R&S®NPA Power Analyzers Getting Started

1179162902
Version 04

ROHDE&SCHWARZ
Make ideas real

This document describes following models:

- R&S NPA101 Power Meter (3657.0562.02)
- R&S NPA501 Power Analyzer (3657.0562.03)
- R&S NPA501-G Power Analyzer (3657.0562.05)
- R&S NPA701 Compliance Tester (3657.0562.04)
- R&S NPA701-G Compliance Tester (3657.0562.06)

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1179.1629.02 | Version 04 | R&S®NPA

Throughout this document, R&S® is indicated as R&S.

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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 R&S NPA power analyzers are used to measure and analyze AC/DC load and standby current characteristics, e.g. for measuring inrush currents or compliance testing. It is designed for industrial use, e.g. production testing, maintenance and engineering labs.

The test adapter R&S NPA-Zx is an accessory for the R&S NPA power analyzers. It can be used to analyze the performance of the mains with the DUT connected. The test adapter is available with several country-specific outlets. The AC/DC clamp-on current probes R&S HZC50 and R&S HZC51 provide extended power measurement range.

Use the product and its accessories only for their designated purpose. Observe the operating conditions and performance limits stated in the specificartion document, also called data sheet.

Target audience

Only connect, set up and use a power analyzers if you are an electrically skilled person. Such persons have the education and experience needed to recognize risks and to avoid hazards of working with electricity.

This document provides information throughout the life cycle of the product for installers, operators, technicians, maintenance and service personnel.

Follow the safety instructions provided in Section 1.1, "Safety instructions", on page 6 and the additional information provided during setup or operation procedures.

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 Section 1.1, "Safety instructions", on page 6. The same information is provided in many languages in printed format. The printed "Safety Instruc-

tions" for "Power Supplies and Power Analyzers" (document number 1171.2055.99) 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 data sheet, manuals and the printed "Safety Instructions". If you are unsure about the appropriate use, contact Rohde & Schwarz customer service.

Only people skilled in electrical work should connect, set up and use the product. Such persons have the education and experience needed to recognize risks and avoid hazards of working with electricity. 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 data sheet. 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

Look up the maximum weight in the data sheet. A single person can only carry a maximum of 18 kg safely depending on age, gender and physical condition. If your product is heavier than 18 kg, do not move or carry it by yourself.

To move the product safely, you can use lifting or transporting equipment such as lift trucks and forklifts. 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 to live parts, which can lead to electric shock, serious personal injury or death if you touch the casing.

Unless otherwise specified, you can operate the product up to an altitude of 2000 m above sea level. 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 data sheet.

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 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 the safety fuse specified in the data sheet.
- 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.

Working with hazardous voltages

Voltages higher than 30 V RMS, or 42 V peak, or 60 V DC are regarded as hazardous contact voltages. Direct contact with them can cause serious injuries.

When working with hazardous contact voltages, use protective measures to preclude direct contact with the measurement setup:

- Before each measurement, inspect all components for damage and replace them if necessary.
- Do not touch exposed connections and components when power is applied.
- Casing, chassis and all measuring terminals are connected to a grounding connection. Never disconnect a grounding connection on the product.
- Switch off the power before connecting or disconnecting the terminal block to the rear panel connector. Tighten all wires connected to the terminal block.
- Only use the wires and terminal blocks delivered with the product.
- Only use insulated wires, not stripped wires, for the terminal connections.
- Turn the mains switch off when the product is not in use.
- When operating measuring accessories, only use the cables delivered with the accessory. If you have to use cables from other manufacturers, make sure that they are of the required overvoltage category.

Do not operate the product in series or parallel unless that setup is supported. If accessories are provided for a product, only use them for that product. See the data sheet.

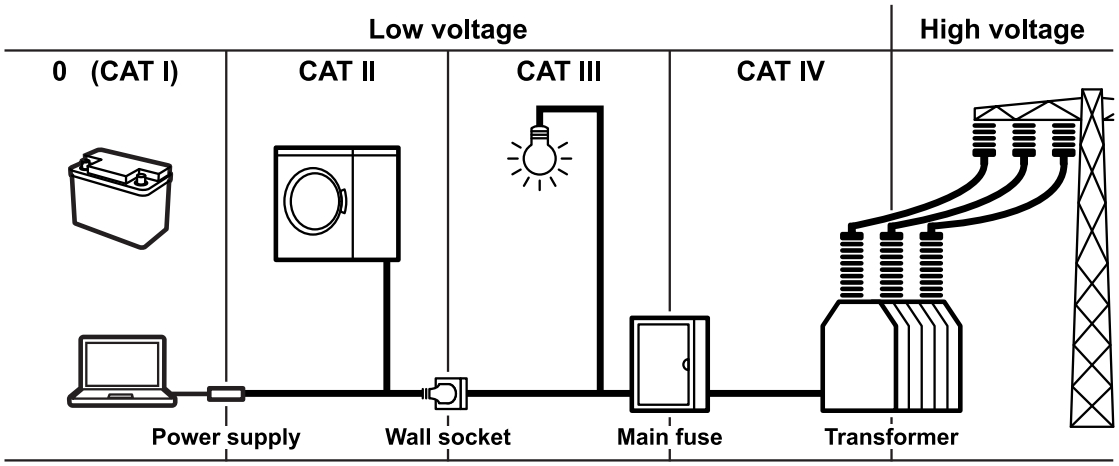
In series or parallel setups, protect yourself against electric shock before connecting access ports such as the Ethernet port or the USB port using one of the following measures:

- Ensure that all products are grounded by connecting them to the AC power.
- Disconnect all power connections to the product, including outputs.

Measurement categories

IEC 61010-2-030 defines measurement categories that rate instruments on their ability to resist short transient overvoltages that occur in addition to the working voltage. Use the measurement setup only in electrical environments for which they are rated.

- 0 - Instruments without rated measurement category
  For measurements performed on circuits not directly connected to mains, for example, electronics, circuits powered by batteries, and specially protected secondary circuits. This measurement category is also known as CAT I.
- CAT II:
  For measurements performed on circuits directly connected to the low-voltage installation by a standard socket outlet, for example, household appliances and portable tools.
- CAT III:
  For measurements performed in the building installation, such as junction boxes, circuit breakers, distribution boards, and equipment with permanent connection to the fixed installation.
- CAT IV:
  For measurements performed at the source of the low-voltage installation, such as electricity meters and primary overcurrent protection devices.



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.

	Potential hazard Read the product documentation to avoid personal injury or product damage.
	Electrical hazard Indicates live parts. Risk of electric shock, fire, personal injury or even death.
	Hot surface Do not touch. Risk of skin burns. Risk of fire.
	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 R&S NPA power analyzers

Labels on the casing inform about:

- Personal safety, see "Meaning of safety labels" on page 10.
- Product and environment safety, see Table 1-1.
- Identification of the product, see the serial number on the rear panel.

Table 1-1: Labels regarding the R&S NPA power analyzers 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 service life. For more information, see the product user manual, chapter "Disposal".
	Grounding terminal (earth ground contact)
	Chassis grounding terminal
	ON (supply voltage)
	OFF (supply voltage)

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 Key features

The R&S NPA power analyzers set standards in power analyzing. Outstanding key features are:

- Graphical display up to the 50th harmonic on the logarithmic scale
- Configurable dual-channel trend chart function
- Simultaneous display of current and voltage
- High basic measurement accuracy
- Up to 26 definable measurement and mathematical functions
- Adjustable filter system
- Clearly represented display of all measured parameters
- Customizable display of up to 10 numerical measurement functions at a time

For more information, see the specifications document.

3 Documentation overview

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

www.rohde-schwarz.com/manual/npa

Further documents are available at:

www.rohde-schwarz.com/product/npa

3.1 Getting started manual

Introduces the R&S NPA power analyzers and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

3.2 User manual

Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance and instrument interfaces. Includes the contents of the getting started manual.

The user manual is also available for download or for immediate display on the Internet.

3.3 Tutorials

Tutorials offer guided examples and demonstrations on operating the R&S NPA power analyzers. They are provided on the product page of the internet.

