HARRIS®

3DX®

25, 50 and 100 kW AM Transmitters

HD Radio®

3DX®

Performance, Efficiency and Reliability

Harris® 3DX® digital solid-state AM transmitters—available in 25, 50 and 100 kW models—feature Direct Digital Drive (3D) high-power technology for improved signal linearity.

This technology enables a range of functional enhancements, including the elimination of the RF driver. The result is a streamlined design, enhanced power efficiency and greater reliability, which translates into reduced costs of operation.

Complete Internet Protocol (IP)-based control and monitoring of 3DX transmitters in any location is possible by using the Harris WEB Remote system tied to the station's LAN or directly to the Internet. All 3DX transmitters are digitally modulated, making the transition to DRM™ or HD Radio™ effortless. Simply add the appropriate exciter, and 3DX is on the air in digital broadcast mode.

HD Radio is a trademark of iBiquity Digital Corp.

3DX Features

- Harris Direct Digital Drive modulation technology improves signal linearity, reliability and provides overall efficiency of 88%.
- Harris Digital Serial Adaptive Modulation (DSAM) makes the 3DX virtually auto-servicing.
- Hot-pluggable power amplifiers enable service while the transmitter is on the air.
- Optional dual digital exciters, low-voltage power supplies, binary amplifiers and binary amplifier power supplies with automatic switchover deliver unmatched redundancy

3DX

A Family of Features

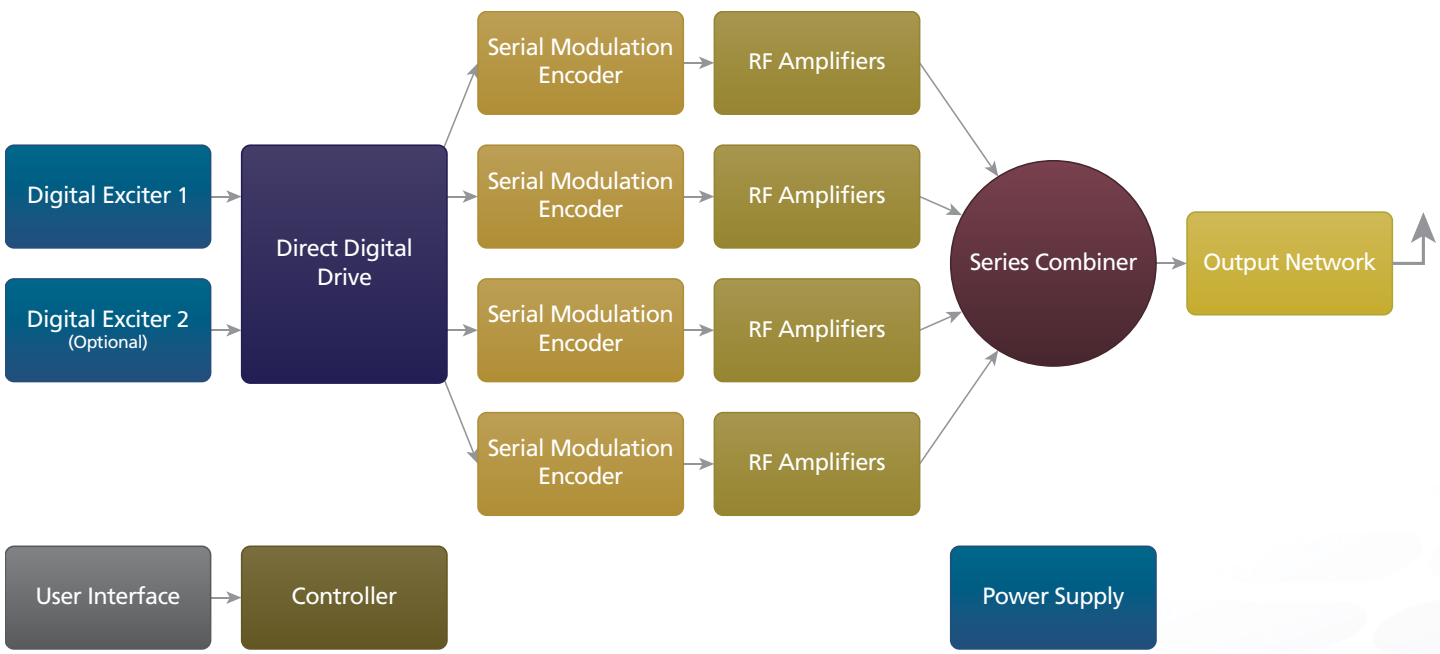
Intelligent User Interface
IntelliStat—the ultimate in control and diagnostic user interfaces--with internationally identified control buttons, a status panel with selectable metering and ¼ VGA color display provides all critical control and status parameters.

