R&S®CLGD
DOCSIS Cable Load Generator
Release Notes
Firmware Version 1.4.5

The following abbreviations are used throughout this document:

R&S® DOCSIS Cable Load Generator is abbreviated as R&S CLGD.

ROHDE&SCHWARZ

Table of Contents

1 Information on the Current Version and History

1.1 Version 1.4.5

Firmware package contents

- Software Version (svn) 83284

Fixed Issues

- FDX OFDMA playout is now constrained to the sequencer on time when triggered.

- OFDMA playout in FDX mode will now be replicated to fill the entire on-time of the sequencer when the OFDMA waveform is too short and the frame structure is an integer multiple of the sequencer on-time. This allows use of shorter OFDMA symbol files to get around the constraint on the available ARB memory.

- The CLGD will automatically select the first OFDMA channel when loading a 2 channel OFDMA symbol file into a 96 MHz wide FDX sub-band.

- The CLGD no longer incorrectly positions the OFDMA channel when a 1 channel OFDMA symbol file is loaded into a 192 MHz wide FDX sub-band.

- The User manual has been updated to better explain how the FDX sequencer interacts with OFDMA playout when sequenced.

Known Issues

- Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

- Recommend using Firefox or Chrome for use of the Web GUI.

- CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

- File upload using SCPI can erase a file by renaming it.

- Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.2 Version 1.4.4

Firmware package contents

- Software Version (svn) 83256

Fixed Issues

- OFDM Continuous pilot parameter UI dialog fixed.

- FDX scheduler now obeys period for OFDMA waveforms.

- Corrected button layout for FDX GUI pages.

- Drawing revision of CLGD displayed on GUI, replacing BOM revision that is N/A.

- Default preamble pattern updated for OFDMA waveform generation.

- Downstream SQAM channel playout synchronized to OFDM playout when generating multiple carriers.

- Fixed helper dialogue used to set OFDM continuous pilot parameters.

- Fixed a stability issue in FDX mode which caused the CLGD to crash when configuring certain power values over SCPI.

Known Issues

- Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

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1.3   Version 1.4.3

Firmware package contents

● Software Version (svn) 83150

Fixed Issues

● SNMP can no longer crash CLGD when generating an FDX ARB file or turning off a legacy ARB in FDX mode.

● SNMP parameter added for "RF_PATH_LABEL_1".

● Factory ARB file "j83c.cfg" had the frequency plan adjusted to go from 55 MHz to 1009 MHz with equal 6 MHz channel spacing.

Known Issues

● Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

● Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.4 Version 1.4.2

Firmware package contents

- Software Version (svn) 82523

Fixed Issues

- Resolved Upstream ARB playout drift issue to allow properly looping transmission.

- Resolved backwards compatibility issue with calibration change, previous versions of Firmware can be installed after v1.4.2.

- ATDMA generated waveforms using a constellation value of QAM16/QAM64 are now generated with proper symbol mappings.

- The external trigger can again be used to initiate upstream ARB playout. The selection of whether to use an external trigger or internal trigger (software based) to initiate playout must now be specified explicitly via the "Trigger Source" parameter.

- Fixed an issue where the micro reflections table in the web UI would lose focus during entry.

- Renaming a file in the web UI no longer includes the file size during edit.

- Pressing enter in the arb generation dialogue no longer navigates to a non existent web page.

- Preset now correctly reverts SFP+ IP addresses back to default values.

- Creation of an OFDMA arb file with an advanced minislot configuration that has different constellation and pilot patterns for each minislot can be saved and removed.

Known Issues

- DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

- Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

- Recommend using Firefox or Chrome for use of the Web GUI.

- CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

- File upload using SCPI can erase a file by renaming it.

- Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

- SNMP can crash CLGD when generating an FDX arb file or turning off a legacy arb in FDX mode.

1.5 Version 1.4.1

Firmware package contents

● Software Version (svn) 82428

Fixed Issues

● Resolved issue to allow demo license for FDX functionality.

● Resolved Upstream CCDF performance issue when multiple channels are replicated.

● Improvement made to DAC calibration procedure allowing new units a slight improvement in spurious performance.

Known Issues

● Some units received calibration that caused a loss of backwards compatibility below software version v1.4.1, upgrading to version 1.4.2 or greater restores backwards compatibility.

● DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

● Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

● Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

● SNMP can crash CLGD when generating an FDX arb file or turning off a legacy arb in FDX mode.

1.6 Version 1.4.0

Firmware package contents

- Software Version (svn) 82263

New Functionality

- Full Duplex Support

Fixed Issues

- DNS host name resolution will now work in networks with a DNS/DHCP server.

- Invalid transient PLL errors are no longer displayed when connecting or disconnecting the external reference.

- Improved the out of band frequency characteristics for AWGN impairment.

Known Issues

- DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

- Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

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- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

- SNMP can crash CLGD when generating an FDX arb file or turning off a legacy arb in FDX mode.

1.7 Version 1.3.3

Firmware package contents

● Software Version (svn) 81185

New Functionality

● Capability to define the OFDM PLC Downstream Channel ID.

Fixed Issues

● The system no longer reports incorrect fan warning errors.

● The webpage now responds with proper channel numbers when a user causes frequency conflicts.

● Updated ATDMA "Guard Time Size" name to "Guard Band Size".

● Added new factory default configuration files.

● Added 1024 QAM ARB file factory default waveforms.

● Added channels 83-112 to J83C default configuration.

● Fixed Upstream AM hum impairment to use proper scaling.

● Removed spectral "bump" and fixed center frequency in AWGN impairment that appeared in certain configurations.

● Selecting Source = MPEG on D3.0 channels works properly.

● There is no longer a time varying CCDF crest factor on upstream ARB.

Known Issues

● DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

● Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

● In some network configurations DNS host name resolution may not work, even though an IP address is assigned.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

● Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.8 Version 1.3.2

Firmware package contents

● Software Version (svn) 79280

New Functionality

● The system now defaults the web page to a detailed information page if the software crashes for any reason.

Fixed Issues

● DVBC web page now correctly generates only 120 channels. The previous version was incorrectly building a table with 160 channels which broke parameter submission.

● Encompassed spectrum calculations fixed in the downstream DOCSIS 3.1 configuration page. Encompassed spectrum is now calculated correctly even when switching between FFT sizes.

