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Honeywell

Technical Information

# ControlEdge PLC Specification

## CE03-100-180.1

**Release 180.1**

**December 2023,**

**Version 1.4**

# 1. Introduction

This document provides technical information for the Honeywell ControlEdge™ PLC. Product details can be found in the Product Information Note. Detailed planning, installation and configuration information is available in the product user guides.

## 1.1. ControlEdge PLC Overview

Honeywell's advanced Programmable Logic Controller (PLC) technology improves control performance while offering greater flexibility and lower costs. The new ControlEdge™ PLC improves integration with Experion®, HMIs and third-party devices, and reduces configuration efforts by utilizing the industry-accepted IEC 61131-3 programming languages, as well as remote configuration and firmware updates.

**The key features of the ControlEdge PLC include:**

- First PLC with HART enabled Redundant/Non-redundant Universal I/O module for greater configuration flexibility
- ISASecure EDSA Level 2 certified cyber security capabilities improved safety of the plant and personnel
- Designed and developed by Honeywell, a global leader in process automation for more than 40 years
- Tightly integrated with Experion, Honeywell's best-in-class Distributed Control System (DCS), Supervisory Control and Data Acquisition (SCADA) system, safety system and Experion Panel PC
- Tight integration with Honeywell's market leading Field Device Manager - FDM
- Native controller redundancy
- Optionally redundant power supplies
- I/O racks of various sizes (1,4, 8 and 12 IO slots options)
- Three variants of power supplies: 51W 24VDC, 58W 110/240AC & 41W 110/240 AC (Extended Temperature)
- Leverages Honeywell's LEAP™ project methodology and Universal I/O for greater configuration flexibility
- Compatible with leading open network standards such as Modbus and OPC UA
- Built-in EtherNet/IP Protocol with both Server and Client, ODVA Certification
- Built-in PROFINET Protocol with PROFINET IO Controller
- Support DLR on EtherNet/IP Protocol Client and PROFINET IO Controller
- Support DNP3 Master and Outstation
- Support Serial Communication Module (2×RS232 ports, 2×RS485 ports) with User Defined Protocol
- Connects to Human-Machine Interface (HMI) through Modbus and OPC UA protocols
- Support MQTT with Sparkplug B with DNS function for remote monitoring and analytics
- Powerful IEC 61131-3 programming environment
- HART function block supporting all HART commands in PLC
- Support Removal and Insertion under Power for CPM and I/O modules
- Support Fail safe state configuration on output signal type
- Simulation support on standalone and on Virtual Engineering Platform
- Support Subsea application MDIS based on OPC UA
- Support Fault Tolerant Ethernet (FTE) network.
- Support communication to EUCN when CPM is working as ELMM. EUCN uses FTE as media.
- Support IEC60870-5-104 Outstation.
- Support recording data locally for standalone or as a backup-data source to a Historian or SCADA.
- Robust support for MasterLogic IO to increase resiliency for high performance applications.

## 1.2. Document Scope

This document provides specifications for the following components:

- ControlEdge PLC Controller
- ControlEdge PLC IO Modules
- ControlEdge PLC Expansion Processor Module
- ControlEdge PLC Serial Communication Module
- ControlEdge PLC Power Supplies
- ControlEdge PLC Power Status Modules
- ControlEdge PLC Racks
- ControlEdge Remote Termination Panel
- ControlEdge Builder

## 1.3. Terminology

| Terminology | Description |
|---|---|
| CIP | Common Industrial Protocol |
| CPM | Control Processor Module |
| CPU | Control Processor Unit |
| DLR | Device Level Ring |
| DNP3 | Distributed Network Protocol Version 3 |
| DNS | Domain Name System |
| ELMM | Enhanced Logic Manager Module |
| EPM | Expansion Processor Module |
| ETAP | EtherNet/IP™ Tap |
| EUCN | Enhanced Universal Control Network |
| Expansion I/O Rack | I/O Rack with EPM installed |
| FTE | Fault Tolerant Ethernet |
| I/O Network | Network between CPM and expansion I/O rack |
| MQTT | Message Queuing Telemetry Transport |
| IPsec | Internet Protocol G3 |
| Local I/O Rack | I/O Rack with CPM installed |
| ODVA | Open Device Vendors Association |
| OWD | Open Wire Detect |
| Redundant CPM Rack | Rack with 2 CPMs installed |
| RSM | Redundant Switch Module |
| RTP | Remote Terminal Panel |
| SCADA | Supervisory Control And Data Acquisition |
| VM | Virtual Machine |
| PPS | Parameters Per Second |
| VEP | Virtual Engineering Platform |
| UIO | Universal Input/output Module |
| VFD | Variable Frequency Drive |

# 2. Specifications

## 2.1. Control Processor Module (900CP1-0200) and Ext. Temp (-40 to 70°C) Model (900CP1-0300) and Control Processor Module (900CP2-0100).

