



TV TRANSMITTER

ECUAPOWER 700U

The Ecuapower 700U with the power 700 W rms COFDM, 850 Wrms ATSC and 1300 W p.s. 4/5RU solution composed by one driver and one amplifier.

Transmitter, transposer, repeater, gap filler, multimode and multistandard

The ECUAPOWER 700U is the light low power transmitter solution from Ecuapower family.

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
- Light solution UP to 800Wrms / 1000Wps
- 2x INPUT= SAT (S2 with CAMSlot), Ethernet, ASI= Hitless switch
- Single or multiple redundant power supply each HPA
- Regenerative and SFN Gapfiller functionality
- Freq. agile with static or adaptive pre-correction
- BUILT in GPS receiver
- Easy to use: web graphic interface GUI response.

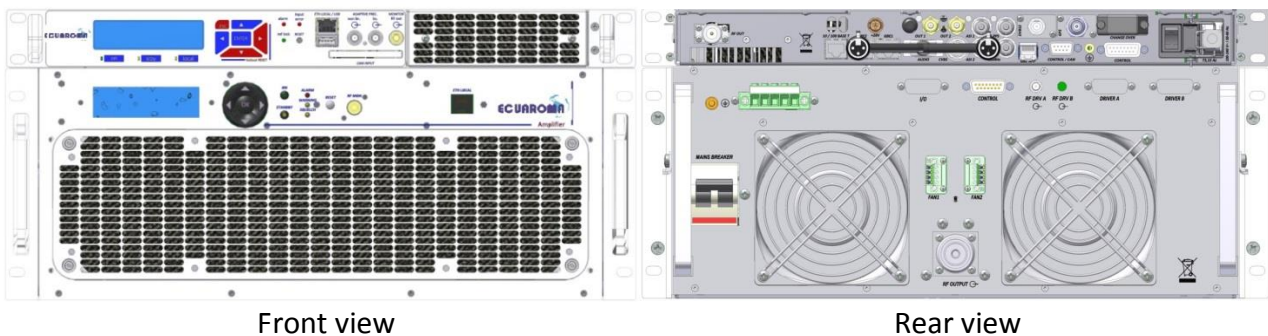




The Air Cooled transmitters line = Ecuapower offers air cooled TV transmitters, with one or more amplifier modules. The product lineup covers from low to high power levels, featuring excellent signal quality and small size.

Slim 3 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: 3 Final stages or High Power version: 4 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)
- depending on redundancy over power supplies, with 2+0 or 2+1 plug in power supplies, and depending on mains network (single phase, three phases, 50 or 60 Hz etc)



The Ecuapower 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.

ECUAPOWER is one of the “best Seller” of Ecuaroma, some of Ecuapower model are actually operating since 90’.

