

# R&S® NRP-Toolkit

## Release Notes Version 4.20

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# 1 General information

This package contains the R&S® NRP-Toolkit software. This software is designed to work with all R&S®NRP® USB power sensors as well as the frequency selective power sensor NRQ6.

The R&S®NRP-Toolkit contains the following components:

- Windows USB kernel-mode driver (WHQL certified) for NRP Power Sensors
- Windows USB "userland" interface driver (NrpControl2.dll)
- Tool for assigning network parameters of Network Sensors via a (temporary) USB connection (NrpNetSet). This tool also displays Zeroconf TCP/IP address assignments
- Firmware Update Tool (PureFW)
- Tool to determine the extended measurement uncertainty of NRP Power Sensors (NrpUncertaintyCalc.exe)
- Terminal Tool for NRP USB Sensors (NrpTerm2)
- S-Parameter Update Tool (to load/save S2P files to/from sensor)
- Tool to display version information of installed NRP products related software (NrpVersionCollector)

The supplied drivers fully support both 32-bit and 64-bit PC architectures.

Additionally there are separate packages available for users/programmers who are to be integrating the R&S®NRP® USB power sensors in their own applications. For this group of persons, the so called VXI Plug&Play driver package is available. For the sake of simplicity, the NRP-Toolkit installer V4.4 (and higher) comes with this driver by default and installs it right after the installation of the lower driver layers.

Optionally the NRP-Toolkit installer offers the installation of a so called SDK (Software Development Kit) which puts source code and link libraries for a couple of demo programs to a common directory (C:\ProgramData\Rohde-Schwarz\NRP-Toolkit-SDK)

- 32-bit & 64-bit link libraries (rsnrpz\_32.lib, rsnrpz\_64.lib)
- Header files for development of own applications
- Demo applications  
(source code in various languages [C, C#, C++, Python, ...])

An interactive application supporting multiple simultaneously used sensors can also be downloaded from the R&S® website

- Virtual Power Meter (NRPV [supporting multiple sensors/channels])

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**Note:** This brochure describes the usage of the power sensors under Windows desktop operating systems. There are separate driver packages available for 32-bit and 64-bit Linux operating systems. These packages come as installable \*.deb or \*.rpm packages for popular Linux distributions. Besides this a MacOSX package is

available and we also support Windows CE. Furthermore most R&S® USB power sensors are useable with selected Android devices (Smartphones, Tablets, Phablets).

Please contact our support if you are interested in application areas other than Microsoft Windows®.

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**Note:** The operation of the frequency selective power sensor NRQ6 requires an installed VISA on the controlling host. This is not part of the present NRP-Toolkit. If a VISA is not yet installed on your PC, please refer to

[https://www.rohde-schwarz.com/de/applikationen/r-s-visa-application-note\\_56280-148812.html](https://www.rohde-schwarz.com/de/applikationen/r-s-visa-application-note_56280-148812.html)

for downloading the R&S VISA installer free of charge.

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## 2 Information on the Current Version and History

**Hint:** If you are searching the free user application **Power Viewer** (formerly known as **Power Viewer Plus**) you can download it separately from the Rohde & Schwarz website. Power Viewer is not part of the NRP-Toolkit and is not required for operating the tools and applications, which come with the NRP-Toolkit.

### 2.1 Version 4.20

**Released: August 2020**

**Functional improvements:**

- New release of USB driver, including support for new 90 GHz thermal power sensors (NRP90T, NRP90TN) and NRP67SN-V TVAC (thermal vacuum) Three-path Diode Power Sensor

### 2.2 Version 4.17

**Released: February 2020**

**Functional improvements:**

- New release of WHQL Certified USB driver, including new waveguide power sensors
- Extended various tools to support new base unit NRX
- Extended the number of supported sensors from 32 to 63

**Issues eliminated:**

- NRQ sample programs from NRP-Toolkit-SDK now use the full SENS:BAND:RES command for resolution bandwidth setting. In previous NRQ firmware versions the :RES part was optional

### 2.3 Version 4.16

**Released: September 2018**

**Functional improvements:**

- Added Multicast-DNS Service Discovery (mDNS-SD) functionality to Network Sensor Configuration tool
- Display for Zeroconf network parameters

