



DP1000

Installation Manual

DATALOGIC  **DL**

Bar Code & More

DP1000

INSTALLATION MANUAL

We

DATALOGIC S.p.A.
Via Candini, 2
40012 - Lippo di Calderara
Bologna - Italy

declare under our sole responsibility that the product

DP1000-XXXX, Decoder and all its models

to which this declaration relates is in conformity with the following standards or other normative documents

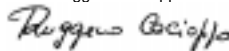
EN 55022, August 1994:	LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT (ITE)
EN 50082-2, March 1995:	ELECTROMAGNETIC COMPATIBILITY. GENERIC IMMUNITY STANDARD. PART 2: INDUSTRIAL ENVIRONMENT

Following the provision of the Directive(s):

89/336 CEE AND SUCCESSIVE AMENDMENTS, 92/31 CEE; 93/68 CEE

Lippo di Calderara, 01.29.1998

Ruggero Cacioppo



Quality Assurance Supervisor

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DP1000

General View

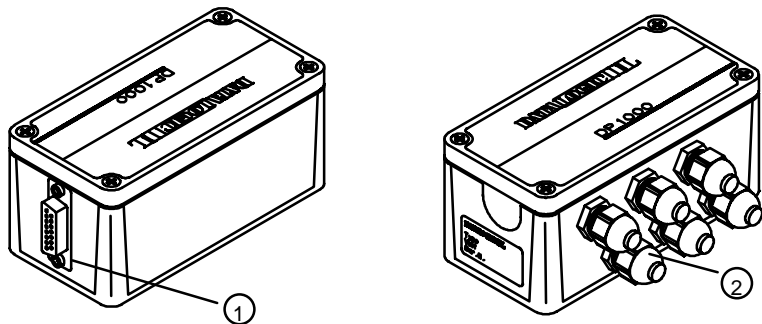


Figure A

- ① Scanner connector
- ② Glands panel

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1. INTRODUCTION

1.1 GENERAL FEATURES

The DP1000 is an industrial decoder for barcode scanners combining decoding functions and easy installation in an economic solution.

Standard Application Program

A Standard Application Program is factory-loaded onto the DP1000. This program controls barcode reading, serial port interfacing, data formatting and many other operating and control parameters.

It is completely user configurable from a host computer using the Winhost interface utility program provided on diskette with the decoder or using the Host Mode programming procedure, by ESC sequences via the serial interface.

There are four different programmable operating modes to suit various barcode reading system requirements. Included in these is a test mode to verify the reading features and exact positioning of the barcode reader without using external tools.

Custom Application Programs

If your requirements are not met by the Standard Application Program, Custom Application Programs can be developed by your local Datalogic distributor.

Some of the main features of this decoder are given below:

- completely configurable from host computer
- 3 output signals (open collector, open emitter)
- 2 serial communication interfaces
- reads all popular codes
- connections to a PLC using Siemens protocols
- configurable in different operating modes to suit the most various barcode reading system requirements
- test mode to verify the reading features and exact positioning of the scanner without the need of external tools

1.2 - Introduction

1.1.1 Available models

DP1000 is available in three models that are different for the type of main interface.

DP1000 - 1 X 00



0 = RS232 serial interface

1 = RS485 serial interface

2 = 20 mA C.L. serial interface

1.1.2 Communication interfaces

DP1000 is provided with two serial interfaces. The main interface type depends on the model (see paragraph 1.1.1). All models of the DP1000 support an RS232 auxiliary interface to be connected to an host computer or an external system.

1.1.3 Inputs

The DP1000 has a presence sensor input (PS) which can be used to signal the start of barcode reading. This is typical of On Line operating mode.

1.1.4 Outputs

Three outputs are present to signal if the barcode reading has been performed or not:

- NO READ output
- RIGHT output
- WRONG output

The NO READ output activates when a code to be read, signalled by the presence sensor, is not decoded.

The RIGHT output is used to signal the presence of a correct code, thus a good decode condition.

The WRONG output is used only in Verifier mode. This output activates when the code read does not correspond to the verifier code.

