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## H2u Series PLC User Manual

Code: 19010136 V0.0

Thank you for purchasing the H2U Series Programmable Logic Controller developed by Inovance Control Technology Co., Ltd. Before using the equipment, please read this manual carefully to fully understand the features of the product so as to ensure correct use.

This manual mainly describes the specifications, features and usage of the H2U series PLC. For the developing environment and design of user programs, see the "AutoShop Programming User Manual" and the "H1UH2U Series Programmable Logic Controller Instruction & Programming Manual", and the "H2U Series Communication Manual" that are also issued by our company.

The manual is subject to change without a notice due to product upgrade, specification modification as well as the efforts to increase the accuracy and convenience of the manual.

Main features of the H2U series PLC:

- Built-in large program memory space without an external extension memory card can reach up to 24K steps.
- An internal large-capacity power supply can directly provide power to externally connected devices such as sensors, HMI, and external auxiliary relays.
- It provides high-speed, multi-channel and high-frequency I/O terminals, and has rich operation and positioning control functions.
- It integrates four independent communication ports, which support multiple communication protocols including MODBUS instruction and are convenient for system integration.
- It provides comprehensive encryption function that can protect users' intellectual property rights.
- It supports up to 128 subprograms and 21 interrupt subprograms.
- It comes with fast execution speed.

### Safety Precautions

Before operating the equipment, please read the safety precautions carefully so as to ensure your safety and prevent damage to property. Installation and operation of the product may only be performed by the authorized personnel who have been strictly trained, comply with the precautions in the manual, and observe related industry safety code.

### Design Precautions



Provide a safety circuit outside the PLC so that the application system can still work safely once external power failure or PLC fault occurs. Take the following aspects into considerations in design:

- Outside the PLC, an emergency stop circuit, a protection circuit, an interlock circuit and a positioning limit circuit may be necessary to prevent damage to your machine.
- To ensure safe operation of the machine, please design external protection circuit and safety mechanism for the output signals that may cause heavy accidents.
- When the PLC CPU detects its own system abnormality, all outputs may be closed. When part of the controller circuit fails, related outputs may be out of control. Thus, design an appropriate external circuit to ensure normal operation of the machine.
- If output units (relay or transistor) are damaged, related outputs may be kept on the "ON" or "OFF" status.
- PLC is designed for indoor electric environment. Its power supplies should have lightning protection device. Ensure that lightning over-voltage is not applied on PLC terminals so as to avoid damage to the machine.

### Installation Precautions



- Do not install the PLC in the places where dust, oil smoke, conducting dust, corrosive gas, or combustible gas exists; where it will be exposed to high temperature, dew, wind and rain; and where vibration or shock occurs. In addition, electric shock, fire, maloperation may also cause damage and deterioration to the controller.
- When handling screw holes and wiring, do not make metal filings and wire lead drop into the controller vent holes. Otherwise, a fire, failure, and malfunction may be caused.
- Ensure there are no foreign bodies including packaging materials like dustproof paper on the face of ventilation after installation is complete. Otherwise, poor heat dispersion may be caused during running, which may lead to a fire, failure and malfunction.
- Do not connect or plug/unplug the cable in the state of power supply. Otherwise, electric shock or damage to circuit may result.
- The Installation and wiring should be fixed and reliable. Otherwise, poor contact may cause malfunction.
- Select shielded cables as hi-frequency signal input/output cables in applications with serious interference so as to enhance system anti-interference ability.

### Wiring Precautions



- Make sure all power supplies are cut off before the installation or wiring work.
- Please connect AC power supply to the L/N terminal correctly.
- When handling screw holes and wiring, do not make metal filings and wire lead drop into controller vent holes. Otherwise, fire, failure, or malfunction may result.
- Do not connect or plug/unplug the cable in the state of power supply. Otherwise, electric shock or damage to circuit may result.

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- Don't supply external power to terminal [24+] of the main unit or expansion units. Do not wire vacant terminals externally.
- Select shielded cables as high-frequency signal input/output cables in applications with serious interference so as to enhance system anti-interference ability.
- Please use wires of above 2mm<sup>2</sup> to connect the ground terminal of the main unit to avoid sharing grounding with the heavy electrical system.

