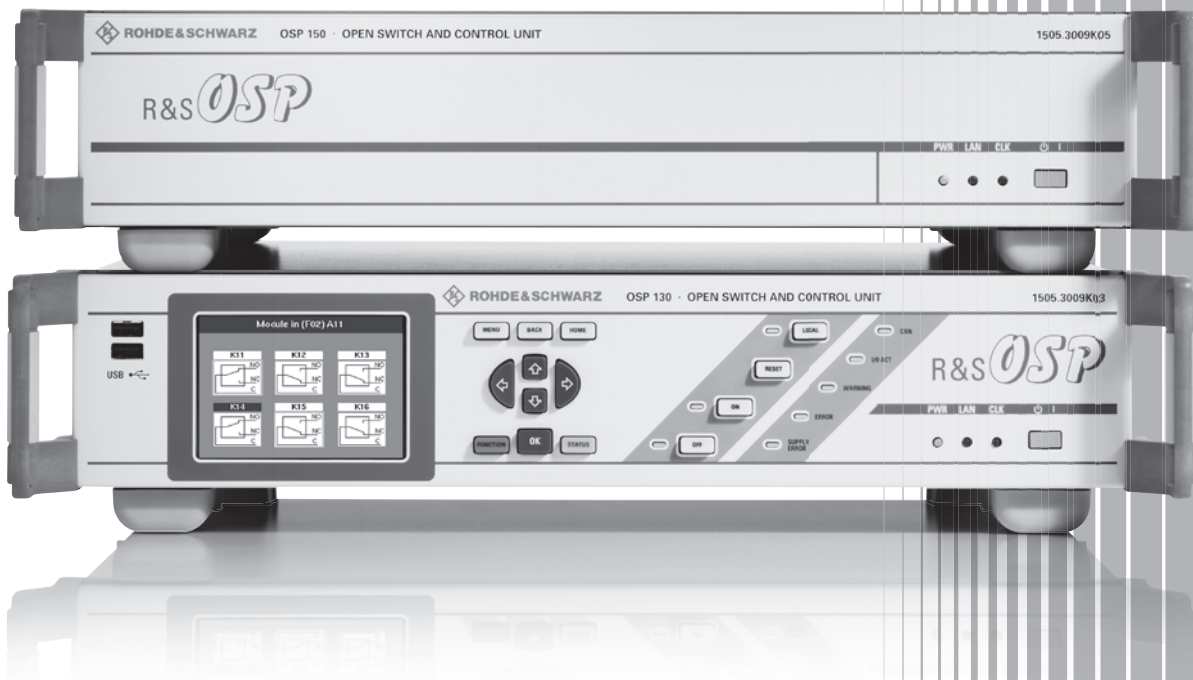


R&S®OSP

Open Switch and Control Platform Specifications



75 Years of
Driving
Innovation


ROHDE & SCHWARZ

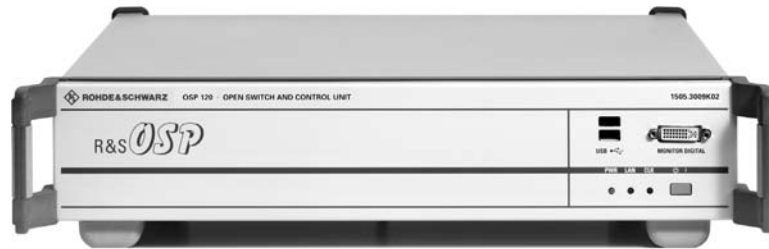
Introduction

The R&S®OSP is a modular switch and control platform that enables you to perform RF switch and control tasks quickly. By combining the various RF switch and control modules that are available for the platform, you can open the door to a broad scope of applications ranging from simple RF switch functions to the RF wiring of complex systems such as EMC systems.

You may choose from among the three R&S®OSP models described in this data sheet.

R&S®OSP120

The R&S®OSP120 is a base unit designed for control via LAN. You may integrate it into a test setup as well as connect it to a PC for automatic or manual control from a software application. You can also operate it by using an external monitor and a keyboard.



