EXE Connections and Configurations

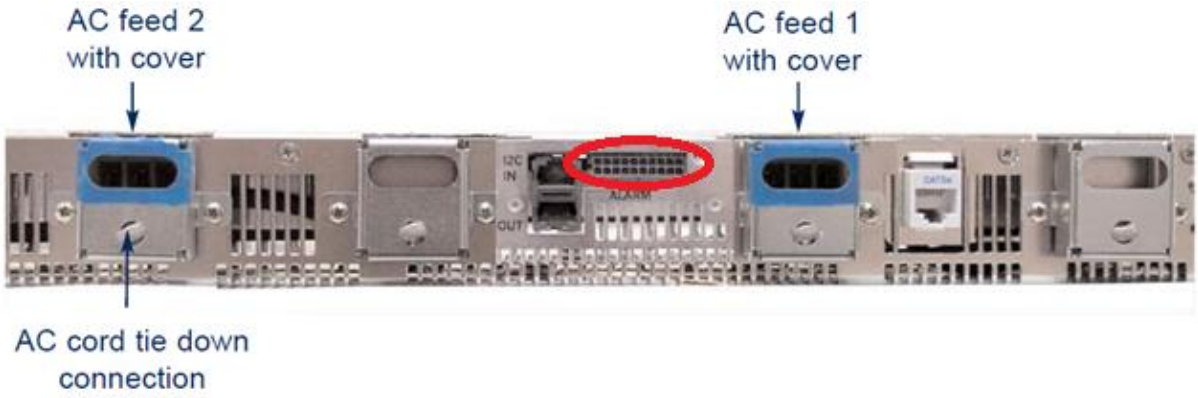
The following steps should be observed when setting up the EXE.

Power Supply Connection:

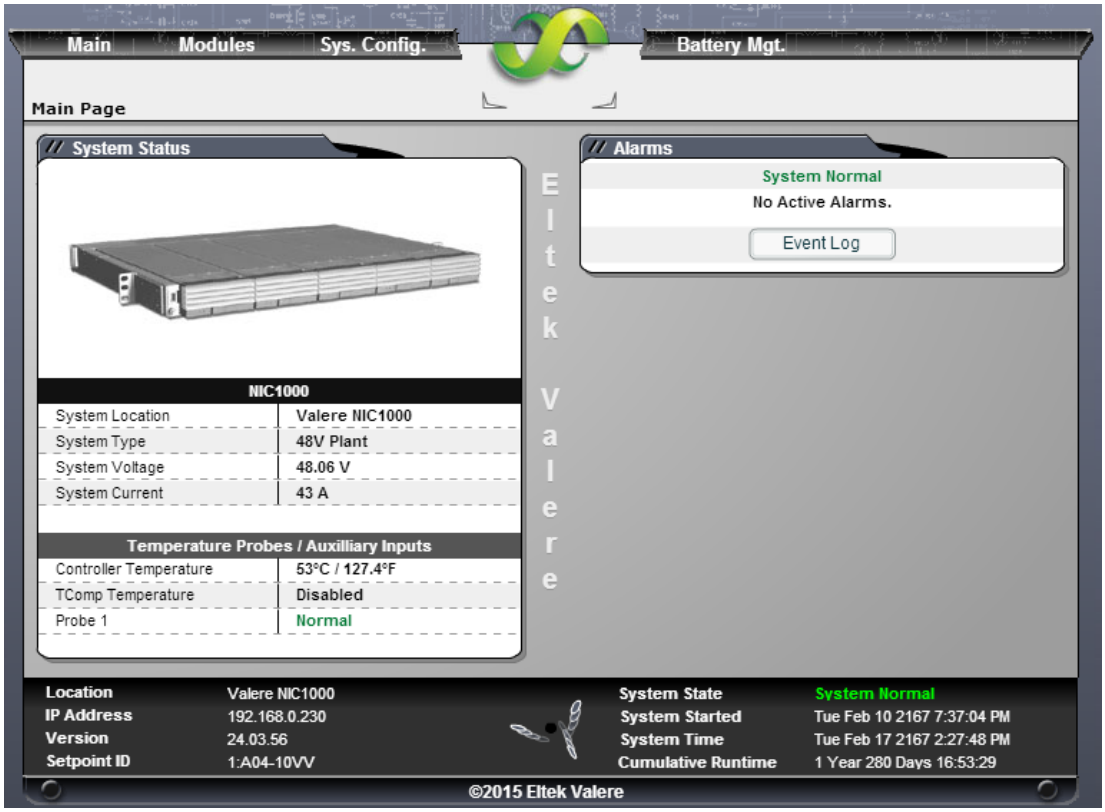
The power supply comes with an external power switch mounted on a 1RU panel.