### Startup and Maintenance Precautions



- Do not touch any terminal while power is on. Otherwise, electric shock or malfunction may be caused.
- Make sure power supplies are cut off before cleaning or retightening terminal. Otherwise, you may be shocked by electricity.
- Please connect or remove the communication cable and the cables of expansion modules and control unit after cutting off all power supplies. Otherwise, machine damage or malfunctions may be caused.
- Perform operations such as online modification, coercible output, RUN and STOP after understanding the instruction manual and ensuring the safety of the machine.
- When inserting or removing remote extension card, make sure that power supplies are cut off.
- Make sure to replace coin battery at power-off. If you really need to replace the battery during power supply, let professional electrical technician wearing insulating gloves complete replacement within 30 seconds. Otherwise, data loss may result.
- Please dispose scrapped PLC as industrial wastes.

### Product Information

#### Designation Rules

H2U-3232MRAX-XP

- Product Information
- Series No.
- Total Inputs
- Total Outputs
- Module Classification

H: Inovance controller  
2U: the second generation controller  
32: 32 inputs  
32: 32 outputs  
M: Main module of general purpose controller  
P: Positioning controller  
N: Network Controller E: Extension Module  
R: Relay T: Transistor  
A: AC 220V (Null indicates AC220V by default)  
B: AC110V C: AC24V D: DC24V

- Output Type
- Power Supply Type
- Special Function Identification  
Such as high speed I/O function and analog function, etc.
- Auxiliary version No. XP: 9

#### Basic Parameters

Model	Total I/Os	I/O Features						
		Total I/Ps	Hi-speed I/Ps (H2U-XP)	Hi-speed I/Ps (H2U)	Input VOLT	Total O/Ps	Hi-speed O/Ps	Output Type
H2U-1616MR-XP	32	16	6×60kHz	6×100kHz	DC24V	16	/	Relay
H2U-1616MT-XP	40	24	2×60kHz 4×10kHz	2×100kHz 4×10kHz	DC24V	16	3×100kHz	Transistor
H2U-2416MR-XP							/	Relay
H2U-2416MT-XP							2×100kHz	Transistor
H2U-2416MTQ-F01							5×100kHz	
H2U-3624MR-XP	60	36	2×60kHz 4×10kHz	2×100kHz 4×10kHz	DC24V	24	/	Relay
H2U-3624MT-XP							2×100kHz	Transistor
H2U-3232MR-XP							/	Relay
H2U-3232MT-XP	64	32	6×60kHz 6×100kHz	6×100kHz	DC24V	32	3×100kHz	Transistor
H2U-3232MTQ							5×100kHz	Transistor
H2U-3232MTP							8×100kHz	Transistor
H2U-4040MR-XP	80	40	6×60 kHz	6×100kHz	DC24V	40	/	Relay
H2U-4040MT-XP							3×100kHz	Transistor
H2U-6464MR-XP		128	6×60 kHz	6×100kHz	DC24V	64	/	Relay
H2U-6464MT-XP							3×100kHz	Transistor

**Note:**  
Total inputs include hi-speed inputs. Hi-speed input terminals can be used for common inputs. Total frequencies of H2U-XP hi-speed inputs cannot exceed 70kHz. Total frequencies of H2U hi-speed inputs cannot exceed 100kHz.

#### 1.3 General Specifications

Environment Parameters			Ambient Condition	Transport Ambient Condition	Storage Ambient Condition
Type	Parameter	Unit			
Climatic Condition	Ambient Temp.	Low Temp.	℃	-5	-40
		High Temp.	℃	55	70
	Humidity	Relative Humidity	%	95 (30℃±2℃)	95 (40℃±2℃)
		/	/	/	/
	Air Pressure	Low Pressure	kPa	70	70
		High Pressure	kPa	106	106

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Environment Parameters			Ambient Condition	Transport Ambient Condition	Storage Ambient Condition
Type	Parameter	Unit			
Mechanical Stress	Sine Vibration	Displacement	mm	3.5 (5-9Hz)	/
		Acceleration	m/s <sup>2</sup>	10 (9-150Hz)	/
	Random Vibration	Acceleration Spectral Density	m <sup>2</sup> /s <sup>3</sup> (dB/Oct)	/	5-20Hz: 1.92dB 20-200Hz: -3dB
		Frequency Range	Hz	/	5-200
		Vibration Direction	/	/	X/Y/Z
	Shock	Type	/	/	Half-sine
		Acceleration	m/s <sup>2</sup>	/	180
	Dipping	Dipping Height	m	/	1