The ControlEdge PLC 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 I/O Modules per controller | 144[1,2] |
| Maximum Analog channels per controller | 2304[1,2] |
| Maximum Digital channels per controller | 4608[1,2] |
| Maximum expansion I/O racks for non-redundant controller | 11 |
| Maximum expansion I/O racks for redundant controller | 12 |
| Command execution time | 85µs per 1000 commands in ST |
| Note:<br>1. I/O capability, as a soft limit, will decrease depending on the number of used EtherNet/IP connections and PROFINET IO Devices connected. Refer performance calculator tool for details.<br>2. I/O capability is based on I/O module type selection and combination. For more information, see section 2.5.<br>3. Only limited for 900 IO modules, not for MasterLogic IO modules. | |

### 2.1.2. Hardware specification and Features

| Item | Specification |
|---|---|
| Processor | Dual Core ARM® Cortex™-A9 Core (32 bit) 667 MHz |
| User Programming memory, (Flash) | User: 10 MB (Program 5 MB, Data 5 MB).<br>256 MB (Flash) of (900CP1-0200 and 900CP1-0300).<br>512MB (Flash) of (900CP2-0100). |
| SD card support | 32GB Class 6 / Class 10 industry standard |
| Running Memory (RAM) | 256MB with Error Correction Code of (900CP1-0200 and 900CP1-0300).<br>512MB with Error Correction Code of (900CP2-0100). |
| Controller Redundancy | Supported (Hot Standby) |
| Real-Time Clock | 2 weeks of retention after a power loss |
| CPU Watchdog | CPU automatically resets if error is detected |
| Nonvolatile memory data life | 20+ years (no battery required) |
| Real-time clock resolution | 1 ms |
| I/O Scan Time | 10 ms – 3000ms (adjustable per control strategy) |
| Switchover | Internal parameters, variables and outputs are maintained during transition.<br>Switchover time <100 ms |
| Operating Modes | Run Locked<br>Stop Locked<br>Remote Running<br>Remote Stopped |
| LED | 2 LEDs, three color each, indicate the status and role of the CPM |

### 2.1.3. Datalog Support

| Item | Specification |
|---|---|
| Datalog Media | Flash memory or optional SD Card |
| Datalog rate | Configurable: 1 second, 5 seconds, 10 seconds, 1 minute, 5 minutes, 10 minutes and1 hour |
| Datalog Timestamp resolution | 1 ms |
| | |

### 2.1.4. 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 | MODBUS TCP/UDP, OPC UA, HART-IP, CDA Responder, EtherNet/IP Server, EUCN[1], DNP3, MQTT, IEC60870-5-104 Outstation |
| Protocols, CPM ports 3 & 4 | I/O Communication, EtherNet/IP Client, PROFINET |
| Embedded Firewall[2] | Supported on ports 1&2 |
| IPsec[3] | Supported on ports 1&2 |
| FTE | Supported on ports 1&2 |
| Time Synchronization[4] | SNTP, DNP3 |

Note:

1. EUCN is available, only when CPM is working as PLC-FTE (formerly ELMM). PLC-FTE is a separate firmware image.
2. For detailed information of Firewall, see ControlEdge PLC and ControlEdge RTU Network and Security Guide.
3. Running on Windows 10 or Windows Server 2016 OS or later version.
4. PLC's time can be synchronized from either NTP/SNTP server or DNP3 Master.

