

TV TRANSMITTERS (High Power Air Cooled)

SLIM3-5U LINE

OVERVIEW

Up to 6200 Wrms COFDM, 7000 Wrms ATSC and 12000 W p.s. only one air cooled rack solution composed by one driver and several amplifiers. Transmitter, transposer, repeater, gap filler, multimode and multistandard

The SLIM3 5U air cooled transmitters is the light medium power transmitter solution from SLIM Line. High efficiency PPT option available. (PPT: registered proprietary mark, patent pending).

The overall efficiency of a single final stage is about 42% and the efficiency of the whole transmitter is about 38%.

Key facts:

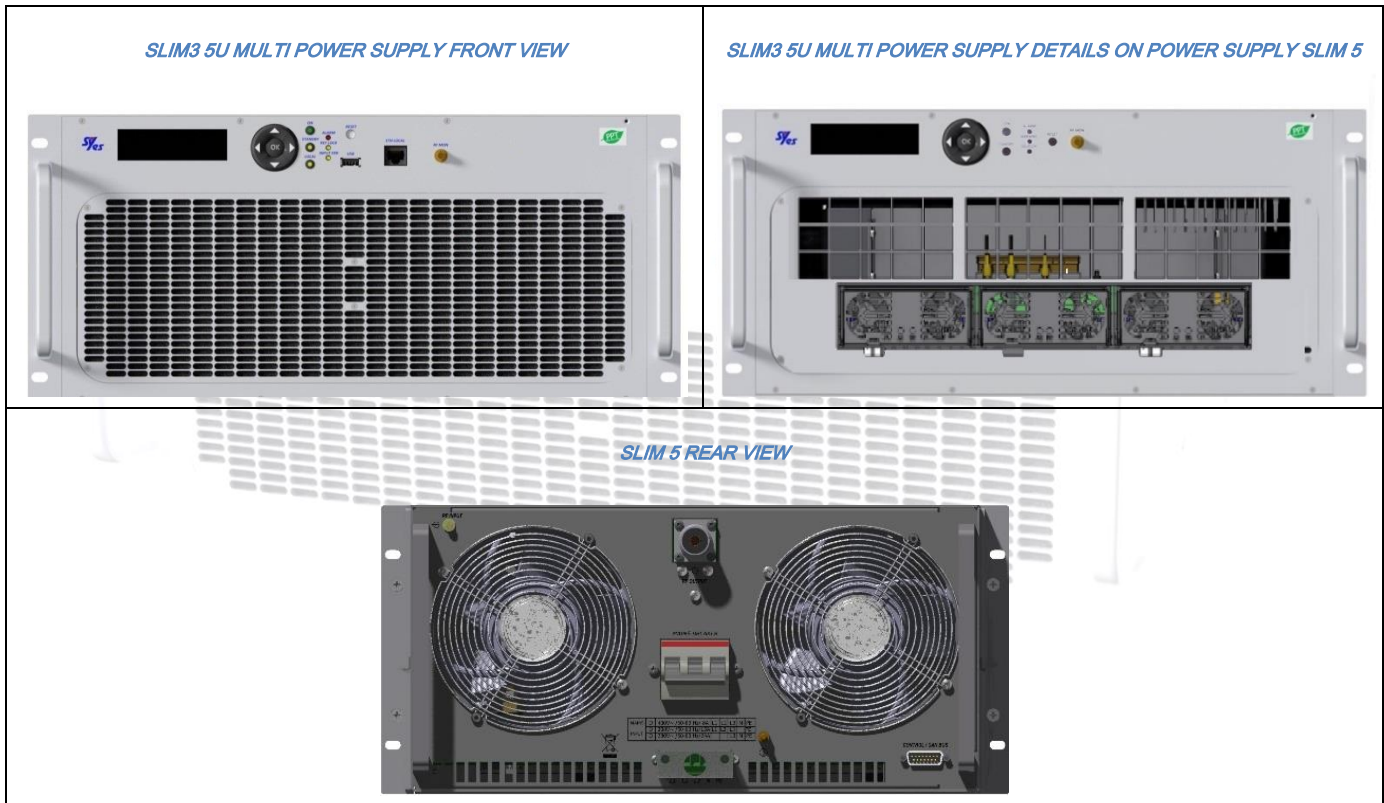
- Multimode platform – same hardware: System driver, low power transmitter, heterodyne transposer, regenerative transmitter, translator (integrated DVB-S2 receiver), gapfiller and Single Frequency Echo Canceller
- Multistandard Transmitter: All digital / All analog in the same hardware
- Output power solution UP to 6200 Wrms / 12000 Wps
- 2x INPUT= SAT (S2 with CAMSlot), Ethernet, ASI= Hitless switch
- Regenerative and SFN Gapfiller functionality
- Single or multiple power supply each amplifier
- Freq. agile with static or adaptive pre-correction
- BUILT in GPS receiver
- Easy to use: web graphic interface GUI response.
- Up to several amplifiers housed in one 19" standard rack
- The Air Cooled transmitters line = SLIM Line offers air cooled TV transmitters, with one or more amplifier modules.

