ProView™ PVR 6000 Series

Professional Integrated Receiver Decoders

Version 4.1

Part Number: MAN-PVR6000-4.1
Revision A

File ProView™ PVR 6000 User Rev 4.1

INTRODUCTION

Harmonic Inc. takes great pride in delivery of its products and makes every endeavor to ensure its clients full satisfaction.

On behalf of the whole Harmonic team, we would like to extend our congratulations on your investment in the ProView™ PVR 6000 series of Professional Integrated Receiver Decoders.

MANUAL SCOPE AND STRUCTURE

The ProView™ PVR 6000 series Professional Integrated Receiver Decoders user manual is comprised of the following main sections:

1. OVERVIEW:

This section provides the introduction and product description, including: highlights, benefits and typical applications, a functional and physical description of the unit, and its main capabilities and specifications.

2. INSTALLATION:

This section provides information and procedures required to install and activate the unit. The procedures include: site preparation and requirements, installation in a 19" rack, cable connections, rear panel options and pin-out descriptions, initial settings, and serviceability check.

3. OPERATION:

This section provides information on the operation of the unit, as well as data and instructions on using the unit and operating the control and monitoring functions.

4. APPENDIXES

This section provides information on software loading and downloading.

TECHNICAL SUPPORT

In case of technical problems with the IRD or one of its components, refer to the System Documentation. Usually, this may assist you to resolve most technical difficulties.

Call your local distributor for technical support should you be unable to resolve the problem.

HOW TO RETURN FAULTY PARTS

Before Returning An Item:

- Request an RMA (Return Merchandise Authorization) Tracking Number from your local distributor.
- Harmonic Support will assign an RMA Tracking Number; this must accompany the item being returned and will be referred to in all correspondence.
- Send the item to Harmonic with the RMA Number included in the accompanying documentation (shipping and customs forms).

Customer Support Contact Information

Harmonic Inc.

549 Baltic Way
Sunnyvale, California 94089
+1.408.542.2500
USA +1.800.788.1330
FAX +1.408.542.2510
http://www.harmonicinc.com
Email: support@harmonicinc.com

Warranty

Harmonic warrants that the hardware (a tangible device or component thereof, including any embedded code or firmware required for such device to function on a stand-alone basis), purchased under Harmonic's sales terms and conditions will be free from defects of material and workmanship under normal use and service as follows: (i) For a period of one (1) year following shipment by Harmonic, Harmonic will supply, at no charge and at Harmonic's option, either new or refurbished replacement parts for defect parts of the products or new or refurbished products to replace defective products; and (ii) For a period of one (1) year following shipment by Harmonic, Harmonic will pay the labour charges incurred by Harmonic to repair defective products. You are responsible for any labour charges incurred following such one (1) year period.

This warranty will not apply to any products which have been repaired or altered other than by Harmonic, your failure to meet environmental specifications, or products which have been subjected to misuse, negligence, accident, unusual physical or electrical stress, or other causes other than the normal and intended use of the products.

THE WARRANTY FOR THE PRODUCTS AS SET FORTH HEREIN IS IN LIEU OF, AND HARMONIC HEREBY DISCLAIMS, ALL OTHER WARRANTIES EXPRESSED, STATUTORY OR IMPLIED, WHETHER ORAL OR WRITTEN, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

COMPLIANCE	EMC	SAFETY
	EN55022 (CISPR 22)	EN60950
	EN55024 (CISPR 24)	CB (IEC60950)
	EN55013 (CISPR 13)	UL60950
	EN55020 (CISPR 20)	cTUVus
	FCC part 15 (class B)	
	CB	

CE Certification

The ProView™ PVR 6000 meets all the CE Class A requirements.
In order to meet CE requirements, appropriate cables must be connected on all ASI outputs (when applicable). When cables are connected to these outputs then the device is compliant with the use of FAIR-RITE 0443164151.

FCC Compliance Notice

Trade Name	Harmonic
Product Name	Integrated Receiver Decoder
Product Model Number	ProView™ PVR 6000 Series

These devices comply with Part 15 of the FCC Rules.

OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

These devices may not cause harmful interference.

These devices must accept any interference received, including interference that may cause undesired operation.

The FCC Wants You to Know

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 instructions, 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 expense.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

WEEE / RoHS Compliance Policy

Harmonic Inc. intends to fully comply with the European Union's Directive 2002/96/EC as amended by Directive 2003/108/EC, on Waste Electrical and Electronic Equipment, also known as "WEEE," and Directive 2002/95/EC, as amended, on the Restriction of use of Hazardous Substances, also known as "RoHS."

Harmonic will ensure that product which cannot be re-used will be recycled in compliance with the WEEE Directive. To that end, users are advised that (1) Harmonic equipment is not to be discarded in household or office garbage, (2) Harmonic Inc. will pay the freight for shipment of equipment to be disposed of if it is returned to Harmonic, (3) customers should call the normal RMA telephone numbers to arrange for such shipment, and (4) customers may consult the Harmonic website (http://harmonicinc.com/ah_weee_recycle.cfm) for additional and updated information on this process.

Harmonic will ensure that its products will either be re-used or recycled in compliance with the WEEE Directive. For the latest information concerning Harmonic's WEEE/RoHS Compliance Policy and its Recycling and Take-Back process, please visit our website.

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Chapter 1.
OVERVIEW

1.1. GENERAL INFORMATION

The PVR 6000 professional MPEG-2 DVB and ATSC processing platform is designed to meet even the most demanding application requirements while maximizing ease of use and flexibility. With a graphical front-panel display, the ProView™ PVR 6000 includes:

- Variety of Telco and cable front-end options
- MPEG-over-IP inputs
- MPEG-over-IP output
- ASI transport-stream input
- SNMP and web based management support

The ProView™ PVR 6000 concurrently decodes up to two video programs from the transport stream.

The ProView™ PVR 6000 features the following product lines:

- **PVR 6000-6030**: Professional single 4:2:0 decoder IRD
- **PVR 6040-6050**: Professional single 4:2:0/4:2:2 decoder IRD
- **PVR 6060-6080**: Professional dual 4:2:0 decoders PVR 6000

Housed in a true 1RU slim-line chassis and featuring low power consumption, the PVR 6000 fully integrates with the Harmonic Inc. product platform.

1.2. HIGHLIGHTS AND BENEFITS

The processing platform's main features and options include:

- Variety of front-end options including DVB-S, DVB-S2, DVB-DSNG, G.703, MPEG-over-IP and DS3-ATM
- DVB-S2 professional
- MPEG-over-IP (MPEGoIP) inputs supporting up to 44Mbps (SPTS and MPTS)
    - Configurable De-Jitter delay
    - Physical Link Redundancy
    - Logical Source Redundancy
    - FEC (Forward Error Correction) ProMPEG CoP3v2
- MPEGoIP output supporting up to 60Mbps
- IP-over-MPEG output up to 60 Mbps (MPE decapsulation)
- 1 or 2 L-Band inputs
- ASI transport stream input and output
- Service and PID Filtering over the ASI and IP outputs (dynamic and static modes)
- DVB common interface (2 slots – 1 active simultaneously)
- SDI, AES/EBU and analogue outputs
- Up to 4 pairs of audio outputs supporting:
    - Musicam
    - Dolby Digital® AC-3 Pass-Through
    - Dolby Digital® AC-3 2.0 Down Mixing
    - Linear PCM Audio and Dolby-E Pass-Through (up to 3 outputs)
- Embedded audio in SDI and re-insertion of VBI
- VBI re-insertion in composite and SDI
- Genlock for high-end accurate frame synchronization
- Redundancy support, 2 GPI Dry Contact relays with separate control
- OSD (On-Screen Display) subtitling
- Various of management interfaces: Graphical front-panel, user-friendly Web-Interface, command-line-interface (CLI) and SNMP
- SW permission mechanism enables future upgrade

1.3. APPLICATIONS

The PVR 6000 processing platform is a technologically advanced choice for a wide range of applications. Some typical uses for the include:

- Digital turnaround
- CATV IP head-end receiver/decoder
- CATV IP distribution edge decoder
- Satellite distribution
- Telco distribution
- DSNG
- Syndication

Harmonic Inc. offers this series of professional IRDs in a wide range of standard configurations, with the flexibility to select specific interfaces and applicable required features.

1.4. FUNCTIONALITY

The TS Router block receives input streams from an available source, for example: L-Band, MPEG-over-IP IN and ASI IN. Then the block routes the selected input to the Master and Slave decoders. Each decoder decodes one program from the input stream, routed by the TS router block, and provides decoded digital audio and video streams. These streams are provided to the Video Router block that routes them to the relevant outputs as well as to the analog video output. The Analog Video Output receives a digital video, converts the digital video into analog video, and outputs the analog video. The analog and digital audio output component outputs the digital and analog audio.

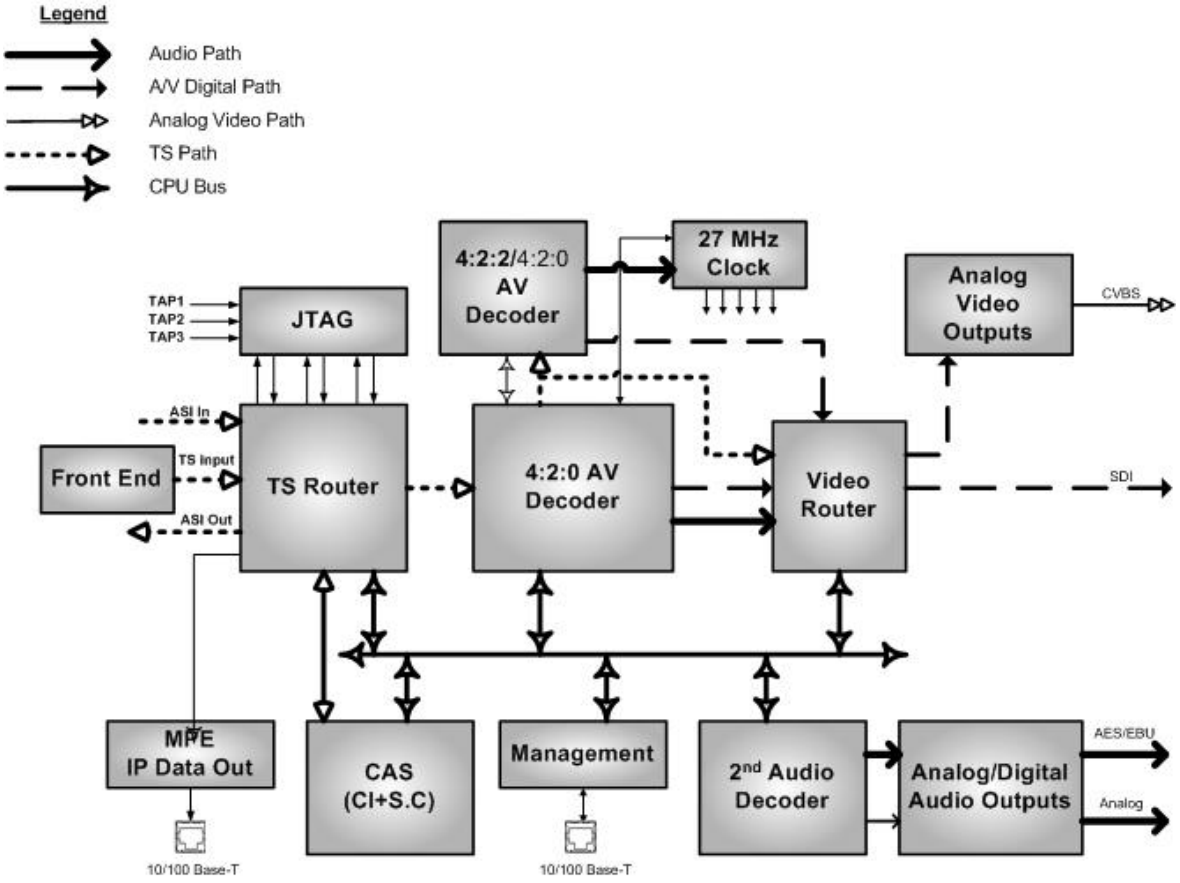


Figure 1-1: Signal Path in the PVR 6000 – Functionality Block Diagram

1.5. MECHANICAL STRUCTURE

The PVR 6000 is housed in a rugged industrial enclosure, 1RU by 19" (rack mount).

Figure 1-2: PVR 6000 Unit

1.5.1. Front Panel

The front panel allows control using a four-way touch pad, **[Enter]** key, **[Esc]** key, and two programmable **[F1]**/**[F2]** keys. Operational commands and parameters are displayed on a graphical LCD. The four-way touch pad allows parameter modification and scrolling through the embedded VBI menus. Two LEDs show the WARNING and PWR/FAIL status (see Figure 1-3).

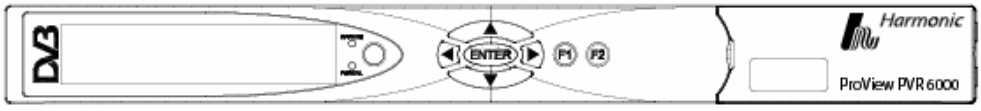


Figure 1-3: Front View of the IRD

1.5.2. Various Front-Ends

PVR 6000 supports the following interfaces:

- DVB-S Single L-Band input
- DVB-S Dual L-Band input
- DVB-DSNG Dual L-Band input
- DVB-S2 Dual L-Band input
- MPEG over IP (MPEGoIP) dual input
- G.703 E3 single input with Loop-through
- ASI-In Decoder only (except for PVR 6000)

In this manual all rear panels are displayed with the DVB-S interface. Each model has standard features and interfaces as well as features requiring active software licenses.
The MPEGoIP input interface can be supported by all PVR 6000 devices. Figure 1-4 illustrates the PVR 6010 rear panel with an MPEGoIP input interface.

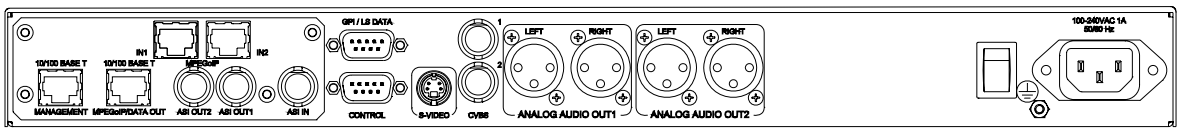


Figure 1-4: PVR 6010 Rear Panel (IP Input interface)

Figure 1-5 illustrates the PVR 6010 rear panel with **DVB-S (QPSK) Dual Input** configuration.

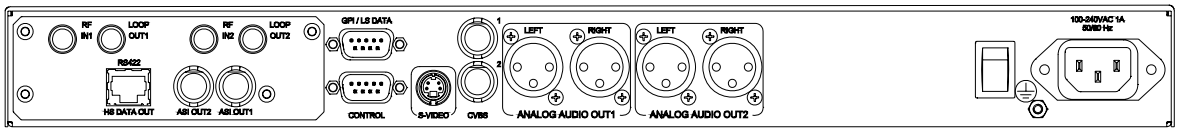


Figure 1-5: PVR 6010 Rear Panel (DVB-S Dual Input interface)

Figure 1-6 displays the PVR 6010 rear panel with **Decoder Only** configuration.

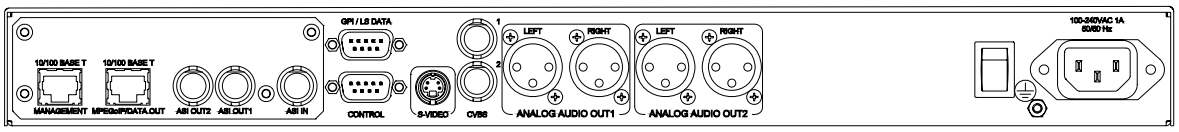


Figure 1-6: PVR 6010 Rear Panel (Decoder Only interface)

NOTE

*PVR 6000 models supporting **MPEGoIP** output and **IP data out** (MPE de-capsulation) output can be configured to support either **MPEGoIP** or **IP data out**.*

1.5.3. Software Permission (Licensing)

Each PVR 6000 model is provided with a basic feature package. In order to suit specific requirements, additional license-permitted features are available. The Next chapter specifies the basic and optional features available for each model.
In order to enable optional features perform one of the following:

- **Upon unit ordering** - order the relevant features. The unit will be provided with the ordered features enabled.
- **After unit ordering** - order the relevant features. In this case, a 16 character **key** issued by Harmonic Inc. will be provided. The key must be entered to the unit thru the front-panel or the web-interface. For details see section 4.2.10.5

NOTE

***When RS-232 low-speed-data** and/or **RS-422 high-speed-data** are enabled the **PID Filtering** is unavailable.*

1.5.4. PVR 6000 models

1.5.4.1. PVR 6000 Interfaces and Features

The PVR 6000 is a single 4:2:0 Decoder IRD. The PVR 6000 devices consist of two composite video interfaces. The CVBS #1 connector is used for broadcasting quality video and the CVBS #2 connector is used for monitoring.
Figure 1-7 illustrates the PVR 6000 rear panel. The PVR 6000 basic features and software-licensed features are also detailed.

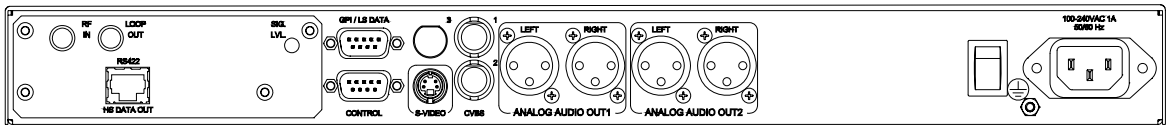


Figure 1-7: PVR 6000 Rear Panel (Standard)

Basic Features

- 1 composite video - Broadcast quality (upper connector)
- 1 composite video - Monitoring quality (lower connector)
- 2 active analog – audio - stereo balanced interfaces
- GPI

Software-Licensed Features

- Dolby digital (AC-3) LT/RT downmixing
- RS-232 low speed data output
- RS-422 high speed data output

NOTES

The PVR 6000 does not support the Decoder Only configuration.
The Russian SECAM D/K (composite video only) is available only through Special orders.

1.5.4.2. PVR 6010 Interfaces and Features

The PVR 6010 is a single 4:2:0 decoder IRD. The PVR 6010 family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector is used for monitoring.
Figure 1-8 illustrates the PVR 6010rear panel. The PVR 6010basic features and software-licensed features are also detailed.

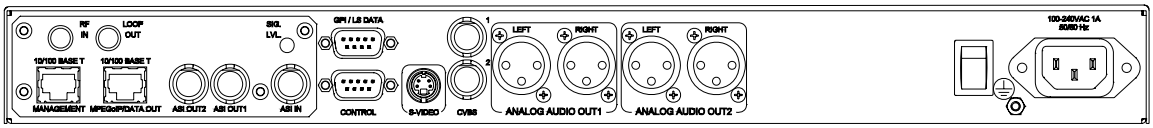


Figure 1-8: PVR 6010Rear Panel

Basic Features

- 1 composite video - Broadcast quality (upper connector)
- 1 composite video - Monitoring quality (lower connector)
- 2 active analog – audio - stereo balanced interfaces
- SNMP management (10/100 Base-T)
- Web based management (10/100Base-T)
- GPI

Software-Licensed Features

- ASI Input
- Dual (identical) ASI outputs
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- Dolby Digital (AC-3) LT/RT downmixing
- Genlock input and loop-through output
- Pro MPEG FEC
- IP Dual input (link and source redundancy
- PID and service filtering
- RS-232 low speed data output

NOTES

In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.
The Russian SECAM D/K (composite video only) is available only through special orders.

1.5.4.3. PVR 6020 Interfaces and Features

The PVR 6020 is a single 4:2:0 decoder. The entire PVR 6020 family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector can is for monitoring.
Figure 1-9 illustrates the PVR 6020 rear panel. The PVR 6020 basic features and software-licensed features are also detailed.

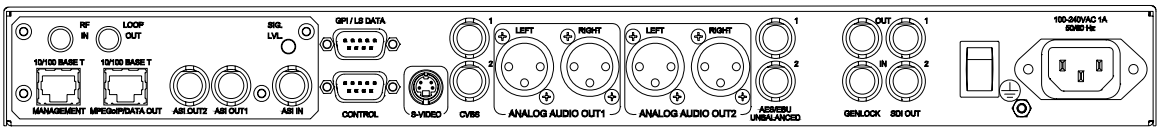


Figure 1-9: PVR 6020 Rear Panel

Basic Features

- 1 composite video - Broadcast quality (upper connector)
- 1 composite video - Monitoring quality (lower connector)
- 2 SDI interfaces
- Embedded VBI and up to 2 stereo channels in SDI
- 2 activated analog-audio-stereo balanced interfaces
- 2 activated AES/EBU-SPDIF audio-unbalanced interfaces
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- GPI
- Front panel A/V monitoring connectors

Software-Licensed Features

- ASI Input
- Dual (identical) ASI outputs
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing.
- Pro MPEG FEC
- PID and service filtering
- H.264 (One Program Only)
- RS-232 low speed data output

NOTE

In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.

1.5.4.4. PVR 6030 Interfaces and Features

The PVR 6030 is a single 4:2:0 decoder. The entire PVR 6030 family consists of two composite video interfaces. The CVBS #1 connector is used for broadcast quality video and the CVBS #2 connector is used for monitoring.
Figure 1-10 illustrates the PVR 6030 rear panel. The PVR 6030 basic features and software-licensed features are described below.

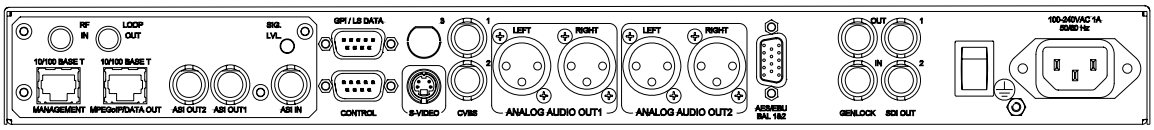


Figure 1-10: PVR 6030 Rear Panel

Basic Features

- 1 composite video - Broadcast quality (upper connector)
- 1 composite video - Monitoring quality (lower connector)
- 2 SDI interfaces
- Embedded VBI and up to 2 stereo channels in SDI
- 2 active analog-audio-stereo balanced interfaces
- 2 active AES/EBU-SPDIF audio-balanced interfaces
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- GPI
- Front panel A/V monitoring connectors

Software-Licensed Features

- ASI input
- Dual (identical) ASI output
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing
- Pro MPEG FEC
- IP Dual input (link and source redundancy
- PID and service filtering
- RS-232 low speed data output

NOTES

This model requires a breakout cable to connect to the AES/EBU interfaces.
In case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000

1.5.4.5. PVR 6040 Interfaces and Features

The PVR 6040 is a single 4:2:0/4:2:2 decoder. The PVR-6040 family consists of two composite video interfaces. Both CVBS #1 and CVBS #2 connectors are for broadcast quality video.

Figure 1-11 illustrates the PVR 6040 rear panel. The PVR 6040 basic and software-licensed features are also detailed.

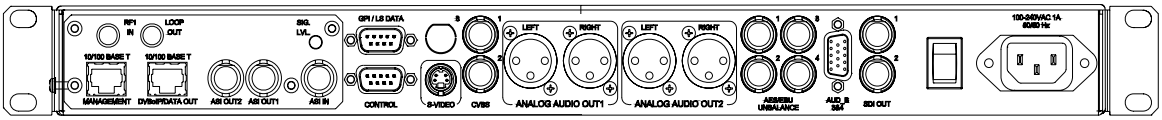


Figure 1-11: PVR 6040 Rear Panel

Basic Features

- 2 composite video interfaces – Broadcast quality
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- Decoding 4:2:2 PP@ML (1.5–50 Mbps)
- 2 out of 4 active analog-audio-stereo balanced interfaces
- 2 out of 4 active AES/EBU-SPDIF audio unbalanced interfaces
- 1ST and 2ND active AES/EBU-SPDIF
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- GPI
- Front panel A/V monitoring connectors

Software-Licensed Features

- ASI input
- Dual (identical) ASI output
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- 3RD Active analog stereo pair
- 4TH Active analog stereo pair
- 3RD Active AES/EBU-SPDIF
- 4TH Active AES/EBU-SPDIF
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E pass-through
- Pro MPEG FEC
- IP Dual input (link and source redundancy
- PID and service filtering
- RS-232 low speed data output

NOTES

This model requires a breakout cable to connect to the 3rd and 4th analog stereo pairs.
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.

1.5.4.6. PVR 6050 Interfaces and Features

The PVR 6050 is a single 4:2:2 decoder. The PVR-6050 family consists of two composite video interfaces. Both CVBS interfaces are for service broadcast video quality.
Figure 1-12 illustrates the PVR 6050 rear panel. The PVR 6050 basic and software-licensed features are also detailed.

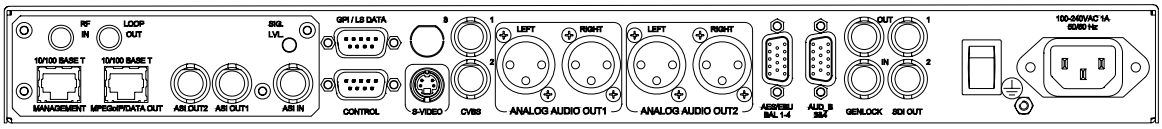


Figure 1-12: PVR 6050 Rear Panel

Basic Features

- 2 composite video interfaces – Broadcast quality
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- Decoding 4:2:2 PP@ML (1.5–50 Mbps)
- 2 out of 4 active analog-audio-stereo balanced interfaces
- 2 out of 4 active AES/EBU-SPDIF audio-balanced interfaces
- Genlock input and loop-through output
- SNMP management (10/100 Base-T)

Software-Licensed Features

- ASI input
- Dual (identical) ASI output
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- 3rd Active analog stereo pair
- 4th Active analog stereo pair
- 3rd Active AES/EBU-SPDIF
- 4th Active AES/EBU-SPDIF
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E pass-through

- Web-based management (10/100 Base-T)
- GPI
- Front panel A/V monitoring connectors
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing.
- Pro MPEG FEC
- PID and service filtering
- H.264 (One Program Only)
- RS-232 low speed data output

NOTES

This model requires a breakout cable to connect to the AES/EBU interfaces and to connect to the 3rd and 4th analog stereo pairs.
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.

1.5.4.7. PVR 6060 Interfaces and Features

The PVR 6060 is a dual 4:2:0 decoder. The PVR-6060 family consists of three composite video interfaces. The CVBS #1 connector is for the broadcast quality video of decoder #1. The CVBS #2 is used for monitoring. The CVBS #3 connector is for the broadcast quality video of decoder #2.
Figure 1-13 illustrates the PVR 6060 rear panel. The PVR 6060 basic and software-licensed features are also detailed.

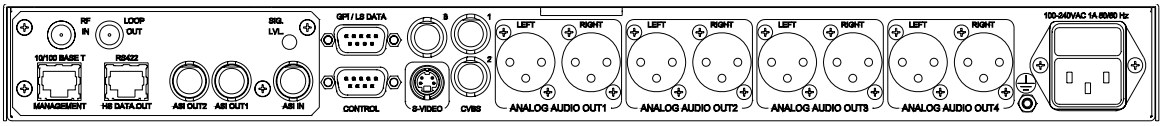


Figure 1-13: PVR 6060 Rear Panel

Basic Features

- 1 composite video for program 1- Broadcast quality (upper-right connector)
- 1 composite video for program 2 - Broadcast quality (upper-left connector)
- 1 composite video for program 1- Monitoring quality (lower connector)
- 4 active analog-audio-stereo balanced interfaces
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- RS-422 high speed data output
- GPI

Software Licensed Features

- ASI input
- Dual (identical) ASI output
- Dolby Digital (AC-3) LT/RT downmixing
- H.264 (One program only)
- RS-232 low speed data output
- RS-422 high speed data output

NOTE

In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.
The Russian SECAM D/K (composite video only) is available only through special orders.

1.5.4.8. PVR 6070 Interfaces and Features

The PVR 6070 is a dual 4:2:0 decoder. The PVR-6070 family consists of three composite video interfaces. The CVBS #1 connector is for the broadcast quality video of decoder #1. The CVBS #2 is used for monitoring. The CVBS #3 connector is for broadcast quality video of decoder #2.
Figure 1-13 illustrates the PVR 6070 rear panel. The PVR 6070 basic features and software-licensed features are also detailed.

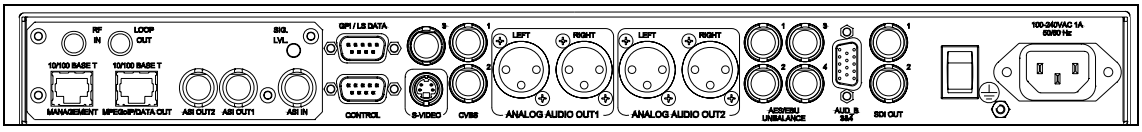


Figure 1-14: PVR 6070 Rear Panel

Basic Features

- 3 composite video interfaces (2 for broadcast, 1 for monitoring)
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- 4 active analog-audio-stereo balanced interfaces
- 4 active AES/EBU-SPDIF audio unbalanced interface
- SNMP management (10/100 Base-T)
- Web-based management (10/100 Base-T)
- GPI

Software-Licensed Features

- ASI input
- Dual (identical) ASI output
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E pass-through.
- Pro MPEG FEC
- H.264 (One program only)
- PID and service filtering
- RS-232 low speed data output

NOTES

This model requires a breakout cable to connect to the 3rd and 4th analog stereo pairs.
In case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000.

1.5.4.9. PVR 6080 Interfaces and Features

The PVR 6080 is a dual 4:2:0 decoder. The PVR-6080 family consists of three composite video interfaces. The CVBS #1 is for service broadcast video quality. The CVBS #2 is for service monitoring and OSD video quality. The CVBS #3 is for additional service broadcast video quality.
Figure 1-15 illustrates the PVR 6080 rear panel. The PVR 6080 basic features and software-licensed features are also detailed.

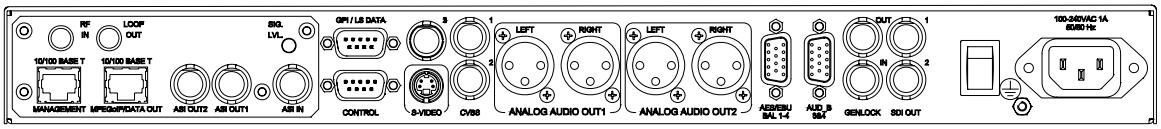


Figure 1-15: PVR 6080 Rear Panel

Basic Features

- 3 composite video interfaces (2 for broadcast, 1 for monitoring)
- 2 SDI interfaces
- Embedded VBI and up to 4 stereo channels in SDI
- 4 active analog-audio-stereo balanced interfaces
- 4 active AES/EBU-SPDIF audio balanced interfaces
- SNMP management (10/100 Bas-T)
- Web-based management (10/100 Base-T)

Software-Licensed Features

- ASI input
- Dual (identical) ASI output
- MPEG-over-IP output or IP data output (MPE de-capsulation)
- Genlock input and loop-through output
- Dolby Digital (AC-3) LT/RT downmixing
- Linear PCM (SMPTE 302M 2000), Dolby-E pass-through
- Pro MPEG FEC
- H.264 (One program only)
- PID and service filtering

- GPI
- RS-232 low speed data output

NOTES

This model requires a breakout cable to connect to the AES/EBU interfaces and to connect to the 3rd and 4th analog stereo pairs.
In the case of power failure or system shutdown, ASI OUT 1 output will become ASI loop-through. Use ASI OUT 1 output for cascading a chain of PVR 6000

1.6. MANAGEMENT

The following sections detail the different management interfaces and methods available to control the PVR 6000.

1.6.1. Local Management

The PVR 6000 supports two local management methods:

- **Front Panel Control** - The PVR 6000 front panel provides an easy to use graphical display with a large LCD screen and intuitive control.
- **PC Terminal Control -** The PVR 6000 supports PC terminal control from a standard PC terminal (over RS-232 or RS-485). The terminal provides access to control and monitor functionalities that are not available when using any PVR 6000 front panel feature.

1.6.2. Remote Management

PVR 6000 supports three remote management methods:

- **NMS-4000 and Future NMS-7000 -** The NMS-4000 Network Management System enables management of the PVR 6000 through the transmission link. The NMS-4000 provides a menu and dialog-driven interface from which control, modification, and upgrade operations can be performed on the IRD.
- **Web-Based Management -** PVR 6000 supports web-based management. Managing PVR 6000 parameters using web-based control is as easy as point-and-click.
- **Telnet -** The PVR 6000 supports remote control throughout the Internet. The PVR 6000 can be controlled and configured from a standard PC terminal (over Ethernet). The terminal provides access to control and monitor

functionalities that are not available when using any PVR 6000 front panel feature.

1.7. CHARACTERISTICS AND SPECIFICATIONS

The following section provides with the PVR 6000 Characteristics and specification.

1.7.1. Transport Stream Interface Options

FEATURE	SPECIFICATIONS
DVB-S **SINGLE INPUT**	• Interface - F-type 75Ω • Constellation - QPSK • Single L-band input • Frequency range - 950-2150 MHz • RF Input level: (-65) – (-25) dBm • Symbol rate range - 1-45M Sym/s • L-Band RF input with LNB control and loop-through output
DVB-S **DUAL INPUT**	• Interface - F-type 75Ω • Constellation - QPSK • Dual L-band input • Dual independent demodulators • Manual selection between inputs • Frequency range - 950-2150 MHz • Symbol rate range - 1-45M Sym/s • L-Band RF input with LNB control and loop-through output

FEATURE	SPECIFICATIONS
DVB-DSNG **SINGLE INPUT**	• Interface - F-type 75Ω • Constellation – QPSK, 8PSK and 16QAM • Single L-band input • Frequency range - 950-2150 MHz • Symbol rate range - 1-45M Sym/s • L-Band RF input with LNB control and loop-through output
DVB-S2 **SINGLE INPUT**	• Applications - Broadcast services and DSNG EN 302 307 • Mode - Constant Coding and Modulation (CCM) • Constellations: QPSK, 8PSK, 16APSK • FEC frames: Normal (64800 bits), short (16200 bits) • Roll-Off: 0.35, 0.25, 0.20 • Pilots – On, Off • Frequency range: 950 MHz - 2150 MHz • Symbol rate range - 64Ksym/s - 45Msym/s • TS bit rate range - 128Kbps - 107Mbps • 2 L-Band RF 75Ω inputs with LNB control

FEATURE	SPECIFICATIONS

MPEGoIP INPUT	• Two physical links - 10/100 Base-T, RJ-45 – one active at a time
	• Two logical sources (sockets) – one active at a time
	• Physical Link and logical source redundancy (coupled)
	• De-Jittering buffer size - configurable 0-2000mSec
	• TS bit rate: up to 44 Mbps
	• Encapsulation type: UDP and RTP (Automatic detection)
	• SPTS/MPTS
	• Unicast/Multicast
	• IGMPv2
	• Forward Error Correction (FEC)
	  • ProMPEG CoP3v2
	  • Maximum input bit-rate: 25Mb/s
	  • Columns only FEC protection
	  • Matrix dimensions - Columns 1-20, Rows 4-20. Columns*Rows ≤ 100 (Automatic detection)

MPEGoIP OUTPUT	• TS bit rate - up to 60 Mbps • SPTS/MPTS • Encapsulation - UDP • All programs and PIDs are present in the output TS • Interface 10/100 Base-T, RJ-45
DVB-ASI INPUT	• Interface: copper, BNC 75 ohm • TS bit rate: up to 100 Mbps (Byte and Burst mode)

FEATURE	SPECIFICATIONS

DVB-ASI OUTPUT	• 2 ASI connectors: copper, BNC 75 ohm
	• ASI options:
	  • **ASI OUT 1** - output stream with decrypted selected program, output stream and loop-through
	  • **ASI OUT 2** - output stream with decrypted selected program, output stream
	• ASI output rate - up to 100 Mbps (Byte mode)

TELECOM G.703 INPUT	• Unframed PDH Data rates::E1,E2 or E3 • FEC (optional): DVB-C FEC • Loop-through output
DVB-PDH INPUT	• Interface: ATM AAL-1 • Data rates: DS3 or E3 • Loop-through output

1.7.2. Advanced Processing

FEATURE	SPECIFICATIONS
SERVICE AND PID FILTERING	• Active on ASI and IP outputs • PCR re-stamping • VBR and CBR modes (NULL stuffing) • Forward only and filter only modes • Dynamic Service filtering (tracks PIDs' modifications) • Static PID filtering • PSI/SI tables are not modified.

FEATURE	SPECIFICATIONS
DATA	• High speed data: RS-422 Up to 20 Mbps, RJ-45 (supported by PVR 6000 , PVR 6060) • IP Data Out (RJ-45): up to 60Mbps (MPE de-capsulation)

1.7.3. Decoder Outputs

FEATURE	SPECIFICATIONS

VIDEO	• Video Formats:
	  • PAL-B/G/I/M/N/D, NTSC, SECAM L/B/G/K1
	  • Russian SECAM D/K (composite video only supported only by special order in PVR 6000 , PVR 6010and PVR 6060)
	• Decoding:
	  • 4:2:0 MP@ML (1.5 – 15 Mbps)
	  • 4:2:2 PP@ML (1.5 – 50 Mbps) (supported only in IRD298x)
	• Maximum TS decoding bit rate: 108Mbps
	• Video resolution interpolation: Pan-scan, letter box or Pass through
	• Aspect ratios: 4:3/16:9
	• Aspect ratio 14:9 by signaling over VBI video index
	• Graphical processing (OSD): DVB subtitling, EBU (Teletext) subtitling
	• OSD only through monitoring output
	• Genlock input and loop-through output (supported only by IRD2962, IRD2963, IRD2981 and IRD2992)
	• Genlock Sync lock resolution: +/- 37nSec

FEATURE	SPECIFICATIONS
FRONT PANEL MONITORING	• Video monitor output connector (Supported only by 298x) • Audio monitor output connector (Supported only by 298x)
VBI RE-INSERTION	• All VBIs adhere the relevant standards including the line numbers • In composite video and embedded SDI • WST Teletext and inverted Teletext • WSS, VPS, VITC, CC, AMOL I, AMOL II (Nielsen), TV-Guide, V-CHIP • Enhanced VITS with built-in generator
AUDIO	• Modes: stereo, joint stereo, dual channel, single channel • Analog max output level: +18 dBu @ 600Ω • Digital max output level: 0 dBFs • Attenuation control at -64 dB to 0 dB and mute • Dolby Digital (AC-3) Pass-through • Dolby Digital (AC-3) LT/RT downmixing • Linear PCM (SMPTE 302M 2000) supported over analog and digital outputs 2/3/4 (supported in IRD2980, IRD2981, IRD2991, IRD2992) • Dolby-E pass-through supported over digital outputs 2/3/4 (supported in IRD2980, IRD2981, IRD2991, IRD2992)

1.7.4. Conditional Access

FEATURE	SPECIFICATIONS
EMBEDDED DVB-DESCRAMBLING	• BISS mode-1 • BISS-E • CAS-5000
DVB-CI	• Interface – 2 CI slots EN-50221 (Only 1 active simultaneously) • Maximum of decrypted programs - 1 for single decoder, and 2 for dual decoder (in case the specific CAM supports it). • Maximum TS bitrate – 72 Mbps • CA methods: Multicrypt, Simulcrypt • CASs: Viaccess®, Irdeto®, Conax®, MediaGuard®, Nagravision®, Cryptoworks®, VideoGuard®, OnDigital®, CODICrypt®

1.7.5. Control and Monitoring

FEATURE	SPECIFICATIONS
LOCAL	• Graphical easy-to-use front panel • Advanced satellite scanning (CLI support only) • Operates in service and PID modes • 2 GPI dry contacts for various status and fault indications
ENHANCED DVB MONITORING	• Front panel display: signal quality, Eb/N0, BER, ASI format, network and service information, CA information, CI slots, video and audio decoded information

REMOTE	• SNMP management • Web-based management • Telnet • Terminal via RS-232 or RS-485 • Software download
OVER THE AIR	• Software download

1.7.6. Compliance

FEATURE	SPECIFICATIONS
EMC	• EN55013 (CISPR 13) • EN55020 (CISPR 20) • EN55022 (CISPR 22) • EN55024 (CISPR 24) • FCC part 15 (Class B)
SAFETY	• EN60950 • CB (IEC60950) • UL60950 • cTUVus

1.7.7. Environmental Conditions

FEATURE	SPECIFICATIONS
OPERATION	• Temperature - 0°C - 50°C • Humidity - 5% - 90% (non-condensing)
STORAGE AND TRANSPORTATION	• Temperature - -40°C - 70°C • Humidity - 0% - 95% (non-condensing)

1.7.8. Physical and Power Specifications

FEATURE	SPECIFICATIONS
PHYSICAL	• 1RU unit, 19'' rack mountable • Dimensions (HxWxD) – 1RU X 19" X 14"/44mm X 482.6mm X 357mm • Weight – 3.5Kg. (7.7lbs).
POWER	• Voltage: • 100 - 240V AC, 50/60Hz • Power consumption – up to 50w max

Chapter 2.
INSTALLATION

This section details the safety precautions and inventory check when installing the ProView™ PVR 6000.

2.1. SAFETY PRECAUTIONS

To avoid injury and prevent equipment damage, observe the following safety precautions:

- Do not move or ship equipment unless it is correctly packaged in its original wrapping and shipping containers.
- Only Harmonic Inc. trained personnel can perform service and maintenance.
- To prevent lightning damage, ground the unit according to local regulations.
- Do not permit unqualified personnel to operate the unit.

2.2. INVENTORY CHECK

⚠ ***CAUTION***

IF ANYTHING IS MISSING OR DAMAGED, DO NOT CONTINUE WITH THE INSTALLATION. SEE THE PROCEDURES IN THE FRONT OF THIS MANUAL FOR HARMONIC INC. SUPPORT INFORMATION.

Before installing the unit, ensure that all the equipment has arrived and check for damage according to the following list:

ITEM	QUANTITY
PVR 6000 Professional Integrated Receiver Decoder	1
Power cable	1
User manual, PVR 6000 Professional Integrated Receiver Decoder	1
Breakout cable if applicable	1/2

2.3. INSTALLATION INSTRUCTIONS

This section explains the mechanical installation of the rack and PVR 6000 device.

2.3.1. Site Preparation

When installing the PVR 6000 in a standard 19" rack, verify that the rack is fully prepared for the installation. To facilitate easy access during installation and maintenance, leave sufficient space behind the rack.
The PVR 6000 must be installed within 1.5m (5 feet) from an easily accessible grounded AC outlet, capable of furnishing the required supply voltage as detailed in Section 2.5.1.
The use of a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulation) is highly recommended to ensure uninterrupted operation.
Ensure that a qualified electrician has installed the main power supply in accordance with local power authority regulations. All powering should be wired with an earth leakage in accordance with local regulations.

WARNING

TO AVOID ELECTROCUTION ENSURE THAT THE RACK HAS BEEN CORRECTLY GROUNDED BEFORE SWITCHING ON THE PVR 6000 DEVICE. WHEN REMOVING THE UNIT, REMOVE THE GROUNDED CONNECTION ONLY AFTER THE UNIT IS SWITCHED OFF AND UNPLUGGED.

2.3.2. Mechanical Rack Installation

Due to its considerable weight, the device must be placed on a pair of rack-slides, specially designed for this product (see Figure 2-1).

CAUTION

THE RACK-SLIDES MUST BE INSTALLED IN THE DEVICE'S DESIGNATED LOCATION WITHIN THE RACK, SINCE THEY ARE INTENDED TO CARRY THE DEVICE'S WEIGHT. DO NOT RELY ONLY ON THE DEVICE'S MOUNTING BRACKETS FOR SUPPORTING THE DEVICE'S WEIGHT. DOING SO MAY RESULT IN DAMAGE TO THE RACK, DEVICE, AND OTHER MOUNTED DEVICES.

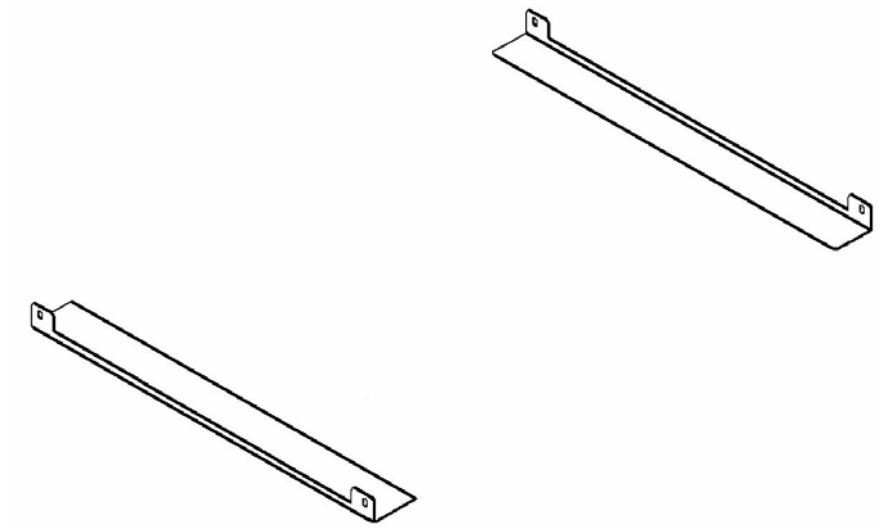


Figure 2-1: Pair of Rack Slides

Slide structure is especially designed to ensure proper ventilation of these products, as it is consistent with the ventilation scheme of all Harmonic Inc. rack-mount devices.

⚠ *CAUTION*

USING RACK-SLIDES THAT ARE NOT SPECIALLY DESIGNED FOR HARMONIC INC. RACK-MOUNT DEVICES MAY RESULT IN OVERHEATING AND DAMAGE TO ONE OR MORE MOUNTED DEVICES.

Figure 2-5 illustrates the exact measurements of special rack-slides.

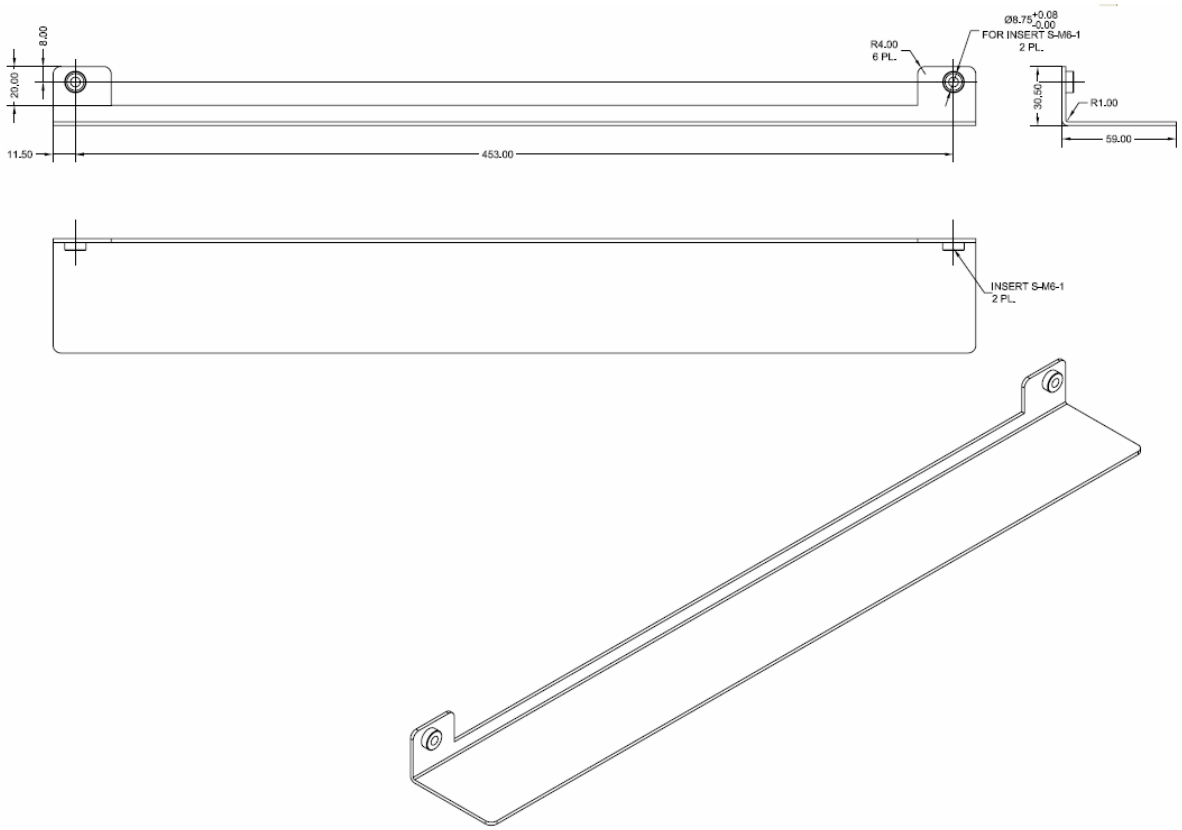


Figure 2-2: Rack Slide Measurement Specifications

Fasten the pair of rack slides to the rack's side rails in the device's designated location with four M6 screws (two on each side of the rack) before continuing.
After tightly fastening the supporting rack-slides to the rack, perform the following steps to install the device within the rack:

1. Lay the device on the rack-slides in its designated location within the rack. Figure 2-3 is a see-through illustration, demonstrating the placing of the device on the rack-slides.

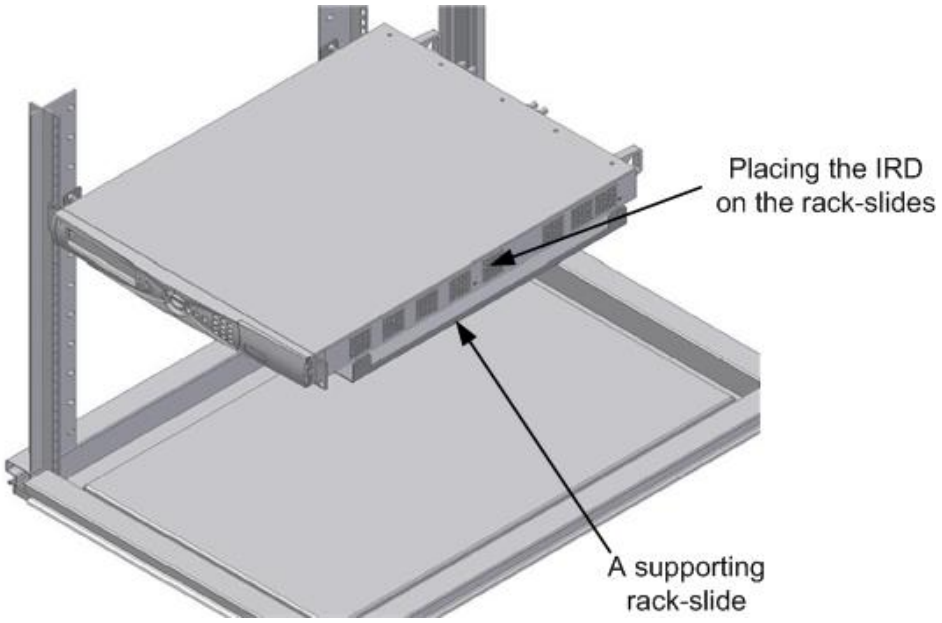


Figure 2-3: Laying the Device on the Rack-Slides

2. The device is supplied with two mounting brackets (see Figure 2-4). The mounting brackets are clipped to the device chassis on both sides before leaving the factory. Align the mounting brackets' holes with the relevant holes in the rack's side rails.

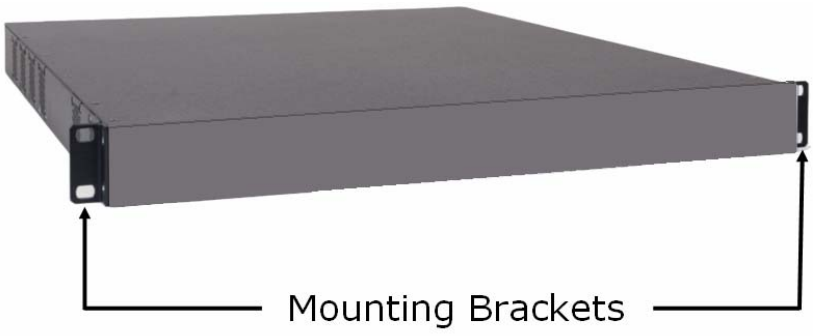


Figure 2-4: Clipped Mounting Brackets

3. Fasten the mounting brackets to the side-rails with four screws (two on each side). The device is now safely installed within the rack.

Figure 2-5 illustrates a general view of the device, when installed within the 19'' rack.

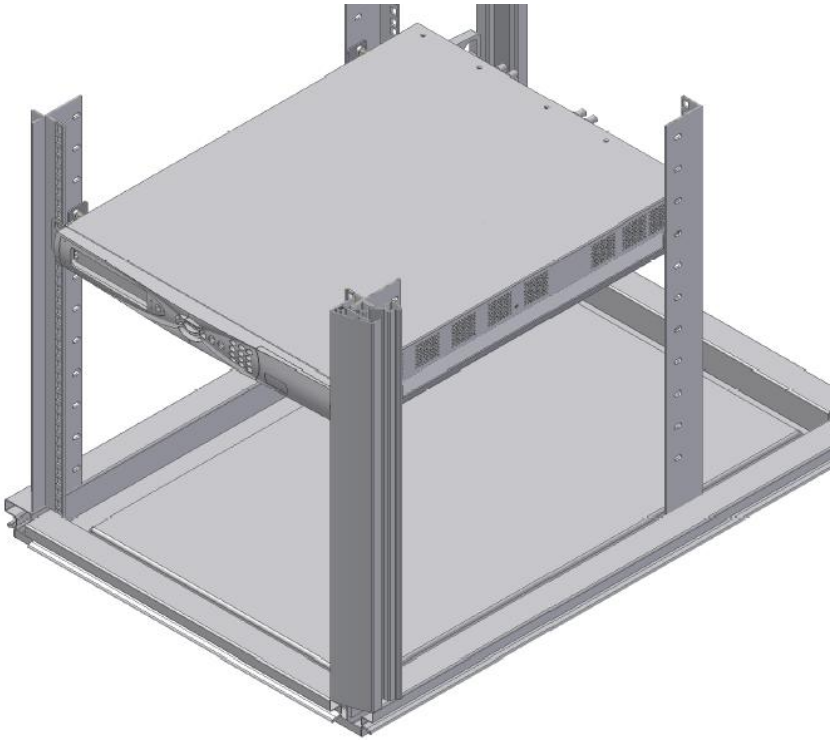


Figure 2-5: Device Mounted on a Pair of Rack-Slides

A single pair of rack-slides can carry up to 50Kg (110 lbs). This allows saving rack space by placing a number of rack-mount devices one upon the other (be careful not to exceed the specified maximum weight).

WARNING

DO NOT APPLY OVER 50KG (110LBS) OF WEIGHT ON A SINGLE PAIR OF RACK-SLIDES. DOING SO MAY RESULT IN COLLAPSING OF THE RACK-SLIDES, SERIOUS INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

Figure 2-6 illustrates multiple devices when rack-mounted on a single pair of rack-slides.

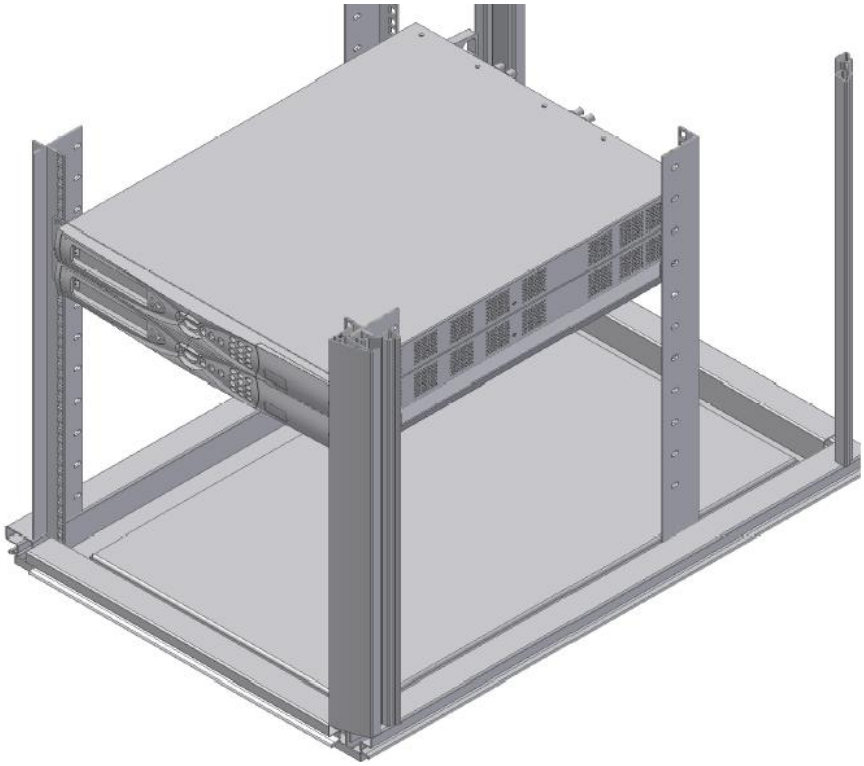


Figure 2-6: Multiple Devices Mounted on a Single Pair of Rack-Slides

2.3.3. Insertion of the DVB-CI Module (PCMCIA)

⚠ ***CAUTION***

DO NOT REMOVE OR INSERT THE DVB-CI MODULE OR THE SMART CARD WHILE THE PVR 6000 IS POWERING UP OR INITIALIZING.

