Honeywell

ComfortPoint CP-IPC
Installation Instructions

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Installation

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This document provides the information you need to install CP-IPC and CP-EXPIO controllers. It describes the dimensions, mounting details and the terminal connections to these devices. Unless explicitly mentioned all details mentioned for CP-IPC applies to CP-EXPIO too.

Safety instructions

- When performing any operation (installation, mounting, start-up), all instructions given by the manufacturer and in particular the safety instructions provided in this document are to be observed.

- The CP-IPC controller must be installed and mounted only by authorized and trained personnel.

- If the unit is modified in any way, except by the manufacturer, all warranties concerning operation and safety becomes invalid.

- Make sure that certain local standards and regulations are observed at all times.

- Use only accessory equipments coming from or approved by Honeywell.

- Before the system is dismantled, disconnect the power supply. To perform this, remove the terminal block or install an additional 3rd-party switch onto the DIN rail close to the controller. Carefully read the following caution note.
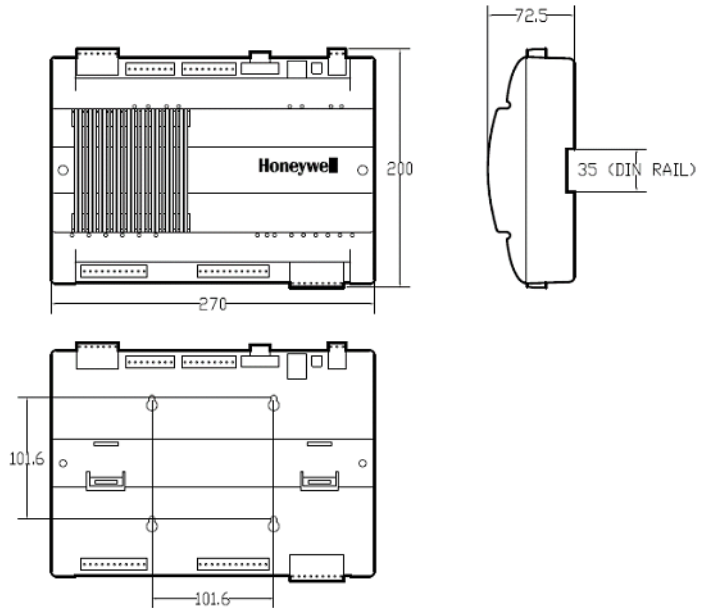
⚠ Caution

Disconnect the power supply before you start to install the CP-IPC controller. Do not reconnect the power supply until you have completed the installation.

CP-IPC controller dimensions

The following figure shows the controller dimensions of CP-IPC controller. All dimensions in the figure are in millimeters.
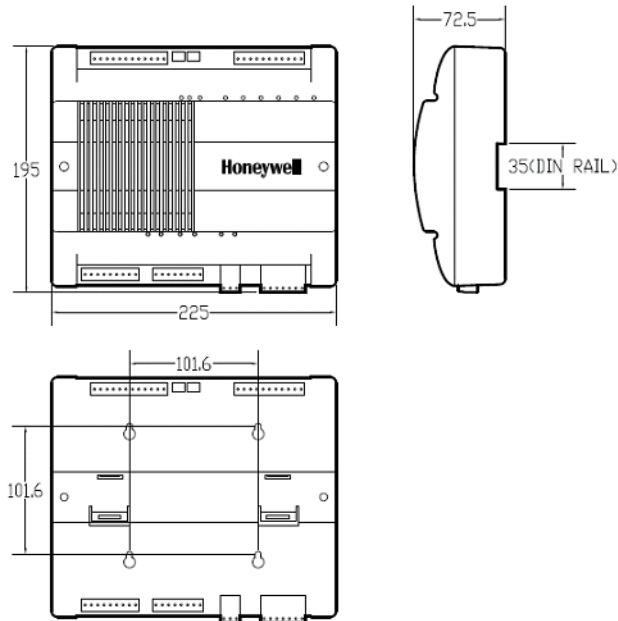
Figure 1 CP-IPC controller dimensions

CP-EXPIO module dimensions

The following figure shows the controller dimensions of CP-EXPIO controller. All dimensions in the figure are in millimeters.
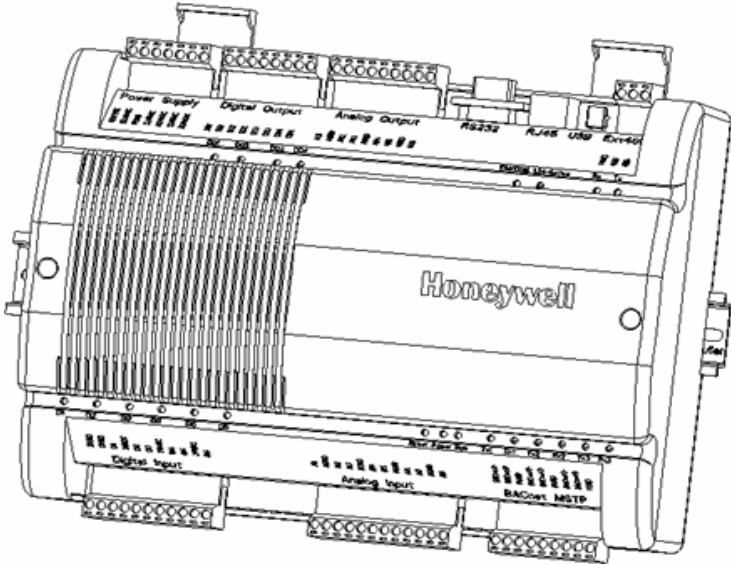
Figure 2 CP-EXPIO dimensions

Mounting CP-IPC on DIN Rail

The CP-IPC controller can be mounted on a DIN rail or with the screws on the back panel in the following figure.

Figure 3 DIN rail mounted CP-IPC

Note

The same information applies to CP-EXPIO also.

Dismounting CP-IPC

To dismount the CP-IPC controller, pull the lock strips of the controller up and then remove the controller from the DIN Rail on which it is installed.The same procedure can be applied to dismount CP-EXPIO.