### Performance Specifications

Item	H2U Series	
Operation control mode	Circular scanning and interrupting instruction	
I/O control mode	Batch processing mode (when END instruction is executed, I/Os immediately refresh.)	
Programming language	Ladder diagram (LD), instruction list (IL) and sequential function chart (SFC)	
Max. storage capacity	24K steps including file registers	
Instruction type	Basic sequence Control/ step-ladder diagram	27 sequential control instructions, 2 step-ladder diagram instructions
	Application Instruction	128 kinds 298 instructions
Execution Speed	Basic Instruction	0.26μs/ instruction (H2U-XP: 0.1μs/ instruction)
	Application Instruction	1 to hundreds of μs/ instruction (H2U-XP: 0.5 to hundreds of μs/ instruction)
Total I/Os	Total inputs when extended	X000-X377 (Octal No.) 256 points
	Total outputs when extended	Y000-Y377 (Octal No.) 256 points
	Total I/Os when extended	Octal No. 256 points
Auxiliary Relay (M)	General ※1	M0-M499 500 points
	Latched ※2	M500-M1023 524 points
	Latched ※3	M1024-M3071 2,048 points
	Special	M8000-M8255 256 points
State Register (S)	Initialization	S0-S9 10 points
	General ※1	S10-S499 490 points
	Latched ※2	S500-S899 400 points
	Signal ※2	S900-S999 100 points
Timer (T)	100ms	T0-T199 200 points (0.1-3276.7seconds)
	10ms	T200-T245 46 points (0.01-327.67seconds)
	Cumulative 1ms ※3	T246-T249 4 points (0.001-32.767 seconds)
	Cumulative 100ms ※3	T250-T255 6 points (0.1-3276.7 seconds)
	16-bit unidirectional ※1	C0-C99 100 points (0-32767 counting)
Counter (C)	16-bit unidirectional ※2	C100-C199 100 points (0-32767counting)
	32-bit bi-directional ※1	C200-C219 20 points (-2147483648 to +2147483647counting)
	32-bit bi-directional ※2	C220-C234 15 points (-2147483648 to +2147483647counting)
	32-bit hi-speed bi-directional ※2	C235-C255 21 points (-2147483648 to +2147483647 counting)
	16-bit general ※1	D0-D199 200 points
Data register (32-bit when a pair is used)	16-bit latched ※2	D200-D511 312 points
	16-bit latched ※3	D512-D7999 7488 points (Take 500 points as the unit to set file registers after D1000)
	16-bit special	D8000-D8255 256 points
	For use with index address 16 bit	V0-V7, Z0-Z7 16 points
	For branch use with JAMP.CALL	P0-P127 128 points
Pointer	Input interrupt	I0□-I50□ 6 points
	Timer interrupt	I6□-I8□ 3 points
	Counter interrupt	I010-I060 6 points
Nesting Pointer	Master control	N0-N7 8 points
Constants	Decimal (K)	16-bit: -32768 to +32767 32-bit: -2147483648 to +2147483647
	Hexadecimal (H)	16-bit: 0-FFFF 32-bit: 0-FFFFFFFF

**Note:**  
※1: Non-battery backup area can be changed into battery backup area via parameter setup.  
※2: Battery backup area can be changed into non-battery backup area via parameter setup.  
※3: Such permanent battery backup area cannot be changed.

