

## BSWM-4X8ER

Bidirectional Blocking Wideband 4X8 Switching Matrix 100 kHz ... 8500 MHz

### Features

- extremely wideband
- high isolation
- high dynamic
- non-reflective
- compact 19", 1 U design
- graphical user interface

### Applications

- MIMO test
- network investigation
- signal routing
- research & development (R&D)
- test equipment

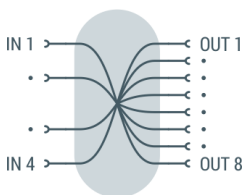


### At a Glance

Modern communication standards like cellular Wi-Fi, ISM and Bluetooth need bidirectional signal transmissions, independent of the multiplex method TDD (Time Domain Division) or FDD (Frequency Domain Division). The BSWM-4X8ER is an innovative and efficient solution for modern communication systems that must cover the frequency range up to 8 GHz. It offers 4 full parallel bidirectional signal paths.

### Principal Block Diagram

The BSWM-4X8ER has 4 equivalent inputs and 8 equivalent outputs. The matrix is a blocking type suitable for bidirectional point to point links. Each output port can be connected to one input. If a new input is selected for an output, the existing connection is disconnected.



### Wear-free Solid-State Switches

Inside the BSWM-4X8ER modern solid state switching elements are integrated. This ensures a quick response to operating inputs and a huge number of switching cycles with a minimum of maintenance.

### High Channel Isolation

To avoid unintended coupling between different types of signals the device offers a high channel isolation. Adjacent radio channels with strong and weak signals have no influence to each other.

### Versatile Control

To control and operate with BSWM-4X8ER the device is equipped with a local MMI on the front panel as well as LAN and USB interfaces. Suitable to the customer's application the user is able to manage the system either through the associated and intuitive web-based user interface or with SCPI-based ASCII-commands via its interface ports.

### Synchronous Operation

The BSWM-4X8ER offers two switching modes:

- Direct switch execution after receiving single commands.
- Common synchronous switching after executed by a SYNC command.

In synchronous mode all upcoming switching operations are done only after receiving a SYNC command.

### External Triggering

Like many other products of Becker Nachrichtentechnik GmbH, the BSWM-4X8ER offers a TRIGGER IO port. Due to the physical interface the device features a synchronous execution of switching operations in a compound of many matrices, triggered by hardware.

## RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{IN}/Z_{OUT}$		50		$\Omega$	
number of inputs	$N_{IN}$		4			bi-directional, blocking
number of outputs	$N_{OUT}$		8			bi-directional, blocking
low frequency	$f_{MIN}$		100	200	kHz	
high frequency	$f_{MAX}$	8000	8300		MHz	
insertion loss	$S_{21}$		-4		dB	$f \leq 4000$ MHz
			-6		dB	$f > 4000$ MHz
return loss	$S_{11}/S_{22}$		-14	-11	dB	$f \leq 4000$ MHz
			-10	-8		$f > 4000$ MHz
OFF isolation	$S_{21}$		-90	-80	dB	$f \leq 4000$ MHz, SPDT switch open
			-85	-70		$f > 4000$ MHz
channel isolation	$S_{23}$		-90	-80	dB	$f \leq 4000$ MHz, SPDT switch closed
			-85	-70		$f > 4000$ MHz
3 <sup>rd</sup> order intercept	OIP3		+47		dBm	
2 <sup>nd</sup> order intercept	OIP2		+85		dBm	
DC voltage	$U_{DC}$			20	V	RF ports
ESD discharge resistor	$R_{ESD}$		4.7		k $\Omega$	RF ports
RF power	$P_{ON\_MAX}$			+30	dBm	CW, "ON", $f > 10$ MHz
	$P_{OFF\_MAX}$			+20	dBm	CW, "OFF", $f > 10$ MHz
RF connectors	$X_{RF}$	SMA female				rear side
processing time	$t_{SW}$		15		ms	between two switching commands
trigger input	$X_{TRIG}$	BNC female				internal 1 k $\Omega$ pull up, active high
trigger level	$U_{TRIG}$	TTL (0 / 5 V)				
trigger offset	$t_{O\_FALL}$		6.5		$\mu$ s	50% trigger $\rightarrow$ 50% RF falling edge, note 1
	$t_{O\_RISE}$		1.1		$\mu$ s	50% trigger $\rightarrow$ 50% RF rising edge, note 1
switch rise time	$t_{RISE}$		1		$\mu$ s	10% $\rightarrow$ 90% RF
switch fall time	$t_{FALL}$		2		$\mu$ s	90% $\rightarrow$ 10% RF

Note 1: capacitive load at 'TRIGGER IO' Port  $\leq 100$ pF, trigger mode "OUT"

**Common Specification**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply		90	230	260	V	50 / 60 Hz AC
power consumption			35		W	
power socket	X <sub>AC</sub>	IEC-60320 C14				country specific mains cable
<b>Remote interfaces</b>						
	LAN	10/100 BaseT		TCP/IP		RJ45
	USB	2.0 (high speed)				USB type B
<b>Dimensions and weight</b>						
dimensions	W x H x D	approx. 482 x 44 x 455			mm	19" 1 U, without connectors and handles
weight	m		4.5		kg	
<b>Environment conditions</b>						
operating temp. range	T <sub>o</sub>	+5		+45	°C	
storage temp. range	T <sub>s</sub>	-40		+70	°C	
<b>Product conformity</b>						
Electromagnetic compatibility	EU: in line with EMC directive (2014/30/EC)				applied harmonized standards: EN61326-2-1, (for use in control and laboratory environments), EN55024, EN55032, EN61000-3-2, EN61000-3-3	
Electrical safety	EU: in line with low voltage directive (2014/35/EC)				applied harmonized standard: EN 61010-1	
<b>Ordering information</b>	BSWM-4X8ER	2005.4702.1				



### Screenshot of Graphic User Interface

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



## Switching Matrix

All OFF

<b>OUT1</b> X21  <input type="button" value="X (OFF)"/>	<b>OUT2</b> X22  <input type="button" value="X (OFF)"/>	<b>OUT3</b> X23  <input type="button" value="X (OFF)"/>	<b>OUT4</b> X24  <input type="button" value="X (OFF)"/>
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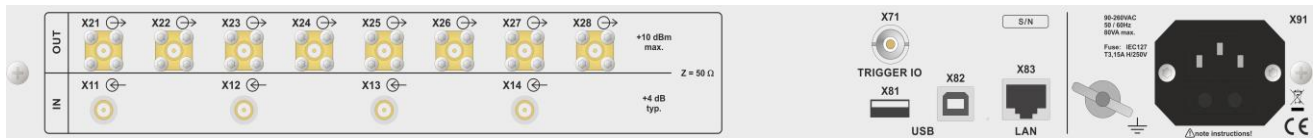
## Appearances

### Front View



### Rear

### View



### Dimensions



all dimensions in mm  
± 2 mm