3.4 Service manual

Describes the performance test for checking the rated specifications, module replacement and repair, firmware update, troubleshooting and fault elimination, and contains mechanical drawings and spare part lists.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS):

See https://gloris.rohde-schwarz.com

3.5 Instrument security procedures

Deals with security issues when working with the R&S NPA in secure areas. It is available for download on the internet.

3.6 Printed safety instructions

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

3.7 Specifications and product brochures

The specifications document, also known as the data sheet, contains the technical specifications of the R&S NPA. 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/npa

3.8 Calibration certificate

The document is available on https://gloris.rohde-schwarz.com/calcert. You need the device ID of your instrument, which you can find on a label on the rear panel.

3.9 Release notes and open source acknowledgment (OSA)

The release notes list new features, improvements and known issues of the current software version, and describe the software installation.

The software uses several valuable open source software packages. An open source acknowledgment document provides verbatim license texts of the used open source software.

See www.rohde-schwarz.com/firmware/npa

3.10 Application notes, application cards, white papers, etc.

These documents deal with special applications or background information on particular topics.

See www.rohde-schwarz.com/application/npa

3.11 Remote control driver

The instrument drivers enable remote control via the corresponding interfaces. The drivers and installation instructions are available for download on the product page at:

www.rohde-schwarz.com/driver/npa

4 Preparing for use

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

4.1 Lifting and carrying

See "Lifting and carrying the product" on page 6.

For mounting the R&S NPA in a rack, see Section 4.4.2, "Mounting the product in a rack", on page 19.

4.2 Unpacking and checking

1. Unpack the product carefully.
2. Retain the original packing material. Use it when transporting or shipping the product later.
3. Using the delivery notes, check the equipment for completeness.
4. Check the equipment for damage.

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

4.3 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 7.

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.

4.4 Setting up the product

For safety information, see:

- "Setting up the product" on page 7
- "Intended use" on page 5

4.4.1 Placing the product on a bench top

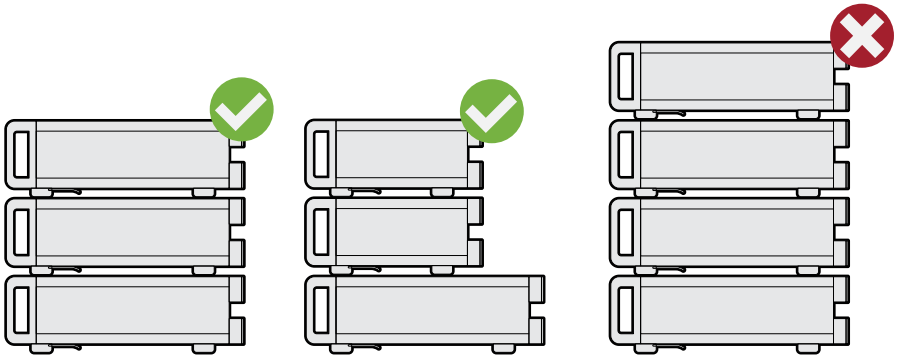
To place the product on a bench top

1. Place the product on a stable, flat and level surface. Ensure that the surface can support the weight of the product. For information on the weight, see the specifications document.
2. **CAUTION!** Foldable feet can collapse. For safety information, see "Setting up the product" on page 7.

   Always fold the feet completely in or out. With folded-out feet, do not place anything on top or underneath the product.
3. **WARNING!** A stack of products can fall over and cause injury. Never stack more than three products on top of each other. Instead, mount them in a rack.

   Stack as follows:

- If the products have foldable feet, fold them in completely.
- It is best if all products have the same dimensions (width and length). If the products have different dimensions, stack according to size and place the smallest product on top.
- Do not exceed the permissible total load placed on the product at the bottom of the stack:
  – 50 kg when stacking products of identical dimensions (left figure).
  – 25 kg when stacking smaller products on top (middle figure).



Left = Stacked correctly, same dimensions
Middle = Stacked correctly, different dimensions
Right = Stacked incorrectly, too many products

4. **NOTICE!** Overheating can damage the product.

   Prevent overheating as follows:

   - Keep a minimum distance of 10 cm between the fan openings of the product and any object in the vicinity to provide sufficient airflow and ventilation.
   - Do not place the product next to heat-generating equipment such as radiators or other products.

4.4.2 Mounting the product in a rack

To prepare the rack

1. Observe the requirements and instructions in "Setting up the product" on page 7.
2. **NOTICE!** Insufficient airflow can cause overheating and damage the product.

   Design and implement an efficient ventilation concept for the rack.

To mount the product in a rack

1. Use an adapter kit to prepare the R&S NPA for rack mounting.
   a) Order the rack adapter kit designed for the R&S NPA power analyzers. For the order number, see the specifications document.
   b) Mount the adapter kit. Follow the assembly instructions provided with the adapter kit.
2. Lift the R&S NPA to shelf height.
3. Push the R&S NPA onto the shelf until the rack brackets fit closely to the rack.
4. Tighten all screws at the rack brackets with a tightening torque of 1.2 Nm to secure the R&S NPA at the rack.

To unmount the product from a rack

1. Loosen the screws at the rack brackets.
2. Bring the lifting equipment to shelf height.
3. Remove the R&S NPA from the rack.
4. If placing the R&S NPA on a bench top again, unmount the adapter kit from the R&S NPA. Follow the instructions provided with the adapter kit.

4.5 Considerations for test setup

Cable selection and electromagnetic interference (EMI)

Electromagnetic interference (EMI) can affect the measurement results.

To suppress electromagnetic radiation during operation:

- Use high-quality shielded cables, for example:
  – Double-shielded data cables for connecting external devices. The length of data cables must not exceed 3 m.
  – Shielded cables (RG58/U coaxial cable) for signal transmission connections. The length of signal cables must not exceed 1 m.
  – Double-shielded USB cables. The length of passive USB cables must not exceed 1 m.
  – CAT6+ LAN cables, e.g. RJ-45 with a length ≤3 m.

  - Double-shielded IEEE-488 (GPIB) bus cables. We recommend that you use the double-shielded cable "R&S HZ72" from Rohde & Schwarz (GPIB-cable 2 m, order no. 3594.4269.02).
- Cables for output supply:
  - Use insulated cables of the same type
  - Keep the cable length as short as possible
  - Use cables with maximum cross-section to minimize the conductor resistance
- Always terminate open cable ends.
- Ensure that connected external devices comply with EMC regulations.
- Check regularly that all cables, including power cables are in perfect condition.

Input and output levels

Information on voltage levels is provided in the specifications document. Keep the voltage levels within the specified ranges to avoid damage to the product and connected devices.

4.6 Preparing for mains voltage

The R&S NPA is designed for 115 V or 230 V mains voltage. The range is specified on the label next to the AC power supply, see Rear view > "AC power supply" on page 40, and in the specifications document.

If the mains voltage exceeds the permissible range, contact the Rohde & Schwarz customer service, see Section 8, "Contacting customer support", on page 54.

Take care to adjust the R&S NPA to the supplied mains voltage. When delivered, the R&S NPA is configured for 230 V mains voltage.

The product is protected with a line fuse. The suitable fuse type depends on the supplied mains voltage. Table 4-1 shows the suitable fuse types.

Table 4-1: Fuse types

Mains voltage	Fuse F1/F2
115 V	IEC60127-2/5 - F630H/250V, order no. 3622.2330.00
230 V	IEC60127-2/5 – F400H/250V, order no. 3622.2323.00

4.6.1 Preparing for 115 V

If you want to supply the R&S NPA with 115 V mains voltage, you need to do the following:

- "To change the fuse" on page 22
- "To set the supplied mains voltage" on page 23

To change the fuse

The fuses for 115 V mains voltage are delivered with the R&S NPA.

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, disconnect the product from the power source.

2. Insert a flathead screwdriver with a blade width of approximately 2 mm under the small opening tab of the fuse holder.