Figure 4 Screw mounted CP-IPC
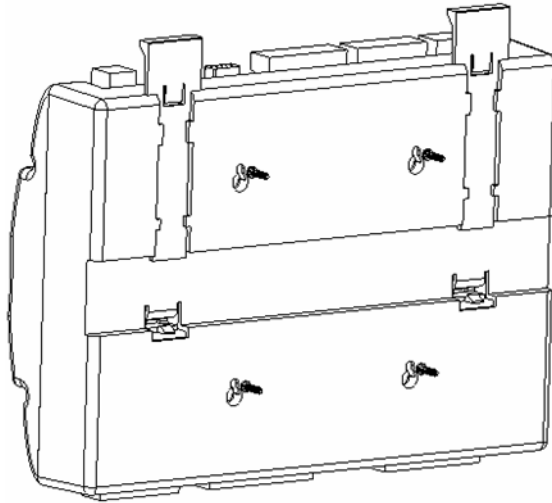
Note

The same information applies to CP-EXPIO also.

Terminal settings

2

This chapter describes the terminal settings on the CP-IPC/CP-EXPIO controller.

CP-IPC terminal overview

The following figure describes the layout of pins on the CP-IPC controller.

Figure 5 Screw mounted CP-IPC

CP-IPC LED Operation

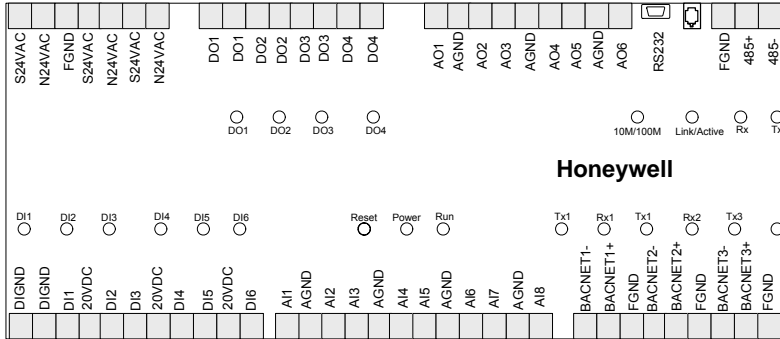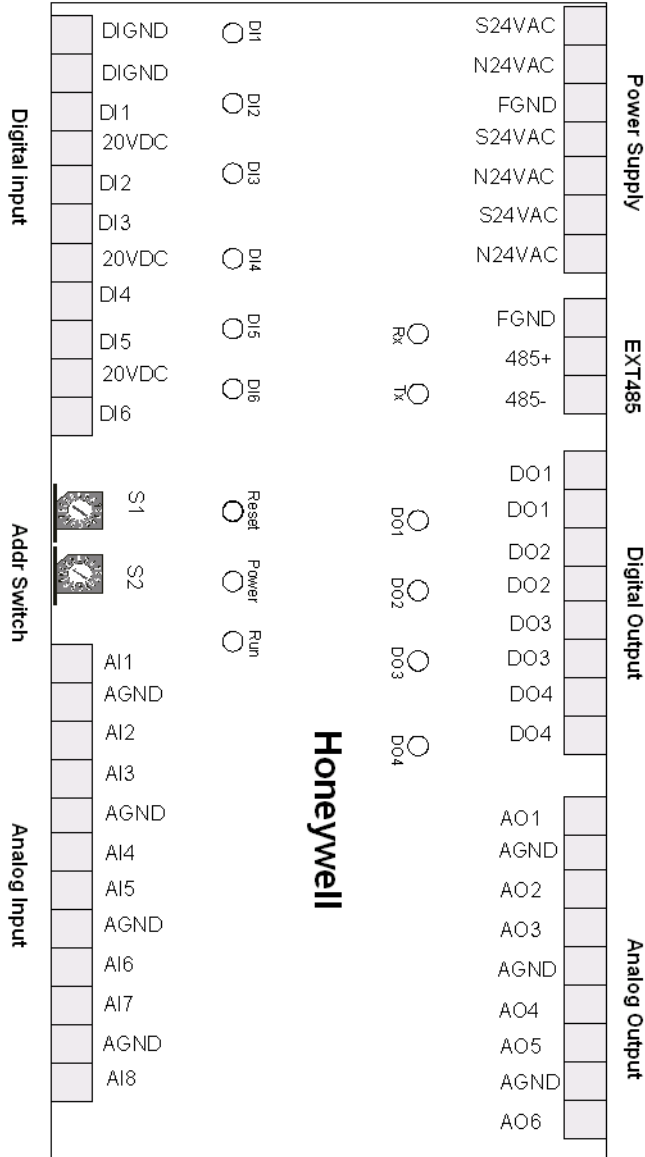| Sr.No	LED Label	LED Color	Description
1	DI1	Yellow	LED is ON when contact is closed on the Digital Input 1, Off on Contact Open
2	DI2	Yellow	LED is ON when contact is closed on the Digital Input 2, Off on Contact Open
3	DI3	Yellow	LED is ON when contact is closed on the Digital Input 3, Off on Contact Open
4	DI4	Yellow	LED is ON when contact is closed on the Digital Input 4, Off on Contact Open
5	DI5	Yellow	LED is ON when contact is closed on the Digital Input 5, Off on Contact Open
6	DI6	Yellow	LED is ON when contact is closed on the Digital Input 6, Off on Contact Open
7	Power	Green	LED is ON when Power is applied to the controller and is On continuously. Off when no power to the controller.
8	Run	Green	LED is blinking when controller is working normally
9	Rx1	Yellow	LED indicates Receive of data on MSTP Channel 1
10	Tx1	Yellow	LED indicates Transmit of data on MSTP Channel 1
11	Rx2	Yellow	LED indicates Receive of data on MSTP Channel 2
12	Tx2	Yellow	LED indicates Transmit of data on MSTP Channel 2
13	Rx3	Yellow	LED indicates Receive of data on MSTP Channel 3
14	Tx3	Yellow	LED indicates Transmit of data on MSTP Channel 3
15	Rx	Yellow	LED indicates Receive of data on XEM IO Bus
16	Tx	Yellow	LED indicates Transmit of data on XEM IO Bus
17	Link/ Active	Green	LED indicates the communication on LAN port
18	10M/100M	Green	LED is ON if LAN Connection is 100M Bits
19	DO1	Red	LED is ON when the Triac of Digital output1 is activated
20	DO2	Red	LED is ON when the Triac of Digital output2 is activated
21	DO3	Red	LED is ON when the Triac of Digital output3 is activated
22	DO4	Red	LED is ON when the Triac of Digital output4 is activated

CP-EXPIO Terminal Overview

The following figure shows the terminal layout of CP-EXPIO controller.