Slim 3 5U transmitters are now available in several different amplifier configuration, in order to satisfy all customer requests.

- depending on number of final stages provided each amplifier (Low Power version: 6 Final stages or High Power version: 8 Final stages)
- depending on type of final stage: classic AB amplification class, or high efficiency amplification class (3 sub bands or one broad band final stage; PPT proprietary technology)



TECHNICAL SPECIFICATIONS



The SLIM models are available also as repeaters of the off-air signal, with a wide choice of operation settings, or as retransmitters, with satellite or Ethernet input.

SLIM line is one of the “best Seller” of Syes, some of SLIM model are actually operating since 90’.

Slim line represents the state of the art of the low-medium RF transmitter technology. SLIM always count on PCM driver ([PCM Line](#)), the unique investment exciter thanks to its capability to modulate in all Digital standard, TV and Radio as the TV analog too.

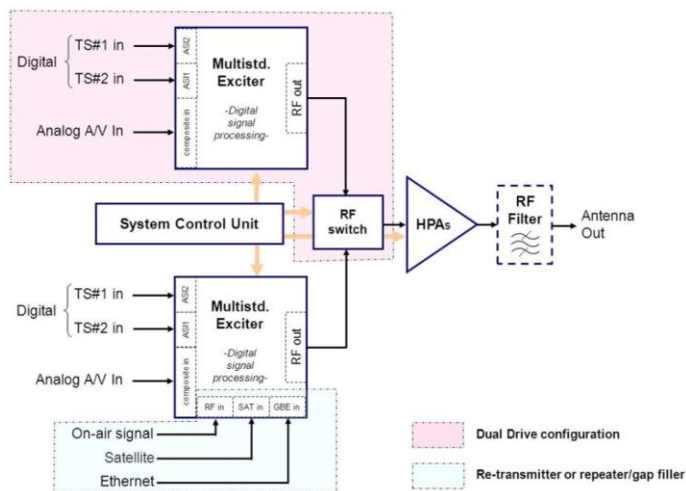
Transmitter configurations are based on single or multiple identical amplifier units (PA), SLIM type. The equipment layout depends on the desired output power level and operational requirements. The PA(s) are directly fed by the exciter. The choice of redundancy configurations can include dual drive (exciter std-by), passive reserve (1+1 or n+1) and more others. The equipment parts are suitable to be assembled in a cabinet, 19” rack std., typically containing also the RF output filter. Single-PA – single-drive models are typically supplied as loose 19” modules.

For redundancy configurations and/or multichannel transmission, important space savings are allowed by the “N-in-one” configurations, with N transmitters in a single cabinet.

Cooling is by forced air, with redundant blowers for each module and hot air extraction from the cabinet top.





Equipment operation is supervised by the SyES designed control unit.

BLOCK DIAGRAM



TECHNICAL FEATURES

TECHNICAL SPECIFICATIONS

SPECIFIC PERFORMANCES								
Model	*SLIM3-01-UHF-DD-PCM 5U (LP)	*SLIM3-01-UHF-DD-PCM 5U (HP)	SLIM3-02-UHF-DD-PCM 5U (LP)	SLIM3-02-UHF-DD-PCM 5U (HP)	SLIM3-03-UHF-DD-PCM 5U (LP)	SLIM3-03-UHF-DD-PCM 5U (HP)	SLIM3-04-UHF-DD-PCM 5U(LP)	SLIM3-04-UHF-DD-PCM 5U(HP)
								
N° of Amplifiers	1	1	2	2	3	3	4	4
N° of Final Stage	6	8	12	16	24	32	36	48
COFDM Output power (W rms)	1250	1600	2500	3200	3750	4800	5000	6200
COFDM Power consumption (W)	3280	4200	6570	8420	9860	12630	13150	16315
ATSC Output power (W rms)	1400	1750	2750	3500	4125	5250	5500	7000
ATSC Power consumption (W)	3600	4600	7230	9210	10850	13815	14470	18420
PAL/NTSC Output power (W rms)	2500	3000	5000	6000	7500	9000	10000	12000
PAL/NTSC Power consumption (W)	5000	6000	10000	12000	15000	18000	20000	24000
Graceful degradation (one transistor fail)	84%	88%	91%	93%	95%	96%	97%	98%
N° of TX in one rack	4	4	2	2	1	1	1	1
Weight (kg)	94	94	144	144	195	195	236	236
Air flow rate (cooling) (m3/h)	400	400	800	800	1200	1200	1600	1600

