Table of Contents

Development and production:

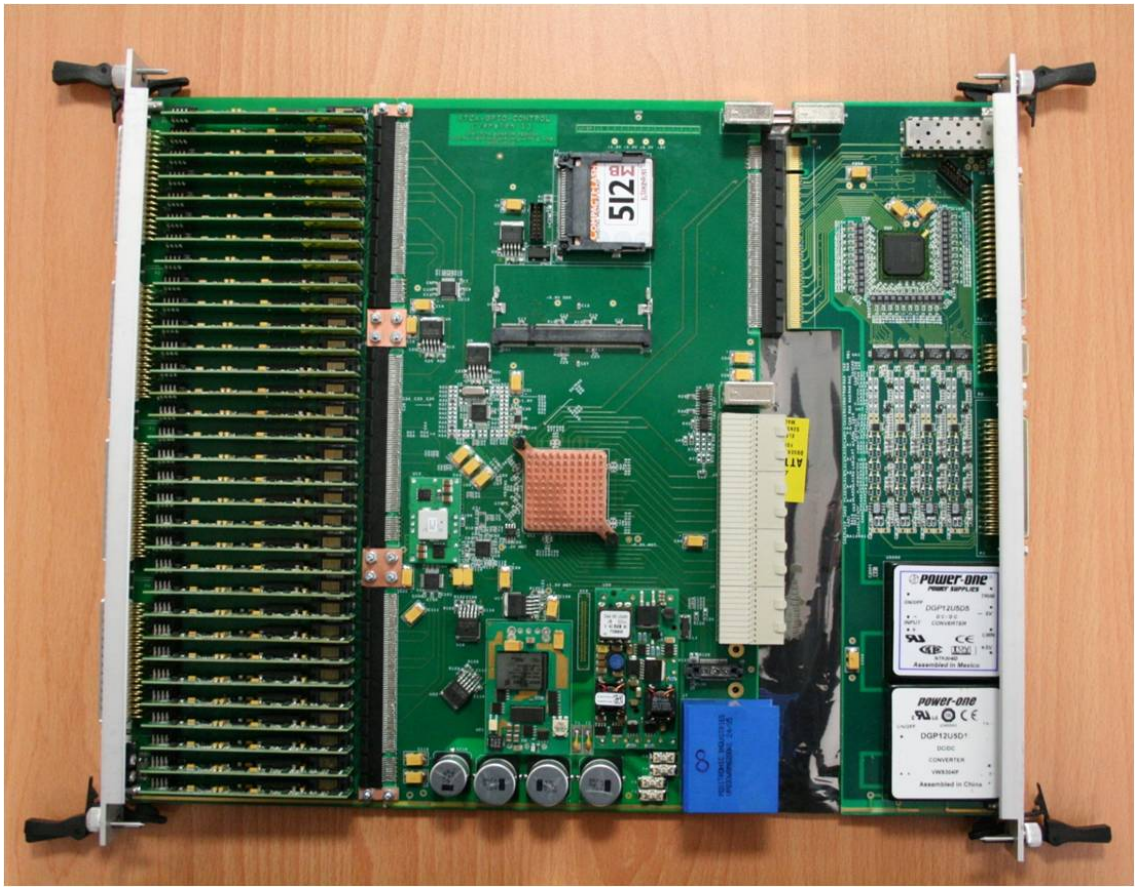
Description

The card provides 32 analog input channels (digitizer/transient recorder) and 8 analog output channels (waveform generator) Different types of carrier boards and rear transition modules can be used.

This ATCA single width card comprises a main board, a carrier board, isolated ADC or DAC modules and a rear transition module (RTM) mechanically connected together. Both types of analog I/O can be present on the carrier board and on the RTM. Up to 12 cards can also be inserted on an ATCA shelf.

This card is specially suitable for MIMO controllers since:

- The data sampled by all ADCs of all cards is available simultaneously on all FPGA processors (one per board).
- Processed data in each FPGA can be sent to any DAC on any card.
- All cards (up to 12) are interconnected in a full-mesh topology with sub-microsecond data transport latencies.
- High-speed fiber optic and RS-485 digital interfaces are provided for controlling remote actuators (up to 300 m).