Figure 6 CP-EXPIO: Terminal Layout

CP-EXPIO LED operation

Sr.No	LED Label	LED Color	Description
1	DI1	Yellow	LED is ON when contact is closed on the Digital Input 1, Off on Contact Open
2	DI2	Yellow	LED is ON when contact is closed on the Digital Input 2, Off on Contact Open
3	DI3	Yellow	LED is ON when contact is closed on the Digital Input 3, Off on Contact Open
4	DI4	Yellow	LED is ON when contact is closed on the Digital Input 4, Off on Contact Open
5	DI5	Yellow	LED is ON when contact is closed on the Digital Input 5, Off on Contact Open
6	DI6	Yellow	LED is ON when contact is closed on the Digital Input 6, Off on Contact Open
7	Power	Green	LED is ON when Power is applied to the controller and is On continuously. Off when no power to the controller
8	Run	Green	LED is blinking when controller is working normally
9	Rx	Yellow	LED indicates Receive of data on XEM IO Bus
10	Tx	Yellow	LED indicates Transmit of data on XEM IO Bus
11	DO1	Red	LED is ON when the Triac of Digital output1 is activated.
12	DO2	Red	LED is ON when the Triac of Digital output2 is activated.
13	DO3	Red	LED is ON when the Triac of Digital output3 is activated.
14	DO4	Red	LED is ON when the Triac of Digital output4 is activated.

Setting MAC address of CP-EXPIO

There are two Hex switches on the controller: S1 and S2, as shown in the following Figure 7 on page 16.

Figure 7 HEX switches
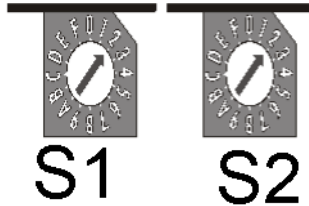
S1=2 for address 2

S1=3 for address 3

S1 is used for Setting Address of EXPIO. S2 is not used and is for future use. This is HEX Switch which means if address 10 is desired to be set S1 should be set to A.

Attention

Each CP-EXPIO on same EXT 485 bus should have unique Address and this has to be ensured. Valid Address for EXPIO is from 1 to 15.

0 is reserved by IPC controller.

Analog inputs

Analog inputs can be used, for both CP-IPC and CP-EXPIO.

Technical specification

Item	Description
Number	8 Universal Inputs
	Note: The input type selection is done in the Programming Tool software.
	The controller is capable of detecting Open and Short Circuit condition for each of the above sensor type. If Alarm is enabled for the Analog Input then an Alarm would be shown On the BACNet Client (EBI) with the state of the Object as To Fault.
Resolution	12 Bit A/D.
Types of input signals	1. NTC 20 kΩ ohms(0 to +40 deg.C)
	2. PT1000 (-50 to +150 deg.C)
	3. 0 to +10 V
	0 (4) to 20 mA (with an external resistor of 499Ω + or - 0.25%)
	1. Potential Free Contact (Digital Input)

Connection example 1

AI module and field devices connected to separate transformers

The following figure shows a connection example of an AI module and field devices connected to a separate transformers.

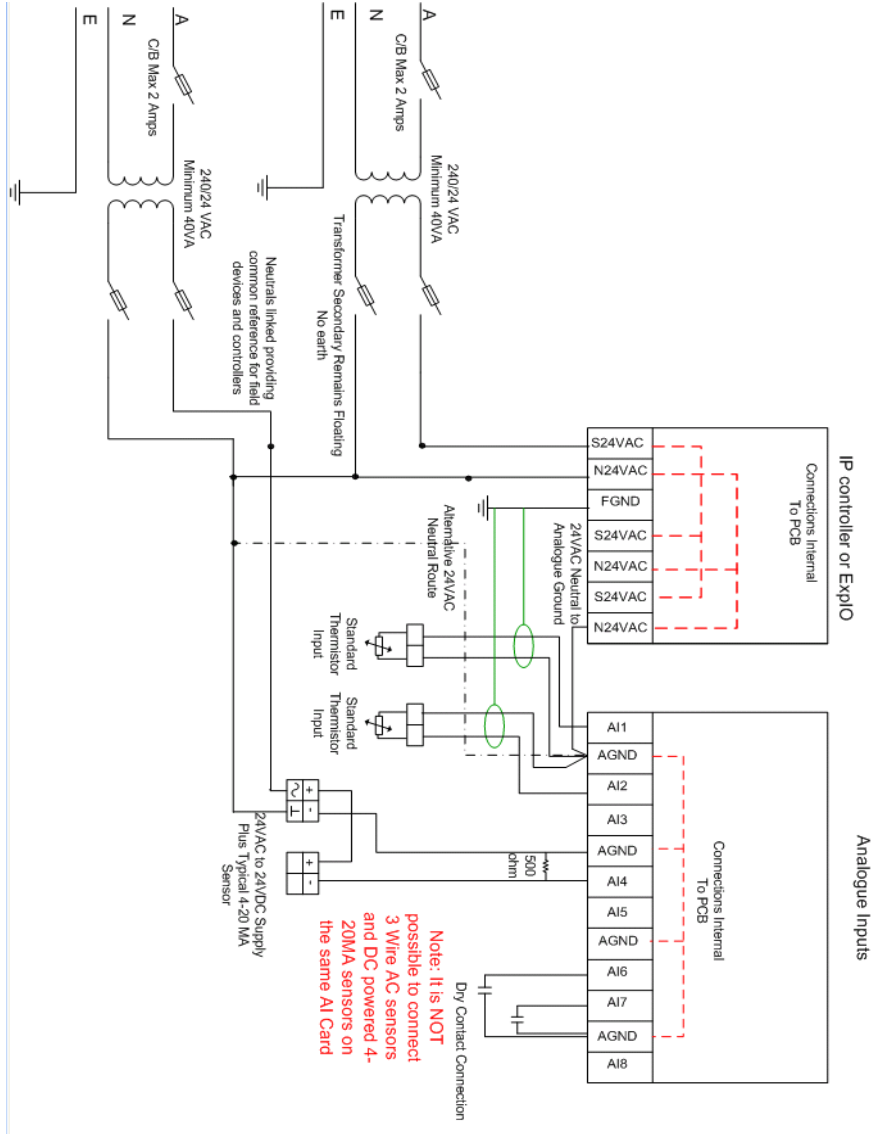**Figure 8** Analog inputs and sensor connections
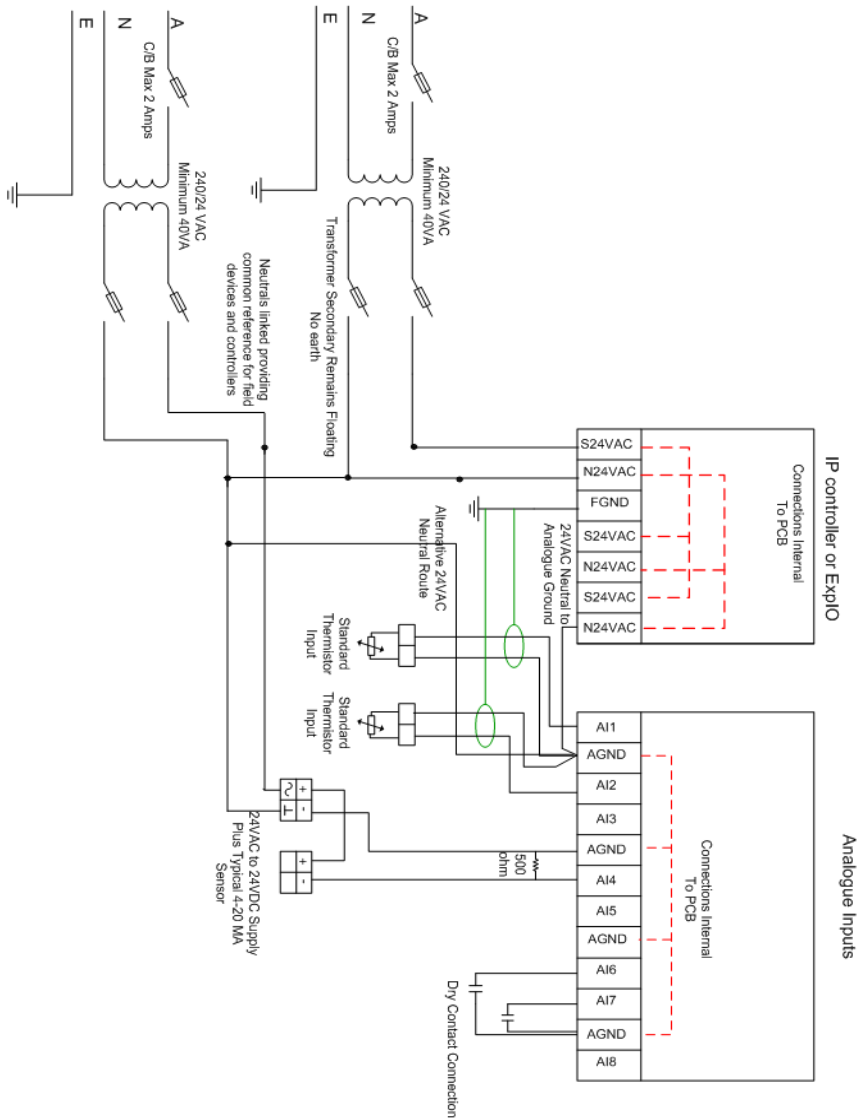
Note

