



FnIO M-Series

Most Suitable to Process Automation Today



www.crevis.co.kr



Introduction

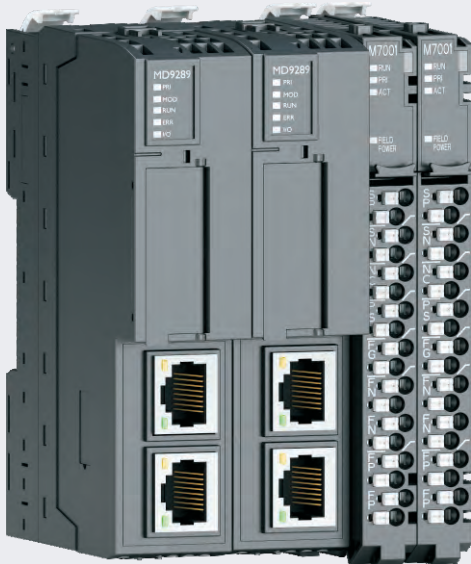
M-Series is an advanced automation system to control in a redundant way, which is specialized for process automation. It provides hot-swap and redundancy for maintenance and ensures a non-stop operation. This is the most suitable solution for users who need the various industrial protocols, and it will help users configure nodes easily with their own devices and systems.

Dual Type Network Adapter

Anytime Reliable - Communication & Power Redundancy
Preventing forced system shutdown due to external factors
Minimizing losses by operating standby modules when system shuts down.

Single Type Network Adapter

Offering the various industrial protocols which enables users to configure system as required in any application.



- Communication Redundancy

Available to maintain the stable communication through dual-type network adapters on “Active-Standby” mode by operating Standby module immediately when the active module has issues.

- Power Redundancy

Preventing forced system shutdown due to external factors and minimizing losses by operating standby modules in case of any unexpected system shutdown.

- Supporting Industrial Protocols



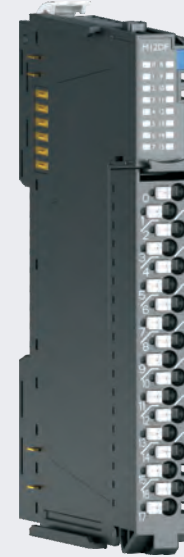


Programmable I/O

Executing the program requiring the high-speed via the powerful CODESYS software platform.
Micro PLC for easy programming
Expandable up to 63 I/O slots.

I/O Modules

Providing total solution with all types of I/Os such as digital, analog and special type (Encoder, Serial Interface).



- Hot swap

Module communication and power supply through backplane.
Simple and quick maintenance - enabling the module replacement during the power on in case of emergency.

