Trusted TMR Expander Interface Adapter Unit

Product Overview

This document provides general information for the Trusted® Triple Modular Redundant (TMR) Expander Interface Adapter Unit T8312. Two versions of the Unit are available; one providing inter-connection between the Trusted Expander Interface Modules in the Controller Chassis and four Expander Chassis (T8312-4), and the other providing inter-connection to seven Expander Chassis (T8312-7).

Features:

- Allows easy inter-connection of Controller and Expander Chassis.
- Unit is fully shielded for Electro-Magnetic Compatibility (EMC).
- Version available for smaller Trusted Systems – up to four Expander Chassis.
- Locking connectors for increased reliability.

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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.

No patent liability is assumed by Rockwell Automation, with respect to use of information, circuits, equipment, or software described in this manual.

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 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
9	Sep 05	Format
10	Jun 08	Legend and photos
11	Oct 15	Rebranded and reformatted with corrections to the Relative Humidity Range and Operating Temperature statements in the Specification Section
12	Jun 16	Updated to incorporate IEEE standards with correction of typographical errors.

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1. Description

Figure 1 T8312 Photo

The Trusted Expander Interface Adapter Unit T8312 comprises four, or seven 12-pin ODU connectors (dependent on type of Unit), a printed circuit board (PCB), a 96-way C type connector which plugs into a double 96-way connector assembly designed to be connected to the Trusted Expander Interface Modules resident in the Controller Chassis. The Unit is contained within a metal enclosure and is designed to be clipped onto the Controller Chassis rear connectors. A release button is provided to enable the Unit to be disconnected.

The illustration below shows the configuration of the Unit.

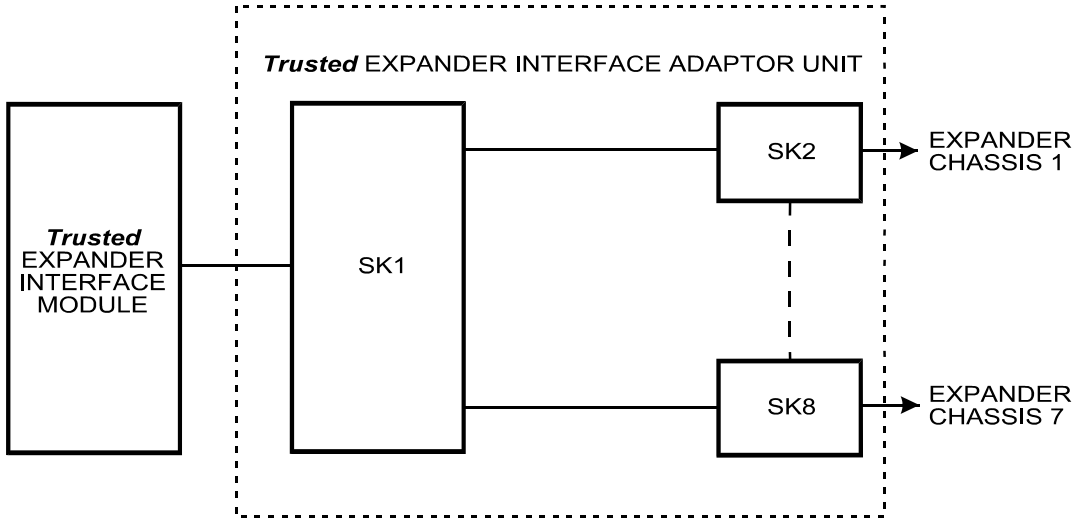


Figure 2 Expander Interface Adapter Schematic

The ODU connectors are mounted on the rear of the Unit and are numbered to identify the Expander Chassis which may be connected. The pin assignments for the ODU connectors are as follows:

Pin	Service
1	TXA+
2	TXA-
3	RXA+
4	RXA-
5	TXB+
6	TXB-
7	RXB+
8	RXB-
9	TXC+
10	TXC-
11	RXC+
12	RXC-

Table 1 ODU Connector Pin Assignments

The cable which must be used with the Unit is the 250 MHz Communications Cable – TC-301-01.

