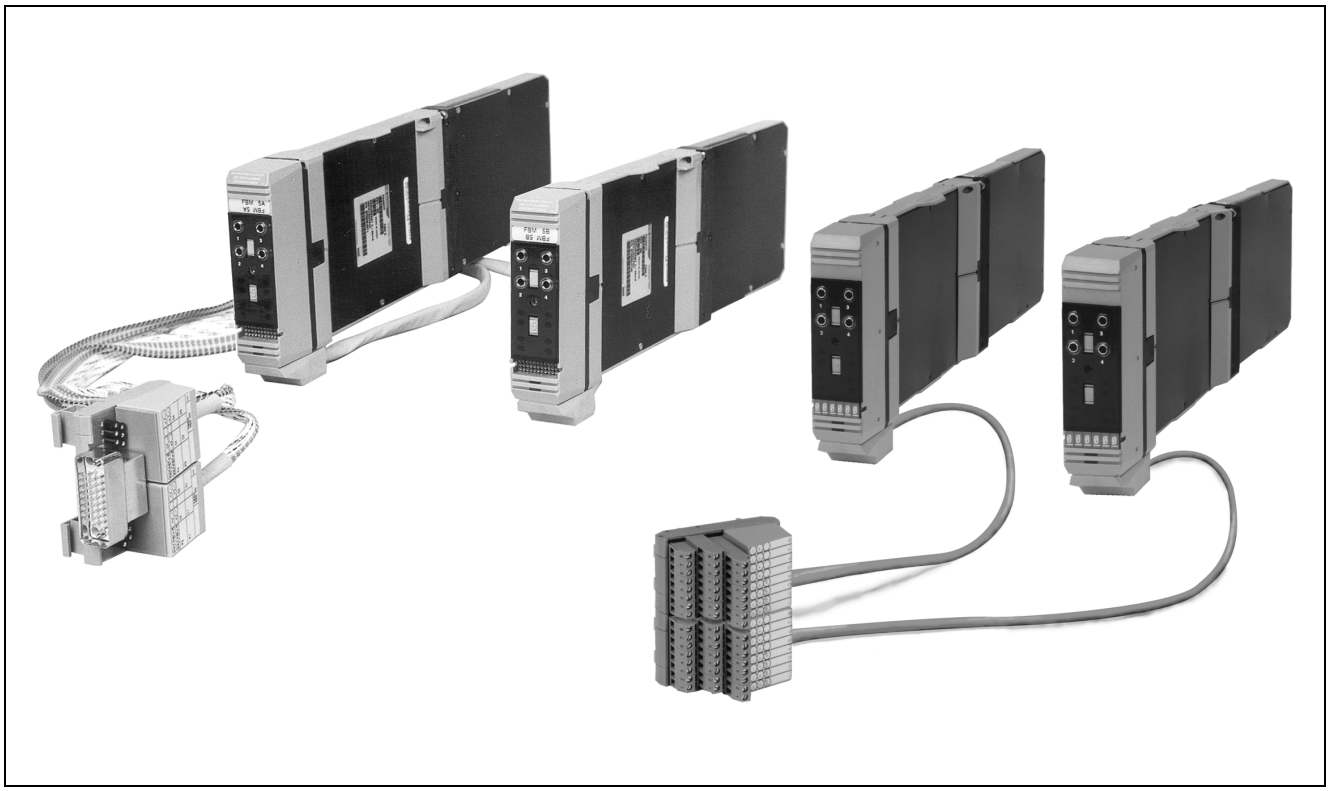
FOXBORO®

PSS 21H-2D2 B4

I/A Series® Hardware
Redundant Dual Baud Rate Interface to Intelligent Transmitters and Redundant Analog Outputs (FBM46)



The Redundant Dual Baud Rate Interface to Intelligent Transmitters and Redundant Analog Outputs consists of a pair of Fieldbus Modules that contain four redundant, individual Intelligent Transmitter (IT) interface channels and four redundant, 0 to 20 mA dc analog output channels. The pair of modules combines to provide redundancy from the Fieldbus Module level to one common connection block. Field I/O is also wired to the connection block (Figure 1).

Intelligent Transmitter Interface Channels

Each redundant IT interface channel pair provides diode OR'd internally isolated power and communication capabilities to a single IT over one set of twisted-pair wires within a shielded cable. The module pair also allows the use of an external power supply to power the IT.

