

HARRIS[®]



Flexiva[™] Air-Cooled FM Transmitter

For Worldwide Analog and Digital Standards up to 40 kW

Flexiva™ Transmitter

Cost-effective, solid-state technology for FM radio

Power

The Harris® Flexiva™ FM solid-state transmitter for both analog and digital operations, combines innovative quad-mode RF amplification and software-defined exciter technology for full FM radio power.

Efficiency

With Harris PowerSmart® and 50-Volt LDMOS technologies, Flexiva delivers enhanced power density and efficiency, which translates into lower operating costs and cost of ownership over the life of the transmitter.

Harris, World Leader in Digital Transmission Reliability

Reliability

Built on the legacy of the ZX® series--the most popular solid-state FM transmitter worldwide--Flexiva features industry-proven power supply, cooling and control technology, as well as key digital technology for stellar performance.

Service, Support

Harris is the industry-leading provider of solutions for the most complex technological challenges in broadcast, and is committed to helping customers achieve optimum transmission performance. Support includes telephone technical assistance 24 hours a day, seven days a week, as well as parts, training, full system design and implementation and field maintenance contracts.



Features:

- Power efficiency, low operating costs
- Compact and lightweight space-saving design
- Latest state-of-the-art laterally diffused metal oxide semiconductor (LDMOS)-field effect transistor (FET) power amplifier technology
- Quad-mode operation: FM, FM + HD Radio™, HD Radio only or DRM™+
- Fully broadband modules, 88-108 MHz, requires no tuning or adjustments
- 1:1 power amplifier (PA) module to power supply (PS) redundancy
- Hot-pluggable RF amplifier modules and auto-ranging power supplies
- Built-in backup controller allows full power operation if main controller is non-operational
- Proportional voltage standing wave ratio (VSWR) foldback for safe operation at reduced power into marginal loads (icy antenna, etc.)
- Automatic restart after AC mains interruption; returns to previous operational mode
- SNMP web-enabled remote graphic user interface (GUI)
- In-depth diagnostics via an easy-to-use front-panel control



Flexiva 10kW rack with additional 2kW



Flexiva 20 kW rack

The Flexiva Advantage

Maximum Efficiency

Leveraging Harris PowerSmart technology, 50-volt LDMOS device technology delivers enhanced power density and efficiency, which translates into lower operating costs and cost of ownership over the life of the transmitter.

Compact Footprint, Lightweight Design

Flexiva is a compact, lightweight FM, ideal for crowded, shared transmitter sites. Flexiva enables efficient use of space and saves on shipping costs and because of its compact, simplified design, is easier to install and maintain.

High Power, Outstanding Reliability

Flexiva delivers market-leading power levels from very low (50W) to very high (40kW) for analog and digital broadcasts. With distributed control architecture, Flexiva delivers outstanding reliability, and enables soft failure operation.

Improved Uptime

Hot-pluggable, redundant power amplifier (PA) and universal power supply (PS) modules make on-air servicing easy and eliminates costly service interruptions. Standard backup controller allows full power operation if main controller is non-operational, maximizing uptime.

The distributed design enables fast-acting independent protection at the module. Operational parameters and potential equipment problems are easy to view on the liquid-crystal control screen. Front-panel buttons and LED indicators allow for simple control and feedback on all the key operating parameters. Navigation buttons allow for quick review, setup and recall of all menus on the front-panel screen. By simply connecting a PC to either the front- or rear-panel RF-45 jack, the user can monitor and control all the settings on the PC.

Lightweight for Easy Handling

Lightweight and universal PA modules (broadband from 88 to 108 MHz; 4.5 kg) and PS modules (auto-ranging 90-264 VAC, 47- 63 Hz; 2.5 kg) facilitate overnight/same-day shipment from a centralized depot for simplified and cost-effective spares holding. The use of lightweight modules virtually eliminates two-person lift requirements for routine maintenance. The Flexiva transmitter also supports the simple replacement of pretuned amplifier pallets in the field, eliminating the need for complex tuning after FET replacement.

