

# INSTALLATION MANUAL



> PWR-120



Datalogic S.r.l.  
Via S. Vitalino 13  
40012 Calderara di Reno  
Italy

PWR-120 Installation Manual

Ed.: 12/2018

© 2002 – 2018 Datalogic S.p.A. and/or its affiliates ♦ ALL RIGHTS RESERVED. ♦ Without limiting the rights under copyright, no part of this documentation may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means, or for any purpose, without the express written permission of Datalogic S.p.A. and/or its affiliates.

Datalogic and the Datalogic logo are registered trademarks of Datalogic S.p.A. in many countries, including the U.S.A. and the E.U.

Matrix 120, DL.CODE and X-PRESS are trademarks of Datalogic S.p.A. and/or its affiliates. All other trademarks and brands are property of their respective owners.

Datalogic shall not be liable for technical or editorial errors or omissions contained herein, nor for incidental or consequential damages resulting from the use of this material.

821005900 (Rev. A)

# CONTENTS

---

- SAFETY REGULATIONS .....iv**
- Electrical Safety ..... iv
- Product Data Label ..... iv
- CE Compliance ..... v
- Support Through the Website ..... v
  
- GENERAL VIEW .....vi**
  
- 1 OPERATING FEATURES.....1**
- 1.1 Description .....1
- 1.2 Output Protection .....1
- 1.2.1 Overload Protection .....1
  
- 2 PRE-INSTALLATION CHECKLIST .....3**
- System Wiring: DC Output .....3
- System Wiring: AC Input .....3
- System Wiring: Test .....4
  
- 3 MECHANICAL INSTALLATION .....5**
- 3.1 Cabinet Mounting .....5
  
- 4 LOW VOLTAGE ELECTRICAL CONNECTIONS .....6**
- 4.1 DC Low Voltage Cable Insertion .....6
- 4.1.1 Compression Connectors .....6
- 4.1.2 Installing the AS-I Cable .....6
- 4.2 DC Voltage Terminal Block .....7
- 4.2.1 DC OK Monitoring .....7
- 4.2.2 DC Direct Output .....7
- 4.3 Laser Barcode Scanners .....8
- 4.3.1 Supply Capacity When Wiring Directly to AS-I Compatible Scanners .....8
- 4.3.2 Supply Capacity When Wiring Directly to Lonworks Scanners .....9
- 4.4 Image-Based ID Readers .....10
- 4.4.1 Supply Capacity When Wiring to XRF410N Readers .....10
- 4.4.2 Supply Capacity When Wiring to Matrix 450N Readers .....12
  
- 5 AC LINE VOLTAGE ELECTRICAL CONNECTIONS .....13**
- 5.1 AC Line Input Voltage .....13
  
- 6 TECHNICAL FEATURES .....14**
  
- A ELECTRICAL DIAGRAMS .....15**
- PWR-120 Electrical Diagram .....15

# SAFETY REGULATIONS

---

## ELECTRICAL SAFETY

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

- EN 61439-1
- EN 60204-1
- EN 60950-1 +A11 +A1 +A12 +A2



**IMPORTANT:** This symbol is used to bring the user's attention to details that are considered IMPORTANT.



**HIGH VOLTAGE CAUTION:** 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.

It also identifies a hazard or procedure that, if incorrectly performed, could cause personal injury or result in equipment damage. **Operations having this symbol must be performed by qualified personnel only.**

## 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 20<sup>th</sup>, 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.

