



XGB CPU Modules



CPU Module (with embedded I/O)

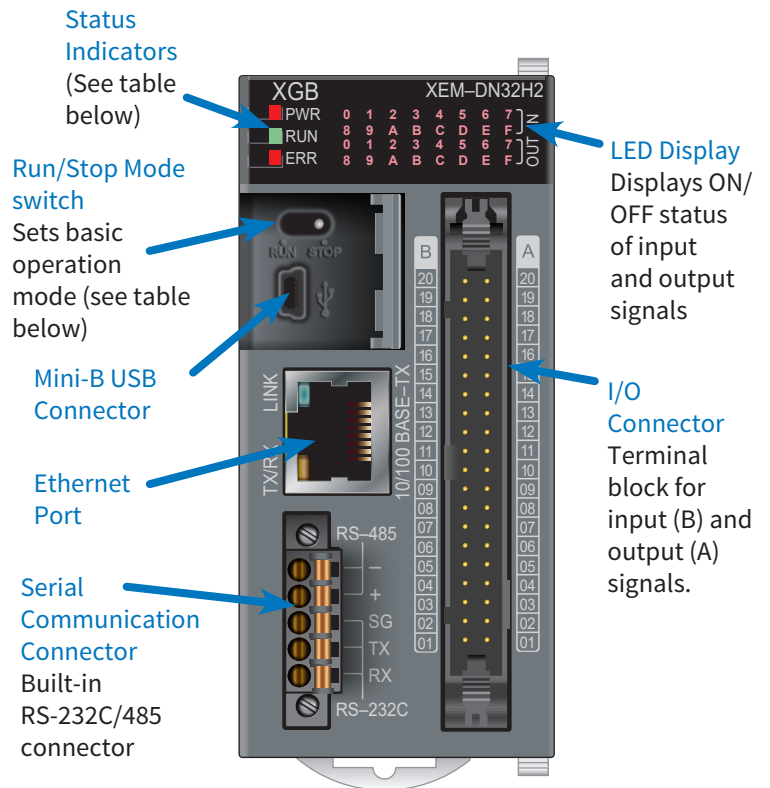
- XEM-DN32H2
- XEM-DN32HP
- XEM-DP32H2
- XEM-DP32HP

The XEM CPU module from LS Electric is the anchor of the XGB PLC series. It is a high performance motion-capable PLC in a small package. The CPU module is equipped with a high performance microprocessor that controls up to 6 axis of position control, high speed I/O, and built in ethernet communications. Optional EtherCAT® motion modules allow control of up to 16 EtherCAT® servo drives.

The XEM CPU is a stand-alone block style PLC. It requires one Smart Link cable and terminal block for wiring the embedded 16 input points and 16 output points. The systems supports 16 built-in PID loops and can be expanded with up to 7 modules.

I/O and memory are assigned direct variables. User-defined symbolic variables can be created for easy reference in the programming.

The PLC offers an advanced level of programming, featuring the IEC61131-3 standard capable of Ladder, Structured Text, Sequential Function Chart and Instruction List. Over 700 advanced Function block instructions, including 80+ motion specific, are available for use in both Ladder and Structured Text programming.



Features

- 16 DC inputs, 16 DC outputs
- (4) 200kHz high speed counters
- 2- or 6-axis motion control (high speed pulse outputs)
- Module expansion supports up to 7 slots
- 22 different option modules available to handle digital, analog, counter input, and communications
- EtherCAT® motion modules offer position control for up to 16 EtherCAT® servo drives
- XG5000 software with IEC 61131 programming languages: Ladder, Structured Text, SFC, and IL. Includes XG-PM software for table-based motion configuration and testing

CPU Status Indicators	
PWR	Red LED is illuminated when power is on.
RUN	Green LED is illuminated when PLC is in RUN mode.
ERR	Red LED is illuminated to indicate program error(s).

CPU RUN/STOP Switch	
RUN position	Executes user program.
STOP position	Normal program load position. Allows for Remote Run from XG5000.

PLC (CPU with I/O) Feature Breakdown

Part Number	Price	Built-in I/O			Max Option Cards	USB	Ethernet	RS-232C	RS-485	Memory Backup	Online Editing	Drawing
		Motion Axis	Inputs	Outputs								
XEM-DN32H2	\$299.00	2	16 sink/ source	16 sink	7	Yes (mini-B)	Yes (10/100Base-T)	Yes	Yes	Memory: Non-Volatile RAM RTC: 6 month backup (No battery)	Yes	PDF
XEM-DP32H2	\$299.00	2		16 source								PDF
XEM-DN32HP	\$349.00	6		16 sink								PDF
XEM-DP32HP	\$349.00	6		16 source								PDF

XGB Series PLC - Basic System Setup

Follow the steps below to select and configure the fundamental components needed to get your XEM CPU module up and running. You can also access several quick start video guides here: [Building and Powering the LS PLC Rack](#)

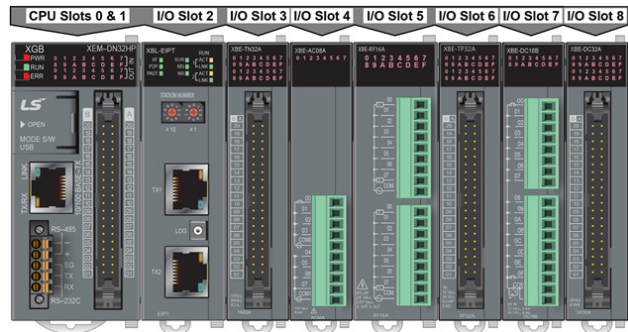
- 1 Select your XEM CPU module, Smart Link cable, and Smart Link terminal block. The Smart Link cable and terminal block are only required if using on board I/O.
See "Smart Link I/O System" on page <?> for cable and terminal block part numbers.



Note: Screwdriver size 04/2.5

- 2 Select and install up to seven option modules. 32-point I/O and counter input modules will require a Smart Link cable and terminal block. EtherCAT modules must be added to Slot 2 and 3 only.

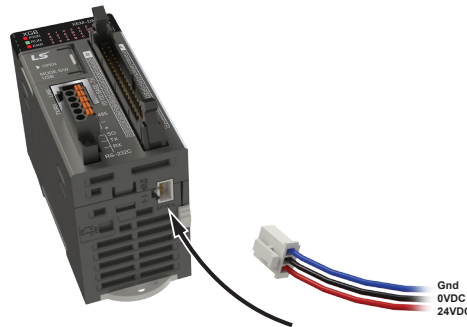
Use the Product Selector to help configure the PLC at automationdirect.com/xgb/config.



Note: Screwdriver size 2.5 mm

- 3 Connect user-supplied 24VDC power. Connect power to the XEM module, then connect power to the XTB-40H terminal block and any installed I/O modules.

Note: XGB-CON-3PX cable pigtail is included with the CPU.



USB Connection
MOSAIC-CSU

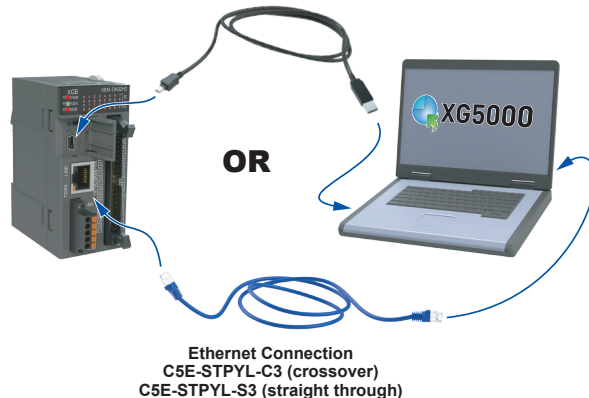
- 4 Choose programming cable, either a USB connection cable or Ethernet cable.

To connect via USB:

[USB Connection to XEM CPU](#)

To connect via Ethernet:

[Ethernet Connection to XEM CPU](#)





XGB CPU Modules

Performance Specifications, XEM-DN32H2/HP and XEM-DP32H2/HP

Specification			Part Number			
			XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Power Specifications	Input	Input Voltage Range	20.4–28.8 VDC (-15% to +20%)			
		Rated Input Voltage	24VDC			
		Input Current	1A or less			
		Efficiency	60% or more			
		Permitted Momentary Power Failure	1ms or less			
	Output	Rated Output Voltage	5VDC (±2%)			
		Output Current	2.0 A			
	Power Supply Status Indication		LED On when power supply is normal			
	Cable Specification		0.75–2 mm ²			
Program Control Method			Cyclic execution of stored program, time-driven interrupt, process-driven interrupt			
I/O Control Method			Batch processing by simultaneous scan (refresh method), directed by program instruction			
Programming Languages			LD (Ladder Diagram), ST (Structured Text), SFC (Sequential Function Chart), IL (Instruction List)			
Programming Instructions	Operator (LD only)		11			
	Extension (LD, ST, IL)		9 (Break, Call, End, For, Jmp, Next, Ret, Sbrt, Init_Done)			
	Function (LD, ST, IL)		400+ (295+ for Data Tpe Conversion)			
	Function Block (LD & ST)		300+ (80+ motion specific)			
	Sequential Function Chart		7			
Special Features/Instructions			User Defined Data Type, User Defined Functions/Function Blocks			
Processing Speed (Basic Instruction)			40ns/step			
Program Capacity			384kb			
Maximum Base Rack I/O Points			(PLC + 7 option cards) Digital: 32(PLC built in) + 224 (32 point IO x 7 slots) = 256 Total Analog: 56 (8 point AI x 7 slots) = 56 total			
Data Area (User Assigned)	Symbolic Variable		64KB (retain selectable by individual variable)			
	Direct Variables	M	32KB (retain configurable - by block)			
		W	64KB (retain)			
Data Area (PLC Reserved)	Input Variables	I	2KB (%IX0.0.0–%IX15.15.63)			
	Output Variables	Q	2KB (%QX0.0.0–%QX15.15.63)			
	Flag Variables	F	4KB			
		K	8KB			
		L	8KB			
		U	0.5 KB			
	P2P Service Variables	N	20KB			
Total Program			256			
Task	Initialization Task		1			
	Cycle Time Task		Max 16			
	I/O Task		Max 8			
	Internal Device Task		Max 16			
	High Speed Counter Task		Max 4			
	Position Control Task		1			
Operation Mode			RUN, STOP, DEBUG			
Self-diagnosis Function			Detects errors of scan time, memory, I/O and power supply			
Program Port			USB Mini-B type, USB 1 channel			
Retain Area Setup			Retain area setting in basic parameter			
Internal Consumption Current			540mA			
Weight			134g (4.73 oz)			

Built-in Functions, XEM-DN32H2/HP and XEM-DP32H2/HP

Specification			Part Number			
			XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Number of Motion Control Axis			2-axis		6-axis	
Interpolation Function			<ul style="list-style-type: none"> 2-axis linear interpolation 2-axis circular interpolation 		<ul style="list-style-type: none"> 2/3/4/5/6 axis linear interpolation 2-axis circular interpolation 3-axis helical interpolation 	
High Speed Counter	Performance	1 phase	200kHz			
		2 phase	100kHz			
	Channels	1 phase	4 channels			
		2 phase	2 channels			
	Counter Mode		4 counter modes are supported: <ul style="list-style-type: none"> Single pulse counter mode with 1 pulse input Pulse and direction counter mode with 2 pulse inputs CW/CCW counter mode with 2 pulse inputs Quadrature (Phase A/B) counter mode with 2 pulse inputs 			
Function		Internal/external preset, Latch counter, Compare output, Number of rotations per unit time				
High Speed Pulse Output Motion Control	Basic Function	Control Method	Position control, Speed control, Speed/Position control, Position/Speed control			
		Control Unit	Pulse, mm, inch, degree			
		Position Data	400 steps for each axis (1–400)			
		Operation Mode	End, Keep, Continuous			
		Operation Method	Single, Repeat			
	Position	Control	Absolute method/Incremental method			
		Address Range	-2,147,483,648 – 2,147,483,647 (Pulse)			
		Speed	200kHz max			
		Acc/Dec Processing	Trapezoid-shaped, S-curve			
	Homing Method		DOG+HOME (Off), DOG+HOME (On), Upper/Lower limit + HOME, DOG, High speed, Upper/Lower limit, HOME			
Jog Operation		Jog operation, Inching operation, Manual Pulse Generator operation				
Pulse Catch			10μs 4-point (%IX0.0.0–%IX0.0.3), 50μs 4-point (%IX0.0.4–%IX0.0.7)			
External Point Interrupt			10μs 4-point (%IX0.0.0–%IX0.0.3), 50μs 4-point (%IX0.0.4–%IX0.0.7)			
Input Filter			1,3,5,10,20,70,100 ms			
PID Control			Max. 16 PID loops, Control by instruction, Auto-tuning, PWM output, Forced output, Operation scan time setting, Antiwindup, Delta MV, SV lamp, Hybrid operation, Cascade operation			
Serial (Cnet)	Protocol		Modbus RTU/ASCII, XGT Dedicated, User-defined			
	Channel		1 RS-232C port, 1 RS-485 port			
Ethernet (FEnet)	Transfer Spec		Cable: 100Base-TX, Speed: 100Mbps, Auto-MDIX ¹ , IEEE 802.3			
	Topology		Star			
	Diagnosis		Module information, Service condition			
	Protocol/Usage		Modbus TCP/IP Client and Server, Email (SMTP client), XGT dedicated, User Define frame, Programming/Online Monitoring			
	Channel		1 port 10/100MB Ethernet			
	Service		P2P, High Speed link, Remote connection, SMTP, SNTP, Auto scan			

1 - Auto-MDIX (Automation medium-dependent interface crossover) automatically detects whether the cable connected to the Ethernet port is peer-to-peer (straight) or crossover cable.

Digital Input Specifications, XEM-DN32H2/HP and XEM-DP32H2/HP

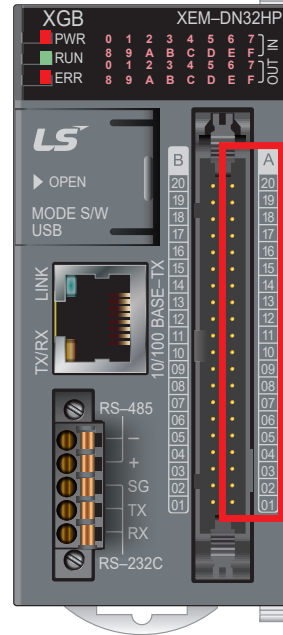
16-point 24VDC Input (Sink/Source Type) Specifications				
Model	XEM-DN32H2	XEM-DP32H2	XEM-DN32HP	XEM-DP32HP
Input Point	16 point			
Insulation Method	Photocoupler Insulation			
Rated Input Volage	24VDC			
Rated Input Current	~4mA (Inputs 0-3 about 7mA)			
Operation Voltage Range	20.4-28.8 VDC (within ripple rate 5%)			
On Voltage	19VDC or higher			
On Current	3mA or higher			
Off Voltage	6VDC or less			
Off Current	1mA or less			
Input Resistance	About 5.6 kΩ (Inputs 0-7 about 4.7 kΩ)			
Response Time	Off → On	1/3/4/10/20/70/100 ms (set by I/O parameter)		
	On → Off	Default: 3ms		
Insulation Pressure	AC560Vrms / 3 cycle (altitude 2000m)			
Insulation Resistance	100MΩ or more by MegOhmMeter			
Common Method	16 point / COM			
Proper Cable Size	0.3 mm ²			
Operation Indicator	LED On when Input On			
External Connection Method	40 point connector			

Note: Red box highlights pins of the CPU inputs.

16-point 24VDC Input (Sink/Source Type) Circuit Configuration				
Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description
	A1	B20	%IX0.0.0	High Speed Counter Inputs 1 phase- 200kpps 4 channel 2 phase- 100kpps 2 channel or General Input
	B1	B19	%IX0.0.1	
	A2	B18	%IX0.0.2	
	B2	B17	%IX0.0.3	Preset Input or General Input
	A3	B16	%IX0.0.4	
	B3	B15	%IX0.0.5	General Input
	A4	B14	%IX0.0.6	
	B4	B13	%IX0.0.7	General Input
	A5	B12	%IX0.0.8	
	B5	B11	%IX0.0.9	General Input
	A6	B10	%IX0.0.10	
	B6	B09	%IX0.0.11	General Input
	A7	B08	%IX0.0.12	
	B7	B07	%IX0.0.13	General Input
	A8	B06	%IX0.0.14	
	B8	B05	%IX0.0.15	General Input
A9	B04	-	Not used (NC)	
B9	B03	-	Not used (NC)	
A10	B02	-	Common	
B10	B01	-	Common	

Digital Output Specifications, XEM-DN32H2 and XEM-DN32HP

16-point Transistor Output (Sink Type) Specifications		
Model	XEM-DN32H2	XEM-DN32HP
Input Point	16 point	
Insulation Method	Photocoupler Insulation	
Rated Load Voltage	12VDC / 24VDC	
Operation Load Voltage Range	10.2–26.4 VDC	
Max. Load Current	%QX0.0.0–11: 0.1A / 1-point, %QX0.0.12–15: 0.5 A / 1-point, 2A / 1COM	
Off Leakage Current	0.1 mA or less	
Max. Inrush Current	4A / 10ms or less	
Max. Voltage Drop when On	0.4 VDC or less	
Over Voltage Protection	TVS diode	
Response Time	Off → On	1ms or less
	On → Off	1ms or less (rated load, resistive load)
Common Method	16-point / COM	
Proper Wire Size	Stranded wire, 0.3–0.75 mm ² (external diameter 2.8 mm or less)	
External Power	Voltage	12VDC / 24VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	80mA or less (when connecting 24VDC)
Operation Indicator	LED On when Output On	
External Connection Method	40-point connector	

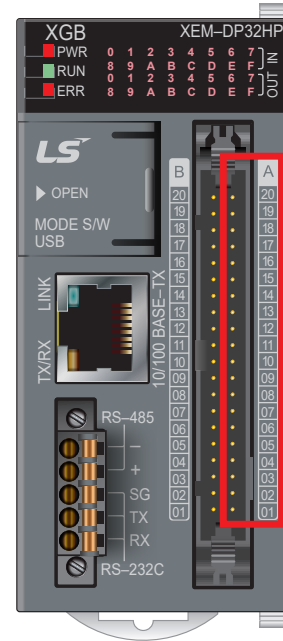


16-point Transistor Output (Sink Type) Circuit Configuration					
Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description	
	A11	A20	%QX0.0.0	Pulse- Axis1 or General Output 0.1A/pt	
	B11	A19	%QX0.0.1	Pulse- Axis2 or General Output 0.1A/pt	
	A12	A18	%QX0.0.2	Pulse- Axis3* or General Output 0.1A/pt	
	B12	A17	%QX0.0.3	Pulse- Axis4* or General Output 0.1A/pt	
	A13	A16	%QX0.0.4	Pulse- Axis5* or General Output 0.1A/pt	
	B13	A15	%QX0.0.5	Pulse- Axis6* or General Output 0.1A/pt	
	A14	A14	%QX0.0.6	Direction- Axis 1 or General Output 0.1A/pt	
	B14	A13	%QX0.0.7	Direction- Axis 2 or General Output 0.1A/pt	
	A15	A12	%QX0.0.8	Direction- Axis 3* or General Output 0.1A/pt	
	B15	A11	%QX0.0.9	Direction- Axis 4* or General Output 0.1A/pt	
	A16	A10	%QX0.0.10	Direction- Axis 5* or General Output 0.1A/pt	
	B16	A09	%QX0.0.11	Direction- Axis 6* or General Output 0.1A/pt	
	A17	A08	%QX0.0.12	General Outputs - 0.5A/pt	2.0A/common
	B17	A07	%QX0.0.13	General Outputs - 0.5A/pt	
	A18	A06	%QX0.0.14	General Outputs - 0.5A/pt	
	B18	A05	%QX0.0.15	General Outputs - 0.5A/pt	
A19	A04	-	P (24VDC)	2.0A/common	
B19	A03	-	P (24VDC)		
A20	A02	-	OUT_COM		
B20	A01	-	OUT_COM		

* Note: DN32HP module only

Digital Output Specifications, XEM-DP32H2 and XEM-DP32HP

16-point Transistor Output (Source Type) Specifications		
Model	XEM-DP32H2	XEM-DP32HP
Input Point	16 point	
Insulation Method	Photocoupler Insulation	
Rated Load Voltage	12VDC / 24VDC	
Operation Load Voltage Range	10.2–26.4 VDC	
Max. Load Current	%QX0.0.0–11: 0.1A / 1-point %QX0.0.12–15: 0.5 A / 1-point, 2A / 1COM	
Off Leakage Current	0.1 mA or less	
Max. Inrush Current	4A / 10ms or less	
Max. Voltage Drop when On	0.4 VDC or less	
Over Voltage Protection	TVS diode	
Response Time	Off → On	1ms or less
	On → Off	1ms or less (rated load, resistive load)
Common Method	16-point / COM	
Proper Wire Size	Stranded wire, 0.3–0.75 mm ² (external diameter 2.8 mm or less)	
External Power	Voltage	12VDC / 24VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	50mA or less (when connecting 24VDC)
Operation Indicator	LED On when Output On	
External Connection Method	40-point connector	



16-point Transistor Output (Source Type) Circuit Configuration					
Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description	
	A11	A20	%QX0.0.0	Pulse- Axis1 or General Output 0.1A/pt	
	B11	A19	%QX0.0.1	Pulse- Axis2 or General Output 0.1A/pt	
	A12	A18	%QX0.0.2	Pulse- Axis3* or General Output 0.1A/pt	
	B12	A17	%QX0.0.3	Pulse- Axis4* or General Output 0.1A/pt	
	A13	A16	%QX0.0.4	Pulse- Axis5* or General Output 0.1A/pt	
	B13	A15	%QX0.0.5	Pulse- Axis6* or General Output 0.1A/pt	
	A14	A14	%QX0.0.6	Direction- Axis 1 or General Output 0.1A/pt	
	B14	A13	%QX0.0.7	Direction- Axis 2 or General Output 0.1A/pt	
	A15	A12	%QX0.0.8	Direction- Axis 3* or General Output 0.1A/pt	
	B15	A11	%QX0.0.9	Direction- Axis 4* or General Output 0.1A/pt	
	A16	A10	%QX0.0.10	Direction- Axis 5* or General Output 0.1A/pt	
	B16	A09	%QX0.0.11	Direction- Axis 6* or General Output 0.1A/pt	
	A17	A08	%QX0.0.12	General Outputs - 0.5A/pt	
	B17	A07	%QX0.0.13	General Outputs - 0.5A/pt	
	A18	A06	%QX0.0.14	General Outputs - 0.5A/pt	
	B18	A05	%QX0.0.15	General Outputs - 0.5A/pt	
	A19	A04	-	OUT_COM	2.0A/common
	B19	A03	-	OUT_COM	
	A20	A02	-	N (0VDC)	
	B20	A01	-	N (0VDC)	

* Note: DP32HP module only

PLC I/O Wiring (Sinking Outputs), XEM-DN32H2/HP

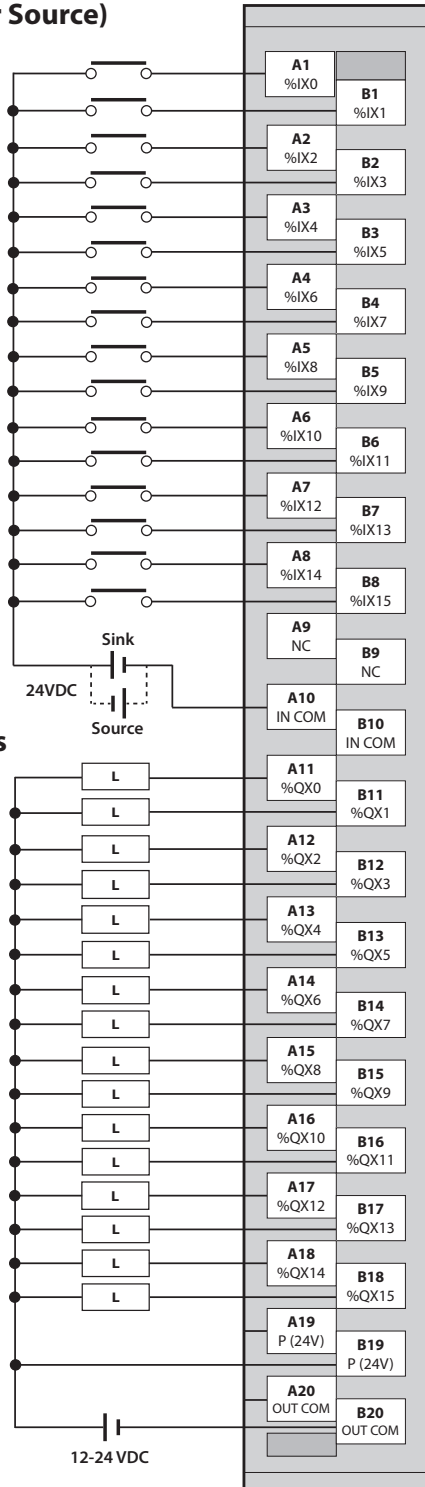
Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring

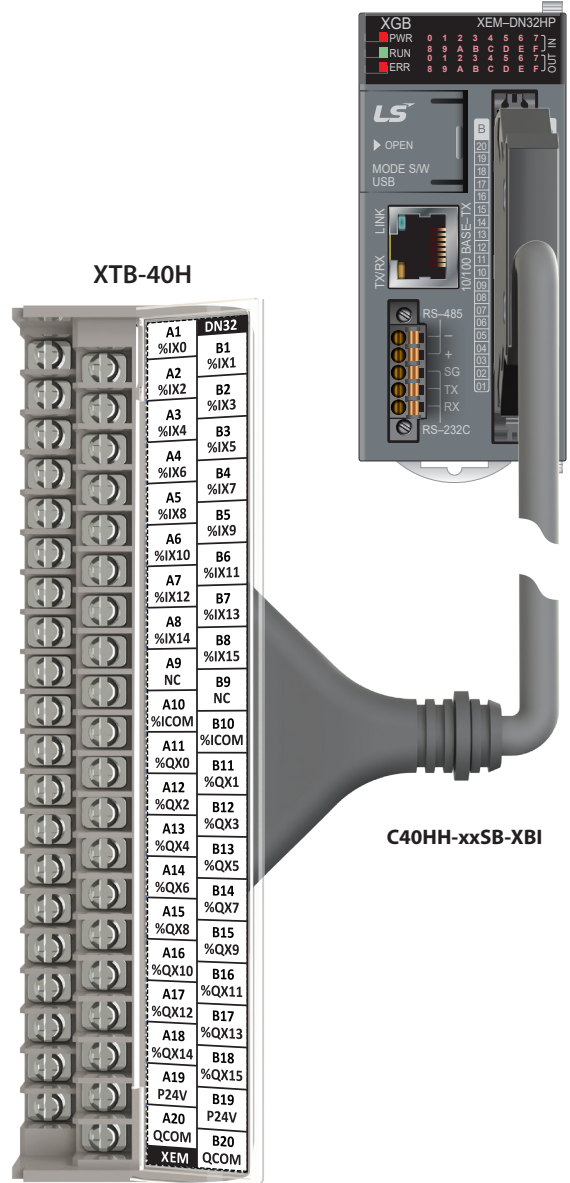
PLC Connection

Inputs
(Sink or Source)

XTB-40H



XEM PLC



- Note:**
- Wiring: AWG22-16 (1.5mm²/MAX)
 - Screw: M3 X 8L
 - Screw Torque: 1.2 N·m (12kgf·cm)

PLC I/O Wiring (Sourcing Outputs), XEM-DP32H2/HP

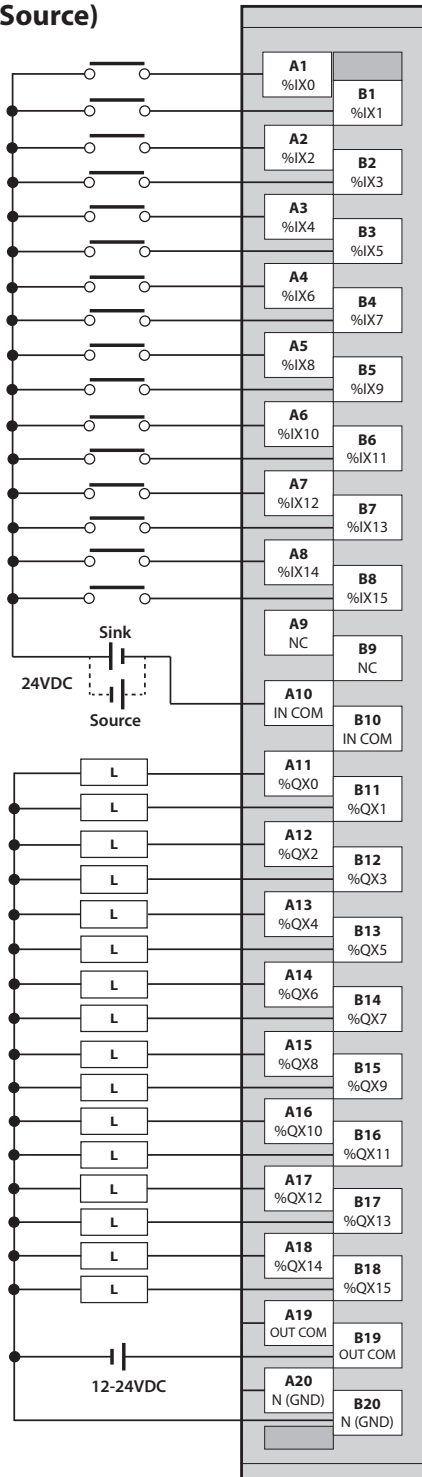
Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring

PLC Connection

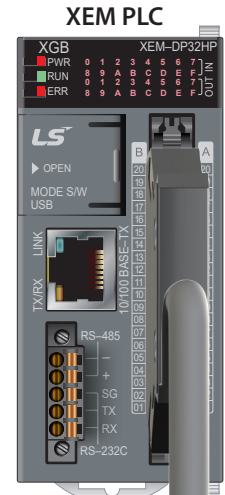
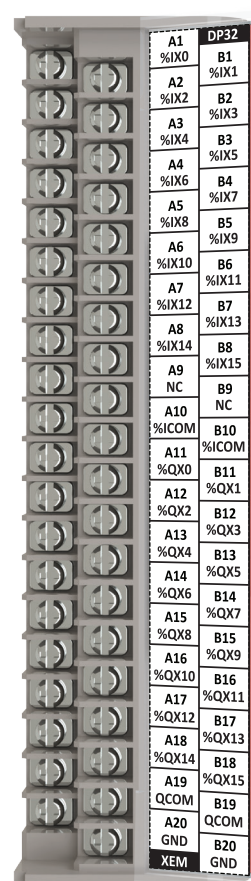
Inputs
(Sink or Source)

XTB-40H



Outputs
(Source)

XTB-40H



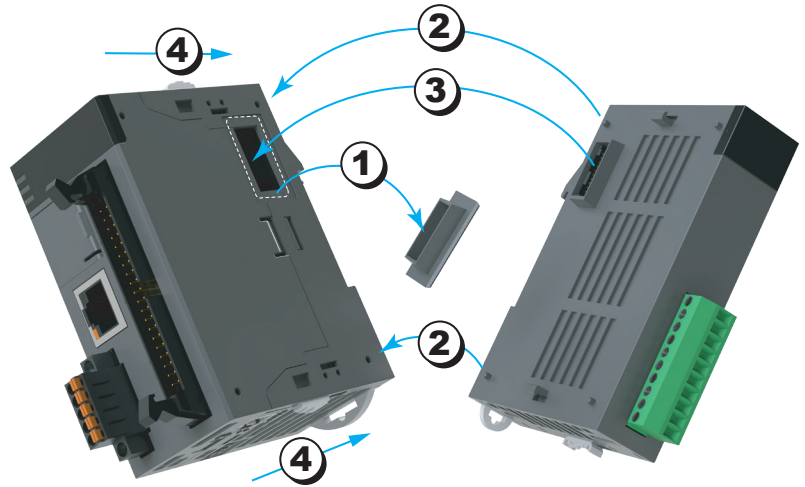
C40HH-xxSB-XBI

Note:

- Wiring: AWG22-16 (1.5mm²/MAX)
- Screw: M3 X 8L
- Screw Torque: 1.2 N·m (12kgf·cm)

I/O Module Installation

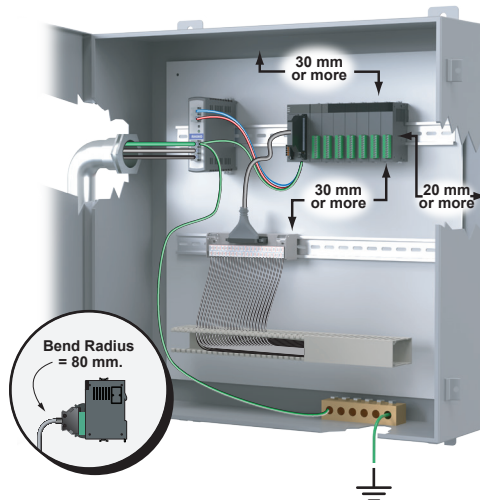
Attach each I/O module to the PLC per the diagram to the right. Up to seven modules can be attached by hooking in to each expansion module in the same manner. Any 32-point I/O and counter input module will require a Smart Link cable and terminal block. Use the online Product Selector to help configure the PLC at automationdirect.com/xgb/config.