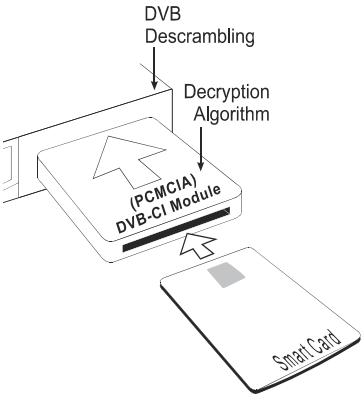


Figure 2-7: DVB-CI Module

Figure 2-7 illustrates the PVR 6000 with the DVB-CI module (PCMCIA card) and the Smart Card used to decrypt the incoming signal. The PVR 6000 is provided with two PCMCIA slots for up to two DVB-CI modules. The PCMCIA should be firmly inserted into one of the two provided slots to ensure contact. Each DVB-CI module accommodates one Smart Card, inserted with the UP mark pointing upwards and forward.

When installed, the card is detected automatically by the PVR 6000 and enabled if the three following conditions are valid:

- The installed card must be EN50221 compatible
- Services have been selected at **TV1**/**TV2** (for further information see section 4.2.5.1)
- Using a valid card licensing

2.4. CABLE CONNECTION

The PVR 6000 provides all the connections on its rear panel.
The rear panel is comprised of audio outputs, video outputs, data outputs, and control interfaces (see Table 2-1 for cable connection specifications).
Figure 2-8illustrates the PVR 6080 rear panel in order show connector types.

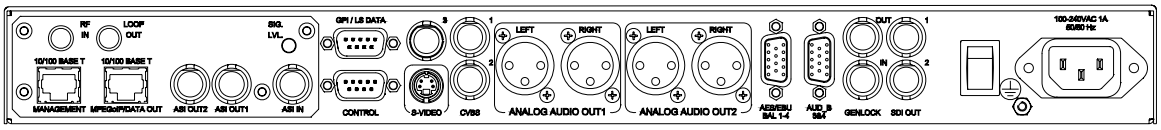


Figure 2-8: PVR 6080 Rear Panel

Table 2-1: PVR 6000 Rear Panel – Connectors and Cables

INTERFACE	CONNECTOR TYPE	CABLE TYPE
L-Band Front-end RF IN	75 Ω F-Type	RG-6
L-Band Front-end Loop-Through Connector	75 Ω F-Type	RG-6
MPEGoIP Input	RJ-45	FTP Cat 5
Management	RJ-45	FTP Cat 5
MPEGoIP/DATA Output	RJ-45	FTP Cat 5
Analog Audio Out1 left	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out1 right	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out2 left	600 Ω XLR (balanced)	Shielded audio cable
Analog Audio Out2 right	600 Ω XLR (balanced)	Shielded audio cable
Video Out, S-Video Y/C	75 Ω DIN connector	Super video cable
Composite Video Out, CVBS1	75 Ω BNC	RG-59 RG11 A/U (recommended)
Composite Video Out, CVBS2	75 Ω BNC	RG-59 RG11 A/U (recommended)
Composite Video Out, CVBS3	75 Ω BNC	RG-59 RG11 A/U (recommended)

Table 2-1: PVR 6000 Rear Panel – Connectors and Cables

INTERFACE	CONNECTOR TYPE	CABLE TYPE
Data Output (RS-232/RS-422)	9 PIN D-Type	Serial Cable
Control (RS-232/RS-485)	9 PIN D-Type	Serial Cable
Audio Balanced 3 & 4	600 Ω D-sub 15p to 4XLR	Breakout Cable 204346 (Harmonic Inc. material)
AES/EBU 1-4 Unbalanced	75 Ω 4xBNC or 75 Ω D-sub 15p	BNC Cable
ASI in/out1/out2	75 Ω BNC	RG-59 RG11 A/U (recommended)
Genlock In	75 Ω BNC	RG-59 RG11 A/U (recommended)
Genlock Out	75 Ω BNC	RG-59 RG11 A/U (recommended)
SDI out 1 &2	75 Ω BNC	RG-59

The ProView™ PVR 6000 supports terminal-control from a standard PC through a serial RS-232/RS-485 connector.
Figure 2-9 illustrates the Control Interface and Low Speed Data/GPI 9-pin male connectors pin numbering.

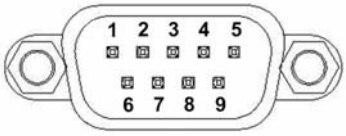


Figure 2-9: 9-Pin Male Connector Pin Numbering

Table 2-2 lists the RS-232/RS-485 Control Interface connector pin-out.

Table 2-2: RS-232/RS-485 Control Connector Pin-Out

PIN	FUNCTION	PIN	FUNCTION
1	RS-232 CD/RS-485 TX (+)	6	RS-232 DSR/RS-485 TX (-)
2	RS-232 RxD	7	RS-232 RTS
3	RS-232 TxD	8	RS-232 CTS/RS-485 RX (+)
4	RS-232 DTR	9	RS-232 Ring/RS-485 RX (-)
5	Common		

Table 2-3 lists the RS-232 low speed data and GPI interface pin-out. This connector is used at the same time for both GPI and low-speed data output.

Table 2-3: RS-232 Low Speed Data and GPI Pin-Out

PIN	FUNCTION	PIN	FUNCTION
1	GPI1 NC	6	GPI1 Common
2	RxD	7	GPI1 NO
3	TxD	8	GPI2 NC
4	GPI2 Common	9	GPI2 NO
5	Common		

Table 2-4lists the RS-422 high speed data and interface pin-out.

Table 2-4: RS-422 High Speed Data Pin-Out

PIN	FUNCTION	PIN	FUNCTION
3	Enable (-)	6	Enable (+)
4	Data (-)	7	Clock (-)
5	Data (+)	8	Clock (+)

Table 2-5 lists the Audio 3-4 breakout cable interface pin-out.

Table 2-5: Audio 3-4 Breakout Cable Pin-Out (Harmonic Inc. P/N 204346)

PIN	FUNCTION	PIN	FUNCTION
1	Audio 4 XLR Right (+)	8	Audio 4 XLR Left Common
2	Audio 4 XLR Left (+)	10	Audio 3 XLR Left Common
3	Audio 3 XLR Right Common	11	Audio 4 XLR Right (-)
4	Audio 3 XLR Right (+)	12	Audio 4 XLR Left (-)
5	Audio 3 XLR Left (+)	14	Audio 3 XLR Right (-)
7	Audio 4 XLR Right Common	15	Audio 3 XLR Left (-)

Table 2-6 lists the AES/ABU balanced breakout cable pin-out.

Table 2-6: AES/EBU Balanced Breakout Cable Pin-Out (Harmonic Inc. P/N 204345)

PIN	FUNCTION	PIN	FUNCTION
1	AES/EBU 4 (+)	8	AES/EBU 3 Common
2	AES/EBU 3 (+)	10	AES/EBU 1 Common
3	AES/EBU 2 Common	11	AES/EBU 4 (-)
4	AES/EBU 2 (+)	12	AES/EBU 3 (-)
	AES/EBU 1 (+)	14	AES/EBU 2 (-)
7	AES/EBU 4 Common	15	AES/EBU 1 (-)

2.5. INITIALIZATION AND CONFIGURATION

Before powering-up the PVR 6000, ensure that all cabling is correct. Ensure that the unit is connected to the main power supply and correctly grounded.

2.5.1. Electrical Power Connection

The PVR 6000 is powered by an AC power supply unit. Grounding of is provided when the AC power cable is connected to the device's AC connector. The PVR 6000 is shipped with either AC connector configuration, as shown in Figure 2-10. Before powering-up a rack-mounted PVR 6000, the device's grounding jackscrew must be connected to the rack housing, which must be correctly grounded (see Figure 2-10).

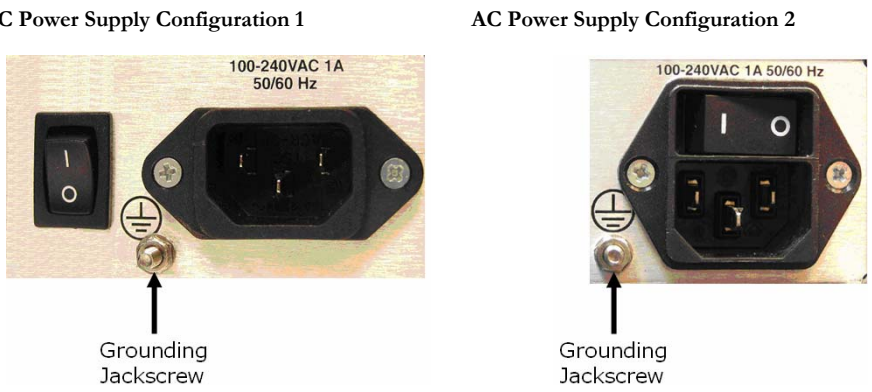


Figure 2-10: Power Supply Configurations and Rack-Mount Grounding Jackscrew

2.5.2. Powering Up

When powering up the PVR 6000 and the receiver is not tuned, expect one of the following warnings:

- **Front-End warning** – Demodulator not sync
- **Bit Stream warning** – No sync – 0x47 detected
- **Bit Stream warning** – PSI not detected

In case the PVR 6000 warning LED is lit orange, the operator must perform the following:

- Tune or configure the PVR 6000 device
- Select a service from the input stream

When the PVR 6000 is correctly configured, "All OK" is displayed and both LEDs are lit green.

NOTE

Prior to initialization, review Chapter 4-Operation and Management, for how to use and navigate through the menus and for information on configuration parameters.

2.5.3. Tuning

The PVR 6000 receiver must be configured to receive a transport stream. For details about an PVR 6000 device with a DVB-S receiver module, see Section 4.2.2. For details about an PVR 6000 device with an MPEG-over-IP front-end module, see Section 4.2.2.4.

2.5.4. Performing Serviceability Check

After installing, initializing, or configuring the IRD, maintenance checks must be performed to ensure that the unit is serviceable. A video monitor must be connected to the PVR 6000 to perform the check lists systematic instructions for performing a serviceability check.

Table 2-7: PVR 6000 Serviceability Check

STEP	CHECK
1	On the LCD display, the LCD status message reads "STATUS OK".
2	On the PVR 6000 front panel the two LEDs are lit green.
3	The service selected is displayed on the LCD display.
4	Video picture is displayed on monitor.
5	Audio channels left and right.

Chapter 3.
PVR 6000 CONTROL INTERFACES

This section explains the Front Panel and Web Management control interfaces used for operating, configuring, and monitoring the PVR 6000.

3.1. FRONT PANEL CONTROL INTERFACE

The front panel control interface explained in this section is composed of the following:

- **Controls and Displays** – see section 3.1.1
- **Front Panel Screens** – see section 3.1.2
- **Menu Tree** – see section 3.1.3
- **Front Panel Initialization Sequence** – see section 3.1.4

3.1.1. Controls and Displays

The front panel is used for extensive local control and for monitoring the device's operation. Figure 3-1 illustrates the PVR 6000 front panel.

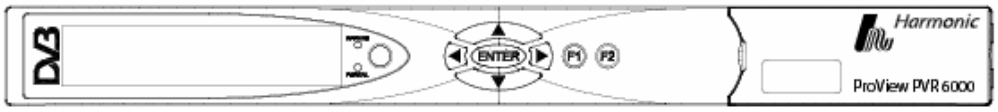


Figure 3-1: Front Panel

The PVR 6000 front panel contains:

- **LCD Display**

  The LCD display is a large, easy to use, graphical display. It is used to display enhanced menus with graphical interfaces, such as: charts, radio buttons, tables, and icons.

- **Status LEDs**

  The two LEDs indicate **WARNING** and **PWR/FAIL** statuses, when both LEDs are lit green the PVR 6000 status is OK. The **WARNING** LED (Green/Orange) indicates the operational status. The **PWR/FAIL** LED (Green/Red) indicates the hardware status.

- **Arrow Keys**

  The arrow keys include **[Up]**, **[Down]**, **[Right]**, **[Left]**. The keys are used to navigate between the different menu items and sub-menus. They are also used to select and change parameters during setup and configuration procedures.

- **[Enter] Key**

  Used to select or enter a configuration setup.

- **[Esc] Key**

  Used to abort a configuration setup or to return to the menu's previous level.

- **Short Cut Keys**

  Include the **[F1]**/**[F2]** buttons that are operator–programmable for immediate activation of predefined procedures (in the future software versions).

3.1.2. PVR 6000 Front Panel Screen Types

The PVR 6000 display leads to the following five screen types:

- Menu Navigation screen
- Edit Menu screen
- Table Menu screen
- Edit Value screen
- Select Value screen

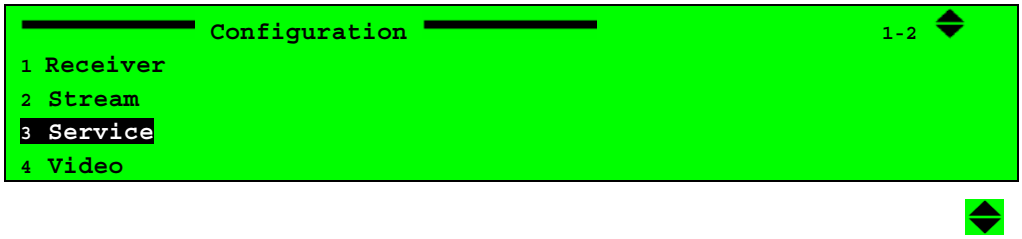
NOTE

*The Front panel can display only up to four menu items at a time. When a menu has more than four items, the first four are visible in the panel, followed by a scroll icon []. Additional items can be accessed using the **[up]/[down]** arrows. To illustrate the difference between the two types of items, two types of screen shots were used in this user manual: dark grey for the visible items and light grey for the hidden ones.*

Sections 3.1.2.1 to 3.1.2.5 detail the different front panel screen types.

3.1.2.1. Menu Navigation Screen

The **Menu Navigation** screen enables navigating through the tree structure of the PVR 6000 menu.
In this example, the menu navigation screen displays the following items:



A. Top line indicates the menu name (Configuration) and the menu hierarchal position (`1-2`, for example `Configuration` under the `Root` menu). **[**▲Up**]**/**[**▲▼Up/Down**]**/**[**▼Down**]** symbols indicate that up or down scrolling is enabled.

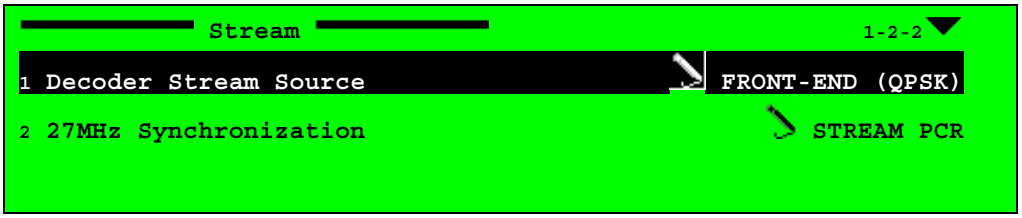
B. Next up to four displayed lines is a list of numbered items.

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items are enabled, you can scroll using the **[UP]**/**[Down]** arrow keys.
The currently selected option is displayed with white characters over a black background (see Item #3 in the example above).
To access the next menu level press **[Enter]** to select the marked item (either another menu navigation screen or an Edit Menu screen).

3.1.2.2. Edit Menu Screen

The **Edit** menu screen enables selecting, changing or displaying the value of a parameter or set of parameters.
In this example, the **Edit Menu** screen displays the following items:



A. Top line indicates the menu name (**Stream**) and the menu hierarchal position **(1-2-2**, for example **Root-Configuration-Stream**) in the PVR 6000 Menu Tree. **[**▲Up**]/[**▲▼Up/Down**]/[**▼Down**]** symbols indicate that up or down scrolling is enabled.

B. Next up to four displayed lines is a list of numbered items relevant to the menu and their current values. The information provided for each list item is:

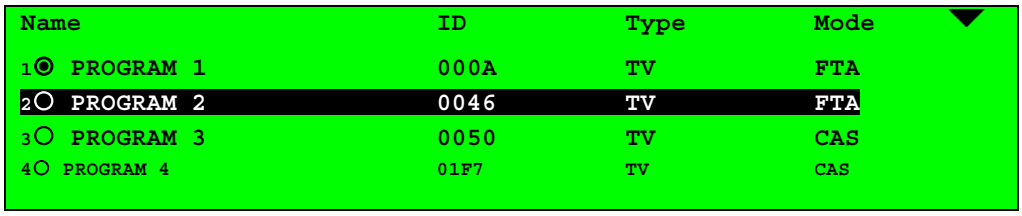
- **Left-aligned column** displays a numbered list of parameters.
- **Right-aligned column** displays parameter values.
  - Editable parameters have a pencil icon next to them.
  - Parameters without the pencil icon are for information only.

C. Additional Available Items

The list can include more than four items, but only four items are visible at the time. When more than four items are enabled, you can scroll the list using the **[UP]/[Down]** arrow keys.
The currently selected option is displayed with white characters over a black background (see Item #1 in the example above).
Press **[ESC]** to abort the selection or to return to the menu's previous level.
Press **[Enter]** to select the pointed editable option; a parameter-editing screen is displayed. This can be a Table Menu screen, an Edit Value screen, or a Select Value screen.

3.1.2.3. Table Menu Screen

The **Table** menu screen displays parameter information, using a table format. In this example, the **Table Menu** screen displays the following columns:



A. **Top line** displays the headers for each table column.

B. **Next up to four displayed lines** is a numbered list of parameters relevant to the menu and their current values. A radio button indicates which parameter is currently active (◉ is currently enabled and ○ is currently disabled)

C. **Additional Available Items**

The list can include more than four items, but only four items are visible at a time. When more than four items are available, you can scroll the list using the **[UP]/[Down]** arrow keys.

The currently selected option is displayed with white characters over a black background (see Item #2 in the example above).

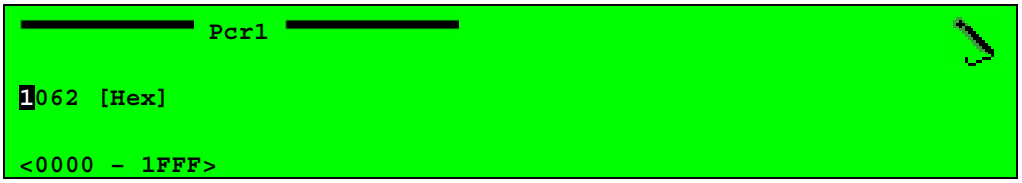
Press **[ESC]** to abort the selection and return to the Edit Menu screen without changing the parameters.

Press **[Enter]** to select the currently enabled button ◉**.** The selected option becomes enabled and the former active option is disabled.

3.1.2.4. Edit Value Screen

The **Edit Value** screen enables setting a parameter value. The parameter value can be a number or a string of characters. Each digit or character is set up individually.

In this example, the **Edit Value** screen displays the following information:



A. **Top line** displays the parameter name (`Pcr1`). The pencil icon indicates that the parameter value is editable.

B. **Second line** displays the current parameter value. Change the value of the parameter with the arrow keys:

- **[Left]** and **[Right]** arrow keys are used to mark a digit or a character for change. The marked digit or a character is displayed with white character over black background (see example in page 3-5)
- **[Up]** and **[Down]** arrow keys are used to scroll up or down the digits (0 through 9) or the characters (a to z, A to Z, 0 to 9 and so on.). The scroll range can be limited to prevent values being out of range.

C. **Third line** displays the allowed range of parameter values.

Press **[ESC]** to abort the setup and return one level up to the Edit Value Screen without changing the parameters.

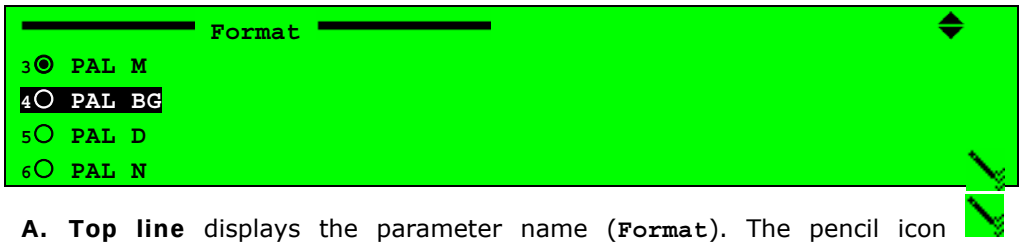
Press **[Enter]** to accept the value. The display returns one level up to the Edit Value Screen and the new value is displayed as the current parameter value.

NOTE

When entering an wrong or out-of-range value the display dismisses the last change and returns one level up in the menu tree.

3.1.2.5. Select Value Screen (Multiple Choices)

The **Select Value** screen displays a list of selectable items.
In this example, the **Select Value** screen displays the following information:



A. Top line displays the parameter name (**Format**). The pencil icon indicates that the items are selectable from the list of displayed options. **[**▲Up**]/[**▲▼Up/Down**]/[**▼Down**]** symbols indicate that up or down scrolling is enabled.

B. Next up to four displayed lines is a numbered list of parameters relevant to the menu and their current values. A radio button indicates which parameters are currently activated (◉ is currently enabled and ○ is currently disabled)

C. Additional Available Items

The list can include more than four items, but only four items are visible at a time. When more than four items exist, you can scroll the list using the **[UP]/[Down]** arrow keys.

The currently selected option is displayed with white characters over a black background (see Item #4 in the example above).

Press **[ESC]** to abort setup and return one level up to the Select Value Screen without changing the parameters.

Press **[Enter]** to select the marked option (the selected option is enabled ◉ and the former enabled option is disabled ○). The display returns up one level to the Select Value screen; the new option is displayed as the current parameter option.

3.1.3. PVR 6000 Menu Tree

Setup, control, and monitoring of the PVR 6000 operation can be performed locally by using the PVR 6000 Menu.
This menu is displayed on the front panel LCD display and is operated using the front panel control keys. The basic tree structure of the PVR 6000 front panel menu is illustrated in Figure 3-2.

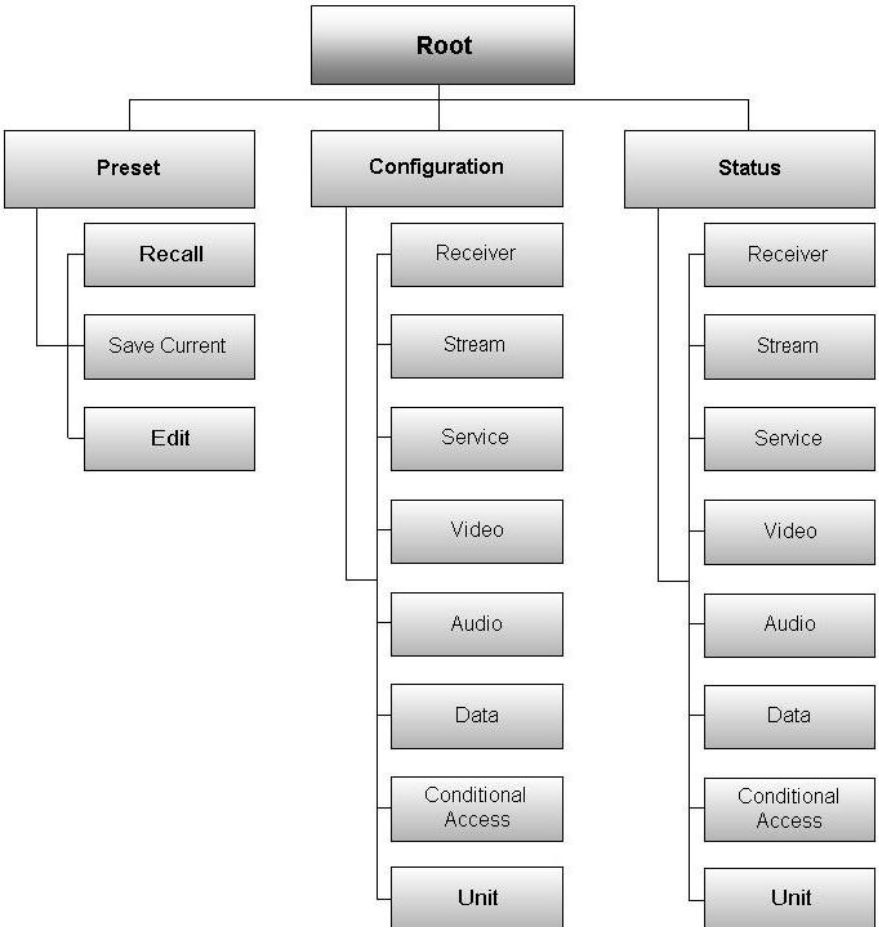
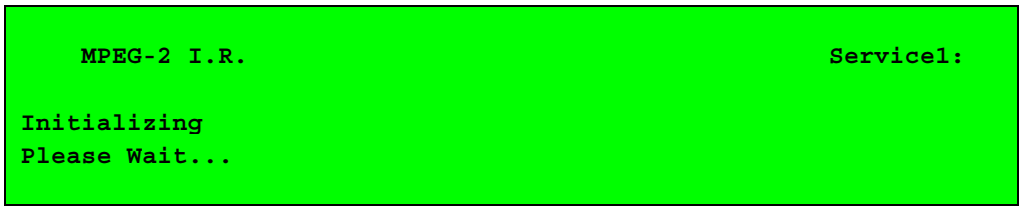


Figure 3-2: PVR 6000 Front Panel Menu (Root Menu) - Basic Structure

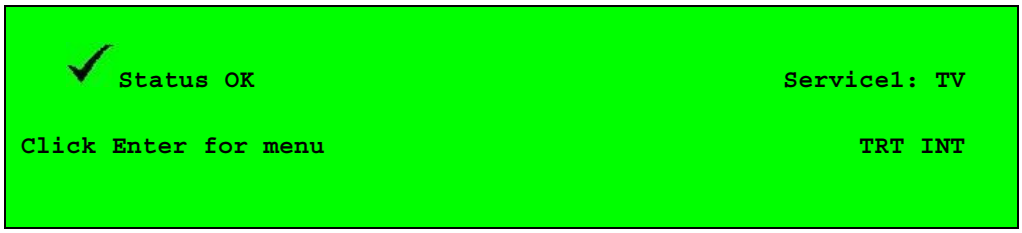
3.1.4. Front Panel Initialization Sequence

To activate the **PVR 6000 Front Panel Root** Menu perform the following:

1. Power up the PVR 6000. The PVR 6000 initialization phase begins and the initialization message is displayed.



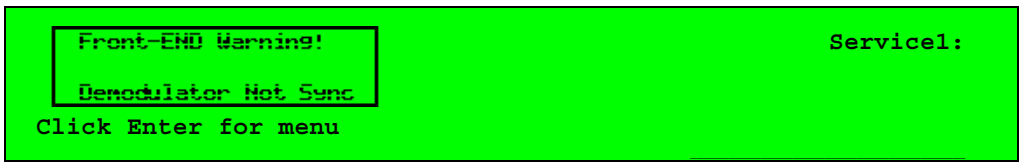
2. When initialization complete, the PVR 6000 displays one of two options:
   - **Status OK** – Both LEDs are lit green.



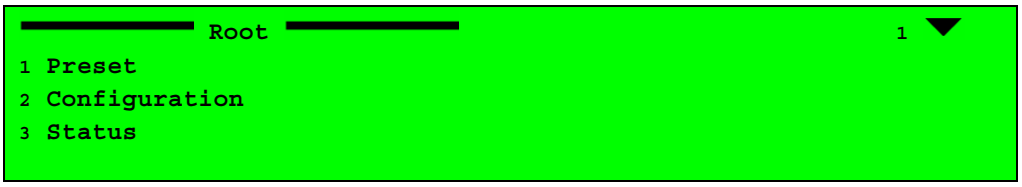
NOTE

*Blank **Service1** and/or **Service2** fields at the front panel' root screen, means service not chosen. In order to select services see section 4.2.5.1*

   - **Front-End Warning** – The warning LED turns orange (For details see Appendix D).



3. Click **[Enter]** to activate and enter the PVR 6000 Root Menu:



The Root Menu provides the following main branch options:

- **PVR 6000 Preset Menu** – See Section 4.1 for details.
- **PVR 6000 Configuration Menu** – See Section 4.2 for a detailed description.
- **PVR 6000 Status Menu** – See Section 4.3 for details.

3.2. WEB MANAGEMENT INTERFACE

The PVR 6000's Web Management software is a user-friendly graphical interface that allows easy control and configuration of the device as well as monitoring the devices current condition. All this is performed through a remote computer, using a regular Web browser. No additional software is needed. Managing the PVR 6000 using the Web-based management GUI is as easy as point-and-click.
In order to access the web-management user-name and password must be entered. The default values are:

- **User name** – ird
- **Password** – ird

Enter your user name and password in the access box. Press **Submit** to confirm or **Clear** to start over. For password change see section 4.2.10.2
Figure 3-3 displays the Web Management access box.

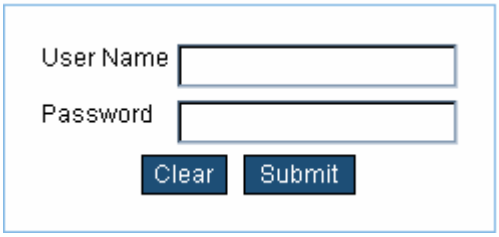


Figure 3-3: PVR 6000 Web Management access box

Figure 3-4 displays an example of the Web Management interface window, demonstrating the commonly used control & management elements.

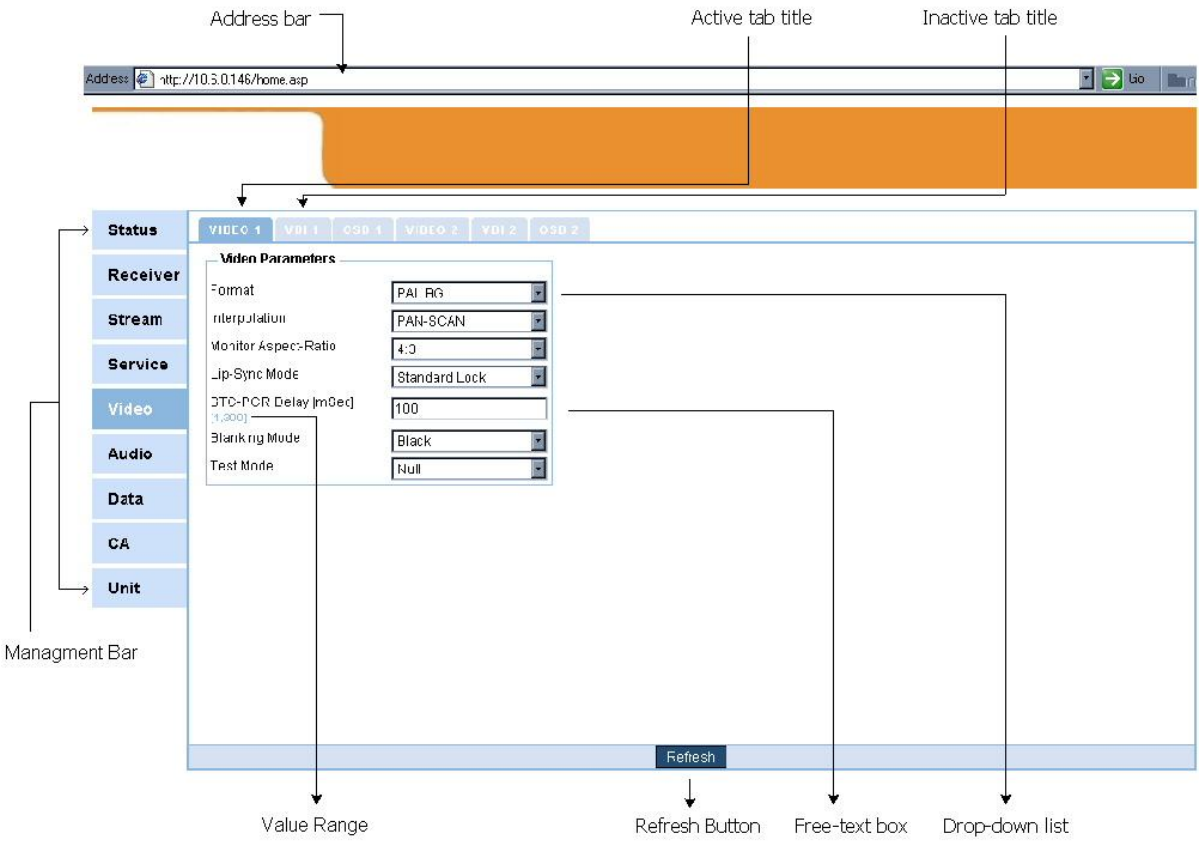


Figure 3-4: PVR 6000 Web Management Interface Screen (Example)

This interface contains elements and controls that are explained and detailed in the following table.

Table 3-1: PVR 6000 Web Management Interface

ELEMENT NAME	FIGURE	DESCRIPTION
Free-Text Box	STC-PCR Delay [mSec] [0,300] 100	Click inside the text-box, and type in a value according to the range limitations
Drop Down Menu	PAN-SCAN	Click the down-pointing arrow, and select an option

Table 3-1: PVR 6000 Web Management Interface

ELEMENT NAME	FIGURE	DESCRIPTION
Refresh Button		The *Refresh* button is located at the bottom of the Web management interface window. Clicking this button displays the actual, current PVR 6000 parameter values that are relevant to the displayed screen
Web-Browser's Address Bar		Displays an example of a Web browser's address bar. The address bar is used for accessing the PVR 6000's Web management interface
Management Bar		An easy-to-use, efficient navigation tool for accessing the PVR 6000 Web management screens. It is generally divided into nine sections: **Status** (used for device monitoring), **Receiver Stream**, **Service**, **Video**, **Audio**, **Data**, **CA**, and **Unit** (for configuring the device' properties). Each section has one or more sub-sections call **Tabs**.

Chapter 4.
OPERATION AND MANAGEMENT

This chapter provides on controlling the PVR 6000 through its front panel, and Web management interfaces.
The Front Panel control interface contains all the existing PVR 6000 control parameters, while the Web management interface allows easy access to the same parameters from a remote computer. Therefore the description of these two interfaces is interlaced, and brought together in this chapter.

4.1. PRESET MENU

The PVR 6000 Preset main menu will be supported in future software releases.

4.2. CONFIGURATION

The **Configuration** Menu screen allows the user to manage the PVR 6000 through the front panel. The Configuration menu consists of eight sub-menus. Each sub-menu manages a specific IRD module.
The following lists PVR 6000 configuration sub-menus:

- **Receiver** - For details, see Section 4.2.1
- **Stream -** For details, see Section 4.2.3
- **Service** - For details, see Section 0
- **Video** - For details, see Section 4.2.6
- **Audio** - For details, see Section 4.2.7
- **Data** - For details, see Section 4.2.8
- **Conditional Access –** For details, see Section 4.2.9
- **Unit** - For details, see Section 4.2.10

NOTE

Sub-menus parameters may be vary from one model to another according to the PVR 6000 technical specifications and licensing

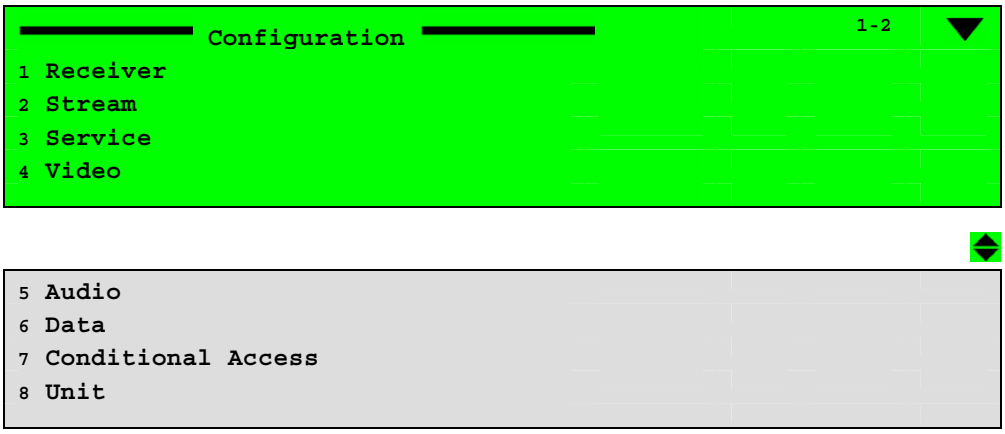


Figure 4-1: PVR 6000 Configuration Main Menu

NOTE

The PVR 6000 can support either IP or L-Band receiver modules. The configuration menu structure changes according to each of these available module options.

4.2.1. Receiver Modules

The purpose of the receiver module is to single out a selected Transport Stream from the transmission that reaches the PVR 6000 inputs, to demodulate it, and pass on the digital transport stream to the decoder module.
Different networks require various receiver types. According to its licensing, the PVR 6000 supports two types of receivers:

1. **Satellite Receiver Modules:**
   - **DVB-S Receiver Module** The configuration parameters of the DVB-S receiver module are detailed in Section 4.2.2
   - **DVB-S2 Receiver Module** The configuration parameters of the DVB-S2 receiver module are detailed in Section 0
   - **DSNG Module** The configuration parameters of the DSNG receiver module are detailed in Section 4.3.1.3
2. **IP Receiver Module:** The configuration parameters of the IP receiver module are detailed in Section 4.3.1.3.

To access the Receiver Configuration menu using the front panel, select ***Configuration→Receiver*** (independently of the receiver module type).

4.2.2. Satellite Receiver Modules

This section details the front panel menus that enable configuring of the **DVB-S DVB-S2** and **DVB-DSNG** receivers in an PVR 6000 front panel.

4.2.2.1. DVB-S Receiver Configuration

This section details the front panel menus that enable configuring the DVB-S receiver in an PVR 6000 DVB-S front end device. The following is the **DVB-S Receiver Configuration** menu as displayed on the PVR 6000 front panel screen:

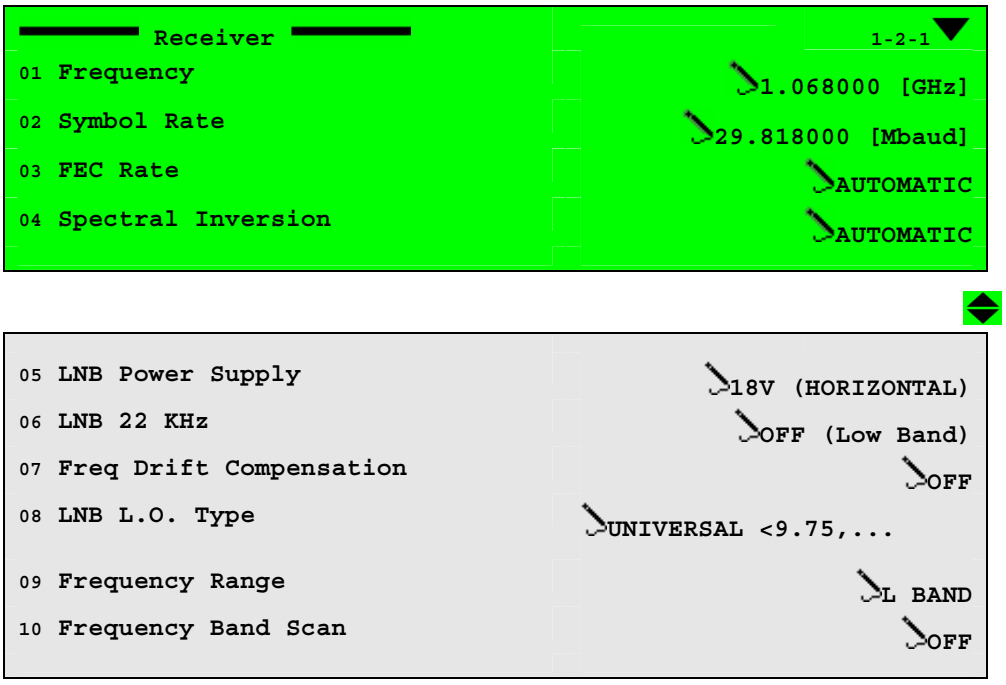


Figure 4-2 displays the corresponding DVB-S Receiver Parameters menu (Web Management screen).

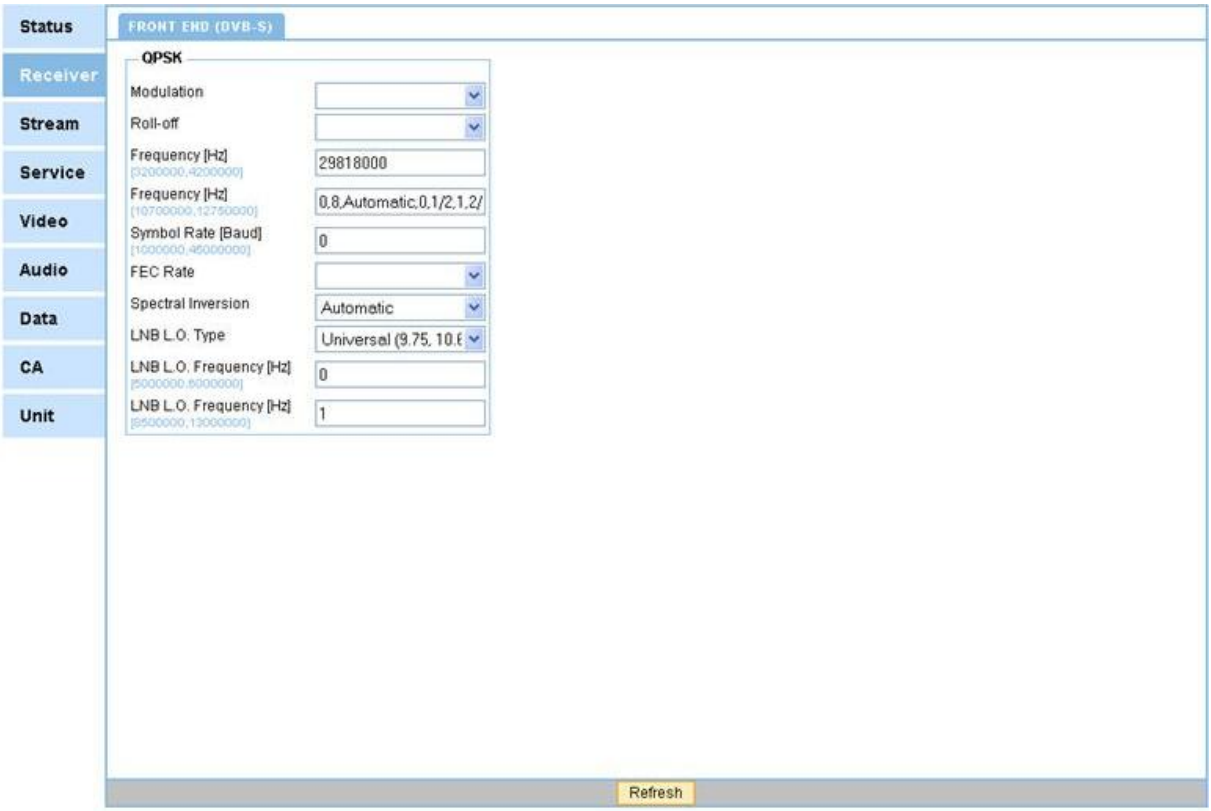
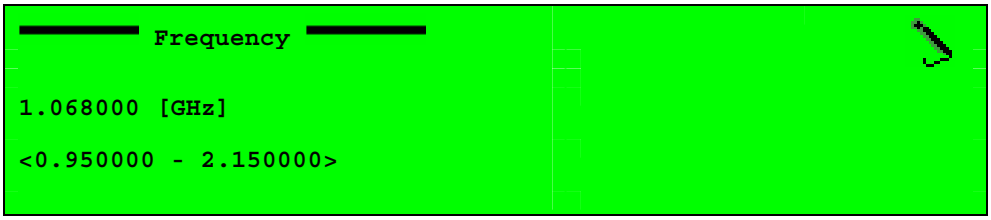


Figure 4-2: DVB-S Receiver Parameters Menu Screen

The DVB-S Receiver Configuration parameters are detailed in the following paragraphs:

FREQUENCY

The **Frequency** parameter must be set in accordance with the required satellite transponder frequency. The frequency can be acquired from the satellite transponder information.
In this example, the valid frequency range is between 0.95 and 2.15GHz.



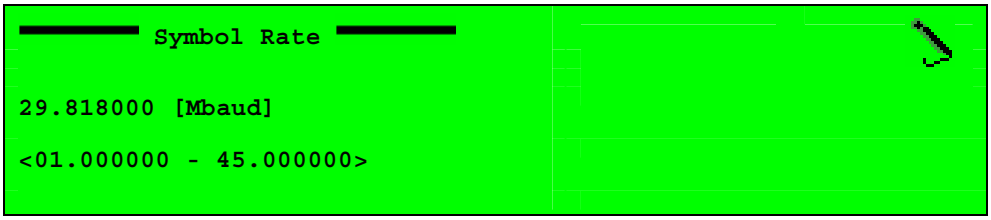
The valid frequency range varies according to the selected band.

Table 4-1: Band Frequency Range

BAND	MINIMUM FREQUENCY	MAXIMUM FREQUENCY
Ku-Band	10.700000GHz	12.750000GHz
C-Band	3.200000GHz	4.200000GHz
L-Band	0.950000GHz	2.150000GHz

SYMBOL RATE

The Symbol Rate parameter must be set according to the satellite transponder symbol rate. The Symbol Rate value can be acquired from the satellite transponder information or can be calculated, with the bit rate information.



Available values range from 01.000000 to 45.000000 Mbaud.

NOTE

It is important to input the accurate Symbol Rate down to the sixth digit after the decimal point.

FEC RATE

The **FEC Rate** parameter sets the Forward error correction rate value. The FEC parameter can be acquired from the satellite transponder information or can be set to automatic. When in Automatic mode, the PVR 6000 device tries all FEC rates until locking the rate to the transport stream.

The available options are:

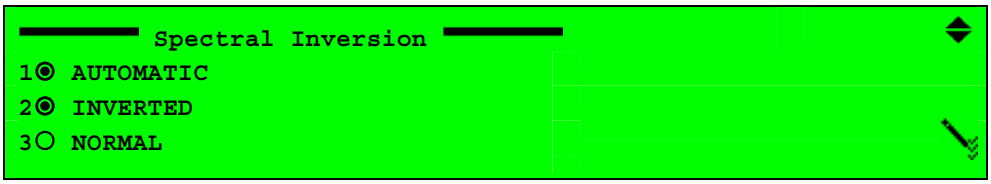
- Automatic
- 1/2
- 2/3
- 3/4
- 5/6
- 7/8

NOTE

If the specific Viterbi rate is not provided, selecting the Automatic option enables the PVR 6000 to automatically detect the Viterbi rate.

SPECTRAL INVERSION

The **Spectral Inversion** parameter sets the spectral mode of operation. This parameter is configured according to the information provided from the broadcast head-end or can be set to automatic.
When set to automatic mode, the PVR 6000 tries the two spectral modes until obtaining synchronization.

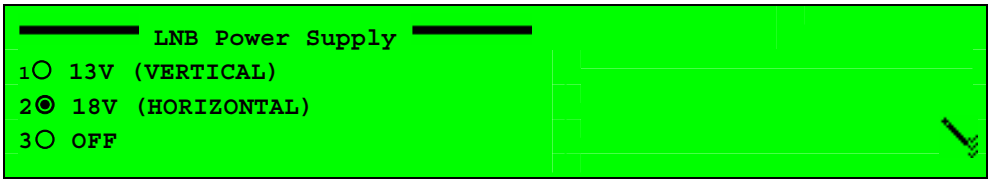


The available options are:

- **AUTOMATIC** – Automatically selects between Normal and Inverted spectral mode
- **INVERTED** – Inverted spectral mode
- **NORMAL** – Normal spectral mode

LNB POWER SUPPLY

The PVR 6000 sets the polarization of the receiving antenna by providing different voltage levels to the LNB, 13v for vertical polarization and 18v for horizontal polarization.
The polarization of the receiving antenna is determined according to the polarity of the satellite transponder.

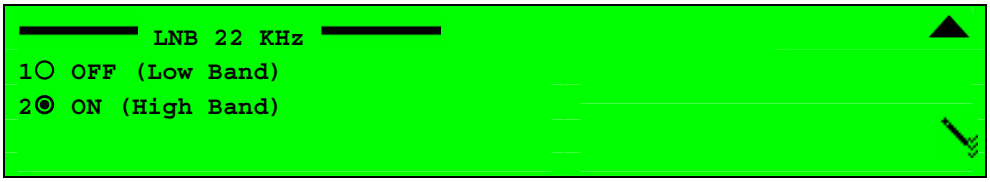


The available options are:

- **OFF** - No voltage is supplied to the LNB. Use this option either when cascading IRDs using the loop-through connector on the L-Band interface or when this voltage is supplied to the LNB by external source.
- **13V (VERTICAL)** – Vertical polarization
- **18V (HORIZONTAL)** – Horizontal polarization

LNB 22 KHz

The receiver controls the LNB band by sending a 22 kHz signal. When the signal is sent, the LNB uses its High Band Local Oscillator (L.O.). When the signal is not sent, the LNB uses its Low Band L.O.
The local oscillator is used to convert the signal from Ku-Band or C-Band to L-Band. Two local oscillators exist one for each band to leverage full spectrum.

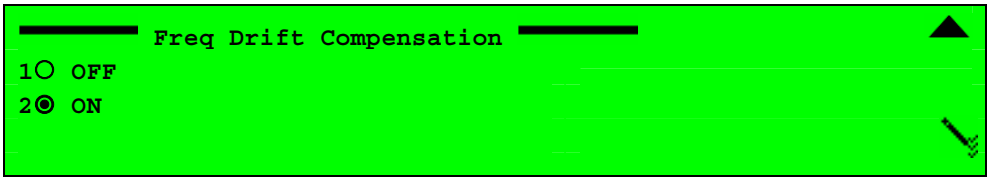


The available options are:

- **OFF** – Low band L.O.
- **ON** – High band L.O.

FREQ DRIFT COMPENSATION

The PVR 6000 uses **Freq Drift Compensation** to automatically correct inaccurate frequencies set by the operator.
When the operator sets the receiver frequency, the PVR 6000 checks whether it is set to the optimum frequency. When a deviation is detected, the PVR 6000 calculates the offset from the original setting and enables correcting it.
Turning on the Freq Drift Compensation activates the automatic frequency adjustment. When Drift compensation is turned off, the device uses the original frequency setting that was inserted by the operator.



The available options are:

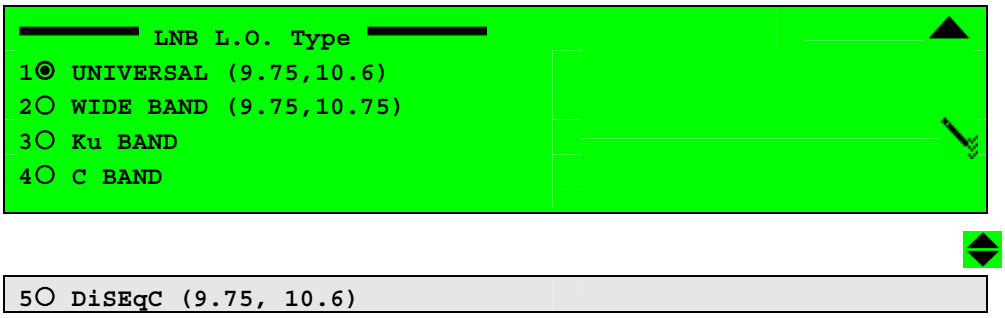
- **OFF** – Drift Compensation is off; the receiver remains with the configured frequency**.**
- **ON** - Drift Compensation is on; the receiver adjusts its optimal frequency.

LNB L.O. TYPE

The **LNB L.O. type** parameter defines the LNB oscillator type in use. Two standards are generally used: 'Universal' and 'Wide Band'.
In addition, the oscillator value can be manually configured.
The LNB L.O. type can be acquired from satellite transponder information. Most satellites use the 'Universal' type of L.O. unless otherwise specified.

NOTE

Manual configuration of the oscillator frequency is rarely used and is intended only for advanced users.



Available LNB L.O. types are:

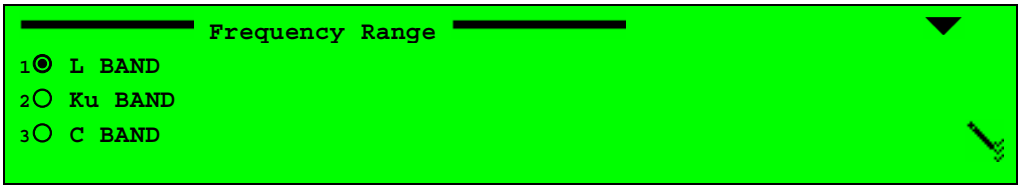
- **UNIVERSAL (9.75,10.6)** – Defines LNB universal L.O. type
- **WIDE BAND (9.75, 10.75)** – Defines LNB wide band L.O. type
- **Ku-BAND** – Defines Ku-Band LNB L.O. type
- **C-BAND** – Defines C-Band **LNB L.O**. type
- **DiSEqC** (9.75, 10.75)

NOTE

When selecting the Ku-Band or the C-Band, you must manually set the L.O. frequency (see the following Section in this chapter).

FREQUENCY RANGE

The **Frequency Range** parameter defines the input frequency in the Ku, C or L bands.
This parameter affects the displayed frequencies and ranges of the PVR 6000 DVB-S receiver parameters.



The available options are:

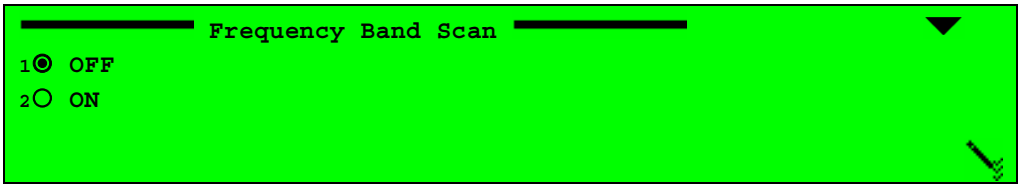
- **L-BAND** – Receiving in the L-Band frequency range
- **Ku-BAND** – Receiving in the Ku-Band frequency range
- **C-BAND** – Receiving in the C-Band frequency range

FREQUENCY BAND SCAN

The **Frequency Band Scan** command allows scanning the selected frequency range if the frequency is unknown. The symbol rate must be known and set in the IRD. The PVR 6000 scans the frequency range, while seeking a valid DVB stream. Upon locating a valid DVB stream, the PVR 6000 marks the located frequency and service name. Results output either to the RS-232 port (terminal) or Telnet. The following screen displays the Frequency Band Scan Screen

NOTE

The PVR 6000 scans only the L-band frequency range. Located frequencies are shown in L-Band and must be modified for the relevant frequency value if they are tuned to either C-band or Ku-band.



The available options are:

- **OFF** – Frequency scan is disabled
- **ON** – Frequency scan is enabled

4.2.2.2. DVB-S2 Receiver Configuration

This section details the front panel menus that enable configuring the DVB-S2 receiver in an PVR 6000 DVB-S2 front end device.

