Honeywell

Honeywell Process Solutions

Experion LX Hardware Installation Guide

Release 110

Honeywell

Notices and Trademarks

Copyright 2014 by Honeywell International Sárl.
Release 110 February 2014

While this information is presented in good faith and believed to be accurate, Honeywell disclaims the implied warranties of merchantability and fitness for a particular purpose and makes no express warranties except as may be stated in its written agreement with and for its customers.

In no event is Honeywell liable to anyone for any indirect, special or consequential damages. The information and specifications in this document are subject to change without notice.

Honeywell, PlantScape, Experion® PKS, Experion® LX, and TotalPlant are registered trademarks of Honeywell International Inc.

Other brand or product names are trademarks of their respective owners.

Honeywell Process Solutions
1860 W. Rose Garden Lane
Phoenix, AZ 85027 USA
1-800 822-7673

About This Document

This document provides hardware planning and installation details of EXPERION LX.

This documentation is intended for the following audience:

- System engineers who would configure the EXPERION LX modules, and operate the run-time EXPERION LX modules.
- Field engineers who would install and maintain EXPERION LX modules.

Knowledge of SCADA systems and experience of working in a Microsoft Windows environment are required.

Release Information

Document Name	Document ID	Release Number	Publication Date
Experion LX Hardware Installation Guide	EXDOC-X269-en-110A	110A	February 2014

Support and Other Contacts

United States and Canada

Contact:	Honeywell Solution Support Center
Phone:	1-800-822-7673
	Calls are answered by dispatcher between 6:00 am and 4:00 pm Mountain Standard Time. Emergency calls outside normal working hours are received by an answering service and returned within one hour.
Fascimile:	1-973-455-5000
Mail:	Honeywell TAC, MS L17
	1860 W. Garden Lane
	Phoenix, AZ, 85027 USA

Europe, Middle East, and Africa (EMEA)

Contact:	Honeywell TAC-EMEA
Phone:	+32-2-728-2345
Fascimile:	+32-2-728-2696
Mail:	TAC-BE02
	Hermes Plaza
	Hermeslaan, 1H
	B-1831 Diegem, Belgium

Pacific

Contact:	Honeywell Global TAC – Pacific
Phone:	1300-364-822 (toll free within Australia)
	+61-8-9362-9559 (outside Australia)
Fascimile:	+61-8-9362-9564
Mail:	Honeywell Limited Australia
	5 Kitchener Way
	Burswood 6100, Western Australia
Email:	GTAC@honeywell.com

India

Contact:	Honeywell Global TAC – India
Phone:	+91-20- 6603-9400
Fascimile:	+91-20- 6603-9800
Mail:	Honeywell Automation India Ltd
	56 and 57, Hadapsar Industrial Estate
	Hadapsar, Pune –411 013, India
Email:	Global-TAC-India@honeywell.com

Korea

Contact:	Honeywell Global TAC – Korea
Phone:	+82-80-782-2255 (toll free within Korea)
Fascimile:	+82-2-792-9015
Mail:	Honeywell Co., Ltd
	4F, Sangam IT Tower
	1590, DMC Sangam-dong, Mapo-gu
	Seoul, 121-835, Korea
Email:	Global-TAC-Korea@honeywell.com

People's Republic of China

Contact:	Honeywell Global TAC – China
Phone:	+86- 21-2219-6888
	800-820-0237
	400-820-0386
Mail:	Honeywell (China) Co., Ltd
	33/F, Tower A, City Center, 100 Zunyi Rd.
	Shanghai 200051, People's Republic of China
Email:	Global-TAC-China@honeywell.com

Singapore

Contact:	Honeywell Global TAC – South East Asia
Phone:	+65-6580-3500
Fascimile:	+65-6580-3501
	+65-6445-3033
Mail:	Honeywell Private Limited
	Honeywell Building
	17, Changi Business Park Central 1
	Singapore 486073
Email:	GTAC-SEA@honeywell.com

Taiwan

Contact:	Honeywell Global TAC – Taiwan
Phone:	+886-7-536-2567
Fascimile:	+886-7-536-2039
Mail:	Honeywell Taiwan Ltd.
	17F-1, No. 260, Jhongshan 2nd Road.
	Cianjhen District
	Kaohsiung, Taiwan, ROC
Email:	Global-TAC-Taiwan@honeywell.com

Japan

Contact:	Honeywell Global TAC – Japan
Phone:	+81-3-6730-7160
Fascimile:	+81-3-6730-7228
Mail:	Honeywell Japan Inc.
	New Pier Takeshiba, South Tower Building,
	20th Floor, 1-16-1 Kaigan, Minato-ku,
	Tokyo 105-0022, Japan
Email:	Global-TAC-JapanJA25@honeywell.com

Elsewhere

Call your nearest Honeywell office.

World Wide Web

Honeywell Solution Support Online:

http://www.honeywell.com/ps

Training Classes

Honeywell Automation College:

http://www.automationcollege.com

Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
	REFERENCE -EXTERNAL: Identifies an additional source of information outside of the bookset.
	REFERENCE - INTERNAL: Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.

Symbol	Definition
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: **Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

Contents

1. Introduction

1.1 Overview

This document contains a description of Experion LX components for installation within Division 2 and Zone 2 hazardous areas. Equipment installed within Zone 2 and Division 2 is intended to be used in places in which explosive atmospheres caused by gases, vapors or mists are unlikely to occur or, if it does occur infrequently and for a short period only. The Experion LX models are certified as nonincendive; Non-Arcing, type nA, and protected sparking, type nC.

For the application of the Experion LX hardware components, the hardware has to be built and installed according to the FM and CSA guidelines for Division 2/Zone 2. This document describes the considerations and requirements for the Experion LX hardware components, which have been certified by FM and CSA for applications in hazardous locations.

1.2 1.2 Architecture Overview

The Experion LX platform comprises many different integrated hardware and software solutions depending upon the needs of the application. This pictured architecture is a representation of many of the possible nodes that can be used in the Experion LX architecture. Note that the architecture is highly scalable and not all nodes are necessary or required.

Series 8 C300 Controller Overview

Honeywell's C300 Controller provides powerful and robust control for the Experion LX system. The C300 is a node in operating Honeywell's field-proven deterministic Control Execution Environment (CEE) core software. The CEE software provides a superior control execution and scheduling environment. Control strategies for each controller node are configured and loaded through a common Control Builder, an easy and intuitive engineering tool.

In addition to a standard and robust library of pre-built function blocks and algorithms, the C300 Controller also supports Custom Algorigthm Blocks (CABs). Custom Algorithm Blocks are similar in purpose and structure to the standard function blocks that are distributed with Control Builder. However, CABs have user-defined algorithms and data structures, allowing custom tailored strategies to be developed to specific requirements.

Series 8 Profibus Gateway Module Overview

The PROFIBUS Gateway Module provides a common module platform to support the interface to the PROFIBUS DP and the C300 Controller. The PGM is developed in the Series 8 form factor for use with the C300 Controller. The Series 8 form factor employs

an Input Output Termination Assembly (IOTA) and an electronics module which mounts and connects to the IOTA.

As a PROFIBUS gateway, PGM is always a master and communicates with the PROFIBUS compatible slave devices.

The PGM mounts in the same fashion and shares all characteristics, power and grounding, certifications, and meets all environmental rating as all other Series 8 components.