- Added an extensive guide for setup and troubleshooting of the Ethernet interface of Network Sensors

**Issues eliminated:**

Fixed possible deadlock under sustaining error condition of sensor (for example, by permanent 'permissible input power exceeded')

## 2.4 Version 4.15

**Released: April 2018**

**Functional improvements:**

- Added support for frequency selective power sensor NRQ6
- Added Python and C/C++ samples to NRP-Toolkit-SDK for demonstrating various NRQ6 measurement modes (located in `C:\ProgramData\Rohde-Schwarz\NRP-Toolkit-SDK\examples\NRQ\` after installation)

**Issues eliminated:**

- Fixed redundant warning in S-Parameter tool when using R&S VISA v5.8.4

## 2.5 Version 4.14

**Released: February 2018**

**Functional improvements:**

- Fixed installer to register OCX modules which are required by S-Parameter Multi application
- Fixed problem with auto-detection of CAL:USER:DATA after a sensor firmware change

## 2.6 Version 4.13

**Released: November 2017**

**Functional improvements:**

- Added a tool to set (TCP/IP) network-parameters of NRPxxXN sensors via USB port of the corresponding sensor
- Enhanced resource string evaluation; a trailing `': : INSTR'` is now silently ignored
- Fixing sign propagation in 64-bit compilations for function which translates error-numbers into error-messages (= `rsnrpz_error_message()` in VXI Plug&Play driver)

## 2.7 Version 4.12

**Released: September 2017**

**Functional improvements:**

- Fixed NRP Uncertainty calculator (swapped temperature range of NRP110T)

## 2.8 Version 4.11

**Released: June 2017**

**Functional improvements:**

- Improved version of Firmware Update program 'PureFW'. The program now supports firmware update of new base devices

## 2.9 Version 4.10

**Released: September 2016**

**Functional improvements:**

- Improved MacOSX implementation
- Improved multi-thread capability of contained VXI Plug&Play driver 'rsnrpz' (all OSes)
- Fixed handling/re-usage of open sessions under LabView environment.

## 2.10 Version 4.9

**Released: Juli 2016**

**Functional improvements:**

- R&S internal release; added libraries again for 32-bit Windows XP from older NRP-Toolkit to support existing XP device installations. This is **not** included in the package which is released to the public.

## 2.11 Version 4.8

**Released: June 2016**

**Functional improvements:**

- Updated WHQL certification for actual USB driver and sensor models.



- Added support for NRPC18, NRPC33, NRPC40, NRPC50, NRPC67, NRPC18-B1, NRPC33-B1, NRPC40-B1, NRPC50-B1, NRPC67-B1, NRPM3, NRPM3N
- Added handling of binary data (read & write) to NrpTerm2
- All tools and user-land driver are compiled with Visual Studio 2015; including appropriate runtime libraries (vc14.0) in installer

## 2.12 Version 4.7

**Released: December 2015**

### **Functional improvements:**

- Maintenance release. Improved handling of plug-/unplug events under Windows CE
- Added missing USB IDs of some special sensor models
- Windows 10 (32-/64-bit) now officially supported
- Dropped Windows XP support
- Fixed spurious race-condition in (separately available) R&S NRP Visa Passport driver
- Added function to retrieve overview of sensors attached to different applications in multi-application szenarios (usage map)
- Mentioned the existence of the Uncertainty Calculator also in the release notes

## 2.13 Version 4.6

**Released: September 2015**

### **Functional improvements:**

- Maintenance release. Implementation of multi-application functionality in other high-level drivers and various sample programs

## 2.14 Version 4.5

**Released: August 2015**

### **Functional improvements:**

- Made low-level driver capable of being used in multiple applications simultaneously. Introduced a new status information (NRP\_ERROR\_SENSOR\_IN\_USE) for synchronizing multiple instances
- Enhanced upper driver layers in order to take 'sensor-is-in-use' status into account
- Improved various applications and sample programs to take 'sensor-is-in-use' status into account
- Fixed NRP VISA Passport driver (available as a separately downloadable package)

