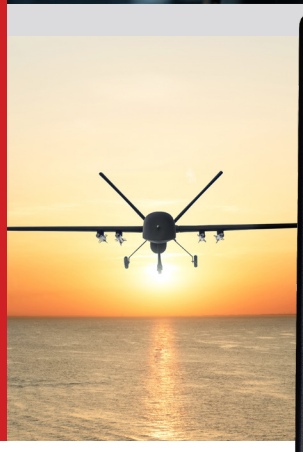
FlexRadio

ML-9600™ Series

COTS 1.7-30 MHZ 100W MODERNIZED
HF WIDEBAND TRANSCEIVER



ML-9600™ Series

WIDEBAND HF TRANSCEIVER

WIDEBAND HF - MODERNIZED FOR ULTIMATE BLOS PERFORMANCE

FlexRadio's ML-9600 series of wideband Software Defined Radios are the ultimate platform for commercial and government HF applications. This Commercial Off The Shelf (COTS) transceiver can support up to 78kHz* transmit bandwidth and up to 1.2MHz* receiver bandwidth to support the latest modernized waveforms.

The fully integrated modem provides native use of modern protocols and waveforms including: 2G/3G/4G ALE, MIL-STD-188-110D, MIL-STD-188-141D, STANAG 4285, 4415, 4529, 4538, 4539 and 5069.

With built in IP-based Ethernet communications the transceiver can be operated locally with an included Windows application, or through custom applications via an open API.

For rapid deployment or prototyping of waveforms, we offer an optional GNU Radio source/sink interface compatible with multiple operating systems. The SmartSDR open API allows for developers to create custom applications and waveforms to interface directly with the radio using plain language commands and standard VITA- 49 streaming RF/IF and FFT data. Waveforms can be loaded directly into the ML-9600 for operational use.

The ML-9600 includes a additional +10dBm exciter output that can be combined with FlexRadio's COTS high power, modular RF Power Amplifier solutions up to 10 kW such as the FPA-5K and FPA-10K.

For more information, contact commercial@flexradio.com

FEATURES

- 1.7 to 30 MHz 100W Continuous Transmit/Receive
- Broad Range of NATO and MIL-STD Waveforms
- 2G/3G/4G ALE Support
- Full Featured Open Waveform and Open Control API
- Up to 78kHz* Available Transceiver Bandwidth
- Up to 1.2 MHz* Receiver Bandwidth
- Ethernet Communication
- GNU Radio Source/Link Compatible
- Up to Four Independent Narrowband (20kHz) Receivers
- Up to Four 14 MHz Real Time Spectrum Displays
- Ultra-Low Phase Noise RX/TX
- Diversity Reception
- Simplex and Full Duplex Receive Capable
- Optional Integrated GPSDO for Precision Time/Location
- Optional Precision Time Stamping Enables Wide Range of Applications including DF, TDOA, Beam Steering and More
- Two Low Power +10dBm Exciter Outputs
- Separate 4-Core CPU for Customer Waveforms

PRELIMINARY SPECIFICATIONS

RECEIVER	
Independent Band/Mode Receivers (Max)	4*
ADC Spectral Capture Channels	2
Simultaneous Receive Antenna Inputs	2
Diversity Reception	Standard
Full Duplex Receive	Standard
Frequency Coverage	100kHz - 80MHz
Noise Figure (Max Gain)	6dB
Streaming Channels	4 Audio @ 24–96 ksps / 4 Digital I/Q 0.024-1.536Msps (Standard)
Receiver Phase Noise	<-145 dBc/Hz @ 20 kHz
Ultimate IF Filter Rejection	115 dB
Line Audio Output	-10 dBV Unbalanced
SPECTRUM/WATERFALL DISPLAY	
Spectrum/Waterfall Displays (Min/Max)	4*
Spectrum/Waterfall Bandwidth (Min/Max)	1.2 kHz–14 MHz
Spectrum Sensitivity (Max Gain)	> -152 dBm
Spectrum Resolution Bandwidth (Min)	1.5 Hz
WAVEFORMS	
2G / 3G /4G ALE	Optional (active on one receiver at a time)
MIL-STD-188-110D	Optional (active on one receiver at a time)
MIL-STD-188-141D	Optional (active on one receiver at a time)
STANAG 4285, 4415, 4529, 4538, 4539, 5069	Optional (active on one receiver at a time)
TRANSMITTER	
High Power Output (2 ports)	1-100W PEP/CW (50 Ohms)
Integrated Antenna Tuner Range	3:1 VSWR (100 Watts)
Low Power Output (2 ports)	0 – +10dBm (50 Ohms)
Frequency Coverage	1.7 - 29.999999 MHz, 30.0 - 54.0 MHz (reduced specifications)
Analog Waveform Channel Bandwidth	20 kHz (Max, for waveforms supplied as line-level audio)
Maximum Transmit Bandwidth	48 kHz (Standard), 78 kHz (for waveforms presented as VITA-49)
Balanced Audio Input	600 Ohm
Mic Level Audio Input	600 Ohm Psuedo Balanced with Bias Option
3rd Order IMD Products (100 Watt PEP)	-36 dBc Below Equal Tones
3rd Order IMD Products (+10 dBm PEP)	-40 dBc Below Equal Tones
Duty Cycle	100% (+10dBm), ICAS (100W PEP)
GENERAL	
Tuning Resolution	1 Hz
Frequency Stability (Standard)	0.5 ppm (0-50C) without GPSDO active
Integrated GPSDO Freqency Stability	5 x 10^{-12} Over 24 Hours
External 10 MHz Reference Input	Standard
External Up/Down Converter IF Control Display Range	0-999 GHz
Certifications	FCC Part 87 & 90, CE, DD-1494 & JF/12 available
Native Modes	USB, LSB, CW, Digital, AM, FM, SAM, FreeDV, AME
Integrated Remote Operation / Multi-User Operation	Standard
User Client Interface Options	Windows 10 or above, GNU Radio
Power Supply Requirements	25A, 13.8 VDC Nominal +/- 15% @ 100W Output
Dimensions	6.74"H (171.1cm) x 14"W (35.6cm) x 13.25"D (33.7cm)
Control	1000BASE-T (IEEE 802.3ab) RJ-45 1GB Ethernet with Open API

***Additional Receivers and Spectral Displays Optional**

NOTE: This device has not been authorized by the rules of the FCC. This device is not, and may not, be offered for sale or lease, or sold or leased, until authorization is obtained. Specifications subject to change without notice.

FlexRadio

ML-9600 Series

4616 W HOWARD LN #8-860
AUSTIN, TX 78728

P +1.512.535.4713

FLEXRADIO.COM
SALES@FLEXRADIO.COM

ASSEMBLED IN USA

© 2023 FlexRadio all rights reserved. All features and specifications are subject to change without notice. FlexRadio is a registered trademark and SmartLink, ML-9600, ML-9600W, ML-9600X are trademarks of FlexRadio Systems. Windows is a registered trademark of Microsoft. All other trademarks are registered to their respective owners.