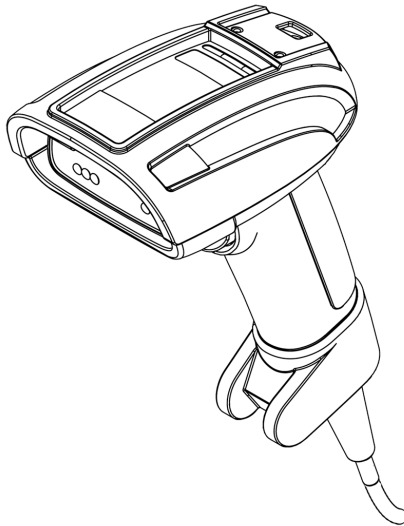




METROLOGIC INSTRUMENTS, INC.

MS1890 Focus®

Area Imaging Bar Code Scanner
Installation and User's Guide



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Product Overview

The MS1890 is a rugged, high performance hand-held area imaging bar code scanner that utilizes a high-resolution CMOS imaging sensor for superior image quality. The MS1890 utilizes Omniplanar, Inc.'s Swiftdecoder® software for reliable decoding of both 1D and 2D bar code symbologies. Sharp images can be captured and transmitted in a variety of outputs, including: .jpg, .bmp, and .tiff.

Omnidirectional scanning capabilities and an extended depth of field provides aggressive scanning of all standard 1D, GS1 DataBar™, PDF417, microPDF, EAN/UCC Composite, Matrix and Postal Codes symbology types. Firmware updates are easily loaded via Flash ROM.

The MS1890 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.

Model Number	Interface
MS1890 – 11	IBM 468X/469X, RS232-TXD, RXD, RTS, CTS
MS1890 – 14	RS232 (TX, RX, RTS, CTS, DTR)
MS1890 – 38	Low Speed USB
MS1890 – 40	Full Speed USB
MS1890 – 47	Keyboard Wedge, Stand-Alone Keyboard and RS232 Transmit/Receive

INTRODUCTION

Scanner and Accessories


BASIC KIT	
Part #	Description
MS1890	Area Imaging Bar Code Scanner
00-02544	MetroSelect® Single-Line Configuration Guide*
00-02281	Area Imaging Bar Code Supplemental Configuration Guide*
00-02293	MS1890 Series Area Imaging Bar Code Scanner Installation and User's Guide*

* Available on the Metrologic website - www.metrologic.com

OPTIONAL ACCESSORIES	
Part #	Description
AC to DC Power Transformer - Regulated 5.2VDC @ 1A output.	
46-00525	90VAC to 255VAC United States, Canada and Japan
46-00526	90VAC to 255VAC Continental European
46-00527	90VAC to 255VAC United Kingdom
46-00528	90VAC to 255VAC Australia
46-00529	90VAC to 255VAC China
53-53700.x-3	RS232 PowerLink Cable with Built in Power Jack Black, Coiled Cord with Long Strain Relief
53-53702.x-3	Keyboard Wedge PowerLink Cable with Adapter Cable Black, Coiled Cord with Long Strain Relief
53-53720.x-3	Stand Alone Keyboard PowerLink Cable Black, Coiled Cord with Long Strain Relief

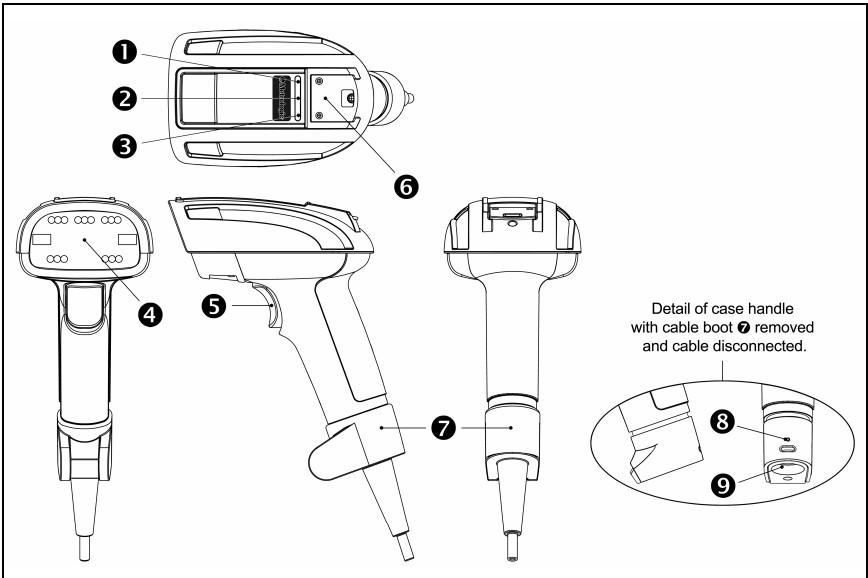
Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor, or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

Scanner and Accessories

OPTIONAL ACCESSORIES	
Part #	Description
53-53713.x-N-3	USB Full Speed Cable Locking Plus-Power™ Type A, Black, Coiled Cord with Long Strain Relief
53-53714.x-N-3	USB Full Speed Cable Locking Plus-Power™ Type A, Black, Coiled Cord with Long Strain Relief, Extended Length  This cable is for use with full speed USB (-40) interface only.
53-53735.x-3	USB Low Speed Communication Cable Type A Black, Coiled Cord with Long Strain Relief
MVCI-3M106C-IB9	IBM Applications Metrologic Voltage Converter (MVC) Cable* ±12VDC to +5.2VDC
* 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 Components



