



MHB1

Optional Integrated PLC

- ✧ Core Technology of the Advanced SoC
- ✧ Compact and Rugged
- ✧ High Quality and High Reliability
- ✧ Competitive Low Price
- ✧ Easy to Use, Common Instruction Sets

Standard Main Units

Specification			MHB1-10MR	MHB1-10M(T/J)	MHB1-14MR	MHB1-14M(T/J)	MHB1-20MR	MHB1-20M(T/J)	MHB1-24MR	MHB1-24M(T/J)
Model										
Digital input	24VDC	High speed (50KHz)	4 points (2-Axis single phase or A/B phase)				6 points (3-Axis single phase or A/B phase)		8 points (4-Axis single phase or A/B phase)	
		Medium (Total 5KHz)	2 points		4 points		6 points		6 points	
		Low speed	—		—		—		—	
Digital Output	Relay		4 points	—	6 points	—	8 points	—	10 points	—
	Transistor (5~30 VDC)	High speed (50KHz)	—	2 points (1-Axis single phase or A/B phase)	—	2 points (1-Axis single phase or A/B phase)	—	4 points (2-Axis single phase or A/B phase)	—	4 points (2-Axis single phase or A/B phase)
		Low speed	—	2 points	—	4 points	—	4 points	—	6 points
Communication port		Built-in	3 port (Port0:RS232、Port1:RS232、Port2:RS485)							
		Expandable	2 ports (Port3~4,RS485 or RS232 or Ethernet)							
Calendar			Built-in							
Wiring mechanism			5mm European fixed terminal block							
Dimension			Figure 1 (Slim)				Figure 2 (Slim)			

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Specification			MHB1-32MR	MHB1-32M(T/J)	MHB1-40MR	MHB1-40M(T/J)	MHB1-60MR	MHB1-60M(T/J)
Model								
Digital input	24VDC	High speed (50KHz)	8 points (4-Axis single phase or A/B phase)					
		Medium (Total 5KHz)	8 points					
		Low speed	4 points		8 points		20 points	
Digital Output	Relay		12	—	16	—	24	—
	Transistor (5~30 VDC)	High speed (50KHz)	—	6 points (3-Axis single phase or A/B phase)	—	6 points (3-Axis single phase or A/B phase)	—	8 points (4-Axis single phase or A/B phase)
		Low speed	—	6 points	—	10 points	—	16 points
Communication port		Built-in	3 port (Port0:HMI Port、Port1:RS232、Port2:RS485)					
		Expandable	2 ports (Port3~4,RS485 or RS232 or Ethernet)					

Calendar	Built-in	
Wiring mechanism	5mm European fixed terminal block	
Dimension	Figure 3 (Slim)	Figure 4 (Slim)

Environmental Specifications

Item		Specification	Note
Storage ambient temperature		-25°~70°C	Non-freezing
Operating ambient temperature		0°~55°C	Non-freezing
Operating ambient humidity		5~95%	Non-condensing, RH-2
Pollution resistance		Degree II	
Corrosion resistance		Based on IEC-68 standard	
Operating altitude		≤2000m	
Vibration resistance	Installed on DIN rail	0.5G, 2 hours for each direction of 3 axes	
	Fasten by screw	2G, 2 hours for each direction of 3 axes	
Shock resistance		10G, three times for each direction of 3 axes	
Noise durability		1500Vp-p, pulse width 1μS	
Insulation resistance		500VAC, 1 minute (DC)	L, N to any terminal
Dielectric withstand voltage		1500VAC, 1 minute (AC)	

DC Model Power Specifications

Item	Specification	10/14 Points Main Unit	20/24 Points Main Unit	32/40 Points Main Unit	60 Points Main Unit
Rated voltage		24VDC, -15%/+20%			
Power consumption		2.5W/3W	3.5W/4W	4.5W/5W	6W
Inrush current		20A@24VDC			
Allowable instantaneous power failure time		<2ms			
Power fuse rating		2A,125VDC			