The PGM is optionally redundant and supports two DP networks per module.

Series 8 I/O Overview

This document provides technical information to configure the Series 8 I/O, released with Experion LX. The following Series 8 I/O items are included in this document.

- TC/RTD

- Analog Input – Single Ended

- Analog Input with HART – Single Ended

- Analog Input with HART – Differential

- Analog Output

- Analog Output with HART

- Digital Input Sequence of Events

- Digital Input 24 VDC

- Digital Input Pulse Accumulation

- Digital Output 24 VDC

- DO Relay Extension Board

- C300 Processor

- Profibus Gateway

Definitions

- Input Output Termination Assembly (IOTA): An assembly that holds the IOM and the connections for field wiring;

- Input Output Module (IOM): A device that contains most of the electronics required to perform a specific I/O function. The IOM plugs onto the IOTA.

Features

All Series 8 components feature an innovative design that supports enhanced heat management. This unique look provides significant reduction in overall size for the equivalent function.

The unique features of Series 8 I/O include:

- I/O Module and field terminations are combined in the same area. The I/O Module is plugged into the IOTA to eliminate the need for a separate chassis to hold the electronics assemblies

- Two level "detachable" terminals for landing the field wiring in the enclosure, providing easier plant installation and maintenance.

- Field power is supplied through the IOTA, with no need for extra power supplies and the associated craft wired marshalling

- Redundancy is accomplished directly on the IOTA without any external cabling or redundancy control devices, by simply adding a second IOM to an IOTA

- For both IOM and IOTA, coated (module numbers starting with 8C) and uncoated (module numbers starting with 8U) options are provided. Conformal coating material is applied to electronic circuitry to act as protection against moisture, dust, chemicals, and temperature extremes. Coated IOM and IOTA are recommended when electronics must withstand harsh environments and added protection is necessary.

The Series 8 inherits the innovative styling of Series C. This styling includes features to facilitate the effective use of control hardware in a systems environment. These features include:

- Vertical mounting allows for more effective wiring since most fields wiring applications require entry from the top or bottom of the systems cabinet.

- An "information circle" allows for a quick visual cue to draw the Maintenance Technician's eyes to important status information.

- "Tilted" design allows for effective heat management within the cabinet enclosure. Since Series 8 allows for a significant increase in cabinet density, an effective heat management system is critical for high systems availability.

- Input and output circuits are protected from shorts to alleviate the need for in- line fusing, reducing installation and maintenance costs

Series 8 IOTAs combine multiple functions into a single piece of equipment:

- Single and redundant configurations

- On-board termination of process signals

- On-board signal conditioning

- On-board connection to appropriate networks (FTE, I/O LINK)

- Field power distribution without external marshalling

- IOM plugs into the IOTA and receives power from the IOTA

- The IOTA receives its power through cables from header board.

Series 8 I/O Sizing

In virtually all configurations, the C300 controller and Series 8 I/O provides useful, maintainable process equipment connections in a smaller footprint than competitors' systems. Installing Series 8 I/O modules contributes to overall total installed cost savings.

IOTA sizes vary based on the application. In general, an analog module has 16 points and resides on a 6-inch (152mm) IOTA for non-redundant applications and a 12-inch (304mm) IOTA for redundant applications. A discrete module has 32 points and resides on a 9-inch (228mm) IOTA for non-redundant applications and a 12-inch (304mm) IOTA for redundant applications. Specific information on the size of a particular module can be found in the Model Number Table.

I/O Module Functions

- TC/RTD (16pt) – Provides thermocouple (TC) and resistance temperature device (RTD) inputs.

- Analog Input – Single Ended (16pt) - The Analog Input Module supports analog inputs Analog inputs are typically 4-20mA DC for traditional devices.

- Analog Input with HART – Single Ended (16pt) – The Analog Input Module supports both analog and HART inputs. Analog inputs are typically 4-20mA DC for both traditional and HART devices. HART data can be used for status and configuration. HART data, such as the secondary and tertiary variables, can also be used as process control variables.

- Analog Input with HART – Differential (16pt) – The Analog Input Module supports Single Ended or Differential analog inputs, and HART inputs.

- Analog Output (16pt) – The Analog Output Module supports standard 4-20mA DC outputs.

- Analog Output with HART (16pt) – The Analog Output Module supports both standard 4-20mA DC outputs and HART transmitter outputs.

- Digital Input Sequence of Events (32pt) - Accepts 24VDC discrete signals as discrete inputs. The inputs can be time tagged to support 1ms resolution Sequence of Events.

- Digital Input 24 VDC (32pt) – Digital input

sensing for 24V signals

- Digital Input Pulse Accumulation (32pt) – Accepts 24VDC discrete signals as discrete inputs. The first 16 channels can be configured either as Digital Input or Pulse accumulation to support Pulse Accumulation and frequency measurement on per channel basis.

- Digital Output 24 VDC (32 pt) – Current sinking digital outputs. Outputs are electronically short-circuited protected.

- DO Relay Extension Board (32 pt) – Digital output with NO or NC dry contacts. It can be used for low power or high power applications.

Series 8 Field Connections

Series 8 Field connections use a standard modular connector. The connector modularity allows for removal and insertion of the field wiring. This significantly reduces installation and maintenance procedures and can assist in field check out. Series 8 field connectors accept up to 12ga AWG / 2.5 mm^2 stranded wire.

IOTA Sizes

IOTA Sizing is nominal (6in = 152mm, 9in =228mm, 12in =304mm). I/O modules are associated with their respective IOTAs in the table below. The I/O Module is supported by one or more IOTAs.

Model Number	Description	Channels	Size	Red.
Analog Input				
8C-TAIXA1	Single Ended AI IOTA, Coated	16	6"	
8U-TAIXA1	Single Ended AI IOTA, Uncoated			
8C-TAIDA1	Differential AI IOTA, Coated		9"	
8U-TAIDA1	Differential AI IOTA, Uncoated			
8C-TAIXB1	Single Ended AI IOTA, Red, Coated		12"	√
8U-TAIXB1	Single Ended AI IOTA, Red, Uncoated			√
8C-TAIDB1	Differential AI IOTA, Red, Coated			√
8U-TAIDB1	Differential AI IOTA, Red, Uncoated			√
TC/RTD				

Model Number	Description	Channels	Size	Red.
8C-TAIMA1	TC/RTD IOTA, Coated	16	9''	
8U-TAIMA1	TC/RTD IOTA, Uncoated			
Analog Output				
8C-TAOXA1	Analog Output IOTA, Coated	16	6''	
8U-TAOXA1	Analog Output IOTA, Uncoated			
8C-TAOXB1	Analog Output IOTA Red, Coated		12''	√
8U-TAOXB1	Analog Output IOTA Red, Uncoated			√
Digital Input				
8C-TDILA1	Digital Input 24VDC IOTA, Coated	32	9''	
8U-TDILA1	Digital Input 24VDC IOTA, Uncoated			
8C-TDILB1	Digital Input 24VDC IOTA Red. Coated		12''	√
8C-TDILB1	Digital Input 24VDC IOTA Red. Uncoated			√
Digital Output				
8C-TDODA1	Digital Output IOTA, Coated	32	9''	
8U-TDODA1	Digital Output IOTA, Uncoated			
8C-TDODB1	Digital Output IOTA Red, Coated		12''	√
8U-TDODB1	Digital Output IOTA Red, Uncoated			√
C300 Control Processor				
8C-TCNTA1	Series 8 C300 ControllerIOTA, Coated			
8U-TCNTA1	Series 8 C300 ControllerIOTA, Uncoated			
Profibus Gateway				

