

50 MHz Bandwidth Radio Link Simulator (RLS-50)




OVERVIEW

The Square Peg Communications Inc. 50 MHz Radio Link Simulator (RLS-50) facilitates the testing of physical layer and end-to-end network performance of communications systems incorporating one or more satellite or terrestrial radio links.

The simulated signal path includes the RF characteristics of the transmitter, uplink, satellite/relay, downlink, and receiver, via realistic modelling of characteristics such as path delay, Doppler, and fading. A simple yet powerful user interface allows users to directly map their real-world scenarios to the applicable elements in the signal path.

All stations (Transmitter, Satellite/Relay, Receiver) can be in motion, with the affected simulation parameters updated dynamically. For modelling of HEO, LEO or MEO satellites, the RLS-50 includes integrated real-time multi-satellite orbit calculation. Additionally, an integrated GPS simulator can be used to output GPS signals corresponding to a selected station's position, for applications where a station requires a GPS reference in order to operate.

Graphical displays of signal spectrum, power profile, and other parameters are available at points throughout the signal path, facilitating debug of test setups and allowing simple visualization of the effects of the applied impairments.



SPECIFICATIONS

FUNCTIONAL CAPABILITIES

Channel impairments

Independently-specifiable parameters:

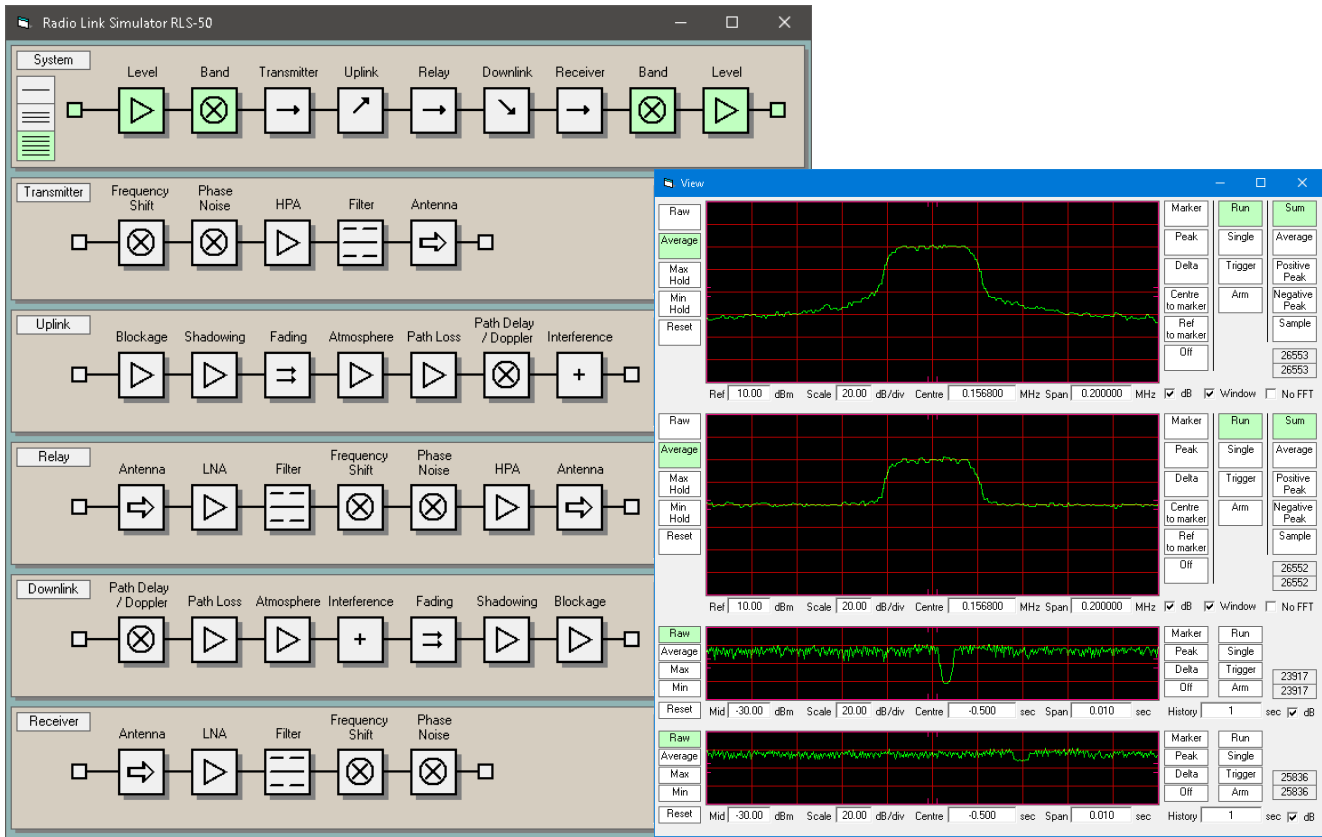
- Fixed carrier frequency error
- Doppler rate, peak offset
- Route-based Doppler and path delay
- GEO/HEO/LEO/MEO orbital dynamics
- Interference type, level and frequency offset
- Continuous phase noise spectrum, level
- Discrete phase noise level, frequency offset
- Fading model, bandwidth(s), C/M ratio, differential delay(s), path Doppler(s)
- Atmospheric effects
- Antenna phase and/or amplitude jump distribution, magnitude, interval
- Antenna gain patterns
- Blockage and shadowing
- Transmission path delay
- HPA non-linearity
- AWGN

Other capabilities

Test loop translator
GPS simulator

SIGNAL PATH

Connectors	SMA(F)
Impedance	50 ohms nominal
Frequency	950 to 2200 MHz Independent for input and output
Input level	-40 to +16 dBm
Max instant. output level	-40 to 0 dBm
Bandwidth	50 MHz



SYSTEM VIEW OF RADIO LINK SIMULATOR

GPS SIMULATOR

Satellites	Up to 8
Connector	N(F)
Impedance	50 ohms nominal
Frequency	1575.42 MHz (GPS L1)
Level	-90 to -50 dBm

ADDITIONAL CAPABILITIES

Remote control	Ethernet
Station position output	Ethernet ARINC 429
Antenna pointing input	Ethernet Serial
Antenna emulation	OpenAMIP
Spectral display	2 independent
Power profile display	2 independent
Reference mode	Internal External Disciplined

MONITOR & CONTROL INTERFACES

Sync	TTL, configurable as input or output
Reference	10 MHz
Ethernet	10/100/1000 Base T
Serial	RS-232/422/485
USB	USB 2.0, USB 3.0
Video	DisplayPort, HDMI, VGA

MECHANICAL/ENVIRONMENTAL

Form factor	19" / 2.5U rack mount
Size (with bumpers)	L 51 cm x W 51.75 cm x H 12.07 cm L 20 in x W 20.38 in x H 4.75 in
Weight	≈ 7 kg (15 lb)
Power connector	IEC 320 male
Voltage	100-240 VAC, 50/60 Hz
Current (typical)	≈ 1.2 A rms at 115 VAC
Operating temperature	10°C to 35°C
Operating humidity	20% to 75% relative humidity, non-condensing
Regulatory	FCC, CE and RoHS compliant Safety: EN61010-1 Emissions & immunity: EN61326-1 Class A



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