable Supplemental 1



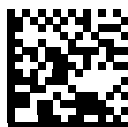
User-Programmable Supplemental 2

UPC/EAN/JAN Supplemental Redundancy

- **Parameter # 80**

If you selected **Autodiscriminate UPC/EAN/JAN Supplementals**, this option adjusts the number of times to decode a symbol without supplementals before transmission. The range is from two to thirty times. Five or above is recommended when decoding a mix of UPC/EAN/JAN symbols with and without supplementals. The default is 10.

Scan the symbol below to set a decode redundancy value. Next, scan two numeric programming symbols in **Numeric Keyboard**. Enter a leading zero for single digit numbers.



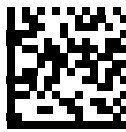
UPC/EAN/JAN Supplemental
Redundancy

UPC/EAN/JAN Supplemental AIM ID Format

● Parameter # 672

Select an output format when reporting UPC/EAN/JAN barcodes with Supplementals using **AIM Code ID Character**:

- **Separate** - transmit UPC/EAN with supplementals with separate AIM IDs but one transmission, i.e.:
]E<0 or 4><data>]E<1 or 2>[supplemental data]
- **Combined** – transmit UPC/EAN with supplementals with one AIM ID and one transmission, i.e.:
]E3<data+supplemental data>
- **Separate Transmissions** - transmit UPC/EAN with supplementals with separate AIM IDs and separate transmissions, i.e.:
]E<0 or 4><data>
]E<1 or 2>[supplemental data]



Separate
(0)



* Combined
(1)



Separate Transmissions
(2)



UPC Supp2 On
(1)



UPC Supp2 Off
(0)



UPC Supp5 On
(1)

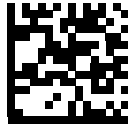


UPC Supp5 Off
(0)

UPC Reduced Quiet Zone

● Parameter # 1289

Scan one of the following programming symbols to enable or disable decoding UPC barcodes with reduced quiet zones. If you select **Enable**, select **1D Quiet Zone**.



Enable UPC Reduced Quiet Zone
(1)



* Disable UPC Reduced Quiet Zone
(0)

Transmit UPC-A Check Digit

● Parameter # 40

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate programming symbol below to transmit the barcode data with or without the UPC-A check digit. It is always verified to guarantee the integrity of the data.



* Transmit UPC-A Check Digit
(1)



Do Not Transmit UPC-A Check Digit
(0)

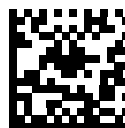
Transmit UPC-E Check Digit

● Parameter # 41

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate programming symbol below to transmit the barcode data with or without the UPC-E check digit. It is always verified to guarantee the integrity of the data.



* Transmit UPC-E Check Digit
(1)



Do Not Transmit UPC-E Check Digit
(0)

Transmit UPC-E1 Check Digit

● Parameter # 42

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate programming symbol below to transmit the barcode data with or without the UPC-E1 check digit. It is always verified to guarantee the integrity of the data.



* Transmit UPC-E1 Check Digit
(1)



Do Not Transmit UPC-E1 Check Digit
(0)

UPC-A Preamble

● Parameter # 34

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-A preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



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

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



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

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E1 preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



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

Enable this to convert 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 (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E decoded data as UPC-E data, without conversion.



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

Enable this to convert UPC-E1 decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E1 decoded data as UPC-E1 data, without conversion.



Convert UPC-E1 to UPC-A (Enable)
(1)



* Do Not Convert UPC-E1 to UPC-A
(Disable)
(0)

EAN-8/JAN-8 Extend

● Parameter # 39

Enable this parameter to add five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols. Disable this to transmit EAN-8 symbols as is.



Enable EAN/JAN Zero Extend
(1)



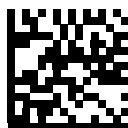
* Disable EAN/JAN Zero Extend
(0)

Bookland ISBN Format

● Parameter # 576

If you enabled Bookland EAN using **Enable/Disable Bookland EAN**, select one of the following formats for Bookland data:

- **Bookland ISBN-10** - The reader 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 reader reports Bookland data (starting with either 978 or 979) as EAN-13 in 13-digit format to meet the 2007 ISBN-13 protocol.



* Bookland ISBN-10
(0)



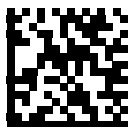
Bookland ISBN-13
(1)

For Bookland EAN to function properly, first enable Bookland EAN using **Enable/Disable Bookland EAN**, then select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in **Decode UPC/EAN/JAN Supplementals**.

UCC Coupon Extended Code

● Parameter # 85

Enable this parameter to decode UPC-A barcodes starting with digit '5', EAN-13 barcodes starting with digit '99', and UPC-A/GS1-128 Coupon Codes. UPCA, EAN-13, and GS1-128 must be enabled to scan all types of Coupon Codes.



Enable UCC Coupon Extended Code
(1)



* Disable UCC Coupon Extended Code
(0)

See **UPC/EAN/JAN Supplemental Redundancy** to control autodiscrimination of the GS1-128 (right half) of a coupon code.

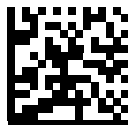
Coupon Report

● Parameter # 730

Select an option to determine which type of coupon format to support.

- Select **Old Coupon Format** to support UPC-A/GS1-128 and EAN-13/GS1-128.
- Select **New Coupon Format** as an interim format to support UPC-A/GS1-DataBar and EAN-13/GS1-DataBar.

- If you select **Autodiscriminate Format**, the reader supports both **Old Coupon Format** and **New Coupon Format**.



Old Coupon Format
(0)



* New Coupon Format
(1)



Autodiscriminate Coupon Format
(2)

ISSN EAN

● Parameter # 617

To enable or disable ISSN EAN, scan the appropriate programming symbol below.



Enable ISSN EAN
(1)



* Disable ISSN EAN
(0)

9-7 Code 128

Enable/Disable Code 128

- **Parameter # 8**

To enable or disable Code 128, scan the appropriate programming symbol below.



* Enable Code 128
(1)



Disable Code 128
(0)

Set Lengths for Code 128

- **Parameter # L1 = 209, L2 = 210**

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 128 to any length, one or two discrete lengths, or lengths within a specific range. The default is 1 to 55.

When setting lengths for different barcode types, enter a leading zero for single digit numbers.

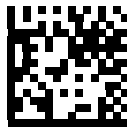
- **One Discrete Length** - Select this option to decode only Code 128 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 128 symbols with 14 characters, scan **Code 128 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Code 128 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 128 symbols containing either 2 or 14 characters, select **Code 128 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Code 128 symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode Code 128 symbols containing between 4 and 12 characters, first scan **Code 128 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Select this option to decode Code 128 symbols containing any number of characters within the reader's capability.



Code 128 - One Discrete Length



Code 128 - Two Discrete Lengths



Code 128 - Length Within Range

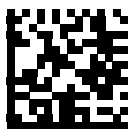


Code 128 - Any Length

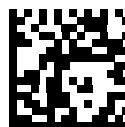
Enable/Disable GS1-128 (Formerly UCC/EAN-128)

- **Parameter # 14**

To enable or disable GS1-128, scan the appropriate programming symbol below.



* Enable GS1-128
(1)

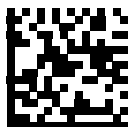


Disable GS1-128
(0)

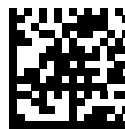
Enable/Disable ISBT 128

- **Parameter # 84**

ISBT 128 is a variant of Code 128 used in the blood bank industry. Scan a programming symbol below to enable or disable ISBT 128. If necessary, the host must perform concatenation of the ISBT data.



*Enable ISBT 128
(1)



Disable ISBT 128
(0)

ISBT Concatenation

● Parameter # 577

Select an option for concatenating pairs of ISBT code types:

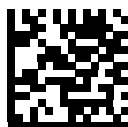
- If you select **Disable ISBT Concatenation**, the reader does not concatenate pairs of ISBT codes it encounters.
- If you select **Enable ISBT Concatenation**, there must be two ISBT codes in order for the reader to decode and perform concatenation. The reader does not decode single ISBT symbols.
- If you select **Autodiscriminate ISBT Concatenation**, the reader decodes and concatenates pairs of ISBT codes immediately. If only a single ISBT symbol is present, the reader 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.



*Disable ISBT Concatenation
(0)



Enable ISBT Concatenation
(1)



Autodiscriminate ISBT Concatenation
(2)

Check ISBT Table

- **Parameter # 578**

The ISBT specification includes a table that lists several types of ISBT barcodes that are commonly used in pairs. If you set **ISBT Concatenation** to **Enable**, enable **Check ISBT Table** to concatenate only those pairs found in this table. Other types of ISBT codes are not concatenated.



* Enable Check ISBT Table
(1)



Disable Check ISBT Table
(0)

ISBT Concatenation Redundancy

- **Parameter # 223**

If you set **ISBT Concatenation** to **Autodiscriminate**, use this parameter to set the number of times the reader must decode an ISBT symbol before determining that there is no additional symbol.

Scan the programming symbol below, then scan two numeric programming symbols in **Numeric Keyboard** to set a value between 2 and 20. Enter a leading zero for single digit numbers.



ISBT Concatenation Redundancy

Code 128 Security Level

● Parameter # 751

Code 128 barcodes are vulnerable to misdecodes, particularly when Code 128 Lengths is set to **Any Length**. The reader offers four levels of decode security for Code 128 barcodes. There is an inverse relationship between security and reader aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- **Code 128 Security Level 0:** This setting allows the reader to operate in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- **Code 128 Security Level 1:** A barcode must be successfully read twice, and satisfy certain safety requirements before being decoded. This default setting eliminates most misdecodes.
- **Code 128 Security Level 2:** Select this option with 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. 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. Selecting this level of security significantly impairs the decoding ability of the reader. 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

Scan one of the following programming symbols to enable or disable decoding Code 128 barcodes with reduced quiet zones. If you select **Enable**, select **1D Quiet Zone Level**.



Enable Code 128 Reduced Quiet Zone
(1)



* Disable Code 128 Reduced Quiet Zone
(0)

Ignore Code 128 <FNC4>

● Parameter # 1254

This feature applies to Code 128 barcodes with an embedded <FNC4> character. Enable this to strip the <FNC4> character from the decode data. The remaining characters are sent to the host unchanged. When disabled, the <FNC4> character is processed normally as per Code 128 standard.



Enable Ignore Code 128 <FNC4>
(1)



* Disable Ignore Code 128 <FNC4>
(0)

9-8 Code 39

9-8-1 Enable/Disable Code 39

- **Parameter # 0**

To enable or disable Code 39, scan the appropriate programming symbol below.



* Enable Code 39
(1)



Disable Code 39
(0)

Enable/Disable Trioptic Code 39

- **Parameter # 13**

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. To enable or disable Trioptic Code 39, scan the appropriate programming symbol below.

Note: You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.



Enable Trioptic Code 39
(1)



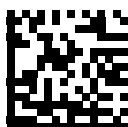
* Disable Trioptic Code 39
(0)

Convert Code 39 to Code 32

- **Parameter # 86**

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate programming symbol below to enable or disable converting Code 39 to Code 32.

Code 39 must be enabled for this parameter to function.



Enable Convert Code 39 to Code 32
(1)



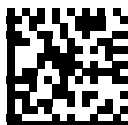
*** Disable Convert Code 39 to Code 32**
(0)

Code 32 Preamble

- **Parameter # 231**

Scan the appropriate programming symbol below to enable or disable adding the preamble character "A" to all Code 32 barcodes.

Convert Code 39 to Code 32 must be enabled for this parameter to function.



Enable Code 32 Preamble
(1)



*** Disable Code 32 Preamble**
(0)

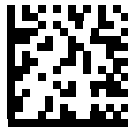
Set Lengths for Code 39

● Parameter # L1 = 18, L2 = 19

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 39 to any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options. The default is 1 to 55.

When setting lengths for different barcode types, enter a leading zero for single digit numbers.

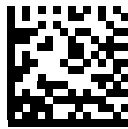
- **One Discrete Length** - Select this option to decode only Code 39 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 39 symbols with 14 characters, scan **Code 39 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Code 39 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 39 symbols containing either 2 or 14 characters, select **Code 39 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Code 39 symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Select this option to decode Code 39 symbols containing any number of characters within the reader's capability.



Code 39 - One Discrete Length



Code 39 - Two Discrete Lengths



Code 39 - Length Within Range



Code 39 - Any Length

Code 39 Check Digit Verification

- **Parameter # 48**

Enable this feature to check 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.



Enable Code 39 Check Digit
(1)

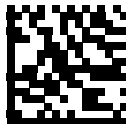


*** Disable Code 39 Check Digit**
(0)

Transmit Code 39 Check Digit

- **Parameter # 43**

Scan a programming symbol below to transmit Code 39 data with or without the check digit. 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

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set. To enable or disable Code 39 Full ASCII, scan the appropriate programming symbol below.

You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.

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.



**Enable Code 39 Full ASCII
(1)**



*** Disable Code 39 Full ASCII
(0)**

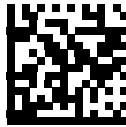
Code 39 Security Level

● Parameter # 750

The reader offers four levels of decode security for Code 39 barcodes. There is an inverse relationship between security and reader aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- **Code 39 Security Level 0:** This setting allows the reader to operate in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- **Code 39 Security Level 1:** This default setting eliminates most misdecodes.
- **Code 39 Security Level 2:** Select this option with greater barcode security requirements if **Security Level 1** fails to eliminate misdecodes.
- **Code 39 Security Level 3:** If you selected **Security Level 2**, and misdecodes still occur, select this security level to apply the highest safety requirements.

Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes. Selecting this level of security significantly impairs the decoding ability of the reader. If this level of security is required, try to improve the quality of the barcodes.



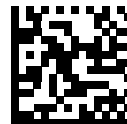
Code 39 Security Level 0
(0)



* Code 39 Security Level 1
(1)



Code 39 Security Level 2
(2)

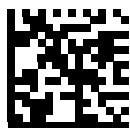


Code 39 Security Level 3
(3)

Code 39 Reduced Quiet Zone

- **Parameter # 1209**

Scan one of the following programming symbols to enable or disable decoding Code 39 barcodes with reduced quiet zones. If you select **Enable**, select **1D Quiet Zone Level**.



**Enable Code 39 Reduced Quiet Zone
(1)**



*** Disable Code 39 Reduced Quiet Zone
(0)**

9-9 Code 93

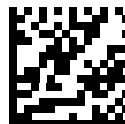
Enable/Disable Code 93

- **Parameter # 9**

To enable or disable Code 93, scan the appropriate programming symbol below.



* Enable Code 93
(1)



Disable Code 93
(0)

Set Lengths for Code 93

- **Parameter # L1 = 26, L2 = 27**

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 93 to any length, one or two discrete lengths, or lengths within a specific range. The default is 1 to 55.

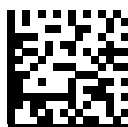
- **One Discrete Length** - Select this option to decode only Code 93 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 93 symbols with 14 characters, scan **Code 93 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Code 93 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Code 93 symbols containing either 2 or 14 characters, select **Code 93 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Code 93 symbol with a specific length range. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode Code 93 symbols containing any number of characters within the reader's capability.



Code 93 - One Discrete Length



Code 93 - Two Discrete Lengths



Code 93 - Length Within Range



Code 93 - Any Length

9-10 Code 11

Code 11

- **Parameter # 10**

To enable or disable Code 11, scan the appropriate programming symbol below.



Enable Code 11
(1)



* Disable Code 11
(0)

Set Lengths for Code 11

- **Parameter # L1 = 28, L2 = 29**

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 4 to 55.

- **One Discrete Length** - Select this option to decode only Code 11 symbols containing a selected length. Select the length using the numeric programming symbols in [Numeric Keyboard](#). For example, to decode only Code 11 symbols with 14 characters, scan **Code 11 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Code 11 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in [Numeric Keyboard](#). For example, to decode only Code 11 symbols containing either 2 or 14 characters, select **Code 11 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Code 11 symbol with a specific length range. Select lengths using numeric programming symbols in [Numeric Keyboard](#). For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode Code 11 symbols containing any number of characters within the reader's capability.



Code 11 - One Discrete Length



Code 11 - Two Discrete Lengths



Code 11 - Length Within Range



Code 11 - Any Length

Code 11 Check Digit Verification

● Parameter # 52

This feature allows the reader to check the integrity of all Code 11 symbols to verify that the data complies with the specified check digit algorithm. This selects the check digit mechanism for the decoded Code 11 barcode. The options are to check for one check digit, check for two check digits, or disable the feature.

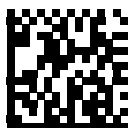
To enable this feature, scan the programming symbol below corresponding to the number of check digits encoded in the Code 11 symbols.



* Disable
(0)



One Check Digit
(1)



Two Check Digits
(2)

Transmit Code 11 Check Digits

- **Parameter # 47**

This feature selects whether or not to transmit the Code 11 check digit(s).

Note: Code 11 Check Digit Verification must be enabled for this parameter to function.



Transmit Code 11 Check Digit(s) (Enable)
(1)



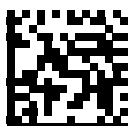
* Do Not Transmit Code 11 Check Digit(s)
(Disable)
(0)

9-11 Interleaved 2 of 5 (ITF)

Enable/Disable Interleaved 2 of 5

● Parameter # 6

To enable or disable Interleaved 2 of 5, scan the appropriate programming symbol below, and select an Interleaved 2 of 5 length from the following pages.



*Enable Interleaved 2 of 5
(1)



Disable Interleaved 2 of 5
(0)

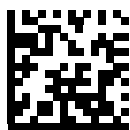
Set Lengths for Interleaved 2 of 5

● Parameter # L1 = 22, L2 = 23

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 I 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The range for Interleaved 2 of 5 lengths is 0 - 55. The default is 6 to 55.

- **One Discrete Length** - Select this option to decode only I 2 of 5 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only I 2 of 5 symbols with 14 characters, scan **I 2 of 5 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only I 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only I 2 of 5 symbols containing either 2 or 14 characters, select **I 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode an I 2 of 5 symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode I 2 of 5 symbols containing any number of characters within the reader's capability.

Note: Due to the construction of the I 2 of 5 symbology, it is possible for a scan 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.



I 2 of 5 - One Discrete Length



I 2 of 5 - Two Discrete Lengths



I 2 of 5 - Length Within Range

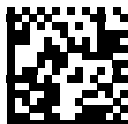


I 2 of 5 - Any Length

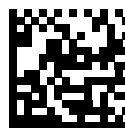
I 2 of 5 Check Digit Verification

- **Parameter # 49**

Enable this feature to check 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
(0)



USS Check Digit
(1)

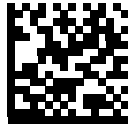


OPCC Check Digit
(2)

Transmit I 2 of 5 Check Digit

● Parameter # 44

Scan the appropriate programming symbol below to transmit I 2 of 5 data with or without the check digit.



Transmit I 2 of 5 Check Digit (Enable)
(1)

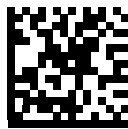


* Do Not Transmit I 2 of 5 Check Digit
(Disable)
(0)

Convert I 2 of 5 to EAN-13

● Parameter # 82

Enable this parameter to convert 14-character I 2 of 5 codes to EAN-13, and transmit to the host as EAN-13. To accomplish this, 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)

I 2 of 5 Security Level

● Parameter # 1121

Interleaved 2 of 5 barcodes are vulnerable to misdecodes, particularly when I 2 of 5 Lengths is set to **Any Length**. The reader offers four levels of decode security for Interleaved 2 of 5 barcodes. There is an inverse relationship between security and reader 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:** This setting allows the reader to operate 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:** Select this option with 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.

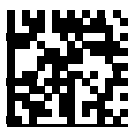
Note: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes. Selecting this level of security significantly impairs the decoding ability of the reader. If this level of security is required, try to improve the quality of the barcodes.



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)

I 2 of 5 Reduced Quiet Zone

- **Parameter # 1210**

Scan one of the following programming symbols to enable or disable decoding I 2 of 5 barcodes with reduced quiet zones. If you select **Enable**, select **1D Quiet Zone Level**.



**Enable I 2 of 5 Reduced Quiet Zone
(1)**



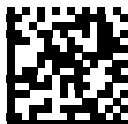
*** Disable I 2 of 5 Reduced Quiet Zone
(0)**

9-12 Discrete 2 of 5 (DTF)

Enable/Disable Discrete 2 of 5

- **Parameter # 5**

To enable or disable Discrete 2 of 5, scan the appropriate programming symbol below.



Enable Discrete 2 of 5
(1)



* Disable Discrete 2 of 5
(0)

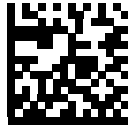
Set Lengths for Discrete 2 of 5

- **Parameter # L1 = 20, L2 = 21**

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 D 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The range for Discrete 2 of 5 lengths is 1 - 55.

- **One Discrete Length** - Select this option to decode only D 2 of 5 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only D 2 of 5 symbols with 14 characters, scan **D 2 of 5 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only D 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only D 2 of 5 symbols containing either 2 or 14 characters, select **D 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a D 2 of 5 symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode D 2 of 5 symbols containing any number of characters within the reader's capability.

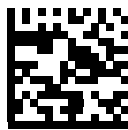
Note: Due to the construction of the D 2 of 5 symbology, it is possible for a scan covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (**D 2 of 5 - One Discrete Length, Two Discrete Lengths**) for D 2 of 5 applications.



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

9-13 Codabar (NW-7)

Enable/Disable Codabar

- **Parameter # 7**

To enable or disable Codabar, scan the appropriate programming symbol below.



* Enable Codabar
(1)



Disable Codabar
(0)

Set Lengths for Codabar

- **Parameter # L1 = 24, L2 = 25**

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 Codabar to any length, one or two discrete lengths, or lengths within a specific range. The default is 4 to 55.

- **One Discrete Length** - Select this option to decode only Codabar symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Codabar symbols with 14 characters, scan **Codabar - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Codabar symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Codabar symbols containing either 2 or 14 characters, select **Codabar - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Codabar symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode Codabar symbols containing any number of characters within the reader's capability.



Codabar - One Discrete Length



Codabar - Two Discrete Lengths



Codabar - Length Within Range



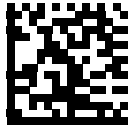
Codabar - Any Length

CLSI Editing

- **Parameter # 54**

Enable this parameter to strip the start and stop characters and insert a space after the first, fifth, and tenth characters of a 14-character Codabar symbol. Enable this feature if the host system requires this data format.

Note: Symbol length does not include start and stop characters.



Enable CLSI Editing
(1)



* Disable CLSI Editing
(0)

NOTIS Editing

- **Parameter # 55**

Enable this parameter to strip the start and stop characters from a decoded Codabar symbol. Enable this feature if the host system requires this data format.



Enable NOTIS Editing
(1)



* Disable NOTIS Editing
(0)

Codabar Upper or Lower Case Start/Stop Characters Detection

- **Parameter # 855**

Select whether to detect upper case or lower case Codabar start/stop characters.



Lower Case
(1)



* Upper Case
(0)

9-14 MSI

Enable/Disable MSI

- **Parameter # 11**

To enable or disable MSI, scan the appropriate programming symbol below.



Enable MSI
(1)



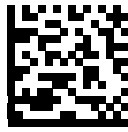
* Disable MSI
(0)

Set Lengths for MSI

- **Parameter # L1 = 30, L2 = 31**

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 MSI to any length, one or two discrete lengths, or lengths within a specific range. The default is 4 to 55.

- **One Discrete Length** - Select this option to decode only MSI symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only MSI symbols with 14 characters, scan **MSI - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only MSI symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only MSI symbols containing either 2 or 14 characters, select **MSI - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a MSI symbol with a specific length range. Select lengths using numeric programming symbols in **Numeric Keyboard**. For example, to decode MSI symbols containing between 4 and 12 characters, first scan **MSI - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode MSI symbols containing any number of characters within the reader's capability.
- Due to the construction of the MSI symbology, it is possible for a scan covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the programming symbol. To prevent this, select specific lengths (**MSI - One Discrete Length, Two Discrete Lengths**) for MSI applications.



MSI - One Discrete Length



MSI - Two Discrete Lengths



MSI - Length Within Range



MSI - Any Length

MSI Check Digits

● Parameter # 50

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, scan the **Two MSI Check Digits** programming symbol to enable verification of the second check digit.



* No MSI Check Digit
(0)



One MSI Check Digit
(1)

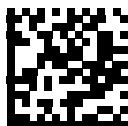


Two MSI Check Digits
(2)

Transmit MSI Check Digit(s)

- **Parameter # 46**

Scan a programming symbol below to transmit MSI data with or without the check digit.



Transmit MSI Check Digit(s) (Enable)
(1)



*** Do Not Transmit MSI Check Digit(s)**
(Disable)
(0)

MSI Check Digit Algorithm

- **Parameter # 51**

Two algorithms are possible for the verification of the second MSI check digit. Select the programming symbol below corresponding to the algorithm used to encode the check digit.



MOD 10/MOD 11
(0)



*** MOD 10/MOD 10**
(1)

9-15 Chinese 2 of 5

Enable/Disable Chinese 2 of 5

- **Parameter # 408**

To enable or disable Chinese 2 of 5, scan the appropriate programming symbol below.



**Enable Chinese 2 of 5
(1)**



*** Disable Chinese 2 of 5
(0)**

9-16 Matrix 2 of 5

Enable/Disable Matrix 2 of 5

- **Parameter # 618**

To enable or disable Matrix 2 of 5, scan the appropriate programming symbol below.



Enable Matrix 2 of 5
(1)



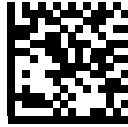
* Disable Matrix 2 of 5
(0)

Set Lengths for Matrix 2 of 5

- **Parameter # L1 = 619, L2 = 620**

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 Matrix 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The default is **4 to 55**.

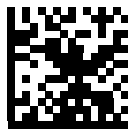
- **One Discrete Length** - Select this option to decode only Matrix 2 of 5 symbols containing a selected length. Select the length using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Matrix 2 of 5 symbols with 14 characters, scan **Matrix 2 of 5 - One Discrete Length**, then scan **1** followed by **4**.
- **Two Discrete Lengths** - Select this option to decode only Matrix 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode only Matrix 2 of 5 symbols containing either 2 or 14 characters, select **Matrix 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**.
- **Length Within Range** - Select this option to decode a Matrix 2 of 5 symbol with a specific length range. Select lengths using the numeric programming symbols in **Numeric Keyboard**. For example, to decode Matrix 2 of 5 symbols containing between 4 and 12 characters, first scan **Matrix 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers).
- **Any Length** - Scan this option to decode Matrix 2 of 5 symbols containing any number of characters within the reader's capability.



Matrix 2 of 5 - One Discrete Length



Matrix 2 of 5 - Two Discrete Lengths



Matrix 2 of 5 - Length Within Range



Matrix 2 of 5 - Any Length

Matrix 2 of 5 Check Digit

● Parameter # 622

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate programming symbol below to transmit the barcode data with or without the 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**

Scan a programming symbol below to transmit Matrix 2 of 5 data with or without the check digit.



**Transmit Matrix 2 of 5 Check Digit
(1)**



*** Do Not Transmit Matrix 2 of 5 Check
Digit
(0)**

9-17 Korean 3 of 5

Enable/Disable Korean 3 of 5

- **Parameter # 581**

To enable or disable Korean 3 of 5, scan the appropriate programming symbol below.

Note: The length for Korean 3 of 5 is fixed at 6.



Enable Korean 3 of 5
(1)



* Disable Korean 3 of 5
(0)

9-18 Inverse 1D

- **Parameter # 586**

This parameter sets the 1D inverse decoder setting. Options are:

- **Regular Only** - the reader decodes regular 1D barcodes only.
- **Inverse Only** - the reader decodes inverse 1D barcodes only.
- **Inverse Autodetect** - the reader decodes both regular and inverse 1D barcodes.



* Regular
(0)



Inverse Only
(1)



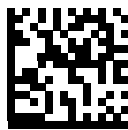
Inverse Autodetect
(2)

9-19 GS1 DataBar

The variants of GS1 DataBar are DataBar-14, DataBar Expanded, and DataBar Limited. The limited and expanded versions have stacked variants. Scan the appropriate programming symbols to enable or disable each variant of GS1 DataBar.

GS1 DataBar-14

- **Parameter # 338**



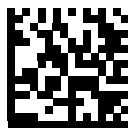
* Enable GS1 DataBar-14
(1)



Disable GS1 DataBar-14
(0)

GS1 DataBar Limited

- **Parameter # 339**



* Enable GS1 DataBar Limited
(1)



Disable GS1 DataBar Limited
(0)

GS1 DataBar Expanded

- **Parameter # 340**



* Enable GS1 DataBar Expanded
(1)



Disable GS1 DataBar Expanded
(0)

Convert GS1 DataBar to UPC/EAN

● Parameter # 397

This parameter only applies to GS1 DataBar-14 and GS1 DataBar Limited symbols not decoded as part of a Composite symbol. Enable this to strip the leading '010' from DataBar-14 and DataBar Limited symbols encoding a single zero as the first digit, and report the barcode as EAN-13.

For barcodes beginning with two or more zeros but not six zeros, this parameter strips the leading '0100' and reports the barcode as UPC-A. The UPC-A Preamble parameter 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
(1)



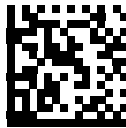
* Disable Convert GS1 DataBar to UPC/EAN
(0)

GS1 DataBar Limited Security Level

● Parameter # 728

The reader offers four levels of decode security for GS1 DataBar Limited barcodes. There is an inverse relationship between security and reader aggressiveness. Increasing the level of security may result in reduced aggressiveness in scanning, so choose only that level of security necessary.

- Level 1 – No clear margin required. This complies with the original GS1 standard, yet might result in erroneous decoding of the DataBar Limited barcode when scanning some UPC symbols that start with digits “9” and “7”
- Level 2 – Automatic risk detection. This level of security may result in erroneous decoding of DataBar Limited barcodes when scanning some UPC symbols. The reader defaults to Level 3, otherwise to Level 1.
- Level 3 – Security level reflects newly proposed GS1 standard that requires a 5 times trailing clear margin.
- Level 4 – Security level extends beyond the standard required by GS1. This level of security requires a 5 times leading and trailing clear margin.



GS1 DataBar Limited Security Level 1
(1)



GS1 DataBar Limited Security Level 2
(2)



* GS1 DataBar Limited Security Level 3
(3)



GS1 DataBar Limited Security Level 4
(4)

9-20 BC412

Important: **Decoder Effort** must be set to **Level 4** for the reader to support BC412.

To enable or disable BC412, scan the appropriate symbol below.



Enable BC412
(1)



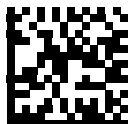
* Disable BC412
(0)

9-21 Composite

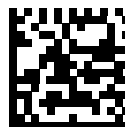
Composite CC-C

- **Parameter # 341**

Scan a programming symbol below to enable or disable Composite barcodes of type CC-C.



Enable CC-C
(1)

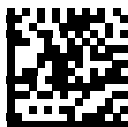


* Disable CC-C
(0)

Composite CC-A/B

- **Parameter # 342**

Scan a programming symbol below to enable or disable Composite barcodes of type CC-A/B.



Enable CC-A/B
(1)



* Disable CC-A/B
(0)

Composite TLC-39

● Parameter # 371

Scan a programming symbol below to enable or disable Composite barcodes of type TLC-39.



Enable TLC39
(1)



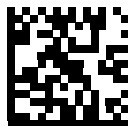
* Disable TLC39
(0)

UPC Composite Mode

● Parameter # 344

Select an option for linking UPC symbols with a 2D symbol during transmission as if they were one symbol:

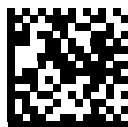
- Select **UPC Never Linked** to transmit UPC barcodes regardless of whether a 2D symbol is detected.
- Select **UPC Always Linked** to transmit UPC barcodes and the 2D portion. If 2D is not present, the UPC barcode does not transmit.
- If you select **Autodiscriminate UPC Composites**, the reader determines 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)

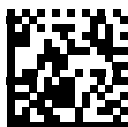


Autodiscriminate UPC Composites
(2)

Composite Beep Mode

- **Parameter # 398**

To select the number of decode beeps when a composite barcode is decoded, scan the appropriate programming symbol.



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**

Select whether to enable or disable this mode.



Enable GS1-128 Emulation Mode for
UCC/EAN Composite Codes
(1)



* Disable GS1-128 Emulation Mode for
UCC/EAN Composite Codes
(0)

9-22 2D Symbologies

Enable/Disable PDF417

- **Parameter # 15**

To enable or disable PDF417, scan the appropriate programming symbol below.



* Enable PDF417
(1)



Disable PDF417
(0)

Enable/Disable MicroPDF417

- **Parameter # 227**

To enable or disable MicroPDF417, scan the appropriate programming symbol below.



Enable MicroPDF417
(1)



* Disable MicroPDF417
(0)

Code 128 Emulation

● Parameter # 123

Enable this parameter to transmit data from certain MicroPDF417 symbols as Code 128. **AIM Code ID Character** must be enabled for this parameter to work.

Enable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following preambles:

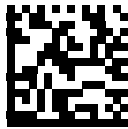
- J C1 if the first codeword is 903-905
- J C2 if the first codeword is 908 or 909
- J C0 if the first codeword is 910 or 911

Disable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following preambles:

- J L3 if the first codeword is 903-905
- J L4 if the first codeword is 908 or 909
- J L5 if the first codeword is 910 or 911

Scan a programming symbol below to enable or disable Code 128 Emulation.

Linked Micro PDF codewords 906, 907, 912, 914, and 915 are not supported. Use GS1 Composites instead.



Enable Code 128 Emulation
(1)

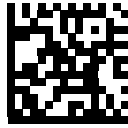


* Disable Code 128 Emulation
(0)

Data Matrix

- **Parameter # 292**

To enable or disable Data Matrix, scan the appropriate programming symbol below.



* Enable Data Matrix
(1)



Disable Data Matrix
(0)

GS1 Data Matrix

- **Parameter # 1336**

To enable or disable GS1 Data Matrix, scan the appropriate programming symbol below.



* Disable GS1 Data Matrix
(0)



Enable GS1 Data Matrix
(1)

Data Matrix Inverse

● Parameter # 588

This parameter sets the Data Matrix inverse decoder setting. Options are:

- **Regular Only** - The reader decodes regular Data Matrix symbols only.
- **Inverse Only** - The reader decodes inverse Data Matrix symbols only.
- **Inverse Autodetect** - The reader decodes both regular and inverse Data Matrix symbols.



Regular
(0)



Inverse Only
(1)



* Inverse Autodetect
(2)

QR Code

● Parameter # 293

Inverse QR symbols decode if **QR Code** is enabled.

To enable or disable QR Code, scan the appropriate programming symbol below.



* Enable QR Code
(1)



Disable QR Code
(0)

GS1 QR

- **Parameter # 1343**

To enable or disable, scan the appropriate programming symbol below.



**Disable
(0)**



***Enable
(1)**

Micro QR Code

- **Parameter # 573**

To enable or disable Micro QR Code, scan the appropriate programming symbol below.