It is not mandatory to use separate 24 vac transformer for the Field Device and the controller, this is just an example. You can use the same transformer for IPC and Field device if it is of suitable rating, but do connect a separate fuse for the controller and the field devices.

Connection example 2

AI module connected to 4-20mA devices

The following figure shows a connection example of an AI module connected to 4-20mA devices.

Figure 9 Analog inputs and sensor connections

Note

It is not mandatory to use separate 24 vac transformer for the Field Device and the controller, this is just an example. You can use the same transformer for IPC and Field device if it is of suitable rating, but do connect a separate fuse for the controller and the field devices.

Digital inputs

This applies to both CP-IPC and CP-EXPIO.

Technical specification

Item	Description
Number	6 digital inputs.
Indication	LED on the controller illuminates for Contact Closure.
Types of input signals	1. DC signal (max. 30 Vdc). 2. Potential Free contact. 3. Totalizer upto 15 HZ.

Dynamic parameters of totalizers

Frequency	Pulse Duration	Pause Interval	Bounce Time
Max-15Hz	Min.-20ms	Min.-30ms	Max-5 ms

DI Logic threshold when using External Power:

Logic Status	Input voltage
0	Greater than or equal to 2. 1V
1	Lesser than or equal to 6. 5V

Connection example 1

The following figure shows the example of a DI module connection showing all dry contacts.
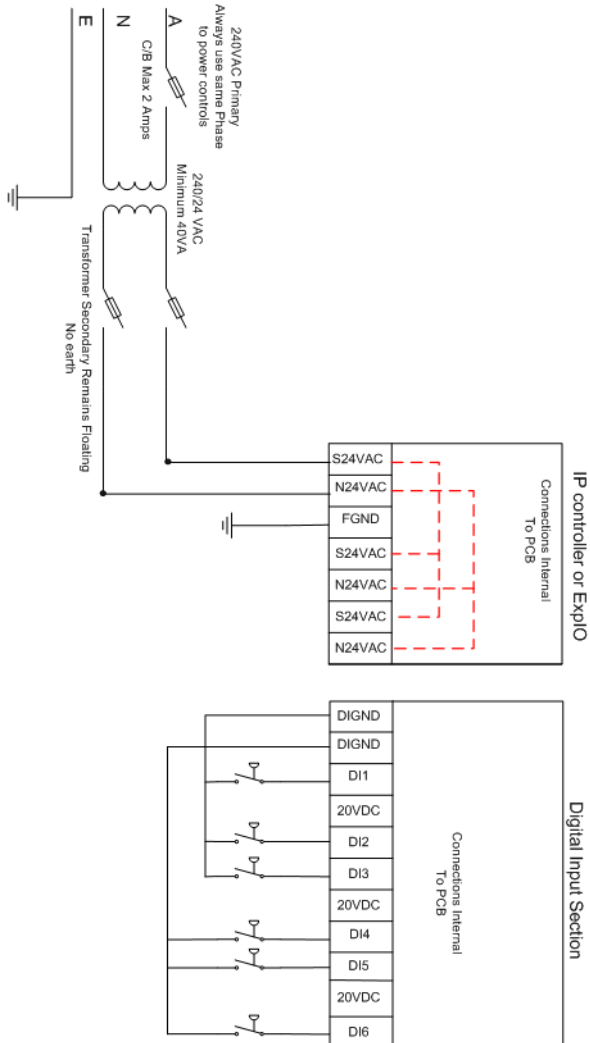
Figure 10 DI module connection showing all dry contacts
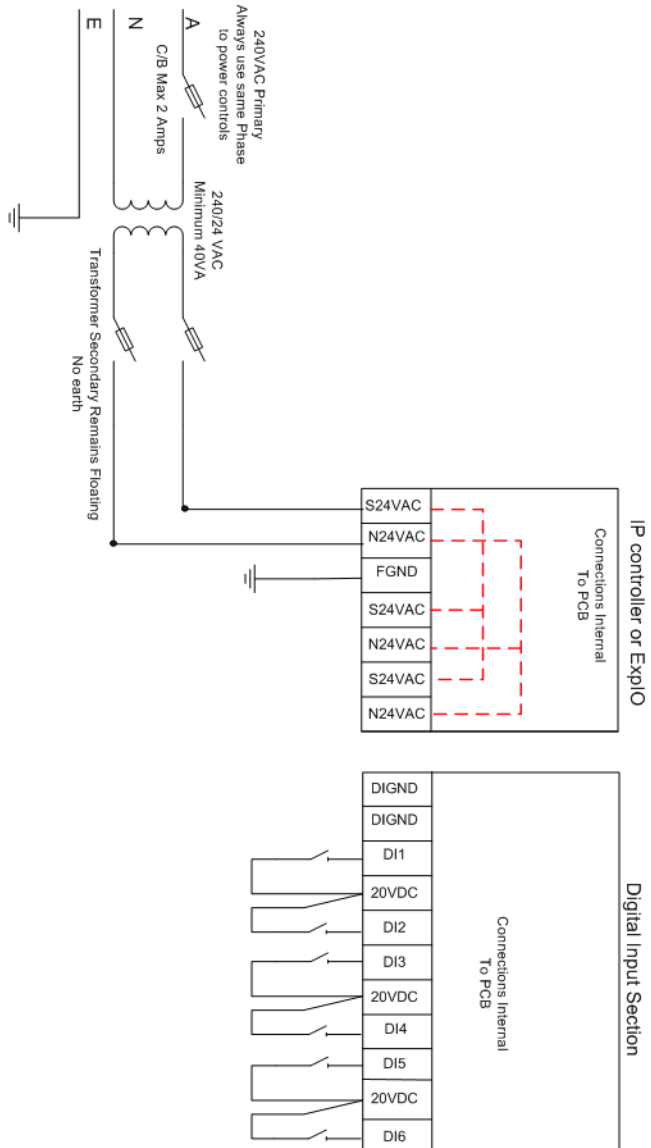
Connection example 2