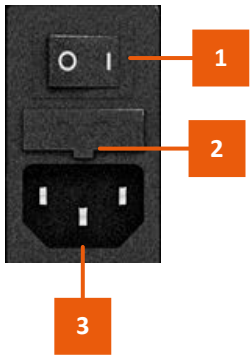


Figure 4-1: AC power connector

1 = Power supply switch
2 = Opening tab of the fuse holder
3 = AC power supply connector

   When unlocking the mechanism, the fuse holder is pushed outwards by compression springs.

3. Pull out the fuse holder.

4. Lever out the fuse.

   Keep the fuse for later use, if intact.

5. **WARNING!** If the fuse protection is insufficient, the R&S NPA can overheat and even cause a fire.

   Check the fuse rating on the caps of the fuse that is delivered with the R&S NPA. Make sure that the fuse type matches the characteristics that are indicated next to the fuse holder for 115 V mains voltage.

6. Inspect the compression springs of the fuse holder carefully. With deformed or protruding springs, you cannot insert the fuse properly. Contact Rohde & Schwarz at http://www.customersupport.rohde-schwarz.com.

7. Insert the fuses into the groove of the fuse holder.

8. Align the fuse holder with the guide bar facing the socket.

9. Carefully slide the fuse holder against the spring pressure into the slot until both plastic locks latch.

To set the supplied mains voltage

The AC power supply voltage selector switch is on the rear panel.

► To set to 115 V mains voltage, use a tool e.g. a flat screwdriver to slide the voltage selector so that the label indicates *115 V*.

4.6.2 Reverting to 230 V

If needed, you can revert to 230 V mains voltage by:

- Inserting the fuse for 230 V mains voltage.
- Selecting 230 V as supplied mains voltage.

4.7 Connecting to power

For safety information, see:

- "Connecting to power" on page 7
- "Working with hazardous voltages" on page 8

To ground the chassis

The protective ground terminal ⏚ on the rear panel enables you to connect a ground cable firmly with a screw, see "Ground terminal" on page 40.

See also Section 1.2, "Labels on the R&S NPA power analyzers", on page 10

1. Unscrew the screw of the ground terminal using a cross-recess screw driver.
2. Attach a ground cable with a ring terminal and pass the screw through it.
3. Tighten the screw to 1.2 Nm using a torque wrench.
4. Connect the cable to ground.

To connect to AC supply

1. If necessary, ground the chassis of the R&S NPA. See "To ground the chassis" on page 24.
2. **WARNING!** If the fuse protection is insufficient, the R&S NPA can overheat and even cause a fire.

   Ensure that R&S NPA is prepared for the supplied mains voltage. See Section 4.6, "Preparing for mains voltage", on page 21.
3. Plug the AC power cable into the AC power supply connector. Only use the AC power cable delivered with the R&S NPA.
4. Plug the AC power cable into a power outlet with ground contact.
   Do not use a cheater plug or other means to bypass or disconnect the protective ground lead.

   The required ratings are listed on the reat panel of the R&S NPA, see rear panel.

4.8 Connecting to LAN

The R&S NPA power analyzers provide Ethernet (LAN) connectivity. If you have assigned the corresponding rights, you can use this interface for remote control and data transfer from a controller PC. Make sure that you have connected the controller PC in the same network.

Consult your network administrator before performing the following tasks to avoid a network failure:

- Connecting the instrument to the network
- Configuring the network
- Changing IP addresses

For remote control over other interfaces, refer to the description in section "Network and remote control operation" in the user manual of the R&S NPA.

To operate the instrument securely

1. **NOTICE!** The R&S NPA is designed to operate at local workplaces or in secured networks (LAN).
   When connected to the LAN, the R&S NPA can potentially be accessed from the internet, which constitutes a security risk. For example, attackers can misuse or damage your device.

   Use secured connections for internet or remote access, if applicable.
2. Ensure that the network settings comply with the security policies of your company. Contact your local system administrator or IT department before connecting your product to your company LAN.
3. Always install the latest firmware.

To connect to LAN

The LAN connector is on the rear panel.

1. **WARNING!** Risk of electric shock. With certain test setups , you achieve higher voltages and currents. Observe the safety information in "Working with hazardous voltages" on page 8.

   Ensure that all products are grounded by connecting them to the AC power.
2. Connect the LAN socket using an RJ-45 cable to the LAN.

   By default, the R&S NPA is configured to use DCHP that assigns the IP address automatically.
   If the R&S NPA cannot obtain an IP address automatically, it returns a time-out message after about three minutes and clears the parameters in the "Ethernet Settings" dialog. Possible reasons are that the LAN does not support DCHP or requires a specific TCP/IP configuration, or that the connection is missing.
3. If the time-out message is displayed, proceed as follows:

a) Check if you have connected of both, the R&S NPA and the controller PC to the LAN.
b) Consult your network administrator to request support and an IP address, if necessary.
c) If necessary, assign the IP address manually as described in section "Network operation and remote control > Configuring remote access connections" in the user manual.

If connected and switched on, the R&S NPA indicates the address information and LAN parameters in the "Ethernet Settings" dialog.

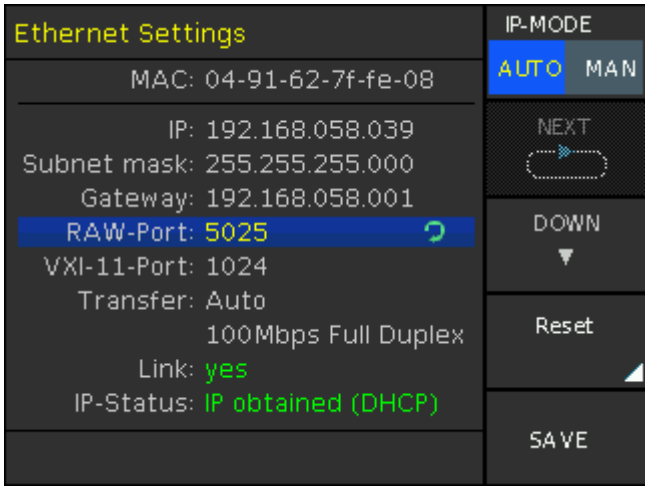


Figure 4-2: Ethernet settings dialog

See "Network operation and remote control > Remote access settings > Ethernet settings" in the user manual. For information on how to control the instrument remotely, see "Network operation and remote control > Starting and stopping remote control".

4.9 Connecting USB devices

The USB A connector is on the front panel.

You can connect or disconnect all USB devices from the R&S NPA during operation. But do not remove an external USB memory stick during a firmware update, data logging and storing screen captures, as it can lead to unsuccessful updates and loss of data.

To connect USB storage devices

USB storage devices, such as memory sticks, allow easy data transfer from/to the R&S NPA. You can also use them for firmware updates.

► Connect the USB storage device to the USB type A connector directly, without connecting cable.
Connecting cables can cause electromagnetic radiation and impair the measurement result.

4.10 Connecting a device under test (DUT)

For safety information, see "Working with hazardous voltages" on page 8.

The R&S NPA power analyzer enables you to measure AC/DC loads and current characteristics with different measurement methods.

As a brief introduction, the following test setup example describes the basic steps to be taken when setting up a measurement with the R&S NPA-Zx test adapter. See also the installation instructions of the R&S NPA-Zx test adapter.

For further applications and test setups, see section "Measurement setups" in the user manual.

Test setup

This setup shows the R&S NPA-Zx test adapter connected to the R&S NPA power analyzer, and a DUT connected to the adapter.

The R&S NPA-Zx test adapter is like a standard AC outlet with grounded safety sockets. The three connections V, A and COM to the power analyzers transmit the mains values for the measurement.

Figure 4-3: Measurement setup of the R&S NPA and the R&S NPA-Zx to a DUT

1 = R&S NPA power analyzer
2 = R&S NPA-Zx test adapter
3 = Power supply of the R&S NPA-Zx (cord with IEC plug)
4 = DUT power plug
5 = A, COM and V connection cables

To connect the R&S NPA-Zx test adapter to the R&S NPA power analyzer

See also Figure 4-3.

1. Use the cables delivered with the R&S NPA-Zx test adapter, as they are aligned for connection of the R&S NPA-Zx to the R&S NPA power analyzer. If you use other measurement equipment, ensure that it fulfills the requirements as described in the R&S NPA-Zx installation instructions, section "Connecting to the R&S NPA power analyzer and the DUT".
2. Inspect the cables and the cable connectors to ensure that they are not damaged.

