



Document No. 6325-112  
Revision 2  
February 24, 2025

## **DOCSIS Signal Generator**

### **Release Notes**

### **Firmware Version 2.1.0**

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The following abbreviation is used throughout this manual:

Calian DOCSIS Signal Generator is abbreviated as SFD.

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## 1. Information on the Current Version and History

### 1.1 Version 2.1.0

#### Firmware Package Contents

- Software Version v2.1.0

#### New Functionality


- Network IQ output added for all channel types allowing the signals to be transmitted digitally via the SFP+ network interface.
- Network IQ input added allowing the SFD to transmit downstream or upstream RF sourced from a network stream of digitally modulated IQ samples over the SFP+ interface.
- AM Hum depth scaling reference is selectable between conventional modulation index or ANSI/SCTE 16 modulation factor.

#### Fixed Issues

- None

#### Known Issues

- The SFD may not respond to its name, (i.e. sfd-200000.local), but the user can still access it using the IP address.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.2 Version 2.0.0

### Firmware Package Contents

- Software Version v2.0.0

### New Functionality


- Updated product to Calian branding including Web GUI, SCPI and SNMP MIB
- Added mechanism to upgrade firmware from Software > Upgrade
- Devices starting at Serial Number 200000 will have hostname sfd-xxxxxx.local (where xxxxxx is the serial number of the device)
- Existing Rohde and Schwarz licences will continue to work on this version and subsequent versions of the firmware.

### Fixed Issues

- None.

### Known Issues

- The SFD may not respond to its name, (i.e. sfd-200000.local), but the user can still access it using the IP address.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
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### 1.3 Version 1.4.1

#### Firmware Package Contents


- Software Version (svn) 83172

#### New Functionality

- Undocumented K202 carrier level control capabilities add to SCPI.

#### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.4 Version 1.4.0

### Firmware Package Contents

- Software Version (svn) 83124

### New Functionality


- Extended SCQAM Spectrum mode added (requires licence).

### Fixed Issues

- UCD message generated on upstream pilot carrier now properly generated when advanced minislot configuration file is used to describe the minislot profiles.
- Custom user reference value is properly saved when external reference is plugged in.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.5 Version 1.3.1

### Firmware Package Contents

- Software Version (svn) 82401


### Fixed Issues

- Improved support for ranging DOCSIS 3.1 cable modems in conjunction with a DSA (Firmware v2.2.1 required).
- Improved support for SFD Static Upstream Analysis when used with a DSA (Firmware v2.2.1 required).
- Applying an external 10 MHz reference no longer displays a warning in the Alarm log due to the momentary internal reference changeover.
- SCPI command execution time is now improved to initial SFD performance level.
- There is no longer an offset in the AWGN waveform compared to that of the channel it is tied to.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.



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## 1.6 Version 1.3.0

### Firmware Package Contents


- Software Version (svn) 81428

### New Functionality

- Support for ranging DOCSIS 3.1 cable modems in conjunction with a DSA (Firmware v2.1.3 required).
- Support for SFD Static Upstream Analysis when used with a DSA (Firmware v2.1.3 required).

### Known Issues

- Applying an external 10 MHz reference may display a warning in the Alarm log due to the momentary internal reference changeover, the message can be ignored.
- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- There is a slight offset in the AWGN waveform compared to that of the channel it is tied to the amount can be up to 3 MHz.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.7 Version 1.2.0

### Firmware Package Contents

- Software Version (svn) 81205

### New Functionality


- Support for ranging DOCSIS 3.0 cable modems in conjunction with a DSA.
- Custom ARB support added for OFDMA playout.

### Fixed Issues

- FSW Compatibility mode control now works properly.
- Fan warning speed threshold lowered to prevent false positive warnings.
- Encompassed spectrum for upstream DOCSIS 3.1 is now properly displayed.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- There is a slight offset in the AWGN waveform compared to that of the channel it is tied to the amount can be up to 3 MHz.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.8 Version 1.1.1

### Firmware Package Contents

- Software Version (svn) 79801

### Modified Functionality


- About page updated with current information.