- RTB (Removable Terminal Block) and Expansion

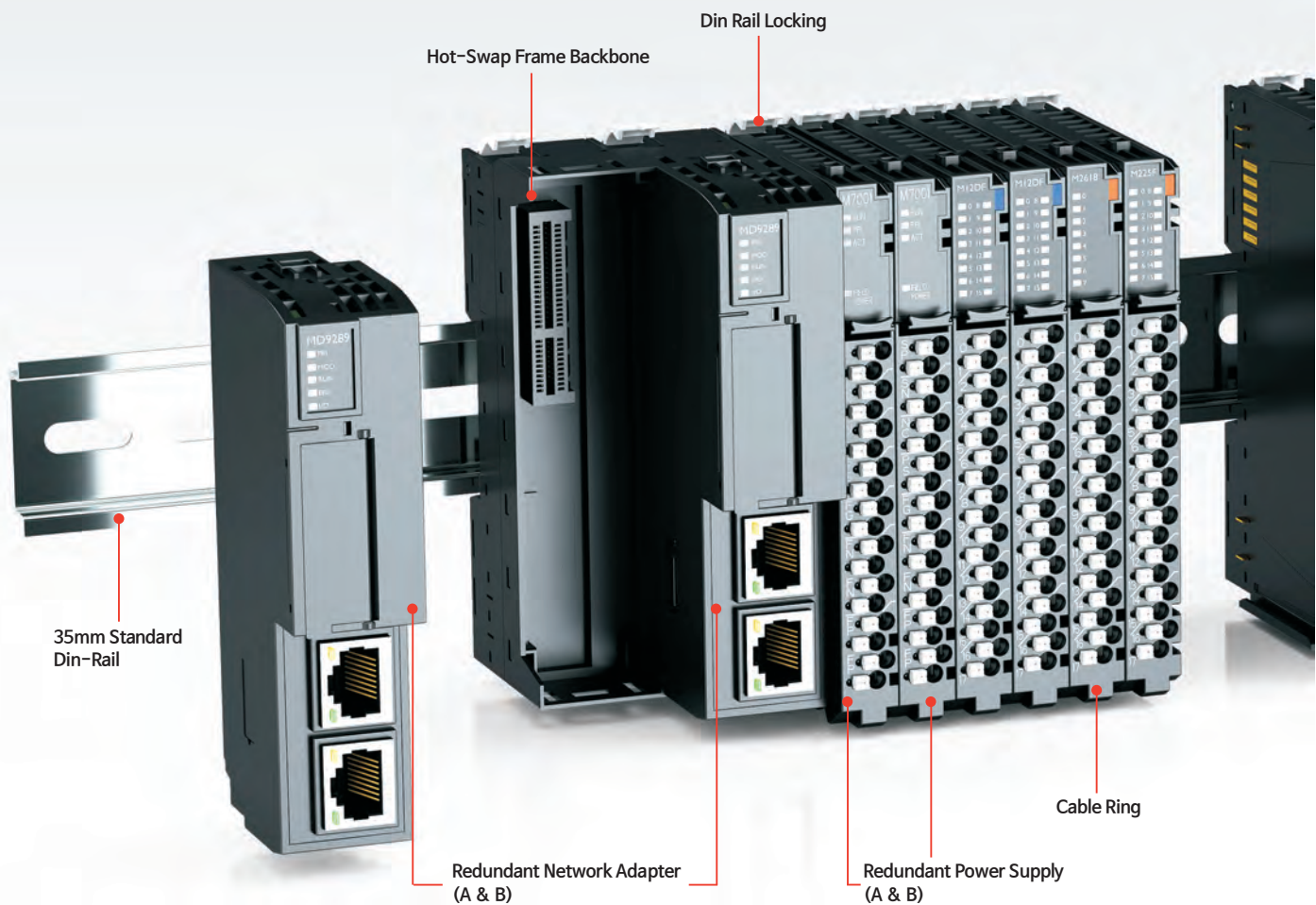
Efficient in replacement without removing existing wiring of removal terminal blocks and slice type of I/Os.

- Certificates



* More certificates will be updated soon.