**Modbus Protocol**

| Item | Specification |
|---|---|
| Device Function | Master and Slave |
| Multi-Master support | Yes |
| Ethernet support | MODBUS TCP and Modbus UDP[1], Configurable TCP port number and TCP Inactivity Timeout |
| Serial support | Modbus RTU or ASCII (Master/Slave)<br>via Serial Communication Module (900ES1-0100) |
| Slave connection | 64 per Ethernet port, 32 per Serial port, 128 per CPM |
| Master connection per CPM | 16 per Ethernet port |
| Maximum Number of Registers per CPM as slave | 16000 |
| Register Size[2] | 16, 32, 64 Bits |
| Ethernet Network Connection | 10/100 Base-T, RJ-45 |
| Note:<br>1. User Datagram Protocol<br>2. 32 and 64 Bits is available, only when CPM is working as Modbus Master. | |

**OPC UA Protocol**

| Item | Specification |
|---|---|
| Device Function | Server and Client |
| Generic OPC information models | Data Access (DA), Subscription |
| Technology specific information models | PLCOpen V1.0 |
| Number of OPC UA Client per CPM | 10 |
| Number of OPC UA Server per CPM | 10 |
| Number of variables for one CPM acting as OPC UA Server | 2000 |
| Number of variables for one CPM acting as OPC UA Client | 500 |
| Supported data types | BOOL, SBYTE, BYTE, INT16, UINT16, INT32, UINT32, INT64, FLOAT, DOUBLE, STRING (max 255 characters), DateTime |
| Certified Profile | Embedded UA Server Profile, Minimum UA Client Profile |
| Additional Facets | Attribute Read Client Facet,<br>Attribute Write Client Facet,<br>DataChange Client Facet,<br>Method Client Facet |
| Security Policies | SecurityPolicy - Basic128Rsa15,<br>SecurityPolicy - Basic256,<br>SecurityPolicy - Basic256Sha256,<br>SecurityPolicy - Aes128_Sha256_RsaOaep,<br>SecurityPolicy - Aes256_Sha256_RsaOaep |
| User Identity Tokens | User Token - Anonymous Facet,<br>User Token - User Name Password Server Facet |
| Certificate Management | Global Discovery Services "Push" model - UA Server<br>Global Discovery Services "Pull" model - UA Client |
| Note: MDIS is an application based on OPC UA, so they have the same specification. The MDIS library has a set of OPC UA function blocks representing all the MDIS OPC UA object types as defined in the MDIS OPC UA Companion Specification V1.2. The MDIS OPC UA Object function blocks are used to obtain data from MDIS OPC UA compliant Servers. | |

**MQTT Protocol**

| Item | Specification |
|---|---|
| Device Function | Edge of Network (EoN) Node, OASIS MQTT v3.1.1 compliant client |
| MQTT Payload Type | Sparkplug B |
| Maximum MQTT broker connections | 1 active server with 1 backup server across both Ethernet ports. |
| Variable Capacity | 2000 |
| Supported Data Types | BOOL, SINT, USINT, INT, UINT, DINT, UDINT, REAL and LREAL |
| Data Publish Modes | Periodic or Event |
| MQTT Quality of Service (QoS) Levels Supported | 0: At most once delivery<br>1: At least once delivery<br>2: Exactly once delivery |
| Secured Communications | TLS v1.2, v1.3 White list |
| Support Store & Forward | Yes |
| broker URL addresses | DNS and multi-gateway routing (static routing) |

Note:
1) DNS is converting a hostname (such as www.example.com) into a computer-friendly IP address (such as 192.168.1.1.).
2) Multi-gateway routing is used for data transferring via right way even you don't know the exact IP address.
3) DNS and multi-gateway routing is only for MQTT protocol in Release R174.1.

**CDA Protocol**

Control Data Access (CDA) is a protocol used for communication between the PLC Controller and controllers in Experion PKS and PlantCruise/LX system. All supported points in ControlEdge PLC can be browsed[1] in Experion Control Builder for CDA communication.

| Item | Specification |
|---|---|
| Supported Experion Controllers | C300, ACE, SIM-C300, SIM-ACE, UOC, vUOC |
| Maximum Peer to Peer Outgoing Data | 1000 PPS (Parameters Per Second) |
| Number of CDA Responder connections | 20 |
| Supported Data Types | BOOL, SINT, INT, DINT, USINT, UINT, REAL, LREAL, BYTE, WORD, DWORD, ULINT, LWORD, STRING |

Note:

1. Browsing feature of PLC tags will be supported from Experion R511.3 or later version.
2. For CDA link redundancy, it is suggested to deploy PLC-FTE firmware when connecting to Experion FTE network.
3. CDA communication on PLC is designed for peer to peer communication between PLC and Experion Controllers. For communication to Experion Server/Stations, it is suggested to use OPC UA with ControlEdge PLC channel.

