Metrologic

METROLOGIC INSTRUMENTS, INC.

MS6200 Pulsar™ Series

Single-Line Hand-Held Laser Scanner

Installation and User's Guide

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MLPN 2447
Printed in USA
May 2000

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INTRODUCTION

The MS6220 Pulsar™ is an entry-level hand held contact laser bar code scanner that combines the high-speed and accuracy of a laser scanner with the working range and price of a typical CCD.

Pulsar has a controlled 7.6 cm (3") depth of field on 100% UPC bar codes, which makes it perfect for large retail applications where UPC/EAN bar codes are frequently scanned at less demanding, low-volume check-out areas or satellite cash registers.

The MS6220 Pulsar is equipped with PowerLink user-replaceable cables, utilizes MetroSelect® configuration bar codes and is MetrOPOS™ compatible.

Scanner	Interface
MS6220-9	OCIA
MS6220-11	IBM 468X/469X
MS6220-41	Full RS-232/Light Pen Emulation
MS6220-47	Keyboard Wedge, Stand-Alone Keyboard and RS232 Transmit/Receive

ACCESSORIES AND SUPPLIES

The following is a list of parts that may or may not be included in a MS6220 kit.

- **MS6220** Pulsar™ Single-Line Contact Laser Scanner
- **AC to DC Power Transformer** – Regulated 5.2VDC @ 650 mA output
  - One of the following may be included:
    - 120 V United States [MLPN 45-45593]
    - 220 V - 240 V Continental European [MLPN 45-45591]
    - 220 V – 240 V United Kingdom [MLPN 45-45592]
- **PowerLink Cable** with built in power jack.
  - One of the following may be included:
    - Standard – 2.1 m (7') straight cord, short strain relief [MLPN 54-54000]
    - Optional – 2.7 m (9') coiled cord, long strain relief [MLPN 53-53000]
- **Keyboard Wedge PowerLink Cable Kit** [MLPN 53-53002 or 54-54002]
  - A PowerLink " Y" Cable with a 5-pin DIN female connector and a 6-pin mini DIN male connector
  - An Adapter Cable with a 5-pin DIN male connector and a 6-pin mini DIN female connector
- **Installation and User's Guide** [MLPN 00-02447]
- **Scanner Custom Configuration Guide**
- **MetroSelect® Single Line Configuration Guide** [MLPN 00-02544]

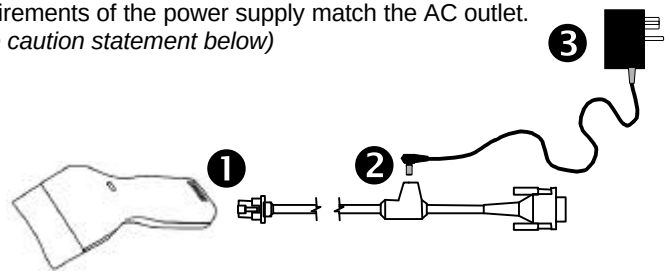
Other items may be ordered for the specific protocol being used. To order additional items, contact the dealer, distributor or call Metrologic's Customer Service Department at 1-800-ID-METRO or 1-800-436-3876.

QUICK START

1. Connect the 10-pin RJ45 male connector into the jack on the Pulsar™ MS6220. You will hear a 'click' when the connection is made.

2. Connect the L-shaped plug of the power supply into the power jack on the PowerLink cable.

3. Connect the power supply into an AC outlet. Make sure the AC input requirements of the power supply match the AC outlet. *(See caution statement below)*



4. When the MS6220 is ready to scan, the green LED will turn on, the red LED will flash and the scanner will beep once.

5. The MS6220 's operation is automatic. The laser pulses on and off. When the laser is on, the green LED will be on. When the laser is off, the green LED will be off.

Operational Test

6. Place a bar code in front of the scanning window. The scanner will beep once and flash the red LED if the bar code was successfully decoded.

7. The scanner is shipped from the factory programmed with default settings. To configure the MS6220 scanner to meet the host system's specific needs, refer to the Programming Guide or custom configuration guide for instructions on how to change the scanners default settings.

Caution:

To maintain compliance with federal regulations 21 CFR, Part 1040.10, section (f)(6) the scanner must be plugged into an electrical outlet with a switch accessible to the user or be powered by a host system containing a switch that will disable power to the scanner.

STANDARD SCANNER INSTALLATION

1. Turn off the host system.

2. Connect the 10-pin RJ45 male connector of the PowerLink cable into the jack on the MS6220.

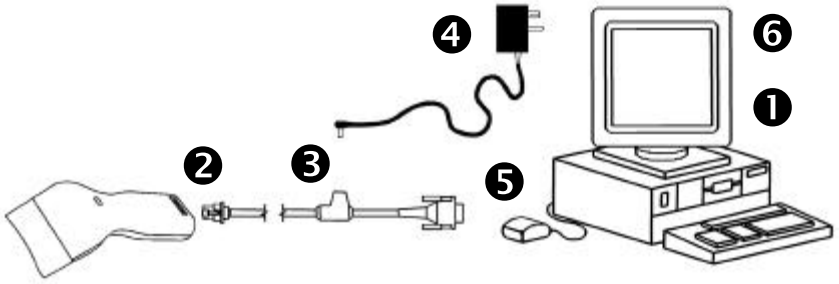
   Note: If the MS6220 is receiving power from the host system, skip to step #5. *(See caution statement below*)*

3. Connect the L-shaped plug of the power supply into the power jack on the PowerLink cable. *(See caution statement below**)*

4. Make sure the AC input requirements of the power supply match the AC outlet. Connect the power supply into an AC outlet.

