

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).

This document describes cables for Triple Modular Redundant (TMR) modules (typically 40 channel). For dual modules (typically 60 channel), refer to Trusted Dual I/O SmartSlot Cables, publication [ICSTT-RM314](#) (PD-TC600) and Trusted Dual I/O Companion Slot Cables, publication [ICSTT-RM315](#) (PD-TC700).

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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All trademarks are acknowledged.

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 TechConnectSM Support Contract. For more information about TechConnect Support Contract Access Level and Features please 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 will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

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
10	Sep 05	Format TC221,TC222 added
11	Aug 06	Free wire idents
12	Dec 07	Flame retardance
13	Aug 08	8424 Cables
14	Apr 10	TC 211
15	Apr 16	Rebranded and reformatted
16	May 18	Updated IO & FTA References, cable drawings for TC209 through TC212. Not published.
17	Aug 18	Not published.
18	Aug 18	Updates to Table 1: Change TC-222-02 to TC-222-01, Change TC-223-0?-xMx to TC-223-02-xMx. Not published.
19	Feb 19	Removed information about cables that are no longer offered. Added trademarks statement. Updated to display Rockwell Automation publication numbers.
20	May 19	Added information about -03 suffix (UL) cables.
21	Jul 19	Updated for the T8425 release.

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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 VFITA
TC-209-03-xmx	I/O Companion Slot, Internal, 40 Channel Output to VFITA (UL)
TC-210-02-xmx	I/O Companion Slot, External, 40 Channel Output to VFITA
TC-210-03-xmx	I/O Companion Slot, External, 40 Channel Output to VFITA (UL)
TC-211-02-xmx	I/O Companion Slot, Internal, 40 Channel Input to VFITA

Cable Type	Description
TC-211-03-xmx	I/O Companion Slot, Internal, 40 Channel Input to VFTA (UL)
TC-212-02-xmx	I/O Companion Slot, External, 40 Channel Input to VFTA
TC-212-03-xmx	I/O Companion Slot, External, 40 Channel Input to VFTA (UL)
TC-215-02-xmx	I/O Companion Slot Internal 40 Channel Output to FTA (Integral Power)
TC-215-03-xmx	I/O Companion Slot Internal 40 Channel Output to FTA (Integral Power) (UL)
TC-216-02-xmx	I/O Companion Slot Internal 40 Channel Output to Flying Lead / Free Wire (Integral Power)
TC-216-03-xmx	I/O Companion Slot Internal 40 Channel Output to Flying Lead / Free Wire (Integral Power) (UL)
TC-218-02-xmx	I/O Companion Slot External 40 Channel Output to Flying Lead / Free Wire (Integral Power)
TC-218-03-xmx	I/O Companion Slot External 40 Channel Output to Flying Lead / Free Wire (Integral Power) (UL)
TC-221-02-xmx	I/O Companion Slot Internal 16 Channel AC Output to T8871 FTA (Integral Power)
TC-221-03-xmx	I/O Companion Slot Internal 16 Channel AC Output to T8871 FTA (Integral Power) (UL)
TC-223-02-xmx	I/O Companion Slot Internal 40 Channel AC Input from T8824 FTA
TC-223-03-xmx	I/O Companion Slot Internal 40 Channel AC Input from T8824 FTA (UL)

Table 1 Trusted I/O Companion Slot Cables

INTERNAL	SMARTSLOT	INPUT	FTA	TC-501-
			VFTA	TC-511-
			Flying Lead	TC-502-
		OUTPUT	FTA	TC-505-
			VFTA	TC-509-
			Flying Lead	TC-506-
	COMPANION SLOT	INPUT	FTA	TC-201-
			VFTA	TC-211-
			Flying Lead	TC-202-
		OUTPUT	FTA	TC-205-
			VFTA	TC-209-
			Flying Lead	TC-206-
EXTERNAL	SMARTSLOT	INPUT	FTA	TC-503-
			VFTA	TC-512-
			Flying Lead	TC-504-
		OUTPUT	FTA	TC-507-
			VFTA	TC-510-
			Flying Lead	TC-508-
COMPANION SLOT	INPUT	FTA	TC-203-	
		VFTA	TC-212-	
		Flying Lead	TC-204-	
	OUTPUT	FTA	TC-207-	
		VFTA	TC-210-	
		Flying Lead	TC-208-	
		Integral Power	Flying Lead	TC-218-

Table 2 TMR 40 Channel Standard Cable Selection Guide

INTERNAL	SMARTSLOT	INPUT	FTA	TC-601-
	COMPANION SLOT	INPUT	FTA	TC-701-

Table 3 Dual 60 Channel Standard Cable Selection Guide

The various types of I/O Companion Slot Cables, i.e. TC-201, TC-202 etc. are described in the following sections.

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2. I/O Companion Slot Cable Type TC-201

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 1 below.

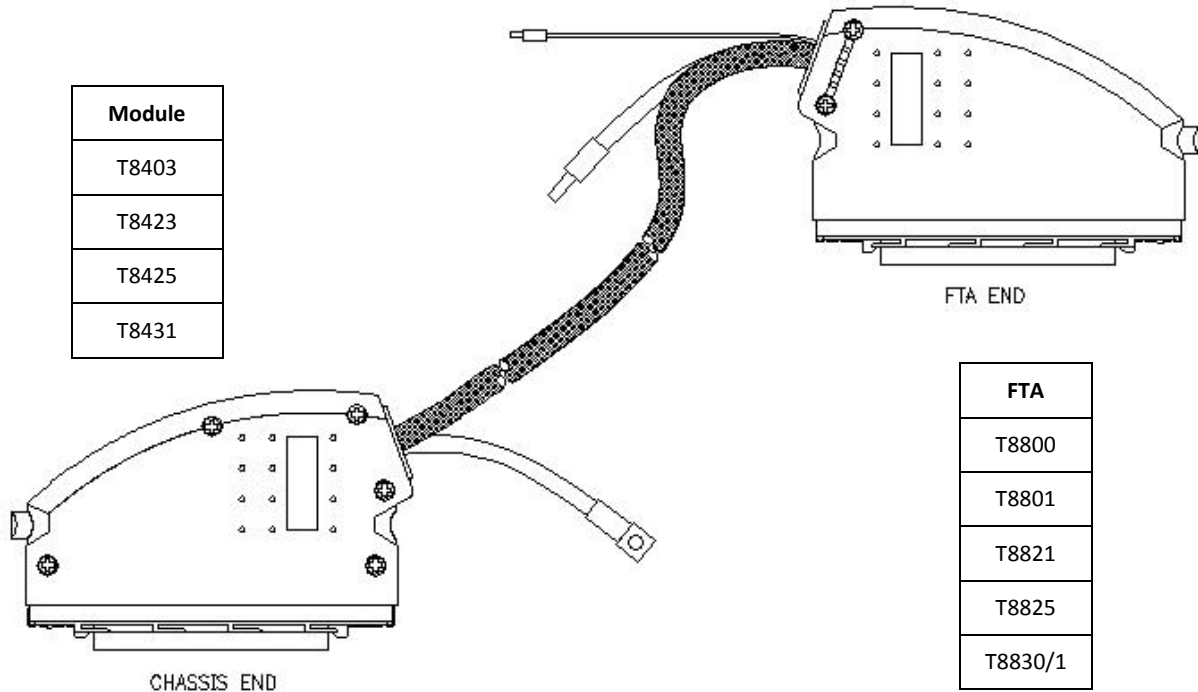


Figure 1 I/O Companion Slot Cable Type TC-201

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

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is fitted with a 96-way type 'R' connector housed in a single-width hood enabling the cable to be connected to an FTA.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeveing 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.