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## Mechanical Design

### Mounting Dimension

Figure 1 Mounting dimension diagram

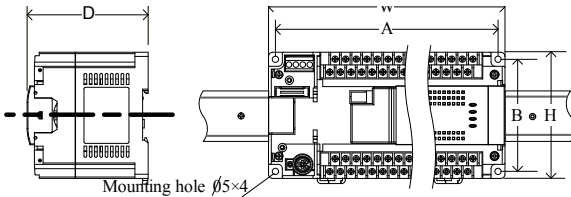


Table 1 Physical dimension

Model	Total I/Os	Mounting Dimension		Dimension W×H×D (mm)
		A (mm)	B (mm)	
H2U-1616M_	32	160	80	170×90×88
H2U-2416M_	40	160	80	170×90×88
H2U-3624M_	60	210	80	220×90×88
H2U-3232M_	64	210	80	220×90×88
H2U-4040M_	80	275	80	285×90×88
H2U-6464M_	128	340	80	350×90×88

### Requirements on Mounting Position

- Do not remove the paper tape that prevents foreign objects from dropping into the unit during installation. Once installation is complete, remove the paper tape before power-on so as to prevent overheating.
- To prevent overheating inside the PLC, mount the unit in wall-hanging mode, as shown in Figure 1. Keea a distance of 300mm at the top and bottom.
- Leave a distance of 50mm or more between the main PLC module and other devices or structures. Keep the equipment as far as possible away from the high-voltage cable, high-voltage devices and power devices.

### How to Fix the PLC

The H2U Series PLC can be installed with the DIN rail or directly with four screws M4 in a shock application.

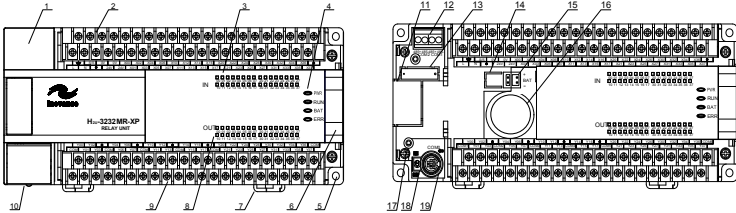
To fix the PLC with the DIN rail, do as follows:

- Fix the DIN rail on the backplane horizontally.
- Pull out the DIN rail buckle at the bottom of the module.
- Link the module onto the DIN rail, push the buckle back in position, and then lock the module.
- Finally fix the DIN-rail to two sides of the module so as to avoid sliding around.

## Electrical Design

Here is the configuration of main module input and output terminal blocks of the H2U Series PLC. Relay and transistor, output type of the PLC, share the same terminal configuration.

### Product Structure



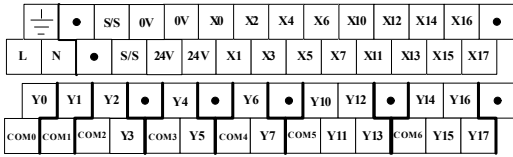
Component names and function description are:

- Foldaway
- Power supply, auxiliary power supply and detachable terminals for signal inputs
- Input status indicator LEDs
- Running status indicator LEDs  
PWR: Power LEDs  
RUN: Operating LEDs (It blinks when PLC runs normally.)  
BAT: LEDs for Battery low-voltage  
ERR: Error LEDs
- Screw holes (4)
- Cover of the interface for connecting extended module
- DIN rail mounting buckles (2)
- Output status indicator LEDs
- Detachable terminals for signal outputs
- Cover of user program download port (COM0)
- Special function adapter board knock-down hole (It should be cut off before installation of the board.)
- Wiring terminal for RS485 communication port
- Special function extension card and special function adapter board interface
- System program port (User's operation is prevented here.)
- Battery socket (BAT) (Do not reverse the polarity)
- Coin battery (provided by Inovance)
- Special function extension card and special function adapter board fixed bolts
- RUN/STOP switch
- User program download port (COM0)

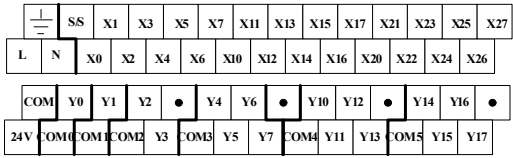
## Hardware Interface

### Terminal Block Definition

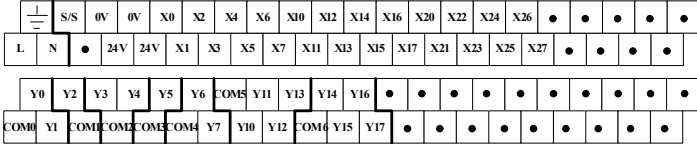
Terminal block definition of H2U-1616MR and H2U-1616MT



