7882DM2-LB4-CA2-ASI Series

Satellite DVB-S/S2/S2X Demodulator
User Manual

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IMPORTANT SAFETY INSTRUCTIONS

⚡	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "Dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
⚠	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.

- Read these instructions
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

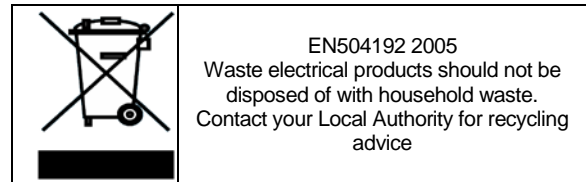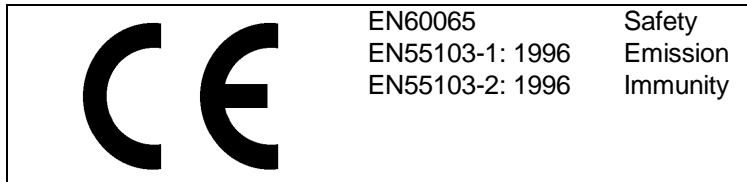| |
|---|
| **WARNING**
TO REDUCE THE RISK OF FIRE OR ELECTRIC – SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE |
| **WARNING**
DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT |
| **WARNING**
TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE |
| **WARNING**
THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE |

INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

| CE | EN60065
EN55103-1: 1996
EN55103-2: 1996 | Safety
Emission
Immunity | | EN504192 2005
Waste electrical products should not be disposed of with household waste.
Contact your Local Authority for recycling advice |

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

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Figures

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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Feb 2019

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1. OVERVIEW

The 7882DM2-LB4-CA2-ASI series is a complete hardware based solution for demodulating digital DVB-S/S2/S2X satellite signals. With a modular form-factor and multiple inputs and multiple demodulators available per card, the 7882DM2-LB4-CA2-ASI series represents one of the highest density and most flexible solutions in the industry.

Applications include signal reception for cable, DTH and IPTV providers, or any other small to large head-end operators who need to receive and redistribute satellite content. The 7882DM2-LB4-CA2-ASI series provides ASI outputs, ideal for turnaround, transcoding, monitoring or other applications where the received signal remains in the compressed domain. For baseband output, the demodulator may be coupled with an Evertz decoder module, providing a full IRD solution.

Monitoring parameters such as Es/No, demodulator lock, RF power, MER, Bit Error Rate, Frequency Offset and FEC activity provide extensive information on received signal quality and robustness. These parameters as well as full control of the demodulator are relayed over SNMP, for convenient remote access using Evertz's own VistaLINK® PRO SNMP monitoring and control package.

For applications requiring decryption, the 7882DM2-LB4-CA2-ASI provides dual slots for installation of customer supplied DVB-CI compliant conditional access modules.

Features & Benefits

- Capable of multi–stream reception.

- DVB–S,DVB–S2, DVB–S2X capable.

- Four DiSEqC 1.x compatible transmitter, 22–kHz.

- One DiSEqC2.x compatible receiver, 22–kHz.

- Signal quality monitoring, including Es/N0, demodulator locking, RF power and FEC activity are selectable among internal demods.

- Standard support for advanced transport stream processing including service filtering and output bitrate control.

- Standard support for advanced modulation schemes, including DVB–S2/S2X with 16APSK, 32APSK and 64APSK.

- Long frames and Short frames.

- CCM, VCM and ACM.

- SCPC and MCPC support.

- Automatic detection and configuration of modulation type, filter roll–off, symbol rate, pilot presence (on/off) and frame length.

- Flexible transport stream processor: PID filtering and bitrate control.

- Supports on–board Input auto–failover between various inputs including RF or ASI inputs.

- Optional BISS and BISS-E decryption.
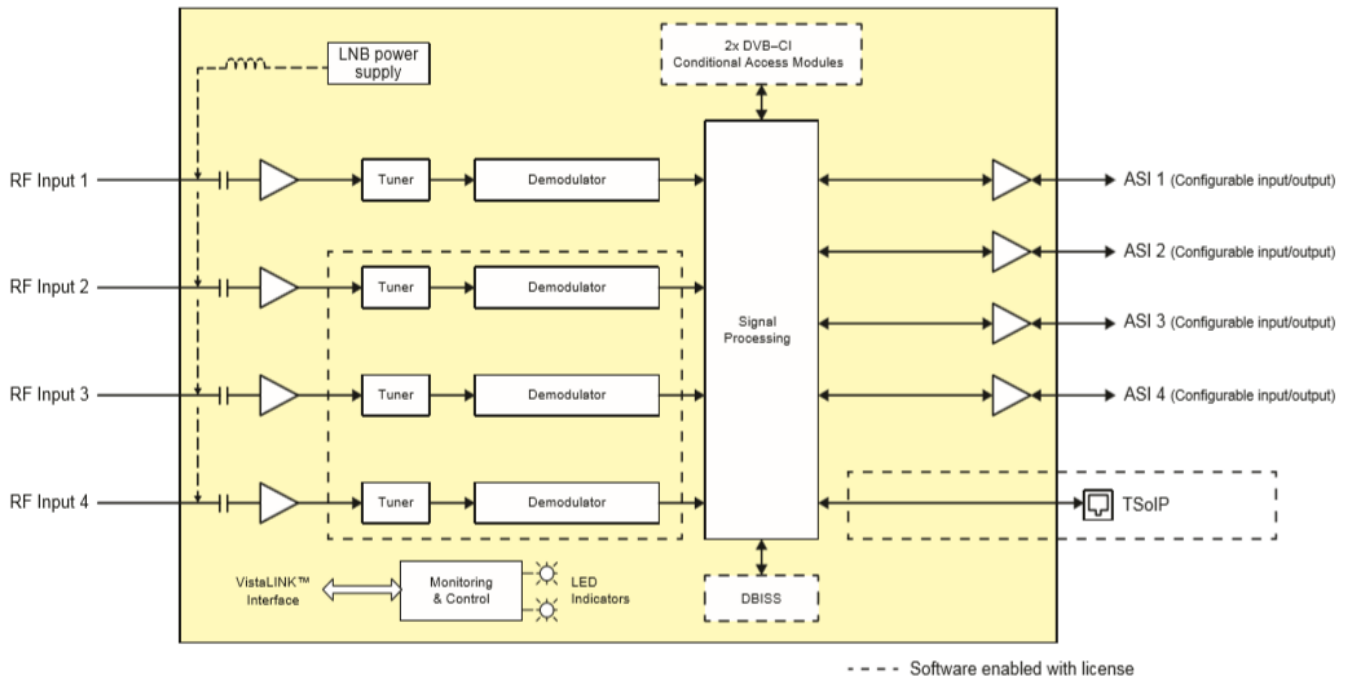
Figure 1-1 : 7882DM2-LB4-CA2-ASI Versions Block Diagram

2.   INSTALLATION

2.1.   REAR PLATE DESCRIPTION

Figure 2-1 provides an illustration of the 7882DM2-LB4-CA2-ASI series rear plates.
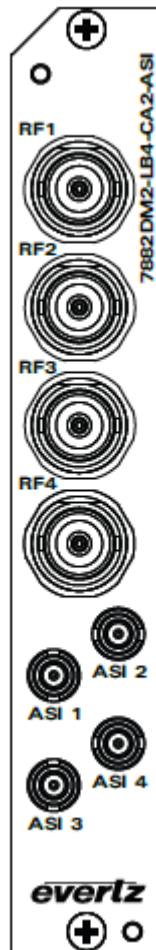
Figure 2-1 : 7882DM2-LB4-CA2-ASI Series Rear Plates

2.1.1. Connectors

RF <1-4>:   Input F-type (optional BNC with +B75 option) connector for L-band output of a suitable digital cable network directly or via a suitable attenuator giving lighting and surge protection.

ASI <1-4>:   Input/output DIN connectors.

2.2. HARDWARE INSTALLATION

Before handling the card it is important to minimize the potential effects of static electricity. It is therefore recommended that an ESD strap be worn. Locate on the 7800 chassis two adjacent vacant slots. Unpack the 7882DM2-LB4-CA2-ASI and separate the rear panel from the main card. Locate on the rear of the rack an empty slot and remove the blanking panels. Insert the rear panel into the back of the chassis and secure using the screws provided.

Before inserting the front card, connect the serial cable provided to the board. Now insert the 7882DM2-LB4-CA2-ASI Series card into the corresponding front slots ensuring the card lines up with the slot runners on the bottom and the top of the chassis. Push the card into the slot ensuring that when it mates with the rear card that it has been firmly pushed into a seated position. This can be confirmed when the connectivity lights for the Ethernet port are illuminated. Do not connect any cables to the rear card until the initial configuration has been completed (failure to do this could cause unwanted network issues).

2.3. CONFIGURATION OF MANAGEMENT IP CONNECTION

The first step is to configure the management IP connection so that the customer can create management access to the unit via the user's Local Area Network. The user can change the management IP address from the serial port of the frame controller by following the steps below.

1. Remove the panel by unscrewing both knobs on the side.
2. Connect the serial upgrade cable (ribbon cable) provided by Evertz to the 2x3 header at the front edge of the 7801FC/7800FC.
3. Open a terminal program such as HyperTerminal. Setup the terminal program as shown in Figure 2-2.
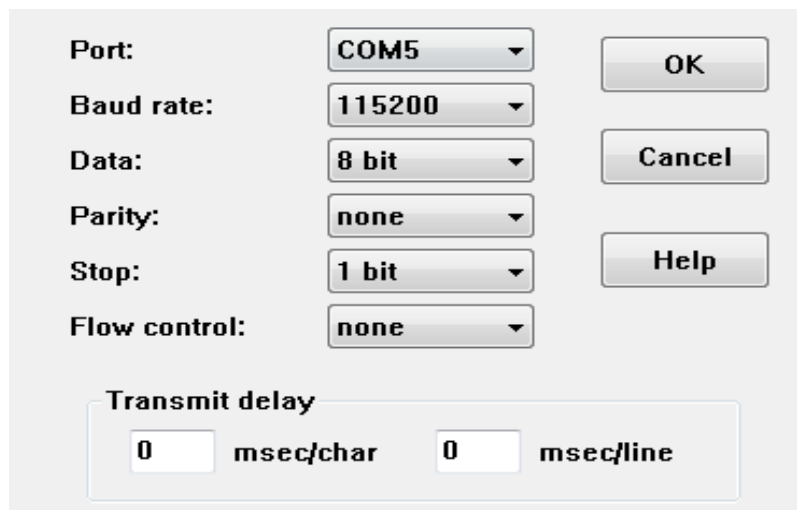

Figure 2-2 : COM Port Settings

4. Power on the unit and allow unit to boot up.
5. After boot up, press <ENTER> and the Login screen will appear. Enter login: **customer** and password: **customer**
6. After logging in, the Main Menu will appear in the terminal window as shown in Figure 2-3.

```
                                          ####
          ==========================================####=======~
      :####:  .,,.       .,,,,.      :####:       ####:    .,,,,,,,,,.
     :########: ####     #### :#######: ########: ####    :##########
     ####  :##.'###   ####: ####   :###. #######: ####:        :####I
    ############# ### ####: ###########: :#### ####    :####=
    :##^^^^^^^^^ ###=#### :##^^^^^^^^ ####:     ####:   :#####,
   :###:  :##.  #######:  :###.  :###::####   :#####: :#####
   :##########:  #####   ##########: ####:    :####: ###########
    :#####:     ####      :#####:  :####      ###  :##########:

                  Evertz Microsystems Ltd.   2012

gent 9 call to disable trap
----------------------------
     **** Main Menu ****

(1)   Network Setup
(2)   SNMP Setup
(3)   Engineering Debug Tool
(4)   Build In System Test
(5)   SYSLOG configuration

(X)   Save and Exit
(W)   Exit without Saving
```

Figure 2-3 : Main Menu Prompt

7. Select option 1 in the main menu to view the IP, Netmask, Gateway, and Broadcast addresses. Changes to the addresses may be made by selecting the desired option on the Network Setup screen shown in Figure 2-4 and pressing ENTER.

```
> 1

*********************************************************
* WARNING:                                             *
* Improper changes to IP addresses may affect          *
* network configuration. Incorrect IP addresses        *
* could potentially affect other devices on the        *
* network. It is good practice to confirm              *
* validity of all IP addresses with your IT/IS         *
* departments prior to configuration.                  *
*********************************************************
--------------------------------
     **** Network Setup ****

(1)    IP Address [192.168.8.20]
(2)    Netmask    [255.255.255.0]
(3)    Gateway    [192.168.8.1]
(4)    Broadcast  [192.168.8.255]

(X)    Exit
```

Figure 2-4 : Network Setup Screen

8. After making the changes, choose X and press ENTER to exit.
9. Again, choose X and press ENTER to exit and save or choose W to exit without saving.
10. The frame controller can now be used with the new IP address.

