DS6300

Reference Manual

DATALOGIC

DS6300

REFERENCE MANUAL

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DS6300 Reference Manual

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CONTENTS

REFERENCES

REFERENCE DOCUMENTATION

The documentation related to the DS6300 management is listed below:

- C-BOX Installation Manual
- INT-60 20 mA Current Loop Interface Board
- PWR-120 power supply unit
- GFC-60 90° deflecting mirror
- GFC-600 90° deg. mirror close distance
- GFX-60 X-pattern mirror
- Document about the Ethernet connectivity
- Document about the Profibus connectivity
- Help On-Line in PDF format

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SAFETY REGULATIONS

ELECTRICAL SAFETY

This product conforms to the applicable requirements contained in the European Standard for electrical safety EN-60950 at the date of manufacture.

LASER SAFETY

The following information is provided to comply with the rules imposed by international authorities and refers to the correct use of the DS6300 reader.

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.

Avoid that the laser beam hits the eye of an observer, even through reflective surfaces such as mirrors, etc.

This product conforms to the applicable requirements of both EN60825-1 and CDRH 21 CFR1040 at the date of manufacture. The reader is classified as a Class 2 laser product according to EN60825-1 regulations and as a Class II laser product according to CDRH regulations.

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

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

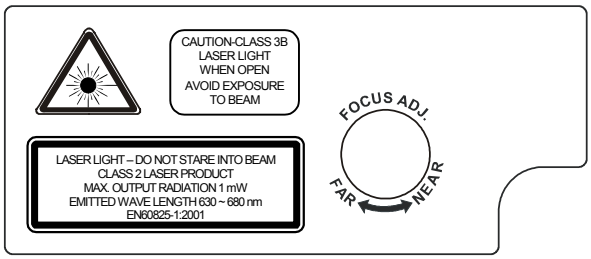
WARNING

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 head of the reader (Figure 1, 7).

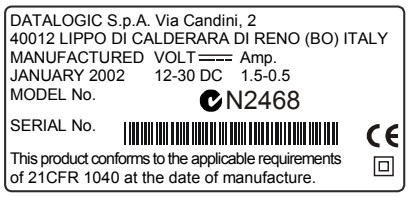
Warning labels indicating exposure to laser light and the device classification are applied onto the head of the reader (Figure 1, 1, 3):

Laser Safety Label for Oscillating Mirror and Standard Models



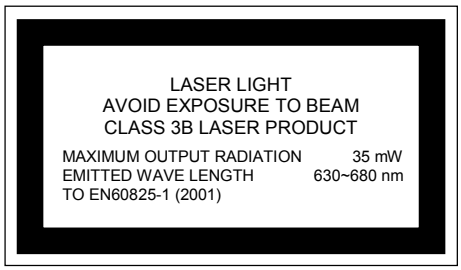
Warning and Device Class Label

The identification label is applied onto the bottom part of the scanner (Figure 1, 2):



Device Identification Label

The laser diode used in this device is classified as a Class 3B laser product according to EN60825-1 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 is reproduced here:



Laser Diode Class Label

Any violation of the optic parts in particular can cause radiation up to the maximum level of the laser diode (35 mW at 630~680 nm).

POWER SUPPLY

- **This product is intended to be installed by Qualified Personnel only.**

- **All DS6300 Models:**

  This device is intended to be supplied by a UL Listed Power Unit marked “Class 2” or LPS power source which supplies power directly to the scanner via the 25/26-pin connector.

GENERAL VIEW

DS6300

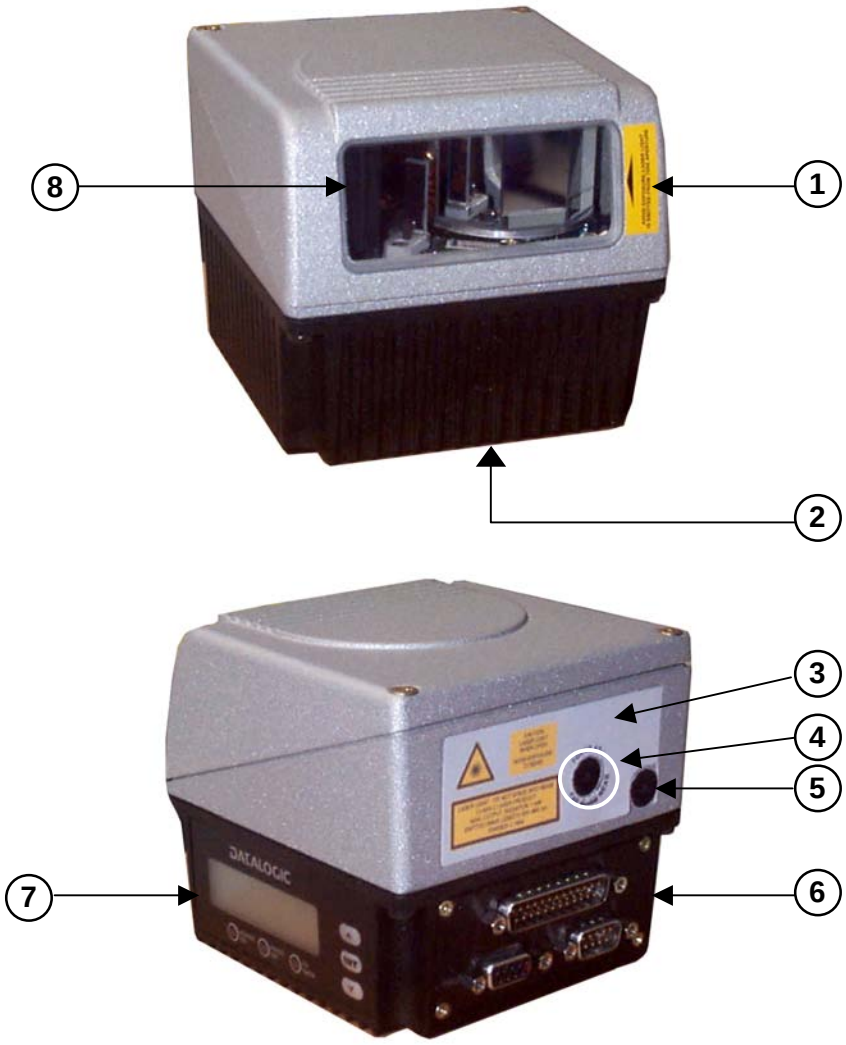


Figure 1 - DS6300

1. Laser Safety Label
2. Identification Label
3. Warning and Device Class Label
4. Focus Adjusting Screw
5. Service Cap
6. Connector Panel
7. Display and Keypad Panel
8. Laser Beam Output Window

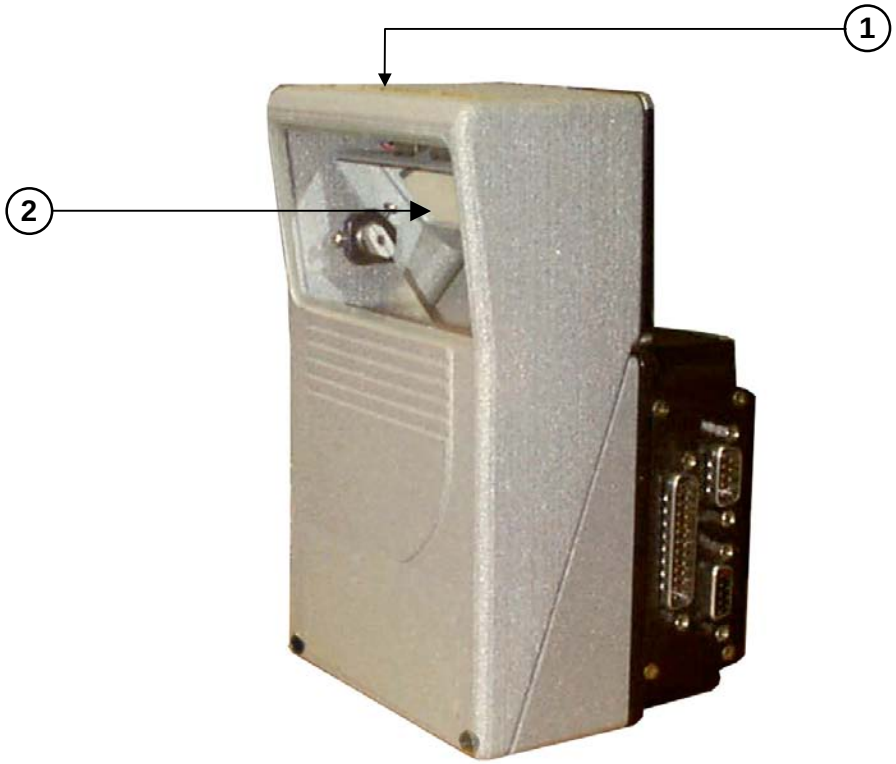


Figure 2 - DS6300 Oscillating Mirror Version

1 Laser Safety Label

2 Laser Beam Output Window

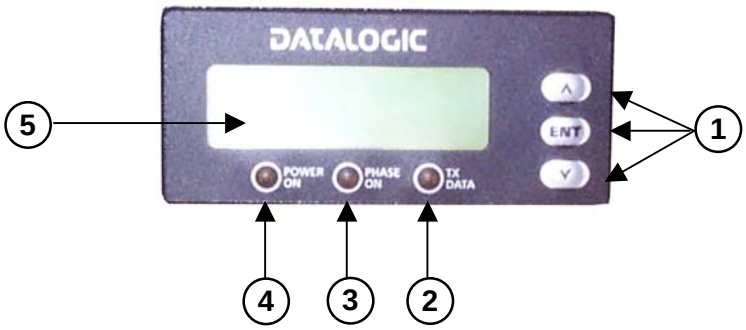


Figure 3 - Display and Keypad Panel

1 Programming Keypad

2 TX Data LED

3 Phase On LED

4 Power On LED

5 LCD Display

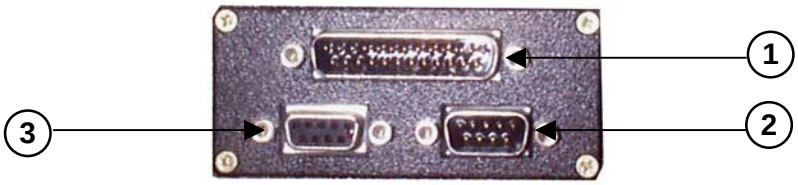


Figure 4 - Connector Panel for Master/Slave Models

1. Main/Aux. Interface 25-pin D-Sub male connector
2. Lonworks 9-pin male connector
3. Lonworks 9-pin female connector

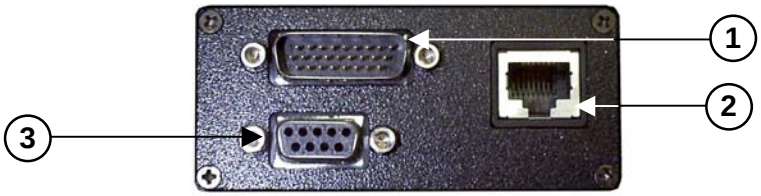


Figure 5 – Connector Panel for Ethernet Models

1. Main/Aux. Interface 26-pin D-Sub male connector
2. RJ45 modular connector for Ethernet Interface
3. Lonworks 9-pin female connector

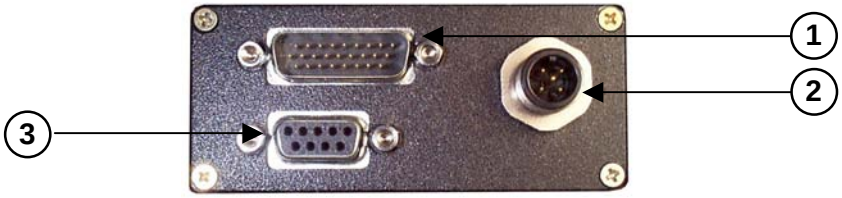


Figure 6 – Connector Panel for DeviceNet Models

1. Main/Aux. Interface 26-pin D-Sub male connector
2. DeviceNet 5-pin male connector
3. Lonworks 9-pin female connector

Figure 7 – Connector Panel for Profibus Models

1. Main/Aux. Interface 26-pin D-Sub male connector
2. Profibus 9-pin female connector (white)
3. Lonworks 9-pin female connector

GUIDE TO INSTALLATION

POINT-TO-POINT INSTALLATION

The following can be used as a checklist to verify all the steps necessary to complete installation of the DS6300 scanner.

1) Read all information in the section “Safety Precautions” at the beginning of this manual.

2) Correctly mount the scanner using the bracket provided according to the information in par. 2.2.2.

3) Position the reader at the correct reading distance according to your model as shown in par.2.5.

4) Make electrical connections to your DS6300 scanner by:

   a) Connecting the DS6300 scanner to the C-BOX 100 by means of one of the cables provided as accessory (see par. 1.5).

   b) Providing correct and complete system cabling through the C-BOX 100 according to the signals (trigger, inputs, outputs) necessary for the layout of your application.
      - Layout: Point-to-Point, RS232 Master/Slave, Lonworks, Fieldbus. See sub-paragraphs under 2.7 for reference.
      - Cabling: Power, Main Serial Interface – RS232, RS485 Half Duplex, RS485 Full Duplex, 20 mA Current Loop, Auxiliary Interface, Inputs, Outputs, etc -. For further details, see all sub-paragraphs under par. 2.3.

5) Configure the DS6300 scanner by installing and running the Genius™ configuration program from the CD-ROM provided. The main steps are:
   - Select the codes to be read
   - Set-up the communication parameters
   - Define data formatting parameters
   - Fine tune your DS6300 scanner using the Test Mode as described in Genius™.

6) Exit the configuration program and run your application.

The installation is now complete.

MASTER/SLAVE LONWORKS INSTALLATION

The following can be used as a checklist to verify all the steps necessary to complete installation of the DS6300 scanner in a Master/Slave Lonworks network.

1) Repeat the previous procedure from step 1 to step 3.

2) Make electrical connections to your DS6300 scanner by:
   a) Connecting the DS6300 Master scanner to the C-BOX 100 by means of one of the cables provided as accessory (see par. 1.5).
   b) Correctly inserting the BTK-6000 terminator in the DS6300 Master reader according to the information given under “Local Lonworks Network” in par. 2.3.2.
   c) Completing the system wiring adding as much slave scanners as required by your system layout (refer to par. 2.7).
   d) Correctly inserting the BTK-6000 terminator in the last DS6300 Slave reader of the network according to the information given under “Local Lonworks Network” in par. 2.3.2.

3) Configure the DS6300 Slave scanners using one of the procedures given below:
   a) Defining each DS6300 slave scanner address by using the scanner keypad according to the information given in par. 2.8.
   b) Installing and running the Genius™ configuration program from the CD-ROM provided and defining each DS6300 slave scanner address as described in par. 3.2.2.

4) Configure the DS6300 Master scanner using one of the procedures given below:
   c) Configure the DS6300 scanner as Master by using the scanner keypad according to the information given in par. 2.8.
   d) Configure the DS6300 scanner as Master by using the Genius™ program as described in par. 3.2.2.

5) Connect the DS6300 Master scanner to configure the network layout by using the Genius™ program.

6) Configure all the DS6300 slave scanners through the Genius™ program. The main steps are:
   - Select the codes to be read
   - Set-up the communication parameters
   - Define data formatting parameters

NOTE

All slave scanners may also be configured remotely via Genius™ through the Master scanner.

7) Fine tune your DS6300 scanner using the Test Mode as described in Genius™.

The installation is now complete.

1 INTRODUCTION

1.1 PRODUCT DESCRIPTION

The DS6300 is the first high performance laser scanner in a complete range of industrial barcode readers offering an innovative and modular solution in terms of reading performance, connectivity and maintenance, in addition to a completely new hardware and software platform.

The DS6300 has been specifically designed for simple installation, easy use and flexibility. An innovative mechanical design together with the Datalogic patent pending Step-a-Head™ feature make it possible to rotate the reader head and the decoder base independently from each other. Step-a-Head™ enables the DS6300 to always be installed in the ideal position, by modifying the orientation of the connector panel while leaving the laser window in the desired position. The need for space is minimized and installation is easier.

The DS6300 has an innovative multi-step optic assembly for mechanically adjustable focusing, providing the scanner with a particularly large reading range of 250 mm to 2,000 mm (10-80 inches). Its key features are excellent reading field at the minimum distance and outstanding reading performance on low contrast bar codes. These features are a great benefit in applications such as reading bar codes directly printed on cardboard boxes.

The DS6300 can read all most popular bar codes even in the most difficult conditions, thanks to a new generation decoder with StrongARM CPU and code reconstruction technology (ACR™ 3).

This reader is also offered in a model with an integrated SW programmable oscillating mirror.

Great attention has been given to built-in connectivity for all market standards. Lonworks, Profibus, DeviceNet and Ethernet bus have been integrated in dedicated versions of the decoder base.

Some of the main features of DS6300 are listed below:

- scanning speed up to 1200 scans/sec;
- 2 serial communication interfaces
- reading all popular codes;
- supply voltage from 12 to 30 Vdc;
- electrical connection through connectors;
- high speed Lonworks connectivity for Master/Slave layout;
- built-in connectivity for Profibus, DeviceNet and Ethernet;
- programmable in 5 different operating modes to suit the most various barcode reading system requirements;
- light source: solid state laser diode; the light emitted has a wavelength between 630~680nm.
- IP64 protection class of the enclosure (not yet available for Ethernet models).

The DS6300 is the first product of a new family of scanners designed to satisfy the needs of the Manufacturing industry. Manufacturing, the core process from row material to finished product, is a huge industry divided in different branches of economic sectors: from automotive to electronics, from food & beverages to white goods.

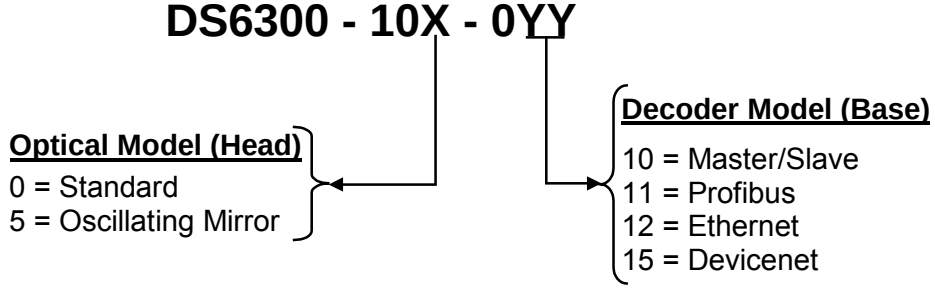
The DS6300 features have been defined to give a set of benefits answering the main manufacturing industry needs .

Features	Benefits
Modular solution with separated head and base and Step-A-Head™ feature	• Possibility to select the combination of head and base that best fits the needs of the application; • Great scalability of the offer; • Down time cost reduction, since the decoder base works even if the head has been removed; • Easy maintenance. In case of replacement of the head, all the configuration parameters are stored in the base, and the scanner is automatically configured; • Easy installation with the minimum room needed.
Reading performance on low contrasted or thermal printed barcodes	• Best result in typical manufacturing reading application.
"Sealed" scanner	• All the scanner setup are managed via SW, with the possibility to "clone" a customized scanner by simply downloading a configuration file.
Master working as a multiplexer on a high speed Lonworks bus	• Great competitiveness of the offer, since the cost of an external multiplexer is saved; • High data transfer on a industrial, reliable bus running at 1,2 Mbit/sec
GENIUS™ Configurator SW	• Reduced learning time, with an easy wizard approach; • Multilanguage platform; • All the configuration parameters stored into the scanner; • Not dependent on Physical interface.

1.2 MODEL DESCRIPTION

The DS6300 scanner is available in versions that differ in regard to the following characteristics:

- Optical Model (Head)
- Decoder Model (Base)



1.3 INDICATORS

The DS6300 decoder base provides an LCD display for system messages and configuration menus. The three keys present on the side of the display allow configuration menu navigation (Figure 3, 1).
The three LED indicators have the following functions:

POWER ON	(red)	Indicates the reader is turned on (Figure 3, 4)
PHASE ON	(yellow)	Indicates the presence sensor is turned on (Figure 3, 3).
TX DATA	(green)	Indicates the main serial interface is operating correctly during data transmission (Figure 3, 2).

1.4 OSCILLATING MIRROR MODELS

Oscillating mirror models are used when coverage of a large reading area is required, mainly in picket fence applications.
The DS6300 scanner mounts a dedicated optic head with integrated oscillating mirror driven by a linear motor. The speed, the precision, the repeatability, and the reliability of this driving technology assure high level performance.

The new oscillating mirror is completely software controlled and software programmable. The Genius™ software tool allows adjusting the linear motor speed (oscillating frequency) and the upper and lower limits of the oscillation by defining the top and bottom line limit angles.

When the oscillating mirror is programmed to read barcode labels at very small angles, position the reader to **assure at least 10°** for the Skew angle (see par. 2.4). This angle refers to the most inclined or external laser line, so that all other laser lines assure more than 10° Skew. This avoids the direct reflection of the laser light emitted by the reader.

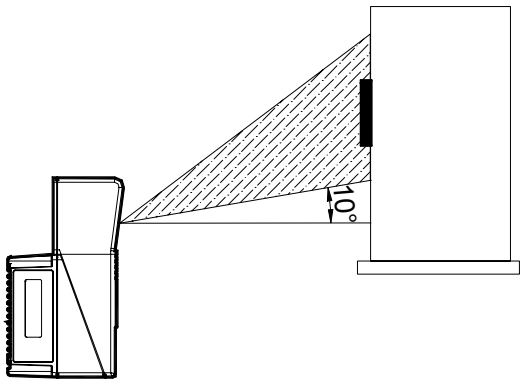


Figure 8 – Oscillating Mirror Skew Angle

Otherwise, the scanner can be mounted at an angle of inclination of 17.5° in order to attain symmetrical deflection ranges.

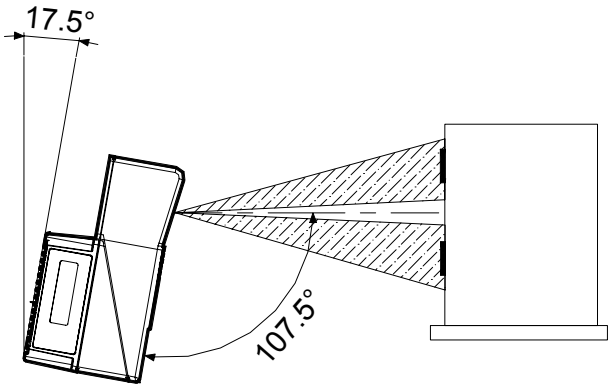


Figure 9 - Oscillating Mirror Reading Position

In the above case, the zone where the scan line is perpendicular to the reflecting surface corresponds to a neutral zone at the center of the reading field.

The mirror can be deflected up to 40°. Oscillation with respect to the output window median axis is asymmetrical (see figure below).

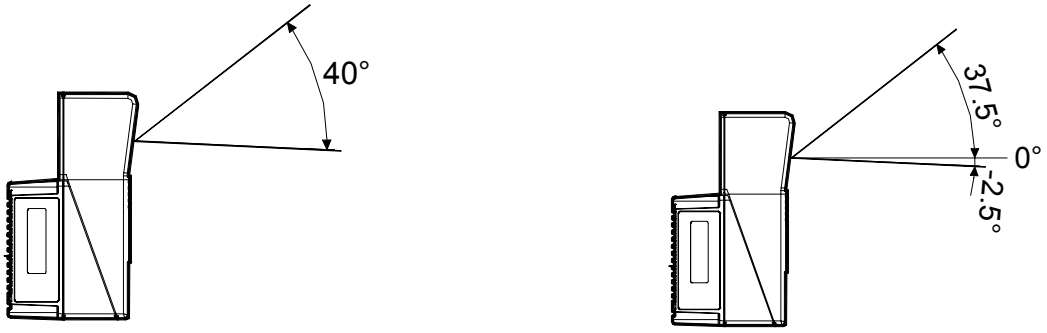


Figure 10 - Oscillating Mirror Maximum Aperture and Asymmetry

By configuring the oscillating speed up to the maximum value of 19 Hz, raster emulation can be performed for reading fast moving objects.

Hz	Max. Aperture
0-5	40°
6-10	30°
11-15	20°
16-19	10°

NOTE

By limiting the raster width to the minimum necessary, the number of scans on the reading surface is increased.

Oscillating angles are selected in software where the minimum and maximum angles correspond to –2.5° and +37.5°.

The scanner can be tilted in order for the 17.5° software setting to correspond with the 0° horizontal plane.