**EtherNet/IP Protocol**

EtherNet/IP™ is an application layer protocol for industrial automation applications. It uses all the transport and control protocols used in traditional Ethernet including the Transport Control Protocol (TCP), the User Datagram Protocol (UDP), the Internet Protocol (IP) and the media access and signaling technologies found in off-the-shelf Ethernet interfaces and devices. It allows the user to address a broad spectrum of process control needs using a single technology.
The Common Industrial Protocol (CIP) is an industrial protocol for industrial automation applications. It is used in EtherNet/IP.

| Item | Specification |
|---|---|
| Device Function | Server and Client |
| Certification | ODVA Conformant |
| Maximum Packets/Parameters per Seconds | 8000 PPS (Packets per Second) for Class 1 Implicit messaging<br>1000 PPS (Parameter per Second) for Class 3 Explicit messaging |
| Client Class 1 Implicit (I/O) Messaging | CIP Connections: 160<br>Total Combined Input and Output Data Size: 320KB<br>Maximum Data Size: 1024 Bytes per device<br>Connection Type (Target to Originator): Multicase/Unicast<br>Transport Trigger: Cyclic<br>Data Type: Based on EDS file or BYTE, DINT, INT, REAL (generic module)<br>Tag Access Method: Data Read/Write<br>RPI: 20-3200ms<br>Electronic Keying: Supported<br>Network Levels: Single Level |
| Client Class 3 Explicit (Peer to peer) Messaging | Class 3 CIP Connation: 10<br>Maximum Data Size: 480 Byte (Read), 256 Byte (Write)<br>Connection Type: Peer to Peer<br>Transport Trigger: Application<br>Data Type: BOOL, SINT, INT, DINT, USINT, UNIT, UDINT, REAL<br>RPI: Follow Task Cycle Time |
| Server Class 3 Explicit Messaging | CIP Connection: 32<br>Connection Type: Peer to Peer<br>Tag Access Method: Data Read/Write<br>Data Type: BOOL, SINT, INT, DINT, USINT, UNIT, UDINT, REAL<br>RPI: Follow Task Cycle Time |
| Network Topology | DLR, STAR, LINEAR[1], MIXED |
| Qualified Switch Type | MOXA[2, 3, 4], Stratix5700, Stratix 8000, 1783-ETAP |

Note:
1. LINEAR topology is supported only for non-redundant CPM.
2. Qualified MOXA switches are listed in the section 2.3.
3. Communication between ControlEdge PLC controller and I/O modules in the I/O expansion rack is only supported through MOXA switches.
4. Moxa or any other unmanaged switches (copper/fiber) are not recommended for ring network (HSR/DLR).

**PROFINET Protocol**

PROFINET™ is an Ethernet open standard (IEC 61158) defined by PI (PROFIBUS and PROFINET International) and complies with the industrial Ethernet requirements. PROFINET IO is Ethernet based automation standard. PROFINET uses TCP/IP for diagnostics, non-real time critical data and for communicating with other non PROFINET IO based devices. PROFINET uses real-time protocol for IO data access. This real-time protocol co-exists with TCP/IP stack without restrictions.

| Item | Specification |
|---|---|
| CPM as a PROFINET IO Controller | Yes |
| CPM as a PROFINET IO Device | No |
| Number of PROFINET Devices | 128 |
| PROFINET IO Device Minimum Scan Interval | 8 ms[1] |
| Max. Size of Cyclic Input and Output Data | 64 KB includes IOxS[2] status bytes |
| Acyclic Communication | No |
| DCP Function | No |
| Alarms | No |
| Diagnostics | Yes |
| HART Support | No |
| Controller Redundancy | Yes. S2 redundancy is not supported.[3] |

Note:
1. 8 ms is the fastest scan interval setting for CPM. However, the fastest scan interval depends on both Controller and connected device scan speeds.
2. IOxS means IOPS and IOCS.
3. PROFINET is supported on redundant PLC. S2 redundancy is not supported. PROFINET devices will take about 3 sec to connect to redundant controllers after switchover.
4. A separate license SP-IPROF01 is needed for each logic controller.