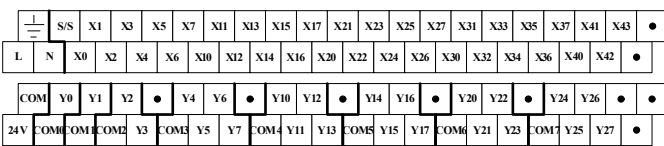
Terminal block definition of H2U-2416MR and H2U-2416MT



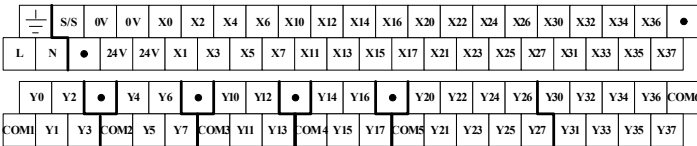
Terminal block definition of H2U-2416MTQ-F01



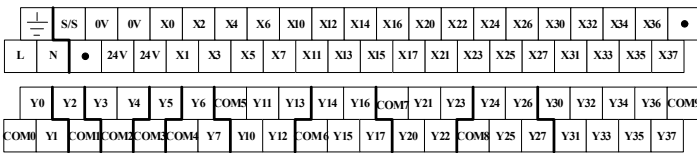
Terminal block definition of H2U-3624MR and H2U-3624MT



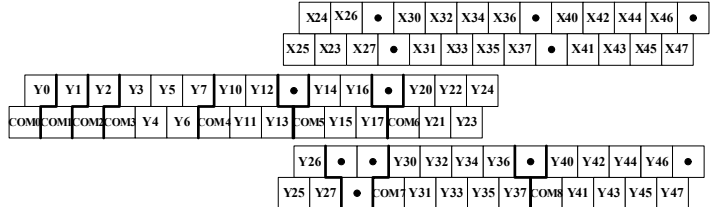
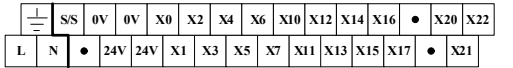
Terminal block definition of H2U-3232MR and H2U-3232MT



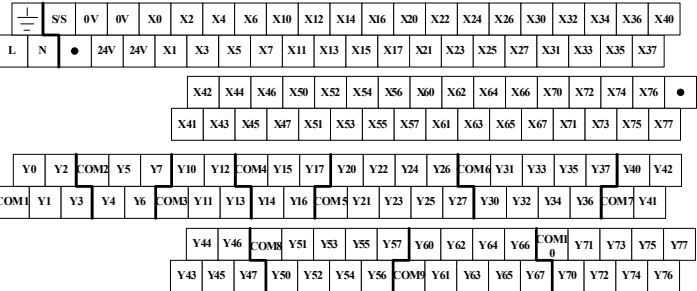
Terminal block definition of H2U-3232MTQ



Terminal block definition of H2U-4040MR and H2U-4040MT



Terminal block definition of H2U-6464MR and H2U-6464MT



Terminal wiring specification: 22-14AWG wire

The terminal block of the PLC models mentioned above is detachable. To detach a terminal block, loosen the screws on both sides of the terminal block by a screwdriver. It's suggested that you loosen one screw about half and then loosen the other one. Alternately loosen them until both are completely loosened. Then gently raise up the terminal block. Remember not to loosen the two screws one by one.

To mount a terminal block put terminal pins into correct position and then slightly tighten one screw. After ensuring the screw doesn't fall off, tighten the other one. Alternately tighten them until they are fixed. During the process, insert the two sides of the terminal block as balanced as possible. Otherwise, terminals may damage, which may cause bad contact or short circuit.

## Communication Interface Definition

The H2U PLC main unit has two communication ports (H2U-XP has four communication ports). COM0 hardware is standard RS422, selected by jumper JP0. If JP0 is connected, RS422 is selected. If JP0 is disconnected, the RS422 and RS485 are compatible. COM0 hardware of H2U-XP is standard RS422, which cannot be connected with JP0. Otherwise, the PLC cannot work normally. The terminal interface is Mini-DIN8 socket.