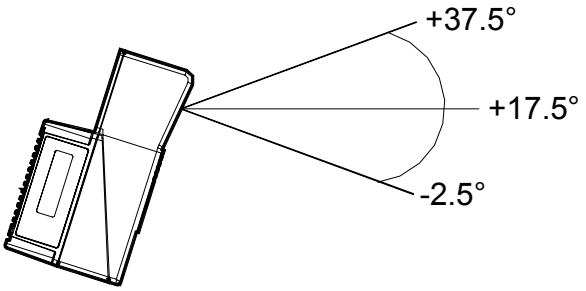


Figure 11 - Oscillating Mirror Extreme Angle Positions

These models provide higher scanning speed (1200 scans/sec) compared to standard models and the reading performance is not adversely effected by the oscillating mirror.

The following example represents the selection of an angle of +10° for the bottom line and an angle of +20° for the top line (see figure below).

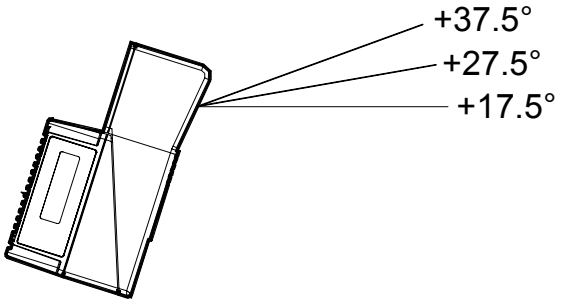


Figure 12 - Oscillating Mode

Refer to par. 2.2.1 for details about oscillating mirror mounting.

1.5 ACCESSORIES

The following accessories are available on request for DS6300:

Order no.	Accessory	Description
93A051190	CAB-6001	cable to C-BOX100 1 m
93A051200	CAB-6002	cable to C-BOX100 2 m
93A051210	CAB-6005	cable to C-BOX100 5 m
93A051221	CAB-6011	cable to C-BOX100 1 m (DS6300 Fieldbus version)
93A051222	CAB-6012	cable to C-BOX100 2 m (DS6300 Fieldbus version)
93A051223	CAB-6015	cable to C-BOX100 5 m (DS6300 Fieldbus version)
93A051220	CAB-6101	cable master/slave 1 m
93A051230	CAB-6102	cable master/slave 2 m
93A051240	CAB-6105	cable master/slave 5 m
93A051224	CAB-6112	cable master/slave no power 2 m
93A051225	CAB-6115	cable master/slave no power 5 m
93A051250	CAB-6205	cable to SC8000 5 m
93A051260	CAB-6210	cable to SC8000 10 m
93A15021	INT-60	20 m.A. C.L. interface board
93A201102	GFC-600	90° deg. mirror close distance
93ACC1510	C-BOX 100	passive connection box
93A301000	C-BOX 300	Profibus-DP connection box
93A301030	C-BOX 310	Profibus-DP connection box with display
93ACC1530	PWR-120	power unit 110/230 V AC 24 V
93ACC1710	BTK-6000	terminator kit (5 pcs)
93ACC1718	PG6002	single unit power supply (US)
93ACC1719	PG6001	single unit power supply (UK)
93ACC1720	PG6000	single unit power supply (EU)
93ACC1721	FBK-6000	fast bracket kit (2 pcs)
93A201100	GFC-60	90° mirror
93ACC1730	GFX-60	x-pattern mirror
890001020	US-60	mounting bracket kit (5 pcs) for multisided stations
93ACC1727	MEP-542	Photocell kit – PNP
93ACC1728	MEP-543	Photocell kit - NPN

2 INSTALLATION

To install the system follow the given procedure:

- Select the mounting location for DS6300;
- Mount the DS6300 scanner;
- Proceed with system electrical connection;
- Position the scanner with respect of the barcode;
- Install the GENIUS™ program on the PC;
- Adjust the focus position to the reading plane of the barcode.

NOTE

If your system requires the DS6300 reader to be connected to C-BOX-100 refer to the Reference Documentation section for details.

2.1 PACKAGE CONTENTS

Verify that the DS6300 reader and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- DS6300 reader
- Installation Quick Reference + barcode test chart
- DS6300 configuration CD-ROM
- Mounting bracket and screws

Figure 13 - DS6300 Package Contents

2.2 MECHANICAL MOUNTING

2.2.1 Mounting the Scanner

The DS6300 reader can be positioned and installed in the best way possible as a result of the Step-a-Head™ feature. Thanks to the separation between Head and Base, you can modify the orientation of the decoder base, and therefore display-keypad and connector panels, while keeping the optic head in the correct reading position. The reading head and the decoder base can be rotated independently from each other allowing the installation even in the most critical locations.

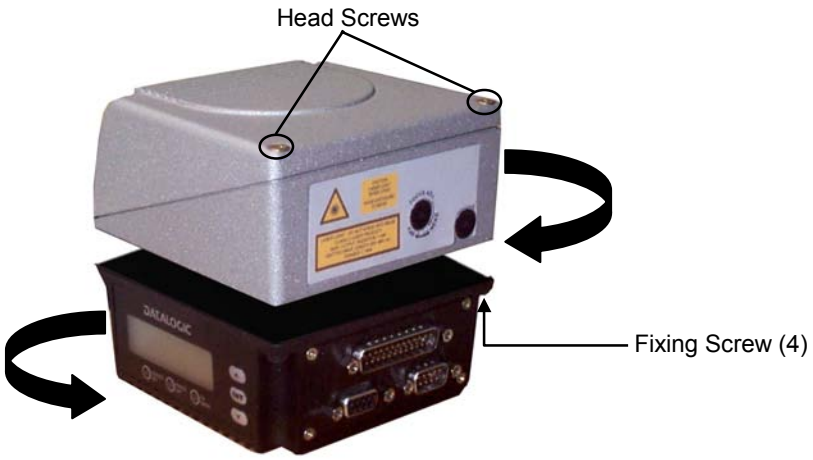


Figure 14 - Step-A-Head™ Feature

To rotate the head follow the given procedure:

1. detach the head from the base by unscrewing the four fixing screws;
2. rotate the head in the desired position;
3. loosen the two screws on top of the head;
4. affix the head onto the base by tightening the four fixing screws;
5. tighten the two screws on top of the head.

The following diagrams give the overall dimensions of the reader standard model, the oscillating mirror model and mounting brackets. They may be used for their installation. Refer to par. 2.4 for correct positioning of the scanner with respect to the code passage zone.

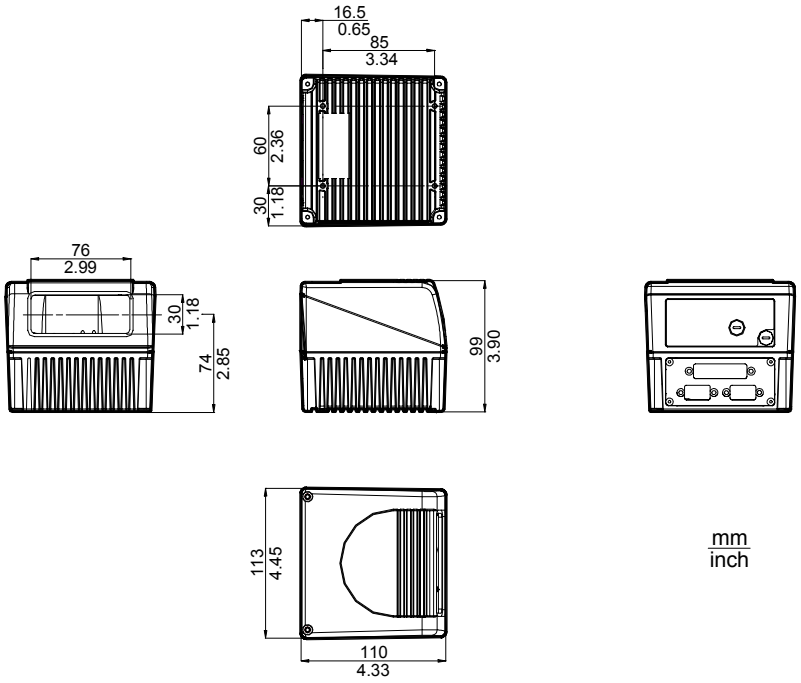


Figure 15 - DS6300 Overall Dimensions

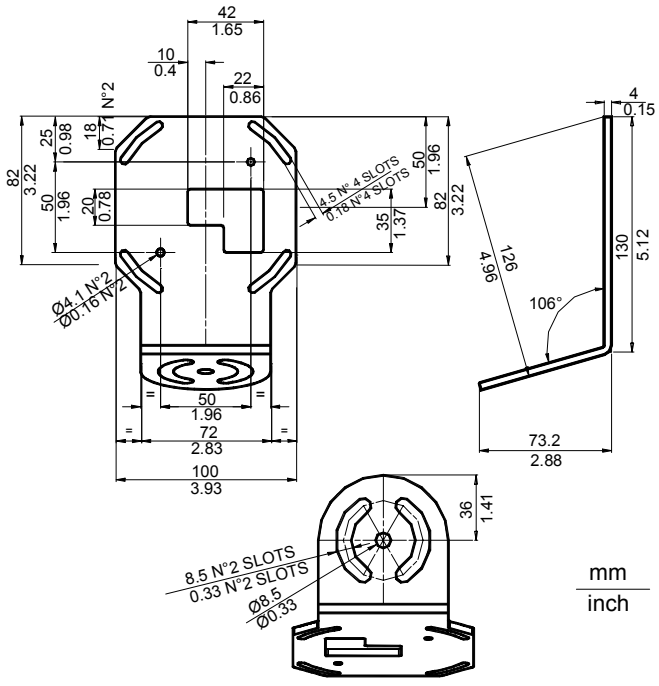


Figure 16 – ST-237 Mounting Bracket Overall Dimensions

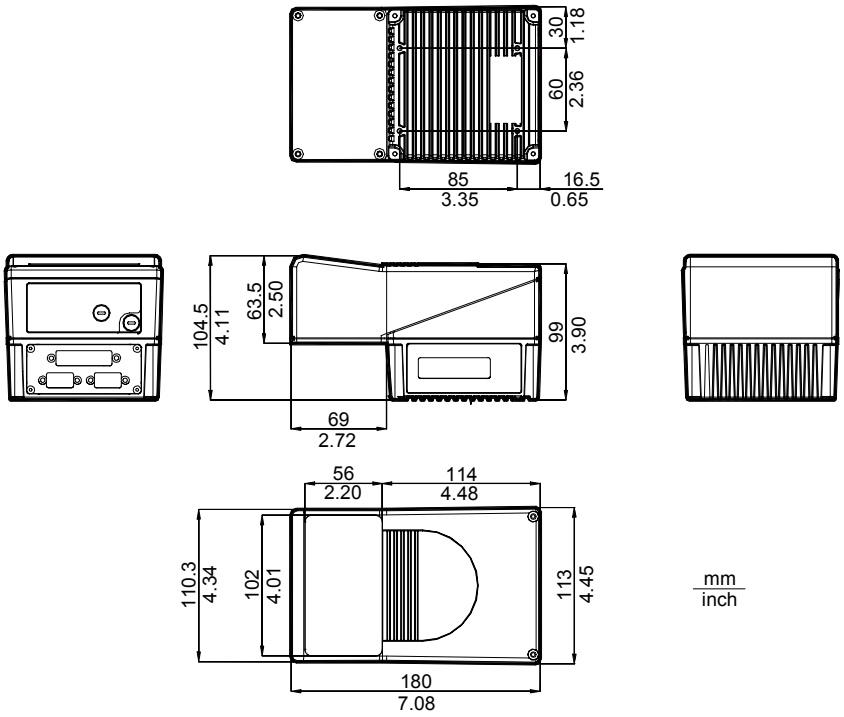


Figure 17 - DS6300 Oscillating Mirror Model Overall Dimensions

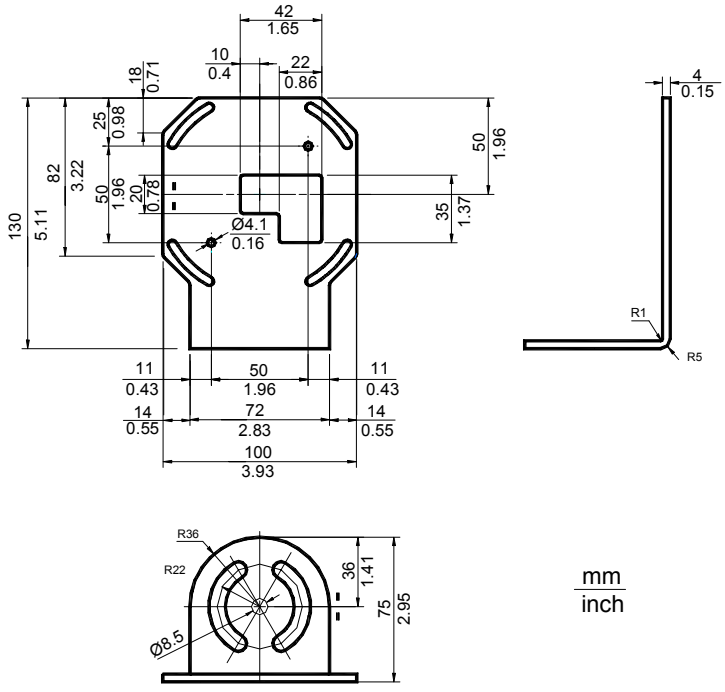


Figure 18 – ST-210 Mounting Bracket Overall Dimensions

2.2.2 Mounting the Scanner with Accessories

The following accessories allow installing the DS6300 reader in the most suitable position for your network layout:

- ST-237 mounting bracket;
- ST-210 mounting bracket;
- FBK-6000 fast bracket.

The ST-237 is a 105° mounting bracket to be mounted on the reader as displayed in the image below:

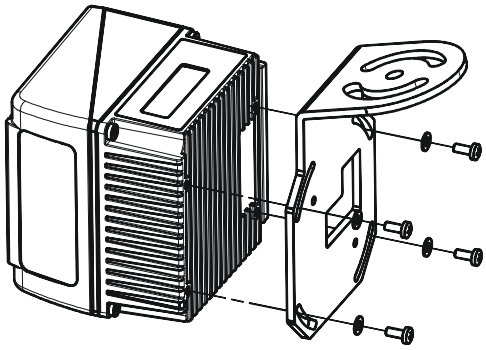


Figure 19 – Mounting the ST-237 Mounting Bracket

The ST-210 is a 90° mounting bracket to be mounted on the reader as displayed in the image below:

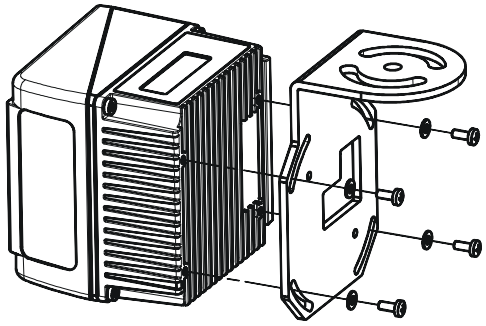


Figure 20 – Mounting the ST-210 Mounting Bracket

The FBK-6000 is a fast bracket kit allowing a quick and easy mounting of the scanner on either the ST-210 or the ST-237 brackets.

First, it is necessary to fix the FBX-6000 to the DS6300 scanner by means of the mounting screws:

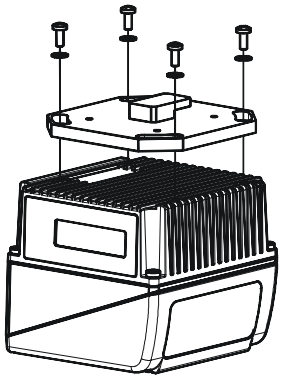


Figure 21 – Mounting the FBK-6000 on the Scanner

Then, attach the assembly to the mounting bracket by slipping the hook into the bracket hole.

Finally, fix it by means of the 2 fixing screws:

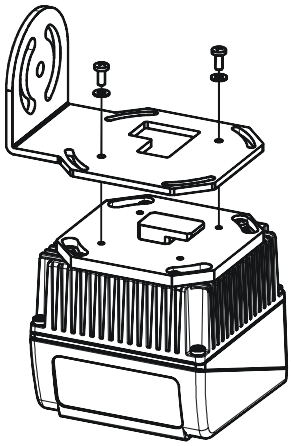


Figure 22 – Mounting the Assembly on the Bracket

2.2.3 Mounting the Scanner with GFX-60

The GFX-60 is an X-pattern mirror for the New DS6300 Series Scanners. The following procedure describes how to mount the GFX-60.

1. Unscrew the upper cover of the scan head, which houses the scanner output window.

   a) Remove the two top screws.

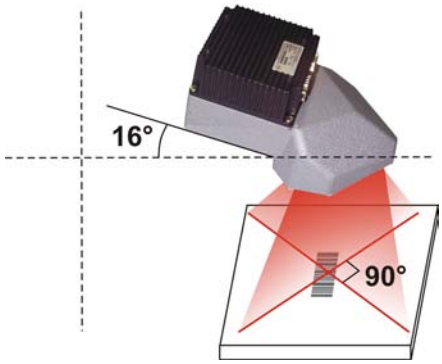
   b) Loosen the two bottom screws on the scanner output window side.

   c) Carefully remove the scanner output window from the scan head.

2. Mount the GFX-60 onto the scan head paying attention to correctly align the sealing gasket.

3. Start the four screws partially before tightening them to assure correct alignment to the scan head.

4. Mount the scanner at an angle of 16°, as indicated in figure below, in order to obtain an angle of 90° between the two scan lines. This guarantees an omni directional reading of the barcode, if the code label satisfies the ACR™ 3 conditions (see par. 4.1).



The DS6300 with the GFX-60 can be mounted over a conveyor in different positions.

The following picture illustrates the suggested position offering the best compromise between width and height of the reading area:

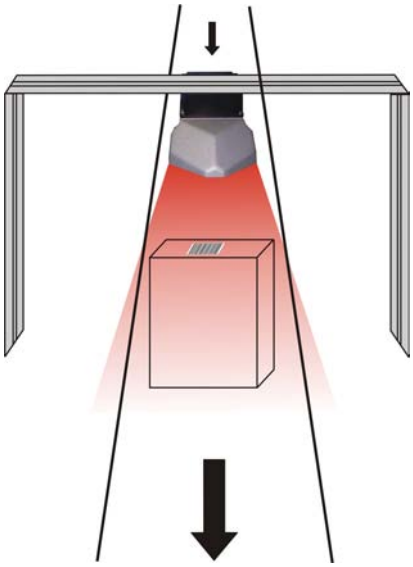


Figure 23 – Central Reading Position

The Central Reading position allows maximizing the reading distance (height) when the width of the reading area is not critical (narrow conveyors). In this case a complete reading on the central part of the conveyor plane is guaranteed.

NOTE

To better exploit the scanner reading performance when GFX-60 is mounted, the use of a dedicated recipe is recommended.

For details about reading performances of the DS6300 with GFX-60 see par. 4.2.3.

2.3 ELECTRICAL CONNECTIONS

All the connectors available for each scanner model are the following:

Scanner Model	Connector
Master/Slave	25-pin male serial interface and I/O connector 9-pin male Lonworks connector* 9-pin female Lonworks connector
Ethernet	26-pin male serial interface and I/O connector 9-pin female Lonworks connector RJ45 modular connector
DeviceNet	26-pin male serial interface and I/O connector 9-pin female Lonworks connector 5-pin male connector
Profibus	26-pin male serial interface and I/O connector 9-pin female Lonworks connector 9-pin female Profibus connector (white)

CAUTION

** Do not connect an RS232 port to the 9-pin Lonworks Connector. This may damage your Laptop PC.*

The table below gives the pinout of the C-BOX 100 terminal block connectors. Use this pinout when the DS6300 reader is connected in a network by means of the C-BOX 100:

C-BOX 100 Terminal Block Connectors				
Power				
1, 3, 5	VS			
2, 4, 6	GND			
7, 8	EARTH GROUND			
20, 40	Reserved			
Inputs				
27	EXT TRIG A (polarity insensitive)			
28	EXT TRIG B (polarity insensitive)			
29	IN 2A (polarity insensitive)			
30	IN 2B (polarity insensitive)			
31, 33	IN 3A (polarity insensitive)			
32, 34	IN 4A (polarity insensitive)			
36	IN 3B/IN 4B Reference (polarity insensitive)			
Outputs				
21	OUT 1+			
22	OUT 1-			
23	OUT 2+			
24	OUT 2-			
25	OUT 3A (polarity insensitive)			
26	OUT 3B (polarity insensitive)			
Auxiliary Interface				
35	TX AUX			
37	RX AUX			
38, 39	GND			
Main Interface				
Pin	**RS232**	**RS485 Full-Duplex**	**RS485 Half-Duplex**	**20 mA C.L. (INT-60 Only)**
11, 15	TX232	TX485+	RTX485+	CLOUT+
12, 16	RTS232	TX485-	RTX485-	CLOUT-
17	RX232	RX485+		CLIN+
18	CTS232	RX485-		CLIN-
10, 14, 19	SGND Main Isolated	SGND Main Isolated	SGND Main Isolated	
9, 13		RS485 Cable Shield	RS485 Cable Shield	

2.3.1 Main/Aux. Serial Interface and I/O Connector

The DS6300 master/slave model is equipped with a 25-pin male D-sub connector for connection to the host computer, power supply and input/output signals.
The DS6300 fieldbus models (Ethernet, DeviceNet, Profibus) adopt a 26-pin male connector instead of the 25-pin one.

The details of the connector pins are indicated in the following table:

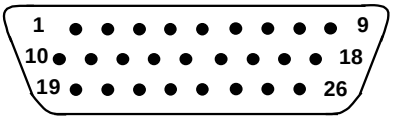


Figure 24 - 26-pin Connector

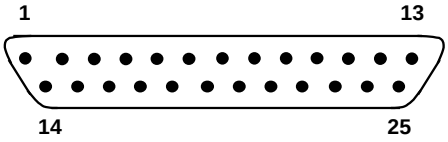


Figure 25 - 25-pin Connector

DS6300 25-pin/26-pin D-sub connector pinout		
Pin	**Name**	**Function**
1	Shield	Cable shield - internally connected by capacitor to the chassis
20	RXAUX	Receive data of auxiliary RS232 (referred to GND)
21	TXAUX	Transmit data of auxiliary RS232 (referred to GND)
8	OUT 1+	Configurable digital output 1 - positive pin
22	OUT 1-	Configurable digital output 1 - negative pin
11	OUT 2+	Configurable digital output 2 - positive pin
12	OUT 2-	Configurable digital output 2 - negative pin
16	OUT 3A	Configurable digital output 3 - polarity insensitive
17	OUT 3B	Configurable digital output 3 - polarity insensitive
18	EXT_TRIG A	External trigger (polarity insensitive)
19	EXT_TRIG B	External trigger (polarity insensitive)
6	IN 2A	Input signal 2 (polarity insensitive)
10	IN 2B	Input signal 2 (polarity insensitive)
14	IN 3A	Input signal 3 (polarity insensitive)
15	IN 4A	Input signal 4 (polarity insensitive)
24	IN_REF	Common reference of IN3 and IN4 (polarity insensitive)
9,13	VS	Supply voltage - positive pin
23,25,26*	GND	Supply voltage - negative pin

Main Interface Connector Pinout				
Pin	**RS232**	**RS485 Full Duplex**	**RS485 Half Duplex**	**20 mA C.L. (INT-60 Only)**
2	TX	TX485 +	RTX485 +	CLOUT +
3	RX	RX485 +		CLIN +
4	RTS	TX485 -	RTX485 -	CLOUT -
5	CTS	RX485 -		CLIN -
7	GND_ISO	GND_ISO	GND_ISO	GND**

* Pin 26 is only available for fieldbus models (Ethernet, DeviceNet, Profibus).

** For 20 mA C.L. connections, GND is the same of the scanner power supply.

Main Interface

The main serial interface is compatible with the following electrical standards:

RS232

RS485 full-duplex

RS485 half-duplex

20 mA current loop

The 20 mA Current Loop interface is available if the optional INT-60 accessory is installed. This accessory interface replaces the RS232/RS485 selections.

The main serial interface type and its relative parameters (baud rate, data bits, etc.) are selected via software using the Genius™ utility program. For more details refer to the section "Main Serial Port" in the Genius™ Help On Line.

Details regarding the connections and use of the main interface selection are given in the next paragraphs.

RS232 Interface

The main serial interface is used for communication with the Host computer and allows both transmission of code data and configuring the reader.

