

## Precorrections Procedure for Comark EXACT-V2 High End TV Exciter

The purpose of this Service Bulletin is to illustrate the basic operation of the EXACT-V2's Digital Adaptive Precorrections within the transmitter environment.

**Prerequisites:** The exciter firmware should be at least **Rev. s144** or higher. Please see **Technical Service Bulletin 201214** for more information.

The digital pre-correction feature consists of two types of corrections:

- **Non-linear pre-correction** – compensation of the power amplifier distortion
- **Linear pre-correction** – compensation of distortion due to the channel filter

**Note:** This procedure applies to an active on-air exciter.

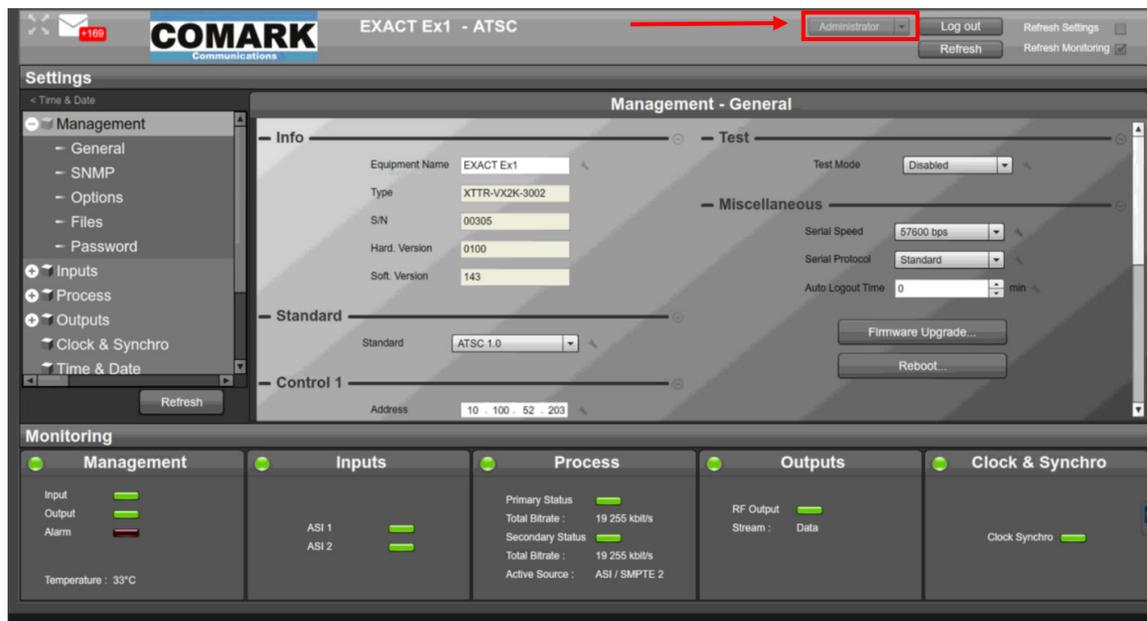
1. After accessing the **Exciter GUI**, log in using the following account information:

Default IP Address Ex1: **192.168.0.209**

Default IP Address Ex2: **192.168.0.210**

Username: **Administrator**

Password: **admin**



2. Locate the RF output couplers in the path before and after the mask filter for transmitter feed-back to the Exact-V2 exciter.

There are two SMA connectors, labeled FBA (Feed Back Amplifier) and FBF (Feed Back Filter), respectively.

The FBA signal should come from the transmitter output sample before the mask filter. This is used for non-linear (shoulder) correction.

