R&S®QPS201
Quick Personnel Security Scanner
Getting Started

1179343802
Version 02

ROHDE&SCHWARZ
Make ideas real

This manual contains information about the R&S®QPS201 and accesories with the following order numbers:

- R&S®QPS201 (HW 3.30) (order no. 1333.5000K02)
- R&S®QPS201 (HW 3.50) (order no. 1340.0030K02)
- R&S®LPS (order no. 1340.8001.02)

Mühldorfstr. 15, 81671 München, Germany
Phone: +49 89 41 29 - 0
Email: info@rohde-schwarz.com
Internet: www.rohde-schwarz.com

1179.3438.02 | Version 02 | R&S®QPS201

Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol and without the model designation, e.g. R&S®QPS201 (HW 3.30) is indicated as R&S QPS.

Contents

1 Safety Instructions

The R&S QPS is manufactured according to the highest technical standards. To use the scanner safely, follow the instructions provided here and throughout the product documentation. Keep the documentation nearby and offer it to other users.

Use the scanner only as intended and within its performance limits. The limits are described in the product documentation, such as the data sheet, manuals and this brochure. If you are unsure about the appropriate use, contact the Rohde & Schwarz customer service.

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

If any part of the product is damaged or broken, stop using the product. Never open the casing of the scanner or its components. Only service personnel authorized by Rohde & Schwarz are allowed to repair the product.

Lifting, carrying and installing the R&S QPS

The R&S QPS is heavy and can cause physical injuries when it falls or tips over.

Setup and installation must be done by trained staff. Make sure to install the R&S QPS exactly as described in the installation manual. During the installation, make sure that the installation site is only accessible by people working on the installation.

Because of its weight, at least two strong people are required to move or install the scanner. Lifting heavy items can cause structural and muscular injuries. You must use the specially designed installation tool if you have to move or lift the scanner panels (R&S QPS-Z800, order no. 1333.5900.02). You must also use the installation tool to install the scanner on the platform.

Using the installation tool can pinch your fingers, especially when you attach it to the R&S QPS and when you use the levers.

Loose ball-lock pins can cause the panels to fall over during transportation. Make sure that the ball-lock pin is seated correctly whenever you use one.

If you have to move the pallet the R&S QPS is delivered on, always use a forklift.

During transport, installation or repair, wear appropriate protective clothing that complies with your local rules and regulations. If you are unsure of which equipment to use, ask your safety inspector.

We recommend to wear:

- Safety shoes with toe cap and ESD protection.
- Protective gloves

ESD protected shoes and gloves also protect the hardware from being damaged.

Installing cables

A R&S QPS installation consisting of the scanner, operator touchscreen and monitors requires cable connections (power cables, LAN cables etc.). Make sure to secure all cables on the floor and cover them up.

Loose cables are a tripping hazard. Tripping on cables can cause physical injuries.

Properly covered cables also minimize the risk of cable damage.

Choosing the operating site

Use the R&S QPS only indoors. The R&S QPS is not waterproof and water that enters can electrically connect the casing with live parts. This can lead to electric shock, serious personal injury or death if you touch the casing.

For more information on environmental operating conditions, such as ambient temperature, and humidity, see the data sheet.

Supplying the R&S QPS with power

You can connect the R&S QPS to the power distribution system normally used to supply energy-consuming equipment, such as household appliances and similar loads. Electrically powered products have risks, such as electric shock, fire, personal injury or even death.

Take the following measures for your safety:

- Only use the power cable delivered with the R&S QPS. It complies with country-specific safety requirements. Only insert the plug into an approved grounded outlet.
- For components that need an external AC adapter, only use the one that is delivered with the components.
- 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.
- If the voltage or frequency is higher than 230 V or 50 Hz, the leakage current of the R&S QPS can be above the limits. In that case, a protective ground connection must be established for each panel before connecting them to the mains supply.
- Only connect the R&S QPS to supply networks with a fuse protection of maximum 20 A.
- Ensure that you can disconnect the product from the mains supply at any time. Pull the power plug to disconnect the product. The power plug must be easily accessible.

