



## DIGITAL TRANSMITTER

Siel's technical experience, gained after years of continuous research, developed a wide FM transmitters/exciter.

Now is pleased to proposed new digital line in LD-MOS technology.

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# 10KW SOLID STATE DIGITAL FM TRANSMITTER

## ETLFM10KS

### Main Features

Innovative FM exciter, digitally synthesized direct to channel

The exciter, includes stereo coder, RDS coder and audio limiter

Mono aural, stereo (L+R), MPX and AES/EBU inputs

Complete solid state transmitter able to grant a HIGH PA EFFICIENCY thanks to the last high voltage LD-MOS technology

HIGH redundancy in the RF amplifiers and power supply

Internal HIGH ENERGY DC return for lightning protection

Amplifier specially designed to obtain HIGH LINEARITY to allow common amplification of both FM and IBOC DAB signal or DRM signal

Transmitter provides automatic restart after AC mains interruption; return to previous operational mode

Ethernet SNMP remote diagnostic through the microprocessor supervisor

The FM products joins to the new innovative technologies the traditional reliability that contraddistinguished SIEL products since the beginning



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SIEL is very glad to introduce the innovative 10 KW VHF FM transmitter model ETLFM10KS with single drive and dual drive configuration as option as it can be seen from the block diagram and lay-out given below.

The amplifier has been specially designed in order to obtain a high linearity to allow common amplification of both FM and IBOC DAB signal or DRM signal.

The innovative FM exciter, digitally synthesized direct to channel, is built in 2 units mainframe; the audio signal is entirely digital processed and amplified by a RF amplifier of 1 watt output power. No blower is therefore necessary for the cooling of the exciter. The exciter already includes the stereo coder, the RDS coder and audio limiter. Mono aural, stereo (L+R), MPX and AES/EBU signals may be normally applied.

The ETLFM10KS is a completely solid state transmitter able to grant a high PA efficiency thanks to the last high voltage LD-MOS technology and as it can be seen from the given block diagram, the transmitter has a very high built-in redundancy in the power amplifier section. Internal high energy DC return for lightning protection is also included.

In fact 4 2500W power amplifier, are used to build-up the requested 10KW at the output of the transmitter, the ALC grants a constant RF output level.

Each one of the 4 power amplifier in turn is composed by 4 paralleled RF amplifier board supplied by 4 power supply. In this way a graceful degradation of output power is obtained in case of failure of power supply and /or RF power amplifier board.

Two blowers, each one providing the cooling air flow necessary for two RF amplifier drawer, are installed in the rack cabinet containing the 4 RF power amplifier.

The cooling air inlet is from the front of the power amplifier drawer and a hot air extractor fan is installed on the top of the rack cabinet, extracting hot air from the cabinet and ducting hot air outside the transmitter room through proper ducting to be installed in the transmitter room.

Each one of the 4 power amplifier drawer has it's own alphanumeric digital display giving the readings of the most important parameters of the amplifier.

The power amplifier rack is provided with a transformer, that in addition of working as a step-down transformer, providing a 50V A.C. voltage that is feeding the 4 power supply of each one of the 4 RF power amplifier drawer contained in each rack, it is also acting as an isolation transformer. Each RF power amplifier drawer has it's own breaker at the bottom of the rack so that in case of maintenance actions or failure each individual power amplifier can be isolated from the transmitter.

Individual breaker for the exciters, and switch-over logic unit are also provided.

Transmitter provides automatic restart after AC mains interruption; returns to previous operational mode.

The FM product joins to the new innovative technologies the traditional reliability that contraddistinguished EuoTel products since the beginning.

SIEL products are ISO 9001 certified.

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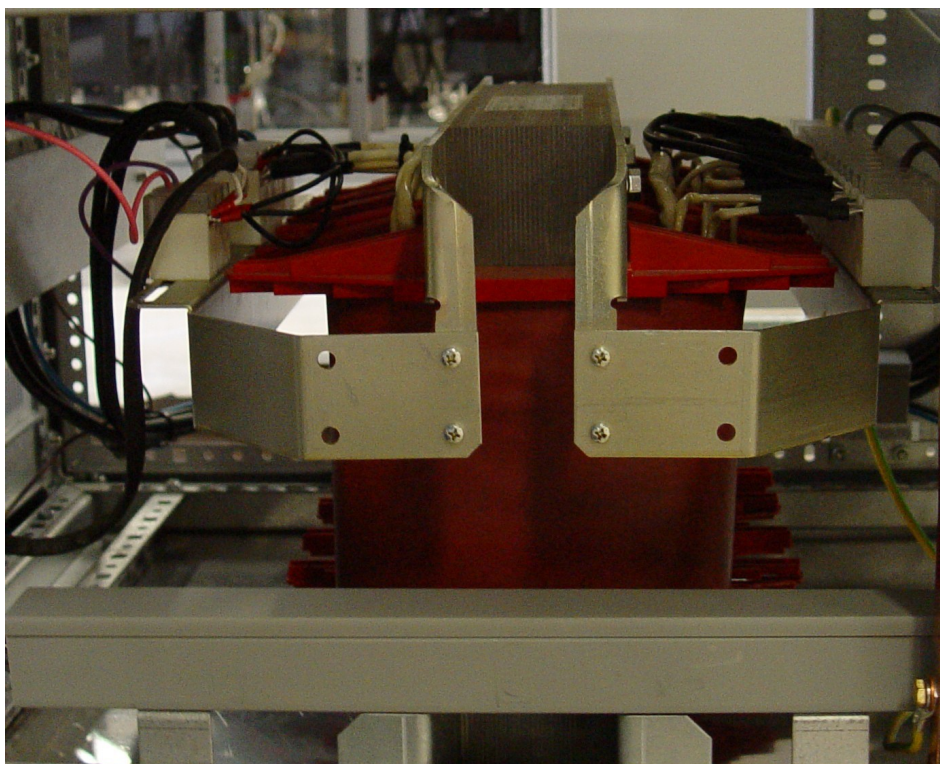
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# POWER DIVIDERS



