GATESAIR

Connecting What's Next

Maxiva™ ULX-OP / VLX-OP

High-Efficiency UHF & VHF
Liquid-Cooled Digital TV Transmitters

Maxiva™ ULX-OP / VLX-OP Product Overview

We did it again.

GatesAir has once again shattered the expectations of what is possible with high-power, solid-state transmitters in terms of efficiency, power density, and performance.

Power levels from up to 44kW UHF / 43kW VHF Band III / 36kW VHF Band I

High-efficiency broadband Doherty power amplifiers for all bands (VHF and UHF)

Software defined modulation for future upgradeability

Doherty amplification for highest efficiency and Maximum energy savings
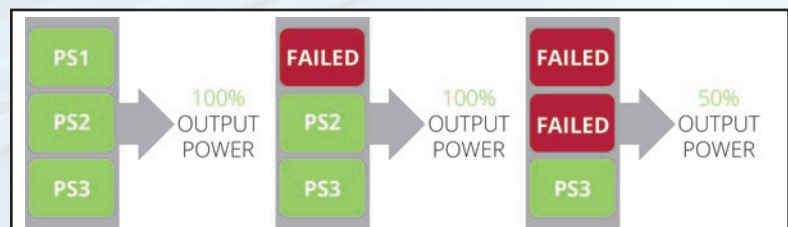
Hot-swappable power amplifiers

Separate hot-swappable compact power supplies, 3 per PA; for 2 of 3 full power redundancy**

Optimized for best performance using Real Time Adaptive Correction

Innovative, High-efficiency liquid-cooling system

**Power supply redundancy per PA module

PS1		FAILED		FAILED	
PS2	100% OUTPUT POWER	PS2	100% OUTPUT POWER	FAILED	50% OUTPUT POWER
PS3		PS3		PS3	

Maxiva™ ULX-OP / VLX-OP Main Features

- High power density, compact dimensions
- Power levels up to 44kW UHF / 43kW Band III, 36kW Band I (pre-filter power)
- High-efficiency broadband Doherty PA design
- Dual drive option
- Enhanced power supply redundancy
- Digital modulations: ATSC, DVB-T, DVB-T2, ISDB-T/Tb, DTMB, DAB/DAB+
- Analog models also available (see Maxiva OP-AN Series brochure)
- S/W Upgradeable architecture
- Adaptive pre-correction included
- Optional high-stability GPS/GLONASS receiver
- Control system with GPIO and Web GUI
- Parallel, dual redundant pumps for each rack
- Multiple DC fans on heat exchanger: variable speed for efficiency optimization
- Automatic daily heat exchanger airflow reversal to eliminate debris
- Automatic coolant refill reservoir to reduce maintenance

Maxiva™ ULX-OP-44000-R42
Liquid-Cooled 44kW DTV Transmitter System

Maxiva™ ULX-OP / VLX-OP Specifications

System

UHF digital ouptut power	1.4kW to 44kW rms @ MER 38dB typ. (DVB-T/T2, ISDB-T)
UHF analogue output power	Refer to Maxiva OP-AN Brochure
VHF digital output power	1.8kW to 43.2 kW rms VHF-Band III 1.5kW to 36kW rms VHF-Band I
VHF analogue output power	Refer to Maxiva OP-AN Brochure
Configurations	Single or dual driver
RF output connector	7/8" (f) or 1 5/8" (f) or 3 1/8" (f) or 4 1/8" (f), EIA, 50 Ohm (according to output power and frequency band)
Frequency agility	UHF Band IV and V or VHF Band III/VHF Band I
Frequecy resolution	1 Hz
Precorrection	Real Time Adaptive Correction
Exciter	UAXT/VAXT UC series exciter/driver
Integrated matrix circuits	ASI/BTS/Video (dual), audio and RF
BTS/ASI/Video matric connectors	BNC (f), 75 Ohm
Cooling	Liquid-cooling, with integrated dual pumps and external heat exchanger with multiple fans

Modulator

DVT-T/DVB-T2

Standard	EN300744, EN302304, EN302755 V1.3.1 (DVB-T2-Lite), TS101191, TS102773, (T3-MI), TS102034
Inputs	4x ASI BNC (f), 75 Ohm or 2x ASI BNC (f), 75 Ohm and 2 x RJ45 TS oIP 10/100/1000 Seamless switch between any input Hierarchical and not hierarchical (DVB-T)
FFT	1K (DVB-T2), 2K, 4K, 8K, 8K ext. (DVB-T2), 16K & 16K ext. (DVB-T2), 32K & 32K ext. (DVB-T2)
Code rate	All modes available according to the standard Block Short or Normal (DVB-T2) DVB-T: Reed-Solomon (204, 188) DBT-T2: BCH, LDPC
Guard Interval	1/32, 1/16, 1/8, 1/4, 19/256 (DVB-T2), 19/128 (DVB-T2), 1/128 (DVB-T2)
Constellation	QPSK, 16QAM, 64QAM, 256QAM (DVB-T2). Rotated and non-rotated (DVB-T2)
MISO processing	Supported

