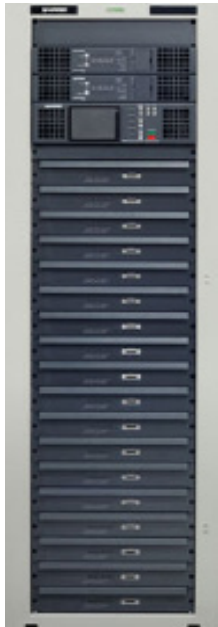


Platinum™ VLX

VHF Liquid-Cooled TV/DAB Transmitter



TELEVISION TRANSMISSION // VHF TRANSMITTERS



The Platinum™ VLX VHF liquid-cooled transmitter delivers the newest and most advanced VHF transmission platform with exceptional power efficiency, superior RF performance, and a modular user-friendly design. These capabilities along with the VLX's flexible configurations and superior power density provide the critical features upon which broadcasters can build their network.

The Platinum VLX incorporates the Harris®PowerSmart® solid-state architecture with 50 Volt LDMOS amplifier devices and the Harris Apex M2X™ exciter technology with RTAC™ to provide today's broadcaster with leading power efficiency and unmatched signal performance. The VLX power amplifiers have a record of proven performance and reliability with Harris transmitters and are in use around the world. This powerful blend of technologies provides best-in-class performance with respect to power efficiency, transmitter size and user features. The modular design allows for simpler installation, easier maintenance and reduced total cost of ownership over the life of the transmitters. The VLX is available over a wide range of output power configurations that are suitable for broadcast applications where liquid cooling and space considerations are a premium.

The VLX transmitter is capable of multiple modulation schemes for band III VHF analog or digital TV and digital radio operation — including ATSC, ATSC MDTV, DVB-T/H, DVB-T2, ISDB-Tb, CMMB, CTTB, DAB/DMB and future digital standards. Upgrading from analog to digital or to newer digital standards is readily accomplished to further extend the capability and life of the transmitter.

FEATURES

- PowerSmart technology, for best-in-class power efficiency and lowest operating costs
- Rugged, reliable design and construction
- Digital power levels up to 12 kW ATSC and 6.4 kW DVB-T/T2
- Incorporates field-proven Harris Apex M2X exciter technology, allowing easy migration from analog to digital or between different standards
- All-digital linear and nonlinear pre-correction, including exclusive Harris Real-Time Adaptive Correction (RTAC™)
- Fully broadband PA ruggedized modules — 168 to 242 MHz
- 1:1 PA pallet to power supply redundancy
- Hot-pluggable linear RF amplifier modules
- Transmitter monitoring and in-depth diagnostics via easy-to-use, front-panel controls
- Incorporates Harris® Web-enabled remote control graphical user interface

PRODUCT DETAILS

Compact Footprint

As one of the most compact liquid-cooled Band III transmitter, the Platinum VLX is ideal for crowded, shared transmitter sites. The Platinum VLX transmitter reduces facility space requirements, simplifies installation, lowers shipping costs and allows for easier maintenance.

Global Monitoring and Control

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Global Monitoring and Control

Platinum VLX transmitters use a modular transmitter control unit (TCU) housed in the main transmitter cabinet. The TCU communicates with the modules of the exciter and transmitter, as well as with the cabinet level controllers located in additional cabinets. The TCU serves as the central communication point for remote control and monitoring.

A color touch-screen allows easy review of all operational parameters and easy diagnosis of any equipment problems. Front-panel, finger-friendly buttons and bright LED indicators provide straightforward control and feedback on all the key operating parameters. The additional navigation buttons allow for simple review, setup and recall of all menus via the front-panel screen. Simply connect a PC to either the front- or rear-panel RJ-45 connection and you can monitor and control all the settings on a connected PC.

In addition to local control, options allow the Platinum VLX transmitter to be controlled from anywhere in the world with an intuitive browser-based GUI or SNMP over TCP/IP via a telecom or network connection with password protection.

Improved up Time and reduced Service Costs

Hot-pluggable, redundant power amplifier (PA) and universal power supply (PS) modules make on-air servicing fast and eliminates costly service interruptions. Light-weight universal PA pallets and universal PS modules facilitate overnight/same-day shipping for simple, cost-effective spares holding. With lightweight subassemblies, the Platinum VLX eliminates two-person lift requirements for routine maintenance and troubleshooting.

Smooth upgradeability

The Platinum VLX features the world-class Apex M2X software-defined exciter, allowing for a seamless transition from any analog standard to a digital terrestrial standard, or from an existing digital standard to a future standard, such as from DVB-T to DVB-T2 or from ATSC to ATSC MDTV.

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SPECIFICATIONS

Specifications are subject to change without notice.

