UHF/VHF Передатчики SLx8000

R&S®SLx8000 Family of UHF/VHF Transmitters

At a glance

The UHF/VHF low-power transmitters of the R&S®SLx8000 family are available for ATV, DTV and DAB/T-DMB. They are reliable, compact and flexible and fill coverage gaps in transmitter networks. These features make them ideal for use at small, remote transmitter sites that offer only limited space, are difficult to access and affected by strong variations in power supply.

The R&S®SLx8000 family includes UHF and VHF transmitters for digital and analog TV as well as for digital audio broadcasting. The compact devices can be used as transmitters or retransmitters. Intelligent operating functions reduce the transmitters' setting times. A special feature is the automatic set&go function that does away with the time-consuming output stage precorrection for all digital standards. The compact, flexible all-in-one-box concept allows various options to be integrated, which simplifies logistics and handling when transmitter sites are difficult to access.

The transmitters can handle both analog and digital TV standards (DVB-T, DVB-T2, DVB-H, ISDB-T/ISDB-T_B and ATSC including ATSC Mobile DTV). Output power ranges up to 100 W for DVB-T, DVB-T2, DVB-H and ISDB-T/ISDB-T_B up to 150 W for ATSC and up to 250 W for analog TV. If necessary, an analog transmitter can easily be switched over to digital TV without modifying the hardware.

For digital audio broadcasting, the transmitter family supports transmission in line with the DAB, DAB+ and T-DMB specifications with output power of up to 300 W.

The broadband output stages are based on powerful LDMOS and VMOS transistors and feature high efficiency. Since the components used have a high level of integration, the transmitters are favorably priced and can be delivered at short notice, even if they are ordered in large quantities. And the low-power transmitters come with the high quality that stands for.

Key facts

- UHF/VHF low-power transmitters for analog and digital TV and digital audio broadcasting
- Retransmitter in multifrequency networks for DVB-T, DVB-T2 and DVB-H
- Compact equipment of only two to four height units
- Broadband precorrection for digital standards with set&go function
- Simple conversion from analog to digital TV (without hardware modifications)
- Top quality with excellent price/performance ratio

R&S®SLx8000 Family of UHF/VHF Transmitters

Benefits and key features

Compact, flexible and easy to use

- Compact solution
- Retransmitter in multifrequency networks for DVB-T, DVB-T2 and DVB-H
- Convenient operation; on-site or remote diagnostics
- Precorrection for digital standards with set&go function

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Special features for operation

- Switchover from analog to digital TV
- DVB-T/DVB-H receiver for signal monitoring
- Highly sensitive GPS receiver with fast synchronization (option)

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Always on air

- Convenient supply with different rated voltages
- Self-monitoring power output stages
- Standby systems for high availability

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Output power of the R&S®SLx8000 family of UHF/VHF transmitters [1]					Height units (HU)		
Frequency band	**DVB-T, DVB-T2 DVB-H, ISDB-T/ ISDB-T_B (RMS)**	**ATSC ATSC Mobile DTV (RMS)**	**ATV (sync peak)**	**DAB(+) T-DMB (RMS)**	**2**	**3**	**4**
UHF	2 W	3 W			•		
	5 W	8 W	12 W		•		
	10 W	16 W	25 W		•		
	25 W	40 W	60 W			•	
	50 W	80 W	125 W			•	
	100 W	150 W	250 W			•	
VHF	25 W	40 W	60 W	40 W		•	
	50 W	80 W	125 W	75 W		•	
	100 W	150 W	250 W	150 W		•	
				300 W			•

[1] Power before bandpass filter.

Compact, flexible and easy to use

Compact solution

The R&S®SLx8000 transmitters have a compact design. They are 19" wide, occupy two to four height units and contain all basic components such as transmitter input unit, modulator unit, output stage module, and display plus keypad. The housing fan is attached outside for easy access. In addition, the transmitters can accommodate a variety of options. The transmitters can be set up wherever required and are easy to transport.

Retransmitter in multifrequency networks for DVB-T, DVB-T2 and DVB-H

The R&S®SLx8000 can be used as a retransmitter. For DVB-T and DVB-H, an integrated receiver (option) delivers a demodulated baseband signal to the internal signal processing unit. For DVB-T2, the receiver is housed in an additional external box. This operating mode offers the advantage that the signal is "refreshed" by applying error correction (as specified in the standard for demodulation).

Convenient operation, on-site or remote diagnostics

The transmitter has a backlit graphical display and a keypad on the front panel for local operation. Shortcuts provide quick access to frequently used menu items. LEDs signal important operating states at a glance.

As an alternative, the R&S®SLx8000 can be operated both locally or remotely from a PC via a web interface, a quick and easy way to set up the transmitter. An optional module with floating contacts offers yet another means for remote monitoring, for reliable device control in areas without a fast network infrastructure.

