

TICI Contact Input with Point Isolation

Functional Description

The Contact Input with Point Isolation (TICI) terminal board provides 24 point isolated voltage detection circuits to sense a range of voltages across relay contacts, fuses, and switches.



Caution

In 240 V ac applications, do not inadvertently cross-connect the 240 V ac and the dc voltages. The peak voltage will exceed the MOV rating resulting in a failure.

Most ac supplies operate with a grounded neutral, and if an inadvertent connection between the 125 V dc and the ac voltage is created, the sum of the ac peak voltage and the 125 V dc is applied to MOVs connected between dc and ground. However, in 120 V ac applications, the MOV rating can withstand the peak voltage without causing a failure.

Installation

Connect the wires for the 24 isolated digital inputs directly to two I/O terminal blocks on the terminal board. These blocks are held down with two screws and can be unplugged from the board for maintenance. Each block has 24 terminals accepting up to #12 AWG wires. A shield terminal strip attached to chassis ground is located immediately to the left of each terminal block.

In a simplex system, connect TICI to the PDIA I/O pack using connector JR1. In a TMR system, connect TICI to the PDIA's using connectors JR1, JS1, and JT1.

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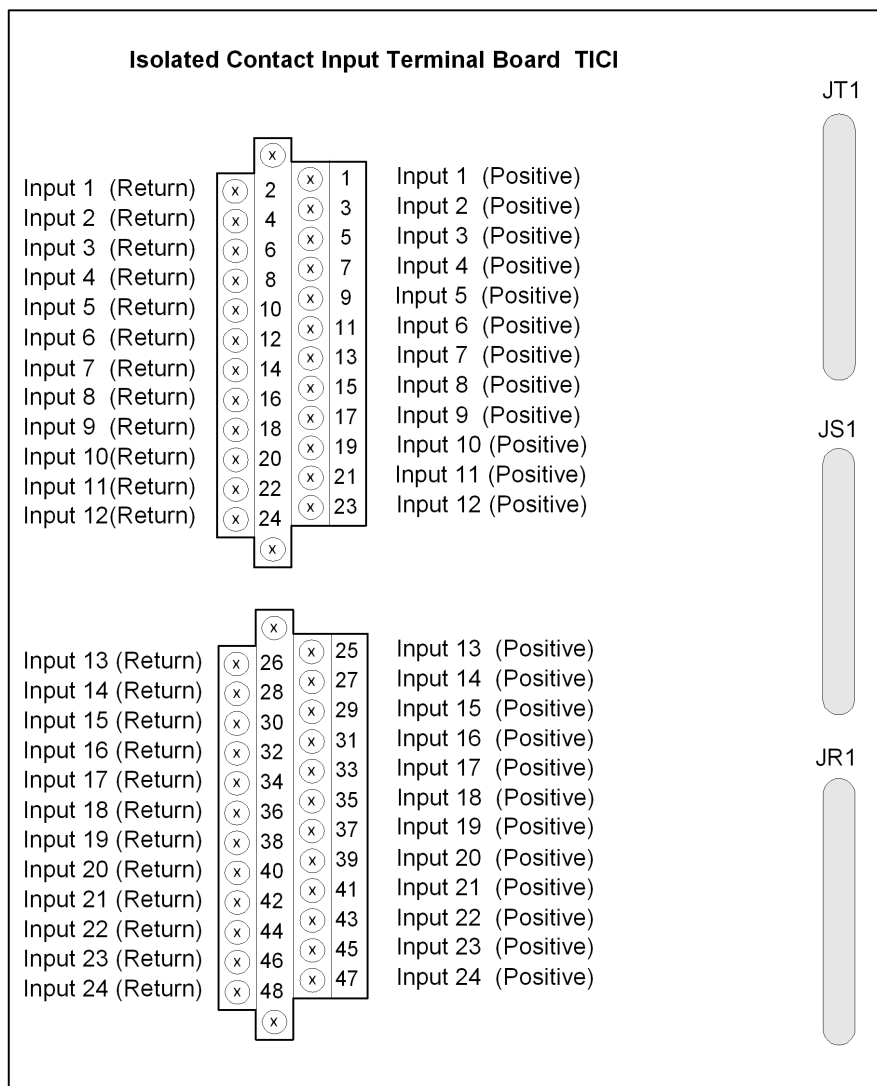
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J - Port Connections:

Plug in PDIA I/O Pack(s)
for Mark VIe control

or

Cables to VCCC board(s)
in the Mark VI control

The number and location
depends on the level of
redundancy required.

Terminal Blocks can be unplugged
from terminal board for maintenance

Up to two #12 AWG wires per
point with 300 volt insulation

TICI Terminal Board Wiring and Cabling

Operation

The TICI is similar to TBCI, except for the following items:

- No contact excitation is provided on the terminal board.
- Each input is electrically isolated from all others and from the active electronics.

There are two groups of the TICI with different nominal voltage thresholds. TICIH1 has the following input voltage ranges:

- 70-145 V dc, nominal 125 V dc, with a detection of 39 to 61 V dc
- 200-250 V dc, nominal 250 V dc, with a detection of 39 to 61 V dc
- 90-132 V rms, nominal 115 V rms, 47-63 Hz, with a detection of 35 to 76 V ac
- 190-264 V rms, nominal 230 V rms, 47-63 Hz, with a detection of 35 to 76 V ac

TICIH2 has the following input voltage range:

- 16-32 V dc, nominal 24 V dc, with a detection threshold of 9.5 to 15 V dc

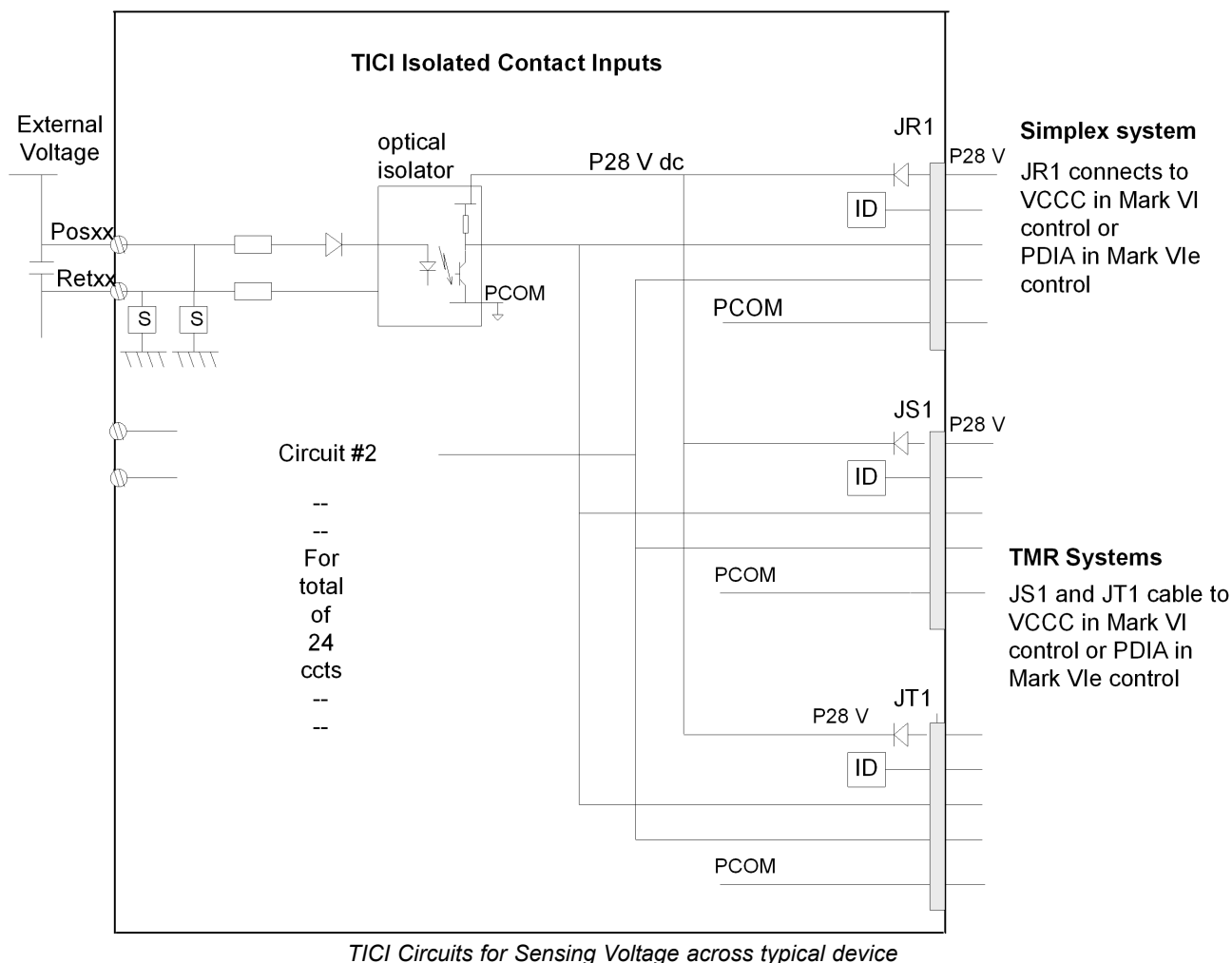
TICI provides input hardware filtering with time delays of 15 ms, nominal:

- For dc applications the time delay is 15 ± 8 ms
- For ac applications the time delay is 15 ± 13 ms

In addition to hardware filters, the contact input state is software-filtered, using configurable time delays selected from 0, 10, 20, 50, and 100 ms. For ac inputs, a filter of at least 10 ms is recommended.

The following restrictions should be noted regarding creepage and clearance on the 230 V rms application:

- For NEMA requirements: 230 V single-phase
- For CE Certification: 230 V single or 3-phase



Specifications

Item	Specification
Number of channels	24 input channels for isolated voltage sensing
Input voltage	TICIH2: 16-32 V dc, nominal 24 V dc, with a detection threshold of 9.5 to 15 V dc TICIH1: 70 -145 V dc, nominal 125 V dc, with a detection threshold of 39 to 61 V dc 200 -250 V dc, nominal 250 V dc, with a detection threshold of 39 to 61 V dc 90 -132 V rms, nominal 115 V rms, 47-63 Hz, with a detection threshold of 35 to 76 V ac 190-264 V rms, nominal 230 V rms, 47-63 Hz, with a detection threshold of 35 to 76 V ac
Fault detection in I/O board	Non-responding contact input in test mode Unplugged cable or failed ID chip
Physical	
Size	17.8 cm high x 33.02 cm wide (7.0 in x 13.0 in)
Temperature	Operating -30 to 65°C (-22 to 149 °F)

Diagnostics

Diagnostic tests to components on the terminal boards are as follows:

- The excitation voltage is monitored. If the excitation drops to below 40% of the nominal voltage, a diagnostic alarm is set and latched by the PDIA.
- As a test, all inputs associated with this terminal board are forced to the open contact (fail-safe) state. Any input that fails the diagnostic test is forced to the fail-safe state and a fault is created.
- If the input from this board does not match the TMR voted value from all three boards, a fault is created.
- Each terminal board connector has its own ID device that is interrogated by the PDIA. The connector ID is coded into a read-only chip containing the board serial number, board type, revision number, and the JR1/JS1/JT1 connector location. When the chip is read by the PDIA and a mismatch is encountered, a hardware incompatibility fault is created.

Configuration

There are no jumpers or hardware settings on the terminal board.