2. INSTALLATION

2.1 PACKAGE CONTENTS

Verify that the DP1000 decoder and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- 1) DP1000 decoder
- 2) Installation manual
- 3) Mounting screws and washers (4 ea.)
- 4) DP1000 communication and utility program disk

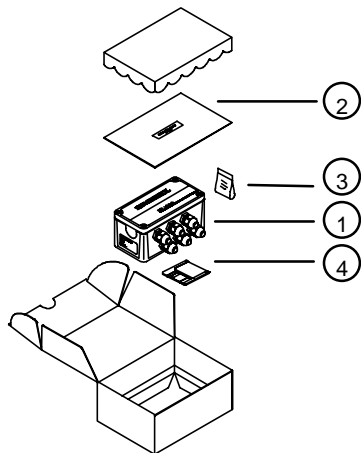


Figure 2.1 - DP1000 package contents

2.2 GUIDE TO INSTALLATION

The following can be used as a checklist to verify all of the steps for a complete installation of the DP1000 decoder.

- If the main serial interface is RS485, open the decoder to select the polled or non polled interface configuration (see the section "RS485 Interface" under paragraph 2.5.3)
- Provide correct system cabling according to the selected layout (paragraph 2.6) connecting all necessary signals (see paragraphs 2.3, 2.3.1 and all sub-paragraphs under 2.5)
- Consult the default configuration in the Winhost utility program to determine which parameters (if any) of the Standard Application program need to be changed for your application.
- Configure the software parameters from a host computer using the Winhost utility program or the Host Mode programming procedure. For more details about these configuration methods refer to the section "DP1000 Configuration" in the Help on Line of the Winhost utility program.

2.2 - Installation

NOTE

Fine tuning of the scanner position for barcode reading can be accomplished using the Test Mode. For further details refer to the section "Test Mode" in the Help On Line of the Winhost utility program.

The installation is now complete.

2.3 OPENING THE DEVICE

Before installing the DP1000 it may be necessary to open it to perform the following operations;

- 1) Select the polled or non polled interface configuration if the main serial interface is RS485. (Section" RS485 Interface" under paragraph 2.5.3)
- 2) Set the multiplexer address selection on the DIP switch if the main serial interface is RS485. (Section" RS485 Interface" under paragraph 2.5.3)
- 3) Change cable connections. (Paragraph 2.3.1)

WARNING

The decoder must be disconnected from the power supply during this operation.

DP1000

DATALOGIC

Refer to the following instructions and diagram when opening the decoder:

- 1) Turn the DP1000 off.
- 2) Unscrew the four screws as shown in figure 2.2 to open the decoder.

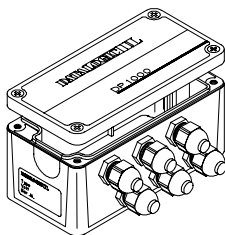


Figure 2.2 - Opening the DP1000

2.3.1 Connection and wiring procedure

The connection and wiring procedure for DP1000 is described as follows:

- 1) Turn the DP1000 off if it is connected to the power supply.
- 2) Open the DP1000 as described in paragraph 2.3.
- 3) Unscrew the glands and pass all the system cables through them in the device housing.

2.4 - Installation

4) To connect the power and input/output signals:

- Prepare the individual wires of the system cables by stripping the insulation back approximately 1 cm.
- Using a device such as a screwdriver, push down on the lever directly above the clamp (see figure 2.3).
- Insert the wire into the clamp and release the lever.

The wire will now be held in the spring clamp.

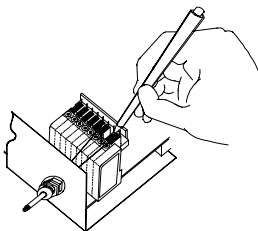


Figure 2.3 - System cable connection to the DP1000

The wiring can be solid or stranded but must meet the following specifications.

Positions 1-8:	24-16 AWG	0.2-1.5 mm ²
Positions 9-29:	26-20 AWG	0.14-0.5 mm ²

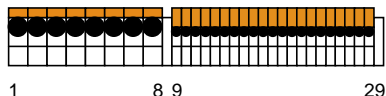


Figure 2.4 - DP1000 pinout

PIN	NAME	FUNCTION
1	VS	Operating Voltage
2	GND	Ground
3	VS	Operating Voltage
4	GND	Ground
5	VS	Operating Voltage
6	PS+	Presence Sensor Signal
7	PS-	Complementary of Presence Sensor Signal
8	GND	Ground
9	SHIELD	Reader Shield
10	TXA	Auxiliary Interface Output
11	RTSA	Auxiliary Handshake
12	RXA	Auxiliary Interface Input
13	CTSA	Auxiliary Handshake
14	SGND	Signal Ground
15	TX232/TX485+/CLOUT+	Main Interface Signals* **
16	RTS232/TX485-/CLOUT-	(see paragraph 2.5.3)
17	GND485	Ground485**

