

R&S APPLICATION DASHBOARD FOR POWER SUPPLIES AND METERS

Products:

- ▶ R&S®NGU201
- ▶ R&S®NGU401
- ▶ R&S®NGU411
- ▶ R&S®NGM200 series
- ▶ R&S®NGL200 series
- ▶ R&S®NGP800 series
- ▶ R&S®NGA100 series
- ▶ R&S®NGE100B series
- ▶ R&S®NGC100 series
- ▶ R&S®LCX100
- ▶ R&S®LCX200

Thomas Lechner | 1GP140 | Version 0e | 08.2024

<https://www.rohde-schwarz.com/appnote/1GP140>

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1 Overview

Rohde & Schwarz offers a wide range of essential lab equipment, like power supplies, LCR meters and power analyzers. To enhance the versatility of these instruments, a selection of application programs is available. These application programs typically remote-control equipment for more complex tasks like sweeps, logging and battery testing.

In a larger lab there may be a larger number of such instruments present, and a selection of available application programs installed on a PC. In such a case it is desirable to have a kind of dashboard providing an overview over both, including version check and links to documentation on the Rohde & Schwarz website.

The R&S® application dashboard for power supplies and meters is providing this functionality. The application document contains the description and user manual for the software. Furthermore a package is provided containing installers for all related application programs.

2 Prerequisites and Installation

2.1 Prerequisites

The 1GP140 application program runs on Windows 10 and higher. It may also run on Windows 7, but it has not been tested on this operation system. It requires .Net runtime 6.0 or higher. In the aforementioned Windows versions, this .Net runtime version is usually present.

Supported application programs need a certain minimum version in order to be detected by the 1GP140 program, and to cooperate with it. A package comprising all concerned application programs is available on the 1GP140 web page.

2.2 Installation

There are two alternatives for installation. If all application programs you need are already installed, you can install 1GP140 alone.

Download 1GP140_xyz.msi from the 1GP140 web page and copy it to the local drive of your PC. Start the installer and follow the instructions on the screen.

The installer establishes shortcuts in the Program menu and on the desktop. The 1GP140 program is started by opening one of these shortcuts.

Some functionality like instrument firmware version check and application software version check requires internet access.

As an alternative choice you can download the R&S distributor file “RS_PSM_ApplicationPackage_xyz.exe” which contains installers of all currently available application programs supported by the application dashboard 1 GP140. This distributor file also comprises the installer for 1GP140.

After starting the distributor and accepting the terms and conditions, you can select the application programs to be installed. You can re-run the distributor later to install more programs if needed.

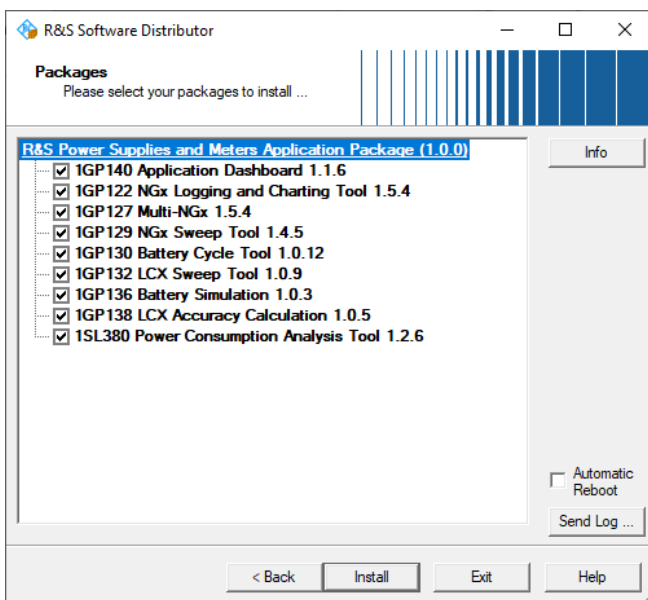


Figure 2-1 R&S Software distributor

“Automatic Reboot” is not required.

3 Using the software

3.1 Main window

Upon start of the 1GP140 program, the main window opens.



Figure 3-1 Main Window of the 1GP140 program

The main window is divided into three parts:

- The function buttons on the left side
- A panel for instrument tiles
- A panel for application program tiles on the right side

3.1.1 Function buttons



Settings: Opens the program settings window. See section 3.5.



Search for instruments: Performs a search on USB and adds tiles for newly found instruments. See section 3.6.



Add instrument: Adds an instrument connection according to manual entry. See section 3.7.



Connection list: Shows a window with an editable list of known instrument connections. See section 3.8.



Supported instruments: Shows an illustrated list of instrument types supported by this program. See section 3.9.



Deselect instrument: Clears the instrument selection in the instrument tiles panel. See section 3.11.



Look for applications on the computer



Open the support web page in a new browser window

3.1.2 Instrument tiles panel

The instrument tiles panel accommodates one instrument tile for each established instrument connection. The instrument needs to be listed as supported instrument (see sections 3.9 and 5). Theoretically it is possible to have more than one tile for the same instrument if there exist connections on different interfaces at the same time. Double connections on the same interface to the same instrument are suppressed.

