GE
Intelligent Platforms

R15-EC
RoHS Dual Port MIL-STD-1553 ExpressCard Interface

Features

- 1 or 2 Independent MIL-STD-1553 Dual Redundant Channels
- Multi-function or Single-function Configurations
- Bus Controller – BC
  - BC → RT, RT → BC, RT → RT
  - Mode Codes, Broadcast and single-shot messaging
  - Programmable time delays
  - Major/Minor frames
  - Real-time conditional branching
  - Two aperiodic messaging methods
  - Error injection
- Remote Terminal – RT
  - RT data wrapping
  - Multiple RT buffers
  - Automatic Mode Code and status bit responses
  - Programmable response time
  - Error injection
- Bus Monitor – BM
  - Full error detection
  - Multiple monitoring methods
  - 45-bit time-tagging (capable of over 1 year time tag data)
  - Adv. interrupts and triggers
- Architecture
  - IRIG-B Rec (AM or DC/TTL) optional, Gen (DC/TTL) standard
  - Two bi-directional discretes (open drain)
  - BC & RT error injection/detection

- BC & RT link list structures
- 1 Mbyte RAM per channel
- Transformer coupling
- Input/Output Triggering
- Environmental options
- Software Support
  - Advanced, high-level API for Microsoft® Windows® 7 (32 and 64bit), Solaris®, VxWorks®, Linux®
  - Source code included
  - BusTools Analyzer supported

The R15-EC card provides the highest level of performance and density for MIL-STD-1553A/B in an ExpressCard form factor. The R15-EC card provides 1 or 2 channels integrated with powerful API software that provides instant access to all 1553 databus functionality and data.

Features include IRIG-B Receiver (AM or DC/TTL), Generator (DC/TTL), real-time bus playback (with ability to edit out RTs), aperiodic message insertion, error injection/detection, conditional BC branching, 45-bit timetags and "Oneshot" BC operation. The Bus Monitor mode provides 100% bus monitoring of a fully loaded 1553 bus.

Multi-function Interface

One or two multi-function 1553 interfaces operate simultaneously as a BC, up to 31 RTs and as a BM. Each can completely emulate a dual-redundant 1553 channel internally.

Single-function Interface

One or two single-function 1553 interfaces are available with all the features and functionality of the multi-function version, but with only one major operational mode enabled at a time. Each interface functions as either a Bus Controller or 31 Remote Terminals or as a Bus Monitor.

Software

Included with the R15-EC card is GE Intelligent Platforms' easy-to-use, flexible, high level API. Source code and Windows 7, Vista, XP, NT and Linux support is provided. LabVIEW drivers and BusTools/1553, GE's GUI bus analysis and simulation solution for 1553, are optionally available.

GE's high performance and intuitive software solutions provide complete and simplified access to MIL-STD-1553 functionality for development , integration, test , embedded and maintenance applications.

QNX, LynxOS, Integrity available upon request.

R15-EC – RoHS Dual Port MIL-STD-1553 ExpressCard Interface

Specifications

Physical
- ExpressCard/54 extended module

Environmental
- Card operating temperature: 0° C to +55° C
- Extended temperature: -40° C to +65° C available (operating case temperature range not to exceed -40° C to +65° C)
- Storage temperature: -50° C to +100° C
- Relative humidity: 5 to 90% (non-condensing)

Software
- API – Includes high-level API libraries for Windows 7 Vista, XP, NT, Linux, Solaris and VxWorks
  - Source code API library provided
  - Hardware interrupts supported
- GUI – Optional BusTools/1553 GUI bus analysis, simulation and data logging software
- LV-1553 – LabVIEW support for MIL-STD-1553

Connections
- Transition cabling provided via robust 36-pin Champ type connector
- Input and output triggers
- Two bi-directional avionics discretes
- Transformer coupling
- IIRIG-B Rec (AM or DC/TTL), Gen (DC/TTL) standard
- Fixed output voltage

Multi-function Operational Modes
- Simultaneous BC, 31 RTs and BM

Single-function Operational Modes
- BC or 31 RTs or BM

Thermal Design Power (2 channels at 90% duty cycle)
- 1.75 W max

On-board Dual-port RAM
- 1 Mbyte per channel

Description

Bus Controller
- Programmable control over:
  - Major and minor frame content and timing
  - Intermessage gap times
  - Response time-out and late response
- Modify messages, data or setup while card is running
- Insert aperiodic messages into a running BC list
- "Oneshot" mode for simplified BC operation
- Conditional message sequencing based on real-time message data or status
- Selectable interrupt generation and status messages
  - Full range of system conditions
  - All detected errors
- Full error detection
  - Invalid word – Late response
  - Bit count error – Early response
  - High word – No response
  - Low word – Incorrect RT address
  - Inverted sync – Parity error
  - Manchester
- Extensive programmable error injections (on a per word basis)
- Synchronize BC operation to external time source

Remote Terminal
- Multiple RT simulation (up to 31 RTs)
- Programmable message content (linked message buffers)
- Modify data, status words or setup while card is running
- Programmable error injection (on a per word basis)
- Interrupts can be generated on a per message basis upon End of Message and error conditions

Bus Monitor
- Capture 100% fully loaded bus traffic with:
  - Time-tagging – Error status
  - Word status – Message status
  - RT response time
- Interrupts can be selected by RT / SA / WC
- Extensive filtering and triggering options
  - By individual RT/subaddress
  - Transmit, receive or broadcast mode codes
  - Internal or external triggering
  - Trigger output on user specified data
- Real-time bus playback with RT edit mode
- 45-bit, microsecond resolution timetagging

Ordering Information

R15-EC-1S	MIL-STD-1553 single-function, single dual-redundant channel
R15-EC-1M	MIL-STD-1553 multi-function, single dual-redundant channel
R15-EC-2S	MIL-STD-1553 single-function, two dual-redundant channel
R15-EC-2M	MIL-STD-1553 multi-function, two dual-redundant channel

Ordering Information

-W suffix	IRIG
-R suffix	Operating case temperature range not to exceed -40° C. to +65° C

Optional Software

BusTools/1553	MIL-STD-1553 Bus Analysis & Data Logging software for Windows
LV-1553	Lab/View support for MIL-STD-1553

About GE Intelligent Platforms

GE Intelligent Platforms is a division of GE that offers software, control systems, services, and expertise in automation and embedded computing. We offer a unique foundation of agile and reliable technology providing customers a sustainable competitive advantage in the industries they serve, including energy, water, consumer packaged goods, oil and gas, government and defense, and telecommunications. GE Intelligent Platforms is headquartered in Charlottesville, VA. For more information, visit www.ge-ip.com.

GE Intelligent Platforms Contact Information

Americas: **1 877 429 1553** Global regional phone numbers are listed by location on our web site at **defense.ge-ip.com/avionics-contacts**

defense.ge-ip.com/avionics