Reliable
Digital Serial Adaptive modulation (DSAM) continuously monitors each serial modulation encoder and RF PA module, and makes automatic module reassignment.

Digital Exciter
The 3DX 25, 50, and 100 exciters use Direct Digital Drive to accurately produce the RF signal. A low-level digital signal drives the PAs, eliminating the RF driver section for enhanced efficiency, easy frequency changes, and improved signal linearity and bandwidth for digital broadcasting.

Safety
3DX transmitters are IEC215 compliant. The 3DX100 offers a high level of safety with keylocks, ensuring that AC mains are disconnected while DC supply and RF outputs are mechanically earthed before access is allowed.

Serial Modulation Encoder
Each encoder provides the direct drive to 16 RF power amplifier modules, which are turned on or off to produce the modulated RF signal. All serial modulation encoders are interchangeable with the auto-servicing feature.



RF Power Amplifiers

These modules are protected from over-temperature, loss of RF drive, loss of power and shorted RF output conditions, and are hot-pluggable for on-air servicing. These modules are made of simple construction with easy access to the individual RF output transistors.

RF Combiner

Output from RF power amplifiers is summed in a simple, field-proven combiner. The combiner assembly is readily accessible from the rear of the transmitter, and allows individual RF motherboards to be easily removed.

Output Network

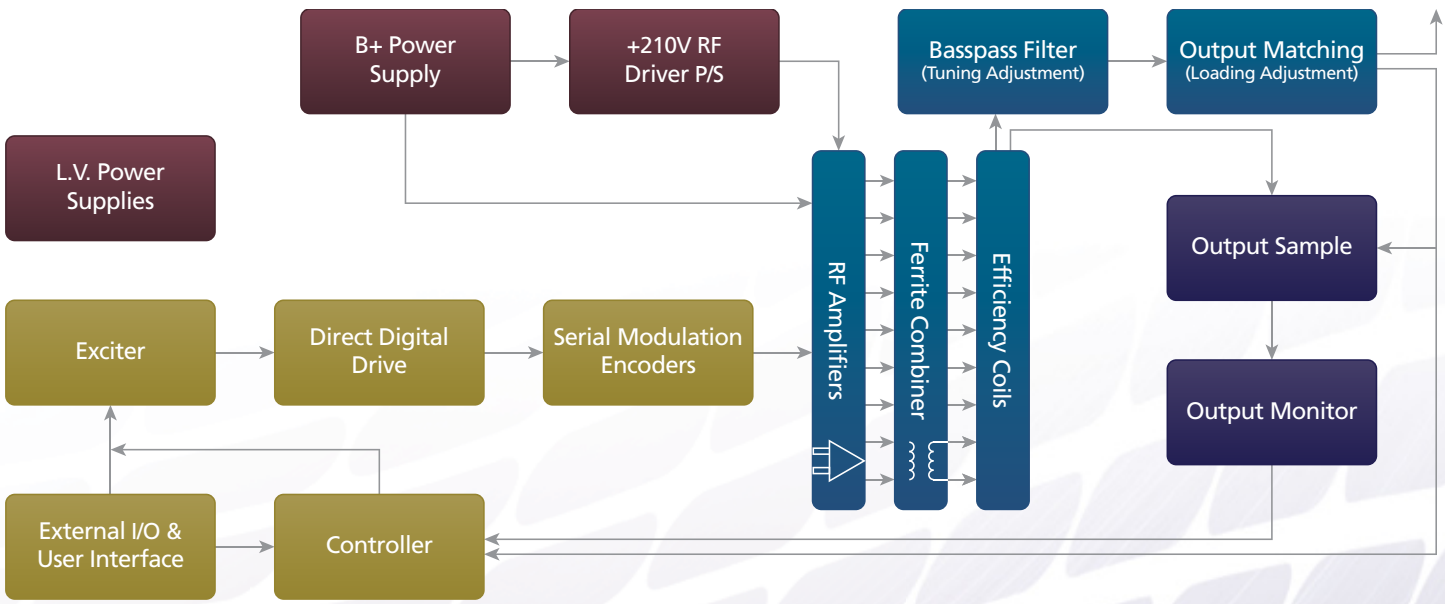
The output network ensures the transmitter is properly matched into a 50 ohm antenna. The internal bandpass filter provides VSWR protection and improves turnaround loss. The transmitter uses a minimum of frequency-determined components for ease of frequency changes in the field. A VSWR detector, carbon arc gap, arc detector and static drain choke are all provided for protection against lightning and static electricity.