**DNP3 Protocol**

| Item | Specification |
|---|---|
| Device Function | Master and Outstation (Slave) |
| Protocol Compliance Level[1] | Level 3+ |
| Capacity of events buffered | Flash memory: 100,000 events or<br>Optional SD Card: 500,000 events |
| Data monitoring by multiple DNP3 Masters | Yes, on separate ports<br>(5 masters per port, 10 masters total) |
| Maximum connections to Outstations | 10 Outstations across both Ethernet ports |
| Register Capacity | 6,000 per Ethernet port |
| Report by Exception Capability | Yes |
| Ethernet Support | Yes, configurable TCP port number – default 20000 |
| Serial Support | No |
| Check Before Operate (CBO) Support | Yes |

Note:
1. See ControlEdge PLC DNP Device Profile Document (DPD) for complete details

**HART-IP Protocol**

Honeywell's Field Device Manager[1] R500.2 and FDM Express[1] R500 Express onwards uses HART-IP for instrument asset management of ControlEdge PLC connected HART devices.

| Item | Specification |
|---|---|
| Device Function | Read system capacity of ControlEdge PLC<br>Read ControlEdge PLC and HART devices identity information<br>HART command passes through to the connected HART devices<br>HART delayed response mechanism to maximize system performance |
| Ethernet support | HART-IP Protocol, Version 7, based on TCP/IP<br>Configurable TCP port number<br>Support single Honeywell Field Device Manager connection |
| Note: For more information about FDM, please refer to FDM Specification. | |

**EUCN Protocol**

EUCN is a communication protocol for ELMM applications. ELMM requires software release TPN R688.1 or later version.

| Item | Specification |
|---|---|
| FTE Protocol | Honeywell Proprietary protocol that provides built-in communication redundancy on the uplink communication ports, i.e., ETH1 and ETH2 |
| EUCN Communication | Honeywell Proprietary UCN protocol built over FTE<br>Has a built-in firewall and connects to Level 2 network directly |
| Note: EUCN Protocol support also provides Logic Manager Point processing capability on ControlEdge PLC. See LMM Specifications | |

**IEC60870-5 Protocol**

| Item | Specification |
|---|---|
| Device Function | Outstation (Slave) |
| Maximum connections from Masters | 5 Masters per Ethernet port |
| Variable Capacity | 2000 |
| Data update modes | General Interrogation, Spontaneous, Cyclic |
| Events Capacity | 50k on Flash or 150k on SD Card |
| Point Types | Binary Inputs, Analog Inputs, Counters |
| Time Synchronization | SNTP server or IEC60870-5-104 master |
| Commands | Interrogation, Cyclic, Spontaneous, Control |
| Connection | Channel Redundancy |
| Secured Communications | TLS v1.2 v1.3 |

## 2.2. Expansion Processor Module (900SP1-0200) and Ext. Temp (-40 to 70°C) Model (900SP1-0300)

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 99 |
| 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 |
| Protocols, EPM ports 1 & 2 | I/O Communication |

## 2.3. I/O Network Topology

ControlEdge 900 platform hardware supports Star, Ring and DLR topology to connect Expansion I/O rack, EtherNet/IP, and PROFINET I/O devices with CPM rack.

| Item | Specification |
|---|---|
| Expansion I/O Network Topology | Star, Ring or DLR 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<br>100 m (328 ft.) CPM to EPM (expansion I/O rack), or to switch.<br><br>Fiber optic cable<br>multi-mode: 5000m (16,404 ft.)[1] CPM to EPM or to switch.<br>Single mode: 40km (131,234 ft.) [1] CPM to EPM or to switch. |

| Item | Specification |
|---|---|
| Network Switch and Fiber Optic Equipment Recommendations[2] | Unmanaged Ethernet Switches[3]<br>• Moxa model EDS-308 with (eight) 10/100 Ethernet ports<br>• Moxa model EDS-308-MM-SC with (six) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors<br>• Moxa model EDS-308-SS-SC with (six) 10/100 Ethernet ports, (two) single mode fiber ports with SC Connectors<br>• Moxa model EDS-316-MM-SC with (fourteen) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors<br>• Moxa model EDS-316-SS-SC with (fourteen) 10/100 Ethernet ports, (two) single mode fiber ports with SC Connectors<br>• Moxa model EDS-308 with (eight) 10/100 Ethernet ports, G3 coated<br>• Moxa model EDS-308-MM-SC with (six) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors, G3 coated<br>• Moxa model EDS-308-SS-SC with (six) 10/100 Ethernet ports, (two) single mode fiber ports with SC Connectors, G3 coated<br>• Moxa model EDS-316-MM-SC with (fourteen) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors, G3 coated<br>• Moxa model EDS-316-SS-SC with (fourteen) 10/100 Ethernet ports, (two) single mode fiber ports with SC Connectors, G3 coated<br><br>Fiber Optic Converters[3]<br>• Qualified Moxa IMC-101-M-SC with 10/100BaseT(X) to 100BaseFX multi-mode fiber port with SC connectors<br>• Qualified Moxa IMC-101-S-SC with 10/100BaseT(X) to 100BaseFX single mode fiber port with SC connectors<br>• Qualified Moxa IMC-101-M-SC with 10/100BaseT(X) to 100BaseFX multi-mode fiber port with SC connectors, G3 coated<br>Qualified Moxa IMC-101-S-SC with 10/100BaseT(X) to 100BaseFX single mode fiber port with SC connectors, G3 coated<br><br>Copper Ethernet cable<br>• Shielded CAT5 Cable<br><br>Fiber optic cable<br>• 50/125µm with SC connectors on both ends (Multi)<br>• G.652 with SC connectors on both ends (Single) |
| Note:<br>1. Select qualified MOXA switch as I/O Network Switch. For detail information refer to MOXA datasheet.<br>2. Honeywell Model number is available in Model number list.<br>3. All Ethernet Switches and Fiber Optic convertors require 24VDC Power. | |