The following pins of the 25-pin and 26-pin connector are used for RS232 interface connection depending on the reader model:

Pin	Name	Function
2	TX	Transmit
3	RX	Receive
4	RTS	Request to send
5	CTS	Clear to send
7	GND-ISO	Main signal ground

The RTS and CTS signals control data transmission and synchronize the connected devices.

If the RTS/CTS hardware protocol is enabled, the DS6300 activates the RTS output to indicate a message can be transmitted. The receiving unit must activate the CTS input to enable the transmission.

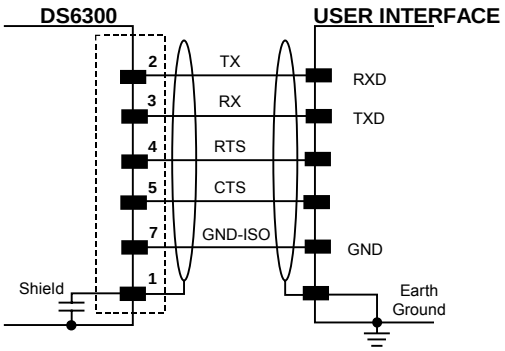


Figure 26 - RS232 Connections

RS485 Full-Duplex Interface

The RS485 full-duplex interface is used for non-polled communication protocols in 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 and 26-pin connector are used for RS485 full-duplex interface connection:

Pin	Name	Function
2	TX485 +	RS485 output (+)
3	RX485 +	RS485 input (+)
4	TX485 -	RS485 output (-)
5	RX485 -	RS485 input (-)
7	GND-ISO	Main signal ground

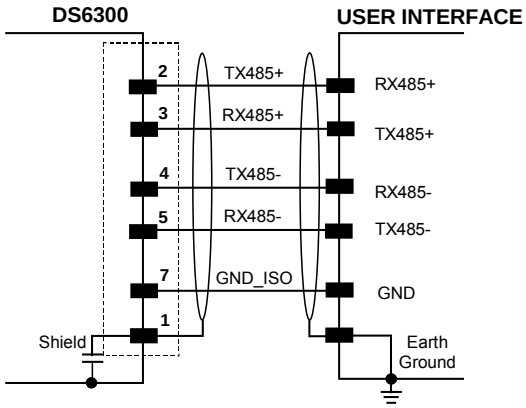


Figure 27 - RS485 Full-Duplex Interface Connections

RS485 Half-Duplex Interface

The RS485 half-duplex interface can be used for multidrop connections with a Datalogic multiplexer or it can also be used for a master/slave layout.

The following pins of the 25-pin and 26-pin connector are used for RS485 half-duplex interface connection:

Pin	Name	Function
2	RTX485 +	RS485 input/output (+)
4	RTX485 -	RS485 input/output (-)
7	GND-ISO	Main signal ground

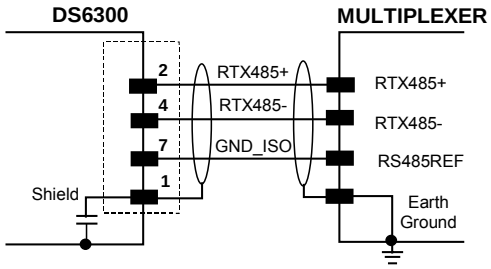


Figure 28 – RS485 Half-Duplex Interface Connections

20 mA Current Loop (INT-60 Accessory Only)

When the INT-60 accessory board is installed, the DS6300 is equipped with a 20 mA current loop interface. The INT-60 board supports both active and passive type connections.

Active Connections

The following pins of the 26-pin output connector are used for the active connections:

Pin	Name	Function
4	CLOUT -	Current Loop Output (-)
5	CLIN -	Current Loop Input (-)
7	GND	Earth Ground*

* For 20 mA C.L. connections, GND is the same as the scanner power supply GND.

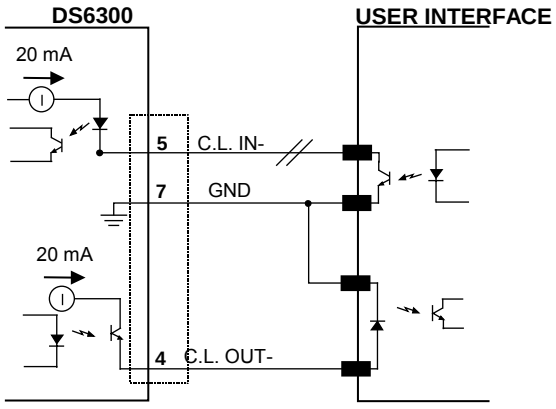


Figure 29 – 20 mA C.L. Active Connections

When the DS6300 scanner is connected to the C-BOX 100 by means of CAB-61X0, the signals are available on the C-BOX 100 terminal connectors:

Pin	Name	Function
12, 16	CLOUT -	Current Loop Output (-)
18	CLIN -	Current Loop Input (-)
10, 14, 19	GND	Earth Ground*

Passive Connections

The following pins of the 26-pin output connector are used for the passive connections:

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

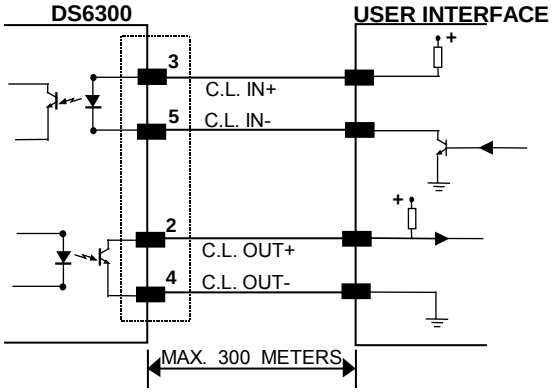


Figure 30 – 20 mA C.L. Passive Connections

When the DS6300 scanner is connected to the C-BOX 100 by means of CAB-61X0, the signals are available on the C-BOX 100 terminal connectors:

Pin	Name	Function
11, 15	CLOUT +	Current Loop Output (+)
12, 16	CLOUT -	Current Loop Output (-)
17	CLIN +	Current Loop Input (+)
18	CLIN -	Current Loop Input (-)

Auxiliary Interface

The auxiliary serial interface is equipped with RS232 full-duplex interface connections. The interface type is exclusive and is selectable through the Genius™ configuration program.

The following pins of the 25-pin and 26-pin connector are used for RS232 full-duplex interface connection:

Pin	Name	Function
20	RXAUX	Receive data
21	TXAUX	Transmit data
23	SGND AUX	Auxiliary signal ground

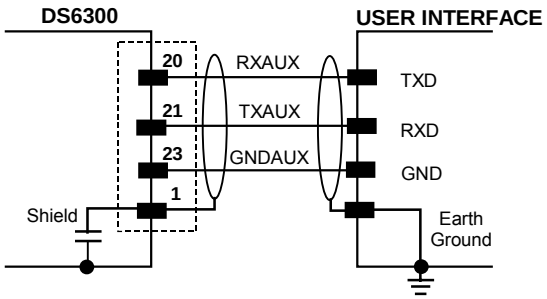


Figure 31 - RS232 Auxiliary Interface Connections

Inputs

The inputs of the reader are on the 25-pin and 26-pin connector (Figure 4, 1 and Figure 5, 1) of the DS6300.

These inputs are called EXT_TRIG, IN2, IN3 and IN4.

Pin	Name	Function
18	EXT_TRIG A	External trigger (polarity insensitive)
19	EXT_TRIG B	External trigger (polarity insensitive)
6	IN2A	Input signal 2 (polarity insensitive)
10	IN2B	Input signal 2 (polarity insensitive)
14	IN3A	Input signal 3 (polarity insensitive)
15	IN4A	Input signal 4 (polarity insensitive)
24	IN_REF	Common reference of IN3 and IN4 (polarity insensitive)

IN2 is normally used for the Encoder input.

EXT_TRIG is the main presence sensor. When active, this input tells the scanner to scan for a code and that decoding can take place. The yellow LED (Figure 3,3) indicates the EXT_TRIG is active.

IN3 and IN4 can be used as the stop signal for the reading phase.

All inputs are optocoupled, polarity insensitive, and driven by a constant current generator; the command signal is filtered through an anti-disturbance circuit which generates a delay which can be set to 5 ms or 500 μs. In particular, EXT_TRIG, IN3 and IN4 share the same value which usually corresponds to 5 ms when using a photoelectric sensor, while IN2 has a different value which is set to 500 μs when this input is used for the Encoder.

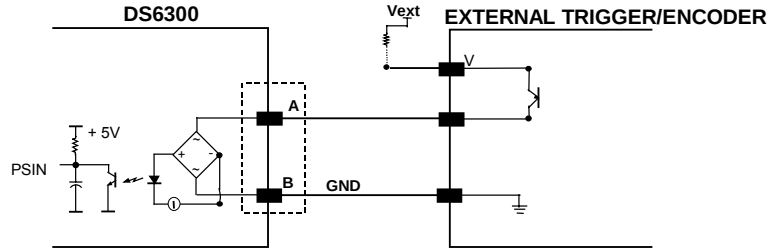


Figure 32 – PNP Command Input Connection

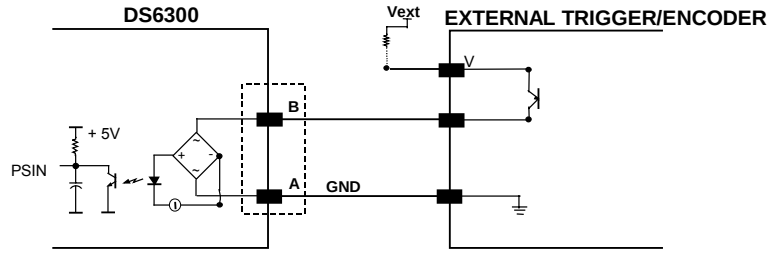


Figure 33 - PNP Command Input Connection

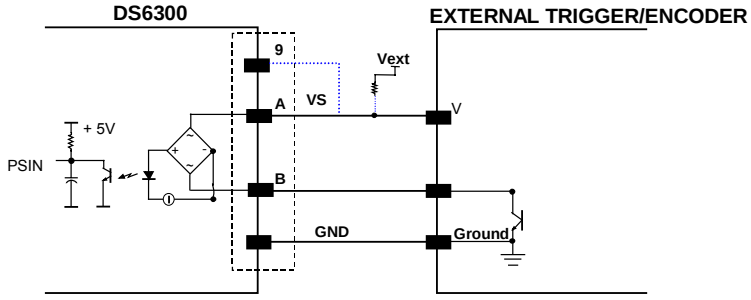


Figure 34 - NPN Command Input Connection

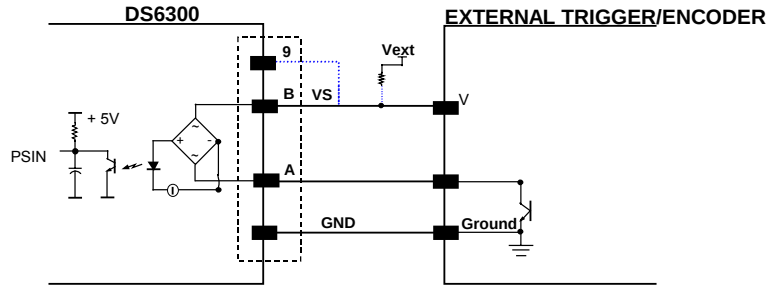


Figure 35 - NPN Command Input Connection

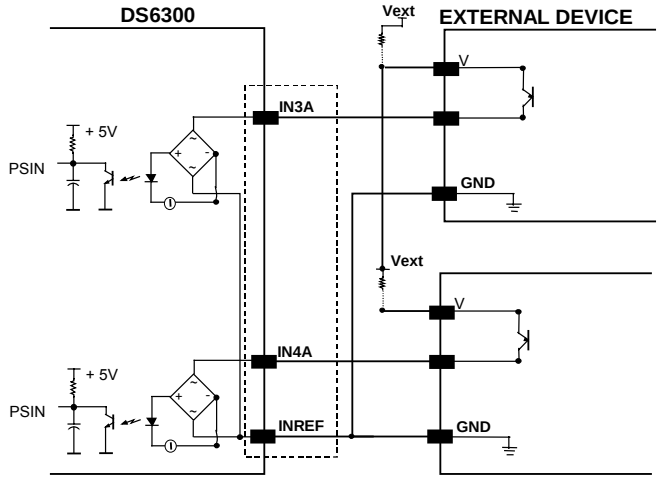


Figure 36 - PNP Input Command

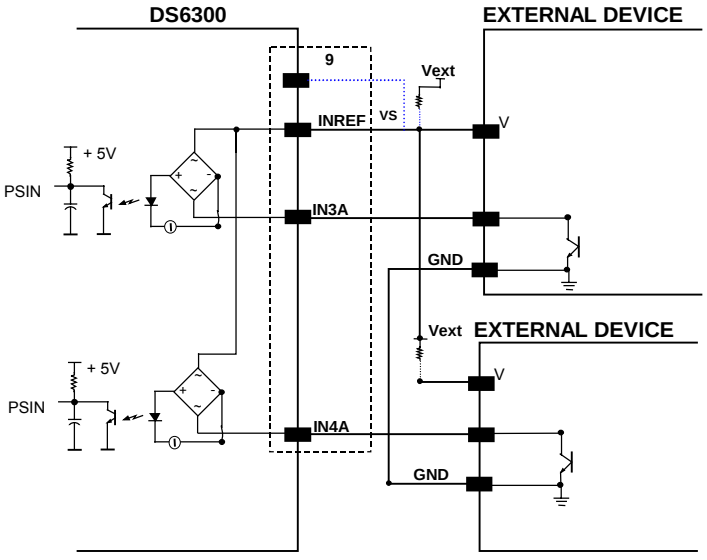


Figure 37 - NPN Input Command

The inputs can be powered using the VS signal on the scanner (pin 9).
However, isolation between the command logic and the scanner is maintained by powering the inputs with a different supply voltage (Vext) from that supplied on pin 9 of the 25-pin/26-pin I/O connector.

The driving logic of the input signals may be powered, for convenience, with the voltage supply between pins A (VS) and B (GND) of the connector. In this case, however, the device is no longer electrically isolated.

The voltage available on the input connector, between pins A and B, is physically the same as used to power the scanner.

The electrical features of these inputs are:

Maximum voltage 30 V
Maximum current 10 mA

Outputs

Three general purpose outputs are available.

Pin	Name	Function
8	OUT 1+	Configurable digital output 1 – positive pin
22	OUT 1-	Configurable digital output 1 – negative pin
11	OUT 2+	Configurable digital output 2 – positive pin
12	OUT 2-	Configurable digital output 2 – negative pin
16	OUT 3A	Configurable digital output 3 – polarity insensitive
17	OUT 3B	Configurable digital output 3 – polarity insensitive

The function of the three outputs OUT1, OUT2 and OUT3 can be defined by the user.
Refer to Genius™ Help On-Line for further details.

By default, OUT1 is associated with COMPLETE READ event, which activates when the code has been read correctly. In case the reader has been programmed to read several codes within the same reading phase, the event activates when all codes have been read.

OUT2 is associated with NO READ event, which activates when no code has been read.

OUT3 is associated with NONE, which means that the output is always in line state.

The OUT1 and OUT2 electrical features are given below:

Collector-emitter voltage	30 V Max.
Collector current	130 mA Max.
Saturation voltage (VCE)	1 V at 10 mA Max.
Maximum power dissipation	90 mW at 50°C (Ambient temperature).

The limit requested by the maximum power dissipation is more important than that of the maximum collector current: if one of these outputs is continuously driven, the maximum current must not be more than 40 mA although 130 mA may be reached in pulse conditions.

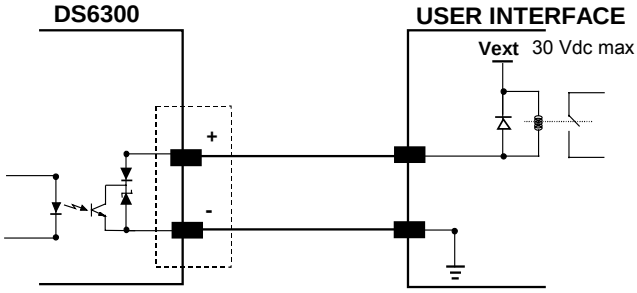


Figure 38 – Output 1 and Output 2 Interface

OUT3 has different electrical features, since it is a bi-directional solid state relay with a built-in current limit protection. If this output is continuously driven, the maximum current must be not more than 200 mA although more than 300 mA may be reached in pulse conditions for an ambient temperature of 25°C. At the maximum ambient temperature of 50°C the maximum respective current is 160 mA continuous and 240 mA pulse.

The OUT3 electrical features are given below:

Maximum voltage	± 100 V
Collector current (pulse)	240 mA Max.
R on	6 – 15 Ω
R off	> 500 Ω
Off-state leakage current	< 1 µA
Maximum power dissipation	550 mW at 50°C (Ambient temperature).

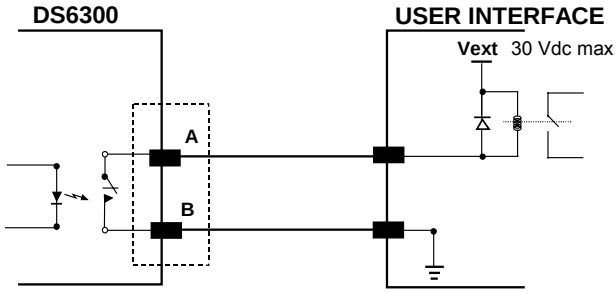


Figure 39 – Output 3 Interface

The command signal is filtered and generates a delay of about 50 µs for OUT1 and OUT2 and 1 ms for OUT3.

When the load is powered by an external power supply, the voltage must be less than 30 V.

2.3.2 Lonworks Connectors

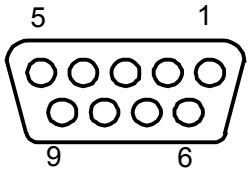
CAUTION

Do not connect an RS232 port to the 9-pin Lonworks Connector. This may damage your Laptop PC.

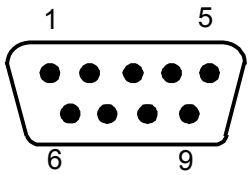
The local network used by DS6300 exploits a Lonworks standard communication system requiring only two wires (polarity insensitive) to enable a connection. The connector also provides a positive and a negative supplying wire. In this way, all the slave readers can be powered by the master through the Datalogic standard cables.

When working in applications requiring enhanced synchronization capabilities, the DS6300 master reader (output) transmits two system signals named Sys_I/O and Sys_Enc_I/O to the slave readers (input). For example, when working with applications requiring an encoder the signal is received by the master and directly transmitted to the slaves through the cable.
The internal circuits generating the system signals are externally supplied by means of the VS_I/O and REF_I/O pins and are isolated from the reader supply voltage.

The use of these system circuits is not required in all the operating modes (see par. 2.7 for details). Anyway, for a correct system functioning it is suggested to use Datalogic cables and accessories and follow the description of the typical layout (see par. 2.7 for details).



Female (all models)



Male (Master/Slave model)

Figure 40 – 9-pin Local Lonworks Connectors

DS6300 9-pin Lonworks connector pinout		
Pin	**Name**	**Function**
1	Shield	Cable shield
9	VS	Supply voltage - positive pin
2	GND	Supply voltage - negative pin
6	VS_I/O	Supply voltage of I/O circuit
3	Ref_I/O	Reference voltage of I/O circuit
4	SYS_ENC_I/O	System signal
5	SYS_I/O	System signal
7	LON A	Lonworks line (polarity insensitive)
8	LON B	Lonworks line (polarity insensitive)

Network Termination

When building a Lonworks system the network must be properly terminated by positioning BTK-6000 terminator in the DS6300 master reader and in the last DS6300 slave reader.

Each side of the terminator provides a different connector; thus, it can be inserted either into the Lonworks 9-pin male connector of the master reader or in the Lonworks 9-pin female connector of the last slave reader:

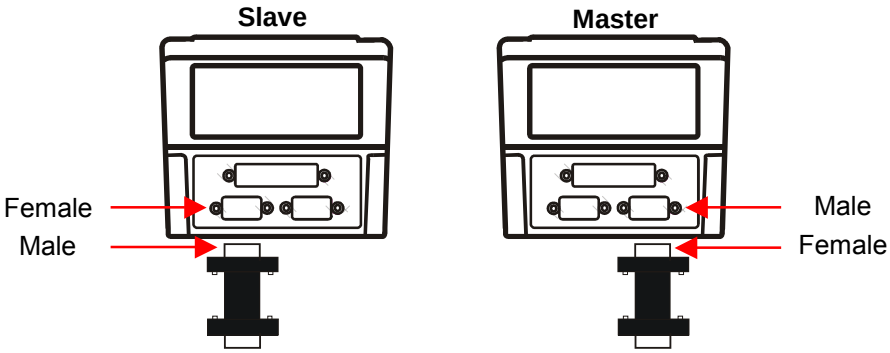


Figure 41 - BTK-6000 Network Terminator

NOTE

For Fieldbus models no terminator must be inserted in the reader, since it is internally integrated.

Lonworks Interface

The Lonworks network is used for both input and output connection to build a multi-sided or omni-station system connecting several readers.

The DS6300 master usually employs the 9-pin female connector for output connection to the first slave, while the 9-pin male one is terminated by inserting the BTK6000 terminator (see par. 2.7.2 for details). If creating a T-network configuration, it is necessary to use both connectors to create the double branch line of slave readers.

Both connectors are always employed when connecting together the slave readers. In particular, the 9-pin female connector is used for output connection and the male one for input connection. The female connector is always terminated in the last slave reader to close the system network.

The following diagram represents the connection between a DS6300-XXX-010 working as master and a DS6300-XXX-010 working as a slave reader.

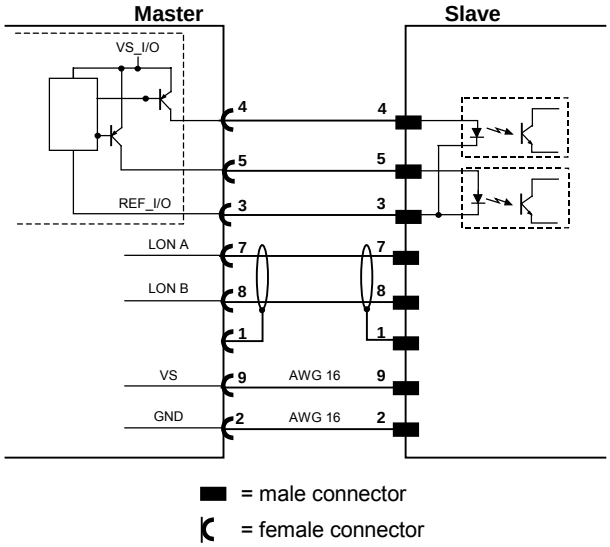


Figure 42 – DS6300-XXX-010 Master/Slave Lonworks Connection

CAUTION

*The maximum current to be propagated to the slave readers through the master is **2 A**.*
For this reason, it is suggested the use of a 24 V power supply allowing to supply up to three readers (master + 2 slaves).

The following diagrams represent different network terminations using the BTK-6000 terminator. In each diagram the terminator is indicated by the T element, while the figure below shows its electrical circuit in details:

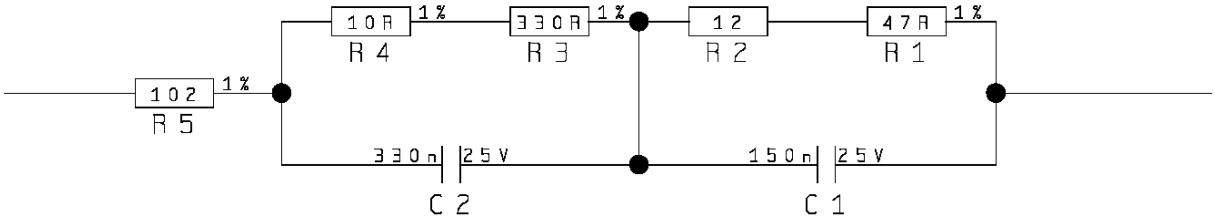


Figure 43 – BTK-6000 Electrical Circuit

The diagram below represents the termination of a DS6300-XXX-010 working as master by means of the BTK-6000 terminator.

