Honeywell

Technical Information

ControlEdge PLC Specification

CE03-100-150.1

Release 150.1

February 2018, Version 1.3

Revision History

Revision	Date	Description
1.0	November 2017	ControlEdge PLC R150 software release and New IO module hardware
1.1	December 2017	Update HLAI module to 900A16-0103
1.2	January 2018	• Minor update for Moxa model EDS-308-SS-SC with (six) 10/100 Ethernet ports, change “(two) multi-mode fiber ports with SC Connectors” to “(two) single mode fiber ports with SC Connectors” • Change width dimensions for CPM, EPM and UIO.
1.3	February 2018	• Add supported data types for OPC UA protocol • Update descriptions for 900J02-0001 and 900J10-0001

Note:
Product release number is applicable for software and firmware of the product. Hardware is referred with version number and is not associated with software release number.

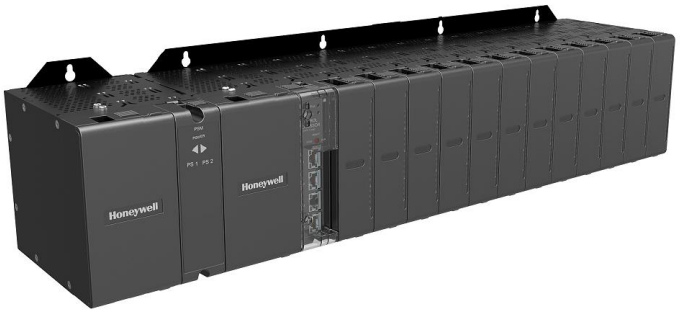
Table of Contents

1. Introduction

This document provides technical information for the Honeywell ControlEdge PLC. 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. 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 Universal I/O for greater configuration flexibility
- 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, and safety system
- Tight integration with Honeywell's market leading Field Device Manager - FDM and FDM Express
- Tight integration with Honeywell's new Panel PC – Experion Panel PC
- Native controller redundancy
- Optionally redundant power supplies
- Two variants of power supplies: 58W 24VDC and 110/240VAC
- Leverages Honeywell's LEAP project methodology and Universal I/O for greater configuration flexibility
- I/O racks of various sizes
- Integration with third-party systems and devices such as motors, drivers, and compressors
- Connects to Human-Machine Interface (HMI) through Modbus and OPC UA protocols
- Compatible with leading open network standards such as Modbus and OPC UA
- Qualified MOXA MGate MB3180 Modbus Gateway
- Powerful IEC 61131-3 programming environment
- Best-in-class cyber security capabilities like built in Control Firewall, Secure boot, Secure Communication to ensure the safety of the system, personnel and critical information
- 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

This document provides specifications for the following components:

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

1.3. Terminology

Terminology	Description
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. Specifications

2.1. Control Processor Module (900CP1-0200)

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 for controller	144
Maximum Analog channels for controller	2304[1]
Maximum Digital channels for controller	4608[1]
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:

1. I/O capability is based on I/O module type selection and combination. For more information, refer the Input/output Module section.

2.1.2. Hardware specification and Features

Item	Specification
Processor	Dual Core ARM® Cortex™-A9 Core (32 bit) 667 MHz
User Programming memory, max	10 MB (Program 5MB, Data 5MB)
SD card support	32GB Class 6 / Class 10 industry standard
Controller Redundancy	Supported
Real-Time Clock	2 weeks of retention after a power loss
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 control strategy)
Switchover	Internal parameters, variables and outputs are maintained during transition.
Operating Modes	Run Locked Stop Locked Remote Running Remote Stopped
LED	2 LEDs, three color each, indicate the status and role of the CPM

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	MODBUS TCP, OPC UA, HART-IP, CDA, Modbus ASCII/RTU[3]
Protocols, CPM ports 3 & 4	I/O Communication
Embedded Firewall[1]	Supported on ports 1&2
IPsec[2]	Supported on ports 1&2

Note:
1. For detail information on Firewall refer to User's Guide.
2. Running on Windows 10 or Windows Server 2016 OS.
3. Using qualified MOXA MGate MB3180 Modbus Gateway to convert between Modbus TCP and Modbus ASCII/RTU.

