



## Terrestrial Modulator Series(DVB-T/T2/Tx2)

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### FNJ-DT2-04



Version 1  
2020



## Description

Today in many countries digital terrestrial broadcasting is being considered as primary means of delivering multimedia services to the mass audience. This fact has absorbed the broadcast industry to introduce efficient solutions for this platform. In this regard Fanamoj Company is proud to present FNJ-DT2 as a professional DVB-T/T2 modulator/exciter to the international markets. The capability of this product to broadcast simultaneously two DVB-T signals is considered as a distinctive feature.

FNJ-DT2 is in full compliance with EN300744 and EN302755 standards. By utilizing this modulator as the exciter of TV transmitters it is possible to transmit two independent transport streams on two different channels at the same time with only one transmitter. This astonishing feature can help broadcasters to realize very economic solutions.

Furthermore an internal self-contained IRD/Remux totally obviates any need for external Sub-Headends. Thanks to this optional feature it is possible to demodulate up to four transport streams from DVB-T/T2 or DVB-S/S2 signals. These four streams are processed by the embedded Remux to generate two customized transport streams which along with the external ASI inputs can be used for feeding the dual output modulator. Moreover it is possible to decrypt BISS encoded services from any input streams prior to multiplexing without any limitation on the number of encrypted components.

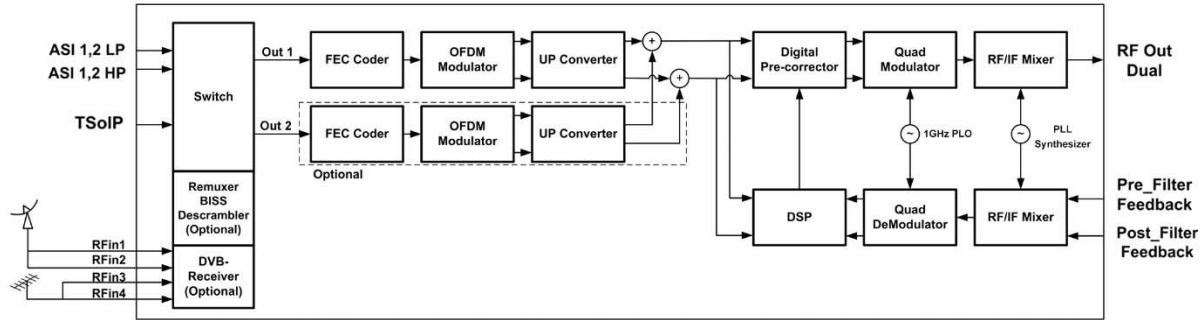
FNJ-DT2 is equipped with a wide variety range of mechanisms which make it a competent selection as a DVB-T/T2 transmitter exciter. One of these mechanisms is the adaptive linear/nonlinear precorrector which is considered as a crucial feature. This capability makes it possible to drive any RF power amplifier with up to tens of kilowatts output and achieve the best possible signal quality.



## Features

- Capable of transmitting one DVB-T2 or two independent DVB-T signals at the same time
- In full compliance with the latest version of EN300744 (DVB-T) and EN302755 (DVB-T2) standard
- VHF or UHF output frequency band.
- Optional IRD/Remux capable of demodulating any of DVB-T/T2/S/S2 signals with superior input sensitivity.
- BISS decryption capability.
- Remote control and monitoring via HTTP, SNMP and GSM network.
- Capable of true RMS output power measurement of transmitter.
- Up to +10dBm output power in order to directly drive a wide range of amplifiers.
- Utilization of advanced adaptive precorrector for eliminating linear and nonlinear distortions of amplified signals.
- Measurement of key qualitative parameters of transmitter output signal including MER, Shoulder Distance, Frequency Response and etc.

# Block Diagram



## Technical Descriptions

### ➤ Back Panel



## ➤ Technical Specifications

### • Input

- ASI Inputs
- TSOIP Input
- DVB-T/T2 RF Input (Optional)
- DVB-S/S2 RF Input (Optional)

- 10 MHz Reference Input
- 1 PPS Reference Input
- Pre-Filter Feedback Input
- Post-Filter Feedback Input

- up to 4xBNC, 75 Ω, DVB-ASI, 188 /204 Bytes
- 1xRJ45 TS over IP Input Based on SMPTE-2022
- Up to 4 F Connectors, RF Frequency Range: VHF/UHF, Level: -70dBm ~ -25dBm
- Up to 4 F connectors, RF Frequency Range: 950-2150MHz, Level: -92dBm ~ -10dBm, LNB Feed: 13V/14V, 18V/19V, 22 kHz
- 1xBNC, 50 Ω, 500mVpp~5Vpp
- 1xBNC, 50 Ω, LVTTTL
- 1xSMA, 50 Ω, -10~10dBm
- 1xSMA, 50 Ω, -10~10dBm