Calibrating the R&S QPS

The calibration cylinder is heavy and can cause physical injury.

Install the calibration cylinder exactly as described in the installation manual.

At least two people are required to carry or lift the calibration cylinder.

Installing the calibration cylinder requires a ladder. At least two people are therefore required to install the calibration cylinder - one person must secure the cylinder and ladder while the second person assembles the calibration setup.

Meaning of safety labels

Safety labels on the product warn against potential risks.

	Potential hazard Indicates a potential risk like personal injury or product damage. Read the product documentation for more information.
	Electric hazard Indicates live parts. Risk of electric shock, fire, personal injury or even death.
	Protective ground terminal Connect this terminal to a grounded external conductor or to protective ground. This protects you against electric shock if an electric problem occurs.
	Pinched fingers Indicates a potential risk of pinching your hands or fingers.
	Protective clothing Indicates that you must wear protective clothing when you use the device to avoid physical injuries.
	Read manual Indicates that you must read the product manual before using the device. The manual contains instructions on how to use the device correctly.

2 Regulatory Information

The R&S QPS complies with the following regulations.

2.1 Regulations for Canada

This device contains licence-exempt transmitter(s) / receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following three conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.
- This device shall be used indoors only.

Cet appareil contient un (des) émetteur(s) / récepteur(s) exempts de licence, conforme(s) aux normes CNR d'Innovation, Sciences et Développement économique Canada (ISDE). L'opération est soumise aux trois conditions suivantes:

- Cet appareil ne doit pas provoquer d'interférences.
- Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.
- Cet appareil doit être utilisé à l'intérieur uniquement.

2.2 Regulations for the USA

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The R&S QPS is currently restricted to indoor operations (as of October 2020).

The R&S QPS may only be operated on a non-interference basis to existing and future services with frequency allocations in the 70 GHz to 80 GHz frequency band, and operators will be required to mitigate any instances of harmful interference that may occur.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause interference.
- This device must accept any interference, including interference that may cause undesired operation of the device.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction

manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3 Key Features

The R&S QPS Quick Personnel Security Scanner is a system that allows the detection of hidden metallic and non-metallic objects that a person might carry in or underneath their clothing.

Possible threats like weapons or explosives can be detected and measures taken against them.

The objects are recognized by an evaluation of the reflected (backscattered) microwave signal. The microwaves are of very low intensity. The signal level is several orders of magnitude below the signal level of mobile phones. Therefore, the system presents no health hazards for the scanned persons.

A person is scanned, front and back. The data is analyzed and evaluated by an automatic detection software (algorithm).

After the evaluation, the scanned person either is cleared, or has to undergo further investigation in the form of a manual screening. The manual screening can be performed by the screener or by additional inspectors in a separate resolution station.

In case of an inadequate scan, the scan can be repeated or followed by manual screening.

4 EMI Suppression

Electromagnetic interference (EMI) may affect the measurement results.

To suppress generated electromagnetic interference (EMI):

- Use suitable shielded cables of high quality. For example, use double-shielded LAN cables.
- Always terminate open cable ends.
- Note the EMC classification in the data sheet.

5 System Components

The system consists of various parts.

- Two panels that contain the measuring electronics. The first panel (= primary panel) scans the front of a person. The second panel (= secondary panel) scans the back of a person. The primary panel controls the secondary panel, therefore both panels must be connected to each other.
  The primary panel shows the silhouette of a person. Otherwise both panels are the same.
- A floorplate that provides a stable and even surface for the scanner.
- A touchscreen monitor to control the scanner. The touchscreen monitor is connected to the primary panel.

The images show the components of HW 3.50. The components of HW 3.30 are the same, except for the connectors which are at a different location on the panel.

The R&S LPS is the same as a R&S QPS HW 3.50 but with 30 antenna clusters instead of 32 in each panel.