## 2.4. Serial Communication Module (900ES1-0100)

Serial Communication module provide 2* RS232 Port and 2* RS485 port. Supporting Modbus Serial communication protocol and user defined protocol.

| Item | Specification |
|---|---|
| Protocol support | Modbus ASCII Master<br>Modbus ASCII Slave<br>Modbus RTU Master<br>Modbus RTU Slave<br>User defined Protocol |
| Connector | 2*RS232:9-Pin D-sub male connector, share the same isolator<br>2*RS485: Isolated from each other and from RS232 ports |
| Galvanic Isolation | 2000 VDC |
| Maximum slave devices connected per RS485 port | 32 |
| Module status LED | Supported |
| Channel communication LED | Supported |
| Maximum communication module per CPM | 6 |
| Operation Temperature | -40 to 70°C |
| Storage Temperature | -40 to 85°C |
| Baud rate | 300bps to 115200bps, adjustable |
| Flow control | None, RTS-CTS, RTS |
| Parity | None, Odd, Even |
| Data Bits | None, Odd, Even |
| Stop Bits | 7, 8 (7 is not supported on Modbus RTU protocol) |
| Experion Integration – Diagnostic | Supported |
| Maximum Length of User Defined Protocol | 532 Bytes |
| Supported data types on User Defined Protocol | USINT, UINT, UDINT, LINT REAL, LREAL |

# 3. Module Number List

## 3.1. ControlEdge 900 I/O Modules

| Item | Model | Description |
|---|---|---|
| | | **Racks** |
| 1 | 900RR0-0300 | Redundant CPM Rack (Assembly), Ext. Temp (-40 to 70°C) |
| 2 | 900R01-0300 | 1 I/O Slot Rack – Non-Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| 3 | 900R04-0300 | 4 I/O Slot Rack – Non-Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| 4 | 900R08-0300 | 8 I/O Slot Rack – Non-Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| 5 | 900R12-0300 | 12 I/O Slot Rack – Non-Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| 6 | 900R08R-0300 | 8 I/O Slot Rack – Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| 7 | 900R12R-0300 | 12 I/O Slot Rack – Redundant Power (Assembly), Ext. Temp (-40 to 70°C) |
| | | **Control Processor Module** |
| 8 | 900CP1-0200 | Control Processor Module v1 |
| 9 | 900CP1-0300 | Control Processor Module, Ext. Temp (-40 to 70°C) |
| 10 | 900CP2-0100 | Control Processor Module v2 |
| | | **Expansion Processor Module** |
| 10 | 900SP1-0200 | Expansion Processor Module |
| 11 | 900SP1-0300 | Expansion Processor Module, Ext. Temp (-40 to 70°C) |
| 12 | 900ES1-0100 | 4 port serial communications module, 2 x RS232, 2 x RS485, Ext. Temp (-40 to 70°C) |
| | | **IO Module** |
| 13 | 900U01-0100 | Universal IO Module, Ext. Temp (-40 to 70°C) |
| 14 | 900A01-0202 | Universal AI, RTD, TC, V, 8 Ch |
| 15 | 900A16-0103 | Analog Input high level (16 channel) |
| 16 | 900B01-0301 | Analog Output, 0 to 20mA, (4 channel) |
| 17 | 900B08-0202 | Analog Outputs 0 to 20mA (8 channel, 5 modules/rack) |
| 18 | 900G03-0202 | Digital Input 120/240 VAC, 16 Ch |
| 19 | 900G32-0301 | Digital Input 24VDC, 32Ch, Ext. Temp (-40 to 70°C) |
| 20 | 900G01-0202 | Digital Input, Contact type, (16 channel) |
| 21 | 900G04-0101 | Digital Input, 120/240 VAC-125VDC, (16 channel Isolated) |
| 22 | 900H03-0202 | Digital Output, 120/240 VAC, 8 Ch |
| 23 | 900H32-0302 | Digital Output,24VDC, 32 Ch, Ext. Temp (-40 to 70°C) |
| 24 | 900H01-0202 | Digital Output, Relays (8 channel) |
| 25 | 900K01-0201 | Pulse/Freq (4 channel) |
| | | **Power Supply** |
| 26 | 900P01-0501 | 120/240 V AC, 58 W Power Supply |
| 27 | 900P24-0501 | 24 V DC, 51W Power Supply |
| 28 | 900P01-0701 | AC-DC-NON SIL 41W Power supply, Ext. Temp (-40 to 70°C) |
| 29 | 900PSM-0200 | Redundant Power Status Module, Ext. Temp (-40 to 70°C) |
| | | **Terminal Blocks** |
| 30 | 900TEK-0200 | TB Housing, Black 20 Position Euro style |
| 31 | 900TER-0200 | TB Housing, Red 20 Position Euro style |
| 32 | 900TCK-0200 | TB Housing, Black 36 Position Euro style |
| 33 | 900TBR-0200 | High Voltage Terminal Block (Barrier Style) |

