

Trusted 40 Channel Analogue or Digital Output FTA

Product Overview

The Trusted® 40 Channel Analogue Output or Digital Output Field Termination Assembly (FTA) is designed to act as the main interface between the Trusted Triple Modular Redundant (TMR) 24 Vdc Digital Output Module T8451, Trusted Triple Modular Redundant (TMR) 24/48 Vdc Digital Output Module T8461¹ or Trusted TMR Analogue Output Module T8480 and the field device.

Features:

- 40 output channels per FTA.
- Industry standard field device connections (2-wire).
- Standard DIN rail compatibility.
- Screw clamp terminals on both field and power.
- Simple installation and connection.
- 24 Vdc operation.
- SmartSlot connection for 'one to many' hot replacement of output modules.
- Five isolated groups of eight channels.
- On-board LED indication of field power supply.
- Field terminal wire size allowance 12 AWG to 28 AWG.

¹ The T8461 module is not approved for direct connection to hazardous areas and should be used in conjunction with Intrinsic Safety Barrier devices.

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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.

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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.

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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.

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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
8	Sep 05	Format
9	Apr 10	TBF1 changed to TB2
10	Apr 12	T8850 layout changes Fig 1
11	Nov 14	Fig 1 updated to show SK1 fitted.
12	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.
13	May 17	Voltage Range details in Specifications section amended. Note regarding voltage range and use of positive connections added to Specifications section.
14	May 18	Specification table, GA, connection diagram update.
15	Jan 19	Added footnote on T8461 module in Product Overview. Updated header and footer to display Rockwell Automation publication number. Added trademarks statement.

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1. Description

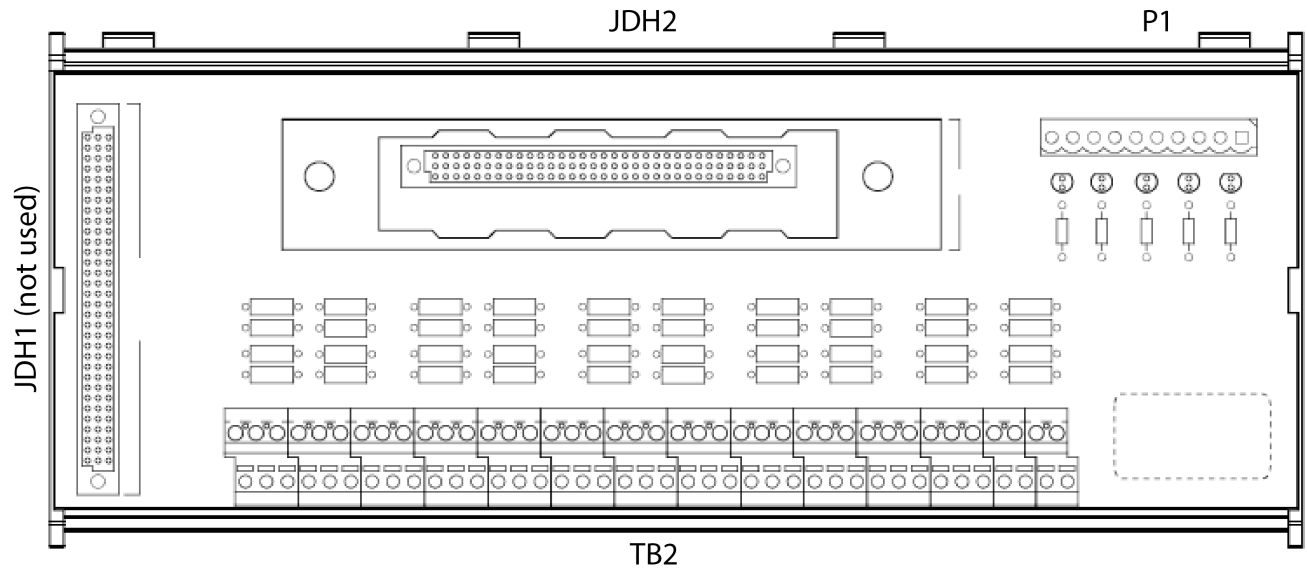


Figure 1 T8850 Layout

The Trusted 40 Channel Analogue Output or Digital Output FTA T8850 provides termination for a maximum of 40 output field loops. The 40 channels are arranged in five groups each comprising eight identical channels.

Figure 2 below shows the configuration of two channels within a group.