### Fixed Issues

- Messages inserted into PLC no longer disappear after longer time periods.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- There is a slight offset in the AWGN waveform compared to that of the channel it is tied to the amount can be up to 3 MHz.
- Encompassed spectrum is not populating correctly for upstream DOCSIS 3.1, the settings entered are used for the channel.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.9 Version 1.1

### Firmware Package Contents

- Software Version (svn) 78496

### New Functionality

- Phase noise impairment functionality added.
- AM hum impairment functionality added.

### Modified Functionality


- Upstream burst sources are now filtered for the selected burst type.

### Fixed Issues

- When changing the data source in upstream D3.1 and D3.0, playout options now update to valid selections.
- Upstream DOCSIS 3.1 ranging bursts now have functioning power control.
- The downstream DOCSIS 3.0 symbol rate now updates to current value without being displayed as an incorrect dirty field.
- ATDMA and SCDMA preamble patterns are now bitwise flipped as required by DOCSIS specification.
- SCPI bug fix that caused parameters to be improperly reported after successive requests for invalid configurations.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- There is a slight offset in the AWGN waveform compared to that of the channel it is tied to the amount can be up to 3 MHz.
- Encompassed spectrum is not populating correctly for upstream DOCSIS 3.1, the settings entered are used for the channel.
- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 1.10 Version 1.0

### Firmware Package Contents


- Software Version (svn) 78065

### Existing Functionality


- Web GUI support.
- Option licensing support.
- SNMP and SCPI is supported.
- Single real-time modulated channel generation of:
  - US ATDMA, SCDMA or OFDMA.
  - DS DOCSIS 3.1 J83 Annex A, B or C.
  - ARB Waveform (DS or US).
- Support for SFP+ (1 or 10 Gbps) as a channel source.
- Inclusion of the R&S PIAS daemon to allow software updates.
- RF Impairments supported:
  - BER.
  - AWGN.
- 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 SFD will report the instantaneous data rate of each channel with a set source port.

### Known Issues

- The SFD may not respond to its name, (i.e. rssfd-101553.local), but the user can still access it using the IP address.
- There is a slight offset in the AWGN waveform compared to that of the channel it is tied to, the amount can be up to 3 MHz.
- When changing the data source in upstream D3.1 the playout options do not update properly to reflect the new possible choices. Clicking on the box forces the update.
- Encompassed spectrum is not populating correctly for upstream DOCSIS 3.1, the settings entered are used for the channel.
- Upstream DOCSIS 3.1 ranging burst types have incorrect power control making the ranging section of the channel higher power than the surrounding carriers.

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- Upstream DOCSIS 3.1 bandwidth request burst type do not playout correctly in periodic mode, the simulated load carriers disappear.
- The downstream DOCSIS 3.0 symbol rate shows up as a modified field on first load, but pressing undo reverts it to the current value.
- File upload using SCPI can erase a file by renaming it.
- It is recommended to use Firefox or Chrome to browse the Web GUI.
- Some browser extensions or add-ons, 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 SFD.

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## 2. Modifications to the Documentation

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

### 2.1 User Manual Revision 2


- Added description of SFD-K2010 Network IQ features

### 2.2 Getting Started Revision 2

- Updated RoHS/WEEE Certificate

### 2.3 Specifications Revision 2

- Added specifications of SFD-K2010 Network IQ features

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### 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 when the SFD front panel Power & Status LEDs turn green and all other LEDs are off.

