# LabWindows/CVI, VXIpnp and LabVIEW driver history for the R&S® Power Sensors
# Driver Documentation

**Products:**

| R&S®NRP-Zxx

Linux drivers are available on request from our Customer Support:
customersupport@rohde-schwarz.com

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ROHDE & SCHWARZ

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# 1 Supported Instruments

In the following table, the supported R&S instruments and firmware versions are listed:

| Which instruments are supported? | | |
|---|---|---|
| **Current revision of instrument driver supports these instruments and firmware versions:** | | |
| **Instrument** | **Supported Firmware** | **Remarks** |
| NRP-Zxx | 4.xx | |

# 2 CVI, VXIplug&play, LabVIEW drivers history

| rsnrpz Instrument Driver | | |
|---|---|---|
| **Driver history for LabWindows/CVI and VXIplug&play Instrument Driver for C#, C/C++, Visual Basic .NET, VEE, etc.** | | |
| Revision | Date | Note |
| 3.6.0.0 | 09/2018 | - Added recognition of new version scheme (MAJOR.MINOR.DateStr[.beta]) in rsnrpz_fw_version_check(), as introduced by some new devices (for example, '1.20.18061401' instead of formerly '18.06.14.01') |
| 3.5.7.0 | 07/2018 | - New LabVIEW installer, the precondition is installation of rsnrpz VXIpnp driver 3.5.6.0 or newer + NRP Toolkit 4.15 or newer<br><br> - New Help file format<br><br> - Fixed buffer allocation bugs for VIs returning strings<br><br> - Removed ArraySize and Buffer Size parameters when not necessary<br><br> - Changed inputs from recommended to mandatory on several VIs |
| 3.5.6.0 | 01/2018 | VXIpnp installer update only:<br><br> - Added rsnrpz.mdd file to VXIPnP driver installer |
| 3.5.1.0 | 12/2017 | LabVIEW update only:<br><br> - Reworked all VI icons and Palette icons<br><br> - Obsolete VIs RSNRPZ Add Sensor.vi and RSNRPZ Close Sensor.vi moved to the subfolder Channels<br><br> - New Help file format<br><br> - Removed examples, they are to be found in a separate package on the driver's web site<br><br> - New VI: RSNRPZ Wait for Measurement Complete State.vi. This VI performs polling of RSNRPZ Get Measurement Complete State.vi with timeout |
| 3.5.0.0 | 12/2016 | - Fixed broken locking under Linux<br>LabVIEW changes:<br><br> - New format of DLL-wrappers without the case structures<br><br> - All Front Panel controls converted from classis to Modern styles<br><br> - All VIs are re-entrant to be used in parallel threads<br><br> - All DLL-nodes are set to be run in Non-GUI threads<br><br> - Error messages now also show the call chain<br><br> - RSNRPZ Get Sensor Count.vi - removed VISA session controls<br><br> - RSNRPZ Get Sensor Info.vi - removed VISA session controls<br><br> - RSNRPZ Get Usage Map.vi - removed VISA session controls |
| 3.4.1.0 | 09/2016 | - LabView usage: Fixed the error when existing session was not closed before a new session was opened. Now in case that the session is still valid, it will be re-used |
| 3.2.2.0 | 12/2015 | - No functional changes in the driver, just the update of the rsnrpz_vxi.chm help file. The chapter **Initialize** contains the updated list of all the supported powersensors including the new ones – NRPxxS/SN including their PID numbers |
| 3.2.1.0 | 09/2015 | - Added informational function rsnrpz_getUsageMap() |