There is one switch for the power supplies at the top of the frame and one switch for the supplies at the bottom of the frame. When the switch is in the *Off* position all the power modules will be shutdown, and when the switch is returned to the *On* position it will cause the power modules to power back up.

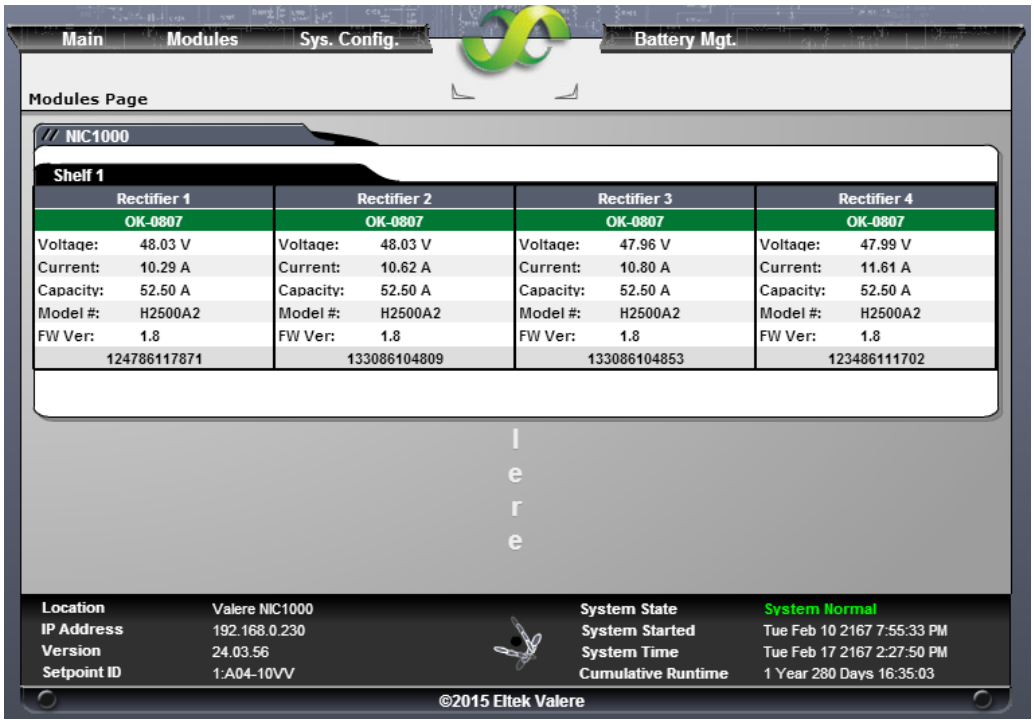
Each switch has a mating cable, with four alarm connectors. *The alarm connectors are required for the power tray to current share and therefore must be plugged into the back of each operating power supply tray.*



First, connect an Ethernet cable from the Control Network to the front of the PSU unit. Use a web browser to open the Power Supply Unit (PSU) web interface, login with username *Admin* and password *exeadmin*. By default each PSU's IP is set to **192.168.0.230**.



On the *Main* page verify that the System Voltage is set to 48V.