- Separated Power Viewer Plus from NRP-Toolkit. Power Viewer Plus V7.1 and higher comes in a separately installable package now
- Added more sample programs to the NRP-Toolkit-SDK (including samples for using power sensors with VISA and NRP VISA Passport under C/C++ and C#)

## 2.15 Version 4.4

**Released: June 2015**

### **Functional improvements:**

- Added latest kernel-mode device drivers for new R&S® NRP USB devices (WHQL certified)
- VXI Plug&Play driver no longer is an optional component; it is installed always now
- Improved NrpVersionCollector application which displays versions of installed software packages
- Fixed uninstaller issues

## 2.16 Version 4.3

**Released: May 2015**

### **Functional improvements:**

- New installer structure. Single installer for 32-bit & 64-bit drivers and optional SDK (Software Development Kit) with programming examples
- Installer option for deploying IVI Shared Component containing USBTMC driver (necessary for NRPxxS/NRPxxSN series power sensors)
- Improved firmware-update tool (PureFW) supporting Zero-Conf sensor connections
- Fixed rendering issues of WebGUI
- Added tool to display version information of all relevant currently installed drivers
- New version of Power Viewer Plus, [Version 7.0](#)

## 2.17 Version 4.2.0

**Released: November 2014**

### **Functional improvements:**

- Synchronized device change events for NRPxxS[N] series sensors with the end of the boot procedure of the firmware
- Added new, re-written S-Parameter tool
- Added optional VXI Plug&Play driver installation and demo programs

**Known issues:**

- Firmware update program PureFW sometimes ends prematurely when updating NRPxxS[N] series sensors via network (but firmware update succeeds anyway)
- Firmware update program PureFW sometimes has access violation on Windows XP
- WebGUI of NRPxxSN network sensor may exhibit rendering errors when used with Internet Explorer. If possible, a different browser should be used
- Uninstallation of NRP-Toolkit on a system with activated UAC sometimes leaves an empty NRP-Toolkit folder in the Start Menu until next reboot

## 2.18 Version 4.1.0

**Released: September 2014**

**Functional improvements:**

- Added support for additional power sensors (NRPxxS[N] series)
- New tools for Firmware Update, S-Parameter management and basic interactive I/O
- Included new Terminal Tool NrpTerm2 replacing ancient USB Term

## 2.19 Version 4.0.0

**Released: August 2014**

**Functional improvements:**

- Updated WHQL certified kernel-mode drivers for Microsoft Windows® 7 (32-bit/64-bit) and Windows® 8 (32-bit/64-bit)
- Added useful Uncertainty Calculator tool and documentation
- Fixed NRP-Z5 support where the runtime environment could have been initialized twice under certain conditions
- New version of Power Viewer Plus, [Version 6.4](#)

## 2.20 Version 3.1.0

**Released: May 2013**

**Functional improvements:**

- Introduced new WHQL certified kernel-mode drivers, adding support for Microsoft Windows® 8 (32-bit/64-bit)
- Locale independent floating point data entry in vintage Power Viewer

- New version of Power Viewer Plus, [Version 6.1](#)

## 2.21 Version 2.3.1

**Released: January 2013**

**Functional improvements:**

- Added support for R&S® USB Hub R&S® NRP-Z5
- New version of Power Viewer Plus, [Version 5.9](#)

## 2.22 Version 2.2.0

**Released: July 2012**

**Functional improvements:**

- New version of Power Viewer Plus, [Version 5.6](#)

## 2.23 Version 2.1.19

**Released: May 2012**

**Functional improvements:**

- Power Viewer Plus, [Version 5.5](#)
- MacOS and Linux: Updated VXI PnP driver
  - Zeroing function has timed out with NRP-Z8x sensors
  - Fixed potential dead-lock situation in `rsnrpz_isMeasurementComplete()`
- MacOS: Updated list of supported NRP-Z sensors in `NrpLib` driver

## 2.24 Version 2.1.18

**Released: April 2012**

**Functional improvements:**

- Power Viewer Plus, [Version 5.4](#)

## 2.25 Version 2.1.17

**Released: March 2012**

**Intermediate release**

- Intermediate. Not publically released

## 2.26 Version 2.1.16

**Released: January 2012**

**Functional improvements:**

- Power Viewer Plus, [Version 5.3](#)