Main Power Supply

Voltage soft start protects the transmitter when it is turned on and eliminates separate step-start/run contractors and resistors. The power supply tolerates AC line fluctuations of +/-5% (full performance) and +10/-15% (operational).

Simple Migration to Digital

3DX transmitters were built for digital broadcasting standards. To migrate to digital broadcast, simply connect the appropriate digital modulator (HD Radio™ or DRM™) to the inputs of the 3DX transmitter.



Harris AM Transmitter Power Reduction Algorithms

U.S. Broadcasters: Take Advantage of Energy-Saving MDCL Technology

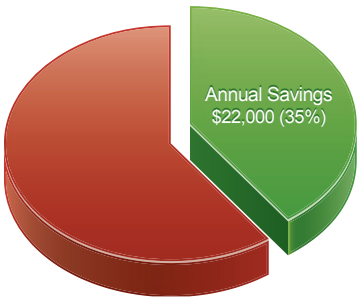
Power efficiency is an extremely important factor for broadcasters, both in dollars spent annually on energy consumption and the ever-growing need to be environmentally conscious. Harris® Power Smart® technology continues to deliver energy-savings for broadcasters, and the company now extends Modulation Dependent Carrier Level (MDCL) power reduction algorithm technology to AM transmitter customers in the U.S.

Harris offers two distinct MDCL algorithms for its AM transmitters — **Adaptive Carrier Control (ACC plus) and Amplitude Modulation Companding (AMC plus)** — enabling broadcasters to choose the solution that best fits their individual needs. These power-reducing algorithms have been used on Harris transmitters for international customers since 1993.

Why is This Now Being Introduced in the U.S.?
Recognizing the trend toward higher energy costs, the FCC delivered Public Notice DA 11-1535 on September 13, 2011. This notice acknowledges the benefits of algorithms (termed MDCL by the FCC) that are used to reduce AM carrier power under-modulation and the potential savings for broadcasters. The significance of notice DA 11-1535 is that it allows the implementation, via waiver, of MDCL algorithms by U.S. broadcasters, enabling them to start saving significant dollars in energy costs.

AM licensees who wish to implement MDCL technology shall file with the Audio Division a letter requesting waiver of Section 73.1560(a) of the rules, addressed to:

MDCL Waivers
Federal Communications Commission
Audio Division, Media Bureau
445 12th Street SW, Room 2-B450
Washington, DC 20554



Significant Savings Can Be Achieved
50kW AM Transmitter
Potential Annual Energy Savings
with ACC+/AMC+ 0.10 kW/hr rate,
8760 hours

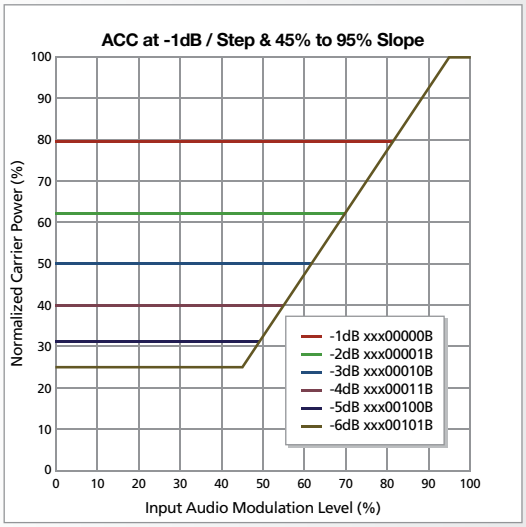
How Green Can Your Transmitters Be?
While the actual power savings is dependent upon the audio content and audio processing, real-world savings of up to 35% have been achieved, resulting in significant dollar savings for the broadcaster.

