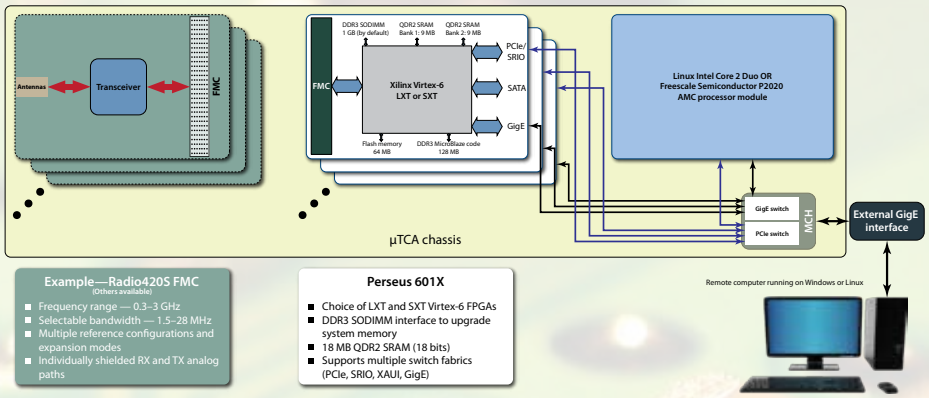
Product sheet

µSDR420

FPGA-based, multimode, tunable RF SDR solution

- SISO, dual-band and 2×2 MIMO RF transceivers
- Wide frequency range — 0.3–3.0 GHz
- Selectable bandwidth — 1.5–28.0 MHz
- Combines Virtex-6 with Lyrtech's Linux embedded OS framework
- Supports remote GigE access from Windows and Linux
- Supports embedded applications trough Linux processor blade option
- Develop applications more quickly with model-based design

The µSDR420 is a customizable, embedded SDR solution that incorporates tremendous FPGA logic and memory, as well as a powerful multimode SDR single/dual-channel RF transceiver module. The µSDR420 is capable of uplinking and downlinking data streams to a remote computer running on Linux or Windows through high-speed GigE interfaces. (Lyrtech also offers stand-alone embedded PC configurations that use an AMC slot through PCIe or GigE. See below for more.)



µSDR420s greatly reduce your time to market, bringing the performance that you need to a wide range of applications such as multimode SDR, advanced telecommunications (MIMO systems, cognitive radios, LTE, WiMAX, white space, Wi-Fi, GSM, WCDMA), and signal intelligence (SIGINT).

Based on the µTCA architecture, the µSDR420 has limitless channel expansion capability and offer the number of AMC slots necessary to any specific application. More specifically, the entry-level, dual-slot system with integrated MCH (pictured above) constitutes a very cost effective and competitive solution for applications where space is an issue and only a small number of channels is necessary. The µSDR420 also benefit from ultra-high bandwidth crosspoint links between FPGA elements (through the µTCA backplane), making it possible to add DSP algorithms that can be simultaneously applied to all system channels — useful in such applications as MIMO, SIGINT, cognitive radios, white space and others.

Fully integrated solution

The µSDR420 integrates a complete array of tools and capabilities for added efficiency and ease of use:

- Available FPGA for intensive processing, down-conversion, up-sampling and filtering
- Complete Lyrtech FPGA framework, including embedded Linux MicroBlaze Ethernet server
- Tools for real-time GigE data exchanges between a host device CPU (Linux or Windows) and GigE data streaming (PCIe available for embedded PC)
- Tools for recording and playback (DAQ applications)
- Capability for local (embedded AMC processor blade) and remote access
- Capability for real-time and hardware-in-the-loop cosimulation with the FPGA
- Seamless integration to the MATLAB/Simulink model-based design flow
- Capability for stand-alone operation, running directly from the flash memory
- Available graphical control applications

FPGA section

The Perseus 601X, making up the FPGA section of the µSDR420, is designed around the high-performance Virtex-6, which offers the flexibility and acceptable tradeoffs between high-performance logic and massive digital signal processing power.

Infinite possibilities...

LYRTECH

Features

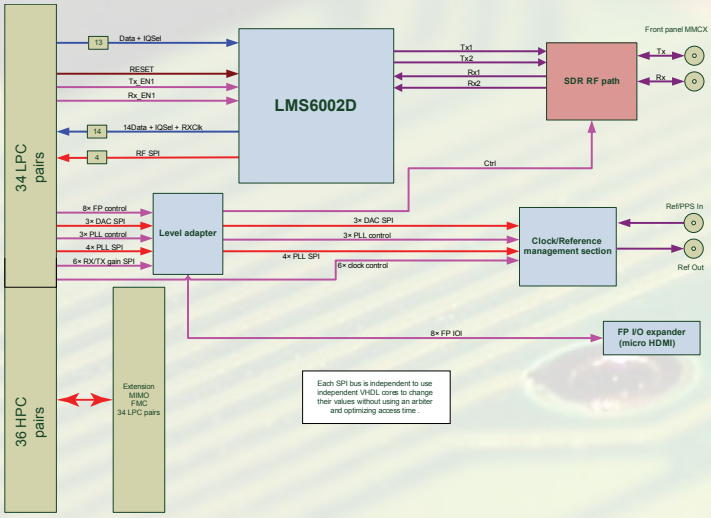
- Supports LX240T, LX550T, SX315T, and SX475T devices
- Supports PCIe (1×, 4× and 8×)
- Fabric clock — RX or TX (default 100 MHz PCIe)
- IPMI controller (based on the AVR version of the Pigeon Point AdvancedMC MMC)
- FPGA and IPMI JTAGs on the Mestor interface