The use of an external power supply common to two or more IT loops requires the use of a Cable Balun Module to maintain the digital communication line balance that prevents crosstalk.

Invensys™

Product Specifications

The baud rate is software-selectable with all IT channels of the FBM at the same baud rate. At a 4800 baud rate, each module provides bi-directional digital communication between the Intelligent Transmitter and the system redundant Fieldbus or, at a 600 baud rate, provides bi-directional digital communication while allowing simultaneous 0 to 20 mA analog signals for use with other equipment, such as emergency shutdown systems.

The module pair is an IT host, enabling the system to receive digital messages from the transmitter in engineering units. Each message is received five times per second at 4800 baud and once every 1.5 seconds at 600 baud and contains:

- Two measured variables (that is, primary pressure and transmitter temperature) in IEEE 32-bit floating-point
- Security information
- Diagnostics
- Message checking.

This information is available to all elements of the system. Since the communication is bi-directional, the system can display the output, transmitter temperature (°C and °F), and continuous self-diagnostics. In addition, information that can be displayed or reconfigured from the console or a Hand-Held Terminal (PSS 2A-1Z3 A) includes:

- Output in engineering units
- Fail-safe state
- Tag number, name and location
- Device name (letterbug)
- Last calibration date
- Two levels of upload/download capabilities

The Intelligent Transmitter interface portion of each module executes the Intelligent Transmitter application program. The configurable options for this program are Fieldbus Switching Enable and Fieldbus Switching Time.

Output Channels

Each redundant output channel drives a single I/P device with a 0 to 20 mA output current. Each output channel performs the signal conversion required to interface the electrical output signals to field actuators from the redundant Fieldbus.

The output channel portion of the module executes the analog I/O application program. The configurable options for this program are Fail-Safe Configuration (Hold/Fallback), Analog Output Fail-Safe Fallback Data (on a per channel basis).

To assure redundant outputs from each module, the outputs are diode OR'd together in the termination cable assembly (TCA).

Security

Pairs of modules may be mounted in different ways to avoid commonality (single point of failure). The more favorable configuration locates the modules in different mounting structures (for example, separate bus configuration). In other configurations, the modules can be in the same Y-adapter or in the same mounting structure.

