

WSDU-1X8S

High Dynamic 1X8 Shortwave Multicoupler Module, 300 kHz ... 30 MHz

Features

- wideband
- high dynamic
- lossless in level
- input band pass filter
- lightning protection
- built-in test function (option)
- compact 6 U slot-in module
- RF monitoring port

Applications

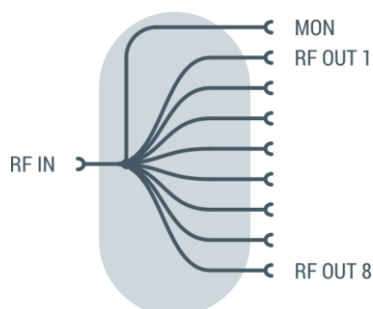
- shortwave signal distributions
- antenna signal distributions
- receiving systems
- radio monitoring
- direction finding

Scope

Slot-in module WSDU-1X8S is a wideband multicoupler, especially designed for the use in professional shortwave receiving systems. Due to its excellent dynamic properties, the WSDU-1X8S is suitable for applications with difficult reception conditions. The frequency range extends from 300 kHz up to 30 MHz. WSDU-1X8S has a monitoring output. Via this monitoring port tests at signals can be done without interruption of operation. The slot-in module is foreseen for integration into the SR6-11C system platform.

Principal Block Diagram

The WSDU-1X8S multicoupler distributes the signals from one input to 8 equal outputs without loss in level. Additionally, the module has a DC bypass between RF_IN and RF_OUT5 for e.g., phantom supply.



Distribution without Loss in Level

The multicoupler utilizes low-noise high dynamic amplifier stages. As a result, the distributed input signal is made available at the eight outputs of the multicoupler without any loss in level. All RF ports have SMA female connectors, located on the rear side of the module.

RF Input Protection

The WSDU-1X8S provides protection against lightning, surges and out-of-band signals. The RF input of the device is equipped with a discharge element and an over level protection with clipping diodes. An additional bandpass filter suppresses unwanted out-of-band signals.

Remote Control

In combination with the SR6-CU controller module, the WSDU-1X8S is remote controllable via standard interfaces USB and LAN with simple SCPI orientated ASCII strings. The WSDU-1X8S has a standby function for energy saving.

Built-In Test Function

Total current consumption, operating points of amplifier stages and internal temperature of WSDU-1X8S 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		Ω	
low frequency	f_{MIN}		200	300	kHz	
high frequency	f_{MAX}	30	35		MHz	
gain	S_{21}	+2	+3	+4	dB	
input return loss	S_{11}		-25	-14	dB	VSWR < 1.5
output return loss	S_{22}		-20	-14	dB	VSWR < 1.5
reverse isolation	S_{12}		-30	-27	dB	
o-o isolation	S_{23}		-34	-27	dB	
o-o amplitude balance	ΔS_{21}		± 0.02	± 0.5	dB	
o-o phase balance	$d\phi_{21}$		± 0.3	± 1.0	$^{\circ}$	
monitor coupling loss	S_{21MON}	-34	-31	-29	dB	
attenuations	S_{21_50k}		-25	-17	dBr	@ 50 kHz, rel. S_{21} @ 10 MHz
	S_{21_60M}		-22	-17	dBr	@ 60 MHz, rel. S_{21} @ 10 MHz
	S_{21_80M}		-40	-30	dBr	@ 80 MHz, rel. S_{21} @ 10 MHz
2 nd order intercept	OIP2 ¹	+65	+85		dBm	
3 rd order intercept	OIP3 ²	+22	+25		dBm	f < 500 kHz
	OIP3 ²	+26	+29		dBm	500 kHz \leq f < 1 MHz
	OIP3 ²	+32	+39		dBm	f > 1 MHz
1 dB compression	P_{1dB}	+15	+18		dBm	f < 1 MHz
	P_{1dB}	+17	+20		dBm	f \geq 1 MHz
noise figure	NF		7	9	dB	
maximum input power	P_{in}			+25	dBm	CW, no damage
DC bypass	U_{DC}	RF_IN to OUT_5				
DC bypass voltage	U_{BYP}			24	V	
DC bypass current	I_{BYP}			200	mA	
DC bypass resistance	R_{BYP}		9	11	Ω	
DC bypass bandwidth	BW_{BYP}		25		kHz	
maximum DC voltage	U_{DC}			24	V	all RF ports
ESD discharge resistor	R_{ESDO}		10		k Ω	RF outputs, excluding RFOUT5
RF connectors		SMA female				

Note 1: test frequency pairs for OIP2: 1.0 / 1.3 MHz, 2.5 / 3.5 MHz, 12 / 15 MHz, 22 / 27 MHz. Output level 2 x 0 dBm.