No.	Item Description	
1	Blue LED	See <i>Visual Indicators</i> (on page 14)
2	White LED	See <i>Visual Indicators</i> (on page 14)
3	Yellow LED	See <i>Visual Indicators</i> (on page 14)
4	Red Window	LED Aperture
5	Trigger	See <i>Modes of Operation</i> (on page 12)
6	Utility Hook	
7	Cable Boot	See <i>The PowerLink Cable</i> (on page 5)
8	Cable Release Pin-Hole	See <i>The PowerLink Cable</i> (on page 5)
9	Cable Connection	10-pin RJ45, Female Socket, See <i>Scanner Pinout Connections</i> (on page 31)

Figure 1. Scanner Components

The PowerLink Cable

Connecting



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

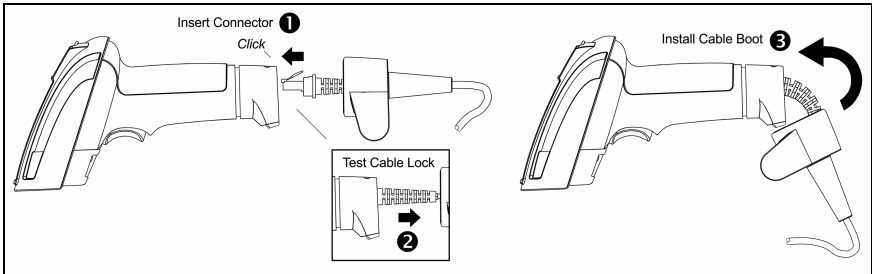


Figure 2. Connecting the PowerLink Cable

1. Insert the 10-pin RJ45 end of the cable into the socket on the MS1890. There will be an audible click when the connector locks into place.
2. Gently pull on the cable strain relief to insure the cable is installed.
3. Install the cable boot cover over the cable strain relief and onto the end of the unit's handle.

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.

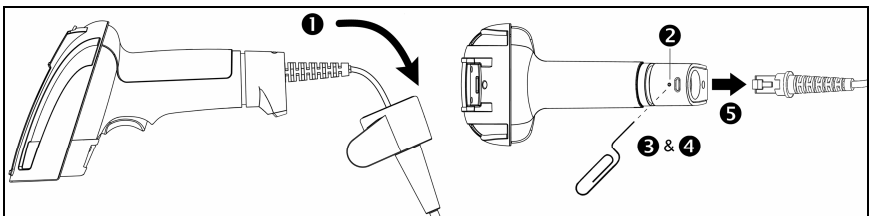


Figure 3. Releasing the PowerLink Cable

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

INTRODUCTION

Labels

Each scanner has a label located on the underside of the head. 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 and its location.

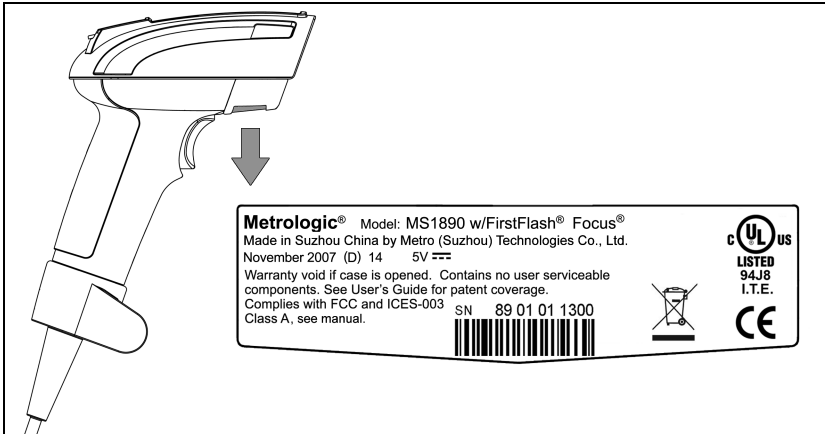


Figure 4. Label Samples and Location

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.

Maintenance

Smudges and dirt can interfere with the proper scanning of a bar code. The output window should be routinely cleaned with glass cleaner sprayed onto a lint free, non-abrasive cloth.

INSTALLING THE SCANNER TO THE HOST SYSTEM

RS232 MS1890-14

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 MS1890. There will be an audible *click* when the connector lock engages.
3. Slide the protective cable boot up the cable, over the connector and onto the end of scanner handle.
4. Connect the 9-pin D-type connector of the communication cable to the proper COM port of the host device.
5. Plug the power supply 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.

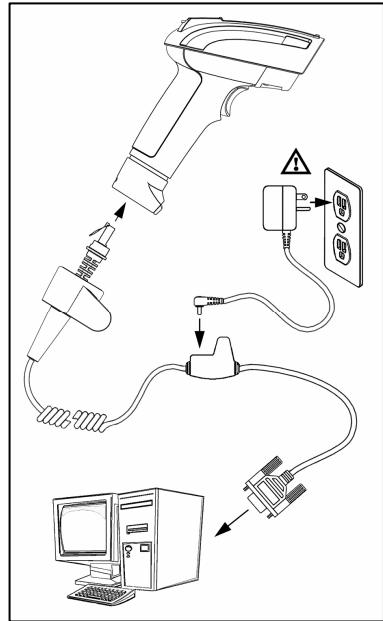


Figure 5.