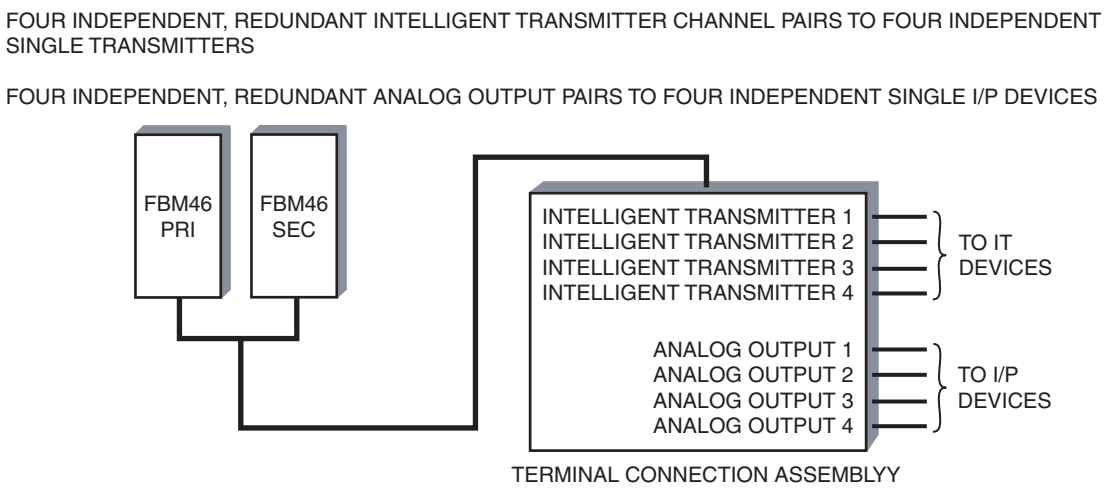


Figure 1. FBM46 Redundant Configuration to Single IT and Single I/P

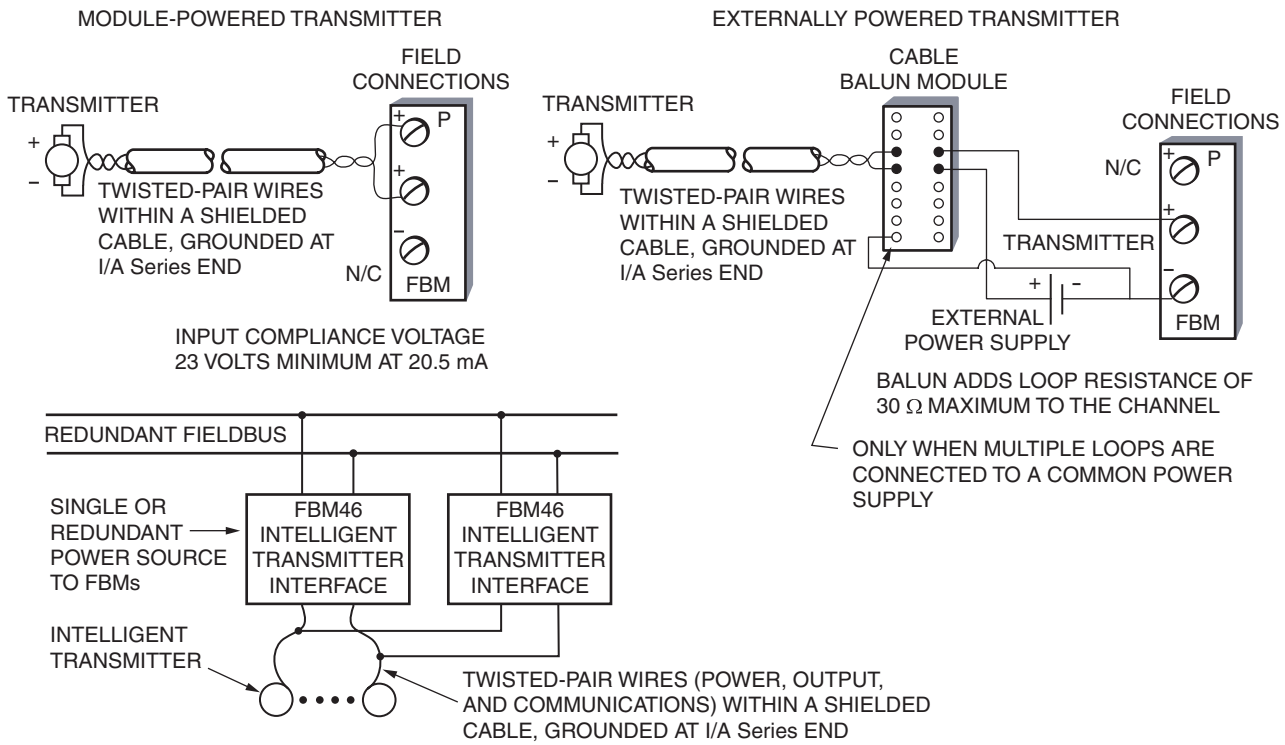


Figure 2. Field Connections

FUNCTIONAL SPECIFICATIONS

Common Characteristics

POWER REQUIREMENTS

Input Voltage (Redundant)
26 to 42 V dc

Consumption
11 W (maximum)/module

Heat Dissipation
8 W (maximum)/module

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.

COMMUNICATION

Via a redundant Fieldbus

Output Channels

OUTPUT

4 redundant, isolated, 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

±0.1% of span (25°C)

OUTPUT TEMPERATURE COEFFICIENT

100 ppm/°C

SETTLING TIME

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

LINEARITY ERROR

±0.05% of span (monotonic)

RESOLUTION

12 bits

Transmitter Channels

INTERFACE

4 redundant, isolated, independent channels

ERROR CHECKING

CCITT 2 byte CRC

COMMUNICATIONS

Redundant, point-to-point, master/slave, asynchronous, half-duplex at a software-selectable baud rate of 600 or 4800 baud. All four channels must be configured at the same baud rate (600 baud for 4 to 20 mA analog/digital transmitter configurations or 4800 baud for digital-only transmitter configurations).

SPEED

5 messages per second at 4800 baud, or
1 message per second at 600 baud

MAXIMUM DISTANCE (INTERFACE TO TRANSMITTER)*

(Shielded twisted-pair wires, or at minimum, twisted-pair wires with overall shield)
609.6 m (2000 ft) (shielded-twisted pair wires) at 4800 baud, or 1800 m (6000 ft) at 600 baud

MAXIMUM LOOP RESISTANCE

500 Ω (not including the transmitter). The maximum resistance between the Hand-Held Terminal (HHT) and the transmitter is 350 Ω.