Note 2: test frequency pairs for OIP3: 290 / 310 kHz, 490 / 510 kHz, 0.9 / 1.1 MHz, 2.8 / 2.9 MHz, 29.8 / 29.9 MHz.

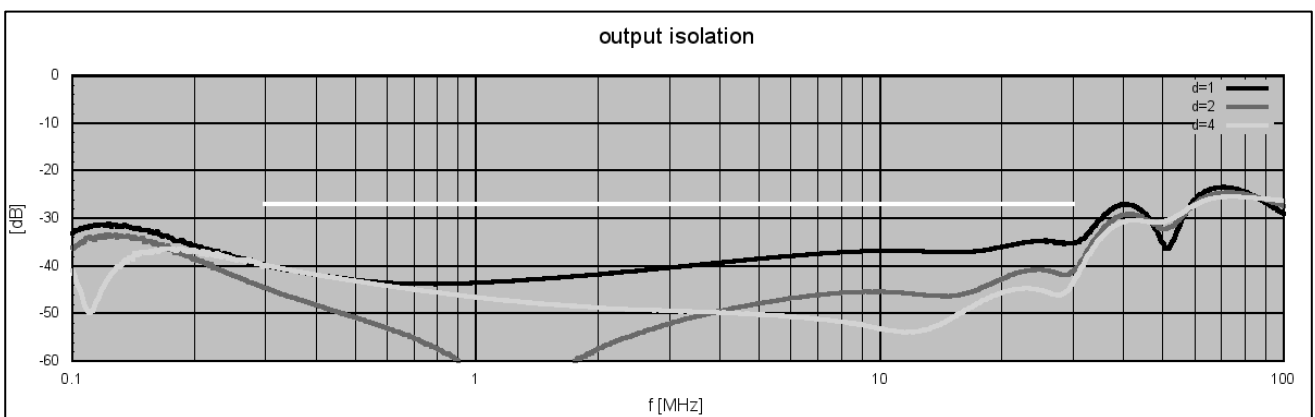