*** Enable MicroQR
(1)**

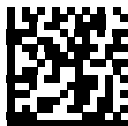


**Disable MicroQR
(0)**

Aztec

● Parameter # 574

To enable or disable Aztec, scan the appropriate programming symbol below.



* Enable Aztec
(1)



Disable Aztec
(0)

Aztec Inverse

● Parameter # 589

This parameter sets the Aztec inverse decoder setting. Options are:

- **Regular Only** - The reader decodes regular Aztec symbols only.
- **Inverse Only** - The reader decodes inverse Aztec symbols only.
- **Inverse Autodetect** - The reader decodes both regular and inverse Aztec symbols.



Regular
(0)



Inverse Only
(1)

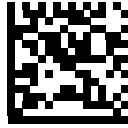


* Inverse Autodetect
(2)

Han Xin

● Parameter # 1167

To enable or disable Han Xin, scan the appropriate programming symbol below.



Enable Han Xin
(1)



* Disable Han Xin
(0)

Han Xin Inverse

● Parameter # 1168

Select a Han Xin inverse decoder setting:

- **Regular Only** - The decoder decodes Han Xin barcodes with normal reflectance only.
- **Inverse Only** - The decoder decodes Han Xin barcodes with inverse reflectance only.
- **Inverse Autodetect** - The decoder decodes both regular and inverse Han Xin barcodes.



* Regular
(0)



Inverse Only
(1)



Inverse Autodetect
(2)

DotCode

● Parameter # 1906 – DotCode

Important: **Decoder Effort** must be set to **Level 4** for the V450-H to support DotCode.

To enable or disable DotCode for V410-H and V450-H readers, scan the appropriate symbol below.



DotCode Enable (V450-H) (1)



* DotCode Disable (V450-H) (0)



DotCode Enable (V410-H) (1)



* DotCode Disable (V410-H) (0)

● Parameter # 1907 – DotCode Inverse (V410-H Only)

Scan one of the following symbols to select a DotCode Inverse decoder setting. Options are:

- **Regular Only** – Decodes DotCode symbols with normal reflectance only.
- **Inverse Only** – Decodes DotCode symbols with inverse reflectance only.
- **Inverse Autodetect** – Decodes both regular and inverse DotCode symbols.



Regular (0)



Inverse Only (1)



* Inverse Autodetect (2)

● Parameter # 1908 – DotCode Mirrored (V410-H Only)

Scan one of the following symbols to select a DotCode Mirror decoder setting. Options are:

- **Non-Mirrored Only** – Decodes non-mirrored DotCode symbols only.
- **Mirrored Only** – Decodes DotCode symbols with inverse reflectance only.
- **Autodetect** – Decodes both mirrored and non-mirrored DotCode symbols.



Non-Mirrored Only (0)



Mirrored Only (1)



* Autodetect (2)

● Parameter # 1937 – DotCode Prioritize (V410-H Only)

Enable DotCode Prioritize to configure the reader to decode DotCode before any other symbologies.



Disable DotCode Prioritize (0)



Enable DotCode Prioritize (1)

9-23 Postal Codes

US Postnet

- **Parameter # 89**

To enable or disable US Postnet, scan the appropriate programming symbol below.



Enable US Postnet
(1)

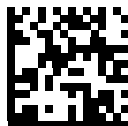


* Disable US Postnet
(0)

US Planet

- **Parameter # 90**

To enable or disable US Planet, scan the appropriate programming symbol below.



Enable US Planet
(1)



* Disable US Planet
(0)

Transmit US Postal Check Digit

- **Parameter # 95**

Select whether to transmit US Postal data, which includes both US Postnet and US Planet, with or without the check digit.



* Transmit US Postal Check Digit
(1)



Do Not Transmit US Postal Check Digit
(0)

UK Postal

- **Parameter # 91**

To enable or disable UK Postal, scan the appropriate programming symbol below.



Enable UK Postal
(1)

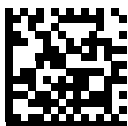


* Disable UK Postal
(0)

Transmit UK Postal Check Digit

- **Parameter # 96**

Select whether to transmit UK Postal data with or without the check digit.



* Transmit UK Postal
Check Digit
(1)

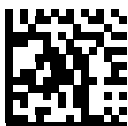


Do Not Transmit UK Postal Check Digit
(0)

Japan Postal

- **Parameter # 290**

To enable or disable Japan Postal, scan the appropriate programming symbol below.



Enable Japan Postal
(1)



* Disable Japan Postal
(0)

Australia Post

- **Parameter # 291**

To enable or disable Australia Post, scan the appropriate programming symbol below.



Enable Australia Post
(1)



*** Disable Australia Post**
(0)

Australia Post Format

● Parameter # 718

To select one of the following formats for Australia Post, scan the appropriate programming symbol below:

- **Autodiscriminate** (or Smart mode) - Attempt to 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:

<https://auspost.com.au/business/marketing-and-communications/bulk-mailouts/barcoding-process>.



* Autodiscriminate
(0)



Raw Format
(1)



Alphanumeric Encoding
(2)



Numeric Encoding
(3)

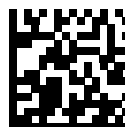
USPS 4CB/One Code/Intelligent Mail

- **Parameter # 592**

To enable or disable USPS 4CB/One Code/Intelligent Mail, scan the appropriate programming symbol below.



Enable USPS 4CB/One Code/Intelligent Mail
(1)



* Disable USPS 4CB/One Code/Intelligent Mail
(0)

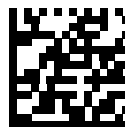
UPU FICS Postal

- **Parameter # 611**

To enable or disable UPU FICS Postal, scan the appropriate programming symbol below.



Enable UPU FICS Postal
(1)



* Disable UPU FICS Postal
(0)

Mailmark

- **Parameter # 1337**

To enable or disable Mailmark, scan the appropriate programming symbol below.



* Disable Mailmark
(0)



Enable Mailmark
(1)

9-24 Symbology-Specific Security Levels

Redundancy Level

● Parameter # 78

The reader offers four levels of decode redundancy. Select higher redundancy levels for decreasing levels of barcode quality. As redundancy levels increase, the reader's aggressiveness decreases.

Select the redundancy level appropriate for the barcode quality.

Redundancy Level 1

The following code types must be successfully read twice before being decoded:

Code Type	Code Length
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 following code types must be successfully read twice before being decoded:

Code Type	Code Length
All	All

Redundancy Level 3

Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Code Type	Code Length
MSI	4 characters or less
D 2 of 5	8 characters or less
I 2 of 5	8 characters or less
Codabar	8 characters or less

Redundancy Level 4

The following code types must be successfully read three times before being decoded:

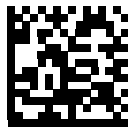
Code Type	Code Length
All	All



* Redundancy Level 1
(1)



Redundancy Level 2
(2)



Redundancy Level 3
(3)



Redundancy Level 4
(4)

Security Level

● Parameter # 77

The reader offers four levels of decode security for delta barcodes, which include the Code 128 family, UPC/EAN, and Code 93. Select increasing levels of security for decreasing levels of barcode quality. There is an inverse relationship between security and reader aggressiveness, so choose only that level of security necessary for any given application.

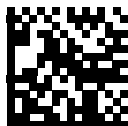
- **Security Level 0:** This setting allows the reader to operate in its most aggressive state, while providing sufficient security in decoding most “in-spec” barcodes.
- **Security Level 1:** This default setting eliminates most misdecodes.
- **Security Level 2:** Select this option if Security level 1 fails to eliminate misdecodes.
- **Security Level 3:** If you selected Security Level 2 and misdecodes still occur, select this security level. Be advised, selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes. Selecting this level of security significantly impairs the decoding ability of the reader. If you need this level of security, try to improve the quality of the barcodes.



Security Level 0
(0)



* Security Level 1
(1)



Security Level 2
(2)



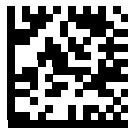
Security Level 3
(3)

1D Quiet Zone Level

● Parameter # 1288

This feature sets the level of aggressiveness in decoding barcodes with a reduced quiet zone (the area in front of and at the end of a barcode), and applies to symbologies enabled by a Reduced Quiet Zone parameter. Because higher levels increase the decoding time and risk of misdecodes, Symbol Technologies strongly recommends enabling only the symbologies which require higher quiet zone levels, and leaving Reduced Quiet Zone disabled for all other symbologies. Options are:

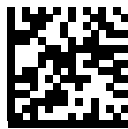
- **0** - The reader performs normally in terms of quiet zone.
- **1** - The reader performs more aggressively in terms of quiet zone.
- **2** - The reader only requires one side EB (end of barcode) for decoding.
- **3** - The reader decodes anything in terms of quiet zone or end of barcode.



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**

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 reader from decoding the symbol. If this problem occurs, scan the **Large Intercharacter Gaps** parameter to tolerate these out-of-spec barcodes.



* Normal Intercharacter Gaps
(6)



Large Intercharacter Gaps
(10)

9-25 Report Version

Scan the programming symbol below to report the version of software installed in the reader.



Report Software Version

9-26 MacroPDF Features

MacroPDF is a special feature for concatenating multiple PDF symbols into one file. The reader can decode symbols that are encoded with this feature, and can store more than 64 Kb of decoded data stored in up to 50 MacroPDF symbols.

Caution: When printing, keep each MacroPDF sequence separate, as each sequence has unique identifiers. Do not mix barcodes from several MacroPDF sequences, even if they encode the same data. When scanning MacroPDF sequences, scan the entire MacroPDF sequence without interruption. If, when scanning a mixed sequence, the reader emits two long low beeps (Low/Low) this indicates an inconsistent file ID or inconsistent symbology error.

Flush Macro Buffer

This flushes the buffer of all decoded MacroPDF data stored to that point, transmits it to the host device, and aborts from MacroPDF mode.



Flush MacroPDF Buffer

Abort MacroPDF Entry

This clears all currently-stored MacroPDF data in the buffer without transmission and aborts from MacroPDF mode.



Abort MacroPDF Entry

10

WebLink_{PC}

This section describes how to set up and use WebLink_{PC}, Omron Microscan's configuration software for V410-H and V450-H Handheld Readers.

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10-1 Overview

The browser-based WebLink_{PC} interface enables quick and easy configuration and testing of V410-H and V450-H Handheld Readers.

WebLink_{PC} is reliable, lightweight, and operating-system-independent without compromising the power and depth of its tool set.

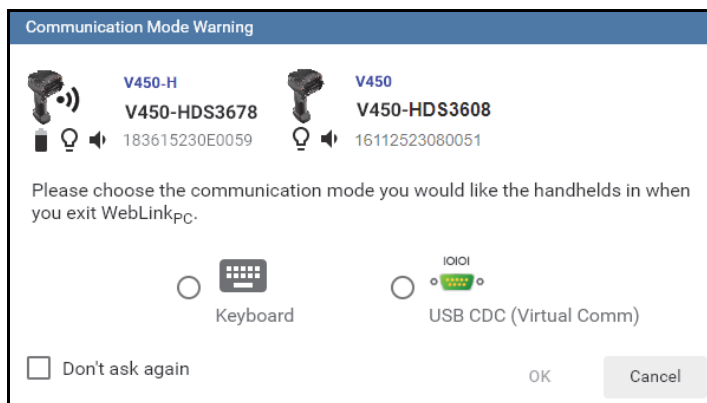
WebLink_{PC} offers novice users an intuitive way to connect, configure, monitor, and troubleshoot a V410-H or V450-H, and provides the power and flexibility expected by advanced users.

10-1-1 Splash Screen

When you double-click the WebLink_{PC} icon on your desktop or open a web browser and enter **http://localhost:8090** or **http://127.0.0.1:8090**, the first thing you will see is the **splash screen** shown below.

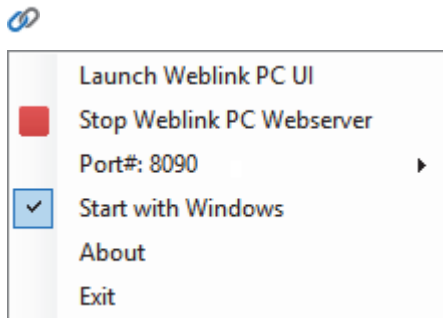


Before landing on the splash screen, you may be prompted to make a selection at the **Communication Mode Warning** or the **WebLink_{PC} Update Available** dialogs.



10-1-2 Task Tray App

Search for **TaskTrayApp** in the **Start** menu. Right-click on the **Task Tray icon** to display the menu shown below.



Launch WebLink_{PC} UI launches the WebLink_{PC} user interface in a default browser window.

Start/Stop WebLink_{PC} Webserver starts or stops the webserver.

Port# shows the currently used port number for the webserver and provides the option to enter a new port number.

Start with Windows enables or disables the Task Tray App to start when Windows starts.

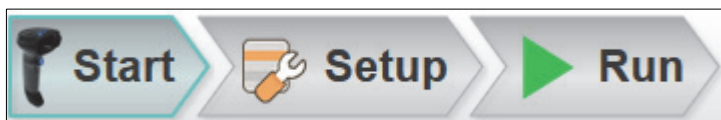
About shows the **About TaskTrayApp** dialog.



Exit closes the Task Tray App. (Closing the Task Tray App does not affect the webserver itself.)

10-1-3 Navigation Bar

The navigation bar at the top of the WebLink_{PC} interface features buttons for three primary views: **Start**, **Setup**, and **Run**.



10-1-4 Barcode Programming

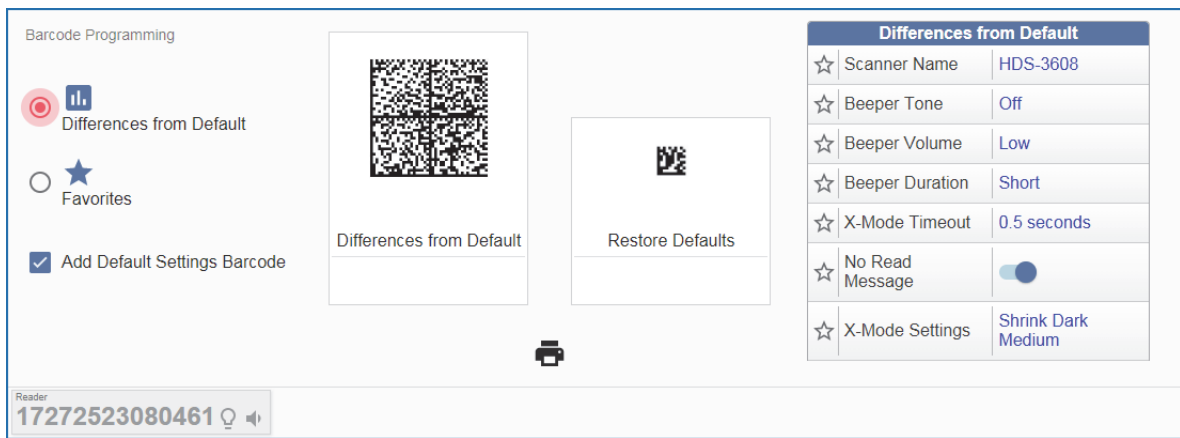
Click the **Barcode Programming icon** to open the Barcode Programming view.



When the **Differences from Default** radio button is selected, Barcode Programming automatically creates a Differences from Default Data Matrix symbol encoded with all the reader's current settings that are different from default settings. Any time the Differences from Default symbol is subsequently decoded, it returns the reader to those same settings.

When you select **Add Default Settings Barcode**, a **Restore Defaults** Data Matrix symbol appears. Scanning the Restore Defaults symbol returns the reader to factory default settings.

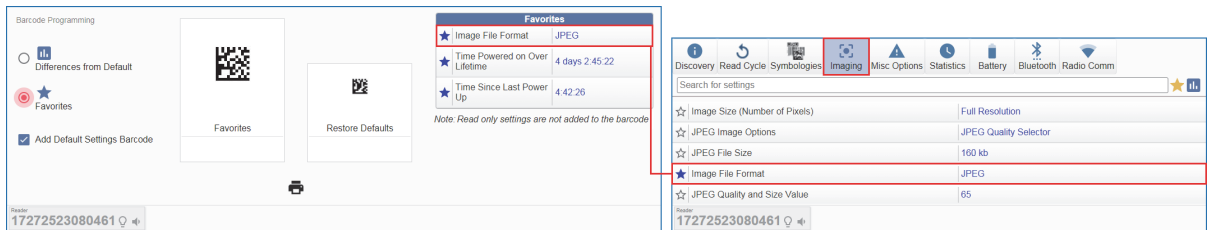
Note: You can change the captions "**Differences from Default**" and "**Restore Defaults**" to captions of your choice.



When the **Favorites** radio button is selected, Barcode Programming automatically creates a Favorites symbol encoded with all the settings that are marked as favorites in the **Advanced Settings** menus. Any time the Favorites symbol is subsequently decoded, it returns the reader to the user-defined settings for only those parameters.

When you select **Add Default Settings Barcode**, a **Restore Defaults** Data Matrix symbol appears. Scanning the Restore Defaults symbol returns the reader to factory default settings.

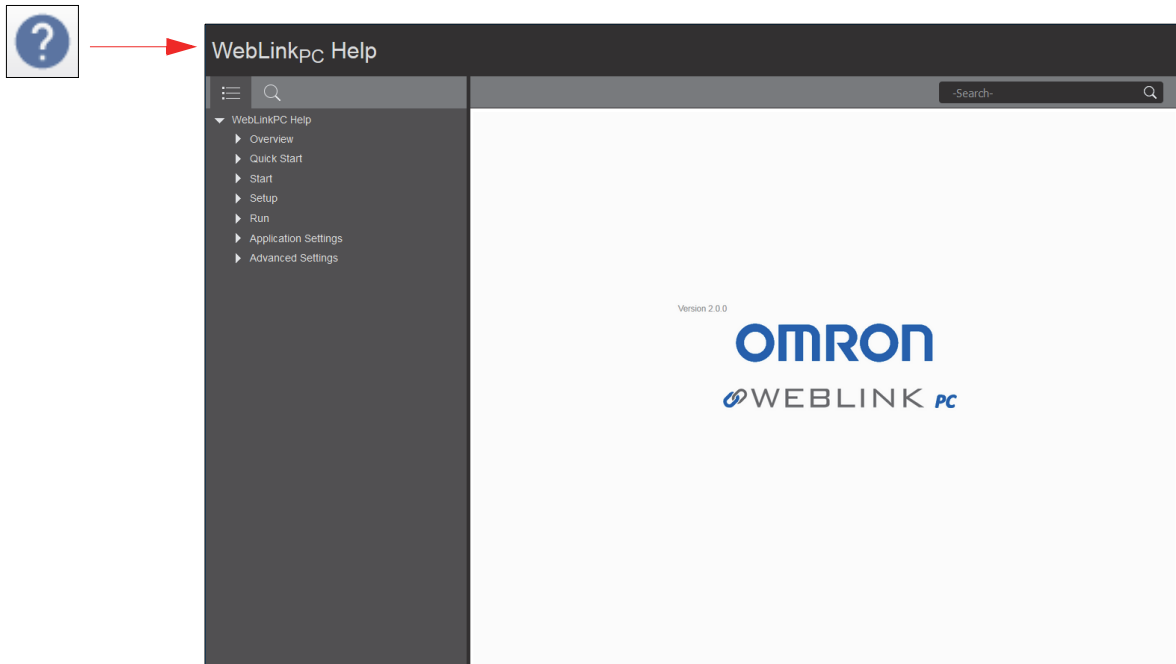
Note: You can change the caption "**Favorites**" to a caption of your choice.



By clicking the **Printer icon**, you can print your Differences from Default or Favorites configuration symbol with a title and footer of your choice.

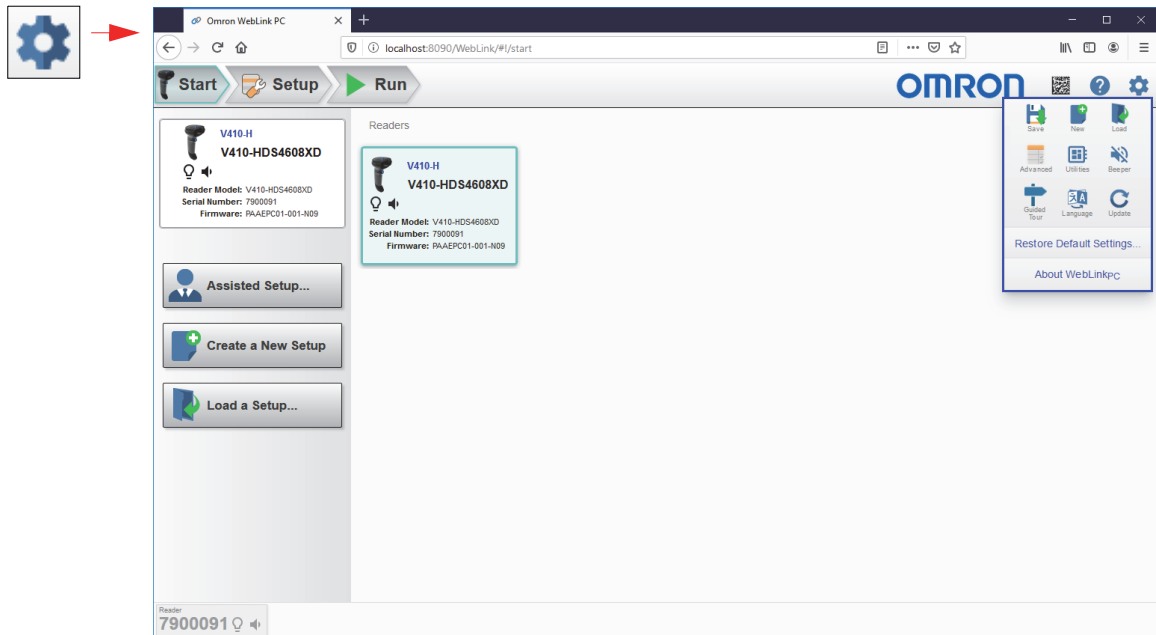
10-1-5 Help Icon

The **help icon** is located to the right of the Barcode Programming icon. Click this icon to open **WebLink_{PC} Help**.



10-1-6 Application Settings Icon and Application Settings Menu

Click the **gear icon** to the right of the help icon to open the **Application Settings** menu.



10-1-7 Left Panel

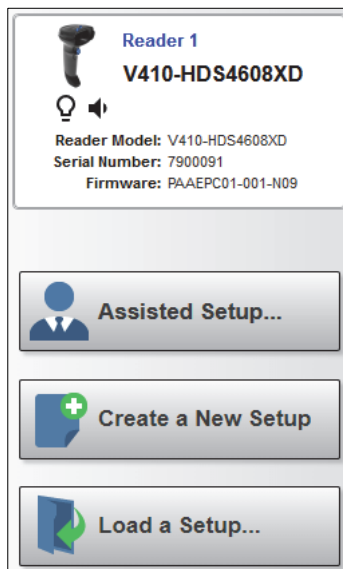
The area to the left of the **Image Area** is different depending on whether you are in the **Start** or **Setup** view. (In the **Run** view, the Image Area expands and the left panel is not present.)

Left Panel in Start View

In the **Start** view, the left panel shows the **Reader Model**, **Serial Number**, and **Firmware** version.

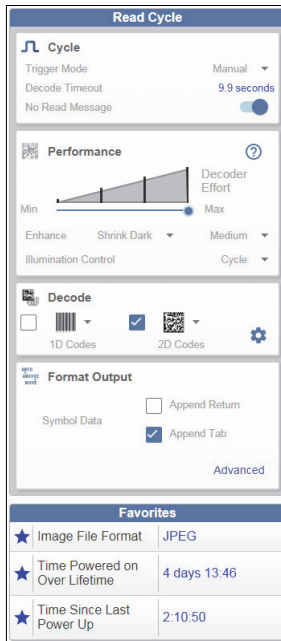
Note: The information in this area is selectable so that you can copy it to a clipboard.

The left panel in the Start view also contains buttons for **Assisted Setup**, **Create a New Setup**, and **Load a Setup**.



Left Panel in Setup View

In the **Setup** view, the left panel contains the majority of WebLinkPC's configuration tools: **Cycle**, which allows you to set the trigger mode; **Performance**, which allows you to set the amount of time the reader will attempt to decode a symbol; **Decode**, which allows you to choose which symbologies the reader can decode; **Format Output**, which allows you to determine the ways in which barcode data can be formatted before it is output as a data string; and **Favorites**, which allows you to define the commands you use most frequently and gives you quick access to their command parameters.



10-1-8 Right Panel

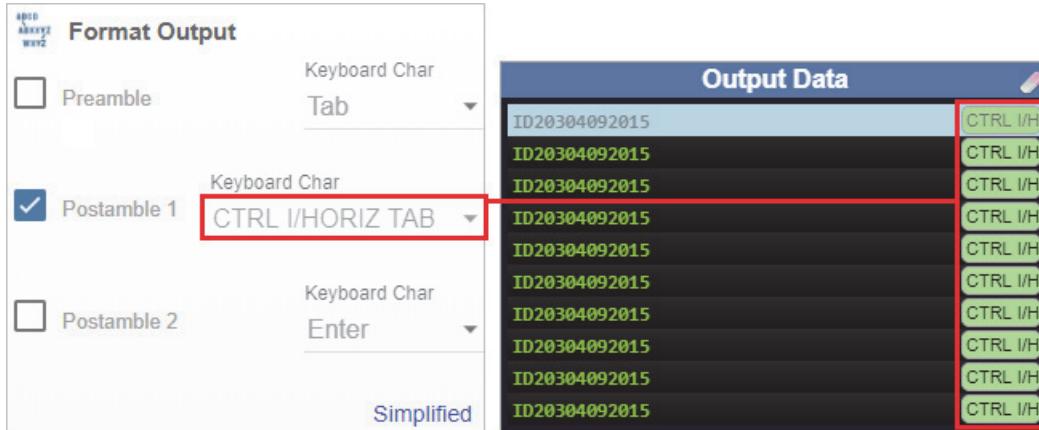
The panel to the right of the **Image Area** shows **Cycle Count** and **Cycle Time**, and an **Output Data** area that displays decoded symbol data.

Counts	
Cycle Count	1677
Cycle Time	54

Output Data	
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H

If you set a **Preamble** in **Format Output**, it is displayed before decoded symbol data in the **Output Data** area. If you select a **Postamble**, it is displayed after decoded symbol data in the Output Data area.

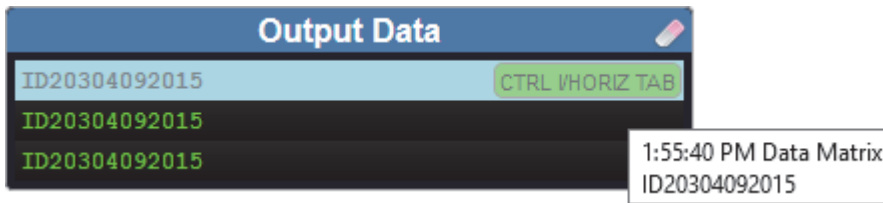
In the example below, **Postamble 1** is set to **CTRL I/HORIZ TAB** in Format Output and displayed after decoded symbol data in the Output Data area.



You can erase output data history by clicking the **eraser icon** to the right of the Output Data heading.

Note: If you hover over a Preamble or Postamble in the Output Data section (Postamble **CTRL I/H** in this example), the green-highlighted area displays the full Preamble or Postamble.

Hover text displays the time of the decode, the symbology, and the decoded data for all lines of Output Data with or without Preambles or Postambles.



10-1-9 Image Area

The **Image Area** is the main focus of WebLink_{PC}. This area allows you to see what currently falls within the reader's field of view, and offers four image control tools: **Fit Image to Window**, **Zoom In**, **Zoom Out**, and **Save Current Image**.

The default image type is **JPEG**. This can be changed to **BMP** or **TIFF** via the **Image File Format** setting. Make Image File Format a **Favorite** to bring it to the **Setup** view.

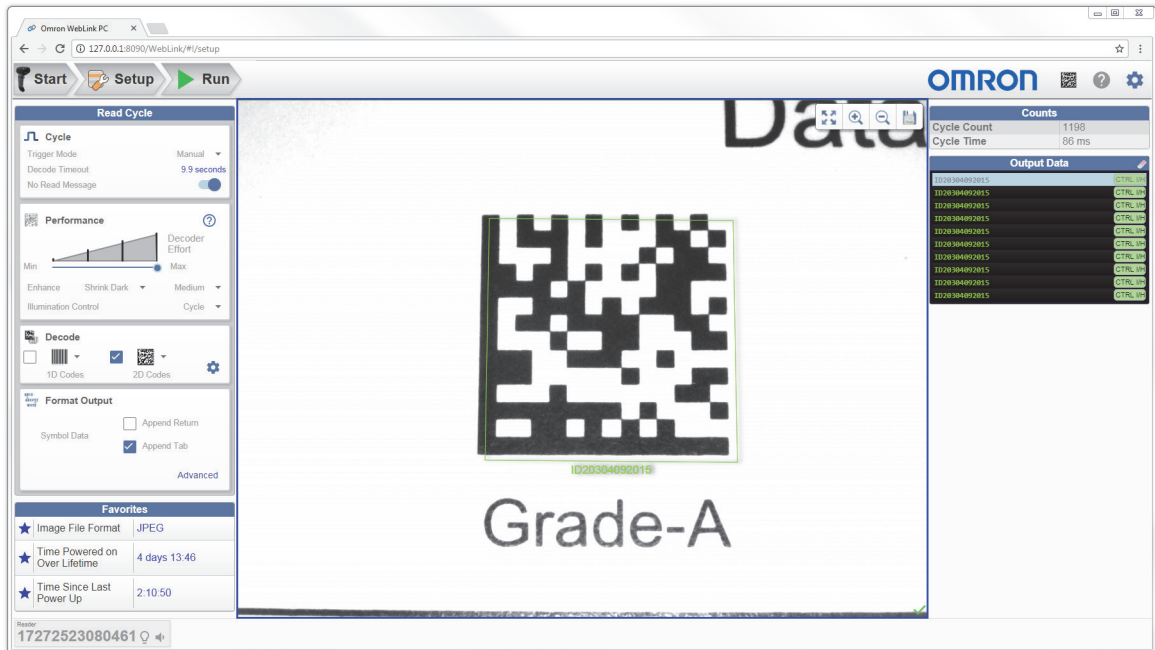
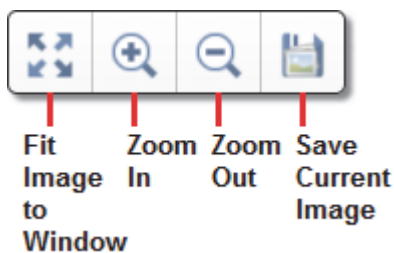


Image Control Toolbar



- **Fit Image to Window**

Fits the captured image to the Image Area window.

- **Zoom In**

Zooms in on the desired area of the captured image.

- **Zoom Out**

Zooms out and decreases the size of the captured image.

Note: You can also zoom in and out by scrolling up or down with your mouse, and you can move the image around by clicking and dragging.

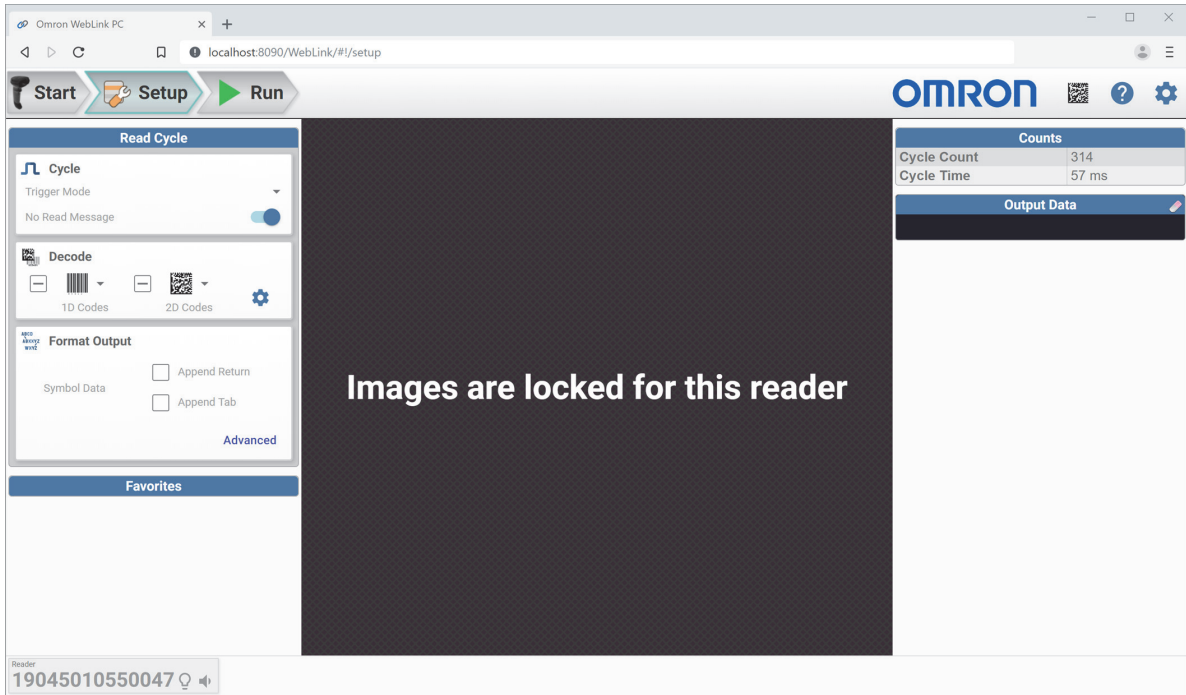
- **Save Current Image**

Allows you to save the current captured image to the location of your choice on your PC.

10-1-10 Image Lock

Some applications require that V410-H and V450-H readers have their firmware image-locked. An image-locked reader does not create image data or return it to WebLink_{PC}. A note appears in both **Setup** and **Run** modes stating **Images are locked for this reader**.

Although images are not shown for image-locked readers, decode data appears as usual in the **Output Data** field to the right of the image view. Image Lock is at the reader level only, meaning that if there are two readers connected and one is image-locked, the image-locked reader will not interrupt the other reader's ability to display captured images.



10-1-11 Status Bar

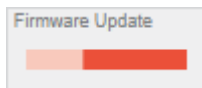
The **Status Bar** shows the serial number of the current reader at the lower left of the WebLink_{PC} interface.

Click the **Light Bulb icon** to locate the current reader by activating its indicator LEDs.

Click the **Speaker icon** to locate the current reader by activating its beeper.



When you update firmware from the **Utilities** view, a **Firmware Update** progress bar appears in the Status Bar.



10-2 WebLink_{PC} Quick Start

10-2-1 Check Hardware and Connect the System

See [Quick Start](#) for information about how to set up and configure V410-H and V450-H Handheld Reader hardware.

10-2-2 Install WebLink_{PC} and Connect

Install

The WebLink_{PC} installer can be found at: www.automation.omron.com/weblinkpc.

