

C-BOX 100 Instruction Manual

The C-BOX 100 is a connection box which can be used as an accessory to several Datalogic family scanners to facilitate the system connections.

System cabling is made through spring clamp terminal blocks inside the C-BOX 100 while the scanner is connected to the C-BOX 100 through a 25-pin connector placed on the left side of the housing.

A 9-pin connector placed inside the C-BOX 100 facilitates connection between an external PC and the auxiliary serial interface of the scanner for configuration or data monitoring.

GENERAL VIEW

C-BOX 100



Figure A

- ① 25-pin scanner connector
- ② Compression connectors
- ③ Cover screws (4)

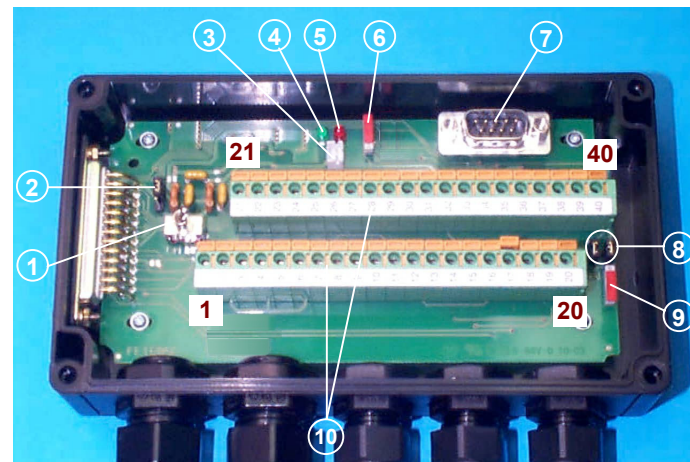


Figure B

- ① Power switch (ON/OFF)
- ② Chassis grounding selector
- ③ INT-30 power connector for 20 mA C.L.
- ④ Power on LED (green)
- ⑤ Power Polarity Error LED (red)
- ⑥ Scanner selection switch
- ⑦ Auxiliary port connector
- ⑧ OM4000 jumpers
- ⑨ Termination resistance switch
- ⑩ Spring clamp terminal blocks

SAFETY PRECAUTIONS

ATTENTION: READ THIS INFORMATION BEFORE INSTALLING THE PRODUCT

POWER SUPPLY

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

This device is intended to be supplied by a UL Listed NEC Class 2 power source, rated 10-30V, minimum 0.50A.

CAUTION

The overall value of power consumption of the system (C-BOX 100 + scanner) is given by adding the scanner power consumption to that of the C-BOX 100. Refer to the manual of the connected scanner for details about minimum/maximum supply voltage and power consumption.

SUPPORTED SCANNER MODELS

The C-BOX 100 can be connected to the following readers through the 25-pin connector illustrated in Figure A.

Linear Scanners				2D Readers/Cameras	
DS2100A	*DS1100	DS4600A	DS6XXX	MATRIX-1XXX	DV9500
DS2400A	*DS2200		DX6XXX	MATRIX-2XXX	
			DS8100A		

* It is necessary to use 10-30 V versions for DS1100 and DS2200 scanners.

OPENING THE DEVICE

To install the C-BOX 100 or during normal maintenance, it is necessary to open it by unscrewing the four cover screws:

CAUTION

The C-BOX 100 must be disconnected from the power supply during this operation.

MECHANICAL INSTALLATION

The diagram below gives the overall dimensions of the C-BOX 100 and may be used for its installation.

