PWR-480 B

INSTALLATION MANUAL



Reading Station Power Supply

DATALOGIC

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PREFACE

ABOUT THIS MANUAL

This Installation Manual is provided for users seeking advanced technical information, including installation, connections, maintenance and specifications.

Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in this manual to notify the reader of key issues or procedures that must be observed:



NOTE: Contains important information necessary for proper installation and use of the device.



CAUTION; This symbol advises you of actions that could damage equipment or property.



HIGH VOLTAGE: This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock. Operations having this symbol must be performed by qualified personnel only.

TECHNICAL SUPPORT

Support Through the Website

Datalogic provides several services as well as technical support through its website. Log on to (www.datalogic.com).

For quick access, from the home page click on the search icon, and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Hover over the Support & Service menu for access to Services and Technical Support.

Reseller Technical Support

An excellent source for technical assistance and information is an authorized Datalogic reseller. A reseller is acquainted with specific types of businesses, application software, and computer systems and can provide individualized assistance.

SAFETY REGULATIONS

Electrical Safety

This product conforms to the applicable requirements contained in the following European Standards:

- EN 61439-1
- EN 60204-1
- EN IEC 61010-2-201:2018
- UL580A Industrial control panel for General Use

Product Data Label

The Product data label is located on the outside door panel.



Figure 1 – Product Data Label

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since Datalogic promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through Datalogic commercial reference contacts. Since April 20th, 2016 the main European directives applicable to Datalogic products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. Datalogic products are mainly designed for integration purposes into more complex systems. For this reason, it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.

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.

GENERAL VIEW

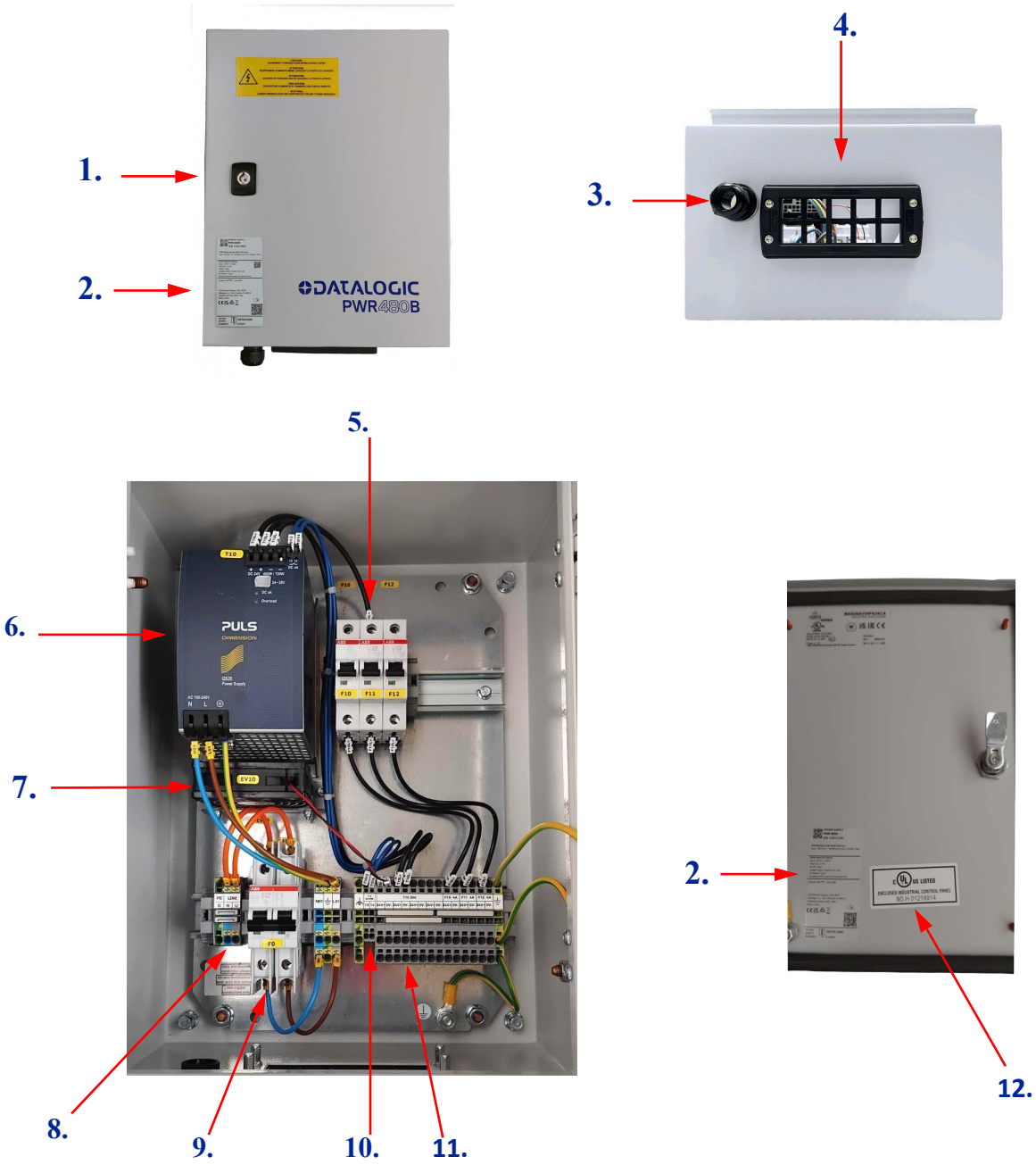


Figure 2 - PWR-480B General View

- 1. Key Lock
- 2. Product Data Label
- 3. AC Input Cable Compression Connector
- 4. Cable Entry Plate
- 5. Low Voltage Current Limiting Fuses
- 6. Monophase Switching Power Supply
- 7. Cooling Fan
- 8. AC Line Input Terminal Block
- 9. Thermal-magnetic circuit breaker
- 10. DC OK" Terminal Block
- 11. 24 Vdc Terminal Block
- 12. UL 508A Label

CHAPTER 1
OPERATING FEATURES

DESCRIPTION

The PWR-480B is an electrical cabinet housing a 24 Vdc power supply which is used to power up a varying number of reading devices (depending on the product), along with their relative accessory devices. See chapter 4 for details.

As shown in the Electrical Diagram in Appendix A, the AC Input Line passes through a protective thermo-magnetic circuit breaker and connects to the monophase switching power supply.

The 24 Vdc output power is connected to the output terminal blocks divided into two sections: a direct connection block and a current-limiting block. While the direct connection block is protected by the internal power supply features, the current limiting block is protected by a Miniature circuit breaker (MCB), 4 A, 1p, C-Char.

Two output power supply status monitoring signals (DC-OK) are provided to connect to an optional digital alarm. If for some reason the output voltage is reduced by less than 90% of nominal) these lines open.

OUTPUT PROTECTION

The power supply implements both output short-circuit and overload protection.

Short-Circuit Protection

If a short-circuit occurs on the output lines causing the output voltage to drop below 20 Vdc, the power supply enters hiccup mode where power is supplied for 2 seconds and then shuts off for 17 seconds. This procedure is repeated until the short-circuit is resolved. Refer to the diagram below.

