HollySys

LM MICRO SERIES PLC

SELECTION GUIDE

Performance | Modular | Expandable | Low Power | Compact | Easy

Features Highlight

Powerful CPU and Analogue Processing
The CPU calculation speed for a single boolean instruction is 0.37μs. It can simultaneously process dozens of analog channels and multiple loops of PID (proportional Integral Derivative) calculations.

Compact In Size
LM Micro Series PLC provides a tight integration of hardware and a complete range of functions within a compact size module.

Diversity of Modules
Adopting a modular design, LM Micro Series PLC consist of a diversity of CPU modules and expansion modules to meet different applications and industries. A CPU module operating with a maximum of 7 expansion modules supports up to 152 digital I/O points or 56 analogue I/O channels.

Flexible System Configuration
LM Micro Series PLC utilizes a flexible system configuration with a large portfolio of expansion modules such as digital I/O, analogue I/O and other dedicated functional modules. Digital I/O modules available are 8-channel, 16-channel, and mix channels (4DI+4DO). Analogue I/O modules available are 4-channel input, 8-channel input, 4-channel thermocouple input, and 4-channel thermal resistance input that are used to receive current, voltage, thermocouple, thermal resistance and other types of signals. Analogue output module available are 2-channel.

Communications
The dedicated communication modules available are the PROFIBUS-DP slave modules and the Ethernet slave modules. Various communication interfaces such as RS-232, RS-485, PROFIBUS-DP and Ethernet are employed for the connection with other systems.

Easy Installation and Wiring
LM Micro Series PLC can be easily mounted on walls or standard DIN rails. The space-saving, patented WAGO wiring terminals are employed to ensure solid and firm wiring.

Data Loss Protection
Instructions and command data of the user are stored in a permanent storage area to prevent data loss caused by power loss or other failures.

Standard Programming Language
PowerPro, the programming software for the system that complies with IEC61131-3 international standard, represents the latest industrial PLC programming trend. Six programming languages are available including LD, FBD, IL, ST, SFC and CFC.

Rich Function Blocks and Instructions
The system is provided with over 400 function blocks and many other instructions tailored according to needs of users. Common instructions include arithmetic operation, evaluation, Boolean, shift, selection, compare, data type conversion, addressing, call, strings etc. Other function blocks include enhanced PID controller, signal generator, function manipulator, analogue processing, MODBUS, PROFIBUS, Ethernet, real-time clock, analogue potentiometer, watchdog, mono-phase and bi-phase counters, pulse output etc.

Off-line Simulation
Off-line simulation allows programmers to simulate, test and debug their programming logic before actual 'live' implementation. Simulation features such as single-step, single cycle, breakpoint debugging and etc, conveniently facilitate the debugging process. All these make programming much easier and more convenient since it is not required to connect the PLC and download the programming codes to hardware devices.

Typical Applications
The LM Micro Series PLC can be utilized in many areas of applications such as the machine tool, punching machinery, printing machinery, spinning machinery, packaging machinery, plastic machinery, environmental protection equipment, central air conditioning, latex industry and various production lines.

Certification

CPU Modules

I/O Expansion Modules

Communication Modules

LM Micro series PLC modules are certified based on European standards EN61131-2 for electromagnetic compatibility testing and safety testing, EN60950-1:2001 low-voltage directives. The certification indicates that LM Micro series PLC products are in compliance with the safety, health, environmental and consumer protection requirements of the Member States of the European Union.

CE

LM Micro Series PLC

Product Selection List		
Modules	**Product Code**	**Description**
CPU	**LM3104**	**14 Points,** 8x DI 24VDC , 6x DO 24VDC Transistor, 24VDC Power Supply
	LM3105	**14 Points,** 8x DI 24VDC, 6x DO Relay, 187~242VAC Power Supply
	LM3106	**24 Points,** 14x DI 24VDC, 10x DO Transistor, 24VDC Power Supply
	LM3016A	**24 Points,** 14x DI 24VDC, 10x DO Transistor, (2x 100KHz PWM or 50KHz PTO), 24VDC Power Supply
	LM3107	**24 Points,** 14x DI 24VDC, 10x DO Relay, 187~242VAC Power Supply
	LM3107E	**23 Points Mix,** 12x DI 24VDC, 8x DO Relay, 2x AI (10-bit, accuracy 1%, 0~10V/0~20mA), 1x AO (12-bit, accuracy 1%, 0~10V/0~20mA), 85~264VAC Power Supply
	LM3108	**40 Points,** 24x DI 24VDC, 16x DO Transistor, 24VDC Power Supply
	LM3109	**40 Points,** 24x DI 24VDC, 16x DO Relay, 187-242VAC Power Supply
Communication	**LM3401**	**Profibus-DP slave station interface module**
	LM3403	**Ethernet interface module**
Digital Input	**LM3210**	**8 Points Expansion,** 8x 24VDC Digital Input
	LM3212	**16 Points Expansion,** 16x 24VDC Digital Input
Digital Output	**LM3220**	**8 Points Expansion,** 8x 24VDC Digital Output Transistor
	LM3221	**16 Points Expansion,** 16x 24VDC Digital Output Transistor
	LM3222	**8 Points Expansion,** 8x Digital DC/AC Output Relay
	LM3223	**16 Points Expansion,** 16x Digital DC/AC Output Relay
Digital Mix I/O	**LM3230**	**8 Points Mix Expansion,** 4x 24VDC Digital Input, 4x 24VDC Digital Output Transistor
	LM3231	**8 Points Mix Expansion,** 4x 24VDC Digital Input, 4x DC/AC Digital Output Relay
	LM3233	**16 Points Mix Expansion,** 8x 24VDC Digital Input, 8x DC/AC Digital Output Relay
Analog Input	**LM3310**	**4 Channels Expansion**, 4x analog input (pseudo-differential input), 4~20mA/0~20mA/0~10VDC, 12-bits ADC, Accuracy ±0.5%fs, AI step-response 6ms.
	LM3310A	**4 Channels Expansion**, 4x analog input (single-ended input), 4~20mA/0~20mA/0~10VDC, 12-bits ADC, Accuracy ±0.5%fs, AI step-response 6ms.
	LM3310B	**4 Channels Expansion**, 4x analog input (single-ended input), 0~20mA or 0~100mV/500mV/1V/5V/10V, 16-bits ADC, Accuracy ±0.5%fs (0~100mV/500mV), Accuracy ±0.2%fs (0~20mA or 0~1V/5V/10V), AI step-response 50ms.
	LM3311	**4 Channels Expansion**, 4x analog thermocouple input, J,K,E, N, T, B, R, S type, ±80mV
	LM3312	**4 Channels Expansion**, 4x analog RTD input, Cu50, Pt100
	LM3313	**8 Channels Expansion**, 8x analog input, single-ended input, -20~20mA/-10~10VDC, 12-bits ADC, Accuracy ±0.5%fs, AI step-response 15ms.
Analog Output	**LM3320**	**2 Channels Expansion**, 2x analog output, 0~20mA /0~10VDC
Analog Mix I/O	**LM3330**	**5 Channels Mix Expansion**, 4x analog input, 1x analog output, Input: 4~20mA /0~20mA/0~10VDC, 12-bit ADC, single-ended input, Accuracy ±0.5%fs, AI step-response 6ms. Output: 0~20mA/0~10V, 12-bit DAC, Accuracy ±0.5%fs.
Software & Cables	**LA3801-COM-300**	LM PLC Programming RS-232 cable (3-meters), DB9 (male) to DB9 (female)
	LS3600	PowerPro programming software for LM Micro Series PLC (CD)
	LS3810	LM module extension cable (500mm)

Offering a wide range of CPU modules with different configuration to meet your automation needs. We provide various models with digital or analogue inputs and outputs, among which, the LM3107E model combines both digital and analogue I/Os in a single module.

CPU Modules								
Specifications	**LM3104**	**LM3105**	**LM3106**	**LM3106A**	**LM3107**	**LM3107E**	**LM3108**	**LM3109**
Digital input	8	8	14	14	14	12	24	24
Digital output	6 x transistor	6 x relay	10 x transistor	10 x transistor	10 x relay	8 x relay	16 x transistor	16 x relay
Analog input	--	--	--	--	--	2	--	--
Analog output	--	--	--	--	--	1	--	--
Maximum number of expansion modules	2	2	4	4	4	4	7	7
Current limit +24VDC (for expansion Bus)	300mA	260mA	300mA	300mA	260mA	260mA	400mA	320mA
Current limit +5VDC (for expansion Bus)	800mA	800mA	800mA	800mA	800mA	800mA	1500mA	1300mA
Communication interface	1x RS-232 (non-isolation)						1x RS-232 and 1x RS-485 (non-isolation)	
Communication protocol	MODBUS RTU, G3 proprietary, or FreePort protocol							
High speed input counter	3 points 100KHz mono-phase input counters or 2 points 100KHz bi-phase input counters							
Pulse output	1 point, 20kHz	None	2 points, 20kHz	2 points, 100kHz PWM or 50kHz PTO	None	None	2 points, 20kHz	None
Timer	Unlimited number of timers, 1ms to 49 days							
Counter	Unlimited number of counters, 15 bits counting range							
Boolean execution speed	0.37μs per instruction							
Power Supply	21~27VDC	187 ~ 242VAC @ 47 ~ 63Hz	21~27VDC	21~27VDC	187 ~ 242VAC @ 47 ~ 63Hz	85 ~ 242VAC @ 47 ~ 63Hz	21~27VDC	187 ~ 242VAC @ 47 ~ 63Hz
Dimension	125mm(L) x 90mm (W) x 70mm(H)					125mm(L) x 90mm (W) x 70mm(H)	200mm(L) x 90mm (W) x 70mm(H)	

Offering various expansion digital inputs/outputs modules with either 8 or 16 points, among which, the LM3230 and LM3231 models both contain 4 DIs and 4 DOs within one module.

Expansion Digital I/O Modules			
Digital Input	**DI**		**Dimension**
LM3210	8 points, 0 ~ 30VDC		50mm(L) x 90mm (W) x 70mm(H)
LM3212	16 points, 0 ~ 30VDC		75mm(L) x 90mm (W) x 70mm(H)
Digital Output	**DO**		**Dimension**
LM3220	8 points, transistor DC output		50mm(L) x 90mm (W) x 70mm(H)
LM3221	16 points, transistor DC output		75mm(L) x 90mm (W) x 70mm(H)
LM3222	8 points, relay DC/AC output		50mm(L) x 90mm (W) x 70mm(H)
LM3223	16 points, relay DC/AC output		75mm(L) x 90mm (W) x 70mm(H)
Digital Mix	**DI**	**DO**	**Dimension**
LM3230	4 points, 0 ~ 30VDC	4 points, transistor DC output	50mm(L) x 90mm (W) x 70mm(H)
LM3231	4 points, 0 ~ 30VDC	4 points, relay DC/AC output	50mm(L) x 90mm (W) x 70mm(H)
LM3233	8 points, 0 ~ 30VDC	8 points, relay DC/AC output	50mm(L) x 90mm (W) x 70mm(H)

Offerring various expansion analogue inputs/output modules such as pseudo-differential, single ended, thermocouple, RTD, and NTC. Among all the models, the LM3330 provides 4 channels of analogue inputs and a 1 channel of analogue output.

Expansion Analog I/O Modules					
Analog Input	**AI**	**Resolution**	**Input Range (Voltage/Temperature)**	**Input Range (Current)**	**Dimension**
LM3310	4 channels, Pseudo-Differential	12 bit A/D converter	0 ~ 10V	0 ~ 20mA / 4~20mA	75mm(L) x 90mm (W) x 70mm(H)
LM3310A	4 channels, Single-Ended	12 bit A/D converter	0 ~ 10V	0 ~ 20mA / 4~20mA	75mm(L) x 90mm (W) x 70mm(H)
LM3310B	4 channels, Single-Ended	16 bit A/D converter	0 ~ 100mV 0 ~ 500mV 0 ~ 1V 0 ~ 5V 0 ~ 10V	0 ~ 20mA	75mm(L) x 90mm (W) x 70mm(H)
LM3313	8 channels, Single-Ended	12 bit A/D converter	-10V to +10V	-20mA ~ +20mA	75mm(L) x 90mm (W) x 70mm(H)
LM3311	4 channels, Thermocouple	----	J,K,T,N,E,R,S,B thermocouple type, voltage range ±80mV	----	75mm(L) x 90mm (W) x 70mm(H)
LM3312	4 channels, RTD	----	Pt100 (-150 ~ 619.6℃, Pt100 (-150 ~ 157.2℃), Cu50 (-50 ~ 150.1℃), Cu50 (-50 ~ 140.1℃),	----	75mm(L) x 90mm (W) x 70mm(H)
LM3314	4 channels, NTC	----	R = 10K at 25℃; B value is selectable.	----	75mm(L) x 90mm (W) x 70mm(H)
Analog Output	**AO**		**Output Range (Voltage)**	**Output Range (Current)**	**Dimension**
LM3320	2 channels	----	0 ~ 10V	0 ~ 20mA	75mm(L) x 90mm (W) x 70mm(H)
Analog Mix	**AI**	**AO**	**Input/Output Range (Voltage)**	**Input/Output Range (Current)**	**Dimension**
LM3330	4 channels, Single Ended	1 channel	12 bit A/D converter	0 ~ 10V	Input: 0 ~ 20mA / 4 ~ 20 mA Output: 0 ~ 20mA	75mm(L) x 90mm (W) x 70mm(H)

PROFIBUS-DP slave station interface module is used to establish communication with other PLC while the Ethernet Interface module are used to establish communication with computers via the RJ-45 interface.

