AIE-W4VR

4 Port V/UHF Air Interface Emulator, 50 … 2000 MHz

Features

- wideband
- 127 dB attenuation range
- LAN and USB Remote Interface
- Trigger interface
- compact 19”, 1 U device

Applications

- Air interface emulation
- Fading simulation
- Multiple access communication testing

At a Glance

The air interface emulator AIE-W4VR enables the realistic emulation of HF levels for radio field communication such as in wireless networks. The device offers 4 bidirectional inputs and outputs for connecting different terminals. Each port can be fed separately with a composite RF signal. A freely programmable mixture of the other 3 signals can then be set individually for each port. The levels can be varied over a wide dynamic range using internal precision attenuators. The AIE-W4VR makes it possible to emulate a realistic air interface in which connected terminals simultaneously receive field signals of different strengths from other terminals in the network. The reproducibility of different realistic scenarios in a laboratory environment saves time and money in product development and verification.

Matrix function

The AIE-W4VR can also be used as a non-blocking matrix switch. Each input and output can be connected to the other ports in any way. Attenuators between the signal paths also allow the emulation of fading effects. Due to the fast response time of the attenuators, the device is ideal for efficient and fast solutions in automatic test systems.

Wideband

Due to its wide frequency range, the AIE-W4VR is usable for many communication standards, including military communications.

High Dynamic

The adjustment range of the digitally controlled attenuator is 127.0 dB and can be freely adjusted in 0.25 dB steps. This enables use in test applications with the highest demands on dynamics and accuracy. The high attenuation range allows RF signal levels to be reduced below the sensitivity limit of connected devices.

Synchronous Operation

The AIE-W4VR can be conveniently and efficiently remotely controlled via LAN and USB interfaces and an additional TRIGGER-IO port. With each execution of switching commands, the trigger interface delivers a precise voltage pulse that can be used for the synchronous execution of switching commands from other devices in the compound. In addition, external pulses can be applied to this port in order to synchronously trigger the execution of pending switching commands. The emulator's attenuator configuration can be preloaded with SCPI-oriented ASCII strings in a queue over the LAN interface. After a positive TTL pulse edge at the trigger input, the preloaded damper configuration is then executed by the hardware without delay.

Principle diagram

RF Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{IN}/Z_{OUT}		50		Ω	
low frequency	f_{min}		1	50	MHz	
high frequency	f_{max}	2000	2200		MHz	
number of RF ports	n_{RF}		4			bi-directional
return loss*2	S_{11}, S_{22}		-16	-13	dB	
insertion loss*1	S_{21}	-19	-17		dB	f = 50 MHz
	S_{21}	-24	-21		dB	f = 1 GHz
	S_{21}	-30	-26		dB	f = 2 GHz
attenuation dynamic*3	dATT		-20		dB	
attenuation range	ΔS_{21}	0.00		127.0	dB	
attenuation resolution	dS_{21}		0.25		dB	
attenuation accuracy	ATT_{ERR}		± 0.50		dB	@ 2 GHz, ATT = 63.5 dB
atten. setting time	t_{ASET}		1		µs	
atten. response time	t_{ARSP}		1		ms	
DC voltage	U_{DC}			20	V	
ESD discharge resistor	R_{ESD}		4.7		kΩ	all inputs and outputs
input power	P_{RF}			+30	dBm	CW
RF connector	X_{RF}	N female				rear side
trigger input	X_{TRIG}	BNC female				internal 1 kΩ pull up, active high
trigger level	u_{TRIG}	TTL (0 / 5 V)				
trigger offset	t_O		0.5		µs	50% trigger → 50% RF
attenuator settling time	t_{RISE}		0.2		µs	10% → 90% RF