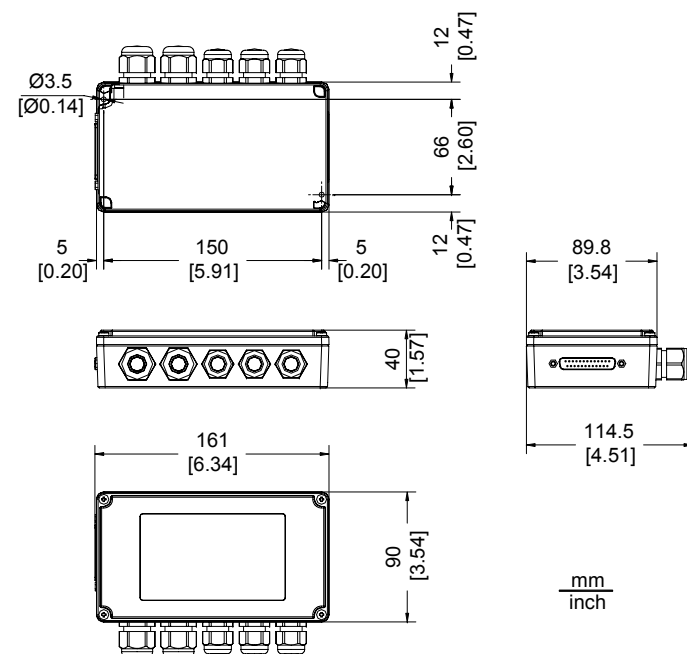


Figure 1 - Overall Dimensions

ELECTRICAL CONNECTIONS AND SETUP

The following figure shows the typical layout.

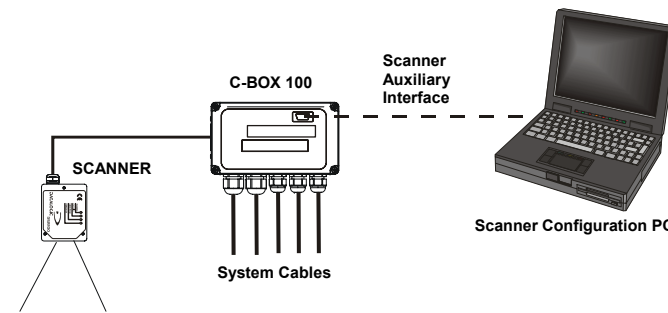


Figure 2 – System Layout

The dotted line in the figure refers to an optional (temporary) hardware configuration in which a portable PC can be quickly connected to the C-BOX 100 (and consequently to the scanner auxiliary interface) through the internal 9-pin connector. This allows monitoring of the data transmitted by the scanner or configuration through the utility program (see the scanner Installation Manual for more details). The scanner auxiliary interface signals are also available on the internal spring clamp connectors.

After making system cabling and switch settings, connect the scanner to the 25-pin connector on the left side of the C-BOX 100 housing.

Switch ON the C-BOX 100 power switch (see Figure 3). The correct polarity of the power connection is signaled by the green LED, while the red LED turns on in case of wrong polarity.

NOTE

Power is supplied to the connected scanner (25-pin connector only) through an electronic circuit which: limits the inrush current; provides short circuit protection and over current protection (automatic retry).

After system functioning has been verified, close the C-BOX 100 using the 4 cover screws making sure the rubber seal is fitted correctly between the parts of the housing.

POWER SUPPLY

Power is supplied to the C-BOX 100 through the pins provided on the spring clamp connector.

The power switch (see Figure 3) switches the power supply ON or OFF for both the C-BOX 100 and the connected scanner.

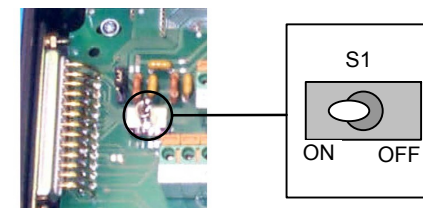


Figure 3 - Power Switch ON/OFF Positions

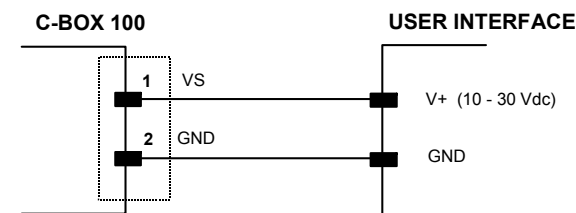


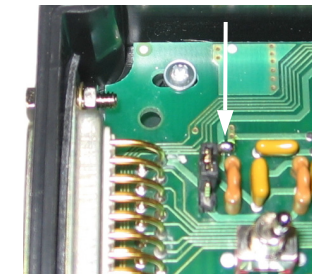
Figure 4 - Power Supply Connections

NOTE

Pin 1 is also electrically connected to pins 3 and 5, just as pin 2 is electrically connected to pins 4 and 6. This is useful for external trigger/inputs connections.

The power supply must be between 10 and 30 Vdc only.

POWERING C-BOX 100 FROM A SCANNER



In order for C-BOX 100 to accept power from the scanner through the 25-pin connector, a solder bridge must be made at the two pads indicated in Figure 5.