The following is a screen of the DVB-S2 **Receiver** Configuration menu as displayed on the front panel screen:

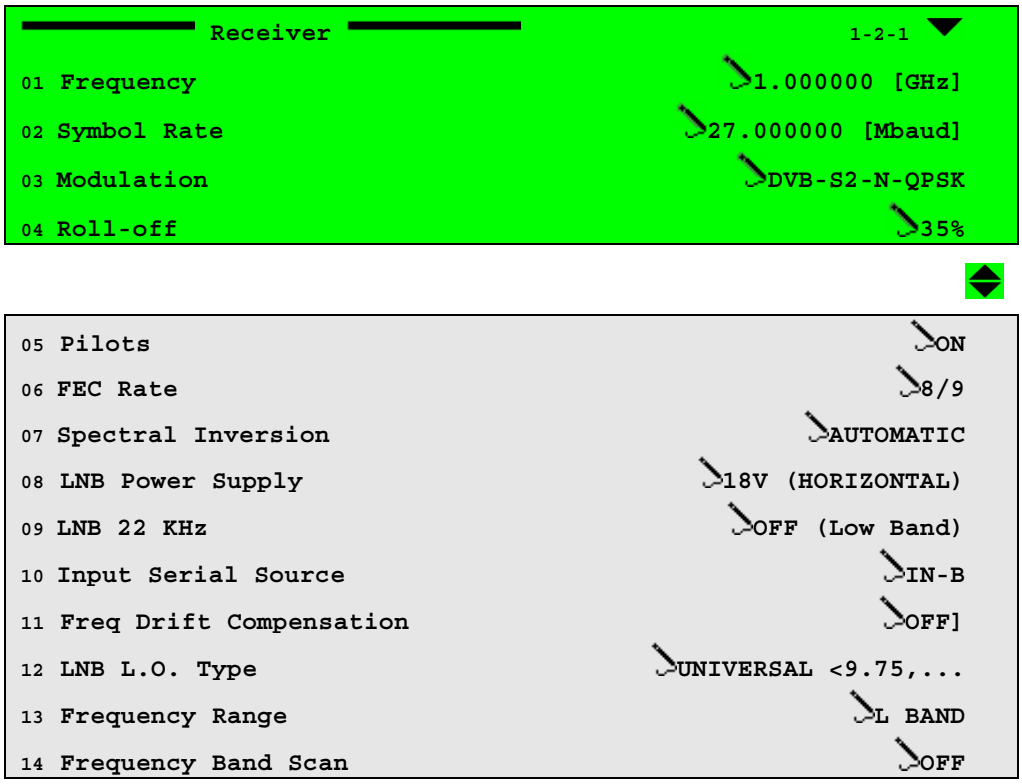


Figure 4-3 displays the corresponding DVB-S2 Receiver Parameters menu (Web Management screen).

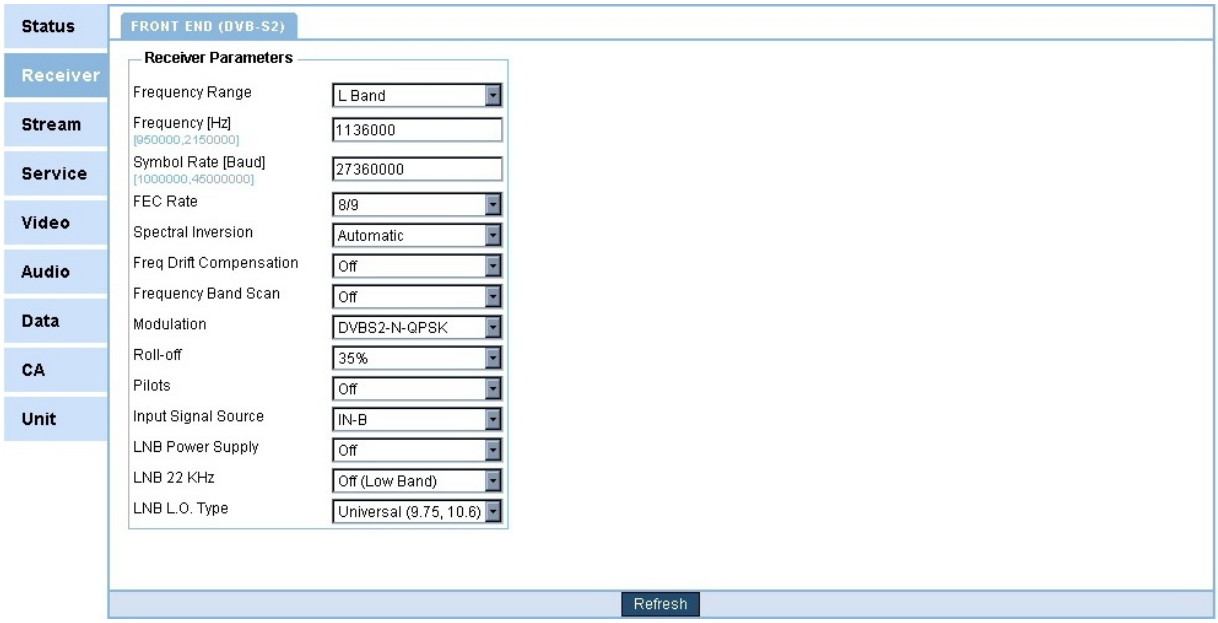
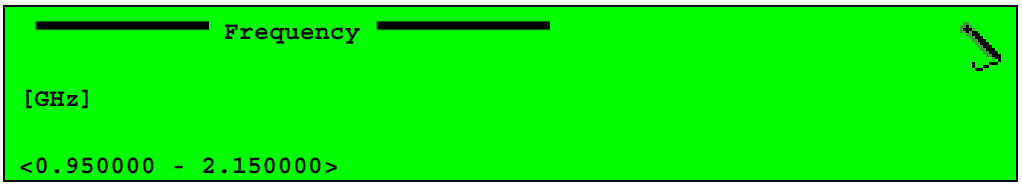


Figure 4-3: DVB-S2 Receiver Parameters Menu Screen

The DVB-S2 Receiver Configuration parameters are detailed as follows:

FREQUENCY

The **Frequency** menu is used for tuning the PVR 6000 receiver to the relevant satellite frequency.



The displayed frequency range corresponds with the frequency band that is currently selected.

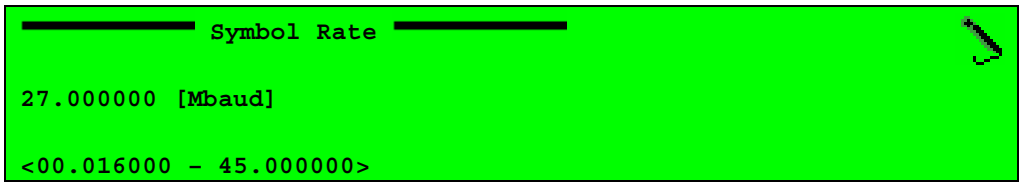
Table 4-2 lists the different bands, and their respective frequency ranges.

Table 4-2: Band Frequency Designations

BAND	FREQUENCY
L-Band	0.950000-2.150000GHz
C-Band	3.200000-4.200000GHz
Ku-Band	10.700000-12.750000GHz

SYMBOL RATE

The **Symbol Rate** menu is used for adjusting the receiver's symbol rate to the symbol rate of the received signal.



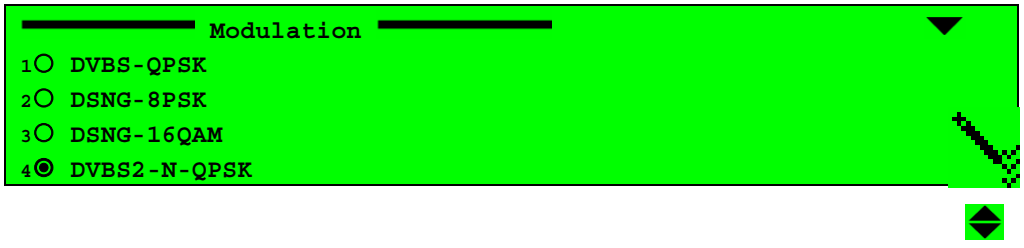
Available values range from 00.016000 to 45.000000 Mbaud

NOTE

*The symbol rate must be set to match the **exact** symbol rate value used by the satellite transponder.*

MODULATION

The **Modulation** menu allows setting the PVR 6000 receiver to the relevant modulation method.

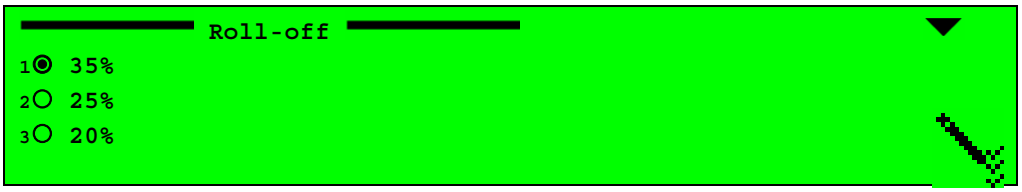


Available modulation options are:

- **DVBS-QPSK**
- **DSNG-8PSK**
- **DSNG-16QAM**
- **DVBS2-N-QPSK**
- **DVBS2-N-8PSK**
- **DVBS2-N-16APSK**
- **DVBS2-S-QPSK**
- **DVBS2-S-8PSK**
- **DVBS2-S-16APSK**

ROLL- OFF

The **Roll off** menu is used for setting the receiver's roll-off factor value according to the roll-off factor of the transmitted signal.
The Roll-off factor is the factor that is used for the base-band shaping of the transmitted signal. Set the Roll-Off factor in accordance with the transmitted Roll-Off factor.

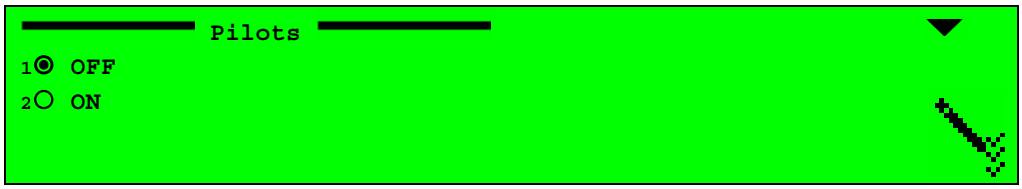


Available options for the Roll-off factor are:

- **35%**
- **25%**
- **20%**

PILOTS

In order to expedite carrier recovery, the standard allows two operating modes for each modulation type: Pilot-less (i.e. no Pilot symbols are inserted) and Piloted, where Pilot symbols are inserted to aid carrier synchronization. The Pilots menu enables to choose between the two operating modss.



The available options are:

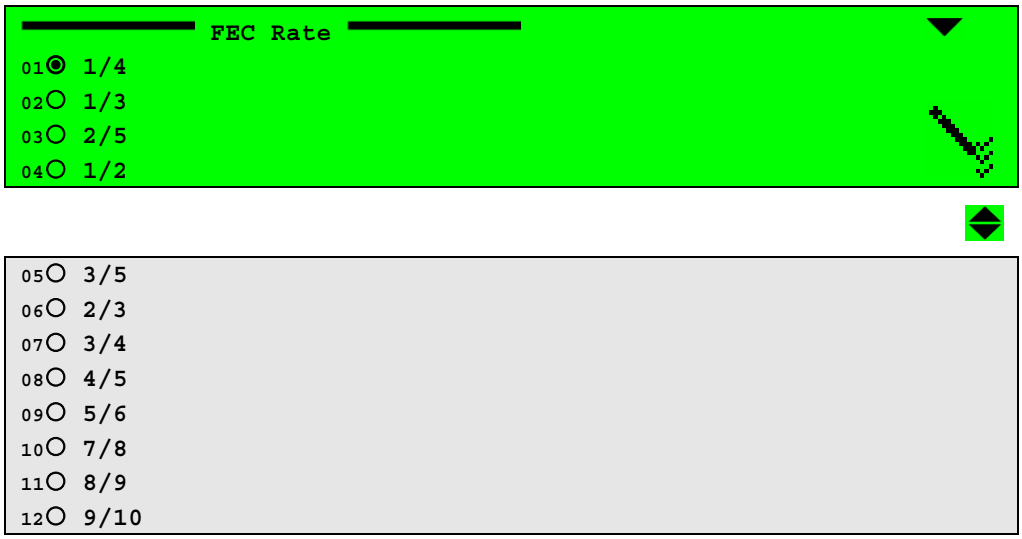
- **OFF** – selects Pilot-less mode
- **ON** - selects Piloted mode

NOTE

The PLSCODE informs the receiver regarding the pilot configuration, which resides in the PLHEADER. Usually, only a few modes, such as 8PSK rate 2/3, 16APSK rate 2/3 and 3/4, and 32APSK rate 3/4, need pilot assistance for carrier recovery.

FEC RATE

The **FEC Rate** menu enables to set the Forward Error Correction rate according to the FEC rate of the transmitted signal.

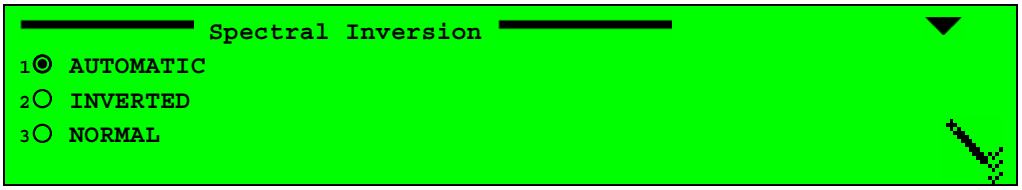


Available FEC rates are:

- 1/4
- 1/3
- 2/5
- 1/2
- 3/5
- 2/3
- 3/4
- 4/5
- 5/6
- 7/8
- 8/9
- 9/10

SPECTRAL INVERSION

The **Spectral Inversion** menu is used for setting the spectral inversion mode.

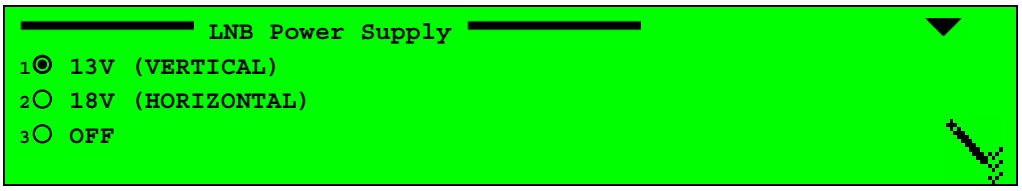


The available options are:

- **AUTOMATIC** – the PVR 6000 automatically detects and sets the Spectral Inversion Mode
- **INVERTED** – sets the PVR 6000 receiver to "inverted" Spectral Inversion Mode.
- **NORMAL** - sets the PVR 6000 receiver to normal Spectral Inversion Mode.

LNB POWER SUPPLY

The **LNB Power Supply** menu is used for setting the power supply voltage level to the LNB in order to control the received signal polarization.

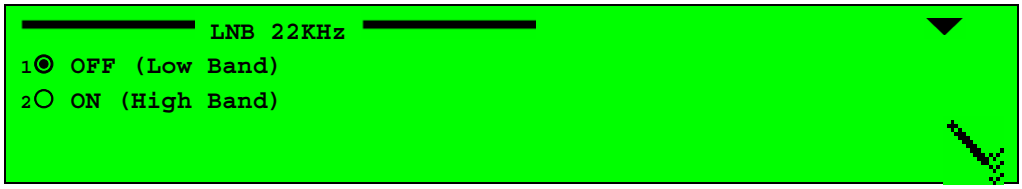


The available options are:

- **13V (VERTICAL)** – sets the LNB polarization to vertical
- **18V (HORIZONTAL)** - sets the LNB polarization to horizontal
- **OFF –**power to the LNB is disabled.

LNB 22KHz

The **LNB-22KHz** menu enables selecting between LNB low band and high band reception, by generating a 22 kHz signal that is sent to the LNB for this purpose.

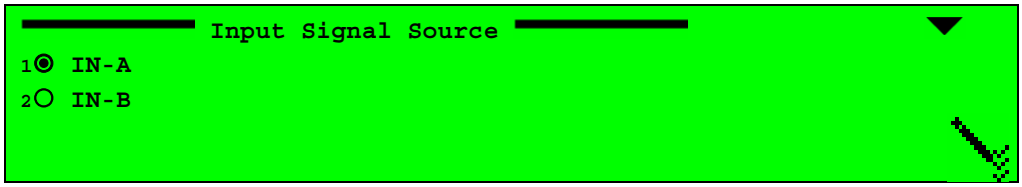


The available options are:

- **OFF (Low Band)** – the 22 kHz signal is not generated, and low band reception is selected
- **ON (High Band)** - the 22 kHz signal is generated and high band reception is selected.

INPUT SIGNAL SOURCE

The **Input Signal Source** menu selects the RF interface source through which to acquire the signal to be received. This menu exists only in Dual RF Input PVR 6000 devices.

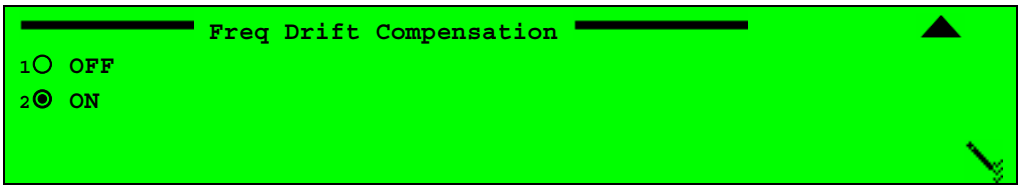


The available options are:

- **IN-A** – the PVR 6000 receives the input signal from RF IN 1 interface
- **IN-B** - the PVR 6000 receives the input signal from RF IN 2 interface

FREQ DRIFT COMPENSATION

The PVR 6000 uses **Freq Drift Compensation Feature** to automatically correct inaccurate frequencies inserted by the operator.
When the operator sets the receiver frequency, the PVR 6000 checks whether the inserted frequency is set to the optimal frequency. When a deviation is detected, the PVR 6000 calculates the offset from the original setting and enables correcting it.
Turning on the **Freq Drift Compensation** in the following menu activates the automatic frequency adjustment. When Drift compensation is turned off, the device uses the original frequency setting that was inserted by the operator.

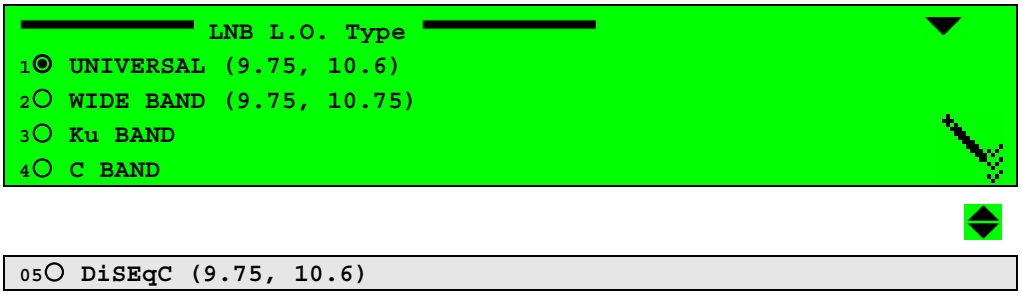


The available options are:

- **OFF** – Drift Compensation is off; the receiver remains tuned to the configured frequency.
- **ON** - Drift Compensation is on; the receiver tunes to the optimum frequency.

LNB L.O. TYPE

The **LNB L.O. Type** menu enables selecting the type of installed LNB.

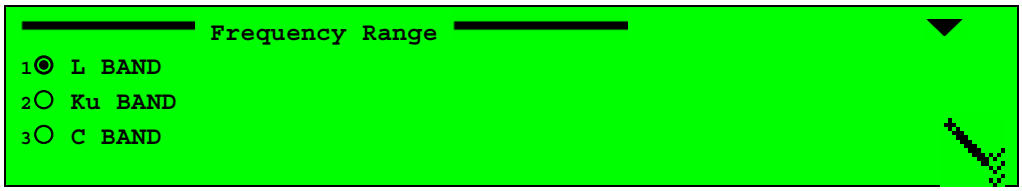


The available options are:

- **UNIVERSAL** (9.75, 10.6)
- **WIDE BAND** (9.75, 10.75)
- **Ku BAND**
- **C BAND**
- **DiSEqC** (9.75, 10.6)

FREQUENCY RANGE

The **Frequency Range** menu is used for selecting the receiver's active frequency band.

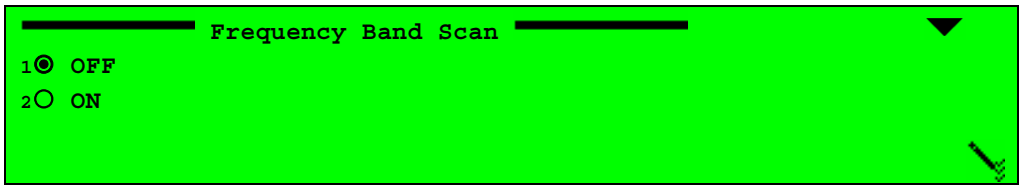


Available frequency band options are:

- **L BAND** – selects the frequency range 0.950000 - 2.150000 GHz
- **Ku BAND** - selects the frequency range 3.200000 - 4.200000 GHz
- **C BAND** - selects the frequency range 10.700000 - 12.750000 GHz

FREQUENCY BAND SCAN

The **Frequency Band Scan** menu is used for mapping all the available transmission frequencies received by the antenna. The symbol rate during the scan is constant and must be set according to the satellite's symbol rate. Upon locating a valid DVB stream, the PVR 6000 logs the located frequency and service name and outputs the log through the RS232 port (terminal) or through Telnet.

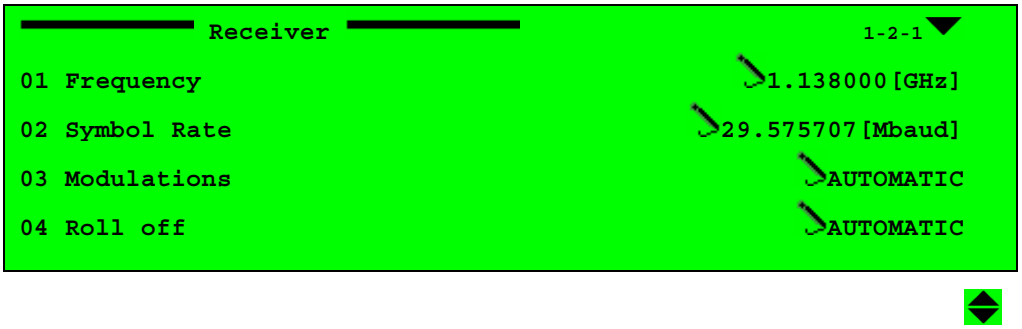


The available options are:

- **OFF** – band scan is disabled
- **ON** – starts the band scan

4.2.2.3. DVB-DSNG Module

This section details the front panel menus that enable configuring the DVB-DSNG receiver in an PVR 6000 DVB-DSNG front end device.
The following is the **DVB-DSNG Receiver Configuration** menu as displayed on the PVR 6000 front panel screen:



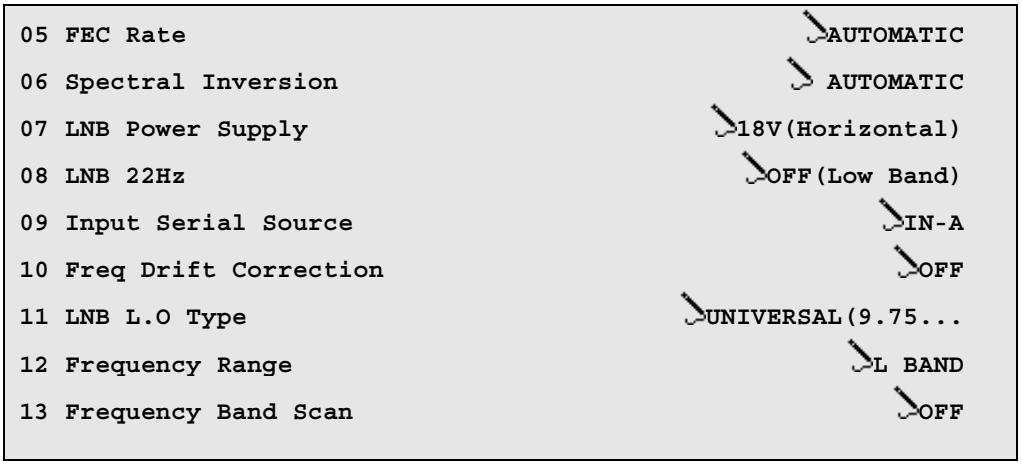


Figure 4-4 displays the corresponding DVB-DSNG receiver parameters menu (Web Management screen).

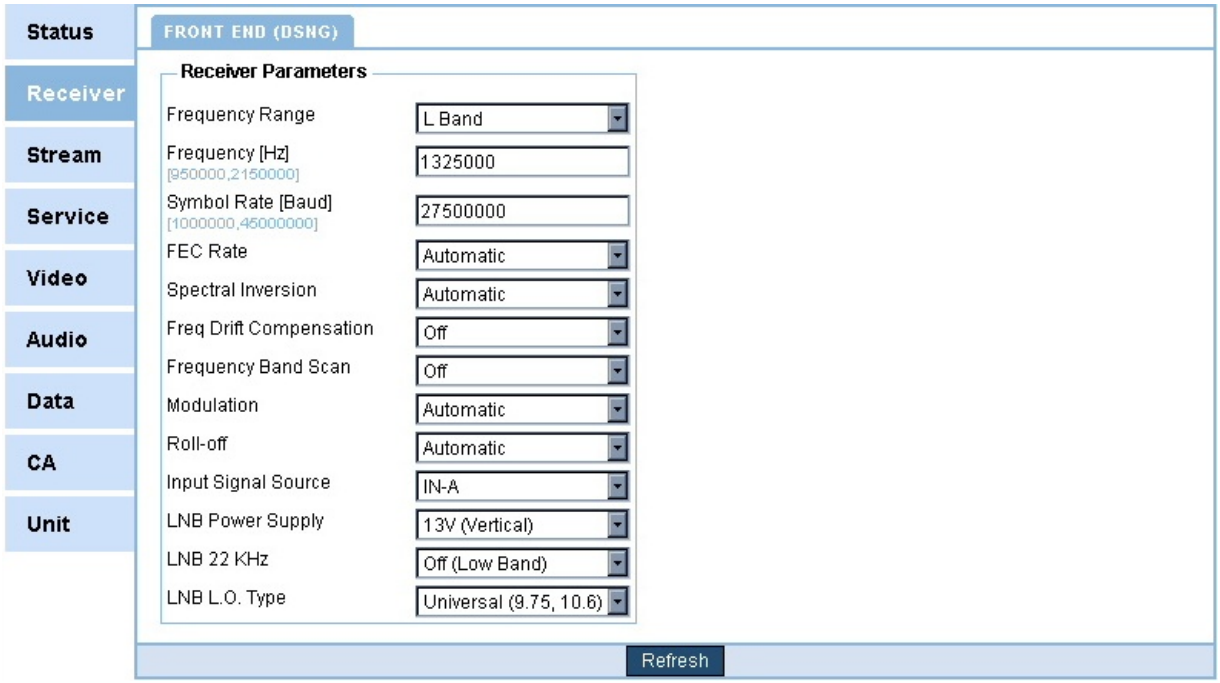
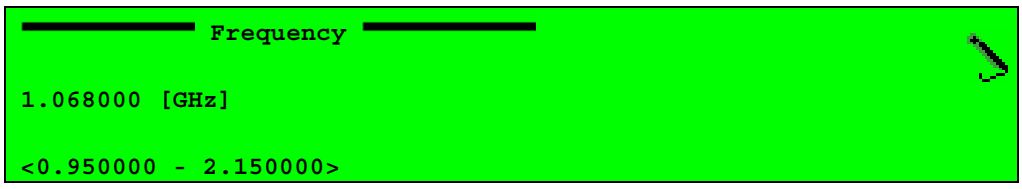


Figure 4-4: DVB-DSNG Receiver Parameters Menu Screen

FREQUENCY

The **Frequency** parameter must be set in accordance with the required satellite transponder frequency. The frequency can be acquired from the satellite transponder information.
In this example, the valid frequency range is between 0.95 and 2.15GHz.



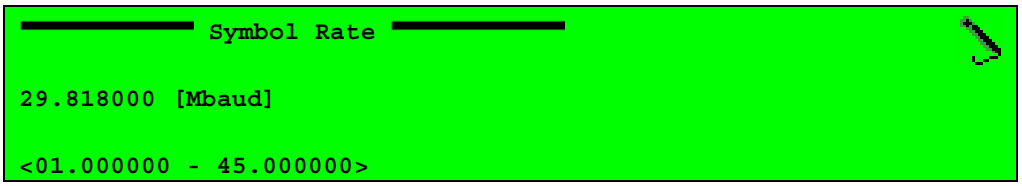
The valid frequency range varies according to the selected band.

Table 4-3: Band Frequency Range

BAND	MINIMUM FREQUENCY	MAXIMUM FREQUENCY
Ku-Band	10.700000GHz	12.750000GHz
C-Band	3.200000GHz	4.200000GHz
L-Band	0.950000GHz	2.150000GHz

SYMBOL RATE

The **Symbol Rate** parameter must be set according to the satellite transponder symbol rate. The Symbol Rate value can be acquired from the satellite transponder information or can be calculated, with the bit rate information.



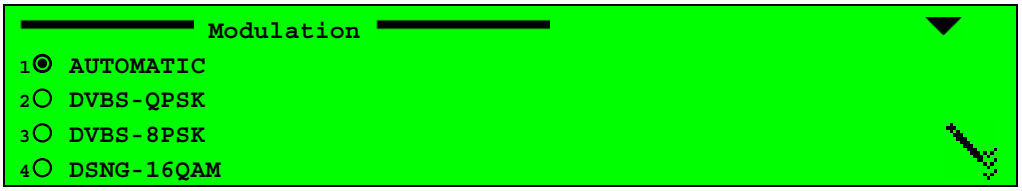
Available values range from 01.000000 to 45.000000 Mbaud.

NOTE

It is important to input the accurate Symbol Rate down to the sixth digit after the decimal point.

MODULATION

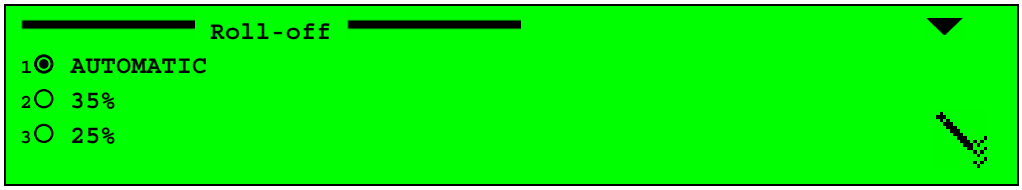
The Modulation menu allows setting the PVR 6000 receiver to the relevant modulation method.



ROLL- OFF

The **Roll off** menu is used for setting the receiver's roll-off factor value according to the roll-off factor of the transmitted signal.

The Roll-off factor is the factor that is used for the base-band shaping of the transmitted signal. Set the Roll-Off factor in accordance with the transmitted Roll-Off factor.



Available options for the Roll-off factor are:

- **35%, 25%, 20%**

FEC RATE

The **FEC Rate** parameter sets the Forward error correction rate value. The FEC parameter can be acquired from the satellite transponder information or can be set to automatic. When in Automatic mode, the PVR 6000 device tries all FEC rates until locking the rate to the transport stream.

The available options are:

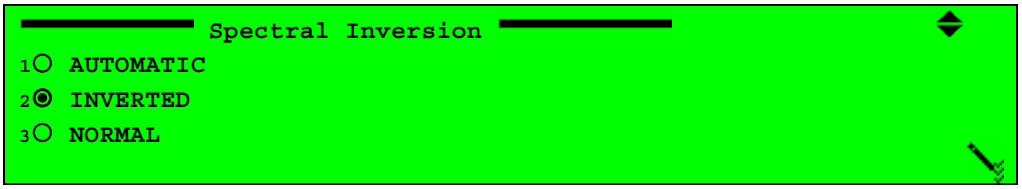
- **Automatic**
- **1/2**
- **2/3**
- **3/4**
- **5/6**
- **7/8**
- **8/9**

NOTE

If the specific Viterbi rate is not provided, selecting the Automatic option enables the PVR 6000 to automatically detect the Viterbi rate.

SPECTRAL INVERSION

The **Spectral Inversion** parameter sets the spectral mode of operation. This parameter is configured according to the information provided from the broadcast head-end or can be set to automatic.
When set to automatic mode, the PVR 6000 tries the two spectral modes until obtaining synchronization.

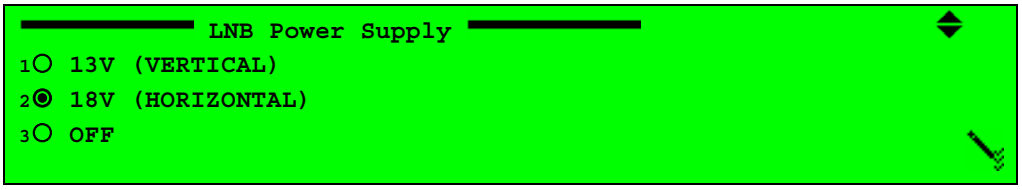


The available options are:

- **Automatic** – Automatically selects between Normal and Inverted spectral mode
- **INVERTED** – Inverted spectral mode
- **NORMAL** – Normal spectral mode

LNB POWER SUPPLY

The PVR 6000 sets the polarization of the receiving antenna by providing different voltage levels to the LNB, 13v for vertical polarization and 18v for horizontal polarization.
The polarization of the receiving antenna is determined according to the polarity of the satellite transponder.

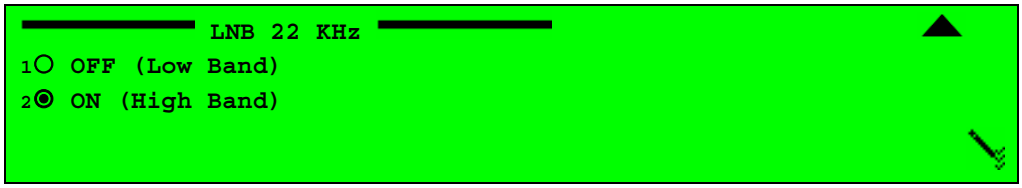


The available options are:

- **OFF** – No voltage is supplied to the LNB. Use this option either when cascading IRDs using the loop-through connector on the L-Band interface or when this voltage is supplied to the LNB by external source.
- **13V (Vertical)** – Vertical polarization
- **18V (Horizontal)** – Horizontal polarization

LNB 22 KHz

The receiver controls the LNB band by sending a 22 kHz signal. When the signal is sent, the LNB uses its High Band Local Oscillator (L.O.). When the signal is not sent, the LNB uses its Low Band L.O.
The local oscillator is used to convert the signal from Ku-Band or C-Band to L-Band. Two local oscillators exist one for each band to leverage full spectrum.

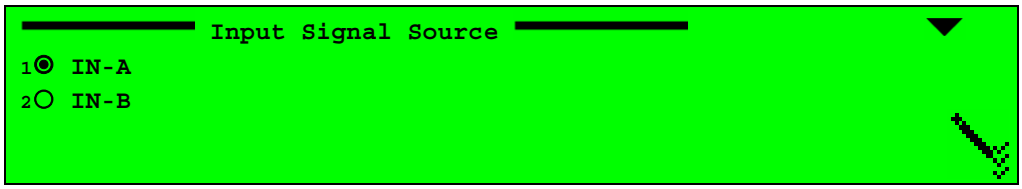


The available options are:

- **OFF** – Low band L.O.
- **ON** – High band L.O.

INPUT SIGNAL SOURCE

The **Input Signal Source** menu selects the RF interface source through which to acquire the signal to be received. This menu exists only in Dual RF Input PVR 6000 devices.

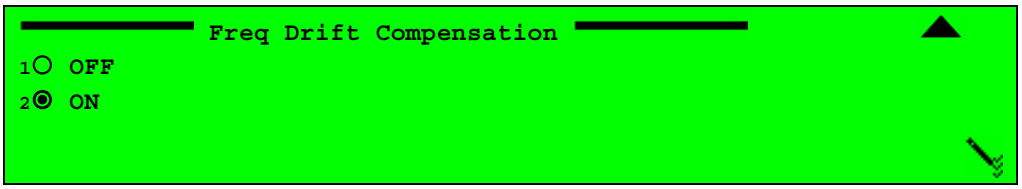


The available options are:

- **IN-A** – the PVR 6000 receives the input signal from RF IN 1 interface
- **IN-B** - the PVR 6000 receives the input signal from RF IN 2 interface

FREQ DRIFT COMPENSATION

The PVR 6000 uses **Freq Drift Compensation** to automatically correct inaccurate frequencies set by the operator.
When the operator sets the receiver frequency, the PVR 6000 checks whether it is set to the optimum frequency. When a deviation is detected, the PVR 6000 calculates the offset from the original setting and enables correcting it.
Turning on the Freq Drift Compensation activates the automatic frequency adjustment. When Drift compensation is turned off, the device uses the original frequency setting that was inserted by the operator.

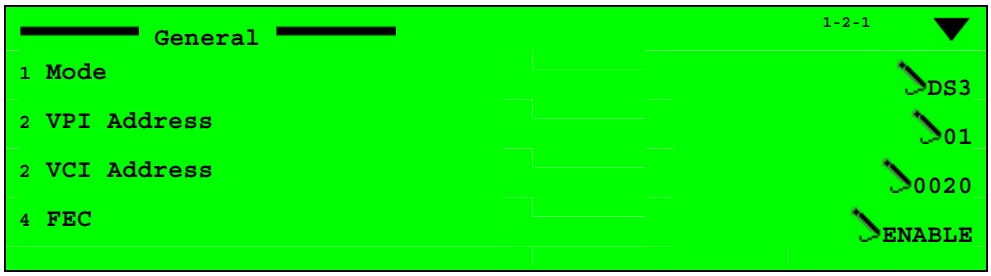


The available options are:

- **OFF** – Drift Compensation is off; the receiver remains with the configured frequency.
- **ON** - Drift Compensation is on; the receiver adjusts its optimal frequency.

4.2.2.4. DVB-ATM Module

This section details the front panel menus that enable configuring the DVB-ATM receiver in a PVR 6000 DVB-ATM front end device.
The following is the **DVB-ATM Receiver Configuration** menu as displayed on the PVR 6000 front panel screen:



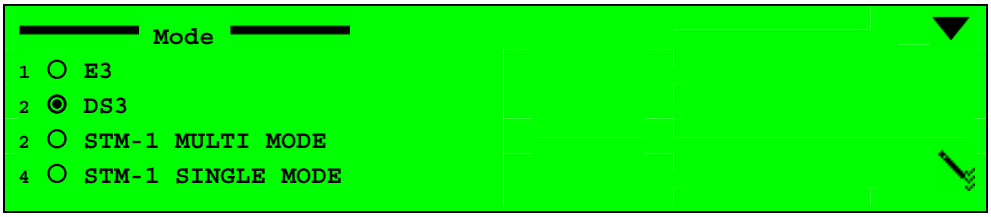
The available options are:

- **Mode** – this parameter allows the user to set the operational mode of the ATM receiver.
- **VPI Address** –this parameter allows the user to set the path address for the ATM receiver.
- **VCI Address** – this parameter allows the user to set the channel address for the ATM receiver.

- **FEC** – this parameter allows the user to enable FEC for the ATM receiver.

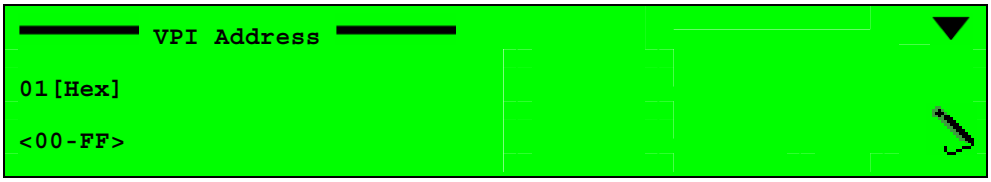
MODE

The **Mode** parameter allows the user to set the operational mode of the ATM receiver. The following is the front panel **Mode** screen:



VPI ADDRESS

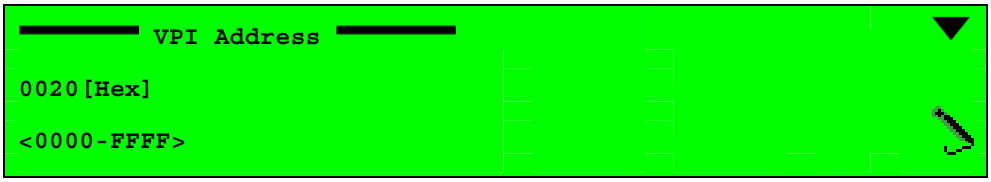
The **VPI Address** parameter allows the user to set the path address for the ATM receiver. The following is the front panel **VPI Address** screen:



The available values range from 00 to FF.

VCI ADDRESS

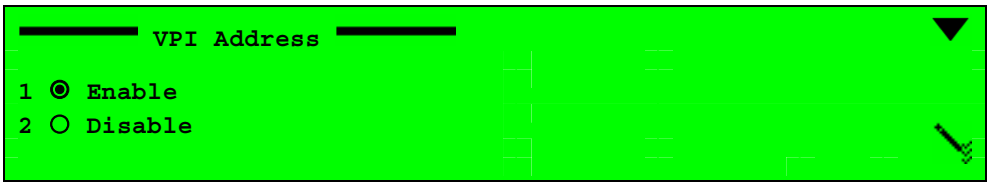
The **VCI Address** parameter allows the user to set the channel address for the ATM receiver. The following is the front panel **VCI Address** screen:



The available values range from 00 to FF.

FEC

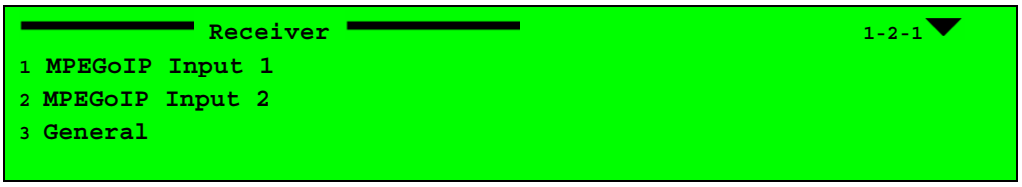
The **FEC** parameter allows the user to enable or disable FEC for the ATM receiver. The following is the front panel **FEC** screen:



4.2.2.5. IP Receiver Configuration Menu

This section details the front panel menus that enable configuring the IP receiver in a PVR 6000 IP front end device.

The following is the IP **Receiver** Configuration menu as it is displayed on the PVR 6000 front panel screen:



The available options are:

- **MPEGoIP Input 1** - allows the user to configure the MPEGoIP receiver connected to the rear panel *MPEGoIP IN 1* interface
- **MPEGoIP Input 2**- allows the user to configure the MPEGoIP receiver connected to the rear panel *MPEGoIP IN 2* interface
- **General** - allows the user to configure parameters such as redundancy, De-jittering delay, and FEC.

MPEGoIP Input 1

The **MPEGo-IP Input 1** sub-menu allows the user to configure the MPEGoIP receiver connected to the rear panel MPEGoIP interface.

Note

MPEGoIP Input 2 *menu is identical to the* ***MPEGoIP Input 1*** *menu*

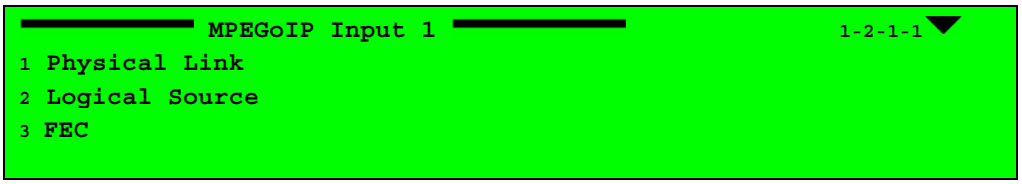


Figure 4-5 displays the corresponding DVB-IP Receiver MPEGoIP 1 Parameters Menu (Web Management screen).

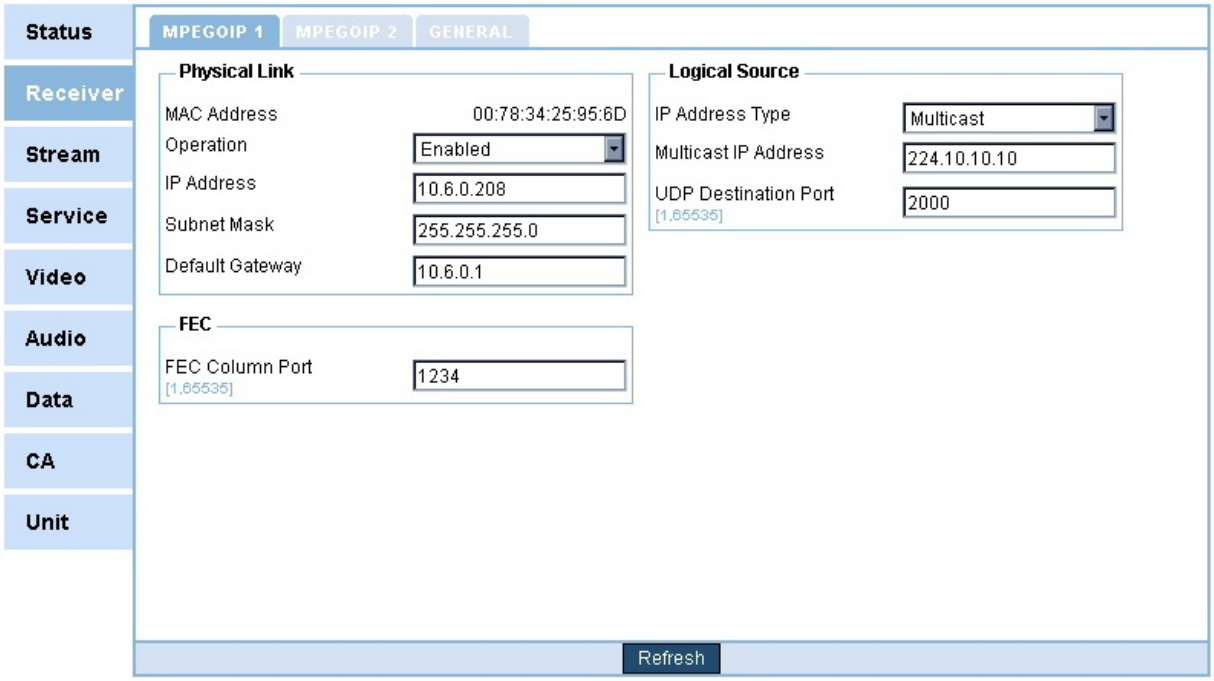


Figure 4-5: DVB-IP Receiver – MPEGoIP 1 Parameters Menu Screen

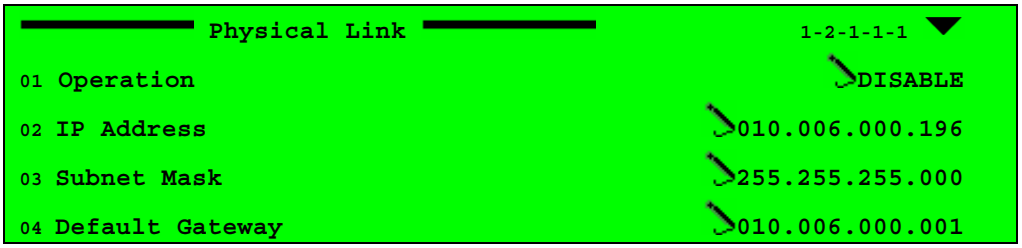
The available options are:

- **Physical Link** – for configuring this physical link parameters
- **Logical Source (Socket)** – for configuring the IP parameters of the TS source end-device ("logical port" parameters)
- **FEC** – for configuring the Forward Error Correction parameters the three options are detailed follows.

The three options are detailed as follows:

PHYSICAL LINK

The **physical Link** menu is used for enabling the operation of the physical link (the MPEGoIP IN1 interface in this example), as well as for configuring its parameters.



Available options are

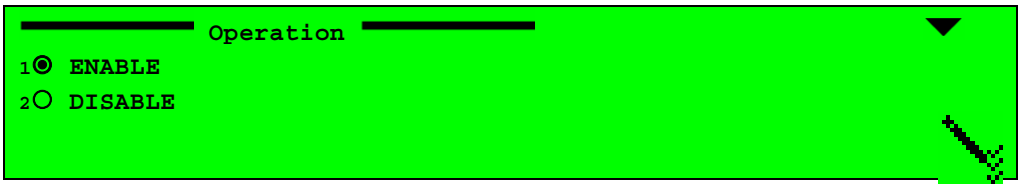
- **Operation** - for enabling or disabling this port
- **IP Address** - this MPEGoIP input port's IP address
- **Subnet Mask** - this MPEGoIP input port's Subnet Mask
- **Default Gateway** - the default gateway address

NOTE

*The operator must enter valid IP addresses before the PVR 6000 can operate. If one or more IP addresses are not entered correctly, the following message is displayed: "**Front-End Warning – IP Configuration Error".** This message remains until all IP addresses are entered correctly.*

OPERATION

The **Operation** menu is used for enabling or disabling this MPEGoIP input port.

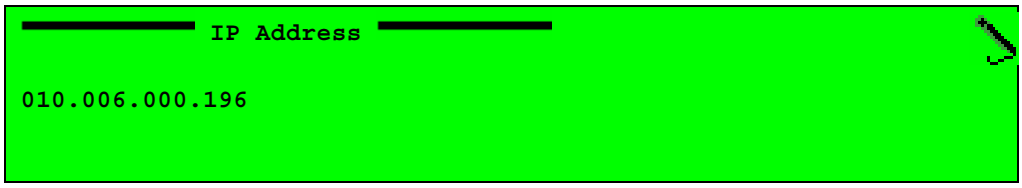


The available options are:

- **ENABLE** – enables the relevant MPEGoIP input (*MPEGoIP IN1* in this example)
- **DISABLE** - disables the relevant MPEGoIP input (*MPEGoIP IN1* in this example).

IP ADDRESS

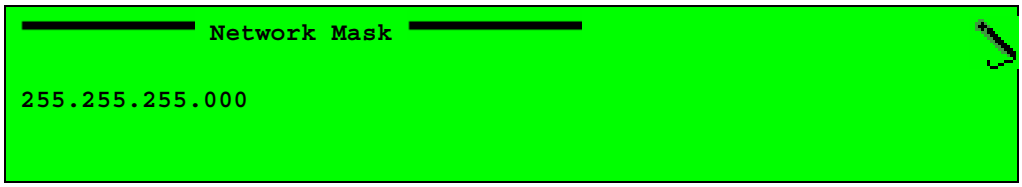
The **IP Address** menu is used for setting the IP address of this physical MPEGoIP input port (MPEGoIP IN1 in this example)



Use the front panel right/left arrows to navigate between the digits locations, and the up/down arrows to toggle the digits for creating the address.

NETWORK MASK

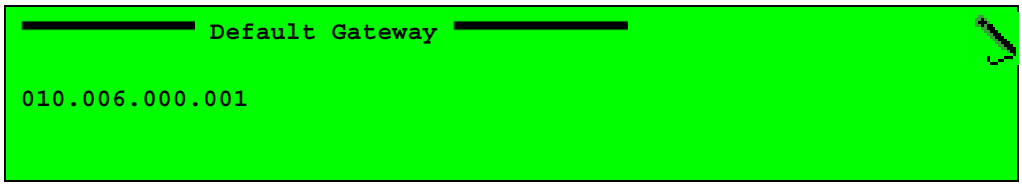
The **Network Mask** menu is used for setting the Network Subnet Mask of the physical MPEGoIP input port (*MPEGoIP IN1* in this example)



Use the front panel right/left arrows to navigate between the digits locations and the up/down arrows to toggle the digits for creating the address.

DEFAULT GATEWAY

The Default **Gateway menu** is used for setting the default gateway address for the PVR 6000's physical MPEGoIP input port



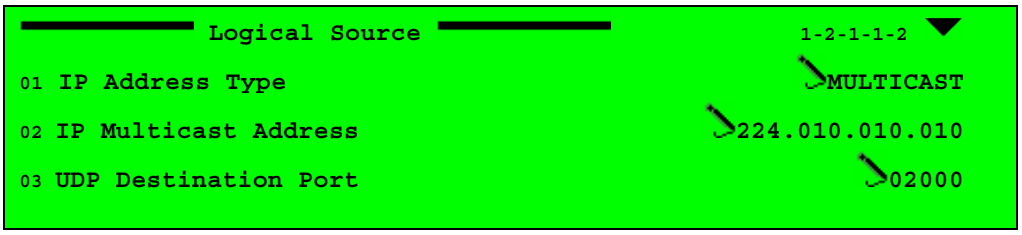
Use the front panel right/left arrows to navigate between the digits locations, and the up/down arrows to toggle the digits for creating the address.

NOTE

Both MPEGoIP input ports must use the same gateway.

LOGICAL SOURCE (SOCKET)

The **Logical source** menu is used for configuring the connection with the end device ("logical port").

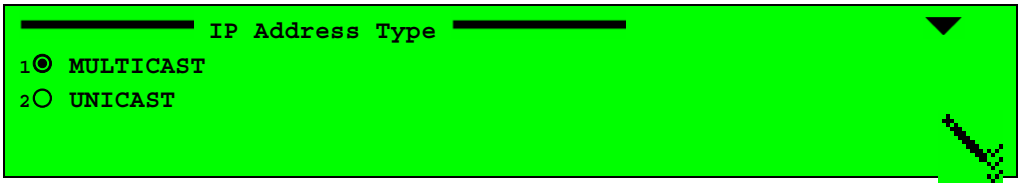


The available options are:

- **IP Address Type** - for choosing between Multicast and Unicast address types
- **IP Multicast Address** - the logical port's IP address (this menu is displayed only when Multicast IP address type is selected)
- **UDP Destination Port** - the logical port's UDP port from which to receive data

IP ADDRESS TYPE

This menu is used for choosing the Multicast or Unicast address type.

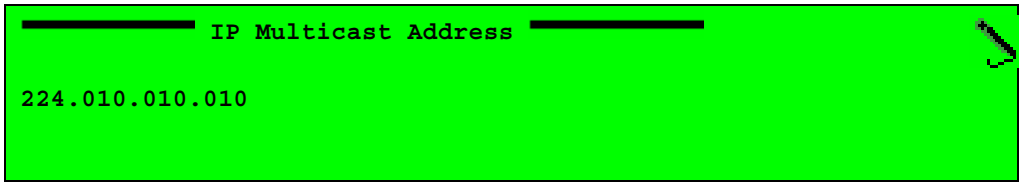


The available options are:

- **MULTICAST** – for selecting Multicast IP address type. When selected, the IP Multicast address menu is displayed, which enables configuring the Multicast address. An IGMP Join request is sent for connecting with the IP Multicast address that was configured. The PVR 6000 filters the relevant transport stream with the configured Multicast IP address and UDP port.
- **UNICAST** - for selecting Unicast IP address type. The PVR 6000 filters the relevant transport stream only by the configured UDP port.

IP MULTICAST ADDRESS

The **IP Multicast Address** menu enables setting the logical port's IP address (this menu is displayed only when the Multicast IP address type is selected).



Use the front panel right/left arrows to navigate between the digits locations, and the up/down arrows to toggle the digits for creating the address.

UDP DESTINATION PORT

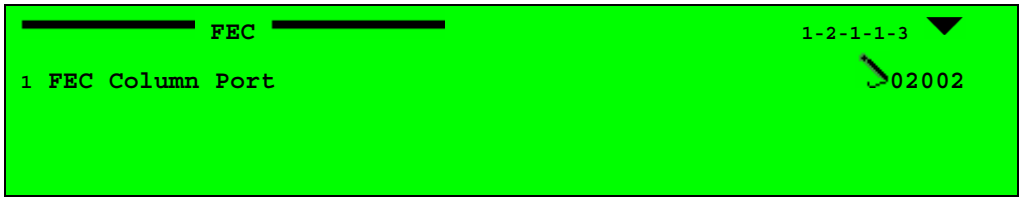
The **UDP Destination Port** menu enables setting the logical port's UDP port number

Use the front panel right/left arrows to navigate between the digits locations and the up/down arrows to toggle the digits for creating the address.

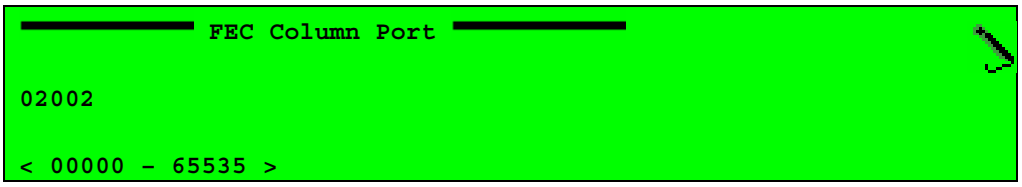
FEC (FORWARD ERROR CORRECTION)

The PVR 6000 IP Front End-**FEC** Implementation complies with ProMPEG CoP3v2, with the following limitations:

- Columns support only
- Maximum TS bit-rate - 20 Mbps



Selecting **FEC Column Port** displays the following screen, which allows setting the UDP port number carrying the FEC data.



Available values range from 0 to 65535.
Use the front panel **[right]**/ **[left]** arrows to navigate between the digit location and the **[up]**/ **[down]** arrows to toggle for the required digits.

NOTE

The default FEC Column port is set to N+2, where N is the value of the UDP Destination port.

GENERAL

General sub-menu screen allows the user to set several parameters:

Figure 4-6 displays the corresponding DVB-IP Receiver **General** Parameters Menu (Web Management screen).