3.1.3 Application tiles panel

The application tiles panel accommodates one application tile for each qualified application program found installed on the PC. The following table gives an overview of the currently supported application programs:

No.	Title	Description	Supported Instruments	Min. Version
1GP122	NGx Logging and Charting Tool	Standard logging, fast logging and data collection with chart display and data analysis	NGA100, NGE100, NGC100, NGL200, NGM200, NGP800, NGU201, NGU401, NGU411	1.5.4
1GP127	Remote Control of Multiple DC Power Supplies	Common control of a stack of power supply channels	NGL200, NGM200	1.0.5
1GP129	NGx Sweep Tool	I-V sweep with chart display	NGM200, NGU201, NGU401, NGU411	1.4.5
1GP130	NGL, NGM, NGU Battery Cycle Tool	Battery cycling with logging and chart display. Generation of battery model from logged data	NGL200, NGM200, NGU201, NGU401, NGU411	1.0.11
1GP132	LCX Sweep Tool	Sweep over frequency, test signal level, bias voltage or bias current with logging and chart display	LCX100, LCX200	1.0.8
1GP136	Battery Simulation	Relaxation measurement, charging and discharging of batteries with logging and chart display. Generation of battery models from logged data	NGM200, NGU201, NGU401, NGU411	1.0.3
1GP138	LCX Accuracy Calculation	Calculation of measurement accuracy for a given set of measurement parameters	LCX100, LCX200	1.0.5
1SL380	Power Consumption Analysis Tool	Fast logging with chart display and analysis functions	NGM200, NGU201, NGU401, NGU411	

Table 3-1 Application programs supported by the 1GP140 program

An installed application program is qualified to cooperate with the 1GP140 program if it is listed in Table 3-1 and has a version number equal to or higher than the minimum version listed there. New application programs published after the release date of this software may be automatically detected and displayed in an application tile.

3.2 Instrument tile

Each instrument tile provides an overview over the connected instrument, its status as well as control for some selected functions. There is a button to open the comprehensive instrument control window with even more functionality.

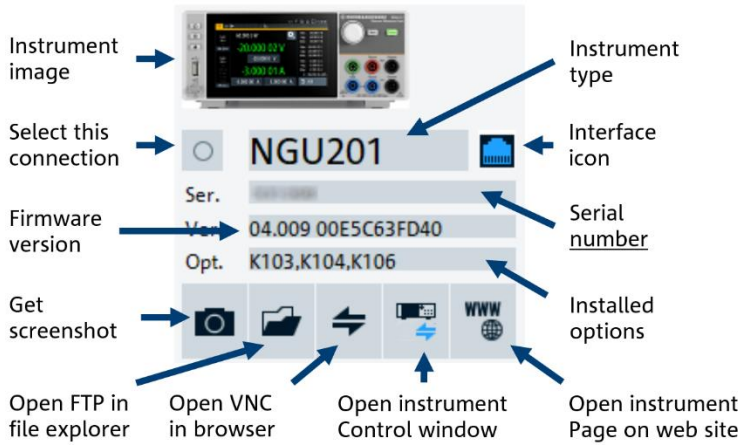







Figure 3-2 Functionality of the instrument tile

A yellow back color of the text field for the firmware version indicates that a newer firmware version has been found on the instrument’s product page of the R&S web site.

FTP and VNC are only available on network connections, and only for some instrument types. For USB connections and other instrument types, the respective buttons are disabled. For FTP, the user name must be set to the instrument type, and the password must be set to the serial number of the instrument in the device menu of the instrument.

The interface icon shows the type of interface through which the instrument is connected:

-  Ethernet with TCP/IP (LXI) protocol
-  Ethernet with HSLIP protocol
-  GPIB (IEEE488)
-  USB TMC (Test and Measurement Class)
-  USB VCP (Virtual COM Port)

3.3 Instrument control window

While an instrument tile provides an overview over an instrument connection and some of the most common functionalities related to it, the instrument control window provides extended functionality. It is opened by clicking the respective button on an instrument tile.

