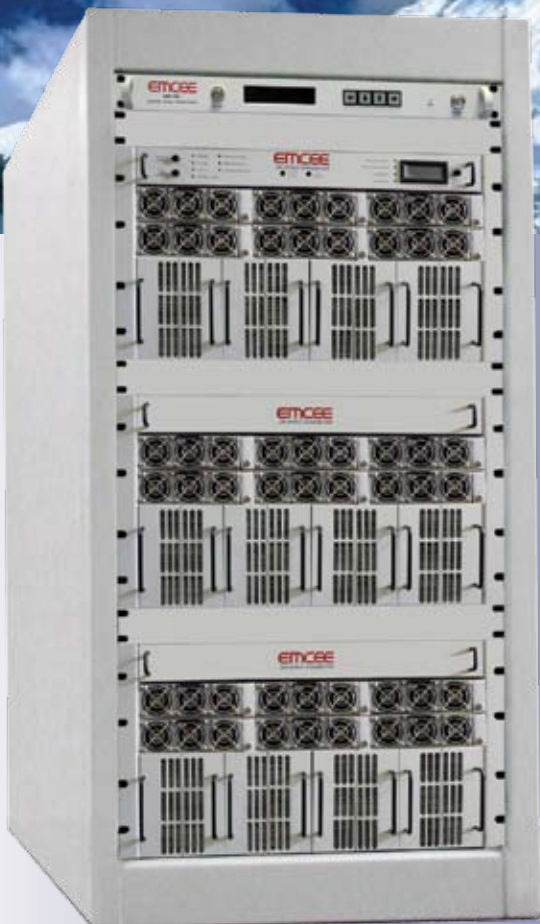


EMCEE

HDTV

TRANSMISSION SYSTEMS

INNOVATIVE TRANSMITTER DESIGNS SINCE 1960



LPU/LPV Series[®] Transmitters & Translators

LPU/LPV Series[®] Transmitters & Translators

The LPU & LPV Series[®] UHF and VHF transmitters were developed especially for lower power DTV transition. These transmitters feature a 100% solid-state modular architecture and utilize the latest high efficiency LDMOS devices to provide transmitters that are economical to purchase and operate and easy to service. EMCEE engineers also combined soft-fail technology with plug-in convenience to create a line-up of transmitters that will supply your desired power, reliability, and performance. All of these features in transmitters that perform above and are priced below the competition. These transmitters are fully analog and digital compatible and certified for operation in all broadcast services.

Analog Now, Digital Later...Talk About Versatility!

CONFIGURE your new digital VHF or UHF transmitter with the versatile DRP-1000 modulator/processor and build your new LPU/LPV Series[®] as a Transmitter or Translator. With either an off-air DTV input or SMPTE310/ASI transport stream input, this unit provides a 19.39 Mb/s 44 MHz IF output that transfers your packetized audio, video and data. With enhanced baseband processing and patented PSIP **Modification, it is the world's most** versatile ATSC A.53 compliant Modulator/ Processor.

Fully ATSC A.53 compliant, the very linear output provides a clean drive to excite your transmitter with a precise signal that has very high SNR (MER) and very low EVM.

Transport stream monitoring outputs are also provided. The DRP-1000 digitally performs ATSC transmission layer coding, 8-VSB modulation, filtering, and up-conversion to produce a pristine IF output signal. Precise frequency and timing offsets are also available using the selectable GPS lock input.

CHOOSE the C8M modulator for analog modulation. This modulator is loaded with premium features found only in much more expensive modulators. It has superior performance yields an exceptional C/N of 65dB. The C8M uses a bright 2-line front panel vacuum florescent display (VFD) that provides access to all modulator controls and is accessed via a convenient menu system. The C8M truly delivers very

high-end performance at a very attractive price.

ADD a SiteLock[®] control system to your LPU/LPV Series[®] transmission system to establish 1 Hertz precision frequency control, or for locking a system to a precision offset; or build a multi-site single frequency network (SFN).

CONTROL your transmitter with the embedded **TransView[®]** remote control system which enables web based IP or SNMP control capability. RS-422 serial style remote control, and parallel interfaces are also supported. Simple and effective, the standard remote control system lets you monitor performance, faults, voltages, currents and forward and reflected power.

Built By Engineers For Engineers!

LPU and LPV Series[®] both provide a very high level of system reliability. Each transmitter system includes a control system, and one or more power amplifier modules in a single chassis or additional PA chassis. The control portion includes the modulator, up-converter chain, system control, remote user interface, driver amplifier, and power amplifier system.