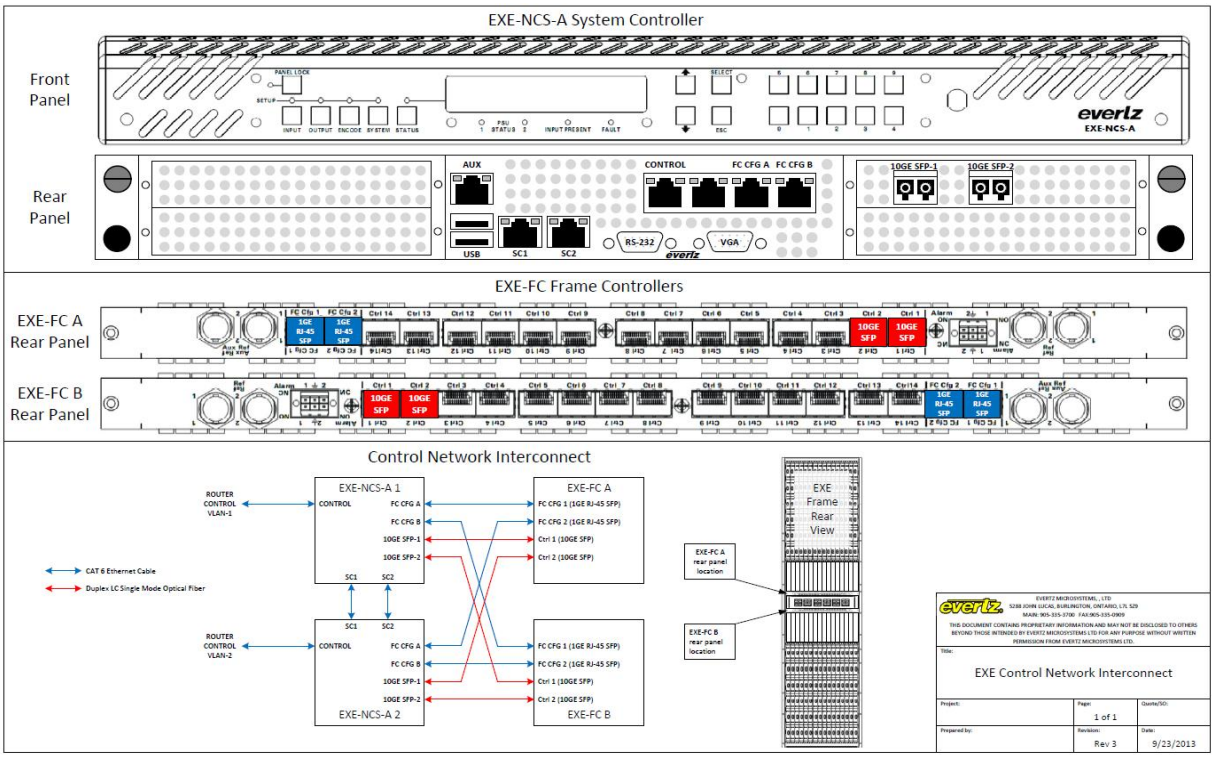


On the *Modules* page verify that all Rectifiers in a Shelf have similar current consumptions.

Compare the PSU currents of different shelves that power the top half of the frame and the bottom half of the frame (if applicable). The shelves that are current sharing should have similar current consumptions; if they do not then check the current sharing cable that interconnects the PSU shelves.

EXE NCS-A Connections:

1. Connect the NCS-A to the EXE frame according to wiring diagram, use instructions below as reference:



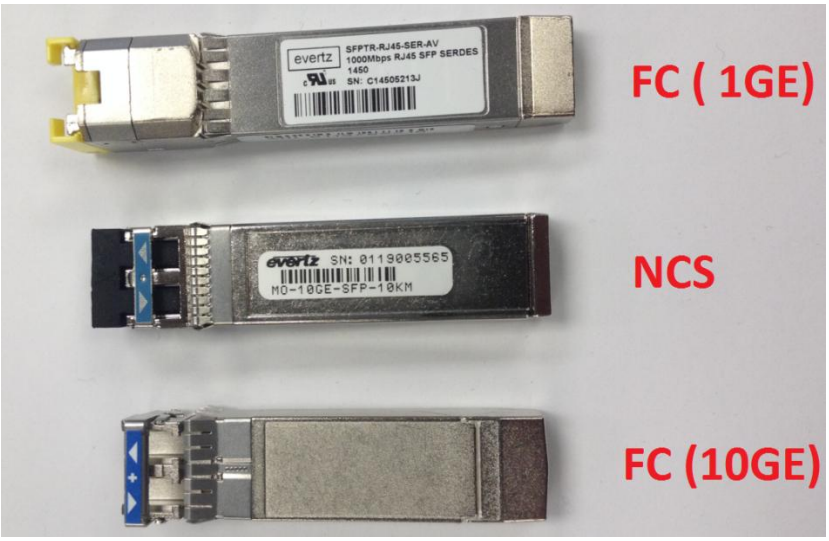
   a. Connect the NCS's *Control* port using a 1GE RJ-45 SFP to a switch or directly to the controlling PC so that the NCS User Interface may be accessed.
   b. Connect the NCS's *FC CFG A* port using a 1GE RJ-45 SFP to *EXE-FC A* on *FC Cfg1* using another 1GE RJ-45 SFP.
   c. Connect the NCS's *FC CFG B* port using a 1GE RJ-45 SFP to *EXE-FC B* on *FC Cfg1* using another 1GE RJ-45 SFP.
   d. Connect the NCS's *10GE SFP1* port to *EXE-FC A* on *Ctrl 1.*
   e. Connect the NCS's *10GE SFP2* port to *EXE-FC B* on *Ctrl 1.*
   f. Repeat steps a-e with the second NCS except this time using *FC Cfg2* on both FC's, and *Ctrl 2* on both FCs for the 10Gb fibers (as shown in the reference diagram above).
   g. Connect reference input to Ref1 on both FC's.

Special Note:

The connections listed above require specific SFP types:

a. On EXE-NCS-A , 10GE ports use **MO-10GE-SFP-10KM**

b. On EXE-FC , 10GE ports use **SFP10G-TR13-A**
c. On EXE-FC , 1GE ports use **SFPTR-RJ45-SER-AV**



Map of NCS ports to physical ports:

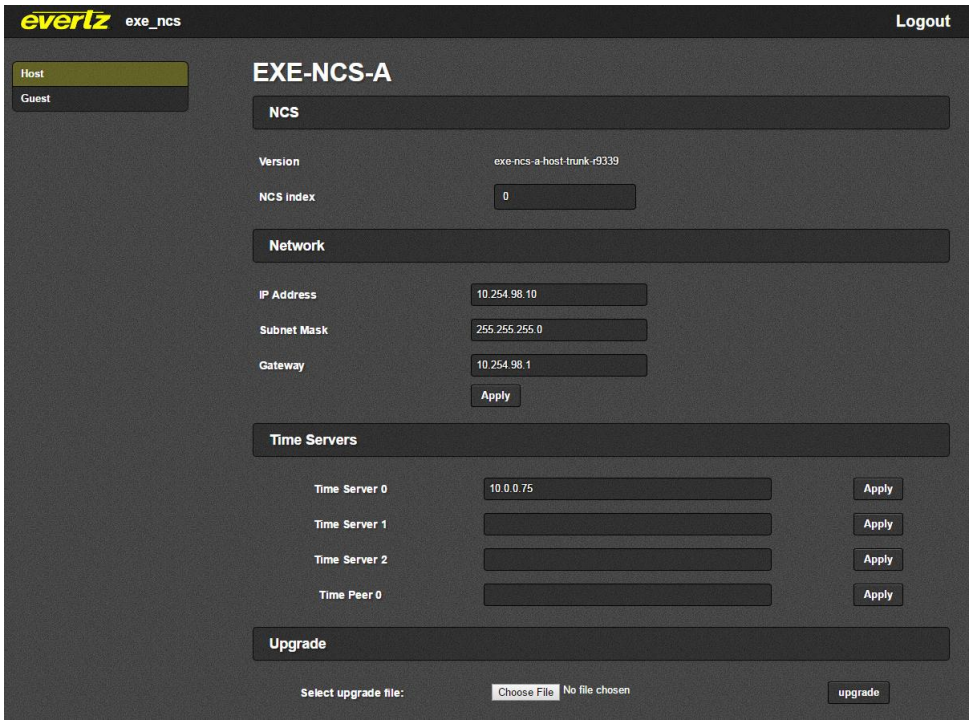
Control	→	eth0
FC CFG A	→	eth2
FC CFG B	→	eth3
SC1	→	eth4
SC2	→	eth5
10GE SFP-1	→	eth7
10GE SFP-2	→	eth6