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3. I/O Companion Slot Cable Type TC-202

This type of cable, and the modules it is used with, is shown in Figure 2 below.

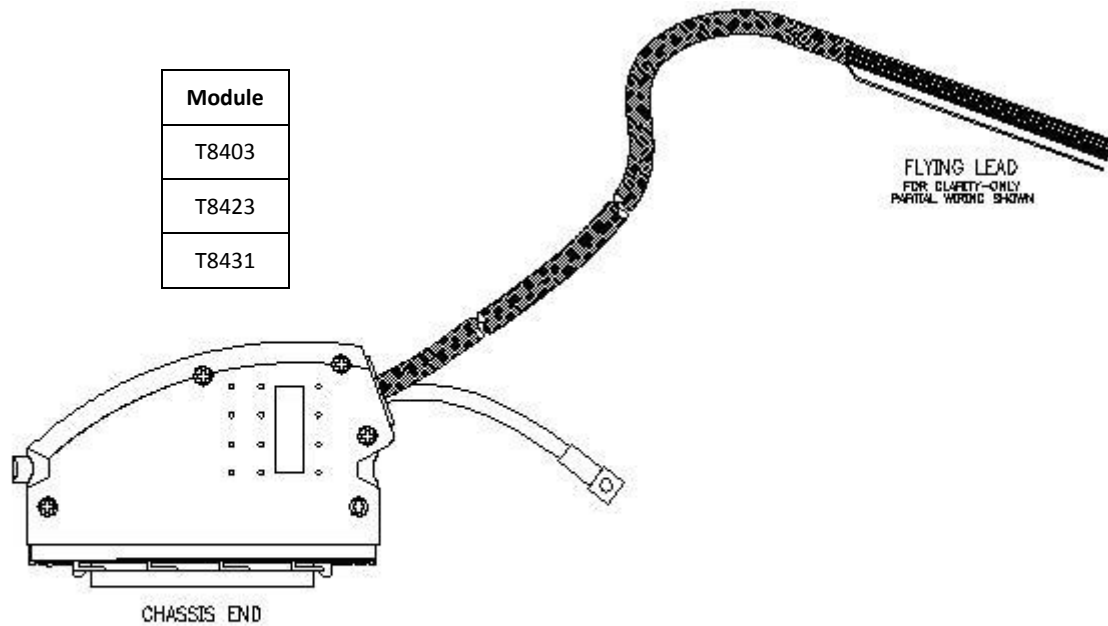


Figure 2 I/O Companion Slot Cable Type TC-202

This type of Trusted I/O Companion Slot Cable is designed for use with analogue or digital input modules and is suitable for connecting input signals from internal terminals to the module.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals.

The flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or 0 V for group reference terminations.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.

NOTE The TC-202 cable does not support the T8425 module because the T8425 module requires the attenuation found on the T8825 FTA for proper operation.

4. I/O Companion Slot Cable Type TC-203

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 3 below.

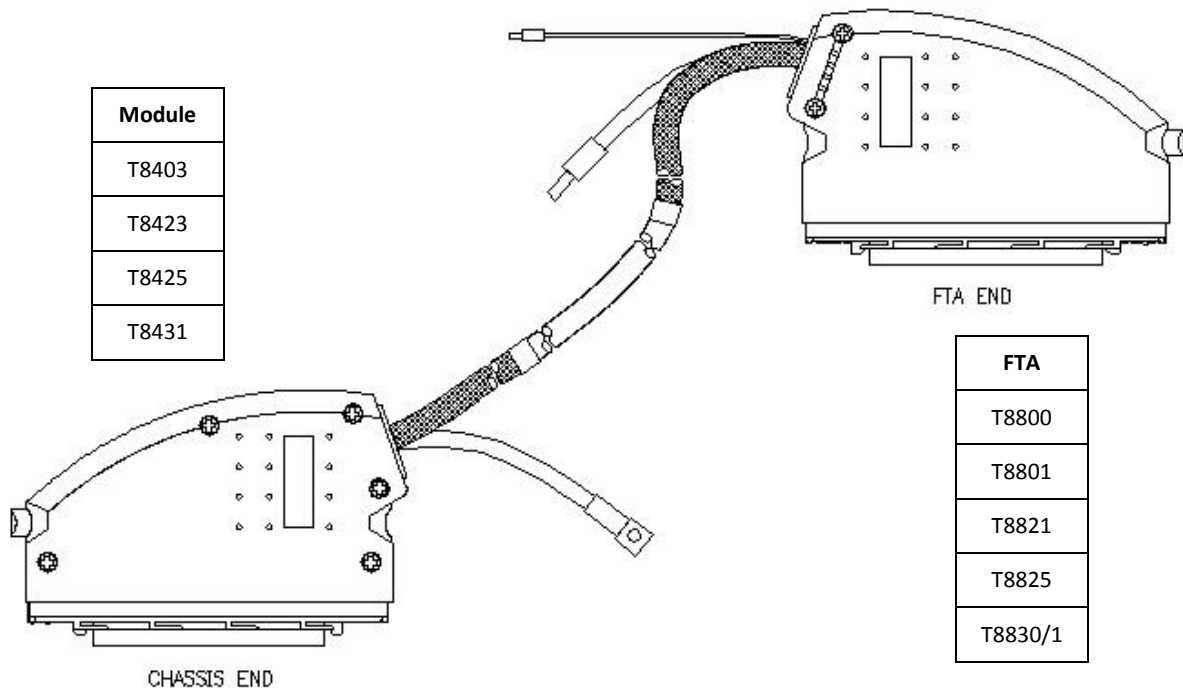


Figure 3 I/O Companion Slot Cable Type TC-203

This type of Trusted I/O Companion Slot Cable is designed for use with analogue or digital input modules and is suitable for connecting input signals from a remote FTA to the module.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is fitted with a 96-way type 'R' connector housed in a single-width hood enabling the cable to be connected to an FTA.

The multi-core cable is stripped back 2.0 m at the chassis end and 1.5 m at the FTA end. Both ends are then shrouded in nylon Rilgain sheathing. The Rilgain sheathing is cut with a heat gun to help prevent fraying. Joints between the Rilgain sheathing and the multi-core outer sheath are taped over with 25 mm PVC insulating tape and then covered with heatshrink sleeving.

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.

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5. I/O Companion Slot Cable Type TC-204

This type of cable, and the modules it is used with, is shown in Figure 4 below.