Includes a complete framework of Virtex-6 interfaces to all the FPGA section's peripherals:

- High-speed GTX transceivers
- External memory controllers
- MicroBlaze instantiation and startup through a Linux kernel running Lyrtech's central communication engine (CCE) server application
- External control through PCIe and GigE
- APIs and graphical interfaces for remote management (such as FPGA application deployment, parameter control and data streaming)

Radio section

The radio section is equipped with two state-of-the-art multimode, multiband RF transceivers that support operation anywhere between 0.3 GHz and 3 GHz, TDD or FDD. Its selectable bandwidth (1.5 MHz to 28.0 MHz) makes it suitable for a large number of narrowband and broadband applications with excellent channel selectivity.



Optional embedded processor section

The µSDR420 can be equipped with cutting-edge embedded processor options and a complete Linux framework, APIs and application examples.

AMC GPP module options

- Intel Core2 Duo AMC processor module
- Freescale Semiconductor P2020 AMC processor module

Note: SATA and solid-state HDDs are available for storage. Contact Lyrtech for details and availability.

Specifications

Refer to the Perseus 601X and Radio420X product sheets for detailed specifications about these products.

FPGA

Xilinx Virtex-6 FPGA:

- Perseus 6010: LX240T
- Perseus 6011: LX550T
- Perseus 6012: SX315T
- Perseus 6013: SX475T

FPGA memory

- Default 1 GB, 64-bit DDR3 SDRAM SODIMM
- 18 MB QDR2 SRAM (18 bits) — two banks of 9 MB
- 64 MB NOR flash memory (16 bits) — for FPGA images, MicroBlaze boot code and user code
- 128 MB DDR3 SRAM (8 bits) — for MicroBlaze FPGA applications

Radio

- 0.3 – 3.0 GHz
- Dual SISO/2×2 MIMO
- 1.5 MHz to 28.0 MHz bandwith

Embedded GPP (optional)

Intel option

- Intel Core2 Duo processor
- Server class Intel 3100 chipset
- Single DDR2-400 SO-RDIMM socket up to 4 GB capacity
- Onboard, 4 GB flash memory and graphics controller

Freescale option

- P2020 AMC processor module, 1.2 GHz
- PCIe on ports 4–7 (SRIO also available)
- Up to 4 GB of DDR3 SDRAM with ECC
- Dual GbE per AMC.2 specifications on ports 0 and 1
- 32 MB NOR flash memory
- 256 MB NAND flash memory

Electrical

- External universal 110/220 V AC (–48 V DC standard telecommunications supply also available. Contact Lyrtech for details.)

Standards compliance

- AdvancedTCA base 3.0 (PICMG 3.0/3.1/3.4/3.5)
- AdvancedMC R2.0 (PICMG AMC.0/AMC.1/AMC.2/AMC.3/AMC.4)
- Support for AdvancedMC R1.0 also available
- µTCA R1.0
- VITA 57.1 FMC HPC (supports the rugged and commercial form factors)
- Hot swap
- IPMI

Testing and development interfaces

- Mestor interface — FPGA JTAG, IPMI JTAG, mini-B USB serial port, GPIOs)
- Test points
- Jumpers
- Software switches
- USB
- LEDs

Mechanical

- 1U rackmount, 2 slots (integrated MCH) with 2 HDD bays

Power consumption

- TBD

Environmental

Contact Lyrtech about this specification.

Available configurations

Nomenclature

Product nomenclature is µSDR420A-B.

- A stands for:
  - S for SISO configuration
  - M for MIMO configuration
- B stands for:
  - 0: LX240T Virtex-6 FPGA
  - 1: LX550T Virtex-6 FPGA
  - 2: SX315T Virtex-6 FPGA
  - 3: SX475T Virtex-6 FPGA

Basic common kit

- 2-slot µTCA chassis
- Perseus 601X, full size, full debugging features development bundle:
  - Mid-size, Perseus 601X
  - Mestor expansion kit
  - Mestor breakout box 1
  - Mestor JTAG adapter kit
  - Perseus 601X MBDK

µSDR420S-X

- Radio420S FMC (contact Lyrtech for availability)
- One RF transceiver (0.3–3.0 GHz)
- Programmable bandwidth (1.5–28.0 MHz)

µSDR420M-X

- Radio420M FMC (contact Lyrtech for availability)
- Two RF transceiver (0.3–3.0 GHz)
- Programmable bandwidth (1.5–28.0 MHz)

Options

AMC GPP module options

- Intel Core2 Duo mid-size AMC processor module
- Freescale Semiconductor P2020 mid-size AMC processor module

Note: SATA and solid-state HDDs are available for storage. Contact Lyrtech for details and availability.

Purchase information

Phone

(1) 418-877-4644

1-888-922-4644

Fax

(1) 418-877-7710

E-mail

info@lyrtech.com

Visit us on the Web at www.lyrtech.com.

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