

cPCI-1760-SW-4

Four Port Fibre Channel/MIL-STD-1760E
Interface Test Module for cPCI

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General Overview

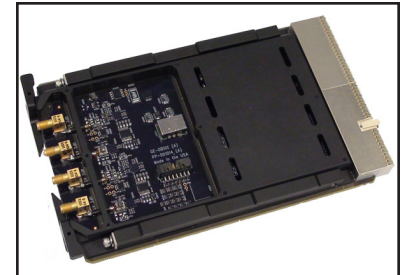
The cPCI-1760-SW-4 is a 3U conduction-cooled Compact PCI board designed to meet the emerging requirements of the high-speed databus on production weapon systems compliant to the MIL-STD-1760E standard. This includes the emerging requirements for the interface to Mini-Munitions (SAE AS5725) and interface to Micro-Munitions (SAE AS5726).

The cPCI-1760-SW-4 is a circuit card assembly that may be used as a Carriage Store Interface (CSI), Carriage Store Station Interface (CSSI) or it may be installed in a stores management computer to perform as an Aircraft Store Interface (ASI). MIL-STD-1760e, AS5653, AS5725, and AS5726 are very recent standards developments that are being integrated into hardware for evaluation for wider fleet adoption. The cPCI-1760-SW-4 demonstrates the integration and performance improvements of the high speed serial Up Fibre Channel (UFC) and Down Fibre Channel (DFC) interfaces of the new standards using Fibre Channel platform communications and switching functions. The cPCI-1760-SW-4 can be integrated into a stores management system to provide high speed communications with both stores and host platform avionics.

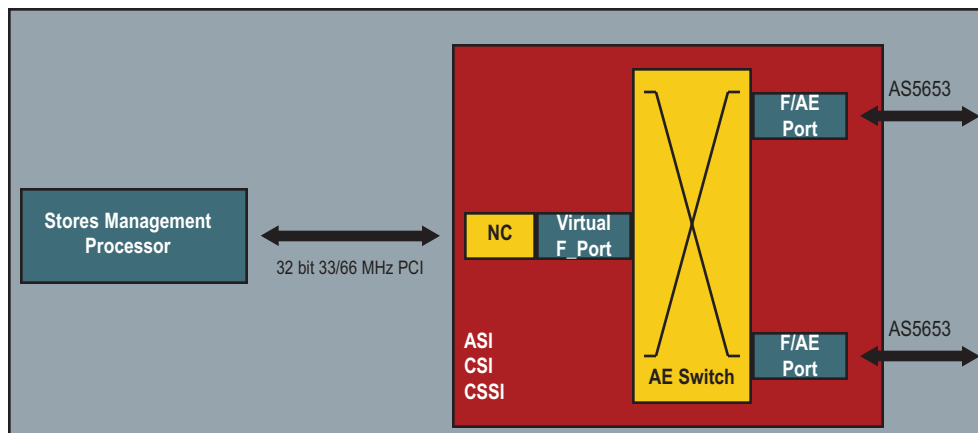
As a Network Controller (NC), the cPCI-1760-SW-4 communicates with the stores management computer or some other processor via the 32-bit wide PCI bus of the Compact PCI standard operating at 33MHZ/66MHZ at 3.3V as defined by the PICMG 2.0 specification. A software API and

device driver supplied with the board runs under Windows XP or VxWorks 6.4 Operating Systems.

The cPCI-1760-SW-4 implements a 1.0625Gbps cut-through four-port Fibre Channel switch with two physical ports acting as F/AE ports plus one virtual back end port used for general cPCI-1760-SW-4 management as well as communication with the embedded NC functionality. The cPCI-1760-SW-4 implements the protocol stack for an FC-AE-1553 NC attached via the "virtual" back end port.



The cPCI-1760-SW-4 supports all the required aspects of AS5653, including requiring that the switch also support at least two priority levels and that NTs also support at least two priority levels. Each of the four priority levels is capable of a single active message. While transmitting a message from a lower priority level and before the message is completed, the NC is capable of initiating another message from a higher priority level. Once available for transmission, a higher priority message is initiated on the first available inter-frame gap within a lower priority message.



