## 10,4kW COFDM, 13,6kW ATSC, 20,8kWps

# 10,4 kW UHF TV TRANSMITTER

HIGH EFFICIENCY

MULTI-PLATFORM

MULTI INPUT

MULTI-STANDARD

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

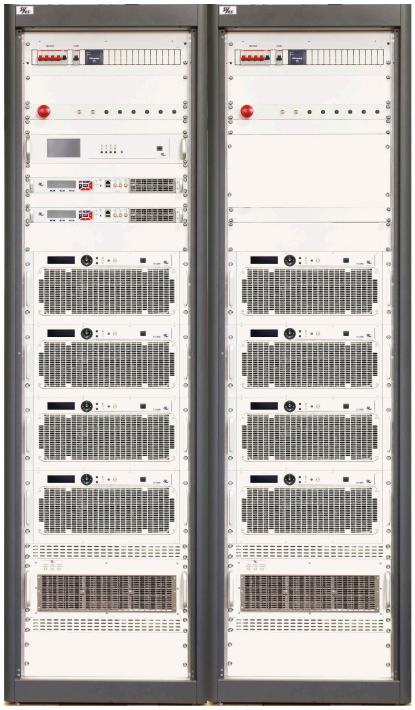
WIDE BAND

AIR COOLED

GNSS
(GPS, GLONASS, BEIDU, GALILEO)

MONITORING

SNMP, WEB BASED GUI,
DRY CONTACTS



FRONT VIEW

- ☐ Multimode platform: Transmitter, Heterodyne Transposer, Regenerative Transmitter, Gap Filler and Single Frequency Echo Canceller
- ☐ Multi Standard: DVB-T/T2, ATSC1.0/3.0, ISDB-T, DTMB, Analog(NTSC/PAL), 5G Broadcast Multi
- ☐ Input: RF, SAT (DVB-S/S2/SX), 2x ASI (T2MI,SMPTE310) with Hitless switch (Priority customer settable), 2x IP Ethernet, 1xSFP (optical/electrical), A/V for analog broadcasting.
- ☐ The most advanced manual, automatic and adaptive linear and nonlinear pre-corrector.
- ☐ Sky-High efficiency to minimize energy consumption and OPEX;
- ☐ 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.
- ☐ Fully frequency agile without need for any tuning or trimming.
- ☐ Hot Pluggable Power Amplifiers Option;
- ☐ Power Amplifiers with triple redundant Hot Plug-in power supplies;
- ☐ Use of tools for maintenance reduced almost to zero including pallets replacement.
- ☐ Dual Independent temperature controlled low-noise fans for better efficiency and performance (tool free swap)
- ☐ Remote control via SNMP, friendly web browser GUI, no need of plug-in or apps, dry contacts.

TV TRANSMITTER

The SLIM5-08/UHF HP is the Syes Compact AIR Cooled TV transmitters SLIM Line.

Fully wide band high efficiency with a system efficiency up to 44%.

Composed by one PCM driver (Dual Driver Option) and eight (8) 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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# 10,4 kW UHF TV TRANSMITTER