5. Connect the PowerLink cable to the proper port on the host system.

6. Turn on the host system



7. When the MS6220 is ready to scan, the green LED will turn on, the red LED will flash and the scanner will beep once.

Manufacturer's Note:

Plugging the scanner into a port on the host system does not guarantee that the scanned information will be communicated properly to the host system. The scanner and/or the host system may need to be configured for communications to occur.

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 60950.

*To maintain compliance with standard CSA C22.2 No. 950/UL 1950 and norm EN 60950, the power source should meet applicable performance requirements for a limited power source.

**To maintain compliance with federal regulations 21 CFR, Part 1040.10, section (f)(6) the scanner must be plugged into an electrical outlet with a switch accessible to the user or be powered by a host system containing a switch that will disable power to the scanner.

KEYBOARD WEDGE INSTALLATION

1. Turn off the host system.

2. Connect the 10-pin RJ45 male connector of the PowerLink cable into the jack on the MS6220.

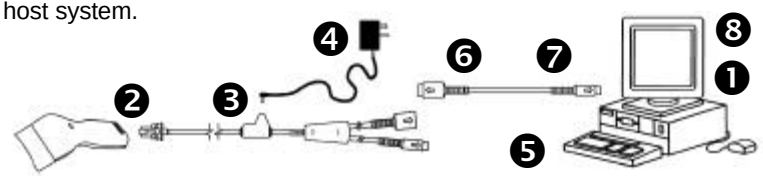
3. Connect the L-shaped plug of the power supply into the power jack on the PowerLink cable (*refer to the manufacturer's recommendation on page 6*).

4. Make sure the AC input requirements of the power supply match the AC outlet. Connect the power supply into an AC outlet (*see caution statement below**)*.

5. Disconnect the keyboard from the host system.

6. The PowerLink "Y" cable is terminated with a 5-pin DIN female connector on one end, and a 6-pin mini DIN male on the other. 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 "Y" cable, leaving the necessary termination exposed for connecting to the keyboard and the keyboard port on the host system.

7. Connect the PowerLink "Y" cable to the keyboard and keyboard port on the host system.



8. Power up the host system.

9. When the MS6220 is ready to scan, the green LED will turn on, the red LED will flash and the scanner will beep once.

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 60950.

*To maintain compliance with standard CSA C22.2 No. 950/UL 1950 and norm EN 60950, the power source should meet applicable performance requirements for a limited power source.

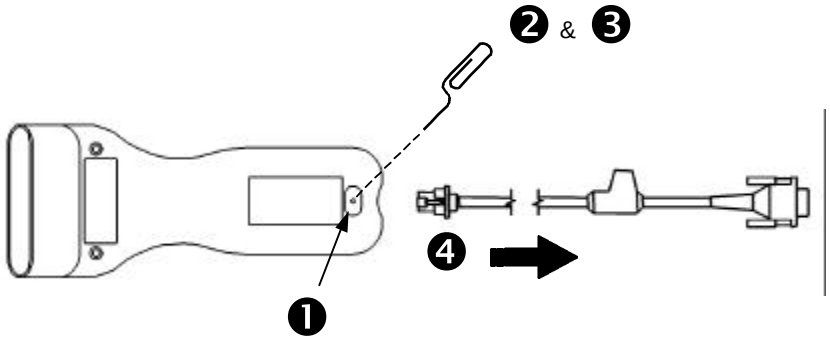
**To maintain compliance with federal regulations 21 CFR, Part 1040.10, section (f)(6) the scanner must be plugged into an electrical outlet with a switch accessible to the user or be powered by a host system containing a switch that will disable power to the scanner

Manufacturer's Recommendation

If the keyboard port of the host system cannot supply enough current, the use of an external power supply with the MS6220 Keyboard Wedge will be necessary. Powering the MS6220 directly from the computer keyboard connector could interfere with the operation of the scanner or the computer. Not all computers supply the same current through the keyboard port, so a scanner may work on one computer and not another *(see caution statement on page 5)*.

