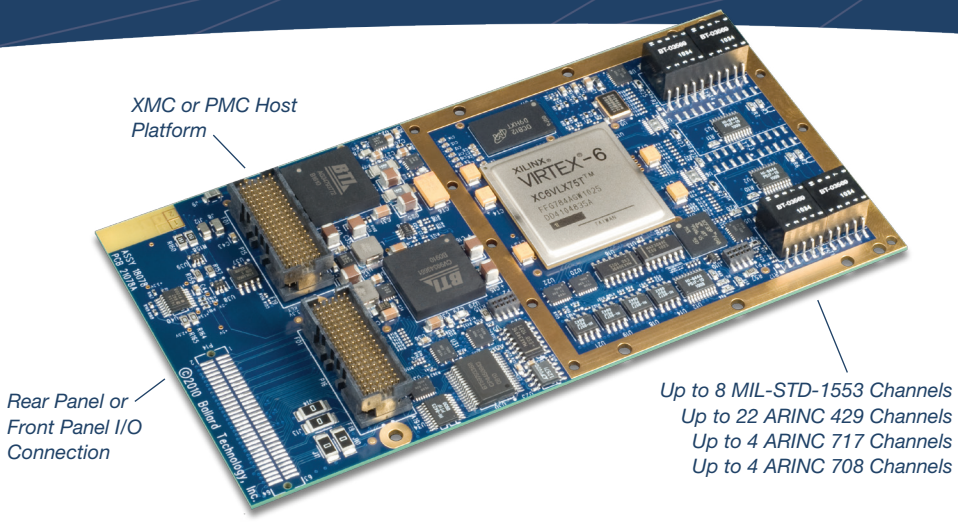
Mx5 Multi-Protocol
XMC & PMC Interfaces

Available Protocols

- MIL-STD-1553 (Single or Multi-Function)
- ARINC 429
- ARINC 708
- ARINC 717
- Serial (RS-422/485)
- Avionics Discrete I/O
- Differential Discrete I/O



XMC & PMC Interfaces to multiple simultaneous avionics protocols

The Mx5 family of XMC and PMC cards enable electronic systems to interface with commercial and military avionics databuses. They provide extensive functionality and are used to communicate with, simulate, test, and monitor MIL-STD-1553, ARINC 429, ARINC 717, and ARINC 708 equipment and systems. These high-density high-performance cards are suitable for applications ranging from test equipment to rugged deployable systems.

A wide selection of models are available: XMC and PMC, front and rear panel I/O, and with an assortment of protocols, channel counts and capabilities. All models may be used in either conduction or convection cooled systems. Each card can be ordered with one or more avionics protocols, saving card space, while providing the most cost effective solution.

All models include avionics discretes, timers, IRIG synchronization/generation, and differential interfaces usable as discrete I/O.

Hardware

Mx5 cards incorporate the latest 5th generation protocol engine and use bus mastering to yield high performance. They support maximum data throughput on all channels and have a large 64 MB built-in memory with error correction.

Once configured, the Mx5 hardware performs all protocol processing. It manages the reception, transmission, error checking, time-tagging and buffering of messages. This frees the host software to focus on high-level user-specific processing.

Software

Users can develop their own software applications with the included BTIDriver API. With only a few function calls a program can operate an Mx5 and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, time-tagging, and manipulating data. With BTIDriver, application code migrates seamlessly to and from other Ballard devices, reducing development time and costs. A translation driver allows use of code from older (non-BTIDriver) Ballard devices.

Features

- Interface XMC or PMC to Multiple Avionics Databus Protocols with a Single Card
- 8 Avionics Discrete I/O
- IRIG A/B PWM and AM
- 64 MB ECC Data Memory
- Extensive Built-in Test (BIT)
- Small, Portable, and Rugged

Software

- Universal BTIDriver™ API compatible
- Efficient DMA monitoring
- Compatible with other Ballard hardware
- Translator for older Ballard devices

Benefits

- Choice of XMC or PMC backplane
- Powerful protocol engine relieves host
- Mixed protocol saves system space
- Rugged design (MIL-STD-810)
- Free customer support for product life
- Standard limited warranty
- RoHS compliant

Applications

- Rugged deployed systems
- Embedded test systems
- High performance simulators
- Demanding requirements
- Mixed protocol systems
- Avionics upgrades and retrofits
- Databus health monitoring

Ballard TECHNOLOGY

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Mx5 Multi-Protocol
XMC & PMC Interfaces