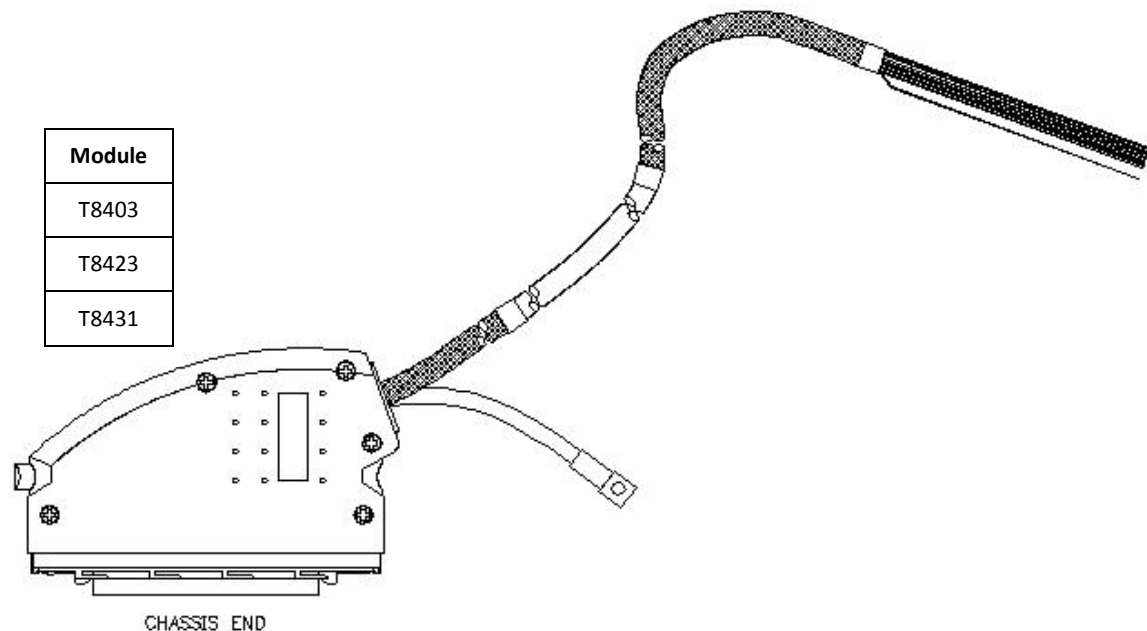


Figure 4 I/O Companion Slot Cable Type TC-204

This type of Trusted I/O Companion Slot Cable is designed for use with analogue or digital input modules and is suitable for connecting input signals from external terminals to the module.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals.

The flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or 0 V for group reference terminations.

The multi-core cable is stripped back 2.0 m at both ends, then shrouded in nylon Rilgain sheathing. The Rilgain sheathing is cut with a heat gun to help prevent fraying. Joints between the Rilgain sheathing and the multi-core outer sheath are taped over with 25 mm PVC insulating tape and then covered with heatshrink sleeving.

At the chassis 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.

NOTE The TC-204 cable does not support the T8425 module because the T8425 module requires the attenuation found on the T8825 FTA for proper operation.

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.

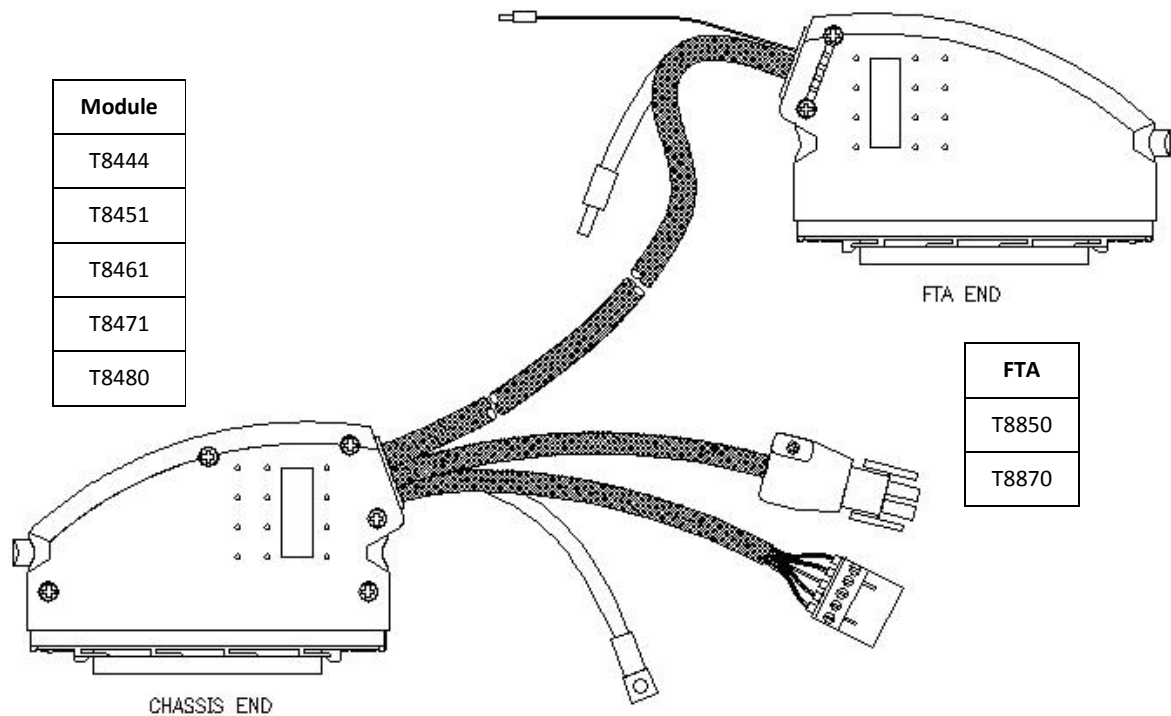


Figure 5 I/O Companion Slot Cable Type TC-205

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.

7. I/O Companion Slot Cable Type TC-206

This type of cable, and the modules it is used with, is shown in Figure 6 below.

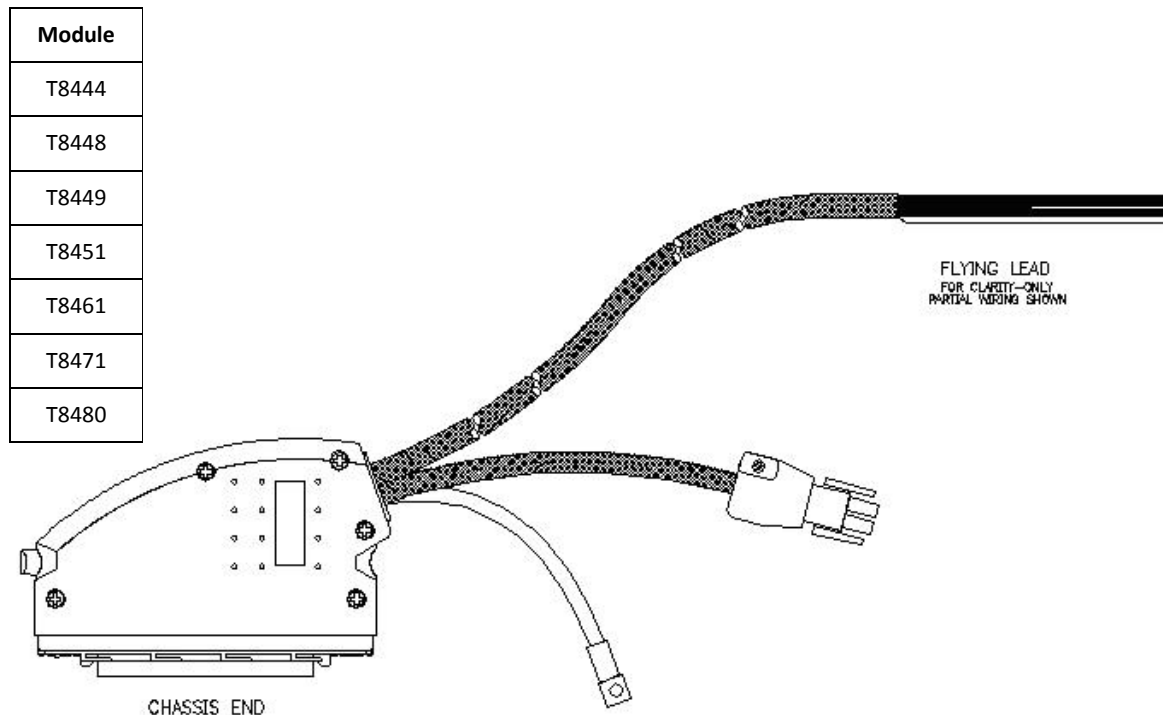


Figure 6 I/O Companion Slot Cable Type TC-206

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 internal terminals.