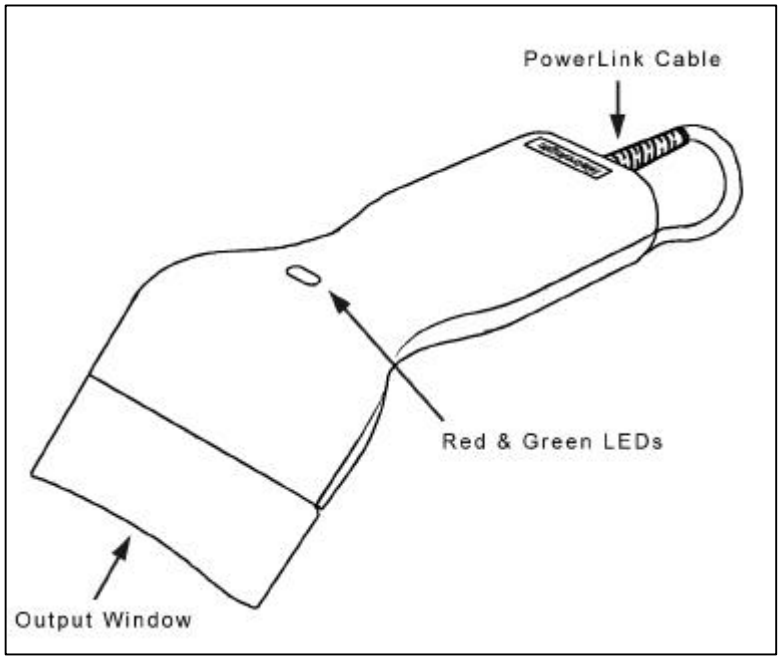
DISCONNECTING THE POWERLINK CABLE FROM THE SCANNER

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.



1. Locate the small ‘pin-hole’ on the back of the scanner.
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. You will here a faint ‘click’. Pull gently on the strain-relief of the PowerLink cable and it will slide out of the scanner.

SCANNER PARTS



1. **Green & Red LEDs**
   The MS6220 laser pulses on and off during normal operation. When the laser is on, the green LED will be on. When the laser is off, the green LED will be off. On a successful read of a bar code, the red LED will flash and the scanner will beep once. The LEDs are also used as diagnostic indicators and mode indicators.

2. **Output Window**
   Laser Light emits from this aperture.

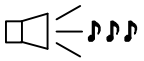
3. **PowerLink Cable**
   The 10-pin modular plug on the PowerLink cable connects into the 10-pin modular jack on the MS6220.

AUDIBLE INDICATORS

When the MS6220 scanner is operational, 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 Configuration Guide.

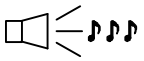
One Beep – on power up
The green LED will turn on, then the red LED will flash and the scanner will beep once. The red LED will remain on for the duration of the beep. The scanner is now ready to scan.

One Beep – during operation
When the scanner successfully reads a bar code, the red LED will flash and the scanner will beep once (if programmed to do so). If the scanner does not beep once and the red light does not flash, then the bar code has not been successfully read.



Three Beeps – during operation
When entering the program mode, the red LED will flash while the scanner simultaneously beeps three times. The red LED will continue to flash until the unit exits program mode. Upon exiting program mode, the scanner will beep three times and the red LED will stop flashing.

When configured for communication timeout, 3 beeps during operation will indicate that a communication timeout has occurred.



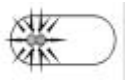
Three Beeps – on power up
This is a failure indicator. Refer to the *Failure Modes* section of this guide on page 11.

Razzberry Tone
This is a failure indicator or an invalid code read during program mode. Refer to the *Failure Modes* section of this guide on page 11.

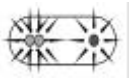
VISUAL INDICATORS

There is a red LED and a green LED on the MS6220. When the scanner is on, the activity of the LEDs indicates the status of the current scan and the scanner.

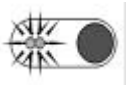
Green and Red LEDs are off
The LEDs will not be illuminated if the scanner is not receiving power from the host or transformer.



Flashing Green
During normal operation, the laser pulses on and off. When the laser is active, the green LED is on. When the laser is off, the green LED is off.

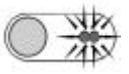


Flashing Green and Single Red Flash
When the scanner successfully reads a bar code, the red LED will flash and the scanner will beep. If the red LED does not flash and the scanner does not beep, then the bar code has not been successfully read.



Flashing Green and Steady Red
After a successful read, 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 red LED will remain on until the data can be transmitted.

Steady Green
Indicates continuous laser operation. Accompanied by a razzberry tone, it indicates that an invalid bar code has been scanned.

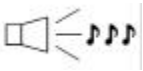


Steady Green and Continuous Flashing Red
When entering the program mode, the red LED will flash, the green LED will turn on and the scanner will beep three times. The red LED will continue to flash and the green LED will stay on until the unit exits the program mode.