   Note: If the visual inspection shows any damage, replace the cable.
3. Inspect the A, COM and V safety sockets of both, the R&S NPA and the R&S NPA-Zx visually to check that they are clean, undamaged and mechanically compatible.

Note: If the visual inspection shows that a connector requires cleaning, see section "Maintenance > Cleaning" in the user manual.

4. To connect the R&S NPA to the R&S NPA-Zx:
   a) Connect the black cable to the COM safety socket of the R&S NPA "Measurement connectors" on page 37.
   b) Connect the blue cable to the A, and the red cable to the V safety sockets.
   c) Stick to the color and connect the cables to the COM, A and V safety sockets of the R&S NPA-Zx.
5. To connect the R&S NPA and the R&S NPA-Zx to the AC supply:
   a) Power on the R&S NPA, as described in Section 4.7, "Connecting to power", on page 23.
   b) Power on the R&S NPA-Zx as described in the R&S NPA-Zx test adapter installation instructions, section "Connecting to power".
   c) Switch on the R&S NPA, see Section 4.11, "Switching on or off", on page 30.

   Tip: The R&S NPA-Zx does not have an On/Off switch.

To connect to the DUT

1. **NOTICE!** Risk of damage to the R&S NPA-Zx. The R&S NPA-Zx test adapter standard AC ground safety outlet system is approved for a 10 A continuous load. Higher loads can damage or even destroy the device.

   Ensure that the load meets the values specified in the specifications document.
2. Plug in the power cable of the DUT into the DUT power plug of the R&S NPA-Zx test adapter.
3. To configure and execute a measurement, continue as described in the examples under Section 6, "Trying out the instrument", on page 42.

See also the installation instructions of the R&S NPA-Zx test adapter.

4.11 Switching on or off

For safety reason, switch off the mains switch when the R&S NPA is not in use.

To switch on the R&S NPA

The instrument is off but connected to power, see Section 4.7, "Connecting to power", on page 23.

1. Set the AC power supply switch on the rear panel to position [I].

   The LED of the standby key lights red, see Section 5.1.2.4, "POWER On/ Standby key", on page 37.

2. Press the standby key on the front panel.

   The LED of the standby key turns off. The instrument performs a system check, boots the operating system, and starts the firmware.

   At restart, the R&S NPA starts up in the operating mode used before the last switch-off.

   Note: Initially, the R&S NPA displays a help screen.

3. To hide the help screen, press the key next to the "Hide" softkey on the front panel.

   Tip: The "Hide Forever" softkey deactivates the automatic display of the help screen when starting the instrument.

To shut down the product

► Press the standby key.

All current settings are saved and the operating system shuts down. The LED of the standby key changes to red.

To disconnect from power

The product is in the standby state.

1. **NOTICE!** Risk of data loss. If you disconnect the product from power when it is in the ready state, you can lose settings and data. Shut it down first.

   Set the switch on the power supply to position [0].

   The LED of the standby key is switched off.

2. Disconnect the product from the power source.

4.12 Configuring the initial instrument settings

Basically, you can start working with the R&S NPA without any special initial settings. If necessary, you can set the internal clock to the current date and time when you put it into operation the first time.

This section describes how to set up date the R&S NPA initially. For further basic instrument settings, see the R&S NPA user manual.

To set date and time of the instrument internal clock

1. Press the [SETUP] key on the front panel.
2. In the setup softkey menu, press the "Misc" softkey.

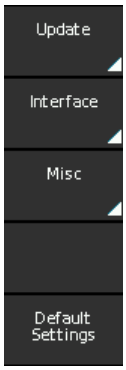


Figure 4-4: Setup softkey menu

3. In the miscellaneous menu, select the "Date & Time" softkey.

   The "Set Date & Time" dialog opens. It indicates the date and time of the internal clock. Yellow digits are editable.
4. Turn the [rotary knob] to increase or decrease, e.g., the "<year>" digits.
5. Press the [rotary knob] to confirm the setting.
6. Select the following digits with the right [▸] arrow key.
7. Repeat steps (step 4 to step 6) to complete the date and time setting.

8. Press the [rotary knob] to confirm the setting.

   The R&S NPA uses the information for assigning a time stamp to saved measurement readings and printed outputs during operation.

5 Instrument tour

The instrument tour provides an overview of the front control elements and connectors of the R&S NPA instrument models.

The meanings of the labels on the R&S NPA are described in Section 1.2, "Labels on the R&S NPA power analyzers", on page 10.

5.1 Front view

Depending on the R&S NPA instrument model, some of the connectors and control elements are not available.

Figure 5-1 shows the front view of the R&S NPA101 power meter instruments. The power meter has no sensor input connectors.

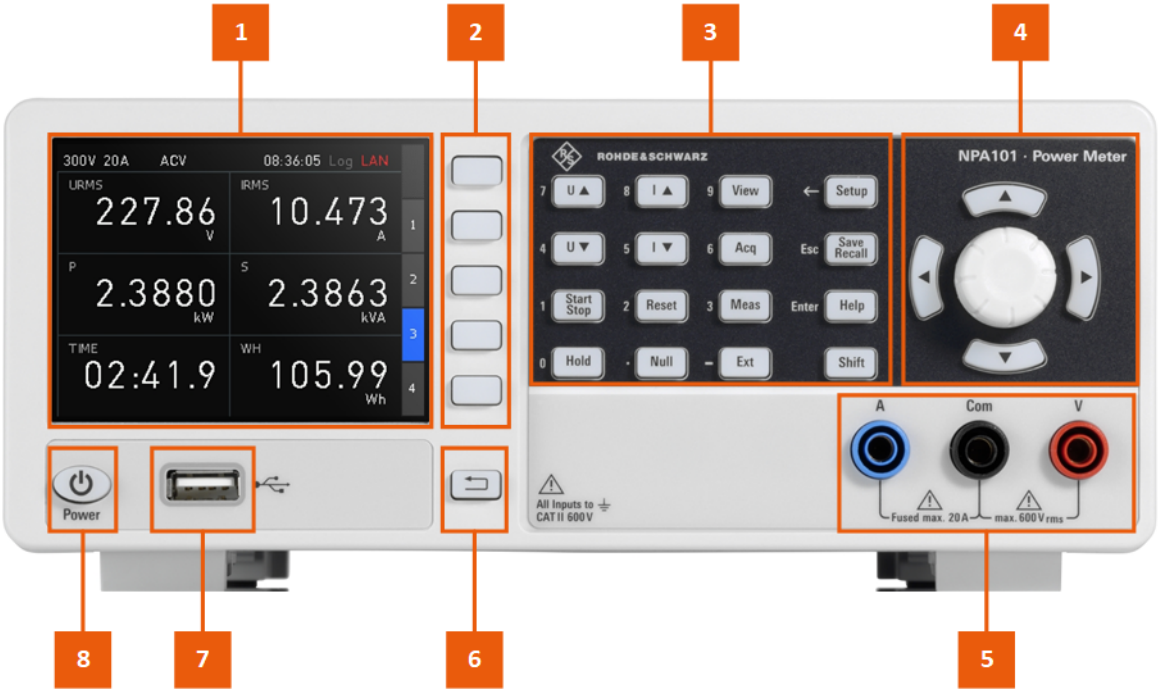


Figure 5-1: Front view of the R&S NPA101

1 = Display
2 = Section 5.1.2.1, "Interactive softkeys", on page 35
3 = Section 5.1.2.2, "System and function keys", on page 35
4 = Section 5.1.2.3, "Navigation controls", on page 36.
5 = Measurement input connectors, see "Measurement connectors" on page 37

6 = Back key, see Section 5.1.2.3, "Navigation controls", on page 36
7 = USB connector, see "USB A" on page 37
8 = Section 5.1.2.4, "POWER On/Standby key", on page 37

Figure 5-2 represents the R&S NPA701(-G) and also the R&S NPA501(-G) power analyzer as the front views of both instument models are the same.

