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R&S® ZS129x Switch Units

RF and IF signal distribution

The R&S® ZS129x switch unit family is a cost-effective and reliable approach to RF and IF signal distribution. Its flexible concept allows adaptation to system requirements by adding optional extensions.

The R&S® ZS129x family offers the following outstanding features:

- ◆ Suitable for stationary, transportable, and mobile applications
- ◆ Tried and tested in various systems
- ◆ Compact design
- ◆ Cost-effective implementation of customer-specific solutions due to modular design and wide variety of units and modules
- ◆ Manual operation and remote control for optimum hardware and software interworking
- ◆ Additional outputs for controlling additional switch units via the same control interface



ROHDE & SCHWARZ

Introduction

Monitoring systems usually consist of several receiving antennas that have to be dynamically switched to the receivers in order to achieve the optimum system configuration for the individual tasks.

The R&S®ZS129x switch units constitute an intelligent and flexible solution for stationary, transportable, and mobile applications.

The R&S®ZS129x family of universal switch units includes the R&S®ZS129A1 basic model as well as the R&S®ZS129A2, R&S®ZS129A5 and R&S®ZS127Z1 models for enhanced capabilities.

R&S®ZS129A1 switch unit

The R&S®ZS129A1 has been designed as an indoor RF and IF switch unit for stationary, transportable, and mobile systems.

The following standard models of the R&S®ZS129A1 are available:

- ◆ R&S®ZS129A1 model 02 with 1-out-of-12 switch, DC to 3 GHz
- ◆ R&S®ZS129A1 model 06 with 1-out-of-6 switch, DC to 3 GHz
- ◆ R&S®ZS129A1 model 08 with 1-out-of-8 switch, DC to 3 GHz
- ◆ R&S®ZS129A1 model 12 with 1-out-of-12 switch, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S®ZS129A1 model 16 with 1-out-of-6 switch, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S®ZS129A1 model 18 with 1-out-of-8 switch, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S®ZS129A1 model 22 with 2-out-of-2 switch, DC to 3 GHz
- ◆ R&S®ZS129A1 model 34 with 1-out-of-4 switch, DC to 3 GHz (GaAs switch)

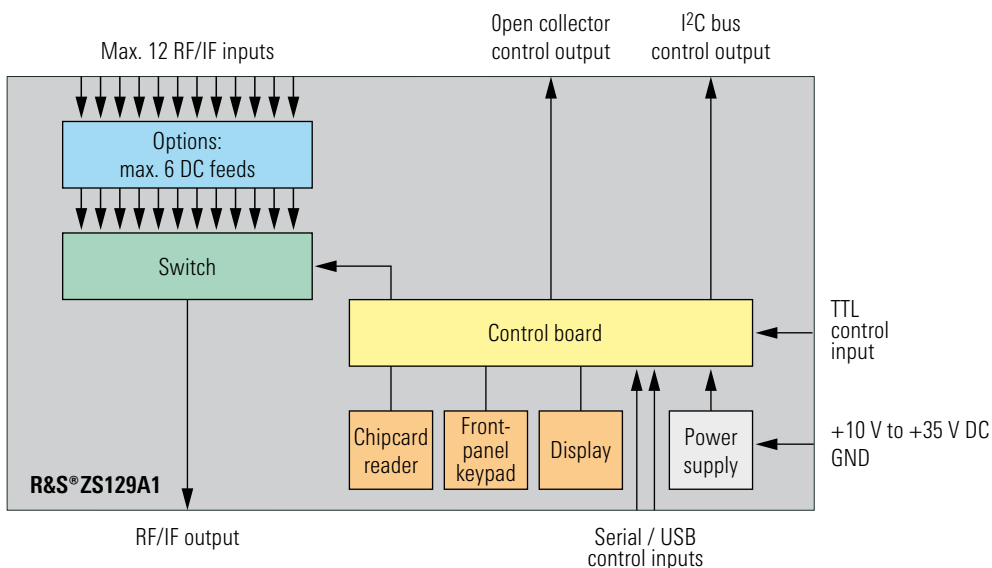
The R&S®ZS129A1 includes a switch, a control board, a chipcard reader, a front-panel keypad, an alphanumeric display, and a power supply covering an input voltage range from +10 V to +35 V DC. Models 02 to 18 are factory-equipped with a DC feed. Up to six DC feeds can be integrated as options.

The DC feed (option R&S®ZS129F1) is used to apply a DC voltage to the inner conductor of the antenna input. This is an ideal solution for the power supply of most active receiving antennas. The DC feed can supply a DC voltage of up to 30 V at a maximum current of 500 mA.

The switch unit is usually integrated into the rack at the operator position and connected to the system controller via a serial interface or USB interface or it is connected directly to the receiver via a TTL interface. It may be operated manually at its front-panel keypad or remotely via the system software.

The TTL interface provides a maximum of 16 parallel TTL lines. This makes it possible to control both the internal and the external (via control outputs) RF switches directly from a receiver with TTL control output.

When the R&S®ZS129A1 is operated manually, the user enters the requested setting via the front-panel keypad. The switch unit guides the user by means of menus that are adapted to the specific system configuration. The current settings and relevant parameters can be read from the alphanumeric display.



Block diagram of the R&S®ZS129A1

The R&S® ZS129A1 has two control outputs on its rear panel to control external units:

- ◆ One I²C bus control output including an I²C bus interface, the +28 V DC supply and GND, for connecting an R&S® ZS129A2 or an R&S® ZS129A5 (to control one switch)
- ◆ One open-collector control output including four independent control lines, the +28 V DC supply and GND, for connecting an R&S® ZS129A5 (to control up to four 1-out-of-2 switches or two 1-out-of-3 switches or two 1-out-of-4 switches) or up to four R&S® ZS127Z1

The functionality of the system can thus be enhanced without a second control unit being required.

