MITSUBISHI ELECTRIC

Changes for the Better

DIAMOND CONTROLS

Data Sheet

DCM 8000 Controller

Description

The DCM 8000 is a compact, embedded Niagara Framework®-based controller and server platform for connecting multiple and diverse devices and sub-systems.

With internet connectivity and web-serving capability, the DCM 8000 controller provides integrated control, supervision, data logging, alarming, scheduling and network management. It streams data and rich graphical displays to a standard web browser via an ethernet or wireless LAN, or remotely over the internet.

The licensing model for the DCM 8000 controller features standard drivers along with optional IO and field bus expansion modules for ultimate flexibility and expandability.

The DCM 8000 controller is optimized for the Niagara 4 platform. In larger facilities, multi-building applications and large-scale control system integrations, Niagara 4 Supervisors can be used with DCM 8000 controllers to aggregate information, including alarms, and historical and real-time data, to create a single, unified application.

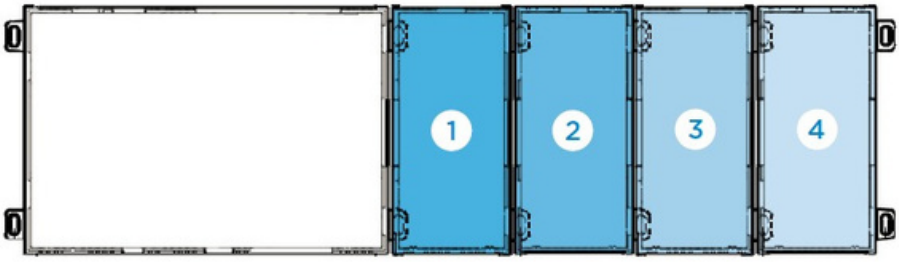
Specifications

TI AM3352: 1000MHz Arm® Cortex®-A8
1GB DDR3 SDRAM
Removable micro-SD card with 4GB flash total storage/2GB user storage
Wi-Fi (Client or WAP)*
IEEE802.11a/b/g/n
IEEE802.11n HT20 @ 2.4GHz
IEEE802.11n HT20/HT40 @ 5GHz
Configurable radio (Off, WAP, or Client)
WPAPSK/WPA2PSK supported
USB type A connector*
Back-up and restore support
(2) isolated RS-485 with selectable bias and termination
(2) 10/100MB Ethernet ports
Secure boot
Supply requirements: 24VAC rated at 24VA minimum, or 24VDC rated at 1A (24W) minimum**
Runs Niagara AX: 3.8u1 and later
Runs Niagara 4: 4.1 and later
Niagara Analytics 1.1 requires Niagara AX 3.8u1 or later update builds
Niagara Analytics 2.0 requires Niagara 4.2 and later
Real-time clock
Batteryless

** Niagara Enterprise Security requires 4 hours of standby power

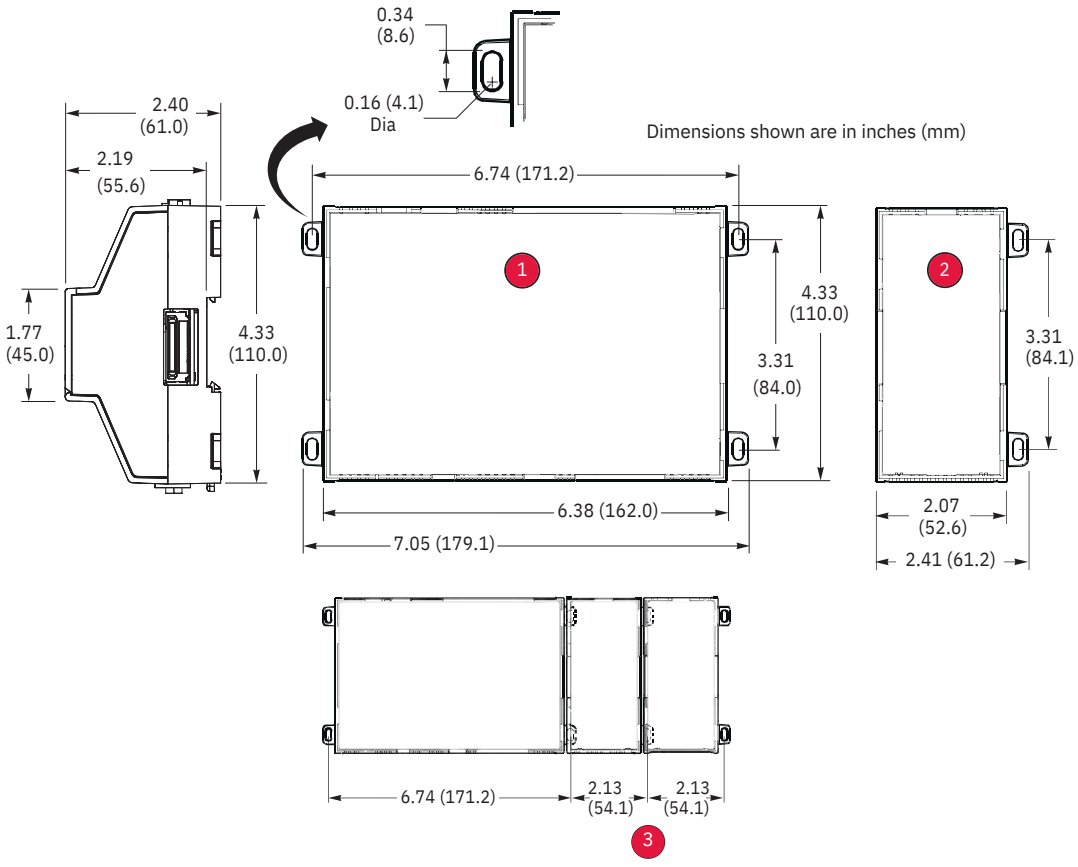
Expansion Module and IO Configurations

Maximum Combinations



Expansion 1	Expansion 2	Expansion 3	Expansion 4
232 or LON	232 or LON	232 or LON	232 or LON
485 x 2	232 or LON	232 or LON	232 or LON
485 x 2	485 x 2	232 or LON	
485 x 2	485 x 2		

DCM 8000 Controller Mounting and Dimensions



1. DCM 8000 controller. Allow at least 1.5" (38mm) clearance around all sides and minimum 3" (76mm) at bottom for Wi-Fi antenna.
2. Expansion module. Up to four (4) may be used. See "Expansion Module and IO Configurations".
3. Distance between center of tabs from one unit to another unit.