| rsnrpz Instrument Driver | | |
|---|---|---|
| **Driver history for LabWindows/CVI and VXIplug&play Instrument Driver for C#, C/C++, Visual Basic .NET, VEE, etc.** | | |
| Revision | Date | Note |
| 3.2.0.0 | 08/2015 | - Added support for functions which are only available on the new sensors (i. e. with NRPxxS[N] series): <br>   rsnrpz_setSensorName() <br>   rsnrpz_getSensorName() <br>   rsnrpz_setLedMode() <br>   rsnrpz_getLedMode() <br>   rsnrpz_setLedColor() <br>   rsnrpz_getLedColor() <br>   rsnrpz_trigger_setMasterPort() <br>   rsnrpz_trigger_getMasterPort() <br>   rsnrpz_trigger_setSyncPort() <br>   rsnrpz_trigger_getSyncPort() <br> - Support for multi-process synchronization of underlying library, i. e. driver returning NRP_ERROR_SENSOR_IN_USE |
| 3.1.0.0 | 07/2015 | - Read/write of factory- and user-calibration data (was previously for internal use only, but becomes publicly available now) <br> - Minor function call fix (WinCE 7 compilation) |
| 3.0.2.0 | 07/2015 | - Better explanation of zero calibration in documentation (no code changes) |
| 3.0.1.0 | 06/2015 | - fixed Unicode issue (for WinCE 7 compilation) |
| 3.0.0.0 | 10/2014 | - removed the prototypes of calib data read/write functions from the header file, because otherwise MatLab could not load the *.dll <br> - added internal tracing capability for analyzing a strange issue with a single NRP-Z31load the *.dll |
| 2.3.9.0 | 09/2014 | - fixed issue with aux array allocation in case the array size changes while switching auxiliary values on |
| 2.3.8.0 | 09/2014 | - added minimum FW version information for NRPxxS[N] |
| 2.3.7.0 | 10/2014 | - added support for NRPxxS[N] |
| 2.3.5.0 | 06/2014 | - added internal tracing capability for analyzing a strange issue with a single NRP-Z31 |
| 2.3.4.0 | 02/2014 | - removed the prototypes of calib data read/write functions from the header file, because otherwise MatLab could not load the *.dll <br> - added internal tracing capability for analyzing a strange issue with a single NRP-Z31load the *.dll |
| 2.32.0 | 06/2013 | Note: Please install NRP-Toolkit Version 2.3.2 first! <br> Modifications: |

| rsnrpz Instrument Driver | | |
|---|---|---|
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| Revision | Date | Note |
| | | - calib data read/write functions (for internal use only) |
| 2.31.0 | 01/2013 | Modifications:<br><br>- fixed potential string problems with VEE<br><br>- fixed rsnrpz_initZ5()for VEE<br><br>- removed unused code<br><br>- added recognition of NRPC series Power Sensors<br><br>- fixed potential string problems with VEE<br><br>- Added functions for supporting R&S USB Hub NRP-Z5<br><br>  rsnrpz_GetDeviceStatusZ5()<br><br>  rsnrpz_GetDeviceInfoZ5()<br><br>  rsnrpz_initZ5() |
| 2.2.0 | 05/2012 | Modifications:<br><br>- fixed dead lock situation in rsnrpz_chan_isMeasurementComplete()<br><br>- fixed handling of CAL:ZERO:AUTO in rsnrpz_WriteCommand() |
| 2.1.9 | 03/2012 | Modifications:<br><br>- added function rsnrpz_fw_version_check() to get current and<br><br>  required minimal version of sensor firmware<br><br>- changed signature of rsnrpz_init_long_distance() to keep<br><br>  MeasurementStudio happy |
| 2.1.8 | 10/2011 | Modifications:<br><br>- fixed compatibility issues on 64-bit OS when VISA is included<br><br>- rsnrpz_GetSensorInfo, channel index starts at 1 for first sensor<br><br>- rsnrpz_chan_isMeasurementComplete checks if sensor is still alive |
| 2.1.7 | 06/2011 | Modifications:<br><br>- added function rsnrpz_corr_getSParamDevList()<br><br>- clearing errors in rsnrpz_defaultInstrSetup()<br><br>- clear session in case of errors during rsnrpz_init()<br><br>- exporting functions rsnrpz_status_setDeviceChangedCallback() and<br><br>  rsnrpz_GetSessionControlHandle() only when not running under VEE |
| 2.1.5 | 04/2011 | Modifications:<br><br>- fix situation where rsnrpz_close() will be called by a user<br><br>  with a session which was already closed before<br><br>  (now returning VI_ERROR_PARAMETER1 in this case)<br><br>- better compatibility with CVI below V9.0<br><br>- fixed LFR & UFR parameter of rsnrpz_chan_zeroAdvanced()<br><br>- fixed problem when unplugging sensor during measurement<br><br>- bugfix in rsnrpz_NotifyCommand where LeaveCriticalSection may have<br><br>  been called without EnterCriticalSection<br><br>- improved trace functionality |

