

R&S® ZCPS Converter Power Supply User Manual



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Version 02

ROHDE & SCHWARZ

Make ideas real



This User Manual describes the following models:

- Converter power supply R&S ZCPS (1325.6101.02)

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Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol , e.g. R&S®<prodtype> is indicated as R&S <prodtype>.

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1 Safety and regulatory information

The product documentation helps you use the product safely and efficiently. Follow the instructions provided here and in the following sections.

Intended use

The converter power supply R&S ZCPS provides all necessary supply voltages for the mmWave converters of the R&S ZCxxxx family. One R&S ZCPS can supply two converters. The current sourcing capability for each voltage has been adapted to the maximum current that is needed by any converter model at that specific voltage.

Converters and converter power supply are intended for the development, production and verification of electronic components and devices in industrial, administrative, and laboratory environments. Only use them for their designated purpose.

The converter power supply has been designed and tested in accordance with the EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards. To maintain this condition and to secure safe operation, you must observe all instructions and warnings given in this manual and in the user manual of the connected converter modules R&S ZCxxxx.

Observe the operating conditions and performance limits stated in the specifications document.

Where do I find safety information?

Safety information is part of the product documentation. It warns you of potential dangers and gives instructions on how to prevent personal injury or damage caused by dangerous situations. Safety information is provided as follows:

- In [Chapter 1.1, "Safety instructions"](#), on page 5. The same information is provided in many languages in printed format. The printed "Safety Instructions" for "Mains-Powered Products, Not Heavy" (document number 1171.1771.99) are delivered with the product.
- Throughout the documentation, safety instructions are provided when you need to take care during setup or operation.

1.1 Safety instructions

Products from the Rohde & Schwarz group of companies are manufactured according to the highest technical standards. To use the products safely, follow the instructions provided here and in the product documentation. Keep the product documentation nearby and offer it to other users.

Use the product only for its intended use and within its performance limits. Intended use and limits are described in the product documentation such as the specifications document, manuals and the printed "Safety Instructions" document. If you are unsure about the appropriate use, contact Rohde & Schwarz customer support.

Using the product requires specialists or specially trained personnel. These users also need sound knowledge of at least one of the languages in which the user interfaces and the product documentation are available.

Reconfigure or adjust the product only as described in the product documentation or the specifications document. Any other modifications can affect safety and are not permitted.

Never open the casing of the product. Only service personnel authorized by Rohde & Schwarz are allowed to repair the product. If any part of the product is damaged or broken, stop using the product. Contact Rohde & Schwarz customer support at <https://www.rohde-schwarz.com/support>.

Lifting and carrying the product

The maximum weight of the product is provided in the specifications document. You can lift or carry the product by yourself, if you can manage the weight on your own. Alternatively, you can use lifting or transporting equipment. Follow the instructions provided by the equipment manufacturer.

Choosing the operating site

Only use the product indoors. The product casing is not waterproof. Water that enters can electrically connect the casing with live parts, which can lead to electric shock, serious personal injury or death if you touch the casing.

If Rohde & Schwarz provides accessories designed for outdoor use of your product, e.g. a protective cover, you can use the product outdoors.

You can operate the product up to an altitude of 2000 m above sea level. If a higher altitude is permissible, the value is provided in the specifications docu-

ment. The product is suitable for pollution degree 2 environments where nonconductive contamination can occur. For more information on environmental conditions such as ambient temperature and humidity, see the specifications document.

Setting up the product

Always place the product on a stable, flat and level surface with the bottom of the product facing down. If the product is designed for different positions, secure the product so that it cannot fall over.

If the product has foldable feet, always fold the feet completely in or out to ensure stability. The feet can collapse if they are not folded out completely or if the product is moved without lifting it. The foldable feet are designed to carry the weight of the product, but not an extra load.

If stacking is possible, keep in mind that a stack of products can fall over and cause injury.

If you mount products in a rack, ensure that the rack has sufficient load capacity and stability. Observe the specifications of the rack manufacturer. Always install the products from the bottom shelf to the top shelf so that the rack stands securely. Secure the product so that it cannot fall off the rack.

Connecting the product

Before connecting the interfaces and measuring inputs of the product to other products or electrical circuits, make sure that the other products or electrical circuits provide special protection against electric shock. This protection principle is referred to as SELV (safety extra-low voltage) and is based on a low voltage level and increased insulation. Exceptions are indicated by a measurement category on the product and given in the specifications document.

Connecting to power

The product is an overvoltage category II product. Connect the product to a fixed installation used to supply energy-consuming equipment such as household appliances and similar loads. Keep in mind that electrically powered products have risks, such as electric shock, fire, personal injury or even death. Replace parts that are relevant to safety only by original parts, e.g. power cables or fuses.

