

## Product Features

- 2500 MHz - 2700 MHz Broadband Transmitter
- LDMOS Power Amplifier provides 100 Watt output for broadcast of digital waveforms
- Universal exciter supports DVB-T and DVB-T2 waveforms
- DVB-T/H SFN, MFN and Hierarchical support
- DVB-T2 Single and Multiple PLP support, MFN and SFN (with T2-MI support) operation, SISO/MISO transmission
- Manual Linear and Non-linear Digital Pre-correctors
- GbE Transport Stream Input based on Pro-MPEG Forum CoP #3 / SMPTE 2022
- Automatic power-up following an AC interruption
- High power efficiency and low operating cost
- Touch screen display for real time user interface
- Remote manageable via Web GUI and SNMP
- Integrated GPS or GPS/GLONASS Receiver (optional)
- Occupying only 3 RU of standard 19" cabinet space



## Product Description

### Overview

The DTX 1000S is a compact, solid-state transmitter, designed for digital terrestrial television broadcasting over a S-Band frequency range of 2500 MHz to 2700 MHz.

The medium power design provides up to 100 Watts of output power for broadcast of DVB-T and DVB-T2 waveforms.

The DTX 1000S transmitter includes a universal exciter module, 100W power amplifier and integrated AC/DC power supply.

All of the transmitter's components are enclosed in a standard 19" rack mount chassis, occupying only 3 "RU" of cabinet space. The transmitter is forced air cooled using two compact high performance fans, which are installed on the transmitter enclosure front panel.

### Universal Exciter

The exciter utilizes the innovative UBS universal waveform engine, supporting world-wide digital standards for terrestrial broadcasting.

The exciter can be factory configured with the necessary hardware to support one or both of the waveforms listed above, allowing the user to easily switch from one waveform to another. The exciter can also be upgraded in the field as standards evolve.

The exciter includes two ASI inputs and two Gb Ethernet input (DVB-T) or two ASI / T2-MI inputs (DVB-T2).

Using the latest technology, the exciter converts an input transport stream to a COFDM modulated RF signal. UBS has developed a Direct Digital Synthesis (DDS) process that allows the exciter to provide the amplifier portion of the transmitter with a modulated RF signal.

For SFN operation, the exciter provides signal synchronization with external (optional internal) 10 MHz and 1PPS reference signals.

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### Product Description

#### Power Amplifier

The power amplifier architecture is based on a solid state design operating in Class A/AB linear mode over a frequency range of 2500 MHz to 2700 MHz.

The PA employs its own microcontroller, which monitors the operating parameters of the PA and provides protection against abnormal operation conditions (reflected power, current overloads and high temperature). The PA microcontroller communicates with the main system controller for parameter and alarm reporting.

Each power amplifier module includes an internal AC/DC power supply and two internal fans that provide forced air cooling.

#### Control and Monitoring

The exciter serves as the main system controller responsible for configuration and management of the entire transmitter.

The exciter and PA are linked by a RS-485 serial cable for control and monitoring. The system controller supports transmitter operation, configuration, management and status reporting. System control includes power up, power down, RF control processes, control commands for status requests and operating parameters, etc.

The DTX 1000S features an intuitive Web interface allowing the user to access the current transmitter status and configure the operational parameters. The Web interface uses a simple hierarchical menu structure which provides access to all transmitter parameters. The Web interface can be accessed locally or remotely via an IP network using a standard web browser.

The SNMP v3 interface provides the means for remote management of the transmitter in accordance with SNMP protocol (Get, Set and SNMP traps). This remote control feature is intended for systems solutions where it is desired to integrate the control of a range of SNMP compliant equipment in a common management system.

