

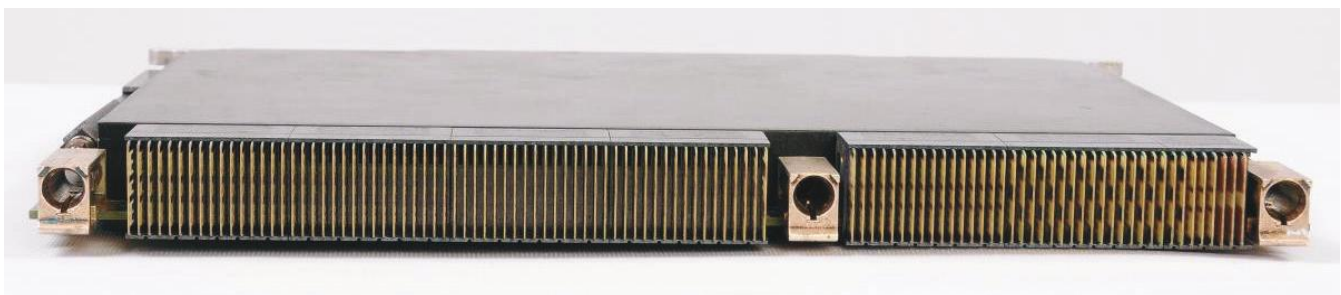
Radar Timing & IO generation (RTIO) board

Radar Timing and I/O (RTIO) generation board generates all timing and I/O signals required for RADAR operation. The board features an FPGA based solution implemented to meet the functional requirements of the board.

The functional design employs SoC concept, where PPC440, a hard macro available in Virtex5 FXT series of FPGAs is used for communication with the external world via GigE link. Messages are received from the external world over Ethernet, which are decoded by the software application running on the PPC440 and appropriate registers are configured in the FPGA. Based on the configured values, RTL logic in the FPGA generates timing signals for various RADAR sub systems.

The board finds use in airborne radar timing generation and has been adopted across multiple radars:

- Radar Processing Unit chassis
- Receiver Processor chassis



KEY FEATURES

- All timing and I/O pins terminated on the VPX backplane connectors
- Remote FPGA configuration through Gigabit Ethernet interface
- FPGA configuration flash programming through JTAG and LAN
- Linux OS running embedded PPC440 in the Virtex 5 FPGA
- SRIO link (x4) capable of running at 3.125Gbps
- Health monitoring: Temperature & voltage monitoring of board

SPECIFICATIONS

FPGAs / Processor

- Xilinx Virtex-5 FX100T FPGA with PPC440 embedded processor

Software

- Software running on PPC440 of Virtex-5 FPGA device, for Ethernet communication to/from RTIO board on open source Linux
- Power PC based embedded sub-system with peripherals such as boot memory, system monitor, timer module, UART, Interrupt controller etc
- Control, Configuration and Status monitoring through embedded sub-system

Additional information

- 128 Mbit of on-board Platform Flash memory
- 256 Mbytes of on-board DDR2 Memory
- 256 Mbytes of on-board NOR-Flash memory

Interfaces

- Output
 - 148 LVTTTL
 - 14 TTL
 - 28 LVDS pairs
 - 16 RS422 pairs
 - 28 V control signal
- Bidirectional
 - 16 LVTTTL I/O
- Input
 - 64 LVTTTL
 - 6 RS422 pairs
 - 8 LVDS pairs
- Gigabit Ethernet interface
- One SRIO link (x4) capable of running at 3.125Gbps
- RS232

MECHANICAL

- 0.85" pitch, Conduction Cooled 6U VPX form factor conforming to VITA48.2
- The card weighs 1.2 kg

POWER CONSUMPTION

- The card consumes 25 W (max) power
- Input voltages is 12V and 5V as per VPX standard

ENVIRONMENTAL

- Qualification : MIL-STD-810D EMI/EMC MIL-STD-461E
- Temperature range : -55°C and +85°C (Storage) -40°C and +65°C (Operational)

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