

Keysight Technologies

Propsim F8 Channel Emulator

Data Sheet



Versatile Channel Emulator for
Advanced Performance Testing

The industry standard MIMO channel emulator for WLAN 802.11ac chipset research and design verification, supporting up to 160 MHz signal bandwidth with MU-MIMO and 3D beamforming.

Manufacturers of wireless devices, chipsets and systems use Prosim F8 to:

- Verify WLAN 802.11 chipset and device performance
- Quickly test multi-link airborne, aerospace and satellite radio performance
- Evaluate wireless research and technology programs (e.g. LTE-A and 5G)
- Perform LTE-A base station testing with real devices
- Enhance LTE-A multi-mode device and chipset development with real base station functionality
- Improve over-the-air (OTA) testing of wireless devices

Prosim F8 offers unrivalled RF channel emulation capabilities and accuracy:

- Enables the most accurate signal fading processing in terms of time, phase and amplitude
- Exceeds the linearity requirements for 256/1024 QAM and 160 MHz signals in MIMO topology
- Supports up to 8x8 full MIMO/mesh topology (64 internal channels)
- Supports a wide range of LTE-Advanced scenarios including CA schemes, CoMP, HetNet, Hi-order MIMO, 3D beamforming and more
- Performs ultra-wideband signal (>1 GHz instantaneous signals) testing using Keysight patented RF channel combination technology
- Supports 5G radio channel models defined in 3GPP TR38.900 and 5G METIS research program, enabling research labs to start early experimental testing of 5G physical layer technologies at mmW bands (requires external mmW band UC/DC hardware)

Easy operation across a vast range of functions via GUI or Automation API:

- Includes wizard with guided steps for simple test scenario creation and editing
- Offers built-in input power measurement
- Provides fully automated phase and amplitude calibration without a vector network analyzer
- Automated 24/7 testing and ATE remote control interface for GPIB and LAN enable unattended, cost-effective and quick test case execution
- Compatible with other Prosim products test automation interface enabling smooth and convenient transfer or share of test automation scripts

Industry leading intuitive channel modeling tools:

- Prosim WLAN tool for design and verification of MIMO performance and interoperability of WLAN products
- Prosim Geometric Channel Modeling tool (GCM) enables easy multi-link test scenario definition based on SCME, WINNER models to test MU-MIMO, beamforming, smart antennas, CoMP, carrier aggregation, HetNet and multi-RAT performance and interoperability testing of real devices and real base stations
- Prosim MIMO OTA modeling tools compatible with CTIA/3GPP/CCSA test plans (and beyond) enable easy benchmarking of off-the-shelf devices in anechoic chamber installations
- Prosim Aerospace Modeling tool for testing airborne, aerospace and satellite radio communication devices and systems

Specifications

RF interface channel configurations	2, 4, 6 or 8
MIMO emulation	2x2, 4x2, 4x4, 8x2, 8x4 up to 8x8
MANET emulation	up to eight radios in full mesh topology
Multi emulator synchronization	up to 6 units
RF interface channel frequency range	220 to 6000 MHz
RF interface channel signal bandwidth	up to 160 MHz
Number of fading paths per RF interface channel (in terrestrial channel emulation mode)	up to 48
Number of fading channels. All independently controllable via GUI for fading, Doppler, path amplitude and path phase offset	up to 64
Internal interference generators	AWGN, CW
Satellite or any flying object maximum Doppler shift in aerospace channel emulation mode (for each path independently)	up to 1.5 MHz
Excess delay range for terrestrial channel emulation	up to 3000 μ s
Excess delay range for aerospace channel emulation mode	up to 1.3 s
Bi-directional emulation	Flexible and reliable duplex separation provided with interfacing unit
Number of integrated RF local oscillators	up to 4 internal and 4 external carrier frequencies (in total up to 8)
Input power measurement	Automatic input level setting
Input power meter modes	Continuous and RF burst-triggering
ATE control interface for easy test case automation	
Integrated phase and amplitude calibration	
Fully automatic phase and amplitude calibration with Keysight ACU external hardware unit (no need for VNA)	
User defined active RF connector setting simplifies switching between test cases in automated tests	