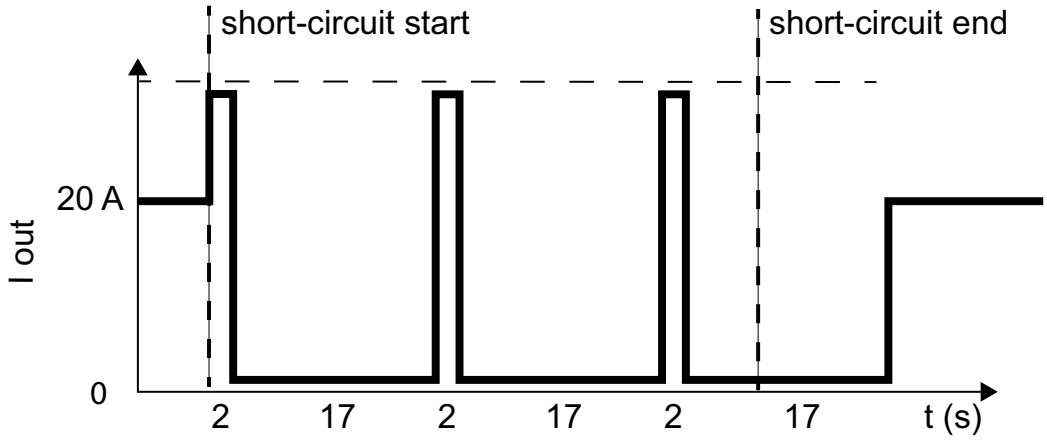


Figure 3 – Short-Circuit Protection Hiccup Mode

Overload Protection

In the event of sustained output current overloading, overload protection is provided where overload power is supplied as explained in the examples below:

Example 1: Up to 120% power overload

The overload is supplied for approximately 12 seconds and then is reduced (Voltage and Current) to about 104% power continuously. In this case output voltage is reduced but remains above 20 Vdc.

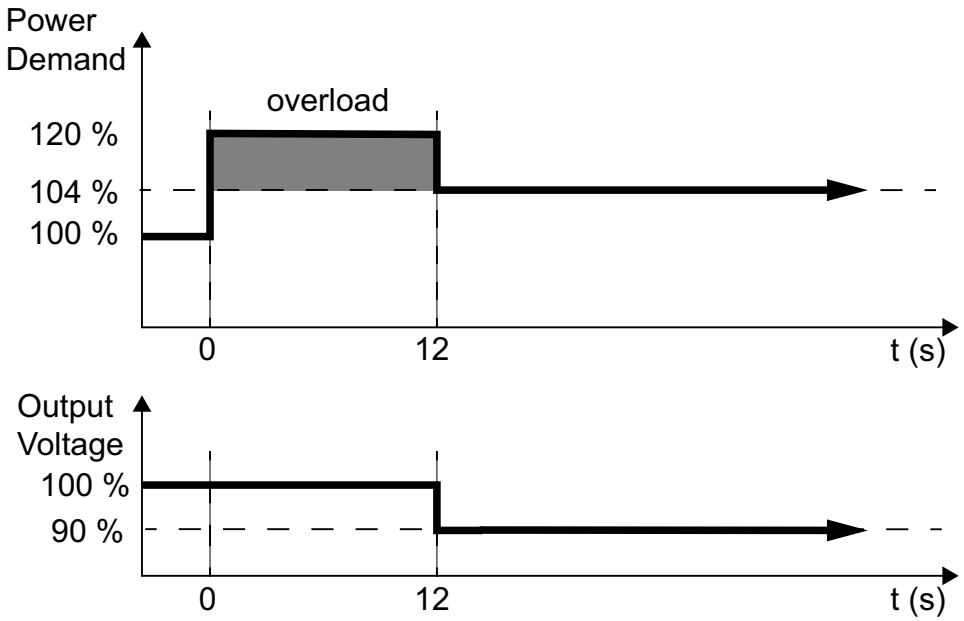


Figure 4 - Overload Protection up to 120%

Example 2: 125% power overload

The overload is supplied for approximately 10 seconds and then is reduced (Voltage and Current) to about 95% power for another 10 seconds. In this case the output voltage falls below 20 Vdc and therefore the power supply shuts down for a recovery time of 17 seconds. This procedure is repeated until the excessive current overload is resolved.

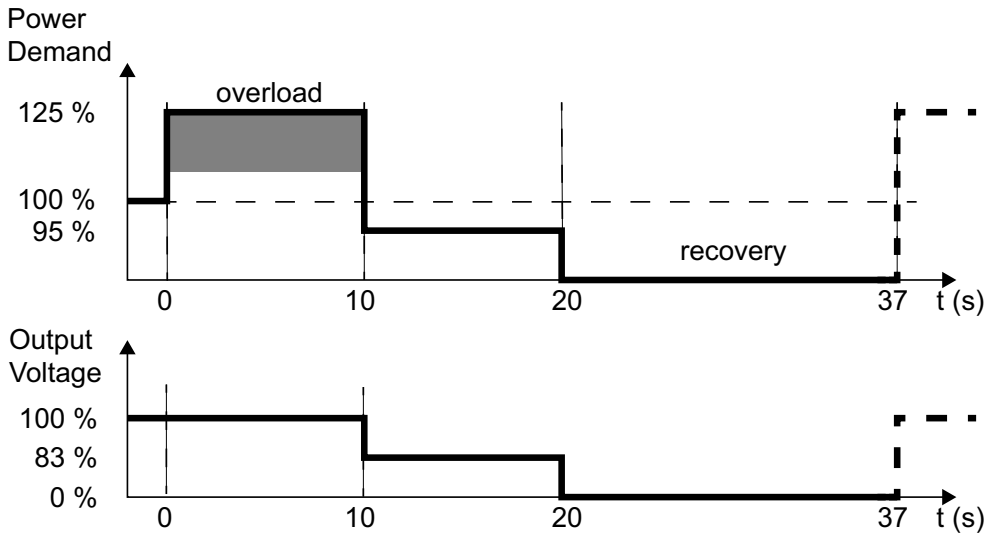


Figure 5 - Overload Protection at 125%

Example 3: 150% power overload

The overload is supplied for approximately 4 seconds and then is reduced (Voltage and Current) to about 48% power for another 2 seconds. In this case the output voltage falls below 20 Vdc and therefore the power supply shuts down for a recovery time of 17 seconds. This procedure is repeated until the excessive current overload is resolved.

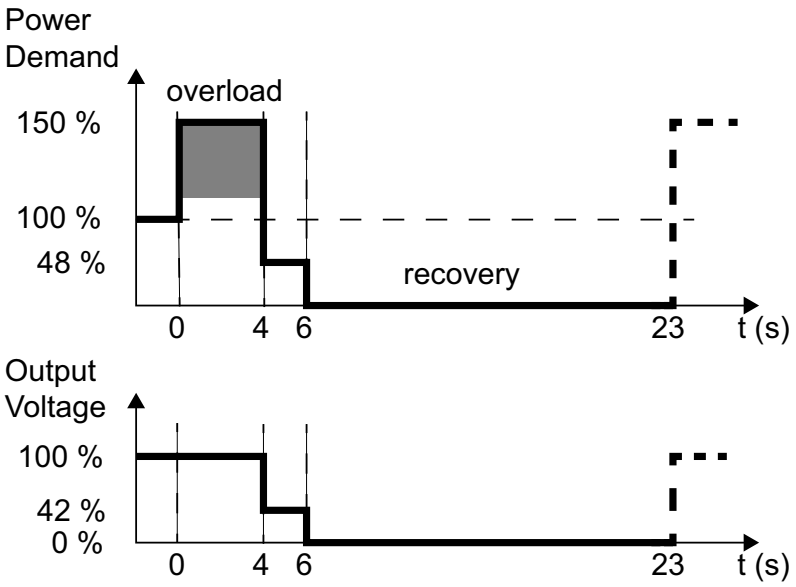


Figure 6 - Overload Protection at 150%

CHAPTER 2
PRE-INSTALLATION CHECKLIST

This chapter can be used as a checklist to verify all the steps necessary to complete installation of the PWR power supply.



HIGH VOLTAGE: Opening the cabinet requires a key that should be used by a person adequately advised or supervised by an electrically skilled person to enable him or her to perceive risks and avoid hazards which electricity can create. Internal components guarantee an IP20 degree of protection against direct contact.

