

M9384B VXG

M9383B VXG-m

Microwave Signal Generators

NOTE: Any version may update the instrument's FPGAs, allow at least 30 minutes to perform the update, longer on 2-channel instruments. This will also require the instrument to be manually power cycled upon completion. Refer to [VXG Update Instructions](#).

Software Version A.11.65

Release Date:	November 2023
File Name:	Keysight.PathWave.SG.Setup_A.11.65.exe

Known issues or special consideration

- 5GNR app was moved from Signal Mode to a separate app page and only single app instance is supported. For 5GNR SCPI usage:
 - o “[SOURce]:RADio:SElect NR5G” is required before using any other 5GNR SCPIs
 - o SCPIs started with “SIGNal2:NR5G” will get an error
 - o “SIGNal{1:32}:MODE NR” will get an error
- The following capabilities are provided as Beta level functionality, the features work reasonably well but may have defects
 - o N7608APPC, Custom Modulation
 - o N7624APPC, LTE FDD Uplink/PRACH

Defect Fixes

- Fixed problem where the front panel harkeys for Preset, triple-bar, etc. would not be operational if the instrument is booted with no LAN connected, or after usage of the Help system.

Software Version A.11.61

Release Date:	April 2023
File Name:	Keysight.PathWave.SG.Setup_A.11.61.exe

Known issues or special consideration

- 5G NR app was moved from Signal Mode to a separate app page and only single app instance is supported. For 5G NR SCPI usage:
 - o “[SOURCE]:RADio:SElect NR5G” is required before using any other 5G NR SCPIs
 - o SCPIs started with “SIGNal2:NR5G” will get an error
 - o “SIGNal{1:32}:MODE NR” will get an error
- The following capabilities are provided as Beta level functionality, the features work reasonably well but may have defects
 - o N7608APPC, Custom Modulation
 - o N7624APPC, LTE FDD Uplink/PRACH

New Features and Enhancements

- Updated Keysight Licensing to version 5.5.1

Software Version A.11.56

Release Date:	February 2023
File Name:	Keysight.PathWave.SG.Setup_A.11.56.exe

Known issues or special consideration

- 5G NR app was moved from Signal Mode to a separate app page and only single app instance is supported. For 5G NR SCPI usage:
 - o “[SOURCE]:RADio:SElect NR5G” is required before using any other 5G NR SCPIs
 - o SCPIs started with “SIGNal2:NR5G” will get an error
 - o “SIGNal{1:32}:MODE NR” will get an error
- The following capabilities are provided as Beta level functionality, the features work reasonably well but may have defects
 - o N7608APPC, Custom Modulation
 - o N7624APPC, LTE FDD Uplink/PRACH

Defect Fixes

- Product general fixes
 - o Proper operation of Status Operation register Bit 5

- In the Numeric Entry GUI, single digit editing eliminated spinner appearing
- For option CB4, fixed phase discontinuity resulting from temperature drift

Software Version A.11.01

Release Date:	December 2022
File Name:	Keysight.PathWave.SG.Setup_A.11.01.exe

Known issues or special consideration

- 5G NR app was moved from Signal Mode to a separate app page and only single app instance is supported. For 5G NR SCPI usage:
 - “[SOURce]:RADio:SElect NR5G” is required before using any other 5G NR SCPIs
 - SCPIs started with “SIGNal2:NR5G” will get an error
 - “SIGNal{1:32}:MODE NR” will get an error
- The following capabilities are provided as Beta level functionality, the features work reasonably well but may have defects
 - N7624APPC, LTE FDD Uplink/PRACH

New Features and Enhancements

- Added support for new features
 - Interactive tool tips on settings providing context-sensitive Help and SCPI commands
 - PathWave Calibration Advisor for reporting the calibration status of the instrument
- Updated features
 - In the Numeric Entry GUI, single digit editing can be performed – use the left and right arrow keys to enter single digit editing mode
 - For instruments with Option 403, added Flat Noise Power setting
 - Ability to query options per channel via SCPI
 - N7631APPC 5G NR Application
 - Added 5G NR app-only operations: Preset/New, Save as, Open/Recall
 - Updated capabilities equal to those of PathWave Signal Generation Desktop 2023, including remote programming