REDUNDANCY

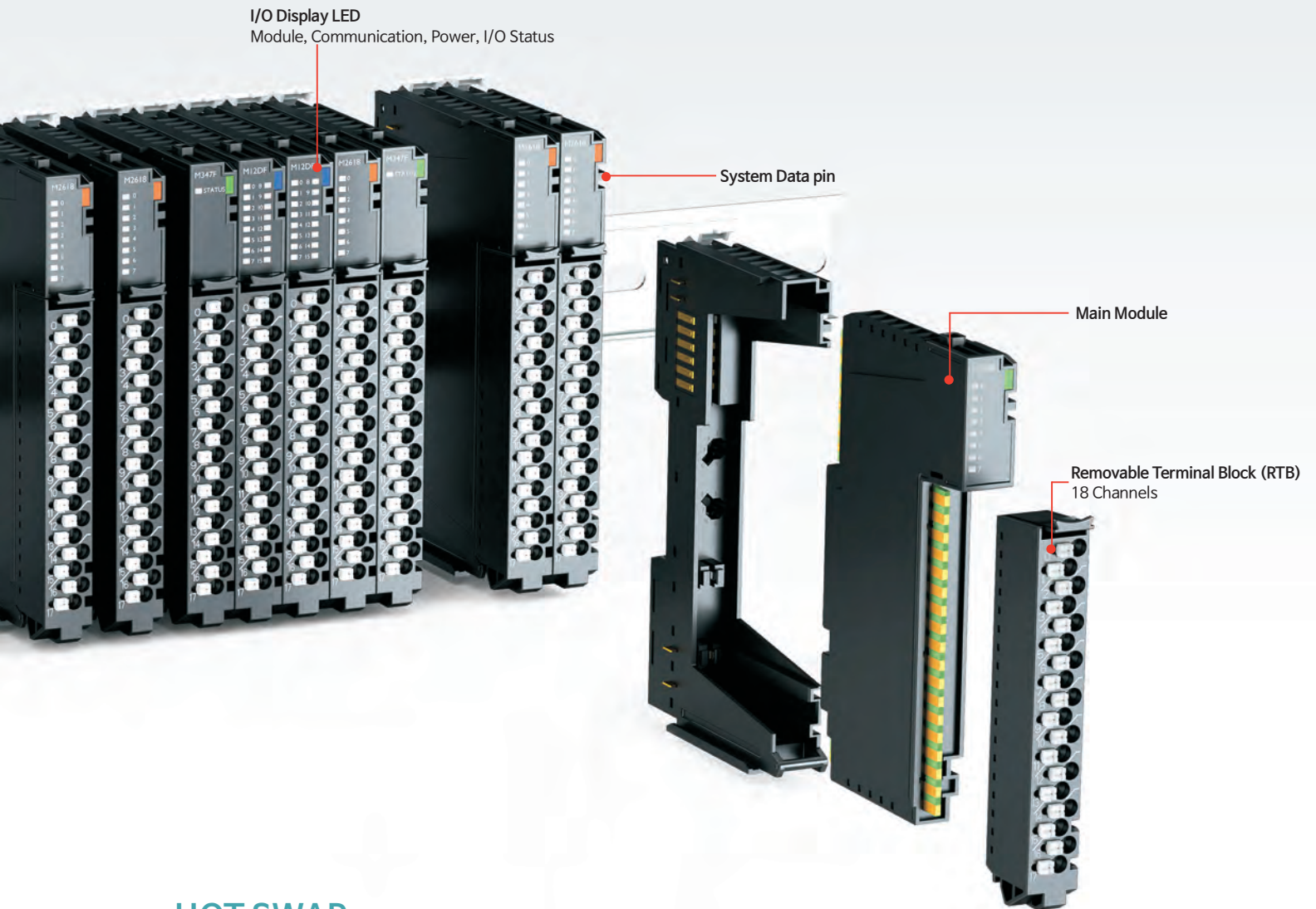


REDUNDANCY

Anytime Reliable – Communication & Power Redundancy

- **Stability**
Maintaining the stable communication & power by Standby module when errors occur.
- **Sustainability**
Keeping the system stable by preventing shutdown.

HOT SWAP



HOT SWAP

Supporting hot swap function with backbone structure.

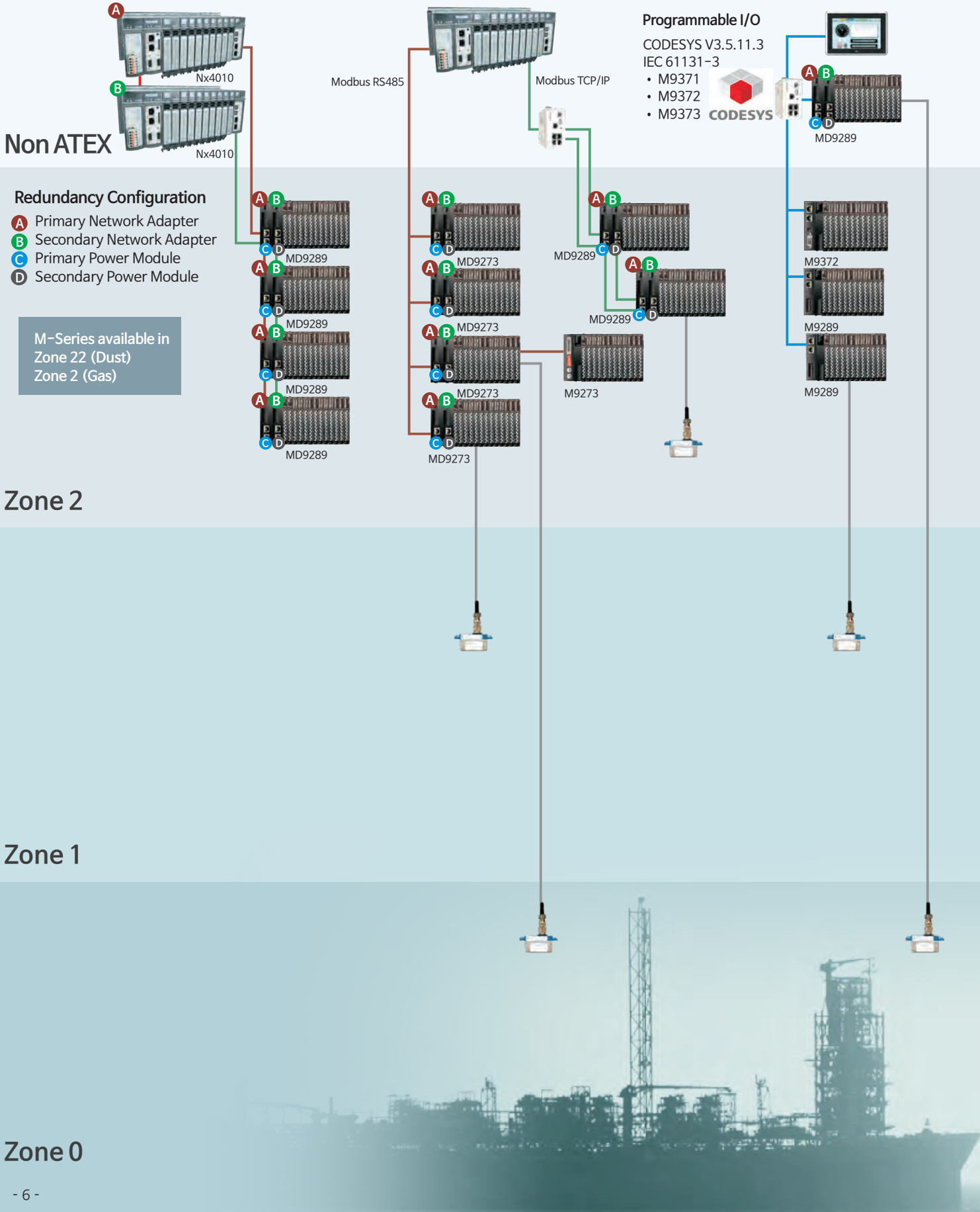
- Efficiency
Capable of working I/Os independently by hot swap.
- Reliability
Stable module communication and power supply through backplane.
- Usability
Easy maintenance.