Modbus TCP Protocol

Item	Specification
Device Function	Master and Slave
Multi-Master support	Yes
Ethernet support	MODBUS TCP, Configurable TCP port number
Serial support	Via device server/protocol converter
Slave connection per CPM	64 per port
Master connection per CPM	16 per port
Maximum Number of Registers per CPM as slave	8000
Ethernet Network Connection	10/100 Base-T, RJ-45

OPC UA Protocol

Item	Specification
Device Function	Server and Client
Generic OPC information models	Data Access (DA)
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 variable for one CPM acting as OPC UA Server	2000
Number of variable 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

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

CDA Protocol

Control Data Access (CDA) is a protocol used for communication between the PLC Controller and controllers in Experion PKS system.

Item	Specification
Supported Experion Controllers	C300, ACE, SIM-C300,SIM-ACE
Maximum Peer to Peer Outgoing Data	1000 PPS (Parameters Per Second)
Number of CDA connections	20

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 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 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) single 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 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) • G.652 with SC connectors on both ends(Single)

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.

2.4. Input/output Module

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

- Universal Input/output module, 16 channel
- Universal AI – RTD,TC,V 8 Channel
- Analog Input High Level, 16 Channel
- Analog Output, 4 Channel
- Digital Input 120/240 VAC, 16 Channel
- Digital Input 24 VDC, 32 Channel
- Digital Input Contact, 16 Channel
- Digital Output 120/240 VAC, 16 Channel
- Digital Output 24 VDC, 32 Channel
- Digital Relay Output, 8 Channel
- Pulse/Frequency, 4 Channel

2.4.1. Universal Input/output Module (900U01-0100, HW Revision D/E, Version 02 in Builder)

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 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

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_5W_{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
	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.

High Level Analog Input Specifications

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.

High Level Analog Input Reference Accuracy

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

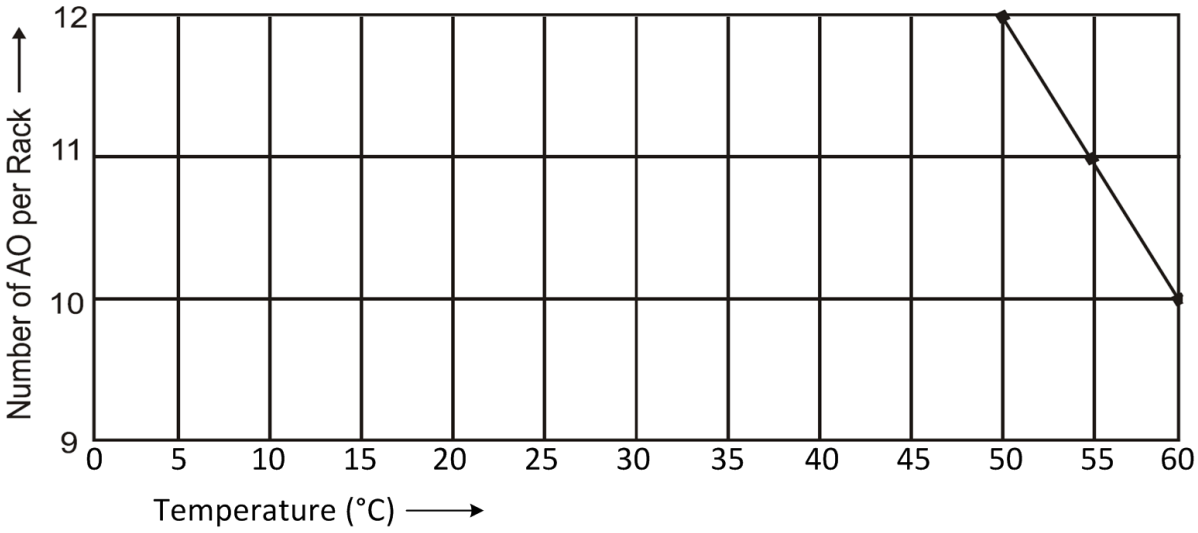
2.4.4. Analog Output, 0 to 20mA, 4 Channel (900B01-0301)

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	500VDC 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.