ISDB-Tb

Standard	ABNT NBR 15601, ABNT NBR 15603
Inputs	4x ASI TS/BTS BNC (f), 75 Ohm or 2x ASI TS/BTS BNS (f), 75 Ohm and 2x RJ45 TS/BTS oIP 10/100/1000 Seamless switch between any input
FFT	Mode 1 (2K), Mode (4K), Mode 3 (8K)
Code Rate	1/2, 2/3, 3/4 5/6 7/8
Guard Interval	1/4, 1/8, 1/16, 1/32
Hierarchical Modulations	Up to 3 layers
Constellation	QPSK, 16QAM, 64QAM
Time Interleaver	Fully Supported

Partial Reception	Supported

DAB/DAB+

Standard	EN300401, ETS 300 799
Inputs	4x ETI (NI[G703], NA5376[G704] or NA5592[G704]) BNC (f), 75 Ohm or 2x ETI BNC (f), 75 Ohm + 2x EDI (ETSI TS 102 693) RJ45 10/100/1000 Seamlesss switch between any input
Transmission Modes	Mode I, II, III, IV (Automatically detected from the ETI stream, or user selectable)
Operation	MFN or SFN operations

ATSC

Standard	A/53, A/110
Inputs	4x ASI/SMPTE-310M BNC (f), 75 Ohm or 2 ASI/SMPTE-310M BNC (f), 75 Ohm and 2x RJ45 TS oIP 10/100/1000 Seamless switch between any input
Modulation	8-VSB
Input Bit Rate	19.39 Mbit/s
Bandwidth	6 MHz
Max Processing Delay	Up to 1 second (programmable)

Analogue

Standard	B, G, D, K, M, N, I
Inputs	Video BNC (f), 75 Ohm, audio Tini-QG "Mini XLR", 6 Pin (m), 600 Ohm
Color System	PAL, NTSC
Integrated NICAM Encoder	Available

Satellite Receiver (Option)

Standard	ETSI EN 300 421 (QPSK) (DVB-S) ETSI EN 302 307 (QPSK, 8 PSK, 16APSK) (DVB-S2) ETSI EN 50083-9 (ASI) ETSI EN 50221 (Common Interface)
DVB-S2	VCM, CCM, Multi Stream and Single Stream, Normal and Short FEC frames
Symbol Rate	1 - 45 Msym/s (DVB-S) 2 - 45 Msym/s (DVB-S2)
Constellation	QPSK, 8PSK, 16APSK
FEC	Automatic, all modalities available according to the standard Block short or Normal DVB-S: Reed-Solomon (204, 188) DVB-S2: BCH, LDPC
Roll-Off	0.2, 0.25, 0.35
Input Connector	F(f), 75 Ohm
Frequency	L-band 930(divide symbol here)2250 MHz
LNB Control Voltage	Off, +13/18 Vdc, 22kHz, 0.25 A (overload protection)
RF Input Level	40 (divide symbol) 100 db/uV (with attenuator)
Output Connector	F(f), 75 Ohm
Modality	188 bytes
Max Input Bit Rate	80 Mbps (CAM limit: 72 Mbps)
CAM Interface	PCMCIA DVB-CI Common Interface

Maxiva™ ULX-OP / VLX-OP Specifications

CA Mode (Conditional Access)	Multicrypt, Simulcrypt
CAS Support	Mediaguard, Viaccess, Irdeto, Conax, BISS with professional multiprogram CAM (descrambling of up to 24 Elementary Streams) Betacrypt, Cryptoworks, Nagravision with standard consumer CAM (descrambling of up to 4 services)

GNSS (GPS/GLONASS) [Option]

Input Connector	N (f), 50 Ohm
Input/Monitor Output 10 MHz	BNC (f), 75 Ohm
Input/Monitor Output 1 PPS	BNC (f), 75 Ohm
Phase Noise	-140 dBc/Hz @10 KHz -150 dBc/Hz @ 100 kHz
Stability	1e-12 / 24 hours with disciplined OCXO
Hold-over Stability	5 us after 5 hours (optional 1 us after 24 hours)

