

# PT3082 DVB-T2 Exciter

## PT3080 DVB-T/H



The PT3082 DVB-T/T2 ProTelevision Technologies Exciter provides maximum efficiency for Broadcasters and Transmitter Manufacturers.

The exciter is characterized by a high RF and MER performance and by its unique ability to optimize the performance of any third party power amplifier.

- ◆ Software upgradable to from **DVB-T** to **DVB-T2**.
- ◆ High performance digital adaptive **linear and nonlinear pre-correction** for maximum transmitter performance.
- ◆ **4x Ethernet Gigabit** interfaces for control and data transport.
- ◆ **OPTIPOWER®** - market leading enhanced adaptive pre-correction and PAPR clipping technology for maximum optimization of transmitter power efficiency (Option PT3756)
- ◆ **SNMP** client Get/Set/Trap.
- ◆ Support of **255 PLPs**
- ◆ **VHF and UHF** (selectable frequency from 30MHz to 860 MHz in steps of 1Hz)
- ◆ Integrated Multi Standard Global Navigation Satellite System (GNSS) receiver for time and frequency reference based on **GPS and GLONASS** systems (Option PT3711).
- ◆ Three choices of internal precision (Local Oscillator) according to the needs of the system: 2ppm, 0.25ppm or 0.01ppm.
- ◆ Available SW based Automatic Level Control to regulate any third party power amplifier output. (Option PT3770/00).
- ◆ User friendly intuitive WEB GUI control for use with standard Web Browser (Internet Explorer, Mozilla Firefox, Google Chrome and Opera compatible).
- ◆ **Seamless switching** between any input combination (ASI-IP, IP-IP, ASI-ASI).

**DVB<sup>®</sup> T2**  
**DVB T**

**OPTIPOWER<sup>®</sup>**

**Standard configuration:**

PT3080 DVB-T/H Exciter  
PT3082 DVB-T2 Exciter

By installing the license "PT3726 Dualcast T&T2" to any of the above products, a DVB-T/T2 configuration is obtained, holding both DTT standards in one exciter.

## Application

The **PT3082 DVB-T/T2** is characterized by a high RF and MER performance and by its unique ability to optimize the performance of any third party power amplifier being utilized together with the modulator.

PT3080 is the pure **DVB-T/H modulator**, always upgradable to DVB-T2.

The PT3082 DVB-T2 modulators accept input in ASI format and in TSolP format subject to the particular configuration; The PT3182 DVB-T modulators have four Ethernet Gigabit ports with different MAC addresses. Either one or two of these ports are optimized for TSolP (PT3720/00).

When operating in the Interface A input mode (ref.TS 102 733 paragraph 4.2, system architecture) the modulator accepts input of legacy MPEG-2 transport stream over the ASI and TSolP interfaces.

When operating in the Interface B input mode (ref. TS 102 773 paragraph 4.2, system architecture) the modulator accepts input of T2-MI over the ASI and TSolP interfaces (T2-MI encapsulated in MPEG-2 TS). The PT3182 Modulator, is transparent to any compression format carried by the MPEG-2 (MPEG-2, MPEG-4, H.264, HEVC or any future format).

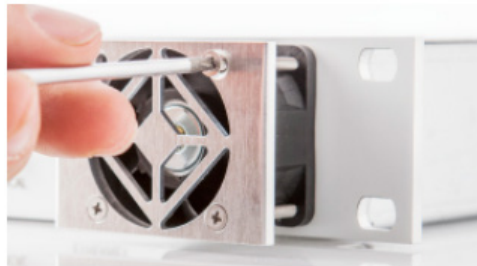
The PT3082 DVB-T2 exciter is designed in accordance with the ETSI standards TS 102 773 (T2-MI) and EN 302 755 (DVB-T2 channel coding and modulation).

Please refer to Signal Processing DVB-T/H (PT3180) description in the specification section.

**Seamless switching** between any combination of inputs (**ASI and/or IP**) is supported for both **DVB-T and DVB-T2** in SFN mode.



Easy navigation



Easily exchangeable fan



Optipower is a ProTelevision Technologies' proprietary solution developed to provide an increase of quality (MER) and efficiency to new or existing TV transmitters.

Optipower consists of:

- 1) Enhanced Nonlinear Precorrection algorithm with **DEEP MEMORY EFFECTS** based on the Volterra polynomial series.
- 2) **Adaptive PAPR clipper**.

These two adaptive mechanisms, allow achieving the maximum MER value on any transmitter system (VHF, UHF, Class AB, Doherty, etc...) compared with other precorrection solutions on the market.

This MER extra increase, can be used to **enhance the overall efficiency of the transmitter system**.

