

Air-Cooled ETL Series

New Technologies and innovative equipment manufacturing



*Low Power UHF_{B4-5} - VHF_{B3} - VHF_{B1}
Transmitter, Transposer and Gap-Filler*

▶ UHF_{B4-5} Digital and Analog Transmitters

	ETL3100UA	ETL3100UC	ETL3100UL	ETL3100UE
Output power (RMS) for COFDM standards*	1 W	4 W	25 W	50 W
Output power (RMS) for ATSC standards*	1.4 W	6 W	35 W	70 W
Output power (sync peak) for ANALOG TV*	4 W	10 W	100 W	200 W

▶ VHF_{B3} Digital and Analog Transmitters

	ETL3100TC	ETL3100TL	ETL3100TE
Output power (RMS) for COFDM standards*	4 W	25 W	50 W
Output power (RMS) for ATSC standards*	5.6 W	35 W	70 W
Output power (sync peak) for ANALOG TV*	10 W	100 W	200 W

▶ VHF_{B1} Digital and Analog Transmitters

	ETL3100FC	ETL3100FE
Output power (RMS) for COFDM standards*	4 W	50 W
Output power (RMS) for ATSC standards*	5.6 W	70 W
Output power (sync peak) for ANALOG TV*	10 W	200 W

*Before bandpass filter.

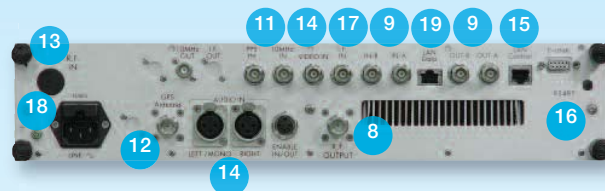
▶ Exciter + Amplifier single module

	ETL3100_U_T_F (1)
Number of amplifiers	1
Mainframe units	3
Output power (RMS) for COFDM standards *	100 W
Output power (RMS) for ATSC standards *	130 W
Output power (sync peak) for ANALOG TV *	280 W



Low Power Transmitter 3U Mainframe

Front and Back Panel



- Main Switch** – Convenient front panel main switch used to turn ON and OFF the unit.
- User Control** – Straight-forward control and intuitive indicators allow for quick status and control.
- Status Monitoring and LCD** – Front-panel indication and LCD of key operating parameters for quick status assessment. Additional indicators note the status of the rear-panel digital inputs to provide confidence regarding the status of the backup sources.
- Front-Panel Ethernet** – Convenient front-panel Ethernet port permits quick system updates or setup. All parameters are available via web interface.
- Air Filter** – Input air filter to limit the dust in the RF amplifier heat sink.
- RF Output monitor** – Convenient front-panel RF output monitor
- Serial Connectivity** – Multiple communications ports provide standard connectivity RS-232.
- RF Output** – Main high-level output of the amplifier provides 1 to 100 W of power depending on the model and mode of operation.
- Dual-Switching Inputs Outputs** – Dual ASI (with high and low priority) inputs and an isolated monitor output for confidence monitoring.
- GSM SIM card** – SIM card input for GSM remote monitoring and controlling.

- External Reference Input** – Support for single frequency networks (SFNs) is included with every ETL3100. Supports both 10 MHz and 1 PPS inputs.
- Integrated GPS Receiver** – High-quality integrated GPS receiver provides ultra-accurate reference for SFN operation and reduces installation costs and space, you need to add only the GPS receiving antenna and cable.
- RF Input** – Optional input for an off-air signal to support operation as both a transposer or translator, and for an on-channel GAP filler system in SFN networks.
- Analog Inputs** – Analog inputs support a wide range of standards including NTSC and PAL, with built-in stereo or dual sound operation and stereo encoder generator.
- LAN Control** – Ethernet Connectivity, RJ-45 connector provides system 10/100 Base-T Ethernet connectivity to the ETL3100 to facilitate diagnostics, monitoring and system updates.
- Parallel Remote Control** – Dedicated DB-9 type connectors provide property E-link BUS interfacing the transmitter to the excitors for control system operations.
- IF Input** – Input for analogue or digital IF signals to support operation as up-converter using external modulator.
- AC Main** – Single phase AC main input, different standards available.
- LAN Data** – IP connector RJ-45.

Air-Cooled ETL Series

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The EuroTel Air-Cooled low power solid-state transmitter series has been designed for digital TV standards as well as for analog TV standards. High power density, excellent transmission quality and superb reliability are the main features of EuroTel Air-Cooled low power series.

