



New DSP Family CM Sweep Feature

Introduction

The purpose of this document is to provide instruction on the proper use of the CM Sweep feature, included on the 1G DSP, and optional on the 360 DSP and 720 DSP meters.

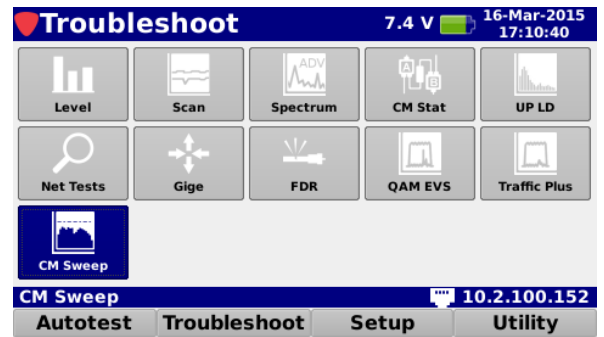
The traditional method used to balance the return path is to have a handheld device in the field send back fixed carriers to a headend device, and then have the headend device communicate back to the handheld unit the levels at which the carriers are received. This method works well, however, there are some drawbacks. First is the requirement and the added expense of the headend unit. Second is the fact that, as the return path gets crowded with upstream traffic, there is less and less room for injected sweep carriers. And finally, the traditional method does not allow for any in-band analysis because the active upstream signals are avoided.

The CM Sweep menu on the DSP line of meters uses the active upstream, specifically the modem carriers, to help balance the upstream. In addition, it will provide pre-equalization information to help troubleshoot impairments that may be present in the system. It must be noted, however, that the accuracy of this function will depend on the specific receive level tolerance configured in the CMTS. In other words, if the CMTS is expecting the modem to connect at 0 dBmV but will accept a range of -1 to +1 dBmV, this may explain some differences in launch levels noted in the field.

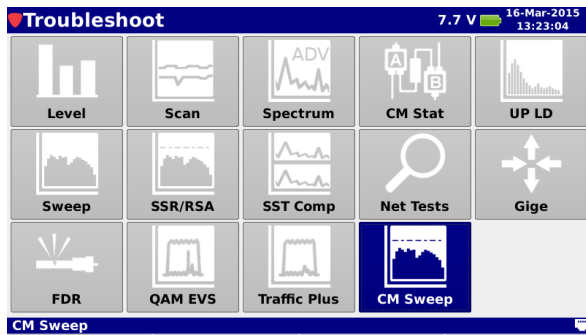
To access this feature, select the **CM Sweep** icon from the **Troubleshoot** menu, as shown in the images below.



360 DSP Troubleshoot Menu



720 DSP Troubleshoot Menu



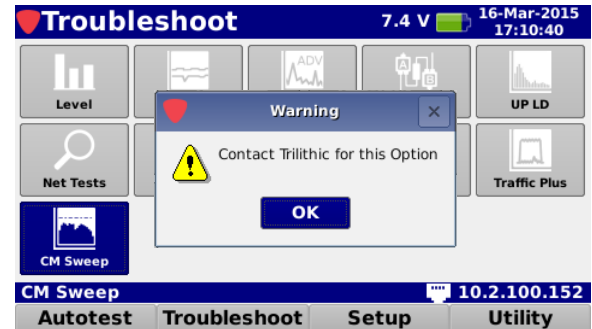
1G DSP Troubleshoot Menu

How to Verify Activation of the CM Sweep Option on a 360 DSP or 720 DSP?

The CM Sweep feature is included with all 1G DSP meters and is an optional feature for the 360 DSP and 720 DSP. If the CM Sweep Option is not activated on your device, you can purchase an activation code for this feature by calling Trilithic at 1-800-344-2412 or 317-895-3600.

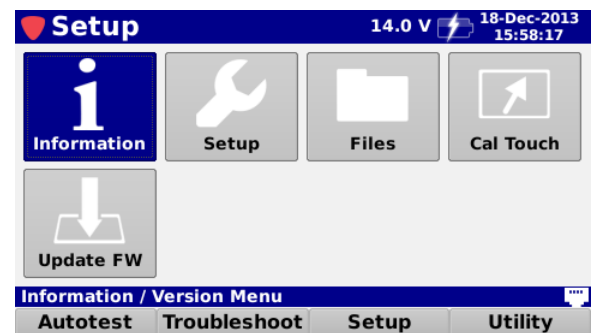
There are two methods that can be used to verify whether the CM Sweep Option has been activated on your 360 DSP or 720 DSP:

- Select the **CM Sweep** icon from the **Troubleshoot** menu. If the option is activated, you will be able to access this feature. If the option is not activated, a **Warning** window will appear as shown in the image to the right.



