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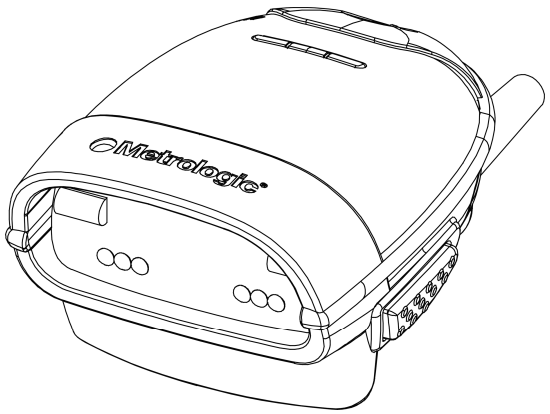
METROLOGIC INSTRUMENTS, INC.

IS1650 Focus*E*™
Area Imaging Bar Code Scanner
Installation and User's Guide



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INTRODUCTION

PRODUCT OVERVIEW

The IS1650 is a high performance area imaging bar code scanner that utilizes a high-resolution CMOS imaging sensor for unrivaled image quality. The IS1650 is the choice of 2D imaging scanners that delivers superior performance for presentation and fixed-mount applications. The IS1650 employs Omniplanar, Inc.'s SwiftDecoder™ software, for reliable decoding of all 1D and 2D bar code symbologies.

Omnidirectional scanning capabilities and an extended depth of field provides aggressive scanning of all standard 1D, RSS, PDF417, microPDF, Composite, Matrix and Postal Codes symbology types. In addition, the IS1650 scanner supports OCR (A, B, & MICR).

The IS1650 provides a built-in object detection sensor (IR) that instantly turns on the scanner when an object is presented within the scanner's field of view. Whether fixed mount or in stand, the IS1650 delivers aggressive, convenient hands-free scanner. Firmware updates are easily loaded into Flash memory.

KEY PRODUCT FEATURES

The IS1650 is equipped with a multitude of standard features including:

- Automatic Scanning Operation
- Supports Multiple Interfaces Including USB and Keyboard Wedge
- Custom Edit the Bar Code Data
- OPOS and JPOS System Compatible
- User Replaceable Cables
- Sunrise 2005 Compliant
- RoHS Compliant
- Supports Customer Software Plug-Ins

APPLICATIONS AND PROTOCOLS

The model number on each scanner includes the scanner number and factory default communications protocol.

SCANNER	VERSION IDENTIFIER	COMMUNICATION PROTOCOL(S)
IS1650 -	14	RS232 (TX, RX, RTS, CTS, DTR)
	38	Low Speed USB and RS232 Transmit/Receive
	47	Keyboard Wedge, Stand-Alone Keyboard and RS232 Transmit/Receive
	106	IBM 46xx RS485, Full Speed USB, and RS232 Transmit/Receive

The IS1650-47 with a built-in PC Keyboard Wedge Interface is designed for Keyboard emulation use only. Many RS232 configurable functions are also available as keyboard wedge functions.

The following are the most important selectable options specific to the keyboard wedge.

Keyboard Type

- **AT (includes IBM® PS2 models 50, 55, 60, 80)
- IBM PS2 (includes models 30, 70, 8556)

Keyboard Country Type

- *USA
- Belgian
- French
- German
- Hungarian
- Italian
- Japanese
- Russian Cyrillic
- Slovenian
- Spanish
- Swiss
- Swedish/Finnish
- Turkish
- United Kingdom

** For additional information on the IS1650's default settings refer to pages 32-35. For information on how to change the default settings, refer to help files in MetroSet2 or the MetroSelect Single-Line Configuration Guide (MLPN 00-02544).

SCANNER AND ACCESSORIES

BASIC KIT	
Part #	**Description**
IS1650	Area Imaging Bar Code Scanner
00-02544	MetroSelect® Single-Line Configuration Guide*
00-02281	Area Imaging Supplemental Configuration Guide*
00-02287	IS1650 Series Area Imaging Bar Code Scanner Installation and User's Guide*

** Also available for download on the Metrologic website - www.metrologic.com*

OPTIONAL ACCESSORIES	
Part #	**Description**
AC to DC Power Transformer Regulated 5.2VDC @ 1 AMP output.	
46-00525	120V United States
46-00526	220V-240V Continental European
46-00870	220V-240V United Kingdom
46-00528	220V-240V Australia
46-00529	220V-240V China

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

SCANNER AND ACCESSORIES

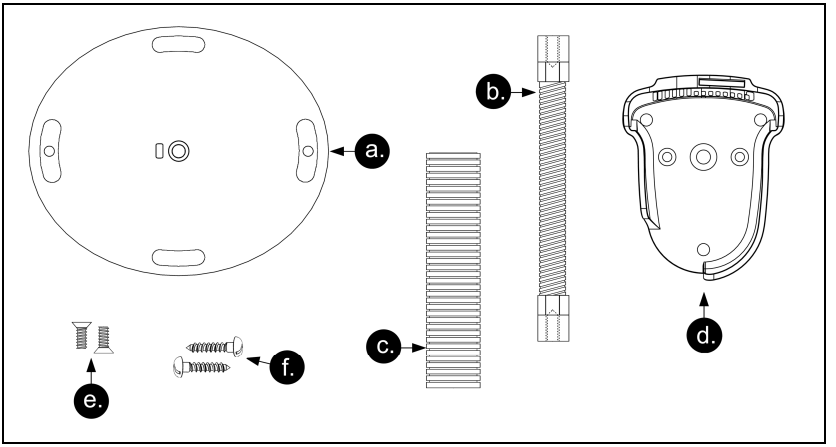
OPTIONAL ACCESSORIES	
Part #	**Description**
IS1650 Scanner Interface Specific Cables	
59-59000-3	RS232 PowerLink Cable with Built in Power Jack, straight, black
54-54002-3	Keyboard Wedge PowerLink Cable with Adapter Cable, straight, black
54-54020-3	Stand Alone Keyboard PowerLink Cable, straight, black
59-59313-N-3	USB Power/Communication Cable, straight, black
MVC-3M106S-IB9	Metrologic Voltage Converter (MVC) Cable* ±12VDC to +5.2VDC, straight, black
* *Contact a Metrologic customer service representative for additional information on the MVC cable series and the host connections available.*	

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

SCANNER AND ACCESSORIES

OPTIONAL ACCESSORIES	
Part #	**Description**
00-02001	IS1650 Series Stand Installation Guide
46-00710	Flex Stand, Kit

Flex Stand, Kit Components



a. Stand Base ..... Qty. 1

b. Flexible Shaft ..... Qty. 1

c. Flexible Shaft Cover ..... Qty. 1

d. Scanner Cradle ..... Qty. 1

e. 1/4" – 20 x 1/2" Flat Head Phillips ..... Qty. 2

f. #8 Round Head Wood Screw ..... Qty. 2

Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

DESIGN SPECIFICATIONS

	IS1650 DESIGN SPECIFICATIONS	
OPERATIONAL		
Light Source:	LED 645 nm	
Pulse Duration:	1 ms to 8 ms	
Maximum Output of an Osram LED:	Maximum 85 mA emits 3,120 mlm	
Depth of Scan Field:	0 mm – 254 mm (0" – 10") for 0.330 mm (13 mil) Bar Code at Default Setting	
Field of View:	49 mm W x 19 mm H (1.9" W x 0.8"H) at 20 mm (0.8")	
	264 mm x 106 mm (10.4"W x 4.2" H) at 280 mm (11.0")	
Minimum Bar Width:	0.127 mm (5.0 mil)	
Infrared Activation:	Long Range: 0 mm – 203 mm (0" – 8") from Window	
	Short Range: 0 mm – 101 mm (0" – 4") from Window	
Decode Capability:	Autodiscriminates All Standard 1-D, RSS, PDF417, microPDF, MaxiCode, Data Matrix, QR Code, UCC, EAN Composites, Postals, Aztec, *OCR (A, B, MICR) (*Image Transfer*) – BMP, TIFF, or JPEG output ** Optional Decode Capability*	
System Interfaces:	PC Keyboard Wedge, RS232 (FULL & TTL), IBM 46xx RS485, Stand Alone Keyboard, USB (Low/Full Speed)	
Print Contrast:	20% Minimum Reflectance Difference	
Number Characters Read:	Up to 80 Data Characters on 1D; 1850 Text Characters for PDF417	
Beeper Operation:	7 tones or no beep	
Indicators (LED) *Default Settings:*	Blue	Unit Powered, Ready to Scan
	White	Good Read
	Yellow	In Stand
MECHANICAL		
Height:	62 mm (2.44")	
Width:	80 mm (3.15")	
Depth:	116 mm (4.57")	
Weight:	204 g (7.2 oz.)	
Termination:	10 pin modular RJ45	

Specifications are subject to change without notice.

DESIGN SPECIFICATIONS (CONT.)

