

Flexiva DAX™

1 to 6 kW AM/IBOC - HD Radio/DRM Transmitter Family



The Flexiva DAX™ transmitters deliver high-quality, solid design in the 1-6kW range.

Accurate digital signal reproduction with low bit error rate is essential to maximizing digital coverage. That is why our engineers specifically designed Flexiva DAX transmitters to not only deliver exceptional linearity and bandwidth but to also deliver the cleanest analog sound in this power range and provide the most accurate reproduction of the HD Radio signal in the low power ranges.

Flexiva DAX Transmitters use the WEB Remote System, tied to the station's LAN or directly to the Internet, to provide IP based control and monitoring.

Flexiva DAX performs with a high-efficiency modulation technique called Digital Adaptive Modulation. This technology uses a digitally generated AM waveform with DSP based adaptive correction to give the user a high performance transmitter in a cost-effective platform. Digital Adaptive Modulation samples the modulated output and dynamically corrects for non-linearity. The result is the cleanest, purest analog or digital (DRM or HD Radio) signal in this power level.

The Flexiva DAX™ family is made up of four different AM/HD/DRM transmitters, which provides superior HD Radio™, DRM™, and analog performance.

Product Features

- Ready for Digital
- 50 kHz broadband modulator for exceptional linearity
- Lightweight main chassis
- Compact, 16 RU rack-mount design
- Hot-spare redundancy at 1 kW (Flexiva DAX-1R only)
- Extensive diagnostics and fault reporting
- Unsurpassed factory support – 24/7

Options

- Adjustable Output Matching Network
- Spare Parts Kits
- Factory Training

Product Details

An unmatched high-performance modulation solution

The Flexiva DAX uses GatesAir's new wide bandwidth and high-performance modulation technique called Digital Adaptive Modulation. Designed to provide the linearity demanded by digital transmission, Digital Adaptive Modulation uses a digitally generated AM waveform with DSP-based adaptive correction, giving users a high performance transmitter in a cost effective platform. This technology enables sampling of the transmitter output, and corrects for load-induced distortion. Reduced distortion and noise translates to cleaner sounding analog, and extended digital coverage.

Exceptional transmitter reliability and serviceability

The Flexiva DAX features a modular architecture and "hot-swappable" PA modules that enhance reliability as well as provide on-air serviceability. The Flexiva DAX-5/6 occupies less than 24 x 34 inches of floor space, yet no compromises were made to provide easy access to all components and user connections. The Flexiva DAX-1 and DAX-3 are rack mount transmitters (16RU), ideal for installations where space is premium.

Intelligent user interface designed for low power transmission

The Flexiva DAX is designed with extensive diagnostic, control and lower-stage metering capabilities. The software-driven dot matrix display allows for easy control and monitoring of the Flexiva DAX and provides parameter metering, status, fault log retention and a set-up/configuration menu.

A cost-effective and flexible migration path

The Flexiva DAX provides a cost-effective solution for the HD Radio transition. With the Flexiva DAX, users can broadcast a clean analog signal now and can easily make the transition to digital by simply adding a GatesAir DEXSTAR® HD Radio exciter, which can be mounted right in the Flexiva DAX cabinet or rack.

A complete end-to-end solution

Only GatesAir can provide everything that is needed for a smooth transition to digital radio—anything from source to studio, and STL HD to transmission. And our systems team is available to help put together the system that makes the most sense for any operation—for now and in the future.

DEXSTAR® Exciter (Optional)

DEXSTAR® generates the required IBOC magnitude and phase signals to drive the Flexiva DAX transmitter directly through dedicated IBOC inputs, and provides the necessary diversity delay to the analog signal. The DEXSTAR can be integrated into the Flexiva DAX transmitter cabinet, eliminating the need for separate extra deep rack space. It also features an all-XLR Audio I/O, all BNC RF I/O, and an intuitive GatesAir graphical user interface. These enhancements allow for maximum performance and functionality.

The DEXSTAR is available with the exclusive ePAL® option. ePAL provides the required synchronization and sample rate conversion to the incoming STL signal, DEXSTAR audio bypass switching, and digital audio distribution.

The DEXSTAR-AM also features:

- Remote control of digital carrier on/off and day/night setups
- A standard internal GPS receiver which provides stable and accurate time reference for all subassemblies
- Easy operation locally or remotely with our exclusive Graphical User Interface (GUI)
- Extensive diagnostics with automatic fault-logging for troubleshooting

Another benefit of the DEXSTAR is the investment security that comes with GatesAir technology. We have delivered more DTV exciters than all of its competitors combined. We have also provided HD Radio equipment for major HD Radio field tests.