6. Connect AC power to the transformer.
7. The MS1890 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately 2 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.
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 page 6.

INSTALLING THE SCANNER TO THE HOST SYSTEM

Keyboard Wedge MS1890-47

1. Turn off the host device.
2. Plug the 10-pin RJ45 male end of the PowerLink cable into 10-pin socket on the MS1890. There will be an audible *click* when the connector lock engages.
3. Slide the protective cable boot up the cable, over the connector and onto the end of scanner handle.
4. Disconnect the keyboard from the host device.
5. 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.
6. 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.

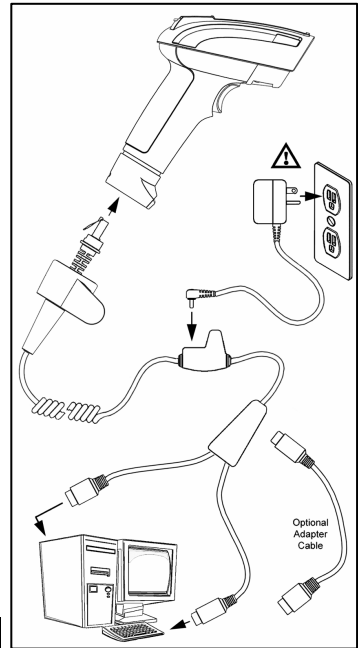


Figure 6.

7. Connect AC power to the transformer.
8. The MS1890 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately 2 seconds then start to flash alternately. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep 3 times indicating that the scanner is ready for use.
9. 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 page 6.

INSTALLING THE SCANNER TO THE HOST SYSTEM

Stand Alone Keyboard MS1890-47

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 MS1890. There will be an audible *click* when the connector lock engages.
3. Slide the protective cable boot up the cable, over the connector and onto the end of scanner handle.
4. Plug the other end of the communication cable into the host's keyboard port.
5. Plug the external power supply 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.

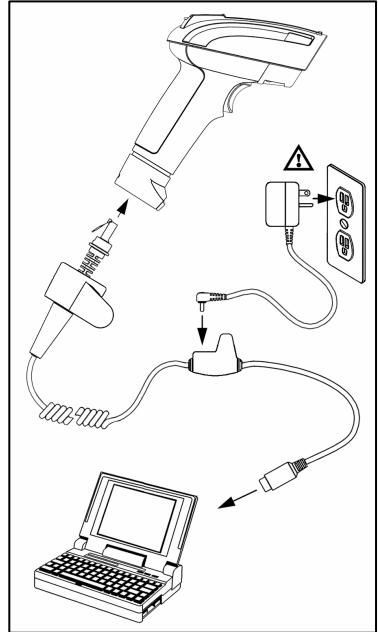


Figure 7.

6. Connect AC power to the transformer.
7. The MS1890 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately 2 seconds then start to flash alternately. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep 3 times indicating that the scanner is ready for use.
8. 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 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 page 6.

INSTALLING THE SCANNER TO THE HOST SYSTEM

IBM MS1890-11

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 MS1890. There will be an audible *click* when the connector lock engages.
3. Slide the protective cable boot up the cable, over the connector and onto the end of scanner handle.
4. Connect the other end of the MVC cable to the host device.
5. Turn on the host device.
6. The MS1890 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately 2 seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep 3 times indicating that the scanner is ready for use.

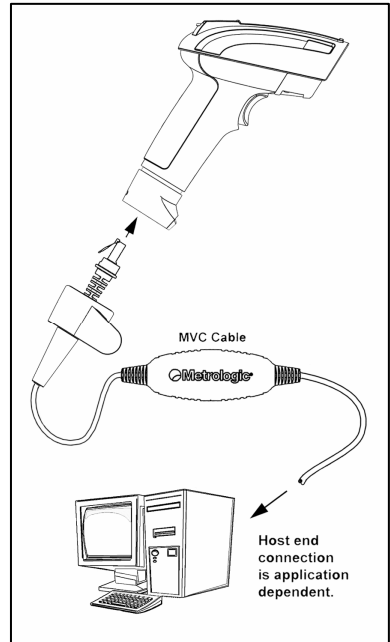


Figure 8.



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 page 6.

INSTALLING THE SCANNER TO THE HOST SYSTEM

Integrated USB:

Full Speed MS1890-40

Low Speed MS1890-38

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 MS1890. There will be an audible *click* when the connector lock engages.
3. Slide the protective cable boot up the cable, over the connector and onto the end of scanner handle.
4. Plug the USB type A end of the USB cable into the host's USB port.
5. Turn on the host device.
6. The MS1890 will start to initialize. All LEDs (yellow, white, and blue) will light for approximately 2 seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep 3 times indicating that the scanner is ready for use.

