Honeywell

Unit Operations Controller Specifications

LX03-370

Unit Operations Controller Specifications for Experion LX
February 2022, Version 3.0

Revision History

Revision	Date	Description
1.0	November 2018	Release version for Experion LX R510
2.0	December 2019	Updated version for Experion LX R511, covering new I/O modules, PROFINET support and other Ethernet/IP section updates
3.0	February 2022	Updated for Experion LX R520. Added Composite Device Point adder (100 pts), Advanced Batch point adder part numbers. And added UOC capabilities. And Certification updates.

Table of Contents

1. Introduction

This document provides technical information for the Honeywell Unit Operations Controller (UOC). Further product descriptions can be found in the Product Information Note. Detailed planning, installation and configuration information is available in the product user guides.

1.1. UOC Overview

Honeywell's advanced Unit Operations Controller (UOC) and associated 900 IO offers a DCS controller solution that improves control performance while offering greater flexibility and lower solution costs. The UOC provides inherent integration with Experion®, improved integration with HMIs and third-party devices, and reduces configuration efforts by utilizing proven Experion Control Execution Environment (CEE) programming environments, as well as remote configuration and firmware updates.

1.2. Document Scope

This document provides specifications for the following components:

- ControlEdge 900 Controller
- ControlEdge 900 IO Modules
- ControlEdge 900 Expansion Processor Module
- ControlEdge 900 Power Supplies
- ControlEdge 900 Power Status Modules
- ControlEdge 900 Racks
- ControlEdge Remote Termination Panel
- ControlEdge UOC Control Execution Environment (CEE)

ControlEdge UOC utilizes Experion Control Builder as programming environment. Refer ControlEdge UOC CEE specification section for software related details and specifications.

1.3. Terminology

Terminology	Description
UOC	Unit Operations Controller (Experion)
vUOC	Virtual Unit Operations Controller (Experion)
CEE	Control Execution Environment (Experion)
CDA	Control Data Access
DLR	Device Level Ring
HSR	High Availability Seamless Ring
PRP	Parallel Redundancy Protocol
CPM	Control Processor Module
CPU	Control Processor Unit
EPM	Expansion Processor Module
Expansion I/O Rack	I/O Rack with EPM installed
I/O Network	Network between CPM and expansion I/O rack
IPSec	Internet Protocol Security
Local I/O Rack	I/O Rack with CPM installed
OWD	Open Wire Detect
Redundant CPM Rack	Rack with 2 CPMs installed
RSM	Redundant Switch Module
RTP	Remote Terminal Panel
Scanner	Expansion Rack Scanning Unit
UIO	Universal Input/output Module
PPS	Parameters Per Second

2. Hardware Specifications

2.1. Control Processor Module (900CP1-0200)

The ControlEdge 900 platform has a rack based modular hardware design with control processor modules that plug onto different rack options depending on system configuration requirement.

2.1.1. Performance and Capability

Item	Specification
Maximum ControlEdge 900 I/O modules for controller	144
Maximum I/O count for controller	2048[1]
Maximum ControlEdge 900 I/O racks per controller	12
Note 1: This soft limit is a combination of real physical I/O (transmitters, valves, limit switches, solenoids, etc.) wired to ControlEdge 900 I/O, real physical I/O wired to smart protocol (PROFINET, EtherNet/IP, ModbusTCP, etc.) based I/O (ex. Turck BL20), and smart protocol based Composite Devices (ex. smart motor starters and drives on PROFINET, EtherNet/IP, ModbusTCP, etc.).	

2.1.2. Hardware specification and Features

Item	Specification
Processor	Dual Core ARM® Cortex™-A9 Core (32 bit) 667 MHz
User Programming memory, max	32 MB (physical UOC) 128MB Virtual UOC
SD card support[1]	32GB Class 6 / Class 10 industry standard
Controller Redundancy	Supported
CPU Watchdog	CPU automatically resets if error is detected
Nonvolatile memory	16Mbits
Nonvolatile memory data life	20+ years (no battery required)
Real-time clock resolution	1 ms
I/O Scan Time	10 ms – 3000ms (adjustable per IO module)
Switchover	Internal parameters, variables and outputs are maintained during transition.
LED	2 LEDs, three color each, indicate the status and role of the CPM
Note 1: SD Card is utilized for controller memory retention during power failure	

2.1.3. Communication Capabilities

Item	Specification
Ethernet Ports	4
Network connection	Shielded RJ45 connector, auto-crossover
Network port speed	10/100BaseTx, auto-detecting
Isolation	1500 Volts RMS 1 minute, 60 Hz
Transient Voltage Suppression	600W peak pulse power capability at 10×1000µs waveform, repetition rate:0.01%
Diagnostic LEDs on each port	Yes
Protocols, CPM ports 1 & 2	CDA through FTE, Modbus/TCP
Protocols, CPM ports 3 & 4	ControlEdge 900 I/O, Ethernet/IP, PROFINET
Embedded Firewall	Supported on all ports
IPSec	Supported on ports 1&2

CDA Peer to Peer
Control Data Access (CDA) is a protocol used for communication between the UOC/vUOC Controller and controllers in Experion LX system.

Item	Specification
CDA parameter access	Supports both as responder (server) and initiator (client)
Supported Experion Controllers	C200, C200E, C300, UOC, Virtual UOC, ControlEdge PLC

OPC UA DA Server in UOC
Starting Experion LX R520, UOC has onboard OPC UA DA Server functionality that allows UOC to connect and read/write with OPC UA DA client devices.

Item	Specification
Maximum number of OPC UA client connections per UOC	5
Minimal sampling interval for Publish-Subscription	250ms

2.2. Expansion Processor Module (900SP1-0200)

EPM acts as the interface module between expansion I/O and control processor module. Required for I/O racks to communicate to CPMs in a different rack.

2.2.1. Hardware specification and Features

Item	Specification
Processor	Dual Core ARM® Cortex™-A9 Core (32 bit) 667 MHz
Rotary Address Switch	Determine the Rack address range from 1 to 12
LED	2 LEDs, three color each, indicate the status of EPM

2.2.2. Communication Capabilities

| Item	Specification
Ethernet Ports	2
Network connection	Shielded RJ45 connector, auto-crossover
Network port speed	10/100BaseTx, auto-detecting
Isolation	1500 Volts RMS 1 minute, 60 Hz
Transient Voltage Suppression	600W peak pulse power capability at 10×1000µs waveform, repetition rate:0.01%
Diagnostic LEDs on each port	Yes
Downlink Redundancy support	HSR, PRP, DLR

2.3.   I/O Network Topology

ControlEdge 900 platform hardware supports both Star and Ring topology to connect Expansion IO rack with CPM rack.

Item	Specification
Expansion I/O Network Topology	Star or Ring topology supported up to 100baseTx using standard RJ45 connections for both Redundant and non-redundant systems.
I/O network maximum cable lengths	Shielded Ethernet cable 100 m (328 ft.) CPM to EPM (expansion I/O rack), or to switch. Fiber optic cable Multi-mode: 5000m (16,404 ft.)[1] CPM to EPM or to switch. Single-mode: 40km (131,234 ft.)[1] CPM to EPM or to switch.
Network Switch and Fiber Optic Equipment Recommendations[2]	Unmanaged Ethernet Switches[3] • Moxa model EDS-308 with (eight) 10/100 Ethernet ports • Moxa model EDS-308-MM-SC with (six) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors • Moxa model EDS-308-SS-SC with (six) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors • Moxa model EDS-316-MM-SC with (fourteen) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors • Moxa model EDS-316-SS-SC with (fourteen) 10/100 Ethernet ports, (two) single mode fiber ports with SC Connectors • SIEMENS Scalance model X208, managed IE switch, 8x 10/100 Mbit/s RJ45 port (for use to support connectivity to PROFINET MRP networks) Fiber Optic Converters[3] • Qualified Moxa IMC-101-M-SC with 10/100BaseT(X) to 100BaseFX multi-mode fiber port with SC connectors • Qualified Moxa IMC-101-S-SC with 10/100BaseT(X) to 100BaseFX single mode fiber port with SC connectors Copper Ethernet cable • Shielded CAT5 Cable Fiber optic cable • 50/125µm with SC connectors on both ends (Multi mode) • G.652 with SC connectors on both ends (Single mode)

Note:
1. Select qualified MOXA switch as I/O Network Switch. For detail information refer to MOXA datasheet.
2. Honeywell Model number is available in Model number list.
3. All Ethernet Switches and Fiber Optic convertors require 24VDC Power.

2.3.1.   Device Level Ring (DLR)

See section: Ethernet/IP Architecture

2.3.2.   High availability Seamless Redundancy (HSR) Ring
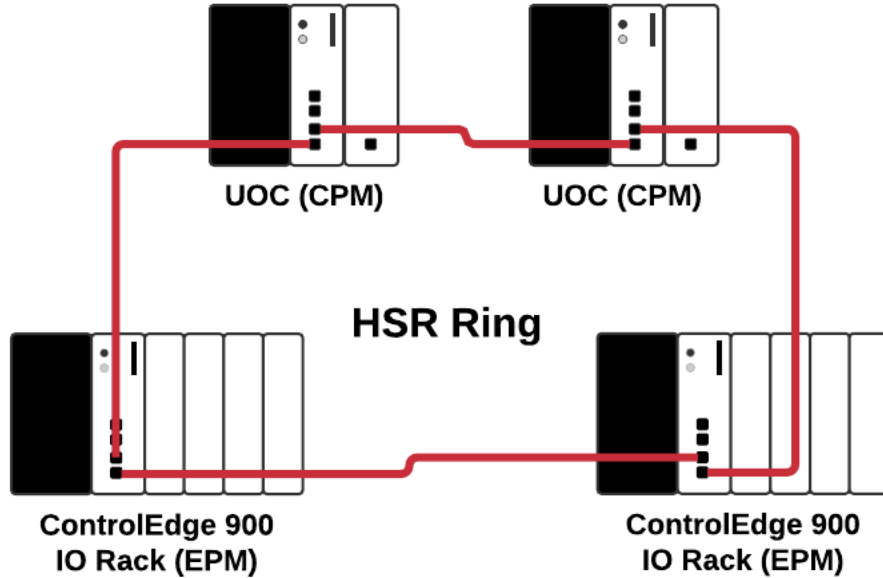
1. Supports ControlEdge 900 I/O only
2. 4, 8, and 12 Racks are supported
3. 12 Racks maximum supported
4. A maximum of 2048 I/O and signals are supported per controller
5. HSR is not support for use with Virtual UOC (vUOC)
6. No EtherNet/IP, PROFINET devices are supported on HSR networks

Proper HSR connections
- CPM A Port 3 → CPM B Port 4
- CPM B Port 3 → EPM 1 Port 1
- EPM 1 Port 2 → EPM 2 Port 1
- EPM 2 Port 2 → EPM 3 Port 1
- …
- EPM 12 Port 2 → CPM A Port 4

Do NOT Connect:
- CPM Port 3 to CPM Port 3
- CPM Port 4 to CPM Port 4
- CPM Port 3 to EPM Port 1
- CPM Port 4 to EPM Port 2
- EPM Port 1 to EPM Port 1
- EPM Port 2 to EPM Port 2