Specifications

Specifications and designs are subject to change without notice

Flexiva DAX-1/3 - 1 or 3 kW AM/IBOC Transmitter Specifications	
General	
Type of Modulation	GatesAir Digital Adaptive Modulation (Patent pending)
Transmitter Type	Medium wave, 100% solid state
Power Output Range	Flexiva DAX-1: 5 W to 1.15 kW Flexiva DAX-3: 15 W to 3.4 kW Five adjustable power levels are provided
Frequency Range	529 kHz to 1705 kHz. Supplied, tuned, and tested on one frequency as specified Direct, digital, synthesized (DDS) in 1 kHz steps
AC Mains Input	Standard: Single phase 220 to 240 VAC, 50/60 Hz
Power Supply Variation	±5% voltage, ±3 Hz frequency for full performance +10/-15% voltage transmitter operational
Output Power Regulation	Less than 1% for all power line voltage variations
Transient Protection	Meets ANSI/IEEE C62.41-1980 requirements; includes high energy MOVs
Frequency Stability	±2 PPM over frequency range and temperature range 0 to 50° C Higher stability available with external 10 MHz reference Optional internal precision frequency reference
Audio Input	-10 to +10 dBm, adjustable transformerless input; 600 and 10k terminators provided
Dedicated Digital (IBOC/DRM) Input	Magnitude: -10 to +10 dBm; Phase: 2 to 20 V pk-pk, remote switchable
RF Output	Flexiva DAX-1: Type 'N' Flexiva DAX-3: 7/8" EIA flange, bullet provided
RF Load	50 ohms, fixed, unbalanced, resistive
VSWR	1.3:1 for full rated power, no tuning required Cabinet and Harmonic Meets or exceeds FCC, IC, and/Spurious Radiation: other world standards
Overall AC RF Efficiency	73% or better at rated power output (0 to 100% sinusoidal modulation) 77% typical
Metering	9 parameters from front panel Additional diagnostics and metering through serial interface
Monitoring and Control	Parallel and serial (VT100) interface
Audio Performance	
Audio Frequency Response	+0.2/-0.8 dB at 90% or 95% modulation, 30 Hz to 10 kHz Reference: 1 kHz. No audio filter required
Total Harmonic Distortion+Noise	90% or 95% modulation, 30 Hz to 10 kHz, 1 kW (Flexiva DAX-1), 3 kW (Flexiva DAX-3): 0.7% or less; 0.15% typical 10% of rated power: 1.25% or less
Intermodulation Distortion	1% or less 1:1, 60/7000 Hz; SMPTE at 95% modulation 1.5% or less 4:1
Transient Intermodulation Distortion	0.6% or less at 85% modulation, 2.96/8.0 kHz, 4:1. 30 kHz bandwidth
CCIF Intermodulation Distortion	0.2% or less, 1:1 80/5000, 85% modulation
Squarewave Overshoot	1% or less, 400 Hz, 70% modulation. (No linear phase filter required, rise time limited to 50 (s or less)

Squarewave Tilt	0.5% or less at 40 Hz, 70% modulation
Carrier Shift	Less than 1% at 95% modulation at 1 kHz
Hum and Noise	-60 dB or better below 100% modulation (unweighted)
Incidental Quadrature	
Modulation	-38 dB at 1 kHz, 95% modulation; -45 dB typical
Positive Peak Capability	+145% or greater at 1 kW (Flexiva DAX-1), 3 kW (Flexiva DAX-3) audio program modulation, at $\pm 5\%$ mains voltage
Duty Cycle	Continuous 100% modulated sine wave at rated power
IBOC/DRM Compatibility	
Audio Frequency Response	+0.2/-1.2 dB, 30 Hz to 15 kHz, 90% or 95% modulation, ref 1 kHz
Audio Total Harmonic Distortion (THD+N)	0.8% or less, 30 Hz to 15 kHz, 90% or 95% modulation
Group Delay Variation	± 3 μ s, 200 Hz to 15 kHz, ref 1 kHz at 90% or 95% modulation
J3E Linearity Test	(Single Sideband suppressed carrier) -50 dB, 4/5 kHz equal amplitude tones -50 dB, 4/5 kHz 5 kHz -1 dB relative to 4 kHz -65 dB, 5/8 kHz 8 kHz -30 dB relative to 5 kHz
Service Conditions	
Power Consumption	Flexiva DAX-1 (Flexiva DAX-3): 1.3 kW (3.9 kW) or less typical at 1 kW (3 kW), 0% modulation; 2.0 kW (5.8 kW) or less typical at 1 kW (3 kW), 100% tone modulation
Ambient Temperature	0° C to 50° C; derate 2° C per 1,000 feet (305 meters) of altitude
Humidity Range	0 to 95% non-condensing
Altitude	Up to 13,000 feet (3962 meters)
Size (Rack Mount Chassis)	
(H x W x D)	16 RU, 28 x 19 x 22.75 in. (71 x 48 x 58 cm)
Size (Power Supply Transformer)	16 x 16 x 16 in. NEMA enclosure
Weight	(Rack Mount Chassis): Flexiva DAX-1: 100 lbs (45 kg) Flexiva DAX-3: 104 lbs. (47 kg) (Power Supply Transformer): Flexiva DAX-1: 97 lbs (44 kg) Flexiva DAX-3: 162 lbs. (74 kg)
Flexiva DAX-5/6 - 5 or 6 kW AM/IBOC Transmitter Specifications	
General	
Type of Modulation	GatesAir Digital Adaptive Modulation (Patent pending)
Transmitter Type	Medium Wave, 100% solid state
Power Output Range	Flexiva DAX-5: 25 W to 5.75 kW. Flexiva DAX-6: 25 W to 7.0 kW. Five adjustable power levels are provided
Frequency Range	529 kHz to 1705 kHz. Supplied, tuned, and tested on one frequency as specified Direct, digital, synthesized (DDS) in 1 kHz steps
AC Mains Input	Standard: 3-phase 197 to 251 VAC Optional: 3-phase 380 to 415VAC, Single phase 220 to 240 VAC, 50/60 Hz
Power Supply Variation	+5% voltage, +3 Hz frequency for full performance +10/-15% voltage transmitter operational
Output Power Regulation	Less than 1% for all power line voltage variations