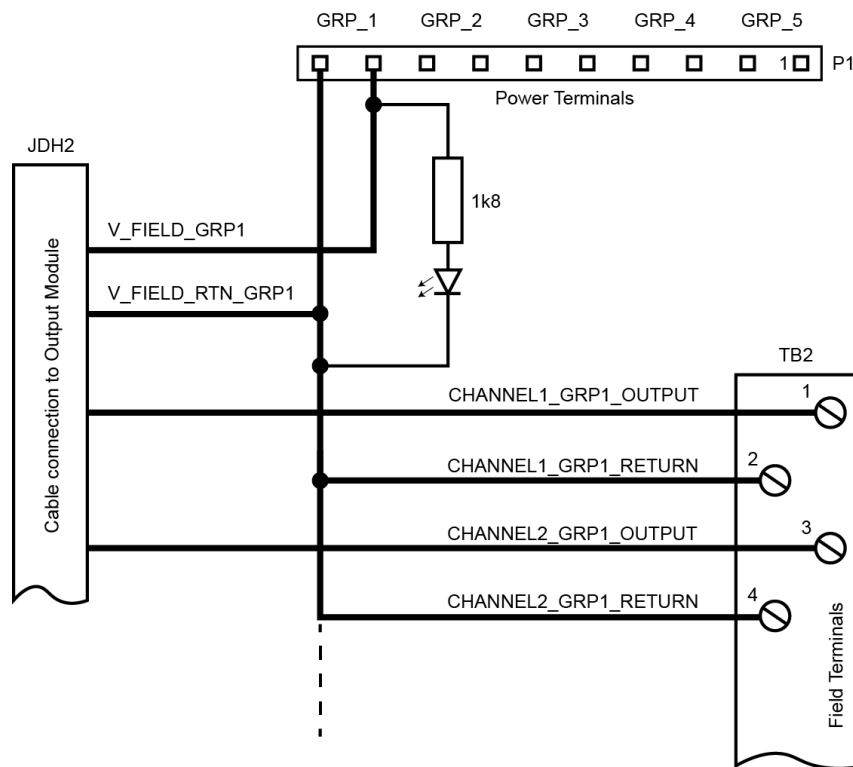


Figure 2 - Two Channel Schematic

Indication of the presence of the field power supply is provided by a green LED (one for each power group).

The signal to the field device is routed through the FTA from the output module.

The cable linking the 40 channels on the output module to the FTA is terminated at the 96-way socket JDH2. SmartSlot (Version 1) signals from the module are also connected to JDH1. The dc field power supplies can be connected to the FTA via a 10-way terminal block P1. The output signals to the field (40-off) are connected by 2-wire arrangements terminated on the dual height terminal blocks TB2.

2. Installation

Trusted 40 Channel Analogue Output or Digital Output FTA T8850 is designed to be mounted on either of the TS32 or TS35 DIN rails in the horizontal or vertical positions as required.

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3. Associated Cable Selection

Refer to the product descriptions detailed below:

Publication [ICSTT-RM311](#) (PD-TC200) Trusted I/O Companion Slot Cables

Publication [ICSTT-RM313](#) (PD-TC500) Trusted I/O SmartSlot Cables

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4. Assembly Pinout Connections

4.1. P1 Connections

Pin	Service
1	V_FIELD_GRP5
2	V_FIELD_RTN_GRP5
3	V_FIELD_GRP4
4	V_FIELD_RTN_GRP4
5	V_FIELD_GRP3
6	V_FIELD_RTN_GRP3
7	V_FIELD_GRP2
8	V_FIELD_RTN_GRP2
9	V_FIELD_GRP1
10	V_FIELD_RTN_GRP1

Table 1 - P1 Connections

4.2. TB2 (Field Terminals)

Pin	Service	Pin	Service
1	Chan 1 Group 1 Output	2	Chan 1 Group 1 Return
3	Chan 2 Group 1 Output	4	Chan 2 Group 1 Return
5	Chan 3 Group 1 Output	6	Chan 3 Group 1 Return
7	Chan 4 Group 1 Output	8	Chan 4 Group 1 Return
9	Chan 5 Group 1 Output	10	Chan 5 Group 1 Return
11	Chan 6 Group 1 Output	12	Chan 6 Group 1 Return
13	Chan 7 Group 1 Output	14	Chan 7 Group 1 Return

Pin	Service	Pin	Service
15	Chan 8 Group 1 Output	16	Chan 8 Group 1 Return
17	Chan 9 Group 2 Output	18	Chan 9 Group 2 Return
19	Chan 10 Group 2 Output	20	Chan 10 Group 2 Return
21	Chan 11 Group 2 Output	22	Chan 11 Group 2 Return
23	Chan 12 Group 2 Output	24	Chan 12 Group 2 Return
25	Chan 13 Group 2 Output	26	Chan 13 Group 2 Return
27	Chan 14 Group 2 Output	28	Chan 14 Group 2 Return
29	Chan 15 Group 2 Output	30	Chan 15 Group 2 Return
31	Chan 16 Group 2 Output	32	Chan 16 Group 2 Return
33	Chan 17 Group 3 Output	34	Chan 17 Group 3 Return
35	Chan 18 Group 3 Output	36	Chan 18 Group 3 Return
37	Chan 19 Group 3 Output	38	Chan 19 Group 3 Return
39	Chan 20 Group 3 Output	40	Chan 20 Group 3 Return
41	Chan 21 Group 3 Output	42	Chan 21 Group 3 Return
43	Chan 22 Group 3 Output	44	Chan 22 Group 3 Return
45	Chan 23 Group 3 Output	46	Chan 23 Group 3 Return
47	Chan 24 Group 3 Output	48	Chan 24 Group 3 Return
49	Chan 25 Group 4 Output	50	Chan 25 Group 4 Return
51	Chan 26 Group 4 Output	52	Chan 26 Group 4 Return
53	Chan 27 Group 4 Output	54	Chan 27 Group 4 Return
55	Chan 28 Group 4 Output	56	Chan 28 Group 4 Return
57	Chan 29 Group 4 Output	58	Chan 29 Group 4 Return
59	Chan 30 Group 4 Output	60	Chan 30 Group 4 Return
61	Chan 31 Group 4 Output	62	Chan 31 Group 4 Return