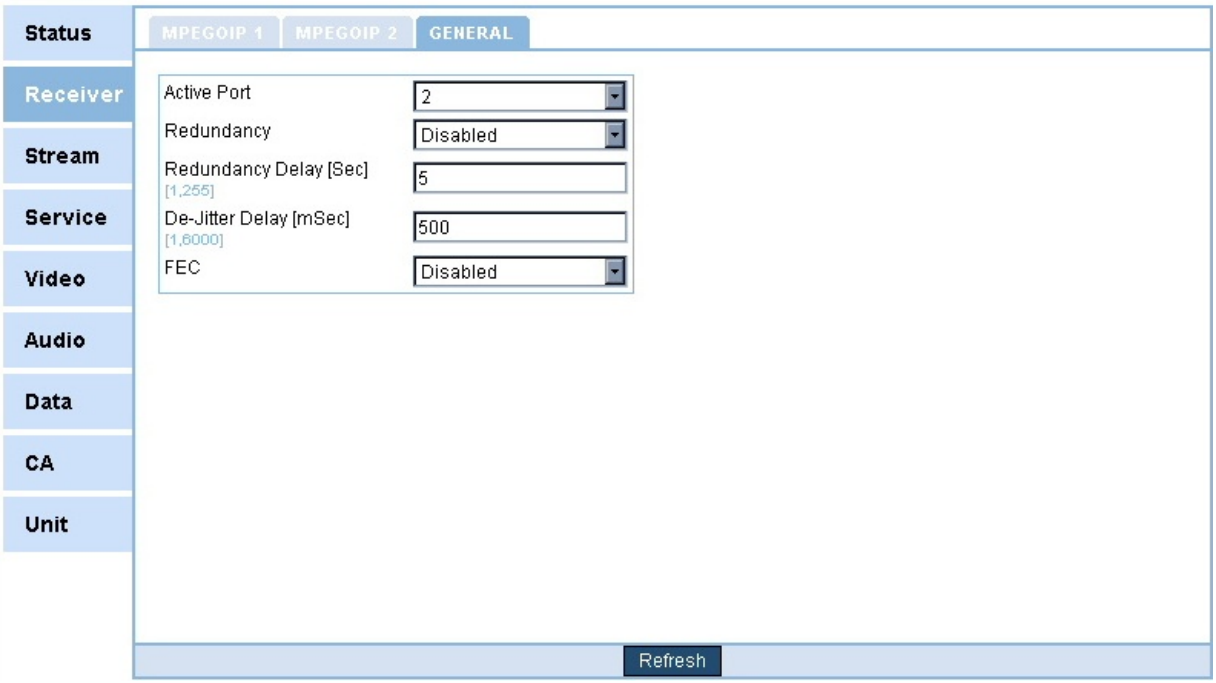
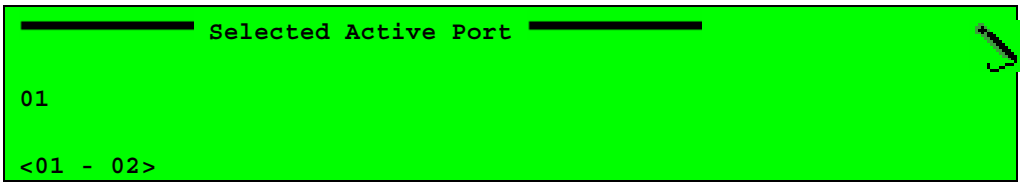


Figure 4-6: DVB-IP Receiver – General Parameters Menu Screen

- **Selected Active Port** – for selecting the active input port. This port will become active and remain active unless a redundancy event caused the PVR 6000 to switch to the other input port.
- **Redundancy** - enables or disables the PVR 6000 redundancy feature
- **Redundancy Delay** - for setting the time delay that defines a redundancy event
- **De-Jitter Delay** - for setting the de-jitter buffer time delay
- **FEC** – enables or disables the FEC feature

SELECTED ACTIVE PORT

The **Selected Active Port** menu is used for selecting the active input port. This port will become active, and remain active unless a redundancy event caused the PVR 6000 to switch to the other input port.



Available values are 01 and 02.

REDUNDANCY

The PVR 6000 IP front end supports both physical link and logical source redundancy. The physical link and logical source are coupled, i.e. switching from one physical link to the other (in the case of a link redundancy event) forces switching from the corresponding logical source to the other. In the case of a logical source redundancy event, the physical links are switched as well.

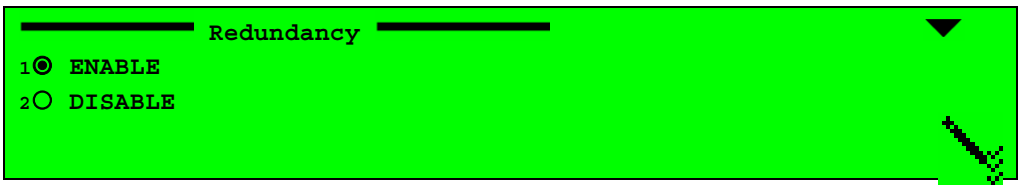
- **Link Redundancy**: protects the directly connected switch/router and the physical cable connection. There are two IP physical links to the PVR 6000: *MPEGoIP IN1* and .*MPEGoIP IN2*.
- **Source Redundancy**: protects the transport stream source (encoder/streamer). Two logical sources (i.e. sockets), containing identical streams, must be configured to enable Source redundancy.

REDUNDANCY EVENT

A redundancy event causes the PVR 6000 to switch from the active Physical Link and Logical Source to the passive ones.
The device identifies a redundancy event when all the following conditions apply:

- Redundancy mode is enabled
- Active physical link failure (through PHY indication) or active logical source failure detection (no stream is being received for a preconfigured *Redundancy Delay* time [see next page)
- Passive physical link is configured, up, and connected
- Passive logical source is configured and connected

The following menu is used for enabling or disabling the operation of the redundancy feature.

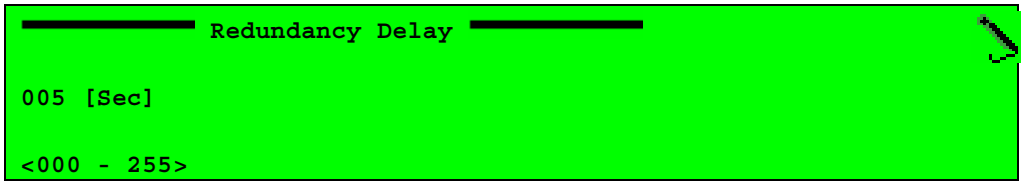


The available options are:

- **ENABLE** – enables redundancy; when a redundancy event occurs the physical link and logical source switch to passive ones
- **DISABLE** - disables redundancy

REDUNDANCY DELAY

The **Redundancy delay** menu is used for setting the time delay, which defines a redundancy event.



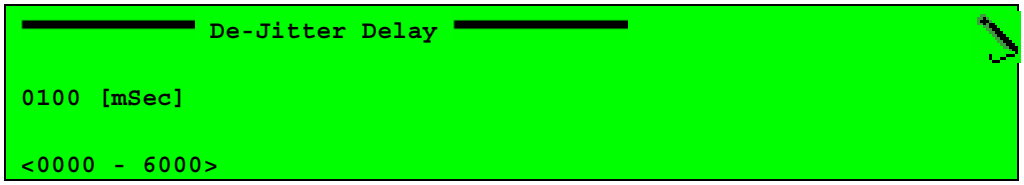
Redundancy delay values range from 0 to 255 seconds.

DE-JITTER DELAY

The **De-jitter Delay** menu is used for setting the decoder's De-Jitter delay in milliseconds.

The aim of the De-Jittering mechanism is to eliminate the inherent jitter introduced by a typical IP network. This mechanism practically acquires the source exact frequency and follows it. The PVR 6000 supports de-jittering of CBR (Constant Bit Rate) streams.

The de-jitter delay configurability enables only optimizing unit-performance according to specific needs. The longer the delay, the longer the jitter that can be eliminated (traded off by longer latency).



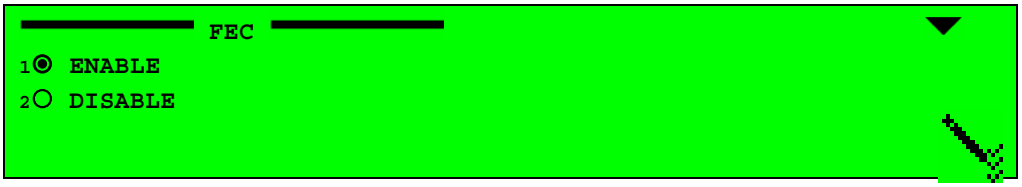
De-jitter delay values range from 0 to 6000 milliseconds.

FEC

The PVR 6000 IP Front End **FEC** Implementation complies with ProMPEG CoP3v2, with the following limitations:

- Columns support only
- Maximum TS bit-rate: 25 Mbps

This menu enables OR disables FEC operation.



The available options are:

- **ENABLE** – enables FEC operation; regenerates missing IP packets using FEC packets received from the configured UDP port.
- **DISABLE** - disables FEC operation; ignores FEC packets and does not regenerate missing IP packets.

4.2.3. Stream Configuration Menu

To access the **Stream Configuration Menu** in the front panel control interface go to ***Configuration→Stream***.
Figure 4-7 displays a tree diagram of the Stream Configuration Menu.

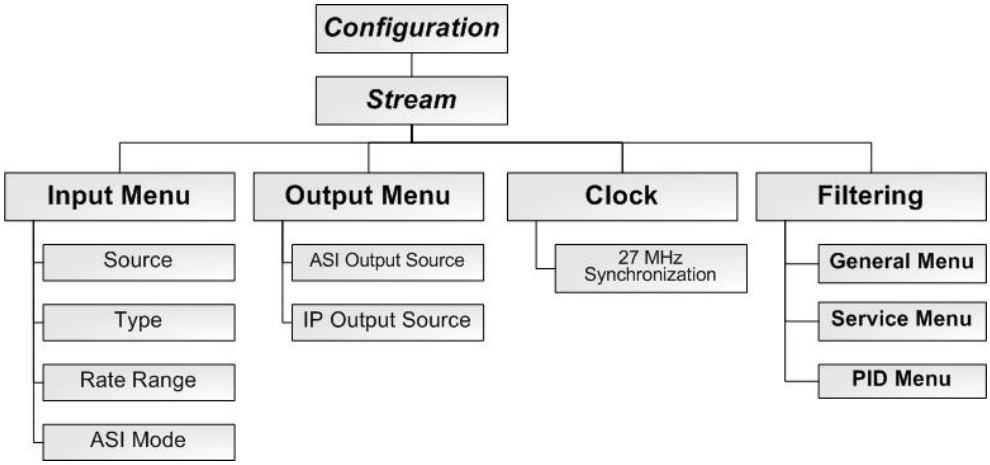


Figure 4-7: Stream Configuration Menu

The following figure displays the **Stream** configuration menu:

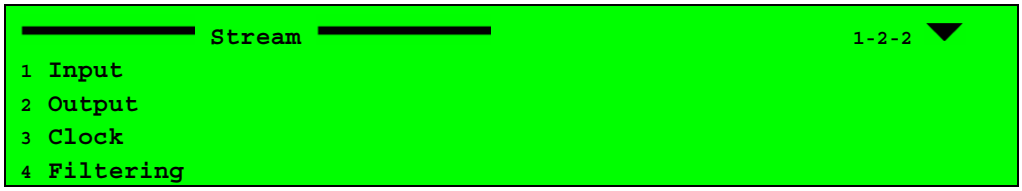


Figure 4-8 displays the corresponding **Stream** configuration (Web Management screen).

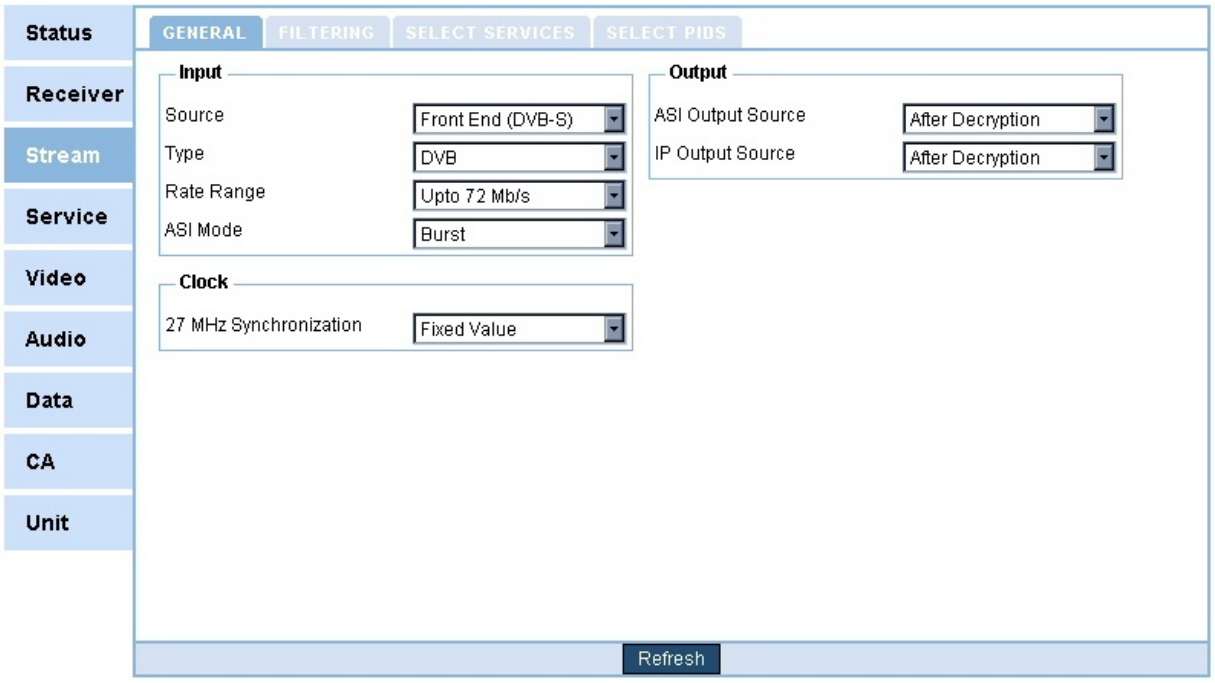
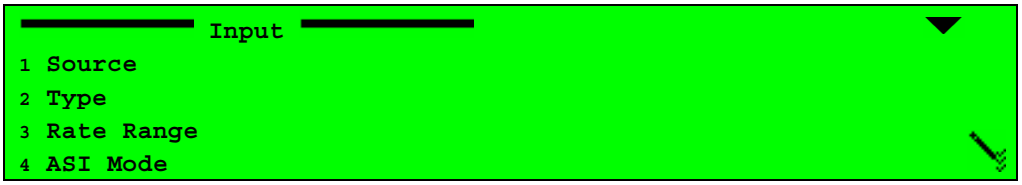


Figure 4-8: Stream Parameters Menu Screen

The following Sections detail the **Stream** Configuration parameters.

4.2.3.1. Input

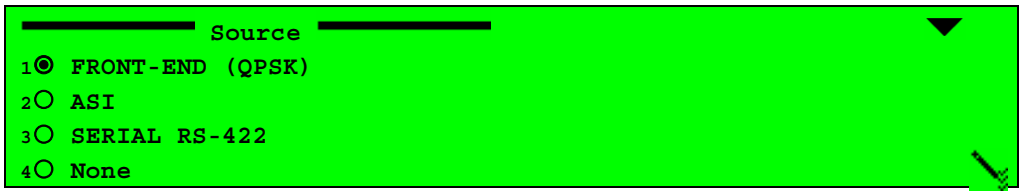
The PVR 6000 supports a wide range of optional input interfaces, allowing the PVR 6000 to receive input streams from different sources.



The **Source** parameter defines the input stream source.

SOURCE

When the receiver is active in the IRD, the following menu is displayed:



NOTE

The Decoder Stream Source screen is dynamic and it changes according to the currently-active PVR 6000 interface.

The available options are:

- **FRONT-END** (if applicable) – Selects the Receiver Front-End Interface as the source for the input transport stream
- **ASI** – Select the ASI digital input as the source for the input transport stream
- **SERIAL RS-422** – Selects the RS-422 serial input as the source for the input transport stream

NOTE

Only qualified personnel should handle serial RS-422 option.

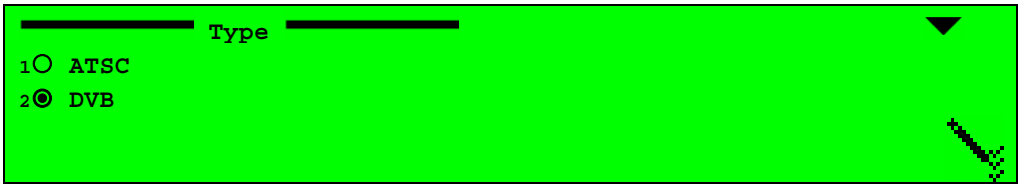
- **None** - No input source is selected for the PVR 6000.

NOTE

*When **Front-End (IP)** is selected, the **27 MHz Synchronization** option must be set to **Fixed-Value** (see next page).*

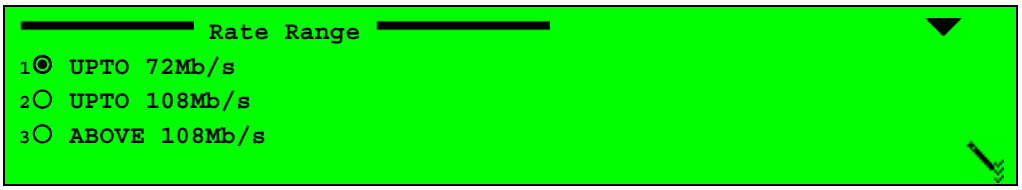
TYPE

The **Type** parameter allows selecting between ATSC format and DVB format.



RATE RANGE

The **Rate Range** parameter defines the range of the ASI input rates.



The available options are:

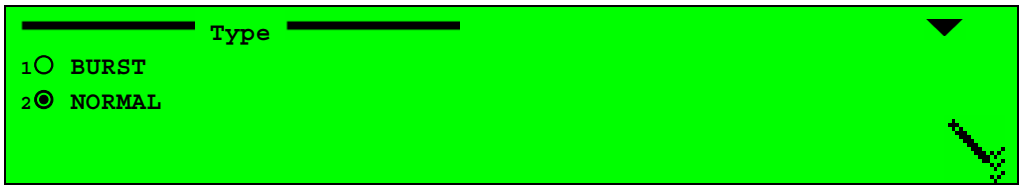
- **UPTO 72Mb/s** – Selected when using a CAM for descrambling
- **UPTO 108Mb/s** – Selected when not using CAM and inputting a transport Stream within a rate of 72M-108Mb/s.
- **ABOVE 108Mb/s** – Not in use.

NOTE

*The **ASI Input-Rate Range** parameter in the front panel interface corresponds with **Stream Rate Range** in the Web management interface (see Figure 4-8).*

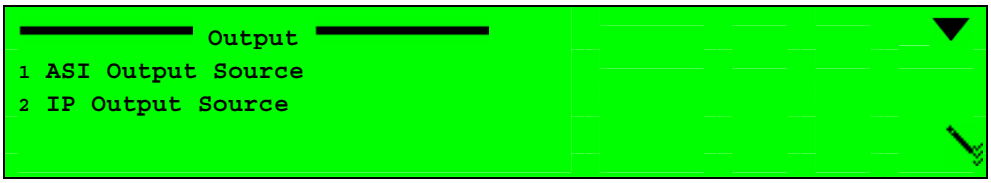
ASI MODE

The **ASI Mode** parameter allows selecting between BURST format and NORMAL format.

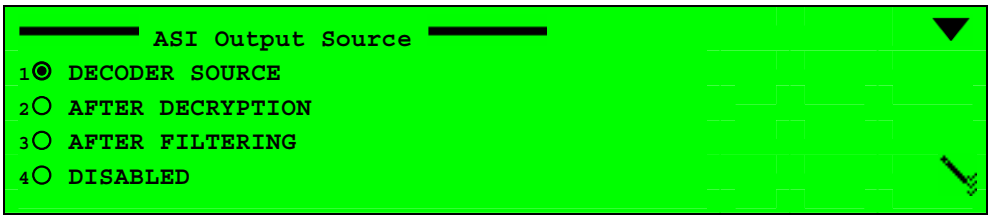


4.2.3.2. Output

The PVR 6000 supports a wide range of optional output interfaces, allowing the PVR 6000 to send output streams to different destinations.



The **ASI Output Source** parameter defines the type of ASI output source.

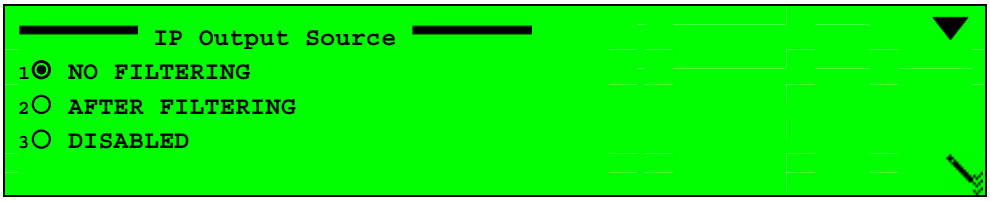


The available options are:

- **DECODER SOURCE** – Input stream is directly routed to the ASI output
- **AFTER DECRYPTION** – Stream passes the CAM and then is directed to the ASI output
- **AFTER FILTERING** – Stream passes the CAM and then is directed to the ASI output
- **DISABLED** – ASI output signal is disabled

IP OUTPUT SOURCE

The **IP Output Source** parameter defines the type of IP output source.

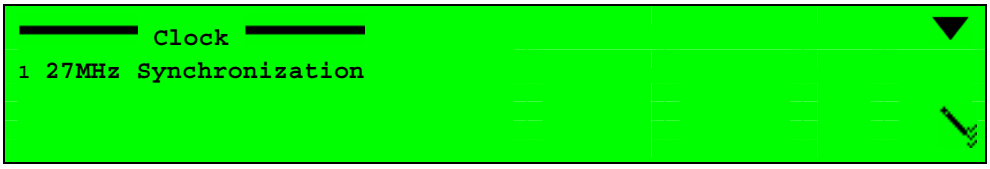


The available options are:

- **DECODER SOURCE** – Input stream is directly routed to the ASI output
- **AFTER DECRYPTION** – Stream passes the CAM and then is directed to the ASI output
- **AFTER FILTERING** – Stream passes the CAM and then is directed to the ASI output
- **DISABLED** – ASI output signal is disabled

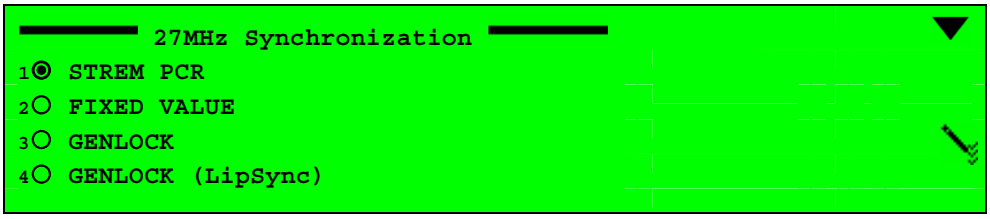
4.2.3.3. Clock

Defines the synchronization source for the PVR 6000.



27 MHZ SYNCHRONIZATION

The **27 MHz Synchronization Configuration Option** defines the synchronization source for the PVR 6000 VCXO.
The Decoder Synchronization Source is a 27 MHz clock, generated by a Voltage Controlled Crystal Oscillator (VCXO). It is used to synchronize the PVR 6000 to the MPEG stream.



The available options are:

- **STREM PCR** – The VCXO is synchronized to the program clock recovered from the PCR data.
- **FIXED VALUE** – The VCXO is running in free mode.
- **GENLOCK** – Synchronizes the PVR 6000 according to MPEG Encoder external video signal.
- **GENLOCK (LipSync)** – Additional Genlock that Synchronizes the PVR 6000 according to the Video GenLock input. This feature ensures a range of approximately 4mSec delta time between Audio/Video synchronization.

NOTE

The VCXO is factory calibrated to a fixed 27 MHz clock.

4.2.4. Filtering

Filtering is a licensing required feature that allow the user to define a method for PID Filtering on PVR 6000 ASI and IP output ports.
The following summarizes the **Filtering** procedures, using both Front Panel and Web-Based Management interfaces:

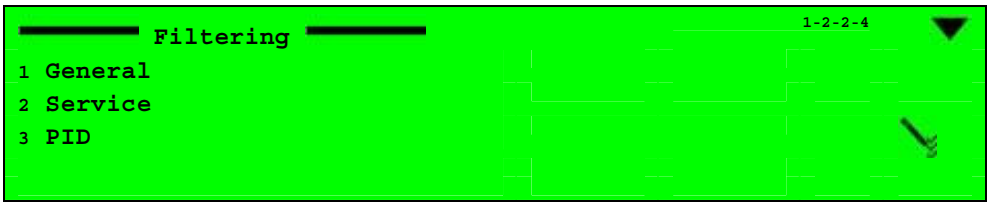
FILTERING THROUGH THE FRONT PANEL

In order to use filtering mode thru the front panel perform the following steps:

- Configure ASI or/and IP outputs to filtering mode (see section 4.2.3.2:

  Configuration→Stream→Output→ASI Output Source→After Filtering
  Configuration→Stream→Output→IP Output Source→After Filtering

- Access the general screen by navigating to:
  Root→Configuration→Stream→Filtering



- Set the following parameters at the **General** sub menu: strategy, mode, Bit-rate mode and bit-rate. (see section 4.2.4.1)

  Configuration→Stream→ Filtering→General

- In case that the service filtering strategy is chosen, select the services (see section 4.2.4.2)

  Configuration→Stream→ Filtering→Service

- In case that the PID filtering strategy is chosen, select the PIDs (see section 4.2.4.3)

  Configuration→Stream→ Filtering→PID

FILTERING THROUGH THE WEB-BASED MANAGEMENT

In order to use filtering mode thru the front panel perform the following steps:

- configure ASI or/and IP outputs to filtering mode:

  Stream→General→Output→ASI Output Source→After Filtering
  Stream→General→Output→IP Output Source→After Filtering

- Set the following parameters at the filtering sub menu: strategy, mode, Bit-rate mode and bit-rate. (see section 4.2.4.1)

  Stream➔ Filtering

- In case that the service filtering strategy is chosen, select the services. (see section 4.2.4.2)

  Stream➔ Select Services

- In case that the PID filtering strategy is chosen, select the PIDs. (see section 4.2.4.3)

  Stream➔ Select PIDs

4.2.4.1. General Filtering Parameters

The **General** menu provides several **filtering parameters** for ASI and IP output ports.

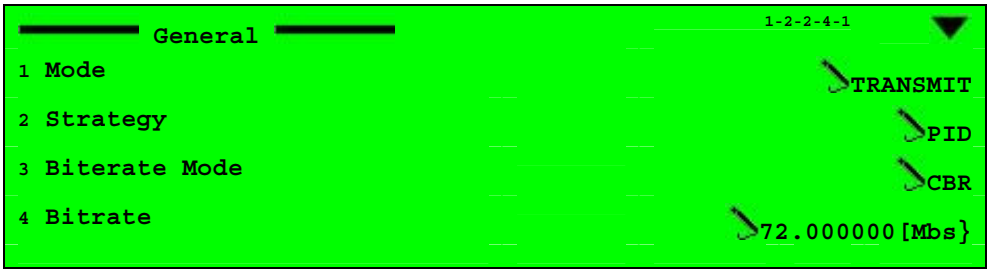


Figure 4-9 displays the General corresponding **Filtering** screen (Web Management screen).

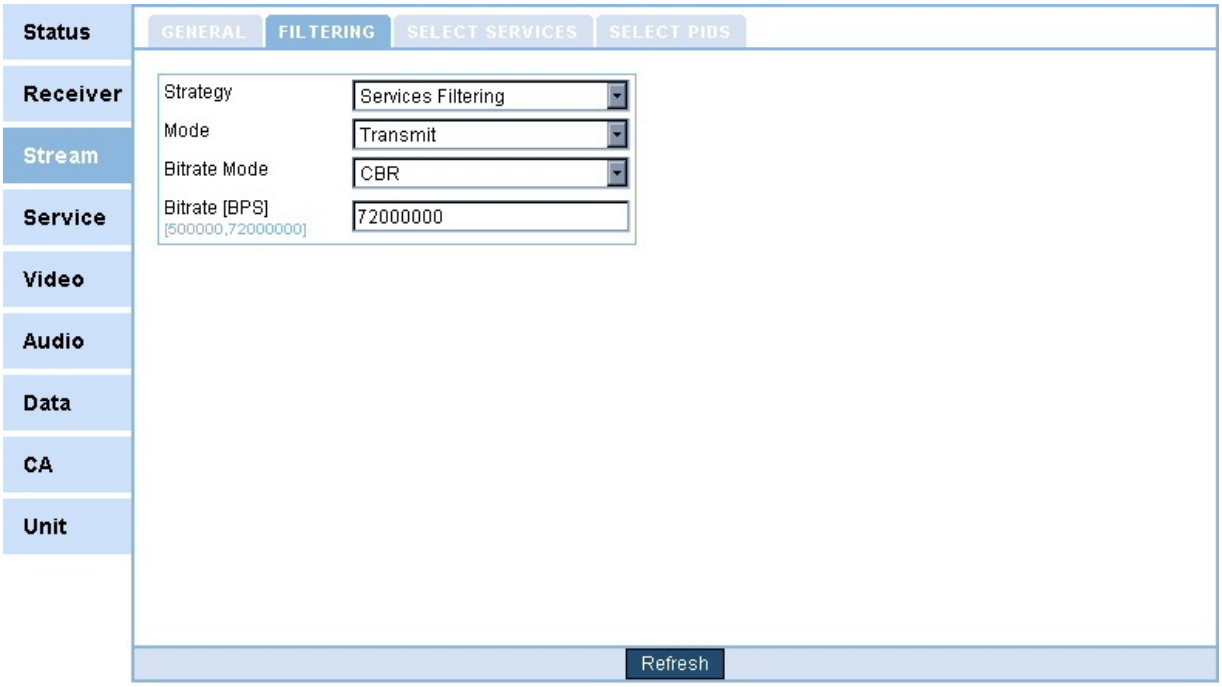


Figure 4-9: General Filtering Parameters Menu Screen

MODE

This parameter allows the user to set the selected services or PIDs to be transmitted or filtered at the output ports. Two values are available:

- **TRANSMIT** – this mode forwards only selected services or PIDs to the output (Excluding unselected or unreferenced services or PIDs).
- **FILTER** - this mode excludes the selected services or PIDs from the output.

STRATEGY

Filtering strategies (decoded only, service filtering and PID filtering):

- **Decoded Service Filtering -** The decoded streams (1-2 services as chosen in the "Service" menu) are selected. All of the service' PIDs (Video, Audio and so on) are transmitted or filtered (based on **Mode** parameter) to the ASI and/or IP outputs.
- **Services Filtering** – This mode allows the user to select specific services from a list (under "select services"). This mode is **dynamic**, means that the IRD follows the services' tables and automatically add or remove PIDs accordingly. The user can select two types of services:
  - **Referenced services** – any service included in the PAT.
  - **Unreferenced service** – the user can add any other service ID. When the service is received at the input, the IRD will forward (or filter) it accordingly. This mode is useful for scenarios were the user want to select an unreferenced service or configures the unit before the system is fully deployed.
- **PIDs Filtering** – allows the user to select specific PIDs, which are selected from a list (under "select PIDs"). This mode is Static, means that the IRD forwards or filters the selected PIDs and does not change it when PMT is changed. The user can select 3 types of PIDs:
  - **Constant PIDs** – such as PAT, CAT and so on. the list is changed according to the stream type DVB or ATSC which is configured by the user
  - **Referenced PIDs** – any PID which is included in the PMT of a referenced service.
  - **Unreferenced PIDs** – the user can add any other PID number. When the PID is received at the input, the IRD will forward (or filter) it accordingly. This mode is useful for scenarios were the user want to select an unreferenced PID or configures the unit before the system is fully •deployed.

BITRATE MODE

This parameter defines the output stream as VBR or CBR. All NULL packets are removed at the input.

- **VBR** - allows variable output stream bit-rate. The IRD drops all unneeded services and PIDs according to the user selection. NULL packets are filtered at the input, and excluded from the output.
- **CBR** – allows constant output stream bit-rate; the bitrate is configured by the user. IRD drops all unneeded services and PIDs. NULL packets are dropped at the input; however, NULL packets are inserted at the output to meet the configured bit rate. The minimum configured bit rate should be 25 percents more then the selected services or PIDs accumulated maximum bit rate. This is due to momentarily burstiness scenario. In case that an overflow occurs, the following alarm Filtering CBR Bit-rate is too Low is turned on (if the alarm is not masked, a trap is generated).

BITRATE

This parameter allows setting the output bitrate limit.
The available values range is 0.500000 to 72.000000 (Mbs).

NOTES

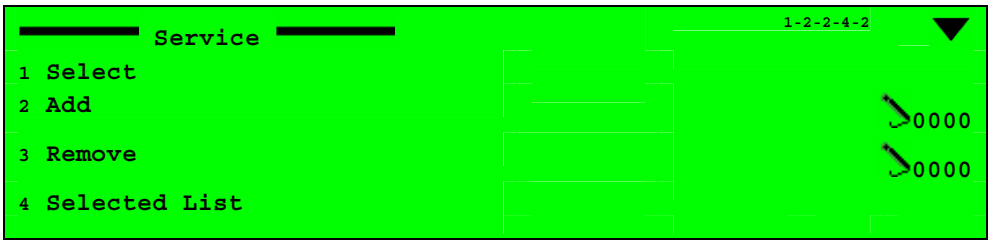
- *When using VBR mode, a **Bitrate limit** must be defined.*
- *In order to prevent system overflow it is highly recommended to use a bit-rate value which is 25% higher then the desired bit-rate. In case of system overflowing, the IRD provides an error trap*
- *PSI/SI tables are NOT regenerated - Tables can be dropped (for example, in **service** mode, PMTs of the filtered services are automatically dropped). However, tables are not modified (for example, in service mode, the PAT includes all original services, including those which were dropped)*

4.2.4.2. Select Services

Service menu is a feature that allows the user to select services used for filtering mode on the PVR 6000 ASI and IP output ports. The following describes service selection in filtering mode thru the front panel and the web-interface.

SELECT SERVICES THRU THE FRONT PANEL

Service menu is located at **Configuration→Stream→ Filtering→Service**



Service menu includes the following parameters:

- **Select** - This parameter lists all available services on the received transport-stream. It allows selection of specific services. The parameters displayed as the service' ID symbol next to the service' name tag. For example: **'000A,PROGRAM1'**.
- **ADD** - This parameter allow the user to manually add services by using the keypad and enter the service' ID. The available values range is **0000** to **FFFF** [Hex].
- **Remove** - This parameter allow the user to manually remove by using the keypad and enter the service' ID. The available values range is **0000** to **FFFF** [Hex].
- **Selected List** - This screen displays all selected services' ID symbols. For example: **010A**.
- **Clear All** – This parameter allows clearing all selected services list. The available options are:
  - **OFF** – clear list disabled.
  - **ON** – active clear list.

NOTE

Service menu is applicable only when service filtering is selected from the Strategy menu

SELECT SERVICES THRU THE WEB INTERFACE

Select Services is the corresponding web-management screen that allows the user to select Services for the filtering mode.
Figure 4-10 displays the corresponding **Select Services** Parameters (Web Management screen).

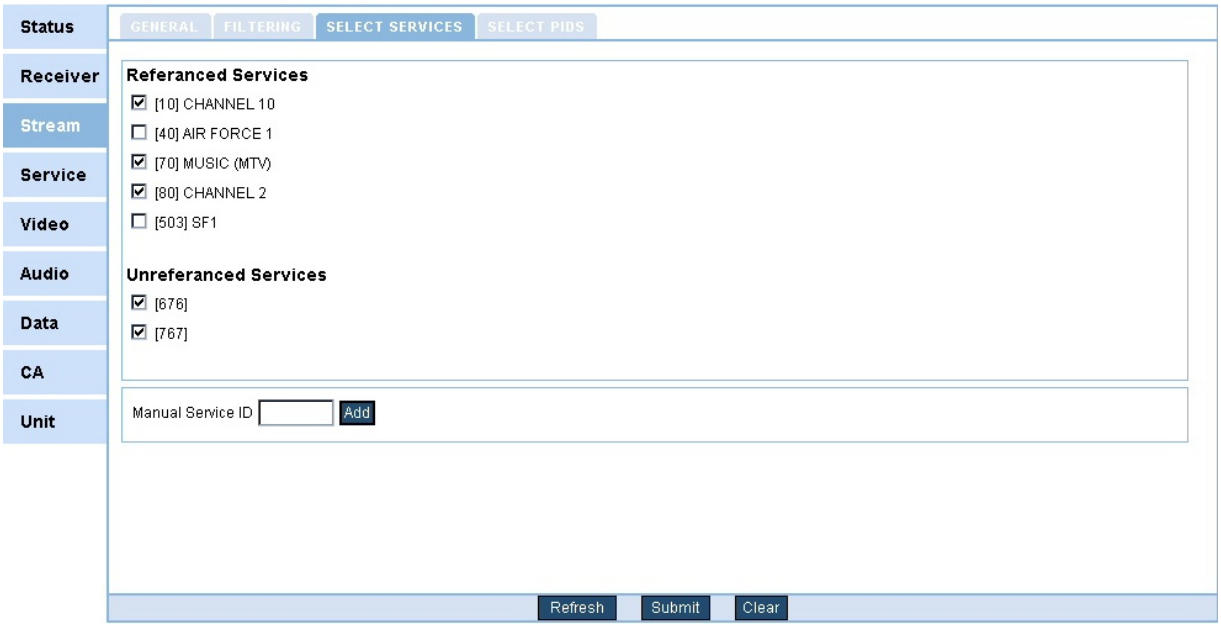


Figure 4-10:Select Services Menu Screen

Select Services screen includes the following parameters:

- **Referenced Services** - This parameter lists all available services on the PVR 6000. It allows selection of specific service. The parameters displayed as the service' ID next to the service' name tag. In order to select a service, select the service' check box and click **Submit**.
- **Unreferenced Services**- This parameter lists all selected unreferenced services' IDs on the PVR 6000. The parameters displayed as the service' ID and name. It allows removal of an unreferenced service. In order to remove an unreferenced services, select the service' check box and click **Submit**.

NOTE

Unreferenced Services is unavailable when no unreferenced services have been selected

- **Manual Service ID -** This parameter allow the user to manually add service-to-filter by entering the service' ID in the text box and click on **Submit**.
- **Clear -** Clicking on **Clear** button empty all selected fields.

NOTE

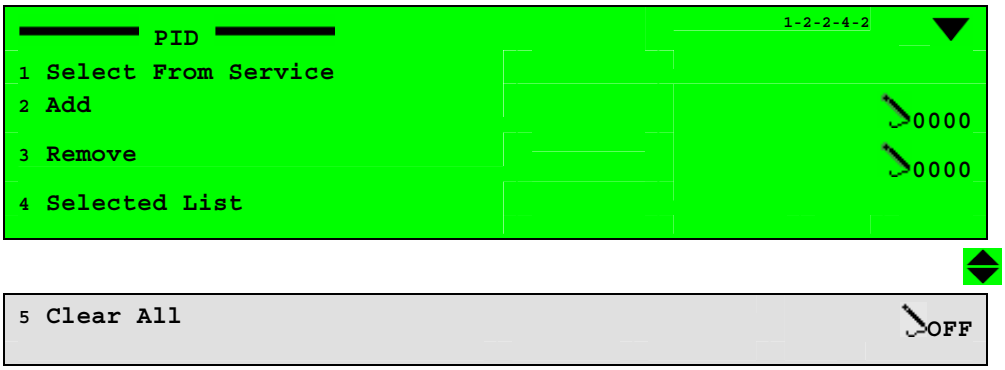
***Service** menu is applicable only when service filtering is selected from **Strategy** menu*

4.2.4.3. Select PIDs

The **PID** menu screen is a feature that allows the user to select PIDs on the PVR 6000 ASI and IP output ports. The following describes PIDs selection in filtering mode thru the front panel and the web-interface.

SELECT PIDS THRU THE FRONT PANEL

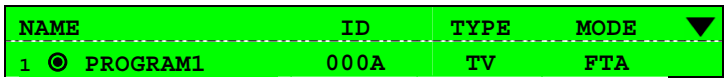
PID menu is located at **Configuration→Stream→ Filtering→PID**



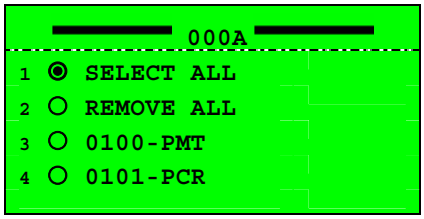
PID menu includes the following parameters:

- **Select from Service** - This table menu lists all available PIDs on the received transport-stream. It allows selection of specific PIDs from a service to be filtered. The **select from service** table menu consist of the following parameters:
  - **NAME** – The service name
  - **ID** – The service identification symbol [Hex]
  - **TYPE** Service type options: TV, Radio, TLTX, NVOD, MOSAIC, PAL, SECAM, MAC, FM, NTSC, and Data.
  - **MODE** – Indicates if the service is encrypted (**CAS**) or free to air (**FTA**).

    For example:



  When selecting a Service listed at the **Select from Service** table menu, a list of all available PIDs of the selected services is displayed, and the user can select specific PIDs.
  For example:



  The selected service's **ID** is displayed at the title. The first two parameters of every service list are:
  - **SELECT ALL** – Select all PIDs of the current service.
  - **REMOVE ALL** – Remove all PID's of the current service.

  The rest of the list includes available PIDs next to the PID' type.

- **ADD** - This parameter allows the user to manually add PIDs by using the keypad and enter the PID symbol [Hex]. The available values range is **0000** to **1FFF** [Hex].
- **Remove** - This parameter allows the user to manually remove PIDs from being filtered by using the keypad and enter the PID symbol [Hex]. The available values range is 0000 to 1FFF [Hex].
- **Selected List** - This screen displays all selected PIDs, For example: **010A**.
- **Clear All** - This parameter allows clearing all selected PIDs-to-filter list. The available options are:

- **OFF** – clear list disabled.
- **ON** – active clear list.

NOTE

> ***PID*** *menu is applicable only when service filtering is selected from the* ***Strategy*** *menu.*

SELECT PIDS THRU THE WEB INTERFACE

Select PIDs is the corresponding web-management screen that allows the user to select PIDs in the filtering mode.

Figure 4-11 displays the corresponding **Select PIDs** configuration (Web Management screen).

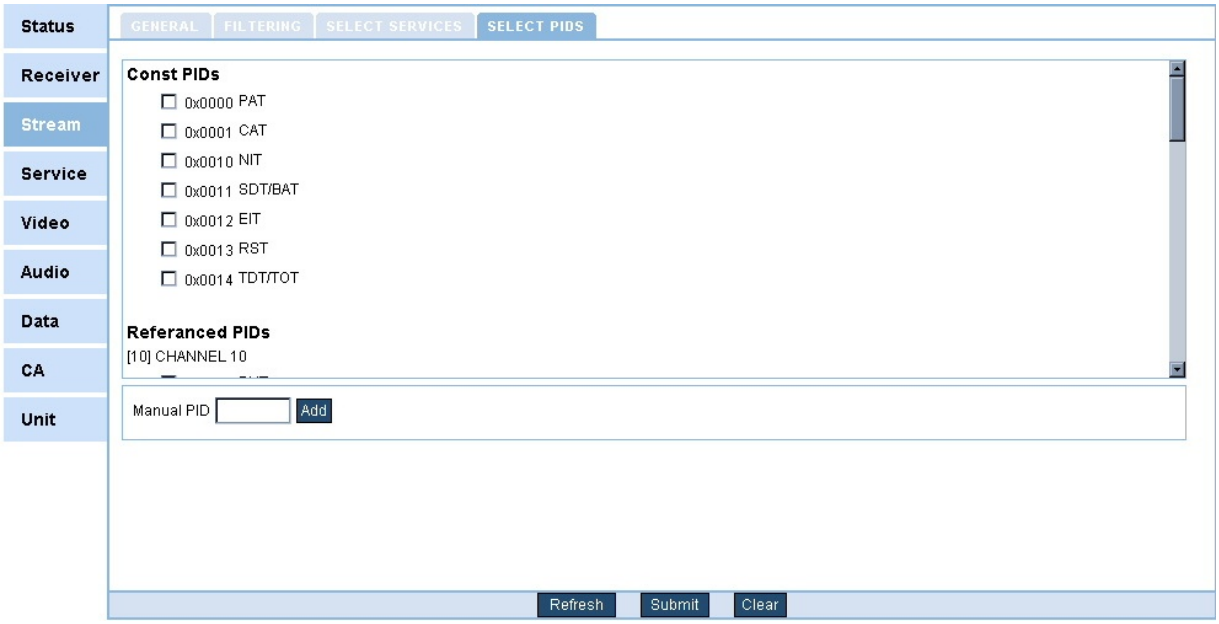


Figure 4-11: Select PIDs Menu Screen

Select PIDs screen includes following parameters:

- **Const PIDs** - This parameter lists all available SI PID's and allows the user to select SI PIDs. In order to select SI PIDs, select the PIDs check boxes and click **Submit**.
- **Referenced PIDs -** This parameter lists all available services PIDs on the received transport-stream grouped under the relevant Service' nametag. It allows selection of specific PIDs. In order to select a PID to filter, select the needed PIDs' check boxes and click **Submit**.
- **Unreferenced PIDs** - This parameter lists all selected unreferenced PIDs. it allows removal of an unreferenced PIDs. In order to remove an unreferenced PID, select the PID' check box and click **Submit**.

NOTE

Unreferenced Services *is unavailable when no unreferenced services have been selected.*

- **Manual PID** - This parameter allows the user to manually add PIDs by entering the PIDs symbol in the text box and click on **Submit**.

NOTE

When the manually selected PID is a constant SI PID or it is part of a referenced service, the relevant checkbox is checked; otherwise, the manually selected PID is added under the unreferenced PIDs list

- **Clear** - Clicking on **Clear** button empty all selected fields**.**

NOTE

Service *menu is applicable only when service filtering is selected from* ***Strategy*** *menu*

4.2.5. Service Configuration Menu

The **Service Configuration Menu** contains parameter setups for video and VBI services.
Figure 4-12 displays a tree diagram of the Service Configuration Menu.

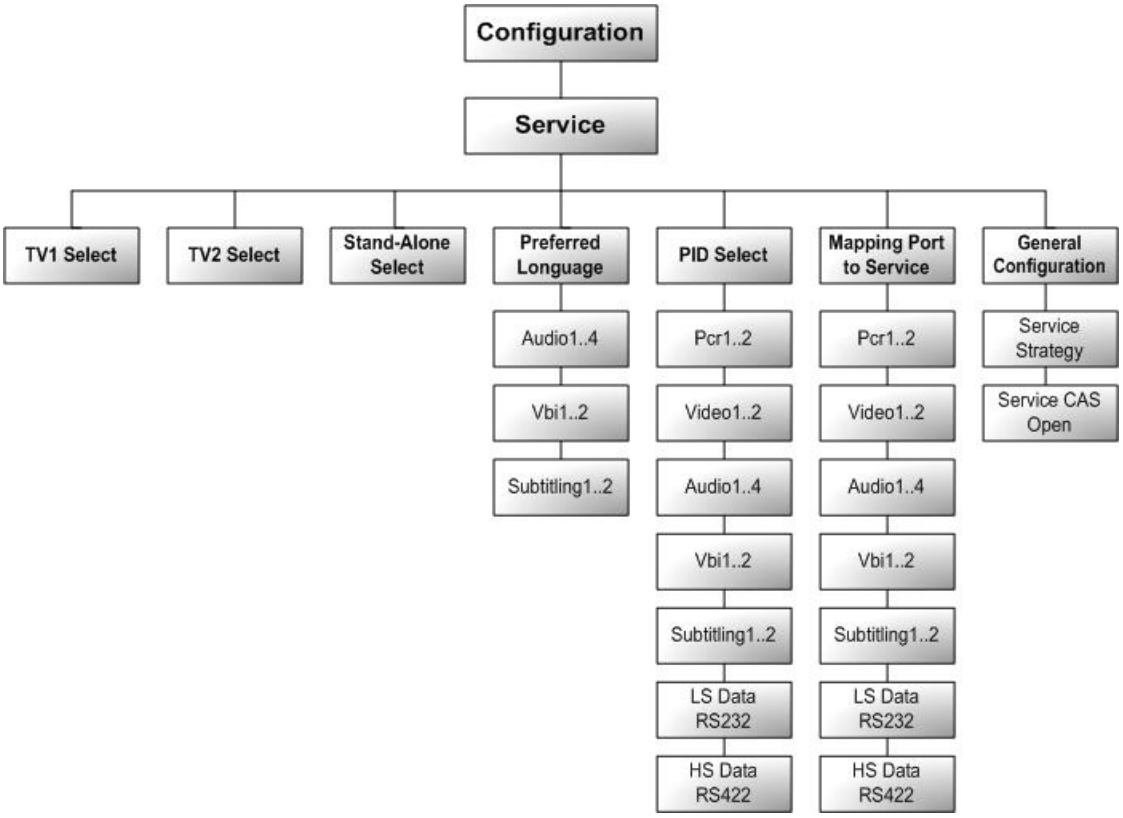
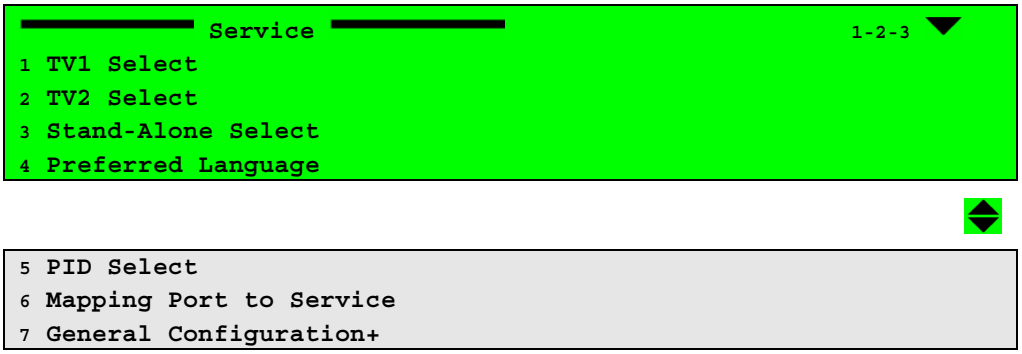


Figure 4-12: Service Configuration Menu

To access the **Service Configuration Menu** in the front panel control interface go to ***Configuration→Service***.

The following screen displays the Service configuration menu:



The **Service Configuration Menu** parameters are as follows:

- **TV1** and **TV2 Select** (if applicable)

  Enables assign a service from the incoming TS to a decoder. In the case of a dual decoder, a user can assign two services from the incoming TS, one for each decoder (see Section 4.2.5.1).

- **Stand-Alone**

  This feature will be supported in the future software releases.

- **Preferred Language**

  This group contains parameters that define the preferred language (see Section 4.2.5.3).

- **PID Select**

  This group contains parameters that define the PID components in the elementary stream (see Section 4.2.5.4).

- **Mapping Port to Service**

  This group contains parameters that define the port mapping and service components for each elementary stream (see Section 4.2.5.5).

- **General Configuration**

  This group contains parameters that define the response of the PVR 6000 to various operational modes (see Section 4.2.5.6).

4.2.5.1. TV1 Select (and TV2 Select)

The **TV1 Select (and TV2 Select** in dual decoder IRDs screen lists the services analyzed from the service descriptor contained in the SDT.
The services in the TV1 Select and TV2 Select Configuration are displayed as a four-column table.
To access the TV1 Select (and TV2 Select) Table Menu in the front panel control interface go to *Configuration→Service→TV1 Select* (or TV2 Select).
The following screen displays the TV1 Select (and TV2 Select) menu:

Name	ID	Type	Mode
1◉ PROGRAM 1	000A	TV	FTA
2○ PROGRAM 2	0046	TV	FTA
3○ PROGRAM 3	0050	TV	CAS
4○ PROGRAM 4	01F7	TV	CAS

The table headers are as follows:

- **NAME** – The service name
- **ID** – The service identification symbol [Hex]
- **TYPE** Service type options: TV, Radio, TLTX, NVOD, MOSAIC, PAL, SECAM, MAC, FM, NTSC, and Data.
- **MODE** – Indicates if the service is encrypted (CAS) or free to air (FTA)

Selecting a service from the TV1 and TV2 Table displays the following Service Information table screen (relevant to the selected service):

TYPE	PID	Description	Port
1 PCR	1262		PCR1
2 Video	1262		Video1
3 Audio	1273	English-eng	AUDIO101
4 Vbi	1269	691.Swedish-swe	VBI1

Figure 4-13displays the corresponding **TV1** Menu (Web Management screen).

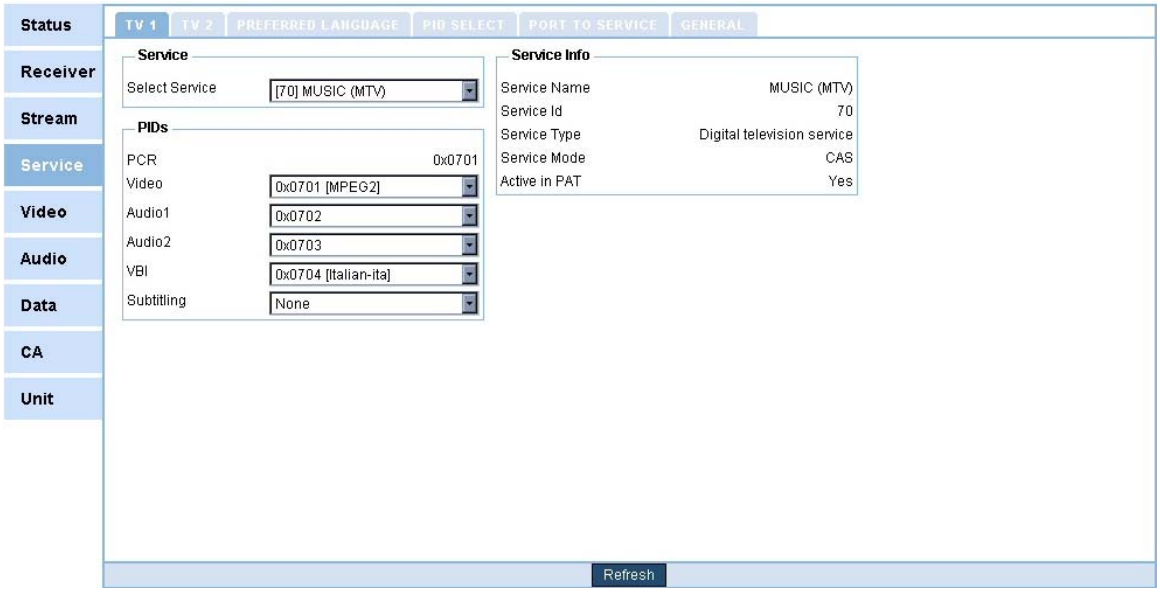


Figure 4-13: TV1 Menu Screen

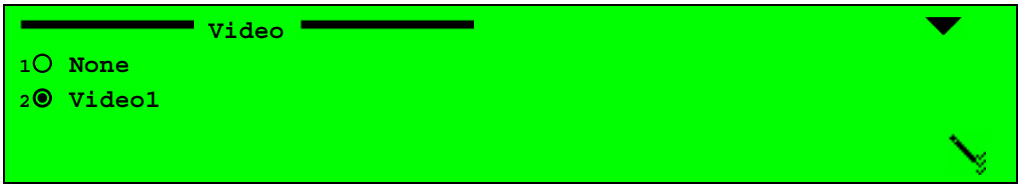
The following paragraphs detail available types of elementary streams.

PCR

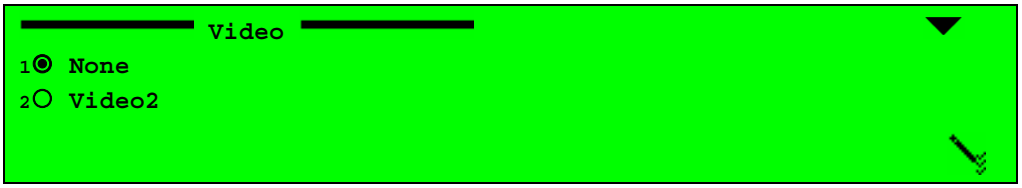
The PCR elementary stream is a read only parameter.

VIDEO

The following figure displays the TV1 Video screen:



The following figure displays the TV2 Video screen:

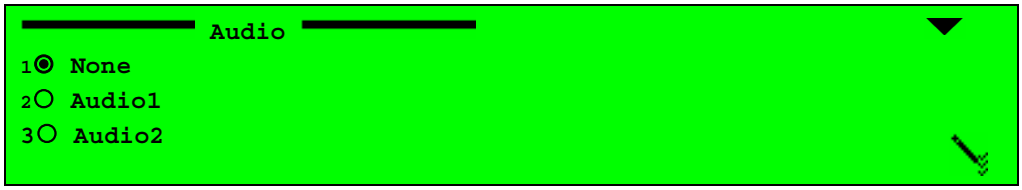


The available options are:

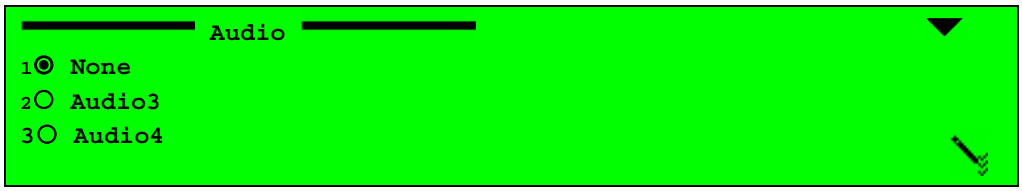
- **None** – Video 1 (or Video 2 correspondingly) is not assigned to this Service.
- **Video 1 (or Video 2)** – Video 1 (or Video 2 correspondingly) is assigned to the Service.

