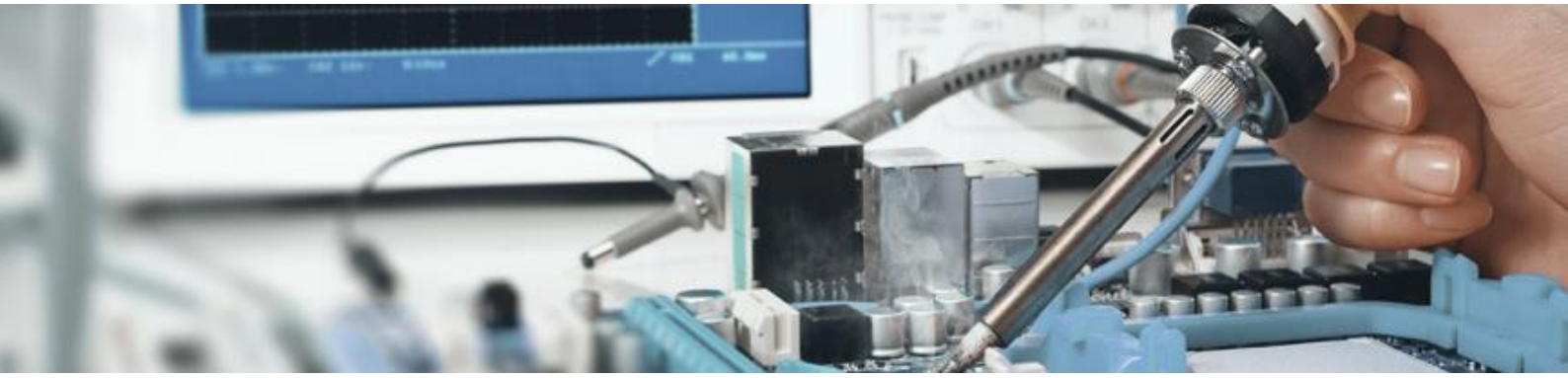
DATASHEET | PCI64EF



Mil-Std-1553, Stanag 3838/3910/EFEx Interface Card

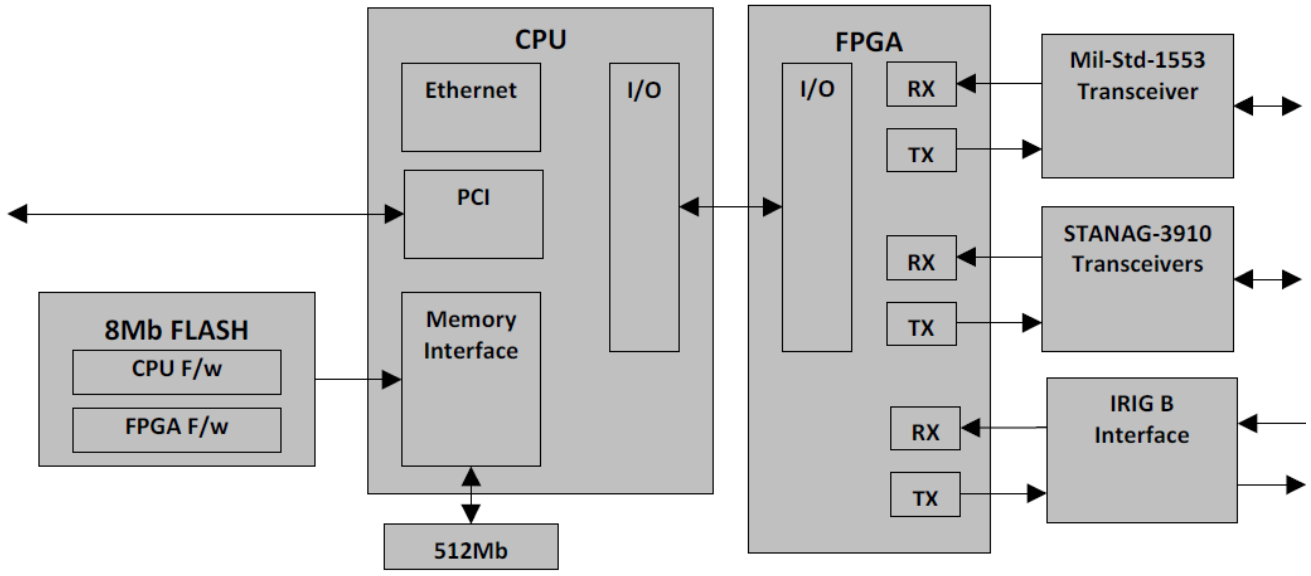
The GSS PCI64EF is an industry standard PCI half card implementing a full dual redundant Stanag 3838/3910/EFEx, as used on the Eurofighter Typhoon/EF2000 aircraft.

