

# R&S® AREG100A AUTOMOTIVE RADAR ECHO GENERATOR

## Specifications



Data Sheet  
Version 06.00

**ROHDE & SCHWARZ**

Make ideas real



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# Definitions

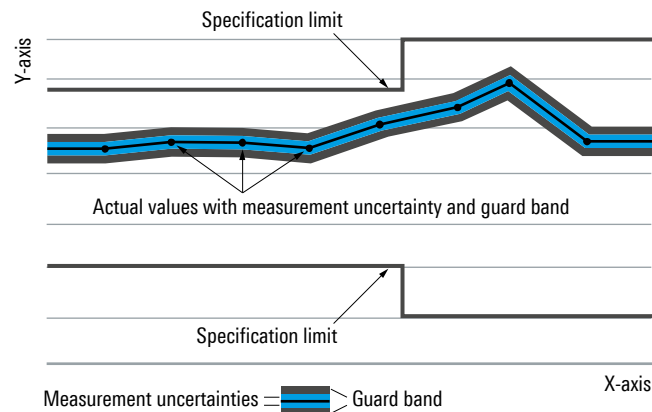
## General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

## Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as  $<$ ,  $\leq$ ,  $>$ ,  $\geq$ ,  $\pm$ , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



## Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

## Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with  $<$ ,  $>$  or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

## Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

## Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

## Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: "parameter: value".

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bits per second (Gbps), million bits per second (Mbps), thousand bits per second (kbps), million symbols per second (MSPS) or thousand symbols per second (kSPS), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, MSPS, kbps, kSPS and Msample/s are not SI units.

## Frequency

RF frequency range	R&S®AREG-B124S/-B124D	24.0 GHz to 24.25 GHz
	R&S®AREG-B177S/-B177D	76.0 GHz to 77.0 GHz
	R&S®AREG-B181S/-B181D, center frequency < 78.5 GHz	76.0 GHz to 80.0 GHz
	R&S®AREG-B181S/-B181D, center frequency ≥ 78.5 GHz	77.0 GHz to 81.0 GHz
RF instantaneous bandwidth	R&S®AREG-B124S/-B124D	250 MHz
	R&S®AREG-B177S/-B177D	1 GHz
	R&S®AREG-B181S/-B181D	4 GHz
IF frequency range at power measurement output and auxiliary IF inputs and outputs	R&S®AREG-B124S/-B124D	0.7 GHz to 0.95 GHz
	R&S®AREG-B177S/-B177D	0.7 GHz to 1.7 GHz
	R&S®AREG-B181S/-B181D, center frequency < 78.5 GHz	0.7 GHz to 4.7 GHz
	R&S®AREG-B181S/-B181D, center frequency ≥ 78.5 GHz	0.725 GHz to 4.725 GHz
RF local oscillator frequency for up and down conversion	R&S®AREG-B124S/-B124D	23.3 GHz
	R&S®AREG-B177S/-B177D	75.3 GHz
	R&S®AREG-B181S/-B181D, center frequency < 78.5 GHz	75.3 GHz
	R&S®AREG-B181S/-B181D, center frequency ≥ 78.5 GHz	76.275 GHz

## Artificial objects

Object type		fixed distance
Total number of generated objects		max. 4 (individually switchable)
Object distances with R&S®AREG-B61	<ul style="list-style-type: none"> <li>up to one R&amp;S®AREG-B61 option</li> <li>object distance = <math>\frac{1}{2} \times \text{signal time delay} \times 299\,700\,000 \text{ m/s}</math></li> <li>reference plane: waveguide plane between R&amp;S®AREG100A frontend module and R&amp;S®AREG100A antenna</li> <li>air gap describes the distance between the radar under test and the reference plane</li> </ul>	3.2 m (nom.) + air gap
	example: air gap = 0.8 m	4 m (nom.)
	change of air gap in test setup by the user after delivery of product results in change of simulated object distance; example: air gap = 1 m	4.2 m (nom.)
Object distances with R&S®AREG-B62	<ul style="list-style-type: none"> <li>up to three R&amp;S®AREG-B62 options</li> <li>desired distance (incl. air gap) for each option must be specified during the ordering process along with the desired air gap value</li> <li>object distance = <math>\frac{1}{2} \times \text{signal time delay} \times 299\,700\,000 \text{ m/s}</math></li> <li>reference plane: waveguide plane between R&amp;S®AREG100A frontend module and R&amp;S®AREG100A antenna</li> <li>air gap describes the distance between the radar under test and the reference plane</li> </ul>	4.2 m to 299.2 m (nom.) + air gap
	example: air gap = 0.8 m	simulated object distance can be ordered to any value between 5 m and 300 m (nom.)
	example: air gap = 1.5 m	simulated object distance can be ordered to any value between 5.7 m and 300.7 m (nom.)

