

DiamondCD®

Solid-State UHF ATSC Transmitter



DiamondCD® transmitters, featuring LDMOS, solid-state technology, provide a new level of UHF reliability. Each DiamondCD system includes a control cabinet and one to five power amplifier cabinets. The control cabinet houses the system controller, exciter, monitoring and control panel/graphical user interface (GUI), driver amplifier, and an optional second exciter and driver with automatic changeover.

You can upgrade your DiamondCD to provide IP based control and monitoring by using the Harris® eCDi® Monitor AND Control tied to the stations LAN or directly to the Internet.

PRODUCT DETAILS

Control Cabinet

Houses the system controller, monitoring and control panel, exciter, driver amplifiers and an optional second exciter with automatic changeover. Also controls electronic RF phase and gain balancing used in multiple amplifier cabinet configurations. Serial RS-232 and standard parallel remote control interfaces are also included.

Graphical User Interface

Eye-level interface provides easy-to-understand transmitter status information complete with signal flow diagrams and analog bar-graph metering.

Power Amplifier (PA) Cabinet

When fully populated with 16 PA modules, each cabinet is a self-contained power RF amplifier with its own AC power feed, control circuits, interlocks, air cooling, RF amplifiers and power supplies.

Power Amplifiers

All PA modules are identical and interchangeable. Each hot-pluggable module features a high-speed DC switch that disables the module if a fault occurs or if the module is removed from the transmitter. Modules are protected against high reflected power, over-temperature, low gain and RF overdrive conditions. Fault status and metering are displayed on the main control panel.

FEATURES

- Apex M2X™ multimedia exciter, allowing easy migration between standards
- Real-Time Adaptive Correction (RTAC™) provides continuous automatic correction, assuring optimum performance at all times
- Developed specifically for the demands of digital transmission for uncompromised signal quality
- Parallel operation of redundant components provides unsurpassed reliability
- Compact footprint, yet powerful configuration allows for flexible installation layouts
- Modular power supply design provides continued operation while faulty unit is removed
- On-air servicing of PA modules to eliminate downtime
- Air-cooled amplifiers for ease of installation and low maintenance costs
- Backed by broadcasting's most extensive factory support, including 24-hour technical assistance, around-the-clock parts and comprehensive training

Solid-State Amplification

Using the latest technology in LDMOS power transistors, the RF amplifiers are extremely rugged. They provide high efficiency, high gain and exhibit excellent thermal characteristics. Linearity and IMD performance are better than older bi-polar designs. Unlike tube amplifiers, solid state devices have no wear-out mechanism.

Power Supplies

Compact, modular, regulated power supplies can be removed while the transmitter is on the air. Power supplies are protected from incoming AC line transients, over current and over voltage. Up to eight power supplies per PA cabinet minimize output power loss. The result is the minimal loss of viewers due to the cliff effect.

Cooling

Air cooling with internal or external fans is provided. With the internal fan, air enters through filters in the rear door of each PA cabinet and is circulated by a direct drive fan. Air is exhausted from the top of the cabinet. An optional external version is ideal when it is necessary to isolate transmitter cooling air from building air.

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SPECIFICATIONS

Specifications are subject to change without notice.

General

RF Load Impedance 50 ohms, 1.1:1 VSWR over specified TV channel
 RF Output Connector 3 1/8 in. EIA (PA cabinet outputs)
 Frequency Range Any specified UHF TV channel, 470 to 806 MHz
 Data Input SMPTE 310M, 19.39 Mb/s
 Data Input Connector BNC, 75 ohms
 PFC Input 10 MHz sinusoid, 0 to +10 dBm, BNC, 50 ohms

Electrical Requirements:⁵ 208 to 240 V ±10%, 3Ø, 3 or 4 wire, 50 to 60 Hz (select one)
 (PA cabinets) and 110 V, ±10%, 1Ø, 50 to 60 Hz (control cabinet)
 480 V ±10%, 3Ø, 3 or 4 wire, 50 to 60 Hz (PA cabinets) and 110 V, ±10%, 1Ø, 50 to 60 Hz (control cabinet)
 Power Factor 0.97, or better

PERFORMANCE

DTV Power Output⁷

Model	Output Power	Model	Output Power
DHD8P1	1.8 kW average	DHD45P2	10.5 kW average
DHD10P1	2.5 kW average	DHD60P2	14 kW average
DHD15P1	3.6 kW average	DHD90P3	20.5 kW average
DHD20P1	5.5 kW average	DHD120P4	27.5 kW average
DHD30P1	7.25 kW average	DHD150P5	34.5 kW average

Power Consumption			
DHD8P1	12.7 kVA	DHD45P2	56.7 kVA
DHD10P1	16.3 kVA	DHD60P2	75.3 kVA
DHD15P1	20.5 kVA	DHD90P3	113.4 kVA
DHD20P1	29.5 kVA	DHD120P4	150.5 kVA
DHD30P1	38.8 kVA	DHD150P5	187.6 kVA

Stability of Output Power ±2% or better
 Frequency Stability (Pilot):^{1,6} ±200 Hz/month
 Frequency Offsets Per FCC requirements
 SNR (MER):² ≥27 dB
 Harmonic and Spurious Radiation Compliant with FCC requirements (Title 47 CFR 73.622)
 Sideband Performance Compliant with FCC mask, with Harris specified output filter (Title 47 CFR 73.622)

Notes

- After initial aging of 60 days.
- Signal to noise ratio (modulation error ratio) measured with HP89440A/HP89441A vector signal analyzer.
- Derate maximum temperature linearly, from 113° F (45° C) at sea level by 35.6° F (2° C) per 1,000 ft (304.8 m) up to 7,500 ft (2,286 m). For operation outside these limits, consult Harris.
- For higher altitude operation, consult Harris.
- For other AC voltages, consult Harris.
- ±3 Hz or better with external precision frequency control option.
- Average power rating is power delivered at output of FCC mask filter.

Service Conditions

Ambient Temperature Range:³ 32 to 113° F (0 to 45° C)
 Ambient Humidity Range 0 to 90% relative humidity, non-condensing
 Altitude:⁴ 0 to 7,500 ft (2,286 m) AMSL

Physical Dimensions and Weights	Size (W x D x H)	Weight
DHD8P1 through DHD30P1	57.1 x 61 x 72.25 in. (1.4 x 1.5 x 1.8 m)	Up to 2,488 lbs (1,128 kg) (DHD30P1)
DHD45P2 and DHD60P2	91.1 x 61 x 72.25 in. 2.3 x 1.5 x 1.8 m)	Up to 4,476 lbs (2,030 kg) (DHD60P2)
DHD90P3	125.1 x 61 x 72.25 in. (3.2 x 1.5 x 1.8 m)	6,464 lbs (2,932 kg)
DHD120P4	159.1 x 61 x 72.25 in. (4 x 1.5 x 1.8 m)	8,452 lbs (3,834 kg)
DHD150P5	193.1 x 61 x 72.25 in. (4.9 x 1.5 x 1.8 m)	10,440 lbs (4,735 kg)