Trusted I/O Companion Slot Cables

Product Overview

This document provides detailed information for the types of Trusted® input/output (I/O) Cables available within the Companion Slot group. These types of cable provide connection facilities between the Trusted analogue and digital I/O modules, and Trusted Field Termination Assemblies (FTAs) or Trusted Versatile Field Termination Assemblies (VFTAs) as required. Cables are also available with a 'flying lead' at one end to allow connection to conditioned terminals.

The types of Trusted I/O Companion Slot Cables currently available are listed in Table 1 on page 4.

The cables are manufactured to user's requirements; therefore length and type of cable insulation must be specified. Length must be specified to the nearest 0.5 m in the format xmx, e.g. 2m0 for a cable length of 2.0 m. This detail must be added to the end of the part number. Note that some cable lengths are preferred options and may be easier to obtain; please refer to Rockwell Automation for details. The type of cable insulation forms part of the cable part number and is denoted by 02 for Low Smoke Zero Halogen (LSZH) or 03 for UL Certified cable material. 02 is also flame retardant to IEC 60332-3 Cat A. When ordering cables, it is recommended that the user supplies the details as shown in Table 1.

The maximum recommended I/O cable length is 15 m. Cables longer than this may be specified if necessary but may suffer from voltage drop, offset, crosstalk and noise and will present materials handling problems.

Internal cables are designed for cables where they are terminated in adjacent enclosures. If the cable needs to leave the enclosure environment, the external cable has more protection. Note that the 'external' cables are not armoured and are not suitable for truly external use and must still be treated with care. These cables will need protection when drawn through a cable route, and should also not be pulled by the connector(s). They should enter cabinets through transit/compression blocks and cannot be glanded.

The Companion Slot cables described in this document allow hot-swap modules to be sited in adjacent slots using a double width chassis socket. For SmartSlot cables, allowing a remote slot to be assigned as necessary for a hot-swap, refer to Trusted I/O SmartSlot Cables, publication ICSTT-RM313 (PD-TC500).

1. Companion Slot Cable Types and Selection Guides

The types of Trusted I/O Companion Slot Cables currently available are listed in Table 1 below:

Cable Type	Description
TC-201-02-xmx	I/O Companion Slot, Internal, 40 Channel Input to FTA
TC-201-03-xmx	I/O Companion Slot, Internal, 40 Channel Input to FTA (UL)
TC-202-02-xmx	I/O Companion Slot, Internal, 40 Channel Input to Flying Lead / Free Wire
TC-202-03-xmx	I/O Companion Slot, Internal, 40 Channel Input to Flying Lead / Free Wire (UL)
TC-203-02-xmx	I/O Companion Slot, External, 40 Channel Input to FTA
TC-203-03-xmx	I/O Companion Slot, External, 40 Channel Input to FTA (UL)
TC-204-02-xmx	I/O Companion Slot, External, 40 Channel Input to Flying Lead / Free Wire
TC-204-03-xmx	I/O Companion Slot, External, 40 Channel Input to Flying Lead / Free Wire (UL)
TC-205-02-xmx	I/O Companion Slot, Internal, 40 Channel Output to FTA
TC-205-03-xmx	I/O Companion Slot, Internal, 40 Channel Output to FTA (UL)
TC-206-02-xmx	I/O Companion Slot, Internal, 40 Channel Output to Flying Lead / Free Wire
TC-206-03-xmx	I/O Companion Slot, Internal, 40 Channel Output to Flying Lead / Free Wire (UL)
TC-207-02-xmx	I/O Companion Slot, External, 40 Channel Output to FTA
TC-207-03-xmx	I/O Companion Slot, External, 40 Channel Output to FTA (UL)
TC-208-02-xmx	I/O Companion Slot, External, 40 Channel Output to Flying Lead / Free Wire
TC-208-03-xmx	I/O Companion Slot, External, 40 Channel Output to Flying Lead / Free Wire (UL)
TC-209-02-xmx	I/O Companion Slot, Internal, 40 Channel Output to VFTA
TC-209-03-xmx	I/O Companion Slot, Internal, 40 Channel Output to VFTA (UL)
TC-210-02-xmx	I/O Companion Slot, External, 40 Channel Output to VFTA
TC-210-03-xmx	I/O Companion Slot, External, 40 Channel Output to VFTA (UL)
TC-211-02-xmx	I/O Companion Slot, Internal, 40 Channel Input to VFTA

6. I/O Companion Slot Cable Type TC-205

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 5 below.