Take the following measures for your safety:

- Before switching on the product, ensure that the voltage and frequency indicated on the product match the available power source. If the power adapter

does not adjust automatically, set the correct value and check the rating of the fuse.


- If a product has an exchangeable fuse, its type and characteristics are indicated next to the fuse holder. Before changing the fuse, switch off the product and disconnect it from the power source. How to change the fuse is described in the product documentation.
- Only use the power cable delivered with the product. It complies with country-specific safety requirements. Only insert the plug into an outlet with protective conductor terminal.
- Only use intact cables and route them carefully so that they cannot be damaged. Check the power cables regularly to ensure that they are undamaged. Also ensure that nobody can trip over loose cables.
- Only connect the product to a power source with a fuse protection of maximum 20 A.
- Ensure that you can disconnect the product from the power source at any time. Pull the power plug to disconnect the product. The power plug must be easily accessible. If the product is integrated into a system that does not meet these requirements, provide an easily accessible circuit breaker at the system level.


Cleaning the product


Use a dry, lint-free cloth to clean the product. When cleaning, keep in mind that the casing is not waterproof. Do not use liquid cleaning agents.

Meaning of safety labels

Safety labels on the product warn against potential hazards.

	<p>Potential hazard Read the product documentation to avoid personal injury or product damage.</p>
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	<p>Electrical hazard Indicates live parts. Risk of electric shock, fire, personal injury or even death.</p>
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	<p>Hot surface Do not touch. Risk of skin burns. Risk of fire.</p>
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Protective conductor terminal

Connect this terminal to a grounded external conductor or to protective ground. This connection protects you against electric shock if an electric problem occurs.

1.2 Labels on the product

Labels on the bottom of the product casing inform about:

- Personal safety, see "[Meaning of safety labels](#)" on page 7
- Product and environment safety, see "[Labels regarding product and environment safety](#)" on page 8
- Identification of the product

Labels regarding product and environment safety



Labeling in line with EN 50419 for disposal of electrical and electronic equipment after the product has come to the end of its life.

1.3 Warning messages in the documentation

A warning message points out a risk or danger that you need to be aware of. The signal word indicates the severity of the safety hazard and how likely it will occur if you do not follow the safety precautions.

DANGER

Imminently hazardous situation. Will result in death or serious injury if not avoided.

WARNING

Potentially hazardous situation. Could result in death or serious injury if not avoided.

CAUTION

Potentially hazardous situation. Could result in minor or moderate injury if not avoided.

NOTICE

Potential risks of damage. Could result in damage to the supported product or to other property.

1.4 Where to find key documents on Rohde & Schwarz

Certificates issued to Rohde & Schwarz that are relevant for your country are provided at www.rohde-schwarz.com/key-documents, e.g. concerning:

- Quality management
- Environmental management
- Information security management
- Accreditations

1.5 Korea certification class A



이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

2 Documentation overview

This section provides an overview of the R&S ZCPS user documentation. Unless specified otherwise, you find the documents at:

www.rohde-schwarz.com/manual/zcxxx

Further documents are available at:

www.rohde-schwarz.com/product/zcxxx

2.1 Manual

The manual (this document) introduces the R&S ZCPS and describes how to set up and start working with the product. Includes general information, e.g. safety instructions. A printed version is delivered with the instrument.

2.2 Printed safety instructions

Provides safety information in many languages. The printed document is delivered with the product.

2.3 Specifications and product brochures

The specifications document, also known as the data sheet, contains the technical specifications of the R&S ZCPS. It also lists the firmware applications and their order numbers, and optional accessories.

The brochure provides an overview of the instrument and deals with the specific characteristics.

See www.rohde-schwarz.com/brochure-datasheet/zcxxx.

3 Preparing for use

Here, you can find basic information about setting up the product for the first time.

3.1 Unpacking and checking

The converter power supply is delivered together with its accessories in a cardboard box. Open the box and unpack its contents carefully:

1. Remove the foam paddings from the top of the box.
2. Remove the accessories (mains cable, fuses) packed into the box.
3. Take the unit out of the packaging.
4. Remove the unit from its ESD bag.
5. Using the delivery notes, check the equipment for completeness.
6. Check the unit for damage.

If the delivery is incomplete or equipment is damaged, contact Rohde & Schwarz.



Packing materials

Retain the original packing material. Use it when transporting or shipping the product later.

3.2 Choosing the operating site

Specific operating conditions ensure proper operation and avoid damage to the product and connected devices. For information on environmental conditions such as ambient temperature and humidity, see the specifications document.