- Select the **Information** icon from the **Setup** menu, as shown in the image to the right. Select the **Option Information** button from the **Information** screen to see if you have the CM Sweep option.

If the option is activated, the screen will display **Yes** before the option name.



Using CM Sweep

The current method used to check for gain and flatness in the return CATV band is to insert test carriers (red dots) between live signals (blue/green traces), receive these signals at the headend sweep receiver, and basically connect the dots, producing a frequency flatness trace (see Figure 1). The problem with this method is available bandwidth. As more channels are inserted into the upstream, the available bandwidth to insert test carriers is diminished.

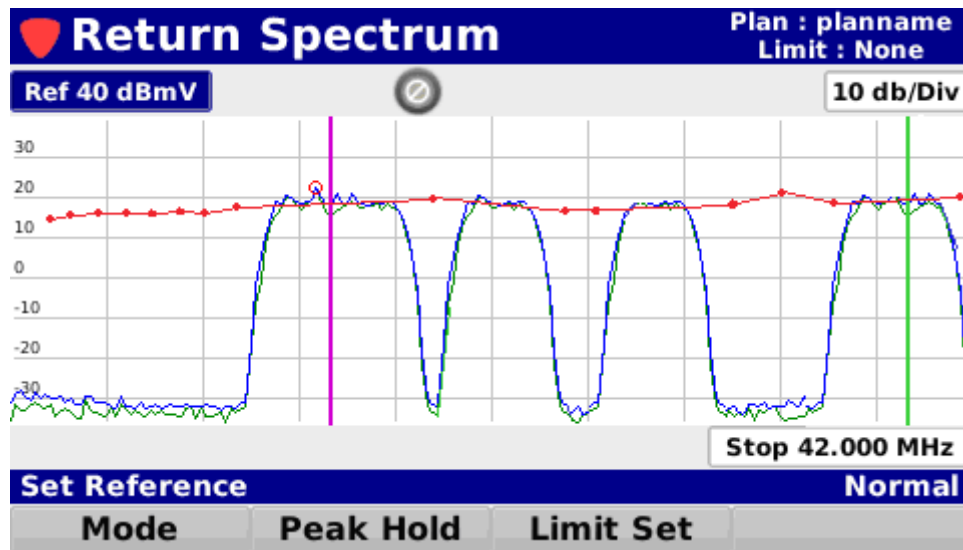


Figure 1

An alternate method of testing the upstream is to process information between the CMTS and the meter's cable modem, in order to present a bar graph representation of the upstream carriers. This allows the technician the ability to analyze the upstream for tilt and gain without the added expense of a Head End Sweep Receiver.

This image below is a return band (upstream) sweep using DOCSIS carriers.

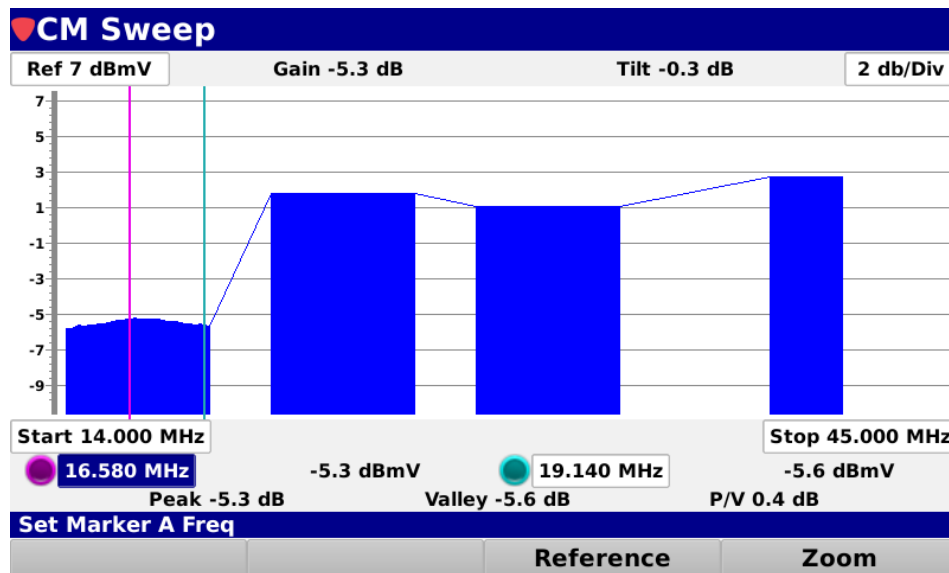


Figure 2

Each bar represents the upstream channel compared to the nominal value expected at the CMTS. Assuming the CMTS is looking for zero, the first channel is indicating that it is about 5 dBmV lower than the CMTS is expecting and the fourth channel is about 3 dBmV higher than the CMTS nominal value.

