Fixed-Position Unattended Bar Code Readers

LazerData® 11000 Series
Bar Code Scanner Installation Manual

Part No. 08867 ♦ Rev. A — 10/98

PSC®

When you need to read a bar code

LazerData® 11000 Series Bar Code Scanner

Installation Manual

NOTICES

The quality of the technical information in this publication is the result of a documentation-development process that includes careful research and review. PSC Inc., however, reserves the right to make product-improvement changes, which may not be reflected in this document. PSC Inc. assumes no liability for damages arising out of, or in connection with, the application described herein.

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CONTENTS

LazerData® 11000 Series Bar Code Scanner

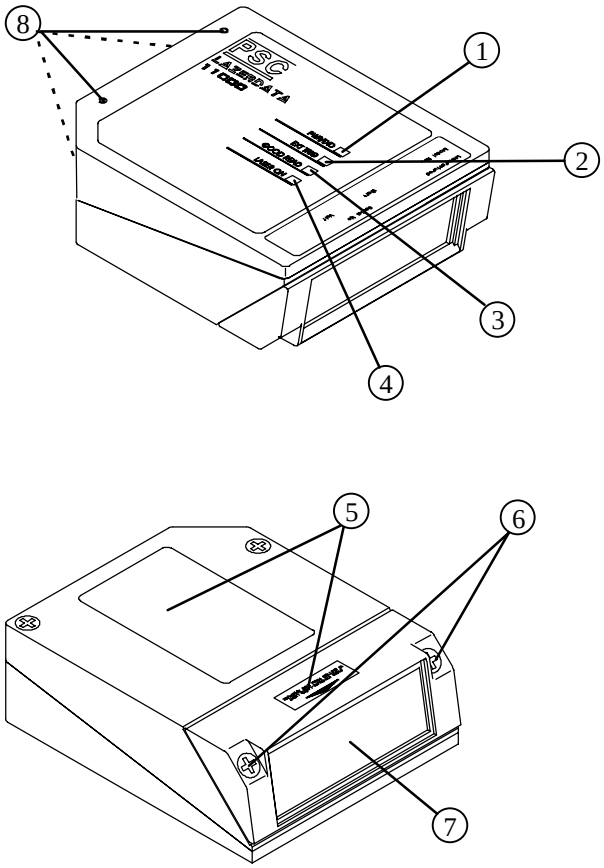


Figure A. Top and Bottom External View

①	Power ON/Data TX LED	⑤	Warning and Device Class Labels
②	Presence Sensor LED	⑥	Accessory Mounting Holes
③	Good Read LED	⑦	Laser Beam Output Window
④	Laser ON LED	⑧	Mounting Holes

SAFETY PRECAUTIONS

LASER SAFETY

The following information is provided to comply with the rules imposed by international regulatory agencies and refers to the correct use of the LazerData® 11000 Series Bar Code Scanner.

Standard Regulations

This scanner utilizes a low-power laser diode. Although staring directly at the laser beam momentarily causes no known biological damage, avoid staring at the beam as one would with any very strong light source, such as the sun. Prevent the laser beam from hitting the eye of any observer, even when the beam is reflected from surfaces such as mirrors, etc.

This product conforms to the applicable requirements of both IEC 825-1 and CDRH 21 CFR 1040 at the date of manufacture. The scanner is classified as a Class 2 laser product according to IEC 825-1 regulations and as a Class II laser product according to CDRH regulations.

There is a safety device that allows the laser to be switched on *only* if the motor is rotating above the threshold of its correct scanning speed.

The laser beam can be switched off with a software command (see also “Beam Shutter” in the LDHOST Help Online).

WARNING

Use of controls or adjustments or performance of procedures other than those specified herein may result in exposure to hazardous visible laser light.

The laser light is visible to the human eye and is emitted from the window on the front of the scanner (Figure A., ⑦).

Warning labels (Figure B.) indicating exposure to laser light and the device classification are applied onto the body of the scanner (Figure A., ⑤).

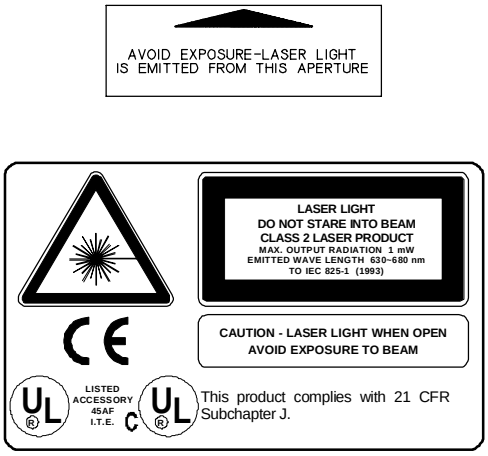


Figure B. Warning and device class labels

Disconnect the power supply when opening the device during maintenance or installation to avoid exposure to hazardous laser light.

The laser diode used in this device is classified as a class 3B laser product according to IEC 825-1 regulations and as a Class IIIb laser product according to CDRH regulations. As it is not possible to apply a classification label on the laser diode used in this device, the following label (Figure C.) is reproduced here.

Figure C. Laser diode class label

Any violation of the optic parts in particular can cause radiation up to the maximum level of the laser diode (7 mW at 630 to 680 nm).

POWER SUPPLY

- Models LD110X11- LD110X16:

This accessory device is intended to be supplied by a UL Listed Power Unit with "Class 2" or LPS power source which supplies power directly to the scanner via the 25-pin connector.

- Models LD110X17 and LD110X18:

This accessory device is intended to be supplied by a UL Listed Power Unit with "Class 2" or LPS power source which supplies power directly to the scanner via the 9-pin connector.

1 GENERAL FEATURES

1.1 INTRODUCTION

The LazerData® 11000 Series Bar Code Scanner is a bar code reader complete with decoder, available in several standard models. These were designed to satisfy demanding requirements associated with high performance scanning.

C Programmability

The LazerData 11000 Scanner belongs to the generation of PSC Automation scanners that operate under the 'C' programming environment, a recognized industry standard.

Standard Application Program

A standard application program is factory-loaded onto the scanner. This program controls bar code reading, serial port interfacing, data formatting, and many other operating and control parameters.

It is completely configurable from a host computer through the LDHOST utility program provided on diskette with the scanner, or through ESC sequences via the serial interface.

Custom Application Programs

If the Standard Application Program doesn't meet your requirements, please contact your local PSC Automation, Inc. distributor.

1.2 DESCRIPTION

Some of the main features of the LazerData® 11000 Scanner are —

- small size
- scanning speed of up to 600 scans/s
- raster version availability
- serial communication interfaces (one or two)
- readability of all popular codes
- supply voltage range from 10 to 30 VDC
- test mode — for verification of reading features and exact scanner positioning without need for external tools
- programmability in four different operating modes — to suit the most varied bar code reading system requirements
- low power consumption

The scanner uses a solid-state laser diode as a light source. The light emitted has a wavelength between 630 and 680 nm. Refer to the section "Safety Precautions" at the beginning of this manual for information on laser safety.

With an IP65 protection class enclosure, the reader is suitable for industrial environments where high protection against harsh external conditions is required.

The four LEDs on the side of the scanner indicate the following:

PWR/TXD (red) (Figure A.,①) indicates the reader is connected to the power supply or, when blinking (green), data transmission.

GOOD READ (red) (Figure A.,③) signals possible, successful bar code reading.

EXT TRIG (yellow) (Figure A.,②) indicates the code presence sensor is active.

LASER ON (green) (Figure A.,④) indicates laser ON state.