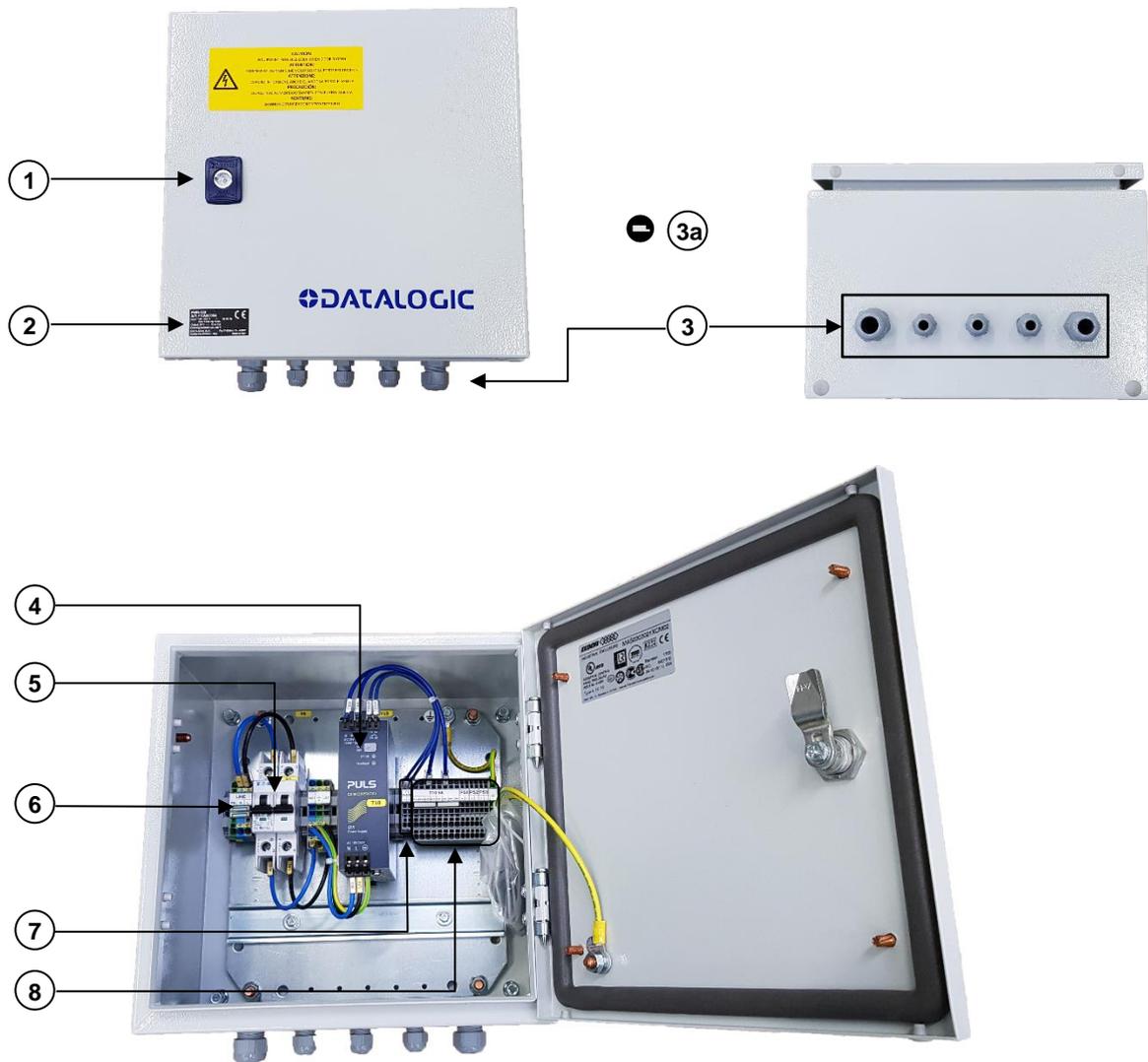
## SUPPORT THROUGH THE WEBSITE

Datalogic provides several services as well as technical support through its website. Log on to [www.datalogic.com](http://www.datalogic.com) and click on the **SUPPORT** link which gives you access to:

- Downloads by selecting your product model from the dropdown list in the Search by Product field for specific Data Sheets, Manuals, Software & Utilities, and Drawings;
- Repair Program for On-Line Return Material Authorizations (RMAs) plus Repair Center contact information;
- Customer Service containing details about Maintenance Agreements;
- Technical Support through email or phone.

# GENERAL VIEW

---



- ① Key Lock
- ② Product Data Label
- ③ Compression Connectors
- ③a AS-I Cable Sealing Grommet
- ④ Monophase Switching Power Supply
- ⑤ Thermal-Magnetic Circuit Breaker
- ⑥ AC Line Input Terminal Block
- ⑦ "DC OK" Terminal Block
- ⑧ 24 Vdc Terminal Block

Figure 2 – PWR-120 General View

# 1 OPERATING FEATURES

## 1.1 DESCRIPTION

The PWR-120 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 monophasic switching power supply.

The 24 Vdc output power is connected to the output terminal blocks which are protected by the internal power supply features.

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.

## 1.2 OUTPUT PROTECTION

The power supply implements an overload protection.

