



Maxiva™ VAX Compact

Low Power VHF Band III TV/DAB
Transmitter / Transposer / Gap Filler



The Maxiva™ VAX Compact family of VHF Band III solid-state transmitters, transposers/translators and gap fillers (formerly Platinum™ VAX Compact Class) builds on the proven foundation of GatesAir low-power

systems and PowerSmart® technology. It provides today's digital broadcaster with a suite of compatible products to accommodate any coverage application, along with unmatched performance, reliability and quality.

Designed for digital broadcasting, the Maxiva VAX Compact is a platform available as a transmitter for DAB, DAB+ and DMB radio, or as transmitter, transposer or SFN gap filler configurations for DVB-T/H, DVB-T2, ATSC, ATSC-MDTV, and ISDB-Tb television networks. The VAX Compact is ideal for extending market coverage and filling in coverage gaps in challenging situations, including busy urban areas that require greater building penetration.

Maxiva VAX Compact covers low-power VHF transmissions in a 2RU chassis design, with rack savings of up to 50 percent compared to previous-generation transmitters of equivalent power levels. This product integrates Maxiva M2X™ exciter technology to enable simple modulation changes and analog-to-digital upgrades, providing broadcasters the highest level of performance and allowing fast setup time with Real Time Adaptive Correction (RTAC™). The shared modulation approach provides a common interface for Maxiva users, reducing training requirements.

The Maxiva VAX Compact provides pre-filter power levels up to 150 W (DAB/DAB+/DMB), 180W (ATSC), or 100W (COFDM). VAX Compact transposers/translators provide efficient and reliable re-broadcast of the received signal in a small and robust package. The gap filler configuration adds a powerful echo cancellation algorithm to deliver on-channel broadcast. This combination of products enables broadcasters to address any network coverage need.

Product Features

Maxiva VAX Compact Platform

- Power levels from up to 150W DAB/DAB+/DMB, 100W TV-COFDM, 180W ATSC
- Broadband, frequency agile design – VHF 168 to 242 MHz
- Built-in GPS option for Single Frequency Network (SFN) support
- Compact, space-saving, 2RU design
- Full remote control capability including:
 - Web-based HTML GUI interface
 - SNMP
 - Parallel control/monitoring

Transmitter

- Dual transport stream inputs with manual/auto switching
- Real-Time Adaptive Correction (RTAC)
- DAB, DAB+, DMB, DVB-T/H, DVB-T2, ATSC, ATSC-MDTV, ISDB-Tb modulations available

Transposer/Translator

- For all TV-COFDM and ATSC standards
- Digital, tunable RF input filter

SFN Gap Filler

- Powerful adaptive echo cancellation with up to 15 dB gain margin for exposed stations and difficult situations
- Very low processing delay, ideal for short guard intervals in COFDM
- Digital IF filter for maximum adjacent channel suppression
- Digital, tunable RF input filter

Product Details

Investment Security Based on Unrivaled Digital Experience

Transitioning to digital and delivering needed coverage require more than a financial investment — broadcasters must meet a whole new technical challenge. As broadcasting'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 developed transmitters for all digital standards, making the Maxiva VAX Compact a confident investment.

Seamless Migration Path to New Digital Standards

The Maxiva VAX Compact has been specifically designed for the wide range of global digital standards. Transmitters can be upgraded from one standard to another (for example, from DVB-T to DVB-T2 or ATSC to ATSC-MDTV), providing a clear, cost-effective and seamless upgrade path for stations or networks wishing to adapt to the changing world of modulation standards.

The RTAC Advantage

All transmitters in the Maxiva VAX Compact series use the reliable and field-proven GatesAir Real-Time Adaptive Correction (RTAC) technology, enabling optimum utilization of the power amplifier, while maintaining spectral mask compliance of the digital signal. The only system with simultaneous, linear and nonlinear, adaptive precorrection, RTAC provides the highest level of system correction capability. With RTAC, the Maxiva VAX Compact transmitter continuously monitors and corrects for linear distortions at the output

of the mask filter, while automatically adapting for amplifier non-linearity, keeping your station well within compliance and maximizing your coverage.

Cost-Efficient, Precorrection Technology

The proprietary RTAC precorrection circuitry of Maxiva VAX Compact family enables the 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.

GatesAir PowerSmart Technology Inside

Featuring PowerSmart technology in its transmitter architecture, the Maxiva VAX line offers superior power and efficiency. New 50-volt LDMOS device technology delivers a dramatic increase in power density, lower operating costs and reduced cost of ownership over the life of the transmitter.