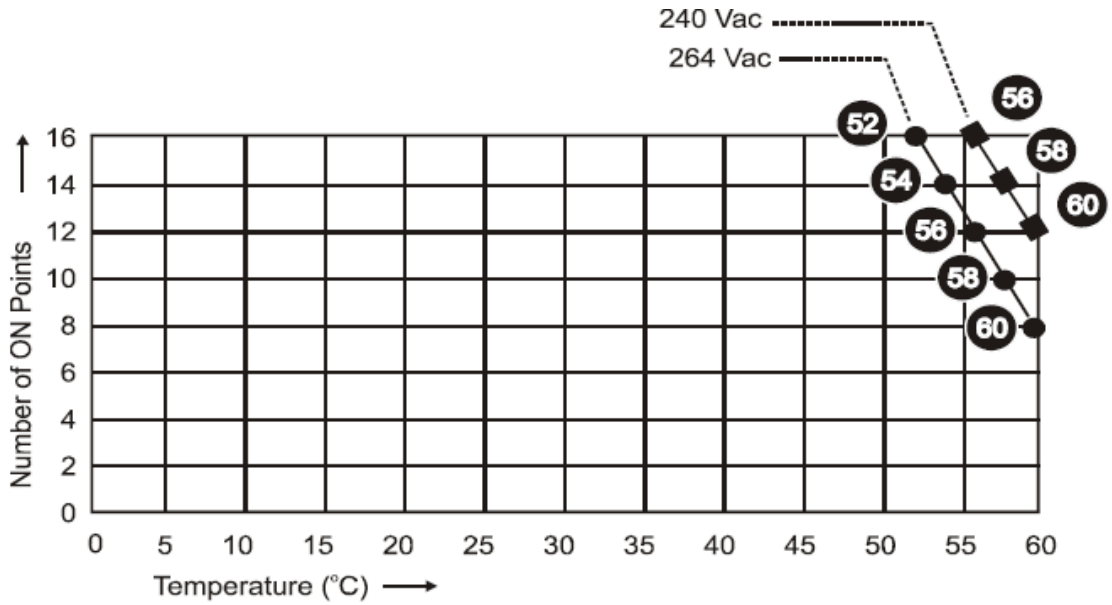
2.4.5. Digital Input 120/240 VAC (900G03-0202)

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



2.4.6. 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.

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

The Contact Closure Digital Input Module is self-powered, providing 15VDC 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 norminal

Note:

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

2.4.8. 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.

2.4.9. 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.

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

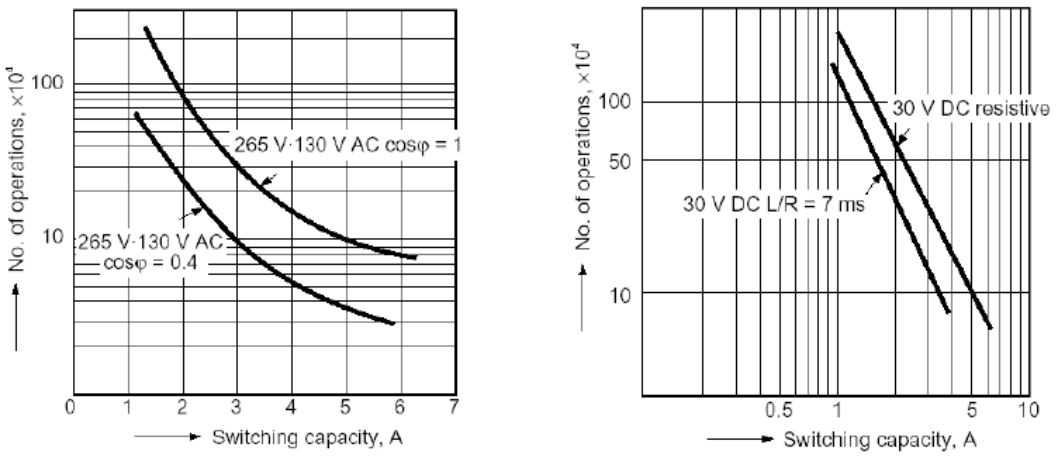
The Relay Output Module provides eight individually isolated, electromechanical relay outputs. Four of the outputs are Form-C, and the other four are Form-A. Output are not fused in the Relay module. Install a fuse for each output at the field device that is appropriate for the load and the wire used.

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
Output channel	4 form A, 4 form C
Output Device	Electromechanical relay
Voltage	120/240VAC, 30 VDC
Current Rating	4A @ 240VAC or 30VDC resistive load 0.5 A @ 240VAC or 30VDC 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 time[1]	11 ms max
ON to OFF response time[1]	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)



2.4.11. 4 Channel Pulse/Frequency/Quadrature Module – DC Voltage type (900K01-0201)

The 4 Channel Pulse/Frequency/Quadrature* Module provides two different functionalities in the form of Pulse Input, Frequency measurement. Each of these channels can be configured for any one of these two functions.