TRANSMITTER INTERNAL POWER

24 V dc +4%, -2%, source resistance 30 Ω maximum

*The maximum distance decreases when the loop is operated through an intrinsic safety barrier. See MI 020-350.

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
WITHOUT Y-ADAPTER
Installable in I/A Series Field Enclosure 4 and the 1x8 FBM Mounting Structure

Mass
1 kg (4.4 lb)

Indicators (Mounted on Termination Connector)
OPERATIONAL STATUS
Red and green light-emitting diodes (LEDs)

Bypass Jack
Built into the termination connector of the output channels. (Accepts a bypass plug from an external 20 mA source.)

Field Termination Connections
DISCRETE WIRE BLOCK
Input Channels
12 screw-clamp terminals
Output Channels
16 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 clam shell hood)
- Burndy MSD 34 PM 824 (plug with suitcase hood)
- or equivalent

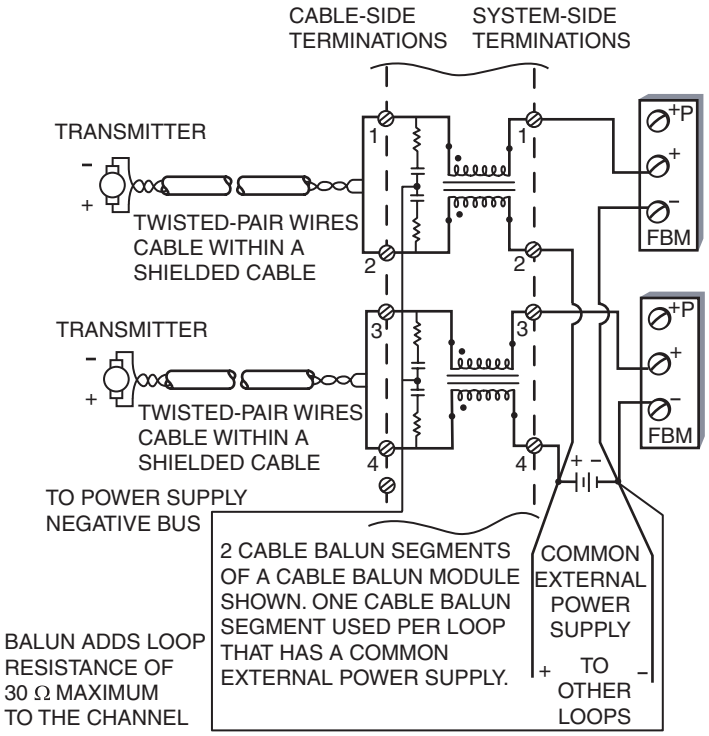
Cable Balun Module Connections
FIELD WIRING SIDE
10 screw-clamp terminals
FBM WIRING SIDE
8 screw-clamp terminals

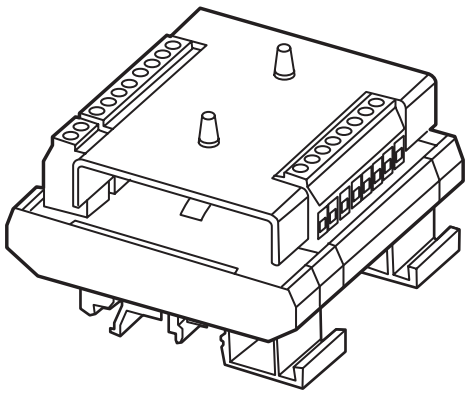
CABLE BALUN MODULE

The Cable Balun Module is used to maintain digital communication line balance for Intelligent Transmitter to FBM loops that are powered from a common external power supply. This effectively connects one line of each loop together. Without the baluns, the common connection at the external power supply would cause near end crosstalk at the system end of the loop wiring cable. Loops using FBM internal power source do not require baluns.

The Cable Balun Module contains multiple baluns. One balun segment is to be interconnected in each loop powered from an external power supply per the diagram above. There is one Cable Balun Module. The module mounts on a DIN rail.

Module Model	Module Part No.	No. of Baluns in the Module
CB-4	P0903SV	4





CABLE BALUN MODULE

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