Minimum PC Requirements

- Intel® Core™ 2 Duo Processor
- Microsoft Windows 7 (32-bit)
- Firefox, current version; Edge, current version
- 1 GB / 128 MB Video RAM
- 100 MB hard drive space
- 16-bit color display
- 3.0 Windows Experience Index

Recommended PC Requirements

- Intel® Core™ i3 Duo Processor
- Microsoft Windows 7 (64-bit) or Microsoft Windows 10 (64-bit)
- Google Chrome, current version
- 2 GB RAM / 128 MB Video RAM
- 500 MB hard drive space
- 32-bit color display
- 4.0 Windows Experience Index

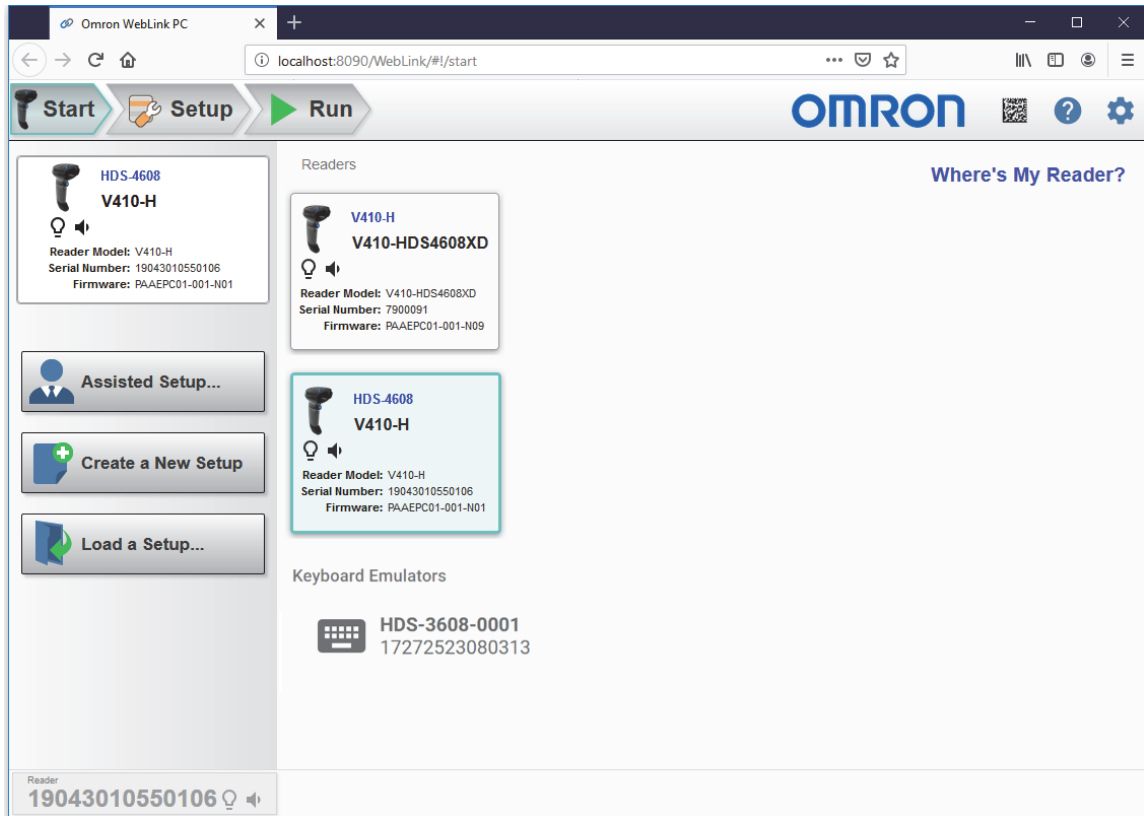
Connect

To start WebLink_{PC}, double-click the icon that was placed on your desktop during installation.

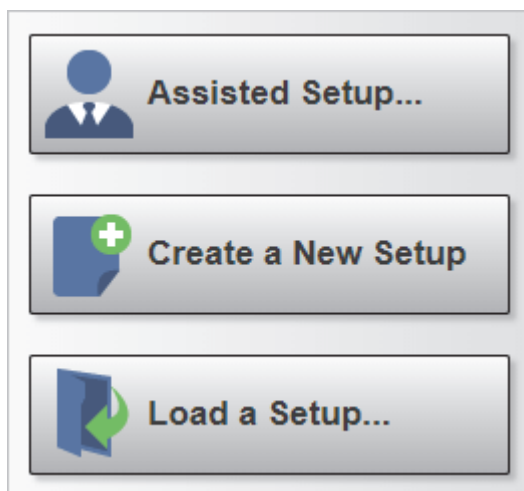
You can also start WebLink_{PC} by connecting the reader to your PC, opening a browser of your choice, and typing <http://localhost:8090> or <http://127.0.0.1:8090> in the address bar.

10-2-3 Explore the Start View

The **Start** view shows all the readers available to the system. The **Reader Model**, **Serial Number**, and **Firmware Version** of each reader are displayed. This view allows you to choose **Assisted Setup**, to **Create a New Setup**, or to **Load a Setup**. The **Gear icon** in the upper right brings up the **Application Settings Menu**.



10-2-4 Create a New Setup or Load an Existing Setup



Assisted Setup

When you click the **Assisted Setup** button in the **Start** view, a dialog will appear asking you a series of application-related questions. Based on your answers, WebLink_{PC} generates your initial setup automatically. Once the setup is created, you can fine-tune its parameters in the **Setup** view.

The screenshot shows the 'Assisted Setup' dialog for a V410-H reader. The question is 'What code types will you be reading?'. Under 'Decode', there are two options: '1D Codes' (represented by a barcode icon) and '2D Codes' (represented by a QR code icon). Both are currently unselected. Below this, there is a toggle for 'Would you like to append a tab or return to the data?' which is turned off. The 'Select the type of application' section shows two icons: a blue square with a white waveform and a blue hand icon. The 'Decode Beeper Volume' is set to a low level, and 'Vibrate on Decode' is turned on. The reader name is 'V410-H' and the page number is '7 / 24'. At the bottom are 'CANCEL' and 'CREATE SETUP' buttons.

The screenshot shows the 'Assisted Setup' dialog for an HS-360X reader. The question is 'What code types will you be reading?'. Under 'Decode', there are two options: '1D Codes' (represented by a barcode icon) and '2D Codes' (represented by a QR code icon). Both are currently selected with checkmarks. Below this, there is a toggle for 'Would you like to append a tab or return to the data?' which is turned on. The 'Select the type of application' section shows two icons: a blue square with a white waveform and a blue hand icon. The 'Decode Beeper Volume' is set to a low level, and 'Vibrate on Decode' is turned on. The reader name is 'HS-360X' and the page number is '7 / 24'. At the bottom are 'CANCEL' and 'CREATE SETUP' buttons.

Create a New Setup

The **Start** view also allows you to create a **New Setup** without using **Assisted Setup**. When you click the **Create a New Setup** button, WebLink_{PC} searches for any differences from default in the reader parameters. If no differences from default are found, you will see the **Setup** view. If differences from default are found, the following message will appear:

The screenshot shows an 'Important!' dialog box with a close button (X) in the top right corner. The message inside reads: 'This action will restore the reader to factory defaults.' At the bottom, there are two buttons: 'RESTORE TO FACTORY DEFAULTS' and 'CANCEL'.

Load a Setup

Select **Load a Setup** to load an existing **.rls** WebLink_{PC} setup file.

10-2-5 Explore the Setup View

The **Setup** view allows you to configure the reader, view the current captured image, and view decoded symbol data.

The following read cycle steps are shown at the left side of the screen:

- Cycle
- Performance
- Decode
- Format Output

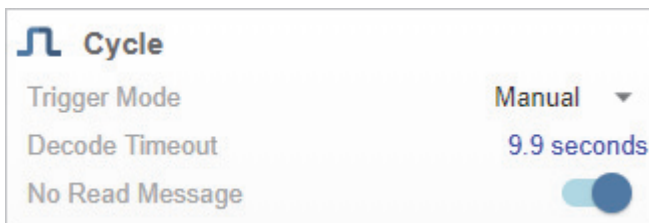


10-2-6 Configure Cycle Settings

The **Cycle** step allows you to choose between **Manual** and **Presentation** Trigger Modes.

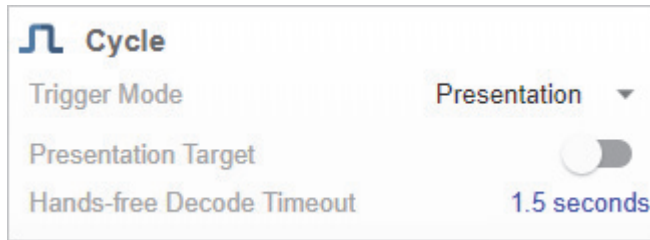
In Manual mode, a decode is attempted when you pull the trigger.

Manual mode in the Cycle step allows you to set **Decode Timeout** and enable or disable a **No Read Message**.

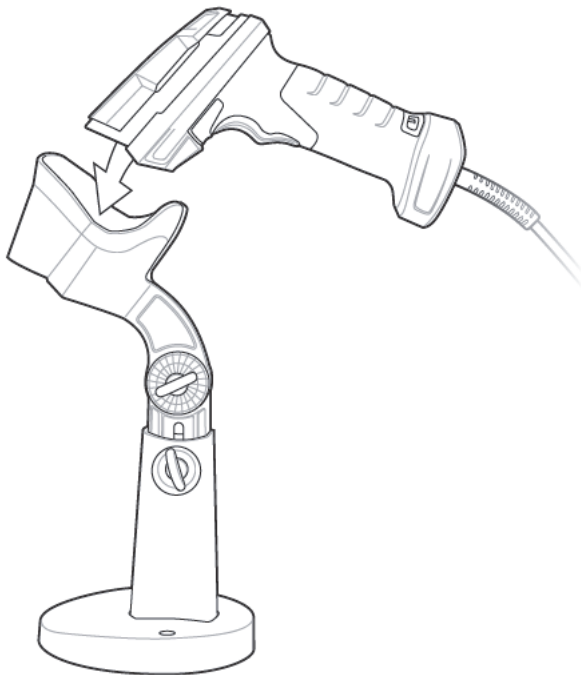


In **Presentation** mode, the read cycle begins when a symbol is detected moving into the reader's field of view.

Presentation mode in the Cycle step allows you to enable or disable a **Presentation Target**, set the **Hands-Free Decode Timeout**, set the **Timeout Between Decodes**, and enable or disable a **No Read Message**.



Note: The reader is automatically set to Presentation mode when placed in the **V450-H Stand**, shown below.



10-2-7 Configure Performance Settings

Performance Step (DPM Optimization)

The **Performance** step allows you to optimize the reader for **Direct Part Mark (DPM)** decoding. A DPM is a permanent mark created by laser etch, chemical etch, or other method, directly on a substrate. DPMs are often harder to read than other symbols, and may require a few attempts before finding optimal settings. The **Decoder Effort** slider has four settings: **Level 1**, corresponding to **Min** on the slider; **Level 2**; **Level 3**; and **Level 4**, corresponding to **Max** on the slider. As Decoder Effort is moved toward Max, the decoder spends an increasing amount of time trying to decode the symbol.

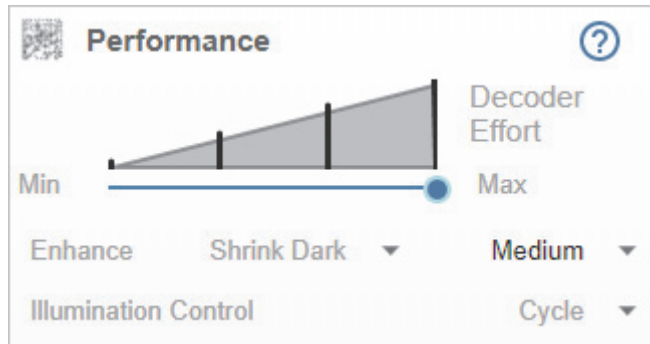
In **Level 4**, you can also enable the **Enhance** option, which improves readability by adding an image pre-processing operation (**Shrink Dark** or **Grow Dark**) to improve decode performance on marks whose cells are not properly formed. You can also select the size (**Small**, **Medium**, or **Large**) of the area or "pixel neighborhood" in which the pre-processing operation is performed. Small = 3 x 3 pixels, Medium = 5 x 5 pixels, and Large = 7 x 7 pixels.

The **Illumination Control** options are:

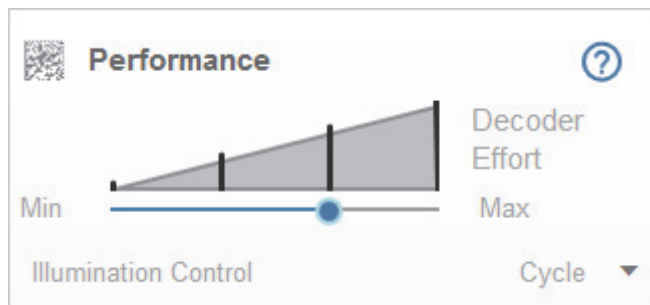
- **Direct:** White LED illumination only. Recommended for use with dot-peened symbols. Tilt the part 30° to avoid specular reflection when using Direct illumination.
- **Indirect:** Red LED illumination only. Recommended for use with laser-etched symbols on curved, rough, grainy, highly-reflective, or visibly-machined surfaces or cylinders.
- **Cycle:** Alternates between Direct and Indirect illumination, starting with the type of illumination used during the last successful decode.

● Examples of Performance Configurations

- **Level 4 (Maximum) Decoder Effort;**
- **Enhance – Shrink Dark** pre-processing operation enabled;
- **Medium**-sized pre-processing area;
- **Illumination Control** set to **Cycle**.



- **Level 3 Decoder Effort;**
- **Illumination Control** set to **Cycle**.



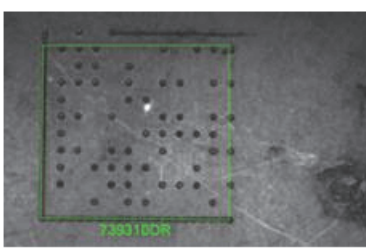


- **Level 4 (Maximum) Decoder Effort;**
- **Enhance – Shrink Dark** pre-processing operation enabled;
- **Small** pre-processing area;
- **Illumination Control** set to **Cycle**.



Clicking the **Question Mark icon** in the upper right corner of the Performance step editor brings up a dialog with more detail about each level of decoder effort.

Decoder Effort

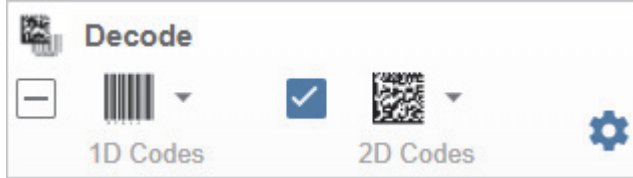
	<h4 style="margin: 0;">No Special DPM Processing (Min)</h4> <p style="margin: 0;">Use only on high-contrast symbols that are printed on labels. This allows the fastest processing time when no DPM reading is required.</p>
	<h4 style="margin: 0;">Least Aggressive DPM Processing</h4> <p style="margin: 0;">Optimized for decoding performance on smaller DPM symbols typically found on electronics and medical instruments, especially on smooth surfaces. These symbols tend to be laser-etched or direct-printed.</p>
	<h4 style="margin: 0;">Best Setting for Most DPMs</h4> <p style="margin: 0;">Optimized for decoding performance on larger DPM symbols typically found on industrial parts, especially on rough, grainy or visibly machined surfaces. These symbols tend to be dot-peened or laser-etched. This setting is the best blend of decode performance and speed to read.</p>
	<h4 style="margin: 0;">Most Aggressive DPM Processing (Max)</h4> <p style="margin: 0;">Use only for most difficult-to-read marks, for which additional DPM processing may be necessary.</p>

OK

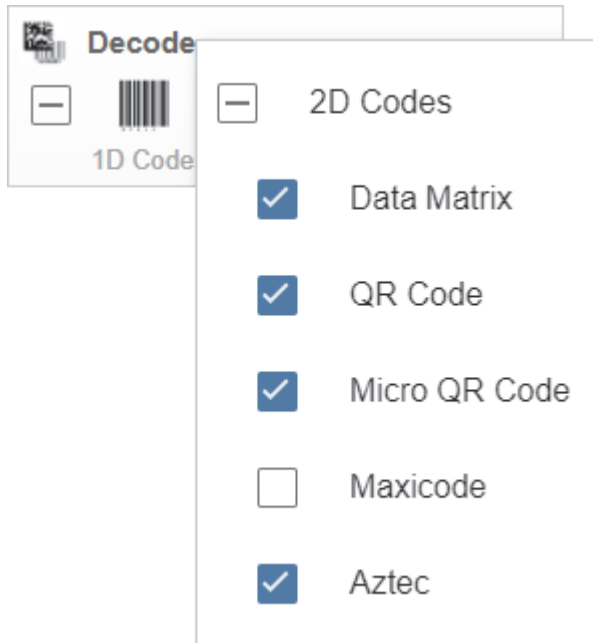
10-2-8 Configure Symbology and Decode Settings

Decode Step

The **Decode** step allows you to select which symbologies to enable and disable. Clicking the **1D Codes** and **2D Codes** checkboxes will enable or disable all the symbologies in that group.



You can also click directly on the images of the 1D and 2D symbols and a popup menu with checkboxes will appear, allowing you to select individual symbologies to enable or disable. In the example below, the user has clicked on the image of the Data Matrix symbol, causing the **2D Codes** menu to appear.



Clicking the **Gear icon** to the right of the **1D Codes** and **2D Codes** checkboxes brings up a **Symbology Settings** dialog that allows you to modify specific parameters for each symbology.


Symbology Settings			
UPC	☆	UPC-A	<input checked="" type="checkbox"/>
Code 128	☆	UPC-E	<input checked="" type="checkbox"/>
Code 39	☆	UPC-E1	<input type="checkbox"/>
Code 93	☆	EAN-8/JAN8	<input checked="" type="checkbox"/>
Codabar	☆	EAN-13/JAN13	<input checked="" type="checkbox"/>
Aztec	☆	BooklandEAN	<input type="checkbox"/>
	☆	UPC/EAN/JAN Supplementals	Ignore Supplemental
	☆	UPC/EAN/JAN Supplemental AIM ID Format	Combined
	☆	UPC Reduced Quiet Zone	<input type="checkbox"/>

10-2-9 Configure Output Formatting

Format Output Step

The **Format Output** step allows you to configure **Preambles** and **Postambles** (Preambles and Postambles) to add to symbol data output.

The **Simplified** version of this control allows you to **Append Return** or **Append Tab** after each string of data output.

 **Format Output**

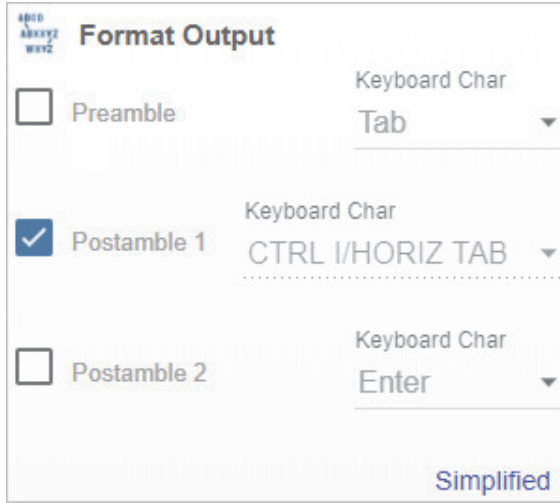
Symbol Data

Append Return

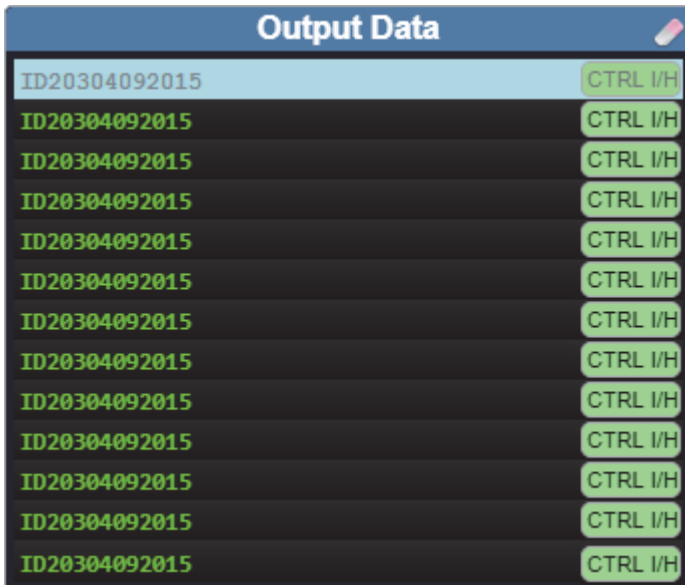
Append Tab

[Advanced](#)

The **Advanced** version allows you to choose from a wide variety of keyboard characters that can be output as a Preamble or Postamble. You can also add a second Postamble if required. You can toggle between the two views by clicking directly on the words **Advanced** and **Simplified** in the lower right corner of the dialog.



If Preamble or Postamble are enabled, the user-selected keyboard character value will appear in **Output Data**. In the example below, the **CTRL I/HORIZ TAB** value is set as **Postamble 1**, which is why it appears after the symbol data (ID20304092015).



10-2-10 Run the Application

The **Run** view allows you to keep track of your application during runtime. The current captured image is shown along with a row of image control tools. A history of decoded symbol data is shown in the right pane along with any preambles or postambles that have been defined.

The **Output Data** display in the right pane shows a list of previous read cycle results. Each result is selectable and erasable.

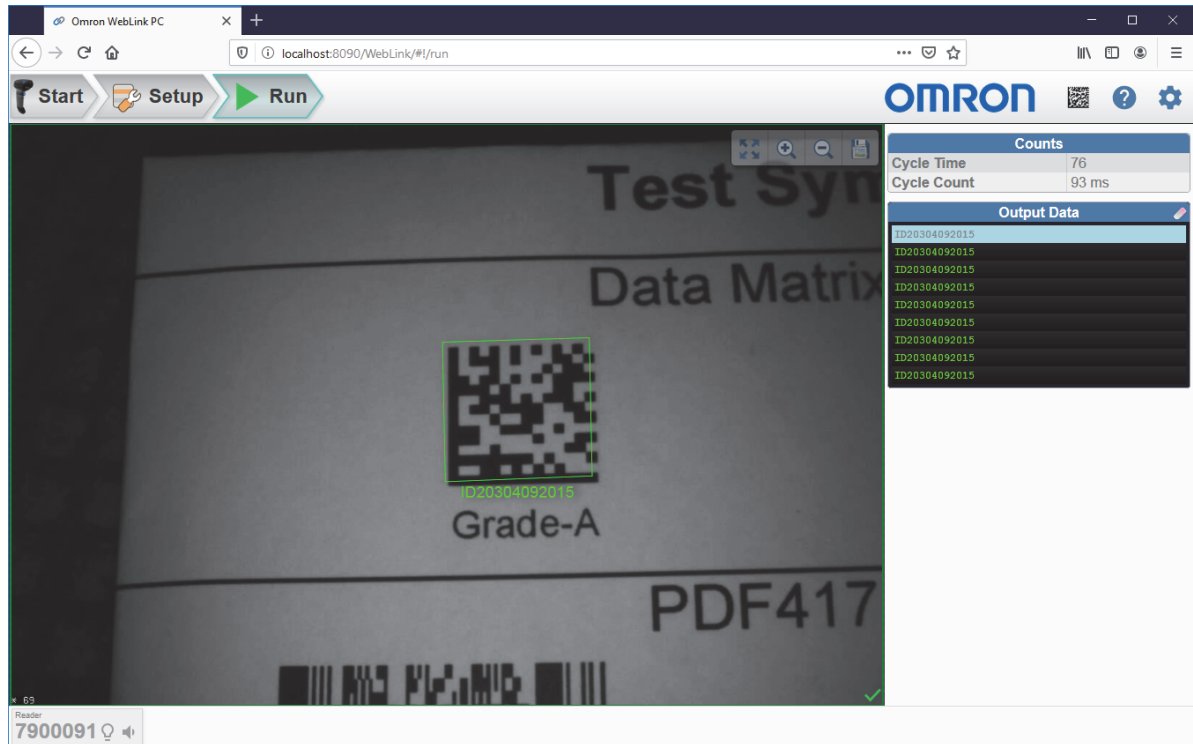
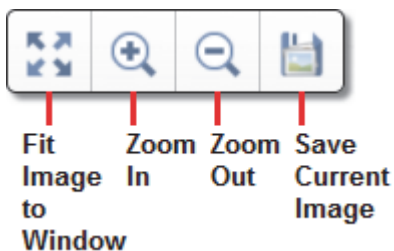


Image Control Tools

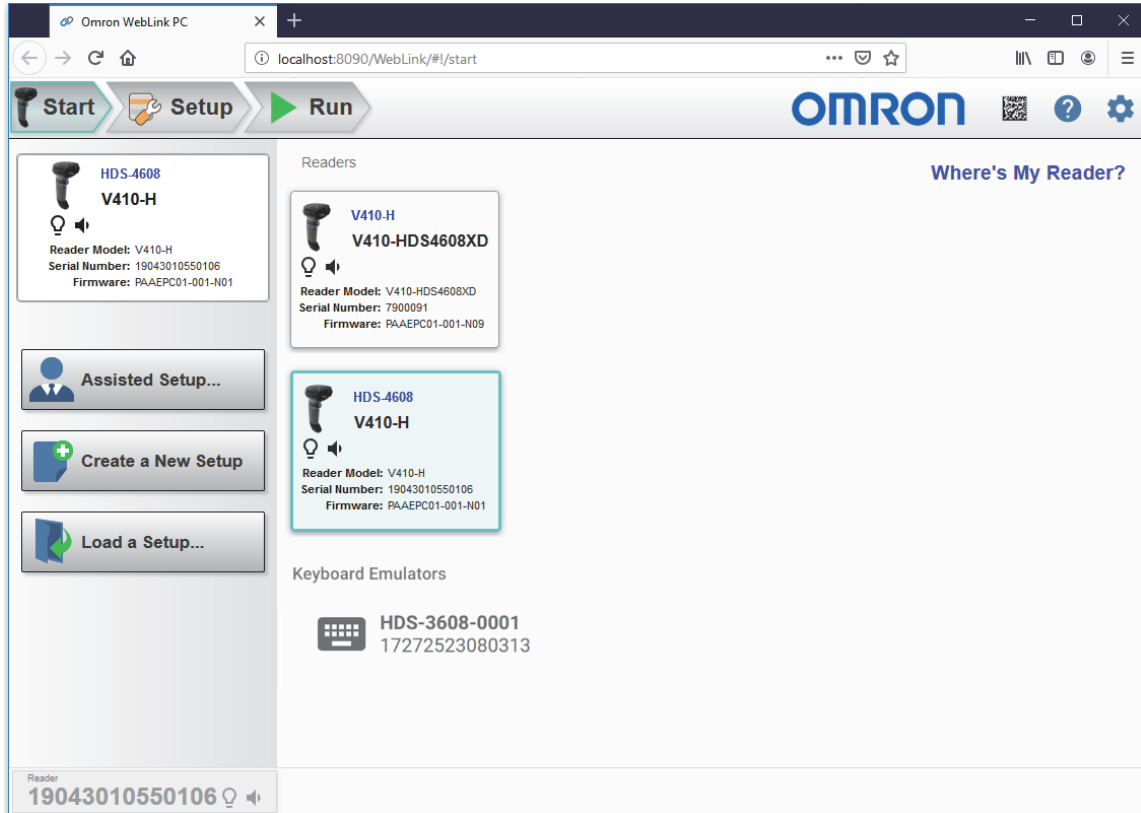
Image control tools are available at the upper right of the image view.



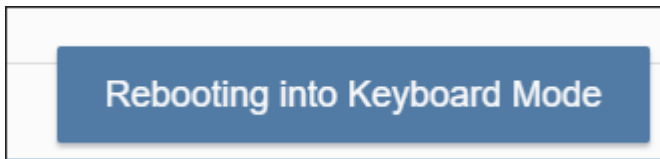
10-3 Start

The **Start** view is the initial view you will see after the splash screen when the WebLink_{PC} session begins. Each connected reader on the network is shown, along with its user-defined name, **Reader Model**, **Serial Number**, and **Firmware version**.

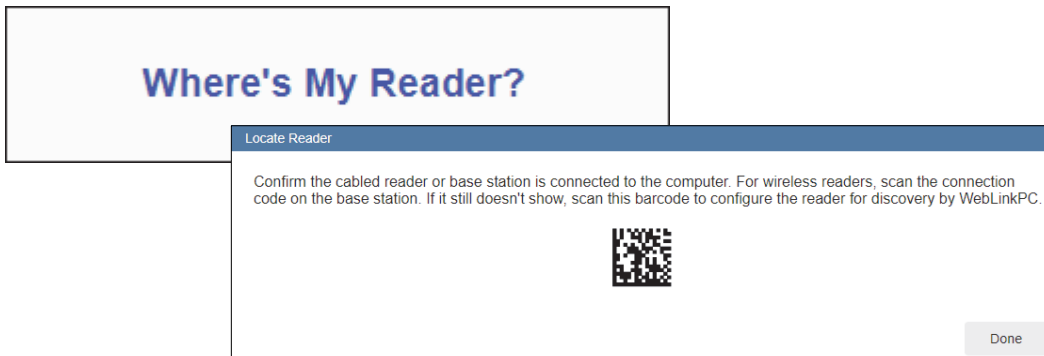
This view also allows you to choose **Assisted Setup**, to **Create a New Setup**, or to **Load a Setup**.



Note: If the reader is in SNAPi mode and you click **Keyboard Emulators** in the Start view, you will see this message at the lower right of the window:

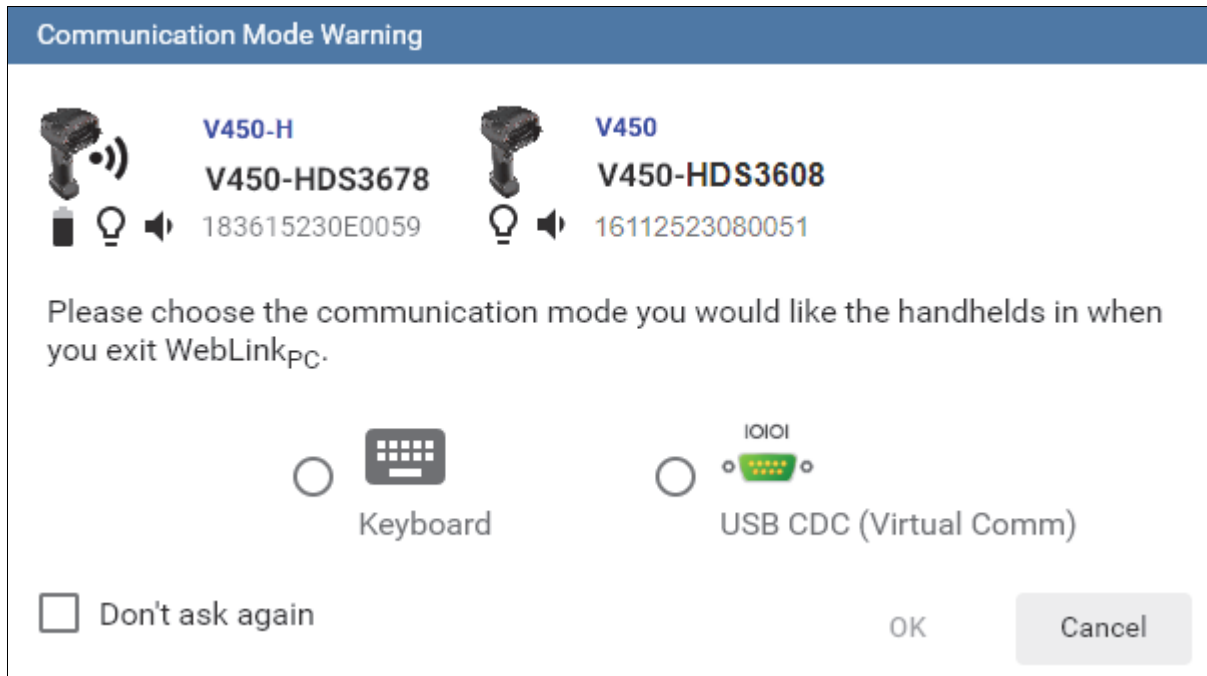


If you don't see your reader in the **Start** view, click **Where's My Reader?** to bring up the **Locate Reader** dialog.

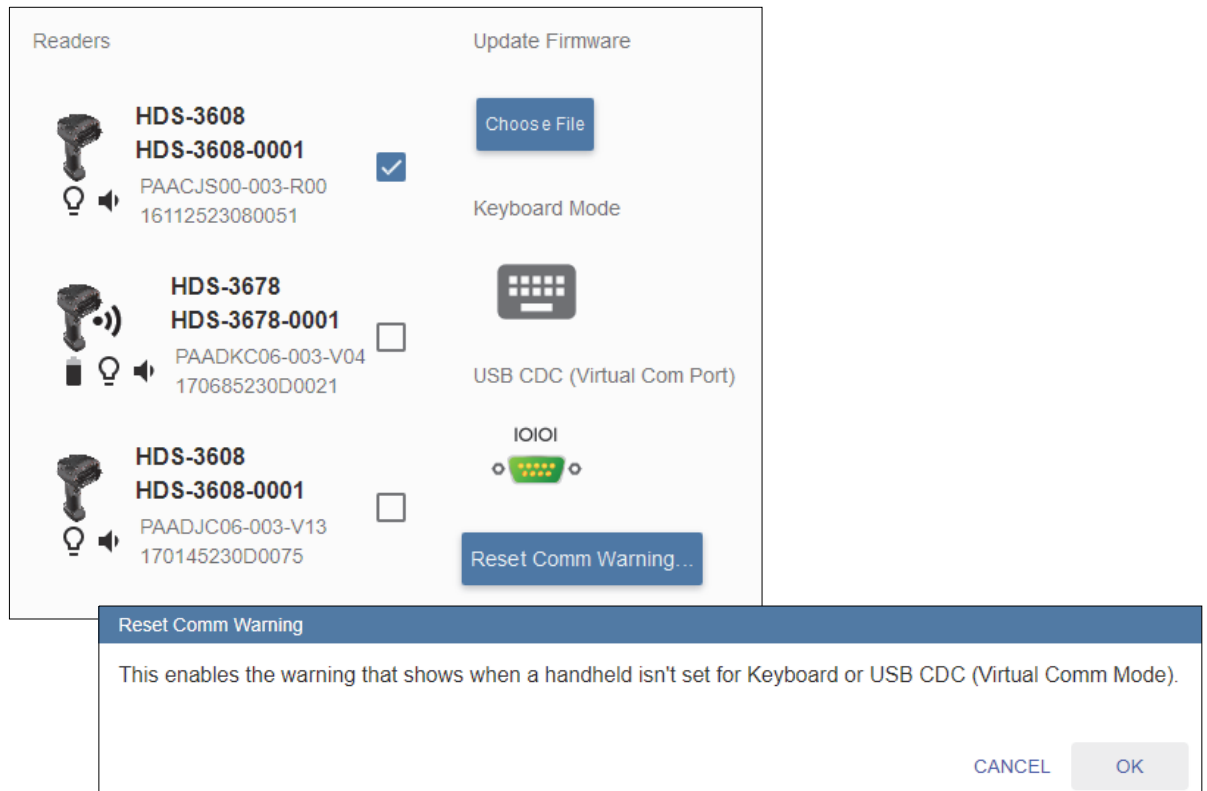


Communication Mode Warning Dialog

If the reader is in SNAPi mode when the server locates it, a dialog will appear allowing you to choose which mode you want the reader to be in when you close WebLink_{PC}: **Keyboard** or **USB CDC (Virtual Comm)**. This allows the reader to be usable outside the WebLink_{PC} user interface. (When the reader is in SNAPi mode, the only way to communicate with it is via the WebLink_{PC} user interface.)

