5-NINES RADIO

5-NINESRADIO(5GNSACONFIGURATIONS)COMPONENTS	
Components	CN Emulator (1 unit) eNB Emulator (1unit) gNB Emulator (1unit) gNB Transceiver-Sub-6GHz (1unit) 5G IoT Bridge (1 unit) 5G Smartphone (2 unit) Programmed SIM cards (10units)
CN Emulator, eNB Emulator, gNB Emulator Hardware Specifications	Dell IntelI7processor,1TBHDD,16GBRAM 27” Monitor
CN Emulator,eNB Emulator,gNB Emulator Software Specifications	NSA: EPC, gNB, eNB Protocol Stacks: 3GPP Release 15 SA: 5GCore, gNB Protocol Stacks: 3GPP Release 17
eNB Bandwidth	5, 10 ,and 20MHz
gNB Bandwidth (Sub-6GHz)	20 and 40MHz
Duplexing Mode	eNB-FDD, gNB-TDD
Operating Band	B7 & n78 (2600 MHz & 3600 MHz)
MIMO Support	1x1 (eNB), 2x2 (gNB)
Active Antennas	1x1 (eNB), 1x1 (gNB)

DEEP RADIO

TECHNICALSPECIFICATIONS:

TRANSCEIVER

Frequency range : 50 MHz–6GHz
Max. Sampling rate :20 MSps
ADC :16 bits

CONNECTIVITY

Wi-Fi : 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac, LAN: Gigabit Ethernet
Video output : HDMI
USB : 1USB3.0, 4xUSB2.0 Male and 1USB 2.0 Female ports

STORAGE : HDD: 500 TB

INPUTPOWER : 5V, 4A

PROGRAMMINGTOOLS/LANGUAGE: GNU Radio, Python, C

ACCESSORIES

23”Monitor, Power adapter–1unit,USB3.0bridge–1unit,WiFiadapter–1unit, USB 2.0MaletoFemalecable– 1 unit, USB 2.0 Male to micro Male cable – 1 unit, Whip antenna – 1 unit, Telescopic antenna – 1 unit

DEEP RADIO EXPERIMENTS

- **Digital Signal Processing**
  - Sampling theorem
  - FIR filter design
  - Down sampling
  - Discrete Fourier Transform
- **Live Signal Processing**
  - Transmission and Reception of AM, FM, QPSK, QAM and GMSK, OFDM modulated signals
- **Monitoring and Decoding GSM and LTE signals Machine Learning**
  - RF Signal Classification for different modulation schemes: BPSK, QPSK, 8PSK, 16 PSK, 32 PSK, GMSK, 16 QAM, GFSK, CPFSK, OOK)
- **Spectrum Analyzer**
  - Deep Radio can act as a spectrum analyzer in the frequency range from 50 MHz-6 GHz
  - Visualization of 4G and 5G Time-Frequency signals
- **Cognitive Radio**
  - Spectrum scanning from 50MHz to 6GHz
  - Spectrum sensing in the frequency range 50 MHz to 6 GHz
- **Jammer**
  - Deep Radio can act as a Wi-Fi Jammer
- **Wireless Channel Modeling**
  - Verification of AWGN, small scale fading distribution, Shadow fading distribution
- **GNU Radio**
  - GNU Radio based OFDM waveform generation and transmission
  - Generation and transmission of 4G and 5G Signals
  -

WI-GUY

WI-GUY TECHNICAL SPECIFICATIONS

SDR RECEIVER

Frequency range: 50–950MHz
Max. Sampling rate: 2.7 MSps
ADC: 8 bits
Max. Rx Gain: 19.2 dB
Operating temperature: 0-50°C

CONNECTIVITY

Wi-Fi: 2.4 GHz and 5 GHz IEEE 802.11. b/g/n/ac
Bluetooth: Bluetooth 4.2
LAN: Gigabit Ethernet (Max. throughput 300Mbps)
Video output: HDMI
USB: 4 x USB 2.0 Male and 1USB 2.0 Female ports

MEMORY

RAM: 1GB
Storage Memory: 32GB

POWER R EQUIREMENTS

Input power: 5V, 2.5A

PROGRAMMINGLANGUAGE

Python,C,C++