*1: ch. attenuator setting: 0.00 dB

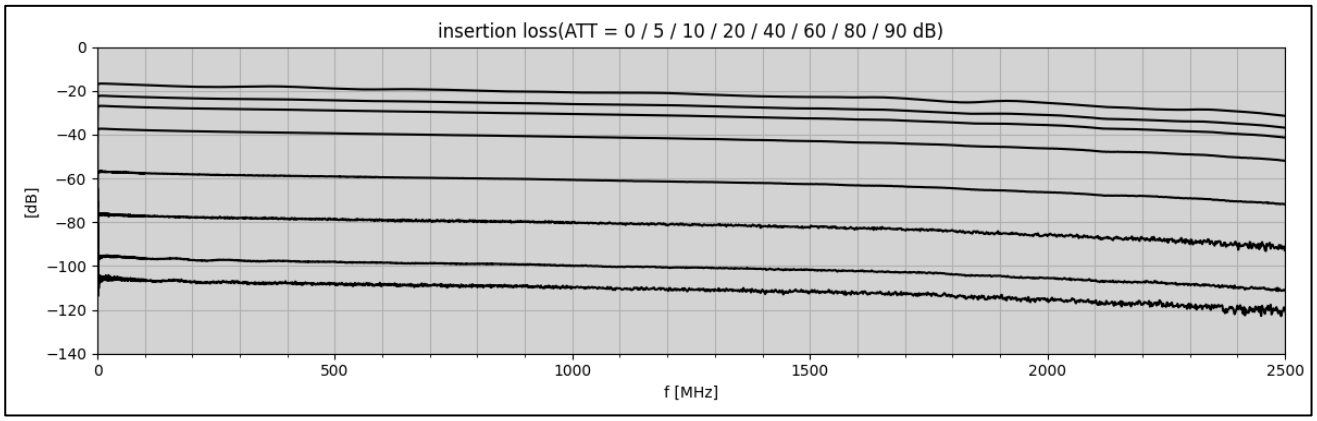
*2: ch. attenuator setting: 127.00 dB

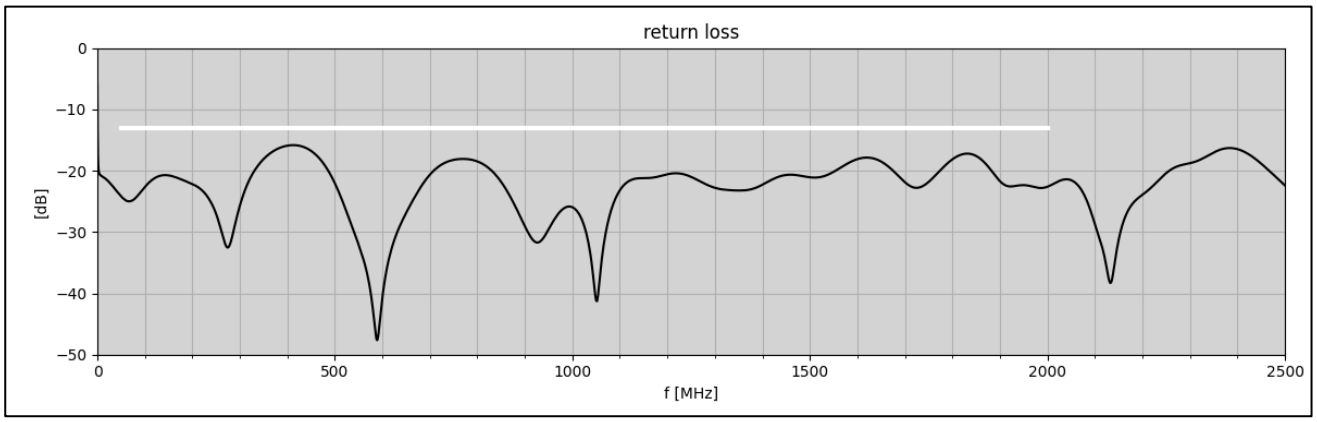
*3: ch. attenuator setting 127.00, all other ch. attenuator setting 0.00 dB, referred to insertion loss

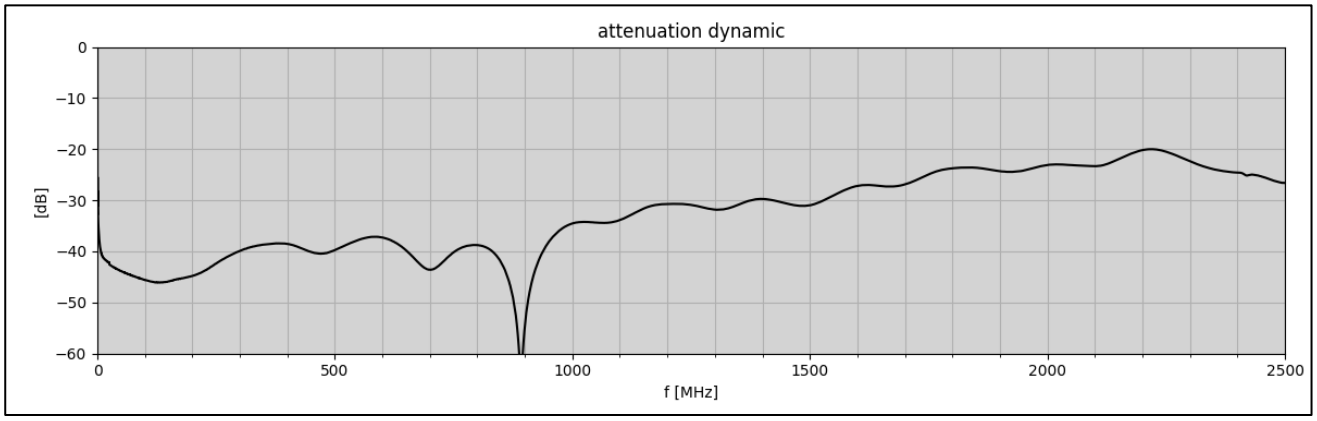
Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
voltage supply range	U_{AC}	90	230	260	V	50 / 60 Hz AC
power consumption	P_{AC}		3		W	
power socket	X_{AC}	IEC-60320 C14				country specific mains cable
Dimensions and weight						
dimensions	W x H x D	approx. 482 x 44 x 460			mm	19” 1 U, without connectors and handles
weight	m		5.3		kg	
Environment conditions						
operating temp. range	T_o	+5		+45	°C	
storage temp. range	T_s	-40		+70	°C	
Remote interfaces						
remote ports	LAN	10/100BaseT		TCP/IP		RJ45
	USB	2.0 (high speed)				USB type B
Product conformity						
Electromagnetic compatibility	EU: in line with EMC directive (2014/30/EC)					applied harmonized standards: EN 61326-1 (for use in industrial environment), EN 61326-2-1, EN 55011 (class B), EN 61000-3-2, EN 61000-3-3
Electrical safety	EU: in line with low voltage directive (2014/35/EC)					applied harmonized standard: EN 61010-1
Ordering information	AIE-W4VR		2509.4002.1			

