УВЧ/ОВЧ Передатчики XLx8000

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Киргизия (996)312-96-26-47
Россия (495)268-04-70
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R&S®XLx8000 UHF/VHF Transposers

At a glance

R&S®XLx8000 UHF/VHF transposers offer compact, flexible solutions to reliably fill coverage gaps in transmitter networks. Plus, they are specially designed to meet the requirements of small, remote transmitter sites that are difficult to access, offer only limited space, and whose power supply may be subject to strong variations.

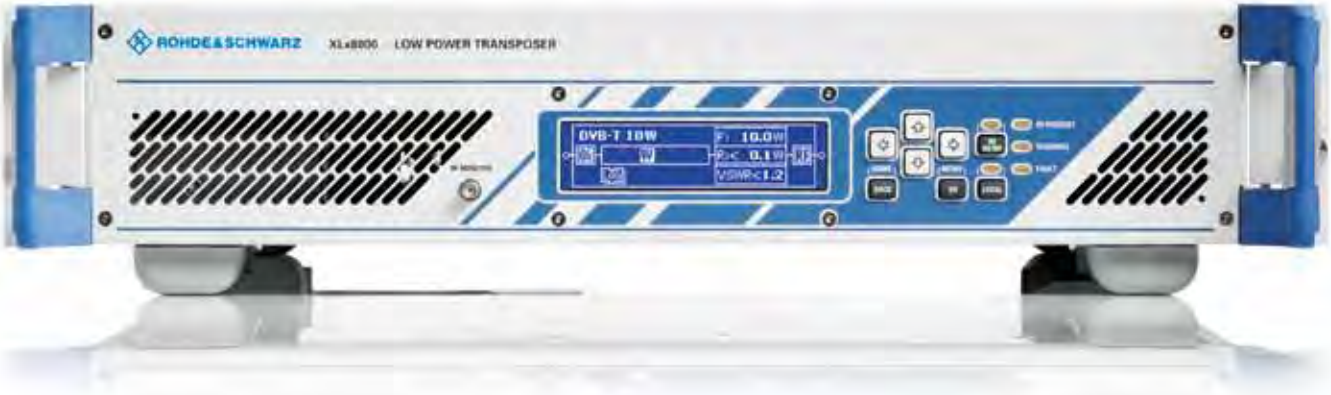
The R&S®XLx8000 family includes UHF and VHF transposers for digital and analog TV as well as for digital sound broadcasting. The compact devices can be used as transposers or retransmitters. Due to the short internal processing time, R&S®XLx8000 transposers can also be integrated into digital single-frequency networks (SFNs). Feedback is eliminated by high-quality, two-level echo cancellation. Intelligent operating functions reduce the transposers' setting times. For example, the automatic set&go function does away with a time-consuming manual precorrection of the output stages for all digital standards. The compact, flexible all-in-one-box concept allows various options to be integrated, which simplifies logistics and handling when sites are difficult to access.

The transposers cover analog TV standards as well as digital TV standards (DVB-T, DVB-T2, DVB-H, ISDB-T, ISDB-T_B, DTMB, CMMB, ATSC and ATSC Mobile DTV). For digital sound broadcasting, the transposers support broadcasts in line with the DAB, DAB+ and T-DMB specifications. If necessary, a transposer can be easily converted from analog to digital TV without modifying the hardware. The output powers range up to 100 W for COFDM based standards, up to 150 W for ATSC/ATSC Mobile DTV, up to 250 W for analog TV and up to 250 W for DAB(+)/T-DMB.

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 transposers are favorably priced and can be delivered quickly, even if they are ordered in large quantities. And the low-power transposers come with the high quality that stands for.