TV
AIR COOLED

| TECHNICAL SPECIFICATIONS | |
|---|---|
| **RF OUTPUT** | |
| **Output power*** | • 10400 Wrms COFDM<br>• 13600 Wrms ATSC<br>• 20800 Wp.s. ANALOG |
| **Spurious / Harmonics** | EN 302-296-2 |
| **Shoulders/MER** | Typical: >40dB/>35dB |
| **Connector / Impedence** | *1 5/8", other available - 50 Ohm* |
| **Bandwidth** | UHF Band IV & V (470MHz-800MHz) |
| **Frequency stability** | 1 Hz |
| **Amplification Class:** | High efficiency: Efficiency >40% with MER 35dB |
| **Final Stage** | N° 8 Amplifiers each with N° 8 Dual transistors Pallets<br>Max Pout achievable with 1 transistor failed: >9800W |
| **Test mode:** | PRBS |
| **Technology:** | LDMOS Solid state transmitter |
| **GENERAL** | |
| **Mechanical** | |
| Composition | • 1x Exciter (Dual Driver Option)<br>• 8x SLIM5 Amplifier |
| Dimensions (WxHxD) mm - Weight) | 2x Rack 44U 520 kg |
| Rack Input Connections | Mains, Input and Cooling from TOP of Rack. Rear, Side, Bottom inputs are available without additional HW |
| 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<br>Storage temperature range | 0° to 50°C<br>-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) ±20% @ 47 to 63 Hz (auto range<br>p.s.) power factor > 0.98 |
| Power Supply | 3x Power supplies per Amplifier<br>2+1 PS redundancy configuration available |
| Efficiency**<br>(typical value referred to OFDM modulation) | Up to 44% |
| Safety /EMC | EN 60215 (IEC 21S), EN301-489-53, FCC-73, IS09001-2010.<br>RED 2014/53/UE, RoHS 2002/93/EC |
| Safe Operations | Interlock Circuit provided and configurable. |

*: 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. VSWR: 2:1

**: 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.

***: Single mains supply per cabinet, with power isolator switch, accessible from the outside

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## 10,4kW COFDM, 13,6kW ATSC, 20,8kWps

# 10,4 kW UHF TV TRANSMITTER

TV TRANSMITTER

| 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/ | 2 / | 3 / | 4 / | 5 / | 6 / | 7 / | 8 / | 9 / | 10 / | 11 / | 12 / | 13 / |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Costellation | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| QPSK | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| 16QAM | | | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | |
| 64QAM | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| 256QAM | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1024QAM | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4096QAM | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ |

| | |
|---|---|
| **DVB-T/-H-T2** | Ch.bandwidth 6,7,8 MHz (8 PLP - DVB-T2 & T2 Lite simultaneous) Mode A&B |
| Standard | EN300744. EN302304. EN302755 v 1.4.1. TS 102831. TS 102 773 (T2-MI) |
| Inputs **** | 2*ASI BNC, 75 ohm / 3xTSolP 10/100/1000 RJ45. |
| FFT Slze | 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. 2S6QAM (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/S4. A/64. A/1S3. 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 |
| **5G** | ETSI TS 103 720 - 5G Broadcast System for linear TV and radio services; LTE-based 5G terrestrial broadcast system. |
| **DIGITAL ADAPTIVE PRECORRECTION** | |
| Type | Linear / non linear; selectable, Type LDPC-BCH |
| 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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TV
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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 thè range -5 to 5 V) - Ret. loss better than -30 dB (0 to 6 MHz) (75 W) |
| Audio input | 6 dBm ± 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 levet | -10dBm to -60dBm (SFN Gap filler)<br>-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<br>(30dB are obtained at 0dB input echo) |
| Noise figure | max 10 dB (SFN Gap filler)<br>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 / 1pps reference | BNC (F). Impedance: 50 ohm / high (selectable). |
| NTP Server | Available |
| SFN | SFN resolution 1100 ns SFN configurable delay ±500 ms |
| Stability | time: max ±10-7 /year - temperature: max ±2.5 10-8 (-20°C to +70 °C) |
| Internal GNSS | GPS/BEIDOU/GALILEO/GLONASS 10MHZ : Sinusoidal, 1PPS: TTL |
| **MONITORING** | |
| Local Full Monitoring and Control | Local operation through LCD display and keyboard located on the front panel |
| Front RJ-45<br>Rear RJ-45 | Local operation through a Web Server Graphical User Interface,<br>Remote Network management (via SNMP) Interface Ethernet 10/100 |
| FW & SW Upgrade | Via web pages, self-upgrade function available via OTA or remote server. |
| GUI | Web Server Graphical User Interface xHTML based |
| SNMP | V2c / V3 provided |

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