

SPECIFICATIONS

USRP-2955

10 MHz to 6 GHz Tunable RF Receiver

This document lists specifications for the USRP-2955 Software Defined Radio Reconfigurable Device.

The USRP-2955 contains a GPS-disciplined oscillator (GPSDO), which enables you to lock the internal clocks to a GPS reference signal, synchronize using GPS timing information, and query GPS location information.

All characteristics described in this document are based on the manufacturing design. This equipment information is only for product description and is not covered by warranty. The USRP-2955 is not a calibrated device.

Characteristic specifications are unwarranted values that are representative of an average unit operating at room temperature.



Note These specifications are characteristic at 25 °C unless otherwise noted.



Caution Do not operate the USRP-2955 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to National Instruments for repair.

Contents

Receiver.....	2
LO Input/Export Connectors.....	3
GPS Disciplined Oscillator (GPSDO).....	4
Power.....	4
Onboard DRAM.....	4
Physical Characteristics.....	4
Environment.....	5
Operating Environment.....	5
Compliance and Certifications.....	5
Safety.....	5
Electromagnetic Compatibility.....	5
CE Compliance	6
Online Product Certification.....	6
Environmental Management.....	6

Receiver

Number of channels	4
Frequency range	10 MHz to 6 GHz
Frequency step	<1 kHz
Gain range ¹	0 dB to 95 dB
Gain step	1 dB
Maximum input power (P_{in})	+10 dBm
Frequency accuracy ²	2.5 ppm
Maximum instantaneous real-time bandwidth ³	80 MHz
Maximum I/Q sample rate	100 MS/s
Analog-to-digital converter (ADC)	
Resolution	14 bit
sFDR	88 dB

Table 1. Noise Figure

Frequency	Noise Figure ⁴ (dB)
10 MHz to 3 GHz	<5
3 GHz to 5 GHz	<4
5 GHz to 6 GHz	<8

¹ The received signal amplitude resulting from the gain setting varies over the frequency band and among devices.

² *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.

³ Each USRP-2955 receiver path has 80 MHz of bandwidth throughout the full frequency range of the device.

⁴ Noise figure values are based on 0 dB RF attenuation and maximum gain settings.

LO Input/Export Connectors

LO OUT 1

IF2

Minimum RF power level	0 dBm
Nominal RF power level	+3 dBm

IF1

Minimum RF power level	-12 dBm
Nominal RF power level	+5 dBm

LO IN 0

IF2

Minimum RF power level	0 dBm
Nominal RF power level	+2 dBm
Maximum RF power level	+20 dBm

IF1

Minimum RF power level	-10 dBm
Nominal RF power level	-5 dBm
Maximum RF power level	+10 dBm

LO IN 1

IF2

Minimum RF power level	0 dBm
Nominal RF power level	+2 dBm
Maximum RF power level	+20 dBm

IF1

Minimum RF power level	-10 dBm
Nominal RF power level	-5 dBm
Maximum RF power level	+10 dBm

GPS Disciplined Oscillator (GPSDO)

Frequency accuracy⁵

OCXO (not locked to GPS)	25 ppb
OCXO (locked to GPS)	5 ppb

Active antenna

Voltage	5 V
Power	0.7 W

Power



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

Input voltage	9 V to 16 V, DC
Input current	7.5 A, maximum
Typical power consumption	38 W to 44 W, varies by application



Caution You must use an LPS or Class 2 power supply with the USRP-2955. The power supply must also meet any safety and compliance requirements for the country of use.

Onboard DRAM

Memory size	1,024 MB
-------------	----------

Physical Characteristics

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

Physical dimensions

(L × W × H)	26.67 cm × 4.06 cm × 21.84 cm (10.5 in. × 1.6 in. × 8.6 in.)
Weight	1.588 kg (3.50 lb)

⁵ *Frequency accuracy* is based on oven-controlled crystal oscillator (OCXO) 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.

Environment

Ambient temperature range	0 °C to 55 °C (tested in accordance with IEC 60068-2-1 and IEC 60068-2-2)
Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Operating Environment

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

Compliance and Certifications

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, 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. 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.

电子信息产品污染控制管理办法（中国 RoHS）



中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

Information is subject to change without notice. Refer to the *NI Trademarks and Logo Guidelines* at ni.com/trademarks for information on NI trademarks. Other product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering NI products/technology, refer to the appropriate location: **Help»Patents** in your software, the `patents.txt` file on your media, or the *National Instruments Patent Notice* at ni.com/patents. You can find information about end-user license agreements (EULAs) and third-party legal notices in the `readme` file for your NI product. Refer to the *Export Compliance Information* at ni.com/legal/export-compliance for the NI global trade compliance policy and how to obtain relevant HTS codes, ECCNs, and other import/export data. NI MAKES NO EXPRESS OR IMPLIED WARRANTIES AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN AND SHALL NOT BE LIABLE FOR ANY ERRORS. U.S. Government Customers: The data contained in this manual was developed at private expense and is subject to the applicable limited rights and restricted data rights as set forth in FAR 52.227-14, DFAR 252.227-7014, and DFAR 252.227-7015.

© 2016 National Instruments. All rights reserved.

376707A-01 Dec16