



# 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 Fanuc Embedded Systems' 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 Windows 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 Fanuc Embedded Systems' 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 XP, 2000, Me, NT, 98, 95, VxWorks, QNX, Linux and Solaris (Q104-1553-P only)
- GUI – Optional BusTools/1553 GUI bus analyzer (multi-function boards only)
- Contact the factory about other OS support

### 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
  - Intermessage gap times
  - Response time-out and late response
  - Multiple BC retry
- 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
  - Bit count error
  - High word
  - Low word
  - Inverted sync
  - Manchester
  - Late response
  - Early response
  - No response
  - Incorrect RT address
  - Parity error
- 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 error injection (on a per word basis)
- Modify data, status words or setup while card is running
- Programmable message content (linked message buffers)
- Interrupts can be generated on a per message basis upon End of Message and error conditions
- RT Map Monitoring

### Bus Monitor

- Capture 100% fully loaded bus traffic with:
  - Time-tagging
  - Word status
  - RT response time
  - Error status
  - Message status
- Interrupts can be selected by RT / SA / WCCMOS
- 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
- IRIG/GPS synchronization

### Universal PCI Signaling

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

### No cost library card driver upgrades

## Ordering Information

- Q104-1553-1M:** MIL-STD-1553 multi-function, single channel, fixed voltage PC/104 interface  
**Q104-1553-2M:** MIL-STD-1553 multi-function, two channel, fixed voltage PC/104 interface  
**Q104-1553-4M:** MIL-STD-1553 multi-function, four channel, fixed voltage PC/104 interface  
**Q104-1553-1S:** MIL-STD-1553 single-function, single channel, fixed voltage PC/104 interface  
**Q104-1553-2S:** MIL-STD-1553 single-function, two channel, fixed voltage PC/104 interface
- P suffix:** PC/104-Plus PCI Bus Configuration  
**-D suffix:** Direct coupled stub option  
**-R suffix:** Ruggedized, extended operating temperature option  
**-W suffix:** IRIG-B Receiver (AM or DC/TTL)/Generator (DC/TTL)

## About GE Fanuc Embedded Systems

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## GE Fanuc Embedded Systems Information Centers

Americas:  
1 800 322 3616 or 1 256 880 0444

Asia Pacific:  
86 10 6561 1561

Europe, Middle East and Africa:  
+49 821 5034-0

## Additional Resources

For more information, please visit the GE Fanuc Embedded Systems web site at:

[www.gefanucembedded.com](http://www.gefanucembedded.com)

