RAR15-XMC-FIO

High Density MIL-STD-1553 and ARINC 429 XMC Front I/O Module

Abaco Systems' embeddable RAR15-XMC-FIO is the latest generation of performance and flexibility for MIL-STD-1553A/B Notice II and ARINC 429 on an XMC.0 mezzanine card. The RAR15-XMC-FIO includes advanced API (Application Programming Interface) software that reduces application development time. Standard features include 8 MBytes of RAM, 64-bit, 25ns bit message time tagging, extensive bus controller (BC) and remote terminal (RT) link-list structures, error injection/detection, automatic/ manual RT status bit and mode code responses, along with advanced BC functionality. The RAR15-XMC-FIO bus monitors provide exceptional error detection and 100% monitoring of fully loaded buses. Conformal coating is optional on the RAR15-XMC-FIO.

ARINC 429 Message Handling
On-board firmware, large data buffers, and a high-level API are integrated to provide total flexibility in monitoring and generating ARINC bus traffic. Simultaneous scheduled and burst mode (FIFO) messaging is supported on all ARINC 429 transmit channels. Each ARINC 429 receive channel provides simultaneous Dedicated and buffered mode storage, along with label/SDI filtering.

Three different methods are provided to buffer received messages:

- Buffered mode utilizes a separate circular buffer for each channel.
- Merged mode combines all received messages into a single, time-sequenced circular buffer
- Dedicated mode provides a snapshot of the latest message by label or label+SDI

ARINC 429 Architecture
The RAR15-XMC-FIO features include independent, software programmable data rates and parity, error detection error injection. All channels operate independently.

MIL-STD-1553 Multi-function Interfaces
RAR15-XMC-FIO multi-function interfaces are easily configured to operate with simultaneous bus controller, up to 31 remote terminals and bus monitor functionality.

MIL-STD-1553 Dual-function Interfaces
Dual-function RAR15-XMC-IT interfaces have all the features of the multi-function versions, with either bus monitor and bus controller or bus monitor and 31 remote terminals.

Software
Abaco Systems provides an advanced 1553 and ARINC 429 API in source code along with support for Microsoft Windows 7, Vista, XP (32- and 64-bit), Linux, INTEGRITY and VxWorks. Contact your local sales person for additional operating system support.

FEATURES:

- 2 or 4 dual-redundant MIL-STD-1553A/B
- Notice II channels
- 10 ARINC 429 receive channels
- 4 or 8 bidirectional ARINC 429 channels
- XMC.3 (PCIe®) host interface
- Standard industrial operating temperature of -40°C to +70°C ambient
- Front I/O
- Simultaneous bus controller (BC), up to 31 remote terminals (RT) and bus monitor (BM)
- Multi-function or dual-function (BC and BM or RT and BM) 1553 operation
- High-level API for Microsoft® Windows® 7, Vista®, XP® (32- and 64-bit), Linux®, INTEGRITY®, and VxWorks® included. Contact your local sales person for additional operating system support.
- Bi-directional avionics level discretes individually configurable as 1553 output or input triggers
- Flexible hardware remote terminal addressing
- IRIG receiver
- 64-bit, 25ns bit message time-tagging
- External differential time-tag reset and clock inputs
- Complete message programmability
- Flexible message status/interrupt generation
- Error injection/detection
- 1760 level compatible
- RoHS compliant to EU directive 2002-95-EC

RAR15-XMC-FIO *High Density MIL-STD-1553 and ARINC 429 XMC Front I/O Module*

Specifications

Physical
- XMC mezzanine card (74mm x 149mm without bezel)
- Front I/O interface

Environmental
- Standard front I/O operating temperature range: -40°C to +70°C ambient
- Relative humidity: Up to 95% (non-condensing)

Software Support
- API – High-level libraries with source code included for Microsoft Windows 7, Vista, XP (32 and 64 bit), Linux, Integrity and VxWorks. Contact your local sales person for supported software.