1. Read all information in this manual before installation, paying particular attention to all Caution and Warning notes.

2. Mount the PWR to the Station frame using the brackets and bolts provided in the package. See "Cabinet Mounting" on page 6.

SYSTEM WIRING: DC OUTPUT

3. Connect your devices to the PWR according to your application.

   Barcode Scanners
   Correctly connect the AS-I cabling to the PWR using the AS-I cable wiring instructions for backbone and branch wiring. See "Laser Barcode Scanners" on page 10 and your scanner manual for details.
   All cables must pass through the cable entry plate using the correct AS-I cable grommets as described in "Cable Entry Plate" on page 7 and "Cable Compression Connector" on page 8.

   Image Based ID Readers
   Connect your specific product as described in the sub-paragraph under 4.4 and the reader manual. All cables must pass through the cable entry plate as described in par. 4.1.1. "Supply Capacity When Wiring Directly to AS-I Compatible Scanners" on page 10

SYSTEM WIRING: AC INPUT

4. To comply with EN 60950-1:2007 par.1.7.2.2, par. 2.7.1, par 2.7.4, par. 3.4.6, and to protect the AC input connection to the device; a disconnecting device with built in overcurrent and earth protection shall be installed external to the equipment according to local regulations.
   According to EN 60950-1:2007 par. 3.2.3; the AC input cable must have a maximum diameter of 14mm and the conduit a max diameter of 16mm.

5. With AC line voltage OFF, wire the AC Line to the AC Line Input Terminal Block see "AC Line Input Voltage" on page 18.

SYSTEM WIRING: TEST

6. Apply the AC line voltage from the building installation or the DWS-SWITCH and check that the PWR powers up correctly. The green DC-OK light should be on steady and the overload light (red) should off.

7. Close and lock the PWR enclosure and check that it does not open (lock functions correctly).

The PWR-480B installation is now complete.

CHAPTER 3
MECHANICAL INSTALLATION

CABINET MOUNTING

The cabinet must be mounted to the reading station frame using the brackets and bolts provided in the package.

1. Mount the bracket to the cabinet.
2. Mount the cabinet to the frame.



Figure 7 – Mounting Brackets

IMPORTANT: The cabinet must be installed vertically in such a way that the key lock is no higher than 1.90 m from the ground (see Figure 8).

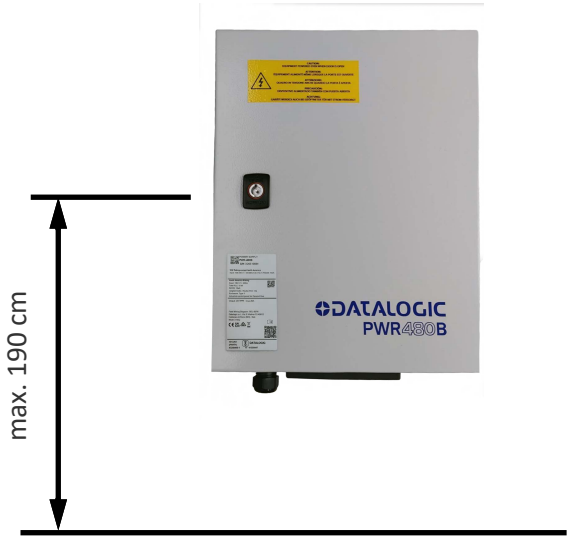


Figure 8 – PWR-480B cabinet max. height

Please note that the cabinet door can be unlocked and opened by using the key provided along with the product.

CHAPTER 4

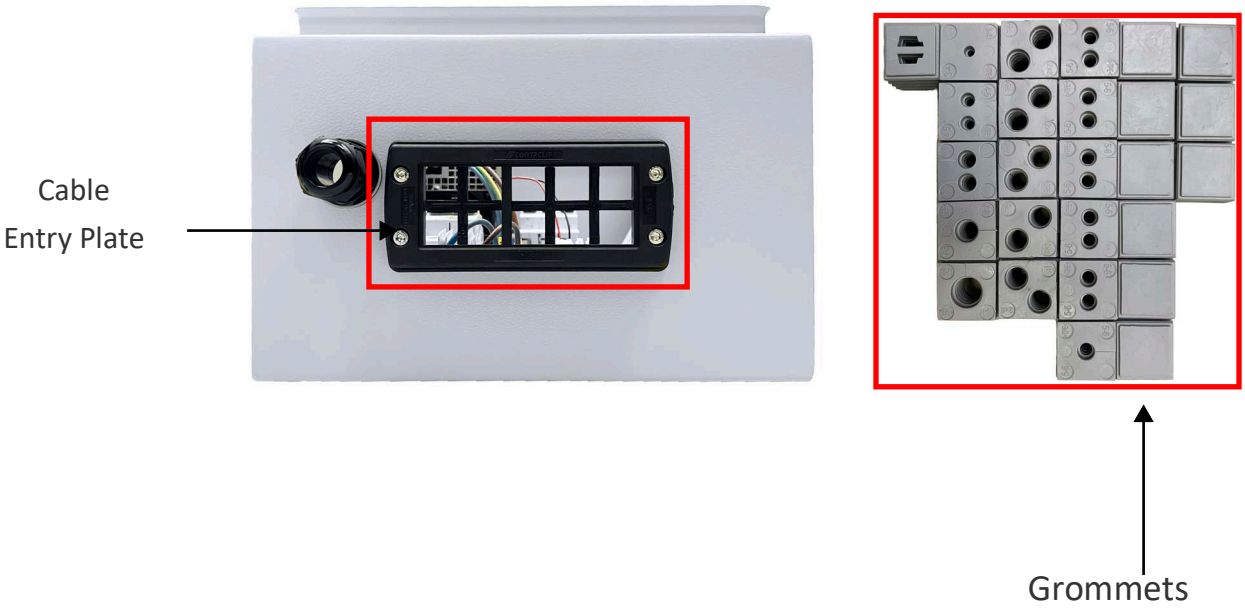
LOW VOLTAGE ELECTRICAL CONNECTIONS

DC LOW VOLTAGE CABLE INSERTION

The PWR-480B is provided with a cable entry plate and a cable compression connector. Follow the instructions below to insert the cables correctly.

Cable Entry Plate

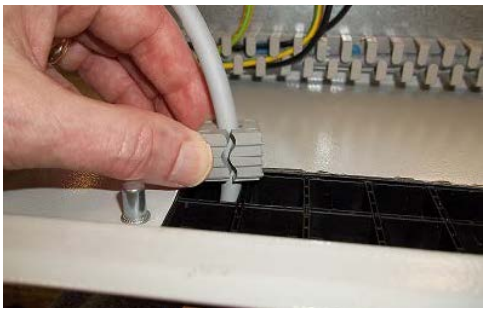
The Cable Entry Plate mounted onto the cabinet has 10 cable entry points with various hole size grommets that can be inserted into the plate.



Follow these instructions to correctly insert the cables:

1. Determine the number and size of the cables coming into and leaving the PWR-480B.
2. Take one cable end and insert it through one of the square openings of the entry plate.
3. Then take a correctly sized grommet, open it and place it around the cable.





4. Insert the grommet into the entry plate opening.



5. Insert the appropriate grommets into the unused entry plate openings to completely seal the cabinet.

Cable Compression Connector

The cable compression connector is used for AC connection.



Pass the cable through the compression connector and make sure there is enough length to easily reach the AC Terminal Block. Make sure to tighten the compression connector nut.