If several DC feeds are integrated or several units are connected, you must remember that the maximum supply current is 1.3 A.

The basic firmware of the R&S® ZS129A1 is identical for each unit. Customer- and system-specific information is defined and stored on a chipcard.

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

However, programming may also be performed by the customer. A null modem cable connected to the R&S® ZS129A1 and the R&S® ZS129x card editor, which runs under Windows XP and Windows 2000, are required to read from and write to the chipcard.



Front view of the R&S® ZS129A1



Rear view of the R&S® ZS129A1

When the chipcard is inserted into the chipcard reader, the R&S® ZS129A1 switch unit is configured automatically for the system in question.

The following information is stored on the chipcard:

- ◆ Function of the commands for the switch and the control outputs
- ◆ Text to be output on the display

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

R&S® ZS129A2 switch unit

The R&S® ZS129A2 switch unit has been designed as an outdoor unit for mounting on top of masts close to receiving antennas. The length of the RF cables between the antennas and the switch unit can be minimized, and only one RF cable and one control cable need to be routed to the equipment inside the station.



Front view of the R&S® ZS129A2

The R&S® ZS129A2 contains a control board, a 1-out-of-8 switch, one DC feed and overvoltage protection for the RF output. As an option, the unit may also be equipped with two additional DC feeds (R&S® ZS129F1 option) to supply power to more than one active antenna.

The R&S® ZS129A2 is controlled from the R&S® ZS129A1 switch unit or from the R&S® GB127S antenna control unit.

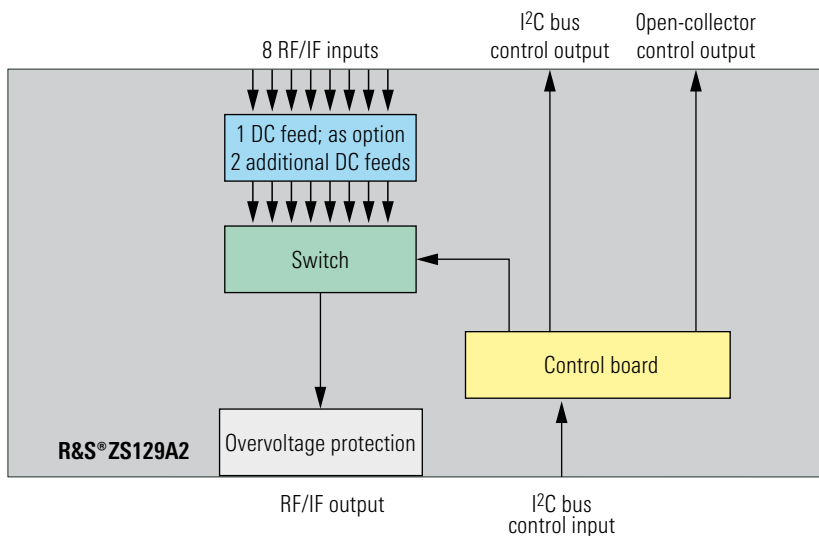
The R&S® ZS129A2 is operated via the I²C bus control interface. A single control cable is used, incorporating an I²C bus interface, a +28 V DC supply

and GND. The control cables supplied by Rohde & Schwarz for connecting the control unit and the R&S® ZS129A2 have been tested for lengths up to 80 m. For ranges above 10 m, the control cable for the I²C bus interface and the +28 V DC supply is split. For minimum requirements, refer to “Specifications” (pages 10 and 11). The connection between the two units requires additional overvoltage protection at the point of entry into the building.

The R&S® ZS129A2 has two control outputs on its rear panel to control external units:

- ◆ One I²C bus control output including an I²C bus interface, the +28 V DC supply and GND, for connecting an R&S® ZS129A2 or an R&S® RD127 (only if the R&S® ZS129A2 is controlled from the R&S® GB127S or R&S® GB127M antenna control unit)
- ◆ One open-collector control output including four independent control lines, the +28 V DC supply and GND, for connecting up to four R&S® ZS127Z1

The functionality of the system can thus be enhanced without an additional control unit or another control cable from the control unit to the external unit on the mast.



Block diagram of the R&S® ZS129A2

R&S® ZS129A5 switch unit

The configurable R&S® ZS129A5 switch unit is ideal for a wide variety of indoor RF and IF switching applications. Its flexible concept allows adaptation to system requirements by adding optional modules. The R&S® ZS129A5 is of modular design. Various switches, power splitters and DC feeds can be integrated into an empty prefabricated enclosure to meet specific requirements.



Rear view of the R&S® ZS129A5 equipped with 1-out-of-8 switch and 1-out-of-2 switch

The base unit is a rugged 19" rack-mount with a height of two units for easy integration into system racks. Since the R&S® ZS129A5 does not have to be operated manually, it can be located at a remote position, e.g. somewhere inside a rack so that no space is wasted at the front. The base unit contains an integrated connection board and connectors for control inputs, control outputs and an optional external power supply. Inside, there is a lot of space to integrate optional modules.