Mechanical

Rack	See table on next page (other configurations are available on request)
Width	600 mm
Rack Height	36 RU rack models: 1,800 mm 42 RU rack models: 2,070 mm 44 RU rack models: 2,180 mm Refer to *Key Features* table on next page for models

Depth	36 RU Rack: 1000mm 42 RU Rack: 1200 mm Refer to Key Features table for details

Control

TFT touchscreen
Web GUI
SNMP
GPIO

Environmental

Operating Temperature Range	0°C to +45°C
Max. Relative Humidity	90% non-condensing
Max. Operating Altitude	2500 m. a.s.l. (>2500 m. optional)

Electrical

Power Supply	Energy distribution system with different options: - Line 380-400 V3N~, 50/60Hz - Line 220 V3N~, 50/60 Hz - Line 220 - 240V~, 50/60 Hz
Efficiency	Up to 40% efficiency in digital
NOTES	

To comply with the applicable standards and limit values for the suppression of out-of-band emissions (and in the case of digital standards, also for maintaining the required shoulder distance), the transmitter may only be operated with suitable filters at the RF outut.

Specifications are subject to change without notice.

Key Features

Liquid-Cooled Digital UHF/VHF OP Models

Digital TV Transmitter Model	COFDM Broadband Power Before Filter (r.m.s. W)	COFDM Wideband (120MHz) Power Before Filter (r.m.s. W)	8VSB Broadband Power Before Filter (r.m.s. W)	8VSB Wideband (120MHz) Power Before Filter (r.m.s. W)	Total Number of PAs	Number of Tx Racks	Number of Pump Sets	Number of Heat Exchangers	Rack Style
UHF Band IV & V Models									
ULX-OP-1P8D-R36	1,400		1,800		1	1	1	1	36 RU
ULX-OP-2P6D-R36	2,200		3,600		2	1	1	1	36 RU
ULX-OP-2P8D-R36	2,600		4,000		2	1	1	1	36 RU
ULX-OP-3P6D-R36	3,300		5,400		3	1	1	1	36 RU
ULX-OP-3P8D-R36	3,900		6,000		3	1	1	1	36 RU
ULX-OP-4P8D-R36	5,200		8,000		4	1	1	1	36 RU
ULX-OP-5P8D-R42	6,500		10,000		5	1	1	1	42 RU
ULX-OP-6P8D-R42	7,800		12,000		6	1	1	1	42 RU
ULX-OP-8P8D-R42	10,400		16,000		8	1	1	1	42 RU
ULX-OP-10P8D-R42	13,000		20,000		10	2	1	1	42 RU
ULX-OP-1P8E-R36	1,800	2,000	2,000	2,000	1	1	1	1	36 RU
ULX-OP-2P6E-R36	2,600	3,000	4,000	4,000	2	1	1	1	36 RU
ULX-OP-2P8E-R36	3,500	4,000	4,000	4,000	2	1	1	1	36 RU
ULX-OP-3P6E-R36	3,900	4,500	6,000	6,000	3	1	1	1	36 RU
ULX-OP-3P8E-R36	5,200	6,000	6,000	6,000	3	1	1	1	36 RU
ULX-OP-4P8E-R36	7,000	8,000	8,000	8,000	4	1	1	1	36 RU
ULX-OP-5P8E-R42	8,500	10,000	10,000	10,000	5	1	1	1	42 RU
ULX-OP-6P8E-R42	10,000	11,500	12,000	12,000	6	1	1	1	42 RU
ULX-OP-8P8E-R42	13,000	15,000	16,000	16,000	8	1	1	2	42 RU
ULX-OP-10P8E-R42	15,000	18,000	20,000	20,000	10	2	1	2	42 RU
ULX-OP-12P8E-R42	19,000	22,000	23,000	23,000	12	2	1	2	42 RU
ULX-OP-16P8E-R42	24,000	28,000	32,000	32,000	16	2	2	4	42 RU
ULX-OP-20P8E-R42	30,000	35,000	40,000	40,000	20	4	2	4	42 RU
ULX-OP-24P8E-R42	36,000	44,000	48,000	48,000	24	4	4	4	42 RU
VHF Band III TV Models									
VLX-OP-1P8-R36	1800		2300		1	1	1	1	36 RU
VLX-OP-2P8-R36	3600		4600		2	1	1	1	36 RU
VLX-OP-3P8-R36	5400		6900		3	1	1	1	36 RU
VLX-OP-4P8-R36	7200		9200		4	1	1	1	36 RU
VLX-OP-6P8-R42	10800		13800		6	1	1	1	42 RU
VLX-OP-8P8-R42	14400		18400		8	1	1	1	42 RU
VLX-OP-12P8-R42	21600		27600		12	2	1	2	42 RU
VLX-OP-16P8-R42	28800		36800		16	2	1	2	42 RU
VLX-OP-24P8-R42	43200		55200		24	4	2	4	42 RU