All optical and electrical tranceivers are onboard, and databus I/O is via standard back panel connectors.

The GSS PCI64EF is one of a family of cards based on the same core technology, but with different user interface control busses. Currently PCI, PCIe, cPCI, USB and Ethernet versions of the hardware are available or in development.

Each type of card can be populated with Mil-Std-1553 and Stanag3910/EFEX interfaces as required. This permits user software to be written to support a wide variety of different host platforms.

Block Diagram



The user control interface is handled by a powerful DSP microprocessor capable of 8000 MIP's. This can be set-up to implement onboard functions in transmitted data buffers, such as ramps, checksums, dyn-tags and complements.

The DSP contains an integrated PCI interface which permits the DSP's DDR2 memory to be dual ported, thus exposing a large amount of memory for the user to setup data buffers and BC bus lists.

All databus activity is handled by the onboard FPGA. This is configured by the DSP at boot time using code contained within the FLASH EPROM. Once configured, DMA engines within the FPGA can transfer bus data to/from the DSP's DDR2 memory without requiring DSP or user interaction.

The user can use API calls to setup the FPGA to achieve RT response times faster than would normally be achievable in a CPU only based system – sub 4uS RT response times are possible.

GSS has incorporated features into this card that users have requested from us over the past 15 years of development. These include onboard IRIG-B time-stamping, onboard complex triggering, onboard visual indication of bus activity via backpanel LED's and variable amplitude Mil-Std-1553B transceivers – all as standard.

This card is designed to be a drop in replacement for the legacy ATT/GSS PCI3910 card when used with the relevant new device drivers and library DLL's. This provides a low risk upgrade/obsolescence path for legacy systems that currently use the PCI3910 card.

Hardware Features

Powerful 64 bit 1 GHz DSP CPU - up to 8000 MIPS

- The CPU has integrated Memory controller, Ethernet and 32 bit 33/66MHz PCI Interfaces
- 512 Mb of onboard dual ported DDR2 RAM, sufficient for a buffer for every RT-SA-MID combination
- 1.5 Million gate FPGA performs implements all bus interface encoder and decoder logic
- The FPGA handles all Databus Interfaces in hardware. The FPGA Firmware fully describes functionality
- CPU and FPGA firmware both contained in non-volatile 8Mb FLASH EPROM, which can be updated over PCI
- CMAC FOFE's and a variable amplitude Mil-Std-1553B transceivers fitted as standard
- Integrated IRIG B analogue input and output for time-tag synchronisation
- Visual indication of all receive and transmit activity via I/O panel LED's.
- Worst case 15 Watt power dissipation (100% bus loading)

Firmware Features

- All BC and RT Response times programmable. The RT simulation can achieve sub 4uS response times.
- Low level bit error injection and detection on both electrical and optical busses.
- Real-time functions applied to transmitted data – Checksums, ramps, complements, DynTags etc.
- Vector word stack and automatic SRB Status setting and clearing
- Complex state machine trigger with If/Then/Else style nested AND/OR conditions

Software Features

- Supported protocols include Mil-Std-1553A & B, Stanag 3838 & 3910, High Speed DDL, EFABus and EFABus Express (EFEx). The Firmware can be updated to support additional features and bug fixes. The standard microcode supports concurrent Bus Controller, 31 Remote Terminals and Bus Monitor.
- Device Driver support for all 32 and 64 bit versions of Microsoft Windows NT4, 2000, XP, Vista, Windows 7 and Windows 8. A Microsoft Windows user API is supplied as source code and 32 bit DLL.
- Fully Supported by the GSS-100 Windows data-bus analyser software