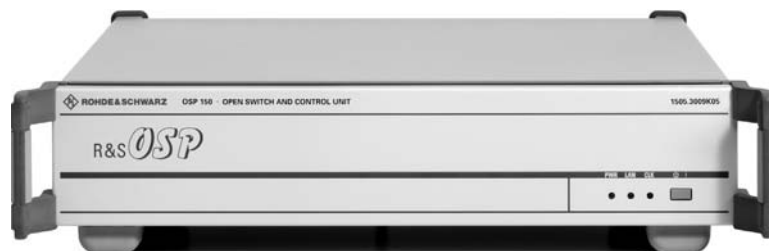
R&S®OSP130

The R&S®OSP130 is a base unit that features an integrated display and can be controlled via LAN. You may use it as a standalone and manually operated instrument, or you may integrate it into a test setup. Moreover, you may connect it to a PC for automatic or manual control from a software application.



R&S®OSP150

The R&S®OSP150 is an extension unit for performing additional or remote RF switch and control tasks. It can be controlled from the R&S®OSP120 or R&S®OSP130 via a CAN bus.



General data

Interfaces of the R&S® OSP (front panel)		R&S®OSP120	R&S®OSP130	R&S®OSP150	
USB	for keyboard, mouse or USB stick	2	2	/	2 x USB 2.0 type A connector (f)
DIGITAL MONITOR	for external monitor	1	/	/	DVI-D connector (f)
Display	for manual operation	/	1	/	QVGA, color
Control panel		/	1	/	
Remote control interfaces (rear panel)					
LAN	remote control via LAN	1	1	/	Ethernet RJ-45 connector (f), 10/100 Mbit/s
CAN	connection of base unit with extension units ¹	1	1	1	9-pin D-Sub connector (m), 512 kbit/s

Operating temperature range		0 °C to +50 °C, in line with EN 60068-2-1 and -2
Storage temperature range		-25 °C to +70 °C
Humidity	+40 °C, non-condensing	95 % relative humidity, in line with EN 60068-2-30
Electromagnetic compatibility		in line with EMC Directive 2004/108/EC, applied standards: EN 61326 + A1 + A2 + A3; EN 55011 + A1 + A2; EN 61000-3-2 + A2 ; EN 61000-3-3 + A1 (emission limits for class B equipment; immunity test requirements for industrial environment (EN 61326 tab A1))
Electrical safety		in line with Low Voltage Directive 2006/95/EC, applied standards: IEC 61010-1 (ed. 2); EN 61010-1 (VDE 0411 part 1); EN 61010-1; UL 61010-1 (ed. 2); CAN C22.2 No. 61010-1-04

Mechanical resistance	non-operating mode	
Vibration, sinusoidal		in line with EN 60068-2-6, 5 Hz to 55 Hz, max. 2 g, 55 Hz to 150 Hz, 0.5 g const. MIL-PRF-28800F, classes 3, 4
Vibration, random		in line with EN 60068-2-64, 10 Hz to 300 Hz, acceleration 1.2 g rms
Shock		EN 60068-2-27; MIL-STD-810F method 516.5 40 g shock spectrum

Power supply		power factor correction, in line with EN 61000-3-2
Input		100 V to 240 V ±10 % (AC), max. 310 VA 50 Hz to 400 Hz ±5 %
Power consumption	configuration-dependent	typ. 30 W to 90 W

¹ Up to four R&S®OSP150 extension units can be cascaded.

Dimensions	W x H x D, overall	465.3 mm x 108.7 mm x 494.8 mm (18.3 in x 4.28 in x 19.48 in)
	for rackmounting	19" 1/1, 2 HU, depth 450 mm (17.72 in)
Weight	R&S® OSP120 (without modules)	approx. 4.5 kg (9.92 lb)
	R&S® OSP130 (without modules)	approx. 5.0 kg (11.0 lb)
	R&S® OSP150 (without modules)	approx. 4.5 kg (9.92 lb)
	with typical options	approx. 5.5 kg (12.1 lb) to 6.5 kg (14.3 lb)

Module slots

Number	RF switch and control modules	3 (1 to 3 modules can be inserted)
Current output	per connected module	max. 800 mA (28 V DC)
	with 3 modules connected	max. 2 A (28 V DC)

Dimensions (W x H x D)		
Module slot 1		107.6 mm x 65.5 mm x max. 70 mm (4.24 in x 2.58 in x max. 2.76 in)
Module slots 2, 3		107.6 mm x 65.5 mm x max. 370 mm (4.24 in x 2.58 in x max. 14.57 in)
Double-width module slot 2 + 3		216.2 mm x 65.5 mm x max. 370 mm (8.51 in x 2.58 in x max. 14.57 in)



Rear view (including options)