Liquid-Cooled Digital UHF/VHF OP Models (continued)

Digital TV Transmitter Model	COFDM Broadband Power Before Filter (r.m.s. W)	COFDM Wideband (120MHz) Power Before Filter (r.m.s. W)	8VSB Broadband Power Before Filter (r.m.s. W)	8VSB Wideband (120MHz) Power Before Filter (r.m.s. W)	Total Number of PAs	Number of Tx Racks	Number of Pump Sets	Number of Heat Exchangers	Rack Style
VHF Band I Models									
VLX-OP-1P8L-R36	1500		2000		1	1	1	1	36 RU
VLX-OP-2P8L-R36	3000		4000		2	1	1	1	36 RU
VLX-OP-3P8L-R36	4500		6000		3	1	1	1	36 RU
VLX-OP-4P8L-R36	6000		8000		4	1	1	1	36 RU
VLX-OP-6P8L-R44	9000		12000		6	1	1	1	44 RU
VLX-OP-8P8L-R44	12000		16000		8	1	1	1	44 RU
VLX-OP-12P8L-R44	18000		24000		12	2	1	2	44 RU
VLX-OP-16P8L-R44	24000		32000		16	2	1	2	44 RU
VLX-OP-24P8L-R44	36000		48000		24	4	2	4	44 RU

Liquid-Cooled DAB OP Models

DAB Transmitter Model	Power Before Filter (p.s. W)	Total Number of PAs	Number of Tx Racks	Auxiliary Racks	Number of Pump Sets	Number of Heat Exchangers	Rack Style
VHF Band III Models							
VLX-OP-1P8-DA	1900	1	1		1	1	36 RU
VLX-OP-2P8-DA	3800	2	1		1	1	36 RU
VLX-OP-3P8-DA	5700	3	1		1	1	36 RU
VLX-OP-4P8-DA	7600	4	1		1	1	36 RU
VLX-OP-6P8-DA	11400	6	1		1	1	42 RU
VLX-OP-8P8-DA	15200	8	1		1	2	42 RU
VLX-OP-12P8-DA	22800	12	2	1	1	2	42 RU
VLX-OP-16P8-DA	30400	16	2	1	2	4	42 RU
VLX-OP-24P8-DA	45000	24	4	2	2	4	42 RU

GATESAIR

GatesAir efficiently leverages broadcast spectrum to maximize performance for multichannel TV and radio services, offering the industry's broadest portfolio to help broadcasters wirelessly deliver and monetize content. With 100 years in broadcasting, GatesAir's exclusive focus on the over-the-air market helps broadcasters optimize services today and prepare for future revenue-generating business opportunities. Until 2019, research, development and innovation has been driven from the company's facilities in Mason, Ohio and supported by the long-standing manufacturing center in Quincy, Illinois. In May 2019, the company acquired an Italian company operating as GatesAir S.r.l. which provides an additional research, development and service location within the EU.

GatesAir's turnkey solutions are built on two pillars: Transport and Transmit. The company is best known for powering over-the-air analog and digital radio/TV stations and networks worldwide with the industry's most operationally efficient transmitters. Groundbreaking innovations in low, medium and high-power transmitters reduce footprint, energy use and more to establish the industry's lowest total cost of ownership. Support for all digital standards and convergence with mobile networks ensure futureproof systems.

In television, GatesAir supplies proven, trusted wireless UHF and VHF solutions across all power requirements to support single-station over-the-air broadcasters on up to large national networks. The industry's most reliable software-definable exciters ensure broadcasters can optimize analog networks and quickly transition to digital TV in the field, with support for all major global DTV standards. GatesAir also supplies a wide array of over-the-air accessories to maximize transmitter control, network redundancy and signal compliance – along with installation, commissioning and ongoing support services – to deliver the industry's strongest turnkey approach for customers worldwide.

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Global Service Locations

Award Winning Service

From experienced installation and field service engineers to responsive factory experts, GatesAir provides the strongest service team in the broadcast transmission industry. Couple that team with reliable products, responsible service parts inventories and a demonstrated commitment to the industry, and you have a service offering that's perfectly matched to your equipment and your operations.

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