

MasterLogic-50

Programmable Logic

Controller

Specification

Overview

Honeywell's new ML50 compact PLC, with its innovative architecture combines power and versatility to help provide performance in a slim, compact and affordable solution. With its high performance and functionality, the new ML50 PLC offer economical automation platform for many industrial control applications. The ML50 family can be used just as I/O, as a standalone PLC or as a distributed control. It offers broad selection of Base modules, Expansion I/O modules, various network interface options and some special modules to enhance control capabilities.

Features

• Easiness and Convenience

ML50 series offers convenient user interface with various network diagnosis & monitoring and back-up functions.

- Enhanced user interface
- Various monitoring functions
- Network diagnosis & monitoring
- Battery less back-up
- Support IEC Programming(MLI)
- All-in-one PLC(U series)

• Compactness

ML50 series is very compact but provides powerful functions and performance. Compact & Powerful performance is ML50's steadfast competitiveness.

• Functionality

With its powerful and various built-in functions, ML series can provide optimum solution for your automation task.

- Communication: RS232, RS485
- 2-axis positioning functions
- High speed counter
- PID Control
- Various input processing like pulse

catch, input filter

- RTC (Real Time Clock) : H/U type, SU/E type : Option
- Built-in Ethernet ports(switching) : U

• High performance

With its high-speed processing(32bit micro processor) and system capability, ML50 series offers utmost efficiency for your applications.

- Appropriate and High processing speed per step and floating-point arithmetic with on-board CPU(32bit)
- Up to 7 expansion modules for S/SU type and Up to 10 expansion modules for H/U type, 256 I/O point control for S/SU type and max. 384 I/O point control for H/U type – PLC system for low-to-mid level applications
- Up to 5 communication ports with built-in-functions and expansion modules

• Integrated programming & debug environment

ML50 series offers enhanced programming convenience and various

monitoring / diagnosis functions.

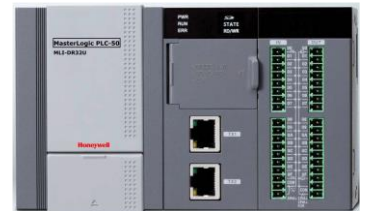
- Programming flexibility with max 715 instructions (28 basic instructions, 677 application instructions for S type and 28 basic instructions, 687 application instructions for H type) and available function blocks (MLI)
- Multi-PLC, Multi-program management integrated network setting monitoring & diagnosis
- Convenient variable editing
- Compatibility with Microsoft Excel
- Address, Special module & Custom trend monitor
- Downloading configuration via USB port (H/U type)

• Easy Expansion

With its detachable terminal block and MIL connector, ML50 provides easy and convenient way for wiring and module change. For expansion of PLC system, each expansion module can be easily connected and separated by its direct-insert method.



S type(MLM)



MLI- U series



MLU series



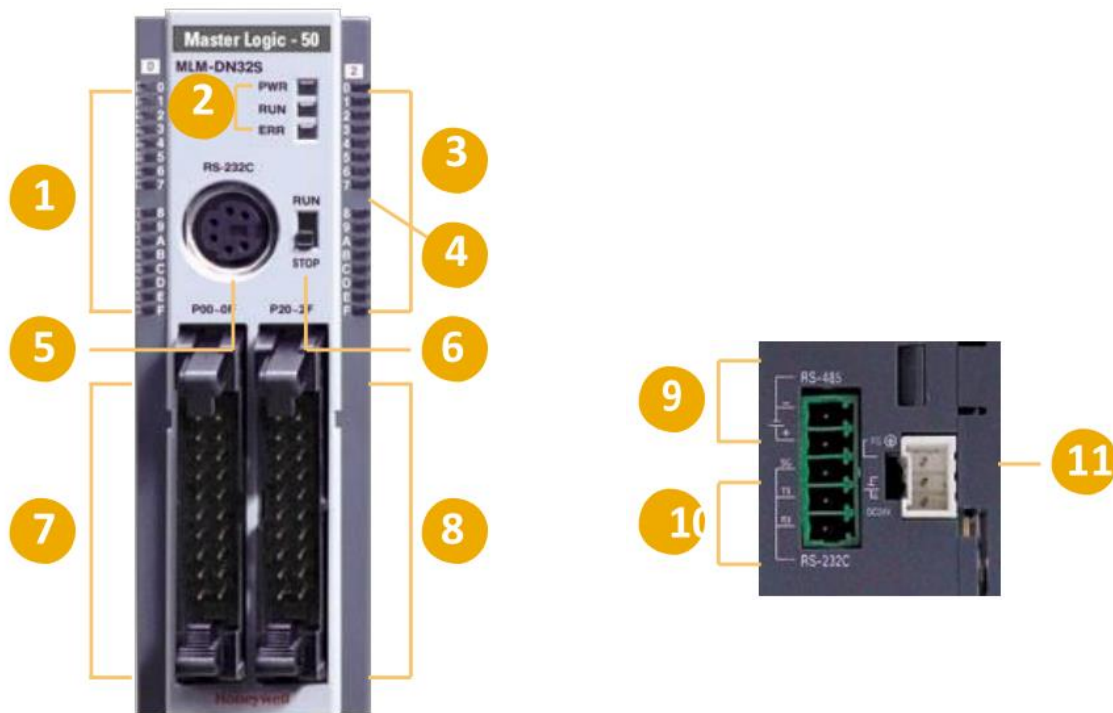
H types(MLC, MLI)



SU, E types(MLI)

Specifications (MLM-DR16S, MLM-DN16S, MLM-DN32S / MLU-DN32HP)							
General							
Rated Power Supply Voltage		24V DC					
Inrush Current (when power supply turns on)		70 Apeak or less					
Insulation Resistance		Higher than 10MΩ under DC 500V megger during power terminal and PE terminal					
Withstand Voltage		500V DC for 1min across power terminal and PE terminal					
Noise Resistance (IEC61131-2)		Square wave impulse noise : +/-1,500V				-	
		Electrostatic discharge : 4kV				IEC61000-4-2	
		Rated electromagnetic field noise : 27 to 500MHz, 10V/m				IEC61000-4-3	
		EFT/B : 2kV in Main unit, 1kV in expansion module				IEC61000-4-4	
Operative Limits	Ambient Temperature	0 to 65°C					
	Relative Humidity	5 to 95%RH (non-condensing)					
	Vibration Resistance (IEC61131-2)	Occasional vibration			Continuous vibration		
		Frequency	Acceleration	Pulse width	Frequency	Acceleration	Pulse width
		10 to 57Hz	-	0.075mm	10 to 57Hz	-	0.035mm
		57 to 150Hz	9.8m/s²	-	57 to 150Hz	4.9m/s²	-
		10 times each direction(X, Y and Z)					
	Shock Resistance (IEC61131-2)	Peak Acceleration: 147 m/s² (15g)					

Indicators and Connectors

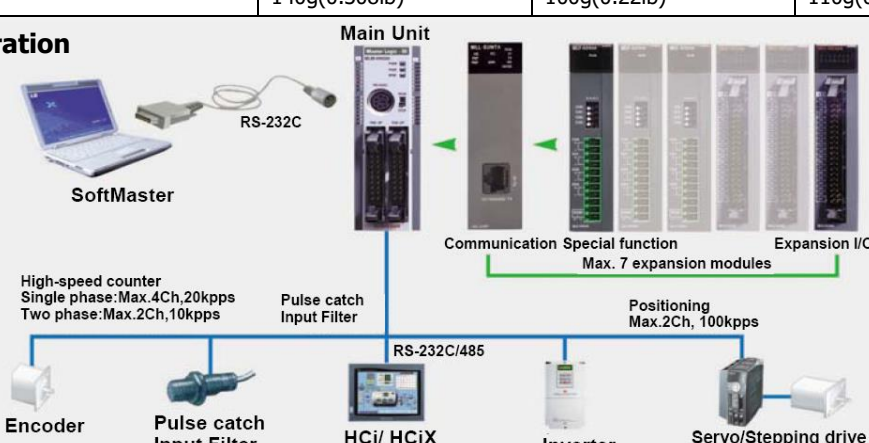


Name		Description	
1	Input LED	Input Indication	Red on/off. Input signal on/off
2	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on/off. PLC error. Red off. PLC normal condition
3	Output LED	Output LED	On/off. Output signal on/off.
4	Expansion Module Connector	Connection of expansion module (I/O, Special function, Communication)	
5	PADT connector	PADT connection	Connector for SoftMaster / monitoring
6	Mode Switch *1	Mode setting	Setting RUN/STOP model of PLC
7	Input Connector / Terminal Block	Input wiring connection	
8	Output Connector / Terminal Block	Output wiring connection	
9	RS 485 Connector	Built-in RS-485 terminal connection	
10	RS-232C Connector *2	Built-in RS232C TxD, RxD, GND terminal connection	
11	Power Connector*3	Power supply connection	DC24V Power Supply

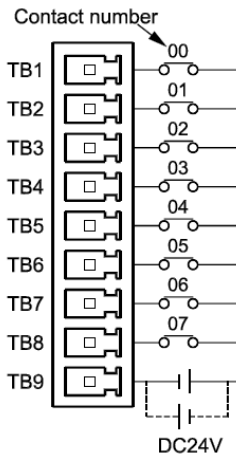
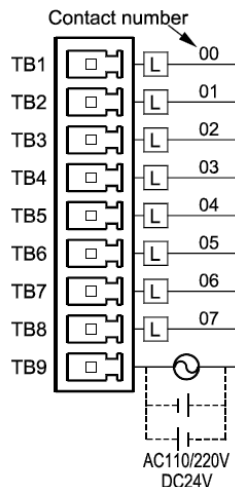
*1) In the remote mode, set the mode switch STOP.

*2) GND terminal of RS-232C can be used as GND terminal of RS-485.

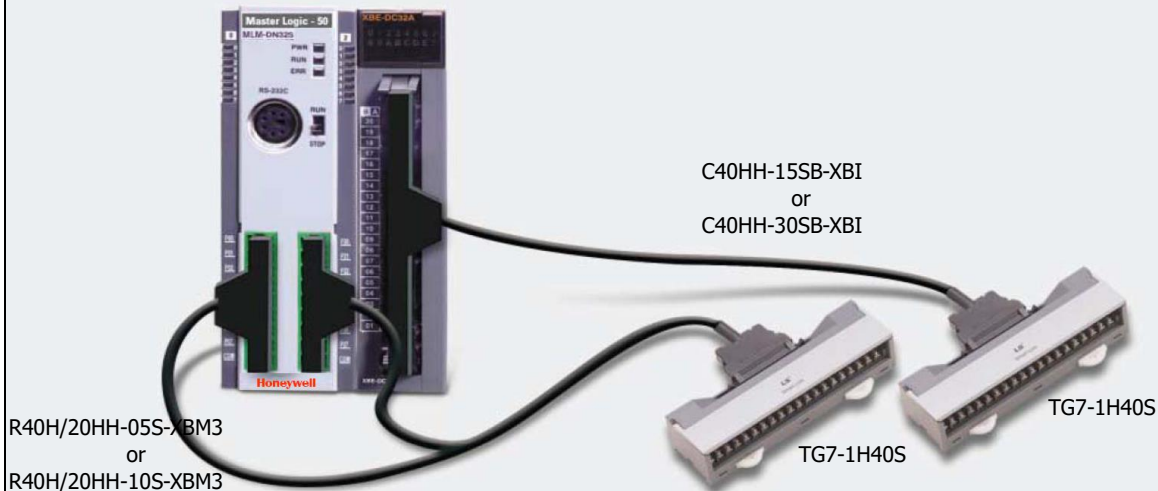
*3) Select DC power supply considering current consumption of PLC system.

Specifications			
Model	MLM-DR16S	MLM-DN16S	MLM-DN32S
Performance			
Internal Current Consumption / Output Current	400mA / 1.5A	250mA / 1.5A	280mA / 1.5A
Control Method	Repetitive, cyclic, interrupt, constant scan		
I/O Control Mode	Refresh mode (Batch processing by scan synchronization) Direct mode by instructions		
Programming Language	Ladder diagram, Instruction List		
Number of Instructions	Basic : 28, Applied : 677		
Processor / Processing Speed	16bit / 0.16 μs/Step (for basic instruction)		
Program Capacity	10 kilo-steps		
Max. I/O Points(Main + 7 expansions)	240 points		256 points
Data Memory	P	P0000 – P127F (2,048 points)	
	M	M0000 – M255F (4,096 points)	
	K	K00000 – K2559F (Special area: K2600 – 2559F) (40,960 points)	
	L	L00000 – L1279F (20,480 points)	
	F	F000 – F255F (4,096 points)	
	T	100msec, 10msec, 1msec: T000 – T255 (Changeable by parameter setting)	
	C	C000 – C255	
	S	S00.00 – S127.99	
	D	D0000 – D5119 (5,120 word)	
	U	U00.00 – U07.31 (Analog data refresh area: 256 word)	
	Z	Z000 – Z127 (128 word)	
	N	N0000 – N3935 (3,936 word)	
No. of Program	128		
Operation Mode	RUN, STOP, DEBUG		
Self Diagnostic	Operation delay monitoring, Memory error, I/O error, Power supply failure, etc.		
Program Port	RS-232C (Loader) Remote connection using RS-232C, RS-485		
Data Retention at Power Failure	Latch range setting at Basic parameter		
Built-in Functions	RS-232C/485, High-speed counter, PID control, Pulse catch, Input Filter		
	-	External interrupt, Positioning	
Weight	140g(0.308lb)	100g(0.22lb)	110g(0.243lb)
System Configuration			
 The diagram illustrates the system configuration centered around the Main Unit. It shows the following components and their connections: SoftMaster: A laptop connected to the Main Unit via RS-232C. Expansion Modules: Up to 7 modules can be added to the Main Unit, including: Communication Special function Expansion I/O Input/Output Connections: Encoder: Connected to the Main Unit for High-speed counter (Single phase: Max. 4Ch, 20kpps; Two phase: Max. 2Ch, 10kpps). Pulse catch Input Filter: Connected to the Main Unit for Pulse catch and Input Filter. HCI/ HcIX: A handheld device connected to the Main Unit via RS-232C/485. Inverter: Connected to the Main Unit for Positioning (Max. 2Ch, 100kpps). Servo/Stepping drive: Connected to the Main Unit for Positioning (Max. 2Ch, 100kpps).			

Specifications				
DC INPUT				
Model		Main Unit		
		MLM-DR16S	MLM-DN16S	MLM-DN32S
Input Points		8	8	16
Insulation Method		Photo-coupler insulation		
Rated Input Voltage / Current		DC24V / 4mA (Contact 00 ~ 03 : 7mA)		
Operation Voltage Range		DC 20.4 to 28.8 V (Ripple rate < 5%)		
ON Voltage / Current		DC19V or more / 3mA or more		
OFF Voltage / Current		DC6V or less / 1mA or less		
Input Resistance		5.6 KΩ (Contact 00~03: 3.3 KΩ)		
Response Time	OFF→ON	1 / 3 / 5 / 10 / 20 / 70 / 100 msec (setting by CPU parameter). Initial value: 3msec		
	ON→OFF			
Insulation Pressure		AC 560Vrms / 3 Cycle (altitude 2000m(6,561.68 fts))		
Insulation Resistance		10 MΩ or more by megger		
COMMON Method		8 points / COM		16 points/COM
Proper Cable Size		Twisted wire 0.3 – 0.75 mm² (external diameter ≤ 2.8mm, 0.11inch)		
Operation Indication		Input On, LED On		
External Connection Method		9-Pin Terminal block	20-pin Connector	20-pin Connector
Open collector OUTPUT				
Model		Main Unit		
		MLM-DN16S		MLM-DN32S
Output Points		8	16	
Insulation Method		Photo-coupler insulation		
Rated Load Voltage		DC 12 / 24V		
Load Voltage Range		DC10.2 to 26.4V		
Max. Load Current		0.2A / Point		0.2A/Point,2A/COM
OFF Leakage Current		0.1mA or less		
Max. Voltage Drop(ON)		DC 0.4V		
Surge Absorber		Zener Diode		
Response Time	OFF→ON	1msec or less		
	ON→OFF	1msec or less(Rated Load, Resistive Load)		
Common Method		8 Points / COM		16 Points / COM
External Power Supply	Voltage	DC12/24V ± 10% (Ripple Voltage ≤ 4 Vp-p)		
	Current	25mA or less (at DC24V)		
Operation Indicator		Output ON, LED ON		
External Connection Method		20-pin connector		

Specifications		
Relay OUTPUT		
Model		Main Unit
		MLM-DR16S
Output Points		8 points
Insulation Method		Relay insulation
Rated Load Voltage/Current		DC 24V, 2A (Resistive load) / AC220V, 2A (COS ψ = 1), 5A/COM
Minimum Load Voltage/Current		DC 5V / 1mA
Maximum Load Voltage/Current		AC250V or DC125V / 2A
OFF Leakage Current		0.1mA (AC250V, 60Hz)
Max. ON/OFF Frequency		3,600 times / Hour
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	10msec or less
	ON→OFF	12msec or less
Common Method		8 points / 1 COM
Operation Indicator		Output ON, LED ON
External Connection		9-pin terminal block
Input & Output wiring		
8-point DC Input		8-point Relay Output
MLM-DR16S		MLM-DR16S
Contact number 		Contact number 

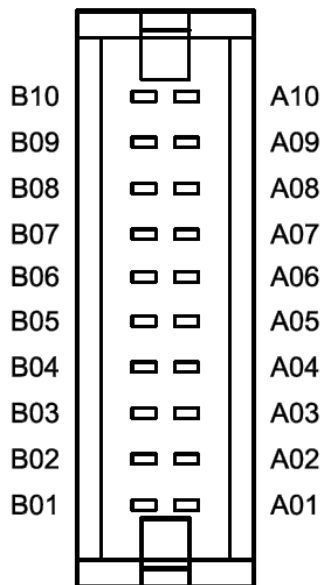
Wiring with Smart Link



ML50 Module	Smart Link Terminal	Description	Cable number	Cable Specification
Main Unit (20+20 pin)	TG701H40S	40pin Main I/O wiring	R40H/20HH-10S-XBM3	Soft tube type 1meter(39.4inch)
			R40H/20HH-05S-XBM3	Soft tube type 0.5meter(19.7inch)
Expansion Input and Output(40pin)	TG701H40S	40pin 32 point expansion I/O wiring	C40HH-15SB-XBI	Soft tube type 1.5meter(59.1inch)
			C40HH-30SB-XBI	Soft tube type 3meter(118.1inch)

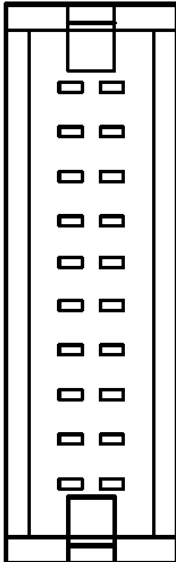
Terminal Layout

20+20pin Terminal Layout(Input)

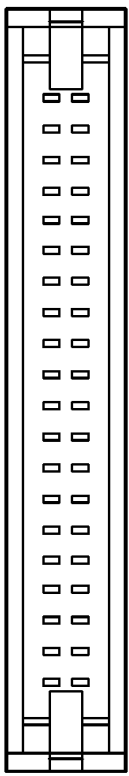


PLC	Smart Link		
	Pin number	MLM-DN16S	MLM-DN32S
			TG7-1H40S
B10	00	00	A1
B09	01	01	B1
B08	02	02	A2
B07	03	03	B2
B06	04	04	A3
B05	05	05	B3
B04	06	06	A4
B03	07	07	B4
B02	COM0	COM0	A5
B01	COM0	COM0	B5
A10	NC	08	A6
A09	NC	09	B6
A08	NC	0A	A7
A07	NC	0B	B7
A06	NC	0C	A8
A05	NC	0D	B8
A04	NC	0E	A9
A03	NC	0F	B9
A02	NC	COM1	A10
A01	NC	COM1	B10

20+20pin Terminal Layout(Output)

 Diagram showing a 20+20pin terminal layout. The left side has pins labeled B10 down to B01. The right side has pins labeled A10 down to A01. The pins are arranged in two columns of 10 each, with a central gap.	PLC			Smart Link
	Pin number	MLM-DN16S	MLM-DN32S	TG7-1H40S
	B10	20	20	A11
	B09	21	21	B11
	B08	22	22	A12
	B07	23	23	B12
	B06	24	24	A13
	B05	25	25	B13
	B04	26	26	A14
	B03	27	27	B14
	B02	+12 / 24V	+12 / 24V	A15
	B01	+12 / 24V	+12 / 24V	B15
	A10	NC	28	A16
	A09	NC	29	B16
	A08	NC	2A	A17
	A07	NC	2B	B17
	A06	NC	2C	A18
	A05	NC	2D	B18
	A04	NC	2E	A19
	A03	NC	2F	B19
	A02	COM0	COM0	A20
	A01	COM0	COM0	B20

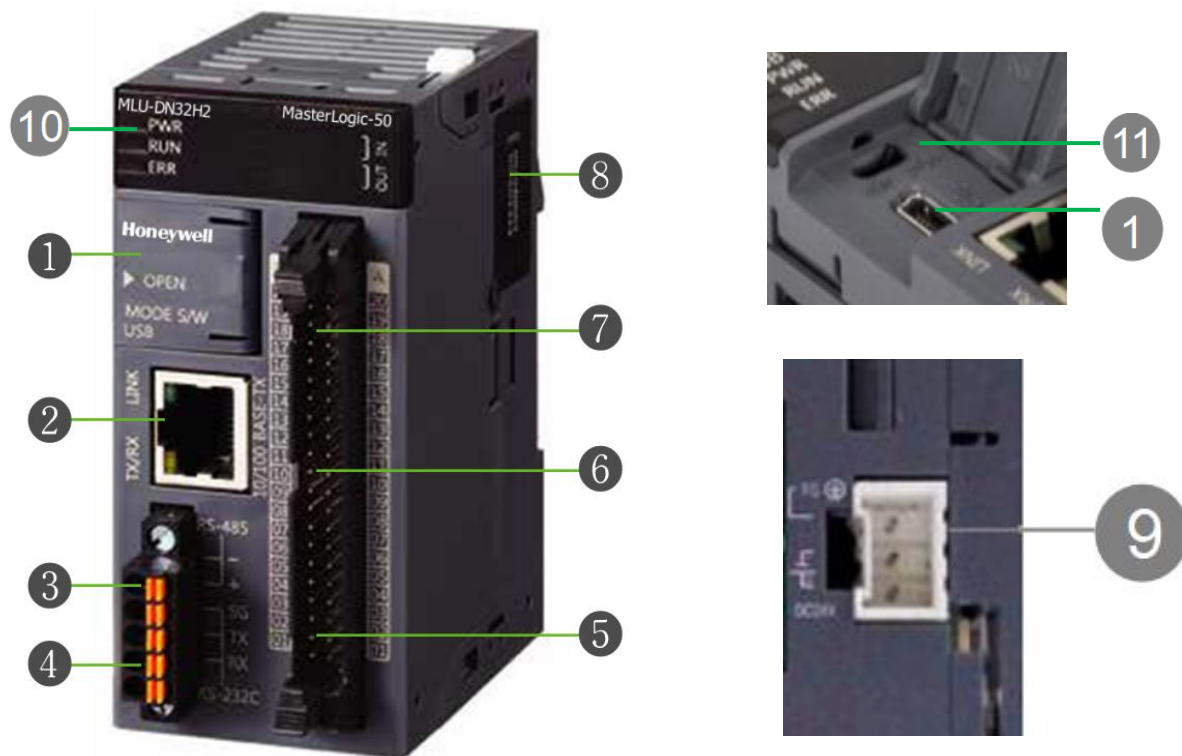
40+40pin Terminal Layout(Output)

 Diagram showing a 40+40pin terminal layout. The left side has pins labeled B20 down to B01. The right side has pins labeled A20 down to A01. The pins are arranged in two columns of 20 each, with a central gap.	PLC						Smart Link	
	Pin number		MLE-DC32A ^(Note1)		MLE-TN32A ^(Note1)		TG7-1H40S (I/O Link terminal)	
	B20	A20	00(20)	10(30)	00(20)	10(30)	A1	A11
	B19	A19	01(21)	11(31)	01(21)	11(31)	B1	B11
	B18	A18	02(22)	12(32)	02(22)	12(32)	A2	A12
	B17	A17	03(23)	13(33)	03(23)	13(33)	B2	B12
	B16	A16	04(24)	14(34)	04(24)	14(34)	A3	A13
	B15	A15	05(25)	15(35)	05(25)	15(35)	B3	B13
	B14	A14	06(26)	16(36)	06(26)	16(36)	A4	A14
	B13	A13	07(27)	17(37)	07(27)	17(37)	B4	B14
	B12	A12	08(28)	18(38)	08(28)	18(38)	A5	A15
	B11	A11	09(29)	19(39)	09(29)	19(39)	B5	B15
	B10	A10	0A(2A)	1A(3A)	0A(2A)	1A(3A)	A6	A16
	B09	A09	0B(2B)	1B(3B)	0B(2B)	1B(3B)	B6	B16
	B08	A08	0C(2C)	1C(3C)	0C(2C)	1C(3C)	A7	A17
	B07	A07	0D(2D)	1D(3D)	0D(2D)	1D(3D)	B7	B17
	B06	A06	0E(2E)	1E(3E)	0E(2E)	1E(3E)	A8	A18
	B05	A05	0F(2F)	1F(3F)	0F(2F)	1F(3F)	B8	B18
	B04	A04	NC	NC	NC	NC	A9	A19
	B03	A03	NC	NC	NC	NC	B9	B19
	B02	A02	COM	COM	DC12/24V	COM	A10	A20
	B01	A01					B10	B20

*NOTE1) The number inside () is the address of 64point I/O module.

Wiring Diagram	
Model	Wiring Diagram
MLM-DN16S Wiring Diagram	
MLM-DN32S Wiring Diagram	
MLE-DC32A Input Wiring Diagram	
MLE-TN32A Output Wiring Diagram (TG7-1H40S)	

Indicators and Connectors MLU-DN32HP

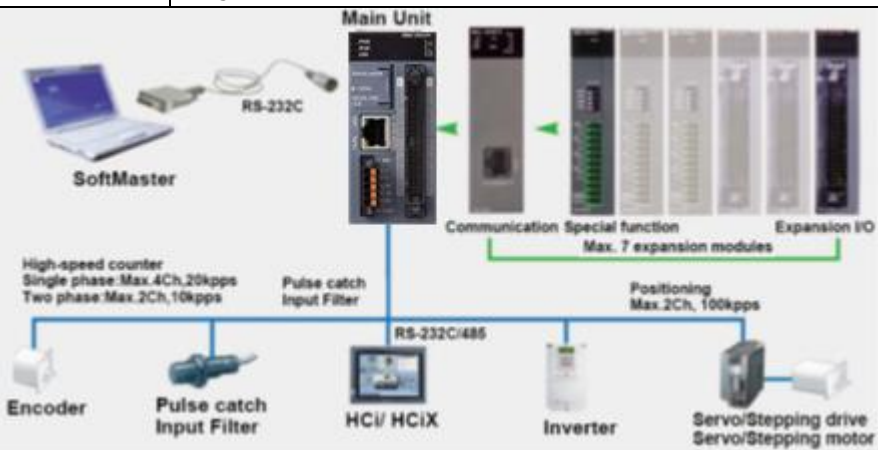


Name		Description	
1	USB Connector	For configuring	Connector for SoftMaster / monitoring
2	Connector for built-in FEnet	Connector of built-in FEnet, 1 port.	
3	RS 485 Connector	Built-in RS-485 terminal connection	
4	RS-232C Connector * ²	Built-in RS232C TxD, RxD, GND terminal connection	
5	Input Connector / Terminal Block	Input wiring connection	
6	Output Connector / Terminal Block	Output wiring connection	
7	High speed counter on DI	Input wiring and built-in Hi-speed counter	
8	Expansion Module Connector	Connection of expansion module (I/O, Special function, Communication)	
9	Power Connector* ³	Power supply connection	DC24V Power Supply
10	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on/off. PLC error. Red off. PLC normal condition
11	Mode Switch * ¹	Mode setting	Setting RUN/STOP model of PLC

*1) In the remote mode, set the mode switch STOP.

*2) GND terminal of RS-232C can be used as GND terminal of RS-485.

*3) Select DC power supply considering current consumption of PLC system.