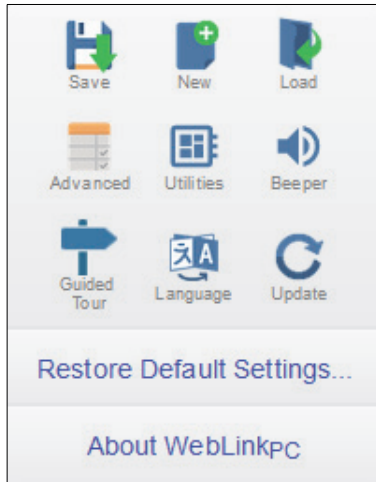


If you click **Don't ask again**, a **Reset Comm Warning** button will appear in the **Utilities** view that allows the user to reset this dialog option. When you click **Reset Comm Warning**, a message appears stating that the warning has been re-enabled.



Application Settings

Click the **gear icon** at the upper right to bring up the **Application Settings** menu. This menu includes several functions: **Save**, **New**, **Load**, **Advanced**, **Utilities**, **Beeper**, **Guided Tour**, **Restore Default Settings**, and **About WebLinkPC**.



Clicking **About WebLinkPC** opens the dialog shown below, which displays the **current WebLinkPC version**, **Browser**, **Operating System**, and **Screen Resolution**.

Note: The information in this dialog is selectable so that you can copy it to a clipboard.

Clicking **Contact Us** takes you to the Omron Microscan website.



10-3-1 Assisted Setup

When you click the **Assisted Setup** button in the **Start** view, a dialog will appear asking you a series of application-based questions. Based on your answers, WebLink_{PC} generates your initial setup automatically. Once the setup is created, you can fine-tune its parameters in the **Setup** view.

The Assisted Setup dialog is designed to be logical and intuitive, and follows this sequence:

- You are asked which code types you will be reading in your application. Code types can be added by clicking directly in the code type field and selecting them from a dropdown menu.
- Then you are asked if you would like to append a tab or return to decoded symbol data. If you do, one or both will be added to symbol data output.
- You are then given a selection of two application types, which represent the available selections in the **Cycle** area of the left panel in the Setup view. The icons represent the **Manual** (manually triggered) and **Presentation** (hand presentation) Trigger Modes.
- The next prompt allows you to set the volume of the good read (decode) beeper.
- Then you are given the option of enabling or disabling **Vibrate on Decode**, which causes the reader to vibrate when a good read occurs.
- Finally, you are given the option of entering a user-defined name for your reader under **Reader Name**.

Click **Create Setup** to configure your WebLink_{PC} setup automatically based on your answers to the Assisted Setup questions.

Assisted Setup

What code types will you be reading?

Decode

1D Codes

2D Codes

Would you like to append a tab or return to the data?

Select the type of application

Decode Beeper Volume

Vibrate on Decode

Reader Name

V410-H

7 / 24

CANCEL CREATE SETUP

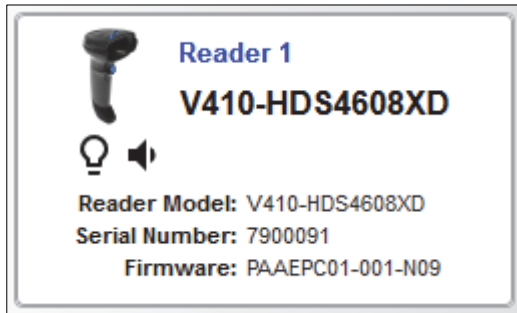
10-3-2 Reader Information

The **Reader Information** section of the left panel of the **Start** view shows your reader's **user-defined name**, **Reader Model**, **Serial Number**, and **Firmware version**.

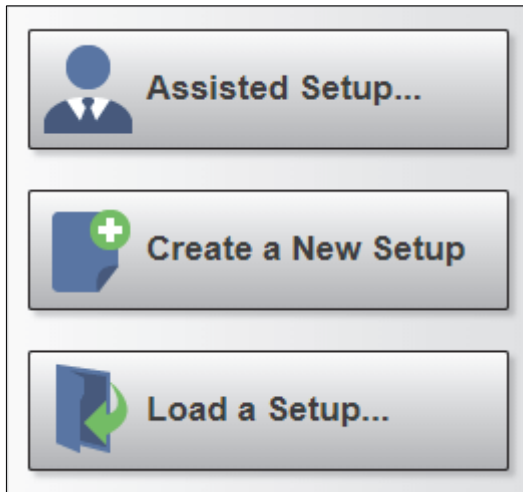
Icons show the type of reader (wired or wireless) and current battery life.

Clicking the light bulb icon activates the selected reader's LEDs, and clicking the speaker icon causes the selected speaker to beep.

Note: The information in this area is selectable so that you can copy it to a clipboard.



10-3-3 Setup Buttons

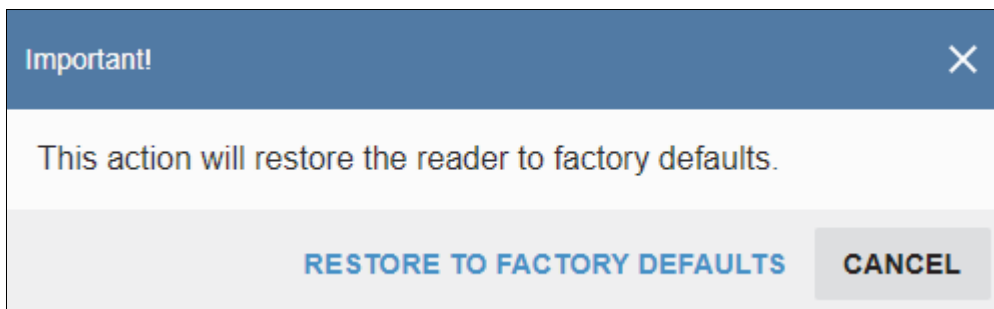


Assisted Setup

When you click the **Assisted Setup** button in the **Start** view, a dialog with a **series of questions** about your application will appear. Answering these simple questions allows WebLink_{PC} to configure your setup for you.

Create a New Setup

New Setup allows you to create a new setup without using Assisted Setup. When you click the New Setup button, WebLink_{PC} searches for any differences from default in the reader parameters. If no differences from default are found, you will see the **Setup** view. If differences from default are found, the following alert will appear, allowing you to choose whether to restore the reader to default settings or to cancel the New Setup.



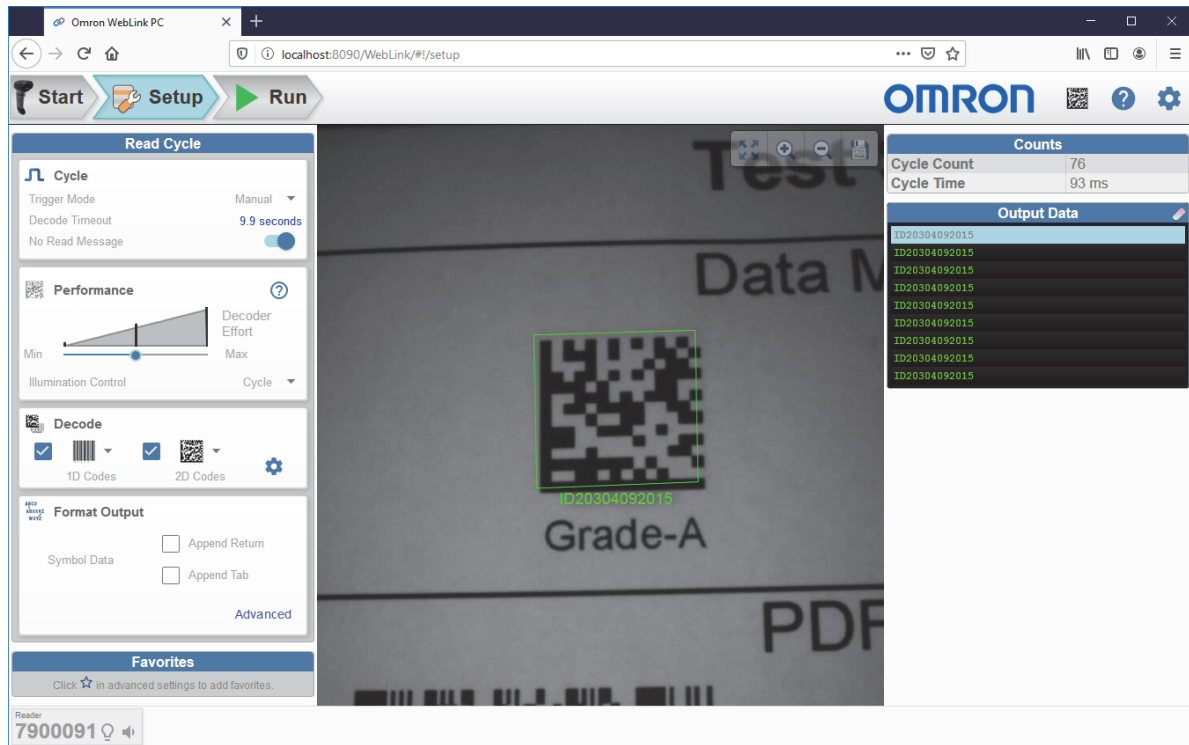
Load a Setup

Select **Load a Setup** to load an existing **.rls** WebLink_{PC} setup file.

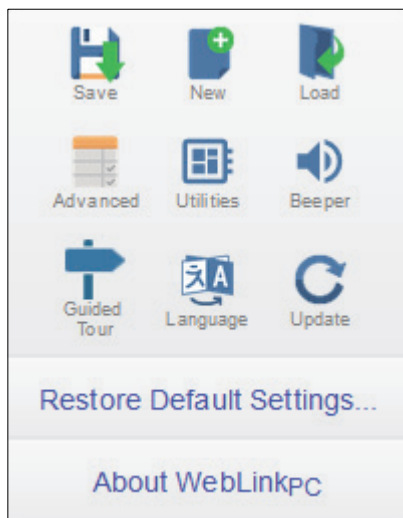
10-4 Setup

The **Setup** view allows you to configure all aspects of a setup. The left panel of the interface gives you the ability to set **Cycle**, **Performance**, **Decode**, **Format Output**, and **Favorites**.

The **question mark icon** at the upper right opens **WebLinkPC Help**.



The **gear icon** at the upper right brings up the **Application Settings** menu. This menu includes several functions: **Save**, **New**, **Load**, **Advanced**, **Utilities**, **Beeper**, **Guided Tour**, **Language**, **Update**, **Restore Default Settings**, and **About WebLinkPC**.



About WebLinkPC opens the dialog below, which shows the current **WebLinkPC version**, **Browser**, **Operating System**, and **Screen Resolution**.

Note: The information in this dialog is selectable so that you can copy it to a clipboard.

Clicking **Contact Us** takes you to the **Omron Microscan website**.

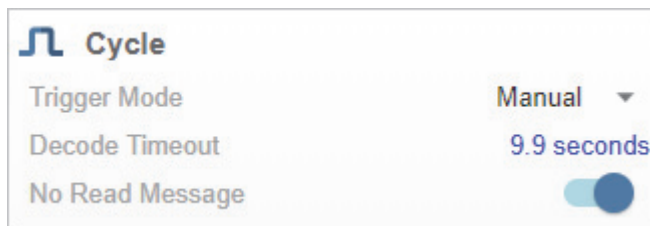


10-4-1 Cycle

The **Cycle** step allows you to choose between **Manual** and **Presentation** Trigger Modes.

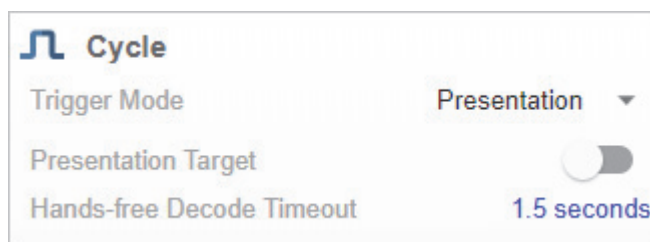
In **Manual** mode, a decode is attempted when you pull the trigger.

Manual mode in the Cycle step allows you to set **Decode Timeout** and enable or disable a **No Read Message**.

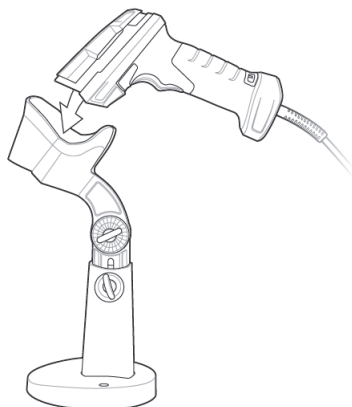


In **Presentation** mode, the read cycle begins when a symbol is detected moving into the reader's field of view.

Presentation mode in the Cycle step allows you to enable or disable a **Presentation Target** and set the **Hands-Free Decode Timeout**.



Note: The reader is automatically set to Presentation mode when placed in the Stand, shown below.



10-4-2 Performance (DPM Optimization for V410-H XD and V450-H Only)

The **Performance** step allows you to optimize the reader for **Direct Part Mark (DPM)** decoding using Omron Microscan's proprietary **X-Mode** decode algorithms. A DPM is a permanent mark created by laser etch, chemical etch, or another method, directly on a substrate. DPMs are often harder to read than other symbols, and may require a few attempts before finding optimal settings.

The **Decoder Effort** slider for the **V410-H XD** has three settings: **Level 1**, corresponding to **Min** on the slider; **Level 2**; and **Level 3**, corresponding to **Max** on the slider. As Decoder Effort is moved toward Max, the decoder spends an increasing amount of time trying to decode the symbol.

The **Decoder Effort** slider for the **V450-H** functions similarly to the V410-H XD Decoder Effort slider, but it has four settings: **Level 1**, corresponding to **Min** on the slider; **Level 2**; **Level 3**; and **Level 4**, corresponding to **Max** on the slider.

At the **Max** setting, you can also enable X-Mode's **Enhance** option, which improves readability by adding an image pre-processing operation (**Shrink Dark** or **Grow Dark**) to improve decode performance on marks whose cells are not properly formed. You can also select the size (**Small**, **Medium**, or **Large**) of the area or "pixel neighborhood" in which the pre-processing operation is performed. Small = 3 x 3 pixels, Medium = 5 x 5 pixels, and Large = 7 x 7 pixels.

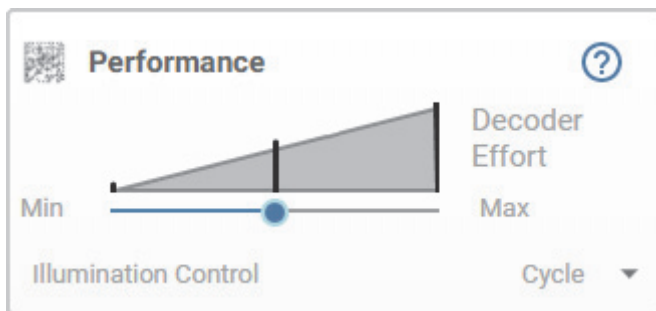
Important: The performance options described here can also be configured by scanning [programming symbols](#).

The **Illumination Control** options are:

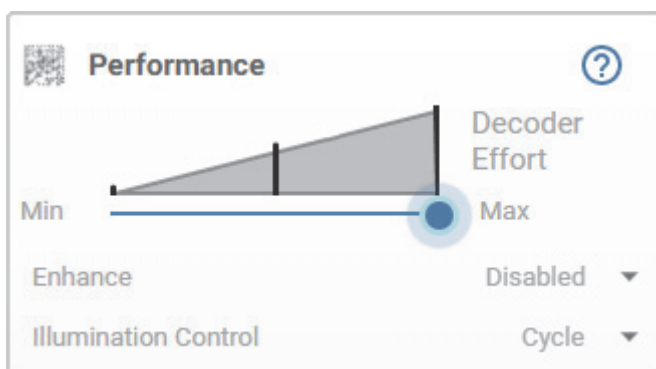
- **Direct:** Recommended for use with dot-peened symbols. Tilt the part 30° to avoid specular reflection when using Direct illumination.
- **Indirect:** Recommended for use with laser-etched symbols on curved, rough, grainy, highly-reflective, or visibly-machined surfaces or cylinders.
- **Cycle:** Alternates between Direct and Indirect illumination, starting with the type of illumination used during the last successful decode.

V410-H XD Performance Configuration Examples

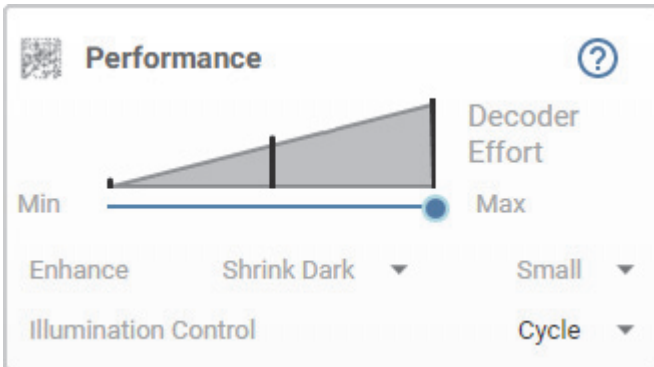
- **Level 2 Decoder Effort;**
- **Illumination Control set to Cycle.**



- **Level 3 (Maximum) Decoder Effort;**
- **Illumination Control set to Cycle.**

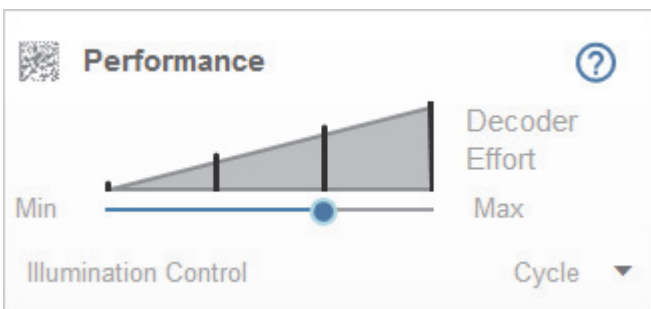


- **Level 3 (Maximum) Decoder Effort;**
- **Enhance - Shrink Dark** pre-processing operation enabled;
- **Small** pre-processing area;
- **Illumination Control** set to **Cycle**.



V450-H Performance Configuration Examples

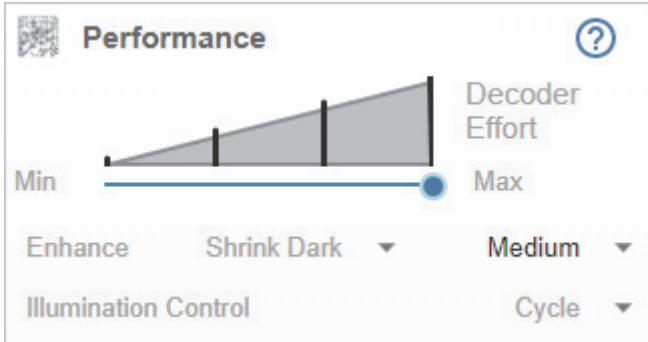
- **Level 3 Decoder Effort;**
- **Illumination Control** set to **Cycle**.



- **Level 4 (Maximum) Decoder Effort;**
- **Enhance - Shrink Dark** pre-processing operation enabled;
- **Small** pre-processing area;
- **Illumination Control** set to **Cycle**.




- **Level 4 (Maximum) Decoder Effort;**
- **Enhance - Shrink Dark** pre-processing operation enabled;
- **Medium-sized** pre-processing area;
- **Illumination Control** set to **Cycle**.



Clicking the **question mark icon** in the upper right corner of the Performance step editor brings up a dialog with more detail about each level of decoder effort.

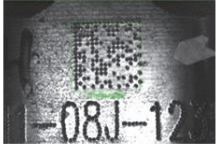
● **V410-H XD**

Decoder Effort



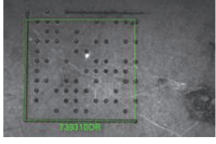
No Special DPM Processing Min

Use only on high-contrast symbols that are printed on labels. This allows the fastest processing time when no DPM reading is required.



Best Setting for Most DPMs

Optimized for decoding performance on larger DPM symbols typically found on industrial parts especially on rough grainy or visibly machined surfaces. These symbols tend to be dot-peened or laser-etched. This setting is the best blend of decode performance and speed to read.




Most Aggressive DPM Processing Max

Use only for most difficult-to-read marks for which additional DPM processing may be necessary.

OK

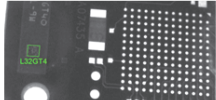
● **V450-H**

Decoder Effort




No Special DPM Processing (Min)

Use only on high-contrast symbols that are printed on labels. This allows the fastest processing time when no DPM reading is required.



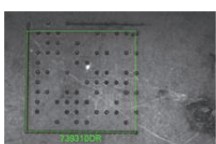
Least Aggressive DPM Processing

Optimized for decoding performance on smaller DPM symbols typically found on electronics and medical instruments, especially on smooth surfaces. These symbols tend to be laser-etched or direct-printed.



Best Setting for Most DPMs

Optimized for decoding performance on larger DPM symbols typically found on industrial parts, especially on rough, grainy or visibly machined surfaces. These symbols tend to be dot-peened or laser-etched. This setting is the best blend of decode performance and speed to read.



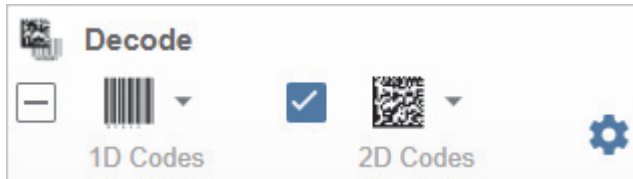
Most Aggressive DPM Processing (Max)

Use only for most difficult-to-read marks, for which additional DPM processing may be necessary.

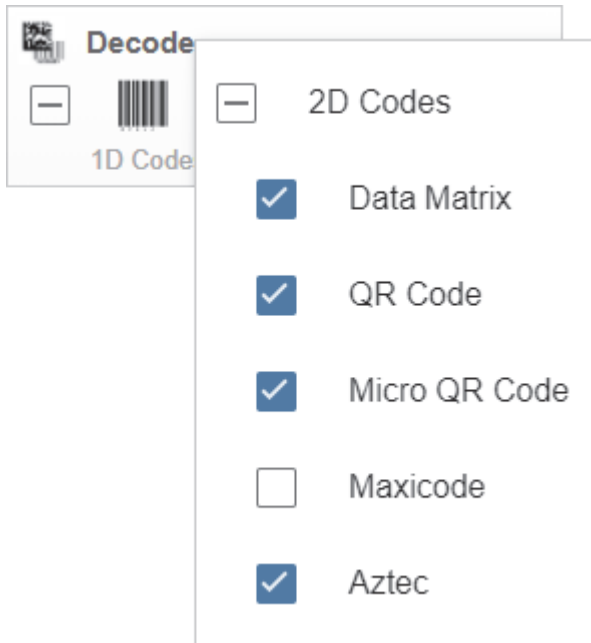
OK

10-4-3 Decode

The **Decode** step allows you to select which symbologies to enable and disable. Clicking the **1D Codes** and **2D Codes** checkboxes will enable or disable all the symbologies in that group.



You can also click directly on the images of the 1D and 2D symbols and a popup menu with checkboxes will appear, allowing you to select individual symbologies to enable or disable. In the example below, the user has clicked on the image of the Data Matrix symbol, causing the **2D Codes** menu to appear.



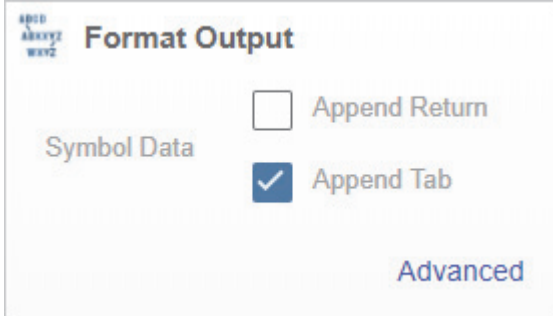
Clicking the **gear icon** to the right of the **1D Codes** and **2D Codes** checkboxes brings up a **Symbology Settings** dialog that allows you to modify specific parameters for each symbology.

Symbology Settings			
UPC	☆	UPC-A	<input checked="" type="checkbox"/>
Code 128	☆	UPC-E	<input checked="" type="checkbox"/>
Code 39	☆	UPC-E1	<input type="checkbox"/>
Code 93	☆	EAN-8/JAN8	<input checked="" type="checkbox"/>
Codabar	☆	EAN-13/JAN13	<input checked="" type="checkbox"/>
Aztec	☆	BooklandEAN	<input type="checkbox"/>
	☆	UPC/EAN/JAN Supplementals	Ignore Supplemental
	☆	UPC/EAN/JAN Supplemental AIM ID Format	Combined
	☆	UPC Reduced Quiet Zone	<input type="checkbox"/>

10-4-4 Format Output

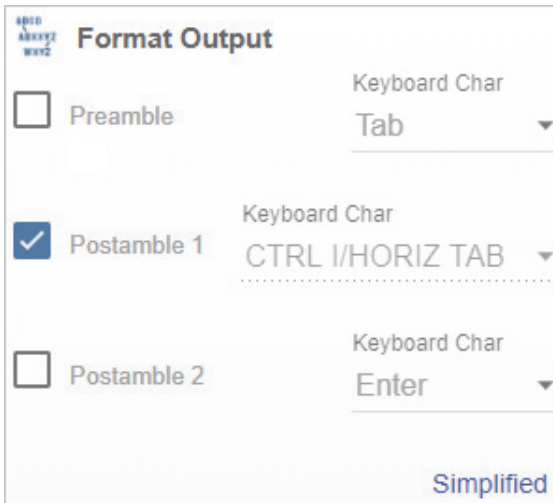
The **Format Output** step allows you to configure **Preambles** and **Postambles** (prefixes and suffixes) to add to symbol data output.

The **Simplified** version of this control allows you to **Append Return** or **Append Tab** after each string of data output.



The **Advanced** version allows you to choose from a wide variety of keyboard characters that can be output as a Preamble or Postamble. You can also add a second Postamble if required. You can toggle between the two views by clicking directly on the words **Advanced** and **Simplified** in the lower right corner of the dialog.

Note: Preambles and Postambles are not ASCII characters. They are actual keyboard keys that are output while the reader is in **Keyboard Mode**. **Keyboard Char** in the **Advanced** view lists all available options.



If Preamble or Postamble are enabled, the user-selected keyboard character value will appear in **Output Data**. In the example below, the **CTRL I/HORIZ TAB** value is set as **Postamble 1**, which is why it appears after the symbol data (ID20304092015).

Output Data	
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H
ID20304092015	CTRL I/H

Function Key Mapping

There are several key codes that require **Function Key Mapping** to be enabled: **Backspace**, **Horizontal Tab**, **Enter**, and **ESC**. If Function Key Mapping is not enabled, the reader will output their equivalent **Ctrl** keys: **Ctrl-H**, **Ctrl-I**, **Ctrl-M**, and **Ctrl [**.

A Function Key Mapping button will appear in the Format Output area when any of the key codes mentioned above are selected.

Note: The **Append Tab** and **Append Return** each have one of the key codes mentioned above. If Append Tab or Append Return are selected in the **Simplified** view, the Function Key Mapping button will appear.

ABCD
ABXYZ
WXYZ

Format Output

Symbol Data Append Return

Append Tab

Function Key Mapping **Advanced**

ABCD
ABXYZ
WXYZ

Format Output

Preamble Keyboard Char
CTRL G


Postamble 1 Keyboard Char
CTRL H/BACKSPACE

Postamble 2 Keyboard Char
CTRL J

Function Key Mapping **Simplified**

This dialog will appear if you are using a V410-H:


Function Key Mapping



Enable

Enable Function Key Mapping


Enable Function Key Mapping in order to send the following keys: Backspace, Horizontal Tab, Enter, and ESC. Scan the associated programming barcode.



Disable

Disable Function Key Mapping


Disable Function Key Mapping in order to send the following keys: Ctrl-H, Ctrl-I, Ctrl-M, and CTRL [. Scan the associated programming barcode.



Function Key Mapping is currently disabled

This dialog will appear if you are using a V450-H:


Function Key Mapping



Enable

Enable Function Key Mapping


Enable Function Key Mapping in order to send the following keys: Backspace, Horizontal Tab, Enter, and ESC. Scan the associated programming barcode.



Disable

Disable Function Key Mapping

Disable Function Key Mapping in order to send the following keys: Ctrl-H, Ctrl-I, Ctrl-M, and CTRL [. Scan the associated programming barcode.



Function Key Mapping is currently disabled

Use the printer button to print the barcodes if necessary. You can scan the programming barcodes from the screen or a printed sheet. The **Function Key Mapping is currently disabled/enabled** message will be updated when the reader scans the programming barcode.

10-4-5 Favorites

The **Favorites** area of the Setup view displays commands that you have selected as favorites by clicking the star icons next to command names in the **Advanced Settings** menus. Double-clicking the blue parameter text brings up dropdown menus that allow you to change the parameters of frequently-used commands without returning to the Advanced Settings menus.

In the example below, notice that the star icon next to the **Image File Format** command in the **Imaging** menu is selected. This causes that command to appear in the Favorites editor in the left panel of WebLinkPC's **Setup** view. Commands that are displayed in Favorites can be configured via dropdown menu in the same way as commands in Advanced Settings.

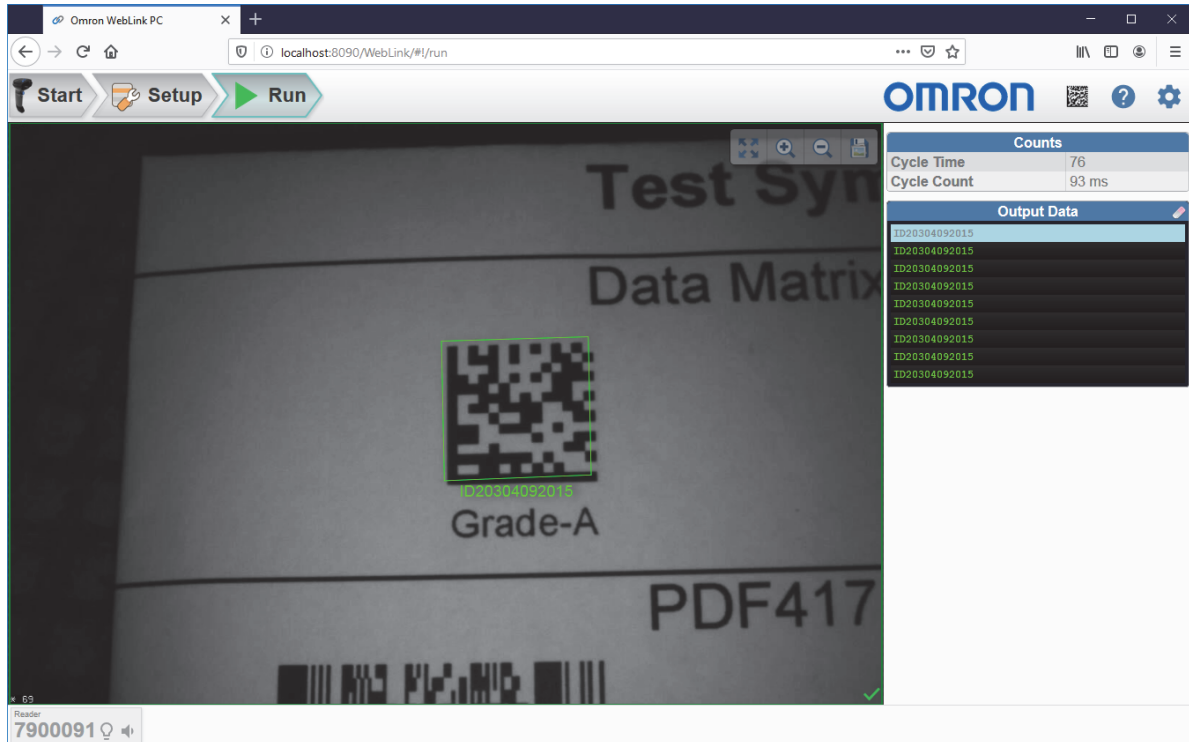
The screenshot shows the WebLinkPC Setup interface. On the left, there are four settings panels: 'Read Cycle', 'Performance', 'Decode', and 'Format Output'. The 'Read Cycle' panel includes 'Cycle' (Manual), 'Decode Timeout' (9.9 seconds), and 'No Read Message' (checked). The 'Performance' panel includes a 'Decoder Effort' slider and 'Enhance' (Shrink Dark) and 'Illumination Control' (Cycle) options. The 'Decode' panel includes '1D Codes' and '2D Codes' (checked). The 'Format Output' panel includes 'Append Return' (unchecked) and 'Append Tab' (checked). Below these is the 'Favorites' section, which lists several items, with 'Image File Format' (JPEG) highlighted in red. On the right, the 'Imaging' menu is selected, showing a list of settings: 'Image Size (Number of Pixels)' (Full Resolution), 'JPEG Image Options' (JPEG Quality Selector), 'JPEG File Size' (160 kb), 'Image File Format' (JPEG), and 'JPEG Quality and Size Value' (65). A red box highlights the 'Image File Format' setting in this list. At the bottom of the right panel, the reader ID '17272523080461' is displayed.

10-5 Run

The **Run** view allows you to keep track of your application during runtime. The current captured image is shown along with an **Image Control Toolbar**.

Cycle Time and **Cycle Count** are displayed in the **right panel**.

A history of decoded symbol data is shown under **Output Data** along with any Preambles or Postambles that have been defined. Each result can be selected to view the associated image. All results can be erased by clicking the **eraser icon** to the right of the Output Data heading.



