# Analog Input Loop and Differential Modules

The Analog Input Loop and Analog Input Differential modules plug into a ROC300-Series Remote Operations Controller or FloBoss™ 407 Flow Manager to monitor current loop and voltage output devices. Each module can accommodate one analog input, and each uses a scaling resistor for converting loop current to input voltage.

The loop module provides a current source for powering current loop devices. The differential module monitors loop current or voltage input from externally-powered devices and is semi-isolated from the ROC power supplies.

Field wiring connections are made through a separate terminal block that plugs in next to the module. This design facilitates replacement of the module without disconnecting field wiring.

## Analog Input Loop Module Specifications

**FIELD WIRING TERMINALS**

   **A:** Loop Power (+T).

   **B:** Analog Input (+).

   **C:** Common (–).

**INPUT**

   **Type:** Single-ended, voltage sense. Current loop with scaling resistor (R1).

   **Loop Current:** 0 to 25 mA maximum range. Actual range depends on scaling resistor used.

   **Voltage Sensing:** 0 to 5 V dc, software configured.

   **Accuracy:** 0.1% of full scale (20 to 30°C). 0.5% of full scale (–40 to 70°C)
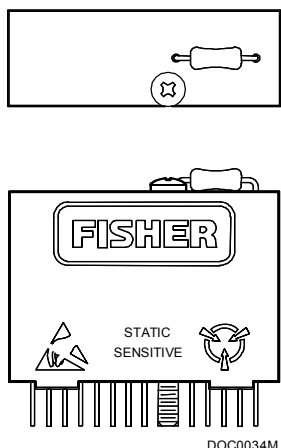
**INPUT (CONTINUED)**

   **Impedance:** Greater than 400 KΩ (without scaling resistor).

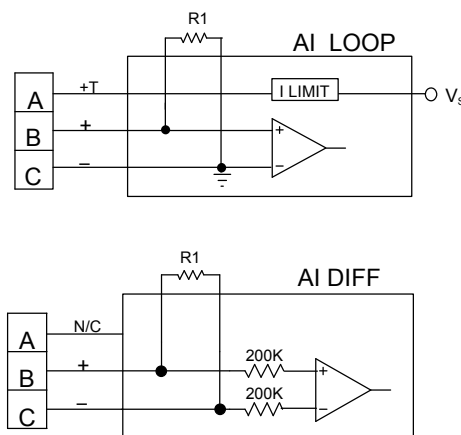   **Normal Mode Rejection:** 50 dB @ 60 Hz.

**POWER REQUIREMENTS**

   **Loop Source:** 25 mA maximum, from ROC or FloBoss power circuits or I/O converter card ($V_s$ = 11 to 30 V dc).

   **Module:** 4.9 to 5.1 V dc, 6 mA maximum; –4.5 to –5.5 V dc, 2 mA maximum (supplied by ROC).

**ISOLATION**

   Not isolated. Terminal C tied to power supply common.



*Typical Analog Input Module*



*Simplified Input Schematics*

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## Analog Input Differential Module Specifications

### FIELD WIRING TERMINALS

**A:** Not used.

**B:** Positive Analog Input (+).

**C:** Negative Analog Input (–).

### INPUT

**Type:** Voltage sense. Externally-powered current loop sensing with scaling resistor (R1).

**Voltage:** 0 to 5 V dc, software configured.

**Accuracy:** 0.1% of full scale (20 to 30°C). 0.5% of full scale (–40 to 70°C).

### INPUT (CONTINUED)

**Normal Mode Rejection:** 50 dB @ 60 Hz.

**Impedance:** Greater than 400 KΩ (without scaling resistor).

### POWER REQUIREMENTS

4.9 to 5.1 V dc, 6 mA maximum; –4.5 to –5.5 V dc, 2 mA maximum (supplied by ROC).

### INPUT ISOLATION

Greater than 400 KΩ input to power supply common.

## Analog Input Common Specifications

### SCALING RESISTOR

250 ohm (supplied) for 0 to 20 mA full scale. 100 ohm for 0 to 50 mA (externally-powered only).

### RESOLUTION

12 bits.

### FILTER

Single pole, low-pass, 40 millisecond time constant.

### CONVERSION TIME

30 microseconds typical.

### VIBRATION

20 Gs peak or 0.06 in double amplitude, 10 to 2,000 Hz, per MIL-STD-202, method 204, condition F.

### MECHANICAL SHOCK

1500 Gs 0.5 millisecond half sine per MIL-STD-202, method 213, condition F.

### CASE

Solvent-resistant thermoplastic polyester, meets UL94V-0. Dimensions are 15 mm D by 32 mm H by 43 mm W (0.60 in. D by 1.265 in. H by 1.69 in. W), not including pins.

### ENVIRONMENTAL

Meets the Environmental specifications of the ROC or FloBoss unit in which the module is installed, including Temperature, Humidity, and Transient Protection.

### WEIGHT

37 grams (1.3 ounces).

### APPROVALS

Approved by CSA for hazardous locations Class I, Division 2, Groups A, B, C, and D.

**Emerson Process Management**

**Remote Automation Solutions**
Marshalltown, IA 50158 U.S.A.
Houston, TX 77041 U.S.A
Pickering, North Yorkshire UK Y018 7JA

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