Standards Compliance

The cPCI-1760-SW-4 has been developed to be fully compliant to the applicable standards.

- ◆ PCI compliance to the PICMG 2.0 specification
- ◆ Physical links compliant to MIL-STD-1760E and SAE AS5653 including the extended output voltage
- ◆ Fibre Channel character of the physical links compliant to FC-PI for 1.0625 gigabaud full-speed links
- ◆ NC functionality compliant to FC-AE-1553 as profiled by SAE AS5653
- ◆ FC-AE Switch compliance to FC-SW-4 Annex D

FC-AE Switch

The cPCI-1760-SW-4 implements a four port non-blocking Fibre Channel switch. The two external ports may be used as either F_Ports or AE_Ports. Each 'plug & play' port is self-discovering. Cascaded switches will discover each other and initialize via the Fast Fabric Initialization (FFI) protocol. Setup of the switch, including the seeding of the Domain Topology Map that defines the initial system configuration, occurs via the PCI interface and the software API interface.

Built-in-Tests (BIT)

The cPCI-1760-SW-4 API interface has hooks for customer-provided BIT tests. There are hooks for four kinds of BIT Tests.

- ◆ Periodic BIT (PBIT)
- ◆ Startup BIT (SBIT)
- ◆ Initiated BIT (IBIT)
- ◆ Maintenance BIT (MBIT)

Network Controller

The cPCI-1760-SW-4 implements all FC-AE-1553 functions as profiled in SAE AS5653. It also implements a very small subset of NT functions in order to implement the NT-to-NT transfers when the NC is the receiving NT.

Export Control Classification

- ◆ ECCN: 7A994
- ◆ Schedule B tariff code: 8542310000 "Electronic Integrated Circuits"

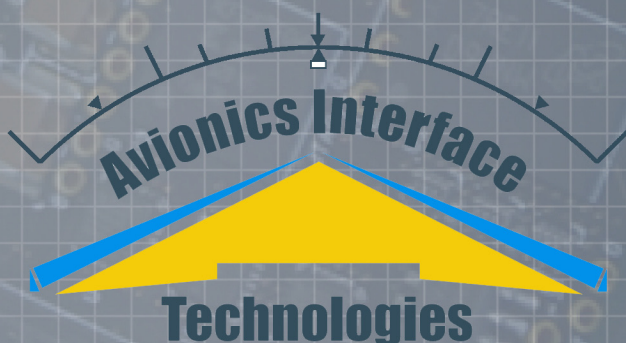
Technical Data

Sub-System Interface:	cPCI PICMG 2.0 specification compliant
PCI BUS:	32-bit wide 33MHZ/66MHZ
Memory:	128 MB RAM on board comprised of 64 MB User RAM and 64 MB RAM for ECC
Encoder/Decoder:	Standard Fibre Channel 8b/10b
Physical Bus Interface:	Two redundant 1.0625 gigabaud MIL-STD-1760E transceivers with variable output amplitude
Connector:	PCibus Standard backplane connector Two external AS5653 compliant F/AW_Ports using two SSMA 75 ohm coax connectors
Dimensions:	3U conduction-cooled Compact PCI board
Power Consumption:	5 Watts typical @ 3.3V Maximum capacitance on 3.3V supply is 200uF
Operating Temp. Range:	-40 degrees C...+80 degrees C ambient
Humidity:	0 to 95% non-condensing
Vibration and Shock:	Design has been verified in a suitable chassis for an aircraft program
BIT Test:	API supported PBIT, SBIT, IBIT, and MBIT Tests
API:	API enabling complete FC-AE-1553 NC functionality and management
Software:	'C' code written to support Windows XP and VxWorks 6.4 OS supporting FC-AE-1553 exchange management for NCs and fast fabric initialization for switches
SAE AS5653 Usage Cases:	May be configured as an ASI, CSI, or CSSI

Ordering Information

cPCI-1760-SW-4

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