R&S®IQW
WIDEBAND I/Q DATA RECORDER

Specifications

Data Sheet
Version 07.00

ROHDE&SCHWARZ
Make ideas real

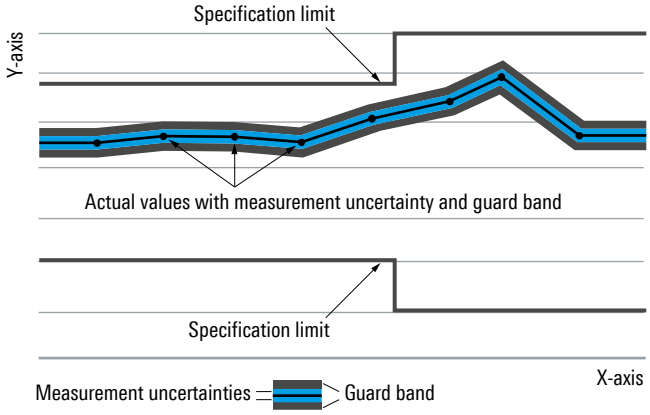
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes 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 <, ≤, >, ≥, ±, 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/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bits per second (Gbps), million bits per second (Mbps), thousand bits 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.

Specifications

Record/play

Performance

Record performance		
RF bandwidth	when used with R&S®FSW	1000 MHz
Play performance		
RF bandwidth	when used with R&S®SMW200A or R&S®SMM100A	1000 MHz

I/Q storage

I/Q sample storage		
Storage size used	per I/Q sample	32 bit
Required disk size	per minute, per Hz RF bandwidth	approx. 300 byte [1]
	per minute, at 512 MHz	≤ 155 Gbyte (nom.) [1, 2]
Storage size used	per I/Q sample	24 bit
Required disk size	per minute, at > 512 MHz	230.4 Gbyte (nom.) [1, 2 ,3]

I/Q data sources for record

It is highly recommended to verify order numbers and required options with the corresponding data sheets of the connected Rohde & Schwarz instrument and with your sales representative.

Rohde & Schwarz instrument	Order No.	Required option
R&S®FSW8, R&S®FSW13, R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67, R&S®FSW85, R&S®FSWT26	1331.5003.08, 1331.5003.13, 1331.5003.26, 1331.5003.43, 1331.5003.50, 1331.5003.67, 1331.5003.85, 1313.7008.26	DIG IQ: • basic option for ≤ 10 MHz: R&S®FSW-B17 • bandwidth extensions: − ≤ 28 MHz: R&S®FSW-B28 − ≤ 40 MHz: R&S®FSW-B40 − ≤ 80 MHz: R&S®FSW-B80 − ≤ 160 MHz, any of: R&S®FSW-B160, R&S®FSW-B320, R&S®FSW-B512, R&S®FSW-B512R, R&S®FSW-B1200, R&S®FSW-B800R, R&S®FSW-B2001
		DIG IQ HS (40G): • 80.1 MHz to 512 MHz: R&S®FSW-B517 and any of: R&S®FSW-B512, R&S®FSW-B512R, R&S®FSW-B800R, R&S®FSW-B1200, R&S®FSW-B2001 • 80.1 to 1000 MHz: R&S®FSW-B1017 and any of: R&S®FSW-B800R, R&S®FSW-B1200, R&S®FSW-B2001

[1] Some overhead because of housekeeping.

[2] 1 Gbyte = 10^9 byte.

[3] R&S®FSW sampling rate is 1200 Msps, if RF bandwidth is greater than 512 MHz.

I/Q data sinks for play

It is highly recommended to verify order numbers and required options with the corresponding data sheets of the connected Rohde & Schwarz instrument and with your sales representative.

