

# R&S® NGL200 Power Supply Getting Started



1178872002



Getting Started

Version 02

Distributed by:



dataTec • Ferdinand-Lassalle-Str. 52 • 72770 Reutlingen • Tel. 07121 / 51 50 50 • Fax 07121 / 51 50 10 • info@datatec.de • www.datatec.de

This manual describes the following R&S®NGL200 models and options:

- R&S®NGL201 1 Channel PSU 60W (3638.3376.02)
- R&S®NGL202 2 Channel PSU 120W (3638.3376.03)
- R&S®NGL-K102 Option Wireless LAN (3652.6362.02)
- R&S®NGL-B105 Option GPIB Interface (3652.6356.02)
- R&S®NGL-K106 Option Battery Simulation (3652.6255.02)
- R&S®NGL-K103 Option Digital I/O (3652.6385.02)

The contents of this manual correspond to firmware version 1.00 or higher.

The software contained in this product uses several valuable open source software packages. For information, see the "Open Source Acknowledgment" document, which is available for download from the R&S NGL200 product page at [www.rohde-schwarz.com/product/ngl200](http://www.rohde-schwarz.com/product/ngl200) > "Downloads > Firmware". Rohde & Schwarz would like to thank the open source community for their valuable contribution to embedded computing.

© 2018 Rohde & Schwarz GmbH & Co. KG

Mühldorfstr. 15, 81671 München, Germany

Phone: +49 89 41 29 - 0

Fax: +49 89 41 29 12 164

Email: [info@rohde-schwarz.com](mailto:info@rohde-schwarz.com)

Internet: [www.rohde-schwarz.com](http://www.rohde-schwarz.com)

Subject to change – Data without tolerance limits is not binding.

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG.

Trade names are trademarks of the owners.

1178.8720.02 | Version 02 | R&S®NGL200

Throughout this manual, products from Rohde & Schwarz are indicated without the ® symbol, e.g. R&S®NGL200 is indicated as R&S NGL200.

# Safety Instructions

## Instrucciones de seguridad

### Sicherheitshinweise

### Consignes de sécurité

---

#### **WARNING**

##### **Risk of injury and instrument damage**

The instrument must be used in an appropriate manner to prevent electric shock, fire, personal injury or instrument damage.

- Do not open the instrument casing.
  - Read and observe the "Basic Safety Instructions" delivered as printed brochure with the instrument.
  - Read and observe the safety instructions in the following sections. Note that the data sheet may specify additional operating conditions.
  - Keep the "Basic Safety Instructions" and the product documentation in a safe place and pass them on to the subsequent users.
- 

#### **ADVERTENCIA**

##### **Riesgo de lesiones y daños en el instrumento**

El instrumento se debe usar de manera adecuada para prevenir descargas eléctricas, incendios, lesiones o daños materiales.

- No abrir la carcasa del instrumento.
  - Lea y cumpla las "Instrucciones de seguridad elementales" suministradas con el instrumento como folleto impreso.
  - Lea y cumpla las instrucciones de seguridad incluidas en las siguientes secciones. Se debe tener en cuenta que las especificaciones técnicas pueden contener condiciones adicionales para su uso.
  - Guarde bien las instrucciones de seguridad elementales, así como la documentación del producto, y entréguelas a usuarios posteriores.
-



## **WARNUNG**

### **Gefahr von Verletzungen und Schäden am Gerät**

Betreiben Sie das Gerät immer ordnungsgemäß, um elektrischen Schlag, Brand, Verletzungen von Personen oder Geräteschäden zu verhindern.

- Öffnen Sie das Gerätegehäuse nicht.
  - Lesen und beachten Sie die "Grundlegenden Sicherheitshinweise", die als gedruckte Broschüre dem Gerät beiliegen.
  - Lesen und beachten Sie die Sicherheitshinweise in den folgenden Abschnitten; möglicherweise enthält das Datenblatt weitere Hinweise zu speziellen Betriebsbedingungen.
  - Bewahren Sie die "Grundlegenden Sicherheitshinweise" und die Produktdokumentation gut auf und geben Sie diese an weitere Benutzer des Produkts weiter.
- 



## **AVERTISSEMENT**

### **Risque de blessures et d'endommagement de l'appareil**

L'appareil doit être utilisé conformément aux prescriptions afin d'éviter les électrocutions, incendies, dommages corporels et matériels.

