

Mixed I/O Link Module

B7AM-6BS

Compact B7A Module Provides 16 Input and 16 Output Points

- Saves space in control panels, measures just 114.5 mm (4.51 in) wide
- Compatible with B7A 8-point mixed I/O terminal wiring blocks
- Switch selected transmission speed for Normal I/O delay (19.2 ms typical) and short I/O delay (3 ms typical)
- Switch selected Hold or Load Off options for handling transmission errors
- DIN rail or surface mounting



Ordering Information

MODEL NUMBER LEGEND

B7AM - 6 B S
1 2 3 4

1. Classification

M: Mixed I/O model

2. Number of I/O

6: Sixteen input points and sixteen output points

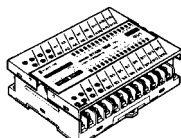
3. Input/Output Configuration

B: NPN input and 100 mA NPN open collector output per point

4. Appearance

S: Screw terminals

MIXED I/O LINK MODULES

Appearance	I/O configuration	I/O delay (typical)	Error processing	Part number
	NPN compatible inputs/ NPN open collector outputs, 100 mA/point	Normal speed 19.2 ms High speed 3 ms (switch selectable)	HOLD/LOAD OFF (switch setting)	B7AM-6BS

POWER SUPPLIES

Input voltage	Output rating	Application	Part number
120 to 240 VAC	0.13 A, 24 VDC	Use one to power each input or output block	S82K-00324
	0.3 A, 24 VDC	Use one to power two blocks from a single power supply	S82K-00724
	0.6 A, 24 VDC	Use this to power blocks connected to sensors, relays indicator lights	S82K-01524
	1.3 A, 24 VDC	Use one where excess power is needed	S82K-03024

Specifications

■ CHARACTERISTICS

General

Item	Normal speed	High speed
Communication method	Unidirectional, time-division multiplex	
Transmission distance	500 m max.	100 m max. (See Note 1)
I/O delay	Typical: 19.2 ms; 31 ms max.	Typical: 3 ms; 5 ms max.
Minimum input time (See Note 2)	16 ms	2.4 ms
Operating voltage range	12 to 24 VDC (10.8 to 26.4 VDC)	
Insulation resistance	100 MΩ min. at 500 V between each terminal and external parts	
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between each terminal and external parts	
Noise immunity (See Note 3)	Noise level: 1.5 kV; pulse width: 100 ns to 1 μs	
Vibration resistance	10 to 55 Hz, 1.5 mm double amplitude	
Shock resistance	300 m/s ² (approx. 30G)	
Ambient temperature	Operating: -10°C to 55°C (14°F to 131°F) with no icing Storage: -25°C to 65°C (-13°F to 149°F) with no icing	
Ambient humidity	Operating: 35% to 85% with no condensation	

Note: 1. A shielded transmission cable or a twisted pair or VCTF cable with a thickness of 0.75 mm² minimum must be used for signal transmission. If the twisted pair or VCTF cable is used, however, the transmission distance will be 10 m maximum regardless of whether or not independent power supplies for the Input and the Output Link Terminals are used.

2. The minimum input time is required for the B7AM to read an input signal.

3. As for the high-speed transmission setting, these values are possible without grounding the shielded line.

Mixed I/O Terminal Block

Item	B7A-6BS
I/O delay	Standard (typical 19.2 ms); high-speed (typical 3 ms), switch selectable (See Note 4)
Current consumption (See Note 1)	240 mA max. with all input/output terminals ON
Operating voltage range	12 to 24 VDC
Compatible inputs (See Note 2)	Switches, two-wire sensors with DC output, three-wire NPN sensors
Input logic	Active low
Input voltage range	0 VDC to supply voltage
Input current range	-6 to -3 mA/point (current flowing from input terminals)
Minimum input time	Standard: 16 ms; high-speed: 2.4 ms
ON/OFF threshold	No-contact input: ON voltage: 4 V max. OFF voltage: 6 V min. Contact input: ON discrimination resistance: 660 Ω max. OFF discrimination resistance: 2 kΩ min.
Output configuration	NPN open collector
Rated load voltage	5 to 24 VDC
Output residual voltage	0.8 V max.
Output current	Sink current, 100 mA max./ point
Error processing	HOLD/LOAD OFF is set using a selection switch (See Note 3)
Mounting strength	No damage when 5 kgf (49 N) pull is applied for 1 min each in all directions
Terminal strength	No damage when 5 kgf (49 N) pull is applied for 1 min each in all directions
Tightening torque	8 to 12 kgf • cm (0.78 to 1.18 N • m)
Weight	Approx. 230 g

Note: 1. Consumption when all 16 input/output points are ON. Excludes external sensor current for Input Terminals and external load current and error load current for Output Terminals.