Specifications

Environmental Specifications

Operating temperature: -20 to 60°C (-4 to 140°F)

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

Humidity: 5 to 95%, non-condensing

Shipping & vibration: ASTM D4169, Assurance Level II

MTTF: 10 years+

Agency Certifications

UL 916

CE EN 61326-1

RCM

FCC Part 15 Subpart B, Class B

FCC Part 15 Subpart C

C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 "Signal Equipment"

1999/5/EC R&TTE Directive

CCC

SRRC

RSS

RoHS

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SCAN ME

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DIAMOND CONTROLS

Data Sheet

DCM 9000 Controller

PRODUCT DEFINITION

The DCM 9000 is a compact, embedded IoT (Internet of Things) controller and server platform for connecting multiple and diverse devices and sub-systems. With internet connectivity and web-serving capability, the DCM 9000 controller provides integrated control, supervision, data logging, alarming, scheduling, and network management. It streams data and rich graphical displays to a standard web browser via an Ethernet or wireless LAN, or remotely over the internet.

The licensing model for the DCM 9000 controller is simplified and features standard drivers, along with optional IO and field bus expansion modules for ultimate flexibility and expandability. The DCM 9000 controller operates with Niagara 4, the latest version of the Niagara Framework®, for optimum performance. In larger facilities, multi-building applications and large-scale control system integrations, Niagara 4 Supervisors can be used with JACE controllers to aggregate information, including alarms, and historical and real-time data, to create a single, unified application.

HARDWARE SPECIFICATIONS

NXP iMX8M+ Quad Core CPU
2GB LPDDR4 RAM
Removable 8GB micro-SD card
Wi-Fi (Client or WAP) • Wi-Fi 5 (802.11ac) • 1x1 802.11 a/b/g/n/ac • Configurable radio (Off, WAP, or Client) • WPAPSK/WPA2PSK supported
USB type C connector • Debug port
(2) isolated RS-485 with selectable bias and termination
(2) 10/100/1000MB Ethernet ports
Secure boot
*Supply requirements: 24VAC rated at 24VA minimum, or 24VDC rated at 1A (24W) minimum
Runs Niagara 4: 4.13 and later
Real-time clock
Batteryless

**Niagara Enterprise Security requires four hours of standby power*

EXPANSION MODULE AND IO CONFIGURATIONS

MAXIMUM EXPANSION (MODULES SUPPORTED)

- NPB-8000-LON (4)
- NPB-8000-232 (4)
- NPB-8000-2X-485 (2)

MAXIMUM IO (MODULES SUPPORTED)*

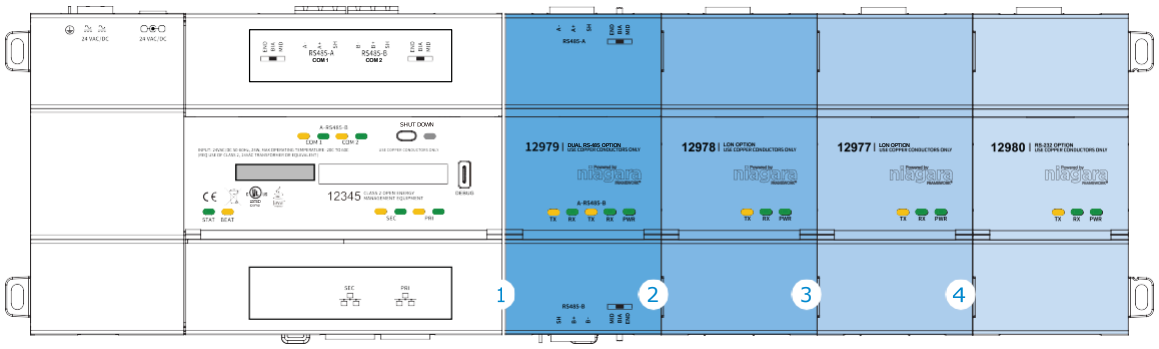
- IO-R-16 (16)*
- IO-R-34 (8)*

**See DCM IO R data sheet for configuration details*

MAXIMUM NIAGARA ENTERPRISE SECURITY (MODULES SUPPORTED)*

- T-SEC-R2R*
- T-SEC-RIO*

**16 total each or combined*



MAXIMUM COMBINATIONS

EXPANSION 1	EXPANSION 2	EXPANSION 3	EXPANSION 4
232 or LON	232 or LON	232 or LON	232 or LON
485 485	232 or LON	232 or LON	232 or LON
485 485	485 485	232 or LON	
485 485	485 485		

