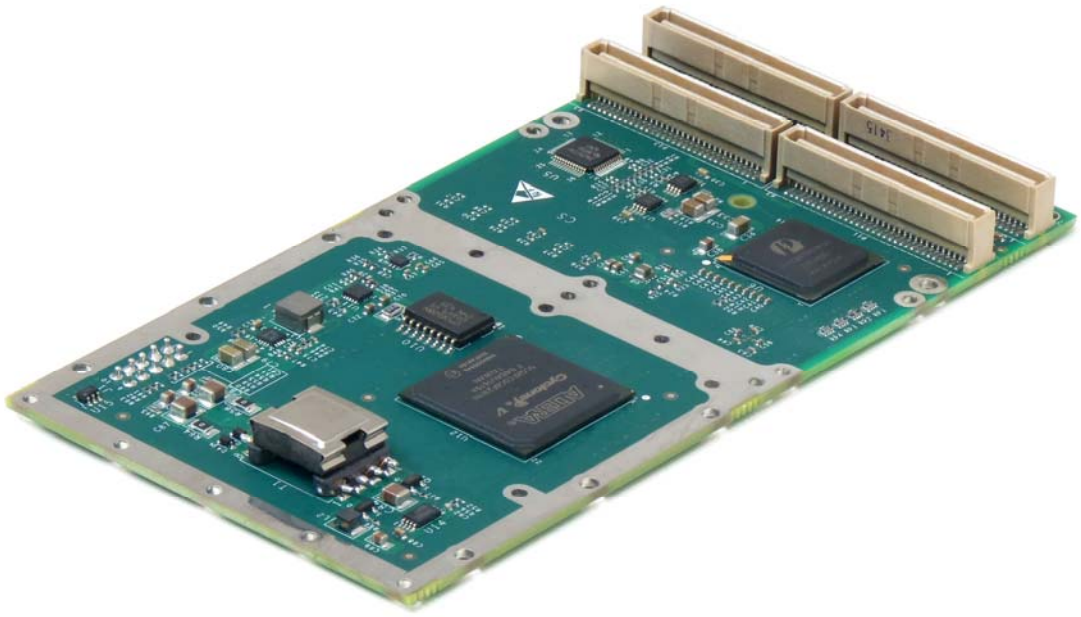
M575

HUD Controller PMC

Aitech
Embedded Computing *without* Compromise



- **Single Width PMC**
- **PCI-X 64-bit @ 133 MHz Host Interface**
- **Sophisticated HUD Interface**
  - Stroke-Only and Stroke-On-Raster Operation Modes
  - Full Handshake with HUD (Discrete Channels)
  - HUD Controller Integrated in FPGA
  - High-Speed Signal Generator
  - High-Speed 14-bit DAC Interface (for Driving HUD Deflection Signals)
  - ADC Feed-Back Module (for Calibration and BIT)
- **Remote System Update Capability**
- **BIT Support**
- **5.5 W Power Consumption**
- **Operating System Support**
  - Wind River VxWorks®
  - Green Hills INTEGRITY®
- **Conduction and Air-Cooled Versions**
- **Vibration & Shock Resistant**

M575

HUD Controller PMC

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Aitech's M575 HUD Controller PMC receives OpenGL graphics commands from the host and translates them to vector data to be "drawn" on the HUD. It supports both Stroke-Only and Stroke-On-Raster HUD operation, making it a superior choice for a wide range of HUD implementations.