2. Power must be supplied to the three-wire sensor via the positive power supply terminal or from an independent power supply. Two-wire sensors must satisfy the following requirements:

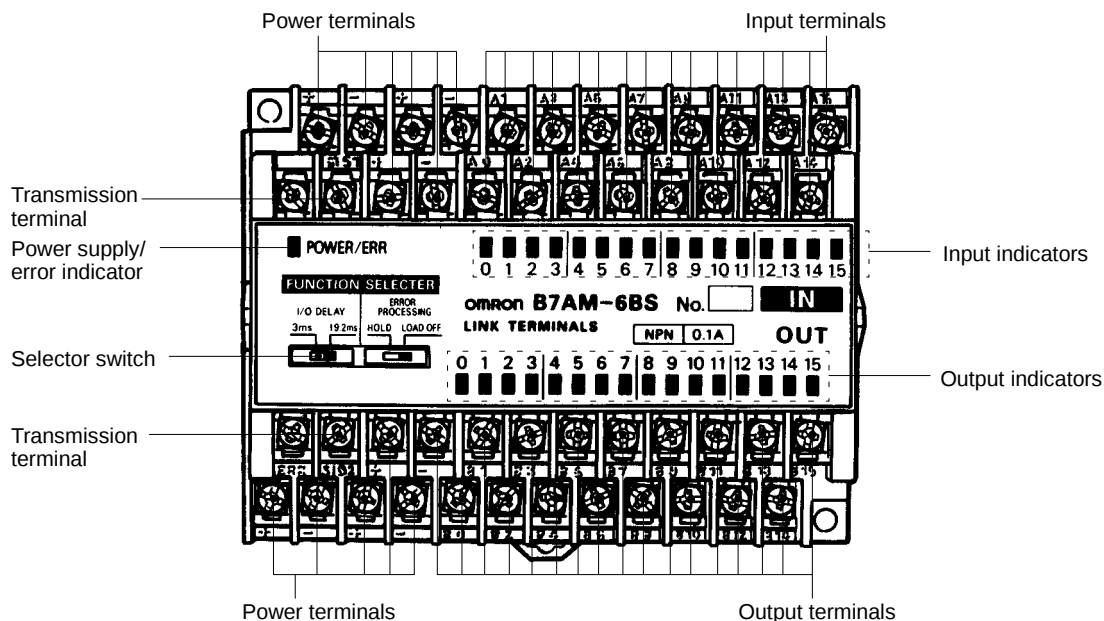
Residual voltage: 4 V max.

Current leakage: 1.5 mA max.

The lower limit of control output: 3 mA (Use a bleeder resistor to eliminate this restriction.)

3. Default settings are 19.2 ms and LOAD OFF.

Nomenclature



Indicator Operation

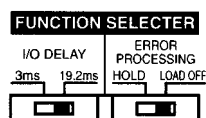
Indicator	Function
POWER/ERR	G Lit when power is supplied and the Terminal is operating without error.
	R Lit during transmission errors (SIG2).
	N Not lit when power is not supplied.
I/O	O Lit when the input signals are ON.
	N Not lit when the signals are OFF.

Note: G: Green indicator lit; R: Red indicator lit;
O: Orange indicator lit; N: Not lit

Recommended Solderless Terminals

Wire	JIS specifications
0.75 mm ² (AWG#18)	RAV 1.25 to 3.5 (vinyl-insulated round wire) or RAP 1.25 to 3.5 (nylon-insulated round wire)
1.25 mm ² (AWG#16)	

Selector Switch Settings



Transmission speed selector switch		Error processing selector switch	
3 ms	19.2 ms	HOLD	LOAD OFF
High-speed: (typical 3 ms)	Standard: (typical 19.2 ms)	When an error occurs, the output holds the state that existed right before the error occurred.	When an error occurs, the output shuts off everything.

