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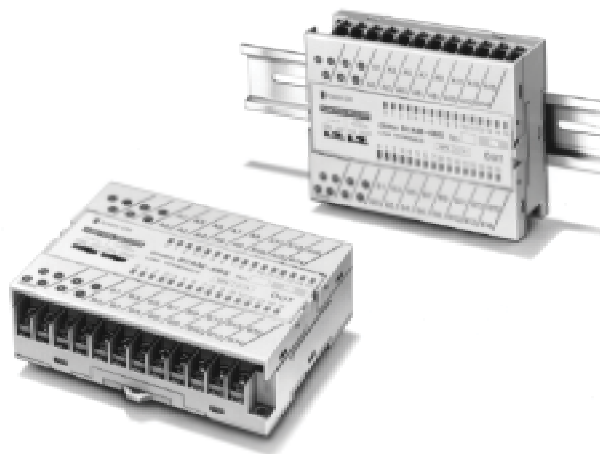


## Mixed I/O Link Module

**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

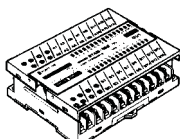
**3. Input/Output Configuration**

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)	<b>B7AM-6BS</b>

#### 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	<b>S82K-00324</b>
	0.3 A, 24 VDC	Use one to power two blocks from a single power supply	<b>S82K-00724</b>
	0.6 A, 24 VDC	Use this to power blocks connected to sensors, relays indicator lights	<b>S82K-01524</b>
	1.3 A, 24 VDC	Use one where excess power is needed	<b>S82K-03024</b>

# Specifications

## ■ CHARACTERISTICS

### General

Item	Normal speed	High speed
<b>Communication method</b>	Unidirectional, time-division multiplex	
<b>Transmission distance</b>	500 m max.	100 m max. (See Note 1)
<b>I/O delay</b>	Typical: 19.2 ms; 31 ms max.	Typical: 3 ms; 5 ms max.
<b>Minimum input time</b> (See Note 2)	16 ms	2.4 ms
<b>Operating voltage range</b>	12 to 24 VDC (10.8 to 26.4 VDC)	
<b>Insulation resistance</b>	100 M $\Omega$ min. at 500 V between each terminal and external parts	
<b>Dielectric strength</b>	1,000 VAC, 50/60 Hz for 1 min between each terminal and external parts	
<b>Noise immunity</b> (See Note 3)	Noise level: 1.5 kV; pulse width: 100 ns to 1 $\mu$ s	
<b>Vibration resistance</b>	10 to 55 Hz, 1.5 mm double amplitude	
<b>Shock resistance</b>	300 m/s <sup>2</sup> (approx. 30G)	
<b>Ambient temperature</b>	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	
<b>Ambient humidity</b>	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 mm<sup>2</sup> 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
<b>I/O delay</b>	Standard (typical 19.2 ms); high-speed (typical 3 ms), switch selectable (See Note 4)
<b>Current consumption</b> (See Note 1)	240 mA max. with all input/output terminals ON
<b>Operating voltage range</b>	12 to 24 VDC
<b>Compatible inputs</b> (See Note 2)	Switches, two-wire sensors with DC output, three-wire NPN sensors
<b>Input logic</b>	Active low
<b>Input voltage range</b>	0 VDC to supply voltage
<b>Input current range</b>	-6 to -3 mA/point (current flowing from input terminals)
<b>Minimum input time</b>	Standard: 16 ms; high-speed: 2.4 ms
<b>ON/OFF threshold</b>	No-contact input: ON voltage: 4 V max. OFF voltage: 6 V min. Contact input: ON discrimination resistance: 660 $\Omega$ max. OFF discrimination resistance: 2 k $\Omega$ min.
<b>Output configuration</b>	NPN open collector
<b>Rated load voltage</b>	5 to 24 VDC
<b>Output residual voltage</b>	0.8 V max.
<b>Output current</b>	Sink current, 100 mA max./ point
<b>Error processing</b>	HOLD/LOAD OFF is set using a selection switch (See Note 3)
<b>Mounting strength</b>	No damage when 5 kgf (49 N) pull is applied for 1 min each in all directions
<b>Terminal strength</b>	No damage when 5 kgf (49 N) pull is applied for 1 min each in all directions
<b>Tightening torque</b>	8 to 12 kgf • cm (0.78 to 1.18 N • m)
<b>Weight</b>	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:

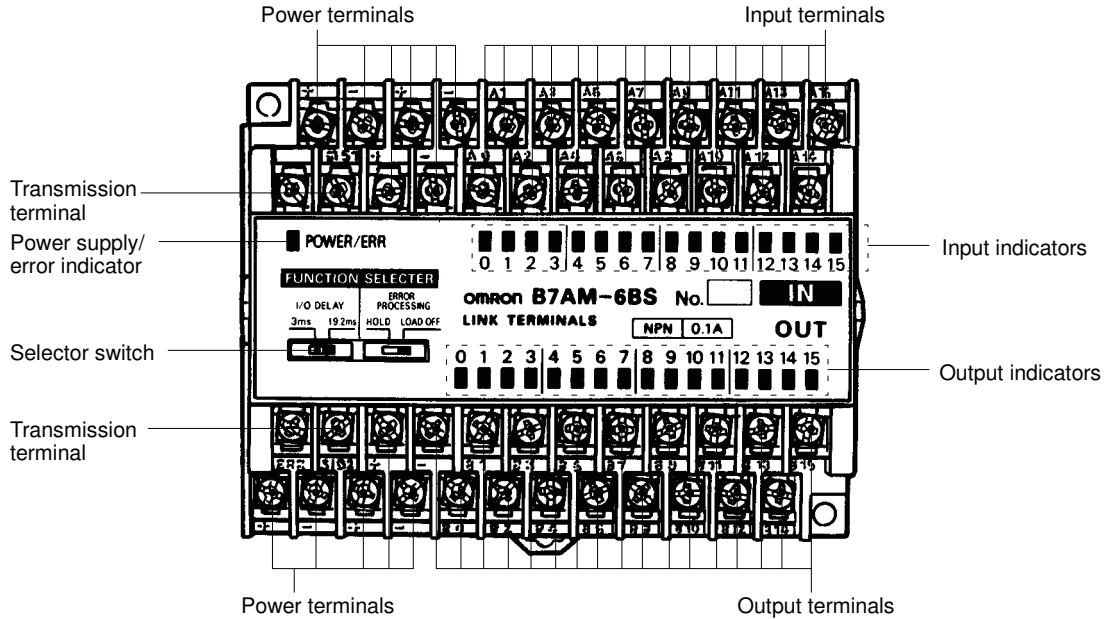
Residual voltage: 4 V max.

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

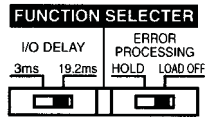
Indicator		Function
POWER/ERR	G	Lit when power is supplied and the Terminal is operating without error.
	R	Lit during transmission errors (SIG2).
	N	Not lit when power is not supplied.
I/O	O	Lit when the input signals are ON.
	N	Not lit when the signals are OFF.

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 <sup>2</sup> (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 <sup>2</sup> (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.