AUDIO

The following figure displays the TV1 Audio screen:



The following figure displays the **TV2 Audio** screen:



The available options are:

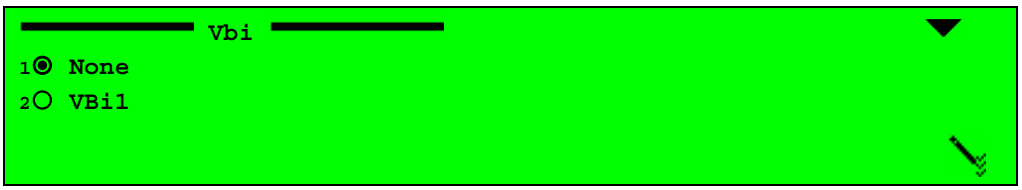
- **None** – No Audio is assigned to this Service.
- **Audio 1 (and Audio 3 correspondingly)** – Audio 1 (or Audio 3 correspondingly) is assigned to the service.
- **Audio 2 (and Audio 4 correspondingly)** - Audio 2 (or Audio 4 correspondingly) is assigned to the service.

VBI

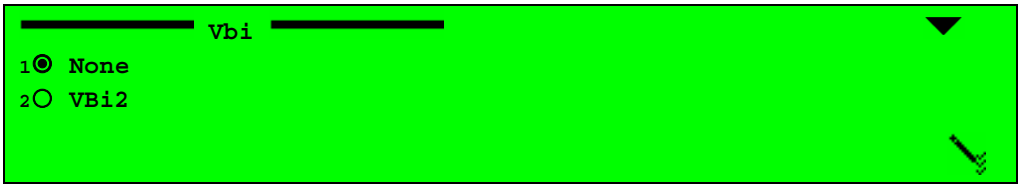
The ProView™ PVR 6000 supports decoding and displaying Teletext Subtitling graphics (according to DVB VBI standard EN 301 775, which specifies EBU Teletext subtitling data, used for language translation).
Differently from DVB subtitling, Teletext Subtitling requires the decoder to be able to create relevant language fonts. The PVR 6000 has the following Teletext Subtitling fonts installed:

- **Croatian**
- **Czech**
- **Danish**
- **Dutch**
- **English**
- **English Old**
- **Estonian**
- **Finnish**
- **French**
- **German**
- **Hungarian**
- **Italian**
- **Latvian**
- **Lithuanian**
- **Norwegian**
- **Portuguese**
- **Romanian**
- **Serbian**
- **Slovak**
- **Slovenian**
- **Spanish**
- **Swedish**

Assigning a VBI to a Service through this menu allows adding **Teletext Subtitles** to the Service (for this purpose, the selected VBI PID must contain Teletext Subtitling data).
When choosing Teletext Subtitling here, the operator must also enable **TLTX Subtitle Mode**. For enabling TLTX Subtitle mode, see Section 4.2.6.3.
The following figure displays the **TV1 VBI** screen:



The following figure displays the **TV2 VBI** screen:



The available options are:

- **None** – This VBI PID is not assigned to the service.
- **VBI 1 (and VBI 2 correspondingly)** – VBI 1 (or VBI 2 correspondingly) is assigned to this service.

4.2.5.2. Stand-Alone Select

This feature will be supported in the future software releases.

4.2.5.3. Preferred Language

The **Preferred Language** Edit menu screen lists the audio channels available for the received services.

To access the **Preferred Language** Edit menu in the front panel control interface go to ***Configuration→Service→Preferred Language***.

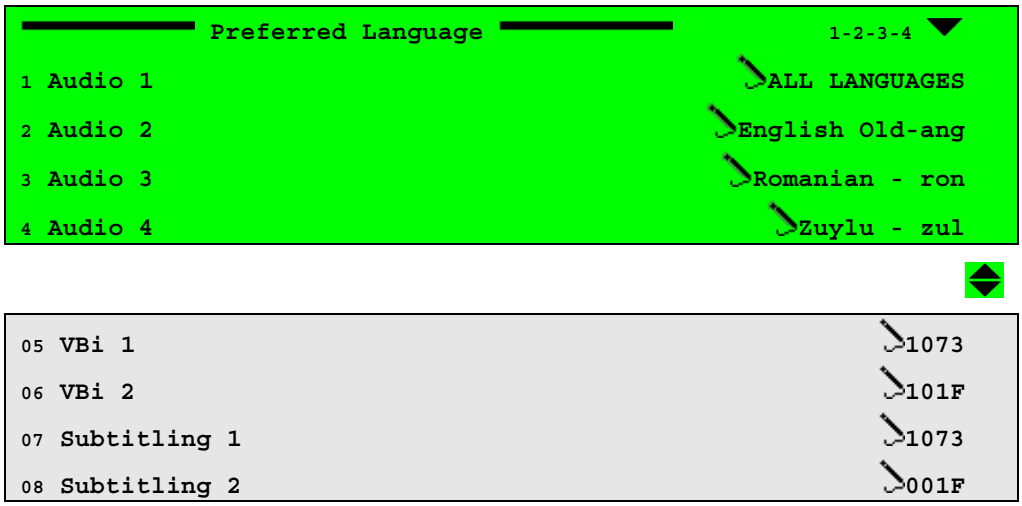


Figure 4-14 displays the corresponding **Preferred Language** Menu (Web Management screen).

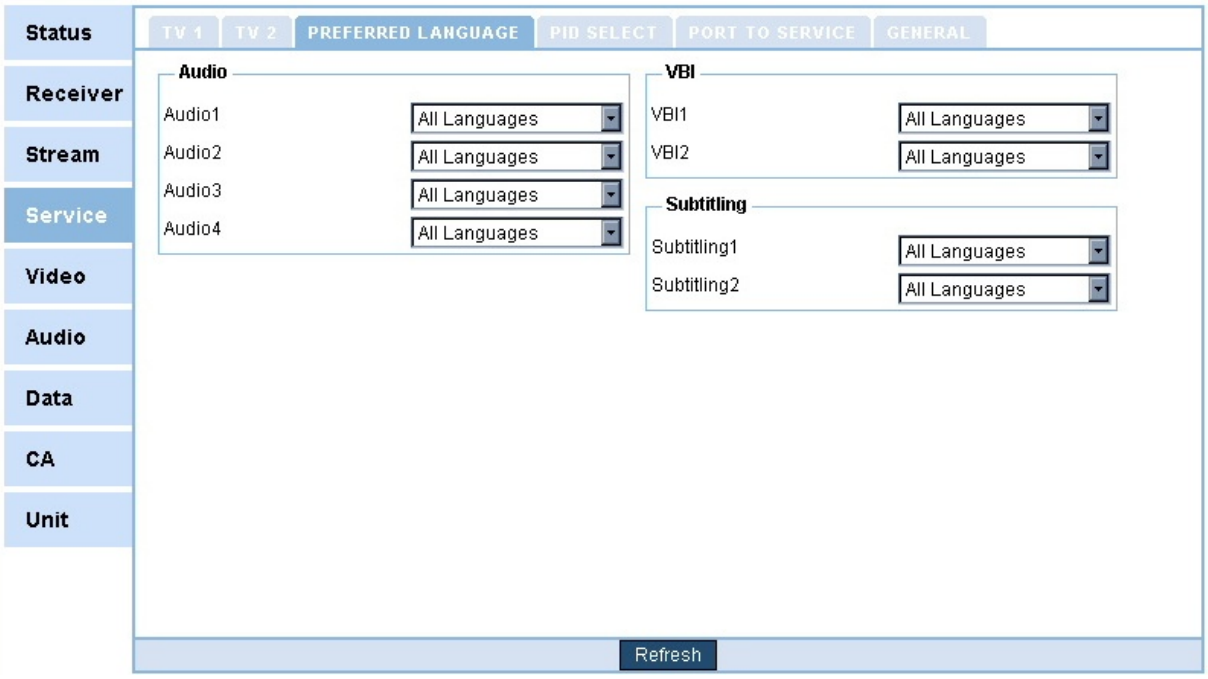


Figure 4-14: Preferred Language Screen

NOTE

*The number of audio channels provided in the **Preferred Languages Menu** is dynamic and is determined by the PVR 6000 model. Audio 3 and Audio 4 channels are available in dual decoders, PVR 6040, and PVR 6050 models only.*

The operator can assign a preferred language to each of the Audio channels, as well as to the available VBIs and Subtitling.

Selecting option displays a **Select Value** screen that lists the following available languages:

01. ALL Languages	**13. Dutch - dut**	**25. Hungarian - hun**	**37. Polish - pol**
02. Albanian - alb	**14. Egyptian - egy**	**26. Indonesian - ind**	**38. Portuguese - por**
03. English Old - ang	**15. English - eng**	**27. Irish - iri**	**39. Romany - rom**
04. Arabic - ara.	**16. Spanish - esl**	**28. Italian - ita**	**40. Romanian - ron**
05. Armenian - arm.	**17. Finnish - fin**	**29. Japanese - jpn**	**41. Russian - rus**
06. Byelorussian - bel.	**18. French - fra**	**30. Latin - lat**	**42. Spanish - spa**
07. Bulgarian - bul.	**19. French - fre**	**31. Macedonian - mac**	**43. Swedish - swe**
08. Chechen - che	**20. Gaelic - gae**	**32. Miscellaneous - mis**	**44. Swedish - swe**
09. Chinese - chi	**21. German - ger**	**33. Multiple - mul**	**45. Tamil -tam**
10. Check - cze	**22. Greek Modern - gre**	**34. Norvegian - nor**	**46. Thai - tha**
11. Danish - dan	**23. Hebrew - heb**	**35. Turkish - ota**	**47. Zuylu - zul**
12. German - deu	**24. Hindi - hin**	**36. Persian - per**	

NOTE

*Option **01. ALL Languages** (default).*
No specific language is selected. The audio language is set according to the Service PID.

4.2.5.4. PID Select

This option is intended for **advanced users only** and should **not be used normally**.
Create a Service only through **Configuration→Service→TV1/TV2** Select.
The PID Select menu allows the operator to directly assign an ES to an output port directly, without attaching it to a Service. This option can be useful when the PMT is not available or is defective.
Before assigning the ES to an output, the operator verifies that the new PID entered is correct.

⚠ ***CAUTION***

USING THIS CONTROL MENU DISASSOCIATES THE SELECTED ELEMENTRY STREAM FROM ANY SERVICE AND MAKE IT A STAND ALONE STREAM WITH NO ATTATCH SYNCHRONIZATION AND NO OTHER ASSOCIATED SIGNAL MAY COUSE VIDEO AND AUDIO ISSUES IF NOT HANDLES CORRECTLY. IT IS HIGHLY RECOMMENDED TO CONSULT HARMONIC INC. CUSTOMER SUPPORT BEFORE USING THIS CONTROL MENU.

To access the **PID Select** Menu in the front panel control interface go to ***Configuration→Service→PID Select***.

The following screen displays the **PID Select** menu:

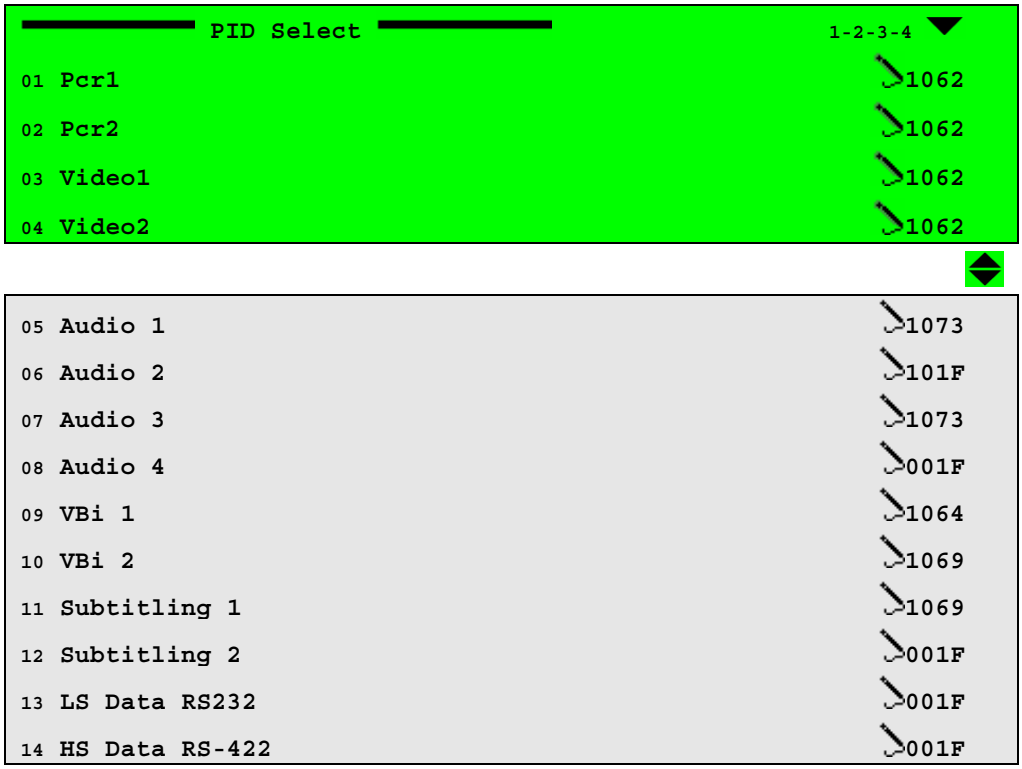


Figure 4-16 displays the corresponding **PID Select** Menu (Web Management screen).

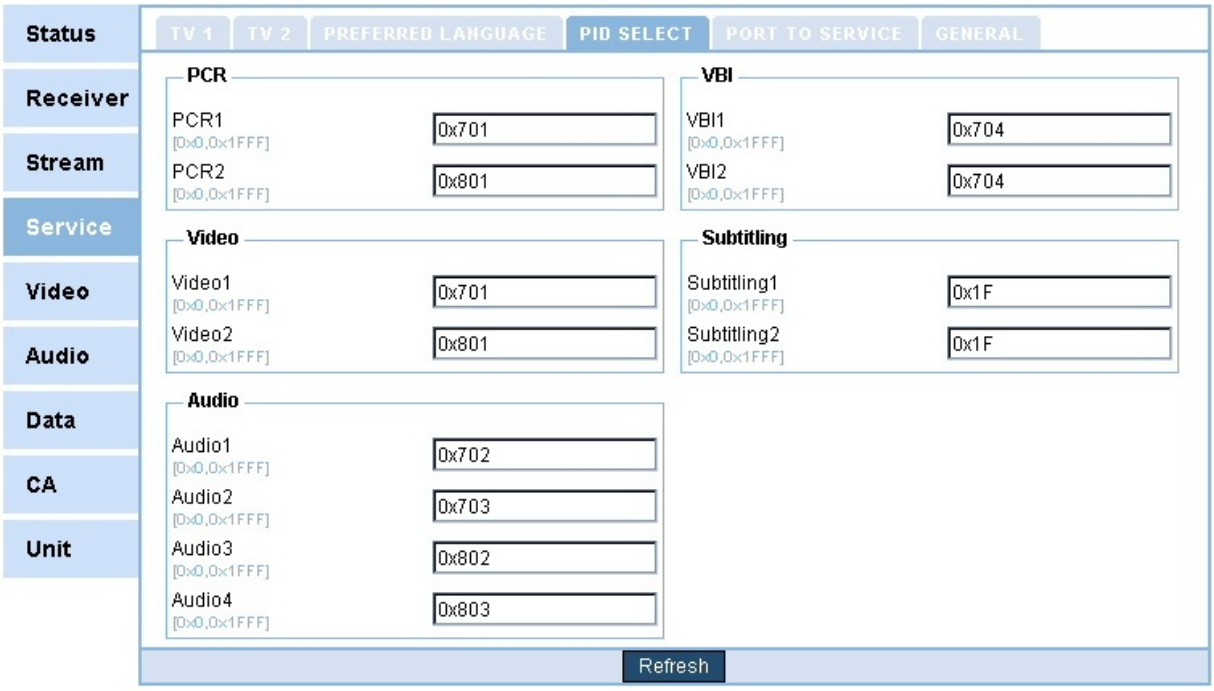


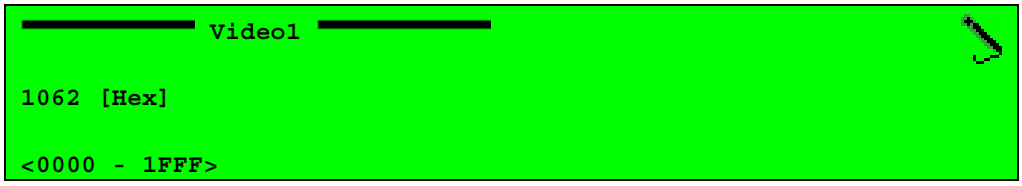
Figure 4-15: PID Select Menu Screen

The available options are:

- **Pcr1**
- **Pcr2** (if applicable)
- **Video1**
- **Video2** (if applicable)
- **Audio1**
- **Audio2**
- **Audio3** (if applicable)
- **Audio4** (if applicable)
- **VBI1**
- **VBI2** (if applicable)
- **Subtitling1**
- **Subtitling2** (if applicable)
- **LS Data RS232**
- **HS Data RS-422**

All PID-Assigning screens are identical in structure and functionality. The only difference is the screen header, which changes according to the chosen port.

The following figure is an example of a PID Assigning screen, as it appears in the PVR 6000 front panel control interface (the selected port in this example is **Video1**):



Available values range from **0000** to **1FFF** (Hexadecimal)**.**

NOTES

The PVR 6000 decodes and displays DVB Subtitling according to the DVB-Subtitling Standard ETS 300 743. This standard specifies the coding method of subtitles, logos, and other graphical elements for the DVB and the method of carrying them within a DVB Bit Stream.
Dual Decoder devices can decode two different programs, each with its own subtitling simultaneously.

4.2.5.5. Mapping Port to Service

The **Mapping Port to Service Menu** enables the operator to manually map PVR 6000 physical ports to Service 1 and to Service 2.
The factory default mapping (in dual decoders) is symmetrical. Service 1 is assigned Video1, Audio1, Audio2, VBI1 etc. and Service 2 is assigned Video2, Audio3, Audio4, VBI2, etc. Operator must not change these settings unless they are well informed with PVR 6000 internal properties.

⚠ *CAUTION*

MAPPING PORT TO SERVICE IS INTENDED FOR ADVANCED USERS ONLY. CHANGING THIS OPTION'S VALUES IS NOT RECOMMENDED. IN ALL CASES IT IS RECOMMENDED TO USE THE MAPPING PORT TO SERVICE FACTORY DEFAULTS.

To access the Mapping Port to Service menu in the front panel control interface go to **Configuration→Service→ Mapping Port to Service** menu.

The following screen displays the Mapping Port to Service menu:

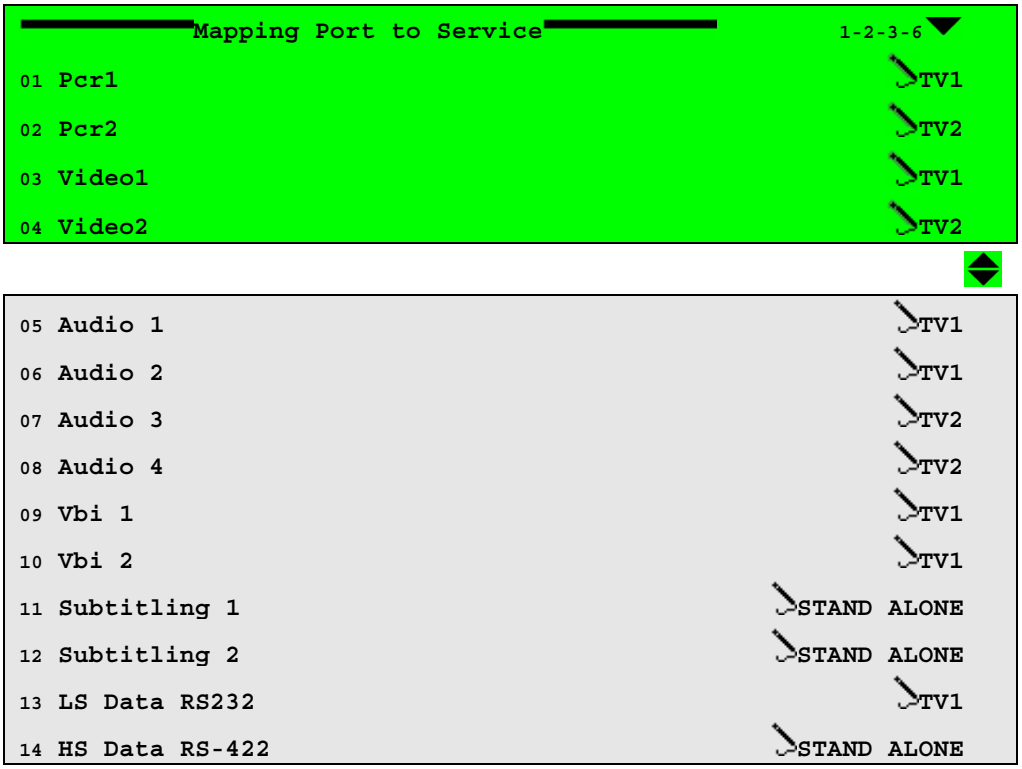


Figure 4-16 displays the corresponding **Port to Service** Menu (Web Management screen).

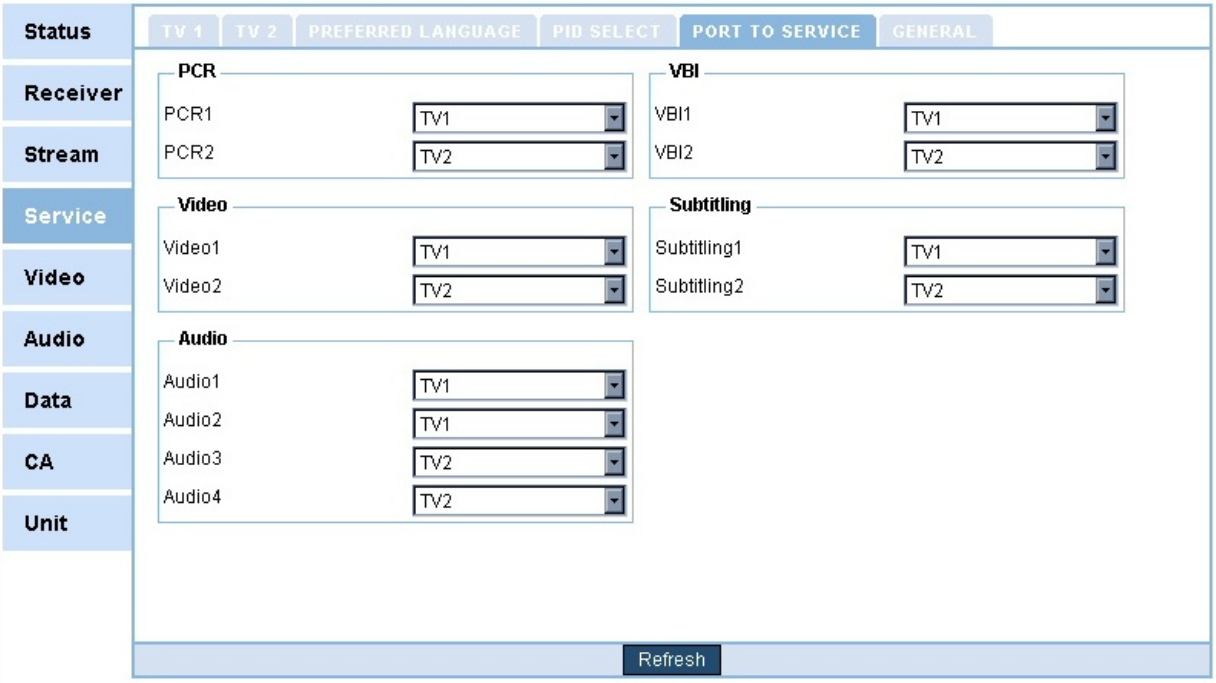


Figure 4-16: Port to Service Menu Screen

The available options are:

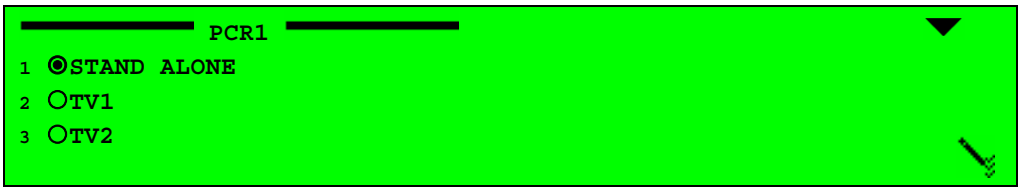
- Pcr1
- Pcr2 (if applicable)
- Video1
- Video2 (if applicable)
- Audio1
- Audio2
- Audio3 (if applicable)
- Audio4 (if applicable)
- VBI1
- VBI2 (if applicable)
- Subtitling1
- Subtitling2 (if applicable)
- LS Data RS232
- HS Data RS-422
- IP Data

MAPPING PORTS TO SERVICES THRU THE FRONT PANEL

In order to map a port to service thru the front panel, perform the following:

- Navigate to **Configuration→Service→ Mapping Port to Service**

- Select one of the listed ports using the keypad. For example: **PCR1**. After selection, the following menu screen lists all options for the selected port.



The available options are:

- **STAND ALONE** – This mode indicates that you can assign the elementary stream PID. In this mode, the elementary stream is independent of the services selected for Decoder#1 and decoder#2.
- **TV1** – This mode indicates that the elementary stream is related to the service assigned to Decoder#1.
- **TV2** – This mode indicates that the elementary stream is related to the service assigned to Decoder#2.

4.2.5.6. General Configuration

The Service **General Configuration** menu defines the PVR 6000 service selection strategy (either automatic or user-defined). It also allows the operator to instruct to the CAM (Conditional Access Module) which ES to decrypt.
To access the **General Configuration** menu, in the front panel control interface go to **Configuration→Service→General Configuration**.
The following is the front panel **General Configuration** screen:

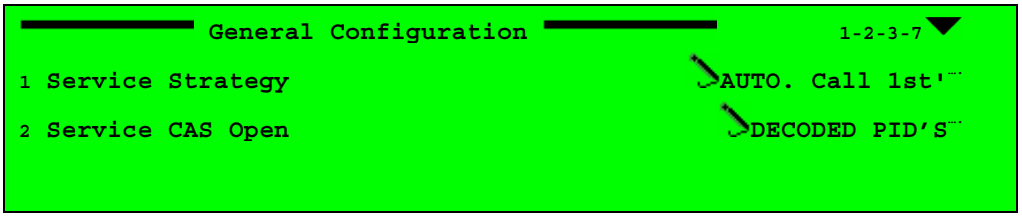


Figure 4-17 displays the corresponding **General** Service menu (Web Management screen).

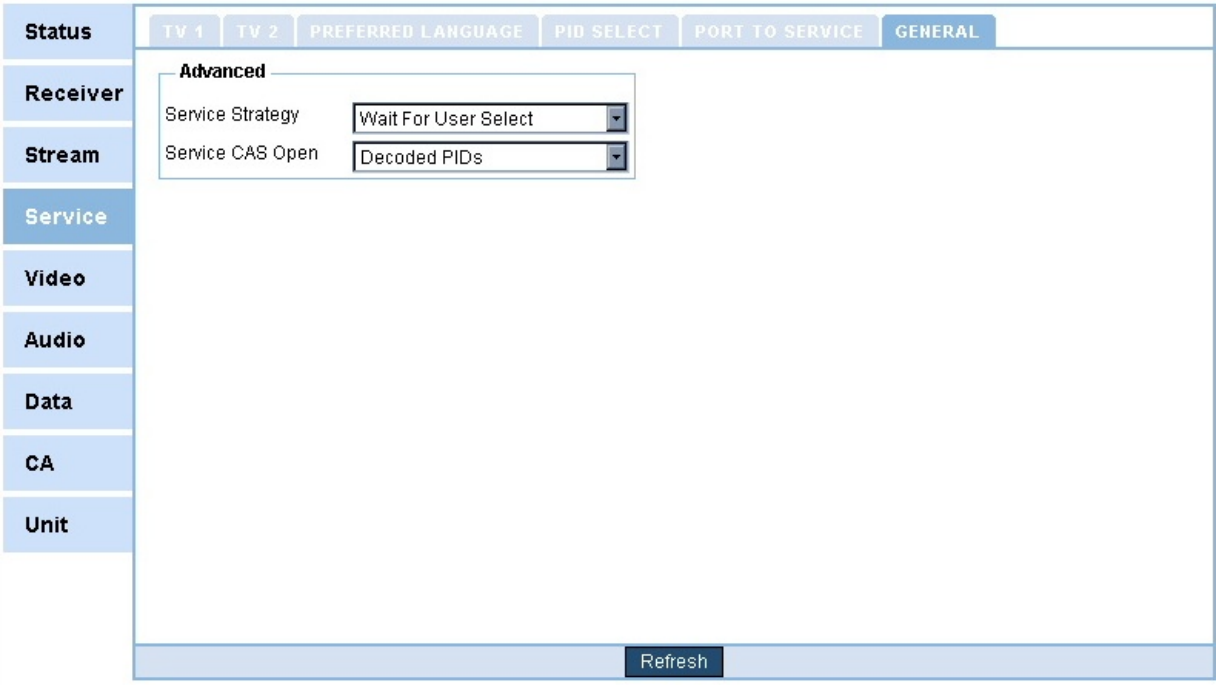


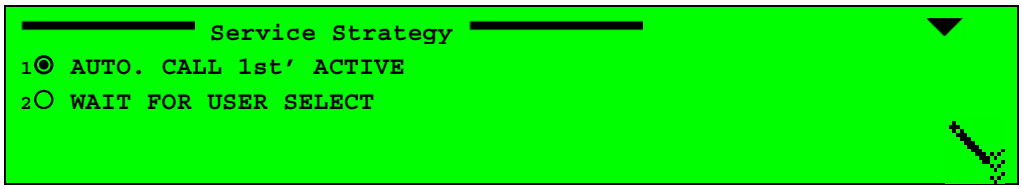
Figure 4-17: General Service Menu Screen

The General Configuration Parameters are:

- Service Strategy
- Service CAS Open

SERVICE STRATEGY

Service strategy determines the decoder' behaviour at the start-up or when the decoding program is inactive. The following options in the **Service Strategy** screen set the PVR 6000 service selection strategy parameters.



The available options are:

- **Auto. Call 1st Active** – The PVR 6000 locks-onto the first active service detected in the transport-stream. This mode is recommended for DSNG and other applications that frequently change the decoded program.

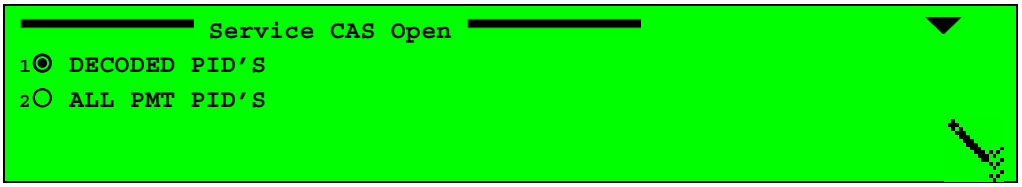
NOTE

*When **Auto call first active** mode is selected, the PVR 6000 might switch to the first detected program when the TS is interrupted for any reason.*

- **Wait for User Select** – The PVR 6000 searches for a specific (user-defined) service to lock-on to the PVR 6000 is tuned to decode the selected program, even if it does not exist in the TS. This mode is recommended for broadcast applications where the decoded program is fixed, and seldom changes.

SERVICE CAS OPEN

This parameter defines which ES will be decrypted by the CAM. It is possible to either instruct the PVR 6000 to decrypt all the received ES, or allow it to decrypt only the ones that are currently being decoded.



The available options are:

- **DECODED PID'S** – the CAM descrambles only the PIDs that are currently decoded by the PVR 6000
- **ALL PMT PID'S** - the CAM descrambles all the received PIDs

4.2.6. Video Configuration Menu

The **Video Configuration Menu** contains parameters that set the video decoder mode of operation.
Figure 4-18 displays a tree diagram of the Video Configuration Menu.

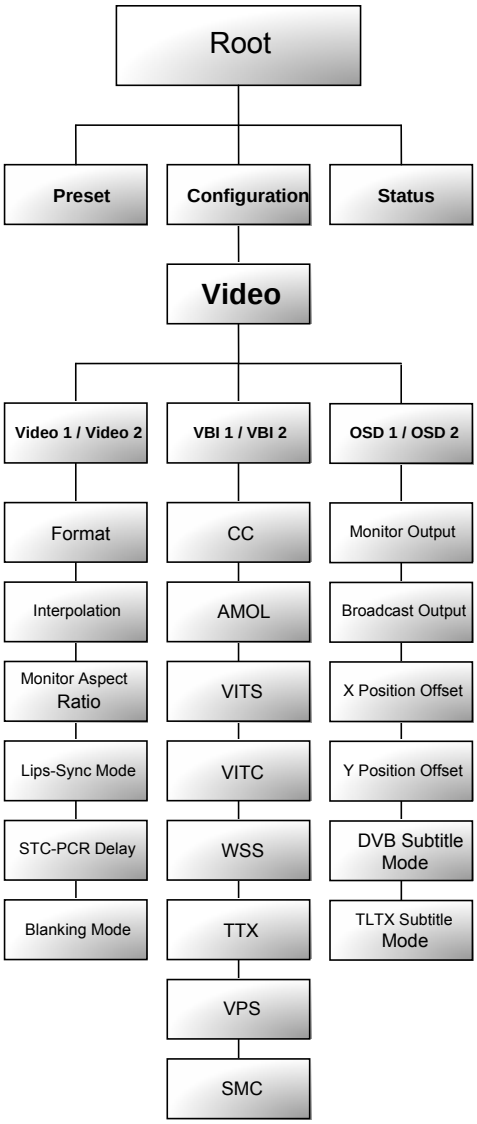
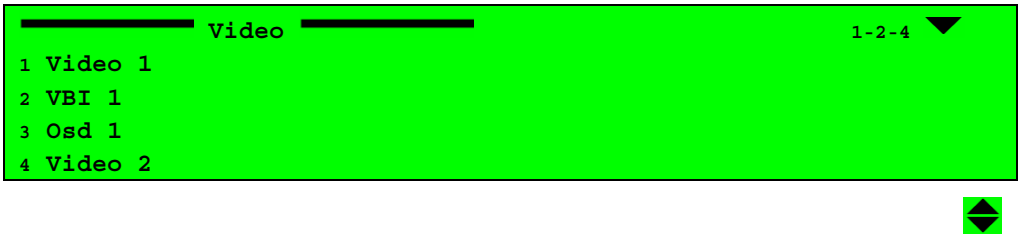


Figure 4-18: Video Configuration Menu

NOTE

The number of Video Channel Configurations (as well as the VBI) provided in the Video Configuration menu is dynamic and is determined by the PVR 6000 model.

To access the **Video Configuration Menu** in the front panel control interface go to ***Configuration→Video***.
The following screen displays the Video menu:



The Video Configuration parameters are as follows:

- **Video 1**

  This group contains parameters that define the format, lip-sync mode and STC-PCR delay parameters for the video stream for a signal to decoder #1.
  For details on the Video 1 Parameter, see Section 4.2.6.1.

- **VBI 1**

  This group contains parameters that define VBI functioning for Decoder #1.
  For details on the VBI 1 Parameter, see Section 0.

- **Osd 1**

  This group contains parameters that define OSD functioning for Decoder #1.

- **Video 2** (if available)

  This group contains parameters that define the format, lip-sync mode and STC-PCR delay parameters for the video stream for a signal to decoder #2.
  For details on the Video 2 Parameter, see Section 4.2.6.1.

- **VBI 2** (if available)

  This group contains parameters that define VBI functioning for the PVR 6000 Decoder #2.
  For details on the VBI 2 Parameter, see Section 4.3.4.2.

- **Osd 2** (if available)

  This group contains parameters that define OSD functioning for Decoder #2.

4.2.6.1. Video 1 and Video 2 Configuration Options

The **Video 1** and **Video 2** Menu allow the user to set parameters for Video 1 and/or Video 2 outputs (if applicable).
To access Video 1 or Video 2 menu screens navigate to **Root→Configuration→ Video→Video 1** or **Video2**
This section displays Video 1 configuration menu screens.

NOTE

> ***Video 2*** *menu screens are identical to* ***Video 1****menu screens.*

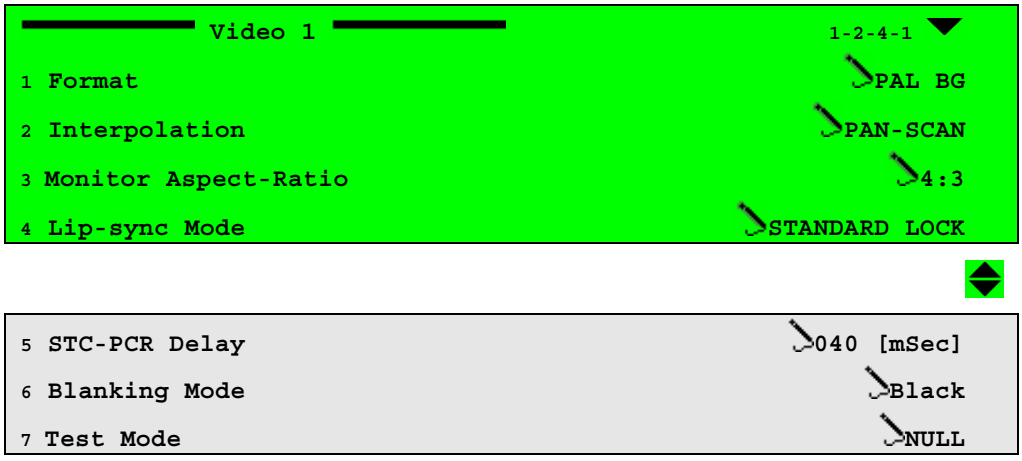


Figure 4-19 displays the corresponding **Video1** Menu (Web Management screen).

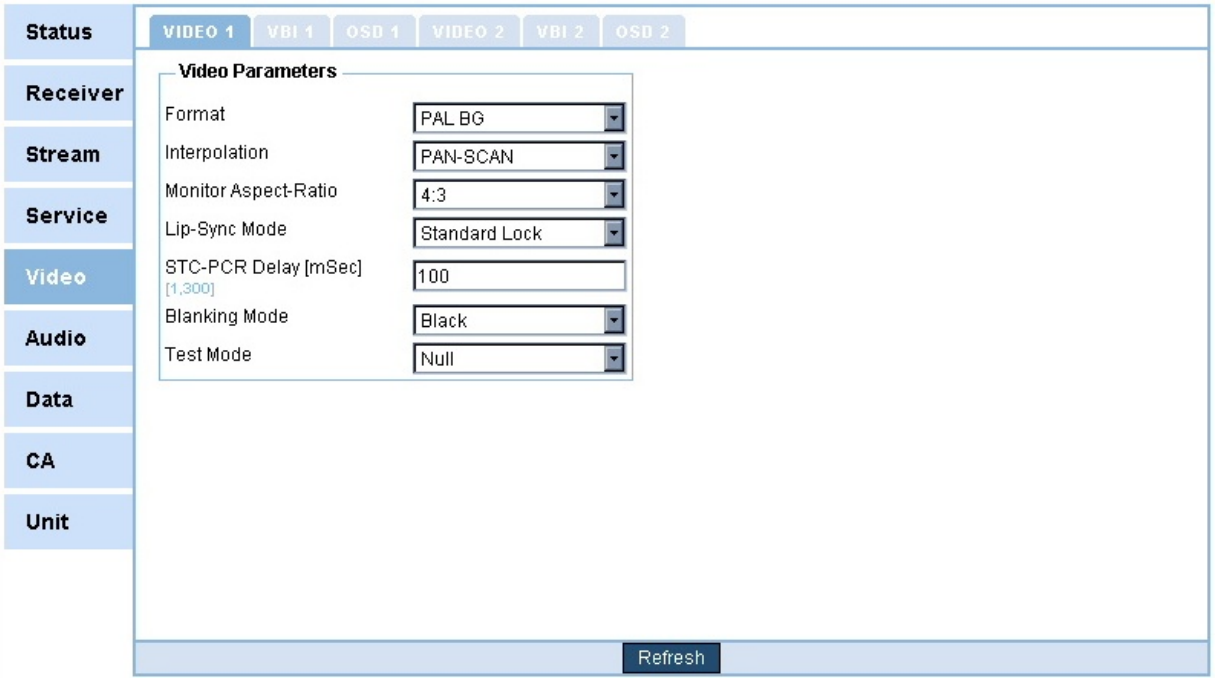


Figure 4-19: Video 1 Menu Screen

The available options are:

- **Format**
- **Interpolation**
- **Monitor Aspect-Ratio**
- **Lip-sync Mode**
- **STC-PCR Delay**
- **Blanking Mode**
- **Test Mode**

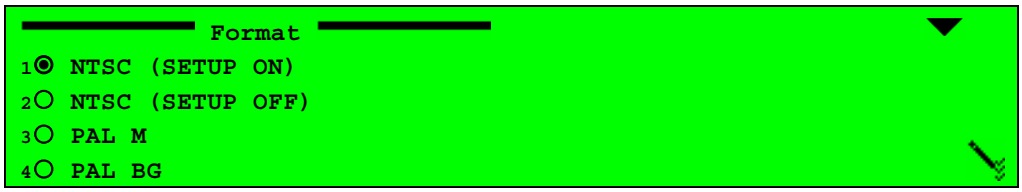
NOTE

After selecting an option under the Video (1..2) menu, the front panel returns to the Video (1..2) menu and displays the current selection.

The following paragraphs detail Video Configuration options.

FORMAT

The **Format** parameter selects the format of the video signal.



The available options are:

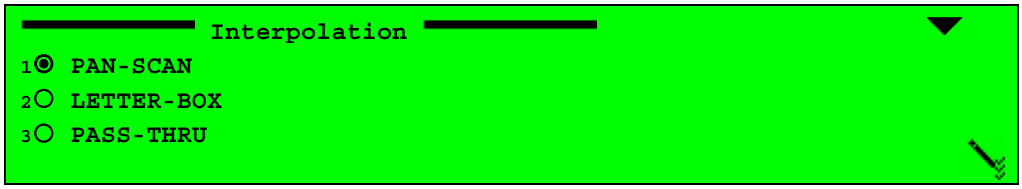
NTSC, PAL M, PAL BG, PAL D, PAL N, SECAM, RUSSIAN SECAM.

INTERPOLATION

The **Interpolation** parameter sets the re-sampling method of the image (should be set according to the Aspect Ratio parameter setting and to the actual aspect ratio of the received video signal)

NOTE

*See 04.3.8.4.Appendix C for extensive details on how **Interpolation** configuration affects the resulting image.*



The available options are:

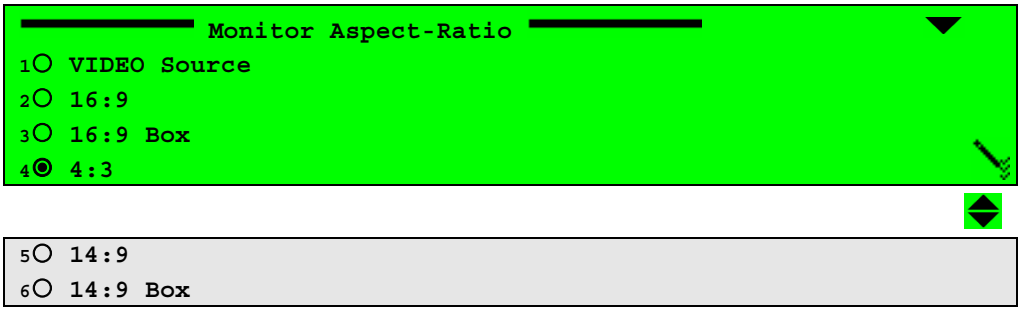
- **PAN-SCAN** – Set interpolation to Pan & Scan
- **LETTER-BOX** – Set interpolation to Letter-Box
- **PASS-THRU** – No interpolation occurs.

MONITOR ASPECT-RATIO

This parameter sets the intended image aspect ratio. It is used along with **Interpolation** to determine the required Aspect Ratio Conversion.

NOTE

*See 4.3.8.4.Appendix C for extensive details on how **Monitor Aspect-Ratio** configuration affects the resulting image.*



The available options are:

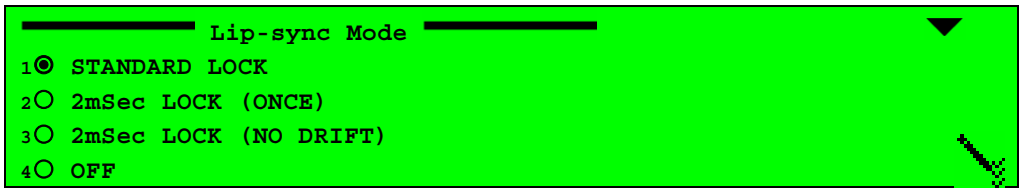
- **VIDEO Source** – Monitor aspect ratio is determined by the video sequence
- **16:9** – Monitor aspect ratio is set to 16:9.
- **16:9 Box** – Monitor aspect ratio is set to 16:9 with letter-box**.**
- **4:3** – Monitor aspect ratio is set to 4:3**.**
- **14:9** – This option will be supported in future PVR 6000 versions.
- **14:9 Box** – This option will be supported in future PVR 6000 versions.

NOTE

*The option **VIDEO Source** should not be selected along with choosing **TV MONITOR** under Configuration→Video→VBI 1 / 2→WSS, since the two A/R may contradict each other and cause unexpected results.*

LIP-SYNC MODE

The **Lip-sync** parameter selects the PVR 6000 lip-sync mode of operation.



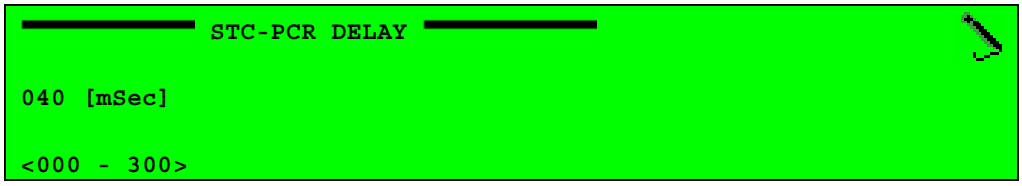
The available options are:

- **STANDARD LOCK** – Standard sync of video and audio data within ±40mSec
- **2mSec LOCK (ONCE)** – Sync audio to video within ±2 mSec. In this mode, the PVR 6000 synchronizes the audio to the video only once, monitoring audio sync to video stops. Only PVR 6040 and PVR 6050 Audio 3 and Audio 4 support this feature.
- **2mSec LOCK (NO DRIFT)** – Sync audio to video within ±2 mSec. In this mode, the PVR 6000 continuously monitors the audio sync to video for maintaining synchronization within ±2 mSec. Only PVR 6040 and PVR 6050 Audio 3 and Audio 4 support this feature.
- **OFF** – No Lip-Sync

STC-PCR DELAY

The **STC PCR Delay** parameter sets the delay between the System Time Clock (STC) and the PVR 6000 clock. The PVR 6000 clock is recovered from PCR data to compensate for:

- Delay between STC and PCR
- Correctly processing the Presentation Time Setup (PTS)
- Preventing a buffer underflow



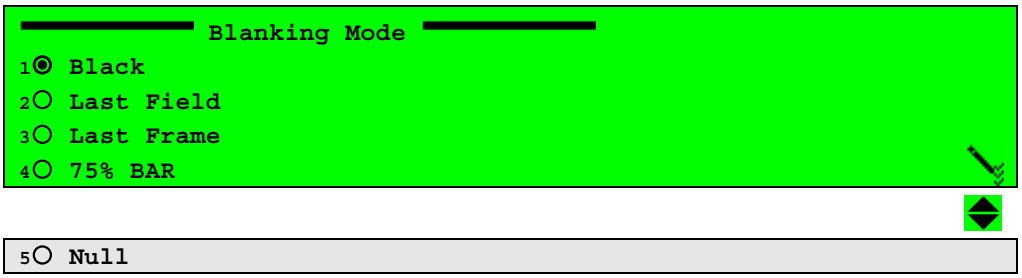
Available delay range is a number from 0 to 300 mSec.

NOTE

In the Web management interface, set the STC PCR Delay by typing the required delay (in Milliseconds) into the parameter's free text window.

BLANKING MODE

The **Blanking Mode** parameter sets the display mode of a service when reception stops.

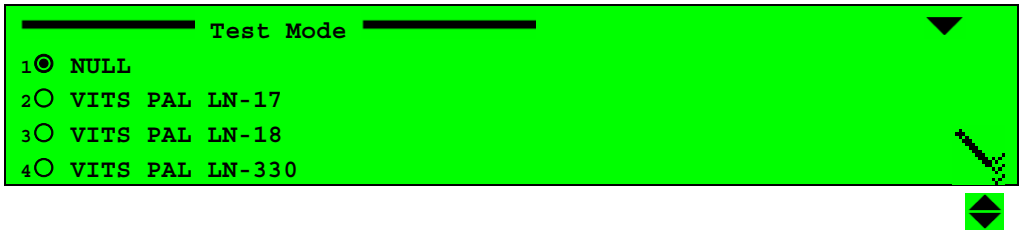


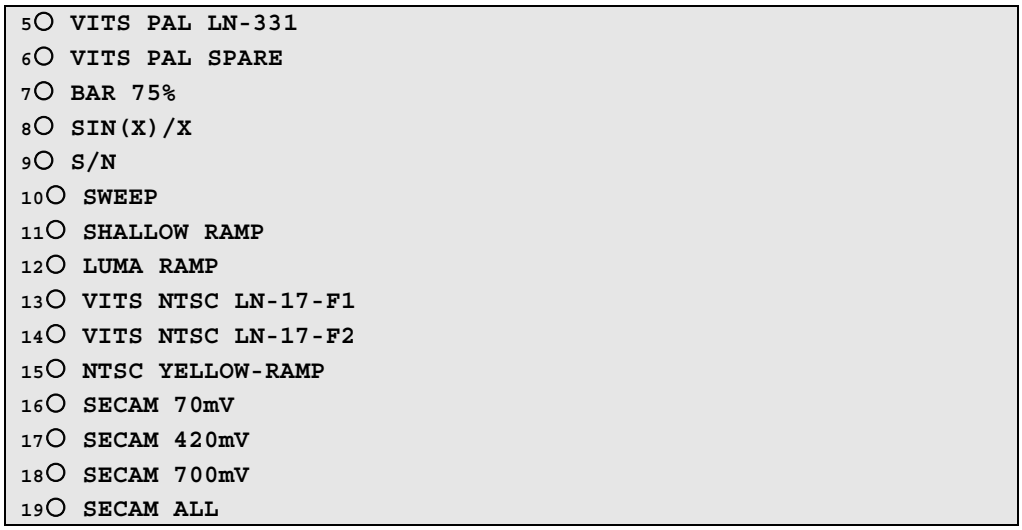
The available options are:

- **Black** – video output signal is a black screen.
- **Last Field** – video output signal is the last field displayed.
- **Last Frame** – video output signal is the last frame displayed.
- **75% BAR** – video output signal is a colour-bar display.
- **Null –** video outputs shut down with no output signal.

TEST MODE

The PVR 6000 can generate a number of Video Test Bars for video quality testing. All the bars have a full-screen overlay (produced using a Digital Graphics engine) and are intended for 625 and 525 systems.





Select from the following Test Bars:

- VITS PAL LN-17
- VITS PAL LN-18
- VITS PAL LN-330
- VITS PAL LN-331
- VITS PAL SPARE
- BAR 75
- SIN(X)/X
- S/N
- SWEEP
- SHALLOW RAMP
- LUMA RAMP
- VITS NTSC LN-17-F1
- VITS NTSC LN-17-F2
- NTSC YELLOW-RAMP
- SECAM 70mV
- SECAM 420mV
- SECAM 700mV
- SECAM All

4.2.6.2. VBI 1 and VBI 2

The **VBI 1** (and **VBI 2** in dual decoder IRD's) Menu contains all VBI (Vertical Blanking Interval) parameters that are available through the IRD.

To access the VBI 1 and VBI 2 Menus in the front panel control interface go to ***Configuration→Video→Vbi1 (or Vbi2).***

The following figure illustrates the VBI configuration menu:

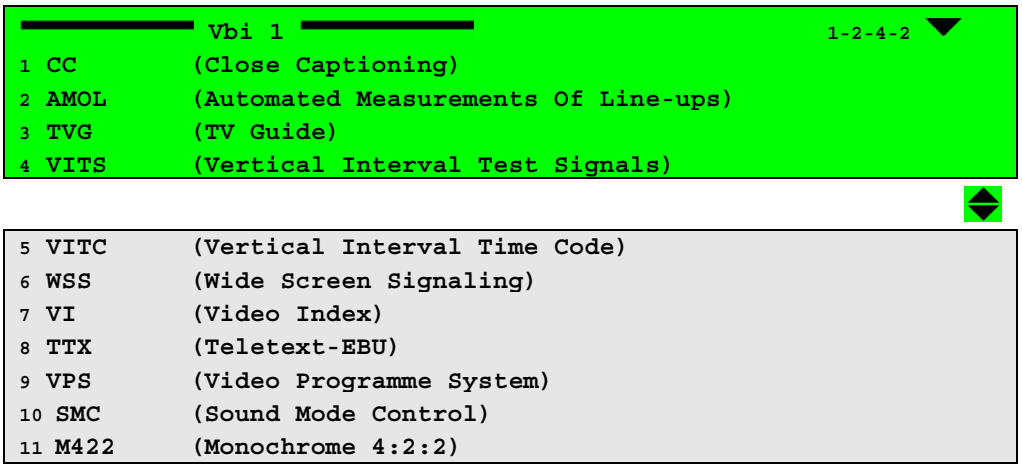


Figure 4-20 displays the corresponding **VBI1** Web management screen.

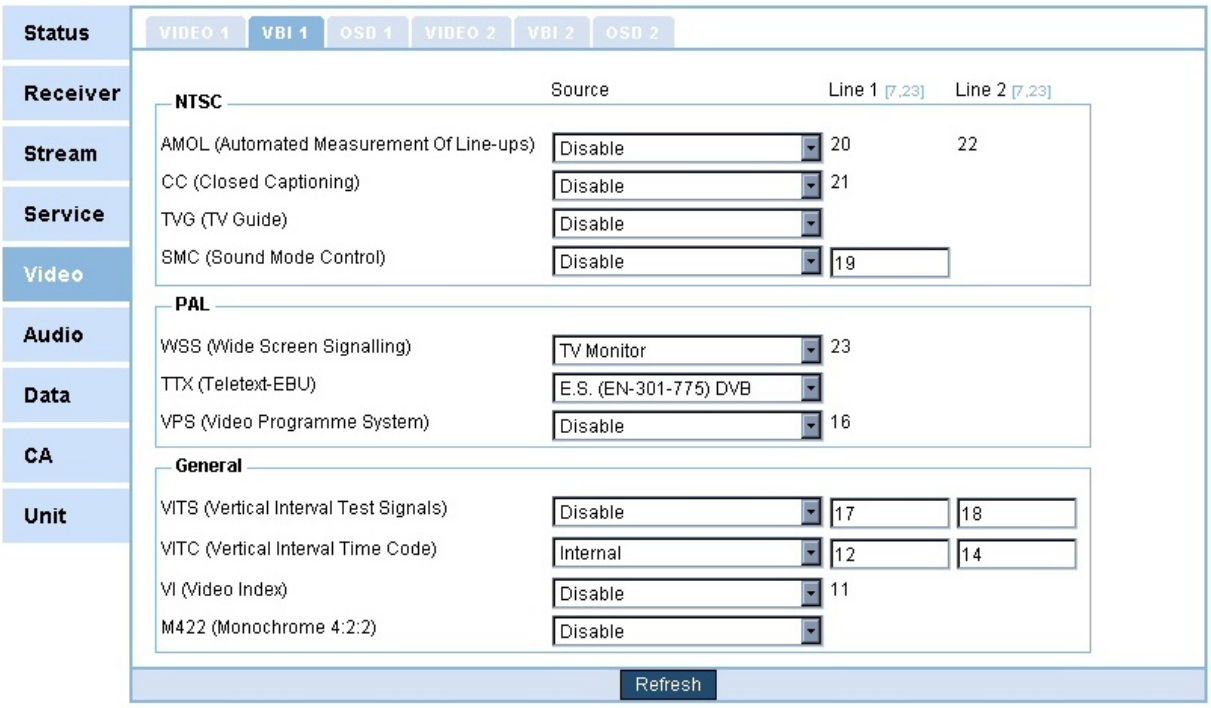
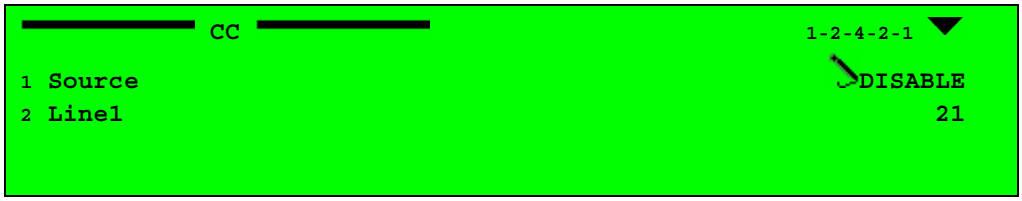


Figure 4-20: VBI 1 Parameters

The following paragraphs describe the **VBI** Configuration options.

