

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

INVENSYS TRICONEX

3503E

TMR DIGITAL INPUT MODULE

Used with the applicable Tricon v9-v10 system configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official pages follow this cover with source pagination retained.

Invensys 9700077-012, February 2009

24 to 48 VAC/VDC Digital Input Modules

This figure is a simplified schematic for models 3502E, 3503E, and 3505E, which are 24 to 48 VAC/VDC, 32-point TMR Digital Input Modules with a self-test feature. The self-test feature continuously verifies the ability of a Tricon controller to detect the transition of a normally energized circuit to the Off state.

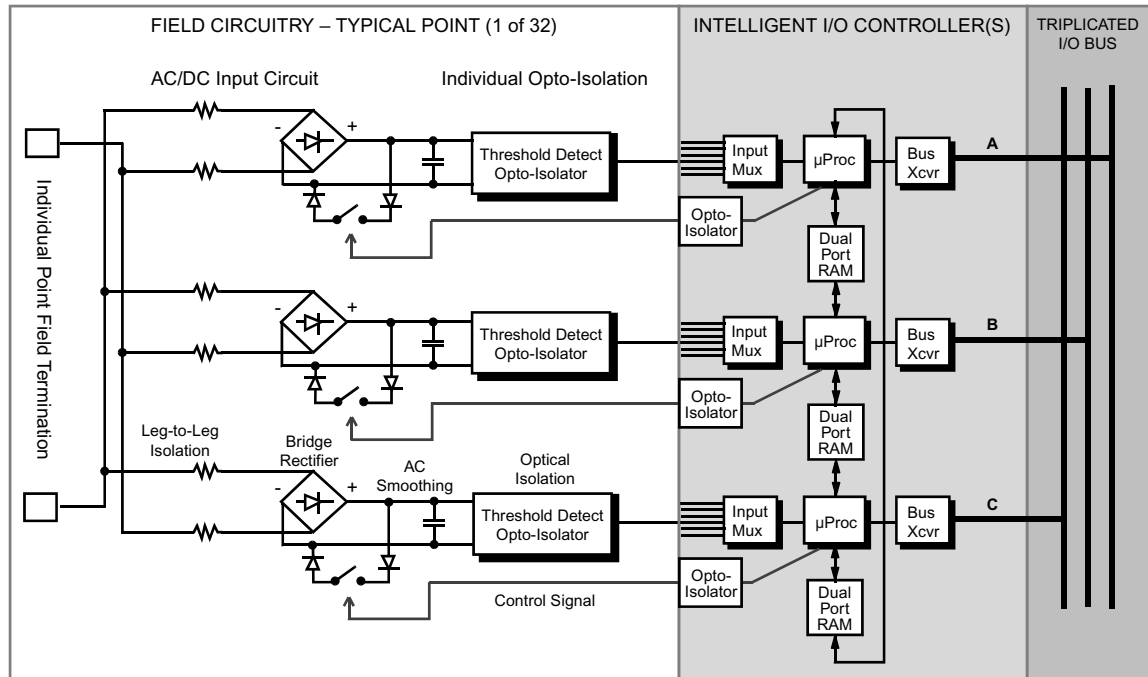


Figure 30 3502E, 3503E, and 3505E Simplified Schematic

This figure shows the front panels of models 3502E, 3503E, and 3505E.

