WEB PAGE, VNC AND FTP ON R&S® DC POWER SUPPLIES, AND ON LCR METERS R&S®LCX

Products:

- ► R&S®NGL200
- ► R&S®NGM200
- ► R&S®NGU201
- ► R&S®NGU401
- ► R&S®NGP800
- ► R&S®LCX100
- ► R&S®LCX200

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Contents

1 Overview

This application note applies to DC power supplies R&S®NGL200, R&S®NGM200, R&S®NGP800, R&S®NGU201 and R&S®NGU401, as well as LCR meters R&S®LCX100 and R&S®LCX200. It provides an overview over ethernet-based remote services provided by the referenced R&S® instruments. These services comprise an instrument web page, VNC remote control and FTP file transfer between the instrument and a remote computer. The application note gives instructions on how to set up the instrument and the remote computer in order to be able to utilize these services.

2 Background

2.1 Instrument web page

An instrument web page, as for example specified by the LXI consortium [1], is provided by the DC power supplies and LCR meters which are subject of this application note.

2.2 VNC

VNC ("Virtual Network Computing") is a platform-independent method for remote-controlling a computer via ethernet by sharing its desktop [2]. The control is done either from a dedicated program in the remote computer or from a browser window. Usually the local user interface remains visible and accessible during VNC remote control.

2.3 FTP

FTP ("File Transfer Protocol") is a protocol for transferring files between computers on a network [3]. It is independent of the operation systems.

3 Using the instrument web page

3.1 Preparations

On the instruments which are subject of this application note, the instrument web page is always enabled. The preparations come down to establishing an ethernet connection between the instrument and the computer in question.

The ethernet settings are found in menu subitem "Device → Interfaces → Network → LAN". If both the instrument and the computer are connected to a network with DHCP server, set "DHCP & Auto-IP to "ON". After a successful registration with the network, the IP address and subnet mask are displayed on the screen.

If no network is available, you can establish a peer-to-peer connection by directly connecting the sockets of instrument and computer with a LAN cable. In this situation you have to disable DHCP and set fixed IP addresses on both. Choose IP addresses close to each other and subnet mask 255.0.0.0.

3.2 Opening the instrument web page

Open a browser and enter the IP address of the instrument in place of a URL.

3.3 User Interface

Entering the IP address of the instrument opens the instrument welcome page. The contents of this page are following the specification in [1].
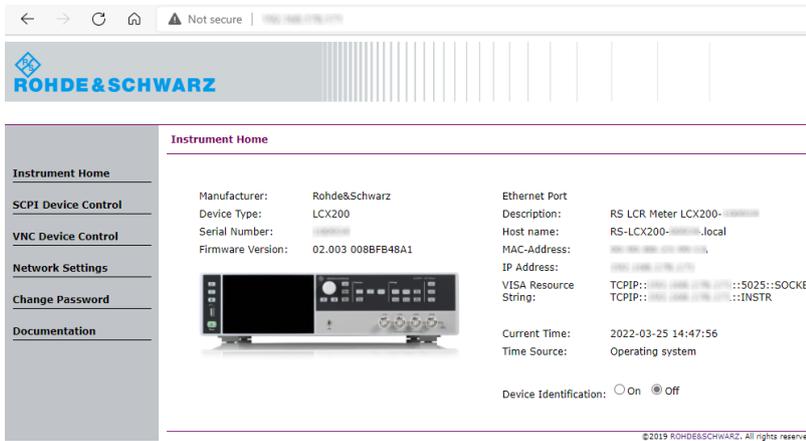

