



MasterLogic-200 Input/Output Modules

Specifications and Technical Data

Release R200

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Version 4.0

Release 200

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Revision History

Revision	Date	Changes
1.0	February 2008	Initial Version
2.0	July 2008	Updated to reflect new modules
3.0	Oct 2008	Added specifications for AI 16 & Terminal Boards
4.0	May 2010	Removed Experion PKS introduction, Included ML200R DC24V power supply, Remove Smart IO and Position Control Module

Legend for Change Column:

A – Added

D – Deleted

M – Modified

1. Introduction

1.1 Overview



MasterLogic-200, Honeywell's next generation Programmable Logic Controllers (PLC) adds power and robustness to logic-interlock-sequence batch control capabilities of Experion network.

It is state of the art, compact yet powerful & versatile, cost-effective solution ideal for fast logic, sequential, and batch control applications

The highlights of MasterLogic-200 PLC system are:

- Powerful & Versatile CPU (high speed / memory, IEC programming etc)
- Compact footprint (Rack room, cabinet space saver, shipping costs saver)
- Modular options (power supply, range of I/O modules to suit your configuration)
- Flexibility in module assignment – any module can be installed in any slot of any base without any restrictions.
- Open networks (Fast Ethernet, UTP/Fiber-Optic, serial RS232C/422/485)
- Open protocols (Profibus-DP, MODBUS ASCII/RTU/TCP)
- Peer-to-Peer networks (Dedicated Fast Ethernet on UTP/Fiber-optic)
- Simulation Environment to test control strategies without hardware or process connections.
- Engineer-friendly software (Connection options, easy configuration & trouble-shooting)
- Diagnostics (System/Error Logs, system monitoring, network monitoring, ping test, frame monitor)
- Experion HS Integration (PLC alarm/events, clock synch, etc)
- Redundancy (CPU, Power, I/O network redundancy)

1.2 MasterLogic-200 PLC system architecture

Redundancy options

MasterLogic-200 provides the control system designer with various redundancy architecture options that fits the requirement.

Fully Redundant system

CPU Model: 2MLR-CPUH/# provides a fully redundant system:

- Redundant CPU
- Redundant Power
- Redundant I/O cable (ring topology with dual paths)

Non-redundant system

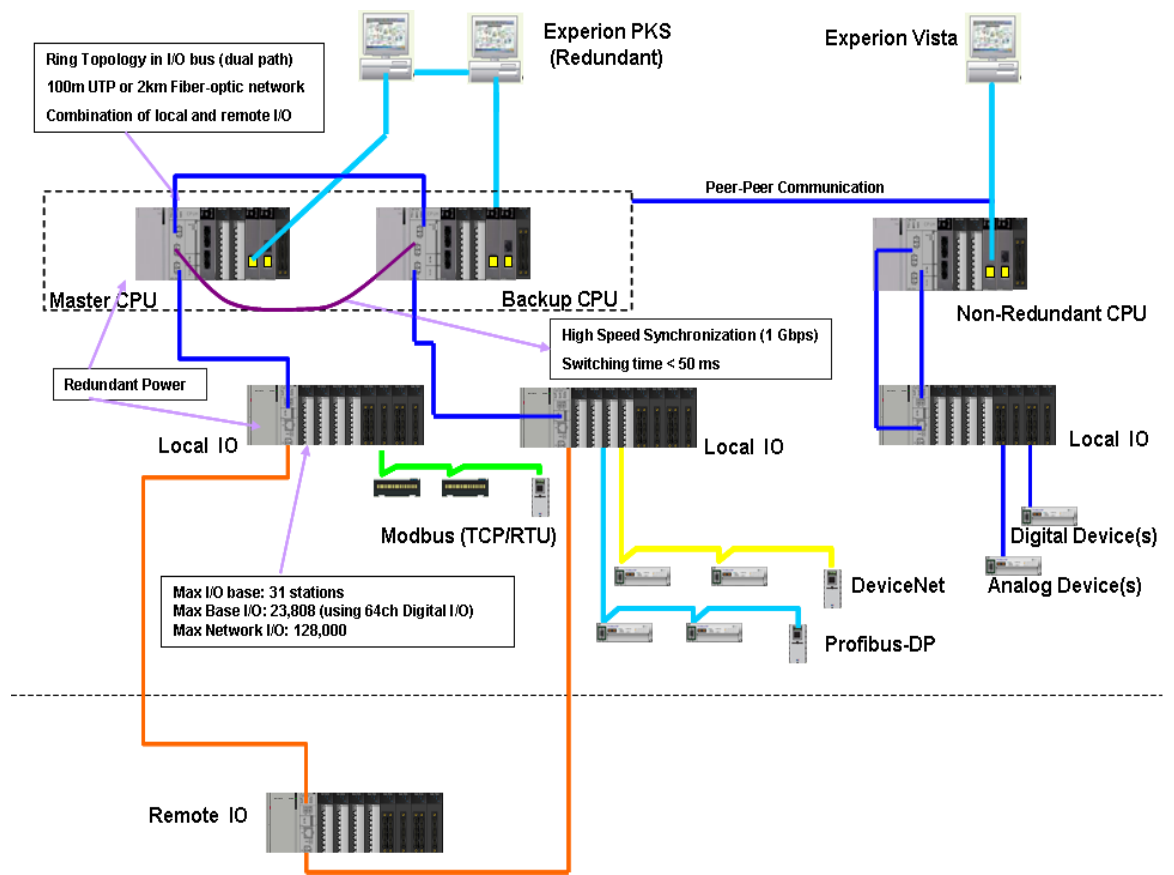
For cost-effective applications, CPU Model: 2MLI-CPUU provides a fully non-redundant system:

- Non-redundant CPU
- Non-redundant Power
- Non-redundant I/O cable

Non-redundant CPU but Redundant Power and I/O cable

A slight variation of the fully redundant architecture with only the master CPU of 2MLR-CPUH/# (excluding the standby CPU) offers the functionality of:

- Non-Redundant CPU
- Redundant Power
- Redundant I/O cable (ring topology with dual paths)



2. Input/Output Modules

2.1 IO Module Description

MasterLogic-200 Programming Controllers features Analog and Digital IO Modules along with special modules like High Speed Counter Module.

Module Type	Description
Digital Input Modules	• Available in 8, 16, 32 and 64 channel • 110V AC DI cards (16 channels) available • 220V AC DI cards (8 channels) available • LED for Channel status indication • 24V DC Input Modules(8,16,32 and 64 channels) in Sink/Source or source only type available • Photocoupler Isolation • Easy Maintenance – Terminal Block type
Digital Output Modules	• Available in 8, 16, 32 and 64 channel • Relay, Triac and Transistor Modules (Sink or Source Type) • LED for Channel status indication • Photocoupler Isolation • Easy Maintenance – Terminal Block type • Thermal Protection
Analog Input Modules	• High Speed A/D conversion and Processing (250 μs / channel) • 16 Bit High Resolution • 8 & 16 channel Voltage and Current modules • 4 channel Isolated AI card (Voltage and Current) • LED for module RUN status indication • Channel input signal disconnection status

