

5kW COFDM, 6kW ATSC, 10,4kWps, 9kW DAB

5 kW VHF-BIII TV TRANSMITTER



TV TRANSMITTER

The SLIM5-04/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 four (4) SLIM5 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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HIGH EFFICIENCY



MULTI-PLATFORM



MULTI INPUT



MULTI-STANDARD
DVB-T/T2 ATSC/ATSC 3.0
ISDB-Tb DTMB NTSC (analog)



WIDE BAND



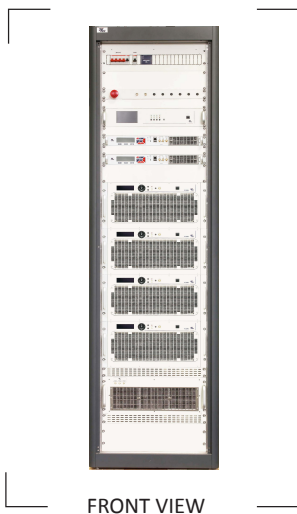
AIR COOLED



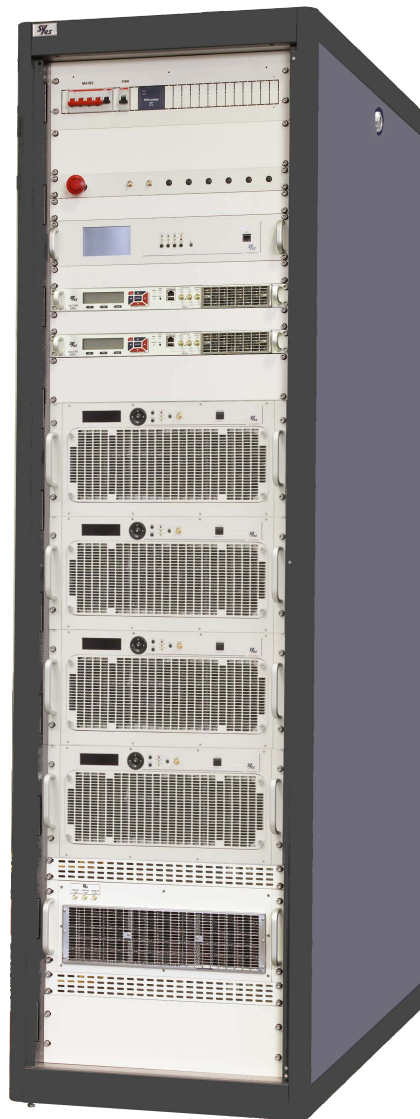
GNSS
(GPS, GLONASS, BEIDU, GALILEO)



MONITORING
SNMP, WEB BASED GUI,
DRY CONTACTS



FRONT VIEW



- ☐ Multistandard: ATSC (including ATSC 3.0), ISDB-T, DTMB, DVB-T/T2, Analog, DAB.
- ☐ 2x ASI with Hitless switch, 2x IP Ethernet, 2x ETI/EDI + 1xSFP (optical/electrical), A/V for analog broadcasting.
- ☐ The most advanced manual, automatic and adaptive linear and nonlinear pre-corrector.
- ☐ ON Board GNSS receiver (GPS, GLONASS, BEIDU, GALILEO).
- ☐ USB input to fast save/load configurations. Each amplifier equipped with No. 3 Hot Pluggable power supplies.
- ☐ Overall efficiency up to 50% with highest performances in terms of MER, BER and shoulders.
- ☐ 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.

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TECHNICAL SPECIFICATIONS	
RF OUTPUT	
Output power*	• 5000 Wrms COFDM • 6000 Wrms ATSC • 10400 Wp.s. ANALOG • 9000 Wrms DAB
Spurious / Harmonics	EN 302-296-2
Shoulders/MER	Typical: >40dB/>35dB
Connector/ Impedence	3 1/8", other available
Bandwidth	VHF Band BIII (170MHz-230MHz)
Frequency stability	1 Hz
Amplification Class:	HE or AB class available
Final Stage	No. 4 Amplifiers each with No. 6 Pallets with 4 final transistors each (LDMOS latest technology).
GENERAL	
Mechanical	
Composition (Main components in one rack 44U)	• 1x Exciter • 4x SLIM5-V Amplifier
Dimensions (WxHxD mm- Weight)	44 RU rack 240 kg
Cooling	
Cooling System	Air Cooled
Cooling redundancy	Dual fan for driver and dual fan for each 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	208/ 400 Vac (three phase) 47 to 63 Hz (auto range p.s.) power factor > 0.98
Power Supply	3x Power supplies per Amplifier 2+1 PS redundancy configuration available
Efficiency** (typical value referred to OFDM modulation)	Up to 50%
Safety /EMC	EN 60215 (IEC 215), EN301-489-53, FCC-73, IS09001-2010. RED 2014/53/UE, RoHS 2002/93/EC

*: 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.

** : Efficiency depends on several parameters such as operating standard and frequency, output power settings, spectrum performances, environmental conditions etc.

SYES

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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 / 3xTSolP 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 / 3xTSolP 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 /2xTSolP 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 /2xTSolP 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													
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	
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	
Internal clock	OCXO single oven or dual oven (optional)
External 10 MHz reference	BNC (F). Impedance: 50 ohm / high (selectable). Level: -5 to +10 dBm
External 1pps reference	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	Local operation through LCD display and keyboard located on the front panel
Front RJ-45 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

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