## 2.27 Version 2.1.15

**Released: October 2011**

**Functional improvements:**

- Power Viewer Plus, [Version 5.0](#)

## 2.28 Version 2.1.14

**Released: July 2011**

**Functional improvements:**

- Bugfix in Silent Installation

## 2.29 Version 2.1.12

**Released: February 2011**

**Functional improvements:**

- Added new NRP Sensors to USB Driver (NRP-Z211, NRP-Z221)
- Power Viewer Plus, [Version 4.1](#)

**Issues eliminated:**

- -

## 2.30 Version 2.1.10

**Released: February 2011**

**Functional improvements:**

- Firmware Update: changed messages during the progress to prevent sensor unplugging
- Power Viewer Plus, [Version 4.0](#)

**Issues eliminated:**

- -

## 2.31 Version 2.1.6

**Released: August 2010**

**Functional improvements:**

- New S-Parameter Update Tool to load more S2P files into an NRP-Z81
- No Wizards or other Dialogs occur after plugging a new sensor to the PC
- Power Viewer Plus, [Version 3.3](#)

**Issues eliminated:**

- -

## 3 Power Viewer Plus

### 3.1 Version 7.1 (and higher)

**Released: August 2015**

- Power Viewer Plus has been separated from the NRP-Toolkit. Starting with this version the application is available as a separate package. Search R&S® websites for the appropriate installer

### 3.2 Version 7.0

**Released: May 2015**

**Functional improvements:**

- Sensor connection via VXI11 support added
- LAN sensor management dialog added
- LAN sensor settings dialog added
- dB $\mu$ V added to continuous average panel
- support for TRIG2 trigger (SMB connector) added

**Functional Change:**

- Script language changed from proprietary format to JavaScript. Existing script files are no longer compatible and must be migrated

**Issues eliminated:**

- Fixed bug in S-paramer dialog when a new device was added

### 3.3 Version 6.4

**Released: August 2014**

**Functional improvements:**

- Configurable separator in data log output-file
- Unit 'Voltage' added to Continuous Average display
- Minor bugfixes

## 3.4 Version 6.1

**Released: May 2013**

**Functional improvements:**

- S-parameter management dialog added (Windows version only)
- New dialog to control gamma correction and s-parameter correction state

## 3.5 Version 5.9

**Released: January 2013**

**Functional improvements:**

- Data log: data log repeats old data in empty bins
- Multi channel measurement: more robust against user interactions due to better internal data buffering
- Script mode: NRT01 added to the list of accepted VISA devices
- Script mode: ';' cannot be used any longer as comment
- Script mode: new command 'CONVERT SCALAR' added
- Script mode: improved syntax highlighting
- Scripting: new command 'GRAPH' with Y-axis autoscaling to 1-2-5 grid displays time series
- Trace: corrected limits that apply to reference level and trigger level
- Trace: autoset algorithm improved
- Data log: max. recording time increased to 99 days
- Continuous measurement: improved display
- Continuous measurement: average filter resets only if frequency is changed
- Analysis panel: panel is now more compact and shows only the enabled channel widgets
- Improved text formatting in histogram and QQ-plot
- Continuous, multi-channel: average count can be increased up to 1M depending on sensor
- Data log: improved zoom-in algorithm

**Issues eliminated:**

- Updated application icon to new R&S style
- Debug dialog: fixed USB tree issue with USB3 devices and new hardware



## 3.6 Version 5.6

**Released: July 2012**

**Functional improvements:**

- New variable `_TIME` added to script mode
- SCPI queries improved in script mode

**Issues eliminated:**

- Corrected USB ID for FSH-Z1

## 3.7 Version 5.5

**Released: May 2012**

**Functional improvements:**

- MacOS and Linux only: Recompiled with updated VXI PnP driver code

## 3.8 Version 5.4

**Released: March 2012**

**Functional improvements:**

- Added support for new power sensors

**Issues eliminated:**

- Small internal bugfixes and typo corrections

**Known issues:**

- First start of this version resets the application colour settings to factory defaults