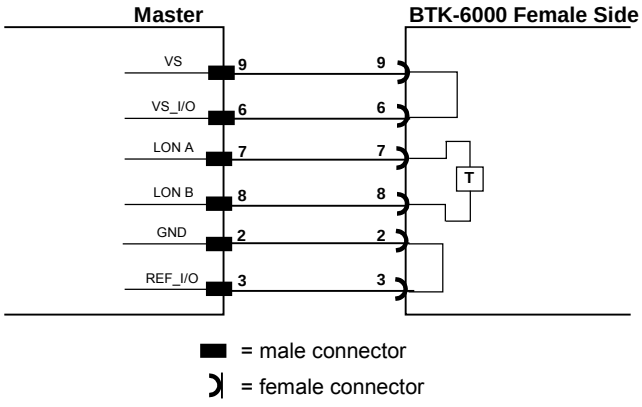


Figure 44 – DS6300-XXX-010 Master Termination

The diagram below represents the termination of a DS6300-XXX-010 working as slave by means of the BTK-6000 terminator.

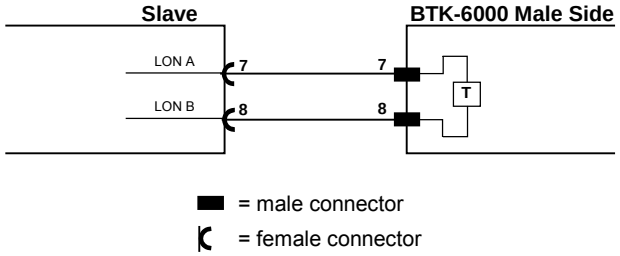


Figure 45 – DS6300-XXX-010 Slave Termination

The diagram below represents the connection between a DS6300 Fieldbus model, which always works as master, and a DS6300-XXX-010 working as a slave reader.

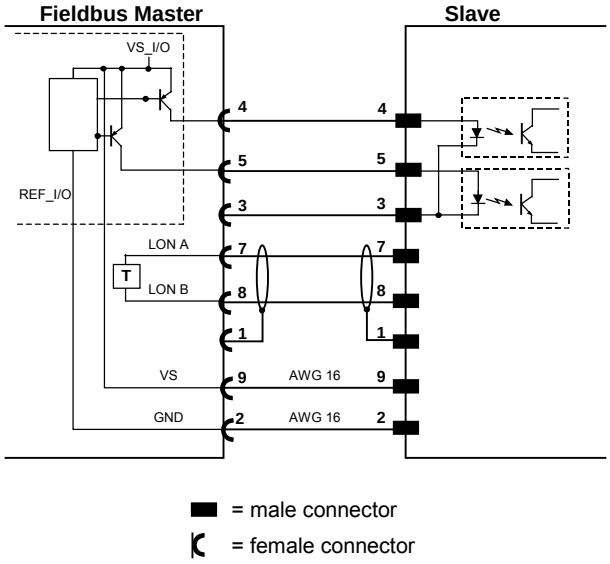


Figure 46 – DS6300-XXX-010 Master/Slave Lonworks Connection

2.3.3 Ethernet Connector

This connector is only available for DS6300 Ethernet models and allows the Ethernet connection between the host and the scanner.

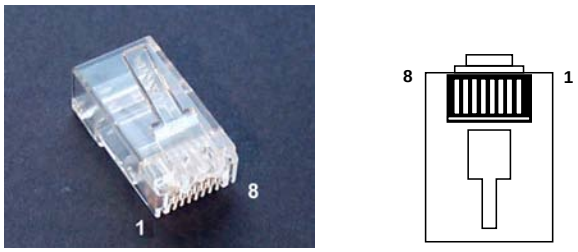


Figure 47 – Cable RJ45 Male Modular Connector

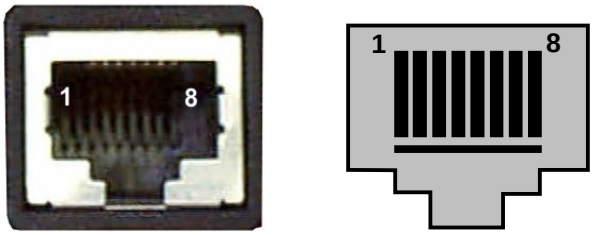


Figure 48 – DS6300 RJ45 Female Modular Connector

This interface and the connector pinout (see the following table) are IEEE 802.3 10 BaseT and IEEE 802.3u 100 BaseTx compliant.

RJ45 Modular Jack Pinout		
Pin	**Name**	**Function**
1	TX +	Transmitted data (+)
2	TX -	Transmitted data (-)
3	RX +	Received data (+)
6	RX -	Received data (-)
4, 5, 7, 8	N.C.	Not connected

Ethernet Interface

The Ethernet interface (NIC) can be used for TCP/IP communication with remote or local host computer by connecting the scanner to a LAN as well as with a host PC directly connected to the scanner.

The following is an example of a connection to a LAN through a Hub using a straight through cable:

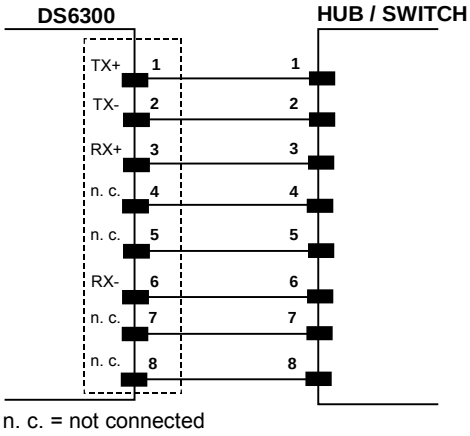


Figure 49 – Straight Through Cable

The following is an example of direct connection to a PC using an inverted cable:

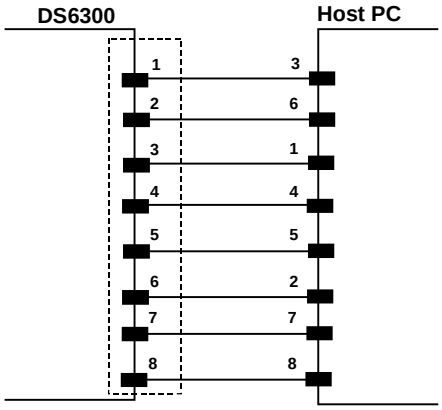


Figure 50 – Inverted Cable

For further details refer to the "Ethernet.pdf" document provided as supplementary documentation.

2.3.4 DeviceNet Connector

NOTE

When using DeviceNet, the Main serial interface is disabled and must not be physically connected.

The 5-pin male connector is only available in the DS6300 DeviceNet model and allows connection between the host and the reader:

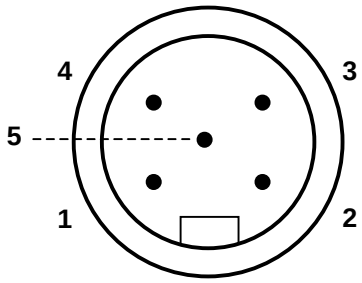


Figure 51 - DeviceNet 5-pin Male Connector

DS6300 5-pin DeviceNet connector pinout		
Pin	**Name**	**Function**
2	V +	Supply voltage – positive pin
5	CAN_L	CAN bus data line – L
1	SHIELD	Shield
4	CAN_H	CAN bus data line – H
3	V -	Supply voltage – negative pin

NOTE

The power supplied on pin V+ and V- is used only to propagate power to the section of the DeviceNet board directly connected to the Bus. It is completely isolated from the DS6300 power which must be supplied on pin 9, 13 and pin 23, 25 of the 26-pin Main/Aux connector.

2.3.5 Profibus Connector

The 9-pin female Profibus connector (white) is only available in the DS6300 Profibus model and allows connection between the host and the reader:

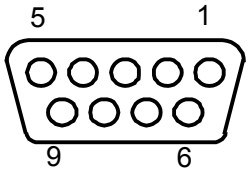


Figure 52 - Profibus 9-pin Female Connector

DS6300 9-pin Profibus connector pinout		
Pin	**Name**	**Function**
1	Shield*	Shield, Protective Ground resp.
2	Free	
3	B-LINE (RxD/TxD-P)	Received/Transmitted Data-P
4	CNTR-P**	Repeater Control Signal
5	DGND	Data Ground (M5V)
6	+5 V	Voltage Plus (P5V)
7	Free	
8	A-LINE (RxD/TxD-N)	Received/Transmitted Data
9	CNTR-N**	Repeater Control Signal

* signal is optional

** signal is optional; RS485 level

Profibus Interface

The Profibus interface is used for communication with an Host and allows expanding the networking and remote diagnostic capabilities of the scanner.

For further details refer to the “Profibus_Fam6k.pdf” document provided as supplementary documentation.

2.3.6 Power Supply

The supply voltage of a single scanner must be between 12 and 30 VDC.
Datalogic strongly recommends a minimum 24 VDC supply voltage when using a master/slave configuration.
The power consumption of the different DS6300 models is slightly different.

In particular, when connecting several DS6300 readers in a master/slave connection, the maximum power consumption for each scanner is 15 W. There is a power peak of about 20 W lasting 5..10 seconds caused by the motor starting.

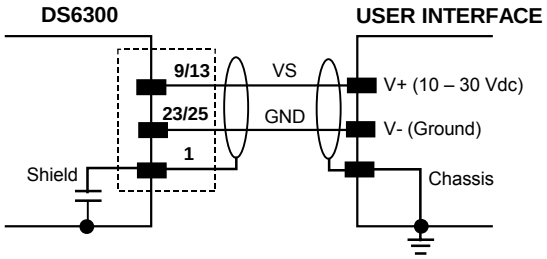
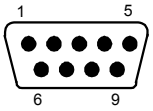
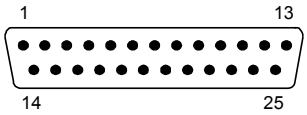


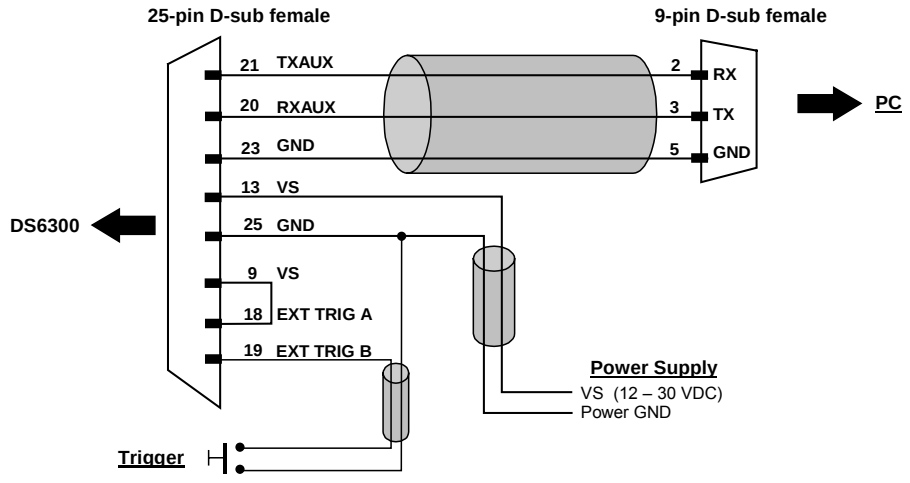
Figure 53 – Power Supply Using the 25/26-pin Connector

2.4 USER INTERFACE

RS232 PC-side connections			
 9-pin male connector		 25-pin male connector	
Pin	**Name**	**Pin**	**Name**
2	RX	3	RX
3	TX	2	TX
5	GND	7	GND
7	RTS	4	RTS
8	CTS	5	CTS

How To Build A Simple Interface Test Cable:

The following wiring diagram shows a simple test cable including power, external (push-button) trigger and PC RS232 COM port connections.



Test Cable for DS6300

2.5 POSITIONING THE SCANNER

The DS6300 reader is able to decode moving barcode labels at a variety of angles, however significant angular distortion may degrade reading performance.

When mounting DS6300 take into consideration these three ideal label position angles: **Pitch 0°**, **Skew 10° to 30°** and **Tilt 0°**.

Follow the suggestions for the best orientation:

The **Pitch** angle is represented by the value **P** in Figure 54. Position the reader in order to minimize the Pitch angle.

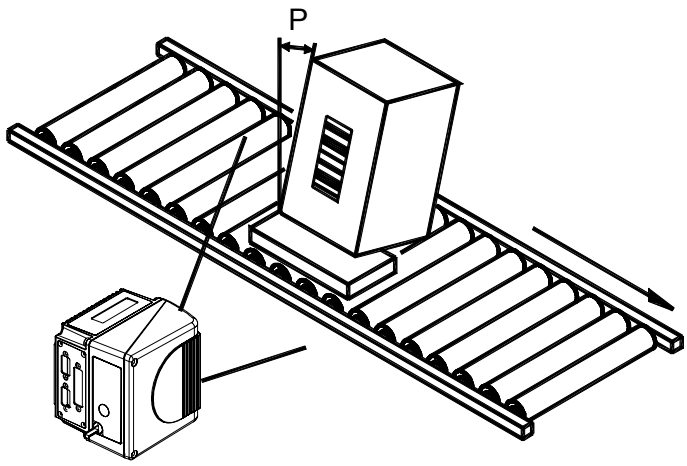


Figure 54 - "Pitch" Angle

The **Skew** angle is represented by the value **S** in Figure 55. Position the reader to **assure at least 10°** for the **Skew** angle. This avoids the direct reflection of the laser light emitted by the scanner.
For oscillating mirror models, this angle refers to the most inclined or external laser line, so that all other laser lines assure more than 10° Skew.

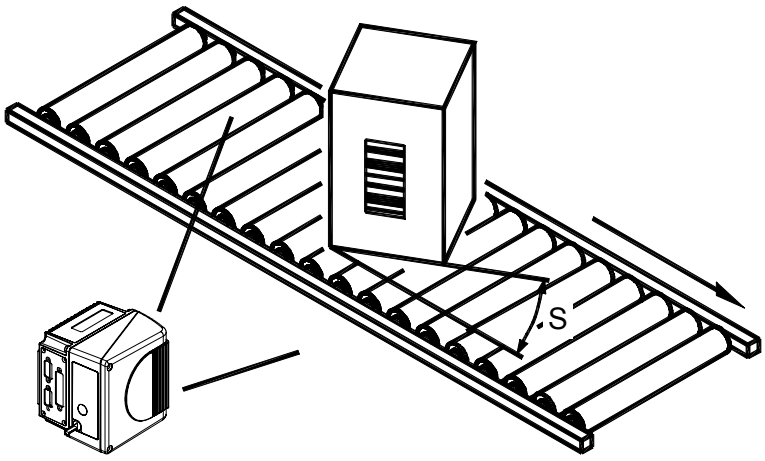


Figure 55 - "Skew" Angle

The **Tilt** angle is represented by the value **T** in Figure 56.

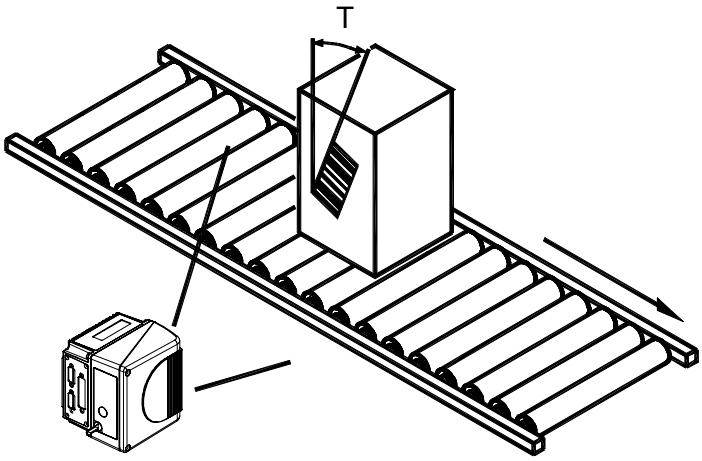


Figure 56 - "Tilt" Angle

2.6 TYPICAL INSTALLATIONS

2.6.1 Standard Installation

The DS6300 scanner is mounted on the ST-237 105° mounting bracket (see Figure 16) which guarantees a built-in Skew angle (**S** in the figure below) of 15° with respect to the frame plane (typically the Skew angle should be between 10° - 20°). This avoids the direct reflection of the laser light emitted by the scanner. Furthermore, the bracket guides allow adjusting the Tilt angle (**T** in the figure below, which is typically 0°) for the best scanner orientation:

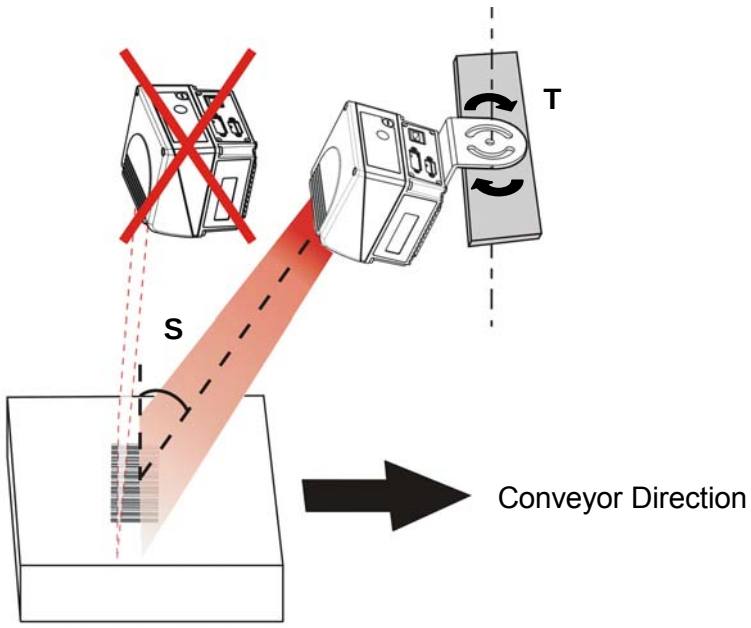


Figure 57 – Standard Installation

2.6.2 "45° Skew" Installation

The DS6300 scanner is mounted on the ST-210 90° mounting bracket (see Figure 18). By adjusting the mounting bracket guides, reach 45° for the Skew angle (**S** in the figure below) to avoid the direct reflection of the laser light emitted by the scanner:

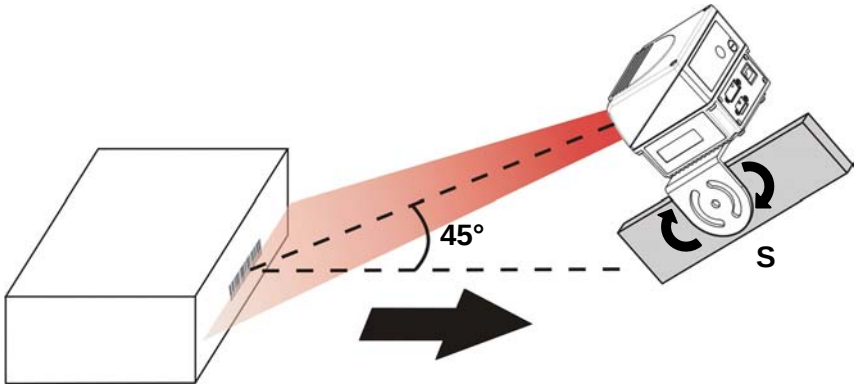


Figure 58 – 45° Skew Installation

ATTENTION

If using the "45° Skew" installation, it is not guaranteed that the scanner reading performances (see reading diagrams in par. 4.2.1) will match those measured for the standard installation with Skew angle between 10° - 20°.

NOTE

The ST-210 mounting bracket is an accessory of the DS6300 standard model available in the US-60 kit (order no. 890001020).

2.7 TYPICAL LAYOUTS

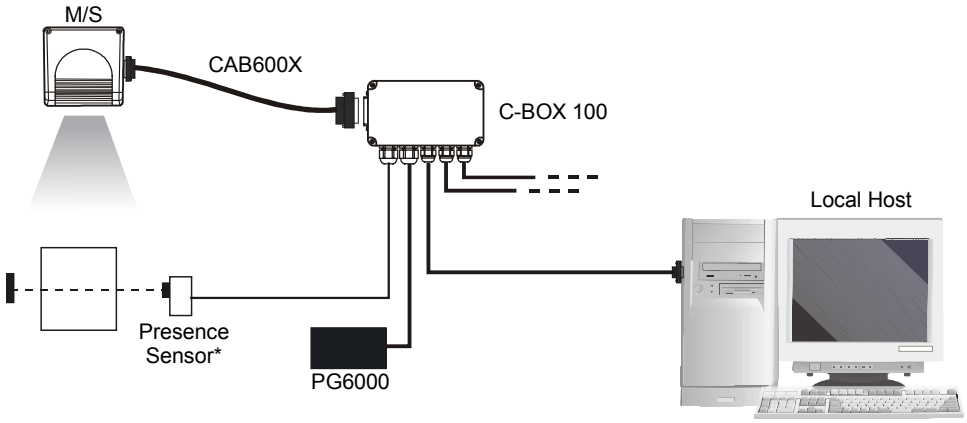
The following typical layout refers to the system hardware configurations, but it also requires the correct setup of the software configuration parameters (see par. 3.2 for details).
Other layouts require the use of DS6300 scanner having a specific decoder base.
The accessories and cables indicated in the following figures are Datalogic products. We suggest their use to guarantee the correct system functioning.

2.7.1 Point-to-Point

Using a Point-to-Point layout, the data is transmitted on the Main interface as well as on the Auxiliary interface. The Main interface can be selected for RS232 or RS485 full-duplex communications.
Two different layouts are available according to the DS6300 reader model used for the connection.

Master/Slave Models

When On-Line operating mode is used, the reader is activated by an External Trigger (photoelectric sensor) when the object enters its reading zone. In the following case, the signal is passed to the DS6300 by the C-BOX 100, which also supplies the system.

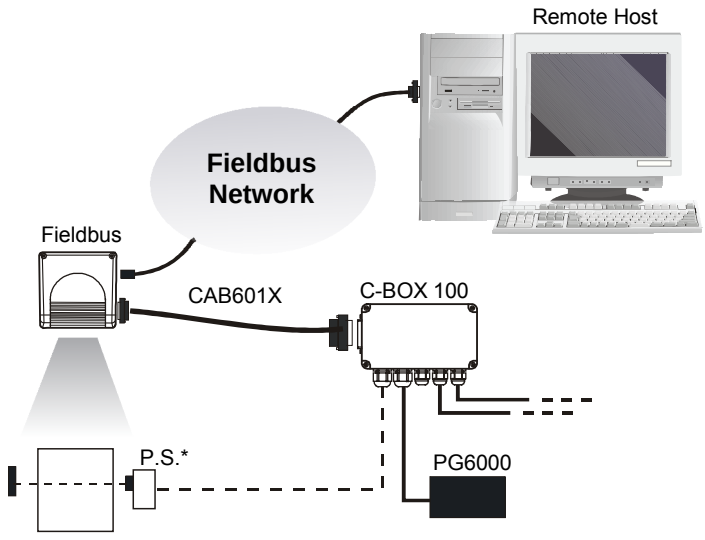


* Presence Sensor connected to External Trigger input.

Figure 59 – Point-to-Point for Master/Slave Models

Fieldbus Models

In this case no External Trigger is used and the C-BOX 100 only supplies the reader. The DS6300 (Ethernet, DeviceNet or Profibus model) is connected to a fieldbus remote Host. It can be activated by a signal generated by the remote Host or be always active if working in Automatic operating mode.



* P.S. (Presence Sensor) connected to External Trigger input.

Figure 60 – Point-to-Point for Fieldbus Models

2.7.2 Pass Through

When Pass Through is activated on the Auxiliary interface, the DS6300 reader (all models) can be integrated in a network consisting of different scanners not provided with a Lonworks interface.