Main Unit Specifications

Item		Specification	MHB1	Note
Execution speed			0.33uS/Sequential instruction	
Memory capacity	Program (Word)		7936 Words	
	Comment (Byte)		8K Bytes	
Program memory			FLASH ROM or SRAM+Lithium battery Back-up	
Sequential instruction			36 instructions	
Function instruction			326 instructions(126 kinds)	Include derivative instructions
Flow chart command (SFC)			4 instructions	
Communicate on Interface	Port0 (HMI Port) Speed 921.6kbps Port1 (RS232) Speed 4.8k~115.2kbps Port2 (RS485) Speed 4.8k~921.6kbps		Built- in	Default setting of port0 is 921.6kbps Default setting of port1~4 is 9.6kbps, Port1~4 provides MERITEK or Modbus RTU/ASCII or user defined communication protocol

	Port3~4 (RS232, RS485, Ethernet) Speed 4.8k~921.6kbps		Expandable Port1 and Port2	
	Maximum link stations		254	
Digital (Bit status)	X	Input contact (DI)	X+Y=128	Corresponding to external digital input
	Y	Output relay (DO)		Corresponds to external digital output
	TR	Temporary relay	TR0~TR39 (40)	
	M	Internal relay	M0~M799 (800)*1	Can be configured as retentive type
			M1400~M1911 (512)	
		Retentive	M800~M1399 (600)*1	Can be configured as non-retentive
		Special relay	M1912~M2001 (90)	

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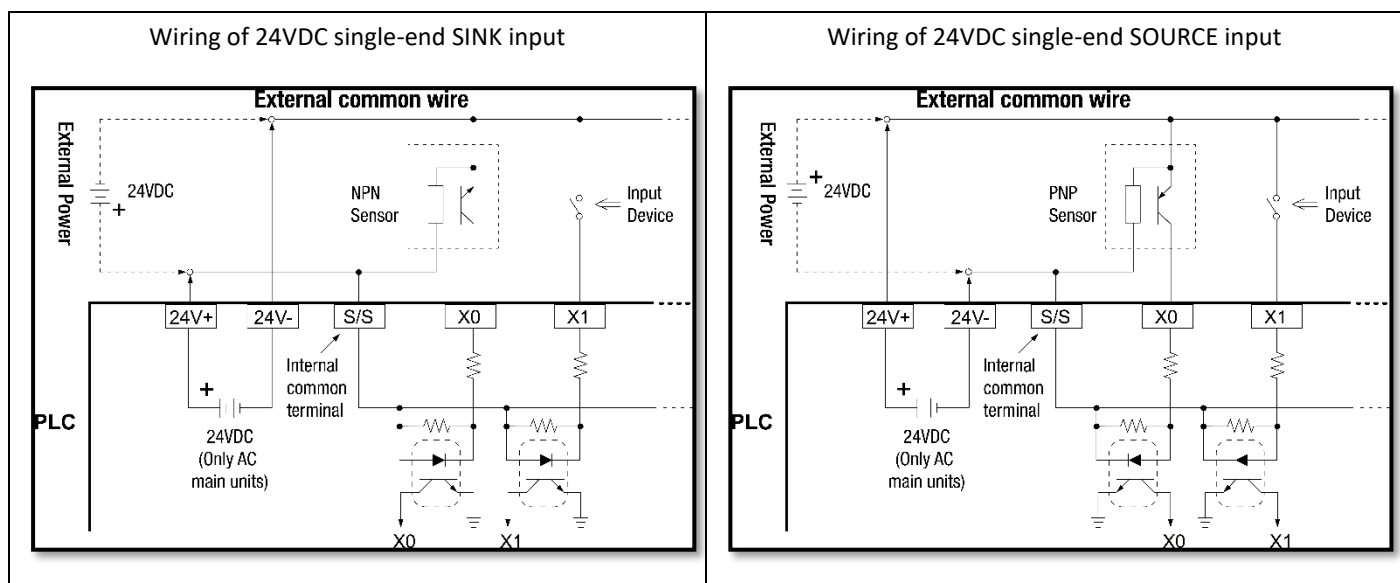
Item				Specification	MHB1				Note	
Digital (Bit status)	S	Step relay		Non-retentive	S0~S499 (500)* ¹				S20~S499 can be configures as retentive type	
				Retentive	S500~S999 (500)* ¹				Can be configures as non-retentive type	
	T	Timer "Time-Up" status contact			T0~T255 (256)					
	C	Counter "Count-Up" status contact			C0~C255 (256)					
Register (Word data)	TMR	Time current value register		0.01S Time base	T0~T49 (50)* ¹				T0~T255 members for each time base can be adjusted	
				0.1S Time base	T50~T199 (150)* ¹					
				1S Time base	T200~T255 (56)* ¹					
	CTR	Counter current value register		16-bit	Retentive	C0~C139 (140)* ¹				Can be configured as non-retentive type
					Non-retentive	C140~C199 (60)* ¹				Can be configured as retentive type
				32-bit	Retentive	C200~C239 (40)* ¹				Can be configured as non-retentive type
					Non-retentive	C240~C255 (16)* ¹				Can be configured as retentive type
	HR DR	Data register		Retentive	R0~R2999 (3000)* ¹				Can be configured as non-retentive type	
					D0~D3999 (4000)					
					R5000~R8071 (3072)* ¹				When not configured as ROR, it can serve normal register (for read/write)	
				Non-retentive	R3000~R3839 (840)* ¹				Can be configured as retentive type	
	ROR			Read only register	R5000~R8071 can be set as ROR, default setting is (0)* ¹				ROR is stored in special ROR area and not occupy program space	
	FR			File register	F0~F8191 (8192)				Saved/retrieved via dedicated instruction	
	IR	Input register			R3840~R3857 (18)				Corresponding to the external numerical input	
	OR	Output register			R3904~R3921 (18)				Corresponding to the external numerical output	
	SR	Special system register				R3968~R4167 (200)				
						D4000~D4095 (96)			D4072~4075(4) Corresponds LAIO Module inputs*2	
						R4152~R4154 (3)			D4076~4077(4) Corresponds LAIO Module outputs*2	
		High-speed counter register		Hardware(4 sets)	DR4096~DR4110 (4x4)					
				Software(4sets)	DR4112~DR4126 (4x4)					
		Calendar register			R4128 (sec)	R4129 (min)	R4130 (hour)	R4131 (day)		