	IS1650 DESIGN SPECIFICATIONS
ELECTRICAL	
Input Voltage:	5.0VDC ± 0.25V
Power:	Peak = 2 W (Typical)
	Operating = 1.65 W (Typical)
	Idle / Standby = 800 mW (Typical)
Current:	Peak = 400 mA (Typical)
	Operation = 330 mA (Typical)
	Idle / Standby = 160 mA (Typical)
DC Transformer:	Class 2; 5.2VDC @ 1 AMP
For Regulatory Compliance information, see pages 40- 42	
ENVIRONMENTAL	
Temperature:	Operating = 0°C to 40° (32° to 104°F)
	Storage = -40°C to 60°C (-40°F to 140°F)
Humidity:	0% to 95% Relative Humidity, Non-Condensing
Light Levels:	Up to 100,000 Lux (9,290 Footcandles)
Shock:	Designed to withstand 1.0 m (3.3 ft.) drops
Contaminants:	Sealed to resist airborne particulate contaminants
Ventilation:	None required

Specifications are subject to change without notice.

IS1650 SCANNER

Components

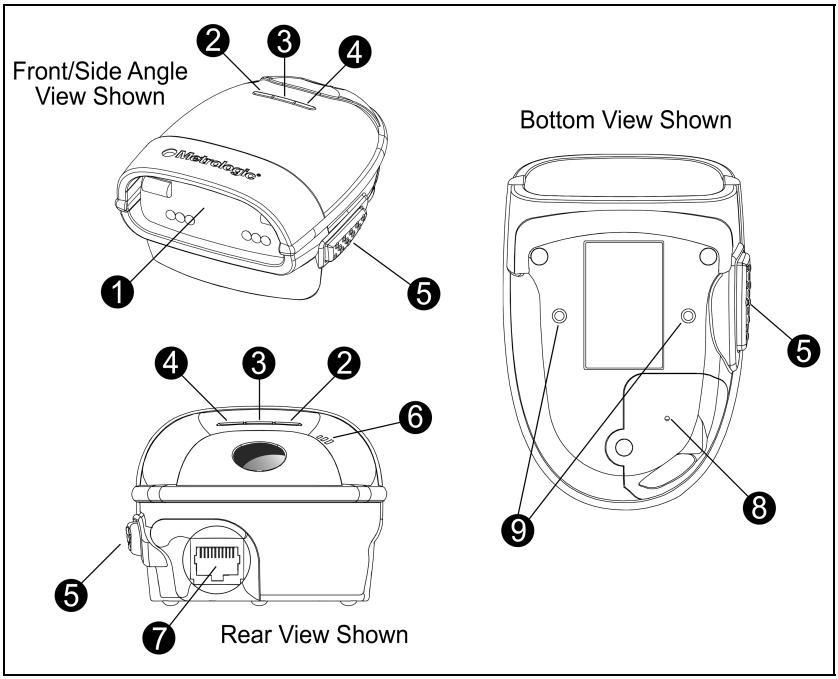


Figure 1. Scanner Components

	Item Description	
1	Red Window	LED Aperture
2	Blue LED	See *Visual Indicators* (on page 23)
3	White LED	See *Visual Indicators* (on page 23)
4	Yellow LED	See *Visual Indicators* (on page 23)
5	Trigger	Initiates Bar Code Read
6	Speaker	See *Audible Indicators* (on page 22)
7	Cable Connection	10-pin RJ45, Female Socket, See *Scanner Pinout Connections* (on page 36)
8	Cable Release	See *The PowerLink Cable* (on page 11)
9	M3 Mounting Holes	M3 Mounting Holes for Mounting Scanner

IS1650 SCANNER

Dimensions

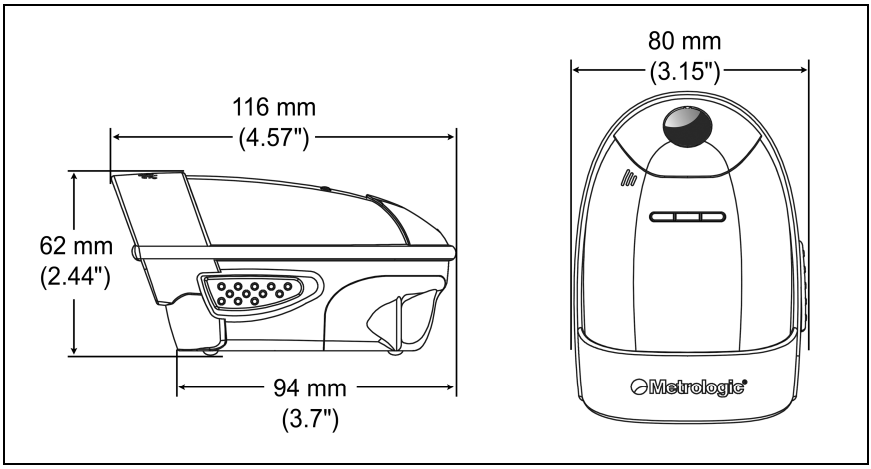


Figure 2. Scanner Dimensions

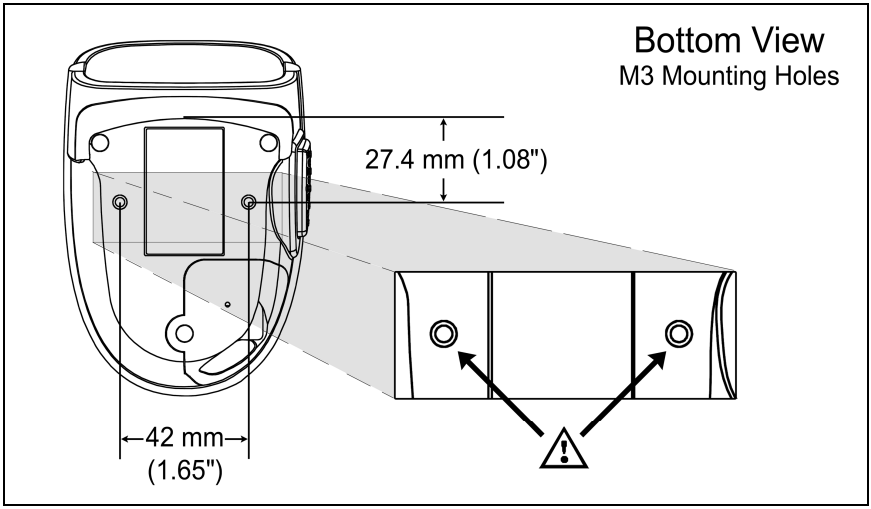


Figure 3. M3 Mounting Hole Dimensions

Caution:
The depth of each mounting hole is 12 mm (0.5"). For fixed mount, the mounting screws should not be over-tightened or go deeper than 10 mm (0.4") passing the bottom surface of the unit. Going further may cause serious damage to the unit and void the manufacturer warranty.

IS1650 SCANNER

Caution and Serial Number Labels

Each scanner has a label located on the bottom of the unit, as well as text embedded into the bottom casing. This label provides the unit's model number, date of manufacture, serial number, CE and caution information. The following figure gives an example of the label/text and their location.

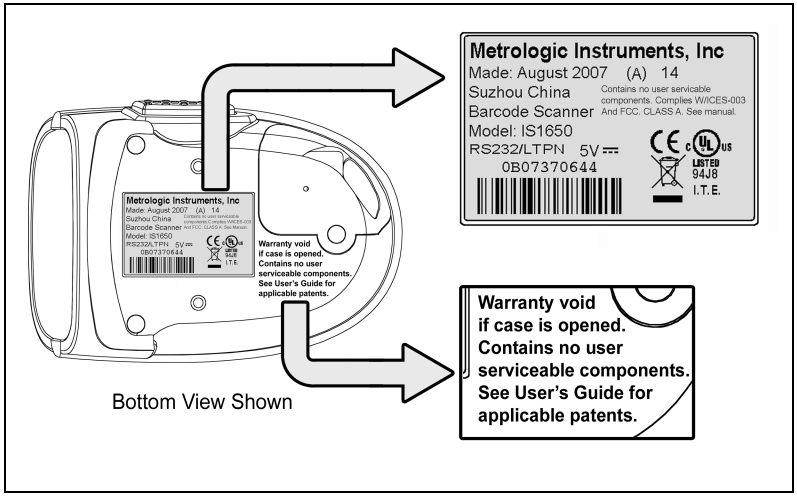


Figure 4. Label Samples and Location

Caution:
To maintain compliance with applicable standards, all circuits connected to the scanner must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950-1.

To maintain compliance with standard CSA-C22.2 No. 60950-1/UL 60950-1 and norm EN/IEC 60950-1, the power source should meet applicable performance requirements for a limited power source.

THE POWERLINK CABLE

Connecting

Important: If the PowerLink cable is not fully 'latched', the unit can power intermittently.

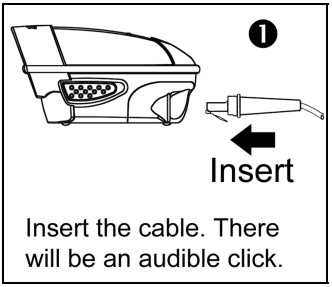


Figure 5.

