Trusted Communication Interface Adapter

Product Overview

This document provides general information for the Trusted® Communication Interface Adapter T8153. The Assembly provides easy access to the communications ports of the Trusted Communication Interface Modules in the Controller Chassis for Peer to Peer communications, DCS and other links, networked PCs etc., and external connections.

Note: Gateway module Ethernet ports do not work well with a T8153 Communications Interface Adapter. It is possible to get most ports working by forcing the arbitration to 100BaseT and full duplex, however, the T8173 Gateway Adapter is recommended instead for use with the Gateway Module and also includes connections for a keyboard, video and mouse ports.

Features:

- Allows easy access for external systems to communicate with a Trusted System.
- Easy installation i.e. connects directly to the back of the Trusted Communication Interface.
- Two 10/100BaseT connections.
- Four RS422/485 connections.
- Two RS232 connections (one ‘full’ RS232).

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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 applies to **Trusted Release: 3.6.1**.

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 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 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	Jan 05	Add Gateway peripherals, TQ779 and format
7	Sep 05	Format
8	Nov 06	10Base2 removed
9	Dec 06	Connector pins
10	Sep 07	Gateway USB conns
11	Dec 08	Gateway connections
12	Apr 10	Reference to T8173 Gateway Adapter added
13	Sep 15	Rebranded and reformatted
14A	Apr 16	Standardisation of Relative Humidity and Operating Temperature Statements in Specification Section, also correction of typographical errors.

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Table of Contents

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1. Associated Equipment

Part Number	Product Name	Description
T8151B	Communication Interface	Multiple communications links to external systems
T8173	Gateway Adapter	Communication, keyboard, mouse and video link

Table 1 Associated Equipment

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2. Description

Figure 1 T8153 Photo

The Trusted Communication Interface Adapter T8153 is designed to be connected directly to the rear of a Trusted Communication Interface Module in a Trusted Controller Chassis T8100. The Assembly provides a communications connection interface to remote systems. Connection between the Assembly and the Trusted Communication Interface module is via a 78+2-way Inverse DIN41612 M-type connector (SK1).

Figure 2 shows the physical layout of the Assembly with a side plate removed.