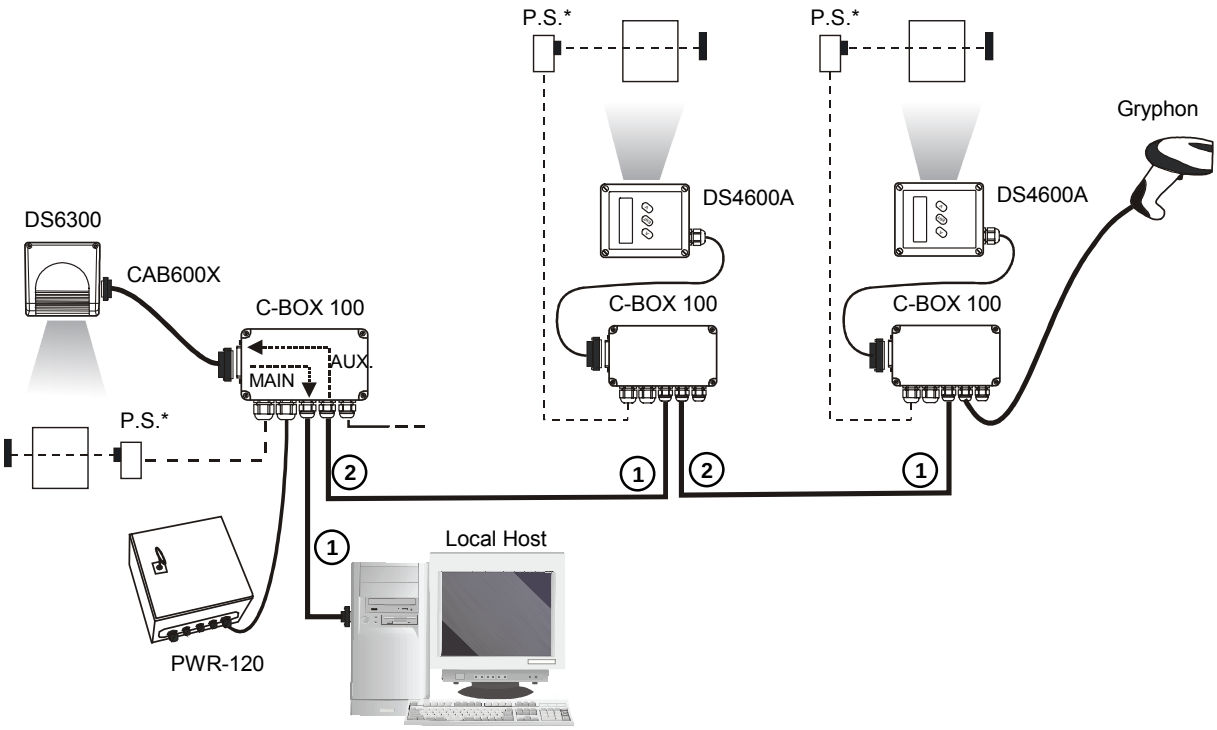
This connection mode allows two or more devices to be connected to a single external serial interface. The DS6300 transmits the messages received by its auxiliary interface (RS232 only) onto its main interface.

In this configuration a series of scanners can be connected together using RS232 on the main interface and all messages will be passed through this chain to the host. The reading phase of each scanner is independent from the others. In Pass Through connections each scanner is provided with its relative External Trigger (multi P.S.).

Applications can be implemented to connect a device such as a hand-held reader to the Auxiliary port for manual code reading capability.

For the RS232 connections the maximum cable length is 15 m (49.21 ft).

The DS4600A scanners represented in the following figures are configured in Pass Through mode.

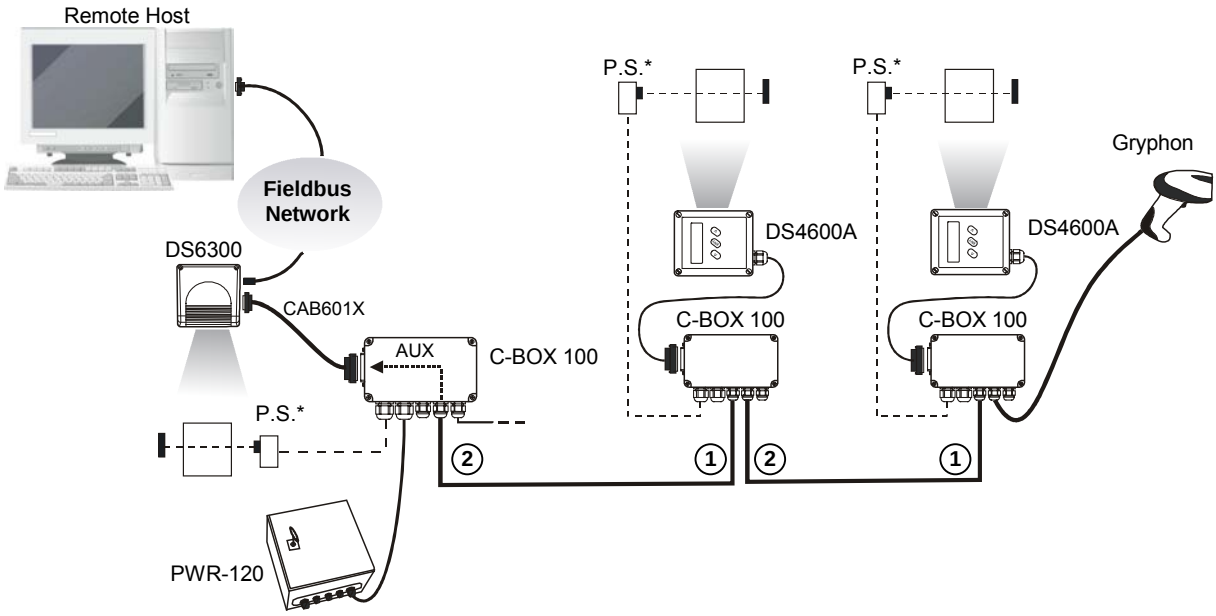


* P.S. (Presence Sensor) connected to External Trigger input.

(1) Main Serial Interface

(2) Auxiliary Serial Interface

Figure 61 – Pass Through Connection for DS6300 Master/Slave Models



* P.S. (Presence Sensor) connected to External Trigger input.

(1) Main Serial Interface

(2) Auxiliary Serial Interface

Figure 62 – Pass Through Connection for Fieldbus Models

2.7.3 RS232 Master/Slave

The RS232 master/slave connection is used to integrate a DS6300 reader (all models) in a network consisting of different scanners not provided with a Lonworks interface.

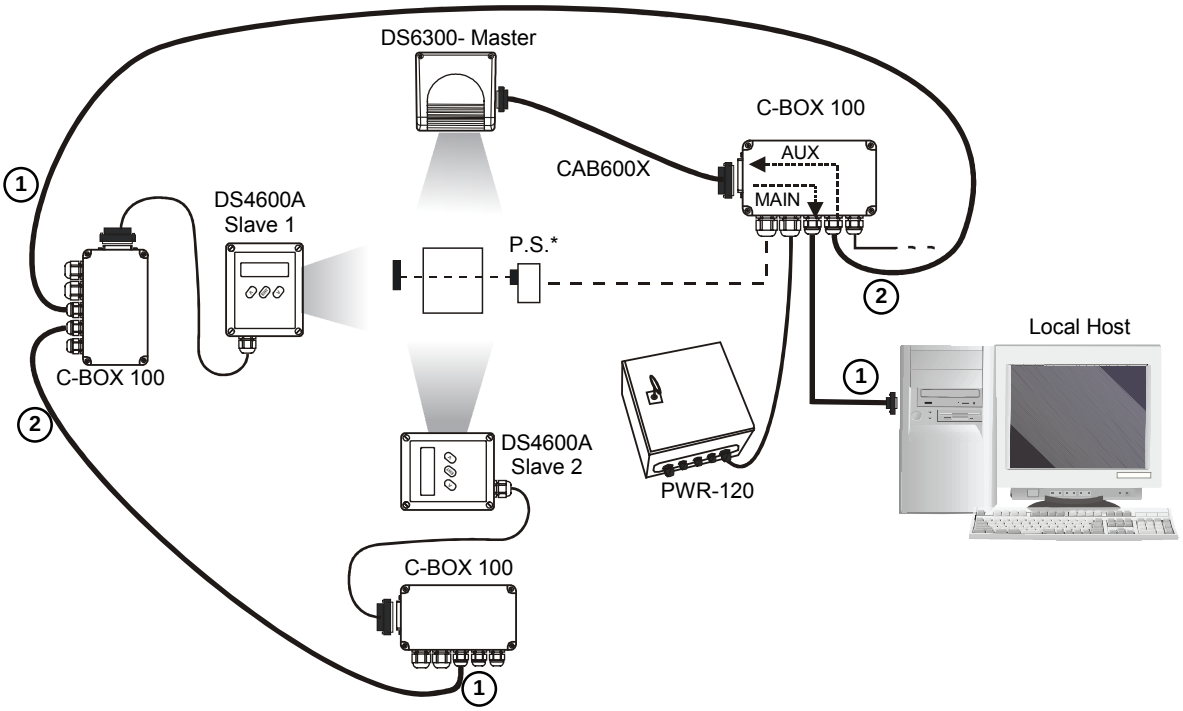
The Slave scanners use RS232 only on the main and auxiliary interfaces. Each slave scanner transmits the messages received by the auxiliary interface onto the main interface. All messages will be transferred towards the master.

The master scanner is connected to the Host PC on the main RS232 serial interface through the C-BOX 100 (20 mA C.L. can also be used if the INT-60 accessory is installed).

In RS232 Master/Slave connections the External Trigger signal is unique to the system (single P.S.).

NOTE

*The **DS6300 master/slave scanner model** (DS6300-10X-**010** only), working as Master in an RS232 network, may be simultaneously connected to a Lonworks network consisting of DS6300 slave scanners. Be careful when assigning the slave address, since the number of the first Lonworks slave must be a progressive number with respect to the address number defined for the last slave scanner of the RS232 network. For example, if the RS232 network consists of Slave 1 and Slave 2, the address to be assigned to the first Lonworks slave scanner will be Slave 3 (not Slave 1).*

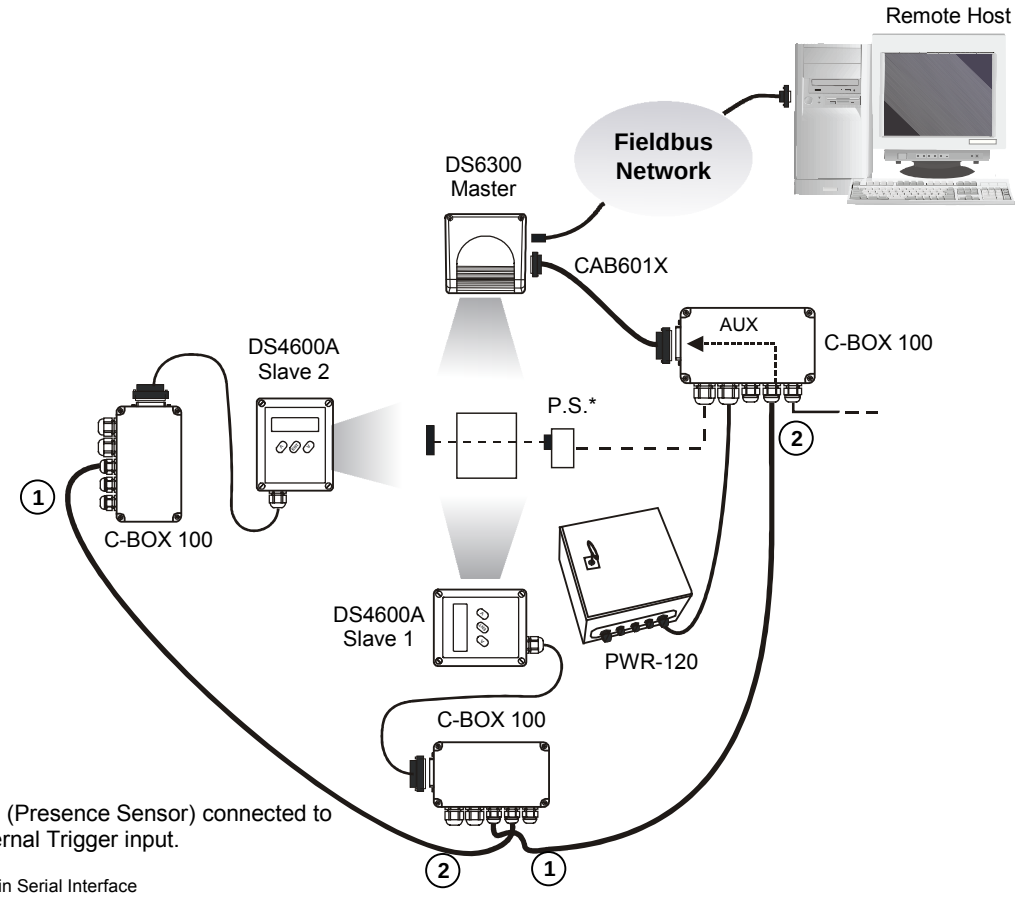


* P.S. (Presence Sensor) connected to External Trigger input.

(1) Main Serial Interface

(2) Auxiliary Serial Interface

Figure 63 – RS232 Master/Slave for DS6300 Master/Slave Models



* P.S. (Presence Sensor) connected to External Trigger input.

(1) Main Serial Interface

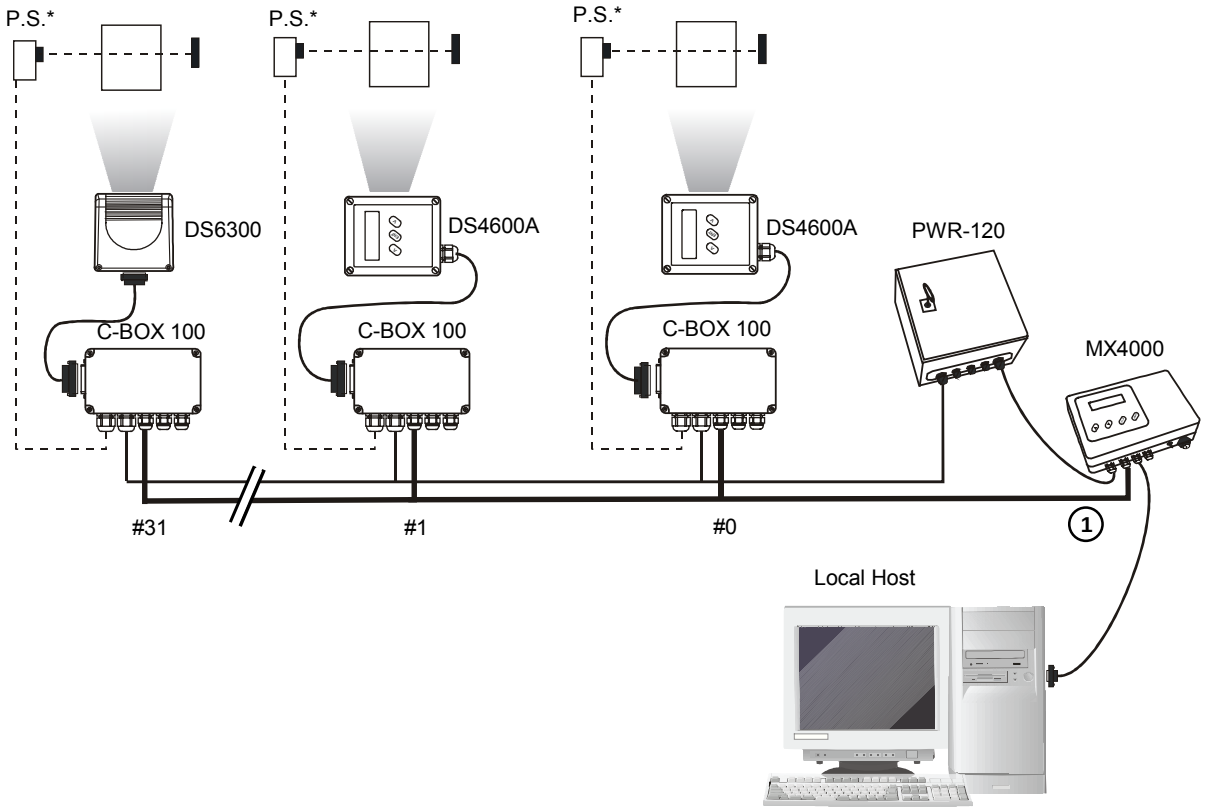
(2) Auxiliary Serial Interface

Figure 64 – RS232 Master/Slave for DS6300 Fieldbus Models

2.7.4 Multiplexer

The Multiplexer connection is used to integrate a DS6300 slave reader in a Multidrop network consisting of different scanners not provided with a Lonworks interface.

Each scanner is connected to a Multiplexer (MX4000) with the RS485 half-duplex main interface.



* P.S. (Presence Sensor) connected to External Trigger input.

(1) RS485 HD Main Interface

Figure 65 – Multiplexer for DS6300 Master/Slave Models

The auxiliary serial interface of the slave scanners can be used to visualize collected data or to configure it using the Genius™ utility.

When On-Line operating mode is used, the scanner is activated by an External Trigger when the object enters its reading zone.

2.7.5 Local Lonworks Network

A local Lonworks network allows electrically connecting a DS6300 master reader up to 31 DS6300 slaves. Actually, the maximum number of readers to be employed in the network depends on the system operating conditions, that is adopted operating mode and amount of data stream. For example, the On Line operating mode, (see Genius™ Help On-Line for further details), typically supports a maximum number of 8 slave readers.

Whenever creating your network, always keep in mind the following guidelines:

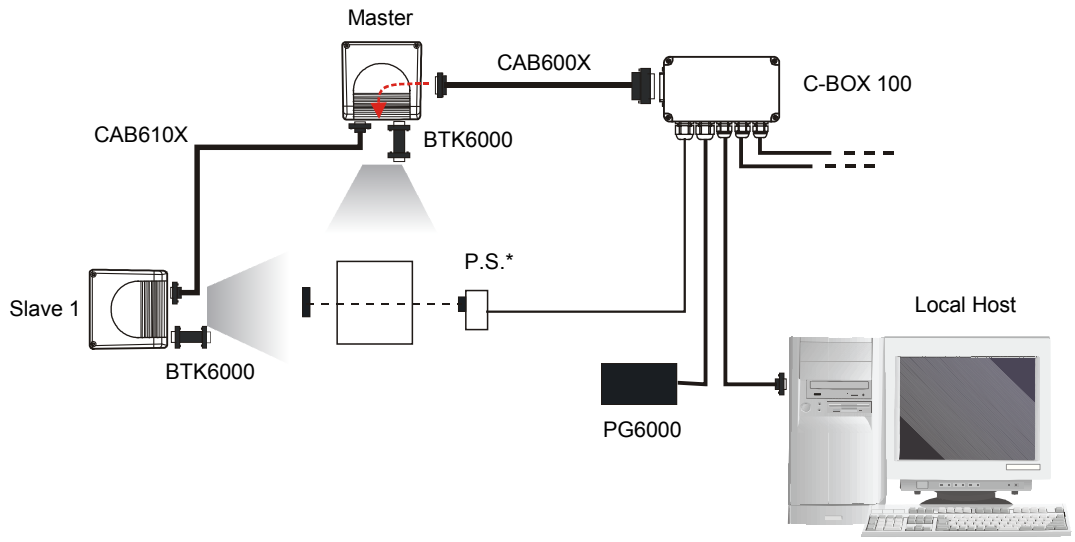
- the network electrically supports a maximum number of 31 DS6300 readers and may extend up to 130 m (426.5 ft);
- the maximum number of DS6300 readers supported depends on the type of power propagation adopted by the system (see par. 2.3.6 for details).

Contact Datalogic S.p.A., if your network requires a higher number of readers or in case the application throughput is very high.

When building the network, the DS6300 master reader must be connected to a local host computer or a C-BOX 100 by means of a cable connected to the 25 D-sub male connector.
The local Lonworks 9-pin female connector connects the master reader to the first slave reader of the system, while the local Lonworks 9-pin male connector must be properly terminated by inserting the BTK-6000 terminator.
The slave readers are connected together through the local Lonworks connectors. Only the 9-pin female connector of the last slave reader must be terminated by the BTK-6000 terminator.

Single P.S.

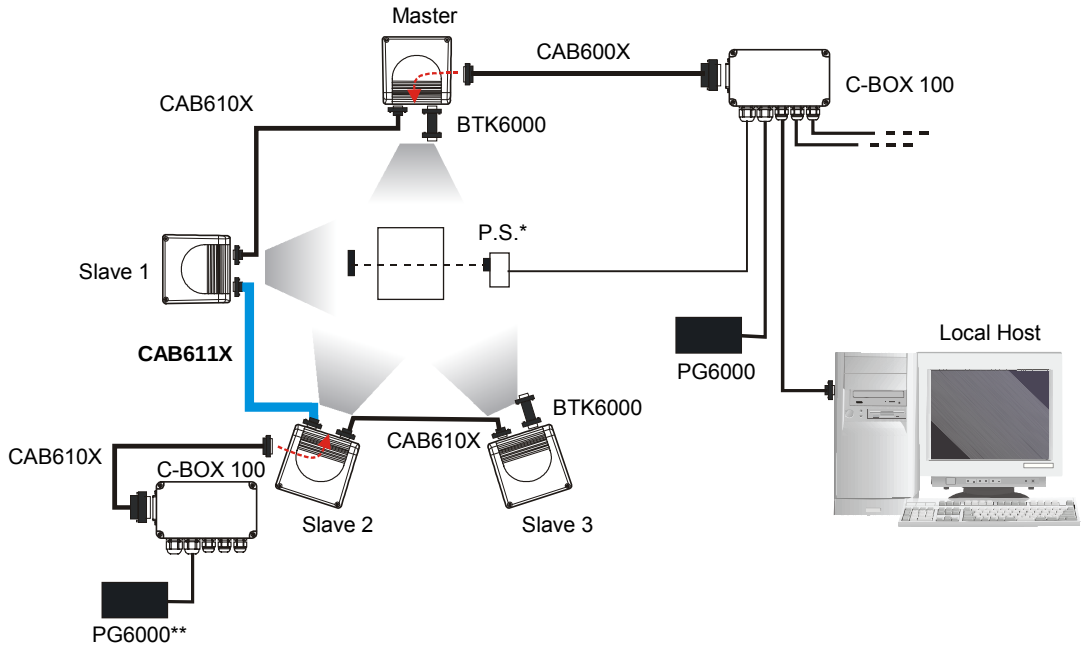
The presence sensor is connected to the C-BOX 100 and is unique to the system. There is only a single reading phase and a single message from the master reader to the Local Host. The **On-Line** operating mode is used for this layout.



* P.S. (Presence Sensor) connected to External Trigger input

Figure 66 - Single P.S. with 2 Readers

The following image shows a system consisting of four readers supplied by two different power units. The Master reader receives external signals (trigger, serial to host, etc..)and together with Slave 1 is powered by the first PG6000 through a C-BOX 100, while Slave 2 and Slave 3 are connected to another PG6000 through a C-BOX 100 and the 610X cable. Each PG6000 supplies up to 2 readers. CAB611X cable connects two different groups: Master, Slave 1 AND Slave 2, Slave 3. It does not propagate power but only network and synchronization signals.

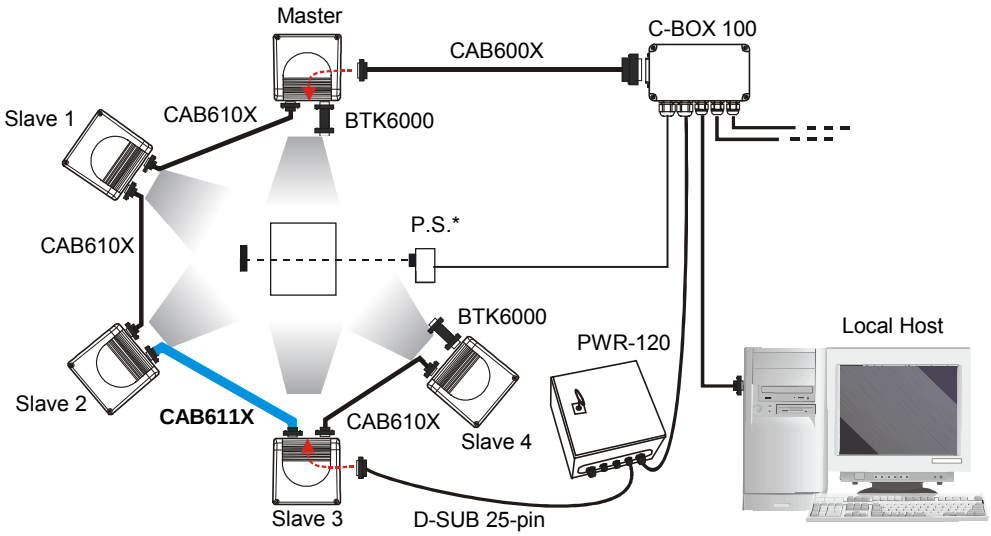


* P.S. (Presence Sensor) connected to External Trigger input

** PG6000 can be connected directly to Slave 2 by means of a custom cable with 2 AWG 20wires (VS + GND).

Figure 67 - Single P.S. with more than 2 Readers and Multiple Power Units

The following image shows a system consisting of five readers, where the Master reader receives external signals (trigger, serial to host, etc..) and together with Slave 1 and Slave 2 is powered by the C-BOX 100, while Slave 3 and Slave 4 are connected to the power supply through the PWR-120 and the 610X cable. This is due to the fact that C-BOX 100 can supply a maximum of 3 readers. This means that the CAB611x cable connects two different groups: Master, Slave 1, Slave 2 AND Slave 3, Slave 4. It does not propagate power but only network and synchronization signals.
The cable connecting PWR-120 to Slave 3 is a custom cable with two AWG 20 wires (VS + GND).