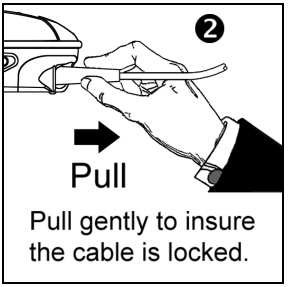


Figure 6.

Disconnecting

Before removing the cable from the scanner, Metrologic recommends that the power on the host system is off and the power supply has been disconnected from the PowerLink cable.

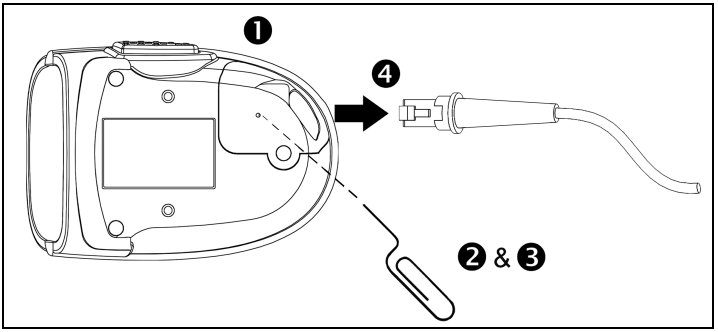


Figure 7. Releasing the PowerLink Cable

1. Locate the small 'pin-hole' on the bottom of the unit near the cable.
2. Bend an ordinary paperclip into the shape shown above.
3. Insert the paperclip (or other small metallic pin) into the small 'pin-hole'.
4. There will be a faint 'click'. Pull gently on the strain-relief of the PowerLink cable to remove the cable from the unit.

CABLE INSTALLATION (INTERFACE SPECIFIC)

RS232 IS1650-14

1. Turn off the host device.
2. Plug the male 10-pin RJ45 end of the PowerLink cable into the 10-pin socket on the IS1650. There will be an audible *click* when the connector lock engages.
3. Connect the 9-pin D-type connector of the communication cable to the proper COM port of the host device.
4. Plug the power supply into the power jack on the PowerLink cable.

> Check the AC input requirements of the power supply verify the voltage matches the AC outlet. The outlet must be located near the equipment and be easily accessible.

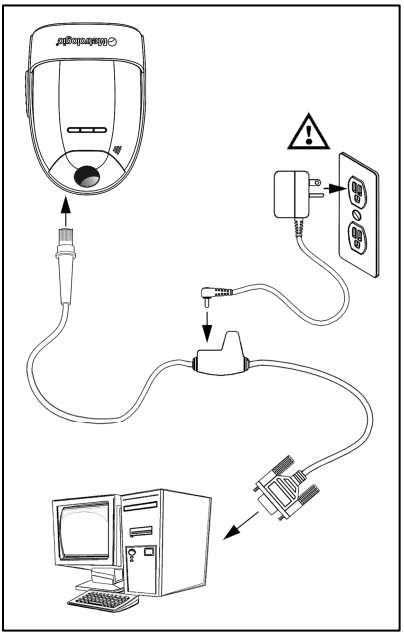


Figure 8.

5. Connect the power supply transformer to an appropriate AC power outlet.
6. The IS1650 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.
7. Turn on the host device.

> Plugging the scanner into a port on the host system does not guarantee that scanned information will be communicated properly to the host system. The scanner is shipped from the factory configured with default settings. Please refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet2's help files for instructions on changing the scanner's configuration. In addition, please check that the scanner and host system are using the same communication protocol.

> *See SELV Power caution statement located on page 10 of this manual*.

CABLE INSTALLATION (INTERFACE SPECIFIC)

Keyboard Wedge IS1650-47

1. Turn off the host device.
2. Plug the 10-pin RJ45 male end of the PowerLink cable into 10-pin socket on the IS1650. There will be an audible *click* when the connector lock engages.
3. Disconnect the keyboard from the host device.
4. Connect the "Y" ends of the communication cable to the keyboard and keyboard port on the host device.
   If necessary, use the male/female adapter cable supplied with the scanner for proper connections.
5. Plug the external power supply (*required*) into the power jack on the PowerLink cable.

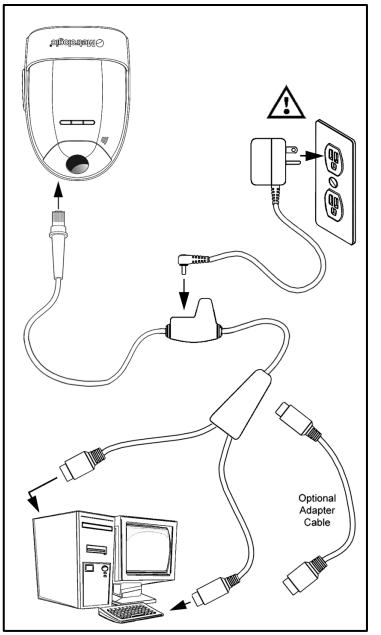


Figure 9.

> Check the AC input requirements of the power supply to verify the voltage matches the AC outlet. The outlet must be located near the equipment and be easily accessible.

6. Connect the power supply transformer to an appropriate AC power outlet.
7. The IS1650 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.
8. Turn on the host device.

> Plugging the scanner into a port on the host system does not guarantee that scanned information will be communicated properly to the host system. The scanner is shipped from the factory configured with default settings. Please refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet2's help files for instructions on changing the scanner's configuration. In addition, please check that the scanner and host system are using the same communication protocol.

See SELV Power caution statement located on page 10 of this manual.

CABLE INSTALLATION (INTERFACE SPECIFIC)

Stand Alone Keyboard IS1650-47

1. Turn off the host device.
2. Plug the male 10-pin RJ45 end of the PowerLink cable into the 10-pin socket on the IS1650. There will be an audible *click* when the connector lock engages.
3. Plug the other end of the communication cable into the host's keyboard port.
4. Plug the external power supply (*required*) into the power jack on the PowerLink cable.

> Check the AC input requirements of the power supply to verify the voltage matches the AC outlet. The outlet must be located near the equipment and be easily accessible.

5. Connect the power supply transformer to an appropriate AC power outlet.

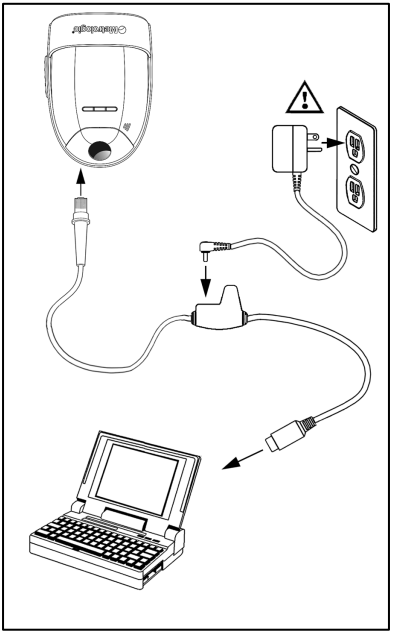


Figure 10.

6. The IS1650 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.
7. Turn on the host device.

> Plugging the scanner into a port on the host device does not guarantee that scanned information will be communicated properly to the host device. The scanner is shipped from the factory configured with default settings. Please refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet*2*'s help files for instructions on changing the scanner's configuration. In addition, please check that the scanner and host system are using the same communication protocol.

See SELV Power caution statement located on page 10 of this manual.

CABLE INSTALLATION (INTERFACE SPECIFIC)

IBM 46xx RS485 IS1650-106

1. Turn off the host device.
2. Plug the male 10-pin RJ45 end of the MVC cable into the 10-pin socket on the IS1650. There will be an audible *click* when the connector lock engages.
3. Connect the other end of the MVC cable to the host device.
4. Turn on the host device.
5. The IS1650 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.

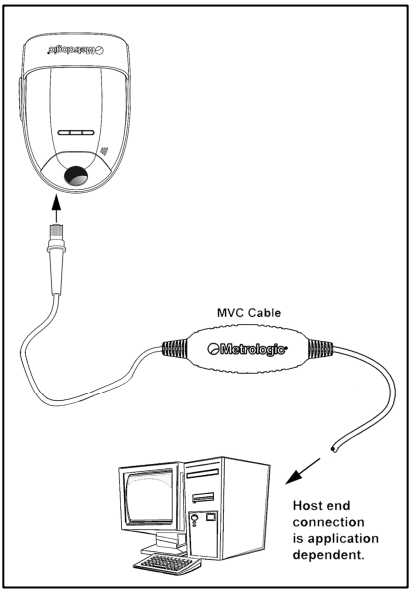


Figure 11.

Plugging the scanner into a port on the host system does not guarantee that scanned information will be communicated properly to the host system. The scanner is shipped from the factory configured with default settings. Please refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet2's help files for instructions on changing the scanner's configuration. In addition, please check that the scanner and host system are using the same communication protocol.

