



HB1

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		Model		HB1-10MR	HB1-10M(T/J)	HB1-14MR	HB1-14M(T/J)	HB1-20MR	HB1-20M(T/J)	HB1-24MR	HB1-24M(T/J)
		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		Model		HB1-32MR	HB1-32M(T/J)	HB1-40MR	HB1-40M(T/J)	HB1-60MR	HB1-60M(T/J)
		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	HB1	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	
Communicati on Interface	Port0 (HMI Port)	Built-in	Default setting of port0 is 921.6kbps Default setting of port1~4 is 9.6kbps, Port1~4 provides FATEK or Modbus RTU/ASCII or user defined communication protocol
	Speed 921.6kbps		
	Port1 (RS232)		
	Speed 4.8k~115.2kbps		
Port2 (RS485)			
	Speed 4.8k~921.6kbps		

	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	Non-retentive	M0~M799 (800)*1		Can be configured as retentive type
			Retentive	M1400~M1911 (512)		
	Special relay		M800~M1399 (600)*1		Can be configured as non-retentive	
			M1912~M2001 (90)			

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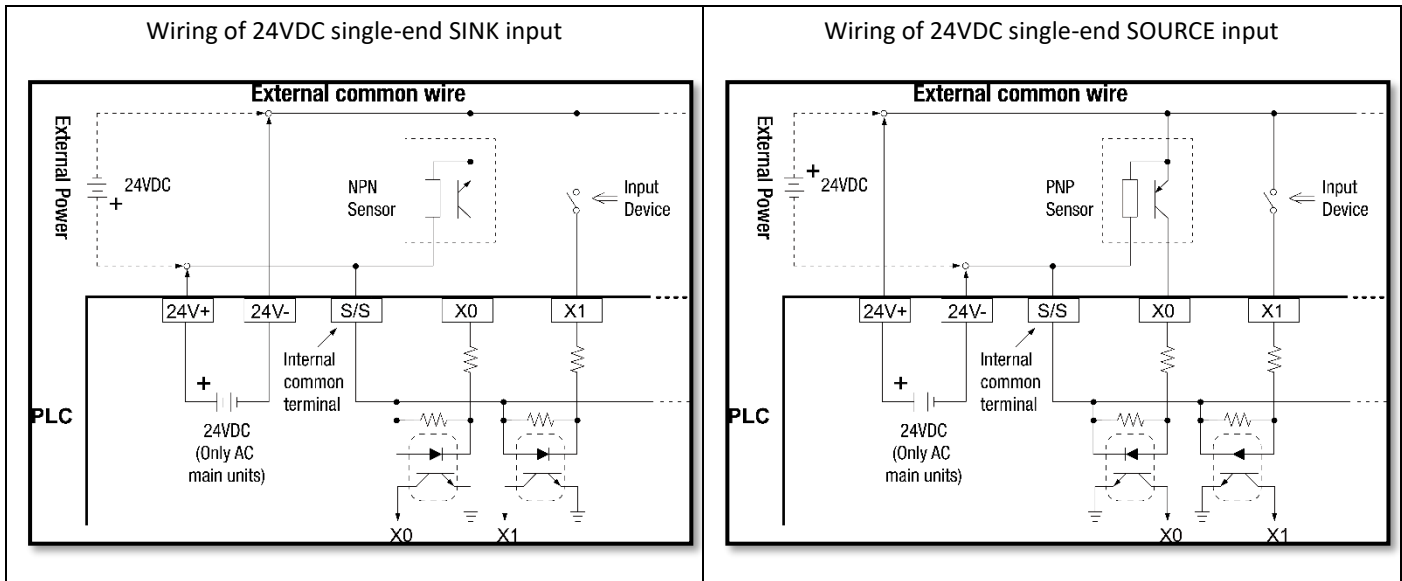
Item		Specification		HB1		Note	
Digital (Bit status)	S	Step relay	Non-retentive	S0~S499 (500)*1		S20~S499 can be configured as retentive type	
			Retentive	S500~S999 (500)*1		Can be configured as non-retentive type	
	T	Timer "Time-Up" status contact		T0~T255 (256)			
	C	Counter "Count-Up" status contact		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)				
	0.1mS High-speed timer register		D4000~D4095 (96)		D4072~4075(4) Corresponds LAIO Module inputs*2 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)				
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

Item	Specification	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)				

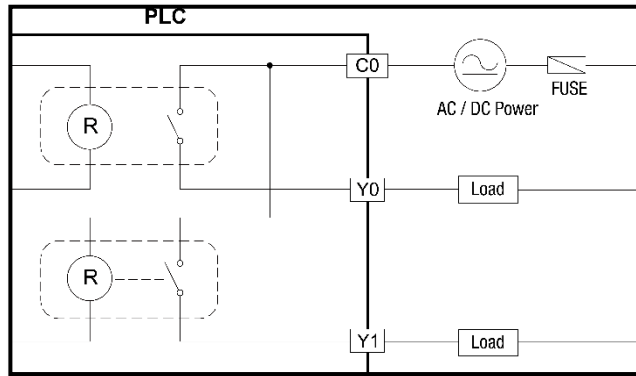
Noise filtering methods	AHF(0.42us)+DHF(14KHz~1.8MHz or 0.1~15ms)	AHF(0.2ms)+DHF(1~15ms)	AHF(1mS)	DHF: Digital Filter AHF: Analog Filter
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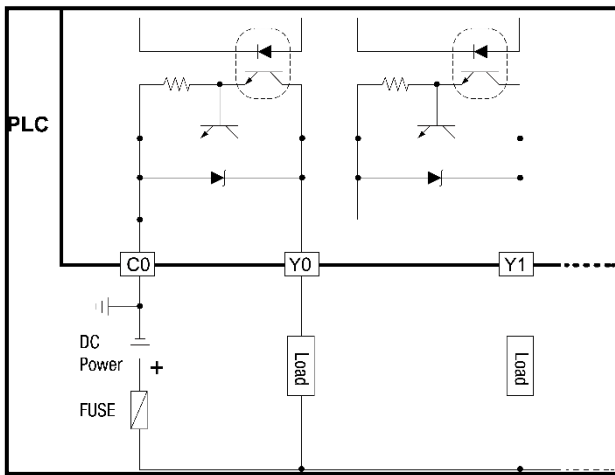
Digital Output (DO) Specifications