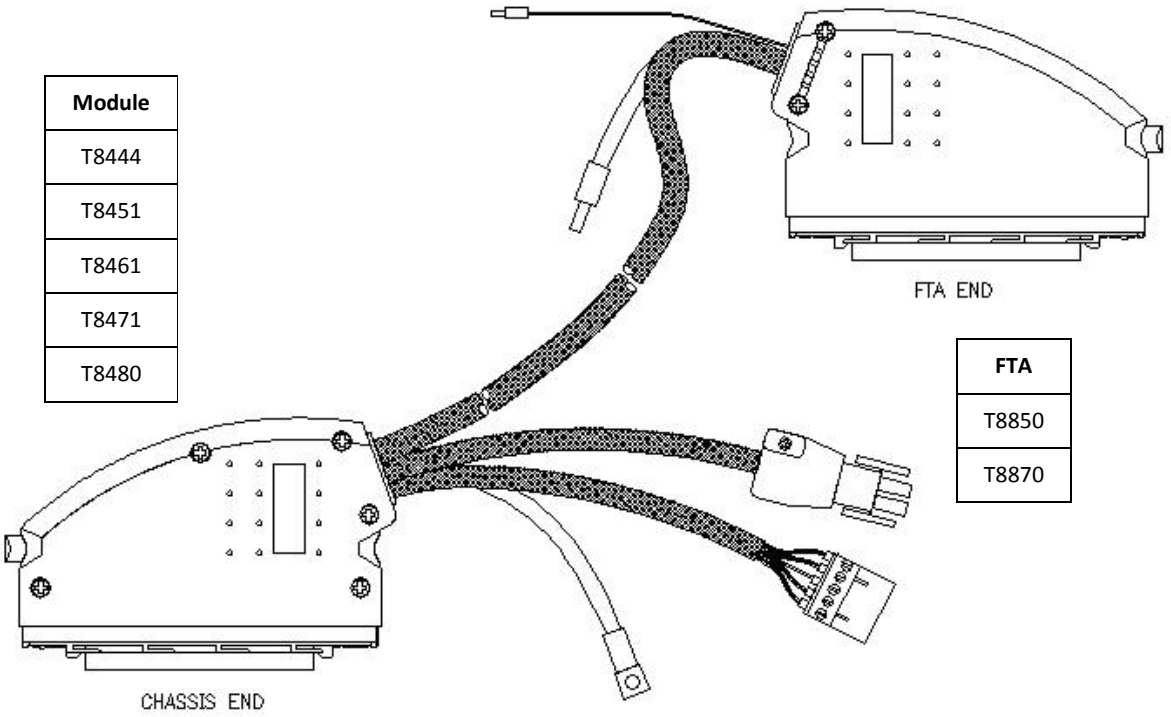


Figure 5 I/O Companion Slot Cable Type TC-205

This type of Trusted I/O Companion Slot Cable is designed for use with digital 24 V/120 Vdc or analogue output modules and is suitable for connecting output signals from the module to an internal FTA.

Three multi-core cables are used for this application. The chassis end of multi-core 1 is fitted with two 96-way type ‘C’ connectors housed in a double-width hood. The non-chassis end of multi-core 1 is fitted with a 96-way type ‘R’ connector housed in a single-width hood enabling connection to an FTA. The non-chassis end of multi-core 2 is fitted with a 5-way BLZF 3.5 series connector enabling the cable to be terminated at a T8290 Output Power Distribution Unit. This cable is used for field power return. The non-chassis end of multi-core 3 is fitted with a 6-way AMP plug used to connect power to the field from a T8290 or T8297 and is made up of five individual 2.5 mm wires contained within Rilgain sleeving.

The 0 V connection at the chassis end allows a module reference so that it can measure its output voltage, this must be connected to the field 0 Volts.

The FTA contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection between this field supply and the T8290 Output Power Distribution Unit (TB1 pins 1 and 2).

Multi-core 1 is stripped back 1.5 m at both ends. Multi-cores 1, 2 and 3 are shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated, or over sleeved as required to help prevent fraying.

At both the chassis and remote end, a sheathed braid allows the connector hood to be wired to safety earth. At the remote end, the multi-core screen drain is wired to a green wire to allow connection to screen earth.