EuroTel low power family fill coverage gaps in transmitter network. They are reliable, compact and flexible. They are designed to meet requirements of small, remote transmitter sites that are difficult to access offering only limited space. ETL3100 EuroTel exciter is one of the most integrated, cost effective and versatile Transmitter, Transposer and Gap-Filler product in the broadcasting market. The EuroTel multistandard exciter performs full signal processing from



the video/audio input signal (analog TV) or the transport stream (digital TV) to the standard-conforming RF output signal. ETL3100 exciter is extremely versatile and can handle the DVB-T2, DVB-T, ISDB-T / ISDB-Tb, ATSC and DVB-H digital as well as analog standards.

The EuroTel low power Transmitter, Transposer, Gap-Filler series is capable of serving broadcasters needs for efficient, flexible and easy to maintain transmitter systems.

Features

- High efficiency due to design technology and high performance components
- Air-cooled system
- Full support multi standards for digital and analog transmission, switching from analog to digital and back with a simple command
- Transmitter, Transposer and Gap-Filler functions
- Highly efficient echo cancellation for use in single-frequency networks
- Outstanding adjacent-channel selectivity
- Rugged, reliable and highly redundant design
- Multistandard TV exciter for digital and analog transmission, switching from analog to digital and back with a simple command
- Fully broad bands module: UHF_{B4-5} – VHF_{B3} – VHF_{B1}
- Web, SNMP remote control, and parallel commands remote control interface
- Flexible integration as options

Product details

EuroTel low power series includes UHF and VHF transmitters, transposers and gap-filler for digital and analog TV.

The EuroTel ETL3100 consists of a compact and powerful unit. This module includes within a single package, a RF down-converter, a digital processing platform and an up-converter.

ETL3100 can retransmit either on the same frequency (Gap-Filler mode), or on a different channel (Transposer mode). When used in the Gap-Filler mode, a short processing time enables to use this module into single-frequency networks (SFNs). An integrated digital echo cancellation algorithm enhances the overall system stability and performance.

Simple to use linear and non-linear pre-correction circuits are incorporated to compensate for output filter and power amplifier characteristics.

High Efficiency via EuroTel Technology

The EuroTel Air-Cooled low power series offers high efficiency due to design technology and field-proven components.

New high gain, high ruggedness LDMOS device technology delivers a high increase in power density, ensuring high output power and lower operating costs.

High adjacent-channel selectivity

Digital signal processing ensures high quality for all

supported standards, and integrated digital filters provide high adjacent-channel selectivity. Additional optional external filter can be introduced as option to further increase adjacent-channel selectivity for critical conditions.

Synchronized operation in networks

The optional internal GPS receiver featuring excellent sensitivity ensures a stable transmit frequency even under critical conditions. The GPS receiver's synchronization time ensures an extremely precise and efficient gap-filler operation in a single-frequency network. If GPS receive antenna fails, gap-filler can be operated up to 24 hours in an SFN without a 1pps clock.

High reliability and ruggedness

The mains transformer provides safely isolated low voltage to high reliability switch mode power supply. The output stage module of the low power series is equipped with protective circuits. RF-overdrive, high VSWR, high HS temperature, Crow-Bar are standard protection.

Monitoring, Web interface and remote control

All low power transmitter units can be operated locally or remotely from a PC running a standard web browser, which allows the transmitter to be set easily and fast from anywhere in the world. This allows to accurately evaluate the transmitter status of unattended stations.

Specifications

Specifications are subject to change without notice.

GENERAL

PRIMARY POWER	single-phase 47 to 60 Hz, 240/230/127/110V
AC LINE VARIATION	± 15 %
MAX INSTALLATION ALTITUDE	2000 m above sea level (>2000 m on request)
OPERATING TEMPERATURE RANGE	-5 °C to +45 °C
PERMISSIBLE RELATIVE HUMIDITY	95%, non-condensing
COOLING METHOD	Forced Air

OUTPUT PARAMETERS

OUTPUT	BANDS IV-V: 470-860 MHz
FREQUENCY	BAND III: 174-250 MHz
RANGE	BAND I: 47 to 68 MHz
OUTPUT IMPEDANCE	50 Ω, unbalanced
PERMISSIBLE VSWR	< 1.5
IN-BAND INTERMODULATION PRODUCTS	< 60 dBc (-8, -10, -16 dB) @ rated output
SPURIOUS SUPPRESSION	> 60 dB
HARMONIC SUPPRESSION	> 60 dB
FREQUENCY STABILITY	1x10 ⁻⁷ (internal ref. or in accordance with ext. ref accuracy)
TUNING RESOLUTION	1Hz

