



# Q104-1553

## High Density PC/104-Plus Interface

### Features

- 1, 2 or 4 Independent MIL-STD-1553 Dual Redundant Channels
- Multi-function Features
  - Simultaneous Bus Controller, 31 Remote Terminals and Bus Monitor
- Single-function Features
  - Bus Controller or 31 Remote Terminals or Bus Monitor
- 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
- Remote Terminal – RT
  - 1 to 31 RTs
  - RT data wrapping
  - Multiple RT buffers
  - 1760 startup time w/busy bit set
  - Dynamic Bus Control
  - Automatic Mode Code and Status Bit responses
  - Programmable response time – RT Map Monitoring
  - Hardwired RT Address option
- Bus Monitor – BM
  - Full error detection
  - Multiple monitoring methods
  - 45-bit time-tagging
  - Adv. interrupts and triggers

- Architecture
  - BC & RT error injection/detection
  - BC & RT link list structures
  - 1 Mbyte RAM per channel
- Options
  - Environmental options
  - IRIG-B Receiver/Generator
  - Direct coupled stubs
  - PC/104 or PC/104-Plus

GE Intelligent Platforms Q104-1553 provides new levels of performance and flexibility for MIL-STD-1553A/B Notice II in the PC/104 (ISA backplane) and PC/104-Plus (PCI backplane) form factors. Available in commercial and ruggedized versions with one, two or four dual-redundant channels, the Q104-1553 includes advanced API (Application Programming Interface) software that reduces application development time. Standard features include 1 Mbyte of RAM per channel, 45-bit message time-tagging, triggers, extensive BC & RT link-list structures, error detection/injection, transformer coupling, automatic/manual RT Status Bit and Mode Code responses, programmable or hardwired RT Address lines (with 1760 startup times and busy bit set), along with advanced BC functionality. IRIG-B signal Receiver/Generator, direct coupled stubs and extended operating temperature range are optional. With the highest speed

encoder/decoder in the industry, the Q104-1553 Bus Monitor provides unparalleled error detection and 100% monitoring of fully loaded buses.

### Multi-function Interfaces

Q104-1553 multi-function interfaces are easily configured to operate with simultaneous Bus Controller, 31 Remote Terminals and Bus Monitor functionality.

### Single-function Interfaces

Single-function Q104-1553 interfaces have all the features and functionality of the multi-function versions, but only one major operational mode is enabled at a time. Each interface can independently emulate either a Bus Controller or 31 Remote Terminals or Bus Monitor.

### Software

Our high-level “abstract” 1553 API is provided in source code, along with integrated support for Microsoft® Windows® 7 (32 and 64bit), XP, 2000, Me, NT, 98, 95, VxWorks, QNX, Linux®, Solaris (Q104-1553-P only) and other operating systems. To access 1553 functionality without software development, BusTools/1553, GE’s MIL-STD-1553 bus analysis, simulation and data logging/monitoring solution is available.



# Q104-1553 – High Density PC/104-Plus Interface

## Specifications

### Physical

- Standard PC/104 card size (3.7" x 3.5")

### Environmental

- Commercial operating temp. range: 0 to +70° C
- Optional ruggedized, extended operating temperature range: -40 to +85° C

### Software

- API – High-level libraries with source code included for Windows 7 (32 and 64bit), XP, 2000, Me, NT, 98, 95, VxWorks, QNX, Linux and Solaris (Q104-1553-P only)
- GUI – Optional BusTools/1553 GUI bus analyzer
- Contact the factory about other OS support

### Universal PCI Signaling

- PC/104-Plus (5V or 3.3V)

### Connections

- Transformer coupling standard
- Input and output triggers
- Ten avionics-level I/O discretes
- Hardwired RT Address Lines
- 40 pin I/O connector with retaining device

### Multi-function Operational Modes

- Simultaneous BC, 31 RTs and BM

### Single-function Operational Modes

- BC or 31 RTs or BM

### Power (at 87% duty cycle)

- +5 VDC 1 channel 600 mA
- 2 channels 990 mA
- 4 channels 1.63 A

### On-board Shared RAM

- 1 Mbyte (per dual-redundant channel)

### Options

- PC/104 or PC/104-Plus support
- IRIG-B Rec. (AM or DC/TTL)/Gen. (DC/TTL)
- Direct coupled stubs
- Environmental options

## Description

### Bus Controller

- Programmable control over:
  - Major and minor frame content and timing
  - Intermittent gap times
  - Response time-out and late response
- Modify messages, data or setup on the fly
- Insert aperiodic messages into a running BC list
- Conditional message sequencing based on real-time message data or status
- Selectable interrupt generation and status messages on full range of system conditions or all detected errors
- Synchronize BC operation to external time source

### 45-bit micro second resolution time tagging on BC, RT and BM

- Over a full year of time stamping

### Programmable full error detection/injection available on BC and RT and full detection available on BM (on a per word basis)

- Invalid word
- Bit count error
- High word
- Low word
- Inverted sync
- Manchester
- Late response
- Early response
- No response
- Incorrect RT address
- Parity error

### Remote Terminal

- Multiple RT simulation (up to 31 RTs)
- Modify data, status words or setup while card is running
- Programmable message content (linked message buffers)
- Selectable interrupts upon multiple conditions
- RT Map Monitoring

### Bus Monitor

- Capture 100% fully loaded bus traffic with:
  - Time-tagging
  - Error status
  - Word status
  - Message status
- 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

### No cost library card driver upgrades

## Ordering Information

|                     |  |
|---------------------|--|
| <b>Q104-1553-1M</b> | MIL-STD-1553 multi-function, single channel, fixed voltage PC/104 interface  |
| <b>Q104-1553-2M</b> | MIL-STD-1553 multi-function, two channel, fixed voltage PC/104 interface     |
| <b>Q104-1553-4M</b> | MIL-STD-1553 multi-function, four channel, fixed voltage PC/104 interface    |
| <b>Q104-1553-1S</b> | MIL-STD-1553 single-function, single channel, fixed voltage PC/104 interface |
| <b>Q104-1553-2S</b> | MIL-STD-1553 single-function, two channel, fixed voltage PC/104 interface    |

## Order options

|                  |   |
|------------------|---|
| <b>-P suffix</b> | PC/104-Plus PCI Bus Configuration                 |
| <b>-D suffix</b> | Direct coupled stub option                        |
| <b>-R suffix</b> | Ruggedized, extended operating temperature option |
| <b>-W suffix</b> | IRIG-B Receiver (AM or DC/TTL)/Generator (DC/TTL) |

## Optional Software

|                      |  |
|----------------------|--|
| <b>BusTools/1553</b> | MIL-STD-1553 Bus Analysis, Simulation & Data Logging software for Windows (multi-function boards only) |
| <b>LV-1553</b>       | LabVIEW 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](http://www.ge-ip.com).

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