In addition, ProTelevision Optipower (Option PT3756) will provide **live measurements** on the WEB Graphical User Interface: Shoulders, MER, PAPR, MER vs Carrier and a Spectrum graphic on the channel transmitted (see picture).

Main specifications for (Optipower) precorrection and feedback signals: Connectors: SMA 50 ohm // Level: -10dBm to +10dBm // Return Loss > 20dB // Frequency: 30MHz to 860MHz.



## SIGNAL PROCESSING DVB-T2 (PT3082)

### Supported Interface modes:

Interface A:	Input of 'legacy' MPEG-2 TS for MFN single PLP transmission (requires option PT3784)
Interface B:	Input of T2-MI from external T2 gateway (Single and multi PLP, MFN and SFN)

### System main characteristics

(note: all listed system main characteristics are for Interface B mode subject to the modes supported by the T2 gateway used):

Supported T2 versions and profiles:	1.1.1/Main, 1.2.1/Main, 1.3.1/Main and Lite and 1.4.1/Main and Lite
System bandwidth:	1.7 MHz, 5 MHz, 6 MHz, 7 MHz and 8 MHz

### PLP configuration

(note: all listed PLP configurations are for Interface B mode subject to the modes supported by the T2 gateway used):

Number of PLPs:	
Interface A mode:	Single PLP only
Interface B mode:	Single PLP and Multiple PLP mode up to 255 PLPs equal to the maximum given by the T2 standard.

PLP payload type:	
Interface A mode:	TS
Interface B mode:	TS, GSE, GCS, GFPS
PLP mode:	Normal and High Efficiency
PLP modulation:	QPSK, 16-QAM, 64-QAM, 256-QAM (rotated and none-rotated)
PLP FEC:	16K LDPC, 64K LDPC
PLP LDPC code rate:	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, (plus 1/3, 2/5 for T2 Lite)
PLP time interleaving type:	None, One T2Frame, Several T2Frames
PLP time maximum interleaving length:	1-255 blocks by One T2-frame, 2 - 255 frames by Several T2 frames
PLP ISSY:	ON/OFF
PLP NPD:	ON/OFF

### T2 frame configuration

IFFT:	1K, 2K, 4K, 8K, 16K, 32K (including extended carrier modes)
Guard intervals:	1/4, 19/256, 1/8, 19/128, 1/16, 1/32, 1/128
Pilot pattern:	PP1, PP2, PP3, PP4, PP5, PP6, PP7, PP8
PAPR control:	L1-ACE / P2-TR with T2 version 1.2.1 and 1.3.1 (HW and FW prepared for L1-ACE and ACE only, L1-ACE and TR only, L1-ACE ACE and TR)
L1 Modulation:	DPSK, QPSK, 16-QAM
Network modes:	MFN & SFN (relative & absolute timestamp, MISO/SISO)
Test modes:	Single carrier, PRBS, NULL-P1

## SIGNAL PROCESSING DVB-T/H (PT3080)

Supported modes IFFT:	2K, 4K and 8K
Interleaver:	Native as well as in-depth and native (DVB-H mod)
Guard intervals:	1/4, 1/8, 1/16, 1/32
Code rates:	1/2, 2/3, 3/4, 5/6, 7/8
Constellations:	QPSK, 16-QAM, 64-QAM
Hierarchical modes :	16-QAM and 64-QAM in alpha-1, alpha-2 and alpha-4
Network mode:	MFN and SFN
Bandwidth:	8 MHz, 7 MHz, 6 MHz and 5 MHz

## POWER SUPPLY

Voltage:	Accepts all the DC range from 100-240 VAC
Frequency:	47-63 Hz
Power consumption:	Max. 40 W

## ELECTRICAL SPECIFICATIONS

### Inputs

ASI Inputs/SMTPE-310M inputs	
No. of ASI inputs:	2
Connector:	BNC
Input Impedance:	75 ohm
Return Loss:	> 13 db
Redundancy:	User selectable switching policy between "Primary" and "Secondary" ASI source
Seamless Switching:	Supported for any combination of inputs (ASI/IP) in SFN Configuration

### Ethernet ports (IGBit/sec)

Total No. of ports:	4 (2 of them optimized for TSolP)
Connector:	RJ45 quadruple PCB connector



2x Control & Management

2x IP inputs

### GNSS Receiver Input (Option PT3711)

Connector:	TNC 50 ohm PCB connector
Frequency:	1.575 GHz (GPS) / 1.598-1.606 GHz (Glonass)
Antenna net gain range:	0 to +32 dB
Antenna:	Passive or active antenna (not included)
Antenna DC supply:	OFF, 3 Vdc or 5 Vdc ( $\pm 0.5$ V) user selectable
Antenna DC current:	max 50 mA

