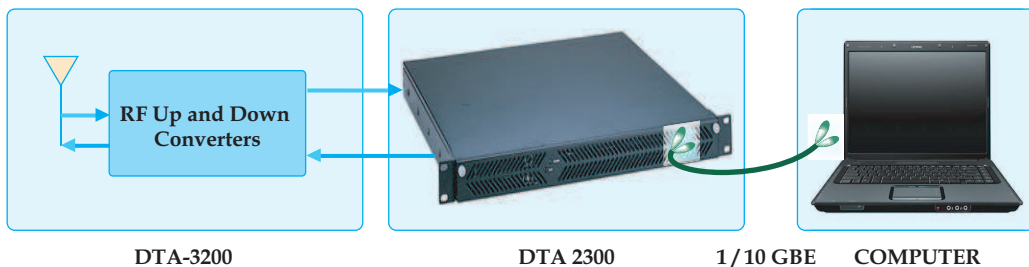
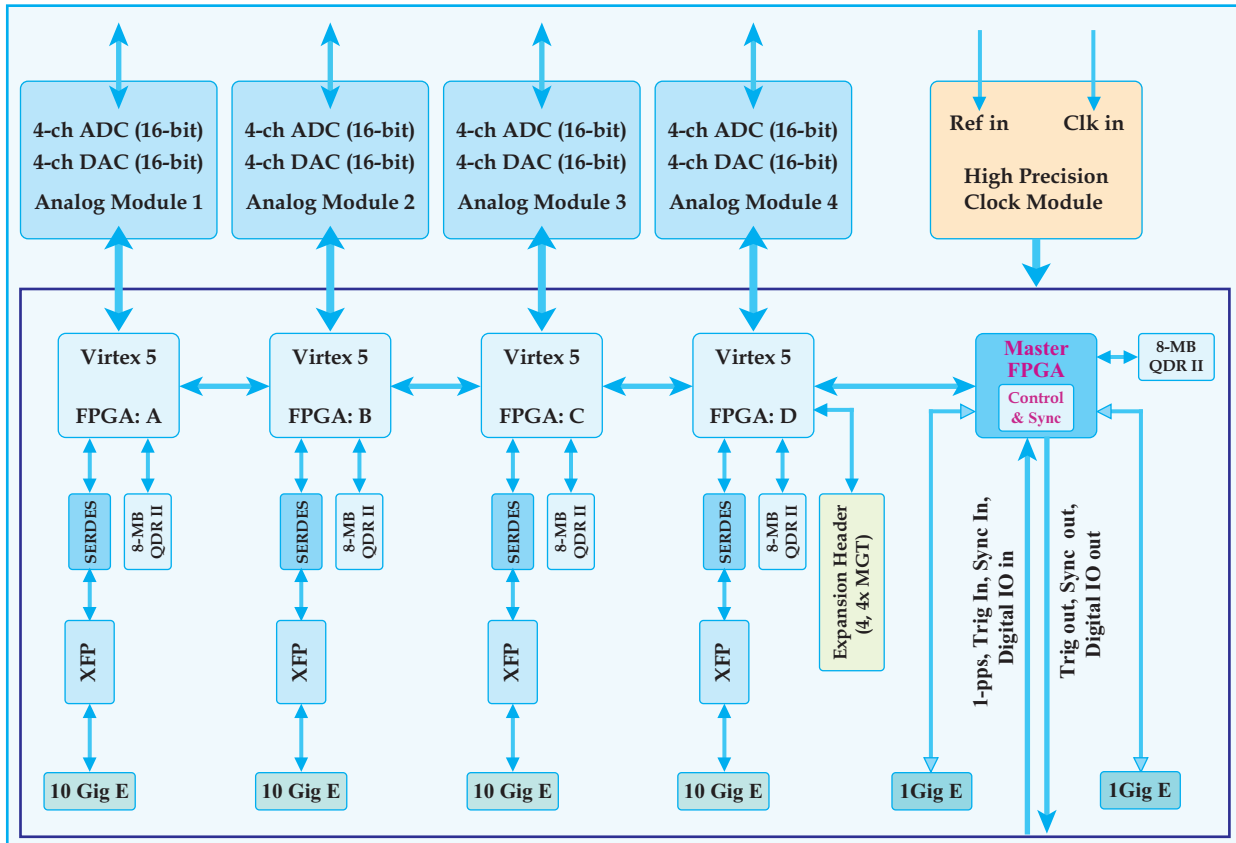
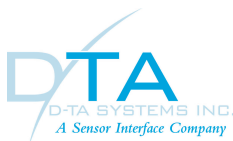