	Each channel can be individually disabled/enabled
Analog Output Modules	- High Speed D/A conversion and Processing 16 Bit High Resolution 8 channel Voltage and Current modules 4 channel Isolated AO card (Voltage and Current) - LED for module RUN status indication - Each channel can be individually disabled/enabled
Thermocouple Module	- Isolation between Channels (4 channels) - High Accuracy of $\pm 0.1\%$ (25°C) - Support various Input Sensors (C-type Sensor) - Additional features like Average, Alarm, Filter, Min/Max Indication - Monitoring and Parameter settings with SoftMaster - LED for module RUN status indication - Channel input signal disconnection status
RTD Module	- Support various features (Average, Alarm, Filter) - Monitoring and Parameter settings with SoftMaster - Digital Conversion, Temperature Indication and User Defined Scaling features - LED for module RUN status indication - Channel input signal disconnection status
High Speed Counter Module	- Voltage Input (Open Connector) and Differential Input (Line Drive) type available each with 2 channels. - Supports various Pulse Input ranges (5V, 12V, 24V) - Incremental Encoder Available - Various multiplication factors for 1-phase and 2-phase pulse input. - Function to prevent from counting external signals. - Supporting HTL-level incremental encoder in the line-drive input type. - Preset or Gate function by program. - LED status displays for Input, Output and module

	ready condition
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Conformal Coating Corrosion Protection: Corrosion is one of the leading failure mechanisms of electronic boards in harsh environments. To insure the maximum possible reliability in corrosive industrial environments, Honeywell provides an optional conformal coating solution. Conformal coating is highly recommended for any installations for which the ambient environment meets either Moderate (G2) or Harsh (G3) conditions as defined by *ANSI/ISA-S71.04-1985, "Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminates."*

2.2 IO Module Specifications

Digital Input Modules

2MLI-D21A - 8 point DC24V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-D21A
Input point			8 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			None
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 kΩ
Response Time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default:3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default:3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			8 point / COM
Proper cable size			Twisted pair 0.3~0.75 mm ² (external diameter 2.8mm or less)
Proper compressed terminal			R1.25-3 (not allowed to use a sleeve attached compressed terminal.)
Current consumption (mA)			20mA
Operation indicator			Input On LED On

Model Specification	Digital Input Module
	2MLI-D21A
External connection method	9 point terminal block connector (M3 X 6 screw)
Weight	0.1 kg

2MLI-D22A - 16 point DC24V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-D22A
Input point			16 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			None
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 kΩ
Response Time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			16 point / COM
Proper cable size			Twisted pair 0.3~0.75 mm ² (external diameter 2.8mm or less)
Proper compressed terminal			R1.25-3 (not allowed to use a sleeve attached compressed terminal.)
Current consumption (mA)			30mA
Operation indicator			Input On, LED On
External connection method			18 point terminal block connector (M3 X 6 screw)
Weight			0.12 kg

2MLI-D24A - 32 point DC24V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-D24A
Input point			32 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			Yes
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 kΩ
Response Time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			32 point / COM
Proper cable size			0.3 mm ²
Current consumption (mA)			50mA
Operation indicator			Input On, LED On
External connection method			40 point connector
Weight			0.1 kg

2MLI-D28A - 64 point DC24V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-D28A
Input point			64 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			Yes
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 kΩ
Response Time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			32 point / COM
Proper cable size			0.3 mm ²
Current consumption (mA)			60mA
Operation indicator			Input On, LED On (32 point LED On by switch operation)
External connection method			40 point connector×2ea
Weight			0.15 kg

2MLI-D22B - 16 point DC24V Input Module (Source Type)

Model Specification		Digital Input Module
		2MLI-D22B
Input point		16 point
Isolation method		Photo coupler isolation
Rated input voltage		DC24V
Rated input current		About 4 mA
Operation voltage range		DC20.4~28.8V (ripple rate < 5%)
Input Derating		None
On Voltage/Current		DC19V or higher / 3 mA or higher
Off Voltage/Current		DC11V or lower / 1.7 mA or lower
Input resistance		About 5.6 kΩ
Response time	Off → On	1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
	On → Off	1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
Isolation voltage		AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance		10 MΩ or more by megger
Common Method		16 point / COM
Proper cable size		Twisted pair 0.3~0.75 mm ² (external diameter 2.8mm or less)
Proper compressed terminal		R1.25-3 (not allowed to use a sleeve attached compressed terminal.)
Current consumption (mA)		30mA
Operation indicator		Input On, LED On
External connection method		18 point terminal block connector (M3 X 6screw)
Weight		0.12 kg

2MLI-D24B - 32 point DC24V Input Module (Source Type)

Specification		Model	Digital Input Module
			2MLI-D24B
Input point			32 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			Yes
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 kΩ
Response time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default: 3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			32 point / COM
Proper cable size			0.3 mm ²
Current consumption (mA)			50mA
Operation indicator			Input On, LED On
External connection method			40 point connector
Weight			0.1 kg

2MLI-D28B - 64 point DC24V Input Module (Source Type)

Specification		Model	Digital Input Module
			2MLI-D28B
Input point			64 point
Isolation method			Photo coupler isolation
Rated input voltage			DC24V
Rated input current			About 4 mA
Operation voltage range			DC20.4~28.8V (ripple rate < 5%)
Input Derating			Yes
On Voltage/Current			DC19V or higher / 3 mA or higher
Off Voltage/Current			DC11V or lower / 1.7 mA or lower
Input resistance			About 5.6 k Ω
Response time	Off → On		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default:3ms
	On → Off		1ms/3ms/5ms/10ms/20ms/70ms/100ms (set by CPU parameter) Default:3ms
Isolation voltage			AC560V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 M Ω or more by megger
Common Method			32 point / COM
Proper cable size			0.3 mm ²
Current consumption (mA)			60mA
Operation indicator			Input On, LED On (32 point LED On by switch operation)
External connection method			40 point connector×2ea
Weight			0.15 kg

2MLI-A12A - 16 point AC 110V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-A12A
Input point			16 point
Isolation method			Photo coupler isolation
Rated input voltage			AC100-120V(+10/-15%) 50/60 Hz(±3 Hz) (distortion rate < 5%)
Rated input current			About 8 mA (AC100,60 Hz), About 7 mA (AC100, 50 Hz)
Inrush current			Max. 200 mA 1 ms (AC132V)
Input Derating			Yes
On Voltage/Current			AC80V or higher / 5 mA or higher (50 Hz, 60 Hz)
Off Voltage/Current			AC30V or higher / 1 mA or lower (50 Hz, 60 Hz)
Input resistance			About 12 kΩ(60 Hz), About 15 kΩ(50 Hz)
Response time	Off → On		15 ms or less (AC100V 50 Hz, 60 Hz)
	On → Off		25 ms or less (AC100V 50 Hz, 60 Hz)
Isolation voltage			AC1780V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			16 point / COM
Proper cable size			Twisted pair 0.3~0.75 mm ² (external diameter 2.8mm or less)
Proper compressed terminal			R1.25-3 (not allowed to use a sleeve attached compressed terminal.)
Current consumption (mA)			30mA
Operation indicator			Input On, LED On
External connection method			18 point terminal block connector (M3 X 6screw)
Weight			0.13 kg

2MLI-A21A - 8 point AC 220V Input Module (Source/Sink Type)

Specification		Model	Digital Input Module
			2MLI-A21A
Input point			8 point
Isolation method			Photo coupler isolation
Rated input voltage			AC100-240V(+10/-15%) 50/60 Hz(±3 Hz) (distortion rate 5%)
Rated input current			About 17 mA (AC200,60 Hz), About 14 mA (AC200, 50 Hz)
Inrush current			Max.500 mA 1 ms below (AC264V)
Input Derating			Yes
On Voltage/Current			AC80V or higher / 5 mA or higher (50 Hz, 60 Hz)
Off Voltage/Current			AC30V or higher / 1 mA or lower (50 Hz, 60 Hz)
Input resistance			About 12 kΩ(60 Hz), About 15 kΩ(50 Hz)
Response Time	Off → On		15 ms or less (AC200V 50 Hz, 60 Hz)
	On → Off		25 ms or less (AC200V 50 Hz, 60 Hz)
Isolation voltage			AC2830V rms/3 Cycle (altitude 2000m)
Isolation resistance			10 MΩ or more by megger
Common Method			8 point / COM
Proper cable size			Twisted pair 0.3~0.75 mm ² (external diameter 2.8mm or less)
Proper compressed terminal			R1.25-3 (not allowed to use a sleeve attached compressed terminal.)
Current consumption (mA)			20mA
Operation indicator			Input On, LED On
External connection method			9 point terminal block connector (M3 X 6screw)
Weight			0.13 kg

