Trusted 60 Channel 24 Vdc Digital Input

Product Overview

The Trusted® 60 Channel 24 Vdc Digital Input T8802 is designed to act as the main interface between a field device generating a digital signal and the Trusted Dual 24 Vdc Digital Input Module T8402.

Features:

- 60 input channels per Field Termination Assembly (FTA).
- Industry standard field device connections (2-wire).
- Standard DIN rail compatibility.
- Simple installation and connection.
- 24 Vdc operation.
- SmartSlot connection for ‘one to many’ hot replacement of input modules.
- Fused field power supply per channel.
- Additional channels to monitor field supplies (Channels 0 and 61).

Page intentionally left blank

PREFACE

In no event will Rockwell Automation be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment. The examples given in this manual are included solely for illustrative purposes. Because of the many variables and requirements related to any particular installation, Rockwell Automation does not assume responsibility or reliability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, with respect to use of information, circuits, equipment, or software described in this manual.

DISCLAIMER

It is not intended that the information in this publication covers every possible detail about the construction, operation, or maintenance of a control system installation. You should also refer to your own local (or supplied) system safety manual, installation and operator/maintenance manuals.

REVISION AND UPDATING POLICY

This document is based on information available at the time of its publication. The document contents are subject to change from time to time. The latest versions of the manuals are available at the Rockwell Automation Literature Library under "Product Information" information "Critical Process Control & Safety Systems".

TRUSTED RELEASE

This technical manual was updated for **Trusted Release 4.0**.

LATEST PRODUCT INFORMATION

For the latest information about this product review the Product Notifications and Technical Notes issued by technical support. Product Notifications and product support are available at the Rockwell Automation Support Centre at
http://rockwellautomation.custhelp.com

At the Search Knowledgebase tab select the option "By Product" then scroll down and select the Trusted product.

Some of the Answer ID's in the Knowledge Base require a TechConnect℠ Support Contract. For more information about TechConnect Support Contract Access Level and Features, click on the following link:

https://rockwellautomation.custhelp.com/app/answers/detail/a_id/50871

This will get you to the login page where you must enter your login details.

IMPORTANT A login is required to access the link. If you do not have an account then you can create one using the "Sign Up" link at the top right of the web page.

DOCUMENTATION FEEDBACK

Your comments help us to write better user documentation. If you discover an error, or have a suggestion on how to make this publication better, send your comment to our technical support group at http://rockwellautomation.custhelp.com

SCOPE

This manual specifies the maintenance requirements and describes the procedures to assist troubleshooting and maintenance of a Trusted system.

WHO SHOULD USE THIS MANUAL

This manual is for plant maintenance personnel who are experienced in the operation and maintenance of electronic equipment and are trained to work with safety systems.

SYMBOLS

In this manual we will use these notices to tell you about safety considerations.

	SHOCK HAZARD: Identifies an electrical shock hazard. If a warning label is fitted, it can be on or inside the equipment.
	WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which can cause injury or death, property damage or economic loss.
	ATTENTION: Identifies information about practices or circumstances that can cause injury or death.
	CAUTION: Identifies information about practices or circumstances that can cause property damage or economic loss.
	BURN HAZARD: Identifies where a surface can reach dangerous temperatures. If a warning label is fitted, it can be on or inside the equipment.
	This symbol identifies items which must be thought about and put in place when designing and assembling a Trusted controller for use in a Safety Instrumented Function (SIF). It appears extensively in the Trusted Safety Manual.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
NOTE	Provides key information about the product or service.
TIP	Tips give helpful information about using or setting up the equipment.

WARNINGS AND CAUTIONS

WARNING: EXPLOSION RISK

Do not connect or disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations or equivalent

AVERTISSEMENT - RISQUE D'EXPLOSION

Ne pas connecter ou déconnecter l'équipement alors qu'il est sous tension, sauf si l'environnement est exempt de concentrations inflammables ou équivalente

MAINTENANCE

Maintenance must be carried out only by qualified personnel. Failure to follow these instructions may result in personal injury.

CAUTION: RADIO FREQUENCY INTERFERENCE

Most electronic equipment is influenced by Radio Frequency Interference. Caution should be exercised with regard to the use of portable communications equipment around such equipment. Signs should be posted in the vicinity of the equipment cautioning against the use of portable communications equipment.

CAUTION:

The module PCBs contains static sensitive components. Static handling precautions must be observed. DO NOT touch exposed connector pins or attempt to dismantle a module.