Seamless Transition to Digital

Flexiva features world-class software-defined exciter technology, enabling a seamless transition from analog to digital.

Advanced Digital Pre-Correction

Harris Real-Time Adaptive Correction (RTAC™) is an advanced type of digital precorrection to better use the transmitter power amplifier, while maintaining spectral mask compliance of the digital signal.

Distributed System Control

Using a central interface to a distributed control system with extensive protection and control capabilities, the main system control is located in the Flexiva amplifier bay and communicates with the exciter for mode switching. The distributed design enables fast-acting independent protection at the module. Operational parameters and potential equipment problems are easy to view on the liquid-crystal control screen. Front-panel buttons and LED indicators allow for simple control and feedback on all the key operating parameters. Navigation buttons allow for quick review, setup and recall of all menus via the front-panel screen. By simply connecting a PC to either the front- or rear-panel RF-45 jack, the user can monitor and control all the settings on the PC.

Global Monitoring and Control

In addition to local control, the Flexiva transmitter can be controlled from anywhere in the world with an intuitive, browser-based graphical user interface (GUI) over TCP/IP via a telecom or network connection with password protection.

Full Simple Network Management Protocol (SNMP) facilities are provided for network management of the entire transmission system using industry standard MIB protocols.

Remote Communication Options

- Graphical user interface
- Ethernet network connection RJ-45 (10/100Base-T) with TCP/IP protocol
- Automated remote alarms in the event of a fault, sent via SNMP or email with the connection to a network
- Simple, parallel interface to panels and remote control systems

Multi-System Controller

For greater redundancy, the Harris Multi-System Controller (MSC) supports a range of backup options, including 1+1, full N+1 and dual-transmitter installations. The MSC monitors and controls the transmitter systems and controls RF switching.

Common Parts

The Flexiva line uses the same major parts—from the highest-power, air-cooled transmitter to compact, low-power systems.

Advanced Digital Precorrection

Two types of precorrection are used: linear and nonlinear. Linear precorrection is for the non-ideal amplitude response and time response of the transmission system, including the power amplifier and any bandpass filters. Linear precorrection helps optimize the modulation performance of the transmitted digital signal so less equalization is required at the receiver. Nonlinear precorrection is for the two major types of nonlinearity (AM->AM and AM->PM) in the RF power amplifier, which cause undesired spectral components and poor RF mask compliance.

AM to AM nonlinearity causes the RF power amplifier's output amplitude to not accurately track the input amplitude. Typically, this nonlinearity occurs near the peak output power of the amplifier, where saturation effects cause the output response to flatten as the input continues to increase and where the amplifier output goes to zero. AM to PM nonlinearity causes the RF power amplifier's output phase to not track the input phase. The amplifier acts like a phase modulator as the power output varies to follow the input signal, producing undesirable sidebands.

Precorrection can be implemented in many ways. In order of sophistication, they are:

- Analog, fixed, precorrection
- Digital, fixed, precorrection
- Digital, adaptive, precorrection
- Digital, memoryful, adaptive, precorrection (RTAC)

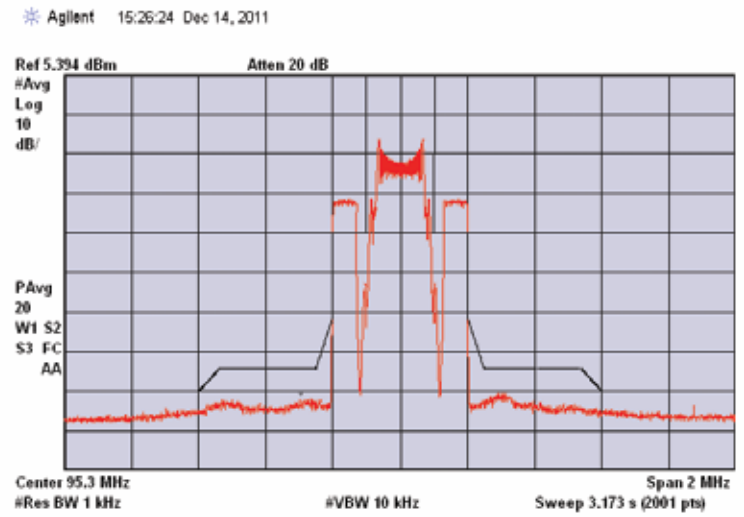
Fixed precorrection can improve the system linearity for one specific operating point, but must be manually readjusted for changes in power output, antenna load impedance, temperature or operating point. Adaptive digital precorrection uses an RF sample taken at the output of the RF amplifier to automatically adjust the shape of the precorrection to continuously optimize the linearization of the system. The bandwidth limitation, especially in tube-type amplifiers (such as, IOT), along with the stored energy in tuned circuits, introduces "memory effects."