M-Series Topology

PLC Redundancy + M-Series Redundancy

Solo PLC+ M-Series Redundancy

CREVIS Programmable I/O + M-Series Redundancy



Programmable I/O

Programmable I/O		M9371	M9372	M9373
CoDeSys Version 3.5.11.3		Economy	Standard	Webvisu
Memory	Program Memory	512 Kbytes		16 Mbytes
	Data Memory	96 Kbytes		16 Mbytes
	Non Volatile Memory	4 Kbytes		32 Kbytes
Program Languages / Run Time System/ RTC		IEC 61131-3 (LD, IL, ST, FBD, SFC, CFC) / Multiple PLC Tasks / Retain Time: 15 days		
Protocol		Ethernet Protocol (Modbus/TCP, Modbus/UDP), SNTP, HTTP (Webvisualization, Web-Server), DHCP/BOOTP/ Serial Protocol (Modbus RTU) / SNMP, MQTT		
OPC Server (DA/UA), TFTP, SQL, Online Change, Breakpoint, Source Up/Download, File Transmit		Not Supporting	Supporting	
Webvisualization		Not Supporting		Supporting
Process Time		1usec (90 Instructions)	7usec (90 Instructions)	
Max. Task / Max. Cycle Task / Max. Status Task		10		
Max. Node / Max. I/O Expansion / I/O Data Size		Limited by Ethernet specification / Max. 63 Slots / Max 128 Byte each slot		
Baud Rate		Ethernet(10/100 Mbps) / Serial(2400~115200 bps)		
Connector Type		2 x RJ-45 / 1 x RTU D-sup 9pin		
System Power		Supply voltage : 24Vdc nominal (15~28.8Vdc)		
Field Power		Supply voltage : 24Vdc typical (Max. 28.8Vdc)		
Power Dissipation / Current for I/O Module		100mA typical @ 24Vdc / 2.0A @5Vdc		
Dimensions		75 mm x 110 mm x 54 mm (M937X + M7XXX)		



Supporting CODESYS V3.5

With IEC 61131-3 Programming Languages : LD, IL, ST, FBD, SFC, CFC

- Master/Slave Type: Modbus TCP/UDP, Modbus RTU
- Operating Temp : -40°C ~ 60°C
- UL Temp : -20°C ~ 60°C
- Internal Bus : < 1ms (128 Bytes)
- Max Slot : 63 slots
- Housing : 18P Terminal Block



“Powerful Control System”

- Big size of internal program memory areas, and a lot of commands that can help to execute complicated programs, and fast running.

“Optimized to speed, Memory and Function”

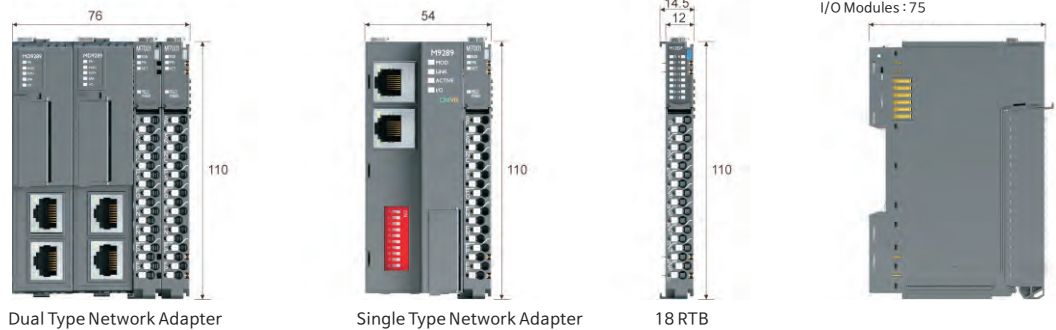
- Executing the program requiring the high-speed via the powerful CODESYS software platform.
 - Providing bigger program, data, and retain memory size than the existing small PLCs

