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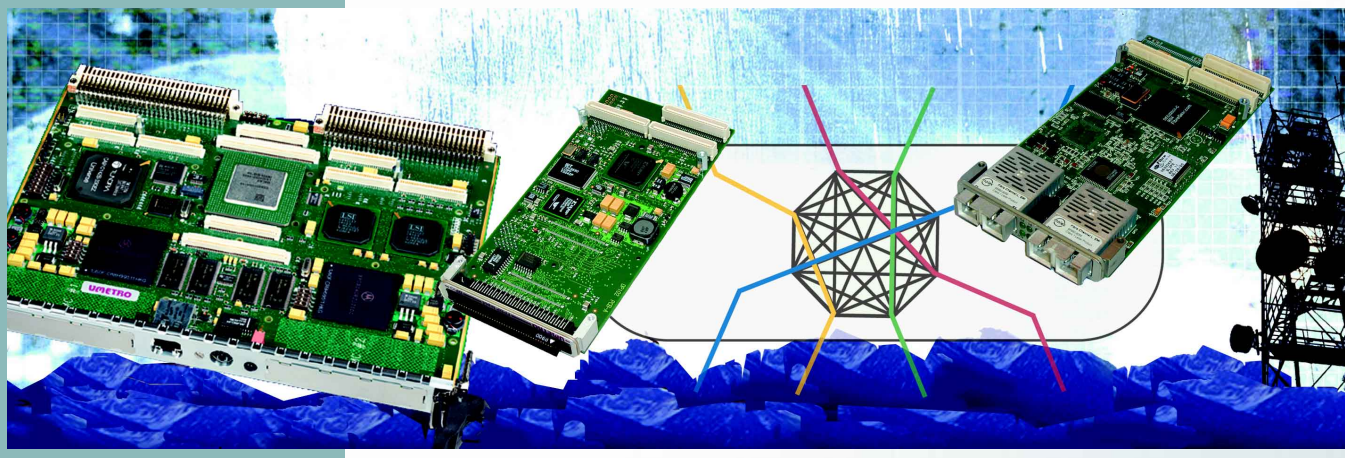
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Find the *Curtiss-Wright / VMETRO M2200SR2/128* at our website: *Click HERE*

# PowerMIDAS™

## PMC I/O Subsystem for RACE++/RACEway & VMEbus



***...essentially about bridging between:***

- ***PMC ⟷ PMC***
- ***PMC ⟷ Disk Recording***
- ***PMC ⟷ RACE***



RACEway READY

RACE++ SERIES

VMETRO

www.vmetro.com

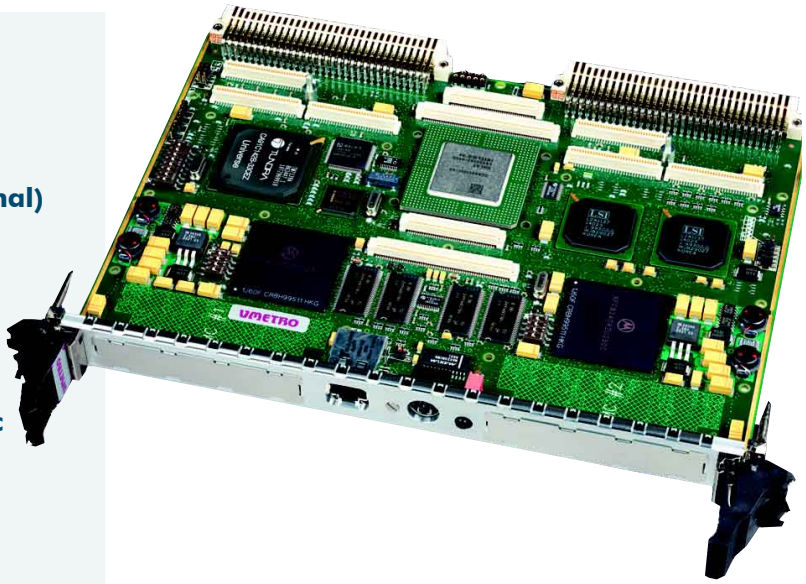
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# PowerMIDAS™