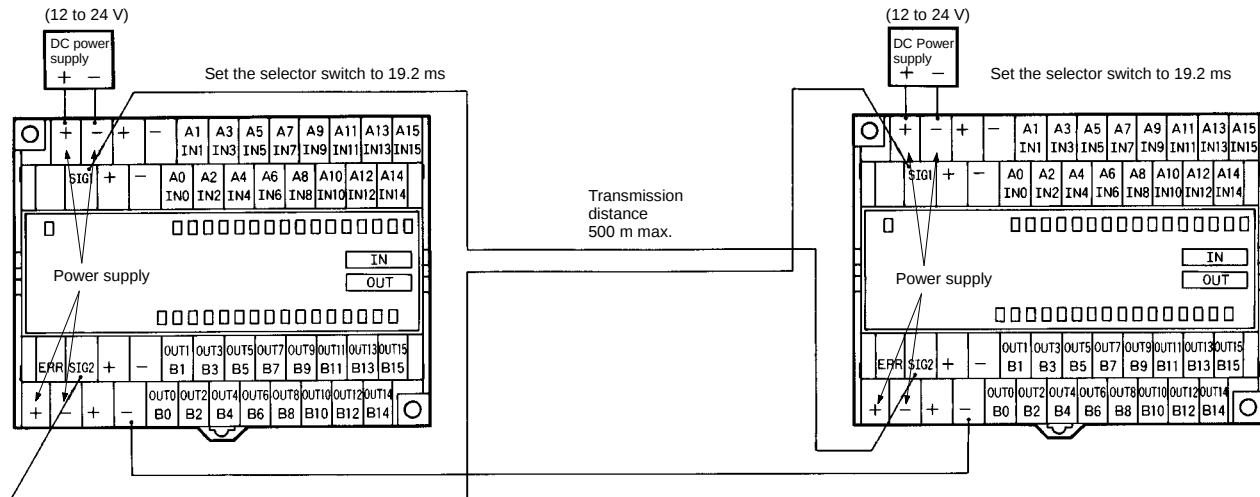
Note: Default settings are 19.2 ms and LOAD OFF.

Operation

■ POWER SUPPLY

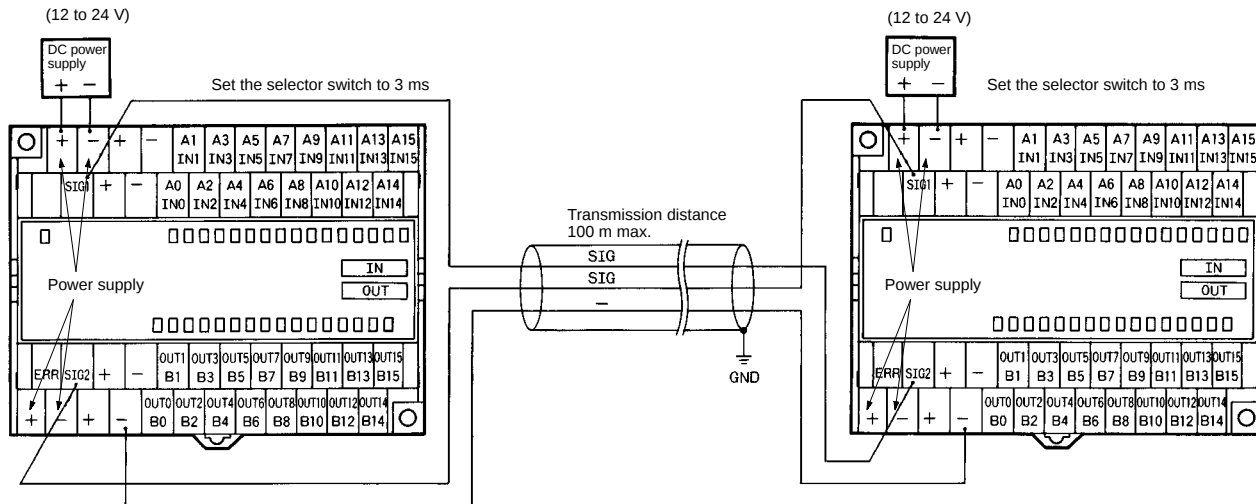
The six positive and six negative terminals on the terminal block are internally connected. Use positive and negative terminals for the power supply terminals and another negative terminal for the negative signal line. Connect the SIG1 terminals to SIG2 terminals for the signal lines.

I/O Delay: Normal Speed



Note: A twisted pair or VCTF cable with a thickness of 0.75 mm² min. must be used for signal transmission.

