Maxiva M2X™

Multimedia Exciter for
Global Digital and Analog Standards

The Maxiva M2X™ multimedia exciter is a state-of-the-art, software-defined exciter that provides broadcasters with a wide range of benefits and flexibility for their transmission systems. The M2X enables analog broadcasters to transition to digital via a simple software update and DTV broadcasters to recognize the full features and functionality of HDTV, DTV and mobile TV channels. This world-class exciter provides a flawless digital signal with complete technical and regulatory compliance for all digital and analog transmitters.

The Maxiva M2X supports a wide range of global digital standards, including ATSC, ATSC MDTV, DVB-T/ H, DVB-T2, ISDB-Tb, DAB/DMB, CMMB, CTTB and a range of analog TV standards, including NTSC and PAL. And you can have confidence in your investment knowing that GatesAir digital exciters have logged more hours in real-time broadcast than all others combined.

Product Features

- Real-Time Adaptive Correction (RTAC™)
- Digital adaptive group delay equalization
- Optimized correction for tube and solid-state transmitters
- Frequency agility – Band I, III, IV, V (L-Band option available)
- Built-in GPS option for synchronous frequency network (SFN) support
- Built-in UPS option to support vital frequency-critical components for SFN operation
- Space-saving, 2RU design
- Easy-to-use operator interface via standard Web browser and external PC
- SNMP information available to higher-level agent
- Dual video or transport stream inputs with autoswitching
- Built-in compliance monitoring (limited suite)
- Seamless integration with new GatesAir transmitter control systems
- Standard support for legacy or third-party transmitters

Product Details

Investment Security Based on Unrivaled Digital Experience
Transitioning to digital and delivering mobile content require more than a financial investment. It's a whole new technical ballgame, and you want to make the right decision. As broadcast's DTV and digital radio transmission leader, GatesAir has developed a solid core competency backed by years of experience in the technical areas essential for maximum digital transmission performance. We have applied this expertise and provided transmitters for every major standards test, so you can be confident of your investment.

The RTAC Advantage
For digital operations, the exclusive Real-Time Adaptive Correction (RTAC) technology incorporated in the Maxiva M2X enables the exciter to more fully utilize the transmitter power amplifier, yet maintain spectral mask compliance of the digital signal. The only system with simultaneous, linear and nonlinear, adaptive, memoryful precorrection, RTAC provides the highest level of correction to all types of RF amplifiers. With RTAC, the Maxiva M2X exciter continuously monitors transmitter output and any filter, while automatically adapting for system nonlinearities — keeping your station well within compliance and maximizing the transmitter's performance.

Prepared for a Multimedia Future
Every day it seems like a new global digital standard emerges. The Maxiva M2X has been specifically designed to tackle a wide range of global standards.

Migration Flexibility
If you are ready to purchase a new transmitter, but not quite ready for digital operation, you can purchase a digital-ready transmitter along with an Maxiva M2X analog exciter today — and simply add an encoder and multiplexer when you are ready to start a digital operation. The Maxiva M2X is the only system that provides a seamless upgrade path with the power of RTAC.

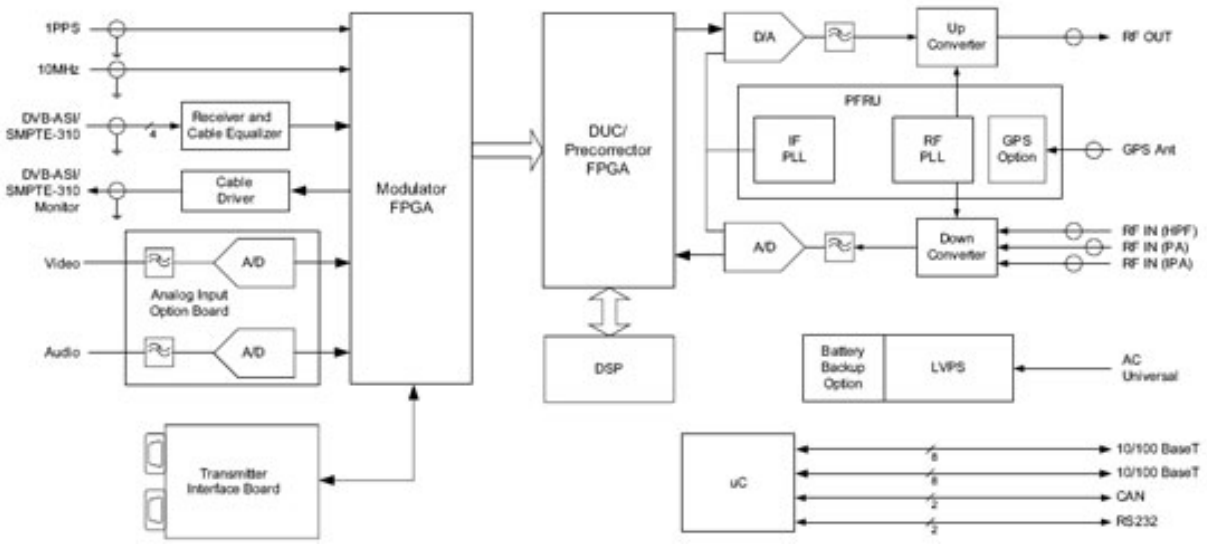
Cost-Efficient, Precorrection Technology
The Maxiva M2X with proprietary RTAC precorrection circuitry enables transmitters to provide linear amplification with seamless content delivery at higher power levels. RTAC technology also increases efficiency for ongoing power savings, while comfortably exceeding the RF mask requirements to prevent signal interference.

