

Flexiva HPX™

High-Power Transmitter for Analog FM and HD Radio™



The Flexiva HPX™ series is the next generation in high-power transmission for FM analog and HD Radio™ broadcasting. The Flexiva HPX series covers a range of power levels, with three models offering nominal FM power of 20 kW, 30 kW and 40 kW in a single configuration, and up to 80 kW in a dual configuration.

With the most flexible control system available in the market, the Flexiva HPX transmitter has a unique combination of dedicated meters and control circuits for rock-solid and simple control, coupled with an optional user-friendly remote monitor and control system that features a color GUI.

In terms of dollars-per-watt, the Flexiva HPX tube-based transmitter outperforms all solid-state transmitters in the same class. Operators can realize a significant savings in cost of ownership over the lifetime of the transmitter, including regular tube replacement.

The Flexiva HPX transmitter provides a smooth upgrade path to HD Radio. Simply add the Flexiva Exciter and the HDE-200 exporter for the latest in HD Radio signal generation, and if desired, the HDI-200 importer will complete the portfolio with supplemental audio channels and other advanced applications data services.

GatesAir provides everything needed to transition to digital radio — from source through studio through STL through transmission. And we have a systems team available to help put together a package that makes the most sense for any operation — now and in the future.

Product Features

The Flexiva HPX highpower FM transmitters feature:

- Fully integrated RF and control interface with Flexiva Exciters
- The Flexiva Exciter is the source of both the HD Radio signal and the conventional analog FM signal — in a single unit. This exciter creates a hybrid signal ready for amplification by the transmitter
- Highvoltage power supply can be remotely located from the transmitter to fit even the tightest transmitter sites
- Basic transmitter controller provides critical life support, control, automatic exciter switching and diagnostic functions on MIMIC panel without reliance on a microprocessor
- Advanced transmitter controller option combines basic controller functionality and life support with a microprocessor and ¼ VGA GUI for advanced control and diagnostics including TCP/IP connectivity, WEB remote control and monitoring, and SNMP communications
- IPA stage uses the fieldproven Z/ZX® hotpluggable PA modules and power supplies with the option for redundancy
- ¼ wave grounded cathode design offers stability and efficiency
- Ability to bypass PA stage using Flexpatch to put exciter and/or IPA directly to air, with blower shut down. No user safety issues while servicing PA cavity
- Backed by broadcasting's most extensive factory support, including 24-hour technical assistance, around-the-clock parts and comprehensive training

System

- High-power FM/FM+HD tubebased transmitter with nominal nameplate (FM) power output rating based on three models of 20 kW, 30 kW and 40 kW

Mechanical

- Solid, welded-steel exterior cabinets; aluminum inner skins and chassis
- Hinged rear doors for normal access, easily removed for maintenance or installation activities
- Major access panels are securely latched with a supplied hex head tool for quick, safe access
- Top- or bottom-entry locations for all cabling

Cooling

- Direct drive 3-phase blower in main PA cabinet
- High-efficiency flushing fans

RF Drive

- Requires only 30 W (analog) exciter
- Fully integrated RF and control interface with Flexiva Exciters
- IPA stage uses the field-proven Z/ZX PA modules
 - Higher-power models employ two modules, providing redundancy
 - Lower-power system can employ optional main/backup IPA
- IPA modules are replaceable from the front of the transmitter

Power Amplifier Stage

- Common tube socket for all models; 4CX20,000C
- ¼ wave grounded cathode design offers stability and efficiency
- Ability to bypass PA stage using Flexpatch to put exciter and/or IPA directly to air, with blower shut down. No user safety issues while servicing PA cavity

Controller

- Basic transmitter controller provides critical life support, control, automatic exciter switching and diagnostic functions on MIMIC panel without reliance on a microprocessor
- Enhanced transmitter controller option combines the basic controller functionality and life support with a microprocessor and ¼ VGA GUI for advanced control and diagnostics including TCP/IP connectivity, WEB remote control and monitoring, and SNMP communications
- Four large front-panel analog meters: Forward/Reflected power, PA volts, PA amps and multimeter for other operating parameters

Power Supplies

- High-voltage, 3-phase linear supply with primary/secondary MOV protection; half tap on transformer and multiple voltage taps; some model upgrades may be accomplished with only change in HV transformer
- Rugged, reliable mains transformer provides worry-free performance, easy to tap for specific installation requirements
- Lowvoltage control and IPA use switching supplies from field-proven ZX products, reducing spare parts costs



Product Details

The Flexiva HPX transmitters are the next generation in high-power transmission for FM analog and HD Radio broadcasting. This amazing line of transmitters offers power and efficiency at an extremely attractive price point.

Powerful, Simple and Rugged

Depending on mode and power level, the Flexiva HPX transmitter achieves market-leading power levels up to 42 kW analog FM, utilizing either the 4CX20,000 or 4CX25,000 series rugged Radial Beam Power Tetrode tube. Additionally, systems can be combined into a dual unit for redundancy and power levels up to 84 kW analog FM. Unlike high-power solid-state transmitters, the Flexiva HPX series can safely operate at higher power levels with elevated VSWR.

Outstanding Value

In terms of dollars-per-watt, the Flexiva HPX tube-based transmitter outperforms all solid-state transmitters in the same class. Operators realize a savings of nearly 25 percent in cost of ownership over the lifetime of the transmitter. This includes regular tube replacement.