DC VOLTAGE TERMINAL BLOCK

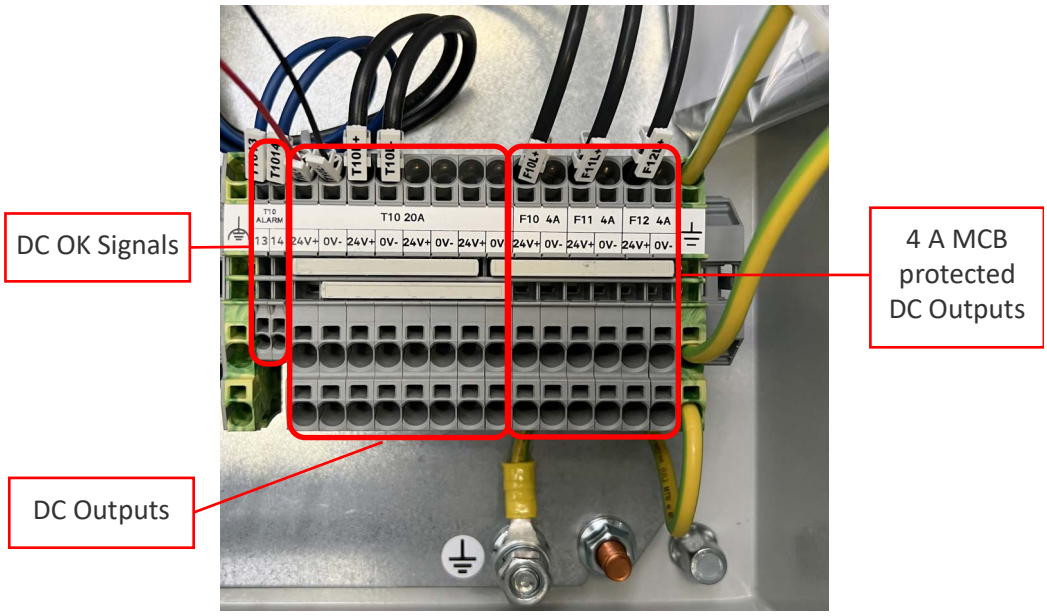


Figure 9 – PWR-480B DC Output Power Connections

DC OK Monitoring

The DC voltage terminal block provides two wiring terminals (13-14), which monitor the status of the switching power supply (DC OK feature). When the power supply module runs correctly, lines 13 and 14 form a normally closed contact. If the power module experiences problems (i.e. output overload causing output voltage to be reduced by less than 90% of nominal) these lines open. Lines 13 and 14 are decoupled from the power output lines and can be connected to a free digital input to signal this alarm condition.

DC Direct Output

The 24 volt DC Output terminals are divided into two sections: direct output and 4A current limited output. Connect the output devices according to your application requirements.

The 4A current limited outputs are each protected by a miniature circuit breaker (MCB), 4A, 1p, C-Char device.

LASER BARCODE SCANNERS

Supply Capacity When Wiring Directly to AS-I Compatible Scanners

For direct wiring, power distribution is performed simultaneously for all the scanners. However all the scanner motors start up slowly so that there is no significant peak current draw. See the specific scanner manual for consumption data.

The maximum number of same type scanners to be supplied for direct wiring by a single PWR-480B is shown in the table below and depends on the wiring topology:

PWR-480B POWER SUPPLY	MAXIMUM NUMBER OF SCANNERS BY TOPOLOGY		
	TRIPLE BRANCH	DOUBLE BRANCH	SINGLE BRANCH
DS8110	22	18	9
DX8210	22	18	9

The following products are also AS-I compatible: DS5100, DM3610, SC5000. In case of networks using a mix of products, you must calculate the total power consumption so as not to exceed the limits for the specific topology used. See the specific product reference manual in the Technical Features chapter for consumption data.

AS-I Single Branch	200 W max
AS-I Double Branch	200 W max per branch
AS-I Triple Branch	480 W max (200 W max per branch)

The power supply unit is connected directly to the scanners via AS-I cabling.

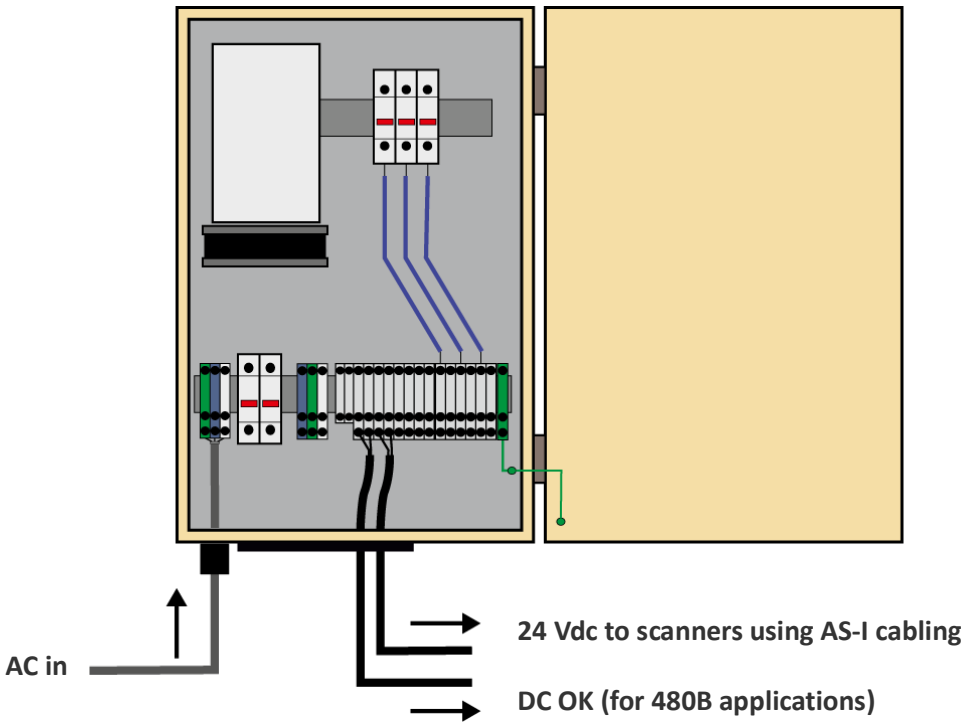


Figure 10 - Connecting PWR-480B Directly to Scanners

Refer to the specific scanner manual for I/O interface wiring connections.