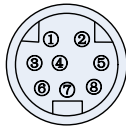


Figure 2 PLC COM0 port

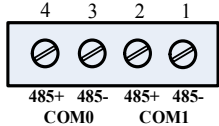


Figure 3 RS485 communication port

**Note:** Figure 3 is communication port of H2U-XP, and COM0 port is H2U's COM0.

Pin No.	Signal	Description
1	RXD-	Receive negative data
2	RXD+	Receive positive data
3	GND	Grounding, no electrical connections for 9 and 10
4	TXD-/RXD-	External send negative data If it is RS485, it can receive negative data.
5	+5V	External power supply +5V, the same with the internal logic +5V
6	CCS	Communication direction control wire
7	TXD+/RXD+	External send positive data. If it is RS485, it can receive positive data.
8	NC	Non-pin

The PLC can be connected to PC or HMI through COM0 in the following three ways:

- (JP0 connected): The PLC side is RS422 and the PC side is USB. PC is connected to the PLC COM0 port via the dedicated USB download cable.
- (JP0 connected): The PLC side is RS422 and the PC side is RS232. PC is connected to the PLC COM0 port via the dedicated serial download cable.
- (JP0 disconnected): The PLC side is RS485 and the PC side is RS485. They are connected through terminal, as shown in Figure 3. The connecting cable is optional.

COM1/COM2 hardware is standard RS485, which is easy to connect with other devices via on-site wiring by users. For the COM1/COM2 definition, see Figure 3. **Note:** Both ports are supported only half-duplex communication mode. COM3 port of H2U-XP can be available through extension card.

### Power Supply Specification

Item	Unit	Min. Value	Typical Value	Max. Value	Remark	
Rated operating voltage	Vac	100	220	240	Normal startup and operating range	
Limit input voltage	Vac	85	/	264	Derating for usage When AC85 to100V and AC240 to 264V,see Figure 3-2.	
Input current	A	/	/	1	AC 85V input, full-load output	
Input power	W/VA	/	/	50W/85VA		
Output voltage	5V/GND	V	4.75	5	5.25	Output1
	24VDD/GND	V	21.6	24	26.4	Output2
	24VCC/COM	V	21.6	24	26.4	Output3
Output current	5V/GND	mA	/	/	1100	The sum of capacity load is the internal consumption and the expansion module. The maximum output power shall be the sum of each full load. Natural cooling is adopted.
	24VDD/GND	mA	/	/	700	
	24VCC/COM	mA	/	/	700	

Output3 in the above table is the sensor power supply. It can also supply power to special function module. Output2 provides power supply to the main module and the relay I/Os of expansion module. Output1 provides power to all modules. During the system configuration, make sure that the demand of each power supply does not exceed its maximum capacity.

### Input Specifications

Here's the internal signal circuit and external wiring of the H2U Series PLC. The location of terminals in the wiring example depends on the model selected.

Item	Hi-speed Inputs X0-X5	General Inputs
Signal Input Mode	Sink/Source mode. It is sink input when S/S terminal and 24V are shorted connection, it is source when s/s terminal and COM are shorted connection.	
Electrical parameters	Detection Voltage	DC24V
	Input Resistance	3.3k 4.3k
	Input : ON	Input current is more than 4.5mA. Input current is more than 3.5 mA.
	Input : OFF	Input current is less than 1.5mA. Input current is less than 1.5mA.
Filter Function	Digital Filter	X0 to X7 has digital filter function. The filter time can be set in the range of 0-60 msec.
	Hardware Filter	Except X0 to X7, the other I/O terminals are hardware filters. The filter time is about 10 msec.
Hi-speed Function	X0 to X5 can realize the function with high-speed counting, interrupt and pulse capture, etc.	
	Max. frequency of X0 and X1 is 100kHz. (Max. frequency of H2U-XP is 60kHz.) Max. frequency of X2 to X5 is 10kHz (the model of 40 I/Os and 60 I/Os). Max. frequency of X2 to X5 is 100kHz (the model of 32 I/Os, 64 I/Os, 80 I/Os and 128 I/Os). (Max. frequency of H2U-XP is 60kHz.)	
Common Connection Terminal	Only a common terminal: S/S	

**Note:**

S/S connecting to 24V+ or COM determines the Sink or Source input mode. The connecting mode is effective to all input points' signals of the main module.