Available Interfaces

MIL-STD-1553
Up to 8 dual-redundant channels
BC/RT/MON (Single- or Multi-Function)
Hardware controlled transmit scheduling
CH/TA/SA filtering
Sequential monitor
Error injection (Multi-Function only)

ARINC 429/575
Up to 22 channels (18R4T or 20R1T max)
Periodic and asynchronous messages
Hardware controlled transmit scheduling
Receive message filtering (Label/SDI)
Sequential monitor

ARINC 708/453
Up to 4 channels (2R2T)
Hardware controlled transmit scheduling
Receive message filtering
Sequential monitor

ARINC 717/573
4 channels (2R2T)
Biphase/Bipolar
Transmit and receive
Sub-frame and super-frame support
64, 128, 256, 512, 1024, 2048, 4096, 8192 wps
Sequential monitor

Differential Discretes
Up to 4 Differential Discrete I/O

RS-422/485 Serial
Up to 4 ports
Contact factory for availability

Other Features

Base Model Features
- 6 Avionics Discrete I/O
- 2 In, 2 Out differential discretes
- 4 Virtual discretes
- IRIG A/B input and output
- 2 LED indicators
- 64 MB ECC (error correction) memory

Discrete I/O
Avionics discretes: programmable, open/Gnd, input/output
Differential discretes: RS-422
Virtual discrete: synchronize events
Log transitions to sequential record

Time-tag/IRIG
48-bit hardware time-tag (1µs resolution)
IRIG A or B, AM, PWM, and PPS modes
Generate or synchronize (AM input only)
Synchronize hardware time-tags

Interrupts/Logging
Poll or use interrupts
Configurable event log
Programmable event logging/interrupts from messages, BC schedule, and buffers

Sequential Monitor
A time-tagged record of selected activity on 429, 717, 708, and discrete I/O
Filter 429 data by channel/label/SDI
Includes ARINC data, channel, speed, errors, and time-tag
Efficient DMA monitor to host

Built-in Test Features
Power-on BIT (PBIT)
Continuous BIT (CBIT)
Initiated BIT (IBIT)

Specifications
Component temperature: -40 to 85°C
Storage temperature: -55 to 100°C
I/O Connectors: SCSI-68 (front I/O), P14/P16 (rear I/O)
Dim: 74 x 143.75 mm
ME5 (XMC) PCI Express bus: x4 lane, bus mastering, power adapts to VPWR
MP5 (PMC) PCI-X bus: 33/66/133 MHz, 32/64 bit, 3.3 VIO

Software
Universal BTIDriver API for C/C++, C#, VB, VB.Net, and LabVIEW™
MS Windows® and Linux® OS drivers
Translation DLLs for older Ballard devices
Call for latest language and OS support.

Ordering Information

Hardware
Includes manuals and software CD.

Part Number Example:

M**E**5**R**/**8M**-**20R4T**-**717**-**7082**/**FXY**[1]

- Form Factor
  - **E** = XMC
  - **P** = PMC
- I/O Panel Connection
  - **R** = Rear I/O
  - **F** = Front I/O
- MIL-STD-1553
  - **1-8** = 1-8 Channels
- MIL-STD-1553 Functionality (all channels)
  - **S** = Single, **M** = Multi
  - **RM** = RT or Monitor
- 429 Channels
  - Up to **20R**[2], up to **4T**[2]
- ARINC 717 Channels
  - **717** = 2R2T
- ARINC 708 Channels
  - **7081** = 1R1T, **7082** = 2R2T
- Available Options
  - **FXY** = Conformal Coating
  - **P14** = Adds P14 connector to XMC

1 For zero channels of a protocol, eliminate that section of the part number (as shown below). Part number example shows maximums for all channels, which is not a possible combination.
2 Maximum for ARINC 429 is 20R1T or 18R4T
3 Call for available model configurations

Following are a few example configurations:

Model ME5R/4M-10R4T – Rear panel I/O XMC with base model features plus 4 dual-redundant multi-function MIL-STD-1553 and 10R/4T ARINC 429 channels

Model MP5F/14R4T-717-7082 – Front panel I/O PMC with base model features plus 14R/4T ARINC 429, 2R2T ARINC 717 and 2R2T ARINC 708 channels

Model MP5R/8M/FXY – Rear panel I/O PMC with base model features plus 8 dual-redundant multi-function MIL-STD-1553 channels with conformal coating

Cables and Accessories
Order separately. Ballard offers a wide selection. Visit www.ballardtech.com or call for more information.

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