ARINC 429 Receive Channels
- 10 receive channels
- Data rates: 12.5 KHz, 100 KHz or 5 KHz to 150 KHz programmable
- Standard input levels: ±6.5 to ±13 VDC (A to B)
- Filtering: Label and/or SDI
- Parity: Odd, even or none
- Error reporting: Parity

ARINC 429 Bidirectional Channels
- 8 fully compliant bidirectional channels
- Data rates: 12.5 KHz, 100 KHz or 5 KHz to 150 KHz programmable
- Automatic transmit slew rate adjustment
- Transmit output level: ±10 VDC (A to B)
- Parity: Odd, even or none
- Transmit error injection option: parity, gap, high or low bit count

Power (4 channels at 75% duty cycle into transformer coupled bus)
- VPWR (+5 or +12)
- Quiescent = 160 mA @12V typ
- Power 25% channel transmit rate = 420mA@12V typ
- Power 75% channel transmit rate = 820mA@12V typ

On-board Shared RAM
- 8 MBytes

Optional Configurations
- Dual or multi-function
- Rugged extended temp -40°C to +75°C ambient
- Conformal coated
- Contact factory for custom requirements

Timing
- Independent 64-bit, 25ns message time-tagging per channel
- Time can be programmed via the host or by a 1553 trigger
- All timers can be synchronized to 0 via the host
- Timers can independently use IRIG time
- Differential IRIG-B receive, single ended, IRIG TX
- Selectable external time-tag clock input provided
- Selectable external time tag reset input provided

Discretes
- 6 or 12 bidirectional avionics discretes

RT Addressing
- External (via discretes) Flash-based channel offsets
- Flash-based only
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1993 Descriptions

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

Dual-function Operational Modes
- BC and BM or 31 RTs and BM

Bus Controller
- Programmable control over major and minor frame content and timing – Inter-message gap times
- Programmable control over 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
- Programmable error injection (on a per word basis) See full error detection/injection table below

Bus Controller (continued)
- Synchronize BC operation to external time source or trigger
- Multiple BC data buffers

Full error detection/injection
- Invalid word – Late response
- Bit count error – Early response
- High word – No response
- Low word – Incorrect RT address
- Inverted sync – Parity error
- Manchester – Invalid command

Remote Terminal
- Multiple RT simulation (up to 31 RTs)
- Programmable error injection (on a per word basis) See Full error detection/injection table
- Modify data, status words or setup while card is running
- Programmable message content
- Selectable interrupts
- 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
- IRIG/GPS synchronization

Ordering information

RAR15-XMC-FIO-1042DA	MIL-STD-1553 and ARINC 429 XMC Interface Card with 10RX, 4 Bidirectional, ARINC 429 Channels; 2 Ch Dual-function 1553, Front I/O, -40°C to +70°C Operating Temp, Fixed Volt, Relay Coupled, 12 Avionics Discretes, Mating Connector
RAR15-XMC-FIO-1042MA	MIL-STD-1553 and ARINC 429 XMC Interface Card with 10RX, 4 Bidirectional, ARINC 429 Channels; 2 Ch Multi-function 1553, Front I/O, -40°C to +70°C Operating Temp, Fixed Volt, Relay Coupled, 12 Avionics Discretes, Mating Connector
RAR15-XMC-FIO-1084DA	MIL-STD-1553 and ARINC 429 XMC Interface Card with 10RX, 8 Bidirectional, ARINC 429 Channels; 4 Ch Dual-function 1553, Front I/O, -40°C to +70°C Operating Temp, Fixed Volt, Relay Coupled, 6 Avionics Discretes, Mating Connector
RAR15-XMC-FIO-1084MA	MIL-STD-1553 and ARINC 429 XMC Interface Card with 10RX, 8 Bidirectional, ARINC 429 Channels; 4 Ch Multi-function 1553, Front I/O, -40°C to +70°C Operating Temp, Fixed Volt, Relay Coupled, 6 Avionics Discretes, Mating Connector

Optional Hardware

-R suffix	Ruggedized, extended temperature
-K suffix	Conformal coated
-CBL suffix	Includes transition cable

Optional Software

BT-1553	MIL-STD-1553 GUI Bus Analysis (BusTools/1553), Simulation and Data Logging Software (BusTools/1553) for Windows 7 (32- and 64-bit) XP/2000/NT

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