



3515

32-Channel TMR Pulse Totalizer Input Module

Product scope

- Implements thirty-two independent 31-bit pulse counters in a TMR input architecture.
- Accepts input frequencies from 0 Hz to 1 kHz with a 300-microsecond minimum pulse width.
- Transfers active counter values to a hot-spare module during online replacement.

Manufacturer source

Triconex Product Specifications, Pulse Totalizer Input Module Specifications

Triconex Product Specifications, Pulse Totalizer Input Module Specifications, document 01-9302048-MM-001.

Request a fast quote	Product reference	
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3515 product reference

32-Channel TMR Pulse Totalizer Input Module

Verified configuration

Triconex 3515 is a 32-channel TMR pulse-totalizer input module with independent 31-bit counters, 0–1 kHz inputs and hot-spare counter re-education.

Manufacturer	Triconex
Model	3515
Product family	Tricon Pulse Totalizer Input Modules
Product type	TMR Pulse Totalizer Input Module
Model	3515
Architecture	TMR pulse totalizer
Counters	32 independent, non-commoned
Counter width	31 bits
Frequency range	0 Hz to 1 kHz
Minimum pulse width	300 microseconds
Active accuracy	±2 counts
Maximum count	2,147,483,647

Manufacturer source

Triconex Product Specifications, Pulse Totalizer Input Module Specifications

The following pages retain the manufacturer technical content for configuration and engineering review.

The Tricon controller supports a comprehensive range of modules to meet customers' needs.

Product Specifications

The Triconex product family includes a comprehensive range of modules. This section includes: a summary of the system components and their uses, a table that lists standard products and their model numbers, and a summary of specifications for each standard product in the Tricon controller family.

See the *Planning and Installation Guide for Tricon v9-v10 Systems* for complete information.

Summary of Tricon System Components

Chassis

- **Main Chassis**—houses Main Processors, memory back-up batteries, communication modules and I/O modules.
- **Expansion Chassis**—for additional I/O modules with up to 100 feet (30 meters) total cable length between the Main Chassis and the last Expansion Chassis.
- **RXM Chassis**—for I/O modules up to 7.5 miles (12 kilometers) away from the Main Chassis.
- **Mechanical Keying**—Each slot in the Tricon controller is mechanically keyed to correspond with a specific type of module. This prevents the installation of modules into improper slots.

For chassis mounting and enclosure specifications, see page 31.

Power Supply Modules

- Provide logic power to modules in the Main, Expansion or RXM Chassis. Available in 24 VDC, 115 VAC and 230 VAC versions. The power rating of each power supply is 175 watts at 140° F (60° C).

Main Processors

The Main Processors execute the system diagnostics and the user-written control program.

Communication Modules

- **Tricon Communication Modules (TCM)** support a number of Triconex protocols and applications and user-written applications on Ethernet (802.3) networks, including TriStation, Modbus TCP, and OPC. It also supports RS-232 and RS-485 serial communication with Modbus devices, TriStation 1131, and GPS for time synchronization.
- **Enhanced Intelligent Communication Modules (EICM)** support RS-232, RS-422 and RS-485 serial communication with Modbus devices and TriStation 1131 applications.
- **Network Communication Modules (NCM)** support a number of Triconex protocols and applications and user-written applications on Ethernet (802.3) networks, including the TriStation 1131 software.
- **Safety Manager Modules (SMM)** act as an interface between a Tricon controller and a Honeywell Universal Control Network (UCN), one of three principal networks of the TDC-3000 DCS.
- **Hiway Interface Modules (HIM)** act as an interface between a Tricon controller and a Honeywell TDC-3000 Hiway Gateway and Local Control Network (LCN).
- **Advanced Communication Modules (ACM)** allow a Tricon controller to interface with a Foxboro Industrial

Automation (I/A) Series DCS and a TriStation 1131 application.

Fiber-Optic Remote Extender Modules (RXM)

For operation of Expansion Chassis up to 7.5 miles (12 kilometers) away from the Main Chassis, with exceptional immunity against electro-static and electro-magnetic interference.

Interface Modules

- **HART Analog Input Interface Modules** act as an interface between 4-20 mA analog input points from HART smart devices in the field and HART Host software running on a PC.
- **HART Analog Output Interface Modules** act as an interface between 4-20 mA analog output points from HART smart devices in the field and HART Host software running on a PC.

