Built**SAFE**™ RIO4-8072

Freescale®-Based 6U VME64x Single Board Computer

mercury systems™

- **Freescale MPC7448 processor**
- **Xilinx Virtex-5 LX30 user-programmable FPGA**
- **Board Management Controller**
- **2x PMC sites**
- **Static routing module (FlexIO™) (optional)**
- **Requires only +5V power**
- **Multiple Operating Systems version support**
- **Commercial Air-Cooled packaging**
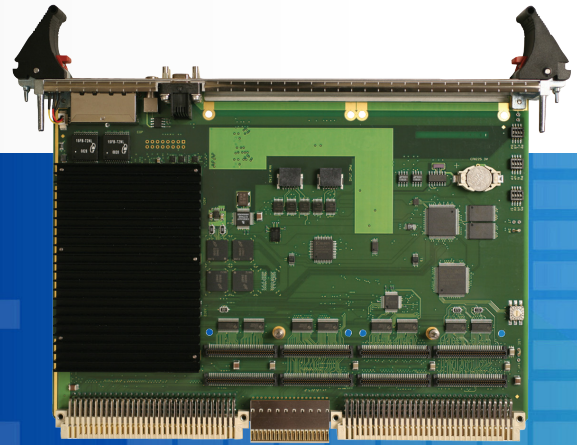
Mercury's BuiltSAFE™ products bring the highest level of flight safety assurance to aerospace and defense applications. Our proven, reusable Design Assurance Level (DAL) certified artifacts for mission computing, avionics, networking and datalink comms processing save time and cost while decreasing risk.

The BuiltSAFE RIO4-8072 is a commercial, air-cooled 6U VME/VME64x Single Board Computer. It is available in three and five-row DIN connector versions and requires only +5V power, therefore it will fit in any VME enclosure.

The RIO4-8072 is the fourth generation of Mercury 6U VME PowerPC computing platform. Multiple models of the RIO4-8072 are available, according to the type of VME-P0 interface. Some models can be equipped with customer-specific I/O lines, communication or serial lines on the VME-P0.

For easy configuration of the I/O pinout and support of legacy pinout requirements a static routing module (FlexIO™) is placed in between the different I/O sources and the backplane connector. Combined with the onboard FPGA-based PCIe to VME bridge, FlexIO makes the BuiltSAFE RIO4-8072 ideal for legacy replacement in ground air-cooled applications.

BuiltSAFE for Avionics

Mercury's expertise and experience in safety certifiable solutions has been built on successful execution of dozens of programs over three decades. This domain knowledge is the foundation of our BuiltSAFE portfolio of open architecture modules, systems and software for avionics, communications, video servers, and mission computing.

Technical Specifications

Compliance

Air-cooled 6U VME64x

Power Consumption

Minimum	typical	maximum	units
-	18	27	Watts

Processor

Freescale® MPC7448 at 1.0 GHz

Memory

256/512 MB DDR2 SDRAM at 1.3 GB/s peak
128 MB Flash (NAND)
64 MB Flash (NOR)
32 KB NVRAM

Mercury Systems is a leading commercial provider of secure sensor and mission processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.

ACQUIRE   DIGITIZE   PROCESS   STORAGE   EXPLOIT   DISSEMINATE

FPGA/User-Programmable/User I/O Lines

Xilinx Virtex-5 LX30 user-programmable FPGA
   (8kLUTs-6 free for user-defined applications)

16x user-specific I/O lines on VME-P2 [A] [D] [H]

64x user-specific I/O lines on PMC-J14 to VME-P2 [A] [D] [H] [R]

32x user-specific I/O lines on PMC-J24 to VME-P0 [A] [H]

Switches/Bridges

1x FlexIO static routing model (backplane configurable pin-out) [C] [P]

Buses

1x 64-bit VME64x 2eSST bus on VME-P1/P2

1x 32/64-bit PCI 2.2 bus at 33 MHz on VME-P0 (optional)

1x 64-bit PCI 2.2 bus at 33 MHz on PMC-J11/J12/J13/J21/J22/J23 [A] [D] [H] [R]

1x 64-bit PCI 2.2 bus at 33/66 MHz on PMC-J11/J12/J13/J21/J22/J23 [C] [P]

One 32-bit PCI 2.2 bus at 55 MHz on Ethernet

High-Speed Links / Connections

1x 10/100Base-TX / 1000Base-T on RJ45 connector [C] [P]

2x 10/100Base-TX / 1000Base-T on RJ45 connectors [A] [D] [H] [R]

2x RS-232 on µDB9 connector

(A) Applies to "A" Model
(C) Applies to "C" Model
(D) Applies to "D" Model
(H) Applies to "H" Model
(P) Applies to "P" Model
(R) Applies to "R" Model

PMC/XMC Sites

2x PMC sites (+5V tolerant)

Board Management Controller

Voltage monitoring

Temperature monitoring (thermal sensors on critical positions)

Development/Debug

Onboard JTAG test port

Xilinx ChipScope Pro FPGA debugging tool

Ruggedization Levels

Level	Description	Cooling Type	Operating Temperature	Vibration (1 hour per axis)	Operating Shocks
A1	Commercial AC	Forced Air*	0°C to 55°C [AC1]	5-100 Hz: increase at 3 dB/octave, 100-1000 Hz: 0.04 g^2/Hz, 1000-2000Hz: decrease at 6 dB/octave	20g, 11ms saw-tooth, three axes

Environmental Specifications

Condition	Limits, standards	Comments
Non-operating temperature	-55°C to 105°C [C4]	
Humidity	95%	
Altitude	-1,500 to 60,000 feet	May require conformal coating
Fungus resistance	No nutrient materials	
Workmanship	IPC-A-160 class 3	
Soldering	IPC J-STD-001 class 3	
PCB Manufacturing	IPC-A-600 class 3	
Conformal coating	IPC-CC-830	Optional
Materials	REACH compliant	ROHS variants as an option
Flammability	UL 94 Class V-0	
Quality	EN 9100:2008	

Product Ordering

RIO4-8072AD   Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 256 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (custom VME-P0)

RIO4-8072CE   Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (Pinout: v1)

RIO4-8072DE   Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (no VME-P0)

RIO4-8072PE   Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (Pinout: v2)

RIO4-8072RE   Air-cooled 6U VME SBC with MPC7448 @ 1 GHz, 1 MB L2, 512 MB, DDR2, 128 MB NAND, 64 MB NOR, 32 KB NVRAM, Virtex-5 LX (3 rows, no VME-P0)

OWL-30850A   Lynx OS® Bundled Package

OWW-30570K   VxWorks® BSP for RIO4

OWW-37570B   VxWorks 653 BSP for RIO4

OWX-30840H   Linux® Toolbox for RIO4

Related Hardware Products

DGB-6207P0   Rear I/O Transition Board for RIO4-8072C/P

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MERCURY MISSION SYSTEMS INTERNATIONAL S.A.
Avenue Eugène-Lance 38, PO Box 584
CH-1212 Grand Lancy 1 • Geneva – Switzerland
+41 (0)22 884 51 00

CORPORATE HEADQUARTERS
50 Minuteman Road • Andover, MA 01810 USA
(978) 967-1401 • (866) 627-6951 • Fax (978) 256-3599

www.mrcy.com