Superior HD Radio Operation and Performance

Combined with GatesAir's Flexiva Exciter and advanced Real-Time Adaptive Correction (RTAC™) feature, the Flexiva HPX transmitter provides superior analog and HD Radio performance, exceeding NRSC-5B mask compliance even at the highest power levels. Up to 31.5 kW FM+HD at -20dBc injection and 17 kW at -10dBc injection are available. For a complete HD Radio system, add the new FlexStar HDE-200 embedded exporter and the HDI-200 advanced services program importer.

Maximum Efficiency

The Flexiva HPX system provides the highest operating efficiency of any transmitter in its class by utilizing tube-based ¼ wave, bandwidth-optimized cavity, grounded cathode design, a 3-phase linear high-voltage power supply, switching power supplies for screen, grid and low voltage control circuits, and a single, high-efficiency 3-phase blower. It can maintain peak efficiency over a wide range of power levels and operating modes.

Compact Footprint — Simple Installation

The most compact, high-power transmitter in its class, the Flexiva HPX system's matching power amplifier (PA) and power supply cabinets measure only 32 in. (W) x 35 in. (D) x 78 in. (H).

The small footprint and the internal low-pass harmonic filter simplify installation and lower shipping costs, while also reducing cost and space requirements in the facility. The high-voltage power supply cabinet and PA cabinet can be separated with the optional (standard 40-ft length) cable set. Other custom lengths are available upon request.

Unparalleled Control and Diagnostics

The Flexiva HPX transmitter incorporates the most advanced control system available. The basic controller option provides critical life support, control, automatic exciter switching and fault diagnostic functions without reliance on a microprocessor. The enhanced transmitter control unit option combines the basic controller functionality with a microprocessor and ¼ VGA touch-screen graphical user interface (GUI) for increased control and diagnostics, including TCP/IP connectivity, WEB remote control/monitoring and SNMP communications. A simple, parallel user interface connects to today's most popular remote transmitter control systems.

Reliability and Serviceability

The solid-state driver stage uses the field-proven Platinum Z/ZX IPA modules and ZX series switching power supplies in a dual redundant configuration. Modules are front-panel accessible and hot-swappable to allow ease of service, provide reliability and simplify spares inventory. Maintenance technicians can easily and safely service the PA cavity because of the ability to bypass the PA stage using FlexPatch, and put the IPA or even the exciter directly to air with the blower and all high voltage shut down.

Common Components and Architecture

From the highest-power FM+HD systems to the lowest-power FM-only systems, the entire Flexiva HPX transmitter line uses virtually all the same major components, including the PA cavity. This consolidation of components makes parts sparing simple and straightforward.

Future-Proof, Smooth Upgradeability

The Flexiva HPX transmitter features the world-class Flexiva Exciter, which can be field-upgraded to HD by adding an Exgine card; Z/ZX IPA components that switch modes "on-the-fly"; a universal transmitter control unit; and additional common components across the full line. With only minor component changes required, upgrading the Flexiva HPX is a simple, smooth, and inexpensive process, whether upgrading to higher power or upgrading from analog to HD Radio or both.

Specifications

Specifications and designs are subject to change without notice

Maximum Power Output	HPX20	HPX30	HPX40
FM Mode	21 kW	31.5 kW	42 kW
FM+HD -20 dBc	21 kW	26.5 kW	31.5 kW
FM+HD -10 dBc	15 kW	16 kW	>17 kW*
HD Mode -20 dBc	8.4 kW	9.4 kW	9.6 kW
HD Mode -10 dBc	6.1 kW	6.8 kW	7.0 kW
Minimum Overall	HPX20	HPX30	HPX40
AC to RF Efficiency	HPX20	HPX30	HPX40
FM Mode	66%	68%	70%
Typical Overall	HPX20	HPX30	HPX40
AC to RF Efficiency	HPX20	HPX30	HPX40
FM Mode	68%	70%	72%
FM+HD -20 dBc	58%	61%	62%
FM+HD -10 dBc	40%	41%	42%

Ambient Temperature	
Output Impedance	50 ohms
Output Connector	3-1/8 in. EIA or 4-1/16 in. male flange
Maximum VSWR	1.5:1 for 100% power output with proportional foldback
Input Voltage	50-60 Hz, 197 to 250 V AC, 3 phase, 3-wire closed Delta or WYE — 250 amperes max or 360-415 V AC 4-wire WYE — 125 amperes maximum
Input Voltage Variation	± 5% for full specification, +10%, -15% for continued operation
Power Factor	0.95
Maximum Altitude	10,000 ft (3,048 m) high-altitude/high-power cooling kit required above 7,500 ft (2,286 m) MSL
Analog FM Mode	32° to 122° F (0° to 50° C); derate 3.6° F (2° C) for each 1,000 ft (304.8 m) elevation
Humidity	95% non-condensing
RF Harmonics/Spurious	
Emissions	Meet or exceed FCC, NRSC, ITU and IC requirements
Asynchronous AM S/N Ratio	55 dB below equivalent 100% AM modulation
Synchronous AM S/N Ratio	52 dB below equivalent 100% AM modulation
Other Audio Specifications	Determined by exciter
Dimensions (W x D x H)	2 cabinets, each 32 x 35 x 78 in. (81 x 88.9 x 198.1 cm); Main PA cabinet contains 13RU of 19 in. rack space for dual exciters and ancillary equipment
Standards Compliance	NRSC-5B or most current HD Radio standard; FCC, Industry Canada, Anatel (Brazil); RoHS-compliant design and manufacturing; Safety EN60215
*Maximum power currently 17 kW at -10 dBc with existing Crest Factor Reduction techniques. Improvements in efficiency and PAPR control within the Flexiva Exciter indicate that an increase of 1-1.5 dB (23 kW max) available output power at -10 dBc is anticipated.	