Up to 200 watts of DTV power can be housed in a single chassis. Additional PA chassis can yield power outputs of up to 200 watts each.

Each additional power amplifier chassis is a self-contained 200 watt average power RF amplifier with its own individual AC power feed, control circuits, interlocks, air cooling, RF amplifier modules and modular power supplies. This distributed architecture provides the ultimate in system redundancy and also supports future expansion.

Each additional power amplifier chassis houses up to 8 parallel RF power amplifier (PA) modules and six parallel power supplies—one for every two PA modules with up to

two spares. This architecture assures minimal loss of output power should one or more PA modules or power supplies be removed from service.

"Hot-Swap" modules and power supplies, means they may be installed and removed from the transmitter without interrupting transmission. This provides for very easy service and maintenance and a fast return to full power. PA modules feature individual control and monitoring; also internal protection against high VSWR, overtemp, over current, low gain, and RF overdrive.

Designed Right—Built Right—Priced Right

LPU/LPV Series[®] Transmitters & Translators

Designed for Easy Operation, Control and Monitoring!

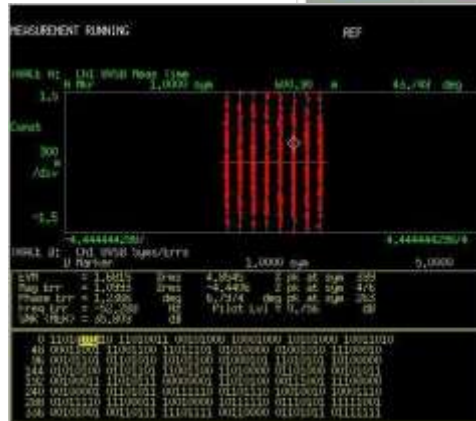
LPU and LPV Series[®] transmitters feature a web enabled color Graphical User Interface (GUI) which displays all monitoring and metering on an easy-to-understand HTML screen. Diagnostics, system configuration, and fault logging are also included. Pushbutton control is provided on an eye-level front panel, and interfaces for remote control and monitoring are conveniently located. A front panel color LED matrix visually indicates operating status of the overall system as well as individual subassemblies. All modules are readily accessible when service is required, from the front of the rack.

LPU and LPV Series[®] transmitters use the same TCP/IP control protocols used in hundreds of thousands of proven applications. The main controller facilitates trouble-shooting by providing detailed status information about each transmitter stage via the bus to the Graphical User Interface (GUI). The local/remote control system “lives above” the internal transmitter control system assuring that the transmitter stays “on-air” in the event of a main/remote controller or network fault.

LPU and LPV Series[®] transmitters require up to 90 percent less routine maintenance than tube transmitters, with fewer adjustments at much less frequent intervals. All of the modules are readily accessible from the front of the transmitter. LPU and LPV Series[®] transmitters are designed so that most maintenance can be performed safely while the transmitter continues to operate.

Since the beginning of digital, EMCEE has been innovating DTV designs making your transition to digital broadcasting an easy and affordable task. Whether UHF or VHF, get big budget technology with affordable pricing. Choose **EMCEE** for your next DTV low power transmitter or translator.

TCP/IP Network & Web Based Remote Control



Ultra Linear Performance



Easy Service Low Maintenance Hot Swap Modules Redundant Power Supplies Total Flexibility



LPU/LPV Series[®] Transmitters & Translators

LPU and LPV Series[®]— A High-Level Flyby!

LPU and LPV Digital Modulators

Choose from the DRP-1000 modulator/processor for low-cost high-quality digital re-modulation. The DRP-1000 combines a 5th Generation ATSC demodulator with baseband processor, allowing for SMPTE310 or ASI transport stream input and PSIP modification. 44 MHz IF modulation is supported with a built-in high quality ATSC A.53 compliant ATSC modulator.

Analog Modulation

The C8M modulator is used for analog modulation. This modulator is loaded with premium features found only in much more expensive modulators. Its superior specs yield a C/N of 65dB. The C8M uses a bright 2-line front panel vacuum florescent display (VFD) that provides access to all modulator controls and is accessed via a convenient menu system.

Frequency Agility

All LPU or LPV transmitters are fully frequency agile. Truly broadband amplifier design means any transmitter may be tuned totally across its band of operation.

Power Amplifier (PA) Chassis

When fully populated with 8 PA modules, each chassis is a self-contained RF power amplifier with its own AC power feed, control circuits, interlocks, air cooling, RF amplifiers and power supplies.