1. Remove expansion port cover.
2. Align tabs with corresponding holes.
3. Seat the expansion port connector.
4. Secure modules with top and bottom sliding lock.

Mounting the PLC

When mounting the completed PLC module to your structure, keep the distances shown in the diagram below to maintain proper ventilation and allow easy detachment and attachment.

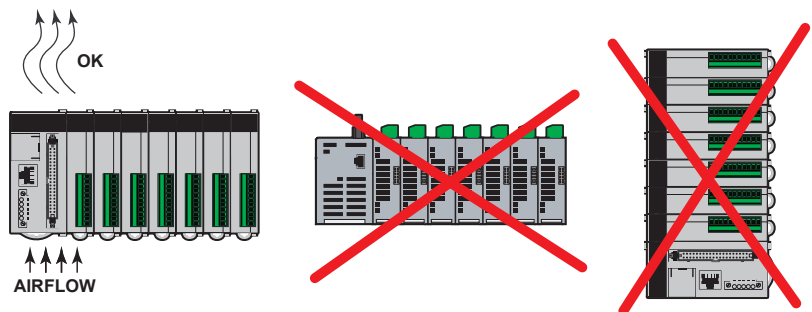


- Additional Clearance Distances:**
- Wire duct on the side requires 5mm or more
 - Panel wall on the side requires 20mm or more
 - Another device on the side requires 50mm or more

DIN Rail Mounting

The PLC has a hook for DIN rail mounting (35mm). To mount to DIN rail:

- Pull the hook as shown below at the bottom of module and install it at the DIN rail.
- Push the hook to fix the module to the rail after installing.





XGB Series PLC Family

Environmental Specifications, all XGB Series Modules

Item		Specification	Reference	
Ambient Operating Temperature		0–55°C (32–131°F)	-	
Storage Temperature		-25–70°C (-13–158°F)		
Ambient Operating Humidity		5–95% relative humidity (non-condensing)		
Storage Humidity		5–95% relative humidity (non-condensing)		
Vibration ¹	Occasional Vibration	5 ≤ f < 8.4 Hz	IEC61131-3-2	
		8.4 ≤ f < 150Hz		
	Continuous Vibration	5 ≤ f < 8.4 Hz		
		8.4 ≤ f < 150Hz		
Shocks		Peak Acceleration		147 m/s ² (15G)
		Duration		11ms
		Pulse Wave Type	Half-sine (3 times each direction per each axis)	
Noise Resistance	Square Wave Impulse Noise		1,500VAC 900VDC	LS Electric standard
	Electrostatic Discharge		Voltage: 4kV (contact discharge)	IEC61131-3-2 IEC61000-4-2
	Radiated Electromagnetic Field Noise		80–1,000 MHz, 10 V/m	IEC61131-3-2 IEC61000-4-3
	Fast Transient / Burst Noise	Classification	Voltage	IEC61131-3-2 IEC61000-4-4
		Power Supply	2kV	
Digital/Analog Input/Output Communication Interface		1kV		
Environment		Free from corrosive gases and excessive dust	-	
Attitude		Less than 2,000m		
Pollution Degree		Less than 2 (see note 2)		
Cooling Method		Air-cooling		

1 - Vibration of 10 times each direction (X, Y, and Z)

2 - Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation is to be expected.



XGB Series PLC Family

Available I/O Modules

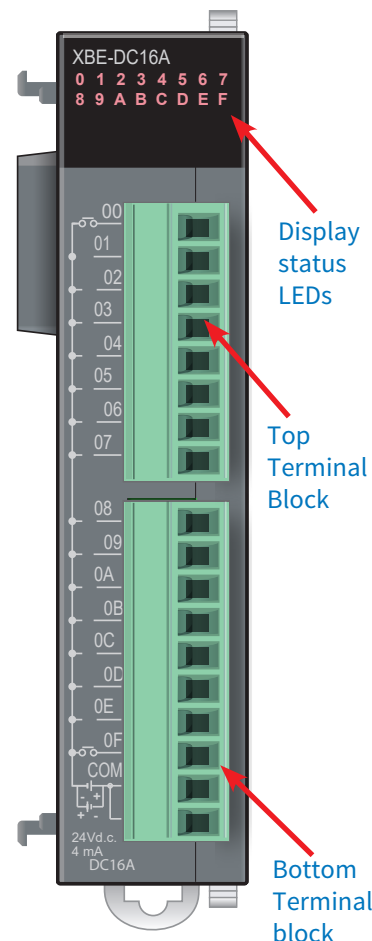
XGB Series I/O Modules								
Part Number	Price	Description	Digital Input	Digital Output	Analog Input	Analog Output	Motion	Smart Link Cable and Terminal Required
Digital								
<u>XBE-DC16A</u>	\$70.00	LS Electric XGB discrete input module, 16-point, 24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	✓					
<u>XBE-DC16B</u>	\$78.00	LS Electric XGB discrete input module, 16-point, 12-24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	✓					
<u>XBE-DC32A</u>	\$97.00	LS Electric XGB discrete input module, 32-point, 24 VDC, sinking/sourcing, 1 common(s), 32 point(s) per common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	✓					✓
<u>XBE-AC08A</u>	\$88.00	LS Electric XGB discrete input module, 8-point, 120 VAC, 2 common(s), 4 point(s) per common. Removable terminal blocks included.	✓					
<u>XBE-RY08B</u>	\$95.00	LS Electric XGB relay output module, 8-point, 125 VDC/250 VAC, (8) Form A, 8 isolated common(s), 1 point(s) per common, 2A/point. Removable terminal blocks included.		✓				
<u>XBE-RY16A</u>	\$110.00	LS Electric XGB relay output module, 16-point, 125 VDC/250 VAC, (16) Form A, 2 isolated common(s), 8 point(s) per common, 2A/point, 5A/common. Removable terminal blocks included.		✓				
<u>XBE-TN16A</u>	\$78.00	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sinking, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				
<u>XBE-TN32A</u>	\$109.00	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sinking, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.		✓				✓
<u>XBE-TP16A</u>	\$88.00	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sourcing, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				
<u>XBE-TP32A</u>	\$93.00	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sourcing, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.		✓				✓
<u>XBE-DN32A</u>	\$172.00	LS Electric XGB discrete combo module, Input: 16-point, 24 VDC, sinking/sourcing, Output: 16-point, 12-24 VDC, sinking, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	✓	✓				✓
Analog								
<u>XBF-AD04A</u>	\$160.00	LS Electric XGB analog input module, 4-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-10 VDC, external 24 VDC required.			✓			
<u>XBF-AD08A</u>	\$242.00	LS Electric XGB analog input module, 8-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, external 24 VDC required.			✓			
<u>XBF-AD04C</u>	\$231.00	LS Electric XGB analog input module, 4-channel, current/voltage, 14-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, +/- 10 VDC, external 24 VDC required.			✓			
<u>XBF-DV04A</u>	\$152.00	LS Electric XGB analog output module, 4-channel, voltage, 12-bit, output voltage signal range(s) of 0-10 VDC, external 24 VDC required.				✓		
<u>XBF-DV04C</u>	\$209.00	LS Electric XGB analog output module, 4-channel, voltage, 14-bit, output voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC and +/- 10 VDC, external 24 VDC required.				✓		
<u>XBF-DC04A</u>	\$162.00	LS Electric XGB analog output module, 4-channel, current, 12-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.				✓		
<u>XBF-DC04C</u>	\$209.00	LS Electric XGB analog output module, 4-channel, current, 14-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.				✓		
<u>XBF-AH04A</u>	\$216.00	LS Electric XGB analog combo module, Input: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC, Output: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC.			✓	✓		
Motion								
<u>XBF-PN04B</u>	\$350.00	LS Electric XGB 4-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.					✓	
<u>XBF-PN08B</u>	\$395.00	LS Electric XGB 8-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.					✓	
<u>XBF-HQ02A</u>	\$176.00	LS Electric XGB counter input module, 200 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, single-ended encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.					✓	✓
<u>XBF-HD02A</u>	\$253.00	LS Electric XGB counter input module, 500 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, differential encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.					✓	✓
Communication								
<u>XBL-EIPT</u>	\$199.00	LS Electric XGB communication module, EtherNet/IP, 2 ports, (2) Ethernet 10/100Base-T (RJ45) port(s). For use with LS Electric XGB series PLCs.						

Note: See "Smart Link I/O System" on page <?> for the XTB-40H terminal block and cables. See "XGB PLC Replacement Terminals" on page <?> for replacement removable terminal blocks.

XBE-DC16A Digital Input Module

Part Number	Price	Classification	Description	Drawing
XBE-DC16A	\$70.00	Digital Input	LS Electric XGB discrete input module, 16-point, 24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	PDF

General Specifications	XBE-DC16A
Input Point	16 point
Insulation Method	Photo coupler insulation
Rated Input Voltage	24VDC
Rated Input Current	4mA
Operation Voltage Range	20.4–28.8 VDC (ripple rate <5%)
On Voltage/Current	19VDC or higher / 3mA or higher
Off Voltage/Current	6VDC or less / 1mA or less
Input Resistance	5.6 kΩ
Response Time	Off → On: 1/3/5/10/20/70/100 ms (set by PLC parameter) On → Off: Default: 3ms
Insulation Pressure	560VACrms / 3 Cycle (2000m altitude)
Insulation Resistance	10MΩ or more by Megohmmeter
Common Method	16 point / COM
Proper Cable Size	Stranded cable 0.3–0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption	40mA (when all point On)
Operation Indicator	Input On, LED On
External Connection Method	8-pin terminal block connector + 10-pin terminal block connector
Weight	53g



XBE-DC16A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-DC16A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%IX0.z.0 – %IX0.z.15

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module here.

[Digital Module Setup](#)

XBE-DC16A Digital Input Module Wiring

XBE-DC16A Circuit Configuration				
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image	
	00	%IX0.z.0		
	01	%IX0.z.1		
	02	%IX0.z.2		
	03	%IX0.z.3		
	04	%IX0.z.4		
	05	%IX0.z.5		
	06	%IX0.z.6		
	07	%IX0.z.7		
	Bottom TB Description	I/O Direct Variable		
	08	%IX0.z.8		
	09	%IX0.z.9		
	0A	%IX0.z.10		
	0B	%IX0.z.11		
	0C	%IX0.z.12		
	0D	%IX0.z.13		
	0E	%IX0.z.14		
0F	%IX0.z.15			
COM	n/a			
COM	n/a			

Note: Can be wired sinking or sourcing. In the I/O Direct Variable name, z=slot number.

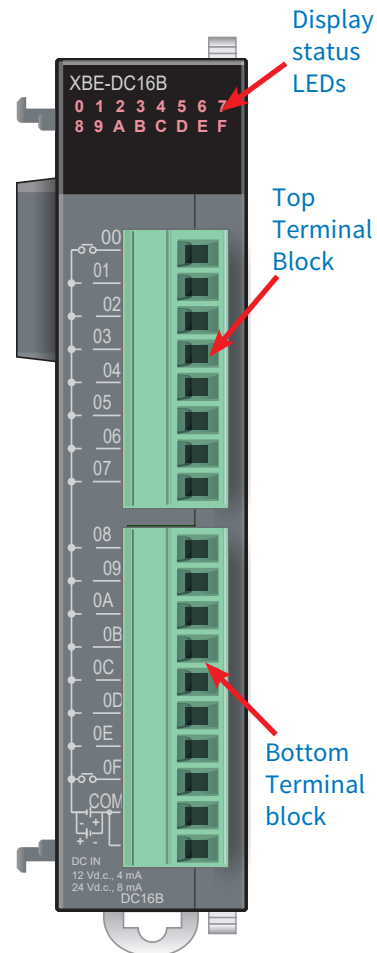


XGB Digital Modules

XBE-DC16B Digital Input Module

Part Number	Price	Classification	Description	Drawing
XBE-DC16B	\$78.00	Digital Input	LS Electric XGB discrete input module, 16-point, 12-24 VDC, sinking/sourcing, 1 common(s), 16 point(s) per common. Removable terminal blocks included.	PDF

General Specifications	XBE-DC16B
Input Point	16 point
Insulation Method	Photo coupler insulation
Rated Input Voltage	12/24 VDC
Rated Input Current	4mA @ 12VDC / 8mA @ 24VDC
Operation Voltage Range	9.5-30 VDC (ripple rate <5%)
On Voltage/Current	9VDC or higher / 3mA or higher
Off Voltage/Current	5VDC or less / 1mA or less
Input Resistance	2.7 kΩ
Response Time	Off → On: 1/3/5/10/20/70/100 ms (set by PLC parameter) On → Off: Default: 3ms
Insulation Pressure	560VACrms / 3 Cycle (2000m altitude)
Insulation Resistance	10MΩ or more by Megohmmeter
Common Method	16 point / COM
Proper Cable Size	Stranded cable 0.3-0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption	40mA (when all point On)
Operation Indicator	Input On, LED On
External Connection Method	8-pin terminal block connector + 10-pin terminal block connector
Weight	53g



XBE-DC16B - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

FFor Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-DC16B	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%IX0.z.0 – %IX0.z.15

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-DC16B Digital Input Module Wiring

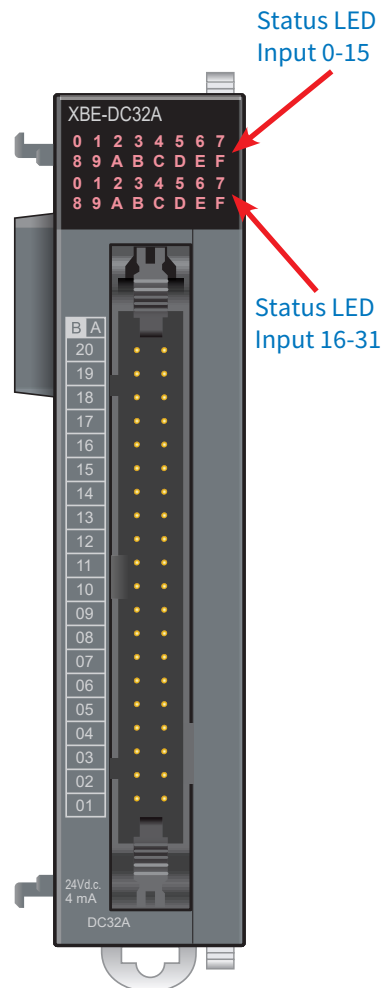
XBE-DC16B Circuit Configuration				
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image	
	00	%IX0.z.0		
	01	%IX0.z.1		
	02	%IX0.z.2		
	03	%IX0.z.3		
	04	%IX0.z.4		
	05	%IX0.z.5		
	06	%IX0.z.6		
	07	%IX0.z.7		
	Bottom TB Description	I/O Direct Variable		
	08	%IX0.z.8		
	09	%IX0.z.9		
	0A	%IX0.z.10		
	0B	%IX0.z.11		
	0C	%IX0.z.12		
	0D	%IX0.z.13		
	0E	%IX0.z.14		
0F	%IX0.z.15			
COM	n/a			
COM	n/a			

Note: Can be wired sinking or sourcing. In the I/O Direct Variable name, z=slot number.

XBE-DC32A Digital Input Module

Part Number	Price	Classification	Description	Drawing
XBE-DC32A	\$97.00	Digital Input	LS Electric XGB discrete input module, 32-point, 24 VDC, sinking/sourcing, 1 common(s), 32 point(s) per common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	PDF

General Specifications		XBE-DC32A
Input Point		32 point
Insulation Method		Photo coupler insulation
Rated Input Voltage		24VDC
Rated Input Current		4mA
Operation Voltage Range		20.4–28.8 VDC (ripple rate <5%)
On Voltage/Current		19VDC or higher / 3mA or higher
Off Voltage/Current		6VDC or less / 1mA or less
Input Resistance		5.6 kΩ
Response Time	Off → On	1/3/5/10/20/70/100 ms (set by PLC parameter) Default: 3ms
	On → Off	
Insulation Pressure		560VACrms / 3 Cycle (2000m altitude)
Insulation Resistance		10MΩ or more by Megohmmeter
Common Method		32 point / COM
Proper Cable Size		Stranded cable 0.3 mm ²
Current Consumption		50mA (when all point On)
Operation Indicator		Input On, LED On
External Connection Method		40-pin connector
Weight		60g



XBE-DC32A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-DC32A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%IX0.z.0 – %IX0.z.31

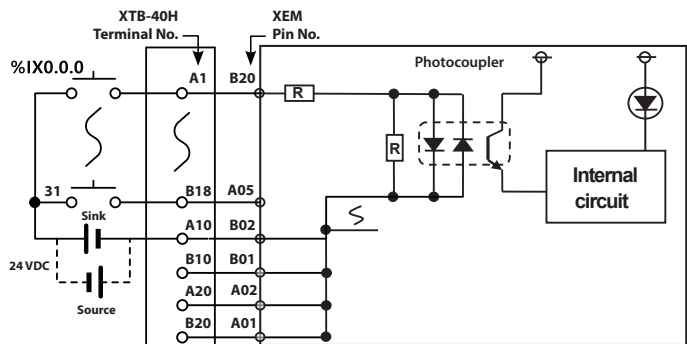
“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-DC32A Digital Input Module Wiring

XBE-DC32A Circuit Configuration				
Circuit Configuration	Module Pins	XTB-40H Terminal	Direct Variable	Description
	B20	A1	%IX0.z.0	Input 0
	B19	B1	%IX0.z.1	Input 1
	B18	A2	%IX0.z.2	Input 2
	B17	B2	%IX0.z.3	Input 3
	B16	A3	%IX0.z.4	Input 4
	B15	B3	%IX0.z.5	Input 5
	B14	A4	%IX0.z.6	Input 6
	B13	B4	%IX0.z.7	Input 7
	B12	A5	%IX0.z.8	Input 8
	B11	B5	%IX0.z.9	Input 9
	B10	A6	%IX0.z.10	Input 10
	B09	B6	%IX0.z.11	Input 11
	B08	A7	%IX0.z.12	Input 12
	B07	B7	%IX0.z.13	Input 13
	B06	A8	%IX0.z.14	Input 14
	B05	B8	%IX0.z.15	Input 15
	B04	A9	-	NC
	B03	B9	-	NC
	B02	A10	-	COM
	B01	B10	-	COM
	A20	A11	%IX0.z.16	Input 16
	A19	B11	%IX0.z.17	Input 17
	A18	A12	%IX0.z.18	Input 18
	A17	B12	%IX0.z.19	Input 19
	A16	A13	%IX0.z.20	Input 20
	A15	B13	%IX0.z.21	Input 21
	A14	A14	%IX0.z.22	Input 22
	A13	B14	%IX0.z.23	Input 23
	A12	A15	%IX0.z.24	Input 24
	A11	B15	%IX0.z.25	Input 25
	A10	A16	%IX0.z.26	Input 26
	A09	B16	%IX0.z.27	Input 27
	A08	A17	%IX0.z.28	Input 28
	A07	B17	%IX0.z.29	Input 29
	A06	A18	%IX0.z.30	Input 30
	A05	B18	%IX0.z.31	Input 31
	A04	A19	-	NC
	A03	B19	-	NC
	A02	A20	-	COM
	A01	B20	-	COM



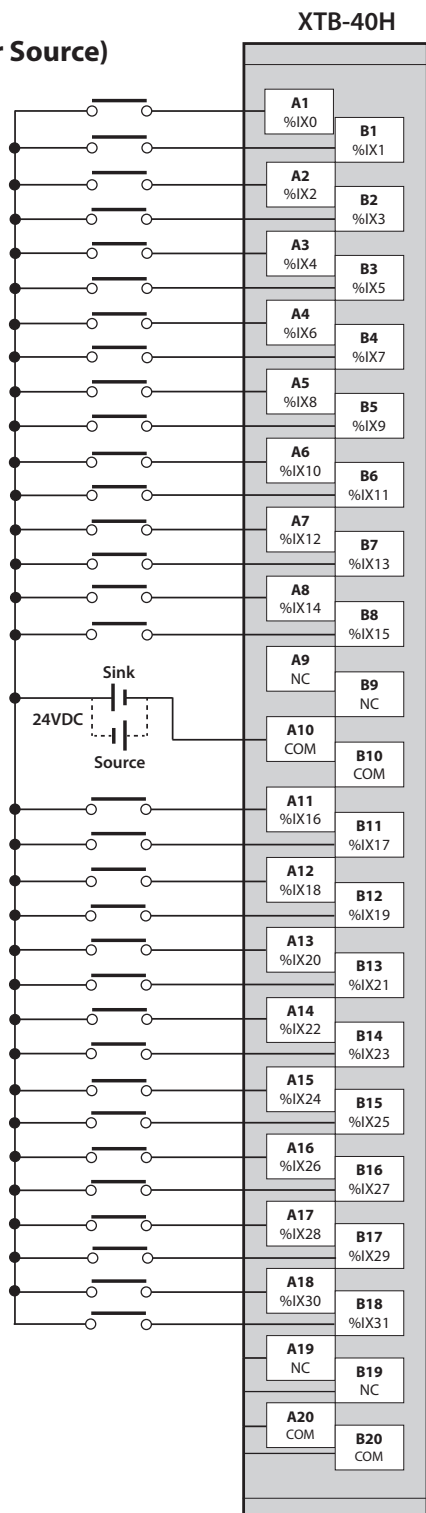
Note: Can be wired sinking or sourcing. In the I/O Direct Variable name, z=slot number.
 Note 2: Input Ambient Temp Derating: Derate 5% for each degree above 50°C. Max 55°C (25% derating at 55°C).

XBE-DC32A Digital Input Module Terminal Block Wiring

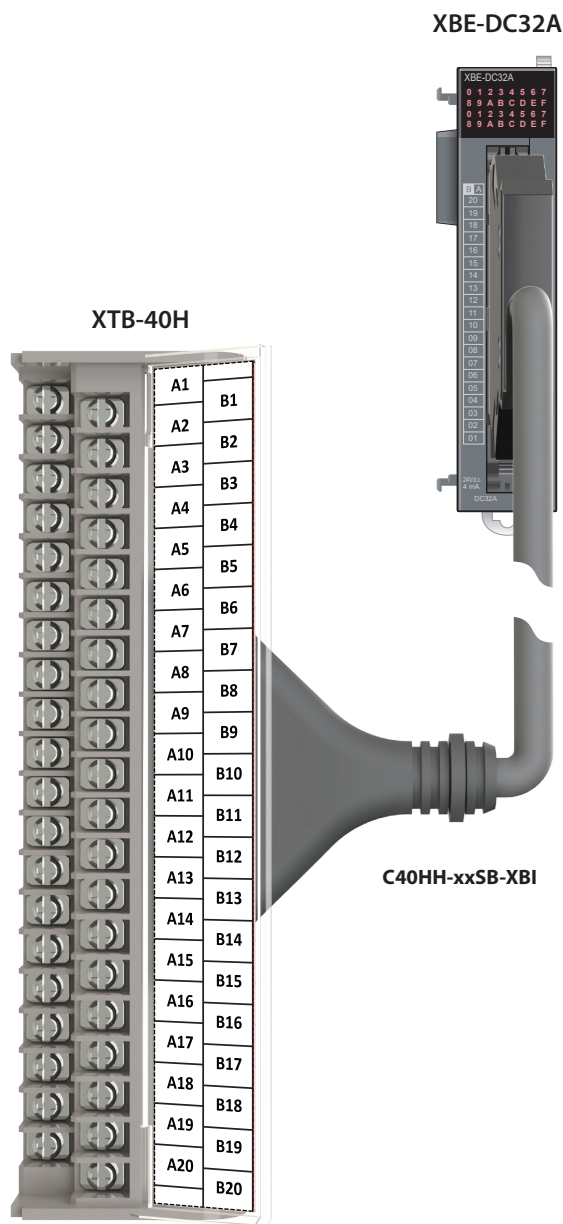
Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring

Inputs
(Sink or Source)



PLC Connection



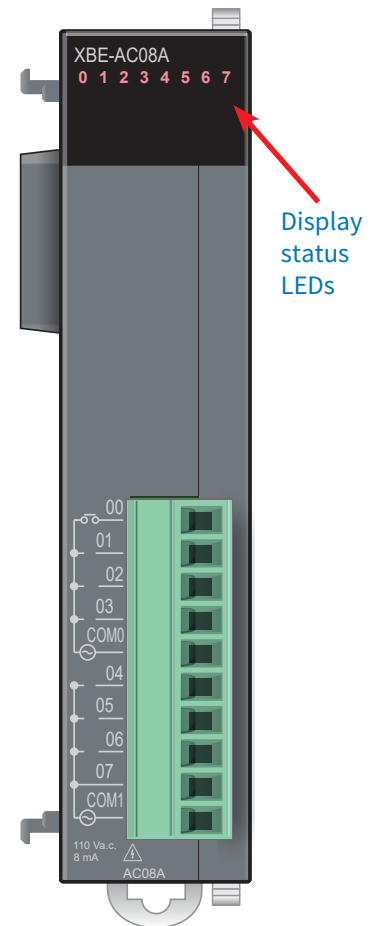
Note:

- Wiring: AWG22-16 (1.5mm²/MAX)
- Screw: M3 X 8L
- Screw Torque: 1.2 N·m (12kgf·cm)

XBE-AC08A Digital Input Module

Part Number	Price	Classification	Description	Drawing
XBE-AC08A	\$88.00	Digital Input	LS Electric XGB discrete input module, 8-point, 120 VAC, 2 common(s), 4 point(s) per common. Removable terminal blocks included.	PDF

General Specifications	XBE-AC08A	
Input Point	8 point	
Insulation Method	Photocoupler isolation	
Rated Input Voltage	100-120 VAC (+10/-15%), 50/60 Hz (\pm Hz) (distortion rate <5%)	
Rated Input Current	8mA at 60Hz, 7mA at 50Hz	
Operation Voltage Range	82-132 VAC	
On Voltage/Current	80VAC or higher, 5mA or higher 50/60 Hz	
Off Voltage/Current	30VAC or lower, 1mA or lower 50/60 Hz	
Input Resistance	12k Ω 60Hz, 15k Ω 50Hz	
Response Time	Off \rightarrow On	20ms or less (100VAC 50/60 Hz)
	On \rightarrow Off	25ms or less (100VAC 50/60 Hz)
Insulation Pressure	560VACrms / 3 Cycle (2000m altitude)	
Insulation Resistance	3000VACrms / 3 cycle (altitude 2000m), 10M Ω or more by Megohmmeter	
Common Method	4 point/common	
Proper Cable Size	0.05-1.5 mm ² (30-16 AWG), Cu wire, PCB terminal block	
Current Consumption	30mA (when all point On)	
Operation Indicator	Input On, LED On	
External Connection Method	10-point terminal block connector	
Weight	70g	



XBE-AC08A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-AC08A	Input: %IX0.z.0 - %IX0.z.63 Output: %QX0.z.0 - %QX0.z.63	%IX0.z.0 - %IX0.z.7

"z" denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-AC08A Digital Input Module Wiring

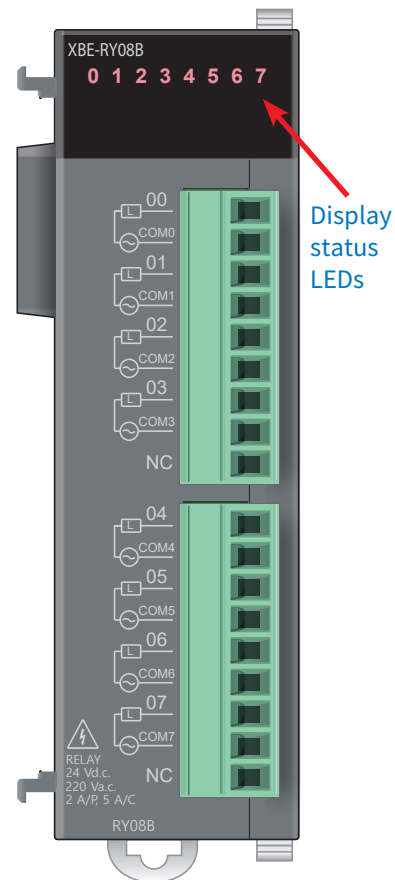
XBE-AC08A Circuit Configuration			
Circuit Configuration	Terminal Block Description	I/O Direct Variable	Terminal Block Image
	00	%IX0.z.0	
	01	%IX0.z.1	
	02	%IX0.z.2	
	03	%IX0.z.3	
	COM0	n/a	
	04	%IX0.z.4	
	05	%IX0.z.5	
	06	%IX0.z.6	
	07	%IX0.z.7	
COM1	n/a		

Note: In the I/O Direct Variable name, z=slot number.