| | | |
|---|---|---|
| 34 | 900TBK-0200 | Low Voltage Terminal Block (Barrier Style) |
| **RTP and RTP Cable** | | |
| 35 | 900RTS-0001 | DI, DO, AO Remote Terminal Panel (RTP) |
| 36 | 900RTA-L001 | Analog Input Remote Terminal Panel |
| 37 | 900RTR-H001 | Relay Output Remote Terminal Panel (RTP) |
| 38 | 900RTC-L210 | Low Voltage RTP Cable (1.0M, 3.28ft.) |
| 39 | 900RTC-L225 | Low Voltage RTP Cable (2.5M, 8.2ft.) |
| 40 | 900RTC-L250 | Low Voltage RTP Cable (5.0M, 16.4ft.) |
| 41 | 900RTC-H210 | High Voltage RTP Cable (1.0M, 3.28ft.) |
| 42 | 900RTC-H225 | High Voltage RTP Cable (2.5M, 8.2ft.) |
| 43 | 900RTC-H250 | High Voltage RTP Cable (5.0M, 16.4ft.) |
| 44 | 900RTC-3410 | RTP Cable, Low Power 16/32CH 1.0M 3.28ft |
| 45 | 900RTC-3425 | RTP Cable, Low Power 16/32CH 2.5M 8.2ft |
| 46 | 900RTC-3450 | RTP Cable, Low Power 16/32CH 5.0M 16.4ft |
| 47 | 900RTC-BA10 | AO - 8 Ch 1.0 M RTP Cable |
| 48 | 900RTC-BA25 | AO - 8 Ch 2.5M RTP Cable |
| 49 | 900RTC-BA50 | AO - 8 Ch 5.0 M RTP Cable |
| **Auxiliary Hardware** | | |
| 50 | 51307946-001 | Security cover, CPM/EPM |
| 51 | 51452262-503 | IO Module Insert Label Kit |
| 52 | 900TNF-0200 | Filler Block Terminal Cover |
| 53 | 900RNF-0200 | Redundant CPM Rack Filler plate (no RSM) |
| 54 | 900TSS-0001 | Shield Terminal Strip (package of 2) |
| 55 | 900J02-0001 | Terminal board jumpers (10, two pos. jumpers) |
| 56 | 900J10-0001 | Terminal board jumpers (10, ten pos. jumpers) |
| 57 | 51205995-501 | MI/MP 250 Ohm Resistor Kit of 8 |
| **Networking Components** | | |
| 58 | 50008930-001 | MOXA EDS-308, Network Switch, 8 Copper ports |
| 59 | 50008930-002 | MOXA EDS-316-MM-SC, Network Switch, 14 Copper + 2 multi-Mode ports |
| 60 | 50008930-003 | MOXA EDS-316-SS-SC, Network Switch, 14 Copper + 2 Single-Mode ports |
| 61 | 50008930-004 | MOXA EDS-308-SS-SC, Network Switch, 6 Copper + 2 Single-Mode ports |
| 62 | 50135395-001 | MOXA IMC-101-M-SC, Ethernet Fiber Optic Converter, Multi-Mode |
| 63 | 50135395-002 | MOXA IMC-101-S-SC, Ethernet Fiber Optic convertor, Single mode |
| **Software and Media Kit** | | |
| 64 | SP-CSPLC1 | Execution Environment, ControlEdge PLC |
| 65 | SP- EMD172-ESD | ControlEdge Builder R172 Media Kit, Electronic Software Distribution |
| 66 | SP-EMD172 | ControlEdge Builder R172 Media Kit |
| 67 | SP-EBLDR1 | ControlEdge Builder Client License |
| 69 | SP-IMDIS1 | Subsea MDIS Interface, Site License. One required for each site using MDIS feature. |
| 70 | SP-CELMM1 | ELMM on ControlEdge PLC, unit license. One required for each ELMM. |
| 71 | SP-IPROF01 | ControlEdge PLC PROFINET Use License |