2.3.3.   Parallel Redundancy Protocol (PRP) Networks

1. Supports ControlEdge 900 I/O only
2. 4, 8, and 12 Racks are supported
3. 12 Racks maximum supported
4. A maximum of 2048 I/O and signals are supported per controller
5. PRP is not support for use with Virtual UOC (vUOC)
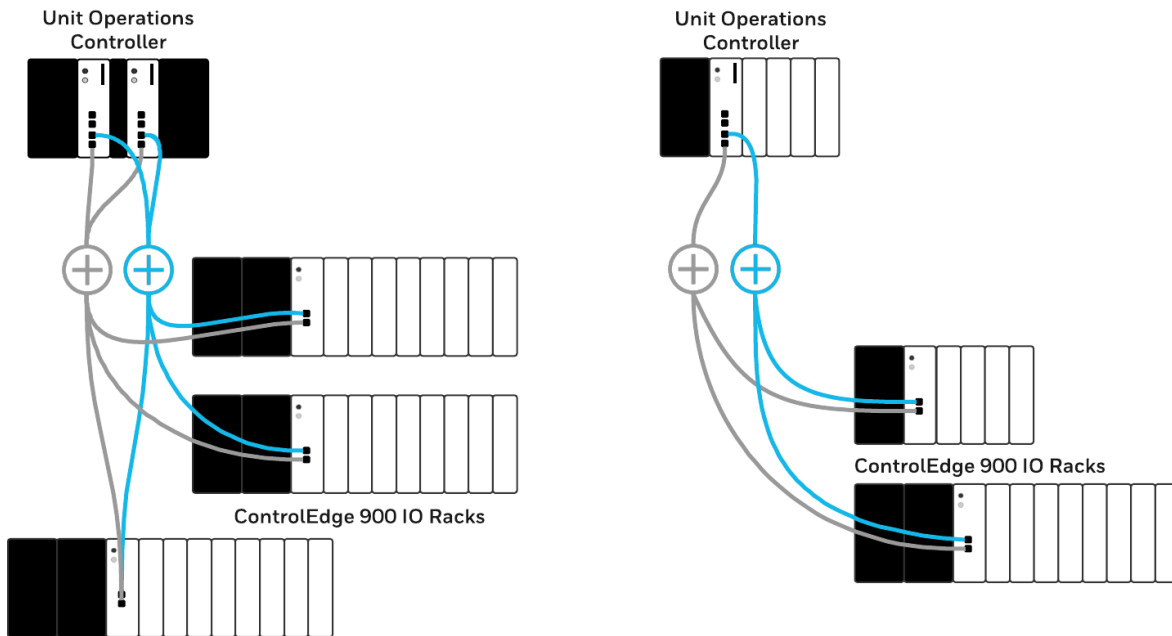6. No EtherNet/IP, PROFINET devices are supported on PRP networks
7. All CPM Ports 3 and EPM Ports 1 should be connected to the "A" switch
8. All CPM Ports 4 and EPM Ports 2 should be connected to the "B" switch

2.4. Input/output Module

ControlEdge UOC supports various input/output modules. This document provides technical information to configure ControlEdge UOC IO Modules. The following IO modules are included in this document.

- Universal Input and Output, 16 Channel
- Universal Analog Input; RTD, TC, V 8 Channel
- Digital Input 120/240 VAC, 16 Channel
- Digital Input 24 VDC, 32 Channel
- Digital Output 120/240 VAC, 16 Channel
- Digital Output 24 VDC, 32 Channel
- Analog Input High Level, 16 Channel
- Analog Output, 0-20mA, 4 Channel
- Analog Output, 0-20mA, 8 Channel
- Digital Input Contact, 16 Channel
- Digital Input, 120/240 VAC -125 VDC, 16 Channel
- Digital Relay Output, 8 Channel

2.4.1. Universal Input/output Module (900U01-0100)

Universal IO channel can be soft configured as AI with HART, AO with HART, DI or DO.

Item	Specification
Channels	16 (Isolate to rack)
Galvanic Isolation	1kV AC between logic and field
24V Field Supply Voltage	24V DC(Typical) 22V DC(Min) 27V DC(Max)
Load	Max 4.2 Amps per module 500 mA per channel

Analog Input

Item	Specification
Input type	Current (2, 3, or 4 wire devices), with HART Support
Input Channels	16 Maximum per module (with or without open wire detect)
A/D Converter Resolution	16 Bit
Input Range	0-20 mA or 4-20 mA
Crosstalk, dc to 60 Hz (channel-to-channel)	58dB
Input Impedance	250 Ω nominal
Maximum Input Voltage (any input referenced to common, no damage)	0 - 30V
Hardware accuracy	0.1% of full-scale (23.5 ± 2°C) 0.25% of full-scale (0 to +60°C)
Transmitter Field Power Conditioning	Current limited to 24 mA
Input Filter	First-order low-pass 100Hz
Max HART Multi-drop Connection	One device per channel

Analog Output

Item	Specification
Output Type	4-20 mA current loop & 0-20 mA Current loop with HART Support
Output Channels	6 Maximum per module[1] (with or without open wire detect)
Output Ripple	=< 125 mV peak-to-peak at power line frequency, across 250 Ohm load
Output Temperature Drift	0.5 % of FSR
Output Current Linearity	< 0.05%
Resolution	12 Bit
Calibrated Accuracy	<0.5% of Full Scale (25°C) including linearity
Directly Settable Output Current Range	0 mA to 23 mA
Maximum Resistive Load	500 Ohms
Minimum Resistive Load	100 Ohms
Maximum Output Compliant Voltage (24 V supply = 22 VDC through 28 VDC)	14 VDC
Maximum Open Circuit Voltage	24 VDC
Fail Safe value configuration	Yes • Hold Last Value • Failsafe Value
Max HART Multi-drop Connection	One device per channel

Note:
1. Connecting greater than 100 ohms resistance load will increase maximum AO channel number per UIO module. Please refer to the User's guide to determine channel usage in different scenarios.

Digital Input with Open Wire Detect

Item	Specification
Open Voltage	24V
Short Circuit Current	7 mA
Open Contact	15 kΩ > 0.1 W
Closed Contact	5 kΩ > 0.25 W
Short circuit detection:	I > 6mA +/-5%
Closed contact detection:	2.8mA < I < 6mA +/-5%
Lead Breakage Detection	I < 0.9mA +/-5%
Input filter	First-order low-pass 100Hz

Digital Input without Open Wire Detect

Item	Specification
Open Voltage	24V
Closed contact current	7 mA ± 5%, after open state detection
	3.5 mA ± 5%, after closed state detection
Closed contact detection	I > 2.81mA
Open contact detection	I < 1.8mA
Input filter	First-order low-pass 100Hz

Digital Output

Item	Specification
Output Channels	16 Maximum per module (with or without open wire detect)
Output Type	Solid state source, short circuit proof
Load Current	0mA Minimum to 0.5A Maximum per channel [1] 4.2 A Maximum per module
On-State Voltage	24 V (typical), load current @ 0.5A
Off-State Voltage	0 VDC
Off-State Leak Current	< 0.1 mA
Fail Safe State configuration	Yes • Hold Last State • Failsafe State

Note:
1. A Universal IO Channel configured for Digital Output can incorrectly report Line Monitoring failures if the load current is less than 10mA. Applications using such light loads need to disable Line Monitoring for those channels to avoid nuisance alarms

2.4.2.   Universal AI (900A01-0202)

The Universal Analog Input module supports up to 8 user-configurable inputs on a per point basis for thermocouple, RTD, Resistance, V, mV, mA. Point-to-point isolation and back-plane isolation are provided. Modules perform analog to digital conversion in synchronization with CPU control execution, eliminating data interchange latency. All analog input modules are processed in parallel, eliminating scan time increases as modules are added. A green blinking status LED on the module indicates when the module is being scanned and red status LED when module diagnostics exist. A user-selectable BURURNOUTN value is supported on a per channel basis. A warning signal is provided for thermocouple inputs to indicate maintenance is needed prior to a sensor failure. A sensor failure signal is also provided.

Item	Specification
Inputs per module	8 (isolated)
Input types	mV, V, T/C, RTD, ohms, mA
Signal Source	See Analog Input Reference Accuracy below for range types. Thermocouple with cold junction compensation RTD , PT100 3 wire, 40 ohms balanced maximum Thermocouples: 100 Ohms/Leg 100 (except Low), 500 & 1000 RTD: 100 Ohms/Leg 100 YIS: 100 Ohms/Leg 100-Low RTD & 10 ohm Cu: 10 Ohms/Leg
Input Impedance	10 megohms for T/C and mV inputs; >1 megohm for volts and 250 ohms for mA inputs
Galvanic Input Isolation	400 VDC point to point, 1K VDC to logic RTDs are isolated in pairs
Noise Rejection	Series Mode >60dB. Common Mode >130dB at 120VAC.
Burnout	T/C, mV, V. Configurable to upscale, downscale, defined value, or none.
Over-range limit	+/- 10% for linear ranges (volts). +/-1% for non-linear ranges (T/C, RTD).
T/C Break Detection	Via current pulse
Faulty thermocouple detection	If greater than 100 ohms, a warning status is provided as an output for the AI block

Item	Specification

Accuracy	Factory configured accuracy = ± 0.1 % of range (± 0.2 % of range for 0V to 10V and -10V to 10V)
	Cold junction accuracy = ± 0.7 °C
	
	Reference conditions:
	       Temperature = 25 °C ± 3 °C (77 °F ± 5 °F)
	       Humidity = 45 % to 55 % RH non-condensing
	       Line voltage = Nominal ± 1 %
	       Source resistance = 0 ohm
	Series mode and common mode = 0 V Frequency = Nominal ± 1 %

Temp. Effect on Accuracy	± 0.01% of full scale per degree Celsius maximum
A/D Converter	One per module
A/D Resolution	15 Bits
Reference Junction Sensing	Via 2 RTDs at top/bottom of module
Update rate	500ms (Analog to Digital Converter per module)
Long term Stability	0.1% per year
Calibration	Data is stored in non-volatile memory Redundant Factory Calibration Individual
Diagnostics	Monitoring of Factory Calibration, 24 VDC supply, and configuration.
Channel Configuration Data	Stored in non-volatile memory

Table 2 - Analog Input Reference Accuracy

Input Type	Range		Reference Accuracy	
Thermocouple inputs	□F	□C	□F	□C
B T/C	0 to 105	-18 to 41	NA	NA
	105 to 150	41 to 66	55.0	30.6
	150 to 500	66 to 260	30.0	16.7
	500 to 1000	260 to 538	8.0	4.5
	1000 to 3300	538 to 1815	4.0	2.3
E T/C	-454 to -202	-270 to -130	25.0	14.0
	-202 to 1832	-130 to 1000	2.3	1.3
E (low) T/C	-200 to 1100	-129 to 593	2.0	1.2
J T/C	0 to 1600	-18 to 871	1.2	0.6
J (low) T/C J	20 to 770	-7 to 410	1.0	0.5
T/C	-292 to 32	-180 to 0	1.0	0.5
K T/C	0 to 2400	-18 to 1316	2.0	1.2
K (low) T/C	-20 to 1000	-29 to 538	1.6	0.8
K T/C (mid)** K	0 to 1800	-18 to 982	1.8	1.0
T/C	32 to 2192	0 to 1200	2.0	1.2
Ni-NiMo (NNM68)	32 to 500	0 to 260	2.0	1.2
	500 to 2500	260 to 1371	1.5	0.8
Ni-NiMo (low)	32 to 1260	0 to 682	1.3	0.7
NiMo-NiCo (NM90)	32 to 500	0 to 260	2.0	1.2
	500 to 2500	260 to 1371	1.5	0.7
NiMo-NiCo (low)	32 to 1260	0 to 682	1.3	0.7
N T/C	0 to 2372	-18 to 1300	2.0	1.2
N T/C	0 to 1472	-18 to 800	1.4	0.9
N T/C	32 to 2192	0 to 1200	2.0	1.2
R T/C	0 to 500	-18 to 260	5.0	2.8
	500 to 3100	260 to 1704	2.2	1.2
S T/C	0 to 500	-18 to 260	4.5	2.5
	500 to 3100	260 to 1704	2.2	1.2
T T/C	-300 to 700	-184 to 371	4.0	2.3
	-100 to 700	-73 to 371	2.0	1.2
T (low) T/C W_-	-200 to 500	-129 to 260	1.0	0.5
W_{26}	-4 to 600	-20 to 2320	27.0	15.0
	600 to 3600	316 to 1982	4.0	2.3
	3600 to 4200	1982 to 2316	4.2	2.4
$W_5 W_{26}$ T/C *	0 to 600	-18 to 316	3.5	2.0
	600 to 3600	316 to 1982	3.0	1.7
	3600 to 4200	1982 to 2316	3.5	2.0
$W_5 W_{26}$ (low) T/C*	0 to 2240	-18 to 1227	2.5	1.4

[*]W_5W_{26} is also known as type "C" Thermocouple.

** Type K thermocouple (mid-range) has a working range from 75 to 1800 °F, 25 to 982 °C. Input measurements below 75°F or 25°C may cause the input to default to the programmed failsafe value. Use type K low or full ranges if measurements are required outside the mid- working range.