2.6 - Installation

PIN	NAME	FUNCTION
18	TX232/TX485+/CLOUT+	Main Interface Signals* **
19	RTS232/TX485-/CLOUT-	(see paragraph 2.5.3)
20	GND485	Ground485**
21	RX232/RX485+/CLIN+	Main Interface Signals*
22	CTS232/RX485-/CLIN-	(see paragraph 2.5.3)
23	SGND	Signal Ground
24	NOREAD+	No Read Output
25	NOREAD-	Complementary of No Read Output
26	RIGHT+	Right Read Output
27	RIGHT-	Complementary of Right Read Output
28	WRONG+	Wrong Read Output
29	WRONG-	Complementary of Wrong Read Output

* Pins 15, 16, 18, 19, 21 and 22 have different meanings depending on the DP1000 main interface type. For RS485 main interface model (see paragraph 1.1.1), follow the instructions in the section "RS485 Interface" under paragraph 2.5.3 to select the polled or non polled interface configuration.

** The signals on pins 15, 16 and 17 are repeated on pins 18, 19 and 20 to facilitate network connections in case of a multidrop line when the main serial interface is RS485 polled. In this way the network bus can enter and exit the DP1000 from different spring clamps but be physically connected together.

5) Close the DP1000 using the 4 cover screws.

2.4 MECHANICAL INSTALLATION

The figure below gives the overall dimensions of the decoder and may be used for its installation.

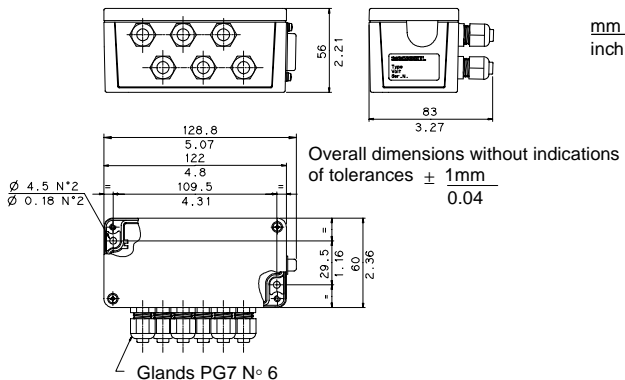


Figure 2.5 - Overall dimensions

DP1000 is designed to be mounted to a panel of metal, plastic or other appropriate material using the mounting screws provided in the package.

2.8 - Installation

To do this:

- 1) Open the DP1000 by unscrewing the 4 cover screws.

If necessary, using the two mounting holes inside the decoder as a pattern, mark the panel with an appropriate object and then drill two small pilot holes in the panel.

- 2) Align the DP1000 and insert the two self-threading screws with their washers and screw them into the panel until tight (see figure 2.6).

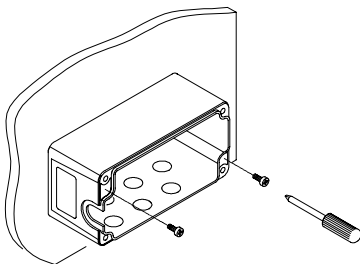


Figure 2.6 - Mounting DP1000

2.5 ELECTRICAL CONNECTIONS

2.5.1 Power supply

Power can be supplied to the decoder through the internal pins as indicated in figure 2.7:

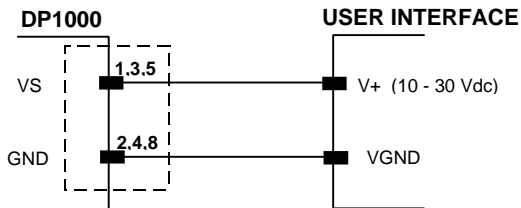


Figure 2.7 - Power supply connections

If the DP1000 is connected to the Datalogic barcode reader LS6100, the minimum supply voltage is 12 Vdc.

2.10 - Installation

2.5.2 Connection to a barcode reader

The DP1000 can be connected to a barcode reader such as LS2100, LS4100 or LS50 through the 15 pin connector illustrated in the figure below.