| rsnrpz Instrument Driver | | |
|---|---|---|
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| Revision | Date | Note |
| | | - removed unused/old code fragments left over from 2.10 change<br><br>- 'external' interface information (ViSession) always<br><br>  is a 32-bit entity now, even with the 64-bit version<br><br>  of the driver<br><br>- Fixed define of PEAK algorithm in trace measurement |
| 1.95 | 07/2010 | Modifications:<br><br>- New functions:<br><br>  - added NrpDeviceChangedCallback<br><br>  - added rsnrpz_status_setDeviceChangedCallback<br><br>  - changed some defines to constants<br><br>  - added panels for functions:<br><br>    rsnrpz_status_driverOpenState<br><br>    rsnrpz_service_getDetectorTemperature<br><br>    rsnrpz_service_startSimulation<br><br>    rsnrpz_service_setSimulationValues<br><br>    rsnrpz_service_stopSimulation |
| 1.93 | 03/2010 | Modifications:<br><br>- New functions:<br><br>  rsnrpz_chan_setCorrectionFrequencyStep<br><br>  rsnrpz_chan_getCorrectionFrequencyStep<br><br>  rsnrpz_chan_setCorrectionFrequencySpacing<br><br>  rsnrpz_chan_getCorrectionFrequencySpacing<br><br>  rsnrpz_chan_getContAvBufferCount<br><br>  rsnrpz_chan_getContAvBufferInfo<br><br>  rsnrpz_scope_setEquivalentSampling<br><br>  rsnrpz_scope_getEquivalentSampling<br><br>  rsnrpz_scope_meas_setTime<br><br>  rsnrpz_scope_meas_getTime<br><br>  rsnrpz_scope_meas_setEquivalentSampling<br><br>  rsnrpz_scope_meas_getEquivalentSampling<br><br>  rsnrpz_scope_meas_getSamplePeriod<br><br>  rsnrpz_calib_test<br><br>  rsnrpz_calib_getTestDeviation<br><br>  rsnrpz_calib_getTestReference<br><br>- Modified functions:<br><br>  rsnrpz_SetBitInRegisters<br><br>  rsnrpz_SetRegister<br><br>- added rsnrpz_chan_getCacheRange()<br><br>  (for internal use by PowerViewerPlus)<br><br>  - bugfix in rsnrpz_FormatCommand() (C locale) |

