

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



Quantum® UHF IOT Transmitters **The QDCN Series for Analog 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**
- **Easily upgraded to digital applications**

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 240kW peak sync analog, 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 plug-in IOT 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. Digital signal processing is used to create and correct both analog and digital modulated spectrums. Full 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 crowbar conditions or 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.

Analog TV Specifications

RF Specifications

System:	NTSC, CCIR "M"
Frequency range:	470 to 810 MHz
Mode of amplification:	Vision/sound combined
Power output:	Up to 240kW peak sync
Vision/sound ratio:	10:1
Frequency stability:	10 ⁻⁷ /3 months with internal OXO (external 10MHz Reference input)
Spurious and harmonics:	-60dB
In-Band IP's:	-60dB
RF load impedance:	50 or 75 Ohms
RF output connector:	System dependent

Vision Performance

Nominal input level:	0.5 to 2.0 volts
Modulation capability:	100%
Sideband response:	
-3.58MHz	Better than -42dB
-1.25MHz	Better than -20dB
-0.5MHz to Fv	Within ±1dB
Fv to +4.0MHz	Within ±0.5dB
+4.0 to +4.18MHz	+0.5dB to -2.0dB
+4.75MHz	Better than -40dB
Response vs picture level:	Within ±0.75dB
LF Linearity:	10%
Differential gain:	5%
Differential phase:	3°
ICPM:	±2°
Envelope delay:	
0.2 to 2.0MHz	±40ns
3.58MHz	±30ns
4.18MHz	±60ns
2T K factor:	2%
12.5T K factor:	3%
Signal to noise: <1kHz	-50dB pk-pk,
: >1kHz	-55dB rms, unweighted
Variation of output:	2%
Regulation of output:	3%

Sound Performance

Modulation capability:	120kHz
Monaural performance:	
Input impedance	600 Ohm, balanced
Input level	0 to +20dBm
Frequency response	±0.5dB, 50Hz to 15kHz
Pre-Emphasis	75us or flat
Total harmonic distortion	0.5% with de-emphasis
FM noise	-60dB rms with de-emphasis
AM noise: Asynchronous	-50dB rms, 30Hz to 15kHz
AM noise: Synchronous	-40dB rms at 400Hz, 25kHz

Composite Stereo Performance

Input impedance:	75 Ohm, unbalanced
Input level:	1 volt nominal
Frequency response:	±0.5dB, 50Hz to 120kHz
Total harmonic distortion:	0.5%
FM noise:	-60dB
Stereo separation:	-40dB, equivalent mode
Crosstalk: Main to SAP	-45dB or better
Stereo to SAP	-45dB or better
SAP to stereo	-50dB or better
Intermodulation distortion:	0.5%
BTSC pilot protection:	-46dB or better

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)
System power factor:	0.9 or better
Typical system Figure of Merit	up to 100%

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

Model	Power Output – kW Pk Sync/Aural	Dimensions – inches			Weight – lbs.
		W	x	D x H	
QDCN1	60/6	87	62	74	2000
QDCN2	120/12	151	62	74	4500
QDCN3	180/18	216	62	74	6500
QDCN4	240/24	280	62	74	8600

Specifications are subject to change without notice.



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