Defect Fixes

- Product general fixes
 - Fixed memory leak which could cause IQ DC Alignment or Skew Alignment to take longer to run
 - Base memory option only provided 33 MSa instead of 256 MSa
 - Fixed Self-Test failure where calibration due date was indicated

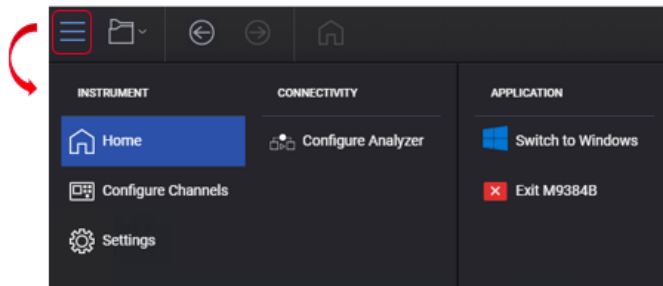
- Fixed spurious response below 3.2 GHz
- Improved External Frequency Reference locking and locking messaging when switching between External and Internal Reference
- Improved External Trigger Playback Synchronization for 2-Tx Coherent configuration
- Increased resolution of AWGN settings of Carrier Power, Total Noise Power, and Channel Noise Power
- Allowed User Power Limit to set to lowest RF Output power
- For N7631APPC 5G NR Application
 - Fixed many known issues

Software Version A.08.02

Release Date:	September 2021
File Name:	Keysight.PathWave.SG.Setup_A.08.02.exe

Known issues or special consideration

- The settings (⚙️) and Channel Configuration have been moved to the three-bar menu:



New Features and Enhancements

- Updated features
 - For instruments with Option 403, added configuring a CW Interferer
 - For instruments with Option DIQ, ability to adjust the differential I and Q output amplitude
 - Added Frequency Offset capability to baseband signals
 - N7631APPC 5G NR Application
 - Moved adding UL Carrier from ellipse (...) button to plus (+) button

Defect Fixes

- Product general fixes

- Fixed issue where I/Q DC Calibration would produce worse EVM, this could also occur after a 5G Generate action
- Improved lower power accuracy (< -85 dBm) in single channel instruments

Software Version A.07.01

Release Date:	June 2021
File Name:	Keysight.PathWave.SG.Setup_A.07.01.exe

Known issues or special consideration

- This version will update the instrument's FPGAs. Ensure you follow the VXG Update Instructions closely.
- Channel Bonding (Option M9384B-CB4, with N7653APPC license) is available as Beta capability. Contact your Keysight Representative for further information.

New Features and Enhancements

- Added support for
 - M1749A mmWave Transceiver
 - Instrument Nonlinear Corrections no longer beta feature
- Updated features
 - For Option DIQ, ability to adjust the I/Q Output Amplitude
 - Added setting to Waveform File mode for indicating the Aggregate Active Bandwidth of the modulation
 - Added control for specifying the External Frequency Reference Locking Range
 - Added support for 10 MHz Reference Output with Hardware ID = 2
 - For instruments with Option D20/D21/D2E, increased bandwidth to 1.2 GHz between RF frequencies of 2.2 GHz and 3.2 GHz for units with Calibration Version 10.
 - Added SCPI for Floating License Borrow and Return operations, and the ability to query automatically checked-out licenses

Defect Fixes

- Product general fixes
 - Fixed issue where External Trigger settings (Polarity, Threshold, etc.) did not take affect when Trigger Mode was Single
 - Removed External Trigger Holdoff
 - Fixed several settings in AWGN that were not reset with Preset
 - Fixed intermittent Power Search failures

Software Version A.06.09

Release Date:	March 2021
File Name:	Keysight.PathWave.SG.Setup_A.06.09.exe

Known issues or special consideration

- This version will update the instrument's FPGAs. Ensure you follow the VXG Update Instructions closely.