This is useful for example, to pass power to connected accessories such as Encoder and Presence Sensor from DX8200A VAC models or other scanner layouts. See the relative scanner Reference Manual for details.

Figure 5– Scanner Power Solder Bridge

SYSTEM WIRING

The connection and wiring procedure for C-BOX 100 is described as follows:

- 1) Open the C-BOX 100 by unscrewing the 4 cover screws.
- 2) Verify that the C-BOX 100 power switch is off (see Figure 3).
- 3) Unscrew the compression connectors and pass all the system cables through them into the C-BOX 100 housing.
- 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 next to the clamp (see Figure 6).
 - Insert the wire into the clamp and release the lever.

The wire will now be held in the spring clamp.

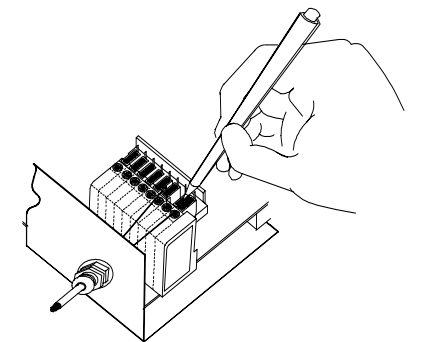


Figure 6 - System Cable Connections

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

All positions: 24 - 16 AWG 0.2 - 1.5 mm²

The C-BOX 100 spring clamp connector pinouts are indicated in the Pinout tables.

Refer to the scanner Installation Manual for signal details.

CHASSIS GROUNDING JUMPER SETTINGS

The scanner chassis grounding method can be selected by positioning a jumper (see Figure 7). In this way the scanner chassis can be connected to earth ground (only if pins 7 or 8 are connected to a good earth ground). For 1, 2, or 4K scanners the chassis can alternatively be connected to the power supply ground signal (GND) or it can be left floating but, in this case, the jumper must be removed. For 6, 8K scanners the chassis is internally connected to GND.

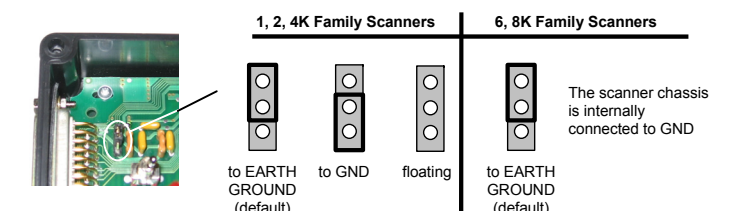


Figure 7 – Chassis Grounding

Linear Scanner Pinouts	
Pin	Name
1, 3, 5	VS
2, 4, 6	GND
7, 8	EARTH GROUND
*9, 13	RS485 CABLE SHIELD
20, 40	RESERVED
35	TX AUX
37	RX AUX

	DS2100A DS2400A	DS4600A	DS1100 DS2200	DS6XXX DX6XXX DS8100A
21	OUT1+	OUT1+	OUT1+	OUT1+
22	OUT REF	OUT1-	IO REF	OUT1-
23	OUT2+	OUT2+	OUT2+	OUT2+
24	OUT REF	OUT2-	IO REF	OUT2-
25	NC	RESERVED	NC	OUT 3A
26	NC	RESERVED	IN1-	OUT 3B
27	EXT TRIG+	EXT TRIG+	EXT TRIG+	EXT TRIG/PS A
28	EXT TRIG-	EXT TRIG-	EXT TRIG-	EXT TRIG/PS B
29	NC	IN1+	NC	IN 2/ENC A
30	NC	IN1-	IO REF	IN 2/ENC B
31	NC	IN2+	NC	IN 3A
32	NC	IN2-	NC	IN 4A
33	RESERVED	RESERVED	RESERVED	IN 3A
34	RESERVED	RESERVED	RESERVED	IN 4A
36	RTSA	GND	NC	IN 3B/IN 4B
38	CTSA	SGND AUX	NC	GND
39	GND	GND	GND	GND