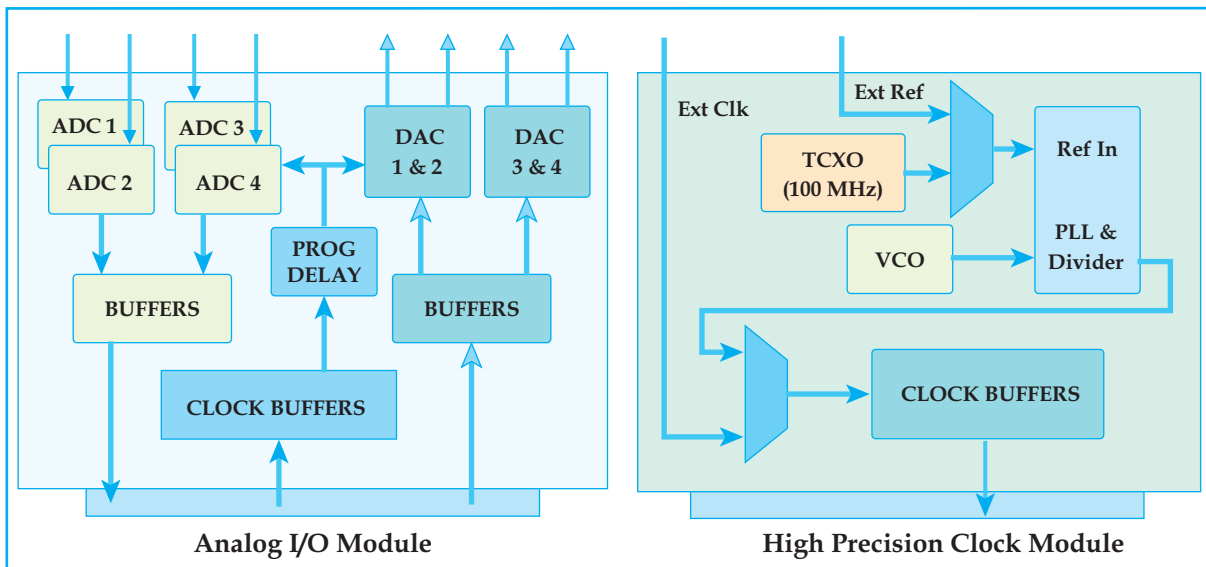
# DTA-2300: The Reconfigurable Digital IF Processor

**DTA-2300:** The Reconfigurable Digital IF Processor is an integral part of the D-TA Systems' Radio platform. This network based multi-channel IF digitization and arbitrary waveform generation product offers a plug and play solution and requires little or no software development resulting in significant cost savings for demanding applications. Available in a standard 19" rackmount chassis (1U) or user defined chassis.



A 16-ch Rx & 16-ch Tx SDR Platform includes DTA-3200 RF Front End, DTA-2300 Digital IF Processor and a Computer





## Features

- Plug and Play for easy integration
- Common platform for multiple applications
- Separate 1 Gig E control interface
- Four 10 Gig E interfaces for high speed data transfer (full duplex)
- 4, 8, 12, 16 analog input and analog output channels available
- Best in class 16-bit, 130 MSPS ADC
- Best in class 16-bit, 500 MSPS DAC
- Four processing and one master FPGA (Virtex5XC5VLX50T). Other LXT, SXT and FXT devices available as options.
- Custom FPGA design and development offered
- High speed expansion header for optional post-processing module
- Separate FPGA for control & synch
- 1-pps input for distributed unit to unit synchronization
- External Trigger and Sync inputs
- Programmable delay lines (10 ps step) on ADC and DAC clocks for phase matching
- Ability to output internal Trigger and Sync signals for multi unit operation
- External Reference In (10 to 100 MHz)
- Internal 100 MHz TCXO
- Ability to provide separate ADC and DAC external clocks
- Optional DTA-3200 16-channel programmable RF up and down converter for direct interfacing to antenna
- Direct control of RF unit from FPGA via digital I/Os
- 19" rackmount, 1U high, 24" deep
- 110/220V operation (optional DC input)
- Custom enclosure available

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The DTA-2300 is designed to work seamlessly with the D-TA Systems front end RF up and down converter (DTA-3200) and provide a complete sensor interfacing solution targeted for complex and demanding applications.