* P.S. (Presence Sensor) connected to External Trigger input.

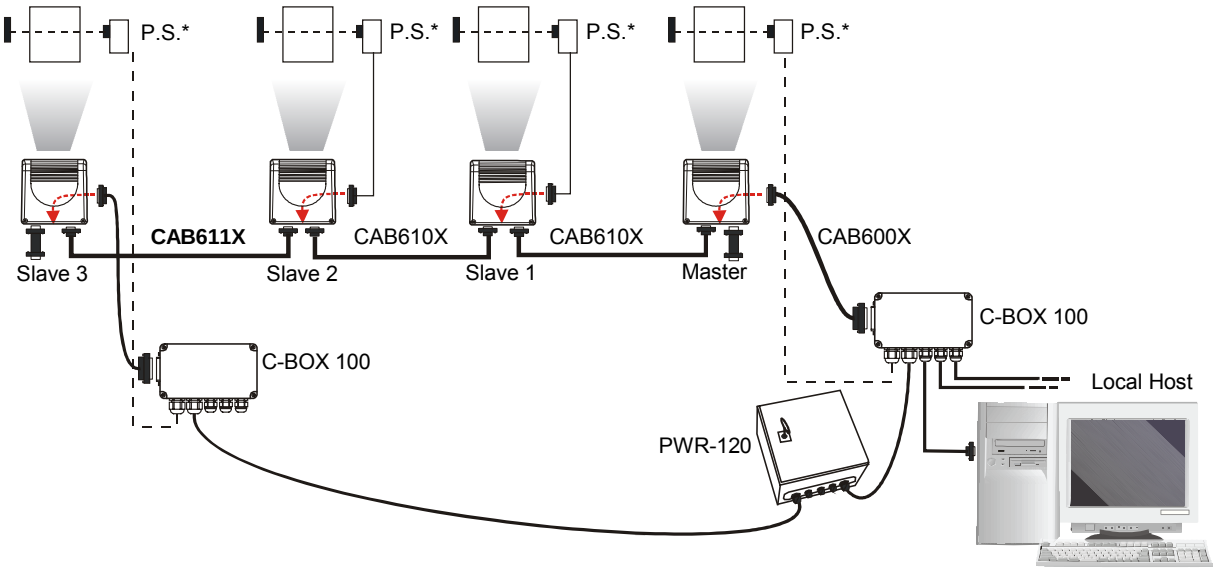
Figure 68 – Single P.S. with more than 2 Readers and Single Power Unit

Multi P.S. (This system configuration will be available soon).

In this layout, up to 7 DS6300 slave readers have their own P.S. and therefore multiple reading phases, while the P.S. activating the master reader is managed by the C-BOX 100.

The master sends all the individual messages collected from the multidrop line as well as its own to the C-BOX 100 which passes them to the Local Host.

The following image shows a system consisting of four readers, where the fourth one must be connected to a dedicated power supply by means of a C-BOX 100, since a single C-BOX 100 can supply groups consisting of maximum 3 readers. This means that the cable (CAB611X) connecting two different groups, in this case the cable connecting Slave 2 and Slave 3, does not propagate power.



* P.S. (Presence Sensor) connected to External Trigger input.

Figure 69 – Multi P.S. with more than 3 Readers

2.7.6 Fieldbus Network

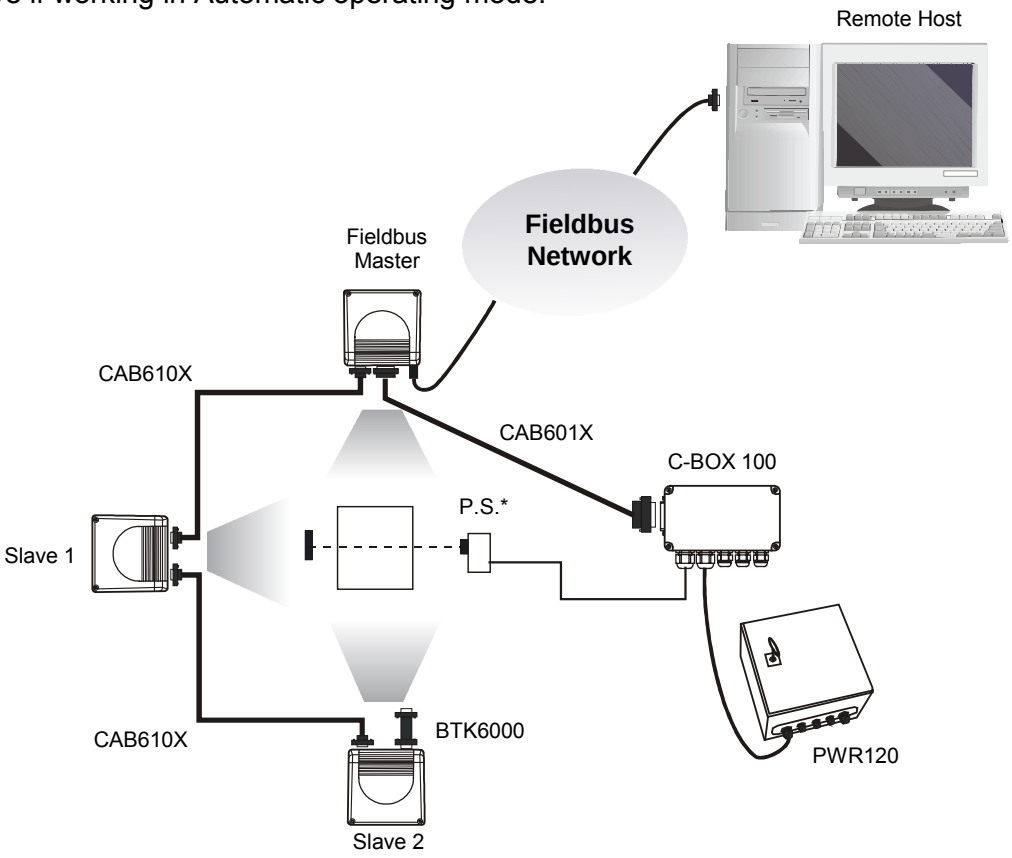
The Fieldbus (Ethernet, Profibus and DeviceNet) model offers connectivity without any converter or adapter needed.

The DS6300 master Fieldbus communicates with a remote host (for ex. remote PC connected via Internet) by means of a cable connected to the Fieldbus (Ethernet, Profibus or DeviceNet) connector provided.
The local Lonworks 9-pin female connector connects the Fieldbus master reader to the first slave reader of the system, while the 26 D-sub male connector may be connected to the C-BOX 100 to supply the reader.

The slave readers (DS6300 master/slave models) are connected together through the local Lonworks connectors. Only the 9-pin female connector of the last slave reader must be terminated by the BTK-6000 terminator. No terminator must be inserted in the Fieldbus master reader, since it is internally integrated.

Single P.S.

The DS6300 (Ethernet, DeviceNet or Profibus model) master is connected to a fieldbus remote Host. It can be activated by a signal generated by the remote Host or be always active if working in Automatic operating mode.



* P.S. (Presence Sensor) connected to External Trigger input.

Figure 70 – Fieldbus Single P.S.

As described before, C-BOX 100 can supply a maximum number of 3 readers. Therefore, if using more than 3 readers, connect the different groups by means of a cable (CAB6111X) not bringing power to, and power each group individually.

2.8 KEYPAD AND DISPLAY

The DS6300 keypad allows entering a menu where selecting one of the following functions:

- Focus Adjustment
- Internal Net
- Test Mode

The same settings may be performed by using the Genius™ program (see chapter 3 for details).

2.8.1 Focus Adjustment

The DS6300 provides a manual adjustment of the optics to optimize the reading performance by choosing the best focus between two extreme positions. The focus adjustment is continuous and not by step; thus, allowing an optimum adjustment around the selected position. The relative focus positions range from 0 to 100.
The adjustment can be simply made through an external screw placed on the back of the optic HEAD and protected by a cap (Figure 73). The screw may be rotated either clockwise or counterclockwise in order to move the scanner internal lenses. In particular, a clockwise rotation causes a farther focus from the scanner, while a counterclockwise rotation causes a nearer focus to the scanner.

An internal sensor tracks the exact laser beam focusing position allowing it to be shown on the reader display or through the Genius™ software program.

WARNING

Do not stare at the laser beam output window during this operation to avoid hazardous visible laser light.

Refer to the following instructions when adjusting the focus:

1) Remove the regulation screw protecting cap (see Figure 73) positioned on the back of the optic Head;
2) Press and hold both the ▲ (up arrow) and ▼ (down arrow) key for about 2 seconds to enter the Main menu;
3) Use the ▲ (up arrow) or ▼ (down arrow) key to select “Test Mode” item, then press the ENT (enter) key to confirm. The reader enters Test Mode;
4) Press the ENT (enter) key to toggle between the graphical (default) and numerical visualization of the focus position;

   Display Visualization

   The first line of the display shows the read code and Good Read percentage. Possible suspending commas at the end of the code mean that the code is too long to be displayed.
   The second line of the display indicates the value of the focus position according to the table below. The indications “Too Near” or “Too Far” are represented for values outside the focus range.

	Graphical Visualization	Numerical Visualization
A	|---^----------| → where **^** indicates the focus position	Fxxx → where xxx ranges from 000 to 100
B	N----------| → where **N** indicates that the focus position is "Too Near"	TooNear
C	|----------F → where **F** indicates that the focus position is "Too Far"	Fxxx* → where xxx is greater than 100

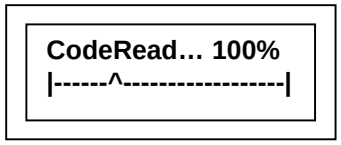


Figure 71 – Graphical Visualization

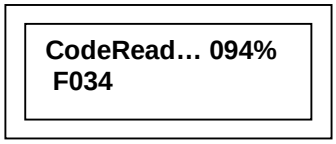


Figure 72 – Normal Visualization

5) Rotate the focus adjustment screw to reach the desired focus position. The display is refreshed with the new values;
6) Press the ▲ (up arrow) key to exit the Test Mode;
7) Use the ▲ (up arrow) and ▼ (down arrow) key to select the "Exit" item, then press the ENT (enter) key to confirm. The scanner exits the Main Menu and returns to its current operating mode.

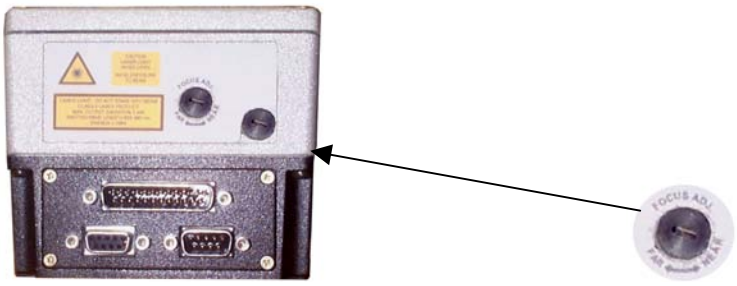


Figure 73 - Focus Adjustment Screw

NOTE

The reader display shows the focus position only when the laser beam is activated.

It is possible to visualize the focus position and the reading percentage on the terminal tool provided by the Genius™ configuration program (see Genius™ Help On-Line for details).

2.8.2 Internal Net

The Internal Net submenu has to be used when configuring the DS6300 scanner within a master/slave network.
It allows defining the scanner function (slave/master) within the network and, if configured as Slave, its address.
To enter the Internal Net submenu and configure the scanner follow the given procedure:

1) Press and hold both the ▲ (up arrow) and ▼ (down arrow) keys for about 2 seconds to enter the Main menu;
2) Use the ▲ (up arrow) or ▼ (down arrow) key to select the “Internal Net” item, then press the ENT (enter) key to confirm;
3) Use the ▲ (up arrow) or ▼ (down arrow) key to select the “LonWAddrSel”” item, then press the ENT (enter) key to confirm;
4) Use the ▲ (up arrow) or ▼ (down arrow) key to select your scanner function among “Master”, “Slave n”, “Disabled”; then, press the ENT (enter) key to confirm;
5) Use the ▲ (up arrow) or ▼ (down arrow) key to select the “Exit” item, then press the ENT (enter) key to confirm. Repeat this step again to exit the Main Menu and return to the scanner current operating mode.

2.8.3 Test Mode

Test Mode is particularly advised during the installation phase, since it causes the reader to be continuously activated allowing to verify its reading features and its reading position with respect to the barcode.
To enter the Test Mode submenu and configure the scanner follow the given procedure:

1) Press and hold both the ▲ (up arrow) and ▼ (down arrow) keys for about 2 seconds to enter the Main menu.
2) Use the ▲ (up arrow) or ▼ (down arrow) key to select the “Test Mode” item, then press the ENT (enter) key to confirm. The reader enters Test Mode.
3) Press the ▲ (up arrow) key to exit the Test Mode.
4) Use the ▲ (up arrow) and ▼ (down arrow) key to select the “Exit” item, then press the ENT (enter) key to confirm. The scanner exits the Main Menu and returns to its current operating mode.

3 SOFTWARE CONFIGURATION

3.1 GENIUS™ INSTALLATION

Genius™ is a new Datalogic scanner configuration tool providing several important advantages:

- Wizard approach for low skilled users;
- Multi-language version;
- Defined configuration directly stored in the reader;
- Communication protocol independent from the physical interface allowing to consider the reader as a remote object to be configured and monitored.

To install Genius™, proceed as follows:

1) Turn on the PC that will be used for configuration and launch Windows 95/98 or NT;
2) Insert the Genius™ CD-ROM;
3) Wait for the CD autorunning and follow the installation procedure.

3.2 GUIDE TO RAPID CONFIGURATION

3.2.1 Wizard for Quick Reader Setup

After installing the Genius™ software program (see par. 3.1) the following window appears asking the user to choose the desired configuration level:

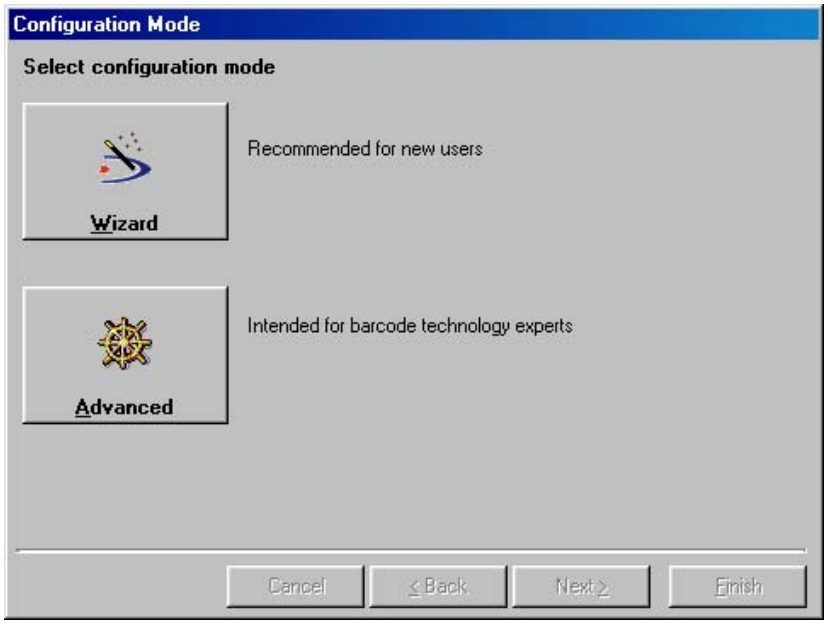


Figure 74 - Genius™ Wizard Opening Window

The Wizard option is advised to low skilled users, since it shows a step by step scanner configuration. The parameters to be defined are the following:

- Barcode selection and definition;
- Operating mode selection and definition (see sub-paragraphs for further details);
- Digital Inputs/Outputs configuration;
- Hardware interface selection;
- Output data format configuration.

After defining the parameter values the following window appears allowing to complete the reader configuration as follows:

- Saving the configuration to disk;
- Switching to Advanced mode;
- Sending the configuration to the scanner.

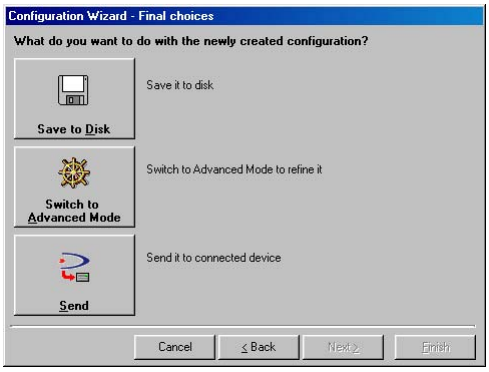


Figure 75 - Genius™ Wizard Closing Window

Test Operating Mode

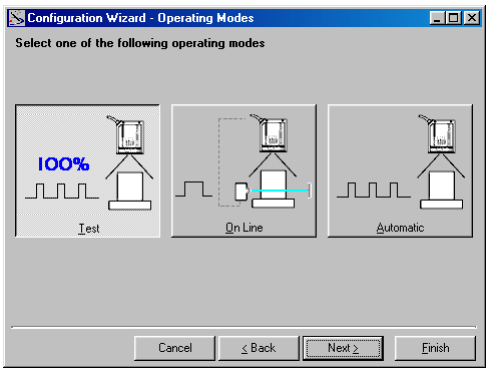


Figure 76 - Test Mode Selection

This operating mode causes the reader to be continuously activated allowing to verify its reading features and its reading position with respect to the barcode. For this reason, it is particularly advised during the installation phase of the reader.
After 100 scan, the values relative to an internal counter and the decoded code are displayed and transmitted on the serial interface. The counter reports the percentage of good reads of the label.

On Line Operating Mode

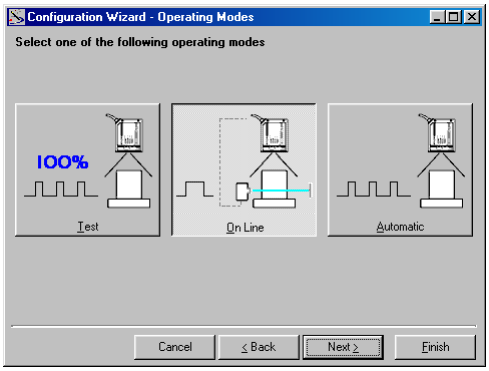


Figure 77 - On Line Mode Selection

This operating mode causes the reader to be connected to an external Presence Sensor using EXT TRIG+ and EXT TRIG- inputs.
During the active phase of the presence sensor, the DS6300 reader tries to acquire and correctly decode the code.
In case the decoding phase is successful, the barcode characters are transmitted on the serial interface. Otherwise, a no read message is sent.

Automatic Operating Mode

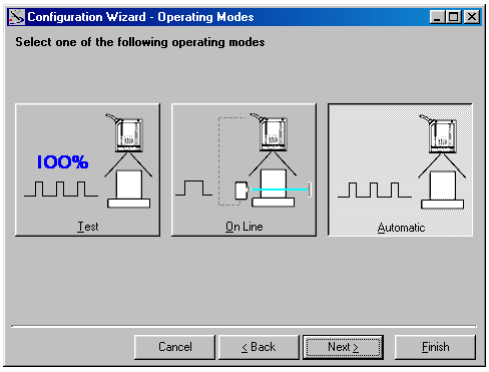


Figure 78 - Automatic Mode Selection

This operating mode does not require the connection to an external Presence Sensor.
When working in this mode the reader is continuously scanning, while the reading phase is activated each time a barcode enters the reader reading zone. The reader stops reading after an N number of scans without a code.
Barcode characters are transmitted on the serial interface. In case of a failed reading phase no message is sent to the host computer.

3.2.2 Network Wizard

The Network Wizard allows defining the model and number of slave scanners of the Lonworks network.

Since this tool is available only for a DS6300 Master, it is first necessary to configure your scanner as Master, as shown in the figure below:

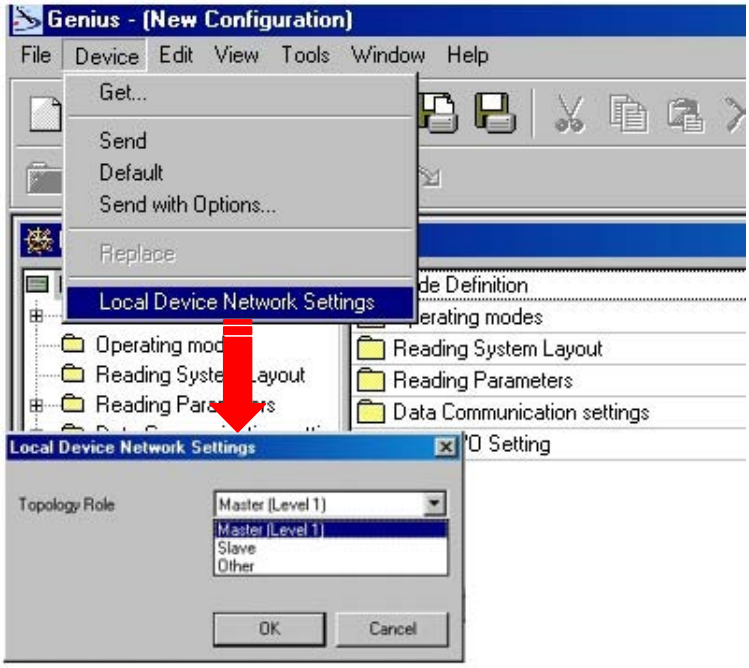


Figure 79 – Local Device Network Settings

Then, it is possible to define the network settings by starting the network wizard:

1) if not, activate the cluster configuration by clicking on the icon available on the Toolbar. Then, the “Devices” area will appear next to the Parameter Explorer window;

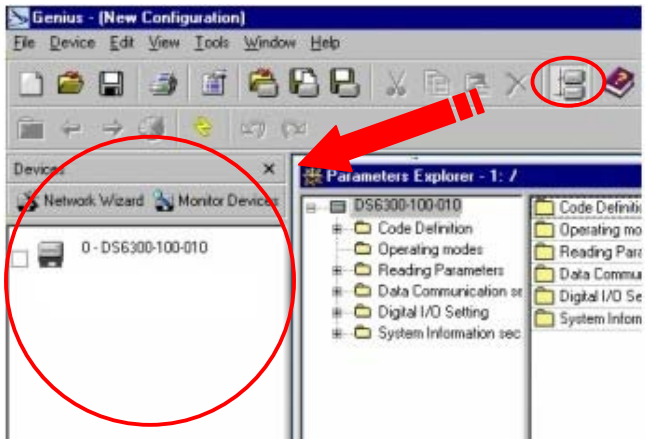


Figure 80 – Cluster Configuration

2) Click on the Network Wizard button available in the “Devices” area to open the Network Wizard dialog box:

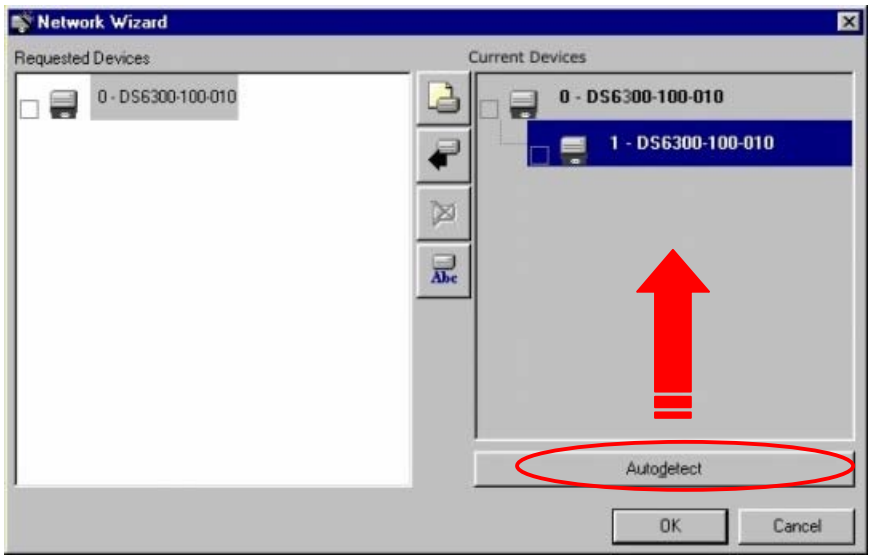


Figure 81 – Network Wizard

a. if the slave scanners have been already configured and wired to the network, click on the Autodetect button to start a polling procedure of the current network. All found slave scanners will be represented in the “Current Devices” area. Then, select the desired slave scanner from the “Current Devices” area and click on the  icon (or drag drop) to transfer it in the “Requested Devices” area where customizing your network.

b. if the slave scanners have **not** been configured and wired to the network, click on the  icon to add a new device defining its address and model. The added slave scanner will be then displayed in the “Current Devices” area.