See SELV Power caution statement located on page 10 of this manual.

CABLE INSTALLATION (INTERFACE SPECIFIC)

Integrated USB:
Low Speed IS1650-38
Full Speed IS1650-106

1. Turn off the host device.
2. Plug the male 10-pin RJ45 end of the USB cable into the 10-pin socket on the IS1650. There will be an audible *click* when the connector lock engages.
3. Plug the USB type A end (locking with power or non-locking, depending upon host setup) of the USB cable into the host's USB port.
4. Turn on the host device.
5. The IS1650 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.

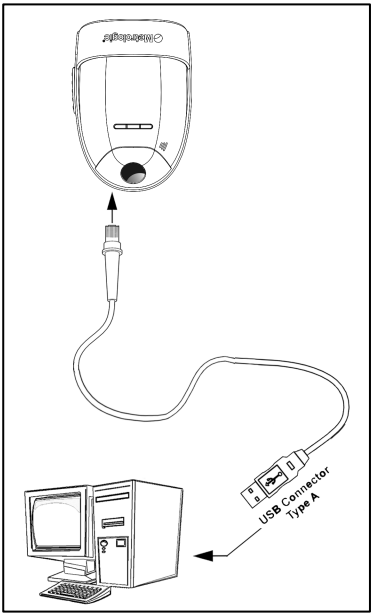


Figure 12.

As a default, the IS1650-38 leaves the factory with USB Keyboard Emulation Mode enabled.

For information on configuring the IS1650-38 for USB Serial Emulation Mode, please refer to the USB section of the MetroSelect Single-Line Configuration Guide (MLPN 00-02544).

Plugging the scanner into a port on the host device does not guarantee that scanned information will be communicated properly to the host device. The scanner is shipped from the factory configured with default settings. Please refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet2's help files for instructions on changing the scanner's configuration. In addition, please check that the scanner and host system are using the same communication protocol.

See SELV Power caution statement located on page 10 of this manual.

FLEX STAND INSTALLATION (OPTIONAL)

Metrologic provides two #8 wood screws for securing the stand base to the counter top. The following figure provides the pilot hole dimensions for securing the stand base.

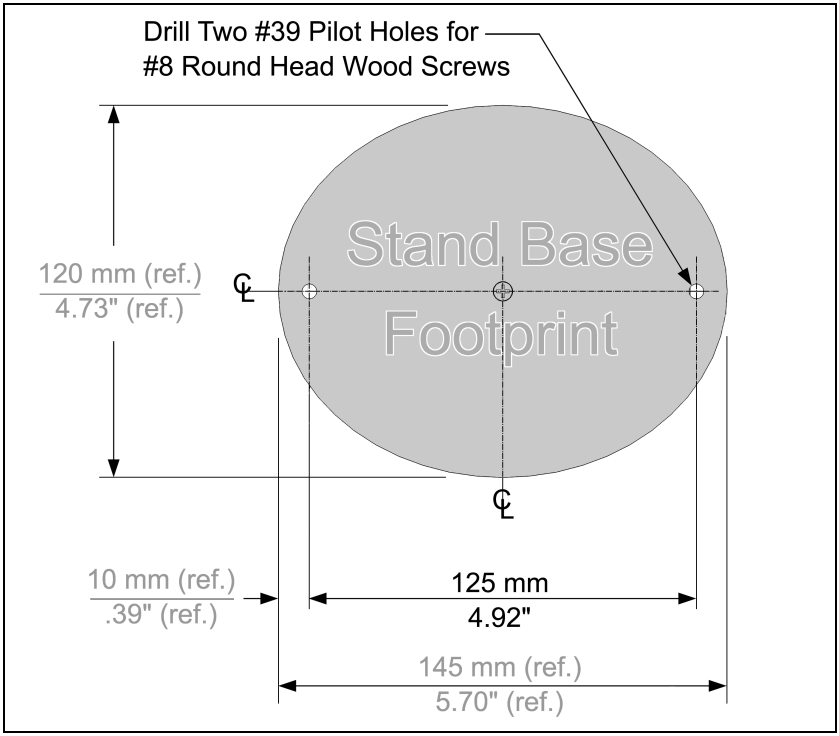


Figure 13. Stand Base Hole Pattern (Not to Scale)

FLEX STAND INSTALLATION (OPTIONAL)

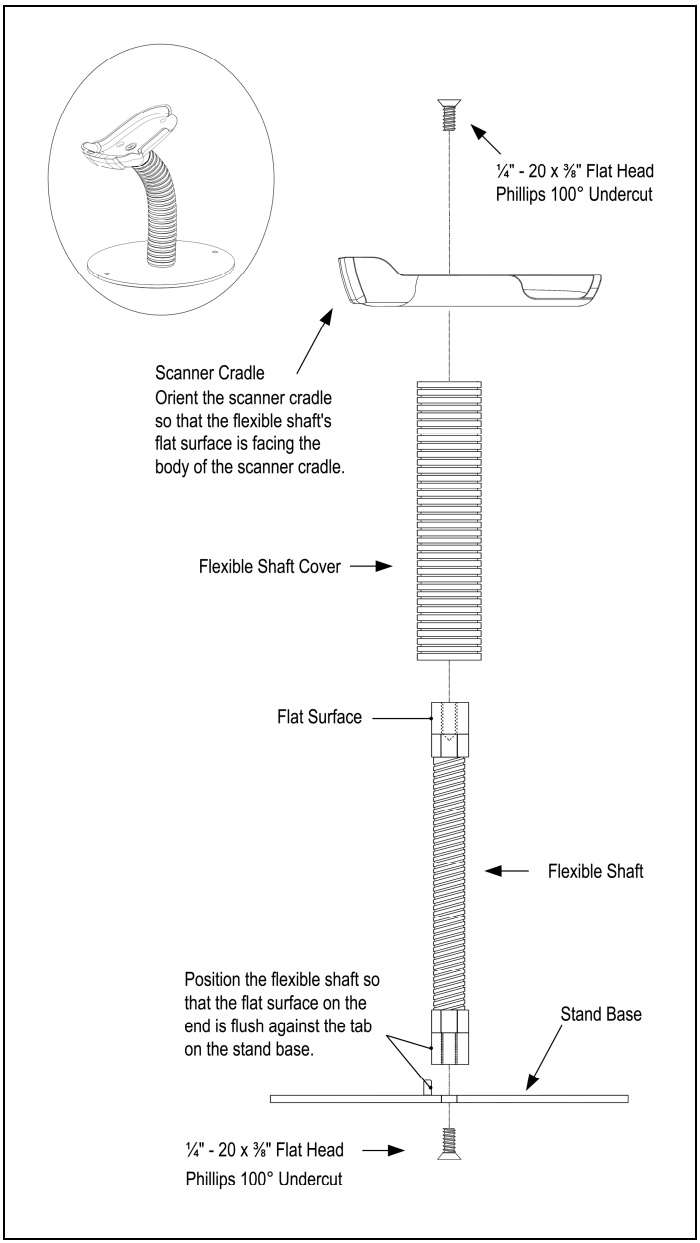


Figure 14. Assembling the Stand

CONFIGURATION MODES

The IS1650 Series scanner has three modes of configuration.

- **Bar Codes**
  The IS1650 can be configured by scanning the bar codes included in the Metrologic Single-Line Configuration Guide (MLPN 00-02544) or the Supplemental Configuration Guide (MLPN 00-02281). These manuals can be downloaded FREE of charge from Metrologic's website (www.metrologic.com).

- **MetroSet*2***
  This user-friendly Windows-based configuration program allows you to simply 'point-and-click' at the desired scanner options. This program can be downloaded FREE of charge from Metrologic's website (www.metrologic.com) or set-up disks can be ordered by calling 1-800-ID-METRO.

- **Serial Configuration**
  This mode of configuration is ideal for OEM applications. This mode gives the end-user the ability to send a series of commands using the serial port of the host system. The commands are equivalent to the numerical values of the bar codes located in the MetroSelect Single-Line Configuration Guide (MLPN 00-02544).

SCANNER CONFIGURATION

The IS1650 Focus*E* is part of Metrologic's line of scanners with flash upgradeable firmware. The upgrade process requires a new firmware file supplied to the customer by a customer service representative◆ and Metrologic's MetroSet*2* software◆◆. A personal computer running Windows 95 or greater with an available RS232 serial or USB port is also required to complete the upgrade.

PowerLink Cable #54-54014 is required when using RS232 for the upgrade process. This cable can be ordered from Metrologic at 1-800-ID-METRO. **Do not** use the standard cable supplied with keyboard wedge or RS485 scanner interface kits. If using USB for the upgrade process, the standard USB Type A cable provided with the scanner can be used.