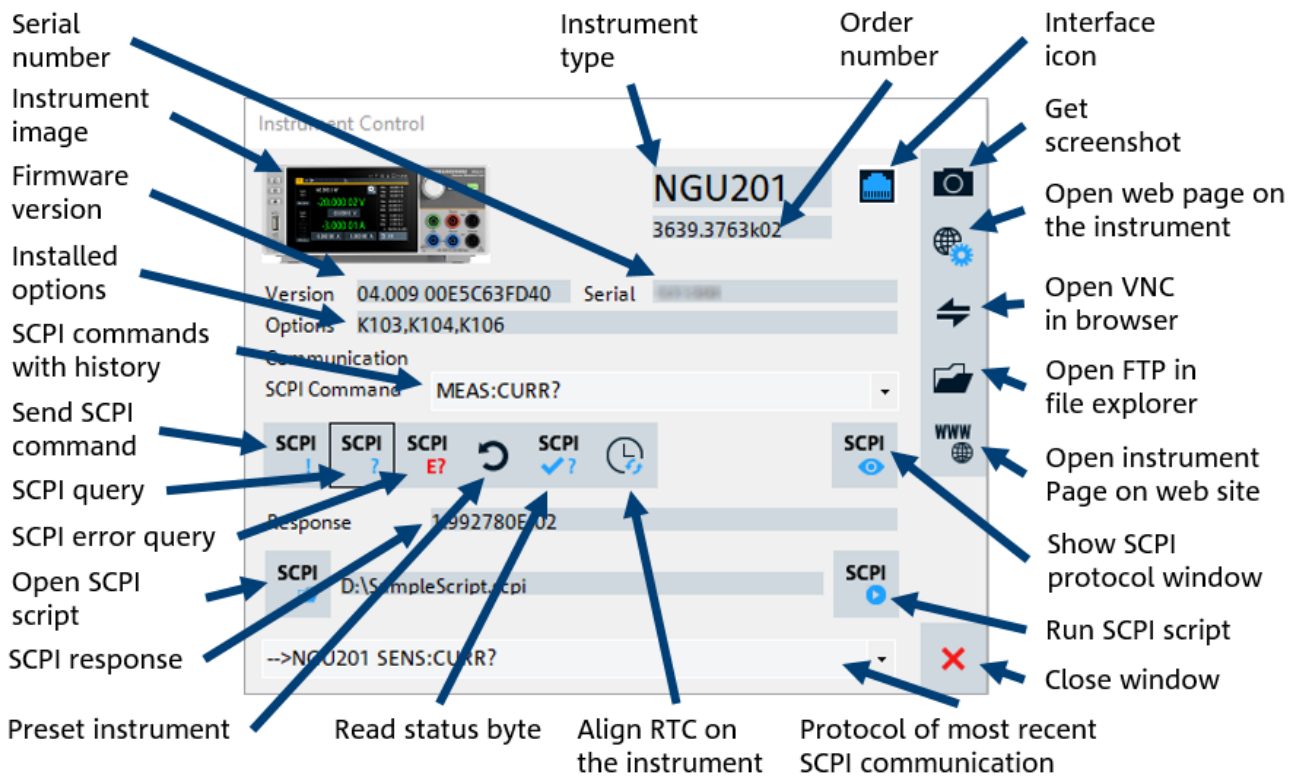


Figure 3-3 Functionality of the instrument control window

The upper part of this window provides information on instrument type, serial number, installed firmware version and installed options.

The lower part enables communication using SCPI commands. There is an entry field for SCPI commands which can be drilled down to see and re-use the most recently used commands. Buttons allow to send the SCPI command and read query responses. Special shortcut buttons allow to directly query the error queue, preset the instrument, read the status byte and set the real-time clock of the instrument to the time of the PC's RTC.

The buttons on the right side can be used to get a screenshot from the instrument and open the instruments internal web page (similar to LXI specification). The latter is available only on network connections. If an instrument connected over network supports VNC, it can be opened in a browser window by clicking on the respective button: Note that VNC must be enabled in the device menu of the instrument for this purpose. If an instrument connected over network supports FTP, the file system on the instrument can be opened in a Windows file explorer window by clicking the respective button. Note that FTP must be enabled in the device menu of the instrument, the FTP user name must be set to the instrument type, and the password must be set to the serial number of the instrument.

If the computer, where the 1GP140 program is installed, has internet access, the product page of the instrument on the R&S web site can be opened in a browser window with one click on the WWW button. The instrument product page provides the full wealth of specification, instructions and application information as well as firmware and software for download.

3.4 Application tile

For each application program found on the computer with the minimum version specified in Table 3-1, an application tile is added to the applications panel.

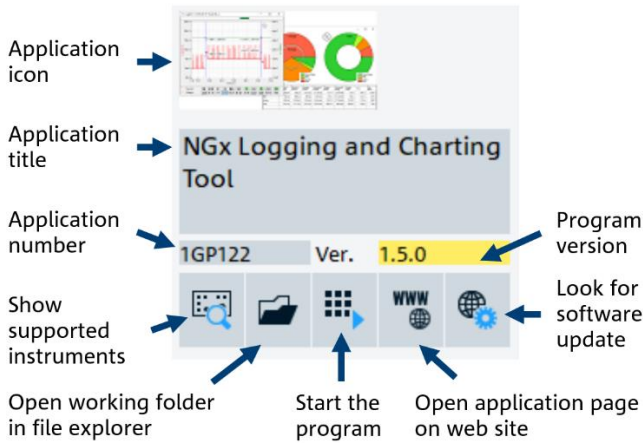


Figure 3-4 Functionality of the application tile

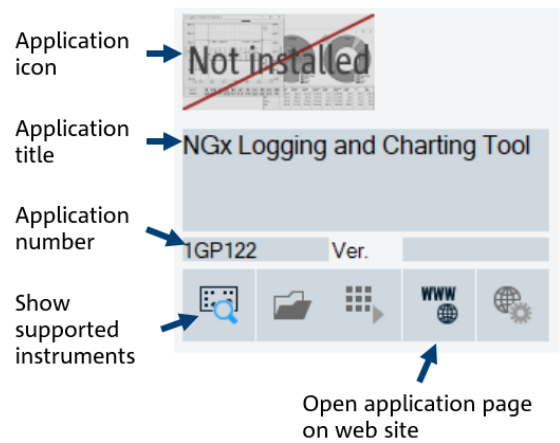


Figure 3-5 Application tile for missing program

A yellow back color of the text field for the program version indicates that a newer version has been found on the R&S web site on the application page for the respective application note.