- N'ouvrez pas le boîtier de l'appareil.
  - Lisez et respectez les "consignes de sécurité fondamentales" fournies avec l'appareil sous forme de brochure imprimée.
  - Lisez et respectez les instructions de sécurité dans les sections suivantes. Il ne faut pas oublier que la fiche technique peut indiquer des conditions d'exploitation supplémentaires.
  - Gardez les consignes de sécurité fondamentales et la documentation produit dans un lieu sûr et transmettez ces documents aux autres utilisateurs.
-

# Customer Support

## Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

## Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish.

We will take care that you will get the right information.

### Europe, Africa, Middle East

Phone +49 89 4129 12345  
[customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com)

### North America

Phone 1-888-TEST-RSA (1-888-837-8772)  
[customer.support@rsa.rohde-schwarz.com](mailto:customer.support@rsa.rohde-schwarz.com)

### Latin America

Phone +1-410-910-7988  
[customersupport.la@rohde-schwarz.com](mailto:customersupport.la@rohde-schwarz.com)

### Asia/Pacific

Phone +65 65 13 04 88  
[customersupport.asia@rohde-schwarz.com](mailto:customersupport.asia@rohde-schwarz.com)

### China

Phone +86-800-810-8228 /  
+86-400-650-5896  
[customersupport.china@rohde-schwarz.com](mailto:customersupport.china@rohde-schwarz.com)



# Contents

<b>1 Documentation Overview.....</b>	<b>5</b>
1.1 Manuals and Instrument Help.....	5
1.2 Data Sheet.....	6
1.3 Release Notes and Open Source Acknowledgment.....	6
<b>2 Conventions Used in the Documentation.....</b>	<b>7</b>
2.1 Typographical Conventions.....	7
2.2 Conventions for Procedure Descriptions.....	7
2.3 Notes on Screenshots.....	8
2.4 Other Conventions.....	8
<b>3 Welcome to R&amp;S NGL200.....</b>	<b>9</b>
<b>4 Putting into Operation.....</b>	<b>10</b>
4.1 Safety.....	11
4.2 Intended Operation.....	13
4.3 Unpacking and Checking the Instrument.....	14
4.4 Setting Up the Instrument.....	15
4.4.1 Bench Operation.....	15
4.4.2 Rack Mounting.....	16
<b>5 Instrument Tour.....</b>	<b>17</b>
<b>5.1 Overview of Controls.....</b>	<b>17</b>
5.1.1 Front Panel.....	17
5.1.2 Rear Panel.....	19
<b>5.2 Switching On the Instrument.....</b>	<b>21</b>
<b>6 Trying Out the Instrument.....</b>	<b>23</b>
6.1 Setting the Output Voltage and Current.....	23

**6.2 Activating the Channels Output..... 23**

**7 Maintenance..... 25**

**Index..... 26**

# 1 Documentation Overview

This section provides an overview of the R&S NGL200 user documentation.

## 1.1 Manuals and Instrument Help

You find the manuals on the product page at:

[www.rohde-schwarz.com/product/ngl200](http://www.rohde-schwarz.com/product/ngl200)

### Getting started manual

Introduces the R&S NGL200 and describes how to set up the product. A printed English version is included in the delivery.

### 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 *online version* of the user manual provides the complete contents for immediate display on the internet.

### Basic safety instructions

Contains safety instructions, operating conditions and further important information. The printed document is delivered with the instrument.

### 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, <https://gloris.rohde-schwarz.com>).



## 1.2 Data Sheet

The data sheet contains the technical specifications of the R&S NGL200. It also lists the options with their order numbers and optional accessories.

See [www.rohde-schwarz.com/brochure-datasheet/ngl200](http://www.rohde-schwarz.com/brochure-datasheet/ngl200)

## 1.3 Release Notes and Open Source Acknowledgment

The release notes list new features, improvements and known issues of the current firmware version, and describe the firmware installation. The open source acknowledgment document provides verbatim license texts of the used open source software.

See [www.rohde-schwarz.com/firmware/ngl200](http://www.rohde-schwarz.com/firmware/ngl200). The open source acknowledgment document can also be read directly on the instrument.