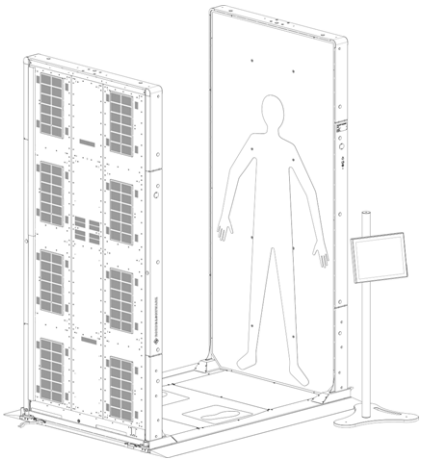
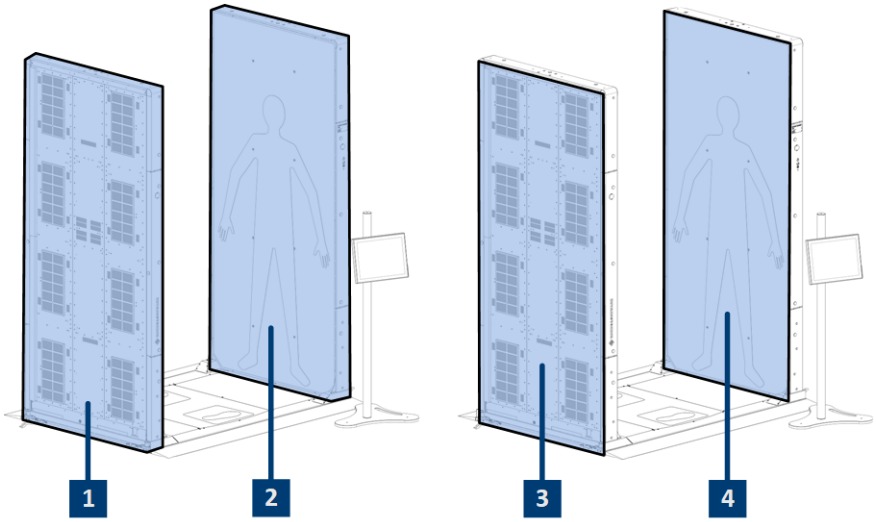
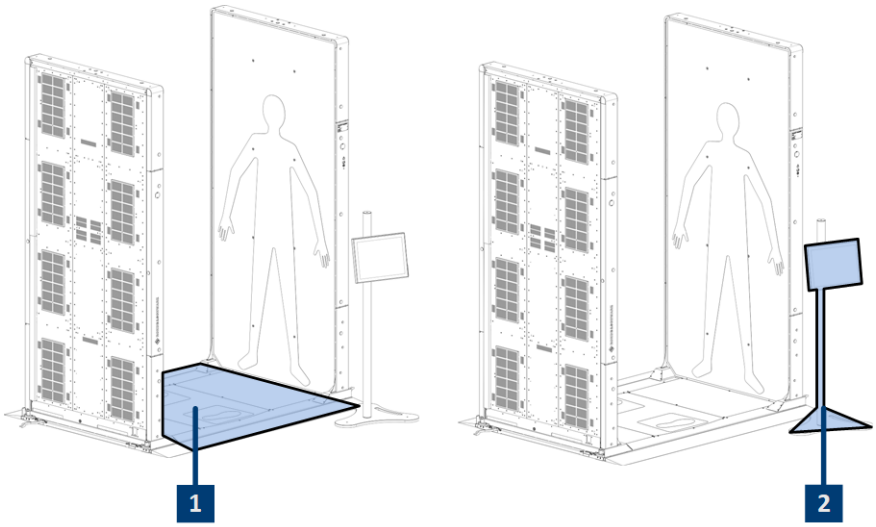


Figure 5-1: Complete system



1 = Secondary panel
2 = Primary panel (with printed avatar on the inside)
3 = Rear side of the panel (facing outward)
4 = Front side of the panel (facing inward)



1 = Floorplate
2 = Touchscreen monitor

6 Preparing for Use

Installing the R&S QPS requires experience and must be performed by trained personnel. For a comprehensive description of the initial installation and configuration of the R&S QPS, refer to the installation manual.