While the “show supported instruments” button is depressed, the tiles of the supported instruments in the instruments panel are highlighted:

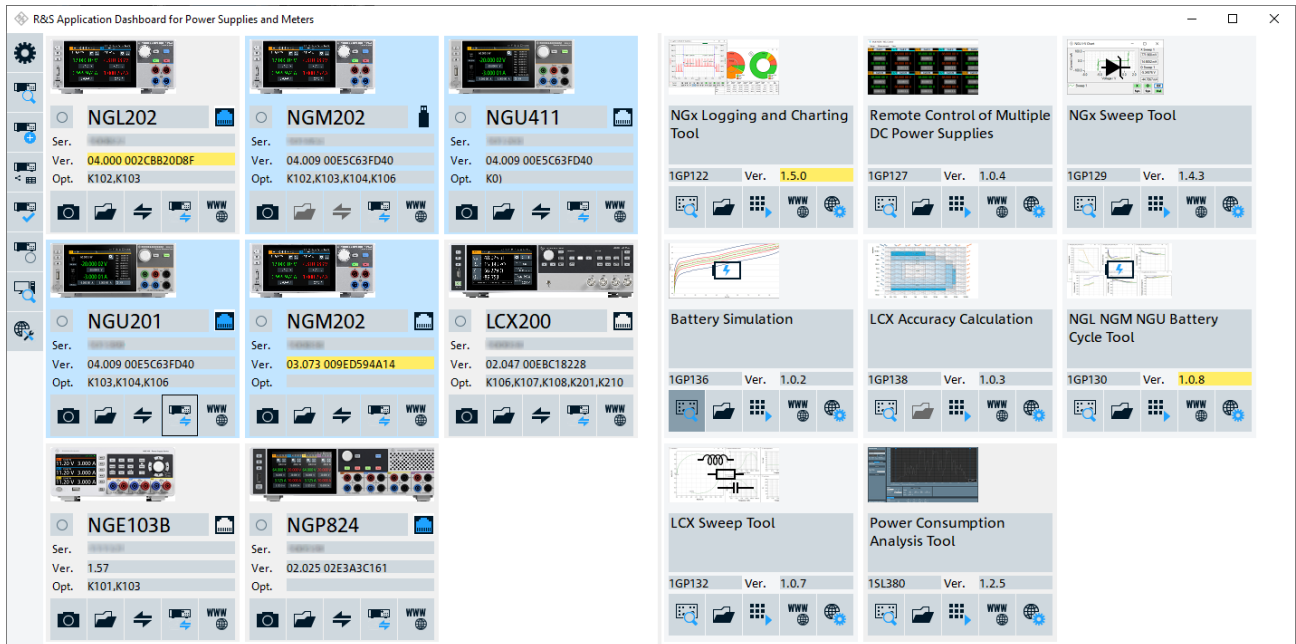


Figure 3-6 Main window with instruments supported by “Battery Simulation” highlighted

You can then for example select one of the highlighted instruments and start the application program connected to the highlighted instrument.

Most of the application programs have an application folder where they store associated data like settings, logs, collected data etc. This folder can be opened in a file explorer window by clicking the respective button.

If the button for starting the application program is clicked while an instrument tile is selected, the application program establishes a connection to the selected instrument via the specified interface after startup.

The WWW button opens the application page on the R&S web site where you can find links to the latest versions of application document and application program.

3.5 Settings

3.5.1 Startup settings

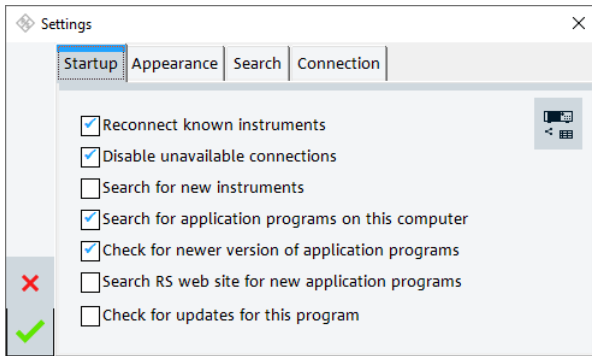


Figure 3-7 Startup settings tab

Reconnect known instruments: Upon start of the program it attempts to re-establish known connections. The list of known connections can be maintained by clicking on the button on the right side of the window (see section 3.8). Note that attempts to connect an unavailable instrument may take time and slow down the startup of the program.

Disable unavailable connections: If a known connection cannot be re-established at startup of the program, it is disabled in the list of known connections and will be ignored at the next startup. See section 3.8 on how to enable known connections again.

Search for new instruments: Searches USB and GPIB for available instruments which are not yet in the list of known connections. Instruments connected via ethernet have to be connected manually using the “add instrument” function (see section 3.7).

Search for application programs on this computer: Upon startup of the program, the computer is scanned for installed qualified application programs (see Table 3-1). For each found qualified application program, an application tile is added to the applications panel.

Check for newer version of application programs: For each installed qualified application program, the program searches the R&S web site for updated versions. Uncheck this item if there is no internet connection, or a connection to the R&S web site is unwanted.

Search RS web site for new application programs: This function is currently not yet implemented.

Check for updates for this program: Like for installed qualified application programs, this function checks the 1GP140 application page for a newer version of this program.