Model Number	Description	Channels	Size	Red.
8C-BPOX01	Series 8 Profibus Gateway IOTA, Coated			
8U-BPOX01	Series 8 Profibus Gateway IOTA, Uncoated			

2. General

2.1 Experion LX Hazardous Certified Modules

2.1.1 Environmental Ratings

The operating conditions for Safety Manager components are as follows:

- Storage temperature: -40°C to +85°C (–40°F to +185°F)

- Ambient temperature (T4): 0°C to +60°C (32°F to +140°F)

- Relative humidity: 5% to 95% (non-condensing)

- Vibration (sinusoidal): excitation: sine-shaped with sliding freq.
      frequency range: 10-150 Hz
      loads: 10 Hz - 57 Hz: 0.075 mm
                     57 Hz - 150 Hz: 1 G
      no. of axes: 3 (x, y, z)
      traverse rate: 1 oct/min.

- Shock: 15 G in 3 axes (shock duration: 11 ms).

2.1.2 Enclosure Requirements

The Experion LX components shall be mounted within a tool-secured enclosure.

Where installed in outdoor or potentially wet locations, the enclosure shall, at a minimum, meet the requirements of IP54. Where installed in locations providing adequate protection against the entry of solid foreign objects or water capable of impairing safety, the enclosure shall, at a minimum, meet the requirements of IP4X

2.1.3 Supply Voltage Requirements

The supply voltages to the Experion LX models must be within the following ranges to ensure correct operation:

- Maximum 24 Vdc

2.2 Certified Experion LX I/O and IOTA Models

The following Experion LX I/O and IOTA models are currently FM Approved/CSA Certified according to the FM/CSA Division 2/Zone 2 guidelines for hazardous locations.

Model	Model Description
8C-PCNTA02	Series 8 C300 Controller - Coated
8U-PCNTA02	Series 8 C300 Controller- Uncoated
C-IP0102	Profibus Gateway - Coated
U-IP0102	Profibus Gateway - Uncoated
8C-PAIMA1	Thermocouple/RTD - Coated
8U-PAIMA1	Thermocouple/RTD - Uncoated
8C-PAINA1	Analog Input - Coated
8U-PAINA1	Analog Input - Uncoated
8C-PAIHA1	Analog Input with Hart Single Ended - Coated
8U-PAIHA1	Analog Input with Hart Single Ended - Uncoated
8C-PAIH54	Analog Input with Hart Differential - Coated
8U-PAIH54	Analog Input with Hart Differential - Uncoated
8C-PAONA1	Analog Output - Coated
8U-PAONA1	Analog Output - Uncoated
8C-PAOHA1	Analog Output with Hart - Coated
8U-PAOHA1	Analog Output with Hart - Uncoated
8C-PDISA1	Digital Input Sequence of Events - Coated
8U-PDISA1	Digital Input Sequence of Events - Uncoated
8C-PDILA1	Digital Input 24VDC - Coated
8U-PDILA1	Digital Input 24VDC - Uncoated
8C-PDIPA1	Digital Input Pulse Accumulation - Coated
8U-PDIPA1	Digital Input Pulse Accumulation - Uncoated
8C-PDODA1	Digital Output 24VDC - Coated
8U-PDODA1	Digital Output 24VDC - Uncoated
8C-SDOX01	DO Relay Extension Board - Coated
8C-SHEDA1	Power Distribution Header - Coated
8U-SHEDA1	Power Distribution Header - Uncoated
8C-TCNTA1	Series 8 C300 Controller I/O Termination Assembly, coated
8U-TCNTA1	Series 8 C300 Controller I/O Termination Assembly, uncoated
8C-TPOXA1	Profibus Gateway I/O Termination Assembly Coated
8U-TPOXA1	Profibus Gateway I/O Termination Assembly Uncoated
8C-TAIMA1,	Thermocouple/RTD I/O Termination Assembly,Coated
8U-TAIMA1,	Thermocouple/RTD I/O Termination Assembly,Uncoated

Model	Model Description
8C-TAIXA1	Analog Input I/O Termination Assembly Non Redundant Coated
8U-TAIXA1	Analog Input I/O Termination Assembly Non Redundant Uncoated
8C-TAIXB1	Analog Input I/O Termination Assembly Redundant Coated
8U-TAIXB1	Analog Input I/O Termination Assembly Redundant Uncoated
8C-TAIDA1	Analog Input with Hart Differential I/O Termination Assembly Non Redundant Coated
8U-TAIDA1	Analog Input with Hart Differential I/O Termination Assembly Non Redundant Uncoated
8C-TAIDB1	Analog Input with Hart Differential I/O Termination Assembly Redundant Coated
8C-TAIDB1	Analog Input with Hart Differential I/O Termination Assembly Redundant Uncoated
8C-TAOXA1	Analog Output I/O Termination Assembly Non Redundant Coated
8U-TAOXA1	Analog Output I/O Termination Assembly Non Redundant Uncoated
8C-TAOXB1	Analog Output I/O Termination Assembly Redundant Coated
8U-TAOXB1	Analog Output I/O Termination Assembly Redundant Uncoated
8C-TDILA1	Digital Input I/O Termination Assembly Non Redundant Coated
8U-TDILA1	Digital Input I/O Termination Assembly Non Redundant Uncoated
8C-TDILB1	Digital Input I/O Termination Assembly Redundant Coated
8U-TDILB1	Digital Input I/O Termination Assembly Redundant Uncoated
8C-TDODA1	Digital Output I/O Termination Assembly Non Redundant Coated
8U-TDODA1	Digital Output I/O Termination Assembly Non Redundant Uncoated
8C-TDODB1	igital Output I/O Termination Assembly Redundant Coated
8U-TDODB1	Digital Output I/O Termination Assembly Redundant Uncoated

ATTENTION

Approval rating for Experion LX Series 8 modules are list below:

- FM: Class I, Division 2, Group A,B,C,D; T4

     Class I, Zone 2, AEx/Ex nA IIC T4 Gc

- CSA: Class I, Division 2, Group A,B,C,D; T4

Class I, Zone 2, Ex nA IIC T4 Gc

- ATEX: II 3G Ex nA IIC T4 Gc

Classification of maximum surface temperatures for Group II electrical equipment are:

Temperature class	Maximum surface temperature $^\circ$C
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

3. Experion LX Series 8 Mounting

3.1 Installation declarations

ATTENTION

This equipment shall be installed in accordance with the requirements of the National Electrical Code (NEC), ANSI/NFPA 70, or the Canadian Electrical Code (CEC), C22.1. It is intended to be mounted within an enclosure or suitable environment acceptable to the local "authority having jurisdiction," as defined in the NEC, or "authorized person" as defined in the CEC.