## 3.2. ML50/200 I/O Modules

| Item | Model | Description |
|---|---|---|
| **Racks/Bases (Only for ML200)** | | |
| 1 | 2MLB-M04A | Main Base 4 slot |
| 2 | 2MLB-M06A | Main Base 6 slot |
| 3 | 2MLB-M08A | Main Base 8 slot |
| 4 | 2MLB-M12A | Main Base 12 slot |
| 5 | 2MLR-E08P | Expansion Base 8 slot |
| 6 | 2MLR-E12P | Expansion Base 12 slot |
| **Adaptors** | | |
| 7 | 2MLL-DBDT | EtherNet/IP adaptor (ML200) |
| 8 | MEL-BSSRT | EtherNet/IP adaptor (ML50) |
| **I/O Modules** | | |
| 9 | MLE-DC32A | DC24V Input (32 ch) |
| 10 | MLE-TN32A | Open Collector Output (32 ch) |
| 11 | MLE-DR16A | DC24V Input (8 ch) & Relay Output (8 ch) |
| 12 | MLE-TP32A | Open Collector Output (32ch)-Source |
| 13 | MLE-RY16A | Relay Output (16 ch) |
| 14 | MLF-AD08A | Current/Voltage Input (8 ch) |
| 15 | MLF-AD04C | Current/Voltage Input (4 ch), Hi-resolution |
| 16 | MLF-DC04C | Current Output (4 ch), Hi-resolution |
| 17 | MLF-AH04A | Current/Voltage Input (2 ch), Current/Voltage Output (2 ch) |
| 18 | MLF-DC04A | Current Output (4 ch) |
| 19 | 2MLI-D22A | Digital Input - DC 24V Input (Sink/Source Type), 16 ch |
| 20 | 2MLI-D28A | Digital Input - DC 24V Input (Sink/Source Type), 64 ch |
| 21 | 2MLQ-TR2A | Digital Output - TR Output, 0.5A (SinkType), 16 ch |
| 22 | 2MLQ-TR8A | Digital Output - TR Output, 0.1A (SinkType), 64 ch |
| 23 | 2MLF-AD16A | Analog Input - Voltage/Current Input Module, 16ch |
| 24 | 2MLT-DMMA | DUMMY Module for empty I/O slots |
| **Power Supply** | | |
| 25 | 2MLP-ACF1 | Free Voltage(110V,220V) / DC5V, 3A, DC24V,0.6A |
| 26 | 2MLP-ACF2 | Free Voltage(110V,220V) / DC5V, 6A |
| 27 | 2MLP-AC23 | AC220V / DC5V, 8.5A |
| 28 | 2MLP-DC42 | DC24V / DC5V |
| **Smart Link Assemblies** | | |
| 29 | TG7-1H40S | Smart Link Terminal Board 40P |
| 30 | R32C-NS5A-40P | Relay Board, 40point (For DO Sink Type only) |
| **TB Cable** | | |
| 31 | C40HF-15PB-1 | Cable Assembly for Terminal Board, 40p-40p, 1.5m |
| 32 | C40HF-30PB-1 | Cable Assembly for Terminal Board, 40p-40p, 3.0m |
| 33 | C40HH-15S-XBI | Smart Link Cable Ass'y 40-40P, 1.5 Meter |
| 34 | C40HH-30S-XBI | Smart Link Cable Ass'y 40-40P, 3.0 Meter |

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