Options – modules

Universal RF switch modules

Overview

Parameters	R&S®OSP-B101	R&S®OSP-B102	R&S®OSP-B107	R&S®OSP-B111	R&S®OSP-B112
Relay type	6 × SPDT, coaxial relay	2 × SP6T, coaxial relay	6 × SPDT, SSR, coaxial relay	6 × SPDT, coaxial relay	2 × SP6T, coaxial relay
Connector type	SMA (female)			SMA 2.9 (female)	
Relay impedance	50 Ω				
Frequency range	0 Hz to 18 GHz	0 Hz to 18 GHz	0 Hz to 6 GHz	0 Hz to 40 GHz	0 Hz to 40 GHz
Switching time (nominal) ²	<10 ms	<15 ms	7 μs	<10 ms	<15 ms
Current consumption	max. 600 mA (+28 V DC)	max. 200 mA (+28 V DC)	max. 15 mA (+28 V DC)	max. 600 mA (+28 V DC)	max. 200 mA (+28 V DC)
Dimensions (W × H)	107.6 mm × 65.5 mm (4.24 in × 2.58 in)				
Dimensions (D)	59.7 mm (2.35 in)	69.5 mm (2.74 in)	61.5 mm (2.42 in)	59.7 mm (2.35 in)	69.5 mm (2.74 in)
Slot position	1, 2 and/or 3				
Weight	approx. 0.4 kg (0.88 lb)		approx. 0.3 kg (0.66 lb)	approx. 0.4 kg (0.88 lb)	

RF characteristic

Type	Parameters	0 Hz to 3 GHz	3 GHz to 8 GHz	8 GHz to 12.4 GHz	12.4 GHz to 18 GHz
R&S®OSP-B101	VSWR ²	≤1.20	≤1.30	≤1.40	≤1.50
	insertion loss	<0.5 dB/≤0.20 dB ²	<0.5 dB/≤0.30 dB ²	<0.7 dB/≤0.40 dB ²	<0.7 dB/≤0.50 dB ²
	isolation ²	≥80 dB	≥70 dB	≥60 dB	≥60 dB
	average power ^{2,3}	240 W	150 W	120 W	100 W
R&S®OSP-B102	VSWR ²	≤1.20	≤1.30	≤1.40	≤1.50
	insertion loss	<0.5 dB/≤0.20 dB ²	<0.5 dB/≤0.30 dB ²	<0.7 dB/≤0.40 dB ²	<0.7 dB/≤0.50 dB ²
	isolation ²	≥80 dB	≥70 dB	≥60 dB	≥60 dB
	average power ^{2,3}	120 W	80 W	60 W	50 W

Type	Parameters	0 Hz to 3 MHz	3 MHz to 10 MHz	10 MHz to 1 GHz	1 GHz to 2.5 GHz	2.5 GHz to 5 GHz	5 GHz to 6 GHz
R&S®OSP-B107	VSWR	<1.30	<1.30	<1.30	<1.30	<1.30	<1.45
	insertion loss	<1.0 dB	<1.0 dB	<1.0 dB	<1.0 dB	<1.3 dB	<1.3 dB
	isolation	>38 dB	>38 dB	>38 dB	>28 dB	>20 dB	>18 dB
	max. power	0.016 W	1 W	1 W	1 W	1 W	1 W
	max. DC voltage	+2.5 V					

Type	Parameters	0 Hz to 6 GHz	6 GHz to 12.4 GHz	12.4 GHz to 18 GHz	18 GHz to 26.5 GHz	26.5 GHz to 40 GHz
R&S®OSP-B111	VSWR ²	≤1.30	≤1.40	≤1.50	≤1.70	≤1.90
	insertion loss	<0.5 dB/≤0.30 dB ²	<0.7 dB/≤0.40 dB ²	<0.7 dB/≤0.50 dB ²	<1.0 dB/≤0.70 dB ²	<1.0 dB/≤0.80 dB ²
	isolation ²	≥70 dB	≥60 dB	≥60 dB	≥55 dB	≥50 dB
	average power ^{2,3}	80 W	60 W	50 W	30 W	10 W
R&S®OSP-B112	VSWR ²	≤1.30	≤1.40	≤1.50	≤1.70	≤2.20
	insertion loss	<0.5 dB/≤0.20 dB ²	<0.7 dB/≤0.40 dB ²	<0.7 dB/≤0.50 dB ²	<1.0 dB/≤0.70 dB ²	<1.1 dB/≤1.10 dB ²
	isolation ²	≥70 dB	≥60 dB	≥60 dB	≥55 dB	≥50 dB
	average power ^{2,3}	40 W	25 W	15 W	10 W	3 W

² Nominal values specified by the manufacturer of the relays for +25 °C.