EXE NCS-A Settings

EXE-NCS-A Network Configuration

The EXE-NCS-A network can be set from either the Host webpage or command line interface. This step is required if the customer wants to use a different IP address, Netmask or Gateway than the pre-set settings.

1. To configure Host's IP address from web interface:
   a. Use web browser to open the Host webpage, in the address bar enter the preset host IP address



   b. Change IP Address, Subnet Mask and Gateway (if required) of the NCS Host.
   c. Select the *Apply* button.

2. To configure Host's IP address from command line:
   a. Connect a monitor and keyboard to the NCS unit. Login to NCS Host with the username: *root*, password: *evertz.*
   b. Set the IP address, netmask and gateway with the command below; retry until no error messages are returned (*Most errors are due to typing mistakes*):
      - `netsetup --force config ip_address netmask gateway || echo error`

Example:

```
NCS-0# netsetup --force config 172.16.227.51 255.255.0.0 172.16.1.1
|| echo error
```

c. Verify if the network is configured as expected using the following commands:
   - `ifconfig | grep ip_address`
   - `ip route | grep default`

Example:

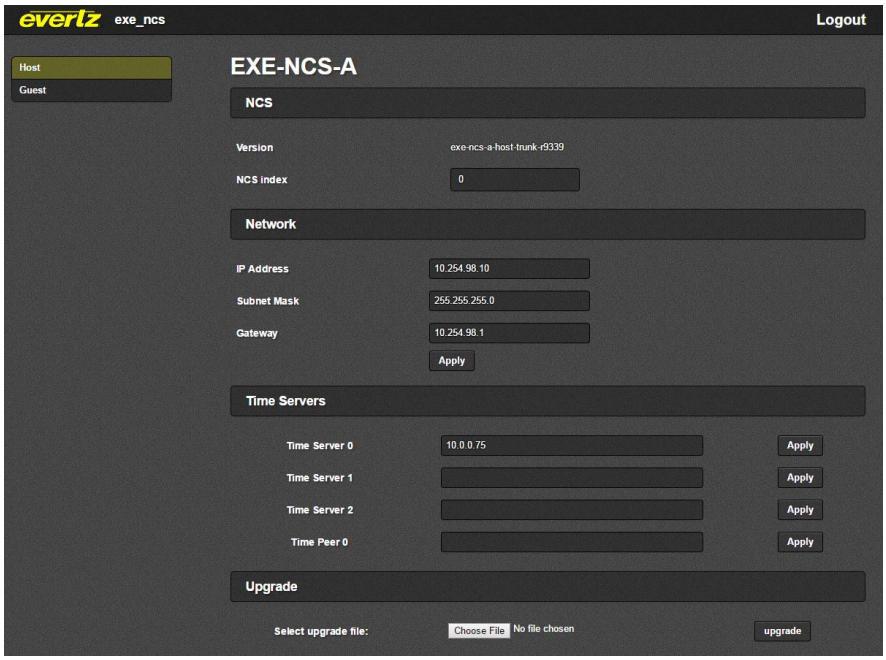
```
NCS-0# ifconfig | grep 172.16.12.90
          inet addr:172.16.12.90  Bcast:0.0.0.0  Mask:255.255.0.0
NCS-0# ip route | grep default
            default via 172.16.227.1 dev breth0
```

Finally reboot the system for the changes to take effect; enter *reboot* in the NCS host terminal.