2.4.   HTTP BROWSER CONTROL

The user can control the 7882DM2-LB4-CA2-ASI using an HTTP browser by following these steps:

1. Connect a network cable (RJ-45) between the management connector labelled "ETHERNET" on the chassis and the LAN connector of the local PC or switch.
2. Open Firefox or Chrome browser (latest version recommended) and type in the Control Port IP Address from Section 0.

> **NOTE: The PC used for management and administrative purposes must be in the same subnet to establish proper connection to the chassis. User may need to change the user's PC IP settings for DHCP to static during the management IP connection.**

3. Log in as user: **root** password: **evertz**

> **NOTE: The default username and password is "root" and "evertz" respectively. This is for read/write privileges.**
>
> **For read only privileges, the customer needs to access with username and password "customer" and "customer" respectively.**

4. The user will be directed to the Frame Controller (FC) Menu as shown in Figure 2-5. To access the 7882DM2-LB4-CA2-ASI (slot 3 in this example) web controls, click on the link under the Name column in the Products section.
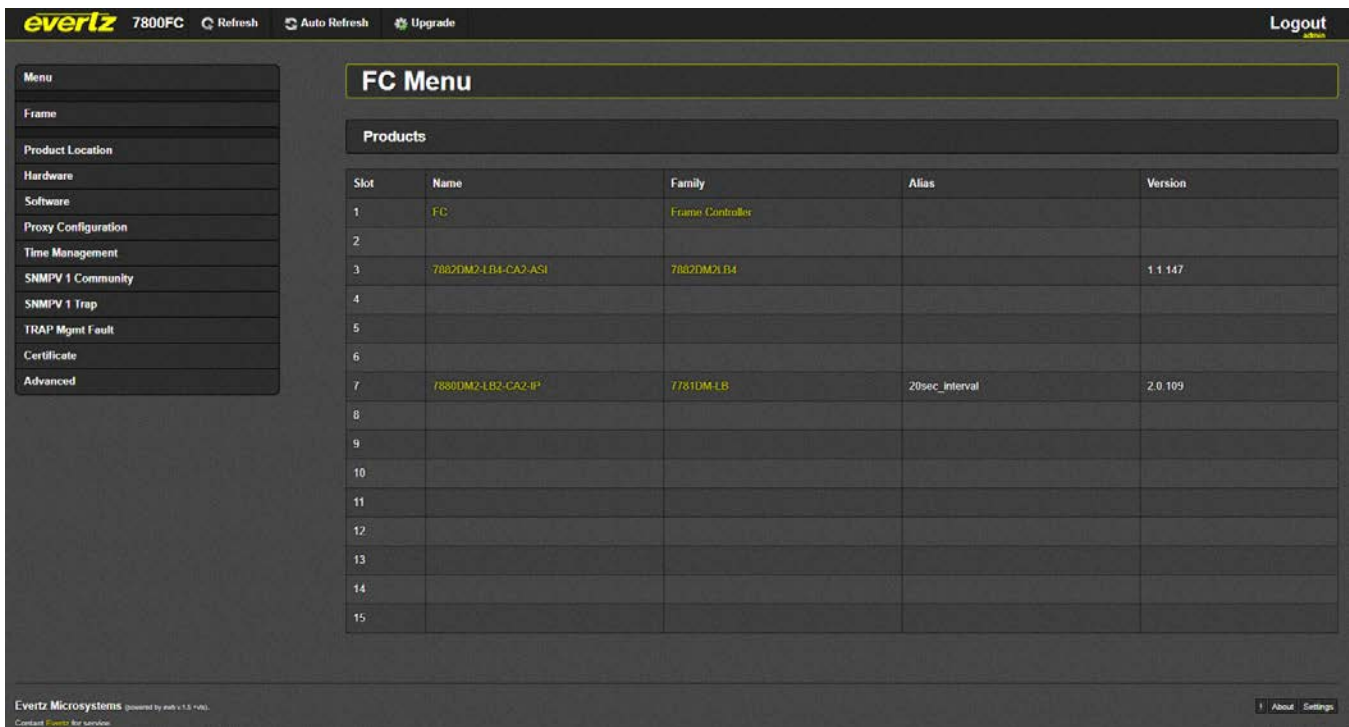

Figure 2-5 : WebEASY® - FC Menu

2.5. SETTING UP USER LOGIN CREDENTIALS AND CHANGES PRIVILEGES

The user can change the roles of the user by following the steps below:
- Go to the FC webpage.
- Click on any of the tabs on the left side, e.g. Hardware tab.
- Click on the **Settings** button on the lower right side of the webpage.
- Under the **Users** tab, click the **Modify** button for customer and change its role to rw-user.
- Logout of the FC and login as **customer**/**customer.**

Figure 2-6 : WebEASY® - FC Menu- Setting User login credentials

The user needs to follow the same steps for the **DEMODULATOR:**

- Login to the card directly with:
  http://<IP address>/slot/<Slot#>/htdocs/login.php
- Login: **root** password: **evertz**
- Click **Settings** on the lower right hand side of the page
- Click the **Users** tab, click the **Modify** button for customer and change its role to rw-user
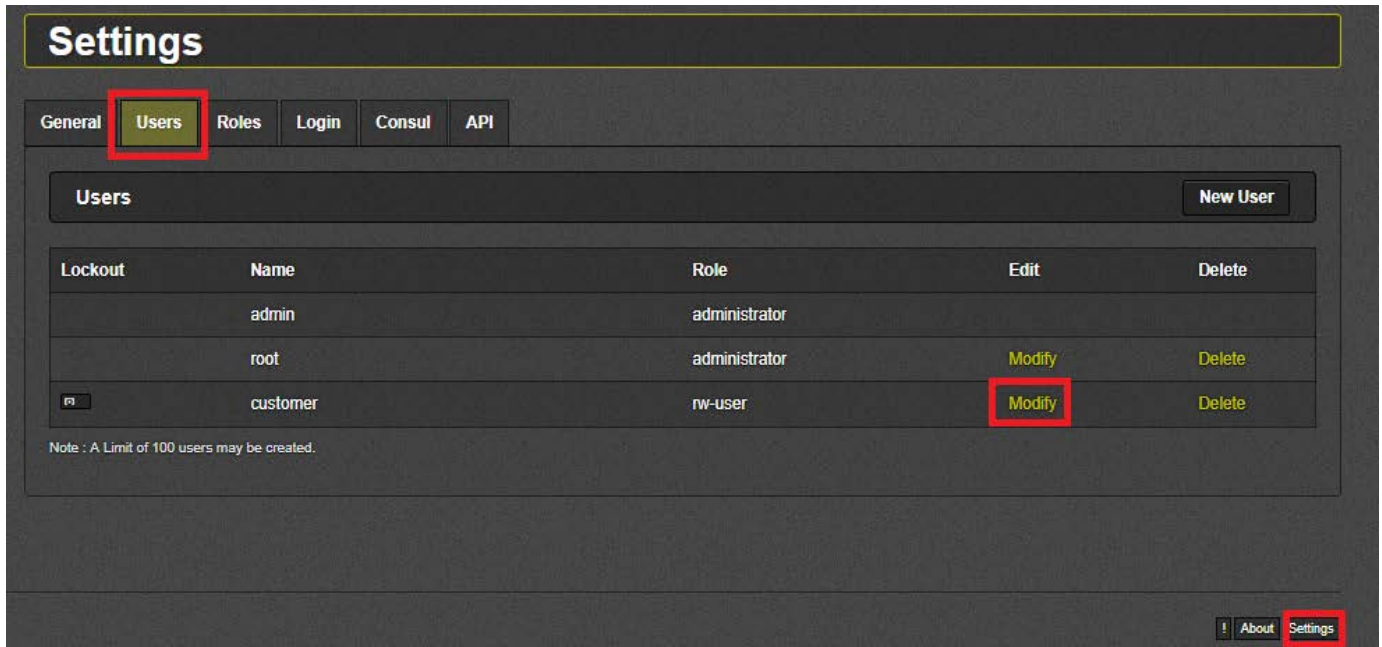- Logout of the demodulator and login as **customer/customer**

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3. SPECIFICATIONS

3.1. RF INPUT

Number	4
Connector Type	F-Type / BNC per IEC 61169–8 Annex A (with B75 option)
Frequency	950 to 2150MHz
Input Power	-20 to -60 dBm

3.2. LNB POWER SUPPLY AND CONTROL (+LNB OPTION)

Voltage	13/18VDC, off (selectable)
LO Control	22KHZ, on/off (selectable)
	DiSEqC 1.x compatible TX and DiSEqC 2.x compatible RX
Max.Current	400mA

3.3. MODULATION SUPPORT

Symbol Rate	Up to:
QPSK, 8PSK, 16APSK	64 Msps or more for
32APSK	51 Msps
64APSK	43 Msps

3.4. CODING RATES

FECFRAME (normal) 64 800 (bits)

DVB–S QPSK	1/2, 2/3, 3/4, 5/6, 7/8
DVB–S2 QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB–S2 8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
DVB–S2 16APSK	2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB–S2 32APSK	3/4, 4/5, 5/6, 8/9, 9/10
DVB–S2x QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10, 13/45, 9/20, 11/20
DVB–S2x 8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10, 23/36, 25/36, 13/18
DVB–S2x 8APSK–L	5/9, 26/45
DVB–S2x 16APSK	2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (S2–MODCODs), 26/45, 3/5, 28/45, 23/36, 25/36, 13/18, 7/9, 77/90
DVB–S2x 16APSK–L	5/9, 8/15, 1/2, 3/5, 2/3
DVB–S2x 32APSK	3/4, 4/5, 5/6, 8/9, 9/10, 32/45, 11/15, 7/9
DVB–S2x 32APSK–L	2/3
DVB–S2x 64APSK	11/15, 7/9, 4/5, 5/6
DVB–S2x 64APSK–L	32/45

FECFRAME (short) 16 200 (bits)

DVB–S2x QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10, 11/45, 4/15, 14/45, 7/15, 8/15, 32/45
DVB–S2x 8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 7/15, 8/15, 26/45, 32/45
DVB–S2x 16APSK	2/3, 3/4, 4/5, 5/6, 8/9, 7/15, 8/15, 26/45, 3/5, 32/45
DVB–S2x 32APSK–L	2/3, 32/45

3.5. ASI INPUTS/OUTPUTS

Connector	Mini DIN 1.0/2.3
Number	4
Type	ASI per DVB TR101-891

3.6. CONDITIONAL ACCESS SUPPORT FOR DVB COMMON INTERFACE DE–SCRAMBLING

Number of DVB–CI slots	2
Connector	PCMCIA dual slots
Standard	DVB_CI EN50221
CA module	PC–Card type II Hot Plug

3.7. CONTROL

- SNMP over Ethernet via FC
- Web browser via FC

3.8. MONITORED PARAMETERS

- Demodulator lock
- RF power
- Es/NO ratio
- FEC activity

3.9. ELECTRICAL

Voltage	+12V DC
Power	<24W
EMI/RFI	Complies with FCC Part 15, Class A EU EMC Directive

3.10. PHYSICAL

Number of slots	1

4. WEB INTERFACE

The 7882DM2-LB4-CA2-ASI series of products are controlled using a web interface. WebEASY® operates using Ethernet and SNMP control protocols. The 7882DM2-LB4-CA2-ASI also supports control through VistaLINK® PRO.

Login

After the card has been installed and configured with the required network addresses for the control port, it can be completely configured using the web interface. For doing this, simply type the IP address of the control port of the 7882DM2-LB4-CA2-ASI module in the web browser.