AS-I Wiring Topologies

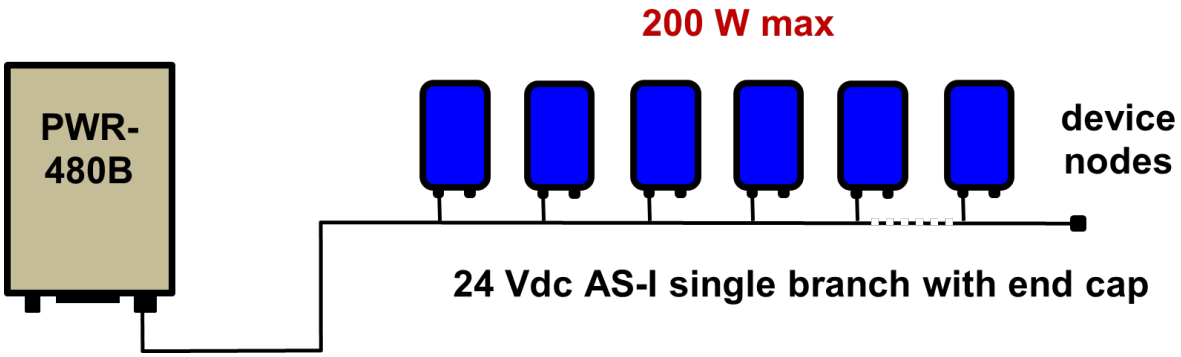


Figure 11 – Single Branch Topology

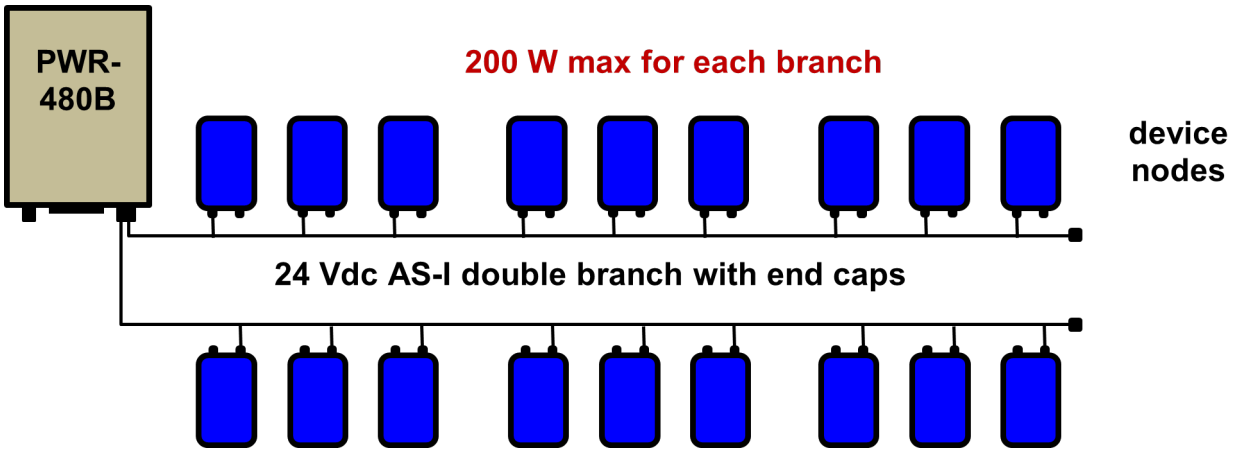
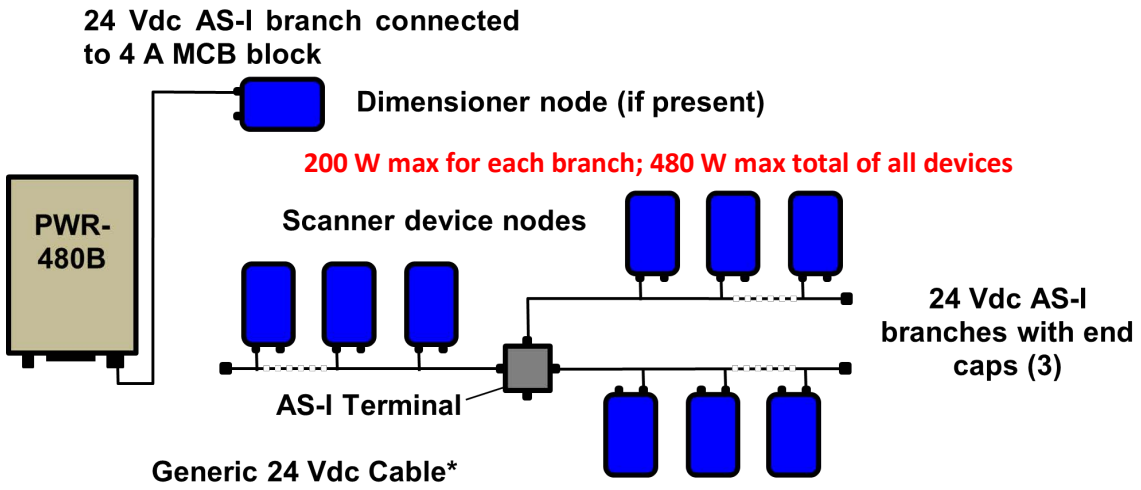


Figure 12 – Double Branch Topology



* 24 Vdc Cable must guarantee at least 23 Vdc at AS-I Terminal input terminal

Figure 13 - Triple Branch Topology

Supply Capacity When Wiring Directly to Lonworks Scanners

IFor direct wiring, power distribution is performed simultaneously for all the scanners. However, all the scanner motors start up slowly so that there is no significant peak current draw. See the specific scanner manual for consumption data.

The maximum number of scanners to be supplied for direct wiring by a single PWR-480B is shown in the table below:

PWR-480B POWER SUPPLY	MAXIMUM NUMBER OF SCANNERS	CABLES
DX8200A	12	CAB-8305 and CAB-8605
DS8100A	16	CAB-8305 and CAB-8605
DX6400	20*	CAB-63xx
DS6400 / DS6300	24*	CAB-63xx

NOTE: * The maximum current to be propagated through 6000 series scanners is 2A, therefore a CAB-63xx power drop cable is required for every three readers.

The power supply unit is connected directly to the scanners through Lonworks cables.

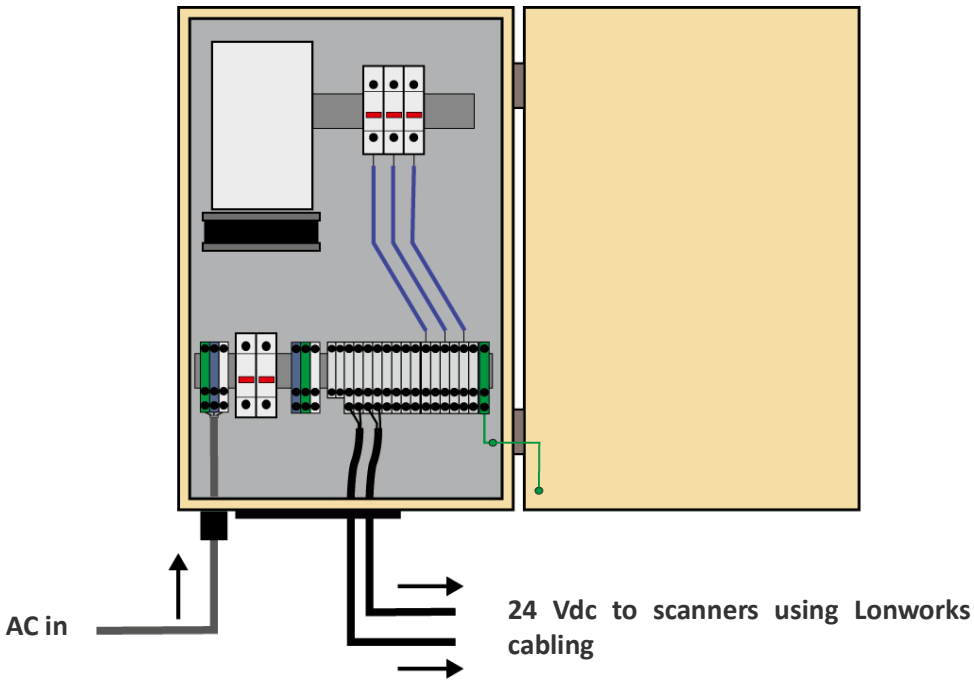


Figure 14 - Connecting PWR-480B Directly to Lonworks Scanners

LONWORKS CABLES	
Wire Color	**Meaning**
Red	+24 Vdc
Black	GND

Refer to the specific scanner manual for I/O interface wiring connections.

IMAGE-BASED ID READERS

Supply Capacity When Wiring to XRF410N Readers

The maximum number of XRF410N modules to be supplied by a single PWR-480B is shown in the following table.

