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DOCSIS Signal Analyzer

Release Notes

Firmware Version 4.2.1

The following abbreviation is used throughout this manual:
Calian DOCSIS Signal Analyzer is abbreviated as DSA.

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1. Information on the Current Version and History

1.1 Version 4.2.1

Firmware Package Contents

- Software Version v4.2.1

New Functionality

- New DSA-684US/DS hardware model supporting upstream up to 684 MHz
- Added MER optimize and auto-level functions in SUA mode
- Improved MER optimize algorithm on downstream measurements
- Added support for 4096-QAM upstream OFDMA demodulation profile

Fixed Issues

- Resolved support for brackets in filenames of SCPI commands
- Resolved support for space character in Dynamic Upstream Analysis diagnostic capture filename
- Resolved support for decimal dB in DS Level Offset and US Level Offset configurations
- Resolved outstanding issue in Dynamic Upstream Analysis where a zero value UCD change count causes the system to mistakenly report no upstream traffic
- Resolved SFD Upstream Analysis occasionally becoming unresponsive at low power levels

Known Issues

- Generic SCQAM mode occasionally times out waiting for lock on QAM16.
- HDMI switch over restarts the software, which results in a long idle time.
- When using streaming network IQ input in DOCSIS 3.0/J.83 QAM receiver mode, receiver may show demod lock on a low-power signal when there is no packet input or all zero-valued sample input.
- Network IQ input can be enabled for the upstream J.83 QAM receiver mode (with DSA-K1502 option) but is not supported. Network IQ input is only supported on downstream OFDM and J.83 modes.

1.2 Version 4.1.0

Firmware Package Contents

- Software Version v4.1.0

New Functionality

- AM Hum measurement for all downstream receiver modes, including upstream J.83 mode.
- Analyze downstream DOCSIS 3.0 and 3.1 carriers as IQ samples streamed into the SFP+ network data interface.
- Files can now be transferred to and from the device using SFTP.

Fixed Issues

- None.

Known Issues

- Generic SCQAM mode occasionally times out waiting for lock on QAM16.
- HDMI switch over restarts the software, which results in a long idle time.
- When using streaming network IQ input in DOCSIS 3.0/J.83 QAM receiver mode, receiver may show demod lock on a low-power signal when there is no packet input or all zero-valued sample input.
- Network IQ input can be enabled for the upstream J.83 QAM receiver mode (with DSA-K1502 option) but is not supported. Network IQ input is only supported on downstream OFDM and J.83 modes.

1.3 Version 4.0.0

Firmware Package Contents

- Software Version v4.0.0

New Functionality

- Updated product to Calian branding including GUI, SCPI and SNMP MIB.
- Devices starting at Serial Number 200000 will have hostname dsa-xxxxxx.local (where xxxxxx is the serial number of the device).
- Existing Rohde and Schwarz licenses will continue to work on this version and subsequent versions of the firmware.

Fixed Issues

- Dynamic upstream analysis works with UCD change count 0.

Known Issues

- Generic SCQAM mode occasionally times out waiting for lock on QAM16.
- HDMI switch over restarts the software, which results in a long idle time.

1.4 Version 3.6.0

Firmware Package Contents

- Software Version (git) v3.6.0-091bb55

New Functionality

- Upstream J83 Receiver.

Fixed Issues

- CCDF display no longer freezes the user interface when navigating away from plot.
- Legend in BER vs time plots fixed to show most recent measurement. In some receivers this was fixed at 0.
- Turning on the OFDMA prefilter for channels with exclusion zones now works as expected. Previously applying the prefilter to a channel with exclusions caused the edges of the channel to be filtered off.

Known Issues

- Generic SCQAM occasionally times out waiting for lock on QAM16.
- HDMI switch over restarts the software, which results in a long idle time.

1.5 Version 3.5.0

Firmware Package Contents

- Software Version (git) v3.5.0-0a9c53e

New Functionality

- Upstream and downstream IQ sample streaming.
- Upstream and downstream RMS jitter measurement.
- Capability to use “Trigger in”-port as a PPS input.

Modified Functionality

- A windowed moving average has been applied to the compensated MER values displayed.
- ATDMA no longer shows negative bursts received.
- ATDMA receiver now supports a wider variety of preambles.

Fixed Issues

- 4k OFDMA Bandwidth Request power measurement.
- When controlled using remote desktop (VNC), loading a config file will no longer end the current VNC session.

Known Issues

- Generic SCQAM occasionally times out waiting for lock on QAM16.
- Navigating away from CCDF display can take up to 5 seconds as the current measurement finishes for ATDMA and OFDMA receivers.
- HDMI switch over must restart software resulting in a long idle time.