	change of air gap in test setup by the user after delivery of the product results in change of simulated object distance; example: the air gap in the test setup is changed from 0.8 m to 1 m by the user	simulated object distance increases by 0.2 m
Object distance accuracy	<p>calculated with the following conditions resp. assumptions:</p> <ul style="list-style-type: none"> <li>the stated distance values are characteristic for the whole specified frequency range and can vary within the limits of the specified group delay flatness</li> <li>signal delay assuming a speed of light of <math>c = 299\,700\,000</math> m/s</li> <li>temperature range from 20 °C to 30 °C</li> </ul> <p>measured by vector network analyzer in attenuation or reflection measurement mode:</p> <ul style="list-style-type: none"> <li>window function: Dolph-Chebyshev</li> <li>arbitrary sidelobe level = 42 dB</li> <li>resolution enhancement factor = 1</li> </ul> <p>R&amp;S®AREG100A set to:</p> <ul style="list-style-type: none"> <li>base attenuation = 0 dB</li> <li>object individual attenuation = 0 dB</li> <li>only one object is active</li> <li>reference plane: R&amp;S®AREG100A frontend waveguide port(s)</li> </ul>	
	with R&S®AREG-B124S/-B124D option	< 0.15 m
	with R&S®AREG-B177S/-B177D option	< 0.1 m
	with R&S®AREG-B181S/-B181D option	< 0.1 m
Echo signal delay	from RX waveguide port to TX waveguide port with R&S®AREG-B61 option	21.35 ns (nom.)
	from RX waveguide port to TX waveguide port with R&S®AREG-B62 option	depends on the customer-defined fixed object distance: 28.03 ns to 1996.66 ns (nom.)
Air gap	The distance between frontend reference plane and DUT must be defined at time of ordering. A change after ordering is possible, but object distances and resulting object radar cross sections will change accordingly.	recommendation: air gap should be large enough to match far field condition of radar under test
Object radar cross section accuracy	<p>Calculated as attenuation accuracy from the peak value of a time domain trace. The stated attenuation values are characteristic for the whole specified frequency range and can vary within the limits of the specified amplitude flatness.</p> <p>measured by vector network analyzer in attenuation or reflection measurement mode:</p> <ul style="list-style-type: none"> <li>window function: Dolph-Chebyshev</li> <li>arbitrary sidelobe level = 42 dB</li> <li>resolution enhancement factor = 1</li> </ul> <p>R&amp;S®AREG100A set to:</p> <ul style="list-style-type: none"> <li>base attenuation = 0 dB</li> <li>object individual attenuation = 0 dB</li> <li>only one object is active</li> <li>reference plane: R&amp;S®AREG100A frontend waveguide port(s)</li> </ul>	
		< 3 dB (meas.)

## Radial velocity

### Frequency offset (R&S® AREG-K799 option)

Doppler frequency shift	with R&S® AREG-K799 common Doppler frequency shift, for all artificial objects together	yes
Velocity setting range	R&S® AREG-B60 and R&S® AREG-K799	±500 km/h
Velocity step size	with R&S® AREG-K799 and R&S® AREG-B124S/-B124D	< 1 km/h
	with R&S® AREG-K799 and R&S® AREG-B177S/-B177D	< 1 km/h
	with R&S® AREG-K799 and R&S® AREG-B181S/-B181D	< 1 km/h

### Doppler simulation (R&S® AREG-B60 option, individual per object)

Individual Doppler frequency shift	with R&S® AREG-B60 Doppler frequency shift, for each artificial object individually	yes
Velocity setting range	R&S® AREG-B60	±500 km/h
Velocity step size	with R&S® AREG-B60 and R&S® AREG-B124S/-B124D	< 0.07 km/h (nom.)
	with R&S® AREG-B60 and R&S® AREG-B177S/-B177D	< 0.03 km/h (nom.)
	with R&S® AREG-B60 and R&S® AREG-B181S/-B181D	< 0.03 km/h (nom.)
Doppler frequency offset accuracy	Measured with a spectrum analyzer in IF domain as frequency offset between base unit IF input and IF output signal, without frontend.	< 2 Hz
Velocity accuracy	Doppler shift velocity error is determined from the measured Doppler shift frequency error by using the equation: $V_{\text{error}} = 3.6 \times (f_{\text{error}}/f_{\text{center}}) \times \frac{1}{2} \times 299\,700\,000 \text{ m/s}$ with $f_{\text{center}}$ being 24.125 GHz (-B124 options), 76.5 GHz (-B177 options) or 78 GHz/79 GHz (-B181 options).	< 0.1 km/h
Spurious objects in Doppler domain	Level of spurious objects relative to desired object with velocity unequal to the desired velocity; for example objects with zero or opposite velocity. Measured with a spectrum analyzer in IF domain, without frontend.	< -32 dBc (meas.)
Doppler switching cycle time	maximum switching time between two consecutive changes of Doppler velocity	30 ms (meas.)

