Digital VLF-HF Receivers R&S® EK895/R&S® EK896

For all shortwave applications from 10 kHz to 30 MHz

◆ Compact DSP-based receivers for the following applications:
  – Radiomonitoring and radio detection
  – Radiocommunications
  – Search operation, DF systems
  – Frontend for HF intelligence tasks

◆ Digital signal processing (DSP) for convenient and versatile operation
◆ Two models:
  – Half-rack receiver R&S EK895
  – Search receiver R&S EK896
◆ Realtime remote control or master-slave mode
◆ Tried and tested system concept
◆ Excellent price/performance ratio
◆ Extremely reliable operation under harsh environmental and EMC conditions
Digital VLF-HF Receivers R&S® EK895/R&S® EK896

**Special features**
- Excellent large-signal behaviour, very good intercept points
- High resolution of tuning frequency down to 1 Hz
- Fast and low-noise synthesizer
- Demodulators for AM, CW, LSB, USB, ISB, FM, FSK, AFSK and FAX included in basic configuration
- 13 bandwidths from 150 Hz to 8 kHz (quasi-continuous on request)
- RF preamplifier, switchable (noise figure 8kT<sub>0</sub>)
- Double notch filter
- Noise blanker
- DATA LINK reception (option)
- Passband tuning
- Syllabic squelch
- Special RTTY (FSK/AFSK) mark and space filters, matched to the selected shift
- Digital data output
- Maximum input voltage protection up to 100 V EMF
- Control interface fully complying with international standards
- Low power consumption <25 VA (basic model R&S EK895), therefore little self-heating
- Powerful microprocessor for bus interfacing, menus and user programs
- Dual receiver as 19” desktop or rack models
- Free slots for retrofitting of options
- Integrated self-test down to module level with plain-text result display
- Available with operator front panel or remote-control-only front panel
- Highly compact; width ⅓19” (R&S EK895) or 19” (R&S EK896)

**Operational features**
- Easy to operate via terminal, computer or front panel
- High rejection of strong interfering signals
- 1000 programmable channel memory locations
- Scan mode for programmable frequency ranges and any desired channel sequences
- Remote control of all settings – over any distance when using modems
- Ideal handoff receivers in stationary, mobile and remote receiving systems
- High availability owing to long MTBF and short MTTR
- Easy to adapt to special requirements by means of optional plug-in modules and standardized interfaces
**Overview**

**General characteristics of the R&S EK895**

With the R&S EK890 family, Rohde & Schwarz is presenting a powerful generation of VLF-HF receivers which are top-end products benefiting from many years of experience in this field. All members of this family are based on the R&S EK890 basic model. Due to the advantages of digital signal processing, embedded in the improved receiver versions R&S EK895/R&S EK 896 a number of additional features and operational convenience have been added. Straightforward, menu-guided selection and programming of the receiving settings ensure excellent processing and handling of the received signal content. The compact design is due to the use of large-scale-integration SMDs. Featuring full system compatibility, the receivers provide the basis for extremely economical customer-specific solutions.

With its excellent RF characteristics and clear cut, full remote-control capability via standardized data interfaces, the R&S EK890 family is suitable for all civil, administrative and military shortwave applications. These receivers are an ideal choice for receiving systems that have to fulfill extremely high reliability requirements, in particular under harsh environmental and EMC conditions.

Operation is possible via an ASCII terminal, a computer (PC) or via the front panel. Using line drivers, a master receiver can control up to 99 remote receivers in master-slave operation. On the R&S EK895/R&S EK896, two wired and bus-integrated slots for plug-in modules are provided for extensions, e.g. BCD interface or input filters.

**Uses**

The comprehensive sequence control can be used for all demanding shortwave reception tasks. Due to flexible programming of the processor, the following operating modes are possible:

- Manual operation
- Remote control or master-slave operation
- Channel scanning, sequential and programmable
- Frequency scan
- Channel reception
- Password-protected channel reception

The R&S EK890 family thus fulfills the requirements for versatile use in voice receiving and any kind of data communication system as well as for all radio-monitoring, radio detection and radio intelligence (COMINT) applications. For application in DF systems, an R&S EK895 is used as the master (controlling synthesizer), its LOs being brought out for external amplification, distribution and phase-locked application to all other receivers.