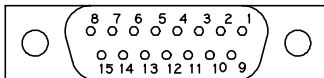


Figure 2.8 - 15 pin female connector

Pin	Name	Function	Pin	Name	Function
1	GND	ground	9	I.U.	internal use - do not connect
2	VDC	operating voltage	10	I.U.	internal use - do not connect
3	-VIDEO	complementary of video signal	11	RR	right read signal
4	+VIDEO	video signal representing code	12	N.C.	not connected
5	+SCAN	scan start	13	RESOL	resolution signal
6	-SCAN	complementary of scan start	14	BS	laser off signal
7	N.C.	not connected	15	N.C.	not connected
8	SHIELD	reader shield			

2.5.3 Main interface

The parameters relative to the main interface (baud rate, data bits, etc.) can be defined using the Winhost interface utility program or the Host Mode programming procedure. For more details refer to the section "Main Interface Menu" in the Help on Line of the Winhost utility program.

RS232 interface

The main serial interface is used in this case for point to point connections; it handles communication with the host computer and allows both the transmission of code data and the configuration of the decoder.

The wires of the external cable must be connected to the internal socket pins for RS232 interface connection as indicated in figure 2.9:

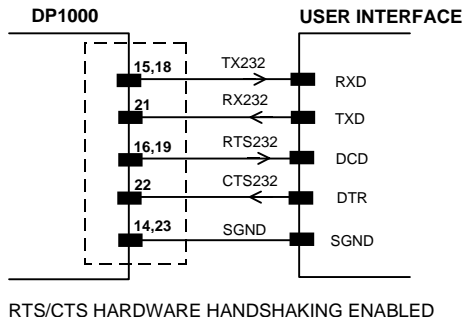


Figure 2.9 - RS232 interface connections

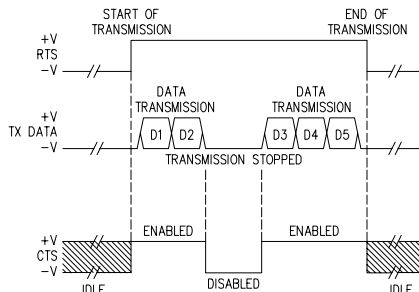


Figure 2.10 - RS232 control signals

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

If the RTS/CTS handshaking protocol is enabled, the DP1000 activates the RTS232 output to indicate a message is to be transmitted. The receiving unit activates the CTS232 input to enable the transmission.

RS485 interface

RS485 interface selection

If the main serial interface is RS485, the polled or non polled interface configuration can be selected to connect the main interface of the DP1000 to the host computer.

To select the interface type configuration:

- 1) Turn the DP1000 off.
- 2) Open the DP1000 as described in paragraph 2.3.
- 3) Take the protection shield off the guides.
- 4) Using a screwdriver, unscrew the two screws that fix the decoder and the interface boards and remove them from the protection shield.

Remove the interface board and position its switches as indicated in figure 2.11:

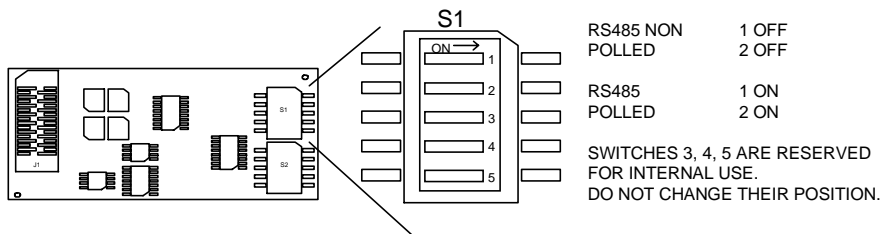


Figure 2.11 - RS485 interface selection

RS485 non polled interface

The RS485 NON POLLED interface is a Full Duplex (4 wires) interface. The NON POLLED configuration is used for point to point connections over longer distances than those acceptable for RS232 communications or in electrically noisy environments. The wires of the external cable must be connected to the internal socket pins for RS485 NON POLLED communications as indicated in figure 2.12:

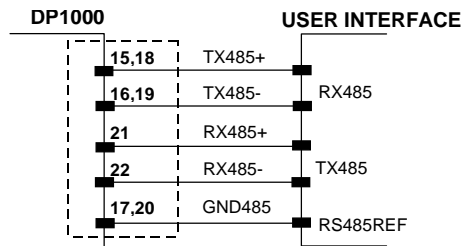


Figure 2.12 - RS485 NON POLLED connections

RS485 polled interface

The RS485 POLLED interface is a Half Duplex (3 wires + shield) interface. The POLLED configuration can be used for Multidrop connections with a multiplexer. The wires of the external cable must be connected to the internal socket pins for RS485 POLLED communications as indicated in figure 2.13:

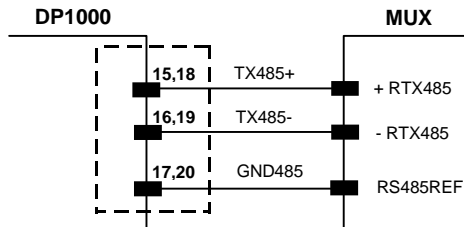


Figure 2.13 - RS485 POLLED connections

For this interface type, the Multidrop address must also be set on the DIP switch as shown in the following figure. Record this information for further setup of the Multidrop line.

2.16 - Installation

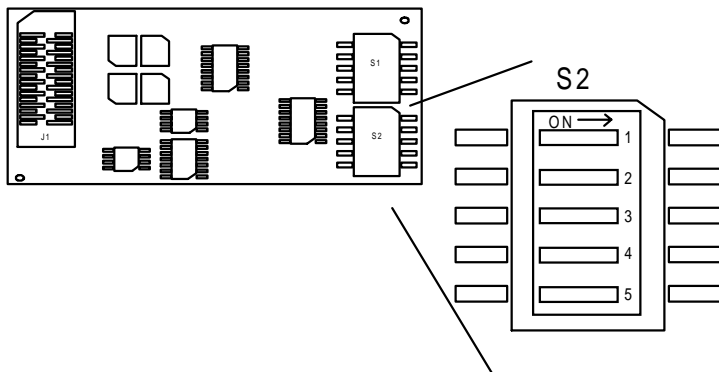


Figure 2.14 - DIP switch for Multidrop address selection

The following table shows the address settings where:

1 = ON

0 = OFF

Position					Address	Position					Address
1	2	3	4	5		1	2	3	4	5	
1	1	1	1	1	31	0	1	1	1	1	15
1	1	1	1	0	30	0	1	1	1	0	14
1	1	1	0	1	29	0	1	1	0	1	13
1	1	1	0	0	28	0	1	1	0	0	12
1	1	0	1	1	27	0	1	0	1	1	11
1	1	0	1	0	26	0	1	0	1	0	10
1	1	0	0	1	25	0	1	0	0	1	9
1	1	0	0	0	24	0	1	0	0	0	8
1	0	1	1	1	23	0	0	1	1	1	7
1	0	1	1	0	22	0	0	1	1	0	6
1	0	1	0	1	21	0	0	1	0	1	5
1	0	1	0	0	20	0	0	1	0	0	4
1	0	0	1	1	19	0	0	0	1	1	3
1	0	0	1	0	18	0	0	0	1	0	2
1	0	0	0	1	17	0	0	0	0	1	1
1	0	0	0	0	16	0	0	0	0	0	0

The figure below shows a multidrop configuration with DP1000 decoder connected.

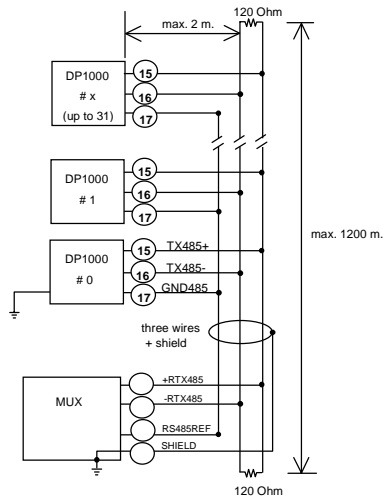


Figure 2.15 - DP1000 Multidrop connection to a multiplexer

20 mA passive current loop interface

The DP1000 only supports passive type current loop connections. The wires of the external cable must be connected to the internal socket pins as indicated in figure 2.16:

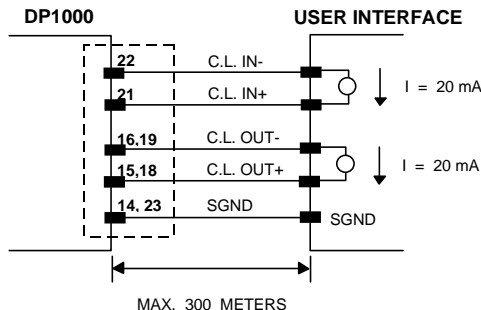


Figure 2.16 - 20 mA C.L. connections

2.5.4 RS232 auxiliary interface

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

2.20 - Installation

The parameters relative to the auxiliary interface (baud rate, data bits, etc.) as well as particular operating modes such as Local Echo can be defined using the Winhost interface utility program or the Host Mode programming procedure. For more details refer to the section "Auxiliary Interface Menu" in the Help on Line of the Winhost utility program.

