



BSWM-4X8ER

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

Features

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



Applications

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

At a Glance

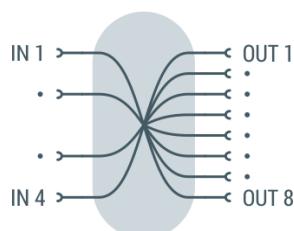
Modern communication standards, including cellular Wi-Fi, ISM, and Bluetooth, require bidirectional signal transmissions regardless of the multiplexing method, whether TDD (Time Domain Division) or FDD (Frequency Domain Division). The BSWM-4X8ER offers an innovative and efficient routing solution for these communication systems, covering frequencies of over 8 GHz and providing four full parallel bidirectional signal paths.

AC or DC Power Supply Options

The BSWM-4X8ER comes in variants designed for either DC or AC mains power supply, catering to both stationary and mobile applications. Both variants support a broad input voltage range, whether AC or DC.

Principal Block Diagram

The BSWM-4X8ER features four equivalent inputs and eight equivalent outputs interconnected via a blocking matrix. A single input can route to multiple outputs without any loss of signal transmission.



Wear-free Solid-State Switches

The BSWM-4X8ER incorporates modern solid-state switching elements, guaranteeing rapid response to operational inputs and an unlimited number of switching cycles with minimal maintenance requirements.

High Channel Isolation

To prevent unintentional signal coupling between different signal types, the device provides high channel isolation. Strong and weak signals in adjacent radio channels do not affect each other.

Versatile Control

The BSWM-4X8ER is equipped with multiple control options for user convenience. It features a local MMI on the front panel, as well as LAN and USB interfaces. Depending on the customer's needs, the system can be managed using the intuitive web-based graphical user interface or through SCPI-based ASCII commands via its interface ports.

Synchronous Operation

The BSWM-4X8ER offers two switching modes:

- Direct: every switching operation is executed after reception of the command.
- Synchronous: all switching commands are stored until a "SYNC" command executes the switching operation synchronously.



External Triggering

Similar to several other products from Becker Nachrichtentechnik GmbH, the BSWM-4X8ER includes a TRIGGER IO port. This physical interface enables the device to execute switching operations synchronously across multiple matrices, triggered by hardware signals.

RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{IN/ZOUT}$		50		Ω	
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 rd order intercept	OIP3		+47		dBm	
2 nd 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		μs	50% trigger \rightarrow 50% RF falling edge, note 1
	t_{O_RISE}		1.1		μs	50% trigger \rightarrow 50% RF rising edge, note 1
switch rise time	t_{RISE}		1		μs	10% \rightarrow 90% RF
switch fall time	t_{FALL}		2		μs	90% \rightarrow 10% RF