2.4.3. Analog Input High Level, 16 Channel (900A16-0103)

The High Level Analog Input module supports up to 16 user-configurable inputs on a per point basis for Voltage or current. Point-to-point isolation and back-plane isolation are provided. Modules perform analog to digital conversion in synchronization with CPU control execution, eliminating data interchange latency. All analog input modules are processed in parallel, eliminating scan time increases as modules are added.

A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module or channel diagnostics exist.

Item	Specification
Inputs per module	16 (Isolated)
Input types	V, mA
Signal Source	See High Level Analog Input Reference Accuracy for range types.
Input Impedance	>1 megohm for volts and 250 ohms for mA inputs
Galvanic Input Isolation	400 VDC point to point, solid state switching; 1K VDC to logic.
Noise Rejection	Series Mode >31dB Common Mode >90dB at 120VAC
Over-range limit	+/- 10% for linear ranges (volts).
Accuracy	Factory configured accuracy = ± 0.1 % of range. Reference conditions- Temperature = 25 °C ± 3 °C (77 °F ± 5 °F) Humidity = 45 % to 55 % RH non-condensing Line voltage = Nominal ± 1 % Source resistance = 0 ohm Series mode and common mode = 0 V Frequency = Nominal ± 1 %
Temp. Effect on Accuracy	±0.01% of full scale per degree Celsius maximum
A/D Converter	One per module
A/D Resolution	±15 Bits
Update rate	100ms (Analog to Digital Converter per module)
Long term Stability	0.1% per year
Calibration	Data is stored in non-volatile memory Redundant Factory Calibration
Diagnostics	Monitoring of Factory Calibration, 24 VDC supply, and configuration
Channel Configuration Data	Stored in non-volatile memory

Table 3 – High Level Analog Input Reference Accuracy

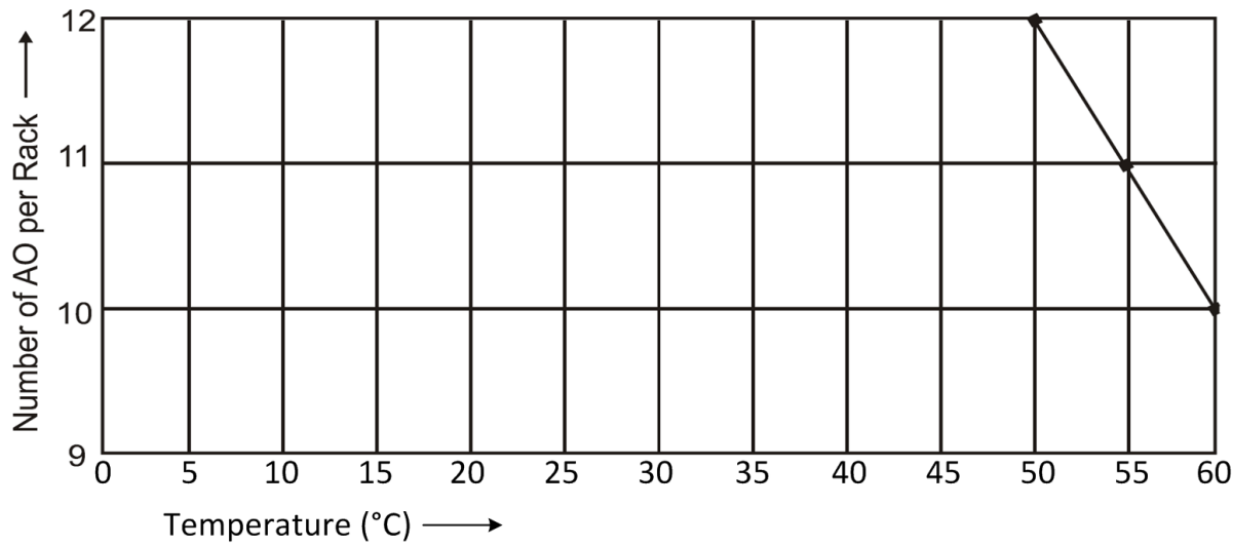| Input Type	Range	Reference Accuracy
Milliamperes	4 to 20 mAdc	± 0.15% F.S. (mA)**
	0 to 20 mAdc	± 0.15% F.S. (mA)**
**Tolerances for these input types include that of internal Dropping Resistors		
Volts	0 to 1 VDC	± 0.1% F.S. (mV)
	0 to 2 VDC	± 0.1% F.S. (mV)
	0 to 5 VDC	± 0.1% F.S. (mV)
	0 to 10 VDC	± 0.1% F.S. (mV)
	1 to 5 VDC	± 0.1% F.S. (mV)
	-1 to 1 VDC	± 0.1% F.S. (mV)
	-2 to 2 VDC	± 0.1% F.S. (mV)
	-5 to 5 VDC	± 0.1% F.S. (mV)
	-10 to 10 VDC	± 0.1% F.S. (mV)

2.4.4.   Analog Output, 0-20mA, 4 Channel (900B01-0301)

The Analog Output module provides 4 isolated 0 to 21.8 mA outputs that may be scaled by the user to any span within this range on a per output basis.

A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module or channel diagnostics exist. A user specified failsafe value is supported to allow predictable operation in the event communication between the module and the controller is interrupted.

Outputs are updated synchronous with IOM scan time which has minimum value is 500ms.

Item	Specification
Outputs per module	4 (isolated)
Current	0 to 21.8 mA, range selectable
Load resistance	750 ohms max
Galvanic Isolation	500 VDC Channel to Channel.
Galvanic Isolation from logic	600 VDC
Accuracy	0.1% full scale at reference conditions
Modules per rack	10 max, up to 12 with product ambient temperature de-rating (see figure below)
Minimum current sensing	> 3.5 mA per output
Calibration Data	Data is stored in non-volatile memory. Redundant Factory Calibration, with automatic rejection of Bad version.
Diagnostics	Monitoring of Factory Calibration, Configuration, and +24 VDC power supply.
Output Verification	Feedback to controller that indicates output current flowing.
D/A Resolution	12 bits
Fail Safe State configuration	Yes • Hold Last Value • Failsafe Value
User specified scan rate	It is supported by the slew rate function block. Slew Rate is the maximum rate of change required to drive the output from full OFF (0%-typically 0 mA or 4 mA) to full ON (100%-typically 20mA). The block will convert this to a maximum change of the milliamp output per execution cycle of this block.

2.4.5. Analog Outputs 0 to 20mA, 8 Channel (900B08-0202)

The Analog Output module provides eight 0 to 21.0 mA outputs that may be scaled by the user to any span within this range on a per output basis. Outputs are isolated in groups of 4 with no isolation between outputs in a group. All points are isolated from controller logic.

A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module or channel diagnostics exist. A user specified failsafe value is supported to allow predictable operation in the event communication between the module and the controller is interrupted.

Outputs are updated synchronous with control execution. A user-specified rate of change limit may be applied to each output when needed by slew rate function block. Requires Euro style 36-terminal terminal block.

Item	Specification
Outputs per module	8, isolated in 2 groups of 4 outputs (1-4, 5-8)
Current	0 to 21.0 mA, range selectable
Load resistance	750 ohms max
Galvanic Isolation	500 VDC group to group. Groups 1-4, 5-8
Galvanic Isolation from logic	500 VDC
Accuracy	0.1% full scale at reference conditions
Modules per rack	5 max when powered from internal 24V backplane power 10 max when powered from external 24V backplane power
Minimum current sensing	> 0.5 mA per output
Calibration Data	Data is stored in non-volatile memory. Redundant Factory Calibration, with automatic rejection of Bad version.
Diagnostics	Monitoring of Factory Calibration, Configuration, and +24 VDC power supply.
Output Verification	Feedback to controller that indicates output current flowing.
D/A Resolution	13+ bits (1 part in 13332)
Fail Safe State configuration	Yes • Hold Last Value • Failsafe Value
User specified scan rate	It is supported by the slew rate function block. Slew Rate is the maximum rate of change required to drive the output from full OFF (0%-typically 0 mA or 4 mA) to full ON (100%-typically 20mA). The block will convert this to a maximum change of the milliamp output per execution cycle of this block.

A DIP switch on the module selects the use of 24V from Rack PS (internal) power or external loop power via a separate 24 VDC power source. The as-shipped (default) switch setting is external power.

Item	Specification
Voltage	Vin: 18 to 36 VDC
Current	350 mA Per module

2.4.6.   Digital Input 120/240 VAC (900G03-0202)

The AC Digital Input modules are externally powered and accommodate two circuit voltages for up to 8 inputs each. Two common terminals are provided for each circuit. AC power applied between the common terminal and an input cause the input to turn ON. There is a green LED state indicator for each channel on the module to indicate when a digital input is ON. Logic in the controller allows the state to be inverted when necessary. A green blinking status LED on the module indicates when the module is being scanned and red status LED when module diagnostics exist.

Item	Specification
Inputs per module	16 (sinking)
Input Voltage Range	80 VAC to 264 VAC
Peak Voltage	264 VAC
AC Frequency	47 Hz to 63 Hz
Galvanic Isolation	2 groups of 8 inputs (350VAC max.)
ON Voltage Level	75 VAC
OFF Voltage Level	20 VAC
Input Impedance	48 K ohms nominal
Input Current	1 mA nominal @ 120 VAC, 60 Hz 2 mA nominal @ 230 VAC, 50 Hz
Minimum ON Current	0.3 mA
Maximum OFF Current	0.2 mA
OFF to ON response time[1]	4 ms + 1.5 line cycles maximum
ON to OFF response time[1]	4 ms + 2 line cycles maximum

Note:

1. Excluding controllers scan time and excluding transmission time from module to backplane

Active input De-rating table for ACDI
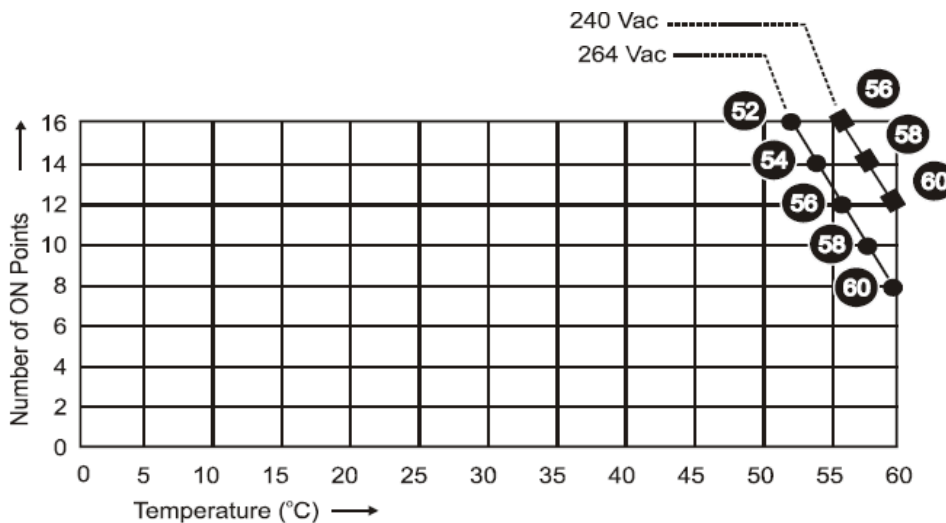
2.4.7. Digital Input 24 VDC (900G32-0101)

The DC Digital Input module provides 32 inputs separated in to 2 groups of 16 channels each. Each group has a pair of screw terminals for the COM connection. DC power applied between the common terminal and an input cause the input to turn ON. There is a green LED state indicator for each channel on the module to indicate when a digital input is ON. A green blinking status LED on the module indicates when the module is being scanned. Red status LED when module diagnostics exist. Logic in the controller allows the state to be inverted when necessary.
Requires Euro style 36-terminal terminal block.

Item	Specification
Inputs per module	32 (sinking)
Input Voltage Range	10 VDC to 32 VDC
Peak Voltage	32 VDC
Galvanic Isolation	2 groups of 16 inputs (30VDC max.)
ON Voltage Level	9.5 VDC minimum
OFF Voltage Level	3.5 VDC maximum
Input Impedance	6.9 K ohms nominal
Input Current	1.7 mA @ 12 VDC 3.5 mA @ 24 VDC nominal
Minimum ON Current	1.0 mA
Maximum OFF Current	0.7 mA
OFF to ON response time[1]	5 ms max
ON to OFF response time[1]	5 ms max
Note:	
1. Excluding controllers scan time and excluding transmission time from module to backplane	

2.4.8. Digital Input Module - Contact type (900G01-0202)

The Contact Closure Digital Input Module is self-powered, providing 15 VDC to external switching hardware to close the input loop. A closed external circuit causes current flow to the input to establish an ON state. Logic in the controller allows this state to be inverted when necessary. Four common terminals are provided to simplify field wiring.
There is a green LED state indicator for each channel to indicate when a digital input is ON. A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module diagnostics exist.

