

AIE-4X4R

4 Channel Air Interface Emulator 500 ... 3000 MHz, 50 Ω

Features

- wideband
- GSM, UMTS, LTE
- MIMO
- 100 dB attenuation range
- up to 2 W RF input level
- LAN and USB remote interface

Applications

- air interface emulation
- handover testing
- fading simulation

At a Glance

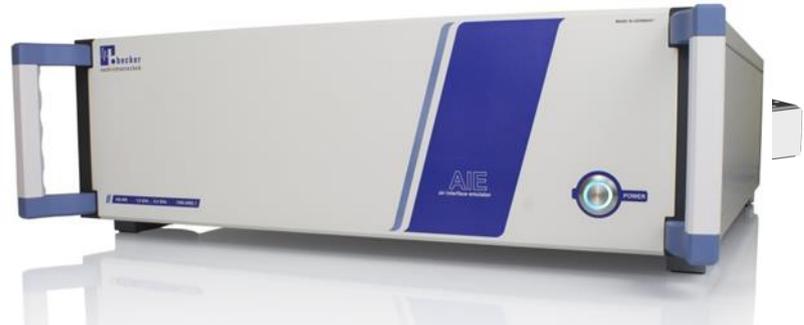
The AIE-4X4R air interface emulator enables real emulation of RF levels for radio communication between mobile devices and a wireless networks. It has 4 RF Ports for base stations and 4 ports for DUTs like cellular phones. All signal paths are bidirectional. Every of the 4 DUT ports can be fed with a composite RF signal that is individually composed of a programmable mix of the 4 signals coming from the base station ports. The variation of levels can be done in a wide dynamic range with internal precision attenuators.

The AIE-4X4R allows to recreate a realistic air interface, whereby the DUTs receives a multiple cellular stations simultaneously with varying propagation loss. In particular it allows the simulation of handovers between cellular base stations and cellular phones.

The reproducible emulation of air interface scenarios in laboratory environment saves time and cost in product development and verification.

Matrix function

The AIE-4X4R can also be used as non-blocking matrix. Every output has free access to each input. Attenuators between the signal paths allow also the emulation of fading effects. With a fast attenuator response time, the device is an efficient and fast solution for automatic testing systems.



Wideband

The operating frequency range covers 500 MHz to 3000 MHz. Therefore the AIE-4X4R is useable for cellular standards GSM, UMTS and LTE.

High Dynamic

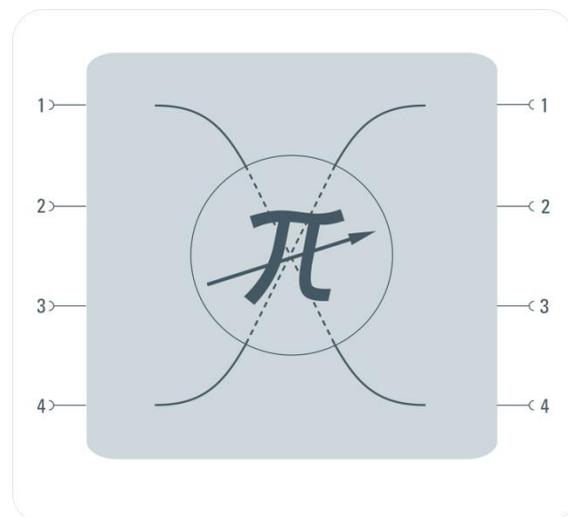
The setting range of the digitally controlled attenuators covers 100 dB and is adjustable in 0.5 dB steps. This allows test scenarios with highest requirements for dynamics and accuracy.

All RF ports of the air emulation system allow signals levels of up to 2 Watts.

Remote Control

The AIE-4X4R can be controlled remotely via LAN and USB interfaces with simple, SCPI-based ASCII control commands.

Principle diagram



RF Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in} / Z_{out}		50		Ohm	
low frequency	f_{min}		500	700	MHz	
high frequency	f_{max}	2800	3000		MHz	
number of inputs	n_{IN}		4			
number of outputs	n_{OUT}		4			
connector type	X		N female			
return loss	S_{11}, S_{22}		-14	-9	dB	
maximum input power	P_{RF}			+33	dBm	
DC voltage	U_{DC}			20	V	
ESD discharge resistor	R_{ESD}		4.7		k Ω	all inputs and outputs
insertion loss	S_{21}	-25	-23*		dB	
attenuation range	ΔS_{21}	0.0		100.0	dB	
attenuation resolution	dS_{21}		0.1		dB	
attenuation accuracy	ATT_{ERR}		± 0.1	± 0.3	dB	$0.5 \text{ dB} \leq a < 3.0 \text{ dB}$
	ATT_{ERR}		± 0.2	± 0.5	dB	$3.0 \text{ dB} \leq a < 9.0 \text{ dB}$
	ATT_{ERR}		± 0.5	± 1.0	dB	$9.0 \text{ dB} \leq a < 50.0 \text{ dB}$
	ATT_{ERR}		± 1.5	± 2.5	dB	$50.0 \text{ dB} \leq a < 80.0 \text{ dB}$
	ATT_{ERR}		± 5.0		dB	$a > 80.0 \text{ dB}$
attenuator settling time	t_{ASET}		1		μs	
att. response time	t_{ATT}		1		ms	

* Insertion loss at attenuator setting 0.00 dB.

Common Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
power supply	u_{AC}	90	230	260	V	50 / 60 Hz	
power consumption	P		9		W		
power plug		type „F“ CEE7/4					
dimensions	W x H x D	approx. 515 x 150 x 450			mm	19", 3 U	
weight			10		kg		
remote interface		10/100BaseT				RJ45 connector	
		2.0 (high speed)				USB type B connector	
operating temp. range	T_o	+ 20		+ 30	$^{\circ}\text{C}$	within specification	
storage temp. range	T_s	- 40		+ 70	$^{\circ}\text{C}$		
EMC		including IEC/EN61326-1				in line with EMC directive 2014/30/EU	
safety		in line with IEC/EN 61010-1					
Ordering information		AIE-4X4R	P/N: 1201.4002.1				

Appearances



Front view



Rear view

Related Products

Product	Description	P/N
AIE-4X4ER	4 Channel Air Interface Emulator 400 ... 6000 MHz	1201.4902.1
AIE-W9	9 Port Air Interface Emulator 1800 ... 6400 MHz	1309.4092.1