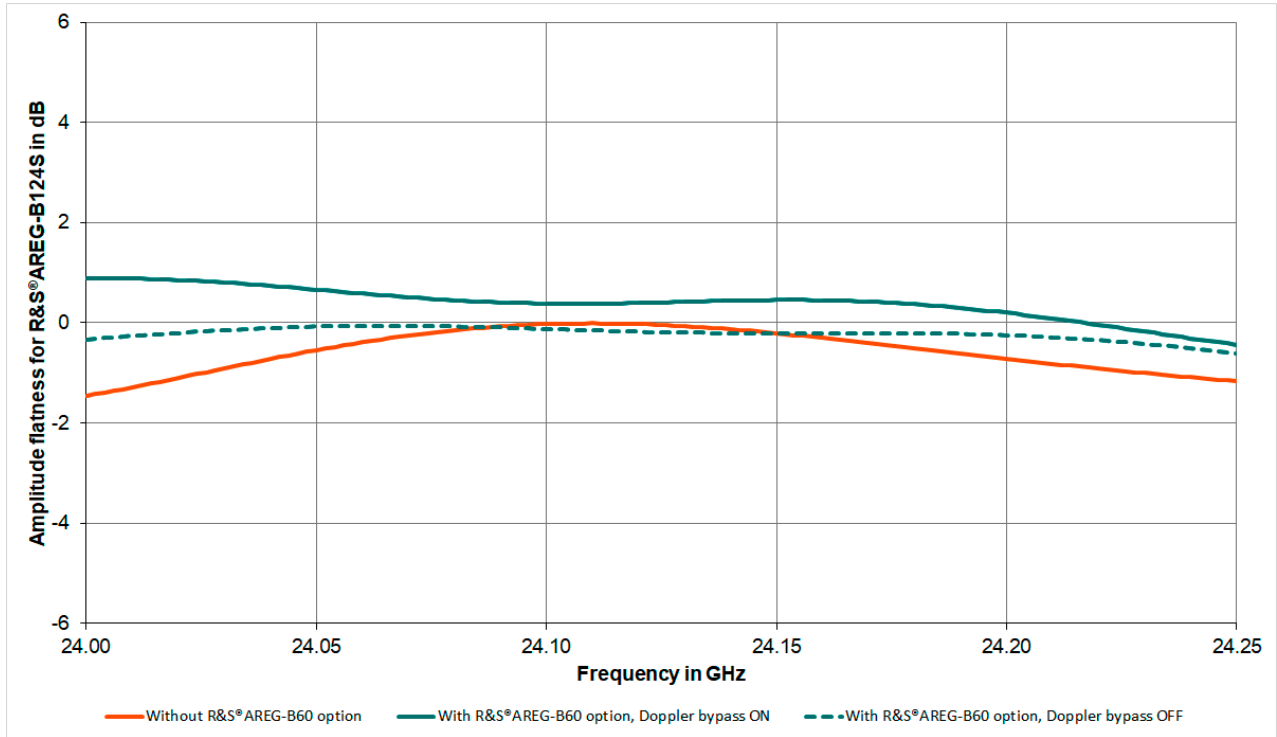
## Level

Absolute maximum RX power at frontend RX waveguide port	R&S®AREG-B124S/-B124D	0 dBm (nom.)
	R&S®AREG-B177S/-B177D	-7 dBm (nom.)
	R&S®AREG-B181S/-B181D	-7 dBm (nom.)
Maximum TX power at frontend TX waveguide port	R&S®AREG-B124S/-B124D	≥ 15 dBm (meas.)
	R&S®AREG-B177S/-B177D	≥ 20 dBm (meas.)
	R&S®AREG-B181S/-B181D	≥ 18 dBm (meas.)
Object individual attenuation range	for each object, user setting	0 dB to 55 dB (meas.), 0.5 dB setting step size (nom.)
Additional base attenuation	effective for all objects, user setting	-35 dB to +25 dB (meas.), 1 dB setting step size (nom.)
	recommended attenuation range for single antenna options due to circulator isolation	-15 dB to +25 dB (meas.)
Total RX to TX attenuation range	antenna port to antenna port (excl. antennas)	-35 dB to +80 dB (nom.)
	recommended attenuation range for single antenna options due to circulator isolation	-15 dB to +80 dB (nom.)