### 1.2.1 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.

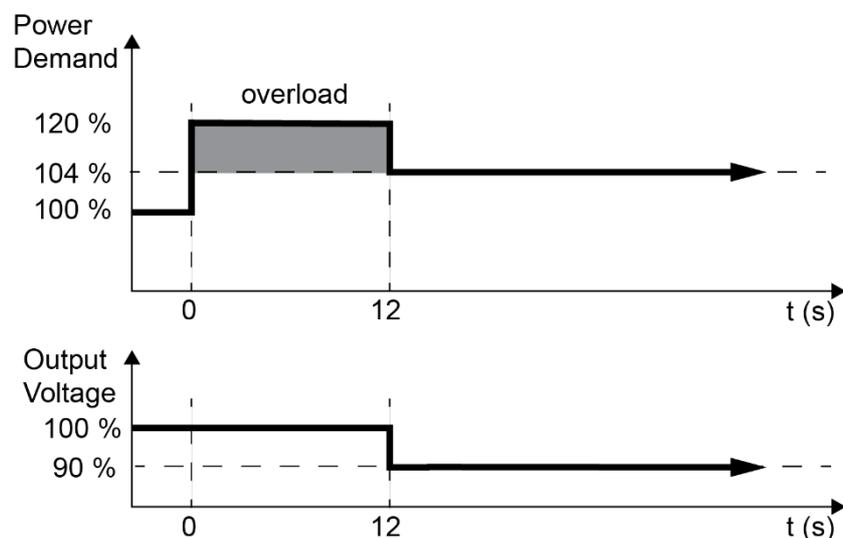


Figure 3 – Overload Protection up to 120%

### 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.

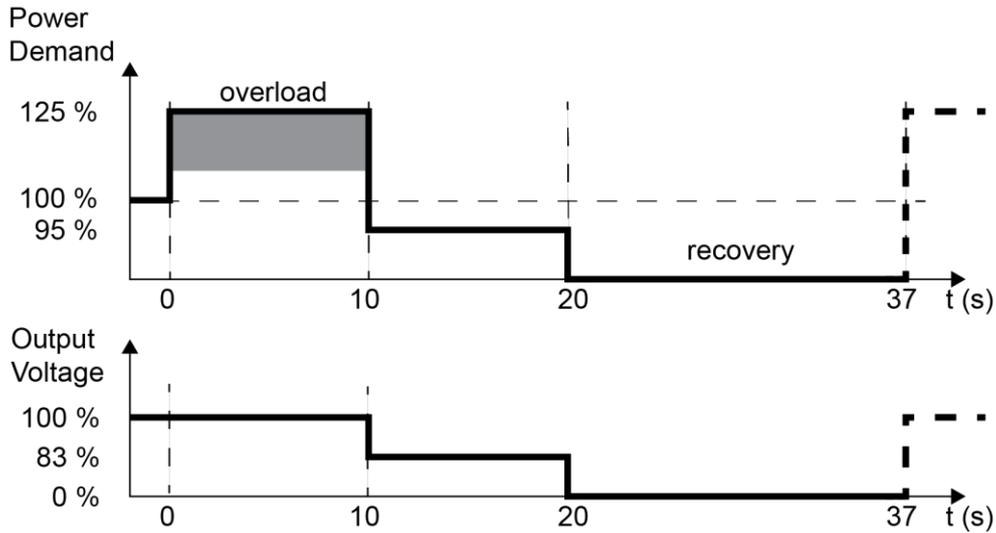


Figure 4 – Overload Protection at 125%

### 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.

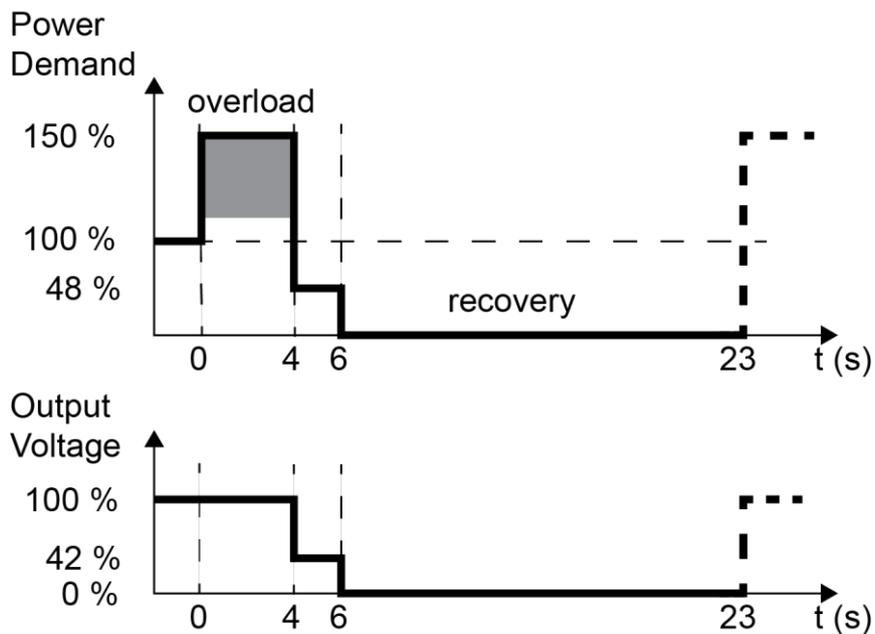


Figure 5 – Overload Protection at 150%

## 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.



**CAUTION:** 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 par. 3.1.

### 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 par. 4.3.1 and your scanner manual for details. All cables must pass through the compression connector as described in par. 4.1.