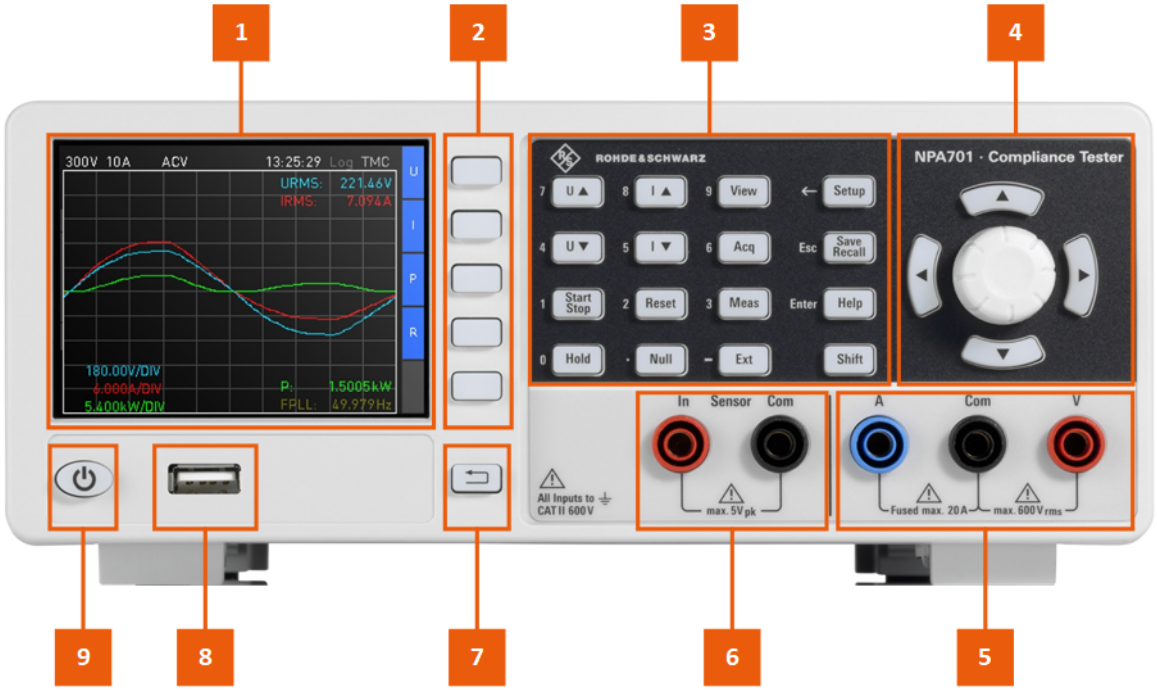


Figure 5-2: Front view of the R&S NPA701(-G) and R&S NPA501(-G)

1 = Display
2 = Section 5.1.2.1, "Interactive softkeys", on page 35
3 = Section 5.1.2.2, "System and function keys", on page 35
4 = Section 5.1.2.3, "Navigation controls", on page 36.
5 = Measurement input connectors, see "Measurement connectors" on page 37
6 = Sensor input connectors, see "Sensor connectors" on page 37
7 = Back key, see Section 5.1.2.3, "Navigation controls", on page 36
8 = USB connector, see "USB A" on page 37
9 = Section 5.1.2.4, "POWER On/Standby key", on page 37

5.1.1 Display

The color display indicates the measurement readings and dialogs for configuring the instrument and measurement settings. The screen display provides status and setting information and allows you to access functions and settings with the interactive softkeys.

See Section 7.2.1, "Understanding the display information", on page 47.

5.1.2 Keys

This section describes briefly the functionality of the controls. For information on how to operate the instrument, see Section 7.2, "Means of manual interaction", on page 46.

5.1.2.1 Interactive softkeys

The interactive softkeys to the right of the display provide access to submenus and functions of the instrument, depending on the selected view.

5.1.2.2 System and function keys

System and function keys provide access to the instrument settings and functions.

Table 5-1: Measurement parameter keys

Key	Assigned functions
[U ▲][1)] [U ▼][1)]	Increase or decrease the voltage range manually in predefined steps.
[I ▲][1)] [I ▼][1)]	Increase or decrease current range manually in predefined steps.
[VIEW]	Switches between the display modes. The supported views depend on the instrument models: • numerical views: R&S NPANPA101, R&S NPA501(-G) and R&S NPA701(-G) • graphical views: R&S NPA501(-G) and R&S NPA701(-G)
[ACQ]	Opens the data acquisition menu to configure how the instrument acquires measurement data.
[START/STOP]	Starts/stops the energy counter.
[HOLD]	Stops the update of measurement values.
[RESET]	Resets the energy counter.
[NULL]	Sets the current display values as zero reference values and displays deviations.

Key	Assigned functions
[MEAS]	Opens the measurement menu to select the measurement mode. The supported measurement modes depend on the instrument models: • "Integrator" and "Logging": R&S NPA101, R&S NPA501(-G), R&S NPA701(-G) • "Limit": R&S NPA501(-G), R&S NPA701(-G) • Standards: R&S NPA701(-G)
[EXT]	Depends on instrument models: • R&S NPA101: not supported, the instrument beeps on using the key • R&S NPA501(-G), R&S NPA701(-G): Opens the external measurement menu to configure the settings when using external probes.
[1] Pressing and holding the key activates the automatic adjustment ("AUTORANGE") of the measurement range. You can activate autorange for the acqusition parameters U and I separately.	

Table 5-2: Utility keys

Key	Assigned functions
[SETUP]	Opens the menu to configure general instrument settings.
[SAVE/RECALL][2]	Saves and loads instrument settings and provides access to configure the screenshot functionality.
[HELP]	Displays integrated help topics.
[SHIFT]	Activates the numeric keypad for setting when applicable.
[2] Pressing and holding the key saves the screenshot to a USB memory device, if connected.	

5.1.2.3 Navigation controls

The navigation controls include a rotary knob, arrow keys, and the back key. The arrow keys light up, when you can use them and the rotary knob for your settings. They allow to navigate within the main view, menus and dialogs, see "Navigation controls" on page 49.

Table 5-3: Navigation controls

Key	Assigned functions
[Rotary knob]	Pressing the knob opens or confirms a setting. Turning the knob allows to adjust a setting, e.g. in an on-screen value list.
[▲] / [▼] / [▲] / [▼][2)]	Navigate up, down, right or left to select settings, when navigation is available.
[back]	Returns to the previous menu level or closes a view.

5.1.2.4 POWER On/Standby key

The [On/Standby] key switches the instrument from the standby to the ready state or vice versa. In standby state, the LED of the [On/Standby] key lights red.

See Section 4.11, "Switching on or off", on page 30.

5.1.3 Connectors

The measurement input connectors and the USB connector are on the front panel.

Measurement connectors
Measurement input connectors.

4 mm safety sockets:
- A: Input for current measurement.
- COM: Common (shared) ground for voltage and current measurement.
- V: Input for voltage measurement.

Sensor connectors
Instrument models R&S NPA501(-G) / R&S NPA701(-G)

Sensor input connectors used for measurements with external shunts or current clamps.

4 mm safety sockets:
- IN: Input for external shunt or current probes.
- COM: Measurement ground for voltage and current measurement.

USB A
USB type A connector, to connect a memory device.

5.2 Rear view

This section provides an overview of the connectors on the rear panel of the instrument. For technical data of the connectors, refer to the specifications document.

Figure 5-3 shows the rear panel view of the R&S NPA101 power meter instruments. The power meter has no IEC 625/IEEE 488 interface and no analog and digital connectors.

