



TV TRANSMITTER

The SLIM4-02/VHF is the Syes Compact AIR Cooled TV transmitters SLIM Line.

Fully wide band high efficiency with a system efficiency up to 50%.

Composed by one PCM driver (Dual Driver Option) and two (2) SLIM4 amplifiers.

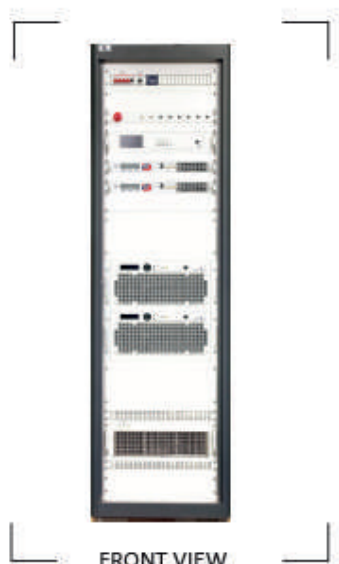
Low Consumption, Compact and Easy to maintain, with a clear and intuitive design, it is Syes next generation of air cooled transmitters, available in band I, III and IV-V.

The SLIM family is designed to be the most efficient, robust and high performance amplifiers in the DTV era.

TV
AIR COOLED

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2,5 kW COFDM, 3 kW ATSC, 5,2 kW_{ps}, 3 kW DAB 2,5 kW VHF-BIII TV TRANSMITTER



- ☐ Multistandard: ATSC (including ATSC3.0), ISDB-Tb (ABNT NBR 15.601), DTMB, DVB-T/T2, Analog.
- ☐ 2x ASI with Hitless switch, 2x IP Ethernet, A/V for analog broadcasting.
- ☐ The most advanced manual, automatic and adaptive linear and nonlinear pre-corrector.
- ☐ Fully frequency agile without need for any tuning or trimming.
- ☐ ON Board GNSS receiver (GPS, GLONASS, BEIDU, GALILEO).
- ☐ USB input to fast save/load configurations.
- ☐ Highest performances in terms of MER, BER and shoulders.
- ☐ Nr. 2 Independent temperature controlled low-noise fans.
- ☐ Use of tools is reduced almost to zero including pallets replacement.
- ☐ Remote control via SNMP, friendly web browser GUI, no need of plug-in or apps, dry contacts.
- ☐ Over temperature protection.
- ☐ VSWR and overpower protection by hardware and software with automatic power reduction.
- ☐ Automatic reboot in case of electricity failure.
- ☐ Alarm history available on web interface and through SNMP.
- ☐ Fully solid-state power amplifier module.

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TECHNICAL SPECIFICATIONS	
RF OUTPUT	
Output power*	• Up to 2500 Wrms COFDM • Up to 2500 Wrms ISDB-Tb • Up to 3000 Wrms ATSC • Up to 5200 W p.s ANALOG • Up to 3000 Wrms DAB
Spurious / Harmonics	EN 302-296-2
Shoulders/MER	Typical: >50dB/>37dB after the filter (ABNT NBR 15.601)
Connector	1-5/8" or other specified in the project
Bandwidth	VHF Band BIII (170MHz-230MHz)
Frequency stability	+/-1 Hz
Final Stage	No. 2 Amplifiers each with No. 8 Pallets with 2 final transistors each (LDMOS latest technology).
Amplification Class:	HE class / Doherty Technology
Output Impedance	50 Ohms
GENERAL	
Mechanical	
Composition	• 1x Exciter • 2x SLIM4-V Amplifier (22/36/44 U rack with top air extractor available upon request) Stand Alone
Dimensions (WxHxD mm)	600 mm / 1800 mm / 1000 mm (17 RU used by TX)
Weight	160 kg
Cooling	
Cooling System	Air Cooled
Cooling redundancy	Dual fan for driver and dual fan for Power Amplifier
Environmental	
Relative humidity	95% max. (non-condensing)
Operation temperature range	0° to 50°C
Storage temperature range	-20° to 70°C
Max. installation altitude	4.800 m a.s.l. (higher altitudes kit on request)
Power supply & Safety	
Voltage (options)	- 100 to 240 VAC - 90-264 Wide Range @ 47 to 63 Hz (auto range p.s.) power factor > 0.98
Safety /EMC	EN 60215 (IEC 215), EN301-489-53, FCC-73, IS09001-2010. RED 2014/53/UE, RoHS 2002/93/EC
Power Supply	3x power supplies in hot plug-in configuration 2+1 power supply redundancy configuration available
Additional Information	Total power capacity of the power supplies > 20% of the consumption of the transmitter operating in maximum power Input over voltage and power surge protection system Output over voltage and power surge protection system