ISSUE RECORD

Issue	Date	Comments
6	Sep 05	Format
7	Jun 16	Rebranded and updated to incorporate IEEE standards with correction of typographical errors and also standardise the Relative Humidity Range and Operating Temperature statements in the Specification Section.
8	Dec 18	Updated spec table, drawing clarifications Updated to display Rockwell Automation publication numbers. Added trademarks statement.

Page intentionally left blank

Table of Contents

Page intentionally left blank

1. Description

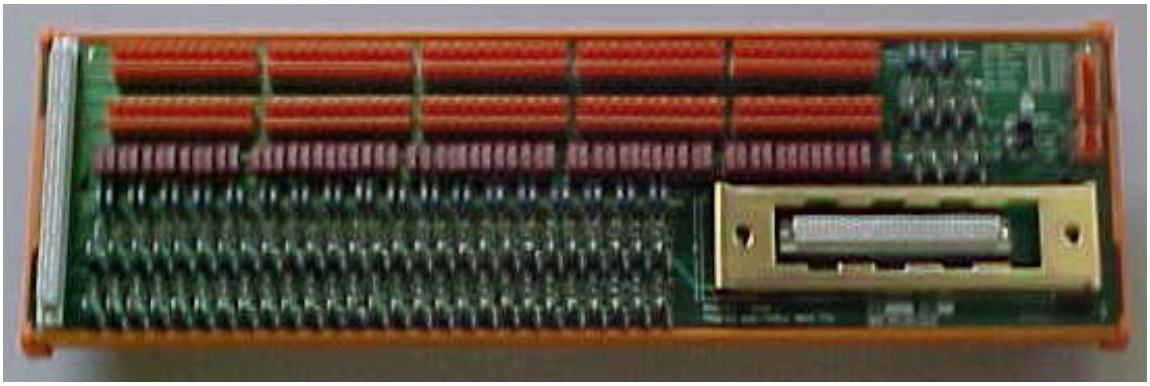

Figure 1 T8802 Layout

The Trusted 60 Channel 24 Vdc Digital Input T8802 provides termination for a maximum of 60 input channels from various types of field devices which generate a digital input. Figure 2 Single Channel Schematic

below shows the configuration of a single channel.

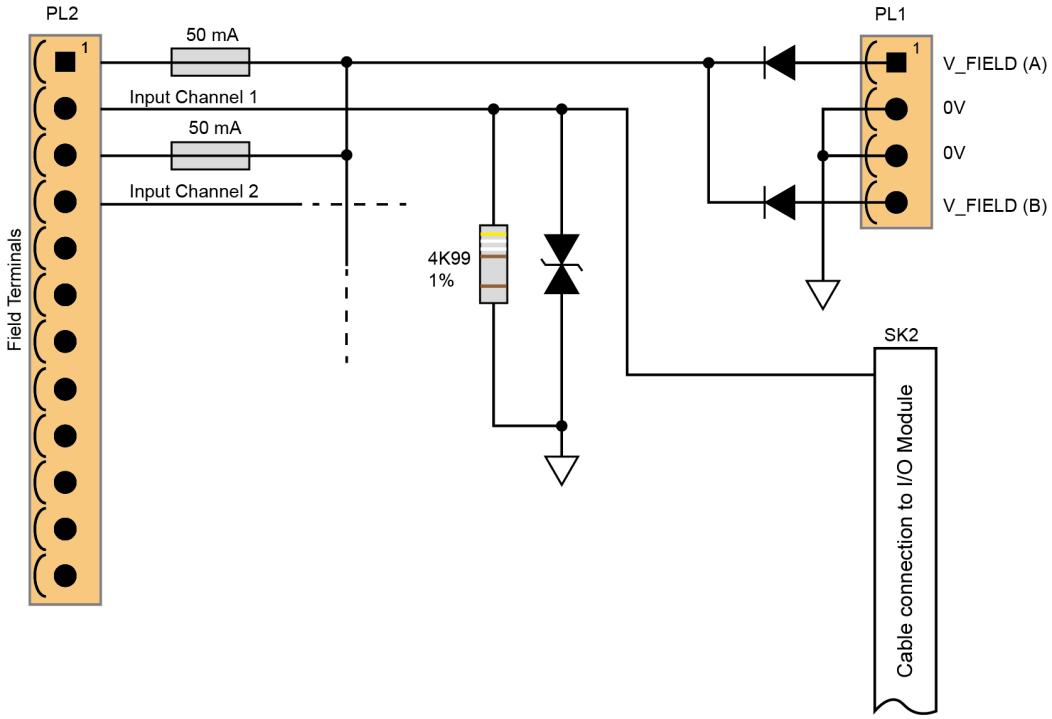

Figure 2 Single Channel Schematic

The field supply is derived from dual 24 Vdc feeds which are 'commoned' via diodes on the FTA. The supply is then fed to each channel. Channel 0 on the Trusted Dual 24 Vdc Digital Input Module will be configured in the future to provide monitoring of the field power supply.