Communication Modules					
	Description	**Interface**	**Protocol**	**Baud Rate**	**Dimension**
LM3401	PROFIBUS-DP slave station Interface Module	9 pin D type socket or wiring terminal	PROFIBUS-DP (Slave Station)	9.6, 19.2, 45.45, 93.75, 187.5, 500Kbps and 1, 1.5, 3, 6, 12Mbps (auto adaptive)	75mm(L) x 90mm (W) x 70mm(H)
LM3403	Ethernet Interface Module	Ethernet RJ-45	MODBUS TCP (Slave Station)	10 Mbps	75mm(L) x 90mm (W) x 70mm(H)

Programming Software and Cable	
	Description
LA3801-COM-300	LM PLC Programming RS-232 cable (3-meters), DB9 (male) to DB9 (female)
LS3600	PowerPro programming software for LM Micro Series PLC (CD)
LS3810	LM module extension cable (500mm)

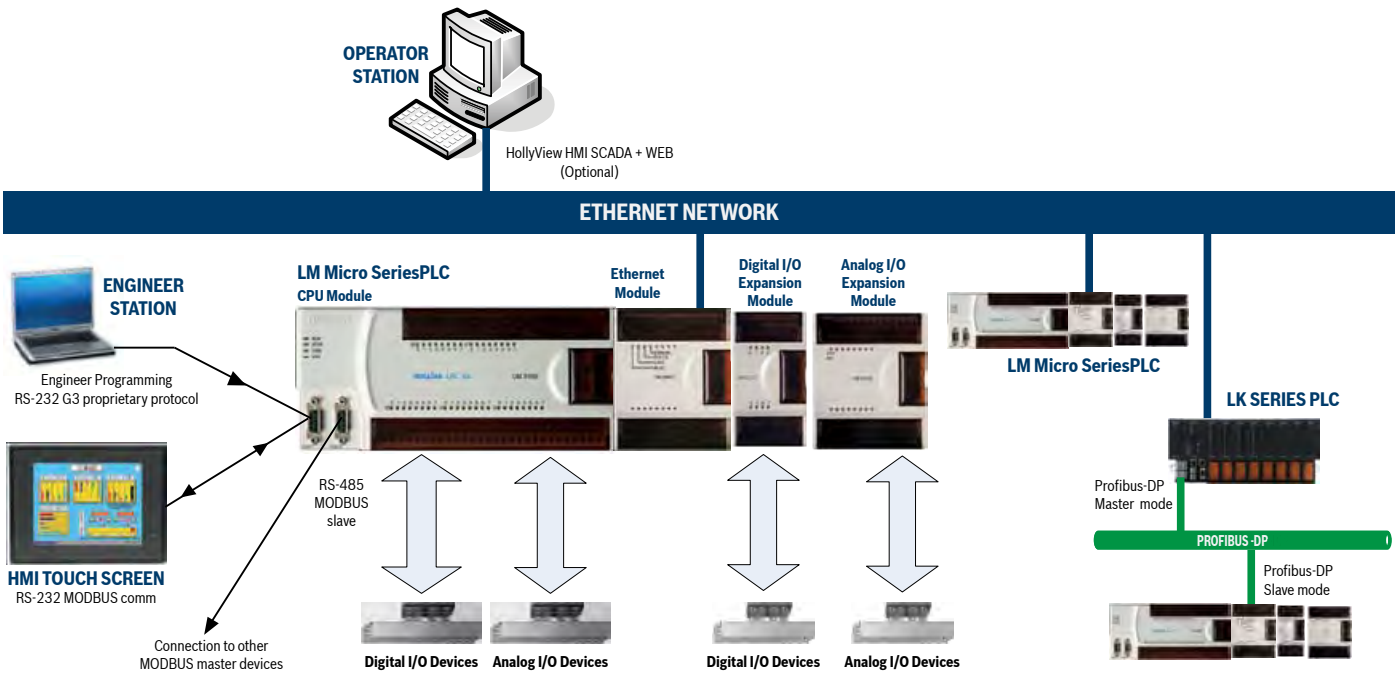
Environmental Specifications	
Operating Temperature	0℃~55℃
Storage Temperature	-40℃ ~ +70℃
Relative Humidity	5%~95% (non condensing)
Drop Test	GB/T2423.7-1995: 50mm, 4 times (without transport packaging)
Free-fall Drop Test	GB/T2423.8-1995: 1m, 5 times (with transport packaging)
Shock Resistance	IEC/EN 60086-2-27 or GB/T2423.5-1995: 15G (147m/S^2) (11ms along 6 axes)
Vibration Resistance	IEC/EN 60086-2-6 or GB/T2423.10-1995: 1G (9.8m/S^2) (resistance to vibration from 10 ~ 150Hz along all 3 axes)
Degree of Protection	IP20
Insulation Resistance	1000VDC, 1min @ 5mA
Environment	Avoid environment containing corrosive gases, Install in a dust-free location

Electromagnetic Compatibility		
Electrostatic discharge immunity tests	External Casing	IEC 61000-4-2: Level 2/3, contact discharge 4kV, environment discharge 8kV
Voltage dips, short interruptions and voltage variations immunity test	AC Power	IEC 61000-4-11: Level 3, Polar disruption 0.5 wave
Electrical fast transient / burst immunity test		IEC 61000-4-4: Level 3, 2kV
Surge immunity test		IEC 61000-4-5: Level 2/3, wire to wire 1kV, wire to ground 2kV
Radiated, radio-frequency, electromagnetic field immunity test	I/O signal or Control signal	IEC 61000-4-3: Level 3, 80MHz ~ 1HHz, 10V / m using 1KHz signal 80% modulation
Electrical fast transient/burst immunity test		IEC 61000-4-4: Level 3, 1kV
Immunity to conducted disturbances, induced by radio-frequency fields		IEC 61000-4-6: Level 3, 10V, 0.15 ~ 80MHz, 1KHz and below, 80% amplitude modulation

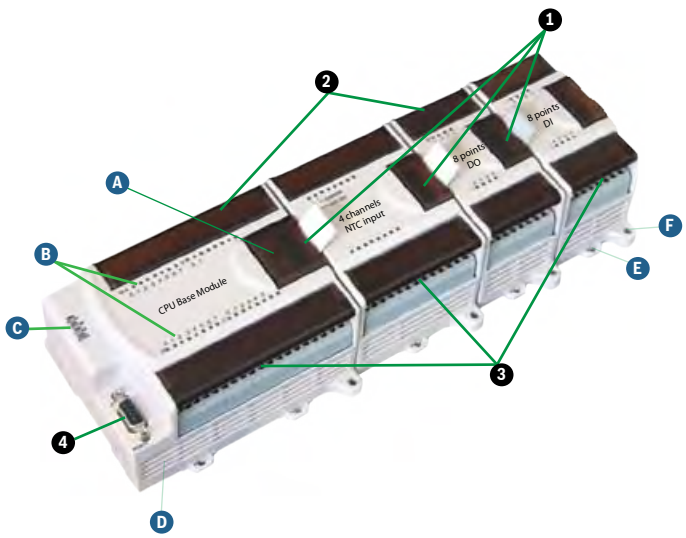
Maximum I/O Configuration				
CPU Modules	**Digital Input**	**Digital Output**	**Analog Input**	**Analog Output**
LM3104 / LM3105 - Maximum number of expansion modules = 2				
CPU Based Module I/O	**8**	**6**	-	-
Maximum Expandable I/O (If connects 2 expansion module)	16 x 2 =**32**	16 x 2 = **32**	8x2= **16**	2x2= **4**
Maximum total I/O	8+32 = **40**	6+32 = **38**	**16**	**4**
LM3106 / LM3107 - Maximum number of expansion modules = 4				
CPU Based Module I/O	**14**	**10**	-	-
Maximum Expandable I/O (If connects 4 expansion module)	16x4= **64**	16x4= **64**	8x4= **32**	2x4= **8**
Maximum total I/O	14+64 = **78**	10+64 = **74**	**32**	**8**
LM3108 / LM3109 - Maximum number of expansion modules = 7				
CPU Based Module I/O	**24**	**16**	-	-
Maximum Expandable I/O (If connects 7 expansion module)	16x7 = **112**	16x7 = **112**	8x7 = **56**	2x7 = **14**
Maximum total I/O	24+112 = **136**	16+112 = **128**	**56**	**14**
LM3107E - Maximum number of expansion modules = 4				
CPU Based Module I/O	**12**	**8**	**2**	**1**
Maximum Expandable I/O (If connects 4 expansion module)	16x4 = **64**	16x4 = **64**	8x4 = **32**	2x4 = **8**
Maximum total I/O	12+64= **76**	8+64 = **72**	2+32 = **34**	1+8 = **9**

LM Micro Series PLC

System Architecture



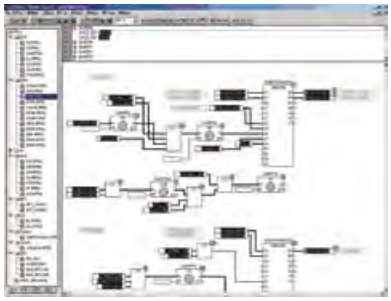
Interfaces and Connections



Legends

- **1** Connection to Expansion Modules
- **2** Wiring Terminal for Output + Input Power Supply
- **3** Wiring Terminal for Input + Output Power Supply
- **4** RS-232 / RS-485 Communication Port
- **A** RUN/STOP operation switch + Analog presets
- **B** I/O Channels Status Indicator
- **C** PLC Status Indicator - Run, Stop, Com, Error
- **D** Heat Radiator
- **E** DIN Rail Fastener
- **F** Hole for Backplane or Wall Mounting

PowerPro Programming Software



In complete accordance with IEC61131-3 international programming standard, PowerPro is a comprehensive, Windows-based programming software tool for LM Micro series PLC. It provides an off-line simulation feature that allows programmers simulating, testing and debugging the programming logic before the actual “live” implementation. This makes programming much easier and more convenient since it is not required to connect the PLC and download the programming codes to the hardware devices.

Programming Languages fully comply with IEC61131-3 Industrial Standard

- Supporting 6 types of programming languages editor
  - **Instruction List (IL)**
  - **Structural Text (ST)**
  - **Function Block Diagram (FBD)**
  - **Ladder Diagram (LD)**
  - **Sequence Function Chart (SFC)**
  - **Continuous Function Chart (CFC)**
- Depending on variable requirements, programmers can choose the relevant programming languages to work with. While working with FBD, LD, or IL, programmers are allowed to switch in between these programming languages.

Hundreds of Instructions and Function Blocks

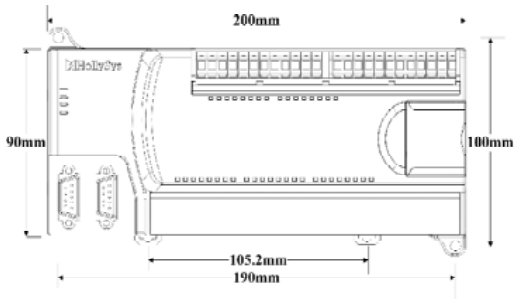
- Over 400 instructions and function blocks to be employed according to variable requirements of user.
- Common instructions include arithmetic, evaluation, Boolean, shift, selection, compare, data type conversion, addressing, call, strings and etc.
- Common function blocks include enhanced PID controller, signal generator, function manipulator, analogue processing, Modbus, ProfiBus, Ethernet, real-time clock, analogue potentiometer, watchdog, mono-phase and bi-phase counters, pulse output and etc.

Integrated Simulation

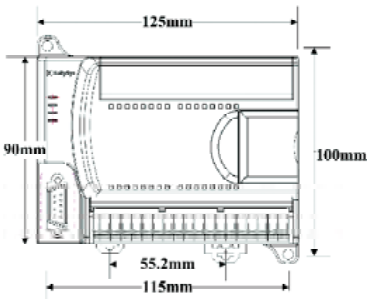
- Debugging of application program without hardware is possible with the build-in simulation feature of PowerPro. The application program can be checked before it is downloaded to the PLC.
- Showing all the variable values declared in the declaration part of each editor.
- All the inputs and outputs can also be simulated.

User Defined libraries

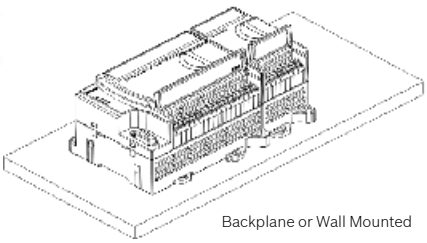
- Customized libraries can be easily created.