DS2100A DS2400A DS4600A DS6XXX DX6XXX DS8100A				
	RS232	RS485FD	RS485HD	20mA CL (with INT-30 only)
*11, 15	TX232	TX485+	RTX485+	see INT-30 instructions
*12, 16	RTS232	TX485-	RTX485-	
17	RX232	RX485+		
18	CTS232	RX485-		
*10, 14, 19	SGND MAIN	SGND MAIN	SGND MAIN	

DS1100 DS2200			
			RS485HD
*11, 15			RTX485+
*12, 16			RTX485-
17			RESERVED
18			RESERVED
*10, 14, 19			SGND MAIN

* The signals on pins 9, 10, 11 and 12 are repeated on pins 13, 14, 15 and 16 to facilitate network connections (i.e. Multiplexer connections using the RS485 half-duplex Interface). In this way the network bus can enter and exit the C-Box 100 from different spring clamps but be physically connected together.

2D Reader/Camera Pinouts			
Pin	Name		
1, 3, 5	VS		
2, 4, 6	GND		
7, 8	EARTH GROUND		
20, 40	RESERVED		
	MATRIX- 2XXX	MATRIX- 1XXX	DV9500
*9, 13	RS485 CABLE SHIELD		RESERVED
35	TX AUX		•RX2 232
37	RX AUX		•TX2 232
21	OUT1+	NC	RESERVED
22	OUT1-	NC	RESERVED
23	OUT2+	NC	GND3
24	OUT2-	NC	OUTPUT+
25	OUT3+	OUT3+	TX3 485-
26	OUT3-	OUT3-	TX3 485+
27	EXT TRIG A	EXT TRIG A	RX3 485-
28	EXT TRIG B	EXT TRIG B	RX3 485+
29	IN 2A	NC	PS-
30	IN 2B	NC	PS+
31	NC	NC	OE+
32	NC	NC	OE-
33	NC	NC	OE+
34	NC	NC	OE-
36	NC	NC	OUTPUT-
38	GND	GND	•GND2
39	GND	GND	GND

* These signals are not available by default but require DV9500 internal jumper settings.

MATRIX-2XXX				
	RS232	RS485FD	RS485HD	20mA CL (with INT-30 only)
*11, 15	TX232	TX485+	RTX485+	see INT-30 instructions
*12, 16	RTS232	TX485-	RTX485-	
17	RX232	RX485+		
18	CTS232	RX485-		
*10, 14, 19	SGND MAIN	SGND MAIN	SGND MAIN	

MATRIX-1XXX			
			RS485HD
*11, 15			RTX485+
*12, 16			RTX485-
17			NC
18			NC
*10, 14, 19			SGND MAIN

DV9500			
*11, 15			INPUT-
*12, 16			•GND1
17			INPUT+
18			•RX1 232
*10, 14, 19			•TX1 232

* These signals are not available by default but require DV9500 internal jumper settings.

SCANNER SELECTION

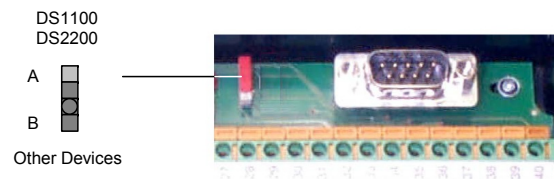


Figure 8 - Scanner Selection

Switch S3 must be set to A only when a DS1100 or a DS2200 scanner (10-30 V version) is connected. For all the other devices switch S3 must be set to B.

RS485 BUS TERMINATION

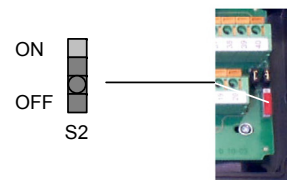


Figure 9 - Termination Resistance Switch

Switch S2 enables or disables the insertion of the bus termination resistor for RS485 Half Duplex Multidrop applications.

CAUTION

In Multiplexer applications the termination resistor must be enabled ONLY on the last device of the chain, the farthest away from the Multiplexer (assuming the Multiplexer is the first device of the chain). On all the other devices this resistor MUST NOT be enabled (S2 = OFF).

NOTE

For all RS485 connections, in case of electrically noisy environments: C-BOX 100 should be connected to a good earth ground (pin 7 or 8), RS485 CABLE SHIELD should be connected to pin 7 or 8, the scanner chassis should be connected to EARTH GROUND through the jumper, see Figure 7.

