

# R&S®FK2900M

## HF Antenna Tuning Unit

For stationary and  
shipboard applications



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### At a glance

The R&S®FK2900M is an antenna tuning unit (ATU) for matching HF transceivers to antennas used in stationary and shipboard applications. It matches the amplifier output of the R&S®M3SR Series4100 and R&S®XK2000 transceivers to rod and mast antennas.

The R&S®FK2900M can handle RF power up to 1000 W CW and PEP at a 100% duty cycle. It operates in the frequency range from 1.5 MHz to 30 MHz, where it performs an antenna impedance transformation into 50  $\Omega$  in both the receive and transmit mode. Additionally, it provides pre- and postselection.

The silent tuning feature of the transceivers improves low probability of intercept (LPI).

#### Key facts

- Tuning range from 1.5 MHz to 30 MHz
- Fully automatic tuning
- 1000 W CW and PEP at 100% duty cycle
- Tuning of rod antennas from 10.5 m to 12 m
- Low probability of intercept (LPI)
- Silent tuning over the entire frequency range



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## Benefits and key features

### **Silent tuning**

The R&S®FK2900M offers silent tuning over the entire frequency range from 1.5 MHz to 30 MHz. Before this feature can be used for an application, the ATU must be connected to an antenna to “learn” its characteristic. Learning takes place in a user-defined frequency range in the HF band (1.5 MHz to 30 MHz).

The ATU “learns” the antenna characteristic by collecting tuning data for a maximum of 1500 predefined frequencies. After the tuning data for these frequencies is known and stored, the ATU setting time is less than 40 ms. The advantage for the user is LPI, since ATU frequency setting is performed very quickly and without any emission of RF power.

### **Rugged design**

The rugged design of the R&S®FK2900M allows it to be operated continuously 24 hours a day.

### **BITE**

The ATU is included in the continuous monitoring of the entire system so that deviations from the normal operating status are displayed on the control unit.

### **ECM and overvoltage protection**

All internal modules are equipped with ECM filters. For protection against overvoltage as produced by lightning strokes, the R&S®FK2900M output is provided with lightning protection.

# Specifications

Specifications		
Frequency range		1.5 MHz to 30 MHz
RF input power		1000 W + 0.5 dB PEP + CW
Duty cycle		100% (continuous)
Input impedance		50 $\Omega$ , VSWR < 1.5:1
Antennas	model .02, rod antennas	10.5 m to 12 m
	model .05, mast antennas	30 m to 50 m
Silent tuning		1500 predefined frequencies for learning antenna characteristic
Tuning time	first-time tuning	< 8 s
	repeated tuning	< 0.3 s
	silent tuning	< 40 ms
Connections	RF input	N female
	antenna	insulator (ceramics), screw terminal
Power supply	via ATU control cable	21 V to 31 V DC, approx. 1.2 A
RF tuning power		40 W $\pm$ 1 dB, VSWR < 3:1
Cable length	between antenna base and ATU	$\leq$ 30 cm
	between transceiver and ATU	$\leq$ 50 m <sup>1)</sup>
<b>General data</b>		
Temperature range	operating temperature	-40°C to +55°C in line with MIL-STD-810E meth. 501.3 and 502.3, cat. A2 and C2
	storage temperature	-40°C to +85°C in line with MIL-STD-810E meth. 501.3 and 502.3
Humidity		+26°C/+41°C, 95% RH, duration of test 5 days in line with MIL-STD-810E meth. 507.3
Permissible altitude		3000 m above sea level, T <sub>amb</sub> < +35°C in line with MIL-STD-810E meth. 500.3, proc. I + II
Vibration	without shockmount	in line with MIL-STD-810E meth. 514.4, cat. 9
	random, without shockmount	4 Hz to 50 Hz, 0.01 g <sup>2</sup> /Hz, 2 h per axis
	with shockmount	in line with MIL-STD-810E meth. 514.4, cat. 9
Shock	random, with shockmount	4 Hz to 50 Hz, 0.02 g <sup>2</sup> /Hz, 2 h per axis
	without shockmount	max. 40 g, 45 Hz to 2000 Hz spectrum in line with MIL-STD-810E meth. 516.4
	with shockmount	50 g, 11 ms, half sine
Solar radiation		basic hot in line with MIL-STD-810E meth. 505.3 proc. II
Salt fog		in line with MIL-STD-810E meth. 509.3
Sand and dust		in line with MIL-STD-810E meth. 510.3 proc. I and II
Icing/freezing rain		in line with MIL-STD-810E meth. 521.1

<sup>1)</sup> A special cable is required for cable lengths > 50 m.

Specifications		
EMI/EMC		in line with MIL-STD-461E, CE102, CS101, CS114, RE101, RE102, RS101, RS103 in line with EN 55022, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
CE conformity mark		in line with ETSI EN300373-1/-2/-3
International protection code		IP66, waterproof in line with IEC 60529
Safety features		built-in lightning overvoltage and overcurrent protection, protection against overtemperature and static charges on antenna
Dimensions	W × H × D, without shockmount, depth including antenna insulator	433 mm × 439 mm × 632 mm (17.05 in × 17.28 in × 24.88 in)
Weight		43 kg (94.80 lb)
Material of case		aluminum
Installation position		all positions allowed
Color		RAL 7001, navy gray
MTRR	without sealing finish	30 min
MTBF		12 000 h in line with MIL-HDBK-217E

## Ordering information

Designation	Type	Order No.
HF Antenna Tuning Unit <sup>1)</sup> , for rod antennas	R&S®FK2900M	6097.1005.02
HF Antenna Tuning Unit <sup>1)</sup> , for mast antennas	R&S®FK2900M	6097.1005.05
<b>Recommended extras</b>		
Shockmount, horizontal mounting	R&S®KS2900M	6116.2507.03
Shockmount, vertical mounting	R&S®KS2900M	6116.2507.02
<b>Cables and connectors</b>		
ATU Control Cable (between transceiver/amplifier and ATU)		
10 m	R&S®GK2903M	6117.9757.10
20 m	R&S®GK2903M	6117.9757.20
30 m	R&S®GK2903M	6117.9757.30
40 m	R&S®GK2903M	6117.9757.40
50 m	R&S®GK2903M	6117.9757.50
Mating Connector Set	R&S®ZF4105	6120.5407.02

<sup>1)</sup> Requires the R&S®GX2901S naval software option when operated with the R&S®XK2000 family.

Your local Rohde & Schwarz expert will help you determine the optimum solution for your requirements. To find your nearest Rohde & Schwarz representative, visit [www.sales.rohde-schwarz.com](http://www.sales.rohde-schwarz.com)

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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 more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

## Environmental commitment

- | Energy-efficient products
- | Continuous improvement in environmental sustainability
- | ISO 14001-certified environmental management system

Certified Quality System  
**ISO 9001**

Certified Quality System  
**EN 9100**

Certified Quality System  
**AQAP-2110**

Certified Quality System  
**EN 9110**

## Rohde & Schwarz GmbH & Co. KG

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Regional contact

- | Europe, Africa, Middle East  
+49 89 4129 123 45  
[customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com)
- | North America  
1 888 TEST RSA (1 888 837 87 72)  
[customer.support@rsa.rohde-schwarz.com](mailto:customer.support@rsa.rohde-schwarz.com)
- | Latin America  
+1 410 910 79 88  
[customersupport.la@rohde-schwarz.com](mailto:customersupport.la@rohde-schwarz.com)
- | Asia/Pacific  
+65 65 13 04 88  
[customersupport.asia@rohde-schwarz.com](mailto:customersupport.asia@rohde-schwarz.com)

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