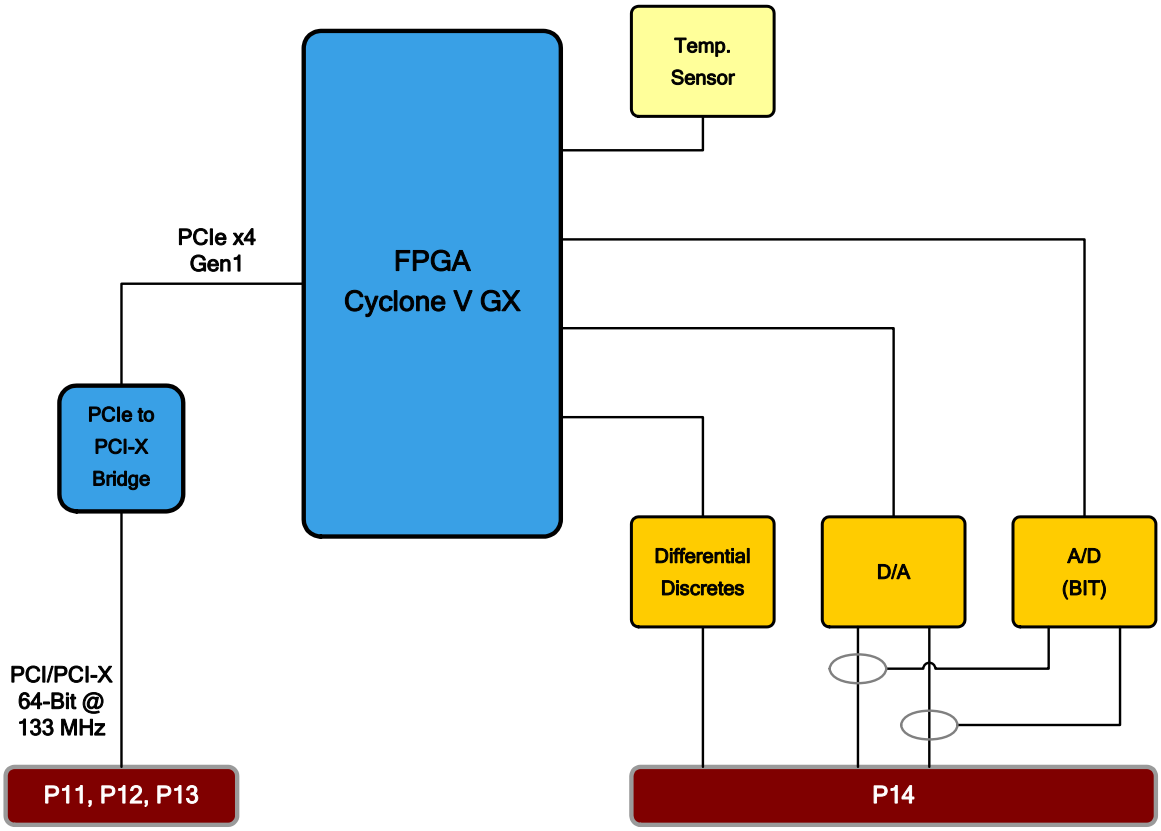
HUD controller functionality is provided by in-house developed IP implemented in an Altera Cyclone V FPGA. This approach translates to a flexible design, with unique features including BIT to verify integrity of the entire HUD functionality and signal pathway, and the implementation of discrete interfaces for HUD control and status signals. The IP also supports up to ten occlusion zones, with priority, enabling the application software to control the layering of displayed HUD data.

Remote System Upgrade (RSU) support enables field upgrade of the IP via the host computer should the need arise.

An on-board temperature sensor monitors PMC temperature, which can be read by the host computer.

To ensure high-speed transfer of HUD data, the M575 interconnects with the host system via a 64-bit PCI/PCI-X link.

Extremely low power consumption enables use of the M575 in difficult to cool environments, in both air-cooled and conduction-cooled systems.



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Board Architecture

Bus Interface	• PCI/PCI-X, 64-bit @ 133 MHz	
Board Resources	• FPGA with Proprietary HUD Controller IP • Hardware Supporting Remote System Update	• On-board Temperature Sensor

HUD IP

HUD Controller	• Stroke-Only and Stroke-On-Raster Operation Modes • Dual 128 kB Frame Buffers (implemented in FPGA)	• HUD Resolution: Up to 16 k x 16 k pixels (14-bit) • Up to 10 Occlusion Zones with Priority
HUD Analog Interface	• 2 Channels: X & Y Deflection • Sampling Rate: Up to 275 MSPS • Voltage Range: -10 to +10 Vdc	• Output Resistance: 100 Ω • BIT using 2 analog outputs connected to on-board ADC
HUD Digital Interface	• Handshake with HUD • 6 Discrete RS-422 I/O Channels • Individually Software Configurable as Input or Output • 100 Ω Terminations on all Inputs	• Default Configuration (custom configurations available) - PDU_BUSY (input) - SYM_COMMAND (input) - BRIGHT_OUT (output) - OP_MODE (output) - MC_BUSY (output) - Spare (I/O)

Software

Operating System	• Wind River VxWorks® • Green Hills INTEGRITY®
BIT	• Hardware BIT: DAC, Discretes • HUD Controller BIT Using FPGA Internal Test Application

Power

M575 Power Consumption

Power Supply	+3.3 V [A]	+5 V [A]	+12 V [A]	-12 V [A]	Total [W]
Consumption	1.0	0.20	0.05	0.05	5.5

Mechanical

	Form Factor & Dimensions	Weight
Air-Cooled	Single Width PMC per IEEE 1386-2001	< 75 g [0.2 lbs]
Conduction-Cooled	Single Width PMC per ANSI/VITA 20-2001	< 75 g [0.2 lbs]

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Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	**Rugged**	**Military**	**Rugged**	**Military**
Operating Temp.	AC1 (0 to +55°C) (2)	AC3 (-40 to +70°C) (2)	AC4 (-40 to +85°C) (1,2)	CC3 (-40 to +70°C) (3)	CC4 (-40 to +85°C) (1,3)
Non-Operating Temp.	C1 (-40 to +85°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)
Vibration	V1	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS1	OS2	OS2
Altitude	15,000 ft.	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity (4)	0 - 90%	0 - 100%			
Conformal Coating	N/A	Acrylic (Silicone and Urethane Optional)			

Notes: (1) **-55°C available, contact an Aitech representative for more information**
(2) Operating ambient air temperature (with sufficient airflow)
(3) Operating card edge temperature
(4) Non-condensing

Ordering Information

M575 - [ ] [ ] [0] [0] - [ ] [ ]

Reserved

Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Cooling
A = Air
R = Conduction

Configuration No.
To be assigned by Aitech

Example: 4M575-R00-00

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the M575 and additional software support.