Station Monitoring Unit R&S SA129

Monitoring of remote stations

◆ Extensive capabilities for supervising remote stations
◆ Various monitoring sensors, e.g. for opening of windows or doors, temperature, relative humidity, smoke detection and power supply
◆ Reinitialization of a remote system
◆ Tried and tested in various systems
◆ Compact design
◆ Cost-effective implementation

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Introduction

The Station Monitoring Unit R&S SA129 provides extensive capabilities for the supervision of remote stations.

A station monitoring system consists of one R&S SA129 (which functions as a status display and remote control console) in the control station and one R&S SA129 per remote station at up to four remote stations.

The R&S SA129 in the remote station scans the connected sensors and executes the remote control commands received from the R&S SA129 in the control station. Various sensors are available for monitoring the opening of windows or doors, temperature, relative humidity, smoke detection and power supply, for example. If an R&S SA129 detects a change in the status of one of the sensors, it sends a message via telephone line to the R&S SA129 in the control station, where the status is displayed on the LCD display. In addition, the status can be output on a printer and/or a visual and/or acoustic signal can be set.

Another application of the R&S SA129 involves reinitializing a remote system by interrupting the power supply, the system process controller being shut down beforehand via a UPS to prevent data loss.

Station Monitoring Unit R&S SA129

The Station Monitoring Unit R&S SA129 is available as a 19" rackmount unit or as a 19" desktop unit. In case of a power failure, an integrated battery ensures operation of the R&S SA129 for up to 24 hours.

Status messages and RC commands are transmitted via dialled PSTN lines. The line should be dedicated to the R&S SA129 only, so that this line is independent of other communication lines. Sequences of DTMF tones are used for information transfer between the R&S SA129 units, as in the case of a telephone answering machine. This simple mode ensures secure operation even under poor line conditions.

The Station Monitoring Unit R&S SA129 has nine sensor inputs and six remote control outputs:

◆ Six inputs are optocoupled but not DC-isolated (low active). The polarity of the inputs can be logically inverted by means of appropriate entries on the chipcard.
◆ Two inputs can be set separately to the same operating mode by means of jumpers or used in complete potential isolation where the two inputs accept voltages from 4 V to 28 V DC. It is possible to define whether the dead or live state corresponds to the OK state.
◆ The I²C bus control input can be used to connect one or more temperature sensors.
◆ Three control outputs are open collector outputs (current sinks) with a maximum voltage of 40 V and a maximum current drain of 800 mA. They switch either the internal supply voltage of 12 V DC or an external voltage corresponding to their capacity.
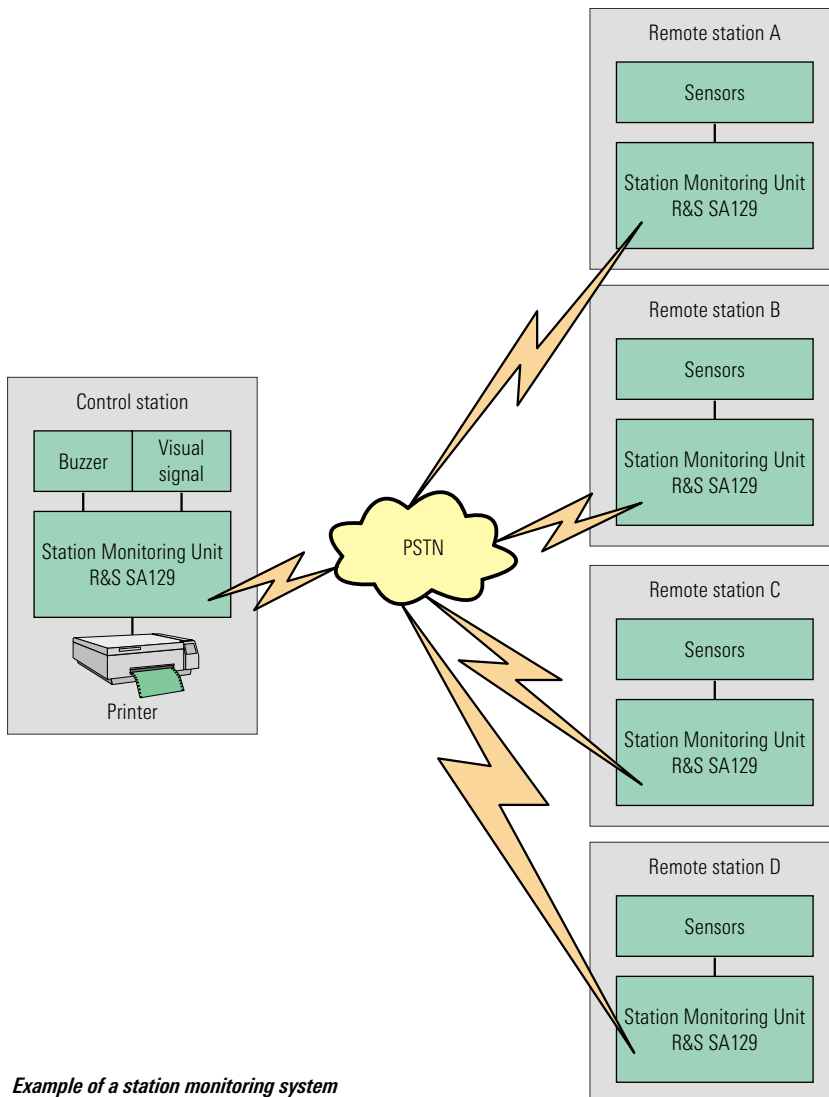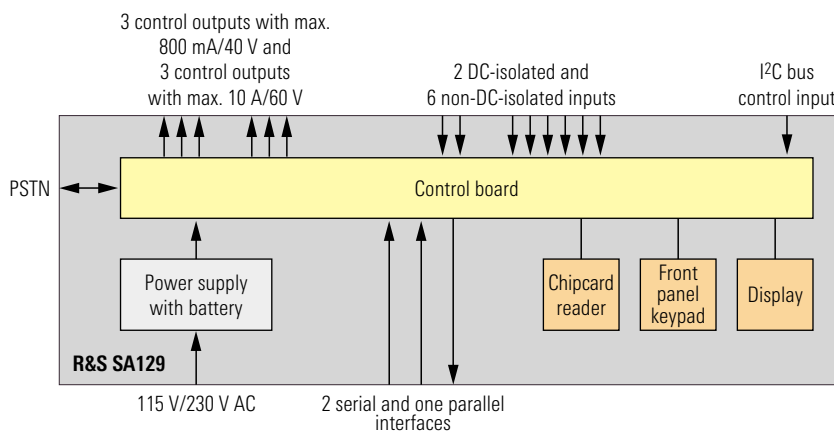
Example of a station monitoring system

◆ Three control outputs are MOSFET switches that are able to handle max. 10 A and max. 60 V. They switch either the internal supply voltage of 12 V DC or an external voltage corresponding to their capacity. The jumpers of the three MOSFET outputs can be set so that the outputs' active circuits are completely isolated from the R&S SA 129.

The R&S SA 129 has two serial RS-232-C interfaces. The COM1 interface can be used to transfer the status signals to a superordinate system. The COM2 interface is used to read from and write to the chip card.

If the R&S SA 129 reinitializes the remote system by disconnecting the power, the UPS must be able to shut down the process controller before switching off the power. Therefore the PC must be connected to a UPS via a serial interface. The PC will receive the message from the UPS. Afterwards the operating system shuts down all running applications and then itself.

When the R&S SA 129 is used as a control station, an EPSON-compatible printer can be connected to the LPT interface. The status messages received together with the time of day are logged by this printer. The interface is also used to update the device firmware.

Block diagram of R&S SA 129

The basic firmware of the R&S SA 129 is identical for each unit. Customer and system-specific information is defined and stored on a chipcard.

If the station monitoring unit is delivered as part of a complete monitoring system, the chip card will usually be programmed to the system-specific configuration by Rohde & Schwarz.

However, the configuration may also be programmed by the customer. A null modem cable connected to the R&S SA 129 as well as the R&S SA 129 Card Editor which runs under Windows XP, Windows 2000 or Windows NT4.0 are required to read from and write to the chipcard.

