



## CBX500

# INSTALLATION MANUAL



Figure A

- ① Indicator LEDs
- ② Cover Screws (4)
- ③ Host Interface Module Panel
- ④ Compression Connectors (5)
- ⑤ 25-pin Device Connector

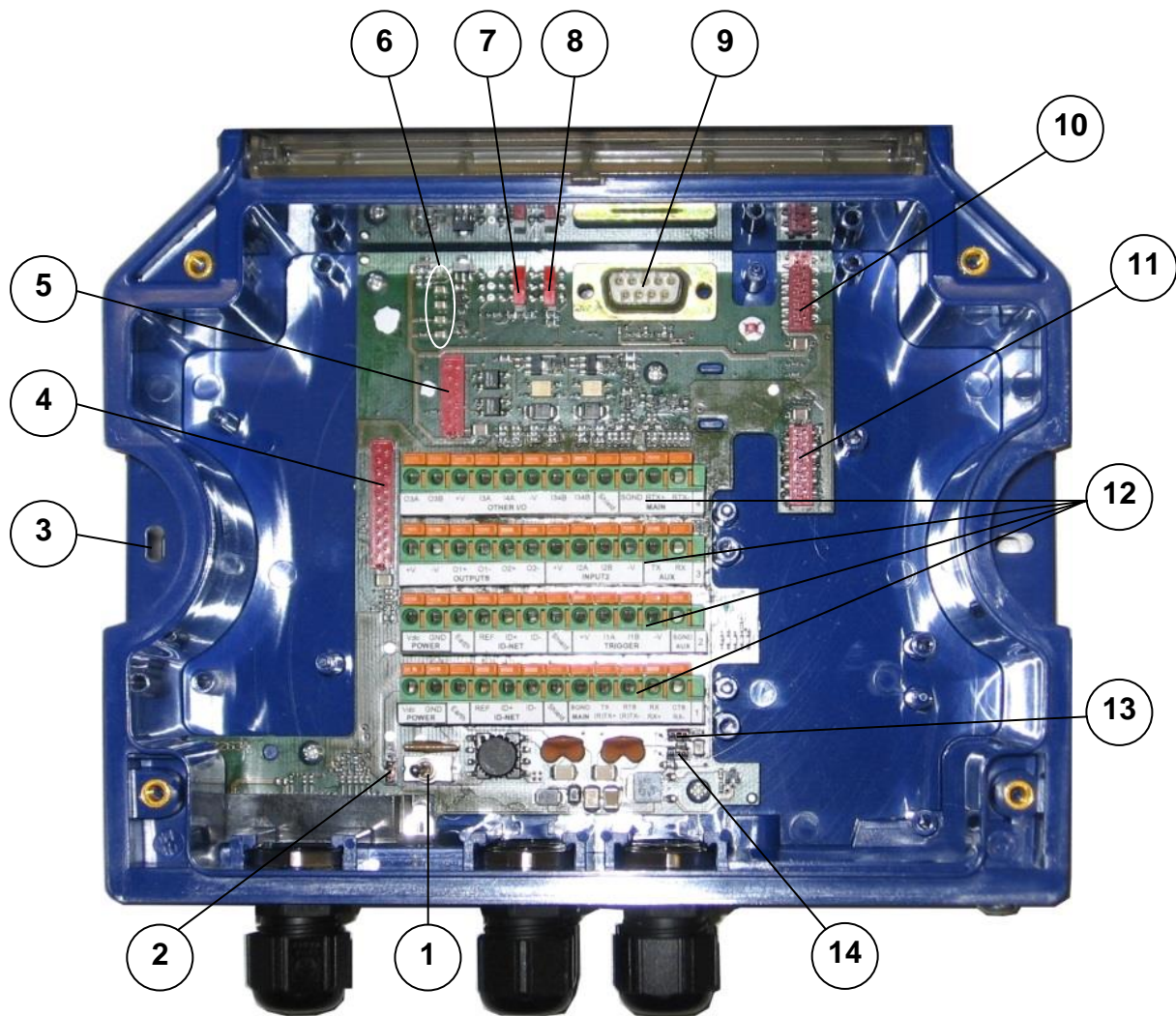


Figure B

- ① Power Switch (ON/OFF)
- ② Device Chassis Grounding Selector
- ③ Mounting Holes (2)
- ④ I/O Extension Module Connector
- ⑤ Backup Module Connector
- ⑥ Indicator LEDs
- ⑦ RS485 Termination Resistance Switch
- ⑧ ID-NET™ Termination Resistance Switch
- ⑨ Auxiliary Port Connector
- ⑩ IP65 Host Interface Module Connector
- ⑪ Standard Host Interface Module Connector
- ⑫ Spring Clamp Terminal Blocks
- ⑬ Shield to Protection Earth Selector
- ⑭ Power Source Selector

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## DESCRIPTION

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The CBX500 is a connection box which can be used as an accessory to facilitate system connections for installation and device replacement of several Datalogic family reading devices.

System cabling is made through spring clamp terminal blocks inside the CBX500 while the reading device is connected to the CBX500 through a 25-pin connector on the housing.

A 9-pin connector placed inside the CBX500 facilitates connection between an external PC and the auxiliary serial interface of the reading device for configuration or data monitoring.

CBX500 can also house several accessories which make the system highly flexible. These include:

- Backup Module - to backup and restore system configuration parameters making system maintenance extremely quick and easy.
- Display Module – to show reading device menu and diagnostic messages at the CBX500.
- Several Host Interface Modules - to interface the scanner with the most popular Fieldbus and non-Fieldbus network types: Ethernet/IP, Profibus; DeviceNet, etc., including IP65 protection versions.
- Mounting Adapters – to provide easy mounting to DIN rails and Bosch profiles.
- M12 Panel Connectors for direct connection using standard cables and IP65 protection.

