ICS Triplex T3411

Regent 16-Channel Monitored Digital Input Module

ICS Triplex T3411 is a Regent monitored digital input module for receiving 16 field-switch signals. T3411 suits existing Regent input assemblies that use the module's regulated 24 V DC field-switch supply and need open- or short-circuit diagnostics.



Technical Specifications

Product Identity	
Manufacturer	Industrial Control Services
Model	T3411
Platform	ICS Regent
Product type	Monitored digital input module
Slot key positions	Upper 4; lower 7
Functional Configuration	
Inputs	16
Performance & Power	
Field-switch supply	24 V DC, internally regulated
Field supply range	15–80 V DC
Maximum field-supply current	450 mA
Input current	5 mA
Maximum on/off response	10 ms
Field-to-logic isolation	2500 V minimum
Environment	
Operating temperature	0–60 °C

Selected original manufacturer pages follow on pages 3–9.

Compatibility & Selection Guide

System compatibility. The Regent WINTERPRET I/O Configuration Editor uses the T3411 module definition. Single, dual and triple arrangements require the corresponding wiring and application voting logic; redundancy uses additional modules of the same type. T3411F has a different field-power arrangement and is not an unqualified substitute.

Wiring & Installation Reference

Field wiring and line monitoring

Field supply. 15–80 V DC · Module regulates switch supply to 24 V DC

Single sensor/module. T0412 · Resistor line-monitor network

Shared sensor/redundant modules. T0413 · Zener line-monitor network

Mounting and handling

Confirm the slot. Use the Regent I/O chassis position wired for T3411; inspect the existing field connections.

Set the keys. Use upper key position 4 and lower key position 7; retain the correct connector orientation.

Verify monitoring. Match single or redundant wiring to the corresponding diagram and configure input/fault variables before commissioning.

Installation precautions. For energize-to-trip safety inputs, line monitoring and fault alarms are required. Do not assume T3411F wiring or keying applies to T3411. Use the site-approved isolation and safety procedures before changing field wiring.

View terminal diagram (PDF) · PDF page 4 | View mounting diagram · PDF page 6

Manufacturer sources: PD-6031, Issue 1, March 2006.

The field power supply voltage is regulated to 24 Vdc inside the module. This power is used to source the power to the field input switches. The return side of the field switches is wired back to the field power supply return.

Figure 6 shows the wiring connections for a single monitored input module.

When redundant field sensors are installed, each input module is wired as shown in Figure 6. In a fault tolerant configuration the input signals are connected in parallel across both input modules as shown in Figure 7.

