

# SPECIFICATIONS

# USRP-2921

Software Defined Radio Device

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## Definitions

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*Warranted* specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

*Characteristics* describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- *Typical* specifications describe the expected performance met by a majority of the models.
- *Nominal* specifications describe parameters and attributes that may be useful in operation.

Specifications are *Characteristics* unless otherwise noted.

## Conditions

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Specifications are valid at 25 °C unless otherwise noted.

# Transmitter

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Frequency range	2.4 GHz to 2.5 GHz and 4.9 GHz to 5.9 GHz
Frequency step	<1 kHz
Maximum output power ( $P_{out}$ )	
2.4 GHz to 2.5 GHz	50 mW to 100 mW (17 dBm to 20 dBm)
4.9 GHz to 5.9 GHz	50 mW to 100 mW (17 dBm to 20 dBm)
Gain range <sup>1</sup>	0 dB to 35 dB
Gain step	0.5 dB
Frequency accuracy <sup>2</sup>	2.5 ppm
Maximum instantaneous real-time bandwidth <sup>3</sup>	
16-bit sample width	24 MHz
8-bit sample width	48 MHz
Maximum I/Q sample rate <sup>4</sup>	
16-bit sample width	25 MS/s
8-bit sample width	50 MS/s
Digital-to-analog converter (DAC)	2 channels, 400 MS/s, 16 bit
DAC spurious-free dynamic range (SFDR)	80 dB

# Receiver

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Frequency range	2.4 GHz to 2.5 GHz and 4.9 GHz to 5.9 GHz
Frequency step	<1 kHz
Gain range <sup>5</sup>	0 dB to 92.5 dB
Gain step	2 dB
Maximum input power ( $P_{in}$ )	-15 dBm

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- <sup>1</sup> The output power resulting from the gain setting varies over the frequency band and among devices.
  - <sup>2</sup> *Frequency accuracy* is based on temperature-compensated crystal oscillator (TCXO) vendor specifications and is not measured. Alternatively, you can incorporate an external reference source to provide a more precise frequency Reference Clock and to achieve better frequency accuracy.
  - <sup>3</sup> Instantaneous bandwidth depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chipset dependent.
  - <sup>4</sup> I/Q sample rate depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chipset dependent.
  - <sup>5</sup> The received signal amplitude resulting from the gain setting varies over the frequency band and among devices.

Noise figure	5 dB to 7 dB
Frequency accuracy <sup>6</sup>	2.5 ppm
Maximum instantaneous real-time bandwidth <sup>7</sup>	
16-bit sample width	19 MHz
8-bit sample width	36 MHz
Maximum I/Q sample rate <sup>8</sup>	
16-bit sample width	25 MS/s
8-bit sample width	50 MS/s
Analog-to-digital converter (ADC)	2 channels, 100 MS/s, 14 bit
ADC sFDR	88 dB

## Half-Duplex Device

The USRP-2921 is a half-duplex device. The USRP-2921 cannot transmit and receive signals at the same time.

## Power



**Caution** The protection provided by this product may be impaired if it is used in a manner not described in this document.

Total power, typical operation

Typical	12 W to 15 W
Maximum	18 W
Power requirement	Accepts a 6 V, 3 A external DC power connector



**Note** You must use either the power supply provided in the shipping kit, or another UL listed ITE power supply marked *LPS*, with the USRP-2921.

<sup>6</sup> *Frequency accuracy* is based on temperature-compensated crystal oscillator (TCXO) vendor specifications and is not measured. Alternatively, you can incorporate an external reference source to provide a more precise frequency Reference Clock and to achieve better frequency accuracy.

<sup>7</sup> Instantaneous bandwidth depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chipset dependent.

<sup>8</sup> I/Q sample rate depends on many factors including, but not limited to, network configuration and host computer performance. Actual data throughput may be chipset dependent.

# Physical Characteristics

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If you need to clean the module, wipe it with a dry towel.

## Physical dimensions

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(L × W × H)	15.875 cm × 4.826 cm × 21.209 cm (6.25 in. × 1.9 in. × 8.35 in.)
Weight	1.193 kg (2.63 lb)

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# Environment

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Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
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Pollution Degree	2
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Indoor use only.

# Operating Environment

Operating temperature	23 °C ± 5 °C
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Relative humidity range	10% to 90%, noncondensing (tested in accordance with IEC 60068-2-56)
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# Compliance and Certifications

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## Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1



**Note** For UL and other safety certifications, refer to the product label or the [Online Product Certification](#) section.

## Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions

- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



**Note** In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia, and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.



**Note** Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



**Note** For EMC declarations, certifications, and additional information, refer to the [Online Product Certification](#) section.

## CE Compliance

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

## Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit [ni.com/certification](https://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at [ni.com/environment](https://ni.com/environment). This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

## Waste Electrical and Electronic Equipment (WEEE)



**EU Customers** At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit [ni.com/environment/weee](https://ni.com/environment/weee).

## 电子信息产品污染控制管理办法（中国 RoHS）



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