3) If desired, select the transferred/added slave scanner within the “Requested Devices” area and click on the  icon to customize the scanner label.

4) Once your network has been customized, close the network wizard. Before closure, the program will show a dialog box asking whether sending the new configuration to the Master. Choose the “Yes” option to start this procedure.

3.3 ADVANCED GENIUS™ CONFIGURATION

The ADVANCED selection available when starting the Genius™ program is addressed to expert users being able to complete a detailed scanner configuration. By choosing this option it is possible either to start a new scanner configuration or to open and modify an old one. The desired parameters can be defined in the following window, similar to the MS Explorer:

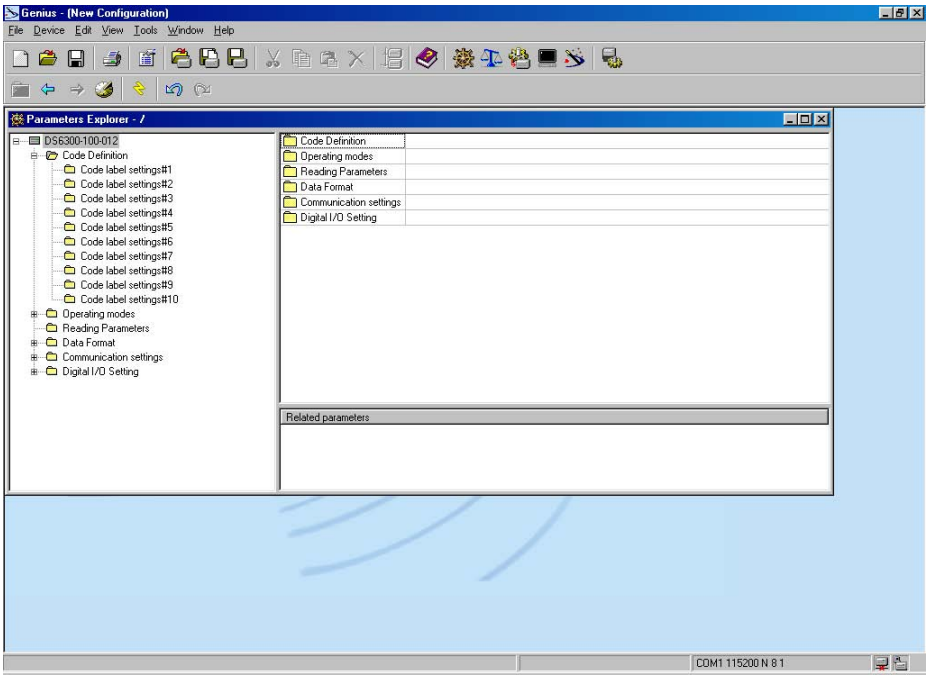


Figure 82 - Genius™ Parameter Explorer Window

The procedure for setting the scanner parameters is supported by an help on-line, which is displayed in an HTML browser.
It can be selected from the Configuration Help option available in the Help menu. In addition, a context-sensitive help can be enabled by pressing the <F1> key after selecting the desired parameter.

3.4 PARAMETER DEFAULT VALUES

The following table contains the list of the factory default settings for the DS6300.
Genius™ also allows checking the parameter default values by selecting the "Compare parameters" option available in the Tools menu and comparing the current scanner configuration to the default one.

Parameter	Default Setting
Code Definition	
Code Combination	Single Label
No read Message	Global No Read Message
No Read String	<CAN>
Code Label Settings #1	
Code Symbology	Interleaved 2 of 5
Label Length	8
Min Code Position	0
Max Code Position	255
Check Digit	Disabled (unchecked)
Decoding Severity	3
Pattern Match String	Empty
Code Label Settings #2	
Code Symbology	Code 39
Label Length	Variable
Minimum Label Length	1
Maximum Label Length	48
Min Code Position	0
Max Code Position	255
Check Digit	Disabled (unchecked)
Decoding Severity	3
Pattern Match String	Empty
Operating Modes	
Operating Mode Selection	On Line
On Line Options	On Line 1 Input
Start Input Number	1
Start Input Active Level	Active Closed
Reading Phase Timeout	Disabled
Reading System Layout	
Device Assignment	Alone
Reading Parameters	
Beam Shutter	Disabled
Overflow Ratio	7
Reading Mode	Reconstruction
Reconstruction Parameters	
Max Scan Gap	5
Max Stacked Codes	1
Scan Line Amplitude	
Amplitude Settings Enable	Disabled

Parameter	Default Setting
Data Communication Settings	
Host Application Protocol Type	Standard
Data Format	
Header TX Start	With data
Termination After No Read Message	Enabled
Message Tx Trigger Selection	On Decoding
Parameters	
Header String	<STX>
Code Direction Identifier Enable	Disabled
Code Identifier	Disabled
Termination String	<CR><LF>
Data Packet Separators	<CR><LF>
Code Field Length Setting	Variable Length
Main Serial Port	
Data Tx	Enabled (checked)
Parameters	
Main Port Communication Mode	Standard
Main Port Electrical Interface	RS232
Handshake	None
Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits	1
Auxiliary Serial Port	
Data Tx	Enabled (checked)
Pass Through	Disabled (unchecked)
Parameters	
Baud Rate	115200
Parity	None
Data Bits	8
Stop Bits	1
Digital I/O Setting	
Digital Input Lines Setting	
Debouncing For Input 1, 3 and 4	5ms
Debouncing For Input 2	500 µs
Input 1 Active Level Overridden by Op. Mode	Active Closed
Input 2 Active Level Overridden by Op. Mode	Active Closed
Input 3 Active Level Overridden by Op. Mode	Active Closed
Input 4 Active Level Overridden by Op. Mode	Active Closed

Parameter	Default Setting
Output 1	
Line State	Normally Open
Activation Event	Complete Read
Alternative Activation Event	Multiple Read
Deactivation Event	Timeout
Alternative Deactivation Event	None
Deactivation Timeout (ms)	50
Output 2	
Line State	Normally Open
Activation Event	No Read
Alternative Activation Event	Partial Read
Deactivation Event	Timeout
Alternative Deactivation Event	None
Deactivation Timeout (ms)	50
Output 3	
Line State	Normally Open
Activation Event	None
Alternative Activation Event	None
Deactivation Event	None
Alternative Deactivation Event	None
Diagnostics	Disabled (unchecked)
Statistics	Disabled (unchecked)

4 READING FEATURES

4.1 ADVANCED CODE RECONSTRUCTION (ACR™ 3)

The traditional way of barcode reading could be called “Linear Reading”. In this case, the laser beam crosses the barcode symbol from its beginning to its end as shown in the following figure:

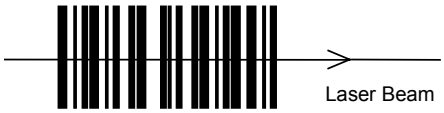


Figure 83 – Linear Reading

In Advanced Code Reconstruction mode it is no longer necessary for the laser beam to cross the label from the start to the end. With just a set of partial scans on the label (obtained using the motion of the label itself), the DS6300 is able to “reconstruct” the barcode. A typical set of partial scans is shown in the figure below:

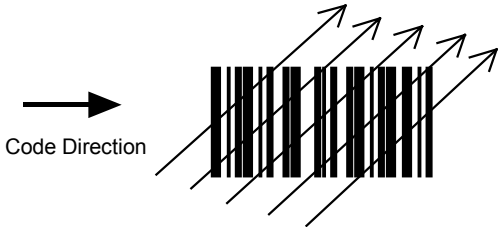


Figure 84 – Partial Scans

None of the partial scans contains the whole label. The decoder aligns each partial scan correctly and combines them in order to obtain the entire code.

The alignment is performed by calculating the time difference from one partial scan to another using a reference code element.

4.1.1 Tilt Angle for Advanced Code Reconstruction

The most important parameter in Advanced Code Reconstruction is the value of the maximum tilt angle (α maximum) under which the code reconstruction process is still possible.

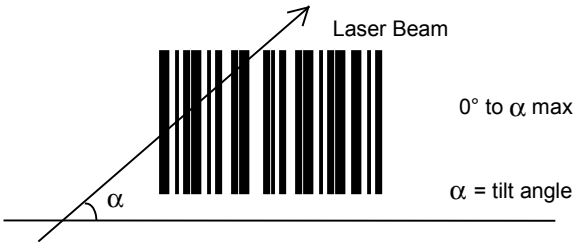


Figure 85 – Tilt Angle

The formulas to calculate α maximum depend on various parameters such as: label height, number of scans per second, code motion speed, etc. To obtain α maximum for your application, please contact your Datalogic representative.
You must remember that the decoder will be able to read the label with a tilt angle between + α max and - α max as shown in the following figure:

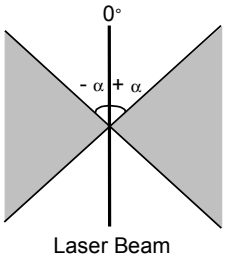


Figure 86 – Reading Zones with α Max

4.2 READING DIAGRAMS

4.2.1 DS6300 Standard Model

DS6300-100-0XX - Resolution: 0.20 mm/8 mils

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

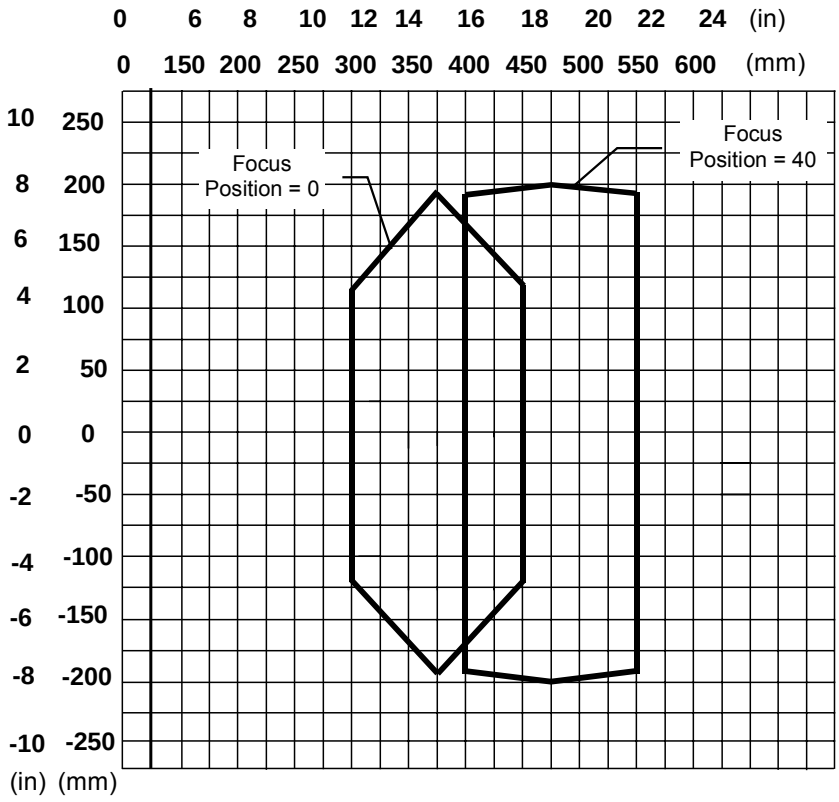


Figure 87 – Standard Model 0.20 mm / 8 mils Reading Diagram

Note: (0,0) is the center of the laser beam output window.

DS6300-100-0XX - Resolution: 0.30 mm/12 mils

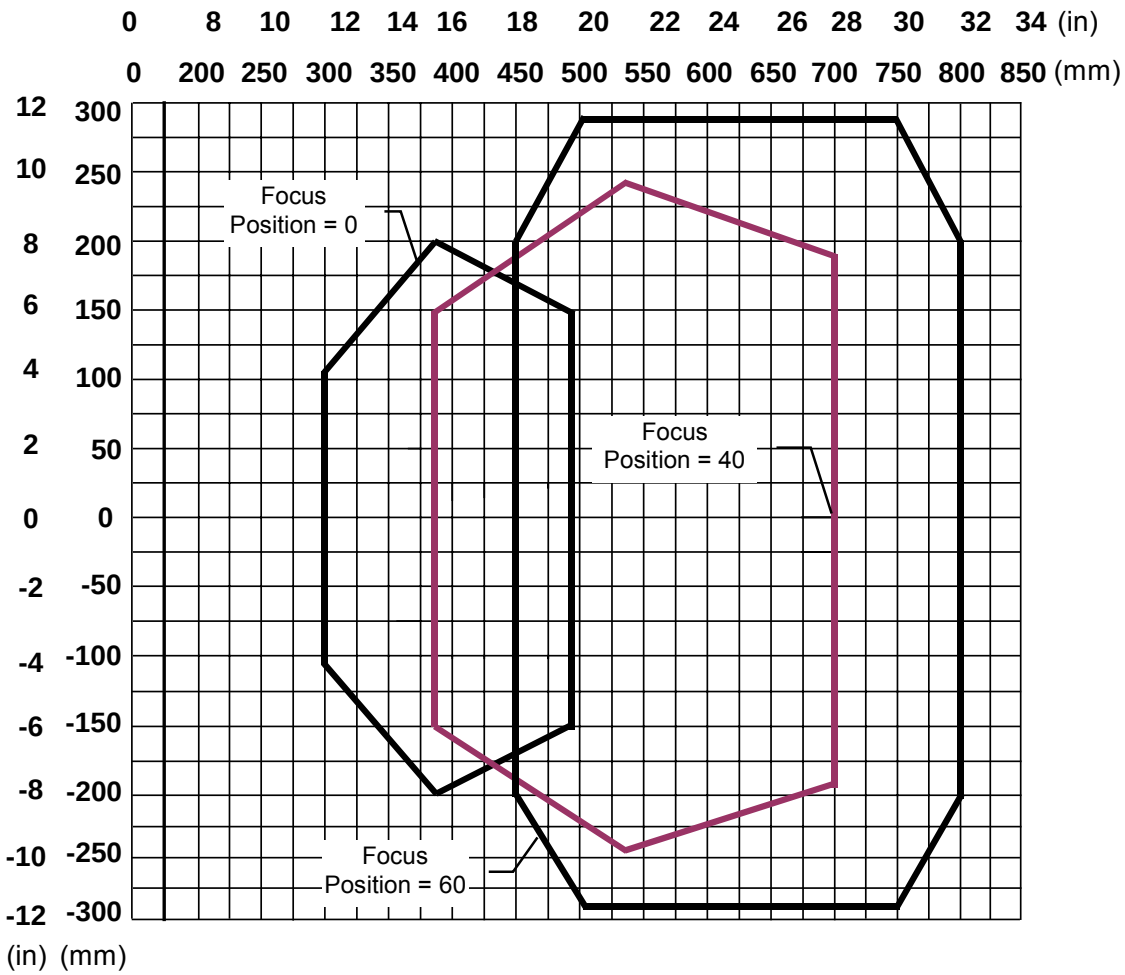


Figure 88 - Standard Model 0.30 mm / 12 mils Reading Diagram

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

Note: (0,0) is the center of the laser beam output window.

DS6300-100-0XX - Resolution: 0.50 mm/20 mils

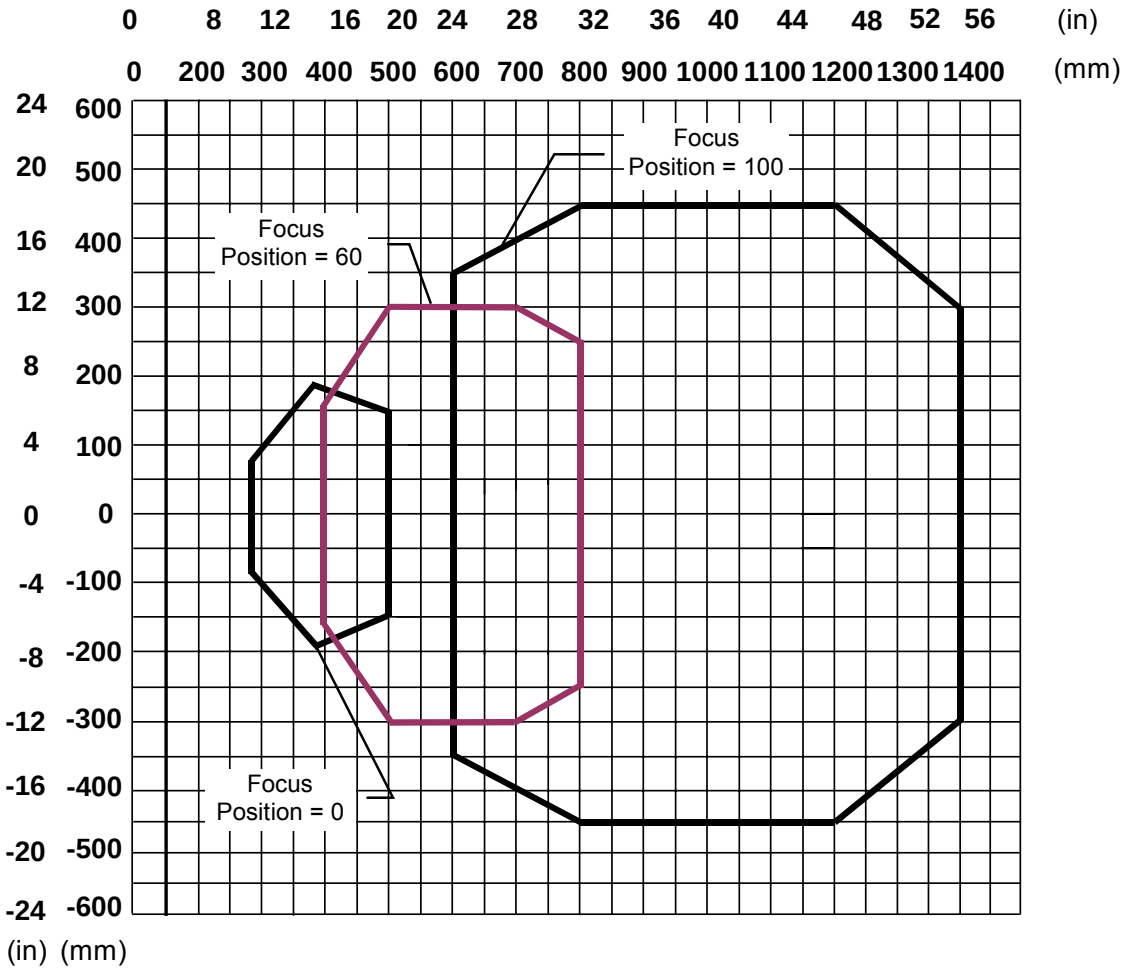


Figure 89 - Standard Model 0.50 mm / 20 mils Reading Diagram

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

Note: (0,0) is the center of the laser beam output window.

4.2.2 DS6300 Oscillating Mirror Model

DS6300-105-0XX (oscillating mirror) - Resolution: 0.20 mm/8 mils

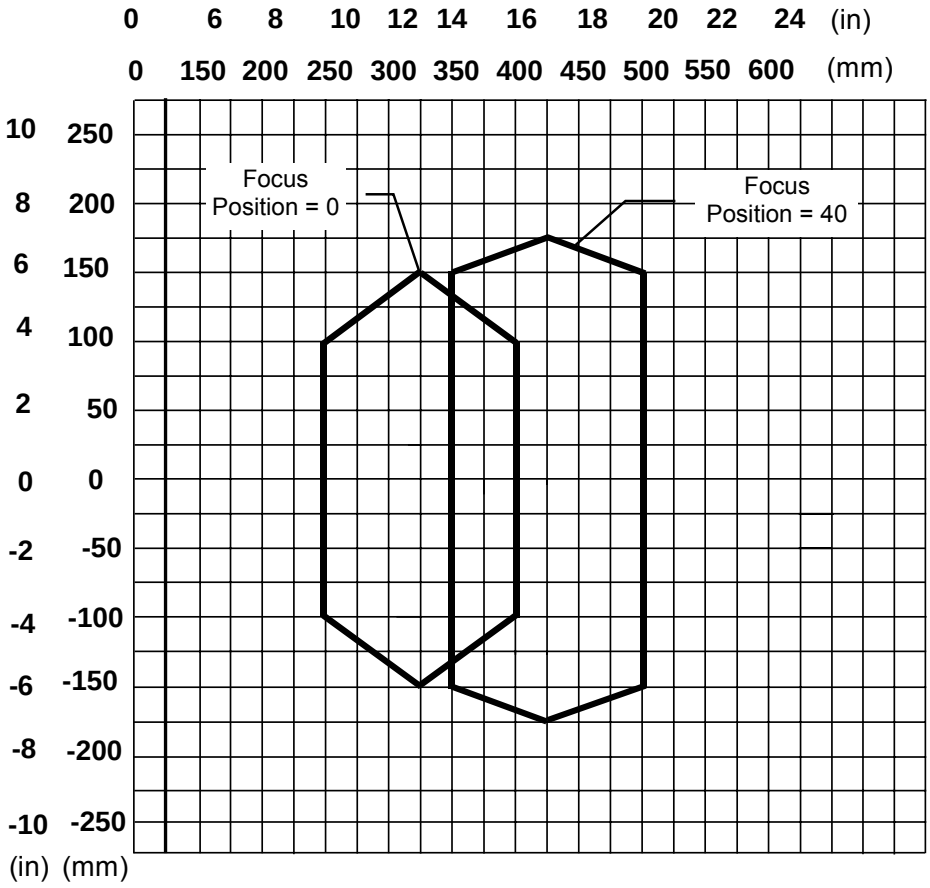


Figure 90 – Oscillating Mirror Model 0.20 mm / 8 mils Reading Diagram

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

Note: (0,0) is the center of the laser beam output window.

DS6300-105-0XX (oscillating mirror) - Resolution: 0.30 mm/12 mils

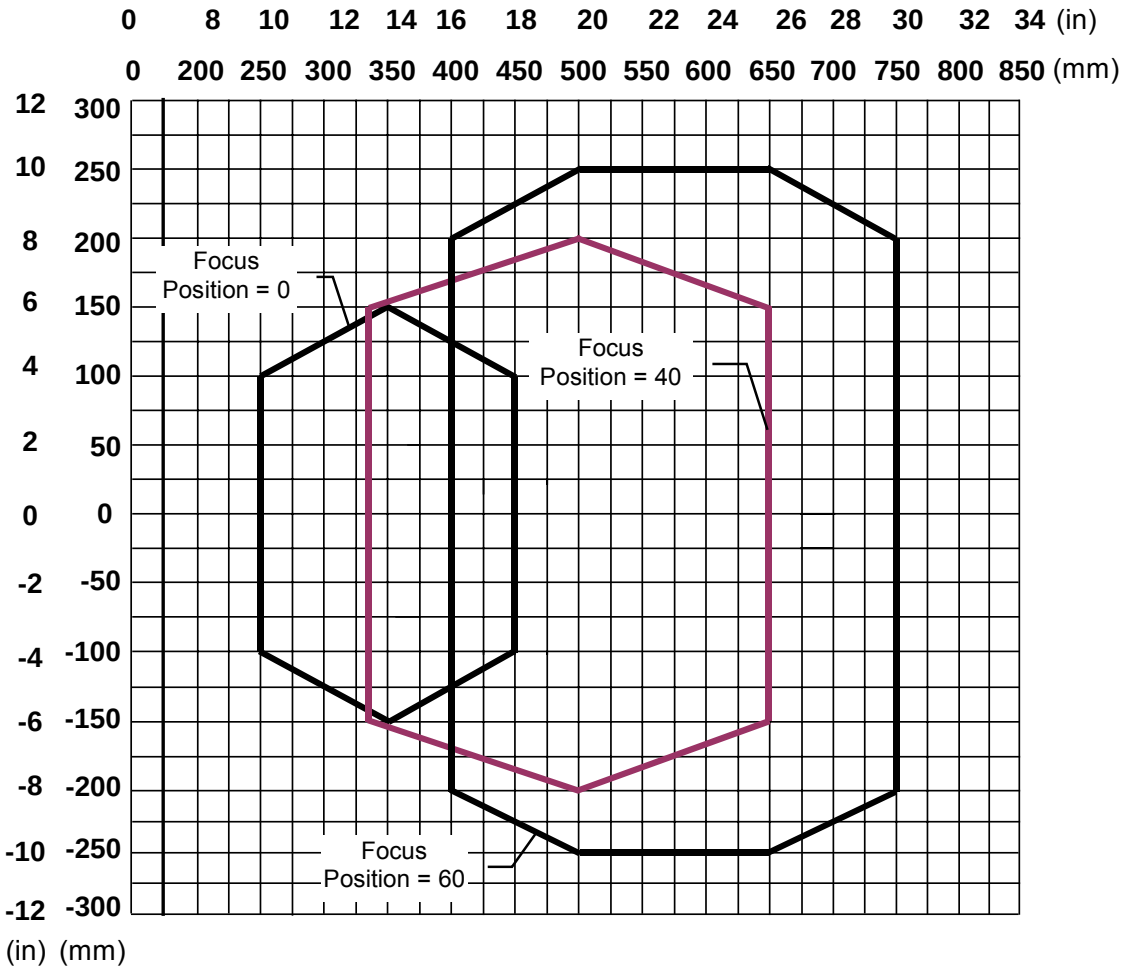


Figure 91 - Oscillating Mirror Model 0.30 mm / 12 mils Reading Diagram

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

Note: (0,0) is the center of the laser beam output window.