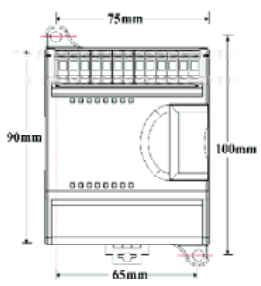
CPU module



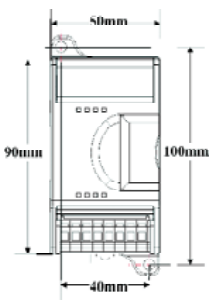
CPU module



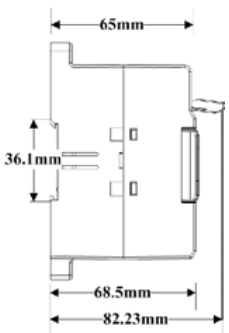
Backplane or Wall Mounted



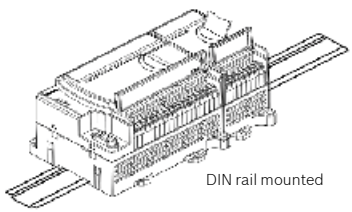
I/O module or communication module



I/O module



side view of any module



DIN rail mounted

CPU MODULES

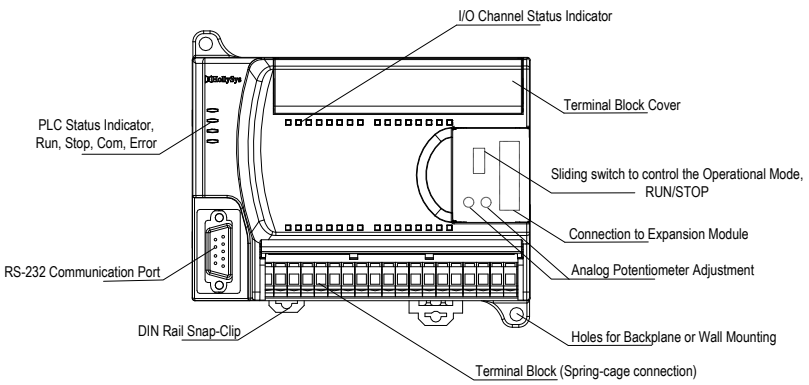
CPU module contains CPU, I/O, and power supply.

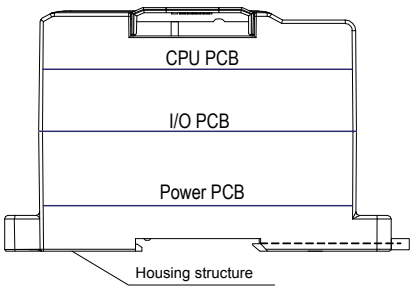
Please review the different product model's specification and features ensuring it can satisfy the requirement of your application. Also, refer to the 'Maximum I/O Configuration' chart in page 7 to determine the maximum possible expansion module you can expand with.

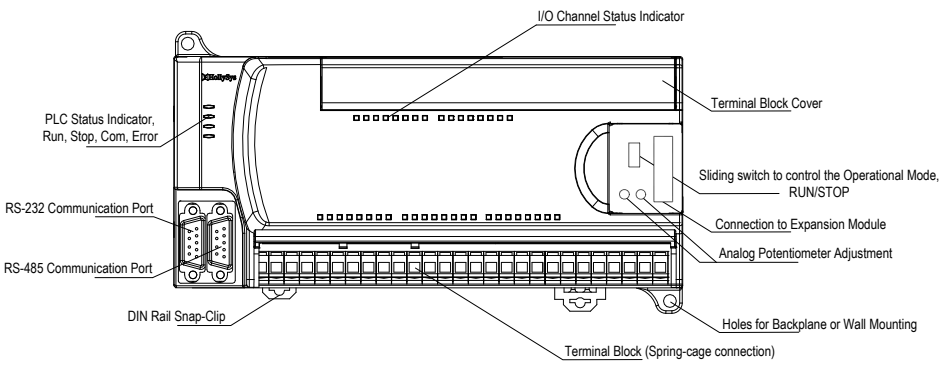
Basic Features

- RUN / STOP sliding switch.
- 2 adjustable analog potentiometer.
- Real-time clock.
- 120K word of program storage memory.
- 6K word of power-loss retain memory zone.
- Sync pulse establishing high-speed data transmission between CPU and expansion modules.
- RS-232 communication/programming port with maximum baud rate of 38400 bps.
- Input power providing 5VDC and 24VDC to all modules.
- Auxiliary 24VDC external output power supply.

CPU MODULES				
	14 points I/O	**24 points I/O**	**40 points I/O**	**23 points MIX I/O**
24V DC Powered	**LM3104** **8x DI, 6x DO transistor**	**LM3106** **14x DI, 10x DO transistor**	**LM3108** **24x DI, 16x DO transistor**	
230V AC Powered	**LM3105** **8x DI, 6x DO relay**	**LM3107** **14x DI, 10x DO relay**	**LM3109** **24x DI, 16x DO relay**	**LM3107E** **12x DI, 8x DO relay, 2x AI, 1x AO**







LM3104 CPU MODULE with 14 points I/O (8DI, 6DO), 24VDC Powered

- **8 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters
  - 2 of the input can be use as pulse catch inputs
  - 2 of the input can be use as interrupt inputs
- **6 digital transistor output**, of which:
  - 1 of the output can be use as 20 KHz high-speed pulse output (PTO or PWM)
- **Expandable with a maximum of 2 additional I/O modules** (Cannot support PROFIBUS-DP and ETHERNET modules)

LM3104 CPU MODULE with 14 points I/O (8DI, 6DO), 24VDC Powered		
Local I/O		
Digital I/O		8 In (24VDC), 6 Out (transistor)
Analog I/O		None
Maximum number of expansion modules		2 modules, (communication modules not supported)
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		2
External interrupt input		2
Pulse output		1 (20KHz)
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		24V DC Power
Line voltage-permissible range		21 ~ 27 VDC
Input current (max load)		1.3 A at 24 VDC
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3104 CPU MODULE with 14 points I/O (8DI, 6DO), 24VDC Powered		
Local I/O		
Digital I/O		8 In (24VDC), 6 Out (transistor)
Analog I/O		None
Maximum number of expansion modules		2 modules, (communication modules not supported)
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		2
External interrupt input		2
Pulse output		1 (20KHz)
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		24V DC Power
Line voltage-permissible range		21 ~ 27 VDC
Input current (max load)		1.3 A at 24 VDC
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3105 CPU MODULE with 14 points I/O (8DI, 6DO), AC Powered

- **8 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters
  - 2 of the input can be use as pulse catch inputs
  - 2 of the input can be use as interrupt inputs
- **6 digital relay output**
- **Expandable with a maximum of 2 additional I/O modules** (Cannot support PROFIBUS-DP and ETHERNET modules)

LM3105 CPU MODULE with 14 points I/O (8DI, 6DO), AC Powered		
Local I/O		
Digital I/O		8 In (24VDC), 6 Out (relay)
Analog I/O		None
Maximum number of expansion modules		2 modules, (communication modules not supported)
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		2
External interrupt input		2
Pulse output		None
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		
Line voltage-permissible range		187 ~ 242 VAC, 47 ~ 63 Hz
Input current (max load)		120 mA
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3105 CPU MODULE with 14 points I/O (8DI, 6DO), AC Powered	
Current limit	
+24 VDC (for expansion bus)	260 mA
+24 VDC (for external)	200 mA
+5 VDC(for expansion bus)	800 mA
Short-circuit protection	400 mA, 24 VDC output
Input Specifications	
Input type	Sink / Source
Number of DC inputs	8
Input voltage	24 VDC
Voltage-permissible range	0 ~ 30 VDC
Logic 1 signal	15 ~ 30 VDC at 3 mA
Logic 0 signal	0 ~ 5 VDC at 1 mA
Optical isolation (galvanic)	500 VAC for 1 minute
Input delay	< 0.6 ms (Rated input voltage)
Isolation group	1 group (8 in)
Output Specifications	
Output type	Relay, dry contact
Number of relay outputs	6
Permissible range	5 ~ 30 VDC or 5 ~ 250 VAC
Output current logic 1 signal	1 A
Output current logic 0 signal	1 mA
Max. current per common/group	< 10 A
ON state resistance (contact)	< 0.2 Ω
Isolation	
Isolation resistance	100 MΩ (minimum)
Isolation coil to contact	3000 VAC for 1 minute
Isolation between open contacts	750 VAC for 1 minute
Isolation group	2 groups (2 out / 4 out)
Pulse train output frequency	1 Hz (maximum)
Relay lifespan	
Switching delay	< 10ms (maximum)
Lifetime mechanical (no load)	10,000,000 times, open / close
Lifetime contacts at rated load	100,000 times, open / close
Physical Specifications	
Size of module	125 mm (L) × 90 mm (W) × 70 mm (H)
Weight	350 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20
Agency approvals	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3106 CPU MODULE with 24 points I/O (14DI, 10DO), 24VDC Powered

- **14 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters
  - 4 of the input can be use as pulse catch inputs
  - 4 of the input can be use as interrupt inputs
- **10 digital transistor output**, of which:
  - 2 of the output can be use as 20 KHz high-speed pulse output (PTO or PWM)
- **Expandable with a maximum of 4 additional modules**

LM3106 CPU MODULE with 24 points I/O (14DI, 10DO), 24VDC Powered		
Local I/O		
Digital I/O		14 In (24VDC), 10 Out (transistor)
Analog I/O		None
Maximum number of expansion modules		4 modules
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		4
External interrupt input		4
Pulse output		2 (20KHz)
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		24V DC Power
Line voltage-permissible range		21 ~ 27 VDC
Input current (max load)		1.3 A at 24 VDC
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3106 CPU MODULE with 24 points I/O (14DI, 10DO), 24VDC Powered	
Current limit	
+24 VDC (for expansion bus)	300 mA
+24 VDC (for external)	300 mA
+5 VDC(for expansion bus)	800 mA
Short-circuit protection	400 mA, 24 VDC output
Input Specifications	
Input type	Sink / Source
Number of DC inputs	14
Input voltage	24 VDC
Voltage-permissible range	0 ~ 30 VDC
Logic 1 signal	15 ~ 30 VDC at 3 mA
Logic 0 signal	0 ~ 5 VDC at 1 mA
Optical isolation (galvanic)	500 VAC for 1 minute
Input delay	< 0.6 ms (Rated input voltage)
Isolation group	2 groups (8 in/ 6 in)
Output Specifications	
Output type	Transistor, Solid-state MOSFET
Number of DC outputs	10
Permissible range	20.4 ~ 28.8 VDC
Rated value	24 VDC
Output current logic 1 signal	1 A
Output current logic 0 signal	1 mA
Max. current per common/group	< 4 A
ON state resistance (contact)	< 0.2 Ω
Surge current	< 8 A for 100 ms, max.
Overload protection	No
Optical isolation (galvanic)	500 VAC for 1 minute
Isolation group	2 groups (5 out / 5 out)
Output delay (off to on / on to off)	Normal output < 1ms, High-speed pulse output < 10μs
Physical Specifications	
Size of module	125 mm (L) × 90 mm (W) × 70 mm (H)
Weight	310 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20
Agency approvals	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3107 CPU MODULE with 24 points I/O (14DI, 10DO), AC Powered

- **14 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters
  - 4 of the input can be use as pulse catch inputs
  - 4 of the input can be use as interrupt inputs
- **10 digital relay output**
- **Expandable with a maximum of 4 additional modules**

LM3107-CAR CPU MODULE with 24 points I/O (14DI, 10DO), AC Powered		
Local I/O		
Digital I/O		14 In (24VDC), 10 Out (relay)
Analog I/O		None
Maximum number of expansion modules		4 modules
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		4
External interrupt input		4
Pulse output		None
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		
Line voltage-permissible range		187 ~ 242 VAC, 47 ~ 63 Hz
Input current (max load)		120 mA
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3107-CAR CPU MODULE with 24 points I/O (14DI, 10DO), AC Powered	
Current limit	
+24 VDC (for expansion bus)	260 mA
+24 VDC (for external)	200 mA
+5 VDC(for expansion bus)	800 mA
Short-circuit protection	400 mA, 24 VDC output
Input Specifications	
Input type	Sink / Source
Number of DC inputs	14
Input voltage	24 VDC
Voltage-permissible range	0 ~ 30 VDC
Logic 1 signal	15 ~ 30 VDC at 3 mA
Logic 0 signal	0 ~ 5 VDC at 1 mA
Optical isolation (galvanic)	500 VAC for 1 minute
Input delay	< 0.6 ms (Rated input voltage)
Isolation group	2 groups (8 in / 6 in)
Output Specifications	
Output type	Relay, dry contact
Number of relay outputs	10
Permissible range	5 ~ 30 VDC or 5 ~ 250 VAC
Output current logic 1 signal	2 A
Output current logic 0 signal	0 A
Max. current per common/group	< 10 A
ON state resistance (contact)	< 0.2 Ω
Isolation	
Isolation resistance	100 MΩ (minimum)
Isolation coil to contact	3000 VAC for 1 minute
Isolation between open contacts	750 VAC for 1 minute
Isolation group	3 groups (4 out / 4 out / 2 out)
Pulse train output frequency	1 Hz (maximum)
Relay lifespan	
Switching delay	< 10ms (maximum)
Lifetime mechanical (no load)	10,000,000 times, open / close
Lifetime contacts at rated load	100,000 times, open / close
Physical Specifications	
Size of module	125 mm (L) × 90 mm (W) × 70 mm (H)
Weight	380 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20
Agency approvals	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3107E CPU MODULE with 23 points MIX I/O (12DI, 8DO, 2AI, 1AO), AC Powered