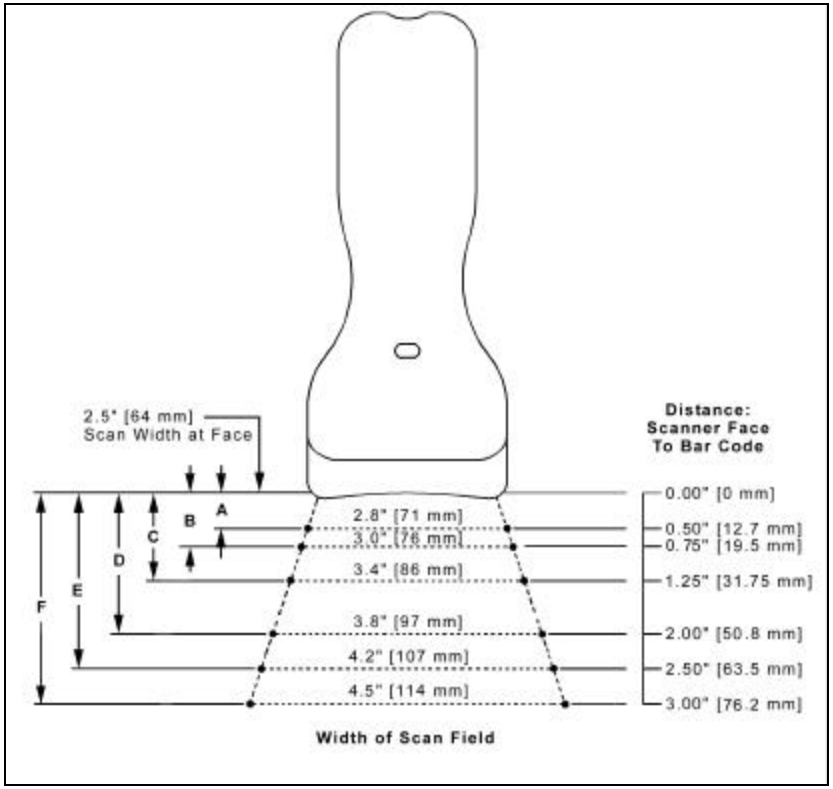
FAILURE MODES

One Razzberry Tone on Power-up
This indicates the scanner has experienced a laser or flipper subsystem failure. Return the unit for repair to a Metrologic Authorized Service Center.

Continuous Razzberry Tone with all LEDs off
If, upon power up, the scanner emits a continuous razzberry tone, then the scanner has an experienced an electronic failure. Return the unit for repair to a Metrologic Authorized Service Center.



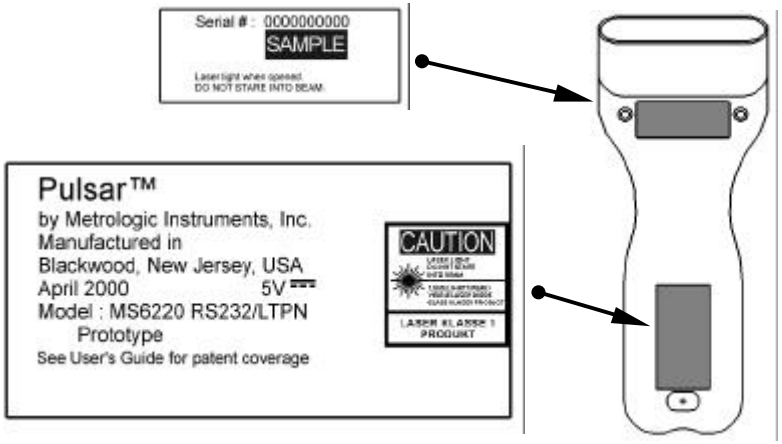
Three Beeps – on power up
If the scanner beeps 3 times on power up then, the non-volatile memory (NovRAM) that holds the scanner configuration has failed. Return the unit for repair to a Metrologic Authorized Service Center.

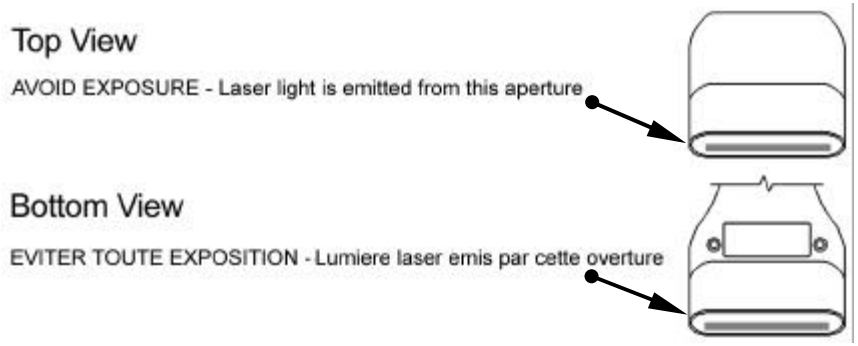


Minimum Bar Code Element Width						
	A	**B**	**C**	**D**	**E**	**F**
mm	.10	.12	.17	.26	.33	.66
mils	4.1	4.8	6.8	10.4	13	26

LABELS

Each scanner has two labels on the underside of the unit. The first label has the model number, date of manufacture, and caution information. The second label shows the serial number and the laser information. The following are examples of these labels:





MAINTENANCE

Smudges and dirt on the window of a bar code scanner can interfere with proper scanning. Therefore, the output window will need occasional cleaning.

1. Spray glass cleaner onto a lint-free, non-abrasive cleaning cloth.
2. Gently wipe the scanner window.

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 on page 28.