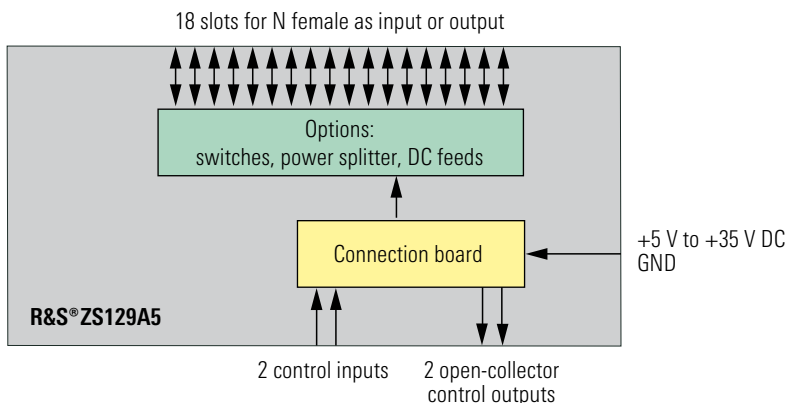
The following switch modules have been designed as standard for the R&S® ZS129A5:

- ◆ R&S® ZS129S1: 1-out-of-2, DC to 3 GHz
- ◆ R&S® ZS129S2: 1-out-of-6, DC to 3 GHz
- ◆ R&S® ZS129S3: 1-out-of-8, DC to 3 GHz
- ◆ R&S® ZS129S8: 1-out-of-12, DC to 3 GHz
- ◆ R&S® ZS129S4: 1-out-of-2, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S® ZS129S7: 1-out-of-6, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S® ZS129S6: 1-out-of-8, DC to 3 GHz, unused inputs terminated into 50 Ω

- ◆ R&S® ZS129S9: 1-out-of-12, DC to 3 GHz, unused inputs terminated into 50 Ω
- ◆ R&S® ZS129S5: 2-out-of-2, DC to 3 GHz

The power splitter (R&S® ZS129M1 option), which can be integrated into the base unit, is a cost-effective solution for taking a signal to two outputs in the frequency range from DC to 4 GHz. Since this module is a resistive power splitter with low output decoupling, it can be combined only with terminated relays.

The DC feed (R&S® ZS129F1 option) is used to supply power to an active antenna.



Block diagram of the R&S® ZS129A5

The R&S® ZS129A5 is remotely controlled from the R&S® ZS129A1 switch unit or from the R&S® GB127S or R&S® GB127M antenna control unit via the control inputs.

The switch unit is operated via three control inputs:

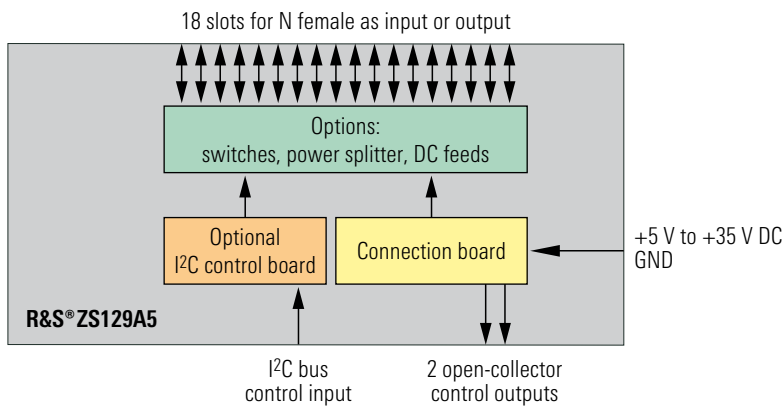
- ◆ Two control inputs including eight independent switched GND control lines, the +28 V DC supply and GND; the number of switches that can be controlled depends on the number of control lines; the control cable supplied by Rohde & Schwarz has been tested for lengths of up to 10 m
- ◆ If the I²C control board (R&S® ZS129C1 option) is included: one I²C bus control input with I²C bus interface, +28 V DC supply and GND; in this case, the two open-collector control inputs are disconnected internally. Internally, a maximum of 16 independent control lines can be used to control the switches. The control cable supplied by Rohde & Schwarz has been tested for lengths of up to 100 m

For special purposes, two open-collector control outputs are provided in order to connect additional units, e.g. to cascade two or more units.

The power connector (+5 V to +35 V DC supply and GND) may be used to feed an external supply voltage for active modules, e.g. when an amplifier or additional DC feed is integrated in the R&S® ZS129A5.

The backplane can be equipped with up to 18 N jacks, used as inputs or outputs, depending on the specific configuration.

Owing to its modular concept, the hardware of the switch unit is easy to configure. The number of components used is limited by the space in the base unit, the number of the control lines of the controlling units, and the current drain.