The built-in memory has capacity for non-volatile storage of 1000 complete channel settings so that channel management and control by an external computer are not required but are nevertheless additionally possible. Due to their excellent characteristics regarding dynamic range, low synthesizer noise and gain control range, the receivers are ideal high-performance frontends for subsequent signal processing.
The R&S EK896 has especially been designed for complex tasks of radio detection and search reception, its operating principle and configuration perfectly matching the relevant requirements. Basically it is fitted with panel controls and LCD displays for local and remote-control operation.

High-speed and reliable radiomonitoring is supported by temporary storage of a complete receiver setup and its transfer to or readout from the connected slave. The R&S EK896 is the optimal operator’s position in modern radiomonitoring systems. In the usual master-slave mode, a master receiver can control up to 99 slave receivers via additional line drivers to handle simultaneous radiomonitoring or specific radio detection tasks. Due to its outstanding characteristics, the R&S EK896 is ideal for use as a standalone receiver. All R&S EK895 options can be fitted.

**Design**

**RF unit**
The antenna signal is routed via a lowpass filter, which is provided for rejecting image frequencies and suppressing oscillator reradiation, and applied to the input mixer where it is converted to the first IF of 41.44 MHz by means of an oscillator variable in 1 Hz steps. The crystal filter that follows determines the maximum receiving bandwidth of 10 kHz and rejects the second image frequency. A fixed frequency of 40 MHz is used for conversion to the second IF of 1.44 MHz.

The high-performance mixer at the receiver input ensures excellent large-signal behaviour. The intercept points are typically +70 dBm (IP2) and +35 dBm (IP3); the crossmodulation transfer is 10% for an interfering signal of +21 dBm. In most cases, additional filters such as sub-octave filters are therefore not required.

**IF/AF processor (DSP)**
The second IF is converted to the third IF of 25 kHz using a 5.66 MHz fixed frequency. After digitization of the third IF in a 16-bit A/D converter, the processor assumes all signal generation and processing tasks (DSP) including the following:

- Automatic, remote or manual control (AGC, DGC, MGC)
- Measurement of received levels
- Filtering with 13 fixed or quasi-continuously adjustable bandwidths
- Demodulation, passband tuning, double notch filter
- Noise blanker, syllabic squelch
- Generation of BFO frequency as analog IF from 0 to 40 kHz, digital IF as serial data and I/Q data stream

**Synthesizer**
The synthesizer supplies all the conversion frequencies required for the RF and the IF demodulator units. Due to direct digital frequency synthesis, the first conversion oscillator can be varied in 1 Hz steps. The settling time of the oscillator is 5 ms for any frequency variation. Two phase-locked loops (PLLs) produce the 40 MHz and 5.66 MHz fixed frequencies. The operation of the total of four PLLs in the synthesizer is continuously monitored.

In the basic version, all the frequencies are derived from a temperature-compensated crystal oscillator. Higher accuracy requirements can be fulfilled by including a heated crystal oscillator (optional OCXO) or using an external frequency standard (1 MHz, 5 MHz or 10 MHz).
Control functions

Processor and software
The 16-bit microprocessor using powersaving CMOS technology is what makes the high-performance, compact, reliable and user-friendly concept of the R&S EK895 possible. The microprocessor is not only responsible for setting and managing the module functions, it also communicates with the outside world via the panel controls and the data interface, executes the internal programs and ensures the high operational reliability through various routines:

- Nonvolatile storage of all settings
- Continuous testing of CPU, RAM and PROM functions
- Continuous monitoring (CM) of synthesizer
- BIT (built-in test) for module testing

The simple and logical ASCII command syntax for controlling the receiver via the serial interface includes control commands for the following:

Basic settings
- Frequency
- BFO
- Bandwidth
- Demodulation modes
- Gain control mode
- Digital threshold
- Passband tuning

Search operations
- Frequency scanning
- Channel scanning
- Hold time
- Dwell time
- Stop criterion

Test operations
- Read CM status
- BIT start
- BIT readout

System operations
Readout of
- Software version
- Options
- Error messages
- Signal level
- Deviation

Channel operations
- Channel manipulations
- Store channel
- Erase channel
- Select channel
- Readout channel

Special operations
- Master-slave operation
- Complete erasure of channel memory

In addition, the following functions can be selected on the front panel:

- Display of interface configuration
- Fast channel storage
- Channel buffer storage
- Default settings on/off
- Password for channel service
- Local/remote mode
- Knob increments

Block diagram of the Digital VLF-HF Receivers R&S EK895/R&S EK896
Various configurations

**Receivers with control panel**
In the standard version, the R&S EK895 receiver is available with an operator front panel, which can also be retrofitted. This front panel also permits manual control and display of all functions while full remote-control capability is maintained. This version is particularly suitable for use as a master receiver in receiving systems or as a standalone unit (standard with R&S EK896).

The operator interface allows for a combination of hardkey and softkey entries. Parameters that are frequently handled, i.e., receive frequency, channel, BFO frequency and passband tuning (PBT), can be entered directly via a separate keypad. All current receiver settings are continuously displayed in large high-contrast characters on a backlit LCD. An additional bargraph indicator allows display of either the receive level (0 to 120 dBµV, in 5 dB steps), the DGC or MGC settings or the frequency offset (as a tuning aid and deviation indication).

**Receivers with remote-control panel**
Optionally, the receivers are remote-controlled by ASCII command sequences via a multistandard interface (RS-232-C, RS-485, RS-422/423, 2-/4-wire). In the simplest case, a terminal can be used as the control unit. For more convenience, a computer can be used to handle complex tasks and to create special user interfaces. A demo program for generating a virtual front panel is available if desired.

The features newly incorporated into the R&S EK895/R&S EK 896, such as preamplifier (PREAMP), noise blanker (NB), squelch (SQ), notch filter (NOTCH) and passband tuning (PBT), are selected in submenus using softkeys. If one of these features is active, a bargraph appears on the display above the relevant inscription (PREAMP, NB, SQ, NOTCH, PBT).

**Remote Control Unit R&S GB 899 (model 03)**
This option is an R&S EK895 reduced to control functions plus a Control Panel R&S GB 890. It is used for real-time remote control of handoff receiving equipment, over long distances preferably via additional modems.

**IF bandwidth configuration**
The R&S EK895/R&S EK896 features 13 bandwidths from 150 Hz to 8 kHz. Quasi-continuous tuning in 128 steps is available as an option.

**Input Filter Unit R&S FK890 H1 (option)**
The input filter module comprises a low-pass filter, a bandpass filter and eight suboctave filters which are automatically selected with the receive frequency.

**BCD Interface R&S GC890 (option)**
A plug-in BCD interface is available for controlling frequency-dependent add-on units with parallel interfaces, e.g., a selective antenna.

**TTY Line Current Source R&S GH 890 (option)**
For the operation of older teletype units that require line current (single/double current), a TTY line current source requiring no extra slot can be accommodated.

**IF Converter R&S UX895 (option)**
The IF Converter R&S UX895 can be supplied as a submodule for incorporation into the IF/AF processor. Instead of the analog IF output signal of 0 to 40 kHz, it linearly converts the set receive parameters to the IF of 455 kHz.