To upgrade the firmware in the IS1650:

1. Plug the scanner into a serial communication port on the host system.
2. Start the MetroSet*2* software.
3. Click on the plus sign (+) next to *Industrial Scanners* to expand the supported scanner list.
4. Choose the Focus*E* from the list.
5. Click on the *Configure FocusE Scanner* button.
6. Choose *Flash Utility* from the options list located on the left side of the screen.
7. Click on the *Open File* button in the Flash Utility window.
8. Locate and open the flash upgrade file supplied by Metrologic.
9. Select the COM port that the scanner is connected to on the host system.
10. Verify the settings listed in the Flash Utility window.
11. Click on the *Flash Scanner* button to begin the flash upgrade.
12. A message will appear on the screen when the upgrade is complete.

◆ Metrologic's customer service department can be reached at 1-800-ID-METRO or 1-800-436-3876.

◆◆ MetroSet*2* is available for download, at no additional cost, from http://www.metrologic.com/corporate/download.

MODES OF OPERATION*

Presentation Mode, Fixed-Mount or In-Stand (Default)

1. The IR detects an object in the IR activation range and the scanner's light output automatically starts to flash as it attempts to scan the bar code.

2. The scanner continuously attempts to scan the bar code until either it succeeds or the bar code is removed from the scanner's field of view.

3. When scanner successfully reads the bar code it will beep once, the white LED will flash and the decoded data will be transmitted to the host.

Single Trigger Mode, Out-of-Stand *

> The IS1650 can switch into different modes of operation using the MetroSet2 Software or Area Imaging Supplemental Guide (00-02281).

1. The IR detects an object in the IR activation range and automatically turns on linear illumination.

2. Aim the scanner's line of light over the bar code.

3. Press the trigger to initiate scanning. The scanner's light output will start to flash as it attempts to scan the bar code.

   > If the trigger is released the scanner will stop trying to scan.

4. When scanner successfully reads the bar code it will beep once, the white LED will flash and the decoded data will be transmitted to the host.

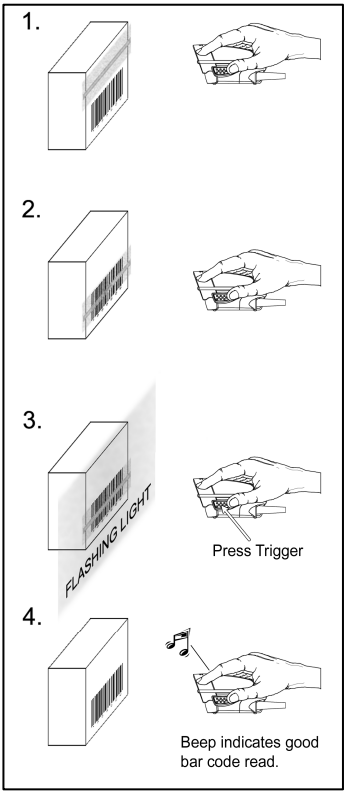


Figure 15. Single Trigger Mode, Out-of-Stand

* For additional configurable modes of operation, please refer to the Area Imaging Supplemental Configuration Guide (MLPN 00-02281).

AUDIBLE INDICATORS

When the IS1650 is in operation, it provides audible feedback. These sounds indicate the status of the scanner. Eight settings are available for the tone of the beep (normal, 6 alternate tones and no tone). To change the tone, refer to the MetroSelect Single-Line Configuration Guide (MLPN 00-02544) or MetroSet2's help files.

One Beep

When the scanner *successfully* reads a bar code, it will beep once and the white LED will turn on indicating data is being transmitted.

If the scanner does not beep once and the white light does not turn on, then the bar code has *not* been successfully read.

Short Razzberry Tone

This tone is a failure indicator (see Failure Modes on page 24).

Long Razzberry Tone

This tone is a failure indicator (see Failure Modes on page 24).

Three Beeps - At Power Up

When IS1650 first receives power, it will start an initialization sequence. All LEDs (yellow, white, and blue) will light for approximately two seconds then start to flash alternately. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep three times indicating that the scanner is ready for use.

Three Beeps - Configuration Mode

When entering configuration mode, the white LED will flash while the scanner will simultaneously beep three times. The white and blue LEDs will continue to flash while in this mode. Upon exiting configuration mode, the scanner will beep three times, and the LEDs will stop flashing.

When configured, three beeps can also indicate a communications timeout during normal scanning mode.

When using single-code-configuring, the scanner will beep three times: a normal tone followed by a short pause, a high tone and then a low tone. This indicates that the single configuration bar code has successfully configured the scanner.

VISUAL INDICATORS

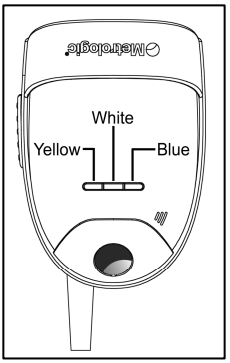


Figure 16.

The IS1650 has three LED indicators (yellow, white and blue) located on the top of the scanner. When the scanner is on, the flashing or constant activity of the LEDs indicates the status of the current scan and the scanner.

No LEDs are Illuminated

The LEDs will not illuminate if the scanner is not receiving power from the host or transformer.

The scanner is in stand-by mode. Present a bar code to the scanner and the blue LED will turn on when the IR detects the object.

Steady Yellow

The yellow LED illuminates when the scanner is in the stand.

Steady Blue

The blue LED illuminates when the scanner is active and linear illumination is on or when the scanner is attempting to decode a bar code.

Steady Blue and Single White Flash

When the scanner successfully reads a bar code, it will beep once and the white LED will turn on indicating data is transmitting.

If the scanner does not beep once and the white light does not turn on, then the bar code has not been read successfully.

Steady White

When the scanner successfully reads a bar code, it will beep once and the white LED will turn on indicating that data is transmitting.

After a successful scan, the scanner transmits the data to the host device. Some communication modes require that the host inform the scanner when data is ready to be received. If the host is not ready to accept the information, the scanner's white LED will remain on until the data can be transmitted.

Alternating Flashing of Blue and White

This indicates the scanner is in configuration mode. A short razzberry tone indicates that an invalid bar code has been scanned while in this mode.

Flashing Blue

The blue LED will flash if the trigger is pressed while the scanner is in the in-stand presentation mode. The blue LED will stop flashing after a brief period of time.

FAILURE MODES

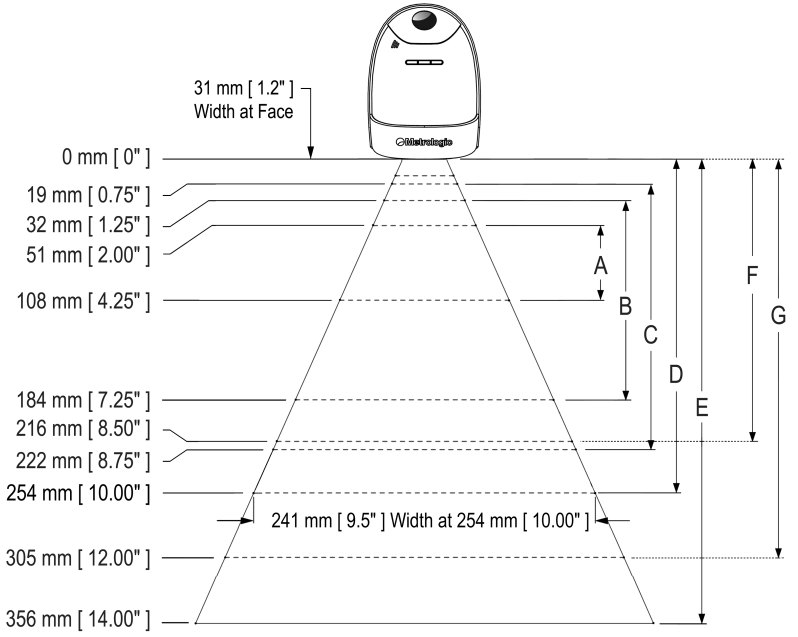
Long Razzberry Tone – During Power Up

Failed to initialize or configure the scanner. If the scanner does not respond after reprogramming, return the scanner for repair.

Short Razzberry Tone – During Scanning

An invalid bar code has been scanned when in configuration.

DEPTH OF FIELD BY MINIMUM BAR CODE ELEMENT WIDTH



	MINIMUM BAR CODE ELEMENT WIDTH						
	1D					PDF	
	A	B	C	D	E	F	G
mm	.132	.191	.254	.330	.533	.254	.381
mils	5.2	7.5	10.4	13	21	10	15.9

Figure 17. Depth of Field by Minimum Bar Code Element Width

Specifications are subject to change without notice.

IR ACTIVATION RANGE

The IS1650 has a built in object detection sensor that instantly turns on the scanner when an object is presented within the scanner's IR activation Area.