## ACCESSORIES

The following accessories are available on request for the CBX500:

Name	Description	Part Number
* BM100	Backup Module	93ACC1808
* BM150	Display Module	93ACC1809
* BM200/210	Ethernet TCP/IP Module STD/IP65	93ACC1851, 93ACC1852
* BM300/310	Profibus Module STD/IP65	93ACC1810, 93ACC1811
* BM400	DeviceNet Module IP65	93ACC1814
* BM500/510/520	EtherNet/IP Module STD/IP65/IP54	93ACC1812, 93ACC1813, 93ACC1840
* BM600	CANopen Module STD	93ACC1815
* BM700/710	Profinet Module STD/IP65	93ACC1816, 93ACC1886
* BM1100	CC-Link Module STD	93ACC1845
* BM1200/1210	Modbus TCP STD/IP65	93ACC1848, 93ACC1849
BA100	DIN Rail Adapters	93ACC1821
BA200	Bosch Adapters	93ACC1822
BA300	M12 3PF Service Connector	93ACC1877
BA400	M12 3PM External Power Connector	93ACC1853
BA500	M12 4PF Trigger Connector	93ACC1854
BA600	M12 5PF ID-NET Out Connector	93ACC1855
BA700	M12 5PM ID-NET In Connector	93ACC1856
BA900	Two Cable Compression Conn. Panel	93ACC1847



**NOTE:** Not all readers support all CBX accessories. Compatibility between the accessories marked with an asterisk (\*) and your reader depends on the reading device application software. See the "Accessories" paragraph in your reading device **Reference Manual** for the list of supported CBX Series accessories.

## SAFETY PRECAUTIONS

**ATTENTION: READ THIS INFORMATION BEFORE INSTALLING THE PRODUCT**

### POWER SUPPLY

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

This product is intended to be connected to a UL Listed Direct Plug-in Power Unit marked LPS or "Class 2".



**CAUTION:** Total power consumption is given by adding the CBX500 power consumption to that of all the devices powered through the CBX500 (reading device, P.S., I/O). Refer to the manual of the connected devices for details about minimum/maximum supply voltage and power consumption.

**Each CBX500 supports only 1 single reading device + system accessories.**

## SUPPORTED READING DEVICE MODELS

### HARDWARE AND SOFTWARE COMPATIBILITY

The CBX500 can be directly connected to all of the following readers through the 25-pin connector illustrated in Figure A.