## Transfer characteristic

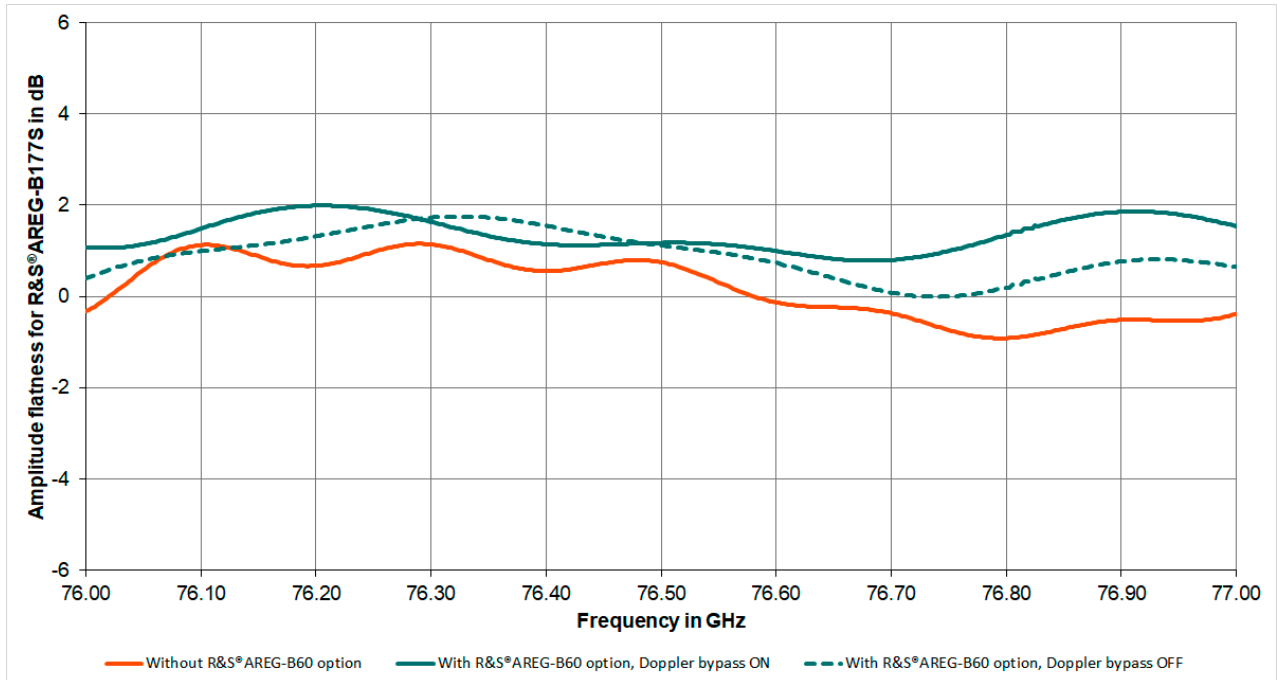
Amplitude flatness	measured by vector network analyzer with time gating centered on object delay:	
	<ul style="list-style-type: none"> <li>frequency step size = 125 kHz</li> <li>window function: normal gate (Hann)</li> <li>type: bandpass filter</li> <li>span: <ul style="list-style-type: none"> <li>- 13.347 ns (R&amp;S®AREG-B124)</li> <li>- 6.673 ns (R&amp;S®AREG-B177/-B181)</li> </ul> </li> </ul>	
	R&S®AREG100A set to:	
	<ul style="list-style-type: none"> <li>base attenuation = 0 dB</li> <li>object individual attenuation = 0 dB</li> <li>only one object is active</li> </ul>	
Group delay flatness	waveguide RX port to waveguide TX port	
	R&S®AREG-B124S/-B124D	< ±2 dB in 250 MHz bandwidth (meas.)
	R&S®AREG-B177S/-B177D	< ±2 dB in 1 GHz bandwidth (meas.)
	R&S®AREG-B181S/-B181D	< ±5 dB in 4 GHz bandwidth (meas.)
Group delay flatness	measured by vector network analyzer with time gating centered on object delay:	
	<ul style="list-style-type: none"> <li>frequency step size = 125 kHz</li> <li>group delay aperture: 100</li> <li>window function: normal gate (Hann)</li> <li>type: bandpass filter</li> <li>span: <ul style="list-style-type: none"> <li>- 13.347 ns (R&amp;S®AREG-B124)</li> <li>- 6.673 ns (R&amp;S®AREG-B177/-B181)</li> </ul> </li> </ul>	
	R&S®AREG100A set to:	
	<ul style="list-style-type: none"> <li>base attenuation = 0 dB</li> <li>object individual attenuation = 0 dB</li> <li>only one object is active</li> </ul>	
Group delay flatness	waveguide RX port to waveguide TX port	
	R&S®AREG-B124S/-B124D	< 1 ns in 250 MHz bandwidth (meas.)
	R&S®AREG-B177S/-B177D	< 1 ns in 1 GHz bandwidth (meas.)
	R&S®AREG-B181S/-B181D	< 1.3 ns in 4 GHz bandwidth (meas.)

## Amplitude flatness for R&S® AREG-B124S



Measured by vector network analyzer with time gating centered on object delay;  
 Window function: normal gate (Hann), type: bandpass filter, span: 13.347 ns;  
 R&S® AREG100A set to: base attenuation = 0 dB, object individual attenuation = 0 dB, only one object with 50 m distance active