³ Cold switching.

RF switch module with N and BNC connectors

R&S®OSP-B106

Number of RF relays	coaxial relays	3 × SPDT with N connector
	shielded electrical relay	3 × SPDT with BNC connector
Relay impedance		50 Ω
Current consumption		495 mA (+28 V DC)
Dimensions (W × H × D)	(8.51 in × 2.74 in × max. 5.98 in)	216.2 mm × 69.5 mm × max. 152.0 mm
Slot position		2 + 3 (double-width module)
Weight		approx. 1.22 kg (2.69 lb)

Type	Parameters	0 Hz to 1 GHz	1 GHz to 2 GHz	2 GHz to 3 GHz	3 GHz to 8 GHz	8 GHz to 12.4 GHz
SPDT relays, N connector	VSWR ⁴	≤1.15	≤1.20	≤1.25	≤1.35	≤1.50
	insertion loss	≤0.15 dB ⁴	<0.4 dB/ ≤0.20 dB ⁴	<0.4 dB/ ≤0.25 dB ⁴	<0.4 dB/ ≤0.35 dB ⁴	<0.5 dB/ ≤0.50 dB ⁴
	isolation ⁴	≥85 dB	≥80 dB	≥75 dB	≥70 dB	≥60 dB
	average power ^{4,5}	700 W	500 W	400 W	250 W	200 W

Type	Parameters		0 Hz to 10 MHz	10 MHz to 100 MHz	100 MHz to 500 MHz	500 MHz to 900 MHz
SPDT relays, BNC connector	VSWR		<1.25	<1.25	<1.45	<1.95
	insertion loss		<0.5 dB	<0.5 dB	<1 dB	<1.2 dB
	isolation		>35 dB	>35 dB	>23 dB	>15 dB
	average power	AC/RF ⁵	60 W	60 W	40 W	20 W
		DC	max. 60 W (max. 2 A, < 60 V)			

Digital I/O module

R&S®OSP-B103

Digital input channels	0 V to 3.3 V DC (LV-CMOS), max. 5.5 V	16, 25-pin D-Sub connector (m)
Digital output channels	open drain, max. 28 V DC, max. 100 mA	16, 25-pin D-Sub connector (f)
Switching time		<10 ms
Current consumption		max. 800 mA (+28 V DC)
Dimensions (W × H × D)	(4.24 in × 2.58 in × 2.50 in)	107.6 mm × 65.5 mm × 63.4 mm
Slot position		1, 2 and/or 3
Weight		approx. 0.1 kg (0.22 lb)

Relay driver module

R&S®OSP-B104

Interfaces for external relays	RF high-power relays	4
Usable relay types	DPDT relay, Spinner 512670 or DPDT relay, Spinner 640075	1 kW/5 GHz 10 kW/1 GHz
Control lines	pick-up current max. 2.5 A at 24 V	2 per relay
Return signal line (optocoupler input)	24 V DC, typ. 7.5 mA	1 per relay
Power supply of relay	+24 V DC, ±2 V	max. 2.5 A short-time, 0.1 A continuous
Interlock loop (optocoupler input)	24 V DC, typ. 15 mA	1
Number of digital input channels	0 V to 3.3 V DC, max. 5.5 V (LV-CMOS)	4
Number of digital output channels	open drain, max. 28 V DC, max. 100 mA	5
Connectors	interfaces for external relays	4× 9-pin D-Sub connector (f)
	digital I/O, interlock	1× 15-pin D-Sub connector (f)
Current consumption		max. 800 mA (+28 V DC) max. 15 A (+5 V DC)
Dimensions (W × H × D)	(4.24 in × 2.58 in × 10.4 in)	107.6 mm × 65.5 mm × 264.1 mm
Slot position		2 and/or 3
Weight		approx. 0.4 kg (0.88 lb)

⁴ Nominal values specified by the manufacturer of the relays for +25 °C.

⁵ Cold switching.