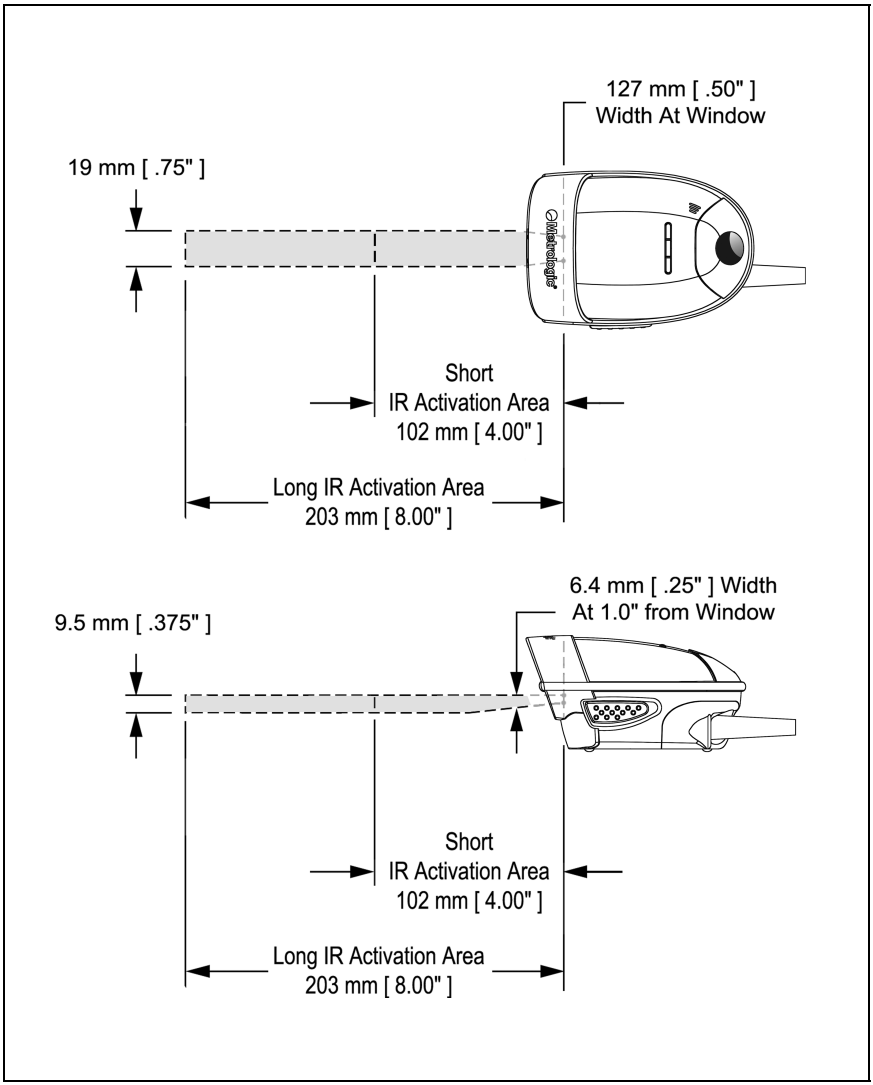


Figure 18. IR Activation Area

Specifications are subject to change without notice.

DAILY MAINTENANCE

Smudges and dirt on the unit's window can interfere with the unit's performance. If the window requires cleaning, use only a mild glass cleaner containing no ammonia. When cleaning the window, spray the cleaner onto a lint free, non-abrasive cleaning cloth then gently wipe the window clean.

If the unit's case requires cleaning, use a mild cleaning agent that does not contain strong oxidizing chemicals. Strong cleaning agents may discolor or damage the unit's exterior.

TROUBLESHOOTING GUIDE

The following guide is for reference purposes only. Contact a Metrologic representative at 1-800-ID-Metro or 1-800-436-3876 to preserve the limited warranty terms.

All Interfaces

IS1650 Series Troubleshooting Symptom / Solution Chart		
Symptoms	**Possible Causes**	**Solution**
No LEDs, beep or illumination	No power is being supplied to the scanner.	Check transformer, outlet and power strip. Make sure the cable is plugged into the scanner.
	No power is being supplied to the scanner from the host.	Some host systems cannot supply enough current to power the 1650. A power supply may be required.
Long Razz tone on power up	The wrong communication cable has been used.	Check that the communication cable matches the unit type and scanner configuration.
	There has been a scanner configuration failure.	Contact a Metrologic service representative, if the unit will not hold the saved configuration.
	There has been a diagnostic failure.	Contact a Metrologic service representative, if the unit will not function.
Long Razz tone when exiting configuration mode	There was a failure saving the new configuration.	Re-try to configure the scanner. Contact a Metrologic service representative if the unit will not hold the saved configuration.
Long Razz tone	There is a scanning mechanism failure.	Contact a Metrologic service representative.
Short Razz tone in configuration mode	An invalid bar code has been scanned.	Scan a valid bar code or quit configuration mode.

Symptoms	Possible Causes	Solution
The unit powers up, but does not beep when bar code is scanned.	The beeper is disabled and no tone is selected.	Enable the beeper and select a tone.
The unit powers up, but does not scan and/or beep.	The bar code symbology trying to be scanned is not enabled.	UPC/EAN, Code 39, interleaved 2 of 5, Code 93, Code 128, Codabar and PDF are enabled by default. Verify that the type of bar code being read has been selected.
The unit powers up, but does not scan and/or beep.	The scanner is trying to scan a bar code that does not match the configured criteria.	Verify that the bar code being scanned falls into the configured criteria (i.e. character length lock or minimum bar code length settings).
The following item is only relevant for RS232 and serial emulation USB Interfaces.		
The unit scans a bar code, but locks up after the first scan and the white LED stays on.	The scanner is configured to support some form of host handshaking but is not receiving the signal.	If the scanner is setup to support ACK/NAK, RTS/CTS, or XON/XOFF, verify that the host cable and host are supporting the handshaking properly.
The unit scans, but the data transmitted to the host is incorrect.	The scanner's data format does not match the host system requirements.	Verify that the scanner's data format matches that required by the host. Make sure that the scanner is connected to the proper host port.

Symptoms	Possible Causes	Solution
The unit beeps at some bar codes and NOT for others of the same bar code symbology.	The bar code may have been printed incorrectly.	Check if it is a check digit/character/or border problem.
	The scanner is not configured correctly for this type of bar code.	Check if check digits are set properly.
	The minimum symbol length setting does not work with the bar code.	Check if the correct minimum symbol length is set.
The unit scans the bar code but there is no data.	The configuration is not set correctly.	Make sure the scanner is configured for the appropriate mode.
The next four items are only relevant for a Keyboard Wedge interface.		
The unit scans but the data is not correct.	The configuration is not set correctly.	Make sure that the proper PC type AT, or PS2 is selected. Verify correct country code and data formatting are selected. Adjust inter-character delay symptom.
	The scanner and host may not be configured for the same interface parameters.	Check that the scanner and the host are configured for the same interface parameters.

Symptoms	Possible Causes	Solution
The unit is transmitting each character twice.	The configuration is not set correctly.	Increase interscan code delay setting. Adjust whether the F0 break is transmitted. It may be necessary to try this in both settings.
Alpha characters show as lower case.	The computer is in Caps Lock mode.	Enable Caps Lock detect setting of the scanner to detect if the PC is operating in Caps Lock.
Everything works except for a couple of characters.	These characters may not be supported by that country's key look up table.	Try operating the scanner in Alt mode.
The following item is only relevant for an RS232 interface.		
The unit powers up OK and scans OK but does not communicate properly with the host.	The com port at the host is not working or not configured properly.	Check to make sure that the baud rate and parity of the scanner and the communication port match and the program is looking for "RS232" data.
	The cable is not connected to the correct com port.	Check to make sure that the cable is connected to the correct com port.
Characters are being dropped.	Inter-character delay needs to be added to the transmitted output.	Add some inter-character delay to the transmitted output by using the Configuration Guides (MLPN 00-02544 and 00-02281).

DEFAULT SETTINGS

Many functions of the scanner can be "configured" – that is, enabled or disabled. The scanner is shipped from the factory configured to a set of default conditions. The default parameter of the scanner has an asterisk (*) in the charts on the following pages. If an asterisk is not in the default column then the default setting is OFF or DISABLED. Not every interface supports every parameter. If the interface supports a parameter listed in the charts on the following pages, a check mark (✓) will appear.

