

R&S® SCx8000 Family of UHF Transmitters for TV A new dimension in compactness



75 Years of
Driving
Innovation


ROHDE & SCHWARZ

R&S®SCx8000 Family of UHF Transmitters for TV At a glance

The R&S®SCx8000 family of UHF transmitters offers compactness and cost-effectiveness unique in its power class. Designed for professional TV broadcast networks, the R&S®SCx8000 features intelligent redundancy concepts for the exciter and the amplifier and allows easy switchover from analog to digital transmission. The transmitters are innovative, robust, failsafe and easy to put into operation. This makes them ideal for use at remote sites and in outdoor applications.

The R&S®SCx8000 transmitter family covers the analog TV standards as well as the ATSC, ATSC Mobile DTV, DVB-T, DVB-H and MediaFLO™ digital TV standards. The transmitters can be switched from analog to digital transmission. The R&S®SCx8000 comes with broadband precorrection data for each digital standard.

With output powers from 200 W to 600 W for DVB-T/ DVB-H, the R&S®SCx8000 can be used for expanding existing transmitter networks and filling coverage gaps.

Rolling out or extending a transmitter network may require large numbers of transmitters; yet costs must be kept to a minimum. Here, the R&S®SCx8000 proves to be the ideal choice: It comes with the high quality that Rohde&Schwarz stands for and offers an excellent price/ performance ratio. Follow-up costs are just as favorable: Due to its ultracompact design, the R&S®SCx8000 reduces infrastructure, rental and installation costs. The transmitter's high efficiency ensures low energy costs throughout the product lifecycle.

Availability is the crucial factor for operators of transmitter systems. The new backup exciter redundancy concept eliminates the need for a separate transmitter control unit. This lowers costs and increases system availability. Each amplifier comes with two power supplies. This ensures high failsafety, which can be further enhanced by adding a third, optional power supply.

Key facts

- UHF transmitters for TV from 200 W to 600 W
- Compact and cost-effective transmitter family offering the high quality that Rohde&Schwarz stands for
- New redundancy concepts for economical use of available space
- High efficiency for reduced energy costs
- Set&go function providing system precorrection



R&S®SCx8000 transmitter configured as R&S®SCV8301EA with one R&S®SX801 exciter and one R&S®VH8301C1 UHF amplifier (base unit).

R&S® SCx8000 Family of UHF Transmitters for TV Benefits and key features

Innovative, compact design

- ▮ Transmitters with high power density
- ▮ Autonomous cooling concept for flexible use
- ▮ New redundancy concepts increase availability and save space

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Special features for operation

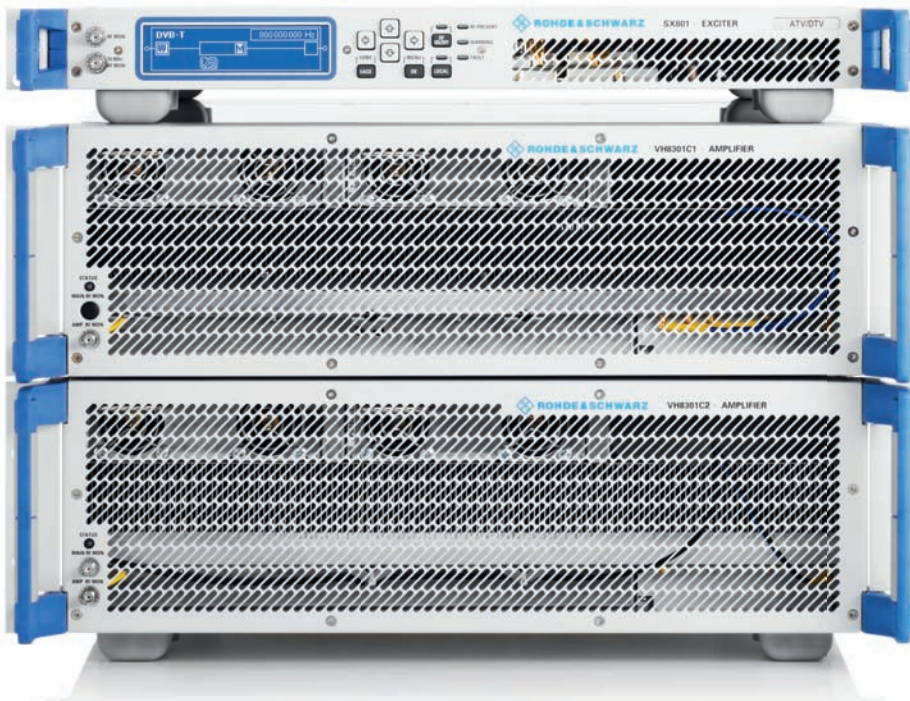
- ▮ Significant reduction of energy costs
- ▮ Precorrection for digital standards with set&go function
- ▮ Solutions for migrating from analog to digital TV
- ▮ Operation either hands-on or via web browser
- ▮ Excellent sound level