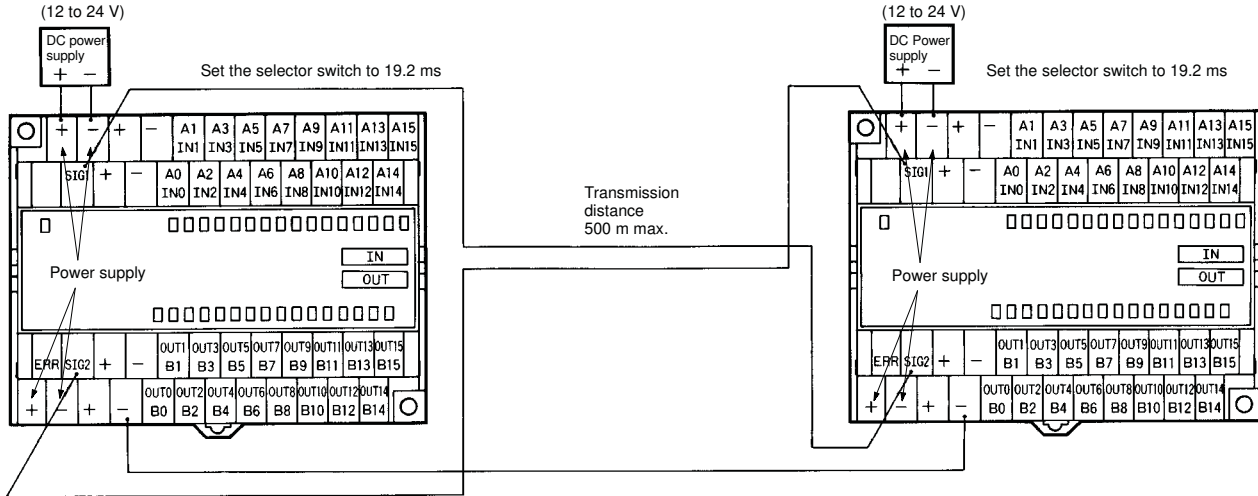
Note: Default settings are 19.2 ms and LOAD OFF.

# Operation

## POWER SUPPLY

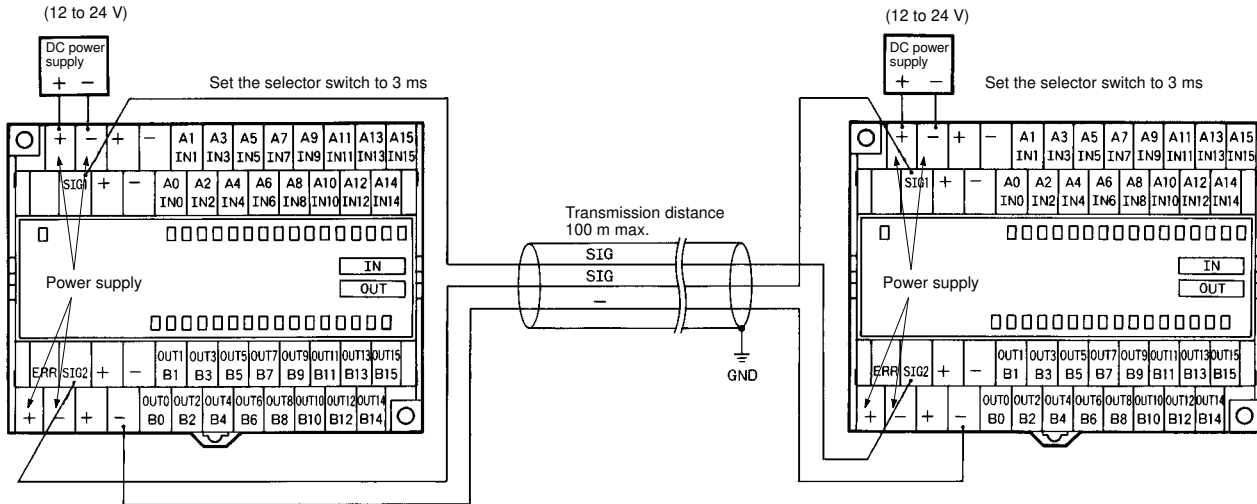
The six positive and six negative terminals on the terminal block are internally connected. Use positive and negative terminals for the power supply terminals and another negative terminal for the negative signal line. Connect the SIG1 terminals to SIG2 terminals for the signal lines.

### I/O Delay: Normal Speed



Note: A twisted pair or VCTF cable with a thickness of 0.75 mm<sup>2</sup> min. must be used for signal transmission.