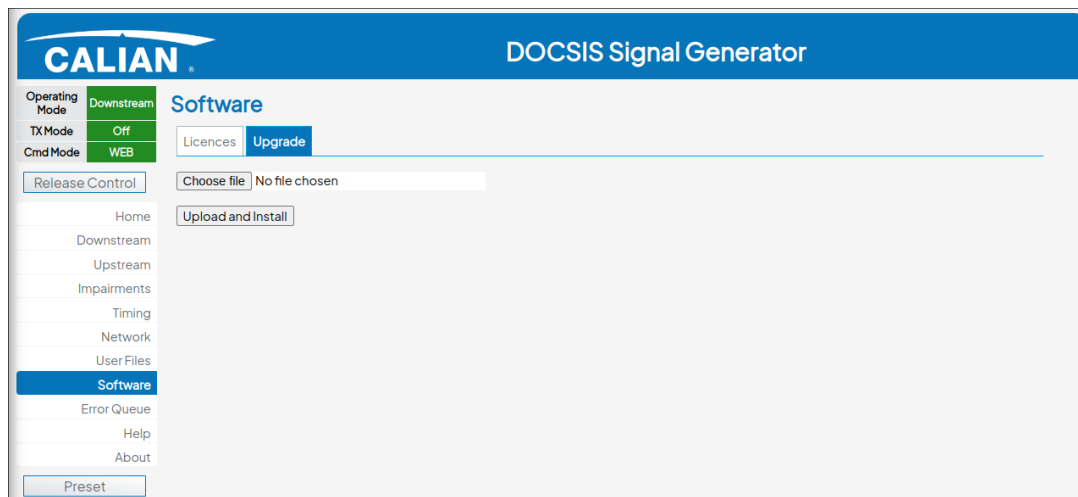
#### 3.1 Updating the Firmware

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

- *SFDSetup\_vx\_x\_x.img*

Perform the update on a computer with a browser supported by the device.

1. Access the SFD web GUI.
2. Navigate to Software > Upgrade.



3. Click "Choose file" and locate the firmware file.
4. Click "Upload and Install".
5. The SFD will redirect the browser to an upgrade status page detailing the status for each step of the upgrade process.
6. At the end of the upgrade process, the system will prompt the user to reboot the SFD.

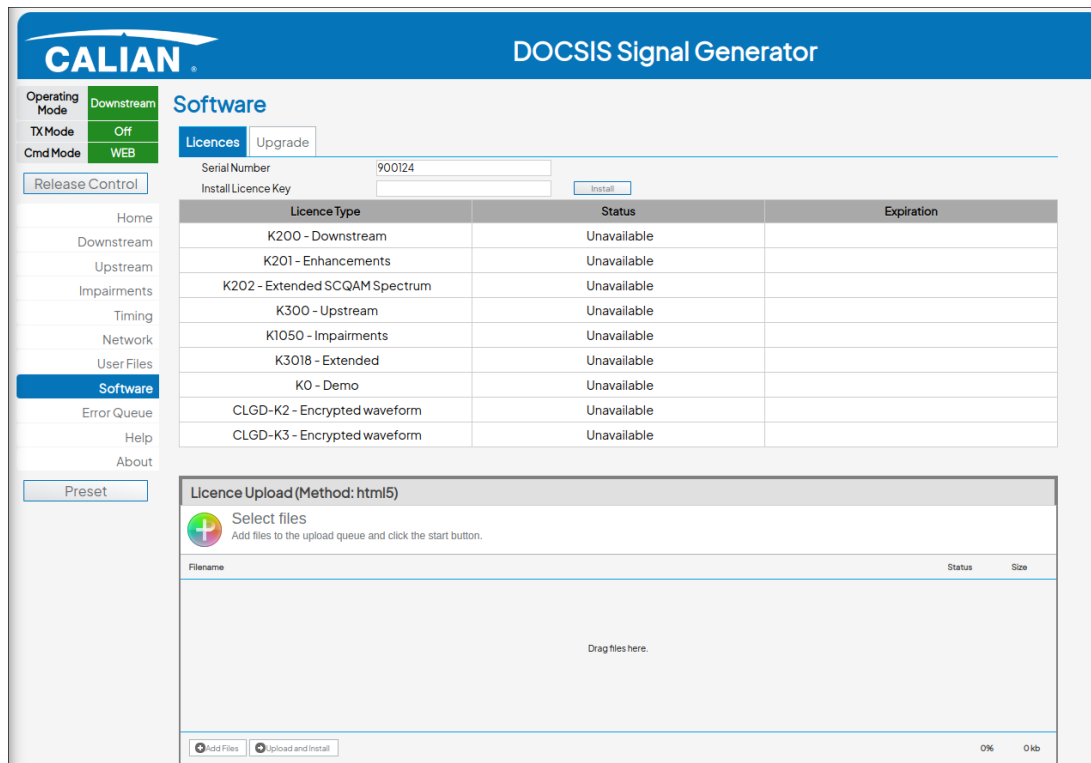


## 4. Licence Installation

### 4.1 Licence Installation for SFD Functionality

Users are able to upgrade the SFD 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 licence file to add each feature. Alternatively, a key can be entered manually in the Install Licence Key field and added by clicking on the Install button.