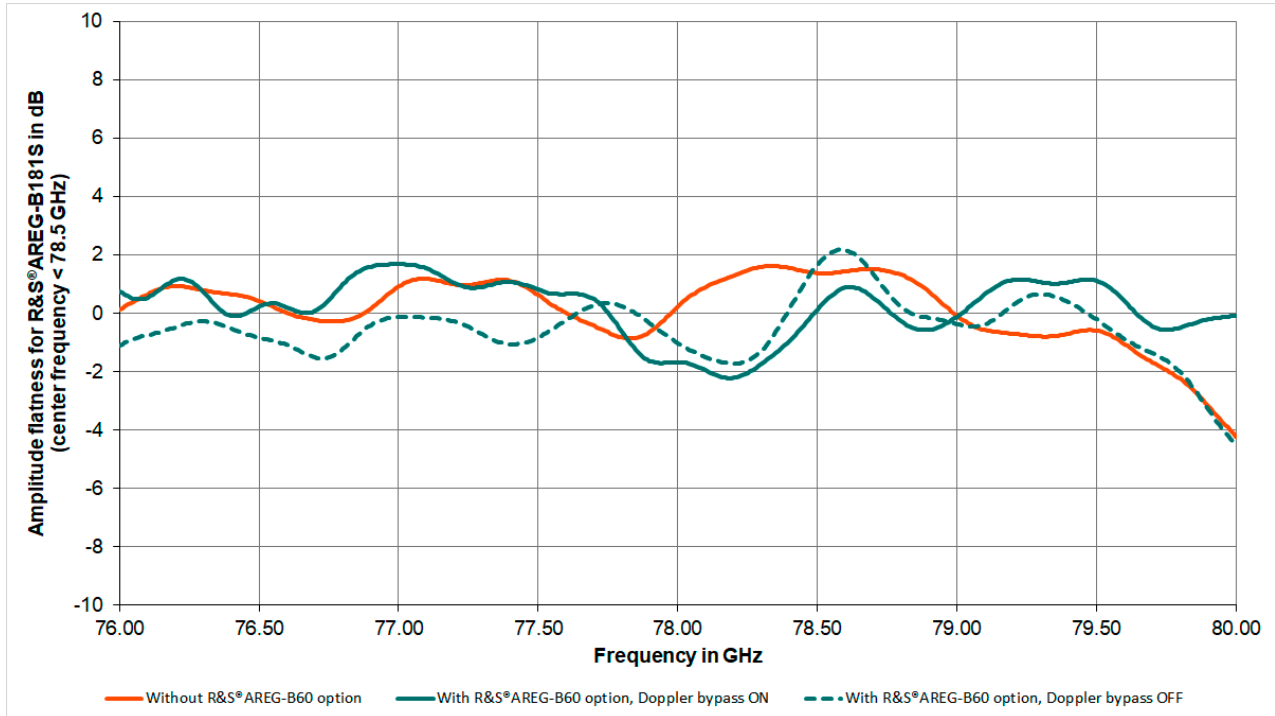
## Amplitude flatness for R&S® AREG-B177S



Measured by vector network analyzer with time gating centered on object delay;  
 Window function: normal gate (Hann), type: bandpass filter, span: 6.673 ns;  
 R&S® AREG100A set to: base attenuation = 0 dB, object individual attenuation = 0 dB, only one object with 50 m distance active



## Amplitude flatness for R&S® AREG-B181S (center frequency < 78.5 GHz)

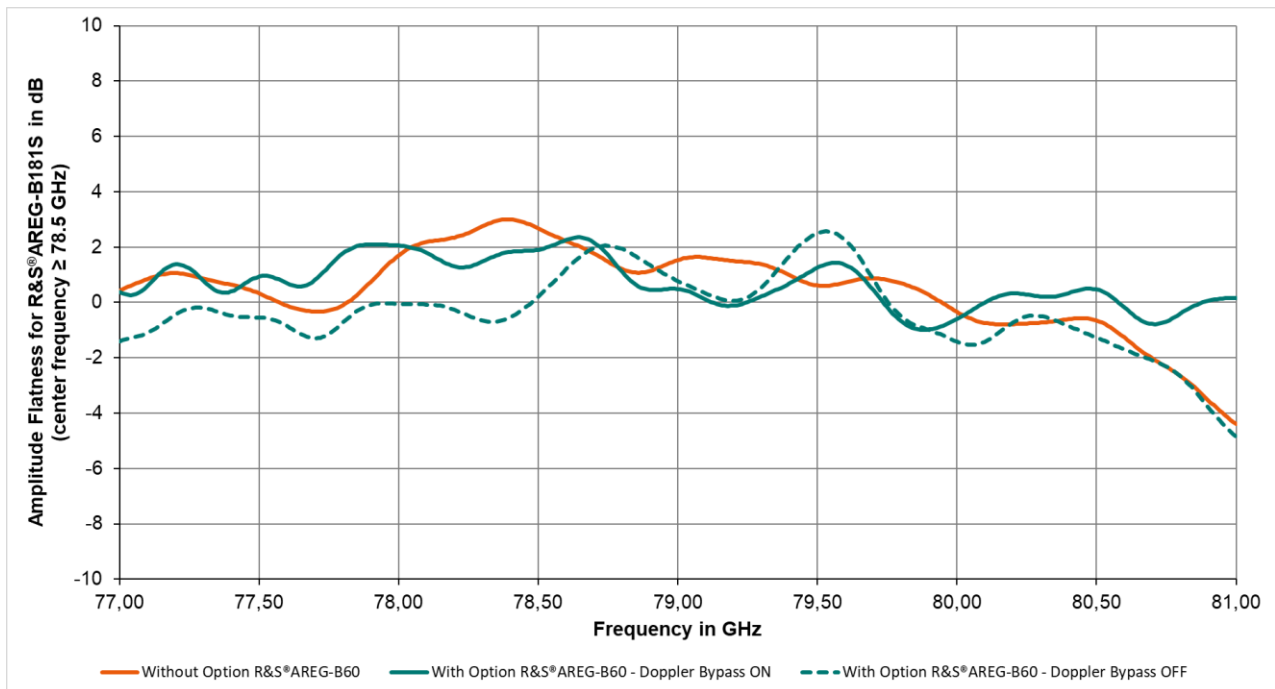


Measured by vector network analyzer with time gating centered on object delay;