**Digital Selection R&S FK896D (option for R&S EK896 only)**
This option considerably improves the input selectivity of the receiver. Two versions are available for 20 dB or 40 dB stopband attenuation. The automatically tracking selection circuit includes the following functions:

- 7-circuit lowpass (0 to 30 MHz)
- 5-circuit lowpass (0 to 1.5 MHz) for rejection of strong shortwave interfering signals
- Tracking single-circuit filter (1.5 MHz to 30 MHz) with a stopband attenuation of >20 dB (40 dB) at 10% spacing from the center frequency
- Switch on/off by remote control
- Input voltage protection of ≥200 V EMF

The Digital Selection R&S FK896D is recommended for use in environments with strong RF interference (collocation problems). It improves input selection by automatically tracking the receive frequency and, at the same time, considerably increases input-voltage protection (overload protection).
### Broadband IF Output R&S GM893 (option)

The optional broadband output (plug-in module) supplies a 1 MHz output signal at the first IF of 41.44 MHz (relative to a receive frequency of ±500 kHz). To prevent impairment of the receiver sensitivity of the main channel (message channel), the path to the broadband channel is decoupled by approx. 10 dB. For broadband spectrum analysis, a spectrum display can be connected to this broadband output.

### Digital data output (option)

For further digital signal processing of the received signal, a separate digital IF interface (connector X 69 at rear) is available, delivering the digital DATA, CLOCK FRAME outputs (0 to 40 kHz, sampling rate 100 ksps).

### DATA LINK option

If DATA LINK operation (MIL-STD-188-203-1A) is required, special receiver versions are available.

### 1.44 MHz IF output, unregulated (option)

For connecting and operating an external IF spectrum display, e.g. the Digital Spectrum Display R&S EP090, an unregulated IF output at 1.44 MHz is available. This option uses the HF unit (model 03) and has to be ordered along with the basic receiver.

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**Operating concept**

The R&S EK890 family has a suitable operating mode for every application (see also page 8). The remote-control interface is configured to the RS-485 standard and is bus-compatible for system operation. Users who want to control their radiomonitoring system from the receiver front panel rather than from a computer can use the receivers of the R&S EK890 family as a master receiver or install the Remote Control Unit R&S GB899.

The softkey-menu operator interface provides the ergonomic advantage of clean front panel layout as well as access to a large number of setting parameters. When you insert extension modules, they are automatically detected and incorporated in the software BIT and the menu system. The clear cut operating concept of the R&S EK890 family has five menu levels which allow 50 logically structured operating routines to be called up by softkeys. In spite of the multitude of functions, operation is highly convenient, e.g. each type of modulation is assigned a default setting with all relevant parameters, which can also be individually programmed.

The table to the left shows all possible settings down to the second menu level.

For fast access to the setting parameters, the R&S EK896 has 12 additional hardkeys, e.g. for standard types of modulation, bandwidth variation, etc.
Control concepts of the Digital VLF-HF Receivers R&S EK895/R&S EK896

Remote control

… via PC or ASCII terminal

R&S EK895 with front panel for remote control

… via the Remote Control Unit R&S GB999, model 03

Local control

R&S EK895 with control panel as a standalone unit or as a master receiver in systems

Search Receiver R&S EK896

Master-slave operation

Slave receivers, max. 99 addressable
### Specifications

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>10 kHz to 30 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 Hz</td>
</tr>
<tr>
<td>Frequency drift</td>
<td>–10 to +45°C aging/year</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency standard</th>
<th>5 x 10⁻²</th>
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<table>
<thead>
<tr>
<th>Frequency range</th>
<th>1 x 10⁻⁶</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>1 x 10⁻⁷</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>External frequency standard</th>
<th>1/5/10 MHz, 0.2 V to 1 V rms</th>
</tr>
</thead>
</table>

| Antenna input | BNC connector, 50 Ω |

| VSWR | ≤5 typ. with preamp on for f > 250 kHz |

<table>
<thead>
<tr>
<th>Max. input voltage (≤30 MHz)</th>
<th>100 V EMF</th>
</tr>
</thead>
</table>

| Oscillator radiation into 50 Ω termination | ≤10 µV |

### Demodulation modes

- CW/MCW (A1A, A1B, A2A, A2B) FAX1 (F1C)
- AM/AME (A3E, H2A, H2B, H2E) USB/LSB (R2A, R3E, J2A, J3E) ISB (B8E) FSK/AFSK (F1A, F1B), F6 (F7B)
- FAX2 (F3C), FM (F3E) DATA LINK acc. to MILSTD-188-203-1A (on request)