10-5-1 Counts

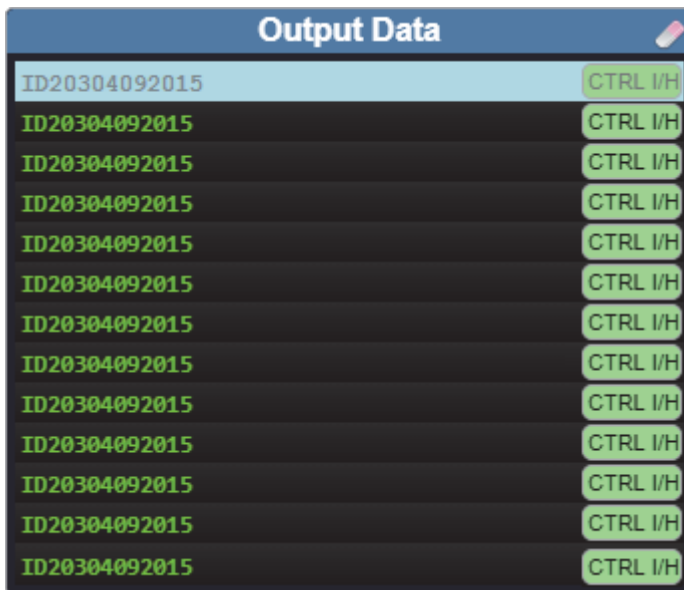
The **Counts** area of the **right panel** provides two data points:

- **Cycle Count** is the number of read cycles that have occurred. If no read is enabled (which it is by default when entering the **Setup** view) then any no reads will be included in the count.
- **Cycle Time** is the amount of time, in milliseconds, that the reader spent decoding the most recent symbol. The Cycle Time is **0** for a no read.

Counts	
Cycle Count	2225
Cycle Time	40 ms

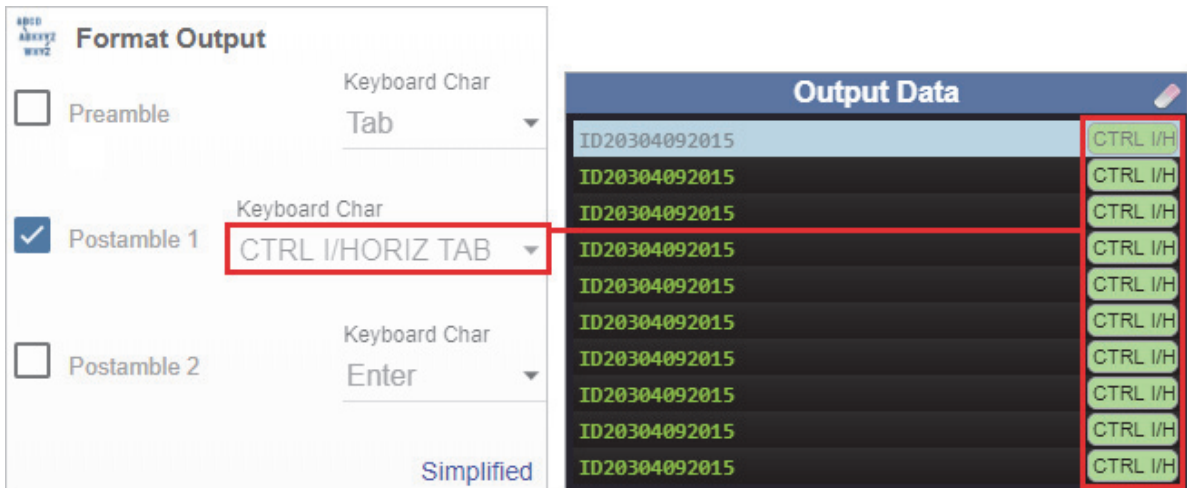
10-5-2 Output Data

The **Output Data** area of the **right panel** shows the data from each decoded symbol.



The **Preamble** and **Postamble** are also shown here if enabled and configured. If you set a Preamble in **Format Output**, it is displayed before decoded symbol data in the Output Data area. If you select a Postamble, it is displayed after decoded symbol data.

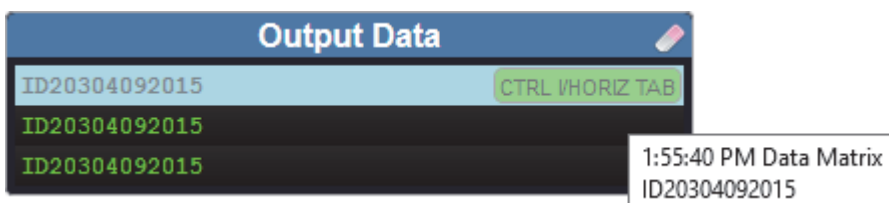
In the example below, **Postamble 1** is set to **CTRL I/HORIZ TAB** in Format Output and displayed after decoded symbol data in the Output Data area.



You can erase output data history by clicking the **eraser icon** to the right of the Output Data heading.

Note: If you hover over a Preamble or Postamble in the Output Data section (Postamble **CTRL I/H** in this example), the green-highlighted area displays the full Preamble or Postamble.

Hover text displays the time of the decode, the symbology, and the decoded data for all lines of Output Data with or without Preambles or Postambles.

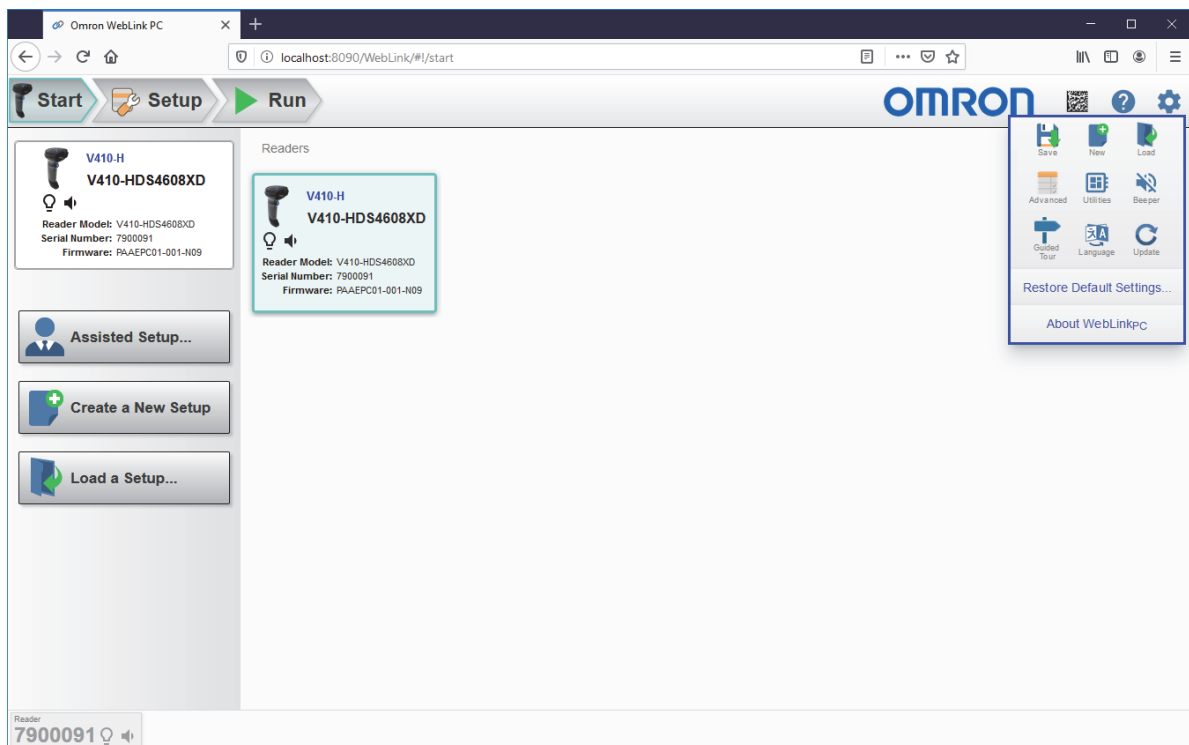


10-6 Application Settings

Click the **gear icon** to the right of the help icon to open the **Application Settings** menu.

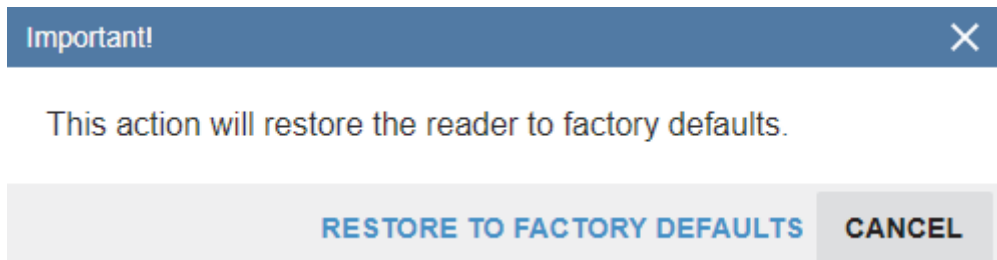


The Application Settings menu allows you to **Save** your setup, create a **New** setup, **Load** a setup file, view **Advanced** settings, open **Utilities**, change **Beeper** settings, go on a **Guided Tour** of the interface, change the **Language**, **Update** the application, **Restore Default Settings**, and open the **About WebLinkPC** dialog.



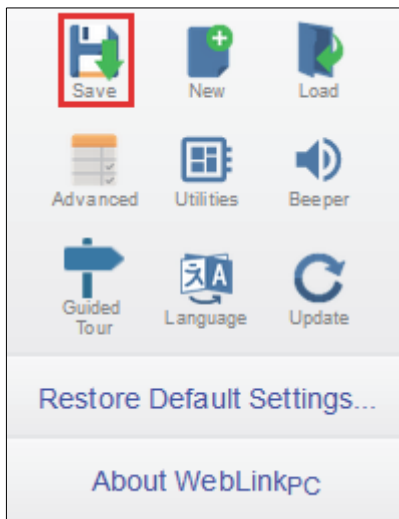
Note: **Update** is only clickable if an update is available.

Clicking **Restore Default Settings** shows the following dialog and sets the reader to **Keyboard Mode** when you click **Restore to Factory Defaults**.



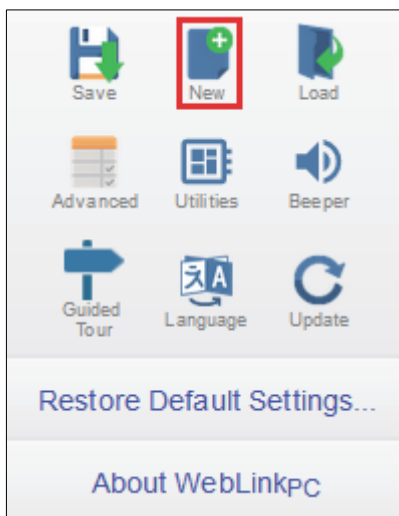
10-6-1 Save

Save saves the current configuration.



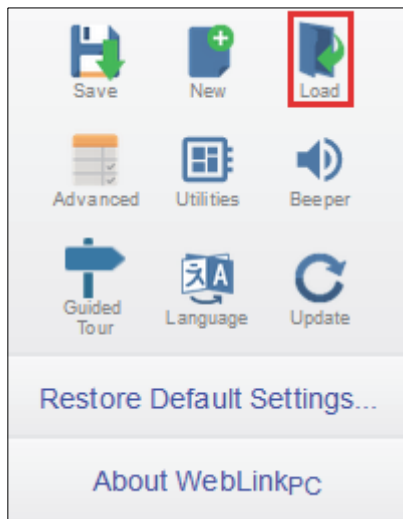
10-6-2 New

New opens a completely new WebLink_{PC} session.



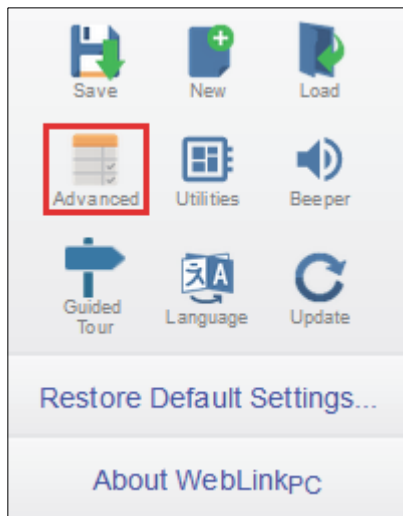
10-6-3 Load

Load allows you to open an existing configuration.



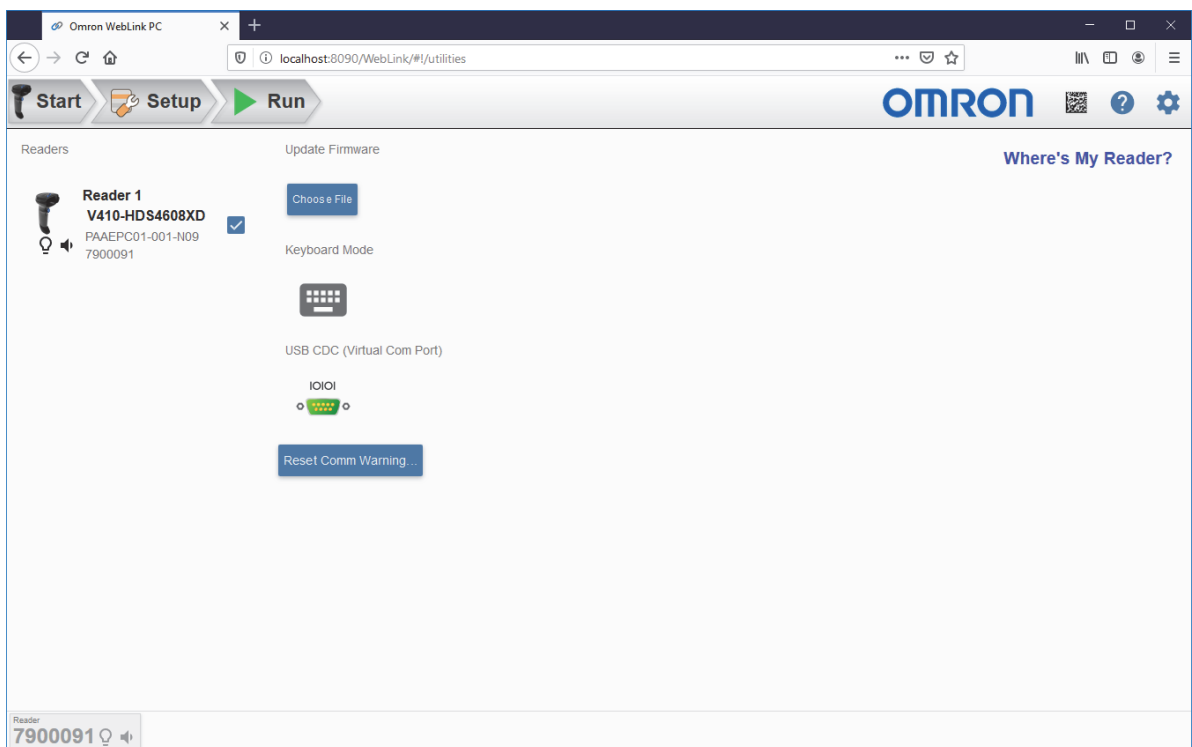
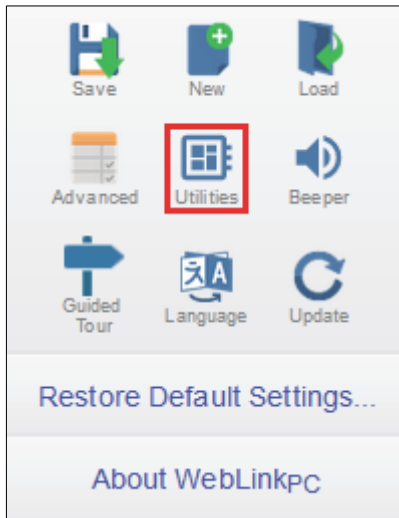
10-6-4 Advanced

Advanced allows you to make precise adjustments to every category of reader functionality using the **Advanced Settings** menus.



10-6-5 Utilities

Clicking **Utilities** opens a view that allows you to switch between **Keyboard Mode** and **USB CDC (Virtual COM Port) Mode** for the selected reader, and also to update reader **firmware**.



Updating Firmware

To update firmware, select the reader or readers you wish to update by clicking their check boxes, then click the **Choose File** button and select the appropriate firmware file. If an individual **.dat** file is selected, only the readers whose models are associated with that **.dat** file will be updated. Any readers not associated with that **.dat** file will not be updated.

● Reader-to-File Associations:

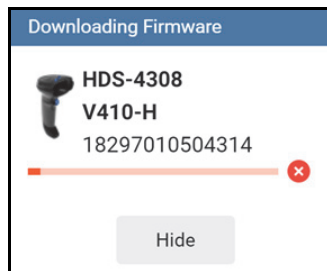
- V410-H or V450-H Wired Reader: PAADJC06.dat
- V450-H Wireless Reader: PAADKC06.dat
- V-50-H Cradle (Base Station): CAACNS00.dat

A **.zip** file can also be provided that contains multiple **.dat** files. The file server chooses the appropriate binary file in the **.zip** file for each reader model.

Note: The V450-H Cradle's firmware cannot be updated via **.zip** file. It must be updated on its own, but the process is the same. Select the V450-H Wireless reader paired with the Cradle whose firmware you want to update, then select and install the Cradle's firmware.

● Firmware Update Progress

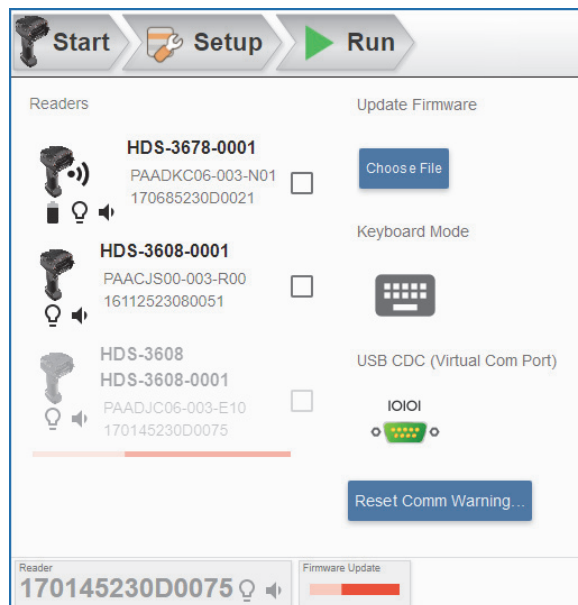
When the firmware download begins, a Downloading Firmware dialog will appear:



If you click **Hide**, the dialog minimizes to the Status Bar.

To cancel the firmware download, click the red, circled **X** next to the download status bar. Note that this only cancels the *download*. Once the process of flashing firmware to the reader starts, it cannot be cancelled.

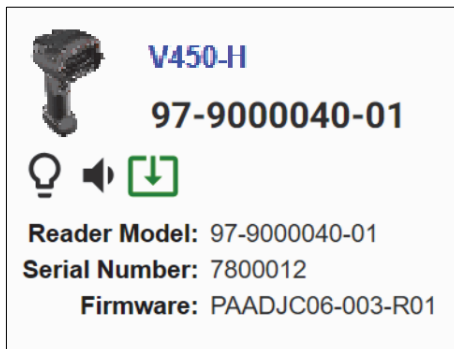
The firmware update begins once firmware is downloaded. Progress is shown by a simple **Firmware Update** progress bar.



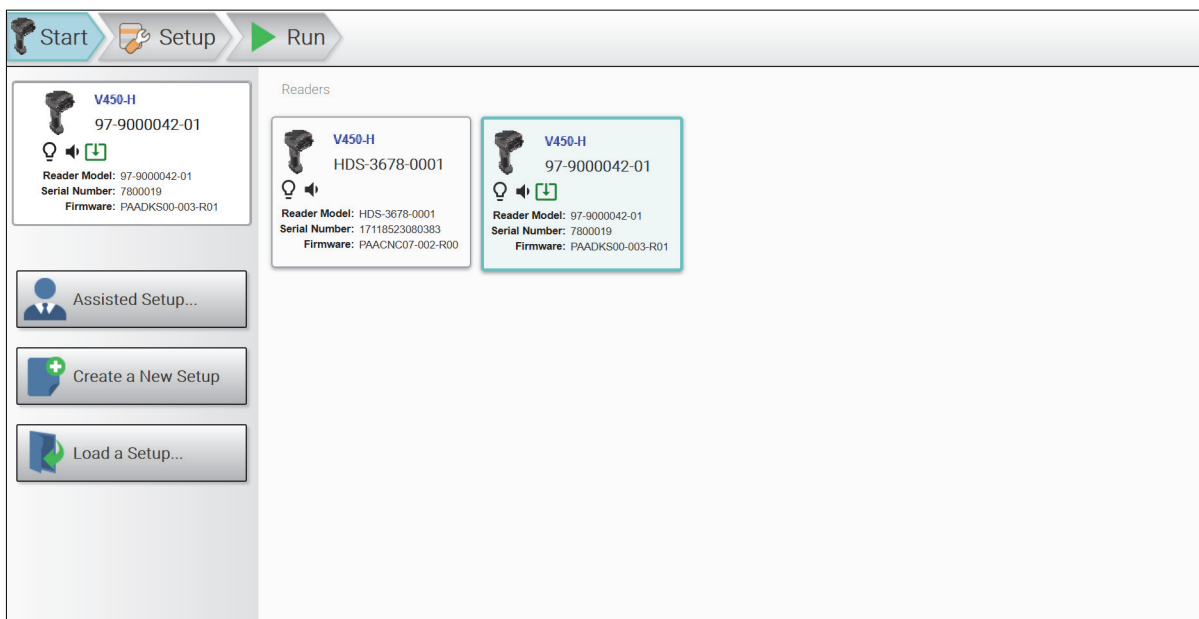
You can continue to work with other connected readers during the firmware update.

Firmware Update Available Notification

When a firmware update is available, a green icon will appear in the reader's device information area in the **Start** view.

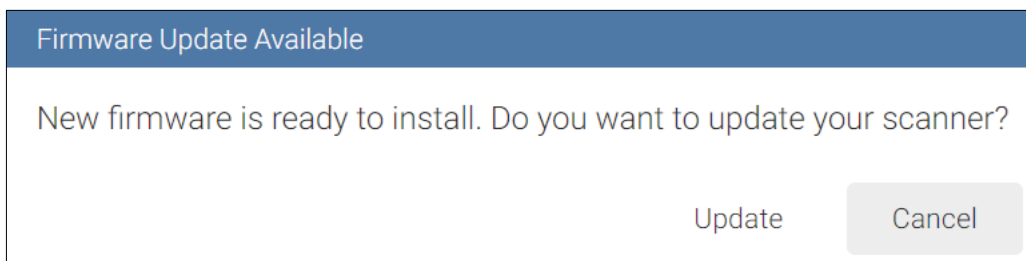


The green icon will also appear on the selected device button.



You can click on the green update icon from either the device information area or the selected device button to start the firmware update process.

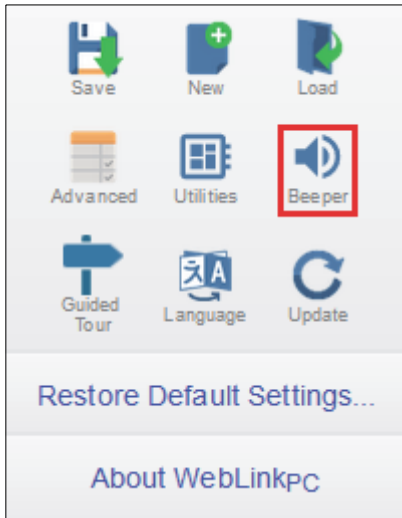
A dialog will appear asking you to confirm that you intend to update the firmware.



Updating firmware from the Start view initiates the same process as updating firmware from the Utilities view.

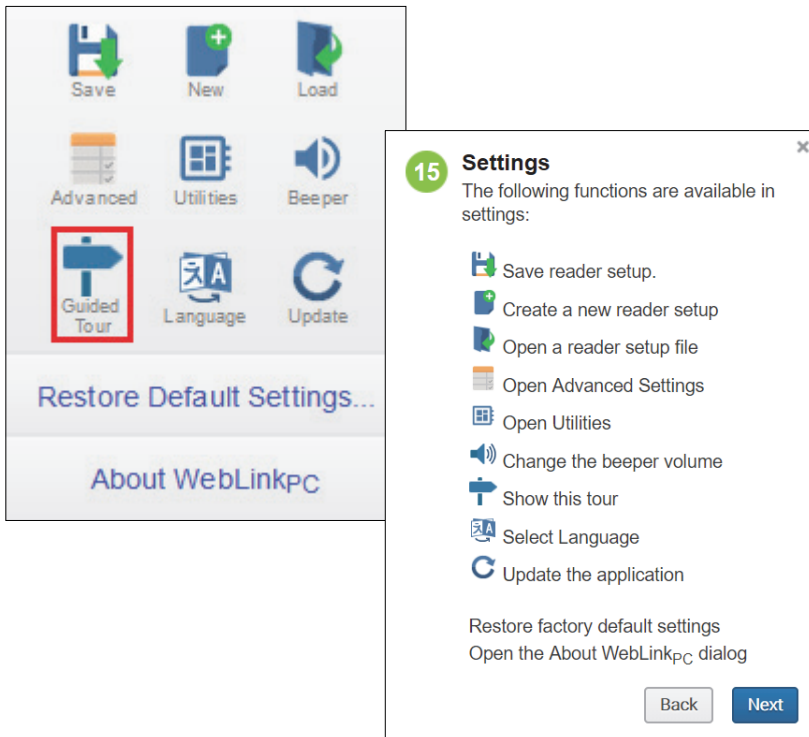
10-6-6 Beeper

Enabling Beeper causes the reader to beep for each valid decode.



10-6-7 Guided Tour

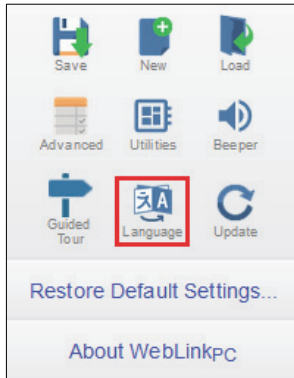
Clicking **Guided Tour** launches a tutorial that explains the functions of the various areas of the WebLink_{PC} user interface.



The **Guided Tour** is a multi-step tutorial that explains the functions of the various areas of the WebLink_{PC} user interface.

Step 15 of the tour is shown above as an example.

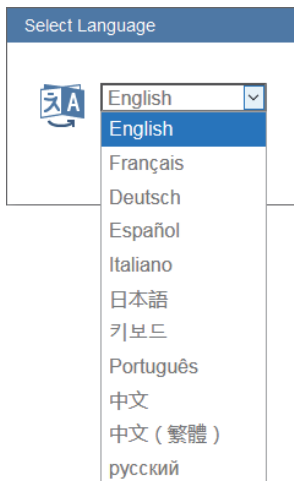
10-6-8 Language



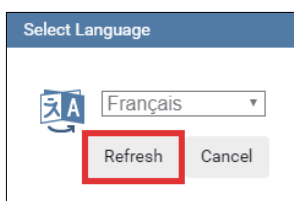
WebLink_{PC} supports eleven languages:

- English
- French
- German
- Spanish
- Italian
- Japanese
- Korean
- Portuguese
- Simplified Chinese
- Traditional Chinese
- Russian

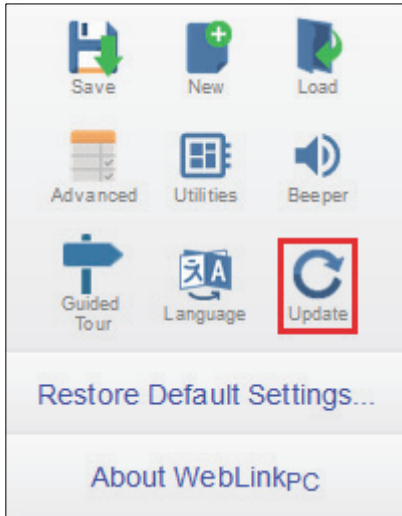
You can set your preferred language by clicking the **Language** button from the **Application Settings** menu and then selecting your language from the **Select Language** dropdown menu.



If you change your preferred language, WebLink_{PC} must be reloaded for the change to take effect. This can be done by clicking the **Refresh** button in the Select Language dialog. After the page refreshes, WebLink_{PC} will display the new language.



10-6-9 Update



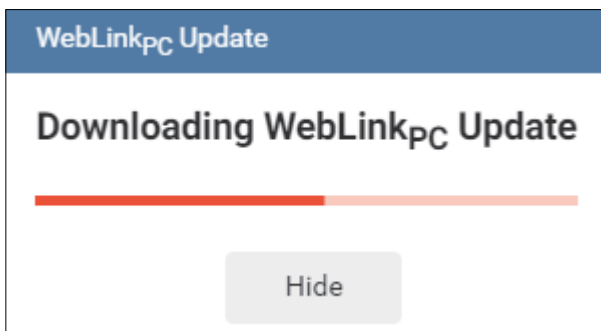
WebLink_{PC} can be updated whenever a new version is available.

You can update your version of WebLink_{PC} by clicking the **Update** icon in the **Application Settings** menu.

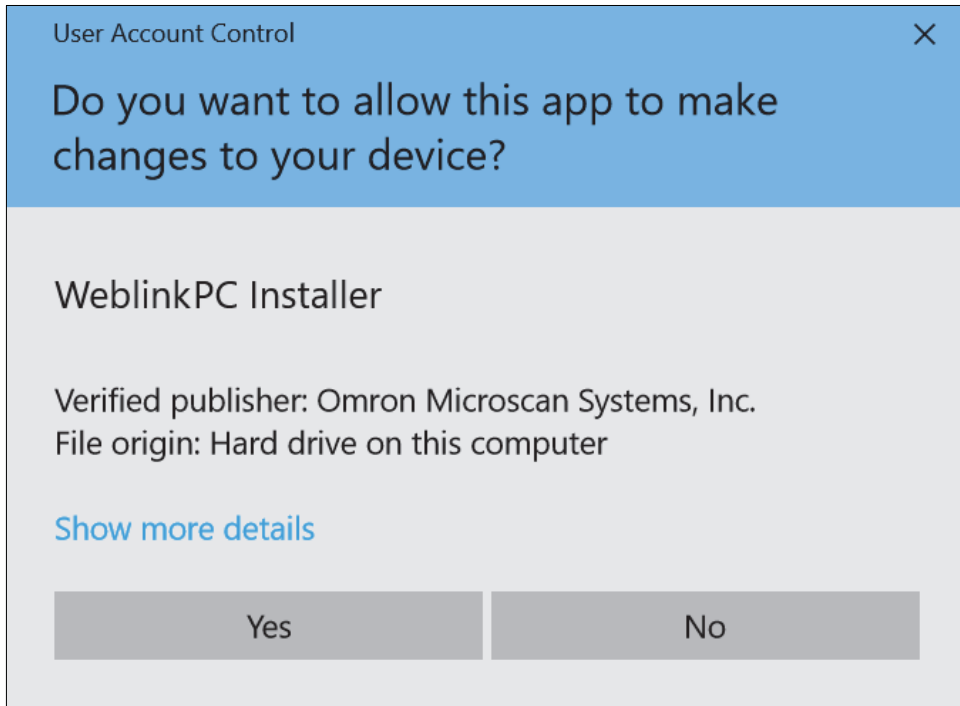
You can also update WebLink_{PC} via the dialog that appears at startup when an update is available. You can disable the update notification by clicking the **Don't ask again** checkbox and then clicking the **Cancel** button.



When you click **Update**, the update file will begin downloading. You can continue to use WebLink_{PC} while the file downloads. The progress of the download appears in real time in both the dialog and the **Status Bar**.

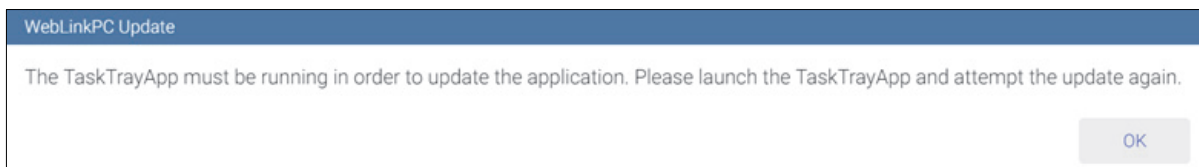


Once the update file is downloaded, you must accept the Windows **User Account Control (UAC)** prompt for the update to proceed. If you decline the UAC, the update process will stop.

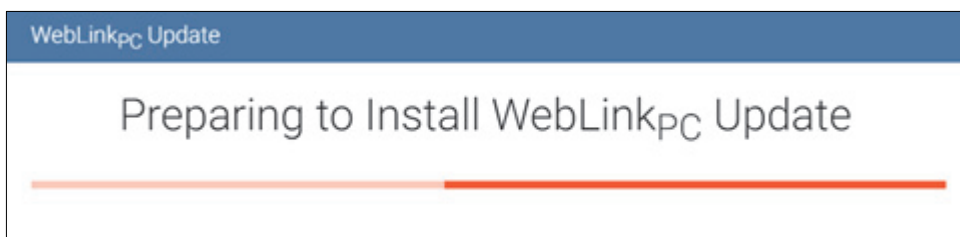


If you click **Yes**, the update installation will proceed. You do not have to provide any additional input for the installation to complete.

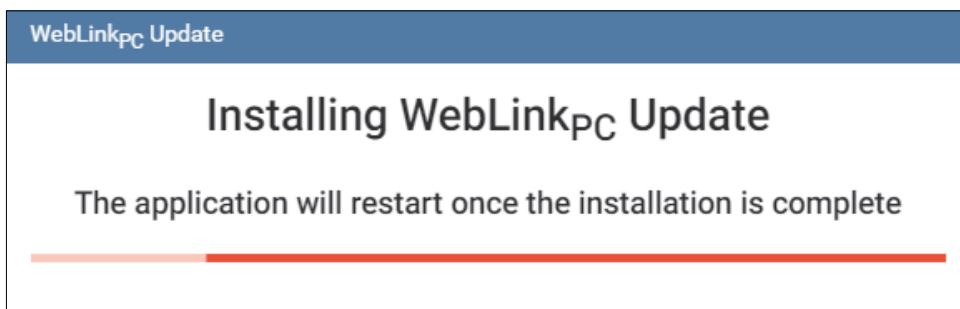
Important: The **Task Tray App** must be open for the download to start. If the Task Tray App is not open, a dialog will appear stating that you must open the Task Tray App and attempt the update again.



A dialog will appear stating that WebLink_{PC} is preparing to install the update.



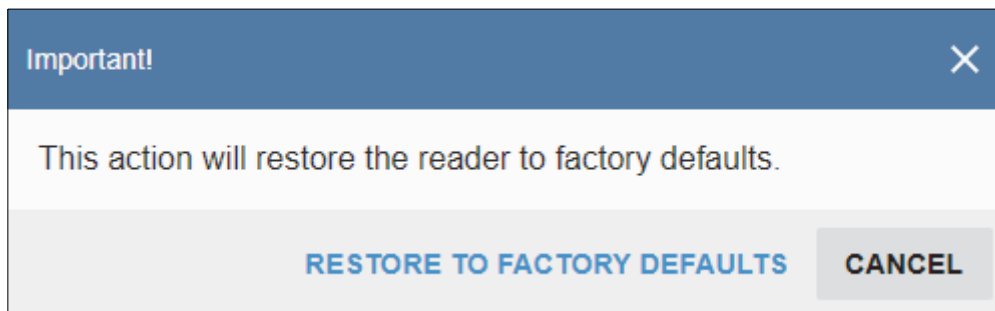
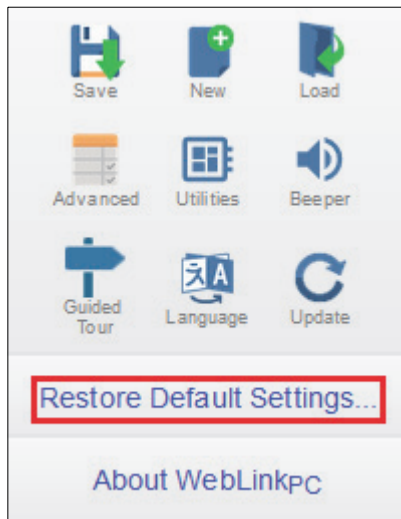
A dialog will then appear stating that the installation is in progress.