EXT. TIME AND REF. FREQUENCY

REFERENCE FREQUENCY	10 MHz
REFERENCE LEVEL	200mV-3Vpp
REFERENCE IMPEDANCE	50 Ω
REFERENCE CONNECTOR	BNC
TIME REF. INPUT FREQUENCY	1 PPS
LEVEL	1 ÷ 5V peak (referred to GND)

ANALOG TRANSMITTERS

Transmission Quality

VIDEO S/N UNIFIED WEIGHTED	> 62 dB
AUDIO S/N RATIO	> 65 dB @ 50kHz deviation
DIFFERENTIAL GAIN ERROR	< 3%
DIFFERENTIAL PHASE ERROR	< 3°
LUMINANCE NON-LINEARITY	< 5%
ICPM	< 3°
VIDEO AMPLITUDE/FREQ. RESPONSE	< ±0.5 dB within the vision band
GROUP DELAY TOLERANCE	< ± 30 ns
AUDIO DISTORTION	< ± 0.05% at 1kHz
AUDIO AMPLITUDE FREQ. RESPONSE	< ± 0.5 dB, 40Hz to 15KHz

Video Input Parameters

VIDEO INPUT SIGNAL LEVEL	1 V p.p.
VIDEO INPUT IMPEDANCE	75 Ω, unbalanced
INPUT RETURN LOSS	> 30 dB
INPUT MANUAL GAIN ADJUSTMENT	± 3 dB
VIDEO CLAMPING	Sync tip or back porch selectable
WHITE CLIPPING SET AT	95% of modulation depth

Audio Input Parameters

AUDIO INPUT SIGNAL LEVEL	+8 dBu at ±50 kHz pk. dev
AUDIO INPUT IMPEDANCE	600 Ω or < 3 k Ω
AUDIO TEST TONE	400 Hz
NOMINAL FREQUENCY	
INPUT MANUAL GAIN ADJUST	+10/-3 dB

DIGITAL TRANSMITTERS

STANDARDS	DVB-T, DVB-T2, DVB-H, ISDB-T, ISDB-T _b , ATSC
MER	> 36 dB
SHOULDERS	> 37 dB
GROUP DELAY ERROR	≤ 100 ns
AMPLITUDE ERROR	≤ 0,5 dB
QUADRATURE ERROR	≤ 1°

DVB-T2 EN 302 755

NETWORK MODE	SFN and MFN
MODE	SPLP, MPLP
CHANNEL BANDWIDTH	1.7/5/6/7/8/10 MHz
LINEAR AND NONLINEAR PRE-CORRECTION	
VOIP INTERFACE WITH FEC SMPTE2022-1/2	
MISO/SISO SUPPORT	
PAPR	

DVB-T EN 300 744

NETWORK MODE	SFN and MFN
INPUT MODE	ASI, VOIP
CHANNEL BANDWIDTH	5/6/7/8 MHz
LINEAR AND NONLINEAR PRE-CORRECTION	
HIERARCHICAL TRANSMISSION MODE	

ISDB-T ARIB STD-B31

PARTIAL RECEPTION	
BTS INTERFACE	
SFN NETWORK MODE	
MULTI-LAYER	

CONTROL AND MONITOR INTERFACES

SERIAL REMOTE	RS232
ETHERNET / SNMP	RJ-45
GSM MODEM (OPTIONAL)	

RF INPUT PARAMETERS (TRANSPOSERS)

INPUT CONNECTOR	N Female
INPUT IMPEDANCE	50 Ω
FREQUENCY RANGE	50 - 870 MHz
INPUT LEVEL	-25 dBm to -65 dBm
INPUT NOISE FIGURE	< 8 dBm @ max gain (typ. 6dB)
MER	36 dB typ. @ -60 dBm < RX field < -25 dBm
SHOULDERS	> 65 dB
SELECTIVITY	40 dB Typ. @ ± 4,3 MHz
IMMUNITY TO OTHER CHANNELS (N±1)	Analogue p.s. / OFDM > 40 dB
IMMUNITY TO OTHER CHANNELS (N±1)	OFDM / OFDM > 30 dB
IMMUNITY TO OTHER CHANNELS (OTHERS)	Analogue p.s. / OFDM > 46 dB
IMMUNITY TO OTHER CHANNELS (OTHERS)	OFDM / OFDM > 40 dB

*Depending from selectivity-filter choice