Built-In GUI Interface

The graphical user interface (GUI) in the Maxiva VAX Compact transmitter works with any Windows® PC running a web browser (supports IE8 and higher, Firefox 3.6.x and higher.) The interface enables in-depth monitoring and easy setup. All Compact Class products also support SNMP monitoring to deliver real-time status to your network management system.

Specifications

Specifications and designs are subject to change without notice

| General | |
|---|--|
| RF Output Frequency Range | VHF Band III, 168 to 242 MHz, in 1 Hz steps |
| Transmission Standards | DAB, DAB+, DMB, ATSC, DVB-T, DVB-T2, ISDB-Tb |
| RF Channel Bandwidth | (System dependant) 1.5, 6,7, or 8 MHz |
| Rated Output Power (before mask filter) | <ul style="list-style-type: none">■ DAB/DAB+/DMB: Up to 150 Watts■ ATSC: Up to 180 Watts■ DVB-T/T2, ISDB-Tb: Up to 100 Watts |
| RF Power Stability | ±0.5dB |
| Output Power Reduction Range | 0 to -10dB |
| RF Load Impedance | 50 ohms |
| Operating Load VSWR | Up to 1.4:1 |
| Maximum VSWR | Protected against open or short circuit, all phase angles. Automatic VSWR foldback with user adjustable threshold. Factory preset to 1.4:1. |

| Inputs/Outputs | |
|-------------------------------|---|
| RF Output Connector | 1 x Type N Female, 50 ohms, rear access |
| RF Input Samples for Adaptive | 1 x SMA, 50 ohms; dynamic range: -20 to +10 dBm, rear access |
| TV Transport Stream Inputs | <ul style="list-style-type: none"> ■ 2 x BNC, 75 ohms terminated (50 ohms connector per ASI rec.), configurable as SPMTE 310M, DVBASI, or DVB-T2MI ■ 2 x BNC, 75 ohms terminated (50 ohms connector per ASI rec.), additional for DVB-ASI hierarchical modulation |
| DAB/DAB+/DMB Signal Inputs | ETI Input: BNC-female, user selectable 75 ohms or high impedance termination. 2x ETI (NI, G703) or 2x ETI (NA, G704), seamless input signal switch-over automatic optional EDI input: 10/100 Base T RJ-45, per ETSI TS 102 693 V1.1.2, 1 channel, UDP/DCP or TCP/DCP protocol |
| 10 MHz Reference Input | 1 x BNC, 50 ohms, rear access, -7 to +20 dBm, <20 dB return loss |
| 1 PPS Reference Input | 1 x BNC, 50 ohms, rear access |
| 10 MHz Reference Output | 1 x BNC, 50 ohms, front access |
| 1 PPS Reference Output | 1 x BNC, 50 ohms, front access |
| Ethernet | <ul style="list-style-type: none"> ■ 1 front, RJ-45, customer access ■ 1 rear, RJ-45, DHCP enabled network interface (SNMP) |
| Parallel Remote Control | 1 rear user remote |
| GPS Antenna Input | 1 x SMA, 50 ohms, rear access (optional) |
| RF Monitor Output | 1 x SMA, 50 ohms, front access |

| AC Power | |
|-----------------|--|
| AC Power Input | 110 to 230 V AC, auto-ranging, ±15%, 47 to 63 Hz |
| Power Factor | >0.96 (typical 0.98) |

| Environmental | |
|---------------------------------|--|
| Operational Temperature Range | 0° to 45° C (32° to 113° F) |
| Storage Temperature Range | -40 to +70° C |
| Relative Humidity | 0 to 95% |
| Altitude | Up to 3,000 m (9,843 ft) above sea level, derate 2° C (3.6° F) per 300 m (984 ft) of elevation |
| Cooling Method | Forced air-cooled, internal fans, airflow front to rear |
| Acoustic Noise | ≤65 dBa (front 1 m) |
| Physical Dimensions (H X W x D) | 2RU x 19 x 23 in. (44 x 483 x 584 mm) |
| Weight | 24.7 lbs (11.2 kg) |
| Shipping Weight | 30.0 lbs (13.6 kg) |
| Compliance | <ul style="list-style-type: none"> ■ RoHS 2002/95/EC ■ R&TTE 1999/5/EC ■ Safety: EN 60215 ■ EMC: EN 301-489-1 ■ FCC Part 73, A/53, A/110 ■ DVB-T: ETSI EN 300 744 ■ DVB-T2: ETSI EN 302 755 ■ Rusia GOST ■ Brazil ANATEL ■ CE Marked |