The DTA-2300 is architected in a modular fashion and comprises of three modules: Network Interface Module (NIM), Analog I/O Module (AIM) and High Precision Clock Module (HPCM). The architecture allows ease of technology upgrade, enormous cost savings and easy tailoring for specific user requirements. For more details, download white paper titled “Ether to Ethernet: Common Radio Platform for Demanding Multi-Channel Applications” from [www.d-ta.com](http://www.d-ta.com).

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## Common Platform for Demanding Applications

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- Phased Array Radar
  - Smart Antenna Base Station
  - Arbitrary Waveform Generation
  - MIMO
  - Sonobuoy
  - Spectrum Monitoring
  - Signal Intelligence (SIGINT) and Electronic Intelligence (ELINT)
  - ECM & EW
  - Radio Head
  - Common Communications Platform
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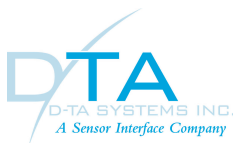
## Network Interface Module

The NIM provides four large data FPGAs and four fully duplex 10 Gbit network interfaces for high-speed data transfer. The 10 Gbit interfaces are capable of handling the raw ADC and DAC data rate in a point-to-point connection. Each data FPGA implements a 10 Gbit Ethernet MAC for direct network connectivity. The NIM can host up to four Analog I/O modules (AIM) and one High Precision Clock Module (HPCM) for synchronized sampling and conversion. This flexible architecture allows other I/O modules to be connected without extensive redesign to the system. A separate Master FPGA implements the control and synchronization functions. Dual gigabit Ethernet interfaces to the Master FPGA can be used for control and set-up. These can also transfer processed data.

The four data FPGAs are interconnected with a MGT link. They are also connected to the Master FPGA with a MGT link. Each of the data FPGAs and the Master FPGA are connected to an expansion header with four MGT links. Expansion modules with delay memory, drop receivers (Digital Down Converters), processors etc., may be added to expand the functionality of the DTA-2300. DTA-2300 comes with four Virtex 5 XC5VLX50T as standard data FPGA. Larger FPGAs like the XC5VSX95T are available as an option. Please contact factory for details.

## Analog I/O Module

The AIM includes four 16-bit 130 MSPS ADCs (Linear Tech LTC2208) and two 16-bit, 500 MSPS dual DACs (TI DAC5687) providing four input and output channels with bandwidths in excess of 50 MHz each. The AIM offers independently programmable delay lines on the ADC and the DAC sampling clocks. The delay is programmable in 10ps steps, which allows for phase adjustment and calibration of front-end equipment for precise synchronization.



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## High Precision Clock Module

The HPCM generates the ADC and the DAC sampling clocks and distributes them to all the AIMS. The HPCM can accept an external reference signal (10 to 100 MHz) or can run from an internal TCXO (100 MHz). It can also accept up to two external clocks: one can serve as an ADC clock while the other serves as the DAC clock. It is also possible to use a common ADC and DAC external clock. The HPCM has an internal VCO (375 to 415 MHz), which is locked to the reference by a PLL/divider. The locked VCO frequency can be divided (integer 1 to 32) and provided as ADC / DAC sampling clocks. Multiple modules can be synchronized.

The following clocking schemes are supported:

1. All ADC / DAC clocks locked to an external reference clock (10 MHz to 100 MHz). ADC / DAC clocks are generated by an integer division of the VCO frequency.
2. All ADC / DAC clocks locked to an internal TCXO based reference clock (100 MHz). ADC / DAC clocks are generated by an integer division of the VCO frequency.
3. Separate external ADC and DAC clocks
4. Common external ADC and DAC clocks

## Custom FPGA Development

The standard FPGA implements the 10 GE MAC core and data packetization functionality for transmission over the 10 Gbit interface. Users can implement their own custom DSP functionality. D-TA Systems offers custom FPGA development services to help users speed up their system deployment. D-TA Systems offers extensive FPGA application capability including DDC/DUCs, FFTs and a whole range communication functions (like modulators, demodulators, FEC etc.). Please contact factory to discuss specific requirements.

## Customized Solution

D-TA Systems can easily tailor the DTA-2300 platform for specific customer requirement. This may include a custom enclosure, different configuration or custom daughter module to connect to the expansion header. Please contact factory for more information.

## DTA-2300 Ordering Info

### DTA-2300-zzzzz-xx-yy

xx: Number of input (ADC) channels. Valid options are: 04, 08, 12 and 16

yy: Number of output (DAC) channels. Note: A dual DAC counts as 2 channels. Valid options are: 04, 08, 12 and 16

zzzzz: FPGA Option. Valid options are 50LXT for Virtex 5 XC5V50LXT; 95SXT for Virtex 5 XC5V95SXT

Please contact factory for more information.