SYMPTOMS	POSSIBLE CAUSE(S)	SOLUTION
No LEDs, beep or laser line	No power is being supplied to the scanner	Check transformer, outlet and power strip. Make sure the cable is plugged into the scanner.
No LEDs, beep	No power is being supplied to the scanner from host	Some host systems cannot supply enough current to power the MS6220. Use the proper power supply.
3 beeps on power up	Non-volatile RAM failure	Contact a Metrologic Representative, if the unit will not hold the programmed configuration.
Continuous razz tone on power up	RAM or ROM failure	Contact a Metrologic Representative.
Razz tone at power up	VLD failure or a Scanner flipper failure	Contact a Metrologic Representative.
Unit scans, Communicates and beeps twice	Same Symbol timeout set too short	Adjust same symbol time out for a longer time.
The unit powers up but does not beep	Beeper disabled. No tone selected	Enable beeper. Select tone.

TROUBLESHOOTING GUIDE (CONTINUED)

SYMPTOMS	POSSIBLE CAUSE(S)	SOLUTION
The unit powers up, but does not scan	Scanning a particular symbology that is not enabled	UPC/EAN, Code 39, Interleaved 2 of 5, Code 93, Code 128 and Codabar 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 has been programmed for a character length lock, or a minimum length and bar code being scanned does not satisfy the programmed criteria	Verify that the bar code that is being scanned falls into the criteria (Typical of Non-UPC/EAN codes.) *The scanner defaults to a minimum of 3 character bar code.*
The unit scans a bar code, but locks up after the first scan and the red 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, XON/XOFF) or D/E, 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.
Scanner beeps at some bar codes and NOT for others of the same bar code symbology	The print quality of the bar code is suspect Or 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. For example change to econo mode or high speed.

TROUBLESHOOTING GUIDE (CONTINUED)

SYMPTOMS	POSSIBLE CAUSE(S)	SOLUTION
Scanner 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.
Scanner beeps at some bar codes and NOT for others of the same bar code symbology	The scanner is not configured correctly for this type of bar code	Check if check digits are set properly.
Scanner beeps at some bar codes and NOT for others of the same bar code symbology	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	Configuration is not correct	Make sure the scanner is configured for the appropriate communication mode.
The unit scans but the data is not correct (Keyboard Wedge)	Configuration is not correct	Make sure that the proper PC type AT, PS2 or XT is selected. Verify correct country code and data formatting are selected. Adjust intercharcter delay.

TROUBLESHOOTING GUIDE (CONTINUED)

SYMPTOMS	POSSIBLE CAUSE(S)	SOLUTION
The unit is not transmitting each character (Keyboard Wedge)	Configuration is not correct	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 (Keyboard Wedge)	Computer is in Caps Lock mode	Enable Caps Lock detect setting of the scanner to detect whether the PC is operating in Caps Lock.
Everything works except for a couple of characters (Keyboard Wedge)	These characters may not be supported by that country's key lookup table	Try operating the scanner in Alt mode.
Power-up OK and scans OK but does not communicate properly to the host	Com port at the host is not working or configured properly or Cable not connected to the proper comm port	Check to make sure that the baud rate, data bits, stop bits and parity of the scanner and the communication port match and the program is looking for "RS-232" data.
The host is receiving data but the data does not look correct	The scanner and host may not be configured for the same interface font	Check that the scanner and the host are configured for the same interface font.
Characters are being dropped	Scanner may not be set for sufficient Inter-character delay	Add some inter-character delay to the transmitted output by using the MetroSelect Programming Guide MLPN 2407.

RS-232 DEMONSTRATION PROGRAM

If an RS-232 scanner is not communicating with your IBM compatible PC, key in the following BASIC program to test that the communication port and scanner are working. This program is for demonstration purposes only. It is only intended to prove that cabling is correct, the communication port is working, and the scanner is working. If the bar code data displays on the screen while using this program, it only demonstrates that the hardware interface and scanner are working. At this point, investigate whether the application software and the scanner configuration match. If the application does not support RS-232 scanners, a software wedge program that will take RS-232 data and place it into a keyboard buffer may be needed. This program tells the PC to ignore RTS-CTS, Data Set Ready (DSR) and Data Carrier Detect (DCD) signals. If the demonstration program works and yours still does not, jumper RTS to CTS and Data Terminal Reading (DTR) to DCD and DSR on the back of your PC.

```
10      CLS
20      ON ERROR GOTO 100
30      OPEN “COM1:9600,S,7,1,CS0,DS0,CD0,LF” AS #1
35      PRINT “SCAN A FEW BAR CODES”
40      LINE INPUT #1, BARCODE$
50      PRINT BARCODE$
60      K$ = INKEY$: IF K$ = CHR$(27) THEN GOTO 32766
70      GOTO 40
100     PRINT “ERROR NO.”; ERR; “ PRESS ANY KEY TO TERMINATE.”
110     K$ = INKEY$: IF K$ = “” THEN GOTO 110
32766   CLOSE: SYSTEM
32767   END
```