“Best hardware and Independent development tools”

- Superior online and offline programming and debugging
 - Providing programming tools such as OOP, IDE and Integrated PLC Simulation

Network Adapter

Dimension (mm)



Dual Type Network Adapter : 81.05
Single Type Network Adapter : 75
I/O Modules : 75

Dual Type Network Adapter

Single Type Network Adapter

18 RTB

* One network adapter with one power module required at least

Dual Type

Network Adapter	MD9289	MD9273
Adapter Type	Slave node (MODBUS/TCP, MODBUS/UDP Server)	Slave node (MODBUS Serial RTU/ASCII Server)
Protocol	MODBUS/TCP, MODBUS/UDP, HTTP, DHCP, 10 TCP Connections (Sub) Ethernet/IP	MODBUS RTU and ASCII
Max. Node	Limited by Ethernet specification	99 Nodes
Max. I/O Expansion I/O Data Size	63 Slots Max 128 Bytes each slot	63 Slots Max 128 Bytes each slot
Baud Rate	Ethernet(10/100 Mbps) / Serial (115200 bps)	9600, 19200, 38400, 115200 bps/ Serial(115200 bps)
Connector Type	2 x RJ-45	2 x RJ-45
System & Field Power Power Dissipation Current for I/O Module Field Power	Supply voltage : 24Vdc (15~28.8Vdc) 150mA typical @ 24Vdc 2.0A @ 5Vdc 24Vdc (Max 28.8Vdc)	Supply voltage : 24Vdc (15~28.8Vdc) 150mA typical @ 24Vdc 2.0A @ 5Vdc 24Vdc (Max 28.8Vdc)
Dimensions	76 mm x 110 mm x 81.05 mm (MD92xx + 2 x M7001)	76 mm x 110 mm x 81.05 mm (MD92xx + 2 x M7001)

Single Type

Network Adapter	M9212	M9222	M9273
Protocol	DeviceNet	PROFIBUS	MODBUS Serial RTU/ASCII Server
Max. Node	64 Nodes	125 Nodes	99 Nodes
Max. I/O Expansion	63 Slots	63 Slots	63 Slots
I/O Data Size	Max. 128 bytes each slot	Input : 244 bytes Output : 244 bytes	Max 128 Byte each slot
Baud Rate	125, 250, 500 Kbps / Serial (115200 bps)	9.6 ~ 12000 Kbps (Auto baudrate selection)	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps/Serial(115200 bps)
Connector Type	5 Pin Open Connector	9 Pin D-Sub Connector	5 Pin Open Connector
System Power	24Vdc (15~28.8Vdc)	24Vdc (15~28.8Vdc)	24Vdc (15~28.8Vdc)
Field Power	24Vdc (Max. 28.8Vdc)	24Vdc (Max. 28.8Vdc)	24Vdc (Max. 28.8Vdc)
Power Dissipation	280mA typical @ 24Vdc	80mA typical @ 24Vdc	70mA typical @ 24Vdc
Current for I/O Module	2.0A @ 5Vdc	2.0A @ 5Vdc	2.0A @ 5Vdc
Dimensions	75 mm x 110 mm x 54 mm (M92xx + M7001)		

Network Adapter	M9287	M9289	M9386
Protocol	PROFINET (Sub) Modbus RTU	MODBUS TCP/UDP (Sub) Ethernet/IP CC-Link IE Field Basic	EtherCAT ID
Max. Node	Limited by Profinet Specification	Limited by Ethernet Specification	65,535 Nodes
Max. I/O Expansion	32 Slots	63 slots	63 Slots
I/O Data Size	Max 1440 bytes	Max 128 bytes each slot	Max 128 bytes each slot
Baud Rate	100Mbps, Auto-negotiation, Full duplex	10/100 Mbps, Auto-negotiation, Full duplex	100 Mbps
Connector Type	2 x RJ-45	2 x RJ-45	2 x RJ-45
System Power	24Vdc (15~28.8Vdc)	24Vdc (15~28.8Vdc)	24Vdc (15~28.8Vdc)
Field Power	24Vdc (Max. 28.8Vdc)	24Vdc (Max. 28.8Vdc)	24Vdc (Max. 28.8Vdc)
Power Dissipation	85mA typical @ 24Vdc	90mA typical @ 24Vdc	70mA typical @ 24Vdc
Protection	Output current limit Reverse polarity protection	Output current limit Reverse polarity protection	Output current limit Reverse polarity protection
Current for I/O Module	2.0A @ 5Vdc	2.0A @ 5Vdc	2.0A @ 5Vdc
Dimensions	75 mm x 110 mm x 54 mm (M92xx + M7001)		