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.

*Note! Quadrature and Pulse Output signal are not supported in current release.

Item	Specification
Input voltage range	0 VDC to 24VDC
Input per module	4
Digital Output type	Open collector, 5 to 24V, 30mA max, used for fast signaling
Pulse Input Specification	
Input Voltage Range	0 VDC to 24 VDC
ON Voltage Level	3.0 VDC minimum
OFF Voltage Level	1.0 VDC maximum
Input Impedance	25K ohm
Frequency	10 KHz maximum
Minimum Pulse Width	3 µsec
Pulse Counter	32 bits
Preset Value	User may configure a preset count value within the range of 32 bit counter
Preset Action	Settable as ON or OFF in HC Designer
Digital Output	• If preset action ON, output turns ON for 1 second. • If preset action OFF, output latches ON, and remains ON until counter reset command.
Counting based on Preset	When the count equals preset value: • If preset action ON, counter is reset and immediately resumes count. • If preset action OFF, counter is not reset and counts beyond preset value.
Counter HOLD	When the HOLD input to the pulse input I/O data type is ON in ControlEdge Builder, the counter holds its current value.
Counter RESET	The counter may be reset only via its I/O data type in ControlEdge Builder, when an OFF to ON transition occurs on the RST input.
Counter Flags	The OVERFLOW flag (STS=33) gets set when the module counter overflows. This flag can be reset when an OFF to ON transition occurs on RST input. Also, the PREI flag is set when the digital output of the module turns ON.
Frequency Input Specifications	
Input Voltage Range	0 VDC to 24 VDC
ON Voltage Level	3.0 VDC minimum
OFF Voltage Level	1.0 VDC maximum
Input Impedance	25k ohm
Frequency	10 HZ minumun 100K HZ maximum
Minimum Pulse width (frequency ranges)	500 µsec (10 Hz to 500 Hz) 50 µsec (10 Hz to 5 KHz) 2.5 µsec (10 Hz to 100 KHz)
Digital Output	ON if put frequency out of range, else OFF

2.4.12. IOM scan time for I/O modules

I/O module	IOM scan time (in local I/O rack or remote I/O
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
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
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
900K01-0201 - Pulse/Freq Input, 4 Channel	10ms

2.5. I/O 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
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
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
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
900K01-0201	900TEK-0200	900TBK-0200	N/A	N/A	N/A

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

2.8. ControlEdge Builder Specification

ControlEdge Builder is ControlEdge PLC's configuration tool to design, configure, program and maintain your PLC project

2.8.1. ControlEdge Builder Capabilities

Item	Specification
IEC 61131-3 Programming	Yes
Programming Languages	Ladder Diagram (LD) Function Block Diagram (FBD) Structured Text (ST) Instruction List (IL) Sequential Function Chart (SFC)
Function Block Libraries[1]	Standard IEC61131-3 Honeywell Control MODBUS OPC UA
Communication Medium to PLC	Ethernet
Remote Download of Program	Yes
Online change[2]	Yes
Remote Reboot	Cold or Warm Reboot
Remote Firmware Upgrade	Yes
Remote Diagnostics	Yes
Note: 1. See Online help in ControlEdge Builder 2. For example, if only one I/O module configuration is changed, other I/O modules will not be impacted when downloading the project. See Online help in ControlEdge Builder for more information.	

2.8.2. ControlEdge Builder Hardware Requirements

Item	Specification
Minimum Processor	Pentium or compatible processor (2 GHz) Recommended: Intel® Core™ i5 equivalent or better
System RAM	Minimum: 1 GB Recommended : 4 GB
Operate System	Windows 7 32-bit or 64-bit with SP1, Windows 10 32-bit or 64-bit
Hard drive	5 GB available memory
DVD-ROM drive	Required
Graphic Card	DirectX 9 capable graphics adapter
Display color settings	True color (32 bit)
Display Resolution	Recommended resolution : 1280 x 800 or above Optimal resolutions: 1920 x 800, 1366 x 768, 1280 x 1024 and 1280 x 800

2.8.3. Project Limits in ControlEdge Builder

The following table lists the limits valid within one project. Please observe the corresponding notes below the table.