OM4000 JUMPER SETTINGS

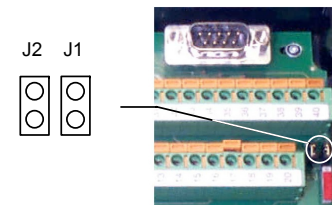


Figure 10 - OM4000 Jumpers

These jumpers allow connection to the EXT TRIG signals on separate spring clamp terminals for applications which use the OM4000 Oscillating Mirror in Trigger Mode.

When jumper J1 is inserted, pin 40 is connected to pin 27 (EXT TRIG+); jumper J2 inserted connects pin 20 to pin 28 (EXT TRIG-).

When the jumpers are removed, pin 20 and pin 40 are disconnected.

9-PIN SCANNER AUXILIARY SERIAL INTERFACE

The scanner auxiliary serial interface available on the internal 9-pin connector can be used either for configuration or for data monitoring.

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

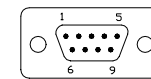


Figure 11 - 9-pin Male Connector

9-pin Connector Pinout		
Pin	Name	Function
1		N.C.
2	RXA	Auxiliary RS232
3	TXA	Auxiliary RS232
4		N.C.
5	GND	Ground
6		N.C.
7	RESERVED	Device Dependent Signal
8	RESERVED	Device Dependent Signal
9		N.C.

NOTE

Pins 7 and 8 have different signals attributed to them depending on the device connected to C-BOX 100. It is recommended to use only pins 2, 3, and 5 for communications.

CAUTION

Do not use the 9-pin connector when C-BOX 100 is connected to DV9500.

TECHNICAL FEATURES

ELECTRICAL FEATURES	
Supply Voltage	10 to 30 Vdc*
Power Consumption	0.5 W + scanner power consumption (see related manual)
Max Current Consumption (short circuit protection on 25-pin connector)	2 to 2.5 A
USER INTERFACE	
LED Indicators	Power on LED (green) Power polarity error LED (red)

* for further details about minimum/maximum supply voltage refer to the manual of the connected scanner, since the minimum supply voltage required may be >10.

PHYSICAL FEATURES	
Mechanical Dimensions	161 x 114.5 x 40 mm (6.34 x 4.51 x 1.57 in.)
Weight	about 320 g. (11.29 oz.)
ENVIRONMENTAL FEATURES	
Operating Temperature	-10° to 50 °C (+14° to 122 °F)
Storage Temperature	-20° to 70 °C (-4° to 158 °F)
Humidity max.	90% non condensing
Vibration Resistance	14 mm @ 2 to 10 Hz EN 60068-2-6 1.5 mm @ 13 to 55 Hz 2 hours on each axis 2 g @ 70 to 200 Hz
Shock Resistance	30 g; 11 ms; EN 60068-2-27 3 shocks on each axis
Protection Class	IP64 (when correctly connected to the scanner)

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

WEEE COMPLIANCE

Information for the user in accordance with the European Commission Directive 2002/96/EC

At the end of its useful life, the product marked with the crossed out wheeled wastebasket must be disposed of separately from urban waste.

Disposing of the product according to this Directive:

- avoids potentially negative consequences to the environment and human health which otherwise could be caused by incorrect disposal
- enables the recovery of materials to obtain a significant savings of energy and resources.

For more detailed information about disposal, contact the supplier that provided you with the product in question or consult the dedicated section at the website www.automation.datalogic.com.

CE COMPLIANCE

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

DATALOGIC DECLARATION OF CONFORMITY CE 07

Datalogic Automation S.r.l.
Via S. Vitalino 13
40012 - Lippo di Calderara
Bologna - Italy

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C-BOX 100, passive connection box

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and all its models
et tous ses modèles
und seine modelle
y todos sus modelos

sono conformi alle Direttive del Consiglio Europeo sottoelencate:
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EN 55022, August 1994: LIMITS AND METHODS OF MEASUREMENTS OF RADIO DISTURBANCE CHARACTERISTICS OF INFORMATION TECHNOLOGY EQUIPMENT

EN 61000-6-2, October 2001: ELECTROMAGNETIC COMPATIBILITY (EMC) PART 6-2: GENERIC STANDARDS – IMMUNITY FOR INDUSTRIAL ENVIRONMENTS

Lippo di Calderara, April 2nd, 2007

Lorenzo Girotti
Product & Process Quality Manager