Note:
Computer must be on the same subnet in order to have communication with the module. If your module is on a different subnet, be sure to configure a gateway address to be able to access the module on a different subnet.
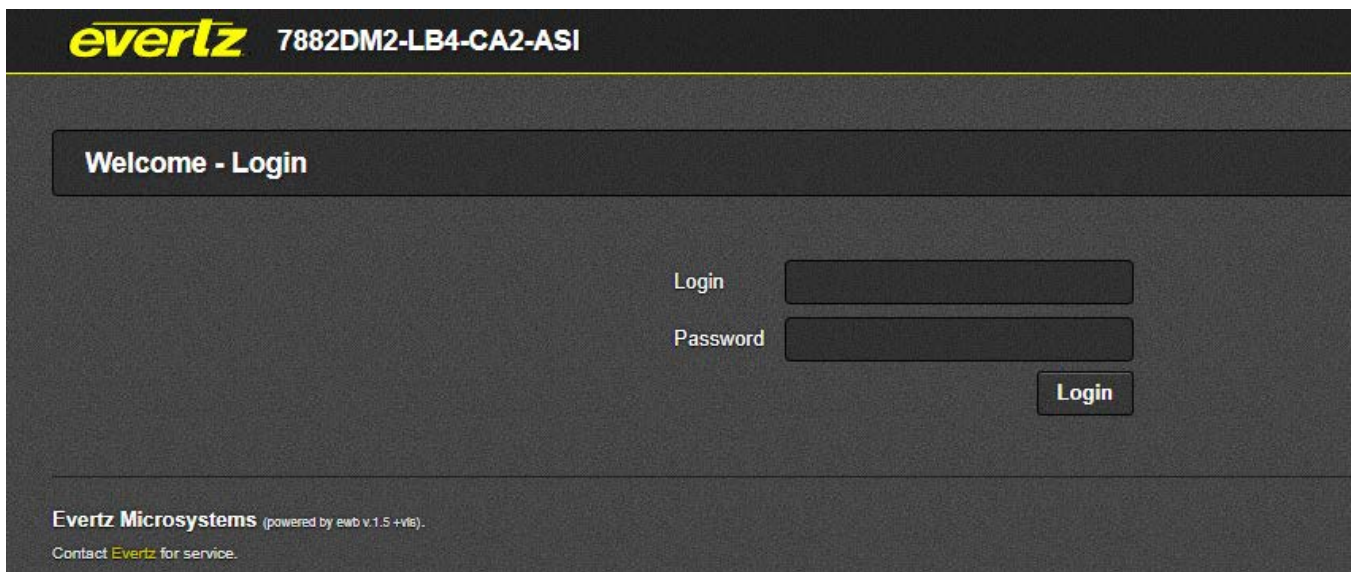

Figure 4-1 : WebEASY® - Login Menu

Login username and password is "customer".

For more privileges use the following logins:
1. User: root & password: evertz
2. User: admin & password: admin

On the web interface there are different types of menus as is shown in Figure 4-2.
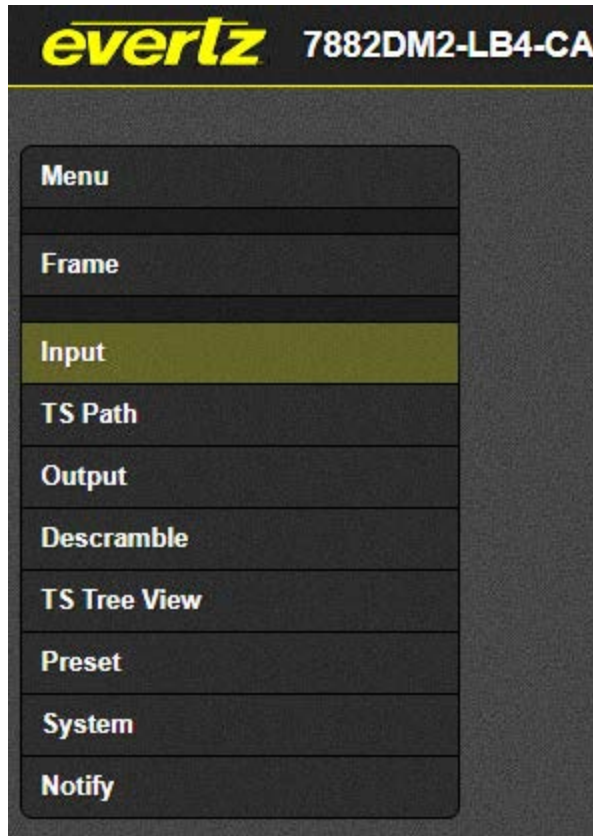
Figure 4-2 : WebEASY® - 7882DM2-LB4-CA2-ASI Main Menu

✎ | **NOTE: The main menu and some fields of the Web Interface may change based on different options, licenses, modes and features.**

4.1. INPUT

Figure 4-3 : WebEASY® - Input

4.1.1. RF Tune

Demod 1, 2, 3 and 4 selection tabs are used to tune each individual demodulator as well as to monitor the health and status of the input signal. The 7882DM2-LB4-CA2-ASI series cards can contain up to four different demodulators on each module.

Please note that there are up to four channels available on the demodulator for 7882DM2-LB4-CA2-ASI models. Since each channel has the same parameters, only Channel 1 will be described in this manual.

Assuming a valid RF input is connected to the rear plate of the demodulator, the user can tune to a certain frequency/ channel by following the steps below:

1. Navigate to the **RF Tune** section of the **Input** tab.

2. Select the demodulator channel to tune by selecting the corresponding numbered tab.

3. User can modify the tab name for each demod channel by right clicking on the tab itself. The name will appear in place of the number of the corresponding tab.

4. Enter the respective parameters for the RF feed.

5. Click **Apply** after changing the settings and click **Refresh** to ensure the values are applied and taken. Both commands can be found at the top of the web page.

6. The **Lock Status** parameter should read **Lock** to confirm the signal is tuned and is able to check for other RF parameters on the same section.

Demod Tag: This field enables the user to associate a tag for each demod channel.

Demod Enable: This field allows the user to enable/ disable the specific demod channel. Only one out of **Demod 1** and **Demod 2** can be locked at a time. Similarly, only one of **Demod 3** and **Demod 4** can be locked at one time. Hence, user can enable the required channels.

Satellite Frequency (MHz): This field enables the user to enter the Satellite Frequency (MHz) value.

> **NOTE: User can enter Sat Freq and LNB Freq or only L-Band Freq in Sat Freq field.**

LNB Frequency (MHz):   This field enables the user to enter the standardized Local Oscillator Frequency (LO) value.

> **NOTE: Lband Frequency = Satellite Frequency - LOF Frequency (for Ku)**
> **Standardized LOF is 5150 for C-Band and 10750 for Ku-band.**
> **When the LOF is C-band the formula is**
> **Lband Frequency = LOF Frequency - Satellite Frequency**

Symbol Rate (kSps): This field enables the user to enter a symbol rate in Ksymbols/s.

ISI Select: This filed allows the user to enter a specific ISI for multiple stream input.

Frequency Search Range (kHz): This field enables the user to set the maximum frequency offset which is covered by the carrier search (in kHz). The default value for search range is 5000 kHz.

Standard: Using the drop down menu, select the Modulation standard type (DVB-S or DVB-S2).

> **NOTE: Satellite frequency, LNB Frequency, Symbol Rate and Standard are mandatory fields to get a Lock ON, other parameters below are auto-detected by the demod chip.**

Modulation: Using the drop down menu, select the Modulation type (QPSK, 8PSK, 16APSK, 32APSK or default to Auto).

Pilot: This parameter allows the user to turn ON or OFF the pilots, user can also set it to Auto mode.

EsNo Margin Threshold: This field enables the user to set the EsNo Margin Threshold and get the trap when real EsNo ratio is less than the threshold value. The range for EsNo threshold is 0.0 to 10.0 dB.

Lock Status: This field allows the user to monitor the demodulator lock status (Idle or Locked).

Standard: This field allows the user to monitor the Standard of locked channel (DVB-S/ DVB-S2)

Modulation and FEC: This field allows the user to monitor the Modulation parameters and FEC for locked channel.

L-Band Frequency: This field displays the Lband frequency calculated from the difference between the RF frequency and the LNB frequency.

Bit Error Rate: This field displays the demodulator Bit error rate.

Es/No ratio: This field displays the ratio between the average energy per transmitted symbol and single sided noise power spectral density. For a summary of performance requirements at QEF over AWGN, please refer to Section 10 of this manual for minimum EsNo ratio required for any given modulation schemes and FEC.

Es/No Margin: This field displays EsNo Margin in dB which indicate how much dB left before losing the lock.

RF Power: This field measures the input power level of the locked channel.

Multiple Stream: This field indicates whether the input RF signal has single stream or multiple streams.

ISI Minimum: This field indicates the minimum ISI present in the list, if using a multiple stream input.

ISI Maximum: This field indicates the maximum ISI present in the list, if using a multiple stream input.

ISI Select Status: This field indicates the current selected ISI from the list, if using a multiple stream input.

4.1.2. LNB

The user can set the LNB controls for individual input ports by switching between tabs LNB 1, LNB 2, LNB 3 and LNB 4.

LNB Power: This field allows the user to enable/disable the LNB power on the input. Using drop-down menu, it can be set to 13V, 18V or OFF.

4.2.   TS PATH

The 7882DM2-LB4-CA2-ASI allows the user to choose the input source from a selection of eight different inputs. The available options are four RF inputs and four ASI inputs, as shown in Figure 4-4.
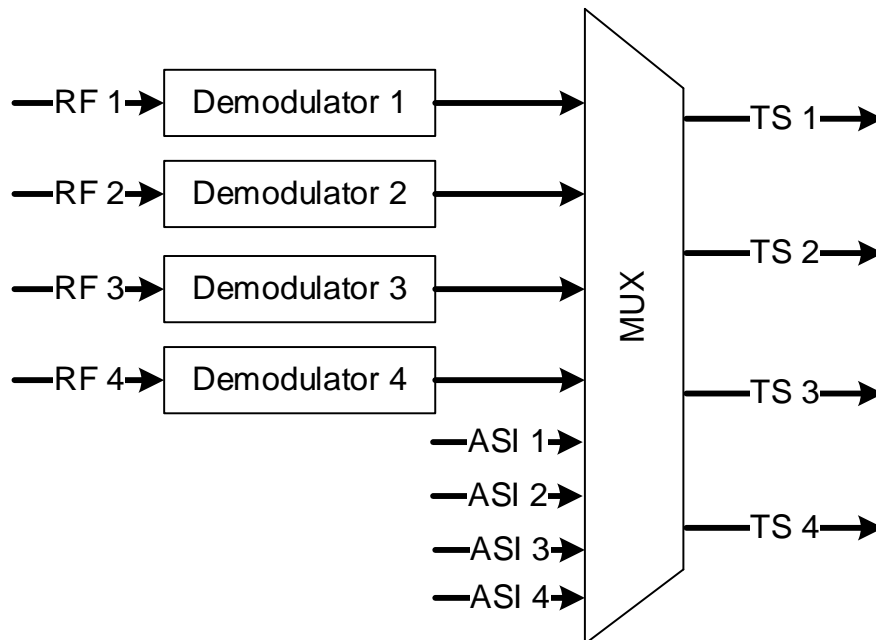

Figure 4-4 : Input Source Diagram

To choose the input to the demodulator, follow the steps below:

1. Navigate to the **TS Path** tab. Under the **TS In Mapping & Status** section, select **Main Source** as Demod 1, Demod 2, Demod 3, Demod 4, ASI1, ASI2, ASI3 or ASI4.