Specifications			
Model		MLU-DN32HP	
Performance			
Internal Current Consumption / Output Current		540mA / 2A	
Control Method		Repetitive, cyclic, interrupt, constant scan	
I/O Control Mode		Refresh mode (Batch processing by scan synchronization) Direct mode by instructions	
Programming Language		Ladder diagram, Instruction List, SFC, ST	
Number of Instructions	Operator and Function	Operator : 18, Basic : 136+Floating Point Arithmetic Functions	
	Function Block	Basic : 43, Special : Each special module offers the own function blocks	
Processor / Processing Speed		32bit / 60 ns/Step (for basic instruction)	
Program Capacity		384kB (32kSteps)	
Max. I/O points		256 points (Main + Expansion 7 stages)	
Data Area	Automatic variable (A)		64KB (All area retain setting available)
	Input variable (I)		2 KB (%IX15.15.63)
	Output variable (Q)		2 KB (%QX15.15.63)
	Direct variable	M	32KB (All area retain setting available)
		R	32KB (2block)
		W	64KB
	Flag variable	F	4KB
		K	8KB
		L	8KB
		U	576KB
N		N0000 ~ N10239 (10,240 word)	
No. of Program		256	
Operation Mode		RUN, STOP, DEBUG	
Self Diagnostic		Operation delay monitoring, memory error, I/O error, battery error, power error, etc.	
Program Port		USB (Rev 2.0) and FEnet(optionally)	
Data Retention at Power Failure		Latch range setting at Basic parameter	
Built-in Functions		RS-232C/485, High-speed counter, PID control, Pulse catch, Input Filter, External interrupt, SNTP(Time-Sync), SMTP(Emailing to users)	
Built-in Functions		FEnet, 1 port. IP address(Default)=192.168.250.120	
Positioning/Motion control		EtherCAT, 2 modules with hi-speed	
Weight		134g	
System Configuration			
			

Specifications		
DC INPUT		
Model		Main Unit
		MLU-DN32HP
Input Points		16
Insulation Method		Photo-coupler insulation
Rated Input Voltage / Current		DC24V / 4mA (Contact 00 ~ 03 : 7mA)
Operation Voltage Range		DC 20.4 to 28.8 V (Ripple rate < 5%)
ON Voltage / Current		DC19V or more / 3mA or more
OFF Voltage / Current		DC6V or less / 1mA or less
Input Resistance		5.6 KΩ (Contact 00~03: 3.3 KΩ)
Response Time	OFF→ON	1 / 3 / 5 / 10 / 20 / 70 / 100 msec (setting by CPU parameter). Initial value: 3msec
	ON→OFF	
Insulation Pressure		AC 560Vrms / 3 Cycle (altitude 2000m(6,561.68 fts))
Insulation Resistance		10 MΩ or more by megger
COMMON Method		16 points / COM
Proper Cable Size		Twisted wire 0.3 – 0.75 mm ² (external diameter ≤ 2.8mm, 0.11inch)
Operation Indication		Input On, LED On
External Connection Method		40-pin Connector(20 pins for digital input)
Open collector OUTPUT		
Model		Main Unit
		MLU-DN32HP
Output Points		16
Insulation Method		Photo-coupler insulation
Rated Load Voltage		DC 12 / 24V
Load Voltage Range		DC10.2 to 26.4V
Max. Load Current		0.2A/Point,2A/COM
OFF Leakage Current		0.1mA or less
Max. Voltage Drop(ON)		DC 0.4V
Surge Absorber		Zener Diode
Response Time	OFF→ON	1msec or less
	ON→OFF	1msec or less(Rated Load, Resistive Load)
Common Method		16 Points / COM
External Power Supply	Voltage	DC12/24V ± 10% (Ripple Voltage ≤ 4 Vp-p)
	Current	25mA or less (at DC24V)
Operation Indicator		Output ON, LED ON
External Connection Method		40-pin connector(20 pins for digital output)

Wiring with Smart Link

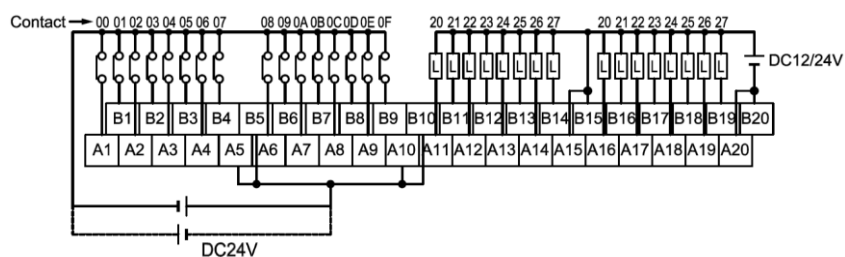
ML50 Module	Smart Link Terminal		Description	Cable number	Cable Specification
MLU-DN32HP : Input and Output(40pin)	TG701H40S	40pin	32 point expansion I/O wiring	C40HH-15SB-XBI	Soft tube type 1.5meter(59.1inch)
				C40HH-30SB-XBI	Soft tube type 3meter(118.1inch)

Terminal Layout

40+40pin Terminal Layout(Output)

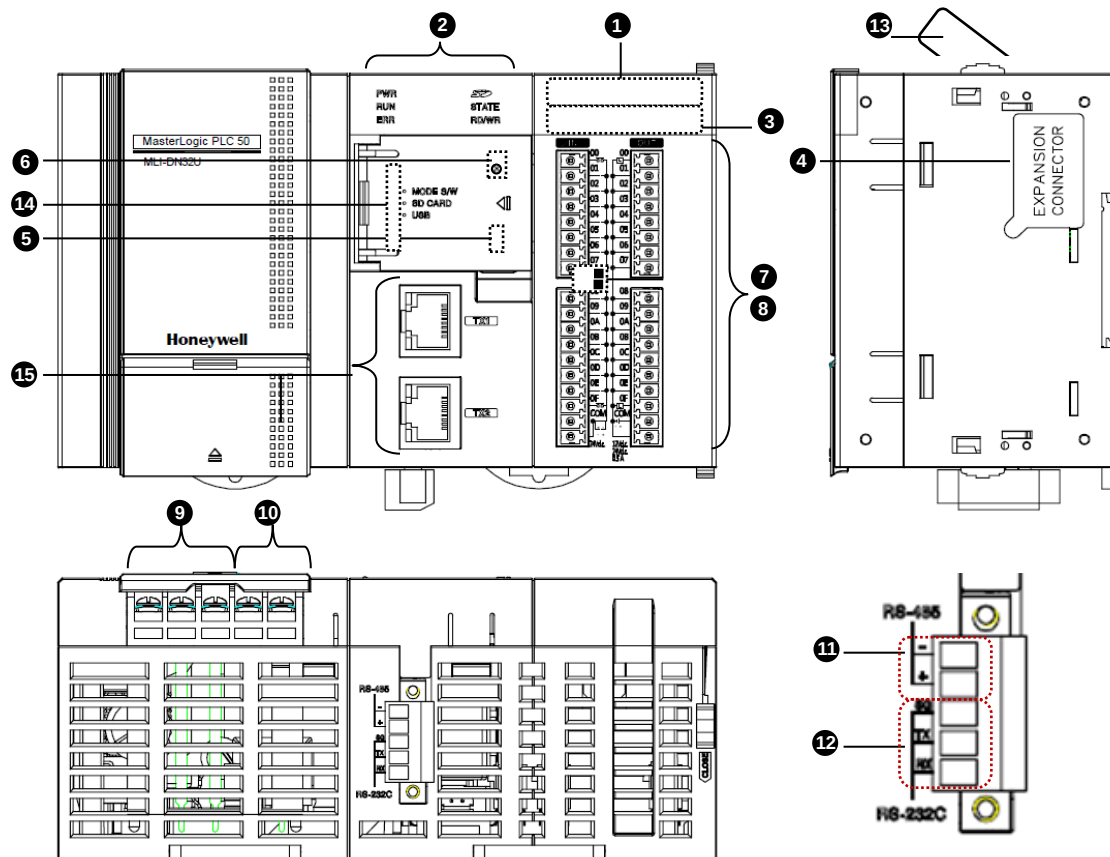
		PLC						Smart Link	
		Pin number		MLE-DC32A ^(Note1)		MLE-TN32A ^(Note1)		TG7-1H40S (I/O Link terminal)	
B20	A20	B20	A20	00(20)	10(30)	00(20)	10(30)	A1	A11
B19	A19	B19	A19	01(21)	11(31)	01(21)	11(31)	B1	B11
B18	A18	B18	A18	02(22)	12(32)	02(22)	12(32)	A2	A12
B17	A17	B17	A17	03(23)	13(33)	03(23)	13(33)	B2	B12
B16	A16	B16	A16	04(24)	14(34)	04(24)	14(34)	A3	A13
B15	A15	B15	A15	05(25)	15(35)	05(25)	15(35)	B3	B13
B14	A14	B14	A14	06(26)	16(36)	06(26)	16(36)	A4	A14
B13	A13	B13	A13	07(27)	17(37)	07(27)	17(37)	B4	B14
B12	A12	B12	A12	08(28)	18(38)	08(28)	18(38)	A5	A15
B11	A11	B11	A11	09(29)	19(39)	09(29)	19(39)	B5	B15
B10	A10	B10	A10	0A(2A)	1A(3A)	0A(2A)	1A(3A)	A6	A16
B09	A09	B09	A09	0B(2B)	1B(3B)	0B(2B)	1B(3B)	B6	B16
B08	A08	B08	A08	0C(2C)	1C(3C)	0C(2C)	1C(3C)	A7	A17
B07	A07	B07	A07	0D(2D)	1D(3D)	0D(2D)	1D(3D)	B7	B17
B06	A06	B06	A06	0E(2E)	1E(3E)	0E(2E)	1E(3E)	A8	A18
B05	A05	B05	A05	0F(2F)	1F(3F)	0F(2F)	1F(3F)	B8	B18
B04	A04	B04	A04	NC	NC	NC	NC	A9	A19
B03	A03	B03	A03	NC	NC	NC	NC	B9	B19
B02	A02	B02	A02	COM	COM	DC12/24V	COM	A10	A20
B01	A01	B01	A01	COM	COM	DC12/24V	COM	B10	B20

MLU-DN32HP Wiring Diagram



Specifications (MLI-DR28U, MLI-DN32U, MLI-DR28UA, MLI-DN32UA, MLI-DR28U/DC, MLI-DN32U/DC, MLI-DR28UA/DC, MLI-DN32UA/DC)							
General							
Rated Power Supply Voltage		100 ~ 240V AC or 24Vdc					
Inrush Current (when power supply turns on)		50 Apeak or less					
Insulation Resistance		Higher than 10MΩ under DC 500V megger during power terminal and PE terminal					
Withstand Voltage		1500V AC 50/60Hz for 1min across power terminal and PE terminal					
Noise Resistance (IEC61131-2)		Square wave impulse noise : +/-1,500V Electrostatic discharge : 4kV (contact discharge) Rated electromagnetic field noise : 80 to 1,000MHz, 10V/m EFT/B : 2kV in Main unit, 1kV in expansion module					- IEC61000-4-2 IEC61000-4-3 IEC61000-4-4
Operative Limits	Ambient Temperature	0 to 65°C					
	Relative Humidity	5 to 95%RH (non-condensing)					
	Vibration Resistance (IEC61131-2)	Occasional vibration			Continuous vibration		
		Frequency	Acceleration	Pulse width	Frequency	Acceleration	Pulse width
		10 to 57Hz	-	0.075mm	10 to 57Hz	-	0.035mm
		57 to 150Hz	9.8m/s²	-	57 to 150Hz	4.9m/s²	-
		10 times each direction(X, Y and Z)					
	Shock Resistance (IEC61131-2)	Peak Acceleration: 147 m/s² (15g) Duration: 11ms Pulse waveform: Half-sine, 3 times each direction per each axis					
Transportation & Storage	Ambient temperature	-25 to +70 °C					
	Relative Humidity	5 to +95% RH (non-condensing)					
Pollution Level		≤ 2 Pollution level indicates the degree to which conductive material is generated in the environment where the equipment is used. Pollution level 2 is the condition that only non-conductive pollution occurred but temporary conductivity may be produced due to condensing.					
Operating Ambience		Free from corrosive gases and excessive dust					
Altitude		Up to 2,000 meters(6,561.68 feet)					
Cooling		Air-cooling					
Base Module (unit: $\frac{mm}{inch}$)		$\frac{150.7}{5.933}(W) \times \frac{90.0}{3.543}(H) \times \frac{65.0}{2.560}(D)$			MLI-DN32U, MLI-DR28U MLI-DN32U/DC, MLI-DR28U/DC		
		$\frac{185.0}{7.283}(W) \times \frac{90.0}{3.543}(H) \times \frac{65.0}{2.560}(D)$			MLI-DN32UA, MLI-DR28UA MLI-DN32UA/DC, MLI-DR28UA/DC		

Indicators and Connectors



Name		Description	
1	Input LED	Input Indication	Red on/off. Input signal on/off
2	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on and off. PLC error. Red off. PLC normal condition
		State	Red on/off. Display status for SD card(when installed)
		RD/WR	Display status of operation when installed SD card.
3	Output LED	Output LED	On/off. Output signal on/off.
4	Expansion Module Connector	Connection of expansion module (I/O, Special function, Communication)	
5	PADT connector	PADT connection	Connector for SoftMaster / SoftMaster-NM connection USB (USB 1.1 supported) 1 Ch., RS-232C 1 Ch.
6	Mode Switch *1	Model setting	Setting RUN/STOP model of PLC
7	Input Terminal Block	Input wiring connection	
8	Output Terminal Block	Output wiring connection	
9	Terminal Block Power Supply	Power supply connection	AC 100 ~ 240 V
10	Terminal Block Power output	Power output connection	24Vdc, 0.4A
11	Built-in Communication for RS485	Built-in RS-485 terminal connection	
12	Built-in Communication for RS232C	Built-in RS232C TxD, RxD, SG terminal connection	
13	Battery Holder	Battery (3V) holder for data back-up	
14	SD card Holder	Connector of External SD card interface upto 16GB(FAT32)	
15	Connector for built-in FEnet	Connector of built-in FEnet, 2 ports.	

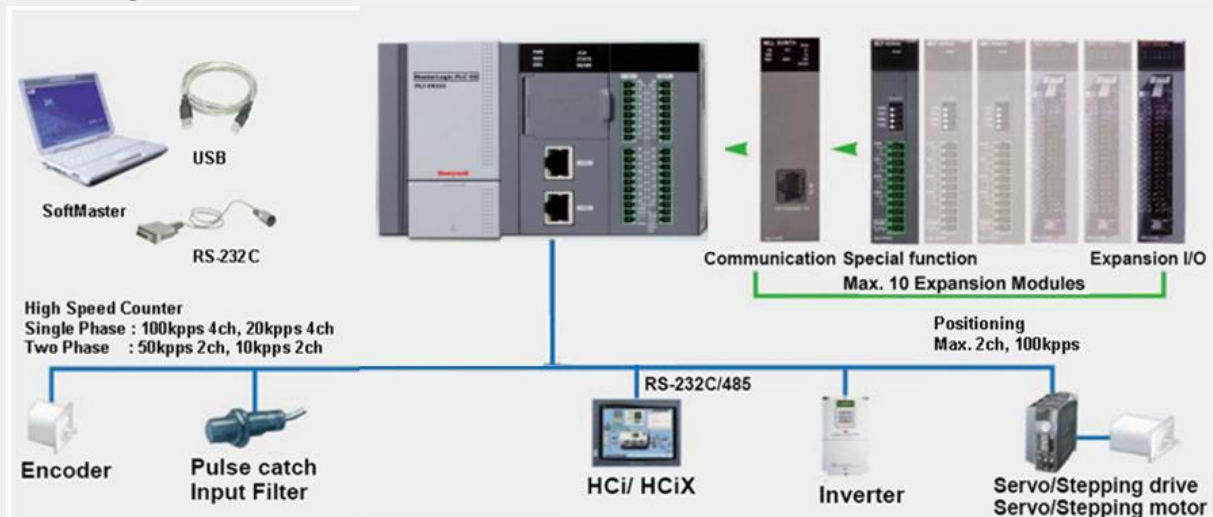
*1) In the remote mode, set the mode switch STOP.

*2) SG terminal of RS-232C can be used as SG terminal of RS-485.

*3) MLI-Dx##UA : Added the IO points(module) with main module, for more detail, please refer to the user guide.

Specifications					
Model		MLI-DR28U	MLI-DN32U	MLI-DR28UA	MLI-DN32UA
Performance					
Internal Current Consumption / Output Current		990mA / 3A	700mA / 2A	1040mA / 3A	780mA / 2A
Control Method		Repetitive, cyclic, interrupt, constant scan			
I/O Control Mode		Refresh mode (Batch processing by scan synchronization) Direct mode by instructions			
Programming Language		Ladder diagram, Instruction List, SFC, ST			
Number of Instructions	Operator and Function	Operator : 18, Basic : 136+Floating Point Arithmetic Functions			
	Function Block	Basic : 43, Special : Each special module offers the own function blocks			
Processor / Processing Speed		32bit / 60 ns/Step (for basic instruction)			
Program Capacity		384kB (32kSteps)			
Max. I/O Points(Main + 10 expansions)		352 points	384 points	352 points	384 points
No. of Program		256			
Operation Mode		RUN, STOP, DEBUG			
Self Diagnostic		Operation delay monitoring, memory error, I/O error, battery error, power error, etc.			
Program Port		USB (Rev 2.0) and FEnet(optionally)			
Data Retention at Power Failure		Latch range setting at Basic parameter			
Built-in Functions		RS-232C/485, High-speed counter, PID control, Pulse catch, Input Filter, External interrupt,			
		-	Positioning	-	Positioning
Built-in Functions		FEnet, 2 ports. IP address(Default)=192.168.250.120			
Positioning/Motion control		EtherCAT, 2 modules with hi-speed			
Weight		630g (1.39lb)	571g (1.26lb)	732g (1.61lb)	683g (1.51lb)

System Configuration



"U" type, Ultimate and High performance type

(1) IEC61131-3 programming

Specifications						
Model			MLI-DR28U	MLI-DN32U	MLI-DR28UA	MLI-DN32UA
Performance						
Data Memory	Symbolic Var.	A	64KB (Retaining area setting is available)			
	Input Var.	I	2KB(%IX 15.15.63)			
	Output Var.	Q	2KB (%QX 15.15.63)			
	Direct Var.	M	32KB (Retaining area setting is available)			
		R	32KB *2 blocks			
		W	64KB, Same area as 'R'			
	Flag Var.	F	4KB, System flag			
		K	16KB, Built-in special flag			
		L	8KB, High speed link flag			
		N	20KB, P2P flag			
		U	768Bytes, Analog Flag			
	Flash Area		128KB (4 block), R device used			
Timer			No limit in points(Time range : 0.001~4,294,967.295)			
Counter			No limit in points(Counter range : 64 bit range)			
Initial Task	Initial task		1			
	Cyclic task		Max 16			
	I/O task		Max 8			
	Internal device task		Max 16			
	High speed counter task		Max 8			
Built-in Function						
PID Control			Control by instruction, auto-tuning, PWM output, Forced output, Operation scan time setting, Anti-windup, Delta MV, PV tracking, Cascade operation			
Serial communication	Protocol		MLDP(Master Logic Dedicated Protocol), Modbus, User-defined, P2P(Client or master) : Embedded00 P2P01			
	Channel		RS232C 1 ch / RS485 1 ch			
Ethernet communication	Transmitting		Cable : 100 Base-TX, speed=100Mbps, Auto MDIX, IEEE802.3			
	Topology		Line, Star (connecting between modules without any switch), max 16 stations			
	Diagnosis		Module information, Service condition			
	Protocol		MLDP(Master Logic Dedicated Protocol), Modbus TCP/IP, User-defined, P2P(Client or master) : Embedded01, P2P02, High-Speed Link01			
	Service		P2P, High-Speed Link, Remote connection			
Data Log	Group		Max 10 groups			
	Data set		32 per group, file format : CSV / File size : Max 16 Mbytes			
	SD memory type		SD,SDHC(Recommendation : Sandisk, Transcend)			
	Memory size		Up to 16 GB, format : FAT32			

Note2. Auto-MDIX(Automatic Medium-dependent Interface Crossover) : It's the function to automatically detect whether the cable connected to the Ethernet port is peer-to-peer(Straight) of cross cable.

Specifications						
Model		MLI-DR28U		MLI-DN32U	MLI-DR28UA	MLI-DN32UA
Built-in Function						
Web server		Protocol:HTTP(Ver1.1)/ optional PLC history/ monitoring device, data log file, etc				
High Speed Counter	Performance	1-phase : 100kHz 8 channels / 2-phase : 50kHz 4 channels				
	Counter	4 counter modes are supported based on input pulse and INC/DEC method 1 pulse operation mode : INC/DEC by program or phase B pulse input 2 pulses operation mode : INC/DEC by pulse input or difference of phase				
	Function	Internal / external preset, latch counter, compare output, no of per unit time				
Positioning	Basic function	No of control Axes	4			
		Control Method	Position, Speed, Speed/Position, Feed Control			
		Control unit	Pulse, mm, inch, degree			
		Positioning data	400 step patterns for each axis			
		Operation pattern	End, Keep, Continuous			
		Operation method	Singular, Repeat			
	Interpolation	2/3/4 axis Linear type, 2 axis Circular type, 3 axis helical type				
	Positioning	Method	Absolute / Incremental method			
		Address range	-2,147,483,648 ~ 2,147,483,647			
		Speed	Max 2 Mpps(1~2,000,000pps)			
		Acc/Dec process	Trapezoid type, S-type			
	Homing method	DOG+HOME(off), DOG+HOME(on), Upper limit+HOME, DOG, High Speed, Upper/Lower, HOME				
	Manual Operation	Jog, MPG, Inching				
	Encoder input	Line drive(RS422A) input, 1 channel (Max 200 kpps)				
Analog input and Output for MLI-D__ UA						
Analog input	Channels	4(Current and Voltage)				
	Specification	Range(note3)	Voltage	1~5V, 0~5V, 0~10V, -10~10V, impedance=1 MΩ or more		
			Current	4-20mA, 0~20mA, impedance=250Ω (within)		
		Resolution	1/16000			
			0.250mV(1~5V), 0.3125mV(0~5V)		1.0μA (4 ~ 20)	
			0.625mV(0 ~ 10V), 1.250mV(±10V)		1.25μA (0 ~ 20)	
Accuracy	±0.2% or less (When ambient temperature is 25℃) ±0.3% or less (When ambient temperature is 0 ~ 55℃)					
Analog output	Channels	Voltage 2 channels ,Current 2 channels				
	Specification	Output Range	Voltage	1~5V, 0~5V, 0~10V, -10~10V, impedance=1 MΩ or more		
			Current	4-20mA, 0~20mA, impedance=600Ω (within)		
		Resolution	1/16000			
			0.250mV(1~5V), 0.3125mV(0~5V)		1.0μA (4 ~ 20)	
			0.625mV(0 ~ 10V), 1.250mV(±10V)		1.25μA (0 ~ 20)	
Accuracy	±0.2% or less (When ambient temperature is 25℃) ±0.3% or less (When ambient temperature is 0 ~ 55℃)					

Note 3. Either Current input or Voltage input can be selected by the terminal.

Specifications				
DC INPUT				
Model		Main Unit		
		MLI-DR28U	MLI-DN32U	MLI-DR28UA MLI-DN32UA
Input Points		16		32
Insulation Method		Photo-coupler insulation		
Rated Input Volt / Current		DC24V / 4mA (Contact 00 ~ 07 : 7mA)		
Operation Voltage Range		DC 20.4 to 28.8 V (Ripple rate < 5%)		
ON Voltage / Current		DC19V or more / 3mA or more		
OFF Voltage / Current		DC6V or less / 1mA or less		
Input Resistance		5.6 KΩ (P00~P07: 2.7 KΩ)		
Response Time	OFF→ON	1 / 3 / 5 / 10 / 20 / 70 / 100 msec (setting by CPU parameter). Initial value: 3msec		
	ON→OFF			
Insulation Pressure		AC 560Vrms / 3 Cycle (altitude 2000m(6,561.68 fts))		
Insulation Resistance		10 MΩ or more by megger		
COMMON Method		8 points / COM		
Proper Cable Size		Twisted wire 0.3 – 0.75 mm ² (external diameter ≤ 2.8mm, 0.11inch)		
Operation Indication		Input On, LED On		
External Connection Method		24 points connecting connector (M3 X 6 screw)		
Open collector OUTPUT				
Model		Main Unit		
		MLI-DN32U		MLI-DN32UA
Output Points		16		
Insulation Method		Photo-coupler insulation		
Rated Load Voltage		DC 12 / 24V		
Load Voltage Range		DC10.2 to 26.4V		
Max. Load Current		0.5A / 1point (P20~23:0.1A/point)		
OFF Leakage Current		0.1mA or less		
Max. Inrush Current		4A / 10msec or less		
Max. Voltage Drop(ON)		DC 0.4V or less		
Surge Absorber		Zener Diode		
Response Time	OFF→ON	1msec or less 1msec or less(Rated Load, Resistive Load)		
	ON→OFF			
Common Method		16 Points / COM		
External Power Supply	Voltage	DC12/24V ± 10% (Ripple Voltage ≤ 4 Vp-p)		
	Current	25mA or less (at DC24V)		
Operation Indicator		Output ON, LED ON		
External Connection Method		24 points connecting connector (M3 X 6 screw)		

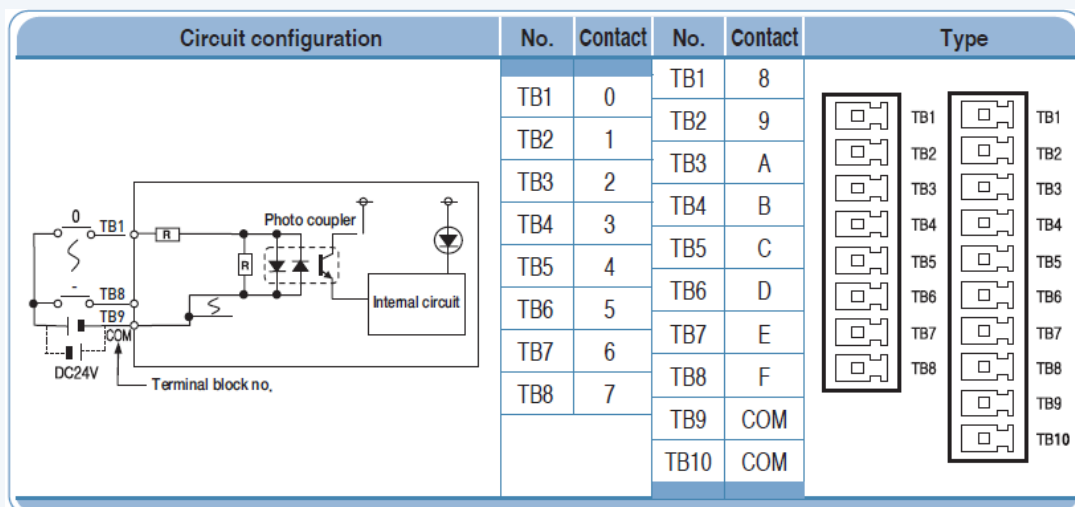
Specifications

Relay OUTPUT

Model	Main Unit	
	MLI-DR28U	MLI-DR28UA
Output Points	12	
Insulation Method	Relay insulation	
Rated Load Voltage/Current	DC 24V, 2A (Resistive load) / AC220V, 2A ($\cos\psi = 1$), 5A/COM	
Minimum Load Voltage/Current	DC 5V / 1mA	
Maximum Load Voltage/Current	AC250V or DC125V / 2A	
OFF Leakage Current	0.1mA (AC220V, 60Hz)	
Max. ON/OFF Frequency	3,600 times / Hour	
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 ($\cos\psi = 0.7$) 100,000 times or more
		AC200V/1A, AC240V/0.5A ($\cos\psi = 0.35$) 100,000 times or more
		DC24V/1A, DC100V/0.1A ($L/R = 7ms$) 100,000 times or more
Response Time	OFF→ON	10msec or less
	ON→OFF	12msec or less
Common Method	1 point / COM (COM0~COM3) for OUT0~OUT3 4 points / COM (COM4 for OUT4~OUT7, COM5 for OUT8~OUT12)	
Operation Indicator	Output ON, LED ON	
External Connection Method	24 point connecting connector (M3 X 6 screw)	

Input & Output wiring

Input wiring (MLI-DR28U / MLI-DN32U / MLI-DR28UA / MLI-DN32UA)



Relay Output wiring (MLI-DR28U / MLI-DR28UA)

Circuit configuration	No.	Contact	Type	
	TB1	0		
	TB2	COM0		TB2
	TB3	1		TB3
	TB4	COM1		TB4
	TB5	2		TB5
	TB6	COM2		TB6
	TB7	3		TB7
	TB8	COM3		TB8
	TB1	4		
	TB2	5		TB2
	TB3	6		TB3
	TB4	7		TB4
	TB5	COM4		TB5
	TB6	8		TB6
	TB7	9		TB7
	TB8	A		TB8
	TB9	B		TB9
	TB10	COM5		TB10

Open Collector wiring (MLI-DN32U / MLI-DN32UA)

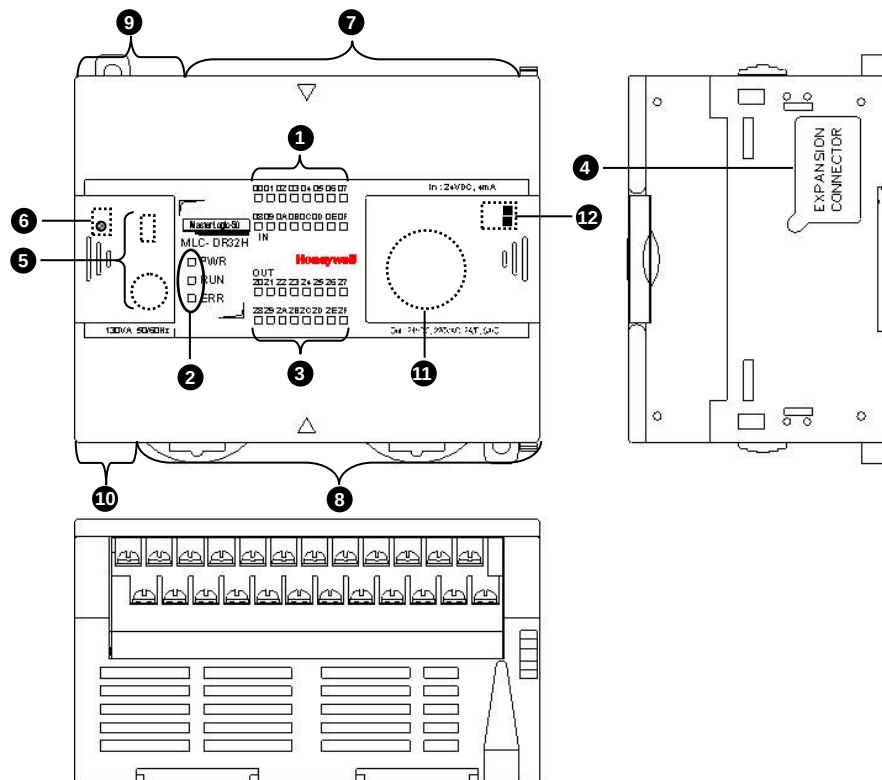
Circuit configuration	No.	Contact	Type	
	TB1	0		
	TB2	1		TB2
	TB3	2		TB3
	TB4	3		TB4
	TB5	4		TB5
	TB6	5		TB6
	TB7	6		TB7
	TB8	7		TB8
	TB1	8		
	TB2	9		TB2
	TB3	A		TB3
	TB4	B		TB4
	TB5	C		TB5
	TB6	D		TB6
	TB7	E		TB7
	TB8	F		TB8
	TB9	DC12/24V		TB9
	TB10	COM		TB10

Specifications (MLC-DR32H, MLC-DN32H, MLC-DR64H, MLC-DN64H) (MLC-DR32H/DC, MLC-DN32H/DC, MLC-DR64H/DC, MLC-DN64H/DC) (MLI-DR32H, MLI-DN32H, MLI-DR64H, MLI-DN64H, MLI-DR32H/D1, MLI-DR64H/D1)

General

Rated Power Supply Voltage		100 ~ 240V AC or 24Vdc					
Inrush Current (when power supply turns on)		50 Apeak or less					
Insulation Resistance		Higher than 10MΩ under DC 500V megger during power terminal and PE terminal					
Withstand Voltage		1500V AC 50/60Hz for 1min across power terminal and PE terminal					
Noise Resistance (IEC61131-2)		Square wave impulse noise : +/-1,500V Electrostatic discharge : 4kV (contact discharge) Rated electromagnetic field noise : 80 to 1,000MHz, 10V/m EFT/B : 2kV in Main unit, 1kV in expansion module				- IEC61000-4-2 IEC61000-4-3 IEC61000-4-4	
Operative Limits	Ambient Temperature	0 to 65°C					
	Relative Humidity	5 to 95%RH (non-condensing)					
	Vibration Resistance (IEC61131-2)	Occasional vibration			Continuous vibration		
		Frequency	Acceleration	Pulse width	Frequency	Acceleration	Pulse width
		10 to 57Hz	-	0.075mm	10 to 57Hz	-	0.035mm
		57 to 150Hz	9.8m/s ²	-	57 to 150Hz	4.9m/s ²	-
		10 times each direction(X, Y and Z)					
Shock Resistance (IEC61131-2)	Peak Acceleration: 147 m/s ² (15g) Duration: 11ms Pulse waveform: Half-sine, 3 times each direction per each axis						
Transportation & Storage	Ambient temperature	-25 to +70 °C					
	Relative Humidity	5 to +95% RH (non-condensing)					
Pollution Level		≤ 2 Pollution level indicates the degree to which conductive material is generated in the environment where the equipment is used. Pollution level 2 is the condition that only non-conductive pollution occurred but temporary conductivity may be produced due to condensing.					
Operating Ambience		Free from corrosive gases and excessive dust					
Altitude		Up to 2,000 meters(6,561.68 feet)					
Cooling		Air-cooling					
Base Module (unit: $\frac{mm}{inch}$)		$\frac{114.0}{4.488}(W) \times \frac{90.0}{3.543}(H) \times \frac{64.0}{2.520}(D)$			MLC-DN32H, MLC-DR32H MLI-DN32H, MLI-DR32H		
		$\frac{180.0}{7.087}(W) \times \frac{90.0}{3.543}(H) \times \frac{64.0}{2.520}(D)$			MLC-DN64H, MLC-DR64H MLI-DN64H, MLI-DR64H		
Expansion Module (unit: $\frac{mm}{inch}$)		$\frac{30.0}{1.181}(W) \times \frac{90.0}{3.543}(H) \times \frac{60.0}{2.362}(D)$			MLM-D__ _S		
		$\frac{20.0}{0.787}(W) \times \frac{90.0}{3.543}(H) \times \frac{60.0}{2.362}(D)$			MLE-DC__ _A, MLE-TN__ _A MLF-__ _04A, MLL-C__ _A		
		$\frac{27.0}{1.063}(W) \times \frac{90.0}{3.543}(H) \times \frac{60.0}{2.362}(D)$			MLE-RY__ _A, MLE-DR__ _A, MLL-EMTA		

Indicators and Connectors



Name		Description	
1	Input LED	Input Indication	Red on/off. Input signal on/off
2	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on and off. PLC error. Red off. PLC normal condition
3	Output LED	Output LED	On/off. Output signal on/off.
4	Expansion Module Connector	Connection of expansion module (I/O, Special function, Communication)	
5	PADT connector	PADT connection	Connector for SoftMaster / SoftMaster-NM connection USB (USB 1.1 supported) 1 Ch., RS-232C 1 Ch.
6	Model Switch *1	Model setting	Setting RUN/STOP model of PLC
7	Input Terminal Block	Input wiring connection	
8	Output Terminal Block	Output wiring connection	
9	Built-in Communication Terminal Block	Built-in RS-485 terminal connection	
		Built-in RS232C TxD, RxD, SG terminal connection	
10	Power Terminal Block*3	Power supply connection	AC 100 ~ 240 V
11	Battery Holder	Battery (3V) holder for data back-up	
12	O/S Mode Dip Switch	Dip Switch for setting operation or O/S download mode	

*1) In the remote mode, set the mode switch STOP.