XBE-RY08B Digital Output Module

Part Number	Price	Classification	Description	Drawing
XBE-RY08B	\$95.00	Digital Output	LS Electric XGB relay output module, 8-point, 125 VDC/250 VAC, (8) Form A, 8 isolated common(s), 1 point(s) per common, 2A/point. Removable terminal blocks included.	PDF

General Specifications		XBE-RY08B
Output Point		8 point
Insulation Method		Relay insulation
Rated Load Voltage		24VDC (resistive load) / 220VAC (COSΨ=1)
Rated Load Current		2A
Minimum Load Voltage/Current		5VDC / 1mA
Maximum Load Voltage		250VAC, 124VDC
Off-leakage Current		0.1 mA (220VAC, 60Hz)
Maximum On/Off Frequency		3,600 times/hour
Over Voltage Protection		None
Service Life	Mechanical	20 million times or more
	Electrical	Rated load voltage / current 100,000 times or more
		200VAC / 1.5 A, 240VAC / 1A (COSΨ=0.7) 100,000 times or more
		200VAC / 1A, 240VAC / 0.5 A (COSΨ=0.35) 100,000 times or more
Response Time	Off → On	10ms or less
	On → Off	12ms or less
Common Method		1 point / COM
Proper Cable Size		Standard cable 0.3–0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption		230mA (when all point ON)
Operation Indicator		Output ON, LED ON
External Connection Method		9 point terminal block connector x 2
Weight		81g



XBE-RY08B - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input direct variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-RY08B	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.7

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.
[Digital Module Setup](#)

XBE-RY08B Digital Output Module Wiring

XBE-RY08B Circuit Configuration				
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image	
	00	%QX0.z.0		
	COM0	-		
	01	%QX0.z.1		
	COM1	-		
	02	%QX0.z.2		
	COM2	-		
	03	%QX0.z.3		
	COM3	-		
	NC	-		
	Bottom TB Description	I/O Direct Variable		
	04	%QX0.z.4		
	COM4	-		
	05	%QX0.z.5		
	COM5	-		
	06	%QX0.z.6		
COM6	-			
07	%QX0.z.7			
COM7	-			
NC	-			

Note: In the I/O Direct Variable name, z=slot number.

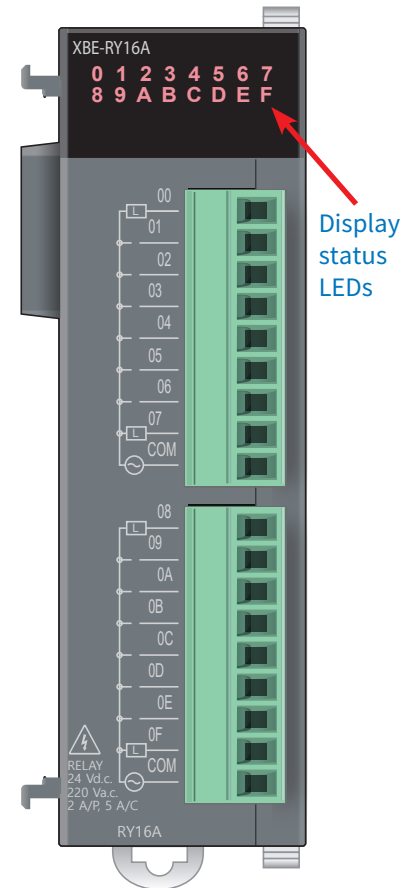


XGB Digital Modules

XBE-RY16A Relay Output Module

Part Number	Price	Classification	Description	Drawing
XBE-RY16A	\$110.00	Relay Output	LS Electric XGB relay output module, 16-point, 125 VDC/250 VAC, (16) Form A, 2 isolated common(s), 8 point(s) per common, 2A/point, 5A/common. Removable terminal blocks included.	PDF

General Specifications		XBE-RY16A
Input Point		16 point
Insulation Method		Relay insulation
Rated Input Voltage		24VDC (resistive load), 220VAC (COSΨ=1)
Rated Input Current		2A/point, 5A/COM
Minimum Load Voltage/Current		5VDC / 1mA
Maximum Load Voltage		250VAC, 125VDC
Off Leakage Current		0.1 mA (220VAC, 60Hz)
Maximum On/Off Frequency		3,600 times/hr
Over Voltage Protection		None
Service Life	Mechanical	20 million times or more
	Electrical	Rated load voltage / current 100,000 times or more
		200VAC / 1.5 A, 240VAC / 1A (COSΨ=0.7) 100,000 times or more
		200VAC / 1A, 240VAC / 0.5 A (COSΨ=0.35) 100,000 times or more
Response Time	Off → On	10ms or less
	On → Off	12ms or less
Common Method		8 point/COM
Proper Cable Size		Standard cable 0.3–0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption		420mA (when all point ON)
Operation Indicator		Output ON, LED ON
External Connection Method		9 point terminal block connector x 2
Weight		130g



XBE-RY16A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-RY16A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.15

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.
[Digital Module Setup](#)

XBE-RY16A Relay Output Module Wiring

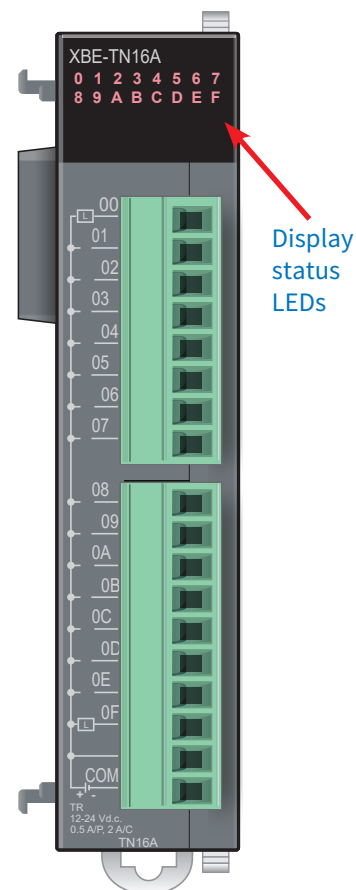
XBE-RY16A Circuit Configuration			
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image
	00	%QX0.z.0	
	01	%QX0.z.1	
	02	%QX0.z.2	
	03	%QX0.z.3	
	04	%QX0.z.4	
	05	%QX0.z.5	
	06	%QX0.z.6	
	07	%QX0.z.7	
	COM	n/a	
	Bottom TB Description	I/O Direct Variable	
	08	%QX0.z.8	
	09	%QX0.z.9	
	0A	%QX0.z.10	
	0B	%QX0.z.11	
	0C	%QX0.z.12	
	0D	%QX0.z.13	
0E	%QX0.z.14		
0F	%QX0.z.15		
COM	n/a		

Note: In the I/O Direct Variable name, z=slot number.

XBE-TN16A Digital Output Module

Part Number	Price	Classification	Description	Drawing
XBE-TN16A	\$78.00	Digital Output	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sinking, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.	PDF

General Specifications		XBE-TN16A
Input Point		16 point
Insulation Method		Photo coupler insulation
Rated Load Voltage		12/24 VDC
Load Voltage Range		10.2 – 26.4 VDC
Maximum Load Current		0.5 A / 1 point, 2A / 1COM
Off Leakage Current		0.1 mA or less
Maximum Inrush Current		4A / 10ms or less
Maximum Voltage Drop (On)		0.4 VDC or less
Over Voltage Protection		Zener Diode
Response Time	Off → On	1ms or less
	On → Off	1ms or less (Rated load, resistive load)
Common Method		16 point / COM
Proper Cable Size		Standard cable 0.3–0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption		60mA (when all point On)
External Power Supply	Voltage	12/24 VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	10mA or less (24VDC connection)
Operation Indicator		Output On, LED On
External Connection Method		8 pin terminal block connector + 10 pin terminal block connector
Weight		54g



XBE-TN16A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-TN16A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.15

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-TN16A Digital Output Module Wiring

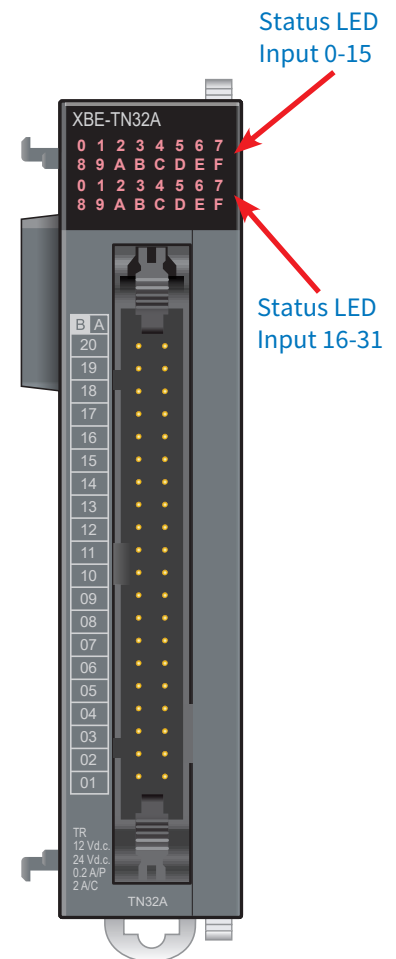
XBE-TN16A Circuit Configuration				
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image	
	00	%QX0.z.0		
	01	%QX0.z.1		
	02	%QX0.z.2		
	03	%QX0.z.3		
	04	%QX0.z.4		
	05	%QX0.z.5		
	06	%QX0.z.6		
	07	%QX0.z.7		
	Bottom TB Description	I/O Direct Variable		
	08	%QX0.z.8		
	09	%QX0.z.9		
	0A	%QX0.z.10		
	0B	%QX0.z.11		
	0C	%QX0.z.12		
	0E	%QX0.z.14		
	0F	%QX0.z.15		
(no label, 12/24V)	-			
COM	-			

Note: In the I/O Direct Variable name, z=slot number.

XBE-TN32A Digital Output Module

Part Number	Price	Classification	Description	Drawing
XBE-TN32A	\$109.00	Digital Output	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sinking, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	PDF

General Specifications		XBE-TN32A
Input Point		32 point
Insulation Method		Photocoupler insulation
Rated Load Voltage		12/24 VDC
Load Voltage Range		10.2 – 26.4 VDC
Maximum Load Current		0.2 A / 1 point, 2A / 1COM
Off Leakage Current		0.1 mA or less
Maximum Inrush Current		0.7 A / 10ms or less
Maximum Voltage Drop (On)		0.4 VDC or less
Over Voltage Protection		Zener Diode
Response Time	Off → On	1ms or less
	On → Off	1ms or less (rated load, resistive load)
Common Method		32 point / COM
Proper Cable Size		0.3 mm ²
Current Consumption		120mA (when all point On)
External Power Supply	Voltage	12/24 VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	20mA or less (24VDC connection)
Operation Indicator		Output On, LED On
External Connection Method		40 pin connector
Weight		60g



XBE-TN32A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-TN32A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.31

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-TN32A Digital Output Module Wiring

XBE-TN32A Circuit Configuration				
Circuit Configuration	Module Pins	XTB-40H Terminal	Direct Variable	Description
	B20	A1	%QX0.z.0	Output 0
	B19	B1	%QX0.z.1	Output 1
	B18	A2	%QX0.z.2	Output 2
	B17	B2	%QX0.z.3	Output 3
	B16	A3	%QX0.z.4	Output 4
	B15	B3	%QX0.z.5	Output 5
	B14	A4	%QX0.z.6	Output 6
	B13	B4	%QX0.z.7	Output 7
	B12	A5	%QX0.z.8	Output 8
	B11	B5	%QX0.z.9	Output 9
	B10	A6	%QX0.z.10	Output 10
	B09	B6	%QX0.z.11	Output 11
	B08	A7	%QX0.z.12	Output 12
	B07	B7	%QX0.z.13	Output 13
	B06	A8	%QX0.z.14	Output 14
	B05	B8	%QX0.z.15	Output 15
	B04	A9	-	NC
	B03	B9	-	NC
	B02	A10	-	+12/24 V
	B01	B10	-	+12/24 V
	A20	A11	%QX0.z.16	Output 16
	A19	B11	%QX0.z.17	Output 17
	A18	A12	%QX0.z.18	Output 18
	A17	B12	%QX0.z.19	Output 19
	A16	A13	%QX0.z.20	Output 20
	A15	B13	%QX0.z.21	Output 21
	A14	A14	%QX0.z.22	Output 22
	A13	B14	%QX0.z.23	Output 23
	A12	A15	%QX0.z.24	Output 24
	A11	B15	%QX0.z.25	Output 25
	A10	A16	%QX0.z.26	Output 26
	A09	B16	%QX0.z.27	Output 27
A08	A17	%QX0.z.28	Output 28	
A07	B17	%QX0.z.29	Output 29	
A06	A18	%QX0.z.30	Output 30	
A05	B18	%QX0.z.31	Output 31	
A04	A19	-	NC	
A03	B19	-	NC	
A02	A20	-	COM	
A01	B20	-	COM	

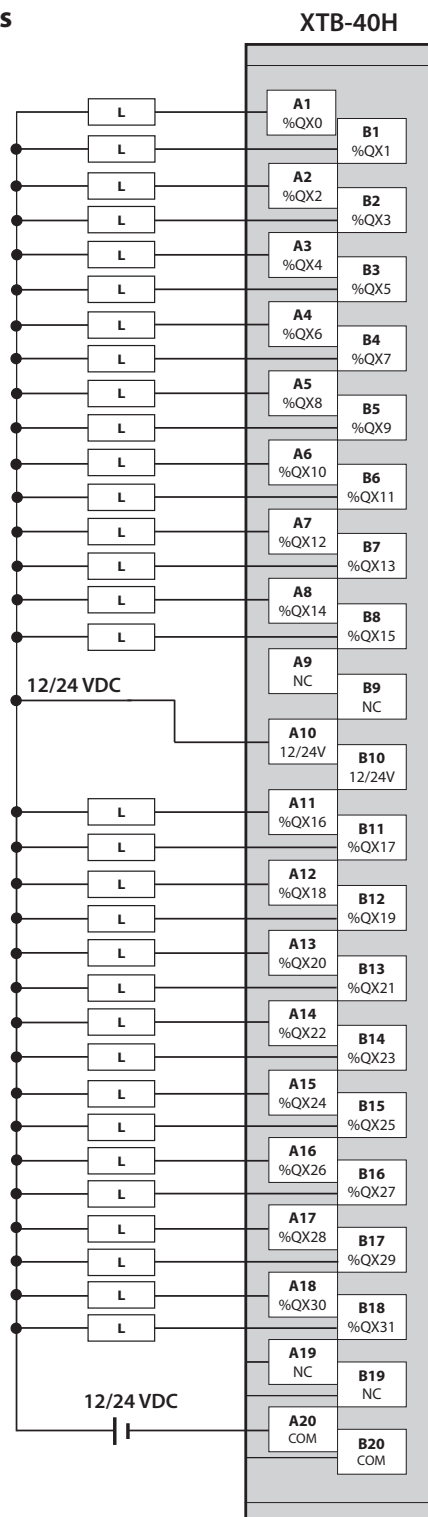
Note: In the I/O Direct Variable name, z=slot number.

XBE-TN32A Digital Output Module Terminal Block Wiring

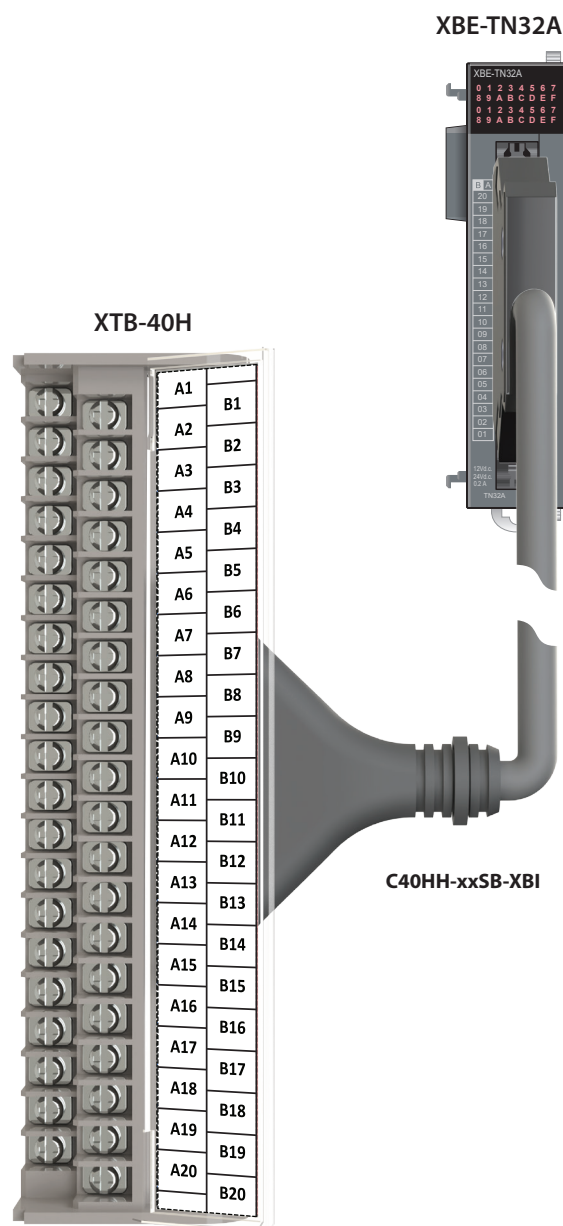
Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring

Outputs
(Sink)



PLC Connection



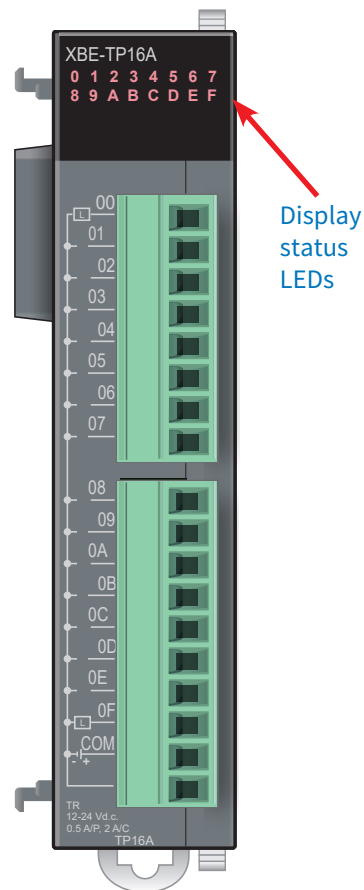
Note:

- Wiring: AWG22-16 (1.5mm²/MAX)
- Screw: M3 X 8L
- Screw Torque: 1.2 N·m (12kgf·cm)

XBE-TP16A Digital Output Module

Part Number	Price	Classification	Description	Drawing
XBE-TP16A	\$88.00	Digital Output	LS Electric XGB discrete output module, 16-point, 12-24 VDC, sourcing, 1 common(s), 16 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.	PDF

General Specifications		XBE-TP16A
Input Point		16 point
Insulation Method		Photocoupler insulation
Rated Load Voltage		12/24 VDC
Load Voltage Range		10.2 – 26.4 VDC
Maximum Load Current		0.5 A / 1 point, 2A / 1COM
Off Leakage Current		0.1 mA or less
Maximum Inrush Current		4A / 10ms or less
Maximum Voltage Drop (On)		0.4 VDC or less
Over Voltage Protection		Zener diode
Response Time	Off → On	1ms or less
	On → Off	1ms or less (rated load, resistive load)
Common Method		16 point / COM
Proper Cable Size		Standard cable 0.3–0.75 mm ² (external diameter 2.8 mm or less)
Current Consumption		60mA (when all point On)
External Power Supply	Voltage	12/24 VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	10mA or less (24VDC connection)
Operation Indicator		LED On when output On
External Connection Method		8 pin terminal block connector + 10 pin terminal block connector
Weight		40g



XBE-TP16A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-TP16A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.15

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-TP16A Digital Output Module Wiring

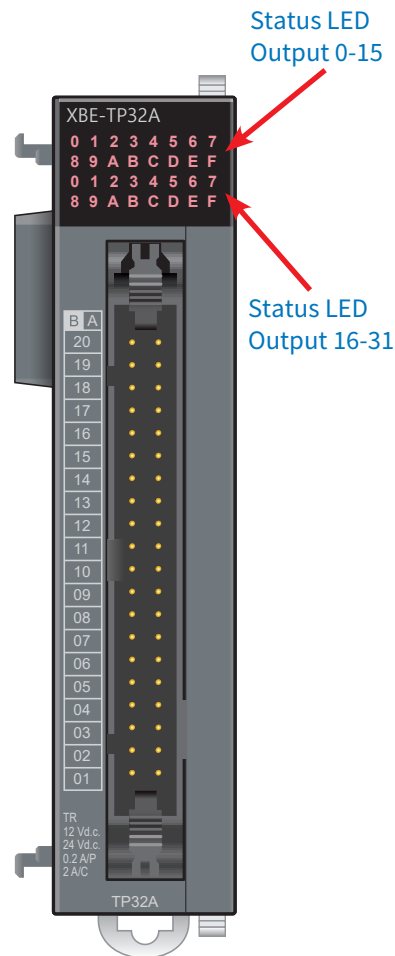
XBE-TP16A Circuit Configuration				
Circuit Configuration	Top TB Description	I/O Direct Variable	Terminal Block Image	
	00	%IX0.z.0		
	01	%IX0.z.1		
	02	%IX0.z.2		
	03	%IX0.z.3		
	04	%IX0.z.4		
	05	%IX0.z.5		
	06	%IX0.z.6		
	07	%IX0.z.7		
	Bottom TB Description	I/O Direct Variable		
	08	%IX0.z.8		
	09	%IX0.z.9		
	0A	%IX0.z.10		
	0B	%IX0.z.11		
	0C	%IX0.z.12		
	0D	%IX0.z.13		
	0E	%IX0.z.14		
0F	%IX0.z.15			
COM (12/24 VDC)	-			
(no label, 0VDC)	-			

Note: In the I/O Direct Variable name, z=slot number.

XBE-TP32A Digital Output Module

Part Number	Price	Classification	Description	Drawing
XBE-TP32A	\$93.00	Digital Output	LS Electric XGB discrete output module, 32-point, 12-24 VDC, sourcing, 1 common(s), 32 point(s) per common, 0.2A/point, 2A/common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	PDF

General Specifications		XBE-TP32A
Input Point		32 point
Insulation Method		Photocoupler insulation
Rated Load Voltage		12/24 VDC
Load Voltage Range		10.2 – 26.4 VDC
Maximum Load Current		0.2 A / 1 point, 2A / 1COM
Off Leakage Current		0.1 mA or less
Maximum Inrush Current		4A / 10ms or less
Maximum Voltage Drop (On)		0.4 VDC or less
Over Voltage Protection		Zener diode
Response Time	Off → On	1ms or less
	On → Off	1ms or less (rated load, resistive load)
Common Method		32 point / COM
Proper Cable Size		0.3 mm ²
Current Consumption		120mA (when all point On)
External Power Supply	Voltage	12/24 VDC ± 10% (ripple voltage 4 Vp-p or less)
	Current	20mA or less (24VDC connection)
Operation Indicator		LED On when output On
External Connection Method		40 pin connector
Weight		60g



XBE-TP32A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-TP32A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%QX0.z.0 – %QX0.z.31

“z” denotes the module slot (2 to 8).

Follow the Quick start video to learn how to Register and Configure any Digital I/O Module.

[Digital Module Setup](#)

XBE-TP32A Digital Output Module Wiring

XBE-TP32A Circuit Configuration				
Circuit Configuration	Module Pins	XTB-40H Terminal	Direct Variable	Description
	B20	A1	%QX0.z.0	Output 0
	B19	B1	%QX0.z.1	Output 1
	B18	A2	%QX0.z.2	Output 2
	B17	B2	%QX0.z.3	Output 3
	B16	A3	%QX0.z.4	Output 4
	B15	B3	%QX0.z.5	Output 5
	B14	A4	%QX0.z.6	Output 6
	B13	B4	%QX0.z.7	Output 7
	B12	A5	%QX0.z.8	Output 8
	B11	B5	%QX0.z.9	Output 9
	B10	A6	%QX0.z.10	Output 10
	B09	B6	%QX0.z.11	Output 11
	B08	A7	%QX0.z.12	Output 12
	B07	B7	%QX0.z.13	Output 13
	B06	A8	%QX0.z.14	Output 14
	B05	B8	%QX0.z.15	Output 15
	B04	A9	-	NC
	B03	B9	-	NC
	B02	A10	-	External Power Common
	B01	B10	-	External Power Common
	A20	A11	%QX0.z.16	Output 16
	A19	B11	%QX0.z.17	Output 17
	A18	A12	%QX0.z.18	Output 18
	A17	B12	%QX0.z.19	Output 19
	A16	A13	%QX0.z.20	Output 20
	A15	B13	%QX0.z.21	Output 21
	A14	A14	%QX0.z.22	Output 22
	A13	B14	%QX0.z.23	Output 23
	A12	A15	%QX0.z.24	Output 24
	A11	B15	%QX0.z.25	Output 25
	A10	A16	%QX0.z.26	Output 26
	A09	B16	%QX0.z.27	Output 27
A08	A17	%QX0.z.28	Output 28	
A07	B17	%QX0.z.29	Output 29	
A06	A18	%QX0.z.30	Output 30	
A05	B18	%QX0.z.31	Output 31	
A04	A19	-	NC	
A03	B19	-	NC	
A02	A20	-	0V GND	
A01	B20	-	0V GND	

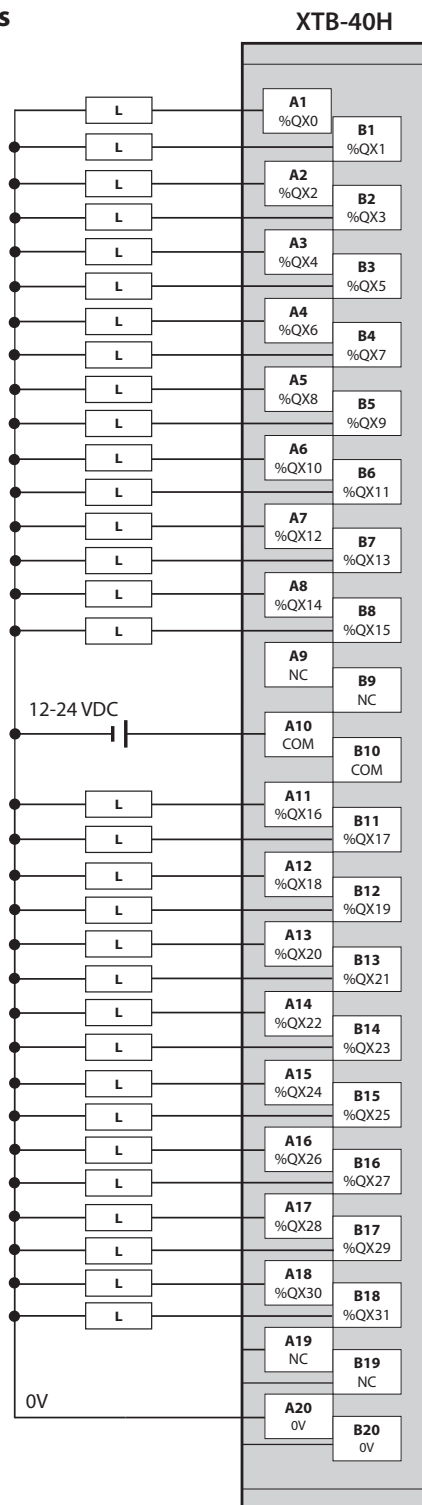
Note: In the I/O Direct Variable name, z=slot number.