● Encompassed spectrum is now validated to 22 MHz as a minimum (resulting in a 24 MHz channel bandwidth due to 1 MHz of guard on each side).

● DNS resolution updated for zero-config network functionality.

Known Issues

● DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

● Certain invalid combinations of parameters can result in a stale state. After this occurs, parameters are read correctly but their value is still cached as the last invalid value. Any new changes to the system will cause the entire system to be validated again, causing any old error message to appear although it seems the parameter is set correctly.

● AWGN Impairment may be off center frequency by up to 1.5 MHz.

● In some network configurations DNS host name resolution may not work, even though an IP address is assigned.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

● Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.9 Version 1.3.1

Firmware package contents

● Software Version (svn) 79193

New Functionality

● DOCSIS 3.1 subcarriers located near 1152MHz DAC spur can be automatically excluded.

Modified Functionality

● AWGN impairment now more closely follows a Gaussian distribution.

● The "About" button now directs user to the main R&S webpage.

● The included configurations for J.83B and DVBC have had the channels increased to 160 and 120, respectively.

Fixed Issues

● Options not yet purchased no longer appear enabled after using remote control commands.

● Inconsistent GUI content now displays correctly after a forced reload of page.

● Wideband ARB can now be placed on intervals less than a full MHz boundary.

● Sending a DOCSIS 3.1 advanced file over SCPI/SNMP no longer causes a crash.

● Corrected the DOCSIS 3.0 auto block allocation functionality for channel assignment.

● Wideband ARB can now be placed at frequencies down to 47 MHz.

● Starting the low frequency wideband ARB generator with a DOCSIS 3.1 waveform when in DOCSIS 3.1 mode no longer causes a freeze.

● When the maximum number of minislots for a reduced bandwidth are assigned and "Fill Remaining Minislots" is set to ON ", the output signal is no longer corrupted.

Known Issues

● DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

- AWGN Impairment may be off center frequency by up to 1.5 MHz.

1.10 Version 1.3

Firmware package contents

- Software Version (svn) 77524

New Functionality

- DOCSIS 3.1 PLC Timesync – The ability to insert a DOCSIS timestamp into the PLC upon receiving a trigger has been added.

- FSW Mode – This feature inserts the DPD messages for all Profiles into the PLC.

- Packet Flow Indicator – The CLGD will now report the instantaneous data rate of each channel with a set source port.

Modified Functionality

- The K-201 license was added to enable all three of the new features described above.

- The upstream ARB functionality was modified to allow up to four (one with replication) narrowband ARBs to playout concurrently with one wideband ARB.

- The PN23 logic was modified to play continuous PRBS data, with 187 bytes of PN data (no PID) per packet.

- Change upstream encompassed spectrum to MHz to be consistent with downstream.

- During ARB file processing a custom message was added to alert the user that large ARB files may take several minutes for upstream generation and transmission.

- All ARB waveforms listed in the manual are now included as factory supplied files.

Fixed Issues

- The Subslot parameter of the OFDMA BW Req generation is now correctly enforced. A safe value for this parameter is the default (1) which is valid for all configurations.

- The upstream ATDMA differential quadrant rotation has been corrected.

- The upstream ATDMA interleaver is now disabled when FEC is disabled.

- The upstream ATDMA minislot size (T) now has a valid option of '1'.

- Fixed a bug caused by not updating the variables used to track the max power channel at the point in power control where channel scales are calculated.

- Fixed a bug that correctly limits configuring a maximum of 8 blocks in DVB-C mode that previously allowed 10 causing crashes.

- Added the missing Wideband Probe "Symbol in Frame" parameter.

- Chassis fans now report health based on RPM speed.

- Wideband probe mapping now uses the correct information elements (P-IEs).

- Fixed a bug where incorrect upstream exclusion zones would cause a crash.

- Fixed a bug when configuring narrowband interference that occurred if the width of the interference carrier is 0 (the default), and the power level is a valid configuration (between -40dBc and 5dBc) that would fail saying the power is too low.

- Fixed a bug where user PLC messages sent to the CLGD were causing crashes.

Known Issues

- When the maximum number of minislots for a reduced bandwidth are assigned and "Fill Remaining Minislots" is set to ON ", the output signal is corrupted. Switching "Fill Remaining Minislots" to OFF produces a fully compliant signal.

- DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

- Recommend using Firefox or Chrome for use of the Web GUI.

- CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

- File upload using SCPI can erase a file by renaming it.

- Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- AWGN Impairment may be off center frequency by up to 1.5 MHz.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

- When a unit has detected a DDR RAM problem an alarm will appear on the GUI, and ARB functionality of the unit will be automatically disabled in all modes. In addition when a unit is in this state, turning on multiple channels in DOCSIS 3.1 mode may cause the unit to hang until it has been power cycled.

1.11 Version 1.2.2

Firmware package contents

● Software Version (svn) 74946

Modified Functionality

● K2 encrypted waveform files are now automatically installed on the CLGD with this release. The license page in the GUI was changed to distinguish between K2 and K3 encrypted ARB waveform licenses.

Fixed Issues

● Upstream generation fix for complementary pilots using OFDMA patterns 7 and 14

● Fixed a crash that was caused when using the management port to deliver PLC data to a DOCSIS 3.1 channel

● Adding a DOCSIS 3.0 channel to blocks 9 or 10 when in DVBC mode will now properly generate an error.

● Fixed a voltage reporting issue causing some units to have intermittent under-voltage alarms

Known Issues

● The Subslot parameter of the OFDMA BW Req generation is not correctly limited or enforced. The max for this field should change based on the symbols per frame, but currently is fixed from 1-4. This range is too restrictive for many configurations, and too relaxed for others. A safe value for this parameter is the default (1) which is valid for all configurations.

● DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

● File upload using SCPI can erase a file by renaming it.

● Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

● When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. NOTE: CLGD functions properly in DHCP mode.

● AWGN Impairment may be off center frequency by up to 1.5 MHz.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.12 Version 1.2.1

Firmware package contents

● Software Version (svn) 73512

New Functionality

● Added multi-channel helper buttons to the Upstream and DOCSIS 3.1 GUI pages, to mimic those on the DOCSIS 3.0 page. These include state, power, and source (DOCSIS 3.1 only).

