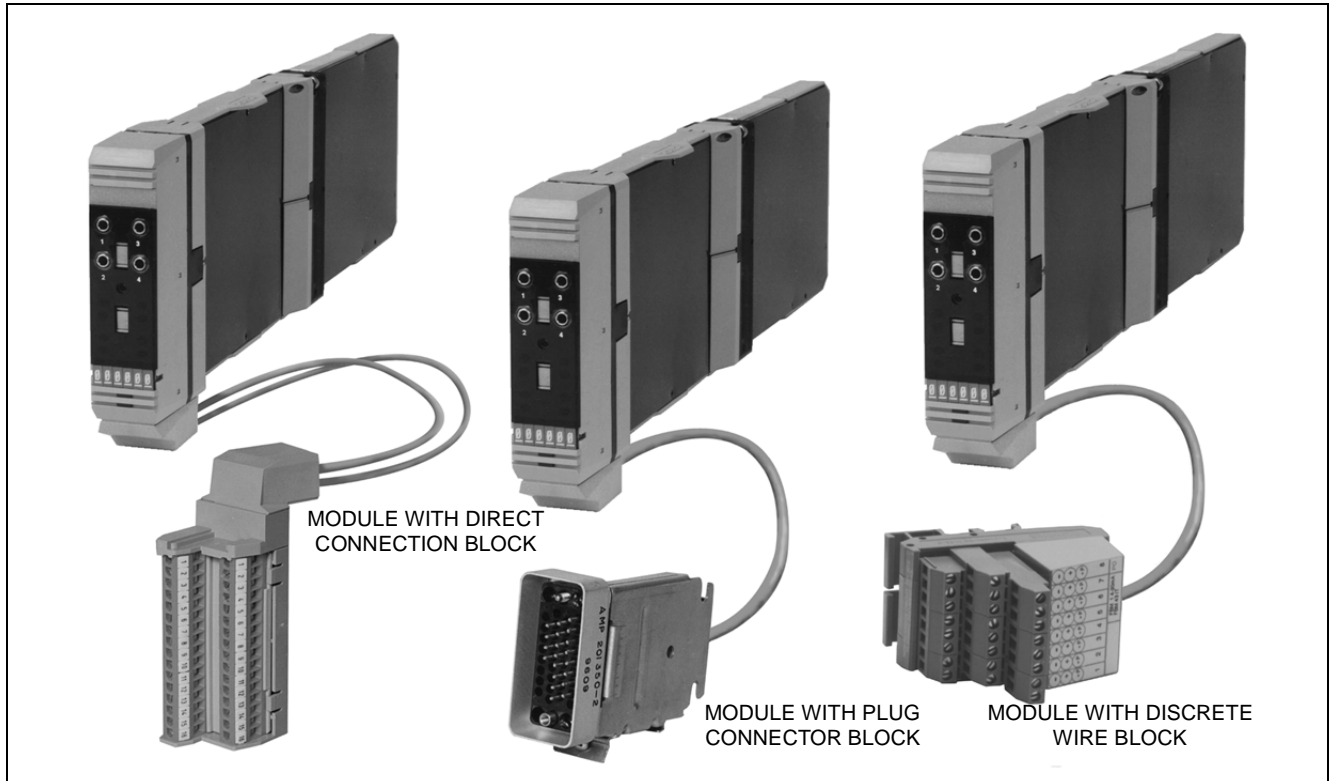


## I/A Series<sup>®</sup> Hardware

### 0 to 20 mA I/O Interface Module (FBM04)



The 0 to 20 mA Input/Output Interface Module contains four 20 mA dc analog input channels and four 20 mA dc analog output channels. Each input channel accepts an analog sensor input such as a 4 to 20 mA transmitter or a self-powered 20 mA source. Each output channel drives an external load and produces a 0 to 20 mA output. The module performs the signal conversion required to interface the electrical input/output signals from/to the field sensors and actuators to/from the redundant Fieldbus. The module is a main type, and independently connects to the redundant Fieldbus.

This module executes the analog I/O application program. The configurable options for this program are Analog Input Resolution (on a per module basis), Fail-Safe Configuration (Hold/Fallback), Analog Output Fail-Safe Fallback Data, (on a per channel basis), Fieldbus Switching Enable and Fieldbus Switching Time.

An optional style of termination cable assembly is available which includes built-in bypass jacks for each output channel on the front connector of the Fieldbus Module. Jacks accept a bypass plug from the I/A Series Output Bypass Station or other external 20 mA source. This option should be considered for applications where maintaining output is desired during maintenance operations, for example, when replacing a failed module.

**FUNCTIONAL SPECIFICATIONS**

**Common Characteristics**

**POWER REQUIREMENTS**

*Input Voltage Range (Redundant)*  
26 to 42 V dc

*Consumption*  
14 W (maximum)

*Heat Dissipation*  
12 W (maximum)

**Isolation**

The module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and earth (ground), or between a given channel and any other channel.

**NOTE**

This does not imply that these channels are intended for permanent connection to hazardous voltage circuits. Connection of these channels to voltages greater than 30 V ac or 60 V dc violates electrical safety code requirements and may expose users to electric shock.