XBE-TP32A Digital Output Module Terminal Block Wiring

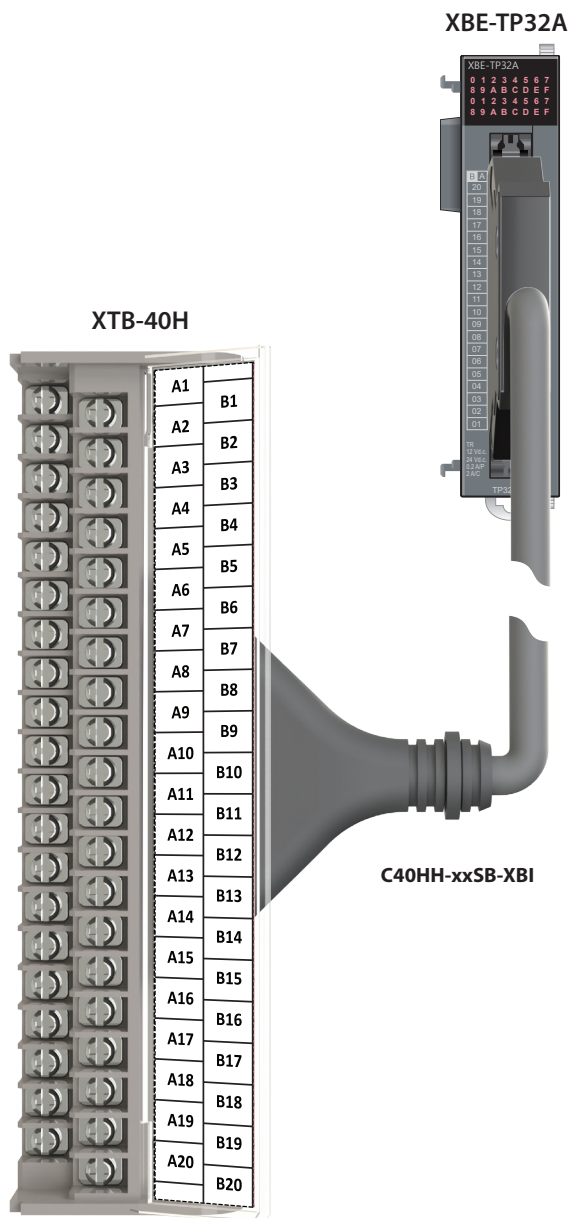
Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring

Outputs
(Sink)



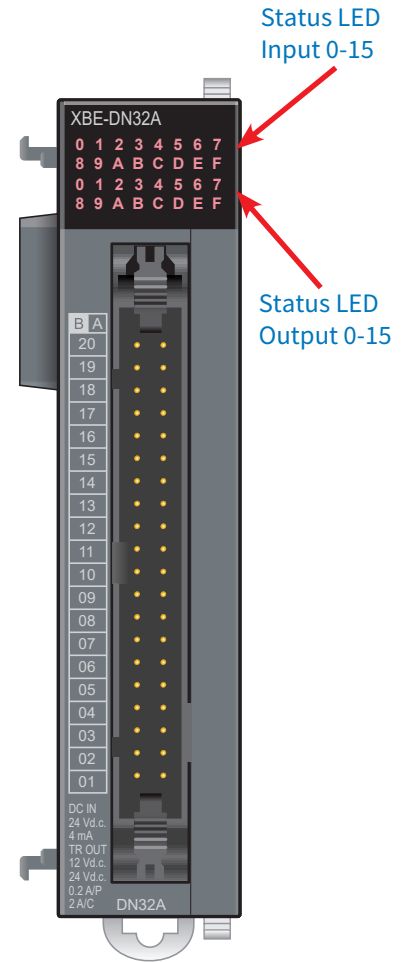
PLC Connection



XBE-DN32A Digital Combo Module

Part Number	Price	Classification	Description	Drawing
XBE-DN32A	\$172.00	Digital Input/Output	LS Electric XGB discrete combo module, Input: 16-point, 24 VDC, sinking/sourcing, Output: 16-point, 12-24 VDC, sinking, 0.2A/point, 2A/ common. Requires XTB-40H terminal block and C40HH-xxSB-XBI cable.	PDF

General Specifications		XBE-DN32A	
Input Specifications	Input Point	16 point	
	Rated Input Voltage	24VDC	
	Rated Input Current	~ 4mA	
	Operation Voltage Range	20.4 – 28.8 VDC (ripple rate <5%)	
	On Voltage/Current	19VDC or higher / 3mA or higher	
	Off Voltage/Current	6VDC or less / 1mA or less	
	Input Resistance	~ 5.6kΩ	
	Response Time	Off → On	1/3/5/10/20/70/100 ms (set by CPU parameter) Default: 3ms
		On → Off	
	Common Method	16 point / COM	
Output Specifications	Output Point	16 point	
	Rated Voltage	12/24 VDC	
	Operation Voltage Range	10.2–26.4 VDC	
	Operation Load Current	0.2 A / 1 point, 2A / 1COM	
	Off Leakage Current	0.1 mA or less	
	Maximum Load Current	0.7A / 10ms or less	
	Maximum Voltage Drop (On)	0.4 VDC or less	
	Response Time	Off → On	1ms or less 1ms or less (rated load, resistive load)
		On → Off	
	Common Method	16 point / COM	
External Power	Voltage	12/24 VDC ±10% (ripple voltage 4 Vp-p or less)	
	Current	20mA or less (connecting 24VDC)	
Over Voltage Protection	TVS Diode		
Insulation Method	Photocoupler insulation		
Insulation Pressure	560VACrms / 3 Cyle (altitude 2000m)		
Insulation Resistance	10MΩ or more by Megohmmeter		
Proper Cable Size	0.3 mm ²		
Current Consumption	60mA (when all inputs and outputs are On)		
Operation Indicator	Input On, LED On		
External Connection Method	40 pin connector		
Weight	60g		



XBE-DN32A - Digital I/O Module Configuration

Direct Variables

The base rack slot number determines the Direct Variable name for the module. Each slot is automatically allocated 64 input points and 64 output points. See the chart below for the actual input Direct Variable assignments used.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Part Number	PLC Memory Allocation	Actual I/O Direct Variable
XBE-DN32A	Input: %IX0.z.0 – %IX0.z.63 Output: %QX0.z.0 – %QX0.z.63	%IX0.z.0 - %IX0.z.15 %QX0.z.0 - %QX0.z.15

“z” denotes the module slot (2 to 8).

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[Digital Module Setup](#)

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XBE-DN32A Digital Combo Module Wiring

XBE-DN32A Input Circuit Configuration				
Circuit Configuration	XTB-40H Terminal	XEM Pin#	I/O Direct Variable	Description
<p>The diagram shows the input circuit configuration for the XBE-DN32A module. It features a 24VDC source connected to a sink terminal (15) and a switch. The switch is connected to terminal A1 (XTB-40H Terminal No. 15) and B20 (Module Pin No. B20). The module contains a photo coupler with an internal circuit. The output of the photo coupler is connected to terminal B20. Other terminals shown include B8, B05, A10, B02, B10, and B01.</p>	A1	B20	%IX0.z.0	General Input 0
	B1	B19	%IX0.z.1	General Input 1
	A2	B18	%IX0.z.2	General Input 2
	B2	B17	%IX0.z.3	General Input 3
	A3	B16	%IX0.z.4	General Input 4
	B3	B15	%IX0.z.5	General Input 5
	A4	B14	%IX0.z.6	General Input 6
	B4	B13	%IX0.z.7	General Input 7
	A5	B12	%IX0.z.8	General Input 8
	B5	B11	%IX0.z.9	General Input 9
	A6	B10	%IX0.z.10	General Input 10
	B6	B09	%IX0.z.11	General Input 11
	A7	B08	%IX0.z.12	General Input 12
	B7	B07	%IX0.z.13	General Input 13
	A8	B06	%IX0.z.14	General Input 14
B8	B05	%IX0.z.15	General Input 15	
A9	B04	-	Not used (NC)	
B9	B03	-	Not used (NC)	
A10	B02	-	Common	
B10	B01	-	Common	

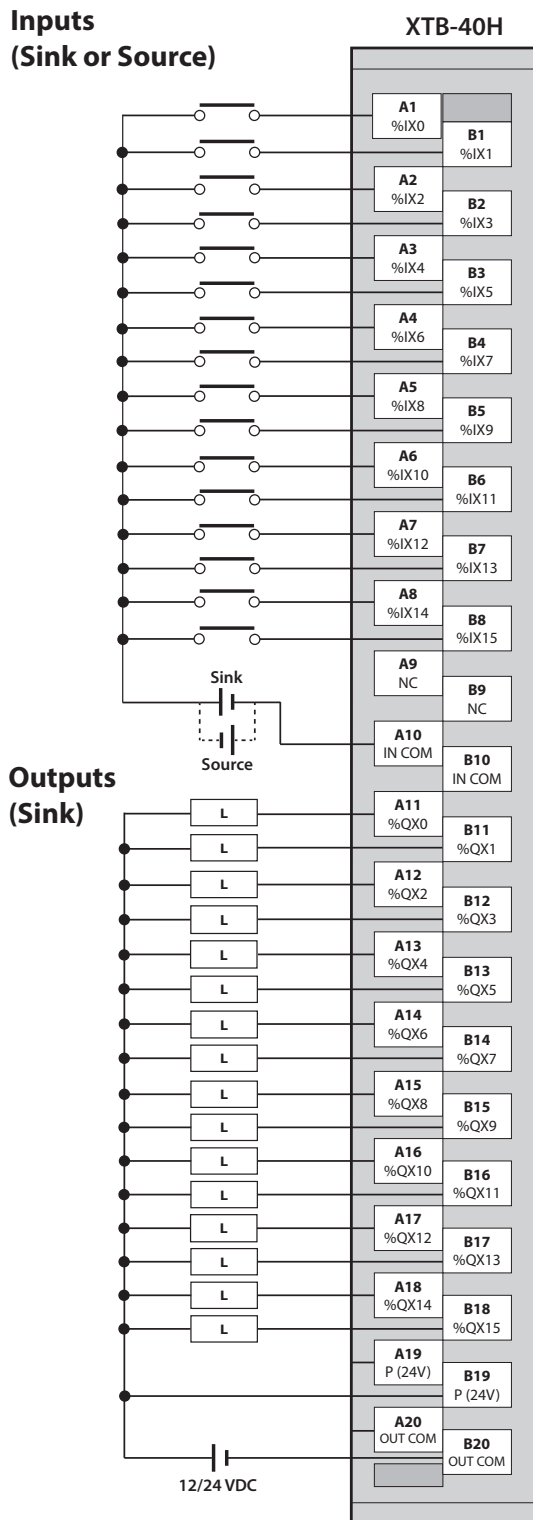
XBE-DN32A Output Circuit Configuration				
<p>The diagram shows the output circuit configuration for the XBE-DN32A module. It features a 5VDC source connected to an internal circuit. The output of the internal circuit is connected to terminal A20 (Module Pin No. A20) and A11 (XTB-40H Terminal No. A11). The module contains a photo coupler with an internal circuit. The output of the photo coupler is connected to terminal A20. The output is connected to a load through terminal A11. The load is connected to terminal B18 (XTB-40H Terminal No. B18) and A19 (XTB-40H Terminal No. A19). The load is connected to a 12/24 VDC source. Other terminals shown include A5, A4, A3, A2, A1, B19, B20, and B15.</p>	A11	A20	%QX0.z.0	General Output 0
	B11	A19	%QX0.z.1	General Output 1
	A12	A18	%QX0.z.2	General Output 2
	B12	A17	%QX0.z.3	General Output 3
	A13	A16	%QX0.z.4	General Output 4
	B13	A15	%QX0.z.5	General Output 5
	A14	A14	%QX0.z.6	General Output 6
	B14	A13	%QX0.z.7	General Output 7
	A15	A12	%QX0.z.8	General Output 8
	B15	A11	%QX0.z.9	General Output 9
	A16	A10	%QX0.z.10	General Output 10
	B16	A09	%QX0.z.11	General Output 11
	A17	A08	%QX0.z.12	General Output 12
	B17	A07	%QX0.z.13	General Output 13
	A18	A06	%QX0.z.14	General Output 14
B18	A05	%QX0.z.15	General Output 15	
A19	A04	-	P (24V)	2.0A/common
B19	A03	-	P (24V)	
A20	A02	-	OUT_COM	
B20	A01	-	OUT_COM	

Note: Input Ambient Temp Derating: Derate 5% for each degree above 50°C. Max 55°C (25% derating at 55°C).

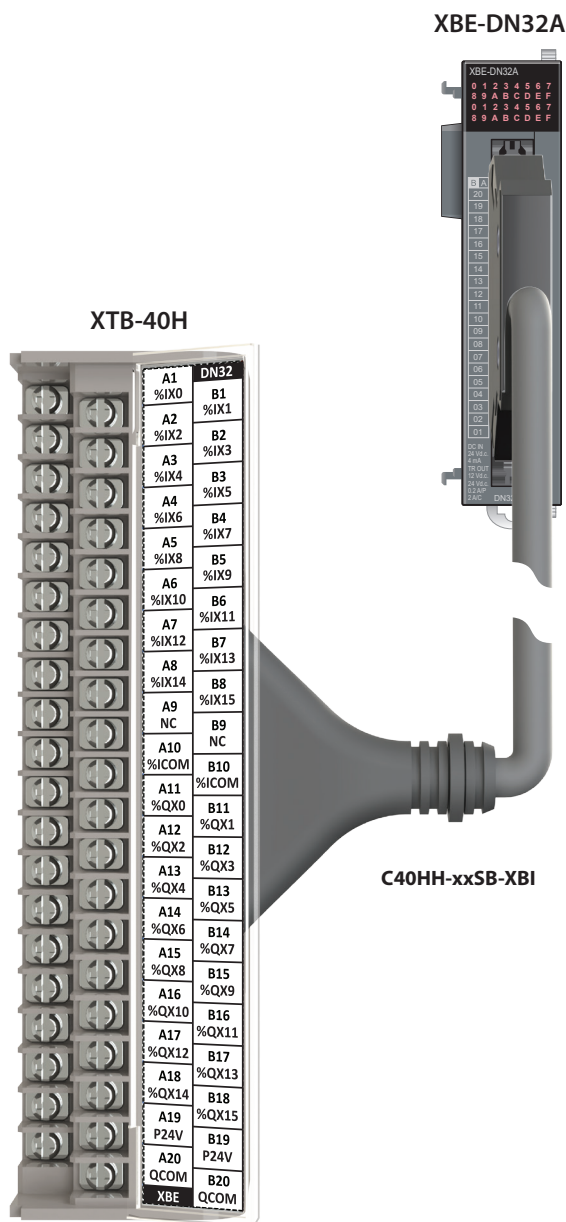
XBE-DN32A Digital Output Module Terminal Block Wiring

Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring



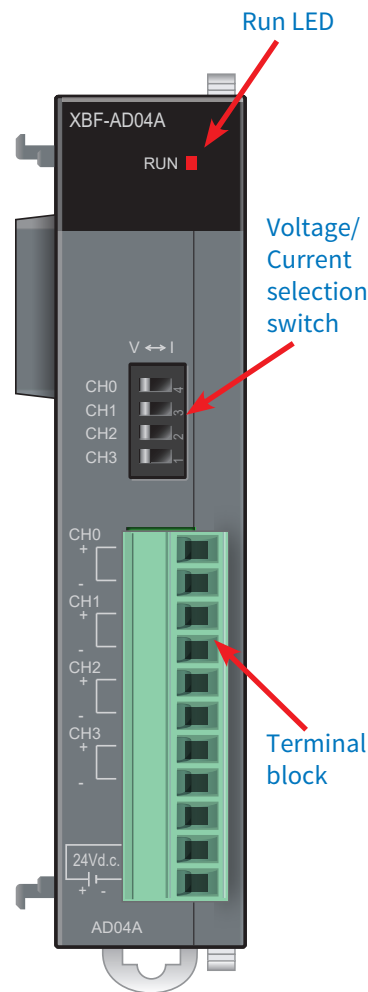
PLC Connection



XBF-AD04A Analog Input Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-AD04A	\$160.00	Voltage/Current Input	LS Electric XGB analog input module, 4-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-10 VDC, external 24 VDC required.	4	PDF

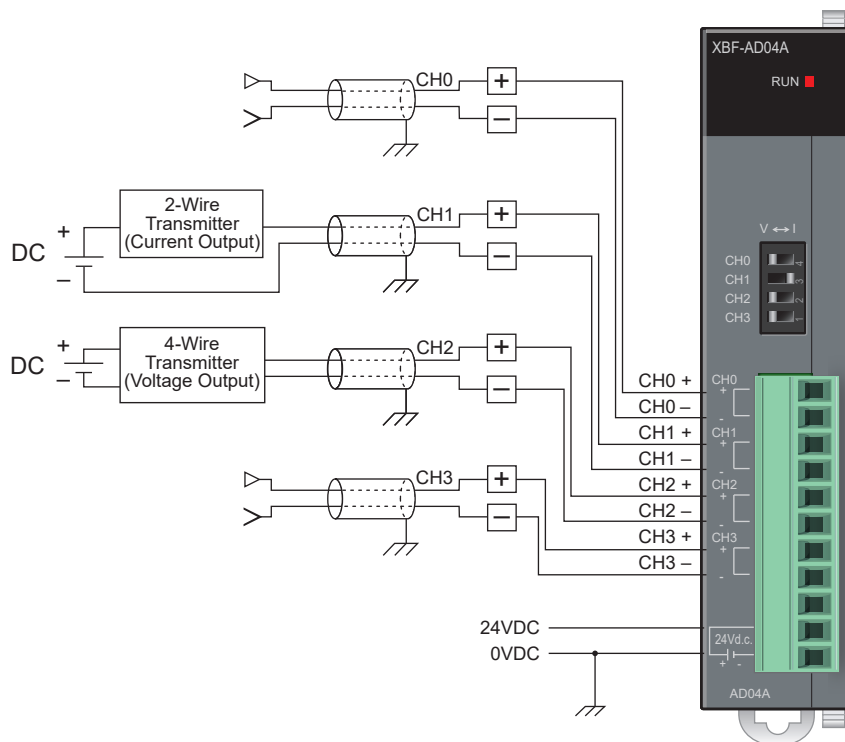
General Specifications		XBF-AD04A		
		Voltage	Current	
Analog Input Range		0-10 VDC (Input resistance: 1MΩ min.)	DC 4-20mA DC 0-20mA (Input resistance: 250Ω)	
Digital Output	Type	12-bit binary data		
	Direct Variable	%UW0.z.0 - %UW0.z.31 (z=slot number)		
	Range	Unsigned Value	0-4000	
		Signed Value	-2000 to 2000	
		Precise Value	0-1000	400-2000 / 0-2000
		Percentile Value	0-1000	
Maximum Resolution		2.5 mV (1/4000)	5μA (1/4000)	
Accuracy		± 0.5% or less		
Maximum Conversion Speed		1.5 ms/channel		
Absolute Maximum Input		±15VDC	±25mA DC	
Number of Input Channels		4 channels		
Insulation Method		Photocoupler insulation between input terminal and PLC power (no insulation between channels)		
Connection Terminal		11-point terminal block		
I/O Points Occupied		Fixed type: 512 points		
Current Consumption	Internal (5VDC)	120mA		
	External (24VDC)	62mA		
Weight		64g		
Additional Function		Filter processing, average processing (time, count)		
Power Supply		20.4-28.8 VDC		



XBF-AD04A Analog Input Module Wiring

When connecting cable to your XBF-AD04A:

- In case of voltage/current input, wiring is the same. Adjust the voltage/current setting switch according to the case.
- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Current input resistance is 250Ω
- Voltage input resistance is 1MΩ
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-AD04A Analog Input Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the "U" memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

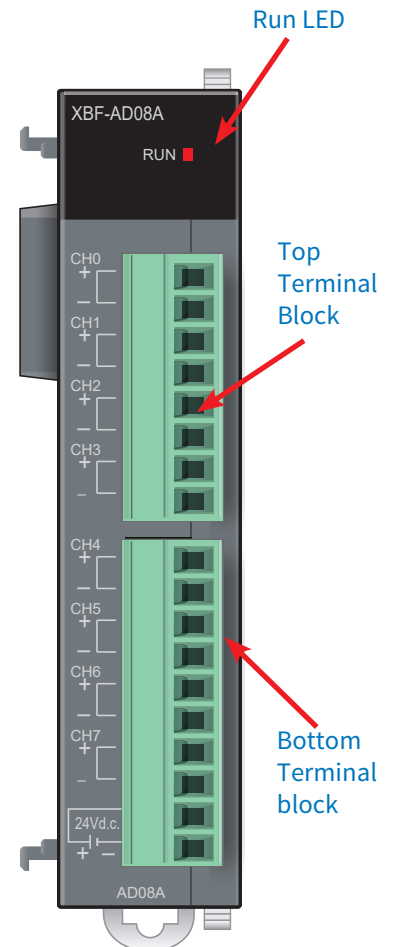
Symbolic variables and direct variables for AD04A are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	._0z_CH0_ACT	%UX0.z.16	BOOL	Analog Input Module: CH0 Activation Status
Tag	GlobalVariable	._0z_CH0_DATA	%UW0.z.2	WORD	Analog Input Module: CH0 Output
Tag	GlobalVariable	._0z_CH1_ACT	%UX0.z.17	BOOL	Analog Input Module: CH1 Activation Status
Tag	GlobalVariable	._0z_CH1_DATA	%UW0.z.3	WORD	Analog Input Module: CH1 Output
Tag	GlobalVariable	._0z_CH2_ACT	%UX0.z.18	BOOL	Analog Input Module: CH2 Activation Status
Tag	GlobalVariable	._0z_CH2_DATA	%UW0.z.4	WORD	Analog Input Module: CH2 Output
Tag	GlobalVariable	._0z_CH3_ACT	%UX0.z.19	BOOL	Analog Input Module: CH3 Activation Status
Tag	GlobalVariable	._0z_CH3_DATA	%UW0.z.5	WORD	Analog Input Module: CH3 Output
Tag	GlobalVariable	._0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Input Module: Bool Array of Active bit for Channel 0 to 3
Tag	GlobalVariable	._0z_CH_DATA_ARY	%UW0.z.2	ARRAY[0..3] OF WORD	Analog Input Module: Word Array of Data for Channel 0 to 3
Tag	GlobalVariable	._0z_ERR	%UX0.z.0	BOOL	Analog Input Module: Error Flag
Tag	GlobalVariable	._0z_ERR_CLR	%UX0.z.176	BOOL	Analog Input Module: Error Clear Request
Tag	GlobalVariable	._0z_RDY	%UX0.z.15	BOOL	Analog Input Module: Ready Flag

XBF-AD08A Analog Input Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-AD08A	\$242.00	Voltage/current Input	LS Electric XGB analog input module, 8-channel, current/voltage, 12-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, external 24 VDC required.	8	PDF

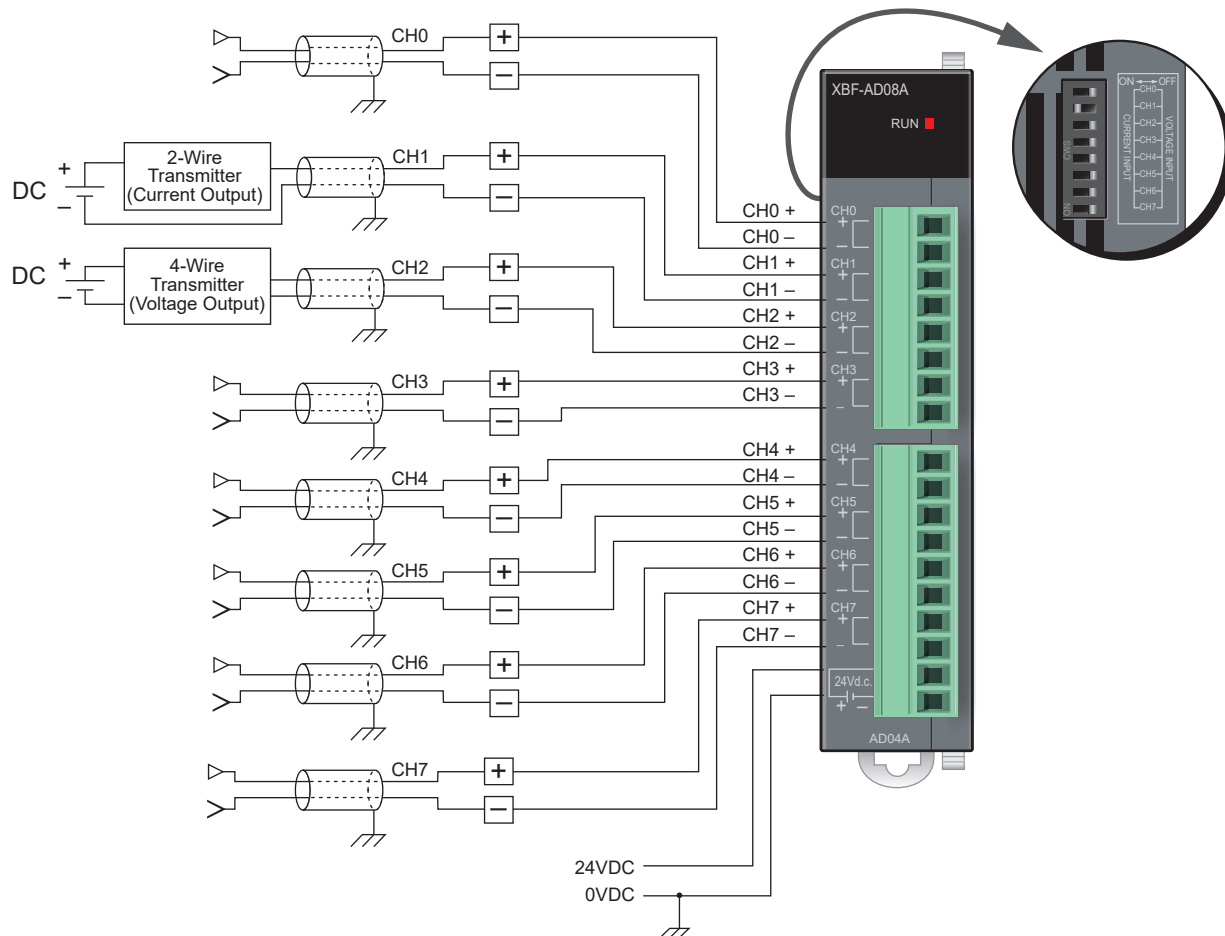
General Specifications		XBF-AD08A		
		Voltage	Current	
Analog Input Range		1-5 VDC 0-5 VDC 0-10 VDC (input resistance 1MΩ min.)	4-20 mA DC 0-20mA DC (input resistance 250Ω)	
Digital Output	Type	12 bit binary data		
	Range	Unsigned Value	0-4000	
		Signed Value	-2000-2000	
		Precise Value	100-500 (1-5 VDC) 0-500 (0-5 VDC) 0-1000 (0-10 VDC)	400-2000 (4-20 mA DC) 0-2000 (0-20 mA DC)
		Percentile Value	0-1000	
Maximum Resolution		1/4000		
Accuracy		±0.5% or less		
Maximum Conversion Speed		1.5 ms/channel		
Absolute Maximum Input		±15VDC	±25mA DC	
Additional Function	Filter Function	Digital filter (4-64,000 ms)		
	Average Function	Time average (4-16,000 ms)		
		Count average (2-64,000 times)		
		Moving average (2-100)		
Alarm Function	Detecting disconnection (1-5 VDC, 4-20 mA DC)			
Insulation Method		Photocoupler insulation between I/O terminal and PLC power (no insulation between channels)		
Input Terminal		8-pin terminal block + 10-pin terminal block connector		
I/O Points Occupied		Fixed type: 512 points		
Current Consumption	Internal (5VDC)	105mA		
	External (24VDC)	85mA		
Weight		81g		
Power Supply		20.4-28.8 VDC		



XBF-AD08A Analog Input Module Wiring

When connecting cable to your XBF-AD08A:

- In case of voltage/current input, wiring is the same. Adjust the voltage/current setting switch according to the case.
- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Current input resistance is 250Ω
- Voltage input resistance is 1MΩ
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-AD08A Analog Input Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the "U" memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31, z = slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-AD08A are as follows (z refers to module slot number (2 to 8)).

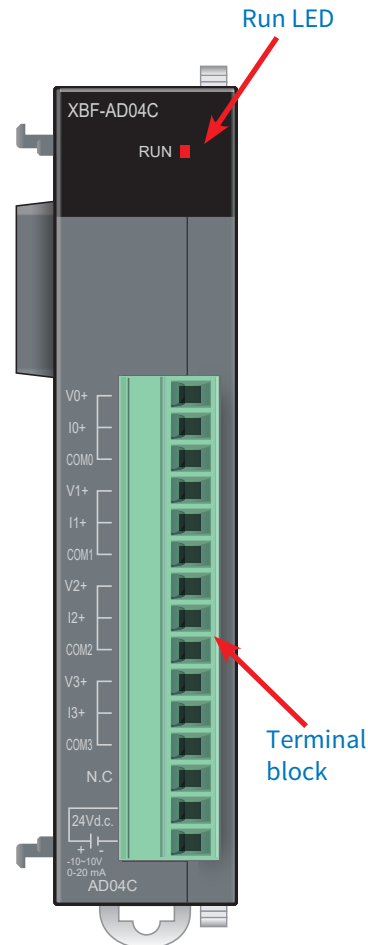
Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_0z_CH0_ACT	%UX0.z.16	BOOL	Analog Input Module: CH0 Activation Status
Tag	GlobalVariable	_0z_CH0_DATA	%UW0.z.2	WORD	Analog Input Module: CH0 Output
Tag	GlobalVariable	_0z_CH0_ERR	%UX0.z.24	BOOL	Analog Input Module: CH0 Error
Tag	GlobalVariable	_0z_CH0_IDD	%UX0.z.160	BOOL	Analog Input Module: CH0 Disconnection Flag
Tag	GlobalVariable	_0z_CH1_ACT	%UX0.z.17	BOOL	Analog Input Module: CH1 Activation Status
Tag	GlobalVariable	_0z_CH1_DATA	%UW0.z.3	WORD	Analog Input Module: CH1 Output
Tag	GlobalVariable	_0z_CH1_ERR	%UX0.z.25	BOOL	Analog Input Module: CH1 Error
Tag	GlobalVariable	_0z_CH1_IDD	%UX0.z.161	BOOL	Analog Input Module: CH1 Disconnection Flag
Tag	GlobalVariable	_0z_CH2_ACT	%UX0.z.18	BOOL	Analog Input Module: CH2 Activation Status
Tag	GlobalVariable	_0z_CH2_DATA	%UW0.z.4	WORD	Analog Input Module: CH2 Output
Tag	GlobalVariable	_0z_CH2_ERR	%UX0.z.26	BOOL	Analog Input Module: CH2 Error
Tag	GlobalVariable	_0z_CH2_IDD	%UX0.z.162	BOOL	Analog Input Module: CH2 Disconnection Flag
Tag	GlobalVariable	_0z_CH3_ACT	%UX0.z.19	BOOL	Analog Input Module: CH3 Activation Status
Tag	GlobalVariable	_0z_CH3_DATA	%UW0.z.5	WORD	Analog Input Module: CH3 Output
Tag	GlobalVariable	_0z_CH3_ERR	%UX0.z.27	BOOL	Analog Input Module: CH3 Error
Tag	GlobalVariable	_0z_CH3_IDD	%UX0.z.163	BOOL	Analog Input Module: CH3 Disconnection Flag
Tag	GlobalVariable	_0z_CH4_ACT	%UX0.z.20	BOOL	Analog Input Module: CH4 Activation Status
Tag	GlobalVariable	_0z_CH4_DATA	%UW0.z.6	WORD	Analog Input Module: CH4 Output
Tag	GlobalVariable	_0z_CH4_ERR	%UX0.z.28	BOOL	Analog Input Module: CH4 Error
Tag	GlobalVariable	_0z_CH4_IDD	%UX0.z.164	BOOL	Analog Input Module: CH4 Disconnection Flag
Tag	GlobalVariable	_0z_CH5_ACT	%UX0.z.21	BOOL	Analog Input Module: CH5 Activation Status
Tag	GlobalVariable	_0z_CH5_DATA	%UW0.z.7	WORD	Analog Input Module: CH5 Output
Tag	GlobalVariable	_0z_CH5_ERR	%UX0.z.29	BOOL	Analog Input Module: CH5 Error
Tag	GlobalVariable	_0z_CH5_IDD	%UX0.z.165	BOOL	Analog Input Module: CH5 Disconnection Flag
Tag	GlobalVariable	_0z_CH6_ACT	%UX0.z.22	BOOL	Analog Input Module: CH6 Activation Status
Tag	GlobalVariable	_0z_CH6_DATA	%UW0.z.8	WORD	Analog Input Module: CH6 Output
Tag	GlobalVariable	_0z_CH6_ERR	%UX0.z.30	BOOL	Analog Input Module: CH6 Error
Tag	GlobalVariable	_0z_CH6_IDD	%UX0.z.166	BOOL	Analog Input Module: CH6 Disconnection Flag
Tag	GlobalVariable	_0z_CH7_ACT	%UX0.z.23	BOOL	Analog Input Module: CH7 Activation Status
Tag	GlobalVariable	_0z_CH7_DATA	%UW0.z.9	WORD	Analog Input Module: CH7 Output
Tag	GlobalVariable	_0z_CH7_ERR	%UX0.z.31	BOOL	Analog Input Module: CH7 Error
Tag	GlobalVariable	_0z_CH7_IDD	%UX0.z.167	BOOL	Analog Input Module: CH7 Disconnection Flag
Tag	GlobalVariable	_0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..7] OF BOOL	Analog Input Module: Each CH Active
Tag	GlobalVariable	_0z_CH_DATA_ARY	%UW0.z.2	ARRAY[0..7] OF WORD	Analog Input Module: Each CH Output
Tag	GlobalVariable	_0z_CH_ERR_ARY	%UX0.z.24	ARRAY[0..7] OF BOOL	Analog Input Module: Each CH Error
Tag	GlobalVariable	_0z_CH_IDD_ARY	%UX0.z.160	ARRAY[0..7] OF BOOL	Analog Input Module: Each CH Disconnection Flag
Tag	GlobalVariable	_0z_ERR	%UX0.z.0	BOOL	Analog Input Module: Error Flag
Tag	GlobalVariable	_0z_ERR_CLR	%UX0.z.176	BOOL	Analog Input Module: Error Clear Request
Tag	GlobalVariable	_0z_RDY	%UX0.z.15	BOOL	Analog Input Module: Ready Flag

XBF-AD04C Analog Input Module

AD04C is an enhanced analog input module which provides higher resolution and upper/lower alarm tag for each channel.

