

4 Channel Air Interface Emulation System 500 ... 3000 MHz, 50 Ω

Features

- wideband 500...3000 MHz
- optimized for GSM, UMTS, Wi-Fi, LTE and MIMO
- delay range 0...1700 ps in 5 ps steps
- attenuation range 0...100 dB in 0.5 dB steps
- up to 2 W RF input level
- LAN and USB remote interface
- built-in web interface



Applications

- tests of mobile devices
- test of mobile networks
- simulation of handover procedures
- beamforming measurements
- antenna diversity simulations

At a Glance

The AIE4X4 air interface emulator system enables real emulation of RF levels for radio communication between mobile devices and a wireless network.

Efficient Testing

With AIE, it is possible to generate reproducible handover scenarios in a laboratory or in a test environment without influence of the live net. This saves time and costs in product development and verification.

Remote Control

The system can be controlled remotely via USB, and LAN interfaces with simple, SCPI-based ASCII control commands. This enables an easy integration into existing test systems. The device is also available in a touchscreen variant. Furthermore, the device is equipped with a web interface.

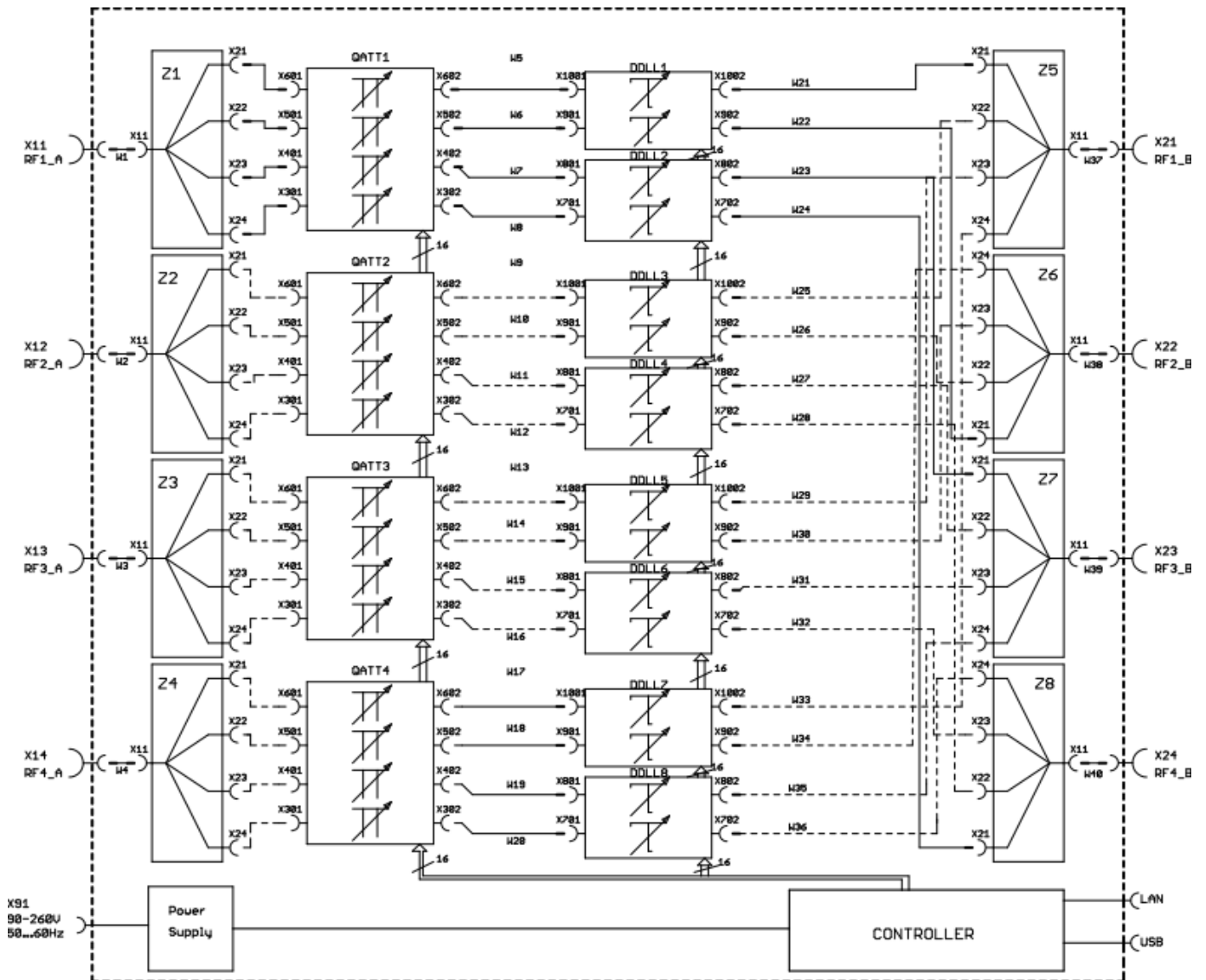
High Dynamic

The precisely controllable delay paths also allow the creation of beamforming scenarios. The combination of attenuators and delay lines allows the user to reproduce phase shifts between the antennas of a MIMO system in combination with variations of the signal strength. This enables the simulation of dynamic handover scenarios with respect to antenna diversity. The digitally controlled attenuators can be adjusted in a range of **100 dB in 0.5 dB steps**. This allows test scenarios with highest requirements for dynamics and accuracy. Each delay line offers a resolution of **5 ps** and can create a delay of **up to 1700 ps**.

The system is based on a universal and robust modular concept.