Window function: normal gate (Hann), type: bandpass filter, span: 6.673 ns;

R&S® AREG100A set to: base attenuation = 0 dB, object individual attenuation = 0 dB, only one object with 50 m distance active

## Amplitude flatness for R&S® AREG-B181S (center frequency ≥ 78.5 GHz)



Measured by vector network analyzer with time gating centered on object delay;

Window function: normal gate (Hann), type: bandpass filter, span: 6.673 ns

R&S® AREG100A set to: base attenuation = 0 dB, object individual attenuation = 0 dB, only one object with 50 m distance active

## Antennas

Configuration	with R&S®AREG-B124S/-B177S/-B181S	1 combined TX/RX antenna (circulator integrated into frontend module)
	with R&S®AREG-B124D/-B177D/-B181D	1 TX and 1 RX antenna, lateral antenna spacing (center to center): 32 mm
Type and gain	with R&S®AREG-B124S/-B124D	WR42 rectangular horn antenna: 10 dBi (nom.)
	with R&S®AREG-B177S/-B177D	WR12 rectangular horn antenna: 10 dBi (nom.)
	with R&S®AREG-B181S/-B181D	WR12 rectangular horn antenna: 10 dBi (nom.)
Polarization		linear, vertical polarization, horizontal polarization possible by rotating frontend module

## Auxiliary IF interfaces (R&S®AREG-B17 option)

### Power measurement output (EIRP measurement)

With calibrated R&S®NRP8S/R&S®NRP8SN power sensor directly connected to the power measurement output port at the frontend module and to the R&S®AREG100A base unit power sensor connector.

EIRP measurement level range	sensor EIRP power at 80 cm air gap, other air gap values will result in different measurement ranges, as free-space loss and received power will change	
	R&S®AREG-B124S/-B124D	0 dBm to 40 dBm (meas.)
	R&S®AREG-B177S/-B177D	5 dBm to 43 dBm (meas.)
	R&S®AREG-B181S	3 dBm to 43 dBm (meas.)
	R&S®AREG-B181D	-6 dBm to 43 dBm (meas.)
IF RX power output gain	from frontend RX waveguide input (at RF frequency) to frontend RX power port (at IF frequency)	
	R&S®AREG-B124S/-B124D, RF frequency = 24.125 GHz	15 dB (nom.)
	R&S®AREG-B177S/-B177D, RF frequency = 76.5 GHz	15 dB (nom.)
	R&S®AREG-B181S/-B181D, RF frequency = 78 GHz or 79 GHz	15 dB (nom.)

### Auxiliary IF output

Auxiliary receive signal IF output for optional signal analysis: connect to a spectrum analyzer or oscilloscope

IF output measurement level range	incident power at RX waveguide input	
	R&S®AREG-B124S/-B124D	max. -8 dBm (meas.)
	R&S®AREG-B177S/-B177D	max. -13 dBm (meas.)
	R&S®AREG-B181S/-B181D	max. -13 dBm (meas.)
IF output gain	from RX waveguide input (at RF frequency) to auxiliary RX IF Out port (at IF frequency)	
	R&S®AREG-B124S/-B124D, RF frequency = 24.125 GHz	12 dB (meas.)
	R&S®AREG-B177S/-B177D, RF frequency = 76.5 GHz	12 dB (meas.)
	R&S®AREG-B181S/-B181D, RF frequency = 78 GHz or 79 GHz	12 dB (meas.)
	IF output frequency range	R&S®AREG-B124S/-B124D
R&S®AREG-B177S/-B177D		0.7 GHz to 1.7 GHz, with 1 GHz bandwidth
R&S®AREG-B181S/-B181D, center frequency < 78.5 GHz		0.7 GHz to 4.7 GHz, with 4 GHz bandwidth
R&S®AREG-B181S/-B181D, center frequency ≥ 78.5 GHz		0.725 GHz to 4.725 GHz, with 4 GHz bandwidth

## Auxiliary IF input

Auxiliary transmit signal IF input allows transmitting additional signals to the radar under test at RF frequency (example: interference signals)