APPENDIX A

Specifications

OPERATIONAL	
Light Source	Visible Laser Diode 650 nm ± 10 nm or 675 nm ± 5 nm
Laser Power	0.75 mW (peak)
Depth of Scan Field	0 mm – 64 mm (0” – 2.5”) for 0.33 mm (13 mil) bar code at default setting
Scan Speed	72 ± 2 scan lines per second
Scan Pattern	Single scan line
Minimum Bar Width	0.102 mm (4.0 mil)
Decode Capability	Autodiscriminates all standard bar codes; for others call Metrologic
System Interfaces	RS232, Keyboard Wedge, Light Pen Emulation, IBM 468X/469X, OCIA, Stand Alone Keyboard
Print Contrast	35% minimum reflectance difference
Number Characters Read	Up to 80 data characters (Maximum number will vary based on symbology and density)
Roll, Pitch, Yaw	42°, 68°, 52°
Beeper Operation	7 tones or no beep
Indicators (LED)	Green = laser on, ready to scan Red = good read
MECHANICAL	
Length	178 mm (7.00”)
Width-Handle	48 mm (1.9”)
Width-Head	70 mm (2.7”)
Weight	121 g (4.2 oz)
Cable	Standard 2.1 m (7’) straight; optional 2.7 m (9’) coil

ELECTRICAL	
Input Voltage	5 VDC ± 0.25 V
Power - Operating	800 mW
Current - Operating	160 mA peak @ 5 VDC
DC Transformers	Class 2; 5.2 V @ 650 mA
Laser Class	Pending
EMC	Pending
ENVIRONMENTAL	
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 60°C (-40°F to 140°F)
Humidity	5% to 95% relative humidity, non-condensing
Light Levels	Up to 4842 Lux (450 footcandles)
Shock	Designed to withstand 1.5 m (5') drops
Contaminants	Sealed to resist airborne particulate contaminants
Ventilation	None required

APPENDIX B

Default Settings

Many functions of the scanner can be "programmed" – that is, enabled or disabled. The scanner is shipped from the factory programmed 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. Every communication does not support every parameter. If the communication supports a parameter listed in the charts on the following pages, a check mark will appear.

Parameter	Default	OCIA	RS-232	Light Pen	IBM 46XX	KBW
Normal Scan Mode (Blink)	*	✓	✓	✓	✓	✓
Continuous Scan Mode		✓	✓	✓	✓	✓
UPC/EAN	*	✓	✓	✓	✓	✓
UPC-A	*	✓	✓	✓	✓	✓
EAN-8	*	✓	✓	✓	✓	✓
EAN-13	*	✓	✓	✓	✓	✓
UPC-E	*	✓	✓	✓	✓	✓
Code 128	*	✓	✓	✓	✓	✓
Code 93	*	✓	✓	✓	✓	✓
Codabar	*	✓	✓	✓	✓	✓
Interleaved 2 of 5 (ITF)	*	✓	✓	✓	✓	✓
MOD 10 check on ITF		✓	✓	✓	✓	✓
Code 11		✓	✓	✓	✓	✓
Code 39	*	✓	✓	✓	✓	✓
Full ASCII Code 39		✓	✓	✓	✓	✓
Telepen		✓	✓	As Code 39	✓	✓
Matrix 2 of 5		✓	✓		✓	✓
Airline 2 of 5 (13)		✓	✓		✓	✓
Airline 2 of 5 (15)		✓	✓		✓	✓
Dual Codabar		✓	✓		✓	✓
DK Plessey		✓	✓		✓	✓
STD 2 of 5		✓	✓		✓	✓
MSI Plessey		✓	✓	As Code 39	✓	✓
Double Border		✓	✓	✓	✓	✓
Small Border		✓	✓	✓	✓	✓
MOD 43 Check on Code 39		✓	✓	✓	✓	✓
MSI-Pessey 10/10 Check Digit		✓	✓	✓	✓	✓
MSI-Plessey MOD 10 Check Digit	*	✓	✓	✓	✓	✓
Paraf Support ITF		✓	✓	✓	✓	✓

Parameter	Default	OCIA	RS-232	Light Pen	IBM 46XX	KBW
ITF Symbol Lengths	Variable	✓	✓	✓	✓	✓
Minimum Symbol Length	3	✓	✓	✓	✓	✓
Symbol Length Lock	None	✓	✓	✓	✓	✓
Bars High as Code 39	*			✓		
Spaces High as Code 39				✓		
Bars High as Scanned				✓		
Spaces High as Scanned				✓		
Low Speed Option				✓		
Toggle on Decode				✓		
10x Narrow Element	*			✓		
50x Narrow Element				✓		
Poll Light Pen Source				✓		
Beeper Tone	Normal	✓	✓	✓	✓	✓
Beep/Transmit Sequence	Before transmit	✓	✓	✓	✓	
Communication Timeout	none	✓	✓	✓	✓	✓
Razzberry tone on Timeout		✓	✓	✓	✓	✓
Three beeps on Timeout		✓	✓	✓	✓	✓
Same symbol rescan timeout 100 msecs		✓	✓	✓	✓	✓
Same symbol rescan timeout 200 msecs		✓	✓	✓	✓	✓
Same symbol rescan timeout 500 msecs	*	✓	✓	✓	✓	✓
Same symbol rescan timeout 1200 msecs		✓	✓	✓	✓	✓
Same symbol rescan timeout 2000 msecs		✓	✓	✓	✓	✓
No Same Symbol Timeout		✓	✓	✓	✓	✓
Extra Same Symbol Check		✓	✓	✓	✓	✓
Normal Same Symbol Check	*	✓	✓	✓	✓	✓
Infinite Same Symbol Timeout		✓	✓	✓	✓	✓
Inter-character delay Programmable in 1 msec steps (max 255 msecs)	1 msecs 10 msecs in KBW	✓	✓	✓	✓	✓
Number of scan buffers (maximum)	2	✓	✓	✓	✓	✓
Transmit UPC-A check digit	*	✓	✓	✓	✓	✓
Transmit UPC-E check digit		✓	✓	✓	✓	✓