**Rack is included isolation transformer that function as a power dividers.**



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# AMPLIFIER

The series ETLFMA4 FM R.F. Amplifier consists of one class “AB” driver stage, that feeds four class “AB” final RF amplifiers combined.

Other parts of this Amplifier are:

- Four identical switch mode power supply modules, a microprocessor controlled metering, alarm and protection module, a directional coupler.
- All these parts are assembled into a standard 4 unit 19 inch rack chassis.
- The four R.F. amplifier modules of the output stage are coupled together by means of three suspended substrate hybrid couplers.
- The R.F. amplifier modules are mounted on a massive heat sink in the upper part of the cabinet and the 4 switch mode power supplies are mounted at the bottom of the cabinet.



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# DIGITAL EXCITER

Siel is very glad to introduce the innovative FM exciter fully digital based, that goes direct to channel, is built in 2 units mainframe;  
The audio signal is entirely digital processed and amplified by a RF amplifier of 1 watt output power.

No blower is therefore necessary for the cooling of the exciter.

The exciter already include:

RDS (radio data system)

Digital Stereo coder > 75dB

Audio Limited

Audio input (left right, multiplex and digital signal AES/EBU)



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# WEB SERVER

Another important change is given by remote control with Internet that allows to monitor and change key parameters of the transmitter from anywhere in the world.



It requires only a web browser, without installing any software.