S-Parameters







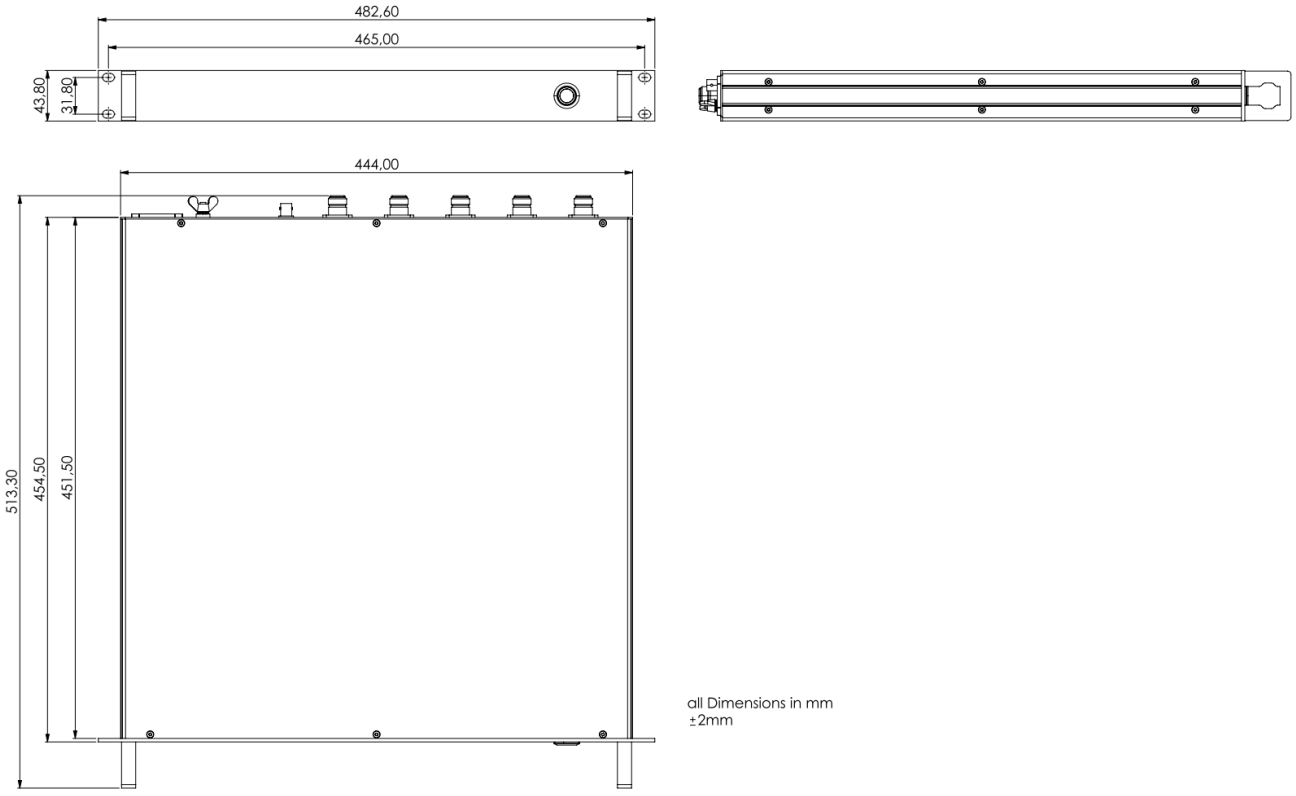
Appearances

Front View

Rear View

Dimensions

Similar appearance with 4 RF ports



all Dimensions in mm
±2mm