Digital Output Modules**2MLQ-RY1A – 8 point Relay Output Module**

Specification		Model	Digital Output Module
			2MLQ-RY1A
Output point			8 point
Isolation method			Relay isolation
Rated load voltage/current			DC24V 2A(resistive load) / AC220V 2A(COS Ψ = 1)
Min. load voltage/current			DC5V / 1mA
Max. load voltage/current			AC250V, DC125V
Off leakage current			0.1mA (AC220V, 60Hz)
Max. on/off frequency			3,600 times/hr
Surge absorber			None
Service life	Mechanical		20 millions times or more
	Electrical		Rated load voltage/current 100,000 times or more
			AC200V / 1.5A, AC240V / 1A (COS Ψ = 0.7) 100,000 times or more
			AC200V / 1A, AC240V / 0.5A (COS Ψ = 0.35) 100,000 times or more
			DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 100,000 times or more
Response Time	Off → On		10 ms or less
	On → Off		12 ms or less
Common method			1 point / 1COM (independent contact)
Current consumption			260mA (when all point On)
Operation indicator			Output On, LED On
External connection method			18 point terminal block connector (M3 X 6screw)
Weight			0.13kg

2MLQ-RY2A – 16 point Relay Output Module

Specification		Model	Digital Output Module
			2MLQ-RY2A
Output point			16 point
Isolation method			Relay isolation
Rated load voltage/current			DC24V 2A(resistive load) / AC220V 2A(COS Ψ = 1)
Min. load voltage/current			DC5V / 1mA
Max. load voltage/current			AC250V, DC125V
Off leakage current			0.1mA (AC220V, 60Hz)
Max. on/off frequency			3,600times/hr
Surge absorber			None
Service life	Mechanical		20 million times or more
	Electrical		Rated load voltage/current 100,000 times or more
			AC200V / 1.5A, AC240V / 1A (COS Ψ = 0.7) 100,000 times or more
			AC200V / 1A, AC240V / 0.5A (COS Ψ = 0.35) 100,000 times or more
			DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 100,000 times or more
Response Time	Off → On		10 ms or less
	On → Off		12 ms or less
Common method			16 point / 1COM
Current consumption			500mA (when all points On)
Operation indicator			Output On, LED On
External connection method			18 point terminal block connector (M3 X 6screw)
Weight			0.17kg

2MLQ-RY2B – 16 point Relay Output Module (Surge Absorber Type)

Specification		Model	Digital Output Module
			2MLQ-RY2B
Output point			16 point
Isolation method			Relay isolation
Rated load voltage/current			DC24V 2A(resistive load) / AC220V 2A(COS Ψ = 1)
Min. load voltage/current			DC5V / 1mA
Max. load voltage/current			AC250V, DC125V
Off leakage current			0.1mA (AC220V, 60Hz)
Max. on/off frequency			3,600times/hr
Surge absorber			Varistor (387 ~ 473V), C.R Absorber (complies with IEC 61006-6-2)
Service life	Mechanical		20 million times or more
	Electrical		Rated load voltage/current 100,000 times or more
			AC200V / 1.5A, AC240V / 1A (COS Ψ = 0.7) 100,000 times or more
			AC200V / 1A, AC240V / 0.5A (COS Ψ = 0.35) 100,000 times or more
			DC24V / 1A, DC100V / 0.1A (L / R = 7ms) 100,000 times or more
Response Time	Off → On		10 ms or less
	On → Off		12 ms or less
Common method			16 point / 1COM
Current consumption			500mA (when all points On)
Operation indicator			Output On, LED On
External connection method			18 point terminal block connector (M3 X 6screw)
Weight			0.19kg

2MLQ-TR2A – 16 point Transistor Output Module (Sink Type)

Specification		Model	Digital Output Module
			2MLQ-TR2A
Output point			16 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.5A / 1 point, 4A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			4A / 10 ms or less
Max. voltage drop (On)			DC 0.3V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Fuse			4A×2 (not replaceable) (Fuse cap.:50A) Common fuse for entire module
Fuse disconnection display			Yes (If a fuse is burnt out, it transfers a signal to CPU and LED is on) If external power supply is off, fuse status is not detected.
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (Rated load, resistive load)
Common method			16 point / 1COM
Current consumption			70mA (when all points On)
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (DC24V connection)
Operation indicator			Output On, LED On
External connection method			18 point terminal block connector
Weight			0.11kg

2MLQ-TR4A – 32 point Transistor Output Module (Sink Type)

Specification		Model	Digital Output Module
			2MLQ-TR4A
Output point			32 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.1A / 1 point, 2A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			0.7A / 10 ms or less
Max. voltage drop (On)			DC 0.2V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (rated load, resistive load)
Common method			32 point / 1COM
Current consumption			130mA (when all points On)
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (DC24V connection)
Operation indicator			Input On, LED On
External connection method			40 Pin Connector
Proper cable size			0.3 mm ²
Weight			0.1 kg

2MLQ-TR8A – 64 point Transistor Output Module (Sink Type)

Specification		Model	Digital Output Module
			2MLQ-TR8A
Output point			64 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.1A / 1 point, 2A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			0.7A / 10 ms or less
Max. voltage drop (On)			DC 0.2V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (rated load, resistive load)
Common method			16 point / 1COM
Current consumption			230mA (when all points On)
Common method			32 point / COM
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (DC24V connection)
Operation indicator			Input On, LED On (32 point LED On by switch operation)
External connection method			40 Pin Connector×2ea
Proper cable size			0.3 mm ²
Weight			0.15 kg

2MLQ-TR2B – 16 point Transistor Output Module (Source Type)

Specification		Model	Digital Output Module
			2MLQ-TR2B
Output point			16 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.5A / 1 point, 4A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			4A / 10 ms or less
Max. voltage drop (On)			DC 0.3V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Fuse			4A×2 (not replaceable) (Fuse cap.:50A) Common fuse for entire module
Fuse disconnection display			Yes (If a fuse is burnt out, it transfers a signal to CPU and LED is ON.)
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (rated load, resistive load)
Common method			16 point / 1COM
Current consumption			70mA (when all points On)
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (DC24V connection)
Operation indicator			Output On, LED On
External connection method			18 point terminal block connector
Weight			0.12kg

2MLQ-TR4B – 32 point Transistor Output Module (Source Type)

Specification		Model	Digital Output Module
			2MLQ-TR4B
Output point			32 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.1A / 1 point, 2A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			4A / 10 ms or less
Max. voltage drop (On)			DC 0.3V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (rated load, resistive load)
Common method			32 point / 1COM
Current consumption			130mA (when all points On)
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (DC24V connection)
Operation indicator			Input On, LED On
External connection method			40 Pin Connector
Suitable cable size			0.3 mm ²
Weight			0.1kg

2MLQ-TR8B – 64 point Transistor Output Module (Source Type)

Specification		Model	Digital Output Module
			2MLQ-TR8B
Output point			64 point
Isolation method			Photo coupler isolation
Rated load voltage			DC 12 / 24V
Load voltage range			DC 10.2 ~ 26.4V
Max. load current			0.1A / 1 point, 2A / 1COM
Off leakage current			0.1mA or less
Max. inrush current			4A / 10 ms or less
Max. voltage drop (On)			DC 0.3V or less
Surge absorber			Zener diode (complies with IEC 61006-6-2)
Response Time	Off → On		1 ms or less
	On → Off		1 ms or less (rated load, resistive load)
Common method			32 point / 1COM
Current consumption			230mA (when all points On)
External Power Supply	Voltage		DC12/24V ± 10% (ripple voltage 4 Vp-p or less)
	Current		10mA or less (if connected to DC24V)
Operation indicator			LED On with Input On (32 point LED On by switch operation)
External connection method			40 Pin Connector × 2ea
Suitable cable size			0.3 mm ²
Weight			0.15kg