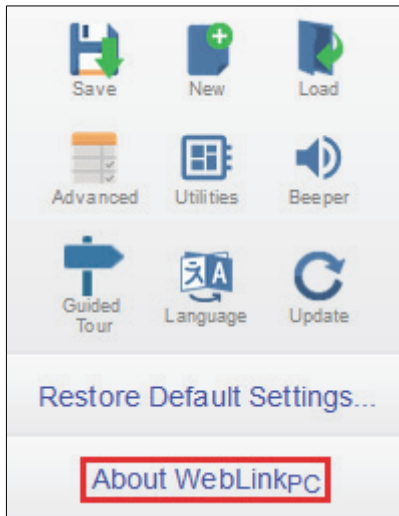
WebLink_{PC} will restart when the installation is complete.

10-6-10 Restore Default Settings

Clicking the **Restore Default Settings** button brings up the message shown below. If you click **Restore to Factory Defaults**, the reader reverts to the default state in which it was shipped from the manufacturer.



10-6-11 About WebLink_{PC}



About WebLink_{PC} opens the dialog below, which shows the current **WebLink_{PC} version**, **Browser**, **Operating System**, and **Screen Resolution**.

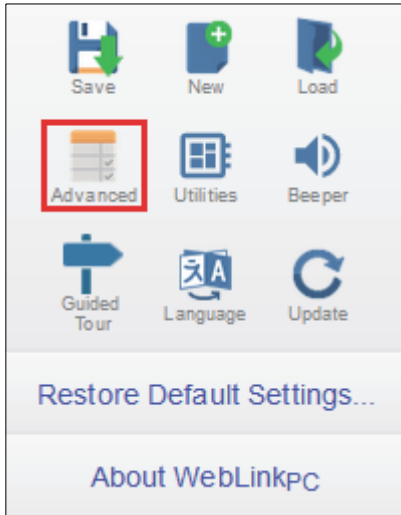
Note: The information in this dialog is selectable so that you can copy it to a clipboard.

Clicking **Contact Us** takes you to the **Omron Microscan website**.



10-7 Advanced Settings

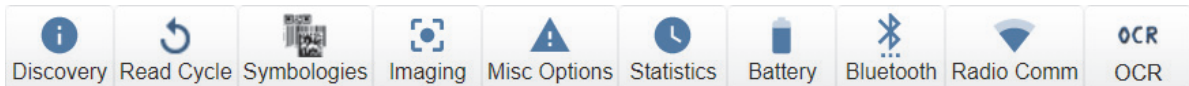
When you click the **Gear icon** to bring up the **Application Settings** menu, one of the options you will see is **Advanced**.



WebLink_{PC}'s **Advanced** settings allow you to make fine adjustments to individual command parameters in all areas of reader functionality: **Discovery**, **Read Cycle**, **Symbologies**, **Imaging**, **Misc. Options**, **Statistics**, **Battery**, **Bluetooth**, **Radio Comm.**, and **Optical Character Recognition (OCR)**. Although many parameters can be configured in the **Setup** interface, all parameters can be configured in the Advanced settings menus.

When you enter Advanced settings, the current reader's configuration automatically loads. Once the parameters are loaded, you can change them as needed and add them to **Favorites** by clicking the star icon next to the setting.

Note: Availability of specific Advanced settings depends on your reader model. **Battery**, **Bluetooth**, and **Radio Comm.** are only available for the **V450-H Wireless**. **OCR** is only available for the **V410-H**.



The **Differences from Default** menu displays only commands that differ from WebLink_{PC} defaults.

10-7-1 Discovery

The **Discovery** menu shows identifying information about your reader, including **Model Number**, **Serial Number**, and **Firmware Version**.

Command parameters can be changed directly from this menu.

Discovery Menu

V410-H

Scanner Information	
☆ Scanner Name	V410-H
☆ Model Number	V410-HDS4608XD
☆ Serial Number	7900101
Manufacture and Service Dates	
☆ Date of Manufacture	25-NOV-2019
☆ Last Service Date	0000000
Firmware Information	
☆ Scanner Firmware Version	PAAEPC01-001-N09
☆ RSM Version	2.0

Reader: 7900101

V450-H

Scanner Information	
☆ Scanner Name	V450
☆ Model Number	V450-HDS3678-1001
☆ Serial Number	183615230E0059
Bluetooth Address	
☆ Bluetooth Address	94 FB 29 22 BE 70
Manufacture and Service Dates	
☆ Date of Manufacture	27-DEC-2018
☆ Last Service Date	0000000
Firmware Information	
☆ Scanner Firmware Version	PAADKC06-005-S00
☆ RSM Version	2.0

Reader: 183615230E0059

10-7-2 Read Cycle

The **Read Cycle** menu shows all the commands that control all aspects of read cycle, including triggering, read cycle timing, and image processing.

Command parameters can be changed directly from this menu.

Read Cycle Menu

V410-H

Section	Parameter	Value
Trigger	Trigger Mode	Auto Aim
	Motion Tolerance	Less
Capture Mode	Hands-free Mode	On
	Continuous Read	Off
	Unique Bar Code Reporting	On
Read Cycle Timeout	Decode Timeout	9.9 seconds
	Hands-free Decode Timeout	1.5 seconds
	Timeout Between Decodes, Same Symbol	0.5 seconds
	Timeout Between Decodes, Different Symbols	0.5 seconds
Decode Mirror Images (Data Matrix Only)	Decode Mirror Images (Data Matrix Only)	Auto
No Read Message	No Read Message	Off
Performance	Decoder Effort	Level 2
	Enhance	Disabled
	Size	Small
	X-Mode Timeout	0.5 seconds

Reader: 7900101

V450-H

Section	Parameter	Value
Trigger	Trigger Mode	Manual
	Motion Tolerance	Less
Capture Mode	Hands-free Mode	On
	Continuous Read	Off
	Unique Bar Code Reporting	On
Read Cycle Timeout	Decode Timeout	9.9 seconds
	Hands-free Decode Timeout	1.5 seconds
	Timeout Between Decodes, Same Symbol	0.5 seconds
	Timeout Between Decodes, Different Symbols	0.5 seconds
No Read Message	No Read Message	Off
Performance	Decoder Effort	Level 3
	Enhance	Disabled
	Size	Small
	X-Mode Timeout	0.3 seconds

Reader: 17240523080237

10-7-3 Symbolologies

The **Symbolologies** menu shows all the commands that allow you precise control of the parameters of all enabled code types. Parameters differ depending on the unique standards of each code type. Command parameters can be changed directly from this menu.

Symbolologies Menu – V410-H

Note: The **Symbolologies** menu in **Advanced Settings** is very long, and is shown here split into quarters. Refer to the topic **Advanced Settings > Symbolologies** in **WebLinkPC Help** for a full-size and continuous view of the menu.

To view each parameter more clearly on this page, simply increase your PDF magnification.

The screenshot shows the following menu structure:

- Discovery Read Cycle **Symbolologies** Imaging Misc Options Statistics OCR
- Search for settings
- Data Matrix
 - BC412
 - BC412
 - ISBT128
 - ISBT128
 - ISBT Conca
 - Convert UPC-E to A
- GS1 Data M
 - ISBT128
 - ISBT Conca
 - Convert UPC-E1 to A
 - Interleaved
 - UCC Coup
 - GS1 DataBar Security Level
 - GS1 DataBar Expanded Security Level
 - Composite
 - Composite CC-C
 - Composite CC-A/B
 - Composite TLC-39
 - UPC Composite Mode
 - UPC Never Linked
 - Composite Beep Mode
 - Beep as each code type is decoded
 - Bookland I
 - GS1-128 Emulation Mode for UCC/EAN Composite Codes
 - Code 93
 - Composite Inverse
 - Regular Only
 - PDF417
 - PDF417
 - Micro PDF417
 - Micro PDF417
 - EAN128
 - EAN128 Emulation
 - US Post
 - US Post 1
 - US Post 2
 - Transmit US postal Check Digit
 - UK Post
 - UK Post
 - Transmit UK Postal Check Digit
 - Postal
 - Japan Post
 - USPS 4CB/One Code/Intelligent Mail
 - UPU FICS Postal
 - Mailmark
 - Australia Post
 - Australia Post
 - Australia Post Format
 - Auto-discriminate
 - Symbology ID
 - Symbology ID
 - Options
 - Redundancy Level
 - Level 1
 - 1D Options
 - Security Level
 - Security Level 1
 - 1D Quiet Zone Level
 - 1D Quiet Zone Level 1
 - Intercharacter Gap Size
 - Normal Intercharacter Gaps
 - CJK
 - Unicode Output Control
 - Universal Output
 - CJK Output Method to Windows Host
 - Universal CJK Output
 - Grid Matrix
 - Grid Matrix
 - Grid Matrix Inverse
 - Regular
 - Grid Matrix Mirrored
 - Non-Mirrored Only
 - securPharm
 - securPharm Decoding
 - securPharm Output Formatting
 - No Formatting
- Reader: 7900091

Symbologies Menu – V450-H

Note: The **Symbologies** menu in **Advanced Settings** is very long, and is shown here split into quarters. Refer to the topic **Advanced Settings > Symbologies** in **WebLinkPC Help** for a full-size and continuous view of the menu.

To view each parameter more clearly on this page, simply increase your PDF magnification.

Reader: 17240523080237

10-7-4 Imaging

The **Imaging** menu allows you to control multiple aspects of image output, including **Image Size** in pixels and **File Format**, as well as image capture parameters such as **Contrast Enhancement** and **Sub-Sampling**.

Command parameters can be changed directly from this menu.

Imaging Menu

V410-H

Section	Setting	Value
Illumination Options	Decoding Illumination	<input checked="" type="checkbox"/>
	Illumination Brightness	10
	Decoding Auto Exposure	<input checked="" type="checkbox"/>
	Analog Gain	Analog Gain x 2
	Digital Gain	32
	Fixed Exposure	100
Image Options	Image Size (Number of Pixels)	Full Resolution
	Image File Format	JPEG
	Contrast Enhancement	<input checked="" type="checkbox"/>
	Sub-sampling	3
	Image Brightness (Target White)	180
	Image Enhancement	Low
Bits Per Pixel	8 BPP	

Section	Setting	Value
Illumination Options	Decoding Illumination	<input checked="" type="checkbox"/>
	Decoding Auto Exposure	<input checked="" type="checkbox"/>
	Analog Gain	Analog Gain x 2
	Digital Gain	32
	Fixed Exposure	100
	Image Options	Image Size (Number of Pixels)
Image File Format		JPEG
Contrast Enhancement		<input checked="" type="checkbox"/>
Sub-sampling		3
Image Brightness (Target White)		180
Image Enhancement		Low
Bits Per Pixel	8 BPP	
JPEG Options	JPEG Image Options	JPEG Quality Selector
	JPEG File Size	160 kb
	JPEG Quality and Size Value	65
	Aim Brightness	0
	Image File Meta Data	<input type="checkbox"/>

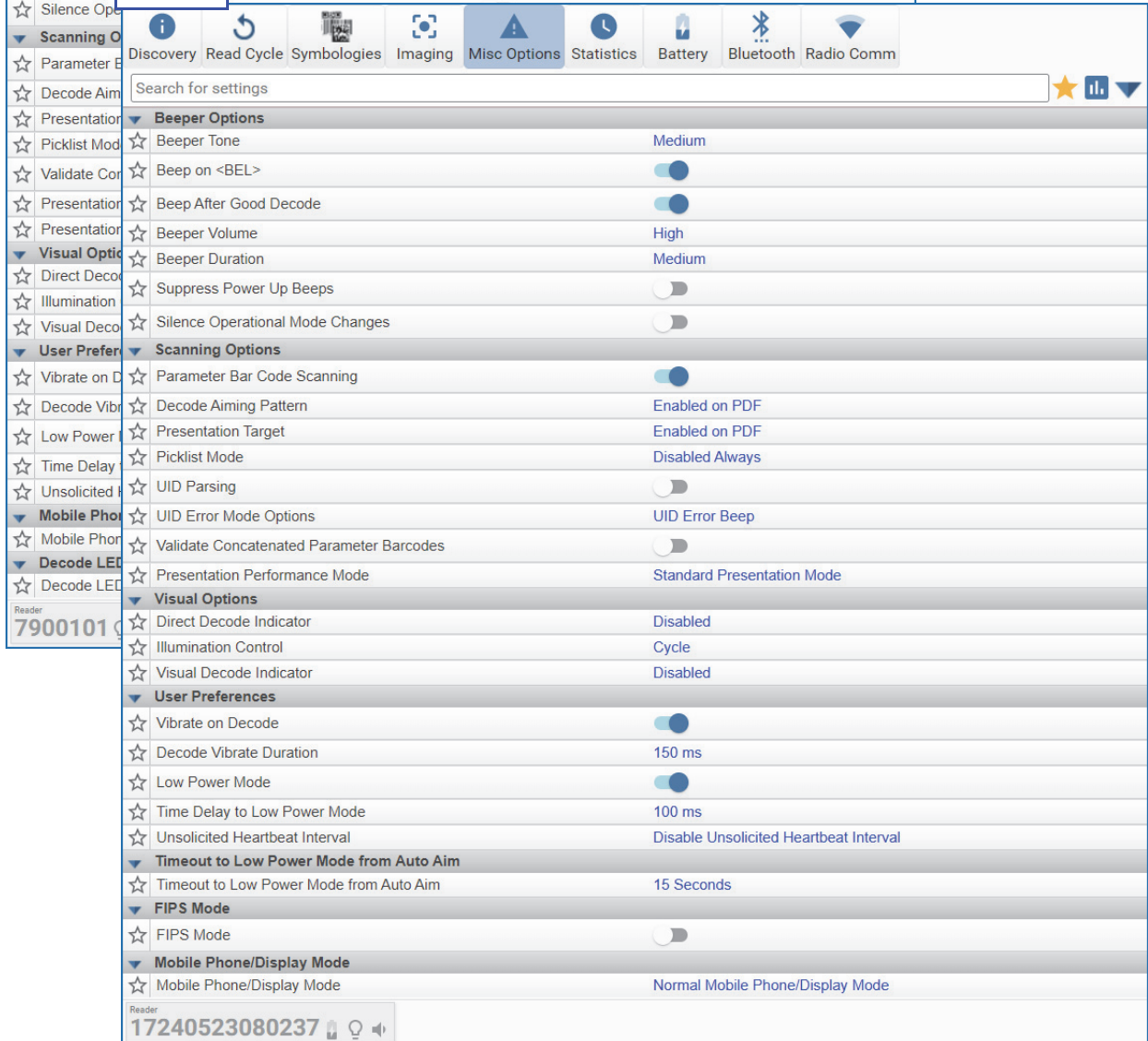
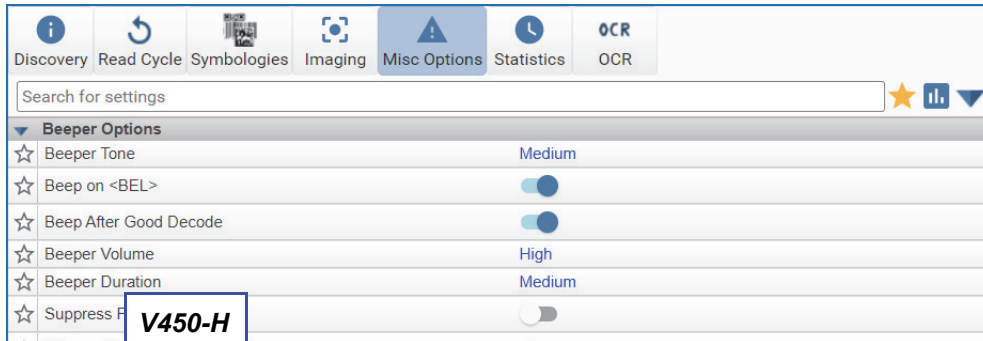
10-7-5 Misc. Options

The **Misc. Options** menu allows you to configure various aspects of reader behavior, such as **Beeper Volume**, **Decode Indicators**, and **Presentation Target**, as well as **UID Parsing** and **Illumination Control**.

Command parameters can be changed directly from this menu.

Misc. Options Menu

V410-H



10-7-6 Statistics

The **Statistics** menu shows read-only information about reader usage. Command parameters can be changed directly from this menu.

Statistics Menu

V410-H

Discovery Read Cycle Symbologies Imaging Misc Options **Statistics** OCR

Search for settings

Power Statistics

☆ Time Powered on Over Lifetime	2 days 13:27:50
☆ Power Up Count	18
☆ Time Since Last Power Up	12:33

Read Cycle Statistics

☆ Cycle Time	258 ms
☆ Symbology Type	27
☆ Content	
☆ Cycle Count	36

Reader 7900101

V450-H

Discovery Read Cycle Symbologies Imaging Misc Options **Statistics** Battery Bluetooth Radio Comm

Search for settings

Power Statistics

☆ Time Powered on Over Lifetime	15 days 10:46:44
☆ Time Since Last Power Up	2:57:41
☆ Power Up Count	198

Read Cycle Statistics

☆ Cycle Time	831 ms
☆ Symbology Type	3
☆ Content	
☆ Cycle Count	87

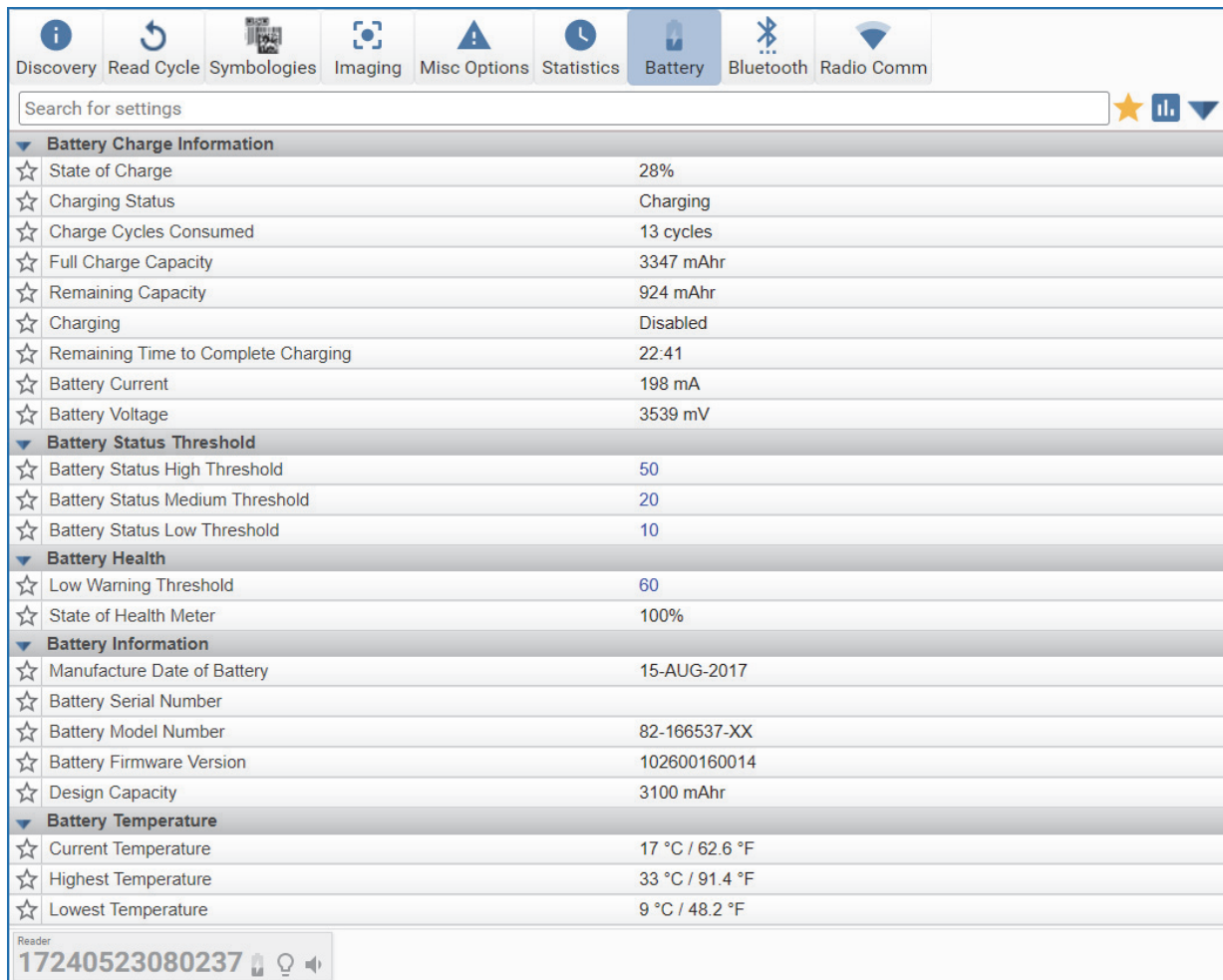
Reader 17240523080237

10-7-7 Battery (V450-H Wireless Only)

The Battery menu shows several read-only data points about battery identity, health, and age, and also allows you to set status and health thresholds.

Command parameters can be changed directly from this menu.

Battery Menu



Category	Parameter	Value
Battery Charge Information	State of Charge	28%
	Charging Status	Charging
	Charge Cycles Consumed	13 cycles
	Full Charge Capacity	3347 mAh
	Remaining Capacity	924 mAh
	Charging	Disabled
	Remaining Time to Complete Charging	22:41
	Battery Current	198 mA
	Battery Voltage	3539 mV
	Battery Status Threshold	Battery Status High Threshold
Battery Status Medium Threshold		20
Battery Status Low Threshold		10
Battery Health	Low Warning Threshold	60
	State of Health Meter	100%
Battery Information	Manufacture Date of Battery	15-AUG-2017
	Battery Serial Number	
	Battery Model Number	82-166537-XX
	Battery Firmware Version	102600160014
	Design Capacity	3100 mAh
Battery Temperature	Current Temperature	17 °C / 62.6 °F
	Highest Temperature	33 °C / 91.4 °F
	Lowest Temperature	9 °C / 48.2 °F

Reader: 17240523080237

10-7-8 Bluetooth (V450-H Wireless Only)

The **Bluetooth** menu shows read-only status information and also allows you to configure the reader's Bluetooth communications functionality.

Command parameters can be changed directly from this menu.

Bluetooth Menu

Setting	Value
Cradle	
☆ In Cradle Detect	In Cradle
☆ Operational Mode	Handheld
Bluetooth Inquiry Mode	
☆ Bluetooth Inquiry Mode	General
Bluetooth Reconnect	
☆ Bluetooth Beep On Reconnect Attempt	<input type="checkbox"/>
☆ Bluetooth Reconnect Attempts	6 seconds
☆ Bluetooth HID Auto Reconnect	Reconnect Immediately
Bluetooth Pincode	
☆ Bluetooth Pincode	12345
☆ Bluetooth Pincode Type	Static

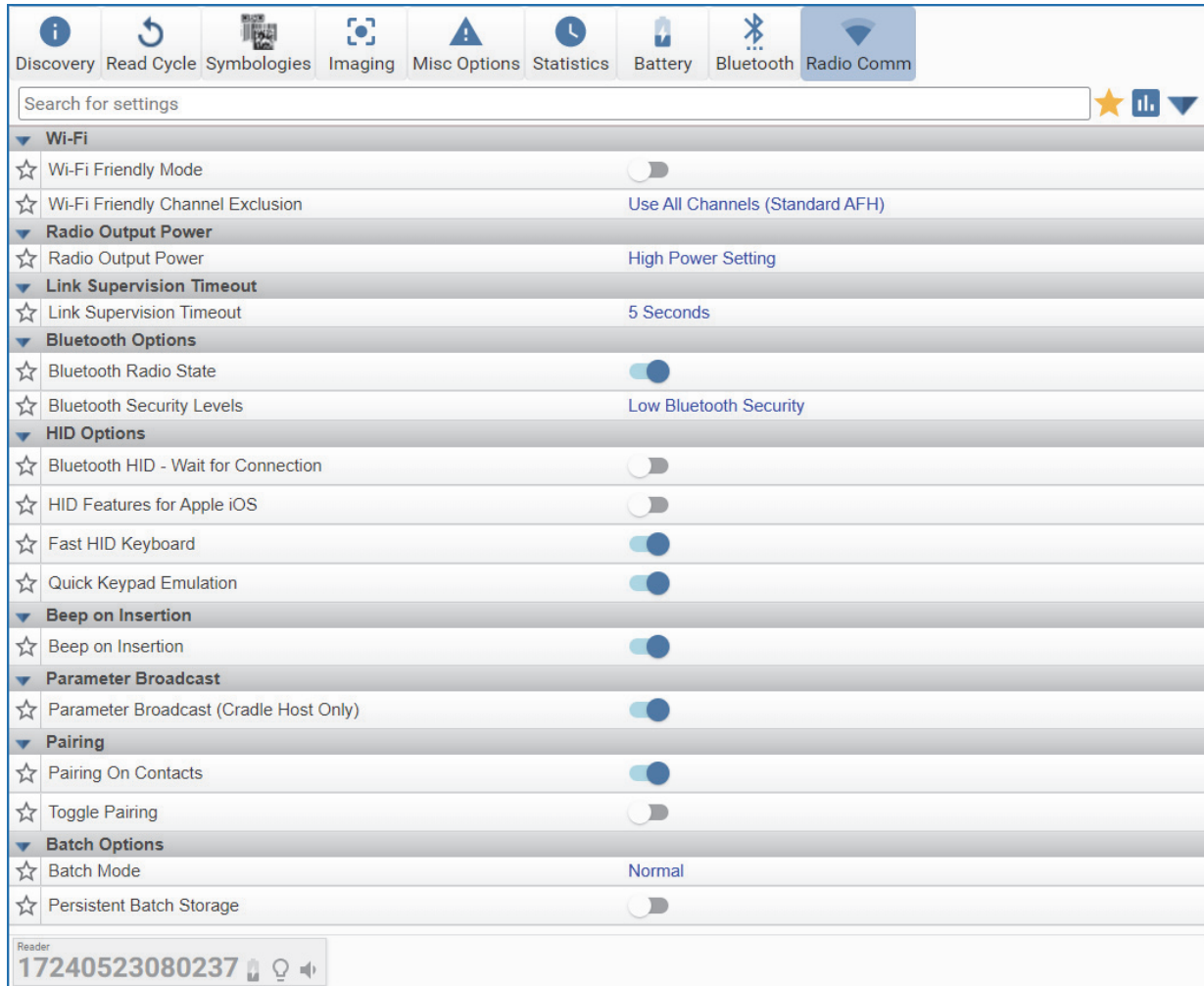
Reader
17240523080237

10-7-9 Radio Comm. (V450-H Wireless Only)

The **Radio Comm.** menu shows various radio communications data points, including information about Bluetooth, pairing, and batch mode.

Command parameters can be changed directly from this menu.

Radio Comm. Menu



10-7-10 Optical Character Recognition (OCR) (V410-H Only)

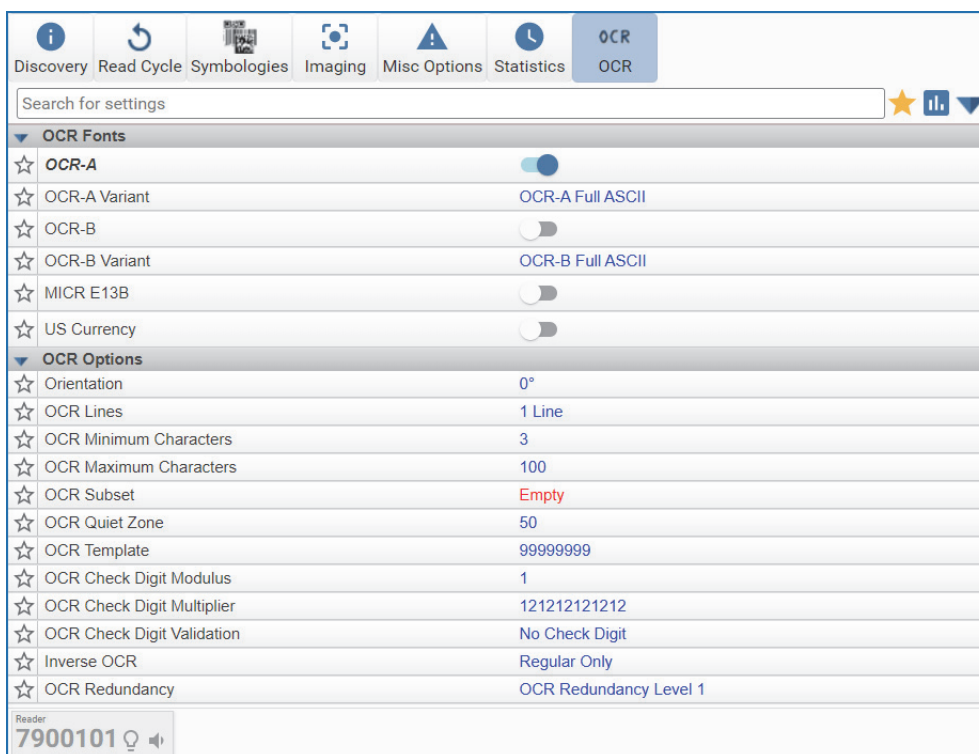
The **OCR** menu allows you to configure the V410-H reader for **Optical Character Recognition** applications. The V410-H can read 6 pt. to 60 pt. text in **OCR-A**, **OCR-B**, **MICR E13B**, and **U.S. Currency Serial Number** fonts.

OCR is not as secure as a barcode. To decrease OCR misreads and speed up OCR reading, set an accurate OCR template and character subset, and use a check digit.

All OCR fonts are disabled by default. Enabling OCR may reduce barcode reading performance. Enabling more than one OCR font may also reduce OCR performance and accuracy.

Command parameters can be changed directly from this menu.

OCR Menu



Hints for Successful OCR Reading

The OCR template is set to read **8** numeric characters by default, and it will only read a string of 8 numeric characters.

Examples of characters allowed in the template:

9 – Expects a numeric character

A – Expects an alpha character

3 – Expects an alphanumeric character

The template needs to be set to match the string you are attempting to read.

Be sure that **Check Digit Validation** is set to **No Check Digit** (this is the default).

Be sure that the length of the string fits between the **OCR Minimum Characters** and **OCR Maximum Characters** (the defaults are **3** and **100**).

Try reducing the Quiet Zone. The default of **50** is a fairly large Quiet Zone.

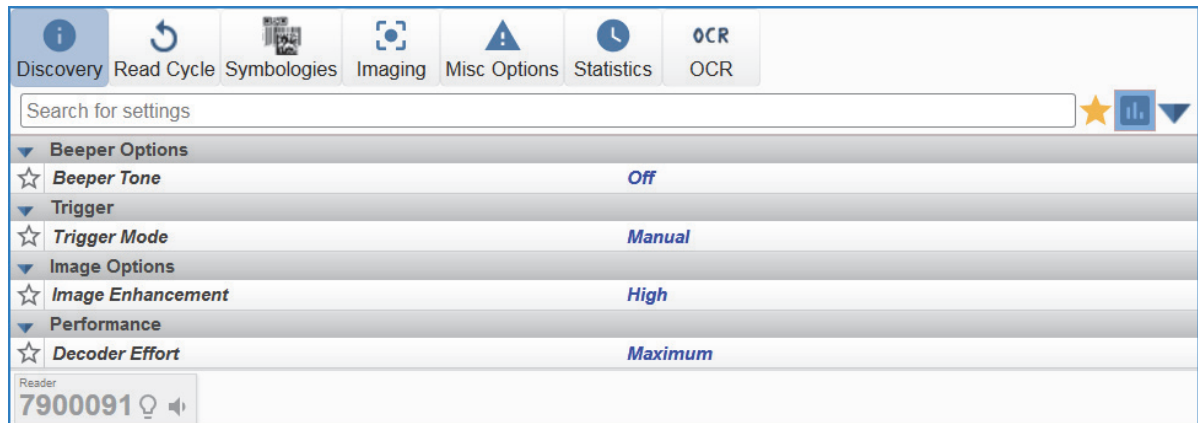
10-7-11 Differences from Default

The **Differences from Default** menu shows only commands whose parameters are not currently set to WebLink_{PC} defaults. Commands from any Advanced settings menu may appear in this menu.

Command parameters can be changed directly from this menu.

Differences from Default Menu

Note: The image below is intended as an example only. The possible combinations of reader parameters displayed in the Differences from Default menu are essentially limitless.



11

OCR Programming (V410-H Only)

This chapter describes how to set up the reader for OCR programming. The reader can read 6 to 60 point OCR typeface. It supports font types OCR-A, OCR-B, MICR-E13B, and US Currency Serial Number.

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11-1 Introduction

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.

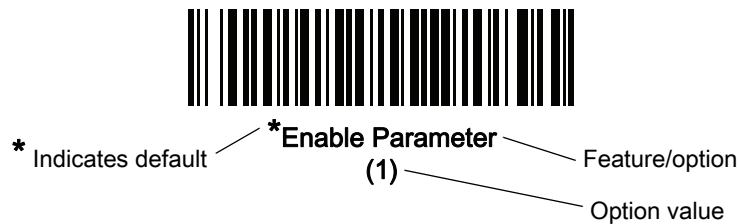
All OCR fonts are disabled by default. You can enable OCR-A and OCR-B at the same time, but not other combined font types.

11-2 Setting 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.

To return all features to default values, scan **Set Factory Defaults**. Throughout the programming barcode menus, asterisks (*) indicate default values.



Scanning Sequence Examples

In most cases scanning one barcode sets the parameter value. For example, to enable OCR-B, scan the **Enable OCR-B** barcode.

Note: Enable OCR-A before setting this parameter. If disabling OCR-A, set the variant to its default (OCR-A Full ASCII). The reader 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.

Errors While Scanning

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

Hints for Successful OCR Reading

The OCR template is set to read **8** numeric characters by default, and it will only read a string of 8 numeric characters.

Examples of characters allowed in the template:

9 – Expects a numeric character

A – Expects an alpha character

3 – Expects an alphanumeric character

The template needs to be set to match the string you are attempting to read.

Be sure that **Check Digit Validation** is set to **No Check Digit** (this is the default).

Be sure that the length of the string fits between the **OCR Minimum Characters** and **OCR Maximum Characters** (the defaults are **3** and **100**).

Try reducing the Quiet Zone. The default of **50** is a fairly large Quiet Zone.