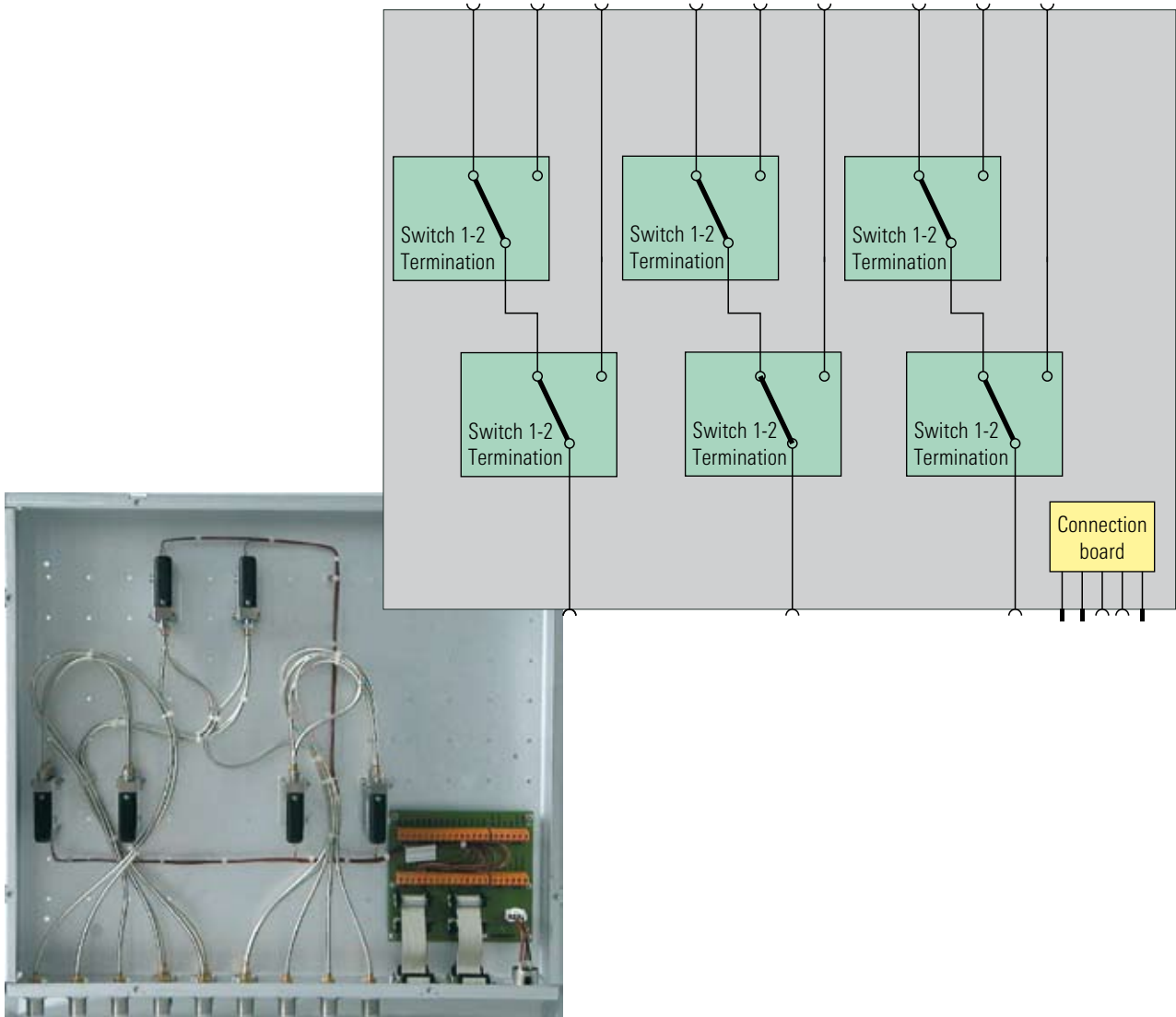


Block diagram of the R&S® ZS129A5 with I²C control board option

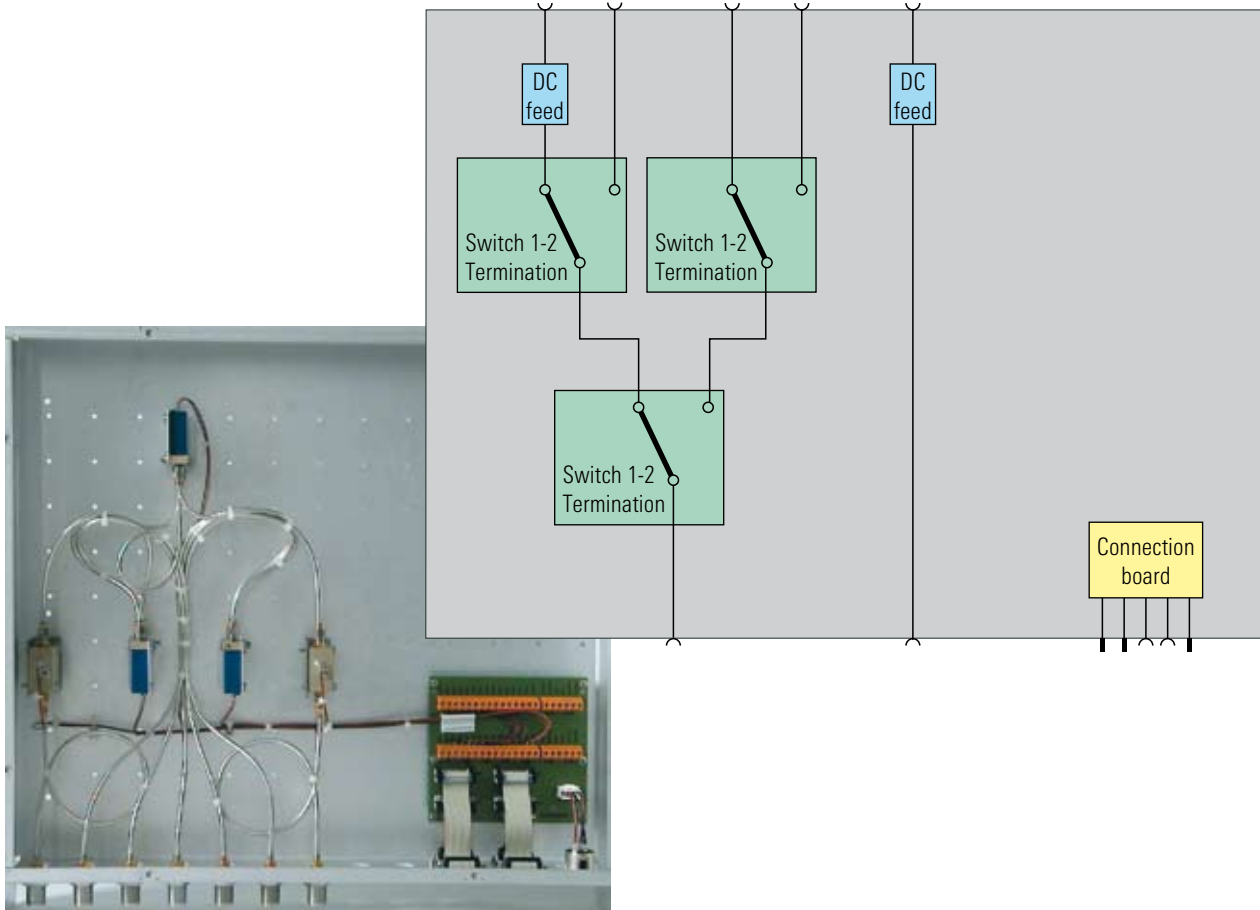
Applications for the R&S® ZS129A5

Example 1:

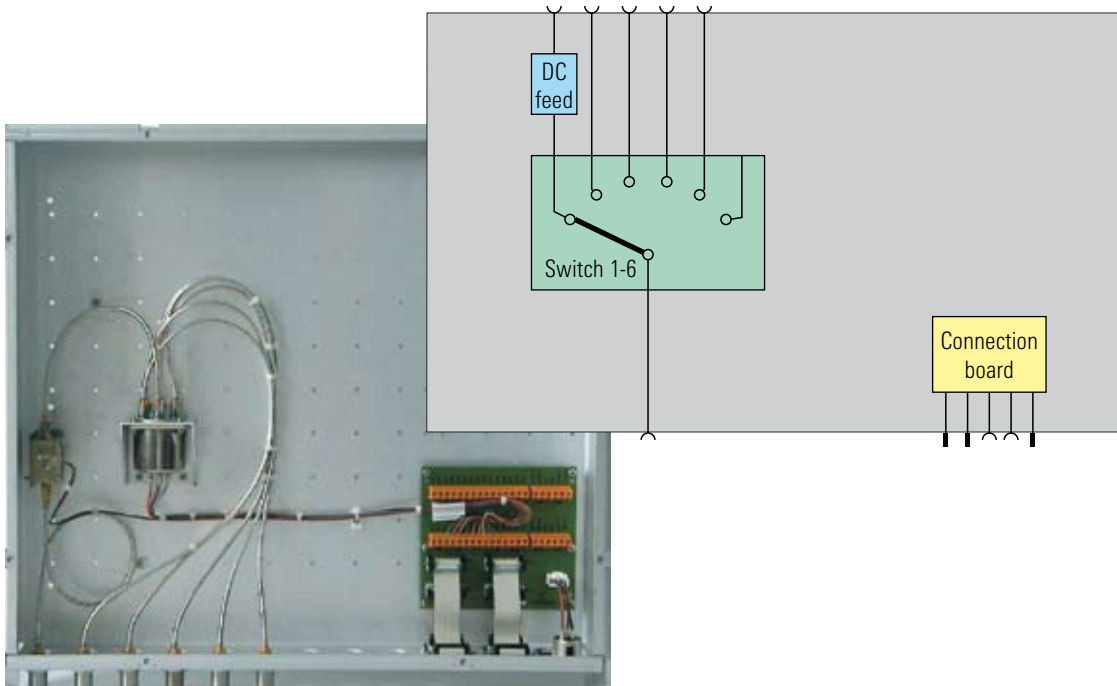
Three independent switches, 1-out-of-3, unused inputs terminated, each implemented by means of two R&S® ZS129S4.



Example 2: One switch, 1-out-of-4, implemented by three R&S®ZS129S1, a feed-through and two R&S®ZS129F1.



Example 3: One switch, 1-out-of-5, implemented by one R&S®ZS129S2 and one R&S®ZS129F1.

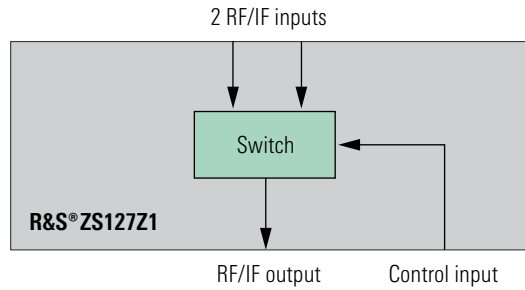


R&S® ZS127Z1 switch unit

The R&S® ZS127Z1 switch unit has been designed as an outdoor unit to enhance the switching functionality of other switch units.

The R&S® ZS127Z1 contains a 1-out-of-2 switch.

The R&S® ZS127Z1 is remotely controlled from the R&S® ZS129A1 switch unit or from the R&S® GB127S or R&S® GB127M antenna control unit via the control input. A single control cable is used, incorporating a +28 V DC supply and a switched GND control line. The control cable supplied by Rohde & Schwarz has been tested for lengths up to 10 m.



Block diagram of the R&S® ZS127Z1



Front view of the R&S® ZS127Z1

Multicouplers

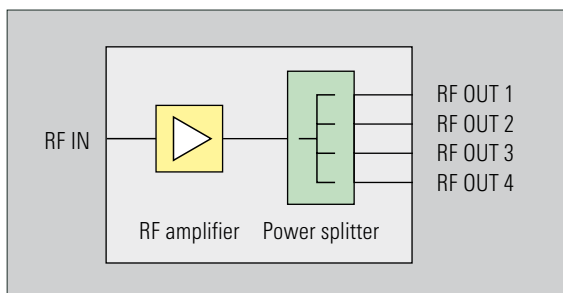
When it comes to distributing antenna signals to more than one receiver at the same time, a multicoupler is most often the best choice. A multicoupler consists of an RF amplifier followed by a power splitter.

The amplifier compensates for the insertion loss of the power splitter so that the overall gain is about 0 dB to +3 dB.

Owing to the high output isolation, in most cases, expensive terminated RF switches can be avoided and standard switch modules may be used.