Figure 3-1 Instrument home page of R&S®LCX200

The SCPI device control page offers a textbox for entering SCPI commands to be sent to the instrument. The commands and query responses are listed in a history textbox below. "Refresh screen data" queries a hardcopy of the instrument graphical user interface in its current state. Unlike VNC, this is just a screenshot. It is not automatically refreshed and cannot be used for remote-controlling the instrument.
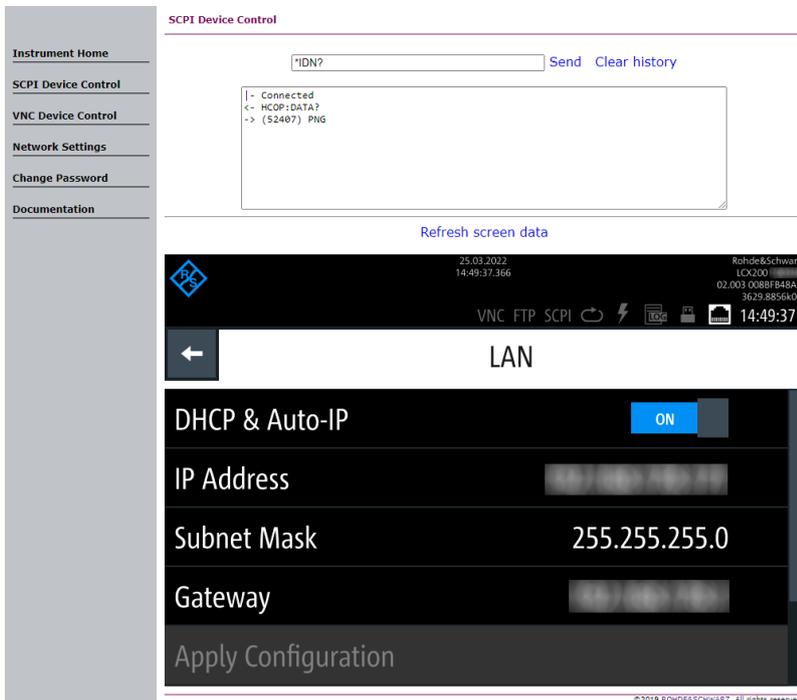

Figure 3-2 SCPI device control page of R&S®LCX200

The VNC control page shows the user interface of the instrument in real-time and allows full control of the GUI and the front panel controls (see section 4). Please be aware that some possible actions like disabling VNC can disrupt the control such that it cannot be re-established remotely without local access to the instrument.
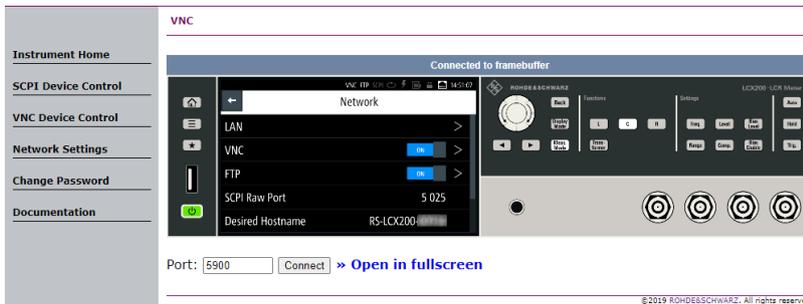
Figure 3-3 VNC device control page of R&S®LCX200

The IPv4 configuration page lists all parameters for the ethernet connection and HiSLIP remote control configuration [4]. Parameters can be edited and sent to the instrument by clicking the "Submit" button. Be aware that changes in the IP configuration will most likely disrupt the ethernet connection.
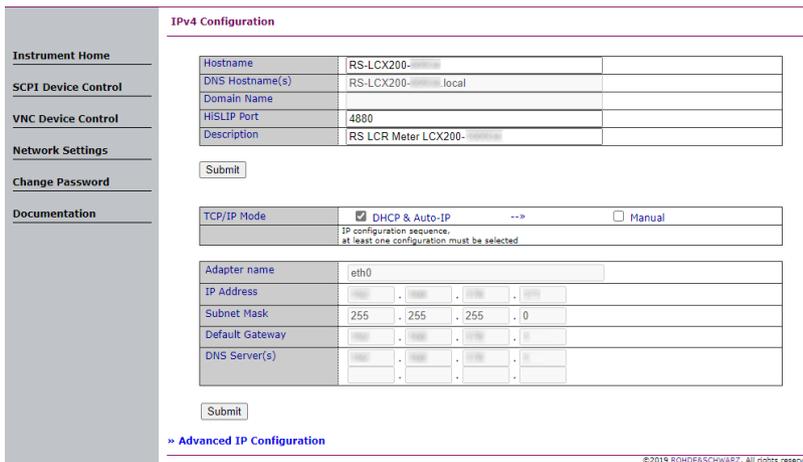

Figure 3-4 Network settings page of R&S®LCX200

The change password page allows to set or change the password for the access to the instrument web site. This helps to protect the access to the instrument from the network.
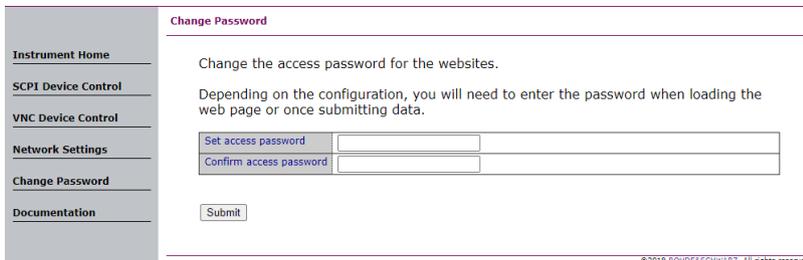