## 3.9 Version 5.3

**Released: January 2012**

**Functional improvements:**

- `.nrp` file extension is assigned to Power Viewer Plus

- Selective suspend mode can be turned off globally from settings panel
- New USB diagnostic panel

**Issues eliminated:**

- Fixed automatic pulse meas. gate for Z8x firmware  $\geq 1.33$
- Long Distance mode setting corrected
- Fixed behaviour of trigger buttons in trace measurement
- Datalog shows warning message if wrong measurement is set
- Datalog did sometimes omit one grid line
- Version information in executable file corrected

## 3.10 Version 5.0

**Released: October 2011**

**Functional improvements:**

- new functionality in script mode (formerly terminal mode)
- updated printer color set and print layout
- new menu entry 'reset measurement' applies default settings
- new menu entry 'exit without saving'
- data processing panels and continuous measurement supports dBW
- functionality added to automatic pulse analysis
- improved startup time by restricting internal search path
- added keyboard shortcuts to menu entries
- power and voltage thresholds are not converted into each other when switching between voltage- and power-related in automatic pulse analysis settings
- improved run/stop indicator
- improved trace update rate with large average filter counts
- new message log window
- new status output windows
- main application window can be sized to below 640 x 480 pixels
- new view modes in trace measurement modes
- marker and gated readings are now related to the selected view mode
- trigger mode 'free run' added to trace
- available S-parameter sets are listed on status panel
- support for FSH-Z18 sensor added

**Issues eliminated:**

- the initial progress dialog did not disappear on some installations
- mouse y-zoom in trace mode did not follow 1/3/5 rule
- splitter in main window did not memorize the size settings
- the multi-channel measurement has sent the value of Ch1 instead of Mx to the data processing panels
- marker search to the right did accidentally search to the left side
- trace display did sometimes not properly react to mouse events

## 3.11 Version 4.1

**Released: April 2011**

**Functional improvements:**

- added color settings dialog
- application uses new style
- hardcopy function added that generates a file on the desktop
- time to last trigger event is shown in trace measurement
- the low level driver version number is checked and compared against minimum requirements
- !SAVE command added to scripting
- minimum permissible reference level in trace changed from 100 nW to 10 nW
- added new view modes in trace measurement: dots, moving average
- default aperture time changed to 5 ms for Z56/57
- updated R&S support hotline contact information

**Issues eliminated:**

- Trace auto set sometimes caused an error message about an invalid number of points
- limit monitor could have crashed if many incidents were recorded in a short period of time

## 3.12 Version 4.0

**Released: February 2011**

**Functional improvements:**

- added READ:BUF? and READ:BUF:AUX? to terminal script language
- Continuous Windows shows 'HOLD' if measurement was stopped
- Improved the representation of numeric readings (resolution, lower limit)
- All data processing modules receive watts instead of dBm. The conversion to dBm is done locally in the data processing module
- Added a limit monitoring module
- Added new command line options
- updated low level instrument drivers, fixed potential crash during startup on Windows XP
- updated to QT 4.7.0 framework
- timeslot shows 'No Trigger' message if no trigger is detected

**Issues eliminated:**

- Fixed a bug in the data log module that caused crash during startup
- The trace mode used auto trigger when set to single trigger mode
- level offset was not correctly applied in timeslot bar chart display
- auto set did not work correctly

- reset moving average filter when reconfiguring a measurement

### 3.13 Version 3.3

**Released: August 2010**

**Functional improvements:**

- New Analysis Panel
- New terminal module added for processing SCPI command scripts or implementation of custom measurements
- Trace: New algorithm type 'PEAK' supported for automatic pulse analysis
- Trace: Improved trigger settings
- Menu bars added to all measurement windows
- Data Log: Statistics mode is enabled by default
- General UI improvements
- Continuous: simulation uses 10dB attenuator pad for S-parameter set when enabled
- Updated command line options
- The status window is automatically raised in case of measurement errors
- Anti aliasing added for drawing trace data
- Firmware Update: New URL for R&S firmware page
- Timeslot: Measurements are now done at a fast rate but UI updates are limited to 1/200 ms
- Timeslot: W and dBm readings are now forwarded to Data Processing windows