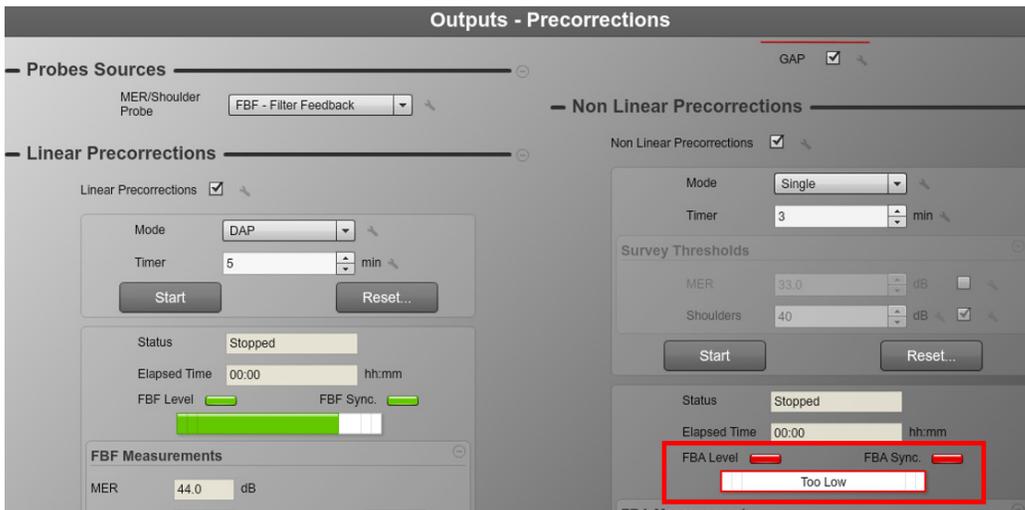
The FBF signal should come from the transmitter output sample after the mask filter. This is used for linear (SNR) correction.

These signal levels should be in the range of -15dBm to -5 dBm.

**Caution:** Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.

To ensure you have the correct sample connected to the correct feedback input, disconnect the before mask filter sample and confirm the FBA Level is lost. Restore connection once this has been confirmed.

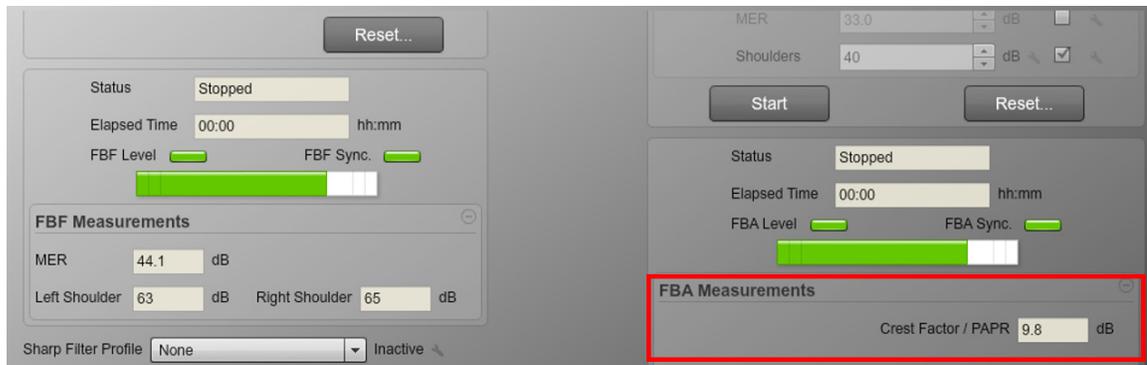
Select **Outputs -> Precorrections** on the side menu.



3. Crest Factor and Protection Clipping Parameter Setting:

- a. The Crest Factor should be adjusted carefully if the user wishes to optimize the performances. Since Exact-V2 is performing a clever PAPR reduction that is less destructive for the signal compared to the amplifier clipping, the Crest Factor must be reduced as much as possible by Exact-V2 instead of the amplifier. For this purpose, the user can use the Crest Factor value monitored from the amplifier feedback signal as a starting point when neither CFR nor Non Linear Precorrections are applied. It is recommended to set the Crest Factor in the RF Output Parameter Menu about 1dB higher than the value that is monitored in the Precorrections Menu.