			R4132 (month)	R4133 (year)	R4134 (week)		
	XR	Index register	V、Z (2), P0~P9 (10)				
Interrupt control	External interrupt control		32 interrupts(16 points input positive/negative edge)				Only main unit input points
	Internal interrupt control		8 interrupts (1、2、3、4、5、10、50、100mS)				
0.1mS high-speed timer			1(16-bit), 4(32-bit, share with HHSC)				
High-speed counter (HSC)	Hardware high-speed counter (HHSC)/32-bit	No. of channel	Up to 4				Total number of HHSC and SHSC is 8 HHSC can be converted into 32-bit/0.1mS time base High-Speed Timer(HST) Half of maximum frequency while A/B phase input
		Counting mode	8 modes (U/D、U/Dx2、P/R、P/Rx2、A/B、A/Bx2、A/Bx3、A/Bx4)				
		Counting frequency	Maximum is 50KHz (Singled-end input)				
	Software high-speed counter(SHSC)/32-bit	No. of channel	Up to 4				
		Counting mode	3 modes (U/D、P/R、A/B)				
		Counting frequency	Maximum sum up to 5KHz				
NC position pulse output (HSPSO)	Number of Axis		Up to 4				
	Output frequency		Maximum is 50KHz (Singled-end input)				Half of the maximum while A/B phase output
	Pulse output mode		3 modes (U/D、P/R、A/B)				
	Programming method		Dedicated position language				
	Interpolation		Maximum 4 axes linear interpolation				
HSPWM output	Number of points		Up to 4				
	Output frequency		72Hz~18.432KHz (with 0.1%resolution) 720Hz~184.3KHz(with 1%resolution)				
Captured input	Points		Maximum 36 points (All inputs in main unit come with this feature)				
	Minimum captured pulse width	>10μS (for Ultra high/high speed input)					
		>47μS (for medium speed input)					
		>470μS (for medium/low speed input)					
Digital filter		X0 ~ X15	Adjustable frequency 14KHz~1.8MHz				Chosen by frequency at high frequency
			Adjustable time constant 0.1~1.5mS/1~15mS(unit: 0.1mS/1mS)				Chosen by time constant at low frequency
				X16 ~ X35	Time constant 1~15mS adjustable(unit: 1mS)		