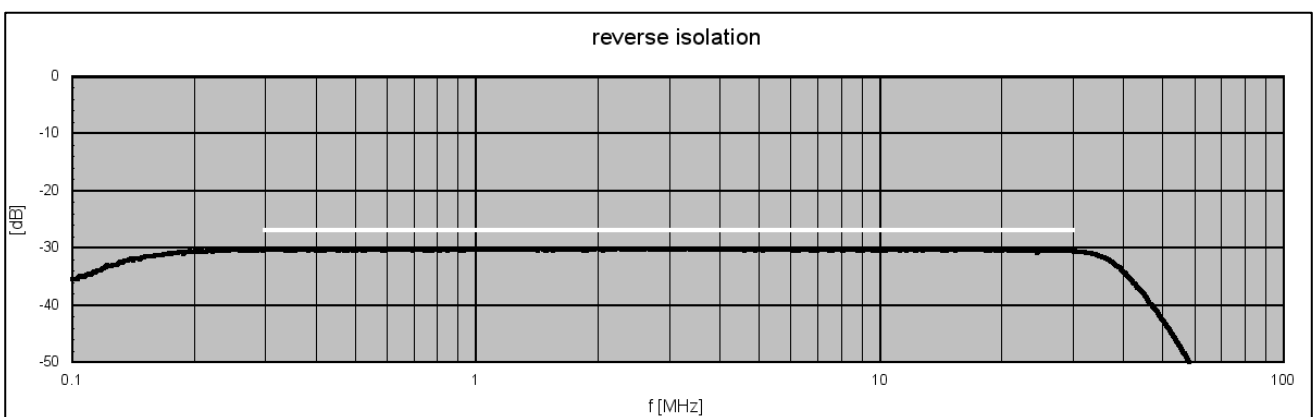
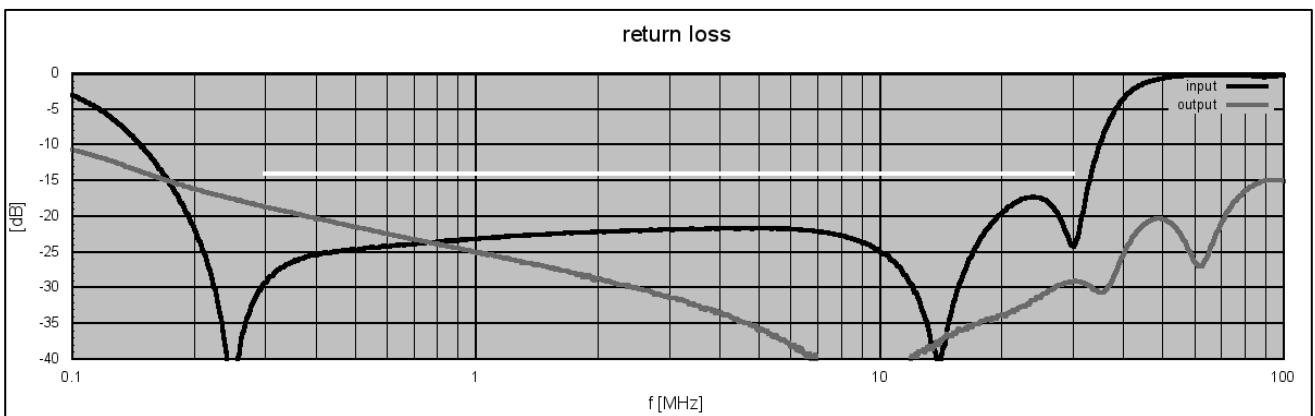
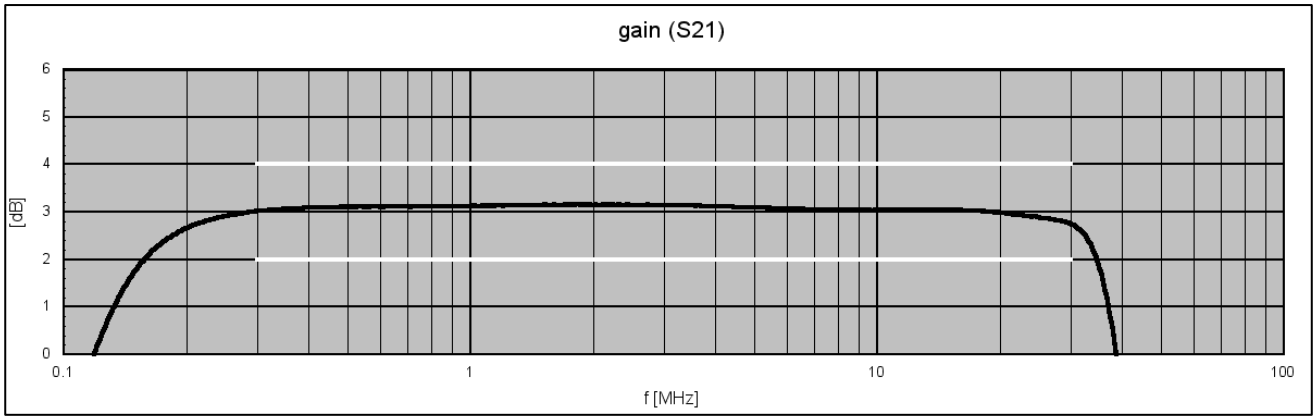
Output level 2 x 0 dBm.