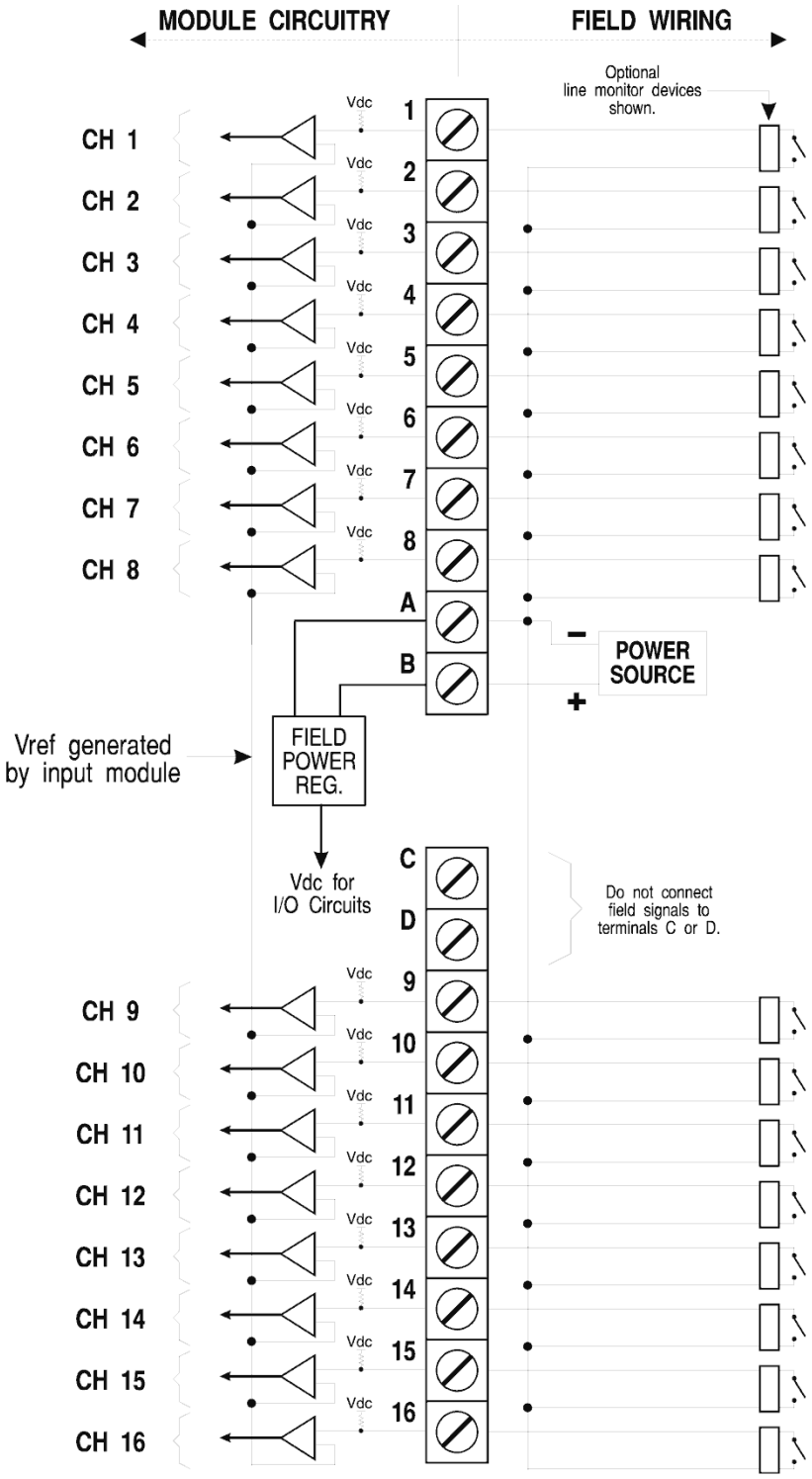


Figure 6. Module Wiring, Single Sensors to a Single Monitored Digital Input Module.

Line Monitoring

The Monitored digital input module can perform line monitoring of the field wiring when a suitable line monitor device is installed across the field input switch. Two types of line monitor devices are available to match the type of module configuration used in the application.

Figure 8 shows a single switch connected to a single monitored input module. This type of configuration uses the T0412 line monitor device which contains two resistors, one in series with the field switch and one in parallel with the field switch. Figure 8 also applies to fault tolerant input configurations that include redundant sensors connected to redundant input modules.

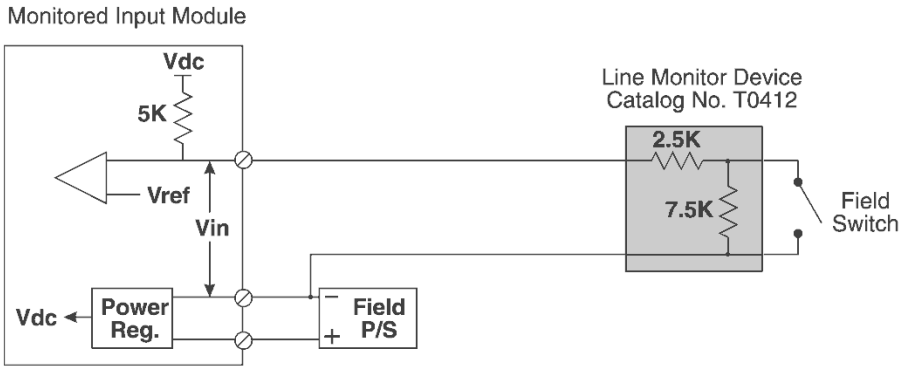


Figure 8. Line Monitoring, Single Switch Connected to Single Module.