2MLQ-SS2A – 16 point Triac Output Module

Model Specification		Digital Output Module
		2MLQ-SS2A
Output point		16 point
Isolation method		Photo coupler isolation
Rated load voltage		AC 100-240V (50 / 60 Hz)
Max. load voltage		AC 264V
Max. load current		0.6A / 1 point 4A / 1COM
Min. load current		20 mA
Off leakage current		2.5 mA (AC 220V 60 Hz)
Max. inrush current		20A / Cycle or less
Max. voltage drop (On)		AC 1.5V or less (2A)
Surge absorber		Varistor (387 ~ 473V), C.R Absorber (complies with IEC 61006-6-2)
Response Time	Off → On	1 ms or less
	On → Off	0.5 Cycle + 1 ms or less
Common method		16 point / 1 COM
Current consumption		300 mA (when all points On)
Operation indicator		Output On, LED On
External connection method		18 point terminal block connector (M3 X 6screw)
Weight		0.2 kg

Analog Input Modules**2MLF-AV8A** – 8 channel Voltage Input Module**2MLF-AC8A** – 8 channel Current Input Module

Item	Specifications																																	
	2MLF-AV8A (Voltage Input Type)		2MLF-AC8A (Current Input Type)																															
Analog input	DC 1 ~ 5 V DC 0 ~ 5 V DC 0 ~ 10 V DC -10 ~ 10 V (Input Resistance: 1 MΩ min.)		DC 4 ~ 20 ma DC 0 ~ 20 ma (Input Resistance 250 Ω)																															
Analog input range setting	Analog input range can be individually selected for each channel either through user program or via user-friendly GUI [I/O parameter] function in SoftMaster																																	
Digital value	(1) Voltage Type																																	
	<table><tr><td rowspan="2">ANALOG INPUT DIGITAL OUTPUT</td><td>1 ~ 5 V</td><td>0 ~ 5 V</td><td>0 ~ 10 V</td><td>-10 ~ 10 V</td></tr><tr><td colspan="4"></td></tr><tr><td>Unsigned Value</td><td colspan="4">0 ~ 16000</td></tr><tr><td>Signed Value</td><td colspan="4">-8000 ~ 8000</td></tr><tr><td>Precise Value</td><td>1000 ~ 5000</td><td>0 ~ 5000</td><td>0 ~ 10000</td><td>-10000 ~ 10000</td></tr><tr><td>Percentile Value</td><td colspan="4">0 ~ 10000</td></tr></table>					ANALOG INPUT DIGITAL OUTPUT	1 ~ 5 V	0 ~ 5 V	0 ~ 10 V	-10 ~ 10 V					Unsigned Value	0 ~ 16000				Signed Value	-8000 ~ 8000				Precise Value	1000 ~ 5000	0 ~ 5000	0 ~ 10000	-10000 ~ 10000	Percentile Value	0 ~ 10000			
	ANALOG INPUT DIGITAL OUTPUT	1 ~ 5 V	0 ~ 5 V	0 ~ 10 V	-10 ~ 10 V																													
	Unsigned Value	0 ~ 16000																																
	Signed Value	-8000 ~ 8000																																
	Precise Value	1000 ~ 5000	0 ~ 5000	0 ~ 10000	-10000 ~ 10000																													
Percentile Value	0 ~ 10000																																	

	(2) Current Type																							
	<table><tr><td> ANALOG INPUT DIGITAL OUTPUT </td><td>4 ~ 20 mA</td><td colspan="2">0 ~ 20 mA</td></tr><tr><td>Unsigned Value</td><td colspan="3">0 ~ 16000</td></tr><tr><td>Signed Value</td><td colspan="3">-8000 ~ 8000</td></tr><tr><td>Precise Value</td><td>4000 ~ 20000</td><td colspan="2">0 ~ 20000</td></tr><tr><td>Percentile Value</td><td colspan="3">0 ~ 10000</td></tr></table>				ANALOG INPUT DIGITAL OUTPUT	4 ~ 20 mA	0 ~ 20 mA		Unsigned Value	0 ~ 16000			Signed Value	-8000 ~ 8000			Precise Value	4000 ~ 20000	0 ~ 20000		Percentile Value	0 ~ 10000		
	ANALOG INPUT DIGITAL OUTPUT	4 ~ 20 mA	0 ~ 20 mA																					
	Unsigned Value	0 ~ 16000																						
	Signed Value	-8000 ~ 8000																						
	Precise Value	4000 ~ 20000	0 ~ 20000																					
	Percentile Value	0 ~ 10000																						
► 16-bit binary value (data: 14 bits) ► Format of digital output data can be individually set for each channel either through user program or via user-friendly GUI [I/O parameter] function in SoftMaster.																								
Max. resolution	<table><tr><td>ANALOG INPUT RANGE</td><td>RESOLUTION (1/16000)</td><td>ANALOG INPUT RANGE</td><td>RESOLUTION (1/16000)</td></tr><tr><td>1 ~ 5 V</td><td>0.250 mV</td><td rowspan="2">4 ~ 20 mA</td><td rowspan="2">1.0 μA</td></tr><tr><td>0 ~ 5 V</td><td>0.3125 mV</td></tr><tr><td>0 ~ 10 V</td><td>0.625 mV</td><td rowspan="2">0 ~ 20 mA</td><td rowspan="2">1.25 μA</td></tr><tr><td>-10 ~ 10 V</td><td>1.250 mV</td></tr></table>				ANALOG INPUT RANGE	RESOLUTION (1/16000)	ANALOG INPUT RANGE	RESOLUTION (1/16000)	1 ~ 5 V	0.250 mV	4 ~ 20 mA	1.0 μA	0 ~ 5 V	0.3125 mV	0 ~ 10 V	0.625 mV	0 ~ 20 mA	1.25 μA	-10 ~ 10 V	1.250 mV				
	ANALOG INPUT RANGE	RESOLUTION (1/16000)	ANALOG INPUT RANGE	RESOLUTION (1/16000)																				
	1 ~ 5 V	0.250 mV	4 ~ 20 mA	1.0 μA																				
	0 ~ 5 V	0.3125 mV																						
	0 ~ 10 V	0.625 mV	0 ~ 20 mA	1.25 μA																				
-10 ~ 10 V	1.250 mV																							
Accuracy	±0.2% or less (when ambient temperature is 25 (±5) °C) ±0.3% or less (when ambient temperature is 0 ~ 55 °C)																							
Max. conversion speed	250 μs/channel																							
Absolute max. input	±15 V		±30 mA																					

Analog input channels	8 channels/1 module
Isolation method	Photo-coupler isolation between input terminal and PLC power (no isolation between channels)
Terminal connected	18-point terminal
I/O addresses assigned	Fixed type: 64 points, Variable type: 16 points
Current Consumption	DC 5 V: 420mA
Weight	140g

2MLF-AD16A – 16 channel Voltage/Current Input Module

Item	Specifications	
	Voltage Input	Current Input
Analog input	DC 1 ~ 5 V DC 0 ~ 5 V DC 0 ~ 10 V DC -10 ~ 10 V (Input Resistance: 1 MΩ min.)	DC 4 ~ 20 mA DC 0 ~ 20 mA (Input Resistance 250 Ω)
Analog input range setting	► Current input or Voltage input can be selected through the external switch. ► Analog input range can be selected through user program or I/O parameter. ► Respective input ranges can be set based on channels.	
Digital output	(1) Voltage Input Analog input ~ 5 V ~ 5 V ~ 10 V ~ 10 V Digital output Unsigned Value 0 ~ 16000 Signed Value -8000 ~ 8000 Precise Value 1000~ 0~500 0~100 10000~	