### IF bandwidth (standard values)

<table>
<thead>
<tr>
<th>3 dB</th>
<th>60 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75 Hz</td>
<td>±150 Hz</td>
</tr>
<tr>
<td>1.50 Hz</td>
<td>±225 Hz</td>
</tr>
<tr>
<td>3.00 Hz</td>
<td>±430 Hz</td>
</tr>
<tr>
<td>5.00 Hz</td>
<td>±770 Hz</td>
</tr>
<tr>
<td>7.50 Hz</td>
<td>±990 Hz</td>
</tr>
<tr>
<td>10.50 Hz</td>
<td>±1600 Hz</td>
</tr>
<tr>
<td>12.00 Hz</td>
<td>±1760 Hz</td>
</tr>
<tr>
<td>13.50 Hz</td>
<td>±1900 Hz</td>
</tr>
<tr>
<td>15.00 Hz</td>
<td>±2100 Hz</td>
</tr>
<tr>
<td>20.00 Hz</td>
<td>±3400 Hz</td>
</tr>
<tr>
<td>24.00 Hz</td>
<td>±3700 Hz</td>
</tr>
<tr>
<td>30.00 Hz</td>
<td>±4200 Hz</td>
</tr>
<tr>
<td>40.00 Hz</td>
<td>±5200 Hz</td>
</tr>
</tbody>
</table>

### Quasi-continuous bandwidth (option for R&S® EK895)

- 128 steps, 100 Hz to 9 kHz

### Sensitivity

<table>
<thead>
<tr>
<th>For S/N=10 dB, f=0.1 MHz to 30 MHz A1A (CW) J3E (SSB), J7B H3E (AME), 1 kHz, m=60%</th>
<th>0.4 µV EMF (–121 dBm), BW=300 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 µV EMF (–113 dBm), BW=2.7 kHz</td>
<td>2.7 µV EMF (–104 dBm), BW=6 kHz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With preamplifier, f=0.2 MHz to 30 MHz A1A (CW) J3E (SSB), J7B H3E (AME), 1 kHz, m=60%</th>
<th>0.2 µV EMF (–127 dBm), BW=300 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 µV EMF (–121 dBm), BW=2.7 kHz</td>
<td>1.0 µV EMF (–113 dBm), BW=6 kHz</td>
</tr>
</tbody>
</table>

### Immunity to interference, non-linearities

<table>
<thead>
<tr>
<th>Intermodulation (1.5 MHz to 30 MHz; Δf ≥ 30 kHz; interfering signal 0 dBm) IP₂</th>
<th>&gt;60 dBm (70 dBm typ.)</th>
</tr>
</thead>
</table>

| Crossmodulation (0.1 MHz to 30 MHz, interfering signal 5 V EMF (+21 dBm); Δf ≥ 30 kHz; m=0.3, f=1 kHz; signal level 10 mV EMF (–33 dBm)) | ≤10% modulation transfer |

### Gain control

- Automatic (AGC), manual (MGC) or 2 x V.28 interface

### CW/MCW (A1A, A1B, A2A, A2B)

- ≤100 V EMF
- 500 mV, Zout = 332 Ω

| 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω | 10 dBm to +10 dBm |

### BFO

- Settling range

| 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω | 10 dBm to +10 dBm |

### Outputs

- AF output 1, AF (I) 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω
- 10 dBm to +10 dBm
- AF output 2 (LSB in ISB mode) 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω
- 10 dBm to +10 dBm
- Monitoring output 500 mV, Zin = 332 Ω
- FM video output 1 V/kHz, Zin = 1 kΩ