**Issues eliminated:**

- Trace: Potential stack overflow during auto adjust fixed
- Trace: Time gated measurements did not get updated when the window was iconized
- Trace: Horizontal cursor lines where sometimes drawn outside of the visible area
- Trace: Level offset was not always correctly updated in the trace display
- Data Log: Context menu did not always represent the current statistics state
- Data Log: Channel settings were not always properly saved in the project file
- Statistics: Potential crash fixed in table mode
- Statistics: Simulation did not handle the level offset correctly
- Timeslot: Measurement did not get upated with global sensor settings (offset/freq/...)
- Continuous: The window sometimes showed up empty due to erroneous splitter settings

## 3.14 Version 3.2

**Released: March 2010**

**Functional improvements:**

- PDF uses video smoothing of 32 traces
- CCDF displays overall peak and peak/average ratio
- Optional video filter and smoothing added for continuous measurement mode
- Linear and log. Scale in trace mode handled separately
- Fast mode for continuous power measurements enabled by default
- Channel assignment is now in separate dialog
- Better formatting of numeric values in many measurements
- Support for high resolution pulse analysis added

**Issues eliminated:**

- Improved font size matching on some machines
- CCDF peak reading corrected
- Settings panel could not be hidden properly
- Marker functions in trace mode corrected
- Auto Set in trace mode corrected

## 3.15 Version 3.1

**Released: January 2010**

**Functional improvements:**

- The tooltip shows the sensor type in the Continuous measurement mode
- Debug feature `contav.fastmode` added for faster Continuous mode measurements

**Issues eliminated:**

- Corrected minimum aperture value for all 3-path diode sensors
- Fixed potential source for crash in the Continuous Measurement mode
- Pk/Av reading corrected in the Statistics measurement mode

## 3.16 Version 3.0

**Released: January 2010**

### **Functional improvements:**

- Added level overage warning in trace and stat. mode, acoustic alert in continuous mode, measurements keep running in overage
- New command line options added, application colours can be changed
- New sensors added
- Improved handling of S-parameter settings
- Pulse measurement thresholds can be set in % voltage or % power
- Level range in timeslot mode can be changed
- Improved sensor simulation
- Added trigger offset setting in trace mode
- Time and level lines in trace mode can be moved simultaneously
- User interface improvements

### **Issues eliminated:**

- .csv export did not use correct locale
- corrected maximum possible aperture time for NRP-Z81
- possible deadlock in trace mode fixed
- fixed font size problems that occurred on some installations

## 3.17 Version 2.3

**Released: July 2009**

### **Functional improvements:**

- Data log captures up to 20000 points and directly writes to file while measurement is running
- Improved data representation in log window
- Continuous mode provides quantile-normal plot for evaluation of power distribution
- S-parameter check box disabled if sensor does not contain S-parameter sets
- Improved marker functionality in the trace mode
- Improved multi channel measurement mode with support for up to 16 sensors
- Increased power range of trace windows to MW for high power applications
- Improved time and level line handling in trace mode
- Minimum sensor firmware requirement for NRP-Z81 is 1.18

### **Issues eliminated:**

- Background sensor scanning could have caused a deadlock situation
- Running the Cont. mode in simulation could have caused NaN or Inv readings
- Trace mode trigger position was sometimes incorrectly saved in project file

- Switching between linear and log. Display in the trace mode did not work correctly
- if large offset values were used
- NRP-Z22 used erroneous configuration in Cont. mode
- Time (H:M:S) calculation corrected in data log window

### 3.18 Version 2.2 / 2.1

**Released: March 2009**

**Functional improvements:**

- Continuous measurement windows can resize
- Increased resolution in the Continuous measurement mode
- LCD background effect can be disabled
- New entry fields with tooltip help indicating the input ranges
- Warning text for SIMULATION mode
- Improved Continuous measurement mode and adjustable range of analog meter
- Statistics mode supports PDF, CDF and CCDF