IF input maximum level	R&S®AREG-B124D/-B177D/-B181D	10 dBm (nom.)
	R&S®AREG-B124S, to prevent receiver damage due to TX-RX isolation with circulator	0 dBm (nom.)
	R&S®AREG-B177S/-B181S, to prevent receiver damage due to TX-RX isolation with circulator	-7 dBm (nom.)
IF input recommended maximum level	to prevent receiver saturation due to TX-RX isolation with circulator	
	R&S®AREG-B124S	< -17 dBm (meas.)
	R&S®AREG-B177S	< -17 dBm (meas.)
	R&S®AREG-B181S	< -18 dBm (meas.)
IF input gain	from auxiliary TX IF In port (at IF frequency) to frontend TX waveguide output (at RF frequency)	
	R&S®AREG-B124S/-B124D, RF frequency = 24.125 GHz	20 dB (meas.)
	R&S®AREG-B177S/-B177D, RF frequency = 76.5 GHz	20 dB (meas.)
	R&S®AREG-B181S/-B181D, RF frequency = 78 GHz or 79 GHz	20 dB (meas.)
IF input compression P1dB	level at TX IF In port (at IF frequency)	
	R&S®AREG-B124D	1 dBm (meas.)
	R&S®AREG-B177D	1 dBm (meas.)
	R&S®AREG-B181D	-5 dBm (meas.)
IF input frequency range	R&S®AREG-B124S/-B124D	0.7 GHz to 0.950 GHz, with 250 MHz bandwidth
	R&S®AREG-B177S/-B177D	0.7 GHz to 1.7 GHz, with 1 GHz bandwidth
	R&S®AREG-B181S/-B181D, center frequency < 78.5 GHz	0.7 GHz to 4.7 GHz, with 4 GHz bandwidth
	R&S®AREG-B181S/-B181D, center frequency ≥ 78.5 GHz	0.725 GHz to 4.725 GHz, with 4 GHz bandwidth

## Reference frequency

### Reference frequency input

Connector type	Ref In on rear panel	BNC female
Input frequency		10 MHz
Input level range		-16 dBm to +13 dBm
Input impedance		50 $\Omega$ (nom.)

### Reference frequency output

Connector type	Ref Out on rear panel	BNC female
Output frequency	sine wave	
	output with source mode: internal	10 MHz $\pm$ 5 ppm derived from internal oscillator
	output with source mode: external	amplified input signal from Ref In routed to Ref Out (only with the input frequency at 10 MHz)
Output level	output with source mode: internal	+8 dBm $\pm$ 1.5 dB
	output with source mode: external	+8 dBm (meas.)
Source impedance		50 $\Omega$ (nom.)

## Remote control

Interfaces	Ethernet/LAN	10/100/1000BASE-T
	remote control with R&S®AREG-B86 option	IEC 60625 (GPIB IEEE 488.2), USB 2.0 (according to VISA USB-TMC)
Command set		SCPI 1999.5 or compatible command sets
IEC/IEEE bus address		0 to 30
Ethernet/LAN protocols and services		<ul style="list-style-type: none"> <li>• VISA VXI-11 (remote control)</li> <li>• Telnet/RawEthernet (remote control)</li> <li>• VNC (remote operation with web browser)</li> <li>• FTP (file transfer protocol)</li> <li>• SMB (mapping parts of the instrument to a host file system)</li> </ul>
Ethernet/LAN addressing		DHCP, static; support of Zeroconf and M-DNS to facilitate the direct connection to a system controller

# Connectors

## Base unit

### Front panel connectors

USB	USB 2.0 (high speed) connector for external USB devices, mouse and keyboard for enhanced operation, R&S®NRP power sensors (with R&S®NRP-Z4 or R&S®NRP-ZKU adapter cable) for external power measurements, memory stick for software update and data exchange	USB type A
Sensor	connector for R&S®NRP power sensors	six-pin ODU Mini-Snap® series B

### Rear panel connectors

Frontend RX IF In	receiver IF signal input from frontend module	SMA female
Frontend TX IF Out	receiver IF and reference signal output to frontend module	SMA female
Frontend control	power and control connection to frontend module	26-pin ODU Mini-Snap® series L, coding A, push-pull connector
Aux IF Out	auxiliary receive signal IF output	SMA female
Aux IF In	auxiliary transmit signal IF input	SMA female
Ref In	10 MHz reference frequency input	BNC female
Ref Out	10 MHz reference frequency output	BNC female
LAN	provides remote control functionality and other services, see Remote control	RJ-45
IEEE 488	remote control of instrument via GPIB	24-pin Amphenol series 57, female
USB	USB 3.0 (high speed) connector for external USB devices, mouse and keyboard for enhanced operation, R&S®NRP power sensors (with R&S®NRP-Z4 or R&S®NRP-ZKU adapter cable) for external power measurements, memory stick for software update and data exchange	USB type A
USB In (Micro-B)	USB 2.0 (high speed), remote control of instrument (USB-TMC), with option R&S®AREG100A-B86	USB type B, micro USB

### Frontend module

RX IF Out	receiver IF signal output to base unit	SMA female
TX IF In	transmitter IF signal and reference input from base unit	SMA female
Control	power and control connection to frontend module	26-pin ODU Mini-Snap® series L, coding A, push-pull connector
RX power	receiver IF signal output for power measurements, connect an R&S®NRP power sensor	SMA female