Modified Functionality

● OFDMA ARB generation will now automatically fix some common issues that would otherwise result in an invalid configuration when configuring a waveform. First/last active subcarriers, symbols per frame, and pilot pattern will be changed to the nearest valid option and an explanation will be added to the error queue.

● The RF path now automatically switches to a valid configuration on the GUI when the mode is changed from upstream to Mixed or DOCSIS 3.1 modes.

● The data base port on the network page is now restricted to the range [1,63087].

● The minimum output power for DOCSIS 3.0 and DOCSIS 3.1 channels has been lowered to 0dBmV, however the accuracy at very low levels is reduced. For best results, using an external attenuator for low power output is recommended.

● The timeout period for the Web GUI has been increased from 3 minutes to 15 minutes. This is to accommodate the possibility of significant pre-distortion calculations required for large ARB waveforms before upstream transmission.

● The default number of symbols per frame for Upstream OFDMA generation has been changed to 9 from 18.

Fixed Issues

● Pings directed to the SFP modules on the CLGD with different TTL values will now be replied to.

● Fixed issues in the SFP+ 1/10GigE data path for DOCSIS 3.0 and DOCSIS 3.1 carriers.

● The error message displayed when a DOCSIS 3.0 carrier is placed outside the allowable range has been changed to be easily understood.

● The rear transmit LEDs on the CLGD now indicate which port is active.

● Multi-burst ARB file generation processing time has been optimized, however it may still take up to a maximum of 14 minutes for large complex ARB files to be generated.

● User set IP ports were being overwritten with the next free allowed port for DOCSIS 3.0 channels. IP ports now use assigned user value as long as the port is within the allowed range.

- Resolved an issue where incorrect sample rates were being used in certain cases on DOCSIS 3.0 or narrowband ARB transmissions limiting the frequency the carrier could be placed.

- Addressed reliability bugs in the triggering functionality.

- An issue affecting power accuracy on narrowband downstream ARB channels has been fixed.

Known Issues

- The Subslot parameter of the OFDMA BW Req generation is not correctly limited or enforced. The max for this field should change based on the symbols per frame, but currently is fixed from 1-4. This range is too restrictive for many configurations, and too relaxed for others. A safe value for this parameter is the default (1) which is valid for all configurations.

- DOCSIS 3.1 and DOCSIS 3.0 channels (or profiles) are currently not restricted from sharing ports. The CLGD is not capable of delivering data from a single port to multiple channels, and so this configuration will not perform correctly. Each channel and profile should have a unique port number assigned it.

- Recommend using Firefox or Chrome for use of the Web GUI.

- CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

- File upload using SCPI can erase a file by renaming it.

- Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. NOTE: CLGD functions properly in DHCP mode.

- AWGN Impairment may be off center frequency by up to 1.5 MHz.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

1.13 Version 1.2

Firmware package contents

● Software Version (svn) 72818

New Functionality

● Phase Noise Impairment functionality added

● CLGD now has the ability to lock to either a 10 MHz or 10.24 MHz external reference.

● A 1024QAM C-DOCSIS ARB file added

● Support for USB mass storage

Modified Functionality

● Licenses can now be entered manually on the License page.

● A Cyclic Prefix of Zero is now an available option for DOCSIS 3.1 channels.

● Users can now input "Encompassed Spectrum" to define a DOCSIS 3.1 downstream channel.

● DOCSIS 3.0, narrowband ARB, and CW carriers can now be placed at frequencies from 47 MHz to 1,218 MHz.

● A warning is generated and ARB functionality is disabled if DDR memory fails.

● Loading configuration files from previous releases may result in invalid data port values for D30 and D31 channels. Ports are re-assigned automatically to an unused port in the valid range and an entry will be added to the error queue to indicate the re-assignment occurred. If multiple re-assignments are performed, only one notification is generated. The User can determine the new port number by viewing the current configuration for the channels.

● DOCSIS 3.1 channels must now have at least 1 active subcarrier between an exclusion band and guard band.

● Configuration of SFP+ Data Input ports labels changed to be more intuitive to users.

● The user reference value is only used to adjust the internal 10MHz reference when the user reference adjust setting is set to "ON". When set to "OFF", the factory reference value will be used.

Fixed Issues

● Fixes in DOCSIS 3.1 PLC messages.

● Fixes in live data transmission over DOCSIS 3.1 modulation.

● Fixes to various SCPI commands.

● Upstream DOCSIS 3.1 waveform now plays out periodically after a trigger event when the inter-burst gap is set to a value less than 9999 us.

- OFDMA initial ranging, fine ranging, wideband probe and bandwidth request ARB file packet generations now properly generate ARB files.

- Upstream AWGN impairment can now be fully configured.

- Upstream Narrowband interference when enabled now generates at RF.

- SCPI MPEG file selection no longer requires a prefix of "//" before the filenames in order to select user uploaded files.

- The advanced tab for DOCSIS 3.1 channel 8 no longer causes the CLGD to hang.

- Hitting undo on DOCSIS 3.1 page no longer turns the subcarriers field dirty (yellow) when no changes have been made from its existing state.

- Reliability improvements were made to boot power sequencing.

- Previously, single DOCSIS 3.1 channels were only attenuated when turned off until a new configuration was applied. RF output for channels that have been turned off are now fully muted.

Known Issues

- Recommend using Firefox or Chrome for use of the Web GUI.

- CLGD configuration files generated with version prior to release 1.0 may not load correctly or crash the CLGD.

- File upload using SCPI can erase a file by renaming it.

- Numeric SCPI channel suffixes do not default to 1, a channel suffix must be specified.

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'.
  NOTE: CLGD functions properly in DHCP mode.

- AWGN Impairment may be off center frequency by up to 1.5 MHz.

- No data should be sent to an SFP data port until after the operating mode and SFP line rate settings have been configured. The SFP port can occasionally get into a non working state if this condition is not met. In this state the SFP activity LED flashes at a high rate and the unit will not reply to ping requests. Data input can be stopped by: 1) turning off the external SFP data source, 2) removing the cable to the SFP model, or 3) removing the SFP module.

- The CLGD will only respond to SFP ICMP ping requests that have a TTL of 64. The default TTL on Windows operating systems is 128. To send a ping from Windows with a TTL of 64, add the "-i 64" option to the ping command.

