

# 360W COFDM, 400W ATSC, 600Wps 360W UHF TV TRANSMITTER



TV TRANSMITTER



FRONT VIEW



The SLIM04-01/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 one (1) 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.

- ☐ 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*                    | <ul style="list-style-type: none"> <li>Up to 360 Wrms COFDM</li> <li>Up to 360 Wrms ISDB-Tb</li> <li>Up to 400 Wrms ATSC</li> <li>Up to 600 W p.s ANALOG</li> </ul>                                                                |
| Spurious / Harmonics             | EN 302-296-2                                                                                                                                                                                                                       |
| Shoulders/MER                    | Typical: >50dB/>37dB after the filter (ABNT NBR 15.601)                                                                                                                                                                            |
| Connector                        | 7/8" or other specified in the project                                                                                                                                                                                             |
| Bandwidth                        | UHF Band IV & V (470MHz-800MHz) Broadband: no HW change needed                                                                                                                                                                     |
| Frequency stability              | +/-1 Hz                                                                                                                                                                                                                            |
| Amplification Class:             | HE class / Doherty Technology                                                                                                                                                                                                      |
| Output Impedance                 | 50 Ohms                                                                                                                                                                                                                            |
| GENERAL                          |                                                                                                                                                                                                                                    |
| <b>Mechanical</b>                |                                                                                                                                                                                                                                    |
| Composition                      | Exciter + n. 1 SLIM4 HPA<br>Stand Alone                                                                                                                                                                                            |
| Dimensions (WxHxD mm)            | 482 mm / 204 mm / 600 mm                                                                                                                                                                                                           |
| Weight                           | 36 kg                                                                                                                                                                                                                              |
| <b>Cooling</b>                   |                                                                                                                                                                                                                                    |
| Cooling System                   | Air Cooled                                                                                                                                                                                                                         |
| Cooling redundancy               | Dual fan                                                                                                                                                                                                                           |
| <b>Environmental</b>             |                                                                                                                                                                                                                                    |
| 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)                                                                                                                                                                                   |
| <b>Power supply &amp; Safety</b> |                                                                                                                                                                                                                                    |
| Voltage (options)                | - 100 to 240 VAC<br>- 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.<br>RED 2014/53/UE, RoHS 2002/93/EC                                                                                                                                         |
| Power Supply                     | 2x power supplies in hot plug-in configuration<br>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<br>Input over voltage and power surge protection system<br>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.

**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/<br>Constellation | 2 /<br>15 | 3 /<br>15 | 4 /<br>15 | 5 /<br>15 | 6 /<br>15 | 7 /<br>15 | 8 /<br>15 | 9 /<br>15 | 10 /<br>15 | 11 /<br>15 | 12 /<br>15 | 13 /<br>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 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            |

### 5G

|  |                                                                                                                       |
|--|-----------------------------------------------------------------------------------------------------------------------|
|  | ETSI TS 103 720 - 5G Broadcast System for linear TV and radio services;<br>LTE-based 5G terrestrial broadcast system. |
|--|-----------------------------------------------------------------------------------------------------------------------|

## DIGITAL ADAPTIVE PRECORRECTION (REAL TIME)

|                      |                                                          |
|----------------------|----------------------------------------------------------|
| 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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## 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)<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

|                                 |                                                                                |
|---------------------------------|--------------------------------------------------------------------------------|
| 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.                                                                                     |

**SY**  
**Yes**

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