Compliance Monitoring Integration
The Maxiva M2X is built on a legacy of integrated compliance monitoring. In addition to the standard 8VSB monitoring, Maxiva M2X provides a set of integrated monitoring tools for coded orthogonal frequency division multiplexing (COFDM) digital and mobile standards. These tools provide solid measurement of many digital parameters to ensure the transmitter is working in compliance within your network. These basic measurements help reduce equipment costs and allow you to feel confident that your system is operating properly.

Built-In GUI Interface
The graphical user interface (GUI) in the Maxiva M2X works with any Windows® PC running a standard web browser. The interface enables in-depth monitoring and easy setup.

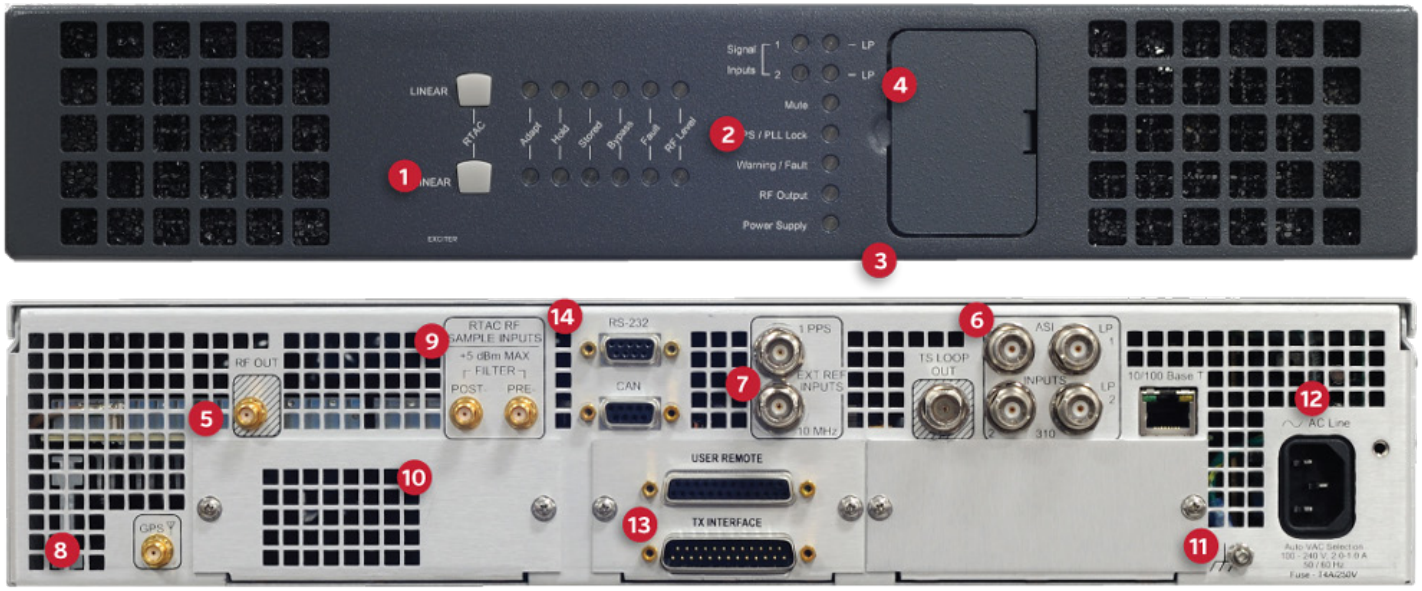
Images / Diagrams

Functional Diagram



Images / Diagrams (cont.)