The following figure shows the example of a DI module connection showing all powered contacts.

Figure 11 DI module connection showing all powered contacts

Analog outputs

This applies to both CP-IPC and CP-EXPIO. Analog outputs can be used, for example, to operate valve or damper actuators

Technical specification

It4em	Description
Number	6 analog outputs.

Analog output details

Voltage	Current	Resolution	Min. Step	Accuracy
0-10 V	Maximum 10 mA	8-Bit	39.22 mV	+ or - 150 mV +or - 1 digit

Connection example

AO module and field devices connected to separate transformers

The following figure shows a connection example of an AO module and field devices connected to separate transformers.

Figure 12 Analog output connection diagram
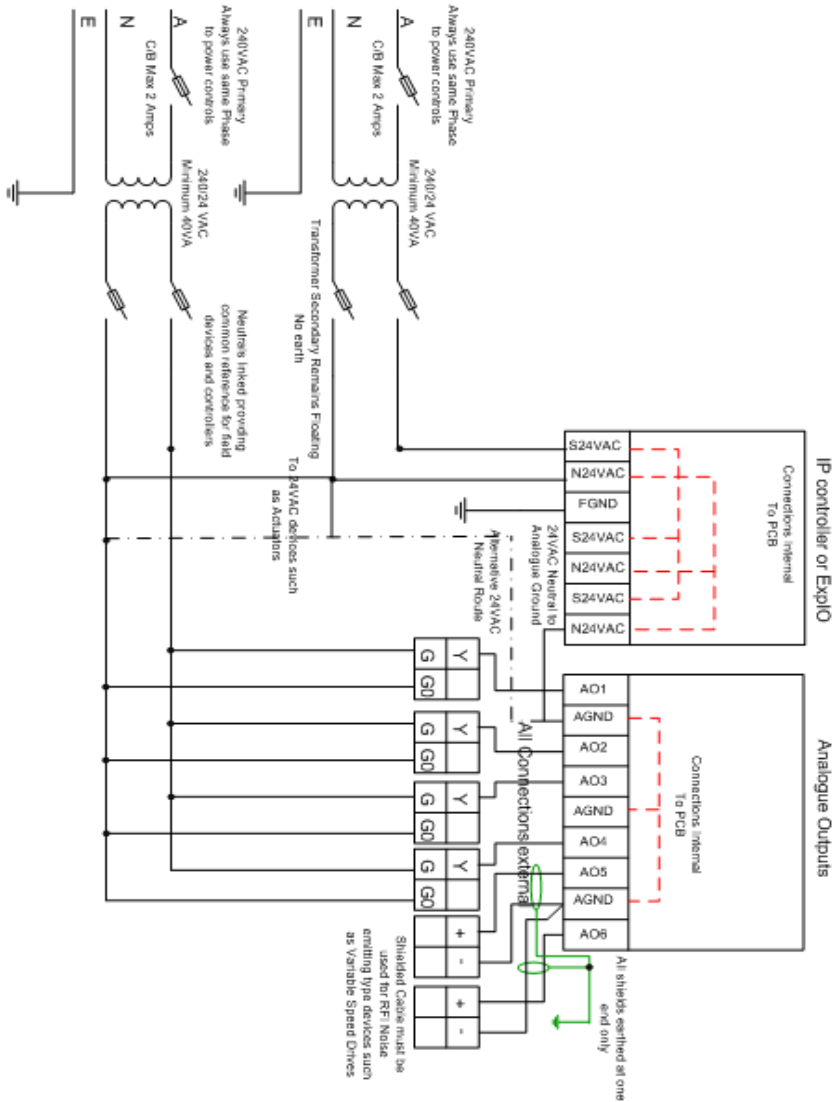
> **Note**
>
> It is not mandatory to use separate 24 vac transformer for the Field Device and the controller, this is just an example. You can use the same transformer for IPC and Field device if it is of suitable rating, but do connect a separate fuse for the controller and the field devices.

Digital outputs

This applies to both CP-IPC and CP-EXPIO. The digital outputs are switched by a triac and can be connected directly to an external relay.

Technical specification

Item	Description
Number	`4 digital outputs.`
Output stages	• Low signal - 0 V • High signal - 24 Vac • Type - `Close, only`
Load per output	• Min.-30 mA • Max-500 mA

Connection example

DO Triacs and field devices connected to separate transformers

The following figure shows a connection example of a DO triacs and field devices connected to separate transformers.