3.5.2 Appearance settings

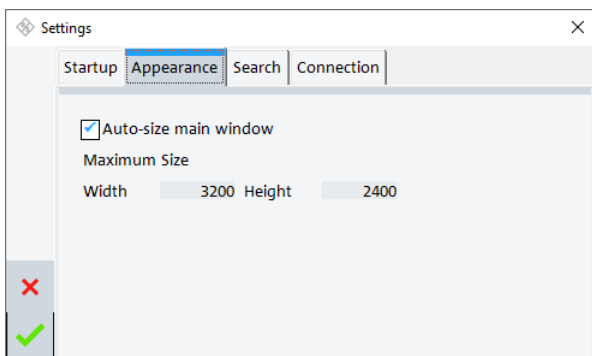


Figure 3-8 Appearance settings tab

Auto-size main window: If this option is activated, the main window is automatically resized when new tiles are added, to visibly accommodate all instrument and application tiles. It is possible to specify a maximum

size of the main window. If not all tiles can be accommodated in the visible part of the panels, vertical scroll bars will automatically appear.

3.5.3 Instrument search settings

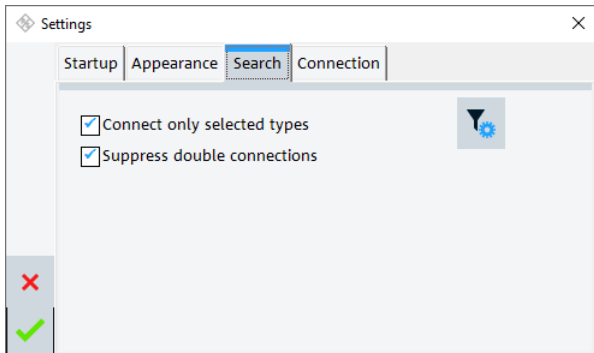


Figure 3-9 Search tab

Connect only selected types: It is possible to restrict the instrument search to a subset of the supported instrument types. To edit the selection list, click the button on the right side of the window.

Suppress double connections: If this option is checked, the addition of a new instrument tile is suppressed if the same instrument is already connected on any interface. Duplication connections to the same instrument on the same interface are in any case suppressed.

3.5.4 Connection settings

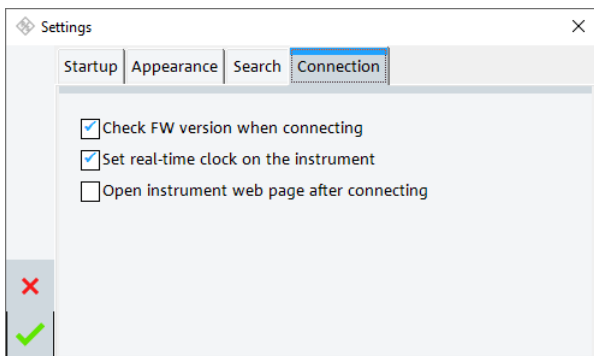


Figure 3-10 Connection tab

Check FW version when connecting: With each new connection to any instrument, the R&S web site is searched for a newer firmware version for the respective instrument. If a newer firmware version is found than the one installed on the instrument, the text field for the firmware version is highlighted in yellow color. Uncheck this option if no internet connection is available from the computer, or if access of the 1GP140 program to the internet is unwanted.

Set real-time clock on the instrument: After each new connection, the real-time clock of the connected instrument is set to the time of the real-time clock on the computer. Note that setting the real-time clock while logging is running might compromise the timing information in the logging data. Uncheck this option if you plan to run longtime logging with the possibility to connect the instrument from the computer while logging is ongoing.

Open instrument web page after connecting: This function is only available for instruments connected via ethernet. After each new connection, the instrument's LXI-style web page is opened in a new browser window.

3.6 Search for instruments

Clicking the “search instruments” button searches GPIB and USB for available supported instruments. For each found instrument an instrument tile is added to the instruments panel. Note that the ethernet is not searched for available instruments. VXI and HISLIP connections have to be established manually using the “add instrument” function (see section 3.7). See section 3.5.3 for options regarding instrument search.

3.7 Add instrument

This function allows to add an instrument connection manually by providing all necessary information on the instrument and on the interface. A VISA connection is specified by a so-called VISA resource string containing unique identifiers for the interface and for the instrument. The interface information comprises the interface type, an interface number and address information, if applicable. Instrument information, if applicable, comprises type code and serial number.

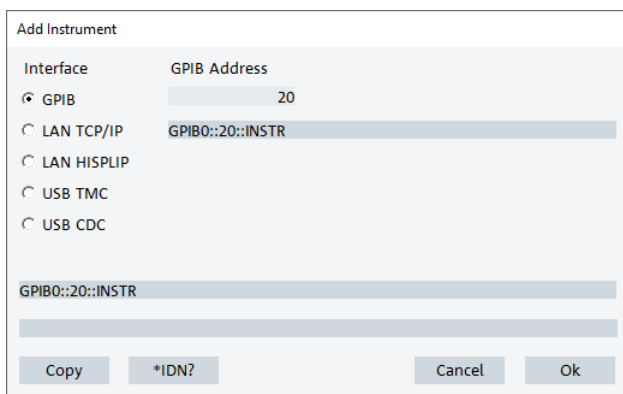
To establish a new connection, first select an interface type which is physically existing between the computer and the instrument. Depending on the selected interface type, the required identifiers have to be chosen or entered.

