

Low VHF: 3,7 kW COFDM, 5 kW ATSC, 12,5 kWps

3,75 kW VHF-BI TV TRANSMITTER



MULTI-PLATFORM



MULTI INPUT



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



WIDE BAND



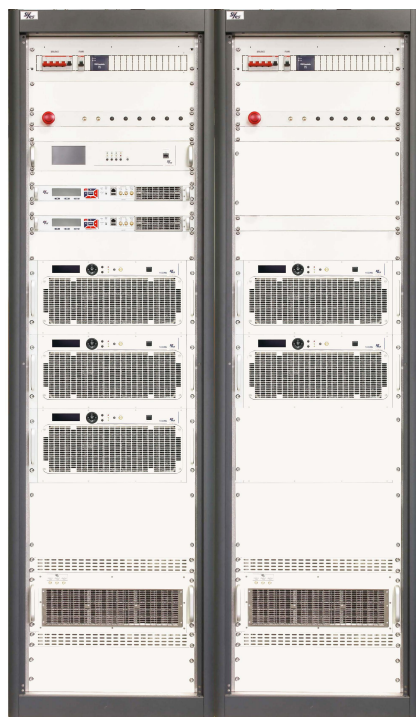
AIR COOLED



GNSS
(GPS, GLONASS, BEIDU, GALILEO)



MONITORING
SNMP, WEB BASED GUI,
DRY CONTACTS



TV TRANSMITTER

The Slim5 Line is the air-cooled Transmitter family from SYES.

The SLIM5-05/BI is composed by one PCM driver (Dual Driver Option) and five (5) SLIM5 amplifiers.

It is equipped with Wideband Low VHF state-of-the-art amplifiers characterized by high-power density and excellent signal quality granting optimal parameters such as shoulder attenuation and MER.

The Slim5 Low VHF amplifiers are equipped with 3x redundant power supplies each, assuring the maximum reliability and the easiest maintenance.

- ☐ Multistandard: ATSC (including ATSC3.0), ISDB-T, 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.
- ☐ Amplifier equipped with 3 GE power supplies Hot Pluggable.
- ☐ RF Pallets with independent carrier mount, no re-adjustment needed.
- ☐ 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*	• 3700 Wrms COFDM • 5000 Wrms ATSC • 12500 Wp.s. ANALOG
Spurious / Harmonics	EN 302-296-2
Shoulders/MER	Typical: >50dB/>35dB
Connector/Impedence	7/8", other available
Bandwidth	Low VHF 47MHz-90MHz
Frequency stability	1 Hz
Amplification Class:	HE or AB class available
Final Stage	N° 5 Amplifiers each with N° 4 Dual transistors pallets.
GENERAL	
Mechanical	
Composition (Main components in one rack 44U)	• 1x Exciter • 5x SLIM5 B1 Amplifiers (22/36/44 U rack with top air extractor available upon request).
Dimensions (WxHxD mm -Weight)	600 mm / 2300 mm / 1100 mm 330 kg
Cooling	
Cooling System	Air Cooled
Coolant flow	NA
Cooling redundancy	Air Flow rate m3/h - forced air / 800 m3/h
Environmental	
Relative humidity	95% max. (non-condensing)
Operation temperature range	0° to 50°C
Storage temperature range	-20° to 70°C
Max. installation altitude	4.600 m a.s.l. (higher altitudes kit on request)
Power supply & Safety	
Voltage	230 Vac (single phase) 47 to 63 Hz 208/ 400 Vac (three phase) 47 to 63 Hz (auto range p.s.)
Power Supply	3x Power supplies In fixed-in configuration 2+1 PS redundancy configuration available on three phase configuration
Safety /EMC	EN 60215 (IEC 215), EN301-489-53, FCC-73, ISO9001-2010. 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.

** : 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.

SYES

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TV TRANSMITTER

DTV MODULATIONS	
<u>ATSC 3.0</u>	
Standard	ATSC 3.0: A/322:2017, A/324:2018 (STL)
Inputs ****	2xTSolP 10/100/1000 RJ45.
FFT Size	2K, 4K, 8K.
Code rate	1/2, 2/3, 3/4, 5/6,
Guard interval	1/32, 1/16, 1/8, 1/4.
Constellation	QPSK, 16QAM, 64QAM, 256QAM
<u>DVB-T/-H-T2</u>	
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)
Code rate	1/2, 2/3, 3/4, 5/6, 3/5 (DVB-T2), 4/5 (DVB-T2)
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)
<u>ISDB-Tb</u>	
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
<u>ATSC</u>	
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	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
**** Type and number of inputs depends on Exciter HW configuration	
DIGITAL ADAPTIVE PRECORRECTION	
Type	Linear / non linear; selectable
Clipping	12 dB
Operation mode	Continuous / Automatic (tnggering: time/shoulder level)
Precorrection status	Running/Stopped
PAPR	Provided

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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	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	
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	
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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