The following wires of the external cable must be connected to the internal socket pins to connect the RS232 auxiliary interface:

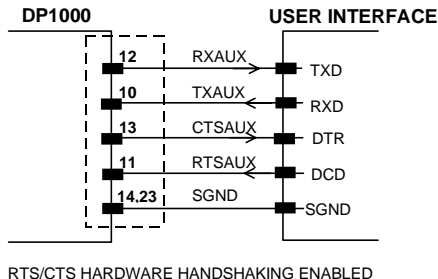


Figure 2.17 - RS232 auxiliary interface connections

The RTS AUX and CTS AUX signals control data transmission and synchronize the connected devices. If the RTS/CTS handshaking protocol is enabled, the DP1000 activates the RTS AUX output to indicate a message is to be transmitted. The receiving unit activates the CTS AUX input to enable the transmission.

2.5.5 Inputs

The only inputs supplied with the DP1000 are the pins relative to the code presence sensor. The wires of the external cable must be connected to the internal socket pins as indicated below:

The inputs indicated are always used to connect the code presence sensor which tells the scanner to scan for a code.

The electrical features are given below:

Maximum voltage	30 Vdc
Maximum current	25 mA

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

This input is optocoupled and can be driven by both an NPN or PNP type command. The connections are indicated in the following figures:

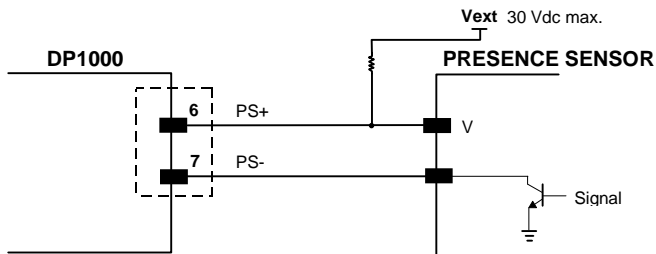


Figure 2.18 - Input NPN command using external power

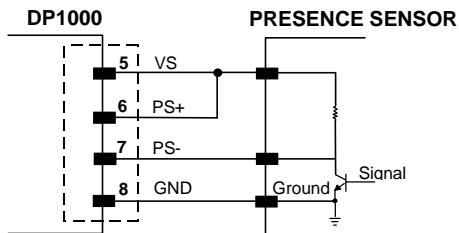


Figure 2.19 - Input NPN command using DP1000 power

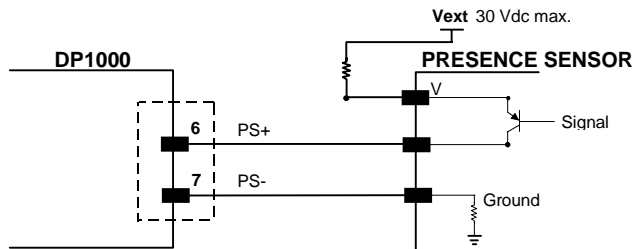


Figure 2.20 - Input PNP command using external power

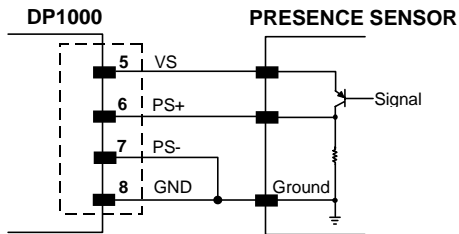


Figure 2.21 - Input PNP command using DP1000 power

2.5.6 Outputs

In addition to the pins relative to the communication interfaces as described in the previous paragraphs, connections for 3 different output signals can be made to the internal socket pins as indicated by the following figures.

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

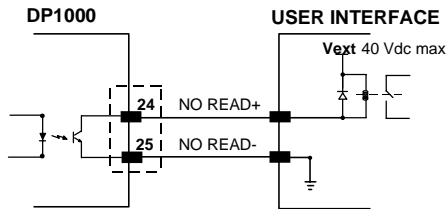


Figure 2.22- NO READ output connection

The RIGHT output activates when the code is decoded correctly.

