



Product Brief

NI Ettus USRP Software Defined Radios

A USRP (Universal Software Radio Peripheral) Software Defined Radio (SDR) device provides a software-defined RF architecture to design, prototype, and deploy wireless systems with custom signal processing. Hardware options range from low-cost to high-performance radios with large, open FPGAs.

Ideal for:

- Radar and electronic warfare research and prototyping
- SIGINT and direction finding
- SATCOM ground stations
- Wireless research & prototyping
- Massive MIMO applications
- Cellular communications



The NI Advantage

01 A USRP for Any Use Case

From a low SWaP-C, highly deployable SDR to a larger device with more channels, higher bandwidth, and onboard FPGAs, NI's USRPs offer an option for any application

02 Your Choice of Development Software

With Windows, Linux, and OS X support, you can pair your SDR with NI-USRP and LabVIEW or utilize UHD with your choice of open-source software to drive your application design

03 Flexibility and Reconfigurability

With the level of customization and flexibility that USRPs offer, you can continue using the same hardware for multiple applications by modifying your existing IP

NI Ettus USRP Family Overview

	X4 Series	X310*	N Series	B Series	E Series
Frequency	30 MHz - 4 GHz (X440) 1 MHz - 7.2 GHz (X410)	*10 MHz - 6GHz	3 MHz - 6 GHz (N32x) 10 MHz - 6 GHz (N310)	70 MHz - 6 GHz	70 MHz - 6 GHz
Bandwidth	Up to 1.6 GHz (X440) 400 MHz (X410)	40 MHz - 160 MHz*	200 MHz (N32x) 100 MHz (N310)	56 MHz	56 MHz
Channels	8 TX, 8 RX (X440) 4 TX, 4 RX (X410)	2 TX, 2 RX 4 RX (TwinRX)	2 TX, 2 RX (N32x) 4 TX, 4 RX (N310)	2 TX, 2 RX	2 TX, 2 RX
Synchronization	8x8 MIMO (X440) 4x4 MIMO (X410)	2x2 MIMO	Up to 128x128 (N32x) full-phase synchronization	2x2 MIMO	2x2 MIMO
Key Features	RFSoc Based, Wide-Band, Multi-channel, SW: LabVIEW and Open-Source Ready	*Configurable RF Front End, Programmable FPGA	Stand Alone, Wide Bandwidth, Multi-Channel Sync Ready (N32x)	Low SWaP-C, Highly Portable	Low SWaP, Embedded Deployable

Highlighted Features

- 1 MHz to 7.2 GHz frequency ranges (tunable up to 8 GHz)
- Up to 1.6 GHz/channel of bandwidth
- Up to eight transmit and eight receive channels per radio
- Local oscillator import/export synchronization
- A GPS disciplined oscillator (GPSDO)
- Development tools such as LabVIEW, open-source UHD, GNU Radio, and MathWorks MATLAB® software
- Windows, Linux, and OS X support
- FPGA development using LabVIEW FPGA and RF Network-on-Chip (RFNoC) framework
- Onboard ARM and x86 processor available on some models
- Communication interfaces such as USB, Gigabit Ethernet, and PCI Express

Customer Story

Challenge—Developing drone defense systems that rapidly evolve with ever-increasing threat frequency and sophistication.

Solution—Rapidly prototyping and deploying with the NI USRP to deliver industry-leading capability into the field faster and at a much lower cost to the government.

“The NI Ettus Research USRP X310 is the only commercially available SDR with the openness and raw RF and DSP capabilities to meet the needs of this rapidly evolving drone threat.” - Scott Torborg, CTO, SkySafe

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