| rsnrpz Instrument Driver | | |
|---|---|---|
| **Driver history for LabWindows/CVI and VXIplug&play Instrument Driver for C#, C/C++, Visual Basic .NET, VEE, etc.** | | |
| Revision | Date | Note |
| | | - changed recognition of supported commands (not using sensor type anymore, but feature-bits from sensor). "Old" behaviour still available by defining USE_CHECKINSTR |
| 1.80 | 12/2008 | - fixed handling of automatic pulse parameter measurement results in conjunction with isMeasurementComplete() |
| 1.79 | 11/2008 | - dropout time handling no longer limited to NRP-Z81 only (relies on sensor features now)<br>- reading pulse measurement's scalar results from cache instead of requesting them from the device again |
| 1.73 | 05/2008 | Please use NRP-Toolkit 1.7.3<br>- fixed memory leak in NrpDataAvailableCallback for aux channels<br>- added (char*) type casts to get rid of gcc -Wwrite-string warnings:<br>    'deprecated conversion from string constant...' |
| 1.71 | 03/2008 | Please use NRP-Toolkit 1.7.0<br>- thread-safe initialization and fixed some LINUX compiler warnings |
| 1.70 | 03/2008 | - fixed deadlock situation in error handling |
| 1.69 | 03/2008 | - fixed compilation under LINUX (stricmp() was missing) |
| 1.68 | 03/2008 | - cleared LabWindows/CVI compiler/linker warnings |
| 1.67 | 02/2008 | Please use NRP-Toolkit 1.6.0  or later<br>Modifications:<br>- fixed compilation problem with #included "visa.h" |
| 1.66 | 01/2008 | Please use NRP-Toolkit 1.6.0<br>Modifications:<br>- integrated latest version of NrpControl2.dll NRP-Toolkit 1.6.0 |
| 1.65 | 01/2008 | Modifications:<br>- added SYST:INFO item 'FPGA Build', and made item check case insensitive |
| 1.64.1 | 12/2007 | Modifications:<br>- fixed installer of VXI Plug&Play driver - added fixed LIB files.<br>    Please note that revision of DLL and driver remains 1.64. |
| 1.64 | 11/2007 | Modifications:<br> - added conditional defines for LINUX compilation<br>    HINT:  There is currently no notification mechanism for service requests (SRQ) under LINUX !<br> - added rsnrpz_GetSensorCount() and rsnrpz_GetSensorInfo()<br> - fixed rsnrpz_chan[s]_isMeasurementComplete checks in Statistics modes |
| 1.63 | 08/2007 | Modifications:<br> - added rsnrpz_GetAvailableSensors() to retrieve a list of all actually connected sensors |

| rsnrpz Instrument Driver | | |
|---|---|---|
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| Revision | Date | Note |
| 1.62 | 072007 | Modifications:<br>- fixed usage of the same event-handles for both read and write<br>   operations due to Rev 1.60 changes (rsnrpz_meass_readMeasurement()<br>   did not work any more) |
| 1.61 | 06/2007 | Modifications:<br>- fixed CriticalSection issue |
| 1.60 | 06/2007 | Modifications:<br>- fixed usage of more than one session at a time. In that case<br>   the rsnrpz_close() unloaded/closed the NrpControl driver as<br>   soon as the first session was closed. This was wrong!<br>   NrpCloseDriver() is only allowed to be called after the<br>   LAST session was closed! |
| 1.51 | 05/2007 | Modifications:<br>  - New functions:<br>   rsnrpz_trigger_setMasterState<br>   rsnrpz_trigger_getMasterState<br>   rsnrpz_trigger_setSyncState<br>   rsnrpz_trigger_getSyncState |
| 1.50 | 02/2007 | Modifications:<br> - enhanced version of rsnrpz_init(); now queries the registry<br>   to find out whether a long distance connection should be<br>   established (for 'AnywhereUSB' remote hub) |
| 1.40 | 10/2006 | Modifications:<br>- New functions:<br>   rsnrpz_get_timeout<br>   rsnrpz_set_timeout<br>    Fixes a timeout-terminated hang in USB Write Functions<br>    on Windows XP Embedded |
| 1.31 | 08/2006 | Modifications:<br>- New functions:<br>   rsnrpz_bandwidth_setBw<br>   rsnrpz_bandwidth_getBw<br>   rsnrpz_bandwidth_getBwList<br>   rsnrpz_chan_setBurstChopperEnabled<br>   rsnrpz_chan_getBurstChopperEnabled<br>   Timegates subsystem<br>   rsnrpz_tslot_setTimeSlotMidOffset<br>   rsnrpz_tslot_getTimeSlotMidOffset |