## PMC I/O Subsystem for RACE++/RACEway & VMEbus

### FEATURES

- **266 MBytes/sec RACE++ 2nd generation RACEway compatible**
- **Dual-Port RACE using two PXB++ (optional)**
- **Twin 64-bit PCI buses each with 266 MBytes/sec bandwidth**
- **100 MHz i960RN I/O processor with 532 MBytes/sec Local Memory bandwidth**
- **Twin i960RN version gives > 1 GByte/sec Memory bandwidth**
- **One or two MPC 8240 PowerPC allows protocol- intensive I/O processing**
- **"Swinging Buffers" operation for continuous Data Acquisition applications**
- **Onboard Fast Ethernet I/F**
- **Ruggedized and Extended temperature range versions available**
- **MC/OS™ support with DX-like API for selected PMC modules**
- **VxWorks® BSP available**



### i960RN: max MB/s

**For streaming oriented applications**

A central element of the PowerMIDAS is the Intel i960RN processor. The highly integrated i960RN contains a powerful 100 MHz RISC I/O processor, two 64-bit PCI bus ports with an on-chip PCI-to-PCI bridge, an ultra-fast 532 MB/s SDRAM memory interface and powerful flexible DMA-controllers with linked-list capability. The 1200 series contains a single i960RN and is available in two PMC configurations. The SR models have a symmetrical PMC layout, i.e. one PMC on each PCI bus. The MR version has both PMCs on the secondary PCI bus (see figures on following pages).

### Dual i960RN

For applications that need extreme memory bandwidth or extra processing power, PowerMIDAS is also available with one or two 100 MHz i960RN processors, giving up to 1 GByte/sec total memory bandwidth (2000 series). Each i960RN has a 64 or 128 MByte SDRAM with ECC, and 2 MByte FLASH memory. The second i960RN is placed on a daughtercard together with 64 or 128 MB of SDRAM. Thus, 1200 models can be field upgraded to 2200 models.

### Introduction to PowerMIDAS

The PowerMIDAS series are unique PMC I/O Subsystems for the 2nd generation RACE++ version of RACEway, as well as for the original RACE 1.0. The boards carry two to five PMC modules with an architecture optimized for high bandwidth flow-through applications, with two separate 64-bit PCI buses. Each PCI bus may be equipped with its own PXB++ interface to the RACE++ crossbar network, providing support for the Dual-port RACE (with the 5-row DIN connector).

The boards are offered in different versions, with a choice of i960RN or PowerPC processor architectures and with various PMC configurations. There is also a choice of ready-to-run Fibre Channel or Parallel I/O solutions for Mercury's RACE/RACE++ series (MIDAS RX, preprogrammed boards bundled with appropriate PMC modules and MC/OS™ API, see page 3). Finally, a VxWorks environment allows customers to make their own I/O solution based on the vast number of PMC modules available on the market (see "Four ways of using PowerMIDAS", page 3).

### Applications

PowerMIDAS is designed to solve the most demanding I/O requirements in RACE++/RACEway systems, in particular for applications such as:

- **Sensor Data Acquisition (Radar/Sonar/Intelligence)**
- **Real-time Recording**
- **Digital Signal Processing**
- **Image Inspection & Generation**


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## PowerPC: max MIPS

### For custom I/O solutions (VxWorks) and protocol- intensive applications

The PowerMIDAS 3000 series is offered with one or two 250 MHz PowerPC MCP8240 processors. Each of these processors are attached to a 2MByte FLASH and a 64MByte SDRAM with ECC and an ultra-fast 64-bit 100 MHz (800 MB/s) memory interface. In addition, the board has one i960RN acting merely as a PCI bridge and providing a high-bandwidth (532 MB/s) shared memory of 64 or 128 MB (normally this CPU is not running any code). The PowerPC is an attractive solution for customers who want to program their own I/O solution based on the widely used VxWorks and PowerPC architecture, taking advantage of the wide variety of PMC cards that are available on the market for VxWorks/PPC drivers.