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



Common Specification

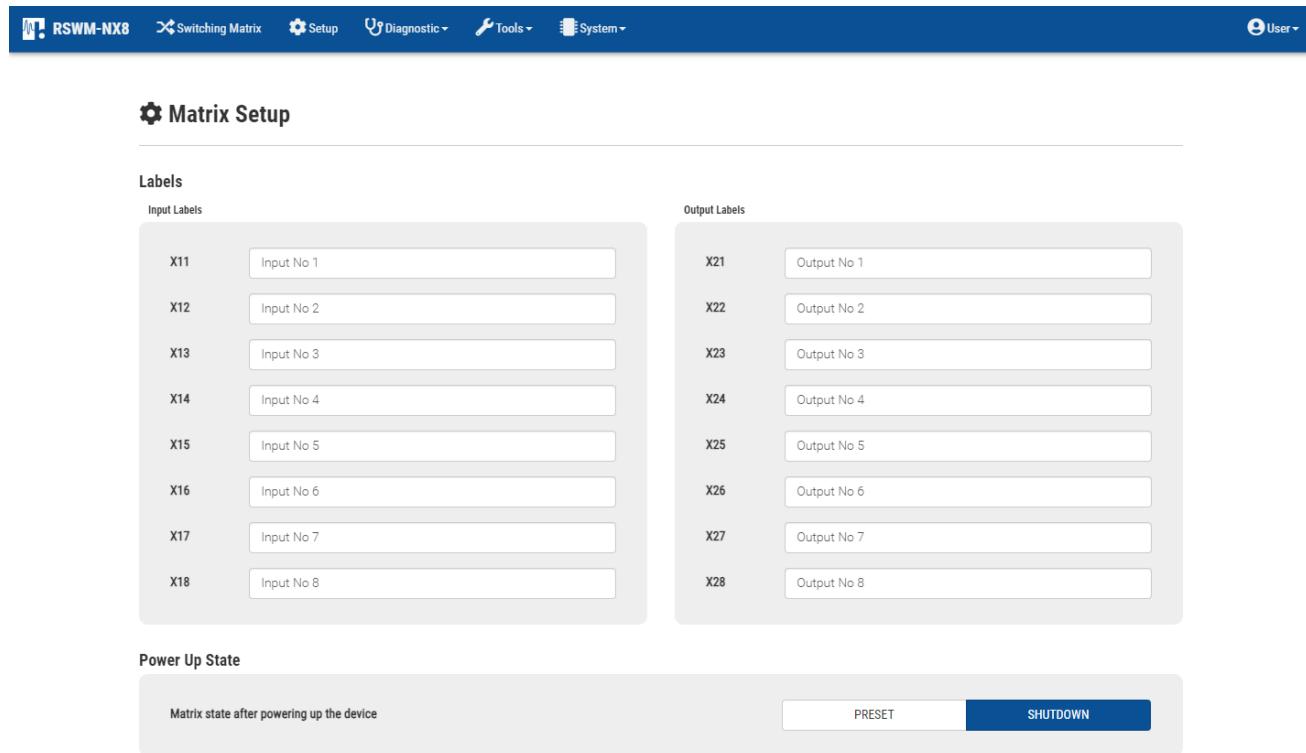
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply		90	230	260	V	50 / 60 Hz AC
power consumption			35		W	
power socket	X _{AC}	IEC-60320 C14				country specific mains cable
Remote interfaces						
	LAN	10/100 BaseT		TCP/IP		RJ45
	USB	2.0 (high speed)			USB type B	
Dimensions and weight						
dimensions	W x H x D	approx. 482 x 44 x 455			mm	19" 1U, without connectors and handles
weight	m		4.5		kg	
Environment conditions						
operating temp. range	T _o	+5		+45	°C	
storage temp. range	T _s	-40		+70	°C	
Product conformity						
Electromagnetic compatibility	EU: in line with EMC directive (2014/30/EC)				applied harmonized standards: EN61326-2-1, (for use in control and laboratory environments), EN55035, 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	
Ordering information	BSWM-4X8ER	2103.4702.1			Variant with AC Supply	
	BSWM-4X8ER	2103.4702.2			Variant with DC Supply	



Graphical User Interface

The graphical user interface (GUI) enables users to define custom labels tailored to their specific applications, making input selection more contextually meaningful.

Matrix Setup Interface



The screenshot shows the 'Matrix Setup' interface with two main sections: 'Input Labels' and 'Output Labels'. Each section contains 8 entries, each with a label and a text input field. The 'Input Labels' section includes entries X11 through X18, and the 'Output Labels' section includes entries X21 through X28. Below these sections is a 'Power Up State' section with a dropdown menu showing 'Matrix state after powering up the device' and buttons for 'PRESET' and 'SHUTDOWN'.

Labels	
Input Labels	
X11	Input No 1
X12	Input No 2
X13	Input No 3
X14	Input No 4
X15	Input No 5
X16	Input No 6
X17	Input No 7
X18	Input No 8

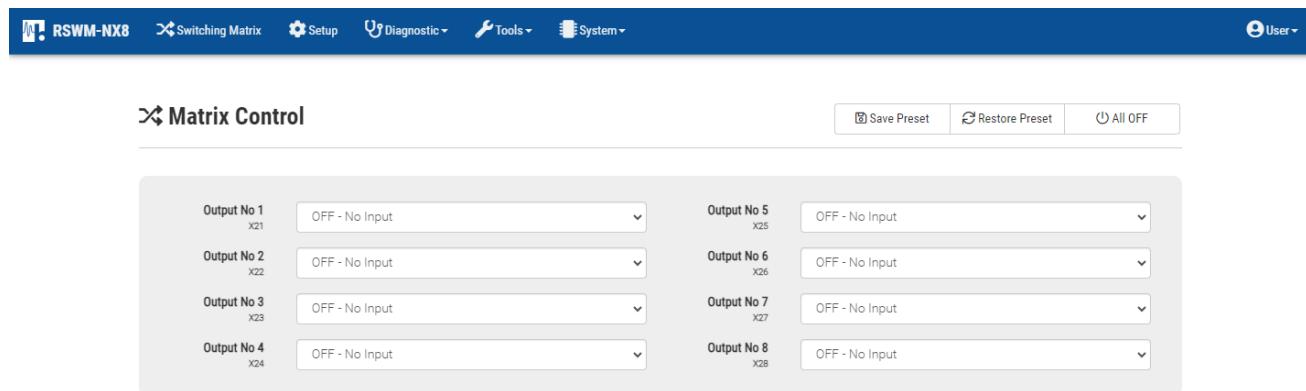
Output Labels	
X21	Output No 1
X22	Output No 2
X23	Output No 3
X24	Output No 4
X25	Output No 5
X26	Output No 6
X27	Output No 7
X28	Output No 8