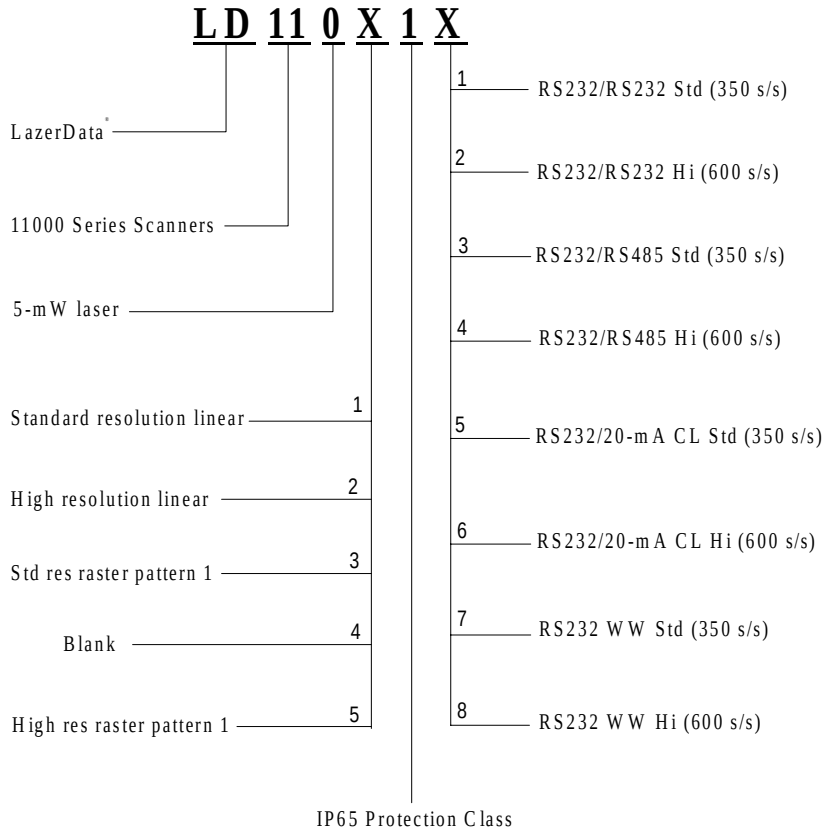
The screw holes on the body of the reader are for mechanical fixture (Figure A.,⑧).

1.3 AVAILABLE MODELS

The LazerData 11000 Scanner is available in models with variances in the following

- Resolution
- Interface module and cable termination
- Linear or raster models
- Performance

The following models are available —



1.4 LD11-90 DEFLECTION MIRROR

The LD11-90DEG Deflection Mirror is available on request for the LazerData 11000 Scanner. The installation of the LD11-90DEG Deflection Mirror is very easy (see Figure 1-1).

> **CAUTION**
> Avoid any contact with the deflection mirror, mirrored rotor, the lenses, or other optical components. Otherwise, the performance of the reader will be reduced.

1. Turn off the device.
2. Remove the scanning window by unscrewing the two cover screws.
3. Attach the mirror to the device by means of the two fixing screws.
4. Remount the scanning window so that the opening face is now at 90° with respect to the scanner body.

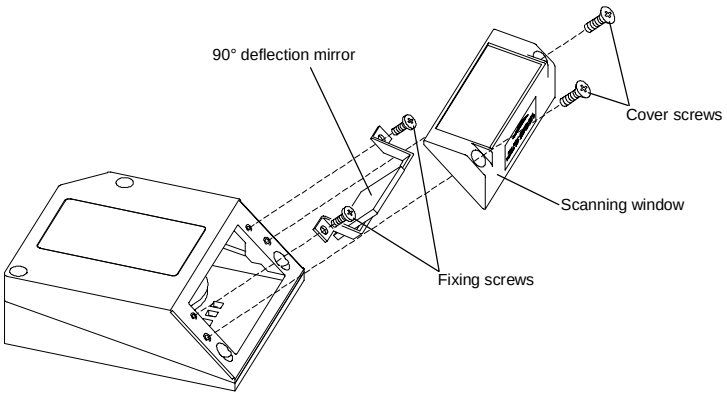


Figure 1-1. Installation of the Deflection Mirror

2 INSTALLATION

2.1 PACKAGE CONTENTS

Verify that the LazerData® 11000 Series Bar Code Scanner and all the parts supplied with the equipment are present and intact when opening the packaging. The list of parts includes:

1. LazerData® 11000 Scanner with cable
2. This installation manual
3. Bar code test chart (PCS = 0.9)
4. LazerData® 11000 Series Scanner configuration program disk
5. Mounting kit – bracket and screws

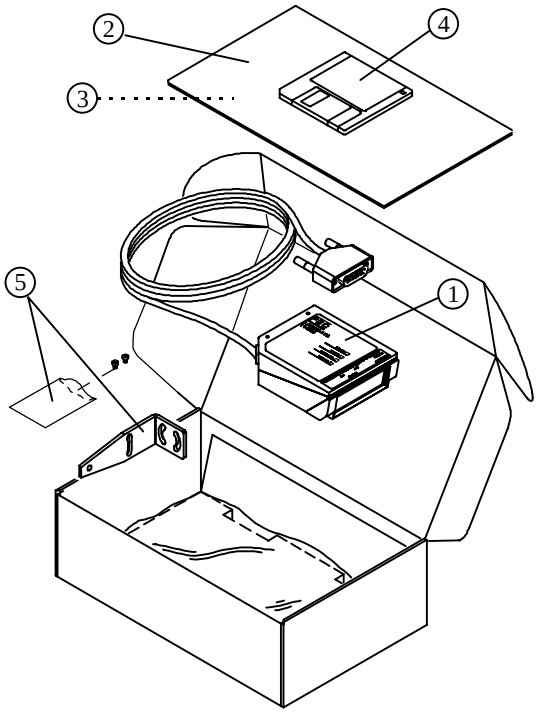


Figure 2.1 - LazerData® 11000 Scanner package contents

2.2 GUIDE TO INSTALLATION

The following can be used as a checklist to verify all of the steps necessary for complete installation of the LazerData® 11000 Scanner.

1. Read all information in the section "Safety Precautions" at the beginning of this manual.

2. Correctly position and mount the scanner for bar code reading according to the information in sections 2.3, 2.5, and 3.4.

3. Provide correct system cabling according to the signals necessary (see all of section 2.4).

4. The Standard Application Program default setting and the instructions to perform software configuration are available in the LDHOST help file.

NOTE

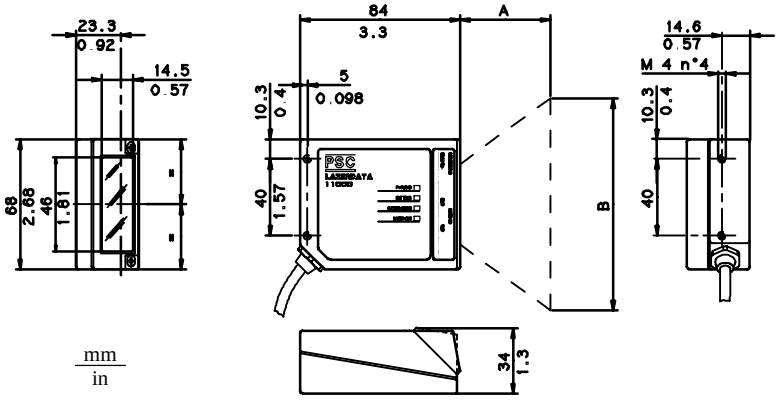
Fine tuning of the scanner position for bar code reading can be accomplished using the Test Mode as described in LDHOST.

The installation is now complete.