### Onboard Ethernet I/F

PowerMIDAS provides an onboard Fast Ethernet I/F to give a direct connection to a network. This simplifies software development and eliminates the need to use a PMC slot for the network connection.

### 3.3V power to PMCs

PowerMIDAS provides onboard 5V-to-3.3V power converters that supply 3.3V power to the CPUs, SDRAM as well as the PMC positions on the board. This allows the use of practically all PMC modules available on the market.

### Ruggedized versions

VMETRO offers ruggedized versions of selected models of PowerMIDAS, characterized for extended temperature range, shock, vibration, altitude and humidity. These boards are equipped with extra and/or special hardware to improve tolerance to shock and vibration. (See specifications on page 7.)

## Four ways of using PowerMIDAS:

### 1. Customer programmed MIDAS boards with PMC modules

**BSP and RACE drivers for custom PMC to RACE and PMC-to-PMC bridging**

To facilitate custom advanced real-time applications, VMETRO offers VxWorks® board support packages for both i960RN and PowerPC that allows for running drivers for a variety of I/O devices from a number of vendors. Also, VMETRO delivers RACE drivers for MC/OS and for VxWorks using the i960 or PowerPC architectures. These products are for experienced customers wanting to have full freedom in programming their PowerMIDAS I/O platform.

**Products*: PM960-BSP, PMPPC-BSP, RACE-DRV-*xxxx***

### 2. Preprogrammed RACE I/O for MC/OS

**RX for interfacing RACE to Recorder, Fibre Channel and FPDP**

PowerMIDAS is used in the RX2 family of ready to run I/O solutions for Mercury MC/OS™. With a DX-like API, MIDAS RX allows PMC I/O functions to be accessed from an MC/OS application with virtually no integration effort by the customer and with no need for any third-party OS or software development tools.

**Products*: RX2-MDR, RX2-FCNET, RX2-DPIO**

### 3. Preprogrammed Recorders

**MDR for FPDP Recorder**

The MDR is a pre-programmed recorder for the FPDP interface (Front Panel Data Port) built around MIDAS. FPDP is the most commonly used interface between A/D converters and DSP processors. The MDR takes only one or two VME slot positions and can be embedded into the customer's VME crate and connected directly to Fibre Channel RAIDs or JBODs for Terabytes of real-time permanent recording and playback of high-speed digital data.