**Issues eliminated:**

- Minimum trace time limit corrected for NRP-Z81
- Y/div was set to zero when changing from log. To linear scale
- Reference trace (trace mode) interfered with measurement trace
- Level offsets were applied twice in Multi channel mode
- Default font changed to 'Helvetica' corrects erroneous font rendering on some installations
- CCDF and PDF corrections
- Continuous mode did not correctly switch to relative readings
- Firmware version string of NRP-Z37 was not properly evaluated

### 3.19 Version 2.0

**Released: January 2010**

**Functional improvements:**

- Automatic pulse analysis added in trace mode (NRP-Z81, firmware  $\geq 1.20$ )
- Improved min-max (signal envelope) view in trace mode
- Improved print report for statistics, timeslot and trace mode
- CCDF shows probabilities down to  $1E-5$  and analyses up to 768 million samples
- CCDF level resolution increased in relative mode
- Dots plotted on CCDF curve if numeric table is enabled
- Improved .csv data export for statistics data
- Improved multi channel measurement settings
- Peak to average reading added in continuous mode
- Improved data log functionality

- New dialog for updating sensor firmware
- Support for NRP-Z31 sensor
- S-parameter sets can be activated for all measurements
- Gamma correction can be configured for all measurements

**Issues eliminated:**

- Zeroing sensor had no effect when a new measurement got started
- Fixed invalid CCDF display in case sensor data was invalid
- Corrected erroneous reading in CCDF numeric result table
- Fixed trace auto set algorithm when noise or DC was applied
- Fixed a potential crash risk if trace data got corrupted during USB transmission
- Fixed a potential dead lock situation that could occur after an unsuccessful firmware update
- Fixed timeslot trigger settings



## 4 Installation

### 4.1 Prerequisites

The R&S NRP-Toolkit software is designed to run on a Microsoft Windows based operating system (Windows 7, 8, 10). The R&S NRP-Toolkit installation requires about 70 Megabytes of free space on the hard disk.

The traditional R&S NRP-Z series of power sensors as well as the newer R&S NRPxxS/SN, NRPxxA/AN and NRPxxT/TN series are self-contained measurement device which can directly be connected to a PC's USB port. For the R&S NRP-Z series either the R&S NRP Z3 or Z4 adapter cable is necessary. The NRPxxS/SN, NRPxxA/AN, NRPxxT/TN series power sensors come with a detachable USB adapter cable for connection to a PC (when orders with NRP-ZKU option). If the passive NRP Z4 or the NRP-ZKU cable is used the USB port must be capable of driving high power USB devices up to 500 mA.

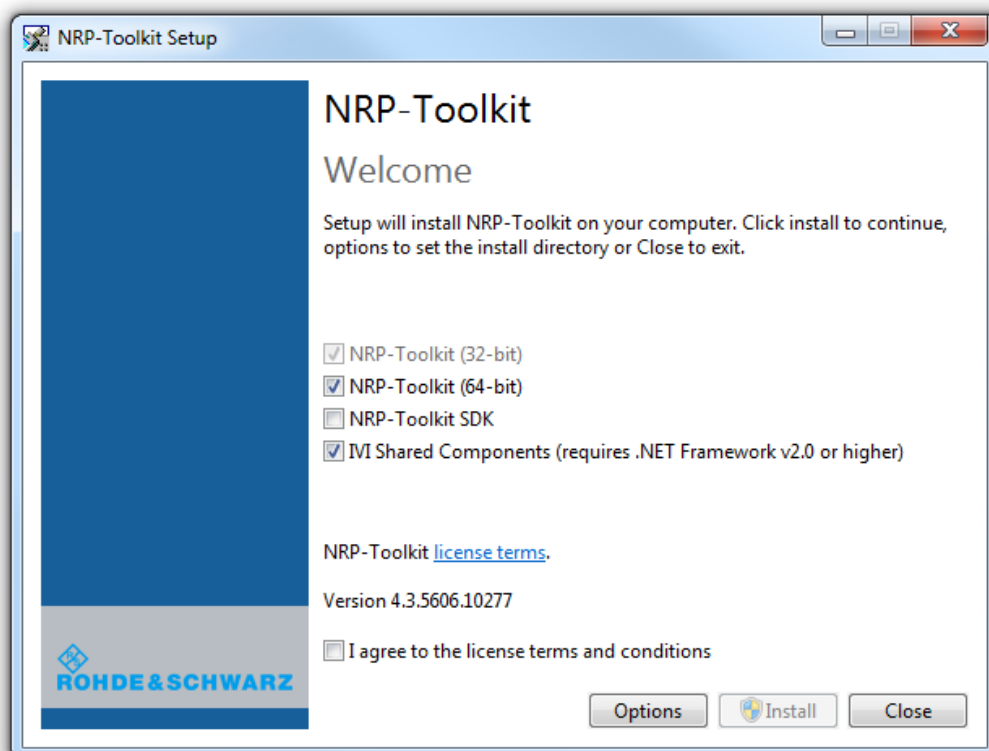
**Note:** If you are up to use the frequency selective power sensor NRQ6, an installed VISA is required on the controlling host. If you do not yet have a VISA on your PC, please navigate to