- **12 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters
  - 4 of the input can be use as pulse catch inputs
  - 4 of the input can be use as interrupt inputs
- **8 digital relay output**
- **2 analog inputs (voltage/current)**
- **1 analog outputs**
- **Expandable with a maximum of 5 additional I/O or communication modules**

LM3107E CPU MODULE with 23 points Mix I/O (12DI, 8DO, 2AI, 1AO), AC Powered		
Local I/O		
Digital I/O		12 In (24VDC), 8 Out (relay)
Analog I/O		2 In, 1 Out
Maximum number of expansion modules		4 modules
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		4
External interrupt input		4
Pulse output		None
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 (non-isolated)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		
Line voltage-permissible range		85 ~ 264 VAC, 47 ~ 63 Hz
Input current (max load)		120 mA

LM3107E CPU MODULE with 23 points Mix I/O (12DI, 8DO, 2AI, 1AO), AC Powered		
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC
Current limit		
+24 VDC (for expansion bus)		260 mA
+24 VDC (for external)		200 mA
+5 VDC(for expansion bus)		800 mA
Short-circuit protection		400 mA, 24 VDC output
Digital Input Specifications		
Input type		Sink / Source
Number of DC inputs		12
Input voltage		24 VDC
Voltage-permissible range		0 ~ 30 VDC
Logic 1 signal		15 ~ 30 VDC at 3 mA
Logic 0 signal		0 ~ 5 VDC at 1 mA
Optical isolation (galvanic)		1000 VAC for 1 minute
Input delay		< 0.6 ms (Rated input voltage)
Isolation group		2 groups (8 in / 4 in)
Digital Output Specifications		
Output type		Relay, dry contact
Number of relay outputs		8
Permissible range		5 ~ 30 VDC or 5 ~ 250 VAC
Output current logic 1 signal		2 A
Output current logic 0 signal		0 A
Max. current per common/group		< 10 A
ON state resistance (contact)		< 0.2 Ω
Isolation		
Isolation coil to contact		3000 VAC for 1 minute, 1 mA
Isolation between open contacts		750 VAC for 1 minute, 1 mA
Isolation group		2 groups (4 out / 4 out)
Relay lifespan		
Switching delay		< 10ms (maximum)
Lifetime mechanical (no load)		10,000,000 times, open / close
Lifetime contacts at 2A rated load		100,000 times, open / close
Analog Input Specifications		
Number of analog input		2 channels
Input range	Voltage	0 to 10 V
	Current	0 ~ 20 mA
Accuracy, typical 25° C (unipolar)		±1% of full-scale
Data word format		0 ~ 10,000
Input impedance		1 MΩ (Voltage), 250 Ω (Current)
Maximum input voltage		30 VDC
Maximum input current		30 mA
Isolation (field side to logic)		None
Sampling refresh time (Analog input step response)		< 20ms every 2 channel (does not include scanning time)

...continued on next page...

LM3107E CPU MODULE with 23 points Mix I/O (12DI, 8DO, 2AI, 1AO), AC Powered		
Analog Output Specifications		
Number of analog output		1 channel
Output Range	Voltage output	0 ~ 10V
	Current output	0 ~ 20 mA
Accuracy, typical 25° C		±1% of full-scale
Data word format		0 ~ 4095
Settling time	Voltage output	≤ 2 ms
	Current output	≤ 2 ms
Maximum drive	Voltage output	2000 Ω (minimum)
	Current output	600 Ω (maximum)
Isolation (field side to logic)		None
Output refresh time		1 scan cycle
Physical Specifications		
Size of module		125 mm (L) × 90 mm (W) × 70 mm (H)
Weight		380 g
Ambient operating environment		0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity		5% ~ 95% non-condensing, no corrosive gas
Storage environment		-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock		15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration		0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection		IP20
Agency approvals		CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3108 CPU MODULE with 40 points I/O (24DI, 16DO), DC Powered

- **24 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters.
  - 4 of the input can be use as pulse catch inputs.
  - 4 of the input can be use as interrupt inputs.
- **16 digital transistor output**, of which:
  - 2 of the output can be use as 20 KHz high-speed pulse output (PTO or PWM).
- **Expandable with a maximum of 7 additional I/O or communication modules.**
- **Additional 1x RS-485 port for communication with local devices.**

LM3108 CPU MODULE with 40 points I/O (24DI, 16DO),24VDC Powered		
Local I/O		
Digital I/O		24 In (24VDC), 16 Out (transistor)
Analog I/O		None
Maximum number of expansion modules		7 modules
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		4
External interrupt input		4
Pulse output		2 (20KHz)
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 and 1 RS-485 comm. port (non-isolation)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		24V DC Power
Line voltage-permissible range		21 ~ 27 VDC
Input current (max load)		1.5 A at 24 VDC
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3108 CPU MODULE with 40 points I/O (24DI, 16DO),24VDC Powered	
Current limit	
+24 VDC (for expansion bus)	400 mA
+24 VDC (for external)	400 mA
+5 VDC(for expansion bus)	1500 mA
Short-circuit protection	900 mA, 24 VDC output
Input Specifications	
Input type	Sink / Source
Number of DC inputs	24
Input voltage	24 VDC
Voltage-permissible range	0 ~ 30 VDC
Logic 1 signal	15 ~ 30 VDC at 3 mA
Logic 0 signal	0 ~ 5 VDC at 1 mA
Optical isolation (galvanic)	500 VAC for 1 minute
Input delay	< 0.6 ms (Rated input voltage)
Isolation group	3 groups (8 in / 8 in / 8 in)
Output Specifications	
Output type	Transistor, Solid-state MOSFET
Number of DC outputs	16
Permissible range	20.4 ~ 28.8 VDC
Rated value	24 VDC
Output current logic 1 signal	1 A
Output current logic 0 signal	1 mA
Max. current per common/group	< 4 A
ON state resistance (contact)	< 0.2 Ω
Surge current	< 8 A for 100 ms, max.
Overload protection	No
Optical isolation (galvanic)	500 VAC for 1 minute
Isolation group	2 groups (8 out / 8 out)
Output delay (off to on / on to off)	Normal output < 1ms, High-speed pulse output < 10μs
Physical Specifications	
Size of module	200 mm (L) × 90 mm (W) × 70 mm (H)
Weight	470 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20
Agency approvals	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

LM3109 CPU MODULE with 40 points I/O (24DI, 16DO), AC Powered

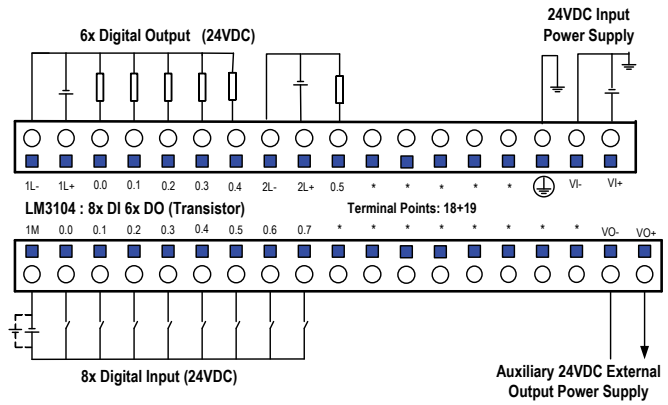
- **24 digital inputs**, (sink/source selectable) of which:
  - 3 of the inputs can be use as 100 KHz high-speed mono-phase counters or 2 of the inputs can be use as 100 KHz high-speed bi-phase counters.
  - 4 of the input can be use as pulse catch inputs.
  - 4 of the input can be use as interrupt inputs.
- **16 digital transistor output**
- **Expandable with a maximum of 7 additional I/O or communication modules.**
- **Additional 1x RS-485 port for communication with local devices.**

LM3109 CPU MODULE with 40 points I/O (24DI, 16DO), AC Powered		
Local I/O		
Digital I/O		24 In (24VDC), 16 Out (relay)
Analog I/O		None
Maximum number of expansion modules		7 modules
Memory		
User program memory		60,000 words
Storage type		Flash RAM
Input storage zone		256 words
Output storage zone		256 words
Mid-variables (M) zone		4000 words
Global (N) zone		12,000 words
Power-loss retain zone		3,000 words, 10 years
Instructions		
Instructions	Basic	340
	Expandable	47
Boolean execution speed		0.37μs per instruction
Timer		Unlimited number of timers, 1ms ~ 49 days
Counter		Unlimited number of counters, 15 bits counting range
Programming languages		Compliance with IEC61131-3 international standards, supporting 6 programming languages, LD, IL, FBD, SFC, ST, CFC
Enhanced Features		
High-speed input counter		Mono-phase counters: 3 In (100KHz) Bi-phase counters: 2 In (100KHz)
Pulse catch input		4
External interrupt input		4
Pulse output		None
Analog potentiometer adjustment		2 potentiometer adjustment, value range: 0~255
Real-time clock		Yes, 10 days power loss protection
Password protection		Yes
Communications		
Number of comm ports:		1 RS-232 and 1 RS-485 comm. port (non-isolation)
Communication protocol		MODBUS RTU or G3 proprietary or FreePort protocol
Max. Baud Rate		Up to 38, 400 baud
Power Specifications		
Input power supply		
Line voltage-permissible range		187 ~ 242 VAC, 47 ~ 63 Hz
Input current (max load)		200 mA
Auxillary 24 VDC external output power		24V DC Power
Voltage range		22.8 ~ 25.2 VDC

LM3109 CPU MODULE with 40 points I/O (24DI, 16DO), AC Powered	
Current limit	
+24 VDC (for expansion bus)	320 mA
+24 VDC (for external)	400 mA
+5 VDC(for expansion bus)	1300 mA
Short-circuit protection	900 mA, 24 VDC output
Input Specifications	
Input type	Sink / Source
Number of DC inputs	24
Input voltage	24 VDC
Voltage-permissible range	0 ~ 30 VDC
Logic 1 signal	15 VDC at 3 mA (minimum)
Logic 0 signal	5 VDC at 1 mA (maximum)
Optical isolation (galvanic)	500 VAC for 1 minute
Input delay	< 0.6 ms (Rated input voltage)
Isolation group	3 groups (8 in / 8 in / 8 in)
Output Specifications	
Output type	Relay, dry contact
Number of relay outputs	16
Permissible range	5 ~ 30 VDC or 5 ~ 250 VAC
Output current logic 1 signal	2 A
Output current logic 0 signal	0 A
Max. current per common/group	< 10 A
ON state resistance (contact)	< 0.2 Ω
Isolation	
Isolation resistance	100 MΩ (minimum)
Isolation coil to contact	3000 VAC for 1 minute
Isolation between open contacts	750 VAC for 1 minute
Isolation group	4 groups (4 out / 4 out / 4 out / 4 out)
Pulse train output frequency	1 Hz (maximum)
Relay lifespan	
Switching delay	< 10ms (maximum)
Lifetime mechanical (no load)	10,000,000 times, open / close
Lifetime contacts at rated load	100,000 times, open / close
Physical Specifications	
Size of module	200 mm (L) × 90 mm (W) × 70 mm (H)
Weight	550 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20
Agency approvals	CE approved (EMC and LVD)

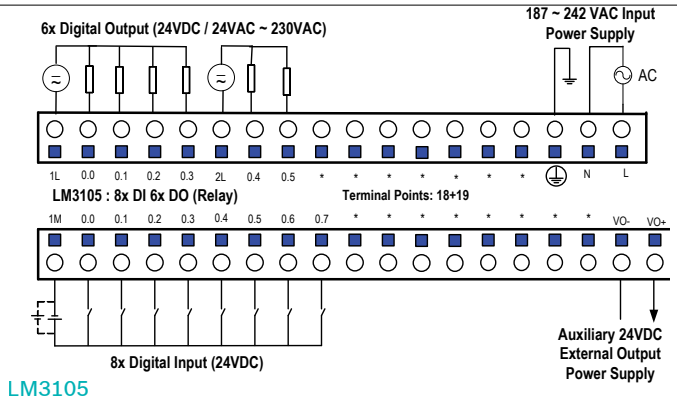
** For more details, please refer to the respective terminal block and wiring diagram on page 25 and 26.*