## General data

<b>Environmental conditions</b>		
Temperature	operating temperature range	+15 °C to +45°C
	storage temperature range	-10 °C to +60 °C
Damp heat		+40 °C, 95 % rel. humidity, steady state, in line with EN 60068-2-78
Altitude	operating	4600 m
	transport	4600 m
<b>Mechanical resistance</b>		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g RMS, in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E, method 516.4, procedure I
<b>Power rating</b>		
Rated voltage		100 V to 240 V AC (± 10 %)
Rated frequencies		50 Hz to 60 Hz (± 5 %), 400 Hz (± 5 %)
Rated current		3.5 A to 1.6 A (50 Hz to 60 Hz), 3.5 A to 2.9 A (400 Hz)
Rated power	when fully equipped	90 W (meas.)
Power factor correction		in line with EN 61000-3-2
<b>Product conformity</b>		
Operating environment	for OTA testing	a shielded environment is required
Electromagnetic compatibility	EU: in line with EMC Directive 2014/30/EU	applied harmonized standards: <ul style="list-style-type: none"> <li>• EN 61326-1 (industrial environment)</li> <li>• EN 61326-2-1</li> <li>• EN 55011 (class A)</li> <li>• EN 61000-3-2</li> <li>• EN 61000-3-3</li> </ul>
Electrical safety	EU: in line with Low Voltage Directive 2014/35/EU	applied harmonized standard: EN 61010-1
	USA	UL 61010-1
	Canada	CAN/CSA-C22.2 No. 61010-1
Laser safety		laser class: 1M, CEI IEC International Standard 60825-1, second edition 2007-03
International safety approvals	VDE – Association for Electrical, Electronic and Information Technologies	GS mark 40046635
	CSA – Canadian Standards Association	CSA <sub>UL</sub> mark 70133349
<b>Calibration interval</b>		
Recommended calibration interval	if operated in a production environment	1 year
<b>Dimensions (W x H x D)</b>	base unit	445 mm x 152 mm x 372 mm (17.52 in x 5.98 in x 14.65 in) (19", 3 HU)
	frontend module	120 mm x 115 mm x 30 mm (4.72 in x 4.53 in x 1.18 in), antennas and circulator not included
<b>Weight</b>	base unit	11.3 kg (25 lb)
	frontend module	1 kg (2 lb)
<b>Cable harness from base unit to frontend module</b>		
RX IF signal cable		1 m ± 0.1 m (nom.), SMA male to SMA male
TX IF signal cable		1 m ± 0.1 m (nom.), SMA male to SMA male
Power and control cable		1.0 m, 26 pin ODU Mini-Snap® series L
<b>Display</b>		7" TFT color display with capacitive touch functionality

## Ordering information

Designation	Type	Order No.
<b>Base unit</b>		
Automotive radar echo generator, including power cable and quick start guide	R&S®AREG100A	1430.3508.02
<b>Options</b>		
Frontend frequency and antenna configuration		
24 GHz to 24.25 GHz, single antenna	R&S®AREG-B124S	1430.5000.02
24 GHz to 24.25 GHz, two antennas	R&S®AREG-B124D	1430.5100.02
76 GHz to 77 GHz, single antenna	R&S®AREG-B177S	1430.5752.02
76 GHz to 77 GHz, two antennas	R&S®AREG-B177D	1430.5700.02
76 GHz to 81 GHz, single antenna	R&S®AREG-B181S	1430.5052.02
76 GHz to 81 GHz, two antennas	R&S®AREG-B181D	1430.5152.02
Fixed distance options		
Short fixed object distance, 3.2 m + air gap	R&S®AREG-B61	1430.5317.02
Fixed object distance, customer-defined	R&S®AREG-B62	1430.5369.02
Radial velocity		
Frequency offset	R&S®AREG-K799	1437.2488.02
Doppler simulation	R&S®AREG-B60	1430.5552.02
Interface options		
Analog IF interface	R&S®AREG-B17	1430.5200.02
Remote control, GPIB and USB	R&S®AREG-B86	1430.5252.02
<b>Recommended extras</b>		
Three-path diode power sensor	R&S®NRP8S	1430.5600.02

<b>Warranty</b>		
Base unit		3 years
All other items <sup>1</sup>		1 year
Options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	

### Extended warranty with a term of one and two years (WE1 and WE2)

Repairs carried out during the contract term are free of charge <sup>2</sup>. Necessary calibration and adjustments carried out during repairs are also covered.

### Extended warranty with calibration coverage (CW1 and CW2)

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs <sup>2</sup> and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

<sup>1</sup> For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

<sup>2</sup> Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

## Service that adds value

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

## Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

**ISO 9001**

Certified Environmental Management

**ISO 14001**

## Rohde & Schwarz training

[www.training.rohde-schwarz.com](http://www.training.rohde-schwarz.com)

## Rohde & Schwarz customer support

[www.rohde-schwarz.com/support](http://www.rohde-schwarz.com/support)