> **ESD HAZARD**
>
> Electrostatic discharge can damage integrated circuits or semiconductors if you touch connector pins or tracks on a printed wiring board. Follow these guidelines when you handle any electronic component:
>
> - Touch a grounded object to discharge static potential
> - Wear an approved wrist-strap grounding device
> - Do not touch the wire connector or connector pins
> - Do not touch circuit components inside a component
> - If available, use a static safe workstation
> - When not in use, keep the component in its static shield box or bag

> **WARNING**
>
> Unless the location is known to be non-hazardous, do **not** connect or disconnect cables or install or remove components while the control system is powered include connecting or disconnecting the IOM from the IOTA. That does not, if not avoided, may result in minor or moderate injury.

Mounting considerations in this section apply to Experion LX systems that include:

Equipment label information

The following information can be found on the label of Experion LX Series 8 as shown below:
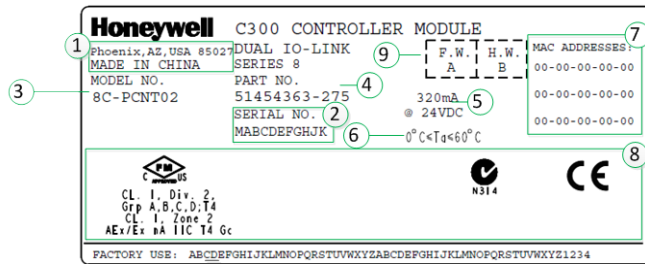
IOM Label

Figure 1 IOM Label

Item	Description
1	Place of production
2	Serial No.

3	Model No.
4	Part No.
5	Maximum Power Consumption
6	Operating temperature
7	Mac address
8	Standards and certifications
9	Version information of factory firmware and hardware

> **TIP**
> The date of manufacture can be identified in the Serial No.
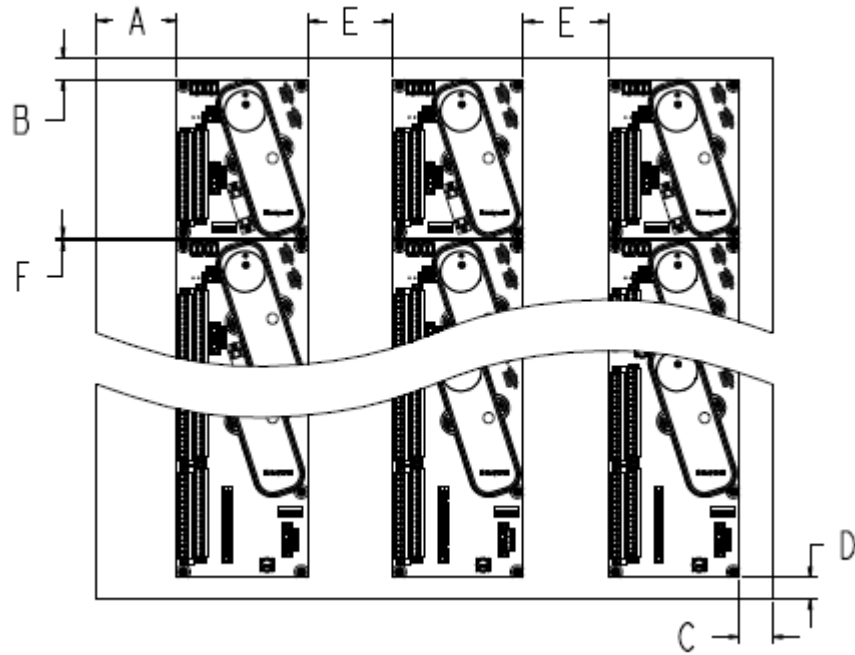
IOTA Label
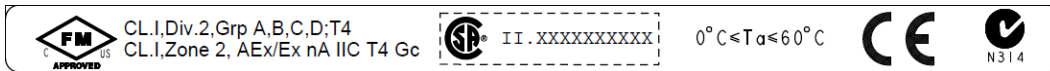
You can find the standards and certifications as well as operating temperature on the IOTA label.

- Typical layout of the back panel on which Experion LX Series 8 modules are installed, see the following figure:

Item	Description
A	>=110MM
B	>=5 MM
C	>=30 MM
D	>=5 MM
E	>=125 MM
F	=2.54 MM
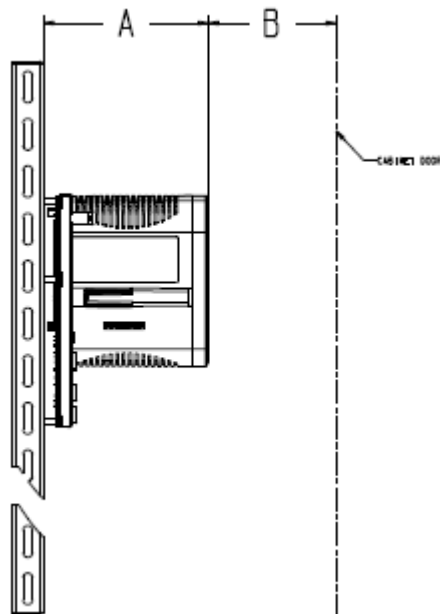
Item	Description
A	156.5 MM (MAX. HEIGHT ON BACK PANEL)
B	>= 150.0 MM (RECOMMENDED DISTANCE FROM MODULE TO CABINET DOOR)

TIP: Tighten the IOTA mounting screw with the torque between 0.4 and 0.5 Nm.
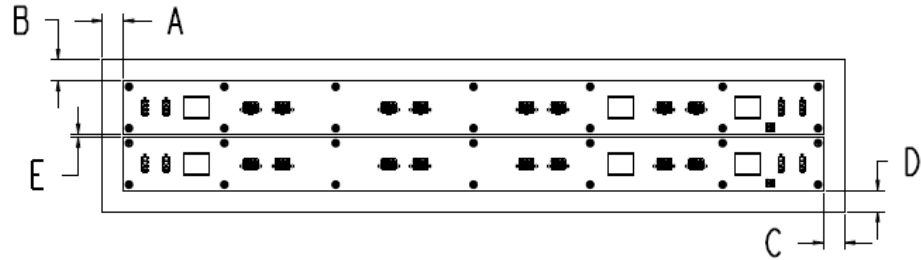
Number	Description
A	>= 5 MM
B	>= 5 MM
C	>= 5 MM
D	>= 5 MM
E	= 3 MM

- IO link and power cable requirements:

  Refer to the following picture for the IO link and power cable link:

CAUTION	Due to the capacity of the combo cable:
	• Up to 2 cables can be connected in a series in a column; up to 6 modules can be connected in a cable.
	• When the system supply is use to charge, if DO modules are installed in the combo cable, AO modules are forbidden to install in the combo cable; if AO modules are installed in the combo cable, DO modules are forbidden to install in the combo cable with up to 5 DO modules connected in the cable.

