

Scientech Software Defined Radio



Scientech 2281 V2.0

Scientech SDR objective is to provide a hands-on learning experience using SDR for engineering students, researcher and industry practitioners who are interested in mastering in software-defined radio (SDR), radio frequency (RF), and wireless communications

Scientech SDR comes with built-in experiments so students can learn faster and explore more.

Benefits

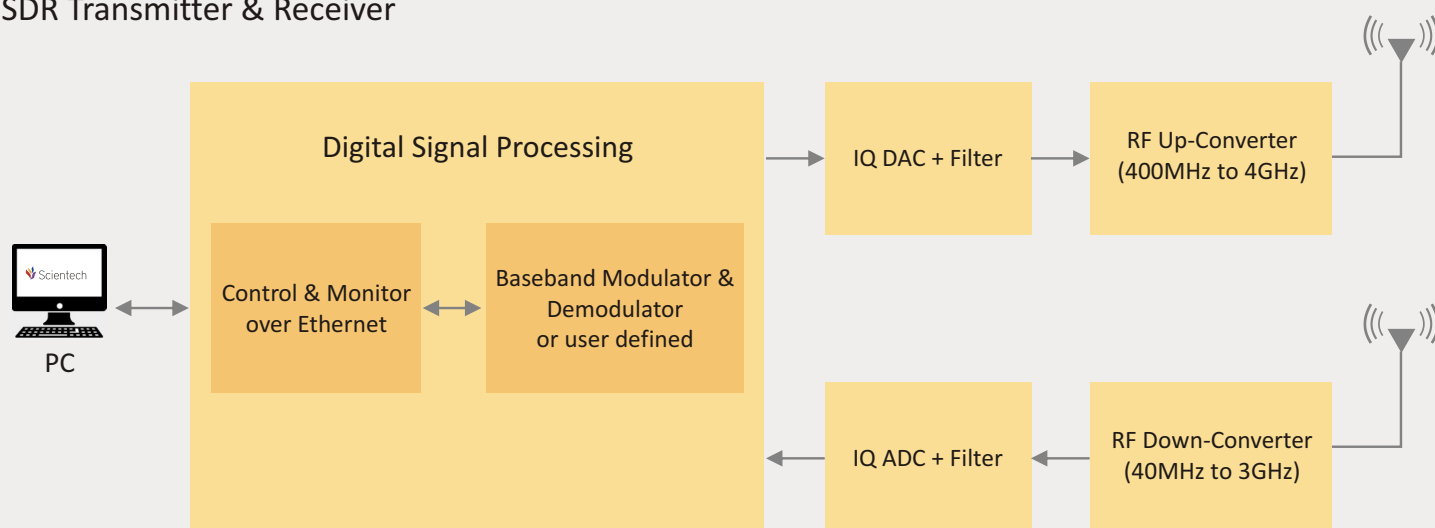
- It allows engineers to prototype and test wireless communication applications.
- It comes along with standard built-in lab work software which will help engineers to kick start their wireless communication journey.
- It allows rapid prototyping of high performance wireless communication system.

Features

- Portable design
- Designed around wireless industry, research & academic need
- Block level approach
- RF-up converter from 400MHz to 4GHz
- RF-down converter from 40MHz to 3GHz
- Fully programmable
- Control & acquisition for real-time signal time domain analysis on software
- Built-in Low-noise frequency synthesizer
- Built-in JTAG for FPGA configuration
- Interface: Ethernet

System Architecture

SDR Transmitter & Receiver



Things you can do

- Install and understand the complete Software Defined Radio setup
- Perform and understand unmodulated carrier in frequency domain using Spectrum Analyzer
- Establish, analyze and verify end to end wireless communication link between Transmitter and Receiver using test data and BPSK baseband modulation & demodulation
- Establish wireless MSK & GMSK modulation and demodulation complete link
- Understanding BER measurement
- Understanding the effect of AWGN noise over end to end wireless communication link

In addition to pre loaded built-in modules users can also implement their wireless communication applications.

Technical Specifications

SDR Transmitter & Receiver

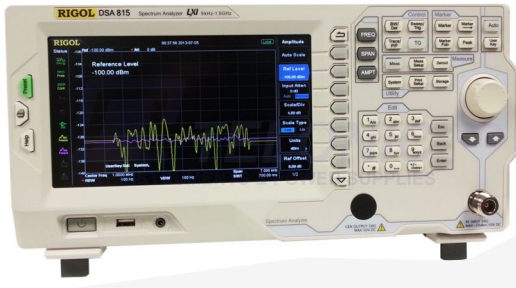
- Maximum Symbol Rate: up to 40 Mbps.
- Device Xilinx Artix7 FPGA (XC7A100T-1) for massive parallel computing
- Dual 500 MSPS 16-bit D/A converters for I Channel and Q Channel
- 14 bit ADC with 100 MHz internal sampling clock
- 6-pole Butterworth clock rejection filters.
- Wideband modulation bandwidth > 200MHz
- DAC clock rejection @ 40 MHz > 84 dBc
- Output voltage: 1Vpp with 0.85V DC bias
- Built-in JTAG USB connector for FPGA configuration
- Standard built-in modulations like BPSK, QPSK, & OQPSK
- Digital Filters: Raised Root Cosine with variable roll-off with interpolation and decimation facility
- Built-in channel impairments generation: AWGN and frequency offset (Doppler)
- Built-in real time Software for Transmitter signal analysis
- Built-in Data Generator as test pattern
- 400MHz to 4GHz Quadrature Modulator
- 40MHz - 3GHz Quadrature De-modulator
- Fixed 10 MHz Local Oscillator (± 2.5 PPM)
- Low-noise frequency synthesizer can be tuned over entire range by steps of 100, 31.25 or 25 KHz
- Built in RF AGC
- Ethernet port for data, control and monitor
- SMA connector

Package contains:

- Scientech 2281 V2.0 : 1 no.
- Omni-directional Antenna : 2 nos.
- Ethernet cable : 1 no.
- USB cable : 1 no.
- Mains cord : 1 no.

Spectrum Analyzer (optional)

- Benchtop DSA815 (1.5GHz)



Optional accessories

- Patch Antenna with mounting stand : 2nos.
- SMA to SMA cable : 2nos.
- N type to SMA adaptor : 2nos

- Handheld MSA438 (3.3GHz)



Designed and Manufactured in India by -

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