The following information is stored on the chipcard:

◆ Type of application (control station or remote station)
◆ Names of stations and their telephone numbers
◆ Number of sensor inputs used
◆ Number of remote control outputs used and their polarity (high or low active)
◆ Language (ASCII)
◆ Text to be output to the display
◆ Limit values for temperature monitoring
◆ Important parameters of national PSTN networks, which do not comply with standards

The card editor and the latest firmware are available at **www.argus.rohde-schwarz.com**.

Rear view of R&S SA 129

Sensors

Since the number and type of sensors and switch units (relays) required largely differ for the remote control functions, these elements are not supplied with the R&S SA129. Rohde & Schwarz offers the optional Sensor Kit R&S SA129-S containing the most frequently used parts.

This kit is accommodated in a prewired installation box, which can be wall-mounted. This box contains two 230 V AC voltage monitoring units, two 230 V/16 A contactors for switching on/off a single-phase AC circuit as well as a screw terminal strip for connecting all remaining I/O lines.

The kit also contains several common door and window contacts, a photoelectric smoke detector, a temperature sensor and a 5 m long cable for connecting the R&S SA129. All these parts are designed for use in the remote stations.

For use in the control station, the kit contains a red warning lamp and an acoustic alarm generator.

Since the installation of the sensors and signalling units depends on the conditions prevailing in the building, the kit does not include any cables. The installation which is easy can be performed by any local fitter. It can of course be carried out by the Rohde & Schwarz field personnel if the customer desires.

In addition to the sensors of the Sensor Kit R&S SA129-S, there are other sensors which form a useful extension of an R&S SA129 system.

Some examples are given below:

◆ Sensor for DC current and DC voltage monitoring (for monitoring the charging state of batteries on emergency power supply units)
◆ Sensor for monitoring aircraft obstruction lights (on large antenna masts)
◆ Sensor for monitoring the air flow, e.g. filter-change warning for air-conditioning plants and ventilation units (the signalling contacts are provided on many units)
◆ Motion detector on PIR (passive infra red) basis or radar
◆ Sensor for wind-speed monitoring (on large antenna systems)
◆ Hygrostate and additional thermostats for monitoring the ambient air conditions

These sensors can be either added by the user or selected and integrated by Rohde & Schwarz during system installation against separate invoice.

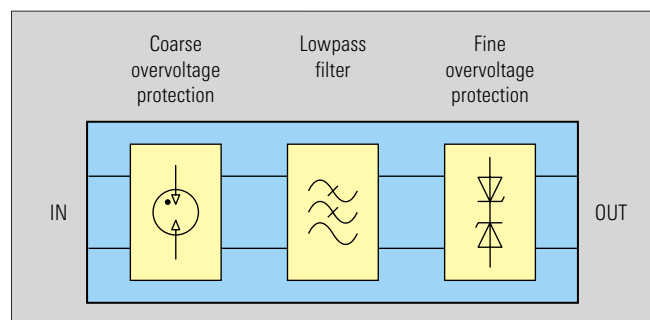## Telephone Filter R&S SA129Z2

During operation, several stations are often interconnected via telephone lines to transfer audio signals and data. The lines used for this purpose are not optimally protected against electromagnetic interference.