Linear Scanners			2D Readers	
DS2100N NSC	DS2400N NSC	DS4800	Matrix 210™	Matrix 300™
DS6300	DS6400	DX6400	Matrix 410™	Matrix 450™
	DS8100A	DX8200A		



**NOTE:** Not all readers support all CBX accessories. Compatibility between the accessories and your reader depends on the reading device application software. See the "Accessories" paragraph in your reading device **Reference Manual** for the list of supported CBX Series accessories.



**NOTE:** CBX500 is backward compatible with DS2100N/DS2400N (black body) model reading devices using the ADP-MM1 25-pin gender changer. See the Gender Changer documentation for the relative CBX pinout. A scanner software upgrade may be required to manage CBX500 accessories.

### HARDWARE COMPATIBILITY ONLY (PASSIVE CONNECTIONS)



**NOTE:** CBX500 is backward compatible with DS4600A, and DS1100/DS2200 10-30 Vdc model reading devices using the ADP-MM1 25-pin gender changer. See the Gender Changer documentation for the relative CBX500 pinout. CBX500 accessory management through device application software is not provided for these products.

## OPENING THE CBX500

To install the CBX500 or during normal maintenance, it is necessary to open it by unscrewing the four cover screws:



**CAUTION:** The CBX500 must be disconnected from the power supply during this operation.

## MECHANICAL INSTALLATION

CBX500 can be mounted to various wooden or plastic surfaces using the two self-threading screws (3.9 x 45 mm) and washers provided in the package.

Mounting to other surfaces such as concrete walls or metallic panels requires user-supplied parts (screws, screw anchors, nuts, etc). A mounting template is included in the package to facilitate hole drilling alignment.

CBX500 can also be mounted to a DIN rail using the BA100 (93ACC1821) mounting accessory or to a Bosch Frame or 80/20 Frame using the BA200 (93ACC1822) mounting accessory.

The diagram below gives the overall dimensions of the CBX500 and shows the two mounting through-holes.