| rsnrpz Instrument Driver | | |
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| Revision | Date | Note |
| | | rsnrpz_tslot_setTimeSlotMidLength |
| | | rsnrpz_tslot_getTimeSlotMidLength |
| | | rsnrpz_tslot_setTimeSlotChopperEnabled |
| | | rsnrpz_tslot_getTimeSlotChopperEnabled |
| | | rsnrpz_trigger_setDropoutTime |
| | | rsnrpz_trigger_getDropoutTime |
| | | rsnrpz_chan_setAuxiliary |
| | | rsnrpz_chan_getAuxiliary |
| | | rsnrpz_meass_readMeasurementAux |
| | | rsnrpz_meass_fetchMeasurementAux |
| | | rsnrpz_meass_readBufferMeasurementAux |
| | | rsnrpz_meass_fetchBufferMeasurementAux |
| | | rsnrpz_stat_confTimegate |
| | | rsnrpz_stat_confScale |
| | | rsnrpz_stat_setOffsetTime |
| | | rsnrpz_stat_getOffsetTime |
| | | rsnrpz_stat_setMidOffset |
| | | rsnrpz_stat_getMidOffset |
| | | rsnrpz_stat_setMidLength |
| | | rsnrpz_stat_getMidLength |
| | | rsnrpz_stat_setScaleRefLevel |
| | | rsnrpz_stat_getScaleRefLevel |
| | | rsnrpz_stat_setScaleRange |
| | | rsnrpz_stat_getScaleRange |
| | | rsnrpz_stat_setScalePoints |
| | | rsnrpz_stat_getScalePoints |
| | | rsnrpz_stat_getScaleWidth |
| | | rsnrpz_scope_fastZero |
| | | rsnrpz_corr_setSParamDevice |
| | | rsnrpz_corr_getSParamDevice |
| | | rsnrpz_chan_setReflectionGammaUncertainty |
| | | rsnrpz_chan_getReflectionGammaUncertainty |
| | | rsnrpz_chan_zeroAdvanced |
| 1.30 | 11/2005 | Modifications: |
| | | - FPHelp fixed - command Index Added into CHM |
| | | - Added support of NRP-Z37, 27, 81 |
| | | - Modified functions: |
| | |     rsnrpz_chan_mode |
| | | - New functions: |
| | |     rsnrpz_chan_configureReflectGammaCorr |

| rsnrpz Instrument Driver | | |
|---|---|---|
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| Revision | Date | Note |
| | | rsnrpz_chan_setReflectionGammaMagn |
| | | rsnrpz_chan_getReflectionGammaMagn |
| | | rsnrpz_chan_setReflectionGammaPhase |
| | | rsnrpz_chan_getReflectionGammaPhase |
| 1.22 | 05/2005 | Modifications: <br><br> Fixed description in: <br><br> - rsnrpz_trigger_configureInternal <br><br> - rsnrpz_trigger_setLevel <br><br> - rsnrpz_trigger_getLevel |
| 1.21 | 04/2005 | Modifications: <br><br> - Fixed rsnrpz_CloseSensor - forces freeing of user data |
| 1.20 | 11/2004 | Modifications: <br><br> - Fixed NrpControl2.dll <br><br> - Fixes rsnrpz_AddSensor() |
| 1.19 | 08/2004 | Modifications: <br><br> - Fixed NrpControl2.dll |
| 1.18 | 03/2004 | Modifications: <br><br> - Fixed NrpControl2.dll <br><br> - Instrument Descriptor: <br><br>   If only one sensor is connected it is possible to use * for the product id or the serial number |
| 1.17 | 12/2003 | Modifications: <br><br> - Removed debug lines with MessageBeep function (now it's 10x faster) |
| 1.16 | 11/2003 | Modifications: <br><br> - Added new NrpControl2.dll (revision 01.21) <br><br> - Float parameters are formatted with %e instead of %f <br><br> - Minor changes in FP file <br><br> - Fixed rsnrpz_status_checkEvent function <br><br> - Changed default value of transition from PTR to NONE <br><br> - changed function rsnrpz_InitializeRegisters <br><br> - changed FP of rsnrpz_status_catchEvent <br><br> - Fixed rsnrpz_chan_infosCount |
| 1.15 | 09/2003 | Modifications: <br><br> - Added new NrpControl2.dll (revision 01.21) <br><br> - Minor changes in FP file |
| 1.14 | 08/2003 | Modifications: <br><br> - Added new Nrpcontrol2.dll (revision 01.20) |
| 1.13 | 08/2003 | Modifications: |