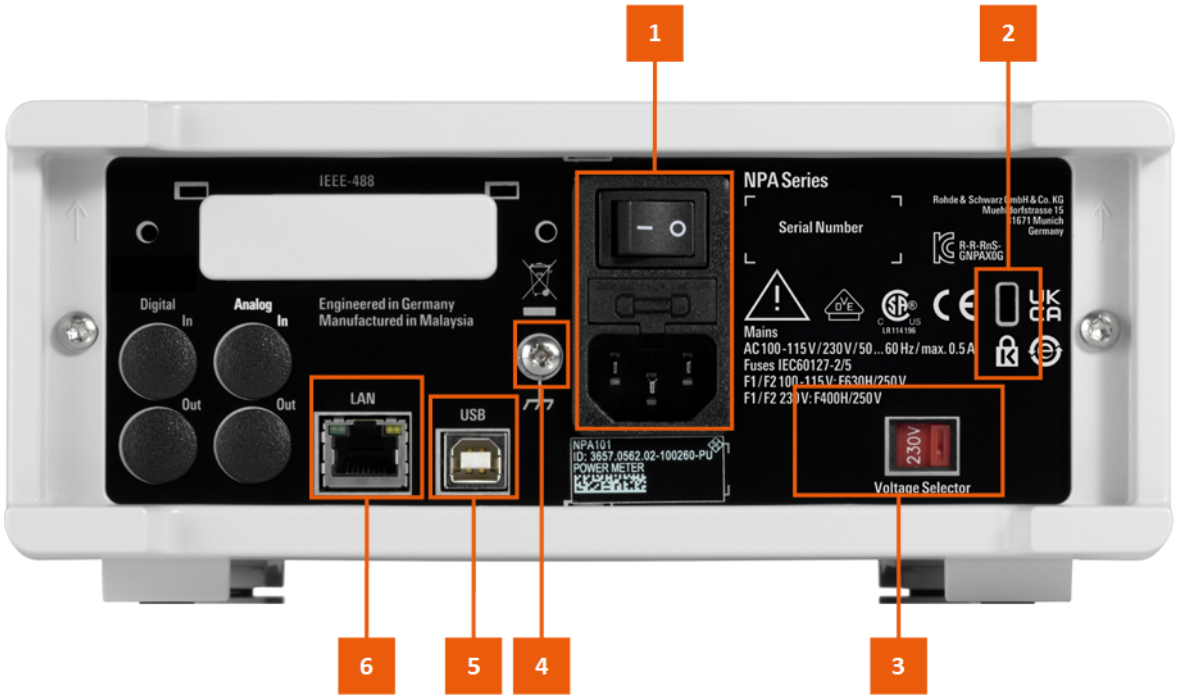


Figure 5-3: Rear view of the R&S NPA101

1 = "AC power supply" on page 40
2 = "Kensington lock" on page 41
3 = "AC power supply voltage selector switch" on page 40
4 = "Ground terminal" on page 40
5 = USB host connector, see "USB B" on page 40
6 = Ethernet (LAN) interface, see "LAN" on page 40

Figure 5-4 represents the R&S NPA701(-G) and also the R&S NPA501(-G) power analyzer as both instument models providee the same interfaces and connectors.

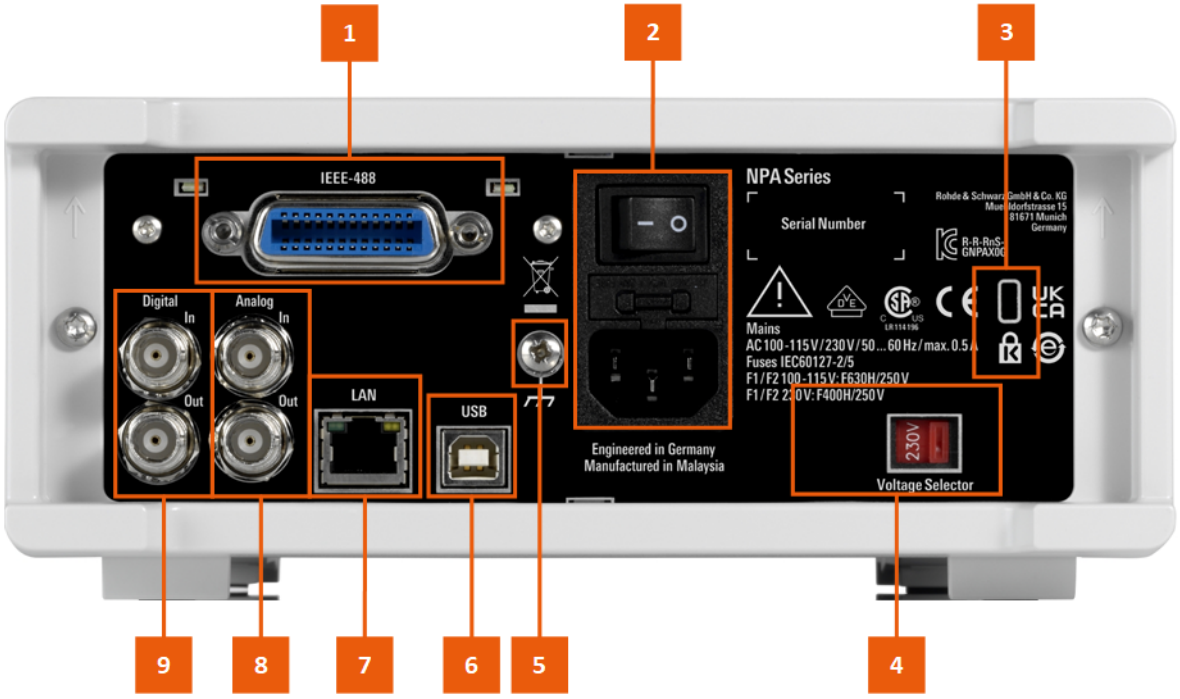


Figure 5-4: Rear view of the R&S NPA501(-G) and R&S NPA701(-G)

1 = IEEE 488 (GPIB) interface (instrument models R&S NPA501-G, R&S NPA701-G), see "IEC 625/IEEE 488" on page 40
2 = "AC power supply" on page 40
3 = "Kensington lock" on page 41
4 = "AC power supply voltage selector switch" on page 40
5 = "Ground terminal" on page 40
6 = USB host connector, see "USB B" on page 40
7 = Ethernet (LAN) interface, see "LAN" on page 40
8 = "ANALOG IN, ANALOG OUT" on page 39
9 = "DIGITAL IN, DIGITAL OUT" on page 39

5.2.1 Connectors

DIGITAL IN, DIGITAL OUT
Instrument models R&S NPA501(-G), R&S NPA701(-G)

Connectors for digital inputs and outputs, e.g. to display "Pass/Fail" status information. At the digital output, you can apply a limit value.

ANALOG IN, ANALOG OUT
Instrument models R&S NPA501(-G), R&S NPA701(-G)

Connectors for analog inputs and outputs, e.g. to display "Pass/Fail" status information. At the analog output, you can apply a limit value.

IEC 625/IEEE 488
Instrument models: R&S NPA501-G, R&S NPA701-G

GPIB (general purpose interface bus) interface to connect a computer for remote control of the R&S NPA. To set up the connection, use high-quality shielded cables.

See section "Network operation and remote control" in the user manual.

LAN
RJ-45 connector to connect the R&S NPA to a LAN (local area network) for remote control, remote operation, and data transfer.

How to: Section 4.8, "Connecting to LAN", on page 24

USB B
USB type B connector, to connect a computer for remote control of the R&S NPA.

See section "Network operation and remote control" in the user manual.

Ground terminal
Protective ground socket to secure the R&S NPA, e.g. with a grounded external conductor.

See Section 1.2, "Labels on the R&S NPA power analyzers", on page 10.

AC power supply
Mains power supply with power switch, fuse holder and IEC socket.

- Mains power switch:
  Switch for connecting and disconnecting the internal power supply from the power source, see Section 4.11, "Switching on or off", on page 30.
- Fuse holder
  Socket for the fuse securing the line voltage. Depending on the power supply system, the corresponding fuse must be plugged before connecting to power. See Section 4.7, "Connecting to power", on page 23.
- IEC socket
  Power supply connector for connecting the R&S NPA to the mains, see Section 4.7, "Connecting to power", on page 23.

AC power supply voltage selector switch
Switch for selecting the line voltage 115 V or 230 V.

How to: Section 4.7, "Connecting to power", on page 23.

Kensington lock

Flat key security slot to prevent the instrument from removal.

A Kensington lock system consists of a small, metal-reinforced hole combined with a metal anchor attached to a rubberized metal cable secured with a key lock. The end of the cable has a small loop that allows the cable to be looped around a permanent object, such as a heavy table or other similar equipment.