Item	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	

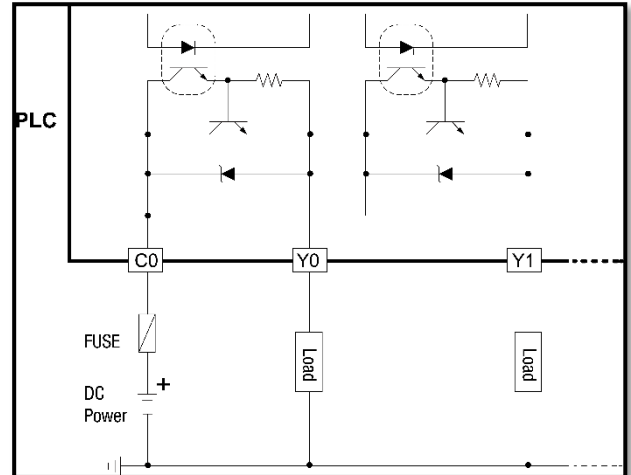
Wiring of relay single-end output



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)

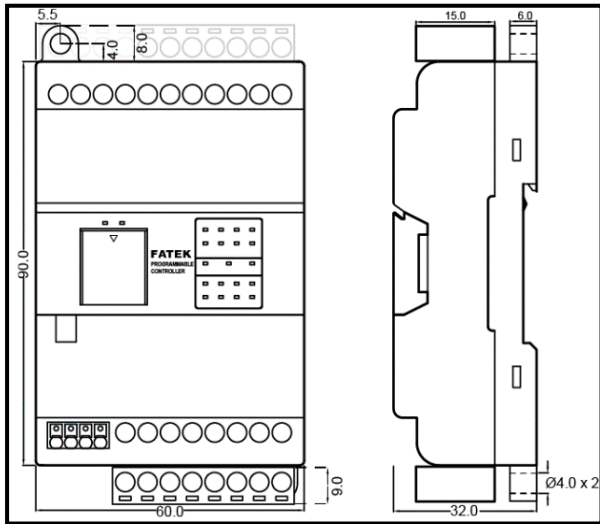


Figure 2 20/24 points main units or expansion modules (slim)

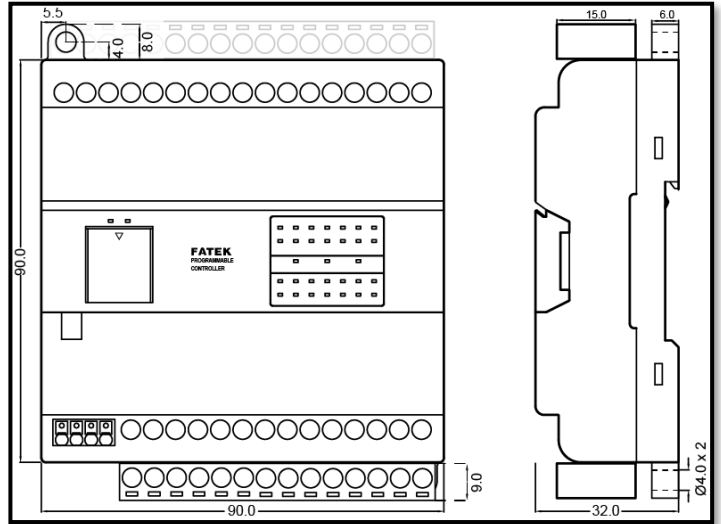


Figure 3 32/40 points main units or expansion modules (slim)

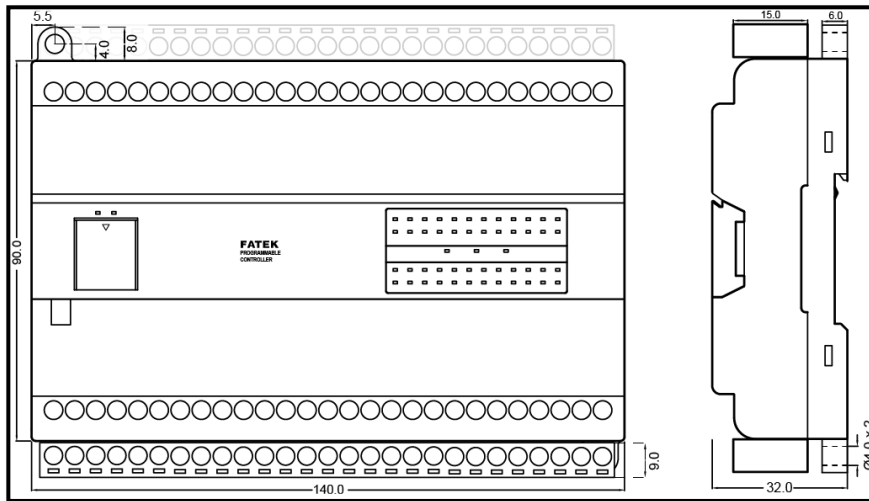


Figure 4 60 points main unit or expansion modules (Slim)