Rohde & Schwarz instrument	Order No.	Required option
R&S®SMW200A	1412.0000.02	DIG IQ: basic options for ≤ 160 MHz: R&S®SMW-B10 and R&S®SMW-B13 or R&S®SMW-B13T or R&S®SMW-B9 and R&S®SMW-B13XT
		DIG IQ HS (50G): basic options for ≤ 1000 MHz: R&S®SMW-B9 and R&S®SMW-B13XT
R&S®SMM100A	1440.8002.02	DIG IQ HS (50G): basic options for ≤ 1000 MHz: R&S®SMM-B9
R&S®SMBV100B	1423.1003.02	DIG IQ, ≤ 166 MHz
		DIG IQ HS (50G), ≤ 500 MHz
R&S®SMCV100B	1432.7000.02	DIG IQ HS (40G), ≤ 300 MHz
R&S®SGT100A	1419.4501.02	DIG IQ, ≤ 160 MHz: R&S®SGT-K18

Signal analysis software

Rohde & Schwarz product	Order No.	Required version
R&S®VSE, basic edition	1345.1011.06	≥ 1.70
R&S®VSE, enterprise edition	1345.1105.06	≥ 1.70

Signal interfaces

Reference frequency

REF OUT		
Connector type	REF OUT on rear panel	BNC female
Output frequency	sine wave	10 MHz
Frequency error		$\pm 5 \times 10^{-6}$
Output level	at time of calibration in production	> 0 dBm
Source impedance		50 Ω (nom.)
REF IN		
Connector type	REF IN on rear panel	BNC female
Input frequency		10 MHz
Frequency locking range		$\pm 5 \times 10^{-6}$
Input level range		–5 dBm to +10 dBm

Trigger

TRIG 1, TRIG 2		
Connector type	TRIG1, TRIG 2 on rear panel	BNC female
Trigger output level		LVTTL, 0 V to 3.3 V
Trigger input level		LVTTL, 0 V to 3.3 V

GPS receiver

GPS receiver performance		
Sensitivity	cold start	–148 dBm (nom.)
	tracking	–165 dBm (nom.)
Time-to-first-fix	cold start	29 s (nom.)
	hot start	1 s (nom.)
Channels		72

R&S®Digital I/Q interface

Digital I/Q signals are available on the rear panel of the instrument. The digital I/Q output can be used for the lossless connection to other Rohde & Schwarz instruments.

DIG IQ IN/OUT		
Interface	direction	input
	connector	26-pin MDR connector
	level	LVDS
Standard protocol	sample rate	≤ 100 Msample/s
	resolution	16 bit for I and 16 bit for Q
	general purpose signals	unused
Enhanced protocol	sample rate	≤ 200 Msample/s
	resolution	16 bit for I and 16 bit for Q
	general purpose signals	unused
Transfer modes	enable mode	supported
DIG IQ OUT		
Interface	direction	output
	connector	26-pin MDR connector
	level	LVDS
Standard protocol	sample rate	≤ 100 Msample/s
	resolution	16 bit for I and 16 bit for Q
	general purpose signals	unused
Enhanced protocol	sample rate	≤ 200 Msample/s
	resolution	16 bit for I and 16 bit for Q
	general purpose signals	unused
Transfer modes	enable mode	supported

R&S®Digital I/Q HS interface

Digital I/Q signals are available on the rear panel of the instrument. The R&S®Digital I/Q HS interface can be used for the lossless connection to other Rohde & Schwarz instruments.

DIG IQ HS A, DIG IQ HS B		
Interface	direction	full duplex
	connector	QSFP+
	level	LVDS
	bandwidth	40 Gbit/s to 50 Gbit/s
Input channels	channel 0	16 bit, ≤ 640 Msps
		12 bit, 1200 Msps
Output channels	channel 0	16 bit, ≤ 640 Msps
		12 bit, 1200 Msps

System controller interfaces

Front panel		
Display	with touchscreen	5.7" TFT color display, 640 × 480 pixel, LED backlighting
USB	for keyboard, mouse, storage	2 × USB 2.0, type A connector
		1 × USB 3.0, type A connector
Rear panel		
DVI	for external monitor	not activated
DisplayPort	for external monitor	not activated
Ethernet	remote control	1 × Ethernet RJ-45, 10/100/1000 Mbit/s
USB	host	2 × USB 2.0, type A connector
		2 × USB 3.0, type A connector
	device	1 × USB 3.0, type B connector
		not activated
System drive	for boot media	CFAST 1.0/2.0

R&S®IQW-B40G option (high speed optical LAN interface)

Rear panel		
Interfaces 10GE0, 10GE1	direction	bidirectional, for import and export
	connector	SFP+
	link speed	10 Gbit/s
Interface 40GE	direction	bidirectional, for import and export
	connector	QSFP+
	link speed	40 Gbit/s