11-3 OCR Parameter Defaults

The table below lists the defaults for OCR parameters. You can 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 reader using WebLink_{PC}.

Note: See [Standard Parameter Defaults](#) for all user preference, host, symbology, and miscellaneous default parameters.

OCR Programming Default Table

Parameter	Parameter Number	SSI Number	Default
OCR Programming Parameters			
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
OCR Quiet Zone	695	F1h B7h	50
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

11-4 OCR Programming Parameters

OCR-A

● Parameter # 680

SSI # F1h A8h

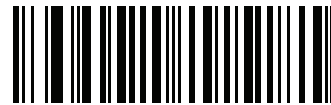
Scan one of the following barcodes to enable or disable OCR-A.

Note: OCR is not as secure as a barcode. To decrease OCR mis-decodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. To set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six-character width quiet zone.

Note: All OCR fonts are disabled by default.



Enable OCR-A
(1)



*Disable OCR-A
(0)

OCR-A Variant

● Parameter # 684

SSI # F1 ACh

The font variant sets a processing algorithm and default character subset for the given font. To choose a variant, scan one of the following barcodes. Select the most appropriate font variant to optimize performance and accuracy.

OCR-A supports the following variants:

- OCR-A Full ASCII

!#\$()*+,-./0123456789<>ABCDEFGHIJKLMNPOQRSTUVWXYZ^

- OCR-A Reserved 1

\$*+,-./0123456789ABCDEFGHIJKLMNPOQRSTUVWXYZ

- OCR-A Reserved 2

\$*+,-./0123456789<>ABCDEFGHIJKLMNPOQRSTUVWXYZ

- OCR-A Banking

-0123456789<> Ƴ Ƴ Ƴ

Special banking characters output as the following representative characters:

Ⓜ outputs as f

Ⓜ outputs as c

Ⓜ outputs as h

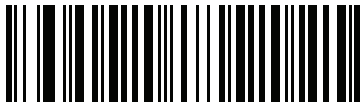
Note: Enable OCR-A before setting this parameter. If disabling OCR-A, set the variant to its default (OCR-A Full ASCII).



*OCR-A Full ASCII
(0)



OCR-A Reserved 1
(1)



OCR-A Reserved 2
(2)



OCR-A Banking
(3)

OCR-B

- **Parameter # 681**

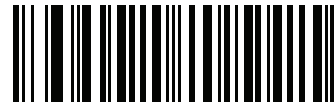
SSI # F1h A9h

Scan one of the following barcodes to enable or disable OCR-B.

- 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. To set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six-character width quiet zone.
- All OCR fonts are disabled by default



Enable OCR-B
(1)



*Disable OCR-B
(0)

OCR-B Variant

● Parameter # 685

SSI # F1h ADh

OCR-B has the following variants. Select the most appropriate font variant to optimize performance and accuracy.

- 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<ABCDEFGHIJKLMNOPQRSTUVWXYZ

- OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards

-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ

- OCR-B Travel Document 2 or 3-Line ID Cards Auto-Detect

!#\$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^|ñ

- OCR-B Passport

-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZñ

- OCR-B Visa Type A

-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ

- OCR-B Visa Type B

-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZñ

- 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.

To choose a variant, scan one of the following barcodes. Selecting the following OCR-B variants automatically sets the appropriate Setting an incorrect orientation can cause mis-decodes. These five variants invoke extensive special algorithms and checking for that particular document type:

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 reader in place (6.5 - 7.5").

Note: Enable OCR-B before setting this parameter. If disabling OCR-B, set the variant to its default (OCR-B Full ASCII).



*OCR-B Full ASCII
(0)



OCR-B Banking
(1)



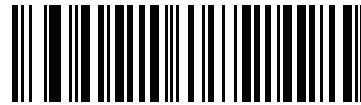
OCR-B Limited
(2)



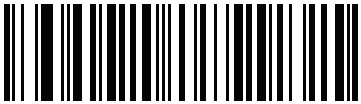
OCR-B ISBN 10-Digit Book Numbers
(6)



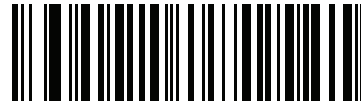
OCR-B ISBN 10 or 13-Digit Book Numbers
(7)



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

Scan one of the following barcodes to enable or disable MICR E13B.

MICR E 13B uses the following characters:

0 1 2 3 4 5 6 7 8 9 | : ; ' | " ' " " "

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

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. To set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six-character width quiet zone.

Note: All OCR fonts are disabled by default.



Enable MICR E13B
(1)



*Disable MICR E13B
(0)

US Currency Serial Number

- **Parameter # 683**

SSI # F1h ABh

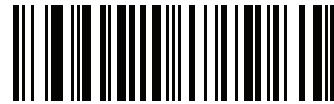
Scan one of the following barcodes to enable or disable US Currency Serial Number.

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. To set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six-character width quiet zone.

Note: All OCR fonts are disabled by default.



Enable US Currency
(1)



*Disable US Currency
(0)

OCR Orientation

● Parameter # 687

SSI # F1h AFh

Select one of five options to specify the orientation of the OCR to read:

- 0° to the imaging engine (default)
- 270° clockwise (or 90° counterclockwise) to the imaging engine
- 180° (upside down) to the imaging engine
- 90° clockwise to the imaging engine
- Omnidirectional

Setting an incorrect orientation can cause mis-decodes.



*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

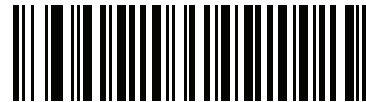
- **Parameter # 691**

SSI # F1h B3h

To select the number of OCR lines to decode, scan one of the following barcodes. Selecting Visas, TD1, or TD2 ID cards automatically sets the appropriate **OCR Lines**. Also see All OCR fonts are disabled by default on page 7.



*OCR 1 Line
(1)



OCR 2 Lines
(2)



OCR 3 Lines
(3)

OCR Minimum Characters

- **Parameter # 689**

SSI # F1h B1h

To select the minimum number of OCR characters (not including spaces) per line to decode, scan the following barcode, 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. The default is 003.



OCR Minimum Characters

OCR Maximum Characters

- **Parameter # 690**

SSI # F1h B2h

To select the maximum number of OCR characters (including spaces) per line to decode, scan the following barcode, 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. The default is 100.



OCR Maximum Characters

OCR Subset

- **Parameter # 686**

SSI # F1h AEh

Create 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 set or modify the OCR font subset:

- 1** Enable the appropriate OCR font(s).
- 2** Scan the **OCR Subset** barcode.
- 3** Scan numbers and letters to form the OCR Subset from [Alphanumeric Barcodes](#).
- 4** Scan [End of Message](#).



OCR Subset

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 Parameter** and re-program the reader.

OCR Quiet Zone

- **Parameter # 695**

SSI # F1h B7h

This option sets the OCR quiet zone. The reader 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.

To set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in [Alphanumeric Barcodes](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six character width quiet zone.



OCR Quiet Zone

OCR Template

- **Parameter # 547**

SSI # F1h 23h

This option 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 the **OCR Template** barcode, and then scan barcodes on the following pages that correspond to numbers and letters to form the template expression. Then scan End of Message. The default is 99999999 which accepts OCR strings containing any character.



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

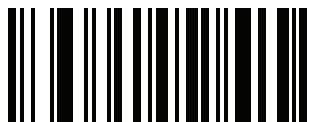


A

Require and Suppress (0)

Any character in this position, including space or reject, is suppressed from the output.

Template	Incoming data	Output
990AA	12QAB	12AB



0

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>
	1ABCZXYZ	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 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 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
P0A9999	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 set a quiet zone, scan the following barcode, then scan a two-digit number using the numeric keypad in Alphanumeric Barcodes. The range of the quiet zone is 20 - 99 and the default is 50, indicating a six character width quiet zone (scan the **OCR Template** barcode, and then barcodes corresponding to numbers and letters to form the template expression, and then End of Message) 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

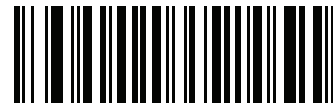
● Parameter # 688

SSI # F1h B0h

The check digit is the last digit (in the right-most position) in an OCR string and improves the accuracy of the collected data. This option sets OCR module check digit calculation. The calculation is performed on incoming data to determine this check digit, based on the numeric weight of the alpha and numeric characters. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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 To set the check digit multiplier, scan the following barcode, and then scan numbers and letters to form the multiplier string from **Alphanumeric Barcodes**. Then scan **End of Message**.

To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in **Alphanumeric Barcodes**. The default is 1.



OCR Check Digit

OCR Check Digit Multiplier

● Parameter # 700

SSI # F1h BCh

This option 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 reader 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.

121212121212 (default)

123456789A (for ISBN, Product Add Right to Left).

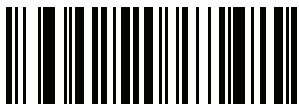
To set the check digit multiplier, scan the following barcode, and then scan numbers and letters to form the multiplier string from **Alphanumeric Barcodes**. Then scan **End of Message**.

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 the following barcode, and then scan numbers and letters to form the multiplier string from **Alphanumeric Barcodes**. Then scan **End of Message**.



OCR Check Digit Multiplier

OCR Check Digit Validation

● Parameter # 694

SSI # F1h B6h

Use the following options to protect against scanning errors by applying a check digit validation scheme.

None

No check digit validation, indicating no check digit is applied. This is the default.



*No Check Digit
(0)

Product Add Left to Right

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

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

Each character in the scanned data is assigned a numeric value. To choose the Check Digit Modulus, such as 10 for Modulus 10, scan the following barcode, and then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in Alphanumeric Barcodes. The default is 1. 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.

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

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 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 (see the table below), 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

Table of 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

Inverse OCR is white or light words on a black or dark background. Select an option for decoding inverse OCR:

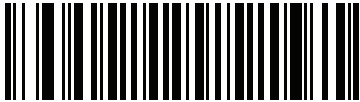
- **Regular Only** - Decode regular OCR (black on white) strings only.
- **Inverse Only** - Decode inverse OCR (white on black) strings only.
- **Autodiscriminate** - Decode both regular and inverse OCR strings.



*Regular Only
(0)



Inverse Only
(1)



Autodiscriminate
(2)

OCR Redundancy

● Parameter # 1770

SSI # F8h 06h EAh

This option 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 default setting allows the reader 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.



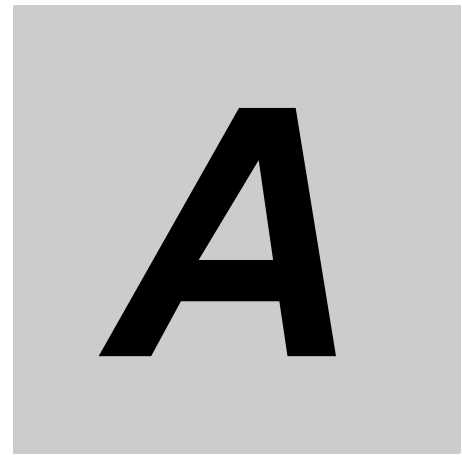
*OCR Redundancy Level 1
(1)



OCR Redundancy Level 2
(2)



OCR Redundancy Level 3
(3)



Appendices

A

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A-1 Default Parameters

Parameter	Parameter Number	Default
Radio Communications		
Radio Communications Host Types	383	Cradle Host
BT Friendly Name	607	n/a
Discoverable Mode	610	General
Wi-Fi Friendly Mode	1299	Disable
Wi-Fi Friendly Channel Exclusion	1297	Use All Channels
Radio Output Power	1324	High
Link Supervision Timeout	1698	.5 Seconds 5 Seconds
Bluetooth Radio State	1354	On
Bluetooth HID - Wait for Connection	1714	Disable
HID Features for Apple iOS	1114	Disable
HID Keyboard Keystroke Delay	N/A	No Delay (0 msec)
CAPS Lock Override	N/A	Disable
Ignore Unknown Characters	N/A	Send Barcodes with Unknown Characters
Emulate Keypad	N/A	Enable
Fast HID Keyboard	1361	Enable
Quick Keypad Emulation	1362	Enable
Keyboard FN1 Substitution	N/A	Disable
Function Key Mapping	N/A	Disable
Simulated Caps Lock	N/A	Disable
Convert Case	N/A	No Case Conversion
Reconnect Attempt Beep Feedback	559	Disable
Reconnect Attempt Interval	558	30 Seconds
Auto-reconnect	604	Auto-reconnect Immediately
Beep on Insertion	288	Enable
Beep on <BEL>	150	Enable
Modes of Operation (Point-to-Point/ Multipoint-to-Point)	538	Point-to-Point
Parameter Broadcast (Cradle Host Only)	148	Enable
Pairing Modes	542	Unlocked
Pairing Methods	545	Enable
Toggle Pairing	1322	Disable
Connection Maintenance Interval	5002	15 Minutes
Batch Mode	544	Normal (Do Not Batch Data)
Persistent Batch Storage	1399	Disable
Page Button	746	Enable
Page Options Page Mode Page State Timeout	1364 1365	Page Simple
Classic and/or Low Energy Bluetooth	1355	Classic and Low Energy
PIN Code (Set and Store)	552	12345
Variable Pin Code	608	Static (Default PIN code is 12345)
Bluetooth Security Levels	1393	Low
User Preferences		
Set Default Parameter	N/A	Restore Defaults
Parameter Barcode Scanning	236	Enable

Parameter	Parameter Number	Default
Beep After Good Decode	56	Enable
Direct Decode Indicator	859	Disable
Beeper Volume	140	High
Beeper Tone	145	Medium
Beeper Duration	628	Medium
Suppress Power Up Beeps	721	Do Not Suppress
Decode Pager Motor	613	Enable
Decode Pager Motor Duration	626	150 msec
Low Power Mode	128	Enable (HS-360X Wireless) Disable (HS-360X Wired Reader)
Time Delay to Low Power Mode	146	100 msec (HS-360X Wireless) 1 Hour (HS-360X Wired Reader)
Timeout to Low Power Mode from Auto Aim (HS-360X Wireless Only)	729	15 Seconds
Handheld Trigger Mode	138	Level
Hands-free Mode	630	Enable
Handheld Decode Aiming Pattern	306	Enable
Hands-free (Presentation) Decode Aiming Pattern	590	Enable Hands-free (Presentation) Decode Aiming Pattern on PDF
Picklist Mode	402	Disabled Always
FIPS Mode (HS-360X Wireless Only)	736	Disable
Continuous Barcode Read	649	Disable
Unique Barcode Reporting	723	Enable
Decode Session Timeout	136	9.9 Seconds
Hands-free Decode Session Timeout	400	15
Timeout Between Decodes, Same Symbol	137	0.5 Seconds
Timeout Between Decodes, Different Symbols	144	0.5 Seconds
Mobile Phone/Display Mode	716	Normal
PDF Prioritization	719	Disable
PDF Prioritization Timeout	720	200 msec
Decoding Illumination	298	Enable
Motion Tolerance (Handheld Trigger Mode Only)	858	Less
Battery Threshold Battery Status High Threshold Battery Status Medium Threshold Battery Status Low Warning Threshold Battery Health Low Warning Threshold	1367 1368 1369 1370	50% 20% 10% 60%
Add an Enter Key	N/A	N/A
Transmit Code ID Character	45	None
Preamble Value	99, 105	7013 <CR><LF>
Postamble 1 Value Postamble 2 Value	98, 104 100, 106	7013 <CR><LF>
Scan Data Transmission Format	235	Data as is
FN1 Substitution Values	103, 109	7013 <CR><LF>
Transmit "No Read" Message	94	Disable
Unsolicited Heartbeat Interval	1118	Disable
UID	740	Disable
UID Error Mode Options	742	UID Error Beep
Decoder Effort Level	1438	Level 3
DPM Illumination Control	429	Cycle Illumination
Imaging Preferences		
Operational Modes	N/A	N/A
Image Size (Number of Pixels)	302	Full



Parameter	Parameter Number	Default
JPEG Image Options	299	Quality
JPEG Target File Size	561	160 kB
JPEG Quality and Size Value	305	65
Image File Format Selection	304	JPEG
Image Rotation	665	0°
USB Host Parameters		
USB Device Type	N/A	USB Keyboard HID
Symbol Native API (SNAPI) Status Handshaking	N/A	Enable
USB Keystroke Delay	N/A	No Delay
USB CAPS Lock Override	N/A	Disable
USB Ignore Unknown Characters	N/A	Send Barcodes with Unknown Characters
Emulate Keypad	N/A	Enable
Emulate Keypad with Leading Zero	N/A	Enable
Quick Keypad Emulation	N/A	Enable
USB FN1 Substitution	N/A	Disable
Function Key Mapping	N/A	Disable
Simulated Caps Lock	N/A	Disable
Convert Case	N/A	None
USB Static CDC	N/A	Enable
Ignore Beep Directive	N/A	Enable (Ignore)
Ignore Barcode Configuration	N/A	Enable (Ignore)
USB Polling Interval	N/A	3 msec
USB Fast HID	N/A	Enable
IBM Specification Version	N/A	Version 2.2
RS-232 Host Parameters		
RS-232 Host Types	N/A	Standard
Baud Rate	N/A	9600
Parity Type	N/A	None
Stop Bits	N/A	1 Stop Bit
Data Bits	N/A	8-Bit
Check Receive Errors	N/A	Enable
Hardware Handshaking	N/A	None
Software Handshaking	N/A	None
Host Serial Response Time-out	N/A	2 Seconds
RTS Line State	N/A	Low RTS
Beep on <BEL>	N/A	Disable
Intercharacter Delay	N/A	0 msec
Nixdorf Beep/LED Options	N/A	Normal Operation
Ignore Unknown Characters	N/A	Send Barcode
Keyboard Wedge Host Parameters		
Keyboard Wedge Host Type	N/A	IBM AT Notebook
Ignore Unknown Characters	N/A	Send Barcodes with Unknown Characters
Keystroke Delay	N/A	No Delay
Intra-Keystroke Delay	N/A	Disable
Alternate Numeric Keypad Emulation	N/A	Enable
Quick Keypad Emulation	N/A	Enable
Simulated Caps Lock	N/A	Disable
Caps Lock Override	N/A	Disable
Convert Wedge Case	N/A	No Convert
Function Key Mapping	N/A	Disable

Parameter	Parameter Number	Default
FN1 Substitution	N/A	Disable
Send Make and Break	N/A	Send Make and Break Scan Codes
Enable/Disable All Code Types		
1D Symbolologies		
UPC/EAN		
UPC-A	1	Enable
UPC-E	2	Enable
UPC-E1	12	Disable
EAN-8/JAN 8	4	Enable
EAN-13/JAN 13	3	Enable
Bookland EAN	83	Disable
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	Ignore
User-Programmable Supplementals Supplemental 1: Supplemental 2:	579 580	000
UPC/EAN/JAN Supplemental Redundancy	80	10
Decode UPC/EAN/JAN Supplemental AIM ID	672	Combined
UPC Reduced Quiet Zone	1289	Disable
Transmit UPC-A Check Digit	40	Enable
Transmit UPC-E Check Digit	41	Enable
Transmit UPC-E1 Check Digit	42	Enable
UPC-A Preamble	34	System Character
UPC-E Preamble	35	System Character
UPC-E1 Preamble	36	System Character
Convert UPC-E to A	37	Disable
Convert UPC-E1 to A	38	Disable
EAN-8/JAN-8 Extend	39	Disable
Bookland ISBN Format	576	ISBN-10
UCC Coupon Extended Code	85	Disable
Coupon Report	730	New Coupon Format
ISSN EAN	617	Disable
Code 128		
Code 128	8	Enable
Set Length(s) for Code 128	209, 210	1 to 55
GS1-128 (formerly UCC/EAN-128)	14	Enable
ISBT 128	84	Disable
ISBT Concatenation	577	Autodiscriminate
Check ISBT Table	578	Enable
ISBT Concatenation Redundancy	223	10
Code 128 Security Level	751	Security Level 1
Code 128 Reduced Quiet Zone	1208	Disable
Ignore Code 128 <FNC4>	1254	Disable
Code 39		
Code 39	0	Enable
Trioptic Code 39	13	Disable
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	Disable
Code 32 Preamble	231	Disable
Set Length(s) for Code 39	18, 19	1 to 55
Code 39 Check Digit Verification	48	Disable
Transmit Code 39 Check Digit	43	Disable



Parameter	Parameter Number	Default
Code 39 Full ASCII Conversion	17	Disable
Code 39 Security Level	750	Security Level 1
Code 39 Reduced Quiet Zone	1209	Disable
Code 93		
Code 93	9	Enable
Set Length(s) for Code 93	26, 27	1 to 55
Code 11		
Code 11	10	Disable
Set Lengths for Code 11	28, 29	4 to 55
Code 11 Check Digit Verification	52	Disable
Transmit Code 11 Check Digit(s)	47	Disable
Interleaved 2 of 5 (ITF)		
Interleaved 2 of 5 (ITF)	6	Disable
Set Lengths for I 2 of 5	22, 23	6 to 55
I 2 of 5 Check Digit Verification	49	Disable
Transmit I 2 of 5 Check Digit	44	Disable
Convert I 2 of 5 to EAN 13	82	Disable
I 2 of 5 Security Level	1121	Security Level 1
I 2 of 5 Reduced Quiet Zone	1210	Disable
Discrete 2 of 5 (DTF)		
Discrete 2 of 5	5	Disable
Set Length(s) for D 2 of 5	20, 21	1 to 55
Codabar (NW-7)		
Codabar	7	Enable
Set Lengths for Codabar	24, 25	4 to 55
CLSI Editing	54	Disable
NOTIS Editing	55	Disable
Codabar Upper or Lower Case Start/Stop Characters Detection	855	Upper Case
MSI		
MSI	11	Disable
Set Length(s) for MSI	30, 31	4 to 55
MSI Check Digits	50	One
Transmit MSI Check Digit	46	Disable
MSI Check Digit Algorithm	51	Mod 10/Mod 10
Chinese 2 of 5		
Chinese 2 of 5	408	Disable
Matrix 2 of 5		
Matrix 2 of 5	618	Disable
Matrix 2 of 5 Lengths	619 620	4 to 55
Matrix 2 of 5 Check Digit	622	Disable
Transmit Matrix 2 of 5 Check Digit	623	Disable
Korean 3 of 5		
Korean 3 of 5	581	Disable
Inverse 1D	586	Regular
GS1 DataBar		
GS1 DataBar-14	338	Enable
GS1 DataBar Limited	339	Enable
GS1 DataBar Expanded	340	Enable
Convert GS1 DataBar to UPC/EAN	397	Disable

Parameter	Parameter Number	Default
GS1 DataBar Limited Security Level	728	Level 3
Composite		
Composite CC-C	341	Disable
Composite CC-A/B	342	Disable
Composite TLC-39	371	Disable
UPC Composite Mode	344	UPC Never Linked
Composite Beep Mode	398	Beep As Each Code Type is Decoded
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	Disable
2D Symbologies		
PDF417	15	Enable
MicroPDF417	227	Disable
Code 128 Emulation	123	Disable
Data Matrix	292	Enable
GS1 Data Matrix	1336	Disable
Data Matrix Inverse	588	Inverse Autodetect
QR Code	293	Enable
GS1 QR	1343	Disable
MicroQR	573	Enable
Aztec	574	Enable
Aztec Inverse	589	Inverse Autodetect
Han Xin	1167	Disable
Han Xin Inverse	1168	Regular
Postal Codes		
US Postnet	89	Disable
US Planet	90	Disable
Transmit US Postal Check Digit	95	Enable
UK Postal	91	Disable
Transmit UK Postal Check Digit	96	Enable
Japan Postal	290	Disable
Australia Post	291	Disable
Australia Post Format	718	Autodiscriminate
USPS 4CB/One Code/Intelligent Mail	592	Disable
UPU FICS Postal	611	Disable
Mailmark	1337	Disable
Symbology-Specific Security Levels		
Redundancy Level	78	1
Security Level	77	1
1D Quiet Zone Level	1288	1
Intercharacter Gap Size	381	Normal

A

A-2 Country Codes

A-2-1 Introduction

This section provides instructions for programming the keyboard to interface with a USB host. The host powers the reader.

To select a code page for the country keyboard type, see [Country Code Pages](#).

A-2-2 2D USB Country Keyboard Types (Country Codes)

Scan the programming symbol 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 **Emulate Keypad** for the USB HID host. For a keyboard wedge host, see **Alternate Numeric Keypad Emulation**.

Note: When changing USB country keyboard types the reader automatically resets and issues the standard startup beep sequences.

Note: For best results when using international keyboards, enable **Quick Keypad Emulation**.

Note: Some country keyboard programming symbols are specific to certain Windows Operating Systems (i.e., Windows 7 or higher). Programming symbols requiring a specific Windows OS are identified in their captions.

Note: Use the **French International** programming symbol for Belgian French keyboards.



* US English (North American)



US English (Mac)



Albanian



Arabic (101)



Arabic (102)



Arabic (102) AZERTY



Azeri (Latin)



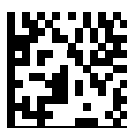
Azeri (Cyrillic)



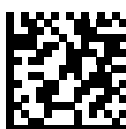
Belarusian



Bosnian (Latin)

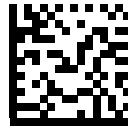


Bosnian (Cyrillic)



Bulgarian (Latin)

A



**Bulgarian Cyrillic (Typewriter)
(Bulgarian -Windows XP
Typewriter - Win 7 or higher)**



Canadian French Win7



Canadian French (Legacy)



Canadian Multilingual Standard



Chinese (ASCII)



Chinese (Simplified) *



Chinese (Traditional) *



Croatian



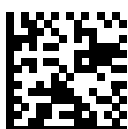
Czech



Czech (Programmer)



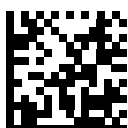
Czech (QWERTY)



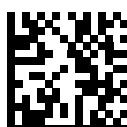
Danish



Dutch (Netherlands)

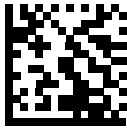


Estonian

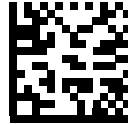


Faeroese

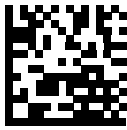
A



Finnish



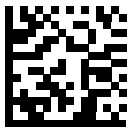
French (France)



**French International
(Belgian French)**



French (Canada) 95/98



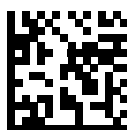
French (Canada) 2000/XP *



Galician



German



Greek Latin



Greek (220) Latin



Greek (319) Latin



Greek



Greek (220)

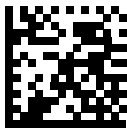


Greek (319)

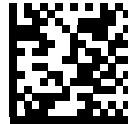


Greek Polytonic

A



Hebrew Israel



Hungarian



Hungarian_101KEY



Icelandic



Irish



Italian



Italian (142)



Japanese (ASCII)



Japanese (SHIFT-JIS) *



Kazakh



Korean (ASCII)



Korean (Hangul) *



Kyrgyz



Latin American

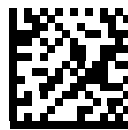
A



Latvian



Latvian (QWERTY)



Lithuanian



Lithuanian (IBM)



Macedonian (FYROM)



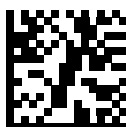
Maltese_47KEY



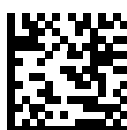
Mongolian



Norwegian



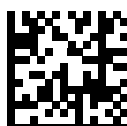
Polish (214)



Polish (Programmer)



Portuguese (Brazil)
(Windows XP)



Portuguese (Brazilian ABNT)



Portuguese (Brazilian ABNT2)

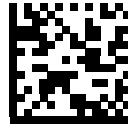


Portuguese (Portugal)

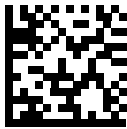




**Romanian
(Windows XP)**



**Romanian (Legacy)
(Win 7 or higher)**



**Romanian (Standard)
(Win 7 or higher)**



**Romanian (Programmer)
(Win 7 or higher)**



Russian



Russian (Typewriter)



Serbian (Latin)



Serbian (Cyrillic)



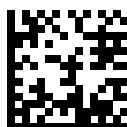
Slovak



Slovak (QWERTY)



Slovenian



Spanish



Spanish (Variation)

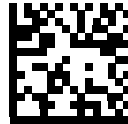


Swedish

A



Swiss French



Swiss German



Tatar



Thai (Kedmanee)



Turkish F



Turkish Q



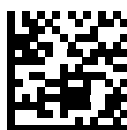
UK English



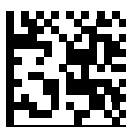
Ukrainian



US Dvorak



US Dvorak Left



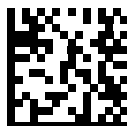
US Dvorak Right



US International



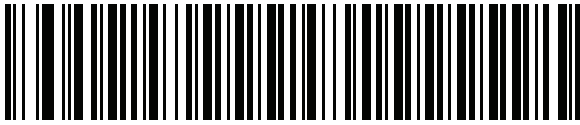
Uzbek



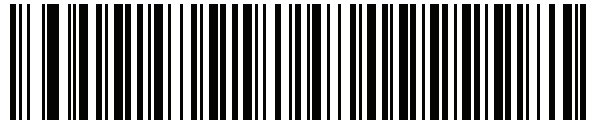
Vietnamese

A

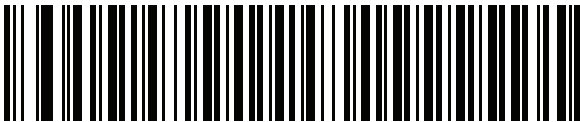
A-2-3 1D USB Country Keyboard Types (Country Codes)



*US English (North American)



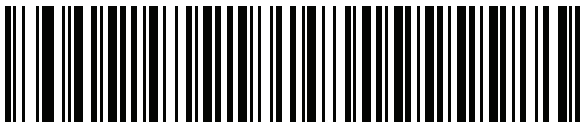
US English (Mac)



Albanian



Arabic (101)



Arabic (102)



Arabic (102) AZERTY



Azeri (Latin)



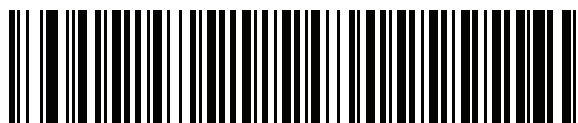
Azeri (Cyrillic)



Belarusian

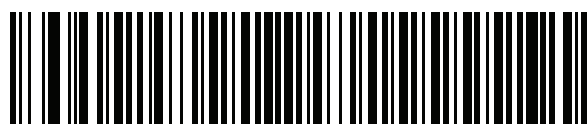


Bosnian (Latin)



Bosnian (Cyrillic)

A



Bulgarian (Latin)



**Bulgarian Cyrillic (Typewriter)
(Bulgarian -Windows XP
Typewriter - Windows 7 or higher)**



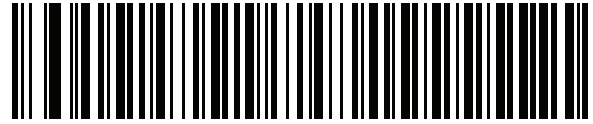
Canadian French Win7



Canadian French (Legacy)



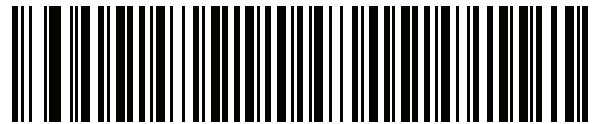
Canadian Multilingual Standard



Chinese (ASCII)

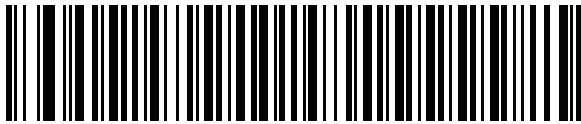


Chinese (Simplified)*



Chinese (Traditional)*

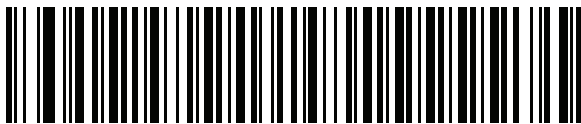
*For CJK keyboard types, see [CJK Decode Control](#).



Croatian



Czech



Czech (Programmer)



Czech (QWERTY)



Danish



Dutch (Netherlands)



Estonian



Faeroese



Finnish



French (France)

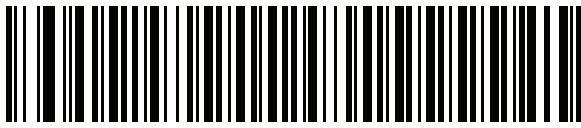


French International
(Belgian French)



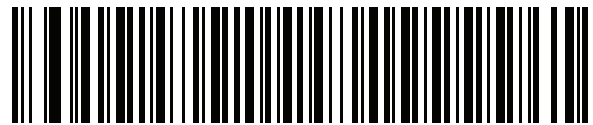
French (Canada) 95/98





French (Canada) 2000/XP*

*There is also a country code barcode for **Canadian Multilingual Standard**. Be sure to select the appropriate barcode for your host system.



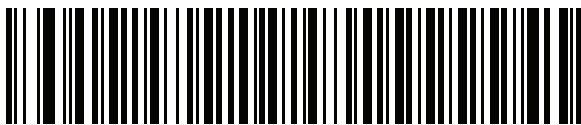
Galician



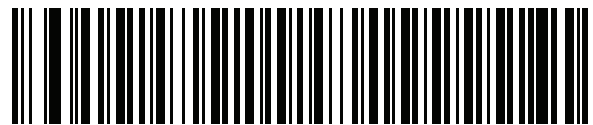
German



Greek Latin



Greek (220) Latin



Greek (319) Latin



Greek



Greek (220)



Greek (319)



Greek Polytonic



Hebrew Israel



Hungarian



Hungarian_101KEY



Icelandic

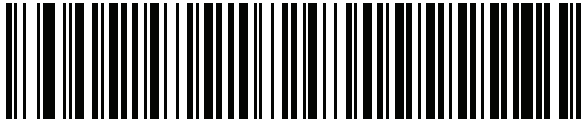


Irish

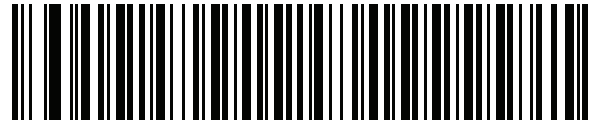


Italian

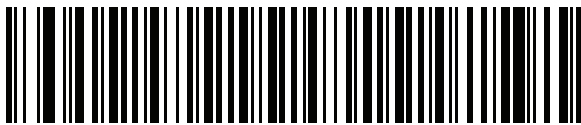
A



Italian (142)



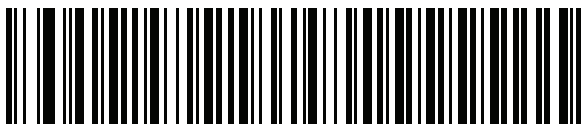
Japanese (ASCII)



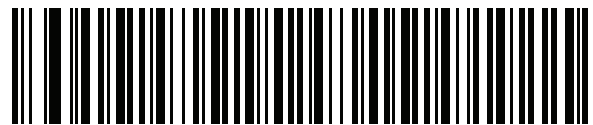
Japanese (SHIFT-JIS)*



Kazakh



Korean (ASCII)



Korean (Hangul)*

*For CJK keyboard types, see [CJK Decode Control](#).



