

Programmable multipurpose wideband digital jammer RS-6000 - Jammer of signals of digital communication and control

Features:

- Direct digital synthesis of jamming signals;
- Time-division multiplexing of channels;
- Light weight and high level of output power;
- Jamming of all the existing standards of communication (2G, 3G, 4G, Wi-Fi);
- Programmable frequency channels;
- Low level of out-of-band emissions;
- High energy efficiency;
- Small size and custom design;
- Directional coverage area when using built-in antennas;
- Wireless remote control;
- Visual control of jamming process on analyzer;



- Continuous and reactive modes of jamming.

Programmable multipurpose wideband digital jammer can be used for jamming of mobile communication and wireless access of all the existing standards, including 3G, 3G, 4G, Wi-Fi, Bluetooth, etc. The equipment allows an operator to jam any suspicious signals after their detection by programming the jammer for a certain frequency range.

The jammer can block eight (optionally 12, 16, etc.) frequency bands with width up to 120 MHz, each of which can be chosen by user in frequency range from 400 to 6000 MHz, with separate output power adjustment in each channel. An operator can create a communication window for all his tasks between two frequency ranges in one jamming channel. All settings can be saved and, if it is necessary, restored from the file. The system features switchable filters for jamming harmonics and other spurious emissions.

When creating a signal, technologies of direct digital synthesis and time-division multiplexing of channels are used; this allows achieving highly effective jamming and

significantly reducing power consumption and also minimizing dimensions and weight of the device as well as harmful impact on an operator and people within the operation area of the jammer. Such technologies permit creating a compact jamming system using only two built-in directional antennas. The system presented features two four-channel modules that include 4 DDS generators, FPGA and communication controller. Each module has its own IP address, which allows an operator to carry out remote control and set the required frequency bands and power levels using Ethernet or Wi-Fi connections.

Together with **SpectrumJet-3.0** spectrum analyzer, which features up to 50 GHz/s scanning speed, **RS6000** can be used as a reactive jammer that is activated only when a subscriber signal appears or an unauthorized signal is detected. In reactive mode special software for control of jamming process is used.

The device can be designed as stationary and mobile, or portable, for example as a case, backpack, or suitcase. It has an external power on/off button. It is also possible to connect external directional or non-directional antennas.

Active jammer mode

In continuous or active mode, settings for each channel are preloaded to the jammer via USD-2.0 or Ethernet:

1. Frequency of jamming signal and spectrum's width of this signal, or f start and f stop.
2. Rate of change of frequency.
3. Attenuation level (0-30 dB).

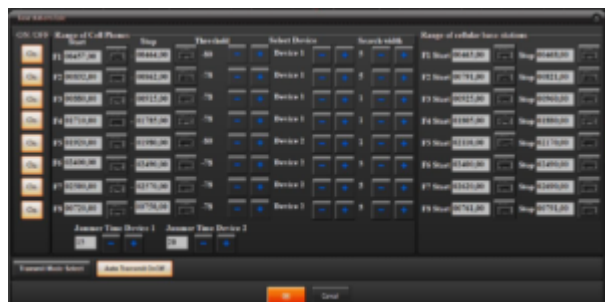
All the values are related, recommendations for jamming of signals of different types are given. Settings can be change during operation of the jammer. Blocking can be switched on/off remotely. The last settings are saved the next time you turn on the power.

Reactive jammer mode

For monitoring of jamming process and control of the settings, as well as for jammer's operation in reactive mode, a monitoring receiver or **Spectrum Jet 3.0** spectrum analyzer is required. The control program is loaded into the receiver's (analyzer's) computer and works together with monitoring software. The equipment is connected by Ethernet or via Wi-Fi (5.1-5.6 GHz). The operation algorithm is as follows: threshold for each channel, or communication standard, is set separately. The threshold can be set in real situation. Jamming time is set, also separately by channels. When subscriber signal is detected, jamming is activated in this channel for a given time. Further, the process is repeated. All settings are user-defined, setting window is presented in pic.2, and observed panorama - in

pic.3. Time from detection till jamming activation is about 50-100 milliseconds. In fact, this is the time required for monitoring of frequency range from 400 MHz to 6 GHz.

It should be noted that **Spectrum Jet 3.0** spectrum analyzer acts as an intelligent remote control system of high level and is recommended for full use of the system's capabilities.



Pic.2

Window for setting of control ranges and thresholds in reactive mode.



Pic.3 Screenshot

of observed panorama (control) of ranges and thresholds' setting in reactive mode (Up-link Down-link).

Technical specifications of RS6000

Jamming frequency range	400-6000 MHz
Number of jamming channels	8 (12 optionally)
Adjustable channel bandwidth	0-120 MHz
Maximum bandwidth in range 4-6 GHz	240 MHz
Output power in continuous mode	20 W (100 W optionally)
Total effective power in multiplexing mode	80 W (400 W optionally)
Output power adjustment	30 dB
Antenna system	Directivity 5-12 dB, two built-in directional antennas

Control	PC with Windows OS, tablet or smartphone
Power supply source	Removable batteries or adapter of alternating current/ charger
Type of batteries	Li-Ion 14.8 V
Operating time from one set of accumulators	1.5-2 hours
Noise level of cooling system at 1 m distance	Not more than 35 dB
Temperature range	-10...+55 °C
Weight (8 channels with built-in antennas in case)	10 ~ 12 kg
Dimensions (8 channels with built-in antennas in case)	45x30x20 cm

Technical specifications of Spectrum Jet 3.0 real-time spectrum analyzer

Frequency range	9 kHz – 6 GHz
Scanning speed with 10 kHz resolution, not less than	30 GHz/s
Intermediate frequency	140 MHz
IF band	24 MHz
Bandwidths of spectrum analyzer	160 kHz – 20 MHz
Displayed average noise level 30 MHz – 6 GHz	-155 dB/Hz
Demodulators	Defined by software
Noise ratio	Not more than 12 dB
Minimum frequency interval of linear receiver	1 kHz
Image channel selectivity	Not less than 70 dB
Spurious-free dynamic range	Typ. 80 dB
Time of adjustment of linear receiver, not more than	200 μs
Phase noise of heterodyne at turning out on 10 kHz (at frequency 1 GHz)	Not more than -86 dBc/Hz
Long-term instability of heterodynes (optionally)	10 ppm (not worse than +/- 1 x 10 ⁻⁷)
Maximum level of input HF signal	Not more than 20 dBm

Input impedance	50 ohm
Operation temperature range	- 20.....+60 °C
Power supply	5 W
Dimensions	178x80x32 mm
Weight	380 g