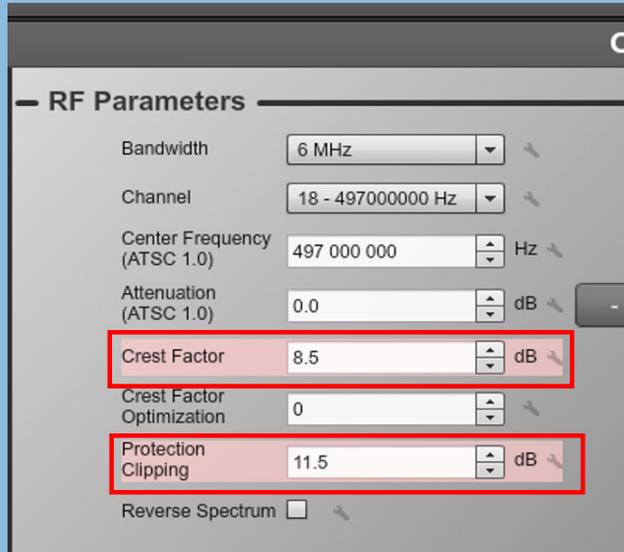
Select **Outputs** -> **Precorrections** on the side menu.



- b. Once the Crest Factor has been set, the Protection clipping must also be set to an appropriate value. The Protection clipping limits the power peaks naturally generated by the Non Linear precorrections. A good initial value is 3 dB more than the initial Crest Factor value. Nevertheless, for amplifier sensitive to overdrive and/or to reflected power, it can be safe to set the Protection clipping to a value less than 3 dB above the CFR value.

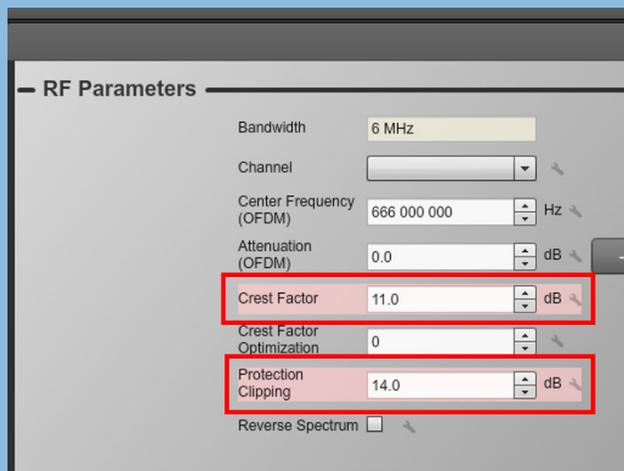
- c. Select **Outputs** -> **RF Output Parameters** on the side menu.
  - i. Please select the appropriate RF Output Parameters from the following three options below. Match the transmitter and modulation to your application.