2. If redundancy is not required, set **Source Mode** to **Force Main**.

3. Click **Apply** after changing the settings and click **Refresh** to ensure the values are applied and taken. Both commands can be found at the top of the web page.
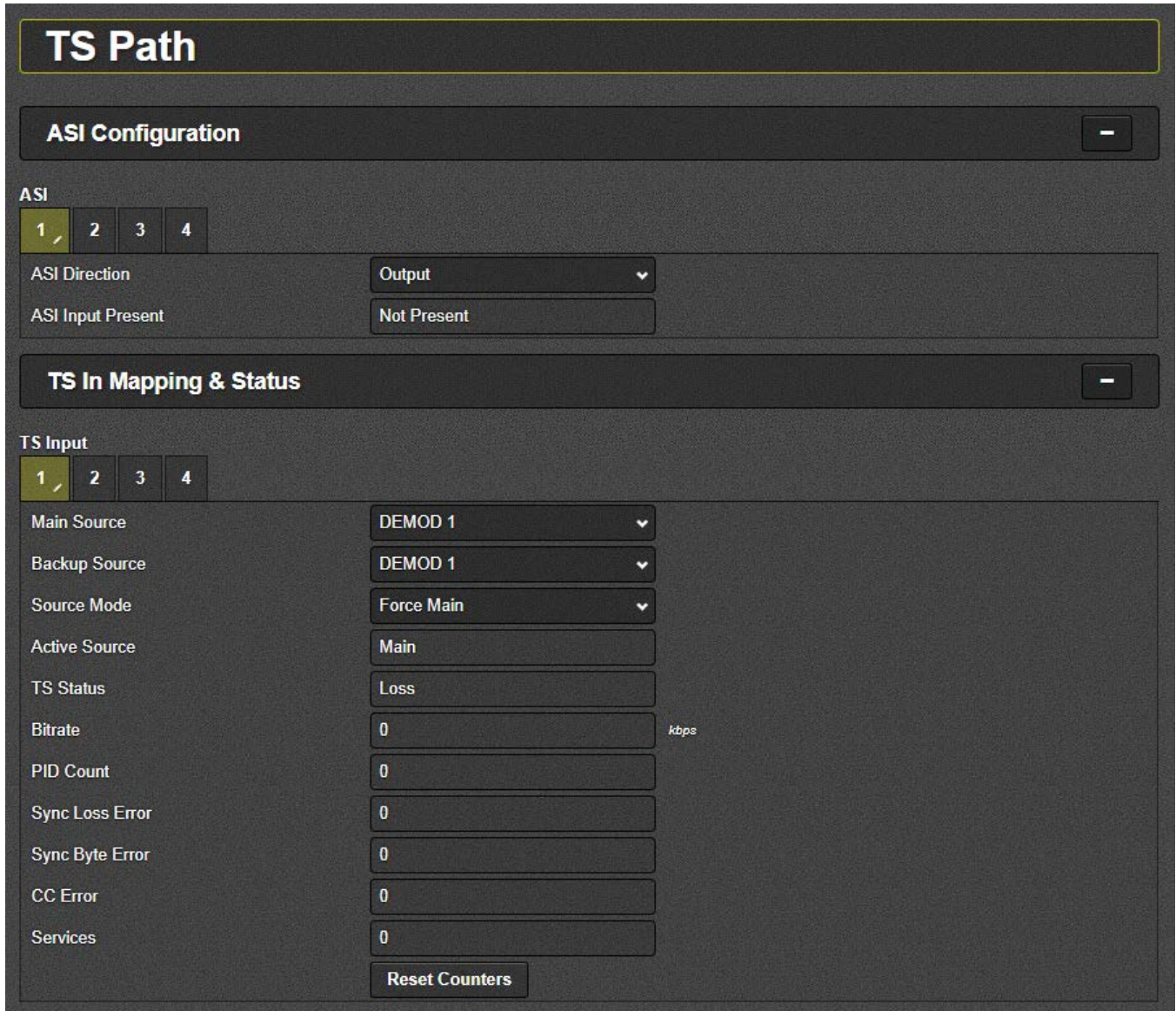
Figure 4-5 : WebEASY® - TS Path

4.2.1. ASI Configuration

If the sources to the demodulator are ASI streams over coaxial cable, it is assumed that a valid source is connected to the ASI INPUT port on the rear plate of the unit.

ASI Direction: This parameter sets the ASI port as input or output.

ASI Input Present: This parameter displays the status for ASI presence.

To select **ASI 1** as a source to the demodulator, follow the steps below:

1. Navigate to the **ASI Configuration** section under the **TS Path** tab.
2. For ASI1, set **ASI Direction** to **Input**, and then click **Apply**.
3. **ASI Input Present** status should confirm a valid ASI source is present.
4. Select **ASI1** as **Main Source** under the **TS Input Mapping & Status** section of the **TS Path** tab.

5. The **Bitrate** parameter should reflect a valid bitrate confirming the ASI input is present.
6. For in depth monitoring of the input, press **Reset Counter** and then **Refresh** to get an accurate reading.

NOTE: All the 4 ASI ports can be configured to be either input or output. If the source is configured to be one out of ASI 1- 4, the "ASI Direction" control needs to be set as input.
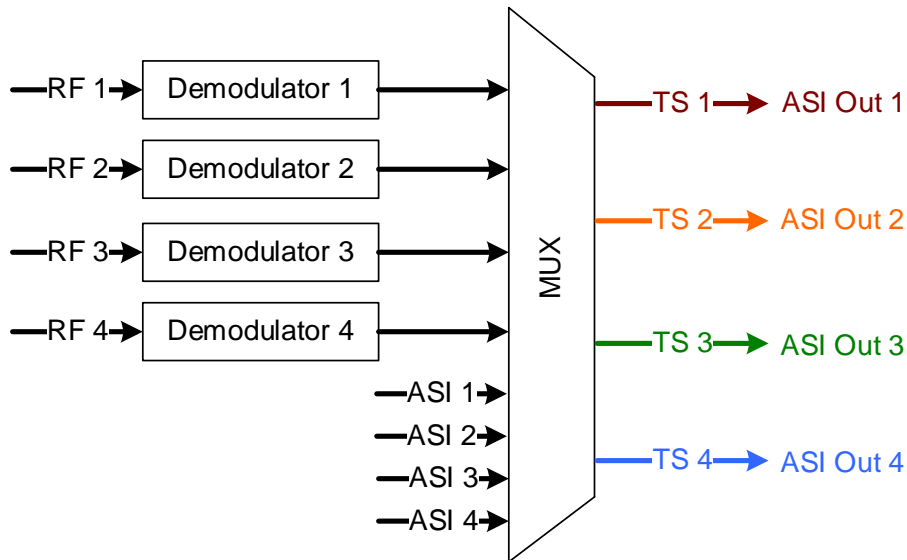

Figure 4-6 : ASI Outputs diagram

4.2.2. TS In Mapping & Status

Main Source: This parameter sets the main input source. Depending on the user's connection, RFs 1-4 or ASI1-4 are viable.

Backup Source: This parameter sets the backup input source to take control if the main source fails.

Source Mode: This parameter sets the input source select mode. The user can select **Force Main** (forces main source to run), **Force Backup** (forces backup source to run), and **Auto** (if the main source fails, then the demodulator will switch to backup source).

Active Source: This parameter displays the input source in use, it can be Main or Backup.

TS Status: This parameter retrieves the input TS present state: Loss or Present.

Bitrate: This parameter retrieves the input TS bitrate in kbps.

PID Count: This parameter retrieves the number of PIDs in the input transport stream.

Sync Loss Error: This parameter retrieves the sync loss error count in the input transport stream.

Sync Byte Error: This parameter retrieves the sync byte error count in the input transport stream.

CC Error: This parameter retrieves the continuity count error count in the input transport stream.

Services: This parameter displays the number of programs in the input transport stream.

Reset Counters: This parameter clears the TS input status counters including Sync Loss Error, Sync Byte Error and CC Error.
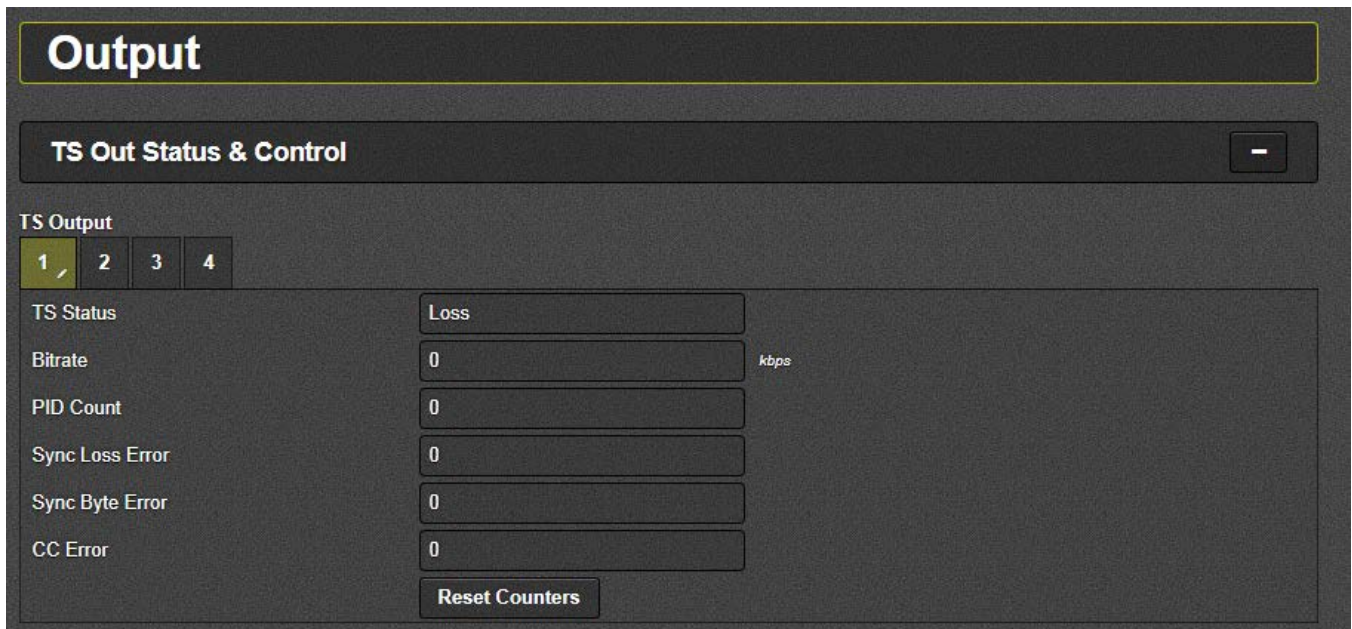
4.3.   OUTPUT

Figure 4-7 : WebEASY® - Output

To monitor the TS output and change the TS output settings, follow the steps below:

1. Click on the **Output** tab.
2. Navigate to the **TS Out Status & Control** section under **Output** tab to monitor the ASI output.
3. Press **Reset Counters** and then **Refresh** to get an accurate reading of the monitoring parameters.
4. Under the same section, user can monitor the presence status of TS output along with other parameters such as Bitrate, PID count, Sync Loss Error, Sync Byte Error and CC errors present in the transport stream.
5. To navigate between different TS, click on tabs 1 to 2.

TS Status: This parameter retrieves the output TS present state: Loss or Present.

Bitrate: This parameter retrieves the output TS bitrate in kbps.

PID Count: This parameter retrieves the number of PIDs in the output transport stream.

Sync Loss Error: This parameter retrieves the sync loss error count in the output transport stream.

Sync Byte Error: This parameter retrieves the sync byte error count in the output transport stream.

CC Error: This parameter retrieves the continuity count error count in the output transport stream.

Reset Counters: This parameter clears the TS output status.

4.4. DESCRAMBLE

Figure 4-8 : WebEASY® - Descramble

While using descrambling by DVB-CI cam, the user needs to set some initial parameters under the **System** tab to control the CAM, as shown below.

4.4.1. CA Descramble

CAM Enable: This field allows the user to enable or disable CAM module.

Multi Service Mode: This field allows the user to choose the CAM type if it is single service CAM (Disable) or multi service CAM (Enable).

Select Maximum TS Bitrate: This field allows the user to define the maximum TS bitrate the CAM can handle. Since each CAM has different clock rate, this control will allow the right clock to the right TS bitrate and CAM capability.

CAT Info Pass Through: This field allows the user to pass the CAT information to the output ASI (Enable) or block the CAT information from the TS output (Disable).