EXE-NCS-A host will automatically assign an IP address for the Guest by using the Host's IP + 1.
For example: Host IP is 10.10.10.10 → Guest IP will be 10.10.10.11

EXE-NCS-A Host

1. Login to the EXE-NCS host webpage with username *root*, password *evertz*. This will bring up the *Host* page displaying the firmware version installed on the host and all host settings.



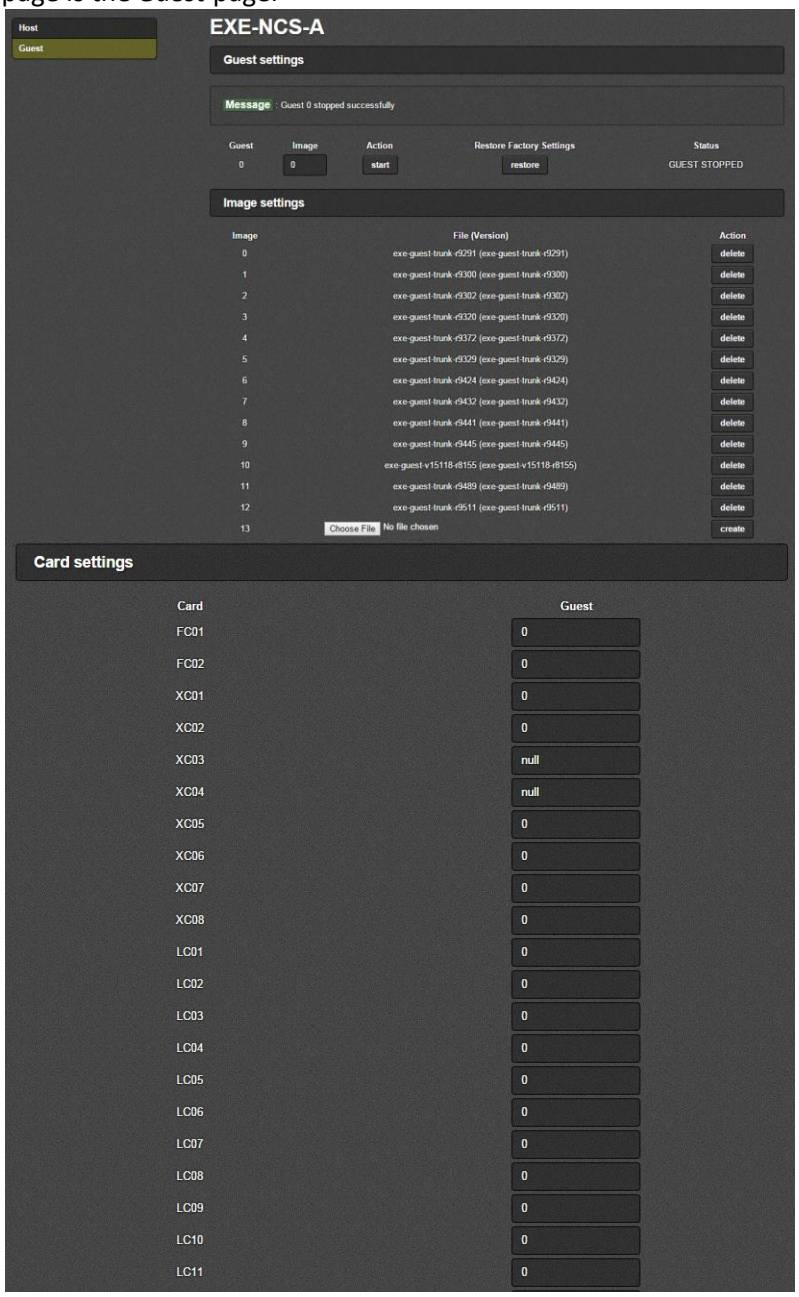
The parameters on this page are defined as:

a. **Version:** Displays the firmware version that is installed on the Host.
b. **NCS Index:** Displays the state of control for the NCS
   - 0 : means the NCS is set up as *main control*.
   - 1 : means the NCS is set up as *redundant control*.