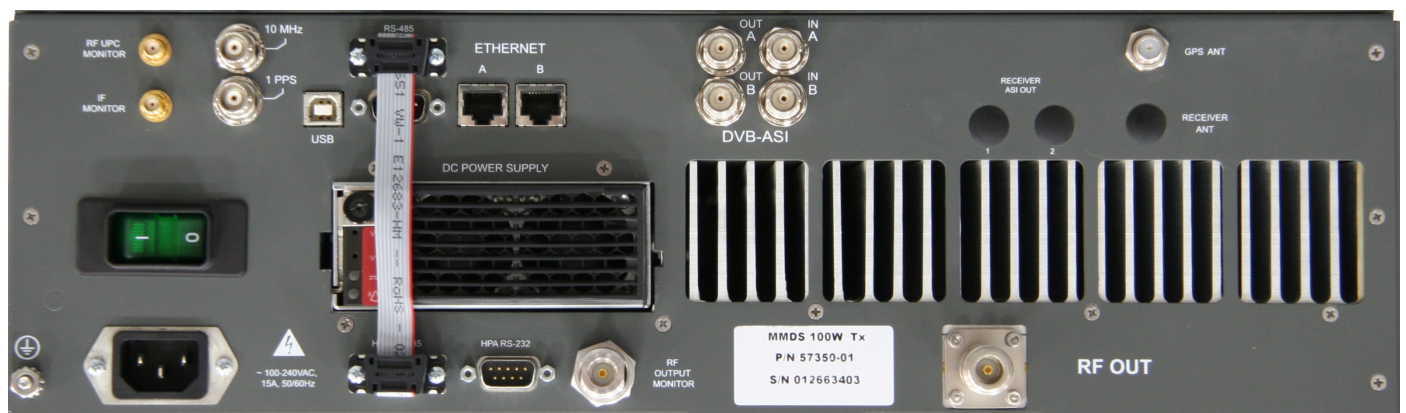
#### Manual Linear and Non-Linear Digital Pre-correctors

The manual linear and non-linear digital pre-correctors are used to maximize the performance of the transmitter in which the exciter is installed.

- The Non-linear pre-corrector balances out gain and phase non-linearity in the transmitter RF power amplifier, thereby significantly reducing the in-band and out of band intermodulation products. Optimizing the transmitter's performance will extend the coverage area. The performance requirement of the transmitter output filter, which is used to suppress radiation in adjacent channels below a maximum allowed level, will also be eased.
- The Linear pre-corrector balances out level and group delay variations that are seen across the channel bandwidth and caused by the transmitter mask filter and/or channel combiner filters. The linear optimization of the transmitter's radiated signal allows the receiver's channel equalizer to focus all of its correction capacity on level and group delay errors originating from the actual transmission path.

#### Internal GPS or GPS/GLONASS Receiver Option

The exciter can be equipped with an internal receiver that provides the 10 MHz and 1PPS reference signals needed for SFN synchronization.



Rear Panel



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## Product Specifications

### Control Interfaces

<b>Front Panel</b>	Touch screen LCD
<b>Ethernet Interface</b>	Connector: 2x RJ45 Speed: 10/100/1000 Base-T
<b>USB Interface</b>	Connector: USB Type B
<b>RS232 Interface</b>	Connector: 9-pin SUB-D Male
<b>RS485 Interface</b>	Connectors: 9-pin SUB-D Female Must be connected to the HPA RS485 interface
<b>HPA RS485 Interface</b>	Connector: 9-pin SUB-D Female Must be connected to the RS485 interface
<b>HPA Serial (RS232)</b>	Connector: 9-pin SUB-D Male
<b>Web Interface</b>	Internet Explorer, Firefox, etc. Connector: Ethernet
<b>SNMP Control Interface</b>	Connector: Ethernet Note: MIBs are provided
<b>CLI (Command Line Interface)</b>	Connector: USB (HyperTerminal) or Ethernet (HyperTerminal and Telnet)
<b>Alarm Relays</b>	Connector: RS232 2 Dry Contact Alarm relays, triggered by any major alarm.

### Exciter Inputs

<b>DVB-ASI</b>	2 inputs: BNC (F), 75 $\Omega$
<b>DVB-ASI / T2-MI</b>	2 inputs: BNC (F), 75 $\Omega$
<b>GbE Transport Stream (DVB-T only)</b>	Connector: RJ45 Protocol: Pro-MPEG Forum CoP #3 / SMPTE 2022
<b>10 MHz (Note 1)</b>	Connector: BNC (F) Frequency: 10 MHz Level: 0 dBm to 15 dBm Impedance: 50 $\Omega$
<b>1 PPS (Note 1)</b>	Connector: BNC (F) Frequency: 1 PPS Level: TTL Trigger: Positive transition Impedance: 50 $\Omega$

**Note 1:** The 10 MHz and 1PPS connectors are inputs, except when the exciter is equipped with internal GPS receiver. In this case, the 10 MHz and 1PPS connectors become monitoring outputs (high impedance).