Figure 3-5 Change password page of R&S®LCX200

The documentation web page contains a web version of the "Getting Started" Manual and a link to the product web page. Navigate back in your browser to return to the instrument web site from either of both.
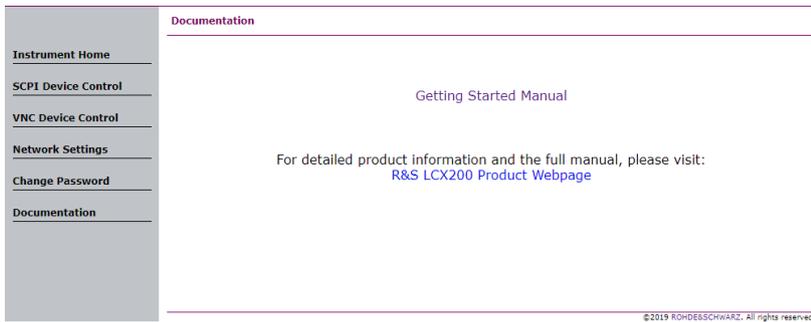
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Figure 3-6 Documentation page of R&S®LCX200

4 Using VNC

4.1 Preparations

The instrument must be connected to the controlling PC via ethernet (see section 3.1). A valid VNC port must be set and VNC must be enabled in subitem "Interfaces → Network → VNC" of the device menu on the instrument.

4.2 Opening the VNC web page

Open a browser window and enter " http://aaa.bbb.ccc.ddd/common/novnc/vnc_lite.html?port=eeee " in place of a URL. "aaa.bbb.ccc.ddd" is the IPv4 address displayed in subitem "Interfaces → Network → LAN " of the device menu. The port address "eeee" must be equal to the VNC port address in subitem "Interfaces → Network → VNC" of the device menu on the instrument.

Figure 4-1 VNC configuration subitem in the device menu

To change the port number, VNC must be disabled first.

Alternatively you can open the LXI web page like described in paragraph 3.2, select the "VNC Device Control" page in the menu on the left and click "Open in fullscreen".

4.3 Controlling the VNC user interface

The VNC user interface shows the complete front panel of the instrument. The GUI on the screen can be operated with the mouse the same way as the touch screen. Front panel keys can also be pressed by mouse-click.

5 Using FTP

5.1 Preparations

The instrument must be connected to the controlling PC via ethernet (see section 3.1). A valid FTP port, a user name and a password must be set, and FTP must be enabled in subitem "Interfaces → Network → FTP" of the device menu on the instrument.
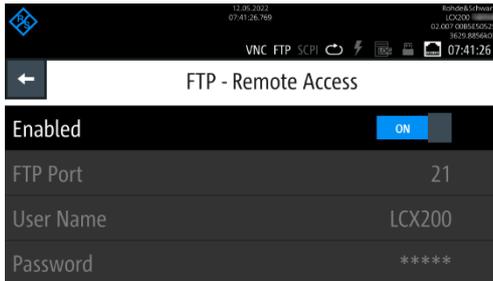

Figure 5-1 FTP configuration subitem in the device menu

To change the settings, FTP must be disabled first.

Note that the count of stars shown in the password field does not equal the count of characters of the password.

5.2 Transferring files

5.2.1 Windows PC

You can use special apps like Filezilla [5] to access the FTP server on the instrument. However, this can also be done using the Windows file explorer.

► Open the Windows file explorer.

► Type "ftp://username:password@IPv4Address" in the address bar, replacing "username" with the user name entered in the FTP settings of the instrument and "password" with the corresponding password. Replace "IPv4Address" with the actual IPv4 address of the instrument.

You can also add a network location in the Windows file explorer which gives permanent access to the FTP server of the instrument, as long as the IPv4 address and login credentials are not changed.

► Open the Windows file explorer.

► Right-click on the computer name.

► Choose "Add a network location".

► Follow the wizard to the page where the internet or network address has to be entered.

► Enter the address in the form " ftp://username:password@IPv4Address " like explained above.

► Click "Next".

► Enter a descriptive name.

► Click "Next".

► Click "Finish".

The file system of the instrument appears with the specified name in the navigation pane of the Windows file explorer.

5.2.2 Mac OS computer

Install an app like Filezilla [5] to access the file system of the instrument. Please refer to the instructions for the chosen app.

6 Firmware update using FTP and VNC

6.1 Transferring the installer

Copy the installer from the computer to folder "/int/service" on the instrument using FTP, as described in section 5.

6.2 Running the update

If local control is possible, this should be the preferred method.

