

Small form factor SDR development platforms

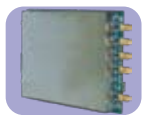
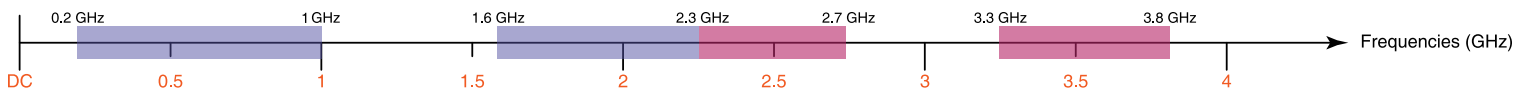
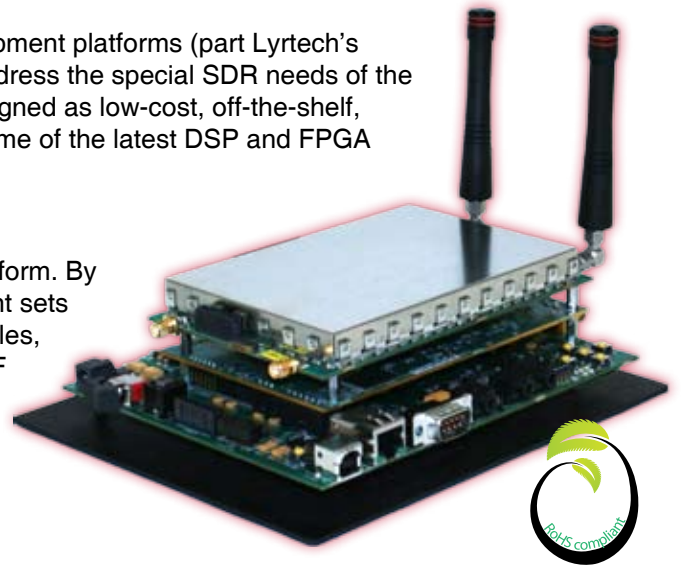
Reference sheet

Lyrtech's small form factor (SFF) software-defined radio (SDR) development platforms (part Lyrtech's advanced development solutions lineup) are especially designed to address the special SDR needs of the military, public safety, and commercial markets. Our platforms are designed as low-cost, off-the-shelf, integrated hardware and software development solutions, and pack some of the latest DSP and FPGA technology—our expertise.

Applications

Modularity is one of the key benefits of the SFF SDR development platform. By combining available modules differently, you can target entirely different sets of applications in a snap. To make your life easier we offer seven bundles, targeting some of the more common application needs (note that all RF modules are tunable):

- Low band
- High band
- 2.5 GHz SISO WiMAX
- 3.5 GHz SISO WiMAX
- 2.5 GHz 2x2 MIMO WiMAX
- 3.5 GHz 2x2 MIMO WiMAX
- Cognitive low band



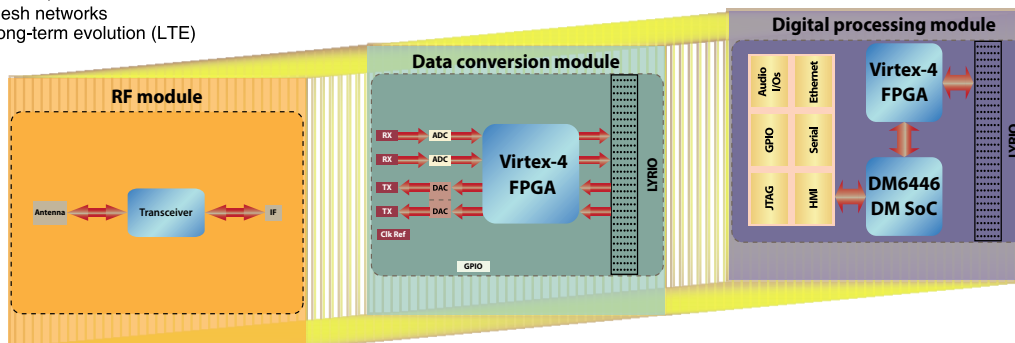
Tunable low-band and high-band ADS

- Typically used for:
- GSM, GPRS, EDGE (femto and pico base stations)
 - Software-defined radio
 - Cognitive radio
 - Public safety applications (TETRA and APCO bands)
 - MILCOMs (gateways, handsets, and man-pack systems)
 - White-space devices
 - Mesh networks
 - Long-term evolution (LTE)