* Also available in stand alone configuration Single driver without rack

Common performances		
RF frequency range (output)	UHF Band IV & V (470MHz-860MHz)	
	Spurious / Harmonics	EN 302-296-2
	Shoulders/MER	>40dB / >35 dB n.a.
	Frequency stability	± 1Hz
ELECTRICAL DATA		
Mains	Voltage	110/230 Vac (single phase) or 208/ 400 Vac (three phase) ±20% @ 47 to 63 Hz (autorange p.s.) PF>0.93
	Power supplies	One power supply (only 3-phase 400Vac available) or multiple power supplies in 2+0 or 2+1 configuration (all power supplies available)
MECHANICAL DATA		
Cooling system /Air flow rate m3/h	forced air / 1600 m3/h	
Size	Width/Height/ Depth	600 mm / 1800 mm / 1000 mm
Weight	136 kg	
Number of Tx / one rack 36U	Max 2	
DIGITAL MODULATION		
DVB-T	ref. standards	ETS 300 744 / EN 50083-9 / TR 101 190 / TR 101 891
	RF channel width	6 MHz, 7 MHz, 8 MHz
	FEC	CC+RS
DVB-T2	ref. standards	EN 302 755 V1.3.1 , TS 102 831, T2-MI
	Streams	Single stream (System A) or up to 8-PLPs (System B)
	RF channel width	6 MHz, 7 MHz, 8 MHz
	FEC	LDPC+BCH
ISDB-T SBTV-D	ref. standards	ABNT NBR 15601 - ARIB STD B31
	Multiple segment operation	total 13 segments, distributed over the existing layers (1seg supported)
	RF channel width	6 MHz
ATSC 8VSB	Standards	ATSC DOC.A/53
	Modulation mode	8-VSB
	Channel spacing	6 MHz

TECHNICAL SPECIFICATIONS

DTMB	Standard	DTMB (GB20200/2006)	
	Symbol rate / Modulation	Symbol rate: 7.56Msps / TDS-OFDM	
	Channel bandwidth	8 MHz or 6 MHz	
Test Mode		PRBS	
Inputs		2xASI (BNC f, 75W) - seamless/hitless switching (SFN) / BTS / SMPTE / T2 MI / AA/VV	
IP input		2xGbE (ProMPEG Cop3) - Electrical + 1XSFP GbE - Opt./Elec.*	
NETWORK OPERATION			
Mode		MFN/SFN	
Network delay (SFN mode)		Up to 1000 ms	
Network synchronization (SFN Mode)		±4ms	
PRECORRECTION			
Manual precorrection		Available	
Automatic precorrection		Available : continuous/ scheduled / on call	
Type		Linear/ non linear	
PAPR		Provided	
Protection Clipping		Provided	
ANALOGUE MODULATION			
TV System		PAL std. B/G, H, K, I, I1, M, N – NTSC std. M – SECAM D/K	
Ref. Standard		ITU-R BT.470-6	
Audio system		MONO/ IRT	
Video input	Level	1V pp (0.5 to 2 V)(DC component level in the range -5 to 5 V)	
	Ret. Loss	better than -30 dB (0 to 6 MHz) (75 W)	
	Connector	1xBNC female, 75 W	
Audio input	Level	6 dBm ± 6 dB (Df= 25 to 50 kHz)	
	Ret. Loss	better than -30 dB (40 Hz to 15 kHz) (600 W, bal.)	
	Connector	DB9 with patch cable for 2xXLR female, 600 W (IRT config. : 2 inputs)	
REPEATER		SFN gap-filler	MFN re-transmitter
RF input	Rfin frequency range	146 to 861 MHz	
	Input level	-10dBm to -60dBm	-20dBm to -70dBm (QEF reception)
	Input ret. Loss	better than -16 dB	
	RF in connector	N female, 50 W	
Echo Canceller	residual echo suppression	up to more than 30 dB (30dB are obtained at 0dB input echo)	n.a.
Noise figure		max 10 dB	max 8 dB
immunity to other chan	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	
Signal level		-65 to -25 dBm	
Connector – Cond. Access		SMA f – CAM slot	
LNB control		available, through RF input PS, polarity / band selection: by standard 13/18VDC and 22kHz signalling	
MONITORING			
RF Monitoring Connectors		FWD/REF: SMA female , 50 W	
Local Control		front panel (keys/display/USB port) / standard web browser	
Remote control port		Ethernet port (10/100/1000) RS 485	
Remote Control	Netw. Mgmt.	web browser / SNMP agent - upgrade also through ASI TS (OTA)	
	Direct signalling	IEC 60864-1	
TIME & REFERENCE			
Built-in ref.	Frequency	10 MHz OCXO	
	Stability	time: max ±10-7 /year - temperature: max ±2.5 10-8 (-20° to 70°C)	
Ext. ref.	Frequency	10 MHz - 1pps	
	Level	1 Vpp (0.7 to 1.4 V)	
VCO tuning step		1 Hz	
ENVIRONMENTAL			
Operating temp. range		0° to 50°C*	
Max rel. air humidity		95% @ 30°C, no condensation	
Max altitude		4000 m a.s.l.	
Immunity	bursts	<4kV (AC) / <1kV (input) - IEC61000-4-4	
	surges	<2kV (differential mode) - <4kV (common mode) - IEC61000-4-5	
Safety		EN 60215 (IEC 215)	