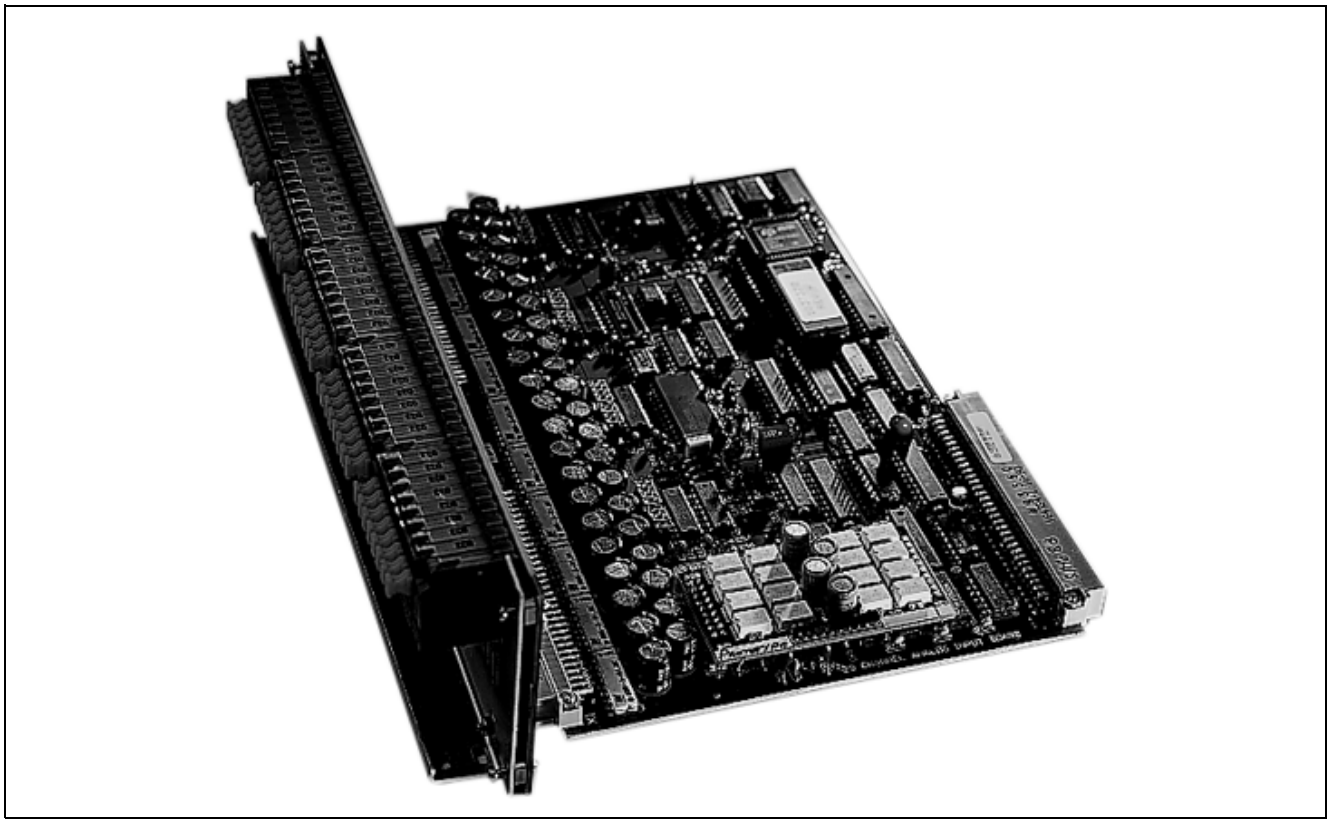
FOXBORO®

PSS 21H-8A9 B4

# I/A Series® Remote Terminal Unit (RTU)
# C50 20 Channel Analog Input Module



The C50 20 Channel Analog Input (AI) Module provides a cost effective method for gathering a large volume of analog information from the field. The module utilizes a self-calibrating Analog/Digital Converter (ADC), which provides accurate 12-bit resolution over wide temperatures ranges.

**FEATURES**

- 20 analog inputs
- 12 bits + sign ADC
- ±1 V or 0 to 2 V ranges
- **RUN/FAIL** LED indicator
- Optional daughter boards allow monitoring of high common mode current loops
- Scaling resistors use screw type terminals and are on the field side of isolation links
- Removable plug-connected termination board allows the logic card to be removed without disconnecting the field wiring
- Zero and full scale voltage checks on the Analog/Digital Converter with offset compensation
- Each input has a disconnect link with test points on each side
- Disconnect link with test points on either side for each output
- Module *operating conditions* available as an RTU database point

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Product Specifications

### Module Description

The analog input module with high speed ADC, shown in Figure 1, performs the data sampling and processing for all analog inputs. The module provides protection against surge transients and noise. An optional daughter board provides high common mode rejection, allowing for monitoring of high common mode current loops.