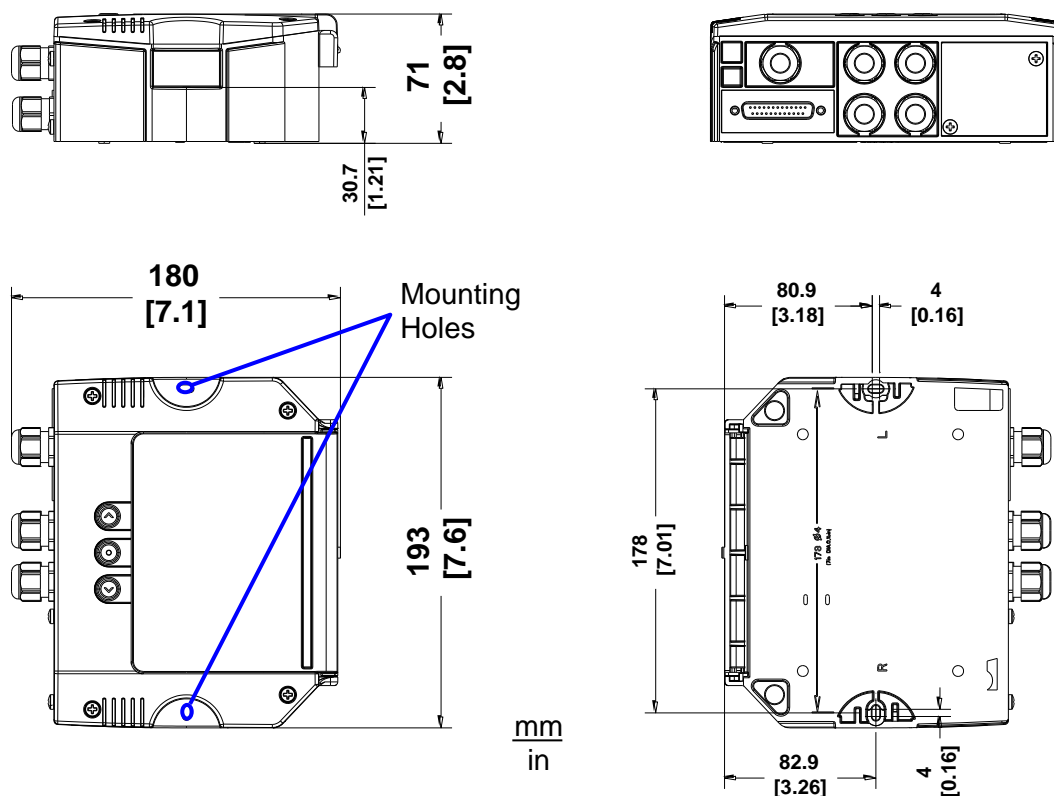


Figure 1 - Overall Dimensions

## ELECTRICAL CONNECTIONS AND SETUP

The following figure shows the typical layout.

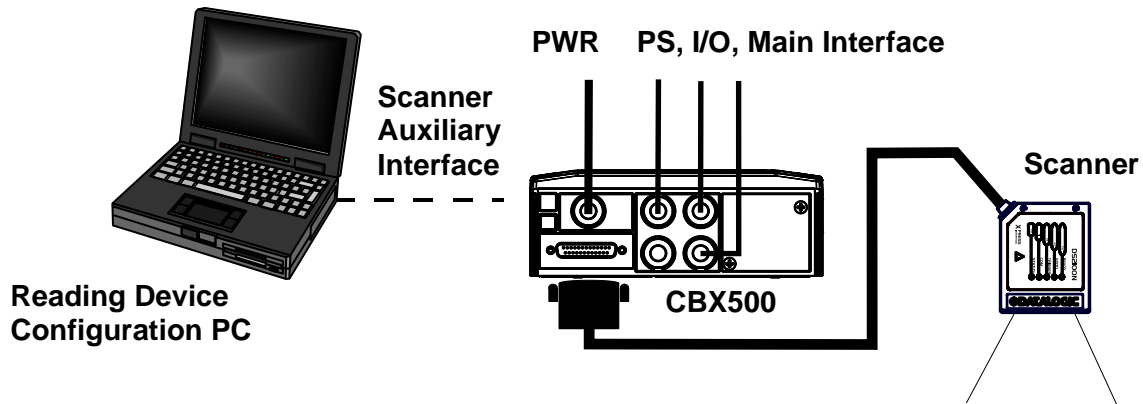


Figure 2 – System Layout

The dotted line in the figure refers to an optional (temporary) hardware configuration in which a portable PC can be quickly connected to the CBX500 (and consequently to the reading device auxiliary interface) through the internal 9-pin connector. This allows monitoring of the data transmitted by the reading device or configuration through the utility program (see the reading device Installation Manual for more details). The reading device auxiliary interface signals are also available on the internal spring clamp connectors.

After making system cabling and switch settings, connect the reading device to the 25-pin connector on the CBX500 housing.

Switch ON the CBX500 power switch (see Figure 3). The Power LED turns on (blue) when the power connection has the correct polarity. The Power LED turns on (red) in case of wrong polarity.

After system functioning has been verified, close the CBX500 using the four cover screws.



## POWER SUPPLY

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Power is supplied to the CBX500 through the Vdc and GND pins provided on the spring clamp connector.

The power switch (see Figure 3) switches the power supply ON or OFF for both the CBX500 and the connected reading device.



**CAUTION:** The power switch does not control power to the Vdc/GND, +V/-V spring clamps, therefore any devices connected to these signals (i.e. external trigger, encoder, etc.), are live and are not protected from polarity inversion. Disconnect the power supply when working inside the CBX500.