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-AD04C	\$231.00	Voltage/current Input	LS Electric XGB analog input module, 4-channel, current/voltage, 14-bit, input current signal range(s) of 0-20 mA, 4-20 mA, input voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC, +/- 10 VDC, external 24 VDC required.	4	PDF

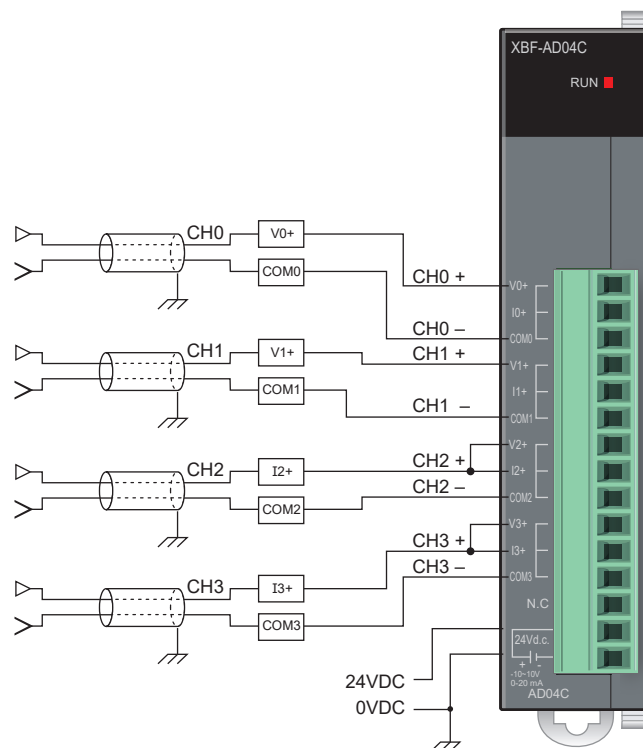
General Specifications		XBF-AD04C	
		Voltage	Current
Analog Input Range		1-5 VDC 0-5 VDC 0-10 VDC ±10 VDC (Input resistance: 1MΩ min.)	4-20 mA DC 0-20 mA DC (Input resistance: 250Ω)
Digital Output	Type	16 bit binary data (Data: 14Bit)	
	Range	Unsigned Value	0-16,000
		Signed Value	±8,000
	Precise Value	1,000-5,000 (1-5 V) 0-5,000 (0-5 V) 0-10,000 (0-10 V) ±10,000 (±10V)	4,000-20,000 (4-20 mA) 0-20,000 (0-20 mA)
	Percentile Value	0-10,000	
Maximum Resolution		1/16,000	
		0.250 mV (1-5 V) 0.3125 mV (0-5 V) 0.625 mV (0-10 V) 1.250 mV (±10V)	1.0 μA (4-20 mA) 1.25 μA (0-20 mA)
Accuracy		±0.2% (when ambient temperature 25°C ± 5°C) ±0.3% (when ambient temperature outside range above)	
Maximum Conversion Speed		1ms/channel	
Absolute Maximum Input		±15VDC	±30mA DC
Additional Function	Filter	Digital filter (4-64,000 ms)	
	Average	Time average (4-16,000 ms)	
	Detection Alarm	Disconnection (1-5VDC, 4-20 mA DC)	
	Hold Last Value	When input signal exceeds the effective range, holds the last effective value	
	Alarm Function	When input signal exceeds the effective range, relevant flag turns on.	
Insulation Method		Photocoupler insulation between input terminal and PLC power (no insulation between channels)	
Connection Terminal		15 point terminal block	
I/O Points Occupied		Fixed type assignment: 512	
Current Consumption	Internal (5VDC)	105mA	
	External (24VDC)	100mA	
Weight		72g	
Power Supply		20.4-28.8 VDC	



XBF-AD04C Analog Input Module Wiring

When connecting cable to your XBF-AD04C:

- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Current input resistance is 250Ω
- Voltage input resistance is 1MΩ
- Terminal screwdriver: slotted 2.5 mm

XBF-AD04C Analog Input Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

Analog Module Setup

Direct Variables

All XGB series analog modules are assigned 32 words in the “U” memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

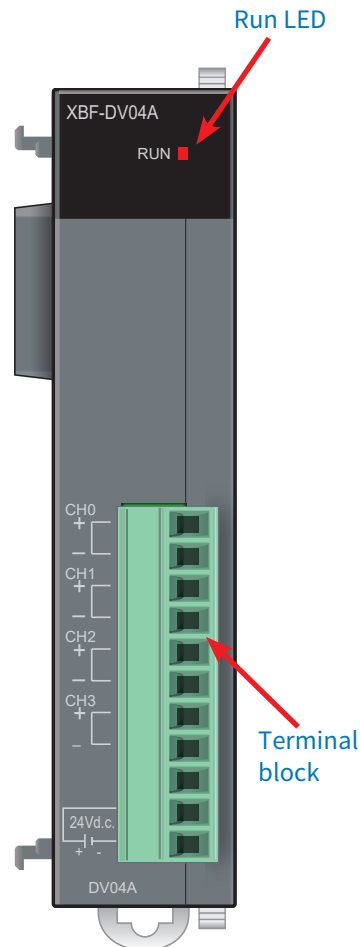
Symbolic variables and direct variables for XBF-AD04C are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_0z_CH0_ACT	%UX0.z.16	BOOL	Analog Input Module: CH0 Activation Status
Tag	GlobalVariable	_0z_CH0_DATA	%UW0.z.2	WORD	Analog Input Module: CH0 Output
Tag	GlobalVariable	_0z_CH0_ERR	%UX0.z.24	BOOL	Analog Input Module: CH0 Error
Tag	GlobalVariable	_0z_CH0_HOOR	%UX0.z.176	BOOL	Analog Input Module: CH0 Upper Alarm
Tag	GlobalVariable	_0z_CH0_IDD	%UX0.z.160	BOOL	Analog Input Module: CH0 Disconnection Flag
Tag	GlobalVariable	_0z_CH0_LOOR	%UX0.z.192	BOOL	Analog Input Module: CH0 Lower Alarm
Tag	GlobalVariable	_0z_CH1_ACT	%UX0.z.17	BOOL	Analog Input Module: CH1 Activation Status
Tag	GlobalVariable	_0z_CH1_DATA	%UW0.z.3	WORD	Analog Input Module: CH1 Output
Tag	GlobalVariable	_0z_CH1_ERR	%UX0.z.25	BOOL	Analog Input Module: CH1 Error
Tag	GlobalVariable	_0z_CH1_HOOR	%UX0.z.177	BOOL	Analog Input Module: CH1 Upper Alarm
Tag	GlobalVariable	_0z_CH1_IDD	%UX0.z.161	BOOL	Analog Input Module: CH1 Disconnection Flag
Tag	GlobalVariable	_0z_CH1_LOOR	%UX0.z.193	BOOL	Analog Input Module: CH1 Lower Alarm
Tag	GlobalVariable	_0z_CH2_ACT	%UX0.z.18	BOOL	Analog Input Module: CH2 Activation Status
Tag	GlobalVariable	_0z_CH2_DATA	%UW0.z.4	WORD	Analog Input Module: CH2 Output
Tag	GlobalVariable	_0z_CH2_ERR	%UX0.z.26	BOOL	Analog Input Module: CH2 Error
Tag	GlobalVariable	_0z_CH2_HOOR	%UX0.z.178	BOOL	Analog Input Module: CH2 Upper Alarm
Tag	GlobalVariable	_0z_CH2_IDD	%UX0.z.162	BOOL	Analog Input Module: CH2 Disconnection Flag
Tag	GlobalVariable	_0z_CH2_LOOR	%UX0.z.194	BOOL	Analog Input Module: CH2 Lower Alarm
Tag	GlobalVariable	_0z_CH3_ACT	%UX0.z.19	BOOL	Analog Input Module: CH3 Activation Status
Tag	GlobalVariable	_0z_CH3_DATA	%UW0.z.5	WORD	Analog Input Module: CH3 Output
Tag	GlobalVariable	_0z_CH3_ERR	%UX0.z.27	BOOL	Analog Input Module: CH3 Error
Tag	GlobalVariable	_0z_CH3_HOOR	%UX0.z.179	BOOL	Analog Input Module: CH3 Upper Alarm
Tag	GlobalVariable	_0z_CH3_IDD	%UX0.z.163	BOOL	Analog Input Module: CH3 Disconnection Flag
Tag	GlobalVariable	_0z_CH3_LOOR	%UX0.z.195	BOOL	Analog Input Module: CH3 Lower Alarm
Tag	GlobalVariable	_0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Input Module: Each CH Active
Tag	GlobalVariable	_0z_CH_DATA_ARY	%UW0.z.2	ARRAY[0..3] OF WORD	Analog Input Module: Each CH Output
Tag	GlobalVariable	_0z_CH_ERR_ARY	%UX0.z.24	ARRAY[0..3] OF BOOL	Analog Input Module: Each CH Error
Tag	GlobalVariable	_0z_CH_HOOR_ARY	%UX0.z.176	ARRAY[0..3] OF BOOL	Analog Input Module: Each CH Upper Alarm
Tag	GlobalVariable	_0z_CH_IDD_ARY	%UX0.z.160	ARRAY[0..3] OF BOOL	Analog Input Module: Each CH Disconnection Flag
Tag	GlobalVariable	_0z_CH_LOOR_ARY	%UX0.z.192	ARRAY[0..3] OF BOOL	Analog Input Module: Each CH Lower Alarm
Tag	GlobalVariable	_0z_ERR	%UX0.z.0	BOOL	Analog Input Module: Error Flag
Tag	GlobalVariable	_0z_ERR_CLR	%UX0.z.208	BOOL	Analog Input Module: Error Clear Request
Tag	GlobalVariable	_0z_RDY	%UX0.z.15	BOOL	Analog Input Module: Ready Flag

XBF-DV04A Analog Output Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-DV04A	\$152.00	Voltage Output	LS Electric XGB analog output module, 4-channel, voltage, 12-bit, output voltage signal range(s) of 0-10 VDC, external 24 VDC required.	4	PDF

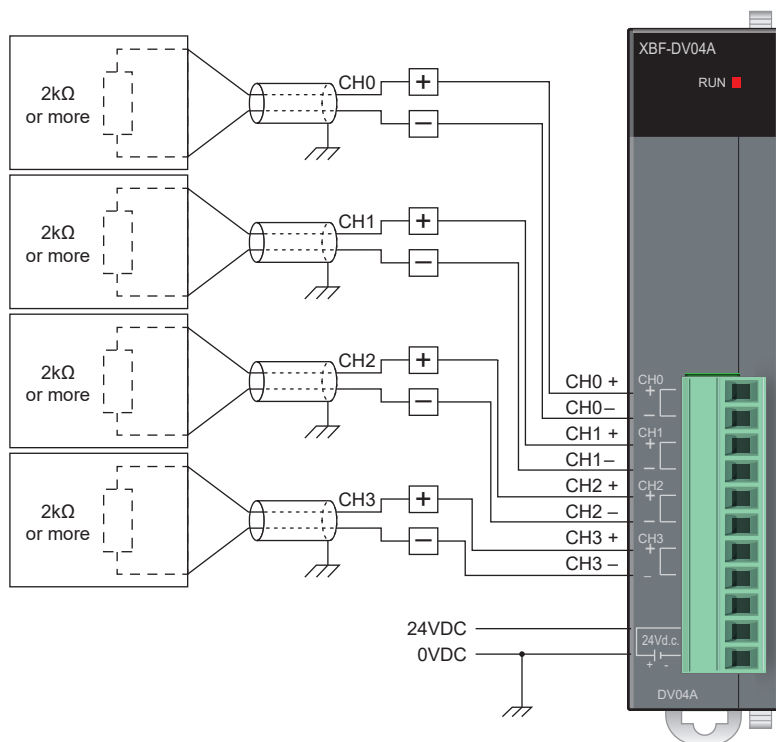
General Specifications		XBF-DV04A
		Voltage
Analog Output Range		0-10 VDC (Load resistance: 2kΩ or more)
Digital Input	Type	12-bit binary data
	Signed Value	±2000
	Unsigned Value	0-4000
	Precise Value	0-1000
	Percentile Value	0-1000
Maximum Resolution		2.5 mV (1/4000)
Accuracy		±0.5% or less
Maximum Conversion Speed		1ms/channel
Absolute Maximum Output		±15VDC
Number of Output Channels		4 channels
Insulation Method		Photocoupler insulation between input terminal and PLC power (no insulation between channels)
Connection Terminal		11-point terminal block
I/O Points Occupied		Fixed type: 512 points
Current Consumption	Internal (5VDC)	110mA
	External (24VDC)	70mA
Weight		64g
Power Supply		20.4-28.8 VDC



XBF-DV04A Analog Output Module Wiring

When connecting cable to your XBF-DV04A:

- Keep the AC power line away from the analog output module's external output signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Terminal screwdriver: slotted 2.5 mm
- Load resistance is 2kΩ or more



XGB Analog Modules

XBF-DV04A Analog Output Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the “U” memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-DV04A are as follows (z refers to module slot number (2 to 8)).

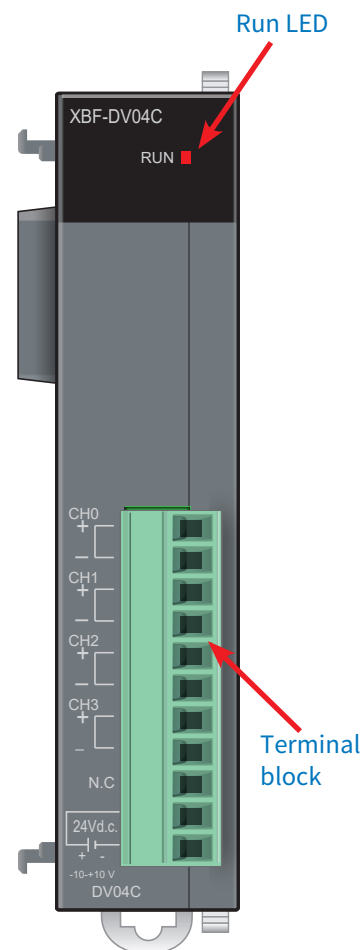
Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_0z_CH0_ACT	%UX0.z.16	BOOL	Analog Output Module: CH0 Activation Status
Tag	GlobalVariable	_0z_CH0_DATA	%UW0.z.3	WORD	Analog Output Module: CH0 Input
Tag	GlobalVariable	_0z_CH0_ERR	%UX0.z.0	BOOL	Analog Output Module: CH0 Error
Tag	GlobalVariable	_0z_CH0_OUTEN	%UX0.z.32	BOOL	Analog Output Module: CH0 Output Enable
Tag	GlobalVariable	_0z_CH1_ACT	%UX0.z.17	BOOL	Analog Output Module: CH1 Activation Status
Tag	GlobalVariable	_0z_CH1_DATA	%UW0.z.4	WORD	Analog Output Module: CH1 Input
Tag	GlobalVariable	_0z_CH1_ERR	%UX0.z.1	BOOL	Analog Output Module: CH1 Error
Tag	GlobalVariable	_0z_CH1_OUTEN	%UX0.z.33	BOOL	Analog Output Module: CH1 Output Enable
Tag	GlobalVariable	_0z_CH2_ACT	%UX0.z.18	BOOL	Analog Output Module: CH2 Activation Status
Tag	GlobalVariable	_0z_CH2_DATA	%UW0.z.5	WORD	Analog Output Module: CH2 Input
Tag	GlobalVariable	_0z_CH2_ERR	%UX0.z.2	BOOL	Analog Output Module: CH2 Error
Tag	GlobalVariable	_0z_CH2_OUTEN	%UX0.z.34	BOOL	Analog Output Module: CH2 Output Enable
Tag	GlobalVariable	_0z_CH3_ACT	%UX0.z.19	BOOL	Analog Output Module: CH3 Activation Status
Tag	GlobalVariable	_0z_CH3_DATA	%UW0.z.6	WORD	Analog Output Module: CH3 Input
Tag	GlobalVariable	_0z_CH3_ERR	%UX0.z.3	BOOL	Analog Output Module: CH3 Error
Tag	GlobalVariable	_0z_CH3_OUTEN	%UX0.z.35	BOOL	Analog Output Module: CH3 Output Enable
Tag	GlobalVariable	_0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Active
Tag	GlobalVariable	_0z_CH_DATA_ARY	%UW0.z.3	ARRAY[0..3] OF WORD	Analog Output Module: Each CH Input
Tag	GlobalVariable	_0z_CH_ERR_ARY	%UX0.z.0	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Error
Tag	GlobalVariable	_0z_CH_OUTEN_ARY	%UX0.z.32	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Output Enable
Tag	GlobalVariable	_0z_OUTEN	%UW0.z.2	WORD	Analog Output Module: Output Enable
Tag	GlobalVariable	_0z_RDY	%UX0.z.15	BOOL	Analog Output Module: Ready Flag

XBF-DV04C Analog Output Module

DV04C is an enhanced analog output module which provides higher resolution and interpolation settings for each channel.

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-DV04C	\$209.00	Voltage Output	LS Electric XGB analog output module, 4-channel, voltage, 14-bit, output voltage signal range(s) of 0-5 VDC, 1-5 VDC, 0-10 VDC and +/- 10 VDC, external 24 VDC required.	4	PDF

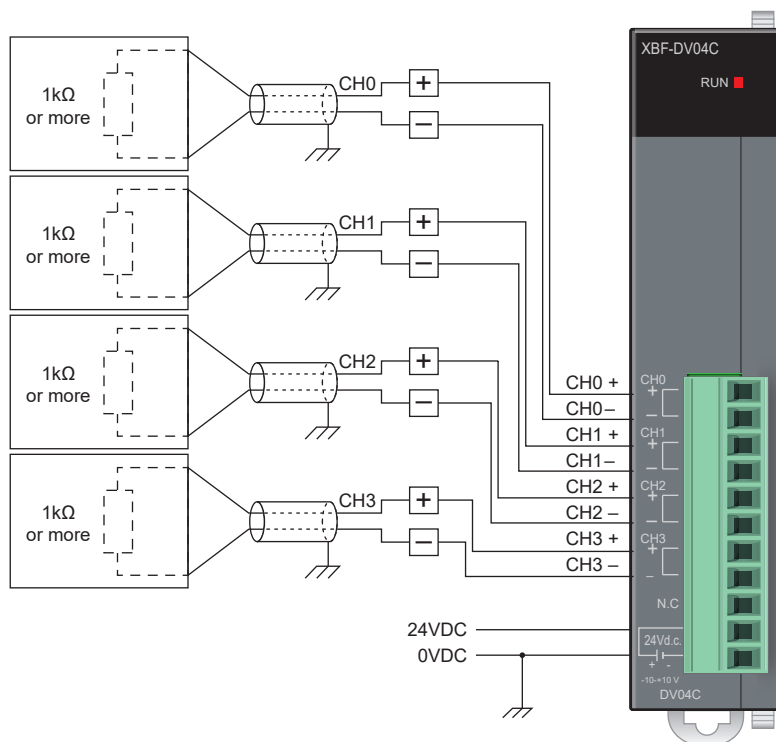
General Specifications		XBF-DV04C	
		Voltage	
Analog Output Range		1-5 VDC 0-5 VDC 0-10 VDC ±10 VDC (Input resistance: 1kΩ min.)	
Digital Input	Type	16 bit binary data (Data: 14Bit)	
	Range	Unsigned Value	0-16,000
		Signed Value	±8000
		Precise Value	1,000-5,000 (1-5 V) 0-5,000 (0-5 V) 0-10,000 (0-10 V) ±10,000 (±10V)
		Percentile Value	0-10,000
Maximum Resolution		1/16,000 0.250 mV (1-5 V) 0.3125 mV (0-5 V) 0.625 mV (0-10 V) 1.250 mV (±10V)	
Accuracy		±0.2% (when ambient temperature 25°C ± 5°C) ±0.3% (when ambient temperature outside range above)	
Maximum Conversion Speed		1ms/channel	
Additional Function		Setting of channel output status (select one among Previous, Min, or Max) Setting of interpolation method (Linear interpolation, S-type interpolation)	
Insulation Method		Photocoupler insulation between output terminal and PLC power (no insulation between channels)	
Connection Terminal		11 point terminal	
I/O Points Occupied		Fixed point assignment: 512 points	
Current Consumption	Internal (5VDC)	75mA	
	External (24VDC)	170mA	
Weight		68g	
Power Supply		20.4-28.8 VDC	



XBF-DV04C Analog Output Module Wiring

When connecting cable to your XBF-DV04C:

- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Load resistance is 1kΩ or more
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-DV04C Analog Output Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the “U” memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

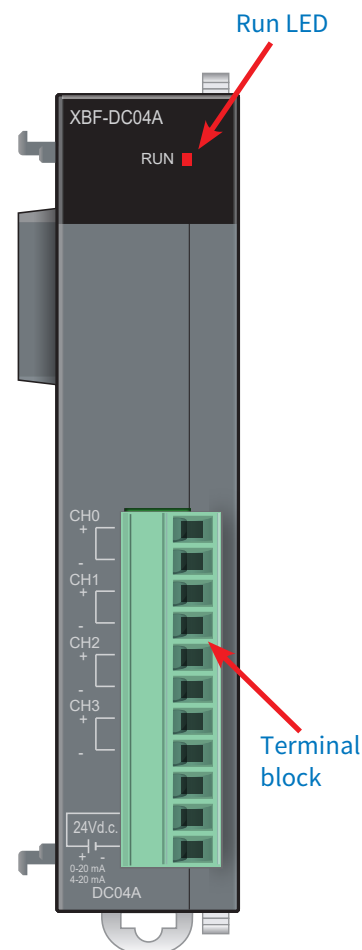
Symbolic variables and direct variables for XBF-DV04C are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_0z_CH0_ACT	%UX0.z.16	BOOL	Analog Output Module: CH0 Activation Status
Tag	GlobalVariable	_0z_CH0_DATA	%UW0.z.3	WORD	Analog Output Module: CH0 Input
Tag	GlobalVariable	_0z_CH0_ERR	%UX0.z.0	BOOL	Analog Output Module: CH0 Error
Tag	GlobalVariable	_0z_CH0_INTP	%UX0.z.24	BOOL	Analog Output Module : CH0 Interpolation Status
Tag	GlobalVariable	_0z_CH0_OUTEN	%UX0.z.32	BOOL	Analog Output Module: CH0 Output Enable
Tag	GlobalVariable	_0z_CH1_ACT	%UX0.z.17	BOOL	Analog Output Module: CH1 Activation Status
Tag	GlobalVariable	_0z_CH1_DATA	%UW0.z.4	WORD	Analog Output Module: CH1 Input
Tag	GlobalVariable	_0z_CH1_ERR	%UX0.z.1	BOOL	Analog Output Module: CH1 Error
Tag	GlobalVariable	_0z_CH1_INTP	%UX0.z.25	BOOL	Analog Output Module: CH1 Interpolation Status
Tag	GlobalVariable	_0z_CH1_OUTEN	%UX0.z.33	BOOL	Analog Output Module: CH1 Output Enable
Tag	GlobalVariable	_0z_CH2_ACT	%UX0.z.18	BOOL	Analog Output Module: CH2 Activation Status
Tag	GlobalVariable	_0z_CH2_DATA	%UW0.z.5	WORD	Analog Output Module: CH2 Input
Tag	GlobalVariable	_0z_CH2_ERR	%UX0.z.2	BOOL	Analog Output Module: CH2 Error
Tag	GlobalVariable	_0z_CH2_INTP	%UX0.z.26	BOOL	Analog Output Module: CH2 Interpolation Status
Tag	GlobalVariable	_0z_CH2_OUTEN	%UX0.z.34	BOOL	Analog Output Module: CH2 Output Enable
Tag	GlobalVariable	_0z_CH3_ACT	%UX0.z.19	BOOL	Analog Output Module: CH3 Activation Status
Tag	GlobalVariable	_0z_CH3_DATA	%UW0.z.6	WORD	Analog Output Module: CH3 Input
Tag	GlobalVariable	_0z_CH3_ERR	%UX0.z.3	BOOL	Analog Output Module: CH3 Error
Tag	GlobalVariable	_0z_CH3_INTP	%UX0.z.27	BOOL	Analog Output Module: CH3 Interpolation Status
Tag	GlobalVariable	_0z_CH3_OUTEN	%UX0.z.35	BOOL	Analog Output Module: CH3 Output Enable
Tag	GlobalVariable	_0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Active
Tag	GlobalVariable	_0z_CH_DATA_ARY	%UW0.z.3	ARRAY[0..3] OF WORD	Analog Output Module: Each CH Input
Tag	GlobalVariable	_0z_CH_ERR_ARY	%UX0.z.0	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Error
Tag	GlobalVariable	_0z_CH_INTP_ARY	%UX0.z.24	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Interpolation Status
Tag	GlobalVariable	_0z_CH_OUTEN_ARY	%UX0.z.32	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Output Enable
Tag	GlobalVariable	_0z_OUTEN	%UW0.z.2	WORD	Analog Output Module: Output Enable
Tag	GlobalVariable	_0z_RDY	%UX0.z.15	BOOL	Analog Output Module: Ready Flag

XBF-DC04A Analog Output Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-DC04A	\$162.00	Current Output	LS Electric XGB analog output module, 4-channel, current, 12-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.	4	PDF

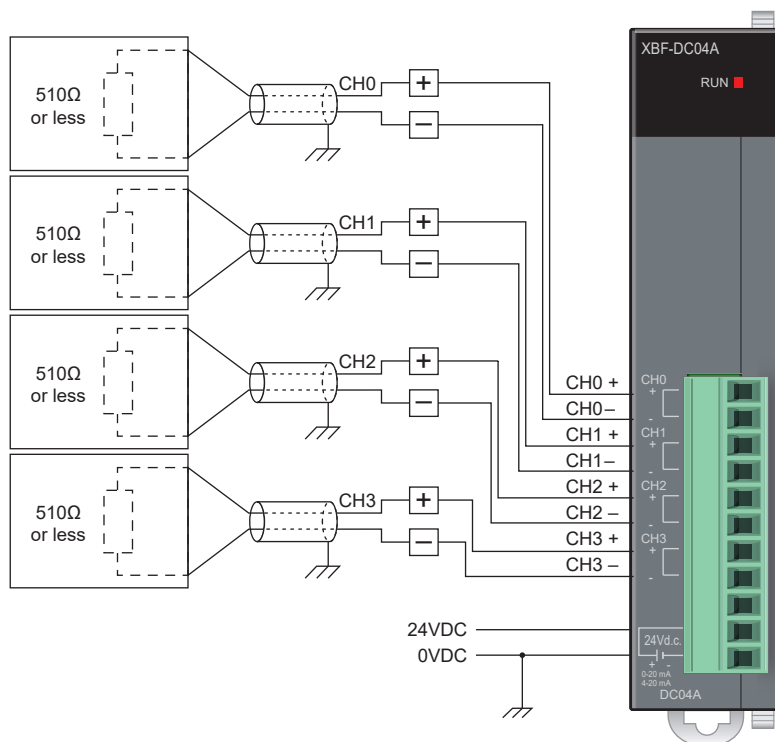
General Specifications		XBF-DC04A	
		Current	
Analog Output Range		4-20 mA DC 0-20 mA DC (Load resistance: 510Ω or less)	
Digital Input	Type	12-bit binary data	
	Range	Unsigned Value	0-4000
		Signed Value	±2000
		Precise Value	400-2000 / 0-2000
		Percentile Value	0-1000
Maximum Resolution		5μA (1/4000)	
Accuracy		±0.5% or less	
Maximum Conversion Speed		1ms/channel	
Absolute Maximum Output		DC +25mA	
Number of Output Channels		4 channels	
Insulation Method		Photocoupler insulation between input terminal and PLC power (no insulation between channels)	
Connection Terminal		11-point terminal block	
I/O Points Occupied		Fixed type: 512 points	
Current Consumption	Internal (5VDC)	110mA	
	External (24VDC)	120mA	
Weight		70g	
Power Supply		20.4-28.8 VDC	



XBF-DC04A Analog Output Module Wiring

When connecting cable to your XBF-DC04A:

- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Load resistance is 510Ω or less
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-DC04A Analog Output Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the “U” memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-DC04A are as follows (z refers to module slot number (2 to 8)).