1.6 Version 3.4.1

Firmware Package Contents

- Software Version (git) v3.4.1-d5dc310

Fixed Issues

- Support for new revision of microprocessor added. Note: DSA units with new microprocessor cannot have DSA Firmware downgraded below v3.4.1.

Known Issues

- Generic SCQAM occasionally times out waiting for lock on QAM16.
- When controlled using remote desktop (VNC), loading a config file will end the current VNC session. A workaround is to start a new VNC session after loading the config file.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- Navigating away from CCDF display can take up to 5 seconds as the current measurement finishes for ATDMA and OFDMA receivers.
- HDMI switch over must restart software resulting in a long idle time.

1.7 Version 3.4.0

Firmware Package Contents

- Software Version (git) v3.4.0-9fd4fab

New Functionality

- MER compensation.
- Cable Modem Ranging Mode extended to support Intel chipset based CMs.
- Support for ATDMA extended preamble in DUA mode.

Fixed Issues

- Spectrum analyzer power measurement accuracy further improved.

Known Issues

- Generic SCQAM occasionally times out waiting for lock on QAM16.
- When controlled using remote desktop (VNC), loading a config file will end the current VNC session. A workaround is to start a new VNC session after loading the config file.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- Navigating away from CCDF display can take up to 5 seconds as the current measurement finishes for ATDMA and OFDMA receivers.
- HDMI switch over must restart software resulting in a long idle time.

1.8 Version 3.3.0

Firmware Package Contents

- Software Version (git) v3.3.0-f8e5f1f

New Functionality

- TV Scan application runs on DSA.

Modified Functionality

- Dynamic Upstream Analysis Mode has had performance and compatibility improvements.
- Phase noise measurement functionality & SCPI commands have been updated.
- User selectable support for Time zone added.
  - Note that the DSA time will be updated to UTC after installation of this version and users will need to set the appropriate time zone.

Fixed Issues

- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is within expected range.
- In the stand alone ATDMA receiver, the ATDMA preamble for initial ranging bursts now allows ATDMA bursts to be received.

Known Issues

- Generic SCQAM occasionally times out waiting for lock on QAM16.
- When controlled using remote desktop (VNC), loading a config file will end the current VNC session. A workaround is to start a new VNC session after loading the config file.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- Navigating away from CCDF display can take up to 5 seconds as the current measurement finishes for ATDMA and OFDMA receivers.
- HDMI switch over must restart software resulting in a long idle time.

1.9 Version 3.1.0

Firmware Package Contents

- Software Version (git) v3.1.0- a00486e

New Functionality

- Dynamic Upstream Analysis mode (ATDMA & OFDMA).

Modified Functionality

- ATDMA: Support for user defined preamble added.
- For CM Ranging: Channel analysis & MER vs time plots are now available.
- SCPI commands for CM ranging and Static upstream analysis are now available.
- BER and CER measurements now use approximately the same timebase.
- Upstream CCDF measurements are now made when the burst is detected.

Fixed Issues

- When MER Optimize is run on an unlocked signal, Auto-level is called to set attenuation and attempt lock before proceeding with optimization.

Known Issues

- In the stand alone ATDMA receiver, if the ATDMA preamble for initial ranging bursts cannot be found a workaround is to turn the “Ranging Mode” option on the Scheduling tab to OFF in order to receive ATDMA bursts.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- Navigating away from CCDF display can take up to 5 seconds as the current measurement finishes for ATDMA and OFDMA receivers.
- HDMI switch over must restart software resulting in a long idle time.
- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is higher than expected.

1.10 Version 2.2.1

Firmware Package Contents

- Software Version (git) v2.2.1-6e3efb6

New Functionality

- SFD Static Upstream Analysis mode.
  - Use of a SFD with firmware v1.3.1 is required.
  - Upstream analysis with the SFD: no additional reference or trigger cable is required.
- DOCSIS 3.1 CM ranging.
  - Use of an SFD with firmware v1.3.1 is required to range a cable modem.
  - Verified with cable modem models: Arris CM8200A, firmware: D31CM-PEREGRINE-1.1.1.0-GA-11-NOSH (DOCSIS 3.1); Motorola MB8600, firmware: 8600-6.1.1.13 (DOCSIS 3.1); Technicolor TC4400-EU, firmware: SR70.12.33-180327.
- CCDF plots for downstream OFDM and upstream OFDMA.
- Downstream OFDM Payload export.
- Adjacent Channel Power mode.
- List of constellation orders for selected downstream OFDM profile, Pilot, PLC and NCP.
- Alarm thresholds for MER and BER.
- Alarm tab showing MER, BER and spectrum mask violations.
- Peak to peak values on downstream OFDM channel analysis plots.
- License support for external application “TVSCAN 2.0”.
- Carrier level vs time and BER vs. time plots.
- Allow output of complete downstream OFDM channel via SFP+.
- Phase noise markers.
- Optimize MER functionality.
- ATDMA IQ Imbalance functionality.