Two multi-core cables are required for this application. The chassis end of the multi-core 1 is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of multi-core 1 is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals. The non-chassis end of multi-core 2 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 flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or V FIELD RTNGRP1 to V FIELD RTNGRP5 for group reference terminations.

The 0 V connections at the flying leads end allows a module reference so that it can measure its output voltage, these must be connected to the field 0 Volts.

The flying lead multi-core contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

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

At the chassis 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.

8. I/O Companion Slot Cable Type TC-207

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 7 below.

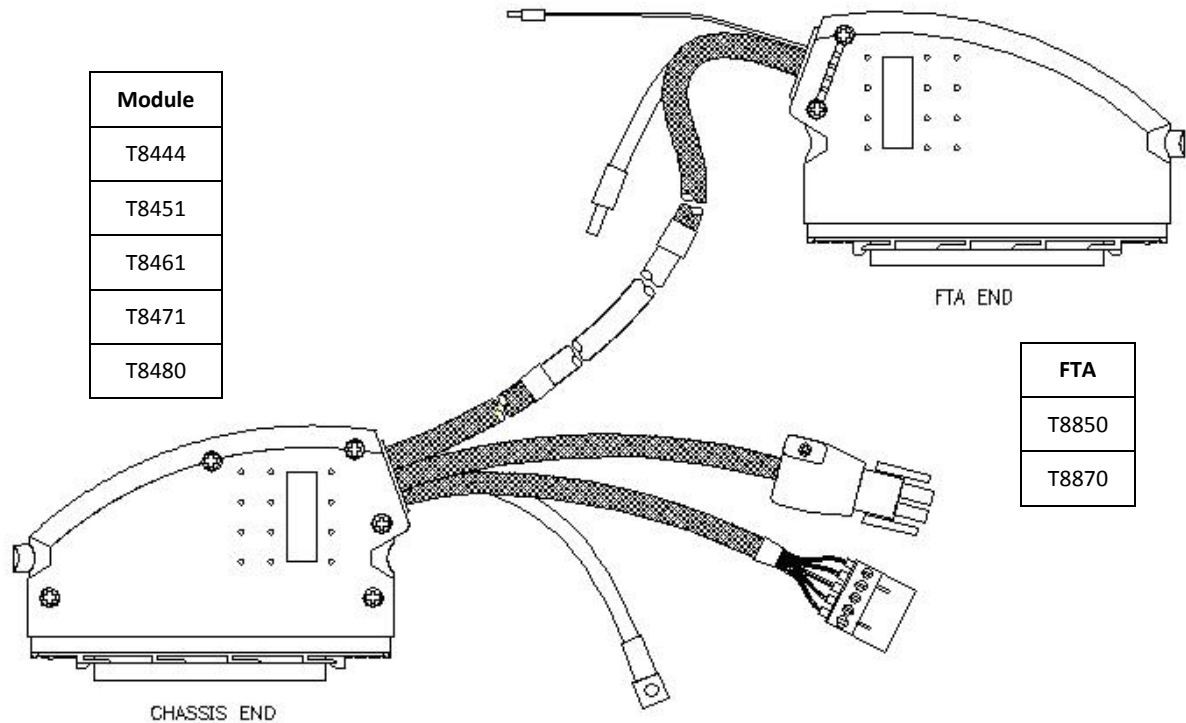


Figure 7 I/O Companion Slot Cable Type TC-207

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 external 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.

9. I/O Companion Slot Cable Type TC-208

This type of cable, and the modules it is used with, is shown in Figure 8 below.

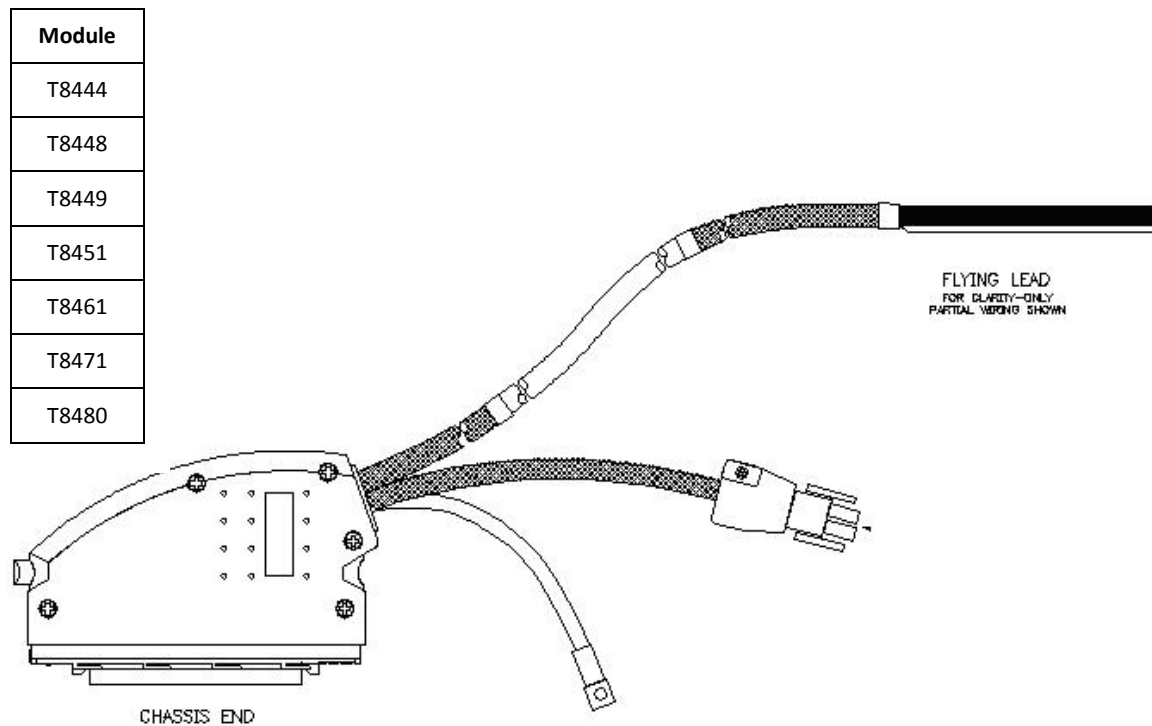


Figure 8 I/O Companion Slot Cable Type TC-208

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 external terminals.

Two multi-core cables are required for this application. The chassis end of the multi-core 1 is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of multi-core 1 is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals. The non-chassis end of multi-core 2 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 flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or V FIELD RTNGRP1 to V FIELD RTNGRP5 for group reference terminations.

The 0 V connections at the flying leads end allows a module reference so that it can measure its output voltage, these must be connected to the field 0 Volts.

The flying lead multi-core contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

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

At the chassis 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.

10. I/O Companion Slot Cable Type TC-209

This type of cable, and the modules/versatile field termination assemblies it is used with, is shown in Figure 9 below.