The bar graphs above also incorporate the pre-equalization information from the CMTS which gives the technician an indication of the in-channel response for each upstream channel. This can aid the technician in quickly evaluating the upstream channel response.

There are two agile markers that allow you to check for gain (tied to the first marker) and tilt (which is the difference between the two markers) both across the upstream band and in-channel. **Peak**, **Valley**, and **P/V** are referenced between the markers.

Once you have your levels at the node set up correctly, you can store a reference and use that reference at the next amplifier to adjust for gain and tilt. Figure 3 shows the above graph but with a reference stored.

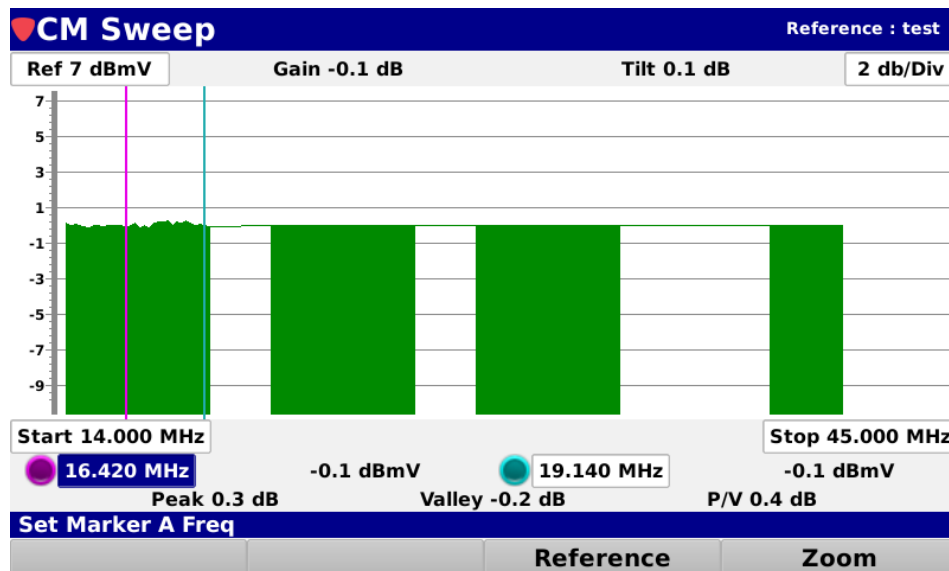


Figure 3

Once you have stored a reference, you can go to the next amp in line and compare the referenced display from the node (Figure 3) to the local display at the amp (Figure 4), which will allow you to EQ and/or pad to get the upstream aligned.

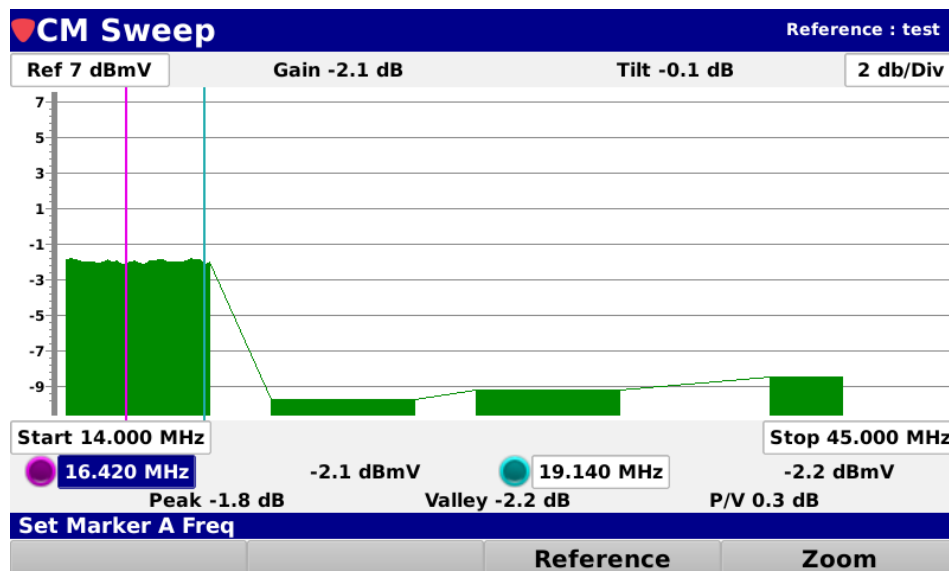


Figure 4



NOTE

The Zoom button is currently still under development.

Conclusion

Issues that typically would not be detectable without sending fixed carriers from a handheld device to a headend unit and back can now be seen by the technician using the CM Sweep feature. This is a powerful tool to help the technician balance and troubleshoot the upstream.



NOTE

***For Additional Help, Contact Trilithic Applications Engineering
1-800-344-2412 or 317-895-3600
support@trilithic.com or www.trilithic.com***