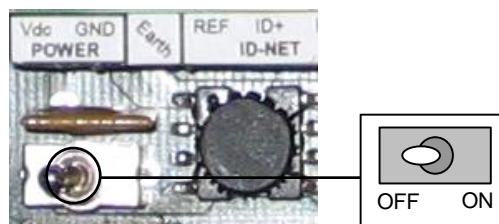


Figure 3 - Power Switch ON/OFF Positions

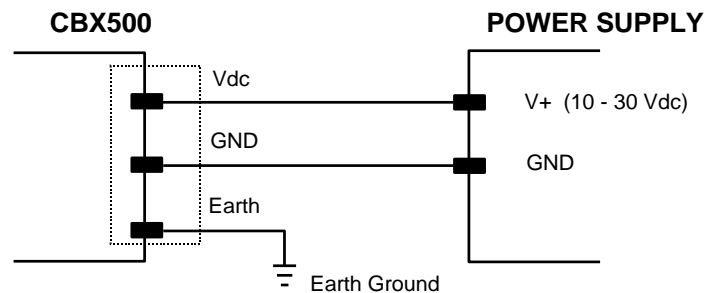


Figure 4 - Power Supply Connections



**NOTE:** Vdc is electrically connected to +V, just as GND is electrically connected to -V. This is useful for supplying external trigger, inputs and outputs from the CBX500 power source, however +V and -V signals should not be used as power supply inputs to the CBX500.

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



## SYSTEM WIRING

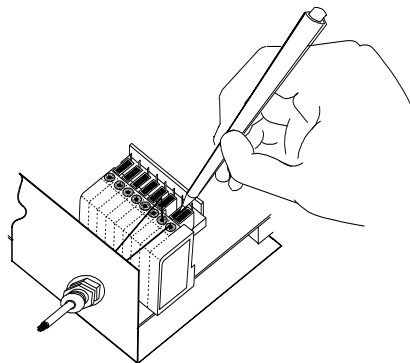
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The connection and wiring procedure for CBX500 is described as follows:

- 1) Open the CBX500 by unscrewing the four cover screws.
- 2) Verify that the CBX500 power switch is off (see Figure 3).
- 3) Unscrew the compression connectors and pass all the system cables through them into the CBX500 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 5).
  - Insert the wire into the clamp and release the lever.

The wire will now be held in the spring clamp.

- 5) Tighten the compression connector nuts so that the internal glands seal around the cables.



**Figure 5 - System Cable Connections**

Flexible stranded wire should be used and must meet the following specifications.

All positions: 24 - 16 AWG 0.2 - 1.5 mm<sup>2</sup>

The CBX500 spring clamp connector pinouts are indicated in the Pinout table.

**Refer to the reading device Installation Manual for signal details.**

## PINOUT

Pinouts				
Group	Name	Function		
Input Power	Vdc	Power Supply Input Voltage +		
	GND	Power Supply Input Voltage -		
	Earth	Protection Earth Ground		
External Trigger Input	+V	Power Source – External Trigger		
	I1A	External Trigger A (polarity insensitive)		
	I1B	External Trigger B (polarity insensitive)		
	-V	Power Reference – External Trigger		
Generic Input	+V	Power Source – Inputs		
	I2A	Input 2A (polarity insensitive)		
	I2B	Input 2B (polarity insensitive)		
	-V	Power Reference – Inputs		
Outputs	+V	Power Source – Outputs		
	-V	Power Reference – Outputs		
	O1+	Output 1+		
	O1-	Output 1-		
	O2+	Output 2+		
	O2-	Output 2-		
Other I/O	O3A	Output 3A (polarity insensitive)		
	O3B	Output 3B (polarity insensitive)		
	+V	Power Source – Other I/O		
	I3A	Input 3A (polarity insensitive)		
	I4A	Input 4A (polarity insensitive)		
	-V	Power Reference – Other I/O		
	I34B	Input 3B and 4B (common) (polarity insensitive)		
	I34B	Input 3B and 4B (common) (polarity insensitive)		
Auxiliary Interface	TX	Auxiliary Interface TX		
	RX	Auxiliary Interface RX		
	SGND	Auxiliary Interface Reference		
ID-NET™	REF	Network Reference		
	ID+	ID-NET™ network +		
	ID-	ID-NET™ network -		
Network	Shield	Network Cable Shield		
		RS232	RS485FD	RS485HD
Main Interface		TX	TX+	RTX+
		RTS	TX-	RTX-
		RX	*RX+	
		CTS	*RX-	
		SGND	SGND	SGND

The input power signals **Vdc**, **GND** and **Earth** as well as the network signals **REF**, **ID+**, **ID-** and **Shield**; and **RTX+**, **RTX-** and **SGND** are repeated to facilitate system cabling. In this way the power and network busses can enter and exit the CBX500 from different spring clamps but be physically connected together.