Item	Specification
Inputs per module	16 (single-ended)
Voltage Supplied by controller	15 VDC normal
Maximum contact resistance	1000 ohms
Galvanic Isolation	Isolation – Between Field wiring (input or output) and Module
OFF to ON response time[1]	4 ms max
ON to OFF response time[1]	6 ms max
Switching current	2.6 mA nominal
Note:	
1. Excluding controllers scan time and excluding transmission time from module to backplane	

2.4.9. Digital Input, 120/240 VAC-125 VDC (900G04-0101)

The AC/DC Input Module provides sixteen individually isolated, inputs that are powered externally. Two terminals are provided for each circuit. AC or DC power applied between the inputs terminals cause the inputs to turn on. There is a green LED state indicator for each channel on the module to indicate when a digital input is ON.
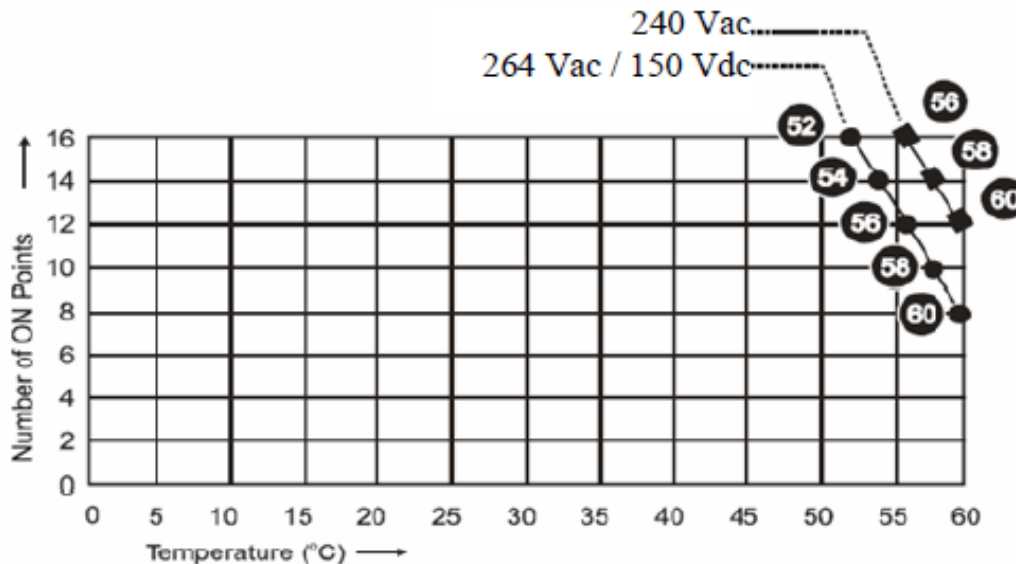A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module diagnostics exist. Logic in the controller allows the state to be inverted when necessary.
Requires Euro style 36-terminal terminal block.

Item	Specification	
	AC Application	DC Application
Inputs per module	16 (single-ended)	
Inputs per Module	16	16
Input Voltage Range	80 VAC to 264 VAC	80 VDC to 125 VDC
Peak Voltage	264 VAC	150 VDC
AC Frequency	47 Hz to 63 Hz	NA
Galvanic Isolation	Input to Input & Input to Chassis (350VAC max)	Input to Input & Input to Chassis (350VAC max)
On Voltage Level	75 VAC	75 VDC
Off Voltage Level	20 VAC	30 VDC
Input Impedance	48 k ohms nominal	48 k ohms nominal
Input Current	1 ma nom. @120 VAC, 60 Hz 2 ma nom. @240VAC, 50 Hz	2 ma nom. @125 VDC
Minimum On Current	0.3 mA	0.3 mA
Maximum Off Current	0.2 mA	0.2 mA
Off to On response time1	6 ms + 1.5 line cycles max.	6 ms + 2 line cycles max.
On to Off response time1	6 ms + 2 line cycles max.	6 ms + 2 line cycles max.

Note:

1. Nominal times excluding controllers scan time and excluding transmission time from module to backplane. DC application must include controller line filter setting of 50/60 Hz

Active Input De-rating table for AC/DC DI

2.4.10.   Digital Output 120/240 VAC (900H03-0202)

The AC Digital Output module provides 8 isolated zero switching Triac solid-state outputs. A shorting comb (900J02-0001/900J10-0001) is available for use with barrier type terminal blocks to simplify connections to a common voltage source for all outputs. Each output has a MOV for transient over- voltage protection and a field-replaceable fuse.
There is a green LED state indicator for each channel on the module to indicate when a digital output is ON.
A green blinking status LED on the module indicates when the module is being scanned. Red status LED when module diagnostics exist.

Item	Specification
Outputs per Module	8
Galvanic Isolation	Per output to output, output to logic
Operating Voltage	85 VAC to 240 VAC
Output Type	Triac (zero switching voltage)
Peak Voltage	250 VAC
AC Frequency	47 Hz to 63 Hz
ON Voltage Drop	<2.0 VAC (>0.1 A) <3.0 VAC (<0.1 A)
Transient Over voltage Protection	MOV
Maximum Load Current	2 A per point, 8 A max. per module, resistive load
Maximum Leakage Current	4 mA (240 VAC, 60 Hz) 1.2 mA (100 VAC, 60 Hz) 0.9 mA (100 VAC, 50 Hz)
Maximum Inrush Current	15 A for 10 ms
Minimum Load	50 mA
OFF to ON response time[1]	3 ms + 0.5 line cycle max
ON to OFF response time[1]	3 ms + 0.5 line cycle max
Fail Safe State configuration	Yes • Hold Last State • Failsafe State
Fuses	1 per output, 3.15 A Time-lag. Replacement part: Littelfuse 37413150410

Note:

 1. Excluding controllers scan time and excluding transmission time from module to backplane

2.4.11.   Digital Output 24 VDC (900H32-0102)

The DC digital Output module provides 32 outputs separated in to 2 groups of 16 channels each that are powered externally. Each group has a pair of screw terminals for +V and COM connections. The outputs are high side switching (current sourcing) type. Over current protection is provided for all outputs in 4 groups of 8 channels each. In case of short circuit for any output channel, that whole group of 8 is switched off. Power cycling is not required to reset the module.

There is a green LED state indicator for each channel on the module to indicate when a digital output is ON. A green blinking status LED on the module indicates when the module is being scanned and red status LED when module diagnostics exist. Requires Euro style 36-terminal terminal block.

Item	Specification
Outputs per module	32 (current sourcing, high side).
Galvanic Isolation	2 groups of 16 outputs
Operating Voltage	10.5 to 32 VDC
Output Type	High side driver
Peak Voltage	32 VDC
ON Voltage Drop	0.15 VDC @ 0.5 A load
Overload Protection	Active Current Limiting is integrated into the output driver as 4 groups of 8 channels each. Power cycling is not required to reset the module after a fault condition.
Maximum Load Current	0.5 A per point, 6 A max per channel group 12 A max. per module, resistive load 0.25 A per point incandescent lamp load (5 mH max)
Maximum Leakage Current	0.15mA @ 32 VDC
Maximum Inrush Current	2 A for 10 ms
Minimum Load	0.0 mA
OFF to ON response time[1]	6 ms
ON to OFF response time[1]	6 ms
Fail Safe State configuration	Yes • Hold Last State • Failsafe State
Fuses	Electronic limiting

Note:
1.   Excluding controllers scan time and excluding transmission time from module to backplane

2.4.12.   Relay Output Module, 8 Channel (900H01-0202)

The Relay Output Module provides eight individually isolated, electromechanical relay outputs. Four of the outputs are Form-C, and the other four are Form-A. Output are not fused in the Relay module. Install a fuse for each output at the field device that is appropriate for the load and the wire used.
There is a green LED state indicator for each channel on the module to indicate when a digital output is ON.
A green blinking status LED on the module indicates when the module is being scanned. A red status LED when module or channel diagnostics exist.

Item	Specification
Outputs per module	32 (current sourcing, high side).
Output channel	4 form A, 4 form C
Output Device	Electromechanical relay
Voltage	120/240VAC, 30 VDC
Current Rating	4A @ 240VAC or 30 VDC resistive load
	0.5 A @ 240VAC or 30 VDC incandescent lamp load
Galvanic Isolation	Relay Output Contact to Relay Output Contact
	Relay Output Contact to Logic
Max. Leakage Current	1 mA@ 350 VDC
De-rating	Max. outputs at max. load – none
	Max. modules per rack - none
OFF to ON response time1	11 ms max
ON to OFF response time1	8 ms max
Expected life (min. operations)	Mechanical at 180 cpm: 5 x 10E7
	Electrical: 10E5
Fail Safe State configuration	Yes • Hold Last State • Failsafe State

Note:

1. Excluding controllers scan time and excluding transmission time from module to backplane

Life expectancy curves (1a1b type)
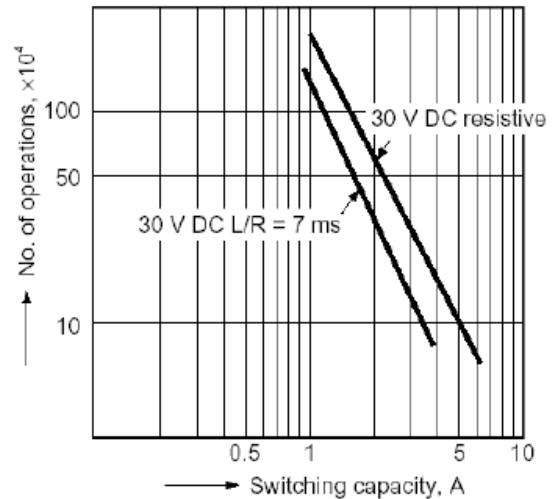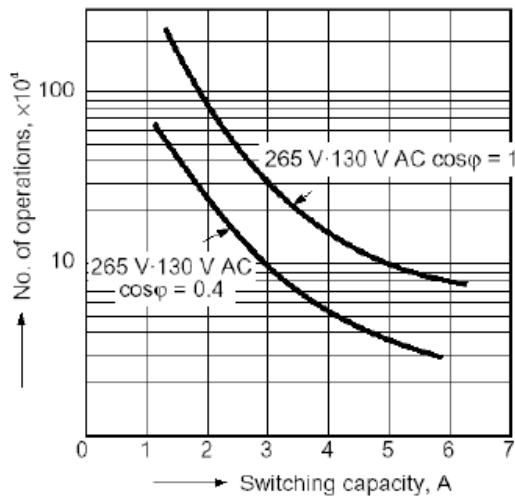
2.4.13. IOM scan time for I/O modules

I/O module	IOM scan time (in local I/O rack or remote I/O rack)
900U01-0100 - Universal Input/Output Module	10ms
900A01-0202 - Universal Analog Input -RTD, TC, V, 8 Channel	500ms
900A16-0103 - Analog Input High Level, 16 Channel	100ms
900B01-0301 - Analog Output, 0 to 20 mA, 4 Channel	500ms
900B08-0202 - Analog Outputs 0 to 20mA, 8 Channel	500ms
900G03-0202 - Digital Input, 120/240 VAC, 16 Channel	10ms
900G32-0101 - Digital Input, 24 VDC, 32 Channel	10ms
900G01-0202 - Digital Input, Contact type, 16 Channel	10ms
900G04-0101 - Digital Input, 120/240 VAC-125 VDC, (16 Channel Isolated)	10ms
900H03-0202 - Digital Output, 120/240 VAC 8 Channel	10ms
900H32-0102 - Digital Output, 24 VDC 32 Channel	10ms
900H01-0202 - Digital Output - Relay, 8 Channel	10ms

2.5. I/O & Remote Terminal Panel Wiring

Remote Termination Panel provides an easy way to terminate field wiring away from I/O Module. Remote Terminal block plugs on to IO modules and are not required if RTP cables are used.