For fault tolerant configurations using single sensors connected to redundant input modules, the T0413 line monitor device is used as shown in Figure 9. This line monitor device includes two zener diodes, one in series with the field switch and one in parallel with the field switch.

Keying

The I/O chassis can be physically keyed to prevent accidental damage caused by inserting a module into a slot wired for a different module type. Figure 10 illustrates how the slot keys are installed on the I/O chassis slot field wiring connectors. The slot key positions for the monitored digital input module are listed in Table 2.

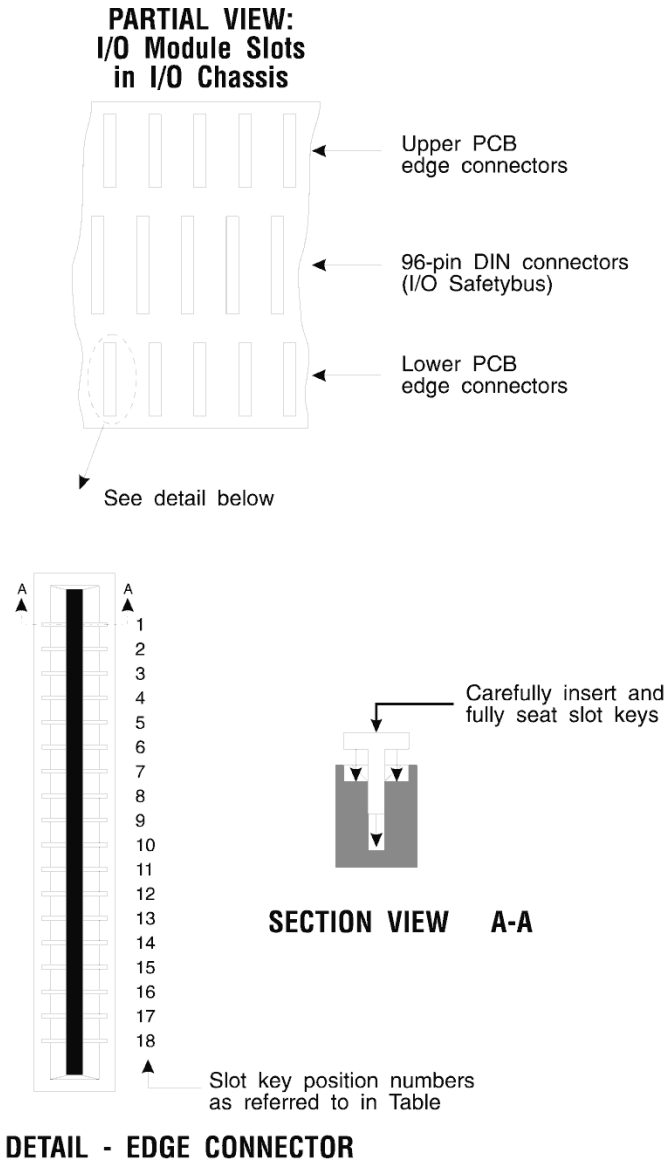


Figure 10. Installing Slot Keys.

Table 2. Slot Key Positions.

Module	Upper Connector	Lower Connector
T3411	4	7

Configuration

Each monitored input module is configured using the WINTERPRET I/O Configuration Editor. In the editor, you will perform the steps described below to configure the input module.

1) Set the Module Type:

   Position the cursor on the module slot you wish to define. Choose Set Module Type from the Edit Menu and select the T3411, 24 Vdc Monitored Digital Input Module from the list.

2) Edit the Module Definition:

   Choose Edit Module Definition from the Edit Menu. A dialog box will open where you can define the input module and point definitions.