	5000 0 00 10000																	
	Percentile Value 0 ~ 10000																	
	(2) Current Input																	
	<table><tr><td>Analog input</td><td>4 ~ 20 mA</td><td>0 ~ 20 mA</td></tr><tr><td>Digital output</td><td></td><td></td></tr></table>		Analog input	4 ~ 20 mA	0 ~ 20 mA	Digital output												
Analog input	4 ~ 20 mA	0 ~ 20 mA																
Digital output																		
	Unsigned Value 0 ~ 16000																	
	Signed Value -8000 ~ 8000																	
	Precise Value 4000 ~ 20000 0 ~ 20000																	
	Percentile Value 0 ~ 10000																	
	16-bit binary value (data: 14 bits)																	
	Format of digital output data can be set through user program or S/W package based on channels.																	
Maximum resolution	<table><tr><th>Analog input range</th><th>Resolution (1/16000)</th></tr><tr><td>1 ~ 5 V</td><td>0.250 mV</td></tr><tr><td>0 ~ 5 V</td><td>0.3125 mV</td></tr><tr><td>0 ~ 10 V</td><td>0.625 mV</td></tr><tr><td>-10 ~ 10 V</td><td>1.250 mV</td></tr></table>	Analog input range	Resolution (1/16000)	1 ~ 5 V	0.250 mV	0 ~ 5 V	0.3125 mV	0 ~ 10 V	0.625 mV	-10 ~ 10 V	1.250 mV	<table><tr><th>Analog input range</th><th>Resolution (1/16000)</th></tr><tr><td>4 ~ 20 mA</td><td>1.0 μA</td></tr><tr><td>0 ~ 20 mA</td><td>1.25 μA</td></tr></table>	Analog input range	Resolution (1/16000)	4 ~ 20 mA	1.0 μA	0 ~ 20 mA	1.25 μA
Analog input range	Resolution (1/16000)																	
1 ~ 5 V	0.250 mV																	
0 ~ 5 V	0.3125 mV																	
0 ~ 10 V	0.625 mV																	
-10 ~ 10 V	1.250 mV																	
Analog input range	Resolution (1/16000)																	
4 ~ 20 mA	1.0 μA																	
0 ~ 20 mA	1.25 μA																	
Accuracy	±0.2% or less (when ambient temperature is 25 C ±5 C) ±0.3% or less (when ambient temperature is 0 C ~ 55 C)																	
Max. conversion speed	500 μs/ channel																	
Absolute max. input	±15 V	±30 mA																
Analog input points	16 channels																	

Insulation method	Photo-coupler insulation between input terminal and PLC power (no insulation between channels)
Terminal connected	32-point terminal
I/O points Occupied	Fixed point assignment: 64 , Variable point assignment : 16
Current Consumption	330 mA
Weight	115g

2MLF-AD4S – 4 channel Voltage/Current Input Module with isolation between channels

Item	2MLF-AD4S				
	Voltage Input		Current Input		
Analog Input range	DC 1 ~ 5 V DC 0 ~ 5 V DC 0 ~ 10 V DC -10 ~ 10 V (Input Resistance: 1 MΩ min.)		DC 4 ~ 20 mA DC 0 ~ 20 mA (Input Resistance: 250 Ω)		
Analog input range setting	Analog input range can be selected through user program or [I/O parameter]. Respective input ranges can be set based on channels.				
Digital value	(1) Voltage Type				
	<				

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	power				
Terminal connected	18-point terminal				
I/O points occupied	Fixed type: 64 points, Non fixed type: 16 points				
Current Consumption	DC 5 V: 610 mA				
Weight	140g				

Analog Output Modules

2MLF-DV4A – 4 channel Voltage Output Module

2MLF-DV8A – 8 channel Voltage Output Module

2MLF-DC4A – 4 channel Current Output Module

2MLF-DC8A – 8 channel Current Output Module

Item	2MLF-DV4A (Voltage Output Type)	2MLF - DV8A(Voltage Output Type)	2MLF -DC4A (Current Output Type)	2MLF -DC8A (Current Output Type)
Analog output	DC 1 ~ 5V DC 0 ~ 5V DC 0 ~ 10V DC -10 ~ 10V } Load resistance : 1 kΩ or more		DC 4 ~ 20 mA DC 0 ~ 20 mA	
			Load resistance :600Ω or less	Load resistance :550Ω or less
	Output range can be selected through applicable program or parameters (for respective channels)			

Digital value	Signed 16-bit binary value (data: 14 bits) : Format of input data can be set through applicable program or parameters (for respective channels)				
	Analog Output Digital input	1 ~ 5V	0 ~ 5V	0 ~ 10V	-10 ~ 10V
	Unsigned Value	0 ~ 16000			
	Signed Value	-8000 ~ 8000			
	Precise Value	100 ~ 5000	0 ~ 5000	0 ~ 10000	-10000~10000
	Percentile Value	0 ~ 10000			
	Analog Output Digital input	4 ~ 20mA		0 ~ 20mA	
	Unsigned Value	0 ~ 16000			
	Signed Value	-8000 ~ 8000			
	Precise Value	4000 ~ 20000		0 ~ 20000	
	Percentile Value	0 ~ 10000			
	Maximum resolution	1/16000 (for respective output ranges)			
	1~5 V	0.250 mV	4~20 mA	1.0 μA	
	0~5 V	0.3125 mV			

	0~10 V	0.625 mV	0~20 mA	1.25 μ A
	$\pm$ 10 V	1.250 mV		
Accuracy	$\pm$ 0.2% or less (when ambient temperature is 25℃) $\pm$ 0.3% or less (when the range is within operational temperature)			
Maximum conversion speed	250 μ s/channel			
Absolute maximum output	$\pm$ 15 V		$\pm$ 24 mA	
Number of output channels	4 channels/ 1 module	8 channels/ 1 module	4 channels/ 1 module	8 channels/ 1 module
Isolation method	Photo-coupler isolation between input terminal and PLC power (no isolation between channels)			
Terminal connected	18-point terminal			
I/O points occupied	Changeable type: 16 points, Fixed type: 64 points			
Current consumption	DC 5V	190 mA	190 mA	190 mA
	DC 24V	140 mA	180 mA	210 mA
Weight (g)	150g			

2MLF-DC4S – 4 channel Current Output Module, Isolation between channels

Item	Specification	
	2MLF-DC4S (Isolated Current Output Type)	
Analog output	DC 4 ~ 20 mA } Load resistance DC 0 ~ 20 mA } : 600 Ω or less	
	Output range can be selected through applicable program or parameters (for respective channels)	

Digital value	Signed 16-bit binary value (data: 14 bits) : Format of input data can be set through applicable program or parameters (for respective channels)					
	↖ Analog output Digital input	1 ~ 5V	0 ~ 5V	0 ~ 10V	-10 ~ 10V	
	Unsigned Value	0 ~ 16000				
	Signed Value	-8000 ~ 8000				
	Precise Value	1000 ~ 5000	0 ~ 5000	0 ~ 10000	-10000 ~ 10000	
	Percentile Value	0 ~ 10000				
	↖ Analog output Digital input	4 ~ 20mA		0 ~ 20mA		
	Unsigned Value	0 ~ 16000				
	Signed Value	-8000 ~ 8000				
	Precise Value	4000 ~ 20000		0 ~ 20000		
	Percentile Value	0 ~ 10000				
	Maximum resolution	1/16000 (for respective output ranges)				
		1~5 V	0.250 mV	1.0 μA		
0~5 V		0.3125 mV				
0~10 V		0.625 mV	1.25 μA			
±10 V		1.250 mV				
Accuracy	Standard accuracy: ±0.1% or less (when ambient temperature is 25℃)					
	Temperature coefficient: ±80 ppm/℃ (0.008 %/℃)					
Maximum conversion speed	10 ms/4 channels					
Absolute	±30 mA					

maximum output		
Number of output channels	4 channels/1 module	
Isolation method	Photo-coupler isolation between input terminal and PLC power (Isolation between channels)	
Terminal connected	18-point terminal	
I/O points occupied	Changeable type: 16 points, Fixed type: 64 points	
Current consumption	Internal	DC5V : 200 mA
	External	DC24V : 220 mA
Weight (g)	150g	