#### 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 compression connector as described in par. 4.1.

### SYSTEM WIRING: AC INPUT

- 4) To comply with EN60950-1:2007 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 EN60950-1:2007 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 par. 5.1.

**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-120 installation is now complete.

## 3 MECHANICAL INSTALLATION

### 3.1 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.

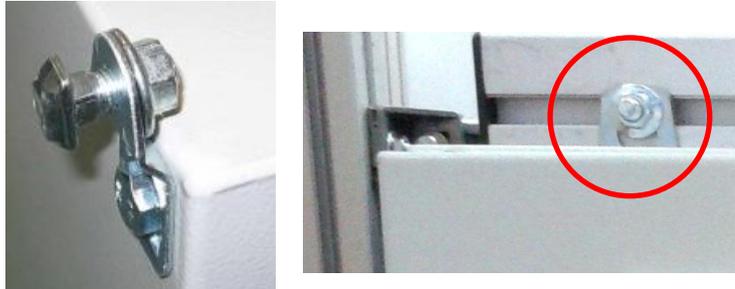


Figure 6 – Mounting Brackets



**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 Fig. 2).



Figure 7 – PWR-120 cabinet max. height

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

## 4 LOW VOLTAGE ELECTRICAL CONNECTIONS

### 4.1 DC LOW VOLTAGE CABLE INSERTION

The compression connectors have IP65 protection capability. All cables must pass through the compression connectors.

#### 4.1.1 Compression Connectors

Follow these instructions to correctly insert the cables:

- 1) Determine the number and size of the cables coming into and leaving the PWR-120.
- 2) Locate the correct compression connector sizes and positions relative to these cables.
- 3) Pass the cable end through the proper compression connector so that the gland material seals around it when tightened.

There are three compression connector sizes with the following specifications:

Number of Compression Connectors	Cable Diameter	
	Millimeters	Inches
1	9 – 14	0.354 – 0.551
3	3.5 – 8	0.138 – 0.315
1	7 – 13	0.276 – 0.512

#### 4.1.2 Installing the AS-I Cable

Prepare the AS-I cable by stripping the wires and inserting first the compression connector nut, then the AS-I cable sealing grommet.



Pass the AS-I cable through the compression connector and make sure there is enough length to easily reach the 24 Vdc Terminal Block.

Seat the AS-I cable sealing grommet into the compression connector and tighten the compression connector nut,

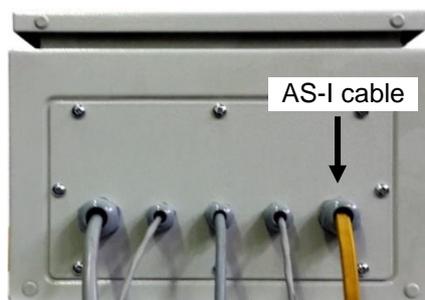


Figure 8 – Cable Insertion

## 4.2 DC VOLTAGE TERMINAL BLOCK

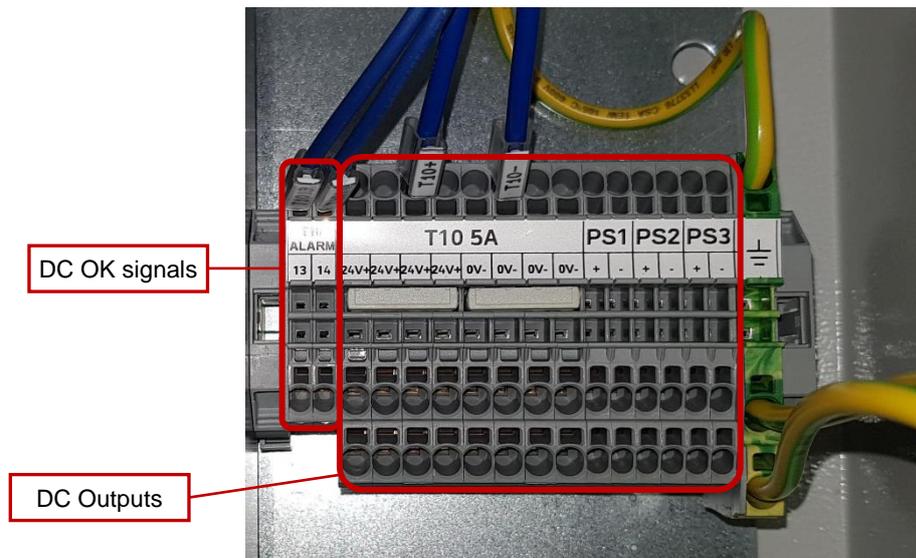


Figure 9 – PWR-120 DC Output Power Connections

### 4.2.1 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.

### 4.2.2 DC Direct Output

The 24 volt DC Output terminals allow direct connection to your devices according to your application requirements.