Characteristics

The **main board** provides:

- I/O parallel digital signal processing and standard independent communications unit, based on the Xilinx XC4VFX60 (or XC4VFX100) FPGA.
- A processing power of 80 GMACS plus 1400 Dhrystone MIPS of the two silicon PowerPC (450 MHz) inside the FPGA.
- A total of 15 RocketIO multi-gigabit transceivers (2.5 GBits/s) connect the FPGA to the ATCA fabric channels, allowing full mesh topologies, plus one connected to the rear transition module.
- Up to 512 MBytes of SODIMM DDR2 and up to 512 MBytes of COMPACT FLASH memory modules connected to the FPGA.

- ATCA interface with one PCI Express channel (x4 full-duplex)
- Up to 11 Xilinx AURORA communications protocol (x1 full-duplex) links for inter-card communications with microsecond latencies.

The **carrier board** can be populated with up to 32 ADC or DAC modules. The ADC module characteristics are:

- one differential analog input
- dynamic range of ±32V
- 18-bit resolution
- 2 MSPS
- passive anti-aliasing filter
- galvanic isolation
- All analog input channels are simultaneously sampled.
- The FPGA provides programmable decimation, digital filtering and signal processing.

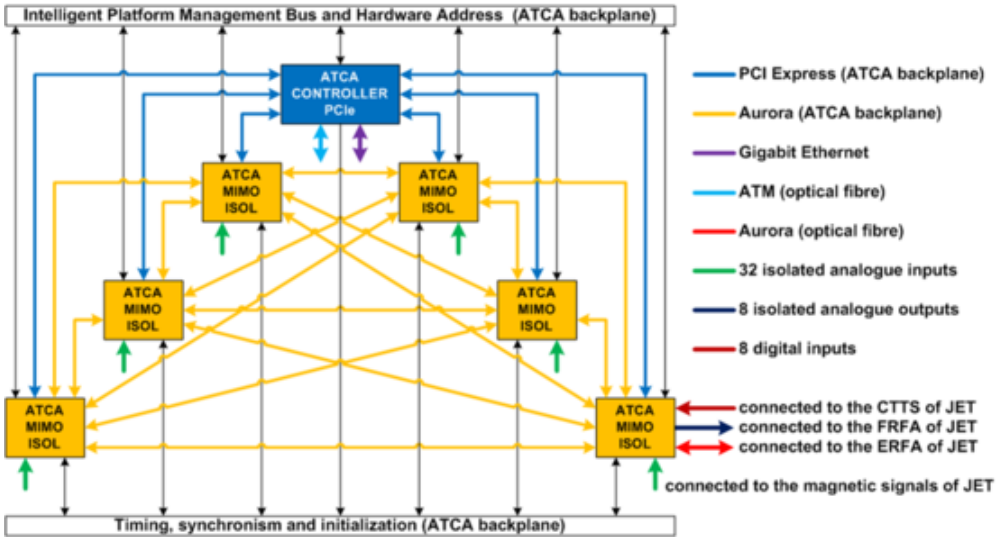
The **rear transition module** contains 8 galvanically isolated DAC channels, each with:

- one differential analog output
- dynamic range of ±10V
- 16-bit resolution
- up to 50 MSPS
- passive reconstruction filter
- fiber optic SFP port for high-speed digital links to remote instrumentation
- 8 programmable digital I/Os (EIA-485 specification) and an RS-232 interface.

Multiple-Input-Multiple-Output (MIMO) control systems

An ATCA system base on the ATCA-IO-CONTROL board can satisfy all requirements:

- Parallel use of two fabrics:
    - PCI Express star links
    - Full-mesh fabric such as SRIO, Aurora [Xilinx] ...
- Processing power on the ATCA controller and distributed among the interconnected nodes
- Embedded timing and synchronization support



User Manual

View the User Manual of this board.