*: Power outputs are subject to change due to out-of-band regulations and the required shoulder attenuation / MER, voltage, channel of operation and type of RF output filter.

** : HE High Efficiency Syes transmitting platform are WIDE BAND native, without any need for software or hardware change, tuning or other setting. Efficiency depends on several parameters such as operating standard and frequency, output power settings, spectrum performances, environmental conditions etc.

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DTV MODULATIONS

ATSC 3.0

Standard	ATSC 3.0: TG3/S32 Physical Layer. STL												
Inputs ****	2xASI BNC (H) , ohm / 2x TSoIP 10/100/1000 RJ45.												
Guard interval	192, 384, 512, 768, 1024, 1536, 2048, 2432, 3072, 3648, 4096 and 4864												
Code Rate/ Constellation	2 / 15	3 / 15	4 / 15	5 / 15	6 / 15	7 / 15	8 / 15	9 / 15	10 / 15	11 / 15	12 / 15	13 / 15	
QPSK	✓	✓	✓	✓	✓	✓	✓	✓		✓			
16QAM			✓	✓		✓	✓	✓		✓			
64QAM		✓	✓	✓	✓	✓	✓	✓	✓	✓			
256QAM			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
1024QAM				✓		✓	✓	✓	✓	✓	✓	✓	✓
4096QAM						✓	✓	✓	✓	✓	✓	✓	✓

DVB-T/H-T2

Standard	EN300744. EN302304. EN302755. TS 102831. TS 102 773 (T2-MI)												
Inputs ****	2*ASI BNC, 75 ohm / 3xTSoIP 10/100/1000 RJ45.												
FFT Size	1K (DVB-T2), 2K, 4K, 8K, 16K (DVB-T2), 32K (DVB-T2) incl. ext. carrier modes												
Code rate	1/2. 2/3. 3/4. 5/6. 3/5 (DVB-T2). 4/5 (DVB-T2) plus 1/3, 2/5 for T2 Lite												
Guard interval	1/32, 1/16. 1/8. 1/4. 19/256 (DVB-T2), 19/128 (DVB-T2), 1/128 (DVB-T2)												
Constellation	QPSK. 16QAM. 64QAM. 256QAM (DVB-T2). Rotated and no rotated (DVB-T2)												

ISDB-Tb

Standard	ARIB STB-B31, TR-B14												
Inputs ****	2xASI BNC, 75 ohm / 3xTSoIP 10/100/1000 RJ45												
FFT Size	2K, 4K, 8K												
Code rate	1/2, 2/3, 3/4, 5/6, 7/8												
Guard interval	1/4, 1/8, 1/16, 1/32												
Hierarchical Transmission	Up to 3 layers												
Constellation	QPSK, 16QAM, 64QAM												

ATSC

Standard	ATSC A/53. A/54. A/64. A/153. A/110B. SMPTE-310M												
Inputs ****	2xASI BNC (F)>. 75 ohm /2xTSoIP 10/100/1000 RJ45.												
Constellation	8VSB												
Symbol rate	0.76 Msmblos/s												
Data rate	19.39 Mbits/s												
Trellis coding	2/3												
Reed-Solomon encoder	207 / 187 / 10												