*2) SG terminal of RS-232C can be used as SG terminal of RS-485.

Specifications				
Model	MLC-DR32H MLI-DR32H	MLC-DN32H MLI-DN32H	MLC-DR64H MLI-DR64H	MLC-DN64H MLI-DN64H
Performance				
Internal Current Consumption / Output Current	660mA / 3A	260mA / 2A	1040mA / 3A	330mA / 2A
Control Method	Repetitive, cyclic, interrupt, constant scan			
I/O Control Mode	Refresh mode (Batch processing by scan synchronization) Direct mode by instructions			
Programming Language	Ladder diagram, Instruction List			
Number of Instructions	Basic : 28, Applied : 687			
Processor / Processing Speed	32bit / 83 ns/Step (for basic instruction)			
Program Capacity	MLC type : 15 kilo-steps / MLI type : 200kB			
Max. I/O Points	352 points(Main + 10 expansions)		384 points (Main + 10 expansions)	
No. of Program	128			
Operation Mode	RUN, STOP, DEBUG			
Self Diagnostic	Operation delay monitoring, memory error, I/O error, battery error, power error, etc.			
Program Port	USB (Rev 1.1), RS-232C (6 pin)			
Data Retention at Power Failure	Latch range setting at Basic parameter			
Built-in Functions	RS-232C/485, High-speed counter, PID control, Pulse catch, Input Filter, External interrupt,			
	-	Positioning	-	Positioning
Weight	600g (1.32lb)	500g (1.10lb)	900g (1.98lb)	800g (1.76lb)
System Configuration				
High Speed Counter Single Phase : 100kpps 4ch, 20kpps 4ch Two Phase : 50kpps 2ch, 10kpps 2ch Encoder Pulse catch Input Filter HCi/ HCiX Inverter Servo/Stepping drive Servo/Stepping motor Communication Special function Max. 10 Expansion Modules Expansion I/O Positioning Max. 2ch, 100kpps RS-232C/485				

"H" type, High performance type

(1) non-IEC

Specifications						
Model			MLC-DR32H	MLC-DN32H	MLC-DR64H	MLC-DN64H
Performance						
Data Memory	Symbolic Var.	P	P0000 ~ P1023F (16,384 points)			
	Input Var.	M	M0000 ~ M1023F (16,384 points)			
	Output Var.	K	K00000 ~ K4095F (Special area: K2600~3339F) (65,536 points)			
	Direct Var.	L	L00000 ~ L2047F (32,768 points)			
		F	F000 ~ F1023F (16,384 points)			
		T	100ms, 10ms, 1ms: T000 ~ T1023 (Changeable by Parameter setting)			
	Flag Var.	C	C000 ~ C1023			
		S	S00.00 ~ S127.99			
		D	D0000 ~ D10,239 (10,240 word)			
		U	U00.00 ~ U0A.31 (Analog data refresh area: 352 word)			
		Z	Z000 ~ Z127 (128 word)			
	Direct Var.	N	N0000 ~ N5119 (5120 word)			
	Flash Area	R	R0000 ~ R10239			

(2) IEC

Specifications						
Model			MLI-DR32H	MLI-DN32H	MLI-DR64H	MLI-DN64H
Performance						
Data Memory	Symbolic Var.	A	32KB (Max. 16KB retain setting available)			
	Input Var.	I	2KB(%IX 15.15.63)			
	Output Var.	Q	2KB (%QX 15.15.63)			
	Direct Var.	M	16KB (Max. retain setting available)			
		R	20KB (1 block)			
		W	20KB, Same area as 'R'			
	Flag Var.	F	2KB, System flag			
		K	8KB, Built-in special flag			
		L	4KB, High speed link flag			
		N	10KB, P2P flag			
		U	1KB, Analog Flag			
	Flash Area		20KB (2 block), R device used			

Specifications				
DC INPUT				
Model		Main Unit		
		MLC-DR32H MLI-DR32H	MLC-DN32H MLI-DN32H	MLC-DR64H MLI-DR64H
Input Points		16		32
Insulation Method		Photo-coupler insulation		
Rated Input Voltage / Current		DC24V / 4mA (Contact 00 ~ 07 : 7mA)		
Operation Voltage Range		DC 20.4 to 28.8 V (Ripple rate < 5%)		
ON Voltage / Current		DC19V or more / 3mA or more		
OFF Voltage / Current		DC6V or less / 1mA or less		
Input Resistance		5.6 KΩ (P00~P07: 2.7 KΩ)		
Response Time	OFF→ON	1 / 3 / 5 / 10 / 20 / 70 / 100 msec (setting by CPU parameter). Initial value: 3msec		
	ON→OFF			
Insulation Pressure		AC 560Vrms / 3 Cycle (altitude 2000m(6,561.68 fts))		
Insulation Resistance		10 MΩ or more by megger		
COMMON Method		16 points / COM		
Proper Cable Size		Twisted wire 0.3 – 0.75 mm ² (external diameter ≤ 2.8mm, 0.11inch)		
Operation Indication		Input On, LED On		
External Connection Method		24 points connecting connector (M3 X 6 screw)		42 point connecting connector (M3 X 6 screw)
Open collector OUTPUT				
Model		Main Unit		
		MLC-DN32H MLI-DN32H		MLC-DN64H MLI-DN64H
Output Points		16		32
Insulation Method		Photo-coupler insulation		
Rated Load Voltage		DC 12 / 24V		
Load Voltage Range		DC10.2 to 26.4V		
Max. Load Current		0.5A / 1point (P20~23:0.1A/point)		
OFF Leakage Current		0.1mA or less		
Max. Inrush Current		4A / 10msec or less		
Max. Voltage Drop(ON)		DC 0.4V or less		
Surge Absorber		Zener Diode		
Response Time	OFF→ON	1msec or less		
	ON→OFF	1msec or less(Rated Load, Resistive Load)		
Common Method		4 Points / COM		4 Points / COM (COM0~COM3) 8 Points / COM (COM4~COM5)
External Power Supply	Voltage	DC12/24V ± 10% (Ripple Voltage ≤ 4 Vp-p)		
	Current	25mA or less (at DC24V)		
Operation Indicator		Output ON, LED ON		
External Connection Method		24 points connecting connector (M3 X 6 screw)		42 point connecting connector (M3 X 6 screw)

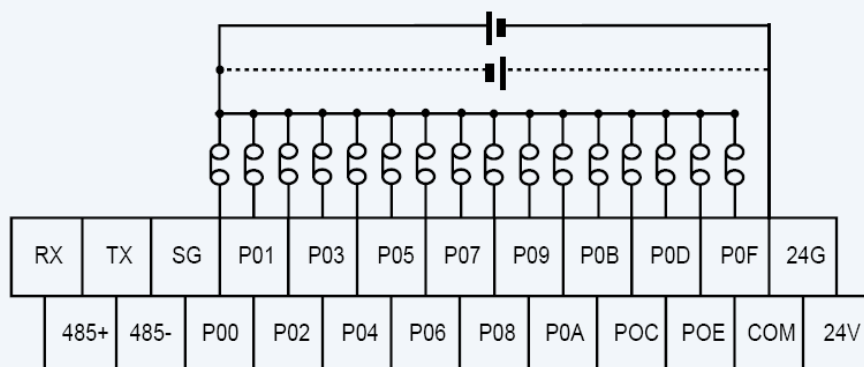
Specifications

Relay OUTPUT

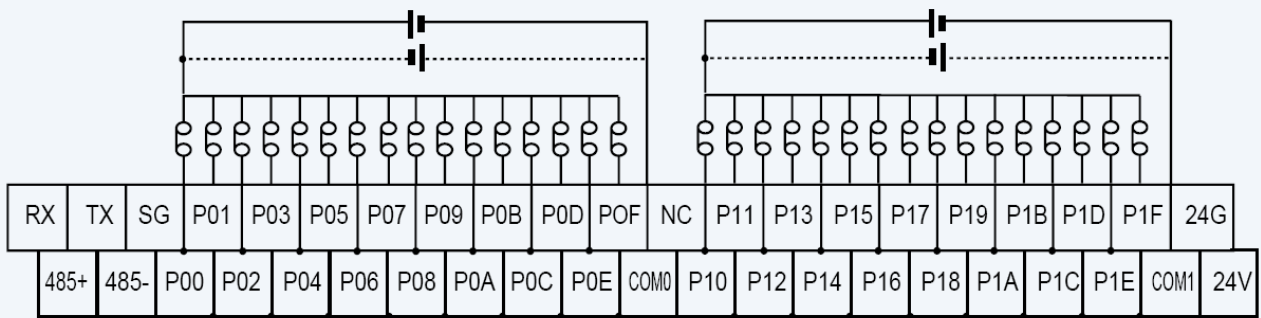
Model	Main Unit	
	MLC-DR32H, MLI-DR32H	MLC-DR64H, MLI-DR64H
Output Points	16	32
Insulation Method	Relay insulation	
Rated Load Voltage/Current	DC 24V, 2A (Resistive load) / AC220V, 2A ($\cos\psi = 1$), 5A/COM	
Minimum Load Voltage/Current	DC 5V / 1mA	
Maximum Load Voltage/Current	AC250V or DC125V / 2A	
OFF Leakage Current	0.1mA (AC220V, 60Hz)	
Max. ON/OFF Frequency	3,600 times / Hour	
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 ($\cos\psi = 0.7$) 100,000 times or more
		AC200V/1A, AC240V/0.5A ($\cos\psi = 0.35$) 100,000 times or more
		DC24V/1A, DC100V/0.1A ($L/R = 7ms$) 100,000 times or more
Response Time	OFF→ON	10msec or less
	ON→OFF	12msec or less
Common Method	4 points / COM	4 point / COM (COM0~COM3)
		8 point / COM (COM4~COM5)
Operation Indicator	Output ON, LED ON	
External Connection Method	24 point connecting connector (M3 X 6 screw)	42 point connecting connector (M3 X 6 screw)

Input & Output wiring

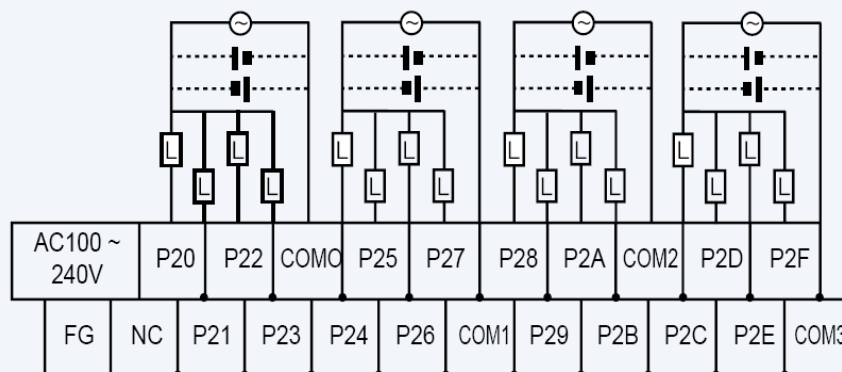
Input wiring (non-IEC : MLC-DR32H / MLC-DN32H), (IEC : MLI-DR32H / MLI-DN32H)



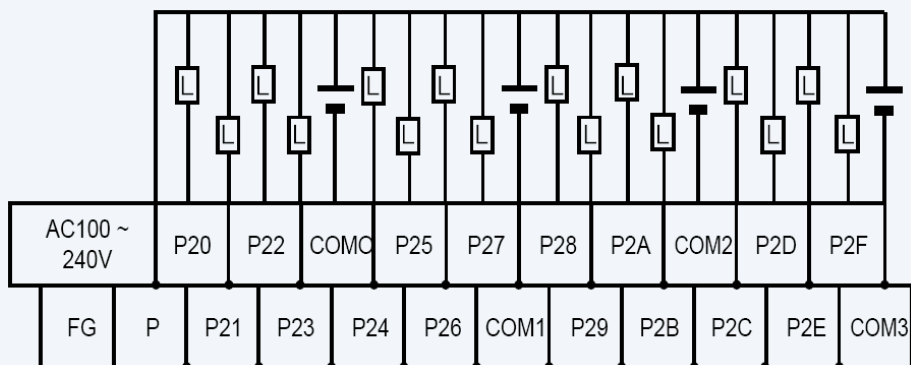
Input wiring (MLC-DR64H / MLC-DN64H) (MLI-DR64H/MLI-DN64H)



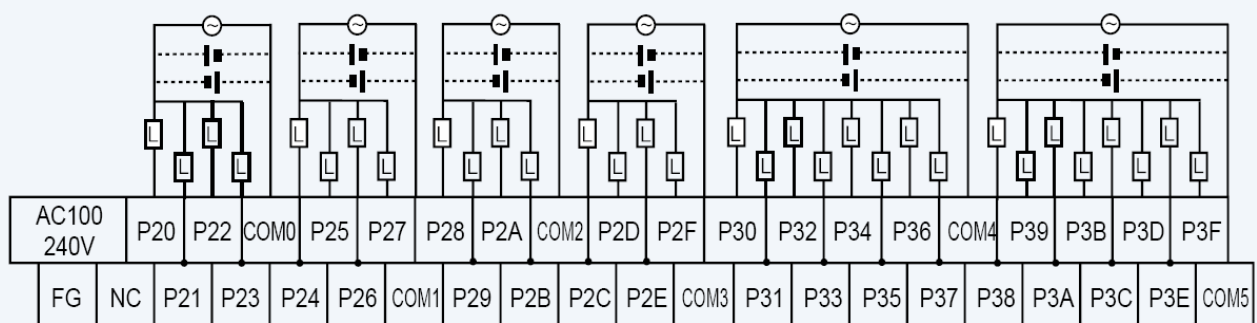
Relay Output wiring (MLC-DR32H) (MLI-DR-32H)



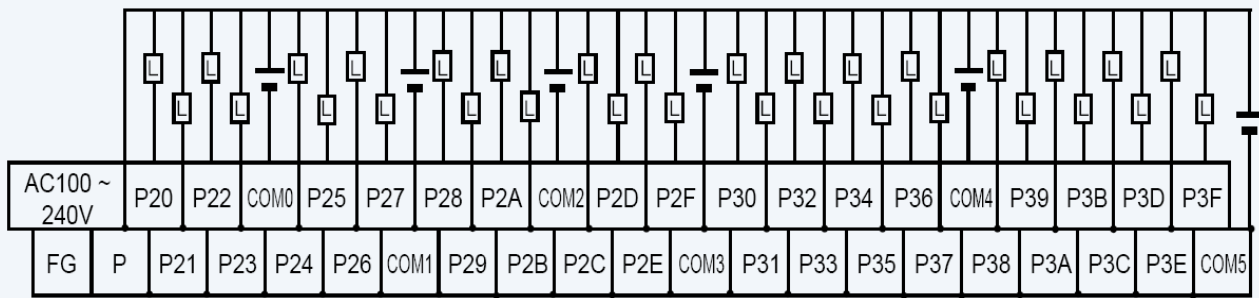
Open Collector wiring (MLC-DN32H) (MLI-DN32H)



Relay Output wiring (MLC-DR64H) (MLI-DR64H)



Open Collector wiring (MLC-DN64H) (MLI-DN64H)



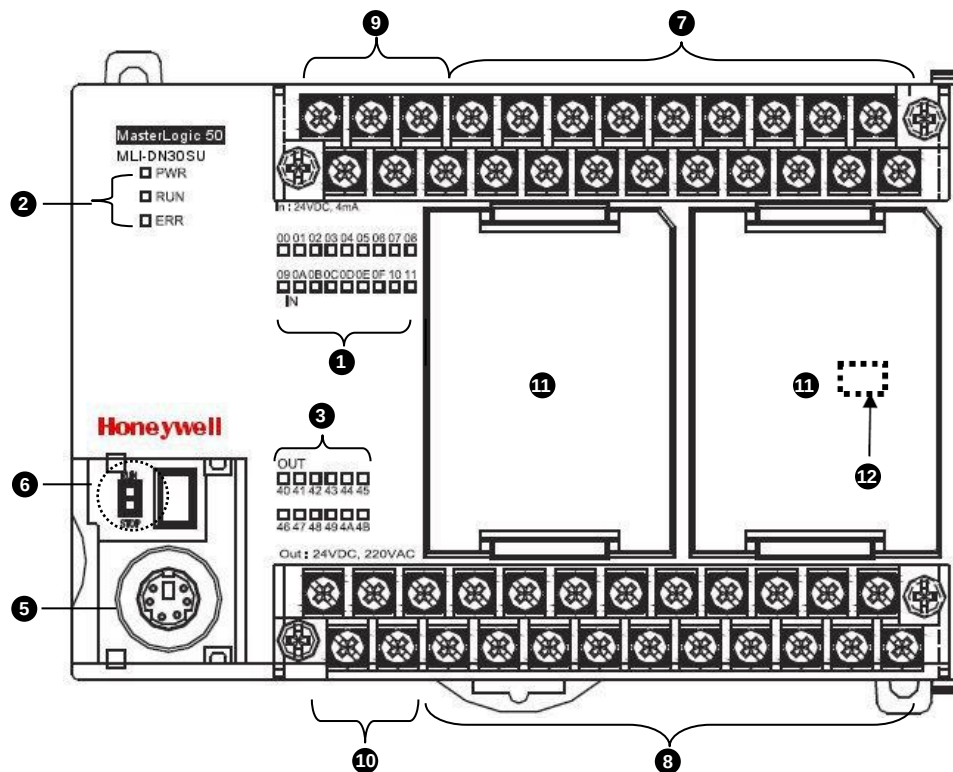
Specifications (MLI-DR10E, MLI-DN10E, DR14E, MLI-DN14E, DR20E, MLI-DN20E, MLI-DR30E, MLI-DN30E) (MLI-DR20SU, MLI-DN20SU, MLI-DR30SU, MLIDN30SU, MLI-DR40SU, MLI-DN40SU, MLI-DR60SU, MLI-DN60SU)

General

Rated Power Supply Voltage		100 ~ 240V AC or 24Vdc					
Inrush Current (when power supply turns on)		50 Apeak or less					
Insulation Resistance		Higher than 10MΩ under DC 500V megger during power terminal and PE terminal					
Withstand Voltage		1500V AC 50/60Hz for 1min across power terminal and PE terminal					
Noise Resistance (IEC61131-2)		Square wave impulse noise : +/-1,500V Electrostatic discharge : 4kV (contact discharge) Rated electromagnetic field noise : 80 to 1,000MHz, 10V/m EFT/B : 2kV in Main unit, 1kV in expansion module				- IEC61000-4-2 IEC61000-4-3 IEC61000-4-4	
Operative Limits	Ambient Temperature	0 to 65°C					
	Relative Humidity	5 to 95%RH (non-condensing)					
	Vibration Resistance (IEC61131-2)	Occasional vibration			Continuous vibration		
		Frequency	Acceleration	Pulse width	Frequency	Acceleration	Pulse width
		10 to 57Hz	-	0.075mm	10 to 57Hz	-	0.035mm
		57 to 150Hz	9.8m/s ²	-	57 to 150Hz	4.9m/s ²	-
	10 times each direction(X, Y and Z)						
Shock Resistance (IEC61131-2)	Peak Acceleration: 147 m/s ² (15g)						

Indicators and Connectors

"E" type

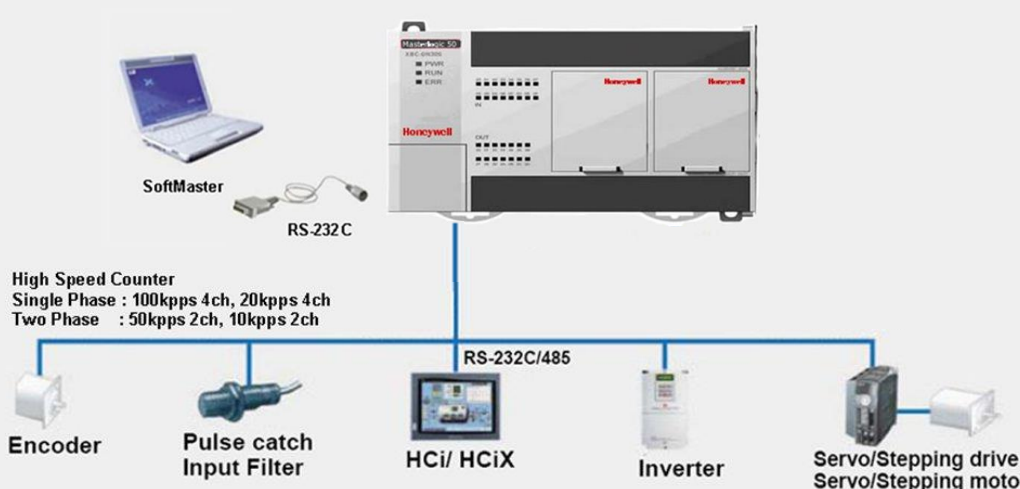


Name		Description	
1	Input LED	Input Indication	Red on/off. Input signal on/off
2	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on and off. PLC error. Red off. PLC normal condition
3	Output LED	Output LED	On/off. Output signal on/off.
5	PADT connector	PADT connection	Connector for SoftMaster / SoftMaster-NM connection RS-232C 1 Ch.
6	Model Switch *1	Model setting	Setting RUN/STOP model of PLC
7	Input Terminal Block	Input wiring connection	
8	Output Terminal Block	Output wiring connection	
9	Built-in Communication Terminal Block	Built-in RS-485 terminal connection	
		Built-in RS232C Tx/D, Rx/D, SG terminal connection	
10	Power Terminal Block*3	Power supply connection	AC 100 ~ 240 V
11	Option Board Holder	Battery (3V) holder for data back-up	
12	O/S Mode Dip Switch	Dip Switch for setting operation or O/S download mode	

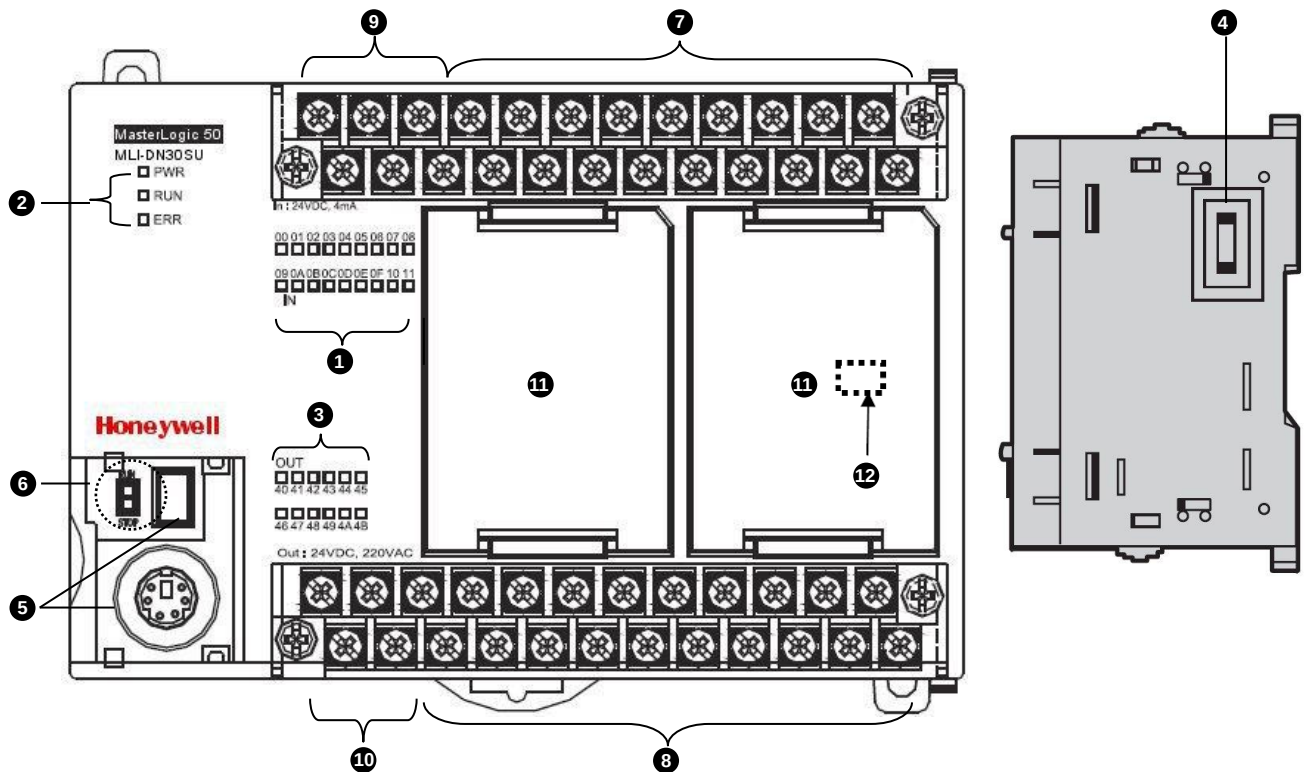
*1) In the remote mode, set the mode switch STOP.

*2) SG terminal of RS-232C can be used as SG terminal of RS-485.

Specifications				
Model	MLI-DR10E MLI-DN10E MLI-DP10E	MLI-DR14E MLI-DN14E MLI-DP14E	MLI-DR20E MLI-DN20E MLI-DP20E	MLI-DR30E MLI-DN60E MLI-DP30E
Performance				
Internal Current Consumption / Output Current	250mA / 0.5A	315mA / 0.5A	355mA / 0.8A	485mA / 0.8A
	180mA / 0.5A	190mA / 0.5A	200mA / 0.8A	210mA / 0.8A
	180mA / 0.5A	190mA / 0.5A	200mA / 0.8A	210mA / 0.8A
Control Method	Reiterative operation, Fixed cycle operation			
I/O Control Mode	Scan synchronized batch processing method (Refresh method) Direct method by instruction			
Programming Language	Ladder Diagram (LD), Sequential Function Chart (SFC) Structured Text (ST), Instruction List (IL)			
Processor / Processing Speed	32 bit / 240 ns/Step (for basic instruction)			
Program Capacity	50kB(4k step)			
Max I/O points(Main unit+Option)	14(1 option)	18(1 option)	28(1 option)	38(1 option)
Operation Mode	RUN, STOP, DEBUG			
No. of Program	128			
Task	Initialization	1		
	Fixed period	8		
	External input	4(%Ix0.0.0 ~ %Ix0.0.3)		
	Internal device	8		
Self Diagnostic	Watchdog Timer, Memory error detection I/O error detection, etc.			
Program Port	RS-232C 1 ch (6 pin)			
Data Retention at Power Failure	Setting to Retain area at Basic parameter			
Built-in Functions	RS-232C or RS-485(1 ch), Pulse catch, Input filter, External interrupt, High-speed counter			
Weight	330g (0.72lb)	340g (0.75lb)	450g (0.992lb)	465g (1.025lb)
	313g (0.69lb)	315g (0.694lb)	418g (0.921lb)	423g (0.933lb)
	313g (0.69lb)	315g (0.694lb)	418g (0.921lb)	423g (0.933lb)

System Configuration	
 The diagram illustrates the system configuration for the Honeywell MLI-DR series. At the top center is the main unit, a rack-mounted device with two bays. To its left is a laptop labeled 'SoftMaster' connected to the main unit via an 'RS-232C' cable. Below the main unit, a horizontal bus labeled 'RS-232C/485' connects to five components: an 'Encoder', a 'Pulse catch Input Filter' (represented by a blue plug), 'Hci/ HciX' (a small screen), an 'Inverter' (a white box), and a 'Servo/Stepping drive Servo/Stepping motor' (a motor and drive unit). To the left of the bus, text specifies the 'High Speed Counter' capabilities: 'Single Phase : 100kpps 4ch, 20kpps 4ch' and 'Two Phase : 50kpps 2ch, 10kpps 2ch'.	

"SU" type



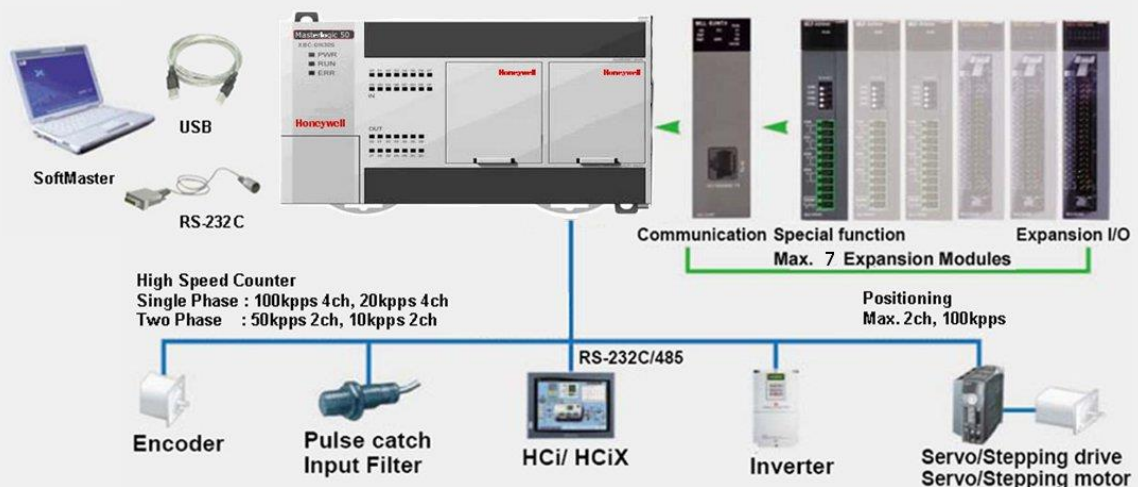
Name		Description	
1	Input LED	Input Indication	Red on/off. Input signal on/off
2	Condition LED	PWR: Power indication	Red on/off. Power on/off
		RUN : RUN indication	Green on/off. PLC RUN/STOP
		ERR : Error indication	Red on and off. PLC error. Red off. PLC normal condition
3	Output LED	Output LED	On/off. Output signal on/off.
4	Expansion Module Connector	Connection of expansion module (I/O, Special function, Communication)	
5	PADT connector	PADT connection	Connector for SoftMaster / SoftMaster-NM connection USB (USB 1.1 supported) 1 Ch., RS-232C 1 Ch.
6	Model Switch *1	Model setting	Setting RUN/STOP model of PLC
7	Input Terminal Block	Input wiring connection	
8	Output Terminal Block	Output wiring connection	
9	Built-in Communication Terminal Block	Built-in RS-485 terminal connection	
		Built-in RS232C TxD, RxD, SG terminal connection	
10	Power Terminal Block*3	Power supply connection	AC 100 ~ 240 V
11	Battery Holder	Battery (3V) holder for data back-up	
12	O/S Mode Dip Switch	Dip Switch for setting operation or O/S download mode	

*1) In the remote mode, set the mode switch STOP.