Type	Removable terminal blocks (900TEK-0200, 900TER-0200, 900TCK-0200, 900TBR-0200, 900TBK-0200)	Remote Terminal Panel[1] (900RTS-0001,900RTA-L001)
Terminal Block Styles	20 screw: Barrier or Euro-style, gold-plated 36 screw: Euro style, gold-plated	40 screw: Euro-style
Wire Size	20-screw: Euro-style - 0.1 mm^2 to 2.0 mm^2 (#14 to 26 AWG) solid or stranded Barrier style - 0.1 mm^2 to 2.0 mm^2 (#14 to 26 AWG) solid or stranded 36-screw: Euro-style – 0.1 mm^2 to 3.0 mm^2 (#12 to 26 AWG) solid or stranded 40-screw: Euro-style – 0.1 mm^2 to 3.0 mm^2 (#12 to 26 AWG) solid or stranded	
Shield terminals (900TSS-0001)	Optional brackets mounted top/bottom of rack. Each strip is 4 slots long with 4 screws.	
RTP Cable	N/A	Low Voltage RTP Cable (1.0M, 3.28ft.) Low Voltage RTP Cable (2.5M, 8.2ft.) Low Voltage RTP Cable (5.0M, 16.4ft.) High Voltage RTP Cable (1.0M, 3.28ft.) High Voltage RTP Cable (2.5M, 8.2ft.) High Voltage RTP Cable (5.0M, 16.4ft.) Low Power 16/32CH RTP Cable (1.0M, 3.28ft) Low Power 16/32CH RTP Cable (2.5M, 8.2ft) Low Power 16/32CH RTP Cable (5.0M, 16.4ft)
RTP Dimensions	N/A	4.38" L x 3.70" W x 2.60" H 111.1mm L x 94.0mm W x 66.0mm H
Terminal load rating[2]	4.2A	2.8A (Low Voltage RTP Cable) 4.2 A (High Voltage RTP Cable)

Note:
1. Standard 35mm wide DIN Rail. Provides connection of field wiring to I/O within an enclosure only.
2. External power supply provides power input for UIO, current load rating need to be align with cable rating.

Below table list the relationship between all I/O modules and their related terminal block or RTP.

I/O Module	Terminal Block (Euro)	Terminal Block (Barrier)	RTP	RTP required per module	RTP Cable
900U01-0100	900TEK-0200	900TBK-0200	900RTS-0001	1	900RTC-L2xx 900RTC-H2xx
900A01-0202	900TEK-0200	900TBK-0200	900RTA-L001	1	900RTC-L2xx
900A16-0103	900TCK-0200	N/A	900RTS-0001	2	900RTC-34xx
900B01-0301	900TEK-0200	900TBK-0200	900RTS-0001	1	900RTC-L2xx
900B08-0202	900TCK-0200	N/A	900RTS-0001	1	900RTC-BAxx
900G03-0202	900TER-0200	900TBR-0200	900RTS-0001	1	900RTC-H2xx
900G32-0101	900TCK-0200	N/A	900RTS-0001	2	900RTC-34xx
900G01-0202	900TEK-0200	900TBK-0200	900RTS-0001	1	900RTC-L2xx
900G04-0101	900TCK-0200	N/A	N/A	N/A	N/A
900H03-0202	900TER-0200	900TBR-0200	900RTS-0001	1	900RTC-H2xx
900H32-0102	900TCK-0200	N/A	900RTS-0001	2	900RTC-34xx
900H01-0202	900TER-0200	900TBR-0200	900RTR-H001	1	900RTC-H2xx

2.6.   Power Supply

2.6.1.   120/240VAC Power Supply (900P01-0301)

Item	Specification
Voltage	90 to 264 V AC, 47 to 63 Hz
Current	1.4 A Max continuous
Inrush Current	40 Amps peak-to-peak for 120 ms at 240 V AC
Input rating	130 VA
Output rating	58W
Fuse	Internal non-replaceable fuse.
Power Supply Hold up time	20milliseconds @ 115V AC, 60HZ maximum Load
Wiring	Screw type terminals, 0.3 mm^2 to 3.3 mm^2 (#12-22AWG)
Test jacks	5 V DC, 24 V DC

2.6.2.   24VDC Power supply (900P24-0301)

Item	Specification
Voltage	21 to 29V DC
Current	5A Max. continuous
Inrush Current	30A for 3ms @ 29V DC
Input rating	72.5W
Output rating	58W
Fuse	Internal non-replaceable fuse.
Power Supply Hold up time	20 milliseconds @ 24V DC, maximum Load
Wiring	Screw type terminals, 0.3 mm^2 to 3.3 mm^2 (#12-22AWG)

2.7. Power Status Module (900PSM-0200)

Item	Specification
Status indication	Green directional indicators using LEDs
Power supply Loading	5V;22mA Max

4. Software Specifications

4.1. ControlEdge UOC CEE Specification

Experion Control Builder is ControlEdge UOC's configuration tool to design, configure, program and maintain your UOC project. Below section covers the key CEE specifications of ControlEdge UOC.

4.1.1. ControlEdge UOC Controller Definition and Types

The ControlEdge Unit Operations Controller is an Experion CEE based controller, available in both:
- The ControlEdge UOC, or UOC, in the rack-based, ControlEdge 900 form factor, containing the following items:
  - o Redundant power supply
  - o Controller (with four Ethernet ports)
  - o 12 I/O modules

  The ControlEdge UOC refers to the embedded hardware control processor module which hosts the UOC firmware personality, creating the (embedded) ControlEdge UOC
- The ControlEdge Virtual UOC (vUOC), which is a virtual appliance, uses VMware® virtualization technology to deliver equivalent functionality to the embedded controller on a virtual host platform. The vUOC is a virtual device, deployed on a (qualified) commercial computer system, hosted on the VMware ESXi hypervisor, version 6.0 or greater.

There are different UOC firmware types depending on the controller and base execution period
- The (embedded) ControlEdge Unit Operations Controller (UOC 50ms)
- The 50ms ControlEdge Virtual Unit Operations Controller (vUOC-50ms) which is primarily used for IO Connected applications or faster supervisory applications
- The 500ms ControlEdge Virtual Unit Operations Controller (vUOC-500ms) which is primarily used for Batch engine applications or large memory intensive applications

4.1.2. Supported Function Blocks

The following table lists the CEE Function Blocks available under various listed function libraries in Control Builder.

Function Block	Function Block	Function Block	Function Block
Auxiliary	LEADLAG	1732E-IR4IM12R	1738-IT2IM12
AUXCALC	DEADTIME	1732E-IT4IM12R	1738-OA2M12AC3
GENLIN	ENHAUXCALC	1732E-IF4M12R	1738-AENT
TOTALIZER	AUXSUMMER	1732E-OF4M12R	**EIP_DRIVE**
LEADLAG	FLOWCOMP	1732E-IB16M12DR	PF755
DEADTIME	SIGNALSEL	**EIP_ARMOR_POINTIO**	PF755_IN
ENHAUXCALC	ROC	1738-IE2CM12	PF755_OUT
AUXSUMMER	CTUD	1738-OE2CM12	**EIP_IOCHANNEL**
FLOWCOMP	ENHGENLIN	1738-IB4DM12	AICHANNEL
SIGNALSEL	BOOLCTL	1738-IB8M12	AOCHANNEL
ROC	DATAACQ	1738-IE4CM12	DICHANNEL
CTUD	DEVCTL	1738-OB2EPM12	DOCHANNEL
ENHGENLIN	Custom Data Block	1738-OB8EM12	**EIP_RELAY**
AUXCALC	Custom Algorithm Block	1738-OE4CM12	193DNEN_E3
GENLIN	**EIP_ARMOR_BLOCK IO**	1738-IR2M12	193DNEN_E3P
TOTALIZER			193DNEN_E3_IN

Function Block	Function Block	Function Block	Function Block
193DNEN_E3_OUT	NOT	SQRT	**SCM**
193DNEN_E3P_IN	OFFDELAY	SUB	HANDLER
193DNEN_E3P_OUT	ONDELAY	TRUNC	STEP
ETHERNET_IP	OR	**PCDI (ModbusTCP)**	TRANSITION
GENADAPTER	QOR	PCDIFLAGARRCH	SYNC
REQFLAGARRAY	RS	PCDINUMARRCH	**SERVICE2**
REQNUMARRAY	RTRIG	PCDITEXTARRCH	DOSEALARM
REQTEXTARRAY	SEL	PCDIGENERICIF	INTERLOCK
RSPFLAGARRAY	SELREAL	PCDI_MASTER	**SYSTEM**
RSPNUMARRAY	SR	PCDIFLAGARRCH	CONTROLMODULE
RSPTEXTARRAY	TRIG	PCDINUMARRCH	UCM
IOREFERENCES	WATCHDOG	POWERGEN	ACTIVITY
AIREF	XOR	HTMOTOR	SCM
AOREF	DELAY	LTMOTOR	RCM
DIREF	PULSE	SOLENOID	MASTERRECIPE
DOREF	MVOTE	VALVEDAMPER	**UTILITY**
SIGNALREFERENCES	CHECKBAD	LEVELCOMP	FLAG
AI	ROL	GRPCAPRBK	NUMERIC
AO	ROR	MAINIBV	TIMER
DI	SHL	STEAMPROP	MESSAGE
DO	SHR	**REGCTL**	TYPECONVERT
LOGIC	MAXPULSE	AUTOMAN	FLAGARRAY
2OO3	MINPULSE	FANOUT	NUMERICARRAY
AND	CHECKBOOL	PID	TEXTARRAY
EQ	STARTSIGNAL	SWITCH	PUSH
FTRIG	CONTACTMON	REMCAS	ANNPANEL
GE	CHGEXEC	OVRDSEL	ALMWINDOW
GT	**MATH**	REGCALC	DIGACQ
LE	ABS	RATIOBIAS	FIRSTOUT
LIMIT	ADD	PIDFF	EXECTIMER
LT	DIV	POSPROP	TEXTCOMMENT
MAX	EXP	RAMPSOAK	**VCONE**
MIN	LN	PULSECOUNT	**WEGCTL**
MUX	LOG	PULSELENGTH	WEGMEM
MUXREAL	MOD	PIDER	CDB
NAND	MUL	PID-PL	RECIPE STEP
NE	NEG	RATIOCTL	
NOON	POW	ENHREGCALC	
NOR	ROLLAVG	INCRSUMMER	
	ROUND	REGSUMMER	

4.1.3. Capacity and Performance

UOC Configuration Options	
Supervisory Control Networks Supported	FTE only
Levels of FTE Switches	2
Device Index Configuration *(configured via 3 rotary switches on CPM)*	Between 1 and 510
Number of downlink I/O Networks Supported	1
Downlink I/O network configuration options	HSR (High Availability Seamless Redundancy) DLR (Device Level Ring) PRP (Parallel Redundancy Protocol)
I/O Network speed	100 Mb Ethernet
Base Execution Period	
UOC-CPM & vUOC-50ms	50 ms
vUOC-500ms	500ms
Controller Redundancy Supported	Yes, in single rack and separate rack.
CE900 I/O Module Execution Period	Same as base execution period for CEE.
CE900 I/O Module Scan Rate *(rate at which inputs are updated from IOM to UOC)*	25ms, 50ms, 100ms, 200ms, 500ms, 1sec, 2sec
Configurable Values for CM/SCM/RCM Execution Periods	
UOC-CPM & vUOC-50ms	50, 100, 200, 500, 1000, 2000 ms
vUOC-500ms	500, 1000, 2000, 5000, 10000, 20000 ms
Configurable Values of Peer Update Rates (period) *(rate at which data is updated for all 'pull/get' requests for peer data initiated by the CEE/UOC)*	
UOC-CPM & vUOC-50ms	100, 200, 500, 1000 ms
vUOC-500ms	500 ms, 1, 2, 5, 10 sec
UOC Time Source	NTP/PTP

UOC Redundancy Specifications	
	For UOC-CPM
UOC Function Block Redundancy Configuration Selection:	"Module is Redundant", Hot standby type redundancy
Redundant Device Index Configuration	Device Index = n, where n is an odd value, used for left slot and Partner Device Index = n+1, in right slot
Control Processing Switchover Interruption Time[1,]	500 ms
Initial Synchronization Time (from Sync Start to Completion)	300 seconds
Maximum Elapsed Time Between Commanded Switchover and Completion of Initial Synchronization	420 seconds
Maximum Elapsed Time Between Switchover Due to Power Cycle of the Primary and Completion of Initial Synchronization	420 seconds

UOC Memory Resources and Block Configuration	
Total Available C300 CEE User Memory (TOTALMEMINK)	
UOC-CPM & vUOC-50ms	32,768 kB

vUOC-500ms	131,072 kB
Maximum Number of Tagged Blocks configurable per UOC CEE (CMs, SCMs, RCMs and IOMs)[2]	4095
Maximum Number of Component Blocks per CM [1]	100
Maximum Number of Component Blocks per SCM/RCM/MR	400
Maximum number of parallel paths executing in SCM/RCM/MR simultaneously	15
Definition: 1kB = 1 Kbytes = 1024 bytes, historically referred to as MU (Memory Unit) Note 1 – Component blocks include basic blocks and contained CMs/SCMs/RCMs/MRs Note 2 – CEE and UOC platform blocks are also tagged blocks.	