[https://www.rohde-schwarz.com/de/applikationen/r-s-visa-application-note\\_56280-148812.html](https://www.rohde-schwarz.com/de/applikationen/r-s-visa-application-note_56280-148812.html)

From there you can download the R&S VISA installer free of charge.

### 4.2 Execution of the Installer program

After downloading the R&S® NRP-Toolkit Installer executable simply start the \*.exe file. The main dialog provides the selection of including optional packages.



The basic package(s) with the low-level drivers (Kernel modules) need to be installed always. If you plan to develop individual programs, the SDK option (Software Development Kit) should also be selected. This provides header-files, link libraries and example source code for programmers -- these parts will be installed in `C:\ProgramData\Rohde-Schwarz\NRP-Toolkit-SDK`.

The NRPxxS/SN, NRPxxA/AN and NRPxxT/TN series power sensors constitute composite USB devices. This means, the devices provide a USBTMC interface and the traditional (so called NRP Legacy) interface in parallel. Therefore the NRP-Toolkit Installer has an option to add the driver for the USBTMC interface by means of the corresponding IVI Shared Component.

There are some command-line switches for the NRP-Toolkit installer which allow system integrators to call the installer from their own installation procedure. In this case it is often desirable to run the sub-installer silently. There could also be situations where you don't want to install the IVI Share Components (for example, because you already have them on the system)

Command-line switch	Description
/install   /repair   /uninstall   /layout	Installs, repairs, uninstalls the NRP-Toolkit or creates a complete local copy of the bundle. 'install' is the default
/passive   /quiet	Displays minimal user interface with no prompts or displays no user interface at all
/norestart	Suppress any attempts to restart. By default the user interface will prompt before restart
/log <filename.txt>	Logs to a specific file. By default a log file is created in the system's temp directory (%TEMP%)
InstallUsbTmc=1 0	Select or deselect IVI Shared Components for Installation

**Examples** (the version numbers are only placeholders):

```
NrpToolkit-4.3.5606.10277 /install /quiet InstallUsbTmc=0
NrpToolkit-4.3.5606.10277 /uninstall /passive
NrpToolkit-4.3.5606.10277 /install /log NrpToolkit_DevServer.txt
```

## 4.3 Update Procedure

The R&S® NRP-Toolkit Installer is capable of updating a previously installed (older) USB device driver on your system. This procedure removes any existing NRP driver from the Windows installation and clears corresponding registry entries. Subsequently the new device drivers become installed. This process may take several minutes.

Whenever USB drivers are updated it is required that the sensors are unplugged and reconnected again. Windows automatically installs the appropriate driver as soon as each sensor is connected initially to the PC.

---

**Note:** If you did not install the R&S® NRP-Toolkit software, Windows will not be able to access the power sensor(s). Instead, the Windows device manager shows an unknown USB device that is marked with a yellow exclamation mark. In this case, please proceed as follows:

- Abort the dialog for driver installation.
  - Install the R&S®NRP-Toolkit from the CD-ROM or from your downloaded package. Then manually assign the USB driver from the NRP-Toolkit to the R&S® NRP device.
  - Go to Control Panel – Add/Remove Hardware and start the hardware assistant to search for new components.
  - Select the R&S® NRP power sensor in the list of hardware components and complete the driver installation.
  - Unplug the power sensor and reconnect it.
-

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