Upon request, Rohde & Schwarz provides different multicouplers as separate 19" rackmounts for the following frequency ranges:

- ◆ (10 kHz) 100 kHz to 80 MHz, 4 or 8 outputs, for example suitable for the R&S® HE010, R&S® HE011, R&S® HUF-Z2 antennas
- ◆ 20 MHz to 1300 MHz, 4 or 8 outputs, for example suitable for the R&S® HE309, R&S® HE 314A1, R&S® HF214, R&S® HK014, R&S® HK309, R&S® HL023A1/A2 antennas
- ◆ 1000 MHz to 3000 MHz, 4 or 8 outputs, for example suitable for the R&S® HF 902 antenna



Block diagram of multicoupler

Specifications

R&S®ZS129A1

RF data	
Frequency range	DC to 3 GHz
Input VSWR	
Signal paths without DC feed	≤1.4 (DC to 3 GHz) typ. ≤1.2 at 1.3 GHz ≤2 (100 kHz to 3 GHz) model 34
Signal paths with DC feed	≤4 (100 kHz to 3 GHz) typ. ≤1.2 at 1.3 GHz
Insertion loss (in/out)	
Signal paths without DC feed	≤0.6 dB (DC to 1.3 GHz) ≤1.2 dB (DC to 3 GHz) ≤3.8 dB (DC to 1.3 GHz) model 34 ≤5.5 dB (DC to 3 GHz) model 34
Signal paths with DC feed	≤1.2 dB (100 kHz to 1.3 GHz) ≤2 dB (100 kHz to 3 GHz)
Impedance	50 Ω
RF power (cold switching)	≤50 W (models 02/06/08) ≤1.0 W per input ≤3.0 W total (models 12/16/18) ≤100 mW (model 34)
Switching time	≤15 ms ≤100 μs (model 34)
Interfaces	
RF INPUTS	N female (X1 to X12)
RF OUTPUT	N female (X13)
COM1	D-Sub male, 9 pins (X20), RS-232-C serial interface
USB	USB 1.1 (X30)
TTL IN	HD-Sub male, 26 pins (X40), TTL control input
EXP1	D-Sub female, 9 pins (X50), open-collector control output
I ² C REM CTRL	D-Sub female, 15 pins (X60), I ² C bus control output
POWER IN	D-Sub male with high current contacts (X110)
General data	
Operating temperature range	0 °C to +50 °C
Storage temperature range	-40 °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	in line with EMC directive of EU (89/336/EEC) and German EMC law
Safety	in line with EN 60950/VDE 0805
Quality standard	developed and manufactured in line with ISO 9000
Power supply	+10 V to +35 V DC/max. 8 A/60 W
Dimensions (W × H × D)	19" rackmount 2 HU – 427 mm × 89 mm × 485 mm (16.81 in × 3.50 in × 19.09 in) 484 mm × 89 mm × 495 mm (overall) (19.06 in × 3.50 in × 19.49 in)
Weight	approx. 6 kg (13.23 lb), depending on installed options

R&S®ZS129A2

RF data	
Frequency range	DC to 3 GHz
Input VSWR	
Signal paths without DC feed	≤1.4 (DC to 3 GHz) typ. ≤1.2 at 1.3 GHz
Signal paths with DC feed	≤1.4 (100 kHz to 3 GHz) typ. ≤1.2 at 1.3 GHz
Insertion loss (in/out)	
Signal paths without DC feed	≤0.6 dB (DC to 1.3 GHz) ≤1.2 dB (DC to 3 GHz)
Signal paths with DC feed	≤1.2 dB (100 kHz to 1.3 GHz) ≤2 dB (100 kHz to 3 GHz)
Impedance	50 Ω
RF power (cold switching)	≤120 W
Switching time	≤15 ms
Interfaces	
X1 to X8	N female RF inputs from receiving antennas
OUTPUT	N female (X10) RF output
CONTROL IN	MIL connector, 10-pin male (X100)
CONTROL OUT	MIL connector, 10-pin female (X60)
EXT/AUX	MIL connector, 6-pin female (X50)
General data	
Operating temperature range	-35 °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	in line with EMC directive of EU (89/336/EEC) and German EMC law
Safety	in line with EN 60950/VDE 0805
Quality standard	developed and manufactured in line with ISO 9000
Power supply	+28 V DC (via control input)
Dimensions (W × H × D)	
Without connectors	404 mm × 313 mm × 183 mm (15.91 in × 12.32 in × 7.20 in)
Overall	404 mm × 335 mm × 183 mm (15.91 in × 13.19 in × 7.20 in)
Weight	approx. 11.2 kg (24.69 lb), depending on installed options

If the distance between the R&S®ZS129A2 and the control unit (R&S®ZS129A1 or R&S®GB127S) is greater than 10 m, two separate cables must be used to carry control data and power supply. The following minimum requirements must be observed.

For the data line, use a KAWAFLEX 00072422 cable (Rohde & Schwarz material number 1137.6397.00) with an impedance of 100 Ω at 1 MHz and max. 57 pF/m wire-to-wire and max. 110 pF/m wire-to-shield. The two signals SCL and SDA must be connected to a twisted pair of stranded wire.

For the power supply line, a GSC-3067 cable (Rohde & Schwarz material number 0360.6108.00) with max. 3.6 mΩ/m per wire must be used.

At the point of entry into the building, the following types of overvoltage protection are required: LEUTRON DataPro 2x1-30V/30V-Tr for the data line, and LEUTRON EnerPro 36V-Tr for the power supply line.

For more detailed information, contact our customer support.

