LS ELECTRIC

XGB Analog Modules

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	Range	Type	12-bit binary data	
			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	Range	Type	12-bit binary data	
			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	
				1.25 mV (1–5, 0–5 VDC) 2.5 mV (0–10 VDC)	5µA (4–20, 0–20 mA DC)
	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..

Input / Output LED

Voltage/ Current selection switch

Terminal block

XBF-AH04A
INPUT
OUTPUT
V ↔ I
INPUT CH0 CH1
OUTPUT CH0 CH1
CH0 +
INPUT CH1 +
CH0 +
OUTPUT CH1 -
NC
24Vd.c.
AH04A
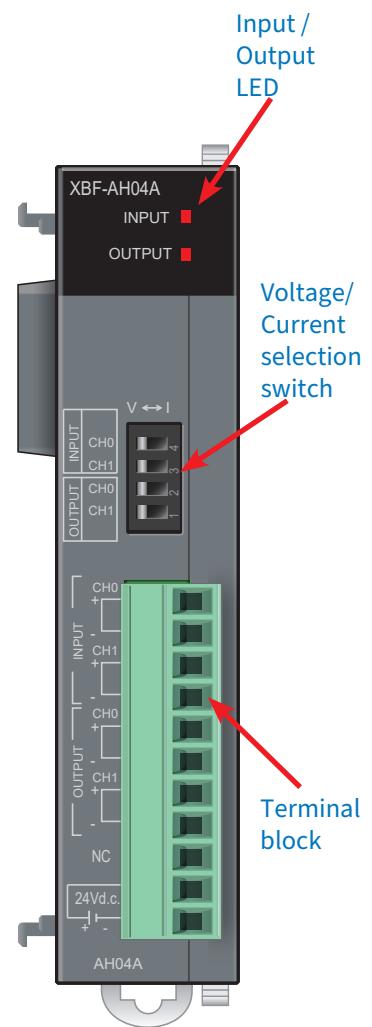
XBF-AH04A Analog Combo Module Wiring

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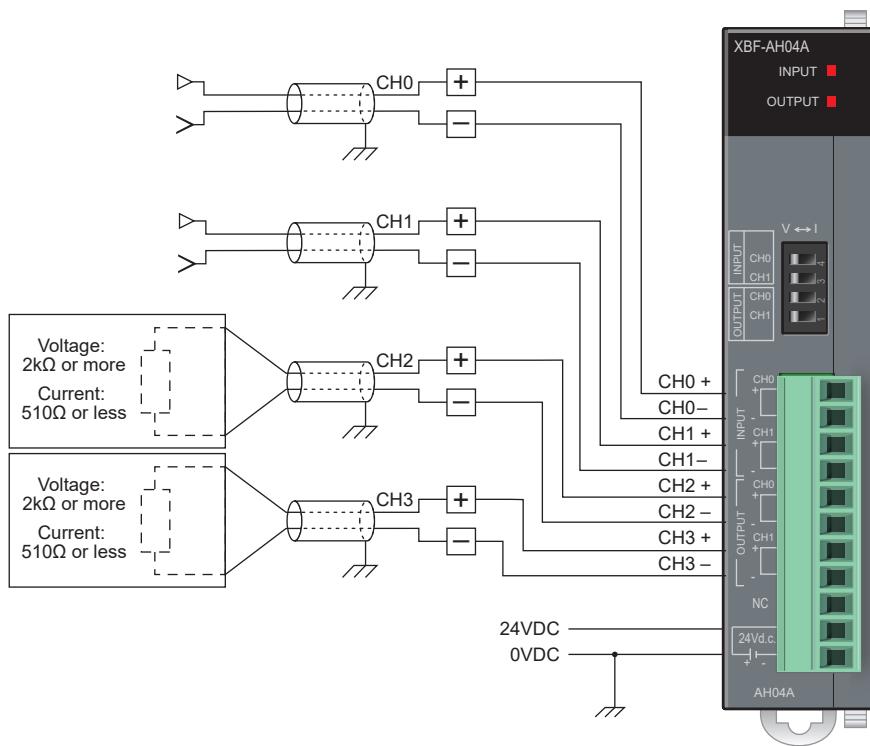
Notes:
- Use 2-core twisted shield cable
- Use AWG22 ($0.3mm^2$) cable
- Current input resistance is 250Ω
- Current output load resistance is 510Ω or less
- Voltage input resistance is 1MΩ
- Voltage output load resistance is 2kΩ or above
- Terminal screwdriver: slotted 2.5 mm

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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

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	Frequency	$5 \leq f < 8.4$ Hz	3.5 mm pulse width	IEC61131-3-2
			$8.4 \leq f < 150Hz$	9.8 m/s^2 (1G)	
	Continuous Vibration		$5 \leq f < 8.4$ Hz	1.75 mm pulse width	
			$8.4 \leq f < 150Hz$	4.9 m/s^2 (0.5G)	
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.

LS ELECTRIC

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	Bus Coupler Compatible	Smart Link Required
Digital										
XBE-DC08A	$59.00	LS Electric XGB discrete input module, 8-point, 24 VDC, sinking/sourcing, 1 common(s), 8 point(s) per common. Removable terminal block included.	✓					✓	
XBE-DC16A	$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.	✓					✓	
XBE-DC16B	$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.	✓					✓	
XBE-DC32A	$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.	✓					✓	✓
XBE-AC08A	$88.00	LS Electric XGB discrete input module, 8-point, 120 VAC, 2 common(s), 4 point(s) per common. Removable terminal blocks included.	✓					✓	
XBE-RY08A	$80.00	LS Electric XGB relay output module, 8-point, 125 VDC/250 VAC, (8) Form A, 1 common(s), 8 point(s) per common, 2A/point, 5A/common. Removable terminal block included.		✓				✓	
XBE-RY08B	$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.		✓				✓	
XBE-RY16A	$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.		✓				✓	
XBE-TN08A	$60.00	LS Electric XGB discrete output module, 8-point, 12-24 VDC, sinking, 1 common(s), 8 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				✓	
XBE-TN16A	$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.		✓				✓	
XBE-TN32A	$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.		✓				✓	✓
XBE-TP08A	$62.00	LS Electric XGB discrete output module, 8-point, 12-24 VDC, sourcing, 1 common(s), 8 point(s) per common, 0.5A/point, 2A/common. Removable terminal blocks included.		✓				✓	
XBE-TP16A	$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.		✓				✓	
XBE-TP32A	$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.		✓				✓	✓
XBE-DN32A	$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.	✓	✓				✓	✓
XBE-DR16A	$97.00	LS Electric XGB discrete combo module, Input: 8-point, 24 VDC, sinking/sourcing, Output: 8-point, 125 VDC/250 VAC, relay, (8) Form A (SPST) relays, 2A/point, 5A/common. Removable terminal blocks included.	✓	✓				✓	
Motion										
XBF-PN04B	$350.00	LS Electric XGB 4-axis positioning module, EtherCAT Master, 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-DxxxHx PLCs.					✓		
XBF-PN08B	$395.00	LS Electric XGB 8-axis positioning module, EtherCAT Master, 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-DxxxHx PLCs.					✓		
XBF-HO02A	$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.					✓	✓	✓
XBF-HD02A	$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.					✓	✓	✓

Note: See "Smart Link I/O System" on page tLSE-125 for the XTB-40H terminal block and cables. See "XGB PLC Replacement Terminals" on page tLSE-124 for replacement removable terminal blocks.