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



The screenshot shows the 'DOCSIS Signal Generator' software interface. On the left is a navigation menu with options: Home, Downstream, Upstream, Impairments, Timing, Network, User Files, **Software**, Error Queue, Help, About, and a Preset button. The 'Software' section is active, showing a 'Licences' tab. Below the tabs, there are input fields for 'Serial Number' (900124) and 'Install Licence Key', with an 'Install' button. A table lists various licence types and their status:

Licence Type	Status	Expiration
K200 - Downstream	Unavailable	
K201 - Enhancements	Unavailable	
K202 - Extended SCQAM Spectrum	Unavailable	
K300 - Upstream	Unavailable	
K1050 - Impairments	Unavailable	
K3018 - Extended	Unavailable	
K0 - Demo	Unavailable	
CLGD-K2 - Encrypted waveform	Unavailable	
CLGD-K3 - Encrypted waveform	Unavailable	

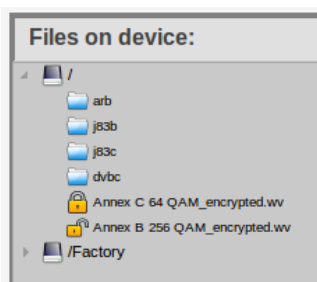
Below the table is a 'Licence Upload (Method: html5)' section. It includes a 'Select files' button, a text prompt 'Add files to the upload queue and click the start button.', and a table with columns 'Filename', 'Status', and 'Size'. The table is currently empty, with a 'Drag files here.' instruction. At the bottom of the upload section are buttons for 'Add Files' and 'Upload and Install', and a progress indicator showing '0%' and '0 kb'.

## 4.2 Licence 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 licence file is provided. This licence file must be uploaded to the SFD (see Uploading a New Licence 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.

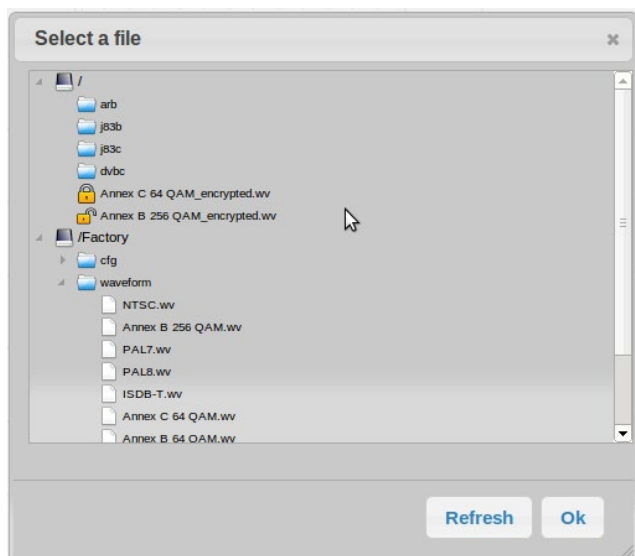



The locked icon indicates that the waveform is encrypted, and the SFD does not have the licence file necessary to decrypt it.



The unlocked icon indicates that the waveform is encrypted but the SFD does have the licence 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.



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A licence file is required in order to decrypt the encrypted waveforms. Once a licence 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 SFD. If no licences are uploaded, it displays "No Licence Files Uploaded".


### Uploading a New Licence File

1. Take control of the SFD 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 licence file into the "Licence Upload" box.
4. At the bottom of the "Licence Upload" box, click "Start Upload".

The file is uploaded to the SFD. When the upload is completed, the new licence option is added to the "Licence Options" field. All encrypted waveforms corresponding to the licence option are available to be used.


## 4.3 License Verification

License certificates verify which license features are currently installed on a device. You can acquire a license certificate by navigating to the Software page, selecting the Licenses tab and then clicking on the "Download License Certificate" link.

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## 5. Open Source Acknowledgement

The firmware used in this instrument makes use of open source software packages. Please refer to the SFD Open Source Acknowledgements document (6325-111) included with the shipped product. On the Web GUI navigate to Help > Software Licences.

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## 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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<https://www.calian.com/products/docsis-signal-generator-sfd>