General

Frequency Range	168 to 242 MHz
Channel Bandwidth	1.5, 1.7, 5, 6, 7 or 8 MHz (system dependent)
RF Load Impedance	50 ohms, 1.1:1 VSWR over any single TV channel
RF Output Connector	DIN 7-16, 1-5/8 or 3-1/8 in. EIA (dependent upon power level)

AC Mains

AC Line Voltage	3-phase 50/60 Hz, 380 to 415 V, or 208 to 240 V (specify when ordering)
AC Line Variation	10% to -15%
Power Factor (displacement)	0.90 or better, 0.98 typical

Environmental

Altitude	Up to 13,123 ft (4,000 m) elevation above mean sea level
Ambient Temperature	32° to 113° F (0° to 45° C) at sea level (upper limit derated 35.6° F (2° C) per 984 ft (300 m) elevation AMSL)
Humidity	95%, non-condensing
Cooling Method	Liquid (50% mixture of water and ethylene glycol or propylene glycol)
Acoustic Noise	65 dBA (measured 1 meter in front of cabinet, not including pump module)

DVB-T/H / DVB-T2/ISDB-TB/CMMB/CTTB

Power Output (Average)	1.2 W to 9.6 kW per cabinet; measured before mask filter
Systems	DVB-T, standard EN 300744; ISDB-TB – Brazil standard, DVB-T2 Standard EN302 755 CMMB, CTTB
ASI Inputs	2 BNC, female; 75 ohms acc. to EN 50083-9
Output Power Reduction	0 dB to -6 dB
Crest Factor	Maximum 13 dB
Shoulder Level	<-37 dB (before mask filter)
END	≤0.5 dB
MER	>33 dB
Harmonics (before filter)	<-40 dB
Central Carrier Suppression	>75 dB
Frequency Stability (without external reference)	±150 Hz/month
Frequency Offsets	1 Hz increments

DAB/DMB

Power Output (Average)	1.2 kW to 9.6 kW per cabinet; measured before mask filter
Systems	DAB/DMB (OFDM) ETSI TR101 496-1
Frequency Range	168 to 242 MHz, in 8 kHz increments
Frequency Stability (without external reference)	<5 x 10 ⁻¹⁰ per day (OXCO aging)
Power Stability	≤±0.25 dB

Harmonic/Spurious Output	Complies with EN 302077-2 when used in conjunction with filter having following attenuation specifications: Critical mask: fc ± 768 kHz: <1.0 dB fc ± 970 kHz: >15 dB fc ± 1.75 MHz: >45 dB fc ± >3 MHz: >45 dB fc ± >10 MHz: >50 dB Non-critical mask: fc ± <768 kHz: <1.0 dB fc ± 970 kHz: >0 dB fc ± 1.75 MHz: >15 dB fc ± >3 MHz: >45 dB fc ± >10 MHz: >50 dB
Shoulder Before Filter	35 dB minimum, >36 to 40 dB typical (compensated)
ETI Inputs/Outputs	BNC-female 75 ohms 3x ETI (NI, G703) or ETI (NI, G703) + 2x ETI (NA, G704) or 2x ETI (NA, G704) resp. 2 x ETI (NI, G703) seamless input signal switch-over automatic. ETI(NI) select 2.048 Mb/s, unbalanced/balanced with optional 2 Mb adaptor
QPSK Input	50 ohms, type SMA-female, 950 to 2150 MHz, -65 to -25 dBm typ. 55 MHz BW, 1-45 MSymb/s, DVB-S QPSK according to EN 300421. LNB supply: 12.5 to 4 V (maximum 350 mA) (vertical) 17.2 to 18.8 V (maximum 350 mA) (horiz.)
GPS Input	SMA-female, 50 ohms, 1.57542 GHz, -130 to -100 dBm. (5 VDC @ 100 mA max output for active antenna)
1 PPS Input	BNC-female, 75 ohms, TTL level
Reference Frequency Input	SMA-female, 50 ohms, 0.1/0.5/1/2.048/5/10 MHz, -7 to 15 dBm
Monitoring Outputs	- ETI Monitor - RF monitor (low power stage) - 1 PPS - Reference frequency 10 MHz

ATSC

Power Output (average)	1.5 to 12 kW per cabinet; measured before mask filter output
System	ATSC A-53, 8-VSB DTV standard
Data Input	19.39 Mb/s
Impedance	75 ohms, unbalanced
Standard	SMPTE 310M
Connector	2 BNC female, isolated
External Precise Frequency Input	10 MHz, sinusoidal
Impedance	50 ohms, unbalanced
Level	0 to 10 dBm
Connector	BNC 50 ohms, female
Signal to Noise (EVM)	27 dB or better (4% or less)
Phase Noise	<104 dBc/Hz @ 20 kHz offset (ATSC A/64)
Pilot Frequency Stability	Less than ±200 Hz/month Less than ±3 Hz with internal or external PFC
Harmonic Radiation and Spurious	Meets mask requirements specified in FCC 5th and 6th report and order
Sideband Performance	Compliant with FCC radiation mask, when measured at the output of Harris-supplied output filter

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Analog

Analog Television Systems CCIR G, I, K, K1, M, N
 Color Systems PAL, NTSC, SECAM
 Sound Systems Monaural, BTSC, IRT, NICAM G
 Power Output (vision peak of sync) 2 to 16 kW per cabinet, measured before IMD filter