MIMO/SISO WiMAX ADS

- Typically used for:
- WiMAX
 - Wi-Fi
 - Software-defined radio



Tunable RF modules
(up to two modules—second module only capable of RX)

- Low-band range: 0.2–1.0 GHz
- High-band range: 1.6–2.3 GHz
- Software-selectable, 5 MHz or 20 MHz RX bandwidths

WiMAX RF modules
(up to two modules)

- 2.5 GHz WiMAX range: 2.3–2.7 GHz
- 3.5 GHz WiMAX range: 3.3–3.8 GHz
- Software-selectable, 7 MHz or 22 MHz RX bandwidths

ADACMaster III

- Virtex-4 LX25 or SX35 FPGA
- Two, 14-bit, 125-MSPS ADCs
- Dual-channel, 16-bit, 500-MSPS interpolating DAC
- Multiple clock sources
- AC coupled

SFF SDR evaluation module

- TMS320DM6446 DP SoC
- Virtex-4 SX35 FPGA
- MSP430 MCU for power management
- 128-MB DDR2 SDRAM
- 128-MB NAND flash memory
- Stereo audio codec (8 kHz to 48 kHz)
- 10/100 Mbps Ethernet

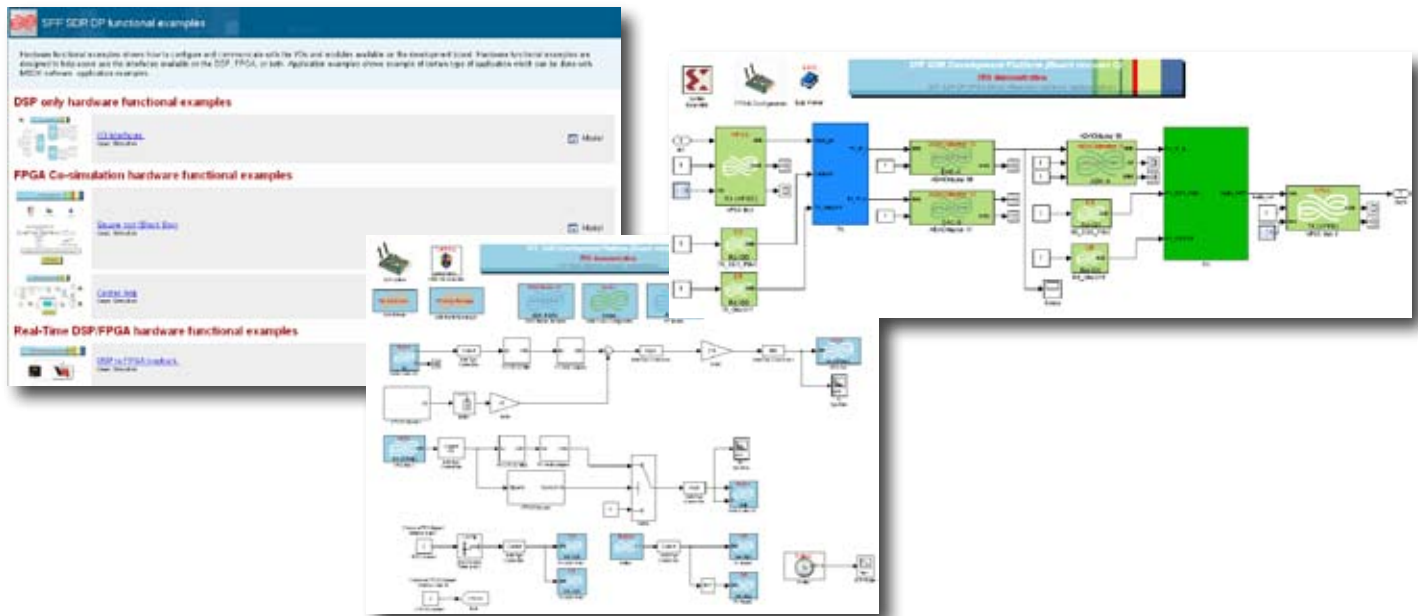
Fully integrated solutions

SFF SDR development platforms integrate a complete array of tools and features, making them perfect for any type of SDR application:

- Embedded, independent power monitoring for each processor in the system
- Tools for real-time data exchanges with the host device CPU
- Seamless hardware and software integration from baseband to antennas
- Real-time and hardware-in-the-loop co-simulation capabilities
- General-purpose processor (GPP), DSP, and FPGA, which makes it easy to implement all protocol layers
- Capable of remote Ethernet access
- Supports many tunable and WiMAX RF modules (see table for details)
- Supports an optional, GPS-disciplined clock synchronization module for mutual boards synchronization or tight clock performance applications

Seamless model-based design

Like most other Lyrtech products, SFF SDR development platforms are seamlessly integrated to the Simulink model-based design environment, making it simple to develop applications and control/validate the different features of their systems in a graphical environment, where programming specific processors is as easy as dragging IP blocks.



SCA integration

The architecture of the platform is also entirely CORBA enabled (GPP, DSP, FPGA) and you can easily develop SCA-compliant waveforms with the SCARI core framework and SCARI tools from the CRC. **(Note that the SCA option is only supported by the tunable, low-band RF module.)**



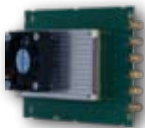
[SFF SDR evaluation module](#)



[ADACMaster III](#)



[Tunable, low/high-band RF module](#)



[2.5 GHz/3.5 GHz WiMAX RF module \(SISO configuration\)](#)



[2.5 GHz/3.5 GHz WiMAX RF module \(2x2 MIMO/dual-band SISO configurations\)](#)



FRS handset



Headset with microphone

Bundles	Features	Models
<p>SFF SDR evaluation module (x1) ADACMaster III (x1) Tunable, low-band RF module (x1) FRS handset (x1) Handset charger (x1) FRS band antenna (x2) Headset with microphone (x1) MBDK license (x1)</p>	<p>Tunable low band</p> <p>SFF SDR evaluation module</p> <ul style="list-style-type: none"> SX35 Virtex-4 FPGA (x1) DM6446 DM SoC 128-MB SDRAM and NAND flash memory <p>ADACMaster III</p> <ul style="list-style-type: none"> 125-MSPS, 14-bit ADC (x2) 500-MSPS, 16-bit interpolating DAC (x2) LX25 Virtex-4 FPGA—AC coupled (x1) <p>RF module</p> <ul style="list-style-type: none"> Selectable bandwidths: 5 MHz or 20 MHz RF range: 200 MHz to 1 GHz 	LYR170-641
<p>SFF SDR evaluation module (x1) ADACMaster III (x1) Tunable, high-band RF module (x1) Quadriband GSM antenna (x2) MBDK license (x1)</p>	<p>Tunable high band</p> <p>SFF SDR evaluation module</p> <ul style="list-style-type: none"> SX35 Virtex-4 FPGA (x1) DM6446 DM SoC 128-MB SDRAM and NAND flash memory <p>ADACMaster III</p> <ul style="list-style-type: none"> 125-MSPS, 14-bit ADC (x2) 500-MSPS, 16-bit interpolating DAC (x2) LX25 Virtex-4 FPGA—AC coupled (x1) <p>RF module</p> <ul style="list-style-type: none"> Selectable bandwidths: 5 MHz or 20 MHz RF range: 1.6 GHz to 2.3 GHz 	LYR170-642
<p>SFF SDR evaluation module (x1) ADACMaster III (x1) 2.5 GHz WiMAX RF module (SISO configuration) (x1) 2.5 GHz WiMAX antenna (x2) MBDK license (x1) ADACMaster III FPGA target MBDK license (x1)</p>	<p>2.5 GHz WiMAX</p> <p>SFF SDR evaluation module</p> <ul style="list-style-type: none"> SX35 Virtex-4 FPGA (x1) DM6446 DM SoC 128-MB SDRAM and NAND flash memory <p>ADACMaster III</p> <ul style="list-style-type: none"> 125-MSPS, 14-bit ADC (x2) 500-MSPS, 16-bit interpolating DAC (x2) SX35 Virtex-4 FPGA—AC coupled (x1) <p>RF module</p> <ul style="list-style-type: none"> Selectable bandwidths: 7 MHz or 22 MHz RF range: 2.3 GHz to 2.7 GHz 	LYR170-651
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<p>SFF SDR evaluation module (x1) ADACMaster III SX35 (x1) 2.5 GHz WiMAX RF module (MIMO configuration) (x2) 2.5 GHz WiMAX antenna (x4) Mini-ADACSync (x1) MBDK license (x1) ADACMaster III FPGA target MBDK license (x1)</p>	<p>2.5 GHz MIMO WiMAX</p> <p>SFF SDR evaluation module</p> <ul style="list-style-type: none"> SX35 Virtex-4 FPGA (x1) DM6446 DM SoC 128-MB SDRAM and NAND flash memory <p>ADACMaster III</p> <ul style="list-style-type: none"> 125-MSPS, 14-bit ADC (x2) 500-MSPS, 16-bit interpolating DAC (x2) SX35 Virtex-4 FPGA—AC coupled (x1) <p>RF modules</p> <ul style="list-style-type: none"> Selectable bandwidths: 7 MHz or 22 MHz RF range: 2.3 GHz to 2.7 GHz <p>Mini-ADACSync</p> <p>Precision, low-jitter clock generator (with GPS time base) Enables complete system synchronization from baseband to RF</p>	TBD
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Bundles	Features	Models
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Options