4.1.4.   UOC I/O Capacities

UOC I/O Overall Capacity Limits	UOC-CPM	vUOC
Number of I/O networks supported per UOC	1 dedicated Ethernet network	1 dedicated Ethernet network
I/O Network Speed	100Mb Ethernet	100Mb Ethernet
Supported devices per I/O Network topology:		
Ring, Device Level Ring (DLR)	EtherNet/IP™ & CE900 I/O	EtherNet/IP™ & CE900 I/O
Ring, High-availability Seamless Redundancy (HSR)	CE900 I/O	Not Supported
Star, PRP	CE900 I/O	Not Supported
Star (non-redundant)	CE900 I/O	CE900 I/O
Max Total Field I/O connections (for traditionally wired I/O device) per UOC (includes all configured I/O Points to all I/O families: CE900 I/O + PROFINET+ EtherNet/IP™ I/O)	2048	2048

ControlEdge UOC I/O	
Maximum number of ControlEdge 900 expansion I/O racks per UOC[1]	12
CE900 IO Rack sizes	4, 8, 12 slot
Note: 1. Rack limit is dependent on rack size and is subject to other limits, particularly the maximum number of total field I/O connections.	

4.1.5. ControlEdge UOC/vUOC Experion Licensing

In addition to core Experion LX licenses, following UOC/vUOC specific license components are required.

ControlEdge UOC/vUOC Controller Level License	
Description	This CEE licenses are purchased for the running process and could also be used for the simulated controllers during application development and testing.
LX-SWCS90	ControlEdge UOC Process Solver (Valid for either Embedded or Virtual UOC). Only 1 Process Solver license is required for a redundant controller.
IO Points Licensing	
Description	Two new Experion license types have been created for "IO Points". "Analog IO Points" and "Digital IO Points" are utilized for signals from 1st party (Honeywell) and 3rd party IO (Non-Honeywell) devices. Additionally, "Server Redundancy" would be included therefore no need for an additional license. **In the base Experion license (LX-DBASE1) 100 Analog IO Point and 300 Discrete IO Point licenses are included.** Also, there are no "enabler" option licensing to get data into the controller. For example, PCDI and EtherNet/IP connections would require no additional licensing. SCADA Points, Parameter Connectors from other control modules, etc. do not count against these IO Point licenses.
LX-AIO100	100 Analog IO Point Adder
LX-DIO100	100 Discrete IO Point Adder
Composite Device Licensing	
Description	When more complex devices such as PLCs, smart drives and motors, loss of weight feeders, etc. are interfaced directly to a Unit Operations Controller then IO Point licenses are not really applicable. Composite Device Points are used to represent these devices. Additionally, "Server Redundancy" would be included therefore no need for an additional license. In the base Experion license (LX-DBASE1) NO Composite Device Point licenses are included. Also, there are no "enabler" option licensing to get data into the controller. For example, PCDI and EtherNet/IP connections would require no additional licensing.
LX-DEV010	10 Composite Device Point Adder
LX-UDV100	100 Composite Device Point Adder

Regulatory and Compliance Points Licensing	
Description	Previously QVCS has been licensed by Process Points. This will continue for C200, and C300 based control modules. For UOC/vUOC we are introducing Regulatory & Compliance Points that will allow scaling of this functionality based on the number of IO Points used in the system. In addition to the QVCS functionality, Regulatory & Compliance Points will also include Electronic Signature which was previously an additional licensed functionality. The Regulatory and Compliance Point licensing needs to match the IO Point Licensing for the Assets that require version control or electronic signatures.
LX-REG100	100 PT REG COMPLIANCE ADDER
Batch Points Licensing	
T1 Batch Point Description	A new batch licensing structure based on point count now covers all batch functionality. This includes Batch functionalities for the associated IO points, including • Recipe Control Modules (RCMs) • Class Based Recipe Control Modules (CBRs) • Batch API (for MES Integration) • Procedure Analyst • Experion ODBC Connection • Formula Sets • Batch History and Reporting The Batch Point licensing must match the total Point Licensing for the batch Assets. This would include the total of points included for those assets including IO Points and

	Process Points as this new functionality works across all Experion controllers (C200E, C300, UOC, and Virtual UOC).
LX-1BP100	100 T1 Batch Point Adder
Advanced Batch Point Description	Advanced Batch Points are ordered per server. The number of Advanced Batch Points should match the total number of Points (I/O and Process) contained in all of the Batch Units (Assets). Advanced Batch Points contain the following functionality: • Campaign Management • Work Instructions
LX-2BP100	100 Advanced Batch Point Adder
PROFINET Usage License	
Description	Used to enable PROFIBUS connectivity, licensed per UOC controller, needed for any controllers that will communicate to devices via PROFINET. One instance for logical UOC controller (i.e. single or redundant physical controller).
LX-PROF01	PROFINET Usage license, per UOC controller instance

5.   ModbusTCP

Experion PCDI is utilized to achieve communications with ModbusTCP devices. PCDI communications occur over the FTE network similarly to how PCDI works with S8 C300.

5.1.   ModbusTCP Capacity

UOC PCDI	
Maximum Number of Modbus TCP devices [1] (represented by PCDI Master blocks)	8
Maximum Number of Serial Modbus Devices per Gateway	16
Maximum Number of Serial Modbus Devices per C300 (8 * 16 of above two specifications)	128
Maximum Number of PCDI Request blocks assigned to a PCDI Master block	64
Maximum Number of PCDI Request block messages per second – includes both Reads and Write [2] (maximum size 256 byte messages assumed)	512

Note:
   1.   Redundant devices that use two PCDI Master blocks count as only one device. Secondary test messages do count in the messages per second for C300 performance estimation.
   2. PCDI impact on C300 performance can be estimated with the C300 Performance Model worksheet; important factors are number of PCDI Master blocks, number of PCDI Request block messages per second, and message data size.	

6.   EtherNet/IP™

CIP and Ethernet/IP™

The **C**ommon **I**ndustrial **P**rotocol **(CIP™)** is a fully networked solution that encompasses a comprehensive suite of messages and services to fully support a broad spectrum of process needs and applications on one protocol. CIP is a peer to peer object-oriented protocol that provides connections between industrial devices (sensors, actuators, drives, motors, I/O, etc.) and higher-level devices (controllers). CIP is applicable to factory and process automation control, safety, synchronization, motion, and the configuration and management of intelligent field devices.

CIP is the protocol language used to enable communication between all nodes on the network. It is physical media and data link layer independent. This media independence provides the ability to choose the CIP Network best suited for your application.

CIP is implemented on various networks as follows…

- CompoNet™ ………   CIP on TDMA technology
- DeviceNet™ ……….   CIP on CAN technology
- ControlNet™ ………   CIP on CTDMA technology
- **EtherNet/IP**™…....   CIP on **ETHERNET** technology

EtherNet/IP™ is the name given to the Common Industrial Protocol (CIP™), as implemented over standard Ethernet (IEEE 802.3 and the TCP/IP UDP protocol suite). Ethernet/IP is a high-level industrial application layer protocol for industrial automation applications that uses the tools and technologies of traditional Ethernet. Ethernet/IP uses all the transport and control protocols used in traditional Ethernet including the Transport Control Protocol (TCP), the Internet Protocol (IP) and the media access and signaling technologies found in off-the-shelf Ethernet interfaces and devices.

EtherNet/IP was introduced in 2001 and today is one of the most developed, proven, and complete industrial Ethernet network solutions available for industrial control and automation solutions. It enables real-time control and data acquisition for discrete applications, continuous process, safety, drive, motion, and applications

requiring high availability. Ethernet/IP is applicable to factory automation, process automation, and is well suited for both batch and continuous operations.

ODVA

Founded in 1995, ODVA is a global association whose members comprise the world's leading automation companies. ODVA's mission is to advance open, interoperable information and communication technologies in industrial automation.
EtherNet/IP™ and CIP™ are managed by ODVA. ODVA publishes *The EtherNet/IP Specification* and helps ensure compliance through conformance testing.

More information is available at the ODVA website, WWW.ODVA.org

6.1.   EtherNet/IP Architecture

DLR Network
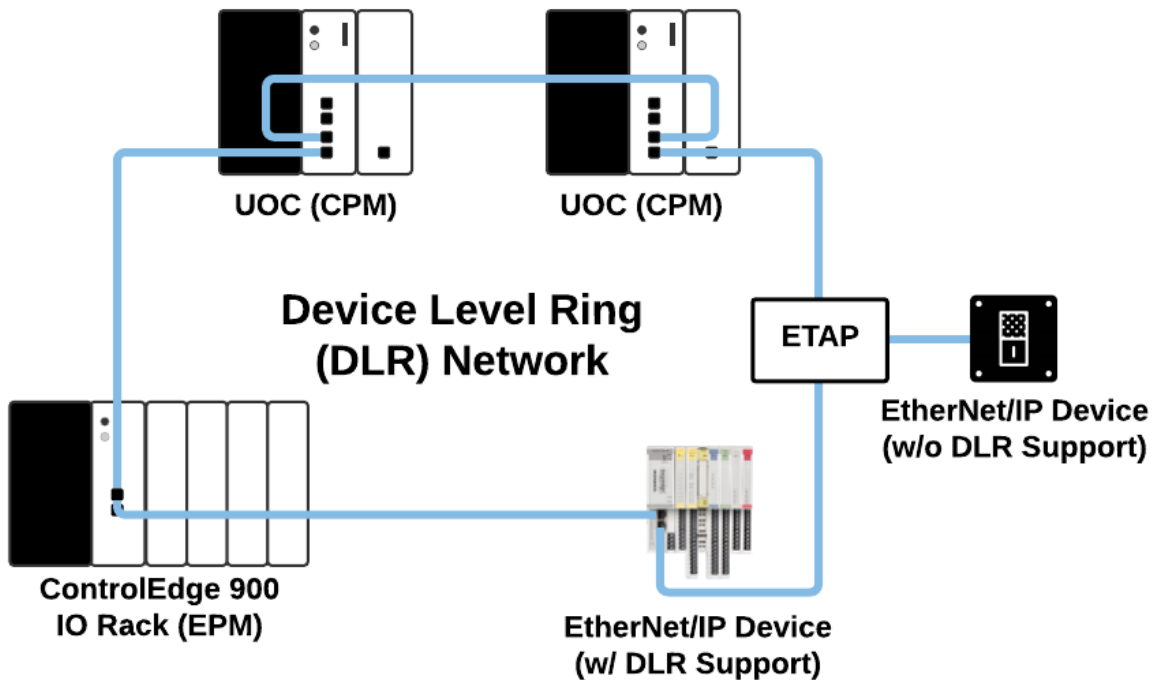
UOC DLR network supports ControlEdge 900 I/O and EtherNet/IP I/O and devices. Either or both may be present.
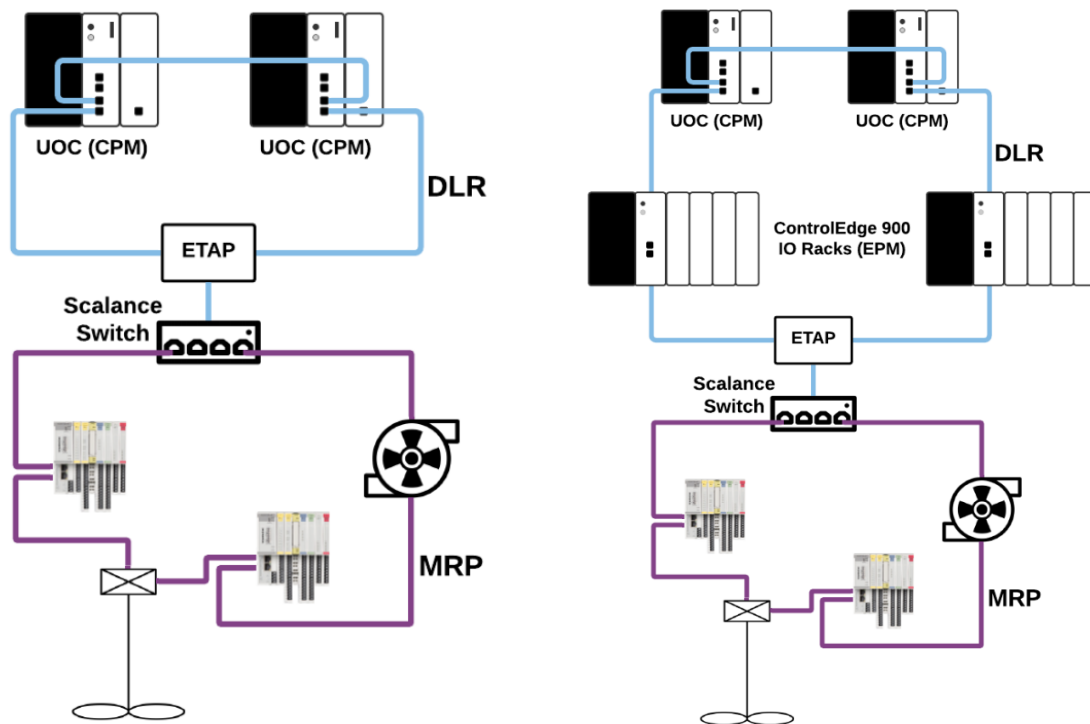- Both redundant and non-redundant UOC configurations support the use of DLR networks
- ControlEdge 900 I/O is connected from an EPM to the DLR via an Allen Bradley 1783-ETAP
- Native DLR EtherNet/IP devices may be connected directed to the LDR w/o the use of an ETAP
- A maximum of 50 IP addressable nodes on a DLR network are supported
- A combined maximum of 2048 I/O and signals are supported in a UOC
- Virtual UOC is supported with DLR networks. An ETAP is required to connect Virtual UOCs to a DLR network.