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Continuous coverage

- ▮ "Everything from a single source" means utmost quality from Rohde&Schwarz
- ▮ Additional transmitter redundancy concepts
- ▮ Self-monitoring power output stages
- ▮ Optimal power supply design

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R&S®SCx8000 transmitter configured as R&S®SCV8302EA with an R&S®SX801 exciter, an R&S®VH8301C1 UHF amplifier (base unit) and an R&S®VH8301C2 UHF amplifier (expansion unit).

Innovative, compact design

Transmitters with high power density

The use of large-scale integrated (LSI) components that combine various classic transmitter functions results in a highly compact design. The new R&S®SX801 exciter provides signal processing and transmitter control functionality at the same time. It comes with a display on its front panel.

The base amplifier includes the amplifier unit, an exciter switch and a signal splitter. In systems with two amplifiers, an expansion amplifier with an internal power combiner is added. Both the base and the expansion amplifier come with an integrated cooling system, each featuring two fans for redundancy.

The individual components are combined as necessary for the required output power and application. Due to the large number of options, including a DVB-T/DVB-H receiver that adds retransmitter functionality to the R&S®SCx8000, the transmitter can be tailored to the specific application.

Autonomous cooling concept for flexible use

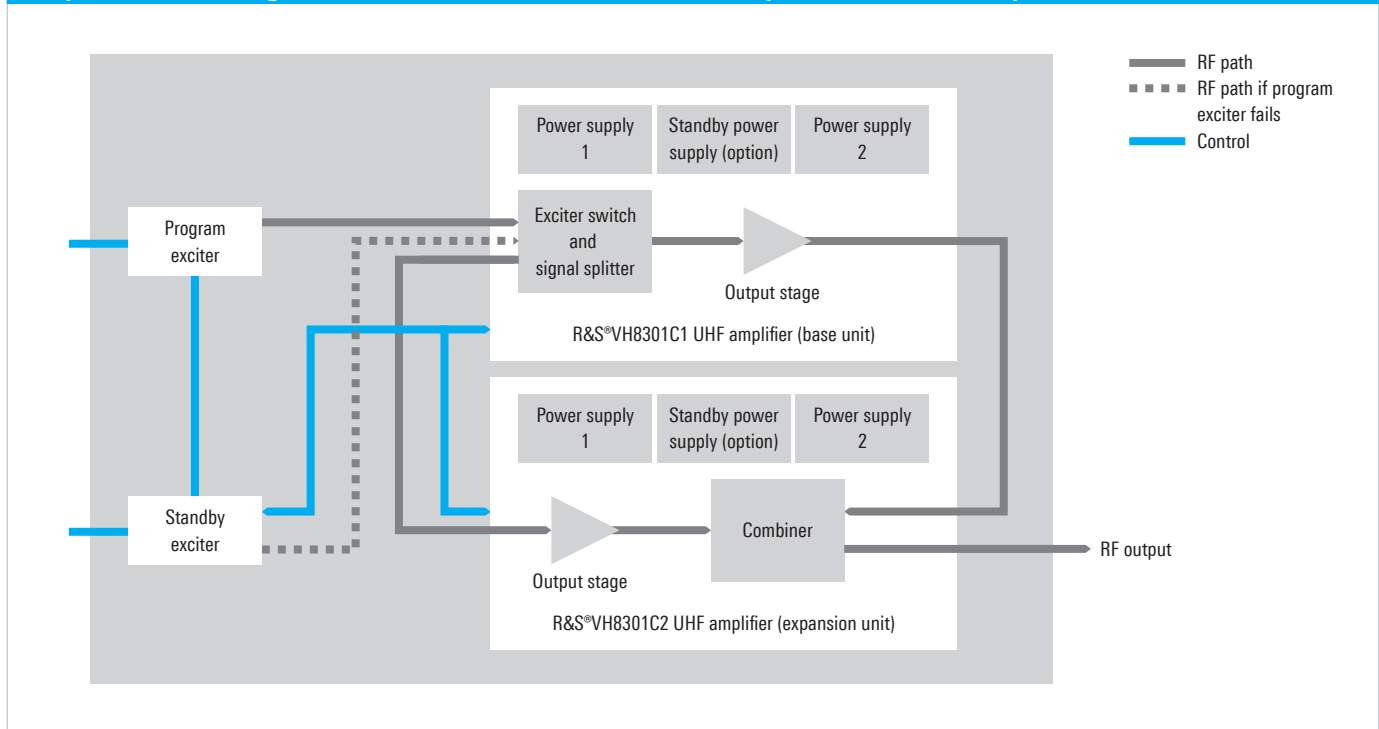
The compact design and integrated cooling make it easy to install the transmitter in a broadcast station, even into unused spaces in crowded racks. The autonomous cooling concept makes the transmitter ideal also for installation in outdoor racks; Rohde&Schwarz offers various solutions for such applications.