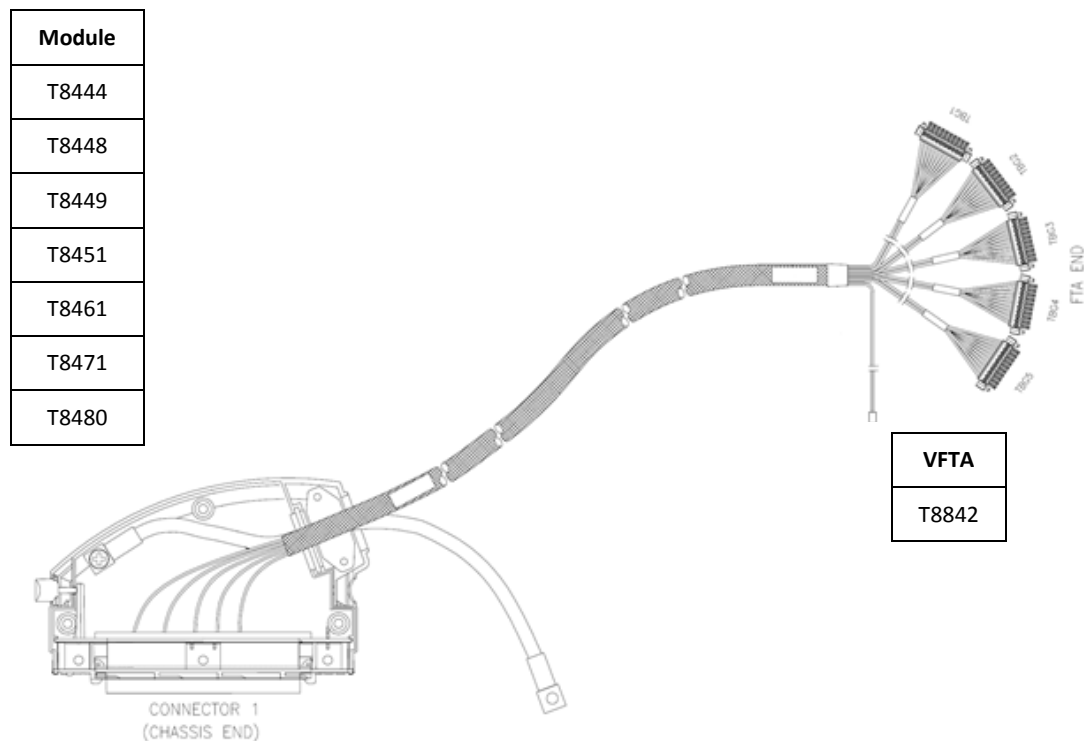


Figure 9 I/O Companion Slot Cable Type TC-209

This type of Trusted I/O Companion Slot Cable is designed for use with digital 24 V/120 Vdc and analogue output modules and is suitable for connecting output signals from the module to an internal VFTA. For the T8448 and T8449, it is recommended to use the T8842 VFTA. Trusted Versatile FTA, publication [ICSTT-RM298](#) (PD-T8842) describes the possible circuits that may be configured for this VFTA.

Two multi-core cables are required for this application. The chassis end of the multi-core 1 is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of multi-core 1 is fitted with one 7-way and five 10-way BLZF 3.5 series connectors enabling the cable to be terminated at a VFTA. The non-chassis end of multi-core 2 is fitted with a 6-way AMP plug used to connect power to the field from a T8290 or T8297. This cable is made up of five individual 2.5 mm wires contained within Rilgain sleeving. For analogue output or low current digital output modules using this cable, the T8297 is recommended.

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

The VFTA contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

Multi-core 1 is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. Multi-core 2 is shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.

11. I/O Companion Slot Cable Type TC-210

This type of cable, and the modules/versatile field termination assemblies it is used with, is shown in Figure 10 below.

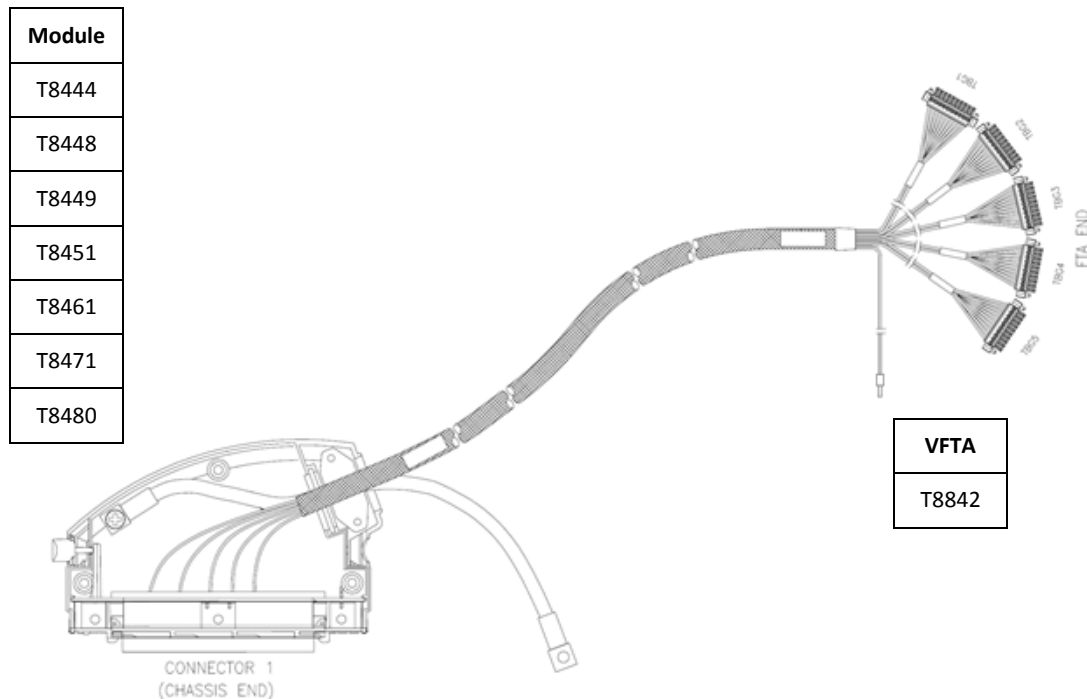


Figure 10 I/O Companion Slot Cable Type TC-210

This type of Trusted I/O Companion Slot Cable is designed for use with digital 24 V/120 Vdc and analogue output modules and is suitable for connecting output signals from the module to an external VFTA. For the T8448 and T8449, it is recommended to use the T8842 VFTA. Trusted Versatile FTA, publication [ICSTT-RM298](#) (PD-T8842) describes the possible circuits that may be configured for this VFTA.

Two multi-core cables are required for this application. The chassis end of the multi-core 1 is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of multi-core 1 is fitted with one 7-way and five 10-way BLZF 3.5 series connectors enabling the cable to be terminated at a VFTA. The non-chassis end of multi-core 2 is fitted with a 6-way AMP plug used to connect power to the field from a T8290 or T8297. This cable is made up of five individual 2.5 mm wires contained within Rilgain sleeving. For analogue output or low current digital output modules using this cable, the T8297 is recommended.

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

The VFTA contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

Multi-core 1 is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. Multi-core 2 is shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.

12. I/O Companion Slot Cable Type TC-211

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 11 below.