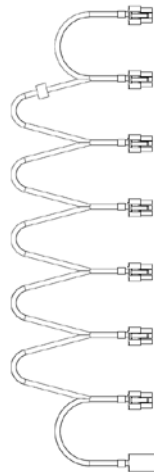• Refer to the following picture for 24VDC power supply connections to the header board
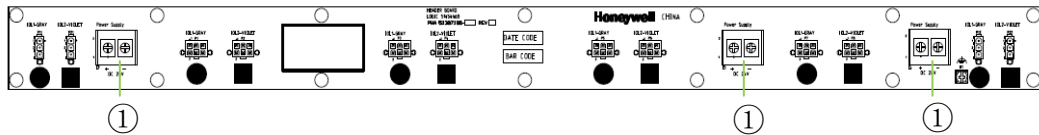
Figure 2 Power Supply terminal on the header board

Number	Description
1	Power Supply Port

• Limit of current rating (drops) , refer to the following table for the maximum current draw rating:

IO Module	IOTA Module	Maximum Current Draw Rating System Power Supply (mA@24VDC)	Maximum Current Values(mA@ 24VDC)	Maximum Current Field Supply(mA @ 24 VDC)
8C-PCNT02/ 8U-PCNT02	8C-TCNTA1/ 8U-TCNTA1	320	320	0
8C-IP0102/ 8U-IP0102	8C-TPOXA1/ 8U-TPOXA1	430	430	0
8C-PAIMA1/ 8U-PAIMA1	8C-TAIMA1/ 8U-TAIMA1	120	120	0

8C-PAINA1/ 8U-PAINA1	8C-TAIXA1/ 8U-TAIXA1	505	105	400
	8C-TAIXB1/ 8U-TAIXB1	610	210	400
8C-PAIHA1/ 8U-PAIHA1	8C-TAIXA1/ 8U-TAIXA1	510	110	400
	8C-TAIXB1/ 8U-TAIXB1	620	220	400
8C-PAIH54/ 8U-PAIH54	8C-TAIDA1/ 8U-TAIDA1	710	310	400
	8C-TAIDB1/ 8C-TAIDB1	1020	620	400
8C-PAONA1/ 8U-PAONA1	8C-TAOXA1/ 8U-TAOXA1	710	710	0
	8C-TAOXB1/ 8U-TAOXB1	1280	1280	0
8C-PAOHA1/ 8U-PAOHA1	8C-TAOXA1/ 8U-TAOXA1	715	715	0
	8C-TAOXB1/ 8U-TAOXB1	1290	1290	0
8C-PDISA1/ 8U-PDISA1	8C-TDILA1/ 8U-TDILA1	275	95	180
	8C-TDILB1/ 8U-TDILB1	370	190	180
8C-PDILA1/ 8U-PDILA1	8C-TDILA1/ 8U-TDILA1	275	95	180
	8C-TDILB1/ 8U-TDILB1	370	190	180
8C-PDIPA1/ 8U-PDIPA1	8C-TDILA1/ 8U-TDILA1	285	105	180
	8C-TDILB1/	390	210	180

	8U-TDILB1			
8C-PDODA1/ 8U-PDODA1	8C-TDODA1/ 8U-TDODA1	3465	105	3360
	8C-TDODB1/ 8U-TDODB1	3570	210	3360
	8C-SDOX01	1010	1010	0

- General grounding guidelines:

> ⚠️ **WARNING**
>
> The grounding system must be installed in accordance with the National Electrical Code (NEC), Canadian Electrical Code (CEC), and any other applicable electrical codes (to include: IEEE-142; Lightning Protection Institute Installation Code LPI-175; NFPA-78 (ANSI); IEEE Std. 142-1972).
>
> A broken or high resistance safety ground creates a potentially lethal situation, especially in equipment that incorporates line filters. The line filters include appreciable line-to-chassis capacitance. As a result, if the green or green/yellow ground wire is not intact, a person touching the equipment and ground can receive a serious and possibly fatal shock.

Adequate grounding is important for safety considerations and for reducing electromagnetic noise interference. All earth-ground connections must be permanent and provide a continuous low impedance path to earth ground for induced noise currents and fault currents. Refer to the following guidelines when considering the grounding requirements of your system:

For safe operation of your equipment, a high-integrity grounding system must be installed as part of the building's wiring system.

- An equipment ground wire must be enclosed with the circuit conductors (phase and neutral wires),
- The isolated ground wire must run directly from the outlet to the power source
- The size of the ground conductor must be the same as, or larger, than the circuit conductors supplying the equipment
- The ground conductor must be securely bonded to the building-ground electrode
- Grounding provisions must be in accordance with the NEC, CEC, and any other local codes.

3.2 Install the Series 8 C300 Controller

C300 Controller assembly

The C300 Controller consists of an Input/Output Terminal Assembly (IOTA) board and the controller module which is housed within a plastic cover and is mounted on the IOTA board. The Controller assembly is installed in a control cabinet on vertically-mounted channels specifically for Series 8 control hardware.

C300 Controller IOTA Board Connector Summary is show below:

C300 IOTA Board	Description
F1	Fuse
IOL1A, IOL1B (Gray cable) IOL2A, IOL2B (Violet cable)	Redundant IOLINK connectors for IOLINK 1 and IOLINK 2
	IOLink A cable connectors are **Yellow**.
	IOLink B cable connectors are **Green**.
FTE A, FTE B	Fault Tolerant Ethernet (FTE) network connectors
	FTE A network cable connectors are **Yellow**.
	FTE B network cable connectors are **Green**.
REDUNDANCY	Redundant private path cable connector.
	Redundancy cable connector is **Orange**
MEMORY HOLD-UP	Battery Backup cable connector
	Battery cable is a twisted pair.
GPS (Currently not used)	GPS cable connector
FTE DEVICE INDEX 99, 10, 1	Three rotary decimal switches used to set the FTE network address (Device Index) of the controller.

Prerequisites

Before you install the C300 Controller you should have:

A control cabinet installed with panel for mounting Series 8 control hardware.

A power supply and RAM Charger Assembly installed in the cabinet.

Following are the parts included:

C300 Controller assembly (control module with IOTA board and mounting hardware)

2 STP Cat5 Ethernet cables (one Yellow cable, one Green cable)

2 or 4 IOLink cable assemblies for connecting on-board IO Link interface if the controller is supporting Series 8 I/O

Ensure the cabinet enclosure is connected to a protective earth ground using at least #8 AWG solid copper wire. There should be metal to metal contact between the grounding bus bar and the enclosure as well as the channel.

Considerations

When installing a redundant controller pair consisting of a primary and a partner secondary controller:

The secondary controller should be installed in the same cabinet as the primary controller.

The secondary controller may be installed on a separate channel from the primary controller.

Installing the Series 8 C300 Controller Procedures

To install a C300 Controller, perform the following steps.

Step	Action
1	Refer to appropriate site location drawings for the specified controller installation location, controller Device Index (FTE address) and wiring diagrams.
2	Identify the mounting location on channel and align mounting holes in IOTA with screw hole locations on the channel.

Step	Action
3	Be sure component side of IOTA is facing up. Refer to the figure below.
	Assemble mounting screws, washers and spacers provided. Insert spacers and washers between backside of IOTA and front of channel.

Step	Action
4	Position the assembled IOTA board at the proper mounting location.
5	Thread the four mounting screws only **half-way** to attach the IOTA board to the channel. Do **not** tighten.
6	Tighten the mounting screws securing the IOTA board to the panel.
7	Connect FTE-A and FTE-B Ethernet link cables to the RJ-45 connectors on C300 IOTA board.
	• The **Yellow** Cat5 cable connects to the "**FTEA**" connector on the IOTA.
	• The **Green** Cat5 cable connects to the "**FTEB**" connector on the IOTA.
8	If using the IOLINK interface in the controller, connect IOLink cable pairs to IOTA board.
	Four connectors on the IOTA provide redundant support for two IOLink interfaces IOLINK 1 (Gray) and IOLINK 2 (Violet). IOLink cable pairs include multidrop connectors to connect other I/O components to the IOLink.
	• Connect IOLINK cable pair to **IOL1A** and **IOL1B** for **IOLINK 1** interface of the controller.
	• Connect a second IOLINK cable pair to **IOL2A** and **IOL2B** for **IOLINK 2** interface of the controller.