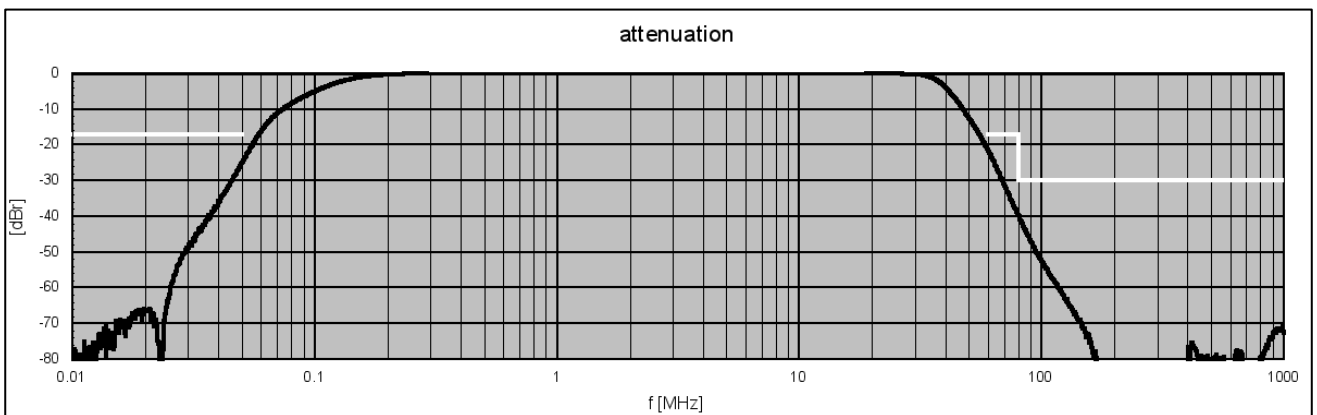
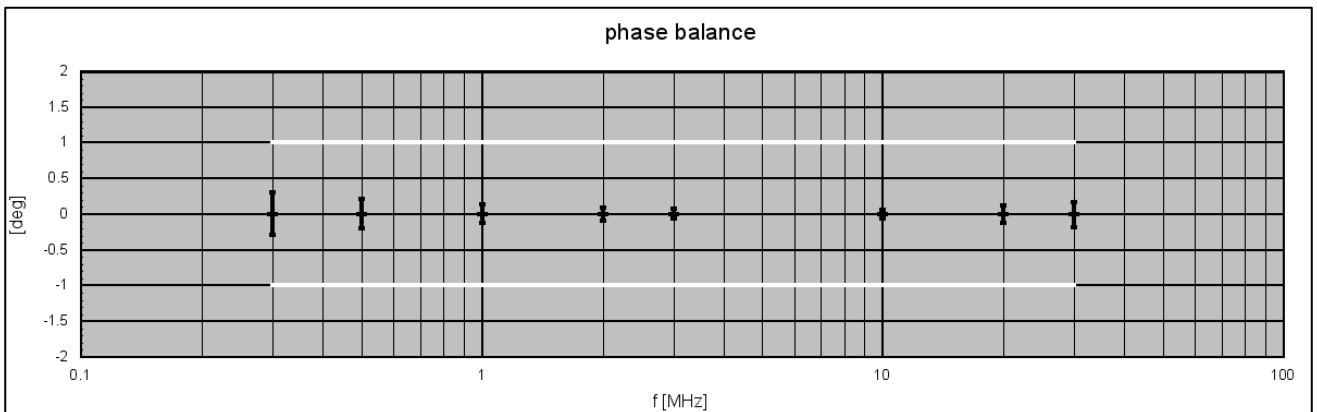
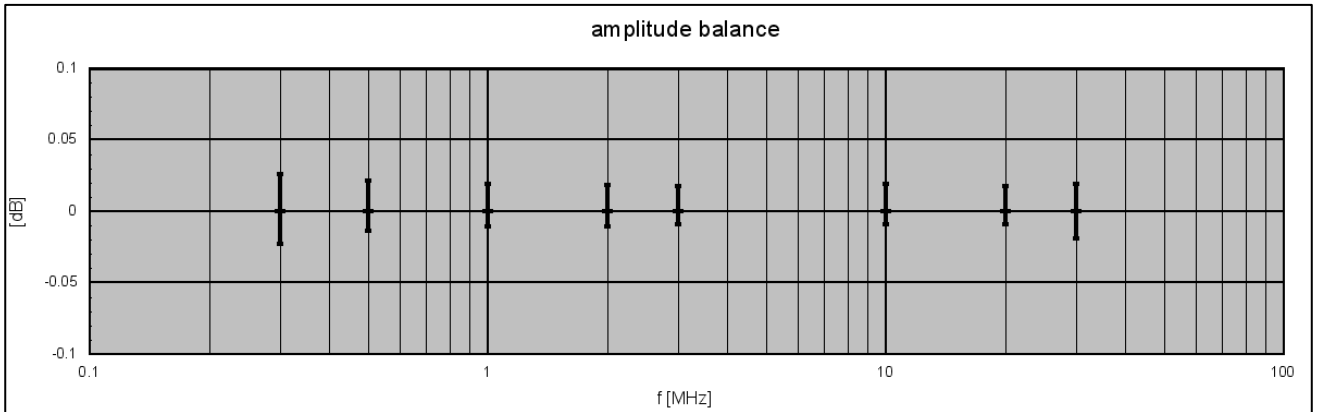
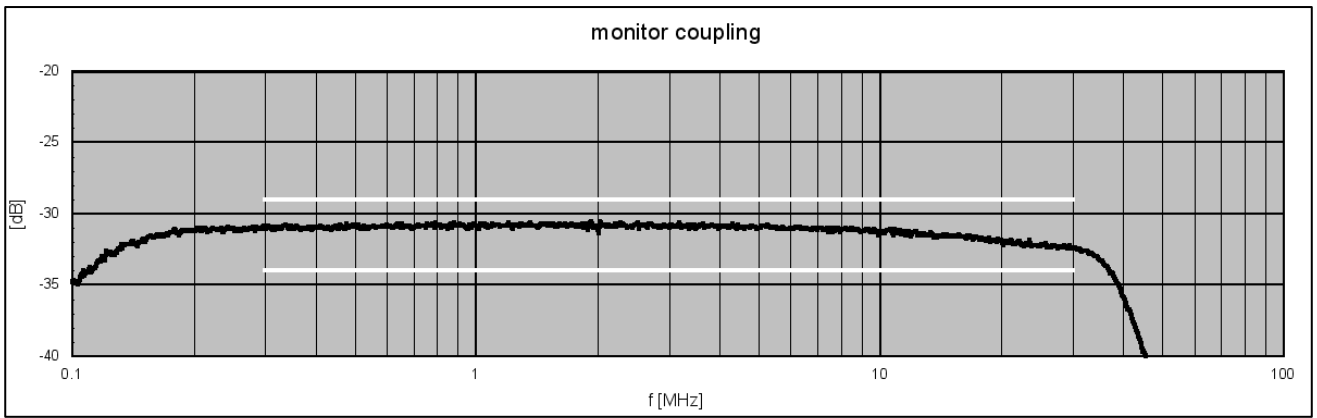
Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U_{DC}	23.5		24.5	V	DC
power consumption	P_{OPR}		6		W	operation
	P_{STB}		1		W	standby
dimensions	W x H x D	approx. 30 x 262 x 197			mm	6 U, 6 HP
weight	m		1.3		kg	
operating temp. range	T_o	-10		+65	$^{\circ}C$	module surface
storage temp. range	T_s	-40		+70	$^{\circ}C$	
relative humidity	RH			95	%	
mean time between failure	MTBF		30000		h	
ordering information		WSDU-1X8S		1502.6100.1		