Thermocouple Input Modules**2MLF-TC4S** – Temperature Input, 4 channels, Isolation between channels

Item	2MLF-TC4S	
No. of input CH	4 CH	
Type of input sensor	K,J,E,T,B,R,S,N,C	JIS C1602-1995 , ITS-90
Range of input temperature	K	-250 ~ 1350 °C
	J	-200 ~ 1200 °C
	E	-250 ~ 1000 °C
	T	-250 ~ 400 °C
	B	400 ~ 1800 °C
	R	-50 ~ 1750 °C
	S	-50 ~ 1750 °C
	N	-270 ~ 1300 °C
	C	0 ~ 2300 °C
Digital value	Temp. display(unit of 0.1)	Displaying down to one decimal place (0.1 °C)
	Scaling display (user-defined scaling)	0 ~ 65535
		-32768 ~ 32767
Preciseness	Ambient temperature(25 °C)	±0.1% (allowable for some section up to 1% of measurable temperature range by sensors)
	Temperature coefficient (range of operating temp)	±100 ppm/ °C
Conversion velocity	40ms / channel	
Isolation method	Inter-channel	Isolation
	Terminal – PLC power	Isolation (Photo-Coupler)
Cold junction	Automatic compensation by RJC sensing (PT100)	

compensation	Compensation degree	$\pm 1.0\text{ }^{\circ}\text{C}$
Function	Averaging function	Time average (320~64000 ms)
		Frequency average (2~64000 times)
		Moving average (2~100)
	Alarm function	Process alarm
		Gradient alarm
		Disconnection detection
	Filter function	Digital filter (160~64000 ms)
	Max./Min. display	Display Max./Min.
Terminal block	18-point terminal	
Current consumption	5V: 610mA	
Weight	150g	

RTD Input Modules**2MLF-RD4A – Temperature (RTD) Input, 4 channels**

Item	2MLF-RD4A		
No. of input channels	4 channels		
Input sensor type	Pt100	JIS C1604-1997	
	JPt100	JIS C1604-1981, KS C1603-1991	
Temperature input range	Pt100	-200.0 – 850.0℃	
	JPt100	-200.0 – 640.0℃	
Digital value	Temperature display (unit: 0.1)	PT100	-200.0 – 850.0℃/-328.0 – 1562.0°F
		JPT100	-200.0 – 640.0℃/-328.0 – 1184.0°F
	Scaling display (Customize)	0 – 65535	
		-32768 – 32768	
Accuracy	Normal temp. (25℃)	Within ±0.2%	
	Full temp. (0 – 55℃)	Within ±0.3%	
Conversion speed	40ms / channel		
Isolation	Channel to Channel	Non-isolation	
	Terminal to PLC Power	Photo-coupler	
Wiring method	3-wire		
Function	Average	Time average (320 – 64000ms)	
		Counting average (2 – 64000 count)	
		Moving average (2 – 100 samples)	
	Alarm	Process alarm	
		Input changing rate alarm	
		Disconnection detection	

	Filtering	Digital filter (160 – 64000ms)
Terminal block	18-point terminal block	
Current consumption	5V: 450mA	
Weight	150g	

High Speed Counter Modules

2MLF-H02A – Voltage Input Type (Open Collector Type)

2MLF-HD2A – Differential Input Type (Line Driver Type)

Item		Specifications	
		2MLF-H02A	2MLF-HD2A
Count input signal	Signal	A-phase, B-phase	
	Input Type	Voltage Input (Open Collector)	Differential Input (Line Drive)
	Signal Level	DC 5/12/24V	RS-422A Line Drive/HTL LEVEL Line Drive
Maximum coefficient speed		200kpps	500kpps (HTL input is 250kpps)
Number of channels		2	
Coefficient range		Signed 32-bit (-2,147,483,648–2,147,483,647)	
Count type (program setting)		Linear Count with Carry/Borrow when 32-bit range is exceeded, maximum/minimum count	
		Ring Count (repeated count within setting range)	
Input mode (program setting)		1-phase input	
		2-phase input	
		CW/CCW input	
Signal type		Voltage	
Count Up/Count down setting	1-phase input	Increase or Decrease of count by B-phase input	
		Increase or Decrease of count by program	
	2-phase input	Automatic setting by difference in phase	
	CW/CCW	A-phase input: increasing operation	
		B-phase input: decreasing operation	
Multiplication function	1-phase input	1/2 multiplication (program setting)	
	2-phase input	1/2/4 multiplication (program setting)	
	CW/CCW	1-multiplication	
Control input	Signal	Preset instruction input, auxiliary mode instruction input	
	Signal Level	DC 5V/12V/24V (select terminal) input type	
	Signal type	Voltage	
External output	Output points	2-point/channel (for each channel): terminal output available	

Item		Specifications	
		2MLF-H02A	2MLF-HD2A
	Type	Select single-compared (>, >=, =, <=, <) or section compared output (included or excluded) (program setting)	
	Output type	Open collector output (SINK)	
Function to display operation status	Input signal	A-phase, B-phase, Preset instruction, Auxiliary mode instruction	
	Output signal	OUT1, OUT2	
	Operation status	Module Ready, A/B phase pulse input status	
Count Enable		To be set through program (count available only in enable status)	
Preset function		To be set through terminal or program	
Auxiliary mode (program setting)		Count Clear Count Latch Sampling (time setting value: 1–60000ms) Count Input Frequency Measure (for respective input phases) Revolution/Unit time (time setting value: 1–60000ms) Count Disable function (setting by internal/external input during count operation)	
Terminal		40-pin connector	
Internal current consumption		270mA	330mA
Weight		90g	

Counter Input Specifications

Item	Specifications			
	Voltage input type			Different type
Input voltage	24V DC (17.0V–26.4V)	12V DC (9.8V–13.2V)	5V DC (4.5V–5.5V)	Line Driver
Input current	7–11 mA	7–11 mA	7–11mA	RS-422A Line Driver HTL LEVEL Line Driver
ON guaranteed voltage (minimum)	17.0 V	9.8V	4.1V	
OFF guaranteed voltage (maximum)	4.5V	3.0V	1.7V	

Preset/Gate Input Specifications

Item	Preset/Gate Input		
Input voltage	24V DC (15.2V–26.4V)	12V DC (10.8V–13.2V)	5V DC (4.1V–5.5V)
Input current	3–6 mA	3–6 mA	3–6 mA
ON guaranteed voltage	15.2 V	10.8V	4.1V
OFF guaranteed voltage	3.2V	2.5V	1.4V
ON delayed time	Less than or equal to 1ms		
OFF delayed time	Less than or equal to 1ms		

Transistor Output (SINK) Specifications

Item	Specifications
Rated output	DC 24V, 100mA / point
Leaked current	Less than or equal to 0.1mA
Saturated area voltage	Less than or equal to 1.3V
ON delayed time	Less than or equal to 0.1ms
OFF delayed time	Less than or equal to 0.1ms

