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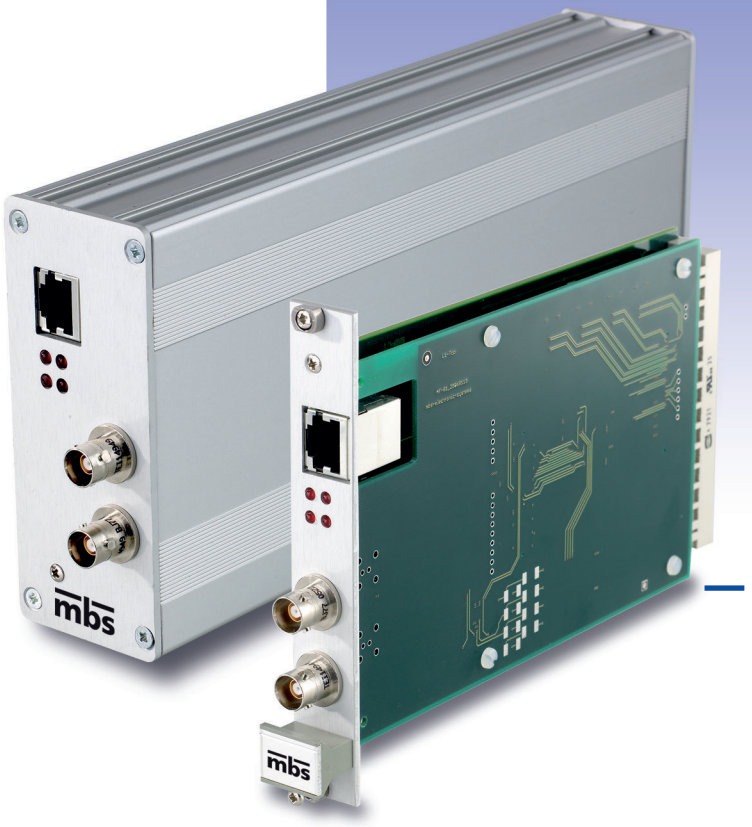
ÆSyBus-1553



Mil. Std. 1553 Interface to Gigabit Ethernet

Features

- Dual Redundant Mil.Std.1553 Bus Channel
- Bus Controller, Remote Terminal or Monitor Operation
- Periodic Message Scheduling
- Aperiodic Messages
- Full Status Monitoring of Transmit and Receive Events
- Time Stamping and Timer Synchronisation

Description

mbs' ÆSyBus product range provides Full Duplex Gigabit Ethernet/IP interfacing to various Avionics and Industrial data buses. ÆSyBus-1553 provides this convenient high speed distributed interfacing capability for realising Dual Redundant MIL.STD.1553 Terminals and Bus Monitoring.

A separate document provides more detail on the ÆSyBus concept and how its unique architecture can be exploited to provide a cost effective, distributed interface and processing system with outstanding performance. Many new products are planned to expand this flexible, easy to program family.

Mil.Std.1553

ÆSyBus-1553 modules can be configured as a Bus Controller, Remote Terminal or Bus Monitor (with or without assigned RT Address).

BC Function

When operating as a Bus Controller, the user enjoys full control over Bus Selection, Periodic and Aperiodic communication via expedient use of the Command FIFO and Transmit Scheduling facilities:

- The Command FIFO provides basic access to all configuration registers, Dual Redundant Bus selection, Mode and Status Registers, and control over non-periodic transmissions. This FIFO has sufficient memory to store up to 85 System Commands.

- The Transmit Scheduler provides the user with a simple means for regimenting Periodic Communications with full control over main and sub-frame messages. The scheduler uses the same command structure as used by the command FIFO, except that it is organised to issue these System Commands in a deterministic series of major and minor communication frames with a fixed period. The scheduler supports major frames with up to 1024 commands. Normally, these system commands are used to issue BC commands to Remote Terminals, but they can also be used to switch dual redundant buses and other system parameters and registers in a deterministic manner.

Aperiodic and periodic transmissions mix naturally onto the buses with periodic transmissions taking priority.

Data for transmission is drawn from user defined locations in the Transmit Data Buffer. This memory is able to buffer up to 1k data words.

Data received from Remote Terminals is automatically transferred to locations in the Receive Data Buffer, which is organised as a cyclic buffer with a capacity for 256 data words. The Write Pointer to this buffer is stored with Time Stamp and other status information in the Message Status memory. This memory is also organised as a cyclic buffer, the contents of which can be automatically transferred with the Receive Data buffer etc. periodically to any host application. By the use of cyclic buffers, multiple host applications can read the Receive and Status Buffers without loosing data. This would not be so, if instead, FIFOs were used to store this information.