R&S®ZS129A5

RF data	
Frequency range	DC to 3 GHz
Input VSWR	depending on hardware configuration
Insertion loss (in/out)	depending on hardware configuration
Impedance	50 Ω
Interfaces	
SIGNAL 1 to 18	RF inputs/outputs, depending on hardware configuration (unused connectors not installed)
CTRL IN 1 and 2	D-Sub male, 15 pins (X21 and X22)
CTRL OUT 1 and 2	D-Sub female, 15 pins (X31 and X32)
POWER	round connector, 3 pins (X100)
SER CTRL	D-Sub male, 9 pins (X23) (for I ² C control option)
General data	
Operating temperature range	-35 °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	in line with EMC directive of EU (89/336/EEC) and German EMC law
Quality standard	developed and manufactured in line with ISO 9000
Power supply	+28 V DC (via control input) or +5 V to +35 V DC (from external power supply)
Dimensions (W × H × D)	19" rackmount without front panel 2 HU – 450 mm × 85 mm × 460 mm (17.72 in × 3.35 in × 18.11 in)
Weight	approx. 3.6 kg (7.94 lb)

Switches for the R&S®ZS129A5

RF data	
Frequency range	DC to 3 GHz
Input VSWR	≤1.4
Insertion loss (in/out)	≤1 dB
Impedance	50 Ω
RF power (cold switching)	
R&S®ZS129S1	≤70 W
R&S®ZS129S2	≤50 W
R&S®ZS129S3	≤50 W
R&S®ZS129S4	≤0.5 W
R&S®ZS129S5	≤50 W
R&S®ZS129S6	≤1.0 W per input, ≤3.0 W total
R&S®ZS129S7	≤1.0 W per input, ≤3.0 W total
R&S®ZS129S8	≤50 W
R&S®ZS129S9	≤1.0 W per input, ≤3.0 W total
Switching time	
R&S®ZS129S1	≤10 ms
Others	≤15 ms
Life	
R&S®ZS129S1	5000000 operations
R&S®ZS129S2	1000000 operations
Others	2000000 operations
Interfaces	
RF inputs	SMA female
RF output	SMA female
CONTROL (wires)	
R&S®ZS129S1	+28 V DC/60 mA, GND
R&S®ZS129S2	+28 V DC/150 mA, CTRL 1 to 6
R&S®ZS129S3	+28 V DC/150 mA, CTRL 1 to 8
R&S®ZS129S4	+28 V DC/205 mA, GND
R&S®ZS129S5	+28 V DC/140 mA, GND
R&S®ZS129S6	+28 V DC/150 mA, CTRL 1 to 8
R&S®ZS129S7	+28 V DC/150 mA, CTRL 1 to 6
R&S®ZS129S8	+28 V DC/150 mA, CTRL 1 to 12
R&S®ZS129S9	+28 V DC/150 mA, CTRL 1 to 12

Specifications (cont.)

Switches for the R&S®ZS129A5 (cont.)

General data	
Operating temperature range	
R&S®ZS129S4	-40 °C to +85 °C
R&S®ZS129S5	-55 °C to +85 °C
Others	-40 °C to +70 °C
Storage temperature range	
-55 °C to +85 °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	
Quality standard	
developed and manufactured in line with ISO 9000	
Power supply	
+28 V DC	
Dimensions (W × H × D)	
R&S®ZS129S1	25 mm × 52 mm × 50 mm (0.98 in × 2.05 in × 1.97 in)
R&S®ZS129S2	80 mm × 69 mm × 65 mm (3.15 in × 2.72 in × 2.56 in)
R&S®ZS129S3	80 mm × 69 mm × 65 mm (3.15 in × 2.72 in × 2.56 in)
R&S®ZS129S4	25 mm × 60 mm × 70 mm (0.98 in × 2.36 in × 2.76 in)
R&S®ZS129S5	56 mm × 52 mm × 60 mm (2.20 in × 2.05 in × 2.36 in)
R&S®ZS129S6	80 mm × 69 mm × 65 mm (3.15 in × 2.72 in × 2.56 in)
R&S®ZS129S7	80 mm × 69 mm × 65 mm (3.15 in × 2.72 in × 2.56 in)
R&S®ZS129S8	89 mm × 79 mm × 65 mm (3.50 in × 3.11 in × 2.56 in)
R&S®ZS129S9	89 mm × 79 mm × 65 mm (3.50 in × 3.11 in × 2.56 in)
Weight	
R&S®ZS129S1	0.1 kg (0.22 lb)
R&S®ZS129S2, R&S®ZS 129S4, R&S ZS129S5	0.2 kg (0.44 lb)
R&S®ZS129S3, R&S®ZS 129S6, R&S ZS129S7	0.3 kg (0.66 lb)
R&S®ZS129S8, R&S®ZS 129S9	0.4 kg (0.88 lb)

Power splitter for the R&S®ZS129A5

RF data	
Frequency range	DC to 4 GHz
Attenuation (in/out)	typ. 6.5 dB
Attenuation (out/out)	>6 dB
Impedance	50 Ω
Max. input power	≤+27 dBm (no damage)
Interfaces	
RF IN	SMA male
RF OUT 1 to 2	SMA male
General data	
Operating temperature range	
-20 °C to +65 °C	
Storage temperature range	
-55 °C to +100 °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	
Quality standard	
developed and manufactured in line with ISO 9000	
Dimensions (W × H × D)	
28 mm × 65 mm × 55 mm (1.10 in × 2.56 in × 2.16 in)	
Weight	
0.1 kg (0.22 lb)	

I°C control board for the R&S®ZS129A5

Interfaces	
SER CTRL	D-Sub male, 9 pins (mounted as X23 at rear panel of the R&S®ZS129A5)
CTRL 1 and 2	flat cables with 16-pin female connector
General data	
Operating temperature range	
-35 °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	
Quality standard	
developed and manufactured in line with ISO 9000	
Power supply	
+28 V DC	
Dimensions (W × H × D)	
123 mm × 31 mm × 53 mm (4.84 in × 1.22 in × 2.09 in), without cables	
Weight	
0.2 kg (0.44 lb)	