## 2 Conventions Used in the Documentation

### 2.1 Typographical Conventions

The following text markers are used throughout this documentation:

Convention	Description
"Graphical user interface elements"	All names of graphical user interface elements on the screen, such as dialog boxes, menus, options, buttons, and softkeys are enclosed by quotation marks.
[Keys]	Key and knob names are enclosed by square brackets.
File names, commands, program code	File names, commands, coding samples and screen output are distinguished by their font.
<i>Input</i>	Input to be entered by the user is displayed in italics.
<a href="#">Links</a>	Links that you can click are displayed in blue font.
"References"	References to other parts of the documentation are enclosed by quotation marks.

### 2.2 Conventions for Procedure Descriptions

When operating the instrument, several alternative methods may be available to perform the same task. In this case, the procedure using the touchscreen is described. Any elements that can be activated by touching can also be clicked using an additionally connected mouse. The alternative procedure using the keys on the instrument or the on-screen keyboard is only described if it deviates from the standard operating procedures.

The term "select" may refer to any of the described methods, i.e. using a finger on the touchscreen, a mouse pointer in the display, or a key on the instrument or on a keyboard.

## 2.3 Notes on Screenshots

When describing the functions of the product, we use sample screenshots. These screenshots are meant to illustrate as many as possible of the provided functions and possible interdependencies between parameters. The shown values may not represent realistic usage scenarios.

The screenshots usually show a fully equipped product, that is: with all options installed. Thus, some functions shown in the screenshots may not be available in your particular product configuration.

## 2.4 Other Conventions

Remote commands may include abbreviations to simplify input. In the description of such commands, all parts that have to be entered are written in capital letters.

Additional text in lowercase characters is for information only.

## 3 Welcome to R&S NGL200

The one or two-channel power supply series are based on a classical transformer concept with linear regulators. This concept allows the instrument to achieve highest accuracy and lowest residual ripple.

The R&S NGL200 power supply series feature galvanically isolated, floating overload and short-circuit proof outputs. The outputs can be connected in parallel and serial to get higher voltages, thus making high currents available.

Multi-purpose protection functions are available for each channel which you can set separately, such as overcurrent protection (OCP), overvoltage protection (OVP) and overpower protection (OPP). If such a limit is reached, the affected output channel is automatically turned off and an indicator icon (Ⓢ, Ⓡ, Ⓟ) blinks on the display. In the case of two-channel power supply, NGL202, the overcurrent protection can be linked to the other channel. In this case, the linked channel is turned off when the other channel reaches a limit.

Additionally, the R&S NGL200 is protected with overtemperature protection (OCP). This safety feature protects the R&S NGL200 from getting overheated, when activated, the channel outputs are turned off.

The Arbitrary function allows a freely definable voltage and current sequences with a timeframe as short as 10 ms. It allows you to vary the voltage or current limit during a test sequence, for example to simulate different charging conditions of a battery. With Ramp function, the R&S NGL200 provides the operating condition to simulate the continuous rise of the supply voltage within a defined timeframe of 10 ms to 10 s.

All R&S NGL200 power supply series are equipped with a color LCD display (800 x 480 pixels). The R&S NGL200 comes with a USB and LAN (LXI) interface. Equipped with a wireless LAN (WLAN) option, you can establish a network connection wirelessly .

The digital I/O interfaces installed at the rear panel is activated with an option, it provides a set of 4-bit digital interfaces that can be individually used as trigger inputs or outputs.

The user manual contains description of the functionalities that the instrument provides. The latest version is available for download at the product homepage (<http://www.rohde-schwarz.com/product/ngl200>).

## 4 Putting into Operation

This chapter describes the steps to set up the R&S NGL200 for the first time.

---

**⚠ WARNING****Risk of injury and instrument damage**

The instrument must be used in an appropriate manner to prevent electric shock, fire, personal injury, or damage.

- Do not open the instrument casing
- Read and observe the "Basic Safety Instructions" delivered as a printed brochure with the instrument. Note that the basic safety instructions also contain information on operating conditions that prevent damage to the instrument

In addition, read and observe the safety instructions in the following sections.

Notice that the data sheet may specify additional operating conditions.

---

---

**⚠ WARNING****Risk of radio interference**

This instrument is compliant with Class A of CISPR 32. In a residential environment, this instrument may cause radio interference.