Flexiva 2kW

Digital, adaptive, memoryful precorrection can correct for these “memory effects” in addition to simple AM to AM and AM to PM distortions. Even wideband, solid-state RF amplifiers have some memory effects that make the shape of the nonlinearities change with the digital modulation data states. As the only system with simultaneous linear and nonlinear, adaptive, and memoryful precorrection, RTAC provides the highest level of correction to all types of RF amplifiers.

Real-time adaptive correction (RTAC) in Flexiva transmitters delivers the highest level of correction, resulting in a broadcast signal that is spectrally pure, while delivering the maximum power output and best efficiency.



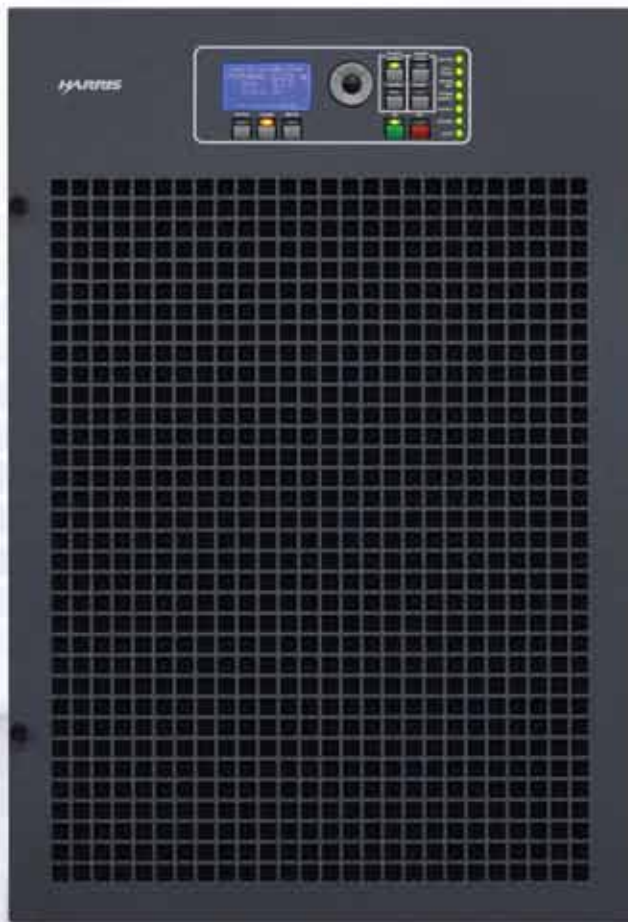
FlexStar® HDx Exciter

World-Class Performance

The Harris FlexStar® HDx FM/HD exciter creates both the analog and HD Radio signals. This ensures RTAC digital precorrection, superior mask compliance, maximum possible power output and best efficiency.

HDx offers dual AES, analog left and right, dual composite and mono audio inputs to provide the user with maximum flexibility. An integrated digital stereo generator, with adjustable composite audio peak limiter, delivers the top performance needed in competitive markets. Two SCA generators with RBDS encoding are built-in and a front-panel spectral display, provides instant verification of mask compliance.

Add the Harris HDE200 Exporter™ for basic HD and HDI200 Data Importer™ for Advanced Applications Services (AAS), such as supplemental audio channels (multicast) or additional data services.



