

AKADEMIKA



Product Catalogue



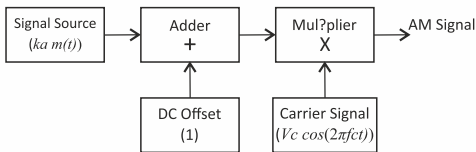
AKADEMIKA is pleased to announce the launch of new Software Define Radio with built-in Embedded Computer, on Linux Platform. Unleash the power of GNU Radio ecosystem. System allows to make telecommunication block diagram and equations come to life using simple building blocks. True open ended modelling system allows professors & students to create any model in telecommunication using the available modules and true real time hardware experimentation.

**FUNCTIONAL BLOCKS**

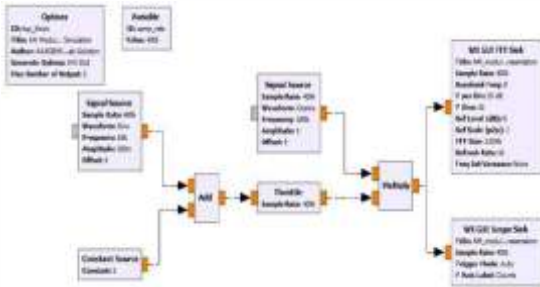
- Audio
  - Boolean Operators
  - Byte Operators
  - Channel Models
  - Channelizers
  - Coding
  - Control Port
  - Debug Tools
  - Deprecated
  - Digital Television
  - Equalizers
  - Error Coding
  - FCD
  - File Operators
  - Filters
  - Fourier Analysis
  - GUI Widgets
  - Impairment Models
  - Instrumentation
  - Level Controllers
  - Math operators
  - Measurements Tools
  - Message Tools
- Paint
  - Modulators
  - Networking Tools
  - NOAA
  - OFDM
  - Packet Operators
  - Pager
  - Peak Detectors
  - Resamplers
  - Stream Operators
  - Stream Tag Tools
  - Symbol Coding
  - Synchronizers
  - Trellis Coding
  - Type Converter
  - UHD
  - Variables
  - Video
  - Waveform Generators
  - ZeroMQ Interfaces
  - Industrial IO
  - Inspector
  - Mapper
  - Many More

**START WITH MATH OR THEORY**  
 $S(t)=V_c [1+ka\ m(t)]cos(2\pi fct)$   
 AM=(DC+Message)xCarrier

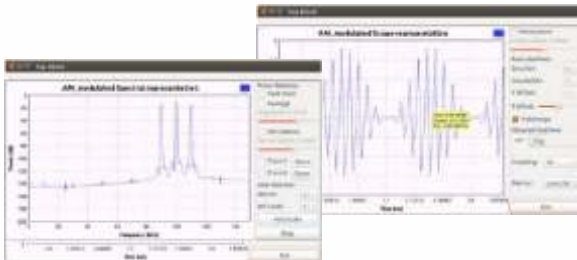
**REPRESENT IT AS A BLOCK DIAGRAM**



**SIMULATE IT FOR IMPLEMENTATION**



**TRANSFER CODES ON HARDWARE PLATFORM FOR REAL TIME RESULT**



## SPECIFICATIONS

### RF Agile Transceiver

- One Transmit, One Receive Channel (with separate Tuning Frequencies)
- Tuning Range : 70 MHz - 6 GHz.
- LO step size: 2.4 Hz
- Tunable Channel Bandwidth : 200 KHz – 20 MHz.
- Integrated DACs (Tx) : 12-bit
- Integrated ADCs (Rx) : 12-bit
- Variable Output Data Rates : 61.44 MSPS - 65.1 kSPS
- Modulation Accuracy (EVM) :  $\leq -40$  dB (typical)
- RX Gain Control : 0 to +74.5dB (800 Mhz)
- Received Signal Strength : 100 dB ( $\pm 2$  dB)
- Internal I/Q Correction and Calibration

### Antenna

- Frequency Range : 824-894 MHz and 1710- 2170MHz
- Connector Type : SMA

### FPGA

- Logic Cells : 28k
- Block RAM : 2.1Mb
- DSP Slices : 80

### SDR Processing System

- Single-core ARM® Cortex™-A9 MPCore™ @ 667 MHZ
- Streams up to 4MSPS with no dropped samples

### Embedded Processing System

Quad-core 64-bit @ 1.4GHz

### Memory

DDR3L

- 1066 Mbps (16-bit Interface)
- 512 Mbytes

### Serial Flash

- 32 Mbyte
- Quad I/O provides throughput up to 54 Mbps

### Embedded Computer with Preloaded Ubuntu and GNU Radio:

- Processor: 2.4GHz quad-core 64-bit Arm Cortex-A76 CPU, 512KB percore L2 caches, and a 2MB shared L3 cache
- Single HDMI display output with HDR support
- LPDDR4X-4267 SDRAM - 8GB
- Dual-band 802.11ac Wi-Fi?
- MicroSD card slot, with support for high-speed SDR104 mode
- 2 × USB 3.0 ports, supporting simultaneous 5Gbps operation
- 2 × USB 2.0 ports
- Gigabit Ethernet, with PoE+ support
- 5V/5A DC power via USB-C, with Power Delivery support
- 18" Monitor
- Mouse
- Keyboard.

## SAMPLE TUTORIAL LIST HELPS YOU CODE YOUR OWN EXPERIMENTS

### Analog Communication

- Application Program to configure the SDR as FM Transmitter.
- Application Program to configure the SDR as FM Receiver
- Amplitude Modulation.
- Amplitude Demodulation.
- Frequency Modulation.
- Frequency Demodulation.

### DIGITAL COMMUNICATION

- Amplitude Shift Keying (ASK) Generation.
- Amplitude Shift Keying (ASK) Demodulation.
- Frequency Shift Keying (FSK) Generation.
- Frequency Shift Keying (FSK) Demodulation.
- Binary Phase Shift Keying (BPSK) Generation.
- Binary Phase Shift Keying (BPSK) Demodulation.
- Quadrature Phase Shift Keying (QPSK) Generation.
- Quadrature Phase Shift Keying (QPSK) Demodulation.
- Analysing Impact of Pulse Shaping .

### Note :

- Due to memory & speed limitation of embedded system complex models at high speed may not give desired results.

# Our Products



Basic Electronics



Analog Communication



Digital Communication



RF/Antenna & Microwave



Fiber Optics



Radar



Wireless Communication



Network Laboratory



Processor



Controls & Instrumentation



Test & Measuring Instruments



Drone Technology Laboratory

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