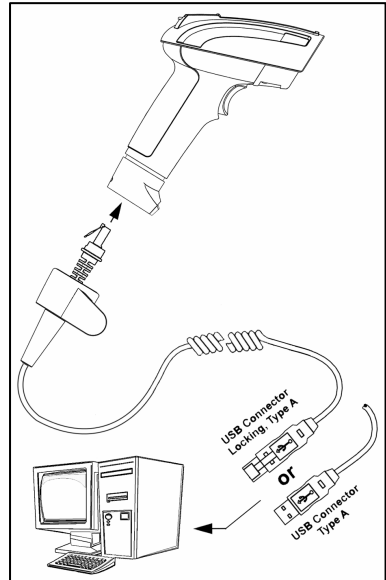


Figure 9.



As a default, the MS1890-38 leaves the factory with USB Keyboard Emulation Mode enabled.

For information on configuring the MS1890-38 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 page 6.

SCANNER OPERATION

Multi-Try Trigger Mode*

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. Pull 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.

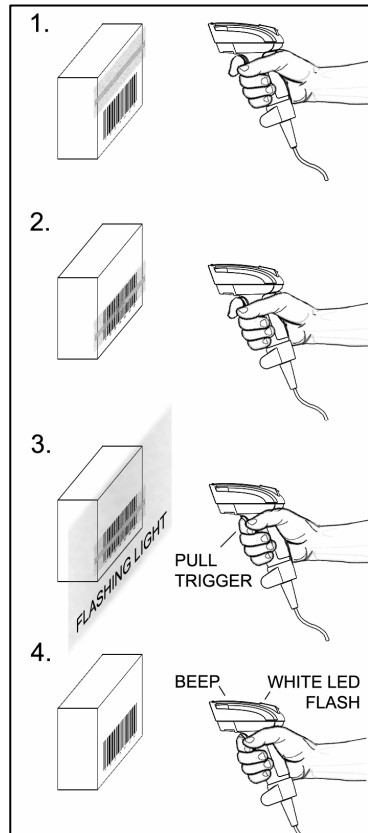


Figure 10. Multi-Try Trigger Mode

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

Audible Indicators

When the MS1890 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 15).

Long Razzberry Tone

This tone is a failure indicator (see Failure Modes on page 15).

Three Beeps - At Power Up

When The MS1890 first receives power it will start an initialization sequence. All LEDs (yellow, white, and blue) will light for approximately 2 seconds then start to alternately flash. When the scanner has finished initializing the LEDs will stop flashing and the unit will beep 3 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 simultaneously beeps 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, 3 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

The MS1890 has three LED indicators (yellow, white and blue) located on the top of the scanner. When the scanner is on, the flashing or stationary activity of the LEDs indicates the status of the current scan and the scanner.

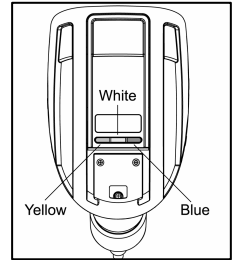


Figure 11.

No LEDs are Illuminated

The LEDs will not be illuminated 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 Blue

The blue LED is illuminated when the scanner is active and linear illumination is on or when the scanner is attempting to decode a barcode.

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 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.

Steady White

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



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.

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 mode or the trigger has been pulled too fast.

Depth of Field by Minimum Bar Code Element Width

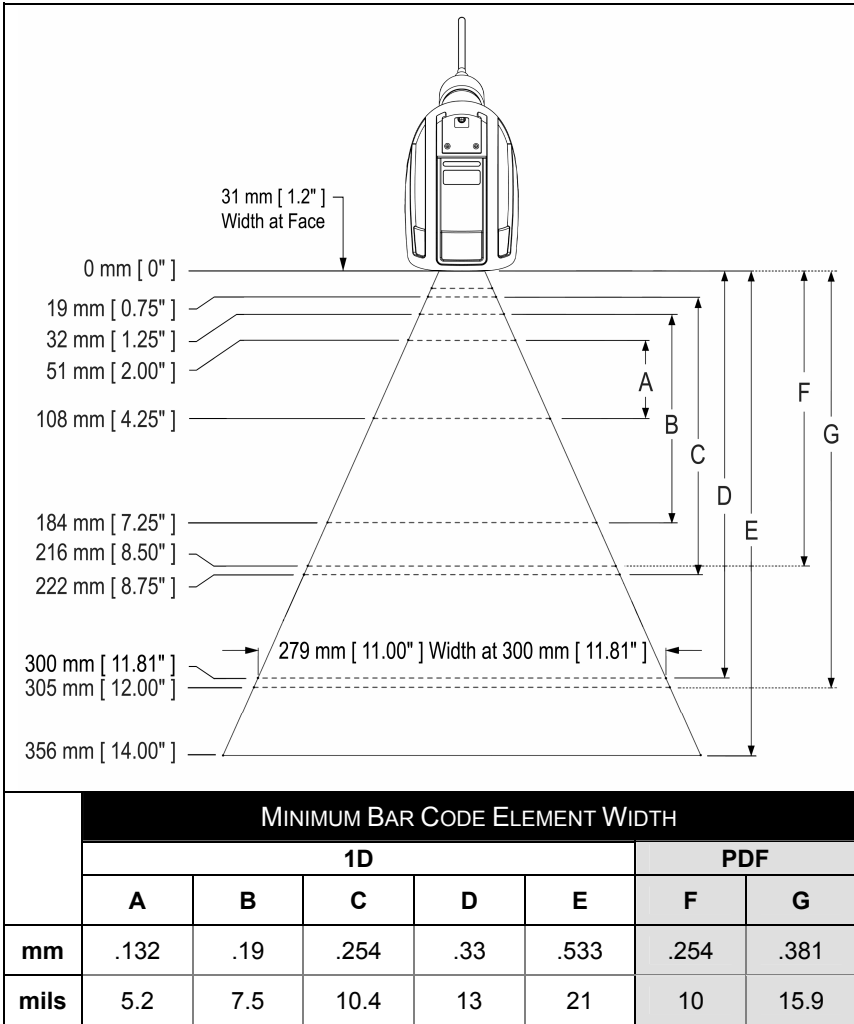


Figure 12. Depth of Field by Minimum Bar Code Element Width

Specifications are subject to change without notice.

