

## RSWM-4X4E

Extremely Wideband 4X4 Switching Matrix 20 ... 8000 MHz – non blocking-

### Features

- wideband
- high dynamic
- non-blocking

### Applications

- radio monitoring
- signal routing
- research & development (R&D)
- test equipment
- laboratory

### At a Glance

Modern communication standards like digital broadcast, cellular, Wi-Fi, ISM and Bluetooth permanently grow up to higher frequency ranges with larger system bandwidths. The huge amount of radio signals covered in the large frequency range effort high demands to the linearity of the multicoupler. On the other side in applications like radio monitoring low noise is very important. The RSWM-4X4E slot-in module is the right solution for modern radio monitoring systems that must cover the frequency range up to 8 GHz. The RSWM-4X4E matrix is foreseen for the integration into the SR6-11C system platform.

### Principal Block Diagram

The RSWM-4X4E has 4 equivalent inputs and 4 equivalent outputs. The matrix is a non-blocking type. Each output port can be connected to any input also one input can be route to more outputs without drop in transmission.



### Wear-free Solid State Switches

The switching elements in the RSWM-4X4E are solid state types. This ensures a short switching time and a huge number of switching cycles with a minimum of maintenance.

### High Channel Isolation

To avoid unwanted signal coupling between the channels RSWM-4X4E has high channel isolation. Adjacent channels with strong and weak signals have no influence to each other.

### Remote Control

In combination with the SR6-CU controller module, the RSWM-4X4E is remote controllable via standard interfaces USB and LAN with simple SCPI orientated ASCII strings. The RSWM-4X4E has a standby function for energy saving.

### Built-In Test Function

Total current consumption, operating points of amplifier stages and internal temperature of RSWM-4X4E are monitored. The module status can be read out via remote interface.

**RF Specification**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{IN}/Z_{OUT}$		50		$\Omega$	
low frequency	$f_{MIN}$			20	MHz	
high frequency	$f_{MAX}$	8000	8500		MHz	
gain	$S_{21}$		3		dB	$f \leq 1000$ MHz
	$S_{21}$		2		dB	$f > 1000$ MHz
gain flatness	$\Delta S_{21}$		$\pm 1.5$		dB	
input return loss	$S_{11}$		-15		dB	
output return loss	$S_{22}$		-17		dB	$f \leq 6000$ MHz
	$S_{22}$		-13		dB	$f > 6000$ MHz
1 dB compression	$P_{1dB}$		+5		dBm	
3 <sup>rd</sup> order intercept	$OIP3^1$		+19		dBm	$f \leq 1500$ MHz
	$OIP3^1$		+15		dBm	$1500 \text{ MHz} < f \leq 4000 \text{ MHz}$
	$OIP3^1$		+12		dBm	$f > 4000$ MHz
2 <sup>nd</sup> order intercept	$OIP2^2$		+38		dBm	40/60 MHz, 1000/1100 MHz
	$OIP2^2$		+28		dBm	3000/3100 MHz, 3900/4000 MHz
noise figure	NF		9		dB	$f < 100$ MHz
	NF		8		dB	$f \geq 100$ MHz
channel isolation	$S_{21}$		-80		dB	$f \leq 3000$ MHz
output isolation	$S_{32}$		-30		dB	
input power	$P_{IN}$		+10		dBm	CW, no damage
maximum DC voltage	$U_{DC}$			20	V	all RF ports
ESD discharge resistor	$R_{ESD}$		4.7		k $\Omega$	all RF ports
RF connectors	$X_{RF}$	N female				

Note 1:  $P_{in} = 2 \times -10$  dBm, specified and tested for  $\Delta f = 100$  MHz

Note 2:  $P_{in} = 2 \times -10$  dBm, specified and tested for mentioned frequency pairs

OIP2 & OIP3 values are the average of the upper and lower intermodulation distortion

Note 2: capacitive load at 'TRIGGER IO' Port  $\leq 100$  pF, trigger mode "OUT"

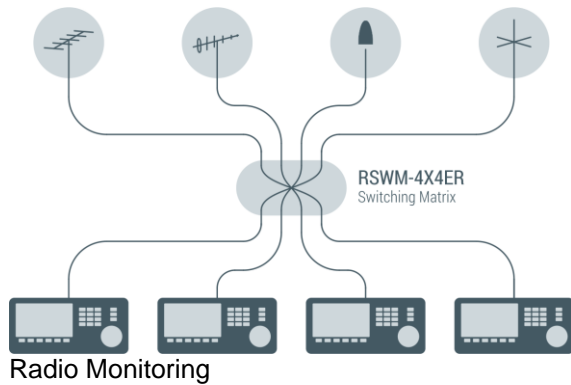
**Common Specification**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	$U_{DC}$	23.5	24.0	24.5	V	via SR6-11C
power consumption	$P_{OPR}$		12		W	operation
	$P_{STB}$		1		W	standby
dimensions	WxHxD	approx. 30 x 262 x 197			mm	6 U, 6 HP
weight	m		1.3		kg	
operating temp. range	$T_o$	+5		+60	$^{\circ}\text{C}$	
storage temp. range	$T_s$	-40		+70	$^{\circ}\text{C}$	
ordering information	RSWM-4X4E		P/N: 2001.4100.1			