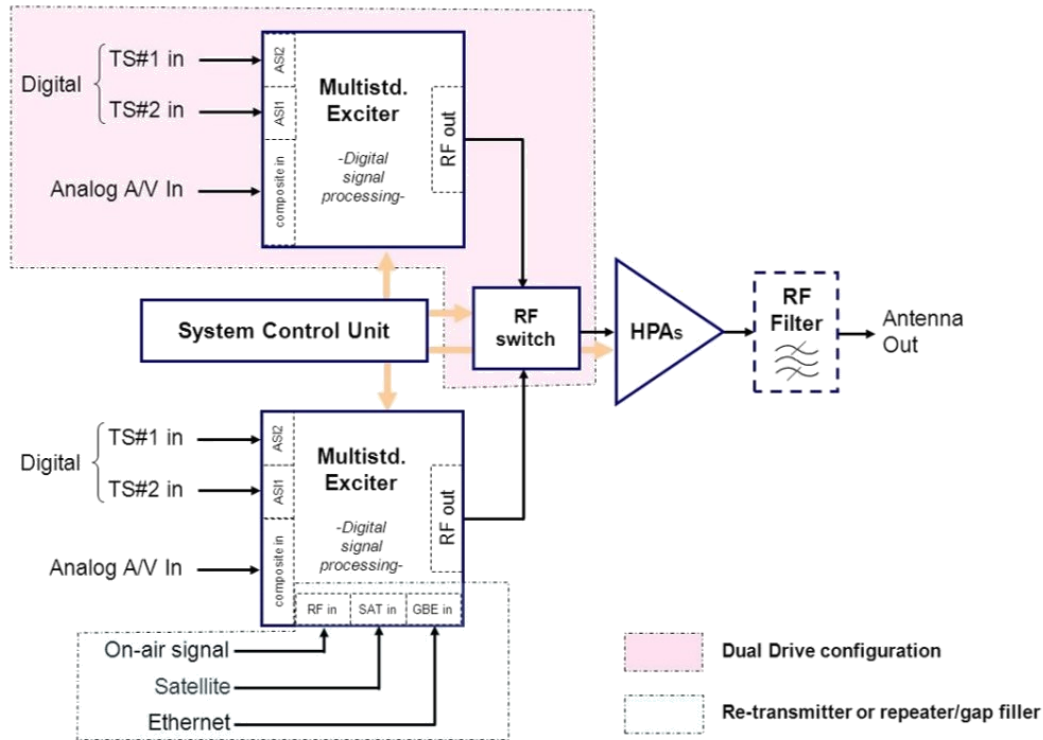
Ecuapower represents the state of the art of the low-medium RF transmitter technology. Ecuapower always count on Ecuadrider driver, the unique investment exciter thanks to its capability to modulate in all Digital standard, TV as the TV analog too.

Transmitter configurations are based on single or multiple identical amplifier units (PA), Ecuadrider 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 Ecuaroma designed control unit.

BLOCK DIAGRAM



TECHNICAL FEATURES

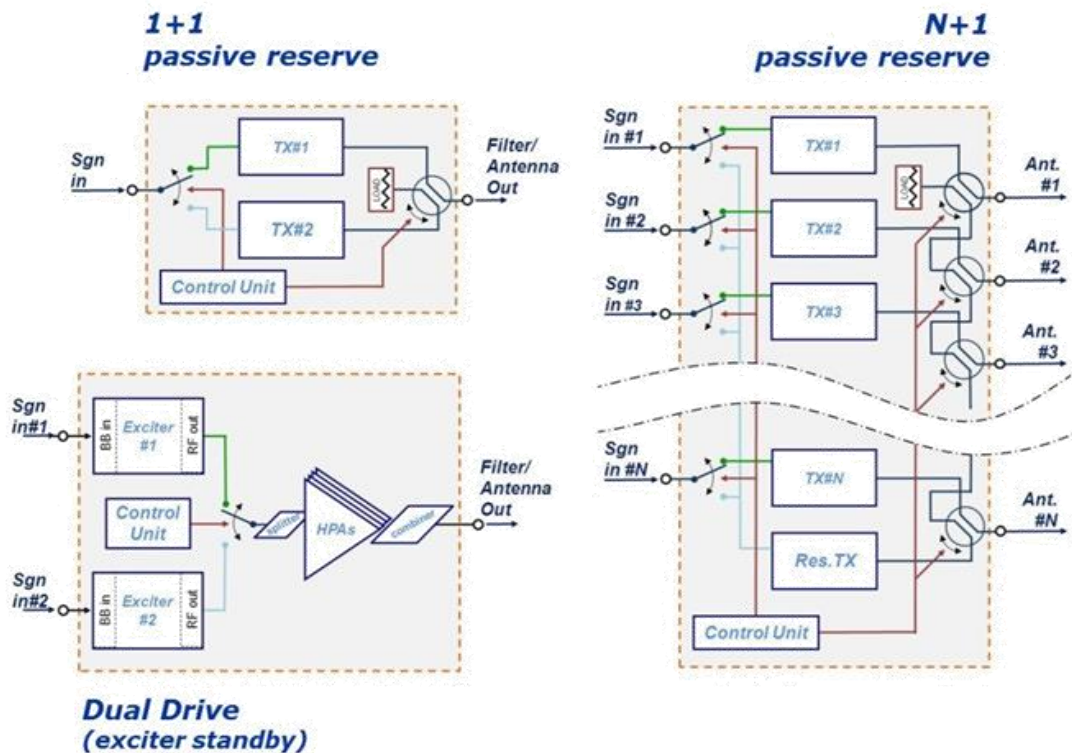
RF PERFORMANCES ECUAPOWER 700U version (4 Final stages)			
RF frequency range (output)		UHF Band IV & V (470MHz-860MHz)	
RF	Output power	700 W rms ISDB-Tb / 850 W rms ATSC	1300 W p.s.
	Spurious / Harmonics	EN 302-296-2	
	MER	>35 dB	n.a.
	Shoulders	>40 dB	n.a.
	Frequency stability	± 1Hz	
	RF Final stage	N° 4 Pallets, 2 final transistor each (LDMOS latest technology) Graceful degradation: 1 fault transistor>>> 77% of max output power	
ELECTRICAL DATA			
Mains	Voltage	108 or 230 Vac (single phase) / 220 or 400 Vac (three phase) ±20% @ 47 to 63 Hz (autorange p.s.) PF>0.93	
	Power supplies	One power supply (3 RU Amplifier height) or multiple power supplies in 2+0 or 2+1 configuration (4 RU amplifier height)	
	Power consumption (LP version)	2.950 W 1786W (PPT version) η>34%	2.500 W
	Power consumption (HP version)	3776 W 2250W (PPT version) η>36%	3.000 W
	Electrical efficiency	36 – 38%	
MECHANICAL DATA			
Cooling system /Air flow rate m3/h		forced air / 400 m3/h	
Size	Width/Height/ Depth	482 mm / 176 mm / 500 mm	
Weight	28 kg		
Number of Tx / one rack 36U	Max 7		