Defect Fixes

- Product general fixes
 - o Updated the power-on voltage stabilization process to ease stress on the frequency reference
 - o Fixed issue with 2-channel instruments encountering error message 'Failed to align the core clocks of the two M9347A channels'
 - o Fixed issue where the front panel knob and instrument specific hardkeys did not work on prior A.06.xx versions

Software Version A.06.05

Release Date:	February 2021
File Name:	Keysight.PathWave.SG.Setup_A.06.05.exe

Defect Fixes

- Product general fixes
 - o Fixed issue where I/Q DC Alignment could hang in certain situations
 - o Fixed issue where connection to floating license server is momentarily lost, causing instrument application to restart

Software Version A.06.04

Release Date:	February 2021
File Name:	Keysight.PathWave.SG.Setup_A.06.04.exe

Known issues or special consideration

- This version will update the instrument's FPGAs. Ensure you follow the VXG Update Instructions closely.

- Signal Mode of Custom Modulation (with N7608APPC license) and Instrument Nonlinear Corrections (with N7653APPC license) are available as Beta capabilities. Contact your Keysight Representative for further information.

New Features and Enhancements

- Updated features
 - o Added ability to play MathWorks MATLAB® .mat files as waveforms
 - o Added support for int16 little endian waveform file format
 - o Added new user interface status of Waiting For Generation to indicate Signal Mode of 5G is select, and Generation action has not been invoked
 - o Increased Waveform Sequence length to 100,000 segments
 - o N7631APPC 5G NR Application
 - Added 70M support to Uplink (already provided for Downlink)

Defect Fixes

- Product general fixes
 - o Fixed problem where FPGA updating did not succeed in some situations
 - o Fixed problem where Waiting For Trigger bit in the SCPI Status Register was not working
 - o Fixed problem where user interface was very slow after File operations
 - o Fixed problem where inappropriate “File Name Error” error message was displayed after performing alignment or running self-test
 - o Added logging of information in the event the alignment fails
- For N7631APPC 5G NR Application
 - o Fixed problem where Generate required a LAN connection to succeed
 - o Fixed problem where auto sample rate may not be sufficient for some multi-carrier cases

Software Version A.05.03

Release Date:	November 2020
File Name:	Keysight.PathWave.SG.Setup_A.05.03.exe

Known issues or special consideration

- This version will update the instrument’s FPGAs. Ensure you follow the VXG Update Instructions closely.

- 5G Generate requires a LAN connection to succeed; it can be any LAN connection, even to a Switch. It does not require connection to the Internet.

New Features and Enhancements

- Updated features
 - o External Trigger Playback Synchronization

Defect Fixes

- Product general fixes
 - o Fixed problem where 2-Channel phase offset coherency did not work below 400 MHz
 - o Fixed problem where floating license and USB dongle types did not permit waveform playback or 5G generation
 - o Fixed problem where I/Q Time Skew adjustment didn't take affect
 - o Fixed problem where Recall State did not restore waveform sample rate for all file types, except .wfm
 - o Fixed problem where waveform playback did not automatically resume when switching between External Trigger and Immediate (internal) Trigger
 - o Fixed problem where waveform playback would occur in External Trigger without external signal if Enable Vector Modulation were toggled on-off-on.
 - o Fixed situation where node-locked license was automatically restored in situations where they are intentionally removed
 - o Improved the viewing of .pdf files in the Help system
 - o Signal Studio live connection waveform downloading wasn't updating the RMS setting
- For N7631APPC 5G NR Application
 - o Auto sample rate was not correct for some multi-carrier configurations

