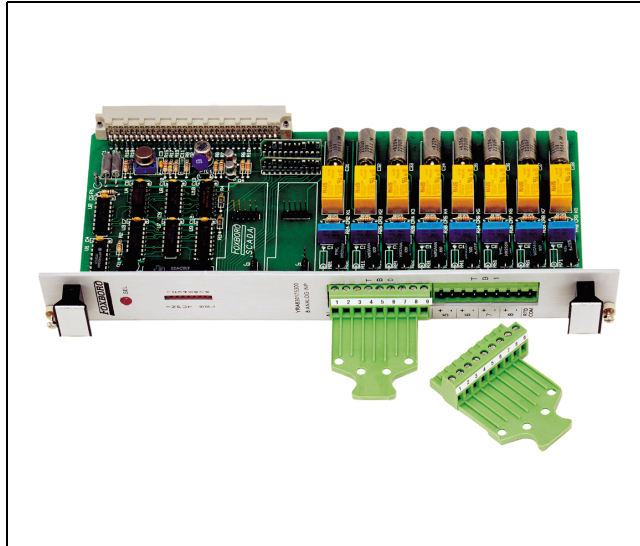


I/A Series® Remote Terminal Unit (RTU)

RTU 20 – 6 Analog Input/Reference Voltage Module



The 6 Analog Input/Reference Voltage module is a half-size electronic board in the I/A Series RTU 20 designed to read and convert 6 analog inputs from the field.

Analog inputs can be:

- current signals
- voltage signals.

Piggy-back adapters can be installed on two input connectors of the module to accept other signals like RTD, T/C Type K, T/C Type J.

Analog inputs are sampled by multiplexing the relevant relay (one for each measure) every x seconds (programmable time). The relay's expected lifecycle is 10^8 operations.

The use of a relay-based multiplexer provides a high common mode noise rejection, typically greater than 100 dB.

The input signal buffering is executed with flying capacitor technique (one capacitor per analog input).

Each capacitor is charged by the relevant analog signal coming from the field.

It is switched, for about 16 ms, to the input of the "successive-approximations type" analog-digital-converter mounted in the RTU's central processing unit (CPU).

This data acquisition method is very effective in terms of accuracy and acquisition rate (about 50 conversions per second), providing a circuit isolation from the external signals equal to the relay contact isolation voltage (1500 Vrms).

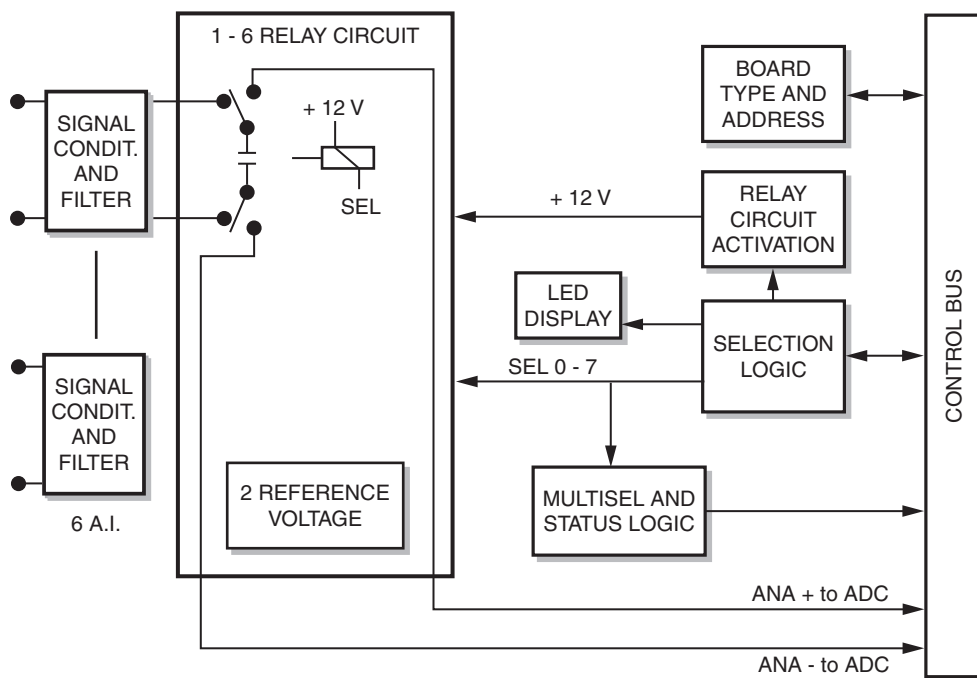
Each acquisition channel (analog input) is provided with a 6 dB per octave (30 dB at 50 Hz) single-cell filter to reject noise in differential mode.

The two reference voltages (life-zero and full scale values) are used to continuously check the analog-to-digital conversion precision.

Signal conditioning is performed inside the module using precision resistive dividers that, properly configured, can interface with wide voltage and current input ranges.

Several LEDs, located on the module's front edge, provide local fault indication and analog input status, while an optional alphanumeric LCD display (mounted on the RTU cabinet) can monitor the analog input values and status, on request.

6 ANALOG INPUT/REFERENCE VOLTAGE MODULE – BLOCK DIAGRAM



SPECIFICATIONS

Inputs

6 multiplexed relay/flying capacitor floating inputs
and 2 reference voltage inputs

Maximum Power Requirements

+ 5 V dc/3 mA, +12 V dc/19 mA (on relay activation)

Signal Conditioning

Built-in resistive dividers $\pm 0.02\%$ precision

Input Filtering

Single-cell filters 6 dB per octave (30 dB at 50 Hz)

Application Data Format

Binary

Input Mode

Differential

Isolation

1500 Vrms (relay coil contacts)

Noise Rejection

100 dB (common mode)

30 dB at 50 Hz (differential mode)

Relay Specification

10^8 operations, gold-plated contacts

(a) Refer to the analog-to-digital converter (ADC) on CPU module.

Accuracy at 25°C(a)

0.1%

Output Offset Drift With Temperature(a)

0.002%/°C

Digital Resolution(a)

12 bits

Digital Output Reading(a)

4095 and overflow bit

Acquisition Rate(a)

50 conversions per second

Operating Temperature

-25°C to +70°C

Field Cable Connection

Removable screw-terminal blocks on module's front edge

Diagnostics and Status

LED indicators on module's front edge

Table 1.

Input Signals	Input Impedance	Less Significant Bit (LSB)	Maximum Continuous Overload
0 to 2 V	≥ 100 KOhm	0.5 mV	10 V
0 to 5 V	≥ 5 KOhm	1.25 mV	25 V
0 to 10 V	≥ 10 KOhm	2.5 mV	50 V
0 to 20 mA	100 Ohm	5 μ A	100 mA
4 to 20 mA	100 Ohm	5 μ A	100 mA

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