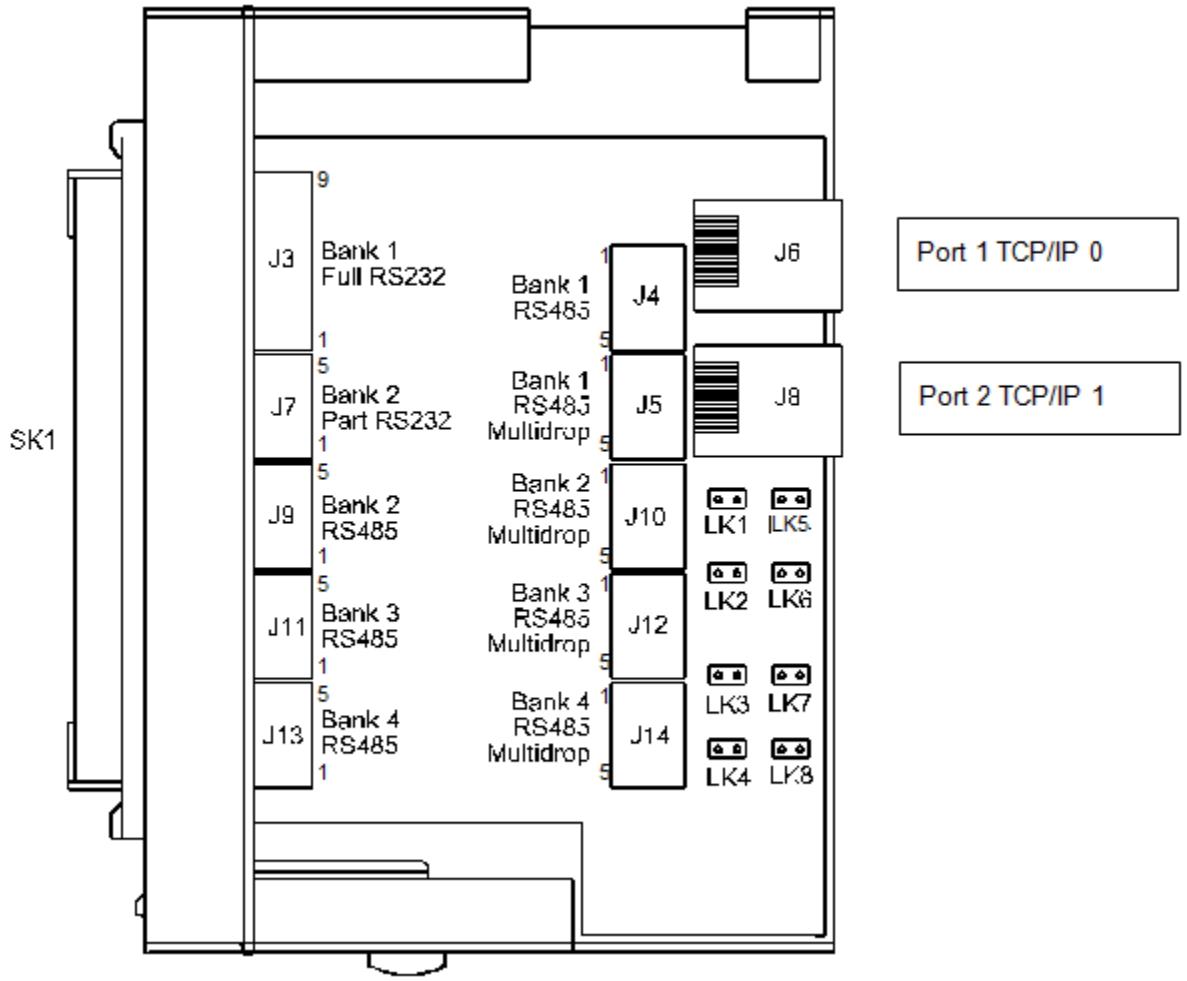

Figure 2 Assembly Layout

The Assembly comprises a printed circuit board (PCB) on which the communications ports and socket SK1 (connector to the Trusted Communication Interface) are mounted. The Assembly is contained within a metal enclosure and is designed to be clipped onto the appropriate connector at the rear of the Controller Chassis. A release button is provided to enable the Assembly to be disconnected.

The communications ports available at the Assembly are RS232 (one each of full and partial), RS485 (both direct and multi-drop) and Ethernet (10BaseT and 100BaseT).

2.1. RS232 Serial Ports

There are two connectors available to access the RS232 ports. Bank 1 provides a full RS232 interface. Bank 2 provides a partial RS232 interface with connections limited to TX, RX, RTS and CTS.

2.2. RS485 Serial Ports

1. There are eight connectors available to directly access the four RS485 ports. Banks 1 and 2 cannot be used in the RS485 mode if the Trusted Communication Interface is configured for RS232 on these ports.
2. The RS485 ports are provided with two connectors per port. Each port is provided with link selectable 120 Ω alternating current (ac) termination on both the transmit and receive circuits as shown in the table below.

Bank	Connector 1	Connector 2	TX Term. Link	TX/RX Term. Link
1	J4	J5	LK5	LK1
2	J9	J10	LK6	LK2
3	J11	J12	LK7	LK3
4	J13	J14	LK8	LK4

Table 2 Configuration for Multiplexed Links

3. The ac coupled termination is used so as to reduce the current drawn on the transmission line during the idle state. The use of two connectors and link selectable termination is to make the configuration of multiplexed transmission lines simpler. This method also provides the termination close to the transceivers thus avoiding unnecessary reflections on the line.

2.3. Examples

RS485 FULL DUPLEX LINK

This is a point to point 4 wire link. The connections to the Termination Assembly should be to Connector 1 with the TX/RX Termination link fitted.

RS485 FULL DUPLEX MULTIPLEXED

This is the most complicated system.

If the Termination Assembly is at the start of the multiplexed chain then Connector 1 is used and the TX/RX Termination link is fitted.

If the Termination Assembly is in the chain then the Connector 1 is used to connect the chain in and connector 2 is used to wire out to the next device. No links are fitted for this port.

If the Termination Assembly is the last device in the chain Connector 1 is used and both the TX Termination Link and the TX/RX Termination Link are fitted. The TX Termination link is

used here so that both ends of the line with multiple transmitters connected are terminated.

RS485 Half Duplex Multiplexed

This is the 2 wires 485 system that is only wired on the RX/TX wires.

If the Termination Assembly is at the start or end of the transmission line Connector 1 is used and the TX/RX Termination link is fitted.

If the Termination Assembly is in the transmission line then Connector 1 is used to connect the chain in and Connector 2 is used to wire out to the next device. No links are fitted for this port.

2.4. RS485 Hints

The signal ground on the RS485 links must always be connected otherwise the communications between the devices may be unreliable. When specifying cable for these connections allowance should be made for the signal ground connection. If screened cable is used the signal ground should not be connected to the screen. It is usual to connect the screen to the chassis earth at one end only.

Some manufacturers tend to use + and – designations on their equipment for labelling the pairs. Since there is no standard as to how these match up with the EIA circuit designators the following may be useful:

> With the transmission line in the ‘Idle’ or ‘Off’ state connect a multimeter on the volts range across the pair. When the multimeter reads a negative voltage the +ve terminal of the multimeter is connected to A and the –ve terminal is connected to B.