XRF410N MODEL	MAXIMUM NUMBER OF MODULES
Base (Bxx)	8
Hi Perf (Hxx)	4

The power supply unit is connected to the XRF410N Base module through the CBX500 ATS-001 according to the following example diagram:

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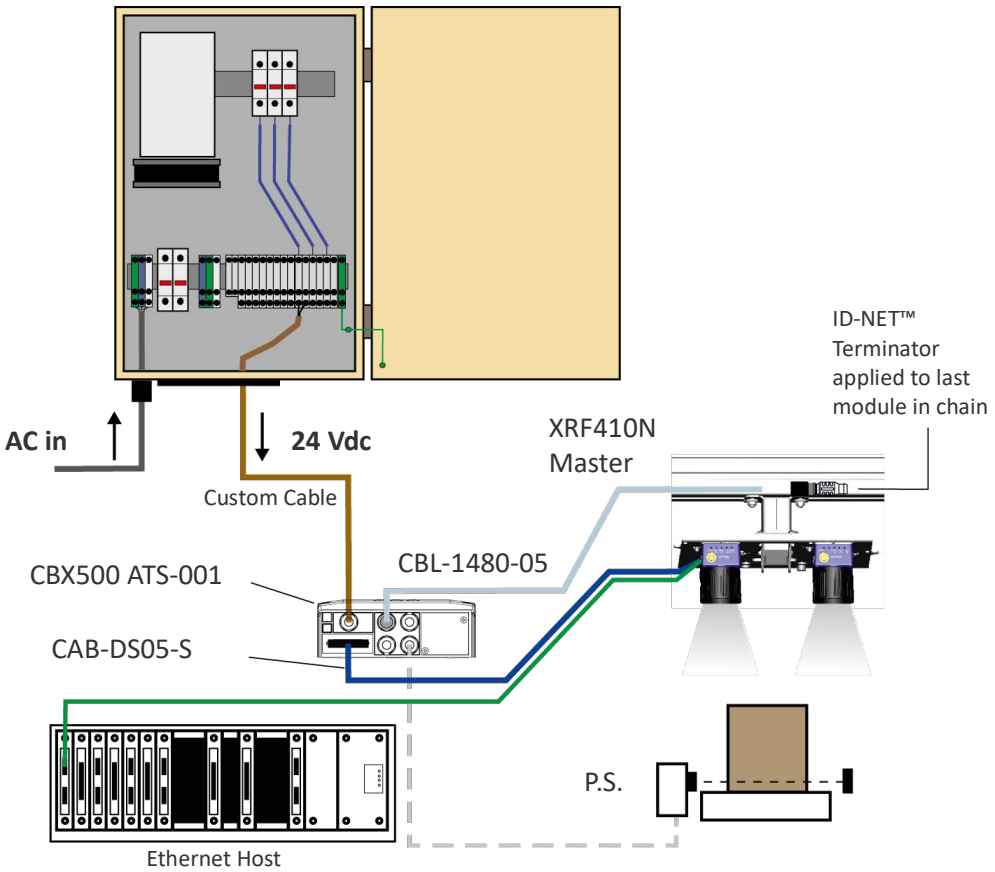


Figure 15 - Connecting PWR-480B to XRF410N Base Modules

CUSTOM POWER CABLE TO CBX	
PWR-480B	**CBX**
+24 Vdc	Vdc
GND	GND

The power supply unit is connected to the XRF410N Hi Perf module through the CBX500 ATS-001 according to the following example diagram. In this case separate power connection is also supplied to the QL connector for Illuminator power.

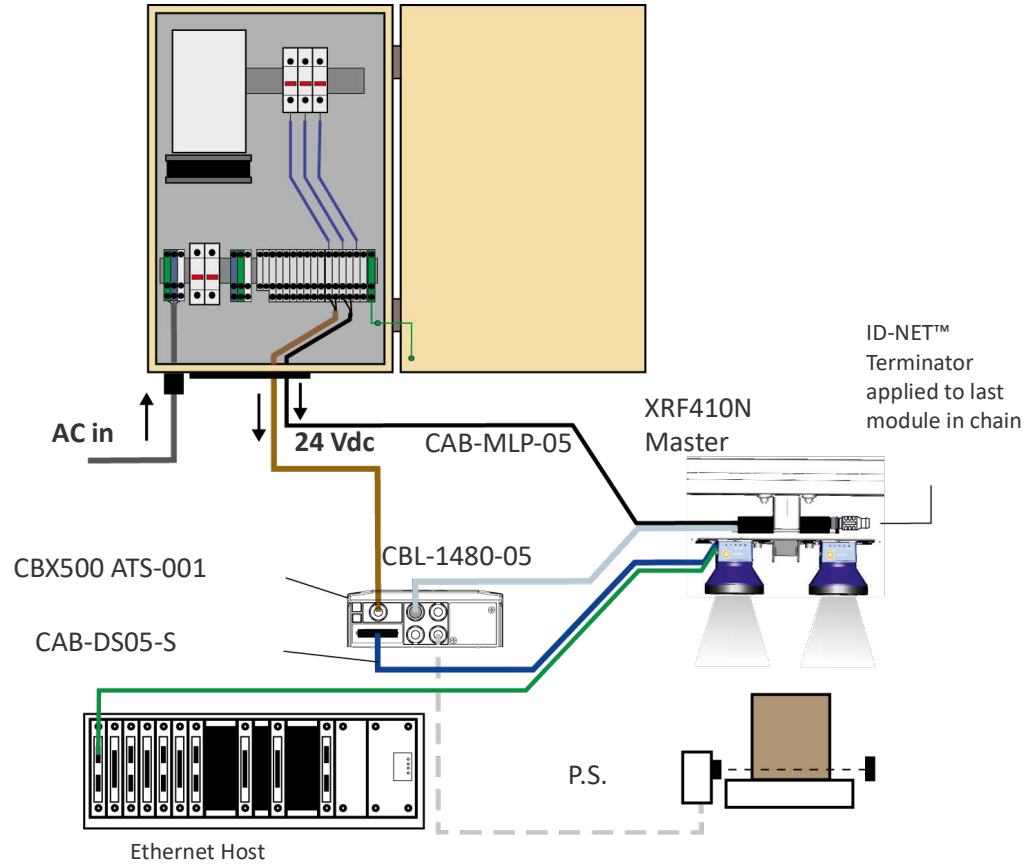


Figure 16 - Connecting PWR-480B to XRF410N Hi Perf Modules

CUSTOM POWER CABLE TO CBX		CAB-MLP-0X CABLE	
PWR-480B	**CBX**	**Wire Color**	**Meaning**
+24 Vdc	Vdc	White	+24 Vdc
GND	GND	Blue	GND

Supply Capacity When Wiring to Matrix 450N Readers

The maximum number of Matrix 450Ns to be supplied by a single PWR-480B is shown in the following table.

	MAXIMUM NUMBER READERS
Matrix 450N	4

The power supply unit can be connected to the Matrix 450N readers according to the following example diagram:

ID-NET Synchronized Network

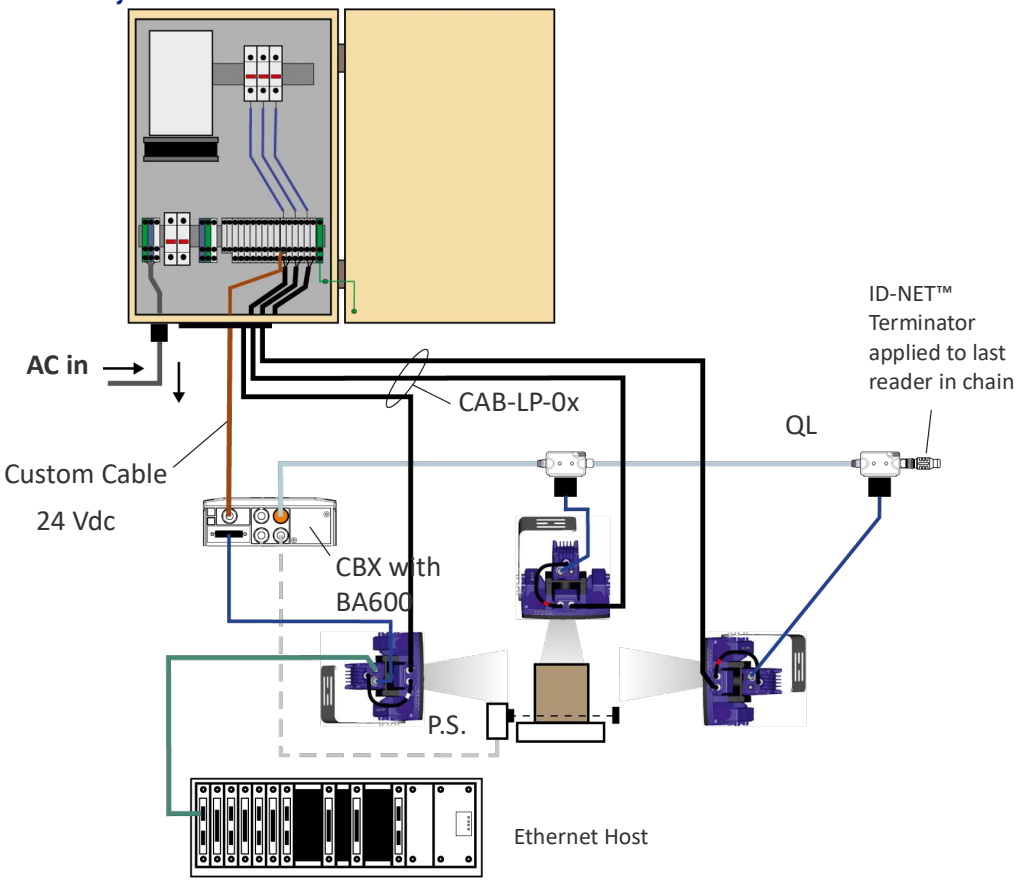


Figure 17 - Connecting PWR-480B to a Matrix 450N ID-NET Synchronized Network

The Matrix M450N ID-NET Master connected to the CBX uses the CAB-LD-102 no power cable while the Slaves connected to the QLs use the CAB-LD-002 power cable between the reader and its relative LT-03x illuminator

CUSTOM POWER CABLE TO CBX		CAB-LP-0X CABLE TO LT-03X	
PWR-480B	**CBX**	**Wire Color**	**Meaning**
+24 Vdc	Vdc	Brown/White	+24 Vdc
GND	GND	Black/Blue	GND

The power supply unit can be connected to the Matrix 450N readers according to the following example diagram:

ID-NET Multidata Network

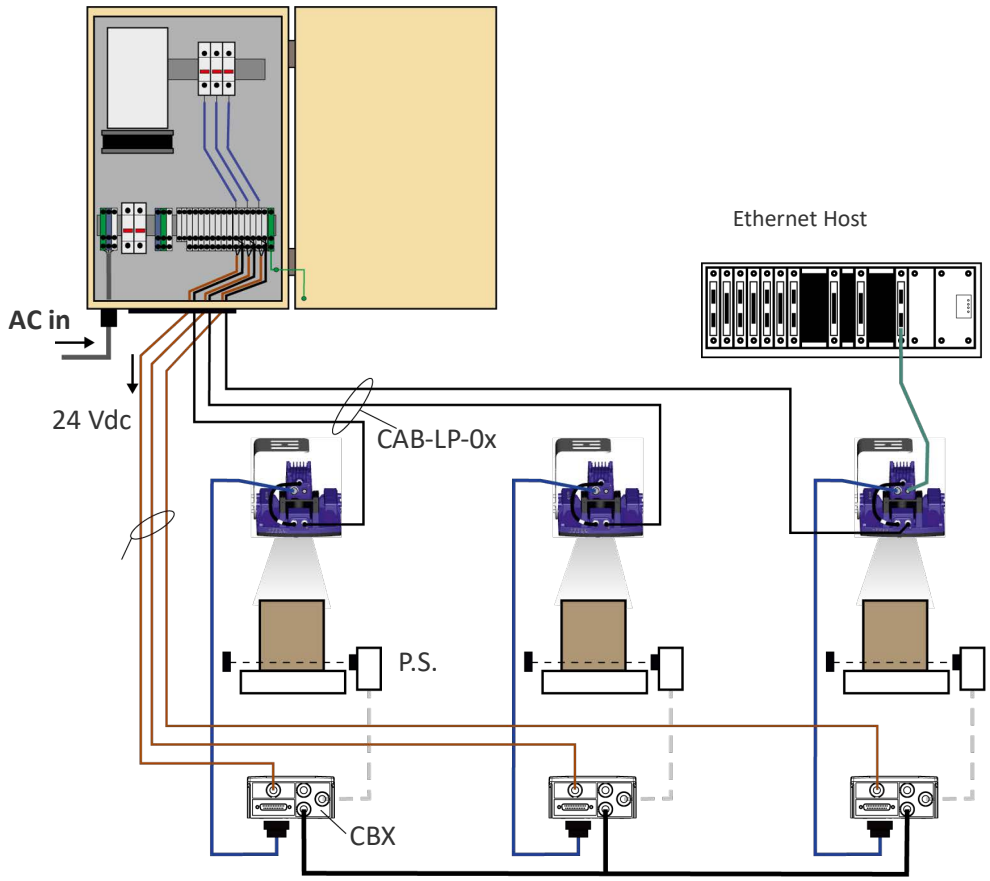


Figure 18 - Connecting PWR-480B to a Matrix 450N ID-NET Multidata Network

All Matrix M450N ID-NET units that require Trigger or IO connections must use the CAB-LD-102 no power cable between the Matrix 450N and its relative LT-03x.

CUSTOM POWER CABLE TO CBX		CAB-LP-0X CABLE TO LT-03X	
PWR-480B	**CBX**	**Wire Color**	**Meaning**
+24 Vdc	Vdc	Brown/White	+24 Vdc
GND	GND	Black/Blue	GND

Supply Capacity When Wiring to AI7000s

One PWR-480B is able to power:

- one AI7000 illuminator (including the AV7000 camera which is powered via this unit and one CBX510 with all the standard sensors)

The power supply unit is connected to the camera illuminator according to the following diagram (power supply side):

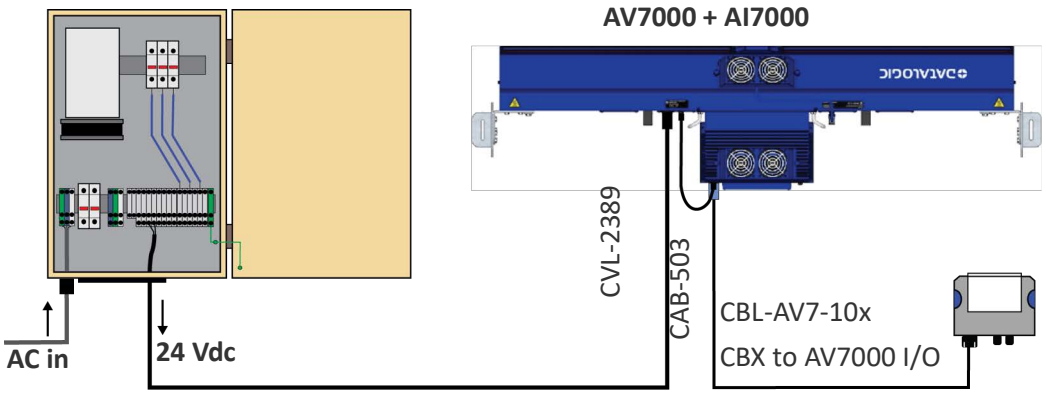


Figure 19 - Connecting PWR-480B to AI7000 Illuminator and CBX

NOTE: The AI7000 series illuminators are supplied with a CVL-2389 extension power cable. Use this cable to connect the PWR-480B power supply by cutting off the cable's male Amphenol connector and connecting the wires to the PWR-480B according to the table below:

CVL-2389 CABLE TO AI7000	
Wire Color	**Meaning**
White	GND
Green	+24 Vdc
Red	+24 Vdc
Black	GND

The CBX510 connection box receives power through the CBL-AV7-10x from the AV7000 IO connector. For further details see the AV7000 Installation Manual.