Expandability is dependent on the type of expansion module used

EXPANDABILITY

MAXIMUM EXPANSION

- (8) IO-R-34s

or

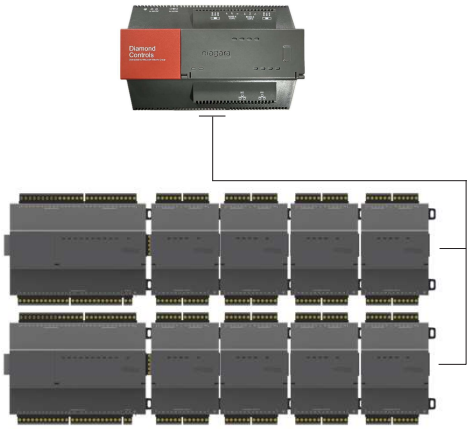
- (16) IO-R-16s

POWER

One IO-R-34 can power four IO-R-16 modules

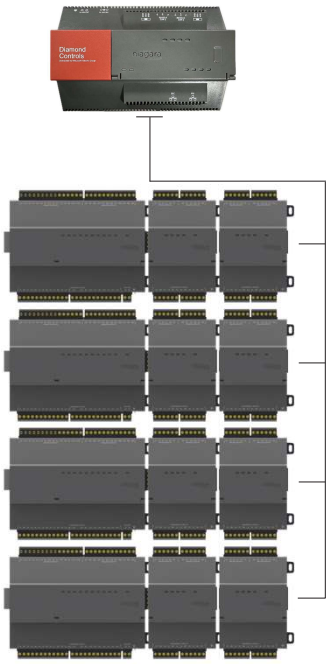
COMMON CONFIGURATIONS

Maximum configuration for 2 panels

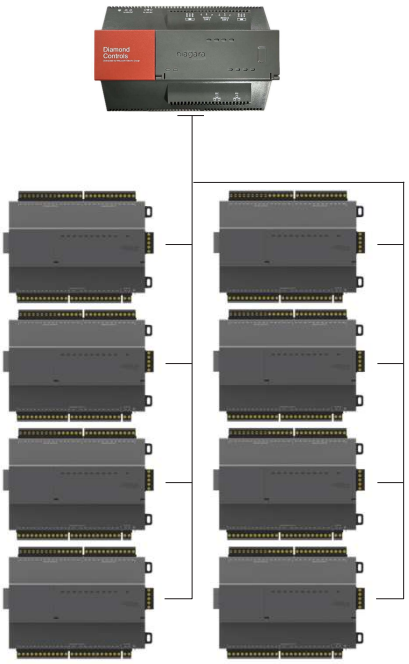


Shown with maximum of 4 IO-R-16s per IO-R-34

Maximum configuration for 4 panels



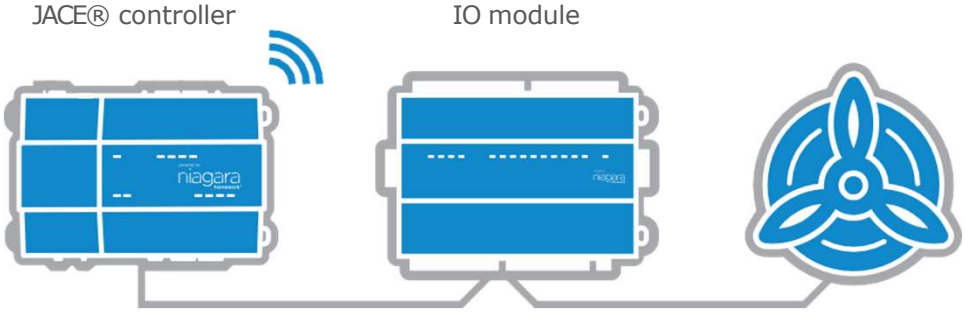
Maximum configuration for 8 panels



AGENCY CERTIFICATIONS

- UL 916
- C-UL
- CE EN 61326-1:2013
- RCM
- FCC part 15, class b
- RoHS2
- REACH
- WEEE
- China ROHS
- Open Energy Management Class 2

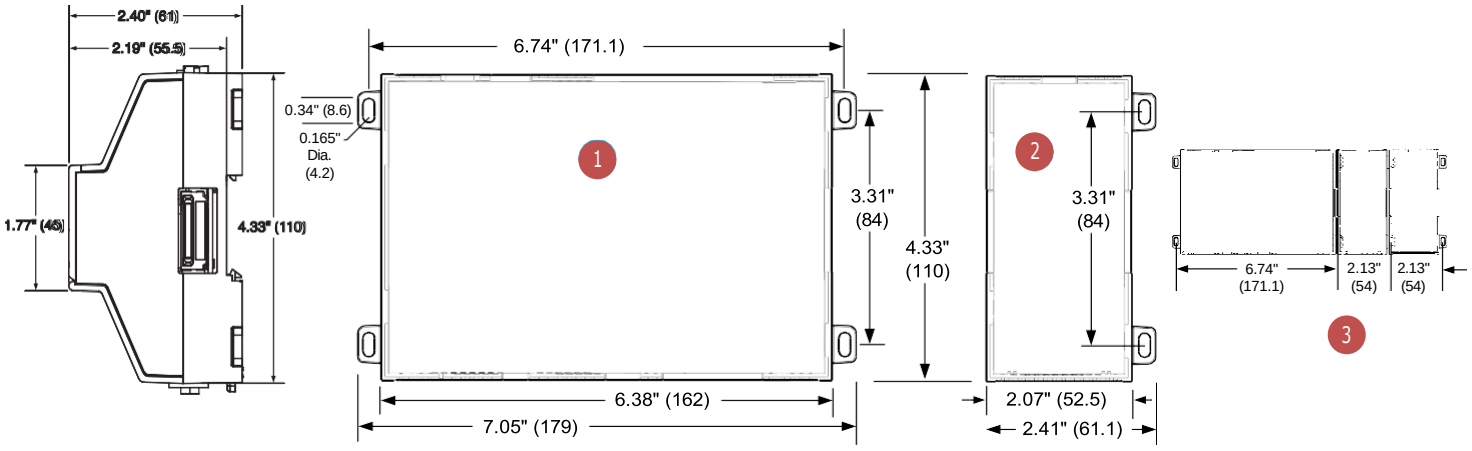
NIAGARA FOR REMOTE MONITORING APPLICATIONS



The JACE IO R is available through a wide variety of original equipment manufacturers. Our open distribution business model and open protocol support allow a vendor-neutral application compatible with devices and systems throughout the world.

DCM 9000 CONTROLLER MOUNTING & DIMENSIONS

1. DCM 9000 controller. Allow at least 1.5" (38mm) clearance around all sides and minimum 3" (76mm) at bottom for optional Wi-Fi antenna
2. Expansion module. Up to four (4) may be used. See "Expansion Module and IO Configurations"
3. Distances between center of tabs from one unit to another unit



Compatible with (DIN43880) enclosures
Suitable for mounting to a panel or to an EN50022 standard 35mm rail

Vizio stencils available upon request

AGENCY CERTIFICATIONS

- UL 916
- CE EN 61326-1
- RCM
- FCC Part 15 Subpart B, Class B
- FCC Part 15 Subpart C
- C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 "Signal Equipment"
- 1999/5/EC R&TTE Directive
- CCC
- SRRC
- RSS
- RoHS

ENVIRONMENTAL SPECIFICATIONS

- **Operating temperature:** -20–60°C
- **Storage temperature:** -40–85°C
- **Humidity:** 5%–95% — Non condensing
- **Shipping & vibration:** ASTM D4169, Assurance Level II
- **MTTF:** 10 years+