Components	Features	Models								
ADACMaster III	<ul style="list-style-type: none"> 125-MSPS, 14-bit ADC (x2) 500-MSPS, 16-bit, interpolating DAC (x2) 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">LX25 FPGA—AC coupled</td> <td style="font-size: small;">LSP151-601</td> </tr> <tr> <td style="font-size: small;">LX25 FPGA—DC coupled</td> <td style="font-size: small;">LSP151-602</td> </tr> <tr> <td style="font-size: small;">SX35 FPGA—AC coupled</td> <td style="font-size: small;">LSP151-611</td> </tr> <tr> <td style="font-size: small;">SX35 FPGA—DC coupled</td> <td style="font-size: small;">LSP151-612</td> </tr> </table>	LX25 FPGA—AC coupled	LSP151-601	LX25 FPGA—DC coupled	LSP151-602	SX35 FPGA—AC coupled	LSP151-611	SX35 FPGA—DC coupled	LSP151-612
LX25 FPGA—AC coupled	LSP151-601									
LX25 FPGA—DC coupled	LSP151-602									
SX35 FPGA—AC coupled	LSP151-611									
SX35 FPGA—DC coupled	LSP151-612									
ADACMaster III FPGA target MBDK license	Allows you to target the ADACMaster III's FPGA with MBDK blocks	LSP151-811								
Tunable, low-band RF module ※ <i>Add an RF module to your ADS (with limited RX functionality) for cognitive radio applications, giving you one full-duplex, RX/TX channel and another RX channel for spectral analysis.</i>	0.2–1.0 GHz range	LYR173-611								
Tunable, high-band RF module ※ <i>Add an RF module to your ADS (with limited RX functionality) for cognitive radio applications, giving you one full-duplex, RX/TX channel and another RX channel for spectral analysis.</i>	1.6–2.3 GHz range	LYR173-612								
2.5-GHz WiMAX RF module ※ <i>Add an RF module to your ADS for 2x2 MIMO or 2.5–3.5 GHz dual-band applications.</i>	<ul style="list-style-type: none"> Narrowband: 2.3–2.5 GHz range Wideband: 2.3–2.7 GHz range 	LSP154-631								
3.5-GHz WiMAX RF module ※ <i>Add an RF module to your ADS for 2x2 MIMO or 2.5–3.5 GHz dual-band applications.</i>	<ul style="list-style-type: none"> Narrowband: 3.4–3.6 GHz range Wideband: 3.3–3.8 GHz range 	LSP154-632								

FOR MORE INFORMATION

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With over 25 years of experience delivering advanced digital signal processing solutions to companies worldwide, Lyrtech serves customers across the Americas, Asia, and Europe. Lyrtech offers a full range of DSP–FPGA development platforms, as well as product development services. Lyrtech works in partnership with such industry leaders as Texas Instruments, The MathWorks, and Xilinx to deliver unsurpassed quality and support to its large OEM customer base, which includes many prestigious names of the consumer electronics, telecommunications, aerospace, and defense fields. In a world where digital signal processing technology is vital to network and wireless communications, audio and video processing, as well as electronic systems in all fields of technology, Lyrtech is an ideal partner.

Lyrtech products are constantly being improved; therefore, Lyrtech reserves itself the right to modify the information herein at any time and without notice.

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