In broadcasting networks containing a large number of devices, efficient and reliable operation has top priority. This is why the R&S®SLx8000 transmitters can be monitored and configured over IP networks from a central control station using an SNMP agent (option).

Precorrection for digital standards with set&go function

The output stages in the transmitters for digital standards are precorrected for all specified frequencies and power levels. After a change in frequency or power, the automatic set&go function loads the corresponding precorrection curve in the background. Manual precorrection is therefore not necessary when a transmitter is put into operation or a when a channel is changed. The available precorrection curves make it possible to reduce the power by as much as 10 dB below the rated power throughout the entire frequency range.

Convenient operation of the R&S®SLx8000 family of UHF/VHF transmitters via a web browser.

Special features for operation

Switchover from analog to digital TV

If necessary, a transmitter for analog TV can be switched over to a digital standard at a later time. The switchover to DVB-T, DVB-H and ATSC is performed over a web interface either locally or remotely without any hardware modification.

DVB-T/DVB-H receiver for signal monitoring

An optional DVB-T/DVB-H receiver can be integrated for analyzing the quality of the input and output signal. All monitored parameters can be viewed on the display or accessed remotely via the integrated web server.

Highly sensitive GPS receiver with fast synchronization (option)

The optional internal GPS receiver featuring excellent sensitivity ensures a stable transmit frequency even under critical SFN conditions. The GPS receiver's extremely short synchronization time of typically less than three minutes makes sure that an R&S®SLx8000 transmitter is immediately ready for operation in a single-frequency network after startup. If the GPS receive antenna fails, the R&S®SLx8000 can be safely operated up to 24 hours in an SFN without a 1 pps clock.

Always on air

Convenient supply with different rated voltages

The use of high-quality single-phase wide-range power supplies allows the models with two and three height units to be operated on all conventional single-phase voltages.

The more powerful models with four height units are equipped with two single-phase 110 V and 230 V power supplies.

The power supplies compensate for voltage fluctuations so that additional equipment for power stabilization is not required. In addition, they are able to buffer power interruptions of up to 20 ms.

The TV transmitters can be operated on a DC voltage of –48 V, which is supplied via an optional DC/DC converter. The transmitters can therefore be integrated into conventional infrastructures that rely on uninterruptible power supply (e.g. in mobile radio environments), without requiring external converters.

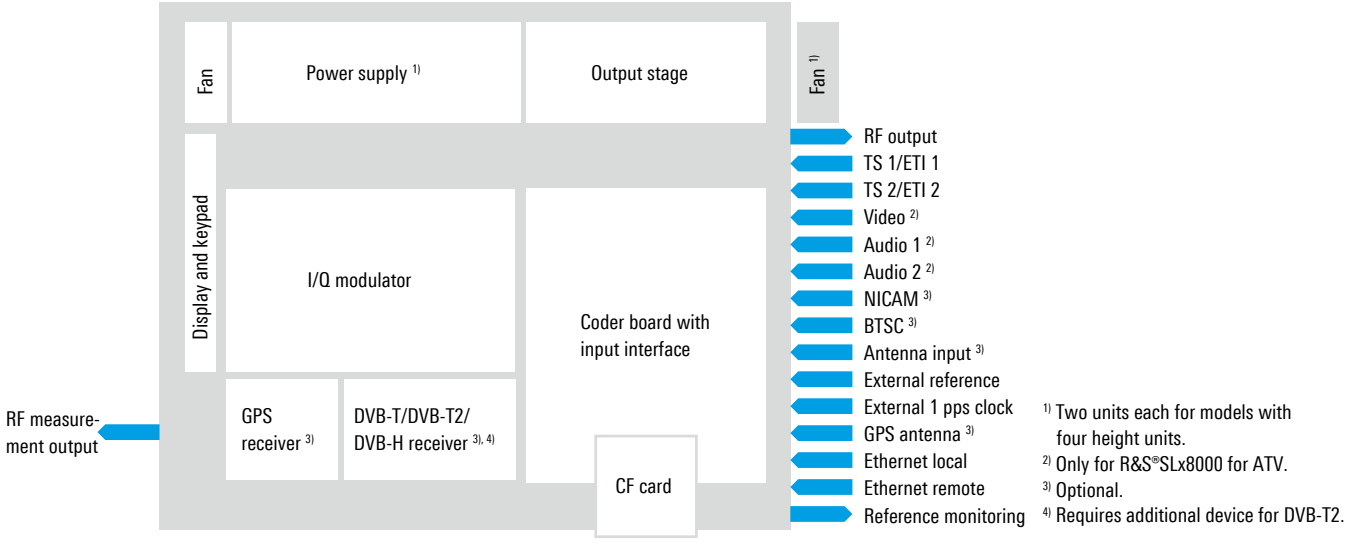
Self-monitoring power output stages

All power amplifiers of the R&S®SLx8000 family are equipped with protective circuits that prevent the transmitters and their transistors from being damaged by overtemperature or high reflected power.