DCM 9000 ORDERING INFORMATION

Part number	Description
DCM-9000	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports and Wi-Fi connectivity.
DCM-9000 Non-Wi-Fi	Identical in form and function to standard DCM 9000 model without the Wi-Fi module and peripherals.
DCM-9000-DEMO	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and a 500 device license. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DCM-9005	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and Up to 5 devices/250 point core. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DCM-9010	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and Up to 10 devices/500 point core. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DCM-9025	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and Up to 25 devices/1250 point core. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DCM-9100	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and Up to 100 devices/5000 point core. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DCM-9200	Base unit includes two isolated RS485 ports, two 10/100/1000MB Ethernet ports, Wi-Fi connectivity, all available Tridium drivers and Up to 200 devices/10000 point core. Hardware Accessories purchased separately. Available with Niagara Analytics (non-production only).
DEVICE-10	Up to 10 devices/500 point upgrade (can be purchased during initial licensing)
DEVICE-25	Up to 25 devices/1,250 point upgrade (can be purchased during initial licensing)
DEVICE-50	Up to 50 devices/2,500 point upgrade (can be purchased during initial licensing)
NPB-8000-2X-485	DCM 8000 & 9000 controllers — add on dual port RS-485 module
NPB-8000-LON	DCM 8000 & 9000 controllers — add on single port LON FTT10A module
NPB-8000-232	DCM 8000 & 9000 controllers — add on single port RS-232 module
WPM-8000	Universal power supply for DCM 8000 & 9000 controllers
IO-R-16	Optional 16 point IO RS485 module designed for use with the DCM 8000 & 9000 — Includes 8 Universal Inputs, 4 Form A Relay Outputs and 4 0-10 VDC Analog Outputs
IO-R-34	Optional 34 point IO RS485 module designed for use with the DCM 8000 & 9000 — Includes 16 Universal Inputs, 10 Form A Relay Outputs and 8 0-10 VDC Analog Outputs

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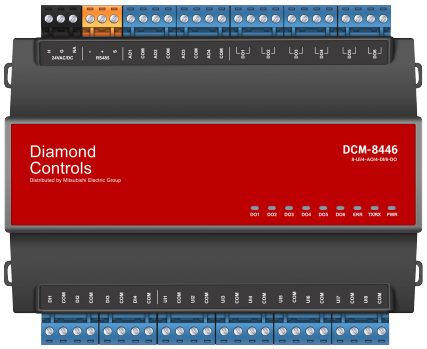
DCM-8446

DCM HVAC Controller

Simple yet Open



- ARM Cortex 32-bits Processor
- Fully Programmable
- Operate Independently
- HVAC Logic Calculation
- Login Password Protection
- Alarm Handler
- Flexible IO Points Combination
- Flexible Functional Module Combination
- Timer Program
- Built-in Real-time Clock
- Mathematical and Logical Calculation

Review

The latest DCM-8446 series adopted the method of applying point counts flexibly, with at least 22 base point counts(8UI, 4DI, 4AO, 6DO). It is provided with BACnet MSTP and Modbus RTU, both are the two largest open-source communication protocols in control systems to monitor various devices.

The most outstanding feature is that users are allowed to add-on different point counts IO extension modules, IO-0800 module (8DI) or IO-6020 module (6UI, 2AO), to come up with a well-designed and highly competitive proposal based on the demands of the project. Besides that, DCM8446 is upgradable to equip more advanced Ethernet function, by adding-on GW-112 extension module. It supports web page function configuration, which allows DCM-8446 to support BACnet IP/Modbus TCP protocols.

Features

Standard Open-Source Protocol

Provided with two of the largest communication protocols in building-automation, BACnet IP/MSTP and Modbus TCP IP/RTU, and able to achieve real-time monitoring and communication with upper layer software.

High Precision Analog Channel Conversion

12-bits analog-to-digital converter (ADC) programmable gain amplifier (PGA) provide high precision resolution and analog input readings.

12-bits digital-to-analog converter (DAC) provides high precision analog output readings.

Online Firmware Upgradable/Configurable

Controller can be upgraded and configured through 485 connection.

High Stability Operating System

Reliability and stability of operating system has been improved with software/ hardware monitor (watchdog).

Built-in high precision real-time clock (backup lithium battery).

✤ **Energy and Device Management Function**

Functional modules are specifically customized for energy and device managements

✤ **Pluggable Extension Module**

Functions or IO point counts of DCM-8446 is extendable through right-sided slot with different modules. It can be applied with IO-0800, IO-6020, whereas its left-sided slot can be extended with GW-112.

Device Informations

Modal	DCM-8446
Description	DCM-8446Series：22 Points General-purpose Controller (8UI,4DI,4AO,6DO)
Name	DCM-8446

Device Parameters

Exterior	Size	166x134x62mm	
	Casing Material	UL 94 ABS+PC	
	Weight	365g	
Electrical Ratings	Power Supply	24V AC +/- 5% or 24V DC +20%/-10%	
	Power Consumption	<10W	
	Rated Current	0.25A at 24VAC/VDC	
	Operating Temperature	30 to 131 °F (0 to 55 °C)	
	Storing Temperature	-4 to 185 °F (-20 to 85 °C)	
	Operating Humidity	0% to 95% relative humidity, without condensation	
	Battery	Panasonic CR1220 Lithium Battery	
Input / Output	Analog Input (UI)	8 Channels, 12-bits with PGA	
		Voltage	0 - 10V (±0.01V), 0 - 5V (± 0.01V)
		Current	4 - 20mA (±0.01mA)， 0 - 20mA (±0.01mA)
		Resistance	0 - 50K
		Thermistor Sensor	NTC: 10K TYPE 2/3，3K，20K （±0.1°C）
		True DI supported	
	Digital Input (DI)	4 Channels	
		Type：Dry Contact, Non-isolated	
		Limit：ON State < 50000Ω, OFF state >90000Ω	
	Digital Output (DO)	6 Channels	
		Type：Relay, SPST NO, 30VDC 1A/125VAC 0.5A	
	Analog Output (AO)	4 Channels, 12-bits	
		Current: 0 - 20mA, 4 - 20mA (Max load resistance, 500Ω)	
		Voltage: 0 - 10V	
Communication	RS485	1 Channels, EIA-485 Standard Two Wire, Half Duplex, 1 Load	
	Modbus Baud Rate	9.6K, 19.2K, 38.4K, 57.6K, 115.2K bit/s	
	BACnet Baud Rate	9.6K, 19.2K, 38.4K, 76.8K bit/s	
	Byte Length	8 bits	
	Parity	None, Even, Odd	
	Supported Protocols	Bacnet MSTP or Modbus RTU	