Note: The NCS's cannot have same NCS Index.

c. **Time Server:** The IP address of the *Time Server* being used to synchronize the NCS Host clock with an NTP server.

2. The Second page is the *Guest* page.



The parameters on this page are defined as:

a. **Guest Settings:** Displays the *image* that is currently used for the Guest. Select Start/Stop under the *Action* label; this will start/stop the guest image. *NOTE: Stop both NCS Guest's before making any firmware changes to avoid sync issues.*

- Only start the Guest when all settings have been applied.
- Always start the Guests one NCS at a time.

- Always start the Guest of *NCS0* first (Main NCS).
- EXE frame will power on after Guest started.

b. **Image Settings:** Displays a list of pre-loaded Guest images. Choose the appropriate image number under the label *Image* corresponding to the Guest of choice**.** If the desired image isn't loaded on the list, click *Choose File*, and select the image file then select *Create***.**

c. **Card Settings**: These allow the user to *enable/disable* blades in the frame.
   - Blades that are not present in EXE frame need to be *Disabled*.
   - Blades can be *disabled* by clicking on the box and choosing *Null***.**
   - Blades can only be *enabled/disabled* when the Guest is stopped.

d. When all settings and configurations are done:
   a. Power on EXE frame and wait for 5 minutes
   b. Ensure all blades boot up.
   c. Ensure both NCS's sync up (i.e. Display *Peer Controller: Online*)
   d. Ensure all previously enabled ports return to *Up*.

Troubleshooting EXE System issues

1. EXE frame can't boot

   There are some reasons that may cause the EXE frame to be unable to boot up properly. The most common reason is because there is no link between the NCS' and the FC's. The following steps will describe how to troubleshoot this problem:

   a. Go to the Host webpage and ensure the Guest is started.
   b. Verify the connections from Guest
      i. SSH into the NCS guest with username: *root*, password: *evertz*.
      ii. Type command `checklinks`**.**
         - If all links are connected properly, it will return "`All links are okay`".
         - If links have problem, NCS guest will show some messages as below:

Link down On NCS0

- *"exe-NCS-0:eth7" connected to "exe-FC-01:fm0-01-F01-P01(fm0-01)"* (Link between Ctr1(fm0-01-F01-P01(fm0-01)) port on FC01 and 10GE-SFP1(eth7) on NCS0 is down)
- *"exe-NCS-0:eth6" connected to "exe-FC-02:fm0-01-F02-P01(fm0-01)"* (Link between Ctr1 (fm0-01-F02-P01(fm0-01)) port on FC02 and 10GE-SFP2(eth6) on NCS0 is down)
- *"exe-NCS-0:eth2" connected to "exe-FC-01:eth0"* (Link between FC Cfg1 (eth0) port on FC01 and FC CfgA (eth2) on NCS0 is down)
- *"exe-NCS-0:eth3" connected to "exe-FC-02:eth0"* (Link between FC Cfg1 (eth0) port on FC02 and FC CfgB (eth3) on NCS0 is down)

Link down On NCS1

- *"exe-NCS-1:eth7" connected to "exe-FC-01:fm0-02-F01-P02(fm0-02)"* (Link between Ctr2(fm0-02-F01-P02(fm0-02)) port on FC01 and 10GE-SFP1(eth7) on NCS1 is down)
- *"exe-NCS-1:eth6" connected to "exe-FC-02:fm0-02-F02-P02(fm0-02)"* (Link between Ctr2(fm0-02-F02-P02(fm0-02)) port on FC02 and 10GE-SFP2(eth6) on NCS1 is down)
- *"exe-NCS-1:eth2" connected to "exe-FC-01:eth1"* (Link between FC Cfg2 (eth1) port on FC01 and FC CfgA (eth2) on NCS1 is down)
- *"exe-NCS-1:eth3" connected to "exe-FC-02:eth1"* (Link between FC Cfg2 (eth1) port on FC02 and FC CfgB (eth3) on NCS1 is down)