Digital Input (DI) Specification

Specification Item		Main Unit			Extension module	Note
		High speed(HHSC)	Medium speed (SHSC)	Low speed (≥ X16)	Low speed	
Input response frequency		50KHz*	Total 5KHz	—	—	HHSC: Hardware High speed counter SHSC: Software High speed counter
Input signal voltage		24VDC±10%				
Threshold current	ON	> 4mA		> 2.3mA		
	OFF	< 1.5mA		< 0.9mA		
Maximum input current		7.6mA		4.5mA		
Indication of input operation		Displayed by LED: light when “ON”, dark when “OFF”				
Input circuit insulation		Optical isolation, 500VAC, 1 minute				
SINK/SOURCE selection		Select by wiring methods (internal common terminal S/S and external common wiring)				

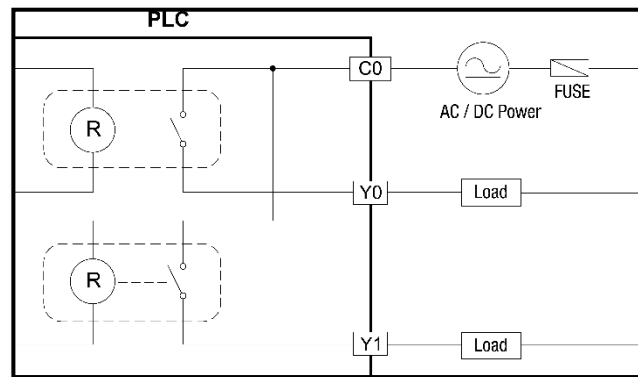
Noise filtering methods	AHF(0.42us)+DHF(14KHz~1.8MHz or 0.1~15ms)	AHF(0.2ms)+DHF(1~15ms)	AHF(1mS)	DHF: Digital Filter AHF: Analog Filter
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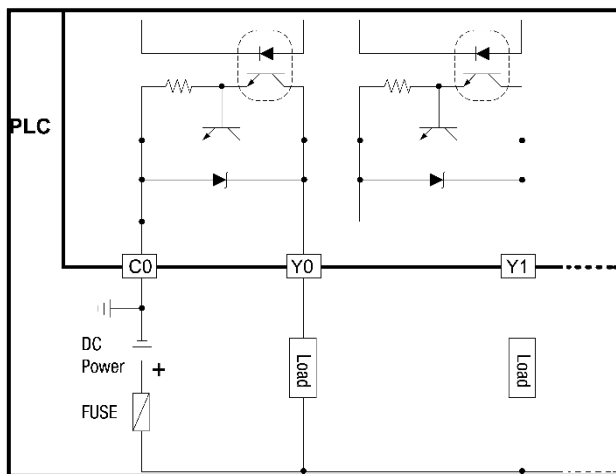
Digital Output (DO) Specifications

Specification		High speed transistor output (Main unit HSPSO)	Low speed transistor output	Single-end relay output	Note
Output response frequency		50KHz*	—	—	HSPSO : Hardware High Speed Pulse Output
Working voltage		5~30VDC		<250VAC/30VDC	
Maximum load current	Resistive	0.3A/0.1A (M4T/J)	0.5A	2A/single, 4A/common	
	Inductive			80VA(AC)/24VA(DC)	
Maximum voltage drop/conducting resistance (initial)		0.5V	1V	30mΩ (@1A, 6VDC)	
Minimum load		—		2mA/DC power	
Open circuit leakage current		< 0.1mA/30VDC		—	
Response time	ON → OFF	15μS		10mS	
	OFF → ON	30μS			
Indication of output operation		Displayed by LED: light when "ON", dark when "OFF"			
Insulation of circuit		Optical isolation, 500VAC, 1 minute		Electromagnetic isolation 1500VAC, 1 minute	

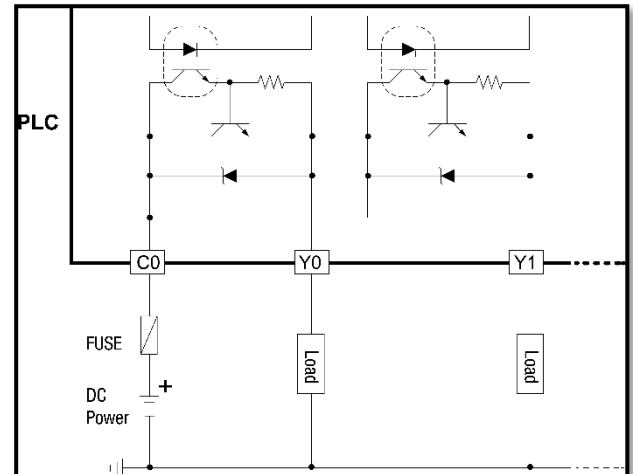
Wiring of relay single-end output



Wiring of transistor single-end SINK output



Wiring of transistor single-end SOURCE output



◆ Dimensions

Figure 1 10/14 points units or expansion modules (slim)