Provision for analog drop resistors is made on the analog input termination board, allowing either current or voltage scaling. The analog inputs are calibrated for ±1 V full scale bipolar or 0 to 2 V unipolar.

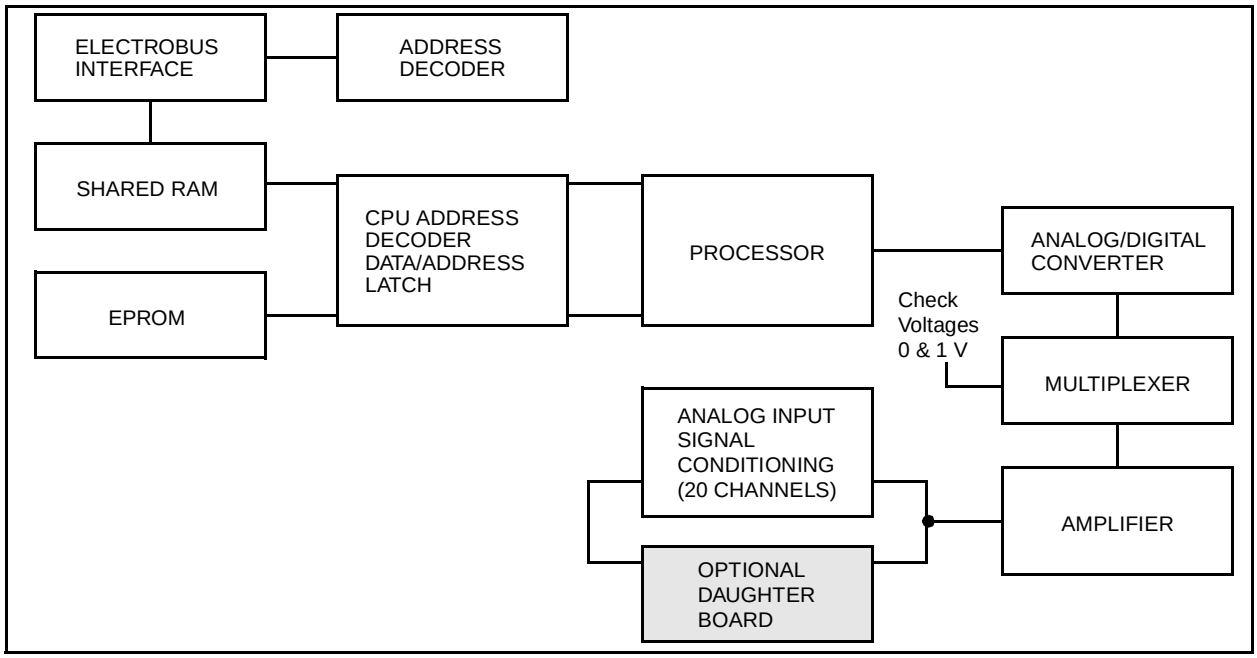


Figure 1. C50 20 Channel Analog Input Module Functional Block Diagram

### Fault Diagnosis

Termination of all cables on the front panel of the unit provides quick access for diagnosis and repair. Test points are provided on each side of the isolation links.

A **RUN/FAIL** LED is provided on the front panel (Figure 2) of each module to simplify troubleshooting procedures. The health of the module is reported to the Master Processor Module for remote/local diagnosis via system database alarm points.

### Analog Inputs

The Analog Input Module consists of a multiplexer, amplifier and an ADC. The circuitry provides a multiplexed sample to the ADC which converts the signal to a 12-bit word. These results are then stored in shared memory for access by the Master Processor Module via the Electrobus interface.

Automatic zero drift correction is provided by the onboard microprocessor. Zero and full scale voltage references are available as internal database points, enabling access by the C50 Master Station.

### Optional Daughter Board

Each set of four inputs may be routed through an optional daughter board. The function of the daughter board is to increase the common mode rejection from 80 dB @ 6 V, to 100 dB @ 2 V. This increase allows the module to be used for the monitoring of high common mode current loops. The daughter board uses solid state relays to switch between charging a capacitor, or passing the capacitor's voltage to the multiplexer.

As the module automatically detects the presence of the daughter board, it's operation is totally transparent to the user.