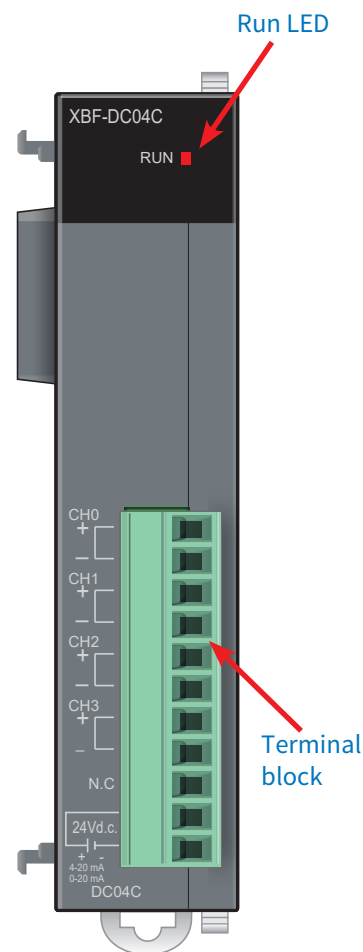
Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	._0z_CH0_ACT	%UX0.z.16	BOOL	Analog Output Module: CH0 Activation Status
Tag	GlobalVariable	._0z_CH0_DATA	%UW0.z.3	WORD	Analog Output Module: CH0 Input
Tag	GlobalVariable	._0z_CH0_ERR	%UX0.z.0	BOOL	Analog Output Module: CH0 Error
Tag	GlobalVariable	._0z_CH0_OUTEN	%UX0.z.32	BOOL	Analog Output Module: CH0 Output Enable
Tag	GlobalVariable	._0z_CH1_ACT	%UX0.z.17	BOOL	Analog Output Module: CH1 Activation Status
Tag	GlobalVariable	._0z_CH1_DATA	%UW0.z.4	WORD	Analog Output Module: CH1 Input
Tag	GlobalVariable	._0z_CH1_ERR	%UX0.z.1	BOOL	Analog Output Module: CH1 Error
Tag	GlobalVariable	._0z_CH1_OUTEN	%UX0.z.33	BOOL	Analog Output Module: CH1 Output Enable
Tag	GlobalVariable	._0z_CH2_ACT	%UX0.z.18	BOOL	Analog Output Module: CH2 Activation Status
Tag	GlobalVariable	._0z_CH2_DATA	%UW0.z.5	WORD	Analog Output Module: CH2 Input
Tag	GlobalVariable	._0z_CH2_ERR	%UX0.z.2	BOOL	Analog Output Module: CH2 Error
Tag	GlobalVariable	._0z_CH2_OUTEN	%UX0.z.34	BOOL	Analog Output Module: CH2 Output Enable
Tag	GlobalVariable	._0z_CH3_ACT	%UX0.z.19	BOOL	Analog Output Module: CH3 Activation Status
Tag	GlobalVariable	._0z_CH3_DATA	%UW0.z.6	WORD	Analog Output Module: CH3 Input
Tag	GlobalVariable	._0z_CH3_ERR	%UX0.z.3	BOOL	Analog Output Module: CH3 Error
Tag	GlobalVariable	._0z_CH3_OUTEN	%UX0.z.35	BOOL	Analog Output Module: CH3 Output Enable
Tag	GlobalVariable	._0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Active
Tag	GlobalVariable	._0z_CH_DATA_ARY	%UW0.z.3	ARRAY[0..3] OF WORD	Analog Output Module: Each CH Input
Tag	GlobalVariable	._0z_CH_ERR_ARY	%UX0.z.0	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Error
Tag	GlobalVariable	._0z_CH_OUTEN_ARY	%UX0.z.32	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Output Enable
Tag	GlobalVariable	._0z_OUTEN	%UW0.z.2	WORD	Analog Output Module: Output Enable
Tag	GlobalVariable	._0z_RDY	%UX0.z.15	BOOL	Analog Output Module: Ready Flag

XBF-DC04C Analog Output Module

DC04C is an enhanced analog output module which provides higher resolution and interpolation settings for each channel.

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-DC04C	\$209.00	Current Output	LS Electric XGB analog output module, 4-channel, current, 14-bit, output current signal range(s) of 0-20 mA and 4-20 mA, external 24 VDC required.	4	PDF

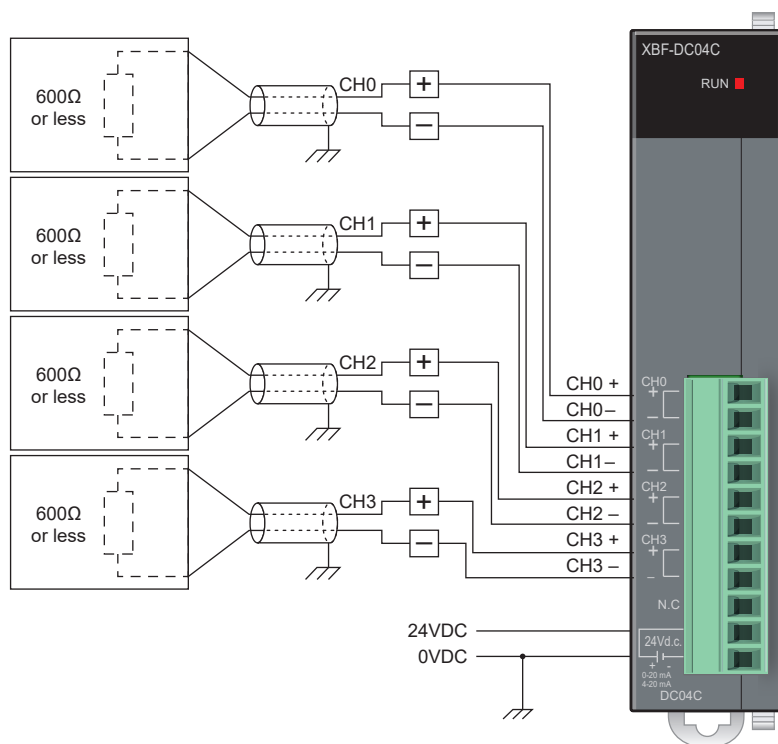
General Specifications		XBF-DC04C	
		Current	
Analog Output Range		4-20 mA DC 0-20 mA DC (Load resistance: 600Ω or less)	
Digital Input	Type	16-bit binary data (Data: 14Bit)	
	Range	Unsigned Value	0-16,000
		Signed Value	±8000
		Precise Value	4000-20,000 (4-20 mA) 0-20,000 (0-20 mA)
		Percentile Value	0-10,000
Maximum Resolution		1/16,000 1.0 μA (4-20 mA) 1.25 μA (0-20 mA)	
Accuracy		±0.2% (when ambient temperature 25°C ± 5°C) ±0.3% (when ambient temperature outside range above)	
Maximum Conversion Speed		1ms/channel	
Additional Function		Setting of channel output status (select one among Previous, Min, Max) Setting of interpolation method (linear interpolation, S-type interpolation)	
Insulation Method		Photocoupler insulation between output terminal and PLC power (no insulation between channels)	
Connection Terminal		11-point terminal	
I/O Points Occupied		Fixed point assignment: 512 points	
Current Consumption	Internal (5VDC)	75mA	
	External (24VDC)	170mA	
Weight		69g	
Power Supply		20.4-28.8 VDC	



XBF-DC04C Analog Output Module Wiring

When connecting cable to your XBF-DC04C:

- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) or greater cable
- Load resistance is 600Ω or less
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-DC04C Analog Output Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

[Analog Module Setup](#)

Direct Variables

All XGB series analog modules are assigned 32 words in the "U" memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31, z = slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

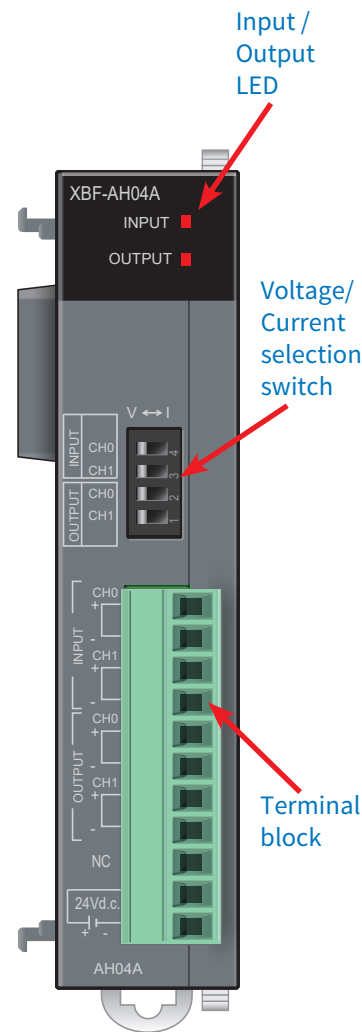
Symbolic variables and direct variables for XBF-DC04C are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_0z_CH0_ACT	%UX0.z.16	BOOL	Analog Output Module: CH0 Activation Status
Tag	GlobalVariable	_0z_CH0_DATA	%UW0.z.3	WORD	Analog Output Module: CH0 Input
Tag	GlobalVariable	_0z_CH0_ERR	%UX0.z.0	BOOL	Analog Output Module: CH0 Error
Tag	GlobalVariable	_0z_CH0_INTP	%UX0.z.24	BOOL	Analog Output Module : CH0 Interpolation Status
Tag	GlobalVariable	_0z_CH0_ODD	%UX0.z.28	BOOL	Analog Output Module: CH0 Output Disconnection
Tag	GlobalVariable	_0z_CH0_OUTEN	%UX0.z.32	BOOL	Analog Output Module: CH0 Output Enable
Tag	GlobalVariable	_0z_CH1_ACT	%UX0.z.17	BOOL	Analog Output Module: CH1 Activation Status
Tag	GlobalVariable	_0z_CH1_DATA	%UW0.z.4	WORD	Analog Output Module: CH1 Input
Tag	GlobalVariable	_0z_CH1_ERR	%UX0.z.1	BOOL	Analog Output Module: CH1 Error
Tag	GlobalVariable	_0z_CH1_INTP	%UX0.z.25	BOOL	Analog Output Module: CH1 Interpolation Status
Tag	GlobalVariable	_0z_CH1_ODD	%UX0.z.29	BOOL	Analog Output Module: CH1 Output Disconnection
Tag	GlobalVariable	_0z_CH1_OUTEN	%UX0.z.33	BOOL	Analog Output Module: CH1 Output Enable
Tag	GlobalVariable	_0z_CH2_ACT	%UX0.z.18	BOOL	Analog Output Module: CH2 Activation Status
Tag	GlobalVariable	_0z_CH2_DATA	%UW0.z.5	WORD	Analog Output Module: CH2 Input
Tag	GlobalVariable	_0z_CH2_ERR	%UX0.z.2	BOOL	Analog Output Module: CH2 Error
Tag	GlobalVariable	_0z_CH2_INTP	%UX0.z.26	BOOL	Analog Output Module: CH2 Interpolation Status
Tag	GlobalVariable	_0z_CH2_ODD	%UX0.z.30	BOOL	Analog Output Module: CH2 Output Disconnection
Tag	GlobalVariable	_0z_CH2_OUTEN	%UX0.z.34	BOOL	Analog Output Module: CH2 Output Enable
Tag	GlobalVariable	_0z_CH3_ACT	%UX0.z.19	BOOL	Analog Output Module: CH3 Activation Status
Tag	GlobalVariable	_0z_CH3_DATA	%UW0.z.6	WORD	Analog Output Module: CH3 Input
Tag	GlobalVariable	_0z_CH3_ERR	%UX0.z.3	BOOL	Analog Output Module: CH3 Error
Tag	GlobalVariable	_0z_CH3_INTP	%UX0.z.27	BOOL	Analog Output Module: CH3 Interpolation Status
Tag	GlobalVariable	_0z_CH3_ODD	%UX0.z.31	BOOL	Analog Output Module: CH3 Output Disconnection
Tag	GlobalVariable	_0z_CH3_OUTEN	%UX0.z.35	BOOL	Analog Output Module: CH3 Output Enable
Tag	GlobalVariable	_0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Active
Tag	GlobalVariable	_0z_CH_DATA_ARY	%UW0.z.3	ARRAY[0..3] OF WORD	Analog Output Module: Each CH Input
Tag	GlobalVariable	_0z_CH_ERR_ARY	%UX0.z.0	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Error
Tag	GlobalVariable	_0z_CH_INTP_ARY	%UX0.z.24	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Interpolation Status
Tag	GlobalVariable	_0z_CH_OUTEN_ARY	%UX0.z.32	ARRAY[0..3] OF BOOL	Analog Output Module: Each CH Output Enable
Tag	GlobalVariable	_0z_OUTEN	%UW0.z.2	WORD	Analog Output Module: Output Enable
Tag	GlobalVariable	_0z_RDY	%UX0.z.15	BOOL	Analog Output Module: Ready Flag

XBF-AH04A Analog Combo Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-AH04A	\$216.00	Voltage/Current Input/Output	LS Electric XGB analog combo module, Input: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC, Output: 2-channel, current/voltage, 0-20 mA and 4-20 mA, 0-5 VDC, 1-5 VDC and 0-10 VDC.	4	PDF

General Specifications		XBF-AH04A			
		Voltage	Current		
Input Performance Specifications	Analog Input Range*		1-5 VDC, 0-5 VDC, 0-10 VDC (Input resistance: 1MΩ or above)	4-20 mA DC, 0-20 mA DC (Input resistance 250Ω)	
	Digital Output	Type	12-bit binary data		
		Range	Unsigned Value	0-4000	
			Signed Value	±2000	
			Precise Value	100-500 (1-5 VDC), 0-500 (0-5 VDC), 0-1000 (0-10 VDC)	400-2000 (4-20 mA DC), 0-2000 (0-20 mA DC)
			Percentile Value	0-1000	
	Additional Function	Filter Function	Digital filter (4-64,000 ms)		
		Averaging Function	Time averaging (4-16,000 ms)		
			Count averaging (2-64,000 times)		
			Moving averaging (2-100 samples)		
Alarm Function	Disconnection detection (1-5 VDC, 4-20 mA DC)				
Output Performance Specifications	Analog Output Range*		1-5 VDC, 0-5 VDC, 0-10 VDC (Load resistance: 2kΩ or above)	4-20 mA DC, 0-20 mA DC (Load resistance 510Ω or less)	
	Digital Input	Type	12-bit binary data		
		Range	Unsigned Value	0-4000	
			Signed Value	±2000	
			Precise Value	100-500 (1-5 VDC), 0-500 (0-5 VDC), 0-1000 (0-10 VDC)	400-2000 (4-20 mA DC), 0-2000 (0-20 mA DC)
			Percentile Value	0-1000	
	Additional Function	Function setting channel output status (can select one from Previous, Minimum, Median, Maximum)			
Common Specifications	Maximum Resolution	1/4000			
	Accuracy	±0.5%			
	Maximum Conversion Speed	1ms/channel			
	Absolute Maximum Input	±15VDC	±25mA DC		
	Insulation Method	Photocoupler insulation between I/O terminal and PLC power (not insulated between channels)			
	I/O Terminal Block	11 points terminal block			
	I/O Points Occupied	Fixed type: 512 points			
	Current Consumption	Internal (5VDC)	120mA		
External (24VDC)		130mA			
Weight	73g				
Power Supply	20.4-28.8 VDC				

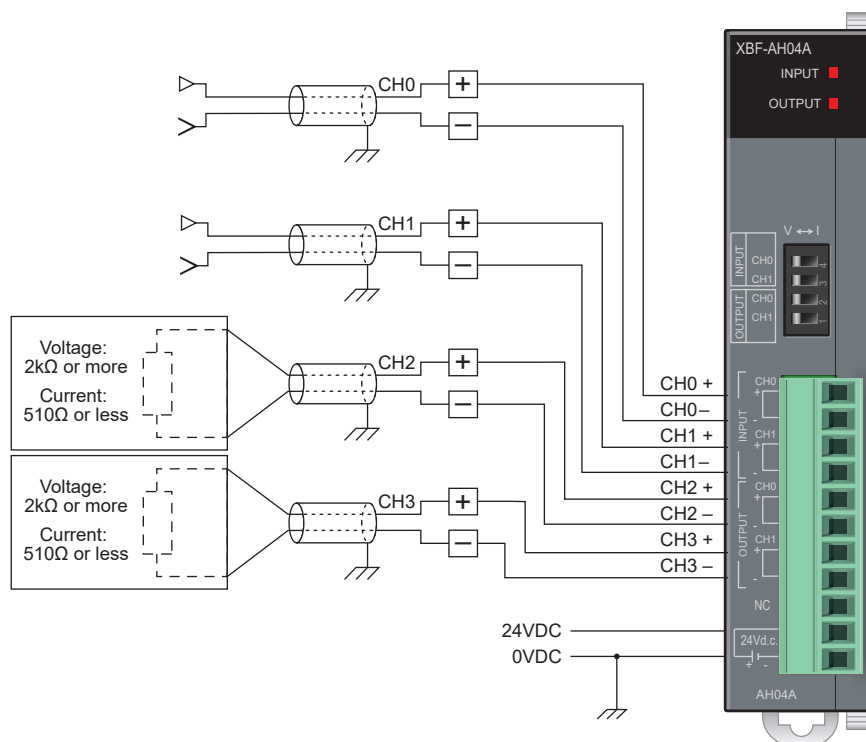


* Input and Output Voltage/Current selection switch for each channel must match user program settings..

XBF-AH04A Analog Combo Module Wiring

When connecting cable to your XBF-AH04A:

- In case of voltage/current input/output, wiring is the same. Adjust the voltage/current setting switch according to the case.
- Keep the AC power line away from the analog input module's external input signal line to prevent surge or inductive noise.
- Use cable rated to meet your application's ambient temperature and current needs. AWG22 (0.3mm²) or greater recommended.
- Keep cable clear of high heat and oil.
- Check polarity when wiring the terminal.
- Using high-voltage line or power line may cause abnormal operations or defects due to inductive hindrance.
- Make sure the desired channel is enabled.



Notes:

- Use 2-core twisted shield cable
- Use AWG22 (0.3mm²) cable
- Current input resistance is 250Ω
- Current output load resistance is 510Ω or less
- Voltage input resistance is 1MΩ
- Voltage output load resistance is 2kΩ or above
- Terminal screwdriver: slotted 2.5 mm



XGB Analog Modules

XBF-AH04A Analog Combo Module Configuration

Follow the Quick start video to learn how to Register and Configure any Analog Module:

Analog Module Setup

Direct Variables

All XGB series analog modules are assigned 32 words in the “U” memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31 , z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-AH04A are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	._0z_AD01_DATA_ARY	%UW0.z.4	ARRAY[0..1] OF WORD	Analog IO Module: Input each CH Data
Tag	GlobalVariable	._0z_AD0_ACT	%UX0.z.16	BOOL	Analog IO Module: AD0 Activation Status
Tag	GlobalVariable	._0z_AD0_DATA	%UW0.z.4	WORD	Analog IO Module: AD0 Digital Output Data
Tag	GlobalVariable	._0z_AD0_ERR	%UX0.z.24	BOOL	Analog IO Module: AD0 Error Code
Tag	GlobalVariable	._0z_AD0_IDD	%UX0.z.20	BOOL	Analog IO Module: AD0 Disconnection Flag
Tag	GlobalVariable	._0z_AD1_ACT	%UX0.z.17	BOOL	Analog IO Module: AD1 Activation Status
Tag	GlobalVariable	._0z_AD1_DATA	%UW0.z.5	WORD	Analog IO Module: AD1 Digital Output Data
Tag	GlobalVariable	._0z_AD1_ERR	%UX0.z.25	BOOL	Analog IO Module: AD1 Error Code
Tag	GlobalVariable	._0z_AD1_IDD	%UX0.z.21	BOOL	Analog IO Module: AD1 Disconnection Flag
Tag	GlobalVariable	._0z_CH_ACT_ARY	%UX0.z.16	ARRAY[0..3] OF BOOL	Analog IO Module: Input/Output each CH Active
Tag	GlobalVariable	._0z_CH_ERR_ARY	%UX0.z.24	ARRAY[0..1] OF BOOL	Analog IO Module: Input/Output each CH Error
Tag	GlobalVariable	._0z_DA01_DATA_ARY	%UW0.z.7	ARRAY[0..1] OF WORD	Analog IO Module: Output each CH DATA
Tag	GlobalVariable	._0z_DA0_ACT	%UX0.z.18	BOOL	Analog IO Module: DA0 Activation Status
Tag	GlobalVariable	._0z_DA0_DATA	%UW0.z.7	WORD	Analog IO Module: DA0 Digital Input Data
Tag	GlobalVariable	._0z_DA0_ERR	%UX0.z.26	BOOL	Analog IO Module: DA0 Error Code
Tag	GlobalVariable	._0z_DA0_OUTEN	%UX0.z.96	BOOL	Analog IO Module: DA0 Output Enable
Tag	GlobalVariable	._0z_DA1_ACT	%UX0.z.19	BOOL	Analog IO Module: Output CH1 Activation Status
Tag	GlobalVariable	._0z_DA1_DATA	%UW0.z.8	WORD	Analog IO Module: DA1 Digital Input Data
Tag	GlobalVariable	._0z_DA1_ERR	%UX0.z.27	BOOL	Analog IO Module: DA1 Error Code
Tag	GlobalVariable	._0z_DA1_OUTEN	%UX0.z.97	BOOL	Analog IO Module: DA1 Output Enable
Tag	GlobalVariable	._0z_DA_OUTEN_ARY	%UX0.z.96	ARRAY[0..1] OF BOOL	Analog IO Module: Output each CH Status Setting
Tag	GlobalVariable	._0z_ERR	%UX0.z.0	BOOL	Analog IO Module: Error Flag
Tag	GlobalVariable	._0z_RDY	%UX0.z.15	BOOL	Analog IO Module: Ready Flag



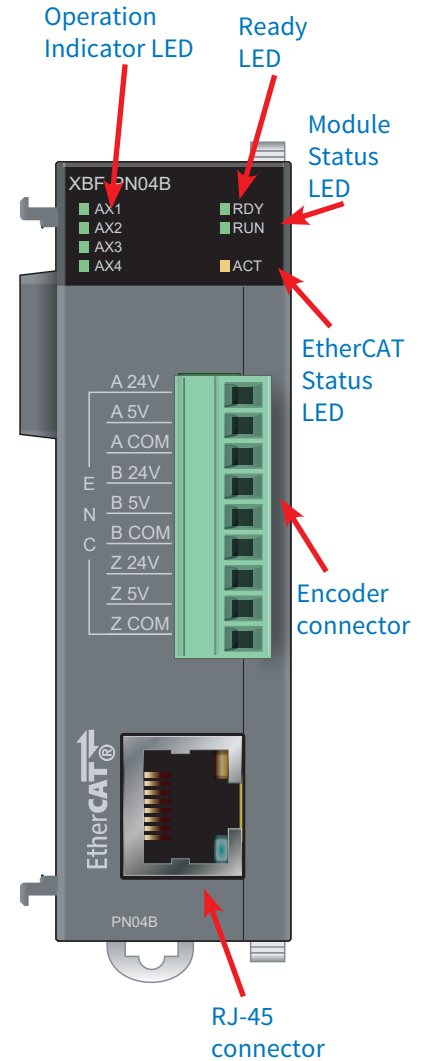
XGB Motion Modules

XBF-PN04B / XBF-PN08B EtherCAT® Multi-Axis Positioning Module



Part Number	Price	Classification	Description	# of Axes	Drawing
XBF-PN04B	\$350.00	Positioning	LS Electric XGB 4-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.	4	PDF
XBF-PN08B	\$395.00		LS Electric XGB 8-axis positioning module, EtherCAT protocol, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-Dx32Hx PLCs.	8	PDF

General Specifications		XBF-PN04B	XBF-PN08B		
Number of Control Axis		4	8		
Interpolation Function		2-4 (8) axes linear interpolation, 2 axes circular interpolation, 3 axes helical interpolation			
Control Method		Position control, Torque Control, Speed control, Speed/Position control, Position/Speed control, Position/Torque control, Feed control			
Control Unit		Pulse, mm, inch, degree			
Positioning Data		Can have up to 400 steps for each axis (1-400) available to set with XG-PM or program			
XG-PM	Connection	RS-232C port, EtherNet port, or USB. Connect through XEM CPU.			
	Setting Data	Common, Basic, Extended, Servo parameter, Operation data, Cam data, Command information			
	Monitor	Operation information, Trend, External input signal, Error information			
Backup		Saves parameters and operation data in MRAM and flash ROM			
Positioning	Positioning Method	Absolute or Incremental			
	Position Address Range	Unit	Absolute	Incremental	Speed/Position, Position/Speed Switching Control
		µm	-214748364.8-214748364.7	-214748364.8-214748364.7	-214748364.8-214748364.7
		Inch	-21474.83648-21474.83647	-21474.83648-21474.83647	-21474.83648-21474.83647
		Degree	-21474.83648-21474.83647	-21474.83648-21474.83647	-21474.83648-21474.83647
Pulse		-2147483648-2147483647	-2147483648-2147483647	-2147483648-2147483647	
Speed Range	Unit	Range			
	mm	0.01-20000000.00 (mm/min)			
	Inch	0.001-2000000.00 (Inch/min)			
	Degree	0.001-2000000.00 (degree/min)			
	Pulse	1-20,000,000 (pulse/sec)			
	RPM	0.1-100000.0 (RPM)			
Acc./Dec. Process		Trapezoid-shaped, S-curve			
Manual Operation		Jog operation, Manual Pulse Generator (MPG) operation, Inching operation			
Homing Method		Refer to the method supported by the servo drive			
Speed Change Function		Speed change (percent/absolute value)			
Torque Command Unit		Rated torque % designation			
Absolute Position System		Available (when using absolute encoder type servo motor)			



NOTE: EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

XBF-PN0xB Multi-axis Positioning Module, continued


General Specifications		XBF-PN04B	XBF-PN08B
External Encoder Input	Channel	1 channel	
	Maximum Input	200kpps	
	Input Form	Line drive input (RS-422A IEC specification), open collector output type encoder	
	Input Type	CW/CCW, Pulse/Dir, Phase A/B	
	Connection Connector	9-point connector	
External Command Signal	Input Point	3-point (Input signal A,B,Z)	
	Input Specification	Same as input specification of external encoder (5V, 24V)	
	Connector	9-point connector (input terminal of external encoder shared)	
Communication Period		1/2/3/4 ms	
Maximum Transmission Distance		100m	
Communication Cable		Over CAT.5 STP (shielded twisted-pair) cable	
Error Indication		Indicated by LED	
Communication Status Indication		Indicated by LED	
Consumable Current		510mA	
Supported EtherCAT Devices		Only EtherCAT servo drives that use CANopen over EtherCAT (CoE)	
Max Modules per XEM CPU		Max of two (2) modules installed immediately adjacent to XEM CPU (slot 2 and 3)	
Weight		115g	

Encoder Input Specifications

NOTE: Encoder inputs can also be used for external command signals.

Specification	Open Collector		Line Driver
Input Voltage	5VDC (4.5 V – 5.5 V)	24VDC (19.2 V – 26.4 V)	In accordance with RS-422A Line Driver Level (5V level)
Input Current	8mA–11mA	8mA–11mA	
Min. On Guarantee Voltage	4.1 V	17.0 V	
Max. Off Guarantee Voltage	1.7 V	4.5 V	
Input Pulse	1) Pulse width 		
	2) Phase difference <p>When A phase input pulse is ahead of B phase input pulse : Position value increases</p> <p>When B phase input pulse is ahead of A phase input pulse : Position value decreases</p>		

XBF-PN0xB Connector Pin Assignments

XBF-PN0xB Pin Arrangement				
Pin Arrangement	Pin No.	Description	Signal Name	Signal Direction
 A 24V A 5V A COM B 24V B 5V B COM Z 24V Z 5V Z COM	1	A 24V	Encoder A 24V input	Input
	2	A 5V	Encoder A 5V input	
	3	A COM	Encoder A input COM	
	4	B 24V	Encoder B 24V input	
	5	B 5V	Encoder B 5V input	
	6	B COM	Encoder B input COM	
	7	Z 24V	Encoder Z 24V input	
	8	Z 5V	Encoder Z 5V input	
	9	Z COM	Encoder Z input COM	



NOTE: 5VDC encoders use the 5V terminals and 24VDC encoders use the 24V terminals. Compatible with 12V systems (see the User Manual for dropping resistor specifications).