Optional Extension Module Parameters

IO-0800 Module

IO-6020 Module

IO-0008 Module

GW-112 Module

IO-0800 Module	Size	89x134x62mm	
	Casing Material	UL 94 ABS+PC	
	Weight	183g	
	Power Supply	Controller Internal Power Supply	
	Internal Communication	Controller Internal Protocol	
	Digital Input (DI)	8 Channels	
		Type：Dry Contact, Isolated 3.7kV	
		Limit：ON State < 50000Ω, OFF state > 90000Ω	

IO-6020 Module	Size	89x134x62mm	
	Casing Material	UL 94 ABS+PC	
	Weight	183g	
	Power Supply	Controller Internal Power Supply	
	Internal Communication	Controller Internal Protocol	
	Analog Input (UI)	6 Channels, 12-bits with PGA	
		Voltage	0 - 10V (±0.01V), 0 - 5V (± 0.01V)
		Current	4 - 20mA (±0.1mA)， 0 - 20mA (±0.1mA)
		Resistance	0 - 50K
		Thermistor Sensor	NTC: 10K TYPE 2/3，3K，20K （±0.1°C）
		True DI supported	
	Analog Output (AO)	2 Channels, 12-bits	
		Current: 0 - 20mA, 4 - 20mA (Max load resistance, 500Ω)	
		Voltage: 0 - 10V	

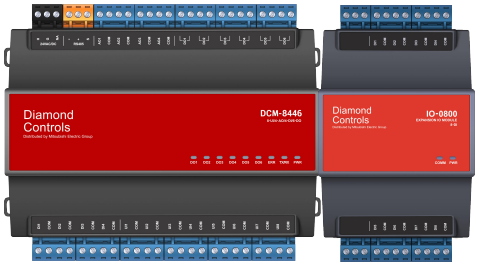
IO-0008 Module	Size	89x134x62mm
	Casing Material	UL 94 ABS+PC
	Weight	183g
	Power Supply	Controller Internal Power Supply
	Internal Communication	Controller Internal Protocol
	Digital Output (DO)	8 Channels
		Type：Relay, SPST NO, 30VDC 1A/125VAC 0.5A

GW-112 Module	Size	89x124x62mm

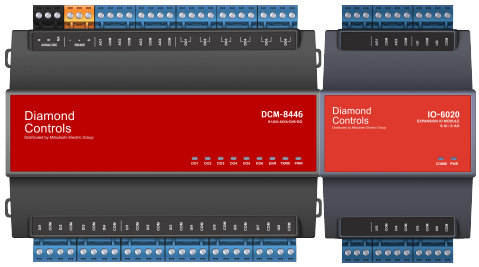
	Casing Material		UL 94 ABS+PC
	Weight		163g
	Internal Communication		Controller Internal Protocol
	RS485	RS485	2Channels, EIA-485 Standard Two Wire, Half Duplex, 1 Load
		Modbus Baud Rate	9.6K, 19.2K, 38.4K, 57.6K, 76.8K,115.2K bit/s
		Bacnet Baud Rate	9.6K, 19.2K, 38.4K, 76.8K bit/s
		Byte Length	8 bits
		Parity	None, Even, Odd
		Protocol	Port1（Bacnet MSTP ,Modbus RTU, Modbus Master)
			Port2（Modbus Bridge，Bacnet Router)
	IP Protocol		IP, TCP, UDP, ICMP, HTTP, BACnet IP , ModbusTCP

The left and right-sided extension ports of DCM-8446 are extendable to 485 bus or IP controller with larger point counts.
The following are existing combinations. Noticed that the extension ports are reserved for DDC to implement different types of functions which can be developed in future.

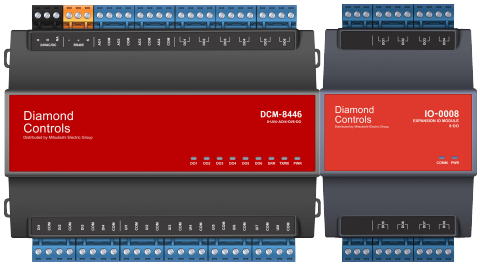
485 Bus Controller
Combination 1: DCM-8446+IO-0800
IO Point Count Combination: 8AI/12DI/4AO/6DO
Total Point Count: 30 Points



Combination 2: DCM-8446+IO-6020
IO Point Count Combination: 14AI/4DI/6AO/6DO
Total Point Count: 30 Points



Combination 3: DCM-8446+IO-0008
IO Point Count Combination: 8AI/4DI/4AO/14DO
Total Point Count: 30 Points



IP Controller Combination

IP Combination 1: GW-112+DCM-8446

IO Point Count Combination: 8AI/4DI/4AO/6DO

Total Point Count: 22 Points

IP Combination 2: GW-112+DCM-8446+IO-0800 IO

Point Count Combination: 8AI/12DI/6AO/6DO Total

Point Count: 30 Points

IP Combination 3: GW-112+DCM-8446+IO-6020 IO

Point Count Combination: 14AI/4DI/6AO/6DO Total

Point Count: 30 Points

IP Combination 4: GW-112+DCM-8446+IO-0008 IO

Point Count Combination: 8AI/4DI/6AO/14DO Total

Point Count: 30 Points

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GW-112

GW-112 IP Module

Simple yet Open

- ✤ MT 7628 Controller
- ✤ Operate Independently
- ✤ Multiple Protocol Conversion
- ✤ On Spot Mini Gateway
- ✤ Standard Open Source Protocol
- ✤ RS485 X 2
- ✤ Niagara Online Programming

Review

GW-112 network module is applied with DCM-8446 controller to perform IP network communication. GW-112 module can be plugged into the left-sided slot of DCM-8446 to become an IP controller. GW-112 is provided with a powerful core processor, every function is handled by GW-112 after it is plugged into DCM 8446. With 2 RS485 communication ports, 1 10M/100M adaptive Ethernet port, it supports standard Modbus or Bacnet IP protocol. COM1 supports DCM-8446 external Modbus RTU/Bacnet Mstp communication, and Modbus Master with at most 4 devices from 8446 series. Whereas COM2 supports Modbus Bridge, Bacnet Router functions, which can effectively connect the devices connected to bus, to IP network through protocol.

Features

✤ Standard Open Source Protocol

Supports Standard Modbus TCP or BacnetIP protocol.

✤ On Spot Mini Gateway

GW-112 supports the following communiation modes.