### I/O Delay: High Speed

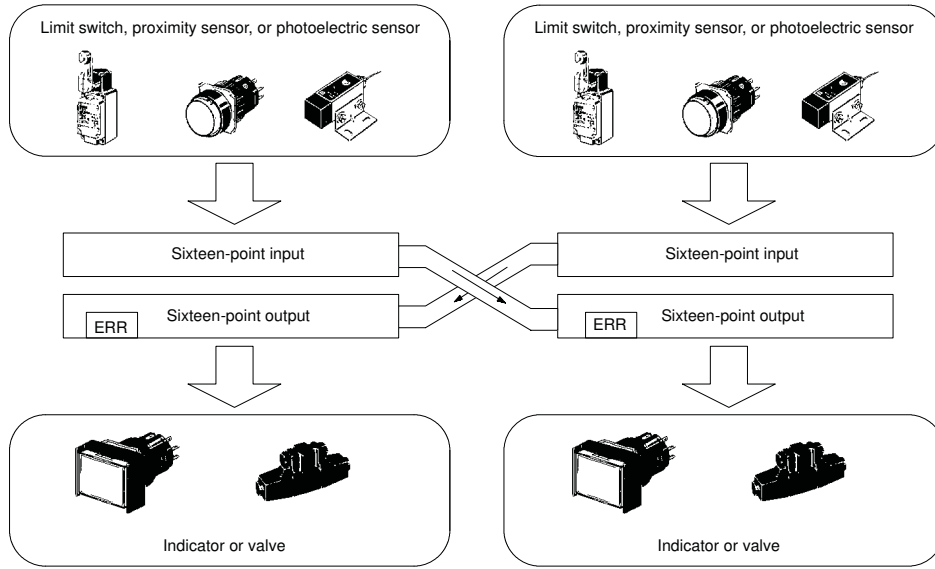


Note: A shielded cable with a thickness of 0.75 mm<sup>2</sup> min. must be used for signal transmission. It is recommended that the shield be grounded.

The maximum transmission distance is 10 m if a twisted pair or VCTF wire with a thickness of 0.75 mm<sup>2</sup> is used instead of a shielded cable for the transmission path.