6.2. EtherNet/IP Capability

EtherNet/IP™ capacity	
Maximum IP Addressable Nodes	50
Maximum EtherNet/IP™ I/O Connections (Class 1 CIP Connections)	160
Maximum EtherNet/IP™ Peer PLC Connections (Class 3 CIP Connections)	10
Consolidated Connection Supported	Yes

7. PROFINET

In Experion R520 the below architectures are recommended. A Siemens Scalance switch coupled with a Rockwell ETAP allow the UOC to connect to a PROFINET MRP network.

7.1. UOC PROFINET Capabilities

PROFINET capacity	
Profinet IO Controller	Yes
Profinet IO Device	No
Media Redundancy (MRP)	No (No support of MRP in UOC in R520, external switches can be used to connect Profinet IO devices in MPR ring topology with non-redundant connection to UOC) (Downlink can be configured in DLR mode in R520 with all Profinet devices connected to DLR rign using ETAP. This topology should only be used if downlink network comprises of mostly EIP devices with very few Profinet IO devices)

7.2. UOC Connected to PROFINET IO

Profinet IO Controller	Yes
Isochronous Mode	No
MRP	No, not directly in R520.1 (use of Siemens Scalance switch and Rockwell ETAP is required)
MRPD	No
Number of IO devices that can be connected	128
Fastest Scan Time Supported (Minimum cycle time)	1 ms
Maximum size of total Cyclic Input & Output Data	64KB Includes IOxS status bytes (This is maximum amount of data that UOC can exchange with Devices using cyclic data exchange protocol)
Maximum number of cyclic input data per device	1440 bytes including IOxS status bytes
Maximum number of cyclic output data per device	1440 bytes including IOxS status bytes
Acyclic Communication	No
DCP Function	Supported (Setting of Name, IP Address, Signal device and Reset device to factory)
Alarms	Yes. Alarms reported to Experion Station
Diagnostics	No
HART support	No
Controller Redundancy	Yes. Support redundant UOC controller on Profinet network. System Redundancy (S2 Redundancy) is not supported.
Shared Device support	No
iDevice (Intelligent Device support)	No
CiR (Configuration in Run) support	No New Profinet IO devices can be added on process. Existing Profinet devices can be removed on process. But any configuration changes in existing device needs that device to made inactive.
Fast Startup Support	No
Support of Device Profiles	No
Certification from PI	No

7.3. Devices used in PROFINET Development & Testing

Device Type	Description	Vendor	Model Number
PLC	SIMATIC S7-1500, CPU 1515-2 PN, Central processing unit	Siemens	6ES75152AM010AB0
ET200S	IM 151 PN High Feature for ET200S to PROFINET	Siemens	6ES71513BA230AB0
ET200M	IM 153-4 High Feature for ET 200M, PROFINET	Siemens	6ES71534BA000XB0

1783-ETAP	Networks and Communication Products, EtherNet/IP Tap3 copper ports	Rockwell	1783-ETAP
Scalance Switch	SCALANCE X208, managed IE switch, 8x 10/100 Mbit/s RJ45 ports	Siemens	6GK52080BA102AA3
PN Encoder	ABS. VALUE ENCODER SINGLETURN	Siemens	6FX20015FN13
Sinamics G120 Drive	SINAMICS G120 CONTROL UNIT CU250S-2 PN	Siemens	6SL32460BA221FA0
MOXA-PN Switch	Entry-level managed Ethernet switch with 8	MOXA	EDS408APN
IO	Multiprotocol 4 DI, 4 DI/DO	Turck	FEN20-4DIP-4DXP
IO	Multiprotocol 16 DI/DO	Turck	FEN20-16DXP
IO	MULTIPROTOCOL Gateway for ETHERNET BL20-E-GW-EN	Turck	BL20-E-GW-EN
PROFINET-PROFIBUS PROXY (Gateway)	netTAP 100 is the protocol converter for sophisticated conversions and supports 2-port Real-Time Ethernet to serial, Fieldbus to Fieldbus, Real-Time Ethernet to Fieldbus and Real-Time Ethernet to Ethernet conversions. It supports slave and master functionality in any combination.	Hilscher	NT 100-RE-DP
PROFINET-PROFIBUS PROXY (Gateway)	PROFINET / PROFIBUS Proxy in a connector	Hilscher	NL-51N-DPL
IO	Multiprotocol remote IO	Turck	TBEN-S2-4AI
IO	Multiprotocol remote IO	Turck	TBEN-S1-4DIP-4DOP
IO	Multiprotocol remote IO	Turck	TBEN-S2-4AO
IO	Multiprotocol remote IO	Turck	TBEN-S1-8DIP-

8. Hardware Power Consumption, Heat Dissipation and Weight

8.1. Power Consumption and Heat Dissipation

Item	Module number	Max. Current @5V	Max. Current @24V	Heat Dissipation (W)
Control Processor Module	900CP1-0200	750 mA	0 mA	3.75W
Expansion Processor Module	900SP1-0200	520 mA	0 mA	2.6W
UIO Module	900U01-0100	380 mA	0 mA	8.5W
Universal AI - RTD, TC, V, 8 Ch	900A01-0202	40 mA	25 mA	0.8W
Analog Input High level,16 Ch	900A16-0103	75 mA	50 mA	2.2W
Analog Output, 0 to 20mA ,4 Ch	900B01-0301 40	40 mA	200 mA	6.8W
Analog Outputs 0 to 20mA,8 Ch	900B08-0202	225mA	350 mA	9.4W
Digital Input 120/240 VAC, 16 Ch	900G03-0202	130 mA	0 mA	0.65W
Digital Input 24VDC, 32Ch	900G32-0101	215 mA	0 mA	1.1W
Digital Input, Contact Type, 16 Ch	900G01-0202	130mA	40mA	1.76W
Digital Input, 120/240 VAC-125VDC, 16 Ch	900G04-0101	130mA	130mA	8.3W
Digital Output - 120/240 VAC, 8 Ch	900H03-0202	218 mA	0 mA	1.09W
Digital Output – 24VDC, 32 Ch	900H32-0102	235 mA	0 mA	1.175W
Digital Output, Relay, 8 Ch	900H01-0202	110mA	100mA	3W
120/240 V AC, 60W Power Supply	900P01-0301	N/A	N/A	25W
24V DC, 60W Power Supply	900P24-0301	N/A	N/A	25W
Redundant Power Status Module	900PSM-0200	22 mA	0 mA	0.11W
MOXA Ethernet Switch (8 ports)	50008930-001	0 mA	350 mA	8.4W
MOXA Ethernet Switch (16 ports)	50008930-002	0 mA	380 mA	9.12W
MOXA Fiber Optic Convertor IMC-101-M-SC, Multi mode	50135395-001	0 mA	160 mA	3.84W
MOXA Ethernet Switch (8 ports), Single mode	50008930-004	0 mA	350 mA	8.4W
MOXA Ethernet Switch (16 ports), Single mode	50008930-003	0 mA	380 mA	9.12W
MOXA Fiber Optic Convertor IMC-101-M-SC), Single mode	50135395-002	0 mA	160 mA	3.84W

8.2. Dimensions and Weight

Item	Module Number	Dimension	Weight
1 I/O slot Rack[1,2]	900R01-0100	5.4" H* x 5.9" W x 6.0" D 137mm H* x 149.7 mm W x 151.7mm D	1109g
4 I/O slot Rack[1,2]	900R04-0200	5.4" H* x 10.5" W x 6.0" D 137mm H* x 266.7mm W x 151.7mm D	2104g
8 I/O slot Rack[1,2]	900R08-0200	5.4" H* x 16.5" W x 6.0" D 137mm H* x 419.1mm W x 151.7mm D	3126g
8 I/O slot Rack with redundant power support[1,2]	900R08R-0200	5.4" H* x 20.9" W x 6.0" D 137mm H* x 530.9mm W x 151.7mm D	4422g
12 I/O slot Rack[1,2]	900R12-0200	5.4" H* x 22.5" W x 6.0" D 137mm H* x 571.5mm W x 151.7mm D	4072g
12 I/O slot Rack with redundant power support[1,2]	900R12R-0200	5.4" H* x 26.9" W x 6.0" D 137mm H* x 683.3mm W x 151.7mm D	5252g

