AADvance Controller

Catalog Numbers T9110, T9300, T9310, T9401/2, T9431/2, T9451, T9481/2

AB QUALITY

Allen-Bradley

by **ROCKWELL AUTOMATION**

T9431/2 Analogue Input Module, 8/16 Channel

The T9431/2 analogue input has eight (T9431) or sixteen (T9432) isolated analogue input channels and measures input current in the range 0 mA to 24 mA. Each channel supplies digital state and analogue data to the processor for process monitoring. Each input has five configurable voltage bands (there are eight distinct switching thresholds to allow hysteresis), each of which can be adjusted to supply line monitoring and field device diagnostics.

The input module makes local module and channel status indications through its front panel LEDs, the same indications can be connected to application variables and viewed at the Workbench. Comprehensive diagnostics at system and module levels give clear indications which help fast maintenance and repair.

The module incorporates signal and power isolation circuits, which divide each input channel from the remainder of the system, protecting the controller from field faults. An independent watchdog arrangement monitors the module operation and supplies more fault containment by a shutdown mechanism if a fault occurs.

These modules mate with the T9831/2/3 Analogue Input termination assemblies. When analogue modules are installed in a dual or TMR configuration they supply fault tolerant input functionality, enabling you to replace input modules without interrupting the channel input data flow to the processor modules.

This module supports HART commands #03 to collect data from the field device. The application can be configured to use HART information to monitor and respond to device conditions, it may also be used to supply module diagnostic information such as comparison and error reporting.

Analogue Input Line Monitoring

Each analogue input module is set up through the AADvance Workbench. Monitoring levels for each input channel are configurable at both the module and channel level. The default parameters are:

- Fault: 0 mA to 3.8 mA
- Normal: 3.8 mA to 22.0 mA
- Fault: > 22.0 mA

T9431/2 Analogue Input Module Specification

Table 29 - Analogue Input Module Specification

Attribute	Value
Functional Characteristics	
Input channels:	T9431: 8 T9432: 16
Degradation	1oo1D, 1oo2D and 2oo3D
Performance Characteristics	
Safety integrity level	IEC 61508 SIL 3 [1]
Safety level degradation	1oo1D, 1oo2D and 2oo3D
Safety accuracy limit	200 µA

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Attribute	Value
Self test interval	< 1 hour; system dependent
Sample update interval (no filter)	6 ms
Value of least significant bit	0.98 µA

Error at 25 °C ± 2 °C
    After 1 year at 40 °C
    After 2 years at 40 °C
    After 5 years at 40 °C
	
	0.21 % + 10 µA
	0.22 % + 10 µA
	0.23 % + 10 µA

Temperature drift	(0.01 % + 0.3 µA) per °C
Electrical Characteristics	
Module supply voltage:	
Voltage	Redundant + 24 Vdc nominal
Module supply power dissipation	T9431: 3.3 W (11.3 BTU/hr) T9432: 4.0 W (13.6 BTU/hr)
Input Current	
Nominal	4 mAdc to 20 mAdc
Maximum range	0 mAdc to 24 mAdc
Maximum Input Slew Rate	See Figure 32 below [2]
Input channel load	see TA Specification
Resolution	0.98 µA, 15-bit
Measurement calibrated accuracy at 25 °C	± 0.05 mA
Field loop power dissipation	see 9831/2/3 TA Specification
Channel isolation - maximum withstanding	± 1.5k Vdc for 1 minute
Mechanical Specification	
Dimensions (height × width × depth)	166 mm × 42 mm × 118 mm (6-½ in. × 1-21/32 in. × 4-21/32 in.)
Weight	T9431: 280 g (10 oz.) T9432: 340 g (12 oz.)
Casing	Plastic, non-flammable

(1) SIL 3 is the maximum achievable for a single channel. Selected CPU, input and output voting configurations could increase or decrease the correct SIL achieved.

(2) The input slew may exceed the specified levels providing the duration of the transgression is less than the process safety time of the configured module.