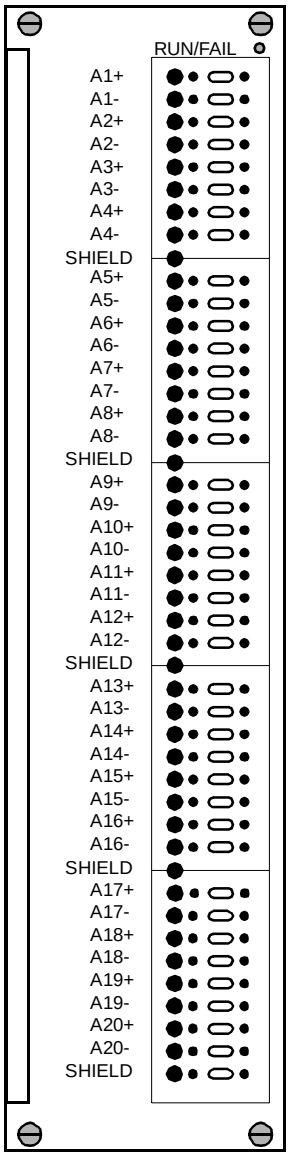


Figure 2. Front Panel

## PHYSICAL SPECIFICATIONS

**Physical Size**
Logic/termination combination 233.4 mm x 160 mm
Termination board 263 mm x 71 mm

## ENVIRONMENTAL SPECIFICATIONS

**Ambient Temperature**
0°C to 60°C (optional -20°C to 60°C)

**Humidity**
10% to 95% RH (non-condensing)

## OVERALL FUNCTIONAL SPECIFICATIONS

**Power Requirements**
+5 V @ 420 mA
+15 V @ 10 mA
-15 V @ 15 mA

**Number of Channels**
20x analog field inputs
2x internal check analog inputs

**Multiplexer**
Solid State

**ADC Type**
Successive Approximation

**Resolution**
12 bits + sign

**Processor Type**
Z80

**Bus Interface**
Electrobus

**Input Circuit**
20 differential inputs

**Maximum Update Period**
25 msec

**Maximum Error**
±0.1% full scale @ 25°C and 0 V common mode

**Temperature Error**
0.0015% per °C (0°C to 60°C)

**Input Signal**
RANGE
±1 V or 0 to 2 V dc
SCALING
Drop resistor for current inputs
VOLTAGE
Provision for dividing voltage inputs on rear side of terminal board

**Full Scale Range**
±2000 counts (over range ±2047 counts) or
+4000 counts (over range +4095 counts)

**Differential Mode Rejection**
60 dB min. @ 60 Hz
DIFFERENTIAL MODE VOLTAGE WITHOUT DAMAGE
±50 V dc or peak ac

**Transient Protection**
Meets IEEE Std 472-1974; ANSI C37.90.1-1974; IEC 255-4 Class 3; IEC 255-22-4; IEC 801-4

**Reference Voltages**
Zero volts and full scale positive (+1 V)

## FUNCTIONAL SPECIFICATIONS

**Without Daughter Board**

MULTIPLEXER SETTLING TIME
4 µsec
COMMON MODE ERROR
0.01%/V to a maximum of ±6 V dc
MAXIMUM ERROR
±0.25% full scale over full common mode and temperature range
COMMON MODE REJECTION
80 dB @ 6 V peak,
dc to 60 Hz @ 1 Kohm impedance unbalance
MAXIMUM COMMON MODE VOLTAGE
*Operating Within Spec*
±6 V dc or peak ac
*Without Damage*
±50 V dc or peak ac

**With Daughter Board**

NUMBER OF CHANNELS PER BOARD
Four/board
MULTIPLEXER SETTLING TIME
50 µsec
COMMON MODE ERROR
0.001% per V to a maximum of ±50 V dc
MAXIMUM ERROR
±0.25% full scale over full common mode and temperature range
COMMON MODE REJECTION
100 dB @ 200 V dc
100 dB @ 50 V ac rms 60 Hz
80 dB @ 200 V ac rms 60 Hz
MAXIMUM COMMON MODE VOLTAGE
*Operating within specification*
±50 V dc or peak ac
*Without Damage*
±200 V dc or peak ac

**ORDERING INFORMATION**

| Part Number | Description |
|---|---|
| 0303349 | 20 Channel Analog Input Logic Board |
| 0303350 | 20 Channel Analog Input Termination Board |
| 0303351 | 20 Channel Analog Input Daughter Board |
| 1050056 | 20 Channel Analog Input Firmware |

**NOTE**

Firmware must be separately ordered and installed.

**The Foxboro Company**
33 Commercial Street
Foxboro, Massachusetts 02035-2099
United States of America
http://www.foxboro.com
Inside U.S.: 1-508-543-8750 or 1-888-FOXBORO (1-888-369-2676)
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