1. Supports Modbus Bridge (not more than 32 devices)
2. Supports Bacnet Router (not more thn 32 devices)
3. Supports Modbus Master functions (not more than 4 devides from DCM-8446 series)

✤ Online Firmware Upgradable/Configurable

Supports web page configuration, and online firmware upgrade.

✤ Energy and Device Management Function

Functional modules are specifically customized for energy and device management.

✤ Supports Niagara 4 Online Program Download

Niagara 4 platform is able to download the functional program to DDC online through APM (Advanced Programming Module).

Device Information

Modal	GW-112
Description	DCM-8446 IP Extension Module
Name	GW-112

Device Parameters

Exterior	Size	89x124x62mm
	Casing Material	UL 94 ABS+PC
	Weight	162g
	Power	<10W
	Rated Current	0.25A at 24VAC/VDC
	Operating	32 to 131 °F (0 to 55 °C)
	Storing	-4 to 185 °F (-20 to 85 °C)
	Operating	0% to 95% relative humidity, without condensation
Module Function	Increase DCM 8446 IP comminication port, Modbus/Bacnet protocol conversion	
RS485 Communication	RS485	2 Channels, EIA-485 Standard Two Wire, Half Duplex, 1 Load
	Modbus Baud	9.6K, 19.2K, 38.4K, 57.6K, 115.2K bit/s
	BACnet Baud Rate	9.6K, 19.2K, 38.4K, 76.8Kbit/s
	Byte Length	8 bits
	Parity	None, Even, Odd
	Supported Protocol	Port1（Modbus Master ，Bacnet MSTP ， Modbus RTU ，）
		Port2（Modbus Bridge，Bacnet Router）
IP Communication	Supported	IP, TCP, UDP, ICMP, HTTP, BACnet IP, Modbus IP

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IO-0800-485

Remote IO Module

Simple yet Open

- ✤ **ARM Cortex 32-bits Processor**
- ✤ **RS485 X 1**
- ✤ **Optocoupler Isolation Signal**
- ✤ **Dip Switch Address**
- ✤ **Less IO Points**
- ✤ **Cost-effective**
- ✤ **Alarm Handler**

Review

IO-0800 is provided with 8 switching optocoupler input function, supports standard BACnet MSTP and Modbus RTU two of the largest open source communication protocols, collects switching signal into the system.

Features

✤ **Standard Open Source Protocol**

Provided with two of the largest communication protocols in building-automation, BACnet MSTP and Modbus RTU, and able to achieve real-time monitoring and communication with upper layer software.

✤ **Online Firmware Upgradable/Configurable**

Controller can be upgraded and configured through RS485 connection.

Device Information

Modal	IO-0800-485
Description	IO-0800 DCM-8446 Series: Remote IO Module (8DI)
Name	IO-0800-485

Device Parameters

Exterior	Size	86x134x62mm
	Casing Material	UL 94 ABS+PC
	Weight	183g
Electrical Ratings	Power Supply	24V AC +/- 5% or 24V DC +20%/-15%
	Power	<10W
	Rated Current	1A at 24VAC/VDC
	Operating	32 to 131 °F (0 to 55 °C)
	Storing	-4 to 185 °F (-20 to 85 °C)
	Operating	0% to 95% relative humidity, without condensation
	Digital Input	8 Channels
		Type : Dry Contact , Isolated 3.7kV
		Limit : ON State <50000Ω, OFF state > 90000Ω
Communication	RS485	EIA-485 Standard Two Wire, Half Duplex, 1 Load
	Modbus Baud	9.6K, 19.2K, 38.4K, 57.6K ,115.2K bit/s
	BACnet Baud Rate	9.6K, 19.2K, 38.4K, 76.8K, bit/s
	Byte Length	8 bits
	Parity	None, Even, Odd
	Supported	Modbus RTU or BACnet MSTP

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IO-0008-485

Remote IO Module

Simple yet Open

- ✤ **ARM Cortex 32-bits Processor**
- ✤ **RS485 X 1**
- ✤ **DO X 8**
- ✤ **DIP Switch Address**
- ✤ **Less IO Points**
- ✤ **Cost-effective**
- ✤ **Alarm Handler**

Overview

IO-0008-485 is provided with 8 switching optocoupler outputs. It supports standard BACnet MSTP and Modbus RTU, two of the largest open source communication protocols, to remote control the connected device through RS485 bus.

Features

✤ **Standard Open Source Protocol**
Provided with two of the largest communication protocols in building-automation, and able to achieve real-time monitoring and communication with upper layer software.

✤ **Online Firmware Upgradable/Configurable**
Controller can be upgraded and configured through RS485 connection.

Device Information

Model	IO-0008-485
Description	IO-0008 DCM-8446 Series: Remote IO Module (8DO)
Name	IO-0008-485

Device Parameters

Exterior	Size	86x134x62mm
	Casing Material	UL 94 ABS+PC
	Weight	183g
Electrical Ratings	Power Supply	24V AC +/- 5% or 24V DC +20%/-15%
	Power Consumption	<10W
	Rated Current	1A at 24VAC/VDC
	Operating Temperature	32 to 131 °F (0 to 55 °C)
	Storing Temperature	-4 to 185 °F (-20 to 85 °C)
	Operating Humidity	0% to 95% relative humidity, without condensation
	Digital Output	8 Channels
		Type：Relay, SPST NO, 30VDC 1A/125VAC 0.5A
Communication	RS485 X 1	EIA-485 Standard Two Wire, Half Duplex, 1 Load
	Baud Rate	9.6K, 19.2K, 38.4K, 57.6K ,76.8K, 115.2K bit/s
	Byte Length	8 bits
	Parity	None, Even, Odd
	Supported Protocols	Port (Bacnet MSTP or Modbus RTU)

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IO-6020-485

Remote IO Module

Simple yet Open

- **ARM Cortex 32-bits Processor**
- **RS485 X 1**
- **UI X 6& AO X 2**
- **Dip Switch Address**
- **Less IO Points**
- **Cost-effective**
- **Alarm Handler**

Review

IO-6020-485 is provided with 6 analog inputs or can be converted to switching values through jumper, and 2 analog outputs. It supports standard BACnet MSTP and Modbus RTU, two of the largest open source communication protocols, collects switching and analog signals into the system.