3. Base Options

3.1 Base options (2MLI-CPUU)

There are four I/O base options to select from: 4 slot, 6 slot, 8 slot & 12 slot bases. The below specifications are applicable only for CPU model: 2MLI-CPUU

Main CPU base options

Model Items	2MLB-M12A	2MLB-M08A	2MLB-M06A	2MLB-M04A
No of Modules	12 modules	8 modules	6 modules	4 modules
Dimension (mm)	426 X 98 X 19	318 X 98 X 19	264 X 98 X 19	210 X 98 X 19
Weight (kg)	0.54	0.42	0.34	0.28

Expansion I/O base options

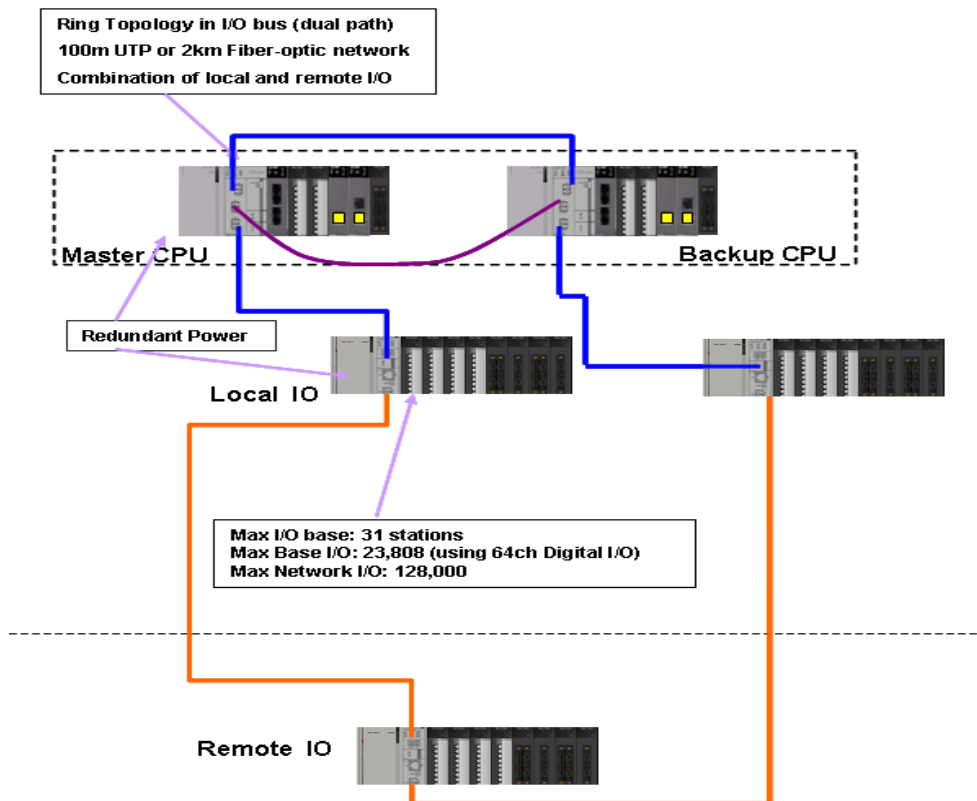
Model Items	2MLB-E12A	2MLB-E08A	2MLB-E06A	2MLB-E04A
No of Modules	12 modules	8 modules	6 modules	4 modules
Dimension (mm)	426 X 98 X 19	318 X 98 X 19	264 X 98 X 19	210 X 98 X 19
Weight (kg)	0.59	0.47	0.39	0.33

Expansion I/O cable options

Model Items	2MLC-E041	2MLC-E061	2MLC-E121	2MLC-E301	2MLC-E501	2MLC-E102	2MLC-E152
Length (m) ⁺	0.40	0.60	1.20	3.00	5.00	10.00	15.0
Weight (kg)	0.15	0.16	0.22	0.39	0.62	1.20	1.80

⁺ The total cable length between the CPU and the farthest I/O expansion base should not exceed 15m.

3.2 Base Options (2MLR-CPUH)



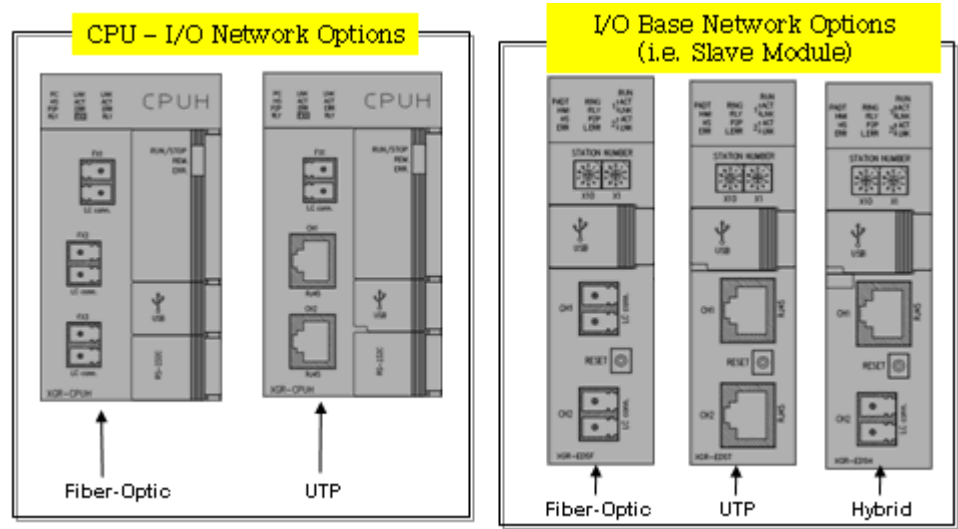
The above diagram demonstrates co-existence of both local I/O base and remote I/O base (i.e. UTP and fiber-optic cables) in a single I/O network.

Please note that only power modules, CPU base & FENet modules can reside on CPU Base.

FENet module can not be installed on the Expansion base.

In redundant system employing CPU model: 2MLR-CPUH/#, Local I/O bases can communicate with the CPU via Industrial Ethernet using UTP CAT5 cable traveling up to a max 100m distance.

Remote I/O bases as far as 2km can communicate with the CPU on fiber-optic networks available in both CPU as well I/O base communication slave modules.



Main CPU base options

Items	Model	2MLR-M06P
No of Modules		6 modules
Dimension (mm)		346 X 98 X 19
Current Consumption (mA)		211

Expansion I/O base options

Items	Model	2MLR-E12P
No of Modules		12 modules
Dimension (mm)		481 X 98 X 19
Current Consumption (mA)		216

4. Smart Link Board Options

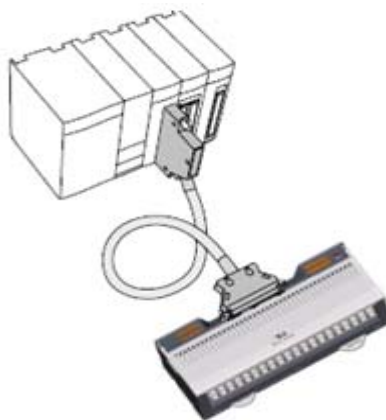
Smart Link Boards are available for Digital I/O modules. The following table depicts the modules for which Smart Link Boards are available.