ACC plus and **AMC plus** both reduce AM carrier power as a function of modulation level, resulting in significant energy savings. ACC plus reduces the carrier level during segments when audio modulation levels are low, while AMC plus reduces the carrier level during segments when modulation levels are high. Determining which algorithm will work best for a particular broadcaster will be dependent on the format of the station (i.e., talk vs. music), the audio processing and personal preference. There are graphs on the next page showing how each algorithm reduces carrier power based on modulation level. ACC plus can be set up to reduce power in 1dB steps from -1 to -6dB as modulation levels decrease, while AMC plus will reduce carrier power by 3dB at 100% modulation.

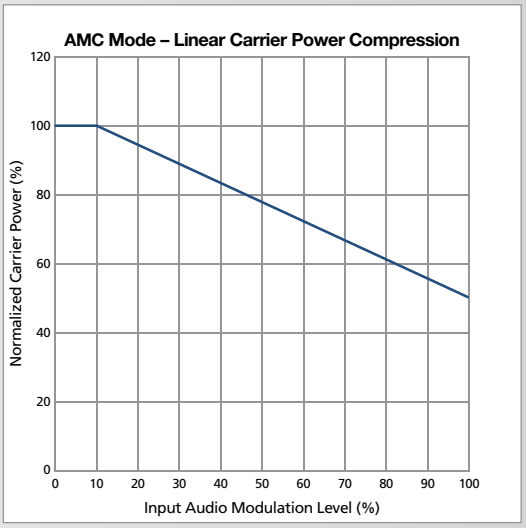
What About HD Radio™?
Initial tests have shown that MDCL technology, and in particular the ACC plus and AMC plus algorithms implemented by Harris, are compatible with hybrid IBOC transmission — including full compliance with the AM IBOC spectral mask requirements. The National Radio Standards Systems Committee created a sub-committee to investigate the effects of these algorithms on the AM IBOC signal and receiver performance. Testing with several types of receivers is underway, and the FCC will permit AM stations broadcasting in hybrid AM IBOC mode to implement these energy-saving algorithms, provided the AM IBOC signal continues to comply with the spectral emissions mask and that the relative level of the analog signal to the digital signal remains constant.

How Can I Take Advantage of ACC plus or AMC plus?

Either of these energy-saving algorithms can be implemented on Harris DAX™, DX® and 3DX® transmitters. AMC plus or ACC plus can be installed on existing transmitters operating in the field or can be factory-installed on new transmitter orders. When upgrading an AM transmitter in the field, the upgrade kit will contain the necessary board assembly, instructions and software chips that allow the broadcaster to implement either energy-saving algorithm based on their preference. To start saving significant dollars in your energy bill, contact your Harris salesperson today.



Typical Example of ACC Characteristics Curve



Typical Example of AMC Curve Graph

What if I Need Help?

For broadcasters unfamiliar with MDCL technology, unclear on how ACC plus and AMC plus work or with questions on how to upgrade an AM transmitter, Harris offers standard package for a full on-site installation and setup in the continental U.S. For upgrades and installation outside the continental U.S., please contact your Harris salesperson to obtain a quotation for a complete upgrade.

Why Harris?

- ACC plus and AMC plus are proven ways to reduce energy consumption up to 35%, resulting in significant dollar savings.
- Harris has a proven track record of success, providing ACC plus and AMC plus systems to international customers since 1993.
- Optimum flexibility is provided in the implementation of MDCL algorithms with ACC plus and AMC plus.
- Harris DAX, DX and 3DX AM transmitters can be upgraded with either algorithm in the field or the technology can be factory-installed on new transmitters.
- Harris continues to be intimately involved with testing on AM transmitters in the U.S. and with HD Radio compatibility testing.

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.

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