IR Activation Range

The MS1890 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.

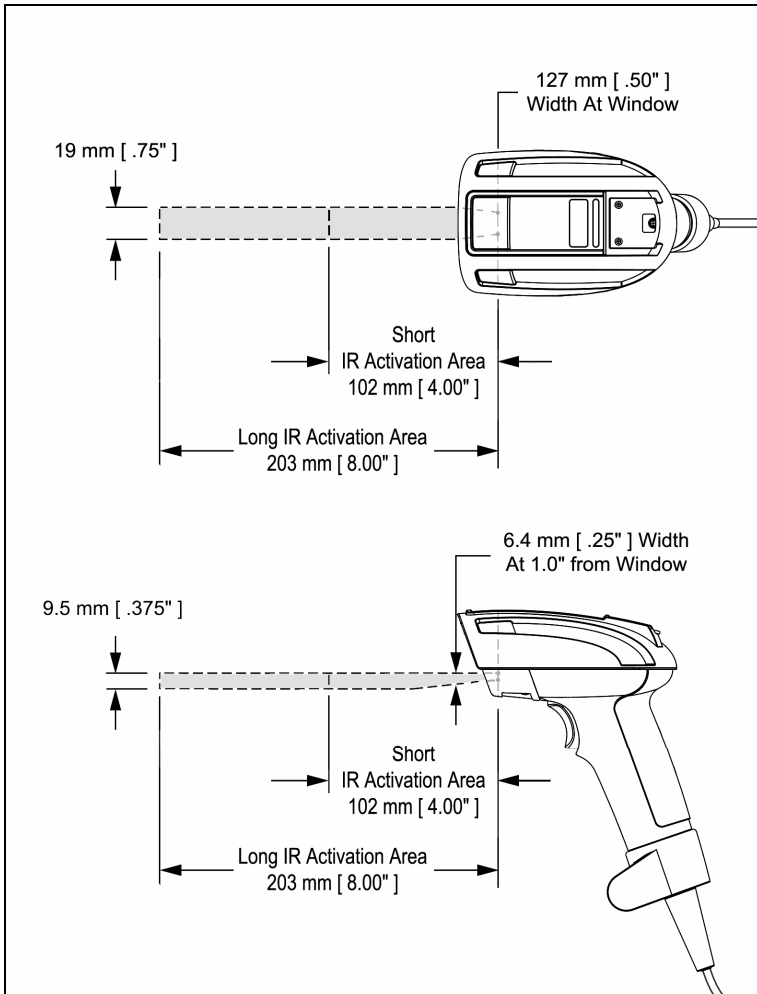


Figure 13. IR Activation Area

Specifications are subject to change without notice.

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

MS1890 Series Troubleshooting Guide		
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 MS1890. 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 RAM or ROM failure.	Contact a Metrologic service representative, if the unit will not function.
Long Razz tone when exiting configuration mode	There was a failure to save 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.

TROUBLESHOOTING GUIDE

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 barcode 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 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.

TROUBLESHOOTING GUIDE

Symptoms	Possible Causes	Solution
The unit beeps at some bar codes and NOT for others of the same bar code symbology.	The print quality of the bar code is suspect.	Check print mode. The type of printer could be the problem. Change print settings (i.e. change to econo mode or high speed).
	The aspect ratio of the bar code is out of tolerance.	Check print mode. The type of printer could be the problem. Change print settings (i.e. change to econo mode or high speed).
	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 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.

TROUBLESHOOTING GUIDE

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 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.	Modify the scanner's configuration to add some inter-character delay to the transmitted output.

DESIGN SPECIFICATIONS

		MS1890 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 – 300 mm (0" – 11.81") 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) 1D, 0.254 mm (10.0 mil) 2D	
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 <i>(Image Transfer)</i> – BMP, TIFF, or JPEG output	
System Interfaces:		PC Keyboard Wedge, RS232, IBM 468X/469X, Stand Alone Keyboard, USB (Low Speed and 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	
LED Indicators (Default):		Blue	Unit Powered, Ready to Scan
		White	Good Read
MECHANICAL			
Height:		183 mm (7.2")	
Depth:		111 mm (4.4")	
Width:		Handle	30 mm (1.2")
		Head	79 mm (3.1")
Weight:		284 g (10.0 oz)	
Termination:		10 pin modular RJ45	
Cable:		See <i>Optional Accessories on page 2.</i>	

Specifications are subject to change without notice.