6 Trying out the instrument

The R&S NPA power analyzers provide manually settable measurements, and automated test procedures. The automated test procedures comply with the requirements of specific standards for power measurement and analysis. The following examples introduce step by step a typical power measurement with any model of the R&S NPA power analyzers, and an automated compliance test with an R&S NPA701 instrument, supported by the verification wizard.

For the description of the complete functionality of the R&S NPA, see the R&S NPA power analyzers user manual. For basic instrument operation, see Section 7, "Instrument control", on page 46.

Prerequisites:

- The R&S NPA is set up, connected to power and started up as described in Section 4.4, "Setting up the product", on page 18.
- The measurement is set up with the DUT connected to the R&S NPA-Zx test adapter, as described in Section 4.10, "Connecting a device under test (DUT)", on page 27.

Measuring the power characteristics of a load

This measurement example describes a typical numeric measurement application of the R&S NPA101 power meter. The example leads you through the steps to be taken to measure and view the readings in numeric mode. It shows, how to select the parameters for the display individually, and how to export the results of the measurement for evaluating, e.g. on a PC application.

To start the measurement

1. Set the instrument to default to start from an initial state:
   a) Press the [SETUP] key on the front panel.
   b) In the setup menu, select the "Default Settings" softkey.

   The instrument displays the "Help" topic with short instructions on the setting, e.g. the numeric mode.
2. Select the "Hide" softkey to close the "Help" topic.
3. Press the [VIEW] key.
4. Select the "Numeric" softkey.

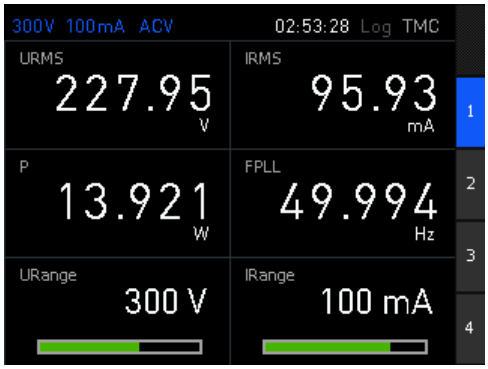


Figure 6-1: Numeric view

The instrument starts the measurement immediately and updates the measurement readings continuously.
The numeric display shows the readings of six measurement parameters, as listed in Table 6-1.

Table 6-1: Parameters displayed in numeric view

Parameter	Description (unit)	Parameter	Description (unit)
"URMS"	True RMS voltage (V)	"IRMS"	True RMS current (mA)
"P"	Active power (mW)	"FPLL"	PLL source frequency (Hz)
"URange"	Range voltage shown as bar graph (V)	"IRange"	Range current shown as bar graph (mA)

To save and export measurement results

To keep measurement results for evaluation, you can save current measurement readings as screenshots to an external USB memory device. This example briefly shows how to save a snapshot of a measurement result.

To record measurement readings over a certain period of time, use the logging function, as described in the user manual.

The USB connector is on the front panel.

To create and save a snapshot:

1. Plug in a USB memory stick.
2. Press the "HOLD" key.
   The R&S NPA freezes the current display.
3. Press and hold the [SAVE/RECALL] key.

The instrument indicates the saving process until it is completed.
The R&S NPA creates a generic file name and saves the file on the memory device with the extension `*.png`.

To save instrument settings

The R&S NPA can save instrument settings and screenshots. It saves screenshots always on an external USB memory stick, to save instrument settings select either the internal non-volatile memory or the USB stick.

The USB connector is on the front panel.

To create and save a snapshot:

1. Plug in a USB memory stick.
2. Press the [SAVE/RECALL] key on the front panel.
3. Press the "Device Settings" softkey.

Figure 6-2: Device settings softkey

4. Select "Save" to open the save to memory dialog.

Figure 6-3: Save softkey

5. Select the memory location, e.g. "STORAGE" > "Front USB".
6. Confirm with "Accept".
7. Press the "FILE NAME" softkey.

Figure 6-4: File name softkey

The system file manager dialog opens.

8. Assign a filename, if needed.
   For settings, the R&S NPA assigns the default filename `SETxxxx`. "xxxx" refers to an incremental index starting from "0001".
9. Select the "Comment" softkey to add a comment.

Figure 6-5: Comment softkey

   The comment appears in the footer of the file manager when the file is selected.
10. Confirm with "Accept".
11. Press the "Save" softkey.

    The R&S NPA saves the instrument settings in binary (HDS) format.

7 Instrument control

This section provides an overview on how to work with the R&S NPA. It introduces the possibilities for operating the instrument and describes the basic functionality of the control elements.

- Ways to operate the instrument 46
- Means of manual interaction 46
- Remote control 53

7.1 Ways to operate the instrument

You can operate an R&S NPA in two ways:

- Manual operation
  Use the front panel controls to configure your measurement. The description under Section 7.2, "Means of manual interaction", on page 46 shows how to operate the instrument manually.
- Remote control
  Create programs to automate repeating settings, tests and measurements. A controller PC with remote access to the instrument runs the programs.
  See Section 7.3, "Remote control", on page 53 for an overview of the interfaces provided for remote control.

7.2 Means of manual interaction

To configure the R&S NPA manually, use the front panel controls, see Section 5.1, "Front view", on page 33. The display shows the current settings and measurement results. Interactive softkeys lead you to menus, dialogs and settings.

- Understanding the display information 47
- Accessing the functionality 48
- Accessing menus and dialogs 50
- Entering data 51

7.2.1 Understanding the display information

At the top of the display, the R&S NPA shows a status bar. It indicates the set voltage and current measuring ranges, information on the measurement mode and general settings, e.g. the selected interface. On the right-hand side of the screen layout, an interactive softkey menu provides access to the selected measurement functions and settings.

The result field depends on the selected view and the measurement mode. It shows readings either numerically, bar graphs or waveform signals graphically.

Figure 7-1 shows the display of the numeric mode as an example.

For detailed information, see the user manual, section "Display Modes".

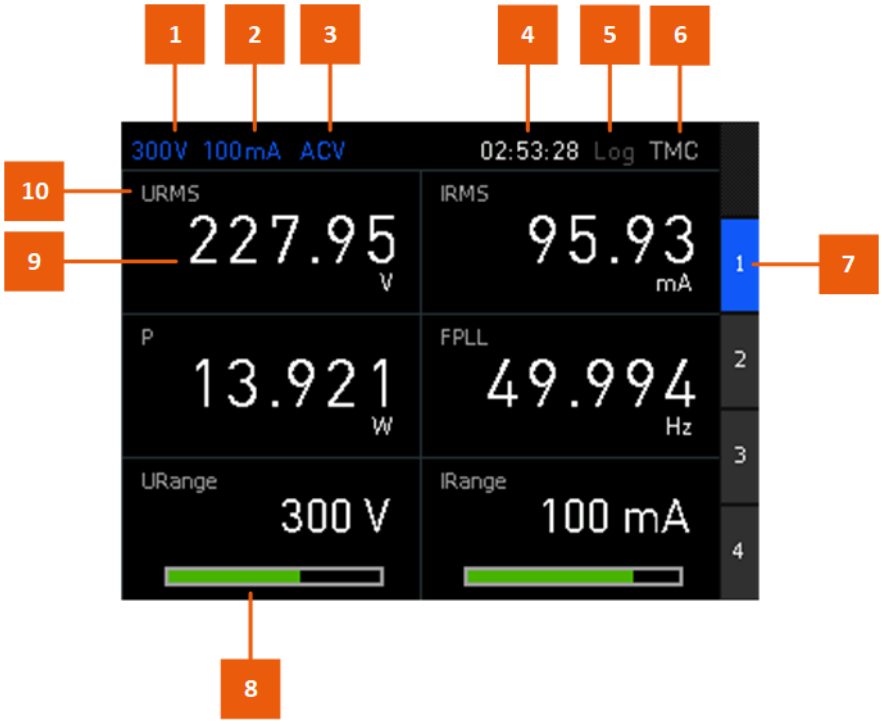


Figure 7-1: Example of screen display in numeric mode

1 = Voltage measuring range
2 = Current measuring range
3 = Acquisition mode
4 = System time / integrator duration (when enabled)
5 = Logging enabled (green)/disabled (white)
6 = Active interface: TMC/VCP/LAN/GPIB
7 = Softkeys, in this example to switch between the four available pages of numeric measurements