- Some DOCSIS 3.1 channels may not accept data sourced from the SFP+ port. This does not affect all channels.

- Some browser extensions or addons, such as Adblock, can cause performance decreases when using the Web GUI. If the Web GUI becomes very slow or unresponsive, try disabling the extension or white-listing the URL used to connect to the CLGD.

- The error message displayed when a DOCSIS 3.0 carrier is outside the allowable range is incorrect. All DOCSIS 3.0 carriers must lie within 47 MHz to 1193 MHz or 72 MHz to 1218 MHz. This is detailed in section 1.2 of the user manual.

1.14 Version 1.1

Firmware package contents

● Software Version (svn) 71738

Fixed Issues

● Preset function will reset all variables.

● When in Mixed-Mode, the Modulator Source button works with all blocks.

● When switching between DOCSIS 3.0 mode and DOCSIS 3.1, parameters (frequency primarily) will appear with correct units.

● Auto-complete of OFDMA encompassed spectrum works as indicated in manual.

● Deleting channels from the DOCSIS 3.0 blocks GUI page (or via SCPI) works.

● DOCSIS 3.0 Channels re-assigned to a higher block number now output correctly.

● Corrections to DOCSIS 3.1 PLC formatting and frequency it is transmit

● Updates DOCSIS 3.1 continuous pilot placements Web GUI field when updated through SCPI or SNMP

● CLGD Web GUI is now discoverable through bonjour or Avanti

● Increased the resolution of ARB waveform playout for improved RF fidelity

Known Issues

● Upstream DOCSIS 3.1 waveform only plays out once after a trigger event, even if inter-burst gap is set to a value other than 9999 us.

● OFDMA initial ranging, fine ranging, wideband probe and bandwidth request ARB file packet generations fail to generate and do not generate an error message.

● Upstream AWGN impairment cannot be fully configured.

● Upstream Narrowband interference when enabled fails to be generated at RF

● Recommend using Firefox or Chrome for use of the Web GUI.

● CLGD configuration files generated with previous version of software may not load correctly or crash the CLGD.

● SCPI MPEG file selection requires a prefix of "//" before the filename in order to select user uploaded files.

● File upload using SCPI can erase a file by renaming it.

● When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. **NOTE:** CLGD functions properly in DHCP mode.

● AWGN Impairment may be off center frequency by up to 1.5 MHz.

● Using the advanced tab for DOCSIS 3.1 channel 8 may cause the CLGD to hang.

- Hitting undo on DOCSIS 3.1 page will turn the subcarriers field dirty (yellow) even though no changes have been made from its existing state.

1.15 Version 1.0

Firmware package contents

● Software Version (svn) 71370

New Functionality

● Upstream functionality is now available

● AWGN Impairment is now available

● Narrowband Interferer Impairment is now available

● USB WiFi is now supported for open networks

● DOCSIS 3.1 pilot placement on specific sub-carriers is now available

● DOCSIS 3.1 advanced configuration (sub-carrier table import / export) functionality is now available

● DOCSIS 3.1 OCD and DPD messages are injected into the profile and PLC

● Support for user input DOCSIS 3.1 PLC data

● RF tilt paths are now enabled

● 1GigE or 10GigE SFP+ input data supported for DOCSIS carriers

● Encrypted ARB files are now supported

Modified Functionality

● Licenses are now required for all options functionality

● DOCSIS 3.1 Interleaver Span renamed to Interleaver Depth

Fixed Issues

● Micro-reflection impairment is now functioning properly

● Corrected an issue with DOCSIS 3.1 signal corruption when certain shortened codewords were used.

● Power Accuracy is now meeting is accuracy specifications

● Fixed a new issue loading and saving of configuration files

● Narrowband ARB file 1 and 2 previously did not play out when activated. This has now been fixed.

● DOCSIS 3.1 Profiles are fixed at A .. D correcting a bug where they could be configured and their default value was 1 .. 4.

● DOCSIS 3.1 center channel frequencies in GUI now show more granularity, previously the small frequency it would display was the nearest MHz.

● Removed the Zero_loaded option for DOCSIS 3.1 as it is an internal parameter not a user parameter and it would crash the CLGD

Known Issues

- Recommend using Firefox or Chrome for use of the Web GUI

- Preset function may not reset all variables

- When in Mixed-Mode, D3.0 Mode = J83B, the Modulator Source button does not work with blocks 9 and 10, generating a blank output which then defaults to PN23 when the apply button is used. The button works correctly for blocks 1 through 8. The same behavior happens in DVB-C mode but it is blocks 7 and 8 and they default to the last valid source.

- Auto-complete of OFDMA encompassed spectrum does not work as indicated in the manual, however it is only an informative field and not required for waveform generation.

- CLGD configuration files generated with previous version of software may not load correctly or crash the CLGD.

- SCPI MPEG file selection requires a prefix of "//" before the filename in order to select user uploaded files

- File upload using SCPI can erase a file by renaming it

- Deleting channels from the DOCSIS 3.0 blocks GUI page (or via SCPI) fails

- DOCSIS 3.0 Channels re-assigned to a higher block number may not output correctly

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. **NOTE:** CLGD functions properly in DHCP mode.

- When switching between a DOCSIS 3.0 mode and DOCSIS 3.1, some parameters (frequency primarily) will appear in the wrong units, refreshing the web page will correct the display

- AWGN Impairment may be off center frequency by up to 1.5 MHz.

- Using the advanced tab for DOCSIS 3.1 channel 8 may cause the CLGD to hang

- Hitting undo on DOCSIS 3.1 page will turn the subcarriers field dirty (yellow) even though no changes have been made from its existing state.

- Not all error conditions raise error messages

1.16 Version 0.8

Firmware package contents

- Software Version (svn) 70567

New Functionality

- Licensing Functionality now operational (note: all functionality enabled by default)

- Added DOCSIS 3.1 LFSR and stuffing pattern insertion to create profile data

Modified Functionality

- Improved Software Updater Stability (backup implemented for FPGA and processor images)

- Calibration File Translation (updates calibration files needed for better power control)

Fixed Issues

- Improved Power Accuracy

- Corrected DOCSIS 3.1 Pilots

- When filling symbols with data on narrower bandwidth DOCSIS 3.1 carriers, an error could occur when codewords ended close to an OFDM symbol boundary. This has been fixed in this release.

