

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 ($\pm 0.01V$), 0 - 5V ($\pm 0.01V$)
		Current	4 - 20mA ($\pm 0.01mA$) , 0 - 20mA ($\pm 0.01mA$)
		Resistance	0 - 50K
		Thermistor Sensor	NTC: 10K TYPE 2/3, 3K, 20K ($\pm 0.1^{\circ}C$)
		True DI supported	
	Digital Input (DI)	4 Channels	
		Type: Dry Contact, Non-isolated	
		Limit: ON State < 50000 Ω , OFF state >90000 Ω	
	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, 500 Ω)	
		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℃)
		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	
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	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.

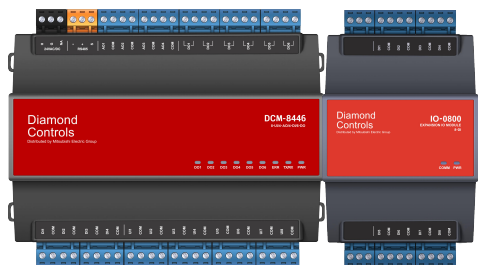
The following are existing combinations. Noticed that the extension ports are reserved for DDC to implement different types of functions which can be developed in future.

485 Bus Controller

Combination 1: DCM-8446+IO-0800

IO Point Count Combination: 8AI/12DI/4AO/6DO

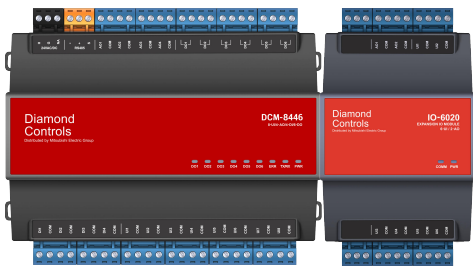
Total Point Count: 30 Points



Combination 2: DCM-8446+IO-6020

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

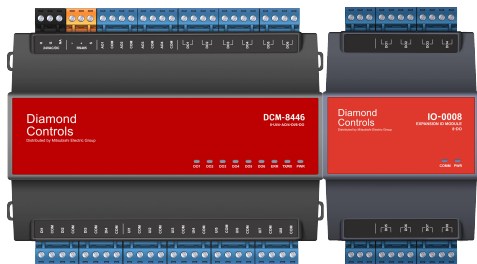
Total Point Count: 30 Points



Combination 3: DCM-8446+IO-0008

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

Total Point Count: 30 Points

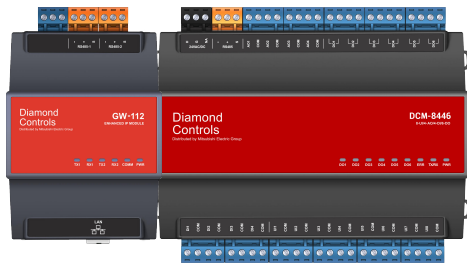


IP Controller Combination

IP Combination 1: GW-112+DCM-8446

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

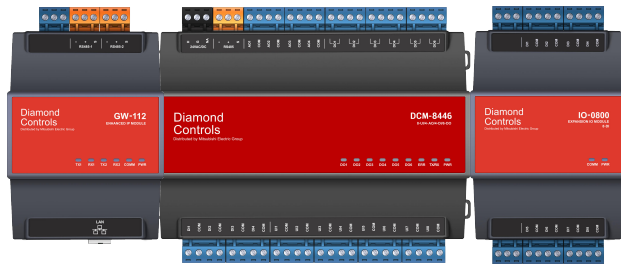
Total Point Count: 22 Points



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

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

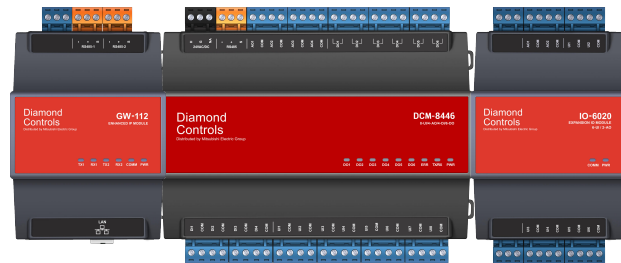
Point Count: 30 Points



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

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

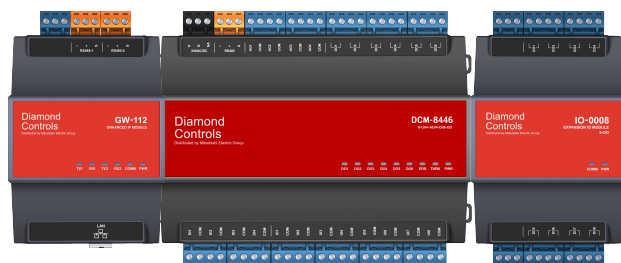
Point Count: 30 Points



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

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

Point Count: 30 Points



mitsubishi ELECTRIC ASIA PTE LTD

307 ALEXANDRA ROAD, MITSUBISHI ELECTRIC BUILDING,
SINGAPORE 159943

Phone: +65-64702601 FAX: +65-64760590

<https://www.MitsubishiElectric.com.sg>