Key facts

- UHF/VHF transposers/retransmitters for analog and digital TV as well as digital sound broadcasting
- High quality with excellent price/performance ratio
- Efficient echo cancellation for use in single-frequency networks (SFN)
- Outstanding adjacent-channel selectivity
- Broadband precorrection for digital standards with the set&go function
- Compact two to four HU device
- Flexible integration of options



R&S®XLx8000 UHF/VHF Transposers

Benefits and key features

Flexible concept and wide range of applications

- Compact solution
- Convenient operation, on-site or remote diagnostics
- Transposer in multifrequency networks
- Retransmitter in multifrequency networks for DVB-T/DVB-H
- Gap filler in single-frequency networks

▷ page 4

Always on air

- Convenient supply with different rated voltages
- Self-monitoring power output stages
- Standby systems for high availability
- Maximum synchronization in single-frequency networks

▷ page 7

Special features for operation

- Precorrection for digital standards with set&go function
- High adjacent-channel selectivity
- DVB-T/DVB-H receiver for signal monitoring

▷ page 8

Custom tailoring

- Desktop unit or rack installation
- Integratable options
- Other accessories

▷ page 9

Output power of the R&S®XLx8000 UHF/VHF transposers [1]					Height units (HU)		
Frequency band	**DVB-T, DVB-T2, DVB-H, ISDB-T/ISDB-T_B, DTMB, CMMB (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	30 W		•	
	50 W	80 W	125 W	60 W		•	
	100 W	150 W	250 W	125 W		•	
	–	–	–	250 W			•

[1] Power before bandpass filter.

Flexible concept and wide range of applications

Compact solution

The R&S®XLx8000 transposers have a compact design. They are 19" wide, occupy two to four height units and contain all basic components such as transposer input unit, modulator unit, output stage module and display plus keypad. The housing fan is attached outside and easily accessible. In addition, the transposers can accommodate a variety of options. The R&S®XLx8000 transposers can be installed anywhere and are easy to transport.

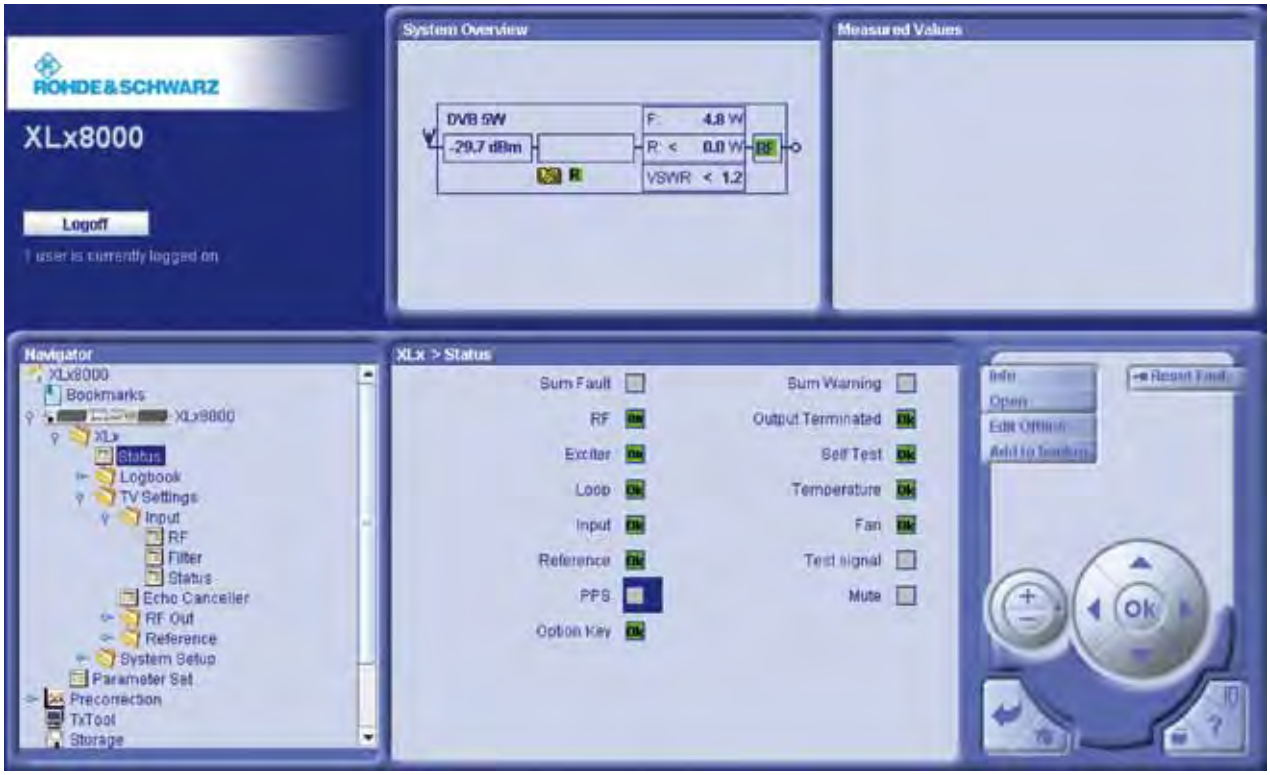
Convenient operation, on-site or remote diagnostics