DTMB

Standard	DTMB (GB20200/2006)												
Inputs ****	2xASI BNC (H), 75 ohm /2xTSoIP 10/100/1000 RJ45												
FFT Size	Single carrier/ 3780												
Constellation	64 QAM, 32 QAM, 16QAM, 4QAM, 4QAM NR												
Code rate	0,4-0,6-0,8												
Data rate	24,365 Mb/s												
Frame header	420 Symbols/595 Symbols/ 945 Symbols												

DIGITAL ADAPTIVE PRECORRECTION (REAL TIME)

Type	Linear / non linear; selectable												
Clipping	12 dB												
Operation mode	Continuous / Automatic (triggering: time/shoulder level)												
Precorrection status	Running/Stopped												
PAPR	Provided												

*** Type and number of inputs depends on Exciter HW configuration



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ANALOGUE MODULATIONS

Standard	PAL std. B/G, H, K, 1, 11, M, N - NTSC Std. M - SECAM D/K
Ref. Standard	ITU-R BT.470-6
Audio	Stereo or Mono IRT
Modulation /amplification	Common
Video input	1V pp (0.5 to 2 V) (OC component level in the range -5 to 5 V) - Ret. loss better than -30 dB (0 to 6 MHz) (75 W)
Audio input	6 dBm $\pm$ 6 dB (Df= 25 to 50 kHz) - Ret. loss: better than -30 dB (40 Hz to 15 kHz) (600 W, bai.)
Video Connector	1xBNC female. 75 Ohm
Audio Connector	DB9 with patch cable for 2xXLR female, 600 W (IRT config.: 2 inputs)

REPEATER AND TRANSPOSER

Type	SFN gap filler, transposer and MFN re transmitter
RF input	N-Connector
Rfm frequency range	146 to 861 MHz
Input level	-10dBm to -60dBm (SFN Gap filler) -20dBm to -70dBm (QEF reception)
Input ret. Loss	better than -16 dB
RF in connector	N type . 50 Ohm
Echo cancellation	Resilient to static and dynamic echoes
Residual echo suppression	up to more than 30 dB (30dB are obtained at 0dB input echo)
Noise figure	max 10 dB (SFN Gap filler) max 8 dB (Transposer)
Immunity to other channel	
N+1	OFDM/OFDM > 30 dB
others	OFDM/OFDM > 40 dB

SATELLITE TRANSPOSER

SatTV standard	DVB-S - DVB-S2 - EN300421
Frequency range	950 - 2150 MHz (Ku band)
Signal level	-65 to -25 dBm
Connector	SMA f - CAM slot (Cond. Access)
LNB control	Available through RF input. PS, polarity / band selection: by standard 13/18VDC and 22kHz signaling

CLOCK AND SYNCHRONIZATION

Interna clock	OCXO single oven or dual oven (optional)
External 10 MHz reference Input	BNC (F). Impedance: 50 ohm / high (selectable). Level: -5 to +10 dBm
External 1pps reference Input	BNC (F). Impedance: 50 ohm / high (selectable)
SFN	SFN resolution 1100 ns SFN configurable delay $\pm$ 500 ms
Stability	time: max $\pm$ 10-7 /year - temperature: max $\pm$ 2.5 10-8 (-20°C to +70 °C)

MONITORING

LC Display (LCD)	Local operation through LCD display front panel keyboard measurements (forward power, reflected power, voltage, current, temperature, amplifier power and others) and controls in the menu.
Front RJ-45	Local operation through a Web Server Graphical User Interface, Remote Network management (via SNMP)
Rear RJ-45	Local operation through a Web Server Graphical User Interface, Remote Network management (via SNMP)
GUI	Web Server Graphical User Interface xHTML based
SNMP	V2c / V3 provided
Communication Interface	USB, ETHERNET
Others	Forward and reflected power monitoring, analogic output with female conector DB type with 50mV to 7V range.