

PT3050 ISDB-T/Tb Exciter



The PT3050 ISDB-T/Tb ProTelevision Technologies Exciter with **internal REMUX** 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.

- ◆ High performance digital adaptive **linear and nonlinear precorrection** for maximum transmitter performance.
- ◆ **OPTIPOWER®** - market leading enhanced adaptive precorrection and PAPR clipping technology for maximum optimization of transmitter power efficiency (Option PT3756).
- ◆ **ISDB-T/Tb REMUX** input mode for operation based on standard MPEG-2 TS input with local PID to layer mapping and local control of transmission mode. (Option PT3785)
- ◆ **BTS** available through **TS** monitoring output for distribution to another ISDB-T compliant.
- ◆ Integrated multistandard Global Navigation Satellite System (GNSS) receiver for time and frequency reference based on **GPS and GLONASS** systems (Option PT3711).
- ◆ **4x Ethernet Gigabit** interfaces for control and data transport.
- ◆ User friendly intuitive WEB GUI control for use with standard Web Browser (Internet Explorer, Mozilla Firefox, Google Chrome and Opera compatible).
- ◆ Power Supply acceptance range: from **5V to 52V**. That allows the usage of existing power supply mounted in the system.
- ◆ Three choices of internal precision (Local Oscillator) according to network requirements 2ppm, 0.25ppm or 0.01ppm.
- ◆ Power Output selectable from **-10dBm to +20dBm** (Option PT3740).
- ◆ Available SW based **Automatic Level Control** to regulate any third party power amplifier output. (Option PT3770/00).
- ◆ **SNMP** client Get/Set/Trap.

ISDB-T
OPTIPOWER®

! REMUX
! INTEGRATED

Application

The standard input format supported by the PT3050 is 204 byte BTS (Broadcast Transport Stream) packets meaning a preprocessed 'ISDB-T compliant' stream carrying the payload complete with layer mapping as well as the mode control and timing information needed by the modulator for automatically setting the operational mode.

By adding the optional **ISDB-T/Tb REMUX FUNCTION** (software option PT3785) the PT3050 will allow ISDB-T transmission based on input of a standard 188 byte MPEG-2 TS feed.

The ISDB-T/Tb REMUX will allow the modulator operator to construct the BTS for transmission based on the payload carried in the standard 188 byte MPEG-2 TS feed. The modulator operator may be assisted by the PT3785 option:

- Set-up the explicit mapping between the individual PIDs carried in the incoming TS feed and the up to three hierarchical layers supported by ISDB-T.
- Select transmission parameters like for example modulation system, guard interval and coderates.

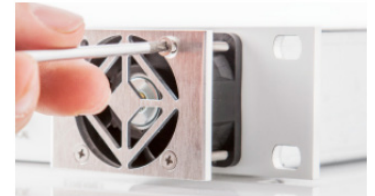
The **PT3785 REMUX** will furthermore automatically add stuffing and other required signal grooming in order to deliver a proper BTS stream as input to the modulator for transmission.

The generated BTS will furthermore be available through TS monitoring output distribution to another ISDB-T compliant modulator if so desired.

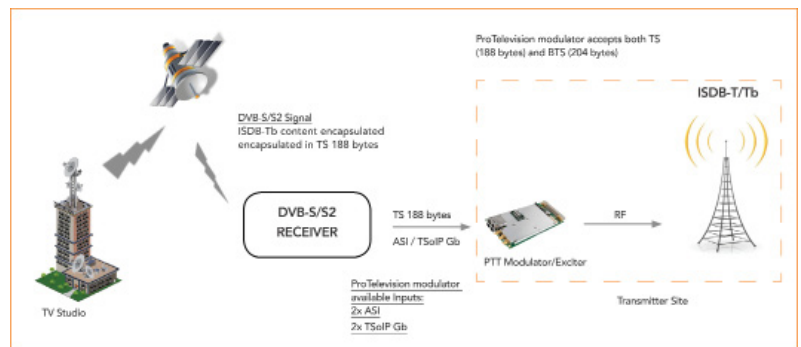
ISDB-T



Easy navigation



Easily exchangeable fan



Typical block diagram for the use of the internal remux software

OPTI POWER®

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.



SUPPORTED INPUT MODES

BTS:	Operation based on standard BTS feed
MPEG-2 TS:	Operaton based on a locally generated BTS through remuxing of a standard MPEG-2 TS input (requires option PT3785)

SYSTEM MAIN CHARACTERISTICS

Main systems supported:	ISDB-T and ISDB-TB
System bandwidth:	6MHz, 7MHz and 8MHz (effective bandwidth in the 6MHz, 7MHz and 8MHz system subject to the selected ISDB-T mode)
ISDB-T TRX modes:	Mode 1, Mode 2, Mode 3
Modulation system:	QPSK, 16QAM, 64QAM
Guard Interval:	1/4, 1/8, 1/16, 1/32
Time interleaving:	Supported
Frequency interleaving:	Intersegment / Intra segment
Selectable inner code rates:	1/2, 2/3, 3/4, 5/6, 7/8
Hierarchical transmission:	up to 3 levels
Network modes:	MFN and SFN (IIP packet)
Test modes:	Single carrier, PRBS

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)

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

ELECTRICAL SPECIFICATIONS

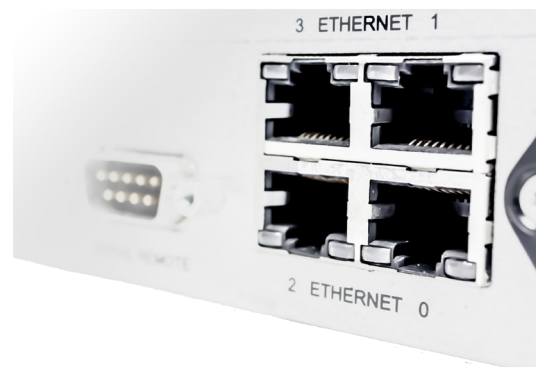
Inputs

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 (1Gbit/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 (±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 k ohm, user selectable

ENVIRONMENTAL SPECIFICATION

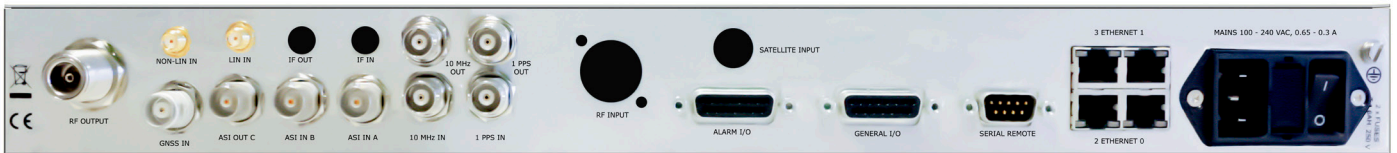
Climatic Temperature range operating:	-5°C to +55°C (+23 F to +131 F)
Temperature range within specs:	+5°C to +45°C (+41 F to +113 F)
Temperature range storage:	-30°C to +70°C (-22 F to +158 F)
Humidity operating:	max 90% RH
Humidity storage:	max 90% RH
EMC	Compliant to EN55022 (emission) and EN55024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

POWER SUPPLY

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

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:

ISDB-T/Tb Exciter

PT3050 ISDB-T/Tb Exciter

Options, software

PT3720	2x TSolP interface (Gigabit)
PT3754	Adaptive digital Pre-corrector
PT3756	OPTIPOWER®: Enhanced precorrection and adaptive PAPR clipper
PT3740	+20 dBm output amplifier
PT3063	ATSC 3.0
PT3770/00	Automatic Level Control

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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