I/O Delay: High Speed

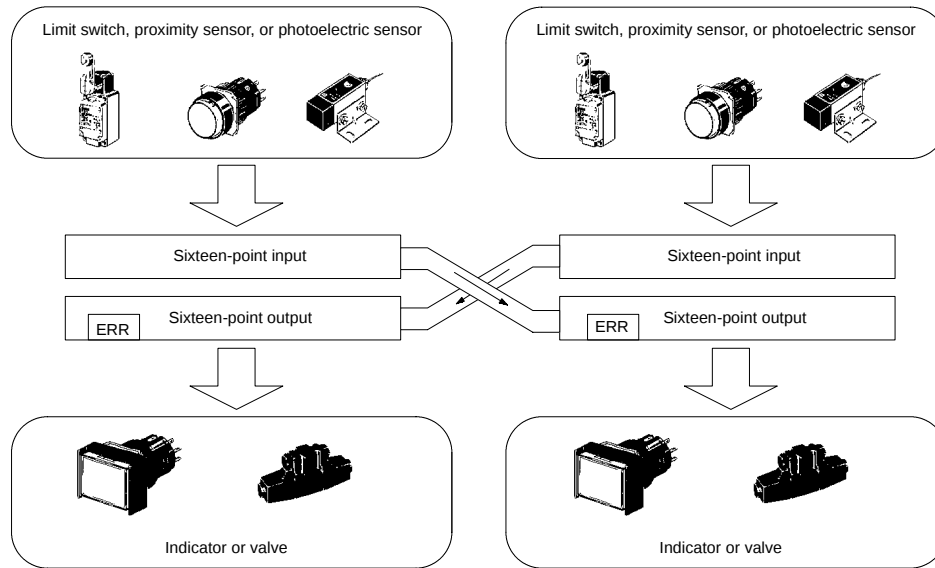


Note: A shielded cable with a thickness of 0.75 mm² min. must be used for signal transmission. It is recommended that the shield be grounded.

The maximum transmission distance is 10 m if a twisted pair or VCTF wire with a thickness of 0.75 mm² is used instead of a shielded cable for the transmission path.

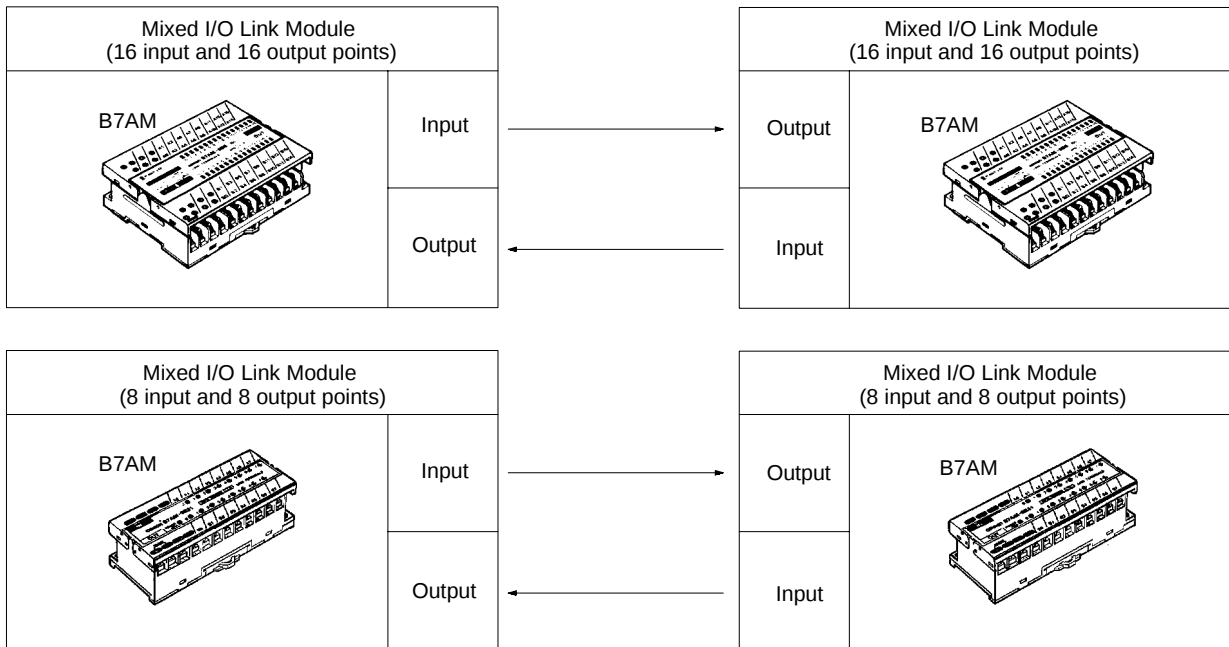
■ CONFIGURATION

Device Connection



Note: The B7AM transmits input signals from SIG1 (input terminal) to SIG2 (output terminal). If an error results while the B7AM is transmitting input signals, an error signal is output from the output side only.