I/O Module

Digital Input Module					
DC	Channel	Type	Voltage	Signal Delay (OFF to ON/ ON to OFF)	Power Dissipation
M12DF	16	Universal	24 Vdc	0.5ms/ 0.5ms	40 mA
M1418	In (8) / Out (8)	Combination - Sink In / Source Out (Diagnostic)	24 Vdc	0.2ms/ 0.3ms	45 mA
M1428	In (8) / Out (8)	Combination - Source In / Sink Out (Diagnostic)	24 Vdc	0.2ms/ 0.4ms	45 mA
AC	Channel	Type	Voltage	Signal Delay (OFF to ON/ ON to OFF)	Power Dissipation
M1808	8	AC	120 Vac	23ms/ 123ms @ 120Vac	30 mA
M1908	8	AC	240 Vac	23ms/ 123ms @ 120Vac	30 mA

Digital Output Module					
Sink	Channel	Type	Voltage	Signal Delay (OFF to ON/ ON to OFF)	Power Dissipation
M225F	16	Sink	24 Vdc	0.5ms/ 0.5ms	40 mA
M2618	8	Sink	24 Vdc	0.3ms/ 0.5ms	40 mA
M2418	8	Sink (Diagnostic)	24 Vdc	0.05ms/ 0.4ms	50 mA
Source	Channel	Type	Voltage	Signal Delay (OFF to ON/ ON to OFF)	Power Dissipation
M226F	16	Source	24 Vdc	0.3ms/ 0.3ms	40 mA
M2628	8	Source	24 Vdc	0.3ms/ 0.5ms	40 mA
M2428	8	Source (Diagnostic)	24 Vdc	0.1ms/ 0.5ms	45 mA
Relay	Channel	Type	Voltage	Signal Delay (OFF to ON/ ON to OFF)	Power Dissipation
M2738	8	MOS Relay	240 Vdc/ac	0.5ms/ 3ms	130 mA
M2768	8	MOS Relay	24 Vdc/ac	1ms/ 3ms	130 mA
M2788	8	MOS Relay	110 Vdc/ac	0.6ms/ 3ms	130 mA
M2744	4	Relay	24 Vdc/ 2A, 240 Vac/2A	7ms/ 7ms @ 24Vdc, 7ms/ 14ms @ 240Vac	30 mA
M2774	4	Form C, Relay	24 Vdc / 2A, 240 Vac/2A	8ms/ 8ms @ 24Vdc, 8ms/ 14ms @ 240Vac	35 mA

Analog Input Module					
Single Ended	Channel	Type	Range	Resolution	Power Dissipation
M317F	16	Current	0~20, 4~20 mA	12 Bits	200 mA
M319F	16	Current	0~20, 4~20 mA	16 Bits	200 mA
M347F	16	Voltage	0~10, 0~5, 1~5 Vdc	12 Bits	200 mA
M349F	16	Voltage	0~10, 0~5, 1~5 Vdc	16 Bits	200 mA
M3C28	8	Voltage Input/Output	0~10, 0~5, 1~5Vdc	12 Bits	30 mA
M3C48	8	Voltage Input/Output	0~10, 0~5, 1~5Vdc	14 Bits	30 mA
M3C68	8	Voltage Input/Output	0~10, 0~5, 1~5Vdc	16 Bits	30mA
Temperature Module	Channel	Type	Sensor Type	Accuracy	Power Dissipation
M3708	8	RTD	PT100,PT200,PT500,PT50, PT1000,JPT100,JPT200,JPT500, JPT50,JPT1000,NI100,NI200, NI500,NI1000,NI120,NI1000LG	± 0.1% @ 25°C ± 0.3% @ -25~60°C	130 mA
M3808	8	T.C. (Thermocouple/MV Input)	K/J/T/B/R/S/E/N/L/U/C/D/ 10uV/1uV/2uV	Recommended Input Range ± 0.1% @ 25°C, ± 0.3% @ -40~60°C (Refer to the manual for more details)	150 mA
Differential	Channel	Type	Range	Resolution	Power Dissipation
M3918	8	Current	0~20, 4~20, -20~20 mA	12 Bits	200 mA
M3938	8	Current	0~20, 4~20, -20~20 mA	16 Bits	200 mA
M3928	8	Voltage	0~5, 0~10, -5~+5, -10~+10 Vdc	12 Bits	200 mA
M3948	8	Voltage	0~5, 0~10, -5~+5, -10~+10 Vdc	16 Bits	200 mA
M3C24	4	Differential Voltage Input/Output	0~5, 0~10, -5~+5, -10~+10Vdc	12 Bits	30mA
M3C44	4		0~5, 0~10, -5~+5, -10~+10Vdc	14 Bits	30mA
M3C64	4		0~5, 0~10, -5~+5, -10~+10Vdc	16 Bits	30mA
Power Measurement	Channel	Type	Range	Resolution	Power Dissipation
M3901	1	3Phase AC measurement	V _{LN} = 288VAC, V _{LL} =500VAC	24 Bits	125 mA