The transposer is equipped with a backlit graphical display and a keypad on the front panel for local operation. Shortcuts provide quick access to frequently used menu items. LEDs indicate important operating states at a glance.

The R&S®XLx8000 can also be operated locally or remotely from a PC via a web interface, a quick and easy way to set up the device. 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®XLx8000 transposers can be monitored and configured over IP networks from a central control station using an SNMP agent (option).

Convenient operation of the R&S®XLx8000 UHF/VHF transposers a via web browser.



Transposer in multifrequency networks

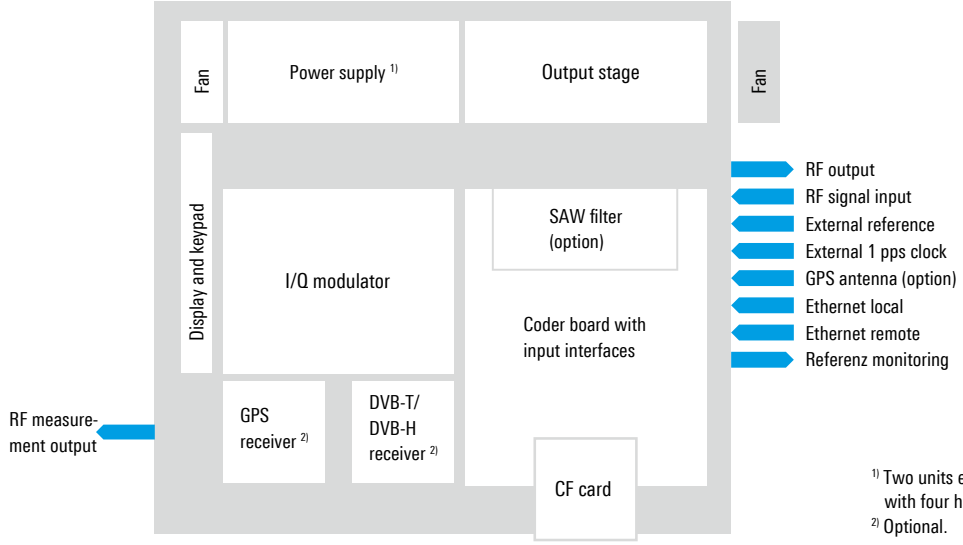
The R&S®XLx8000 can be used in analog as well as digital multifrequency TV and sound broadcasting networks. In this application, the service received over the air interface is transposed to and transmitted on a frequency that deviates from the input channel frequency. If necessary, a transposer for analog TV can be easily converted to a digital standard over a web interface at a later point in time – without any adjustments. This can be done either on-site or from a remote location without modifying the hardware.

Retransmitter in multifrequency networks for DVB-T/DVB-H

If an R&S®XLx8000 is used as a retransmitter, an integratable DVB-T/DVB-H receiver (option) delivers a demodulated baseband signal to the internal signal processing unit. This operating mode has two major advantages:

- An infrastructure for feeding a transport stream is not required
- The signal is "refreshed", because it is error-corrected during demodulation using the correction method specified by the DVB-T/DVB-H standard

Block diagram of the R&S®XLx8000 UHF/VHF transposers



1) Two units each for models with four height units.
2) Optional.