Transient Protection	Meets ANSI/IEEE C62.41-1980 requirements; includes high energy MOVs
Frequency Stability	±2 PPM over frequency range and temperature range 0 to 50° C Higher stability available with external 10 MHz reference Optional internal precision frequency reference
Audio Input	-10 to +10 dBm, adjustable transformerless input; 600 and 10 k terminators provided
Dedicated Digital	
(IBOC/DRM) Input	Magnitude: -10 to +10 dBm; Phase: 2 to 20 V pk-pk, remote switchable
RF Output	7/8" EIA flange, bullet provided
RF Load	50 ohms, fixed, unbalanced, resistive
VSWR	1.3:1 for full rated power, no tuning required
Cabinet and	
Harmonic/Spurious Radiation	Meets or exceeds FCC, IC, and other world standards
Overall AC to RF Efficiency	77% or better at rated power output (0 to 100% sinusoidal modulation); 82% typical
Metering	9 Parameters from front panel Additional diagnostics and metering through serial interface Monitoring and Control Parallel and serial (VT100) interface
Audio Performance	
Audio Frequency Response	+0.2/-0.8 dB at 90% or 95% modulation, 30 Hz to 10 kHz. Reference: 1 kHz. No audio filter required
Total Harmonic	
Distortion+Noise	90% or 95% modulation, 30 Hz to 10 kHz, 5 kW (Flexiva DAX-5), 6 kW (Flexiva DAX-6): 0.7% or less; 0.15% typical. 2.25 kW: 0.8% or less 1.25 kW: 1.0% or less 500 W: 1.25% or less
Intermodulation Distortion	1% or less 1:1, 60/7000 Hz; SMPTE at 95% modulation. 1.5% or less 4:1
Transient Intermodulation Distortion	0.6% or less at 85% modulation, 2.96/8.0 kHz, 4:1. 30 kHz bandwidth
CCIF Intermodulation Distortion	0.2% or less, 1:1 80/5000, 85% modulation
Squarewave Overshoot	1% or less, 400 Hz, 70% modulation. (No linear phase filter required)
Squarewave Tilt	0.5% or less at 40 Hz, 70% modulation
Carrier Shift	Less than 1% at 95% modulation at 1 kHz
Hum and Noise	-60 dB or better below 100% modulation (unweighted)
Incidental Quadrature Modulation	-38 dB at 1 kHz, 95% modulation; -45 dB typical
Positive Peak Capability	+145% or greater at 5 kW (Flexiva DAX-5), 6 kW (Flexiva DAX-6) audio program modulation, at ±5% mains voltage
Duty Cycle	Continuous 100% modulated sine wave at rated power
IBOC/DRM Compatibility	
Audio Frequency Response	+0.2/-1.2 dB, 30 Hz to 15 kHz, 90% or 95% modulation, ref 1 kHz
Audio Total Harmonic Distortion (THD+N)	0.8% or less, 30 Hz to 15 kHz, 90% or 95% modulation
Group Delay Variation	±3 uS, 200 Hz to 15 kHz, ref 1 kHz at 90% or 95% modulation

J3E Linearity Test	(Single Sideband suppressed carrier) -50 dB, 4/5 kHz equal amplitude tones -50 dB, 4/5 kHz 5 kHz -1 dB relative to 4 kHz -65 dB, 5/8 kHz 8 kHz -30 dB relative to 5 kHz
Service Conditions	
Power Consumption	Flexiva DAX-5 (Flexiva DAX-6): 6.1 kW (7.3 kW) or less typical at 5 kW (6 kW), 0% modulation; 9.1 kW (11.0 kW) or less typical at 5 kW (6 kW), 100% tone modulation
Ambient Temperature	0 to 50° C; derate 2° C per 1,000 feet (305 meters) of altitude
Humidity Range	0 to 95% non-condensing
Altitude	Up to 13,000 feet (3962 meters)
Size (H x W x D)	72 x 23.2 x 34 in. (183 x 59 x 86 cm)
Weight	725 lbs. (329 kg)
<p>NOTES</p> <p>All measurements made into test load at rated power, unless otherwise indicated, with adaptive correction circuits enabled.</p> <p>Noise may degrade if AC lines are unbalanced.</p> <p>Audio performance measurements made with standard audio input, no special filters required to obtain these specifications.</p>	