Features

- **Standard Open Source Protocol**

Provided with two of the largest communication protocols in building-automation, BACnet MSTP and Modbus RTU, and able to monitor in real-time and communicate with upper layer software.

- **High Precision Analog Channel Conversion**

12-bits programmable gain amplifier (PGA) analog-to-digital converter (ADC) provide high precision resolution and analog input readings.

12-bits digital-to-analog converter (DAC) provides high precision analog output.

- **Online Firmware Upgradable/Configurable**

Controller can be upgraded and configured through RS485 connection.

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Device Information

Modal	IO-6020-485
Description	IO-6020 DDC-8446 Series: Remote IO Module (6UI/2AO)
Name	IO-6020

Device Parameters

Exterior	Size	86x134x62mm	
	Casing Material	UL 94 ABS+PC	
	Weight	183g	
	Power Supply	24V AC +/- 5% or 24V DC +20%/-15%	
	Power Consumption	<10W	
Electrical Ratings	Rated Current	1A at 24VAC/VDC	
	Operating Temperature	32 to 131 °F (0 to 55 °C)	
	Storing Temperature	-4 to 185 °F (-20 to 85 °C)	
	Operating Humidity	0% to 95% relative humidity, without condensation	
		6 Channels, 12-bits with PGA	
		Voltage	0 - 10V (±0.01V), 0 - 5V (± 0.01V)
		Current	4 - 20mA (±0.01mA) ， 0 - 20mA (±0.01mA)
	Analog Input (UI)	Resistance	0 - 50K
Input / Output		Thermistor Sensor	NTC: 10K TYPE 2/3，3K，20K （±0.1°C）
		True DI supported	
		2 Channels, 12-bits	
	Analog Output (AO)	Current: 0 - 20mA, 4 - 20mA (Max load resistance, 500Ω)	
		Voltage: 0 - 10V	
	RS485	EIA-485 Standard Two Wire, Half Duplex, 1 Load	
	Modbus Baud Rate	9.6K, 19.2K, 38.4K, 57.6K,115.2K bit/s	
Communication	BACnet Baud Rate	9.6K, 19.2K, 38.4K, 76.8K bit/s	
	Byte Length	8 bits	
	Parity	None, Even, Odd	
	Supported Protocols	Modbus RTU or BACnet MSTP	

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DCM-8044

DCM HVAC Controller

Review

DCM-8044 is a general-purpose IP controller, with 16 base points (8UI, 4DO, 4AO), including 8 universal inputs (AI/DI), 4 digital outputs, 4 analog outputs, which is web page functions configurable. This controller is dedicated to new fan unit and temperature humidity control system, such as fan, pump, heat exchanger, humidifier, boiler, valve and so on. Combining with different extension modules, such as IO-V0800 (8DI) or IO-V6002 (6UI, 2DO), to come out with a well-designed proposal. It can also be applied as a Modbus Master, Modbus Bridge, BACnet Router gateway. When used as Modbus Master, it's able to connect up to 4 devices (Only DCM-8446, IO-0008-485, IO-0800-485 and IO-6020-485 are supported).

- ESP32 Processor
- Built-in Real-time Clock
- Alarm Handling
- RS485 X 1
- Flexible Functional Module Combination
- Mathematical and Logical Calculation
- Timer Program
- Login Password Protection
- Fully Programmable
- Flexible IO Points Combination
- Self Operational

Certifications

• CE • FCC • BTL

Features

Standard Open Protocol

Provided with two open communication protocols, BACnet MSTP/IP and Modbus RTU/TCP IP, which is able to easily monitor devices in real-time and communicate to upper layer software.

High Precision Analog Channel Conversion

12-bits analog-to-digital converter (ADC) and programmable gain amplifier (PGA) provide high resolution, high precision analog input readings.
12-bits digital-to-analog converter (DAC) provide more accurate analog output readings.

Plug - In Extensible Module

DCM-8044 is able to be plugged with different extension modules into the right-sided slot to extend its functionality. Available extension modules are IO-V0800, IO-V6002 till this moment.

High Precision Analog Channel Conversion

Stability and reliability of operating system are improved with the software/hard-ware monitor (watchdog).
Come with built-in high precision real-time clock (back up lithium battery).

• Online Firmware Upgradable/Configurable

Functional modules are dedicated to energy and device management.

Device Specifications

Exterior	Dimensions	151x116x40mm	
	Casing Material	UL 94 ABS	
	Weight	500g	
Electrical Ratings	Power Supply	24VAC +20%/-15% or 24VDC +/-5%	
	Consumption	<10W	
	Rate Current	1A at 24VAC/VDC	
	Operating Temp	32 to 131 ° F (0 to 55 ° C)	
	Storage Temp	-4 to 185 ° F (-20 to 85 ° C)	
	Operating Humidity	0% to 95% relative humidity, without condensation	
	Battery	Panasonic CR1220 Lithium Battery	
Inputs & Outputs	Analog/Digital Inputs(U/DI)	8 Channels, 12-bits with PGA	
		Voltage	0-10V (±0.01V),0-5V (± 0.01V)
		Current	4 - 20mA (±0.01mA) , 0 - 20mA (±0.01mA)
		Resistance	0 - 30K, 0 - 10K, 0 - 1.5K
		Thermistor Sensor	NTC: 10K TYPE 2/3, 3K, 20K (±0.1° C)
		True DI supported with jumper selection	
	Digital Output (DO)	4 Channels	
		Type	Relay, SPST NO, 24VAC/DC, 1A
	Analog Output (AO)	4 Channels, 12-bits	
		Current:	0 - 20mA, 4 - 20mA (Max load resistance, 800Ω)
		Voltage:	0 - 10V
Communication 1	RS485	1 Channels, EIA-485 Standard Two Wire, Half Duplex, 1 Load	
	Baud Rate	9.6K, 19.2K, 38.4K, 76.8K, 115.2K bit/s	
	Data Bits	8 bits/7 bits/6 bits/5 bits	
	Parity	None, Even, Odd	
	Supported Protocols	Modbus RTU, BACnet MSTP	
Communication 2	Ethernet	10/100 Base-T	
	Basic agreement	IP, TCP, UDP, ICMP, IGMP, FTP, HTTP	
	Application Protocol	BACnet IP, ModbusTCP	