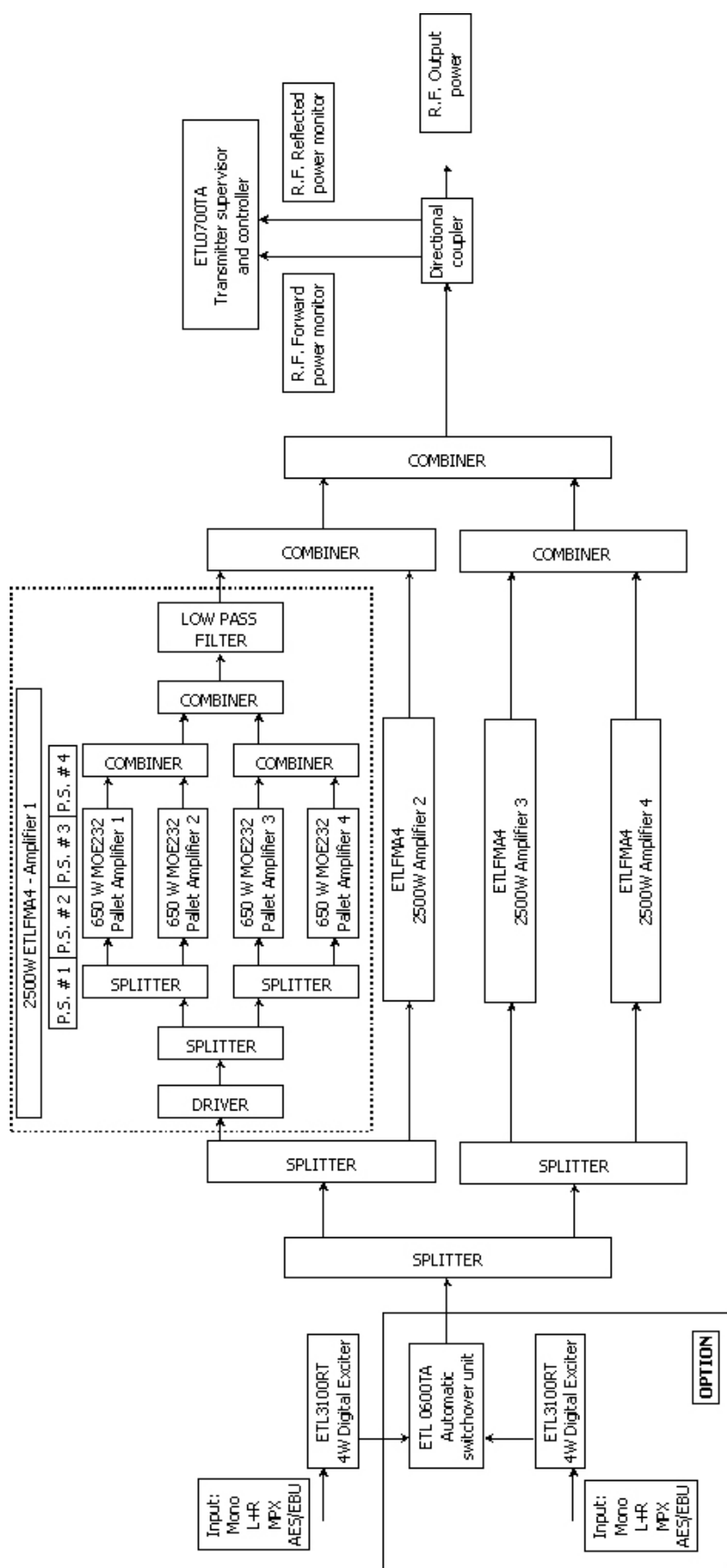
**DVBT-H Modulator**

- Linear Precorrection Values
- Linear Precorrection Amplitude and Group Delay
- Non Linear Precorrection Values
- Non Linear Precorrection Amplitude and Phase
- GPS Data

<b>Processing</b>			
IFFT Mode	8k	IF Out Frequency	17400000
Channel Bandwidth	8MHz	IF Out Level (dBm)	-3.00
Guard Interval	1/32	SFN RF Delay (us)	+0.0
Modulation Mode	64QAM	Cell ID	0
Hierarchical Mode	None	DVB-H Mode	DVB-H Off
HP Code Rate	3/4	LP Code Rate	3/4
HP Time Slicing	HPsliceTPSOff	LP Time Slicing	LPSliceTPSOff
HP MPE FEC	HPmpeTPS Off	LP MPE FEC	LPmpeTPS Off
Hierac. offset	0tp	SFN Loop	+0.00us
OnAir ASI Input	ASI Input A	IF Freq. Offset	+0Hz
SFN	No Error	SFN	Ready
Time & Freq. Ref.	Present	OCCO	In Range
<b>Input</b>			
A ASI Input Rate:	13.99Mb/s	B ASI Input Rate:	0.00Mb/s
A ASI Framer:	Ready	B ASI Framer:	Ready
A ASI:	188	B ASI:	188
A ASI:	Present	B ASI:	Not Present
A MIP:	Not Present	B MIP:	Not Present
A MIP:	Unchanged	B MIP:	Unchanged
A SFN:	Ready>	B SFN:	Ready
<b>Output</b>			
A ASI Output:	ASI Input A	B ASI Output:	ASI Input B
On Air Bit Rate Hp	19.39Mb/s	On Air Bit Rate Lp:	0.00Mb/s
<b>General</b>			
V unregulated:	11.9V	Temperature:	29.5°C

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## 60 VAC SUPPLY OF MODULES



400 VAC THREE PHASES SUPPLY STEPDOWN TRANSFORMER  
SUITABLE ALSO AS ISOLATION ONE



AC DISTRIBUTION AFTER TRANSFORMER



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R.F. OUTPUT COMBINER UNBALANCE DUMMY LOADS

## TECHNICAL SPECIFICATIONS

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### General

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Primary power	Selectable 220 / 380 / 400 / 415 VAC Tri-phase $\pm 15\%$ 47 to 60 Hz Consumption: 18 kW Typical.
Cooling	Forced air.
Operating temperature range	0°C to +45°C.
Altitude	3000 m.
Humidity	95% max, non-condensing
Storage temperature range	-10 to +70°C.
Nominal FF output power	10kW

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### Input Parameters

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Operation modes	Mono, Stereo (L+R), MPX, AES/EBU
Impedance L&R	600 Ohm or > 3000 Ohm

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### Output Parameters

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Output frequency range	BAND: 87,5 - 108 MHz, 100KHz or 10KHz step.
Output impedance	50 $\Omega$ , unbalanced.
Permissible VSWR	<1.5:1
Standard Output power	10 kW
Spurious suppression	> 70 dB
Harmonic suppression	> 70 dB

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**Stereo Transmission Quality** —

(with driver series ETL3100RT)

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Preemphasis	0, 50,75 $\mu$ s selectable.
Deviation	$\pm$ 75 KHz Nominal.
Pilot Deviation	$\pm$ 7,5 KHz Nominal.
Amplitude Frequency response	0.3 dB, 20Hz to 15KHz Typical.
THD	0,03% Typical.
Crosstalk	> 75 dB, 20Hz to 15KHz Typical.
S/N Weighted	> 70 dB
S/N unweighted	> 70 dB

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**Dimensions and Weight** —

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Dimensions	1 Standard 19" frame, 42 unit. H=2200mm, D=1000mm, W=600mm.
Weight	350 kg.

Data may change without notice