Standby systems for high availability

An R&S®SLx8000 can be integrated into an (N+1) standby system (including 1+1). A maximum of eight main transmitters share one standby system that contains all the necessary data of the active equipment and replaces the affected transmitter in the case of a malfunction.

Block diagram of the R&S®SLx8000 family of UHF/VHF transmitters



1) Two units each for models with four height units.
2) Only for R&S®SLx8000 for ATV.
3) Optional.
4) Requires additional device for DVB-T2.

Specifications in brief

General data			
	Transmitters with 2 HU	**Transmitters with 3 HU**	**Transmitters with 4 HU**
Frequency range UHF (band IV/V)	470 MHz to 862 MHz		–
Frequency range VHF (band III)	–	174 MHz to 240 MHz	
Available standards			
Analog TV	B/G, D/K, I, L, M, N		–
Digital TV	DVB-T, DVB-T2, DVB-H, ISDB-T, ISDB-T_B, ATSC, ATSC Mobile DTV		–
Digital audio broadcasting	–	DAB, DAB+, T-DMB	
Supported network types	MFN, SFN (only for digital TV and digital audio broadcasting)		
Supply voltage	100 V to 240 V AC, ± 10 %		230 V AC, –10 % to +15 %
Supported AC frequencies	50 Hz, 60 Hz		
Option	–48 V DC		–
Synchronization			
Reference frequency	10 MHz, 0.1 V to 5 V (V_{pp}) or TTL, BNC		
Reference pulse	1 pps (1 Hz, TTL, BNC)		
Operation			
Local control	display, keypad and status LEDs, web interface (via Ethernet port)		
Remote-control interfaces	web interface (via Ethernet port) and SNMP (option), floating contacts (option)		
Environmental conditions			
Max. installation height	2000 m above sea level (> 2000 m on request)		
Operating temperature range	+1 °C to +45 °C		
Relative humidity (max.)	95 %, non-condensing		
Immunity	class 2 (B) immunity to fast transients and burst in line with IEC 61000-4-4: < 2 kV (power supply) and < 1 kV (signal inputs); class 3 (C) immunity to surges in line with IEC 61000-4-5: ▪ symmetrical < 1 kV (e.g. L1-L2) ▪ unsymmetrical < 2 kV (e.g. L1-N) If the transmitter is operated in another class (> 2 or 3), protective measures must be taken. offers options for overvoltage and lightning protection.		
Dimensions (W × H × D)	483 mm (19") × 88 mm × 467 mm (19.02 in × 3.46 in × 18.39 in)	483 mm (19") × 132 mm × 474 mm (19.02 in × 5.2 in × 18.66 in)	483 mm (19") × 176 mm × 590 mm (19.02 in × 6.93 in × 23.23 in)

Remark: To comply with the applicable standards and limit values for the suppression of out-of-band emissions (and in the case of digital standards, also for maintaining the required shoulder distance), the transmitter may only be operated with suitable filters at the RF output.

Option	Description/Application
Retransmitter kit	operation of the device as a retransmitter
DVB-T/DVB-H monitoring receiver	monitoring of the output signal
GPS receiver	integrated receiver for GPS reference signals
SNMP agent	remote monitoring and control via standardized network management systems (NMS)
Parallel remote-control interface	remote monitoring via floating contacts (additional device)
NICAM	coder or modulator functionality for the NICAM sound standard
DC voltage supply, –48 V (for TV transmitter)	DC power input for UPS-buffered stations
More options and accessories on request	

Ordering information

Designation	Type	Order No.
R&S®SLx8000 low-power UHF transmitters, DVB-T 100 W RMS (typical configuration)		
Low-Power Transmitter, 3 HU, digital base unit	R&S®SLx8000	2100.1000.30
UHF Amplifier, 100 W RMS	R&S®SLx8000B47	2100.1217.02
AC Power Supply, 3 HU	R&S®SLx8000B11	2100.4045.02
Installation Kit for DVB-T/DVB-H monitoring option	R&S®SLx8000B15	2100.3355.20
GPS Receiver Card	R&S®SLx8000B13	2100.3232.02
DVB-T Option Key for R&S®SLx8000(A)	R&S®SLx8000K12	2100.4200.12
Monitoring Option Key for R&S®SLx8000	R&S®SLx8000K25	2100.4200.25
SNMP Option Key for R&S®SLx8000/R&S®SLx8000A	R&S®SLx8000K2	2100.4200.02