### Output Specifications

The H2U Series PLC has relay output and transistor output. Their operating parameters are quite differently. Please select the correct output type so as to avoid misuse.

To protect the PLC output relay contacts, for inductive load (such as relay coil) in DC circuit, the user circuit must have a freewheeling diode. For inductive load in AC circuit, the user circuit should have a RC surge absorption component. In principle, the relay output should not be connected to a capacitive load. If necessary, make sure its impact of the surge current is smaller than the maximum current of the relay's specification. The current of transistor output terminals must be less than the allowable maximum current. If the output current of multiple transistor terminals is greater than 100mA, they should be evenly arranged but not be arranged adjacently, convenient for heat radiation. It is suggested that the output points in ON state simultaneously do not exceed 70% of total output points for long.

Item		Relay outputs	Transistor outputs
Circuit Voltage		Less than AC250V, or less than DC30V	DC5V-DC24V
Circuit Insulation		Relay mechanical insulation	Light coupling insulation
LED		When the relay output contacts close, the LED light is on.	When the light coupling is driven, the LED light is on.
Leakage current during open circuit		None	Less than 0.1mA/DC30V
Min.load		2mA/DC5V	5mA (DC5V-DC24V)
Max. output current	Resistive load	2A/1 point	0.5A/point
		8A/4 points common terminal	0.8A/4 points
		8A/8 points common terminal	1.6A/8 points
	Inductive load	AC220V, 80VA	High speed terminal: 7.2W/DC24V Others: 12W/DC24V
Lamp Load	AC220V, 100W	High speed terminal: 0.9W/DC24V Others: 12W/DC24V	
ON response delay		20 msec Max.	High speed output: 10μs Others: 0.5msec
OFF response delay		20 msec Max.	
High-speed output frequency		None	100kHz per channel (Max.)
Output common ports		Each group shares a common port COM. The groups are insulated .	
Fuse protection		None	

### Internal Equivalent Circuit

PLC has a built-in power supply (DC24V) to detect user switch status, so you only need to connect input signals of dry contact. OC output type is needed if you connect an active transistor or sensor.

PLC signal input and internal equivalent circuit are shown as Figure 4 below. User's circuit and PLC internal circuit are connected by the terminal. Figure 4 shows the Sink input mode, determined by short connection of "S/S" and "24V" terminals.

Figure 4 Sink input mode

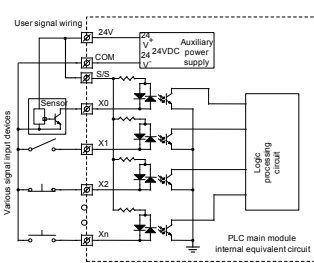
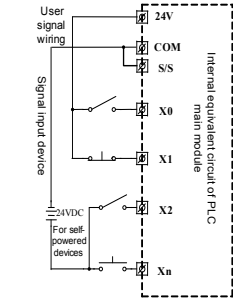


Figure 5 Source input mode



In some special applications, Source input mode may be required. The equivalent input circuit of such mode is shown as Figure 5. S/S and COM terminals are shortly connected.

Figure 6 shows the internal equivalent circuit of the relay output module. The output terminals are divided into several groups. The groups are electrically insulated. The output contacts of different groups are connected with different power circuits.

Figure 6 Internal equivalent circuit of relay output

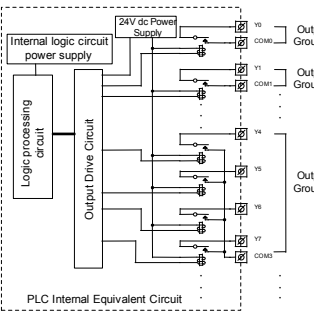
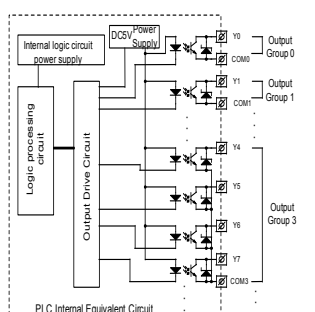


Figure 7 Internal equivalent circuit of transistor output



The internal equivalent circuit of transistor output is shown as Figure 7. The output terminals are divided into several groups, and the groups are electrically insulated. The transistor output can be used for DC24V load circuit only. For the inductive load in AC circuit, you need add a RC component instead, and for the inductive load in DC circuit, you need add a freewheeling diode, as shown in Figure 8.