Step	Action
	Note that when connecting Redundant C300 Controller pairs; connect the primary controller IOLINK and the redundant partner IOLINK to the same IOLink cable pair.
9	Install the two-wire twisted pair Battery cable onto the **MEMORY HOLD-UP** connector on the left side of the IOTA board.
10	Set the Device Index (**FTE DEVICE INDEX**) of the controller according to the site documentation by turning the three rotary decimal switches located on the IOTA board. Set the switches to the three digit address ranging from 001 to 509. The leftmost switch (100) is used to set the hundreds digit. The middle switch (10) is used to set the tens digit and the rightmost switch (1) sets the ones digit.

	The Device Index of all non-redundant and primary C300 Controllers must be set to an odd number address.
	Note: The FTE DEVICE INDEX setting on the switches should match the Device Index number entered on the Controller block's configuration form Main tab.
11	Insert the controller module onto IOTA board making sure that the controller circuit board mates properly with the IOTA board connector.
	Secure the controller module to the IOTA board with two screws located at each side of the plastic cover.
12	If the controller is to be redundant -
	In Control Builder, select the Main tab of the primary controller's configuration form and be sure to check the 'Module is Redundant' check box.

C300 Controller module and IOTA replacement

To replace a non-redundant controller module, perform the following steps.

⚠️ **CAUTION**

This procedure can only be performed while off process.

We recommend that you proceed with **extreme caution** whenever replacing any component in a control system. Be sure the system is offline or in a safe operating mode.

Component replacements may also require corresponding changes in the control strategy configuration through Control Builder, as well as downloading appropriate data to the replaced component.

Step	Action
1	Loosen screws at each side of the module cover that secures the controller module to the IOTA board.
2	Carefully remove the Controller module from the IOTA board and connector.
3	Insert the new controller module onto IOTA board making sure that the controller circuit board mates properly with the IOTA board connector. Note that all modules are keyed.
4	Secure the controller module to the IOTA board with two screws located at each side of the plastic cover.
5	The new controller will boot-up to ALIVE or NODB state.
6	Load firmware which is the same version as was running in the old controller.
7	In **Control Builder**, perform a '**Load with Contents**' to the controller.

To replace a non-redundant controller IOTA board, perform the following steps.

⚠️ **CAUTION**

This procedure can only be performed while off process.

We recommend that you proceed with **extreme caution** whenever replacing any component in a control system. Be sure the system is offline or in a safe operating mode.

Component replacements may also require corresponding changes in the control strategy configuration through Control Builder, as well as downloading appropriate data to the replaced component.

Step	Action
1	On the defective IOTA, loosen screws at each side of the module cover that secures the controller module to the IOTA board.

Step	Action
2	Carefully remove the controller module from the IOTA board and connector.
3	Label and disconnect all cables from the IOTA board connectors, (yellow and green FTE cables, gray and violet IOLink cables, and Battery cable).
4	Loosen the four mounting screws only **half-way** that secure the IOTA board to the channel.
5	Remove completely the four mounting screws securing the IOTA board to the channel and remove the IOTA.
6	Place screws, washers and spacers aside for reassembly.
7	Assemble screws, washers and spacers on the new IOTA board. Mount new controller IOTA board on the channel at the same position as the old IOTA board.
8	Insert and thread the four mounting screws only **half-way** to attach the IOTA board to the channel. Do **not** tighten.
9	Tighten the four mounting screws securing the IOTA board to the channel.
10	Set the Device Index address to the same address as the old IOTA using the three rotary **FTE DEVICE INDEX** switches.
11	Connect FTE-A and FTE-B Ethernet link cables to the RJ-45 connectors on C300 IOTA board. • The **yellow** Cat5 cable connects to the "**FTEA**" connector on the IOTA. • The **green** Cat5 cable connects to the "**FTEB**" connector on the IOTA.
12	Connect IOLink cables to IOTA board, if present. • Connect gray IOLINK cable to **IOL1A** and **IOL1B** for **IOLINK 1** interface of the controller. • Connect violet IOLINK cable to **IOL2A** and **IOL2B** for **IOLINK 2** interface of the controller.
13	Install the two-wire twisted pair Battery cable onto the **MEMORY HOLD-UP** connector on the left side of the IOTA board.
14	Insert the controller module onto IOTA board making sure that the controller circuit board mates properly with the IOTA board connector. Secure the controller module to the IOTA board with two screws located at each side of the plastic cover.
15	The controller will boot-up into an ALIVE state or a NODB operating state.

Step	Action
16	In **Control Builder**, perform a '**Load with Contents**' to the controller.

3.3 Install the Series 8 Profibus Gateway Module

PGM assembly

The PROFIBUS Gateway Module consists of an Input/Output Terminal Assembly (IOTA) board and the PGM module which is housed within a plastic cover and is mounted onto the IOTA board. The PGM assembly is installed in a control cabinet on vertically-mounted channels specifically for Series 8 control hardware. The following table provides information on the PGM IOTA board.

PGM IOTA Board	Description
F1	Fuse.
PBLINK1 PMLINK2	Connectors to the PROFIBUS network.
FTEA, FTEB	Fault Tolerant Ethernet (FTE) network connectors. FTE A network cable connectors are yellow. FTE B network cable connectors are green.
FTE DEVICE INDEX 100,10,1	Three rotary decimal switches used to set the FTE network address (Device Index) of the PGM.
I/O Link A I/O Link B	Connectors to I/O Link cables for PGM power and grounding connection. I/O Link A cable connectors are green. I/O Link B cable connectors are yellow.

Prerequisites

Before you install the PGM you should have:

- A control cabinet installed with appropriate channel hardware for mounting the Series 8 control hardware.

- A power supply and RAM Charger Assembly installed in the cabinet.

- Necessary parts for installing PGM to the control system. See Series 8 System Cabling in the *Control Hardware Planning Guide* for cable hardware details.

 – The PGM assembly (PGM module with IOTA board and mounting hardware)

– Two PBLink cable assemblies for connecting the slave devices.

- Ensure the cabinet enclosure is connected to a protective earth ground using at least #8 AWG solid copper wire. There should be metal to metal contact between the grounding bus bar and the enclosure as well as the channel.