DS6300-105-0XX (oscillating mirror) - Resolution: 0.50 mm/20 mils

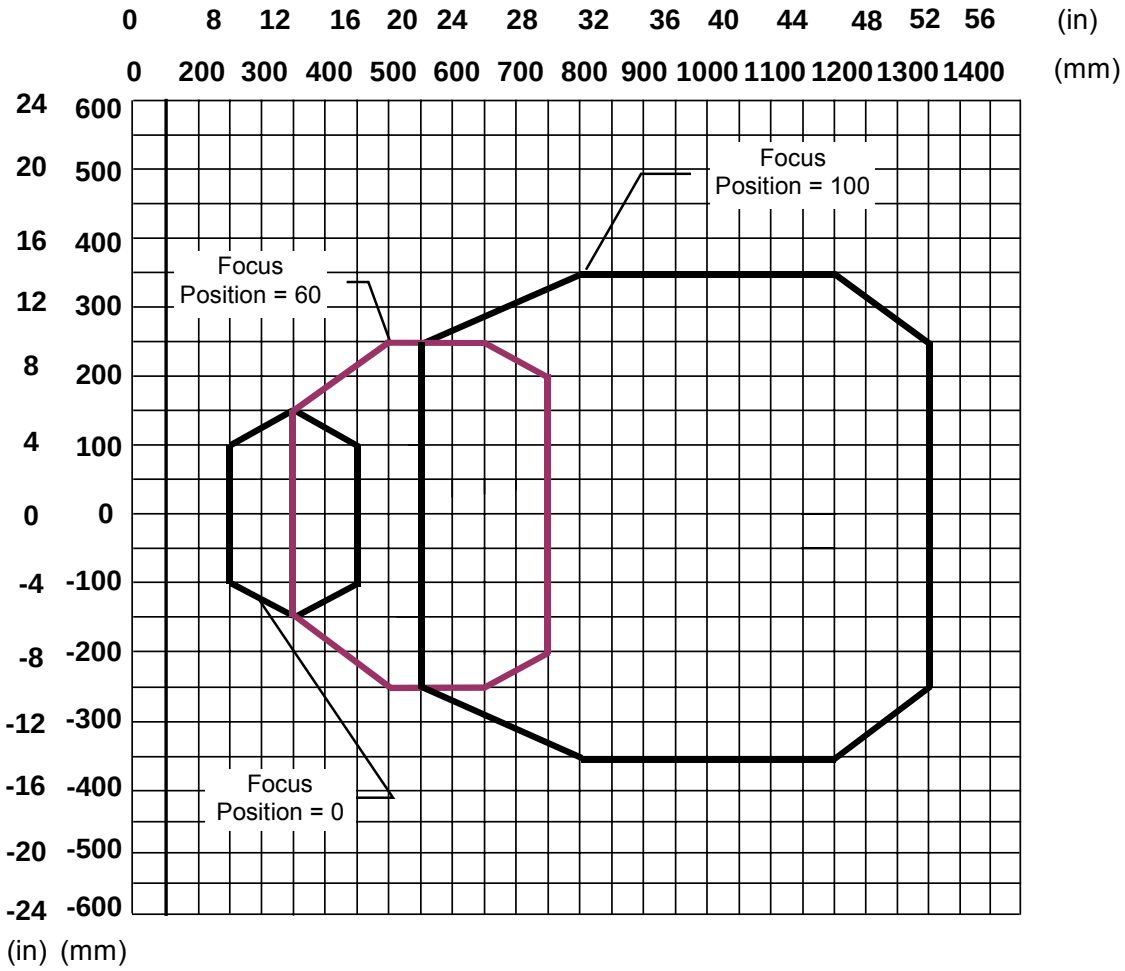


Figure 92 - Oscillating Mirror Model 0.50 mm / 20 mils Reading Diagram

CONDITIONS
Code = Interleaved 2/5 or Code 39
PCS = 0.90
Pitch angle = 0°
Skew angle = 10° - 20°
Tilt angle = 0°

Note: (0,0) is the center of the laser beam output window.

4.2.3 DS6300 with GFX-60

DS6300 with GFX-60 - Resolution: 0.20 mm/8 mils

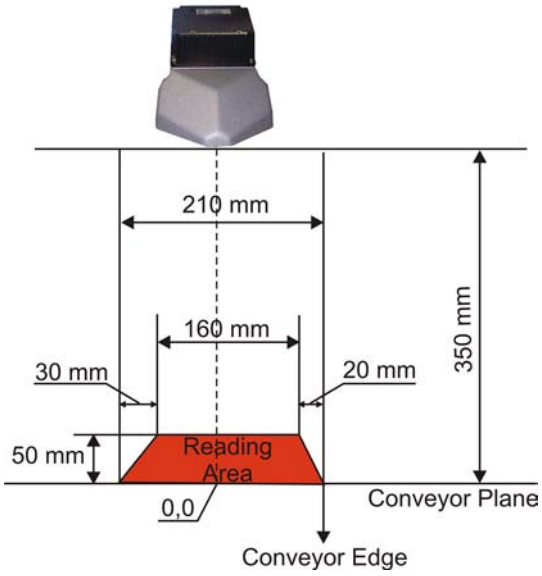


Figure 93 – GFX-60 0.20 mm / 8 mils Reading Diagram

Note: 0 value on the X axis is measured from the nose of the GFX-60
0 value on the Y axis is measured from the conveyor plane
focus position = 0

DS6XXX with GFX-60 - Resolution: 0.30 mm/12 mils

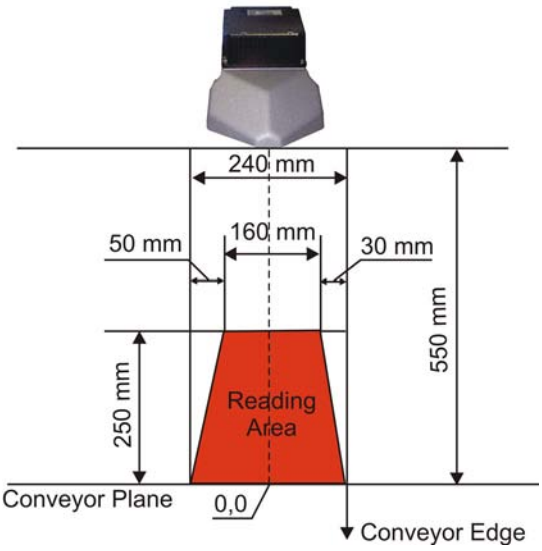


Figure 94 - GFX-60 0.30 mm / 12 mils Reading Diagram

Note: 0 value on the X axis is measured from the nose of the GFX-60
0 value on the Y axis is measured from the conveyor plane
focus position = 40

DS6XXX with GFX-60 - Resolution: 0.50 mm/20 mils

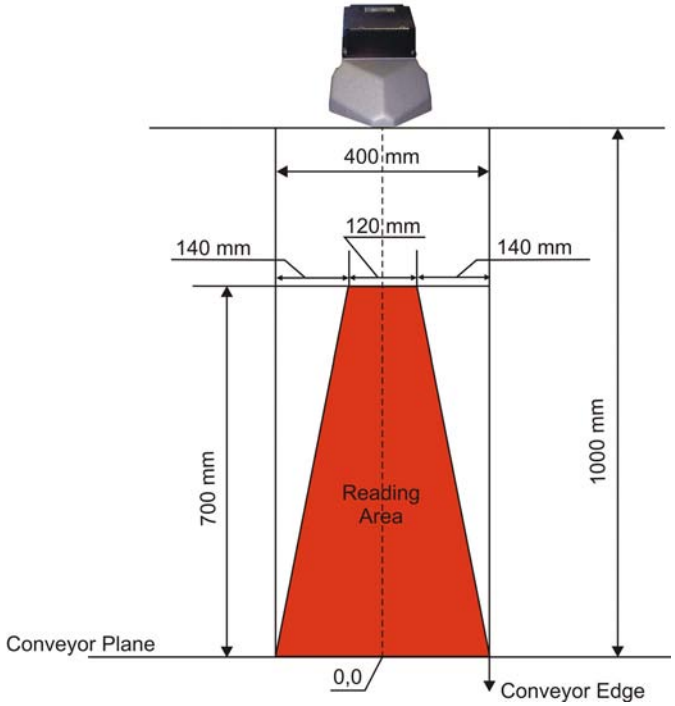


Figure 95 - GFX-60 0.50 mm / 20 mils Reading Diagram

Note: 0 value on the X axis is measured from the nose of the GFX-60
0 value on the Y axis is measured from the conveyor plane
focus position = 100

DS6XXX with GFX-60 - Resolution: 1.00 mm/40 mils

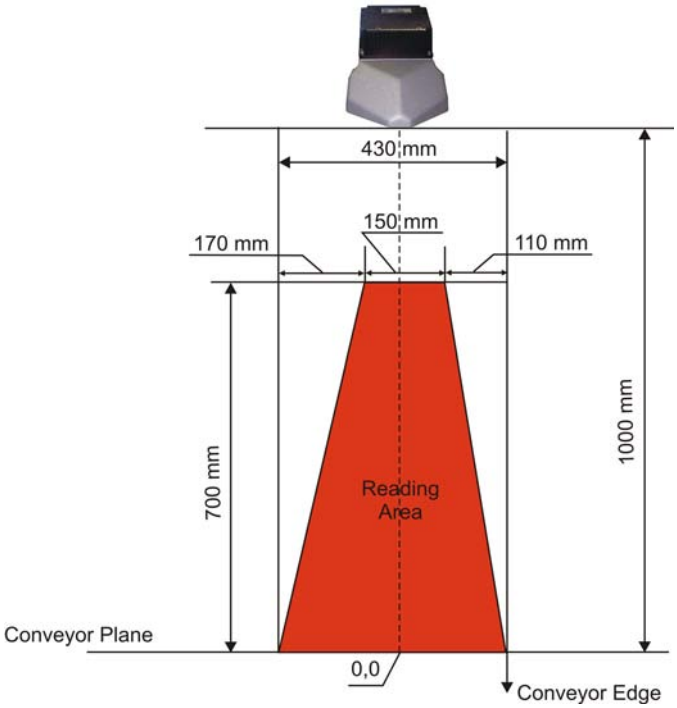


Figure 96 - GFX-60 1.00 mm / 40 mils Reading Diagram

Note: 0 value on the X axis is measured from the nose of the GFX-60
0 value on the Y axis is measured from the conveyor plane
focus position = 100

5 MAINTENANCE

5.1 CLEANING

Clean the laser beam output window (Figure 1, 7) periodically for correct operation of the scanner.

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

Repeat the operation frequently in particularly dirty environments.

Use soft material and alcohol to clean the window and avoid any abrasive substances.

WARNING

Clean the window of the DS6300 when the scanner is turned off or at least when the laser beam is not active.

6 TROUBLESHOOTING

NOTE

*Before contacting your local Datalogic office or Datalogic Partner or ARC, it is suggested to save the device configuration to a *.ddc file by means of the Genius™ software configuration program and check the device exact model and serial number.*

TROUBLESHOOTING GUIDE	
Problem	**Suggestion**
Power On: the “Power On” LED is not lit.	• Is power connected? • If using a power adapter (like PG6000), is it connected to wall outlet? • If using rail power, does rail have power? • If using C-BOX 100, does it have power (check switch and LED)? Check if you are referring to the 25/26-pin connector or to the C-BOX 100 spring clamp connectors. • Measure voltage either at pin 13 and pin 25 (for 25/26-pin connector) or at spring clamp 1 and (for C-BOX 100).
On Line Mode: the Master’s “Phase On” LED is not lit (when external trigger activates).	• Check carefully if you are referring to the 25/26-pin connector or to the C-BOX 100 spring clamp connectors. • Is sensor connected to EXT TRIG input? • Is power supplied to photo sensor? • Is power supplied to one out of the two EXT TRIG (NPN output)? • Is one out of the two EXT TRIG grounded (PNP output)? • Are the photo sensor LEDs (if any) working correctly? • Is the sensor/reflector system aligned (if present)?
On Line Mode: the Master’s “Phase On” LED is correctly lit but nothing happens (no reading results).	• Is the software configuration consistent with the application condition (operating mode, etc..)? In the Genius™ software configuration program select the OPERATING MODES folder and check for related parameters.
Serial On Line Mode: the reader is not triggered (no reading results).	• In the Genius™ program select the OPERATING MODE folder and check if serial on line is enabled as “On Line options” parameter value. • Are the Start-Stop string correctly assigned? • Is the serial trigger source correctly connected and configured)

TROUBLESHOOTING GUIDE	
Problem	**Suggestion**
On Line Mode and Serial On Line Mode: the reader does not respond correctly to the expected external signal end.	• In the Genius™ software configuration program select the OPERATING MODES folder and check the "Reading Phase Timeout" parameterization.

Reading:
it is not possible to read the target barcode (always returns No Read)
	• Check synchronization of reading pulse with object to read.
	• Is the scan line correctly positioned?
	• Place barcode in the center of scan line and run TEST MODE (selectable by Genius™ as Operating Modes).
	If you still have troubles, check the following:
	  • Is the reading distance within that allowed (see reading diagrams)?
	  • Is the Tilt angle too big?
	  • Is the Skew angle less than 10° (direct reflection)?
	  • Choose the CODE tab and enable different code types (except Pharmacode). LENGTH = Variable.
	  • Is the barcode quality sufficient?
	• If you had no success, try to perform the test using the BARCODE TEST CHART included with the product.

Communication: the device is not transmitting anything to the host.	• Is serial cable connected? • Is correct wiring respected? • If using MAIN RS232 or RS485 interface, is the reference ground connected to proper SGND Main Isolated (also referred to as GND_ISO)? Be careful that it is not completely different from GND power ground. • If using C-BOX 100, be sure the RS485 termination switch is OFF positioned. • Are serial host settings equivalent to serial device setting?
Communication: data do not appear on the terminal.	• In the Genius™ program enable the DATA COMMUNICATION SETTINGS/MAIN-AUXILIARY PORT\DATA TX parameter.
Communication: data transferred to the host are incorrect, corrupted or incomplete.	• In the Genius™ program select the DATA COMMUNICATION SETTINGS/DATA FORMAT folder and check for HEADER, TERMINATOR, SEPARATOR and FILL CHAR values. • Check the CODE FIELD LENGTH value, too. • Are the COM port parameters correctly assigned?

TROUBLESHOOTING GUIDE	
Problem	**Suggestion**
How do I obtain my units' serial numbers?	• The device serial number is printed on a label that is affixed above the connector panel of the reader. • The serial number is also displayed when connecting the device through the Genius™ program. • Serial numbers consist of 9 characters: one letter, 2 numbers, another letter followed by 5 numbers.

7 TECHNICAL FEATURES

ELECTRICAL FEATURES (see note 1)		
Supply voltage Power consumption	12 to 30 Vdc 15 W typical 20 W Max. (including startup current)	
Communication Interfaces	**Main (isolated)**	**Baud Rate**
	RS232	1200 to 115200
	RS485 full-duplex	1200 to 115200
	RS485 half-duplex	1200 to 115200
	20 mA Current Loop (with INT-60 accessory)	19200
	Auxiliary	
	RS232	1200 to 115200
	Other	
	Lonworks	1,25 Mb/s
	Ethernet	10 or 100 Mb/s
	DeviceNet	125 or 250 Kb/s
	Profibus	12 Mb/s
Inputs (optocoupled NPN or PNP)	External Trigger 1 3 auxiliary digital inputs	
Outputs (optocoupled)	3 software programmable digital outputs	
OPTICAL FEATURES (see note 1)		
Light receiver Wavelength Safety class Laser control	Avalanche photodiode 630 to 680 nm Class 2 - EN60825-1; Class II - CDRH Security system to turn laser off in case of motor slow down	
READING FEATURES		
Scan rate	600-1200 scans/s	
Maximum resolution Max. reading distance Max. reading width Max. depth of field Aperture angle	(see reading diagrams)	
USER INTERFACE		
LCD Display	2 lines by 16 characters LCD	
Keypad	3 keys	
LED indicators	Power ON (red color) Phase ON (yellow color) TX data (green color)	

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

SOFTWARE FEATURES		
Readable code families • Interleaved 2/5 • Code 39 standard • Codabar • EAN/UPC • Code 128 • EAN128 • Code 93 (standard and full ASCII)		
Code selection	Up to 10 codes during one reading phase	
Headers and Terminators	Transmitted messages can be personalized using up to 128-byte headers and 128-byte terminators	
Operating modes	On Line Automatic Test	
Configuration modes	Genius™ utility program	
Parameter storage	Non-volatile internal FLASH	
ENVIRONMENTAL FEATURES		
Operating temperature Storage temperature Humidity	0° to +40 °C (+32° to +104 °F) -20° to +70 °C (-4° to +158 °F) 90% non condensing	
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 30 G; 11 ms; 3 shocks on each axis	
Protection class	IP64*	
PHYSICAL FEATURES	**Standard Models**	**Oscillating Mirror Models**
Mechanical dimensions	110 x 113 x 99 mm (4.33 x 4.45 x 3.9 in)	113 x 180 x 104.5 mm (4.45 x 7.08 x 4.11 in)
Weight	1.5 kg. (3.3 lb)	2.0 kg. (4.4 lb)

* IP50 grade for standard Ethernet versions.

GLOSSARY

Step-a-Head™

Step-a-Head™ makes it possible to rotate the reader head and the decoder base independently from each other. As a result of the Step-a-Head™, the DS6300 can always be installed in the ideal position. It is possible to change the orientation of the connector panel while the laser window remains in the desired position.

ACR™ 3

Each version of the base has the powerful code reconstruction technology (ACR™ 3). The new third generation ACR considerably increases the code reconstruction reading capability in the case of damaged or very tilted barcodes.

Aperture

Term used on the required CDRH warning labels to describe the laser exit window.

Barcode

A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a barcode symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format.

Barcode Label

A label that carries a barcode and can be affixed to an article.

Baud Rate

A unit used to measure communications speed or data transfer rate.

CDRH (Center for Devices and Radiological Health)

This organization (a service of the Food and Drug Administration) is responsible for the safety regulations governing acceptable limitations on electronic radiation from laser devices. Datalogic devices are in compliance with the CDRH regulations.

Code Positioning

Variation in code placement that affects the ability of a scanner to read a code. The terms Pitch, Skew, and Tilt deal with the angular variations of code positioning in the X, Y and Z axes. See par. 2.5. Variations in code placement affect the pulse width and therefore the decoding of the code. Pulse width is defined as a change from the leading edge of a bar or space to the trailing edge of a bar or space over time. Pulse width is also referred to as a transition. Tilt, pitch, and skew impact the pulse width of the code.

EEPROM

Electrically Erasable Programmable Read-Only Memory. An on-board non-volatile memory chip.

Full Duplex

Simultaneous, two-way, independent transmission in both directions.

Half Duplex

Transmission in either direction, but not simultaneously.

Host
A computer that serves other terminals in a network, providing services such as network control, database access, special programs, supervisory programs, or programming languages.

Interface
A shared boundary defined by common physical interconnection characteristics, signal characteristics and meanings of interchanged signals.

LED (Light Emitting Diode)
A low power electronic device that can serve as a visible or near infrared light source when voltage is applied continuously or in pulses. It is commonly used as an indicator light and uses less power than an incandescent light bulb but more than a Liquid Crystal Display (LCD). LEDs have extremely long lifetimes when properly operated.

Multidrop Line
A single communications circuit that interconnects many stations, each of which contains terminal devices. See RS485.

Parameter
A value that you specify to a program. Typically parameters are set to configure a device to have particular operating characteristics.

Pitch
Rotation of a code pattern about the X-axis. The normal distance between center line or adjacent characters. See par. 2.5.

Position
The position of a scanner or light source in relation to the target of a receiving element.

Protocol
A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.

Resolution
The narrowest element dimension which can be distinguished by a particular reading device or printed with a particular device or method.

RS232
Interface between data terminal equipment and data communication equipment employing serial binary data interchange.

RS485
Interface that specifies the electrical characteristics of generators and receivers for use in balanced digital multipoint systems such as on a Multidrop line.

Scanner
A device that examines a printed pattern (barcode) and either passes the uninterpreted data to a decoder or decodes the data and passes it onto the Host system.

Serial Port
An I/O port used to connect a scanner to your computer, identifiable by a 9-pin or 25-pin connector.

Signal
An impulse or fluctuating electrical quantity (i.e.: a voltage or current) the variations of which represent changes in information.

Skew
Rotation about the Y-axis. Rotational deviation from correct horizontal and vertical orientation; may apply to single character, line or entire encoded item. See par. 2.5.

Symbol
A combination of characters including start/stop and checksum characters, as required, that form a complete scannable barcode.

Tilt
Rotation around the Z axis. Used to describe the position of the barcode with respect to the laser scan line. See par. 2.5.

Trigger Signal
A signal, typically provided by a photoelectric sensor or proximity switch, which informs the scanner of the presence of an object within its reading zone.

UPC
Acronym for Universal Product Code. The standard barcode type for retail food packaging in the United States.

Visible Laser Diode
A light source used in scanners to illuminate the barcode symbol. Generates visible red light at wavelengths between 630 and 680 nm.

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DS6300-XXX-XXX, Laser Scanner

and all its models
e tutti i suoi modelli
et tous ses modèles
und seine modelle
y todos sus modelos

sono conformi alle Direttive del Consiglio Europeo sottoelencate:
are in conformity with the requirements of the European Council Directives listed below:
sont conformes aux spécifications des Directives de l'Union Européenne ci-dessous:
der nachstehend angeführten Direktiven des Europäischen Rats:
cumple con los requisitos de las Directivas del Consejo Europeo, según la lista siguiente:

89/336/EEC EMC Directive e and et und y **92/31/EEC, 93/68/EEC** emendamenti successivi / further amendments / ses successifs amendements / späteren Abänderungen / succesivas enmiendas

73/23/EEC Low Voltage Directive

Basate sulle legislazioni degli Stati membri in relazione alla compatibilità elettromagnetica ed alla sicurezza dei prodotti.
On the approximation of the laws of Member States relating to electromagnetic compatibility and product safety.
Basée sur la législation des Etates membres relative à la compatibilité électromagnétique et à la sécurité des produits.
Über die Annäherung der Gesetze der Mitgliedsstaaten in bezug auf elektromagnetische Verträglichkeit und Produktsicherheit entsprechen.
Basado en la aproximación de las leyes de los Países Miembros respecto a la compatibilidad electromagnética y las Medidas de seguridad relativas al producto.

Questa dichiarazione è basata sulla conformità dei prodotti alle norme seguenti:
This declaration is based upon compliance of the products to the following standards:
Cette déclaration repose sur la conformité des produits aux normes suivantes:
Diese Erklärung basiert darauf, daß das Produkt den folgenden Normen entspricht:
Esta declaración se basa en el cumplimiento de los productos con la siguientes normas:

EN 55022, August 1994: LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT (ITE)

EN 61000-6-2, April 1999: ELECTROMAGNETIC COMPATIBILITY (EMC).
PART 6-2: GENERIC STANDARDS - IMMUNITY FOR INDUSTRIAL ENVIRONMENTS

EN 60950-1, December 2001: INFORMATION TECHNOLOGY EQUIPMENT – SAFETY –
PART 1: GENERAL REQUIREMENTS

EN 60825-1, June 1994: SAFETY OF LASER PRODUCTS –
Amendments A11 (1996), A2 (2001) PART 1: EQUIPMENT CLASSIFICATION, REQUIREMENTS AND USER'S GUIDE

Lippo di Calderara, 08/10/2003

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