PARAMETER	DEFAULT	RS232	IBM 46XX RS485	KBW & KEYBOARD	USB
Multi-Try Trigger, Out-of-Stand		✓	✓	✓	✓
Presentation Mode, In-Stand	*	✓	✓	✓	✓
Presentation Mode, Out-of-Stand	*	✓	✓	✓	✓
Continuous Trigger		✓	✓	✓	✓
Single Trigger		✓	✓	✓	✓
Aiming in Trigger and Continuous Modes	*	✓	✓	✓	✓
Aiming in Presentation Mode	*	✓	✓	✓	✓
Long-Range In-Stand	*	✓	✓	✓	✓
Short-Range In-Stand		✓	✓	✓	✓
Long-Range Out-of-Stand	*	✓	✓	✓	✓
Short-Range Out-of-Stand		✓	✓	✓	✓
UPC/EAN	*	✓	✓	✓	✓
Code 128	*	✓	✓	✓	✓
Code 93	*	✓	✓	✓	✓
Codabar	*	✓	✓	✓	✓
Interleaved 2 of 5 (ITF)	*	✓	✓	✓	✓
MOD 10 check on ITF		✓	✓	✓	✓
Code 11		✓	✓	✓	✓
Code 39	*	✓	✓	✓	✓
Full ASCII Code 39		✓	✓	✓	✓
PDF	*	✓	✓	✓	✓
Data Matrix		✓	✓	✓	✓
QR Code		✓	✓	✓	✓

DEFAULT SETTINGS

PARAMETER	DEFAULT	RS232	IBM 46XX RS485	KBW & KEYBOARD	USB
Maxicode		✓	✓	✓	✓
Aztec		✓	✓	✓	✓
Postals		✓	✓	✓	✓
Mod 43 Check on Code 39		✓	✓	✓	✓
MSI-Plessy 10/10 Check Digit		✓	✓	✓	✓
MSI-Plessy Mod 10 Check Digit	*	✓	✓	✓	✓
Paraf Support ITF		✓	✓	✓	✓
ITF Symbol Lengths	Variable	✓	✓	✓	✓
Symbol Length Lock	None	✓	✓	✓	✓
Beeper tone	Normal	✓	✓	✓	✓
Beep/transmit sequence	Before transmit	✓	✓	✓	✓
Communication timeout	None	✓	✓	✓	✓
Razzberry tone on timeout		✓	✓	✓	✓
Three beeps on timeout		✓	✓	✓	✓
Same symbol rescan timeout: 1000 msecs	*	✓	✓	✓	✓
Same symbol rescan timeout configurable in 50 msec steps (maximum of 6.35 sec.)		✓	✓	✓	✓
No Same symbol timeout		✓	✓	✓	✓
Infinite Same symbol timeout		✓	✓	✓	✓
Inter-character delay configurable in 1 msec steps (maximum of 255 msecs)	1 msecs 10 msecs in KBW	✓	✓	✓	✓
Number of scan buffers (*maximum*)	8	✓	✓	✓	✓
Transmit UPC-A check digit	*	✓	✓	✓	✓
Transmit UPC-E check digit		✓	✓	✓	✓
Expand UPC-E		✓	✓	✓	✓
Convert UPC-A to EAN-13		✓	✓	✓	✓

DEFAULT SETTINGS

PARAMETER	DEFAULT	RS232	IBM 46XX RS485	KBW & KEYBOARD	USB
Transmit lead zero on UPC-E		✓	✓	✓	✓
Transmit UPC-A number system	*	✓	✓	✓	✓
Transmit UPC-A Manufacturer ID#	*	✓	✓	✓	✓
Transmit UPC-A Item ID#	*	✓	✓	✓	✓
Transmit Codabar Start/Stop Characters		✓	✓	✓	✓
CLSI Editing (Enable)		✓	✓	✓	✓
Transmit Mod 43 Check digit on Code 39		✓	✓	✓	✓
Transmit Mod 10/ITF		✓	✓	✓	✓
Transmit MSI-Plessy		✓	✓	✓	✓
Parity	No	✓	✓		✓
Baud Rate	9600	✓			
8 Data Bits	*	✓			
7 Data Bits		✓			
Stop Bits	1	✓			
Transmit Sanyo ID Characters		✓		✓	
Nixdorf ID		✓		✓	
LRC Enabled		✓		✓	
UPC Prefix		✓		✓	
UPC Suffix		✓		✓	
Carriage Return	*	✓		✓	
Line Feed-Disabled by default in KBW	*	✓		✓	
Tab Prefix		✓		✓	
Tab Suffix		✓		✓	
“DE” Disable Command		✓			
Enable Command		✓			
DTR Handshaking support		✓			
RTS/CTS Handshaking		✓			
Character RTS/CTS	*	✓			
Message RTS/CTS		✓			

DEFAULT SETTINGS

PARAMETER	DEFAULT	RS232	IBM 46XX RS485	KBW & KEYBOARD	USB
XON/XOFF Handshaking		✓			
ACK/NAK		✓			
Two Digit Supplements		✓	✓	✓	✓
Five Digit Supplements		✓	✓	✓	✓
Bookland		✓	✓	✓	✓
977 (2 digit) Supplemental Requirement		✓	✓	✓	✓
Supplements are not Required	*	✓	✓	✓	✓
Two Digit Redundancy	*	✓	✓	✓	✓
Five digit Redundancy		✓	✓	✓	✓
Coupon Code 128		✓	✓	✓	✓
† Configurable Code Lengths	7 avail	✓	✓	✓	✓
† Code Selects with configurable Code Length Locks	3 avail	✓	✓	✓	✓
Configurable Prefix characters	10 avail	✓		✓	
Suffix characters	10 avail	✓		✓	
Prefixes for Individual Code types		✓		✓	
Editing		✓	✓	✓	✓
Function/Control Key Support	*	✓	✓	✓	✓
Omnidirectional Scanning	*	✓	✓	✓	✓
Linear Only Scanning		✓	✓	✓	✓
Linear 1D / Omni 2D		✓	✓	✓	✓

† These options are mutually exclusive. One cannot be used in conjunction with the other.

SCANNER PINOUT CONNECTIONS

The IS1650 scanner interfaces terminate to a 10-pin, RJ45 Female Socket. The serial number label indicates the interface enabled when the scanner is shipped from the factory.

Rear View Shown

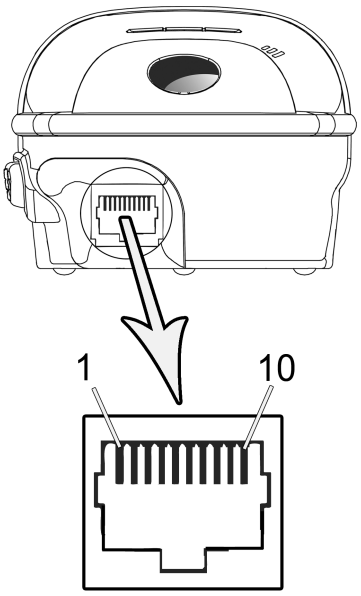


Figure 19.

IS1650-14 RS232	
Pin	**Function**
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	RTS Output
5	CTS Input
6	DTR Input
7	Reserved
8	Reserved
9	+5VDC
10	Shield Ground

IS1650-47, Keyboard Wedge & Stand-Alone Keyboard	
Pin	**Function**
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	PC Data
5	PC Clock
6	KB Clock
7	PC +5V
8	KB Data
9	+5VDC
10	Shield Ground

SCANNER PINOUT CONNECTIONS

IS1650-38 Low Speed USB	
Pin	**Function**
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	RTS Output
5	CTS Input
6	USB D+
7	V USB
8	USB D-
9	+5VDC
10	Shield Ground

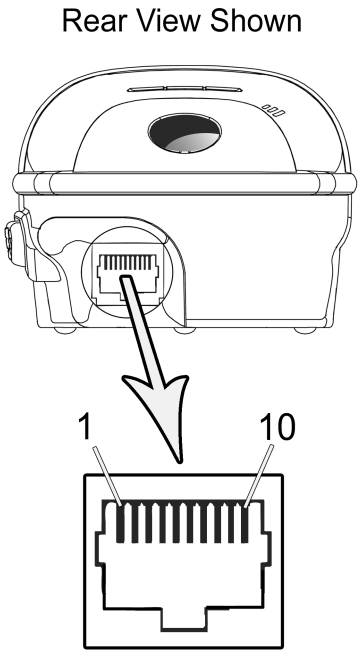
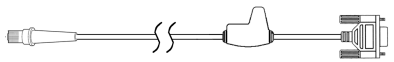


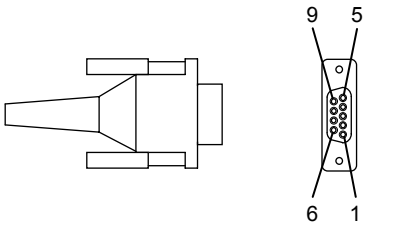
Figure 20.