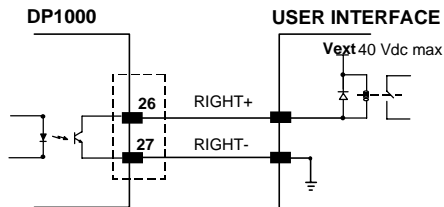


Figure 2.23 - RIGHT code output connection

The WRONG output is used for the Verifier mode. It activates when the decoded code does not correspond to the one set in the configuration.

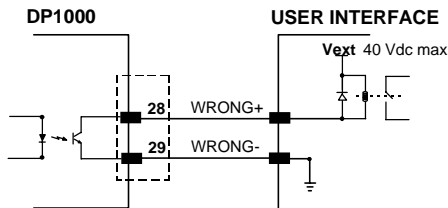


Figure 2.24 - WRONG code output connection

These outputs are both level or pulse configurable: a 50 ms pulse is generated in the second case. For more information refer to the section "Output Lines" in the Help on Line of the Winhost utility program.

2.6 TYPICAL LAYOUTS

In the typical layout, a photoelectric sensor used as a code presence sensor signals the decoder when an object enters the scanner reading zone. The decoder then activates the scanner to read the code (see figure 2.25).

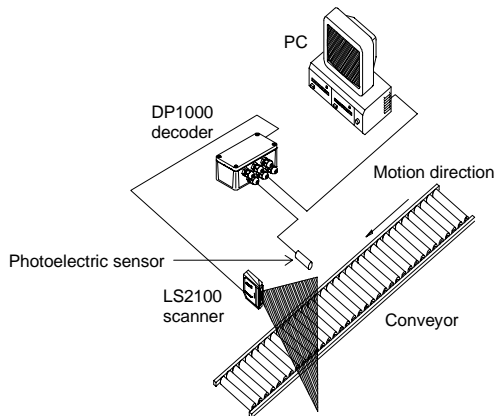


Figure 2.25 - DP1000 typical layout

2.28 - Installation

2.6.1 Master-slave

The master-slave layout is available only for DP1000 RS485 main interface models (see paragraph 1.1.1). It is used to collect data from several devices to build an omni-directional system; there can be one master and up to 5 slaves connected with the RS485 polled mode on their main serial interface. The master decoder is also connected to a host PC with the RS232 auxiliary interface.

The DP1000 can be connected to a barcode reader such as LS2100, LS4100 or LS50. Refer to paragraph 2.5.2 for details about the electrical connection.

The Presence Sensor signal is unique to the system; there is a single reading phase and a single message from the master decoder to the host computer.

In every slave decoder the Multidrop address selection must be set within the range from 0 to 4 max.

The DIP switch selections in the master decoder are ignored.

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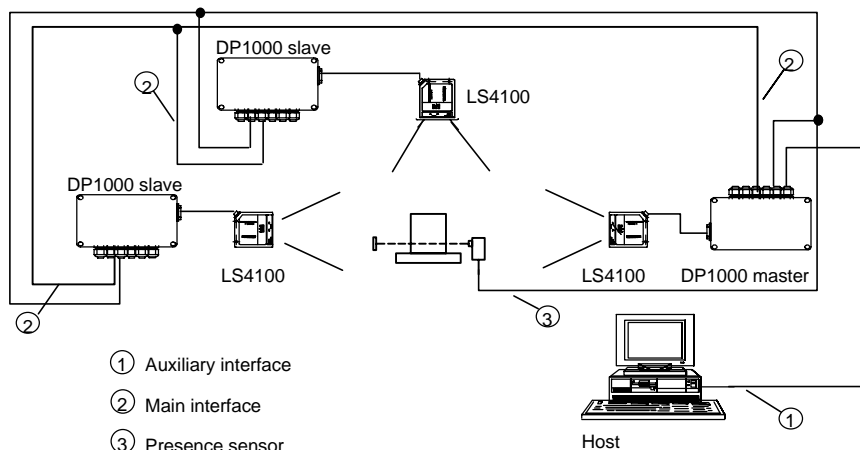


Figure 2.26 - Master-slave layout

2.30 - Installation

NOTE

The auxiliary serial port of the slave decoders is not used.

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

2.6.2 Local echo

In local echo mode the data is transmitted on the RS232 auxiliary interface as well as on the main interface. Host Mode programming can be accomplished either through the main interface or the auxiliary interface in local echo mode.