Software Version A.04.04

Release Date:	September 2020
File Name:	Keysight.PathWave.SG.Setup_A.04.04.exe

Defect Fixes

- Product general fixes
 - o Fixed problem where setting Auto Attenuation to OFF may generate an error
- For N7631APPC 5G NR Application
 - o Fixed problem in 5G NR Signal Generation where EVM was degraded with specific Downlink multi-numerology configurations

Software Version A.04.03

Release Date:	September 2020
File Name:	Keysight.PathWave.SG.Setup_A.04.03.exe

Known issues or special consideration

- This version will update the instrument's FPGAs. Ensure you follow the VXG Update Instructions closely.
- If you use the Auto Configure Analyzer feature, you need the A.28.xx firmware in the X-Series Signal Analyzer. This version is available on Keysight.com.

New Features and Enhancements

- Added support for
 - o Option D2E, RF Bandwidth, 2 GHz, 256 MSa memory for frequency options F32 and F44
 - o Option 1ES, Improved signal to noise ratio for frequency options F14 and F20
 - o N7620B Pulse Building application
 - o Converting waveforms from Keysight MXG/PSG to VXG's requirements
 - o Added the ability to select a light or dark theme for the GUI
- Updated features
 - o Added ability to edit Markers via GUI
 - o Ability to blank the output during the External Trigger Delay period
 - o Ability to software trigger a Pulse Train
 - o Ability to use a 100 MHz external reference frequency and improved the external reference locking time and messaging
 - o Renamed Waveform File Baseband Power to Signal Attenuation and provided the capability to each Vector Modulation Signal Mode
 - o Improved the message queue with timestamps and highlighting recent messages
 - o Improved Power Search algorithm
 - o Improved boot-up speed
 - o N7631APPC 5G NR Application
 - Updated to core 3GPP specs (38.211 ~ 38.214) v15.8.0 (Dec-2019)
 - Updated Downlink Test Model to 3GPP TS38.141 v16.4.0 (Jun-2020) including:
 - Data content of Test model is updated to PN23.
 - Added FR2 TM2a & 3.1a for 256QAM
 - Added 16QAM and QPSK to FR2 TM3.1 and TM2

- Added TDD parameters to Full-filled configurations
- Added TDD parameters to Uplink FRC configurations
- Added Phase Compensation to Uplink FRC and Downlink Test Model configurations
- Uplink SRS updates
- Added support BWP selection
- Added support for multiple SRS in same Uplink carrier
- Added support for 2 waveform plots for 2-Tx configuration

Defect Fixes

- Product general fixes
 - Fixed problem with licensing of N7621APPC Single Sideband
 - Fixed memory error when loading waveforms over 2GByte in size
 - Several aspects of the GUI cleaned-up
- For N7631APPC 5G NR Application
 - Fixed recall of 5G NR state of 2-channel instrument

Software Version A.03.04

Release Date:	May 2020
File Name:	Keysight.PathWave.SG.Setup_A.03.04.exe

Defect Fixes

- Product general fixes
 - Fixed problem with amplitude accuracy at 28.5 GHz

Software Version A.03.03

Release Date:	April 2020
File Name:	Keysight.PathWave.SG.Setup_A.03.03.exe

Known issues or special consideration

- This version will update the instrument's FPGAs. Ensure you follow the VXG Update Instructions closely.

New Features and Enhancements

- Added support for

- Option F14, Frequency range 1 MHz to 14 GHz
- Option F20, Frequency range 1 MHz to 20 GHz
- Option 403, Calibrated AWGN
- Option 1EH, Improved harmonics below 2 GHz
- Updated features
 - Added ability to edit Markers via SCPI
 - Added waveform retriggering
 - N7631APPC 5G NR Application
 - Updated Downlink Test Model and Uplink FRC configurations based on 3GPP TS38.141 v15.4.0 (Dec-2019)
 - Added ability to export Multi-Component Carrier setup to Keysight 89600 .setx file
 - Reduced memory usage when generating multi-carrier signal
 - Improved the waveform sample rate to not always increase in the pace as power of 2

