ICS Triplex T8461C

Trusted TMR 24/48V DC Digital Output Module

ICS Triplex T8461C is the coated Trusted TMR digital output module for controlling 24/48 V DC field loads. T8461C provides 40 outputs with triplicated diagnostics and group fail-safe switching for safety-system applications.



Technical Specifications

Product Identity	
Manufacturer	Rockwell Automation, Inc.
Model	T8461C
Platform	Trusted TMR
Product type	24/48 V DC digital output module
Coating	Conformal coating, C suffix
Functional Configuration	
Outputs	40
Power groups	5 groups of 8
Performance & Power	
Field supply range	18–58 V DC
IMB supply	20–32 V DC
Continuous current per channel	0.75 A
Minimum load current	25 mA
Short-circuit protection	Electronic, latching
Environment	
Operating temperature	0–60 °C

Selected original manufacturer pages follow on pages 3–7.

Compatibility & Selection Guide

System compatibility. Configure T8461C through the Trusted IEC 61131 TOOLSET and System Configuration Manager. The processor applies the downloaded module definition, diagnostics and fail-safe states. Match the FTA, cable, field power groups and installed hardware/firmware before replacing a module.

Wiring & Installation Reference

Field-power and output checks

Outputs. 5 groups × 8 channels · Check each power group and return

Field supply. 18–58 V DC · Nominal 24/48 V DC loads

Unused output. 10 kΩ, 0.5 W to 0 V · Command off in the application

Mounting and handling

Inspect the module. Use static precautions. Do not install a damaged housing or bent connector pins, and do not open the housing.

Check cable and slot keys. Fit the correct field cable and check the module-specific key positions before inserting the module.

Seat and lock. Open the ejector tabs, insert without force, press the top and bottom fascia fully home, then close both ejectors until locked.

Installation precautions. Keep the field supply distinct from the IMB system supply. For T8461 cable keying, remove pins 1, 5 and 7; key both strips for companion-slot installations. Use static precautions, inspect pins and do not force insertion.

View terminal diagram (PDF) · PDF page 4 | View mounting diagram · PDF page 3

Manufacturer sources: ICSTT-RM451D-EN-P, March 2021 / Trusted System declaration, ICSTT-CT004L-EN-E; suffix C denotes conformal coating.

Installation

Module Insertion and Removal

Before installation, visually inspect the Module for damage. Ensure that the Module housing appears undamaged and inspect the I/O connector at the back of the Module for bent pins. If the Module appears damaged or any pins are bent, do not install the Module. Do not try to straighten bent pins. Return the Module for replacement.

Ensure that the Module is of the correct type.

Record the Module type, revision, and serial number of the Module before installation.

WARNING: The Module contains static sensitive parts. Static handling precautions must be observed. Specifically ensure that exposed connector pins are not touched. Under no circumstances should the Module housing be removed.

To install the Module:

1. Ensure that the field cable assembly is installed and correctly located.
2. If I/O Module keys are used, verify that all keys are installed in the correct positions and properly seated in their slots.
3. Release the ejector tabs on the Module using the release key. Ensure that the ejector tabs are fully open.
4. Holding the ejectors, carefully insert the Module into the intended slot.
5. Push the Module fully home by pressing on the top and bottom of the Module fascia.
6. Close the Module ejectors, ensuring that they click into their locked position.

The Module should mount into the chassis with a minimum of resistance. If the Module does not mount easily, do not force it. Remove the Module and check it for bent or damaged pins. If the pins have not been damaged, try reinstalling the Module.

Cable Selection

I/O cables suitable for use with the Trusted TMR 24/48V DC Digital Output Module are detailed in the following Product Descriptions.

- Trusted I/O Companion Slot Cables Product Description, publication ICSTT-RM311 (PD-TC200)
- Trusted I/O SmartSlot Cables Product Description, publication ICSTT-RM313 (PD-TC500)

The Product Descriptions that are detailed above also detail the types of Field Termination Assembly (FTA) or Versatile Field Termination Assembly (VFTA) which may be used with this type of Module.

Custom length multi-core FTA cables are 0.5 mm^2 with a resistance of 40 Ω/km. For example, a 50-m cable has 4-Ω loop impedance at 0.5 A, this equates to a 2V DC volt drop.

Termination

Unused outputs should be commanded off in the application and wired through a 10K 0.5-W resistor to zero volts.

Module Pin-out Connections

This table describes the module pin-out connections:

Table 2 Field Connector Pin-out

	C	B	A
1	SmartSlot Link C	SmartSlot Link B	SmartSlot Link A
2			
3	Chan 5 (+)	Pwr Group 1 (+)	Chan 1 (+)
4	Chan 6 (+)	Pwr Group 1 (+)	Chan 2 (+)
5	Pwr Group 1 Rtn	Pwr Group 1 (+)	Pwr Group 1 Rtn
6	Chan 7 (+)	Pwr Group 1 (+)	Chan 3 (+)
7	Chan 8 (+)	Pwr Group 1 (+)	Chan 4 (+)
8			
9	Chan 13 (+)	Pwr Group 2 (+)	Chan 9 (+)
10	Chan 14 (+)	Pwr Group 2 (+)	Chan 10 (+)
11	Pwr Group 2 Rtn	Pwr Group 2 (+)	Pwr Group 2 Rtn
12	Chan 15 (+)	Pwr Group 2 (+)	Chan 11 (+)
13	Chan 16 (+)	Pwr Group 2 (+)	Chan 12 (+)
14			
15	Chan 21 (+)	Pwr Group 3 (+)	Chan 17 (+)
16	Chan 22 (+)	Pwr Group 3 (+)	Chan 18 (+)
17	Pwr Group 3 Rtn	Pwr Group 3 (+)	Pwr Group 3 Rtn
18	Chan 23 (+)	Pwr Group 3 (+)	Chan 19 (+)
19	Chan 24 (+)	Pwr Group 3 (+)	Chan 20 (+)
20			
21	Chan 29 (+)	Pwr Group 4 (+)	Chan 25 (+)
22	Chan 30 (+)	Pwr Group 4 (+)	Chan 26 (+)
23	Pwr Group 4 Rtn	Pwr Group 4 (+)	Pwr Group 4 Rtn
24	Chan 31 (+)	Pwr Group 4 (+)	Chan 27 (+)
25	Chan 32 (+)	Pwr Group 4 (+)	Chan 28 (+)
26			
27	Chan 37 (+)	Pwr Group 5 (+)	Chan 33 (+)
28	Chan 38 (+)	Pwr Group 5 (+)	Chan 34 (+)
29	Pwr Group 5 Rtn	Pwr Group 5 (+)	Pwr Group 5 Rtn
30	Chan 39 (+)	Pwr Group 5 (+)	Chan 35 (+)
32	Chan 40 (+)	Pwr Group 5 (+)	Chan 36 (+)
32			

Trusted Module Polarisation/Keying

All Trusted Modules have been Keyed to help prevent insertion into the wrong position within a Chassis. The polarization comprises two parts; the Module, and the associated field cable.

Each Module type has been keyed during manufacture. The organization responsible for the integration of the Trusted System must key the cable by removing the keying pieces from the cable so that they correspond with the bungs that are fitted to the associated Module before fitting.

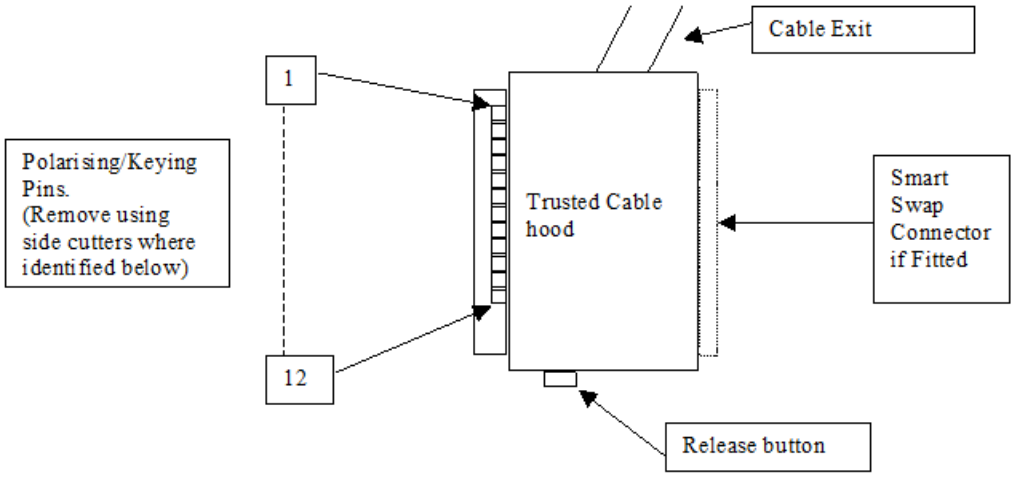


Figure 5: Module Polarization

For Cables with Companion slot installations, both keying strips must be polarized.

For this Module (T8461) remove keying pins 1, 5 and 7.

Specifications

This table lists the module specifications:

Item	Description
Backplane (IMB) Supply	
Voltage	20V DC to 32V DC
Power	26 W
Field Supply	
Voltage	18V DC to 58V DC
Maximum Current	30 A
Power Dissipation	
Field Supply at maximum power group current.	36 W
System Supply	26 W
Module Location	T8100, T8300 I/O Module Slot
Isolation	
Power Group to Power Group	50V Reinforced (continuous)[4] [Type tested at 1411V DC for 60 s].
Field Common	50V Reinforced (continuous)[5] 250V Basic (fault)[6] [Type tested at 2436V DC for 60 s].
Channel to Channel	None
Fusing	Not user serviceable
Number of Outputs	40
Number of Power Groups	5 Each Power Group comprises 8 channels
Output	
Output On State resistance	1.6 Ω
Maximum Current Rating (Continuous)	0.75 A per channel
Minimum On State Load Current	25 mA
Current Measurement Range	0 A to 1.35 A ±5% / ±5 mA[7]
Voltage Measurement Range	0V DC to +58V DC ±2V DC
Maximum Withstanding	-1V DC to +60V DC
Channel to Channel Crosstalk	< 1%
Maximum Load Capacitance	500 µF
Output Short Circuit Protection	Electronic latching
Sequence of Events	
Event Resolution (LSB)	1 ms
Time stamp Accuracy	±10 ms

[4] 50 Vrms Secondary circuit derived from Mains, OVC II up to 300V.

[5] 50 Vrms Secondary circuit derived from Mains, OVC II up to 300V.

[6] 250 Vrms Mains circuit, OVC II up to 300V. Exposure to voltages at these levels shall be temporally constrained consistent with the system MTTR.

[7] Tolerance is ±5 mA up to 0.9 A, thereafter is ±5%.

Item	Description
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%, noncondensing
Environmental Specifications	See Trusted 8000 Series International Safety and Environmental Approvals, publication ICSTT-TD003
Dimensions	
Height	266 mm (10.5 in)
Width	31 mm (1.2 in)
Depth	303 mm (12.0 in)
Weight	1.3 kg (2.7 lb)