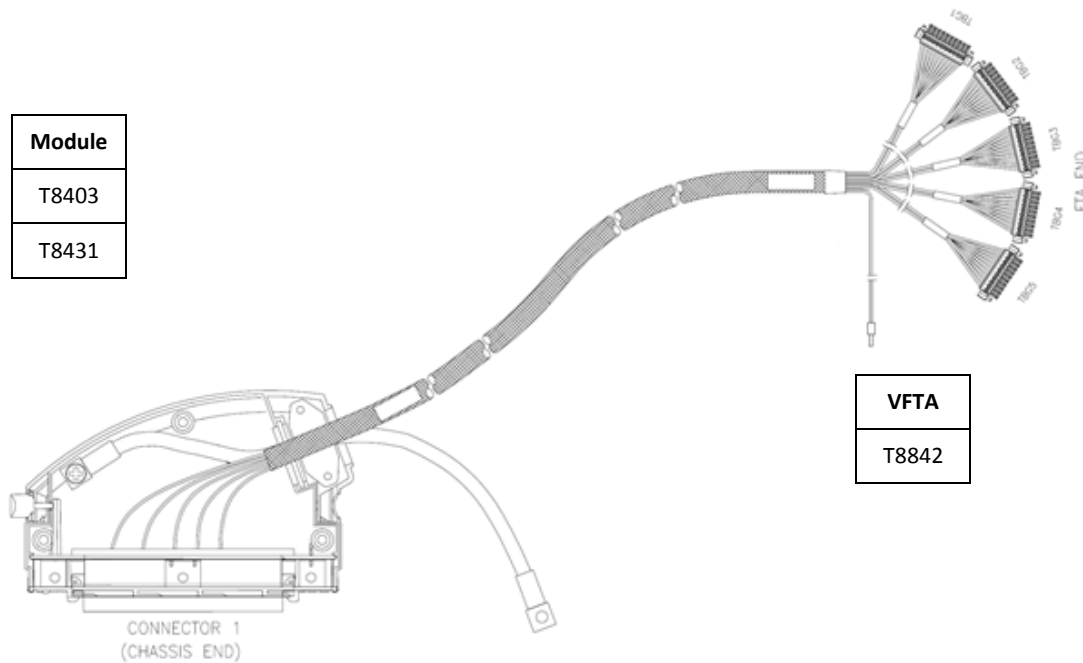


Figure 11 I/O Companion Slot Cable Type TC-211

This type of Trusted I/O Companion Slot Cable is designed for use with analogue or digital input modules and is suitable for connecting input signals from an internal VFTA to the module.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the multi-core is fitted with one 7-way and five 10-way BLZF 3.5 series connectors enabling the cable to be terminated at a VFTA.

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

The VFTA contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

The multi-core is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.

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13. I/O Companion Slot Cable Type TC-212

This type of cable, and the modules/versatile field termination assemblies it is used with, is shown in Figure 12 below.

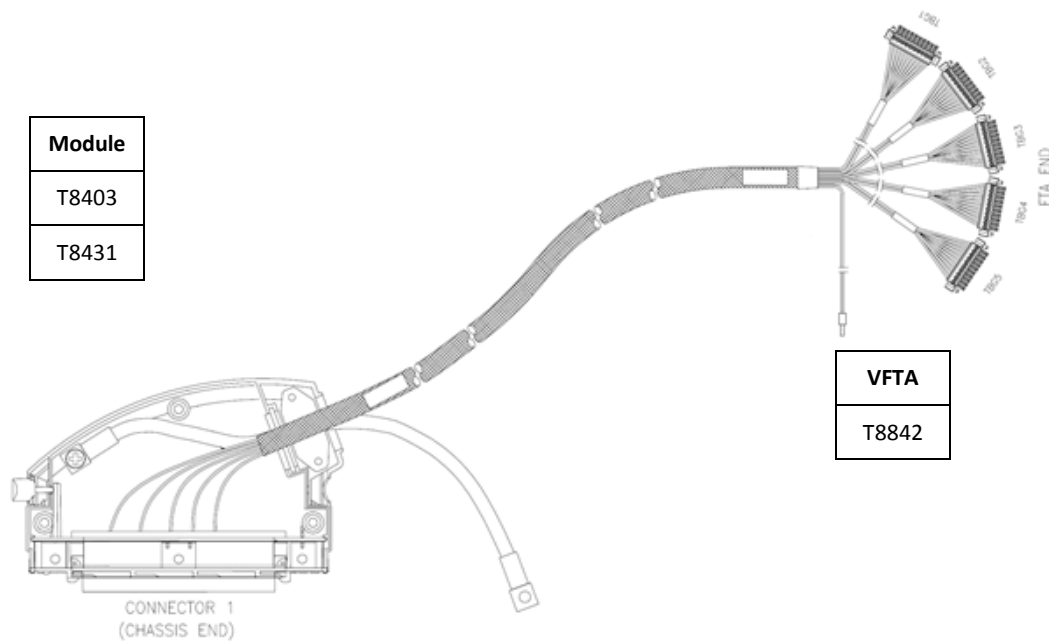


Figure 12 I/O Companion Slot Cable Type TC-212

This type of Trusted I/O Companion Slot Cable is designed for use with analogue or digital input modules and is suitable for connecting input signals from an external VFTA to the module.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the multi-core is fitted with one 7-way and five 10-way BLZF 3.5 series connectors enabling the cable to be terminated at a VFTA.

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

The VFTA contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

The multi-core is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.

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14. I/O Companion Slot Cable Type TC-215

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 13 below.

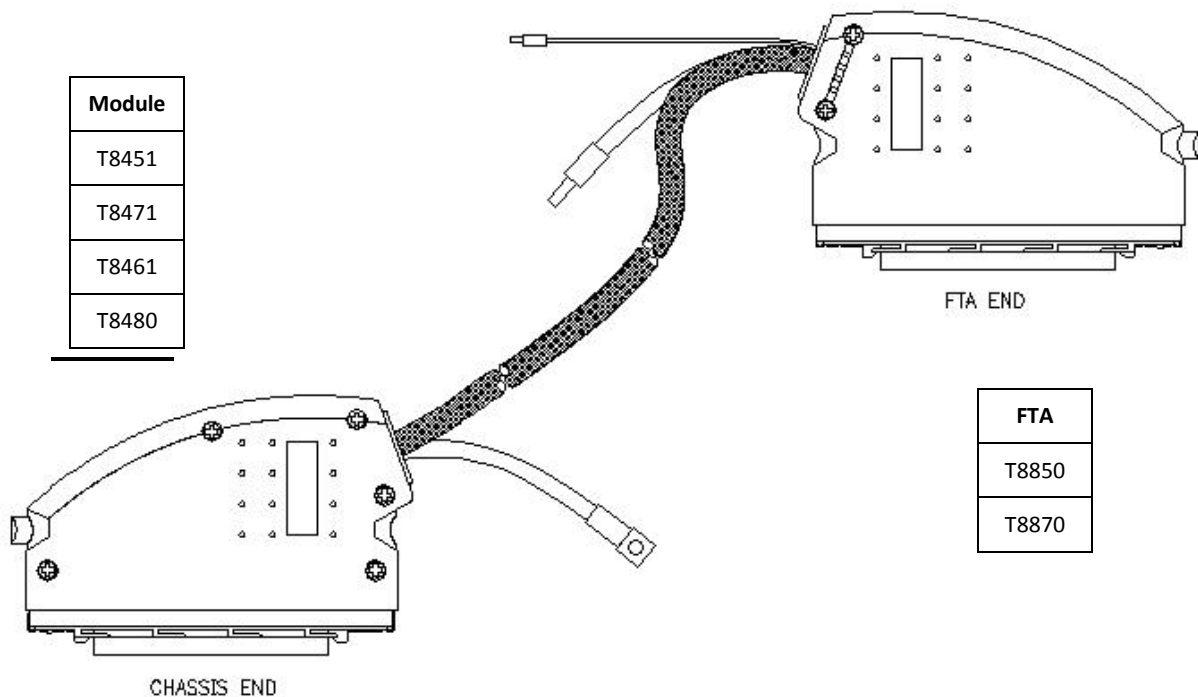


Figure 13 I/O Companion Slot Cable Type TC-215

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

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is fitted with a 96-way type 'R' connector housed in a single-width hood enabling the cable to be connected to an FTA.