## 4.3 LASER BARCODE SCANNERS

### 4.3.1 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-120 is shown in the table below:

PWR-120 Power Supply	Maximum Number of Scanners
	Single Branch
DS8110	6
DX8210	6

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 power limits. See the specific product reference manual in the Technical Features chapter for consumption data.

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

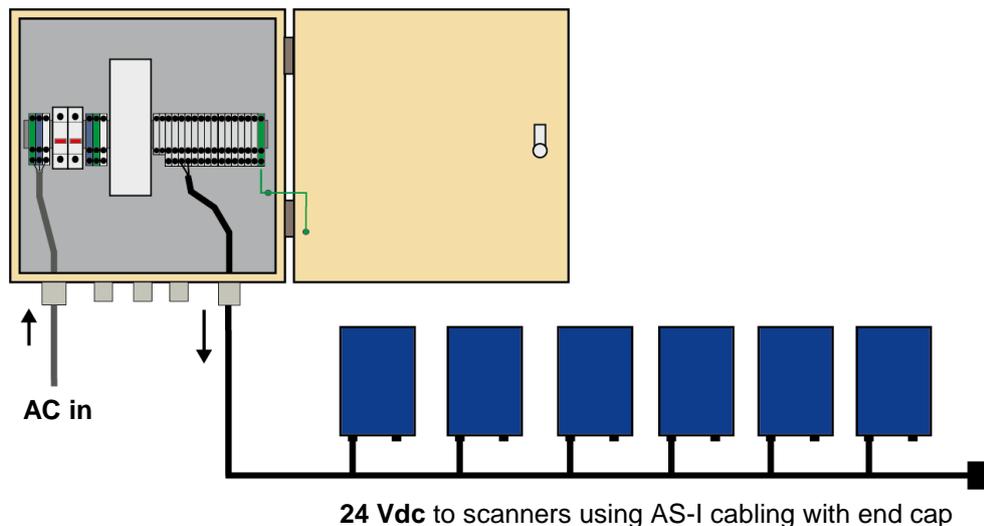


Figure 10 - Connecting PWR-120 to AS-I Compatible Scanners

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

### 4.3.2 Supply Capacity When Wiring Directly to Lonworks 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 scanners to be supplied for direct wiring by a single PWR-120 is shown in the table below:

PWR-120 Power Supply	Maximum Number of Scanners	Cables
DX8200A	3	CAB-8305 and CAB-8605
DS8100A	4	CAB-8305 and CAB-8605
DX6400	5*	CAB-63xx
DS6400 / DS6300	6*	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.

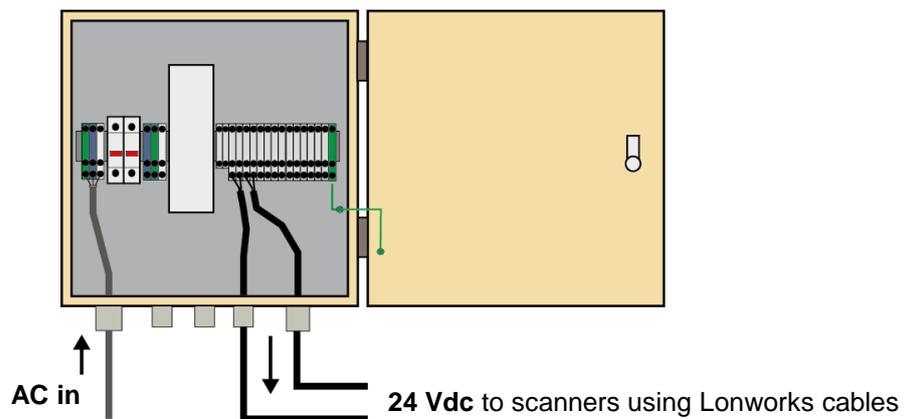


Figure 11 – Connecting PWR-120 to Lonworks Scanners

Lonworks Cables	
Wire Color	Meaning
Red	24 V+
Black	0 V-

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

## 4.4 IMAGE-BASED ID READERS

### 4.4.1 Supply Capacity When Wiring to XRF410N Readers

The maximum number of XRF410N modules to be supplied by a single PWR-120 is shown in the following table.