RT Function

Data buffering for transmission, reception and status monitoring for the ÆSyBus-1553, when configured as a Remote Terminal, functions in a similar manner to the BC terminal described

above, except that it does not instigate messages but simply responds as a slave to BC commands.

MT Function

The ÆSyBus-1553 can be configured as a Bus Monitor to capture receive data and bus status information, as described above, except that the user has the choice to monitor all Bus traffic or just the traffic in relation to a particular terminal.

Discrete I/O

In addition to the dual Redundant data buses, the ÆSyBus-1553 has 4 RS-485 Transceivers which can be used to convey status information with other devices.

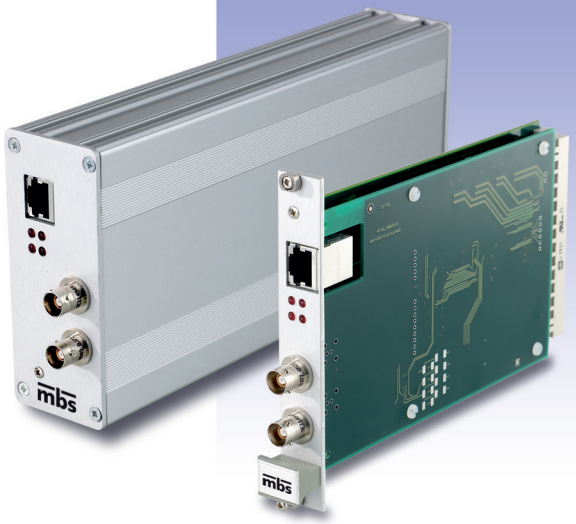
Software

The choice of Ethernet data bus with UDP/IP protocol provides the user with a freedom unimaginable in the past. No longer is it necessary for a single program to control all of the communication with the interface card. With ÆSyBus-1553, the user can divide the system into logical parts and implement them in separate applications, on the same computer or on separate computers attached to the network and these connections can be broken and re-connected while the system is working. No need to switch the system down when connecting a new host to the network.

And how about software drivers for my exotic operating system?

This should not be a problem. Almost all serious operating systems and software development environments provide support for the TCP/IP protocol stack, to which UDP belongs. You can take advantage of all the special tools and classes provided by these systems to easily connect to the UDP user ports on the card, or sending and receiving messages etc..

In addition to the support of readily available software development tools, the ÆSyBus-1553 comes with example software and support classes written in Visual C# and provided with source code. You don't have to waste time struggling with an unfamiliar programming language and environment. You just continue with your favourite tools, they are almost certain to provide the support you need to access the Ethernet/IP and consequently the ÆSyBus devices. In addition, the ÆSyBus-1553 is provided with full documentation and various Windows based utility programs to help you configure IP addresses and check out your network connection.



Functional Specifications

General Features

- 10 (optionally 26) UDP user assigned ports
- Onboard system Timer with support for external synchronisation and clock drift compensation
- Time Stamping of Mil.Std.1553 communications using a 20 bit microsecond and 20 bit second counters
- User configurable, message scheduling of data and other information to host applications, periodically and/or when necessary
- Discrete I/O support
- Full status monitoring including: Time Stamping, BC command words, RT status words, Error status and location and count of words captured
- Automatic capture of all receive data and status into user accessible cyclic data buffers
- Utilises standard message processor compliant to Mil-Std-1553B Notice 2 and Mil-Std-1760 Stores Management

BC Features

- Configurable Transmit Command Scheduler with capacity for 1024 periodic System Commands
- System Command FIFO for asynchronous system control, dual redundant bus switching and aperiodic communication
- Inter-message gap and minor frame period control

RT Features

- Automatic dual redundant bus switching

MT Features

- Choice of monitoring communication from a single Remote Terminal or all Remote Terminals

ÆSyBus 1553 Ordering Information

Part Number	Description
Æ-1553-BCRT-EC	Dual Redundant MIL. STD. 1553/ Ethernet Interface card in Eurocard Format
Æ-1553-BCRT-PoE	Dual Redundant MIL. STD. 1553/ Ethernet Interface Module with Power over Ethernet
Æ-1553-BCRT-EP	Dual Redundant MIL. STD. 1553/ Ethernet Interface Module with External Power Input

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