**Figure 13** Digital outputs: connection of relay
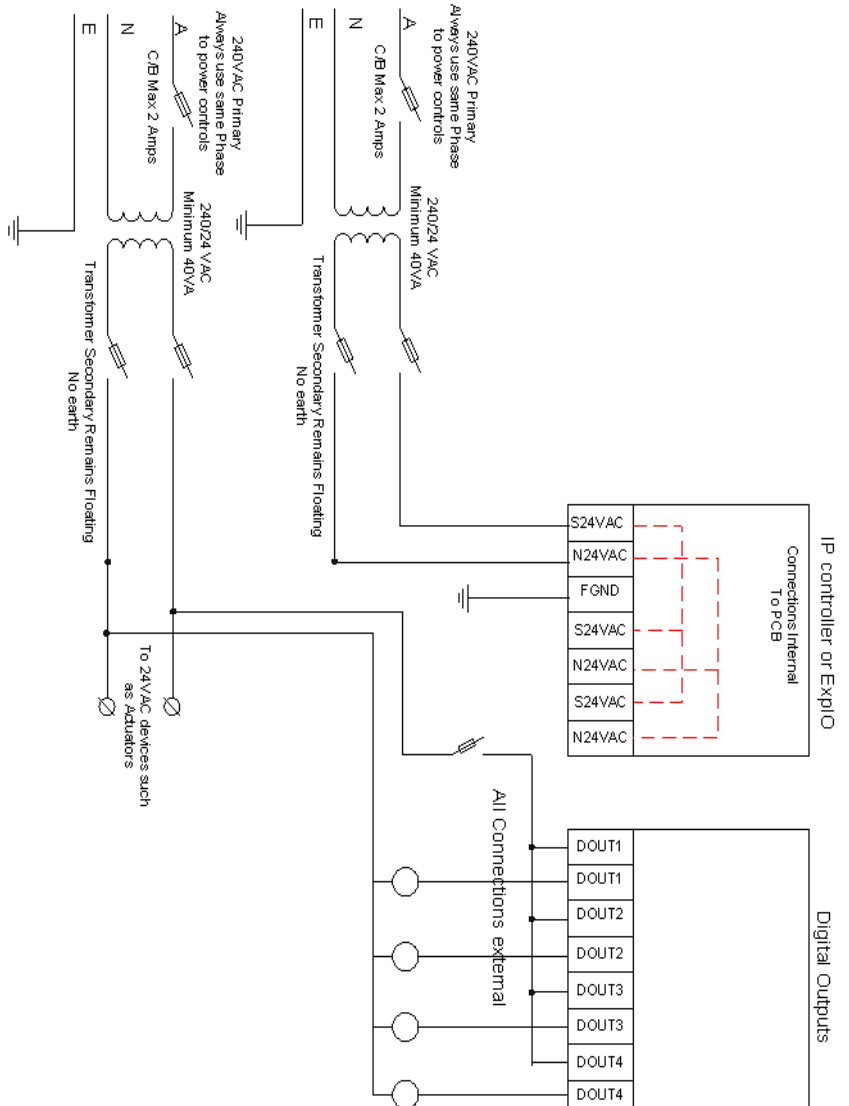
Note

It is not mandatory to use separate 24 vac transformer for the Field Device and the controller, this is just an example. You can use the same transformer for IPC and Field device if it is of suitable rating, but do connect a separate fuse for the controller and the field devices.

Connect a separate fuse for the Triac output's power. No internal fuse is provided inside the controller.

Power supply

The CP-IPC and CP-EXPIO controller is powered by an external transformer.

Figure 14 Powering CP-IPC through an external transformer
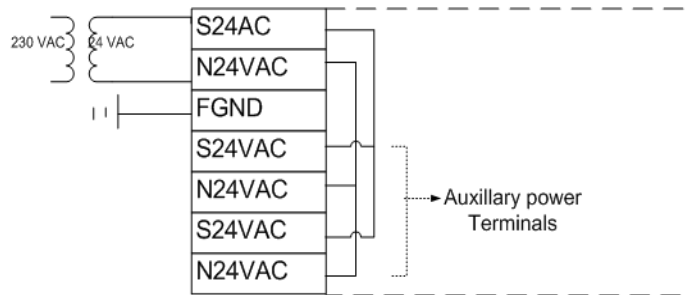
Attention

The Auxiliary power terminals have no internal fuse and the maximum current rating is 750 milli Amp. Drawing more current can damage the board. Connect an external fuse.

Transformer requirements

For one CP-IPC controller

Item	Description
Voltage	24 Vac + or - 20%.
Power	25 VA (Triac power has to be considered.)

For one CPEXPIO controller

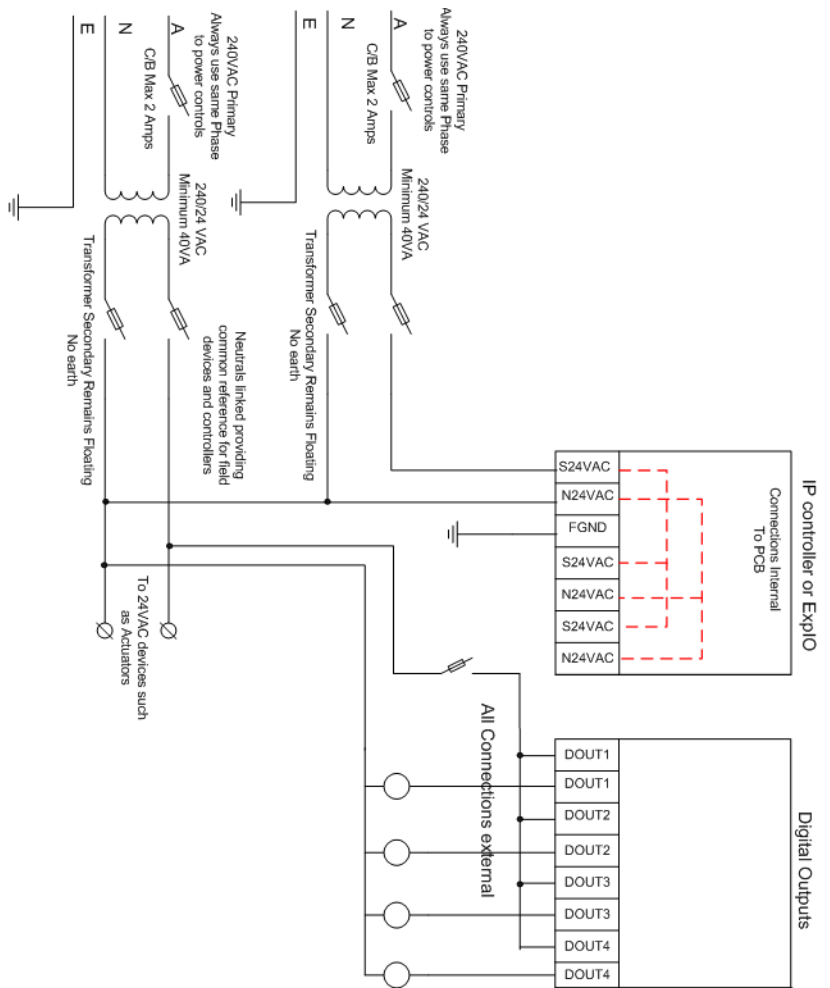| Item	Description
Voltage	24 Vac + or - 20%.
Power	15 VA (Triac power has to be considered separately.)