- Fixed Loading and Saving of Configuration Files

Known Issues

- SCPI MPEG file selection requires a prefix of "//" before the filename in order to select user uploaded files

- Room temperature calibration of power accuracy only

- DOCSIS 3.1 Advanced Field is not implemented (future release)

- Tilt is not functional (future release)

- WiFi configuration/setup incomplete (future release)

- Upstream (future release)

- Some RF impairments incomplete (AWGN, Narrowband interference) (future release)

- Preset may not work properly for all variables

- File upload can erase a file by renaming it

- When switching between a DOCSIS 3.0 mode and DOCSIS 3.1, some parameters (frequency primarily) will appear in the wrong units, refreshing the web page will fix this

- Configuration File field on the home page may not update correctly

- Deleting channels from the DOCSIS 3.0 blocks GUI page (or via SCPI) fails

- DOCSIS 3.0 Channels re-assigned to a higher block number may not output correctly

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. **NOTE:** CLGD functions properly in DHCP mode.

- Old versions of firefox – underpowered Java script interpreter causes flicker in GUI.

- Web GUI is very slow under IE8 and online manuals (pdf format) are not accessible. Recommend using IE9, Firefox or Chrome

- TX mode changes can cause timeout errors on SNMP

- When a user uses the Web GUI or SNMP to monitor and control the CLGD there is only one way to clear an amber Status LED that has been activated by an error logged in the SCPI error queue and that is to issue a SCPI command to clear the error queue.

- When running both a D3.1 channel and either block 9 or block 10 (all the D3.0 channels turned on) results in no D3.0 output and barely any D3.1 output. When only a portion of the block is run then there is no problem and both output signals are clearly visible on the spectrum analyzer. This only occurs when running in DS highband mode. It does not occur when running in DS lowband mode.

1.17　Version 0.7

Firmware package contents

● Software Version (svn) 70101

New Functionality

● MPEG playout on one DOCSIS 3.0 channel with a user uploaded file

Modified Functionality

● Unlicensed License options are all by default disabled: Upstream, Downstream extended and Impairments

● Fixed Continuous Pilot placement

Fixed Issues

● Can now play narrowband waveforms through the wideband ARB interface

Known Issues

● Errors in power control software can result in: internal clipping causing BER up to 10^{-7}, may fail certain spurious DRFI tests with a single active QAM channel, may fail 5th harmonic DRFI test, may fail DRFI phase noise, and power accuracy may not meet specification

● SCPI MPEG file selection requires a prefix of "//" before the filename in order to select user uploaded files

● Continuous Pilots not being added to isolated sections of spectra without a pilot

● A channel power scaling issue in the software is causing bit errors on DOCSIS 3.0 channels. A temporary workaround is to increase the digital clipping margin

● Room temperature calibration of power accuracy only

● DOCSIS 3.1 Advanced Field is not implemented (future release)

● Tilt is not functional (future release)

● WiFi configuration/setup incomplete (future release)

● Upstream (future release)

● Some RF impairments incomplete (AWGN, Narrowband interference) (future release)

● Preset may not work properly for all variables

● File upload can erase a file by renaming it

● When switching between a DOCSIS 3.0 mode and DOCSIS 3.1, some parameters (frequency primarily) will appear in the wrong units, refreshing the web page will fix this

● Configuration File field on the home page may not update correctly

- Deleting channels from the DOCSIS 3.0 blocks GUI page (or via SCPI) fails

- DOCSIS 3.0 Channels re-assigned to a higher block number may not output correctly

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. **NOTE:** CLGD functions properly in DHCP mode.

- Old version of firefox – underpowered Java script interpreter causes flicker in GUI.

- Web GUI is very slow under IE8 and online manuals (pdf format) are not accessible. Recommend using IE9, Firefox or Chrome

- TX mode changes can cause timeout errors on SNMP

- When a user uses the Web GUI or SNMP to monitor and control the CLGD there is only one way to clear an amber Status LED that has been activated by an error logged in the SCPI error queue and that is to issue a SCPI command to clear the error queue.

1.18 Version 0.6

Firmware package contents

- Software Version (svn) 69840

New Functionality

- Inclusion of the R&S PIAS daemon to allow software updates

- Partial RF Impairments (AM Hum & Micro-reflections)

- DOCSIS 3.1 Mode (support for 8 channels using extended port)

Existing Functionality

- Web GUI support

- SNMP and SCPI is supported

- 160 Channels of Annex A, B, C or Narrowband ARB Waveforms

- Wideband ARB support

- Mixed Mode: DOCSIS 3.0 + 4 channels DOCSIS 3.1

- Support for SFP+ (10 Gbps) as a channel source

- RF output port selection support: HIGH, LOW or CSO/CTB

- Support for up to 4 different Narrowband ARB Waveform files

- Constellations of QAM64 and QAM256

- Power Control available for all channels

Modified Functionality

- Improved power control on carriers on the Downstream Low and High RF ports

Known Issues

- Cannot play narrowband waveforms through the wideband ARB interface (will create spurious output)

- Room temperature calibration of power accuracy only

- DOCSIS 3.1 Advanced Field is not implemented (future release)

- Tilt is not functional (future release)

- WiFi configuration/setup incomplete (future release)

- Upstream (future release)

- MPEG playout (future release)

- Some RF impairments incomplete (AWGN, Narrowband interference) (future release)

- Preset may not work properly for all variables

- File upload can erase a file by renaming it

- When switching between a DOCSIS 3.0 mode and DOCSIS 3.1, some parameters (frequency primarily) will appear in the wrong units, refreshing the web page will fix this

- Configuration File field on the home page may not update correctly

- Deleting channels from the DOCSIS 3.0 blocks GUI page (or via SCPI) fails

- DOCSIS 3.0 Channels re-assigned to a higher block number may not output correctly

- When in DHCP mode the Gateway field on the Network Settings page indicates 'Unknown' and may display an error message 'Invalid IP address'. **NOTE:** CLGD functions properly in DHCP mode.

- Old version of firefox – underpowered Java script interpreter causes flicker in GUI.