Power Amplifiers

All PA modules are identical and inter-changeable. Each PA module features a high-speed logic switch which disables the module if a fault occurs or if the module is removed from the transmitter. Modules are protected against high VSWR, over-temperature, loss of bias, and RF overdrive conditions. And, a failed power amp does not cause an outage!



Shown with DRP-1000

Solid State Amplification

EMCEE uses the latest LDMOS technology for the power transistors in the RF amplifiers. These state-of-the-art devices are very efficient and extremely rugged. They provide high efficiency and high gain and exhibit very stable temperature characteristics over a wide operating temperature range. Linearity and distortion performances are much better than older bi-polar designs. And, unlike tube amplifiers which require complicated and costly repairs, solid state amplifiers do not have a limited service life. This saves time and money and provides a sense of technical independence.

Power Supplies

Compact, power efficient, modular, regulated power supplies can be removed while the transmitter is on the air. Power supplies are protected from incoming AC line transients, over current, and over voltage. Up to six power supplies per chassis means N+1 power supply redundancy may be configured for additional up-time assurance.

Air Cooling

Air cooling with internal high-efficiency thermal conduction is standard. Exhaust may be ordered out-the-front, or out-the-back. External fans may be configured to pull exhaust out of the transmitter building.

Simple Front Panel Control

An easy to use front panel control is the base of the transmitter control system. Use simple push button controls for operating mode and status; an easy to read color LED matrix displays high level status and alarm functions to make things easy for attendant operators. A front panel meter displays up-converter supply voltages and % Forward and Reflected power.

Embedded Web Server Remote Control

With its embedded TCP/IP based web server, remote monitoring and control is a snap! No special software is required. Use your standard web browser to control the transmitter. The system even automatically generates error e-mails when a fault occurs. Using standard TCP/IP protocols, you can make the transmitter truly a part of your total IP network.

LPU/LPV Series[®] Transmitters & Translators...Only from EMCEE!

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LPU/LPV Series[®] Transmitters & Translators

LPU and LPV Series[®]— Specifications

Note: *Specifications Subject to Change*

General

Power Output: ¹ See Product Selection Guide

RF Load Impedance: 50 Ohms, 1.2:1 VSWR over specified TV channel

RF Output Connector: Type 'N' (Base Chassis Output)
Type 'N' or 1 $\frac{1}{2}$ " EIA (Multi-PA Rack Output)

Frequency Range: LPU: Any specified UHF TV Channel, 470-806 MHz
LPV: Any specified VHF TV Channel, 54-216 MHz

Data Input: ASI and SMPTE-310M, 19.39 Mbps; or ATSC Off-Air w/DRP-1000

Data Input Connector: BNC, 75 Ohms

External Lock Input: 10 MHz sinusoid, 0 to +10 dBm, BNC, 50 Ohms, Automatic

Performance

Output Power Stability $\pm 2\%$ or better

Frequency Stability (Pilot): ± 200 Hz/month^{2,8}

Frequency Offsets: Per FCC requirements

SNR (MER) : >30dB³ **Phase Noise:** ≤ -104 dBc/Hz @ 20 KHz

Harmonic & Spurious Radiation: FCC Compliant

Sideband Performance: FCC Compliant, with output mask filter

Service Conditions

Ambient Temperature Range: 0 to +50°C (+32 to +122°F)⁴

Ambient Humidity Range: 0 to 95% relative humidity, non-condensing

Altitude: 0-10,000 ft. AMSL⁵

Physical Dimensions & Weights:⁶

LPU/V-10 through LPU/V-2000: Size: 19.0"W x 22.0"D x 10.5"H
Weight: up to 84 lbs (w/o Rack Cabinet)

LPV-3000 through LPV-5000: Size: 22.0"W x 30.0"D x 42.0"H
Weight: up to 750 lbs

LPV-7500 through LPV-10000: Size: 22.0"W x 30.0"D x 72.25"H
Weight: up to 1,150 lbs

Electrical Requirements:⁹ 100-240V, 1 \emptyset /3 \emptyset , 3 or 4 wire, 50-60Hz (PA Chassis),
100-240V, 1 \emptyset /3 \emptyset , 50-60Hz (Base Chassis),
100-240V, 1 \emptyset , 50-60Hz (Control Section).

