Foxboro FBM201 P0914SQ

01 Eight-channel current acquisition

Current-input role

The FBM201 receives current-coded process measurements and passes their converted values to an I/A Series controller. Each of its eight channels has an independent conversion path and galvanic isolation from the other circuits and earth.

Architecture

Input electronics
A dedicated sigma-delta converter serves each channel.

Loop arrangement
The termination selection accommodates internal or external transmitter power.

Digital transport
The redundant 2 Mbps module Fieldbus connects to an associated FCM or control processor.

Modular service
The removable electronic module is separate from the retained field wiring.

Signal-path boundaries

Stage	Interface
Field circuit	Two-wire DC current
Nominal measurement span	0–20 mA
Nominal electrical burden	61.5 Ω
Wiring termination	DIN-rail-mounted TA
Removable interconnection	Type 1 cable to the module baseplate
Status indication	Front-panel LEDs for module functions

Variant boundary

The unsuffixed FBM201 current-input version is distinct from FBM201b, FBM201c and FBM201d voltage versions. Selection of a voltage range in software does not turn this current-input hardware into one of those variants.

Installed-system view

The installed measurement includes the transmitter, its loop supply, conductor resistance, termination, conversion and controller scaling. The module is one defined element in that chain, so troubleshooting benefits from separating electrical current from the final engineering indication.

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02 Input performance and protection

Electrical characteristics

Parameter	Rating
Current inputs	8 isolated channels
Input span	0–20 mA DC
Nominal input impedance	61.5 Ω
Accuracy including linearity	±0.03% of span
Accuracy temperature coefficient	±50 ppm/°C
Loop compliance voltage	22.8 V DC
Input current limit	Less than 30 mA
A/D architecture	One sigma-delta converter per channel
Reading capability	One new reading every 25 ms
Common-mode rejection	>100 dB at 50/60 Hz
Normal-mode rejection	>95 dB at 50/60 Hz
Isolation test	600 V AC for 1 minute

Noise specifications

Common-mode and normal-mode rejection describe different interference mechanisms. The stated values apply at 50 or 60 Hz; use them together with correct wiring practice and the configured integration interval rather than treating either rating as a universal immunity value.

Current-limiting boundary

The channel circuit normally limits input current below 30 mA. Approximately 100 mA is the limited fault condition if the current-limit circuit shorts. It is not a permitted extended measurement range.

Insulation-test boundary

The 600 V AC, one-minute withstand test demonstrates insulation performance. It does not authorize permanent connection of the input channels to that voltage or replace the installed field-circuit limits.

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03 Power, environment and mounting

System characteristics

Parameter	Rating
Module Fieldbus rate	2 Mbps; redundant A/B paths
Power supply	24 V DC; +5%, -10%
Maximum power consumption	7 W
Maximum heat dissipation	3 W
Operating temperature	-20 to +70 °C, module
Storage temperature	-40 to +70 °C
Relative humidity	5–95%, noncondensing
Termination cable class	Type 1
Maximum TA cable length	30 m
Input connection	Two-wire DC per channel

Assembly and enclosure decisions

Item	Selection boundary
PVC TA operating range	-20 to +50 °C
Polyamide TA operating range	-20 to +70 °C
Baseplate location	DIN rail or rack
Baseplate capacity	Four or eight FBM positions
Environment design	Module enclosure arrangements support Class G3 harsh environments

Two power figures

A supply calculation uses up to 7 W per module, while enclosure thermal planning uses up to 3 W heat dissipation. These are separate electrical and thermal budgets.

Independent redundant paths

Either A or B module-Fieldbus path can carry communications. When one path is lost or switched, the module continues communication on the active path without requiring a transmitter-loop rewiring change.

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04 Understand the current-loop voltage budget

Compliance is a circuit budget

A current source needs enough available voltage to force the required current through the field device and wiring. For this input arrangement, the specified 22.8 V DC compliance is evaluated together with wire resistance and the field-device voltage drop.

Calculated nominal burden examples

Current	Voltage across 61.5 Ω	Power in nominal burden
4 mA	0.246 V	0.000984 W
12 mA	0.738 V	0.008856 W
20 mA	1.230 V	0.024600 W

How the examples are obtained

These illustrative electrical calculations use $V = I \times R$ and $P = I^2 \times R$ with the nominal 61.5 Ω input impedance. They are calculated circuit values, not additional accuracy ratings or independent maximum limits.

Evaluate a proposed loop

01	Identify the highest normal operating current used by the application.
02	Obtain the connected transmitter’s required operating voltage.
03	Use both outgoing and return conductor resistance for the installed cable run.
04	Compare the complete requirement with the available compliance before accepting the length.

Separate a clipped signal from a failed converter

If a test source cannot deliver the selected current because its voltage margin is exhausted, the module may correctly report the lower actual current. Confirm the current physically flowing before concluding that conversion is defective.

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05 Upgrade boundaries and application context

Typical measurement contexts

Externally powered source
A self-powered instrument can deliver a current signal through the appropriate TA arrangement.

Loop-powered instrument
The selected termination supports the intended transmitter supply scheme.

Non-HART legacy migration
The FBM201 input function can replace the FBM01 function with the matching termination or adapter.

Marshalled process wiring
A dedicated DIN-rail TA keeps channel wiring accessible away from the module baseplate.

Migration is more than a module exchange

The non-HART FBM01 upgrade relationship describes a specific input function. Assess the termination or adapter and the installed field circuit as part of that conversion; physical placement alone does not establish a correct migration.

Channel processing remains configurable

Independent conversions can yield a new reading every 25 ms. The integration interval and rate-of-change processing then influence the value used by the controller, so the effective application response depends on those selected settings.

Maintenance without recalibration

No module or termination-assembly calibration is required. A service check instead confirms the current delivered by the field circuit, the intended channel destination and the resulting process indication.

Explore other Foxboro catalogue pages

Foxboro CP30B

Foxboro FBM203 P0914SV

Technical basis

Foxboro PSS 21H-2Z1 B4, FBM201/b/c/d Analog Input Interface Modules, selected pages 1, 2, 4–11.