### Selection of Extension Device

When designing an H2U Series PLC system, we must consider the following aspects:

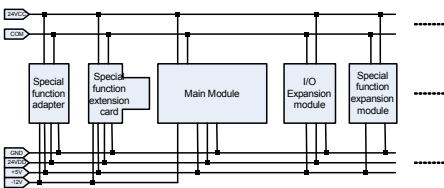
- Total I/Os should be within 256 for a main PLC system.
- Power supply capacitance (see 3.3 for details)

The main modules and the active expansion modules can provide DC24V and DC5V power supply to expansion modules and special modules. But total power consumption of all expansion units should be restricted within the power supply capacitance of main module or the active expansion module.

- The H2U Series main module can be connected to maximum 8 special modules.

## Power Supply Capacitance and Expansion Capacity

The main module and active expansion module provide power to expansion modules, extension cards and adapters. The I/O points of expansion modules and the number of special function expansion modules must be within the power supply capacitance of the main module or active expansion module.



For calculation on power supply capacitance, take the following aspects into considerations:

- Each power supply capacitance should be calculated independently.
- The expansion capacity is decided by the smaller power supply capacitance.

For example: 24VDD allows connection of 6 expansion modules, while +5V only allows 8 expansion. So the system can only be extended up to 6 expansion modules.

## Programming

Soft component arrangement and power-off retentive description

Auxiliary Relay M	M0 to M499, general 500 points, ※1	[M500 to M1023], latched 524 points, ※2	[M1024 to M3071], latched 2048 points, ※3	M8000 to M8255, special 256 points
State	S0 to S499, 500 points ※1 S0-S9 (initialization)	[S500 to S899], 400 points (power-off retentive), ※2	[S900 to S999], alarmed 100 points, ※2	
Timer	T0 to T199, 200 points, 100 msec Subprogram: T192 to T199	T200 to T245, 46 points, 10 msec	[T246 to T249], 4 points, 1 msec retentive ※3	[T250 to T255], 6 points, 100 msec retentive ※3
16-bit up counter	C0 to C99, general 100 points, ※1	Latched C100 to C199, 100points, ※2		
32-bit counter	32 bit reversible	32 bit high-speed counting Reversible, Max.6 points		
Data register D, V, Z	C200 to C219, General 20 points ※1	[C220 to C234], 15 points, Power-off retentive ※2	[C235 to C245], 1 phase unidirectional counting input 2	[C246 to C250], 1 phase and bidirectional counting input ※2
			[C251 to C255], 2 phase counting input ※2	
Nesting pointer	D0 to D199, general 200 points, ※1	[D200 to D511], latched 312 points, ※2	[D512 to D7999], 7488 latched points, ※3	[D8000 to D8255], special 256 points
	N0 to N7, 8 points (master control)	P0 to P127, 128 points (jump subprogram)	I00* to I50*, 6 points (input interrupt pointers)	I6** to 8**, 3 points (timer interrupt pointers)
Constants	K (Decimal)	16 bit (-32,768 to 32,767)	32 bit (-2,147,483,648 to 2,147,483,647)	
	H (HEX)	16 bit (0 to FFFFH)	32 bit (0 to FFFFFFFFH)	
	E (floating point)	-	32 bit (1175×10 <sup>-41</sup> to 3402×10 <sup>35</sup> )	

The components within [ ] is the battery backup area.

- ※1: Non-battery backup area can be changed into battery backup area via parameter setup.
- ※2: Battery backup area can be changed into non-battery backup area via parameter setup.
- ※3: Such permanent battery backup area cannot be changed.



## Product Warranty Card

Innovation

Customer Information	Add. of Unit:	
	Name of Unit:	Contact Person:
	P.C:	Tel:
Product Information	Product Model:	
	Body Barcode (attach here):	
	Agent:	
Failure Information	(Maintenance Time and Content)	
	Maintenance Personnel	

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