Modified Functionality

- Upstream ATDMA & OFDMA receivers now support streaming of received data via SFP+.
- Semi-automatic BER mode removed from J.83 BER measurement.
- OFDM & OFDMA partial equalization is now implemented.

Fixed Issues

- On power up the DSA will now start measuring signals without the need to press any button in the GUI beforehand.
- A delay is no longer required when issuing back to back MMEM:SCAP SCPI commands to save multiple screenshots.
- Network output button now allows enabling / disabling.
- J.83/x: The MER measurement for an unimpaired signal will now provide good repeatability.

Known Issues

- For CM Ranging: Channel analysis & MER vs time (with IUC filter set to ALL) plots are not available.
- SCPI commands to set parameters for Cable modem ranging and Static upstream analysis are not yet available, the commands to read values must include the MODE token.
- Autolevel may set attenuation too high to receive ATDMA initial ranging bursts, workaround is to manually reduce attenuation by 5dB.
- ATDMA: Support for only one preamble.
- DSA can connect to the SFD using the IP address, connection via hostname is not supported.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is higher than expected.

1.11 Version 2.0.0 / 2.0.1

Firmware Package Contents

- Software Version (git) v2.0.0 – e8ba5cd / v2.0.1 – 58379d7
- Installation of v2.0.0 and higher will not allow FW versions below v2.0.0 to be installed later.
- Installation to v2.0.0 from all previous versions requires that no special characters (i.e. spaces) are present in the filename or folder path of the update file.

New Functionality

- Remote desktop operation via web browser.
- IQ density plots.
- Upstream ATDMA & OFDMA receivers and measurements (requires reference and trigger cable).
    - Note: Future modes “Dynamic upstream analysis” and “SFD static upstream analysis” will be provided in a later release that do not require a reference or trigger cable.
- DOCSIS 3.0 & EuroDOCSIS 3.0 CM ranging.
    - Use of an SFD with FW v1.2.0 is required to range a CM.
    - Verified with CM models: Arris SURFboard SB6141, Linksys DPC3008, Motorola MB7220, Motorola SB5102 & FRITZ!Box 6430.
- SNMP support.
- DOCSIS 3.1 digital filtering:
    - Improved filter characteristics when bandwidth is < 192 MHz,
    - Automatically tuned notch filter for excluded subcarriers,
    - Filtering can be switched on or off.

Fixed Issues

- Correct level is displayed after a manual attenuation change.
- Improved auto attenuation functionality.
- Use of static IP address to connect with SFD now functional. (Version 2.0.1)

Known Issues

- On power up the DSA will not start receiving signals until any button on the GUI is pressed.
- Upstream receiver SFP+ output is not yet implemented.
- ATDMA: Support for only one preamble.

- IQ Imbalance functionality is not yet implemented.
- DSA can connect to the SFD by using the IP address. Connecting by hostname is not yet supported.
- DOCSIS 3.1 CM ranging is not yet supported.
- Certain brands of DOCSIS 3.0 and earlier Cable Modems may not receive TOD message and after a few minutes restart the ranging process.
- OFDMA partial equalization is not yet implemented.
- OFDMA Bandwidth Request power measurement may be off by 2dB in 4K mode.
- OFDMA echo pattern shows aliasing when a sparse pilot pattern is chosen.
- OFDMA receiver can get into a state where configuration changes are not accepted, cycling power to unit will resolve issue.
- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is higher than expected.
- A 2 minute delay is required when issuing back to back MMEM:SCAP SCPI commands to save multiple screenshots.
- Sometimes, applying an unimpaired J83 signal may result in lower measured MER (~50dB); a work around is to toggle the parameter “Phase Trk Loop BW” in the “Config” menu (e.g. 6 kHz => 60 kHz => 6 kHz).

1.12 Version 1.1.2

Firmware Package Contents

- Software Version (git) v1.1.2-1253965

Modified Functionality

- The upper tuning range for SC-QAM has been increased to 1,794 MHz.

Fixed Issues

- Improved the Option license system stability.
- Digital filtering added to improve MER of OFDM channels in presence of adjacent channels.

Known Issues

- Remote Desktop functionality not yet available.
- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is higher than expected.
- IQ density plot functionality is not yet available.
- A 2 minute delay is required when issuing back to back MMEM:SCAP SCPI commands to save multiple screenshots.

1.13 Version 1.1.0

Firmware Package Contents

- Software Version (git) v1.1.0- b35240d

New Functionality

- Support for Downstream only hardware.
- Auto Y-axis function added to Channel Analysis plots.