I/O Module

Analog Output Module					
Single Ended	Channel	Type	Range	Resolution	Power Dissipation
M4118	8	Current	0~20 mA	12 Bits	30 mA
M4158	8	Current	0~20 mA	16 Bits	30 mA
M4218	8	Current	4~20 mA	12 Bits	30 mA
M4258	8	Current	4~20 mA	16 Bits	30 mA
M4428	8	Voltage	0~10 Vdc	12 Bits	30 mA
M4468	8	Voltage	0~10 Vdc	16 Bits	30 mA

Special Module				
High Speed Counter	Channel	Type	Voltage	Power Dissipation
M5112	2	High speed counter	5~24Vdc	120 mA
Serial Interface	Channel	Type		Power Dissipation
M5212	2	RS 232, Full Duplex		85mA
M5222	2	RS 422, Full Duplex		85mA
M5232	2	RS 485, Half Duplex		85mA
M5352	2	Synchronous		60 mA
Pulse	Channel	Type		Power Dissipation
M5442	2	PWM, 0.5A/24Vdc, Source		75 mA
M5642	2	Pulse Output, 0.5A/24Vdc, Source		75 mA
Stepper	Channel	Type		Power Dissipation
M5522	2	2-Phase Bipolar Motor (Max. 16 microstepping)		100 mA
Hart	Channel	Type		Power Dissipation
M5914	4	Current Input, 4~20mA with HART		30 mA

Power Module			
Power Module	Type	Power Dissipation	Voltage
M7001	NA Power (Dual/Single Power Mode available)	40 mA	24 Vdc

Accessories	
Accessories	Type (Package)
BST-8000	Backplane Separation Tool
BCM-800A	Backplane Connector Module, Dual Type
BCM-800B	Backplane Connector Module, I/O Type
END-8121C	End Module
RTB-8218C	18Points Removable Terminal Block
RTB-8218F	Field Power 18Points Removable Terminal Block
RTB-8218SF	System/Field Power 18Points Removable Terminal Block



RTB (Removable Terminal Block)

- Easy Maintenance
- Screwless Connection System (Push type)

RTB type	
INFO	18 RTB
Wiring	Max. 0.75mm ² (AWG 18)
Length of Lug (Inserted)	Min 10mm

I/O Guide Pro

To help users' I/O configuration

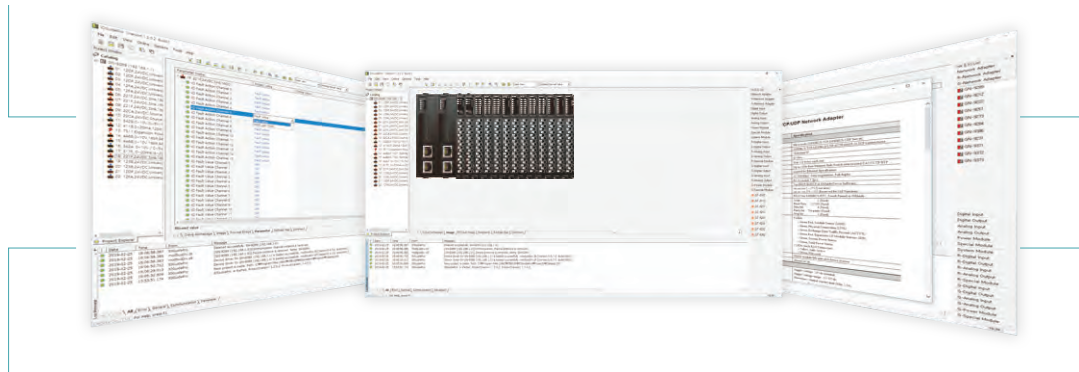
Simple Software Tool for User Convenience

Simulation

Enable to review configuration without modules via I/O Guide Pro
Dimension, Power Consumption, Possibility of expansion

Manual and Project Viewer

Provide the product information as the manual
Enable to export the User-configured project files in Excel or PDF file formats