The supply voltage to the field is fed via the 50 mA fuse. The incoming signal (digital) from the field device is developed across the 5 kΩ (nom) resistor, then connected to the appropriate input circuit on the Input Module. Electrostatic discharge (ESD) transients are suppressed by a bi-directional Transient Voltage Suppressor diode (TVS) as shown. Line monitoring components (if required) are fitted to the field device to provide the necessary thresholds used by the input module to detect the field loop/device status, i.e. open/short circuit, alarm etc.

The connector linking the 60 channels on the input module to the FTA is terminated at SK2 which is a 64-way socket. The SmartSlot connector is SK1 and is a 64-way socket (this socket is no longer used). The dual 24 Vdc power supplies are connected to the FTA via a single 4-way connector (PL1). Ten 12-way connectors are used for the field loops (PL2 to PL9, PL11 and PL12). PL10 is an auxiliary 2-way plug provided for power monitoring purposes (future use).

2. Installation

The Trusted 60 Channel 24 Vdc Digital Input T8802 is designed to be mounted on either of the TS32 or TS35 DIN rails in the horizontal or vertical positions as required.

Page intentionally left blank

3. Associated Cable Selection

Refer to the product descriptions detailed below:

Publication ICSTT-RM311 (PD-TC200)	Trusted I/O Companion Slot Cables
Publication ICSTT-RM314 (PD-TC600)	Trusted I/O SmartSlot Cables 60-Channel
Publication ICSTT-RM315 (PD-TC700)	Trusted I/O Companion Slot 60-Channel

Page intentionally left blank

4. Assembly Pinout Connections

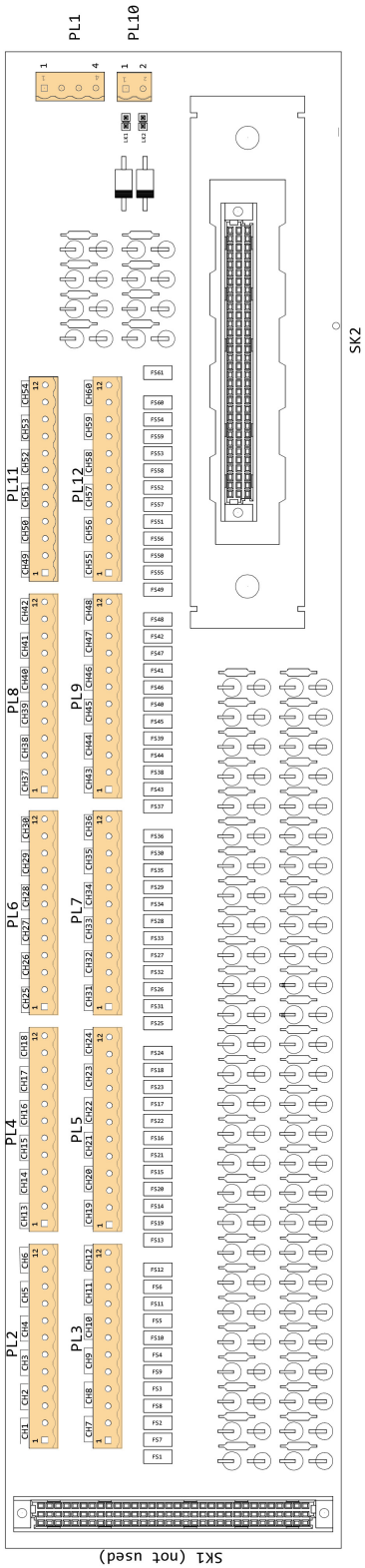

Figure 3 T8802 General Assembly

4.1. SK1 and SK2 Connections

The pin connections of SK1 and SK2 are identical and are detailed below:

Pin	Row		
	A	B	C
1			
2	Not used	Not used	Not used
3	CH_0_ABC	CH_14_AB	CH_28_BC
4	CH_0_ABC	CH_54_C	CH_48_A
5	CH_1_AB	CH_15_AB	CH_29_BC
6	CH_41_C	CH_55_C	CH_49_A
7	CH_2_AB	CH_16_AB	CH_30_BC
8	CN_42_C	CH_56_C	CH_50_A
9	0V	0V	0V
10	CH_3_AB	CH_17_AB	CH_31_BC
11	CH_43_C	CH_57_C	CH_51_A
12	CH_4_AB	CH_18_AB	CH_32_BC
13	CH_44_C	CH_58_C	CH_52_A
14	CH_5_AB	CH_19_AB	CH_33_BC
15	CH_45_C	CH_59_C	CH_53_A
16	CH_6_AB	CH_20_AB	CH_34_BC
17	CH_46_C	CH_60_C	CH_54_A
18	CH_7_AB	CH_21_BC	CH_35_BC
19	CH_47_C	CH_41_A	CH_55_A
20	0V	0V	0V

Pin	Row		
	A	B	C
21	CH_8-AB	CH_22_BC	CH_36_BC
22	CH_48_C	CH_42_A	CH_56_A
23	CH_9_AB	CH_23_BC	CH_37_BC
24	CH_49_C	CH_43_A	CH_57_A
25	CH_10_AB	CH_24_BC	CH_38_BC
26	CH_50_C	CH_44_A	CH_58_A
27	CH_11_AB	CH_25_BC	CH_39_BC
28	CH_51_C	CH_45_A	CH_59_A
29	CH_12_AB	CH_26_BC	CH_40_BC
30	CH_52_C	CH_46_A	CH_60_A
31	CH_13_AB	CH_27_BC	CH_61_ABC
32	CH_53_C	CH_47_A	CH_61_ABC

Table 1 SK1 and SK2 Connections

Note: The pin assignments detailed above indicate the mapping of the input channel to the 'slice' on the Trusted Dual 24 Vdc Digital Input Module, e.g. channel 39 (pin 27, row C is mapped to 'slices' B and C.

4.2. PL1 Connections

Pin	Service
1	24 V-1 V
2	0V
3	0V
4	24 V-2 V

Table 2 PL1 Connections

4.3. PL2 Connections

Pin	Service
1	Channel 1 24 Vdc to field device
2	Channel 1 return signal from field device
3	Channel 2 24 Vdc to field device
4	Channel 2 return signal from field device
5	Channel 3 24 Vdc to field device
6	Channel 3 return signal from field device
7	Channel 4 24 Vdc to field device
8	Channel 4 return signal from field device
9	Channel 5 24 Vdc to field device
10	Channel 5 return signal from field device
11	Channel 6 24 Vdc to field device
12	Channel 6 return signal from field device

Table 3 PL2 Connections

4.4. PL3 Connections

Pin	Service

1	Channel 7 24 Vdc to field device
2	Channel 7 return signal from field device
3	Channel 8 24 Vdc to field device
4	Channel 8 return signal from field device
5	Channel 9 24 Vdc to field device
6	Channel 9 return signal from field device
7	Channel 10 24 Vdc to field device
8	Channel 10 return signal from field device
9	Channel 11 24 Vdc to field device
10	Channel 11 return signal from field device
11	Channel 12 24 Vdc to field device
12	Channel 12 return signal from field device

Table 4 PL3 Connections

4.5. PL4 Connections

Pin	Service
1	Channel 13 24 Vdc to field device
2	Channel 13 return signal from field device
3	Channel 14 24 Vdc to field device
4	Channel 14 return signal from field device
5	Channel 15 24 Vdc to field device
6	Channel 15 return signal from field device
7	Channel 16 2 4Vdc to field device
8	Channel 16 return signal from field device
9	Channel 17 24 Vdc to field device
10	Channel 17 return signal from field device

Pin	Service
11	Channel 18 24 Vdc to field device
12	Channel 18 return signal from field device

Table 5 PL4 Connections

4.6. PL5 Connections

Pin	Service
1	Channel 19 24 Vdc to field device
2	Channel 19 return signal from field device
3	Channel 20 24 Vdc to field device
4	Channel 20 return signal from field device
5	Channel 21 24 Vdc to field device
6	Channel 21 return signal from field device
7	Channel 22 24 Vdc to field device
8	Channel 22 return signal from field device
9	Channel 23 24 Vdc to field device
10	Channel 23 return signal from field device
11	Channel 24 24 Vdc to field device
12	Channel 24 return signal from field device

Table 6 PL5 Connections

4.7. PL6 Connections

Pin	Service
1	Channel 25 24 Vdc to field device
2	Channel 25 return signal from field device
3	Channel 26 24 Vdc to field device

4	Channel 26 return signal from field device
5	Channel 27 24 Vdc to field device
6	Channel 27 return signal from field device
7	Channel 28 24 Vdc to field device
8	Channel 28 return signal from field device
9	Channel 29 24 Vdc to field device
10	Channel 29 return signal from field device
11	Channel 30 24 Vdc to field device
12	Channel 30 return signal from field device