DESIGN SPECIFICATIONS

MS1890 DESIGN SPECIFICATIONS	
ELECTRICAL	
Input Voltage:	5.0VDC \pm 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 @ 1A
<i>For regulatory compliance information, see pages 36 - 38.</i>	
ENVIRONMENTAL	
Temperature:	Operating = 0°C to 50° (32° to 122°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 2 m (6.5 ft.) drops
Contaminants:	Dust tight and protected against splashing water.
Ventilation:	None required
IP Rating:	IP54

Specifications are subject to change without notice.

APPLICATIONS AND PROTOCOLS

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

SCANNER	VERSION IDENTIFIER	COMMUNICATION PROTOCOL(S)
MS1890 -	11	IBM 468X/469X, RS232-TXD, RXD, RTS, CTS
	14	RS232 (TX, RX, RTS, CTS, DTR)
	38	Low Speed USB
	40	Full-speed USB
	47	Keyboard Wedge, Stand-Alone Keyboard and RS232 Transmit/Receive

The MS1890-47 with a built-in PC Keyboard Wedge Interface is designed for Keyboard emulation use only. Many RS232 configurable functions available in other Metrologic scanners 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
- Belgium
- French
- German
- Italian
- Japanese
- Spanish
- Swiss
- United Kingdom

** For additional information on the MS1890's default settings refer to pages 25-28. 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).

DEFAULT SETTINGS – COMMUNICATION PARAMETERS

Many functions of the scanner can be *configured* or enabled/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, the default setting is OFF or DISABLED. Every interface does not support 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	KBW	USB
Multi-Try Trigger Mode	*	✓	✓	✓	✓
Continuous Trigger Mode		✓	✓	✓	✓
Single Trigger Mode		✓	✓	✓	✓
Aiming in Trigger and Continuous Modes	*	✓	✓	✓	✓
Long-Range IR	*	✓	✓	✓	✓
Short-Range IR		✓	✓	✓	✓
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		✓	✓	✓	✓
Maxicode		✓	✓	✓	✓
Aztec		✓	✓	✓	✓
Postals		✓	✓	✓	✓
Mod 43 Check on Code 39		✓	✓	✓	✓

DEFAULT SETTINGS – COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	KBW	USB
MSI-Plessey 10/10 Check Digit		✓	✓	✓	✓
MSI-Plessey 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 msec	*	✓	✓	✓	✓
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 msec)	1 msec 10 msec in KBW	✓	✓	✓	✓
Number of scan buffers (<i>maximum</i>)	8	✓	✓	✓	✓
Transmit UPC-A check digit	*	✓	✓	✓	✓
Transmit UPC-E check digit		✓	✓	✓	✓
Expand UPC-E		✓	✓	✓	✓
Convert UPC-A to EAN-13		✓	✓	✓	✓
Transmit lead zero on UPC-E		✓	✓	✓	✓
Transmit UPC-A number system	*	✓	✓	✓	✓
Transmit UPC-A Manufacturer ID#	*	✓	✓	✓	✓

DEFAULT SETTINGS – COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	KBW	USB
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 – COMMUNICATION PARAMETERS

PARAMETER	DEFAULT	RS232	IBM 46XX	KBW	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 can not be used in conjunction with the other.

CONFIGURATION MODES

The MS1890 Series has three modes of configuration.

- **Bar Codes**

The MS1890 can be configured by scanning the bar codes included in the Metrologic Single-Line Configuration Guide (MLPN 00-02544) or the Area Imaging Bar Code Supplemental Configuration Guide (MLPN 00-02281). These manuals can be downloaded for FREE from Metrologic's website (www.metrologic.com).

- **MetroSet2**

This user-friendly Windows-based configuration program allows you to simply 'point-and-click' at the desired scanner options. This program can be downloaded for FREE from Metrologic' 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).

UPGRADING THE FLASH ROM FIRMWARE

The MetroSet2 program is a functional component of Metrologic's new line of Flash-based scanners. This program allows the user of a Metrologic scanner to quickly upgrade to a new or custom version of firmware. It requires the use of a personal computer running Windows 95 or greater and the use of a serial port. The user merely connects the scanner to a serial port on the PC, launches the MetroSet2 program, and blasts off to new software upgrades.

Each MS1890, regardless of the version number or communication protocol, can be upgraded. In other words, all RS232 (-14), keyboard wedge (-47), IBM 468X/469X (-11), low speed USB (-38), and full speed USB (-40) units can be upgraded. To upgrade all units, a power supply and PowerLink cable (MLPN 53-53701-3) are required.



RS232 units can be upgraded using the standard PowerLink cable (MLPN 53-53700x-3).

The program guides the user with its simplistic one click approach. The user must first select the file. Once the file is selected and verified, the scanner is ready to be upgraded. Press the "Flash Scanner" button to upgrade the scanner. The unit will go into a "flash mode" – the blue and white LEDs will be flashing alternately. The user can follow the progress of the upgrade by watching the screen for details. When the upgrade is complete, the scanner will reset itself. If a razz/beep occurs, the scanner did not upgrade properly. Contact a Metrologic service representative for additional assistance.

Scanner Pinout Connections

The MS1890 scanner interfaces terminate to a 10-pin, RJ45 Female Socket. The serial # label indicates the interface enabled when the scanner is shipped from the factory.