Fixed Issues

- Downstream DOCSIS 3.0 Receiver performance in presence of impairments meets requirements.
- Generic J.83 QAM Receiver Mode now supports QPSK, 32QAM & 128QAM.
- J.83/B QAM Receiver Mode: BER pre Reed Solomon meets requirements.
- DOCSIS 3.1 channels with high rates of PLC MAC messages can now be successfully demodulated.

Known Issues

- Remote Desktop functionality not yet available.
- J.83/B 256QAM Receiver Mode: Uncorrectable BER in the presence of high AWGN is higher than expected.
- IQ density plot functionality is not yet available.
- A 2 minute delay is required when issuing back to back MMEM:SCAP SCPI commands to save multiple screenshots.

1.14 Version 1.0.6

Firmware Package Contents

- Software Version (git) v1.0.6-15290ba

Initial Functionality

- Downstream Spectrum Analyzer Mode.
- Upstream Spectrum Analyzer Mode.
- Downstream DOCSIS 3.0 (SQ-QAM J.83 Annex B) Receiver Mode.
- Downstream EuroDOCSIS 3.0 (SQ-QAM J.83 Annex A) Receiver Mode.
- Downstream DOCSIS 3.0 SC-QAM J.83C (SQ-QAM J.83 Annex C) Receiver Mode.
- Downstream J.83 QAM Receiver Mode.
- Downstream DOCSIS 3.1 OFDM Receiver Mode.

Known Issues

- Downstream DOCSIS 3.0 Receiver susceptible to degraded performance under presence of impairments.
- Remote Desktop functionality not yet available.
- Generic J.83 QAM Receiver Mode does not yet support QPSK, 32QAM or 128QAM.
- J.83/B QAM Receiver Mode: BER pre Reed Solomon is higher than expected.
- IQ density plots functionality is not yet available.
- A 2 minute delay is required when issuing back to back MMEM:SCAP SCPI commands to save multiple screenshots.

2. Modifications to the Documentation

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

2.1 User Manual Revision 3

- Added description of new DSA-684US/DS hardware model supporting upstream up to 684 MHz

2.2 Getting Started Revision 3

- Added description of new DSA-684US/DS hardware model supporting upstream up to 684 MHz

2.3 Specifications Revision 3

- Added specifications of new DSA-684US/DS hardware model supporting upstream up to 684 MHz

3. Firmware Update

NOTICE

This update contains a boot loader update. Do not power the unit off or unplug it while this upgrade is in progress. This upgrade will not perform the boot loader update unless required. The upgrade is complete after the DSA has restarted. After version 2.0.0 is installed, there is no way to install previous versions of DSA firmware.

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).

- *DSASetup-vx.x.x.img*

To update the firmware, follow the steps below:

1. Copy the update file to a USB drive and insert it in the DSA.
2. Switch on the DSA.
3. Wait until the DSA firmware has booted and the application has started.
4. From the Home menu, select Setup > Software > Install Release. This will open a new dialog to select an upgrade image.
5. Double tap on the folders to navigate to the upgrade image on the USB drive.
6. Double tap on the file to begin the upgrade process. The DSA will check the file to ensure it is a valid upgrade image, then if successful the software will shut down and the installation process will begin.
7. The installation process does not require user input and may take up to 10 minutes. After the installation, the DSA will require a restart. The DSA will be preset after the update.

4. Option Installation

4.1 Option Installation for DSA Functionality

Users can upgrade the DSA functionality by installing license files. Please contact your distributor to arrange purchase and delivery of new features. Once you have the license file, simply use a USB key or SFTP to move the file to the device. Navigate to Home > Setup > Software > Option and select the “Install Option From File” button. In the file dialog box navigate to the license file and click “Open” to install.

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 installing an updated license file. When removing a feature, a license certificate will often be requested. The procedure to obtain a license certificate is explained below.

4.2 Licence Verification

License certificates verify which license features are currently installed on a device. You can acquire a license certificate by navigating to Home > Setup > Software > Option, selecting the “Installed” tab, and then clicking on the “Generate License Certificate” button.

5. Open Source Acknowledgement

The firmware used in this instrument makes use of open source software packages. Please refer to the DSA Open Source Acknowledgements document (6325-103) included with the shipped product. On the GUI navigate to Home > Setup > Help > Open Src SW.

6. Customer Support

Technical Support

For quick, expert help with any Calian equipment, contact Calian Support. Your request will be handled by highly qualified personnel to help you find a solution to your query on any aspect of the operation, programming or applications of Calian 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 Calian Support stating your instrument and your wish. We will take care that you will get the right information.

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