Ordering information

Base units

Designation	Type	Order No.
Base Unit with Monitor Interface	R&S®OSP120	1505.3009K02
Accessories: power cord, operating manual (quick start guide), comprehensive documentation and operating software on CD-ROM		

Base Unit with Display and Control Panel	R&S®OSP130	1505.3009K03
Accessories: power cord, operating manual (quick start guide), comprehensive documentation and operating software on CD-ROM		

Extension unit

Extension Unit	R&S®OSP150	1505.3009K05
Accessories: power cord, operating manual (quick start guide), comprehensive documentation on CD-ROM		

Options

RF Switch Module, 6 x coaxial changeover relays (SPDT), 0 Hz to 18 GHz	R&S®OSP-B101	1505.5101.02
RF Switch Module, 6 x coaxial changeover relays (SPDT), 0 Hz to 40 GHz	R&S®OSP-B111	1505.4605.02
RF Switch Module, 2 x coaxial multiposition relays (SP6T), 0 Hz to 18 GHz	R&S®OSP-B102	1505.5201.02
RF Switch Module, 2 x coaxial multiposition relays (SP6T), 0 Hz to 40 GHz	R&S®OSP-B112	1505.4611.02
RF Switch Module, 6 x coaxial changeover relays (SPDT), SSR, 0 Hz to 6 GHz	R&S®OSP-B107	1505.5901.02
RF Switch module, 3 x SPDT (N), 0 Hz to 12 GHz, 3 x SPDT (BNC), 0 Hz to 900 MHz	R&S®OSP-B106	1505.5601.02
Digital I/O Module, 16 x digital inputs, 16 x digital outputs	R&S®OSP-B103	1505.5301.02
Relay Driver Module, control of four external RF power relays, additional digital inputs/outputs	R&S®OSP-B104	1505.5401.02

Accessories for the R&S®OSP150

CAN Bus Cable, 0.5 m	R&S®OSP-Z101	1505.4505.02
CAN Bus Cable, 5 m	R&S®OSP-Z102	1505.4511.02
CAN Bus Y Cable, 0.5 m	R&S®OSP-Z103	1505.4528.02

For further ordering information about available options, please refer to the product brochure (PD 5214.1437.12) or ask your local Rohde & Schwarz subsidiary to find the solution that is optimally suited to your needs.

Recommended extras for manual operation of the R&S®OSP120 via Ethernet ⁶

Industrial Controller 19", 1 HU	R&S®PSL1	1161.5000.14
Mouse with USB Interface, optical	R&S®PSL-Z10	1157.7060.04
Keyboard with USB Interface (US assignment)	R&S®PSL-Z2	1157.6870.04
17" TFT Monitor	R&S®PMC3	1082.6004.12

Recommended extras for installation in 19" racks

19" Rack Adapter, 2 HU	R&S®ZZA-211	1096.3260.00
------------------------	-------------	--------------

Specifications apply under the following conditions:

No warm-up time after booting. "Typical values" are designated with the abbreviation "typ." These values are verified during the final test but are not assured by Rohde & Schwarz. "Nominal values" are design parameters that are not assured by Rohde & Schwarz. These values are verified during product development but are not specifically tested during production. Rohde & Schwarz equipment is designed for reliable operation up to an altitude of 3000 m above sea level and for transport without damage up to an altitude of 4500 m above sea level.

Data without tolerance limits is not binding.

⁶ The direct connection of the R&S®OSP120/130 with a PC/laptop requires a crossover Ethernet cable.
The direct connection of the R&S®OSP120/130 with a network requires a standard Ethernet cable.

Service you can rely on

- | In 70 countries
- | Person-to-person
- | Customized and flexible
- | Quality with a warranty
- | No hidden terms

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Regional contact

Europe, Africa, Middle East

+49 1805 12 42 42* or +49 89 4129 137 74

customersupport@rohde-schwarz.com

North America

1-888-TEST-RSA (1-888-837-8772)

customer.support@rsa.rohde-schwarz.com

Latin America

+1-410-910-7988

customersupport.la@rohde-schwarz.com

Asia/Pacific

+65 65 13 04 88

customersupport.asia@rohde-schwarz.com

Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

For product brochure, see
PD 5214.1437.12
and www.rohde-schwarz.com
(search term: OSP)

Rohde & Schwarz GmbH & Co. KG

Mühldorfstraße 15 | 81671 München

Phone +49 89 41 290 | Fax +49 89 41 29 121 64

www.rohde-schwarz.com

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG
Trade names are trademarks of the owners | Printed in Germany (sv)
PD 5213.9928.22 | Version 04.00 | July 2008 | R&S®OSP
Data without tolerance limits is not binding | Subject to change

*0.14 €/min within German wireline network; rates may vary in other networks (wireline and mobile) and countries.