**Note:** Good starting parameters for **E-Compact ATSC 1.0** transmitters can be found below.



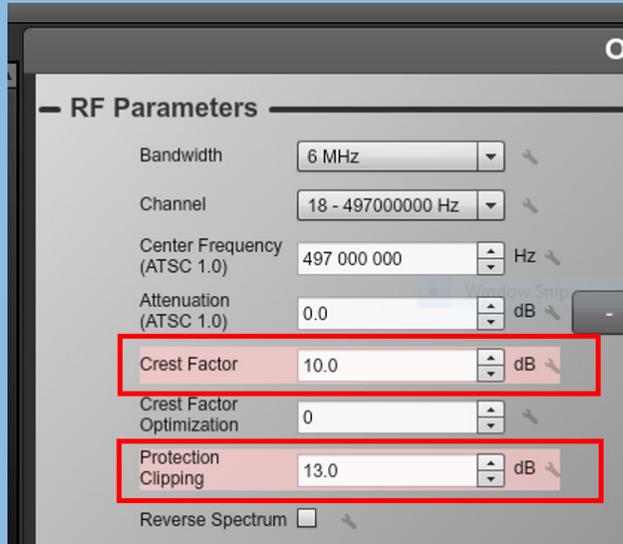
E-Compact Transmitter

**Note:** Good starting parameters for **E-Compact ATSC 3.0 (OFDM)** transmitters can be found below.



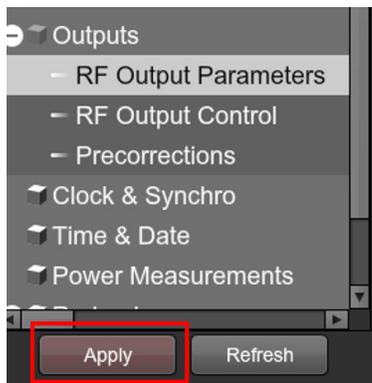
E-Compact Transmitter

**Note:** Good starting parameters for **PARALLAX ATSC 1.0 and ATSC 3.0** transmitters can be found below.



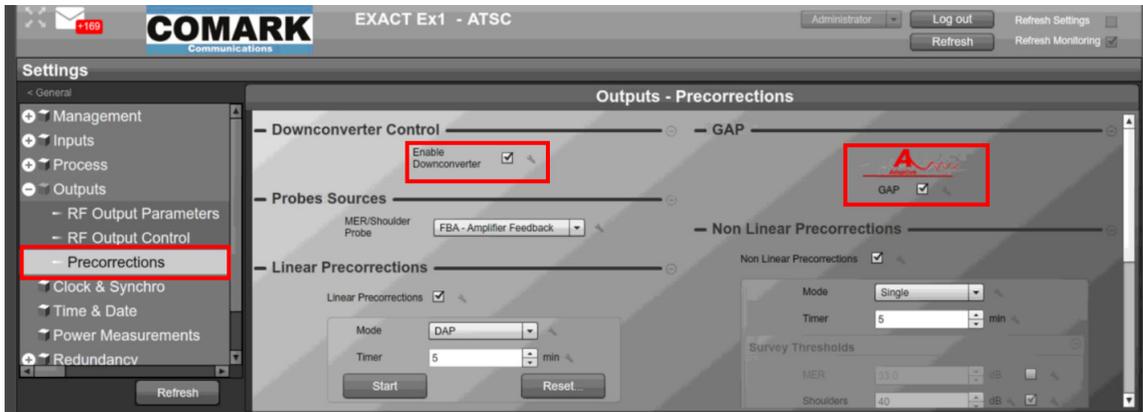
PARALLAX Transmitter

d. Select **Apply**.

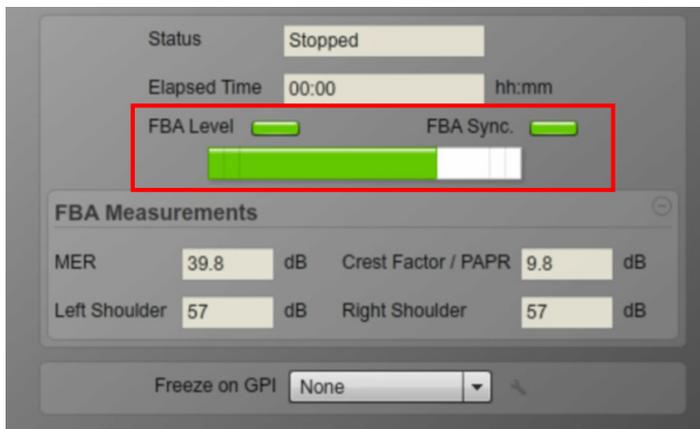


4. Select **Outputs** -> **Precorrections** on the side menu.
5. Verify that **Enable Downconverter** and **GAP** are checked under the Downconverter Control and GAP sections, respectively.