2.3 MECHANICAL INSTALLATION

The LazerData® 11000 Scanner can be installed to operate in different positions. The four screw holes (M4 x 5) on the body of the reader are for mechanical fixture (Figure A., ⑧). See the diagrams below for the overall dimensions of the scanner and mounting bracket that may be used for installation.

Refer to section 2.5 for correct positioning.



Mounting Bracket

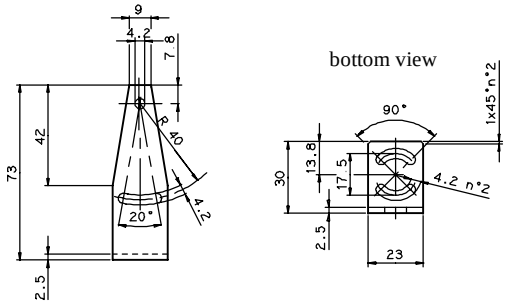


Figure 2.2 - Overall dimensions

2.4 ELECTRICAL CONNECTIONS

Several LazerData® 11000 Scanner models are equipped with a cable terminated by a 25-pin female D-sub connector for connection to the power supply and input/output signals. The details of the connector pins are indicated in the following table:

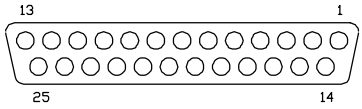


Figure 2.3 - 25-pin female D-sub connector

25-pin D-sub connector pinout		
Pin	**Name**	**Function**
13	VS	Power supply input voltage (+)
25	GND	Power supply input voltage (-)
1	CHASSIS	Chassis Ground
9	VS	Presence sensor supply voltage (+)
18	PS+	Presence sensor (+)
19	PS-	Presence sensor (-)
8	NO READ +	No read output (+)
22	I/O REF	I/O reference
11	RIGHT +	Right read output (+)
12	I/O REF	I/O reference
2*	TX232/TX485+/CLOUT+	
3*	RX232/RX485+/CLIN+	* Main interface signals
4*	RTS232/TX485-/CLOUT-	(see par. 2.4.2)
5*	CTS232/RX485-/CLIN-	
7	SGND	Signal Ground
20	RXAUX	Auxiliary input
21	TXAUX	Auxiliary output
23	CTSAUX	Auxiliary handshake
24	RTSAUX	Auxiliary handshake
6, 10, 14, 15, 16, 17	NC	No Connect

*Pins 2, 3, 4, and 5 of the 25-pin connector have different functions depending on the scanner model.

Some scanner models are equipped with a 9-pin female connector. The details of the connector pins are indicated in the following table:

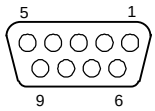


Figure 2.4 - 9-pin female connector

9-pin connector pinout		
Pin	**Name**	**Function**
7	VS	Power supply input voltage (+)
5	GND	Power supply input voltage (-)
8	PS+	Presence sensor (+)
9	PS-	Presence sensor (-)
1	CHASSIS	
2	TX232	Main output
3	RX232	Main input
4	CTS232	Main handshake
6	RTS232	Main handshake

2.4.1 Power supply

Power can be supplied to the scanner through the pins provided on the 25- or 9-pin connector used for communication with the host (Figure 2.5):

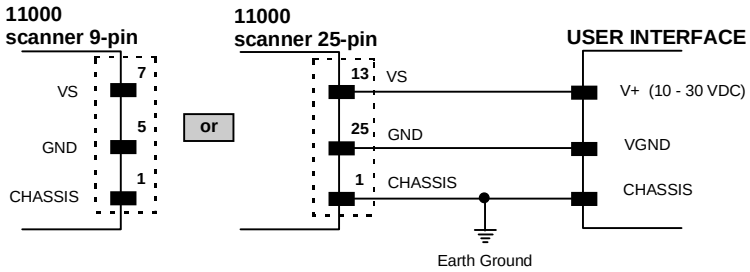


Figure 2.5 - Power supply connections

The power must be between 10 and 30 VDC only.
It is recommended to connect pin 1 (CHASSIS) to a common earth ground.

2.4.2 Main serial interface

The signals relative to the following serial interface types are available on the input/output connector of the scanner depending on the scanner model (see section 1.3).

If the interface type is not compatible with the current communication handshaking, then the system forces the XON/XOFF protocol.

The parameters relative to the interface selected (baud rate, data bits, etc.) can be defined using the LDHOST utility program or "Host Mode" programming provided on diskette.

Details regarding the connections and use of the interfaces are given in the next sections.

RS232 interface

The serial interface is used in this case for point-to-point connections; it handles communication with the host computer and allows both transmission of code data and the programming of the scanner. This is the default setting.

The following pins are used for RS232 interface connection:

9-Pin	25-Pin	Name	Function
2	2	TX232	Transmitted Data
3	3	RX232	Received Data
6	4	RTS232	Request To Send
4	5	CTS232	Clear To Send
5	7	GND/SGND	Signal Ground

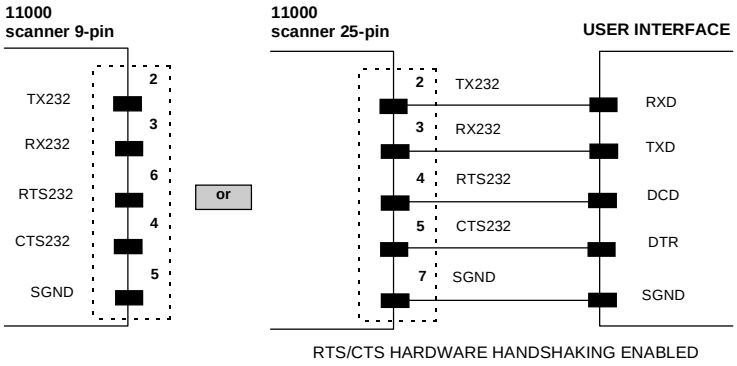


Figure 2.6 - RS232 main interface connections

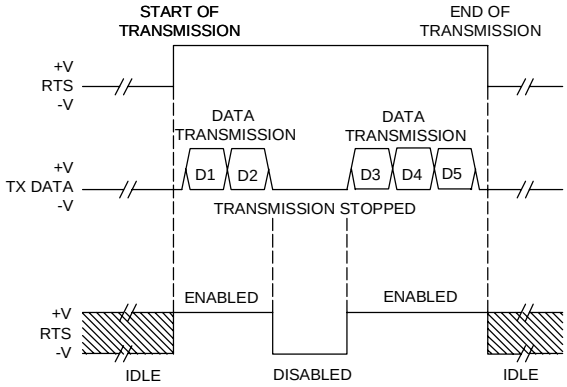


Figure 2.7 - RS232 control signals

The RTS232 and CTS232 signals control data transmission and synchronize the connected devices.

If the RTS/CTS handshaking protocol is enabled, the scanner activates the RTS232 output to indicate a message is to be transmitted. The receiving unit activates the CTS232 input to enable the transmission.

RS485-nonpolled interface

The RS485-nonpolled interface is a Full Duplex interface.

The nonpolled configuration is used for point-to-point connections over longer distances than those acceptable for RS232 communications or in electrically noisy environments.

The following pins of the 25-pin connector are used for RS485-nonpolled communications:

25-Pin	Name	Function
2	TX485+	RS485 output (+)
4	TX485-	RS485 output (-)
3	RX485+	RS485 input (+)
5	RX485-	RS485 input (-)
7	SGND	Signal Ground

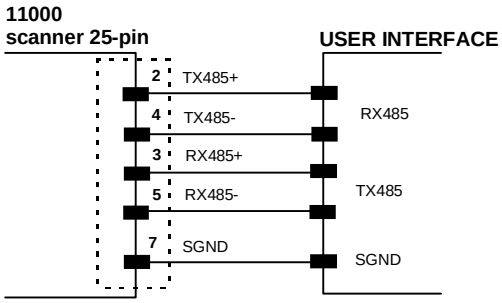


Figure 2.8 - RS485-nonpolled connections

RS485-polled interface

The RS485-polled interface is a Half Duplex (3 wires + shield) interface.

