SERVICE BULLETIN LA-V75-002

Product: Underground VHF Line Amplifier + Ethernet

Subject: Applying conservative Ethernet over Coax (EoC) settings   **Date:** 1st May 2021

Description

This Service Bulletin describes how to manually apply conservative Ethernet over Coax (EoC) configuration settings to a LineAmp+Ethernet (LAE) device. These conservative settings reduce the likelihood of the EoC signal coupling across an LAE device through signal radiation from the Leaky Coaxial (LCX) cables. When this coupling occurs, a network loop results, making the Ethernet communications unusable.

Background

Several sites have reported situations where the EoC status lights on their LAE devices change colours from green to orange / red and back again, with the lights blinking rapidly. After investigating these situations, each was found to have been an instance of the EoC signal coupling out of the LCX cable on one side of the LAE to the other side of the LAE.

In each case this was resolved by:
- Ensuring physical separation of the cables on each side of the LAE
- Ensuring there are no short LCX cable stubs, acting as antennas, on either side of the LAE

However, not all sites are able to achieve sufficient physical separation.

As a response, this service bulletin contains suggested configuration settings that can be applied to each EoC processor in an LAE (i.e. left and right), which reduce the likelihood of the EoC signal coupling across. The conservative configuration settings achieve this by:
- Reducing the transmit power by 6 dB.
- Reducing the AGC gain ceiling that the receiver uses.

If these conservative configuration settings are found to eliminate the problem, then an updated firmware will be released that applies these settings during the upgrade.

Procedure

Start the Coax Configurator tool in EXPERT mode

- Start the **Coax Configurator** tool in expert mode:
  - Open a command prompt.
  - Change directory to the location of the coax configurator JAR file.
  - Run: `java –jar DigitalDriftCoaxConfigurator–1.1.0 expert`

- Enter **admin mode** in the Coax Configurator:
  - Select the menu item: `Options -> Change Configuration Password`
  - Enter the value of `admin` at the resulting dialog box

Connect to the left side EoC processor

- Open the LAE device housing and set the EoC pass-through switch to the **BLOCK** position. By doing this:
  - The left side RJ45 port on the front of the device provides access to the left side EoC processor.
  - The right side RJ45 port on the front of the device provides access to the right side EoC processor.

- Connect the laptop's Ethernet port to the left side RJ45 port using an Ethernet patch lead.

- Click the **Re-discover Network** button in the coax configurator.

- Once discovery completes, the MAC address of the left side EoC processor will be displayed at the top of the Coax Configurator's discovered device list.

- Select this device to load its details into the main pane of the Coax Configurator.

Apply the conservative parameters

- Select the **Advanced Config** tab in the main pane of the Coax Configurator.

- Change the following configuration settings by double clicking on each parameter to bring up a dialog box where the value can be changed:

Parameter	Previous value	New value
AGC.GENERAL.TX_GAIN_CH1	4	1
LINKADAPTATION.MONITORS.DYN_PSDC_ENABLE	YES	NO
PHYMNG.GENERAL.AFE_RXEQ_MODE	0	2
PHYMNG.HGF.POWER_BOOST_ENABLE	1	0

- Click the **Reboot** button in the Coax Configurator to complete the changes to this EoC processor.

Repeat for the right side EoC processor

- Connect the Ethernet patch lead to the right side RJ45 port and repeat the above steps for the right side EoC processor.

Revert the EoC mode to pass-through

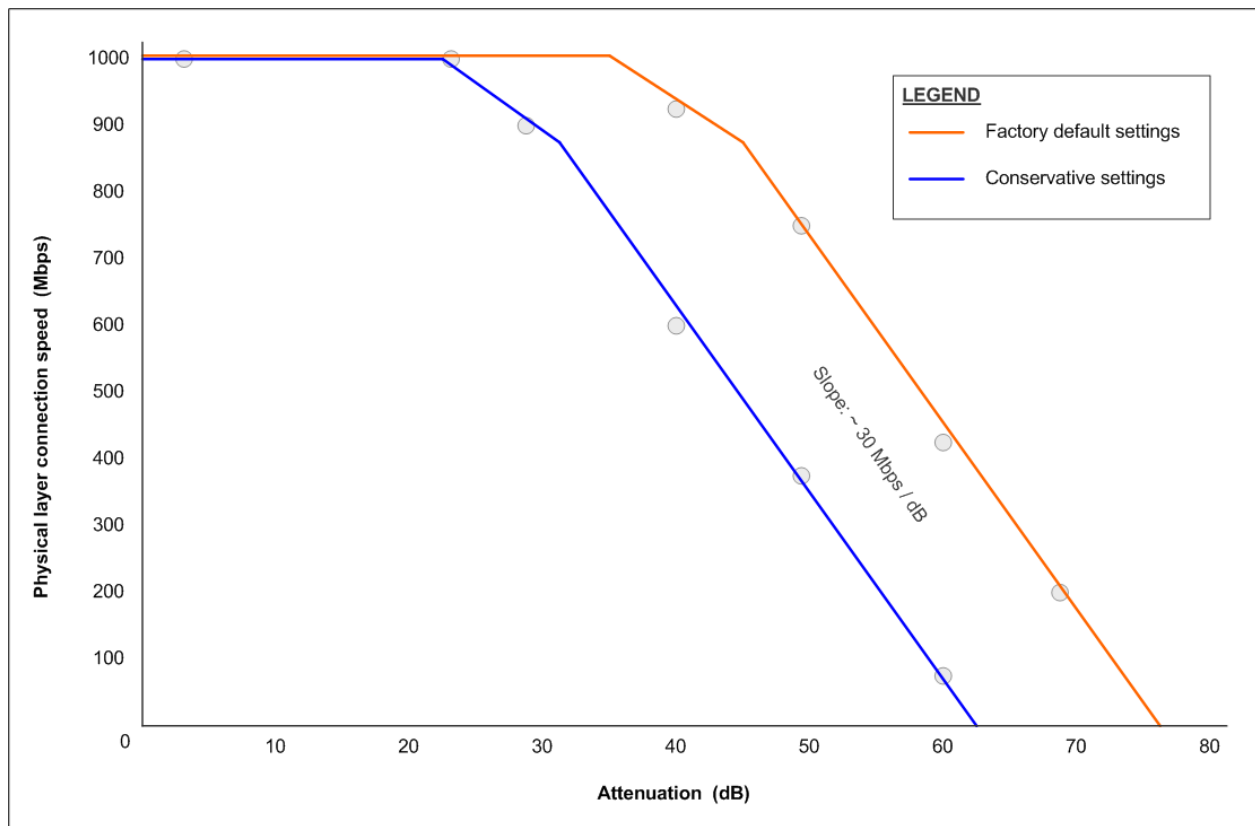- Return the EoC pass-through switch to the **PASS** position.

Performance impacts

These changes mean that each EoC processor has:
- Reduced transmit signal strength
- Reduced receiver gain

The reduced link budget has an effect on physical layer throughput, as illustrated below[1].

[1] The charts are shown for an ideal coaxial link (i.e. non leaky coaxial cable and no external noise).