*2) SG terminal of RS-232C can be used as SG terminal of RS-485.

Specifications				
Model	MLI-DN20SU MLI-DR20SU	MLI-DN30SU MLI-DR30SU	MLI-DN40SU MLI-DR40SU	MLI-DN60SU MLI-DR60SU
Performance				
Internal Current Consumption / Output Current	252mA / 1.5A	270mA / 1.5A	288mA / 2A	340mA / 2.5A
	478mA / 1.5A	626mA / 1.5A	684mA / 2A	942mA / 2.5A
Control Method	Repetitive, cyclic, interrupt, constant scan			
I/O Control Mode	Refresh mode (Batch processing by scan synchronization) Direct mode by instructions			
Programming Language	Ladder Diagram (LD), Sequential Function Chart (SFC) Structured Text (ST), Instruction List (IL)			
Processor / Processing Speed	32 bit / 94 ns/Step (for basic instruction)			
Program Capacity	200kB(15k step)			
Main unit I/O points	20(In:12/Out:8)	30(In:18/Out:12)	40(In:24/Out:16)	60(In:36/Out:24)
Max. I/O Points(Main + 7 expansions)	244 points	254 points	264 points	284 points
No. of Program	128			
Operation Mode	RUN, STOP, DEBUG			
Task	Initialization	1		
	Fixed period	8		
	External input	4(%Ix0.0.0 ~ %Ix0.0.3)		
	Internal device	8		
Self Diagnostic	Detects errors of scan time, memory error, I/O error, battery error, power error, etc.			
Program Port	USB (Rev 1.1), RS-232C 1ch (6 pin)			
Data Retention at Power Failure	Latch range setting at Basic parameter			
Built-in Functions	RS-232C / RS-485(2 ch), Pulse catch, Input filter, External interrupt, PID control, High-speed counter, Positioning			
Weight	475g (1.05lb)	474g (1.045lb)	578g (1.27lb)	636g (1.40lb)
	514g (1.13lb)	528g (1.16lb)	594g (1.31lb)	804g (1.77lb)

System Configuration



"SU" type (Standard type)

Specifications						
Model			MLI-DN20SU MLI-DR20SU	MLI-DN30SU MLI-DR30SU	MLI-DN40SU MLI-DR40SU	MLI-DN60SU MLI-DR60SU
Performance						
Data Memory	Symbolic Var.	A	16KB (Max. 16KB retain setting available)			
	Input Var.	I	2KB(%IX 15.15.63)			
	Output Var.	Q	2KB (%QX 15.15.63)			
	Direct Var.	M	8KB (Max. retain setting available)			
		R	20KB (1 block)			
		W	20KB, Same area as `R`			
	Flag Var.	F	2KB, System flag			
		K	8KB, Built-in special flag			
		L	4KB, High speed link flag			
		U	1KB, Analog Flag			
	Flash Area		20KB (2 block), R device used			

"E" type (Economic type)

Specifications						
Model			MLI-DN10E MLI-DR-10E	MLI-DN14E MLI-DR14E	MLI-DN20E MLI-DR20E	MLI-DN30E MLI-DR30E
Performance						
Data Memory	Symbolic Var.	A	8KB (Max. 16KB retain setting available)			
	Input Var.	I	256 Bytes(%IX 15.15.63)			
	Output Var.	Q	256 Bytes (%QX 15.15.63)			
	Direct Var.	M	4KB (Max. retain setting available)			
		R	10KB (1 block)			
		W	10KB, Same area as 'R'			
	Flag Var.	F	768 Bytes, System flag			
		K	5,120 Bytes, Built-in special flag			
		L	2,560 Bytes, High speed link flag			
		U	704 Bytes, Analog Flag			
	Flash Area		10KB (2 block), R device used			

Specifications					
High Speed Counter					
Model		CPU type			
		S type (MLM)	E type	H type (MLC, MLI)	SU type
Counter input signal	Signal	A-phase, B-phase			
	Input type	Voltage input (Open collector)			
	Signal level	DC 24V			
Max. Count speed		20kpps	4kpps	100kpps	100kpps
No. of channels	1 phase	20kpps 4ch	4kpps 4ch	100kpps4ch/20kpps 4ch	100kpps 2ch/20kpps 6ch
	2 phase	2 multiplication: 10kpps	2kpps 2ch	50kpps 2ch /10kpps 2ch	50kpps 1ch
		4 multiplication: 8kpps		50kpps 2ch / 8kpps 2ch	8kpps 3ch
Count range		Signed 32bit (-2,147,483,648 ~ 2,147,483,647)			
Count mode (Programming setting)		Linear count (If 32bit range exceeded, Carry / Borrow occurs)			
		Ring count (Repeated count within setting range)			
Input mode (Programming setting)		1-phase input			
		2-phase input			
		CW/CCW input			
Signal type		Voltage			
Up/Down setting	1 phase input	Increasing / Decreasing operation setting by B-phase input			
		Increasing / Decreasing operation setting 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 multiplication			
	2 phase input	4 multiplication			
	CW/CCW	1 multiplication			
Control input	Signal	Preset instruction input			
	Signal level	DC 24V input type			
	Signal type	Voltage			
External output	Output points	1 point / channel (for each channel): output contact point of basic unit available		2 point / channel (for each channel): output contact point of basic unit available	
	Type	Select program setting, signal-compared (>, >=, =, <=, <) or section compared output (Included or excluded)			
	Output type	Relay, Open-collector output (Sink)			
Count enable		To be set through program			
Preset function		To be set through terminal (contact) or program			
Auxiliary mode		Count latch			

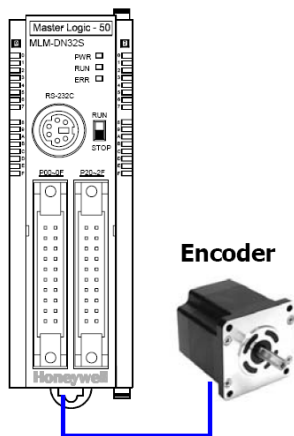
Electrical	
Input Voltage	DC 24V (20.4V ~ 28.8V)
Input Current	4mA
On Guaranteed Voltage (Minimum)	DC 20.4 V
Off Guaranteed Voltage (Maximum)	DC 6V

(1) Non-IEC : MLM-D__ _S, MLC-D__ _H

High-speed Counter Terminal

High speed counter accurately counts the number of high speed pulse generated from encoder or pulse generator.

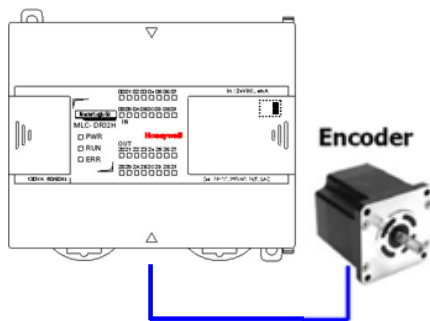
Modular "S" type



Encoder

Terminal Number	1-Phase		2-Phase	
	Signal name	Description	Signal name	Description
P000	Ch0 counter input	Counter input	Ch0 A-axis input	A-axis input
P001	Ch1 counter input	Counter input	Ch0 B-axis input	B-axis input
P002	Ch2 counter input	Counter input	Ch2 A-axis input	A-axis input
P003	Ch3 counter input	Counter input	Ch2 B-axis input	B-axis input
P004	Ch0 preset 24V	Preset input	Ch0 preset 24V	Preset input
P005	Ch1 preset 24V	Preset input	-	-
P006	Ch2 preset 24V	Preset input	Ch2 preset 24V	Preset input
P007	Ch3 preset 24V	Preset input	-	-
COM0	Input COMMON	COMMON	Input COMMON	COMMON

High performance : "H" type

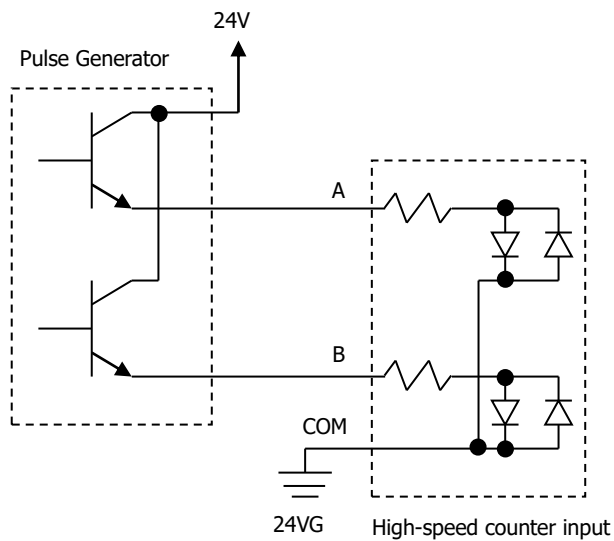


Encoder

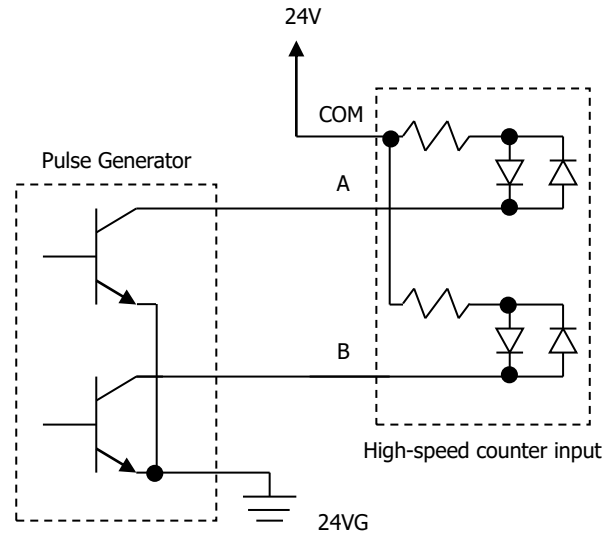
High-speed counter

Terminal Number	1-Phase		2-Phase	
	Signal name	Description	Signal name	Description
P000	Ch0 counter input	Counter input	Ch0 A-axis input	A-axis input
P001	Ch1 counter input	Counter input	Ch0 B-axis input	B-axis input
P002	Ch2 counter input	Counter input	Ch2 A-axis input	A-axis input
P003	Ch3 counter input	Counter input	Ch2 B-axis input	B-axis input
P004	Ch4 counter input	Counter input	Ch4 A-axis input	A-axis input
P005	Ch5 counter input	Counter input	Ch4 B-axis input	B-axis input
P006	Ch6 counter input	Counter input	Ch6 A-axis input	A-axis input
P007	Ch7 counter input	Counter input	Ch6 B-axis input	B-axis input
P008	Ch0 preset 24V	Preset input	Ch0 preset 24V	Preset input
P009	Ch1 preset 24V	Preset input	-	-
P00A	Ch2 preset 24V	Preset input	Ch2 preset 24V	Preset input
P00B	Ch3 preset 24V	Preset input	-	-
P00C	Ch4 preset 24V	Preset input	Ch4 preset 24V	Preset input
P00D	Ch5 preset 24V	Preset input	-	-
P00E	Ch6 preset 24V	Preset input	Ch6 preset 24V	Preset input
P00F	Ch7 preset 24V	Preset input	-	-
COM0	Input COMMON	COMMON	Input COMMON	COMMON

Encoder Wiring



Voltage Output Encoder



Open Collector Encoder

Operation Setting Address of High-speed Counter ("S" type)

ITEM	Device Range for each Channel				Remark
	CH1	CH2	CH3	CH4	
Counter Enable	K2600	K2700	K2800	K2900	Bit
Counter Internal Preset Assignment	K2601	K2701	K2801	K2901	Bit
Counter External Preset Enable	K2602	K2702	K2802	K2902	Bit
Substraction Counter Assignment	K2603	K2703	K2803	K2903	Bit
Comparison Output Enable	K2604	K2704	K2804	K2904	Bit
Rotation Number per Unit Time Enable	K2605	K2705	K2805	K2905	Bit
Latch Counter Enable	K2606	K2706	K2806	K2906	Bit
Carry Signal(Bit)	K2610	K2710	K2810	K2910	Bit
Borrow Signal(Bit)	K2611	K2711	K2811	K2911	Bit
Comparison Output Signal	K2612	K2712	K2812	K2912	Bit

Operation Setting Address of High-speed Counter ("H" type)

ITEM	Device Range for each Channel								Remark
	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	
Counter Enable	K2600	K2700	K2800	K2900	K21800	K21900	K22000	K22100	Bit
Counter Internal Preset Assignment	K2601	K2701	K2801	K2901	K21801	K21901	K22001	K22101	Bit
Counter External Preset Enable	K2602	K2702	K2802	K2902	K21802	K21902	K22002	K22102	Bit
Substraction Counter Assignment	K2603	K2703	K2803	K2903	K21803	K21903	K22003	K22103	Bit
Comparison Output 0 Enable	K2604	K2704	K2804	K2904	K21804	K21904	K22004	K22104	Bit
Rotation Number per Unit Time Enable	K2605	K2705	K2805	K2905	K21805	K21905	K22005	K22105	Bit
Latch Counter Enable	K2606	K2706	K2806	K2906	K21806	K21906	K22006	K22100	Bit
Comparison Output 1 Enable	K2607	K2707	K2807	K2907	K21807	K21907	K22007	K22107	
Carry Signal(Bit)	K2610	K2710	K2810	K29100	K21810	K21910	K22010	K22110	Bit
Borrow Signal(Bit)	K2611	K2711	K2811	K29101	K21811	K21911	K22012	K22111	Bit
Comparison Output 0 Signal	K2612	K2712	K2812	K29102	K21812	K21912	K22013	K22112	Bit
Comparison Output 1 Signal	K2613	K2713	K2813	K29103	K21813	K21913	K22013	K22113	Bit

Parameter Setting Address of High-speed Counter ("S" type)							
ITEM	Description		Device Range for each Channel				Remark
	Setting Value	Setting Description	CH1	CH2	CH3	CH4	
Counter Enable	H0000 H0001	Linear Counter Setting Ring Counter Setting	K300	K330	K360	K390	Word
Pulse Input Mode Setting	H0000 H0001 H0002 H0003	1phase 1input 1multiplication 1phase 2input 1multiplication CW/CCW 2phase 4multiplication	K301	K331	K361	K391	Word
Comparison Output Mode Setting	H0000 H0001 H0002 H0003 H0004 H0005 H0006	(Single comparison) < (Single comparison) ≤ (Single comparison) = (Single comparison) ≥ (Single comparison) > (Section comparison) Inclusion (Section comparison) Exclusion	K302	K332	K362	K392	Word
Internal Preset Value Setting	-2,147,483,648~2,147,483,647		K304	K334	K364	K394	Word
External Preset Value Setting	-2,147,483,648~2,147,483,647		K306	K336	K366	K396	Word
Ring Counter Value Setting	-2,147,483,648~2,147,483,647		K310	K340	K370	K400	Word
Min. Comparison Output Value Setting	-2,147,483,648~2,147,483,647		K312	K342	K372	K402	Word
Max. Comparison Output Value Setting	-2,147,483,648~2,147,483,647		K314	K344	K374	K404	Word
Comparison Output Contact Assignment	0x0000 0x0001 0x0002 0x0003 0x0004 0x0005 0x0006 0x0007	P20 P21 P22 P23 P24 P25 P26 P27	K320	K350	K380	K410	Word
Rotation Number Setting per Unit Time	1 ~ 60000		K322	K352	K382	K412	Word
Pulse Number Setting per Rotation	1 ~ 60000		K323	K353	K383	K413	Word

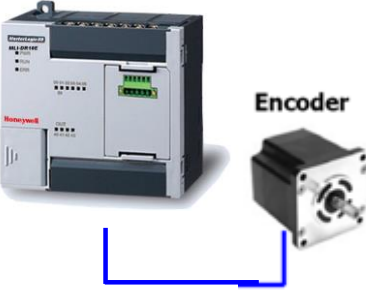
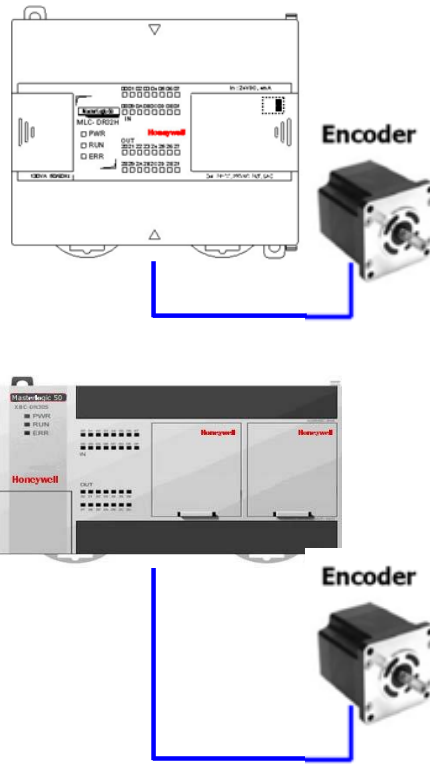
Parameter Setting Address of High-speed Counter ("H" type)							
ITEM	Description		Device Range for each Channel				Remark
	Setting Value	Setting Description	CH1	CH2	CH3	CH4	
			CH5	CH6	CH7	CH8	
Counter Enable	H0000	Linear Counter Setting	K300	K330	K360	K390	Word
	H0001	Ring Counter Setting	K2220	K2250	K2280	K2310	
Pulse Input Mode Setting	H0000	1phase 1input 1multiplication	K301	K331	K361	K391	Word
	H0001	1phase 2input 1multiplication	K2221	K2251	K2281	K2311	
	H0002 H0003	CW/CCW 2phase 4multiplication					
Comparison Output 0 Mode Setting	H0000	(Single comparison) <	K302	K332	K362	K392	Word
	H0001	(Single comparison) ≤					
	H0002	(Single comparison) =	K2222	K2252	K2282	K2312	
	H0003	(Single comparison) ≥					
H0004	(Single comparison) >	K2223	K2253	K2283	K2313		
H0005	(Section comparison) Inclusion						
H0006	(Section comparison) Exclusion						
Comparison Output 1 Mode Setting	H0000	(Single comparison) <	K303	K333	K363	K393	Word
	H0001	(Single comparison) ≤					
	H0002	(Single comparison) =	K2223	K2253	K2283	K2313	
	H0003	(Single comparison) ≥					
H0004	(Single comparison) >	K2223	K2253	K2283	K2313		
H0005	(Section comparison) Inclusion						
H0006	(Section comparison) Exclusion						
Internal Preset Value Setting	-2,147,483,648 ~ 2,147,483,647		K304	K334	K364	K394	DWord
			K2224	K2254	K2284	K2314	
External Preset Value Setting	-2,147,483,648 ~ 2,147,483,647		K306	K336	K366	K396	DWord
			K2226	K2256	K2286	K2316	
Min. Ring Counter Value Setting	-2,147,483,648 ~ 2,147,483,645		K308	K338	K368	K398	DWord
			K2228	K2258	K2288	K2318	
Max. Ring Counter Value Setting	-2,147,483,648 ~ 2,147,483,645		K310	K340	K370	K400	DWord
			K2230	K2260	K2290	K2320	
Min. Comparison Output Value Setting	-2,147,483,648 ~ 2,147,483,645		K312	K342	K372	K402	DWord
			K2232	K2262	K2292	K2322	
Max. Comparison Output Value Setting	-2,147,483,648 ~ 2,147,483,645		K314	K344	K374	K404	DWord
			K2234	K2264	K2294	K2324	
Comparison Output 0 Contact Assignment	0xFFFF	No use	K320	K350	K380	K410	Word
	0x0000	P20	K2240	K2270	K2300	K2330	
	0x0001	P21					
	0x0002	P22					
	0x0003	P23					
	0x0004	P24					
	0x0005	P25					
	0x0006	P26					
	0x0007	P27					
	0x0008	P28					
	0x0009	P29					
	0x000A	P2A					
	0x000B	P2B					
	0x000C	P2C					
	0x000D	P2D					
	0x000E	P2E					
	0x000F	P2F					

Parameter Setting Address of High-speed Counter ("H" type)									
ITEM	Description		Device Range for each Channel				Remark		
	Setting Value	Setting Description	CH1	CH2	CH3	CH4			
			CH5	CH6	CH7	CH8			
Comparison Output 1 Contact Assignment	0xFFFF	No use	K321	K351	K381	K411	Word		
	0x0000	P20							
	0x0001	P21							
	0x0002	P22							
	0x0003	P23							
	0x0004	P24							
	0x0005	P25							
	0x0006	P26							
	0x0007	P27							
	0x0008	P28	K2241	K2271	K2301	K2331			
	0x0009	P29							
	0x000A	P2A							
	0x000B	P2B							
	0x000C	P2C							
	0x000D	P2D							
	0x000E	P2E							
	0x000F	P2F							
Rotation Number Settiing per Unit Time	1 ~ 60000		K322	K352	K382	K412	Word		
			K2242	K2272	K2302	K2332			
Pulse Number Setting per Rotation	1 ~ 60000		K323	K353	K383	K413	Word		
			K2243	K2273	K2303	K2333			
High Speed Counter Monitoring									
Special Function Monitoring									
Special Function Monitoring in SoftMaster can monitor operation condition and data of high speed counter while PLC is on-line.									
Device Monitoring									
While PLC is on-line, Device Monitoring can monitor the operation condition and data by monitoring the device setting area.									
Parameter Setting Address of High-speed Counter ("S" type)									
Item	Device Range for Each Channel					Remark			
	CH1		CH2		CH3				CH4
Present Counter Value	K262		K272		K282		K292		Double Word
No. of Rotation per Unit Time	K264		K274		K284		K294		Double Word
Error Code	K266		K276		K286		K296		Word
Parameter Setting Address of High-speed Counter ("H" type)									
Item	Device Range for Each Channel								Remark
	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	
Present Counter Value	K262	K272	K282	K292	K2182	K2192	K2202	K2212	Word
No. of Rotation per Unit Time	K264	K274	K284	K294	K2184	K2194	K2204	K2214	Word
Error Code	K266	K276	K286	K296	K2186	K2196	K2206	K2216	Word

(2) IEC : MLI-D__ _H, MLI-D__ _SU, MLI-D__ _E

High-speed Counter Terminal

High speed counter accurately counts the number of high speed pulse generated from encoder or pulse generator.

Economic "E"	Terminal Number	1-Phase		2-Phase	
		Signal name	Description	Signal name	Description
	%Ix0.0.0	Ch0 counter input	Counter input	Ch0 A-axis input	A-axis input
	%Ix0.0.1	Ch1 counter input	Counter input	Ch0 B-axis input	B-axis input
	%Ix0.0.2	Ch2 counter input	Counter input	Ch2 A-axis input	A-axis input
	%Ix0.0.3	Ch3 counter input	Counter input	Ch2 B-axis input	B-axis input
	%Ix0.0.4	Ch0 preset 24V	Preset input	Ch0 preset 24V	Preset input
	%Ix0.0.5	Ch1 preset 24V	Preset input	-	-
	%Ix0.0.6	Ch2 preset 24V	Preset input	Ch2 preset 24V	Preset input
	%Ix0.0.7	Ch3 preset 24V	Preset input	-	-
	COM0	Input COMMON	COMMON	Input COMMON	COMMON
High performance : "H" type Standard : "SU" type	Terminal Number	1-Phase		2-Phase	
		Signal name	Description	Signal name	Description
	%Ix0.0.0	Ch0 counter input	Counter input	Ch0 A-axis input	A-axis input
	%Ix0.0.1	Ch1 counter input	Counter input	Ch0 B-axis input	B-axis input
	%Ix0.0.2	Ch2 counter input	Counter input	Ch2 A-axis input	A-axis input
	%Ix0.0.3	Ch3 counter input	Counter input	Ch2 B-axis input	B-axis input
	%Ix0.0.4	Ch4 counter input	Counter input	Ch4 A-axis input	A-axis input
	%Ix0.0.5	Ch5 counter input	Counter input	Ch4 B-axis input	B-axis input
	%Ix0.0.6	Ch6 counter input	Counter input	Ch6 A-axis input	A-axis input
	%Ix0.0.7	Ch7 counter input	Counter input	Ch6 B-axis input	B-axis input
	%Ix0.0.8	Ch0 preset 24V	Preset input	Ch0 preset 24V	Preset input
	%Ix0.0.9	Ch1 preset 24V	Preset input	-	-
	%Ix0.0.10	Ch2 preset 24V	Preset input	Ch2 preset 24V	Preset input
	%Ix0.0.11	Ch3 preset 24V	Preset input	-	-
	%Ix0.0.12	Ch4 preset 24V	Preset input	Ch4 preset 24V	Preset input
	%Ix0.0.13	Ch5 preset 24V	Preset input	-	-
	%Ix0.0.14	Ch6 preset 24V	Preset input	Ch6 preset 24V	Preset input
	%Ix0.0.15	Ch7 preset 24V	Preset input	-	-
	COM0	Input COMMON	COMMON	Input COMMON	COMMON

Error Code of High-speed Counter		
Error Code(Decimal)	Error Description	Remark
20	Out of Counter type range	
21	Out of Pulse input type range	
22	When Requesting RUN of CH1[3] during 2-phase operation of CH0[2] (Use of CH1[3] is not available during 2-phase operation of CH0[2])	
23	Out of Comparison output type range	
25	Internal preset value setting error(Out of counter range)	
26	External preset value setting error(Out of counter range)	
27	Ring counter setting error(Ring counter value should be set as 2 or more)	
28	Comparison minimum value setting error(Out of minimum input range)	
29	Comparison maximum value setting error(Out of maximum input range)	
30	Minimum comparison output1 > Maximum comparison output1	
31	Contact assignment value setting error of comparison output	
34	Out of unit time setting range	
35	Out of pulse value range per rotation	
36	Comparison minimum value setting error except maximum output range. OUT1	'H' type
37	Comparison maximum value setting error except maximum output range. OUT1	'H' type
38	Minimum comparison output1 > Maximum comparison output1	'H' type
39	Contact assignment value setting error of comparison output1	'H' type

NOTE. In case that two mote errors are happened, the module saves the last error code and previous error code is removed.

Specifications					
Positioning Function					
Performance		MLM-D_ _ _S		MLC-D_H/MLI-D_H	MLI-D_ _ _SU
No. of Control Axis		2-axis			
Interpolation		2-axis linear interpolation			
Output type		Pulse + Direction	Pulse + Direction CW / CCW output	Pulse + Direction	
Control Mode		Position control, Speed control, Speed / Position switching control, Position / Speed switching control			
Control Unit		Pulse			
Positioning Data		30-step pattern for each axis (OP step number: 1~30)	80-step for each axis (set in SoftMaster) (Operation step number: 1~80)		
Positioning Monitor		Dedicated monitoring function for positioning in SoftMaster			
Back-up		Permanent Backup of downloaded parameter and running data (FLASH memory)			
		Backup of parameter during operation(MLM) "S" type : 2-month Super Cap. / "H" type : Battery back-up / "SU" type : BAT(option)			
		Stored Data into RAM by command 'WRT' (FLASH memory)			
Positioning	Positioning Method	Absolute / Incremental method			
	Positioning Range	- 2,147,483,648 ~2,147,483,647			
	Speed Range	1~ 100,000 (pulse / sec)			
	Acceleration / Deceleration Type	Trapezoidal acceleration / deceleration			
	Acceleration / Deceleration Time	1~ 10,000 msec (4 patterns each can be set)			
Maximum Output Pulse		100 kpps			
Maximum Distance of Connections		2 meters (6.56 feet)			
Electrical					
Output	Signal	Output Pulse			
	Rated Input Voltage	DC 5 ~ 24V			
	Load Voltage Range	DC 4.75 ~ 26.4V			
	Max. Load Current/Inrush Current	100mA (1 point) 1A / 10msec or less			
	Max. Voltage Drop(ON)	DC 0.3V or less			
	Leakage Current(OFF)	0.1mA or less			
	Response Time	100μs or less			
Input	Signal	External High Limit	External Low Limit	Approximate Zero	Zero
	Rated Input Voltage / Current	DC 24V / 7mA			DC 24V / 4mA
	Load Voltage Range	DC 20.4 ~ 28.8 V			
	ON Voltage / Current	DC 19V / 5.7 mA or more			DC 19V / 3.4 mA or more
	OFF Voltage / Current	DC 6V / 1.8 mA or less			DC 6V / 1.1 mA or less
	Input Resistance	3.3 KΩ			5.6 KΩ
	Response Time	0.5 ms or less			

Positioning Function Terminals ("S" type)

Item	Pin Number		Signal Name		Direction of Positioning Signal	Operating Direction
	X axis	Y axis				
Output	A1	A2	Pulse	Pulse output (open collector)	→	-
	A3	A4	Direction	Pulse output (open collector)	→	-
	A9/A10		DC24V	External 24V Power supply	→	-
	B9/B10		Output COM	External 24V GND	→	-
Input	A1	A3	Limit L	Low Limit	←	Edge
	A2	A4	Limit H	High Limit	←	Edge
	A5	A7	DOG	Near Point	←	Edge
	A6	A8	Zero	Zero signal (+24V)	←	Edge
	A9/10, B9/10		Input COM	COMMON	←	-

Positioning Function Terminals ("H" type-MLC/MLI), ("SU" type-MLI-D _ _ _SU)

Item	Pin Number		Signal Name		Direction of Positioning Signal	Operating condition
	X axis	Y axis				
Output	P0020 (%QX 0.0.0)	P0021 (%QX 0.0.1)	Pulse	Pulse/CW (Open collector)	→	DC5~24V
	P0022 (%QX 0.0.2)	P0023 (%QX 0.0.3)	Direction	Direction/CCCW (Open collector)	→	
	P		DC12V	External power supply	→	
	COMO		Output COM	External 24V GND	→	
Input	P0008 (%IX0 .0.8)	P000A (%IX0 .0.10)	Limit L	Low limit	←	7.4mA/24V
	P0009 (%IX0 .0.9)	P000B (%IX0 .0.11)	Limit H	High limit	←	
	P000C (%IX0 .0.12)	P000E (%IX0 .0.14)	DOG	Near point	←	
	P000D (%IX0 .0.13)	P000F (%IX0 .0.15)	Origin	Zero signal(+24V)	←	
	COM		Input COM	Common	←	