---

**NOTICE****Risk of instrument damage during operation**

An unsuitable operating site or test setup can cause damage to the instrument and the connected devices. Ensure the following operating conditions before you switch on the instrument:

- The instrument is dry and shows no sign of condensation
- The instrument is positioned as described in [Chapter 4.4.1, "Bench Operation"](#), on page 15
- The ambient temperature does not exceed the range specified in the data sheet
- Signal levels at the input connectors are all within the specified ranges
- Signal outputs are correctly connected and not overloaded

**EMI impact on measurement results**

Electromagnetic interference (EMI) may affect the measurement results. To suppress the generated EMI:

- Use suitable shielded cables of high quality, for example, LAN cables
- Note the EMC classification in the data sheet

• <a href="#">Safety</a> .....	11
• <a href="#">Intended Operation</a> .....	13
• <a href="#">Unpacking and Checking the Instrument</a> .....	14
• <a href="#">Setting Up the Instrument</a> .....	15

## 4.1 Safety

This instrument was built in compliance with DIN EN 61010-1 (VDE 0411 part 1), safety regulations for electrical instruments, control units and laboratory equipment.

It has been tested and shipped from the plant in safe condition. It is also in compliance with the regulations of the European standard EN 61010-1 and the international standard IEC 61010-1.

To maintain this condition and ensure safe operation, you must observe all instructions and warnings given in this user manual. Casing, chassis and all measuring ports are connected to a protective earth conductor. The instrument is designed in compliance with the regulations of protection class I.

For safety reasons, the instrument may only be operated with authorized safety sockets. The power cord must be plugged in before signal circuits may be connected.

Never use the product if the power cable is damaged. Check regularly if the power cables are in perfect condition. Choose suitable protective measures and installation types to ensure that the power cord cannot be damaged and that no harm is caused by tripping hazards or from electric shock, for instance.

---

**⚠ DANGER****Risk of electric shock**

It is prohibited to disconnect the earthed protective connection inside or outside of the instrument!

---

If it is assumed that a safe operation is no longer possible, the instrument must be shut down and secured against any unintended operation.

Safe operation can no longer be assumed as follows:

- Instrument shows visible damage
- Instrument includes loose parts
- Instrument no longer functions properly
  - After an extended period of storage under unfavorable conditions (e.g. outdoors or in damp rooms)
  - After rough handling during transport (e.g. packaging that does not meet the minimum requirements by post office, railway or forwarding agency)

---

**⚠ DANGER****Exceeding the low voltage protection**

Use insulated wires and not bare wires for the terminal connection.

It is assumed that only qualified and trained personnel service the power supplies and the connected loads.

---

Prior to switching on the product, it must be ensured that the nominal voltage setting on the product matches the nominal voltage of the AC supply network. If it is necessary to set a different voltage, the power fuse of the product may have to be changed accordingly.

## 4.2 Intended Operation

The instrument is intended only for use by personnel familiar with the potential risks of measuring electrical quantities.

For safety reasons, the instrument may only be connected to properly installed wall outlets. Separating the ground is prohibited.

The power plug must be inserted before signal circuits may be connected.



Use only the power cord included in the delivery package. See "[Delivery package](#)" on page 15.

Before each measurement, measuring cables must be inspected for damage and replaced if necessary. Damaged or worn components can damage the instrument or cause injury.

---

The product may be operated only under the operating conditions and in the positions specified by the manufacturer, without the product's ventilation being obstructed. If the manufacturer's specifications are not observed, this can result in electric shock, fire and / or serious personal injury, and in some cases, death.

Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed.

The instrument is designed for use in the following sectors: Industrial, residential, business and commercial areas and small businesses.

The instrument is designed for indoor use only. Before each measurement, you need to verify at a known source if the instrument functions properly.



To disconnect from the mains, unplug the IEC socket on the back panel.

---

See [Table 4-1](#) for the general data on the instrument specification. For more information, see the instrument datasheet (PN: 5216.1057.12).



**Table 4-1: General data on instrument specification**

General data		
Mains nominal voltage	AC 100 / 115 / 230 V ( $\pm 10\%$ ) 50 Hz to 60 Hz	
Maximum input power	400 W	
Mains fuses	IEC 60127-2 / 5 T4.0H 250 V	
Operating temperature range	+5 °C to +40 °C	
Storage temperature range	-20 °C to +70 °C	
Humidity Non-condensing	5 % to 80 %	
Display	5 " (Resolution 800 x 480, WVGA)	
Input Method	Capacitive touch input	
Rack mount capability	R&S HZN96 rack adapter 2U (P/N: 3638.7813.02)	
Dimensions (W x H x D)	222 mm x 97 mm x 436 mm (8.74 in x 3.82 in x 17.17 in)	
Weight	R&S NGL201	7.1 kg (15.65 lb)
	R&S NGL202	7.3 kg (16.09 lb)

### 4.3 Unpacking and Checking the Instrument

Unpack the R&S NGL200 carefully and check the content of the package.