**Caution:** While corrections are running, do **NOT** Check or Uncheck GAP.



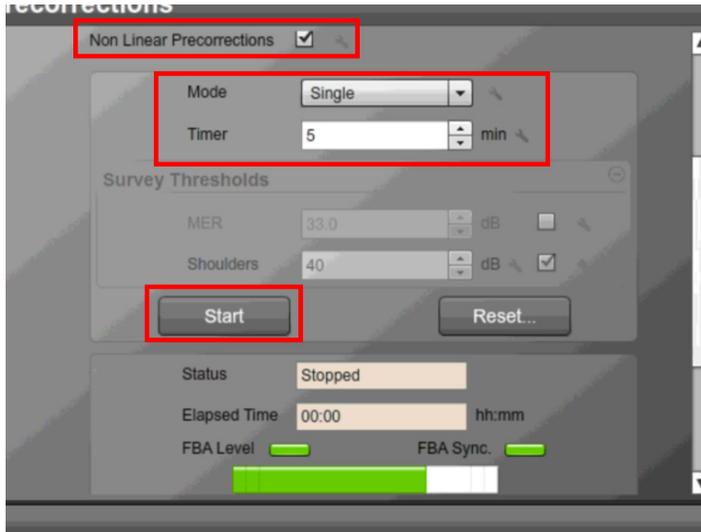
6. Make the following verifications and / or adjustments to the Non Linear Precorrections section found further down on the Precorrections screen:
  - a. Verify the **FBA Level** and **FBA Sync.** icons are green.



**Note:** If either FBA Level and / or FBA Sync. lights are not green, inspect feedback cabling condition and check for loose connections. It may also be necessary to add or reduce the amount of feedback attenuation to adjust the power levels into the correct range (-15 to -5 dBm).

**Caution:** Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.

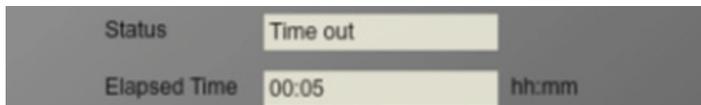
- b. Verify that the Non Linear Precorrections check-box is checked.
- c. Verify that the Mode is set to **Single**.
- d. Set the Timer value between 3 to 8 minutes.
- e. Select **Start**.



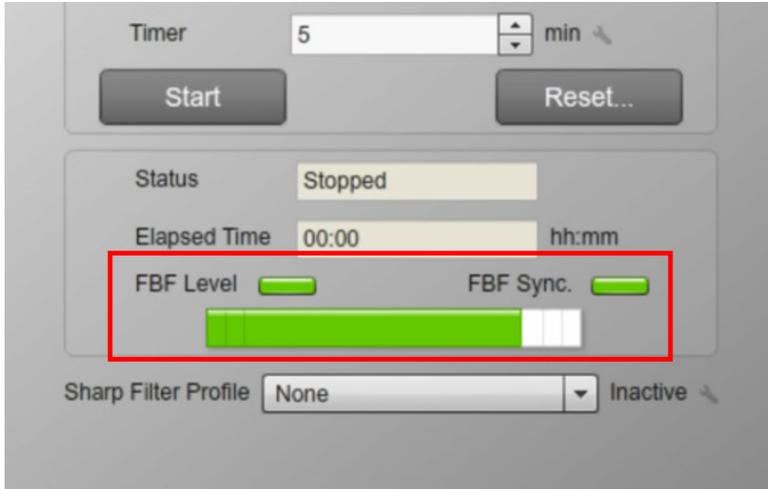
After completing these steps, the Status changes to **Active** as the exciter performs the necessary precorrections and the **Elapsed Time** begins measuring the time that has passed since the start of the pre-correction process.



When the precorrection period is complete, the Status changes to **Time Out**.



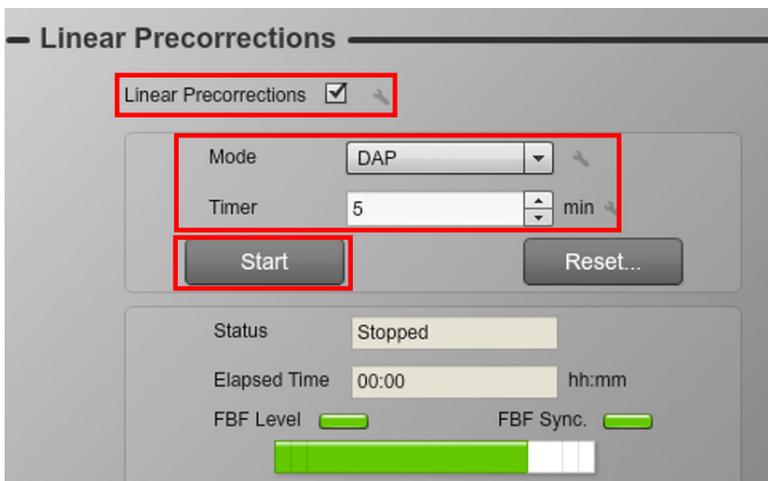
7. Make the following verifications and / or adjustments to the Linear Precorrections:
  - a. Verify the **FBF Level** and **FBF Sync.** icons are green.