After the initial setup of the CAM in previous section, user can move to **Descramble** page and follow the below steps:

1. Select a specific service user wants to descramble from a drop down menu under **Program select** control. By default none of the services will be selected.
2. Click **Apply** after entering the values and click **Refresh** to ensure the values are applied and taken (both the commands are located at the top of the page).
3. Under **Service Info** section, **Output Encryption** of the selected service should change from Scrambled to Free. Click **Refresh** to see the changes.
4. User can descramble up to 30 programs in each CAM, if the CAM module supports it.

4.4.2. Service Info

This section provides information about the services present in the TS.

Service ID: This parameter retrieves the service ID of each program in the received transport stream.

Service Name: This parameter retrieves the name of each program in the received transport stream.

PMT ID: This parameter retrieves the PMT ID of each program in the received transport stream.

Service Provider: This parameter retrieves the name of service provider for each program in the received transport stream

Input Encryption: This parameter retrieves the CA encryption state of each program in the received transport stream: Encrypt or Free.

Output Encryption: This parameter retrieves the output encryption status for each program in the output transport stream: Encrypt or Free.

NOTE: Navigate to the TS Input 2, Input 3, or Input 4 tabs to monitor the service info for all available transport streams.

4.4.3. CA Module

The user can monitor the health status of the CAM modules by following the steps below:

1. Navigate to the **Descramble** tab.
2. Navigate to the **CA Module** section located near the bottom of the tab.
3. To navigate between different CAM module, click on tabs one and two for CAM one and two.

Name: This parameter retrieves the name of the CA module.

Module Name: This parameter retrieves the module name of the CA module.

Manufacturer: This parameter retrieves the manufacturer of the CA module.

Manufacturer Code: This parameter returns the manufacturer code of the CA module.

Module Status: This parameter returns the error status of the CA module: Ok or Error.

System ID: This parameter returns the system ID of the CAM smart card.

4.5. TS TREE VIEW

When a valid input transport stream is present, the user can navigate to the **TS Tree View** section to view the incoming programs on the source TS. The user can view the **TS Tree View** by following the steps below:

1. Navigate to the **TS Tree View** section and scroll down to **TS Tree View**.
2. Click on the service names to get a tree view of all the elementary components and PID values.
3. To navigate between different TS, click on tabs 1-4.

Figure 4-9 : WebEASY® - TS Tree View

4.6. PRESET

Figure 4-10 : WebEASY® - Preset

4.6.1. Saving a Preset

1. The user can save the settings to a particular preset by clicking on one of the three numbered tabs. A maximum of 60 presets can be set (20 per tab, respectively).
2. Enter the name in the **Preset Name** field, and click **Apply**.
3. Click on the **Store** button to save the settings to this preset.
4. A dialog box will appear saying 'Do you want to store settings to this preset?' Click **OK** to store.
5. Follow the above steps to create up to **60 presets**. These 60 presets are arranged in 3 tabs,**1-20** under one tab, **21-40** under second tab and **41-60** are present under third tab.
6. The user can also modify the name for each of these three tabs by right clicking on the tab. Enter the name in the Modify Tab Name field and click OK. The respective tab number will be replaced by the name entered by the user.

4.6.2. Recalling a Preset

1. The user can select which preset to recall by clicking on one of the numbered tabs and navigate to the preset that needs to be recalled.
2. Click on the Recall button.
3. A dialog box will appear saying 'Do you want to recall this preset?' Click OK to recall.
4. The last recalled preset is displayed under the **History** section, that shows the number (index) and name of the preset that is currently loaded into the card.

4.7. SYSTEM

Figure 4-11 : WebEASY® - System

4.7.1. System

Reboot & Factory Reset: These parameters allow the user to reboot and reset 7882DM2-LB4-CA2-ASI.

Card Type: This parameter displays the card's model number.

Alias: This parameter allows the user to set an Alias for the unit.

- The user can create a demodulator Alias by entering a name in the **Alias** control field.
- Click **Apply** after entering a name and click **Refresh** to ensure the name is applied and taken. Both commands can be found at the top of the web page.

4.7.2. CONFIGURATION

This section allows the user to import and export the product configuration files.

Import Configuration: This parameter allows the user to import a previously saved configuration file to the 7882DM2-LB4-CA2-ASI module.

1. Click on **Choose File** to locate the saved configuration file.
2. Click **Upload** button after choosing the file.
3. The **File Import Confirmation** dialog box will appear. Click **OK** to proceed.

Export Configuration: This parameter allows the user to export the configuration of 7882DM2-LB4-CA2-ASI to the local disk by clicking on the **Download** option.

> **NOTE: Configuration section is not available on VLPro. VLPro uses different approach to save and recall the configuration of a product.**

4.7.3. CAM Control

While using descrambling by DVB-CI cam, the user needs to set some initial parameters under the **System** tab to control the CAM. Please refer to Section 4.4 for more details on CAM Control parameters.

4.8. NOTIFY

This section allows the user to monitor the traps generated for various input and output monitoring parameters by following the below steps:

Figure 4-12 : WebEASY® - Notify

1. Navigate to the **Notify** tab.
2. **LNB Send Trap** section allows the user to enable/disable the traps sent for LNB faults on **LNB 1** by default. To navigate between different LNB inputs, click on tabs 1-4.

3. **LNB Fault** section displays LNB faults on **LNB 1** input by default. To navigate between different LNB inputs, click on tabs 1-4.

4. **Demod Send Trap** section allows the user to enable/disable the traps sent for **Demod 1** by default. To navigate between different demod inputs, click on tabs 1-4.

5. **Demod fault** section displays **Demod 1** faults by default. To navigate between different demods, click on tabs 1-4.

6. The user will see the square boxes in front of each parameter that are either **RED** or **GREEN**. **RED** indicates that the respective fault is present whereas **GREEN** box indicates that the fault is not present.

4.8.1. LNB Fault

- **LNB Power:** This trap notifies the user about the **LNB power** status, turns RED if there is a short circuit in the LNB.

4.8.2. Demod Fault

- **Demodulator Lock:** This trap notifies the user about the demodulator **Lock Status**, turns RED if the demodulator channel is **Idle**.

- **Demodulator Input:** This trap notifies the user about the status of the input to the demodulator. This trap turns RED if the demodulator has **no input.**

- **Demodulator Es/No**: This trap notifies the user about the Es/No ratio of the input signal, turns RED if the input signal has an Es/No lower than the **Es No Margin Threshold** value set by the user.

5. VISTALINK® PRO INTERFACE

The 7882DM2-LB4-CA2-ASI series products are controllable using VistaLINK® PRO. VistaLINK® PRO operates using Ethernet and SNMP control protocols. The 7882DM2-LB4-CA2-ASI series modules DO NOT HAVE card edge control support nor direct SNMP agent support. As a result, a 7800FC module must be installed in all frames that house 7882DM2-LB4-CA2-ASI series modules in-order to configure the modules.

Within VistaLINK® PRO the 7882DM2-LB4-CA2-ASI series modules have a set of system configuration controls. The system configuration controls can be accessed by *right-clicking* on the module in the VistaLINK® PRO hardware tree, and selecting *view configuration.* Figure 5-1 illustrates how a 7882DM2-LB4-CA2-ASI module will appear in the VistaLINK® PRO hardware tree.
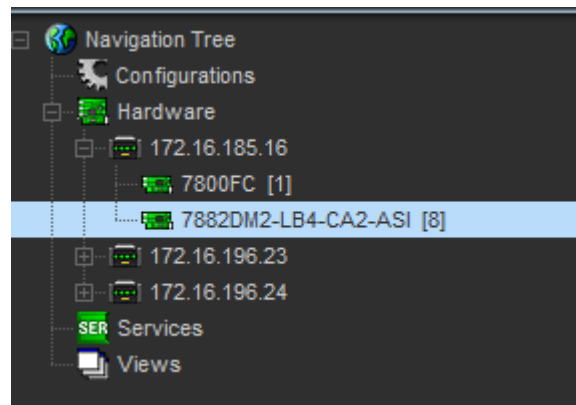

Figure 5-1 : 7882DM2-LB4-CA2-ASI in VistaLINK® PRO Hardware Tree

> **NOTE: When using VistaLINK® PRO it is important to ensure that the most recent 7882DM2-LB4-CA2-ASI series ".JAR" control file is installed. See Section 6.2 for details on how to upgrade the 7882DM2-LB4-CA2-ASI series VistaLINK® PRO JAR files.**

Right click on the module on hardware tree and select View Configuration. The control and monitor sections will appear as is shown in Figure 5-2.
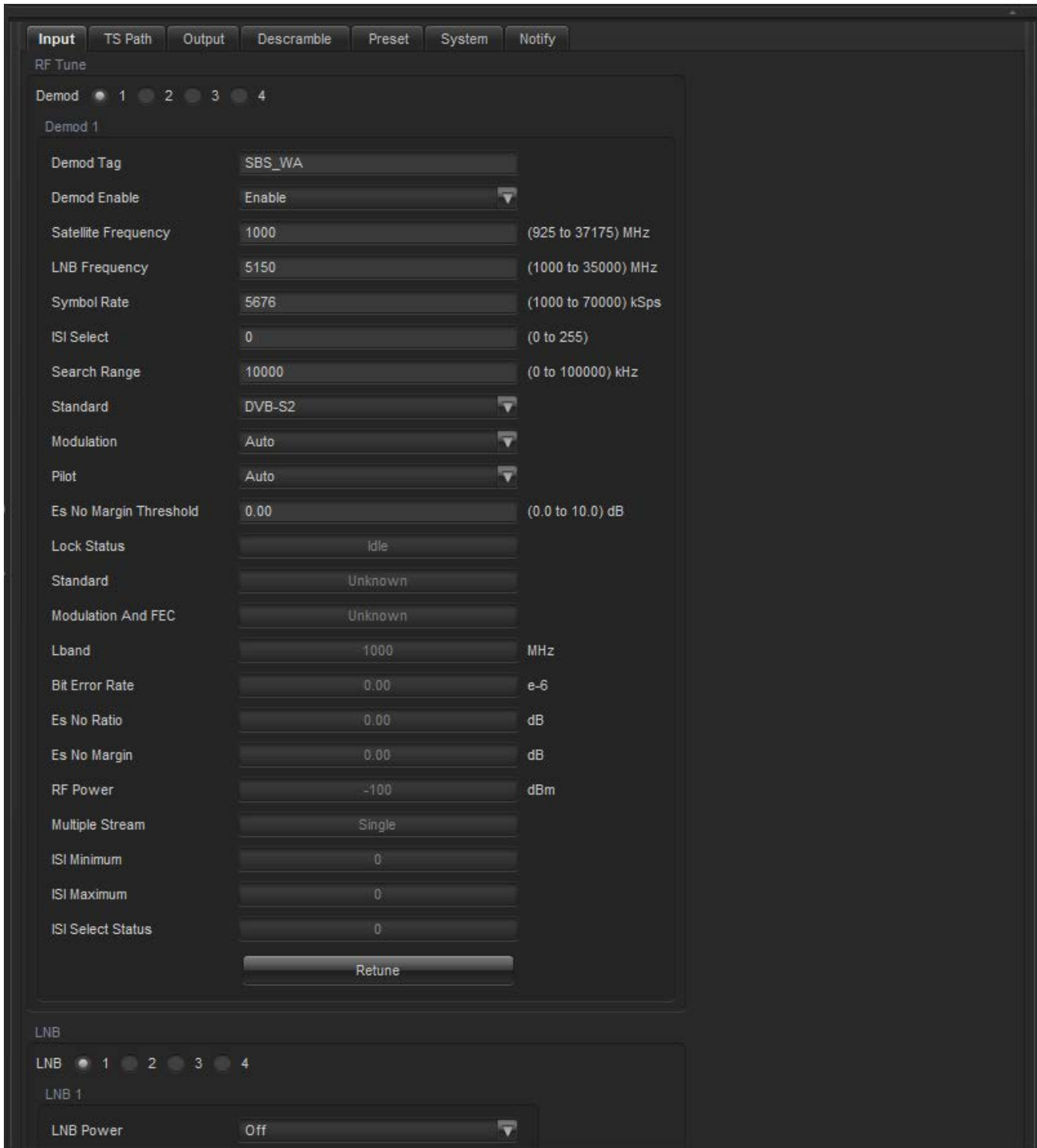
Figure 5-2 : VistaLINK® PRO – Configuration

The functionality of the controls of each menu has been described in Webeasy section (section 4) of this manual.