Terminal block and wiring diagram for CPU Modules



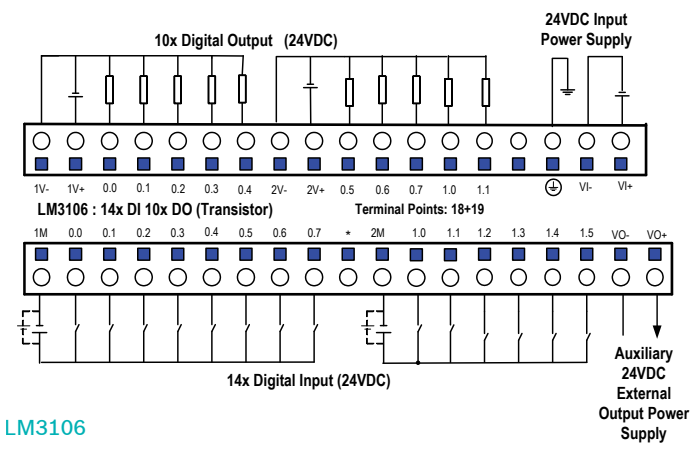
LM3104

Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1L-	DO load drive supply -24VDC GND terminal	1M	Common terminal of DI (connect to 24VDC +/- terminal corresponding to source/sink DI)
1L+	DO load drive supply +24VDC terminal	I0.0	Digital input #0 / high-speed input counter
Q0.0	Digital output #0	I0.1	Digital input #1 / high-speed input counter control
Q0.1	Digital output #1	I0.2	Digital input #2 / high-speed input counter
Q0.2	Digital output #2	I0.3	Digital input #3 / high-speed input counter control
Q0.3	Digital output #3 / High-speed pulse output	I0.4	Digital input #4
Q0.4	Digital output #4	I0.5	Digital input #5
2L-	DO load drive supply -24VDC GND terminal	I0.6	Digital input #0 / high-speed input counter / external interrupt input / pulse catch input
2L+	DO load drive supply +24VDC terminal	I0.7	Digital Input #0 / external interrupt input / pulse catch input
Q0.5	Digital output #5	*	*Not in used*
*	*Not in used*	VO-	Auxiliary -24VDC GND terminal
⏚	EARTH GROUND	VO+	Auxiliary +24VDC power supply terminal
VI-	-24VDC power supply GND terminal		
VI+	+24VDC power supply terminal		



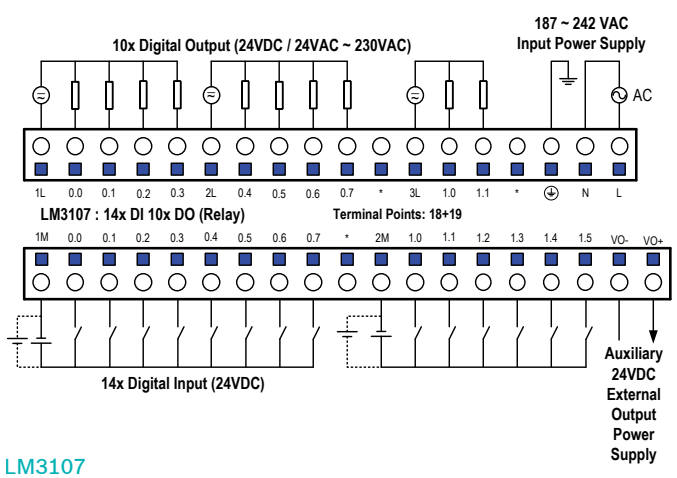
LM3105

Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1L	DO common terminal group#1 (24VDC or 230VAC supply)	1M	DI common terminal (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q0.0	Digital output #0	I0.0	Digital input #0 / high-speed input counter
Q0.1	Digital output #1	I0.1	Digital input #1 / high-speed input counter control
Q0.2	Digital output #2	I0.2	Digital input #2 / high-speed input counter
Q0.3	Digital output #3 / high-speed pulse output	I0.3	Digital input #3 / high-speed input counter control
2L	DO common terminal group#2 (24VDC or 230VAC supply)	I0.4	Digital input #4
Q0.4	Digital output #4	I0.5	Digital input #5
Q0.5	Digital output #5	I0.6	Digital input #0 / high-speed input counter / external interrupt input / pulse catch input
*	*Not in used*	I0.7	Digital Input #0 / external interrupt input / pulse catch input
⏚	EARTH GROUND	*	*Not in used*
N	230VAC Neutral	VO-	Auxiliary -24VDC GND terminal
L	230VAC Live	VO+	Auxiliary +24VDC power supply terminal



LM3106

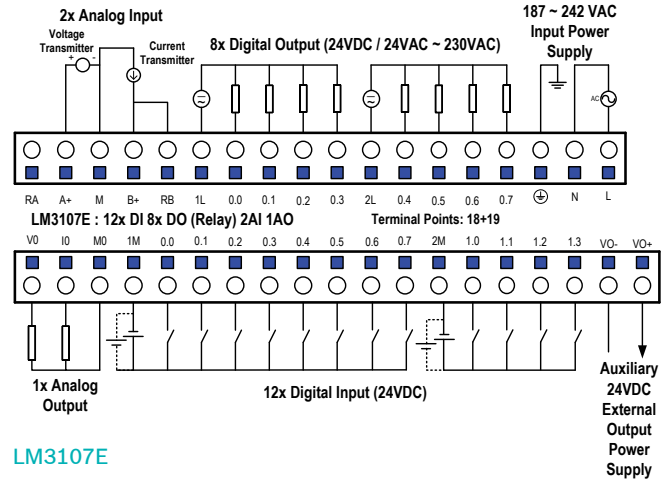
Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1V-	DO load drive supply -24VDC GND terminal	1M	DI common terminal of group #1 (connect to 24VDC +/- terminal corresponding to source/sink DI)
1V+	DO load drive supply +24VDC terminal	I0.0	Digital input #0 / high-speed input counter
Q0.0	Digital output #0	I0.1	Digital input #1 / high-speed input counter control
Q0.1	Digital output #1	I0.2	Digital input #2 / high-speed input counter
Q0.2	Digital output #2	I0.3	Digital input #3 / high-speed input counter control
Q0.3	Digital output #3 / high-speed pulse output	I0.4	Digital input #4
Q0.4	Digital output #4	I0.5	Digital input #5
2V-	DO load drive supply -24VDC GND terminal	I0.6	Digital input #6 / high-speed input counter / external interrupt input / pulse catch input
2V+	DO load drive supply +24VDC terminal	I0.7	Digital Input #7 / external interrupt input / pulse catch input
Q0.5	Digital output #5	*	*Not in used*
Q0.6	Digital output #6	2M	DI common terminal of group #2 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q0.7	Digital output #7	I1.0	Digital Input #8 / external interrupt input / pulse catch input
Q1.0	Digital output #8	I1.1	Digital Input #9 / external interrupt input / pulse catch input
Q1.1	Digital output #9 / high-speed pulse output	I1.2	Digital Input #10
⏚	EARTH GROUND	I1.3	Digital Input #11
VI-	-24VDC power supply GND terminal	I1.4	Digital Input #12
VI+	+24VDC power supply terminal	I1.5	Digital Input #13
		VO-	Auxiliary -24VDC GND terminal
		VO+	Auxiliary +24VDC power supply terminal



LM3107

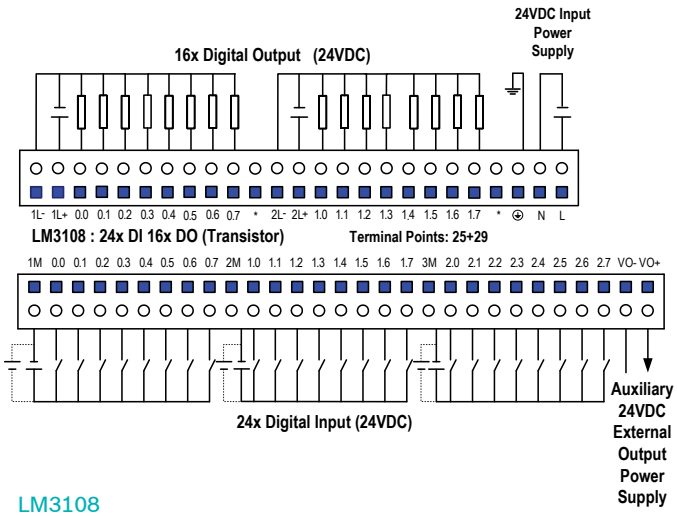
Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1L	DO common terminal of group #1 (24VDC or 230VAC supply)	1M	DI common terminal of group #1 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q0.0	Digital output #0	I0.0	Digital input #0 / high-speed input counter
Q0.1	Digital output #1	I0.1	Digital input #1 / high-speed input counter control
Q0.2	Digital output #2	I0.2	Digital input #2 / high-speed input counter
Q0.3	Digital output #3	I0.3	Digital input #3 / high-speed input counter control
2L	DO common terminal of group #2 (24VDC or 230VAC supply)	I0.4	Digital input #4
Q0.4	Digital output #4	I0.5	Digital input #5
Q0.5	Digital output #5	I0.6	Digital input #6 / high-speed input counter / external interrupt input / pulse catch input
Q0.6	Digital output #6	I0.7	Digital Input #7 / external interrupt input / pulse catch input
Q0.7	Digital output #7	*	*Not in used*
*	Not in used	2M	DI common terminal of group #2 (connect to 24VDC +/- terminal corresponding to source/sink DI)
3L	DO common terminal of group #3 (24VDC or 230VAC supply)	I1.0	Digital Input #8 / external interrupt input / pulse catch input
Q1.0	Digital output #8	I1.1	Digital Input #9 / external interrupt input / pulse catch input
Q1.1	Digital output #9	I1.2	Digital Input #10
*	Not in used	I1.3	Digital Input #11
⏚	EARTH GROUND	I1.4	Digital Input #12
N	230VAC Neutral	I1.5	Digital Input #13
L	234VAC Live	VO-	Auxiliary -24VDC GND terminal
		VO+	Auxiliary +24VDC power supply terminal

Terminal block and wiring diagram for CPU Modules



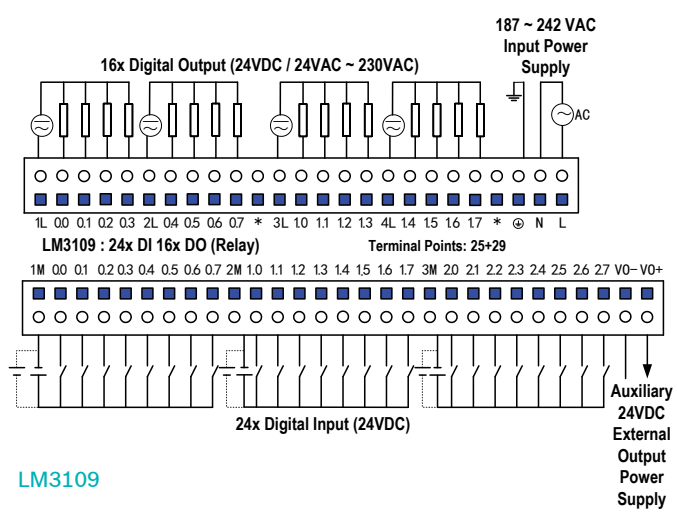
LM3107E

Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
RA	Analog Input #A (Current)	VO	Analog Output (Voltage)
A+	Analog Input #A (Voltage)	IO	Analog Output (Current)
M	AI common terminal	MO	Common terminal of AO
B+	Analog Input #B (Voltage)	1M	DI common terminal of group #1 (connect to 24VDC +/- terminal corresponding to source/sink DI)
RB	Analog Input #B (Current)	I0.0	Digital input #0 / high-speed input counter
1L	DO common terminal of group #1 (24VDC or 230VAC supply)	I0.1	Digital input #1 / high-speed input counter control
Q0.0	Digital output #0	I0.2	Digital input #2 / high-speed input counter
Q0.1	Digital output #1	I0.3	Digital input #3 / high-speed input counter control
Q0.2	Digital output #2	I0.4	Digital input #4
Q0.3	Digital output #3	I0.5	Digital input #5
2L	DO common terminal of group #2 (24VDC or 230VAC supply)	I0.6	Digital input #6 / high-speed input counter / external interrupt input / pulse catch input
Q0.4	Digital output #4	I0.7	Digital Input #7 / external interrupt input / pulse catch input
Q0.5	Digital output #5	2M	DI common terminal of group #2 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q0.6	Digital output #6	I1.0	Digital Input #8 / external interrupt input / pulse catch input
Q0.7	Digital output #7	I1.1	Digital Input #9 / external interrupt input / pulse catch input
⏚	EARTH GROUND	I1.2	Digital Input #10
N	230VAC Neutral	I1.3	Digital Input #11
L	234VAC Live	VO-	Auxiliary -24VDC GND terminal
		VO+	Auxiliary +24VDC power supply terminal