Front and Back Panel



1. **User Control** — Straight-forward tactile control and intuitive indicators allow for quick status and control or RTAC.
2. **Status Monitoring** — Front-panel indication of key operating parameters for quick status assessment. Additional indicators note the status of the rear-panel digital inputs to provide confidence regarding the status of the backup sources.
3. **Front-Panel Ethernet** — Convenient front-panel Ethernet port permits quick system updates, or setup. All parameters are available via the intuitive standard GUI interface.
4. **Sample Outputs** — Convenient front-panel connections for RF sample, and both 10 MHz and the 1 PPS signals, for quick connection to test equipment as needed.
5. **RF Output** — Main high-level output of the amplifier provides 100 to 150 mW of power depending on the mode of operation.
6. **Dual Switching Inputs** — Dual ASI (with high and low priority) or SMPTE 310 inputs for seamless backup switching and an isolated monitor output for confidence monitoring.
7. **External Reference Input** — Support for single-frequency networks (SFNs) is included with every Maxiva M2X. Supports both 10 MHz and 1 PPS inputs.
8. **Integrated GPS Receiver** — Optional high-quality integrated GPS receiver provides ultra-accurate reference for seamless SFN operation and reduces installation costs and space.
9. **RTAC RF Samples** — RTAC monitors both the output of the transmitter and the output of any filters or multi-station combiners to optimize your station's performance for maximum clarity and coverage.
10. **RF Input** — Optional input for an off-air signal to support operation as both a transposer or translator, and for on-channel GAP filler system in SFN networks or DVB-S satellite receiver.
11. **Analog Inputs** — Optional dual analog inputs support a wide range of standards including NTSC and PAL systems, with built-in NICAM stereo operation and support for external BTSC generators.
12. **Ethernet Connectivity** — RJ-45 connector provides system 10/100Base-T Ethernet connectivity to the Maxiva M2X to facilitate diagnostics, monitoring and system updates.
13. **Parallel Remote Control** — Dedicated DB-type connectors provide standard interfacing for transmitter control system connections.
14. **Serial Connectivity** — Multiple communications ports provide standard connectivity including CAN and RS232.

Specifications

Specifications and designs are subject to change without notice

General		
RF Output Connector	1 SMA, 50 ohms	
RF Input Samples for Adaptive Correction	2 SMA, 50 ohms dynamic range: –20 to +10 dBm	
Frequency Range	Band I, III, IV, V, L-Band (option)	
Transport Stream Inputs	• 2 BNC, 75 ohms, configurable as DVB-ASI or SMPTE 310M • 2 BNC, 75 ohms, additional for DVB-ASI hierarchical modulation	
Analog Video Input (option)	2 BNC, 75 ohms	
Audio Input (option)	2 x 5-pin XLR, 1 BNC, composite (BTSC/NICAM)	
Back Porch/Sync and Timing Output	1 BNC, 75 ohms	
10 MHz Reference Input	1 BNC, 50 ohms	
1 PPS Reference Input	1 BNC, User Selectable 50 ohms or Hi-Z termination	
10 MHz Reference Output	1 BNC, 50 ohms, front access	
1 PPS Reference Output	1 BNC, 50 ohms, front access	
Ethernet	• 1 front, DHCP-enabled customer access • 1 rear, transmitter network backbone interface (SNMP)	
GPS Antenna Input (option)	1 SMA, 50 ohms	
RF Monitor Output	1 SMA, 50 ohms, front access	
AC Power Input	100 to 240 VAC, 47 to 63 Hz, auto-ranging	
Environmental	32° to 122° F (0° to 50° C) up to 14,764 ft (4,500 m) AMSL, de-rate 35.6° F (2° C) per 984 ft (300 m) of elevation 95% relative humidity, non-condensing	
Physical	19 in. EIA rack standard, 2RU high, 19 in. depth	
ATSC		
Standards	ATSC A/153, A/153, A/110:2011	
Maximum Power Output	100 mW average	
Regulation of Output Power	<0.25 dB	
Pilot Frequency Stability	• ±150 Hz/month without PFC • <0.5 Hz per 1% supply variation • <50 Hz over ambient temperature range • <100 Hz at 5 minutes during warmup	
Pilot Frequency Offsets[1]	Any frequency within band plan, 2 mHz resolution	
Response Variation	0.2 dB, typical	
Group Delay	2 ns, typical	
Phase Noise	<104 dBc/Hz @ 20 kHz offset (ATSC A/64)	
Spurious Output[2]	In Band	-68 dB (-45 dB as measured in 30 kHz RBW)
	Adjacent Channels	-68 dB (-45 dB as measured in 30 kHz RBW)
	All Others	-40 dB
Signal-to-Noise Ratio	35 dB, typical	