If all required information is entered, the resulting resource string is shown on the bottom of the window. This result string may be copied and pasted to other programs also using VISA for the communication to the instrument(s). Before closing the window, the availability of the specified instrument on the specified interface may be checked with an identity string query (“*IDN?”) by clicking the respective button. When the window is closed using the “Ok” button and the instrument connection is available, a new instrument tile is added in the main window, provided that there has not yet been another tile for the same instrument on the same interface.

3.7.1 GPIB

GPIB is a dedicated hardware interface which usually requires a special accessory for the computer and an option on the instrument. Before instruments were equipped with Ethernet and USB interfaces, it was the most widespread remote-control interface and is still found in many systems. The speed of data transfer is usually below that available on USB and ethernet.

The required drivers for GPIB are usually part of the hardware delivery of the PC interface.



Interface	GPIB Address
<input checked="" type="radio"/> GPIB	20
<input type="radio"/> LAN TCP/IP	GPIB0::20::INSTR
<input type="radio"/> LAN HISLIP	
<input type="radio"/> USB TMC	
<input type="radio"/> USB CDC	

GPIB0::20::INSTR

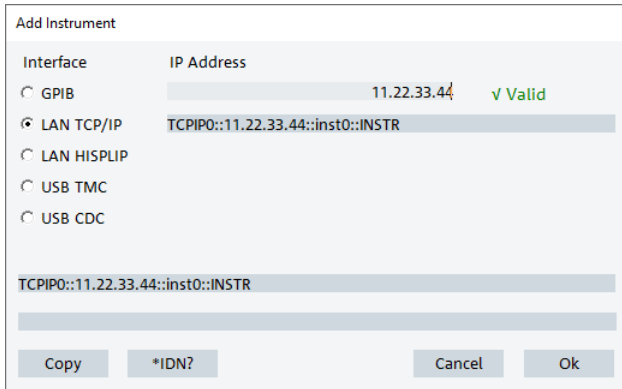
Copy *IDN? Cancel Ok

Figure 3-11 GPIB parameters

Theoretically there can be more than one GPIB interfaces on one computer, but this application program supports only GPIB0. The only parameter that needs to be specified is the GPIB address. 20 is in many cases the default value, but if more than one instrument is connected to the same GPIB bus, different addresses have to be set in the device menu of additional instruments.

3.7.2 Ethernet (LAN) TCP/IP and HISLIP

Ethernet is convenient for instrument remote control because it is a standard infrastructure in contemporary offices, labs and factories. Due to the network structure, distance is not an issue. The speed of data transfer is usually superior to that of the other interfaces. HISLIP is optimized for speed and therefore faster than TCP/IP. Ethernet communication is available in all operational systems and does not require specific drivers.



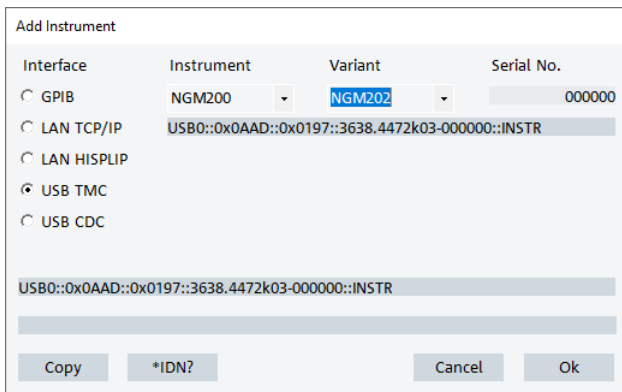
The screenshot shows the 'Add Instrument' dialog box with the 'LAN TCP/IP' interface selected. The 'IP Address' field contains '11.22.33.44' with a green checkmark and the text 'Valid' next to it. Below the interface selection, the text 'TCPIP0::11.22.33.44::inst0::INSTR' is displayed. At the bottom, there are buttons for 'Copy', '*IDN?', 'Cancel', and 'Ok'.

Figure 3-12 TCP/IP and HISLIP parameters

The only required information is the IPv4 address of the instrument. Since in most networks the IPv4 addresses are assigned by DHCP, they have to be looked up in the device menu of the instrument. The Add Instrument window provides information about the correct format of the entered IPv4 address.

3.7.3 USB TMC

TMC ("Test and Measurement Class") is the faster way for controlling test and measurement instruments via USB. If an instrument supports also CDC or VCP besides TMC, the desired node of operation must be set in the settings menu of the device. USB TMC does not require a generic or instrument-specific driver if a VISA is installed on the computer. The VISA itself provides all necessary functionality.



The screenshot shows the 'Add Instrument' dialog box with the 'USB TMC' interface selected. The 'Instrument' dropdown is set to 'NGM200' and the 'Variant' dropdown is set to 'NGM202'. The 'Serial No.' field contains '000000'. Below the interface selection, the text 'USB0::0x0AAD::0x0197::3638.4472k03-000000::INSTR' is displayed. At the bottom, there are buttons for 'Copy', '*IDN?', 'Cancel', and 'Ok'.

Figure 3-13 USB TMC parameters

To uniquely identify an instrument on USB TMC, you have to select the instrument type and variant (if applicable) from the available collections, and to enter the device's serial number.

