

DTU-52 Series High-Power Digital TV Transmitter

**Embodying a commitment to quality
and eco-friendliness**



NEC leads the way forward in the digital TV broadcasting industry around the world

NEC is a leading global company which offers world-class technological solutions and resources in the broadcast market.

The result of expertise and technologies accumulated over many years

NEC transmitter equipment is renowned for High Reliability and Low Maintenance throughout the global broadcast community. The DTU-52 Series inherits the technological and performance advantages of the previous DTU-51 Series, which through many years of field operation, has been highly praised by our customers, and has successfully achieved two additional advantages; high efficiency and small footprint



DTU-52 8.7kW Model DTU-52/8R7PQ



A DVB-T2 compliant DTU-52 Series installed at Winter Hill (U.K.) for Arqiva, transmission provider for UK terrestrial TV.

Features

Enhanced Efficiency

With the new PA, the DTU-52 Series enables a reduction in power consumption by an average of 20 to 30% compared to the previous model.

Small Footprint

The DTU-52 Series provides up to 8.7kW output power (average) by using 10 sets of PA units in a single rack, achieving a footprint of only 590 (W) x 2,000 (H) x 1,000 (D) mm, making it one of the smallest transmitter foot-prints in the world.

Advanced cooling system

With the adoption of Hybrid Closed System for cooling, there is the advantage of excellent cooling liquid exchangeability and automatic removal of air from the system when an amplifier is changed.

Compliant to a variety of digital terrestrial broadcasting standards

The DTU-52 Series is able to support a wide range of global digital standards including ATSC, DVB-T/H, ISDB-Tb, and the latest established standard - DVB-T2.

User friendly monitoring and control

Control and monitoring of the equipment is carried out via the colour LCD on the front of the rack which features an intuitive Graphic User Interface for easy maintainability.

As an example, it is possible to monitor IM and MER without the use of measuring equipment.

Wide range of redundancy configuration

To meet customer's ever increasing demands, the DTU-52 Series can offer wide range of backup options: from redundancy only in the liquid cooling system to N+1 configurations.

Wide band design

The DTU-52 Series is designed to be frequency-agile, covering the entire UHF band and thus, no channel-specific components are required.

Reduced maintenance costs

All DTU-52 Series transmitters are produced from, and supported by, one common set of modules, resulting in reduced costs from purchase to installation and support.

The latest in digital broadcasting technology

Power Amplifiers (PA)

The newly developed UA4000QE-S power amplifier utilizes the latest high power LDMOS, realizing compact design, enhanced efficiency and producing excellent reliability.

Each PA can produce an output power of 1kW average and incorporates a switching power supply. Furthermore, it features an optimized combination of wideband matching circuits and controls.

In terms of safety features, the PA is incorporated with a RS-485 interface, enabling comprehensive monitoring and remote control functionality. With the added benefit of self-protection circuits to protect against external factors such as high temperature, reflected power, low AC voltage and internal factors such as overvoltage and over current. Additionally, the PA is equipped with RF over input protection, which has a function of protecting the PA against excessive output power produced from the exciter due to human mis-operation and from the excessive input power in case there is malfunction in the divider.

UA4000QE-S



Exciter

The compact DM-3000 Series Digital Exciter is packed with NEC's state-of-the-art technology. A synthesizer tuned to all UHF-band signals enables all-band direct conversion to a RF output. Higher or lower bit rates are modified to usable bit rates for flexible bit-rate adaptability. Using the MIP created by the SFN adapter, seamless ASI switching can be performed. A truly impressive characteristic of the DM-3000 Series Digital Exciter is its ability to work in conjunction with other NEC transmitters as a signal processor — which greatly reduces the necessity for spare units while simplifying maintenance.

NEC's newly developed DM-4000A Digital Exciter for the DTU-52 Series has enabled the Worlds first DVB-T2 transmitter into live operation.