Item	Range	Initial value	K area for positioning		Data size
			X-axis	Y-axis	
			MLM/MLC	MLM/MLC	
			MLI	MLI	
Positioning	0: No use, 1 : use	0	K4870 %KX7792	K5270 %KX8432	Bit
Pulse output level	0 : Low Active, 1 : High Active	0	K4871 %KX7793	K5271 %KX8433	Bit
Pulse output mode	0 : CW/CCW 1 : PLS/DIR	0	K4873 %KX7795	K5273 %KX8435	Bit
M code output mode	0 : NONE, 1 : WITH 2 : AFTER	0	K4681-2 %KX7489-90	K5081-2 %KX8129-30	Bit
Bias speed	1 ~ 100,000[pulse/ sec]	1	K450 %KD225	K490 %KD245	Double word
Speed limit	1 ~ 100,000[pulse/ sec]	100,000	K452 %KD226	K492 %KD246	Double word
ACC time 1	0 ~ 10,000[unit: ms]	500	K454 %KW454	K494 %KW494	word
DEC time 1	0 ~ 10,000[unit: ms]	500	K455 %KW455	K495 %KW495	word
ACC time 2	0 ~ 10,000[unit: ms]	1,000	K456 %KW456	K496 %KW496	word
DEC time 2	0 ~ 10,000[unit: ms]	1,000	K457 %KW457	K497 %KW497	word
ACC time 3	0 ~ 10,000[unit: ms]	1,500	K458 %KW458	K498 %KW498	word
DEC time 3	0 ~ 10,000[unit: ms]	1,500	K459 %KW459	K499 %KW499	word
ACC time 4	0 ~ 10,000[unit: ms]	2,000	K460 %KW460	K500 %KW500	word
DEC time 4	0 ~ 10,000[unit: ms]	2,000	K461 %KW461	K501 %KW501	word
S/W upper limit	-2,147,483,648 ~ 2,147,483,647 [pulse]	2,147,483,647	K462 %KD231	K502 %KD251	Double word
S/W lower limit	-2,147,483,648 ~ 2,147,483,647 [pulse]	-2,147,483,648	K464 %KD232	K504 %KD252	Double
Backlash Compensation	0 ~ 65,535[pulse]	0	K466 %KW466	K506 %KW506	word
S/W Limit Detect	0 : No detect1 : detect	0	K4684 %KX7492	K5084 %KX8132	Bit
Upper/lower limits	0: no use, 1: use	1	K4872 %KX7794	K5272 %KX8434	Bit

Item	Setting range	Initial value	Type	Dedicated K		Data size
				X axis	Y axis	
Home Method	0 ~ 2	0	MLM/MLC	K4780	K5180	Bit
			MLI	%KX7648	%KX8288	
Home Direction	0 : CW, 1 : CCW	1	MLM/MLC	K4782	K5182	Bit
			MLI	%KX7650	%KX8290	
Home Address	-2,147,483,648~2,147,483,647[pulse]	0	MLM/MLC	K469	K509	Double word
			MLI	%KD234	%KD254	
Home High Speed	1 ~ 100,000[pulse/s]	5,000	MLM/MLC	K471	K511	Double word
			MLI	%KD235	%KD255	
Home Low Speed	1 ~ 100,000[pulse/s]	500	MLM/MLC	K473	K513	Double word
			MLI	%KD236	%KD256	
Homing ACC Time	0 ~ 10,000[unit: ms]	1,000	MLM/MLC	K475	K515	Word
			MLI	%KW475	%KW515	
Homing DEC Time	0 ~ 10,000[unit: ms]	1,000	MLM/MLC	K476	K516	Word
			MLI	%KW476	%KW516	
DWEELL Time	0 ~ 50,000[unit: ms]	0	MLM/MLC	K477	K517	Word
			MLI	%KW477	%KW517	
JOG High Speed	1 ~ 100,000[pulse/s]	5,000	MLM/MLC	K479	K519	Double word
			MLI	%KD239	%KD259	
JOG Low Speed	1 ~ 100,000[pulse/s]	1,000	MLM/MLC	K481	K521	Double word
			MLI	%KD240	%KD260	
JOG ACC Time	0 ~ 10,000[unit: ms]	1,000	MLM/MLC	K483	K523	Word
			MLI	%KW483	%KW523	
JOG DEC Time	0 ~ 10,000[unit: ms]	1,000	MLM/MLC	K484	K524	Word
			MLI	%KW484	%KW524	
Inching Speed	1 ~ 65,535[pulse/s]	100	MLM/MLC	K485	K525	Word
			MLI	%KW485	%KW525	

Positioning Dedicated Instruction		
Instruction ^{*1)}	Description	Instruction Operand ^{*1)}
ORG	Zero Return Start	Slot, Instruction axis
FLT	Floating-point zero setting	Slot, Instruction axis
DST	Direct Start	Slot, Instruction axis, Position, Speed, Dwell time,
		M code, Control word
IST	Indirect Start	Slot, Instruction axis, Step number
LIN	Linear Interpolation Start	Slot, Instruction axis, Step number, Axis information
SST	Simultaneous Start	Slot, Instruction axis, X-axis step number Y-axis step number, Z-axis step number, Axis information
VTP	Speed/Position Conversion	Slot, Instruction axis
PTV	Position/Speed Conversion	Slot, Instruction axis
Instruction ^{*1)}	Description	Instruction Operand ^{*1)}
STP	Stop	Slot, Instruction axis, Deceleration
SSP	Position Synchronization	Slot, Instruction axis, Step number, Master-axis position, Master-axis setting
SSS	Speed Synchronization	Slot, Instruction axis, Master-axis ratio, Slave-axis ratio, Master-axis setting
POR	Position Override	Slot, Instruction axis, Position
SOR	Speed Override	Slot, Instruction axis, Speed
PSO	Positioning Speed	Slot, Instruction axis, Position, Speed
INCH	Inching	Slot, Instruction axis, Inching amount
SNS	Changing Start Step number	Slot, Instruction axis, Step number
MOF	M code OFF	Slot, Instruction axis
PRS	Present Position Preset	Slot, Instruction axis, Position
EMG	Emergency Stop	Slot, Instruction axis
CLR	Error Reset, Output Disable Annulment	Slot, Instruction axis, Pulse output Enable/Disable
WRT	Parameter / Operation Data Saving	Slot, Instruction axis, Axis information
*1) In instruction, the slot should be assigned as number '0'.		

Variables	Device Area						Status
	Axis X			Axis Y			
	Word	Bit	Address	Word	Bit	Address	
In operation	K420	0	K4200	K430	0	K4300	0: stop, 1: operation
Error		1	K4201		1	K4301	0: no error, 1: error
Positioning completed		2	K4202		2	K4302	0: not completed, 1: completed
M code signal		3	K4203		3	K4303	0:M code Off, 1:M code On
Origin settled		4	K4204		4	K4304	0: origin not decided, 1: origin decided
No pulse output		5	K4205		5	K4305	0: output available, 1: no output
Stopped		6	K4206		6	K4306	0: not stopped 1: stopped
Upper limit detected		8	K4208		8	K4308	0: undetected, 1: detected
Lower limit detected		9	K4209		9	K4309	0: undetected, 1: detected
Emergency stop		A	K420A		A	K430A	0: normal, 1:abnormally stopped
Normal/backward rotation		B	K420B		B	K430B	0: normal direction, 1:backward direction
Operation (acceleration)		C	K420C		C	K430C	0: not accelerated, 1: accelerated
Operation (constant speed)		D	K420D		D	K430D	0: not constant speed, 1: constant speed
Operation (deceleration)		E	K420E		E	K430E	0: not decelerated, 1: decelerated
Operation (dwell)		F	K420F		F	K430F	0: not during dwell, 1: during dwell
Operation (positioning)	K421	0	K4210	K431	0	K4310	0: position not controlled 1: position controlled
Operation (speed control)		1	K4211		1	K4311	0: speed not controlled 1: speed controlled
Operation control (straight interpolation)		2	K4212		2	K4312	0: interpolation not controlled 1: interpolation controlled
Return to origin		5	K4215		5	K4315	0: not returning to origin 1: returning to origin
Position synchronization		6	K4216		6	K4316	0: position not synchronized 1: position synchronized

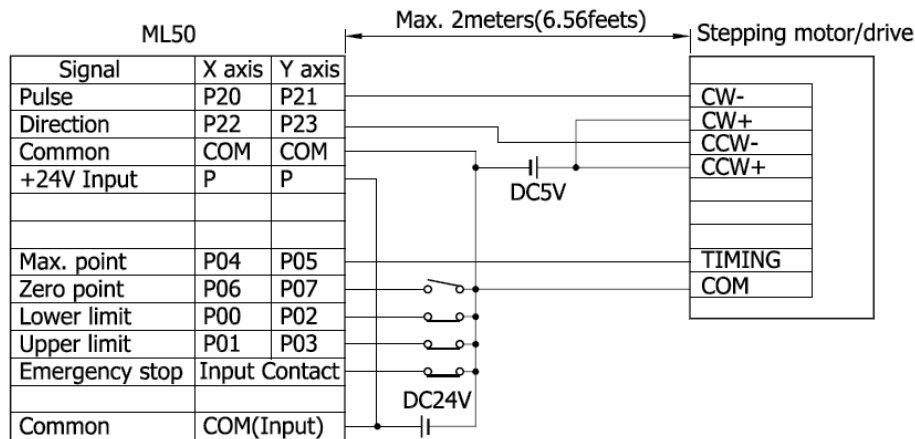
Variables	Device area		Status
	Axis X	Axis Y	
In operation	%KX6720	%KX6880	0: stop, 1: operation
Error	%KX6721	%KX6881	0: no error, 1: error
Positioning completed	%KX6722	%KX6882	0: not completed, 1: completed
M code signal	%KX6723	%KX6883	0:M code Off, 1:M code On
Origin settled	%KX6724	%KX6884	0: origin not decided, 1: origin decided
No pulse output	%KX6725	%KX6885	0: output available, 1: no output
Stopped	%KX6726	%KX6886	0: not stopped 1: stopped
Upper limit detected	%KX6728	%KX6888	0: undetected, 1: detected
Lower limit detected	%KX6729	%KX6889	0: undetected, 1: detected
Emergency stop	%KX6730	%KX6890	0: normal, 1: abnormally stopped
Normal/backward rotation	%KX6731	%KX6891	0: normal direction, 1:backward direction
Operation (acceleration)	%KX6732	%KX6892	0: not accelerated, 1: accelerated
Operation (constant speed)	%KX6733	%KX6893	0: not constant speed, 1: constant speed
Operation (deceleration)	%KX6734	%KX6894	0: not decelerated, 1: decelerated
Operation (dwell)	%KX6735	%KX6895	0: not during dwell, 1: during dwell
Operation (positioning)	%KX6736	%KX6896	0: position not controlled 1: position controlled
Operation (speed control)	%KX6737	%KX6897	0: speed not controlled 1: speed controlled
Operation control (straight interpolation)	%KX6738	%KX6898	0: interpolation not controlled 1: interpolation controlled
Return to origin	%KX6741	%KX6901	0: not returning to origin 1: returning to origin
Position synchronization	%KX6742	%KX6902	0: position not synchronized 1: position synchronized
Speed synchronization	%KX6743	%KX6903	0: speed not synchronized 1: speed synchronized
Jog low speed	%KX6744	%KX6904	0: jog not at low speed 1: jog at low speed
Jog high speed	%KX6745	%KX6905	0: jog not at high speed 1: jog at high speed
Inching operation	%KX6746	%KX6906	0:not during inching operation 1: during inching operation

Operation Data Range for Positioning						
Step Number	Item	Specification	Initial Value	Device Range		Remark
				X-axis	Y-axis	
1	Coordinates	0:Absolute, 1:Relative	Absolute	K5384	K8384	Bit
				%KX8612	%KX13412	
	Operation Pattern	0:End, 1:Continue, 2:Repeat	End	K5382~3	K8382~3	Bit
				%KX8610~1	%KX13410-1	
	Control Method	0:Position control, 1:Speed control	Position	K5381	K8381	Bit
				%KX8609	%KX13409	
	Operation Method	0:Single operation, 1:Repeated Operation	Single	K5380	K8380	Bit
				%KX8608	%KX13408	
	Repeating Step	0~30 ("H" type : 0 ~80)	0	K539	K839	Word
				%KX8607	%KW839	
	Targeted Position	-2,147,483,648~2,147,483,647[pulse]	0	K530	K830	Double
				%KD265	%KD415	Word
	M Code Number	0~65,535	0	K537	K837	Word
				%KW537	%KW837	
	Accel/Decel Number	0:Number1, 1:Number2 2:Number3, 3: :Number4	0	K5386	K8386	Bit
				%KX8614	%KX13414	Bit
				K5387	K8387	
				%KX8615	%KX13415	
	Operation Speed	1~100,000[pulse/sec]	0	K534	K834	Double
				%KD267	%KD417	Word
	Dwell Time	1~50,000[pulse/sec]	0	K536	K836	Word
				%KW536	%KW836	
2	Same items as Step number 1			K540~549	K840~849	-
				%KW540~549	%KW840~849	
3~30	Same items as Step number 1			K550~559	K850~859	-
				%KW550~829	%KW850~1129	

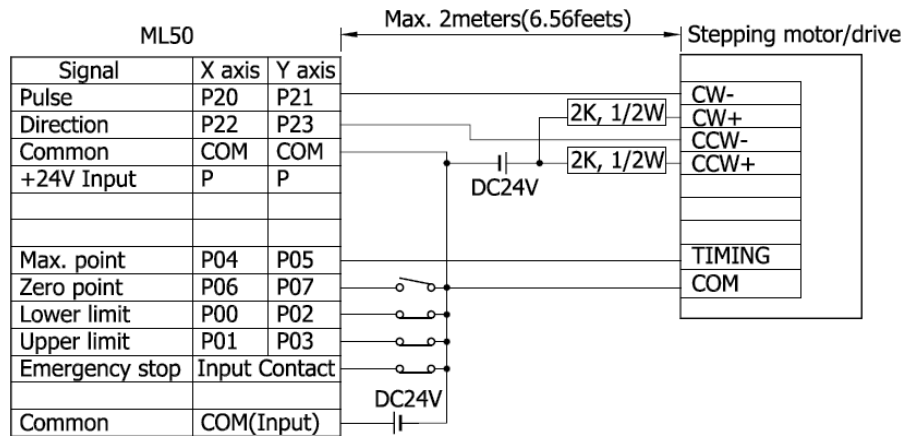
Step Number	Item	Specification	Initial Value	Device Range		Remark
				X-axis	Y-axis	
31 (Only “H” type)	Coordinates	0:Absolute, 1:Relative	Absolute	K23484	K28484	Bit
				%KX37572	%KX45572	
	Operation Pattern	0:End, 1:Continue, 2:Repeat	End	K23482~3	K28482~3	Bit
				%KX37570~1	%KX45570~1	
	Control Method	0:Position control, 1:Speed control	Position	K23481	K28481	Bit
				%KX37569	%KX45569	
	Operation Method	0:Single operation, 1:Repeated Operation	Single	K23480	K28480	Bit
				%KX37568	%KX45568	
	Repeating Step	0~30 (“H” type : 0 ~80)	0	K2349	K2849	Word
				%KW2349	%KW2849	
	Targeted Position	-2,147,483,648 ~2,147,483,647[pulse]	0	K2340	K2840	Double
				%KD1170	%KD1420	Word
	M Code Number	0~65,535	0	K2347	K2847	Word
				%KW2347	%KW2847	
	Accel/Decel Number	0:Number1, 1:Number2 2:Number3, 3: :Number4	0	K23486	K28486	Bit
				%KX37574	%KX45574	
				K23487	K28487	
				%KX37575	%KX45575	
	Operation Speed	1~100,000[pulse/sec]	0	K2344	K2844	Double
				%KD1172	%KD1422	Word
	Dwell Time	1~50,000[pulse/sec]	0	K2346	K2846	Word
				%KW2346	%KW2846	
32	Same items as Step number 31			K2350~2359	K2850~2859	“H” type only
				%KW2350~9	%KW2850~9	
33	Same items as Step number 31			K2360~2369	K2860~2869	
				%KW2360~9	%KW2860~9	
34~79	Same items as Step number 31			K2370~2829	K2870~3329	
				%KW2370 ~2829	%KW2870 ~3329	
80	Same items as Step number 31			K2830~2839	K3330~3339	
				%KW2830~9	%KW3330~3339	

Positioning Function Wiring

- With DC5V

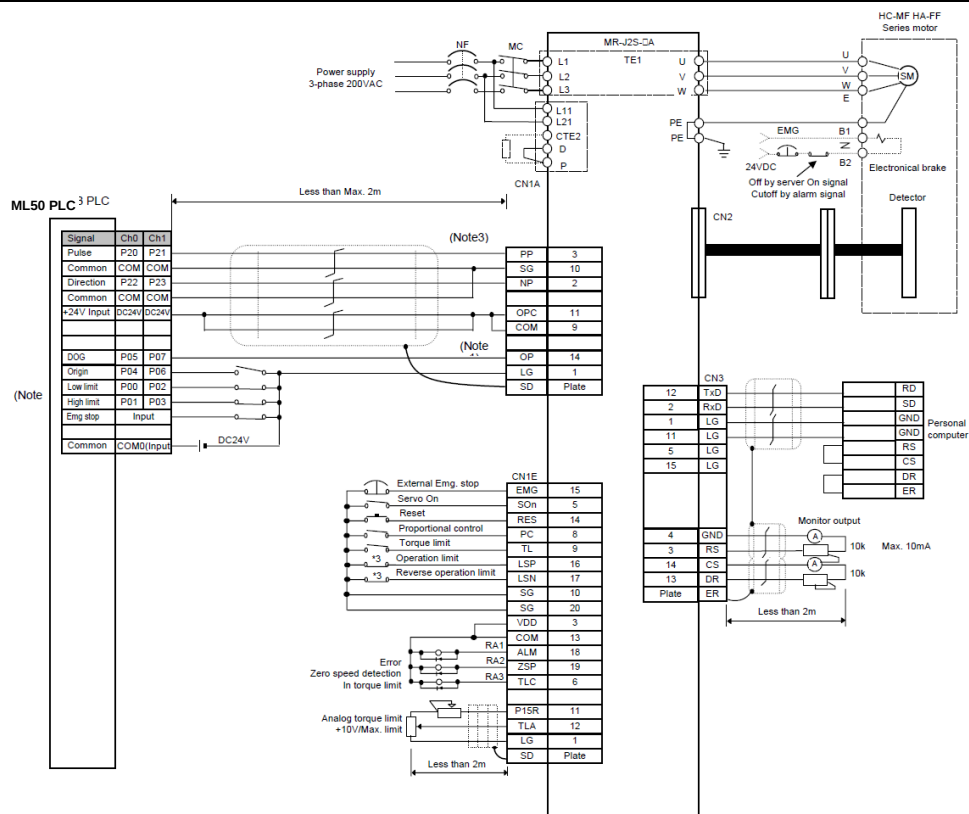


- With DC24V



Servo Motor Wiring

- With MR-J2S-_A

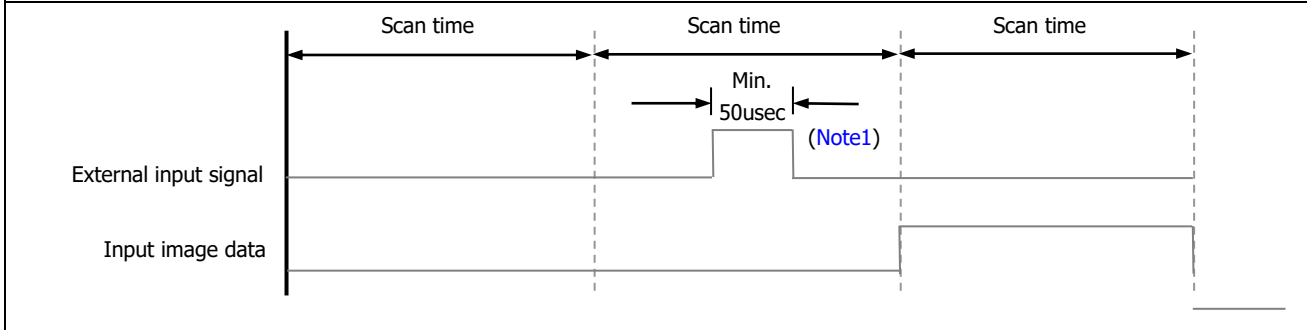


Specifications		
PID Control		
Features - Built-in PID control function in ML50's main unit - Various control operation (P, PI, PD, PID, On/Off) - PWM (Pulse Width Modulation) output of control result - Forward, Reverse, Forward / Reverse Mixed Operation - Enhanced response to disturbance with cascade loop - Available to use 2 set values and PID parameters simultaneously according to operation zone - Various PID control configurations with its SV Ramp, PV Tracking, Delta MV, MV Preset, Alarm functions		
Performance		
No. of Control Loop		16-loop independent control
Control Mode		P control, PI control, PD control, PID control
Control Period		10ms ~ 6563.5 ms (Setting unit: 0.1ms)
Function	Forward / Reverse Mixed Control	Switching control direction automatically when exceeding dead band
	Cascade	Improved control precision by serial connection between Master loop and Slave loop
	SV Ramp	Preventing overload caused by excessive SV change by setting variation slope
	Alarm	Improved control stability with various alarm function such as MV high limit / low limit, PV high limit / low limit, PV variation width
	Auto Tuning	Auto tuning with improved auto-tuning algorithm
	Additional Function	PWM output, PV tracking, Δ MV, Δ PV, etc.

Pulse catch / Input Filter / Task

Pulse Catch

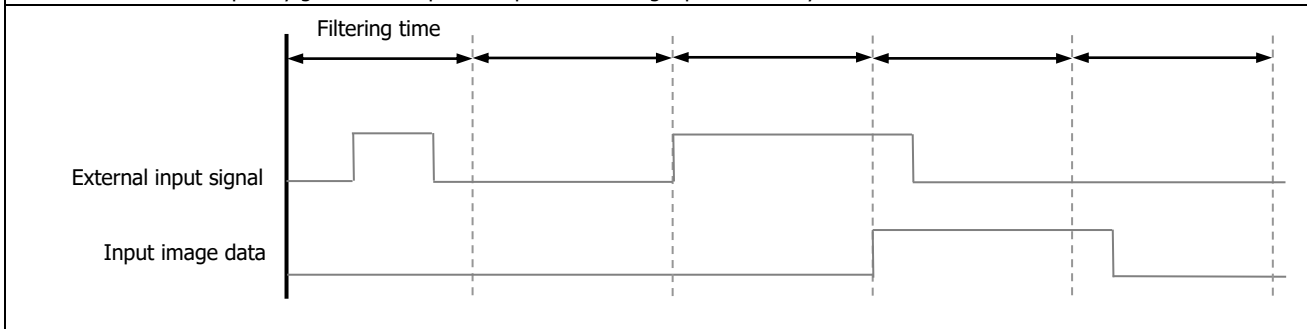
When the On-condition time of input signal (P0000~P0007) is shorter than 1 scan time (Min. 50 μ s), Pulse catch processes the input signal as normal input.



Model	"S" type(MLM)	"H" type(MLC, MLI)	"SU" type, MLI	"E" type, MLI
Pulse Catch	50usec 8 points (P000~P007)	10usec 4 points (P000~P003)	10usec 2 points (P000~P001)	50usec 4 points (P000~P003)
		50usec 4 points (P004~P007)	50usec 6 points (P002~P007)	

Input Filter

Input filter prevents processing of input signal that is shorter than the filtering time. (Filtering time set by parameter). In the application site where noise is frequently generated. Input filter prevents wrong input caused by noise.



No. of Setting Points	Every input contact
Input Filtering Time Setting	Assigning standard input filter / Assigning for each module
Setting Range	1-100msec(1, 3, 5, 10, 20, 70, 100)

Task

Task function is the processing method of internal / external signal generated periodically or none (Total 25 Tasks can be assigned). It stops operation of scan program for the moment and then eMLIutes the assigned task.

Types of Task

Model	"S" type(MLM)	"H" type(MLC, MLI)	"SU" type, MLI	"E" type, MLI
Initialization Task Setting	Running a task one time before 1(INIT_DONE) at initial eMLIution			
Fixed Cycle Task Setting	8 points, Range = 1 ~ 42,94,967,295 msec			
External Points Task Setting Condition : Up, Down, Change	50 μ s: 8 points (P00000~P00007)	10 μ s: 4 points (P00000~P00003) 50 μ s: 4 points (P00004~P00007)	10 μ s: 2 points (P00000~P00001) 50 μ s: 6 points (P00002~P00007)	50 μ s: 4 points (P00000~P00003)
Internal Device Task Setting	8 points , Condition : Up, Down, change, On, Off			

RTC Function

Model	"S" type(MLM)	"H" type(MLC, MLI)	"SU" type, MLI	"E" type, MLI
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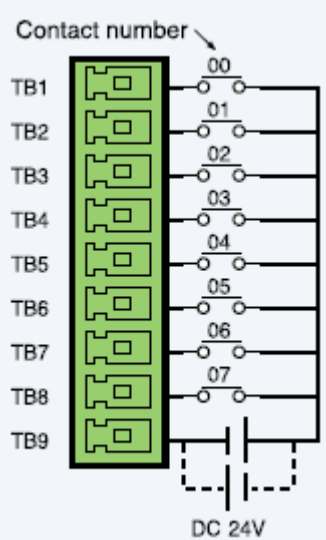
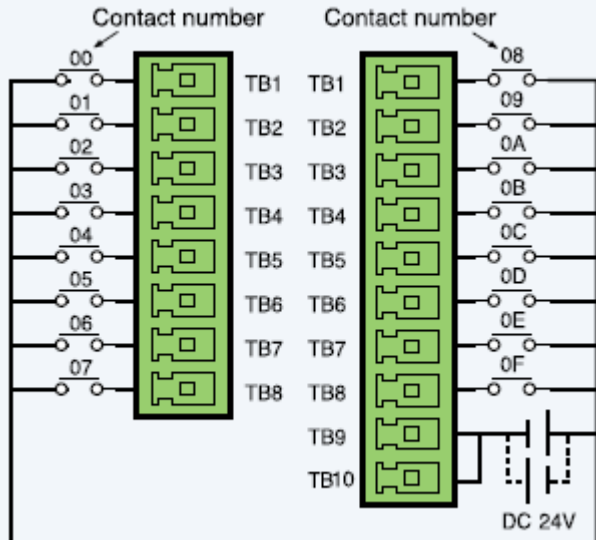
RTC	Not available	Built-in(BAT)	Option Module	Option Module
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Specifications

Digital Input

Model		MLE-DC08A	MLE-DC16A	MLE-DC32A
Input points		8	16	32
Rated input voltage / current		DC24V / 4mA		
Operation voltage range		DC20.4 ~ 28.8V (Ripple rate < 5%)		
On Input Voltage / Current		Min. DC19V / 3mA		
Off Input Voltage / Current		Max. DC 6V / 1mA		
Input resistance		5.6kΩ		
Response time	Off -> On	1 / 3 / 5 / 10 / 20 / 70 / 100ms (setting by CPU parameter) initial value: 3ms		
	On -> Off			
Insulation resistance		10MΩ or more by megger		
COMMON method		8 points / COM	16 points / COM	32 points / COM
Internal current consumption		30mA	40mA	50mA

Wiring

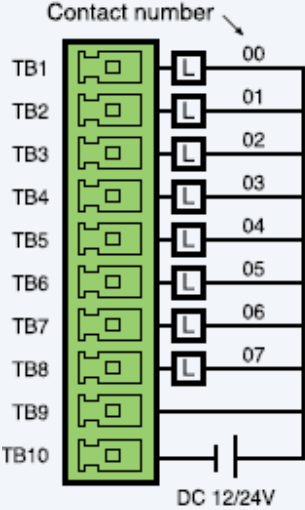
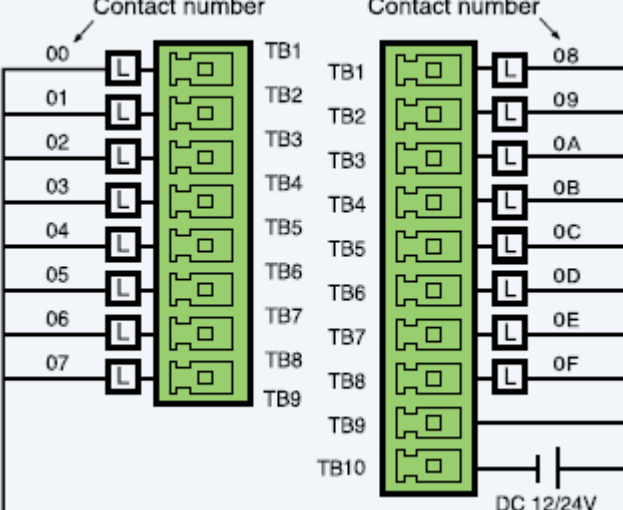
MLE-DC08A	MLE-DC16A
 Diagram showing the wiring for MLE-DC08A. It features 8 input points labeled TB1 through TB8. Each point is connected to a terminal block with contacts numbered 00 through 07. A DC 24V source is connected to the common terminal.	 Diagram showing the wiring for MLE-DC16A. It features 16 input points labeled TB1 through TB8, TB9, and TB10. Each point is connected to a terminal block with contacts numbered 00 through 0F. A DC 24V source is connected to the common terminal.
MLE-DC32A	
Note the wiring with Smart Link	

Specifications

Digital Open Collector Output (Transistor)

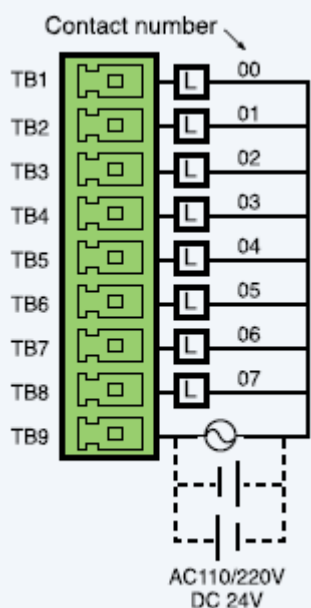
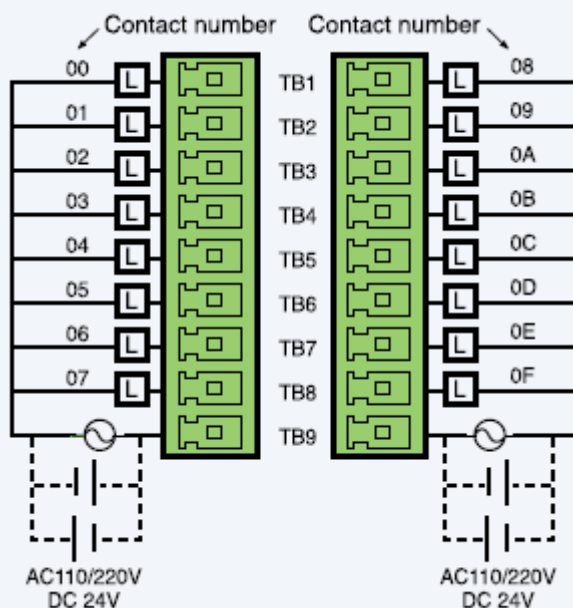
Model		MLE-TN08A	MLE-TP08A	MLE-TN16A	MLE-TP16A	MLE-TN32A	MLE-TP32A
Output points		8		16		32	
Rated load voltage		DC12 / 24V					
Load voltage range		DC 10.2V ~ 26.4V					
Max load current		0.2A / 1 point		0.2A / 1 point, 2A / COM			
Off leakage current		0.1mA or less					
Max. voltage drop (On)		DC 0.4V					
Response time	Off -> On	1 ms or less					
	On -> Off	1 ms or less (Rated load, resistive load)					
Insulation resistance		10MΩ or more by megger					
COMMON method		8 points / COM		16 points / COM		32 points / COM	
Internal current consumption		40mA		60mA		120mA	
External	Voltage	DC 12 / 24V ± 10% (Ripple voltage ≤ 4 Vp-p)					
Power supply	Current	10mA or less (DC 24V connection)				20mA or less (DC 24V connection)	