- Check the equipment for completeness using the delivery note and package contents list for the various items.
- Check the instrument for any damage and loose parts. If there is any damage, immediately contact the carrier who delivered the instrument.



#### **Packing material**

Retain the original packing material. If the instrument needs to be transported or shipped at a later date, you can use the material to protect the control elements and connectors.

**NOTICE****Risk of damage during transportation and shipment**

Insufficient protection against mechanical and electrostatic effects during transportation and shipment can damage the instrument.

- Always ensure that sufficient mechanical and electrostatic protection are provided
- When shipping an instrument, the original packaging should be used. If you do not have the original packaging, use sufficient padding to prevent the instrument from moving around inside the box. Pack the instrument in antistatic wrap to protect it from electrostatic charging
- Secure the instrument to prevent any movement and other mechanical effects during transportation

**Delivery package**

The package contents contain the following items:

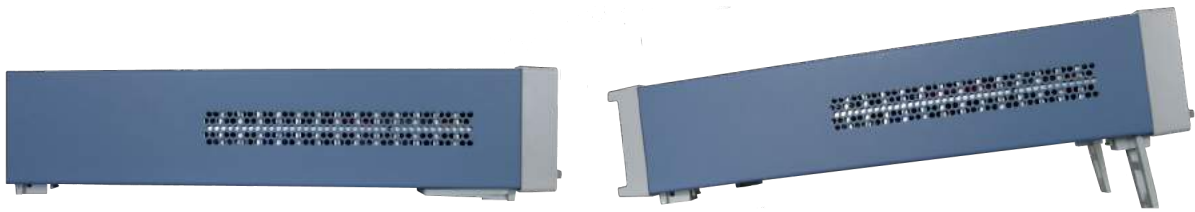
- R&S NGL200 power
- Four power cables
- One printed Getting Started manual
- One document folder containing a printed Basic Safety Instructions

## 4.4 Setting Up the Instrument

The R&S NGL200 is designed for benchtop and rackmount.

### 4.4.1 Bench Operation

On a benchtop, the R&S NGL200 can either lie flat or stand on its feet. As shown in [Figure 4-1](#), feet on the bottom can be folded out to set the instrument in an inclined position.



*Figure 4-1: Operating positions*

---

**NOTICE****Positioning of instrument**

The instrument must be positioned in a manner that allows the user to disconnect the unit from the mains at any time and without restrictions.

---

#### 4.4.2 Rack Mounting

The instrument can be installed in a 19 " rack-mount using a rack adapter kit.

---

**NOTICE****Ambient temperature**

Place the R&S NGL200 in an area where the ambient temperature is within +5 °C to +40 °C. The R&S NGL200 is fan-cooled and must be installed with sufficient space along the sides to ensure free flow of air.

---

## 5 Instrument Tour

This chapter provides an overview of all the controls available in the R&S NGL200 models and steps to switch on the instrument for the first time.