Table 7 PL6 Connections

4.8. PL7 Connections

Pin	Service
1	Channel 31 24 Vdc to field device
2	Channel 31 return signal from field device
3	Channel 32 24 Vdc to field device
4	Channel 32 return signal from field device
5	Channel 33 24 Vdc to field device
6	Channel 33 return signal from field device
7	Channel 3424 Vdc to field device
8	Channel 34 return signal from field device
9	Channel 35 24 Vdc to field device
10	Channel 35 return signal from field device
11	Channel 36 24 Vdc to field device
12	Channel 36 return signal from field device

Table 8 PL7 Connections

4.9. PL8 Connections

Pin	Service
1	Channel 37 24 Vdc to field device
2	Channel 37 return signal from field device
3	Channel 38 24 Vdc to field device
4	Channel 38 return signal from field device
5	Channel 39 24 Vdc to field device
6	Channel 39 return signal from field device
7	Channel 40 24 Vdc to field device
8	Channel 40 return signal from field device
9	Channel 41 24 Vdc to field device
10	Channel 41 return signal from field device
11	Channel 42 24 Vdc to field device
12	Channel 42 return signal from field device

Table 9 PL8 Connections

4.10. PL9 Connections

Pin	Service
1	Channel 43 24 Vdc to field device
2	Channel 43 return signal from field device
3	Channel 44 24 Vdc to field device
4	Channel 44 return signal from field device
5	Channel 45 24 Vdc to field device
6	Channel 45 return signal from field device
7	Channel 46 24 Vdc to field device

8	Channel 46 return signal from field device
9	Channel 47 24 Vdc to field device
10	Channel 47 return signal from field device
11	Channel 48 24 Vdc to field device
12	Channel 48 return signal from field device

Table 10 PL9 Connections

4.11. PL10 Connections

Pin	Service
1	Channel 0
2	Channels 61

Table 11 PL10 Connections

4.12. PL11 Connections

Pin	Service
1	Channel 49 24 Vdc to field device
2	Channel 49 return signal from field device
3	Channel 50 24 Vdc to field device
4	Channel 50 return signal from field device
5	Channel 51 24 Vdc to field device
6	Channel 51 return signal from field device
7	Channel 52 24 Vdc to field device
8	Channel 52 return signal from field device
9	Channel 53 24 Vdc to field device
10	Channel 53 return signal from field device
11	Channel 54 24 Vdc to field device

Pin	Service
12	Channel 54 return signal from field device

Table 12 PL11 Connections

4.13. PL12 Connections

Pin	Service
1	Channel 55 24 Vdc to field device
2	Channel 55 return signal from field device
3	Channel 56 24 Vdc to field device
4	Channel 56 return signal from field device
5	Channel 57 24 Vdc to field device
6	Channel 57 return signal from field device
7	Channel 58 24 Vdc to field device
8	Channel 58 return signal from field device
9	Channel 59 24 Vdc to field device
10	Channel 59 return signal from field device
11	Channel 60 24 Vdc to field device
12	Channel 60 return signal from field device

Table 13 PL12 Connections

5. Specifications

Voltage Range (Field Supply)	18 Vdc to 32 Vdc
Power Dissipation	0.2 W / channel; 12 W maximum total.
Isolation Field Common Field circuits to chassis ground (Slider clamp / DIN rail)	 50 V Reinforced (continuous) (1) 250 V Basic (fault) (2) [Type tested at 2436 Vdc for 60 s]. 50 V Reinforced (continuous) (1) 250 V Basic (fault) (2) [Type tested at 2436 Vdc for 60 s].
Fusing	61-off 50 mA
Maximum Current (Field Supply) Fused	3 A
Maximum Normal Operating Current (Field Supply)	6.4 mA / Channel; 380 mA total
Operating Temperature	0 °C to +60 °C(+32 °F to +140 °F)
Storage Temperature	-25 °C to +70 °C(-13 °F to +158 °F)
Relative Humidity – Operating and storage	10 % – 95 %, non-condensing
Environmental Specifications	Refer to Document ICSTT-TD003
Dimensions Height Width Depth (including mounting rail and connectors)	 110 mm (4.44 in) 455 mm (17.9 in) 68 mm (2.67 in)
Weight	762 g (1.68 lb)

Note 1) 50 Vrms Secondary circuit derived from Mains, OVC II up to 300V.
Note 2) 250 Vrms Mains circuit, OVC II up to 300V. Exposure to voltages at these levels shall be temporally constrained consistent with the system MTTR.