DM-3000A

Functionality Benefits

Adaptive Digital Corrector (ADC)

The ADC automatically generates correction factors of non-linearity distortion and updates the correction table without interrupting program service. Optimum signal quality and service coverage are maintained, protected from the effects of ambient temperature, aging and other factors. The ADC comes integrated in the DM-3000 Series Digital Exciters and can be used to generate the correction factor for preset correction. Furthermore, the ADC is capable of analyzing feedback signals from the TX output, including inter-modulation level, MER value and other graphical data. Automatic adjustment of the IMP/MER values greatly reduces the time required for maintenance.

N+1 System

The DTU-52 Series frequency-agile design, allows for the construction of an N+1 system, offering redundancy for maximized reliability and transmission time. By using the latest N+1 controller, up to 8+1 system are available.

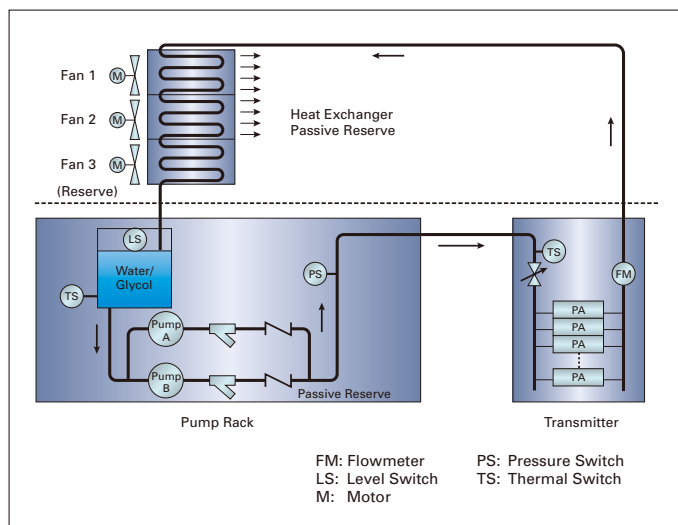
At any given time, there is a transmitter ready to be activated should one of the active transmitters malfunction. When activated, the spare transmitter adjusts its frequency band accordingly without interfering with broadcast signals.

Liquid Cooling

The liquid cooling system incorporates an automatic air-purge function and an Adaptive Fault Forecast function. These features work together to cut noise and installation costs, making the maintenance easier and boosting reliability. Coolant feeding and dust removal have been greatly simplified by a hybrid closed circuit, ensuring the coolant remains clean. There are two types of cooling systems that can be selected from the transmitter models.

“S type” comes with single drive and single pump and heat exchanger.
 “P type” comes with dual drive and redundant pumps and heat exchangers.

● Liquid Cooling System (Single with redundancy)

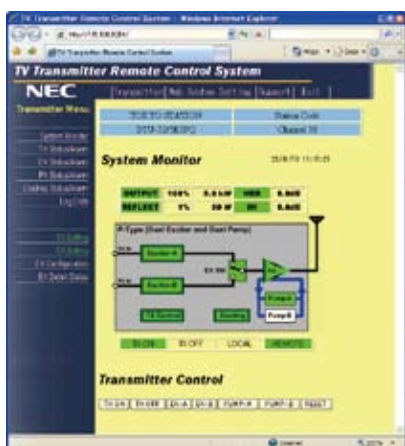


Local Control/Monitoring

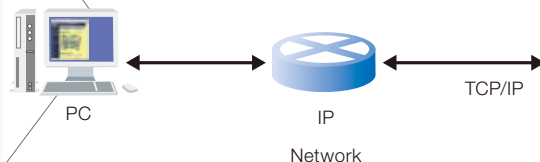
The easy-to-view colour LCD screen located on the front of the rack features an intuitive GUI (Graphical User Interface), making transmitter control, monitoring and maintenance extremely easy to perform. The log data not only displays changes in operational status, including faults, but also enables verification of related data in case of system failure, thereby streamlining analysis of abnormal status. Frequency settings can be conducted at the touch of a button on the colour LCD screen.