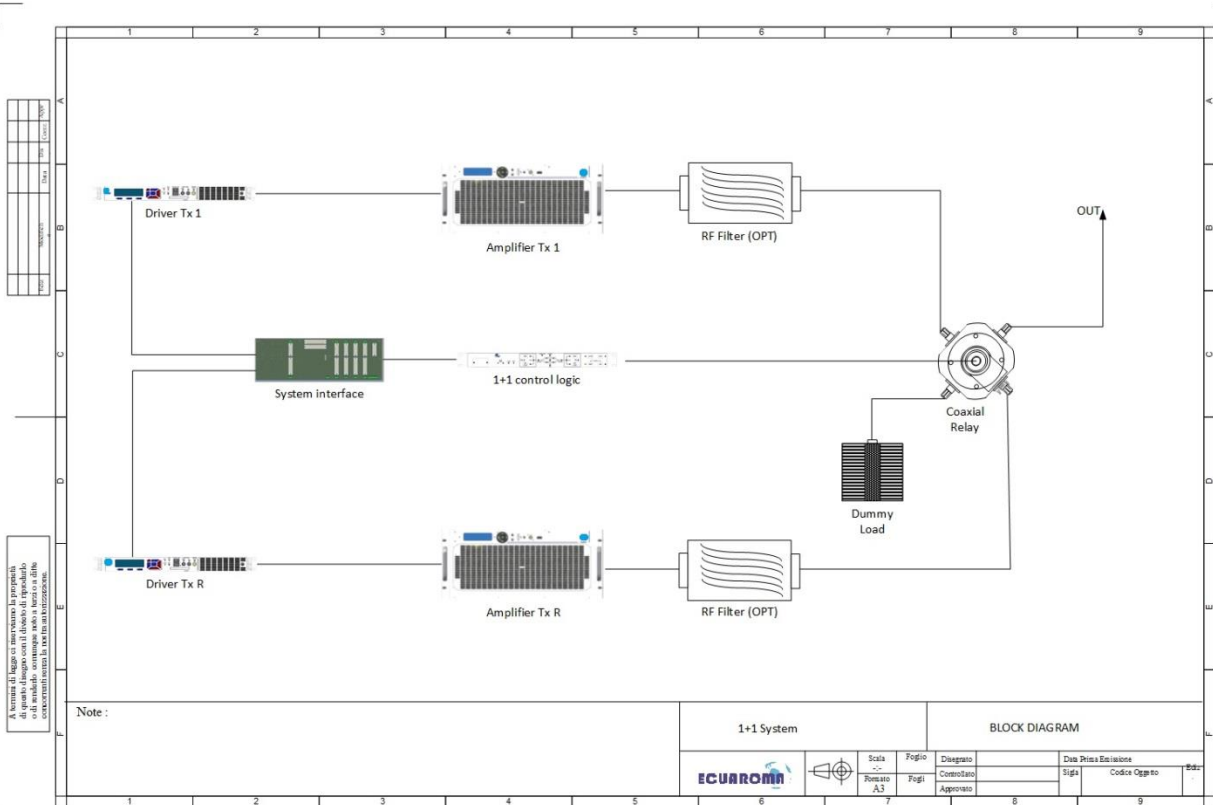
DIGITAL MODULATION		
DVB-T	ref. standards	ETS 300 744 / EN 50083-9 / TR 101 190 / TR 101 891
	RF channel width	6 MHz, 7 MHz, 8 MHz
	FEC	CC+RS
DVB-T2	ref. standards	EN 302 755 V1.3.1, TS 102 831, T2-MI
	Streams	Single stream (System A) or up to 8-PLPs (System B)
	RF channel width	6 MHz, 7 MHz, 8 MHz
	FEC	LDPC+BCH
ISDB-T SBTVD	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
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 $\pm 10^{-7}$ /year - temperature: max $\pm 2.5 \cdot 10^{-8}$ (-20° to 70°C)
Ext. ref.	Frequency	10 MHz - 1pps
	Level	1 V _{pp} (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 <i>a.s.l.</i>
Immunity	bursts	<4kV (AC) / <1kV (input) - IEC61000-4-4
	surges	<2kV (differential mode) - <4kV (common mode) - IEC61000-4-5
Safety		EN 60215 (IEC 215)

