



3704E

64-Point Commoned TMR Analog Input Module

Product scope

- Accepts sixty-four commoned analog input points in one TMR module.
- Selects either 0–5 V or 0–10 V operation through TriStation 1131.
- Provides 12-bit conversion with a 75 ms input update period.

Manufacturer source

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

This web-optimized copy retains only product-relevant manufacturer information.

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3704E verified technical reference

64-Point Commoned TMR Analog Input Module

Exact product identity

Triconex 3704E is a 64-point commoned TMR analog input module with software-selectable 0–5 V or 0–10 V operation and 12-bit conversion.

Manufacturer	Triconex
Model	3704E
Product family	Tricon v9–v11 Analog Input Modules
Product type	Commoned TMR Analog Input Module
Voltage range	0–5 V or 0–10 V, software selectable
Architecture	TMR analog input
Input points	64 commoned
Isolation	Non-isolated
Input update rate	75 ms
Resolution	12 bits
Accuracy	<0.25% FSR, 0°C to 60°C
Input resistance	30 M Ω minimum
Power-off resistance	30 k Ω typical
Leg-to-leg isolation	200 k Ω typical
Input overrange protection	150 VDC / 115 VAC continuous
5 V current conversion	0–20 mA with 250 Ω shunt

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.

Product Specifications

Analog Input Module Specifications

Model Number	3704E	3720	3721
Voltage	0-5V or 0-10V ^a , + 6%	0-5VDC, + 6%	0 to 5 VDC or -5 to +5 VDC ^a , + 6%
Type	TMR, AI	TMR, AI	TMR, AI
No. of Input Points	64, commoned	64, single-ended	32 differential, DC-coupled
Isolated Points	No	Yes	Yes
Input Update Rate	75 ms	10 ms	10 ms
Resolution	12 bits	12 bits or 14 bits programmable	12 bits or 14 bits programmable
Accuracy	< 0.25% of FSR from 0° to 60° C	< 0.15% of FSR from 0° to 60° C	< 0.15% of FSR from 0° to 60° C
Input Resistance (load)	30 MΩ (DC), min.	10 MΩ (DC), min.	10 MΩ (DC), min.
Power-Off Resistance	30 kΩ (DC), typical	140 kΩ (DC), typical	140 kΩ (DC), typical
Common Mode Rejection	n/a	n/a	-85 dB (DC - 100 Hz)
Common Mode Range	n/a	n/a	-12V to +12V peak
Leg-to-Leg Isolation	200 kΩ, typical	420 kΩ, typical	420 kΩ, typical
Normal Mode Rejection	-1 dB @ 8Hz -12 dB @ 60Hz -18 dB @ 120Hz	-3 dB @ 8Hz -17 dB @ 60Hz -23 dB @ 120Hz	-3 dB @ 23 Hz -8 dB @ 60 Hz -14 dB @ 120 Hz
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 for 5V 500 Ω shunt for 10V	0-20 mA (plus 6% over-range) with 250 Ω shunt resistor	0-20 mA with 250 Ω shunt resistor
Diagnostic Indicators			
Module Status	PASS, FAULT, ACTIVE	PASS, FAULT, ACTIVE, FIELD	PASS, FAULT, ACTIVE, FIELD
Color Code	Copper	Yellow	Yellow

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

Analog Output Modules

Analog Output (AO) modules receive output signals from the Main Processor module on each of three channels. Each set of data is then voted and a healthy channel is selected to drive the outputs. Each module monitors its own current outputs (as input voltages) and maintains an internal voltage reference to provide self-calibration and module health information.

Each channel on a module has a current loopback circuit which verifies the accuracy and presence of analog signals independently of load presence or channel selection. The module's design prevents a non-selected channel from driving an analog signal to the

field. In addition, ongoing diagnostics are performed on each channel and circuit of the module. Failure of any diagnostic test deactivates the faulty channel and activates the Fault indicator and the chassis alarm. The module Fault indicator merely indicates a channel fault, not a module failure. The module continues to operate properly with as many as two channels failed. Open loop detection is provided by a LOAD indicator which activates if the module is unable to drive current to one or more outputs.

The module provides for redundant loop power sources with individual power and fuse indicators called PWR1 and PWR2. External loop power

supplies for analog outputs must be provided by the user. A LOAD indicator activates if an open loop is detected on one or more output points. PWR1 and PWR2 are on if loop power is present.

AO modules support hot- spare capability, which allows online replacement of a faulty module.

AO modules require a separate external termination panel (ETP) with a cable interface to the Tricon controller backplane. Each module is mechanically keyed to prevent improper installation in a configured chassis.



3704E engineering review

64-Point Commoned TMR Analog Input Module

Configuration and integration

Triconex 3704E combines sixty-four commoned analog inputs with a software-selectable 0–5 V or 0–10 V range. Three acquisition channels feed the TMR main processors while the field points share the documented commoned arrangement.

A 75 ms update period and 12-bit conversion support dense process monitoring. Continuous module diagnostics, status indicators and the Tricon hot-spare design contribute to maintainability during operation.

Range selection changes the required current shunt from 250 ohms to 500 ohms. Verify the configured range, common return, ETP, cable and mechanical key before wiring a replacement.

Installation attention

3704E uses different shunt values for 5 V and 10 V operation; confirm software range selection before applying field current loops.

Verified functional points

Applications

- Collects large groups of common-reference voltage measurements in safety-system cabinets.
- Interfaces with current transmitters through range-specific 250-ohm or 500-ohm shunts.
- Provides dense analog monitoring where isolation is handled elsewhere in the field design.

Range Selection

- TriStation 1131 selects either the 0–5 V or 0–10 V operating range for the module.
- Five-volt operation uses a 250-ohm shunt when accepting a 0–20 mA current signal.
- Ten-volt operation requires a 500-ohm shunt for the equivalent current-loop conversion.

Channel Layout

- Sixty-four input points share the commoned electrical arrangement defined for this model.
- Twelve-bit conversion produces the digital measurement sent through the TMR channels.
- The 75 ms update characteristic applies to the complete input module configuration.

Installation

- A separate external termination panel and interface cable connect the field circuits to the backplane.
- Mechanical keying is intended to prevent the module from being inserted into the wrong configured position.
- Common-return and shield routing must follow the installed cabinet drawing to avoid measurement errors.

Source record

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



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