As a result, there are often various kinds of interference on these lines, which can be divided into two categories:
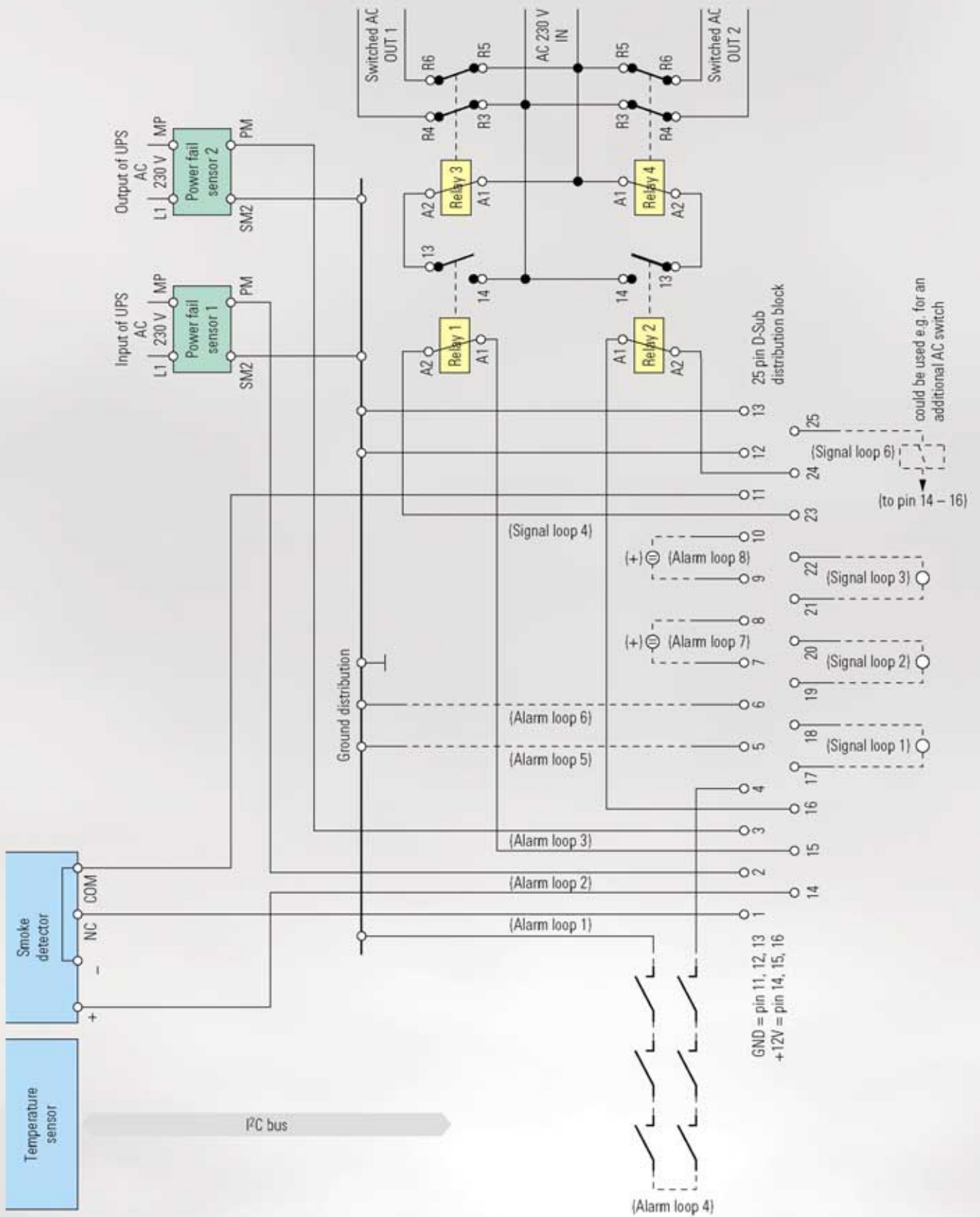
◆ Overvoltage caused by electrostatic discharges such as lightning strikes in the vicinity of telephone lines (no direct strikes). Such transients cause short-time interference, which may cause errors during data transfer. High-energy transients can even destroy the connected terminals.

◆ Spurious signals due to strong electromagnetic signals caused by transmit systems such as broadcasting transmitters or radio links in the vicinity of telephone lines. Overhead telephone lines can have the same effect as antennas for such signals. If the received spurious signal is demodulated by the terminal (e.g. telephone or modem) and superimposed on the useful signal, the broadcast signal is audible in addition to the useful signal itself and often disturbs the technical evaluation of the useful signal.

The Telephone Filter R&S SA129Z2 has been developed to counteract the two types of interference. It is looped into the telephone line near the line's entry point in the building in front of the terminals and connected to the building earth.

