

FlexRadio MLS-9601™

HIGH-POWER WIDEBAND HF SOFTWARE DEFINED RADIO (SDR) COMMUNICATIONS SYSTEM

FlexRadio's MLS-9601 1 kW Wideband SDR Communications System represents a modern benchmark in HF communications, delivering high dynamic-range performance, wideband capability, and architectural flexibility for commercial, government, and defense users. Built in the USA, the system is engineered for mission-critical environments where resilient, high-throughput communications are essential.

At the core of the MLS-9601 is the ML-9600X wideband SDR transceiver, which—when paired with the FPA-1K 1 kW power amplifier—provides robust and adaptable HF communications across a broad frequency range. Leveraging the open SmartSDR API, the system enables seamless integration, rapid waveform development, and mission-specific customization. Support for a wide set of military and NATO protocols, including 2G/3G/4G ALE, MIL-STD-188-110D, MIL-STD-188-141D, and key STANAG standards, ensures that the MLS-9601 aligns with both current and emerging operational requirements.

Designed for operational flexibility, the MLS-9601 performs equally well in local or remote deployments through its IP-centric control architecture, with integration options that include GNU Radio compatibility and support for multiple operating systems. Unlike traditional receiver-exciter solutions, the ML-9600X incorporates a built-in 100 W PA, allowing independent operation without the external amplifier. This dual-mode capability provides unique configuration options for distributed, vehicular, fixed, or modular deployments.



KEY FEATURES

- Up to 78 kHz transmit bandwidth/ Up to 1.2 MHz receive bandwidth
- IP-based Ethernet for local & remote control
- Standard/Protocols: 2G/3G/4G ALE, MIL-STD-188-110D, MIL-STD-188-141D, NATO STANAGS (4285, 4415, 4529, 4538, 4539, 5069)
- Transmission Modes: SSB, AM, CW, FM, Digital Data, Digital Voice, Pulse Modulation, Wideband & Multi-Tone Digital Modes, Automatic Link Establishment
- Integrated Modem
- API Support
- Four real-time 14MHz spectrum displays
- Optional GPSDO
- Optional Time Stamping

MLS-9601 SPECIFICATIONS

Electrical

Frequency Coverage	1.5 MHz - 29.9999 MHz
System Power Output	1000 watts PEP (1:3:1 VSWR or less)
Internal Transceiver PA Power Output	100 watts PEP (1:3:1 VSWR or less in bypass mode)
Exciter Output	+10 dBm outputs for low-power signal generation
Output Impedance	50-ohm
Tuning Steps	1 Hz increments
RF Output Connector	N-Type (alternate types available)
Ethernet Control	Yes (supports local and remote operation)
Duty Cycle	100% across all modes
VSWR Protection	Automatic shutdown for high VSWR
Cooling	Forced air with automatic fan speed control
Harmonic Suppression	> 60dB below carrier
IMD (Intermodulation Distortion)	-32 dB single tone (typical)
Operating Temperature	-10° C to + 50° C
Power Consumption	< 3.5 kVA at full output

Physical

Rack Size (19in rack standard - 11U (1/4 rack)	19.25in H x 22.6 in W x 30 in D
Cooling	Forced air cooling, front-to-back airflow
Power Requirements	220 VAC, Single Phase
Environmental Protection	IP-rated for high dust and moisture environments

Operational

Full Duplex Operation	Yes (capable of simultaneous RX/TX)
Split Site Operation	Yes, via Ethernet IP connectivity
Diversity Reception	Standard (requires two antennas)
Metering and Diagnostics	More than 20 measurable parameters available including voltage, current, power output, SWR, temperature monitoring
Advanced Features	
Real-Time Spectrum Displays	Up to 4 independent displays with 14MHz bandwidth each
Application and Waveform Support	Dedicated 4-core CPU for user-defined processing tasks and user developed waveforms
Precision Time Stamping	Optional high-precision time stamping for advanced applications including DF, TDOA, Beam Steering and more

Compliance and Standards

Protocols	Supports MIL-STD and NATO STANAG waveforms
Certification	FCC, CE, and MIL-STD compliance
Network Protocols	TCP/IP control with RF and audio data exchanged over VITA-49