New redundancy concepts increase availability and save space

To create a system that makes the most economical use of available space, the new backup exciter redundancy concept was developed. RF source redundancy is achieved by using only two exciters. A central control unit is not required. The program exciter serves as the RF source and the backup exciter as the transmitter control unit. If the program exciter fails, the backup exciter automatically takes over RF transmission in addition to providing transmitter control functionality.

An intelligent power supply standby concept provides power supply redundancy for the amplifier. Each amplifier contains two power supplies as standard to maintain interruption-free transmission if one of the power supplies fails. An optional third power supply can be used to further enhance transmission reliability.

Simplified block diagram of the R&S®SCx8000 with two amplifiers and a backup exciter



Special features for operation

Significant reduction of energy costs

At an efficiency of up to 22%, the R&S®SCx8000 features energy costs exceptionally low for a transmitter in this power class. This makes for extremely low cost of ownership throughout the life of the transmitter.

Pre-correction for digital standards with set&go function

The transmitter can be put into operation quickly and easily and is convenient to operate. The system amplifiers come ready with broadband pre-correction for the specific digital standard on delivery. Manual pre-correction is therefore not necessary when the transmitter is put into operation. In the UHF range, each channel can be selected with nominal power or power reduced by up to 6 dB. The automatic set&go function loads the pre-correction curve required for the selected frequency and power in the background. A modulation error ratio (MER) of at least 33 dB is thus achieved for the output stage without requiring any time-consuming manual pre-correction.

Solutions for migrating from analog to digital TV

The transmitters offer intelligent concepts for network operators planning migration from analog to digital transmission. If both analog and digital signals are fed, the desired input mode and standard can be menu-selected.

The MPEG decoder option allows digital input signals to be fed as transport streams. These streams are converted to analog CCVS signals in the exciter FPGA, modulated and transmitted as analog signals. If digital transmission is desired at a later date, switchover from analog to digital transmission can be made easily and without any hardware modification.

Operation either hands-on or via web browser

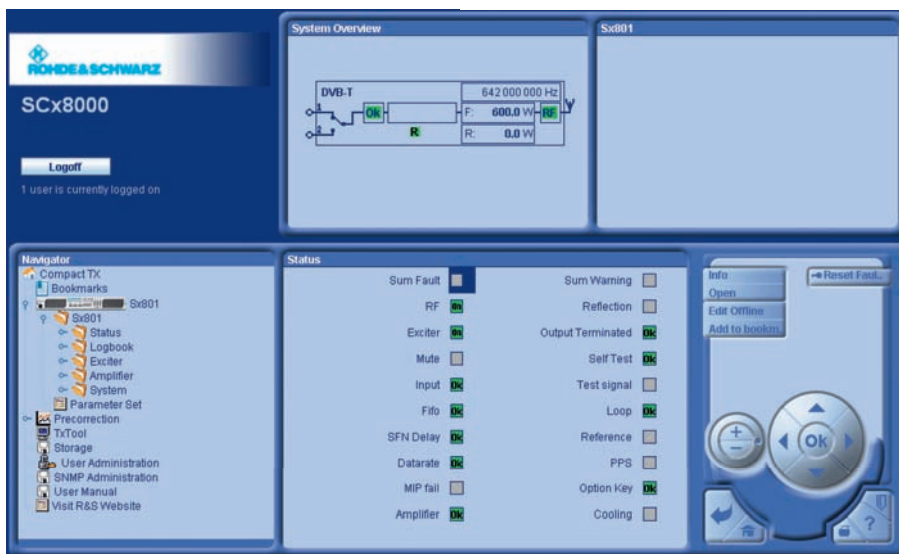
The exciter has a backlit graphical display and a keypad on the front panel for hands-on operation. Shortcuts enable quick access to frequently used menu items. The operating parameters are indicated by LEDs and displayed in the overview menu.

The R&S®SCx8000 can also be operated locally or remotely from a PC running a standard web browser. In addition, the transmitter can be remotely monitored via an optional SNMP agent.

In broadcasting networks containing a large number of devices, efficient and reliable configuration management is important. Like all modern equipment, the R&S®SCx8000 transmitters can be configured via the Internet from a central station. In this way, device and system settings can also be easily saved and transferred from one transmitter to another.