Item	Specification
Configurations in the project tree	1
Resources in the project tree	1
Program instances per resource	1000[1]
Tasks per resource	16[2]
Program instances per task	500[1]
Global variables	100000
Local variables per POU	15000
POUs in a project including POUs from libraries	2000
Total no. of functions and FBs of different types per POU	620[1]
Total no. of functions and FBs of same type per POU	1024[1]
Jumps and labels per POU	750[1]
Jumps and returns per POU	20[1]
SFC steps per POU	750
SFC transitions per POU	1024
SFC transition details in the project tree	256
SFC action details in the project tree	350
SFC actions per code worksheet	600
Contacts / coils per POU	3600
Global PG variables per program instance	2000[1, 2]

Note:
1. The actual value of this limit may be higher than the value mentioned here. However, the given value is the limit by manufacturer definition.
2. The actual value of this limit depends on the PLC type (in particular non-ProConOS targets).

2.8.4. Software Licenses

Model Number	Details
SP-EBLDR1	PLC and RTU builder client license. One required for each computer (physical or virtual) RTU Builder is to be installed on. Can run both online and offline.
SP- CSPLC1	PLC Execution Environment License. One required for each 900CP1-xxxx controller running PLC functionality.
SP-EMD150	ControlEdge Builder R150, Media and documentation. Delivered as DVD with software and documentation.
SP-EMD150-ESD	ControlEdge Builder R150, Media and documentation. Software and documentation is delivered through software link for faster deliveries.
SP-EMD140	ControlEdge Builder R140, Media and documentation. Delivered as DVD with software and documentation. Release R140 is ISASecure Certified.
SP-EMD140-ESD	ControlEdge Builder R140, Media and documentation. Software and documentation is delivered through software link for faster deliveries. Release R140 is ISASecure Certified.

3. Hardware Power Consumption, Heat Dissipation and Weight

3.1. 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 mA	200 mA	6.8W
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	130 mA	40 mA	1.76W
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	110 mA	100 mA	3W
Pulse/Freq	900K01-0201	110 mA	250 mA	6.6W
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

3.2. Dimensions and Weight

Item	Module Number	Dimension	Weight
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
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

Item	Module Number	Dimension	Weight
CPM, ControlEdge 900	900CP1-0200	5.4" H* x 1.5" W 137mm H x 38.1mm W	320g
EPM, ControlEdge 900	900SP1-0200	5.4" H* x 1.5" W 137mm H x 38.1mm W	320g
Universal IO Module	900U01-0100	5.4" H* x 1.5" W 137mm H x 38.1mm 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 hi 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
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 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
Pulse/Freq, (4chan)	900K01-0201	5.4" H* x 1.4" W 137mm H x 35.6mm W	360g
Power Supply 120/240VAC, 60W	900P01-0301	5.4” H* x 2.86” W 137mm H x 72.6mm W	820g
Power Supply 24VDC, 60W	900P24-0301	5.4” H* x 2.86” W 137mm H x 72.6mm W	792g
Power Status Module, Redundant	900PSM-0200	5.4” H* x 1.4” W 137mm H x 35.6mm 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	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 Signle 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 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).

4. Hardware Spacing Requirement

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

5. 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	1 g 30 ms	Not rated
Vibration	0 Hz to 14 Hz— amplitude 2.5 mm (peak-to-peak) 14 Hz to 250 Hz— acceleration 1 g	See below table

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			

6. 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 ≤ 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 ≤ 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
FM[1]	Electrical Equipment for Use in Hazardous (Classified) Locations, General Requirements	FM 3600	2011
	Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2, Hazardous (Classified) Locations	FM 3611	2004
	Electrical and Electronic Test, Measuring and Process Control Equipment	FM 3810	2005
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

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

Hazardous Location Approvals	Approval Rating
FM	Non-incendive for use in Class I, Division 2, Groups A, B, C & D Class I, Zone 2, IIC T*
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
T5	900G32, 900H01, 900K01, 900G01
T4	900H03, 900P01, 900P24, 900RR0, 900CP1, 900SP1, 900U01, 900RR0, 900B01
T6	900A01, 900H32, 900PSM, 900R04, 900R08, 900R12, 900R08R, 900R12R, 900A16