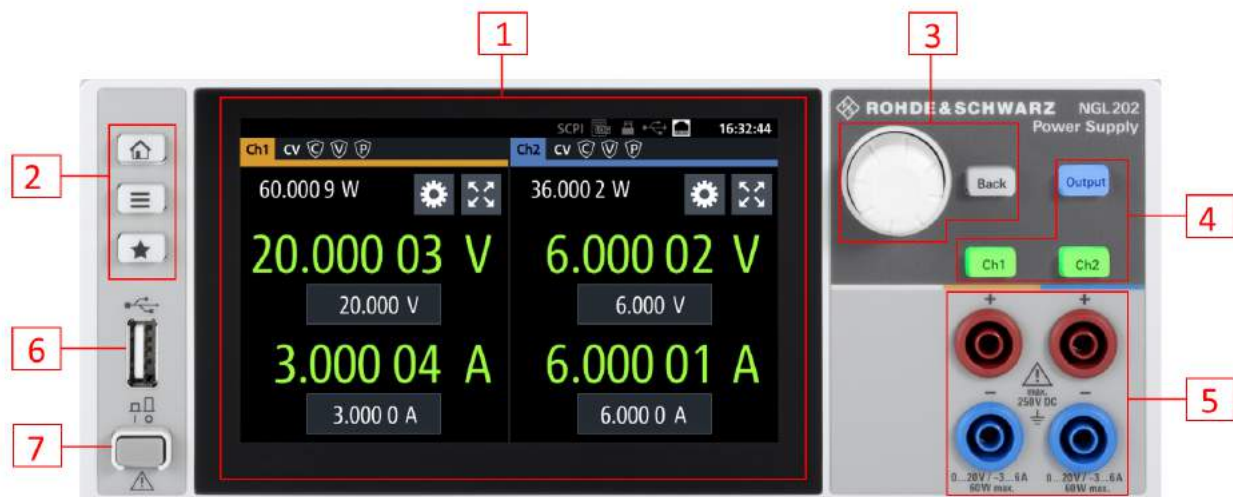
- [Overview of Controls](#)..... 17
- [Switching On the Instrument](#)..... 21

### 5.1 Overview of Controls

#### 5.1.1 Front Panel

The front panel of the R&S NGL200 is as shown in [Figure 5-1](#). The function keys and navigation controls are located beside the display. The various connectors are located right of the display.

The R&S NGL200 has one output channel for NGL201 model and two output channels for NGL202 model .



**Figure 5-1: Front panel of R&S NGL200**

- 1 = Display with touch screen
- 2 = Menu control keys
- 3 = Navigation keys
- 4 = Output and channels keys

5 = Output terminals (one channel with sense NGL201, two channels NGL202)

6 = USB connector

7 = Power key

## Display (1)

The display is a color LCD screen. Depending on the instrument model, up to two channels are shown on the display. The respective measurement settings and functions are displayed in the individual channel display area. There is a status bar in the device level and channel level, showing the device operating mode and respective channel settings of the instrument.

For a detailed description on-screen layout, see section "Display Overview" in the User Manual.

## Menu control keys (2)

The menu control keys allow you to navigate to the home window, main menu window and user button key in the instrument.

For a detailed description on navigation keys, see section "Menu Controls" in the User Manual.

## Navigation keys (3)

The navigation keys are used for menu navigation and value adjustment in the instrument.

For a detailed description on navigation, see section "Navigation Controls" in the User Manual.

## Output and channel keys (4)

Depending on the instrument type, up to two output channels are available to source or sink power to and from the output terminals.

Each channel is capable to source 0 V to 6 V with a current of 6 A or 6 V to 20 V with a current of 3 A. In sink mode, each channel can consume 0 A to 3 A at an input voltage of 0 V to 20 V.

## Output terminals (5)

Both instrument models are equipped with 4 terminals. The R&S NGL201 provides both the output plus the sense connectors at the front panel while the R&S NGL202 provides only output terminals for both channels.

## USB connector (6)

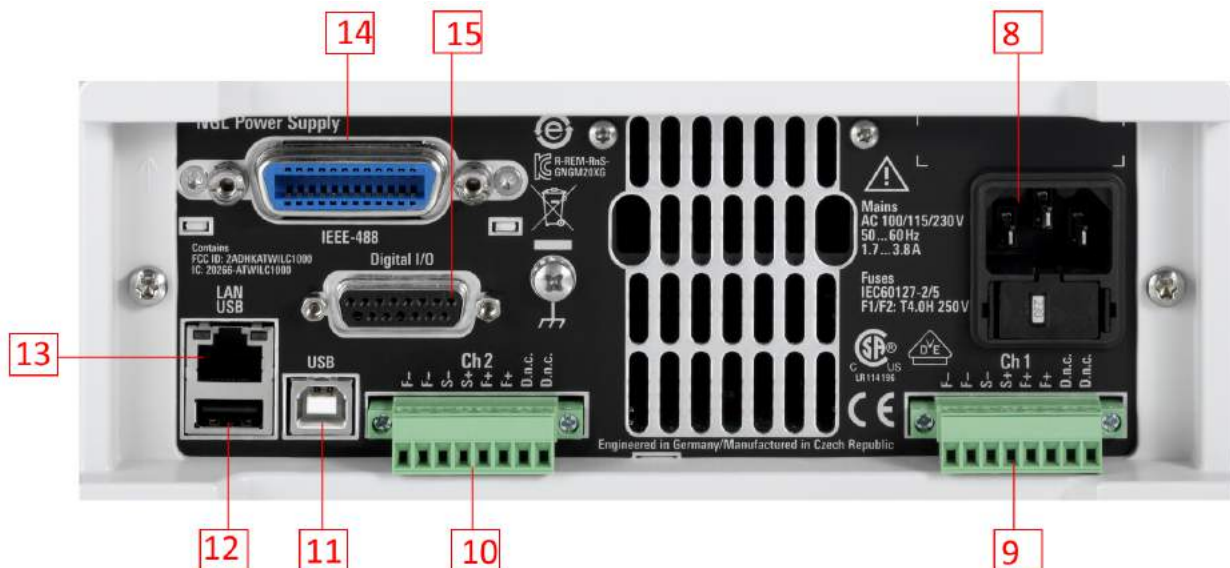
The USB connector is a Type-A connector. You can connect a USB flash drive to this connector to perform a firmware update, store logging data or screen shots.