Power Factor: 0.98, or better

Power Consumption:

LPU/V-10	60 Watts/.062kVA/.98 PF
LPV-100	150 Watts/.152kVA/.98 PF
LPU/V-300	295 Watts/.298kVA/.98 PF
LPU/V-500	525 Watts/.530kVA/.98 PF
LPU/V-750	760 Watts/.768kVA/.98 PF
LPU/V-1000	990 Watts/1.00kVA/.98 PF
LPU/V-1250	1225 Watts/1.24kVA/.98 PF
LPU/V-1500	1455 Watts/1.47kVA/.98 PF
LPU/V-1750	1685 Watts/1.70kVA/.98 PF
LPU/V-2000	1920 Watts/1.94kVA/.98 PF
LPV-3000	3080 Watts/3.11 kVA/.98 PF
LPV-4000	4070 Watts/4.11 kVA/.98 PF
LPV-5000	5120 Watts/5.17 kVA/.98 PF
LPV-7500	7680 Watts/7.76 kVA/.98 PF
LPV-10000	10250Watts/10.35 kVA/.98 PF

LPV Series VHF Product Selection Guide

MODEL #	ATSC POWER	DVB POWER	ANALOG PEAK VISUAL POWER W/-10dB AURAL
LPV-10	1 Watt	.5 Watt	2.5 Watts
LPV-100	10 Watts	5 Watts	25 Watts
LPV-300	30 Watts	15 Watts	75 Watts
LPU-500	50 Watts	25 Watts	125 Watts
LPU-750	75 Watts	38 Watts	175 Watts
LPU-1000	100 Watts	50 Watts	250 Watts
LPU-1250	125 Watts	63 Watts	300 Watts
LPU-1500	150 Watts	75 Watts	375 Watts
LPU-1750	175 Watts	88 Watts	550 Watts
LPU-2000	200 Watts	100 Watts	625 Watts
LPV-3000	300 Watts	150 Watts	1000 Watts
LPV-4000	400 Watts	200 Watts	1250 Watts
LPV-5000	500 Watts	250 Watts	1500 Watts
LPV-7500	750 Watts	375 Watts	2500 Watts
LPV-10000	1000 Watts	500 Watts	3000 Watts

LPU Series UHF Product Selection Guide

MODEL #	ATSC POWER	DVB POWER	ANALOG PEAK VISUAL POWER W/-10dB AURAL
LPU-10	1 Watt	.5 Watt	2.5 Watts
LPU-300	30 Watts	15 Watts	75 Watts
LPU-500	50 Watts	25 Watts	125 Watts
LPU-750	75 Watts	38 Watts	175 Watts
LPU-1000	100 Watts	50 Watts	250 Watts
LPU-1250	125 Watts	63 Watts	300 Watts
LPU-1500	150 Watts	75 Watts	375 Watts
LPU-1750	175 Watts	88 Watts	550 Watts
LPU-2000	200 Watts	100 Watts	625 Watts

Notes:

¹ Average power rating is power delivered at output of FCC mask filter (w/1dB Insertion Loss).

² After initial aging of 60 days.

³ Signal to noise ratio (modulation error ratio) measured with HP89441A Vector Signal Analyzer at input to mask filter.

⁴ Derate maximum temperature linearly, from +50° C at sea level by 2 deg C per 1,000 ft., up to 10,000 ft. For operation outside these limits, consult Factory.

⁵ For higher altitude operation, consult Factory.

⁶ All listed weights approximate and will vary depending on configuration, consult Factory.

⁷ For other AC voltages, consult Factory.

⁸ ± 2 Hz or better with external precision frequency control input.

⁹ Typical Power Consumption, including internal cooling. Configurations will vary dependent on configuration. All values approximate, consult Factory for specifics.

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Service and Support

At EMCEE, we have been committed to customer service excellence since 1960. It is our goal to provide the highest level of support by applying one simple rule: Take ownership of helping your customer succeed. Our support team consists of devoted technical experts who support all situations regarding product performance, integration, and operation. We are experts at providing proven solutions, making projects flow smoother, and ensuring the ultimate reliability of your product and system investment. At EMCEE, our dedicated and experienced team stands ready to help you meet your goals for critical product performance, 100% on-air-time, and reduced maintenance costs.

Warranty

Because we want to assure you that EMCEE stands behind its products and systems solutions, our transmission products carry an industry leading two-year warranty, which is competitive with—and in most cases better—than others in the industry.

Service Packages

We offer value-added services that allow you to customize the level of services you need in meeting mission-critical performance levels. Our service package options offer many ways to upgrade your standard warranty by choosing the EMCEE Warranty^{PLUS} Plan, or by selecting individual services and designing your own maintenance program options. Our service and support team can assist in the selection of the individual services that best suit your requirements.

For more information please visit www.EMCEE.com, or call...

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