- Web GUI is very slow under IE8 and online manuals (pdf format) are not accessible. Recommend using IE9, Firefox or Chrome

- TX mode changes can cause timeout errors on SNMP

- When a user uses the Web GUI or SNMP to monitor and control the CLGD there is only one way to clear an amber Status LED that has been activated by an error logged in the SCPI error queue and that is to issue a SCPI command to clear the error queue.

2 Modifications to the Documentation

Modification of the user documentation from previous versions are detailed below.

2.1 User Manual Version 14

- Fix inconsistent AWGN power range and units (section 3.6.2, 4.10, 4.12, 5.7.4)
- Add zero-bit-loading option for NCP subcarriers (section 4.4)
- Expand notes on subcarrier placement and frame generation for FDX OFDMA channels (section 4.11.3.1)
- Fix incorrect subcarrier skip label in Figure 4-1
- Minor corrections in section 4.11

2.2 Getting Started Version 12

- CE and UKCA certification updated

3 Firmware Update

NOTICE

This update contains a bootloader update. Do not power the unit off or unplug it while this upgrade is in progress. This upgrade will not perform the bootloader update unless required. The upgrade is complete when the CLGD front panel Power & Status LEDs turn Green and all other LEDs are off.

3.1 Updating the Firmware

The firmware update consists of one file. The version number in the file name varies with each update (symbolized by placeholder x).

● *CLGD_Setup_FW_xxxx.exe*

Perform the update on a computer under control of the Windows operating system.

1. Make sure that the computer and the R&S CLGD are connected by LAN.

2. Switch on the R&S CLGD.

3. Wait until the R&S CLGD firmware has booted and the application has started.

4. On the computer, execute *CLGD_Setup_FW_xxxx.exe*.
   The "R&S Software Distributor" is displayed. Only "Remote Installation" is available.
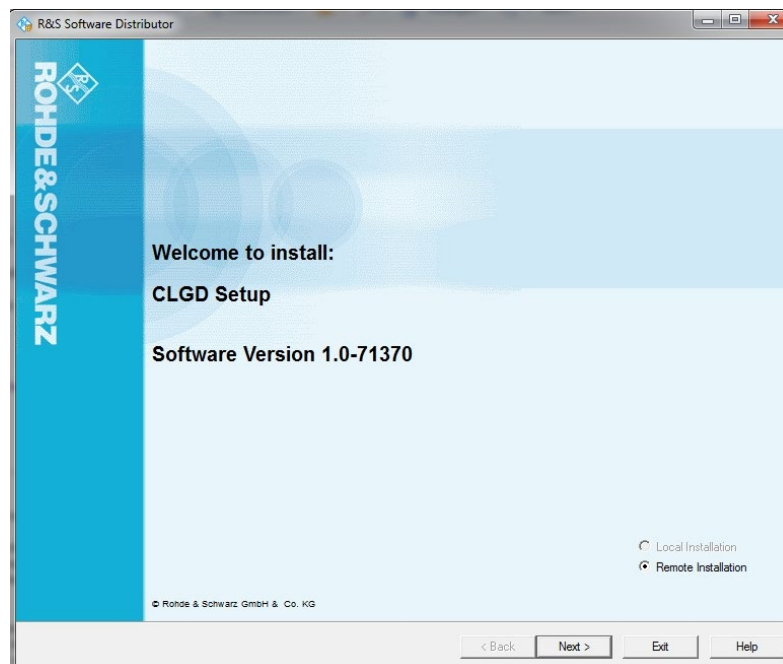
5. Click "Next>".
    By default, "Step 8" is selected. Do not change the selection.
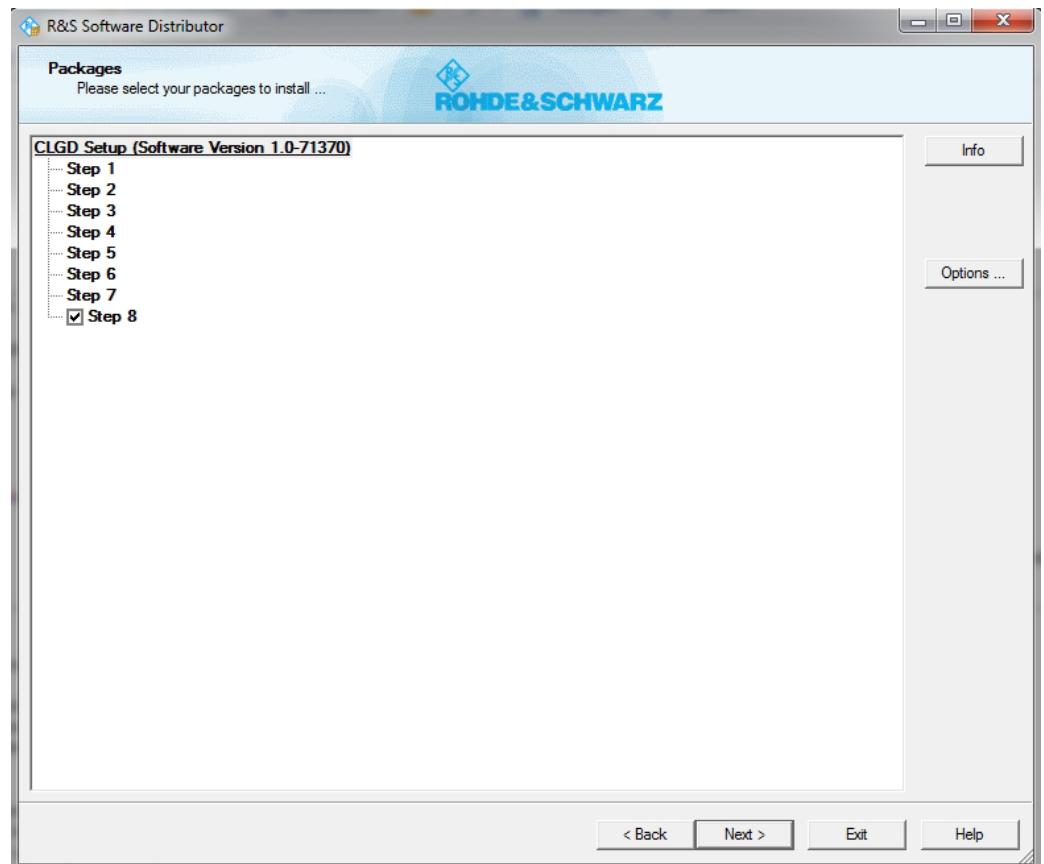
6. Click "Next>".
    All detected R&S CLGDs are displayed.

