

5G NR, NB-IOT Test Radio



Product Features

- 400MHz to 6GHz frequency range
- FDD/TDD support
- 4x4 MIMO or 8x8 MIMO
- CPRI or ORAN Compliance
- 4G LTE, 5G NR and NB-IOT capable
- Class leading RF timing alignment for OTA test
- Millimetric ready
- 200Mhz instantaneous bandwidth
- TX output power 0dBm (400-6000MHz)
- Ambient temperature range 5-50 degree C
- RF connectors N-Type
- Low power consumption typical < 100W
- Product Weight 12Kg

Product Overview

AceAxis is a well-established technology company with a long history in radio design and test solutions for the telecommunications industry. AceAxis has produced a radio designed to support validation of 5G systems.

The AceAxis Radio Test System (RTSx4) is a powerful 19" Rack based 4 channel wideband transceiver for Wireless system testing. It has been designed to operate as a mobile signal emulator for use with LTE eNode B base stations during test and conformance.

The RTSx4 offers flexible BTS connections communicating via CPRI. Internally there are two 2x2MIMO Radio entities, using their own unique IP addresses obtained via DHCP, or set to the default static address. Each Radio has Ethernet control either via anRJ45 interface or via an Ethernet over CPRI channel.

The equipment can support 4Tx, 4Rx channels, 4x4MIMO or 4xSISO. Each radio supports Channel frequencies between 400MHz to 6000MHz and carriers with up to 100MHz instantaneous bandwidth.

General Specifications

Specification	Value
Bandwidth	100 MHz
Frequency ranges	400-6000MHz
Operating mode	FDD/TDD
Number of Tx/Rx paths	4x4 MIMO
Digital baseband I/F	CPRI V4.2
Clock reference	Recovered from CPRI line rate
Ambient Temperature range	5-50 C
Module RF connectors	N-Type
Power meters	Tx and Rx power meters located at the antenna
Calibration	Continuous compensation of quadrature (IQ) imbalance
PSU Spec	100 – 240 VAC, 50-60 Hz; 200W Replaceable or resettable fuse Input: IEC-C14

Fibre Optic interface Specifications

Specification	Value
Physical Interface	4 x SFP+ / SFP28 SFPs are not supplied with this product

CPRI Mode

Operating mode	RE (CPRI slave)
Line rate	Rate 1 (0.6144Gbps) to Rate 8 (10.1376 Gbps)
Number of AxC	currently 2 (extend to 4 in future)
IQ Sample rate	Up to 153.6 Msps
IQ Sample format	12,14 or 15bit, signed
IQ mapping	I and Q samples are reversed and bit interleaved.

Mapping method-3 : backwards compatible (section 4.2.7.2.7 of CPRI spec V4.2)

Tunneled Ethernet	Fast C&M plane to tunnel ethernet packets for control of the RF card
Loopback	CPRI loopback (unpack-repack) used for running BBU FPGA BIST

O-RAN Mode

Operating mode	O-RU (O-RAN Radio Unit)
O-RU category	Category A (non-precoding)
Fronthaul physical layer	10GBASE-R, 25GBASE-R
Transport encapsulation	Ethernet
Transport headers	eCPRI
Time/frequency synchronisation	IEEE 1588-2008 PTP and ITU-T G.8275.1, Synchronous Ethernet

Physical/Environmental and Electrical Specifications

Specification	Value
Height	1U
Depth	Depth 630mm;
Weight/Mass	12kg including removable rails (but with no packaging)
Top Lid	Split lid to protect RF modules when Splitters/Circulators are added.
19" Rack connection	Tool-less rack supplied with product. Rail Range: Min = 660mm; Max = 800mm
Front Panel	8 x N-type RF connectors, female (4 x Rx, 4 x Tx) to SMA, female (internal connector) Center-Center Spacing: > 38mm LED Panels: see Requirements section for details
Rear Panel	2 x SFP ports (bidirectional CPRI), 2x Ethernet Power Input: IEC-C14 Ground Lug with bolt/washer or equivalent
Metalwork colour	Powder Coat: RAL 7021 LT BLACK

Electrical Specifications (at 25°C unless otherwise specified)

Transmit Specifications

Specification	Value
Tx power (OFDM)	TX output power 0dBm (400MHz-2.7GHz) TX output power -10dBm (2.7-5.5GHz) TX output power -15dBm (5.5-5.925GHz)
Tx max. power (CW)	≥10dBm
Tx power meter	Wideband power @ antenna
Tx gain range	>40dB
Tx gain accuracy	0.25dB
Passband ripple	<±1dB
Tx spurious emissions	<-45 dBm
EVM	<1.2% 400MHz to 4.6GHz, <1.6% 4.6GHz to 6GHz
Noise power density	<133dBc/Hz @ 10Mhz offset
Tx to Tx isolation	>50dB
Tx to Rx isolation	>60dB
DAC	16 bit
Gain Flatness (over full bandwidth)	0.8dB
Ripple (over full bandwidth)	0.6dB

Receive Specifications

Specification	Value
Rx power max. (no damage)	30dBm
Rx power meter	Wideband power @ antenna
Noise figure	≤5dB
Rx gain range	60dB
Rx gain accuracy	0.25dB
Spurious emissions	<-45dBm
Pass band ripple	<±1dB
Average EVM	400MHz – 3.5GHz 1.1% @ 64 QAM 3.5GHz – 4.6GHz 1.3% @ 64 QAM >4.6GHz - 1.5% @ 64 QAM

Timing Alignment

Specification	Value
Tx Delay alignment (Tx port to any Tx port)	≤5nS
Rx Delay alignment (Rx port to any Rx port same CPRI link)	≤5nS
Rx path alignment (variation between antenna)	≤15nS
Delay adjustment	+/- 4nS
Delay reporting	T12,T2a ad Ta3 per the CPRI Spec

Ordering Information

A38XX4Xxxxxxxxxxxxxx – 400MHz to 6GHz Radio