LM3108

Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1V-	DO load drive supply -24VDC GND terminal	1M	DI common terminal of group #1 (connect to 24VDC +/- terminal corresponding to source/sink DI)
1V+	DO load drive supply +24VDC terminal	I0.0	Digital input #0 / high-speed input counter
Q0.0	Digital output #0	I0.1	Digital input #1 / high-speed input counter control
Q0.1	Digital output #1	I0.2	Digital input #2 / high-speed input counter
Q0.2	Digital output #2	I0.3	Digital input #3 / high-speed input counter control
Q0.3	Digital output #3 / high-speed pulse output	I0.4	Digital input #4 / normal input counter
Q0.4	Digital output #4	I0.5	Digital input #5 / normal input counter control
Q0.5	Digital output #5	I0.6	Digital input #6 / high-speed input counter / external interrupt input / pulse catch input
Q0.6	Digital output #6	I0.7	Digital Input #7 / external interrupt input / pulse catch input
Q0.7	Digital output #7	2M	DI common terminal of group #2 (connect to 24VDC +/- terminal corresponding to source/sink DI)
*	*Not in used*	I1.0	Digital Input #8 / external interrupt input / pulse catch input
2V-	DO load drive supply -24VDC GND terminal	I1.1	Digital Input #9 / external interrupt input / pulse catch input
2V+	DO load drive supply +24VDC terminal	I1.2	Digital input #10
Q1.0	Digital output #8	I1.3	Digital input #11
Q1.1	Digital output #9 / high-speed pulse output	I1.4	Digital input #12
Q1.2	Digital output #10	I1.5	Digital input #13
Q1.3	Digital output #11	I1.6	Digital input #14
Q1.4	Digital output #12	I1.7	Digital input #15
Q1.5	Digital output #13	3M	DI common terminal of group #3 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q1.6	Digital output #14	I2.0	Digital Input #16
Q1.7	Digital output #15	I2.1	Digital Input #17
*	*Not in used*	I2.2	Digital Input #18
⏚	EARTH GROUND	I2.3	Digital Input #19
VI-	-24VDC power supply GND terminal	I2.4	Digital Input #20
VI+	+24VDC power supply terminal	I2.5	Digital Input #21
		I2.6	Digital Input #22
		I2.7	Digital Input #23
		VO-	Auxiliary -24VDC GND terminal
		VO+	Auxiliary +24VDC power supply terminal



LM3109

Top Terminal Block	Top Terminal Description	Bottom Terminal Block	Bottom Terminal Description
1L	DO common terminal of group #1 (24VDC or 230VAC supply)	1M	DI common terminal of group #1 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q0.0	Digital output #0	I0.0	Digital input #0 / high-speed input counter
Q0.1	Digital output #1	I0.1	Digital input #1 / high-speed input counter control
Q0.2	Digital output #2	I0.2	Digital input #2 / high-speed input counter
Q0.3	Digital output #3	I0.3	Digital input #3 / high-speed input counter control
2L	DO common terminal of group #2 (24VDC or 230VAC supply)	I0.4	Digital input #4
Q0.4	Digital output #4	I0.5	Digital input #5
Q0.5	Digital output #5	I0.6	Digital input #6 / high-speed input counter / external interrupt input / pulse catch input
Q0.6	Digital output #6	I0.7	Digital Input #7 / external interrupt input / pulse catch input
Q0.7	Digital output #7	2M	DI common terminal of group #2 (connect to 24VDC +/- terminal corresponding to source/sink DI)
*	Not in used	I1.0	Digital Input #8 / external interrupt input / pulse catch input
3L	DO common terminal of group #3 (24VDC or 230VAC supply)	I1.1	Digital Input #9 / external interrupt input / pulse catch input
Q1.0	Digital output #8	I1.2	Digital Input #10
Q1.1	Digital output #9	I1.3	Digital Input #11
Q1.2	Digital output #10	I1.4	Digital Input #12
Q1.3	Digital output #11	I1.5	Digital Input #13
4L	DO common terminal of group #4 (24VDC or 230VAC supply)	I1.6	Digital Input #14
Q1.4	Digital output #12	I1.7	Digital Input #15
Q1.5	Digital output #13	3M	DI common terminal of group #3 (connect to 24VDC +/- terminal corresponding to source/sink DI)
Q1.6	Digital output #14	I2.0	Digital Input #16
Q1.7	Digital output #15	I2.1	Digital Input #17
*	Not in used	I2.2	Digital Input #18
⏚	EARTH GROUND	I2.3	Digital Input #19
N	230VAC Neutral	I2.4	Digital Input #20
L	234VAC Live	I2.5	Digital Input #21
		I2.6	Digital Input #22
		I2.7	Digital Input #23
		VO-	Auxiliary -24VDC GND terminal
		VO+	Auxiliary +24VDC power supply terminal

THE DIGITAL I/O MODULES

DIGITAL INPUT MODULES			DIGITAL OUTPUT MODULES			DIGITAL MIX MODULES
	8 points digital input	16 points digital input		8 points digital output	16 points digital output	8 points digital mix
24 VDC Input	**LM3210 8x DI**	**LM3212 16x DI**	Transistor Output	**LM3220 8x DO transistor**	**LM3221 16x DO transistor**	**LM3230 4x DI, 4x DO transistor**
164 ~ 264 VAC Input	**LM3211 8x DI**		Relay Output	**LM3222 8x DO relay**	**LM3223 16x DO relay**	**LM3231 4x DI, 4x DO relay**

The Digital Input Modules

	LM3210 8x DI	LM3212, 16x DI
Input Specifications		
Input type	Sink / Source	Sink / Source
Number of DC inputs	8	16
Input voltage	24 VDC	24 VDC
Voltage-permissible range	0 ~ 30 VDC	0 ~ 30 VDC
Logic 1 signal	15 VDC at 3 mA (minimum)	15 VDC at 3 mA (minimum)
Logic 0 signal	5 VDC at 1 mA (maximum)	5 VDC at 1 mA (maximum)
Optical isolation (galvanic)	500 VAC for 1 minute	500 VAC for 1 minute
Input delay	< 10 ms (constant input voltage)	< 10 ms (constant input voltage)
Isolation group	2 groups (4 in / 4 in)	4 groups (4 in / 4 in / 4 in / 4 in)
Power consumption		
+24 VDC (from expansion bus)	0 mA	0 mA
+24 VDC (from external)	40 mA	80 mA
+5 VDC(from expansion bus)	60 mA	90 mA
Physical Specifications		
Size of module	50 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	110 g	160 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20	IP20
Agency approvals	CE approved (EMC and LVD)	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 31.*

The Digital Output Modules

	LM3220 8x DO, transistor	LM3221 16x DO, transistor
Output Specifications		
Output type	Transistor, Solid-state MOSFET	Transistor, Solid-state MOSFET
Number of DC outputs	8	16
Permissible range	20.4 ~ 28.8 VDC	20.4 ~ 28.8 VDC
Rated value	24 VDC	24 VDC
Logic 1 signal at max. current	20 VDC (minimum)	20 VDC (minimum)
Logic 0 signal with 10 K Ω load	1 VDC (maximum)	1 VDC (maximum)
Output current logic 1 signal	1 A	1 A
Output current logic 0 signal	1 mA	1 mA
Max. current per common/group	< 4 A	< 4 A
ON state resistance (contact)	< 0.2 Ω	< 0.2 Ω
Surge current	< 8 A for 100 ms, max.	< 8 A for 100 ms, max.
Overload protection	No	No
Optical isolation (galvanic)	500 VAC for 1 minute	500 VAC for 1 minute
Isolation		
Isolation resistance	------	------
Isolation coil to contact	------	------
Isolation between open contacts	------	------
Isolation group	2 groups (4 out / 4 out)	4 groups (4 out / 4 out / 4 out / 4 out)
Output delay (off to on / on to off)	< 1ms	< 1ms
Pulse train output frequency	------	------
Relay lifespan		
Switching delay	------	------
Lifetime mechanical (no load)	------	------
Lifetime contacts at rated load	------	------
Power consumption		
+24 VDC (from expansion bus)	0 mA	0 mA
+24 VDC (from external)	Depending on actual load	Depending on actual load
+5 VDC(from expansion bus)	100 mA	180 mA
Physical Specifications		
Size of module	50 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	120 g	170 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting

** For more details, please refer to the respective terminal block and wiring diagram on page 31.*

	LM3222 8x DO, relay	LM3223 16x DO, relay
Output Specifications		
Output type	Relay, dry contact	Relay, dry contact
Number of DC outputs	8	16
Permissible range	5 ~ 30 VDC or 5 ~ 250 VAC	5 ~ 30 VDC or 5 ~ 250 VAC
Rated value	------	------
Logic 1 signal at max. current	------	------
Logic 0 signal with 10 K Ω load	------	------
Output current logic 1 signal	2 A	2 A
Output current logic 0 signal	0 A	0 A
Max. current per common/group	< 10 A	< 10 A
ON state resistance (contact)	< 0.2 Ω	< 0.2 Ω
Surge current	------	------
Overload protection	No	No
Optical isolation (galvanic)	------	------
Isolation		
Isolation resistance	100 MΩ (minimum)	100 MΩ (minimum)
Isolation coil to contact	3000 VAC for 1 minute	3000 VAC for 1 minute
Isolation between open contacts	750 VAC for 1 minute	750 VAC for 1 minute
Isolation group	2 groups (4 out / 4 out)	4 groups (4 out / 4 out / 4 out / 4 out)
Output delay (off to on / on to off)	------	------
Pulse train output frequency	1 Hz (maximum)	1 Hz (maximum)
Relay lifespan		
Switching delay	< 10ms (maximum)	< 10ms (maximum)
Lifetime mechanical (no load)	10,000,000 open / close	10,000,000 open / close
Lifetime contacts at rated load	100,000 open / close	100,000 open / close
Power consumption		
+24 VDC (from expansion bus)	40 mA	80 mA
+24 VDC (from external)	Depending on actual load	Depending on actual load
+5 VDC(from expansion bus)	60 mA	120 mA
Physical Specifications		
Size of module	50 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	140 g	200 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20	IP20
Agency approvals	CE approved (EMC and LVD)	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 31.*

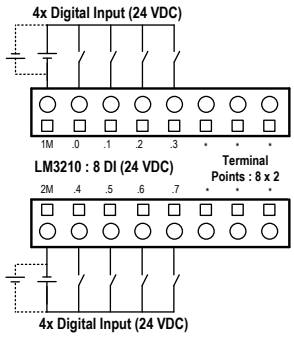
The Digital Mix Modules

	LM3230 4DI 4DO (transistor)	LM3231 4DI 4DO (relay)	LM3233 8DI 8DO (relay)
Input Specifications			
Input type	Sink / Source	Sink / Source	Sink / Source
Number of DC inputs	4	4	8
Input voltage	24 VDC	24 VDC	24 VDC
Voltage-permissible range	0 ~ 30 VDC	0 ~ 30 VDC	0 ~ 30 VDC
Logic 1 signal	15 VDC at 3 mA (minimum)	15 VDC at 3 mA (minimum)	14.4 VDC at 3 mA (minimum)
Logic 0 signal	5 VDC at 1 mA (maximum)	5 VDC at 1 mA (maximum)	5 VDC at 1 mA (maximum)
Optical isolation (galvanic)	500 VAC for 1 minute	500 VAC for 1 minute	1000 VAC for 1 minute
Input delay	< 10 ms (constant input voltage)	< 10 ms (constant input voltage)	< 10 ms (constant input voltage)
Isolation group	1 group	1 group	2 group
Output Specifications			
Output type	Transistor, Solid-state MOSFET	Relay, dry contact	Relay, dry contact
Number of DC outputs	4	4	8
Permissible range	20.4 ~ 28.8 VDC	5 ~ 30 VDC or 5 ~ 250 VAC	5 ~ 30 VDC or 5 ~ 250 VAC
Rated value	24 VDC	------	------
Logic 1 signal at max. current	20 VDC (minimum)	------	------
Logic 0 signal with 10 K Ω load	1 VDC (maximum)	------	------
Output current logic 1 signal	1 A	2 A	2 A
Output current logic 0 signal	1 mA	0 A	0 A
Max. current per common/group	< 4 A	< 10 A	< 8 A
ON state resistance (contact)	< 0.2 Ω	< 0.2 Ω	< 0.2 Ω
Surge current	< 8 A for 100 ms, max.	------	------
Overload protection	No	No	No
Optical isolation (galvanic)	500 VAC for 1 minute	------	------
Isolation			
Isolation resistance	------	100 MΩ (minimum)	100 MΩ (minimum)
Isolation coil to contact	------	3000 VAC for 1 minute	3000 VAC for 1 minute, 1mA
Isolation between open contacts	------	750 VAC for 1 minute	1000 VAC for 1 minute, 1mA
Isolation group	1 group	1 group	2 group
Output delay (off to on / on to off)	< 1ms	------	------
Pulse train output frequency	------	1 Hz (maximum)	1 Hz (maximum)
Relay lifespan			
Switching delay	------	< 10ms (maximum)	< 10ms (maximum)
Lifetime mechanical (no load)	------	10,000,000 open / close	10,000,000 open / close
Lifetime contacts at rated load	------	100,000 open / close	100,000 open / close
Power consumption			
+24 VDC (from expansion bus)	0 mA	20 mA	40 mA
+24 VDC (from external)	Depending on load	Depending on load	Depending on load
+5 VDC(from expansion bus)	90 mA	90 mA	100 mA
Physical Specifications			
Size of module	50 mm (L) × 90 mm (W) × 70 mm (H)	50 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	120 g	120 g	170 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	-5° to +60° C
Relative humidity	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 5%~95% humidity	-40° to +70° C, 5%~95% humidity	-40° to +70° C, 5%~95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20	IP20	IP20
Agency approvals	CE approved (EMC and LVD)	CE approved (EMC and LVD)	CE approved (EMC and LVD)