Gap filler in single-frequency networks

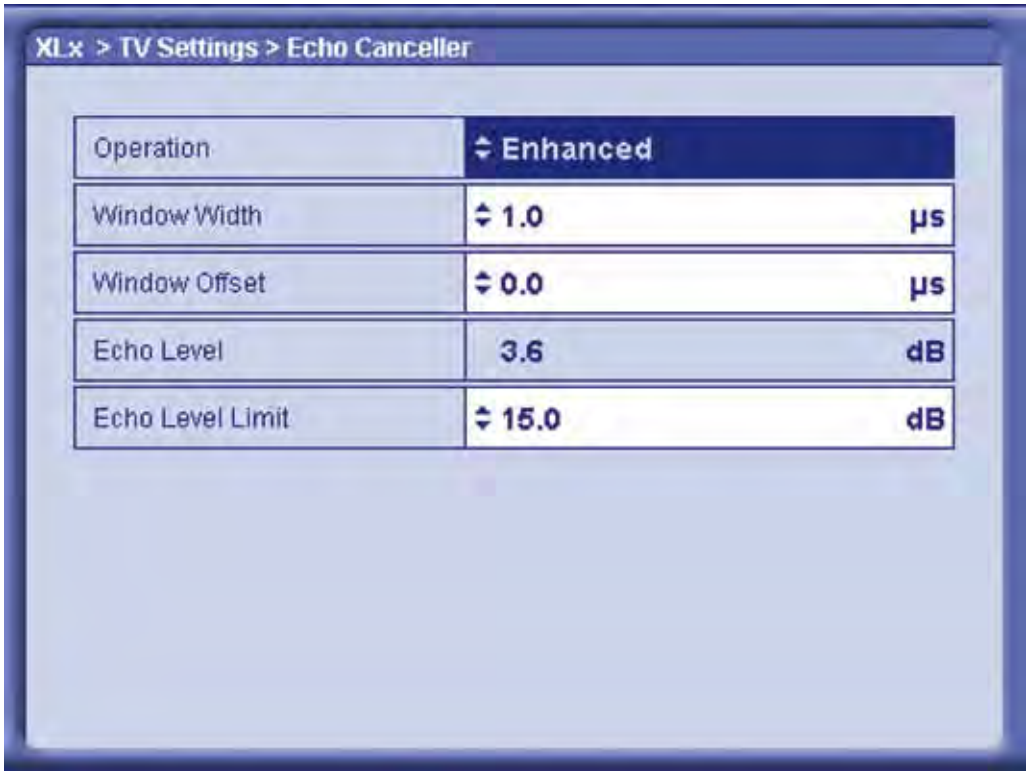
By operating the R&S®XLx8000 on the same frequency as the master transmitter, coverage gaps can be closed without occupying additional frequencies. Due to its very short signal processing times, the R&S®XLx8000 fits perfectly in any single-frequency network and ensures synchronous network operation in the coverage area at all times.

Depending on the isolation between the transmit and the receive antenna, the output power of the transposer and the topographical conditions on-site, a transposer must be able to eliminate interfering echos in a wide time and level range. The R&S®XLx8000 with its efficient echo cancellation is the ideal solution for cost-optimized station planning. Due to a two-level solution for echo cancellation, the R&S®XLx8000 can be flexibly configured for any echo situation.

Basic echo cancellation works well for moderate echo situations, eliminating echos up to +5 dB above the input signal. Enhanced echo cancellation uses an improved mechanism for echo prediction and can cancel echo components that are up to +15 dB above the input level. Echo cancellation between the input and output is in both cases at least 35 dB.

To compensate topographical conditions causing, for example, reflections on buildings or mountains or temporarily occurring reflections, the echo cancellation of the R&S®XLx8000 offers an extremely fast algorithm. Echo analysis takes place in a detection window with a width of up to 5 µs (depending on the standard and the bandwidth). The window's position can be selected to match the actual ambient conditions. For this purpose, the window can be shifted along the time axis.