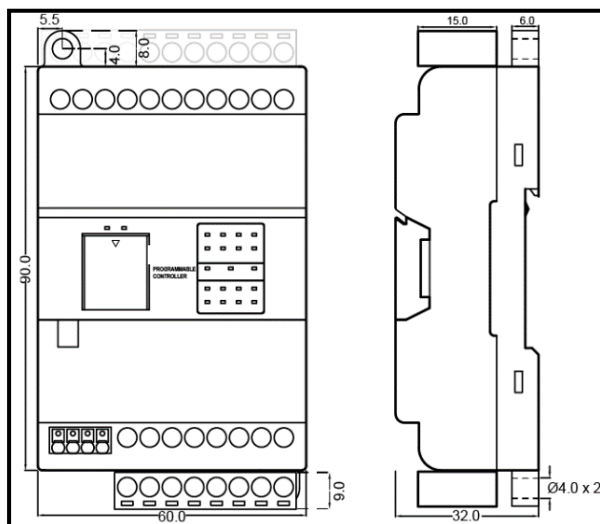


Figure 2 20/24 points main units or expansion modules (slim)

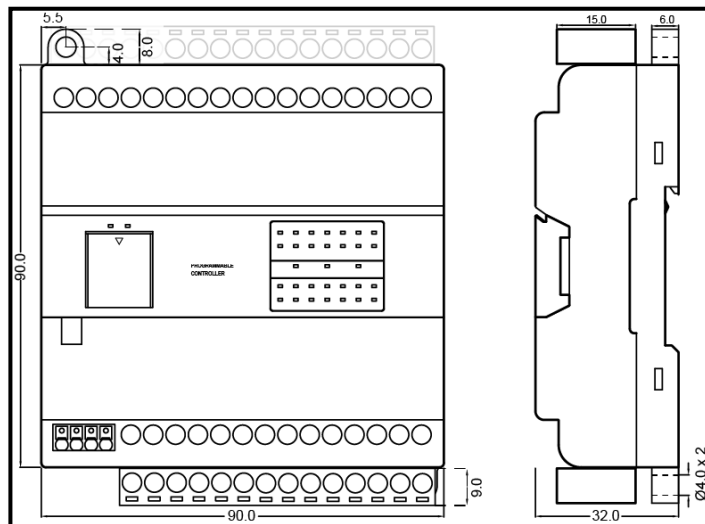


Figure 3 32/40 points main units or expansion modules (slim)

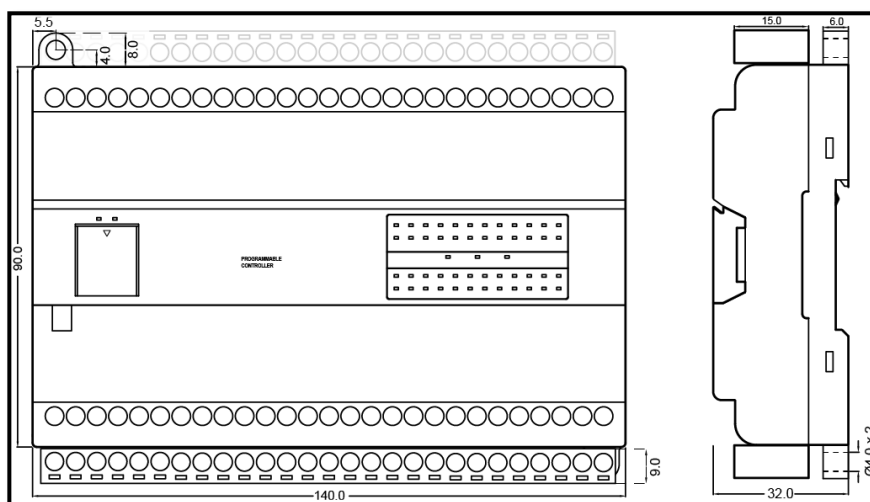


Figure 4 60 points main unit or expansion modules (Slim)