### External Clock reference (carrier frequency and SFN timing):

Connector:	BNC
Frequency:	10 MHz
Level:	100 mV-3 Vpp
Impedance:	50 ohm/ > 1 kohm, user selectable
Coupling:	AC

### Time reference (SFN timing)

Connector:	BNC
Frequency:	1 PPS
Level:	0-5 V, user selectable trigger point 1V or 1.6V
Trigger:	Rising / falling edge, user selectable
Impedance:	50 ohm/ > 1 kohm, user selectable

## CONTROL INTERFACE

### Ethernet interface

Connector:	RJ45 (1 in front panel, 4 in rear panel)
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### RS232/RS485 interface

Connector:	9-pin SUB-D Male in rear panel
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### HW interface

Connector:	15-pin SUB-D Female in rear panel
Alarm output:	Two user programmable alarms via separate floating relays, common make-break contacts, contact rating 60V/0.2 A (5 W max)
Input:	Separate Reset control and Output muting control, user programmable activation: ground closure or open

## OUTPUT

### RF-output

Connector:	N female, 50 ohm
Center frequency:	Adjustable 30-860 MHz in steps of 1 Hz
Frequency stability:	Internal ref 2 ppm to 0.01 ppm or in accordance with external ref. accuracy
Spectrum polarity:	Inverted and non-inverted, user selectable
Level:	Adjustable [-10, +10] dBm (up to +20 dBm with PT 3740 Option)
Stability:	± 0.5 dB
Return loss:	> 16 dB

Spectrum outside band (for RF Output 0 dBm @ 6 MHz)

+/-3,8 MHz:	0db
+/-4,25 MHz (shoulders):	<-50 dB (typically -55 dB)
Harmonics and spurious:	< -55 dBc
MER:	> 45 dB (typically 50 dB)

Internal frequency reference

Selectable Local Oscillator for customer's specific requirements

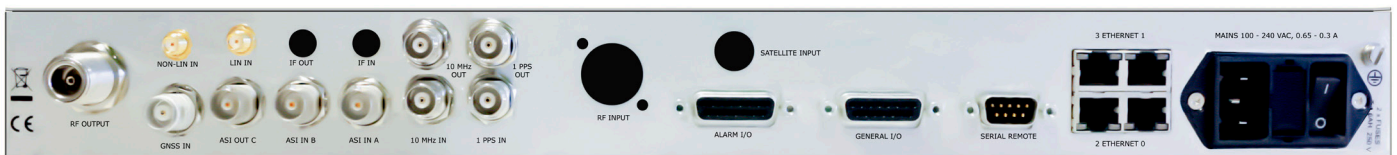
PT3710/00	TCXO 2 ppm (default)
PT3710/10	OCVCXO 0.25 ppm (optional)
PT3710/20	OCVCXO 0.01 ppm (optional)

## ENVIRONMENTAL SPECIFICATION

Climatic Temperature range operating:	-5°C to +55°C (+23 F to +131 F)
Temperature range within specs:	+5°C to +45°C (+41 F to +113 F)
Temperature range storage:	-30°C to +70°C (-22 F to +158 F)
Humidity operating:	max 90% RH
Humidity storage:	max 90% RH
EMC	Compliant to EN55022 (emission) and EN55024 (immunity)
Safety	Compliant to EN60950-1
RoHs	Compliant with directive 2011/65/EU

## MECHANICAL SPECIFICATION

Cabinet:	19" wide, 1RU high
Width:	19"
Depth:	440 mm
Height:	44 mm (1.75")
Weight :	6 kg (16 lbs)
Cooling:	Long life externally mounted chassis fans to assist natural convection
Transport and storage:	Vibration acc. to IEC Publ. 68



## Ordering codes:

### DVB-T/T2 Exciter

PT3080	DVB-T/H Exciter
PT3082	DVB-T2 Exciter

### Options, software

PT3720/00	2x TSolP interface (Gigabit)
PT3754	Adaptive digital Pre-corrector
PT3756	OPTIPOWER®: Enhanced precorrection and adaptive PAPR clipper
PT3784	Interface-A input option
PT3783	DVB-T2 Lite Support (FEF transmission mode)
PT3770/00	Automatic Level Control
PT3726	DVB-T & DVB-T2 Dualcast Support
PT3740	+20 dBm output amplifier

### Options, hardware

PT3711	GNSS module (GPS and GLONASS support)
PT3710/10	Medium Precision Oscillator OCVCXO 0.25 ppm
PT3710/20	High Precision Oscillator OCVCXO 0.01 ppm

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