CHAPTER 5
AC LINE VOLTAGE ELECTRICAL CONNECTIONS

AC LINE INPUT VOLTAGE



HIGH VOLTAGE: This operation must be performed by a certified electrician.

Wire according to the following points:

- Primary wiring: Overcurrent protection should be provided by a 16 A building installation circuit breaker. PWR-480B input components are rated for an Icp of 10 kA max.
- Wiring methods from the branch circuit breaker to the PWR-480B power supply shall comply with the National Electric Code ANSI\NFPA. The Datalogic DWS-SWITCH is an AC Power Disconnector and Distributor cabinet which provides this protection.
- For primary wiring use a 3-conductor cable (between 2.5 mm2 - 4 mm2 (13 AWG – 11 AWG), for every conductor. Choose the overall cable diameter and UL Listed conduits accordingly. The AC input cable must be inserted through the AC Input Cable Compression Connector.
- The individual conductors must be inserted into the dedicated terminal blocks on the DIN rail (see figure below) which are marked Line (L) neutral (N) and Protection Earth (PE).
- Replace the protection cover over the spring clamp connector after correctly installing the wires.

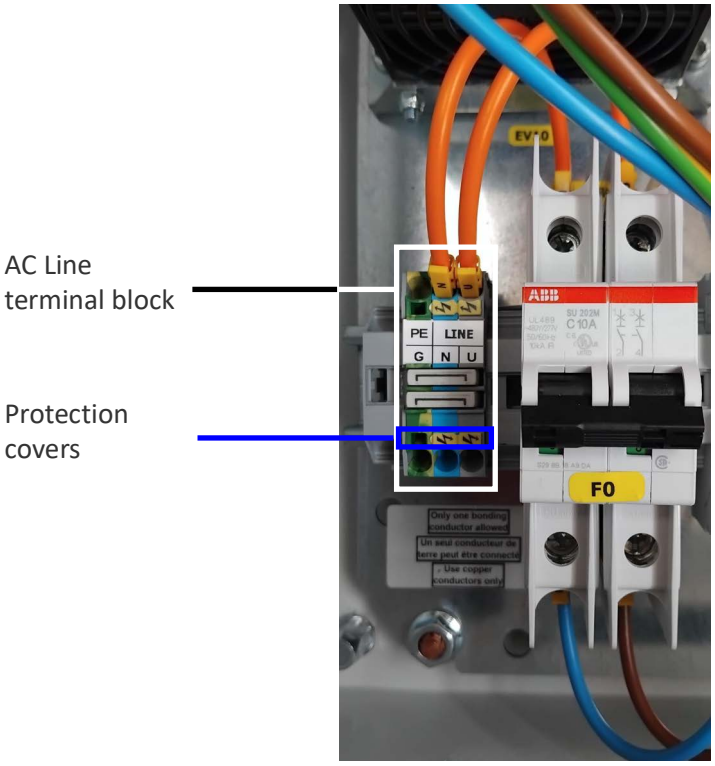


Figure 20 – PWR-480B AC Line Terminal Block with Protection Covers

The terminal block marked with the ground symbol is a special block which allows direct connection of the Protection Earth with the enclosure of the PWR-480B.

CHAPTER 6
TECHNICAL SPECIFICATIONS

ITEM	DESCRIPTION
ELECTRICAL FEATURES	
Input Voltage	AC from 100 to 240 V from 50 to 60 Hz
Input Current Consumption	Max 6 A Icp 10kA - output at full load
Output Voltage	24 Vdc
Nominal Output Current	20 A
Max Continuous Overcurrent	22 A (up to 40°C ambient temperature)
ENVIRONMENTAL FEATURES	
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Storage Temperature	-25 to +70 °C (-13 to +158 °F)
Humidity	5-95% non condensing
Protection Class EN 60529	IP65[a]
PHYSICAL FEATURES	
Mechanical Dimensions HxLxD	400 x 300 x 210 mm (15.8 x 11.8 x 8.3 in)
Weight	about 12 kg (26.5 lbs)

a. when cables are inserted into the proper holes of the cable entry plate and all unused holes and compression connectors are sealed.

APPENDIX A
ELECTRICAL DIAGRAMS

PWR-480B ELECTRICAL DIAGRAM

The PWR-480B components are electrically connected as displayed in the following diagram:

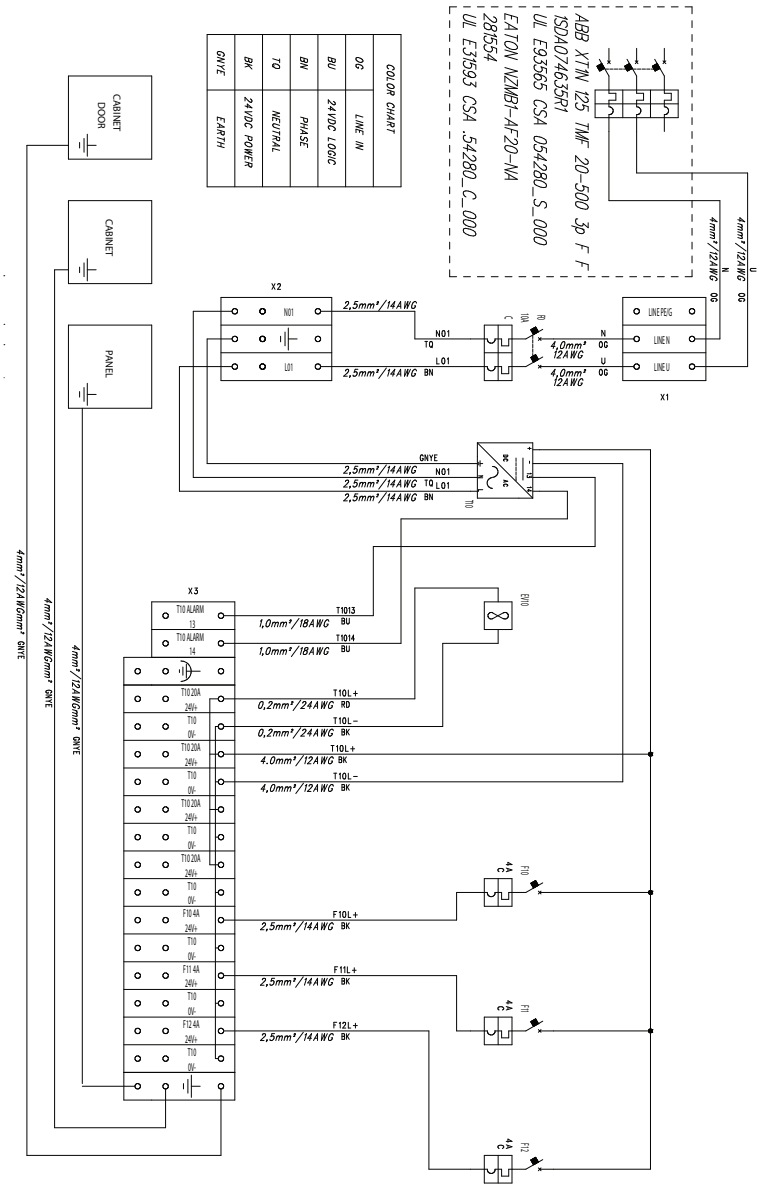


Figure 21 - PWR-480B Electrical Diagram

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