### Desensitization (interfering signal 300 mV EMF; Δf ≥ 30 kHz; signal level 30 µV EMF, bandwidth 3.1 kHz) ≥20 dB SINAD

### Inherent spurious signals (if > 100 kHz) −113 dBm (nominal −124 dBm)

### Image frequency rejection >90 dB

### IF rejection >90 dB

### Weighted S/N ratio for 1 mV EMF >46 dB SINAD

### Gain control

| Automatic (AGC), manual (MGC) or remote (DGC) |

### AGC error | ≤3 dB typ. (1 µV to 1 V EMF) |

### Time response constants

<table>
<thead>
<tr>
<th>Attack time</th>
<th>&lt;15 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decay time</td>
<td>25/150/500 ms, 1 s, 3 s</td>
</tr>
</tbody>
</table>

### DGC range

<table>
<thead>
<tr>
<th>0 to 120 dBµV EMF in 1 dB steps</th>
</tr>
</thead>
</table>

### BFO

- Resolution 10 Hz

### AFSK/FSK demodulator

- Transfer rate (50 baud to 600 baud) and deviation range (+42.5 Hz to ±425 Hz) adjustable; V.28 interface and audible tone circuit

### Diplex telegraphy demodulator (F7B)

- 2 x V.28 interface

### Channel memory

- for 1000 channels, nonvolatile, storage of complete receiver setup for each channel

### Data interface

- RS-232-C, RS-485 (bus-compatible)
- Transfer rate 50 baud to 38400 baud

### Outputs

- AF output 1, AF (I) 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω
- 10 dBm to +10 dBm
- AF output 2 (LSB in ISB mode) 0.3 kHz to 3.4 kHz, floating: Zin = 600 Ω
- 10 dBm to +10 dBm
- Monitoring output 500 mV, Zin = 332 Ω
- FM video output 1 V/kHz, Zin = 1 kΩ

### IF (1.44 MHz output) (unregulated) BW (–3 dB): ≥10 kHz; gain: (18 ±2) dB, 50 Ω

### IF output (analog) 0 to 40 kHz in 100 Hz steps, 0 dBm into 600 Ω or 455 kHz, 0 dBm into 50 Ω (optional)

### IF output (digital) serial data (clock, data, frame), 100 kbps

### I/O output (digital) baseband signal, multiplexed, 5 V CMOS
Options

Control Panel R&S GB890 (model 03)  
with controls and indicators for complete receiver setup; connector for loudspeaker or headphones (max. 1 W into 8 Ω)

Remote Control Unit R&S GB899 (model 03, on request)  
Control Panel R&S GB890 plus R&S EK895 reduced to control functions, using RS-232-C with a transfer rate of 50 baud to 19200 baud; modem operation is recommended for distances beyond about 100 m

Input Filter Unit R&S FK890H1  
lowpass filter 0 to 0.5 MHz  
bandpass filter 0.5 MHz to 1.5 MHz  
8 suboctave filters 1.5 MHz to 30 MHz

BCD Interface R&S GC890  
frequency information, 22 bit parallel (CMOS, 5 V)

TTY Line Current Source R&S GH890  
single current: 40 mA/60 V  
double current: ±20 mA/±30 V

IF Converter R&S UX895 (on request)  
455 kHz, 0 dBm into 50 Ω, BNC female

Digital Selection R&S FK896D (R&S EK896 only)  
Frequency range 0 to 30 MHz, at f<1.5 MHz as LPF  
Stopband attenuation ≥20 dB (>40 dB: R&S FK896D, model 04) at 10% spacing from center frequency (f = 1.5 MHz to 30 MHz)

Gain 0 to +2 dB
Tuning time <10 ms
Inband IP3 ≥34 dBm (≥30 dBm: R&S FK896D, model 04)
Noise figure 13 dB typ.
RF input voltage protection Response threshold ≥200 V EMF (Zin=50 Ω) >10 V EMF or >4 A