**Note:** If either FBF Level and/or FBF Sync. lights are not green, inspect feedback cabling condition and check for loose connections. It may also be necessary to add or reduce the amount of feedback attenuation to adjust the power levels into the correct range (-15 to -5 dBm).

**Caution:** Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.

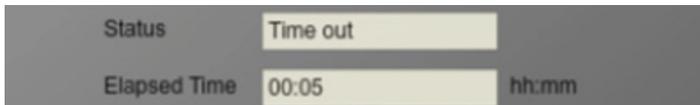
- b. Verify that the Linear Precorrections check-box is checked.
- c. Verify that the Mode is set to **DAP**.
- d. Set the Timer value between **5 to 8 minutes**.
- e. Select **Start**.



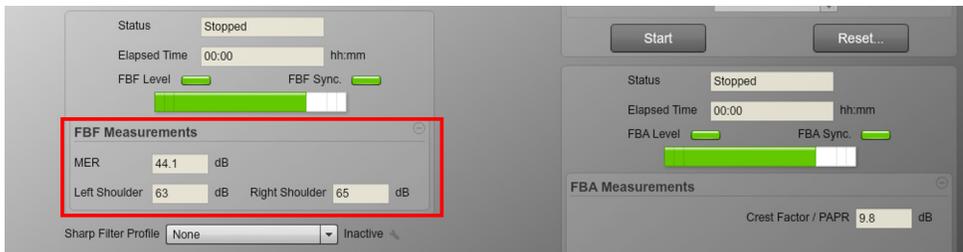
After completing these steps, the Status changes to **Active** as the exciter performs the necessary precorrections and the Elapsed Time begins measuring the time that has passed since the start of the pre-correction process.



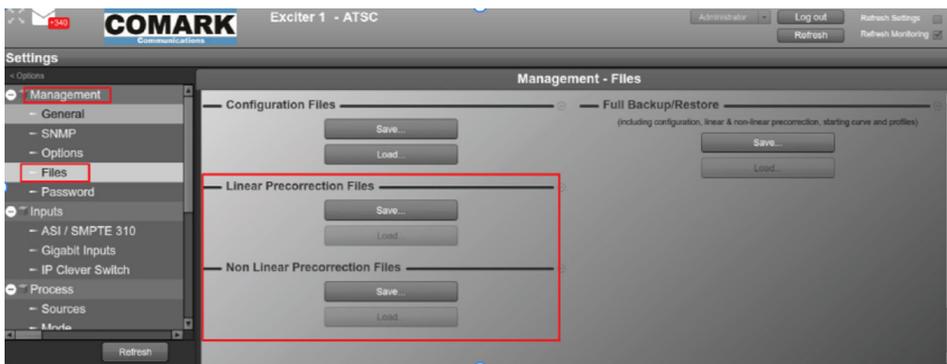
When the precorrection period is complete, the Status changes to **Time Out**.



**Note:** Repeating both Non-linear and Linear pre-correction processes may provide slight additional performance improvements. If this is the first time performing Linear precorrections or the first time the precorrections have been “Reset”, it normally requires 2-3 iterations to obtain good MER results.



**Note:** Precorrection files can be saved for later use under Management Menu, Files.



Hitachi Kokusai Electric Comark LLC  
 104 Feeding Hills Road  
 Southwick, MA 01077 U.S.A.  
 (800) 345-9295  
 support@comarktv.com  
 www.comarktv.com