## rsnrpz Instrument Driver

### Driver history for LabWindows/CVI and VXIplug&play Instrument Driver for C#, C/C++, Visual Basic .NET, VEE, etc.

| Revision | Date | Note |
|---|---|---|
| | | - Added VISA constants and types into header file. VISA is not required. |
| 1.12 | 07/2003 | Modifications:<br>- Fixed bug in the error callback |
| 1.11 | 07/2003 | Modifications:<br>- ignored Sample Error in release version.<br>- used macro constant for device errors instead of magic numbers<br>- isMeasComplete functions don't reflect measurement bits and they return<br>  TRUE when data are available. When functions return TRUE and new data<br>  has not been received, all other isMeasurementComplete function calls<br>  return FALSE. |
| 1.10 | 07/2003 | Modifications:<br>- Fixed rsnrpz_chans_isMeasurementComplete and<br>  rsnrpz_chan_isMeasurementComplete. Functions do not return VI_TRUE when<br>  sensor is in wait for trigger state<br>- Fixed functions rsnrpz_chans_zero and rsnrpz_chan_zero<br>  These function do not wait for acknowledge.<br>- Added better checking for invalid session handle<br>- Fixed functions rsnrpz_avg_setAutoEnabled, rsnrpz_avg_getAutoEnabled<br>  rsnrpz_scope_setAutoEnabled, rsnrpz_scope_getAutoEnabled.<br>- If direction is RSNRPZ_DIRECTION_PTR, and is then set to<br>  RSNRPZ_DIRECTION_NTR, the …PTR is removed<br>- rsnrpz_close and rsnrpz_CloseSensor functions send *RST.<br>- Installer distribute NrpControl2.dll v01.10 |
| 1.11 | 07/2003 | Modifications:<br>- ignored Sample Error in release version.<br>- used macro constant for device errors instead of magic numbers<br>- isMeasComplete functions don't reflect measurement bits and they return<br>  TRUE when data are available. When functions return TRUE and new data<br>  has not been received, all other isMeasurementComplete function calls<br>  return FALSE. |
| 1.10 | 07/2003 | Modifications:<br>- Fixed rsnrpz_chans_isMeasurementComplete and<br>  rsnrpz_chan_isMeasurementComplete. Functions do not return VI_TRUE when<br>  sensor is in wait for trigger state<br>- Fixed functions rsnrpz_chans_zero and rsnrpz_chan_zero<br>  These function do not wait for acknowledge.<br>- Added better checking for invalid session handle<br>- Fixed functions rsnrpz_avg_setAutoEnabled, rsnrpz_avg_getAutoEnabled<br>  rsnrpz_scope_setAutoEnabled, rsnrpz_scope_getAutoEnabled. |

| rsnrpz Instrument Driver | | |
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| Revision | Date | Note |
| | | - If direction is RSNRPZ_DIRECTION_PTR, and is then set to RSNRPZ_DIRECTION_NTR, the …PTR is removed<br><br>- rsnrpz_close and rsnrpz_CloseSensor functions send *RST.<br><br>- Installer distribute NrpControl2.dll v01.10 |
| 1.01 | 06/2003 | Modifications:<br><br>- Cosmetic changes in the help<br><br>- Fixed rsnrpz_error_message function (translate NrpConrol2 errors)<br><br>- Fetch function returns an error when data are not available<br><br>- Fixed functions rsnrpz_chans_isZeroingComplete and rsnrpz_chans_isMeasurementComplete |
| 1.0.0 | 01/2014 | Initial release |

**About Rohde & Schwarz**

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. Founded more than 80 years ago, this independent company has an extensive sales and service network and is present in more than 70 countries.

The electronics group is among the world market leaders in its established business fields. The company is headquartered in Munich, Germany. It also has regional headquarters in Singapore and Columbia, Maryland, USA, to manage its operations in these regions.

**Environmental commitment**
- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system
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Certified Quality System
ISO 9001

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