The polled configuration can be used for Multidrop connections with a Multiplexer, or it can be used for a master-slave layout (see section 2.6.1).

The following pins of the 25-pin connector are used for RS485-polled communications:

25-Pin	Name	Function
2	TX485+	RS485 input/output (+)
4	TX485-	RS485 input/output (-)
7	SGND	Signal Ground

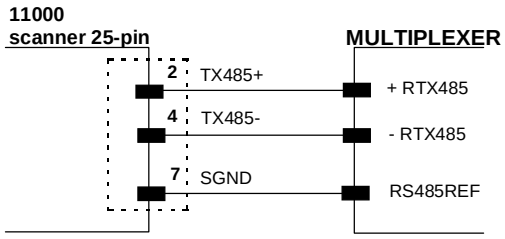


Figure 2.9 - RS485-polled connections

This interface is forced by software when the protocol selected is MUX32 protocol.

For this interface type, the Multidrop address must also be set via serial channel by the LDHOST utility or by ESC sequences.

The figure below shows a multidrop configuration with the LazerData® 11000 Scanner connected to a Multiplexer.

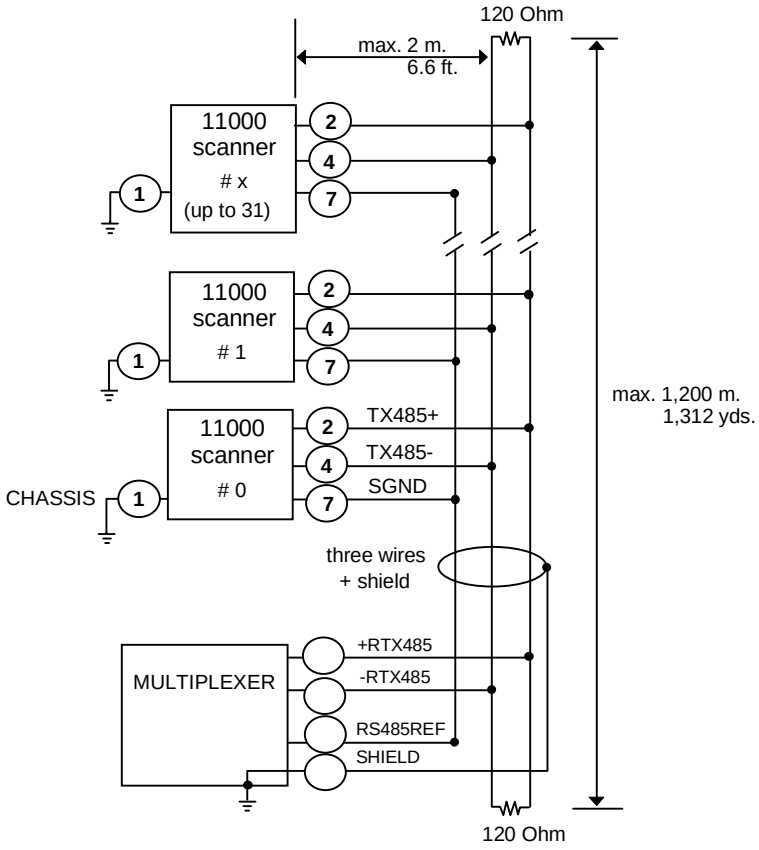


Figure 2.10 - LazerData® 11000 Scanner Multidrop connection to a Multiplexer

20-mA current loop interface

The LazerData® 11000 Scanner only supports passive type current loop connections. The following pins of the 25-pin connector are used:

25-Pin	Name	Function
5	CLIN-	Current Loop Input (-)
3	CLIN+	Current Loop Input (+)
4	CLOUT-	Current Loop Output (-)
2	CLOUT+	Current Loop Output (+)

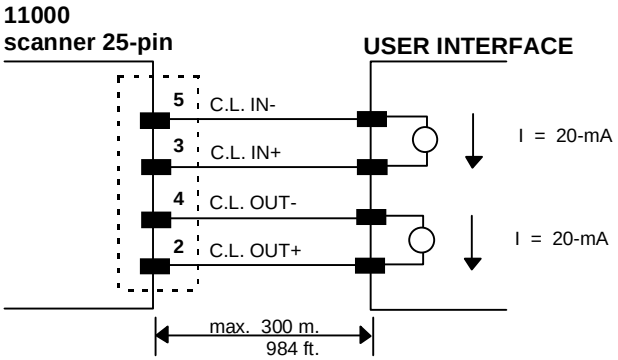


Figure 2.11 - 20-mA C.L. connections

2.4.3 Auxiliary RS232 interface

The auxiliary serial interface is used exclusively for RS232 point-to-point connections.

The parameters relative to the aux interface (baud rate, data bits, etc.) as well as particular operating modes such as LOCAL ECHO can be defined using the LDHOST utility program or "Host Mode" programming provided on diskette.

The following pins of the 25-pin connector are used to connect the RS232 auxiliary interface:

25-Pin	Name	Function
20	RXAUX	Auxiliary input
21	TXAUX	Auxiliary output
23	CTSAUX	Auxiliary handshake
24	RTSAUX	Auxiliary handshake
7	SGND	Signal Ground

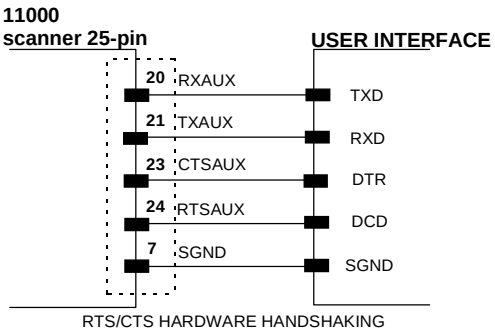


Figure 2.12 - RS232 auxiliary interface connections

The RTSAUX and CTSAUX signals control data transmission and synchronize the connected devices. If the RTS/CTS handshaking protocol is enabled, the scanner activates the RTSAUX output to indicate a message is to be transmitted. The receiving unit activates the CTSAUX input to enable the transmission.

2.4.4 Inputs

The inputs available on the connector supplied with the scanner are the pins relative to the code presence sensor, as indicated below:

9-Pin	25-Pin	Name	Function
8	18	PS+	Presence sensor (input +)
9	19	PS-	Presence sensor (input -)

The inputs indicated are used to connect the code presence sensor, which tells the scanner to scan for a code. The yellow LED (Figure A., ②) is on during the active phase of the PS signal indicating that decoding can take place.