IS1650-106 IBM 46xx RS485 / Full Speed USB	
Pin	**Function**
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	IBM A+
5	IBM B-
6	USB D+
7	V USB
8	USB D-
9	+5VDC
10	Shield Ground

CABLE CONNECTOR CONFIGURATIONS (HOST END)

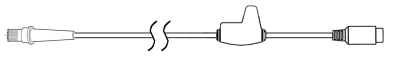
"Standard" PowerLink Cable *59-59000-3, Straight*	
Pin	**Function**
1	Shield Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	DTR Input/Light Pen Source
5	Power/Signal Ground
6	Reserved
7	CTS Input
8	RTS Output
9	+5VDC

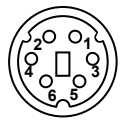




9-Pin D-Type Connector

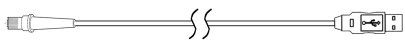
Stand Alone PowerLink Keyboard Cable *54-54020-3, Straight*	
Pin	**Function**
1	PC Data
2	NC
3	Power Ground
4	+5VDC PC Power to KB
5	PC Clock
6	NC





6-Pin Male Mini-DIN Connector

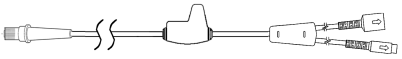
USB Power/Communication Cable *59-59313-N-3, Straight*	
Pin	**Function**
1	PC +5V/V_USB
2	D-
3	D+
4	Ground
Shield	Shield



USB Non-Locking

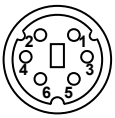
CABLE CONNECTOR CONFIGURATIONS (HOST END)

Keyboard Wedge Cable *54-54002-3, Straight*	
Pin	**Function**
1	Keyboard Clock
2	Keyboard Data
3	No Connect
4	Power Ground
5	+5 VDC



5-Pin DIN, Female

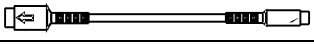
Pin	**Function**
1	PC Data
2	No Connect
3	Power Ground
4	+5 VDC
5	PC Clock
6	No Connect

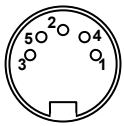


6-Pin DIN, Male

Metrologic will supply an adapter cable with a 5-pin DIN male connector on one end and a 6-pin mini DIN female connector on the other. According to the termination required, connect the appropriate end of the adapter cable to the PowerLink cable, leaving the necessary termination exposed for connecting to the keyboard and the keyboard port on the PC.

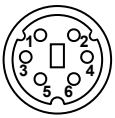
Keyboard Wedge Adapter Cable	
Pin	**Function**
1	PC Clock
2	PC Data
3	No Connect
4	Power Ground
5	+5 VDC





5-Pin DIN, Male

Pin	**Function**
1	Keyboard Data
2	No Connect
3	Power Ground
4	+5 VDC
5	Keyboard Clock
6	No Connect



6-pin Mini DIN, Female

Safety

ITE Equipment

IEC 60950-1, EN 60950-1

LED

Class 1 LED Product: IEC 60825-1:1993+A1+A2,
EN 60825-1:1994+A1+A2

⚠ Caution

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Under no circumstances should the customer attempt to service the LED scanner. Never attempt to look at the LED beam, even if the scanner appears to be nonfunctional. Never open the scanner in an attempt to look into the device. Doing so could result in hazardous radiation exposure. The use of optical instruments with the LED equipment will increase eye hazard.

⚠ Atención

La modificación de los procedimientos, o la utilización de controles o ajustes distintos de los especificados aquí, pueden provocar una exposición de luz brillante peligrosa. Bajo ninguna circunstancia el usuario deberá realizar el mantenimiento del LED (Diodo Emisor de Luz) del lector. Ni intentar mirar al haz del LED incluso cuando este no esté operativo. Tampoco deberá abrir el lector para examinar el aparato. El hacerlo puede conllevar una exposición peligrosa a la luz del LED. El uso de instrumentos ópticos con el equipo LED puede incrementar el riesgo para la vista.

⚠ Attention

L'emploi de commandes, réglages ou procédés autres que ceux décrits ici peut entraîner de graves irradiations. Le client ne doit en aucun cas essayer d'entretenir lui-même le scanner ou la LED. Ne regardez jamais directement le rayon LED, même si vous croyez que le scanner est inactif. N'ouvrez jamais le scanner pour regarder dans l'appareil. Ce faisant, vous vous exposez à un risque d'irradiation. L'emploi d'appareils optiques avec cet équipement à LED augmente le risque d'endommagement de la vision.

⚠ Achtung

Die Verwendung anderer als der hier beschriebenen Steuerungen, Einstellungen oder Verfahren kann eine gefährliche Licht emittierender Dioden strahlung hervorrufen. Der Kunde sollte unter keinen Umständen versuchen, den Licht emittierender Dioden-Scanner selbst zu warten. Sehen Sie niemals in den Licht emittierender Diodenstrahl, selbst wenn Sie glauben, daß der Scanner nicht aktiv ist. Öffnen Sie niemals den Scanner, um in das Gerät hineinzusehen. Wenn Sie dies tun, können Sie sich einer gefährlichen Licht emittierender Diodenstrahlung aussetzen. Der Einsatz optischer Geräte mit dieser Laserausrüstung erhöht das Risiko einer Sehschädigung.

⚠ Attenzione

L'utilizzo di sistemi di controllo, di regolazioni o di procedimenti diversi da quelli descritti nel presente Manuale può provocare delle rischiose esposizioni radiattive. Il cliente non deve assolutamente tentare di riparare egli stesso lo scanner LED (o diodo emettitore di luce). Non guardate mai il raggio LED (d. emettitore di luce), anche se credete che lo scanner non sia attivo. Non aprite mai lo scanner per guardare dentro l'apparecchio. Facendolo potete esporVi ad una radiazione rischiosa. L'uso di apparecchi ottici, equipaggiati con raggi LED (d. emettitori di luce), aumenta il rischio di danni alla vista.

EMC

Emissions
FCC Part 15, ICES-003, CISPR 22, EN 55022

Immunity
CISPR 24, EN 55024

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Class A Devices

The following is applicable when the scanner cable is greater in length than 3 meters (9.8 feet) when fully extended:
Les instructions ci-dessous s'appliquent aux cables de scanner dépassant 3 métres (9.8 pieds) de long en extension maximale:
Folgendes trifft zu, wenn das Scannerkabel länger als 3 Meter ist:

This equipment has been tested and found to comply with 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 their own expense. Any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

This device complies with part 15 of the FCC Rules. 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.

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

Remarque
Cet appareil numérique de classe A est conforme à la norme canadienne NMB-003.

European Standard

Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Funkstöreigenschaften nach EN55022:1998

Warnung!
Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen. In diesem Fall kann vom Betreiber verlangt werden, angemessene Massnahmen durchzuführen.

Standard Europeo

Attenzione
Questo e' un prodotto di classe A. Se usato in vicinanza di residenze private potrebbe causare interferenze radio che potrebbero richiedere all'utilizzatore opportune misure.

Attention
Ce produit est de classe "A". Dans un environnement domestique, ce produit peut être la cause d'interférences radio. Dans ce cas l'utiliseteur peut être amené à predre les mesures adéquates.

EMC

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Class B Devices

The following is applicable when the scanner cable is less than 3 meters (9.8 feet) in length when fully extended:

Les instructions ci-dessous s'appliquent aux cables de scanner ne dépassant pas 3 métres (9.8 pieds) de long en extension maximale:

Folgendes trifft zu, wenn das Scannerkabel kürzer als 3 Meter ist:

This device complies with Part 15 of the FCC Rules. 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.

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

Notice
This Class B digital apparatus complies with Canadian ICES-003.

Remarque
Cet appareil numérique de classe B est conforme à la norme canadienne NMB-003.

PATENTS

This METROLOGIC product may be covered by, but not limited to, one or more of the following U.S. Patents:

U.S. Patent No.:
7,086,595; 7,128,266; 7,213,762; 7,216,810; 7,225,988; 7,225,989; 7,237,722; 7,240,844; 7,240,844; 7,243,847; 7,255,279; 7,267,282; 7,270,272; 7,273,180; 7,278,575; 7,281,661; 7,284,705; 7,293,714; 7,299,986; 7,320,431; 7,325,738

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Other worldwide patents pending.

LIMITED WARRANTY

The IS1650 series scanners are manufactured by Metrologic at its Suzhou, China facility. The IS1650 series scanners have a two (2) year limited warranty from the date of manufacture. Metrologic warrants and represents that all IS1650 series scanners are free of all defects in material, workmanship and design, and have been produced and labeled in compliance with all applicable U.S. Federal, state and local laws, regulations and ordinances pertaining to their production and labeling.

This warranty is limited to repair, replacement of product or refund of product price at the sole discretion of Metrologic. Faulty equipment must be returned to one of the following Metrologic repair facilities: Blackwood, New Jersey, USA; Madrid, Spain; or Suzhou, China. To do this, contact the appropriate Metrologic Customer Service/Repair Department to obtain a Returned Material Authorization (RMA) number.

In the event that it is determined the equipment failure is covered under this warranty, Metrologic shall, at its sole option, repair the Product or replace the Product with a functionally equivalent unit and return such repaired or replaced Product without charge for service or return freight, whether distributor, dealer/reseller, or retail consumer, or refund an amount equal to the original purchase price.

This limited warranty does not extend to any Product which, in the sole judgment of Metrologic, has been subjected to abuse, misuse, neglect, improper installation, or accident, nor any damage due to use or misuse produced from integration of the Product into any mechanical, electrical or computer system. The warranty is void if: (i) the case of Product is opened by anyone other than Metrologic's repair department or authorized repair centers; or (ii) any software is installed on the Product other than a software program approved by Metrologic.

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