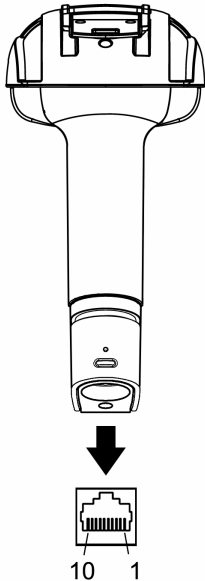


Figure 14.

MS1890-14, 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

MS1890-47, 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

MS1890-11, IBM 468X/469X	
Pin	Function
1	Ground
2	RS232 Transmit Output
3	RS232 Receive Input
4	RTS Output
5	CTS Input
6	Reserved
7	IBM B-Transmit
8	IBM A+ Receive
9	+5VDC
10	Shield Ground

Scanner Pinout Connections

MS1890-38, 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

MS1890-40, Full 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

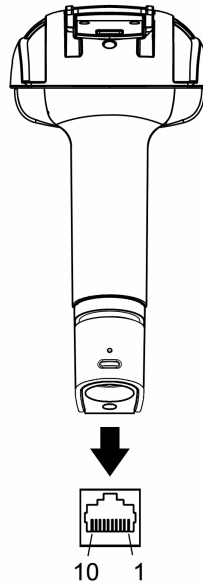

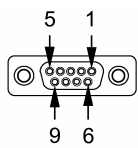

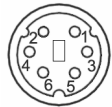





Figure 15.

SCANNER AND CABLE TERMINATIONS

Cable Connector Configurations (Host End)

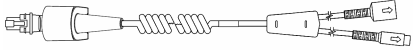

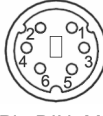
RS232 PowerLink Cable <i>MLPN 53-53700.x-3</i>		
Pin	Function	 <p>9-Pin D-Type Connector</p>
1	Shield Ground	
2	RS232 Transmit Output	
3	RS232 Receive Input	
4	DTR Input/Light Pen Source	
5	Power/Signal Ground	
6	Reserved	
7	CTS Input	
8	RTS Output	
9	+5VDC	

Stand-Alone Keyboard PowerLink Cable, <i>MLPN 53-53720-3</i>		
Pin	Function	 <p>6-Pin Male Mini-DIN Connector</p>
1	PC Data	
2	NC	
3	Power Ground	
4	+5VDC PC Power to KB	
6	NC	

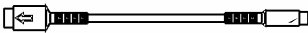

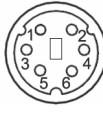
USB Power/Communication Cable <i>MLPN 53-53713.x-N-3 or 53-53714.x-N-3 or 53-53735.x-N-3</i>		
Pin	Function	 <p>USB Type A Locking with Power <i>53-53713.x-N-3 or 53-53714.x-N-3</i></p>
1	PC +5V/V_USB	
2	D-	
3	D+	
4	Ground	
Shield	Shield	 <p>USB Non-Locking <i>(53-53735.x-N-3)</i></p>

SCANNER AND CABLE TERMINATIONS

Cable Connector Configurations (Host End)

Keyboard Wedge PowerLink Cable <i>MLPN 53-53702x-3</i>		
Pin	Function	 5-Pin DIN, Female
1	Keyboard Clock	
2	Keyboard Data	
3	No Connect	
4	Power Ground	
5	+5 VDC	
Pin	Function	 6-Pin DIN, Male
1	PC Data	
2	No Connect	
3	Power Ground	
4	+5 VDC	
5	PC Clock	
6	No Connect	

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	 5-Pin DIN, Male
1	PC Clock	
2	PC Data	
3	No Connect	
4	Power Ground	
5	+5 VDC	
Pin	Function	 6-pin Mini DIN, Female
1	Keyboard Data	
2	No Connect	
3	Power Ground	
4	+5 VDC	
5	Keyboard Clock	
6	No Connect	

LIMITED WARRANTY

The MS1890 series scanners are manufactured by Metrologic at its Blackwood, New Jersey, U.S.A. facility and at its Suzhou, China facility. The MS1890 series scanners have a three (3) year limited warranty from the date of manufacture. Metrologic warrants and represents that all MS1890 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 the case of Product is opened by anyone other than Metrologic's repair department or authorized repair centers.

THIS LIMITED WARRANTY, EXCEPT AS TO TITLE, IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES, EITHER EXPRESS OR IMPLIED, AND SPECIFICALLY EXCLUDES, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE UNDER THE UNIFORM COMMERCIAL CODE, OR ARISING OUT OF CUSTOM OR CONDUCT. THE RIGHTS AND REMEDIES PROVIDED HEREIN ARE EXCLUSIVE AND IN LIEU OF ANY OTHER RIGHTS OR REMEDIES. IN NO EVENT SHALL METROLOGIC BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES, INCIDENTAL DAMAGES, DAMAGES TO PERSON OR PROPERTY, OR EFFECT ON BUSINESS OR PROPERTY, OR OTHER DAMAGES OR EXPENSES DUE DIRECTLY OR INDIRECTLY TO THE PRODUCT, EXCEPT AS STATED IN THIS WARRANTY. IN NO EVENT SHALL ANY LIABILITY OF METROLOGIC EXCEED THE ACTUAL AMOUNT PAID TO METROLOGIC FOR THE PRODUCT. METROLOGIC RESERVES THE RIGHT TO MAKE ANY CHANGES TO THE PRODUCT DESCRIBED HEREIN.