This input is optocoupled and can be driven by both an NPN (neg.-pos.-neg.) or PNP (pos.-neg.-pos.) type command. The connections are indicated in the following diagrams:

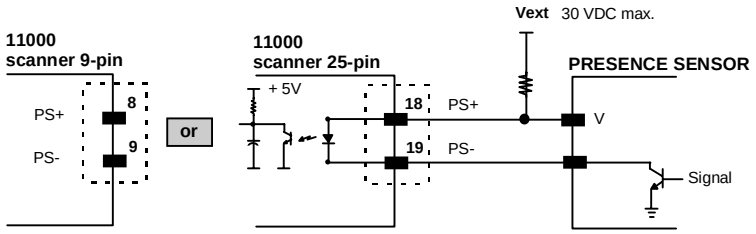


Figure 2.13 - Input NPN command using external power

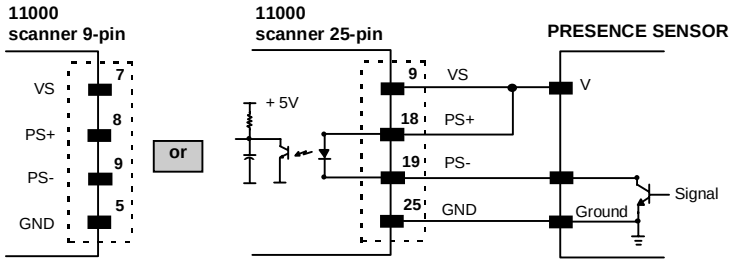


Figure 2.14 - Input NPN command using 11000 Scanner power

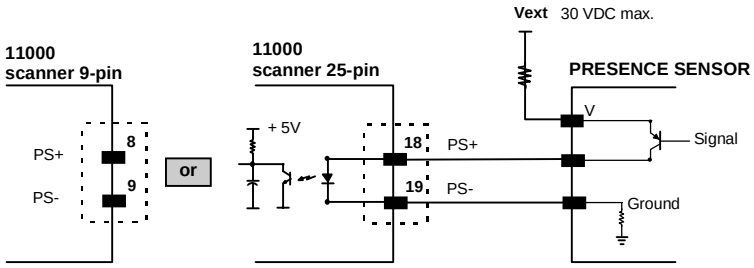


Figure 2.15 - Input PNP command using external power

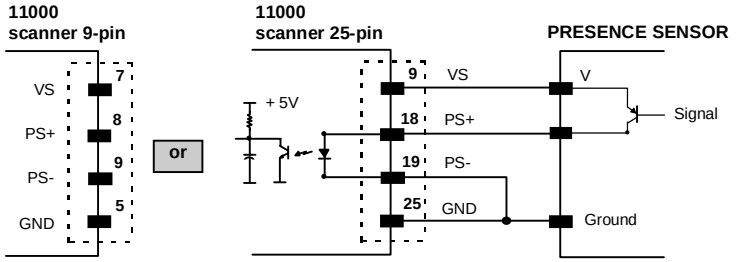


Figure 2.16 - Input PNP command using 11000 scanner power

The electrical features are given below:

Maximum voltage: 30 VDC

Maximum current: 25 mA

An anti-disturbance filter is implemented on the presence sensor input with a nominal delay of about 5 milliseconds.

2.4.5 Outputs

The outputs are available only on 25-pin connector models. The following pins are present on the 25-pin connector of the scanner:

25-Pin	Name	Function
8	NO READ+	No read output (+)
22	I/O REF-	I/O reference
11	RIGHT+	Right read output (+)
12	I/O REF-	I/O reference

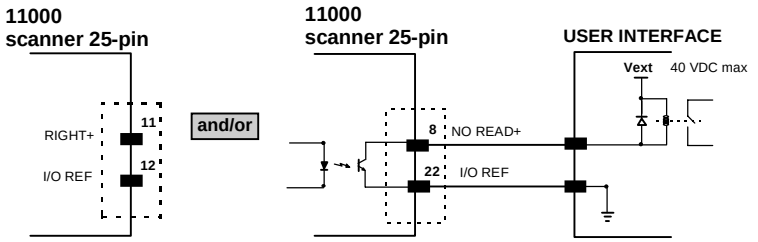


Figure 2.17 - Output connections

The NO READ output activates when the code signaled by the presence sensor is not decoded.

The RIGHT output activates when the code is decoded correctly.

These outputs are both level- or pulse-programmable: a 50-ms pulse is generated in the second case.

2.5 POSITIONING

The LaserData® 11000 Scanner is able to decode moving bar code labels at a variety of angles. However, significant angular distortion may degrade reading performance.

When mounting the scanner, take into consideration these three ideal label-position angles: **Pitch 0°, Skew 10° to 30°, and Tilt 0°**.

Follow these suggestions for the best orientation:

The **Pitch** angle is represented by the angle **P** in Figure 2.18. Position the reader in order to **minimize** the **Pitch** angle.

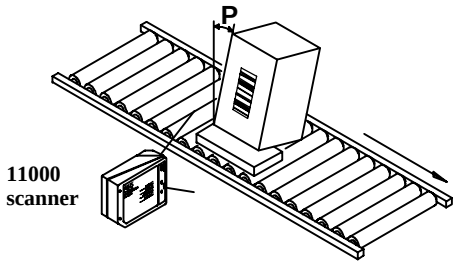


Figure 2.18 - Pitch Angle

The **Skew** angle is represented by the angle **S** in Figure 2.19. Position the reader to obtain a **Skew** angle **of at least 10°**. This avoids the direct reflection of the laser light emitted by the scanner.

For the raster version, this angle refers to the most inclined or external raster line, so that all other raster lines have **more** than 10° Skew.

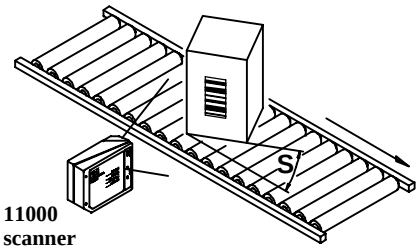


Figure 2.19 - Skew angle

The **Tilt** angle is represented by the angle **T** in Figure 2.20. Position the reader in order to **minimize** the **Tilt** angle.

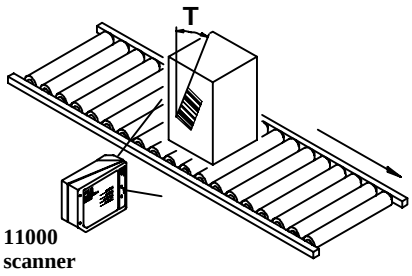


Figure 2.20 - Tilt angle

2.6 TYPICAL LAYOUTS

When an object – bearing a bar code label – enters the scanner's reading zone, a photoelectric sensor senses the presence of the symbol and activates the scanner.

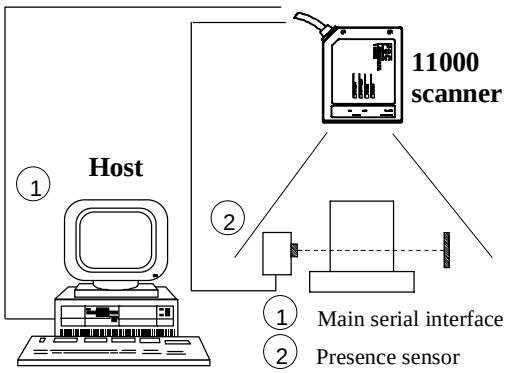


Figure 2.21 - Typical layout

2.6.1 Master-slave

The master-slave connection is used to collect data from several scanners to build a multisided reading system. There can be one master and up to 5 slaves connected with the RS485–polled mode on the main serial interface. The master scanner is also connected to a host PC with the RS232 auxiliary interface.

The P.S. signal is unique to the system. There is a single reading phase and a single message from the master scanner to the host PC.