Broadband IF Output R&S GM893 (model 03)  
Output frequency 41.44 MHz  
3 dB bandwidth >1 MHz  
Attenuation <10 dB relative to antenna input  
Impedance 50 Ω

Oven-controlled frequency standard aging/day ≤1 x 10⁻³ (OCXO)

General data

Environmental conditions to MIL-STD-810 D  
Operating temperature range –10°C to +45°C  
Permissible temperature range –25°C to +55°C  
Storage temperature range –40°C to +80°C  
Humidity (non-condensing) max. 95 % at +40°C

Vibration test 10 to 55 Hz, 0.4 mm double amplitude  
Shock test 30 g, 11 ms

EMC to MIL-STD-461/462

MTBF >14 000 h

Power supply 100/120/220/240 V –15/+10%, 47 Hz to 420 Hz (approx. 25 VA to 75 VA, depending on model)

Dimensions (W x H x D), weight R&S EK895  
211 mm x 132 mm x 460 mm, approx. 8 kg  
R&S EK896  
426 mm x 132 mm x 460 mm, approx. 11 kg
## Ordering information

<table>
<thead>
<tr>
<th>Digital VLF-HF Receiver</th>
<th>R&amp;S EK895</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote control via serial interface</td>
<td>6057.8996.02</td>
</tr>
<tr>
<td>With control panel; for local and remote control</td>
<td>6057.8996.12</td>
</tr>
<tr>
<td>With control panel; for local and remote control; with built-in OCXO</td>
<td>6057.8996.14</td>
</tr>
<tr>
<td>With control panel; for local and remote control; with built-in OCXO; LINK11 reception</td>
<td>6057.8996.17</td>
</tr>
<tr>
<td>With control panel; for local and remote control; with built-in OCXO; LINK11 reception; for use with external frequency standard</td>
<td>6057.8996.37</td>
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<tr>
<td>With control panel; for local and remote control; with 1.44 MHz IF output</td>
<td>6057.8996.63</td>
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<thead>
<tr>
<th>Digital VLF-HF Search Receiver</th>
<th>R&amp;S EK896</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control panel with speaker; for local and remote control</td>
<td>6038.2509.12</td>
</tr>
<tr>
<td>Control panel with speaker; for local and remote control; with built-in OCXO</td>
<td>6038.2509.14</td>
</tr>
<tr>
<td>With control panel; for local and remote control; with built-in OCXO; LINK11 reception</td>
<td>6038.2509.17</td>
</tr>
<tr>
<td>With control panel; for local and remote control; with built-in OCXO; LINK11 reception; for use with external frequency standard</td>
<td>6038.2509.37</td>
</tr>
</tbody>
</table>

| Plug-in modules (R&S EK895, R&S EK896) |
|-------------------------|-----------|
| Preselection Unit | R&S FK899H1 |
| Digitally Tuned RF Selection Stopband attenuation 20 dB; for R&S EK896 only | R&S FK896D |
| Digitally Tuned RF Selection Stopband attenuation 40 dB; for R&S EK896 only | R&S FK896D |
| BCD Interface | R&S GC890 |
| Broadband IF Output | R&S GM893 |

| Recommended extras (R&S EK895, R&S EK896) |
|-------------------------|-----------|
| Transfer Software Package | R&S EK890S3 |
| Quasi-Continuous IF Bandwidth Control | R&S EK895S7 |
| Loudspeaker Unit | R&S GA890L1 |
| Remote Control Unit | R&S GB899 |
| TTY Line Current Source | R&S GH890 |
| Service Kit | R&S KA890C1 |
| 19" Assembling Kit for two R&S EK895 Desktop model | R&S KA890L1 |
| 19" Assembling Kit for two R&S EK895 For rack installation | R&S KA890L1 |
| High-precision Oven-controlled Master Quartz Oscillator | 6007.3255.03 |
| IF Conversion to 455 kHz | R&S UX895 |
| 19" Adapter Kit For one R&S EK895 and one blank panel | R&S ZZ8-98 |