Section 5.1 which is explained below is only available on VistaLINK® PRO and WebEASY® does not cover it.

5.1. ENABLING/ DISABLING THE ALARMS

The user can enable or disable which traps to be notified when triggered by following the below steps:

On VistaLINK, navigate to the Notify section.

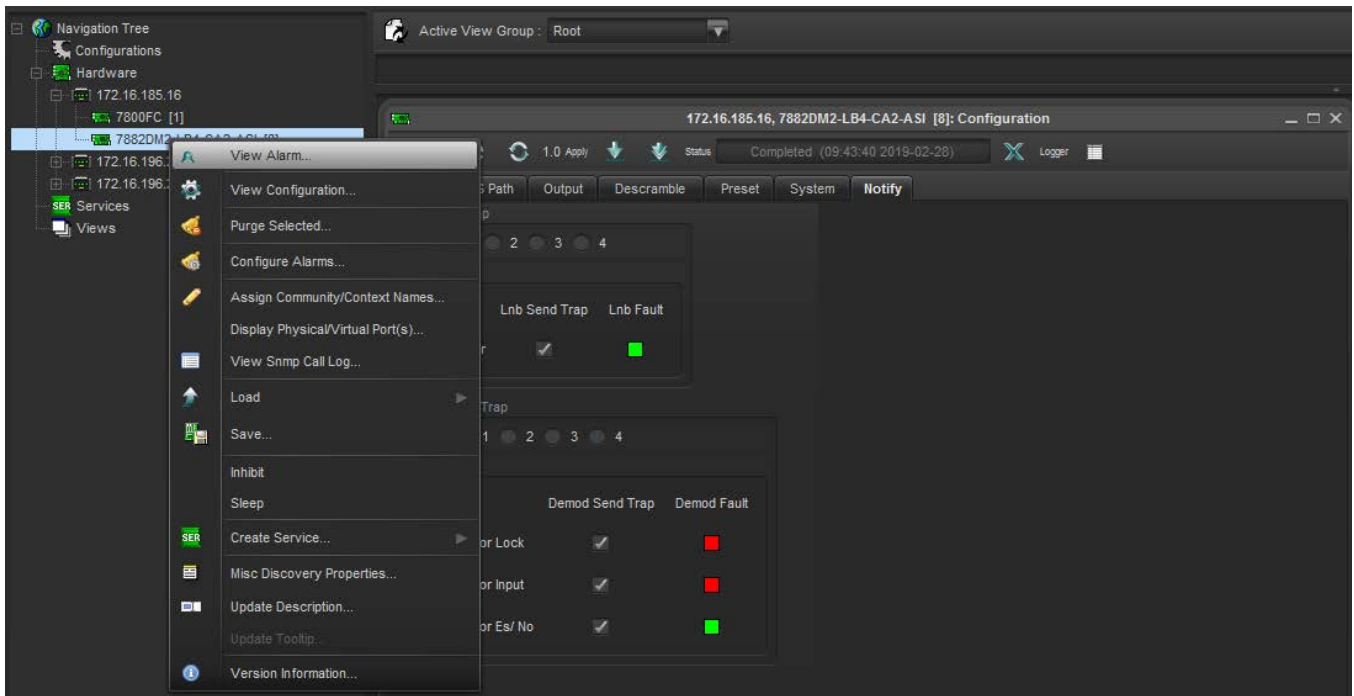User will see a check mark box in front of each trap as shown in Figure 5-3.

Figure 5-3 : VistaLINK® PRO – View Alarm

If this box is checked, this means the user will be notified whenever the respective trap is triggered.
If this box is not checked, this means the user will not be notified even if the respective trap is triggered.
User can see the Alarms for all the notified traps in a separate Alarm window. To open the Alarms window, right click on the demodulator in the Hardware tree and click on View Alarm option as shown in Figure 5-3.

Alarm window will be opened as is shown in Figure 5-4. It will display a list of all the traps with the description of each trap, date and time the trap triggered, device that triggered the alarm, date and time of correction and the duration of the trap.
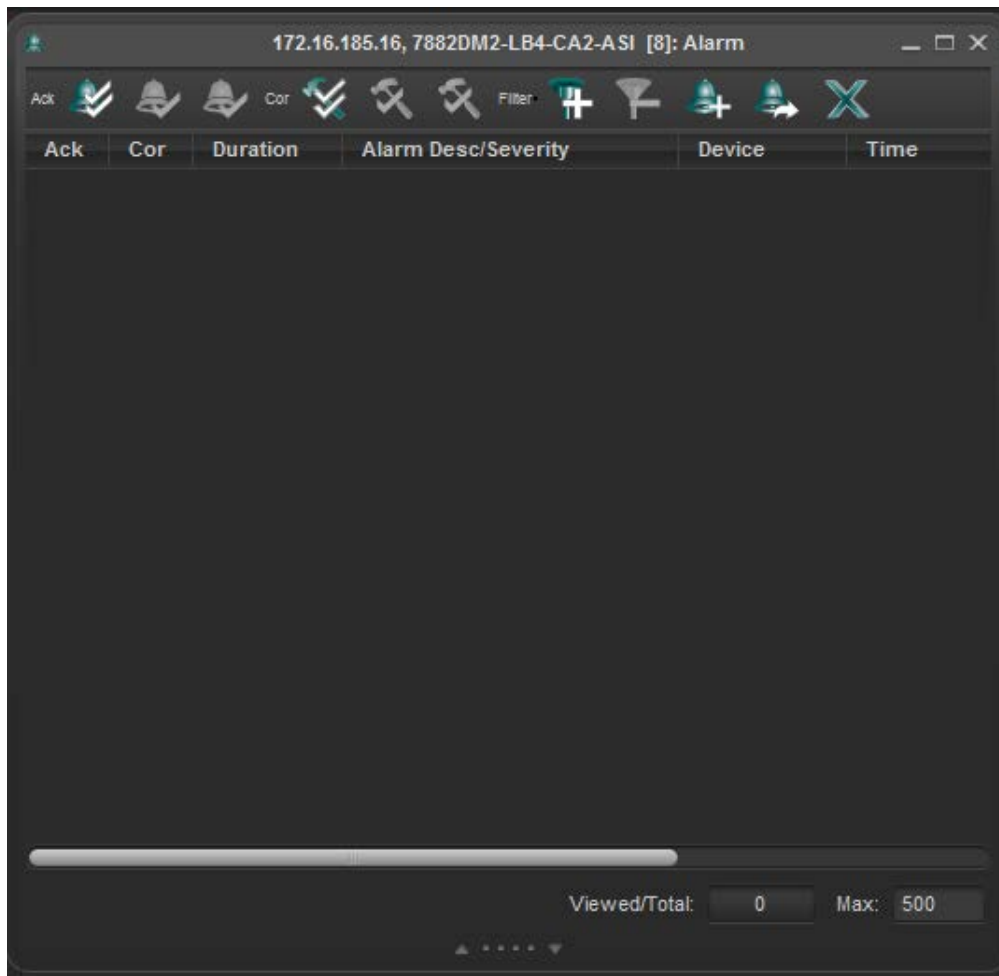
Figure 5-4 : VistaLINK® PRO – Alarm

> ✍ **NOTE: User must specify a valid DESTINATION to view the ALARMS. This can be done by adding the IP address of the machine running VLPRO to the SNMP V1 Trap destinations on the FC web page.**

6. UPGRADE PROCEDURES

6.1. UPGRADE FIRMWARE

6.1.1. Firmware Upgrade Using VistaLINK® PRO

A firmware upgrade can be accomplished through VistaLINK® PRO firmware upgrade facilities. All 7882DM2-LB4-CA2-ASI modules within the same 7800FR frame can be upgraded simultaneously or one-by-one. However, it is more convenient to upgrade them simultaneously.

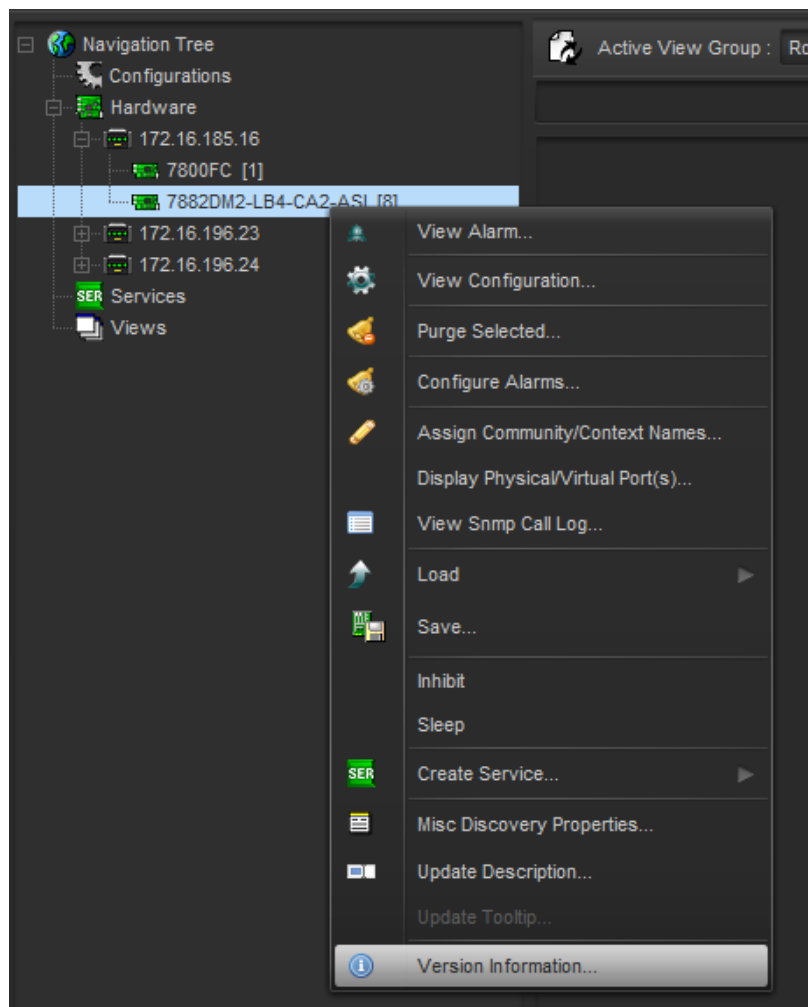Right click on 7800FR frame that contains the 7882DM2-LB4-CA2-ASI modules, and select Version Information.