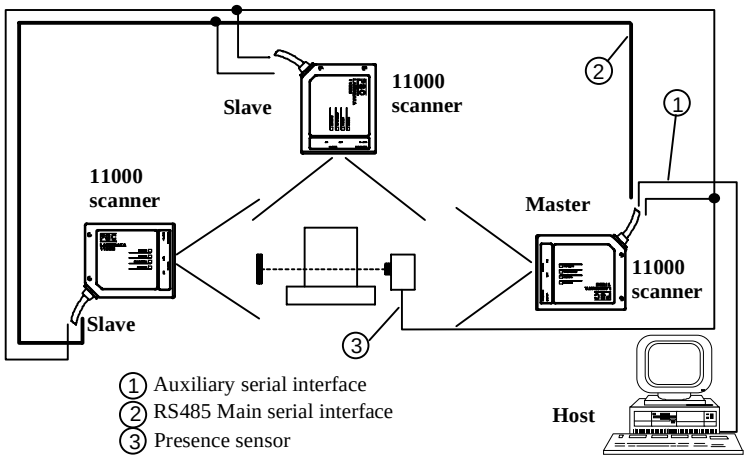


Figure 2.22 - Master-slave layout

NOTE

The auxiliary serial port of the slave scanners is only used for configuration.

The termination resistors of the RS485 bus must not be installed.

2.6.2 Local echo

In Local Echo mode the data is transmitted on both the Auxiliary interface and on the Main interface. Host Mode programming can be accomplished either through the Main interface or the Auxiliary interface in Local Echo mode.

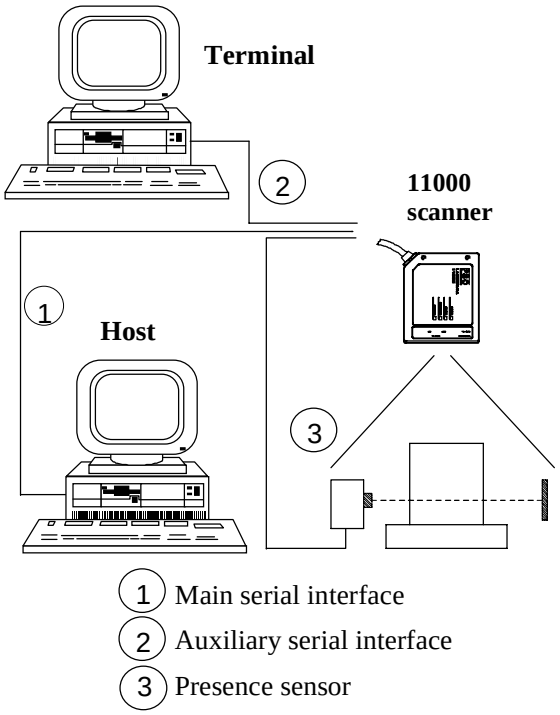


Figure 2.23 - Local echo layout

2.6.3 Pass Through

Pass Through mode allows two or more devices to be connected to a single external serial interface. Each 11000 Scanner transmits the messages received by the auxiliary interface onto the main interface. All messages will be passed through this chain to the host. The main and auxiliary ports are connected as shown in Figure 2.24 below.

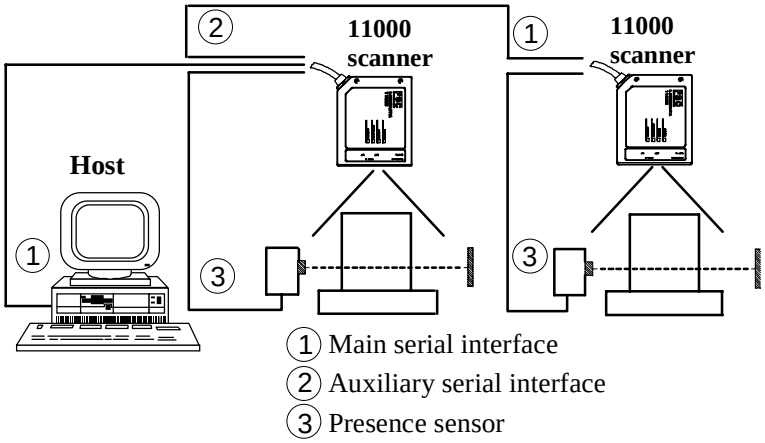


Figure 2.24 - Pass through layout

3 READING FEATURES

The number of scans performed on the code by the scanner – and, therefore, the decoding capability – is influenced by the following factors:

- number of scans per second
- code motion speed
- label dimensions
- scan direction with respect to code motion

Allow at least five scans during the code passage to ensure a successful read.

3.1 STEP LADDER MODE

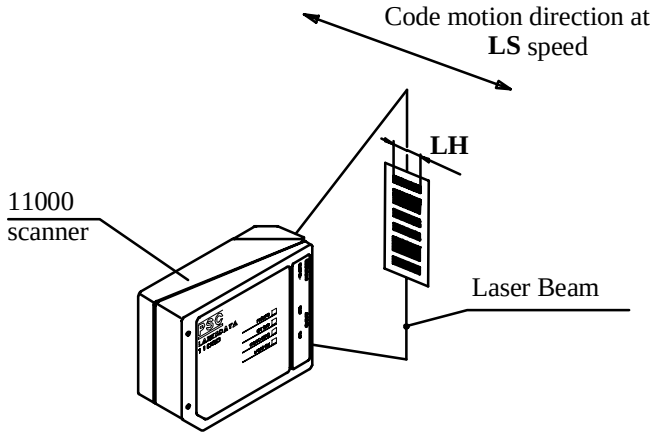


Figure 3.1 - "Step Ladder" Scanning Mode

If scanning is perpendicular to the code motion direction (Figure 3.1 - "Step Ladder" Scanning Mode), the number of effective scans performed by the reader is given by the following formula:

$$SN = [(LH/LS) * SS] - 2$$

Where:
- SN = number of effective scans
- LH = label height (in mm or inches)
- LS = label movement speed (in mm/s or inches/s)
- SS = number of scans per second

For example, the 11000 Scanner (scanning at 350 scans/s) for a 25-mm high code moving at 500 mm/s performs:

SN = [(25/500) ∗ 350] - 2 = **15 effective scans.**

3.2 PICKET FENCE MODE

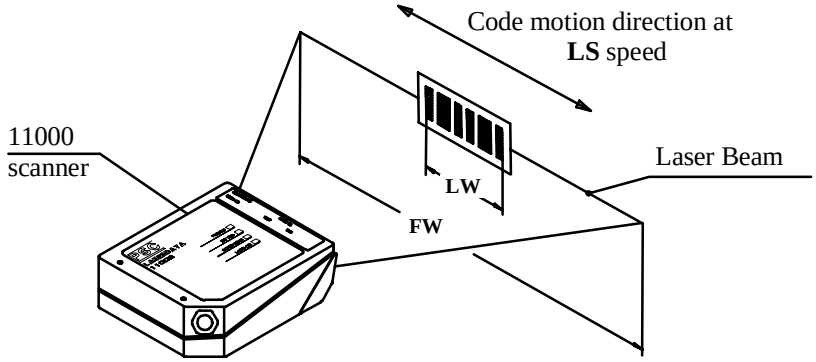


Figure 3.2 - "Picket Fence" Scanning Mode

If scanning is parallel to the code motion, (Figure 3.2 - "Picket Fence" Scanning Mode), the number of effective scans is given by:

SN = {[(FW-LW)/LS] ∗ SS} -2

Where:
- SN = number of effective scans
- FW = reading field width (in mm or inches)
- LW = label width (in mm or inches)
- LS = label movement speed (in mm/s or inches/s)
- SS = scans/s

For example, for a 50-mm wide code moving in a point where the reading field is 200 mm wide and the label is moving at 1500 mm/s, the 11000 Scanner (scanning at 350 scans/s), performs

SN = {[(200-50)/1500] ∗ 350} - 2 = **33 effective scans**

3.3 PERFORMANCE

3.3.1 Optical resolution

The LazerData® 11000 Scanner is available in two optical resolution models (see section 1.3).