For safety information, see "[Choosing the operating site](#)" on page 5.

Electromagnetic compatibility classes

The electromagnetic compatibility (EMC) class indicates where you can operate the product. The EMC class of the product is given in the specifications document.

- Class B equipment is suitable for use in:
 - Residential environments
 - Environments that are directly connected to a low-voltage supply network that supplies residential buildings
- Class A equipment is intended for use in industrial environments. It can cause radio disturbances in residential environments due to possible conducted and radiated disturbances. It is therefore not suitable for class B environments. If class A equipment causes radio disturbances, take appropriate measures to eliminate them.

3.3 Setting up the product

- ▶ **NOTICE!** Possible damage to the converter power supply from overheating. Insufficient air cooling can cause the unit to overheat. Make sure that the ventilation openings are clear and the air flow is not impeded. Position the unit at least 10 cm away from the wall.

Place the unit on a level surface in a horizontal position.

For safety information, see:

- ["Setting up the product"](#) on page 6
- ["Intended use"](#) on page 4

3.3.1 Connecting to power

The converter power supply complies with the specifications for the EN61010-1 protective class.

For safety information, see ["Connecting to power"](#) on page 6.

To connect to the mains:

1. Plug the AC power cable into the AC power connector on the rear panel of the product. Only use the AC power cable delivered with the product.
2. Plug the AC power cable into a power outlet with ground contact.
The required ratings are listed next to the AC power connector and in the specifications document.

3.3.2 Connecting frequency converters

To connect converters of the R&S ZCxxxx family:

1. Switch off the converter power supply.
See [Chapter 3.3.3, "Switching the converter power supply on or off"](#), on page 14.
2. Connect the power supply cables of the related converters to the converter connectors of the converter power supply.
See [Chapter 4.2, "Converter connectors and status LEDs"](#), on page 16.
3. Switch on the converter power supply.
If the status LED turns green, the corresponding converter module is ready to use.

A power supply cable with a length of 1.2 m is supplied with each frequency converter. As spare parts, replacement, or if you need a higher length, you can order one of the following cables.

Table 3-1: Converter power supply cables R&S ZCPSC

Length	Order no.
1.2 m	1323.8159.12
1.6 m	1323.8159.16
2.0 m	1323.8159.20

NOTICE**Cable lengths > 2 m**

If you need longer cables and consider assembling them on your own, please contact your local Rohde & Schwarz representative. Higher lengths can cause considerable voltage drops, which can lead to malfunction of your frequency converter.

3.3.3 Switching the converter power supply on or off

The power switch of the R&S ZCPS has two positions:

- [0]: The unit is disconnected from the AC supply.
- [I]: The unit is receiving power from the AC supply.



Figure 3-1: Mains adapter

To switch the converter power supply on or off, set the power switch to its [I] or [0] position, respectively.

4 Instrument tour

The unit consists of a sheet-metal box with two DC outputs at the front and the AC mains connection at the rear panel.

4.1 Front and rear panel



Figure 4-1: Front and rear view

NOTICE

Possible damage to the converter power supply from overheating

Insufficient air cooling can cause the unit to overheat. Make sure that the ventilation openings are clear and the air flow is not impeded. Position the unit at least 10 cm away from the wall.

4.2 Converter connectors and status LEDs

The converter power supply R&S ZCPS provides two DC connectors (female) for connecting one or two converters of the R&S ZCxxxx family. The connectors are keyed with pin and groove (indicated by red marks) and rotated by 180 degrees relative to each other.

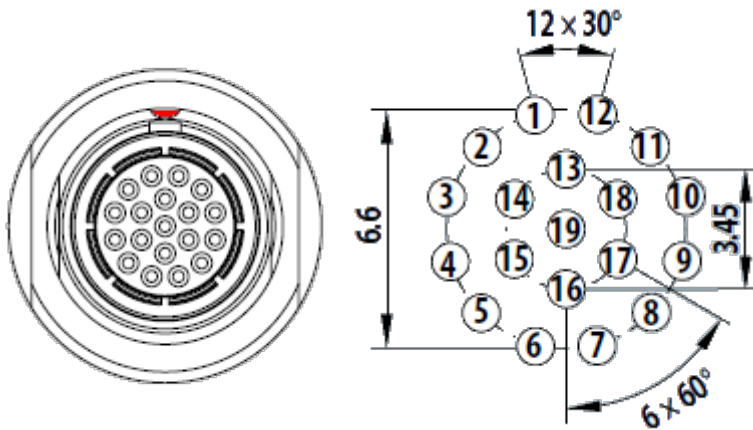



Figure 4-2: Converter Connector

Contact	Signal	Input/Output ^{*)}
1	DC supply 13.8 V	O
2	DC supply -5.5 V	O
3	DC supply 5.8 V	O
4	DC supply 5.8 V	O
5	DC supply 7.3 V	O
6	DC supply 12 V	O
7	DC supply 3.3 V (for Internal use)	O
8	Ground / PE	B
9	Ground / PE	B
10	Ground / PE	B
11	Ground / PE	B
12	DC supply -15 V	O
13	DC supply 5.8 V	O
14	DC supply 5.8 V	O