2.5. Ethernet ports

Ethernet ports 1 (TCP/IP 0) on J6 and 2 (TCP/IP 1) on J8 are provided with connections to 10/100BaseT networks via RJ45 connectors.

3. Installation

3.1. Communications Interface

When connecting to the chassis connect the socket with the rear of the chassis and slide up until it mates and clicks into place. The Communications Interface needs to be removed.

3.1.1. Connector (SK1)

SK1 is a 78+2-way DIN41612, Inverse M-type connector.

Pin	CONNECTOR SK1 PINOUT		
	A	B	C
29			LINK
28	TXD0		
27	RTS0	DTR0	RXD0
26	CTS0	DSR0	DCD0
25	RX/TXB0	RX/TXA0	RI0
24	TXB0	TXA0	GND0
23			
22	TXD1	RTS1	RXD1
21	RX/TXB1	RX/TXA1	CTS1
20	TXB1	TXA1	GND1
19			
18	RX/TXB2	RX/TXA2	GND2
17	TXB2	TXA2	GND2
16			
15	RX/TXB3	RX/TXA3	GND3
14	TXB3	TXA3	GND3
13			

Pin	CONNECTOR SK1 PINOUT		
	A	B	C
12	P1_TD+	P1_TD-	
11	P1_RD+	P1_RD-	
10			CHASSIS GND
9			
8	P2_TD+	P2_TD-	
7	P2_RD+	P2_RD-	
6			CHASSIS GND
5			
4	LINK		

Table 3 SK1 Connector Pin-out

3.1.2. External Connector Full RS232 bank 1 (J3)

J3 is a Phoenix contact 2.5mm pitch connector.

Pin	Service
1	TXD
2	RXD
3	RTS
4	CTS
5	GND
6	DSR
7	DCD
8	DTR
9	RI

Table 4 Connector J3 Pin-out

3.1.3. External Connector Partial RS232 Bank 2 (J7)

J7 is Phoenix contact 2.5 mm pitch connector.

Pin	Service
1	TXD
2	RXD
3	RTS
4	CTS
5	GND

Table 5 Connector J7 Pin-out

3.1.4. External Connectors RS485 Banks 1 to 4 (J4, J5, and J9 to J14)

These are Phoenix 2.5 mm pitch connectors.

Pin	Service
1	GND
2	TXB
3	TXA
4	RX/TXB
5	RX/TXA

Table 6 Connectors J4,5 and 9-14 Pin-out

3.1.5. External Connectors 10/100BaseT (J6 & J8)

These are RJ45 connectors.

Pin	Service
1	TD+
2	TD-
3	RD+
4	

Pin	Service
5	
6	RD-

Table 7 Connectors J6 and J8 Pin-out

3.2. Gateway Module

The Communication Interface Adapter is not recommended for use with the T8170 Gateway Module. The T8173 Adapter is recommended for this purpose. It provides better transport of the Ethernet wiring and keyboard, video and mouse ports.

3.3. Mating Connectors

The following table gives a list of connectors required to interface to the Trusted Communication Interface Adapter (T8153). Note the module is delivered with the Phoenix Contact parts fitted:

Connection	Manufacturer	Part Number
J3 (9 - way socket)	Phoenix Contact	18 81 39 6
J4, J5, J7, J9, J10, J11, J12, J13, J14 (5 - way socket)	Phoenix Contact	18 81 35 4
J6 & J8 * (RJ45 plug)	Molex Stewart Amp	87281-8003 940-SP-3088R 55541693

Items marked * show a selection of manufacturers for these parts as examples only, others can be used.

Table 8 Mating Connections

Notes: An earth point is provided on the PCB of the Assembly so that the chassis earth of the Trusted Communication Interface is connected to both the enclosure and module rack earth.

4. Specifications

Ports (when connected to Communication Interface)	
RS232	2-off (one full RS232 and one partial RS232)
RS485	4-off (with direct and multi-drop facilities)
Ethernet	2-off (10BaseT or 100BaseT)
Operating Temperature	0 ˚C to +60 ˚C (+32 ˚F to +140 ˚F)
Non-operating Temperature	-25 ˚C to +70 ˚C (-13 ˚F to +158 ˚F)
Relative Humidity range (operating, storage & transport)	10 % – 95 %, non-condensing
Environmental Specifications	Refer to Document 552517
Dimensions	
Height	150 mm (5.9 in)
Width	28 mm (1.1 in)
Depth (including mounting rail)	106 mm (4.2 in)
Weight	418 g (0.92 lb.)