\* Do not leave floating, see Reading Device Reference Manual for connection details.



**NOTE:** To avoid electromagnetic interference:

- Connect CBX500 Protection Earth (Earth) to a good earth ground.
- Connect the reading device chassis to earth ground through the jumper, (default setting, see Figure 8).
- Connect the Network Cable Shield (Shield) to Filtered Earth through the jumper (default setting, see Figure 7).



**CAUTION:** Do not connect to the Main Interface spring clamp terminals if using Host Interface Modules (Fieldbus or non-Fieldbus).

## POWER SOURCE JUMPER SETTINGS

For most applications input power is provided through the dedicated spring clamp connectors inside the CBX500.

However CBX500 may accept power from the connected reading device through the 25-pin connector. This is useful, for example, to pass power to connected accessories such as Encoder and Presence Sensor from DX8200A VAC models or 6K/8K scanners powered directly through the network. See the relative reading device Reference Manual for details.

To power CBX500 from the reading device, the power source jumper must be placed in the "power from device" position as indicated in Figure 6.

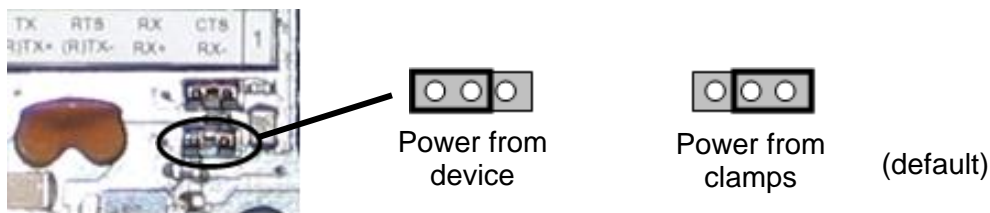


Figure 6–Power Source Jumper Settings

## SHIELD TO PROTECTION EARTH JUMPER SETTINGS

The network shield (Shield) can be connected to Earth Ground (Earth) either directly or through a filter circuit. If the jumper is left open, the network cable shield (Shield) is floating.

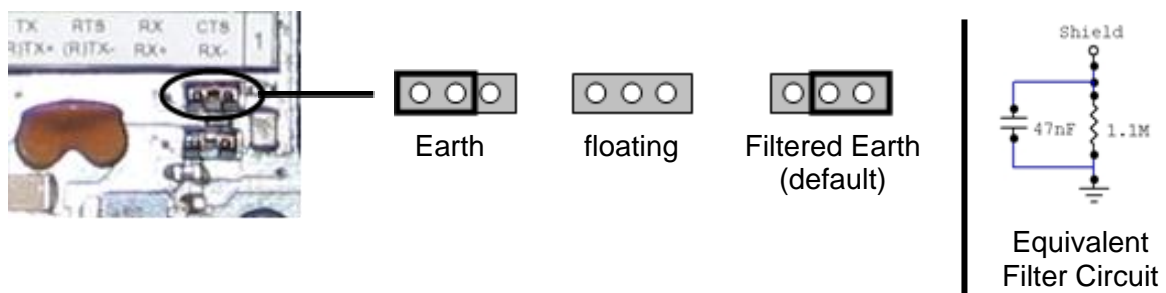


Figure 7– Shield to Protection Earth Jumper Settings

## CHASSIS GROUNDING JUMPER SETTINGS

The reading device chassis grounding method can be selected by positioning a jumper (see Figure 8). In this way the reading device chassis can be connected to earth ground (only if pin Earth is connected to a good earth ground). For all reading devices except 6K/8K, 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 6K or 8K scanners the chassis is internally connected to GND.