Converter connectors and status LEDs

Contact	Signal	Input/Output ^{*)}
15	DC supply 5.8 V	O
16	Power Control	I
17	Ground / PE	B
18	Ground / PE	B
19	DC supply 5.8 V	O
*) O = Output, I = Input, B = Bidirectional		

 The connections are secured by a push-pull locking mechanism. To separate the connection, pull on the outer plug housing to disengage the locking.

The supply voltages of a converter power supply board are enabled by the connected converter: a high level on the power control input (POWER_CTRL) activates them. In active state, the supply voltages are supervised: if one of them falls short of its specific threshold or if POWER_CTRL is low, the board's status LED turns from green to red.

5 Transporting

Packing

Use the original packaging material. It consists of antistatic wrap for electrostatic protection and packing material designed for the product.

If you do not have the original packaging, use similar materials that provide the same level of protection. You can also contact your local Rohde & Schwarz service center for advice.

Securing

When moving the product in a vehicle or using transporting equipment, make sure that the product is properly secured. Only use items intended for securing objects.

For optimum protection and convenient transportation, Rohde & Schwarz offers the transport case R&S ZCSTC (order no. 1323.7730.00) that is designed to accommodate:

- Two frequency converters of the R&S ZCxxxx family
- A converter power supply R&S ZCPS
- A waveguide calibration kit R&S ZV-WRx/ZCWMxx
- Accessories



Figure 5-1: Converter transport case R&S ZCSTC (optional)

The maximum transport altitude without pressure compensation is specified in the specifications document.

6 Maintenance, storage and disposal

The product does not require regular maintenance. It only requires occasional cleaning. It is however advisable to check the nominal data from time to time.

6.1 Cleaning

How to clean the product is described in "[Cleaning the product](#)" on page 7.

Do not use any liquids for cleaning. Cleaning agents, solvents, acids and bases can damage the front panel labeling, plastic parts and display.

6.2 Changing fuses

If the product does not start, it is possible that a blown fuse is the cause. The R&S ZCPS is protected by two time lag fuses (IEC60127-2/5 T3.15H / 250 V, stock no. 0099.6729.00), located in the fuse drawer below the AC power switch on the rear panel (see [Figure 3-1](#)).

1. **WARNING!** The fuse is part of the AC power supply. Handling the fuse while the power is on can lead to electric shock.
Before changing the fuse:
 - a) Set the switch on the power supply to position [0].
 - b) Disconnect the product from the power source.
2. Use a small screwdriver to bend the small clamps on both sides of the fuse drawer inward so that you can lift the fuse drawer out of its slot.
3. Check the condition of the fuse.
4. Replace the blown fuse. Only use a fuse of the specified type.
The fuse type and its characteristics are indicated next to the fuse holder.
5. Push the drawer back into the slot.

6.3 Storage

Protect the product against dust. Ensure that the environmental conditions, e.g. temperature range and climatic load, meet the values specified in the specifications document.

For optimum protection, use the converter transport case R&S ZCSTC (order no. 1323.7730.00). See [Figure 5-1](#).

6.4 Disposal

Rohde & Schwarz is committed to making careful, ecologically sound use of natural resources and minimizing the environmental footprint of our products. Help us by disposing of waste in a way that causes minimum environmental impact.

Disposing of electrical and electronic equipment

A product that is labeled as follows cannot be disposed of in normal household waste after it has come to the end of its life. Even disposal via the municipal collection points for waste electrical and electronic equipment is not permitted.



Figure 6-1: Labeling in line with EU directive WEEE

Rohde & Schwarz has developed a disposal concept for the eco-friendly disposal or recycling of waste material. As a manufacturer, Rohde & Schwarz completely fulfills its obligation to take back and dispose of electrical and electronic waste. Contact your local service representative to dispose of the product.

7 Contacting customer support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz product, contact our customer support center. A team of highly qualified engineers provides support and works with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz products.

Contact information

Contact our customer support center at www.rohde-schwarz.com/support, or follow this QR code:



Figure 7-1: QR code to the Rohde & Schwarz support page