Parameter	Default	OCIA	RS-232	Light Pen	IBM 46XX	KBW
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#	*	✓	✓	✓	✓	✓
Transmit UPC-A Item ID#	*	✓	✓	✓	✓	✓
Transmit Codabar Start/Stop Characters		✓	✓		✓	✓
CLSI Editing (Enable)		✓	✓		✓	✓
Transmit Mod 10/ITF		✓	✓		✓	✓
Transmit MSI-Plessy		✓	✓		✓	✓
Parity	Space		✓		✓	
Baud Rate	9600		✓			
8 Data Bits			✓			
7 Data Bits	*		✓			
Stop Bits	2		✓			
Manufacturer's ID			✓			
Scanner ID			✓			
Transmit Sanyo ID Characters			✓			✓
Nixdorf ID			✓			✓
Aim ID			✓			✓
Sineko ID			✓			✓
Sni Beetle ID			✓			✓
Tec ID			✓			✓
NCR ID			✓			✓
Rochford Thomson ID			✓			✓
Family Dollar ID			✓			✓
LRC Enabled			✓			✓
UPC Prefix			✓			✓
UPC Suffix			✓			✓
Carriage Return	*		✓			✓
Line Feed-Disabled by default in KBW	*		✓			✓
Tab Prefix			✓			✓
Tab Suffix			✓			✓
"C" prefix			✓			✓
"I" prefix			✓			✓
STX prefix			✓			✓

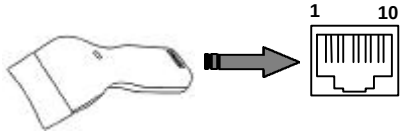
Parameter	Default	OCIA	RS-232	Light Pen	IBM 46XX	KBW
ETX suffix			✓			✓
"DE" Disable Command			✓			
"FL" Laser Commands			✓			
DTR Handshaking support			✓			
RTS/CTS Handshaking			✓			
Character RTS/CTS	*		✓			
Message RTS/CTS			✓			
XON/XOFF Handshaking			✓			
ACK/NAK			✓			
Two Digit Supplements		✓	✓	As Code 39	✓	✓
Five Digit Supplements		✓	✓	As Code 39	✓	✓
Bookland (978)		✓	✓	As Code 39	✓	✓
977 (2 digit) Supplemental Requirement		✓	✓	✓	✓	✓
Supplements are not Required	*	✓	✓	✓	✓	✓
Two Digit Redundancy	*	✓	✓	✓	✓	✓
Five Digit Redundancy		✓	✓	✓	✓	✓
Number System 5 Supplements		✓	✓	✓	✓	✓
FR. Bookland (378)		✓	✓	✓	✓	✓
434/439 Supplement		✓	✓	✓	✓	✓
100 msec to Find Supplement Programmable in 100 msec steps (max 800 msec)	*	✓	✓	✓	✓	✓
Coupon Code 128		✓	✓	As Code 39	✓	✓
Programmable Code Lengths	7 avail	✓	✓	✓	✓	✓
Programmable Prefix Characters	10 avail		✓			✓
Programmable Suffix Characters	10 avail		✓			✓
Prefixes for Individual Code types			✓			✓
Inter Scan-Code Delay Programmable (100 µsec steps)	800 µsec					✓
Function/Control Key Support						✓
Minimum Element Width Programmable in 5.6 µsec steps	1 msec.			✓		
Country Coded Keyboards	US					✓

Scanner Pinout Connections

The MS6220 scanner interfaces terminate to a 10-pin modular jack. The serial # label indicates the interface enabled when the scanner is shipped from the factory.

