

# BuiltSAFE™ RIO6-8093

*Freescale® QorIQ® P2 6U VME Single Board Computer (SBC)*

- Board Management Controller (BMC)
- Freescale® QorIQ® P2020 processor
- Xilinx Spartan®-6 LXT user-programmable FPGA
- Static routing module (FlexIO™)
- 2x PMC/XMC sites
- Rugged 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 RIO6-8093 is an air-cooled, 6U VME Single Board Computer for ground applications. It is specifically designed for the most demanding applications, which require very high compute capabilities.

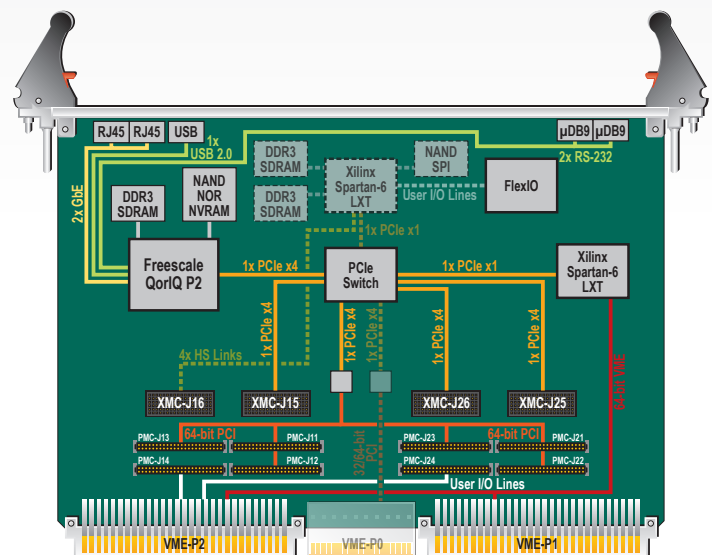
The BuiltSAFE RIO6-8093 is a sixth generation 6U VME PowerPC compute platform. It combines a fast dual-core processor with modern interconnect high-speed links and bridges (PCIe, Gigabit Ethernet) and programmable FPGA for application development.

The BuiltSAFE RIO6-8093 provides a PCI connection over the VME-P0 connector. This additional bus routed on the backplane enables VMEbus offload for operations such as splitting the data plane from the control plane.

For an easy configuration of the I/O pinout and support of legacy pinouts a static routing module (FlexIO) is placed between the different I/O sources and the backplane. Combined with the onboard FPGA-based PCIe to VME bridge FlexIO makes the RIO6-8093 a versatile fit for legacy placements requiring additional compute performance.

## 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.



*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

## Technical Specifications

### Compliance

Air-cooled 6U VME64x  
Power Consumption  
25 Watts (typical)

### Processor

Freescale QorIQ P2020 (2 cores) @ 1.0 GHz

### Memory

1 GB DDR3 SDRAM at 6.4 GB/s peak with ECC protection  
2 GB Flash (NAND)  
128 MB Flash (NOR)  
256 KB NVRAM

### FPGA/User-Programmable/User I/O Lines

Xilinx Spartan-6 LX100T FPGA with dual 128 MB DDR3 SDRAM, 4 GB Flash (NAND) and 8 MB Flash (SPI)

32x user-specific I/O lines on PMC-J14 to VME-P2

48x user-specific I/O lines on PMC-J24 to VME-P2

64x user-specific I/O lines on FPGA to CES FlexIO

### IO Customization

1x FlexIO static routing module (interconnect between PMCs/XMCs, VME-P2 and user FPGA)

### Buses

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

1x 64-bit PCI 3.0 bus at 33/66 MHz on VME-P0

1x 64-bit PCI 3.0 bus at 33/66 MHz on PMC-J11/J12/J13/J21/J22/J23

### High-Speed Links/Connections

3x PCIe x4 on XMC-J15/J25/J26 (1x each) (VITA 42.3)

2x 10/100Base-T /1000Base-T on RJ45 connector

1x USB 2.0 host on USB connector

2x RS-232 on µDB9 connectors (COM 0 supports external trigger input/output) <sup>(T)</sup>

4x high-speed links on FPGA to XMC-J16 <sup>(1)</sup>

(T) "T" model only

(1) Depends on FPGA configuration

### Sites

2x PMC/XMC sites (VITA 42.3)

### Board Management Controller

Power management

Board start-up and 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 <sup>2</sup> /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

RIO6-8093AF	Air-cooled 6U VME SBC with QorIQ P2020 @ 1.0 GHz, 512 KB L2, 1 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM, Spartan-6 LXT
RIO6-8093TF	Air-cooled 6U VME SBC with QorIQ P2020 @ 1.0 GHz, 512 KB L2, 1 GB DDR3, 2 GB NAND, 128 MB NOR, 256 KB NVRAM, Spartan-6 LXT, external trigger input/output on front panel
OWW-30920B	VxWorks® BSP for RIO6-809x
OWW-30930E	VxWorks 653 BSP for RIO6-809x
OWX-30930D	Linux® Toolbox for RIO6-809x

### Related Hardware Products

BPA-6413A0	Passive blackpane adaptor (2 slots)
BPA-6414A0	Passive blackpane adaptor (3 slots)
PEB-6416A0	6U VME PMC carrier board

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INNOVATION THAT MATTERS™

#### 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