	Maximum Number of Modules
<b>XRF410N Model</b>	
<b>Base (Bxx)</b>	2
<b>Hi Perf (Hxx)</b>	1

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

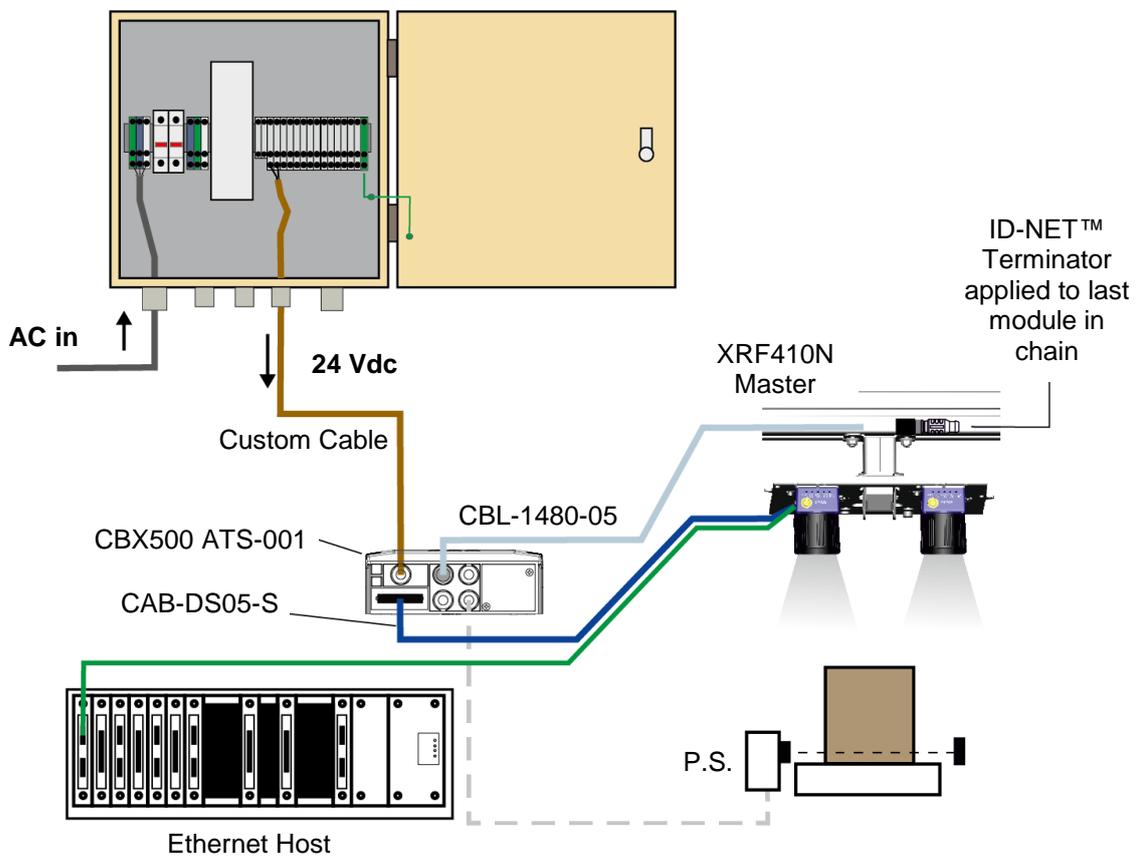


Figure 12 - Connecting PWR-120 to XRF410N Base Modules

Custom Power Cable to CBX	
<b>PWR-120</b>	<b>CBX</b>
24 V+	Vdc
0 V-	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.