Cable is swapped

- *"exe-NCS-0:eth2" connected to "exe-FC-01:eth0"* + *"exe-NCS-0:eth2" connected to "exe-FC-01:eth1"*
  → 1GE link is swapped on FC01. Currently, *FC Cfg2* (eth1) on FC01 is connected to *FC CfgA* (eth2) on *NCS0* instead of connected to FC CfgA (eth2) on *NCS1*

- *"exe-NCS-0:eth7" connected to "exe-FC-01:fm0-01-F01-P01(fm0-01)" + "exe-NCS-0:eth7" connected to "exe-FC-01:fm0-02-F01-P02(fm0-02)"*
  → 10GE link is swapped on FC01. Currently, Ctr2 (fm0-02-F01-P02(fm0-02)) port on FC01 is connected to 10GE-SFP1(eth7) on *NCS0* instead of connected to 10GE-SFP1(eth7) on *NCS1*

Peering link is disconnected

- *"exe-NCS-0:eth4" connected to "exe-NCS-1:eth4"*
  → The first Peer link between NCS0 and NCS1 is disconnected

- *"exe-NCS-0:eth5" connected to "exe-NCS-1:eth5"*
  → The second Peer link between NCS0 and NCS1 is disconnected

c. Check LED lights from the back of NCS for 1GE links and 10GE links. Reseat the SFP from the FC's side if any of them are not lit up. The link should be recovered after reseating.

NOTE: The LED lights for the 10GE links are located between 10GE SFPs. The top 2 LED lights are associated with the 10GE SFP2 port. The bottom 2 LED lights are associated with the 10GE SFP1 port.

2. Port down
   There are some reasons that may cause the EXE port to remain *Down*.
   a. The Port is set to *Down* on the Guest Webpage:
      i. Go to the Port tab on the Guest webpage, make sure *Operation* is set to *Up***.**
   b. The Port is set to the wrong speed:
      i. Go to the Port tab on the Guest webpage, make sure *Speed* is set to the proper speed (1GE/10GE)**.**

c. Ports set to wrong type
    i. Go to Port tab on Guest webpage, ensure *Transceiver Type* is set to the right cable type. There are 2 types of cable.
        - **Optical:** Use for fiber cables.
        - **DAC:** Use for copper cables.
    ii. If you need to set series of port at one time, follow these steps:
        - SSH to guest.
        - Type `cfgsh`
        - Type `set portConfigTransceiverType <port range> <type>`

          Example:

```
set portConfigTransceiverType 10..40 dac
set portConfigTransceiverType 100..240 optical
```

d. Link is down on the other side (end-device)
    i. Ensure the link is UP on other device which is connected to EXE port.
e. Bad SFP
    i. Go to Port tab on Guest webpage and check “TX power level” and “RX power level”.
        - Tx[dBm] should read no less than -8.2, and no greater than +0.5
        - Rx[dBm] should read no less than -10, and no greater than +0.5
    ii. If Tx power is -16, -20 or -40, it is means it is a bad SFP.

3. EXE not swiching in VBI - Verify reference (Genlock) status
    a. From guest SSH to FC by using command:
        - `ssh fc01` (For the top FC)
        - `ssh fc02` (For the bottom FC)

    b. Change directory to **`/evertz/factory/fc`** folder and run `./ref` script

```
FC-01# cd /evertz/factory/fc
FC-01# ./ref
```

        - Ref1: 15.7331655129 kHz (15890)
        - Ref2: not detected (32768)

    i. The ./ref utility reports the detected line rate:
        - NTSC is 27000000/1716 = 15.734 kHz
        - PAL is 27000000/1728 = 15.625 kHz
        - HD formats have higher frequency line rates.