Analog Video Performance

Video Input 0.7 to 1.4 V, 75 ohms, 32 dB return loss
 Regulation of Output Power¹ ±3%
 Variation of Output Power² ±2%
 Vision Sideband Response³ PAL system G shown (other systems available)
 -1.25 MHz and below -20 dB or less
 -4.43 MHz -30 dB or less
 -0.75 to -1.25 MHz 0.5 dB or less
 -0.5 to +4.5 MHz 0.5 to -0.5 dB
 5.0 MHz 0.5 to -2.5 dB
 5.75 MHz and above -35 dB or less
 Frequency Stability⁴ ±150 Hz/month
 Differential Gain⁵ 3%
 Differential Phase⁵ 3°
 Low Frequency Linearity⁶ 10%
 Incidental Carrier Phase
 Modulation⁵ ±3°
 Signal to Noise Ratio >60 dB (weighted)
 K Factor 2% or less with 2T sin² pulse
 20T Equivalent Gain and Delay 3% total baseline distortion
 Spurious and Harmonic Radiation -60 dB, or better
 In-Channel Intermodulation -58 dB (-60 dB typical)
 Distortion

Analog Sound Performance

Frequency Stability ±150 Hz/month
 Modulation Capability ±120 kHz peak deviation
 Monaural Input Adjustable 0 to 12 dBm, 600 ohms, balanced, >30 dB return loss
 Pre-emphasis Selectable 75 or 50 µS
 Frequency Response ±0.5 dB, 40 Hz to 15 kHz
 Harmonic Distortion 0.5%, 30 Hz to 15 kHz
 FM Noise 60 dB RMS with de-emphasis
 AM Noise 50 dB RMS from 30 Hz to 15 kHz
 Synchronous AM Noise 40 dB RMS at 400 Hz with ±25 kHz deviation
 IRT Sound Available upon request
 NICAM Sound Available upon request

Remote Control

Parallel Remote DB-37, female
 Relay Contacts 25 mA @ 24 VDC
 Digital Inputs (TTL level) Pulse duration ≥100 ms or permanent signal
 Ethernet/SNMP (optional) RJ-45, twisted pair

Compliance

RoHS: 2002/95/EC
 R&TTE: 1999/5/EC
 Safety: EN 60215
 EMC: EN 301-489-1
 FCC Part 73
 Manufacturing: ISO 9001: 2008

¹ Variation of peak output power with a change in average picture level from black to white (0% to 100%).
² Peak-to-peak variation of peak sync voltage during one field using field test signal per EIA-508.
³ Response specified for transmitter operating into a resistive load of 1.05:1 VSWR.
⁴ After initial aging of 60 days.
⁵ Measured using 20% peak-to-peak amplitude swept video modulation with pedestal set at 10%, 50% and 90% APL. All percentages relative to a blanking to white transition.
⁶ Measured using a 5-step staircase signal. Test signal #3, CCIR REC. #421-3 derate maximum temperature by 3.6° F (2° C) per 1000 ft (305 m) above mean sea level l

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Power Level

Model Number	Number of Cabinets	Number of PA modules	RF Output Power (W) Pre-Filter
VLX-2000AN	1	2	2,000/200
VLX-1200DA			1,200
VLX-1400AT			1,400
VLX-800DV/T2/IS/FL/CT/CM			800
VLX-4000AN	1	4	4,000/400
VLX-2400DA			2,400
VLX-2800AT			2,800
VLX-1600DV/T2/IS/FL/CT/CM			1,600
VLX-6000AN	1	6	6,000/800
VLX-3600DA			3,600
VLX-4200AT			4,200
VLX-2400DV/T2/IS/FL/CT/CM			2,400
VLX-8000AN	1	8	8,000/800
VLX-4800DA			4,800
VLX-5600AT			5,600
VLX-3200DV/T2/IS/FL/CT/CM			3,200
VLX-12000AN	1	12	12,000/1,200
VLX-7200DA			7,200
VLX-8400AT			8,400
VLX-4800DV/T2/IS/FL/CT/CM			4,800
VLX-16000AN	1	16	16,000/1,600
VLX-9600DA			9,600
VLX-11200AT			11,200
VLX-6400DV/T2/IS/FL/CT/CM			6,400
VLX-32000AN	2	32	32,000/3,200
VLX-19200DA			19,200
VLX-22400AT			22,400
VLX-12800DV/T2/IS/FL/CT/CM			12,800
VLX-48000AN	3	48	43,000/4,800
VLX-28800DA			28,800
VLX-33600AT			33,600
VLX-19200DV/T2/IS/FL/CT/CM			19,200

Modulations AN - Analog
 DA - DAB/DMB
 AT - ATSC
 DV - DVB-T
 T2 - DVB-T2
 IS - ISDB-Tb
 FL - FLO
 CT - CTTB
 CM - CMMB

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Platinum VLX Power Levels

Number of Cabinets	Number of PA modules	COFDM Power Power Levels Before Filter
1	2	1,200
	4	2400
	6	3,600
	8	4,800
	12	7,200
	16	9,600
2	24 (12+12)	14,000
	32 (16+16)	18,800
3	36 (12+12+12)	21,000
	48 (16+16+16)	28,200

IMAGES/DIAGRAMS

Platinum VLX Block Diagram