Figure 6-1 : VistaLINK® PRO - Version information selection

Navigate the hardware tree on the left side of the version information window to select the 7882DM2-LB4-CA2-ASI module listed. The list on the right side of the window should populate with all 7882DM2-LB4-CA2-ASI modules present in the 7800FR. Take note of the current firmware version installed on the 7882DM2-LB4-CA2-ASI modules to confirm afterwards that the upgrade has completed successfully.
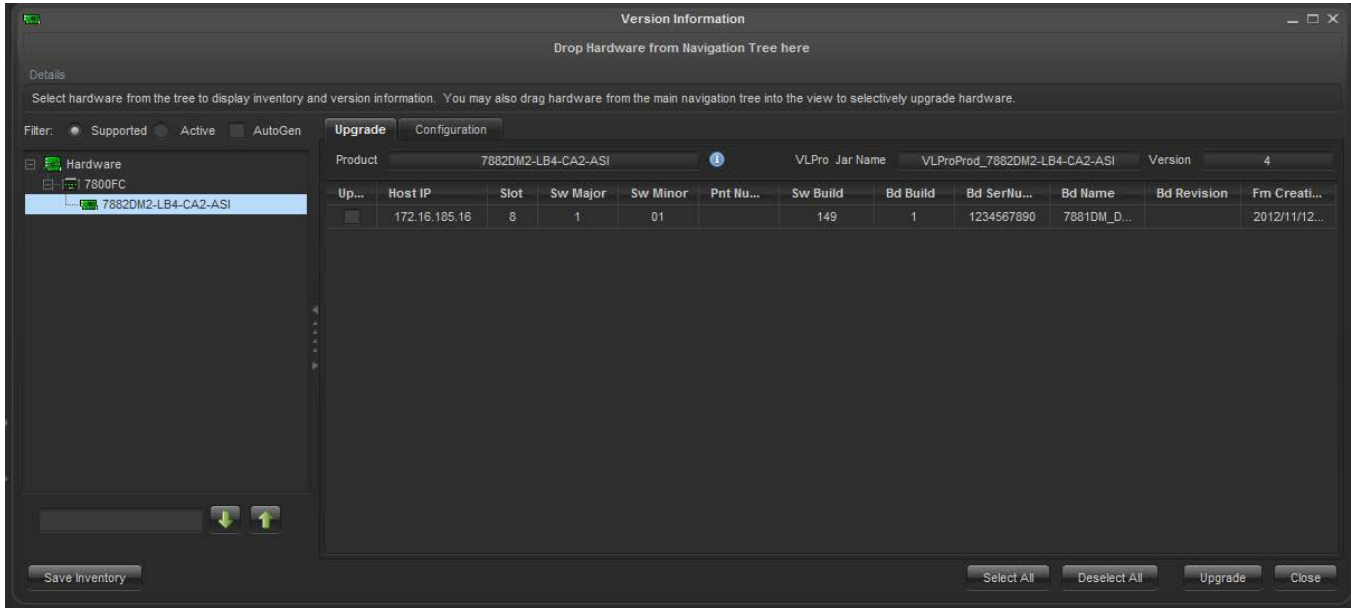
Figure 6-2 : VistaLINK® PRO - Version Information Window

Check the *Upgrade* checkbox for all modules that require the firmware upgrade. Press Upgrade button. This will open a new *Upgrade Firmware* window. Press the Browse button to navigate to the firmware archive provided for upgrading the 7882DM2-LB4-CA2-ASI modules (**File extension is .tar.gz**). Once the correct file has been selected, press the *Start* button to begin the upgrade process.
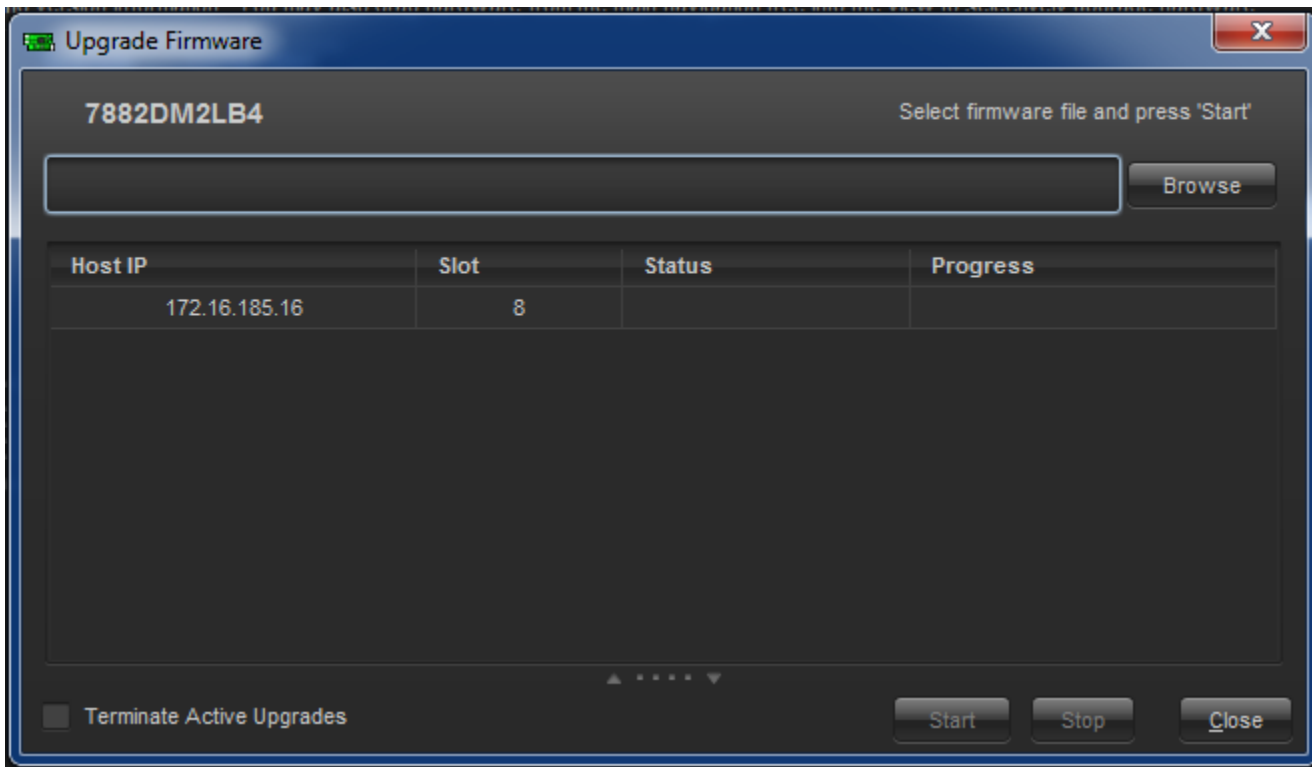

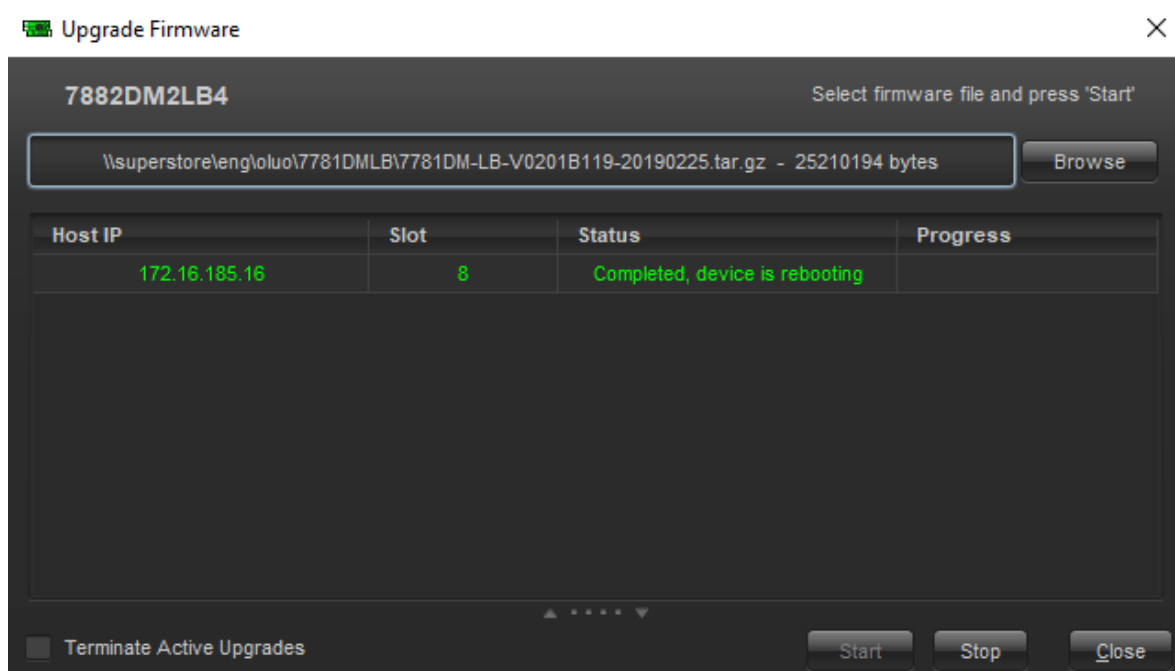**Figure 6-3 : VistaLINK® PRO - Upgrade Firmware Window**

Figure 6-4 : VistaLINK® PRO - Upgrade Complete

After the firmware has been transmitted to the 7882DM2-LB4-CA2-ASI module successfully, the module will reboot to complete the firmware upgrade process. Close the *Upgrade Firmware* window and *Version Information* window.

Once the cards have rebooted, ensure all 7882DM2-LB4-CA2-ASI modules are still present in the VistaLINK® PRO hardware tree. Right click on 7800FR frame that contains the 7882DM2-LB4-CA2-ASI modules, and select *Version Information*. Navigate the hardware tree on the left side of the version information window to select the 7882DM2-LB4-CA2-ASI module listed. The list on the right side of the window should populate with all 7882DM2-LB4-CA2-ASI modules present in the 7800FR. Verify that all modules that have been upgraded are now reporting the expected firmware version.

> **NOTE: If any of the 7882DM2-LB4-CA2-ASI modules do not properly upgrade the firmware, please power-cycle those boards and retry the procedure exclusively on the failed boards. If the issue still persists, contact Evertz for further assistance.**

6.1.2. Firmware Upgrade Using WebEASY®

Select the Upgrade tab at the top of the general page (Figure 6-5).

Figure 6-5 : WebEASY® - Selecting Upgrade

Browse for the latest version of firmware to update with and select the Upgrade button.
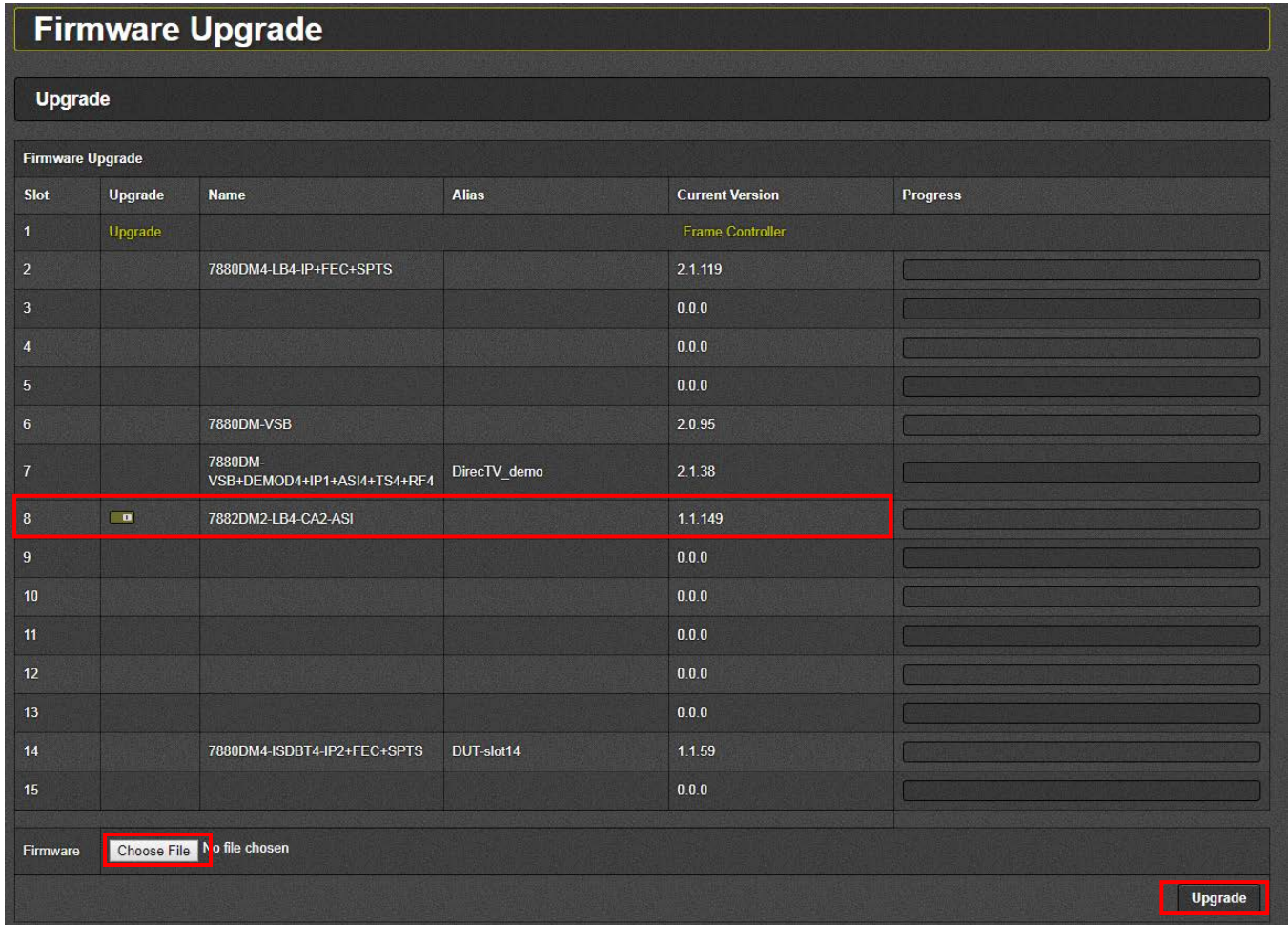
Figure 6-6 : WebEASY₍ₓ₎ - Firmware Upgrade Menu

Figure 6-7 : WebEASY₍ₓ₎ - Completion Indicator

Upon completion, the 7882DM2-LB4-CA2-ASI will reboot automatically and return online in normal "run" mode.