3.7.4 USB CDC

Lower in cost than GPIB, serial (RS-232) connections (COM interfaces) have been quite common in pre-USB times. To provide software compatibility, USB connections simulated COM interfaces in the beginning. This technique is called CDC ("Communications Device Class") or VCP ("Virtual COM Port"). There may be USB-to-RS-232 hardware interfaces connected to a physical COM port in legacy equipment, or a simulation of a COM port on the device side of the USB connection. In all cases a driver is required on the computer, which normally installs automatically when a CDC or VCP device is connected. You may have to adjust the baud rate settings of the driver to match the settings in the instrument.

If a USB CDC connection fails, we recommend to switch to USB TMC.

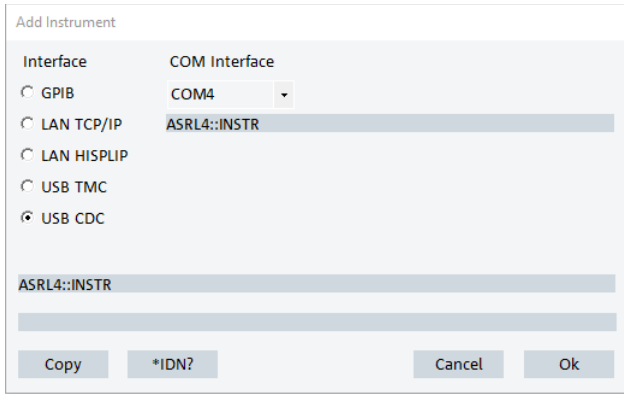


Figure 3-14 USB CDC parameters

The combobox lists all available virtual COM ports. If multiple CDC devices are available, use the “*IDN?” button to find the desired one.

3.8 Edit the connection list

The connection list button on the left side of the main window opens the window for editing the list of known remote control connections.

Remote Control Connections							
	SeL	Resource String	Type	Serial No.	FW Version	Options	Last Connected
	<input type="checkbox"/>	TCPIPO::10.102.189.20::inst0::INSTR	LCX200	102063	02.043 00D5D6AF64	K0(K106+K107+K1...	26-Feb-24 12:56 PM
	<input type="checkbox"/>	TCPIPO::10.102.188.220::inst0::INSTR	LCX100	102037	02.047 00EBC18228	K0(K106+K107+K1...	26-Feb-24 12:57 PM
	<input type="checkbox"/>	TCPIPO::10.102.189.47::inst0::INSTR	NGU201	101399	03.067 0041E9911...	K0(K103+K104+K1...	24-Jan-24 3:25 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.189.139::hislip0::INSTR	NGL202	100822	04.000 002CBB20D...	K0(K102+K103)	26-Feb-24 2:48 PM
	<input checked="" type="checkbox"/>	USB0::0x0AAD::0x0197::3638.4472k03-1...	NGM202	101452	04.009 00E5C63FD...	K0(K102+K103+K1...	26-Feb-24 2:49 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.188.185::inst0::INSTR	NGU411	101203	04.009 00E5C63FD...	K0)	26-Feb-24 2:49 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.189.47::hislip0::INSTR	NGU201	101399	04.009 00E5C63FD...	K0(K103+K104+K1...	26-Feb-24 2:49 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.189.109::inst0::INSTR	NGM202	100836	03.073 009ED594A...		26-Feb-24 2:49 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.189.122::inst0::INSTR	LCX200	100934	02.047 00EBC18228	K0(K106+K107+K1...	26-Feb-24 2:49 PM
	<input checked="" type="checkbox"/>	TCPIPO::10.102.188.131::inst0::INSTR	NGE103B	111121	1.57	K101,K103	26-Feb-24 2:49 PM
	<input type="checkbox"/>	TCPIPO::10.102.188.108::inst0::INSTR	NGP804	100427	02.025 02E3A3C161	K0(K102+K103+K1...	26-Feb-24 1:43 PM

Figure 3-15 Editable connection list

The checkboxes allow to select all connections which should automatically be re-established e.g, at program start. Unchecked connections will be ignored in this process, but they are still memorized in the list and can be reactivated at any time.

The “check” button on the left side checks all connections in the list, while the “uncheck” button unchecks all. A single connection can be highlighted by clicking into the first cell of the associated row, and irrevocably be removed from the list by subsequently clicking the waste bin button.

Clicking the cancel button (red “x”) discards the changes and closes the window. Clicking the Ok button (green check mark) accepts the changes and closes the window.

3.9 Show supported instruments

This button opens a window which shows a list of supported instrument types and variants together with images.



Figure 3-16 Supported instruments

3.10 Select and deselect instruments

The round checkboxes on the instrument tiles act like radiobuttons. Only one instrument can be selected at a time. If you check any of the instruments, the previously checked one will be unchecked. In addition it is possible to completely uncheck all instruments, using the “Deselect” button on the left side of the main window.

If an instrument is selected this way, all tiles of applications supporting this instrument are highlighted.

In the example of Figure 3-17, LCX200 is selected, which highlights the tiles “LCX Accuracy Calculation” and “LCX Sweep Tool”.