Excellent sound level

The R&S®SCx8000 stands out for exceptionally silent operation. Its sound level is typically below 60 dBA, depending on the configuration.



Typical start menu for operation via the web browser.

Continuous coverage

"Everything from a single source" means utmost quality from Rohde&Schwarz

At Rohde&Schwarz, the entire value added chain lies in one hand. This is the ideal prerequisite for long-term, trouble-free operation of transmitter systems, since Rohde&Schwarz products meet the most stringent quality requirements. The transmitters were developed with market requirements in mind right from the start. Rohde&Schwarz manufactures its products at its own plants. This ensures short-term, reliable product delivery independently of external suppliers. An extensive T&M product portfolio and worldwide service and support round out the benefits that come with the R&S®SCx8000 family of transmitters – true to the motto: "Everything from a single source".

Additional transmitter redundancy concepts

In addition to the innovative backup exciter concept, Rohde&Schwarz will continue to offer the established solutions featuring the R&S®NetCCU®800 as the central control unit for dual drive, 1+1 and N+1 standby configurations, which provide additional features in particular with respect to operating ease.

Self-monitoring power output stages

As is customary for Rohde&Schwarz, all power amplifiers of the R&S®SCx8000 family of transmitters are equipped with protective circuits. This prevents the transmitters and their transistors from being damaged by overtemperature or high reflected powers.

Optimal power supply design

The use of high-quality single-phase wide-range power supplies allows the transmitter to be operated on all conventional single-phase voltages. Voltage fluctuations can thus be compensated, eliminating the need for extra transformers. The power supplies are able to buffer power interruptions up to 10 ms.

Option	Description
Retransmitter kit	for operating the transmitter as a retransmitter
DVB-T/DVB-H monitoring receiver	for monitoring 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	floating contacts for messages and commands
Analog-to-digital switchover	for simple switchover from analog to digital transmission
MPEG decoder	enables transmission of digital input signals as analog output signals and subsequent switchover from analog to digital transmission
GPS antenna and cable	accessories for GPS receiver
Racks and installation kits for racks	available in different sizes and versions
Dummy loads	
RF filters	
Power feed	available in different configurations
Air filters	available for amplifier and exciter

Specifications

R&S®SCx8000 output powers (rms) ¹⁾				
Configured as	R&S®SCV8201x	R&S®SCV8301x	R&S®SCV8202x	R&S®SCV8302x
DVB-T/DVB-H, MediaFLO™	200 W	300 W	400 W	600 W
ATSC, ATSC Mobile DTV	300 W	450 W	600 W	900 W
Analog TV (sync peak)	500 W	700 W	1000 W	1400 W
RF output	N		7/16	

¹⁾ Without output filter.

General data		
Frequency range		
UHF (band IV/V)		470 MHz to 862 MHz
Available standards	analog	B/G, D/K, M, M1, N, I, I1
	digital	DVB-T, DVB-H, ATSC, ATSC Mobile DTV, MediaFLO™
Power supply		
AC		100 V to 240 V + 10%, 47 Hz to 63 Hz
DC (option for exciter)		-48 V (-38 V to -72 V)
Synchronization		
Reference frequency		10 MHz, -5 dBm to +20 dBm or LVT, BNC
Reference pulse		1 pps (1 Hz, TTL, BNC)
Operation		
Display, keypad and status LEDs		local operation and display, 200 × 48 pixel color display
Ethernet interface, RJ-45		convenient local or remote control via standard web browser
Parallel remote control interface	optional	floating contacts for messages and commands
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
Dimensions (W × H × D)	R&S®SCV8201x, R&S®SCV8301x	483 mm (19") × 4 HU × 550 mm (19 in × 4 HU × 22.7 in)
	R&S®SCV8202x, R&S®SCV8302x	483 mm (19") × 7 HU × 550 mm (19 in × 7 HU × 22.7 in)

Important: 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

Typical configuration of a UHF transmitter for DVB-T, 600 W rms

Designation	Type	Order No.
R&S®SCV8302E Low-Power Transmitter, UHF (470 MHz to 862 MHz), without rack, single-phase, AC, 600 W rms DVB-T output power		
Exciter, 1 HU, base unit	R&S®SX801	2104.4504K02
UHF Amplifier, DVB-T, 300 W rms, base unit	R&S®VH8301C1	2104.8000K02
UHF Amplifier, DVB-T, 300 W rms, expansion unit	R&S®VH8301C2	2104.8000K02

Your Rohde & Schwarz sales partner will be glad to help you find the optimal solution that exactly meets your requirements.

For your local contact, see www.sales.rohde-schwarz.com

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About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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