



3701

32-Point 0–10 VDC TMR Analog Input Module

Product scope

- Acquires thirty-two differential, DC-coupled input points across a 0–10 V range.
- Uses triple modular redundant channels and mid-value selection for each scan.
- Provides 12-bit resolution with a documented 55 ms input update rate.

Manufacturer source

Tricon Product Guide 01-9302048-MM-001, Analog Input Module Specifications.

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3701 verified technical reference

32-Point 0–10 VDC TMR Analog Input Module

Exact product identity

Triconex 3701 is a 32-point differential 0–10 VDC TMR analog input module with 12-bit conversion and continuous channel diagnostics.

Manufacturer	Triconex
Model	3701
Product family	Tricon v9–v11 Analog Input Modules
Product type	TMR Analog Input Module
Voltage range	0–10 VDC
Architecture	TMR analog input
Input points	32 differential, DC-coupled
Isolation	Non-isolated
Input update rate	55 ms
Resolution	12 bits
Accuracy	<0.15% FSR, 0°C to 60°C
Input resistance	30 MΩ minimum
Power-off resistance	30 kΩ typical
Common-mode rejection	-80 dB, DC–100 Hz typical
Common-mode range	-12 V to +12 V peak
Leg-to-leg isolation	200 kΩ typical

Manufacturer source

Tricon Product Guide 01-9302048-MM-001, Analog Input Module Specifications.

Only facts that can be matched to the exact ordering code are included in this product reference.

Analog Input Modules

Analog Input (AI) Modules includes three independent input channels. Each input channel receives variable voltage signals from each point, converts them to digital values, and transmits the values to the three Main Processor modules on demand. In TMR mode, one value is then selected using a mid-value selection algorithm to ensure correct data for every scan.

Sensing of each input point is performed in a manner that prevents a single failure on one channel from

affecting another channel. Each Analog Input Module sustains complete, ongoing diagnostics for each channel. Failure of any diagnostic on any channel activates the Fault indicator for the module, which in turn activates the chassis alarm signal. The module's Fault indicator merely reports a channel fault, *not* a module failure—the module can operate properly with as many as two faulty channels.

Analog Input Modules support hot-spare capability, which allows online replacement of a faulty module.

Analog Input Modules require a separate external termination panel (ETP) with a cable interface to the Tricon controller backplane. Each module is mechanically keyed for proper installation in a Tricon chassis.

Analog Input Module Specifications

Model Number	3700/3700A	3701	3703E
Voltage	0-5V, + 6% (only 3700A)	0-10V	0-5V or 0-10V ^a , + 6%
Type	TMR, AI	TMR, AI	TMR, AI
No. of Input Points	32, diff, DC coupled	32, diff, DC coupled	16, diff, isolated
Isolated Points	No	No	Yes
Input Update Rate	55 ms	55 ms	50 ms
Resolution	12 bits	12 bits	12 bits
Accuracy	< .15% of FSR, from 0° to 60° C	< .15% of FSR, from 0° to 60° C	< .15% of FSR, from 0° to 60° C
Input Resistance (load)	30 MΩ (DC), min.	30 MΩ (DC), min.	30 MΩ (DC), min.
Power-Off Resistance	30 KΩ (DC), typical	30 KΩ (DC), typical	30 MΩ (DC), min.
Common Mode Rejection	-80 dB (DC-100Hz), typical	-80 dB (DC-100Hz), typical	-90 dB @ 60Hz, min. -100 dB @ DC, min.
Common Mode Range	-12V to +12V peak	-12V to +12V peak	±200V peak
Leg-to-Leg Isolation	200 KΩ, typical	200 KΩ, typical	20 KΩ, typical
Normal Mode Rejection			
@ 8Hz	-3 dB	-3 dB	-3 dB
@ 60Hz	-17 dB	-17 dB	-17 dB
@ 120Hz	-23 dB	-23 dB	-23 dB
Input Overrange Protection	150 VDC/115 VAC continuous	150 VDC/115 VAC continuous	150 VDC/115 VAC continuous
Current Range	0-20 mA, 250 Ω shunt	0-20 mA, 500 Ω shunt	0-20 mA, 250 Ω shunt for 5V 500 Ω shunt for 10V
Diagnostic Indicators			
Module Status	Pass, Fault, Active	Pass, Fault, Active	Pass, Fault, Active
Color Code	Yellow	Light yellow	Mustard yellow

a. The voltage is selected using the TriStation 1131 software.



3701 engineering review

32-Point 0–10 VDC TMR Analog Input Module

Configuration and integration

Triconex 3701 receives thirty-two differential, DC-coupled 0–10 V signals through three independent input channels. Each channel converts the field value and delivers it to the three main processors for mid-value selection.

A 55 ms update rate, 12-bit resolution and less than 0.15% full-scale error support stable process measurements. Continuous diagnostics can identify a channel fault while the remaining healthy channels continue operating.

The module is non-isolated and requires a separate external termination panel and interface cable. Confirm the 500-ohm shunt when a 0–20 mA loop is converted into the 0–10 V input range.

Installation attention

3701 is non-isolated and mechanically keyed; confirm the external termination panel, 500-ohm current shunt and common-mode limits before insertion.

Verified functional points

Applications

- Collects differential voltage measurements from process transducers in safety and critical-control systems.
- Accepts 0–20 mA loops through the documented 500-ohm shunt arrangement.
- Supports online maintenance strategies through the analog-input hot-spare architecture.

Input Performance

- A 55 ms update interval defines how quickly the thirty-two field values are refreshed.
- Twelve-bit conversion provides the module's documented measurement resolution.
- Accuracy remains below 0.15% of full scale from 0°C to 60°C.

Signal Conditioning

- Minimum DC input resistance is 30 megohms for connected voltage sources.
- A 500-ohm shunt converts a 0–20 mA loop into the supported voltage range.
- Normal-mode rejection is specified at 8 Hz, 60 Hz and 120 Hz for predictable filtering behavior.

Diagnostics

- Pass, Fault and Active indicators report module-level operating condition.
- Ongoing channel tests can alarm a failed path without equating it to total module failure.
- The TMR design continues correct acquisition with as many as two faulty channels.

Source record

Tricon Product Guide 01-9302048-MM-001, Analog Input Module Specifications.



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