| DTV COFDM Transmitter | |
|------------------------------|--|
| Rated Output Power | 50 W and 100 W models available, measured before mask filter |
| Shoulder Level | <-42 dB (typical <-50 dB) |
| MER | >37 dB (typical >40 dB) |
| END (per ETR 290) | ≤0.5 dB |
| Frequency Stability | ±150 Hz/month without PFC/GPS (2.3 x 10 ⁻⁷) |
| Internal GPS | Option |
| GPS Back Up Time | 18.4 hours (maximum time drift 12.4 μS) 10° C variation day/night |
| Transmitter Processing Delay | Programmable up to 1 second maximum delay |
| Frequency Offsets | 1 Hz increments |
| Input Bit Rate | <ul style="list-style-type: none"> ■ DVB-T: 4.976 to 31.668 Mbit/s ■ DVB-T2: up to 50.28 Mbit/s ■ ISDB-Tb: Per standard |
| Response Variation | 0.2 dB, typical across channel |
| Phase Noise | <ul style="list-style-type: none"> ■ 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 | <-60 dBc (after mask filter and low pass filter) |
| Harmonics | <-60 dBc after mask filter, <-35 dB before mask filter |
| Spectrum Mask | Per standard. Filters for critical and non-critical mask available |
| Central Carrier Suppression | >75 dB relative to average power |
| Intermediate Frequency (IF) | 140 MHz |

| DAB/DMB+/DMB Transmitter | |
|---------------------------------|---|
| Rated Output Power | 75W and 150W models available, measured before mask filter |
| Systems | DAB/DAB+/DMB (OFDM) ETSI EN 300 401 & ETSI TR101 496-1 |
| Harmonic/Spurious Output | Complies with EN 302077-2 when used in conjunction with proper band pass filter |
| Shoulder Level | 35 dB minimum, >36 to 40 dB typical |
| Spectrum Mask | Per standard. Filters for critical and non-critical mask available |
| Monitoring Outputs | <ul style="list-style-type: none"> ■ ETI Monitor ■ 2.048 MHz ■ Sync ETI ■ Sync OFDM |

| ATSC Transmitter | |
|------------------------------|---|
| Rated Output Power | 90 W and 180 W models available, measured before mask filter |
| Shoulder Level | <-42 dB (typical <-50 dB) |
| EVM | <2% |
| SNR | >34 dB (typical >37 dB) |
| Frequency Stability | ±150 Hz/month without PFC/GPS (2.3 x 10 ⁻⁷) |
| Internal GPS | Option |
| GPS Back Up Time | 18.4 hours (maximum time drift 12.4 μs) 10° C variation day/night |
| Transmitter Processing Delay | Programmable up to 1 second maximum delay |
| Frequency Offsets | 1 Hz increments |
| Input Bit Rate | 19.39 Mbit/s |
| Response Variation | 0.2 dB, typical across channel |
| Phase Noise | <-104 dBc/Hz @ 20 kHz offset (ATSC A/64) |
| Spurious Output | Meets FCC 5th and 6th report and order |
| Spectrum Mask | Per ATSC standard |
| Intermediate Frequency (IF) | 140 MHz |

| Transposer and Gap Filler (TV Only, all standards) | |
|---|---|
| RF Input Frequency Range | Band III 168 to 242 MHz, or Band IV/V 470 to 862 MHz |
| RF Input | SMA-Female, 50 ohms, rear access |
| RF Input Level | -70 dBm to -10 dBm |
| Maximum Input Level | 0 dBm |
| Adaptive Echo Cancellation | Included (applies to Gap Filler only) |
| Gain Margin | <ul style="list-style-type: none"> ■ COFDM: -12 dB minimum, -15 dB typical ■ ATSC: 0 dB |
| Adjacent Channel Rejection | >35 dB |
| Internal Transit Time | <6 μs |
| Echo Window Size | 5 μs |
| Echo Window Offset | 1.5 to 448 μs |
| Static Delay | 0 to 400 μs in steps of 100 μs |
| MER | Up to 34 dB, dependent on input |
| MER Degradation | <2 dB degradation referenced to input, at <34 dB input MER |
| Response Variation | 0.2 dB, typical |
| Spurious Output | <-60 dBc (after mask filter and low pass filter) |
| Harmonics | <-60 dBc (after mask filter and low pass filter), <-35 dB before mask filter |