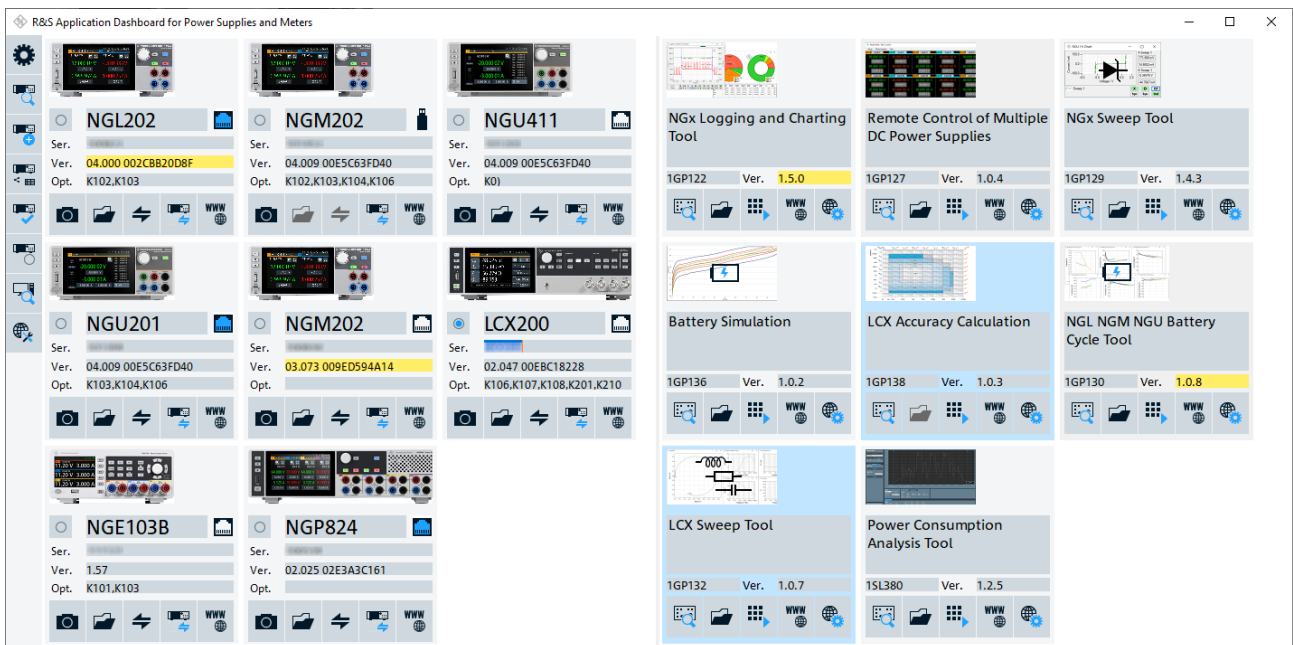


Figure 3-17 Main window with LCX200 selected

With some of the application tiles, the applications will open with the selected instrument connected, when they are launched from the highlighted application tile.

3.11 Search computer for applications

This function searches the computers for installed qualified application programs according to Table 3-1. It can be performed automatically upon startup of the 1GP140 program (see section 3.5.1) [1]

4 Literature

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5 Ordering information

Designation	Type	Order No.
Two-quadrant source measure unit	R&S®NGU201	3639.3763.02
Four-quadrant source measure unit	R&S®NGU401	3639.3763.03
Four-quadrant source measure unit	R&S®NGU411	3639.3763.04
Single-channel power supply	R&S®NGM201	3638.4472.02
Two-channel power supply	R&S®NGM202	3638.4472.03
Single-channel power supply	R&S®NGL201	3638.3376.02
Two-channel power supply	R&S®NGL202	3638.3376.03
Two-channel power supply, 400 W, 32 V/20 A	R&S®NGP802	5601.4007.05
Four-channel power supply, 800 W, 32 V/20 A	R&S®NGP804	5601.4007.02
Four-channel power supply, 800 W, 2 × 32 V/20 A, 2 × 64 V/10 A	R&S®NGP814	5601.4007.04
Two-channel power supply, 400 W, 64 V/10 A	R&S®NGP822	5601.4007.06
Four-channel power supply, 800 W, 64 V/10 A	R&S®NGP824	5601.4007.03
One-channel power supply, 35 V/6 A	R&S®NGA101	5601.8002.02
Two-channel power supply, 35 V/6 A	R&S®NGA102	5601.8002.04
One-channel power supply, 100 V/2 A	R&S®NGA141	5601.8002.03
Two-channel power supply, 100 V/2 A	R&S®NGA142	5601.8002.05
Two-channel power supply	R&S®NGE102B	5601.3800.02
Three-channel power supply	R&S®NGE103B	5601.3800.03
Single-channel power supply	R&S®NGC101	3657.2288.02
Single-channel power supply, GPIB	R&S®NGC101-G	3657.2288.03
Two-channel power supply	R&S®NGC102	3657.2359.02
Two-channel power supply, GPIB	R&S®NGC102-G	3657.2359.03
Three-channel power supply	R&S®NGC103	3657.2413.02
Three-channel power supply, GPIB	R&S®NGC103-G	3657.2413.03
LCR meter, 300 kHz	R&S®LCX100	3629.8856.02
LCR meter, 500 kHz	R&S®LCX200	3629.8856.03

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