Connection example

CP-IPC and CP-EXPIO power supply connections

The following figure shows a connection example of a CP-IPC and CP-EXPIO connected to a power supply.

**Figure 15** Powering CP-IPC Power Supply Terminal

Communication

The CP-IPC controller communicates using:

- One IP LAN port
- One RS232 connector (female)
- One RS485 port for IO communication
- Three Bacnet MSTP ports.

RS232 debug port

The following figure shows RS232 debug port cable connection details.

Figure 16 RS232 Debug Port cable connection details

XL8000-IPC Controller Side   PC Side
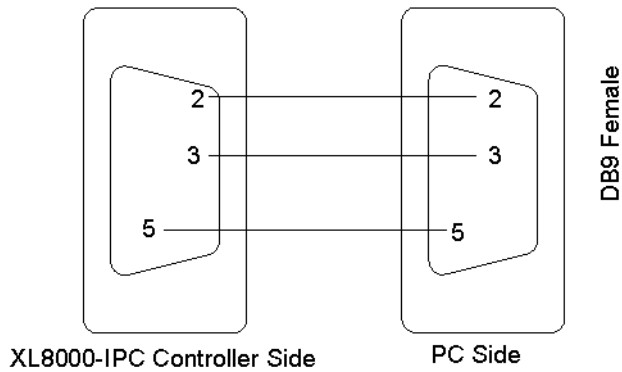
Attention

This connection applies to CP-IPC only.

Cabling

3

This section describes the specifications for cables used in making connections to the CP-IPC/EXPIO controller.

Cable routing

All signal cables (input/output, low voltage) are communication circuits and should therefore be routed separately from the line voltage. Minimum distance is 4 inches. (100 mm).

Shielding Input / Output Module Cables

Shielding input and output module and power supply cables is not necessary if the general guidelines for cable routing are observed. If, in certain cases, the routing guidelines cannot be observed, then shielded cable must be used.

The shield must not be terminated at a controller; instead, to avoid ground loops, the shield must be grounded (at only one end) at the control panel.

To prevent ground loops, shielding of input/output cables leading to peripheral devices must be grounded only at the control panel end.

Attention

Avoid joining sensor cables.

Cable lengths and cross sectional areas

Signal type	Cross-sectional area		Lesser than or equal to 1300 ft. (400 m)
	Lesser than or equal to 300 ft. (100 m)	Lesser than or equal to 500 ft. (170 m)	
Power supply (24 Vac)	Lesser than or equal to 16 AWG (greater than or equal to 1. 5 mm^2)	Lesser than or equal to 14 AWG (greater than or equal to 2. 5 mm^2)	-
Low current signals [i]	Lesser than or equal to 20 AWG (greater than or equal to 0. 5 mm^2)		

   i Example: For 0-10 V sensors, totalizers, digital inputs, 0-10 V signals for actuators.

Recommended cable specifications for MSTP and EXPIO bus

Use Belden 9841 or Equivalent cable with the following specifications

- An MS/TP EIA-485 network shall use shielded, twisted-pair cable with characteristic impedance between 100 and 130 ohms.

- Distributed capacitance between conductors shall be less than 100 pF per meter (30 pF per foot).

- Distributed capacitance between conductors and shield shall be less that 200 pF per meter (60 pF per foot).

- Foil or braided shields are acceptable.

- The maximum recommended length of an MS/TP segment is 1000 meters.

Connection example

24V Actuator

The following figure shows a connection example of a 24V actuator.

Figure 17 Connection of 24V actuator.
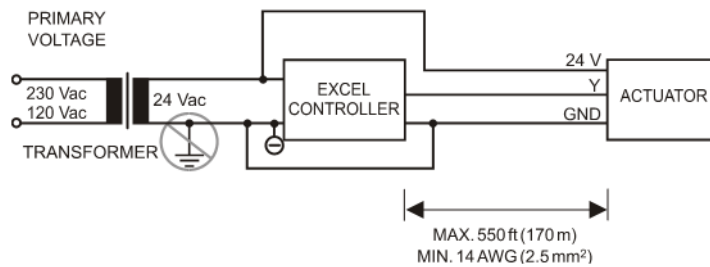
24V Actuator with separate transformer

The following figure shows a connection example of a 24V actuator with a separate transformer.

For distances greater than 550 ft. (170m), connect a separate external transformer directly to the proportional actuator or sensor to produce the 24 Vac supply.

Figure 18 . Connection of a 24V actuator with separate transformer.
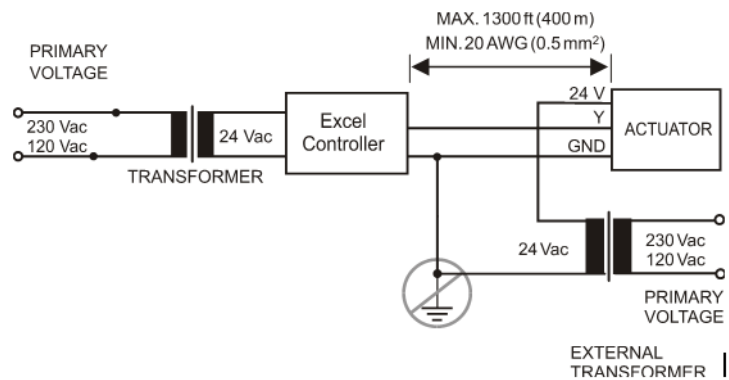
Attention

The maximum length of a signal cable with 24 Vac supply is 550 ft. (170 m). The max. Length of a two-wire, 0-10 Vdc signal cable is 1300 ft. (400 m). The secondary side of the transformer must not be connected to earth ground.