R&S®ZS127Z1

RF data	
Frequency range	DC to 3 GHz
Input VSWR	≤1.4 (DC to 3 GHz) typ. ≤1.2 at 1.3 GHz
Insertion loss (in/out)	≤0.5 dB (DC to 1.3 GHz) ≤1 dB (DC to 3 GHz)
Impedance	50 Ω
RF power (cold switching)	≤120 W
Switching time	≤15 ms
Interfaces	
RF inputs	N female
RF output	N female
CONTROL	3-pin male pin 1 = GND pin 2 = n.c. pin 3 = +28 V DC/60 mA
General data	
Operating temperature range	-35 °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	in line with EMC directive of EU (89/336/EEC) and German EMC law
Safety	in line with EN 60950/VDE 0805
Quality standard	developed and manufactured in line with ISO 9000
Power supply	+28 V DC
Dimensions (W × H × D)	
Without connectors	125 mm × 80 mm × 58 mm (4.92 in × 3.15 in × 2.28 in)
Overall	169 mm × 98 mm × 58 mm (6.65 in × 3.86 in × 2.28 in)
Weight (basic version)	0.7 kg (1.54 lb)

DC feed for the R&S®ZS129A1, R&S®ZS129A2, and R&S®ZS129A5

RF data	
Frequency range	100 kHz to 3 GHz
Input VSWR	≤1.4
Insertion loss (in/out)	≤2 dB
Impedance	50 Ω
RF power	≤1 W
Interfaces	
RF	SMA female
RF & DC	SMA male
POWER	GND, up to +30 V DC/max. 500 mA (depending on antenna supplied from this unit)
General data	
Operating temperature range	-40 °C to +70 °C
Storage temperature range	-55 °C to +85 °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
Quality standard	developed and manufactured in line with ISO 9000
Power supply	+28 V DC
Dimensions (W × H × D)	28 mm × 65 mm × 55 mm (1.10 in × 2.56 in × 2.16 in)
Weight	0.1 kg (0.22 lb)

Ordering information

R&S®ZS129A1

Designation	Type	Order No.
Basic versions		
Switch Unit, 1-out-of-12, DC to 3 GHz For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.02
Switch Unit, 1-out-of-6, DC to 3 GHz For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.06
Switch Unit, 1-out-of-8, DC to 3 GHz For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.08
Switch Unit, 1-out-of-12, DC to 3 GHz, unused inputs terminated into 50 Ω For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.12
Switch Unit, 1-out-of-6, DC to 3 GHz, unused inputs terminated into 50 Ω For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.16
Switch Unit, 1-out-of-8, DC to 3 GHz, unused inputs terminated into 50 Ω For indoor use, control via USB, RS-232-C or TTL interface and manual operation, one DC feed included	R&S®ZS129A1	3026.3012.18
Switch Unit, 2-out-of-2, DC to 3 GHz For indoor use, control via USB, RS-232-C or TTL interface and manual operation	R&S®ZS129A1	3026.3012.22
Switch Unit, 1-out-of-4, DC to 3 GHz, GaAs switch For indoor use, control via USB, RS-232-C or TTL interface and manual operation	R&S®ZS129A1	3026.3012.34
Option		
DC Feed, 100 kHz to 3 GHz Supplies up to 30 V DC at max. 500 mA	R&S®ZS129F1	3024.6614.02

Additional options such as GaAs switches and switches for higher frequencies are available on request.

R&S®ZS129A2

Designation	Type	Order No.
Basic version		
Switch Unit, 1-out-of-8, DC to 3 GHz, with one DC feed For outdoor use, control via R&S®ZS129A1, R&S®GB127S or R&S®GB127M	R&S®ZS129A2	3023.2015.02
Option		
DC Feed, 100 kHz to 3 GHz Supplies up to 30 V DC at max. 500 mA	R&S®ZS129F1	3024.6614.03

Additional options such as the I²C bus control cable and the overvoltage protection set for the I²C bus control cable are available on request.

R&S®ZS129A5

Designation	Type	Order No.
Basic version (can be ordered only together with other options)		
Switch Unit For indoor use, control via R&S®ZS 129A1, R&S®GB 127S or R&S®GB 127M	R&S®ZS129A5	3023.2515.05
Options		
Switch, 1-out-of-2, DC to 3 GHz	R&S®ZS129S1	3024.6514.02
Switch, 1-out-of-6, DC to 3 GHz	R&S®ZS129S2	3024.6520.02
Switch, 1-out-of-8, DC to 3 GHz	R&S®ZS129S3	3024.6537.02
Switch, 1-out-of-12, DC to 3 GHz	R&S®ZS129S8	3024.6620.02
Switch, 1-out-of-2, DC to 3 GHz, unused inputs terminated into 50 Ω	R&S®ZS129S4	3024.6543.02
Switch, 1-out-of-6, DC to 3 GHz, unused inputs terminated into 50 Ω	R&S®ZS129S7	3024.6572.02
Switch, 1-out-of-8, DC to 3 GHz, unused inputs terminated into 50 Ω	R&S®ZS129S6	3024.6566.02
Switch, 1-out-of-12, DC to 3 GHz, unused inputs terminated into 50 Ω	R&S®ZS129S9	3024.6637.02
Switch, 2-out-of-2, DC to 3 GHz	R&S®ZS129S5	3024.6550.02
DC Feed, 100 kHz to 3 GHz Supplies up to 30 V DC at max. 500 mA	R&S®ZS129F1	3024.6614.02
Power Splitter, 2 ways – 0 degree, resistive, DC to 4 GHz	R&S®ZS129M1	3025.4515.02
I ² C Bus Control Board	R&S®ZS129C1	3024.6714.02

Additional options such as switches for higher frequencies, the I²C bus control cable, the overvoltage protection set for the I²C bus control cable, the open-collector control cable and the 19" front panel (2 HU) are available on request.

R&S®ZS127Z1

Designation	Type	Order No.
Switch Unit, 1-out-of-2, DC to 3 GHz For outdoor use, control via R&S®ZS129A1, R&S®GB127S or R&S®GB127M, 28 V DC operation, with 5 m cable	R&S®ZS127Z1	3014.0994.02



More information at
www.rohde-schwarz.com
(search term: ZS129x)



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