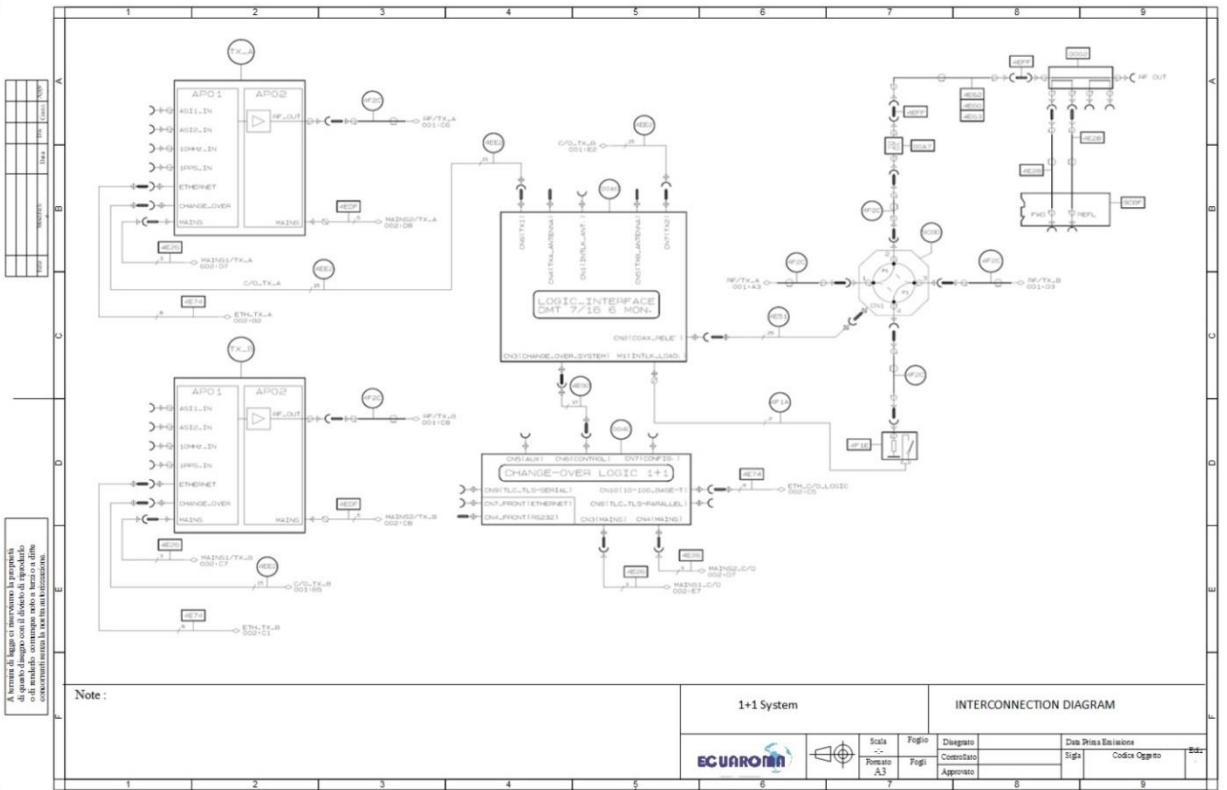
Redundancy type



1+1 Passive configuration diagrams

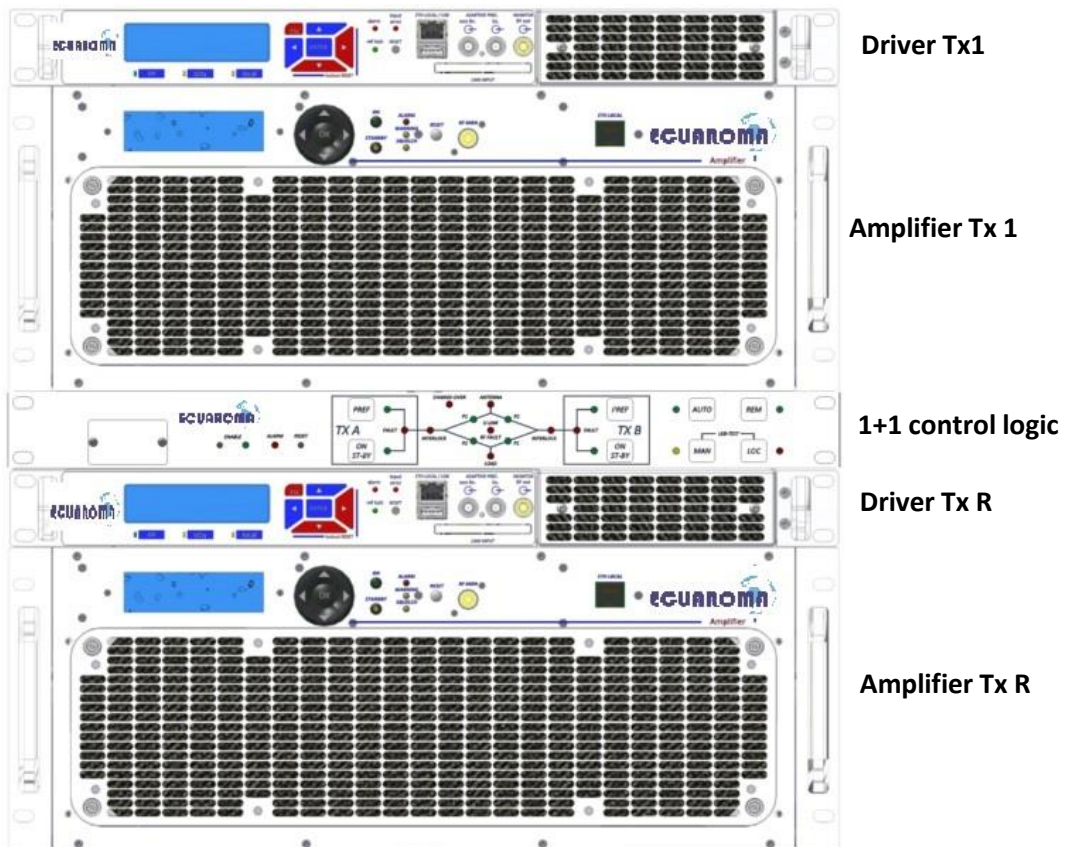


A meno di 10 cm di distanza la portata di questo segnale con il livello di segnale di 100 dBm è di 100 m.