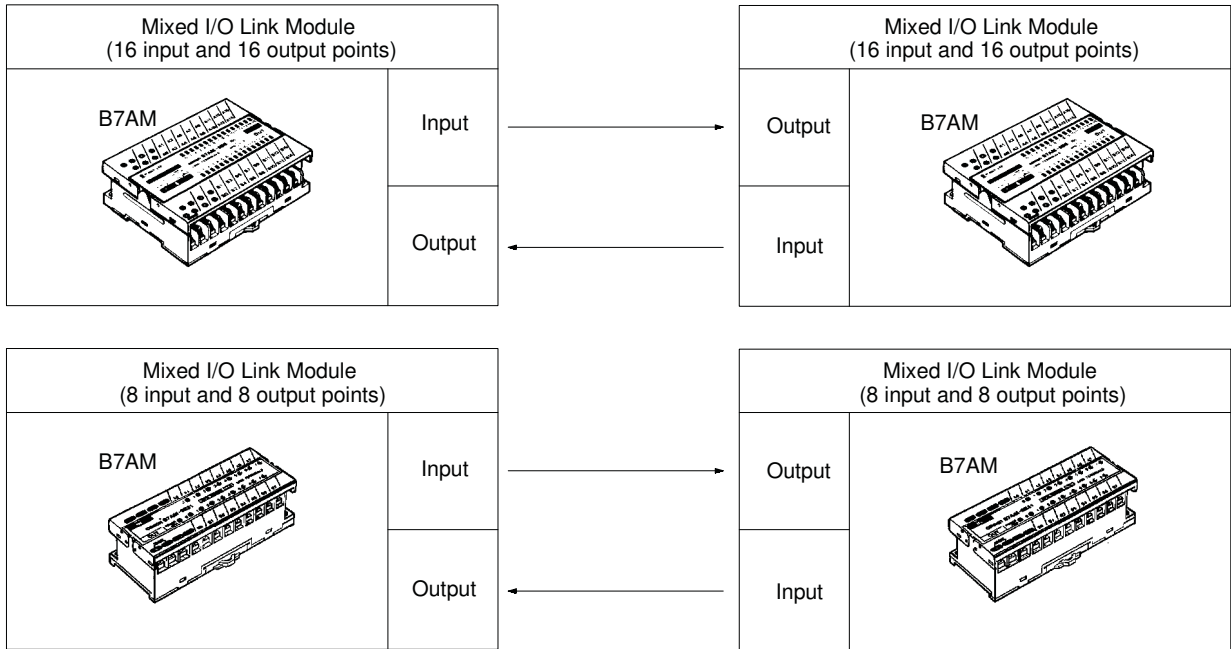
■ CONFIGURATION

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.

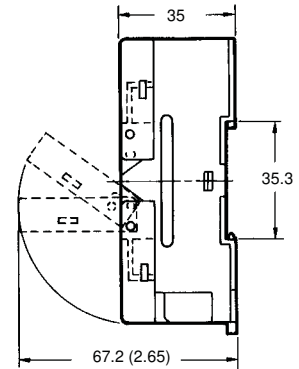
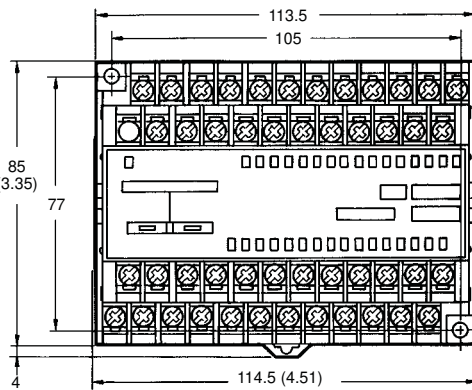
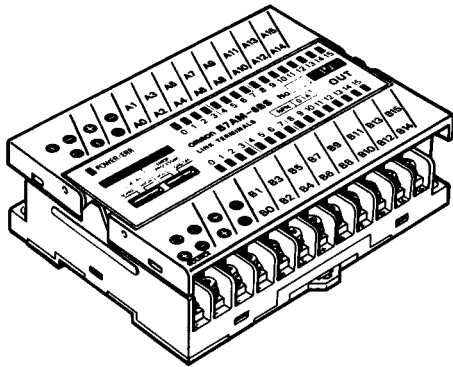
B7AM Mixed I/O System Configuration



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).

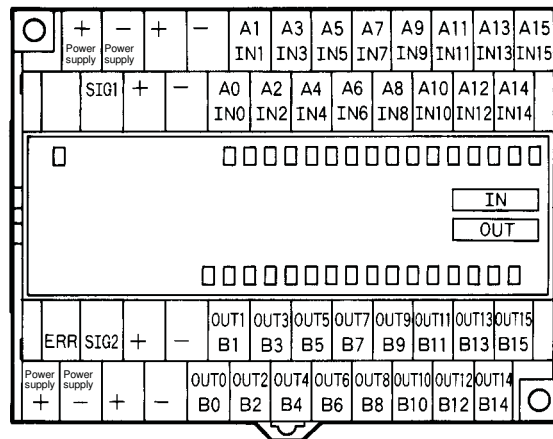
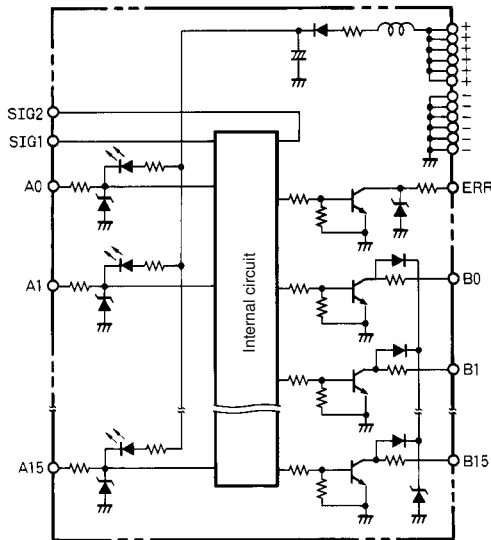
# Dimensions

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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