XBF-PN0xB Variable Assignments

Direct Variables

XGB series EtherCAT modules are assigned 1 word of status information in the "U" memory area based on the slot number assignment. (%UX0.z.0 - %UX0.z.15, z=slot number). See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the motion module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-PN04B/08B are as follows (z refers to module slot number (2 or 3)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GobalVariable	_000z_A1_RDY	%UX0.z.0	BOOL	Positioning Module: 1-Axis Ready
Tag	GobalVariable	_000z_A2_RDY	%UX0.z.1	BOOL	Positioning Module: 2-Axis Ready
Tag	GobalVariable	_000z_A3_RDY	%UX0.z.2	BOOL	Positioning Module: 3-Axis Ready
Tag	GobalVariable	_000z_A4_RDY	%UX0.z.3	BOOL	Positioning Module: 4-Axis Ready
Tag	GobalVariable	_000z_A5_RDY	%UX0.z.4	BOOL	Positioning Module: 5-Axis Ready
Tag	GobalVariable	_000z_A6_RDY	%UX0.z.5	BOOL	Positioning Module: 6-Axis Ready
Tag	GobalVariable	_000z_A7_RDY	%UX0.z.6	BOOL	Positioning Module: 7-Axis Ready
Tag	GobalVariable	_000z_A8_RDY	%UX0.z.7	BOOL	Positioning Module: 8-Axis Ready
Tag	GobalVariable	_000z_AX_RDY_AR	%UX0.z.0	ARRAY[0..7]	Positioning Module: Each Axis Ready
Tag	GobalVariable	_000z_LINKUP_INF	%UX0.z.14	BOOL	Positioning Module: Link up/down informatoin
Tag	GobalVariable	_000z_RDY	%UX0.z.15	BOOL	Positioning Module: Ready Flag

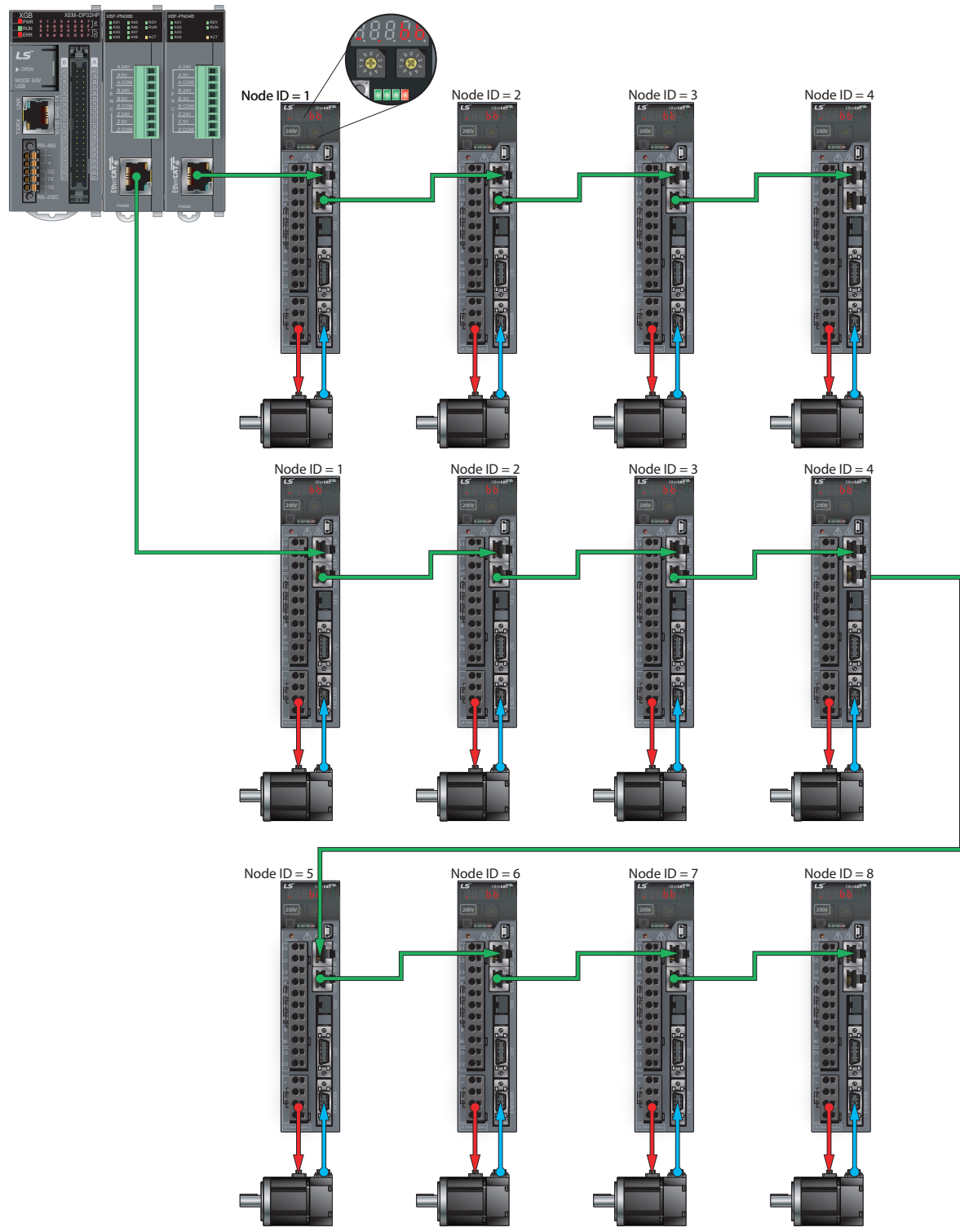


XGB Motion Modules

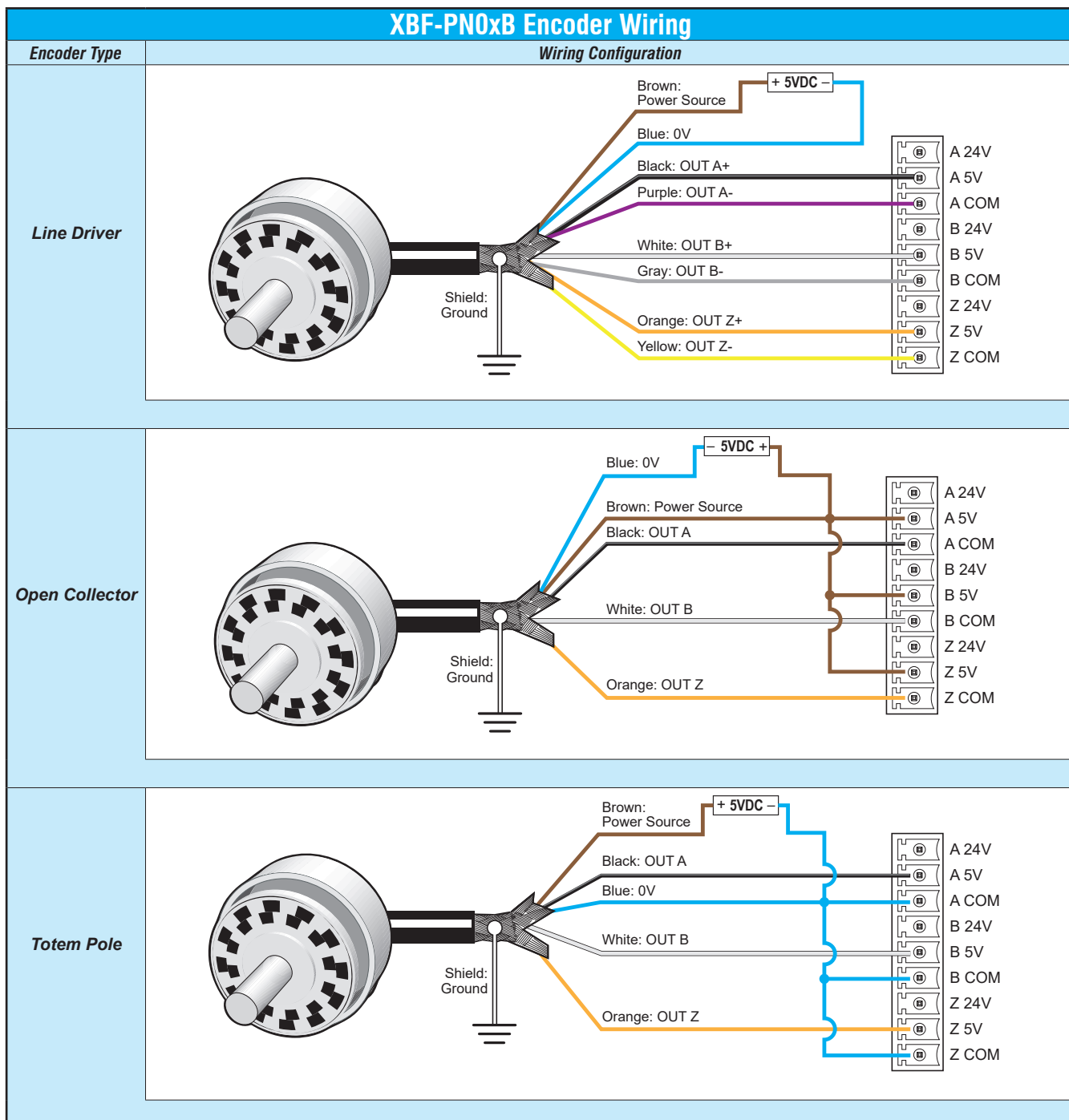
XBF-PN0xB EtherCAT Drive/Motor Setup Example

LS Electric iX7NH EtherCAT drives can be found here: [\(insert web store link for EtherCAT drives\)](#)

NOTE: Each XBF-PN0xB module is a separate EtherCAT® network.



XBF-PN0xB Encoder Wiring Examples

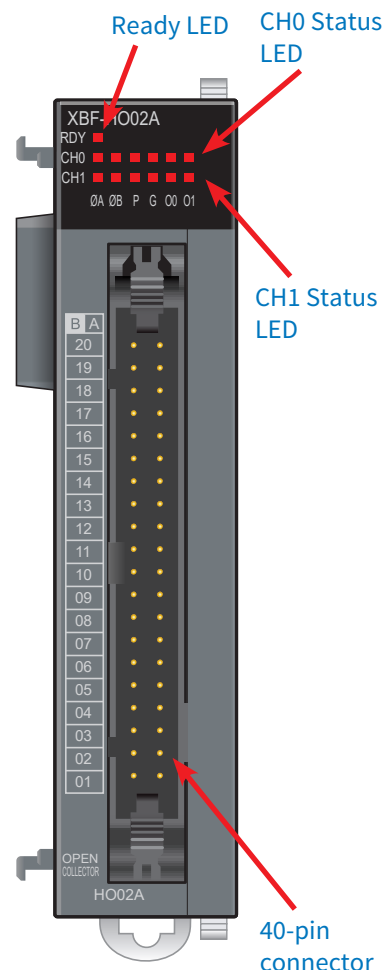


For 12V encoders, use a 1k Ohm dropping resistor between each encoder signal (Out A, Out B, Out Z) and the corresponding 5V terminal above. For 24V encoder signals, wire each encoder signal (Out A, Out B, Out Z) to the A 24V, B 24V, and Z 24V inputs. No dropping resistor required.

XBF-HO02A Counter Input Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-HO02A	\$176.00	Counter Input	LS Electric XGB counter input module, 200 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, single-ended encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.	2	PDF

General Specifications		XBF-HO02A
Count Input Signal	Signal	A-phase, B-phase
	Input Type	Voltage input (Open Collector)
	Signal Level	5/12/24 VDC
Maximum Coefficient Speed		200kHz
Number of Channels		2
Coefficient Range		Signed 32-bit (-2,147,483,648 to +2,147,483,647)
Count Mode		Linear Count (when 32-bit range exceeded, carry/borrow occurs, the count value stopped)
		Ring Count (repeated count within setting range)
Input Pulse Mode		1-phase input
		2-phase input
		CW/CCW
Up/Down Setting	1-phase Input	Increasing/decreasing operation setting by B-phase input Increasing/decreasing operation setting by program
	2-phase Input	Automatic setting by difference in phase
	CW/CCW	A-phase input: increasing operation B-phase input: decreasing operation
Multiplication Function	1-phase Input	1/2 multiplication
	2-phase Input	1/2/4 multiplication
	CW/CCW	1-multiplication
Control Input	Signal	Preset instruction input, auxiliary mode instruction input
	Signal Level	5/12/24 VDC (by terminal selection) input type
	Signal Type	Voltage
External Output	Output Points	2-point/channel (for each channel): terminal output available
	Type	Select single-compared (>, ≥, =, ≤, <) or section compared output (included or excluded)
	Output Type	Open collector output (sink)
Operation Status Display	Input Signal	A-phase input, B-phase input, preset instruction input, auxiliary mode instruction input
	Output Signal	External output 0, external output 1
	Ready Status	Module Ready
Count Enable		Set through program (count available when enabled)
Preset Function		Set through terminal or program
Auxiliary Mode Function		Count clear, count latch, section count (time setting value: 0-60,000 ms), measurement of input frequency (for respective input phase), measurement of counts per hour (time setting value: 0-60,000 ms), count prohibited function
Terminal		40-pin connector
I/O Points Occupied		Fixed point: 512
Internal Consumed Current		200mA
Weight		90g



XBF-HO02A Counter Input Module Wiring

XBF-HO02A Circuit Configuration					
Circuit Configuration	Internal Circuit Number	XTB-40H Terminal	Pin Number		Signal Name
			CH0	CH1	
	1	A24V	B20	A20	A phase pulse input 24V
	2	A12V	B19	A19	A phase pulse input 12V
	3	A5V	B18	A18	A phase pulse input 5V
	4	ACOM	B17	A17	A phase pulse input COM
	1	B24V	B16	A16	B phase pulse input 24V
	2	B12V	B15	A15	B phase pulse input 12V
	3	B5V	B14	A14	B phase pulse input 5V
	4	BCOM	B13	A13	B phase pulse input COM
	5	P24V	B12	A12	Preset input 24V
	6	P12V	B11	A11	Preset input 12V
	7	P5V	B10	A10	Preset input 5V
	8	PCOM	B09	A09	Preset input COM
	5	G24V	B08	A08	Auxiliary function input 24V
	6	G12V	B07	A07	Auxiliary function input 12V
	7	G5V	B06	A06	Auxiliary function input 5V
	8	GCOM	B05	A05	Auxiliary function input COM
	9	OUT0	B04	A04	Comp. output 0
	10	OUT1	B03	A03	Comp. output 1
	11	24V	B02	A02	External power input 24V
	12	24G	B01	A01	External power input GND

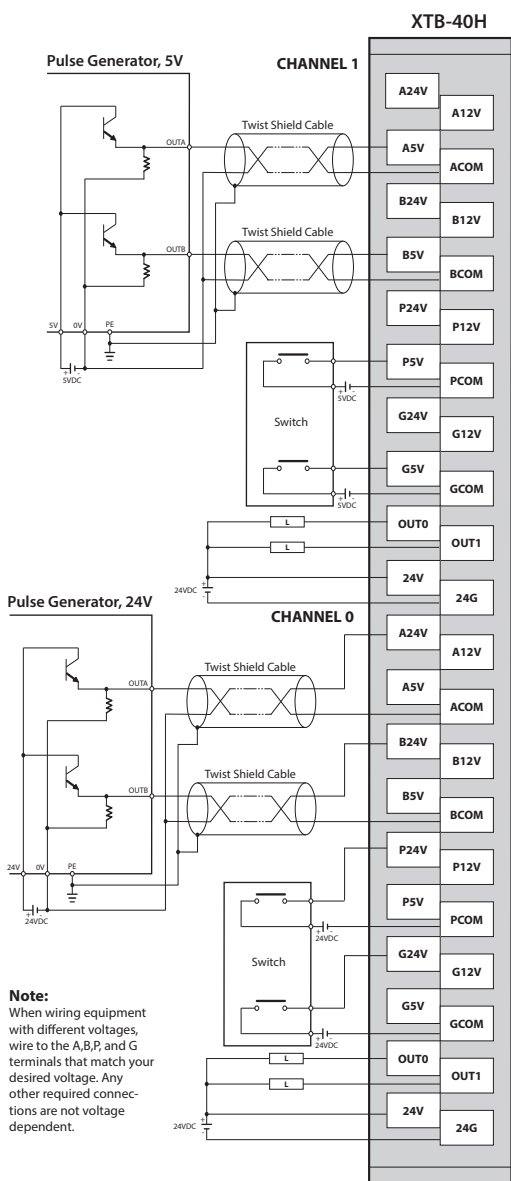
Note: External power (24V: A02, B02 / 24G: A01, B01) is the power source for output comparison output to terminal (A03, B03, A04, B04). Connect when using comparison output.

XBF-HO02A Counter Input Module Terminal Wiring

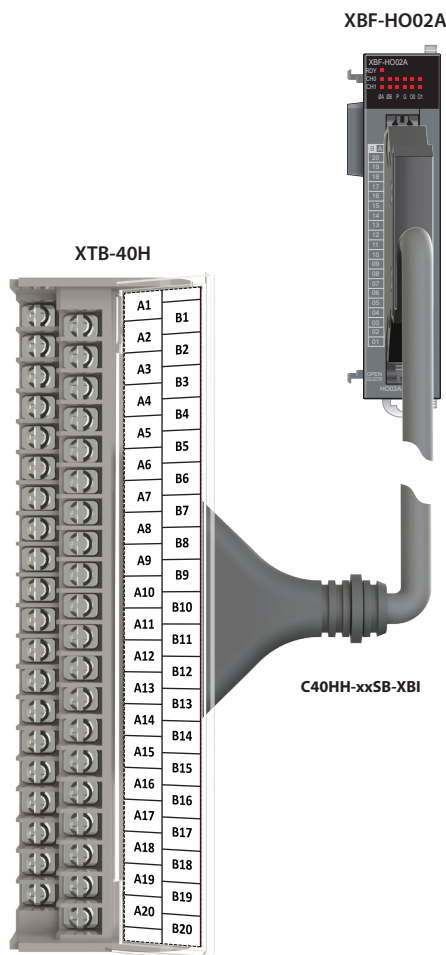
When connecting cable to your XBF-HO02A:

- Take precautions to shield high-speed input wiring from external noise sources.
- Use grounded twisted pair shielded cable (Class3)
- Keep input wiring clear of power or I/O wiring to prevent noise.
- For single-phase applications, connection only to the A-phase input points.
- Ensure wiring length does not exceed the maximum distance specified from the pulse generator.
- Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring



Module Connection





XGB Motion Modules

XBF-HO02A Counter Input Module Configuration

Follow the Quick start video to learn how to Register and Configure this counter input module:

[High Speed Counter Setup - HO02A, HD02A Based](#)

Direct Variables

XGB series high speed counter modules are assigned 32 words in the "U" memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31, z= slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-HO02A are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GobalVariable	_000z_CH0_CNT	%UD0.z.1	DINT	HSC Module: CH0 Count Data
Tag	GobalVariable	_000z_CH0_LTH	%UD0.z.2	DINT	HSC Module: CH0 Latch Count Data
Tag	GobalVariable	_000z_CH0_RNG	%UD0.z.3	DINT	HSC Module: CH0 Sampling Count Data
Tag	GobalVariable	_000z_CH0_FRQ	%UD0.z.4	UDINT	HSC Module: CH0 Input Frequency Data
Tag	GobalVariable	_000z_CH0_RPU	%UD0.z.5	UDINT	HSC Module: CH0 Rev./Unit Time Data
Tag	GobalVariable	_000z_CH0_AUXEN	%UX0.z.371	BOOL	HSC Module: CH0 Auxiliary Function Request
Tag	GobalVariable	_000z_CH0_AUXING	%UX0.z.5	BOOL	HSC Module: CH0 Auxiliary Function Status
Tag	GobalVariable	_000z_CH0_BRW	%UX0.z.4	BOOL	HSC Module: CH0 Borrow Flag
Tag	GobalVariable	_000z_CH0_CMPEN	%UX0.z.372	BOOL	HSC Module: CH0 Enable Compare Function
Tag	GobalVariable	_000z_CH0_CMPOUT0	%UX0.z.6	BOOL	HSC Module: CH0 Compare 0 Output Status
Tag	GobalVariable	_000z_CH0_CMPOUT1	%UX0.z.7	BOOL	HSC Module: CH0 Compare 1 Output Status
Tag	GobalVariable	_000z_CH0_CNTEN	%UX0.z.368	BOOL	HSC Module: CH0 Enable Counter
Tag	GobalVariable	_000z_CH0_CRY	%UX0.z.3	BOOL	HSC Module: CH0 Carry Flag
Tag	GobalVariable	_000z_CH0_CRYBRW_RST	%UX0.z.378	BOOL	HSC Module: CH0 Carry/Borrow Reset Request
Tag	GobalVariable	_000z_CH0_DN	%UX0.z.0	BOOL	HSC Module: CH0 Count Direction Status
Tag	GobalVariable	_000z_CH0_DWNCNT	%UX0.z.370	BOOL	HSC Module: CH0 Count Direction Select
Tag	GobalVariable	_000z_CH0_EQ0RST	%UX0.z.374	BOOL	HSC Module: CH0 Compare 0 EQUAL Reset(Edge) Command
Tag	GobalVariable	_000z_CH0_EQ1RST	%UX0.z.375	BOOL	HSC Module: CH0 Compare 1 EQUAL Reset(Edge) Command
Tag	GobalVariable	_000z_CH0_ERR	%UX0.z.14	BOOL	HSC Module: CH0 Error Flag
Tag	GobalVariable	_000z_CH0_EXTAXX_EN	%UX0.z.380	BOOL	HSC Module: CH0 Enable Aux-Func Ext. Input
Tag	GobalVariable	_000z_CH0_EXTPRE	%UX0.z.1	BOOL	HSC Module: CH0 Preset Ext. Input Flag
Tag	GobalVariable	_000z_CH0_EXTPST_EN	%UX0.z.379	BOOL	HSC Module: CH0 Preset Ext. Input Enable
Tag	GobalVariable	_000z_CH0_EXTPST_RST	%UX0.z.381	BOOL	HSC Module: CH0 Preset Ext. Input Reset Request
Tag	GobalVariable	_000z_CH0_OUTEN	%UX0.z.373	BOOL	HSC Module: CH0 Enable Compare Output Signal
Tag	GobalVariable	_000z_CH0_PREEN	%UX0.z.369	BOOL	HSC Module: CH0 Enable Preset



XGB Motion Modules

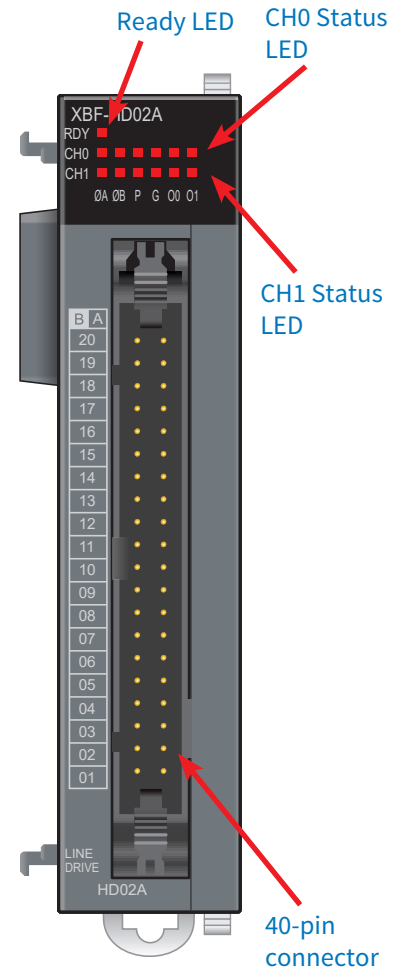
XBF-HO02A Counter Input Module Configuration, *continued*

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GobalVariable	._000z_CH1_CNT	%UD0.z.6	DINT	HSC Module: CH1 Count Data
Tag	GobalVariable	._000z_CH1_LTH	%UD0.z.7	DINT	HSC Module: CH1 Latch Count Data
Tag	GobalVariable	._000z_CH1_RNG	%UD0.z.8	DINT	HSC Module: CH1 Sampling Count Data
Tag	GobalVariable	._000z_CH1_FRQ	%UD0.z.9	UDINT	HSC Module: CH1 Input Frequency Data
Tag	GobalVariable	._000z_CH1_RPU	%UD0.z.10	UDINT	HSC Module: CH1 Rev./Unit Time Data
Tag	GobalVariable	._000z_CH1_AUXEN	%UX0.z.387	BOOL	HSC Module: CH1 Auxiliary Function Request
Tag	GobalVariable	._000z_CH1_AUXING	%UX0.z.21	BOOL	HSC Module: CH1 Auxiliary Function Status
Tag	GobalVariable	._000z_CH1_BRW	%UX0.z.20	BOOL	HSC Module: CH1 Borrow Flag
Tag	GobalVariable	._000z_CH1_CMPEN	%UX0.z.388	BOOL	HSC Module: CH1 Enable Compare Function
Tag	GobalVariable	._000z_CH1_CMPOUT0	%UX0.z.22	BOOL	HSC Module: CH1 Compare 0 Output Status
Tag	GobalVariable	._000z_CH1_CMPOUT1	%UX0.z.23	BOOL	HSC Module: CH1 Compare 1 Output Status
Tag	GobalVariable	._000z_CH1_CNTEN	%UX0.z.384	BOOL	HSC Module: CH1 Enable Counter
Tag	GobalVariable	._000z_CH1_CRY	%UX0.z.19	BOOL	HSC Module: CH1 Carry Flag
Tag	GobalVariable	._000z_CH1_CRYBRW_RST	%UX0.z.394	BOOL	HSC Module: CH1 Carry/Borrow Reset Request
Tag	GobalVariable	._000z_CH1_DN	%UX0.z.16	BOOL	HSC Module: CH1 Count Direction Status
Tag	GobalVariable	._000z_CH1_DWNCNT	%UX0.z.386	BOOL	HSC Module: CH1 Count Direction Select
Tag	GobalVariable	._000z_CH1_EQ0RST	%UX0.z.390	BOOL	HSC Module: CH1 Compare 0 EQUAL Reset(Edge) Command
Tag	GobalVariable	._000z_CH1_EQ1RST	%UX0.z.391	BOOL	HSC Module: CH1 Compare 1 EQUAL Reset(Edge) Command
Tag	GobalVariable	._000z_CH1_ERR	%UX0.z.30	BOOL	HSC Module: CH1 Error Flag
Tag	GobalVariable	._000z_CH1_EXTAUX_EN	%UX0.z.396	BOOL	HSC Module: CH1 Enable Aux-Func Ext. Input
Tag	GobalVariable	._000z_CH1_EXTPRE	%UX0.z.17	BOOL	HSC Module: CH1 Preset Ext. Input Flag
Tag	GobalVariable	._000z_CH1_EXTPST_EN	%UX0.z.395	BOOL	HSC Module: CH1 Preset Ext. Input Enable
Tag	GobalVariable	._000z_CH1_EXTPST_RST	%UX0.z.397	BOOL	HSC Module: CH1 Preset Ext. Input Reset Request
Tag	GobalVariable	._000z_CH1_OUTEN	%UX0.z.389	BOOL	HSC Module: CH1 Enable Compare Output Signal
Tag	GobalVariable	._000z_CH1_PREEN	%UX0.z.385	BOOL	HSC Module: CH1 Enable Preset
Tag	GobalVariable	._000z_RDY	%UX0.z.15	BOOL	HSC Module: Ready Flag

XBF-HD02A Counter Input Module

Part Number	Price	Classification	Description	# of Channels	Drawing
XBF-HD02A	\$253.00	Counter Input	LS Electric XGB counter input module, 500 kHz maximum switching frequency, 2 high-speed input point(s), 5-24 VDC, sinking, 2-channel, differential encoder input(s), 2 high-speed output point(s), 5-24 VDC, sinking, external 24 VDC required.	2	PDF

General Specifications		XBF-HD02A
Count Input Signal	Signal	A-phase, B-phase
	Input Type	Differential input (Line Drive)
	Signal Level	RS-422A Line Drive/HTL LEVEL Line Drive
Maximum Coefficient Speed		500kpps (HTL input: 250kpps)
Number of Channels		2
Coefficient Range		Signed 32-bit (-2,147,483,648 to +2,147,483,647)
Count Mode		Linear Count (when 32-bit range exceeded, carry/borrow occurs, the count value stopped) Ring Count (repeated count within setting range)
Input Pulse Mode		1-phase input 2-phase input CW/CCW
Up/Down Setting	1-phase Input	Increasing/decreasing operation setting by B-phase input Increasing/decreasing operation setting by program
	2-phase Input	Automatic setting by difference in phase
	CW/CCW	A-phase input: increasing operation B-phase input: decreasing operation
Multiplication Function	1-phase Input	1/2 multiplication
	2-phase Input	1/2/4 multiplication
	CW/CCW	1-multiplication
Control Input	Signal	Preset instruction input, auxiliary mode instruction input
	Signal Level	5/12/24 VDC (by terminal selection) input type
	Signal Type	Voltage
External Output	Output Points	2-point/channel (for each channel): terminal output available
	Type	Select single-compared (>, ≥, =, ≤, <) or section compared output (included or excluded)
	Output Type	Open collector output (sink)
Operation Status Display	Input Signal	A-phase input, B-phase input, preset instruction input, auxiliary mode instruction input
	Output Signal	External output 0, external output 1
	Ready Status	Module Ready
Count Enable		Set through program (count available only in enable status)
Preset Function		Set through terminal or program
Auxiliary Mode Function		Count clear, count latch, section count (time setting value: 0-60,000 ms), measurement of input frequency (for respective input phase), measurement of counts per hour (time setting value: 0-60,000 ms), count prohibited function
Terminal		40-pin connector
I/O Points Occupied		Fixed point: 512
Internal Consumed Current		260mA
Weight		90g



XBF-HD02A Counter Input Module Wiring

XBF-HD02A Circuit Configuration						
Circuit Configuration	Internal Circuit Number	XTB-40H Terminal	Pin Number		Signal Name	Driver Type
			CH0	CH1		
	1	AI+	B20	A20	A I phase differentiation input +	RS-422A line driver
	2	AI+	B19	A19	A II phase differentiation input +	HTL level line driver
	3	AI-	B18	A18	A I phase differentiation input -	RS-422A line driver
	4	AI-	B17	A17	A II phase differentiation input -	HTL level line driver
	1	BI+	B16	A16	B I phase differentiation input +	RS-422A line driver
	2	BI+	B15	A15	B II phase differentiation input +	HTL level line driver
	3	BI-	B14	A14	B I phase differentiation input -	RS-422A line driver
	4	BI-	B13	A13	B II phase differentiation input -	HTL level line driver
	5	P24V	B12	A12	Preset input 24V	User terminal per appropriate external power source voltage (5, 12, or 24 VDC)
	6	P12V	B11	A11	Preset input 12V	
	7	P5V	B10	A10	Preset input 5V	
	8	PCOM	B09	A09	Preset input COM	
	5	G24V	B08	A08	Auxiliary function input 24V	User terminal per appropriate external power source voltage (5, 12, or 24 VDC)
	6	G12V	B07	A07	Auxiliary function input 12V	
	7	G5V	B06	A06	Auxiliary function input 5V	
	8	GCOM	B05	A05	Auxiliary function input COM	n/a
	9	OUT0	B04	A04	Comp. output 0	n/a
	10	OUT1	B03	A03	Comp. output 1	
	11	24V	B02	A02	External power input 24V	
	12	24G	B01	A01	External power input GND	

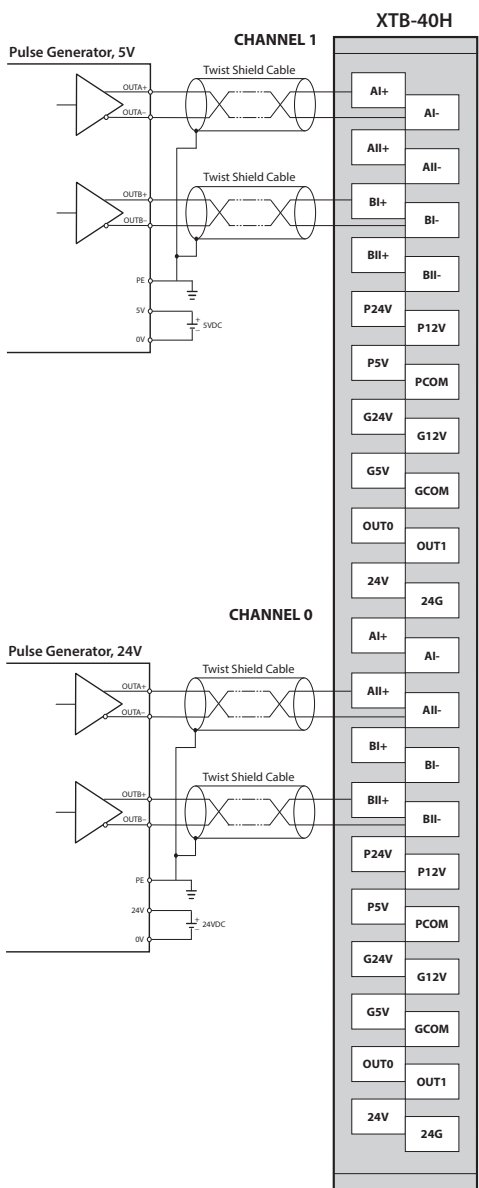
Note: AI+, AI-, BI+, BI- are 5V line driver input terminal. AI+, AI-, BI+, BI- are 24V line driver input terminal.