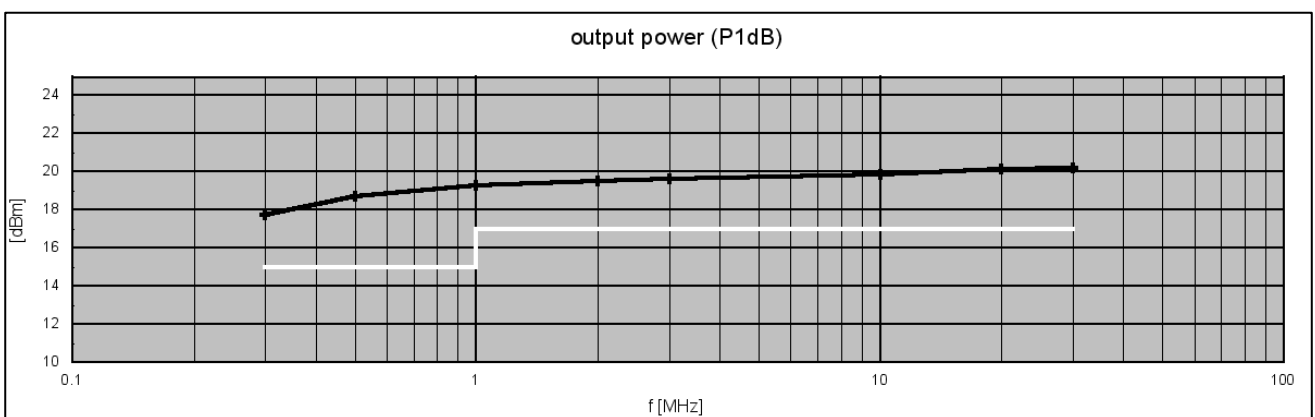
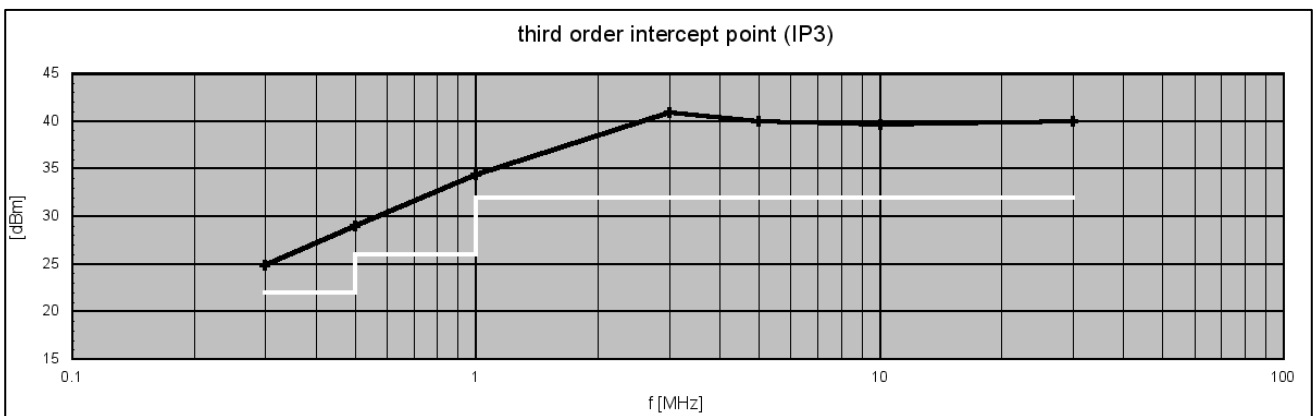
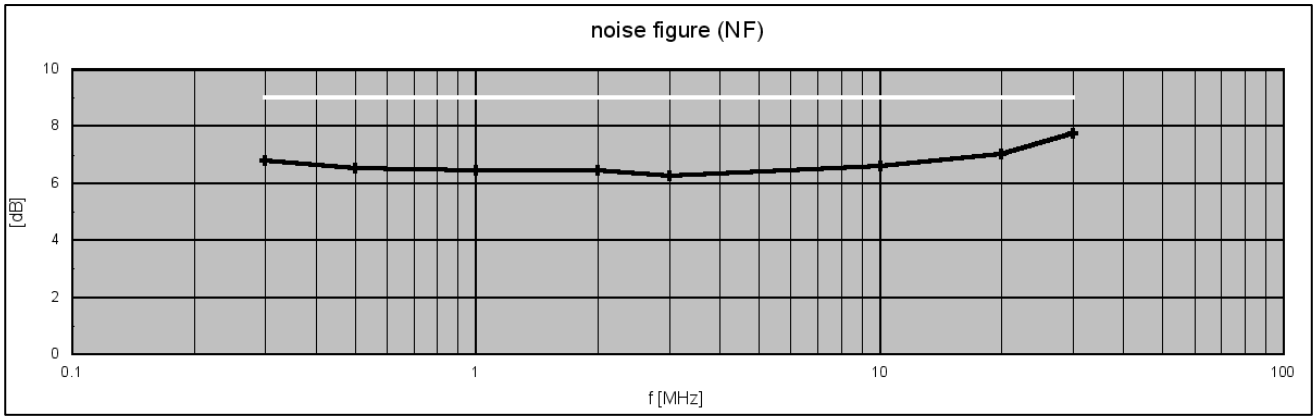