## • Output

RF Output	1xSMA, 50 $\Omega$ , Frequency Range: 470-862 MHz (UHF option), 174-230 MHz (VHF option), (Resolution: 1 Hz) Level: -15 to 0dBm (Resolution: 0.1 dB), (-15 to +10dBm Available as an Option)
RF Monitoring Connector	1xBNC, 50 $\Omega$ , Coupling Factor: 30dB
10MHz Reference Output	1xBNC, 50 $\Omega$ , 3.3V CMOS

## • Digital Adaptive Pre-Correction

Pre-Correction Modes	Signal Output: Adaptive LC, Adaptive NLC Dual DVB-T Mode: Fixed NLC
Correction Criterion	MER, Right/Left Shoulder, Group Delay, In-band Flatness
Crest Factor Reduction (CFR)	Soft and Hard Clipping
NLC Performance	Typically 10dB MER Improvement (Dependent on PA Model)
LC Performance	Up to $\pm 5$ dB Amplitude and $\pm 500$ ns Group Delay Correction

## • Qualitative Signal Characteristics

MER	>40dB (Typical: 42dB)
Shoulder Distance	>50dB (Typical: 57dB)
Output PAPR	Adjustable in 7 to 12dB range
Amplitude Variations in One Channel	<0.3dB
Group Delay after output filter	<10 ns
Out of Band Spurious Emissions	<60dBc
LO Phase Noise	10 Hz <-55dBc/Hz 100 Hz <-85dBc/Hz 1 kHz <-90dBc/Hz 10 kHz <-95dBc/Hz 100 kHz <-112dBc/Hz

## • Modulation (DVB-T)

Number of Modulation Cores	Up to Two DVB-T Cores (EN 300 744 Compliant)
Output Channel Spacing	All Channels within 40MHz Bandwidth (Dual DVB-T Mode)
Transmission Modes	MFN, SFN
IFFT	2K, 4K, 8K
Constellation	QPSK, 16QAM, 64QAM
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8 (For Both LP & HP Streams)
Interleaving	Native, In Depth
Hierarchical Mode	Supported, Mapping $\alpha=1, 2, 4$
Maximum Throughput	31.67 Mbps at Each Modulator
Bandwidth	8 MHz, 7 MHz

## • Modulation (DVB-T2)

Transmission Mode	MFN, SFN-SISO, SFN-MISO
Modulation Mode	Single PLP, Multi-PLP up to 255 PLPs
IFFT	1K, 2K, 4K, 8K, 8K Extended, 16K, 16K Extended, 32K, 32K Extended
Constellation	QPSK, 16QAM, 64QAM, 256 QAM (Normal and Rotated)
Guard Interval	1/4, 1/8, 1/16, 1/32, 1/128, 19/128, 19/256
FEC	1/2, 2/3, 3/4, 3/5, 4/5, 5/6
Interleaving	Time, Frequency, Cell
Hierarchical Mode	Supported, Mapping $\alpha=1, 2, 4$
Maximum Throughput	50.34 Mbps
Bandwidth	8 MHz, 7 MHz

## • Control & Monitoring

Local User Interface	Character LCD and keypad
Remote Connection Port	2x RJ45 (10/100 Base-T)
Remote User Interface	WEB, SNMP v1/v2/v3

## • Physical

### ▪ Power Requirement

Operating Voltage	90~260 VAC, 50~60Hz
Power Consumption	30W max

### ▪ Dimension & Weight

Weight	4.5 kg
Dimensions (W x H x D)	48 cm x 4.4 cm x 35 cm (Width: 19 inch, Height: 1RU)

### ▪ Environmental

Operating Temperature	0 ~ +50 °C
Storage Temperature	-25 ~ +60 °C
Relative Humidity	95% (Non-condensing)

### ▪ Compliance

DVB	ETSI 300744 – ETSI 302755
ASI	DIN EN 500083-9
SFN	ETSI TS 101 191
Environmental Conditions	EN 300 019-1-3 V2.3.2 (2009-11) Class 3.3
Power Supply:	
Safety	UL60950-1, TUV EN60950-1, IEC-215
EMC	EN55022 Class B, EN61000-3-2/3, EN61000-4-2/3/4/5/6/8/11 EN61000-6-2

## • Ordering

Model	Type
FNJ-DT2-Base	(Base System)
FNJ-DT2-IRD/RMX	(Remux and BISS Descrambler)
FNJ-DT2-TX CTRL	(Simple Transmitter Control)
FNJ-DT2-EXT PWR	(Extended output Power up to +10dBm)
FNJ-DT2-GPS	(GPS Receiver)



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