Automatic monitoring

of operating parameters of radio transmitters
from 100 kHz to 6 GHz

MONITORING

Operators of security radio networks for police, rescue services, ambulances, fire brigades, as well as of radio and TV broadcasting transmitters and of other regional and national services must make sure that radio transmitters are operable at all times. These are distributed across densely or sparsely populated areas depending on the service in question. Failures causing deviations in operating parameters, interference of other services, and especially the total loss of transmitter function must be avoided. The task is to monitor the frequencies in question, quickly detect serious problems and total failures, and forward an alarm to a monitoring control center (MCC), where operators can decide what further steps to take. The monitoring units used must meet several requirements:

◆ Wide frequency range
◆ Small outdoor units that do not require a special room
◆ Different types and ranges of power supply (AC/DC)
◆ Easy network integration (wireless, phone lines, etc)
◆ Automatic operation and alarm signaling
◆ Cost effective

Monitoring solution

The compact R&S®UMS100 outdoor monitoring system is the optimal solution for automatically monitoring all frequency ranges and all transmitters of interest if it is placed within the coverage area. The topography and topology of the area to be monitored and the operating RF power of the devices whose signals are to be received determine the number of R&S®UMS100 systems necessary and where they need to be located.

All R&S®UMS100 systems are remote-controlled and administered from an MCC. The R&S®UMS100 can be linked to the MCC via a LAN/WAN or via a wireless connection using mobile phone data services based on standards such as GSM or CDMA.
In the automatic mode, the R&S®UMS100 immediately compares the live measurements with user-defined reference spectra. If one of the alarm criteria is met, an alarm message is automatically generated and forwarded to the MCC. Furthermore, audio recording can be initiated.
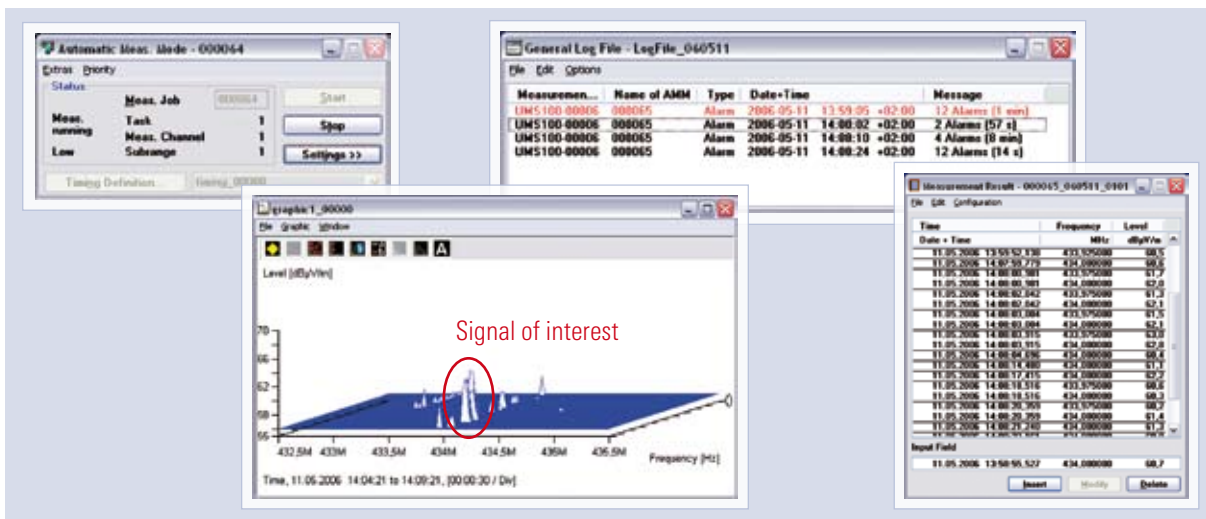
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Application

The MCC runs the powerful R&S®ARGUS platform to provide easy access to all R&S®UMS100 systems. Besides direct interactive access, the preferred mode of operation is automatic measurements. Once a measurement is defined, it will run automatically on the internal processor of the R&S®UMS100, either continuously or within selected timeslots, without requiring any further action on the part of the operator or a network connection. Thus, operating costs will be clearly reduced. Measurement results can be saved and displayed as tables and graphics. All alarm messages created by the R&S®UMS100 are listed in the general log file in the MCC, as shown below (unprocessed entries marked in red). Depending on operational preferences, the MCC can either routinely poll the R&S®UMS100 to request measurement results or wait for alarm messages automatically generated and forwarded by the R&S®UMS100 after a suspicious signal has been detected.

Upon receiving an alarm, the operator in the MCC must decide what further steps need to be taken:
◆ Use the R&S®UMS 100 to listen to the demodulated audio frequency
◆ Perform dedicated measurements on the signal that triggered the alarm
◆ Send special monitoring vehicles to the area of interest
The R&S®UMS100 has been designed as a very cost-efficient, compact, robust, standalone monitoring system. It reliably detects signals with a minimum duration of typically one to two seconds. Plus, it shows the presence of transmitting GSM mobile devices. If the detection of fast frequency hoppers is necessary, Rohde & Schwarz also offers special equipment for this purpose.

Signal of interest

Ordering information

Type	Description	Order number
R&S®UMS100	20 MHz to 1300 MHz	3030.3013.02
R&S®UMS100HF	0.1 MHz to 20 MHz	3030.3020.02 (option)
R&S®UMS100SHF	1.3 GHz to 6 GHz	3030.3036.02 (option)
R&S® ARGUS-UMS	Control Software	3034.0090.02

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