Honeywell

Technical Information

ControlEdge PLC Specification

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Release 130.2

April 2017, Version 1.3

Revision History

Revision	Date	Description
1.0	September 2016	ControlEdge PLC R130 release
1.1	November 2016	ControlEdge PLC R130.2 release
1.2 & 1.3	April 2017	ControlEdge PLC Universal IO (V1.3 date correction)

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 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
- Native controller redundancy
- Optionally redundant power supplies
- Two variants of power supplies: 60W 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
- Powerful IEC 61131-3 programming environment
- Best-in-class cyber security ensuring the safety of the system, personnel and critical information
- Single vendor service and support across PLC, DCS and Safety

This document provides specifications for the following components:

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

1.3. Terminology

Terminology	Description
CPM	Control Processor Module
EPM	Expansion Processor Module
UIO	Universal Input/output Module
RTP	Remote Terminal Panel
OWD	Open wire detect
Local I/O Rack	I/O Rack with CPM installed
Expansion I/O Rack	I/O Rack with EPM installed
Redundant CPM Rack	Rack with 2 CPMs installed
I/O Network	Network between CPM and expansion I/O rack

2. Specifications

2.1. Control Processor Module (900CP1-0100)

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 combined analog and digital channels	2304[1]
Maximum expansion I/O racks for non-redundant controller	11
Maximum expansion I/O racks for redundant controller	12
Note: 1. Software configurable Input/output channel types. Maximum 1152 Analog Output could be configured per CPM (8 AO channels per UIO module, detail information see section *Universal Input/output Module*.)	

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)

Item	Specification
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
Protocols, CPM ports 3 & 4	I/O Communication

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
MDIS Server support	Yes

2.2. Expansion Processor Module (900SP1-0100)

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 5000m (16404 ft.)[1] CPM to EPM or to switch.
Fiber Optic Equipment Recommendations	Unmanaged Ethernet Switch • Moxa Unmanaged Ethernet Switch module EDS-308 with (eight) 10/100 Ethernet ports.(requires 24VDC Power) • Moxa Unmanaged Ethernet Switch model EDS-308-MM-SC with (six) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors (requires 24VDC power) • Moxa Unmanaged Ethernet Switch module EDS-316-MM-SC with (fourteen) 10/100 Ethernet ports, (two) multi-mode fiber ports with SC Connectors (requires 24VDC Power) Converter • Qualified Moxa IMC-101-M-SC with 10/100BaseT(X) to 100BaseFX multi-mode fiber port with SC connectors (require 24VDC power), Copper Ethernet cable • Shielded CAT5 Cable Fiber optic cable • Multi-mode, Duplex, 62.5/125 with SC connectors on both ends
Note: 1. Select qualified Moxa switch as I/O Network Switch.	

2.4. Universal Input/output Module (900U01-0100, HW Revision B, Version 01 in Builder)

Universal IO channel can be soft configured as AI, AO, DI or DO. Details of each IO type are listed in tables below.

Item	Specification
Channels	16
24V Field Supply Voltage	24V DC(Typical) 22V DC(Min) 27V DC(Max)

2.4.1. Analog Input

Item	Specification
Input type	Current (2, 3, or 4 wire devices)
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

2.4.2. Analog Output

Item	Specification
Output Type	4-20 mA current loop & 0-20 mA Current loop
Output Channels	5 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
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.	

2.4.3. 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

2.4.4. 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

2.4.5. Digital Output[1]

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 [2] 1.5 A Maximum per module[3]
On-State Voltage	24 V (typical), load current @ 0.5A
Off-State Voltage	0 VDC
Off-State Leak Current	< 0.1 mA

Note:

1. If a Universal IO Channel configured for Digital Output reports an “OP Fail in circuit/field wire” alarm, the most likely cause of the alarm is a broken wire. Customers should check the continuity of field wiring. Customers are encouraged to enable Line Monitoring for DOs so that the Event Log clearly identifies the problem as a possible wire break
2. A Universal IO Channel configured for Digital Output can incorrectly report Line Monitoring failures if the load current is less than 10mA. Customers using such light loads may want to disable Line Monitoring for those channels to avoid nuisance alarms
3. Typical current load which tested under 60 °C ambient temperature with Terminal Block or High Voltage RTP Cable. Maximum load current will increase in lower ambient temperature. Detail information please refer to User’s guide.