Remote Control/Monitoring

The DTU-52 Series incorporates a web server and SNMP agent, enabling the transmitter to be connected to a local area network for monitoring and control of transmitter operations via a remote PC with a web browser. Whilst also allowing a SNMP manager to monitor and control from a different location at the same time. Thus, provide a cost-efficient maintenance, whilst the transmitter is in operation and without the requirement of expensive measurement equipment.



Sample View of Signal Quality Monitoring



DTU-52 Series Transmitter

Configuration of DTU-52 (Liquid-cooled) Series

DTU-52 Series Lineup

DTU-52/ **1** **2** **3**

1 : Output Power

Type	Output Power
R9	900W
1R8	1.8kW
2R7	2.7kW
3R6	3.6kW
4R4	4.4kW
5R3	5.3kW
6R2	6.2kW
7R0	7.0kW
7R8	7.8kW
8R7	8.7kW
10R0	10.0kW

2 : System Type

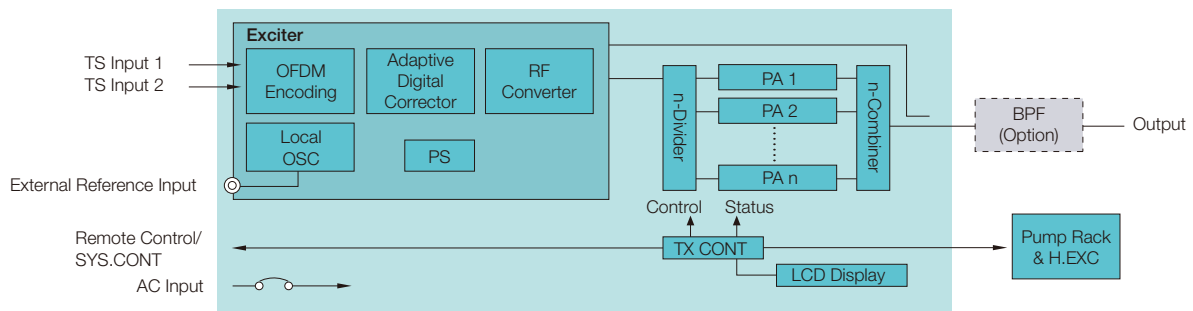
- S** : Single Transmitter with Single Drive
- P** : Single Transmitter with Dual Drive and Multiple PAs
- PE** : Single Transmitter with Dual Drive and Single PA

3 : Cooling Type

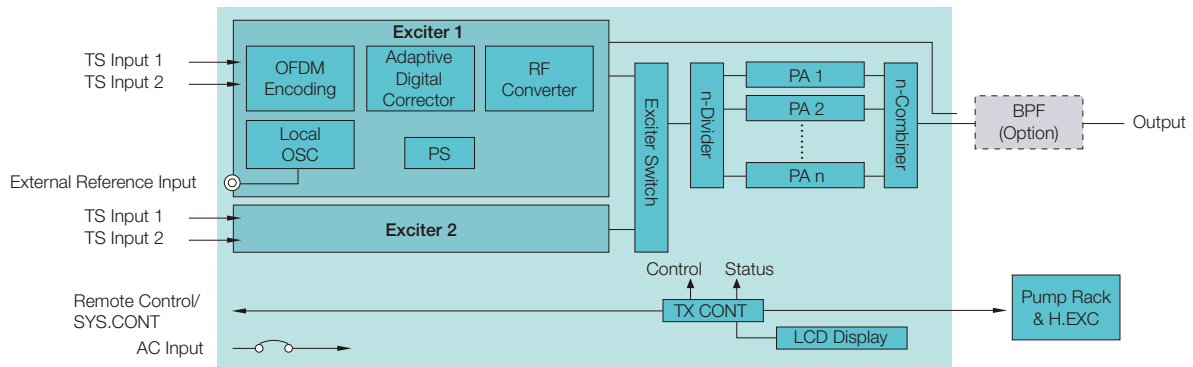
- (S)Q** : Single liquid cooling system
- (P)Q** : Redundant liquid cooling system