**Products*: MDR-220, MDR-250**

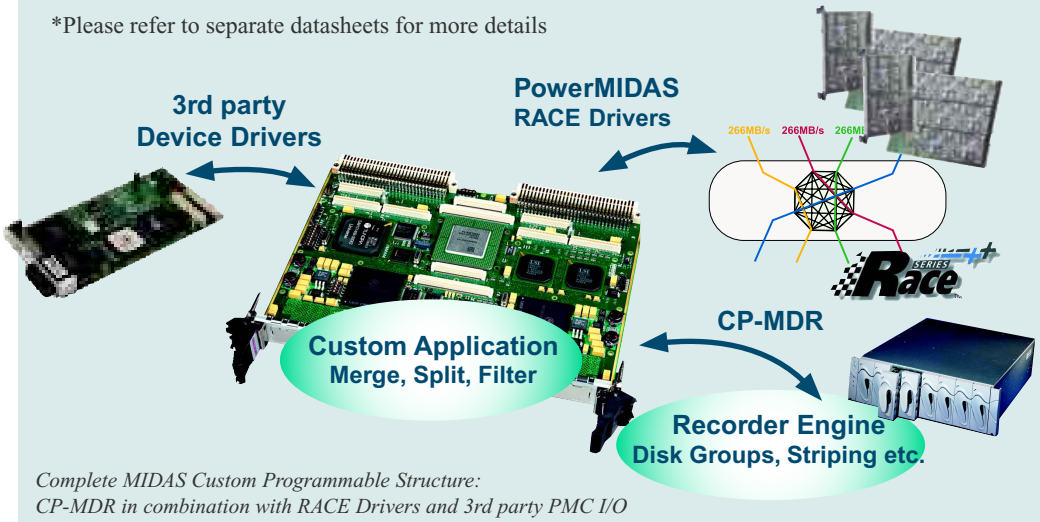
### 4. Custom Programmable Recorders

**CP-MDR for custom Recorders, PMC-to-PMC bridging and custom I/O**

Whereas the MDR product contains a pre-programmed front-end, a transfer engine and a virtualization of a recorder, the CP-MDR just contains the essential optimized back-end recorder engine together with its controlling API. Combined with 3rd party device drivers, the CP-MDR software package is all that is needed to make custom recorders for any PMC interface module. In addition, CP-MDR also provides flexibility in the formatting and merging of data input/output, and providing a general platform for custom I/O applications such as out-of-band signaling between MIDAS I/O controllers and third-party equipment.

**Product*: CP-MDR**

*Please refer to separate datasheets for more details




*Complete MIDAS Custom Programmable Structure:*
*CP-MDR in combination with RACE Drivers and 3rd party PMC I/O*



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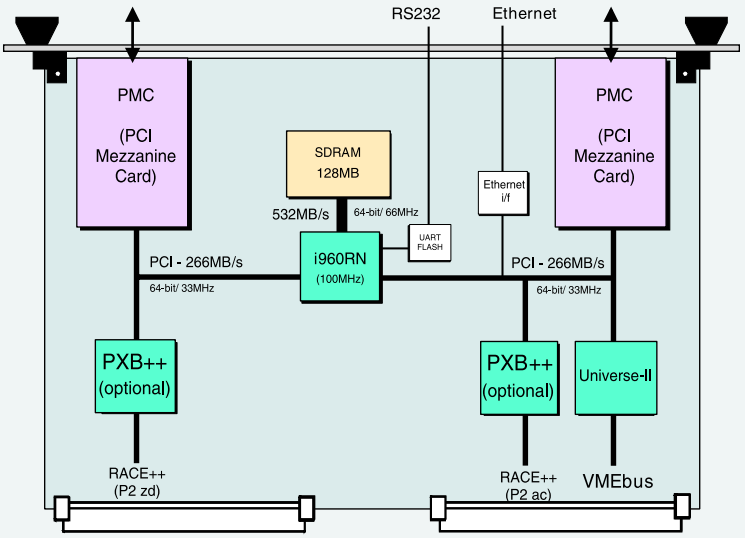
# PowerMIDAS models overview