XBF-HD02A Counter Input Module Wiring

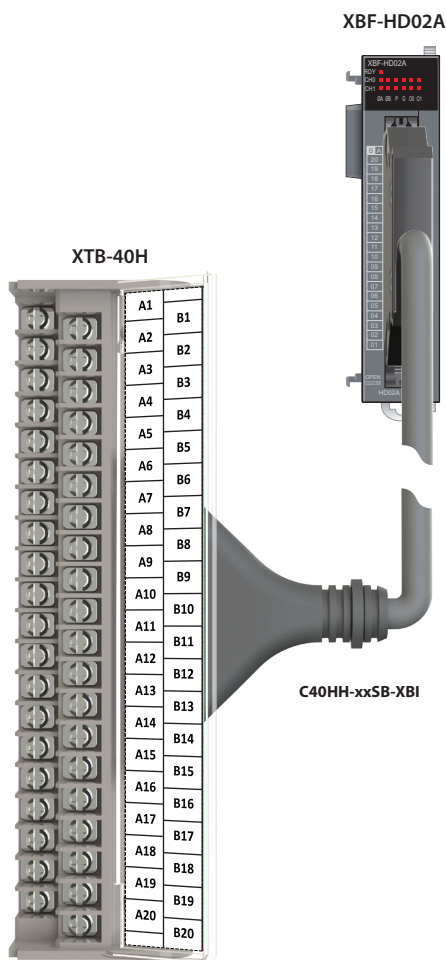
When connecting cable to your XBF-HD02A:

- Take precautions to shield high-speed input wiring from external noise sources.
- Use grounded twisted pair shielded cable (Class3)
- Keep input wiring clear of power or I/O wiring to prevent noise.
- For single-phase applications, connection only to the A-phase input points.
- Ensure wiring length does not exceed the maximum distance specified from the pulse generator.
- Download module specific XTB-40H Terminal Label Printouts here: [Download Printouts](#)

Terminal Wiring



Module Connection





XGB Motion Modules

XBF-HD02A Counter Input Module Configuration

Learn how to Register and Configure this counter input module by viewing the LS PLC Interactive Guide:

[High Speed Counter Setup - HO02A, HD02A Based](#)

Direct Variables

XGB series high speed counter modules are assigned 32 words in the "U" memory area based on the slot number assignment. (%UW0.z.0 - %UW0.z.31, z = slot number). The actual memory address used within the 32 word block are specific to each module. See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the analog module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-HD02A are as follows (z refers to module slot number (2 to 8)).

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GlobalVariable	_000z_CH0_CNT	%UD0.z.1	DINT	HSC Module: CH0 Count Data
Tag	GlobalVariable	_000z_CH0_LTH	%UD0.z.2	DINT	HSC Module: CH0 Latch Count Data
Tag	GlobalVariable	_000z_CH0_RNG	%UD0.z.3	DINT	HSC Module: CH0 Sampling Count Data
Tag	GlobalVariable	_000z_CH0_FRQ	%UD0.z.4	UDINT	HSC Module: CH0 Input Frequency Data
Tag	GlobalVariable	_000z_CH0_RPU	%UD0.z.5	UDINT	HSC Module: CH0 Rev./Unit Time Data
Tag	GlobalVariable	_000z_CH0_AUXEN	%UX0.z.371	BOOL	HSC Module: CH0 Auxiliary Function Request
Tag	GlobalVariable	_000z_CH0_AUXING	%UX0.z.5	BOOL	HSC Module: CH0 Auxiliary Function Status
Tag	GlobalVariable	_000z_CH0_BRW	%UX0.z.4	BOOL	HSC Module: CH0 Borrow Flag
Tag	GlobalVariable	_000z_CH0_CMPEN	%UX0.z.372	BOOL	HSC Module: CH0 Enable Compare Function
Tag	GlobalVariable	_000z_CH0_CMPOUT0	%UX0.z.6	BOOL	HSC Module: CH0 Compare 0 Output Status
Tag	GlobalVariable	_000z_CH0_CMPOUT1	%UX0.z.7	BOOL	HSC Module: CH0 Compare 1 Output Status
Tag	GlobalVariable	_000z_CH0_CNTEN	%UX0.z.368	BOOL	HSC Module: CH0 Enable Counter
Tag	GlobalVariable	_000z_CH0_CRY	%UX0.z.3	BOOL	HSC Module: CH0 Carry Flag
Tag	GlobalVariable	_000z_CH0_CRYBRW_RST	%UX0.z.378	BOOL	HSC Module: CH0 Carry/Borrow Reset Request
Tag	GlobalVariable	_000z_CH0_DN	%UX0.z.0	BOOL	HSC Module: CH0 Count Direction Status
Tag	GlobalVariable	_000z_CH0_DWNCNT	%UX0.z.370	BOOL	HSC Module: CH0 Count Direction Select
Tag	GlobalVariable	_000z_CH0_EQ0RST	%UX0.z.374	BOOL	HSC Module: CH0 Compare 0 EQUAL Reset(Edge) Command
Tag	GlobalVariable	_000z_CH0_EQ1RST	%UX0.z.375	BOOL	HSC Module: CH0 Compare 1 EQUAL Reset(Edge) Command
Tag	GlobalVariable	_000z_CH0_ERR	%UX0.z.14	BOOL	HSC Module: CH0 Error Flag
Tag	GlobalVariable	_000z_CH0_EXTAUX_EN	%UX0.z.380	BOOL	HSC Module: CH0 Enable Aux-Func Ext. Input
Tag	GlobalVariable	_000z_CH0_EXTPRE	%UX0.z.1	BOOL	HSC Module: CH0 Preset Ext. Input Flag
Tag	GlobalVariable	_000z_CH0_EXTPST_EN	%UX0.z.379	BOOL	HSC Module: CH0 Preset Ext. Input Enable
Tag	GlobalVariable	_000z_CH0_EXTPST_RST	%UX0.z.381	BOOL	HSC Module: CH0 Preset Ext. Input Reset Request
Tag	GlobalVariable	_000z_CH0_OUTEN	%UX0.z.373	BOOL	HSC Module: CH0 Enable Compare Output Signal
Tag	GlobalVariable	_000z_CH0_PREEN	%UX0.z.369	BOOL	HSC Module: CH0 Enable Preset



XGB Motion Modules

XBF-HD02A Counter Input Module Configuration, *continued*

Type	Scope	Variable (Symbolic)	Address (Direct Variable Alias)	Data Type	Comment
Tag	GobalVariable	._000z_CH1_CNT	%UD0.z.6	DINT	HSC Module: CH1 Count Data
Tag	GobalVariable	._000z_CH1_LTH	%UD0.z.7	DINT	HSC Module: CH1 Latch Count Data
Tag	GobalVariable	._000z_CH1_RNG	%UD0.z.8	DINT	HSC Module: CH1 Sampling Count Data
Tag	GobalVariable	._000z_CH1_FRQ	%UD0.z.9	UDINT	HSC Module: CH1 Input Frequency Data
Tag	GobalVariable	._000z_CH1_RPU	%UD0.z.10	UDINT	HSC Module: CH1 Rev./Unit Time Data
Tag	GobalVariable	._000z_CH1_DN	%UX0.z.16	BOOL	HSC Module: CH1 Count Direction Status
Tag	GobalVariable	._000z_CH1_EXTPRE	%UX0.z.17	BOOL	HSC Module: CH1 Preset Ext. Input Flag
Tag	GobalVariable	._000z_CH1_CRY	%UX0.z.19	BOOL	HSC Module: CH1 Carry Flag
Tag	GobalVariable	._000z_CH1_BRW	%UX0.z.20	BOOL	HSC Module: CH1 Borrow Flag
Tag	GobalVariable	._000z_CH1_AUXING	%UX0.z.21	BOOL	HSC Module: CH1 Auxiliary Function Status
Tag	GobalVariable	._000z_CH1_CMPOUT0	%UX0.z.22	BOOL	HSC Module: CH1 Compare 0 Output Status
Tag	GobalVariable	._000z_CH1_CMPOUT1	%UX0.z.23	BOOL	HSC Module: CH1 Compare 1 Output Status
Tag	GobalVariable	._000z_CH1_ERR	%UX0.z.30	BOOL	HSC Module: CH1 Error Flag
Tag	GobalVariable	._000z_CH1_CNTEN	%UX0.z.384	BOOL	HSC Module: CH1 Enable Counter
Tag	GobalVariable	._000z_CH1_PREEN	%UX0.z.385	BOOL	HSC Module: CH1 Enable Preset
Tag	GobalVariable	._000z_CH1_DWNCNT	%UX0.z.386	BOOL	HSC Module: CH1 Count Direction Select
Tag	GobalVariable	._000z_CH1_AUXEN	%UX0.z.387	BOOL	HSC Module: CH1 Auxiliary Function Request
Tag	GobalVariable	._000z_CH1_CMPEN	%UX0.z.388	BOOL	HSC Module: CH1 Enable Compare Function
Tag	GobalVariable	._000z_CH1_OUTEN	%UX0.z.389	BOOL	HSC Module: CH1 Enable Compare Output Signal
Tag	GobalVariable	._000z_CH1_EQ0RST	%UX0.z.390	BOOL	HSC Module: CH1 Compare 0 EQUAL Reset(Edge) Command
Tag	GobalVariable	._000z_CH1_EQ1RST	%UX0.z.391	BOOL	HSC Module: CH1 Compare 1 EQUAL Reset(Edge) Command
Tag	GobalVariable	._000z_CH1_CRYBRW_RST	%UX0.z.394	BOOL	HSC Module: CH1 Carry/Borrow Reset Request
Tag	GobalVariable	._000z_CH1_EXTPST_EN	%UX0.z.395	BOOL	HSC Module: CH1 Preset Ext. Input Enable
Tag	GobalVariable	._000z_CH1_EXTMUX_EN	%UX0.z.396	BOOL	HSC Module: CH1 Enable Aux-Func Ext. Input
Tag	GobalVariable	._000z_CH1_EXTPST_RST	%UX0.z.397	BOOL	HSC Module: CH1 Preset Ext. Input Reset Request
Tag	GobalVariable	._000z_RDY	%UX0.z.15	BOOL	HSC Module: Ready Flag



XGB Communication Module

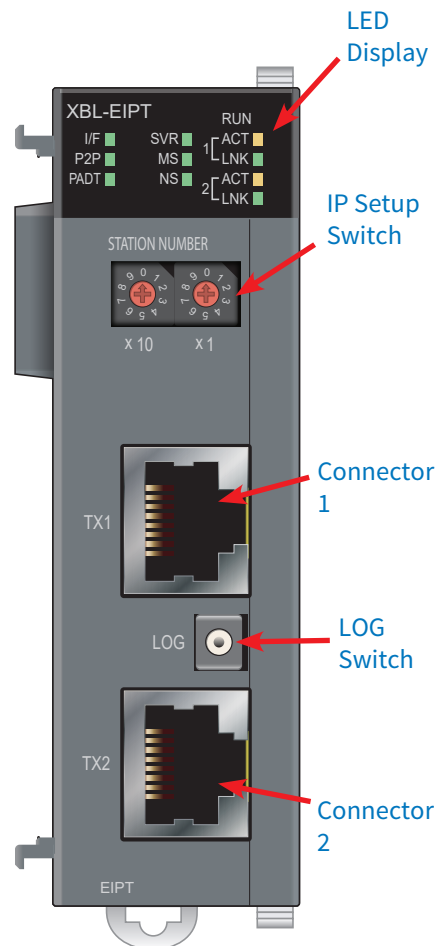
XBL-EIPT Communication Module

This module is used for EtherNet/IP communications. Built in switch functionality and tag based communication configuration make setup easy. The module supports:

- Symbolic Addressing (ANSI Extended Symbol Segment)
- Class 1 Connected Implicit(I/O)Messaging(Cyclic I/O Service Only)
- Class 3 Connected Explicit Messaging(Server Only)
- UCMM Explicit Messaging,

Part Number	Price	Classification	Description	Drawing
XBL-EIPT	\$199.00	Ethernet Communications	LS Electric XGB communication module, EtherNet/IP, 2 ports, (2) Ethernet 10/100Base-T (RJ45) port(s). For use with LS Electric XGB series PLCs.	PDF

General Specifications		XBL-EIPT
Transmission Standard	Speed	100Mbps
	Method	Base band
	Maximum Extension Distance between Nodes	100m
	Communication Zone Excess Method	CSMA/CD
	Frame Error-Checking Method	CRC 32 = X ³² +X ²⁶ +X ²³ +...+X ² +X+1
Topology		Line, Star
Diagnosis Function		Module information, service state, media information, auto scan, ping test
Service	Periodic Client	Implicit I/O Client
	Aperiodic Client	UCMM Client
	Periodic Server	Implicit I/O Server
Number of Connections (Client/Server)	TCP	16/32
	CIP (I/O Communication)	32/64
Maximum Number of Services		2
Maximum Units per CPU		2
Maximum Setting Data Size Per Block	Periodic Client	500 byte
	Aperiodic Client	512 byte
Media		UTP/STP Category 5
Current Consumption		290mA
Weight		102g



XBL-EIPT Communication Module Interface

Device LED Functionality

Faceplate View	LED	Status	Meaning
	RUN	ON	Power ON and process normally operating.
		OFF	Power OFF and process abnormally operating.
	I/F	OFF	I/F operating normally with CPU.
		Flicker/OFF	I/F operating abnormally with CPU.
	P2P	ON	P2P service setting up.
		OFF	P2P service cancelling.
	PADT	ON	XG5000 connected via remote control.
		OFF	XG5000 remote connection released.
	SVR	ON	Exterior client connected.
		OFF	No exterior client connected.
	MS	Green Light ON	Normal operation.
		Green Light flickers	Device configuration in progress.
		Red Light flickers	Incorrect setup or restorable errors.
		Red Light ON	Unrestorable errors.
		Red/Green Light flickers	Self-diagnosis in progress.
	NS	Green Light flickers	No connection to device.
		Green Light ON	Connection with at least 1 device.
		Red Light flickers	Device timeout occurred.
		Red Light ON	Identical IP addresses detected.
	nACT	Flicker	In case of frame - transmitted and received (n=1,2)
nLNK	ON	Network link established (n=1,2)	
	OFF	No network link (n=1,2)	

Device Switch Functionality

Faceplate View	Name	Setting	Function
	Log Switch	Push for > 1s	Press the Log Switch for at least 1 second to store the communication module log to the Flash Area Log. Data in the Flash Area Log is maintained during power cycling. Otherwise, the communication module log is stored to the Memory Area Log and will be erased when the power cycles.
	Station Number (IP setup)	1-90, 94-99	If an IP address is not assigned by the XG5000 software, an IP address will be assigned based as "192.168.250.switch value".
		91-93	Internal configuration only. Do not Use.
		99	For Ring configuration. See User Manual for more information.



XGB Software

XG5000 and XG-PM Software for XGB Series PLC

XG5000 and XG-PM are the powerful software combination used to program and configure the LS Electric XGB Series PLC. Both packages are installed with a single executable file for XG5000.

XG5000

Offers four languages from the IEC61131-3-3 PLC programming standard.

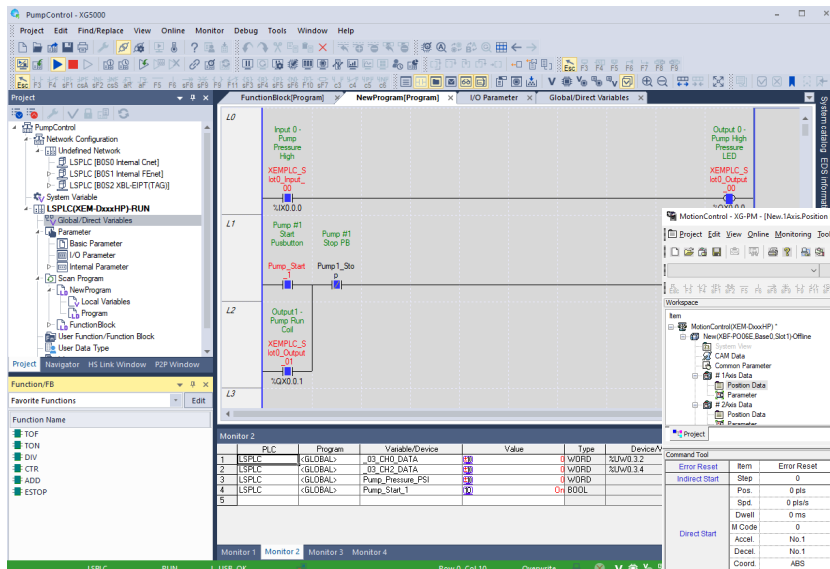
- Ladder Diagram (LD): includes over 700 advanced function blocks for use, with over 80 motion and position functions.
- Structured Text (ST): a text based language which is a powerful tool for advanced motion programming and data handling.
- Sequential Function Chart (SFC) and Instruction List (IL) are also supported.

The software uses Symbolic (also called Automatic) variables created by the user. These can be created as global or local task variables, and can be aliased to direct variables. Variables can be imported/exported for quick editing in spreadsheet format.

Other features include User data types/function blocks, XY Trend for motion visualization, online system information, simulator, EDS file library for EtherNet/IP communications, and much more.

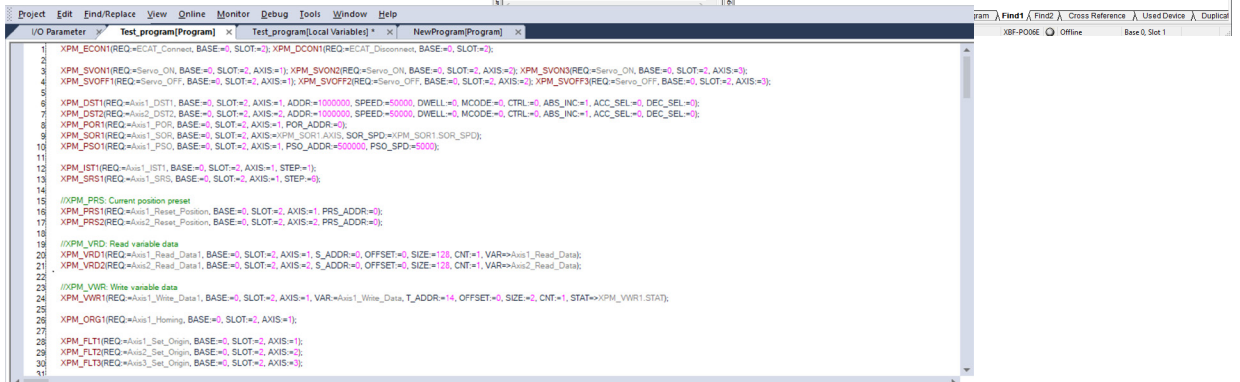
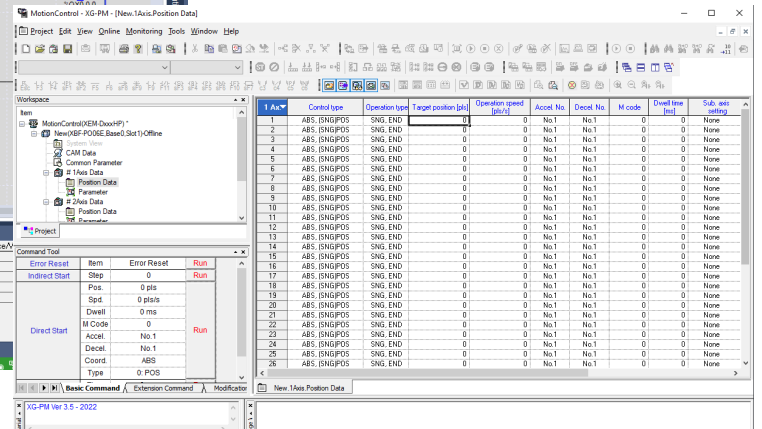
XG-PM

XG-PM Position control software is used to configure the pulse-based or EtherCAT-based motion features in the XGB series PLC. Configuration of up to 400 motion positions per axis via table entry makes setting up complex motion applications simple. The Command Tool allows for quick testing, and online edits per axis make maintenance changes quick and easy. Access XG-PM from the XG5000 Main menu-> Tools -> Position Control.



XG5000 Main Screen

XG-PM Table-based Position Configuration

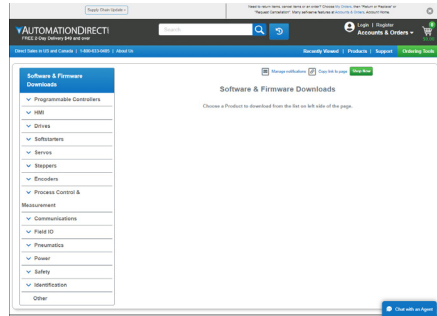


Structured Text Editor

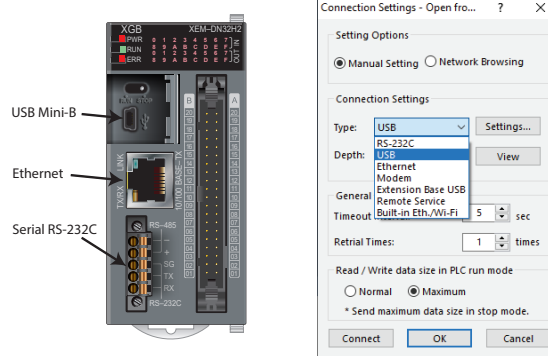
XG5000 Software Setup

View the XG5000 overview topic in the LS PLC Interactive Guide here: [Starting an XG5000 Project](#)

1 Download and install XG5000 software: [Download Software](#)

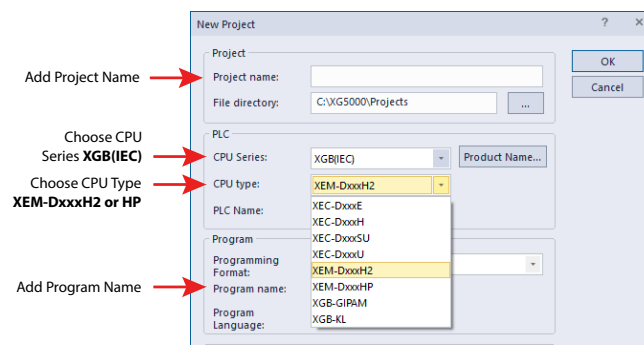


2 Connect your processor to a laptop using USB, Ethernet, or Serial cable (as preferred). Default IP address in the processor is 192.168.250.120.



3 Open XG5000. From the top menu select **Project** → **New Project**.

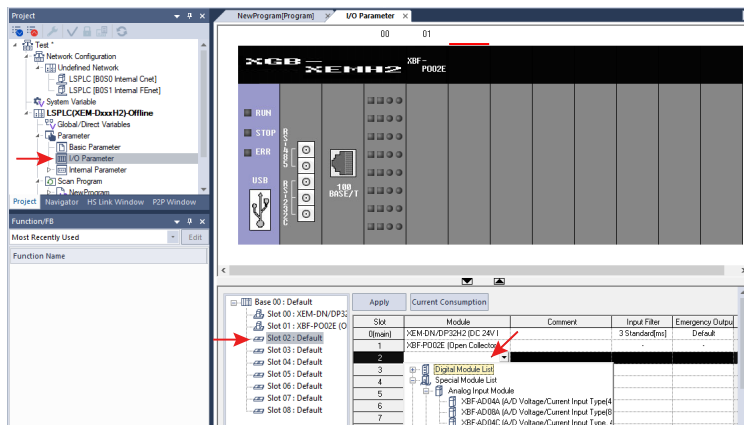
Enter a project name, choose your CPU, add a program name, then click OK to save.



4 Choose **Parameter** → **I/O Parameter** from the project menu bar.

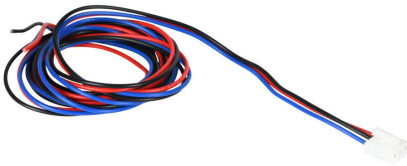
Select a slot from the bottom menu, then use the drop down under **Module** to add modules.

See the video under [Adding Modules](#) for going online and uploading I/O configuration from your rack.



XGB PLC Replacement Terminals

Part Number	Price	Function	Description	Compatible With
<u>XGB-CON-3PX</u>	\$4.00	LS XEM Processor Power 3 pole , Tab Lock, Assembly Connector & Wire	LS Electric XGB terminal block, 3-pin with cable pigtail, replacement. For use with LS Electric XEM-Dx32Hx PLCs.	XEM-DN32H2, XEM-DN32HP, XEM-DP32H2, XEM-DP32HP
<u>XGB-CON-5PX</u>	\$4.00	LS XEM Processor Serial Communication 5 Pole, Screw Lock	LS Electric XGB terminal block, 5-pin spring clamp, replacement. For use with LS Electric XEM-Dx32Hx PLCs.	XEM-DN32H2, XEM-DN32HP, XEM-DP32H2, XEM-DP32HP
<u>XGB-CON-8P</u>	\$5.00	LS XGB PLC IO Connector 8 Pole	LS Electric XGB terminal block, 8-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-DC16A, XBE-DC16B, XBE-TN16A, XBE-TP16A, XBF-AD08A
<u>XGB-CON-9P</u>	\$6.00	LS XGB PLC IO Connector 9 Pole	LS Electric XGB terminal block, 9-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-RY08B, XBE-RY16A
<u>XGB-CON-10P</u>	\$6.00	LS XGB PLC IO Connector 10 Pole	LS Electric XGB terminal block, 10-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBE-DC16A, XBE-DC16B, XBE-TN16A, XBE-TP16A, XBF-AD08A, XBE-AC08A
<u>XGB-CON-11P</u>	\$6.00	LS XGB PLC IO Connector 11 Pole	LS Electric XGB terminal block, 11-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBF-AD04A , XBF-AH04A, XBF-DV04A, XBF-DV04C, XBF-DC04A, XBF-DC04C
<u>XGB-CON-15P</u>	\$7.00	LS XGB PLC IO Connector 15 Pole	LS Electric XGB terminal block, 15-pin screw type, replacement. For use with LS Electric XGB series I/O modules.	XBF-AD04C



XGB-CON-3PX



XGB-CON-9P



XGB-CON-15P



XGB Accessories

Smart Link I/O System

The Smart Link I/O system is a breakout wiring system used for high density I/O modules in the LS Electric XGB PLC series. The system is required for all modules with a 40-pin connection, and consists of a Smart Link cable with an XTB-40H terminal block.

Download module specific XTB-40H Terminal Label Printouts here: [Terminal Printouts](#)



Part Number	Price	Description	Length	Compatible With
<u>XTB-40H</u>	\$20.00	LS Electric XGB terminal block, 40-pin screw type. For use with LS Electric XGB series high-density modules.	n/a	All LS XGB series PLCs and modules with 40-pin connectors
<u>C40HH-05SB-XBI</u>	\$22.00	LS Electric XGB PLC I/O cable, 1.6ft/0.5m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	0.5 m	
<u>C40HH-10SB-XBI</u>	\$25.00	LS Electric XGB PLC I/O cable, 3.2ft/1m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	1m	
<u>C40HH-15SB-XBI</u>	\$29.00	LS Electric XGB PLC I/O cable, 4.9ft/1.5m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	1.5 m	
<u>C40HH-20SB-XBI</u>	\$36.00	LS Electric XGB PLC I/O cable, 6.5ft/2m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	2m	
<u>C40HH-30SB-XBI</u>	\$42.00	LS Electric XGB PLC I/O cable, 9.8ft/3m cable length, 40-pin connector to 40-pin connector. For use with LS Electric XGB series high-density modules.	3m	

XTB-40H Specifications		
Number of Pins	40 pin	
Terminal Pitch	7.0 mm	
Connector Type	MIL-C-83503 (50P polarity guide: 2EA)	
Applicable Wires	AWG22-16 (1.5mm ² /MAX)	
Insulation Resistance	100MΩ (500VDC)	
Dielectric Strength	500VAC 1 minute	
Screw	M3 x 8L	
Screw Torque	1.2N•m (12kgf•cm)	
Ambient Temperature	-10°C to +50°C (no freezing)	
Material	Case	Modified PPO
	Protective Cover	Polycarbonate
	PCB	Epoxy 1.6t

Smart Link I/O System, Terminals and Cable Connections

Module to Cable to Terminal Pinouts		
Module Pins	C40HH-xxSB-XBI	XTB-40H Terminal
B20	<p>HIROSE HIF3BA-40D-2.54R</p> <p>HIROSE HIF3BA-40D-2.54R</p>	A1
B19		A2
B18		A3
B17		A4
B16		A5
B15		A6
B14		A7
B13		A8
B12		A9
B11		A10
B10		A11
B09		A12
B08		A13
B07		A14
B06		A15
B05		A16
B04		A17
B03		A18
B02		A19
B01		A20
A20		B1
A19		B2
A18		B3
A17		B4
A16		B5
A15		B6
A14		B7
A13		B8
A12		B9
A11		B10
A10		B11
A09		B12
A08		B13
A07		B14
A06		B15
A05		B16
A04		B17
A03		B18
A02		B19
A01		B20