Flexiva 10 kW

Flexiva Exciter

The Flexiva low-power family of transmitters includes a 50W and 150W exciter/transmitter. Designed to integrate with the Flexiva high-power family as either an internal or external exciter, with direct-to-channel, digital modulator and all of the popular features and performance of the FlexStar exciter.

The Flexiva exciter is offered as an FM only exciter, with upgrade-options for HD Radio and DRM, as well as audio over IP and USB audio playback and other options for internal GPS, single frequency networking and "Orban Inside" audio processing.



FlexStar HDx Exciter



Harris, World Leader in Digital Transmission

Launching a new broadcast service is a significant financial investment and a shift into unfamiliar technology. Let Harris help.

Harris is the industry-leading provider of solutions for the most complex technological challenges in broadcast, and offers technical expertise and financial stability.

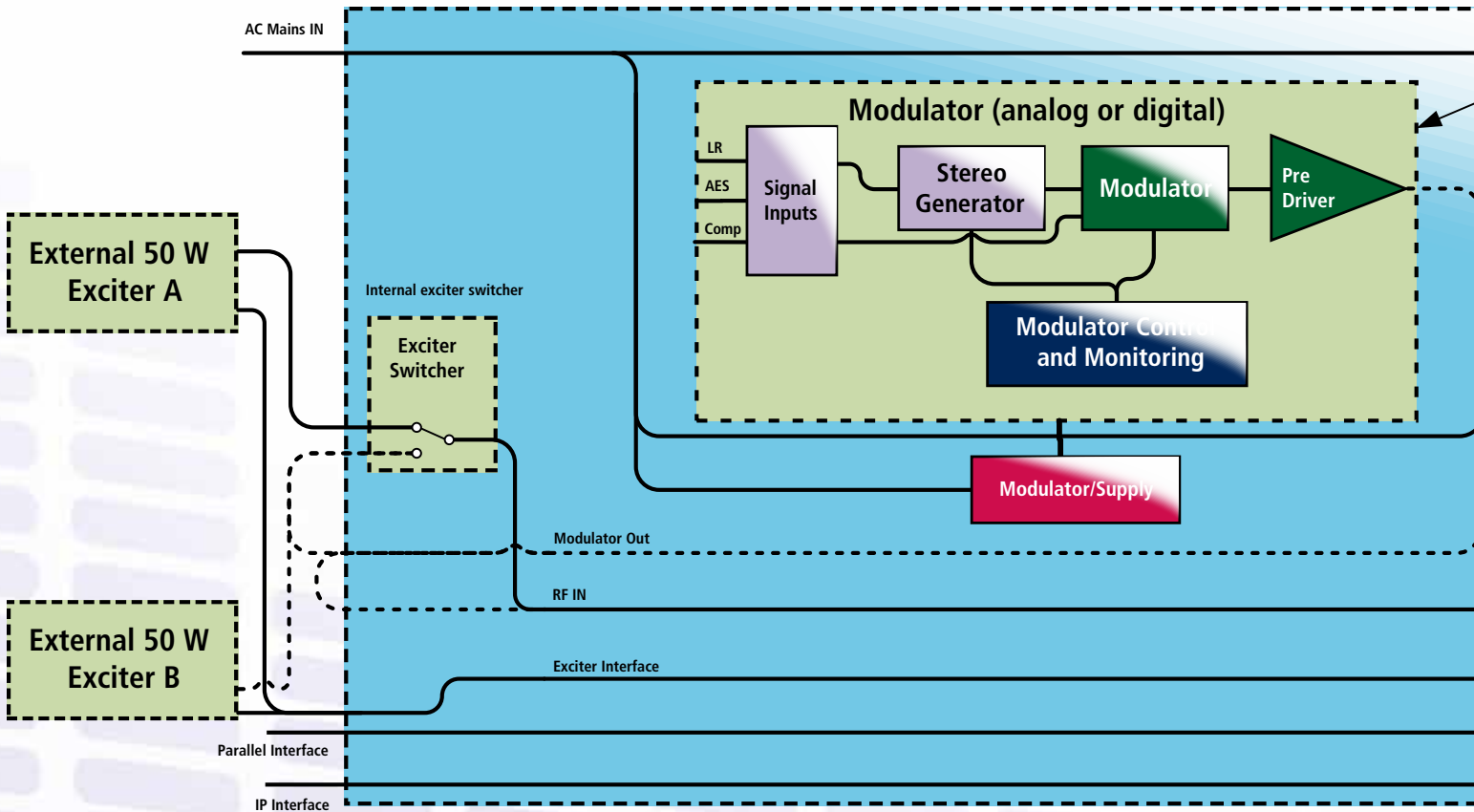
Support includes telephone technical assistance 24 hours a day, seven days a week, as well as parts, training, full system design and implementation, and field maintenance contracts.