Kyrgyz



Latin American



Latvian



Latvian (QWERTY)



Lithuanian



Lithuanian (IBM)

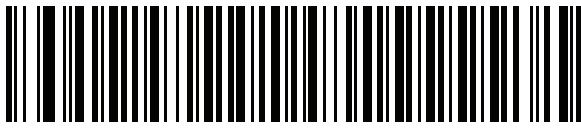


Macedonian (FYROM)



Maltese_47KEY

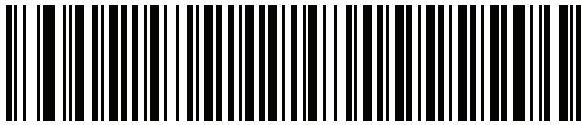
A



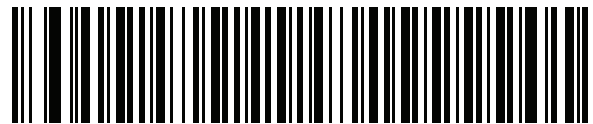
Mongolian



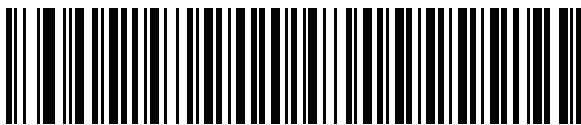
Norwegian



Polish (214)



Polish (Programmer)



Portuguese (Brazil)
(Windows XP)



Portuguese (Brazilian ABNT)



Portuguese (Brazilian ABNT2)



Portuguese (Portugal)



Romanian
(Windows XP)



Romanian (Legacy)
(Windows 7 or higher)



Romanian (Standard)
(Windows 7 or higher)



Romanian (Programmer)
(Windows 7 or higher)

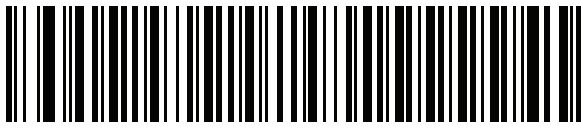


Russian

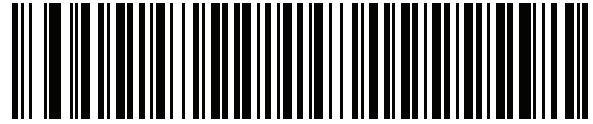


Russian (Typewriter)

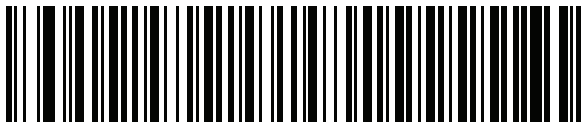
A



Serbian (Latin)



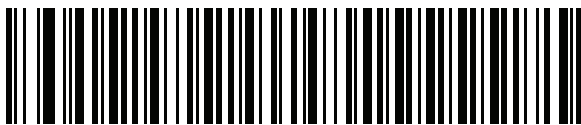
Serbian (Cyrillic)



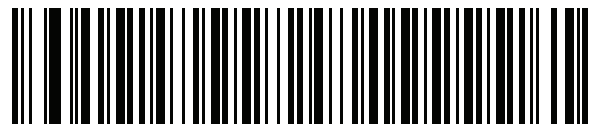
Slovak



Slovak (QWERTY)



Slovenian



Spanish



Spanish (Variation)



Swedish



Swiss French



Swiss German



Tatar



Thai (Kedmanee)



Turkish F

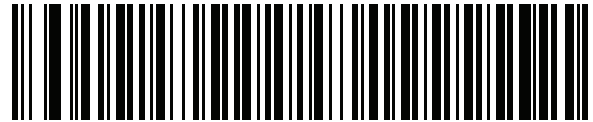


Turkish Q

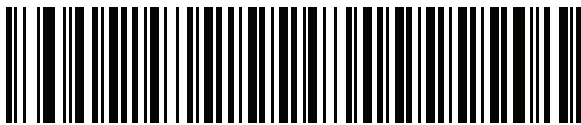




UK English



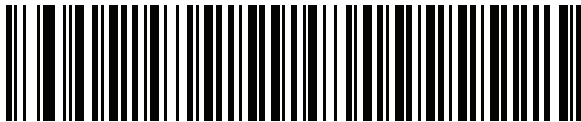
Ukrainian



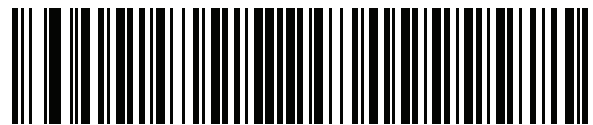
US Dvorak



US Dvorak Left



US Dvorak Right



US International



Uzbek



Vietnamese

A-3 Country Code Pages

A-3-1 Introduction

This chapter provides programming symbols for selecting code pages for the country keyboard type selected in **Standard Default Parameters**. If the default code page in the table below is appropriate for your selected country keyboard type, you do not need to scan a country code page programming symbol.

A-3-2 Country Code Page Defaults

The table below lists the code page default for each country keyboard.

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
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

Country Keyboard	Code Page Default
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
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
Swedish	Windows 1252
Swiss French	Windows 1252
Swiss German	Windows 1252
Tatar	Windows 1251

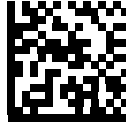
Country Keyboard	Code Page Default
Thai-Kedmanee	Windows 874
Turkish F	Windows 1254
Turkish Q	Windows 1254
Ukrainian	Windows 1251
United Kingdom	Windows 1252
United States	Windows 1252
US Dvorak	Windows 1252
US Dvorak Left Hand	Windows 1252
US Dvorak Right Hand	Windows 1252
US International	Windows 1252
Uzbek Cyrillic	Windows 1251
Vietnamese	Windows 1258

A-3-3 Country Code Page Barcodes

Scan the programming symbol 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



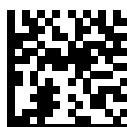
Windows 1254
Latin 5, Turkish



Windows 1255
Hebrew



Windows 1256
Arabic



**Windows 1257
Baltic**



**Windows 1258
Vietnamese**



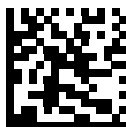
**Windows 874
Thai**



**Windows 20866
Cyrillic KOI8-R**



**Windows 932
Japanese Shift-JIS**



**Windows 936
Simplified Chinese GBK**

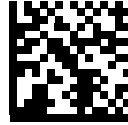


**Windows 54936
Simplified Chinese GB18030**

A



**Windows 949
Korean Hangul**



**Windows 950
Traditional Chinese Big5**



**MS-DOS 437
Latin US**



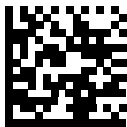
**MS-DOS 737
Greek**



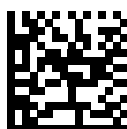
**MS-DOS 775
Baltic**



**MS-DOS 850
Latin 1**



**MS-DOS 852
Latin 2**



MS-DOS 855
Cyrillic



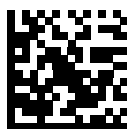
MS-DOS 857
Turkish



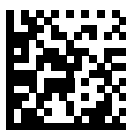
MS-DOS 860
Portuguese



MS-DOS 861
Icelandic



MS-DOS 862
Hebrew



MS-DOS 863
Canadian French

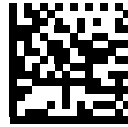


MS-DOS 865
Nordic

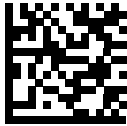
A



**MS-DOS 866
Cyrillic**



**MS-DOS 869
Greek 2**



**ISO 8859-1
Latin 1, Western European**



**ISO 8859-2
Latin 2, Central European**



**ISO 8859-3
Latin 3, Southern European**



**ISO 8859-4
Latin 4, Northern European**



**ISO 8859-5
Cyrillic**



ISO 8859-6
Arabic



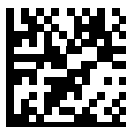
ISO 8859-7
Greek



ISO 8859-8
Hebrew



ISO 8859-9
Latin 5, Turkish



ISO 8859-10
Latin 6, Nordic

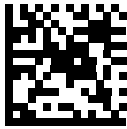


ISO 8859-11
Thai

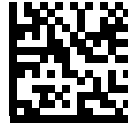


ISO 8859-13
Latin 7, Baltic

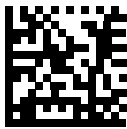
A



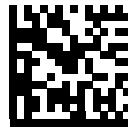
**ISO 8859-14
Latin 8, Celtic**



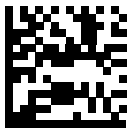
**ISO 8859-15
Latin 9**



**ISO 8859-16
Latin 10, South-Eastern European**



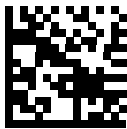
UTF-8



**UTF-16LE
UTF-16 Little Endian**



**UTF-16BE
UTF-16 Big Endian**



**Mac CP10000
Roman**

A-4 Chinese, Japanese, and Korean (CJK) Decode Control

A-4-1 Introduction

This appendix describes control parameters for CJK (Chinese, Japanese, Korean) barcode decoding through USB HID Keyboard Emulation mode.

A-4-2 CJK Control Parameters - Unicode Output Control

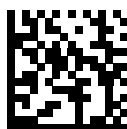
● Parameter # 973

For a Unicode-encoded CJK barcode, select one of the following options for unicode output:

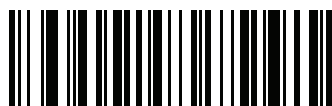
- Universal Output to Unicode and MBCS Application - This default method applies to Unicode and MBCS expected applications, such as MS Word and Notepad on a Windows host.
- **Note:** To support Unicode universal output, set up the registry table for the Windows host.
- Output to Unicode Application Only - This method applies only to Unicode-expected applications, such as MS Word and WordPad, but not Notepad.



* Universal Output
(0)



Unicode Application Only
(1)



*Universal Output
(0)



Unicode Application Only
(1)

A-4-3 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 with Windows Host**.

- **Other options for CJK output** - With the following methods, the reader sends the CJK character hexadecimal internal code (Nei Ma) value to host, or converts the CJK character to Unicode and sends the hexadecimal Unicode value to host. When using these methods, the Windows host must select the corresponding IME to accept the CJK character. See **Unicode/CJK Decode Setup with 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)

(For Japanese Unicode Output, select Simplified Chinese Unicode IME on the Windows host.)



Japanese Unicode Output



**Chinese (Simplified) GBK Output
(1)**



**Chinese (Simplified) Unicode Output
(2)**



**Korean Unicode Output
(50)**



Korean Unicode Output

(For Korean Unicode Output, select Simplified Chinese Unicode IME on the Windows host.)



**Chinese (Traditional) Big5 Output (Windows XP)
(17)**



**Chinese (Traditional) Big5 Output (Windows 7)
(19)**



**Chinese (Traditional) Unicode Output (Windows XP)
(18)**



**Chinese (Traditional) Unicode Output (Windows 7)
(20)**

A

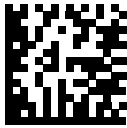
A-4-4 Non-CJK TUTF Barcode Output

- **Parameter # 960**

Some country keyboard type layouts contain characters that do not exist in the default code page (see **Country Keyboard Type Missing Characters** on the next page). Although the default code page can not encode these characters in a barcode, they can be encoded in the UTF-8 barcode. Scan this parameter programming symbol 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 reader to use the original country keyboard type.

Use US English IME on Windows.



Non-CJK UTF-8 Emulation Output



Non-CJK UTF-8 Emulation Output

A-4-5 Country Keyboard Type Missing Characters

Country keyboard type: **Tatar, Uzbek, Mongolian, Kyrgyz, Kazakh and Azeri**

Default code page: CP1251

Missing characters:

Ғ	Ɔ
Ҥ	Ƨ
Қ	Ƙ
Һ	ƞ
Ө	Ɔ
Ә	Ǝ
Ү	Ʊ
Ң	Ɲ
Ж	Ɔ
Ғ	
Һ	ƞ
Ү	Ʊ
Қ	Ƙ
Ҫ	Ɔ
К	Ƙ

Country keyboard type: **Romanian (Standard)**

Default code page: CP1250

Missing characters:

ș	Ș
ț	Ț

Country keyboard type: **Portuguese-Brazilian (ABNT), Portuguese-Brazilian (ABNT2)**

Default code page: CP1252

Missing character: **Ɔ**

Country keyboard type: **Azeri-Latin**

Default code page: CP1254

Missing characters: ə, Ə

A-5 Unicode/CJK Decode Setup with Windows Host

This section describes how to set up CJK decode with a Windows host.

A-5-1 Setting Up Windows Registry Table for Unicode Universal Output

To support the Unicode universal output method, set up the Windows host registry table as follows:

- 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.

A-5-2 Adding CJK IME on Windows

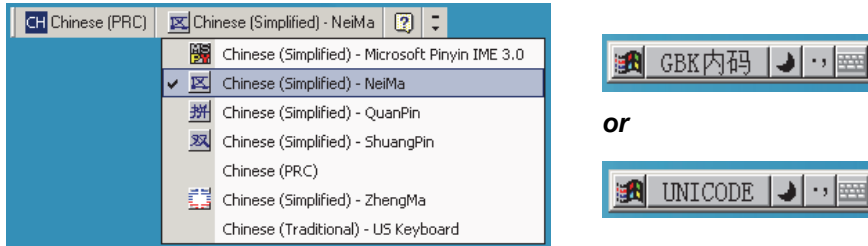
To add the desired CJK input language:

- 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.

A-5-3 Selecting the Simplified Chinese Input Method on the Host

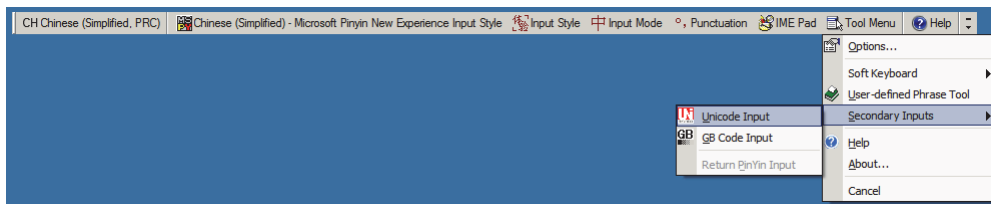
To select the Simplified Chinese input method:

- Select Unicode/GBK input on Windows XP: **Chinese (Simplified) - NeiMa**, then click the input bar to select **Unicode** or **GBK NeiMa** input.



Unicode/GBK Input on Windows XP

- 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**.



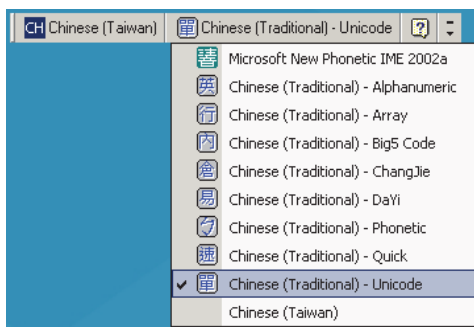
Unicode/GBK Input on Windows 7



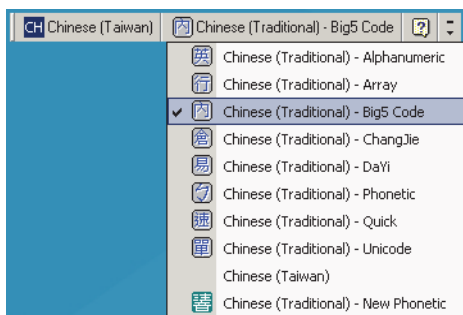
A-5-4 Selecting the Traditional Chinese Input Method on the Host

To select the Traditional Chinese input method:

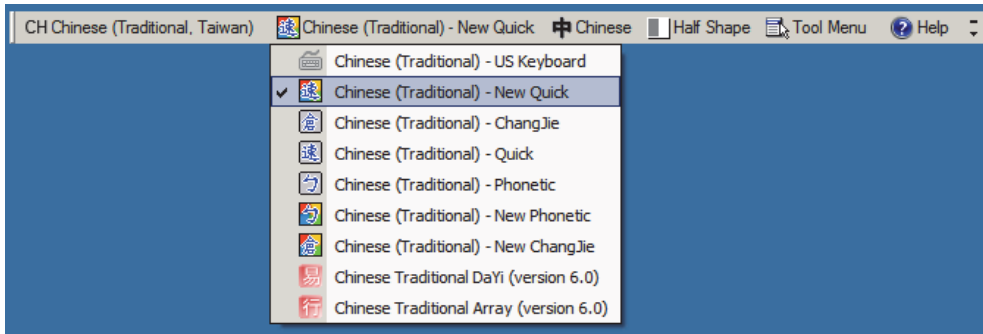
- Select Unicode input on Windows XP: **Chinese (Traditional) - Unicode**



- 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.



A-6 Programming Reference

A-6-1 Symbology Identifiers

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
V	Korean 3 of 5
X	ISSN EAN, PDF417, Macro PDF417, Micro PDF417
z	Aztec, Aztec Rune
P00	Data Matrix
P01	QR Code, MicroQR
P03	US Postnet
P04	US Planet
P05	Japan Postal
P06	UK Postal
P09	Australia Post
P0A	USPS 4CB/One Code/Intelligent Mail
P0B	UPU FICS Postal
P0C	Mailmark
P0H	Han Xin
P0G	GS1 Data Matrix
P0Q	GS1 QR

A



Symbology ID Enabled



Symbology ID Disabled

A-6-2 AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **Jcm** where:

J = Flag Character (ASCII 93)

c = Code Character

m = Modifier Character

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-DM
E	UPC/EAN, Coupon (UPC portion)
e	GS1 DataBar Family
F	Codabar
G	Code 93
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
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, SPS 4CB/One Code/ Intelligent Mail, UPU FICS Postal, Mailmark

A-6-3 Modifier Characters

The modifier character is the sum of the applicable option values based on the table below.

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	
Mailmark	0	No option specified at this time. Always transmit 0.
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.
	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 JI04123	
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 JF04123	
Code 93	0	No options specified at this time. Always transmit 0.
	Example: A Code 93 barcode 012345678905 is transmitted as JG0012345678905	
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 JM14123	
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 JS04123	
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 JE00012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN barcode 123456789X is transmitted as JX0123456789X	
ISSN EAN	0	No options specified at this time. Always transmit 0.
	Example: An ISSN EAN barcode 123456789X is transmitted as JX0123456789X	
Code 11	0	Single check digit
	1	Two check digits
	3	Check characters validated but not transmitted.

Code Type	Option Value	Option
GS1 DataBar Family		No option specified at this time. Always transmit 0. GS1 DataBar-14 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., J̄C1).
		Example: A GS1 DataBar-14 barcode 0110012345678902 is transmitted as J̄e00110012345678902.
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 emulation Note: UPC portion of composite is transmitted using UPC rules.
	1	Data packet is a GS1-128 symbol (i.e., data is preceded with J̄C1).
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 92 _{DEC} has been doubled in transmission.
	1	Reader set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92 _{DEC} are doubled.
	2	Reader set for Basic Channel operation (no escape character transmission protocol). Data characters 92 _{DEC} 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 J̄L2ABCD.
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.
GS1 Data Matrix	2	ECC 200, FNC1 in first or fifth position.
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.

Code Type	Option Value	Option
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.



A-7 Sample Symbols

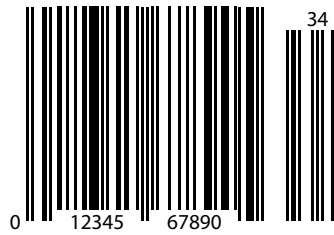
- **Code 39**



- **UPC-A, 100%**



- **UPC-A with 2-Digit Add-On**



- **UPC-A with 5-Digit Add-On**



- **UPC-E**



- **UPC-E with 2-Digit Add-On**



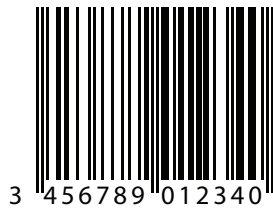
● **UPC-E with 5-Digit Add-On**



● **EAN-8**



● **EAN-13, 100%**



● **EAN-13 with 2-Digit Add-On**



● **EAN-13 with 5-Digit Add-On**

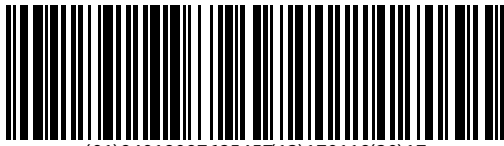


● **Code 128**



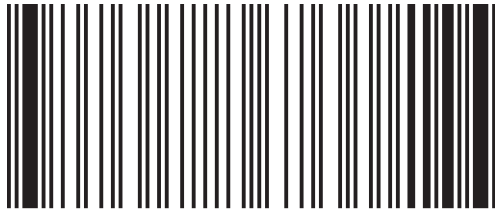
A

● **GS1-128**



(01)94019097685457(13)170119(30)17

● **Code 93**



1234567890

● **Code 11 with 2 Check Digits**



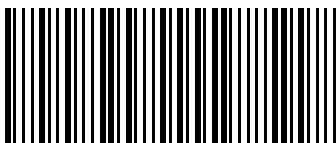
2468101275

● **Interleaved 2 of 5**



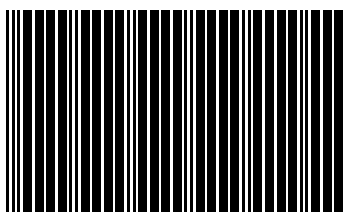
00712345678904

● **MSI with 2 Check Digits**



123455834

● **Chinese 2 of 5**



45454545454

● **Matrix 2 of 5**



223344

● **Korean 3 of 5**



● **GS1 DataBar-14**

DataBar-14 must be enabled to read the barcode below.



● **GS1 DataBar Omnidirectional (formerly GS1 DataBar-14)**



7612341562341

● **GS1 DataBar Truncated**



● **GS1 DataBar Stacked**



● **GS1 DataBar Stacked Omnidirectional**



● **GS1 DataBar Limited**



A

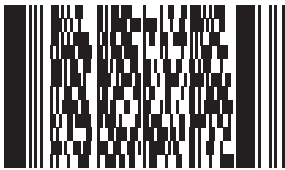
● **GS1 DataBar Expanded**



● **GS1 DataBar Expanded Stacked**



● **PDF417**



● **Data Matrix**



● **QR Code**



● **GS1 QR**



● **MicroQR**

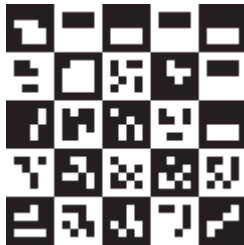


● **Aztec**



● **Grid Matrix**

Note: Grid Matrix must be enabled to read the following barcode.



● **Han Xin**



● **US Postnet**



● **UK Postal**



● **Japan Postal**



● **Australian Post**



A

- OCR-A

WFSGH67890

- OCR-B

12345ABMKP

- MICR E13B

! : 0 1 2 3 || 4 5 6 ||| 7 8 9 0 , ' "

- US Currency

F 01840626 D

A-8 Alphanumeric Keyboard

2D Alphanumeric Programming Symbols



Space



#



\$



%



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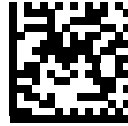


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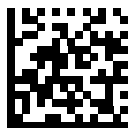
]



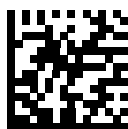
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Important: Do not mistake the following programming symbols for those on the numeric keypad.



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0



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End of Message

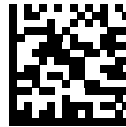


Cancel

A



A



B



C



D



E



F



G



H



I



J



K



L



M



N



O



P



Q



R



S



T



U

A



V



W



X



Y



Z



a



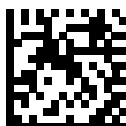
b



c



d



e



f



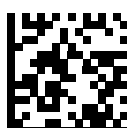
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1D Alphanumeric Programming Symbols

To correct an error or change a selection, scan the following barcode.



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Note: Do not mistake the following barcodes for those on the numeric keypad.



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End of Message



Cancel



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B



C



D

A



E



F



G



H



I



J



K



L



M



N



O



P



Q



R



S



T



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A



W



V



X



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Z



a



b



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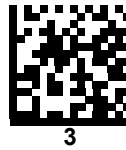
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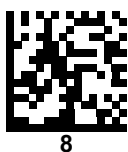
A

A-9 Numeric Keyboard

2D Numeric Programming Symbols

For parameters requiring specific numeric values, scan the appropriately numbered programming symbol(s).





8



9

- **Cancel**

To correct an error or change a selection, scan the programming symbol below.



Cancel

A

1D Numeric Programming Symbols

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

A

A-10 ASCII Character Sets

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1000	%U	CTRL 2	NUL
1001	\$A	CTRL A	SOH
1002	\$B	CTRL B	STX
1003	\$C	CTRL C	ETX
1004	\$D	CTRL D	EOT
1005	\$E	CTRL E	ENQ
1006	\$F	CTRL F	ACK
1007	\$G	CTRL G	BELL
1008	\$H	CTRL H/ BACKSPACE ¹	BCKSPC
1009	\$I	CTRL I/ HORIZONTAL TAB ¹	HORIZ TAB
1010	\$J	CTRL J	LF/NW LN
1011	\$K	CTRL K	VT
1012	\$L	CTRL L	FF
1013	\$M	CTRL M/ ENTER ¹	CR/ENTER
1014	\$N	CTRL N	SO
1015	\$O	CTRL O	SI
1016	\$P	CTRL P	DLE
1017	\$Q	CTRL Q	DC1/XON
1018	\$R	CTRL R	DC2
1019	\$S	CTRL S	DC3/XOFF
1020	\$T	CTRL T	DC4
1021	\$U	CTRL U	NAK
1022	\$V	CTRL V	SYN
1023	\$W	CTRL W	ETB
1024	\$X	CTRL X	CAN
1025	\$Y	CTRL Y	EM
1026	\$Z	CTRL Z	SUB
1027	%A	CTRL [ESC
1028	%B	CTRL \	FS
1029	%C	CTRL]	GS
1030	%D	CTRL 6	RS
1031	%E	CTRL -	US
1032	Space	Space	Space
1033	/A	!	!
1034	/B	"	"
1035	/C	#	#
1036	/D	\$	\$
1037	/E	%	%
1038	/F	&	&
1039	/G	'	'
1040	/H	((
1041	/I))
1042	/J	*	*
1043	/K	+	+
1044	/L	,	,

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the non-bold keystroke transmits.

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1045	-	-	-
1046	.	.	.
1047	/o	/	/
1048	0	0	0
1049	1	1	1
1050	2	2	2
1051	3	3	3
1052	4	4	4
1053	5	5	5
1054	6	6	6
1055	7	7	7
1056	8	8	8
1057	9	9	9
1058	/Z	:	:
1059	%F	;	;
1060	%G	<	<
1061	%H	=	=
1062	%I	>	>
1063	%J	?	?
1064	%V	@	@
1065	A	A	A
1066	B	B	B
1067	C	C	C
1068	D	D	D
1069	E	E	E
1070	F	F	F
1071	G	G	G
1072	H	H	H
1073	I	I	I
1074	J	J	J
1075	K	K	K
1076	L	L	L
1077	M	M	M
1078	N	N	N
1079	O	O	O
1080	P	P	P
1081	Q	Q	Q
1082	R	R	R
1083	S	S	S
1084	T	T	T
1085	U	U	U
1086	V	V	V
1087	W	W	W
1088	X	X	X
1089	Y	Y	Y
1090	Z	Z	Z
1091	%K	[[
1092	%L	\	\
1093	%M]]

A

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the non-bold keystroke transmits.

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1094	%N	^	^
1095	%O	_	_
1096	%W	'	'
1097	+A	a	a
1098	+B	b	b
1099	+C	c	c
1100	+D	d	d
1101	+E	e	e
1102	+F	f	f
1103	+G	g	g
1104	+H	h	h
1105	+I	i	i
1106	+J	j	j
1107	+K	k	k
1108	+L	l	l
1109	+M	m	m
1110	+N	n	n
1111	+O	o	o
1112	+P	p	p
1113	+Q	q	q
1114	+R	r	r
1115	+S	s	s
1116	+T	t	t
1117	+U	u	u
1118	+V	v	v
1119	+W	w	w
1120	+X	x	x
1121	+Y	y	y
1122	+Z	z	z
1123	%P	{	{
1124	%Q		
1125	%R	}	}
1126	%S	~	~
1127			Undefined

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the non-bold keystroke transmits.

ALT Keys	Keystroke
2050	ALT 2
2054	ALT 6
2064	ALT @
2065	ALT A
2066	ALT B
2067	ALT C
2068	ALT D
2069	ALT E
2070	ALT F
2071	ALT G
2072	ALT H
2073	ALT I
2074	ALT J

ALT Keys	Keystroke
2075	ALT K
2076	ALT L
2077	ALT M
2078	ALT N
2079	ALT O
2080	ALT P
2081	ALT Q
2082	ALT R
2083	ALT S
2084	ALT T
2085	ALT U
2086	ALT V
2087	ALT W
2088	ALT X
2089	ALT Y
2090	ALT Z
2091	ALT [
2092	ALT \
2093	ALT]

GUI Key	Keystroke
3000	Right Control Key
3001	PA 1
3002	PA 2
3003	CMD 1
3004	CMD 2
3005	CMD 3
3006	CMD 4
3007	CMD 5
3008	CMD 6
3009	CMD 7
3010	CMD 8
3011	CMD 9
3012	CMD 10
3013	CMD 11
3014	CMD 12
3015	CMD 13
3016	CMD 14
3048	GUI 0
3049	GUI 1
3050	GUI 2
3051	GUI 3
3052	GUI 4
3053	GUI 5
3054	GUI 6
3055	GUI 7
3056	GUI 8
3057	GUI 9
3065	GUI A

Note: GUI Shift Keys - The Apple iMac keyboard has an apple key on either side of the space bar. Windows-based systems have a GUI key to the left of the left ALT key, and to the right of the right ALT key.

GUI Key	Keystroke
3066	GUI B
3067	GUI C
3068	GUI D
3069	GUI E
3070	GUI F
3071	GUI G
3072	GUI H
3073	GUI I
3074	GUI J
3075	GUI K
3076	GUI L
3077	GUI M
3078	GUI N
3079	GUI O
3080	GUI P
3081	GUI Q
3082	GUI R
3083	GUI S
3084	GUI T
3085	GUI U
3086	GUI V
3087	GUI W
3088	GUI X
3089	GUI Y
3090	GUI Z

Note: GUI Shift Keys - The Apple iMac keyboard has an apple key on either side of the space bar. Windows-based systems have a GUI key to the left of the left ALT key, and to the right of the right ALT key.

PF Keys	Keystroke
4001	PF 1
4002	PF 2
4003	PF 3
4004	PF 4
4005	PF 5
4006	PF 6
4007	PF 7
4008	PF 8
4009	PF 9
4010	PF 10
4011	PF 11
4012	PF 12
4013	PF 13
4014	PF 14
4015	PF 15
4016	PF 16

F Keys	Keystroke
5001	F 1
5002	F 2
5003	F 3
5004	F 4
5005	F 5

F Keys	Keystroke
5006	F 6
5007	F 7
5008	F 8
5009	F 9
5010	F 10
5011	F 11
5012	F 12
5013	F 13
5014	F 14
5015	F 15
5016	F 16
5017	F 17
5018	F 18
5019	F 19
5020	F 20
5021	F 21
5022	F 22
5023	F 23
5024	F 24

Numeric Keypad	Keystroke
6042	*
6043	+
6044	Undefined
6045	-
6046	.
6047	/
6048	0
6049	1
6050	2
6051	3
6052	4
6053	5
6054	6
6055	7
6056	8
6057	9
6058	Enter
6059	Num Lock

Extended Keypad	Keystroke
7001	Break
7002	Delete
7003	Pg Up
7004	End
7005	Pg Dn
7006	Pause
7007	Scroll Lock
7008	Backspace
7009	Tab
7010	Print Screen
7011	Insert

Extended Keypad	Keystroke
7012	Home
7013	Enter
7014	Escape
7015	Up Arrow
7016	Dn Arrow
7017	Left Arrow
7018	Right Arrow

A-11 Non-Parameter Attributes

Introduction

This appendix defines non-parameter attributes.

Attributes

● Model Number

Attribute #533

Model number of the reader. This electronic output matches the printout on the physical device label, for example **LI2208-SR00006ZZWW**.

Type	S
Size (Bytes)	18
User Mode Access	R
Values	Variable

● Serial Number

Attribute #534

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).

Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

● Date of First Programming

Attribute #614

Date of first electronic programming represents the first time settings where electronically loaded to the reader either by WebLink_{PC} or via SMS, for example **18MAY14** (which reads the 18th of May 2014).

Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

● **Configuration Filename**

Attribute #616

The name assigned to the configuration settings loaded electronically to the device either by WebLink_{PC} or via SMS.

Note: Scanning the **Set Defaults** programming symbol 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 programming symbol.

Type	S
Size (Bytes)	17
User Mode Access	RW
Values	Variable

● **Beeper/LED**

Attribute #6000

Activates the beeper and/or LED.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values:	

Beep / LED Action	Value
1 high short beep	0
2 high short beeps	1
3 high short beeps	2
4 high short beeps	3
5 high short beeps	4
1 low short beep	5
2 low short beeps	6
3 low short beeps	7
4 low short beeps	8
5 low short beeps	9
1 high long beep	10
2 high long beeps	11
3 high long beeps	12
4 high long beeps	13
5 high long beeps	14
1 low long beep	15
2 low long beeps	16
3 low long beeps	17
4 low long beeps	18
5 low long beeps	19
Fast warble beep	20
Slow warble beep	21

High-low beep	22
Low-high beep	23
High-low-high beep	24
Low-high-low beep	25
High-high-low-low beep	26
Green LED off	42
Green LED on	43
Red LED on	47
Red LED off	48

● Parameter Defaults

Attribute #6001

This attribute restores all parameters to their factory defaults.

Type	X
Size (Bytes)	N/A
User Mode Access	W
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 reader.

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.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	N/A

● Host Trigger Session

Attribute #6005

This attribute triggers a decode session similar to manually depressing the reader trigger button.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	1 = Start Host Trigger Session 0 = Stop Host Trigger Session

● **Firmware Version**

Attribute #20004

The reader's operating system version. For example, NBRFMAAC or PAAAABS00-007-R03D0.

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**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

● **ImageKit Version**

Attribute #20013

Identifies the 2D decode algorithms resident on the device, for example **IMGKIT_7.01T08.31**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

A-12 Communication Protocol Functionality (V410-H Only)

Functionality Supported via Communication (Cable) Interface

This table lists supported reader functionality by communication protocol.

Communication Interfaces	Functionality		
	Data Transmission	Remote Management	Image and Video Transmission
USB			
HID Keyboard Emulation	Supported	Not Available	Not Available
Simple COM Port 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
IBM 4690			
Hand-held Reader Emulation (Port 9B)	Supported	Not Available	Not Available
Table-top Reader Emulation (Port 17)	Supported	Supported	Not Available
Non-IBM Reader Emulation (Port 5B)	Supported	Supported	Not Available
Keyboard Wedge			
IBM PC/AT & IBM PC Compatibles	Supported	Not Available	Not Available
IBM AT Notebook	Supported	Not Available	Not Available

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