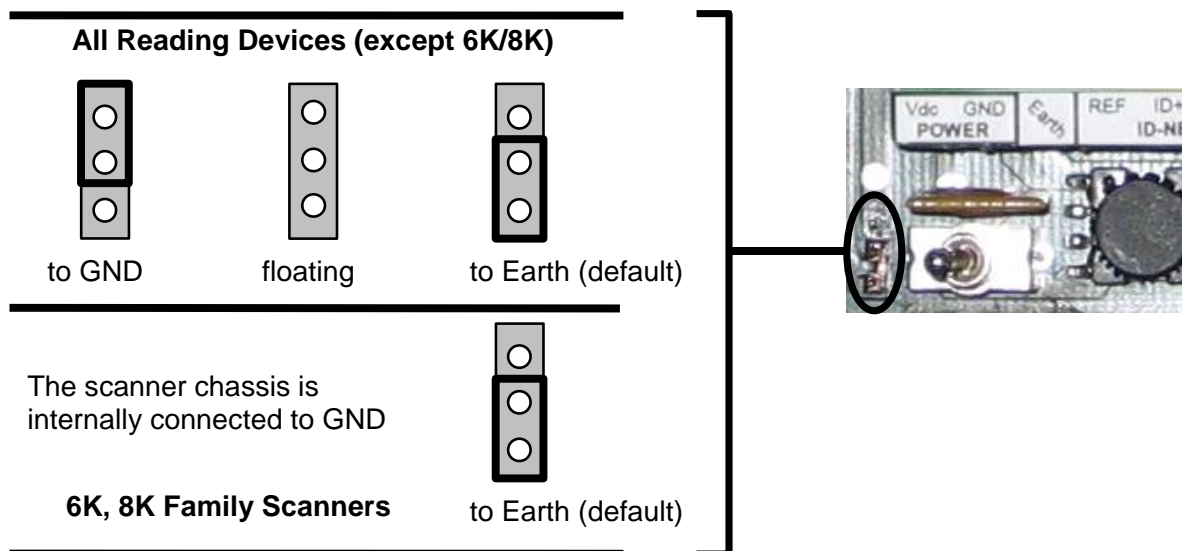


Figure 8 – Chassis Grounding

## 9-PIN READING DEVICE AUXILIARY SERIAL INTERFACE

The reading device auxiliary serial interface available on the internal CBX500 9-pin connector can be used either for configuration or for data monitoring.

Connections can be made to a PC or Laptop using a straight through cable or a USB-RS232 converter.

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

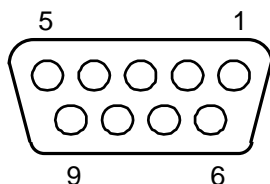


Figure 9 - 9-pin D-Sub Female Connector

9-pin Connector Pinout		
Pin	Name	Function
2	TX	Auxiliary RS232
3	RX	Auxiliary RS232
5	SGND	Auxiliary Reference Ground
1, 4, 6, 7, 8, 9		N.C.

## NETWORK BUS TERMINATION

### ID-NET™

The ID-NET™ termination resistance switch enables or disables the insertion of the bus termination resistor for ID-NET™ network applications.

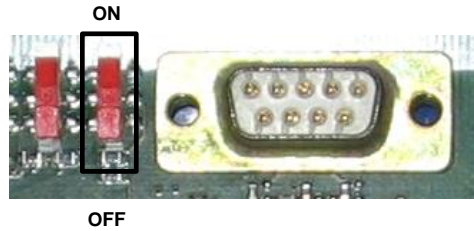


Figure 10 – ID-NET™ Termination Resistance Switch



**CAUTION:** In ID-NET™ network applications the termination resistor must be enabled **ONLY** on the first and last devices of the chain. On all the other devices this resistor **MUST NOT** be enabled (OFF).

### RS485 HD

The RS485 HD termination resistance switch enables or disables the insertion of the bus termination resistor for RS485 Half Duplex Multidrop applications.