CORPORATE HEADQUARTERS, NORTH AMERICA

Metrologic Instruments, Inc.
90 Coles Rd.
Blackwood, NJ 08012-4683
Customer Service Department
Tel: 1-800-ID-METRO
Fax: 856-228-6673
Email: info@metrologic.com

METROLOGIC EUROPEAN REPAIR CENTER (MERC)

Metrologic Eria Ibérica, SL
C/Alfonso Gomez, 38-40, 1D
28037 Madrid
Tel: +34 913 751 249
Fax: +34 913 270 437

MTLG AUTO ID INSTRUMENTS (SHANGHAI) Co., LTD Suzhou Sales Office

BLK A, Room# 03/03-04
No.5 Xinghan Street, Xinsu Industrial Square
China-Singapore Suahou Industrial Park, Suzhou, PRC
Tel: 86-512-67622550
Fax: 86-512-67622560
Email: info@cn.metrologic.com

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 Laserausüstung 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.

REGULATORY COMPLIANCE

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 mètres (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 câbles de scanner ne dépassant pas 3 mètres (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

For patent information, please refer to www.honeywellaidc.com/patents.

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WORLDWIDE HEADQUARTERS

Metrologic Instruments, Inc.

90 Coles Rd. Blackwood, NJ 08012-4683 • Email: info@metrologic.com
Customer Service Tel: 1-800-ID-METRO • Corporate Tel: 856-228-8100
Fax: 856-228-6673 (Sales) • 856-228-1879 (Marketing) • Fax: 856-228-0653 (Legal/Finance)

USA

Omniplanar

Tel: 856.537.6100
Fax: 856.537.6116
Email: info@omniplanar.com

USA

NOVODisplay

Tel: 856.537.6139
Fax: 856.537.6116
Email: info@NOVODisplay.com

METROLOGIC - THE AMERICAS

USA

Metrologic USA - Headquarters

Tel: 1.856.537.6400
Fax: 1.856.537.6474
Email: info@us.metrologic.com

Mexico

Metrologic Mexico, S.A. DE C.V.

Tel: 55.5365.6247
Fax: 55.5362.2544
Email: info@mx.metrologic.com

South America

Metrologic do Brasil Ltda.

Tel: 52.55.11.5182.7273
Fax: 52.55.11.5182.7198
Email: info@sa.metrologic.com

South America

Metrologic South America

Tel: 1.239.642.1958
Fax: 1.239.642.1959
Email: info@sa.metrologic.com

METROLOGIC - EMEA

Central Europe

Metrologic Instruments GmbH Headquarters

Tel: 49-89-89019-0
Fax: 49-89-89019-200
Email: info@de.metrologic.com

France

Metrologic Eria France SA

Tel: +33 (0) 1 48.63.78.78
Fax: +33 (0) 1 48.63.24.94
Email: info@fr.metrologic.com

METROLOGIC - EMEA

Spain

Metrologic Eria Iberica, SL

Tel: +34 913 272 400
Fax: +34 913 273 829
Email: info@es.metrologic.com

Russia

Metrologic Instruments LLC

Tel: +7 (495) 737 7273
Fax: +7 (495) 737 7271
Email: info@ru.metrologic.com

Italy

Metrologic Instruments Italia

Tel: +39 0 57 6511978 or
+39 051 651 1978
Fax: +39 0 51 6521337
Email: info@it.metrologic.com

Poland

Metrologic Instruments

Poland
Tel: +48 (22) 545 04 30
Fax: +48 (22) 545 04 31
Email: info@pl.metrologic.com

United Kingdom

Metrologic Instruments

UK Limited
Tel: +44 (0) 1256 365900
Fax: +44 (0) 1256 365955
Email: info@uk.metrologic.com

METROLOGIC - APAC

Asia

Metrologic Asia (Pte) Ltd Headquarters

Tel : (65) 6842-7155
Fax : (65) 6842-7166
Email: info@sg.metrologic.com

China

Suzhou Sales Office

Headquarters
Tel: 86-512-67622550
Fax: 86-512-67622560
Email: info@cn.metrologic.com

METROLOGIC - APAC

Australia

Metrologic Australia

Tel: 61 2 9652 2726
(international)
Tel: 02 9816 6470 (local)
Tel: 1 800 99 88 38 (Australia)
Email: kmason@au.metrologic.com

China

Beijing Sales Office

Tel/Fax: 86 10 82253472
Email: info@cn.metrologic.com

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Tel: 86-20-38823476
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India

India Sales Office

Tel: +91 80 41256718
Fax: +91 80 41256719
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Korea

Korea Sales Office

Tel: 82-2-6205-5379
Fax: 82-2-3444-3980
Email: Scott.lee@kr.metrologic.com

Japan

Metrologic Japan Co., Ltd.

Tel: 81-3-3839-8511
Fax: 81-3-3839-8519
Email: info@jp.metrologic.com

Thailand

Metrologic Thailand

Tel: +662-610-3787
Fax: +662-610-3601
Email: tawan.jandang@th.metrologic.com

China

Shanghai

Tel: 86-21-58356616
Fax: 86-21-58358873
Email: info@cn.metrologic.com

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