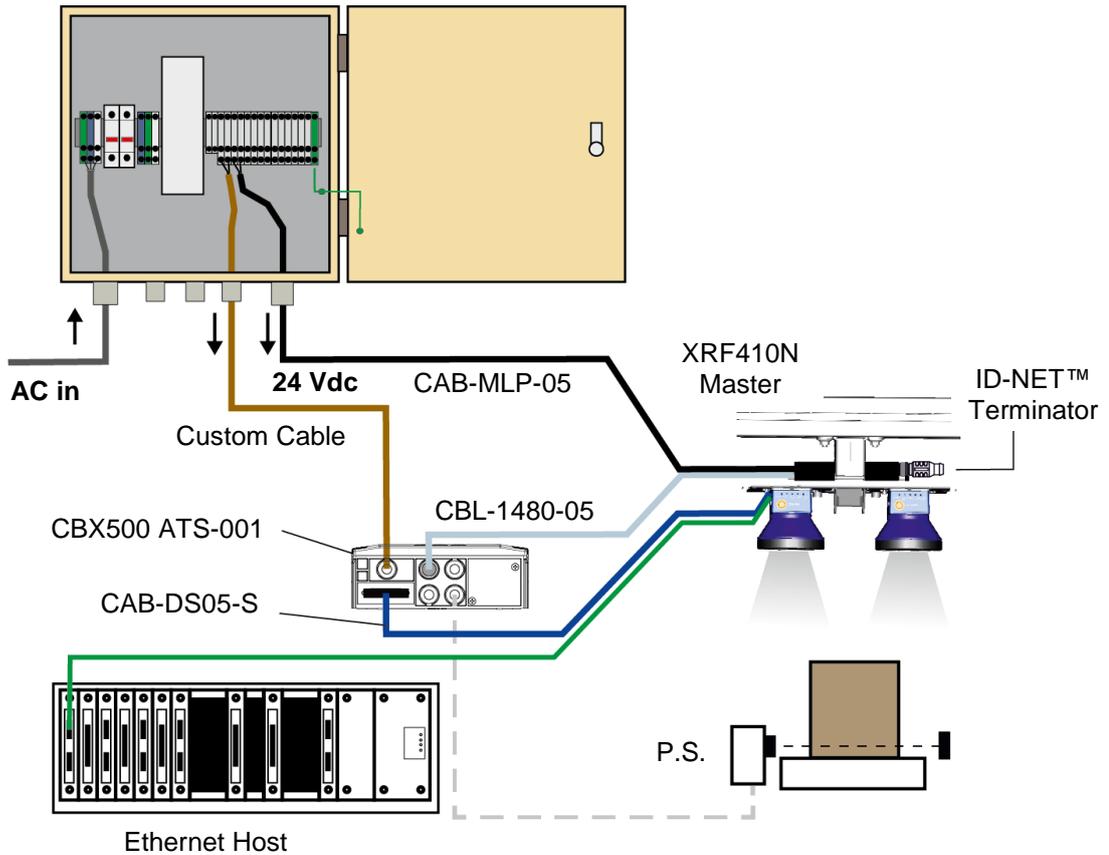


Figure 13 - Connecting PWR-120 to an XRF410N Hi Perf Module

Custom Power Cable to CBX		CAB-MLP-0x Cable	
PWR-120	CBX	Wire Color	Meaning
24 V+	Vdc	White	24 V+
0 V-	GND	Blue	0 V-



## 5 AC LINE VOLTAGE ELECTRICAL CONNECTIONS

### 5.1 AC LINE INPUT VOLTAGE



**HIGH VOLTAGE CAUTION:** 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-120 input components are rated for an Icp of 10 kA max.

Wiring methods from the branch circuit breaker to the PWR-120 power supply shall comply with the National Electric Code ANSI/NFPA. The Datalogic DWS-SWITCH is an AC Power Disconnect and Distributor cabinet which provides this protection.

For primary wiring use a 3-conductor cable (between 2.5 mm<sup>2</sup> - 4 mm<sup>2</sup> (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.

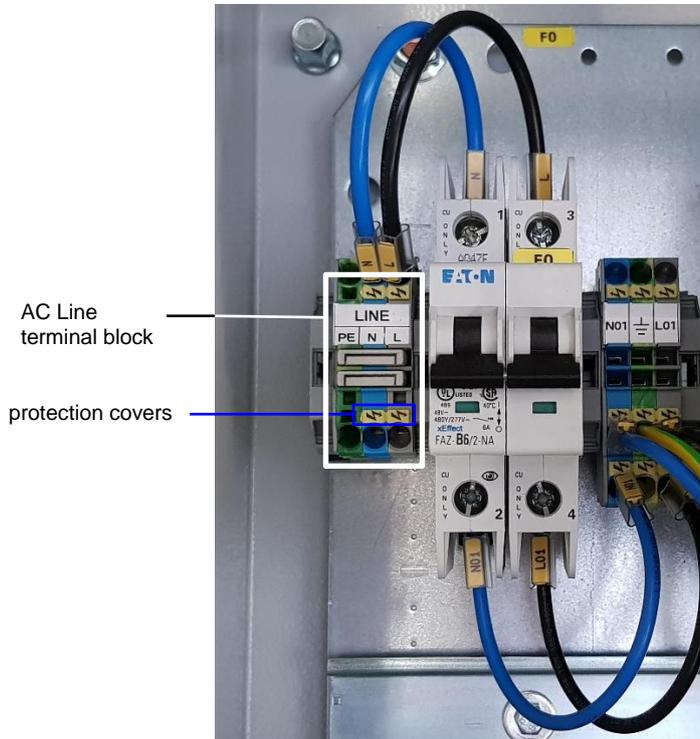


Figure 15 – PWR-120 AC Line Terminal Block with Protection Covers

## 6 TECHNICAL FEATURES

<b>ELECTRICAL FEATURES</b>	
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	5 A
Max Continuous Overcurrent	5.5 A (up to 40° C ambient temp)
<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	90% non condensing
Protection Class	IP65*
<b>PHYSICAL FEATURES</b>	
Mechanical dimensions HxLxD	300 x 300 x 210 mm (11.8 x 11.8 x 8.26 in)
Weight	9 kg (19.84 lb)

\* when all unused compression connectors are sealed with the appropriate plugs.