Block diagram of R&S SA129Z2

Example of connecting the R&S SA129-S

Specifications

R&S SA129

Interfaces	
POWER IN	power plug (X100)
COM 1 and COM 2	D-Sub plug, 9 pins (X1 to X2) standard serial interface (RS-232-C), default 9600 bit/s
LINE	PSTN RJ-11 6P/4C (Western) (X3)
AF	D-Sub jack, 15 pins (X4), not connected
Service	MINI DIN, 6 pins (X5), for servicing only
LPT	D-Sub jack, 25 pins (X6)
I/O 1A	D-Sub jack, 25 pins (X20)
	6 optocoupled inputs, low active, common ground
	2 optocoupled inputs, low active, common ground or fully insulated, 4 V to 28 V DC in insulated mode
	3 open collector outputs (current sinks) 800 mA, using the 12 V DC internal supply or an external supply up to 40 V DC
	3 high current MOSFET outputs, using the 12 V DC internal supply or an external supply up to 60 V DC
	if externally supplied, the outputs can be jumpered to fully insulated operation at a current of up to 10 A
I/O 1B	10 pole screw clamps (X10) gives parallel access to the 3 high current outputs of X20
I²C BUS 1	Mini DIN, 4 pins (X30)
Loudspeaker	built-in loudspeaker for PC and telephone monitoring
Display	LCD, 4 lines by 20 characters with LED backlighting
Keypad	12 numeric keys + 4 function keys + up/down keys
Chipcard reader	for standard ISO chip cards, card type "2048 bytes/I²C bus"
General data	
Operating temperature range	+5°C to +45°C
Storage temperature range	−20°C to +70°C
Humidity	95% relative humidity at +40°C
Sinusoidal vibration	5 Hz to 150 Hz
Random vibration	10 Hz to 300 Hz
Shock	40 g shock spectrum
EMC	meets EMC directive of EU (89/336/EEC) and German EMC law
Safety	meets EN60950/VDE0805
Quality standard	developed and manufactured in compliance with ISO 9000
Power supply	115 V/230 V AC selectable 50 Hz to 60 Hz/55 VA internal battery 12 V DC, 7 Ah
Dimensions (W x H x D)	19" rackmount, 2 HU – 427 mm x 89 mm x 370 mm, 484 mm x 89 mm x 395 mm (overall)
Weight	9.6 kg

R&S SA129-S

Interfaces	
Interface to R&S SA129	D-Sub plug, 25 pins
Sensor inputs	screw-type terminals
Actuator outputs	screw-type terminals
General data	
Operating temperature range	−10°C to +55°C
Storage temperature range	−40°C to +70°C
Humidity	95% relative humidity at +55°C
Sinusoidal vibration	5 Hz to 150 Hz
Random vibration	10 Hz to 300 Hz
Shock	40 g shock spectrum
EMC	meets EMC directive of EU (89/336/EEC) and German EMC law
Safety	meets EN60950/VDE0805
Quality standard	developed and manufactured in compliance with ISO 9000
Dimensions (W x H x D)	187 mm x 297 mm x 177 mm
Weight	2.6 kg (connection box)

Interfaces	
Telephone line input	screw-type terminal, 3 pins (X1)
Telephone line output	RJ11 jack (X10)
Filter data	
Transmission loss	≤0.1 dB (DC to 3.3 kHz) ≤0.2 dB (3.3 kHz to 10 kHz)
Stopband attenuation	≥6 dB (55 kHz to 100 kHz) ≥15 dB (≥100 kHz)
General data	
Operating temperature range	−10°C to +55°C
Storage temperature range	−40°C to +70°C

Humidity	95% relative humidity at +55°C
Sinusoidal vibration	5 Hz to 150 Hz
Random vibration	10 Hz to 500 Hz
Shock	40 g shock spectrum
EMC	meets EMC directive of EU (89/336/EEC) and German EMC law
Quality standard	developed and manufactured in compliance with ISO 9000
Dimensions (W x H x D)	100 mm x 59 mm x 75 mm
Weight	0.35 kg

Certified Environmental System
ISO 14001
REG. NO 1954

Certified Quality System
ISO 9001
DQS REG. NO 1954

Ordering information

Designation	Type	Order No.
Basic versions		
Rackmount Station Monitoring Unit	R&S SA 129	3024.4011.02
Desktop Station Monitoring Unit	R&S SA 129	3024.4011.03
Option		
Sensor Kit for R&S SA129	R&S SA 129-S	3024.4263.02
Extras		
Telephone Filter	R&S SA 129Z2	3023.1519.02

Further sensors are available on request. In many countries, there are service providers for object monitoring. These companies usually provide PSTN alarm access points with DTMF-based protocols. The R&S SA 129 can be connected to such an access point after consultation.

ROHDE&SCHWARZ

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Printed in Germany 0902 (Bi bb)