I/O Modules

- **Digital Input Modules** receive discrete signals of these nominal voltages: 115 VAC/VDC, 48 VAC/VDC, and 24 VAC/VDC. All voltages are available in TMR modules. Non-TMR modules are available in 24 VDC and 48 VDC only. Speed input and totalization modules are also available.
- **Supervised Digital Output Modules** produce discrete output signals of these nominal voltages, with diagnostic coverage of the field circuit and load device: 115 VAC, 120 VDC, 48 VDC, and 24 VDC.
- **Digital Output Modules** produce discrete output signals of these nominal voltages: 115 VAC, 120

Product Specifications

VDC, 24 VDC, and 48 VDC. Dual output modules are also available.

- *Analog Input Modules* receive analog signals of these types: 0-5 VDC, -5 to +5 VDC, 0-10 VDC, and Thermocouple types J, K, T and E. Available in both isolated and DC-coupled versions.
- *Analog Output Modules* are available in these versions: eight output points at 4-20 mA; six output points at 4-20 mA and two at 20-320 mA; and four output points at -60 to 60 mA.

Conformal Coating

Most of the Tricon hardware models in the *Planning and Installation Guide for Tricon v9-v10 Systems* and the *Field Terminations Guide for Tricon v9-v10 Systems* can be ordered with conformal coating by adding the letter "C" to the end of the standard model number.

The following equipment *cannot* be ordered with conformal coating:

- Equipment certified for use in nuclear 1E applications
- All types of cables; including interface cables, I/O bus cables, and fanned-out cables

- Blank slot covers

Neoprene dust covers are provided with external termination panels and chassis that are conformal coated. You can install the dust covers on unused external termination panel connectors and unused backplane connectors, at your discretion.

Some of the Tricon hardware with conformal coating has been certified for use in marine environments. For more information, see "Tricon Equipment Certified for Use in Marine Environments" on page 21.

Product Specifications

Pulse Totalizer Input Module

The Model 3515 Pulse Totalizer Input (PTI) Module provides 32 individual 31-bit counters that operate independently. The counters are used with active-flow sensors or per-unit sensors to measure a quantity (count) which is transmitted to the Main Processors. At the time specified by the control program, the Main Processors clear a single counter or all counters.

The PTI module has three isolated input channels. Each input channel independently processes all input data and passes it to the Main Processors, where it is voted before processing to ensure the highest integrity.

Each PTI module provides complete ongoing diagnostics on each channel, including channel-to-channel count comparison. Failure of any diagnostic on any channel activates the Fault indicator, which in turn activates the

chassis alarm. The Fault indicator points to a channel fault, not a module failure. The PTI module is guaranteed to operate properly in the presence of a single fault, and may continue to operate with certain kinds of multiple faults.

The PTI module can operate with or without a hot-spare module. If you use a hot-spare module, it re-educates all counter values from the active module.

Pulse Totalizer Input Module Specifications

Model Number	3515
Type	TMR, Pulse Totalizer
Number of Input Signals	32, non-commoned
Input Frequency Range	0 Hz to 1 KHz
Minimum Input Pulse Width	300 microseconds
Accuracy	
Active Module	± 2 counts
Hot-spare module (maximum error counts during hot replacement)	1-10 >= 100 Hz 0-1 <= 100 Hz
Maximum Count	2,147,483,647 ($2^{31} - 1$)
Counter Overflow (worst case @ 1 KHz)	596 Hours (24 days)
Count Overflow Indication	Count goes to negative integer
Count Resets	Individual reset per counter
Recommended Input Voltage Range	42.5 VDC absolute maximum
Count Up Switching Level	Rising edge (Off to On)
Switching Voltages	
Off to On	15 VDC typical, 18 VDC worst case
On to Off	8 VDC typical, 6 VDC worst case
Typical Hysteresis	4 VDC
Normal Turn-on Current	6mA to 9mA
Count Input Delay	< 15 ms
Point Isolation (opto-isolated)	1,500 VDC minimum
Diagnostic Indicators	
On or Off State	1 per point
Module Status	PASS, FAULT, ACTIVE
Logic Power	< 10 watts
Nominal Field Power Load	0.5 watts per On point 1.5 watts @ maximum field voltage
Color Code	Purple



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