Other variants (number of ports, etc., additional delay lines) on request

Block Diagram: AIE4X4-MIMO Signal Paths



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				
connector type		N female				
input return loss	S_{11}		-14	-9	dB	
number of outputs	n_{out}	4				
connector type		N female				
input return loss	S_{22}		-14	-9	dB	$f < 2700$ MHz
maximum input power	$P_{in max}$			+33	dBm	
insertion loss	S_{21}		-35		dB	@ 0.0 dB ATT
attenuator setting range	ΔS_{21}	0.0		100.0	dB	in 0.5 dB steps
attenuation accuracy*	ATT_{ERR}		± 0.2		dB	$0.5 \text{ dB} \leq a < 3.0 \text{ dB}$
	ATT_{ERR}		± 0.4		dB	$3.0 \text{ dB} \leq a < 9.0 \text{ dB}$
	ATT_{ERR}		± 0.8		dB	$9.0 \text{ dB} \leq a < 50.0 \text{ dB}$
	ATT_{ERR}		± 2.2		dB	$50.0 \text{ dB} \leq a < 80.0 \text{ dB}$
	ATT_{ERR}		± 7		dB	$a > 80.0 \text{ dB}$
attenuator settling time	t_s		1	3	μs	rise/fall time between att steps
RF command processing rate			500		cmd/s	
delay range		0...1700			ps	in 5 ps steps

Common Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
supply voltage	U	90		260	VAC	AC
	f	50		400	Hz	
power consumption	P		9		VA	
dimensions	L x W x H	approx. 380 x 450 x 135			mm	19" 3 U, without handles
weight	m		7300		g	
operating temp. range	T_o	+5		+45	$^{\circ}\text{C}$	
storage temp. range	T_s	-40		+85	$^{\circ}\text{C}$	
ordering informations		AIE4X4-MIMO		1308.4502.1		



Front view (exemplary picture, image shows 9-port Wi-Fi-Tester AIE-W9)



Rear view (exemplary picture, image shows 9-port Wi-Fi-Tester AIE-W9)



Related Products

Product	Description	P/N
AIE4X4	4 Channel Air Interface Emulation System 500 ... 3000 MHz	1201.4002.1
AIE-W9	9 Port Air Interface Emulator 1800 ... 6400 MHz	1309.4029.1
QATT	4 Channel Step Attenuator 100 kHz ... 4000 MHz	1302.4002.1
QATT-7G	4 Channel Step Attenuator 100 kHz ... 7000 MHz	1302.4702.1
QDLL	4 Channel Programmable Delay Line 250 ... 4000 MHz	1303.4002.1