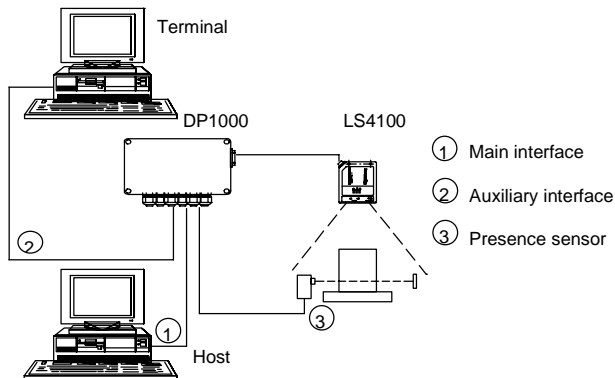


Figure 2.27 - Local echo layout

2.32 - Installation

2.6.3 Pass through

Pass Through mode allows two or more devices to be connected to a single external serial interface. Each DP1000 transmits the messages received by the Auxiliary interface onto the main interface. All messages will be passed through this chain to the host. The main and auxiliary ports are connected as shown in figure 2.28:

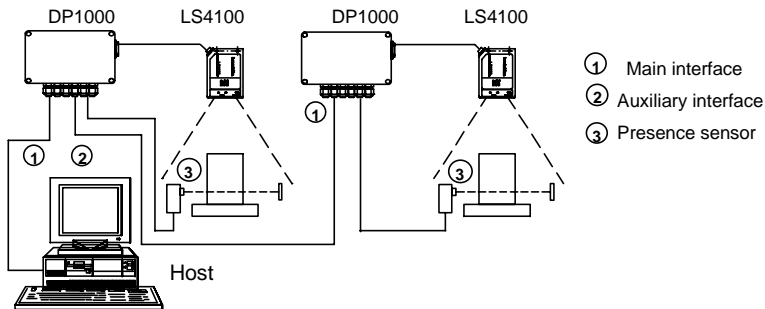


Figure 2.28 - Pass through layout

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3. TECHNICAL FEATURES

ELECTRICAL FEATURES	
INPUT POWER Supply voltage (Note 1) Power consumption max.	10 to 30 Vdc 2 W
SERIAL INTERFACES MAIN AUXILIARY	RS232, RS485 Non Polled, RS485 Polled, 20 mA Passive C. L. RS232
BAUD RATES All Interfaces	150 to 19200
CONTROL INPUTS PRESENCE SENSOR Voltage max. Input current max.	(optocoupled NPN or PNP) 30 Vdc 25 mA
CONTROL OUTPUTS NO READ, RIGHT READ, WRONG READ V_{CE} max. Collector current max. V_{CE} saturation Power dissipation max.	(optocoupled) 40 Vdc 40 mA continuous; 130 mA pulsed 1V at 10 mA max. 90 mW at 40 °C (Ambient temp.)

SOFTWARE FEATURES	
READABLE CODE SYMBOLOGIES	
<ul style="list-style-type: none">• 2/5 Interleaved• Code 39 (Standard and Full ASCII)• Code 32• Code C.I.P.• Codabar• Plessey• Code 93• EAN/UPC (including Add-on 2 and Add-on 5)• Code 128• EAN 128	
CODE SELECTION	up to six codes during one reading phase
DECODING SAFETY	can enable multiple good reads of same code
HEADERS AND TERMINATORS	up to four headers and four terminators
OPERATING MODES	ON LINE, AUTOMATIC, SERIAL ON LINE, TEST
CONFIGURATION MODES	<ul style="list-style-type: none">• using WINHOST utility• receiving commands from one of the serial ports (HOST MODE)
PARAMETER STORAGE	Non-volatile internal EEPROM
ENVIRONMENTAL FEATURES	
Operating temperature	0 to 50 °C
Storage temperature	-20 to 70 °C
Humidity max.	90% non condensing

3.2 - Technical features

ENVIRONMENTAL FEATURES

Vibration resistance	IEC 68-2-6 test FC 1.5 mm; 10 to 55 Hz; 2 hours on each axis
Shock resistance	IEC 68-2-27 test EA 30G; 11 ms; 3 shocks on each axis

PHYSICAL FEATURES

Mechanical dimensions	128,8 x 83 x 56 mm
Weight	approx. 300 g.

Note 1: If DP1000 is connected to the Datalogic LS6100 barcode reader, the minimum supply voltage is 12 Vdc.

NOTE

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