7. Select the R&S CLGD(s) you want to update.
   Note: You can update several R&S CLGDs simultaneously.
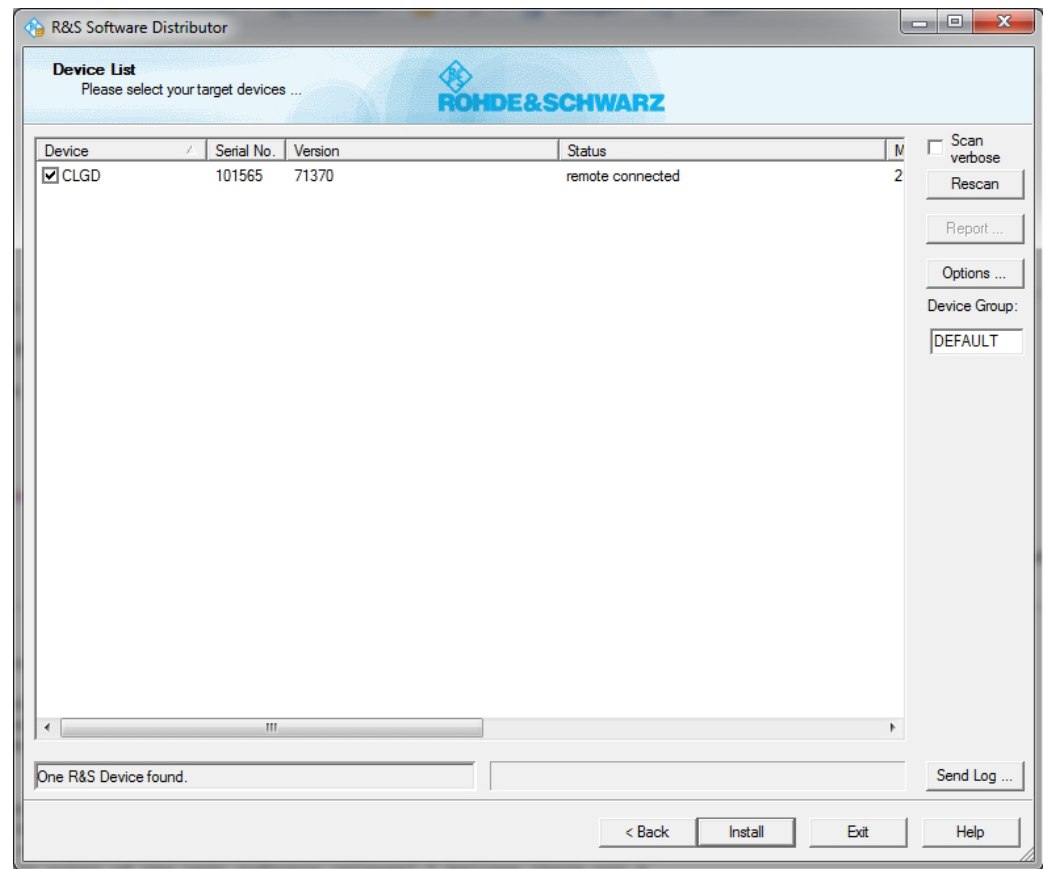
8. If no R&S CLGD is automatically detected, expand the search:

   a) Click "Options".
   b) Click "Add URL".
   c) Enter one or several R&S CLGD URL(s), e.g. 192.168.10.1, to be included in the search.
   d) To save the search address(es), click "Save Options". If you do not save the options, the added search addresses are only used for the current installation.

9. Click "Install".
    The installation process itself is self-explanatory and may take up to 10 minutes.
    After the installation, the "Status" is changed to "Ready".
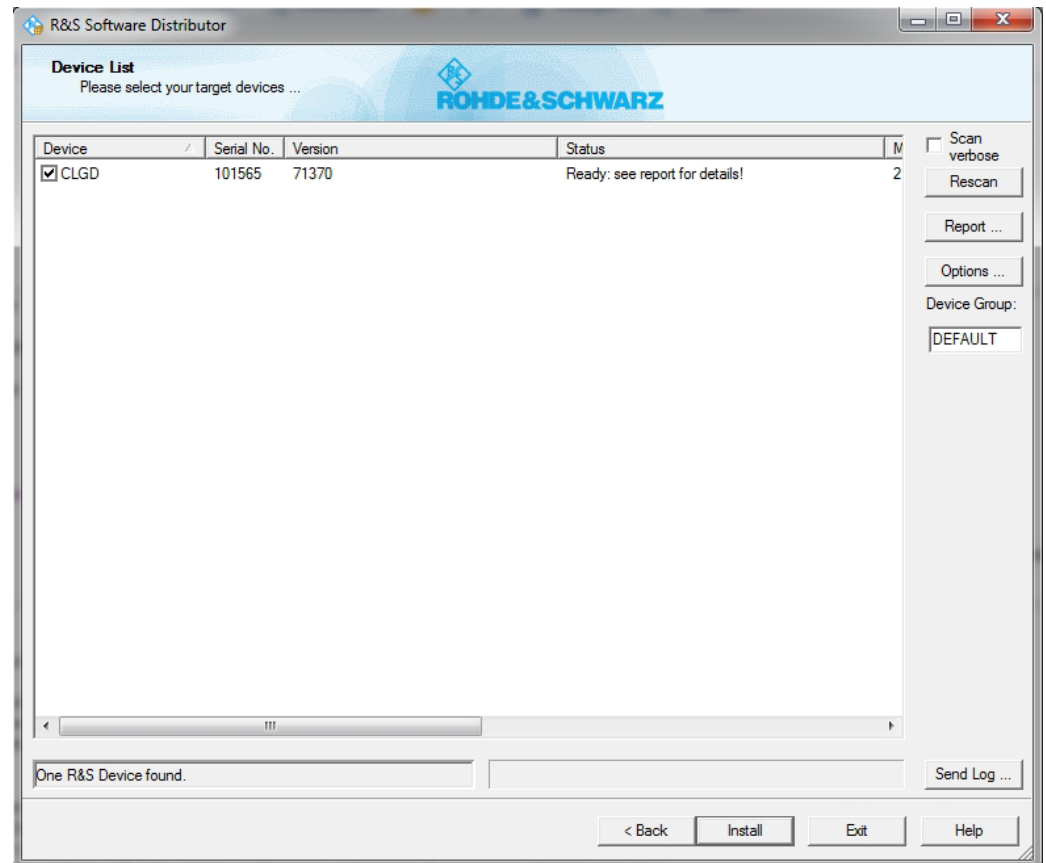
10. Click "Report" to view the installation report. If the installation was successful, no
    errors are displayed (see example below).
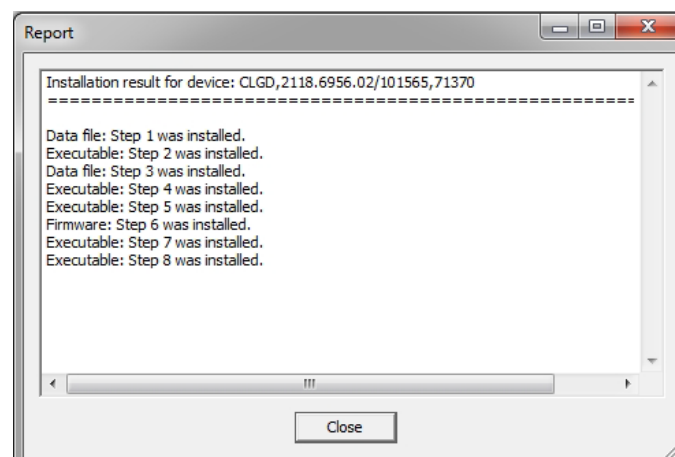
11. Close the report and click "Exit".