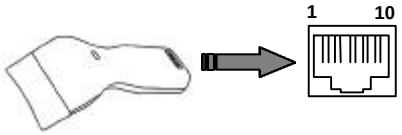
MS6220-**41 RS-232/LTPN**	
Pin	**Function**
1	Ground
2	RS-232 Transmit Output
3	RS-232 Receive Input
4	RTS Output
5	CTS Input
6	DTR Input/LTPN Source
7	Reserved
8	LTPN Data
9	+5VDC
10	Shield Ground

MS6220-**9 OCIA**	
Pin	**Function**
1	Ground
2	No Connection
3	No Connection
4	RDATA
5	RDATA Return
6	Clock In
7	Clock Out
8	Clock in Return/Clock out Rtrn
9	+5VDC
10	Shield Ground



MS6220-**11 IBM 468X/469X**	
Pin	**Function**
1	Ground
2	No Connection
3	No Connection
4	No Connection
5	No Connection
6	No Connection
7	IBM B-Transmit
8	IBM A+ Receive
9	+5VDC
10	Shield Ground

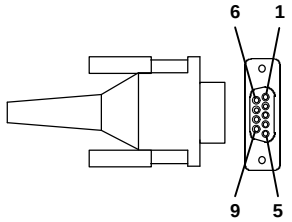
Continued next page



MS6220**-47 Keyboard Wedge**	
Pin	**Function**
1	Ground
2	RS-232 Transmit Output
3	RS-232 Receive Input
4	PC Data
5	PC Clock
6	KB Clock
7	PC +5V
8	KB Data
9	+5VDC
10	Shield Ground

Cable Connector Configurations

"Standard" PowerLink cable (MLPN 53000 or 54000)	
9-pin D-type female connector to the PC	
Pin	**Function**
1	Shield Ground
2	RS-232 Transmit Output
3	RS-232 Receive Input
4	DTR Input
5	Power/Signal Ground
6	Light Pen Data
7	CTS Input
8	RTS Output
9	+5VDC*

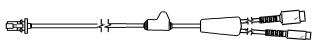


9-Pin D-Type Connector

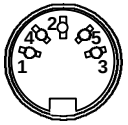
* If a PowerLink power supply is plugged into the PowerLink cable, +5V will NOT be available on this pin. This pin is used when the host is supplying +5V to the scanner.

Keyboard Wedge PowerLink and Adapter Cable

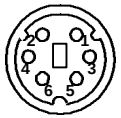
The Keyboard Wedge PowerLink cable is terminated with a 5-pin DIN female connector on one end, and a 6-pin mini DIN male on the other.



Keyboard Wedge PowerLink Cable

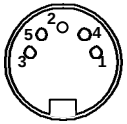


5-Pin DIN, Female



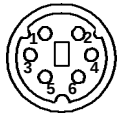
6-Pin DIN, Male

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.



5-Pin Din, Male

Adapter Cable



6-pin Mini Din, Female

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.
The pin assignments are as follows:

POWERLINK CABLE

5-pin Female DIN	
Pin	**Function**
1	Keyboard Clock
2	Keyboard Data
3	No Connect
4	Power Ground
5	+5 Volts DC

6-pin Male Mini-DIN	
Pin	**Function**
1	PC Data
2	No Connect
3	Power Ground
4	+5 Volts DC
5	PC Clock
6	No Connect

ADAPTER CABLE

5-pin Male DIN	
Pin	**Function**
1	PC Clock
2	PC Data
3	No Connect
4	Power Ground
5	+5 Volts DC

6-pin Female Mini-DIN	
Pin	**Function**
1	Keyboard Data
2	No Connect
3	Power Ground
4	+5 Volts DC
5	Keyboard Clock
6	No Connect

APPENDIX D

Warranty and Disclaimer

Limited Warranty

The MS6220 scanners are manufactured by Metrologic at its Blackwood, New Jersey, U.S.A. facility. The MS6220 scanners have a two (2) year limited warranty from the date of manufacture. Metrologic warrants and represents that all MS6220 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 the Metrologic facility in Blackwood, New Jersey, U.S.A. or Puchheim, Germany. To do this, contact Metrologic's 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 judgement 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.

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APPENDIX E

Notices

Caution
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light. Under no circumstances should the customer attempt to service the laser scanner. Never attempt to look at the laser 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 laser light exposure. The use of optical instruments with the laser equipment will increase eye hazard.

Patent Information

"This METROLOGIC product may be covered by one or more of the following U.S. Patents:

U.S. Patent No.;

4,958,894; 5,081,342; 5,260,553; 5,340,971; 5.424,525; 5,484,992; 5,525,789; 5,528,024; 5,616,908; 5,627,359; 5,557,093; 5,661,292; 5,777,315; 5,789,730; 5,789,731; 5,811,780; 5,828,048; 5,925,870; 6,029,894;

4,360,798; 4,369,361; 4,387,297; 4,460,120; 4,496,831; 4,593,186; 4,607,156; 4,673,805; 4,736,095; 4,758,717; 4,816,660; 4,845,350; 4,896,026; 4,923,281; 4,933,538; 4,992,717; 5,081,342; 5,015,833; 5,017,765; 5,059,779; 5,117,098; 5,124,539; 5,130,520; 5,132,525; 5,140,144; 5,149,950; 5,180,904; 5,200,599; 5,229,591; 5,247,162; 5,250,790; 5,250,791; 5,250,792; 5,262,628; 5,280,162; 5,280,164; 5,304,788; 5,321,246; 5,324,924; 5,396,053; 5,396,055; 5,408,081; 5,410,139; 5,436,440; 5,449,891; 5,468,949; 5,479,000; 5,532,469; 5,545,889;

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Other worldwide patents pending.