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

7. Module Number List

	Model	Description
		Racks
1	900RR0-0200	Redundant CPM Rack (Assembly)
2	900R04-0200	4 I/O Slot Rack – Non Redundant Power (Assembly)
3	900R08-0200	8 I/O Slot Rack – Non Redundant Power (Assembly)
4	900R12-0200	12 I/O Slot Rack – Non Redundant Power (Assembly)
5	900R08R-0200	8 I/O Slot Rack – Redundant Power (Assembly)
6	900R12R-0200	12 I/O Slot Rack – Redundant Power (Assembly)
		Control Processor Module
7	900CP1-0200	Control Processor Module
		Expansion Processor Module
8	900SP1-0200	Expansion Processor Module
		IO Module
9	900U01-0100	Universal IO Module
10	900A01-0202	Universal AI,RTD, TC, V, 8 Ch
11	900A16-0103	Analog Input high level (16 channel)
12	900B01-0301	Analog Output, 0 to 20mA, (4 channel)
13	900G03-0202	Digital Input 120/240 VAC, 16 Ch
14	900G32-0101	Digital Input 24VDC, 32Ch
15	900G01-0202	Digital Input, Contact type, (16 channel)
16	900H03-0202	Digital Output, 120/240 VAC, 8 Ch
17	900H32-0102	Digital Output,24VDC, 32 Ch
18	900H01-0202	Digital Output, Relays (8 channel)
19	900K01-0201	Pulse/Freq (4 channel)
		Power Supply
20	900P01-0301	120/240 V AC, 60W Power Supply
21	900P24-0301	24 V DC, 60W Power Supply
22	900PSM-0200	Redundant Power Status Module
		Terminal Blocks
23	900TEK-0200	TB Housing, Black 20 Position Euro style
24	900TER-0200	TB Housing, Red 20 Position Euro style
25	900TCK-0200	TB Housing, Black 36 Position Euro style
26	900TBR-0200	High Voltage Terminal Block (Barrier Style)
27	900TBK-0200	Low Voltage Terminal Block (Barrier Style)
		RTP and RTP Cable
28	900RTS-0001	DI, DO, AO Remote Terminal Panel (RTP)
29	900RTA-L001	Analog Input Remote Terminal Panel
30	900RTR-H001	Relay Output Remote Terminal Panel (RTP)
31	900RTC-L210	Low Voltage RTP Cable (1.0M, 3.28ft.)
32	900RTC-L225	Low Voltage RTP Cable (2.5M, 8.2ft.)
33	900RTC-L250	Low Voltage RTP Cable (5.0M, 16.4ft.)
34	900RTC-H210	High Voltage RTP Cable (1.0M, 3.28ft.)
35	900RTC-H225	High Voltage RTP Cable (2.5M, 8.2ft.)
36	900RTC-H250	High Voltage RTP Cable (5.0M, 16.4ft.)
37	900RTC-3410	RTP Cable, Low Power 16/32CH 1.0M 3.28ft

38	900RTC-3425	RTP Cable, Low Power 16/32CH 2.5M 8.2ft
39	900RTC-3450	RTP Cable, Low Power 16/32CH 5.0M 16.4ft
Auxiliary Hardware		
40	51307946-001	Security cover, CPM/EPM
41	514522622-503	IO Module Insert Label Kit
42	900TNF-0200	Filler Block Terminal Cover
43	900RNF-0200	Redundant CPM Rack Filler plate (no RSM)
44	900TSS-0001	Shield Terminal Strip (package of 2)
45	900J02-0001	Terminal board jumpers (10, two pos. jumpers)
46	900J10-0001	Terminal board jumpers (10, ten pos. jumpers)
47	51205995-501	MI/MP 250 Ohm Resistor Kit of 8
Networking Components		
48	50008930-001	MOXA Network Switch, 8 ports Multi mode
49	50008930-002	MOXA Network Switch, 16 ports Multi mode
50	50135395-001	Ethernet to Fiber Converter
51	50008930-004	MOXA: Network switch, 8 ports, Single mode
52	50008930-003	MOXA: Network switch, 16 ports, Single mode
53	50135395-002	MOXA: IMC-101-S-SC Fiber Optic convertor, Single mode
Software and Media Kit		
54	SP-CSPLC1	Execution Environment, ControlEdge PLC
55	SP- EMD150-ESD	ControlEdge Builder R150 Media Kit, Electronic Software Distribution
56	SP-EMD150	ControlEdge Builder R150 Media Kit
57	SP-EMD140-ESD	ControlEdge Builder R140 Media Kit, Electronic Software Distribution
58	SP-EMD140	ControlEdge Builder R140 Media Kit
59	SP-EBLDR1	ControlEdge Builder Client License
60	SP-MAPLC1	Migration Tool - Annual Subscription

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