CC (CLOSED CAPTIONING) PARAMETER

Selecting **CC** (Closed Captioning) displays the following screen:

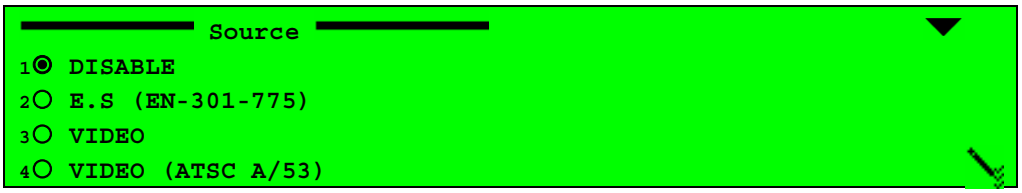


The **CC** screen parameters are:

1 **Source** – used for selecting the source of closed captioning data

2 **Line1** – This is a read-only parameter (closed captioning data is automatically re-inserted in line 21).

Selecting *Source* displays the following screen:



Available Closed Captioning sources are:

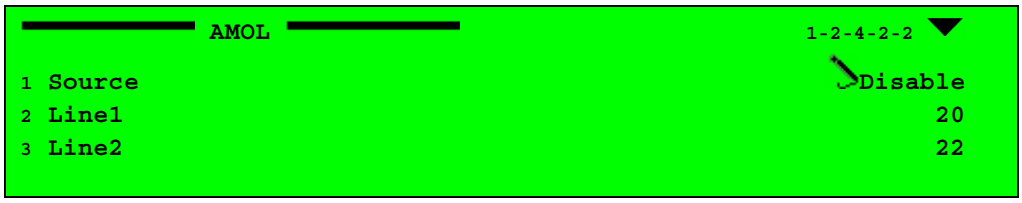
- **DISABLE** – CC is disabled.
- **E.S (EN-301-775)** – CC data is acquired according to the EN 301-775 DVB standard.
- **VIDEO** – The PVR 6000 automatically detects the existing CC standard and acquires the CC data accordingly.
- **VIDEO (ATSC A/53)** – The PVR 6000 automatically detects the existing CC standard and acquires the CC data accordingly, *prioritizing the ATSC A/53 standard*.

NOTE

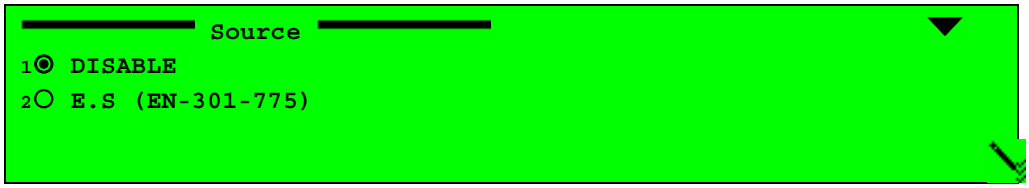
The PVR 6000 supports the following CC standards:
CCube standard
Harmonic Divicom standard
ATSC DVS-53 (Rev 57) EIA 608
ATSC DVS-53 (Rev 57) caption type 4
GI DVS-157

AMOL (AUTOMATIC MEASUREMENTS OF LINE-UPS)

Selecting *AMOL* displays the following screen:



Selecting *Source* displays the following screen:

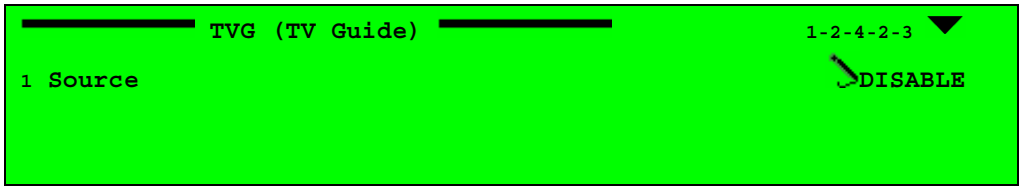


The available options are:

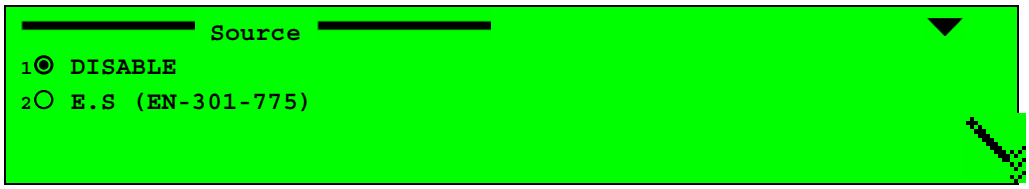
- **DISABLE** – AMOL is disabled.
- **E.S (EN-301-775)** – The PVR 6000 complies with the DVB EN 301-775 AMOL standard.

TVG (TV GUIDE)

Selecting *TVG (TV Guide)* displays the following screen:



Selecting *Source* displays the following screen:



The available options are:

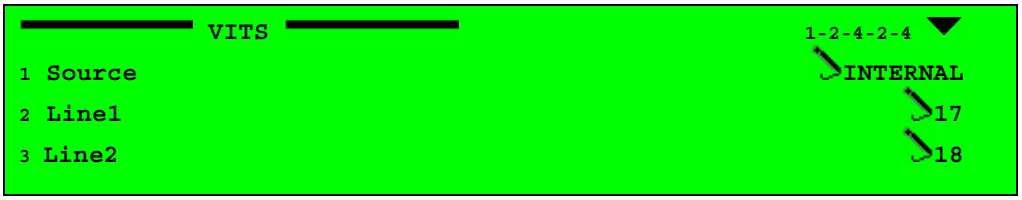
- **DISABLE** – TV Guide reinsertion is disabled.
- **E.S (EN-301-775)** – TV Guide reinsertion is enabled according to the EN 301-775 standard

VITS (VERTICAL INTERVAL TEST SIGNALS) PARAMETER

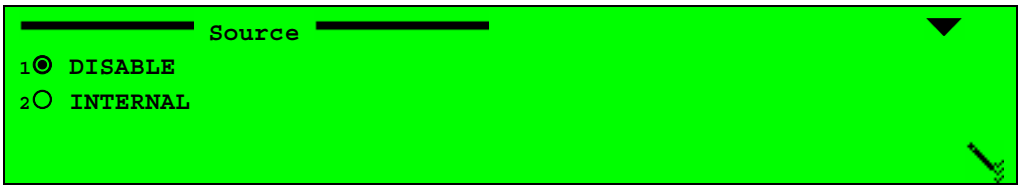
The PVR 6000 supports 10 different VITS signals: 4 signals for PAL, 2 signals for NTSC and 4 signals for SECAM and Russian SECAM. The VITS signals are automatically selected according to the selected video format (PAL, TSC or SECAM/R.SECAM).
The PAL and NTSC VITS signals are according to ITU-T J.63 standard:

- PAL- Lines 17, 18, 330, 331
- NTSC- Line 17 Field 1, Line 17 Field 2
- SECAM/R.SECAM- Lines 17, 18, 330, 331

When working in PAL or SECAM/R.SECAM video format, the user can select two lines. The factory setting is to Line 1: 17 and Line 2: 18. In this case, the PVR 6000 will re-insert the VITS signals automatically to lines 17, 18, 330, 331. In the case of selecting different line numbers for VITS, the PVR 6000 calculates the new line numbers in which to re-insert the VITS signals. For example, changing Line 2 to 19 (instead of 18) will result in VITS signals re-inserted to lines: 17, 19, 330 and 332.
When the **VBI Vertical Interval Test Signals (VITS)** parameter is selected, the following screen is displayed:



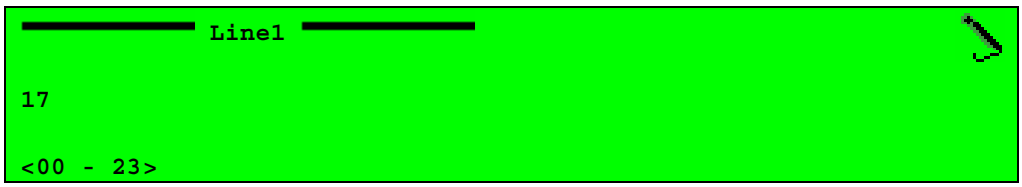
Selecting *Source* displays the following screen:



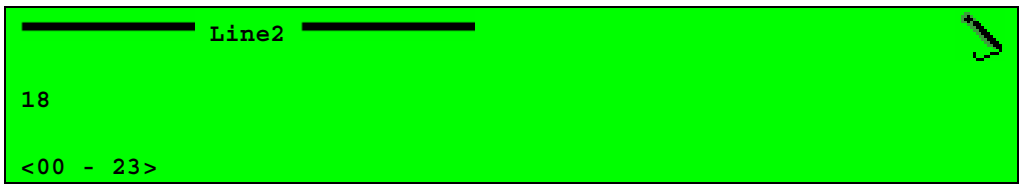
The available options are:

- **DISABLE** – VITS is disabled.
- **INTERNAL** – The PVR 6000 inserts the VITS signal according to the ITU-T standard J. 63.

When selecting the **Line 1** option, the following screen is displayed:



When selecting the **Line 2** option, the following screen is displayed:



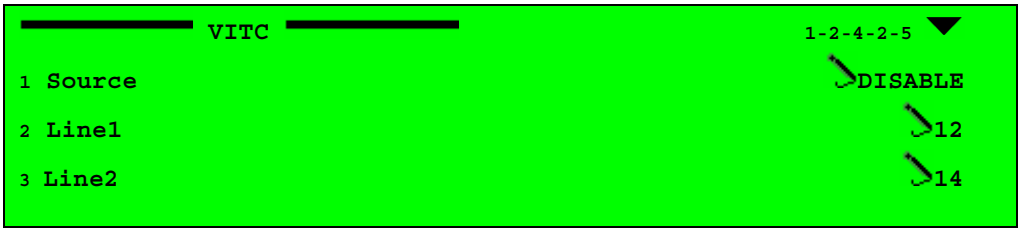
The VITS signal is inserted differently if using PAL or NTSC. When selecting PAL, VITS signals are inserted to lines 17 and 18 and to lines 330 and 331. When selecting NTSC, VITS signals are inserted to line 17-field 1 and line 17-field 2. The PVR 6000 enables the user to insert VITS signals to lines 17 and 18 as well as to any other line between 0 and 23.

NOTE

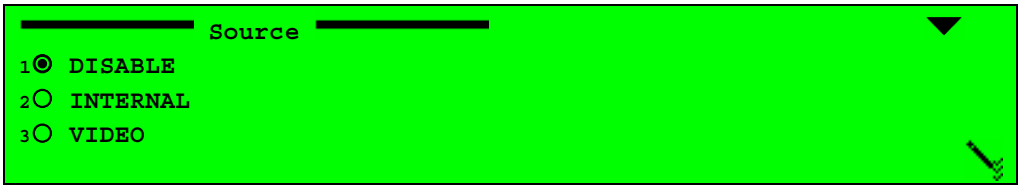
In Russian SECAM format, there are special VITS signals, different in format from PAL VITS. The Russian SECAM VITS are inserted in lines 17 and 18 and in lines 330, and 331.
Only the PVR 6000, PVR 6010, and PVR 6060 support special Russian SECAM VITS.

VITC (VERTICAL INTERVAL TIME CODE) PARAMETER

When the **Vertical Interval Time Code (VITC) VBI** parameter is selected, the following screen is displayed:



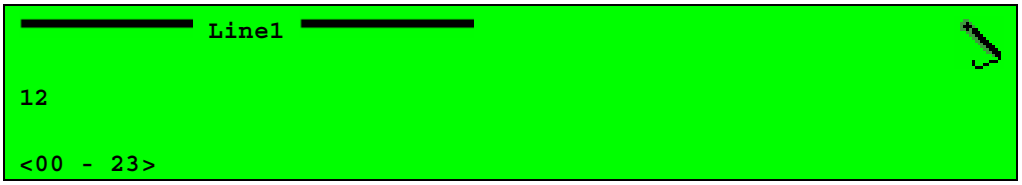
Selecting *Source* displays the following screen:



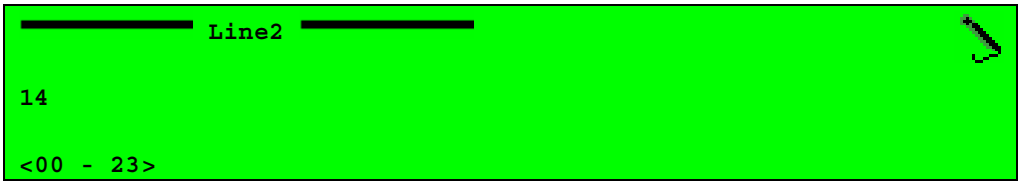
The available options are:

- **DISABLE** – VITC is disabled.
- **INTERNAL** – The PVR 6000 re-inserts the PVR 6000 uptime.
- **VIDEO** – The PVR 6000 re-inserts the VITC signal as included in the transport stream.

When selecting the **Line 1** option, the following screen is displayed:



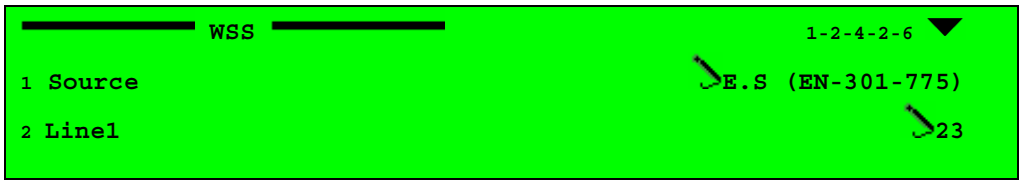
When selecting the **Line 2** option, the following screen is displayed:



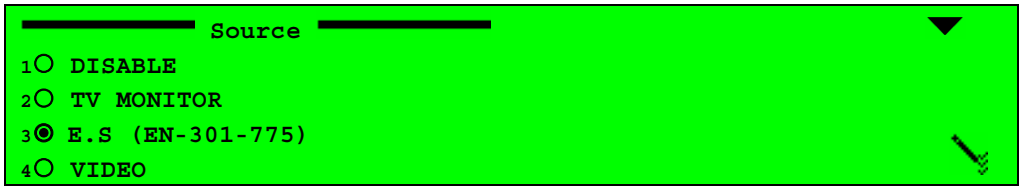
The PVR 6000 allows inserting VITC to any line between 0 and 23.

WSS (WIDE-SCREEN SIGNALLING) PARAMETER

Selecting **Wide-Screen Signaling (WSS)** displays the following screen:



Selecting **Source** displays the following screen:



The available options are:

- **DISABLE** – The PVR 6000 does not output a WSS signal.
- **TV MONITOR** – The PVR 6000 generates the WSS signal according to the Aspect Ratio value entered by the operator through Root→Configuration→Video (1..2)→Monitor Aspect-Ratio (complies with ITU-T standard J. 63).

NOTE

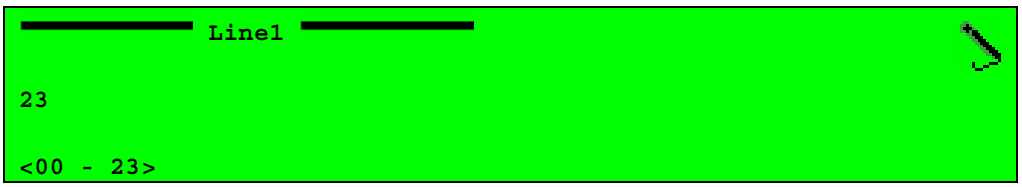
*The option **TV MONITOR** should not be selected along with choosing **VIDEO Source** under **Configuration→Video→Video 1 / 2→Monitor Aspect Ratio**, since the two A/R may contradict each other and cause unexpected results.*

- **E.S. (EN-301-775)** – The PVR 6000 generates the WSS signal according to the WSS information taken from the VBI Elementary Stream (complies with DVB EN 301-775 WSS standard).
- **VIDEO** – The PVR 6000 generates the WSS signal according to the WSS information taken from the Video Header in the Video Elementary Stream.

NOTE

*See 4.3.8.4.Appendix C for extensive details on how **WSS** configuration affects the resulting image.*

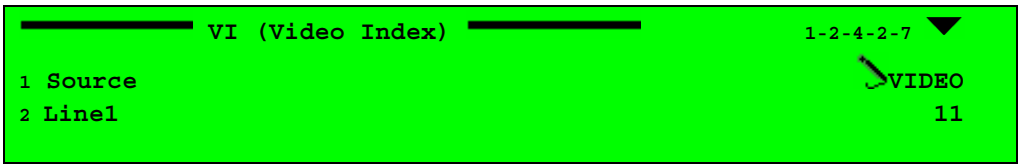
Selecting **Line1** displays the following screen:



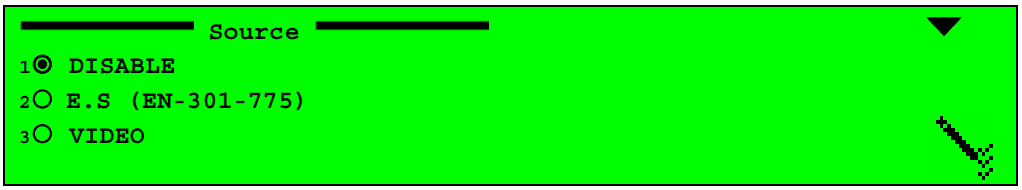
The WSS signal can be inserted into a line between 0 and 23.

VI (VIDEO INDEX)

The PVR 6000 supports AFD (Active Video Format Description) parsing, when such data exists in the video e.s. – User Data, according to ETSI TS 101 154 Annex B. The AFD data is reinserted into VBI VI (Video Indexing) line 11, on 625 systems, according to SMPTE RP 186-1995 (only Class 1.1 "Information required to display the signal, not including pan and scan" is currently supported).
Selecting **VI (Video Index)** displays the following screen:



Selecting **Source** displays the following screen:



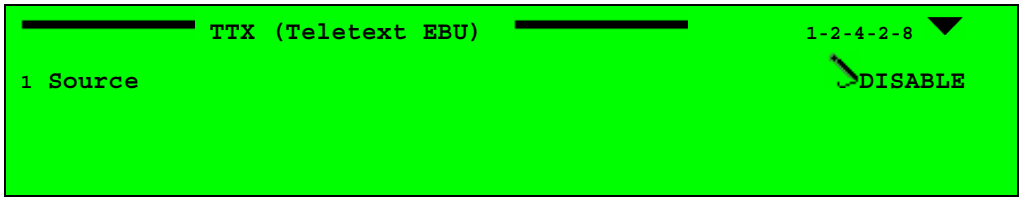
The available options are:

- **DISABLE** – VI data is not reinserted.
- **E.S.(EN-301-775)** – will be supported in the future software releases
- **VIDEO** – the PVR 6000 automatically detects the existing standard and reinserts the VI data accordingly.

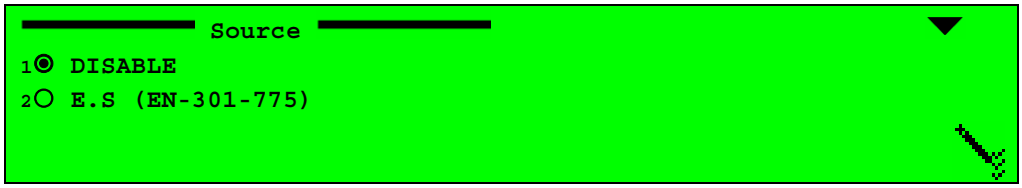
Line1 is a read-only parameter. VI data is always reinserted into line 11.

TTX (TELETEXT-EBU) PARAMETER

When the **TTX (Teletext-EBU)** VBI parameter is selected, the following screen is displayed:



Selecting **Source** displays the following screen:

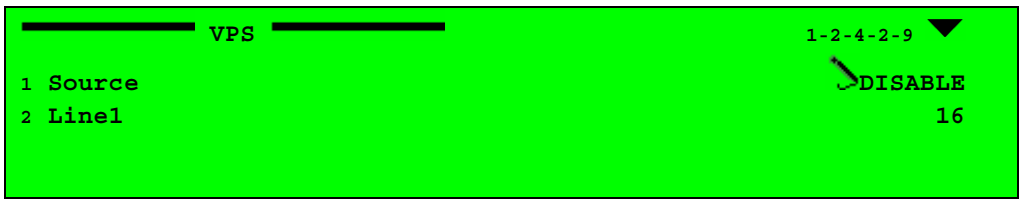


The available options are:

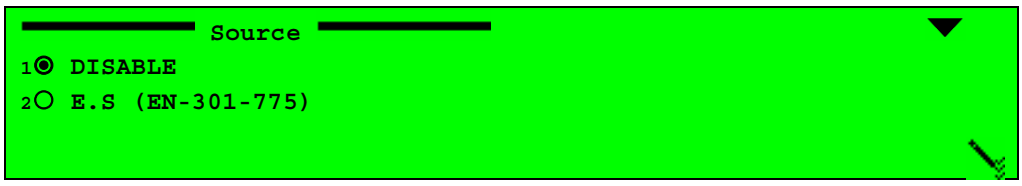
- **DISABLE** – Teletext is disabled.
- **E.S (EN-301-775)** – The PVR 6000 re-inserts the Teletext signal as included in the transport stream according to EN 301-775.

VPS (VIDEO PROGRAM SYSTEM) PARAMETER

When the **VPS (Video Program System) VBI** parameter is selected, the following screen is displayed:



Selecting **Source** displays the following screen:



The available options are:

- **DISABLE** – VPS is disabled.

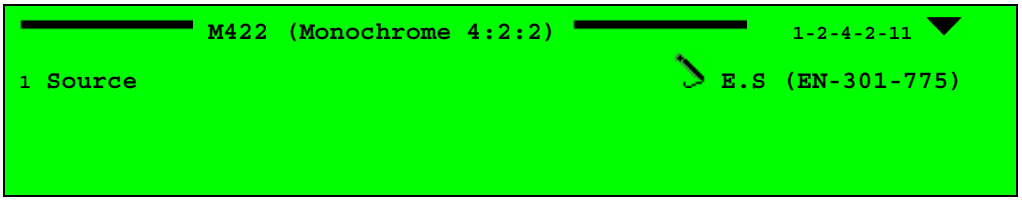
- **E.S (EN-301-775)** – The PVR 6000 re-inserts the signal as included in the transport stream in accordance with EN 301-775.

SMC (VIDEO PROGRAM SYSTEM)

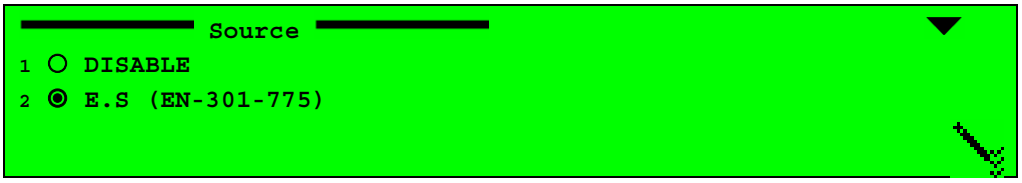
This feature will be supported in the future software releases.

M422 (MONOCHROME 4:2:2)

Selecting **M422 (Monochrome 4:2:2)** displays the following screen:



Selecting **Source** displays the following screen:



The available options are:

- **DISABLE** – Monochrome 4:2:2 reinsertion is disabled
- **E.S (EN-301-775)** – Monochrome 4:2:2 reinsertion is enabled according to the EN 301-775 standard.

4.2.6.3. OSD 1 and OSD 2

The **OSD 1 and OSD 2** Menu contains parameters for Video 1 and Video 2 (if applicable).
These menus are entered from the PVR 6000 Video Configuration Menu (see Section 4.2.6). The following screens display the Video 1 and Video 2 menus:

Figure 4-21 displays the corresponding **OSD1** Menu (Web Management screen).

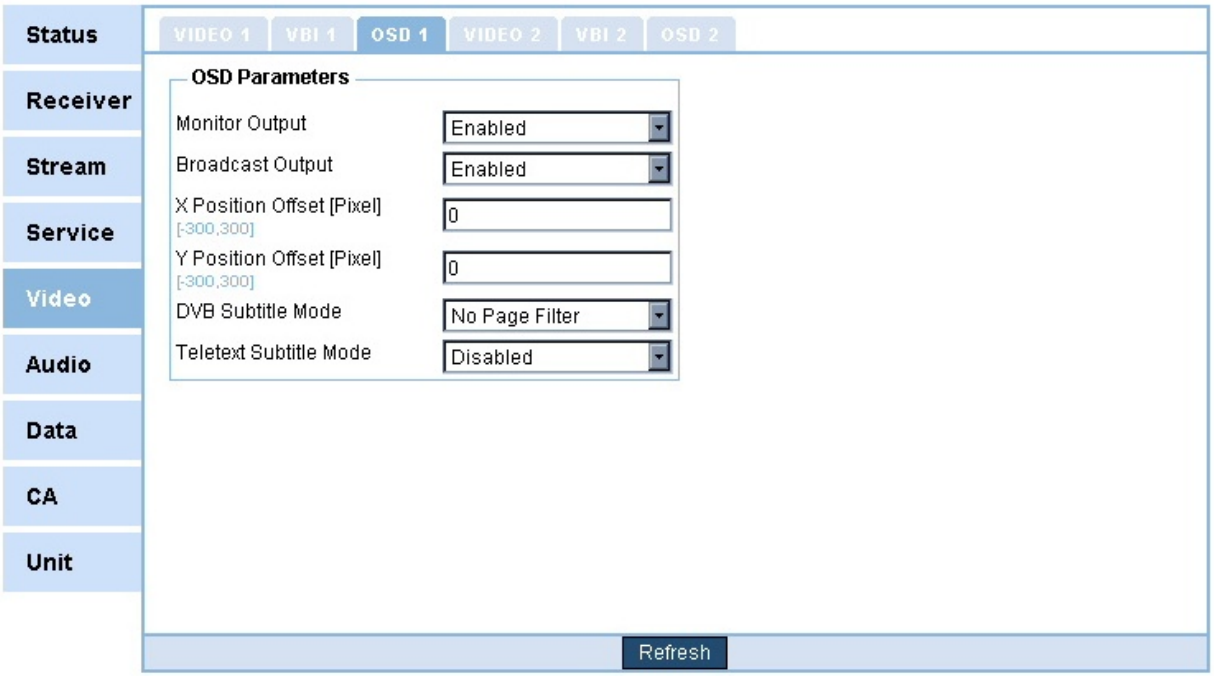


Figure 4-21: OSD1 Menu Screen

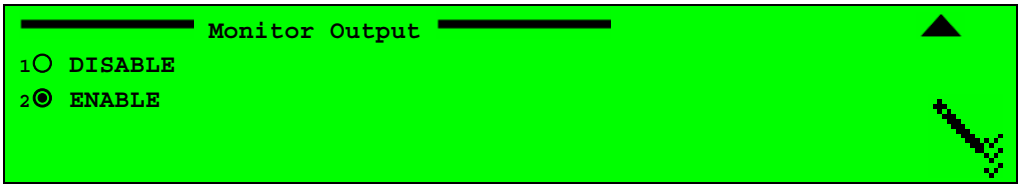
The available options are:

- Monitor Output
- Broadcast Output
- X Position Offset
- Y Position Offset
- DVB Subtitle Mode
- TLTX Subtitle Mode

The following paragraphs describe the **OSD 1 and OSD 2** parameters:

MONITOR OUTPUT

Selecting **Monitor Output** displays the following screen:

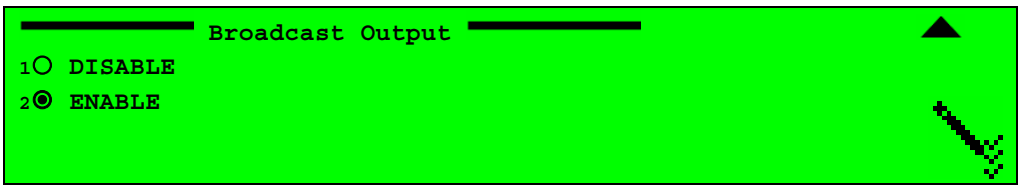


The available options are:

- **DISABLE** – Disables Monitor Output (PVR 6000 rear panel)
- **ENABLE** – Enables Monitor Output

BROADCAST OUTPUT

Selecting **Broadcast Output** displays the following screen:

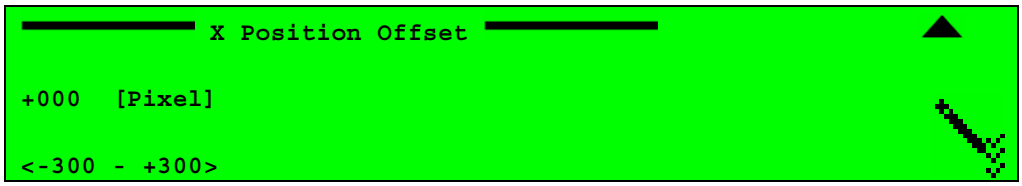


The available options are:

- **DISABLE** – Disables Broadcast Output (PVR 6000 rear panel)
- **ENABLE** – Enables Broadcast Output

X POSITION OFFSET

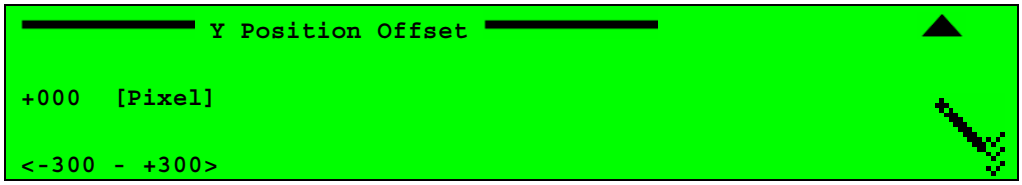
Selecting **X Position Offset** displays the following screen:



This function determines the horizontal offset of the OSD signal.
The valid range of values is between (-300) and (+300) pixels

Y POSITION OFFSET

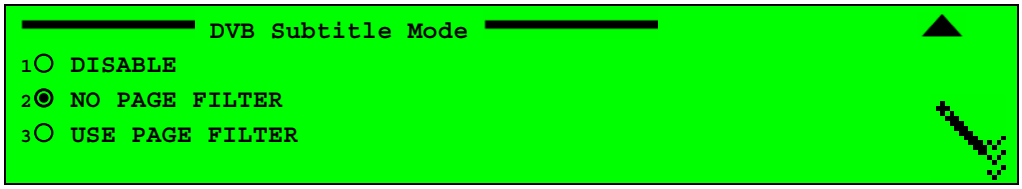
Selecting **Y Position Offset** displays the following screen:



This function determines the vertical offset of the OSD signal.
The valid range of values is between (-300) and (+300) pixels

DVB SUBTITLE MODE

Selecting **DVB Subtitle Mode** displays the following screen:



The available options are:

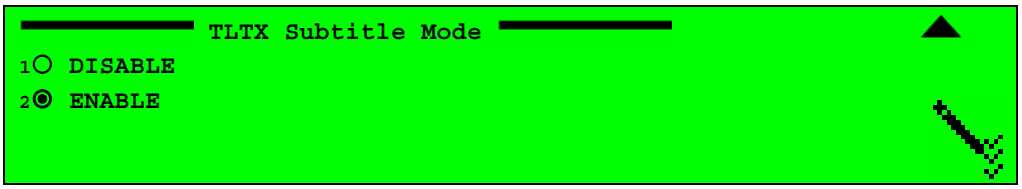
- **DISABLE** – Disables DVB Subtitling.
- **NO PAGE FILTER** – This is the PVR 6000 default setting.
- **USE PAGE FILTER** – Use this option when more than one DVB subtitling pages exist in the OSD PID. The Page Filter identifies the page that contains actual subtitling data.

TLTX SUBTITLE MODE

Different from DVB subtitling, Teletext Subtitling requires the decoder to create relevant language fonts. The PVR 6000 has the following Teletext Subtitling fonts installed (all fonts according to ETS 300 706):

- Croatian
- Czech
- Danish
- Dutch
- English
- English Old
- Estonian
- Finnish
- French
- German
- Hungarian
- Italian
- Latvian
- Lithuanian
- Norwegian
- Portuguese
- Romanian
- Serbian
- Slovak
- Slovenian
- Spanish
- Swedish

Selecting **TLTX Subtitle Mode** displays the following screen:



The available options are:

- **DISABLE** – Disables Teletext Subtitling
- **ENABLE** – Enables Teletext Subtitling

NOTE

*When selecting **DVB Subtitle Mode**, **TLTX Subtitle Mode** is automatically disabled, and vice versa, since only one set of subtitling is allowed per program.*

4.2.7. Audio Configuration Menu

The **Audio Configuration Menu** contains parameters that define the audio decoder mode of operation.
Figure 4-22 displays a tree diagram of the Audio Configuration Menu.

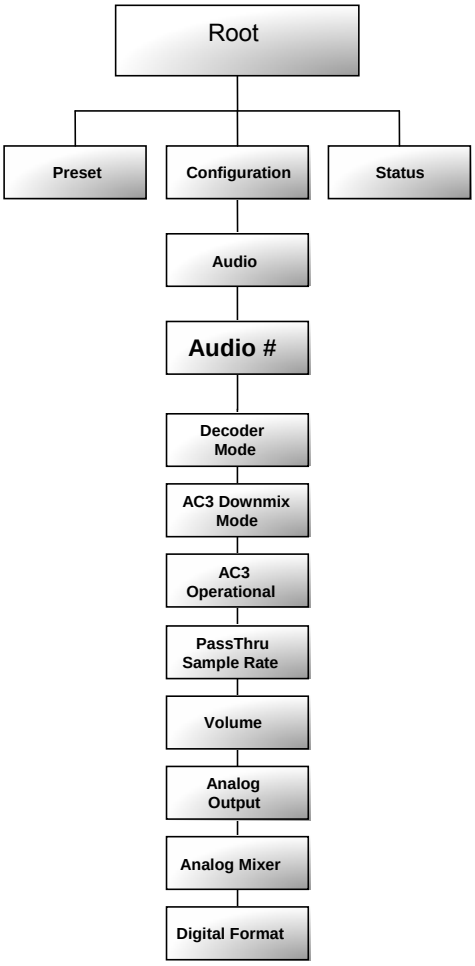
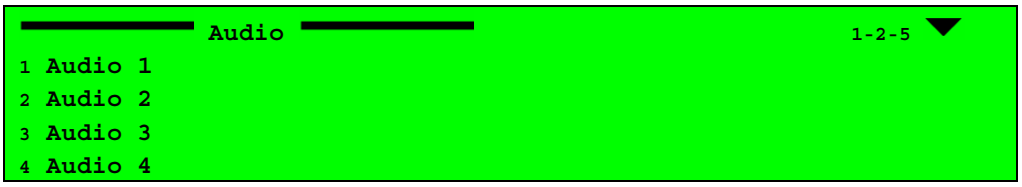


Figure 4-22: Audio Configuration Menu

NOTE

The number of Audio Channel Configurations provided in the Audio Configuration menu is dynamic and is set by the unit configuration.

To access the **Audio Configuration Menu,** in the front panel control interface go to ***Configuration→Audio***.
The following screen displays the **Audio** Configuration Menu:



The available options are:

- **Audio 1**
- **Audio 2**
- **Audio 3** (in dual decoder IRDs)
- **Audio 4** (in dual decoder IRDs)

Audios 1 through 4 have identical parameters, and are accessible through identical controls. The following is an example of Audio 1 front panel control screen. Audio 2, 3, and 4 control screens are exactly the same (except for the screen header).

NOTE

Audio1 *and* ***Audio2*** *correspond with* ***Video1*** *and are always available.* ***Audio3*** *and* ***Audio4*** *correspond with* ***Video2*** *and are available only in dual decoder IRDs.*

4.2.7.1. Audio 1

To access the **Audio 1** Menu in the front panel control interface go to ***Configuration→Audio→Audio1***.
The following screen displays the **Audio 1** menu:

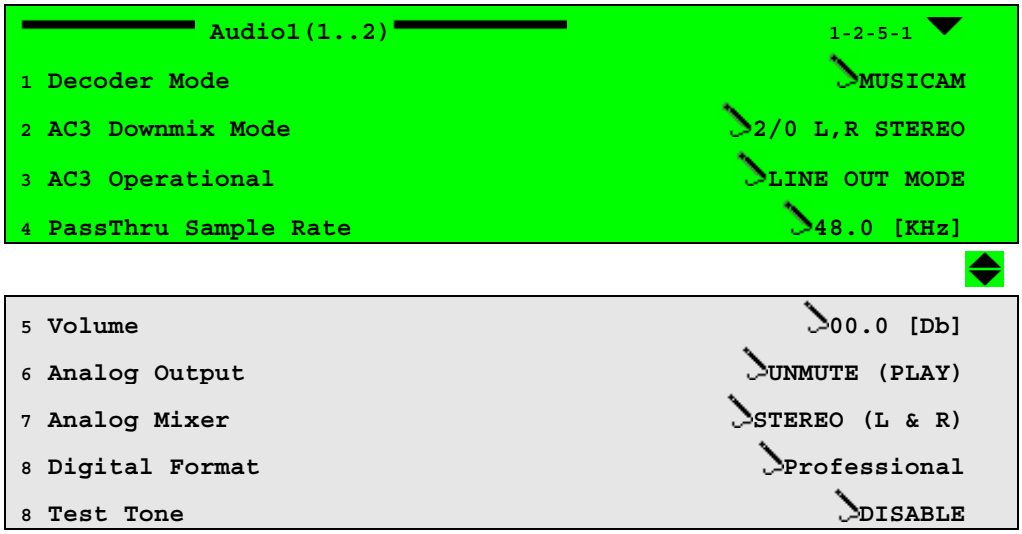


Figure 4-23 displays the corresponding **Audio1** Menu (Web Management screen).

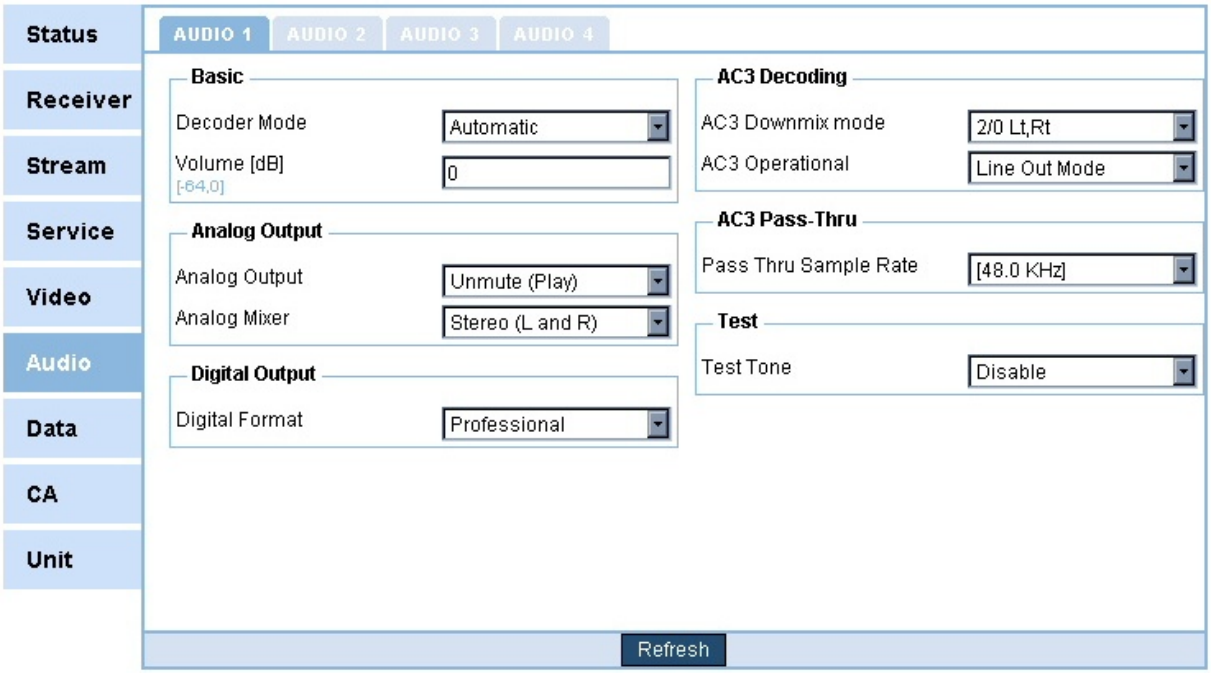


Figure 4-23: Audio 1 Menu Screen

The available options are:

- Decoder Mode
- AC3 Downmix Mode
- AC3 Operational
- PassThru Sample Rate
- Volume
- Analog Output
- Analog Mixer
- Digital Format
- Test Tone

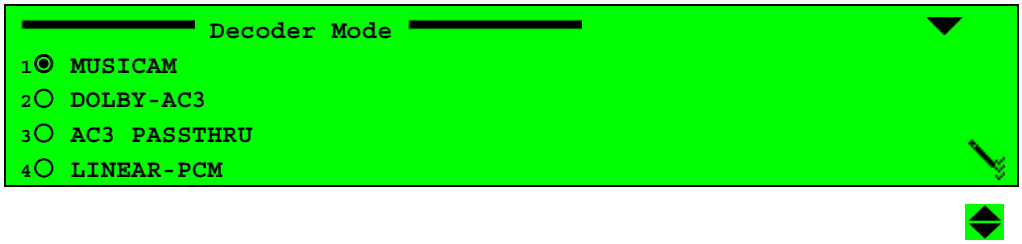
NOTES

*Although **AC3 Downmix Mode**, **AC3 Operational Mode**, and **PassThru Sample Rate** parameters can always be accessed from the **Audio (1..4) Parameters** window, they are affective only when their corresponding mode is selected in **Decoder Mode**.*
*In the Web Management window, **AC3 Downmix Mode** and **AC3 Operational Mode** are effective only when **Dolby AC3** is selected in **Decoder Mode***
*In the Web Management, window **PassThru Sample Rate** is effective only when **PassThru** is selected in **Decoder Mode**.*
Digital Format will be supported by the PVR 6000 Web Control interface in the future SW releases.

The following paragraphs detail the Audio Configuration options.

AUDIO DECODER MODE SETUP

The **Audio Decoder** mode option allows the user setting the following parameters for an Audio channel:



This menu controls the decoder audio mode; The available options are:

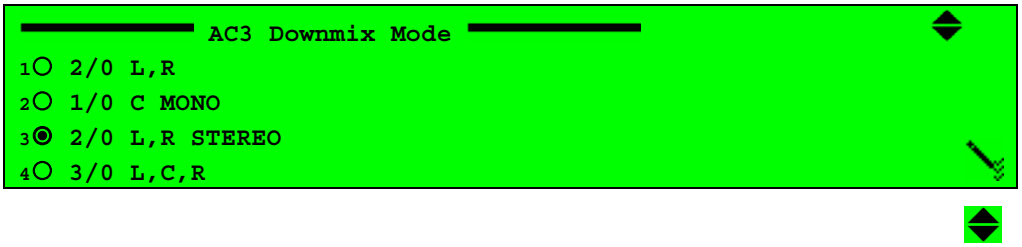
- **MUSICAM** – Sets the audio decoder mode to MUSICAM
- **DOLBY-AC3** – Sets the audio decoder mode for the AC-3 downmix
- **AC3 PASSTHRU** – Sets the audio decoder mode to AC-3 Pass-through
- **LINEAR-PCM** – Sets the audio decoder mode to Linear PCM and Dolby E Pass-through. Only PVR 6040 , PVR 6050, PVR 6070 , and PVR 6070 Audio 3 and Audio 4 support this feature
- **AUTOMATIC** – Automatically detects the audio decoding mode

NOTE

***Audio3** and **Audio 4** Decoder Mode parameters must be identical .For example: when Audio3 Decoder mode is set to **AC3 PASSTHRU**, Audio 4 must be set to **AC3 PASSTHRU** as well.*

AC3 DOWNMIX MODE SETUP

The **AC-3 Downmix** mode allows you to set the downmix mode to 2/0.

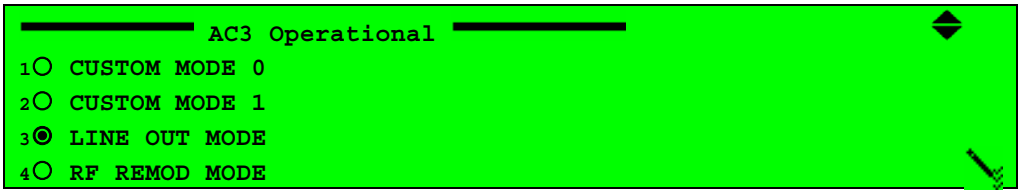


The available options are:

- **2/0 L, R**
- **2/0 C mono**
- **2/0 L, R stereo**
- **3/0 L, C, R**
- **2/1 L, R, S**
- **3/1 L, C, R, S**
- **2/2 L, R, Ls, Rs**
- **2/2 L, C, R, Ls, Rs**

AUDIO AC3 OPERATIONAL SETUP

The **Audio AC3 Operational** parameter selects the audio output mode of operation on a specific audio for the Dolby AC-3 processed audio information (for example, Audio 1 output).



The available options are:

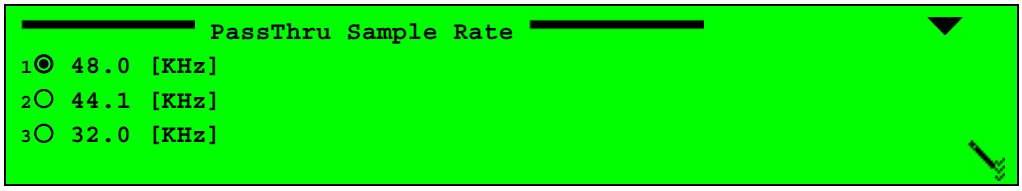
- **Custom Mode 0**
- **Custom Mode 1**
- **Line Out Mode**
- **RF Remod Mode**

NOTE

The default for Audio AC-3 Operational output is Line Out mode.

PASSTHRU SAMPLE RATE

The **PassThru Sample Rate** parameter allows the user setting the sampling frequency for the AC3 Pass-through.

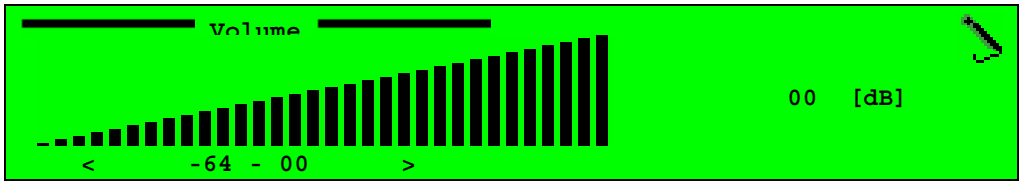


The available options are:

- **48.0 [KHz]**
- **44.1 [KHz]**
- **32.0 [KHz]**

VOLUME

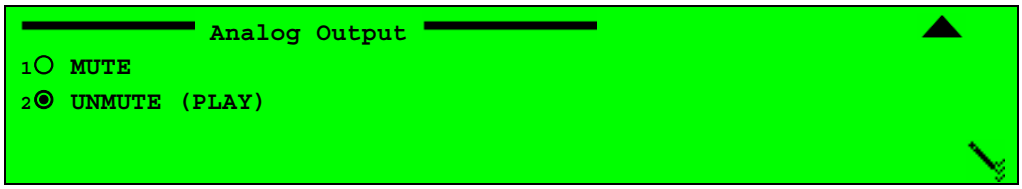
The **Volume** parameter allows the user setting the audio volume of the audio channel.
A graphical volume display illustrates the volume level.



Available values are between **(–)64** and **0dB.**

ANALOG OUTPUT

The **Analog Output** parameter sets Mute or Play mode in an audio channel output.

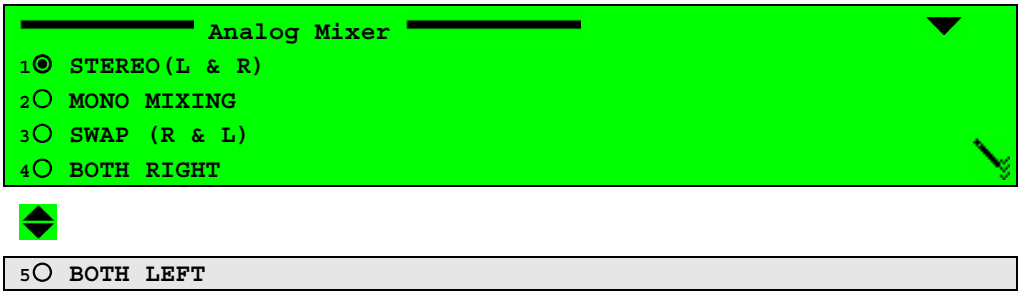


The available options are:

- **MUTE** – this analog audio output is disabled
- **UNMUTE (PLAY)** – this analog audio output is enabled

ANALOG MIXER

The **Analog Mixer** parameter, displayed on the following screen, allows setting the stereo and mono options of the stereo channels.



The available options are:

- **STEREO (L & R)** – Standard stereo output on the respective left and right connectors
- **MONO MIXING** – Mixes left and right stereo channel signals for mono output on both left and right connectors
- **SWAP (R & L)** – Swaps channels:
  - Left channel on right connectors
  - Right channel on left connectors
- **BOTH RIGHT** – Outputs right channels on both left and right connectors
- **BOTH LEFT** – Outputs left channels on both left and right connectors

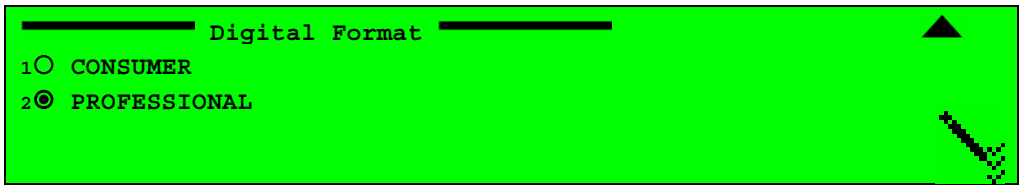
NOTES

Audio 2 Parameters menu is identical in its form and functionality to the Audio 1 Parameters menu (see ***Error! Reference source not found.****).*

Recall that Audio 3 and Audio 4 menus correspond with Video2, and are also identical in form and functionality to Audio 1 and Audio 2.

DIGITAL FORMAT

The **Digital Format** parameter sets the digital audio channel output mode.



The available options are:

- **CONSUMER** – Selects AES/EBU, SPDIF Consumer Mode. – This mode passes the audio mode bits as is.
- **PROFESSIONAL** – Selects AES/EBU Professional Mode. This mode set the audio mode to stereo regardless of actual audio.

NOTE

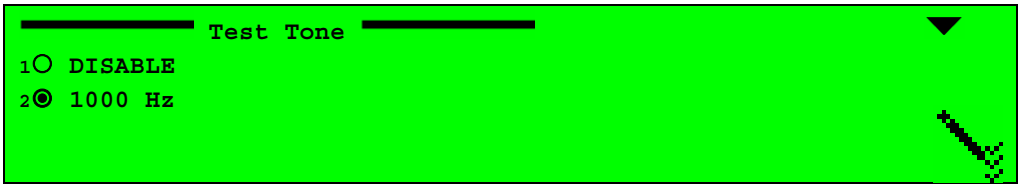
*When **Consumer** mode is chosen: the IRD passes the audio mode bits as is. When **Professional** mode is chosen: the IRD sets the audio mode to stereo regardless of actual audio.*

NOTE

*When choosing PROFESSIONAL, the PVR 6000 will set the Audio header's **Pro** flag to **1** ('Pro') whether the received value was 1 or 0.*

TEST TONE

The PVR 6000 can create a 1 kHz audio test signal, and output it through any of its audio outputs for testing that audio output performance. The operator must select the audio output to be tested and enable the creation of the test tone for that output.



The available options are:

- **DISABLE** – disables the test tone
- **1000 Hz** – creates a 1 kHz audio signal and outputs it through this Audio output

NOTES

It is required to stop al IRD decoding before performing Audio Output testing. Only Audio Outputs 1, 3, and 4 can currently be tested using the PVR 6000 internal 1 kHz test tone.

4.2.8. Data Configuration Menu

The **Data Configuration Menu** allows setting parameters to handle a data output stream.
Figure 4-24 displays a tree diagram of the Data Configuration Menu.

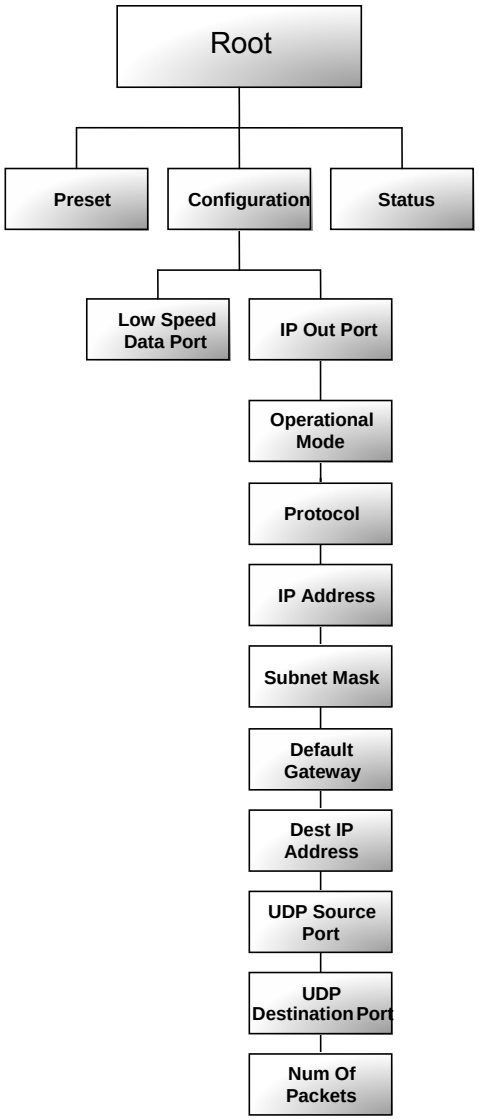
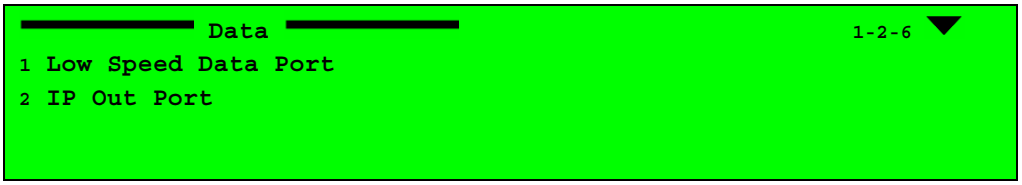
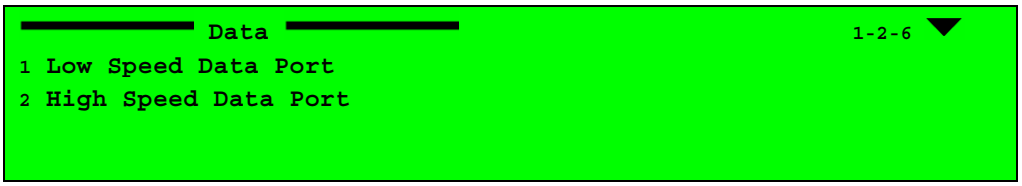


Figure 4-24: Data Configuration Menu

To access the *Data Configuration Menu* in the front panel control interface go to ***Configuration→Data***.
All the PVR 6000 models except PVR 6000 and PVR 6060 support the **IP-Out-Port** option. Following is the corresponding front-panel screen:



The PVR 6000 and PVR 6060 models support the **High Speed Data Port** option (and *not* IP Out Port). Following is the corresponding front-panel screen for these models:



The **Data** Configuration Menu parameters are:

- **Low Speed Data Port**

  Sets the type of data to be outputted through the Low Speed Data port. The PVR 6000 supports LS data output in three levels of filtering. For details see Section 4.2.8.1.