If there is no local access to the instrument, the firmware update can be started using VNC. If the update is successful, remote control can be re-gained afterwards. Be aware that in case of any problems during the update, it may be impossible to re-establish the remote control.

To start the update remotely:

▶ Establish a VNC connection to the instrument as described in section 4.

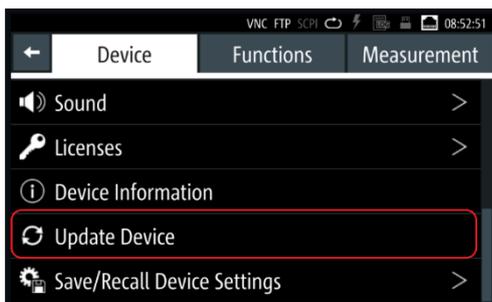▶ In the VNC GUI, open the device menu by clicking the ▣ button.

Figure 6-1 Device menu with item "Update Device"

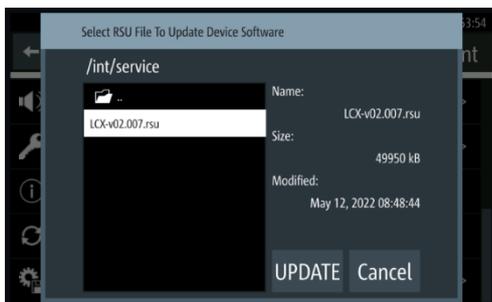▶ Scroll down and click "Update Device".

► Navigate to folder "/int/service" and click on the installer to be used.

► Click "UPDATE".

Since the update process closes the firmware on the instrument, the VNC connection will instantly be lost. It can be re-established after a successful firmware update by clicking the reload ↻ button in the browser.

► Allow approximately 2-3 minutes for the firmware update to finish before doing that

► Retry in case it is not successful in the first place.

After a successful firmware update, the VNC connection should be up and running again, and the GUI should show the message of Figure 6-3.
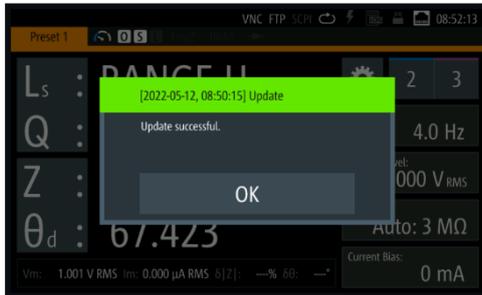

Figure 6-3 Message after successful firmware update

7 Literature

[1] LXI Consortium, "LXI Device Specification 2016, Revision 1.5.01," 14 March 2017. [Online]. Available: https://lxistandard.org/members/Adopted%20Specifications/Latest%20Version%20of%20Standards_/ LXI%20Standard%201.5%20Specifications/LXI%20Device%20Specification%20v1_5_01.pdf. [Accessed 28 April 2022].

[2] Wikipedia, "Virtual Network Computing," Wikipedia.org, 11 December 2021. [Online]. Available: https://en.wikipedia.org/wiki/Virtual_Network_Computing. [Accessed 29 April 2022].

[3] Wikipedia, "File Transfer Protocol," Wikipedia.org, 17 April 2022. [Online]. Available: https://en.wikipedia.org/wiki/File_Transfer_Protocol. [Accessed 29 April 2022].

[4] IVI Foundation, "IVI-6.1: IVI High-Speed LAN Instrument Protocol (HiSLIP)," 23 April 2020. [Online]. Available: https://ivifoundation.org/downloads/Protocol%20Specifications/IVI-6.1_HiSLIP-2.0-2020-04-23.pdf. [Accessed 12 May 2022].

[5] FileZilla Project, "FileZilla The free FTP solution," FileZilla Project, 06 May 2022. [Online]. Available: https://filezilla-project.org/. [Accessed 12 May 2022].

8 Ordering Information

Designation	Type	Order No.
Power Supply	R&S®NGL201	3638.3376.02
Power Supply	R&S®NGL202	3638.3376.03
Power Supply	R&S®NGM201	3638.4472.02
Power Supply	R&S®NGM202	3638.4472.03
Source Measure Unit	R&S®NGU201	3639.3763.02
Source Measure Unit	R&S®NGU401	3639.3763.03
Power Supply	R&S®NGP802	5601.4007.05
Power Supply	R&S®NGP804	5601.4007.02
Power Supply	R&S®NGP814	5601.4007.04
Power Supply	R&S®NGP822	5601.4007.06
Power Supply	R&S®NGP824	5601.4007.03
LCR meter	R&S®LCX100	3629.8856.02
LCR meter	R&S®LCX200	3629.8856.03

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