**Input Channels**

**INPUT**

4 isolated and independent channels

**INPUT RANGE (EACH CHANNEL)**

0 to 20.4 mA dc

**ACCURACY**

±0.05% of span

**COMMUNICATION**

Via a redundant Fieldbus

**INPUT CONNECTIONS**

Two configurations (see Figure 1)

**CONVERSION TIME (SOFTWARE CONFIGURABLE)**

See Table 1 (Input Specifications)

**Output Channels**

**OUTPUT**

4 isolated and independent channels

**OUTPUT RANGE (EACH CHANNEL)**

0 to 20.4 mA dc

**OUTPUT LOAD (MAXIMUM)**

735 Ω

**COMPLIANCE VOLTAGE**

18.6 V nominal at 20 mA dc at I/O field terminals

**ACCURACY**

±0.05% of span (25°C)

**OUTPUT TEMPERATURE COEFFICIENT**

100 ppm/°C

**COMMUNICATION**

Via a redundant Fieldbus

**SETTLING TIME**

100 ms to settle within a 1% band of steady state for a 10 to 90% input step change.

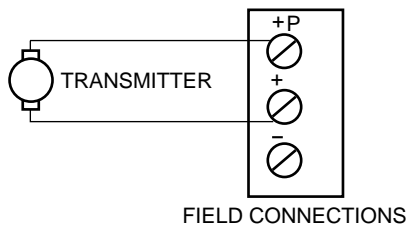
**LINEARITY ERROR**

±0.025% of span (monotonic)

**RESOLUTION**

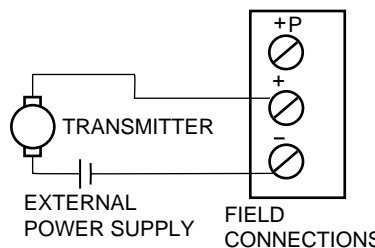
12 bits

MODULE-POWERED TRANSMITTER



INPUT COMPLIANCE VOLTAGE  
22 VOLTS MINIMUM AT 20 mA

EXTERNALLY POWERED TRANSMITTER



INPUT RESISTANCE 50 Ω

Figure 1. Input Connections

Table 1. Input Specifications

Conversion Time (Seconds)	Update Time (Milliseconds)	Settling Time(a) (Seconds)	Linearity Error(b) (% of Range)	Resolution (Bits)
0.1	10	0.25	0.0125	12
0.2	10	0.50	0.0075	13
0.5	25	1.00	0.005	14
1.0	50	2.00	0.005	15

(a) Value settles within a 1% band of steady state for a 10 to 90% input step change.

(b) Monotonic; assures that the signal for Fieldbus communications either increases or remains the same for increasing analog input signals.

### ENVIRONMENTAL SPECIFICATIONS(a)

#### Operating

##### TEMPERATURE

0 to 60°C (32 to 140°F)

##### RELATIVE HUMIDITY

5 to 95% (noncondensing)

##### ALTITUDE

-300 to +3,000 m (-1,000 to +10,000 ft)

#### Storage

##### TEMPERATURE

-40 to +70°C (-40 to +158°F)

##### RELATIVE HUMIDITY

5 to 95% (noncondensing)

##### ALTITUDE

-300 to +12,000 m (-1,000 to +40,000 ft)

#### Contamination

Class G3 (Harsh) as defined in ISA Standard, S71.04

(a) The environmental limits of this module may be enhanced by the type of enclosure containing the module. {Refer to the applicable Product Specification Sheet (PSS) which describes the specific type of enclosure that is to be used.}

### PHYSICAL SPECIFICATIONS

#### Mounting

##### WITH Y-ADAPTER

Installable in the 1x8 Mounting Structure, I/A Series Industrial Enclosures and Field Enclosure 8

##### WITHOUT Y-ADAPTER

Installable in I/A Series Field Enclosure 4 and the 1x8 FBM Mounting Structure

#### Mass

1 kg (2.2 lb)

#### Indicators (mounted on termination connector)

##### OPERATIONAL STATUS

Red and green light-emitting diodes (LEDs)

#### Bypass Jacks

Available on optional termination cable assembly.

#### Field Termination Connections(a)

##### DISCRETE WIRE BLOCK

###### *Input Channels*

12 screw-clamp terminals

###### *Output Channels*

8 screw-clamp terminals

##### DIRECT CONNECTION BLOCK

###### *Input Channels*

12 screw-clamp terminals

###### *Output Channels*

8 screw-clamp terminals

##### PLUG CONNECTOR BLOCK

34-pin connector. Mates with:

- Burndy MSD 34 PM 118 (plug with bar-type cable clamp)
- Burndy MSD 34 PM 124 (plug with clamshell hood)
- Burndy MSD 34 PM 824 (plug with suitcase hood)
- or equivalent

(a) The discrete wire or plug connector block is available on termination cable assemblies for all enclosures excluding the Local Enclosures, Field Enclosure 4, and Multiple (Bridged) Industrial Enclosure 32. The direct connection block is available only on the termination cable assembly for the Local Enclosures and Field Enclosure 4. Multiple (Bridged) Industrial Enclosure 32s use the plug connector block only.

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