Trusted™ TMR Expander Interface

Introduction

The Trusted™ TMR Expander Interface module resides in the Trusted™ Controller Chassis and provides the 'master' interface between the Inter-Module Bus (IMB) in the Controller Chassis and the Expander Bus. The Expander Bus allows multiple chassis systems to be implemented using UTP cable connections whilst maintaining the fault tolerant, high bandwidth IMB capabilities.

The module provides fault containment for the Expander Bus, the module itself and the IMB in the Controller Chassis, ensuring that the effects of these potential faults are localised and system availability maximised. The module is fault tolerant with HIFT TMR architecture. Comprehensive diagnostics, monitoring and testing provide rapid fault identification. Hot standby and module spare slot configurations are supported, allowing automatic and manual repair strategies.

Features

- Triple Modular Redundant (TMR), fault tolerant (3-2-0) operation
- Hardware Implemented Fault Tolerant (HIFT) architecture
- Dedicated hardware and software test regimes which provide very fast fault recognition and response times
- Automatic fault handling without nuisance alarming
- Hot replacement
- Front panel indicators that show module health and status.
- TÜV Certified IEC 61508 SIL 3

3.4. Module Information

The following information is recorded by the TMR Expander Interface Module and made available to the TMR Processor.

- Expander Bus link quality, including receive error counts for each communications link and link status.
- Received message error, on a per link/FCR basis, including frame error, checksum error and discrepancy.
- HIFT Clock, master and slave clock status, and master/slave switching.
- FCR watchdog status.
- Current active/standby status.
- IMB status information.
- Module type code and serial number.
- Module removed flap status.

3.5. System Initialisation File

This module requires a simple entry in the system INI configuration. Within this entry, the System Configurator allows the connection of expansion chassis to each port on the expander interface. There is no further configuration required. For details of editing the system INI configuration, please refer to PD-8082.

In the system INI configuration, the module should be defined in both the primary position and the secondary (hot swap spare) position. This is required to enable the module to be hot swapped. The chassis allocation only needs to be set up in one of the positions; it will be automatically copied to the other position.

3.6. Expander Chassis IMB Connector (SK1)

SK1 is a 185-way DIN41642 type connector.

CONNECTOR SK1 PINOUT					
PIN	**E**	**D**	**C**	**B**	**A**
2	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND
3					
4	IMB_+24V_RTN	IMB_+24V_RTN	IMB_+24V_RTN	IMB_+24V_RTN	IMB_+24V_RTN
5					
6	IMB_+24V_1	IMB_+24V_1	IMB_+24V_1	IMB_+24V_1	IMB_+24V_1
7					
8	IMB_+24V_2	IMB_+24V_2	IMB_+24V_2	IMB_+24V_2	IMB_+24V_2
9					
10					
11	IMBA_CMDN_RSP	GND	IMBA_IOM_SELN	IMBA_INTLK_N	IMBA_MN/X_ID
12	IMBA_D0	GND	IMBA_D1		IMBA_SLOT0_ID
13	IMBA_D2	GND	IMBA_D3		IMBA_SLOT1_ID
14	IMBA_D4	GND	IMBA_D5		IMBA_SLOT2_ID
15	IMBA_D6	GND	IMBA_D7		IMBA_SLOT3_ID
16		GND			
17	IMBA_IOM_CK1	GND	IMBA_SFTY_WDOG	GND	IMBA_+6.5V
18	IMBA_IOM_CK2	GND	IMBA_PWR_FAIL	GND	IMBA_+6.5V
19					
20	IMBB_CMDN_RSP	GND	IMBB_IOM_SELN	IMBB_INTLK_N	IMBB_MN/X_ID
21	IMBB_D0	GND	IMBB_D1		IMBB_SLOT0_ID
22	IMBB_D2	GND	IMBB_D3		IMBB_SLOT1_ID
23	IMBB_D4	GND	IMBB_D5		IMBB_SLOT2_ID
24	IMBB_D6	GND	IMBB_D7		IMBB_SLOT3_ID
25		GND			
26	IMBB_IOM_CK1	GND	IMBB_SFTY_WDOG	GND	IMBB_+6.5V
27	IMBB_IOM_CK2	GND	IMBB_PWR_FAIL	GND	IMBB_+6.5V
28					
29	IMBC_CMDN_RSP	GND	IMBC_IOM_SELN	IMBC_INTLK_N	IMBC_MN/X_ID
30	IMBC_D0	GND	IMBC_D1		IMBC_SLOT0_ID
31	IMBC_D2	GND	IMBC_D3		IMBC_SLOT1_ID
32	IMBC_D4	GND	IMBC_D5		IMBC_SLOT2_ID
33	IMBC_D6	GND	IMBC_D7		IMBC_SLOT3_ID
34		GND			
35	IMBC_IOM_CK1	GND	IMBC_SFTY_WDOG	GND	IMBC_+6.5V
36	IMBC_IOM_CK2	GND	IMBC_PWR_FAIL	GND	IMBC_+6.5V
37					
38	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND	CHASSIS_GND

Table 1 Chassis Connector (SK1) Pinout