### Power Amplifier RF Output

<b>RF Output Connector</b>	N-type (F), 50 $\Omega$
<b>Operating Frequency Range</b>	2500 MHz - 2700 MHz
<b>Frequency Setting Accuracy</b>	1 Hz step over entire operation range
<b>Frequency Stability</b>	1 ppm internal, or in accordance with external GPS accuracy
<b>Digital Average Output Power</b>	100 Watts
<b>Output Power Level Accuracy</b>	$\leq \pm 0.25$ dB
<b>Frequency Response</b>	$\leq \pm 0.5$ dB
<b>MER</b>	> 35 dB
<b>In-band IMD</b>	$\leq -25$ dBc (at rated output power)
<b>Spectral Regrowth</b>	$\leq -30$ dBc (at rated output power)
<b>Phase Noise (SSB)</b>	100 Hz: < -80 dBc/Hz 1 kHz: < -85 dBc/Hz 10 kHz: < -95 dBc/Hz 100 kHz: < -100dBc/Hz 1 MHz: < -110dBc/Hz
<b>Output Spurious Level</b>	$\leq -70$ dBc
<b>Output Harmonics</b>	$\leq -55$ dBc
<b>RF Monitor</b>	Connector: N-type (F), 50 $\Omega$ Level: 50 dB below the RF output

### Exciter Outputs

<b>DVB-ASI</b>	2 outputs: BNC (F), 75 $\Omega$
<b>DVB-ASI / T2-MI</b>	2 outputs: BNC (F), 75 $\Omega$
<b>Modulator RF Monitor</b>	Connector: SMA (F), 50 $\Omega$ Level: 30 dB below RF output
<b>10 MHz (Note 1)</b>	Connector: BNC (F), High Impedance Frequency: 10 MHz Level: 10 dBm, $\pm 2.5$ dB sinewave
<b>1 PPS (Note 1)</b>	Connector: BNC (F), High Impedance Frequency: 1 PPS Level: TTL Trigger: Positive transition

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### Product Specifications

#### Manual Digital Pre-Correction

##### Non-Linear Pre-Correction

<b>Curve Formats</b>	S 21 and VO/M
<b>Amplitude Scale</b>	Linear and Logarithmic
<b>Correction Points</b>	Max. 256, user-defined position
<b>Spectral Regrowth Reduction</b>	Max. 12 dB, subject to available headroom
<b>Phase Correction</b>	-6 to +30 degrees, subject to available headroom

##### Linear Pre-Correction

<b>Correction Points</b>	61
<b>Point Spacing</b>	1/60 of nominal spectrum BW
<b>Amplitude Correction</b>	±10 dB
<b>Amplitude Resolution</b>	0.01 dB
<b>Group Delay Correction</b>	±2000 ns
<b>Group Delay Resolution</b>	1 ns
<b>Peak Power Clip Level</b>	+17 dB to +7 dB (peak power relative to average RMS level)

#### Power Supply

<b>Voltage</b>	100 - 240 VAC
<b>Frequency</b>	50/60 Hz
<b>Power Consumption</b>	max. 1200 Watts
<b>Power Factor</b>	0.96

#### Environmental

<b>Operating Temperature</b>	0° C to +50° C (+32° F to +122° F)
<b>Storage Temperature</b>	-30° C to +70° C (-22° F to +158° F)
<b>Relative Humidity</b>	max. 95%, non condensing
<b>Cooling</b>	Forced air

#### Mechanical

<b>Size</b>	3 U of 19" wide cabinet
<b>Dimensions (W x H x D)</b>	48.26 cm x 13.28 cm x 63.88 cm (19" x 5.23" x 25.15")
<b>Weight</b>	22 kg (48.5 lbs.)



# 100W S-Band Transmitter

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## Product Specifications

### GPS Receiver

<b>Input Connector</b>	F-type (F), 75 $\Omega$ 5 Vdc biased
<b>Recommended Antenna</b>	Bullet III GPS antenna - Trimble model no. 57860-10 or equivalent
<b>Receiver Architecture</b>	L1 1575.42 MHz
<b>12 Parallel Channels</b>	C/A code (1.023 MHz chip rate) Code plus carrier tracking (carrier aided tracking)
<b>Tracking Capability</b>	12 simultaneous satellite vehicles
<b>Acquisition Time (Time To First Fix, TTFF)</b>	< 15 seconds typical TTFF-hot (with current almanac, position, time and ephemeris) < 150 seconds typical TTFF-cold (no stored information)
<b>Positioning Accuracy</b>	< 5 m, 1 - sigma < 10 m, 2 - sigma
<b>Timing Accuracy</b>	< 2 ns, 1 - sigma < 6 ns, 6 - sigma
<b>Holdover Time</b>	$\pm 1$ usec during 2 hours
<b>10 MHz Output Signal</b>	Internally connected to the modulator input Level: 10 dBm $\pm 2.5$ dBm, sine wave Harmonic Level: -40 dBc max. Phase Noise: 1 Hz: < -75 dBc/Hz 10 Hz: < -110 dBc/Hz 100 Hz: < -125 dBc/Hz 1 kHz: < -135 dBc/Hz 10 kHz: < -155 dBc/Hz 100 kHz: < -155 dBc/Hz
<b>1PPS Output Signal</b>	Internally connected to the modulator input Level: TTL