Wiring

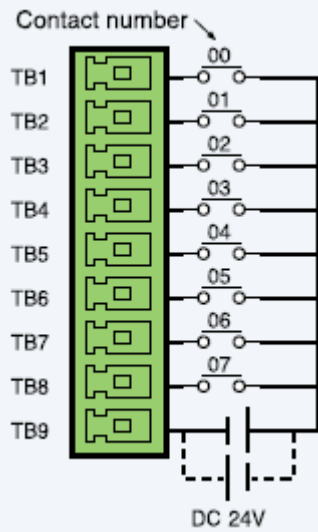
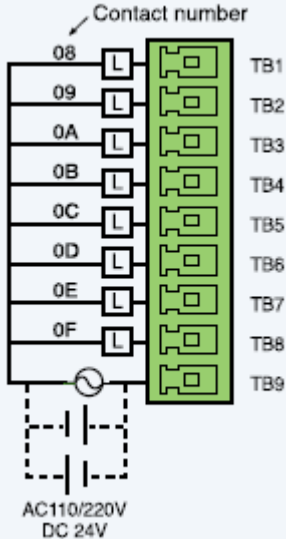
MLE-TN08A	MLE-TN16A
	

MLE-TN32A

Note the wiring with Smart Link

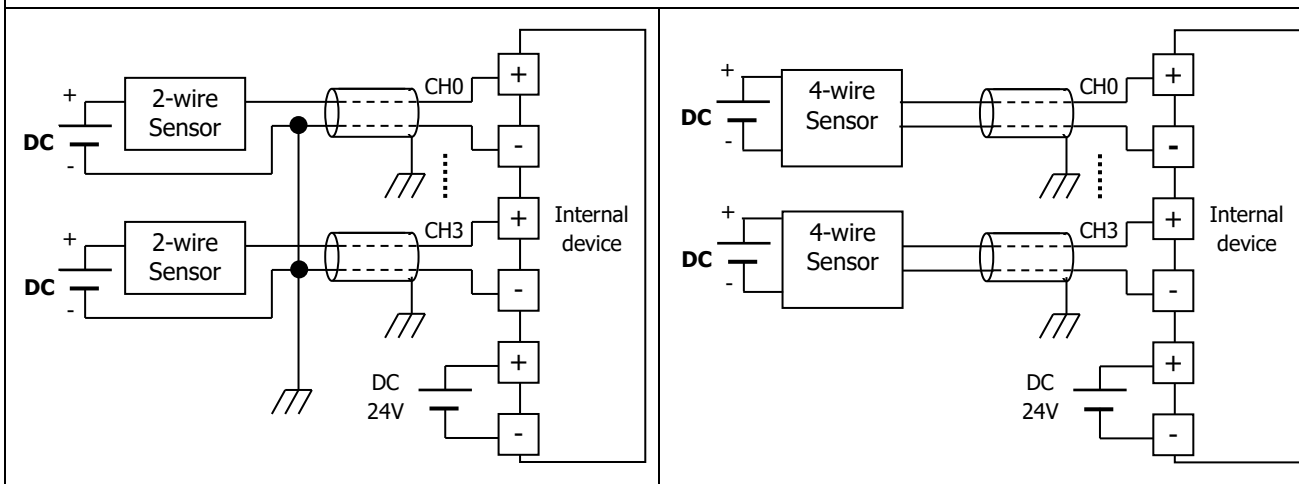
Specifications		
Digital Relay Output		
Model	MLE-RY08A	MLE-RY16A
Output points	8	16
Insulation method	Relay Insulation	
Rated input voltage / current	DC 24V 2A (resistive load) / AC 220V 2A (COSΨ = 1), 5A / COM	
Min. load voltage / current	DC5V 1mA	
Max. load voltage	AC 250V, DC 125V	
Off leakage current	0.1mA (AC 220V, 60Hz)	
Max. on/off frequency	3,600 times / hr	
Surge absorber	None	
Service life	Mechanical	20million times or more
	Electrical	Rated load voltage / current 100,000 times or more
		AC 200V / 1.5A, AC 240V / 1A (COSΨ = 0.7) 100,000 times or more
		AC 200V / 1A, AC 240V / 0.5 (COSΨ = 0.35) 100,000 times or more
	DC 24V / 1A, DC 100V / 0.1A (L / R = 7ms) 100,000 times or more	
Response time	Off -> On	10ms or less
	On -> Off	12ms or less
COMMON method	8 points / 1COM	
Internal current consumption	230mA	420mA
Operation indicator	Output On, LED On	
External connection method	9-pin terminal block connector	9-pin terminal block connector X 2
Wiring		
MLE-RY08A	MLE-RY16A	
AWG#22(0.3mm ²) or greater	AWG#22(0.3mm ²) or greater	
Contact number 	Contact number 	

Specifications		
MLE-DR16A (Digital input / Relay output)		
DC Input		
Input points		8
Insulation method		Photo coupler
Rated input voltage		DC 24V
Rated input current		4mA
Operation voltage range		DC20.4 ~ 28.8V (Ripple rate < 5%)
On voltage / On current		DC19V or more / 3mA or more
Off voltage / Off current		DC6V or less / 1mA or less
Input resistance		5.6kΩ
Response time	Off -> On	1 / 3 / 5 / 10 / 20 / 70 / 100ms (setting by CPU parameter) init value: 3ms
	On -> Off	
COMMON method		8 points / COM
Weight		81g
Relay output		
Output points		8
Insulation method		Relay Insulation
Rated input voltage / current		DC 24V 2A (resistive load) / AC 220V 2A (COSΨ = 1), 5A /COM
Min. load voltage / current		DC5V 1mA
Max. load voltage		AC250V, DC125V
Off leakage current		0.1mA (AC220V, 60Hz)
Max. on / off frequency		3,600 times / hr
Surge absorber		None
Service life	Mechanical	20million times or more
	Electrical	Rated load voltage / current 100,000 times or more
		AC 200V / 1.5A, AC 240V / 1A (COSΨ = 0.7) 100,000 times or more
		AC 200V / 1A, AC 240V / 0.5 (COSΨ = 0.35) 100,000 tiems or more
		DC 24V / 1A, DC 100V / 0.1A (L / R = 7ms) 100,000 times or more
Response time	Off -> On	10ms or less
	On -> Off	12ms or less
COMMON method		8 points / 1COM
Internal current consumption		280mA
Operation indicator		Output On, LED On
External connection method		9-pin terminal block connector

Wiring	
8-point DC input	8-point Relay Output
AWG#22(0.3mm ²) or greater	AWG#22(0.3mm ²) or greater
 Diagram illustrating the wiring for the 8-point DC input. The terminals are labeled TB1 through TB9. The contact numbers are 00 through 07. The wiring is connected to a DC 24V source.	 Diagram illustrating the wiring for the 8-point Relay Output. The terminals are labeled TB1 through TB9. The contact numbers are 08 through 0F. The wiring is connected to an AC110/220V source and a DC 24V source.

Specifications								
Analog Input / Output								
Performance								
Model		MLF-AD04A		MLF-AD04C		MLF-AD08A		
Analog range	Item	Voltage	Current	Voltage	Current	Voltage	Current	
	Range	DC 0~10V (input resistance : 1MΩ min.)	DC 4~20mA, DC 0~20mA (input resistance: 250Ω)	DC 1 ~ 5V DC 0 ~ 5V DC 0 ~ 10V DC -10 ~ 10V (Input resistance : 1MΩ min)	DC 4 ~ 20mA DC 0 ~ 20mA (Input resistance : 250MΩ)	DC 1~5V DC 0~5V DC 0~10V (Input resistance : 250MΩ)	DC 4~20mA, DC 0~20mA (input resistance: 250Ω)	
Digital output	Type	12bit binary data		16bit binary data (Data : 14bit)		12bit binary data		
	Range	Unsigned value	0~4000		0~16000		0~4000	
		Singed value	-2000~2000		-8000~8000		-2000~2000	
		Precise value	0~1000	4000~2000/ 0~2000	100~5000 (1~5V) 0~5000 (0~5V) 0~10000 (0~5V) -10000~10000(±10V)	4000~20000 (4~20mA) 0~20000 (0~20mA)	100~500 (DC 1~5V) 0~500 (DC 0~5V) 0~1000 (DC 0~10V)	4000~2000 (DC 4~20mA) 0~2000 (DC 0~20mA)
		Percentile value	0~1000		0~10000		0~1000	
Resolution		2.5mV (1/4000)	5μA (1/4000)	1/16000		1.25mV (DC1~5V, 0~5v) 2.5mV (DC 0~10V)	5μA (DC 4~20mA, 0~20mA)	
				0.250mV(1 ~ 5V) 0.3125mV(0 ~ 5V) 0.625mV(0 ~ 10V) 1.250mV(±10V)	1.0μA (4 ~ 20mA) 1.25μA (0 ~ 20mA)			
Max. conversion Speed		1.5ms / channel		1.0ms / channel		1.5ms / channel		
Max. absolute input		±15V	±25mA	DC±15V	DC±3mA	±15V	±25mA	
Analog input channels		4 channel/module		4 channel/module		8 channel/module		
Insulation Method		Photocoupler insulation between I/O terminal and power supply		Photo-coupler insulation between input terminal and PLC power (No insulation between channels)		Photocoupler insulation between I/O terminal and power supply		
Connection terminal		11-point terminal block		15-point terminal block		11-point terminal block		
Occupied I/O points		Fixed type : 64 points						
Current	DC5V	120mA		110mA		105mA		
consumption	DC24V	62mA		100mA		85mA		

Analog Input Wiring



* Use 22AWG, 2 conductor, twist shield cable when wiring between analog module and external device.

Analog / Digital Conversion Characteristics (MLF-AD04A)

Output Value Selection	Precise Value			Percentile Value	-2,000 ~ 2,000	0 ~ 4,000	
	4~20mA	0~20mA	0~10V				
Digital Output	2,023	2,023	1,011	1,011	2,047	4,047	
	2,000	2,000	1,000	1,000	2,000	4,000	
	1,600	1,500	750	750	1,000	3,000	
	1,200	1,000	500	500	0	2,000	
	800	500	250	250	-1,000	1,000	
	400	0	0	0	-2,000	0	
Analog Input	0 ~ 10V				-2,048	-48	
	0 ~ 20mA				*Note1)	*Note1)	
	4 ~ 20mA						

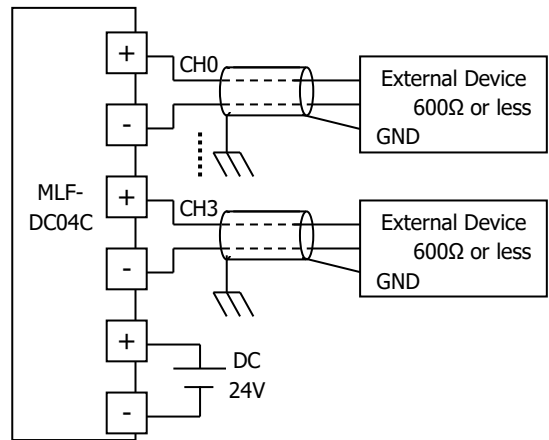
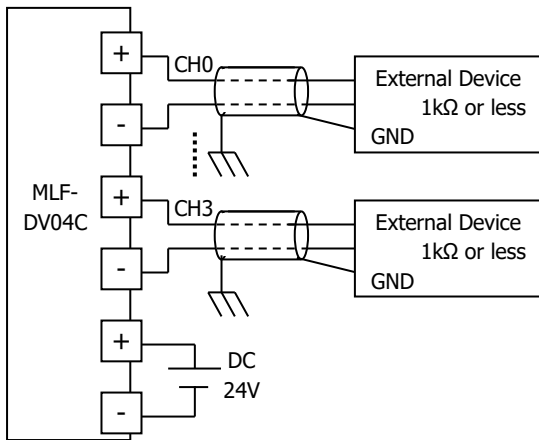
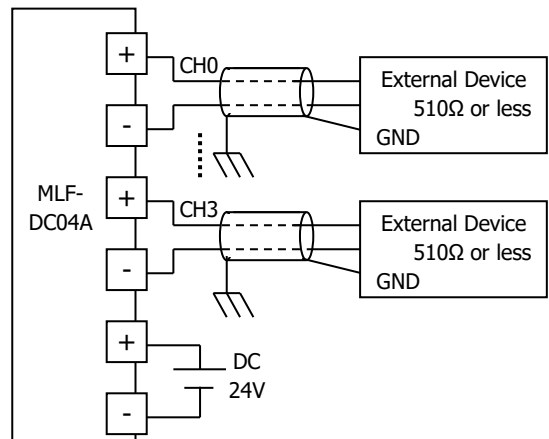
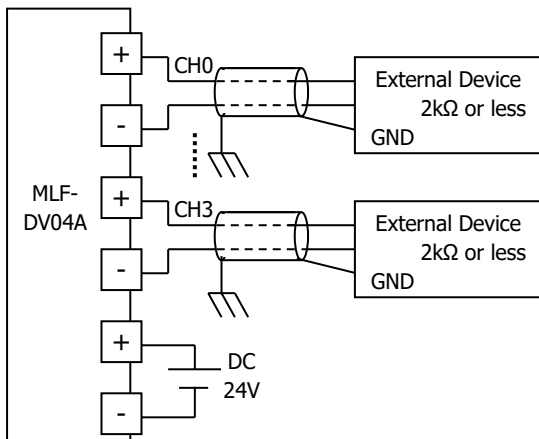
* Note1) Supported in case of analog input is 4~20mA.

Names and Functions

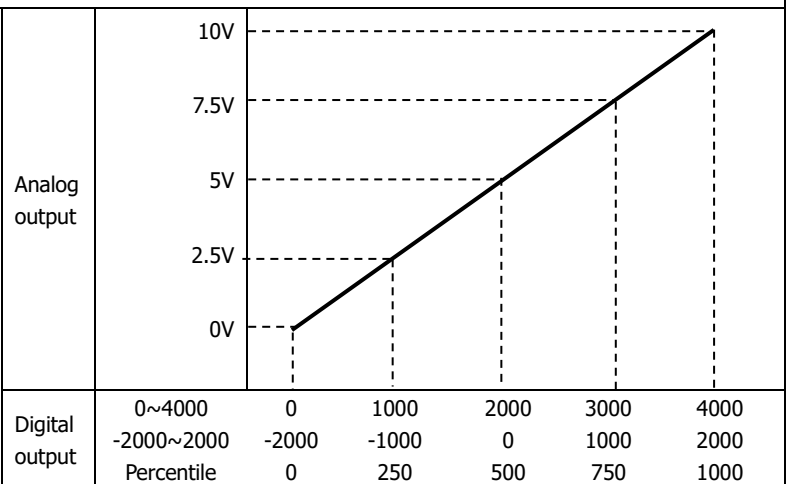
No	Name	Description
1	RUN LED	Indicates condition of module • LED ON : Normal condition • LED Flicking(ON/OFF) : Error • LED OFF : Power off or Module malfunction
2	Input Selection Switch	Voltage/Current selection terminal • V : Voltage input selection • I : Current input selection
3	External Connection Terminal	External device connection
4	External Power Supply Terminal	External DC24V input

Analog Output				
Performance				
Model	MLF-DV04A	MLF-DV04C	MLF-DC04C	MLF-DC04A
Analog range	DC 0 ~ 10 V (Load resistance ≥ 2kΩ)	DC 1 ~ 5V DC 0 ~ 5V DC 0 ~ 10V DC -10 ~ 10V (Input resistance : 1kΩ or more)	DC 4 ~ 20mA DC 0 ~ 20mA (Input resistance : 600MΩ or less)	4 ~ 20mA / 0 ~ 20mA (Load resistance ≤510Ω)
Range selection	-	-	-	Softmaster I/O parameter
Digital data	Output range	0 ~ 10 V	-	4 ~ 20mA / 0 ~ 20mA
	Unsigned value	0~4000	0~16000	0~4000
	Singed value	-2000~2000	-8000~8000	-2000~2000
	Precise value	0~1000	1000~5000(1~5V) 0~5000(0~5V) 0~10000(0~10V) -1000~10000(±10V)	4000~20000(4~20mA) 0~20000(0~20mA)
	Percentile value	0~1000	0~10000	400 ~ 2000 / 0 ~ 2000
	Data format	Data format of digital input is set by user program or I/O parameter (Setting for each channel is available.)		
Resolution		1/4000	1/16000	1/4000
	2.5mV	0.250m(1~5V) 0.3125m(0~5V) 0.625m(0~10V) 1.250m(±10V)	1.0μA(4~20mA) 1.25μA(0~20mA)	5μA
Max. conversion speed	1ms / channel	1ms / channel	1ms / channel	1ms / channel
Max. absolute output	±15V	-	-	±25mA
Accuracy	±0.5% or less	±0.2% or less(at 25°C amb.) ±0.3% or less(at 0~55°C)	±0.2% or less(at 25°C amb.) ±0.3% or less(at 0~55°C)	±0.5% or less
Analog output channels	4 channel / module	4 channel / module	4 channel / module	4 channel / module
Insulation method	Photocoupler insulation between I/O terminal and power supply	Photo-coupler insulation between output terminal and PLC power (no insulation between channels)	Photo-coupler insulation between output terminal and PLC power (no insulation between channels)	Photocoupler insulation between I/O terminal and power supply
Connection Terminal	11-point terminal block			
Occupied I/O Points	Fixed type : 64points			
Current Consumption	DC 5V	110mA	75mA	110mA
	DC 24V	70mA	170mA	120mA

Analog Output Wiring



Analog Output Conversion Characteristics

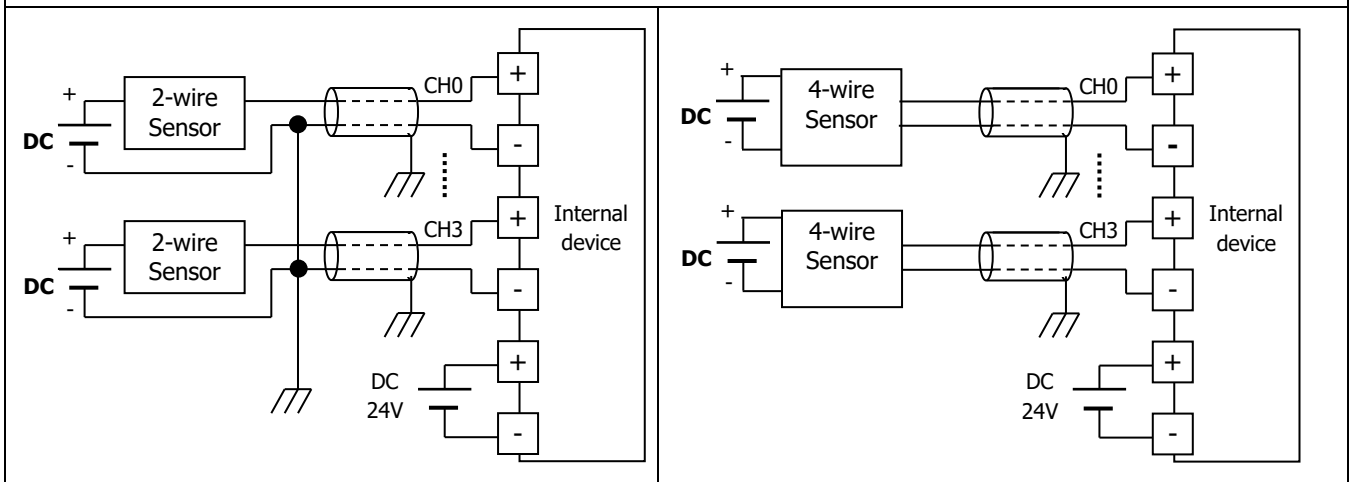


Analog Input/Output

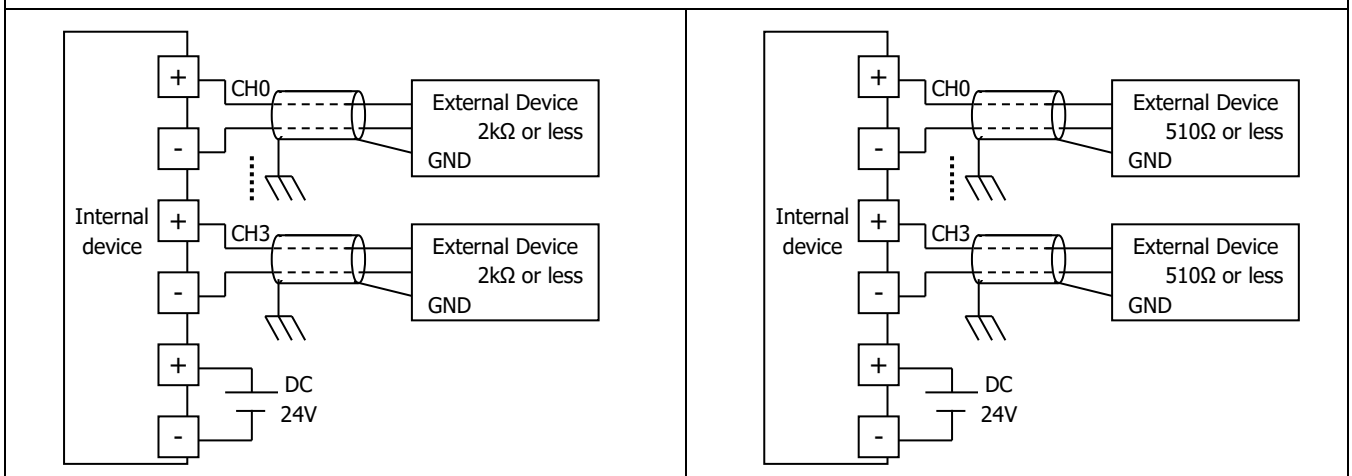
Performance

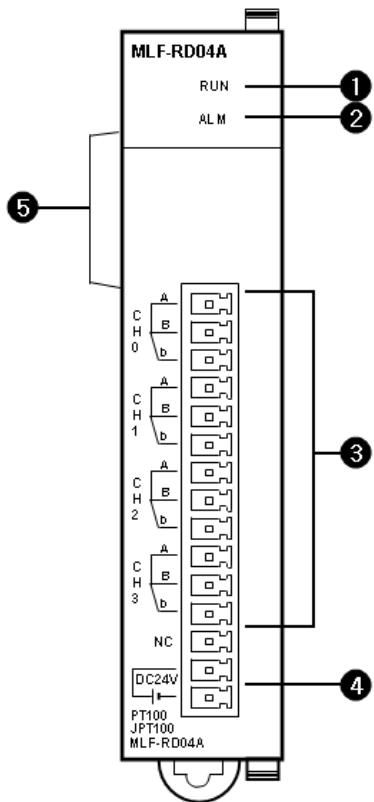
Model		MLF-AH04A	
Analog channel		Input-2channels	Output-2channels
Analog range		DC 1 ~ 5V, DC 0 ~ 5V, DC 0 ~ 10V (Input resistance: 1 M Ω min.) DC 4 ~ 20mA, DC 0 ~ 20mA (Input resistance 250 Ω)	DC 1 ~ 5V, DC 0 ~ 5V, DC 0 ~ 10V (Load resistance $\geq$ 2k Ω) DC 4 ~ 20mA, DC 0 ~ 20mA (Load resistance $\leq$ 510 Ω)
Range selection		Softmaster I/O parameter	
Digital data	Value	Unsigned : 0~4000 / Signed : -2000~2000 / Percentile : 0~1000	
	Precise value	100 ~ 500 (DC 1 ~ 5V), 0 ~ 500 (DC 0 ~ 5V), 0 ~ 1000 (DC 0 ~ 10V) 400 ~ 2000 (DC 4 ~ 20mA), 0 ~ 2000 (DC 0 ~ 20mA)	
Resolution		1.25mV (DC 1~5V, 0~5V), 2.5mV (DC 0~10V), 5.0 μ A (DC 4~20mA, 0~20mA)	
Max. conversion speed		1ms / channel	
Max. absolute output		$\pm$ 15V / $\pm$ 25mA	
Accuracy		$\pm$ 0.5% or less	
Insulation method		Photocoupler insulation between I/O terminal and power supply	
Connection Terminal		11-point terminal block	
Occupied I/O Points		Fixed type : 64points	
Current Consumption		110mA (at DC 5V) / 130mA (at DC 24V)	

Analog Input Wiring

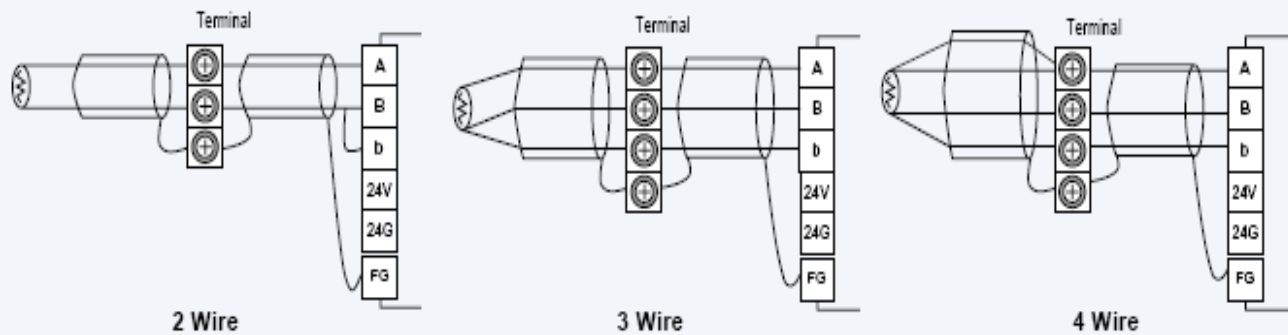


Analog Output Wiring

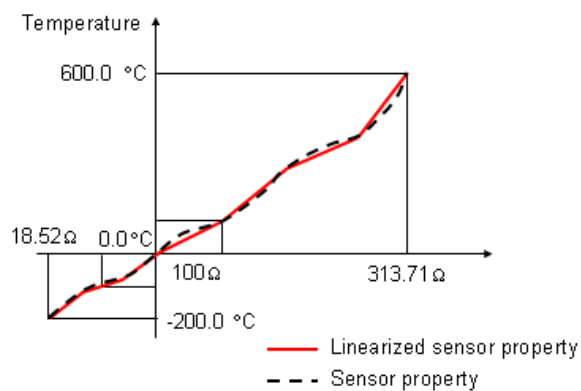


Specifications			
RTD			
Performance			
Model		MLF-RD04A	
Number of Channels		4	
Sensor type	PT100	IEC Pub 751, JIS C1604, KS C1603	
	JPT100	JIS C1604, KS C1603	
Temperature range	PT100	- 200 ~ 600℃(-328 – 1112°F)	
	JPT100	- 200 ~ 600℃(-328 – 1112°F)	
Digital output	PT100	- 2000 ~ 6000	
	JPT100	- 2000 ~ 6000	
Accuracy	25℃	±0.3% or less	
	0 ~ 55℃	±0.5% or less	
Conversion speed		40ms / channel	
Wiring method		3 Wires	
Current consumption	Internal DC5V	100mA	
	External DC24V	100mA	
Names and Functions			
	No	Name	Description
	1	RUN LED	Displays the hardware operation status (Fatal fault) • On: Normal status • Flickering: Error (0.2s flickering) • Off: hardware error or power off
	2	ALARM LED	Displays the status of the channels (Light fault) • Flickering: Line disconnection (1s flickering) • Off: Normal status
	3	External Connection Terminal	3-wire RTD sensors can be connected
	4	External Power Supply Terminal	External DC24V input
	5	Expansion connector	Connects the module with an expansion module

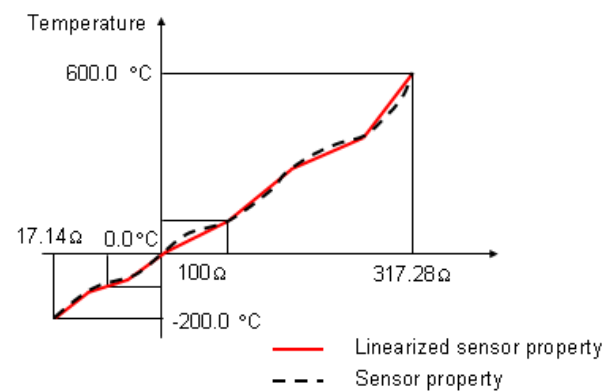
Analog Input Wiring



Temperature Conversion Characteristics (MLF-RD04A)

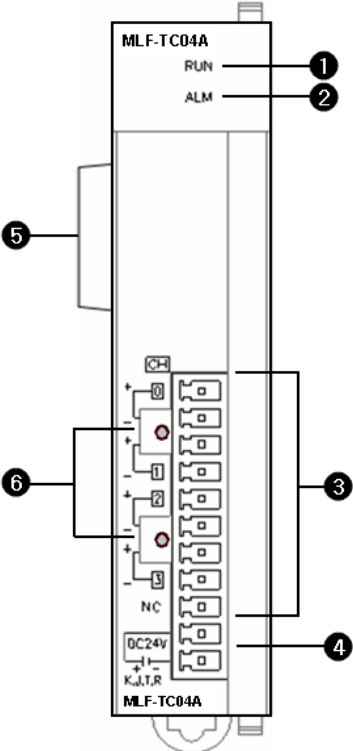


Pt100 (IEC Pub 751, JIS C1604)

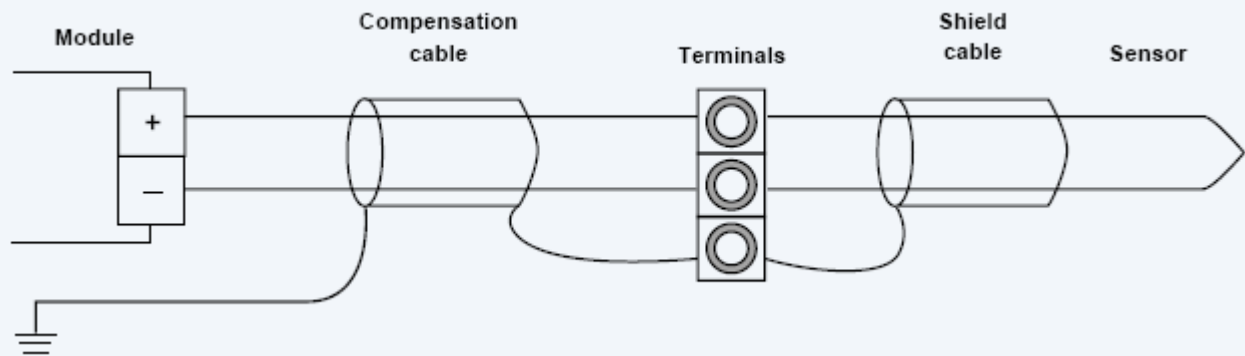


JPt100 (JIS C1604, KS C1603)

Specifications			
Thermocouple			
Performance			
Model		MLF-TC04S	
Number of Channels		4	
Sensor type		Thermocouple K / J / T / R IEC Pub 584-2, JIS C1602, KS C1602	
Temperature range	K(CA)	- 200.0°C ~ 1300.0°C (-328.0°F ~ 2372.0°F)	
	J(IC)	- 200.0°C ~ 1200.0°C (-328.0°F ~ 2192.0°F)	
	T(CC)	- 200.0°C ~ 400.0°C (-328.0°F ~ 752.0°F)	
	R	0.0°C ~ 1700.0°C (32.0°F ~ 3092.0°F)	
Digital output	Temperature display unit	Display down to one decimal place K, J, T: 0.1°C / R: 0.5°C	
	Scaling display	Unsigned scaling (0 ~ 65535)	
	(Defined by user)	Signed scaling (-32768 ~ 32767)	
Accuracy	Normal temperature(25°C)	±0.2%	
	Temperature coefficient (0 ~ 55°C)	±100 ppm / °C	
Conversion speed		50ms / channel	
Warming-up time		15 minutes or more	
Terminal		11 point	
I/O points occupied		64 points	
Current consumption	Internal DC5V	100mA	
	External DC24V	100mA	

Names and Functions			
	No	Name	Description
	1	RUN LED	Displays the hardware operation status (Fatal fault) • On: Normal status • Flickering: Error (0.2s flickering) • Off: hardware error or power off
	2	ALARM LED	Displays the status of the channels (Light fault) • Flickering: Line disconnection (1s flickering) • Off: Normal status
	3	External Connection Terminal	Connects external thermocouple sensor (K, J, T, R Type)
	4	External Power Supply Terminal	External DC24V input
	5	Expansion connector	Connects the module with an expansion module
6	Cold junction compensator	EMLIutes reference junction compensation (RJC)	

Analog Input Wiring



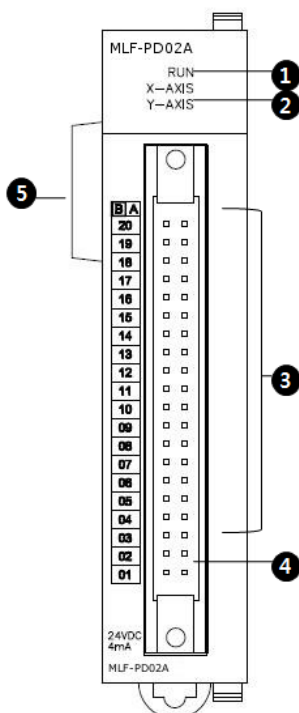
Accuracy and Resolution

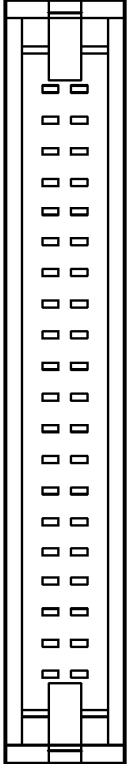
TC type	Temperature input range	Displayed temperature range	Accuracy <i>*Note1)</i>		Resolution
			25°C	0 ~ 50°C <i>*Note2)</i>	
K	-200.0°C ~ 1300.0°C	-270.0°C ~ -200.0°C	<i>*Note3)</i>		
		-200.0°C ~ 0.0°C	±3.0°C	±7.5°C	0.2°C
		0.0°C ~ 1300.0°C	±3.0°C	±7.5°C	0.1°C
		1300.0°C ~ 1372.0°C	<i>*Note3)</i>		
J	-200.0°C ~ 1200.0°C	-210.0°C ~ -200.0°C	<i>*Note3)</i>		
		-200.0°C ~ -100.0°C	±2.8°C	±7.0°C	0.2°C
		-100.0°C ~ 1200.0°C	±2.8°C	±7.0°C	0.1°C
T	-200.0°C ~ 400.0°C	-270.0°C ~ -200.0°C	<i>*Note3)</i>		
		-200.0°C ~ 400.0°C	±1.2°C	±3.0°C	0.1°C
R	0.0°C ~ 1700.0°C	-50.0°C ~ 0.0°C	<i>*Note3)</i>		
		0.0°C ~ 1700.0°C	±3.5°C	±8.5°C	0.5°C
		1700.0°C ~ 1768.0°C	<i>*Note3)</i>		

* Note 1) Total accuracy(25°C) = Accuracy(25°C) + RJC accuracy
= ±(Full scale X 0.2% + 1.0°C)
RJC accuracy = ±1.0°C

* Note 2) Temperature coefficient: ±100 ppm/°C

* Note 3) In the range, temperature can be measured, but accuracy and resolution are not guaranteed.