Flexiva Configuration

Each Flexiva transmitter combines an FM exciter and one or more amplifier bays — each with various configurations of PA modules to achieve the rated power.

The amplifier bays contain several major systems:

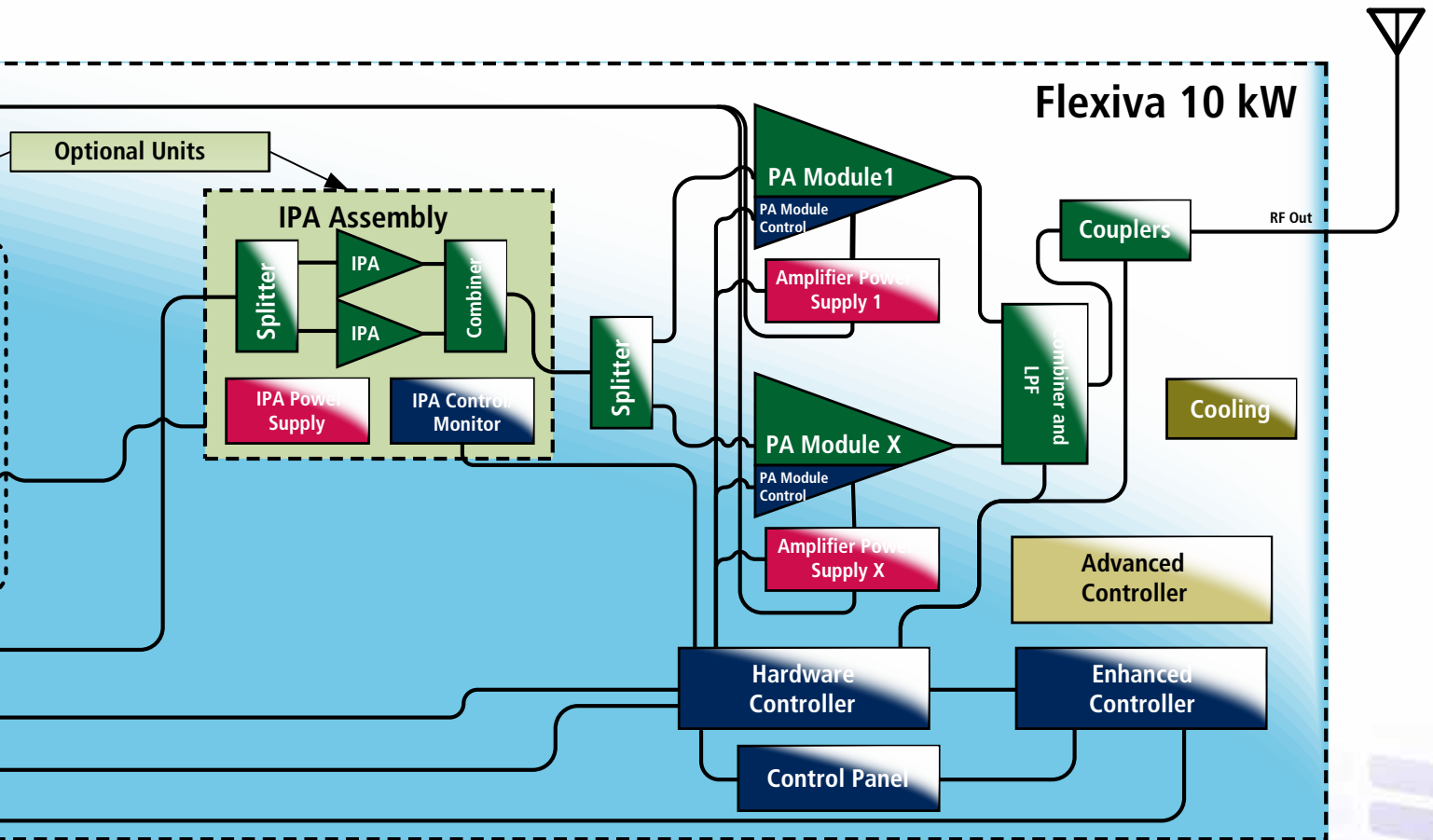


Power Amplifier

The hot-pluggable module features a pair of broadband (88-108 MHz) RF PAs that require no user adjustments. The PA modules are identical and fully interchangeable in each Flexiva transmitter. Each amplifier can be re-biased on the fly for operation in FM, FM + HD Radio and HD Radio only or DRM+ mode.

Power Supply

The hot-pluggable module is a 2400 W 48 V PS with a .98 power factor and mains input range of 90-264 V. The PS interface provides on/off functionality to the power supplies, a fan tachometer alarm and redundant feed to the cooling system. Each module also has +5 V output to redundantly drive the low-voltage control circuits and 1:1 power supply to power amplifier redundancy. Each 48 V power supply's output is also fed to the dual IPA for maximum redundancy.



Cooling System

The air cooling system includes internal redundant fans that pull cool air from the front through a removable filter, allowing exhaust to exit through the rear of the transmitter. Systems integrated in Harris cabinets feature top exhaust to support ducting and optionally can have ducted air input plenum to permit top, bottom or rear air input.

Control System

Featuring extensive protection and control capabilities, the main system control is located in the Flexiva amplifier bay and communicates with the exciter for mode switching. Each PA module has dedicated control and monitoring to support on/off functionality and alarms for reflected power, temperature and current overloads. The control systems also provide for remote access via parallel, SNMP and Web-enabled GUI.

ONE Company for Workflow Solutions Throughout the Media Chain