Note: [1] High-stability external 10 MHz reference or optional built-in GPS required for PFC
[2] Signals referenced to center channel, at rated output, measured in 30 kHz RBW

DVB-T/H, DVB-T2, DAB, ISDB-Tb, DMB-T/H		
Maximum Power Output	100 mW average	
Regulation of Output Power	<0.25 dB	
Pilot Frequency Stability	• ±150 Hz/month without PFC • <0.5 Hz per 1% supply variation • <50 Hz over ambient temperature range • <100 Hz at 5 minutes during warm-up	
Frequency Offsets[1]	Any frequency within band plan, 2 mHz resolution	
Response Variation	0.2 dB, typical	
Group Delay	2 ns, typical	
Phase Noise	10 Hz	<-55 dBc/Hz
	100 Hz	<-85 dBc/Hz
	1 kHz	<-90 dBc/Hz
	10 kHz	<-95 dBc/Hz
	100 kHz	<-112 dBc/Hz
	1 MHz	<-130 dBc/Hz
Spurious Output[2]	In Band	-68 dB (-45 dB as measured in 30 kHz RBW)
	Adjacent Channels	-68 dB (-45 dB as measured in 30 kHz RBW)
	All Others	-40 dB
Modulation Error Ratio	38 dB, typical	
Central Carrier Suppression	>75 dB relative to average power	
Out of Band Shoulders	>50 dB, uncorrected, at rated power	
Note: [1] High-stability external 10 MHz reference or optional built-in GPS required for PFC *[2] Signals referenced to center channel, at rated output, measured in 30 kHz RBW*		
Analog		
Transmission Standards	• B, G, M, N, D, K, I • NTSC/PAL	
Video Modulation	C3F neg.	
Audio Modulation	Sound Carrier 1	F3E; BTSC
	Sound Carrier 2	F3EH; NICAM 728
Video		
Number of Inputs	2	
Impedance	75 ohms	
Return Loss Up to 6 MHz	>34 dB	
Input Crosstalk	>70 dB	
Modulation		
Nominal Video Level	1 V pk-pk	
Video Gain Control Range	-3 to 6	
Gain Control Mode	Manual	
Sync Pulse Restoration	Yes	
Back Porch Clamping	Yes	
50 Hz Rejection	>33 dB	
Burst Phase Distortion	<0.5 dB	
Burst Amplitude Distortion	<1%	
White Level Limiter	5 to 25%	
Residual Carrier Adjustment	5 to 25%	

Linear Distortions	
Receiver Group Delay Correction	According to standard
Sideband Frequency Response	According to standard
Video Frequency Response	According to standard
Group Delay and Impulse Response Without Receiver Precorrection	60 pk-pk ns
Square Wave Distortion	50 Hz: <1%; 5 kHz: <1%; 250 kHz: <1%
Square Wave O/S	15 and 250 kHz: <1.5%
2T Pulse PB	<2%
K2T	<2%
20T Pulse K Factor	<2%
Chrominance to Luminance Delay	20 ns
Static Nonlinearity	0.99
Differential Phase	<±1°
ICPM	<0.5°
Video IM	<-52 dB
IM BT-TT1-TT2	<-68 dB
Audio	
Number of Inputs	2
Switching Criteria	Audio follows video
Input Resistance	
Hi Mode	>10 k ohms
Low Mode 600	±12 ohms
Common Mode Rejection	
40 to 300 Hz	>46 dB
Up to 15 kHz	>30 dB
Modulation Sensitivity	
30 kHz Deviation @ 500 Hz	0 to 12 dBu
Adjustment Steps	<0.1 dB
IRT Dual Carrier System Linear Distortion	
Amplitude Deviation 40 to 15 kHz	<±0.3 dB
Stereo Crosstalk	
Range	100 to 15 kHz @ 30 kHz
Deviation	<-32 dB
	40 to 100 Hz max 6 dB per octave
Channel Crosstalk	40 to 15 kHz >70 dB
Nonlinear Distortion	
Harmonic Distortion	40 to 15 kHz @ 50 kHz
Deviation	<0.5%
Unwanted Modulation	
Quasi-Peak Reference to 30 kHz Deviation	
Unweighted	<-58 dB
Weighted	<-62 dB
Asynchronous AM	<-46 dB
Synchronous AM	<-46 dB
Difference Carrier Noise	
Up to 100 kHz VF Weighted	<-44 dB