Once the scanner itself is installed, you can connect the accessories like the operator touchscreen.

Connecting devices

All required cables are part of the delivery.

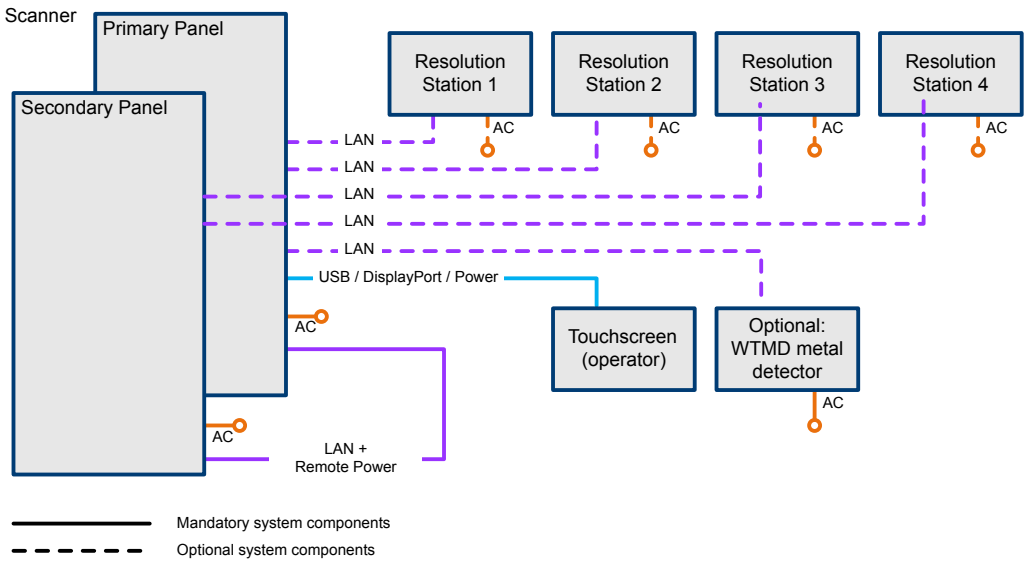


Figure 6-1: Connection overview

The overview shows the connections for HW 3.50. For HW 3.30, the touchscreen is connected to a wall outlet instead of the primary panel. Otherwise the connections are the same for both hardware variants.

The connections for the R&S LPS correspond to those of a R&S QPS HW 3.50.

LAN connections

All devices connected to the R&S QPS must be in the same subnet.

Connecting the panels

► Connect the secondary panel to the primary panel.

a) Establish a LAN connection between the two panels.
b) Establish a remote control power connection between the two panels.

Connecting the operator touchscreen

► Connect the operator touchscreen to the primary panel.

a) Establish a power supply connection between touchscreen and the primary panel.
b) Establish a USB connection between touchscreen and primary panel.
c) Establish a DisplayPort connection between touchscreen and primary panel.

Connecting resolution station monitors

► Optional: Connect the resolution station monitors to the primary or secondary panel (up to four).

a) Establish a LAN connection between resolution station monitor and primary panel.

Connecting accessories

1. Optional: Connect the metal detector to the primary or secondary panel.
   a) Establish a LAN connection between metal detector and primary panel.
2. Optional: Connect devices like the traffic lights to manage the queue of people to be scanned.

If you are using one of the queue management accessories, you have to connect them accordingly.

- Traffic lights via one of the USB connectors.
- Light barriers via USB (for details see the installation manual).