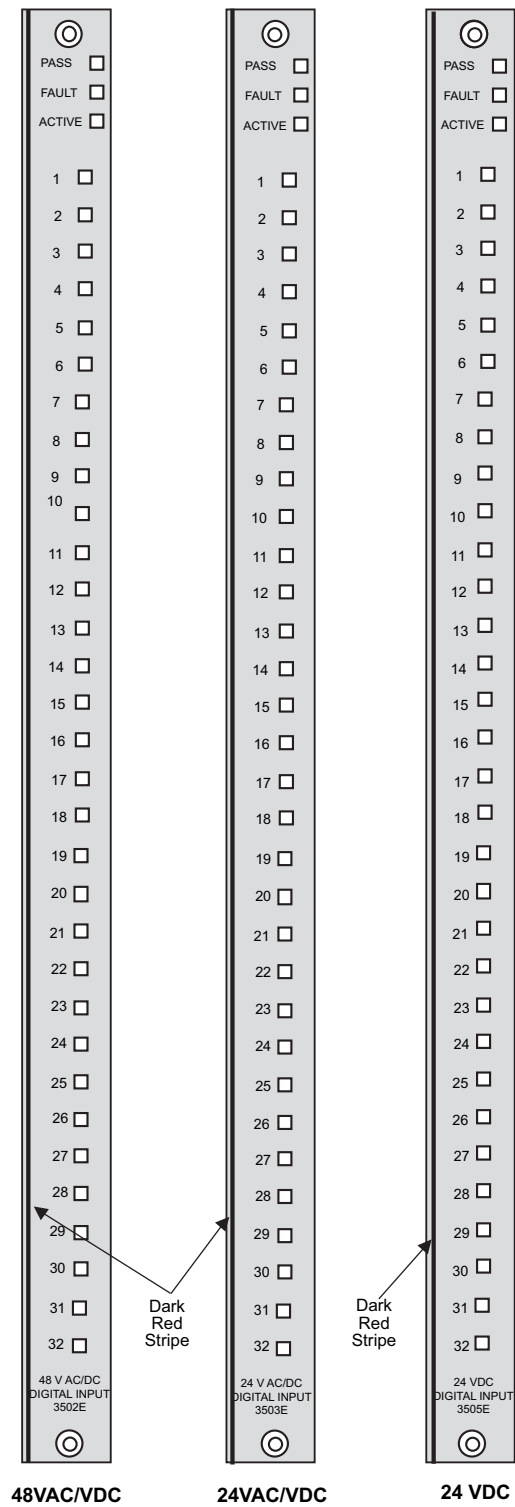


Figure 31 3502E, 3503E, and 3505E Front Panels

3503E Specifications

This table lists the specifications for model 3503E, which is a TMR Digital Input Module with a nominal input voltage of 24 VAC/VDC and a self-test feature.

CAUTION

This model is not recommended for use with shunt-diode intrinsic safety barriers. For these applications, Triconex recommends the model 3505E.

Table 26 3503E Digital Input Specifications

Feature	Specification
Color code	Dark red
Number of input points	32, commoned in groups of 8
Input frequency range	DC or 47-63 Hz
Recommended input range	20–42.5 VDC
Maximum voltage	42.5 VAC/VDC
Switching level: Off to On	15 VAC/VDC typical, 18 VAC/VDC worst-case
Switching level: On to Off	8 VAC/VDC typical, 6 VAC/VDC worst-case
Typical hysteresis	4 VAC/VDC
Nominal turn-on	6 mA to 9 mA
Input impedance	> 1.25 k Ω nominal
Input delay: Off to On	< 8 ms
Input delay: On to Off	< 15 ms
Point isolation, opto-isolated	1000 VAC minimum, 1500 VDC minimum
Status indicator: On or Off State	1 per point
Status indicator: Module status	Pass, Fault, Active
Logic power	< 10 watts
Nominal field power load	0.5 watts per On point ¹ 1.5 watts @ maximum field voltage
Leakage current to chassis @ 60 Hz	0.25 mA maximum per On point
Input diagnostic fault coverage ² :	
Maximum input toggle rate	Every 100 ms
Minimum input toggle rate, On state	Not required
Minimum input toggle rate, Off state	Every 3 months (manually toggled by the user)
Diagnostic glitch duration ³	20 ms typical
Output voltage	< 1/2 V _{IN}
Output impedance	< 1.87 k Ω

1. When used with a typical shunt-diode intrinsic safety barrier, the nominal field power per On point is approximately 350 milliwatts @ 24 VDC.

2. The maximum input toggle rate enables proper operation of I/O diagnostics and detection of all normally detectable faults. The minimum toggle rate provides fault coverage of normally undetectable faults within 10% of the calculated mean-time-between-faults (MTBF) for the module.
3. V_{IN} is the voltage applied to an energized point. Output voltage is noticeable on an adjacent de-energized point for the duration of the diagnostic glitch. Be advised that the glitch output may falsely energize the paralleled input of another piece of equipment.

3505E Specifications

This table lists the specifications for model 3505E, which is a low-threshold TMR Digital Input Module.

Table 27 3505E Digital Input Specifications

Feature	Specification
Color code	Dark red
Number of input points	32, commoned in groups of 8
Recommended input range	20–42.5 VDC
Maximum voltage	42.5 VDC
Switching level: Off to On	10 VDC typical, 12 VDC worst-case
Switching level: On to Off	5 VDC typical, 4 VDC worst-case
Typical hysteresis	2 VDC
Nominal turn-on	3 mA to 5 mA
Input impedance	> 1.25 k Ω nominal
Input delay: Off to On	< 8 ms
Input delay: On to Off	< 15 ms
Point isolation, opto-isolated	1000 VAC minimum, 1500 VDC minimum
Status indicator: On or Off State	1 per point
Status indicator: Module status	Pass, Fault, Active
Logic power	< 10 watts
Nominal field power load	0.5 watts per On point ¹ 1.5 watts @ maximum field voltage
Leakage current to chassis @ 60 Hz	0.25 mA maximum per On point
Input diagnostic fault coverage ² :	
Maximum input toggle rate	Every 100 ms
Minimum input toggle rate, On state	Not required
Minimum input toggle rate, Off state	Every 3 months (manually toggled by the user)
Diagnostic glitch duration ³	20 ms typical
Output voltage	< 1/2 V_{IN}
Output impedance	< 1.87 k Ω