Transmitter Standard Configuration

S Type



P Type



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Transmitter Standard Configuration Table

Output*	Model Name	Equipment Composition [Sets]						Transmitter	
		Exciter	Exciter switch	PA	Divider/Combiner	TX Control	Rack	Size (mm)	Weight
900W	DTU-52/R9SQ	1	-	1	-	1	1	590(W) x 2,000(H) x 1,000(D)	359
	DTU-52/R9PEQ	2	1		-	1			1
1.8kW	DTU-52/1R8SQ	1	-	2	1	1	1		407
	DTU-52/1R8PQ	2	1		1	1	1		415
2.7kW	DTU-52/2R7SQ	1	-	3	1	1	1		447
	DTU-52/2R7PQ	2	1		1	1	1		455
3.6kW	DTU-52/3R6SQ	1	-	4	1	1	1		487
	DTU-52/3R6PQ	2	1		1	1	1		495
4.4kW	DTU-52/4R4SQ	1	-	5	1	1	1		528
	DTU-52/4R4PQ	2	1		1	1	1		536
5.3kW	DTU-52/5R3SQ	1	-	6	1	1	1		568
	DTU-52/5R3PQ	2	1		1	1	1		576
6.2kW	DTU-52/6R2SQ	1	-	7	1	1	1		608
	DTU-52/6R2PQ	2	1		1	1	1		616
7.0kW	DTU-52/7R0SQ	1	-	8	1	1	1		649
	DTU-52/7R0PQ	2	1		1	1	1		657
7.8kW	DTU-52/7R8SQ	1	-	9	1	1	1	690	
	DTU-52/7R8PQ	2	1		1	1	1	698	
8.7kW	DTU-52/8R7SQ	1	-	10	1	1	1	730	
	DTU-52/8R7PQ	2	1		1	1	1	738	
10.0kW	DTU-52/10R0SQ	1	-	12	1	1	2	1,166	
	DTU-52/10R0PQ	2	1		1	1	2	1,174	

* In case of DVB-T/H and ATSC

DTU-52 Series Specifications

Specification	DVB-T/H	ATSC	ISDB-Tb
Output Power	900W - 10kW	900W - 10kW	600W - 7.5kW
Output Frequency	470 - 862 (Band IV/V)		
Output Impedance	50Ω		
Input	ASI x 4 (in pairs, prepared for hierarchical)	SMPTE310 x 2	ASI x 1
Power Supply Voltage	380/400/415 V, 3-phase, 4-wire		
Voltage Fluctuation	-15%, +10%		
Power Supply Frequency	50/60Hz ±2%		
Ambient Temperature Range	Indoors: 0°C to +45°C Outdoors: 0°C to +45°C or -30°C to +40°C(using antifreeze and 3-way valve system)		
Relative Humidity	≅90%(no condensation)		

Standard Performance	DVB-T/H	ATSC	ISDB-Tb
Frequency Stability	≅±1 x 10 ⁻⁷ /year (internal reference use) (it is also possible to lock an external 10MHz reference)		
Amplitude-frequency Response	≅±0.5dB (excluding BPF)		
Bandwidth	6MHz,7MHz,8MHz	6MHz	6MHz
Intermodulation Products	≅-36dB	≅-36dB	≅-43dB
MER(Modulation Error Ratio)	≅32dB	-	≅39dB
SNR(Signal to Noise Ratio)	-	≅27dB	-
Spurious Emission	≅-60dBc	Meet FCC Emission Mask with Output Filter	≅-60dBc
Pilot Carrier Phase Noise	-	-104 dBc/Hz @ 20 kHz offset	-

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ISO 9000 Series



ISO 9001 JMI-0119
NEC Broadcast and Video

ISO 14001



JQA-E-90066
NEC



Safety precautions

To install, make connections and operate this product, please carefully read and observe instructions, precautions and recommendations in our instruction manuals.

● The colours in this brochure may differ from those of the actual unit. Designs and specifications of this product is subject to change without prior notice.

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