Connecting the components to the power supply

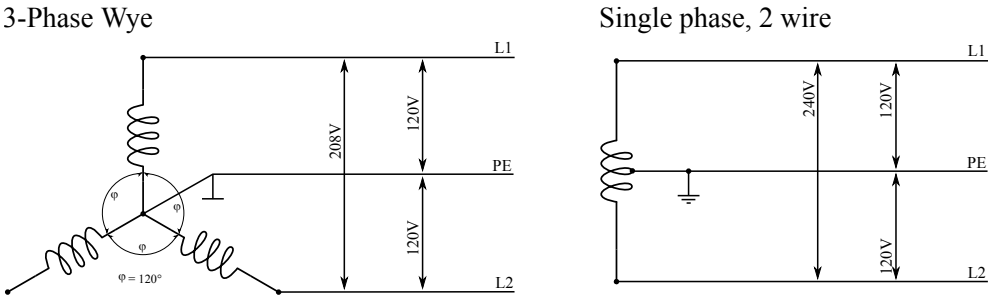
► Connect all devices to the mains supply with the power cord that is part of the delivery.

For resolution stations, you have several methods to supply them with power.

- Connect them to the AC mains supply.
- Connect them to an external PoE injector (R&S QPS-Z113).
  If you are using this method, connect all resolutions stations via LAN to the PoE injector, and the PoE injector to the mains supply.

Establishing a ground connection

1. **WARNING!** Risk of electric shock. If the voltage or frequency are greater than 230 V or 50 Hz, the leakage current of the R&S QPS can be above the limits and can cause personal injuries from an electric shock.
   In that case, a protective ground connection must be established for each panel before connecting them to the mains supply.
   - 200 V to 230 V AC and 50 Hz
     No additional protective ground needed.
   - 230 V to 240 V AC or a frequency greater than 50 Hz
     Additional protective ground needed.
     Exception: The following two 60 Hz AC distribution systems are tested and work without an additional ground.



For the separate protective ground, you need a green/yellow ground wire with a cross section of at least 4 mm^2 in addition to the main protective earthing terminal. The ground wire must be connected permanently to the ground terminal on the side of each R&S QPS panel and earth.
The ground terminal is located on the power supply. Connect the terminal to the protective grounding system of the building or room where the scanner is installed.

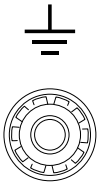


Figure 6-2: Ground terminal

2. Make sure that the power supply is adequately protected against overcurrent. Otherwise the fuse can blow.
   We recommend that you use a power cable that is rated for a 16 A (included in the delivery) and connect each panel to a separately protected power circuit (at least 10 A).

   If you cannot connect the panels to separate power circuits, make sure that the system is protected:
   - By a fuse with at least 20 A in 200 V networks.
   - By a fuse with at least 16 A in 230 V networks.
3. If the voltage drops to 70 % for 500 ms, a reboot occurs.

Supplying the system with power

Always complete all connections (LAN, USB etc.) before connecting the panels to the power supply.

Refer to the data sheet for power rating and electrical safety compliance.

1. Make sure that the protective ground connection is established.
2. Connect the power cord to the panel's AC inlet.
3. Connect the power cord to the AC power source.
4. Turn on the mains power switch (position "I") on both panels.

The panel is supplied with power.

Booting the panel

1. Establish all necessary connections.
2. Supply both panels with power.
3. Press the power button on the side of the primary panel to turn on the complete system.

   The system boots. When done, the operator touchscreen shows the login screen.
4. Log into the system to operate the scanner.

   Note: Level 1, 2 and 3 user accounts will be locked after three failed log in attempts.

Power saving mode

The R&S QPS enters an energy saving mode when it is not used for a while.

Waking up from this mode takes a a few seconds. A corresponding message is displayed on the operator touchscreen.

Turning off the system

1. On the touchscreen monitor, enter the home menu.
2. Select the "Shut Down" menu item.

   The system shuts down.
3. Turn off the mains power switch (position "0").

   The panel is disconnected from the AC power supply.
4. Remove the power cord from the power supply.

Emergency shutdown

In case of an emergency, disconnect the R&S QPS from the power source.

There are several ways to do that.

- If possible, pull the mains plug from the mains outlet.
- Turn off the mains power switch of the panels.