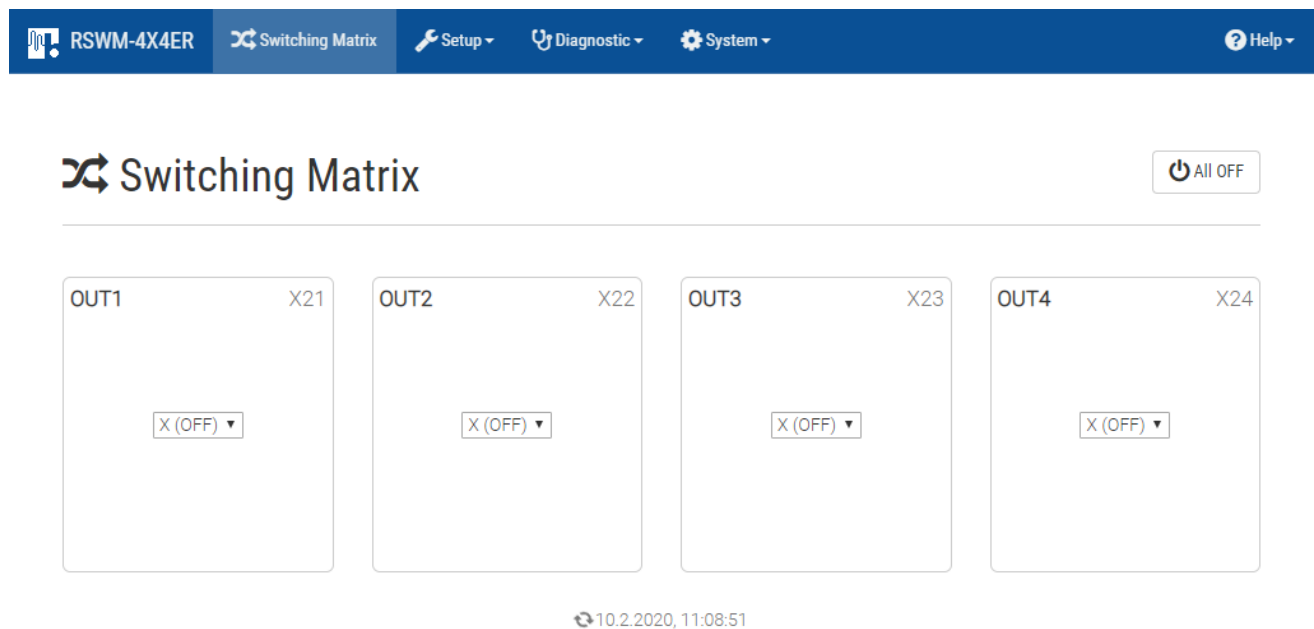
### Application Example

The application shows a setup for a radio monitoring system suitable for the frequency range 20 MHz ... 8000 MHz with 4 antennas and 4 receivers. All receivers have full access to the antennas without loss in signal quality.



### Screenshot of Graphic User Interface

The GUI allows the definition of application-specific labels to make the selection of inputs more meaningful.



### SR6-11C System Platform

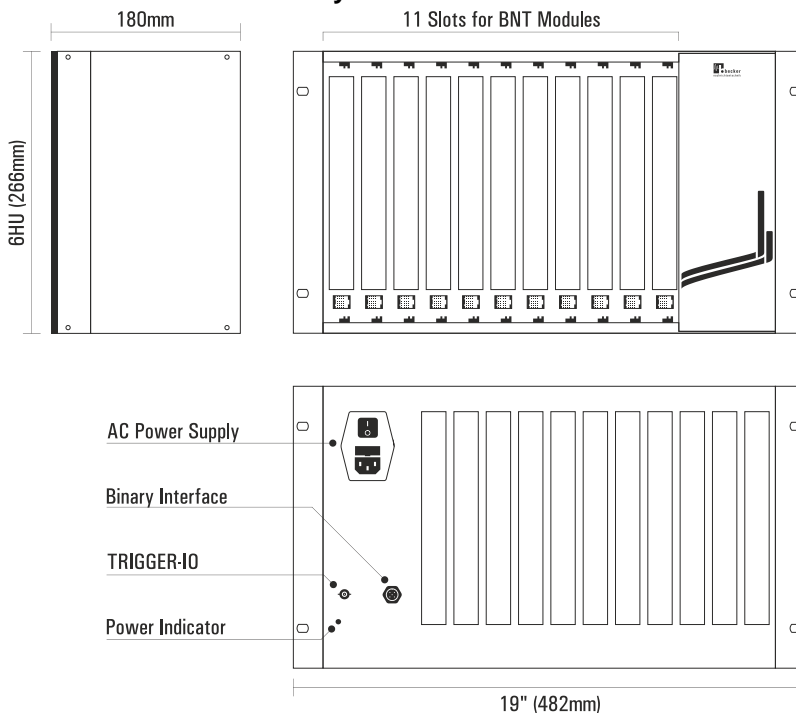
The RSWM-4X4E module is foreseen for the integration into the SR6-11C system platform. 11 slots in the SR6-11C can be used for modules like RF switches, matrices, multicouplers, attenuators, BIAS-Ts, level detectors and bi-directional splitters/combiners for signal conditioning and a controller unit. For the control of RSWM-4X4E module, the SR6-CU controller unit is required.