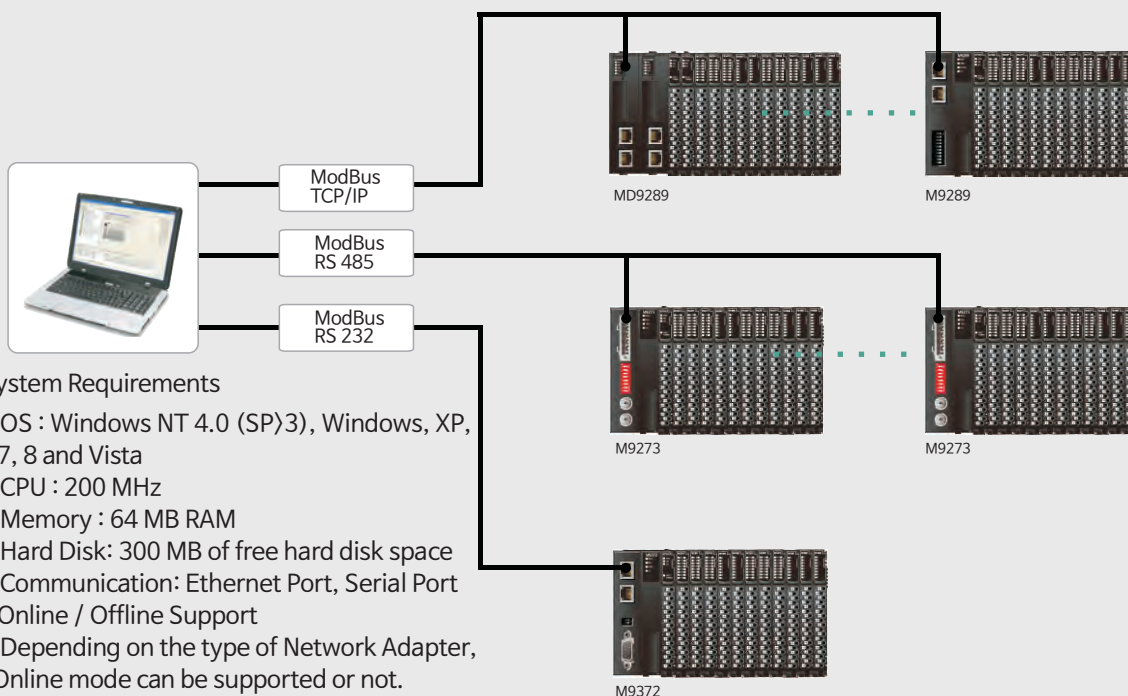


Parameter setting and View Address Map

Enable to change parameters of modules easily
Displaying input/output address map

BOOTP Server and Automatic Scan

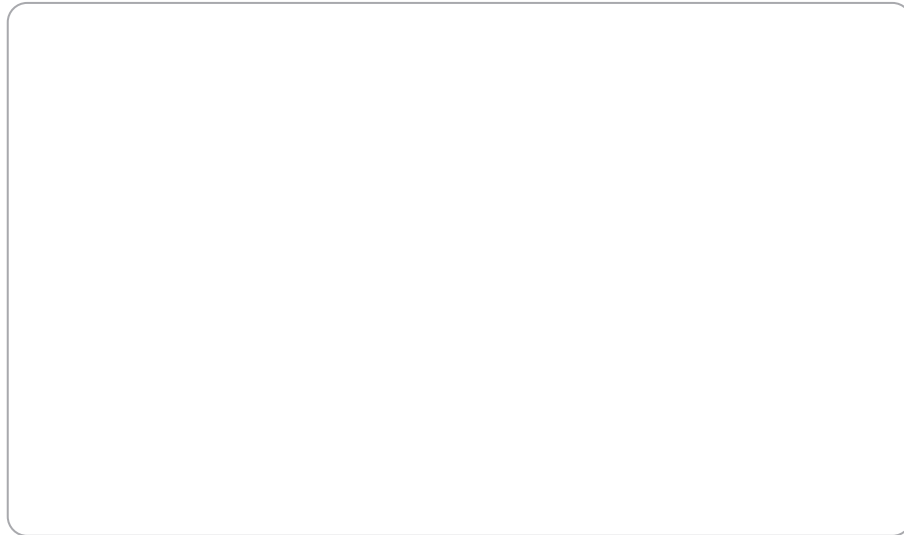
IP setting and connecting communication online without a master
* Online - MODBUS protocol available



System Requirements

- OS : Windows NT 4.0 (SP)3, Windows, XP, 7, 8 and Vista
- CPU : 200 MHz
- Memory : 64 MB RAM
- Hard Disk: 300 MB of free hard disk space
- Communication: Ethernet Port, Serial Port
- * Online / Offline Support
- Depending on the type of Network Adapter, Online mode can be supported or not.

Documentation offered by your distributor



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