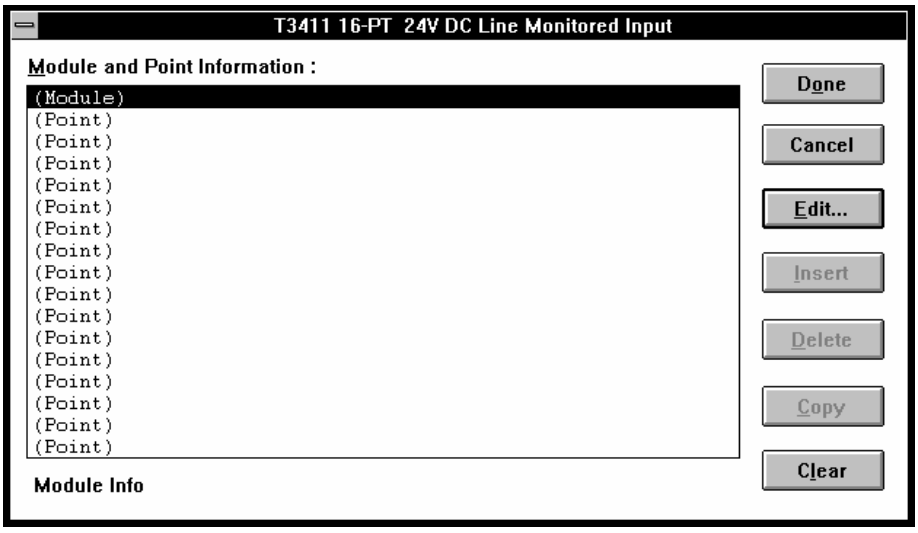


Figure 11. Monitored Digital Input Module Definition.

If energize-to-trip inputs are used in safety critical applications, line monitor devices must be installed at the field switches. The Fault Name variables must be configured and line fault status must be alarmed to plant operations personnel.

For de-energize-to-trip inputs, line monitor devices are recommended in order to detect the difference between a normally closed input and a shorted field wire.

For additional safety considerations, please refer to the Safety Considerations section of the Regent User's Guide.

Specifications

Safetybus Power	0.85 load units
Number of Inputs	16, common power return
Field Power	
Voltage:	15 to 80 VDC
Current:	450 mA, maximum
Turn-On Voltage (default)	> 12 Vdc
Turn-Off Voltage (default)	< 12 Vdc
Input Current	5.0 mA, maximum
Turn-On Delay	10 msec, maximum
Turn-Off Delay	10 msec, maximum
Over Voltage Protection	
Field Power Terminals:	100 Vdc continuous
Input Terminals:	27 Vdc continuous
Heat Dissipation	8.5 Watts, 29 BTUs/hour
Fusing	None required, internal resistor limits current to 5 mA if input short circuit.
Isolation	2500 volts minimum (field wiring to control logic)
Input Circuit Test Interval	Function of application program scan time and size of I/O configuration. Typically less than 2 seconds (see page 5 for details).

Intrinsic Safety	External barrier, if required. (requires threshold adjustment, see page 18).
Operating Temperature	0 to 60 C (32 to 140 F)
Storage Temperature	-40 to 85 C (-40 to 185 F)
Operating Humidity	0 to 95% relative humidity, non-condensing
Vibration	
10 to 55 Hz:	±0.15mm
Shock	
Operating:	15 g, ½ sine wave, 11 msec
Electromagnetic Interference	
• IEC 801 Part 2 - Electrostatic Discharges	Level 3: Contact discharge of 6 kV
• IEC 801 Part 3 - Radiated Electromagnetic Fields	Level 3: 10 V/M, 27 MHz - 500 MHz
• IEC 801 Part 4 - Transients and Bursts	Level 4: 2 kV, 2.5 kHz for t = 60 seconds
• ANSI/IEEE C37.90 - Surge Withstand Capability	2.5 kV damped 1 MHz sine wave 4 kV bi-directional impulse, 10 nsec rise time, fast transient
Safety	Certified to DIN V VDE 0801 for Risk Class 5. Also designed to meet UL 508 and CSA 22.2, No. 142-M1981
Dimensions	
Height:	12.6" (320 mm)
Width:	1.27" (32 mm)
Depth:	10.12" (257 mm)
Weight	3.3 lbs (1.5 kg)