Via the Trigger-IO interface at the rear side of the SR6-11C System Platform a synchronous operation in a device network of SR6-11C can be realized.

After a positive TTL pulse slope at the trigger input, the preloaded configurations are executed only by hardware in micro seconds.

In applications with very fast execution demands the hardware can be directly controlled via the binary interface on the rear side.

### Dimensions of SR6-11C System Platform



### Appearances



RSWM-4X4E  
front view



RSWM-4X4E  
rear view



SR6-11C front view

**Related Products**

Product	Description	P/N
SR6-11C	System Platform with 11 Slots for Modules	1409.1202.1
SR6-CU	Controller Unit with LAN and USB Remote Interface	1409.3000.1
<b>Unidirectional Products: Active Multicouplers, Matrices, Level Detectors</b>		
WSDU-1X8A	8 Way High Dynamic Signal Conditioning Multicoupler 100 kHz ... 4000 MHz	1807.6300.1
WSDU-2X4A	2 Section 4 Way High Dynamic Signal Conditioning Multicoupler 100 kHz ... 4000 MHz	1807.6400.1
WSDU-1X8L	8 Way Multicoupler Module 100 kHz ... 4000 MHz	1807.6100.1
WSDU-2X4L	2 Section Hi Dynamic 4 Way Multicoupler Module 100 kHz ... 4000 MHz	1807.6200.1
WSDU-2X4E+	2 Section 1x4 plus 1x2 Multicoupler Module 20 ... 8000 MHz	1501.6200.1
WSDU-1X8S	High Dynamic 1x8 Shortwave Multicoupler Module 300 kHz ... 30 MHz	1502.6100.1
WSDU-1X2PM	2 Channel, 5 W Multicoupler with ALC Capability 20 MHz...3000 MHz	1606.6000.1
RSWM-4X4	4x4 Switching Matrix -Non-blocking-, 100 kHz ... 4000 MHz or 20 MHz ... 4000 MHz	1205.4100
RSWM-4X4E	4x4 Ultra-Wideband Switching Matrix -Non-blocking-, 20 MHz ... 8000 MHz	2001.4100.1
RFLD-8RE	8 Channel True Power RF Level Detector, 1 MHz ... 8000 MHz	1505.8000.1
<b>Bi-Directional Products: Switches, Matrices, Attenuators, Delay Lines, BIAS-Ts, Splitters/Combiners, Filters</b>		
RSWU-2SP4TS+	2 Channel Non-reflective SP4T Switches plus 1 Channel SPDT Switch, 100 kHz ... 8500 MHz	1408.4010.1
RSWU-8SPSTS	8 Channel Non-reflective SPST Switch 100 kHz ... 8500 MHz	1408.4000.1
RSWU-4SPDTS	4 Channel Non-reflective SPDT Switch 100 kHz ... 8500 MHz	1408.4020.1
RSWU-8SPST-CS	8 Channel High Isolation SPST with DC Load Simulation, 100 kHz ... 7500 MHz	1811.4100.1
BSWM-4X4E	4x4 High Isolation Bi-Directional Switching Matrix –Blocking-, 100 kHz ... 7500 MHz	1205.4600.1
ATT-8E	8 Channel Digital Step Attenuator 0 ... 31.75 dB, 100 kHz ... 8000 MHz	1503.4000.1
DLL-4	4 Channel Programmable Delay Line 0 ... 1700 ps, 250 MHz ... 4000 MHz	1303.4200.1
PT-4CS	4 Channel Programmable DC Sink 0 ... 400 mA, 100 kHz ... 8500 MHz	1605.2020.1
PT-4CL	4 Channel Wideband DC Load, 100 kHz ... 8500 MHz	1605.2040.1
BSDU-2X4A+	2 Section 4 Way, Bi-Directional Signal Conditioning plus 2 Way Splitter/Combiner, 500 MHz ... 7500 MHz	1903.6100.1
BSDU-2X4+	2 Section 4 Way Wideband Bi-Directional plus 2 Way Splitter/Combiner, 500 MHz ... 7500 MHz	1903.6200.1
FBS-1590	L1 Band GNSS Notch Filter	1511.5100.1