# A ELECTRICAL DIAGRAMS

## PWR-120 ELECTRICAL DIAGRAM

The PWR-120 components are electrically connected as displayed in the following diagram:

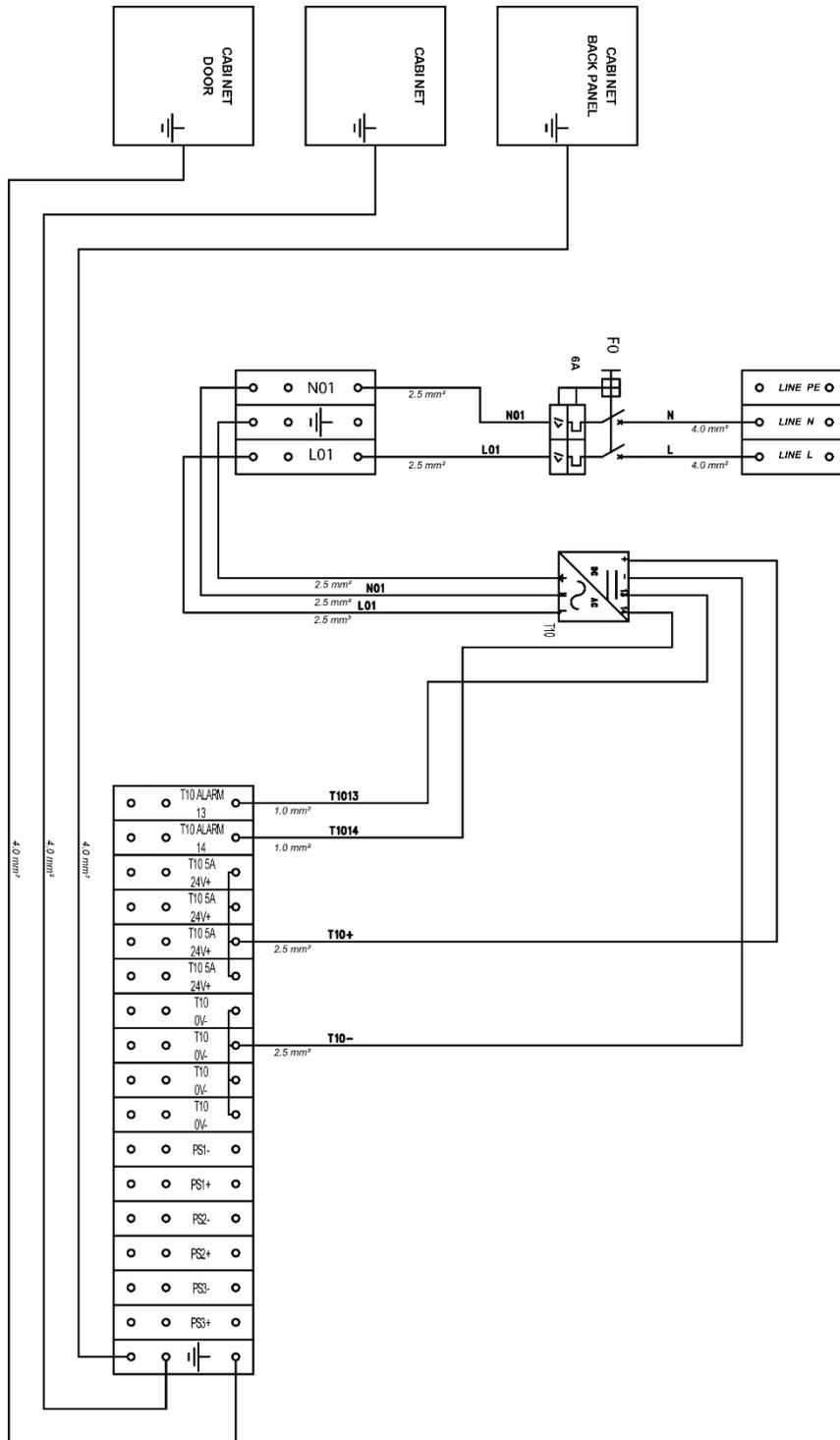


Figure 16 - PWR-120 Electrical Diagram







 **DATALOGIC**

---

[www.datalogic.com](http://www.datalogic.com)