The **Standard resolution** version is a general purpose model with optical resolution that allows code reading from 0.20-mm to 1-mm (approx. 8- to 39-mil) narrow bars in the zone between 40 and 300 mm (1.6 and 12 inches) from the emission window.

The **High resolution** version has an optical resolution that allows reading very high density codes. Typical values are from 0.15-mm to 0.30-mm (approx. 6- to 12-mil) narrow bars in the zone from 30 to 90 mm (1.2 to 3.6 inches) from the emission window.

Refer to the diagrams given in section 3.4 for further details on the reading features. These diagrams refer to the two optical versions and are taken on varied resolution sample codes at a 25°C (77°F) ambient temperature, depending on the conditions given in the notes under each diagram.

3.3.2 Scanning speed

The 11000 Scanner is also available in two standard scanning performance models.

The **Standard performance** version has a scanning speed of 350 scans/s.

The **High performance** version has a scanning speed of 600 scans/s and offers better performance on 0.20- to 0.30-mm (approx. 8- to 12-mil) resolution codes.

3.3.3 Raster

The maximum capture of the raster version is 18 mm (0.7 inch) at a 300-mm (12-inch) distance.

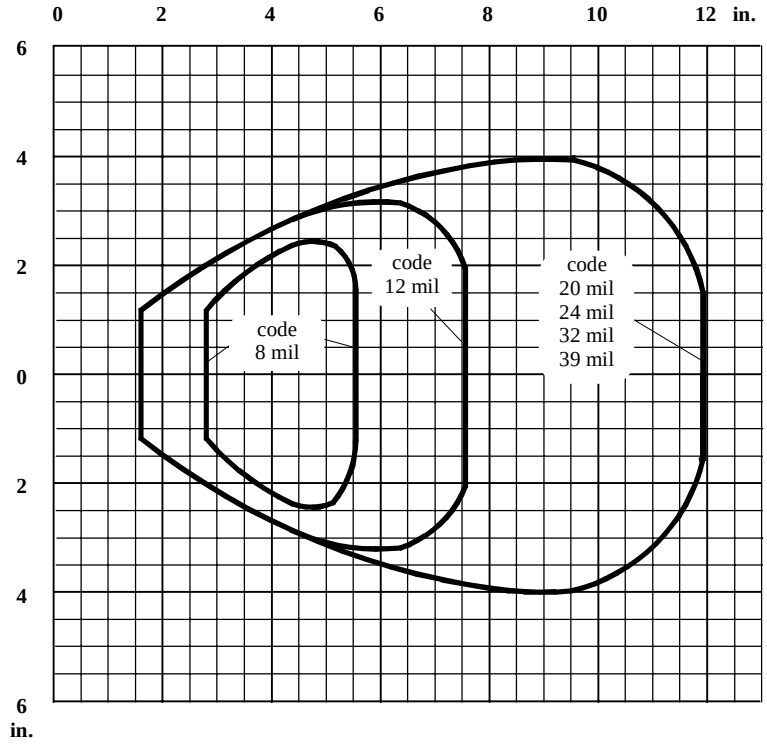
If standard devices do not satisfy your specific requirements, send a representative code sample of your labels to the nearest PSC Automation distributor, who will in turn supply you with complete information on the reading possibilities.

3.4 READING DIAGRAMS

LD-11011X or -11031X

(Standard Resolution, 350 scans/s)

NOTE: (0,0) IS THE CENTER OF THE LASER BEAM OUTPUT WINDOW



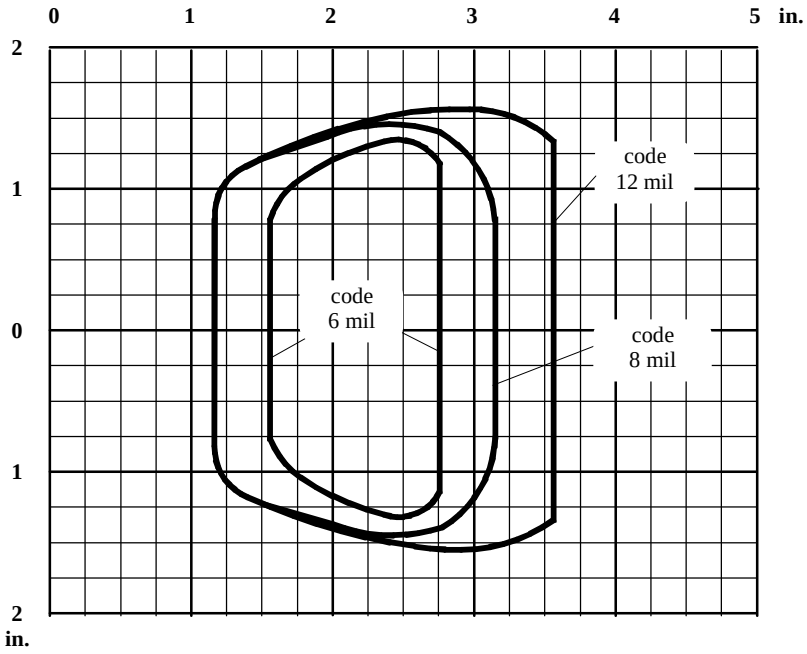
CONDITIONS:

Code	=	Interleaved 2/5 or Code 39
PCS	=	0.90
"Pitch" angle	=	0°
"Skew" angle	=	10°
"Tilt" angle	=	0°

LD-11021X or -11051X

(High resolution, 350 scans/s)

NOTE: (0,0) IS THE CENTER OF THE LASER BEAM OUTPUT WINDOW



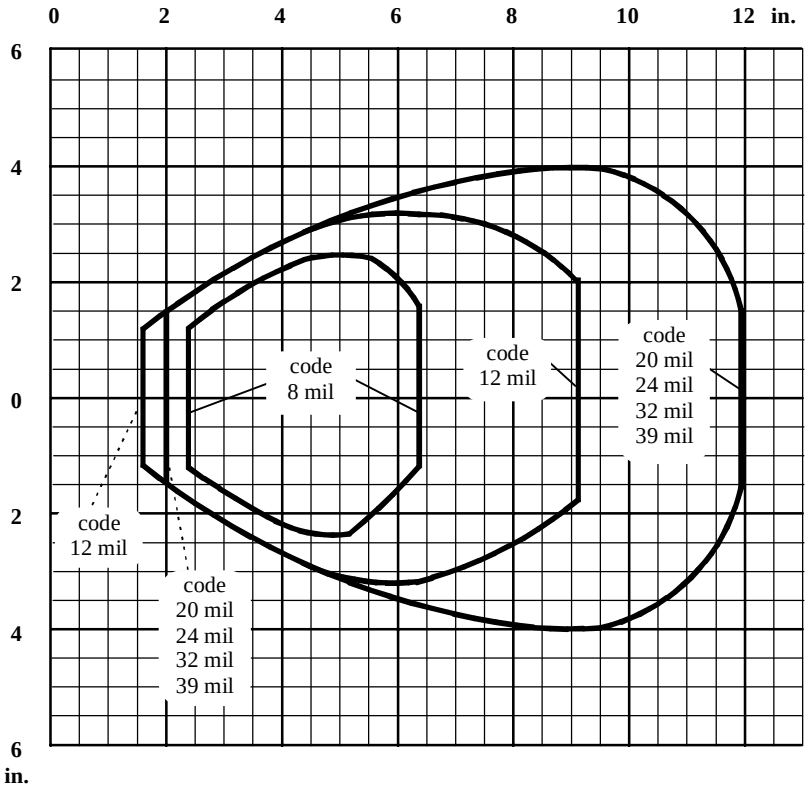
CONDITIONS:

Code	=	Interleaved 2/5 or Code 39
PCS	=	0.90
"Pitch" angle	=	0°
"Skew" angle	=	10°
"Tilt" angle	=	0°

LD-11011X or -11031X

(Standard resolution, 600 scans/s)

NOTE: (0,0) IS THE CENTER OF THE LASER BEAM OUTPUT WINDOW



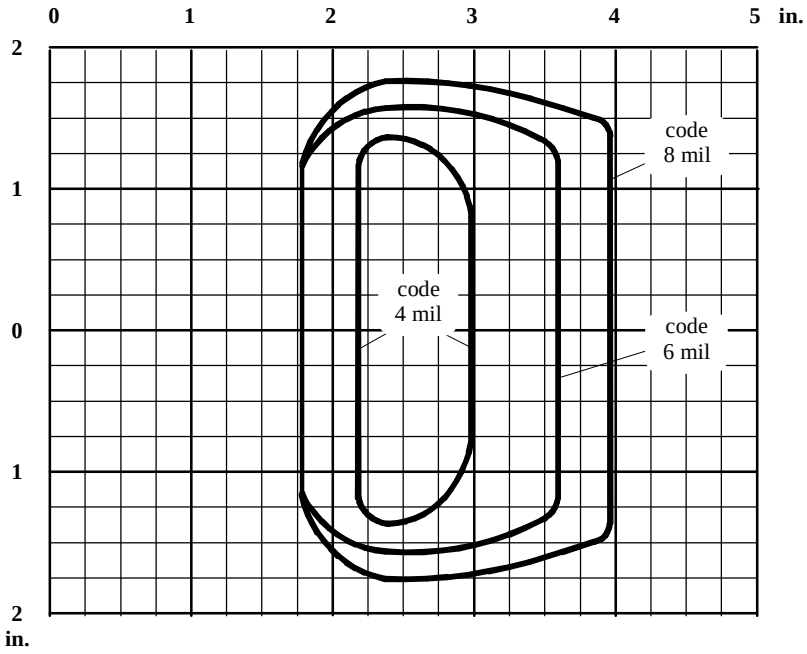
CONDITIONS:

Code	=	Interleaved 2/5 or Code 39
PCS	=	0.90
"Pitch" angle	=	0°
"Skew" angle	=	10°
"Tilt" angle	=	0°

LD-11021X or -11051X

(High resolution, 600 scans/s)

NOTE: (0,0) IS THE CENTER OF THE LASER BEAM OUTPUT WINDOW



CONDITIONS:

Code	=	Interleaved 2/5 or Code 39
PCS	=	0.90
"Pitch" angle	=	0°
"Skew" angle	=	10°
"Tilt" angle	=	0°

4 MAINTENANCE

4.1 CLEANING

Clean the laser beam output window periodically for continued optimal scanner operation.

Dust, dirt, etc. on the window may alter the reading performance.

Repeat the cleaning operation frequently in particularly dirty environments.

Use a soft cloth material and alcohol to clean the window. Avoid any abrasive substances.

WARNING

Clean the LazerData® 11000 Scanner window with the scanner turned off; or, minimally, with the laser beam deactivated.

5 SERVICE AND WARRANTY

PSC Inc. warrants that the LazerData® 11000 Series Bar Code Scanner and component parts will be free from defects in material and workmanship for a period of twelve months from the date of purchase. Scanners not performing to specification must be shipped to the PSC Repair Depot for service. Unless otherwise stated, warranty for products not manufactured by PSC Inc. is limited to the manufacturer's warranty.

EQUIPMENT OR COMPONENT FAILURES DUE TO MISUSE, ABUSE, OR NEGLECT ON THE PART OF THE USER OR THE USER'S AGENTS, ARE NOT COVERED IN THIS WARRANTY.

Service requests due to abuse, neglect, changes in original specifications, or service calls not related to the PSC equipment, will be charged at the current service rate and will include all travel-related expenses. Warranty coverage lasts for 12 months. If the device or part of the device is replaced, the warranty coverage does not start over; however, the replacement part or unit (no charge) is covered under warranty for the remainder of the one-year period, with a minimum time period of 90 days.

PSC Inc. also offers Optional Extended Warranty Programs to augment the standard product warranty. Through these plans, equipment maintenance and repair are offered with fixed cost and fast turnaround for unexpected repairs. Additional details on the coverage, support, and services available for your bar code scanning system, are available from:

PSC Automation, Inc.
675 Basket Road
Webster, New York 14580-9787
Tel: (716) 265-1600
(800) 828-6489
Fax: (716) 265-6400

6 TECHNICAL FEATURES

ELECTRICAL FEATURES	
INPUT POWER	
Supply voltage	10 to 30 VDC
Power consumption max.	3 W
SERIAL INTERFACES (depends on model)	
MAIN	RS232; RS485, Polled/NonPolled; 20 mA C.L.
AUXILIARY	RS232
BAUD	
All Interfaces	150 to 19200
CONTROL INPUTS	
PRESENCE SENSOR	(opto-coupled NPN or PNP)
Voltage max.	30 VDC
Input current max.	25 mA
CONTROL OUTPUTS (only 25-pin models)	
NO READ, RIGHT READ	(opto-coupled)
V_{CE} max.	40 VDC
Collector current max.	40 mA continuous; 130 mA pulsed
V_{CE} saturation	1V at 10 mA max.
Power dissipation max.	90 mW at 40°C / 104°F (ambient temp.)
OPTICAL FEATURES	
Light source	Semiconductor laser diode
Wave length (Note 1)	630 to 680 nm
Safety class	Class 2
READING FEATURES (Note 2)	
Scan rate	350 scans/s standard, 600 scans/s high performance
Reading distance	300 mm max. (~ 12 inches)
Maximum resolution	0.10 mm (~ 4 mil)
Aperture angle	60°
USER INTERFACE	
LED indicators	laser beam active, bar code detected, presence sensor active, data transmission/power ON

SOFTWARE FEATURES	
READABLE CODE SYMBOLOGIES Up to 22 readable bar code symbologies, including: • EAN/UPC (including Add-on 2 and Add-on 5) • 2/5 Interleaved • Code 39 (Standard and Full ASCII) • Codabar • Code 93 • Code 128 • EAN 128 • Plessey	
CODE SELECTION	up to six codes during one reading phase
DECODING SAFETY	can enable multiple good reads of same code
HEADERS AND TERMINATORS	up to four headers and four terminators
OPERATING MODES	ON LINE, AUTOMATIC, SERIAL ON LINE, TEST
CONFIGURATION MODES	• through menus using LDHOST utility • receiving commands from one of the serial ports (HOST MODE)
PARAMETER STORAGE	Non-volatile internal EEPROM
ENVIRONMENTAL FEATURES	
Operating temperature (Note 3)	0 to 40 °C (32 to 104 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)
Humidity max.	90% noncondensing
Vibration resistance	IEC 68-2-6 test FC 1.5 mm; 10 to 55 Hz; 2 hours on each axis
Shock resistance	IEC 68-2-27 test EA 30G; 11 ms; 3 shocks on each axis
Protection class	IP65
PHYSICAL FEATURES	
Mechanical dimensions	68 x 84 x 34 mm (2.7 x 3.3 x 1.3 inches)
Weight	300 g. (0.77 lb.)

Note 1: The features given are typical at a 25°C (77°F) ambient temperature (if not otherwise indicated).

Note 2: Further details given in section 3.3.

Note 3: If the reader is used in high temperature environments (over 35°C / 95°F), use of the Beam-shutter is advised (see the LDHOST configuration program).

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