Install the Series 8 Profibus Gateway Module Procedure

Perform the following steps to install a PGM:

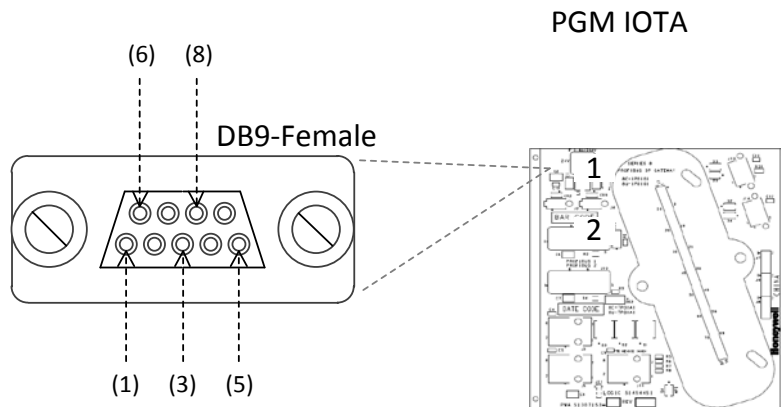| Step	Action
1	Refer to appropriate site location drawings for the specified installation location, PGM Device Index (FTE address), and wiring diagrams.
2	Identify the mounting location on channel and align mounting holes in IOTA with screw hole locations on the channel.
3	Assemble mounting screws, washers and spacers provided. Insert spacers and washers between backside of IOTA and front of channel. Ensure that the component side of the IOTA is facing up.
4	Position the assembled IOTA board at the proper mounting location.
5	Thread the four mounting screws only half-way to attach the IOTA board to the channel.
6	Tighten the mounting screws securing the IOTA board to the channel.
7	Connect FTE-A and FTE-B Ethernet link cables to the RJ-45 connectors on PGM IOTA board. • The Yellow Cat5 cable connects to the "FTEA" connector on the IOTA. • The Green Cat5 cable connects to the "FTEB" connector on the IOTA.
8	**Connect I/O Link cables to the IOTA board.** • The cable with green terminal mark connects to the "IOLA" connector on the IOTA. • The cable with yellow terminal mark connects to the "IOLB" connector on the IOTA.
9	Connect "PBLink1" and "PBLink2" cables to the IOTA board.

10	Set the Device Index (FTE DEVICE INDEX) of the PGM according to the site documentation by turning the three rotary decimal switches located on the IOTA board. Set the switches to the three digit address ranging from 001 to 509. The leftmost switch (100) is used to set the hundreds digit. The middle switch (10) is used to set the tens digit and the right-most switch (1) sets the ones digit.
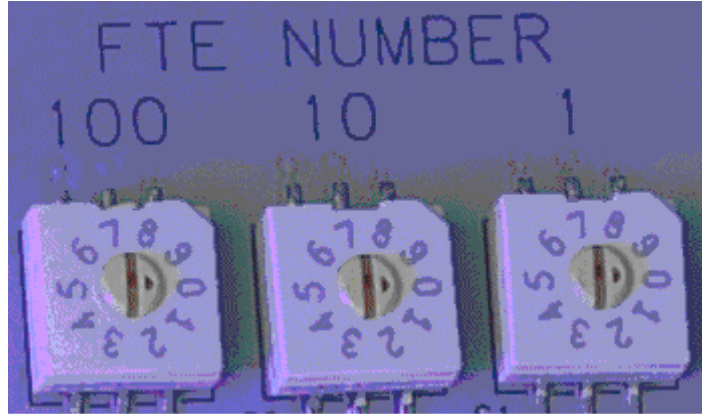
11	Insert the PGM module onto IOTA board making sure that the PGM circuit board is aligned properly with the IOTA board connector. Secure the PGM module to the IOTA board with two screws located at each side of the plastic cover.

PGM IOTA pinouts

The following figure illustrates the pinout diagram of the PGM/IOTA DB9-F connector.

The following table lists the PROFIBUS DB9-F Pin and signal definitions:

Pin Number	Signal	Description
Shell	Shield	Shield, Protective Ground
1	Shield	Shield, Protective Ground(not recommended-see note)
2	--	Not Connected
3	RxD/TxD-P	Receive/Transmit data-plus(B wire, red color)
4	CNTR-P	Repeater control signal(direction control), RTS signal
5	DGND	Data ground(reference potential for VP)*
6	VP	Voltage-plus(P5V), +5V*
7	--	Not Connected
8	RxD/TxD-N	Receive/Transmit data-minus(A wire, green color)
9	--	Not Connected

ATTENTION

Only the signals shown in the above figure and table are available for PGM. Others are not connected.

The metallic shell shall be used as the primary shield and protective ground connection as it provides the best EMI mitigation.

Pin 1 is provided for compatibility with older systems that use this pin as a shield connection point.

* VP (+5V) and DGND are primarily used for external bus termination. Some devices such as electrical to fiber optic repeaters might require external power from these pins (not to exceed 35 mA). CNTR-P (repeater control) is used in some equipment to determine the direction of transmission/reception.

3.4 Install the Series 8 I/O Modules

WARNING

Unless the location is known to be non-hazardous, do not:

- Remove or replace fuse
- Operate DIP (Address) switch
- Connect or disconnect cables
- Install or remove components
- Install or remove IOM

while the control system is powered.

Installing the Series 8 IOTA on the Panel

Prerequisites

Panel for mounting IOTA is installed in a cabinet or desired mounting location.

- Power supply is installed.
- All wiring and pre-fabricated cables are available and labeled as applicable.
- Ensure all power is turned off at the installation location.
- You have the mounting hardware supplied with the components.

Considerations

You can use a redundant IOTA to support a non-redundant Series 8 IOM application. Ensure to install the non-redundant Series 8 IOM in the upper IOM location on the IOTA.

Ensure the enclosure is connected to a protective earth ground using at least #8 AWG solid copper wire.

Mounting the IOTA

Step	Action
1	• Select desired mounting location on carrier and align mounting holes in IOTA with screw-hole locations on the carrier. Ensure component side of IOTA is facing up.
	• When mounting either the 9 or 12 inch IOTA board, it is recommended to secure the three mounting screws on one side (either left or right) and then secure the other side.
	NOTE: Securing the four corner screws and the two middle screws may cause bowing of the board and impact the alignment of the IOTA board to the carrier holes and is not recommended.

2
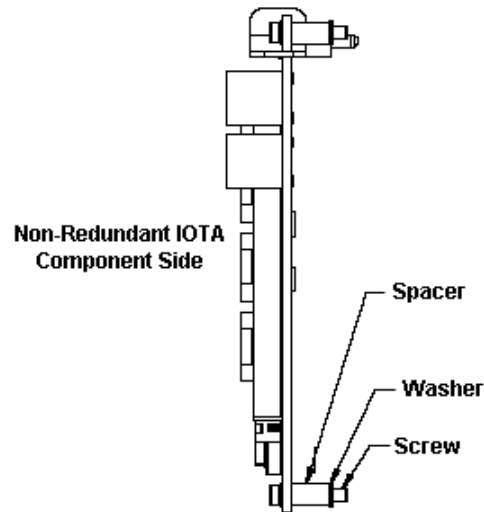
Mounting the I/O module on the IOTA

Prerequisites

It is recommended to attach the IOTA board to the carrier prior to mounting the module to the IOTA. The following also needs to be established:

- IOTA is mounted on the carrier rack.

- Power supply is installed.

- All wiring and pre-fabricated cables are available and labeled as applicable.

- Ensure all power is turned off at the installation location.

- You have the mounting hardware supplied with the components.

Mounting the module

Step	Action
1	Insert the module onto IOTA board ensuring that the circuit board mates properly with the IOTA board connector.
2	Secure the module to the IOTA board - with two screws located at each side of the plastic cover.