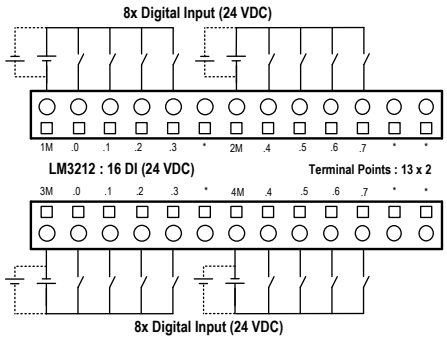
** For more details, please refer to the respective terminal block and wiring diagram on page 31.*

Terminal block and wiring diagram for Digital I/O Modules

Digital Input Modules

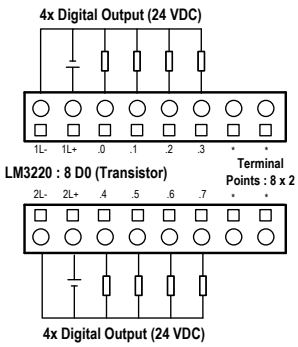


LM3210

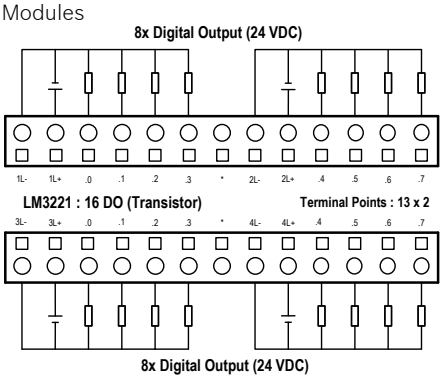


LM3212

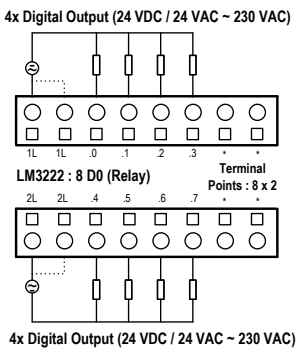
Digital Output Modules



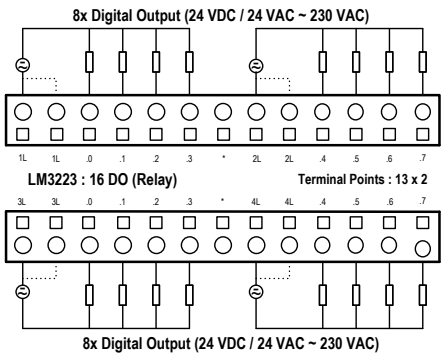
LM3220



LM3221

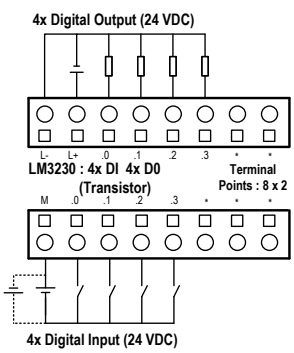


LM3222

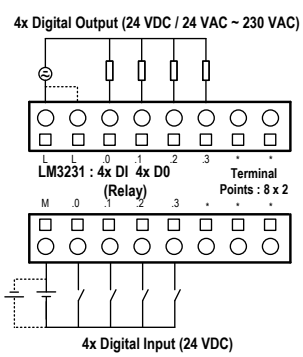


LM3223

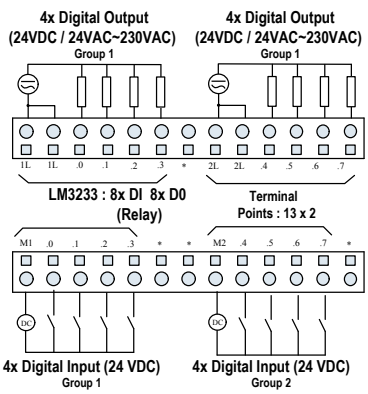
Digital Mix I/O Modules



LM3230



LM3231



LM3233

THE ANALOG I/O MODULES

ANALOG INPUT MODULES						
	Pseudo-differential	Single-Ended		Thermo-couple	RTD	NTC
4 channels	LM3310	LM3310A	LM3310B	LM3311	LM3312	
8 channels		LM3313				LM3314

ANALOG OUTPUT MODULES	ANALOG MIX MODULES
2 channels	4 In + 1 Out
LM3320	LM3330

The Analog Input Modules

		LM3310 4x AI	LM3310A 4x AI
Analog Input Specifications			
Number of analog input		4 channels	4 channels
Input type		Pseudo-differential	Single-ended
Input range	Voltage	0 ~ 10 V	0 ~ 10 V
	Current	0 ~ 20 mA 4 ~ 20 mA	0 ~ 20 mA 4 ~ 20 mA
Resolution		12 bit A/D converter	12 bit A/D converter
Accuracy, typical 25° C		±0.5% of full-scale	±0.5% of full-scale
Data word format		0 to 65535	0 to 65535
Input impedance		1 MΩ (Voltage), 250 Ω (Current)	1 MΩ (Voltage), 250 Ω (Current)
Maximum input voltage		< 30 V	< 30 V
Maximum input current		< 30 mA	< 30 mA
Temperature drift		± 100ppm / ° C	± 100ppm / ° C
Isolation (field side to logic)		Field and system side only; no isolation between channels	None
Isolation endurance		500 VAC for 1 minute	500 VAC for 1 minute
Analog Input step response		6 ms to 95% every 4 channels	6 ms to 95% every 4 channels
Analog to digital conversion time		< 200 µS	< 200 µS
Common mode rejection ratio		> 60 dB, DC to 50Hz	-----
Common mode voltage		Signal voltage plus common voltage (must be < 13V)	-----
Power consumption			
+24 VDC (expansion bus)		20 mA	10 mA
+5 VDC(expansion bus)		100 mA	40 mA
Physical Specifications			
Size of module		75 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight		170 g	170 g
Ambient operating environment		0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity		5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment		-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock		15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration		0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection		IP20	IP20
Agency approvals		CE approved (EMC and LVD)	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 36.*

The Analog Input Modules

		LM3310B 4x AI	LM3313 4x AI
Analog Input Specifications			
Number of analog input		4 channels	8 channels
Input type		Single-ended	Single-ended
Input range	Voltage	0 ~ 100 mV 0 ~ 500 mV 0 ~ 1 V 0 ~ 5 V 0 ~ 10 V	-10 ~ +10 V
	Current	0 ~ 20 mA	-20 ~ +20 mA
Resolution		16 bit A/D converter	12 bit A/D converter
Accuracy, typical 25° C		±0.5% of full-scale (0 ~ 100 mV, 0 ~ 500 mV) ±0.2% of full-scale (0~1 V, 0~5 V, 0~10 V)	±0.5% of full-scale
Data word format		0 to 65535	-32000 to +32000
Input impedance		1 MΩ (Voltage), 250 Ω (Current)	1 MΩ (Voltage), 500 Ω (Current)
Maximum input voltage		< 30 V	< 15 V
Maximum input current		< 30 mA	< 30 mA
Temperature drift		± 100ppm / ° C	± 100ppm / ° C
Isolation (field side to logic)		Field and system side only; no isolation between channels	Field and system side only; no isolation between channels
Isolation endurance		500 VAC for 1 minute	500 VAC for 1 minute
Analog Input step response		50 ms to 95% every 4 channels	15 ms to 95% every 8 channels
Analog to digital conversion time		< 200 µS	< 200 µS
Common mode rejection ratio		-----	-----
Common mode voltage		-----	-----
Power consumption			
+24 VDC (expansion bus)		30 mA	35 mA
+5 VDC(expansion bus)		60 mA	100 mA
Physical Specifications			
Size of module		75 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight		170 g	170 g
Ambient operating environment		0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity		5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment		-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock		15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration		0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection		IP20	IP20
Agency approvals		CE approved (EMC and LVD)	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 36.*

The Analog Input Modules - Thermocouple & RTD

	LM3311 4x AI (Thermocouple)	LM3312 4x AI (RTD)
Analog Input Specifications		
Number of analog input	4 channels	4 channels
Input type	Thermocouple	RTD type (select one): Pt-100 or Cu-50
Input range	Thermocouple type (select one): J, K, T, N, E, R, S, B Voltage range: ± 80 mV	Pt-100 (-150 ~ 619.6 °C) Pt-100 (-150 ~ 157.2 °C) Cu-50 (-50 ~ 150 °C) Cu-50 (-50 ~ 140.1 °C)
Input temperature resolution	0.1 °C / 0.1° F	0.1 °C / 0.1° F
Accuracy, typical 25° C	±0.1% of full-scale	±1° C of full-scale
Data word format	**J : -210 ~ 1200 °C:** -2100 ~ 12000 **K : -270 ~ 1370 °C:** -2700 ~ 13700 **N : -270 ~ 1300 °C:** -2700 ~ 13000 **E : -270 ~ 1000 °C:** -2700 ~ 10000 **T : -270 ~ 400 °C:** -2700 ~ 4000 **R : -50 ~ 1768 °C:** -500 ~ 17680 **S : -50 ~ 1768 °C:** -500 ~ 17680 **B : 0 ~ 1820 °C:** 0 ~ 18200 **-80 ~ 80 mV:** -8000 ~ 8000	**Pt-100 (-150 ~ 619.6 °C):** -1500 ~ 6196 **Pt-100 (-150 ~ 157.2 °C):** -1500 ~ 1572 **Cu-50 (-50 ~ 150 °C):** -500 ~ 1500 **Cu-50 (-50 ~ 140.1 °C):** -500 ~ 1401
Input impedance	> 1 MΩ	-----
Suppression of interference	70 dB @ 50 Hz	70 dB @ 50 Hz
Temperature drift	± 50 ppm / ° C	± 100ppm / ° C
Isolation (field side to logic)	Field and system side only; no isolation between channels	Field and system side only; no isolation between channels
Isolation endurance	500 VAC for 1 minute	500 VAC for 1 minute
Module update time: All channels	450 ms every 4 channels	450 ms every 4 channels
Cold junction error	± 1.5 ° C / 1.5° F	-----
Cold junction compensation	Supported	-----
Open-wire detection	Supported	Supported
Power consumption		
+24 VDC (from expansion bus)	0 mA	0 mA
+24 VDC (from external)	-----	-----
+5 VDC(from expansion bus)	100 mA	120 mA
Physical Specifications		
Size of module	75 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	160 g	160 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20	IP20
Agency approvals	CE approved (EMC and LVD)	CE approved (EMC and LVD)

** For more details, please refer to the respective terminal block and wiring diagram on page 36.*

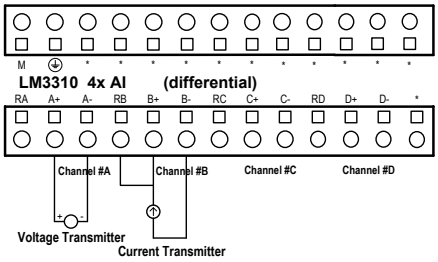
The Analog Output and Mix Modules

		LM3320 4x AO	LM3330 4x AI, 1x AO
Analog Input Specifications			
Number of analog input		---------	4 channels
Input type		---------	Single-ended
Input range	Voltage	---------	0 ~ 10 V
	Current	---------	0 ~ 20 mA 4 ~ 20 mA
Resolution		---------	12 bit A/D converter
Accuracy, typical 25° C		---------	±0.5% of full-scale
Data word format		---------	0 to 65535
Input impedance		---------	1 MΩ (Voltage), 250 Ω (Current)
Maximum input voltage		---------	< 30 V
Maximum input current		---------	< 30 mA
Temperature drift		---------	± 100ppm / ° C
Isolation (field side to logic)		---------	None
Isolation endurance		---------	500 VAC for 1 minute
Analog Input step response		---------	6 ms to 95% every 4 channels
Analog to digital conversion time		---------	< 200 µS
Analog Output Specifications			
Number of analog output		2 channels	1 channels
Output Range	Voltage output	0 ~ 10 V	0 ~ 10 V
	Current output	0 ~ 20 mA	0 ~ 20 mA
Accuracy, typical 25° C		±0.5% of full-scale	±0.5% of full-scale
Data word format		0 to 4095	0 to 4095
Temperature drift		± 100ppm / ° C	± 100ppm / ° C
Settling time	Voltage output	≤ 3 ms	< 100 µS
	Current output	≤ 3 ms	< 1 mS
Maximum drive	Voltage output	2000 Ω (minimum)	2000 Ω (minimum)
	Current output	600 Ω (maximum)	600 Ω (maximum)
Isolation (field side to logic)		Field and system side only; no isolation between channels	None
Isolation endurance		1500 VAC for 1 minute	---------
Power consumption			
+24 VDC (from expansion bus)		0 mA	30 mA
+24 VDC (from external)		80 mA	0 mA
+5 VDC(from expansion bus)		60 mA	50 mA
Physical Specifications			
Size of module		75 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight		160 g	200 g
Ambient operating environment		0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity		5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment		-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock		15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration		0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection		IP20	IP20
Agency approvals		CE approved (EMC and LVD)	CE approved (EMC and LVD)

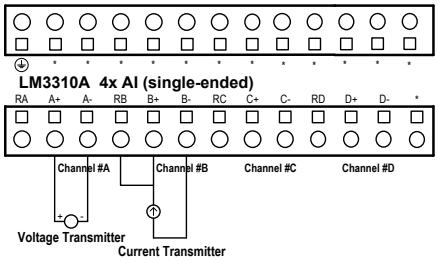
** For more details, please refer to the respective terminal block and wiring diagram on page 36.*