RF Performance

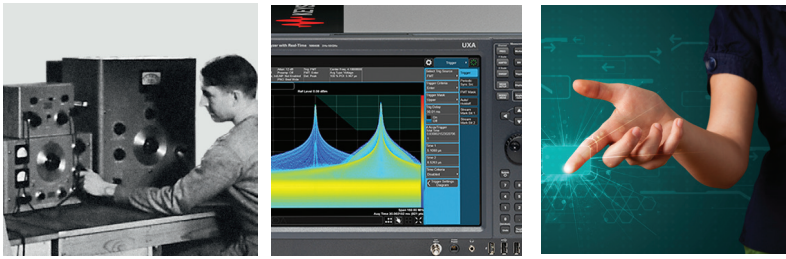
RF input range @ 20 MHz BW	- 55 - 0 dBm (CF 6 dB, SNR >35 dB) - 30 - 0 dB (CF 6 dB, SNR >60 dB, full range)
RF output level range	- 116 to -16 dBm (RMS, CF 6 dB)
Peak output level	max. 0 dBm
RF output level setting resolution	0.1 dB
Digital fading channel dynamics	60 dB
Noise floor	- 171 dBm/Hz (output RMS level < -40 dBm)
EVM performance typical, RMS	WCDMA 3.84 MHz BW < -48 dB OFDMA 20 MHz BW < -45 dB OFDMA 160 MHz BW < -40 dB

Channel Modeling

Standard channel models	3GPP LTE, WCDMA, GSM, 3GPP2 (IS-54, IS 95), TETRA, ITU 3G, WLAN, DVB-T/H
Optional channel models	LTE Advanced evaluation models, IMT-Advanced models, SCM, SCME models, WINNER, WINNER+, TD-LTE, IEEE802.11 WLAN models
Fading profiles	Constant, Rayleigh, Rice, Nakagami, Lognormal, Suzuki, Pure Doppler, flat, rounded, Gaussian, Jakes, Butterworth, user-defined profiles, models from 3rd party simulation tools and ray-tracing applications
Delay profiles	Constant, sinusoidal sliding delay, linear sliding delay, 3GPP birth-death, 3GPP sliding delay group, user-defined, delay profiles from 3rd party simulation tools and ray-tracing applications
Channel configuration topologies	Single or multiple independent or fully synchronized MIMO, MISO, SIMO, SISO, MANET/mesh carrier aggregation, CoMP and relaying transmission schemes
Run-time fading engine	Amplitude, delay, Doppler and environment separately controlled for each fading channel
Channel modeling tool for user-defined channel models	
Impulse response file format for importing user-defined channel models	
Flexible control of pre-defined shadowing profiles or user-defined path loss profiles. Control of up to 64 channels independently	
Emulation of 2D and 3D beamforming channels, single and multi-user scenarios	
Emulation of high speed train scenarios, measured with channel sounder or defined with channel modeling tools	
Field to lab virtual drive testing modeling tool for C2K/GSM/WCDMA/ LTE field data captured with scanners, test terminals or receivers; seamless operation with Keysight Nemo drive test tools	
MIMO OTA modeling tool for CTIA/3GPP/CCSA MIMO OTA testing supports the latest CTIA and 3GPP compliant test scenarios and channel model validations; optional tools for LTE-CA inter- and intraband MIMO (DL), Uplink-MIMO, Bi-directional and 3D MIMO OTA testing	
Geometric channel modeling tool for user-defined Multi-link MIMO, beamforming and smart antenna testing; includes dynamic spatial, defined antenna patterns, 3D modeling and IMTA, WINNER and SCME models	
Aerospace modeling tool for satellite and airborne communication link testing	
Custom channel modeling tool kit for external PC	
Maximize your investment: hardware platform extensions and additional features can be purchased and installed at any time after the initial delivery of an emulator platform	

Evolving

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