## PowerMIDAS-1200S series

**For streaming oriented applications:**
One i960RN I/O Processor and up to 532 MBytes Memory Bandwidth!

**RACEway models:**
M1200SR/128
M1200SR2/128 (Dual RACE++ ports)

**Non-RACEway models:**
M1200S/128



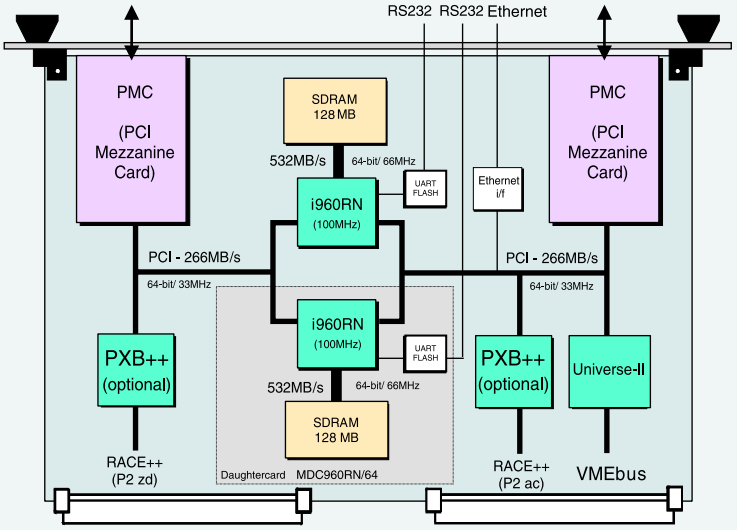

## PowerMIDAS-2200S series

**For streaming oriented applications:**
Two i960RN I/O Processors and up to 1 GByte/s Memory Bandwidth!

**RACEway models:**
M2200SR/256
M2200SR2/256

**Non-RACEway models:**
M2200S/256

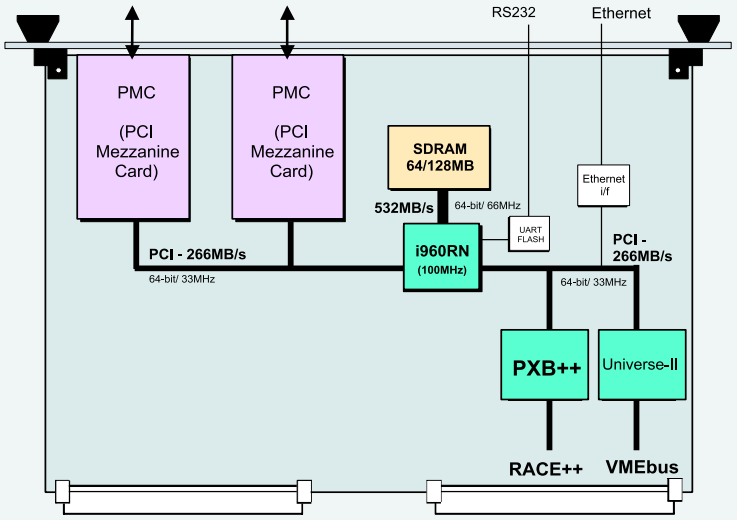
**Daughtercard to upgrade '1200 to '2200 series:**
MDC960RN/128




## PowerMIDAS-1200MR

Single i960RN with both PMC modules on the secondary PCI bus, suitable for redundant PMC functions.

**RACEway models:**
M1200MR/64
M1200MR/128





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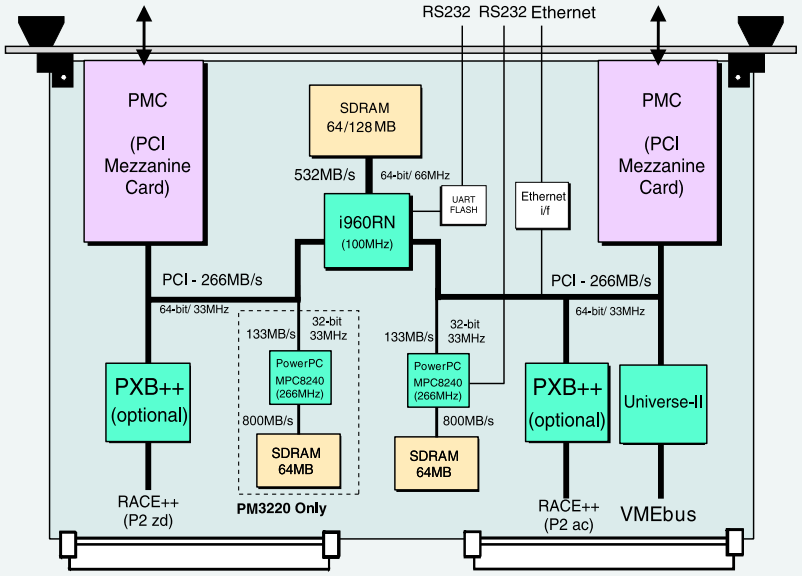
## PowerMIDAS-32X0S series

**For protocol-intensive applications, or custom I/O solutions:**
One or two PowerPCs and one i960RN for maximum I/O processing power!

**RACEway models:**
M3210SR/192 (One PPC)
PM3220SR2/256 (Two PPCs, Dual RACE++ ports)

**Non-RACEway models:**
M3210S/192 (One PPC)
M3220S/256 (Two PPCs)

PowerPC!