Defect Fixes

- Product general fixes
 - Fixed problem where instrument could hang with ~50% progress in the splash screen
 - Improved Power Search stability
 - Improved broadband noise for Frequencies below 200 MHz
 - Set the default Marker settings so Sync Out is using Marker 1

Software Version A.02.02

Release Date:	December 2019
File Name:	Keysight.PathWave.SG.Setup_A.02.02.exe

New Features and Enhancements

- Added support for
 - Option F32, Frequency range 1 MHz to 31.8 GHz
 - Option 1EE, High output power limited above 43.5 GHz
 - Options ST5 and 500 Low phase noise and high performance reference
 - Option D11, RF bandwidth 1 GHz with 256 MSa memory
- Updated features
 - Waveform files in .csv format
 - Waveform sequencing via SCPI

- Ability to launch Signal Studio desktop applications from the VXG application
- Absolute Power Only capability to the Corrections/De-embedding
- For 2-channel instruments, added ability over SCPI to trigger each channel independently
- N7631APPC 5G NR Application
 - Added Downlink Test Model configurations based on 3GPP TS38.141 v15.2.0
 - Updated Uplink FRC configurations based on 3GPP TS38.141 v15.2.0
 - Added Uplink Common configurations based on 3GPP TS38.521 v15.1.0
 - Updated Fill-filled configurations to have more parameters
 - Added 'Copy' function in setup pages of Carrier, Channel, BWP, etc.
 - Added DL-SCH MCS Table 5.1.3.1-3 & TB Scaling Factor
 - Added UL-SCH MCS Table 5.1.3.1-3 and 6.1.4.1-2

Defect Fixes

- Product general fixes
 - Improved Modulated Power accuracy (by approximately 1 dB)
 - Improved messages for errors encountered during Waveform playback
 - Improved SCPI over Socket connection Open-Close-Open response time
 - Improved IQ Skew Alignment
 - Improved time to achieve stable output power level
 - Fixed 'System Reference Unlocked or Missing' error during boot or Alignment
- For N7631APPC 5G NR Application
 - Fixed several minor defects in 5G signal generation

Software Version A.01.06

Release Date:	October 2019
File Name:	Keysight.PathWave.SG.Setup_A.01.06.exe

Defect Fixes

- Product general fixes
 - Fixed issue where SCPI communication over Socket communication would hang the instrument if optional nodes were omitted
 - Fixed issue where trial licenses for N7621APPC, N7631APPC, N7642APPC, or N7653APPC were not recognized

- Fixed issue which caused the error message “An internal application error has occurred. Exception of type 'System.Exception' was thrown”
- Updated ALC Auto behavior for output frequencies > 20 GHz

Software Version A.01.05

Release Date:	September 2019
File Name:	Keysight.PathWave.SG.Setup_A.01.05.exe

Defect Fixes

- Product general fixes
 - Fixed issue where alignment could fail on instruments with option ST5 Low phase noise
 - Fixed issue where Waveform playback RF Blanking encountered an error on instruments without PMR or PME Pulse options
 - Fixed problem where Self-Test on 2 channel systems reported an inappropriate calibration message for the 2nd channel
 - Fixed 2 Tx Coherent phase rotation issue with frequencies > 10 GHz

Software Version A.01.04

Release Date:	August 2019
File Name:	Keysight.PathWave.SG.Setup_A.01.04.exe

New Features and Enhancements

- Added support for
 - Option D06, RF bandwidth 500 MHz with 256 MSa memory

Defect Fixes

- Product general fixes
 - Fixed sluggish response of M9384B front panel knob and step keys
 - Fixed hang with automated control of rapidly switching frequency or power
 - Improved Skew Alignment repeatability
- For N7631APPC 5G NR Application
 - fixed incorrect CSI-RS antenna port mapping in 2 Tx Coherent mode

Software Version A.01.02

Release Date:	July 2019
File Name:	Keysight.PathWave.SG.Setup_A.01.02.exe

Initial product release version