

Radar Timing & IO Generation (RTIO) Board

PRODUCT DESCRIPTION

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 PowerPC440, a hard macro available in Virtex-5 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 PowerPC440 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
- Radar Processing Unit-2

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 on PowerPC440 Embedded Processor in the Virtex-5 FPGA
- SRIO link (x4) capable of running at 3.125 Gbps
- Health monitoring: Temperature & voltage monitoring of board



SPECIFICATIONS

FPGAs / Processor

- Xilinx Virtex-5 FX100T FPGA with PowerPC440 Embedded Processor

Interfaces

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| <ul style="list-style-type: none"> ● Output <ul style="list-style-type: none"> ■ 148 LVTTTL ■ 14 TTL ■ 28 LVDS pairs ■ 16 RS422 pairs ■ 28 V control signal ● Bidirectional <ul style="list-style-type: none"> ■ 16 LVTTTL I/O | <ul style="list-style-type: none"> ● Input <ul style="list-style-type: none"> ■ 64 LVTTTL ■ 6 RS422 pairs ■ 8 LVDS pairs ● Gigabit Ethernet interface ● One SRIO link (x4) capable of running at 3.125 Gbps ● RS232 |
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Software / IP

- Software running on PowerPC440 of Virtex-5 FPGA device, for Ethernet communication to/from RTIO board on open source Linux
- PowerPC440 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 onboard Platform Flash memory
- 256 MBytes of onboard DDR2 memory
- 256 MBytes of onboard NOR-Flash memory

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 25W (max)
- Input voltage 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)

PART NUMBER(S)

CB1040	Radar Timing and I/O (RTIO) Board
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