

# R&S® ZN-Z15

## RFFE INTERFACE

### Specifications



Specifications  
Version 04.00

**ROHDE & SCHWARZ**

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## CONTENTS

Definitions .....	3
General data .....	5
Ordering information .....	6
Warranty and service.....	6

# Definitions

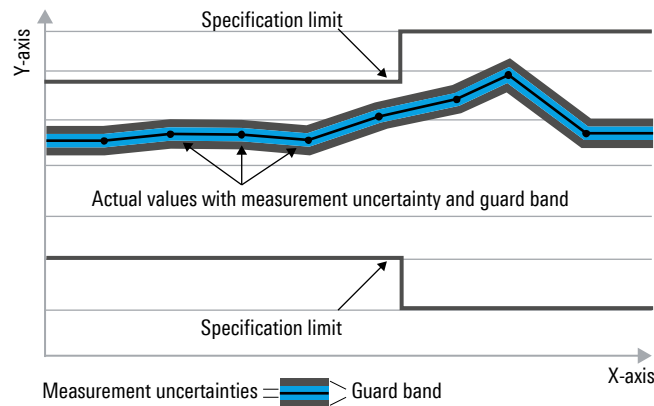
## General

Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

## Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as  $<$ ,  $\leq$ ,  $>$ ,  $\geq$ ,  $\pm$ , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



## Non-traceable specifications with limits (n. trc.)

Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

## Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

## Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with  $<$ ,  $>$  or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

## Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

## Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

## Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (MSPS) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, MSPS, kbps, ksps and Msample/s are not SI units.

<b>RFFE interface</b> (order no. 1325.5905.02 and 1325.5905.03)	RFFE	controls up to two independent MIPI RFFE devices
	GPIO	ten output lanes with different power capability
LAN interface	RJ-45	10/100BASE-T
USB interface		USB type B plug, version 2.0
DIRECT CTRL IN interface		direct control bus input
DIRECT CTRL OUT interface		direct control bus output, power out: max. 180 mA
R&S®ZN-Z15 power input		12 V DC $\pm$ 10 %, 1.2 A
External power supply (order no. 3586.3888.00)		R&S®TRG45A AC/DC adapter, 45 W

<b>RFFE GPIO interface</b> (order no. 1325.5905.02)	provides two independent MIPI RFFE busses, and ten individually configurable output lanes with different power handling capabilities
Connector type	25-pin D-Sub female
Ground (analog and digital)	pin 1, 3, 5, 11 and 22

<b>Output voltage</b>	output configuration selected	voltage range	voltage step size	max. current
RFFE port 1 VIO	pin 2	0 to +2 V	1 mV	20 mA
RFFE port 1 DATA	pin 15	0 to +2 V	1 mV	20 mA
RFFE port 1 CLK	pin 14	0 to +2 V	1 mV	20 mA
configurable clockrate: 31.25 kHz to 52 MHz				
RFFE port 2 VIO	pin 4	0 to +2 V	1 mV	20 mA
RFFE port 2 DATA	pin 17	0 to +2 V	1 mV	20 mA
RFFE port 2 CLK	pin 16	0 to +2 V	1 mV	20 mA
configurable clockrate: 31.25 kHz to 52 MHz				
GPIO 1 to 8	pin 6 to pin 9, pin 18 to pin 21	-5 V to +10 V, typ. -6 V to +12 V	5 mV	20 mA
GPIO 9 and 10	pin 10 and 23	-5 V to +10 V, typ. -6 V to +12 V	5 mV	100 mA