Harris is the ONE company delivering interoperable workflow solutions across the entire media delivery chain — providing today's broadcaster with a single, integrated approach to capitalize on the benefits of IT and mobile applications. By providing unparalleled interoperability across our product portfolio, Harris is able to offer customers integrated solutions that improve workflows, save money, enable new revenue streams and provide a migration path to emerging media business models. To meet the evolving needs of broadcast, distribution, government agencies and entertainment businesses, Harris is the ONE answer for change.

Service And Support

At Harris, we are committed to customer service excellence. It is our goal to provide the highest level of support by applying a simple rule: We take ownership of helping our customers succeed. Our support teams consist of innovative technical experts who support all situations regarding product performance, integration and operational processing. We are adept at providing proven solutions, making workflows better and ensuring reliability of the product and system. At Harris, our experienced and dedicated teams stand ready to help you meet your goals for premium product performance, 100% up-time and reduced maintenance investment.

Warranty

Because we want to assure you that Harris stands beside its products and system solutions, our products carry a standard set of warranty services, which are competitive with — and in some cases outperform — others in the industry.

Service Packages

We offer value-add 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 All-Inclusive OnePak, or by selecting individual services from our extensive portfolio. Our service and support advisors can assist in the selection of the individual services that best suit your requirements.

North America	+1 800 231 9673
Caribbean and Latin America	+1 786 437 1960
Europe and Africa	+44 118 964 8200
Middle East and South Asia	+971 4 433 8250
Asia, Pacific Rim	+852 2776 0628

For more information, please visit broadcast.harris.com/Radio.

Harris is a registered trademark of Harris Corporation. Trademarks and tradenames are the property of their respective companies.



Broadcast Communications Division
9800 South Meridian Boulevard, Suite 300 | Englewood, CO USA 80112 | Tel: +1 303 476 5000
broadcast.harris.com

©2012 Harris Corporation
BR_FLEXIVA_0412