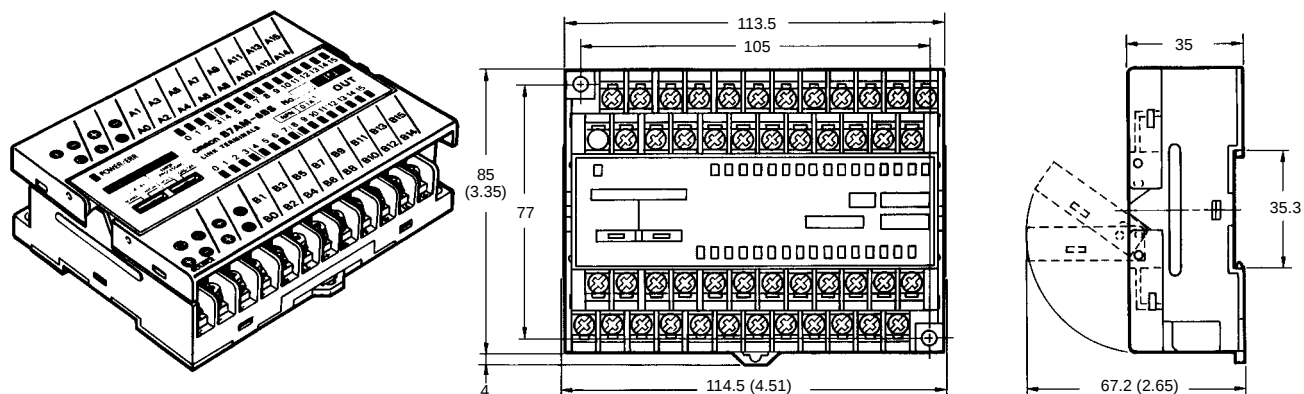
B7AM Mixed I/O System Configuration



Note: The Mixed I/O Link Modules are either 3 ms (typical, for high-speed models) or 19.2 ms (typical, for normal-speed models). Use a Mixed I/O Link Module with the same transmission speed (I/O delay time).

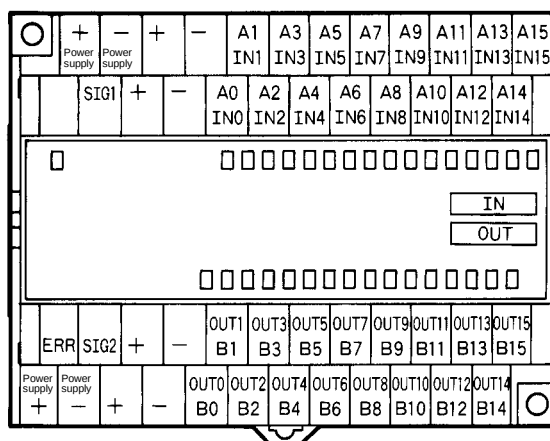
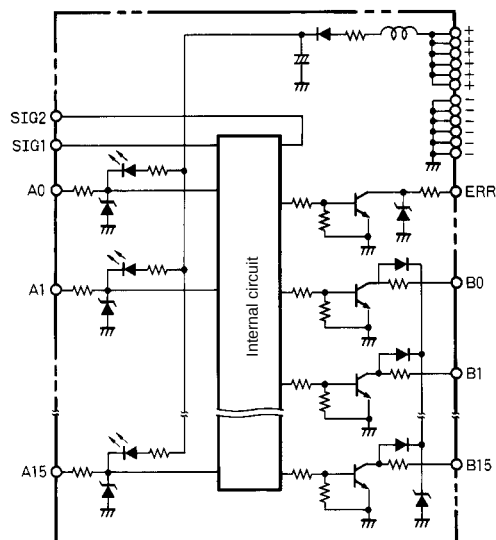
Dimensions

Unit: mm (inch)



Installation

INTERNAL CIRCUITS AND TERMINAL ARRANGEMENT



NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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