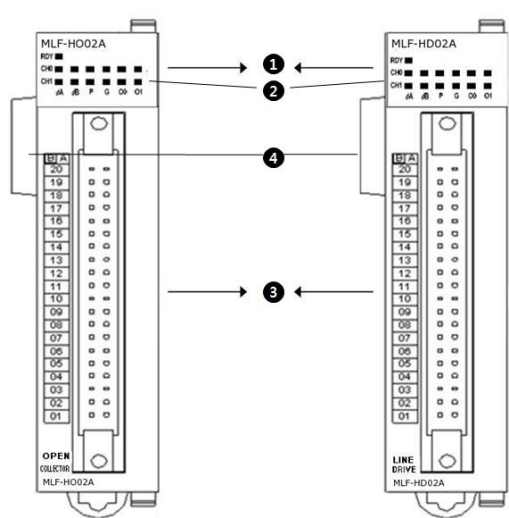
Specifications			
Positioning module			
Performance			
Model / Channels		MLF-PD02A / 2	
Pulse output type		Line drive	
Max. pulse output		2Mpps	
Max. connection length		10meters(32.81 feets)	
Control model		Position control, Speed control, Speed / Position switching control, Position / Speed switching control	
Interpolation		Linear interpolation, Circular interpolation	
Positioning Data		150 operation data for each axis	
Configuration Tool		Built-in function parameter of Softmaster	
Back-up		Flash memory	
Positioning (Unit:Pulse)	Positioning method	Absolute / Incremental method	
	Positioning range	- 2,147,483,648 ~ 2,147,483,648	
	Speed range	1~2,000,000(pulse/sec)	
	Acceleration/Deceleration type	Trapezoidal acceleration / deceleration	
	Acceleration/Deceleration time	0~65,535ms, Asymmetric acceleration / deceleration	
Max. encoder input		200kpps(Line drive)	
Error/Operation		LED	
I/O occupied points		Fixed type: 64 points	
Connection terminal		40 pin connector	
Current consumption		100mA	
Names and Functions			
	No	Name	Description
	1	RUN LED	Displays the hardware operation status (Fatal fault) • On: Normal status • Flickering: Error (0.2s flickering) • Off: hardware error or power off
	2	Operation Indication(LED)	Displays the status of the channels ▶ On : during corresponding axis operation ▶ Off : when the corresponding axis stops ▶ Blink : error of the corresponding axis(LED of axis has error would be blinking)
	3	External Connection Terminal	Drive device, machinery input, Connector to encoder
	4	External Power Supply Terminal	External DC24V input
	5	Expansion connector	Connects the module with an expansion module

Wiring					
		Pin number		Signal name	Remark
		Y-axis	X-axis		
	B20			MPG A+	Manual Pulse Generator / Encoder A+ input
	B19			MPG A-	Manual Pulse Generator / Encoder A- input
	B18			MPG B+	Manual Pulse Generator / Encoder B+ input
	B17			MPG B-	Manual Pulse Generator / Encoder B- input
	B16				
	B15				
	B14				
	B13				
	B12				
	B11				
	B10				
	B09				
	B08				
	B07				
	B06				
	B05				
	B04				
	B03				
	B02				
	B01				
	A20	B18	A18	FP+	Forward pulse+
	A19	B17	A17	FP-	Forward pulse-
	A18	B16	A16	RP+	Reverse pulse+
	A17	B15	A15	RP-	Reverse pulse-
	A16	B14	A14	OV+	High limit
	A15	B13	A13	OV-	Low limit
	A14	B12	A12	DOG	Near point
	A13	B11	A11	NC	-
	A12	B10	A10		
	A11	B09	A09	COM	Common
	A10	B08	A08	NC	-
	A09	B07	A07	INP	In-position signal
	A08	B06	A06	INPCOM	In-position signal common
	A07	B05	A05	CLR	Deviation counter clear signal
	A06	B04	A04	CLR COM	Deviation counter clear signal common
	A05	B03	A03	HOME +5V	Zero signal(DC 5V)
	A04	B02	A02	HOME COM	Zero signal Common
	A03	B01	A01	NC	-

*NOTE1) The number inside () is the address of 64point I/O module.

Specifications			
High speed Counter			
Performance			
Model		MLF-HO02A	MLF-HD02A
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
Max. coefficient speed		200kpps	500kpps (HTL input : 250kpps)
No. of Channels		2 channels	
Coefficient range		Signed 32-bit (-2,147,483,648 ~ 2,147,483,647)	
Count mode		Linear Count (When 32-bit range exceeded, Carry /Borrow occurs, The count value stopped)	
		Ring Count (Repeated count within setting range)	
Input pulse mode		1-phase input	
		2-phase input	
		CW/CCW input	

Specifications			
High speed Counter			
Model		MLF-HO02A	MLF-HD02A
Up/down setting	1-phase input	Increasing / Decreasing operation setting by B-phase input	
		Increasing / Decreasing operation setting 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 multiplication	
	2 phase input	4 multiplication	
	CW/CCW	1 multiplication	
Control input	Signal	Preset instruction input	
	Signal level	DC 24V input type	
	Signal type	Voltage	
External output	Output points	2 point / channel (for each channel): output contact point of basic unit available	
	Type	Select program setting, signal-compared (>, >=, =, <=, <) or section compared output (Included or excluded)	
	Output type	Relay, Open-collector output (Sink)	
Operation Status display	Input signal	A-phase input, B-phase input, Preset instruction input, Auxiliary mode instruction input	
	Output signal	External output 0, External output 1	
	Busy status	Module Ready	
Count enable		To be set through program	
Preset function		To be set through terminal (contact) or program	
Auxiliary mode		Count clear, Count latch, Section count(time setting value: 0~60000ms), Measurement of input frequency(for respective input phase), Measurement of counts per hour(time setting value: 0~60000ms) Count prohibited function	
Terminal		40 pin connector	
I/O Occupied points		Fixed point: 64	
Current consumption		200 mA	260 mA
Weight		90	

Names and Functions			
	No	Name	Description
	1	RUN LED	Displays the hardware operation status (Fatal fault) • On: Normal status • Flickering: Error (0.2s flickering) • Off: hardware error or power off
	2	Operation Indication(LED)	Displays the status of the channels ▶ On : during corresponding axis operation ▶ Off : when the corresponding axis stops ▶ Blink : error of the corresponding axis(LED of axis has error would be blinking)
	3	External Connection Terminal	Drive device, machinery input, Connector to encoder
	4	Expansion connector	Connects the module with an expansion module

Wiring

		Pin number		Signal name		
		B ch1	A ch0	MLF-HO02A		MLF-HD02A
B20	A20	B20	A20	A 24V	A +	A phase differentiation input +
B19	A19	B19	A19	A 12V	A -	A phase differentiation input -
B18	A18	B18	A18	A 5V	A +	A phase differentiation input +
B17	A17	B17	A17	A COM	A -	A phase differentiation input -
B16	A16	B16	A16	B 24V	B +	B phase differentiation input +
B15	A15	B15	A15	B 12V	B -	B phase differentiation input -
B14	A14	B14	A14	B 5V	B +	B phase differentiation input +
B13	A13	B13	A13	B COM	B -	B phase differentiation input -
B12	A12	B12	A12	P 24V	P 24V	Preset input 24V
B11	A11	B11	A11	P 12V	P 12V	Preset input 12V
B10	A10	B10	A10	P 5V	P 5V	Preset input 5V
B09	A09	B09	A09	P COM	P COM	Preset input COM
B08	A08	B08	A08	G 24V	G 24V	Auxiliary function input 24V
B07	A07	B07	A07	G 12V	G 12V	Auxiliary function input 12V
B06	A06	B06	A06	G 5V	G 5V	Auxiliary function input 5V
B05	A05	B05	A05	G COM	G COM	Auxiliary function input COM
B04	A04	B04	A04	OUT0	OUT0	Comparison output 0
B03	A03	B03	A03	OUT1	OUT1	Comparison output 1
B02	A02	B02	A02	24V	24V	External power input 24V
B01	A01	B01	A01	24G	24G	External power input GND

Specifications

Option modules

Model	Description	Remark
XBO- AD02A	Voltage/Current, Input 2 chs	
XBO-DA02A	Voltage/Current, Output 2 chs	
XBO-AH02A	Voltage/Current, Input 1 ch	
	Voltage/Current, Output 1 ch	
XBO-TC02A	TC(Thermocouple), Input 2 chs	
XBO-RTCA	RTC(Real Time Clock)	
XBO-DC04A	DC 24V, Input 4 points	
XBO-TN04A	Transistor(Sink), Output 4 point	
XBO-RD01A	RTD(Resistance Temperature Detect, Input 1 ch)	

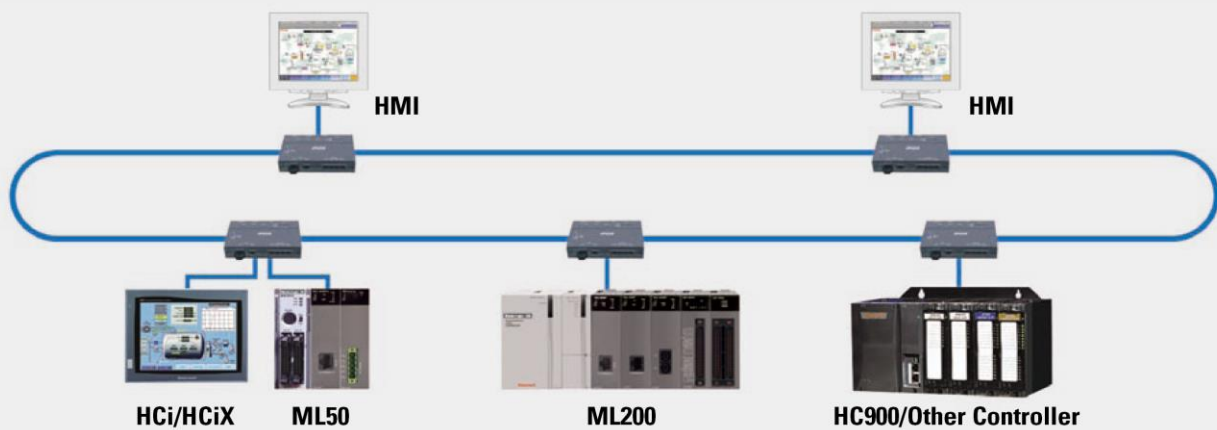
Specifications

Communication – Fast Ethernet

Features

- 10/100 Base-Tx Fast Ethernet for industrial use (IEEE802.3)
- Dedicated service for HMI connection (Modbus-TCP protocol)
- High speed link communication with high-level PLC(MasterLogic-200, MasterLogic-200IEC)
- Remote program, Remote monitoring with SoftMaster remote service
- Network security with Host table(limitation of unwanted connections)
- Convenient network system setting and various self-diagnosis / monitoring with SoftMaster-NM
 - Monitoring network information (Auto scan)
 - Checking module in network (PING)
 - Providing information of each service
(High speed link, P2P, dedicated service, media condition)
- User protocol editing and P2P service (Communication with other brand's equipment)

Network with Ethernet



Performance

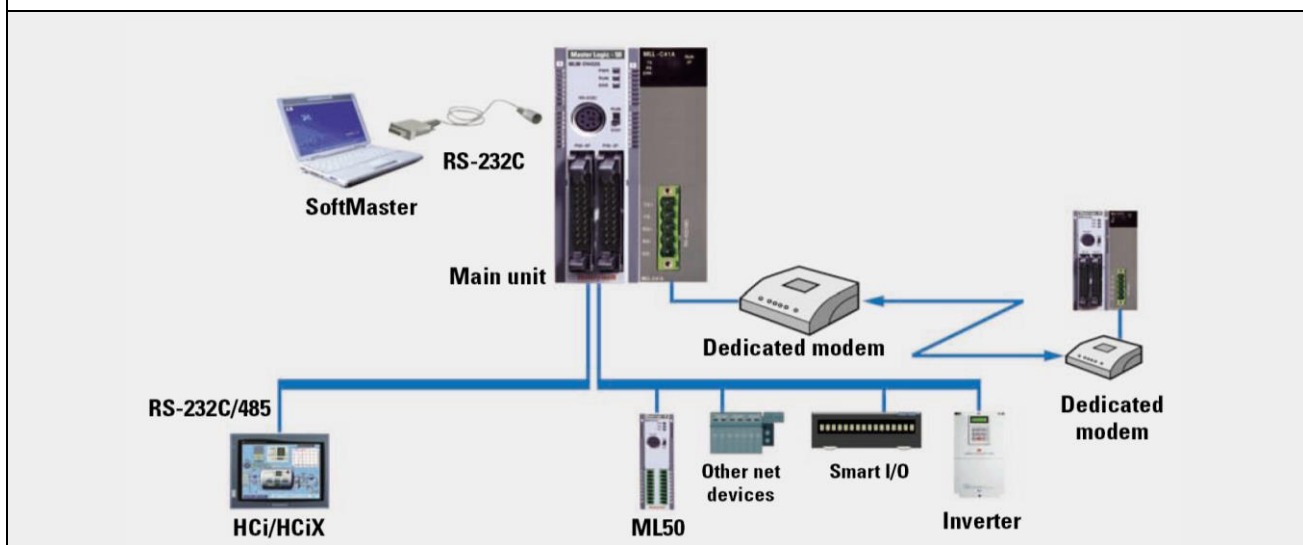
Model		MLL-EMTA
Communication Spec.		10/100 Base-TX
Protocol		TCP/IP, UDP/IP
Service	With ML PLCs	High-speed link, P2P service
	With Other Devices	P2P service
	Application	Dedicated protocol service, SoftMaster Service
HS Link Sending / Receiving		200 words / block(Max. 128 blocks)
No. of Channel Connectable to Upper Stage		4 channels
Service		Communication with PC (HMI) and external devices, high-speed communication among ML PLC's
Media		UTP/STP Category 5
Current Consumption(mA)		410

Communications – Snet

Features

- Max. 2 modules mountable for 1 main unit. Total 5 channels of communication in 1 MasterLogic-50 system(including Loader)
- Max. 32-unit connection through RS-485 communication.
- Protocol editing and parameter setting using SoftMaster-NM.
- Configurable communication speed setting (1,200 ~ 115,200 bps)
- Long distance communication system using dedicated modem (expansion RS-232C Communication module)
- Full duplex / Half Duplex communication (expansion RS485 Communication module)
- P2P : User-defined Communication and Modbus communication master
- Modbus RTU / ASCII drivers for HMI connection
- Various diagnosis function using SoftMaster-NM (I/O information, CPU, Link, Service, LOG)
- Simultaneous monitoring of sending / receiving frame and checking the result of frame
- Communication service information (Checking information of dedicated service, P2P service)

System Configuration



Performance

Model		Built-in RS-232C	MLL-C21A	Built-in RS485	MLL-C41A
Interface		RS-232C 1Ch	RS-232C 1Ch	RS-485 1Ch	RS-422/485 1 Ch
Modem Connection		Remote communication with external devices via modem connection, Available for only RS-232C port.			
Comm. Mode	Dedicated Mode	1:1 or 1:N communication using ML dedicated protocol			
	SoftMaster	Program upload / download and remote control			
	P2P Mode	Communication by protocol using SoftMaster-NM (Interface with other PLC's), HMI, Modbus RTU / ASCII master communication			
Operation Mode	Server(Slave)	Remote connection simultaneously using Modbus server, user-defined			
	Master	Modbus RTU / ASCII master, user defined			
Data Type	Start bit	1			
	Data bit	7 or 8			
	Stop bit	1 or 2			
	Parity	Even / Odd / None			
	Setting	Basic parameter setting with SoftMaster-NM			
Synchronization		Asynchronous			
Transmission Speed(bps)		Selectable 1200 / 2400 / 4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps			
Station Number Setting		Up to 32 stations, from 0 to 31 with SoftMaster-NM			
Transmission Distance		Max.15meters (49.21 feet), extended using modem		Max.500meters (1640.42 feet)	
Modem Communication		Not available	Available	Not available	Not available
Network Configuration		1:1		1:N	
Diagnosis Function		Available through LED and SoftMaster-NM diagnosis service			
Max. Number of Installation		Built-in	2	Built-in	2

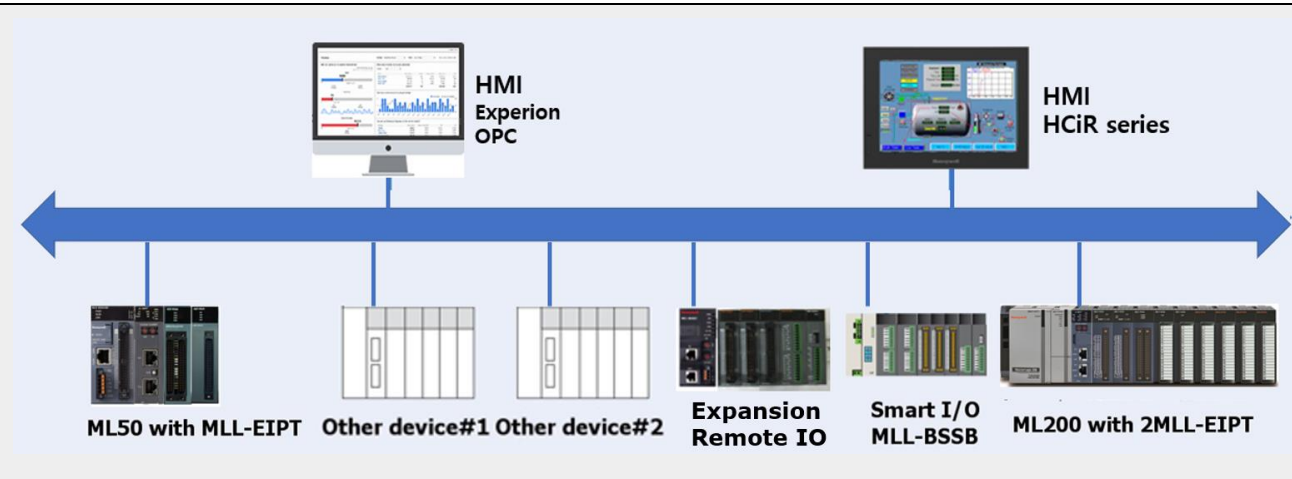
Specifications

Communication –Ethernet/IP

Features

- Extensive Client Messaging Support / •Encapsulated Messages, Explicit Messaging
- Class 3 Connected Explicit Messaging(Server Only)
- Class 1 Connected Implicit(IO) Messaging(Cyclic I/O Service Only)
- EtherNet/IP Conformance Test Suite Version 2.10
- EtherNet/IP, RING, Linear, STAR networking
- 100BASE-TX , 100Mbps/ Full Duplex
- Max.64ea available on 1 CPU module (Main base / Extension base)
- No additional switch or hub (built-in switch)
- Wiring reduction and flexible installation
- Auto cross over function
- Various diagnostic function and network status information
 - Communication module status
 - Auto Scan function
 - Communication module diagnosis through network
 - P2P status
 - Packet and data status

Network with Ethernet



Performance

Model	MLL-EIPT
Transmission speed	Auto, 10/100Mbps
Transmission method	Base band
Max. extension distance between nodes	100m
Max. number of nodes	64
Max. protocol size	1,516 bytes
Access method to service zone	CSMA / CD
Frame error check	$CRC\ 32 = X^{32} + X^{26} + X^{23} + \dots + X^2 + X^1 + 1$
Normal communication guarantee	Max. 1,200 (packet/sec)
Dimension (mm)	90(H) x 27(W) x 60(D)290
Current consumption(mA)	290
Weight (g)	102

Topologies on Ethernet/IP

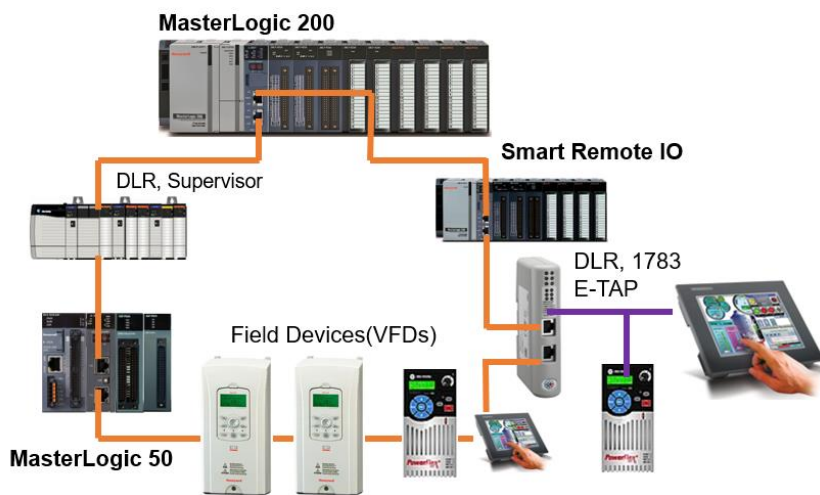
(a) STAR Topology



(b) Linear Topology



(c) RING Topology via Ethernet/IP supervisor(E-TAP)



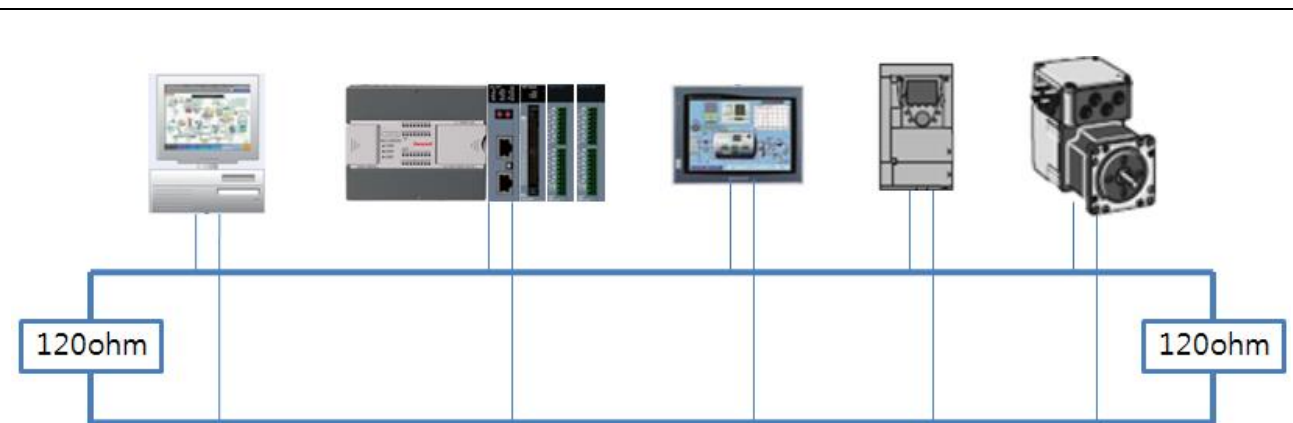
Specifications

Communication –CANopen

Features

- 32 axes (master) and 4 axes (virtual) control
- EtherCAT CoE supported servo drive
- Communication cycle : 1ms
- Built-in DI/DO 8 points each and EtherCAT I/O 512 points
- Program 2MB
- External encoder input 2ch (line drive)
- Max. transmission distance : 100m

Network



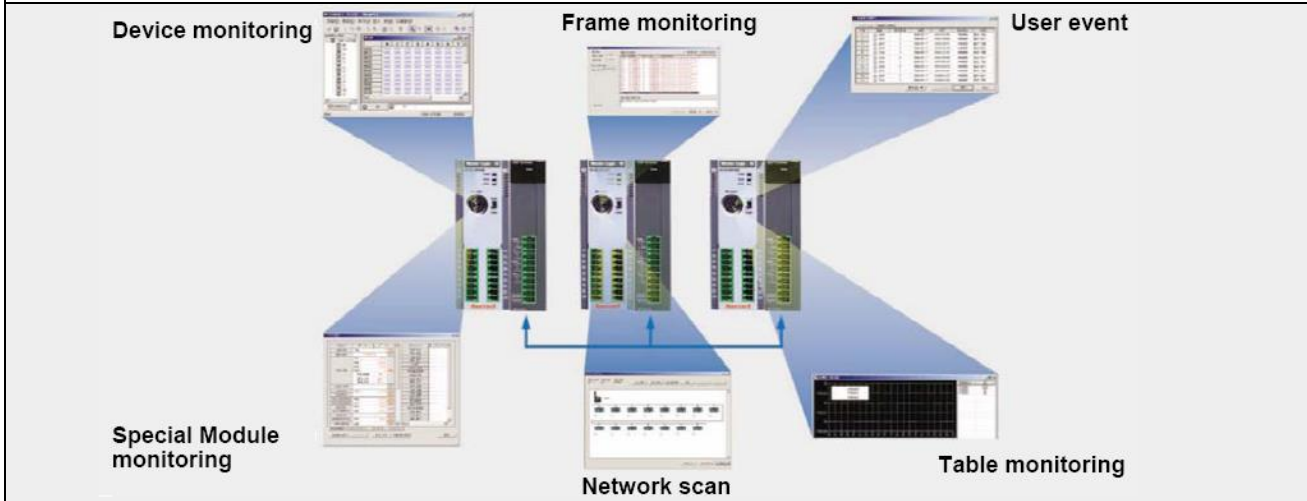
Performance

Model		MLL-CMEA	MLL-CSEA
Transmission speed		10, 20, 50, 100, 125, 250, 500, 800, 1000Kbps	
No. of Port		1	
No. of Node		32	-
PDO	TPDO	64	64
	RPDO		64
Max. size of data per PDO		8 byte	
PDO transfer type		Synchronous acyclic(0), synchronous cyclic(1~240), RTR(252~253), time-event trigger(254~255)	
Support SDO		Client 127/Server 1	Server 1
SDO transfer type		Expedited, Normal	-
Access method		CSMA/BA(Carrier Sense Multiple Access/ Bitwise Arbitration)	
Topology		BUS	
SYNC Service		Producer Cycle : 20~5000ms	Consumer
NMT. eode control		NMT Master	NMT Slave
Emergency		Save the last five per slave	Save up to last 10
NMT. error control		Heartbeat, Life guarding	Heartbeat
Network Scan		0	-
Size(mm)		90(H)X27(W)X60(D)	
Current Consumption(mA)		211	202
Weight(g)		78	

Software

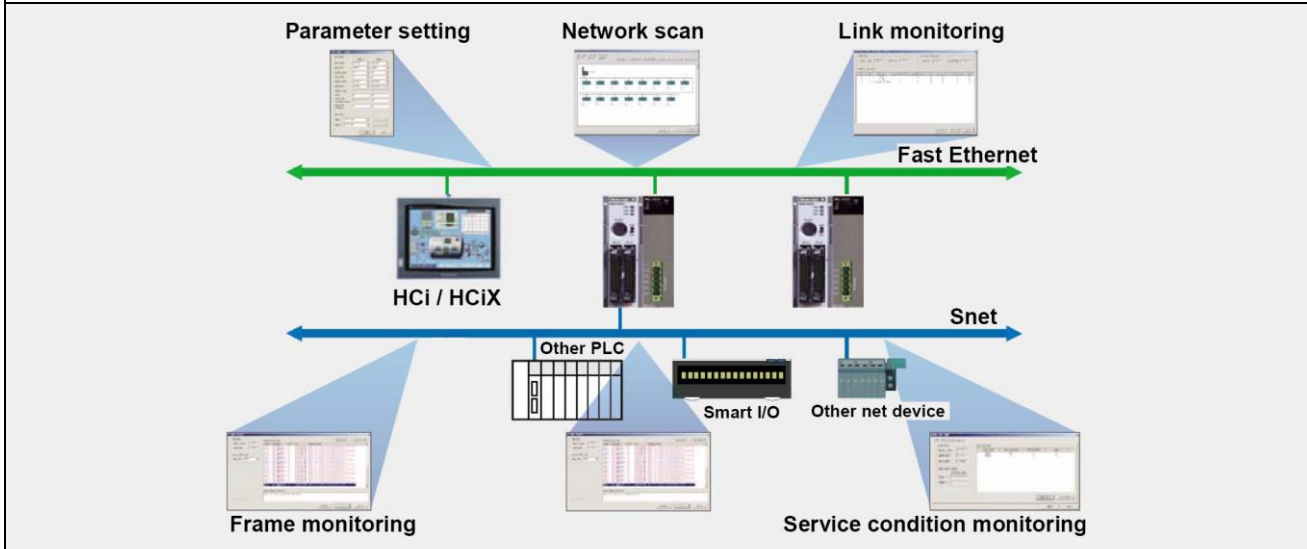
Programming Software : SoftMaster

- Programming editing & engineering software
- Windows based easy operation
- Multi-PLC, Multi-programming supports
- Various monitoring and diagnosis functions
- Windows XP, VISTA, 7/8/10, 32bit/64bit, Windows 11



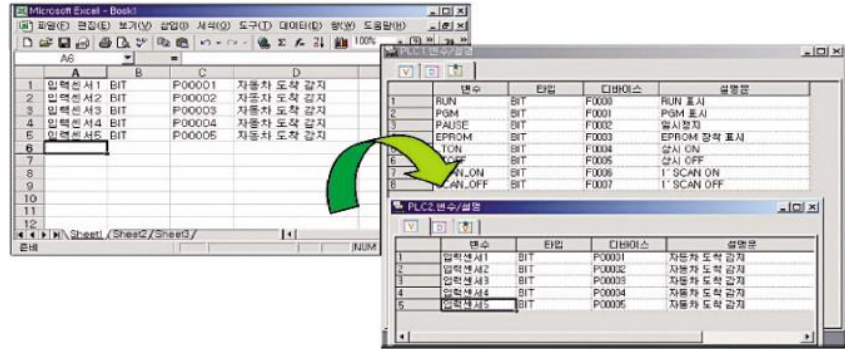
Network setting : SoftMaster

- Configuring network easily/conveniently on Project, monitoring efficiently, saving Diagnostics
- Extensively monitoring function for network system and communication modules
- Fast interface with CPU by effective network management
- Various built-in diagnosis functions, Expandable P2P config., SNTP(Time-Sync on network) for MLI 'U' and MLU series (CPU condition, Link condition, Service condition, Auto scan, LOG, Frame monitoring)



Programming Environment

- Cell type input window
- Cell-unit editing
- Auto filling
- Compatibility with Microsoft EXCEL
- Redo & Undo
- Screen split editing
- Drag & Drop – Supports Drag & Drop for project, Variable / Statement, Ladder editing, Variable monitoring
- User defined shortcut key – Enhances user convenience with user-defined shortcut key
- Remote connection with RS-485 communication & Ethernet
- Remote connection with Max. 32 main units using built-in RS485 Communication



Remote connection using RS-485 Communication



Remote connection using Ethernet

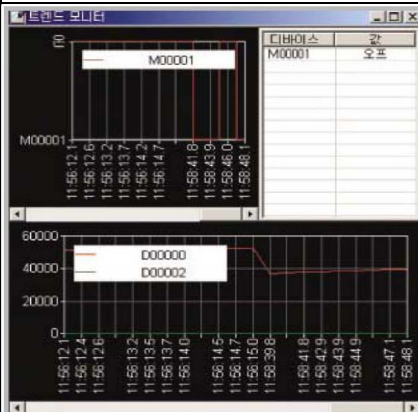
Monitoring

User Defined Events



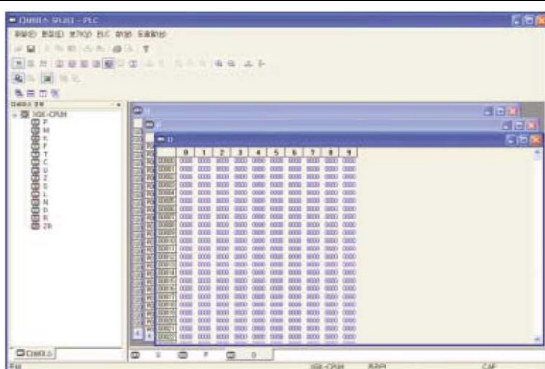
By registering user-defined events, users can read the record of specified event and use it for PLC operation and debugging.