General data

Environmental conditions		
Temperature range	operating	0 °C to +40 °C
	storage	–20 °C to +70 °C
Damp heat		+25 °C/+40 °C, 85 % relative humidity, cyclic, in line with EN 60068-2-30
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.9 g RMS, 300 Hz to 500 Hz, acceleration 1.2 g RMS, in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E, method 516.4, procedure I
AC power supply		
Rated voltage		100 V to 240 V AC (± 10 %)
Rated frequency		50 Hz to 60 Hz (± 5 %)
Rated current		1.5 A to 3.6 A
Rated power	512 MHz recording	≤ 150 W (meas.)
Product conformity		
Electromagnetic compatibility	EU: in line with EMC Directive 2014/30/EC	applied harmonized standards: EN 61326-1 (industrial environment), EN 61326-2-1, EN 55032 (class A)
Electrical safety	EU: in line with Low Voltage Directive 2014/35/EC	applied harmonized standard: EN 61010-1
	USA	UL 61010-1
	Canada	CAN/CSA-C22.2 No. 61010-1
International safety approvals	VDE – Association for Electrical Electronic and Information Technology	VDE
	CSA – Canadian Standard Association	$_{C}CSA_{US}$
RoHS	EU: in line with Directive 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment	applied harmonized standard: EN 50581
Dimensions	W × H × D	249.5 mm × 150 mm × 451 mm (9.82 in × 5.91 in × 17.76 in), ½ 19", 3 HU
Weight		6.3 kg (13.9 lb)

Ordering information

Designation	Type	Order No.
Base units (without storage cartridge)		
Wideband I/Q data recorder, with touchscreen, optimized for storage cartridges for maximum RF bandwidth of 512 MHz	R&S®IQW	1525.7551.05
Wideband I/Q data recorder, with touchscreen, optimized for storage cartridges for maximum RF bandwidth of 100 MHz (200 MHz with R&S®IQW-K200 option)	R&S®IQW100	1525.7551.02
Wideband I/Q data recorder, with touchscreen, optimized for storage cartridges for maximum RF bandwidth of 1000 MHz	R&S®IQW1000	1525.7551.10
Storage cartridge options		
15 Tbyte SSD memory, for maximum RF bandwidth of 1000 MHz	R&S®IQW-BD115	1525.8293.15
6.4 Tbyte SSD memory, for maximum RF bandwidth of 1000 MHz	R&S®IQW-BD106	1525.8293.06
3.2 Tbyte SSD memory, for maximum RF bandwidth of 200 MHz	R&S®IQW-BC103	1525.8293.03
Firmware options		
RF bandwidth upgrade from 100 MHz to 200 MHz, for R&S®IQW100	R&S®IQW-K200	1525.8429.02
Export/import of I/Q data	R&S®IQW-K110	1525.8370.02
Record of GPS coordinates	R&S®IQW-K112	1525.8393.02
Hardware option		
LAN interface board, with 2 × 10 Gbit/s and 1 × 40 Gbit/s connectors	R&S®IQW-B40G	1525.8264.02
Auxiliary equipment		
Cable for R&S®Digital I/Q interface and 40 Gbit/s Ethernet, length: 3 m, 2 × QSFP+ connectors	R&S®DIGIQ-HS	3641.2948.03
Copper cable for 10 Gbit/s Ethernet, length: 5 m, 2 × SFP+ connectors	R&S®GX460-CCG	4094.8635.02
Optical cable for 10 Gbit/s Ethernet, with two optical transceivers, length: 20 m, 2 SFP+ connectors	R&S®GX460-OCG	4094.8641.02
Transport case	IQW-CAS	3664.3534.02

Service options

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [4]. Necessary calibration and adjustments carried out during repairs are also covered.

[4] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Service that adds value

- ► Worldwide
- ► Local and personalized
- ► Customized and flexible
- ► Uncompromising quality
- ► Long-term dependability

Rohde&Schwarz

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Sustainable product design

- ► Environmental compatibility and eco-footprint
- ► Energy efficiency and low emissions
- ► Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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R&S®IQW Wideband I/Q Data Recorder
Data without tolerance limits is not binding | Subject to change

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