4 License Installation

4.1 License Installation for CLGD Functionality

Users are able to upgrade the R&S CLGD functionality by entering option keys. Please contact your distributor to arrange purchase and delivery of new features. Once you have the option key, simply upload the license file to add each feature. Alternatively a key can be entered manually in the Install License Key field and added by clicking on the Install button.

After verification the unit will reset and display the currently licensed features. After verification the unit will display the currently licensed features as ″Available″. Removal of option keys is also supported, by adding a "removal" key.

4.2 License Installation for Encrypted Waveforms

The encrypted waveform functionality provides the ability to play waveform files that are encrypted. Libraries of these files are available for purchase. To use these files, a license file is provided. This license file must be uploaded to the R&S CLGD (see "Uploading a New License File").

Unencrypted waveforms are not affected by the encrypted waveform functionality. They look and function unchanged.

Under ″Files on device″ in the Configurations/ARB screen of the Web GUI, icons indicate if waveforms are encrypted.
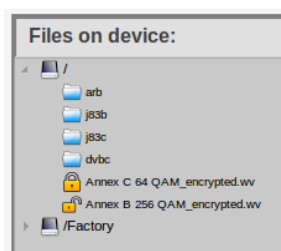

The locked icon indicates that the waveform is encrypted, and the R&S CLGD does not have the license file necessary to decrypt it.

The unlocked icon indicates that the waveform is encrypted but the R&S CLGD does have the license file necessary to decrypt it.

The locked/unlocked icons are also displayed in the "Select a file" pop-up window on the Block Settings screen if the AWG file field is selected. If the file is unlocked, you can select it to be loaded. If it is locked, it cannot be loaded.
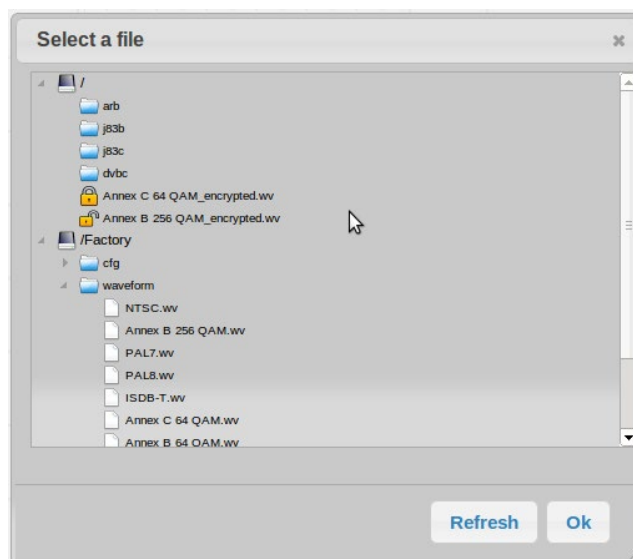
A license file is required in order to decrypt the encrypted waveforms. Once a license file is supplied, it can be uploaded on the Unit Status screen of the Web GUI.

At the bottom of the Unit Status screen is a field called "Licence Options" and a file upload box called "Licence Upload". The "Licence Options" field shows the current licensing options that are available on the R&S CLGD. If no licenses are uploaded, it displays "No Licence Files Uploaded".

Uploading a New License File

1. Take control of the R&S CLGD in the Web GUI.

2. Navigate to the Licences screen.

3. At the bottom of the "Licence Upload" box, click "Add Files", or drag the license file into the "Licence Upload" box.

4. At the bottom of the "Licence Upload" box, click "Start Upload".

The file is uploaded to the R&S CLGD. When the upload is completed, the new license option is added to the "Licence Options" field. All encrypted waveforms corresponding to the license option are available to be used.

5 Open Source Acknowledgement

The firmware used in this instrument makes use of open source software packages.
Please refer to the CLGD Open Source Acknowledgements document (2118.7330.02)
included with the shipped product or downloadable online from the R&S website.

6 Customer Support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish. We will take care that you will get the right information.

Europe, Africa, Middle East
Phone +49 89 4129 12345
customersupport@rohde-schwarz.com

North America
Phone 1-888-TEST-RSA (1-888-837-8772)
customer.support@rsa.rohde-schwarz.com

Latin America
Phone +1-410-910-7988
customersupport.la@rohde-schwarz.com

Asia/Pacific
Phone +65 65 13 04 88
customersupport.asia@rohde-schwarz.com

China
Phone +86-800-810-8828 / +86-400-650-5896
customersupport.china@rohde-schwarz.com