Power Up State

Matrix state after powering up the device

PRESET **SHUTDOWN**

Matrix Control Interface



The screenshot shows the 'Matrix Control' interface with a grid of dropdown menus for selecting output states. Each row contains two outputs: 'Output No 1' (X21), 'Output No 5' (X25), 'Output No 2' (X22), 'Output No 6' (X26), 'Output No 3' (X23), 'Output No 7' (X27), 'Output No 4' (X24), and 'Output No 8' (X28). Each dropdown menu shows 'OFF - No Input' as the selected option. At the bottom of the interface is a timestamp: '2023-08-28 10:37:53'.

Output No 1 X21 Output No 5 X25
 Output No 2 X22 Output No 6 X26
 Output No 3 X23 Output No 7 X27
 Output No 4 X24 Output No 8 X28

2023-08-28 10:37:53



Appearances

Front View



Rear View

Variant with AC-Supply

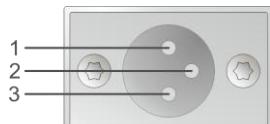


Variant with DC-Supply



DC Variant Pin Assignment

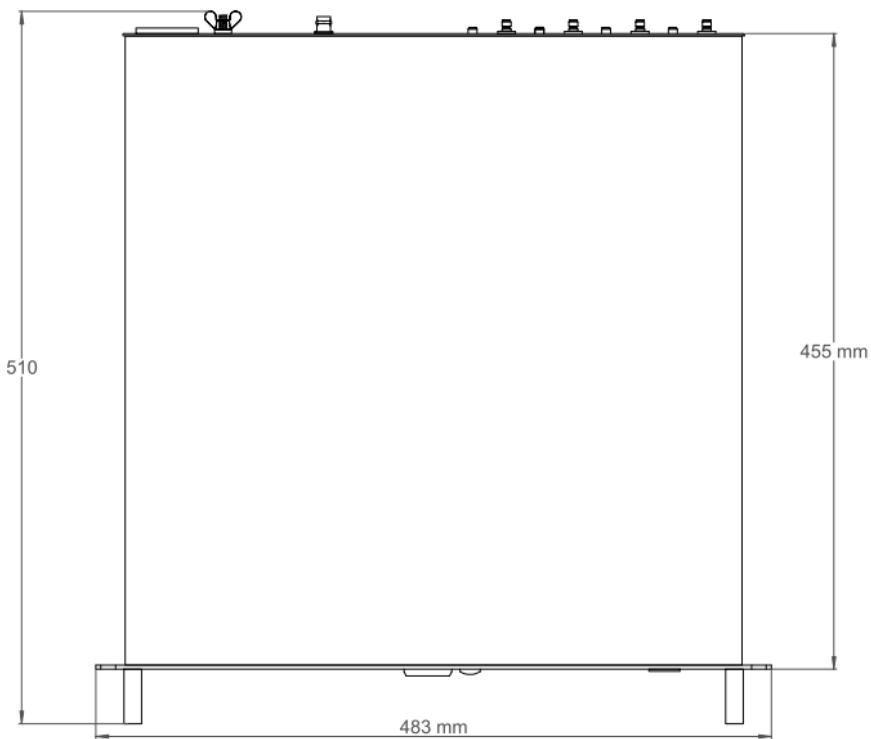
Pin	Assignment
1	DC -
2	not connected
3	DC +(12...27 V), 1 A typ., 4 A max.



Dimensions



all dimensions in mm
± 2 mm



Related Products

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Quality Made in Germany

Subject to change in specification and design without notice.
preliminary version 0.97 – January 2026



RoHS compliant in accordance with
EU Directive 2015/863