8 = Measuring range and limits shown as bar graph ("URange"/"IRange" function)
9 = Measurement reading with unit
10 = Measurement parameter

Display indicators and characteristics

Additional display indicators and characteristics:

- General color coding:
  - White: measurement readings, parameter labels, parameter settings in the status bar when manually selected, setting dialogs and functions
  - Blue: parameter settings in the status bar if automatic selection is enabled, softkey switches
  - Orange: selected softkeys, settings in edit mode
  - Yellow: general information and messages
  - Green: messages and settings parameter names, settings in the status bar
  - Red: warnings, notifications on inactive connections and settings
- Selected parameters have a blue background, the inactive counterparts are indicated with a gray background.
- "---" dashes on the display indicate that the R&S NPA could not determine a value.
- "-OL-" on the display indicate that the measured value exceeds the currently selected voltage or current measurement range.
- symbol indicates the operation with the rotary knob.
- If the NULL function is activated, the R&S NPA displays deviations to the selected reference value on the screen.
- "Fallback" time, an adjustable time period:
  When this time period has elapsed, the instrument either closes a setting dialog, returns to a previous dialog or assigns a certain setting automatically without having confirmed manually.
  Settings in menus are not affected by the fallback time.

7.2.2 Accessing the functionality

The R&S NPA provides all functionalities by function keys, interactive softkeys and the navigation controls on the front panel. This section describes the basic operation for manual interaction with the instrument.

System and function keys

System and function keys include the measurement function keys (see Table 5-1) and utility keys (see Table 5-2). Measurement parameter keys enable you to select and to configure the measurement and to select the results display. A selected measurement key lights up, indicating that the function is active. With the utility keys, you can configure general instrument settings, manage data and configuration files and get help information directly on the instrument.

Numeric keypad

The numeric keypad,

Pressing the [SHIFT] key, the R&S NPA switches the measurement function keys to a numeric keypad to enter values for some parameters directly. The key remains lighting while the numeric keypad is active.

With the numeric keypad, you can perform the commonly known actions:

- Insert numbers [0]...[9]
- Insert a decimal point [.]
- Insert negative numbers with the [-] minus key
- Delete a digit [←] (backspace)
- Abort with [EXT]
- Confirm with [ENTER]

A value entered with the numeric keypad must to be confirmed to apply the setting. Press either the [ENTER] key, the rotary knob or select one of the proposed units with the softkeys.

Interactive softkeys

The interactive softkeys lead to submenus and functions. They allow you to set states directly or access further settings lists or menus. The instrument assigns the setting options for selection next to the softkeys on the right of the screen.

If a specific setting is in the current configuration not available, the softkey is grayed out and blocked.

Navigation controls

The navigation controls include a rotary knob and arrow keys. They allow you to navigate within a setting, menus or dialogs.

- Rotary knob

The rotary knob has several functions:

- Moves the selection, e.g. to a parameter in a settings dialog by turning clockwise or counterclockwise.
- Activates the edit mode of a parameter when pressed.
- Increments (by turning clockwise) or decrements (counterclockwise) a numeric parameter at a defined step size.
- Acts like the [Enter] key when pressed.

- Arrow keys
  - Move the selection up and down, or forward and backward, e.g. to a parameter in a settings dialog.
  - Return to a previous menu level (left arrow key).
  - In a numeric input field, increase or decrease the value, or navigate to the next or previous position.
- Back ⮌ key

  The actions triggered by pressing this key vary, depending on where you press the key:
  - In menus:
    Returns to a previous level (similar to the left arrow key). The menu closes when you go back from the first menu level.
  - On the screen display:
    Resets an activated function, e.g. the edit mode.
  - "Harmonics", "Waveform", "Trendchart" and "Inrush" modes, available for instrument models R&S NPA501(-G), R&S NPA701(-G):
    Toggles the softkey menu: folds down the softkey menu to a narrow menu bar. The bar displays the settings in abbreviated form, but still provides quick access to change a setting with the corresponding softkey. Folded out, the softkey menu indicates the parameters and settings in the usual menu size.

7.2.3 Accessing menus and dialogs

All functions have the settings and parameters assigned to softkey menus. Use the corresponding softkey on the front panel for accessing submenus and settings.

Throughout the description, the term "menu" refers to selection lists for softkeys and settings, and the term "dialog" refers to editable windows in the instrument.

To open a menu

1. Press a function key on the front panel.

   The R&S NPA displays the softkey menu of the selected function. The white arrow tag at the bottom of a softkey indicates that you can access further settings in a submenu.

2. Press the interactive softkey to open the corresponding function.

   The selection leads you either to the settings parameters directly, or to further softkey submenus.

3. To access the next submenu, press the corresponding softkey.

To close or exit a dialog or menu

► Press the ⮌ [back] on the front panel.

  The instrument returns to the previous menu level or exits the menu mode if it is already at the main menu level.

7.2.4 Entering data

Depending on the settings, you can enter data either with the [rotary knob] or the [SHIFT] key and the numeric keypad on the front panel.

7.2.4.1 Entering numeric parameters

If the input field requires numeric input, you can use the [rotary knob] and the [arrow] keys on the front panel to enter a value. Alternatively, you can use the [SHIFT] key and the numeric keypad on the front panel.

To correct a value

1. Rotate the rotary knob to increase (clockwise direction) or to decrease (counterclockwise direction) to the required value.
2. Alternatively, use the [SHIFT] key on the front panel for setting the numeric value directly.
3. Press the rotary knob to confirm the setting.

7.2.4.2 Entering alphanumeric data

For input of texts, e.g., file names or designators, the R&S NPA provides an embedded standard editor with an alphanumerical keyboard.

Use the standard editor to perform the following actions:

- Assign names for specific settings, e.g. the instrument name.
- Define a directory or folder.
- Save the settings files.
- Save measurement data files.

To enter a text

The header of the editor shows a generic label, starting with "Enter..." and the parameter you want to enter, e.g. "Enter file name".

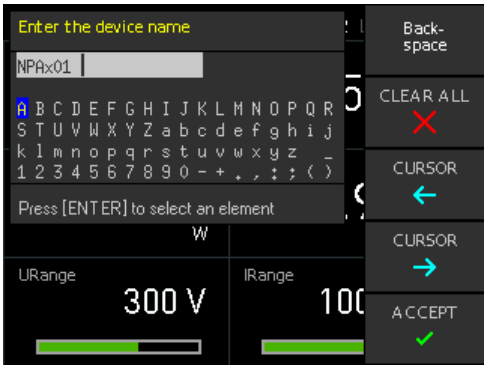


Figure 7-2: Generic standard editor

1. In the "Enter ..." dialog, select a character with the rotary knob.
2. Confirm with the [ENTER] key.
3. Repeat the steps until you have completed the name.
4. For navigation, use the controls in the softkey menu on the right:
   - The "Backspace" softkey deletes the character to the left of the cursor.
   - "Default" assigns the name automatically containing an abbreviated designation and a generic number.
   - "CURSOR ←", "CURSOR →" moves the cursor to the left or to the right.
   - "Accept" confirms the entry and closes the editor.

7.3 Remote control

In addition to operating the R&S NPA directly on the instrument, it is also possible to operate and control it from a remote PC.

Remote control interfaces

The R&S NPA provides several interfaces for remote control:

- Ethernet (LAN) interface
- USB standard interface
- IEE-488 bus interface (GPIB) (instrument model R&S NPAxxx-G)

How to:

- Configure the remote control interfaces, see the user manual, see section "Network and remote control operation"
- Set up LAN connection for remote control, see Section 4.8, "Connecting to LAN", on page 24 for an example on how to set up LAN connection for remote control.
- Start remote operation, see "Network operation and remote control > Remote access settings > starting and stopping remote control" in the user manual

8 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 8-1: QR code to the Rohde & Schwarz support page

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