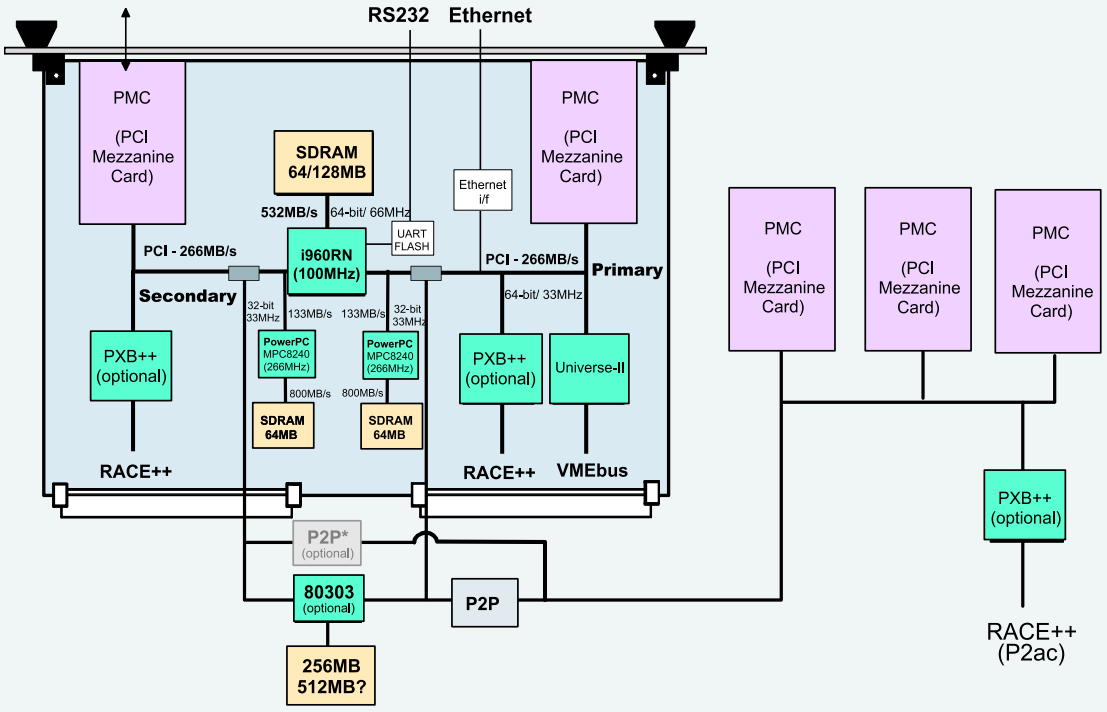

## PowerMIDAS-35X0S series

Five PMC positions, taking two VME slots.
For maximum number of PMCs!

**RACEway models:**
M3510SR/192
M3520SR2/256

**Non-RACEway models:**
M3520S/256

PowerPC!




** Alternative P2P bridge location, please consult factory.*

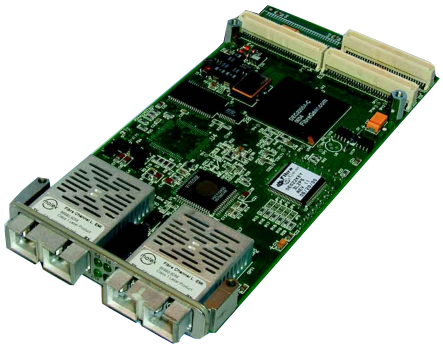

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# PMC
## The PCI Mezzanine Card



*The DPIO2 is a PMC module from VMETRO for Digital Parallel I/O, like FPDP2, ECL, RS422, LVDS or custom ports. (Ref. separate datasheet)*

The PCI Mezzanine Card (PMC) standard is based on the Electrical & Logical layer of PCI (Peripheral Component Interconnect), but with a different mechanical form factor, called the CMC - Common Mezzanine Card. This puts the expansion module parallel to the carrier board, and is thus especially well suited as an expansion standard for VMEbus boards.



