

Dynamic Range Window (DRW)

Using DRW Detection in CX310

Introduction

Upstream Channel Bonding combines multiple RF channels into a group (MAC layer) to allow DOCSIS 3.0/3.1 cable modems to handle higher bandwidths. The DOCSIS 3.0/3.1 specifications state that up to 8 channels can be bonded into a Transmit Channel Set. As more channels are combined into a group, the per channel maximum power decreases so the combined power of the bonded group matches the total MTP (Maximum Transmit Power) of a single channel before bonding. To mitigate this decrease to equal the approximate single channel maximum channel, the use of Dynamic Range Window (DRW) while in Multiple Transmit Channel (MTC) mode is used.

Figure 1: Dynamic Range Window



When activated, the Dynamic Range Window cycles the channels to find the single upstream channel that has the maximum dB transmit level. It then calculates three

transmit levels approximated by the CMTS upon registration: Minimum Transmit Power (MTP_{MIN}), Top Transmit Power (TTP), and Reported Transmit Power (RTP). These values are used to determine the limits for bonded channels. The DRW supports a 12 dB range between the Minimum and Maximum values. **If the values fall outside this range, the modem detects a DRW violation and may not register as online or partially register only.**

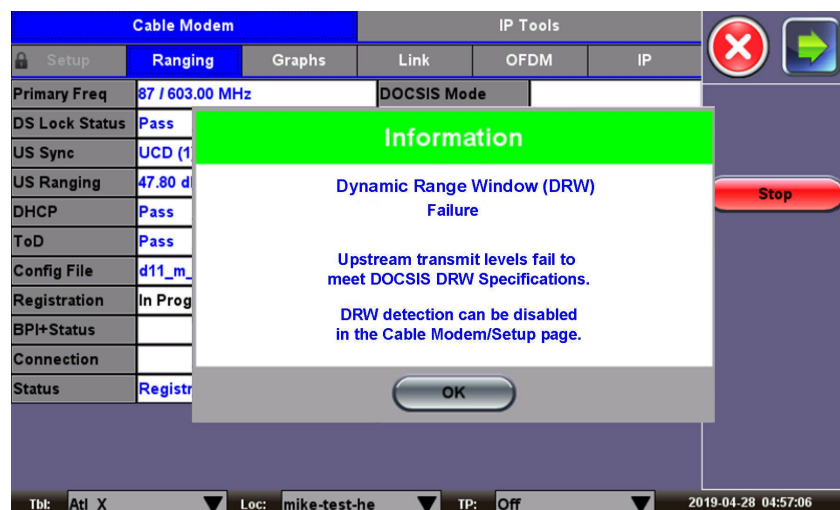
Figure 2: Dynamic Range Window Pros/Cons

Benefits	Disadvantages
May maximize the transmit levels of bonded channels	Modems may be missed completely (not registering).
As more service providers use the transmit values reported by the CMTS, the easier troubleshooting will become.	Modems may be difficult to troubleshoot when partially registering.

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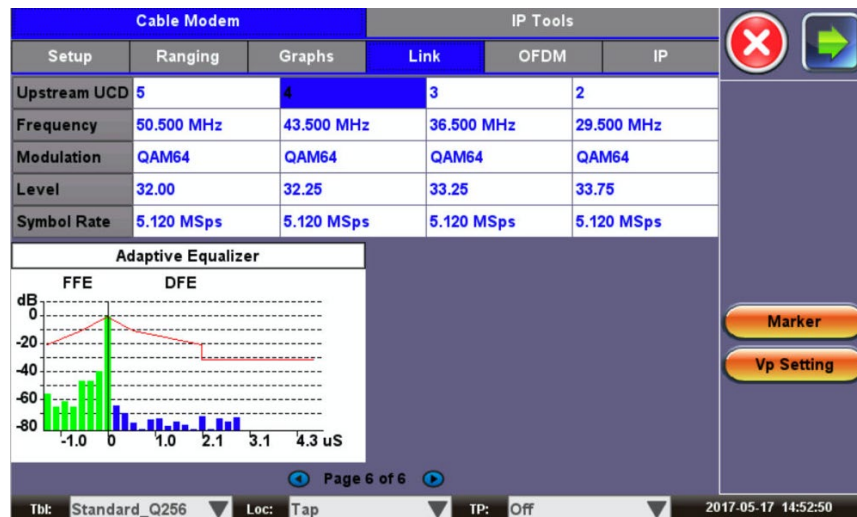
The DRW detection option is disabled by default in the test set's Cable Modem. When enabled, if the Cable Modem Transmit power levels fall outside the DRW 12 dB range, a message appears (See Figure 3).

Figure 3: Test Set DRW Failure Notification



To troubleshoot why the modem is not registering on the first attempt, disable the DRW detection option and check the upstream power levels of each channel in the **Link** measurement tab (See Figure 4).

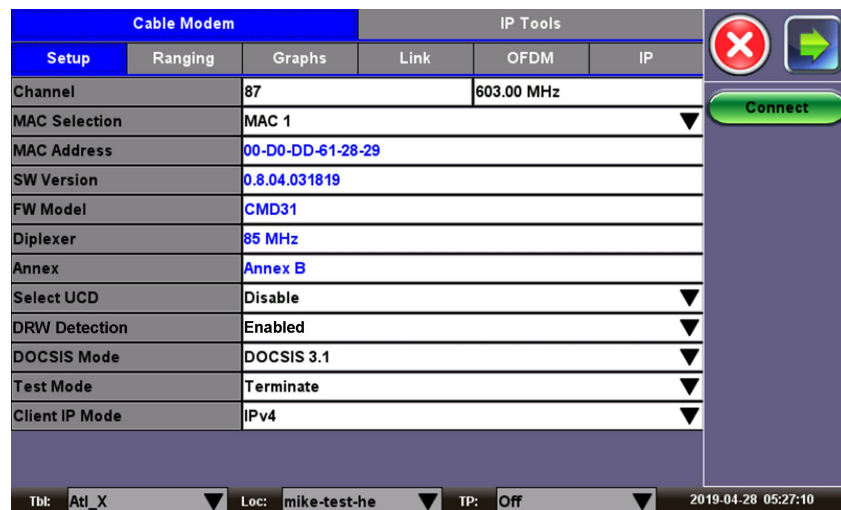
Figure 4: Checking Upstream Power Levels



To enable or disable DRW Detection in CX310

1. Connect the test mode. The test set displays the **Cable Modem Ranging** sub-tab.
2. Click the **Setup** sub-tab to view channel configuration settings.
3. Click the **DRW Detection** drop-down box and select **Enabled** or **Disable** (See Figure 5).

Figure 5: CX310 DRW Detection option



About VeEX

VeEX Inc., an innovative, customer-focused communications test and measurement company, develops next-generation test and monitoring solutions for telecommunication networks and services. With a blend of advanced technologies and vast technical expertise, VeEX has developed products that diligently address all stages of network deployment, maintenance, and field service turn-up and integrate service verification features across DSL, fiber optics, CATV/DOCSIS, mobile backhaul and fronthaul (CPRI/OBSAI), next-generation transport network, fiber channel, carrier and metro Ethernet technologies, WLAN, and synchronization.

P/N: D08-00-058

2827 Lakeview Court, Fremont, CA 94538, USA | Tel.: +1 (510) 651-0500 | Fax: +1 (510) 651-0505 | info@veexinc.com

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