Part No	Part Description	Terminal Board (SLP-T40P)	Relay Board (SLP-RY4A)
2MLI-D24A	DI (DC 24V, 32 point, Current source & sink input)	Yes	No
2MLI-D28A	DI (DC 24V, 64 point, Current source & sink input)	Yes	No
2MLI-D24B	DI (DC 24V, 32 point, Current source input)	Yes	No
2MLI-D28B	DI (DC 24V, 64 point, Current source input)	Yes	No
2MLQ-TR4A	DO (Transistor output, 32 point (for 0.1A, sink output))	Yes	Yes
2MLQ-TR8A	DO (Transistor output, 64 point (for 0.1A, sink output))	Yes	Yes
2MLQ-TR4B	DO (Transistor output, 32 point (for 0.1A, source output))	Yes	No
2MLQ-TR8B	DO (Transistor output, 64 point (for 0.1A, source output))	Yes	No

4.1 Relay Board

The specifications for the relay board (SLP-RY4A) are as follows:

Item	Specifications (SLP-RY4A)
Output point	32 points
Rated load voltage	DC 24V, AC 220V
Leakage current at Off	Less than 0.1 mA
Rated load current	2A/ point, 5A/ COM
Response time	Off -> On: Less than 10 ms On -> Off: Less than 12 ms
Common method	8 points / COM
Display	LED display
Insulation method	Relay
External power supply	DC 24V
Weight (g)	375



Relay Board (SLP-RY4A)

4.2 Terminal Board

The specifications for the terminal board (SLP-T40P) are as follows:

Item	Specifications (SLP-T40P)
No of pins	40 pins
Rated voltage	AC, DC 125V
Rated current	1 A
Withstanding voltage	600V for 1 minute
Insulation resistance	100 M ohm (DC 500V)
Applied wire	1.25 mm ² / MAX
Terminal screw	M3 X 8L
Terminal screw torque	More than 6.2 kgf-cm (M3)
Terminal material	PBT, UL94V-0
Weight (g)	186



Terminal Board (SLP-T40P)

5. Model Numbers

5.1 I/O base, cables (2MLI-CPUU)

Product	Model	Description	Remarks
Main CPU Base (only for 2MLI-CPUU)	2MLB-M04A	For 4 module installation	
	2MLB-M06A	For 6 module installation	
	2MLB-M08A	For 8 module installation	
	2MLB-M12A	For 12 module installation	
Expansion I/O Base (only for 2MLI-CPUU)	2MLB-E04A	For 4 module installation	
	2MLB-E06A	For 6 module installation	
	2MLB-E08A	For 8 module installation	
	2MLB-E12A	For 12 module installation	
Power module (only for 2MLI-CPUU)	2MLP-ACF1	AC 100V~240V input, DC 5V: 3A DC 24V: 0.6A	
	2MLP-ACF2	AC 100V~240V input DC 5V: 6A	
	2MLP-AC23	AC 100V~240V input DC 5V: 8.5A	
	2MLP-DC42	DC 24V Input DC 5V: 6A	
Expansion I/O cable (only for 2MLI-CPUU)	2MLC-E041	Length: 0.4m	Total extension distance should not exceed 15m
	2MLC-E061	Length: 0.6m	
	2MLC-E121	Length: 1.2m	
	2MLC-E301	Length: 3.0m	
	2MLC-E501	Length: 5.0m	
	2MLC-E102	Length: 10.0m	
	2MLC-E152	Length: 15.0 m	

5.2 I/O base, I/O interface modules, cables (2MLR-CPUH)

Product	Model	Description	Remarks
Main CPU Base (for 2MLR-CPUH/T, 2MLR-CPUH/F)	2MLR-M06P	CPU base for 6 module installation	
Expansion I/O Base (for 2MLR-CPUH/T, 2MLR-CPUH/F)	2MLR-E12P	I/O Base for 12 module installation	
Power module (for 2MLR-CPUH/T, 2MLR-CPUH/F)	2MLR-AC13	Power Module, 8.5A, Voltage (AC110V)	
	2MLR-AC23	Power Module, 8.5A, Voltage (AC220V)	
	2MLR-AC12	Power Module, 5.5A, Voltage (AC110V)	
	2MLR-AC22	Power Module, 5.5A, Voltage (AC220V)	
	2MLR-DC42	Power Module, 7.5A, Voltage (DC24V)	
I/O interface modules (for 2MLR-CPUH/T, 2MLR-CPUH/F)	2MLR-DBSF	I/O Interface Module, Fiber Optic	
	2MLR-DBST	I/O Interface Module, TP/CAT5	
	2MLR-DBSH	I/O Interface Module, Hybrid (Fiber Optic & TP/CAT5)	

5.3 Digital I/O modules

Product	Model	Description	Remarks
Digital Input Module	2MLI-D21A	DC 24V Input, 8 point (Current source / sink input)	
	2MLI-D22A	DC 24V Input, 16 point (Current source / sink input)	
	2MLI-D24A	DC 24V Input, 32 point (Current source / sink input)	
	2MLI-D28A	DC 24V Input, 64 point (Current source / sink input)	
	2MLI-D22B	DC 24V Input, 16 point (Current source input)	
	2MLI-D24B	DC 24V Input, 32 point (Current source input)	
	2MLI-D28B	DC 24V Input, 64 point (Current source input)	
	2MLI-A12A	AC 110V input, 16 point	
	2MLI-A21A	AC 220V input, 8 point	
Digital Output Module	2MLQ-RY1A	Relay output, 8 point (for 2A, single COM.)	
	2MLQ-RY2A	Relay output, 16 point (for 2A)	
	2MLQ-RY2B	Relay output, 16 point (for 2A), Varistor included	
	2MLQ-TR2A	Transistor output, 16 point (for 0.5A, Sink output)	
	2MLQ-TR4A	Transistor output, 32 point (for 0.1A, Sink output)	
	2MLQ-TR8A	Transistor output, 64 point (for 0.1A, Sink output)	
	2MLQ-TR2B	Transistor output 16 point (for 0.5A, Source output)	
	2MLQ-TR4B	Transistor output 32 point (for 0.1A, Source output)	

Product	Model	Description	Remarks
	2MLQ-TR8B	Transistor output 64 point (for 0.1A, Source output)	
	2MLQ-SS2A	Triac output, 16 point (for 0.6A)	

5.4 Analog I/O, HSC Modules

Product	Model	Description	Remarks
Analog Input modules	2MLF-AV8A	- Voltage Input: 8 channels - DC 1 ~ 5V / 0 ~ 5V / 0 ~ 10V / -10 ~ +10V	
	2MLF-AC8A	- Current Input: 8 channels - DC 4 ~ 20mA / 0 ~ 20mA	
	2MLF-AD8A	Voltage/Current Input: 8 channels	
	2MLF-AD16A	Voltage/Current Input: 16 Channels	
	2MLF-AD4S	- Voltage/Current Input: 4 channels - Isolation between channels	
Analog Output modules	2MLF-DV4A	- Voltage Output: 4 channels - DC 1 ~ 5V / 0 ~ 5V / 0 ~ 10V / -10 ~ +10V	
	2MLF-DC4A	- Current Output: 4 channels - DC 4 ~ 20mA / 0 ~ 20mA	
	2MLF-DC4S	Current Output: 4 channels, Isolation between channels	
	2MLF-DV8A	- Voltage Output: 8 channels - DC 1 ~ 5V / 0 ~ 5V / 0 ~ 10V / -10 ~ +10V	
	2MLF-DC8A	- Current Output: 8 channels - DC 4 ~ 20mA / 0 ~ 20mA	
Thermocouple Input Module	2MLF-TC4S	Temperature (T/C) Input, 4 channels, Isolation between channels	
RTD Input Module	2MLF-RD4A	Temperature (RTD) Input, 4 channels	

Product	Model	Description	Remarks
High speed Counter Module	2MLF-HO2A	- Voltage Input type (Open Collector type) 200 kHz, 2 channel	
	2MLF-HD2A	- Differential Input type (Line Driver type) 500 kHz, 2 channel	

5.5 Others

Product	Model	Description	Remarks
Terminator	2MLT-TERA	Must use for base expansion	
Dummy module	2MLT-DMMA	Dust protection module for unused slot	

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