Installing a fuse on the secondary side of the transformer is recommended to protect the devices against wrong wiring.

A cable length of 1300 ft. (400m) with a cross sectional area of 0. 5 mm^2 (20 AWG) is permissible for a two-core, 0 to 10 Vdc signal cable.
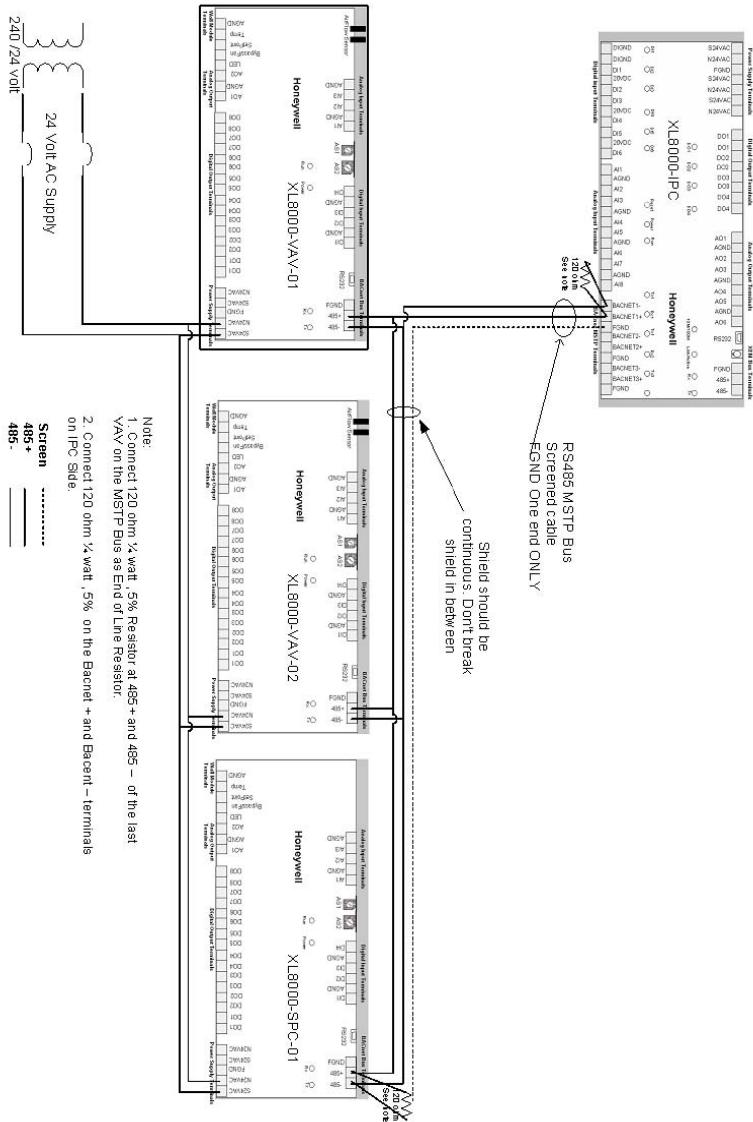

Connection drawings

4

This chapter describes example connection drawings of the CP-IPC/ CP-EXPIO controller with:

- EXPIO bus
- MSTP bus

MSTP bus connection

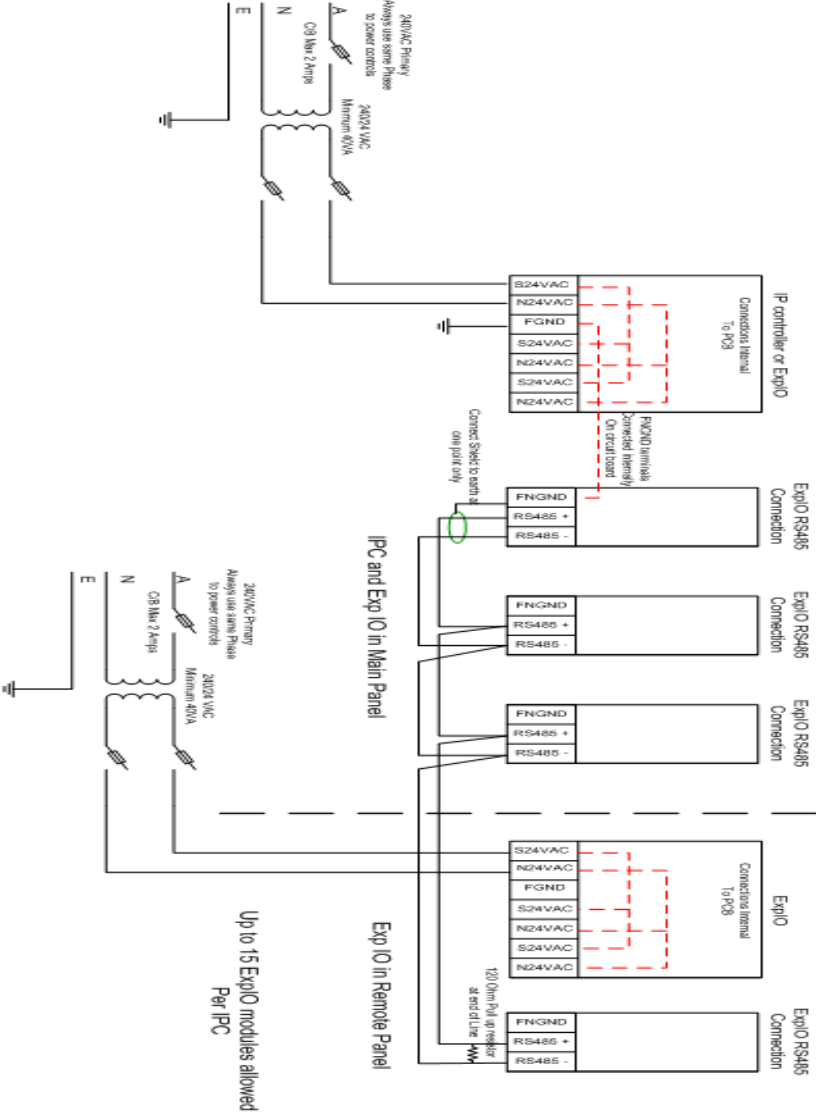The following figure shows MSTP channels connection details.

Figure 19 MSTP Bus connection details

EXPIO bus connection

The following figure shows EXPIO bus connection details.

Figure 20 EXPIO Bus connection details

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