<b>RFFE GPIO interface</b> (order no. 1325.5905.03)		including voltage/current measurement with switchable source resistance 32 internal ADC channels are available on the RFFE GPIO interface measuring voltage and current at each RFFE and GPIO pin simultaneously				
<b>Voltage measurement</b>		voltage range	resolution	accuracy <sup>1</sup>		
RFFE port 1 and 2, VIO, DATA and CLK	pin 2 and 4, pin 14 to pin 17	0 V to +3 V	100 $\mu$ V	2 % $\pm$ 20 mV		
GPIO 1 to 10	pin 6 to pin 9, pin 18 to pin 21, pin 10, pin 23	-5 V to +10 V	100 $\mu$ V	2 % $\pm$ 50 mV		
<b>Current measurement</b> Current values are valid for GPIO voltages -5 V to +8 V		source shunt resistor	current range	resolution	accuracy <sup>1</sup>	repeatability
RFFE port 1 and 2, VIO, DATA and CLK, GPIO 1 to 8	pin 6 to pin 9, pin 18 to pin 21	10 $\Omega$	-20 mA to +20 mA	10 $\mu$ A	2 % $\pm$ 200 $\mu$ A	< 100 $\mu$ A
		100 $\Omega$	-2 mA to +2 mA	1 $\mu$ A	2 % $\pm$ 20 $\mu$ A	< 10 $\mu$ A
		1 k $\Omega$	-200 $\mu$ A to +200 $\mu$ A	100 nA	3 % $\pm$ 3 $\mu$ A	< 1 $\mu$ A
		10 k $\Omega$	-20 $\mu$ A to +20 $\mu$ A	10 nA	5 % $\pm$ 500 nA	< 100 nA
		100 k $\Omega$	-2 $\mu$ A to +2 $\mu$ A	1 nA	5 % $\pm$ 50 nA	< 10 nA
GPIO 9 and 10	pin 10 and 23		-100 mA to +100 mA	10 $\mu$ A	3 % $\pm$ 3 mA	< 100 $\mu$ A
<b>Trigger</b>		TRIG 1/TRIG 2 trigger level		BNC connector TTL level, 3.3 V tolerant		

## General data

<b>Temperature range</b>		
Operating temperature range		0 °C to +50 °C
	with R&S®TRG45A external power supply	0 °C to +40 °C
Permissible temperature range		-10 °C to +55 °C
Storage temperature range		-10 °C to +70 °C
Damp heat		+25 °C/+55 °C, cycl. 95 %
Short dew		-5 °C/+25 °C
Transport above sea level		4500 m
Operation above sea level		2000 m
Calibration interval		1 year
EU legislation	for details, see user documentation	EU: in line with Data Act – Regulation (EU) 2023/2854
EMC	emission	in line with CISPR 11/EN 55011 group 1 class A (for a shielded test setup); instrument complies with the emission requirements stipulated by EN 55011 and EN 61326-1 class A; this means that the instrument is suitable for use in industrial environments
	immunity	in line with EMC Directive 2014/30/EU including: IEC/EN 61326-1 (immunity test requirement for industrial environment, EN 61326 table 2), IEC/EN 61326-2-1, IEC/EN 61000-3-2, IEC/EN 61000-3-3
Electrical safety		in line with IEC 61010-1, EN 61010-1 and UL 61010-1, CAN/CSA-C22.2 No.61010-1
Power supply		100 V to 240 V AC, 1.05 A to 0.55 A, 47 Hz to 63 Hz, safety class I in line with VDE 411
Power consumption		< 25 VA
Conformity marking		cCSA <sub>US</sub> , CE
Dimensions	W x H x D	170 mm x 55 mm x 230 mm (6.7 in x 2.2 in x 9.1 in)
Weight	with accessories	2.0 kg (4.4 lb)
	without accessories	1.1 kg (2.4 lb)

<sup>1</sup> x %  $\pm$  y is to be understood as x % of reading  $\pm$  y.

## Ordering information

Designation	Type	Order No.
RFFE interface	R&S®ZN-Z15	1325.5905.02
RFFE interface, including voltage/current measurements with switchable source resistance	R&S®ZN-Z15	1325.5905.03
<b>Accessory</b>		
Direct control cable	R&S®ZN-B121	1323.9290.00
RFFE cable with adaptors	R&S®ZN-Z25	1334.3424.02

## Warranty and service

<b>Warranty</b>		
Base unit		3 years
All other items		1 year
<b>Service options</b>		
	Service plans	On demand
Calibration	up to five years <sup>2</sup>	pay per calibration
Warranty and repair	up to five years <sup>2</sup>	standard price repair

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<sup>2</sup> For extended periods, contact your Rohde & Schwarz sales office.



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