Terminal block and wiring diagram for Analog I/O Modules

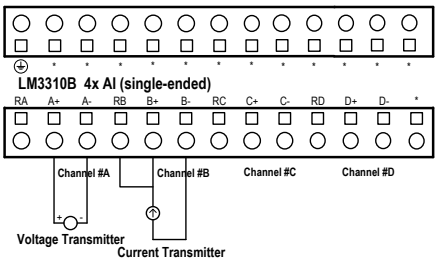
Analog Input Modules



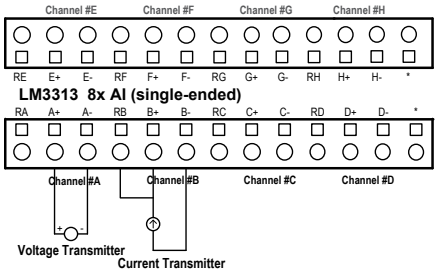
LM3310



LM3310A

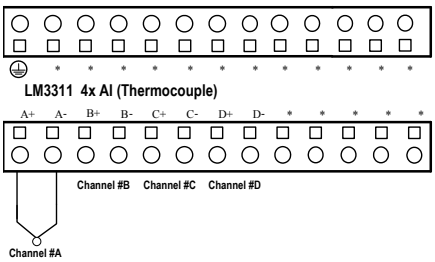


LM3310B

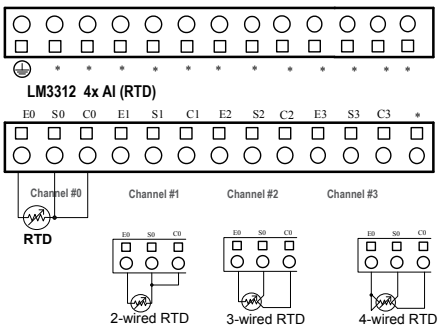


LM3313

Analog Input Modules (Thermocouple, RTD)



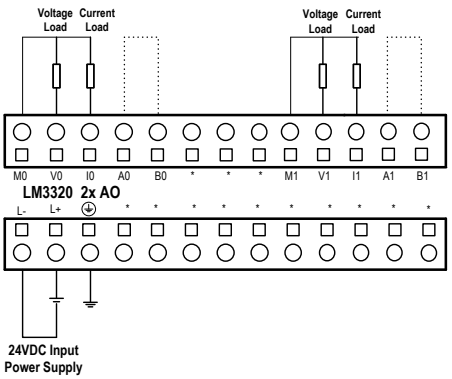
LM3311



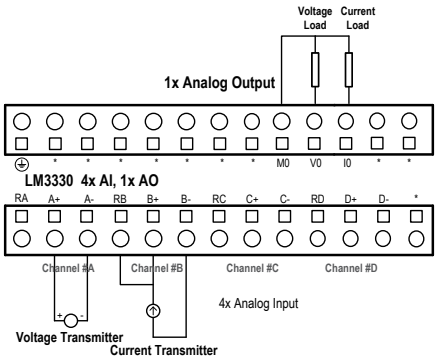
3 different connection methods for various RTD type

LM3312

Analog Output Module and Analog Mix I/O Module



LM3320

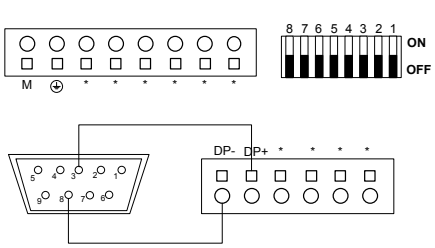


LM3330

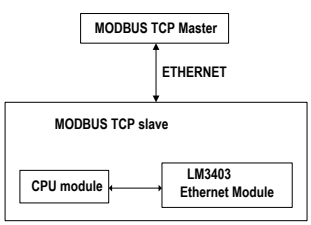
THE COMMUNICATION MODULES

PROFIBUS-DP SLAVE	ETHERNET
 LM3401	 LM3403

	LM3401 PROFIBUS-DP SLAVE	LM3403 ETHERNET
Communication Specifications		
Number of communication port	1 port	1 port (can communicate only with 1 MODBUS TCP master station at any one time)
Area restriction	--------	LAN (does not support internet)
Interface	9 pin D socket type or wiring terminal	Ethernet RJ-45 socket
Protocol	PROFIBUS-DP slave station mode	MODBUS TCP slave station mode
Configuration	--------	IP address, subnetmask, gateway IP, read & write data length. Factory default IP address: 172.20.45.160 * note: Does not required to configure MAC_address
Communication baud rate	Profibus-DP 9.6, 19.2, 45.45, 93.75, 187.5, 500 kbps, and 1, 1.5, 3, 6, 12Mbps (auto-adaptive)	10 Mbps
Station adress setup	0 ~ 126 (dial switch selectable)	--------
Input / Output section size	64 byte each (maximum)	200 bytes each (maximum)
Maximum station for each section	32	Depends on configuration
Maximum station for each network	126	Depends on configuration
Isolation mode	Optical-coupler isolation	--------
Isolation endurance	500 VAC for 1 min	--------
Power consumption		
+24 VDC (from expansion bus)	20 mA	0 mA
+5 VDC(from expansion bus)	120 mA	80 mA
Physical Specifications		
Size of module	75 mm (L) × 90 mm (W) × 70 mm (H)	75 mm (L) × 90 mm (W) × 70 mm (H)
Weight	160 g	160 g
Ambient operating environment	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting	0° to 55° C, horizontal mounting 0° to 45° C, vertical mounting
Relative humidity	5% ~ 95% non-condensing, no corrosive gas	5% ~ 95% non-condensing, no corrosive gas
Storage environment	-40° to +70° C, 25° to 55° C 95% humidity	-40° to +70° C, 25° to 55° C 95% humidity
Mechanical shock	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes	15 G (147m/S2), 11 ms pulse, 6 shocks in each of 3 axes
Sinusoidal vibration	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute	0.30 mm peak-to-peak 10 to 57 Hz; 2 G panel mount, 1G DIN rail mount, 57 Hz to 150 Hz; 10 sweeps each axis, 1 octave/minute
Mechanical protection	IP20	IP20
Agency approvals	CE approved (EMC and LVD)	CE approved (EMC and LVD)

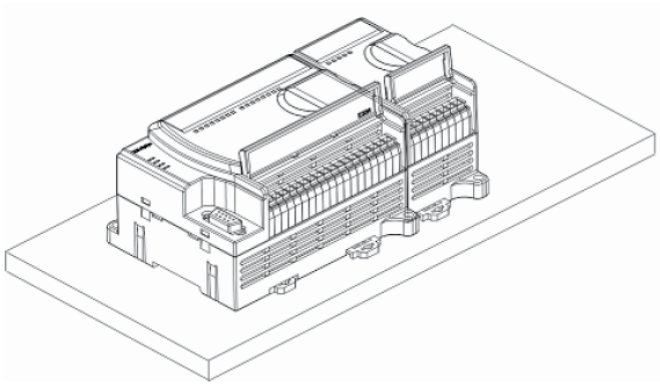


LM3401 Terminal Wiring

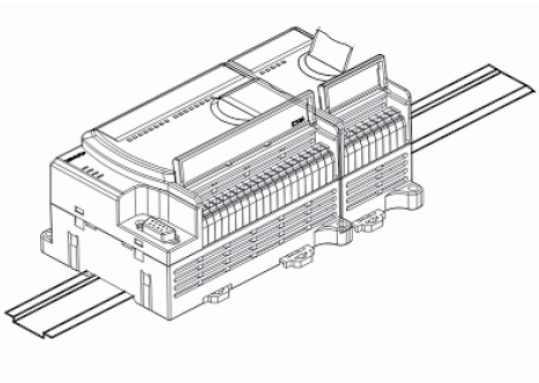


LM3403 Ethernet Connection

Mounting

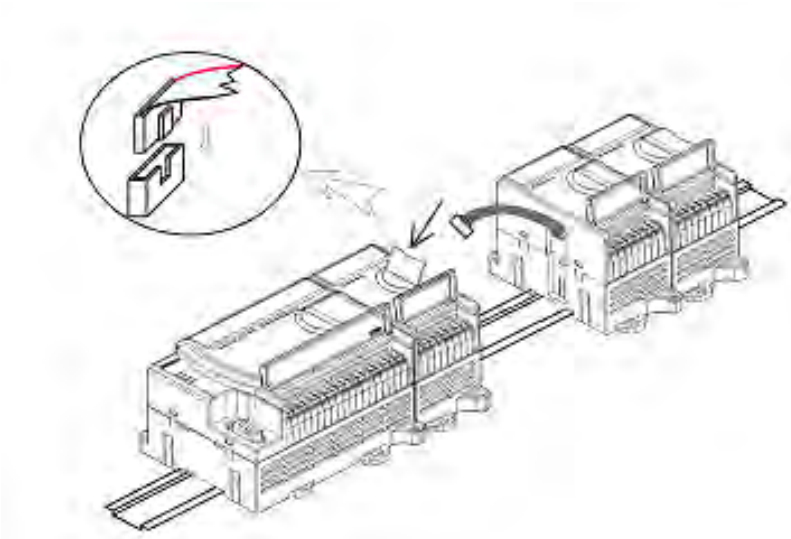


Backplane or Wall Mounted

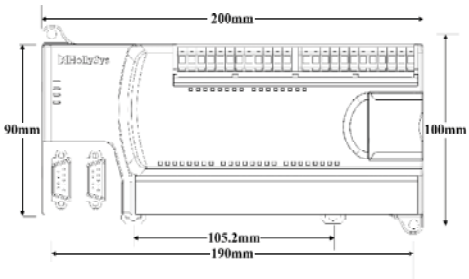


35mm DIN Rail Mounted

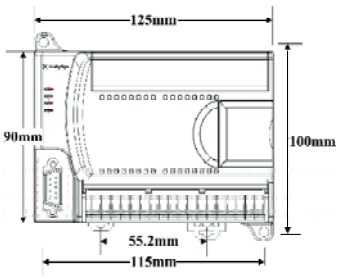
Connection between modules



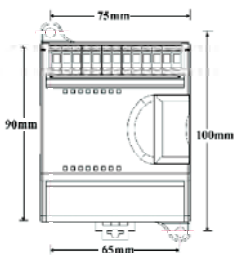
Dimension



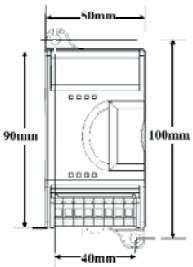
CPU module



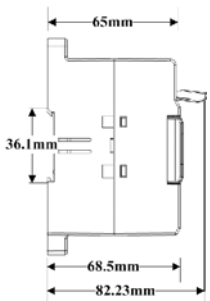
CPU module



I/O module or communication module



I/O module



side view of any module

HollySys has been committed in research and development of products for industrial automation and control providing the industry a complete solution fulfilling the requirements and needs.

The LM MICRO SERIES PLC (Programmer Logic Controller) is the new generation high performance compact size PLC integrated with the latest technology in PLC for discrete application in industrial automation.

LM MICRO PLC is fully designed and developed by HollySys back with careful thoughts and consideration in the design of system, hardware, software, networking, and data communication. Based on user application habits and ease of use, HollySys have developed an extremely high performance, quality, versatile, practical, easy to use, and compact micro PLC product.

LM MICRO PLC is the result of technology combination from automatic control, electronics, communication, computer, and by absorbing the experience and knowledge of our automation expert over the years in the field of PLC technology application.

HollySys will continue to grow and provide specialized solution to the automation industry by delivering cost-effective, high performance, high quality product with excellent services and support hereby enhancing the needs in the factory, manufacturing and industrial automation sector.

Automation Technology for Better Work, Life, and Environment

International Business

Hollysys (Asia Pacific) Pte Ltd

Address: 200 Pandan Loop, #08-01
Pantech 21, Singapore 128388
Tel: +65 6777-0950
Fax: +65 6777-2730

http://www.hollysys.com.sg
Email: sales@hollysys.com.sg

Beijing Hollysys Group

Beijing Hollysys Co., Ltd.
Beijing Hollysys Automation & Drive Co., Ltd.

Address: Di Sheng Middle Road, No. 2
Economic-Technological Development Area
100176 Beijing, P.R. China
Tel: +86 10 5898-1000
Fax: +86 10 5898-1100

Hangzhou Hollysys Automation Co., Ltd.

Address: North No.1, No 19 Road,
Xiasha Economic and Technological Development Zone,
Hangzhou, Zhejiang, 310018, P.R. China
Tel: +86 571 8163-3800
Fax: +86 571 8163-3700

http://www.hollysys.com

This product is distributed by:

Automation Technology for Better Work, Life, and Environment

For many years, the Hollysys name has stood for quality and reliability. Hollysys proudly offers a wide range of automation and control products from PLCs to DCS to help you find the solution for any industrial automation and process control application. We are the global supplier of choice for innovative technology backed by the highest level of service and support. When you need products and solutions you can rely on, choose HollySys.

Visit our Web site for the latest information.
http://www.hollysys.com.sg

May /2011