

Compact SDR receiver of HF frequency band “Philin-HF”

Compact receiver of interception and surveillance “Philin-HF” is purposed for reception, demodulation, and listening of signals within the frequency band from 1 to 30 MHz.

Receiver has computer control via interface USB 2.0 (LAN 1 Gbps – optional) and provides amplitude signal spectrum observation on the monitor. Information from receiver output is presented in the form of digital quadrature samples transmitted via USB-port (LAN-port) into computer and can be used both for recording and for signal spectrum observation. In the receiver there is also LF output for connecting terminal equipment and play back of demodulated spoken information.

SDR-receiver is deigned on direct conversion circuit of signal frequency by 16-bit ADP and BBC converting into the complex form (I/Q-samples) with the following signal processing in PGA and DSP-processor.

Digital signal conversion increases phase stability and parameters repetition.

Presence of antenna input “1-30 MHz” and connector for antenna-feeder devices control extends capabilities when operating the receiver in the composition of receiving complexes with different HF-sections and antenna-feeder devices of HF band.

Power supply of receiver can be provided both from DC power supply unit +7.5 V and from industrial network 220 V, 50 Hz using regular power supply unit.

SDR-receiver “Philin-HF” is purposed for:

- 1) for receiving and signal demodulation within the frequency band from 1 MHz to 30 MHz;
- 2) for generating I/Q-samples of signal complex envelope for the following recording and computing of amplitude-frequency spectrum of received signals;
- 3) for operation at stationary objects and in field conditions.

COMPOSITION

- receiver of HF frequency band “Philin-HF”;
- special software for external PC;
- complete set of connecting cables;
- power supply unit form AC network 220 V, 50 Hz;
- operational documentation.

Compact receiver
of interception and
surveillance



Main technical parameters of HF band receiver “Philin-HF”

Name	Parameter
Operating frequency band	1 MHz – 30 MHz
Antenna input (connector SMA)	Z_{in} =50 Ohm
VSWR of antenna input	not more than 1.8
Tuning resolution of receiver	1 Hz
Tuning time of frequency synthesizer	not more than 0.5 ms
Relative tuning frequency instability within operating frequency band	not more than $\pm 2.5 \cdot 10^{-6}$
Types of modulation	AM, SSB, CW FM, FSK
Bands of digital filters in modulation mode	0.15; 0.3; 0.6; 1.0; 1.5; 2.0; 2.4; 2.7; 3.0; 4.0; 4.8; 6.0; 9.0; 12.0 kHz
Bands of digital filters in registration mode	0.15; 0.3; 0.6; 1.0; 1.5; 2.0; 2.4; 2.7; 3.0; 4.0; 4.8; 6.0; 9.0; 12; 15; 30; 50; 120; 150; 250; 300; 500; 750 kHz; 1; 1.25; 1.5; 2.0 MHz
Maximal scanning rate by memory channels by frequency band	250 channels/s 500 channels/s
Sensitivity in CW mode (bandwidth 1 kHz, SNR 10 dB): in the band 1.0...2.6 MHz in the band 2.6...30 MHz	not more than 0.25 μV not more than 0.15 μV
Noise factor	not more than 13 dB
Dynamic range by third order intermodulation distortions	not less than 90 dB
Attenuation of side receiving channels	not less than 85 dB
Attenuation adjustment of HF attenuators	coarse 0, 30 dB, fine 0...31 dB, step 1 dB
Range of AGC adjustment depending on sensitivity level	120 dB
Time constant of AGC “discharge”	0.1/0.5/1/5/10 s
LF signal volume control	0...30 dB
Level of LF output for connecting headphones	68 Ohm, 1.0 V
Consumed power from net 220 V/50 Hz from DC source 7.5 V	not more than 7 W not more than 4.5 W
Weight of receiver	not more than 1.1 kg
Overall dimensions of receiver	not more than 86×50×215 mm
Operating frequency band	-10°C ...+50°C

* – it is allowed to connect external reference frequency generator 409.6 MHz with relative frequency instability $\pm 1.0 \cdot 10^{-7}$

“Scientific-Engineering Centre of Radio Engineering System of Applied Radioelectronics of Academy of Sciences” Ltd.

Ukraine, 61005 Kharkov, Zashitnikov Ukrainy sq. 7/8,
+38 (057) 732-25-53, fax +38 (057) 732-68-63,

✪ E-mail: ntcrts@kharkiv.com www.ntcrts.com