*The VMFC-2100/2250 is a Fibre Channel PMC module from VMETRO with onboard hub and two fibre optic or copper ports.*

### PMCs replace entire VME boards

Due to the high level of integration offered by PCI ASICs typically found on PMC modules, a single PMC module may in many cases replace an entire "old-fashioned" VME board. Traditionally, functions like I/O, memory and special processors like DSPs have occupied a full VME board, but now, these functions may take only a neat PMC module to implement. This offers a number of obvious benefits:

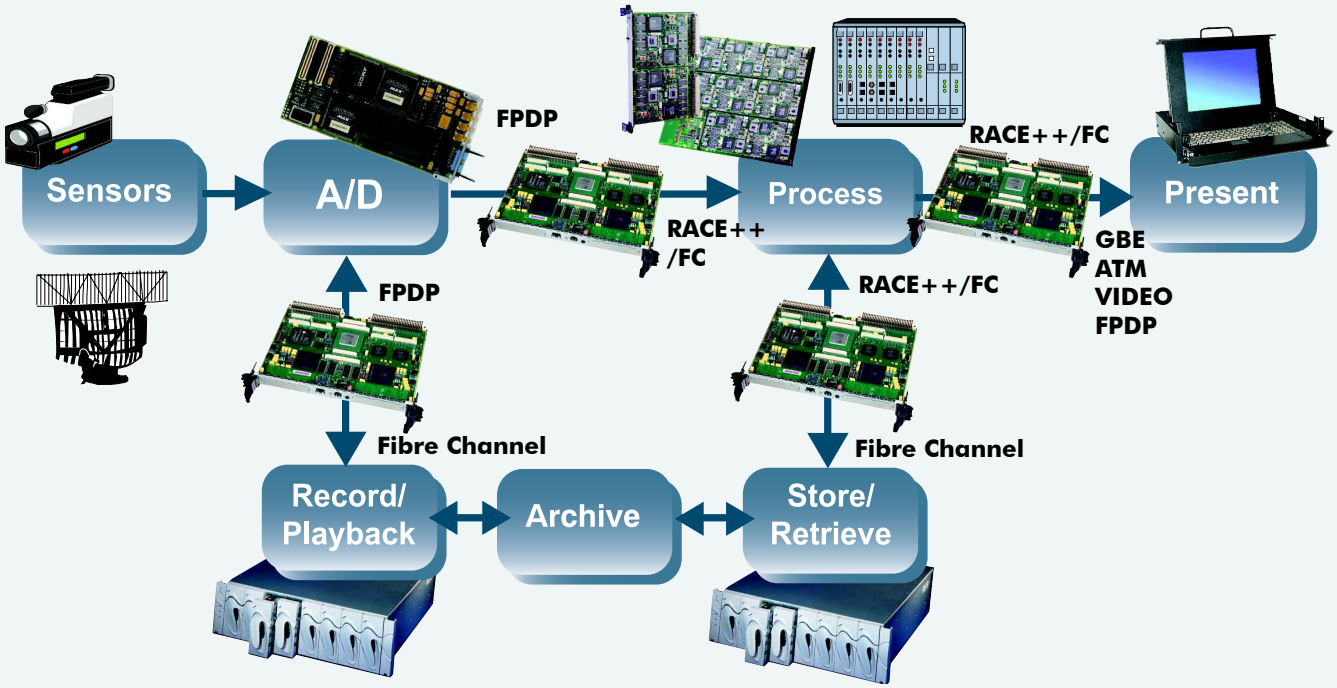
- **Reduced system size**
- **Reduced power consumption**
- **Reduced cost**
- **Increased performance**

### Available PMC modules

A number of companies offer a variety of PMC products. A selection of such modules available from VMETRO and third parties is given below:

- **Digital Parallel I/O (FPDP)**
- **Fibre Channel**
- **Serial FPDP**
- **Ethernet**
- **ATM**
- **DSP Processors**
- **PowerPC Processor**
- **DRAM (Up to 1GB)**
- **SCSI-2**
- **Serial Communications**
- **Frame Grabber**
- **Graphics**
- **FDDI**
- **VSB**
- **Myrinet**
- **A/D Converters**
- **D/A Converters**
- **Digital Receivers**