Using this cable, the field power is connected at the FTA, which has indicators for each power group which are voltage sensitive. For this reason, the T8850 FTA should be used with the T8451 and the T8870 with the T8471.

The 0 V connection at the FTA 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 to this field supply.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving 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.

15. I/O Companion Slot Cable Type TC-216

This type of cable, and the modules it is used with, is shown in Figure 14 below.

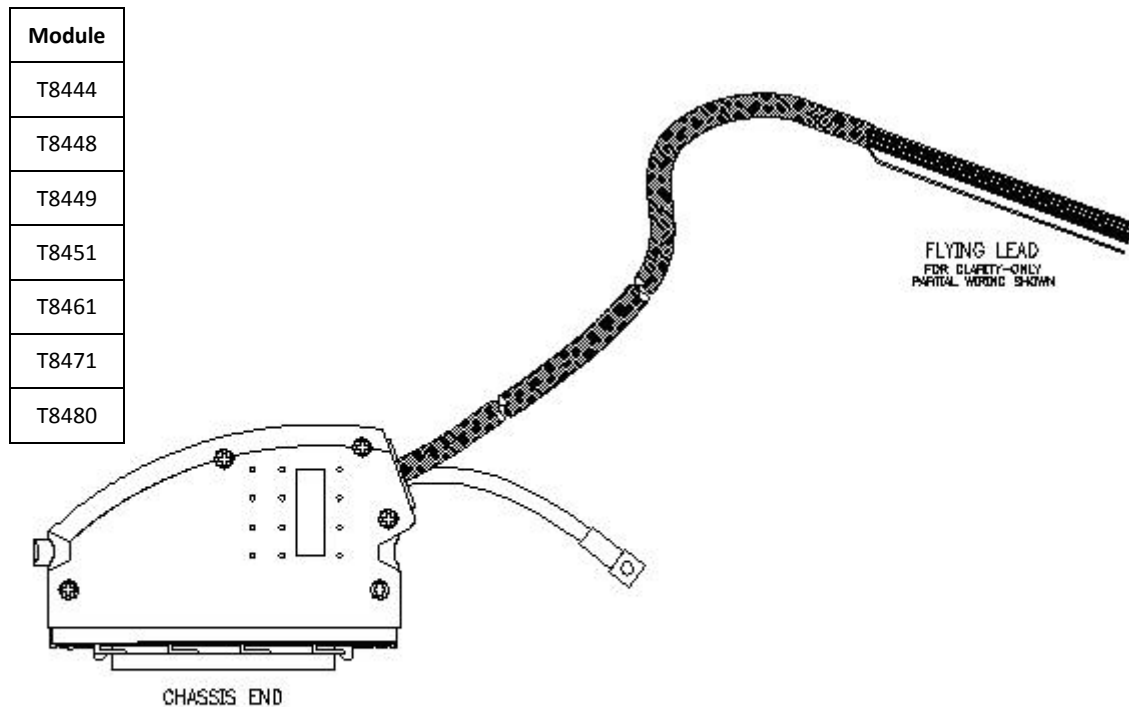


Figure 14 I/O Companion Slot Cable Type TC-216

This type of Trusted I/O Companion Slot Cable is designed for use with digital and analogue output modules and is suitable for connecting output signals from the module to internal terminals. Power connections are integral with this type of cable.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals.

The flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or V FIELD GRP1 to V FIELD GRP5 for group field supply terminations or V FIELD RTNGRP1 to V FIELD RTNGRP5 for group reference terminations.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

The 0 V connections at the flying lead ends allows a module reference so that it can measure its output voltage, this must be connected to the field 0 Volts.

The flying lead multi-core contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

At the chassis 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.

16. I/O Companion Slot Cable Type TC-218

This type of cable, and the modules it is used with, is shown in Figure 15 below.

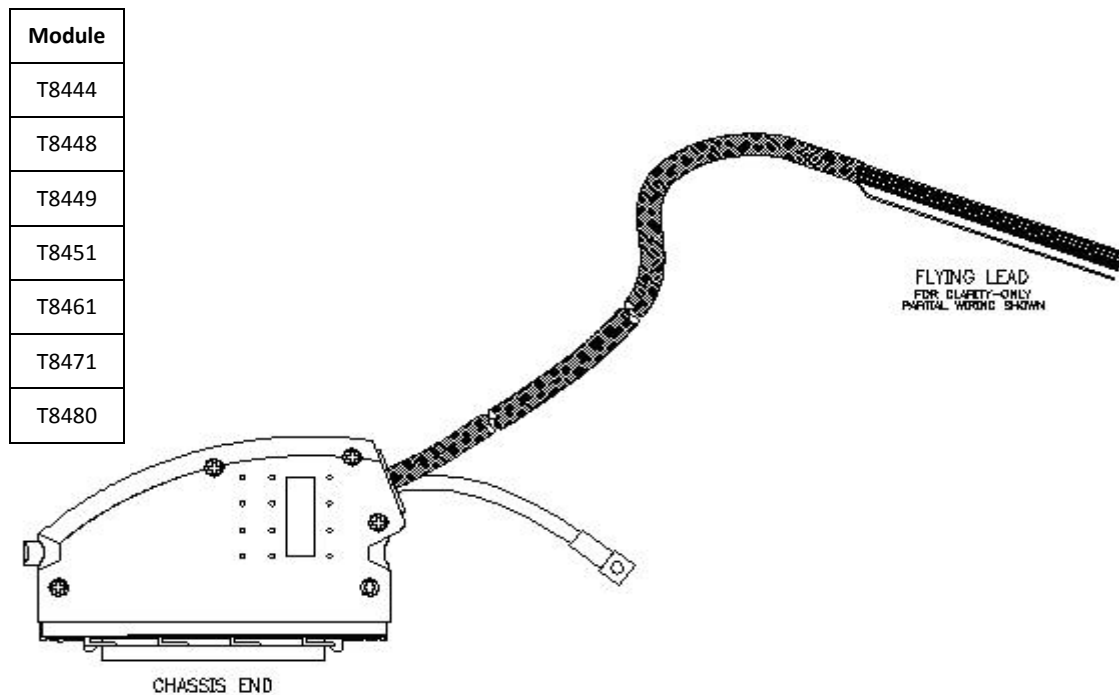


Figure 15 I/O Companion Slot Cable Type TC-218

This type of Trusted I/O Companion Slot Cable is designed for use with digital and analogue output modules and is suitable for connecting output signals from the module to external terminals. Power connections are integral with this type of cable.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the cable is left as a 'flying lead' enabling the cable to be terminated as required, e.g. connected to conditioned field terminals.

The flying leads are sleeved with identity ferrules marked CH1, CH2, CH3 etc. for channel terminations or V FIELD GRP1 to V FIELD GRP5 for group field supply terminations or V FIELD RTNGRP1 to V FIELD RTNGRP5 for group reference terminations.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

The 0 V connections at the flying lead ends allows a module reference so that it can measure its output voltage, this must be connected to the field 0 Volts.