Optional extended IO module parameters

IO-V6002 Module		
Dimensions	120x80x40mm	
Casing Material	UL 94 ABS	
Weight	150g	
Power Supply	Internal Of The Controller	
Communication	Internal Of The Controller Protocol	
Universal Input	6 Channels, 12-bits with PGA	
	Voltage	0 - 10V (±0.01V), 0 - 5V (± 0.01V)
	Current	4 - 20mA (±0.1mA) ,0 - 20mA (±0.1mA)
	Resistance	0 - 30K ,0 - 10K ,0 - 1.5K
	Thermistor Sensor	NTC: 10K TYPE 2/3, 3K, 20K (±0.1°C)
	True DI supported with jumper selection	
Digital Output	2 Channels	
	Type	Relay, SPST NO, 24VAC/DC, 1A

IO-V0800 Module		
Dimensions	120x80x40mm	
Casing Material	UL 94 ABS	
Weight	150g	
Power Supply	Internal Of The Controller	
Communication	Internal Of The Controller Protocol	
Digital Input	8 Channels	
	Type	Dry Contact, Isolated 3.7kV
	Limit	ON state < 2000Ω, OFF state > 20000Ω

IO-V6002 Module

IO-V0800 Module

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DCM-8044-D

DCM HVAC Controller

Review

DCM-8044-D is a general-purpose IP controller with a LCD Screen. It has 16 base points (8UI, 4DO, 4AO), including 8 universal inputs (AI/DI), 4 digital outputs, 4 analog outputs, which is web page functions configurable. This controller is dedicated to new fan unit and temperature humidity control system, such as fan, pump, heat exchanger, humidifier, boiler, valve and so on. Combining with different extension modules, such as IO-V0800 (8DI) or IO-V6002 (6UI, 2DO), to come out with a well-designed proposal. It can also be applied as a Modbus Master, Modbus Bridge, BACnet Router gateway. When used as Modbus Master, it's able to connect up to 4 devices (Only DCM-8446, IO-0008-485, IO-0800-485 and IO-6020-485 are supported).

- ESP32 Processor
- Built-in Real-time Clock
- Alarm Handling
- RS485 X 1
- Flexible Functional Module Combination
- LCD Screen
- Mathematical and Logical Calculation
- Timer Program
- Login Password Protection
- Fully Programmable
- Flexible IO Points Combination
- Self Operational

Certifications

• CE • FCC • BTL

Features

Standard Open Protocol

Provided with two open communication protocols, BACnet MSTP/IP and Modbus RTU/TCP IP, which is able to easily monitor devices in real-time and communicate to upper layer software.

High Precision Analog Channel Conversion

12-bits analog-to-digital converter (ADC) and programmable gain amplifier (PGA) provide high resolution, high precision analog input readings.
12-bits digital-to-analog converter (DAC) provide more accurate analog output readings.

Plug - In Extensible Module

DCM-8044 is able to be plugged with different extension modules into the right-sided slot to extend its functionality. Available extension modules are IO-V0800, IO-V6002 till this moment.

High Precision Analog Channel Conversion

Stability and reliability of operating system are improved with the software/hard-ware monitor (watchdog).
Come with built-in high precision real-time clock (back up lithium battery).

- Online Firmware Upgradable/Configurable

Functional modules are dedicated to energy and device management.

Device Specifications

Exterior	Dimensions	151x116x40mm	
	Casing Material	UL 94 ABS	
	Weight	500g	
Electrical Ratings	Power Supply	24VAC +20%/-15% or 24VDC +/-5%	
	Consumption	<10W	
	Rate Current	1A at 24VAC/VDC	
	Operating Temp	32 to 131 ° F (0 to 55 ° C)	
	Storage Temp	-4 to 185 ° F (-20 to 85 ° C)	
	Operating Humidity	0% to 95% relative humidity, without condensation	
	Battery	Panasonic CR1220 Lithium Battery	
Inputs & Outputs	Analog/Digital Inputs(U/DI)	8 Channels, 12-bits with PGA	
		Voltage	0-10V (±0.01V),0-5V (± 0.01V)
		Current	4 - 20mA (±0.01mA) , 0 - 20mA (±0.01mA)
		Resistance	0 - 30K, 0 - 10K, 0 - 1.5K
		Thermistor Sensor	NTC: 10K TYPE 2/3, 3K, 20K (±0.1° C)
		True DI supported with jumper selection	
	Digital Output (DO)	4 Channels	
		Type	Relay, SPST NO, 24VAC/DC, 1A
	Analog Output (AO)	4 Channels, 12-bits	
		Current:	0 - 20mA, 4 - 20mA (Max load resistance, 800Ω)
		Voltage:	0 - 10V
Communication 1	RS485	1 Channels, EIA-485 Standard Two Wire, Half Duplex, 1 Load	
	Baud Rate	9.6K, 19.2K, 38.4K, 76.8K, 115.2K bit/s	
	Data Bits	8 bits/7 bits/6 bits/5 bits	
	Parity	None, Even, Odd	
	Supported Protocols	Modbus RTU, BACnet MSTP	
Communication 2	Ethernet	10/100 Base-T	
	Basic agreement	IP, TCP, UDP, ICMP, IGMP, FTP, HTTP	
	Application Protocol	BACnet IP, ModbusTCP	

Optional extended IO module parameters

IO-V6002 Module		
Dimensions	120x80x40mm	
Casing Material	UL 94 ABS	
Weight	150g	
Power Supply	Internal Of The Controller	
Communication	Internal Of The Controller Protocol	
Universal Input	6 Channels, 12-bits with PGA	
	Voltage	0 - 10V (±0.01V), 0 - 5V (± 0.01V)
	Current	4 - 20mA (±0.1mA) ,0 - 20mA (±0.1mA)
	Resistance	0 - 30K ,0 - 10K ,0 - 1.5K
	Thermistor Sensor	NTC: 10K TYPE 2/3, 3K, 20K (±0.1°C)
	True DI supported with jumper selection	
Digital Output	2 Channels	
	Type	Relay, SPST NO, 24VAC/DC, 1A

IO-V0800 Module		
Dimensions	120x80x40mm	
Casing Material	UL 94 ABS	
Weight	150g	
Power Supply	Internal Of The Controller	
Communication	Internal Of The Controller Protocol	
Digital Input	8 Channels	
	Type	Dry Contact, Isolated 3.7kV
	Limit	ON state < 2000Ω, OFF state > 20000Ω

IO-V6002 Module

IO-V0800 Module

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