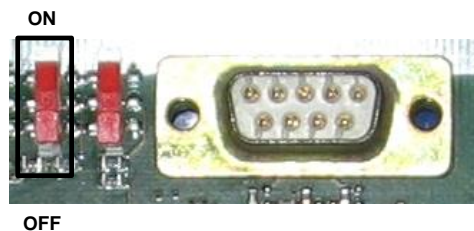


Figure 11 – RS485 HD Termination Resistance Switch



**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 be OFF (disabled).**

**This switch must also be OFF (disabled) when Fieldbus Modules are used.**

## INDICATOR LEDS

There are five Indicator LEDs which signal power and I/O activity and are visible from the CBX500 outside cover.

The Power LED is blue when power is correctly applied to the CBX500 and the power switch is turned on.

This LED is red if power polarity is incorrect. In this case the connected reading device and optional Backup Module are protected.

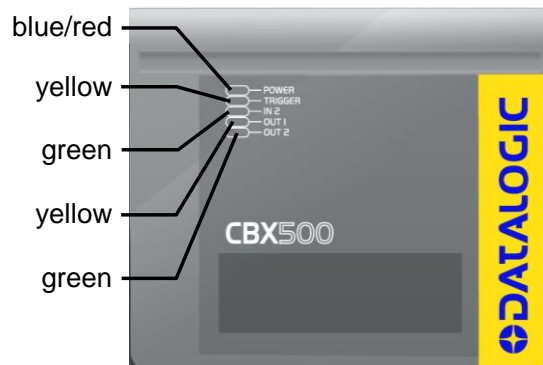


Figure 12 – Indicator LEDs

The remaining four LEDs signal activity on the relative I/O lines. Their meaning depends on the software configuration of the connected reading device.



**CAUTION:** If external I/O devices are powered through CBX500 (connected to +V/-V), they are not protected from polarity inversion.

## TECHNICAL FEATURES

<b>ELECTRICAL FEATURES</b>	
Supply Voltage	10 to 30 Vdc*
Consumption	0.8 – 0.5 A
Limited Current Consumption CBX + reading device consumption (see related manual)	2.5 A
<b>USER INTERFACE</b>	
LED Indicators	Power On/Polarity Error (blue/red) Trigger (yellow) IN2 (green) OUT1 (yellow) OUT2 (green)
<b>PHYSICAL FEATURES</b>	
Mechanical Dimensions	193 x 180 x 71 mm (7.6 x 7.1 x 2.8 in.)
Weight	about 780 g. (27.5 oz.)
<b>ENVIRONMENTAL FEATURES</b>	
Operating Temperature	0° to 50 °C (+32° to 122 °F)
Storage Temperature	-20° to 70 °C (-4° to 158 °F)
Humidity max.	90% non condensing
Vibration Resistance EN 60068-2-6 2 hours on each axis	14 mm @ 2 to 10 Hz 1.5 mm @ 13 to 55 Hz 2 g @ 70 to 200 Hz
Shock Resistance EN 60068-2-27	30 g; 11 ms; 3 shocks on each axis
Protection Class EN 60529	IP65 **

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

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

\*\* when compression connectors and reading device are correctly connected.  
If Host Interface (Fieldbus) Modules are used, only correctly installed IP65 models guarantee IP protection. Protection is not guaranteed when Standard Fieldbus Modules are mounted.

## COMPLIANCE

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### 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.

### 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.

### FCC COMPLIANCE

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## LEGAL NOTICES

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[www.automation.datalogic.com](http://www.automation.datalogic.com)*declares that the***CBX100; Connection Box Compact****CBX500; Connection Box Modular****BM100; Backup module****BM150; Display module***and all its models**are in conformity with the requirements of the European Council Directives listed below:***2004 / 108 / EC EMC Directive***This Declaration is based upon compliance of the products to the following standards:***EN 55022 ( CLASS A ITE ), DECEMBER 2010:***INFORMATION TECHNOLOGY EQUIPMENT  
RADIO DISTURBANCE CHARACTERISTICS  
LIMITS AND METHODS OF MEASUREMENTS***EN 61000-6-2, SEPTEMBER 2005:***ELECTROMAGNETIC COMPATIBILITY (EMC)  
PART 6-2: GENERIC STANDARDS - IMMUNITY FOR INDUSTRIAL  
ENVIRONMENTS*

Monte San Pietro, January 20th, 2012

Paolo Morselli  
Quality Manager