- **IP Out Port**

  Sets the PVR 6000 IP Out port parameters (e.g. the chosen transfer protocol, the PVR 6000 IP address, UDP port and so on.). For detailed information, see Section 4.2.8.2.

- **High Speed Data Port** (PVR 6000 and PVR 6060 only)

  Sets the transfer rate & direction, and the type of data to be sent, through the High Speed Data port. For details see Section 4.2.8.3.

4.2.8.1. Low Speed Data Port

This menu is used for setting the PVR 6000 Low Speed Data port parameters. The PVR 6000 supports Low Speed Data output through RS232. It enables different rates of transmission, as well as three levels of output-data filtering.

NOTE

The PVR 6000 automatically directs PIDs with the MPEG-2 descriptor - private_data_indicator = 15 with indicator value 0 for transmission through its Low Speed Data port.
The minimum amount of data that can be transmitted through the LS Data port is the size of one PES payload.

To access the Low Speed Data menu, in the front panel control interface go to **Configuration→Data→Low Speed Data Port**
Following is the corresponding front-panel screen:

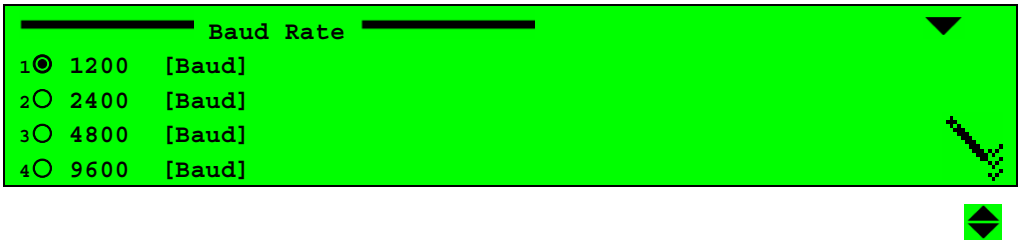
The *Low Speed Date Port* screen contains the following parameters:

- **Baud Rate**
- **Layer Filtering**

The following paragraphs provide details of these parameters.

BAUD RATE

This parameter enables electing between eight possible LS data transmission rates. Following is the corresponding front panel screen:



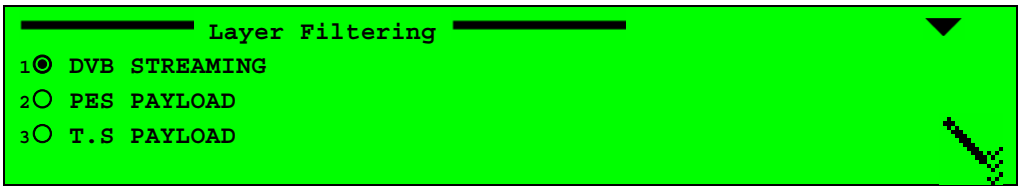
The available transmission rates are: 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 Baud.

NOTE

The LS Data transmission Baud Rate settings must comply with the corresponding encoder data-encapsulation rate.

LAYER FILTERING

The PVR 6000 supports three levels of Low Speed Data filtering, determining the type of data to be transmitted through the LS Data port. Following is the front panel **Layer Filtering** screen:



The three levels of data filtering are:

- **DVB STREAMING** – For outputting only DVB Asynchronous Data Streaming according to the EN-301-192 standard (the first 3 bytes of the PES_data_packet are stripped)
- **PES PAYLOAD** – For outputting only the PES payload (the PES header is stripped)
- **T.S PAYLOAD** or outputting only the transport stream payload (the TS header and the adaptation field are stripped)

4.2.8.2. IP-Out-Port Configuration Menu

NOTE

When selecting MPE mode verify that the MPE encapsulator setup is such that the MPEG packet contains data of a single IP frame (for example, a single MPEG packet cannot contain data belonging to two separate IP frames).

This menu is used for setting the IP-Out port parameters.

To access the *IP-Out-Port Menu* in the front panel control interface go to ***Configuration→Data→IP Out Port***.

The following screen displays the **IP Out Port** menu:

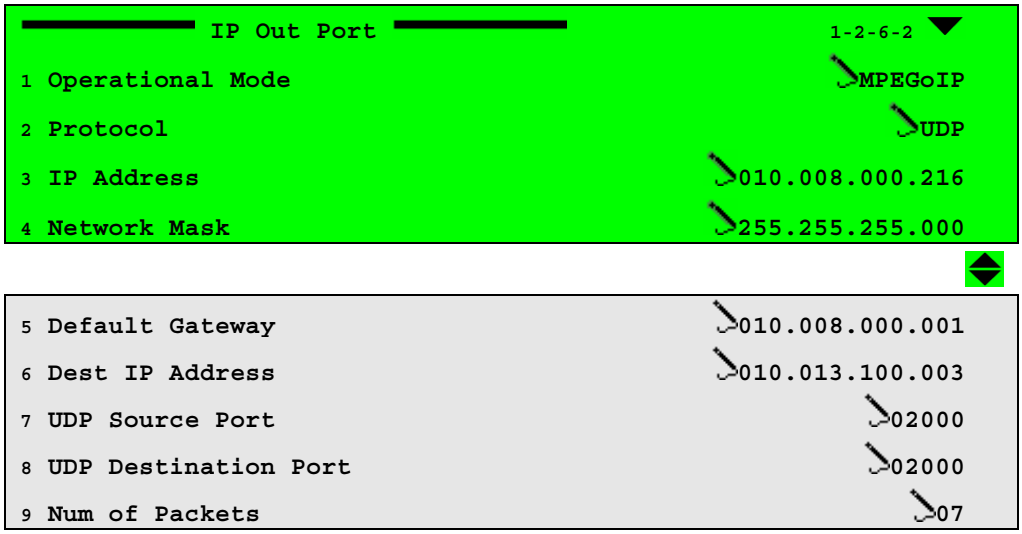


Figure 4-23 displays the corresponding **IP DATA PORT** Menu (Web Management screen).

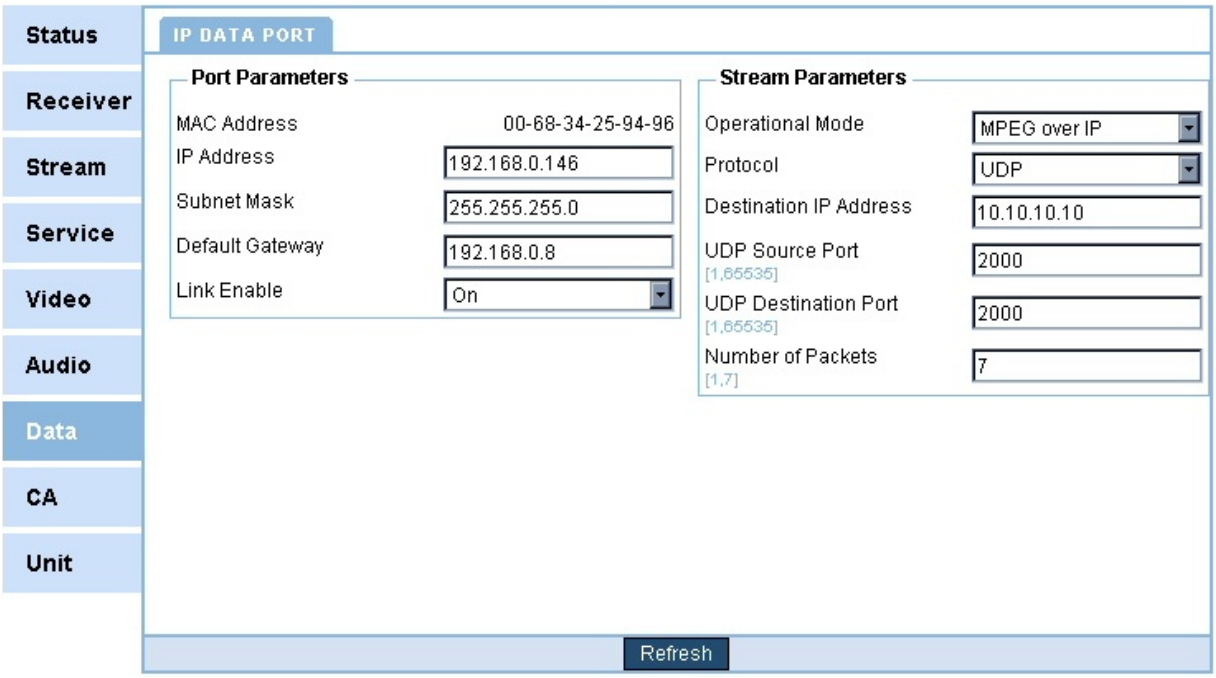


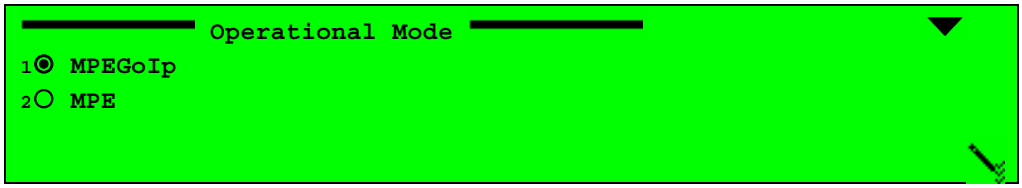
Figure 4-25: IP DATA PORT Menu Screen

The available options are:

- **Operational Mode**
- **Protocol**
- **IP Address**
- **Network Mask**
- **Default Gateway**
- **Dest IP Address**
- **UDP Source Port**
- **UDP Destination Port**
- **Num of Packets**

OPERATIONAL MODE

The **Operational Mode** screen displays the currently active mode of operation and allows setting the mode using the following Select Value screen:



The available options are:

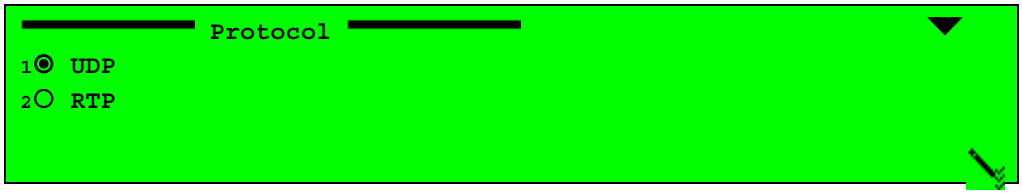
- **MPEGoIp** – MPEG-over-IP mode
- **MPE** – IP data (MPE de-capsulation)

NOTE

When Operational mode is set to MPEG-over-IP, all other items in the IP-Out-Port menu must be configured. When Operational mode is set to MPE, then the IP address, Subnet Mask, and Default Gateway items must be configured.

PROTOCOL

The **Protocol screen** displays the currently active L3 protocol and allows setting the protocol using the following Select Value screen.

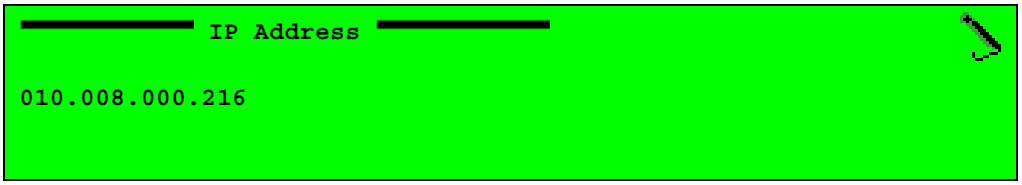


The available options are:

- **UDP** – User Datagram Protocol
- **RTP** – Real Time Protocol (this feature will be supported in future software releases)

IP ADDRESS

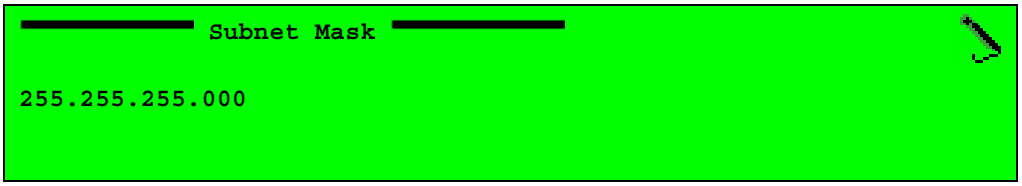
The **IP Address** parameter allows setting the IP Address of the output port.



The value in each field must be a whole number between 0 and 255.

SUBNET MASK

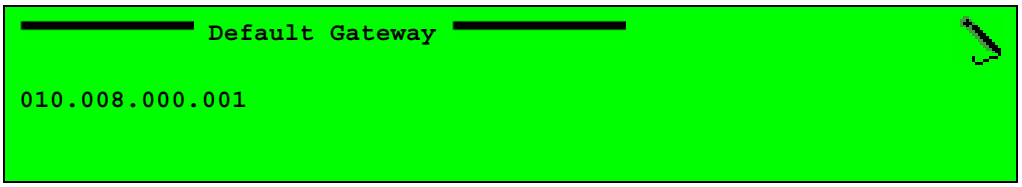
The **Subnet Mask** parameter defines the network sub-mask.



The value in each field must be a whole number between 0 and 255.

DEFAULT GATEWAY

The **Default Gateway** parameter allows setting the network default gateway address. This is the address of a local IP router on the same network as the PVR 6000 that is used to forward traffic beyond the local network.



The value in each field must be a whole number between 0 and 255.

DESTINATION IP ADDRESS

The **Destination IP Address** parameter allows setting the required destination IP address.

The value in each field must be a number between 0 and 255.

UDP SOURCE PORT

The **UDP Source Port** parameter allows setting the source UDP port number.

The value in each field must be a whole number between 0 and 65535.

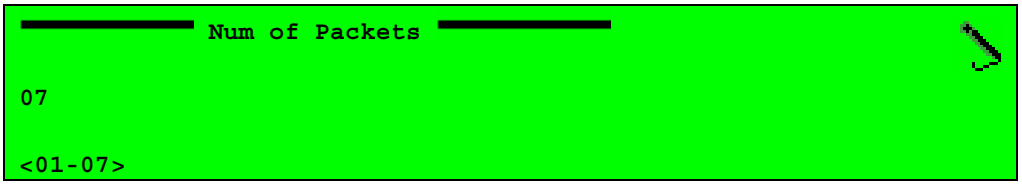
UDP DESTINATION PORT

The **UDP destination Port** parameter allows setting the UDP Destination port number.

The value is a whole number between **0** and **65535**.

NUMBER OF PACKETS

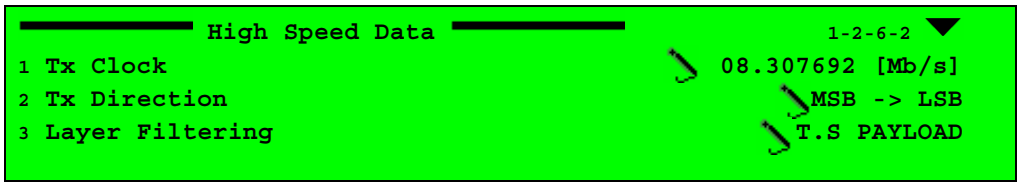
The **Number of Packets** parameter allows setting the number of MPEG packets to be contained in an IP frame (using the following Edit Value Screen).



Available values are between **1 and 7.**

4.2.8.3. High Speed Data

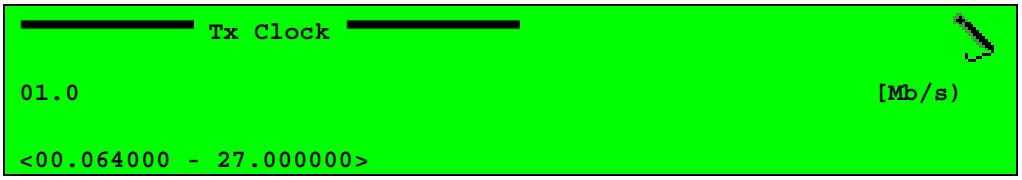
HS data is only supported in PVR 6000 and PVR 6060 models.
The *High Speed Data Menu* is used for setting the transfer rate & direction (MSB↔LSB) and the type of data to be sent, through the High Speed Data port.
To access the **High Speed Data** Menu in the front panel control interface go to ***Configuration→Data→High Speed Data Port***.
Following is the corresponding front-panel screen:



The HS Data parameters are detailed as follows:

TX CLOCK

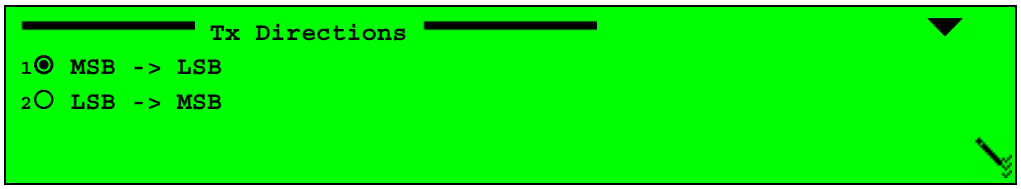
The **Tx Clock** parameter sets the speed of the high speed data port.



Legal values range from 00.064000 to 27.000000 Mbps.

TX DIRECTION

The **Tx Direction** parameter defines whether MSB or LSB is sent first.

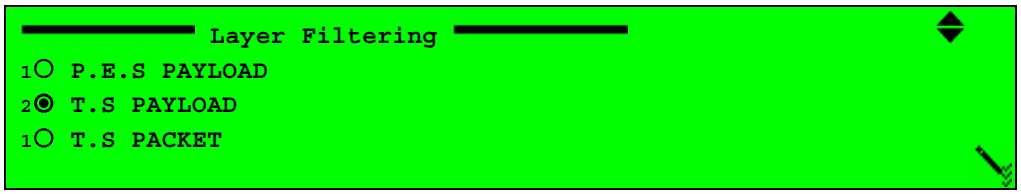


The available options are:

- **MSB → LSB** – MSB sent first
- **LSB → MSB** – LSB sent first

LAYER FILTERING

The **Layer Filtering** parameter selects a filtering mode to data.



The available options are:

- **P.E.S PAYLOAD** – Strips the header of the packetized elementary stream (PES).
- **T.S PAYLOAD** – Strips the transport stream header (first 4 bytes out of the 188 bytes packet)
- **T.S PACKET** – Enables the entire transport stream packet (188 bytes)

4.2.9. Conditional Access Configuration Menu

This menu allows access to all PVR 6000 CA (Conditional Access) parameters. Figure 4-26 displays a tree diagram of the Conditional Access Configuration Menu.

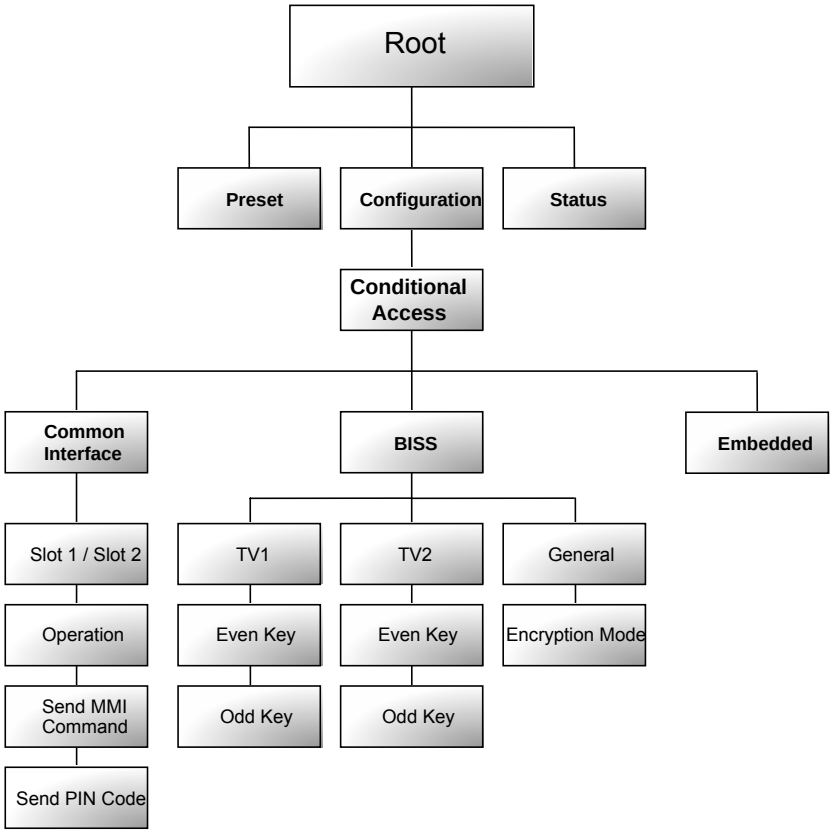
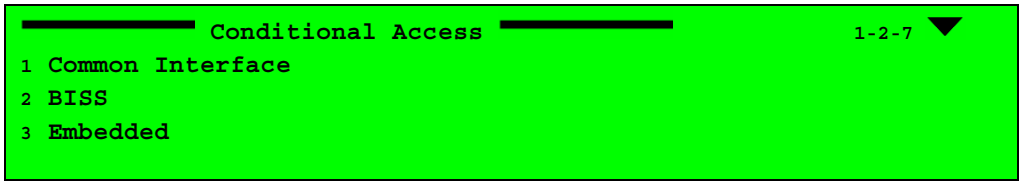


Figure 4-26: Conditional Access Configuration Menu

To access the Conditional Access Configuration menu in the front panel control interface go to Configuration→ Conditional Access.
The following screen displays the Conditional Access menu:



The **Conditional Access** Menu parameters are as follows:

- **Common Interface (CI)**

  Enable setting up the configuration of the CAMS in the PVR 6000 using the DVB-CI standard. For details, see Section 4.2.9.1.

- **BISS Mode**

  Enable setting up the BISS encryption mode. For details, see Section 4.2.9.2.

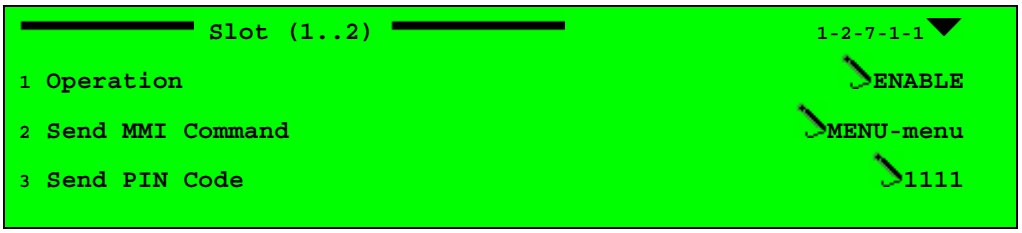
- **Embedded Mode**

  Enable setting up the embedded encryption mode. For details, see Section 4.2.9.3.

4.2.9.1. Common Interface Configuration Menu

The **Common Interface (CI)** menu displays the current status of the PVR 6000 CI slots.
To access the Common Interface menu in the front panel control interface go to *Configuration→Conditional Access→Common Interface.*
The following screen displays the Common Interface menu:

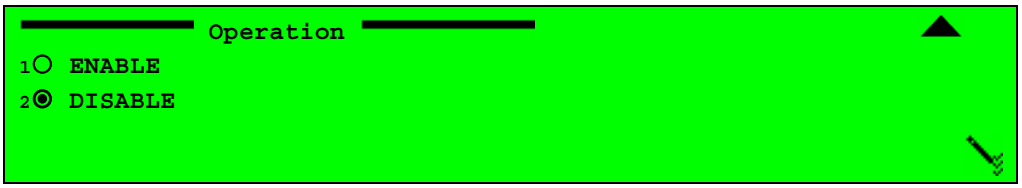
Once a CI Slot is selected, an Edit Menu screen is displayed. The **Slot 1 and Slot 2 Configuration edit menu** provides access to the CI parameters for the respective PVR 6000 CI Slot:



The following paragraphs detail the **Slot Configuration** options.

OPERATION

The **Operation** parameter enables or disables the slot.

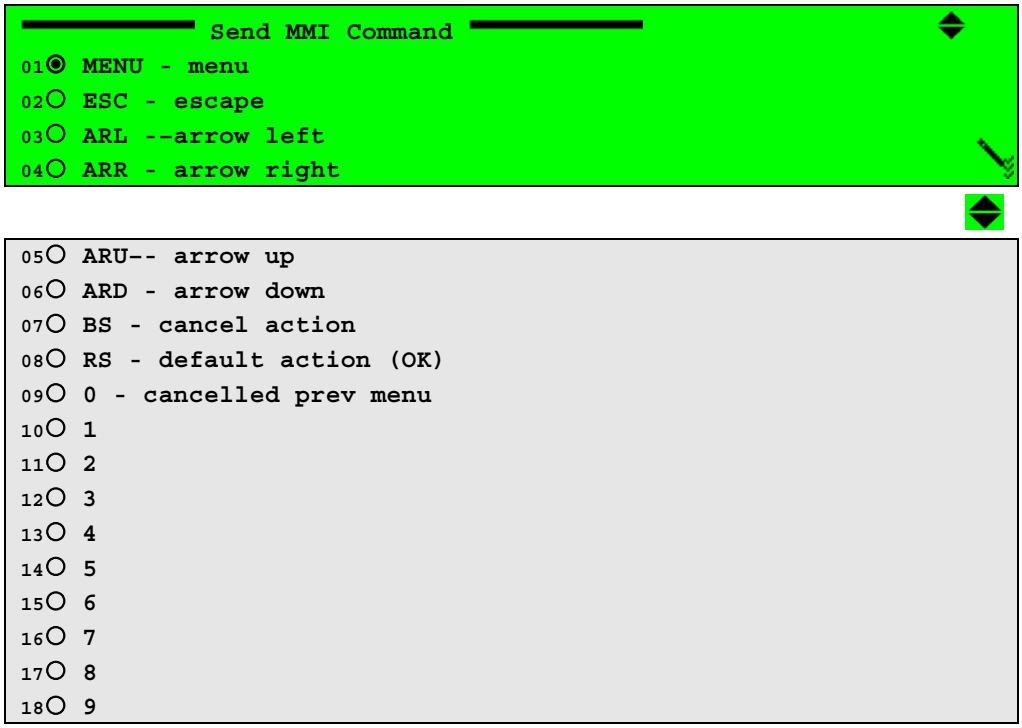


The available options are:

- **ENABLE**
- **DISABLE**

SEND MMI (MAN-MACHINE INTERFACE) COMMAND

The **Send MMI Command** sets and sends the MMI command to the CAM installed in the CI slot. This MMI contains a set of commands that can be sent to the CA application in the Conditional Access Module (CAM).
The CAM response is displayed either on the CLI or using OSD on the video monitoring port.

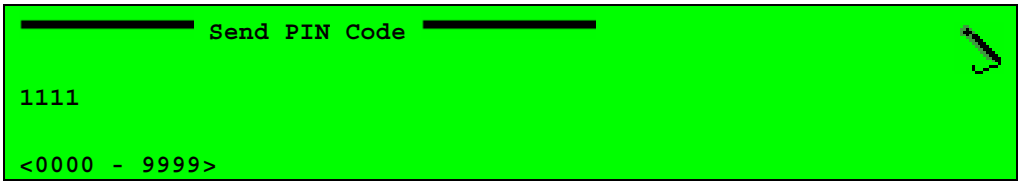


The available options are:

Menu (menu); **ESC** (escape); **ARL** (arrow left); **ARR** (arrow right); **ARU** (arrow up); **ARD** (arrow down); **BS** (cancel action), **RS** (default action), **0-9 digits**

SEND PIN CODE

The **Send PIN Code** parameter allows setting and sending a PIN code to the CAM.

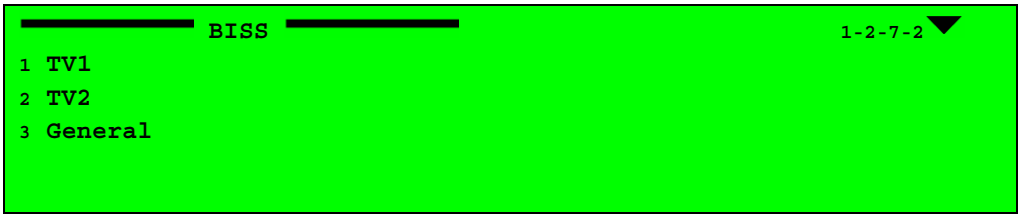


4.2.9.2. BISS Mode

The PVR 6000 supports the following encryption modes:

- Even-Odd Encryption ('Harmonic Inc. private' mode)
- BISS Mode 1
- BISS-E Clear Session Word
- BISS-E with Injected ID
- BISS-E with Buried ID

The previously mentioned **BISS** options operate according to the EBU-UER Tech 3292 manual.
Even-Odd Encryption is a Harmonic Inc. developed encryption option that uses both an even and an odd key. This is another encryption option that is available for the operator.
The following screen displays the **BISS** menu navigation screen:



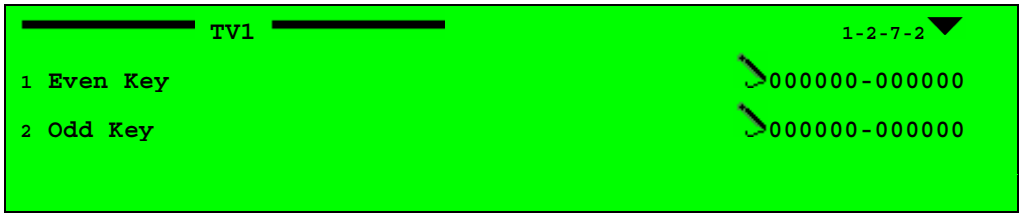
The **BISS** Menu parameters are:

- **TV(1..2)** - Enables the operator to set Encryption Keys values of the selected input
- **General** – Allows the operator to select between the different encryption modes

The following paragraphs detail the **BISS** parameters.

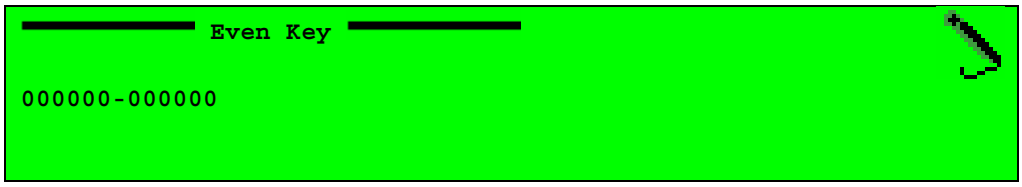
TV1

The following screen displays the **TV1** Edit Menu Screen:

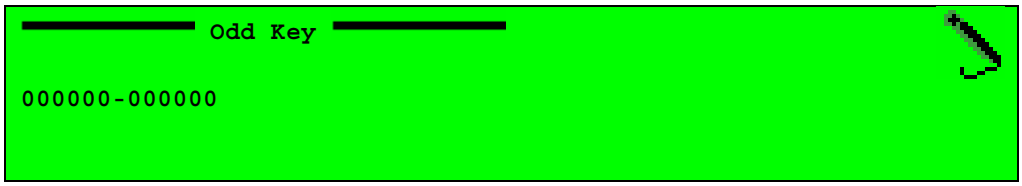


The **TV1** menu available parameters are:

- Even Key
- Allows operator to set the Even Key encryption value

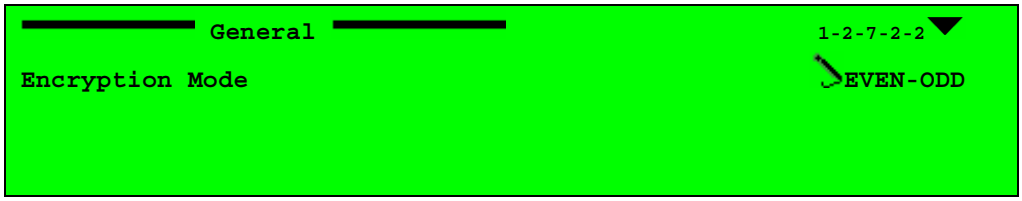


- odd Key
- Allows operator to set the Odd Key encryption value



GENERAL

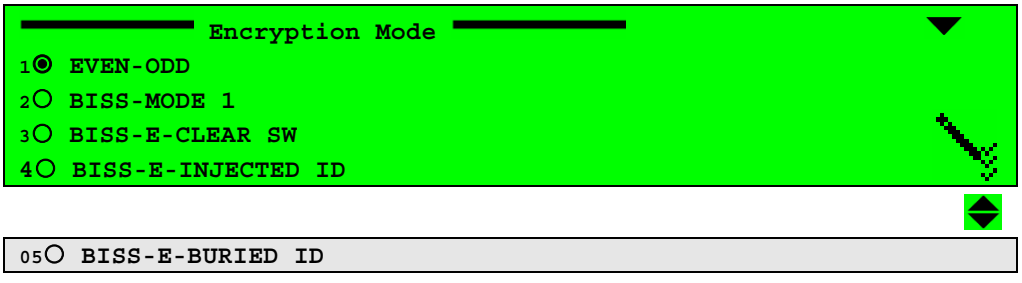
The following screen displays the **General** Edit Menu Screen:



The **General Menu** parameters are:

ENCRYPTION MODE

This screen allows the operator to select between the IRD's different encryption modes.



The available options are:

- EVEN-ODD
- BISS-MODE 1
- BISS-E-CLEAR SW
- BISS-E-INJECTED ID
- BISS-E-BURIED ID

4.2.9.3. Embedded Mode

This feature will be supported in the future software releases.

4.2.10. Unit Configuration Menu

The **Unit Configuration Menu** allows setting general PVR 6000 parameters. Figure 4-27 displays a tree diagram of the Unit Configuration Menu.

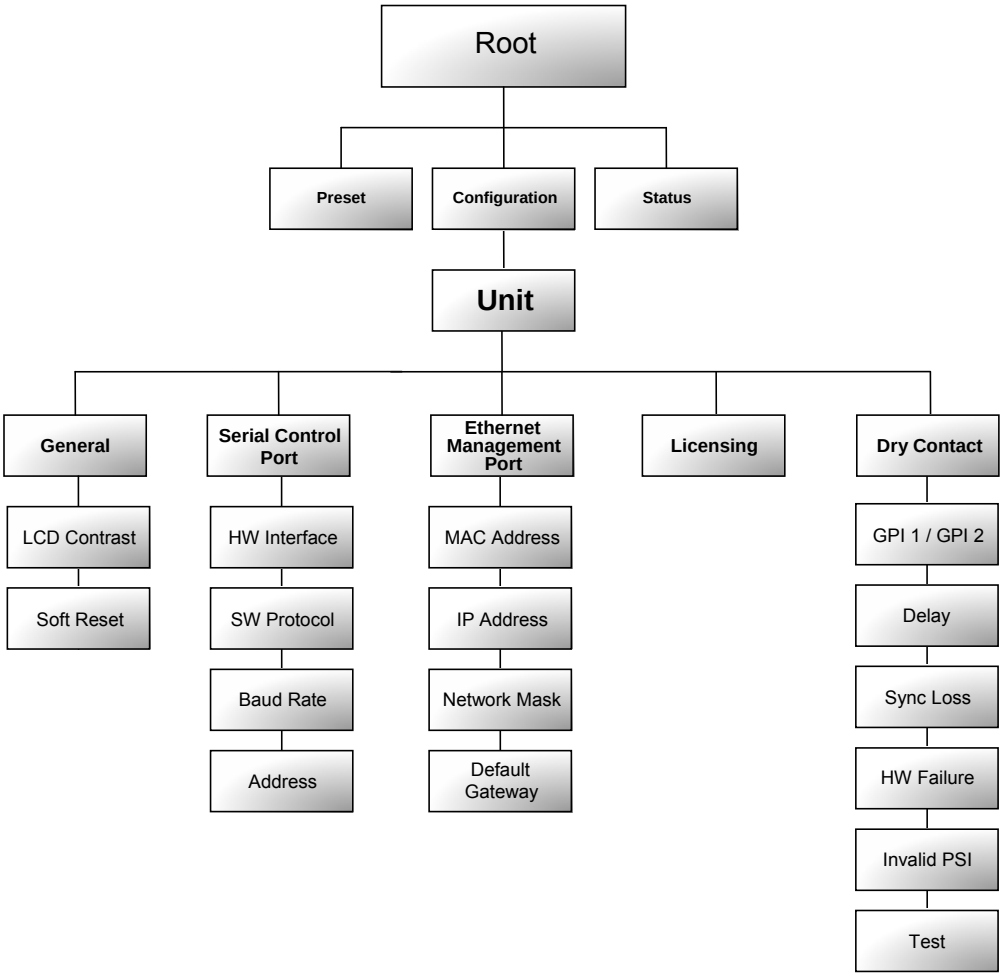
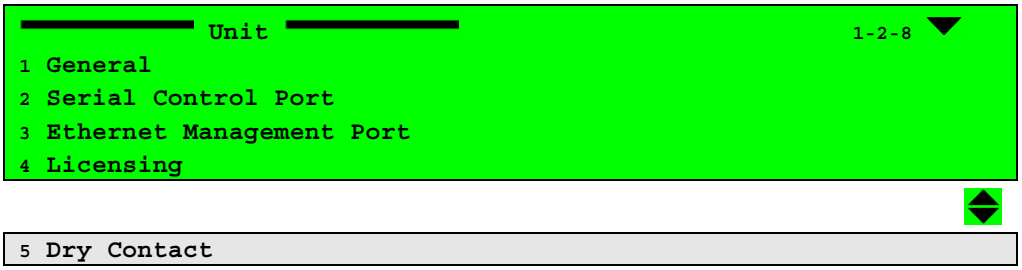


Figure 4-27: Unit Configuration Menu

To access the **Unit** Configuration Menu in the front panel control interface go to ***Configuration→Unit***.
The following screen displays the Unit menu:



The **Unit** Configuration Menu parameters are as follows:
General
Allows operator to set the LCD contrast value and perform soft reset (see Section 4.2.10.1)

SERIAL CONTROL PORT

Allows operator to configure the control port parameters (see Section 4.2.10.2)

ETHERNET MANAGEMENT PORT

Allows operator to configure the Ethernet management port (see Section 4.2.10.4)

LICENSING

Allows operator to activate features that require software license (see Section 4.2.10.5)

DRY CONTACT

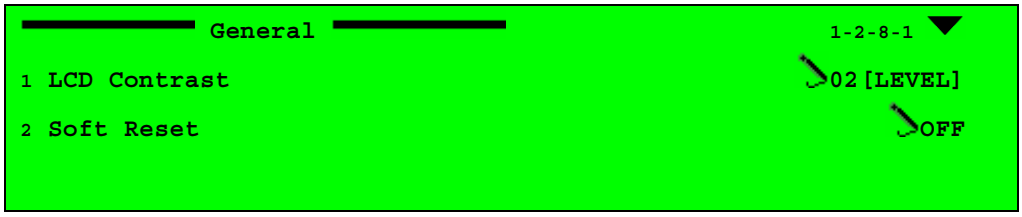
Allows operator to configure GPI-1 and GPI-2 parameters (see Section 0)

4.2.10.1. General Configuration Menu

The **General** Menu adjusts the LCD contrast level and enables soft reset of the device.

To access the **General** Menu in the front panel control interface go to ***Configuration→Unit→General***.

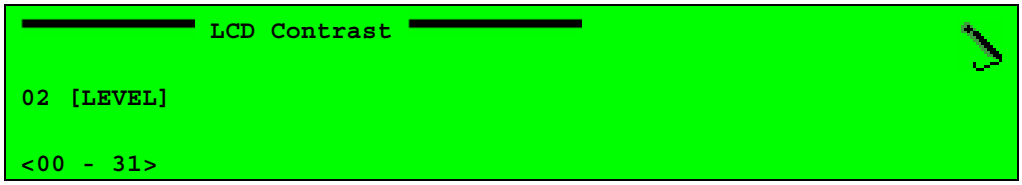
The following screen displays the General menu:



The following paragraphs describe the **General menu** parameters.

LCD CONTRAST

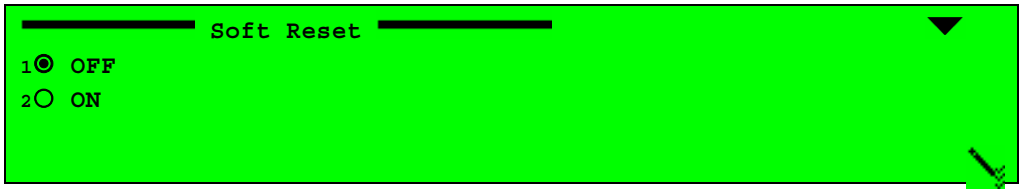
The **LCD Contrast** option sets the PVR 6000 LCD contrast.



Valid range is between **0** and **31**, where **0** is brightest and **31** is darkest.

SOFT RESET

This parameter is used for performing a warm reset on the PVR 6000.



The available options are:

- **OFF**
- **ON** – for performing soft reset

Figure 4-28 shows the corresponding Unit **General** Web management screen.

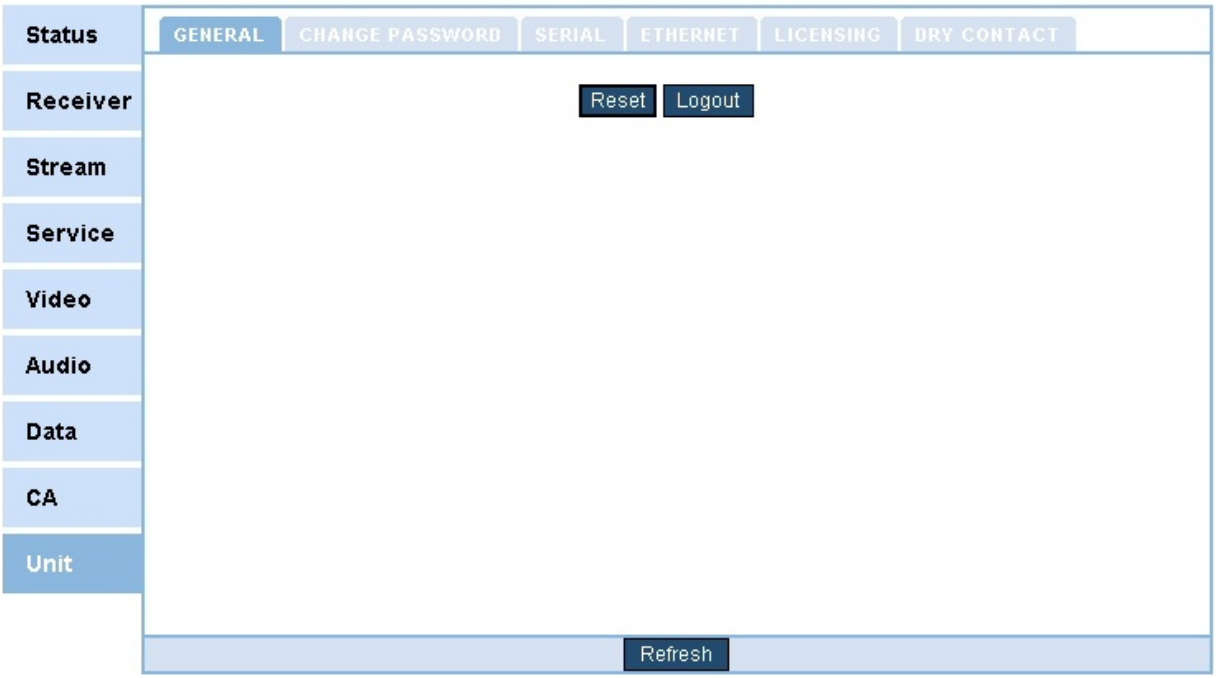


Figure 4-28: Unit General Screen

4.2.10.2. Change Password

The **CHANGE PASSWORD** menu screen allows the user to change the current password to the Web-Management interface
To change the password navigate to **Unit→CHANGE PASSWORD**
Figure 4-29 displays the Change Password menu screen.

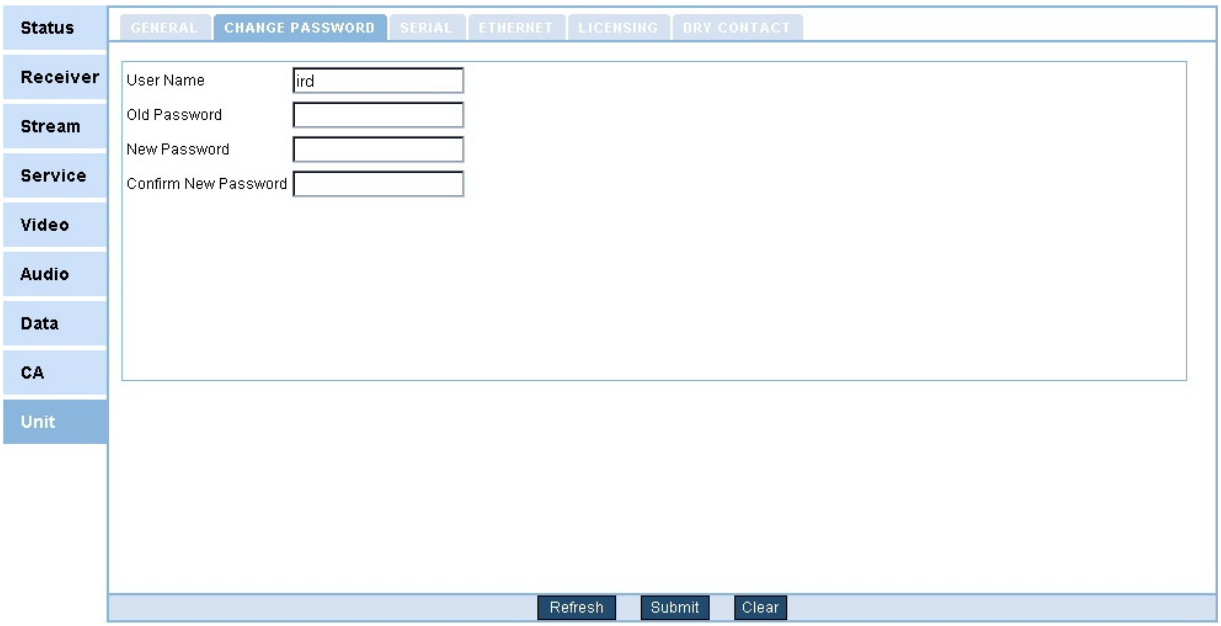


Figure 4-29: Change Password Screen

The following fields must be filled:

- **User Name** – enter the user name. The Web-Management displays the current User Name as the default value.
- **Current password –** enter the current password
- **New Password –** enter a new password
- **Confirm New Password –** re-enter the new password

NOTE

This feature is available only true the Web-Management.

4.2.10.3. Serial Control Port Configuration

The **Serial Control Port** Menu allows the user setting the serial control port parameters.

To access the **Serial Control Port** Menu in the front panel control interface go to ***Configuration→Unit→ Serial Control Port***.

The following screen displays the **Serial Control Port** menu:

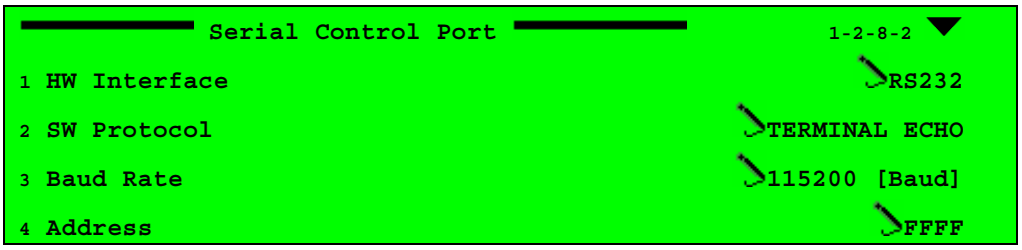


Figure 4-30 shows the corresponding Unit **Serial** Web management screen.

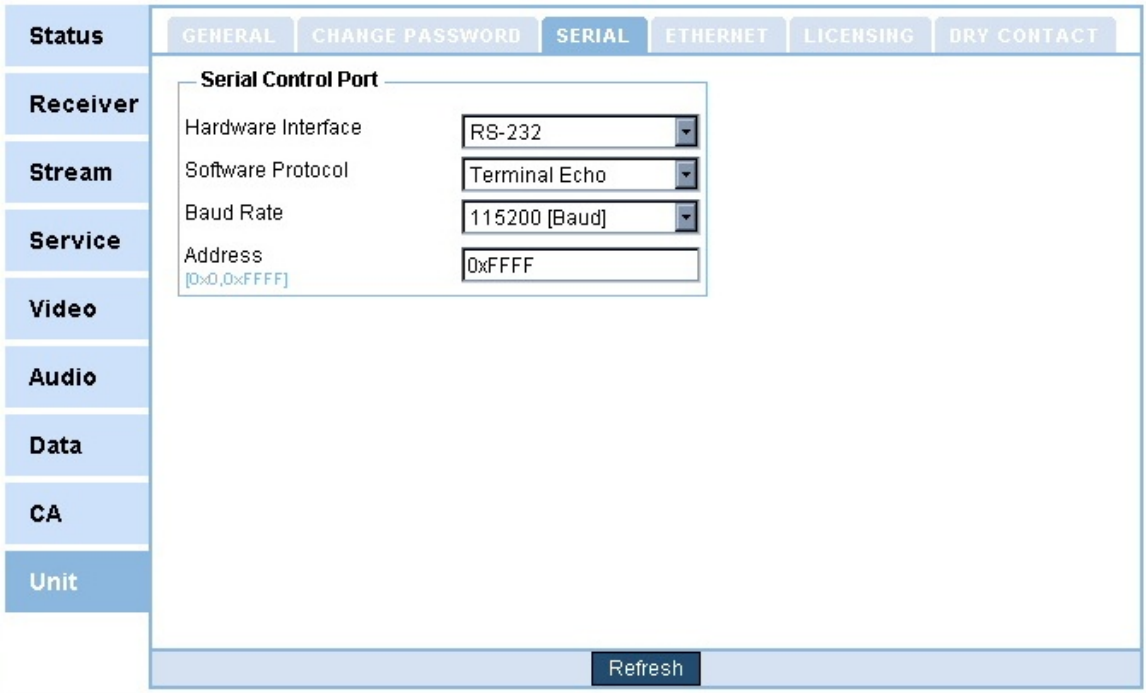
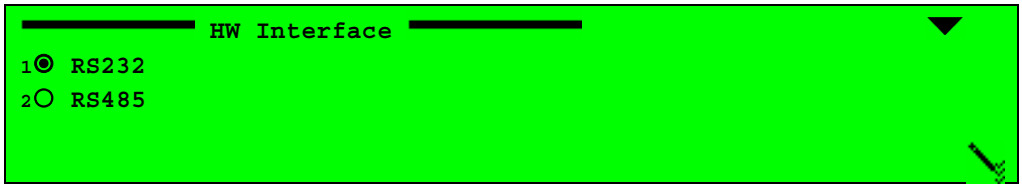


Figure 4-30: Unit Serial Screen

The following paragraphs detail the **Unit Serial Control Port** configuration options.

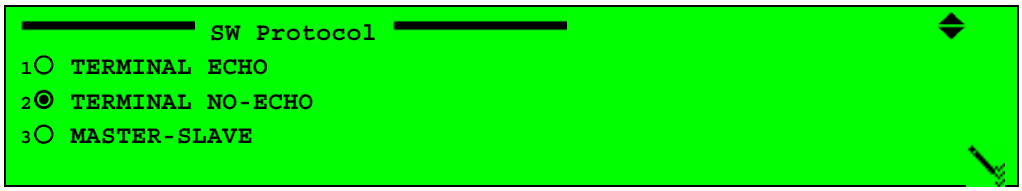
HW INTERFACE



The available options are:

- **RS-232**
- **RS-485**

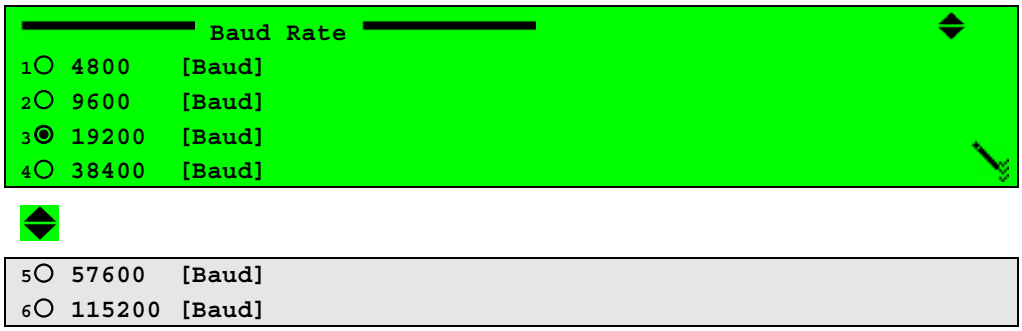
SW PROTOCOL



The available options are:

- **Terminal Echo**
- **Terminal No-Echo**
- **Master-Slave**

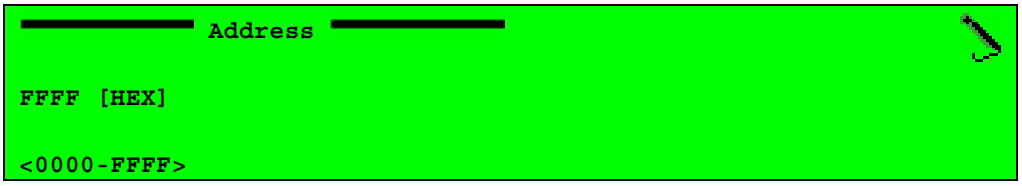
BAUD RATE



The available options are:

4800, 9600, 19200, 38400, 57600, 115200 Baud

ADDRESS



Valid range is between **0** and **FFFF (Hexadecimal)**.

4.2.10.4. Ethernet Management Port

The **Ethernet Management Port** Menu allows setting the Ethernet management port parameters.

To access the **Ethernet Management** Menu in the front panel control interface go to ***Configuration→Unit→Ethernet Management Port***.

The following figure illustrates the Ethernet Management Port menu:

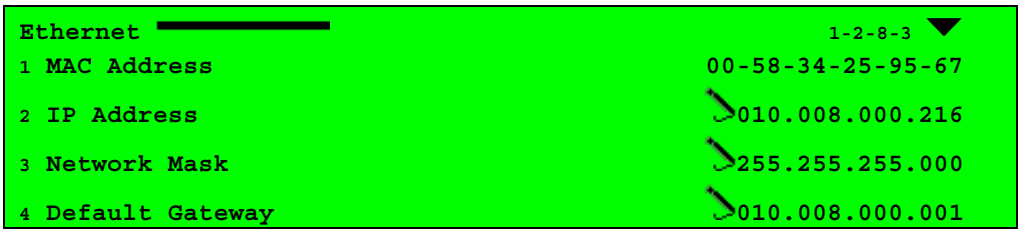


Figure 4-31 shows the corresponding Unit **Ethernet** Web management screen.

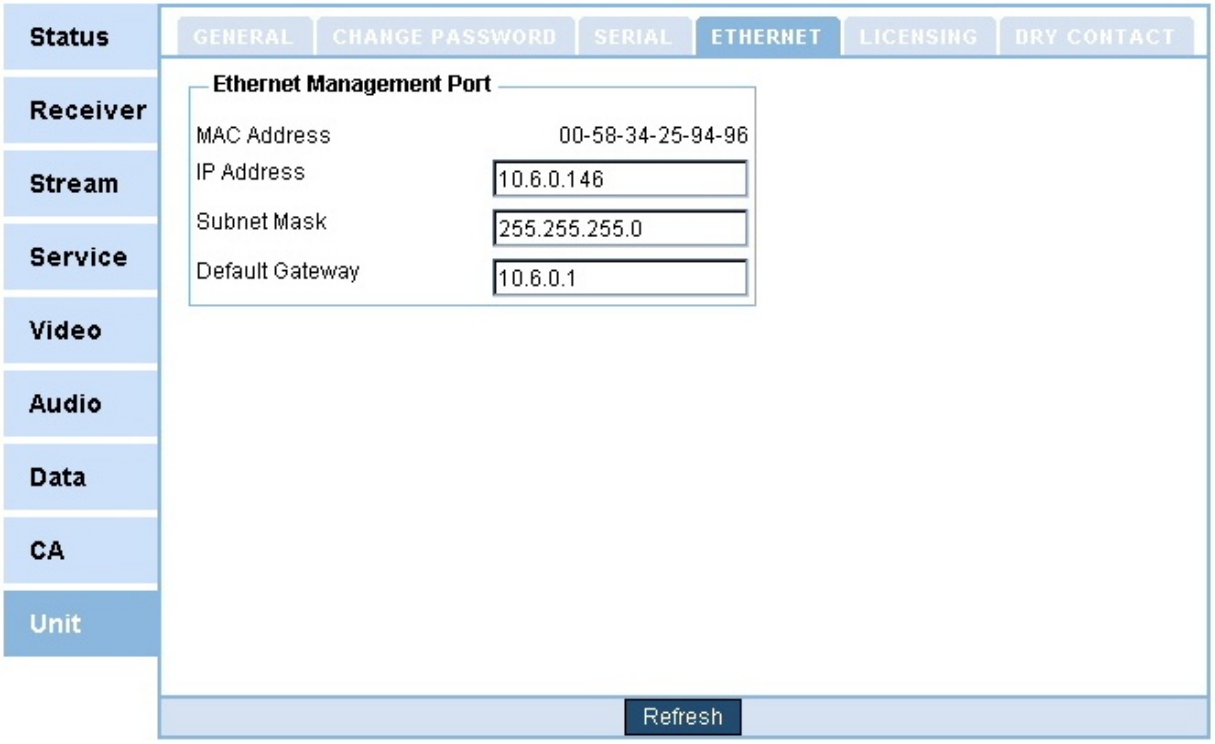


Figure 4-31: Unit Ethernet Screen

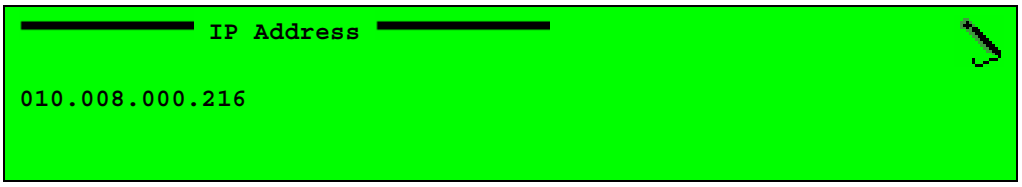
The following paragraphs describe the **Ethernet Management Port Configuration** parameters.

