

**Now with maximum efficiency, water-cooled,
Depressed Collector IOT technology**



Quantum® UHF IOT Transmitters The QDC Series for ATSC & DVB-T Digital Applications



Quantum® – The high power IOT equipped UHF transmitter line from Ai.

- **Exclusively created to fully exploit the latest generation of Depressed Collector IOTs – in Analog and Digital service**
- **Water-cooled IOT and circuit assembly for optimum cooling and safety**
- **Glycol-free cabinet environment**
- **Developed to solve the problems broadcasters face with old klystron equipment – reliability and utility costs**
- **Flexibility provides support for global standards**
 - **Analog (NTSC/PAL/SECAM)**
 - **Digital (ATSC and DVB-T)**
- **Proven dependability and performance of incorporated Rohde & Schwarz technology**

The New Standard in High Power Transmitters

Designed for high reliability with simple, elegant solutions and appropriate use of advanced technologies. With power levels up to 120kW average ATSC 8-VSB and DVB-T COFDM, Ai's Depressed Collector IOT (Inductive Output Tube) equipped UHF **Quantum** line was developed to solve the problems broadcasters face with old klystron equipment – reliability and utility costs. This new line of products incorporates field proven advanced exciter and driver solid-state technology from Rohde & Schwarz.

New Technology

Designed to take full advantage of the new generation of water-cooled Depressed Collector IOT. This product exclusively features IOT plug-in technology, allowing easy tube changeouts using a built-in IOT hoist assembly, without circuit assembly disconnection. The IOT is cooled by clean, safe, de-ionized water in a field-proven configuration in use for many years in MSDC klystron transmitters. Further, all glycol is eliminated from the cabinet environment.

Advanced Flexibility

The exciter system is the most advanced available today, and supports all global standards, analog and digital. State-of-the-art signal monitoring and automatic correction is fully integrated into the transmitter system. The digital correction effectively reduces both the linear and non-linear distortion.

Dependable and Serviceable

The cabinet has a positive pressure cooling system that has minimized the number of rotating fans, using a single high reliability blower for improved system dependability. Packaged close to the IOT itself, located within the high volume cabinet cooling plenum, are the fully accessible "hot-swap" LDMOS driver amplifiers.

Rugged and Reliable

All IOT related power supplies are linear, leading to high reliability. Application and removal of high voltage is controlled by a novel solid-state step start system that also provides rapid removal of AC to the HVPS in the event of HV faults. The System Controller is an industrial PC running Linux software for unparalleled system stability. The HPA Controller is Programmable Logic Controller (PLC) based. This equipment was chosen because of its proven track record in hostile industrial environments. The logic structure is in ladder form and consequently is easily understood. User interface is kept very simple via the use of a straightforward menu structure. A variety of options for interface to customer provided remote control systems are available.

Practical

Analog meters are used for a rapid indication of critical transmitter conditions. More in-depth information is available via alpha/numeric menu driven displays. All adjustments and calibrations are carried out digitally via the controller front panel.

Digital TV Specifications

ATSC RF Specifications

System:	ATSC
Power output:	Up to 30kW average per HPA (IOT dependent)
Frequency range:	470 to 810 MHz
Frequency tolerance:	Settable within 1Hz per FCC requirement
Frequency stability:	10 ⁻⁷ /3 months with internal OCXO (external 10MHz Reference input)
Out of Band products:	Fully compatible with FCC mask, including harmonics
SNR (receiver eq OFF):	30dB typical, 27dB minimum
EVM:	4% or better
Carrier phase noise:	-105dBc/Hz (20kHz offset) or better
RF load impedance:	50 or 75 Ohms, better than 1.1:1 over DTV channel
RF load connector:	System dependent
Data input:	SMPTE 310M, 19.39Mb/s or ASI
Data input connector:	BNC, 75 Ohm

DVB-T RF Specifications

System:	DVB-T 6,7 or 8MHz Bandwidth
Power output:	Up to 30kW average per HPA (6MHz) (IOT and output shoulder requirement dependent)
Frequency range:	470 to 810MHz
Frequency tolerance:	Settable within 1Hz
Frequency stability:	10 ⁻⁷ /3 months with internal OCXO (external 10MHz Reference input)
Out-of-Band products:	System dependent
RF load impedance:	50 or 75 Ohms, better than 1.1:1 over DTV channel
RF load connector:	System dependent
Data input:	Qty 2 ASI high priority, qty 1 ASI low priority

General Physical / Environmental

Ambient temperature:	0 to +45 degrees C
Humidity:	90%, non-condensing
Altitude:	6500' AMSL (see note)
AC power input:	480 volt (±2%)/3 phase/60Hz/3 or 4 wire (see note)
Power factor:	0.9 or better
Typical system efficiency:	up to 45% (standard dependent)

Note: Contact factory for higher altitude operation and/or different AC power standards.

Model	Average Power Output – kW	Dimensions – inches			Weight – lbs.
		W	D	H	
QDC1	Up to 30	87	62	74	2000
QDC2	Up to 60	151	62	74	4500
QDC3	Up to 90	216	62	74	6500
QDC4	Up to 120	280	62	74	8600

Specifications are subject to change without notice



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