



Teledyne Q-Flex modems

Added by Steve Foley, last edited by Steve Foley on Mar 09, 2015

The Comtech 550 and 570 modems are being replaced by Teledyne Q-Flex modems in 2015. They are being shipped out now to vessels, largely preconfigured for drop in replacement use initially. At some point, they will need to have some more considerable changes made to their configuration so as to make use of their IP interfaces for data. However, that change will need to be coordinated across an individual beam. For now, initial installation will involve the serial interface between the modem and Cisco router.

Receiving a new modem

Upon receiving a new modem, please do the following:

- Apply power to it and inspect the configuration
 - For L-band systems, adjust the LNB settings to match Comtech
 - LNB type (Main, 2, 3, 8) should be None (Sikuliaq may be different...)
 - Check the Rx parameters to confirm that they match the Comtech modem
 - Interface (Main, 2, 3, 1) should be RS422
 - Service (Main, 2, 3, 2) should be Closed
 - Rate (Main, 2, 3, 3) should match Comtech, but in Mbps (ie 512kbps is .512 Mbps)
 - Clocks (Main, 2, 3, 5) should be Internal
 - ModCod (Main, 2, 3, 6) should be TPC, modulation (enter) should be QPSK, FEC code rate (enter) should be 0.75 (3/4)
 - Carrier frequency band (Main, 2, 3, 7, 1) should be IF for CDM-550 replacement, L-band for CDM-570 replacement
 - Frequency (Main, 2, 3, 7, 2) should be your Comtech's frequency
 - For L-band systems, adjust the BUC settings to match Comtech
 - BUC type (Main, 2, 2, 8, 1) should be #2, BUC no comms
 - 10 MHz Reference (Main, 2, 2, 8, 4) should be #2, on
 - LO (Main, 2, 2, 8, 2) should be set to -15.450000 GHz (Sikuliaq should use -7.375 GHz and Point Sur should use 12.800 GHz)
 - Check the Tx parameters to confirm that they match the Comtech modem
 - Interface (Main, 2, 2, 1) should be RS422
 - Service (Main, 2, 2, 2) should be Closed
 - Rate (Main, 2, 2, 3) should match Comtech, but in Mbps (ie 512kbps is .512 Mbps)
 - Clocks (Main, 2, 2, 5) should be Internal
 - ModCod (Main, 2, 2, 6) should be TPC, modulation (enter) should be QPSK, FEC code rate (enter) should be 0.75 (3/4)
 - Carrier frequency band (Main, 2, 2, 7, 1) should be IF for CDM-550 replacement, L-band for CDM-570 replacement
 - Frequency (Main, 2, 2, 7, 2) should be your Comtech's frequency, but in GHz instead of MHz (move the decimal)
 - Transmit mode (Main, 2, 2, 7, 6) should be Rx Enabled (the equivalent of RTI mode)
 - Spectrum Inversion (Main, 2, 2, 7, 4) should match the Comtech modem Tx Spectral Inversion. For L-band ships, this is likely On.
 - Adjust the Tx power level (Main, 2, 2, 7, 5) to match the Comtech modem's Tx power level
 - Set the M&C port IP address (Main, 2, 5, 2), subnet mask (enter), and gateway (enter)
 - Give the modem a name (Main, 2, 4, 1, 4) like "R/V shipname"
 - Store the config for safe keeping (Main, 2, 7, 1) – Give it a name
- Rack the modem in place of the old Comtech modem
- Connect the modem
 - M&C port can go into a network spot for control

- Tx and Rx connectors go to your Tx and Rx coax cables respectively. If you are pulling out an CDM-570L modem, use the large N-type coax ports. If you are pulling out a CDM-550 modem, use the smaller BNC connectors.
- Connect the serial cable to the DB-25 serial port (labeled EIA-530), remove any grey cabled DB-25/DB-25 adapters you may have in line.
- Do NOT connect a cable between the DAC and the "Alarms" port on the modem. The new modems aren't ready to talk to the DAC yet.
- If your DAC's System Type setting is 0007, set it to 0005. If it is 0071, set it to 0069. Save the settings in the DAC if you made a change.
- Power up the modem.
- Obtain a receive lock on the shore-to-ship signal.
- When the Rx light is green, contact HSN staff via IM or phone to transmit. Please don't transmit the first time without having someone watch your signal come up.
- Login via the web interface (default user is admin, password is "paradise"), export the saved settings, and send them to HiSeasNet staff (hiseasnet@ucsd.edu)

Integration with SeaTel antennas

DAC/modem cable

The techs on the Sikuliaq report that the old [DAC/modem cables](#) have been shown to work well given the following modifications on the alarms (modem) end of the cable. On the DB-15 side,

1. The wire in pin 15 should go to pin 10
2. The wire in pin 1 should go to pin 15 (ground)
3. The wire in pin 7 should go to pin 2 (fault common)
4. The wire in pin 9 should go to pin 7 (Tx off)
5. Set the DAC system type to have the 2 bit in it
 - a. If the DAC system type parameter is set to 0005, set it to 0007.
 - b. If the DAC system type parameter is set to 0069, set it to 0071.
 - c. If it isn't either of those values, contact the HiSeasNet admins.

The pinout for the alarm port is located on page 189 of the [attached manual](#).

MXP/modem cable

The MXP controller is a little different than the DAC, so the cable is different. The Endeavor techs are working on getting the right pinout setup for this cable.

Configuration fetch and reload

According to the Teledyne support folks, it is possible to download a configuration from the modem in a format that can be added back to the modem. Using pup, one can:

- Use the 'gc' command fetch the current config and use the 'add' command to upload a config.
- The 'add' command creates a config file (if it doesn't exist) and adds settings to it, it has the syntax:
 - add <config name> <mcp=value> <mcp=value> ...
- The mcp can be specified as either a name or number and the command is designed to allow the output of the gc command to be fed back to it to re-upload a config.
- The 'list' command displays all the configs stored on the modem.

- The 'delete <config name>' command is used to delete configs.
- The 'show <config name>' command is used to display a config memory in the same format as the gc command.

If one wants to upload/download config files in XML, one will need root access and have to use FTP. But hopefully the above commands should suffice.

Quirks

The modems have a few quirks. The most confusing bits related to settings that are only available when in other modes. Be sure to put the modem in the right mode to enable the settings for those modes. While the web interface greys these values out, the front panel interface may never present them, so it may be difficult to know what is going on.

BUC and LNA local oscillator frequencies are assumed to be low-side. If you wish to enter a high-side LO, put a negative sign in front of the LO when you enter it. This should get the correct calculation to show up. When entering an LO, the Tx or Rx frequency will go from L-band MHz to C- or Ku-band GHz values. If you wish to enable a BUC or LNB (because you need to have a 10 MHz reference or power going to it), you can still enter the L-band frequency for Tx or Rx. To do so, you need to set the applicable LO to 0 MHZ.

Do take note of spectral inversion. When the LO frequency is high-side, you will need to turn on spectral inversion in order to properly lock up a signal and pass data. The Teledyne modems may show a valid EbNo, but not pass traffic when the inversion is incorrect.

The Java- based graphs in the View menu of the web interface are a little tricky to get working. As of Jan 2015, they seem to require Firefox (or at least not Safari), and a recent enough version of Java (8 is fine), along with site security exceptions in the Java control panel, plus a bunch of acceptance of expired or unsigned security certificates.