Echo cancellation settings.



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. For the more powerful models with four height units, two single-phase power supply options are available for 110 V and 230 V.

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.

Alternatively, a DC voltage of –48 V can be applied via a DC/DC converter option. The transposers 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

As is customary for power amplifiers, the output stage modules of the R&S®XLx8000 UHF/VHF transposers are equipped with protective circuits. This prevents the transposers and their transistors from being damaged by overtemperature or high reflected power, for example.

Standby systems for high availability

An R&S®XLx8000 transposer can be integrated into an (N+1) standby system (including 1+1). A maximum of eight active transposers share one standby system that contains all the necessary data of the active transposers and replaces the affected transposer in the case of a malfunction.

Maximum synchronization in single-frequency networks

The optional internal GPS receiver featuring excellent sensitivity ensures a stable transmit frequency even un-der critical SFN conditions. The GPS receiver's extremely short synchronization time of typically less then three minutes makes sure that an R&S®XLx8000 transposer is immediately ready for operation in a single-frequency network after startup. If the GPS receive antenna fails, the R&S®XLx8000 can be safely operated up to 24 hours in an SFN without a 1 pps clock.

Special features for operation

Precorrection for digital standards with set&go function

The output stages in the transposers for digital standards are precorrected for all specified frequencies and powers. After a change in frequency or power, the automatic set&go function loads the appropriate precorrection curve in the background. Manual precorrection is therefore not necessary when a transposer is put into operation or a when a channel is changed. The available precorrection curves make it possible to reduce the power by up to 10 dB below the nominal power in the entire frequency range.