### GPS/GLONASS Receiver

<b>Input Connector</b>	F-type (F), 75 $\Omega$ 5 Vdc biased
<b>Recommended Antenna</b>	Bullet III GPS antenna - Trimble model no. 57860-10 or equivalent
<b>Receiver Architecture</b>	L1 - 1575.42 MHz / GLONASS - L1 frequency range
<b>32 Parallel Channels</b>	GPS C/A code (1.023 MHz chip rate) / GLONASS PT code - WASS / EGNOS Code plus carrier tracking (carrier aided tracking)
<b>Tracking Capability</b>	24 simultaneous satellite vehicles
<b>Acquisition Time (Time To First Fix, TTFF) (Tested at -40°C to +85°C)</b>	< 15 s typical TTFF-hot (with current almanac, position, time and ephemeris) < 40 s typical TTFF-warm (with current almanac, position, time) < 150 s typical TTFF-cold (No stored information)
<b>Positioning Accuracy</b>	GPS: < 10m / 20m GLONASS: < 10 m / 20m
<b>Timing Accuracy</b>	< 100 ns
<b>1 PPS + 10 MHz</b>	
<b>Holdover Time</b>	$\leq 2.5$ $\mu$ sec during 2 hours
<b>10 MHz Output Signal</b>	Internally connected to the exciter input Level: 10 dBm $\pm 2.5$ dBm, sine wave Harmonic Level: -30 dBc max. Phase Noise: 1 Hz: < -75 dBc/Hz 10 Hz: < -110 dBc/Hz 100 Hz: < -125 dBc/Hz 1 kHz: < -135 dBc/Hz 10 kHz: < -155 dBc/Hz 100 kHz: < -155 dBc/Hz
<b>1PPS Output Signal</b>	Internally connected to the exciter input Level: TTL



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Part Number Configuration



**Band**  
 YL – L-Band  
 YS – S-Band  
 YC – C-Band  
 YX – X-Band  
 KU – Ku-Band  
 KA – Ka-Band

**Output Power**  
*L-Band*  
 0250W,0500W  
*S-Band*  
 0150W, 0300W  
*C-Band*  
 0010W, 0020W, 0040W,  
 0080W,0100W, 0150W,0200W,  
 0250W,0300W, 0325W,0400W,  
 0650W,0800W  
*X-Band*  
 0275W, 0550W  
*Ku-Band*  
 0060W,  
 0080W,0100W, 0150W,0200W,  
 0300W,0400W, 0800W,  
*Ka-Band*  
 TWTA, UP TO 1.5KW  
 AVAILABLE PLEASE CALL FOR INQUIRY

**FOR HIGH POWER 1KW AND ABOVE PLEASE CONTACT OUR SALES DEPARTMENT**

**Sub Band**  
*L-Band*  
 A (1.0-2.0 GHz)  
 B (1.5-3.0 GHz)  
 C (1.0- 2.5 GHz)  
*S-Band*  
 A (2.02-2.12 GHz)  
 B (2.20-2.30 GHz)  
*C-Band*  
 A (5.850-6.425 GHz)  
 B (5.750-6.475 GHz)  
 C (5.750-6.670 GHz)  
 D (5.850-6.725 GHz)  
 E (6.425-6.725 GHz)  
 F (6.725-7.025 GHz)  
*X-Band*  
 A (7.70-8.40 GHz)  
 B (7.90-8.40 GHz)  
 C (7.50-8.50 GHz)  
 D (9.50-10.50 GHz)  
*Ku-Band*  
 A (14.00-14.50 GHz)  
 B (13.75-14.50 GHz)  
 C (12.75-13.25 GHz)  
 D (13.00-14.50 GHz)  
 E (13.25-13.75 GHz)  
*Ka-Band*  
 A (27.5-31.0 GHz)

**Configuration/Options**  
 STD – Standard  
 ISP – Input Sample Port  
 WGF\* – 90° Output W/G Flange  
 WSP\* – 90° Output W/G Flange with Input Sample Port  
 FPS\*\* – Front Panel Power Switch  
 RPM – Reflected Power Monitor  
 FRM\*\* – Front Panel Power Switch and Reflected Power Monitor  
 EPS – External, Redundant Power Supply, 1RU N+1  
 EPE – External Power Supply, 1RU N+1 and Rear Panel

\* Available in all but S-Band-and L-Bands  
 \*\* Not Available with External 1RU N+1 Redundant Power Supply

**Block Up Converter**  
 B - BUC  
 X – Not Available

**Enclosure**  
 I - Indoor  
 O - Outdoor