The flying lead multi-core contains isolated power group field 0 Volts which connect to field 0 V supply. Commoning of the reference is obtained by a connection to this field supply.

At the chassis 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.

17. I/O Companion Slot Cable Type TC-221

This type of cable, and the modules it is used with, is shown in Figure 16 below.

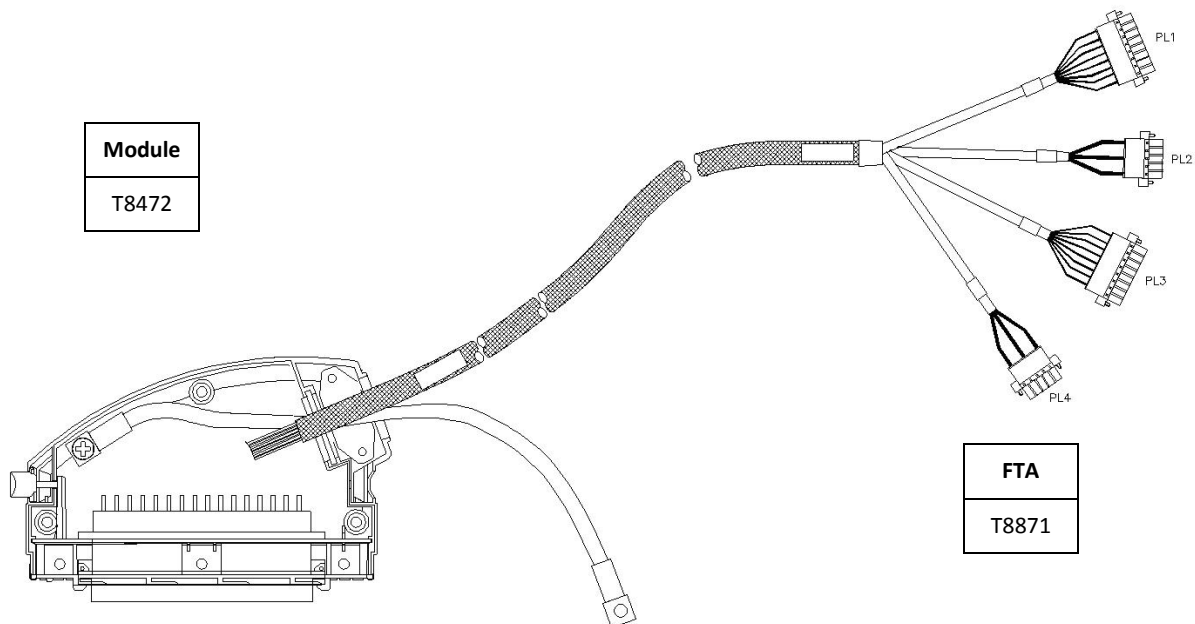


Figure 16 I/O Companion Slot Cable Type TC-221

This type of Trusted I/O Companion Slot Cable is designed for use with the T8472 120 Vac digital output module only and is suitable for connecting output signals from the module to an internal T8871 FTA. Power connections are integral with this type of cable.

The chassis end of the multi-core cable is fitted with two 32-way type 'D' connectors housed in a double-width hood. The other end of the cable is fitted with two 8-way and two 5-way BLZF 5 series connectors enabling the cable to be terminated at an T8871 FTA. Both ends are fitted with screw retention. The two 5-way connectors carry AC field power on three of the terminals, which is supplied to the FTA via screw terminals. Each connector powers one group of eight terminals. The AC power cables may also be stripped out of the multi-core sheath and terminated at an AC marshalling panel elsewhere.

The multi-core cable is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis end, a sheathed braid allows the connector hood to be wired to safety earth.

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18. I/O Companion Slot Cable Type TC-223

This type of cable, and the modules/field termination assemblies it is used with, is shown in Figure 17 below.

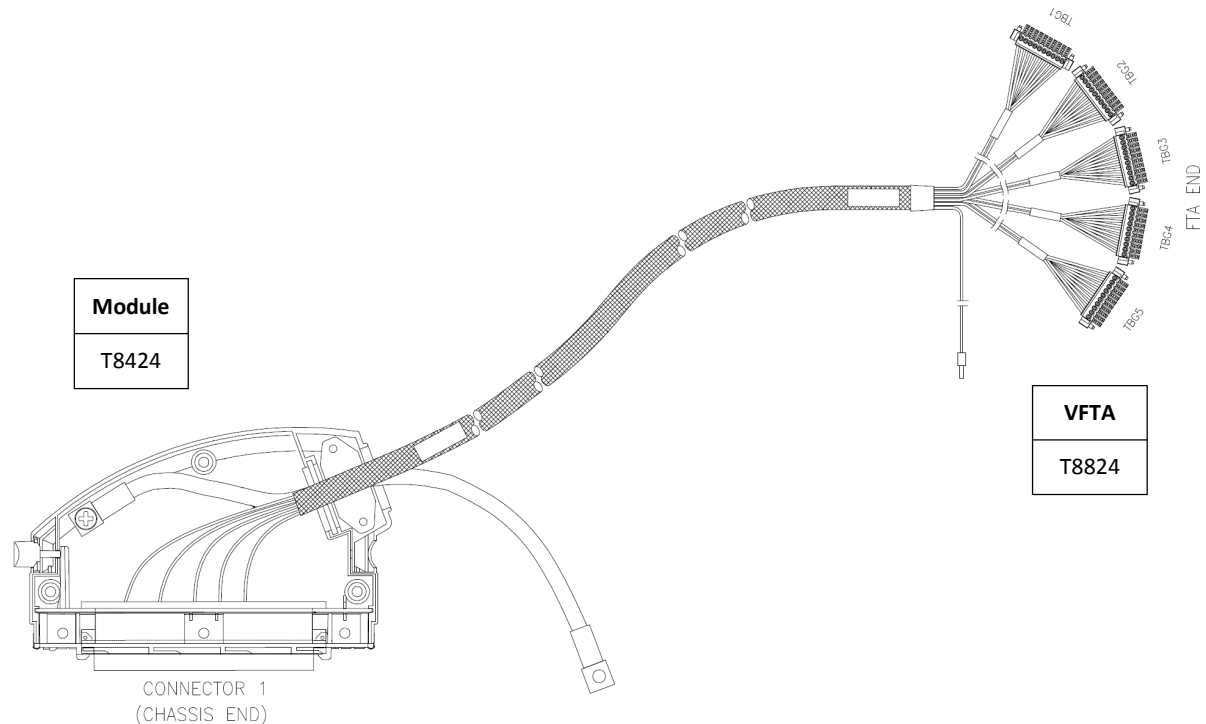


Figure 17 I/O Companion Slot Cable Type TC-223

This type of Trusted I/O Companion Slot Cable is designed for use with T8424 120 Vac Digital Input Modules and is suitable for connecting input signals from an internal VFTA to the module. Note that the T8424 should only be paired with a T8824 FTA.

The chassis end of the multi-core cable is fitted with two 96-way type 'C' connectors housed in a double-width hood. The other end of the multi-core is fitted with five 10-way screw-retained connectors enabling the cable to be terminated at a T8824 VFTA.

The multi-core is stripped back 1.5 m at both ends, then shrouded in nylon Rilgain sheathing. The ends of the sheathing are heated or fitted with over sleeving to help prevent fraying.

At the chassis 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.