S-Parameters (typical responses)





Dynamic Range (typical responses)



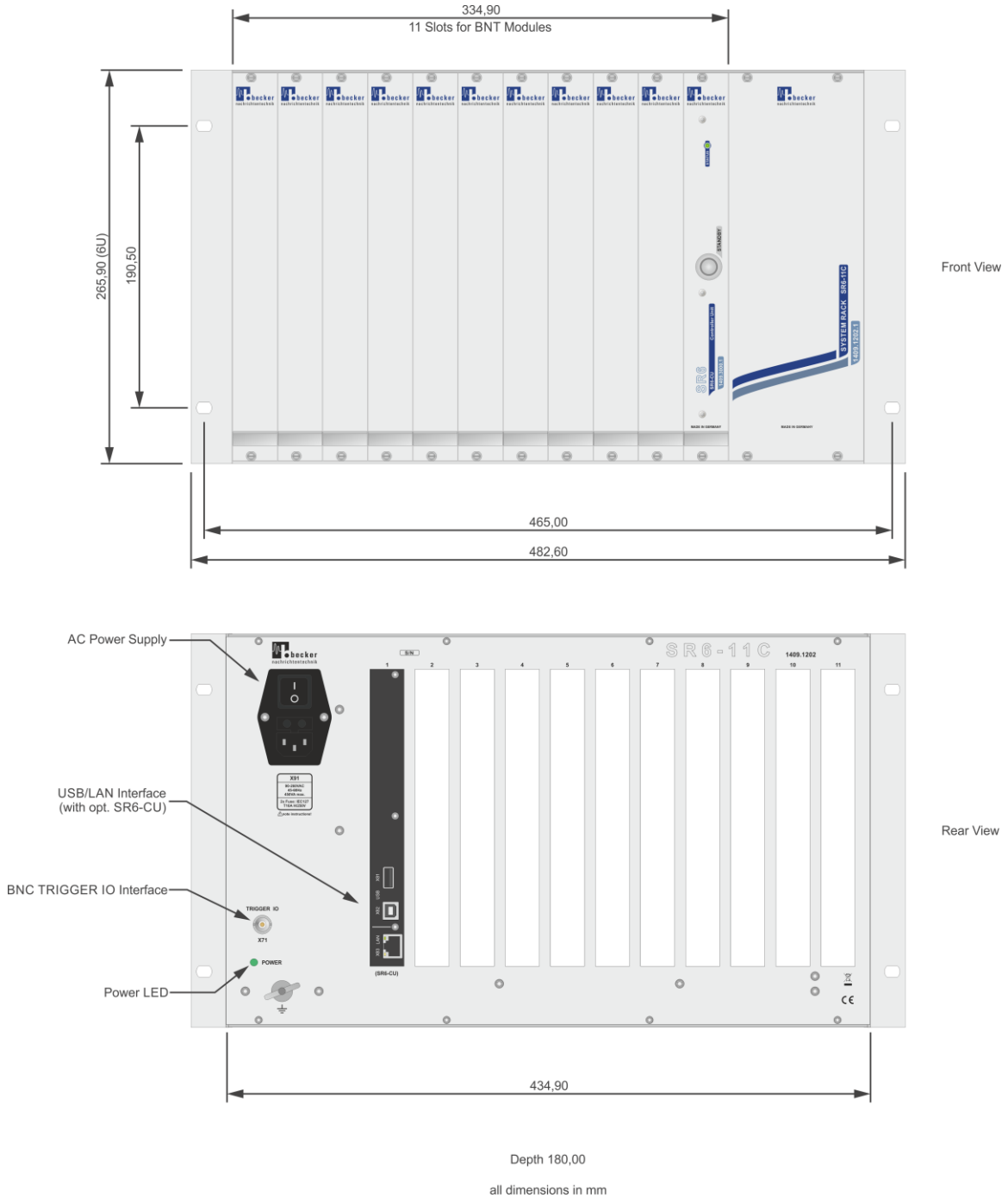
Appearances

SR6-11C System Platform

The WSDU-1X8S 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, bi-directional

splitters/combiners for signal conditioning and a controller unit. For the module health monitoring the WSDU-1X8S a SR6-CU controller unit is required.

Dimensions of SR6-11C System Platform



Front View



Rear View



SR6-11C System Platform



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
Unidirectional Products: Active Multicouplers, Matrices, Level Detectors		
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-1X8U	Ultra-Wideband 8-Way Multicoupler Module, 100 kHz ... 18000 MHz	2109.6000.1
WSDU-1X8S	High Dynamic 1x8 Shortwave Multicoupler Module, 300 kHz ... 30 MHz	1502.6100.1
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-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	1205.4100.1
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
Bi-Directional Products: Switches, Matrices, Attenuators, Delay Lines, BIAS-Ts, Splitters/Combiners, Filters		
BSDU-1X8A	8 Way Bi-directional Signal Conditioning Splitter Module, 500 ... 9000 MHz	2109.6200.1
BSDU-2X4A	2 Section 4 Way Bi-directional Signal Conditioning Splitter Module, 500 ... 9000 MHz	2109.6250.1
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
FBS-1590	L1 Band GNSS Notch Filter	1511.5100.1