## Power key (7)

The [Power] key switches the instrument on and off.

## 5.1.2 Rear Panel

Figure 5-2 shows the rear panel of the R&S NGL200 with its connectors.



**Figure 5-2: Rear panel of R&S NGL200**

- 8 = AC inlet with fuse holder and voltage selector
- 9 = Channel 1 rear panel connector
- 10 = Channel 2 rear panel connector (NGL202 model)
- 11 = USB connector (Device)
- 12 = USB connector (Host)
- 13 = Ethernet (LAN) connector
- 14 = Cover for optional IEEE 488 (GPIB) Interface
- 15 = Digital I/O connector

## AC inlet with fuse holder and voltage selector (8)



### Main supply cord

Do not use detachable mains supply cord with inadequate rating.

For safety reasons, the instrument can only be operated with authorized safety sockets.

The power cable must be plugged in before signal circuits can be connected. Never use the product if the power cable is damaged. See [Chapter 5.2, "Switching On the Instrument"](#), on page 21 for more information.

The built-in voltage selector selects the mains voltage between 100 V, 115 V and 230 V. All voltage settings are using the same fuse rating.

### Channel connectors (9, 10)

#### **NOTICE**

##### **Output Terminals**

Either the output terminals at the front panel or those at the back panel can be used. Using both terminals at the same time can cause instrument malfunction.



DVM pins on the channel connector are only available in the NGM types power supply.

The channel connectors contain both output ("F+", "F-") and sense ("S+", "S-") connections. Connector for "Ch 2" is only available in the R&S NGL202 model.

### USB connectors (11, 12)

The USB host connector (Type-A) can be used for mass storage devices like the USB connector at the front panel.

The USB device connector is a Type-B connector for remote control operation.

### Ethernet connector (13)

This connector is used for establishing remote control via SCPI.

See section "Ethernet Setup" in the user manual for more information on the connection setup.

### Option GPIB interface (14)

An IEEE488 GPIB interface can be ordered (NGL-B105). This interface is not user installable.

### Digital I/O connector (15)

The Digital I/O connector is a terminal block for external input or output.

The Digital Trigger I/O option (NGL-K103) must be installed for this function to be available in the instrument.

## 5.2 Switching On the Instrument

Before switching on the instrument, check if the value on the voltage selector corresponds to the mains voltage (100 V, 115 V or 230 V). Switch it on, if necessary.



### Fuse rating

The R&S NGL200 is using the same fuse ratings for all main voltages.

---

#### To change power fuse:

1. Peel off the yellow label sticker on the AC inlet.
2. Release the latch of the fuse holder which is located directly below the socket and pull it out.
3. Pull out the removable part of the fuse holder.
4. Turn this part until correct voltage label (100, 115 or 230) is displayed in the window of the holder.
5. Return the fuse holder to its position in the panel.

#### To switch on instrument:

1. Connect the power cable to the AC power connector on the rear panel of the R&S NGL200.
2. Connect the power cable to the socket outlet.
3. Press [Power] key on the front panel.



## Switching On the Instrument

The instrument performs a system check, boots the operating system, and starts the R&S NGL200 firmware.

By default, all output channels are turned off when the instrument is switched on to prevent connected loads from being damaged unintentionally.