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated Equipment Ratings table	4
Updated information	entire document

ATTENTION: Before installing, configuring, operating, or maintaining this product, read this document and the documents listed in the additional resources section for installing, configuring or operating equipment. Users should familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.
This equipment is certified for use only within the surrounding air temperature range of 0…60 °C (32…140 °F). The equipment must not be used outside of this range.
Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with applicable code of practice.
In case of malfunction or damage, make no attempt at repair. Return the module to the manufacturer for repair. Do not dismantle the module.
Use only a soft dry anti-static cloth to wipe down equipment. Do not use any cleaning agents

IMPORTANT Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability for actual use based upon the examples shown in this publication

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000m (6562ft) without de-rating. This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.
This equipment is supplied as open-type equipment for indoor use. It must be horizontally mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.
In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation.
Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wrist-strap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use

Removal and Insertion Under Power (RIUP)

WARNING: When you insert or remove the module while backplane power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is non-hazardous before proceeding. Repeated electric arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts can create electrical resistance that can affect module operation.

FTA connections

WARNING: The following non-latched FTA connections shall not to be used in hazardous location installations:
T8800: JDH1; T8801: JDH1; T8802: SK1; T8830: JDH1; T8831: JDH1; T8832: SK1; T8842: SK1; T8850: JDH1.
Models may be followed by suffix C

Programming / Maintenance Connections

WARNING: The Programming/Monitoring PS2 connection on the T8151B and T8111 front fascia shall not be used in hazardous location installations.
T8111 may be followed by suffix C. T8151B is equivalent to T8151C

North American Hazardous Location approval

The following information applies when operating this equipment in hazardous locations (note that it does not apply to the following modules: T8423, T8424, T8425, T8442, T8471, T8472, T8292, T8293, T8824, T8825, T8846, T8870, T8871, and T8891):

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A,B,C,D, Hazardous Locations and non-hazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.

Model[1]	Description	Supply Ratings	Input/Output Ratings	Fuse	Certification
T8891	Speed Output Field Terminal Assy (SOFTA)	N/A – supply from T8442	3A / 120Vac 2A / 30Vdc	-	Ordinary Locations
TC-001-0x-xMx TC-002-0x-xMx	Trusted TC000 Power Cables	60V/20A max	-	-	Ord/HazLoc/ATEX/IECEx
TC-003-0x-xMx TC-004-0x-xMx		60V/5A max			Ordinary Locations
TC-006-0x-xMx		60V/5 A max			Ord/HazLoc/ATEX/IECEx
TC-011-0x-xMx		60V/20 A max			Ord/HazLoc/ATEX/IECEx
TC-201-02-xMx	Trusted I/O Companion Slot Cables	60 V/2A max per channel	-	-	HazLoc/ATEX/IECEx
TC-201-03-xMx		150 Vdc			Ordinary Locations
TC-202-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-202-03-xMx		150 Vdc			Ordinary Locations
TC-203-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-203-03-xMx		150 Vdc			Ordinary Locations
TC-204-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-204-03-xMx		150 Vdc			Ordinary Locations
TC-205-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-205-03-xMx		150 Vdc			Ordinary Locations
TC-206-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-206-03-xMx		150 Vdc			Ordinary Locations
TC-207-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-207-03-xMx		150 Vdc			Ordinary Locations
TC-208-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-208-03-xMx		150 Vdc			Ordinary Locations
TC-209-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-209-03-xMx		150 Vdc			Ordinary Locations
TC-210-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-210-03-xMx		150 Vdc			Ordinary Locations
TC-211-0x-xMx		150Vdc			Ordinary Locations
TC-212-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-212-03-xMx		150 Vdc			Ordinary Locations
TC-215-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-215-03-xMx		150 Vdc			Ordinary Locations
TC-216-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-216-03-xMx		150 Vdc			Ordinary Locations
TC-218-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-218-03-xMx		150 Vdc			Ordinary Locations
TC-221-02-xMx		60 V/2A max per channel			HazLoc/ATEX/IECEx
TC-221-03-xMx		150 Vdc			Ordinary Locations
TC-223-0x-xMx		150Vdc			Ordinary Locations
TC-301-0x-xMx TC-302-0x-xMx	Trusted Communications Cables	60V/2A max per channel	-	-	Ord/HazLoc/ATEX/IECEx
TC-303-0x-xMx TC-304-01		60V/2A max per channel			Ordinary Locations
TC-305-01		60V/2A max per channel			Ord/HazLoc/ATEX/IECEx
TC-306-02		60V/2A max per channel			HazLoc/ATEX/IECEx
TC-306-03		150Vdc			Ordinary Locations
TC-308-02		60V/2A max per channel			HazLoc/ATEX/IECEx
TC-308-03		150Vdc			Ordinary Locations
TC-310-0x		150 Vac/2A per channel			Ordinary Locations
TC-311-0x TC-312-0x TC-313-0x TC-314-0x-xMx		60V/2A max per channel			Ord/HazLoc/ATEX/IECEx