Pin	Service	Pin	Service
63	Chan 32 Group 4 Output	64	Chan 32 Group 4 Return
65	Chan 33 Group 5 Output	66	Chan 33 Group 5 Return
67	Chan 34 Group 5 Output	68	Chan 34 Group 5 Return
69	Chan 35 Group 5 Output	70	Chan 35 Group 5 Return
71	Chan 36 Group 5 Output	72	Chan 36 Group 5 Return
73	Chan 37 Group 5 Output	74	Chan 37 Group 5 Return
75	Chan 38 Group 5 Output	76	Chan 38 Group 5 Return
77	Chan 39 Group 5 Output	78	Chan 39 Group 5 Return
79	Chan 40 Group 5 Output	80	Chan 40 Group 5 Return

Table 2 TB2 (Field Terminals) Connections

4.3. JDH1 / JDH2

	C	B	A
1	Smart Slot Link C	Smart Slot Link B	Smart Slot Link A
2			
3	Chan 5	V_FIELD_GRP1	Chan 1
4	Chan 6	V_FIELD_GRP1	Chan 2
5	V_FIELD_RTN_GRP1	V_FIELD_GRP1	V_FIELD_RTN_GRP1
6	Chan 7	V_FIELD_GRP1	Chan 3
7	Chan 8	V_FIELD_GRP1	Chan 4
8			
9	Chan 13	V_FIELD_GRP2	Chan 9
10	Chan 14	V_FIELD_GRP2	Chan 10
11	V_FIELD_RTN_GRP2	V_FIELD_GRP2	V_FIELD_RTN_GRP2
12	Chan 15	V_FIELD_GRP2	Chan 11

	C	B	A
13	Chan 16	V_FIELD_GRP2	Chan 12
14			
15	Chan 21	V_FIELD_GRP3	Chan 17
16	Chan 22	V_FIELD_GRP3	Chan 18
17	V_FIELD_RTN_GRP3	V_FIELD_GRP3	V_FIELD_RTN_GRP3
18	Chan 23	V_FIELD_GRP3	Chan 19
19	Chan 24	V_FIELD_GRP3	Chan 20
20			
21	Chan 29	V_FIELD_GRP4	Chan 25
22	Chan 30	V_FIELD_GRP4	Chan 26
23	V_FIELD_RTN_GRP4	V_FIELD_GRP4	V_FIELD_RTN_GRP4
24	Chan 31	V_FIELD_GRP4	Chan 27
25	Chan 32	V_FIELD_GRP4	Chan 28
26			
27	Chan 37	V_FIELD_GRP5	Chan 33
28	Chan 38	V_FIELD_GRP5	Chan 34
29	V_FIELD_RTN_GRP5	V_FIELD_GRP5	V_FIELD_RTN_GRP5
30	Chan 39	V_FIELD_GRP5	Chan 35
31	Chan 40	V_FIELD_GRP5	Chan 36
32			

Table 3 JDH1/JDH2 Connections

5. Specifications

Field Supply	60 Vdc maximum via T8290 ⁽³⁾
Power Dissipation	0.5 W per power group
Isolation	
Power group to Power group	50 V Reinforced (continuous) ⁽¹⁾ [Type tested at 1411 Vdc for 60 s].
Field Common	50 V Reinforced (continuous) ⁽¹⁾ 250 V Basic (fault) ⁽²⁾ [Type tested at 2436 Vdc for 60 s].
Channel to Channel (within Power Group)	None
Fusing	None
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 Specification	Refer to Document ICSTT-TD003
Dimensions	
Height	110 mm (4.33 in)
Width	360 mm (14.17 in)
Depth	68 mm (2.67 in)
Weight	950 g (2.1 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.

Note 3) When using a field voltage range above 32 Vdc the field supply must not be connected to P1 (Pins 1, 3, 5, 7, 9). Output positive connections in these cases should only be via the output power distribution unit (OPDU), Trusted Part Number T8290.