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-0101)**	**Remote Terminal Panel (900RTS-0001)[1]**
Terminal Block Styles	20 screw: Euro-style, gold-plated	40 screw: Euro-style
Wire Size	0.1 mm^2 to 2.0 mm^2 (#14 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.)
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	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.

2.6. Power Supply

2.6.1. 120/240VAC Power Supply (900P01-0101)

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	60W
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 (900P24-0101)

Item	Specification
Voltage	21 to 29V DC
Current	5A Max. continuous
Inrush Current	30A for 3ms @ 29V DC
Input rating	72.5W
Output rating	60W
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-0101)

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

Item	Specification
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
Remote Reboot	Cold or Warm Reboot
Remote Firmware Upgrade	Yes
Remote Diagnostics	Yes
Note: 1. See Online help in ControlEdge Builder	

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

3. Hardware Power Consumption, Heat Dissipation and Weight

3.1. Power Consumption and Heat Dissipation

Item	Module number	Power Consumption (W)	Heat Dissipation (W)
Control Processor Module	900CP1-0100	3.75W[1]	3.75W
Expansion Processor Module	900SP1-0100	2.6W[1]	2.6W
UIO Module	900U01-0100	1.9W[1]	8.5W
120/240 V AC, 60W Power Supply	900P01-0101	25W	25W
24V DC, 60W Power Supply	900P24-0101	25W	25W
Redundant Power Status Module	900PSM-0101	0.11W[1]	0.11W

Note:
1. Current rate @ 5VDC

3.2. Rack Dimensions and Weight[1,2]

Item	Module Number	Dimension	Weight
4 I/O slot Rack	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	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	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	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	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	900RR0-0200	5.4” H* x 10.3” W x 6.0” D 137mm H* x 261.6mm W x 151.7mm D	1751g

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		

7. Module Number List

No.	Model	Description
1	900CP1-0100	Control Processor Module
2	900SP1-0100	Expansion Processor Module
3	900U01-0100	UIO IOM
4	900RR0-0200	Redundant CPM Rack (Assembly)
5	900RNF-0100	Redundant CPM Rack Filler plate (no RSM)
6	900TNF-0101	Filler Block Terminal Cover
7	900R04-0200	4 I/O Slot Rack - Non Redundant Power (Assembly)
8	900R08-0200	8 I/O Slot Rack - Non Redundant Power (Assembly)
9	900R12-0200	12 I/O Slot Rack - Non Redundant Power (Assembly)
10	900R08R-0200	8 I/O Slot Rack - Redundant Power (Assembly)
11	900R12R-0200	12 I/O Slot Rack - Redundant Power (Assembly)
12	900PSM-0101	Redundant Power Status Module
13	900RTS-0001	DI, DO, AO Remote Terminal Panel (RTP)
14	50008930-001	Ethernet Switching Hub (8 ports)
15	900P01-0101	120/240 V AC, 60W Power Supply
16	900P24-0101	24 V DC, 60W Power Supply
17	900TEK-0101	Low Voltage Terminal Block (Euro Style) (UIO module)
18	900RTC-L110	Low Voltage RTP Cable (1.0M, 3.28ft.)
19	900RTC-L125	Low Voltage RTP Cable (2.5M, 8.2ft.)
20	900RTC-L150	Low Voltage RTP Cable (5.0M, 16.4ft.)
21	900RTC-H110	High Voltage RTP Cable (1.0M, 3.28ft.)
22	900RTC-H125	High Voltage RTP Cable (2.5M, 8.2ft.)
23	900RTC-H150	High Voltage RTP Cable (5.0M, 16.4ft.)
24	900TSS-0001	Shield Terminal Strip (package of 2)
25	SP-EBLDR1	ControlEdge Builder Client License
26	SP-EMD130	ControlEdge Builder Media Kit

For more information
To learn more about Honeywell's products or solutions visit our website **www.honeywellprocess.com** or contact your Honeywell account manager.

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