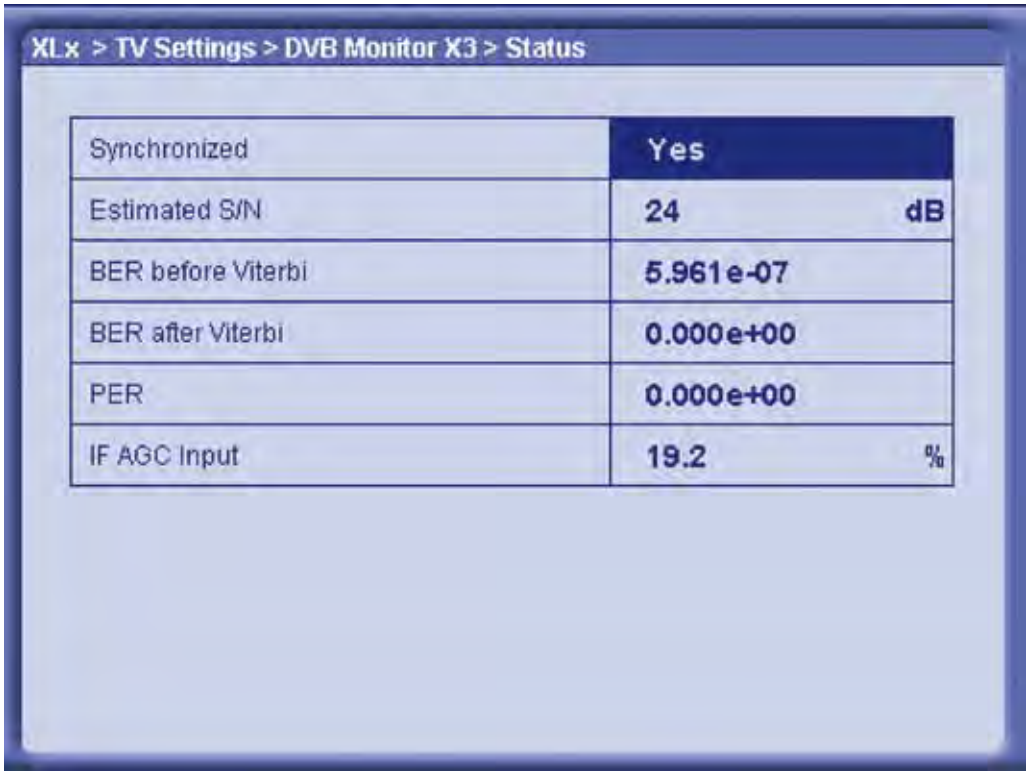
High adjacent-channel selectivity

Digital signal processing ensures high signal quality for all supported standards at all times. In addition, integrated digital filters provide high adjacent-channel selectivity. For use under extreme conditions, additional optional SAW filters increase adjacent-channel selectivity by approx. 10 dB. Integrated SAW filters are available for bandwidths of 1.5 MHz, 5 MHz, 6 MHz, 7 MHz and 8 MHz. The transposers can thus be flexibly adapted to the on-site situation.

DVB-T/DVB-H receiver for signal monitoring

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

DVB-T/DVB-H signal monitoring settings.



Custom tailoring

Desktop unit or rack installation

The transposers of the R&S®XLx8000 family can be used as desktop units or optionally installed in a 19" rack. Racks and rack installation kits for the individual transposer systems are optionally available.

Integratable options

- Echo cancellation
- Enhanced echo cancellation
- SAW filters
- Modification kit for operation as retransmitter
- DVB-T/DVB-H monitoring receiver
- GPS receiver
- SNMP agent
- –48 V DC power supply

Other accessories

- Floating contacts
- Bandpass filter
- Additional directional coupler after filter
- GPS antenna and cable
- Installation kit for 19" rack
- 19" racks of different heights for installing the transposers
- N+1 standby system kits
- Dust filter

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, DTMB, CMMB, 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)		
Input interfaces			
Sensitivity, digital TV	–70 dBm to 0 dBm		
Sensitivity, analog TV	–53 dBm to 0 dBm		
Sensitivity, DAB(+), T-DMB	–80 dBm to –10 dBm		
Internal processing time (depending on filter)			
For DTV	6 µs to 13 µs		
For DAB/T-DMB	20 µs to 28 µs		
Echo cancellation			
Permitted echo at input			
Without echo cancellation	< –10 dB relative to input signal		
With echo cancellation	≤ +5 dB relative to input signal		
With enhanced echo cancellation	≤ +15 dB relative to input signal		
Echo cancellation between input and output	35 dB		
SAW filter (option)			
Filter bandwidths	1.5 MHz, 5 MHz, 6 MHz, 7 MHz, 8 MHz		
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.

Ordering information

Designation	Type	Order No.
UHF transposer for DVB-T, 100 W RMS (typical configuration)		
Low-Power Transposer (configured as R&S®XLV8100, UHF (470 MHz to 862 MHz), DVB-T power 100 W RMS)		
Low-Power Transposer, 3 HU, base unit	R&S®XLX8000	2100.1100.30
DVB-T UHF Amplifier, 100 W RMS	R&S®SLX8000B47	2100.1217.02
AC Power Supply, 3 HU	R&S®SLX8000B11	2100.4045.02
Power Cable		country-specific
Hardware options		
Enhanced Echo Cancellation	R&S®XLX8000B19	2104.2201.02
GPS Receiver Card	R&S®SLX8000B13	2100.3232.02
GPS Antenna, suitable for R&S®SLX8000B13	R&S®SLX8000B17	2100.4100.02
SAW Filter, 8 MHz	R&S®XLX8000B80	2104.2153.02
Installation Kit for DVB-T/DVB-H monitoring receiver	R&S®SLX8000B15	2100.3355.20
Dust Filter for 3 HU base unit	R&S®SLX8000B23	2100.3803.03
Software options		
Echo Cancellation Option Key	R&S®XLX8000K18	2100.4300.18
Enhanced Echo Cancellation Option Key	R&S®XLX8000K19	2100.4300.19
Monitoring Receiver Option Key for R&S®XLx8000	R&S®XLX8000K25	2100.4300.25