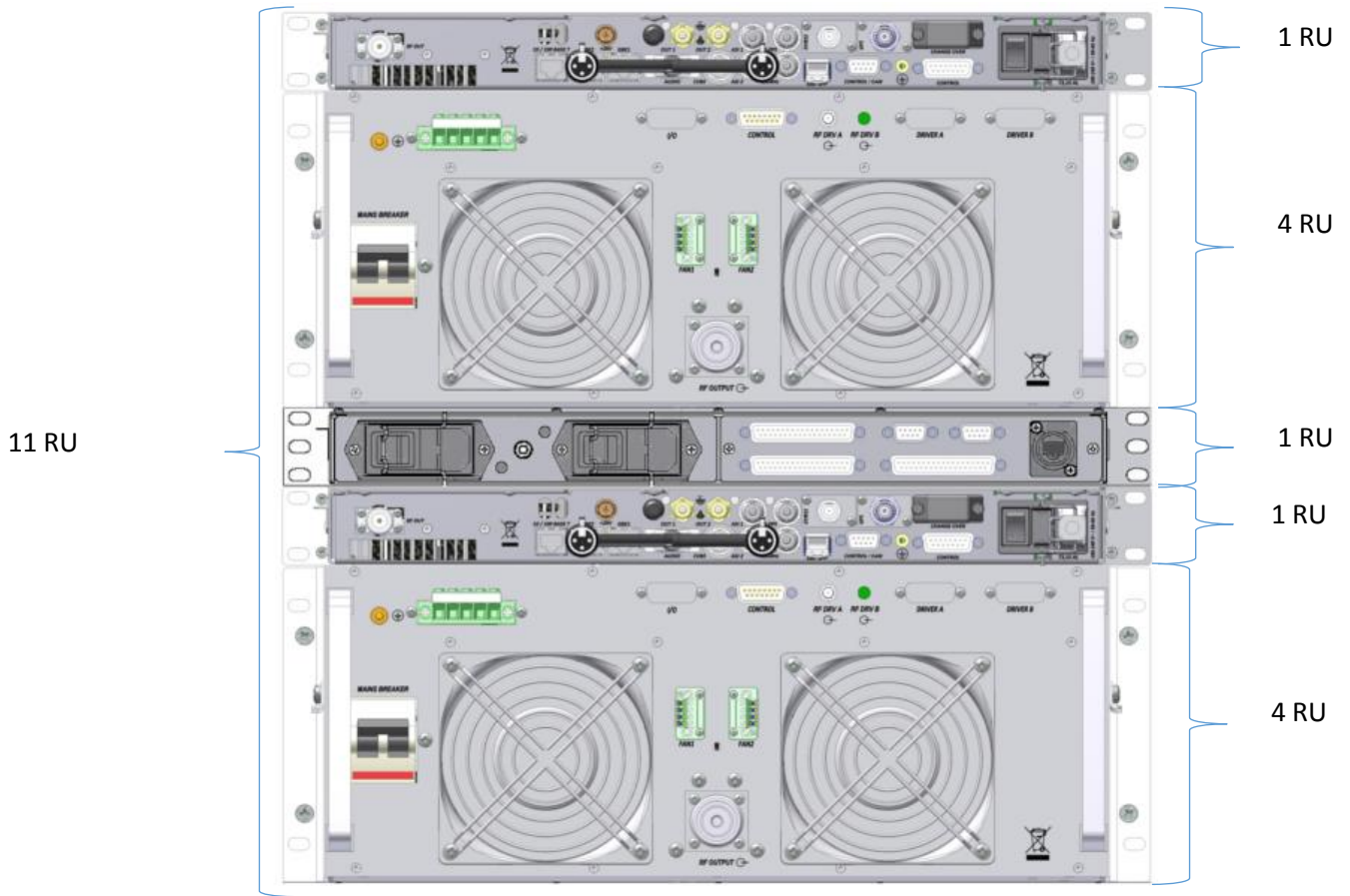




1+1 Passive configuration layout



Front view



Rear view