6.2. UPGRADE VISTALINK₍ₓ₎ PRO JAR FILE

Products from Evertz are constantly evolving and new features are often added. It is therefore important to update Jar files in use to provide access to all the latest features or enhancements. It will also be necessary to add Jar files for new products.

To perform a JAR update, ensure that all VLPro clients are closed (those clients which are not closed will automatically be disconnected as soon as the VLPro Server is restarted). Maximize the VLPro Server window from the windows task bar, select *Help>Apply Update>Product* from the menu (Figure 6-8).
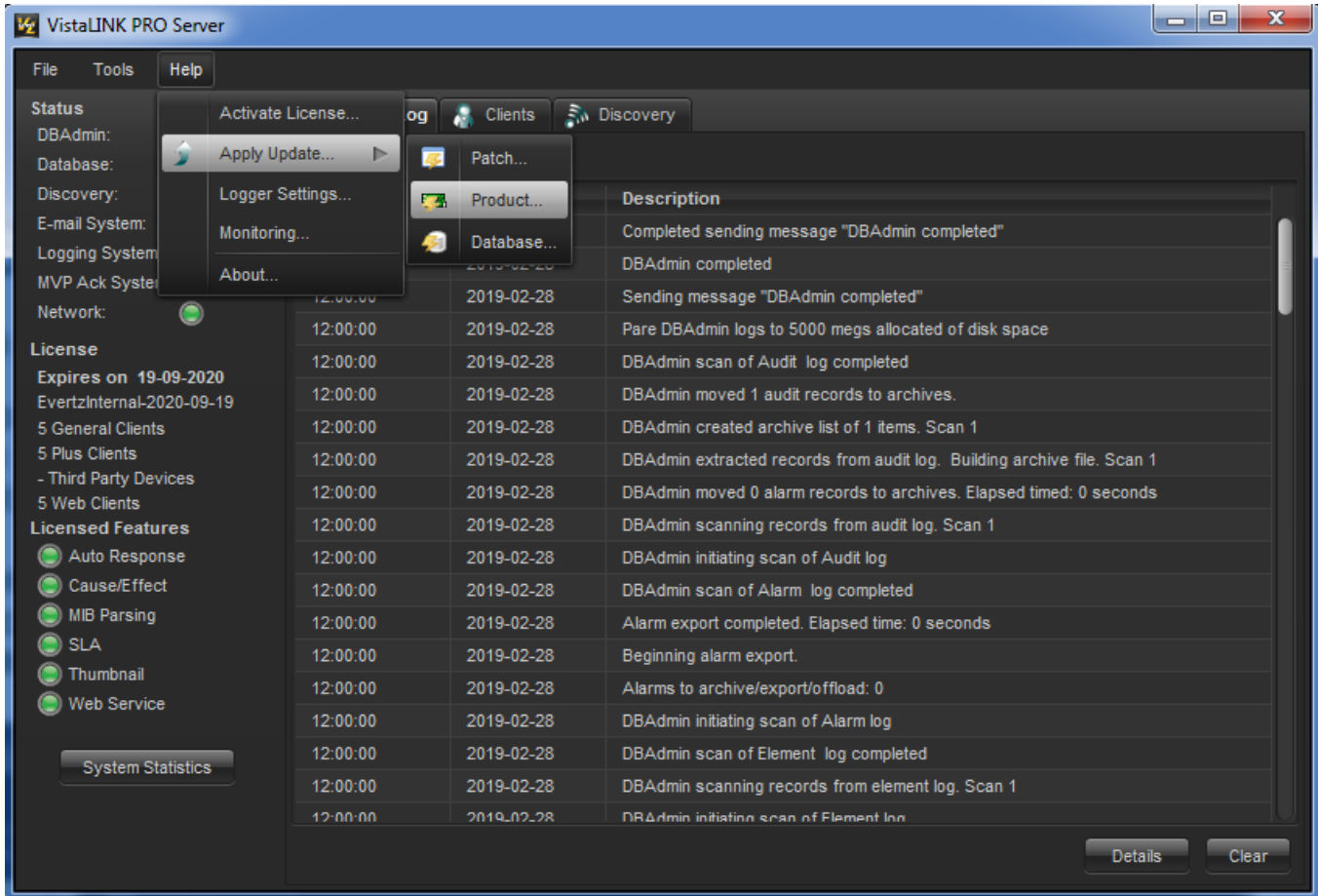
Figure 6-8 : VistaLINK® PRO Server – Apply Update

A window will appear as shown in Figure 6-9. Navigate to the location of the new JAR file and double click to select the file. The window will automatically close and the update will be applied in the background.
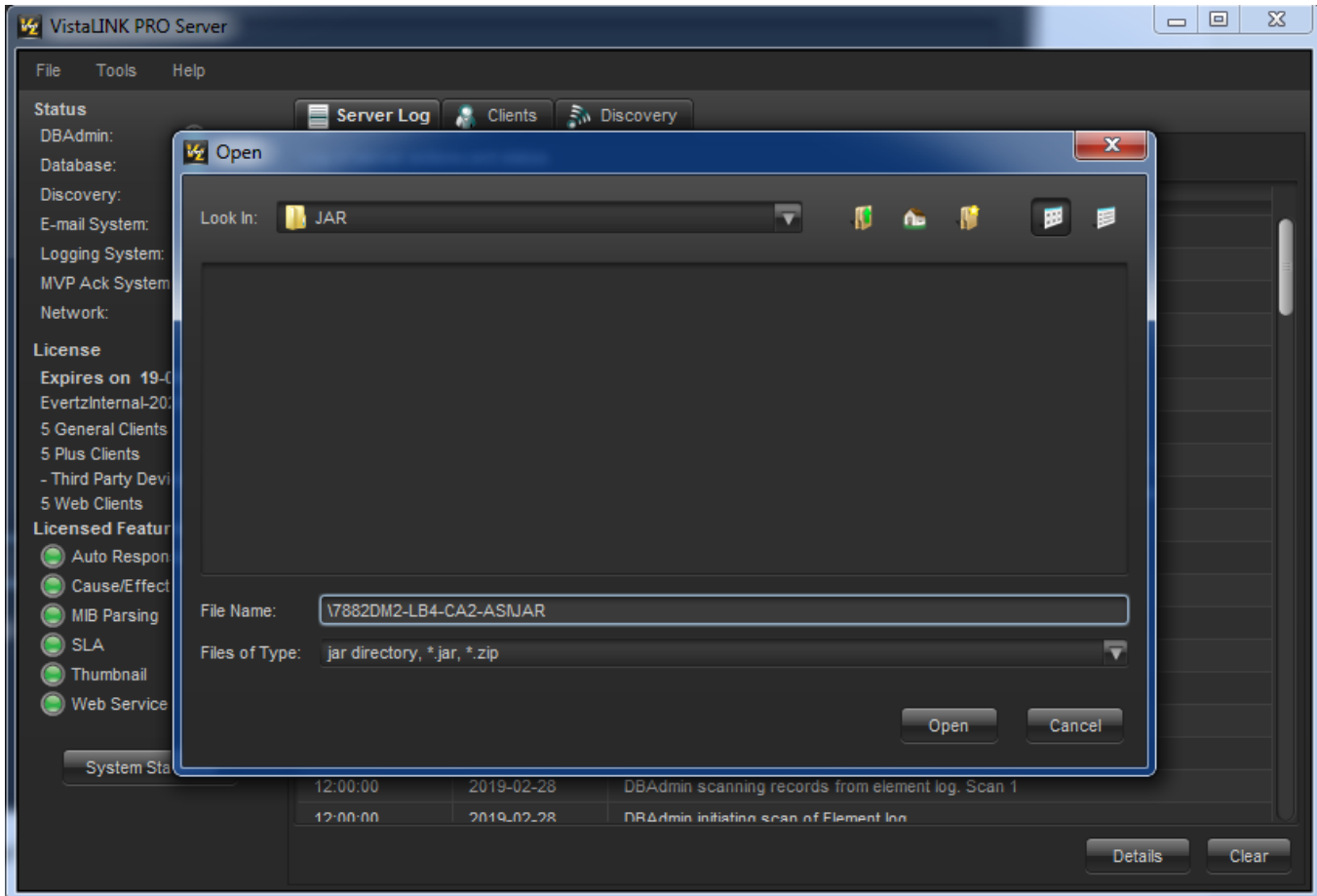
Figure 6-9 : VistaLINK® PRO - Applying JAR Updates

The user will be prompted to restart the server to enable the change to take effect. Apply as many JAR updates as required before restarting the server.

Shutdown the server by selecting from the menu: File>shutdown Server. Now re-open the server, it is normal for the start up to take marginally longer while each individual update is being applied. Once complete, you may restart the VLPro Clients. As the client restarts, the user will experience a short delay while the update is applied. A prompt will appear confirming that the updates have been applied.

7. MINIMUM ES/NO RATIO REQUIRED FOR EACH OF MODULATION & FEC SCHEMES

Table below summarizes performance requirements at QEF over AWGN (Es= average energy per transmitted symbol). Ideal Es/No (dB) is the figure achieved by computer simulation, 50 LDPC fixed point decoding iterations (see annex G), perfect carrier and synchronization recovery, no phase noise, AWGN channel. For short FEC FRAMEs an additional degradation of 0.2 dB to 0.3 dB has to be taken into account. For calculating link budgets, specific satellite channel impairments should be taken into account.

PER is the ratio between the useful transport stream packets (188 bytes) correctly received and affected by errors, after forward error correction.

Mode	Spectral efficiency	Ideal E_s/No (dB) for FECFRAME length = 64 800
QPSK 1/4	0,490243	-2,35
QPSK 1/3	0,656448	-1,24
QPSK 2/5	0,789412	-0,30
QPSK 1/2	0,988858	1,00
QPSK 3/5	1,188304	2,23
QPSK 2/3	1,322253	3,10
QPSK 3/4	1,487473	4,03
QPSK 4/5	1,587196	4,68
QPSK 5/6	1,654663	5,18
QPSK 8/9	1,766451	6,20
QPSK 9/10	1,788612	6,42
8PSK 3/5	1,779991	5,50
8PSK 2/3	1,980636	6,62
8PSK 3/4	2,228124	7,91
8PSK 5/6	2,478562	9,35
8PSK 8/9	2,646012	10,69
8PSK 9/10	2,679207	10,98
16APSK 2/3	2,637201	8,97
16APSK 3/4	2,966728	10,21
16APSK 4/5	3,165623	11,03
16APSK 5/6	3,300184	11,61
16APSK 8/9	3,523143	12,89
16APSK 9/10	3,567342	13,13
32APSK 3/4	3,703295	12,73
32APSK 4/5	3,951571	13,64
32APSK 5/6	4,119540	14,28
32APSK 8/9	4,397854	15,69
32APSK 9/10	4,453027	16,05

NOTE: Given the system spectral efficiency η_{tot} the ratio between the energy per information bit and single sided noise power spectral density $E_b/N_0 = E_s/N_0 - 10\log_{10}(\eta_{tot})$

Table 13: Es/No performance at Quasi Error Free PER = 10-7(AWGN channel)

Spectral efficiencies (per unit symbol rate) are computed for normal FECFRAME length and no pilots.

✎ **NOTE: This section is reference from Table 13 in ETSI EN 302 307 v1.1.1 (2005-03)**

End Of Document