## Application Example:
## DSP System using PowerMIDAS for Sensor I/O, Recording and Readback






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# Specifications

## VMETRO Commercial Models

**Temperature**

| | |
|---|---|
| Operational, at sea level: | 0 to 50 ºC (Forced air cooling, exit air temp.) |
| Non-operational: | -40 to 70 ºC |

**Humidity**

| | |
|---|---|
| Operational: | 5-95% RH (non-condensing) |

## Power Requirements

**+5V** (+5% / -2.5%):
3.0 - 5.0A (est.)
**+12V** (+/- 10%)
50 mA max.
**-12V** (+/- 10%)
0.0 mA
(All values excluding any current drawn by PMC modules)

## Mechanical

**Size:**
233.4 x 160mm (6U)

**Weight:**
390g (M3220SR2/256)

## *Rugged/Extended Temperature Options

| Operational (600ft/min air flow) (Non - operational) | 0 to 50°C (- 40 to 70C) | - 10 to - 55°C (- 55 to 85C) | - 40 to 75°C (- 55 to 85C) |
|---|---|---|---|
| Not Characterized (All screws etc. Glued) | -A0 | | |
| Vibration Characterized (model dependent) | | - B1 | - B2 |
| Extended Vibration<br>Sinus 10G peak 5 – 2000Hz<br>Random: 0.040g²/Hz (20 – 1000Hz flat, then –6dB/oct to 2000Hz)<br>Shock: 30G (11ms half sine)<br>50G (6ms half sine) | | - C1 | - C2 |

No sockets or jumpers on ruggedized boards, Humidity: 5-95% RH non-condensing. Optional conformal coating: Using Humiseal 1B31, minimum order 10 boards. * Environmental specifications subject to change, please consult factory.
Refer to separate document for detailed specifications. Not all the options are available for all models.

*All specifications subject to change. Preliminary. Patent pending.*
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# PowerMIDAS models

| | VME slots | PMC positions | Baseboard type | i960 processors | i960 SDRAM | RACE++ ports | PPC processors | PPC SDRAM |
|---|---|---|---|---|---|---|---|---|
| **Single i960 RACE** | | | | | | | | |
| M1200SR/128 | 1 | 2 | S | 1 | 128 | 1 | - | - |
| M1200SR2/128 | 1 | 2 | S | 1 | 128 | 2 | - | - |
| M1200MR/64 | 1 | 2 | M | 1 | 64 | 1 | - | - |
| M1200MR/128 | 1 | 2 | M | 1 | 128 | 1 | - | - |
| **Dual i960 RACE** | | | | | | | | |
| M2200SR/256 | 1 | 2 | S | 2 | 2x128 | 1 | - | - |
| M2200SR2/256 | 1 | 2 | S | 2 | 2x128 | 2 | - | - |
| **PowerPC RACE** | | | | | | | | |
| M3210SR/192 | 1 | 2 | S | 1 | 128 | 1 | 1 | 64 |
| M3220SR2/256 | 1 | 2 | S | 1 | 128 | 1 | 2 | 2x64 |
| M3510SR/192 | 2 | 5 | S | 1 | 128 | 2 | 1 | 64 |
| M3520SR2/256 | 2 | 5 | S | 1 | 128 | 2 | 2 | 2x64 |
| **Non-RACE** | | | | | | | | |
| M1200S/128 | 1 | 2 | S | 1 | 128 | - | - | - |
| M2200S/256 | 1 | 2 | S | 2 | 2x128 | - | - | - |
| M3210S/192 | 1 | 2 | S | 1 | 128 | - | 1 | 64 |
| M3220S/256 | 1 | 2 | S | 1 | 128 | - | 2 | 2x64 |
| M3520S/256 | 2 | 5 | S | 1 | 128 | - | 2 | 2x64 |

VMETRO, Inc.
1880 Dairy Ashford, #400
Houston, TX 77077, USA
Tel.: (281) 584-0728
Fax: (281) 584-9034

VMETRO asa
Brynsveien 5
0667 Oslo, Norway
Tel.: +47 22 10 60 90
Fax: +47 22 10 62 02

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Email: info@vmetro.com
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