Item	Module Number	Dimension	Weight
Redundant CPM Rack[1,2]	900RR0-0200	5.4" H* x 10.3" W x 6.0" D 137mm H* x 261.6mm W x 151.7mm D	1751g
CPM, ControlEdge 900	900CP1-0200	5.4" H x 1.4" W 137mm H x 35.6mm W	320g
EPM, ControlEdge 900	900SP1-0200	5.4" H x 1.4" W 137mm H x 35.6mm W	320g
Universal IO Module	900U01-0100	5.4" H x 1.4" W 137mm H x 35.6mm W	190g
Universal AI - RTD, TC, V, 8 Ch	900A01-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	210g
Analog Input High Level, 16 Ch	900A16-0103	5.4" H x 1.4" W 137mm H x 35.6mm W	397g
Analog Output, 0 to 20mA, 4 Ch	900B01-0301	5.4" H x 1.4" W 137mm H x 35.6mm W	408g
Analog Outputs 0 to 20mA, 8 Ch	900B08-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	400g
Digital Input 120/240 VAC, 16 Ch	900G03-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	210g
Digital Input 24VDC, 32Ch	900G32-0101	5.4" H x 1.4" W 137mm H x 35.6mm W	175g
Digital Input, Contact type, 16 Ch	900G01-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	354g
Digital Input, 120/240 VAC-125VDC, 16 Ch	900G04-0101	5.4" H x 1.4" W 137mm H x 35.6mm W	400g
Digital Output - 120/240 VAC, 8 Ch	900H03-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	230g
Digital Output – 24VDC, 32 Ch	900H32-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	180g
Digital Output, Relays, 8 Ch	900H01-0202	5.4" H x 1.4" W 137mm H x 35.6mm W	425g
Power Supply 120/240VAC, 60W	900P01-0301	5.4" H x 2.86" W 137mm H* 72.6mm W	820g
Power Supply 24VDC, 60W	900P24-0301	5.4" H x 2.86" W 137mm H* 72.6mm W	792g
Power Status Module, Redundant	900PSM-0200	5.4" H x 1.4"W 137mm H* 25.6mm W	448g
MOXA Network Switch (8 ports)	50008930-001	5.31" H x 2.11"W x 4.13" D 135mm H* x 53.6mm W x 105mm D	790g
MOXA: Network switch, 16 Port Multi mode	50008930-002	5.31" H x 3.15"W x 4.13" D 135mm H* x 80.1mm W x 105mm D	1140g
MOXA: IMC-101-M-SC Fiber Optic convertor, Multi Mode	50135395-001	5.31" H x 2.11"W x 4.13" D 135mm H* x 53.6mm W x 105mm D	630g
MOXA Network Switch (8 ports), Single mode	50008930-004	5.31" H x 2.11"W x 4.13" D 135mm H* x 53.6mm W x 105mm D	790g
MOXA: Network switch, 16 Port Single mode	50008930-003	5.31" H x 3.15"W x 4.13" D 135mm H* x 80.1mm W x 105mm D	1140g
MOXA: IMC-101-S-SC Fiber Optic convertor, Single mode	50135395-002	5.31" H x 2.11"W x 4.13" D 135mm H* x 53.6mm W x 105mm D	630g

Note:
1. Surface mounting with 4 screws in the back of rack. Installation Category II, Pollution Degree 2, IEC 60664, UL840 Installation coordination.
2. Rear mounting plate extends height to 6.9" (175.3mm).

9. Hardware Spacing Requirement

Item	Specification
Vertical Spacing (between rack to rack, rack to cell/floor)	6.5 " (165mm)
Horizontal Spacing	0 " (0 mm)

10. Environment Conditions

Item	Rated	Transportation & Storage
Ambient Temperature	32 to 140 °F 0 to 60 °C	-40 to 158 °F -40 to 70 °C
Ambient Relative Humidity	10% to 90 % RH non-condensing	5 % to 95 % RH non-condensing
Mechanical shock Acceleration Duration	Half-sine, 15g peak / 11 ms durations, 6 directions	Not rated
Vibration	IEC 60068-2-6 Sinusoidal (5 to 8.4 Hz) 3.5mm / (8.4 to 150 Hz) 1.0 g;1 octave/min, 10 cycles per axis, 3 axes.	See below table
Corrosives	Conformal Coated- G3 level of harsh environment under ANSI/ISA S71.04 Standard (*except power supply)	
RoHS	Compliant to RoHS 2 directive (*except power supply)	

The Test condition of random vibration

Frequency (Hz)	PSD (g^2/Hz)	RMS (g)	Duration	Direction
10	0.0065	0.74	60min/direction	X, Y
20	0.0065			
120	0.0002			
121	0.003			
200	0.003			
240	0.0015			
340	0.00003			
500	0.00015			
5	0.01	1.07		Z
100	0.01			
300	0.00001			

11.   Standards and Approvals

Item	Specification		
CE Conformity	This product is in conformity with the protection requirements of the following European Council Directives: 2014/35/EU, the Low Voltage Directive, and 2014/30/EU, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.		
	LVD Directive:		
	Title	Number	Issue date
	Safety requirements for electrical equipment for measurement, control, and laboratory use –Part 1: General requirements	EN 61010-1	2010
	EMC directive:		
	Title	Number	Issue date
	Programmable controllers- Part 2: Equipment requirements and Tests	IEC 61131-2	2007
	Electrical equipment for measurement, control, and laboratory use – EMC requirements – Part 1: General requirements	EN 61326-1	2013
	Industrial, scientific, and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement	CISPR 11	2015
	Electromagnetic compatibility (EMC) – Part 3-2: Limits –Limits for harmonic current emissions (equipment input current $\leqslant$ 16A per phase)	IEC 61000-3-2	2014
	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 $\leqslant$ 16 A per phase and not subject to conditional connection	IEC 61000-3-3	2013
	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 61000-4-4:2012	2012
	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test	IEC 61000-4-5	2014
	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	IEC61000-4-6	2013
	Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test	IEC61000-4-8	2009
	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions, and voltage variations immunity tests	IEC61000-4-11	2004
c UL us (General purpose safety)	Compliant with EN61010-1, ANSI/UL 61010-1 and CAN/CSA-C22.2 No. 61010-1-12		

Item	Specification		
RCM	Electromagnetic compatibility (EMC) – Part 6.3: Generic standards – Emission standard for residential, commercial, and light-industrial environments	AS/NZS 61000.6.3	2012
	Electromagnetic compatibility (EMC) – Part 6.4: Generic standards – Emission standard for industrial environments	AS/NZS 61000.6.4	2012
CSA[1]	Non-incendive Electrical Equipment for use in Hazardous Locations	CAN/CSA C22.2 No. 213 – M1987	2008
	Electrical and Electronic Test, Measuring and Process Control Equipment	CAN/CSA-C22.2 No. 61010-1-12	2012
ATEX	Electrical apparatus for explosive gas atmospheres. Part 0: General Requirements	EN 60079-0	2012
	Electrical apparatus for explosive gas atmospheres Construction, test and marking of type of protection "n" electrical apparatus	EN 60079-15	2010
ISA Secure Level 2	ISASecure™ Embedded Device Security Assurance Program Version 2.0.0 Level 2	ISA 99	2017
EAC	Technical Regulations of the Eurasian Customs Union conformity		2020
ABS	ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS	19-HS1910403-PDA	2019
BV	Bureau Veritas Rules for Classification of Steel Ships	NR467 C1 R11 58869/A0 BV	2019
LR	Lloyd's Register Type Approval System Test Specification Number 1	LR2003627TA	2020
DNV	DNV GL rules for classification – Ships, offshore units, and high speed and light craft	TAA00002TA, Rev3	2021
KR	Korean Register Type Approval Certificate.	SHI41089-AC001	2020
IACS	E10 Test Specification for Type Approval IACS UR-E10 rev7		2018
RoHS	Directive 2011/65/EU		
RoHS China	The Administrative Measures for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products		
ODVA	ODVA composite Conformance Test (CT)	CT 14	2018

Note:
1. All certifications are not applicable for MOXA devices.

Hazardous Location Approvals	Approval Rating
CSA	Class I, Division 2, Groups A, B, C & D T*
ATEX	II 3 G Ex nA IIC T* Gc
Temperature class (T*)	**Module Number**
T3C	900G03, 900G04
T4	900H03, 900CP1, 900SP1, 900U01, 900B01, 900B08
T5	900G32, 900H01, 900G01
T6	900A01, 900H32, 900A16, 900PSM

Note:

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

Temperature class	Maximum surface temperature ℃
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

12.   Model Number List

Model	Description
Controller, Expansion Module, and Racks	
900CP1-0200	Control Processor Module
900RR0-0200	Redundant CPM Rack (Assembly)
900R01-0100	1 I/O slot Rack – Non-Redundant Power (Assembly) *Used for rack to rack redundancy*
900E01-0100	Redundancy Module
900SP1-0200	Expansion Processor Module
900R04-0200	4 I/O Slot Rack – Non-Redundant Power (Assembly)
900R08-0200	8 I/O Slot Rack – Non-Redundant Power (Assembly)
900R12-0200	12 I/O Slot Rack – Non-Redundant Power (Assembly)
900R08R-0200	8 I/O Slot Rack – Redundant Power (Assembly)
900R12R-0200	12 I/O Slot Rack – Redundant Power (Assembly)
IO Modules	
900U01-0100	Universal IO Module
900A01-0202	Universal AI, RTD, TC, V, 8 Ch
900A16-0103	Analog Input High Level, 16 Ch
900B01-0301	Analog Output, 0 to 20mA, 4 Ch
900B08-0202	Analog Outputs 0 to 20mA, 8 Ch
900G03-0202	Digital Input 120/240 VAC, 16 Ch
900G32-0101	Digital Input 24VDC, 32 Ch
900G01-0202	Digital Input, Contact type, 16 Ch
900G04-0101	Digital Input, 120/240 VAC-125VDC, 16 Ch
900H03-0202	Digital Output 120/240 VAC, 8 Ch
900H32-0102	Digital Output,24VDC, 32 Ch
900H01-0202	Digital Output, Relays, 8 Ch
Power Supply	
900P01-0301	120/240 V AC, 60W Power Supply

900P24-0301	24 V DC, 60W Power Supply
900PSM-0200	Redundant Power Status Module

Terminal Blocks	
900TEK-0200	TB Housing, Black 20 Position (Euro Style)
900TER-0200	TB Housing, Red 20 Position (Euro Style)
900TCK-0200	TB Housing, Black 36 Position (Euro Style)
900TBR-0200	High Voltage Terminal Block (Barrier Style)
900TBK-0200	Low Voltage Terminal Block (Barrier Style)
RTP and RTP Cable	
900RTS-0001	DI, DO, AO Remote Terminal Panel (RTP)
900RTA-L001	Analog Input Remote Terminal Panel
900RTR-H001	Relay Output Remote Terminal Panel (RTP)
900RTC-L210	Low Voltage RTP Cable (1.0M, 3.28ft.)
900RTC-L225	Low Voltage RTP Cable (2.5M, 8.2ft.)
900RTC-L250	Low Voltage RTP Cable (5.0M, 16.4ft.)
900RTC-H210	High Voltage RTP Cable (1.0M, 3.28ft.)
900RTC-H225	High Voltage RTP Cable (2.5M, 8.2ft.)
900RTC-H250	High Voltage RTP Cable (5.0M, 16.4ft.)
900RTC-3410	RTP Cable, Low Power 16/32CH 1.0M 3.28ft
900RTC-3425	RTP Cable, Low Power 16/32CH 2.5M 8.2ft
900RTC-3450	RTP Cable, Low Power 16/32CH 5.0M 16.4ft
900RTC-BA10	AO - 8 Ch 1.0 M RTP Cable
900RTC-BA25	AO - 8 Ch 2.5M RTP Cable
900RTC-BA50	AO - 8 Ch 5.0 M RTP Cable

Auxiliary Hardware	
51307946-001	Security cover, CPM/EPM
514522622-503	IO Module Insert Label Kit
900TNF-0200	Filler Block Terminal Cover
900RNF-0200	Redundant CPM Rack Filler plate (no RSM)
900TSS-0001	Shield Terminal Strip (package of 2)
900J02-0001	Jump 2 Position
900J10-0001	Jump 10 Position PKG of 10
51205995-501	MI/MP 250 Ohm Resistor Kit of 8
Networking Components	
50008930-001	MOXA Network Switch, 8 ports Multi mode
50008930-002	MOXA Network Switch, 16 ports Multi mode
50135395-001	MOXA: IMC-101-M-SC Fiber Optic convertor, Multi-Mode
50008930-004	MOXA: Network switch, 8 ports, Single mode
50008930-003	MOXA: Network switch, 16 ports, Single mode
50135395-002	MOXA: IMC-101-S-SC Fiber Optic convertor, Single mode
50008930-008	Ethernet Switching Hub, 16 ports, Multi Mode, G3
50135395-003	Ethernet to Multi Mode Fiber Converter, G3

Software (In addition to Experion LX R51x software)	
LX-SWCS90	ControlEdge UOC Process Solver (Valid for either Embedded or Virtual UOC)
LX-AIO100	100 Analog IO Point Adder
LX-DIO100	100 Discrete IO Point Adder
LX-DEV010	10 Composite Device Point Adder
LX-UDV100	100 Composite Device Point Adder
LX-REG100	100 Point Regulatory & Compliance Adder
LX-1BP100	100 T1 Batch Point Adder
LX-1BP200	100 Advanced Batch Point Adder
LX-PROF01	UOC PROFIBUS Interface, per controller instance
Note- Refer LX03-200-520 Experion LX R520 HMI Specification for Experion LX software models	

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