Trend Monitoring

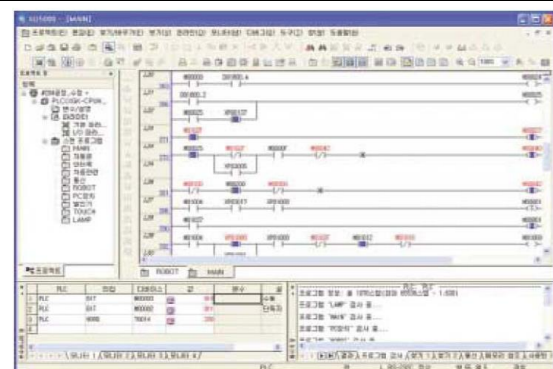


The progressive / changing value can be monitored and saved as a file.

Device Monitoring



Variable Monitoring

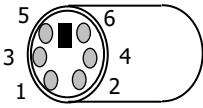
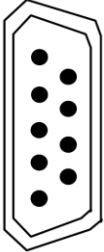
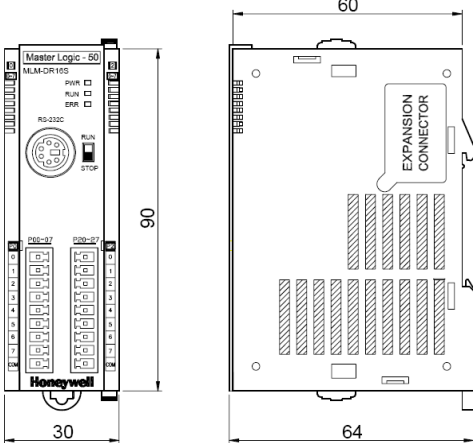
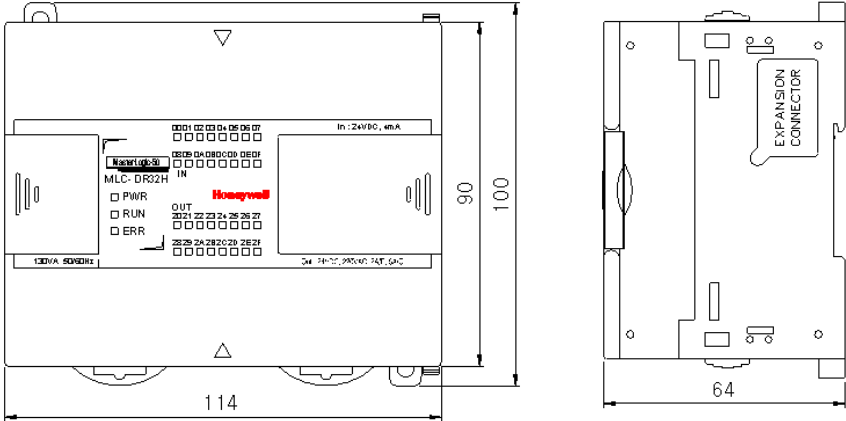


System Requirement	
O/S	Windows XP ~ Windows 7/8/10 and Windows 11
CPU	Computer(station) Min. 200 MHz Pentium Processor or later CPU
Memory	Min. 256 Mbytes RAM(Recommended Min. 1GB)
HDD	500 MB(Free Memory space)
Serial Port	Serial COM Port RS-232C or USB for programming/ Engineering
Printer	Compatible with Windows Operating System(Recommended HP)
Mouse	Compatible with Windows Operating System

Product List / Dimension			
Product List			
Item	Model	Specification	Remark
Modular type, "S" Non-IEC	MLM-DR16S	DC24V power supply, DC24V input 8 points, Relay output 8 points	
	MLM-DN16S	DC24V power supply, DC24V input 8 points, open collector output 8 points, built-in positioning function	
	MLM-DN32S	DC24V power supply, DC24V input 16 points, open collector output 16 points, built-in positioning function	
Block type, "H" (High performance) Non-IEC	MLC-DR32H	AC110~220V or DC24V power supply, DC24V input 16 points, Relay output 16 points, RTC function	
	MLC-DN32H	AC110~220V or DC24V power supply, DC24V input 16 points, open collector output 16 points, built-in positioning function, RTC function	
	MLC-DR64H	AC110~220V or DC24V power supply, DC24V input 32 points, Relay output 32 points, RTC function	
	MLC-DN64H	AC110~220V or 24Vdc power supply, DC24V input 32 points, open collector output 32 points, built-in positioning function, RTC function	
	MLC-DR32H/DC	DC 24V, 16-point DC input, 16-point Relay output	
	MLC-DN32H/DC	DC 24V, 16-point DC input, 16-point TR output	
	MLC-DR64H/DC	DC 24V, 32-point DC input, 32-point Relay output	
	MLC-DN64H/DC	DC 24V, 32-point DC input, 32-point TR output	
Block type, "H" (High performance) IEC 61131-3 standard programming	MLI-DR32H	AC110~220V or DC24V power supply, DC24V input 16 points, Relay output 16 points, RTC function	
	MLI-DN32H	AC110~220V or DC24V power supply, DC24V input 16 points, open collector output 16 points, built-in positioning function, RTC function	
	MLI-DR64H	AC110~220V or DC24V power supply, DC24V input 32 points, Relay output 32 points, RTC function	
	MLI-DN64H	AC110~220V or 24Vdc power supply, DC24V input 32 points, open collector output 32 points, built-in positioning function, RTC function	
	MLI-DR32H/D1	DC 12/24V, 16-point DC input, 16-point Relay output	
	MLI-DR64H/D1	DC 12/24V, 32-point DC input, 32-point Relay output	

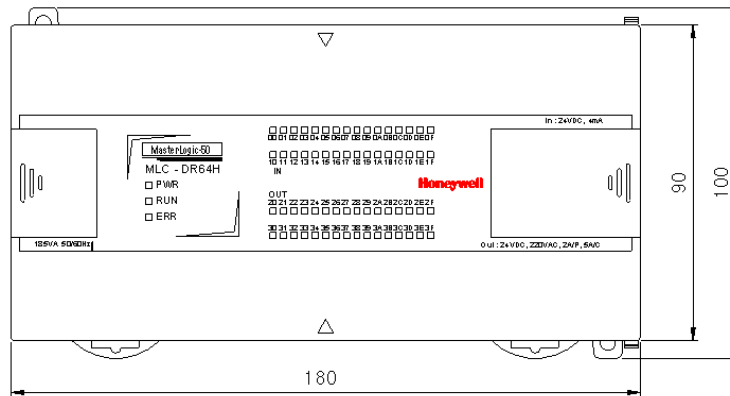
Product List			
Item	Model	Specification	Remark
Block type, "E" (Economic type) IEC 61131-3 standard programming	MLI-DR10E	AC 100 ~ 240V, 6 points DC input, 4 point Relay output	
	MLI-DR14E	AC 100 ~ 240V, 8 points DC input, 6 point Relay output	
	MLI-DR20E	AC 100 ~ 240V, 12 points DC input, 8 point Relay output	
	MLI-DR30E	AC 100 ~ 240V, 18 points DC input, 12 point Relay output	
	MLI-DN10E	AC 100 ~ 240V, 6 points DC input, 4 point transistor output (Sink)	
	MLI-DN14E	AC 100 ~ 240V, 8 points DC input, 6 point transistor output (Sink)	
	MLI-DN20E	AC 100 ~ 240V, 12 points DC input, 8 point transistor output (Sink)	
	MLI-DN30E	AC 100 ~ 240V, 18 points DC input, 12 point transistor output (Sink)	
	MLI-DP10E	AC 100 ~ 240V, 6 points DC input, 4 point transistor output(Source)	
	MLI-DP14E	AC 100 ~ 240V, 8 points DC input, 6 point transistor output(Source)	
	MLI-DP20E	AC 100 ~ 240V, 12 points DC input, 8 point transistor output(Source)	
	MLI-DP30E	AC 100 ~ 240V, 18 points DC input, 12 point transistor output(Source)	
Block type, "SU" (Standard type) IEC 61131-3 standard programming	MLI-DN20SU	AC 100 ~ 240V, 12-point DC input, 8-point TR output	
	MLI-DR20SU	AC 100 ~ 240V, 12-point DC input, 8-point Relay output	
	MLI-DN30SU	AC 100 ~ 240V, 18-point DC input, 12-point TR output	
	MLI-DR30SU	AC 100 ~ 240V, 18-point DC input, 12-point Relay output	
	MLI-DN40SU	AC 100 ~ 240V, 24-point DC input, 16-point TR output	
	MLI-DR40SU	AC 100 ~ 240V, 24-point DC input, 16-point Relay output	
	MLI-DN60SU	AC 100 ~ 240V, 36-point DC input, 24-point TR output	
	MLI-DR60SU	AC 100 ~ 240V, 36-point DC input, 24-point Relay output	
Advanced CPU 'U' -Ultimate control -Webserver	MLI-DN32U	AC100~240V, 16-point DC input, 16-point TR output,1Enet	
	MLI-DN32U/DC	24Vdc, 16-point DC input, 16-point TR output,1Enet	
	MLI-DN32UA	AC100~240V, 16-point DC in, 16-point TR out, 4 AI/ 4 AO,1Enet	DC : OK
	MLI-DR28U	AC100~240V, 16-point DC input, 16-point Relay output,1Enet	
	MLI-DR28U/DC	24Vdc, 16-point DC input, 16-point Relay output,1Enet	
	MLI-DR28UA	AC100~240V, 16-point DC in, 16-point Relay out,1Enet	DC : OK
Block, hi-Perform	MLU-DN32HP	24Vdc, 16-point DC input, 16-point TR output,1Enet	
Expansion I/O Module	MLE-DC08A	DC24V input 8 points	
	MLE-DC16A	DC24V input 16 points	
	MLE-DC32A	DC24V input 32 points	
	MLE-RY08A	Relay output 8 points	
	MLE-RY16A	Relay output 16 points	
	MLE-TN08A	Open collector output 8 points(Sink output)	

Product List			
Item	Model	Specification	Remark
Expansion I/O Module	MLE-TN16A	Open collector output 16 points(Sink output)	
	MLE-TN32A	Open collector output 32 points(Sink output)	
	MLE-TP08A	8-point Transistor (source) output	
	MLE-TP16A	16-point Transistor (source) output	
	MLE-TP32A	32-point Transistor (source) output	
	MLE-DR16A	DC24V input 8 points, Relay output 8 points	
Expansion Special Module	MLF-AD04A	Current / Voltage input 4 channel	
	MLF-AD04C	4-channel analog input(current / voltage, resolution : 1/16000)	
	MLF-AH04A	2-channel analog input (current/voltage)/ 2-channel analog output (current/voltage)	
	MLF-DC04A	Current output 4 channel	
	MLF-DC04C	4-channel analog input(current, resolution : 1/16000)	
	MLF-DV04A	Voltage output 4 channel	
	MLF-DV04A	4-channel analog input(voltage, resolution : 1/16000)	
	MLF-RD04A	RTD input 4 channel	
	MLF-TC04S	Thermocouple input 4 channel	
	MLF-PD02A	Positioning control (Line drive 2 axis)	
	MLF-AD08A	8-channel analog input (Current / voltage)	
	MLF-HO02A	2-channel High-speed counter input(Open collector)	
	MLF-HD02A	2-channel High-speed counter input(Line drive)	
Expansion Comm. Module	MLL-C21A	Snet (RS-232C, Modem)	
	MLL-C41A	Snet (RS422/485)	
	MLL-EMTA	Ethernet interface 1ch	
	MLL-EIPT	Ethernet/ IP, 2 ch	
	MLL-CMEA	CANopen(10, 20, 50, 100, 125, 250, 500, 800, 1000Kbps, Num of PDO : 32)	
	MLL-CSEA	CANopen(10, 20, 50, 100, 125, 250, 500, 800, 1000Kbps, Num of PDO : 64)	
Loader Cable	PMC-310S	Connection Cable (PC to PLC), 9 pin (PC) – 6 pin (PLC), soft tube type cable.	
	USB-301A	Connection Cable (PC to PLC), USB1.1 for MLC only.	
Option modules For "E" and "SU"	MLO-AD02A	Voltage/ Current, Input 2 ch	
	MLO-DA02A	Voltage/ Current, Output 2 ch	
	MLO-AH02A	Voltage/ Current, Input 1ch / Voltage/Current, Output 1ch	
	MLO-TC02A	TC (Thermo couple), Input 2 ch	
	MLO-RTCA	RTC (Real time clock), Battery	
	MLO-DC04A	DC 24V, Input 4 points	
	MLO-TN04A	TR (Sink), Output 4 points	
	MLO-RD01A	RTD (Resistance temperature detector), Input 1ch	
Software	SoftMaster	Engineering software	

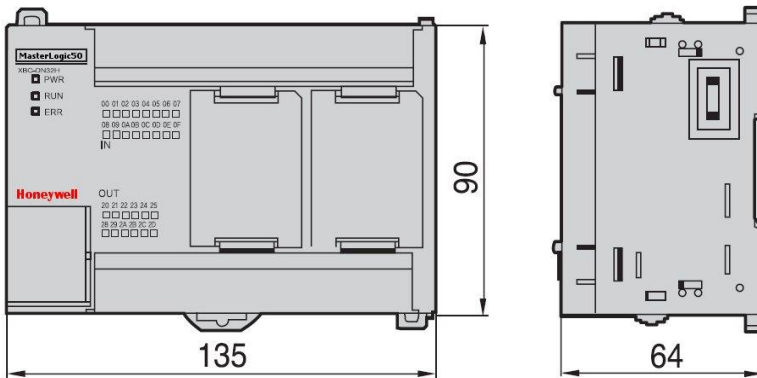
Loader Cable Connection PMC-301S	ML50(6Pin, Male)  PC(9Pin, Female) 
Dimension	Model : MLM-DN16/32S, MLM-DR16S Unit : mm  Model : "H" type for MLC/MLI 32 points(MLC-D_32H, MLI-D_32H) Unit : mm 

Model : "H" type for MLC/MLI 64 points (MLC-D_64H, MLI-D_64H)

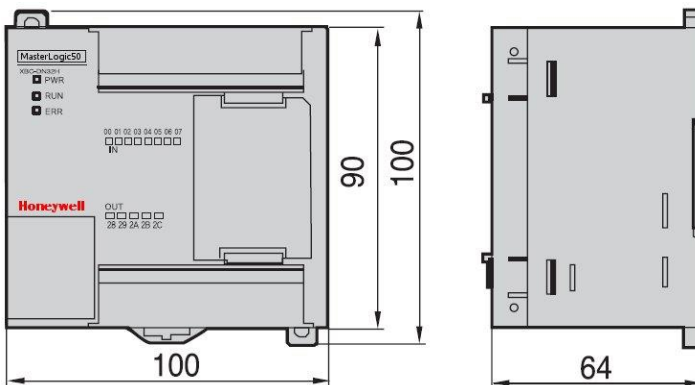
Unit : mm



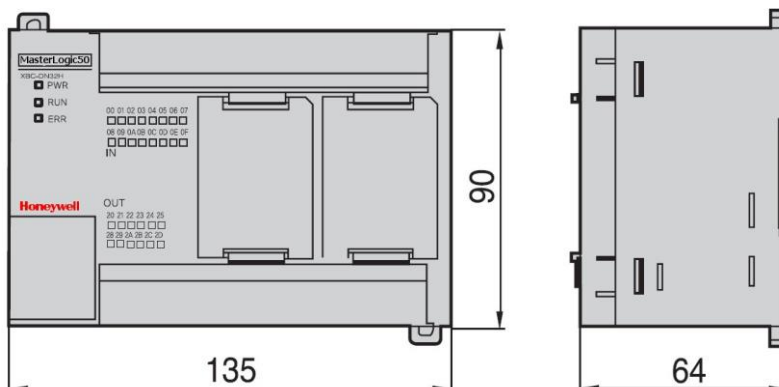
Model : "SU" type for MLI(MLI-D_ _SU)



Model : "E" type for MLI(MLI-D_10E, MLI-D_14E)

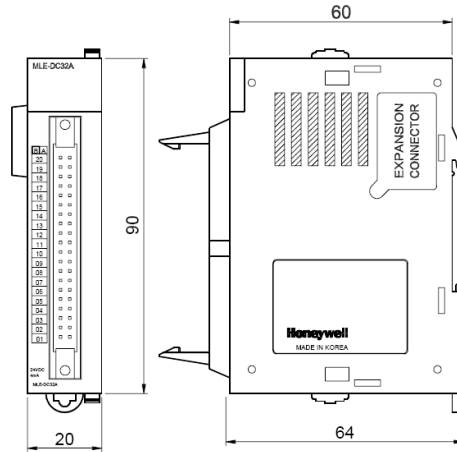


Model : "E" type for MLI(MLI-D_20E, MLI-D_30E)



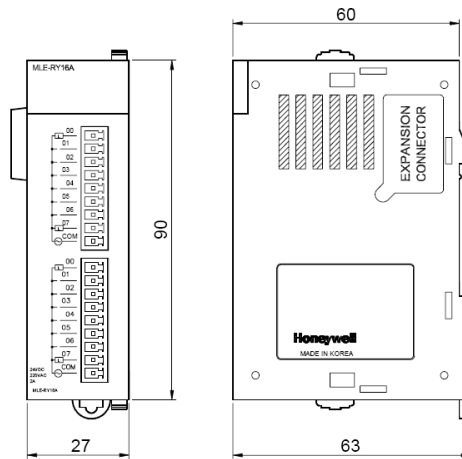
Model : MLE-DCXXA, MLE-TNXXA, MLF-ADXXA(C), MLF-DX04A, MLL-XXXX

Unit : mm



Model : MLE-RY16A, MLL-EMTA, MLL-EIPT, MLL-CXEA

Unit : mm



Model Interpretation

MasterLogic 50 Logic Controller Assemblies

SPECIFICATIONS		MODEL NUMBER	AVAILABILITY
BASE MODULE (CPU + PWR SUPPLY + BASE I/O), Non-IEC			
DC24V PWR Supply, DC24V Input (8 ch) & Relay Output (8 ch)	(Note 1)	MLM-DR16S	•
DC24V PWR Supply, DC24V Input (8 ch) & Open Collector Output (8 ch)	(Note 1)	MLM-DN16S	•
DC24V PWR Supply, DC24V Input (16 ch) & Open Collector Output (16 ch)	(Note 1)	MLM-DN32S	•
AC110~220V PWR Supply, DC24V input (16 ch) & Open Collector Output (16 ch)	(Note 1)	MLC-DN32H	•
AC110~220V PWR Supply, DC24V input (32 ch) & Open Collector Output (32 ch)	(Note 1)	MLC-DN64H	•
AC110~220V PWR Supply, DC24V input (16 ch) & Relay Output (16 ch)	(Note 1)	MLC-DR32H	•
AC110~220V PWR Supply, DC24V input (32 ch) & Relay Output (32 ch)	(Note 1)	MLC-DR64H	•
DC24V PWR Supply, DC24V input (16 ch) & Open Collector Output (16 ch)	(Note 1)	MLC-DN32H/DC	•
DC24V PWR Supply, DC24V input (32 ch) & Open Collector Output (32 ch)	(Note 1)	MLC-DN64H/DC	•
DC24V PWR Supply, DC24V input (16 ch) & Relay Output (16 ch)	(Note 1)	MLC-DR32H/DC	•
DC24V PWR Supply, DC24V input (32 ch) & Relay Output (32 ch)	(Note 1)	MLC-DR64H/DC	•
DIGITAL INPUT EXPANSION			
DC24V Input (8 ch)		MLE-DC08A	•
DC24V Input (16 ch)		MLE-DC16A	•
DC24V Input (32 ch)		MLE-DC32A	•
DIGITAL OUTPUT EXPANSION			
Relay Output (8 ch)		MLE-RY08A	•
Relay Output (16 ch)		MLE-RY16A	•
Open Collector Output (8 ch)		MLE-TN08A	•
Open Collector Output (16 ch)		MLE-TN16A	•
Open Collector Output (32 ch)		MLE-TN32A	•
DIGITAL INPUT / OUTPUT EXPANSION			
DC24V Input (8 ch) & Relay Output (8 ch)		MLE-DR16A	•
ANALOG INPUT EXPANSION			
Current/Voltage Input (4 ch)		MLF-AD04A	•
RTD Input (4 ch)		MLF-RD04A	•
TC Input (4 ch)		MLF-TC04S	•
ANALOG OUTPUT EXPANSION			
Current Output (4 ch)		MLF-DC04A	•
Voltage Output (4 ch)		MLF-DV04A	•
COMMUNICATION EXPANSION			
RS-232C/Modem (MLDP)		MLL-C21A	•
RS-422/485 (MODBUS RTU/ASC II, MLDP)		MLL-C41A	•
Ethernet (TCP/IP, UDP/IP), 10/100Mbps		MLL-EMTA	•
Ethernet/IP, 10/100Mbps		MLL-EIPT	•
Profibus-Master		MLL-PMEC	•
Profibus-Slave		MLL-PSEA	•
CANopen, Master		MLL-CMEA	•
CANopen, Slave		MLL-CSEA	•
MANUAL & ACCESSORY			
Loader Cable		PMC-310S	•
USB Cable	(Note 3)	USB-301A	•

SPECIFICATIONS	MODEL NUMBER	AVAILABILITY
BASE MODULE (CPU + PWR SUPPLY + BASE I/O)		
AC110~220V PWR supply, DC24V input(16ch) & Relay output(16ch)	MLI-DR32H	●
AC110~220V PWR supply, DC24V input(16ch) & Open Collector Output(16ch)-Sink	MLI-DN32H	●
AC110~220V PWR supply, DC24V input(32ch) & Relay output(32ch)	MLI-DR64H	●
AC110~220V PWR supply, DC24V input(32ch) & Open Collector Output(32ch)-Sink	MLI-DN64H	●
AC110~220V PWR supply, DC24V input(16ch) & Open Collector Output(16ch)-Source	MLI-DP32H	●
AC110~220V PWR supply, DC24V input(32ch) & Open Collector Output(32ch)-Source	MLI-DP64H	●
DC12/24V PWR supply, DC12/24V input(16ch) & Relay output(16ch)	MLI-DR32H/D1	●
DC12/24V PWR supply, DC12/24V input(32ch) & Relay output(32ch)	MLI-DR64H/D1	●
AC100~240V PWR supply, DC24V input(12ch), Open Collector Output(8ch)-Sink	MLI-DN20SU	●
AC100~240V PWR supply, DC24V input(12ch), Relay output(8ch)	MLI-DR20SU	●
AC100~240V PWR supply, DC24V input(12ch), Open Collector Output(8ch)-Source	MLI-DP20SU	●
AC100~240V PWR supply, DC24V input(18ch), Open Collector Output(12ch)-Sink	MLI-DN30SU	●
AC100~240V PWR supply, DC24V input(18ch), Relay output(12ch)	MLI-DR30SU	●
AC100~240V PWR supply, DC24V input(18ch), Open Collector Output(12ch)-Source	MLI-DP30SU	●
AC100~240V PWR supply, DC24V input(24ch), Open Collector Output(16ch)-Sink	MLI-DN40SU	●
AC100~240V PWR supply, DC24V input(24ch), Relay output(16ch)	MLI-DR40SU	●
AC100~240V PWR supply, DC24V input(24ch), Open Collector Output(16ch)-Source	MLI-DP40SU	●
AC100~240V PWR supply, DC24V input(36ch), Open Collector Output(24ch)-Sink	MLI-DN60SU	●
AC100~240V PWR supply, DC24V input(36ch), Relay output(24ch)	MLI-DR60SU	●
AC100~240V PWR supply, DC24V input(36ch), Open Collector Output(24ch)-Source	MLI-DP60SU	●
AC100~240V PWR supply, DC24V input(6ch), Relay output(4ch)	MLI-DR10E	●
AC100~240V PWR supply, DC24V input(8ch), Relay output(6ch)	MLI-DR14E	●
AC100~240V PWR supply, DC24V input(12ch), Relay output(8ch)	MLI-DR20E	●
AC100~240V PWR supply, DC24V input(18ch), Relay output(12ch)	MLI-DR30E	●
AC100~240V PWR supply, DC24V input(6ch), Open Collector Output(4ch)-Sink	MLI-DN10E	●
AC100~240V PWR supply, DC24V input(8ch), Open Collector Output(6ch)-Sink	MLI-DN14E	●
AC100~240V PWR supply, DC24V input(12ch), Open Collector Output(8ch)-Sink	MLI-DN20E	●
AC100~240V PWR supply, DC24V input(18ch), Open Collector Output(12ch)-Sink	MLI-DN30E	●
AC100~240V PWR supply, DC24V input(6ch), Open Collector Output(4ch)-Source	MLI-DP10E	●
AC100~240V PWR supply, DC24V input(8ch), Open Collector Output(6ch)-Source	MLI-DP14E	●
AC100~240V PWR supply, DC24V input(12ch), Open Collector Output(8ch)-Source	MLI-DP20E	●
AC100~240V PWR supply, DC24V input(18ch), Open Collector Output(12ch)-Source	MLI-DP30E	●
AC100~240V,DC24V Input(16ch), Open Collector Output(16ch)-Sink	MLI-DN32U	●
AC100~240V,DC24V input(16ch), Relay output(12ch)	MLI-DR28U	●
AC100~240V,DC24V Input(16ch), Open Collector Output(16ch)-Sink, AI/AO-8ch	MLI-DN32UA	●
AC100~240V, DC24V input(16ch), Relay output(12ch), AI/AO-8ch	MLI-DR28UA	●
DC24V,DC24V Input(16ch), Open Collector Output(16ch)-Sink	MLI-DN32U/DC	●
DC24V,DC24V input(16ch), Relay output(12ch)	MLI-DR28U/DC	●
DC24V,DC24V Input(16ch), Open Collector Output(16ch)-Sink, 8 AI/AO	MLI-DN32UA/DC	●
DC24V,DC24V input(16ch), Relay output(12ch), 8 AI/AO	MLI-DR28UA/DC	●
24VDC, DC24V Input(16ch), Open Collector Output(16ch)-Sink, POS 6AX, 1xENET	MLU-DN32HP	●
DIGITAL INPUT / OUTPUT EXPANSION		
DC24V Input (16 ch) & Open Collector Output (16 ch)	MLE-DN32A	●
ANALOG INPUT EXPANSION		
TC Input (4 ch), Signal 0-100mV	MLF-TC04B	●
Special Module for Positioning and Motion		
TC Input (4 ch), Signal 0-100mV	MLF-TC04B	●
MANUAL & ACCESSORY		
Smart Link Terminal Board 40 pins (Note 4,5)	TG7-1H40S	●
Smart Link Cable Ass'y 20x2-40P, 0.5 Meter (Note 4)	R40H/20HH-05S-XBM3	●
Smart Link Cable Ass'y 20x2-40P, 1.0 Meter (Note 4)	R40H/20HH-10S-XBM3	●
Smart Link Cable Ass'y 40-40P, 1.5 Meter (Note 5)	C40HH-15SB-XBI	●
Smart Link Cable Ass'y 40-40P, 3.0 Meter (Note 5)	C40HH-30SB-XBI	●

Note 1: Documentation is not provided with this model. If required, order the item separately.

Note 2: The manual set contains all ML50 product manuals. Documentation is available only in English language.

Note 3: The cable is used for the configuration, it's available for MLC series.

Note 4: The cable is used for the remote wiring of the Base Module MLM-DN32S and MLM-DN16S.

Note 5: The cable is used for the remote wiring of the DI/O Expansion Module MLE-TN32A / MLE-DC32A only.

Warranty / Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose**. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use. While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications are subject to change without notice.

Honeywell Process Solution

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