3.5   Removal and insertion under power

Many of the Experion LX system's modules (that is, I/O Communications) are designed to permit removal and insertion under power (RIUP) without damaging the module or interrupting backplane communications. However, arching or sparking can occur anytime electrical connections are made or broken. For this reason, removal and insertion must *not* be performed in hazardous locations when the modules are under power.

> **WARNING**
>
> Experion LX's removal and insertion under power (RIUP) feature does not apply to installations that must conform to Division 2/Zone 2, Hazardous Location requirements. Unless the location is known to be non-hazardous, DO NOT do the following:
>
> • Connect or disconnect cables;
>
> • Connect or disconnect Removable Terminal Blocks (RTBs);
>
> • Install or remove modules.
>
> • Remove or replace fuse
>
> • Operate DIP (Address) switch

Experion LX communication ports

Experion LX has two Ethernet ports, two RS232 ports and two RS485 ports. All of these ports can be used to communicate with SCADA, third-party devices and so on.

RS232 ports and Ethernet ports

An RJ45 female connector is provided for each of RS232 and Ethernet ports. These ports are identical in both connection and functionality. The connection between RJ45 male and female follows EIA/TIA-561 standard.

For RS232 ports, a pre-wired DB9F to RJ45F adapter is included in these units. Use this adapter to make a connection between a serial port on your computer (DB9 male) and RJ45 female on Experion LX.
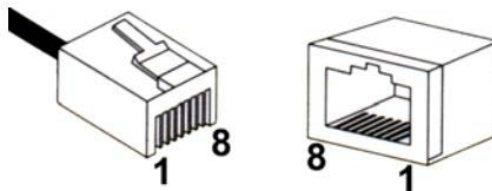

Figure 3: RJ45 Pin Locations (for RS232 and Ethernet)

RS485 ports

RS485 port is also available on all Experion LX units. Experion LX provides two RS485 connections to some specific equipment. It is provided with four terminals: for signal

ground, 485+, 485- and termination. Generally, + is connected to + and – is connected to – between units. However, there is no standard for RS485 terminal designations. The situations that + to – or – to + are allowed in some cases. These unconventional operations don't result in any damages. It is highly recommended that you connect the signal ground to an appreciate ground if available between all RS485 units. Ensure to use a good quality communication cable with three conductors (twisted is preferred) with a shield. To prevent ground loops, the shield must be connected to chassis ground on any one end of any cable connection.

ATTENTION

If you have an existing wiring that has only two conductors and a shield, you can use the shield to connect the signal grounds between stations. This is not an optimal (especially for long cable connection) method, but works in most situations.

RS485 Terminals: The Experion LX units have RS485 termination components (150-ohm resistor and a 0.1 µF capacitor connected in series). To terminate the RS485 network, connect the "T" terminal to the RS485 terminal. Ensure to use the same type and size of the conductor as used previously for your RS485 connection. It is recommended that both the end stations connected to your RS485 network be terminated. For third-party devices, refer to their user manual for termination instructions.

ATTENTION

Incorrect connections of RS485 will cause communication failure.

Bias Resistors: On a RS485 2-wire network, a pair of bias resistors (1K ohm typically) is required for the transmit/receive wires. The function of bias resistors is to force the transmit/receive wires to a known (non-floating) state when none of the RS485 devices are transmitting data. If the bias resistors are not present, the inputs received on some RS485 devices may react to the noise on the floating wires. Some RS485 devices have bias resistors built-in, and are enabled through DIP-switch or jumper settings. Make sure that there is only one pair of bias resistors acting upon the network.

4. Maintenance

If you cannot resolve a problem, you can request support from your local Honeywell Technical Assistance Center (TAC) or support center listed in the "Support and other contacts" section of this document. When requesting support, supply as many relevant details about the problem.

When a controller failure occurs, you should gather information about the controller and the conditions under which it failed. This information will be beneficial to Honeywell TAC to help in diagnosing and correcting the fault and/or replacing the controller hardware.

Use this list to obtain information from the controller and the system so that when you contact Honeywell TAC a complete description of the problem can be made.

- Remove and replace the failed controller. Refer to the section **Error! Reference source not found.** for details.

- Install the failed controller in a safe off-process location and start it up.

Obtain the following:

- Hardware revision number of the controller

- Firmware revision, both the Boot image and Application image

- The RTU System Release number in which the controller was operating.

Additional information regarding the operating conditions of the controller and sequence of events:

- Was the controller operating in a redundant or non-redundant hardware configuration?

- What was the redundancy state of the controller at the time of the failure, if redundant?

- Any other status or fail indications on the controller's faceplate observed at the time of the failure or following the event?

- Provide a detailed summary of the sequence of events leading up to the failure.

- What operations preceded the event, such as: load, activate, change parameter, delete, power cycle, synchronization, switchover, and so on?

5. Factory Mutual Conditions of Use for Division 2/Zone 2 Hazardous Location Installation

5.1 For Use in United State (FM Approvals Standards)

- The installer shall provide transient over-voltage protection external to the apparatus such that the voltage at the supply terminal of the apparatus does not exceed 140% of the voltage rating of the equipment.

- The equipment shall be mounted in an enclosure providing a minimum degree of protection of IP54 in accordance with ANSI/IEC 60529, and in a tool-secured enclosure which meets the requirements of ANSI/ISA 60079-0 and ANSI/ISA 60079-15.

- Equipment shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

Title	Number	Issue Date
Electrical Equipment for Use in Hazardous (Classified) Locations, General Requirements	3600	2011
Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2, Hazardous (Classified) Locations	3611	2004
Electrical and Electronic Test, Measuring and Process Control Equipment	3810	2005
Electrical apparatus for explosive gas atmospheres. Part 0: General Requirements	ANSI/ISA-60079-0	2013
Explosive atmospheres Part 15: Equipment protected by type of protection "n"	ANSI/ISA-60079-15	2012

5.2 Canadian Standards

- The installer shall provide transient over-voltage protection external to the apparatus such that the voltage at the supply terminal of the apparatus does not exceed 140% of the voltage rating of the equipment.

- The equipment shall be mounted in an enclosure providing a minimum degree of protection of IP54 in accordance with CSA C22.2 No. 60529, and in a tool-secured enclosure which meets the requirements of CAN/CSA 60079-0 and CAN/CSA 60079-15.

- Equipment shall be installed in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

Title	Number	Issue Date
Non-incendive Electrical Equipment for use in Hazardous Locations	CAN C22.2 No. 213 - M1987	1987 (2013)
Electrical and Electronic Test, Measuring and Process Control Equipment	C22.2 No. 1010.1	2004
Electrical apparatus for explosive gas atmospheres. Part 0: General Requirements	CAN/CSA E60079-0	2011
Explosive atmospheres Part 15: Equipment protected by type of protection "n"	CAN/CSA E60079-15	2012

5.3   European Standards

Title	Number	Issue Date
LVD directive		
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements	EN 61010-1	2010
EMC directive		
Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 1: General requirements	EN 61326-1	2006
Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement.	CISPR 11: 2009+A1	2010
Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16A per phase)	IEC 61000-3-2	2009
Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection	IEC 61000-3-3	2005

Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	IEC 61000-4-2	2008
Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3:2006+A1:2007+A2	2010
Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test	IEC 61000-4-4	2004
Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test	IEC 61000-4-5	2005
Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6	2008
Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test	IEC 61000-4-8	2009
Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11	2004

Honeywell