**To switch off instrument:**

1. Press [Power] key.  
All current settings are saved to internal memory and the firmware shutdown.
2. Disconnect the AC power cable from the AC power supply.

## 6 Trying Out the Instrument

This chapter describes some basic functions that you can perform with the R&S NGL200.



### Source and sink current

The R&S NGL200 series are 2 quadrant power supplies which may both source and sink current. This function needs no separate configuration or mode switching. As soon as the voltage across the output terminal exceeds the set voltage, current flows into the instrument. This is an intended feature and it is safe.

On the display, sink mode is shown as negative current.

### 6.1 Setting the Output Voltage and Current

1. Press [Home] key.  
The R&S NGL200 displays the home window.
2. Select voltage or current parameter in the home window  
The R&S NGL200 displays an on-screen keypad to set the value.
3. Enter the required value.
4. Confirm value with the unit key (for voltage - V or mV, for current A or mA).

### 6.2 Activating the Channels Output

The output voltages can be switched on or off regardless of the operating mode the instrument is in.

To switch on or off channel output.

1. Select desired channel key ([Ch1] or [Ch2]) on the front panel.
2. Press [Output] key.

The R&S NGL200 output the set voltage level on the selected output channel terminal.

Depending on the mode which the channels are operated in, the followings are observed:



### CR mode

CR mode is a special case of sink mode in which the instrument behaves like a constant resistor. Only in this mode, the respective channel keys and display font color in the home window turns cyan.

In "normal" sink mode, the colors are the same as in source mode: green if the current flowing into the R&S NGL200 is below the set current and red if the current is limited to the set value. The only visible indication of sink mode is the change of the sign of the current readout change to "Minus".

Color illuminated on front panel keys and display font color of voltage and current in home window	Operating mode
Green	Constant voltage mode (CV)
Red	Constant current mode (CC)
Cyan	Constant resistance mode (CR) Note: Instrument is operated in sink mode and "Constant Resistance" is activated.

Also, the operating symbol mode (CV, CC or CR) is displayed at the channel status bar of the respective channel.

## 7 Maintenance

Before cleaning the instrument, ensure that it has been switched off and power cable is disconnected.

Clean the outer case of the instrument at regular intervals, using a soft, lint-free dust cloth.

---

**NOTICE****Instrument damage caused by cleaning agents**

Cleaning agents contain substances that may damage the instrument. For example, cleaning agents that contain a solvent may damage the front panel labeling, plastic parts, or the display.

Never use cleaning agents such as solvents (thinners, acetone, etc.), acids, bases, or other substances.

---

The display may only be cleaned with an appropriate glass cleaner. Rub the display down with a dry, clean and lint-free cloth. Do not allow cleaning fluid to enter the instrument.

# Index

## A

Activating the channels output ..... 23

## B

Basic safety instructions ..... 5

Brochure ..... 6

## C

Controls ..... 17

Conventions ..... 7

## F

### Front Panel

Display ..... 17

Navigation keys ..... 17

Output and channel keys ..... 17

Output terminals ..... 17

Power key ..... 17

Rotary knob ..... 17

USB connector ..... 17

## G

Getting started ..... 5

## I

### Instrument tour

Overview control ..... 17

Switching NGL on off ..... 17

Instrument Tour ..... 17

Intended operation ..... 13

## M

Maintenance ..... 25

## O

Open source acknowledgment ..... 6

## P

Package contents ..... 14

Putting into operation ..... 10

Intended operation ..... 13

Safety ..... 11

Unpacking and checking the instrument

..... 14

## R

### Rear Panel

AC inlet with fuse holder ..... 19

Channel connectors ..... 19

Digital I/O connector ..... 19

Ethernet connector ..... 19

USB connectors ..... 19

Voltage selector ..... 19

Release notes ..... 6

## S

Safety ..... 11

Safety instructions ..... 5

Service manual ..... 5

Setting the output voltage and current limit  
..... 23

### Setting Up the Instrument

Bench Operation ..... 15

Rack Mounting ..... 15

Switching On the Instrument ..... 21

## T

### Trying out the instrument

Activating the channels output ..... 23

Setting the output voltage and current  
limit ..... 23

## U

Unpacking and checking the instrument . 14

User manual ..... 5

## W

Welcome to R&S NGL200 ..... 9