1.1. Chassis Connector (SK1)

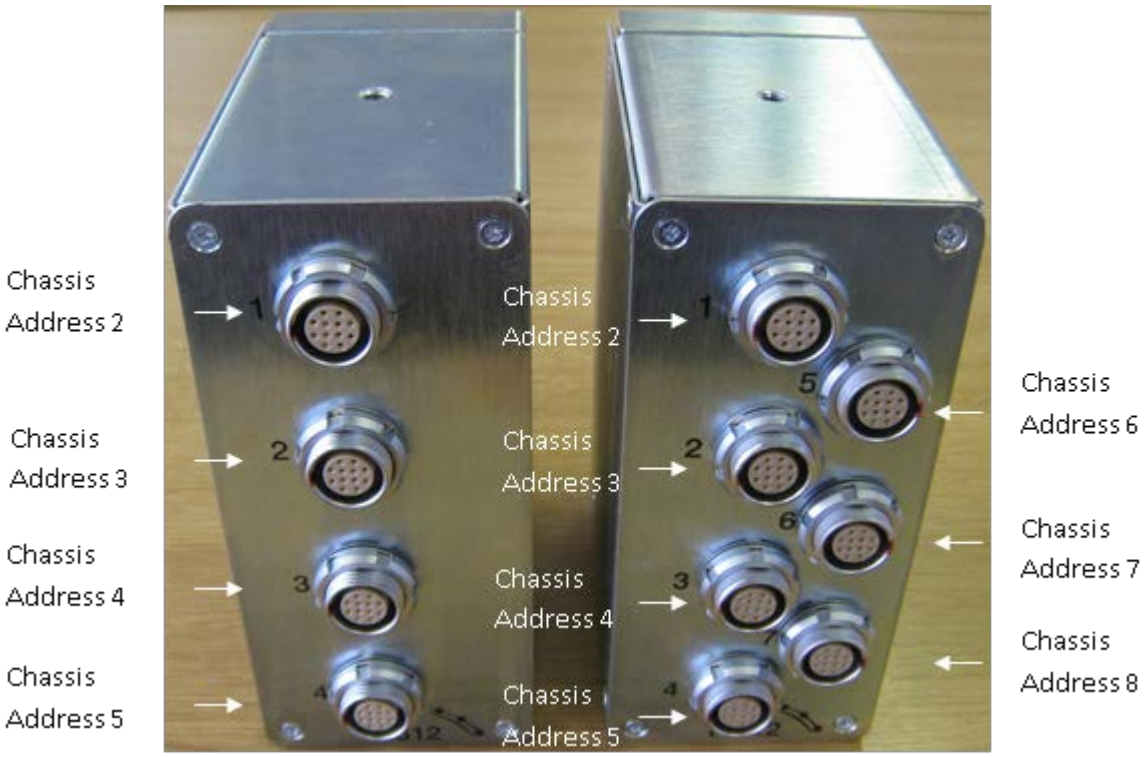
SK1 is a double, 96-way DIN41612, C-type connector.

Pin	CONNECTOR SK1 PIN-OUT		
	A	B	C
1	RXC7-	RXC6-	RXC5-
2	RXC7+	RXC6+	RXC5+
3	RXC4-	RXC3-	RXC2-
4	RXC4+	RXC3+	RXC2+
5	RXC1-	LB_A_ACTN/STB_1	TXC7-
6	RXC1+	LB_A_ACTN/STB_2	TXC7+
7	TXC6-	TXC5-	TXC4-
8	TXC6+	TXC5+	TXC4+
9	TXC3-	TXC2-	TXC1-
10	TXC3+	TXC2+	TXC1+
11	GND	GND	GND
12	RXB7-	RXB6-	RXB5-
13	RXB7+	RXB6+	RXB5+
14	RXB4-	RXB3-	RXB2-
15	RXB4+	RXB3+	RXB2+
16	RXB1-	LB_B_ACTN/STB_1	TXB7-
17	RXB1+	LB_B_ACTN/STB_2	TXB7+
18	TXB6-	TXB5-	TXB4-
19	TXB6+	TXB5+	TXB4+
20	TXB3-	TXB2-	TXB1-

Pin	CONNECTOR SK1 PIN-OUT		
	A	B	C
21	TXB3+	TXB2+	TXB1+
22	GND	GND	GND
23	RXA7-	RXA6-	RXA5-
24	RXA7+	RXA6+	RXA5+
25	RXA4-	RXA3-	RXA2-
26	RXA4+	RXA3+	RXA2+
27	RXA1-	LB_C_ACTN/STB_1	TXA7-
28	RXA1+	LB_C_ACTN/STB_2	TXA7+
29	TXA6-	TXA5-	TXA4-
30	TXA6+	TXA5+	TXA4+
31	TXA3-	TXA2-	TXA1-
32	TXA3+	TXA2+	TXA1+

Table 2 Chassis Connector (SK1) Pin-out

Chassis connections for both Units are organised as below.



1 connects to the first Expander Chassis (which has its three ID switches configured to address 2).

2 connects to the second Expander Chassis (which has its three ID switches configured to address 3).

…

8 connects to the eighth Expander Chassis (which has its three ID switches configured to address 8).

The addresses are set 2,3,4…8 to fit logically with the Processor Chassis virtual address of 1. If more than eight Chassis are needed, a second Expander Interface is required. The address switches on these Chassis are also set 2,3,4…8 but the virtual addresses (as seen by the application and diagnostics) are 9,10,11…15 as set in the System.INI configuration.

Refer to PD-8300 for further explanations on ID settings.

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2. Specifications

Use with Chassis/Module	T8100/T8311
Expander Bus Data Rate	250 Mbps (0.25 Gbps)
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	130 mm (5.1 in)
Width	60 mm (2.4 in)
Depth	115 mm (4.5 in)
Weight	650 g (1.43 lb)