MAC ADDRESS

The **MAC Address** parameter displays the MAC address of the PVR 6000 management.

IP ADDRESS

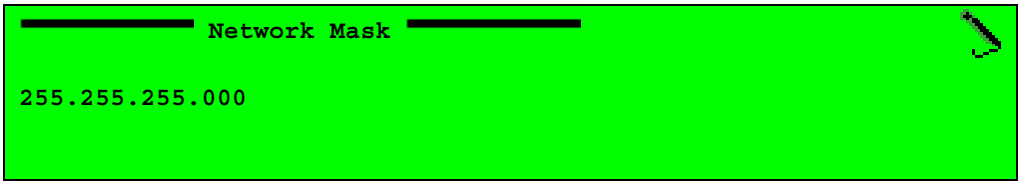
The **IP Address** parameter displays and allows setting the currently active IP Address of the management port



The value in each field must be a number between **0** and **255.**

NETWORK MASK

The **Network Mask** parameter allows setting the network sub-mask.



The value in each field must be a number between **0** and **255**.

DEFAULT GATEWAY

The **Default Gateway** parameter allows setting the network default gateway address. This is the address of a local IP router on the same network as the PVR 6000, which is used to forward traffic beyond the local network.

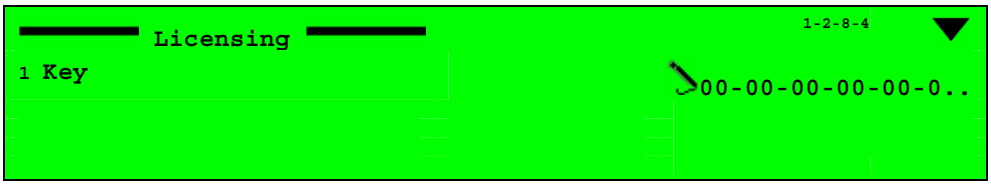
The value in each field must be a whole number between **0** and **255**.

4.2.10.5. Licensing Menu

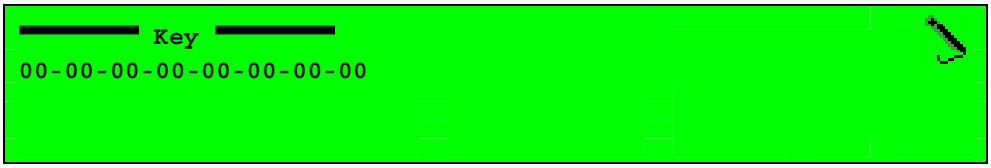
The **Licensing** Menu screen allows the user to enable software-licensed features by entering a serial number (key). The serial key can be entered thru the front panel or the web-management. The serial key composed of 16 characters issued by Harmonic Inc. video networks.

ENTERING A SRERIAL KEY THRU THE FRONT PANEL

To enter a serial key thru the front panel access **Key** the **Licensing** menu screen.



Use the **[UP]**/**[DOWN]** keys to change a characters value. User the **[LEFT]**/**[RIGH]** keys to move to a different character.



A licensing list is available at status menu screen. For details see section 4.3.8.4

ENTERING A SRERIAL KEY THRU THE WEB-MANAGMENT

To enter a serial key thru the web-management access the **Licensing** tab at the **Unit** menu screen. Fill in the appropriate field with the serial key.
Figure 4-32 displays the corresponding **Licensing** Web management screen.

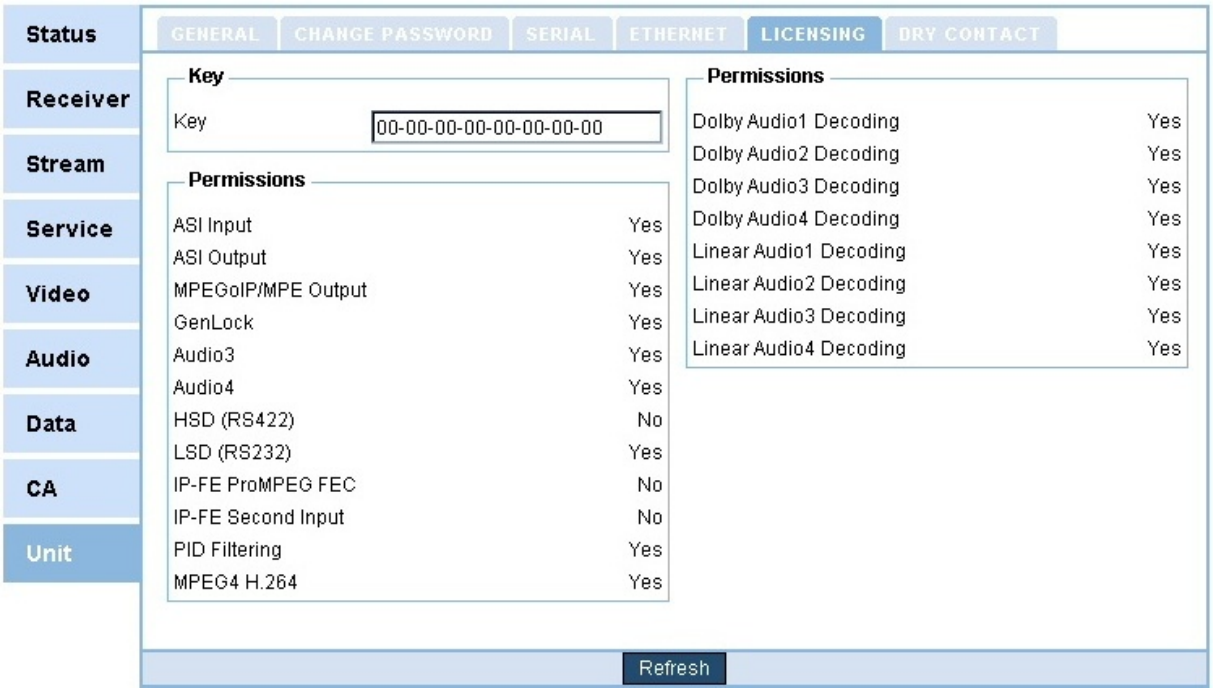


Figure 4-32: PVR 6000 Licensing Screen

4.2.10.6. Dry Contact Menu

The **Dry Contact** menu allows selecting the GPI 1 or GPI 2 configuration menu. The GPI (General Purpose Interface) is a dry contact relay, used by the PVR 6000 for displaying warnings that appear in the device. This is useful, for example, in case the operator wants to receive an PVR 6000 warning indication somewhere other than on the IRD's display.

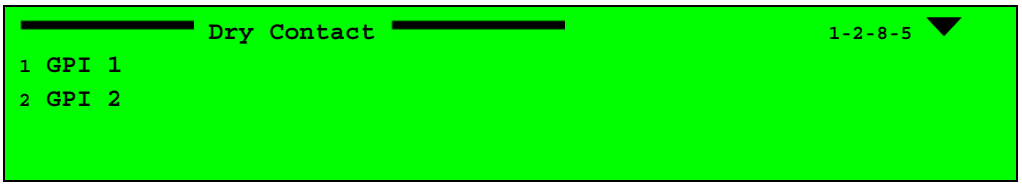


Figure 4-33 displays the corresponding **Dry Contact** Web management screen.

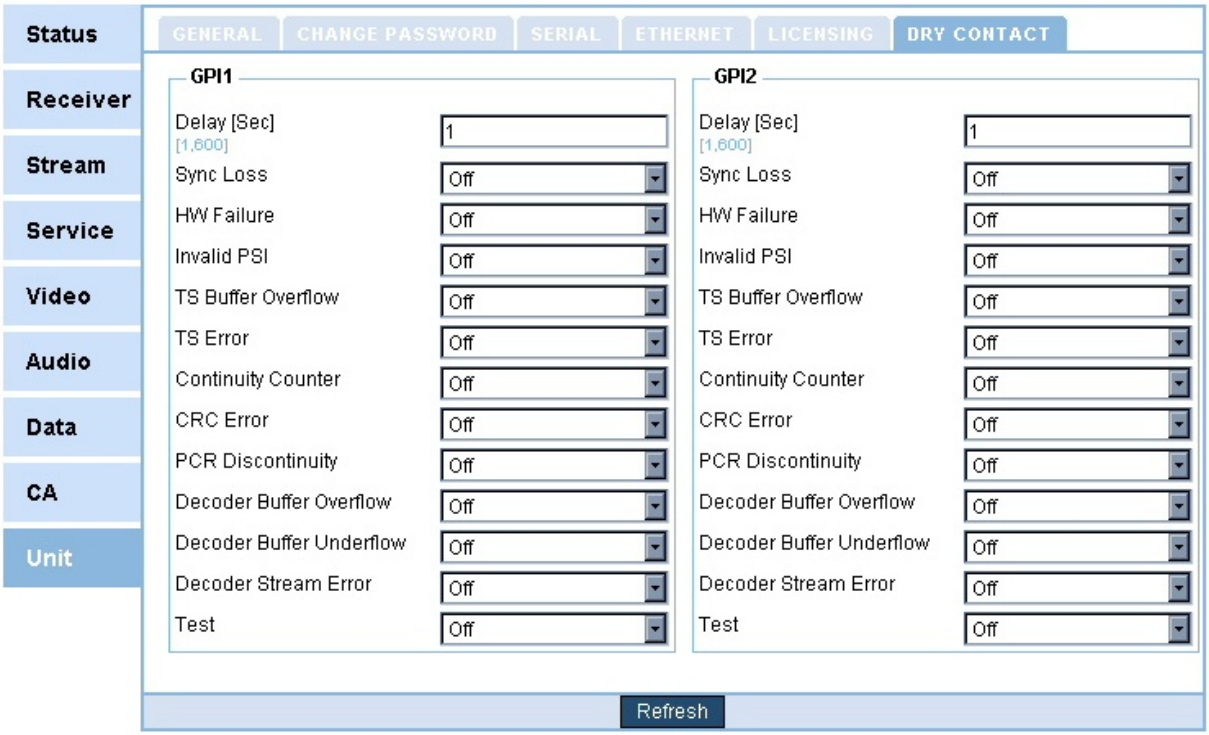
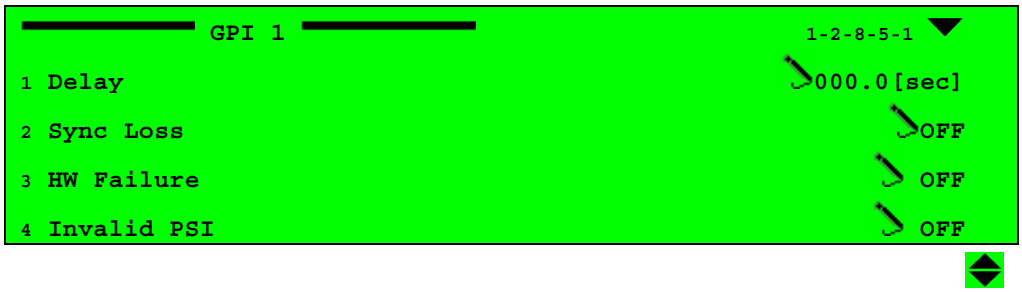


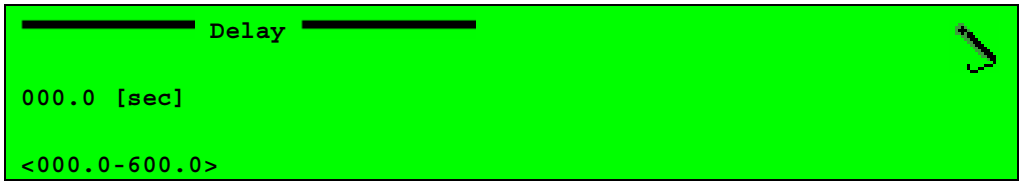
Figure 4-33: PVR 6000 Dry Contact Screen

The **GPI 1** and **GPI 2** configuration menus are identical.
The following is the **GPI 1** Edit Menu screen:



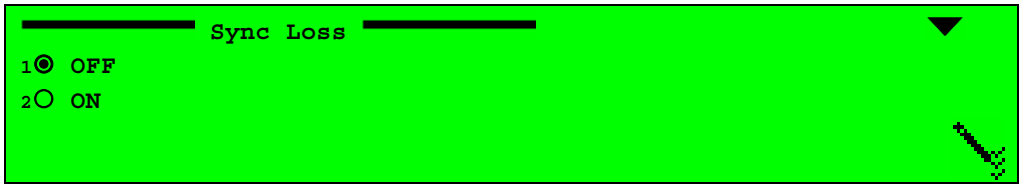
DELAY

The PVR 6000 can delay warnings through the GPI.
Set the **Delay** parameter to a value between **0** (no delay) and **600** (in seconds).



SYNC LOSS

The **Sync Loss** menu defines whether or not a Sync Loss warning will cause a GPI warning indication.

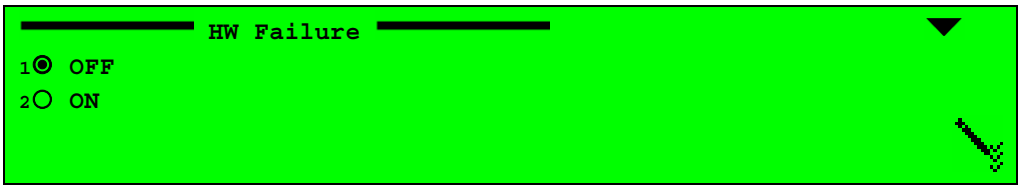


The available options are:

- **OFF –** Sync Loss GPI warning indication is turned off
- **ON** – Sync Loss GPI warning indication is turned on

HW FAILURE

The **HW Failure menu** defines whether or not a Hardware Failure warning will cause a GPI warning indication.

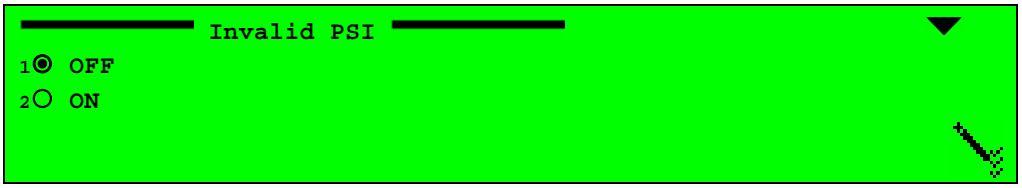


The available options are:

- **OFF** – Hardware Failure GPI warning indication is turned off
- **ON** – Hardware Failure GPI warning indication is turned on

INVALID PSI

The Invalid PSI menu defines whether or not an Invalid PSI warning will cause a GPI warning indication.

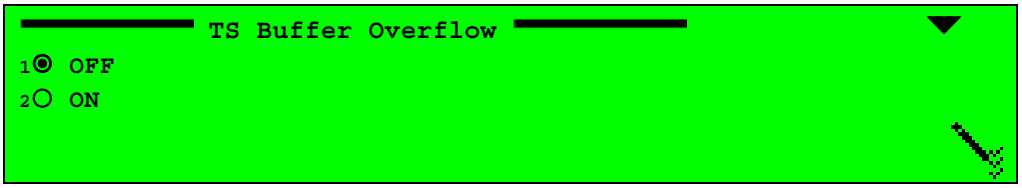


The available options are:

- **OFF -** Invalid PSI GPI warning indication is turned off
- **ON** – Invalid PSI GPI warning indication is turned on

TS BUFFER OVERFLOW

The **TS Buffer Overflow** menu defines whether or not to activate a GPI warning indication in case of the TS counter reaches the threshold for transport stream overflow.

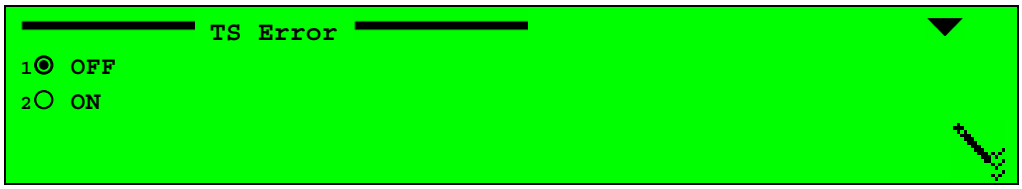


The available options are:

- **OFF -** TS Buffer Overflow GPI warning indication is turned off
- **ON** – TS Buffer Overflow GPI warning indication is turned on

TS ERROR

The **TS Error** menu defines whether or not to activate a GPI warning indication in case of the TS counter reaches the threshold for transport stream error.

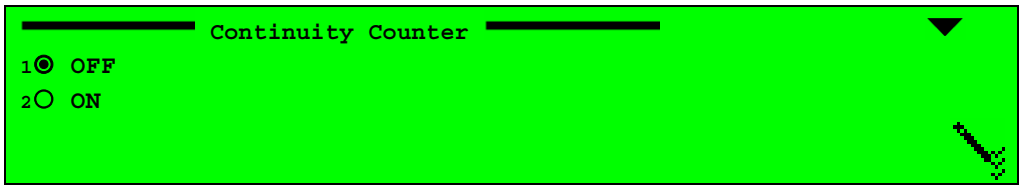


The available options are:

- **OFF -** TS Error GPI warning indication is turned off
- **ON** – TS Error PSI GPI warning indication is turned on

CONTINUITY COUNTER

The **Continuity Counter** menu defines whether or not to activate a GPI warning indication in case of the TS counter reaches the threshold for transport stream continuity error.

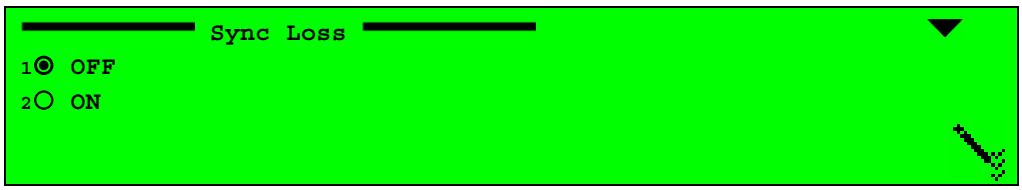


The available options are:

- **OFF -** Continuity Counter PSI GPI warning indication is turned off
- **ON** – Continuity Counter PSI GPI warning indication is turned on

CRC ERROR

The **CRC Error** menu defines whether or not to activate a GPI warning indication in case of the TS counter reaches the threshold for CRC error.

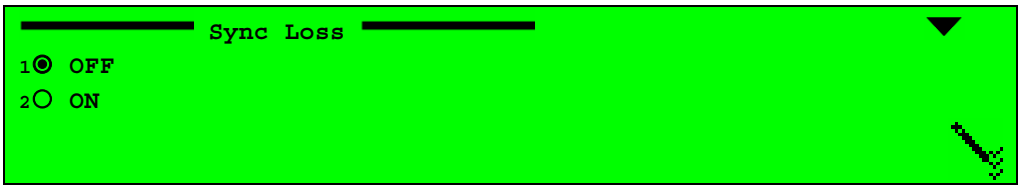


The available options are:

- **OFF -** CRC Error GPI warning indication is turned off
- **ON** – CRC Error GPI warning indication is turned on

PRC DISCONTINUITY

The **PRC Discontinuity** menu defines whether or not to activate a GPI warning indication in case of the TS counter reaches the threshold for PRC Discontinuity error.

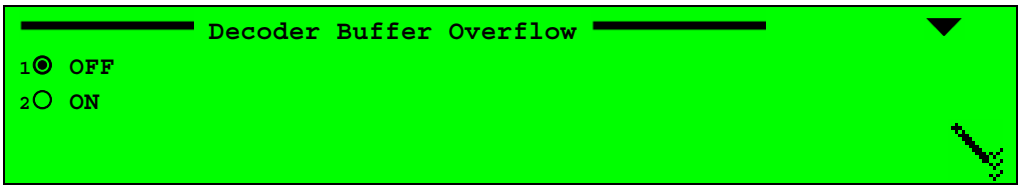


The available options are:

- **OFF -** PRC Discontinuity GPI warning indication is turned off
- **ON** – PRC Discontinuity GPI warning indication is turned on

DECODER BUFFER OVERFLOW

The **Decoder Buffer Overflow** menu defines whether or not to activate a GPI warning indication in case of the unit counter reaches the threshold for decoder overflow.

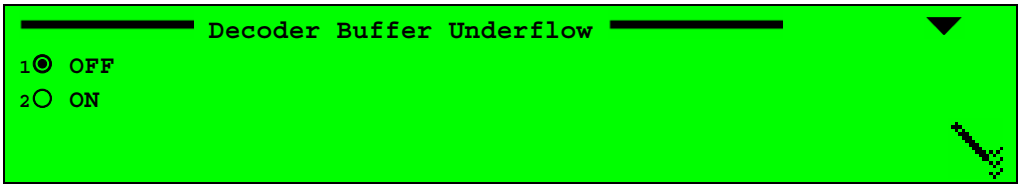


The available options are:

- **OFF -** Decoder Buffer Overflow GPI warning indication is turned off
- **ON** – Decoder Buffer Overflow GPI warning indication is turned on

DECODER BUFFER UNDERFLOW

The **Decoder Buffer Underflow** menu defines whether or not to activate a GPI warning indication in case of the unit counter reaches the threshold for decoder underflow.



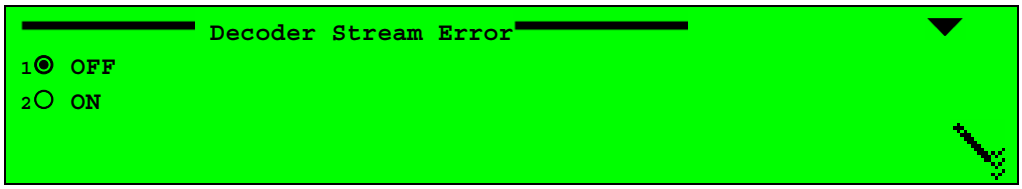
The available options are:

- **OFF -** Decoder Buffer Underflow GPI warning indication is turned off

- **ON** – Decoder Buffer Underflow GPI warning indication is turned on

DECODER STREAM ERROR

The **Decoder Stream Error** menu defines whether or not to activate a GPI warning indication in case of the unit counter reaches the threshold for decoder stream error.

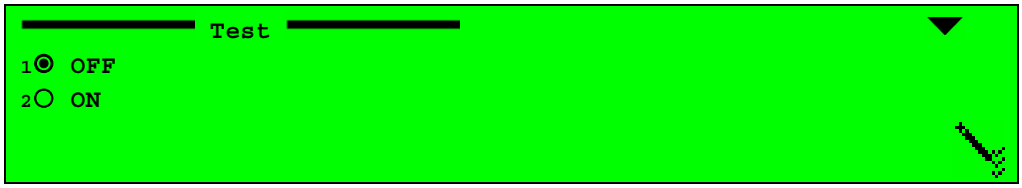


The available options are:

- **OFF -** Decoder Stream Error GPI warning indication is turned off
- **ON** – Decoder Stream Error GPI warning indication is turned on

TEST

The **Test** menu allows operator to manually enable or disable the relevant GPI.

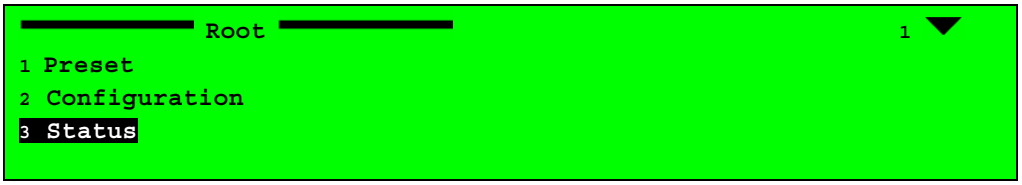


The available options are:

- **OFF** – Disables this GPI.
- **ON** – Enables this GPI.

4.3. STATUS

The **PVR 6000** allows the user to monitor different parameters statuses thru the front panel or the web-management.
To access the PVR 6000 **Status menu**, select "Status" in the **Root** Menu (navigate vertically by using the **[Up]/[Down]** arrow keys and confirm by pressing **[Enter]**).



The PVR 6000 **Status** Menu is displayed in the following menu navigation screen (eight options):

Figure 4-34 displays the corresponding Web management screen.

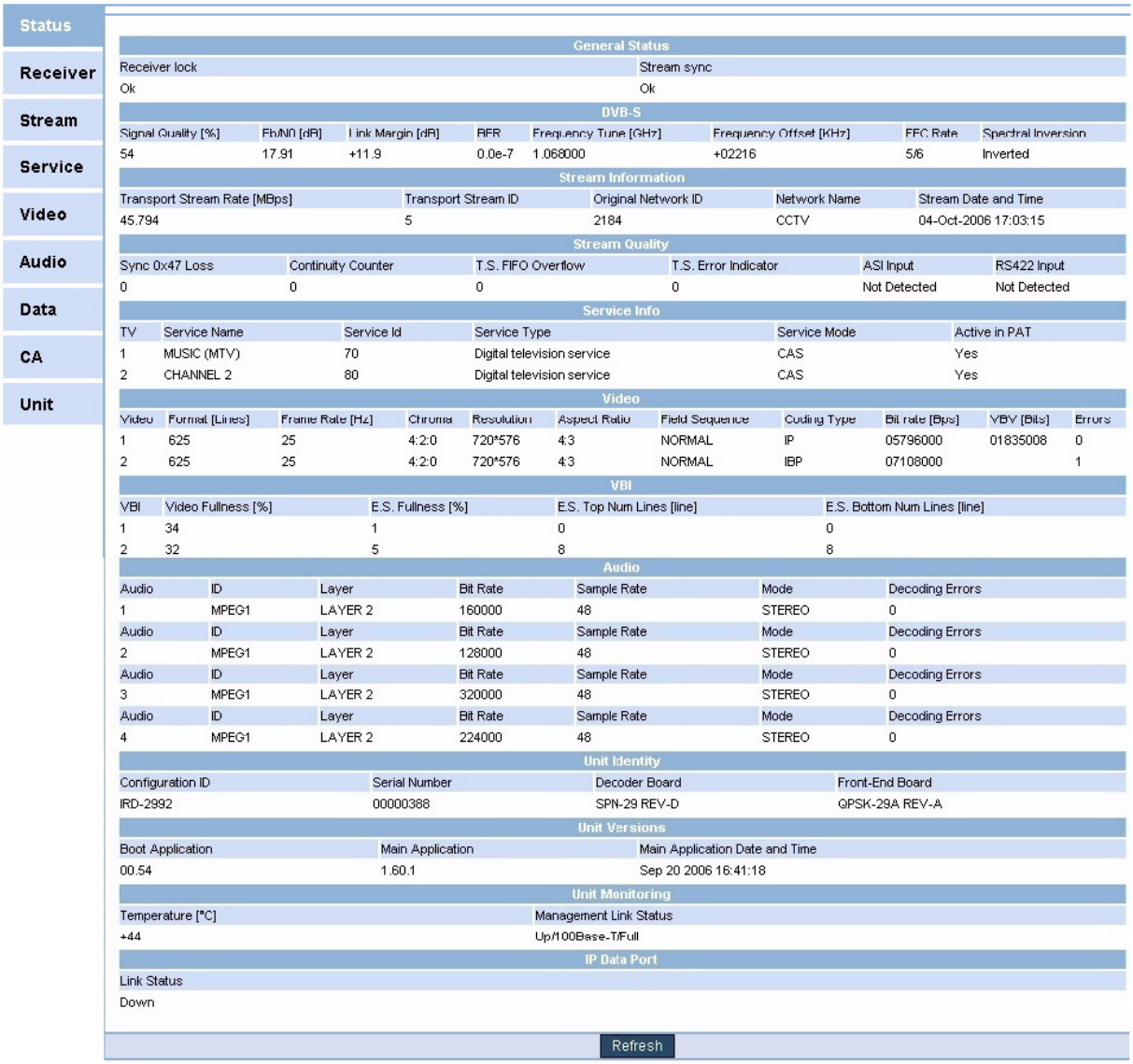


Figure 4-34: PVR 6000 Status Screen

4.3.1. Receiver Status

The **Receiver Status** screen displays the main Receiver parameter current values. The following paragraphs detail the Status screen of each available receiver module type (DVB-S, DVB-S2, and IP).

To enter the Receiver Status menu in the front panel, go to ***Status→Receiver*** (independently of receiver module type).

4.3.1.1. DVB-S Receiver Status

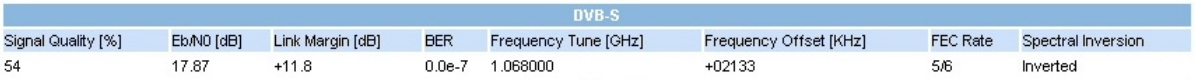
To access the **DVB-S Receiver Status Menu** in the front panel control interface go to ***Status→Receive***r.

NOTE

*The **LNB L.O. Frequency** parameter is activated when the Ku and C-Band is selected.*

The following screen displays the DVB-S **Receiver** Status menu:

Figure 4-35 displays the corresponding Web management screen.

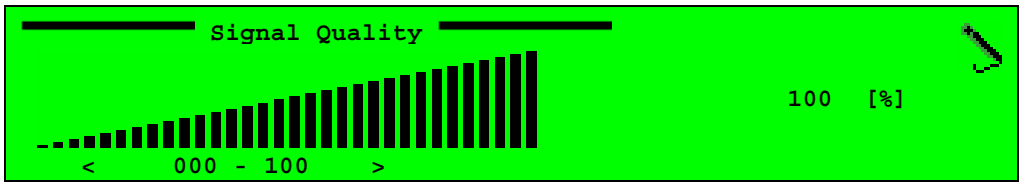


DVB-S							
Signal Quality [%]	Eb/N0 [dB]	Link Margin [dB]	BER	Frequency Tune [GHz]	Frequency Offset [KHz]	FEC Rate	Spectral Inversion
54	17.87	+11.8	0.0e-7	1.068000	+02133	5/6	Inverted

Figure 4-35: PVR 6000 DVBS Status Screen

The available options are:

- **Signal Quality** – Qualitative indicator of the received signal C/N relative to the maximum C/N that can be measured without forcing the receiver to saturation.



Values range from **0** to **100**%

- **Eb/N0** – Received signal Eb/N0 measurement
- **Link Margin** – Estimated C/N of the received signal relative to the C/N in EN 300-421 for a given Viterbi rate
- **Iturbi BER** – Error bits that the Viterbi error correction did not correct. BER is measured over 10^7 symbols.
- **Frequency Tune** – The value is dependent on the mode selected in ***Root→ Configuration → Receiver → Freq Drift Compensation*** (see Section 4.2.2 and 7)
- When Frequency Drift Compensation is set to **On**, the value of the frequency tune displays the frequency of the incoming signal after frequency offset is set to off.
- When Frequency Drift Compensation is set to **Off**, the value of the frequency tune displays the actual frequency.

NOTE

Displayed frequencies are L-Band frequencies.

- **Frequency Offset** - Displays the offset from the frequency as was set in ***Configuration → Receiver → Frequency*** (see Section 4.2.2).
- When Frequency Drift Compensation is set to On, the frequency offset displays the value 0.
- When Frequency Drift Compensation is set to Off, frequency offset displays the value of the offset from the tuned frequency in KHz.
- **Viterbi Rate** – When Viterbi rate mode is set to automatic (see FEC Rate parameter in section 4.2.2), the value displayed is selected by the PVR 6000. The Viterbi rate can also be configured manually to a specific rate by the operator.
- **Spectral Inversion** – When the Spectral Inversion mode is set to automatic (see Section 4.2.2), the value displayed is PVR 6000 selected.

When you set the Spectral Inversion manually, the user selects the value.

4.3.1.2. DVB-S2 Receiver Status

To access the **DVB-S2 Receiver Status** Menu in front panel control interface go to ***Status→Receiver***.

The following screen displays the DVB-S2 **Receiver** Status menu:

Receiver	1-3-1
1 Signal Quality	94 [%]
2 Signal Level	-8.00 [dBm]
3 Eb/N0	21.10 [dB]
4 BER	0.0e-7

5 Frequency Tune	1.000000 [GHz]
6 Frequency Offset	+00011 [KHz]
7 Modulation	DVBS2-N-QPSK
8 FEC Rate	8/9
9 Roll-off	35%
10 Spectral Inversion	NORMAL

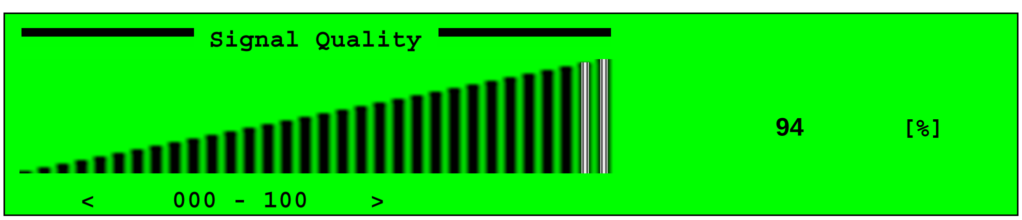
Figure 4-36 displays the corresponding Web management screen.

DVB-S2							
Signal Quality [%]	Eb/N0 [dB]	Link Margin [dB]	BER	Frequency Tune [GHz]	Frequency Offset [KHz]	FEC Rate	Spectral Inversion
41	13.10	-1.2	0.0e-7	1.070000	+00172	5/6	Inverted

Figure 4-36: PVR 6000 DVBS2 Status Screen

The **Receiver** Status screen contains the following parameters:

- **Signal Quality** – Qualitative indicator of the received signal C/N relative to the maximum C/N that can be measured without forcing the receiver to saturation. The signal quality is calculated by: *SQ[%]=C/N [dB]/25 *100*



Signal Quality values range from 0 to 100%

- **Signal Level** – the signal power level in dBm
- **BER** – reports the estimated Bit Error Rate
- **Eb/N0** – Received signal Eb/N0 measurement

- **Frequency Tune** – This parameter points out the optimal frequency checked by the PVR 6000 for obtaining the highest quality of the received signal.
- **Frequency Offset** – displays the deviation between the frequency inserted by the operator and the frequency that was indicated by the *Frequency Tune*.
- **Modulation** – displays the configured modulation method
- **FEC Rate** – reports the selected FEC rate
- **Roll Off** – the configured Roll-Off factor value
- **Spectral Inversion** – When the Spectral Inversion mode is set to automatic (see Section 4.2.2), the value displayed is the one selected by the device. Otherwise, this parameter displays the Spectral Inversion method that was selected manually.

NOTE

All displayed frequencies are in L-Band.

4.3.1.3. IP Receiver Status

The **IP Receiver Status** menu enables monitoring the main IP receiver parameters. It displays both static information (such as MPEGoIP port MAC Address) and live data (e.g. type of data encapsulation received, current bit rate, whether or not IP parameters are valid, etc.).

To access the **IP Receiver Status** menu in the front panel interface go to ***Status→Receiver***

The **IP Receiver Status** menu as displayed on the PVR 6000 front panel screen:

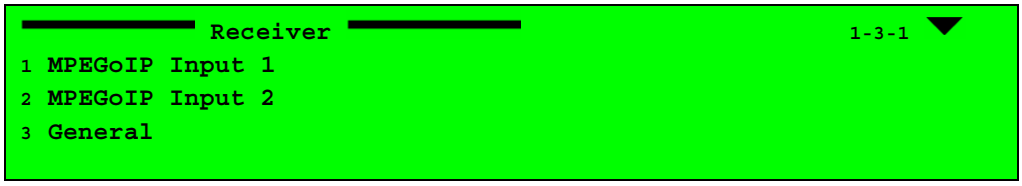
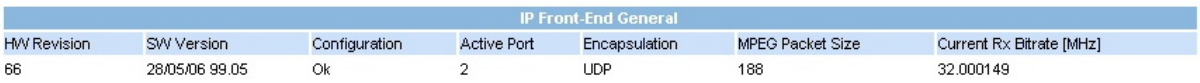


Figure 4-37displays the corresponding Web management screen.



IP Front-End General

HW Revision	SW Version	Configuration	Active Port	Encapsulation	MPEG Packet Size	Current Rx Bitrate [MHz]
66	28/05/06 99.05	Ok	2	UDP	188	32.000149

Figure 4-37: PVR 6000 DVB IP Status Screen

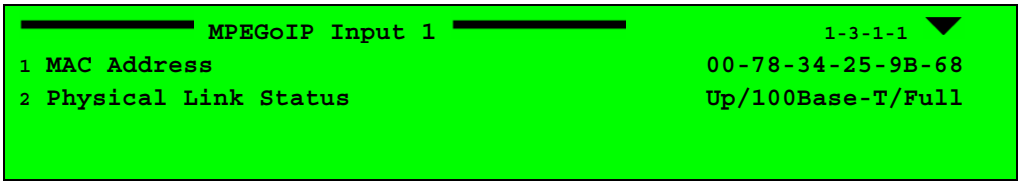
The available options are:

- **MPEGoIP Input 1** – for monitoring receiver data arriving through the *MPEGoIP IN1* interface
- **MPEGoIP Input 2** - for monitoring receiver data arriving through the *MPEGoIP IN2* interface
- **General** – for viewing general parameters values, such as software and hardware version number, IP configuration consistency, type of detected encapsulation, bit-rate of currently received data, etc.

The following paragraphs detail the IP Receiver Status sub menus.

MPEGoIP Input 1

Below is an illustration of the **MPEGoIP Input 1** menu as displayed on the PVR 6000 front panel screen:



The MPEGoIP Input 1 Status parameters are:

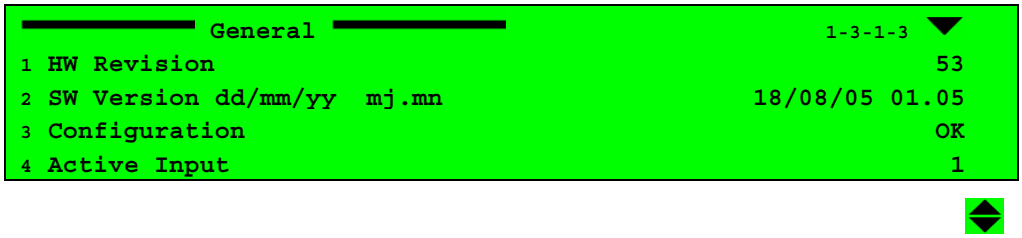
- **MAC Address** – *MPEGoIP IN1* port MAC address. The MAC address is a unique, read-only address.
- **Physical Link Status** – current link status. The available options are:
  - **Down** – Physical link is down
  - **Up** – Physical link is up and connection is established
  - **10Base-T**, 100Base-T – IP Port data input rate
  - **Full** – receiving in full duplex
  - **Half** – receiving in half duplex

NOTE

***MPEGoIP Input 2** Status parameters are identical to those of **MPEGoIP Input 1** Status and provide information on MPEGoIP IN2 data.*

GENERAL

The IP Receiver Status **General** menu as displayed on the PVR 6000 front panel screen:



The General menu parameters are:

- **HW Revision** – FPGA hardware Revision
- **SW Version** – software date and software version
- **Configuration** – displays "OK" if receiver configuration is valid, or "Mismatch" if it has inconsistencies
- **Active Input** - the actual
- **Receive Mode** – displays "UDP" or "RTP" according to the type of received data
- **MPEG Packet Size** – size of received packets (in bytes). Can be either 188 or 204 bytes
- **Rx Bitrate Current** – current rate of received data (in MHz)

4.3.2. Stream Status Menu

The **Stream Status Menu** provides an extended menu of status monitoring options on the input stream.

To access the **Stream Status Menu** in the front panel control interface go to ***Status→Stream***.

The following screen displays the **Stream** Status menu:

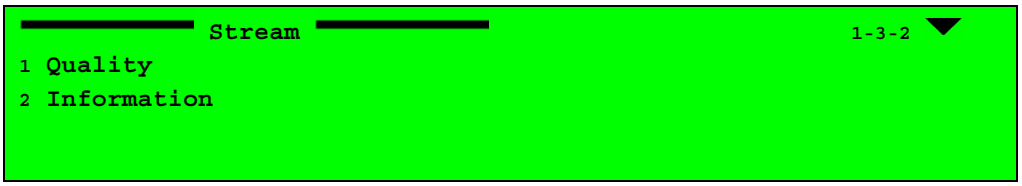
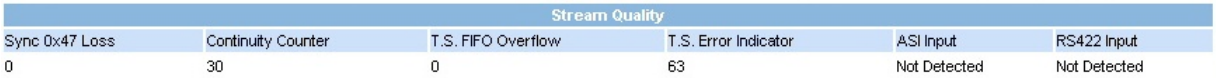


Figure 4-38displays the corresponding Web management screen.



Stream Quality					
Sync 0x47 Loss	Continuity Counter	T.S. FIFO Overflow	T.S. Error Indicator	ASI Input	RS422 Input
0	30	0	63	Not Detected	Not Detected

Figure 4-38: PVR 6000 Stream Status Screen

4.3.2.1. Quality

The **Quality** Menu displays information about the quality of the Input Stream.

To access the **Quality Menu** in the front panel control interface go to ***Status→Stream→Quality***.

The following screen displays the Quality menu:

The **Quality** Menu parameters are:

- **Sync-0x47 Loss** – Counts the number of sync loss events
- **Continuity Counter** – Counts the number of a continuity of error events
- **TS FIFO overflow** – Counts the number of FIFO buffer events
- **TS Error Indicator** – Counts the number of MPEG packets that were received by the PVR 6000 and had the TS error indicator bit set

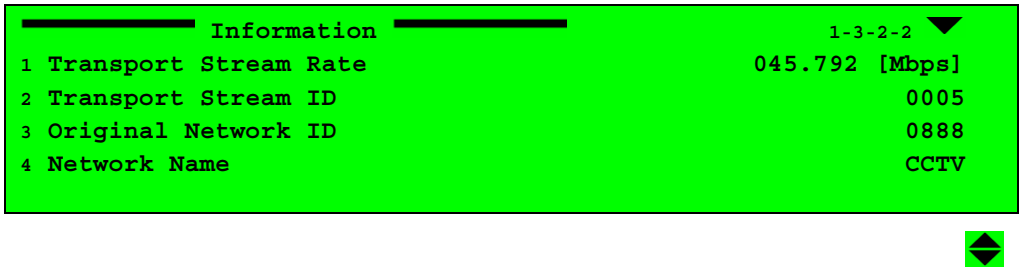
- **ASI Input**.-. Has three modes:
  - **NOT DETECTED** – No input
  - **188 DETECTED** – MPEG packets without FEC
  - **204 DETECTED** – MPEG packets with FEC
- **RS-422 Input** – Has three modes:
  - **NOT DETECTED** – No input
  - **188 DETECTED** – MPEG packets without FEC
  - **204 DETECTED** – MPEG packets with FEC

4.3.2.2. Information

The **Information** Menu displays information about the transport stream and network.

To access the **Information** Menu in the front panel control interface go to ***Status→Stream→Information***.

The following screen displays the **Information** menu:



The **Information Menu** parameters are as follows:

- **Transport Stream Rate** – Displays the Transport Stream rate
- **Transport Stream ID** – Displays the identification code of the current transport stream ID in Hexadecimal values
- **Original Network ID** –Displays the identification code of the current network in Hexadecimal values
- **Network Name** – Displays the provider name of the current network
- **Stream Time** – Displays the time (HH:MM:SS) of the current incoming stream
- **Stream Date** – displays the date (DD-MMMM-YYYY) of the current incoming stream

4.3.3. Service Status

The **Service Info** is a section in the **Status** web-interface screen. It provides information of service's status and parameters.
Figure 4-39 displays the Service Status Web management screen.

Service Info					
TV	Service Name	Service Id	Service Type	Service Mode	Active in PAT
1	AIR FORCE 1	40	Digital television service	FTA	Yes

Figure 4-39: PVR 6000 Service Status Screen

The following parameters are displayed:

- **TV –** This parameter indicates the active decoder as TV1 (or TV1/TV2 in case of a dual decoder unit).
- **Service Name –** This parameter displays the service's name.
- **Service Type –** This parameter indicates the service type: TV, Radio, TLTX, NVOD, MOSAIC, PAL, SECAM, MAC, FM, NTSC, and Data.
- **Service ID** – This parameter displays the service identification symbol [Hex].
- **Service Mode** - Indicates if the service is encrypted (**CAS**) or free to air (**FTA**).
- **Active in PAT** – this parameter indicates whether the service is included in the PAT table or not.

4.3.4. Video Status Menu

The **Video Status Menu** displays the status of Video and VBI parameters.
OSD parameter status will be available in future software versions.
The **Video Status Menu** provides an extended menu of status monitoring options on Video and VBI data.
To access the **Video Status Menu** in the front panel control interface go to ***Status→Video***.
The following screen displays the **Video** Status menu:

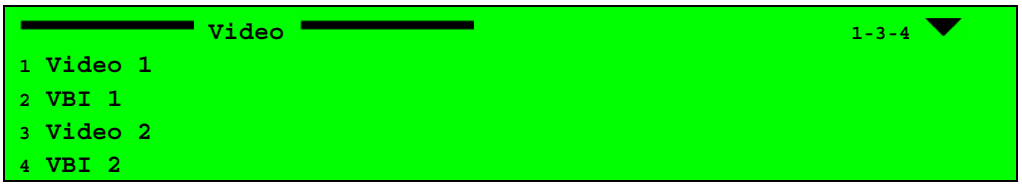


Figure 4-40 displays the corresponding Web management screen.

Video										
Video	Format [Lines]	Frame Rate [Hz]	Chroma	Resolution	Aspect Ratio	Field Sequence	Coding Type	Bit rate [Bps]	VBV [Bits]	Errors
1	525	29.97	4:2:0	352*480	4:3	NORMAL	IBP	04314800		44

Figure 4-40: PVR 6000 Video Status Screen

The **Video** Status Menu parameters are as follows:

- **Video 1** – This group displays information about the video for Decoder #1 (see Section 4.2.6).
- VBI 1 - This group displays information about the VBI for Decoder #1.

  See Section 4.2.6

- **Video 2** (if applicable) - This group displays information about the video for Decoder #2, See Section 4.2.6.
- **VBI 2** (if applicable) - This group displays information about the VBI for Decoder #2, See Section 4.2.6.

4.3.4.1. Video 1 (and Video 2)

The **Video 1** Menus **(**and **Video 2** in dual decoder IRDs) display video parameter Statuses.

To access the **Video 1 Menu** in the front panel control interface go to ***Status→Video→Video 1.***

The following screen displays the Video 1 menu:

```
Video 1                                   1-3-4-1
1 Standard Format                          625 [Ln]
2 Frame Rate                                25 [Hz]
3 Chroma Format                              4:2:0
4 Resolution                        H:720 * V:608
```

```
5 Aspect Ratio                               4:3
6 Field Sequence                          NORMAL
7 Picture Coding Type                        P-B
8 Bit Rat                          11080800 [Bps]e
9 VBV Buffer Size                   04096000 [Bit]
10 Decoding Errors                        000000
```

NOTE

The "Decoding Errors" parameter indicates the video stream health.

The available information is:

- **Standard Format** – Indicates the number of lines in the incoming video. In this example, 625 lines indicate PAL video format.
- **Frame Rate** – Displays the frame rate of the incoming video stream
- **Chroma Format** – Displays the Chroma format currently used for the incoming video stream
- **Resolution** – Displays the horizontal and vertical video resolutions for the incoming video stream (for example, the number of pixels per horizontal and vertical screen lines)
- **Aspect Ratio** – Displays the aspect ratio for the incoming video stream
- **Field Sequence** – Displays the type of field sequence found in the decoded service. There are two available values: *Normal*, and *3:2 Pulldown*

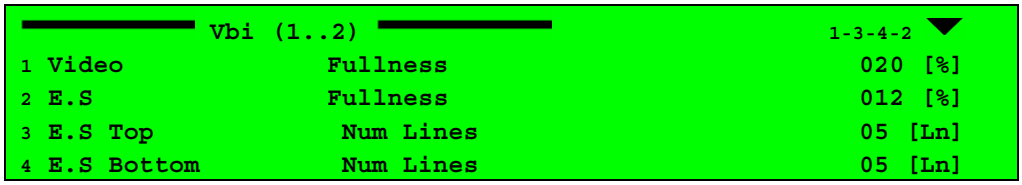
- **Picture Coding Type** – displays the types of picture coding that were found in the decoded service. Available picture coding types are: *I-B-P*, *I-P*, *P-B* and *P Only*.
- **Bit Rate** – Displays the bit rate, in bits/sec, for the incoming video stream
- **VBV Buffer Size** – Displays the VBV buffer size
- **Decoding Errors** – Displays the total number of decoding errors

4.3.4.2. VBI 1 (and VBI 2)

The **VBI 1** Menu **(**and **VBI 2** in dual decoder IRD's) display VBI parameters Status.

To access the **VBI 1** Menu in the front panel control interface go to **Status→Video→Vbi 1.**

The following screen displays the **VBI 1** menu:



The available information is:

- **Video Fullness** – Fullness level of the buffer containing VBIs derived from the video stream
- **E.S Fullness** – Fullness of the buffer containing VBIs derived from the elementary stream
- **E.S Top Num Lines** – Counts the number of E.S VBI lines in a field
- **E.S Bottom Num Lines** – Counts the number of E.S VBI lines in a field

4.3.5. Audio Status Menu

The **Audio Status Menu** displays information on the audio channels.

To access the **Audio Status Menu** in the front panel control interface go to ***Status→Audio.***

The following screen displays the **Audio** Status menu:

```
Audio                                   1-3-5
1 Audio 1
2 Audio 2
3 Audio 3
4 Audio 1
```

4.3.5.1. Audio (1..4)

Select Audio 1 through 4.

The **Audio (1..4)** Menu displays information on the audio decoding process.

When Musicam mode is activated, the following screen is displayed:

```
Audio (1..4)                            1-3-5-1
1 ID                                       MPEG
2 Layer                                  LAYER2
3 Bit Rate                          129000 [Bps]
4 Sample Rate                          48 [KHz]
```

```
5 Mode                                   STEREO
6 Decoding Errors                        000894
```

Figure 4-41 displays the corresponding Web management screen.

Audio						
Audio	ID	Layer	Bit Rate	Sample Rate	Mode	Decoding Errors
1	MPEG1	LAYER 2	096000	48	STEREO	85
Audio	ID	Layer	Bit Rate	Sample Rate	Mode	Decoding Errors
2	MPEG1	LAYER 2	064000	48	STEREO	969
Audio						Decoding Errors
3	No Audio					0
Audio						Decoding Errors
4	No Audio					0

Figure 4-41: PVR 6000 Audio Status Screen

NOTE

*The **"Decoding Errors**" parameter indicates the video stream health.*

When Dolby-AC3 mode is activated, the following screen is displayed:

```
Audio (1..4)                                  1-3-5-1
1 ID                                        DOLBY AC3
2 Bit Rate                                128000[Bps]
3 Sample Rate                               48[KHz]
4 AC Mode                               2/0 L,R STEREO
```

```
5 BS Mode                                 COMPLETE MAIN
6 Decoding Errors                                083914
```

When Linear PCM mode is activated, the screen below is displayed:

```
Audio (1..4)                                  1-3-5-1
1 ID                                            LINEAR
2 Sample Rate                                48 [KHz]
3 Bits per Sample                            20 BITS
4 Channel ID                                        2
```

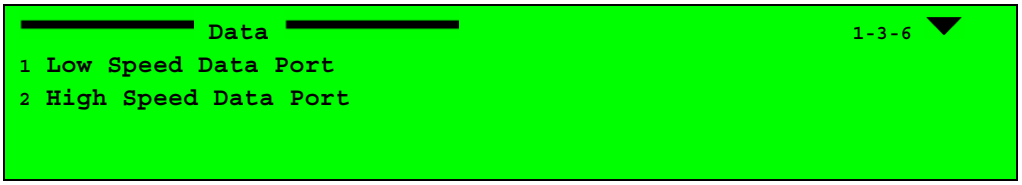
```
5 Output Mode                                  2/0 L,R
6 Decoding Errors                                 0003
```

NOTE

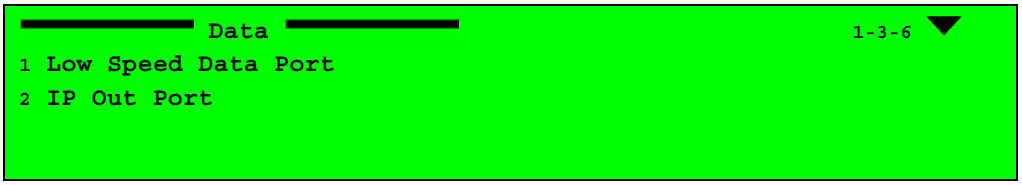
The Channel ID parameter value is according to the channel number of the AC3 header.

4.3.6. Data Status Menu

The **Data Status Menu** displays information about the data input stream.
To access the **Data Status Menu** in the front panel control interface go to ***Status→Data.***
The following screen displays the Data Status menu:
The **High Speed Data Port** option is supported only in the PVR 6000 and PVR 6060 models. In these models, the following is the corresponding front panel screen:



IP-Out-Port is supported in all PVR 6000 models, except for the PVR 6000 and PVR 6060 models. For these models, the Data Status menu is displayed as follows:



The Data Status menu parameters are as follows:

- **Low Speed Data Port** – See Section 4.3.6.1.
- **High Speed Data Port** – See Section 4.3.6.2.
- **IP Out Port** – See Section 4.3.6.3.

4.3.6.1. Low Speed Data Port

This feature will be supported in the future software releases.

4.3.6.2. High Speed Data Port

This feature will be supported in the future software releases.

4.3.6.3. IP-Out-Port Status Menu

The **IP-Out-Port Status** Menu provides IP and Port related parameter statuses.
To access the **IP-Out-Port Status** Menu in the front panel control interface go to ***Status→Data→IP Output Port***.
The following screen displays the Output Port Status menu:

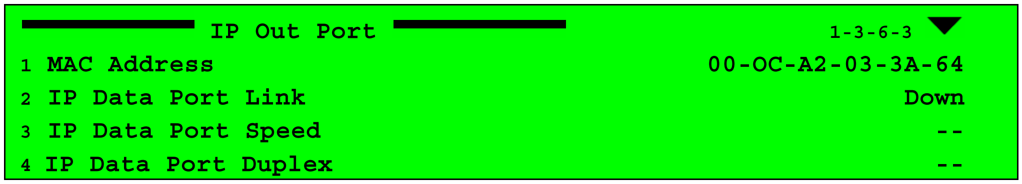


Figure 4-42 displays the corresponding Web management screen.

Figure 4-42: PVR 6000 IP Data Port Status Screen

The available options are:

- **MAC Address** – Displays the IP MAC address.
- **IP Data Port Link** – Displays the status of the IP out link.

  The link statuses:
  - **Down** – Link is down
  - **Up** – Link is up and connection established
- **IP Data Port Speed** – 10 Base-T, 100 Base-T
- IP Data Port Duplex –
  - **Full**: Full duplex
  - **Half**: Half duplex

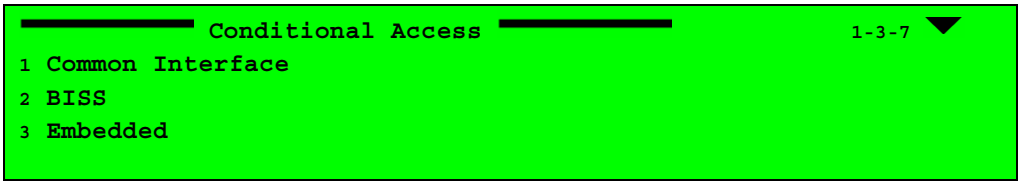
When the IP Data Port link status is down or when the IP Data Port is disconnected, the horizontal bars [--] are displayed

4.3.7. Conditional Access Status Menu

The **Conditional Access Status Menu** allows viewing Conditional Access parameter statuses.

To access the **Conditional Access Status Menu** in the front panel control interface go to ***Status→Conditional Access***

The following screen displays the Conditional Access Status menu:



CAUTION

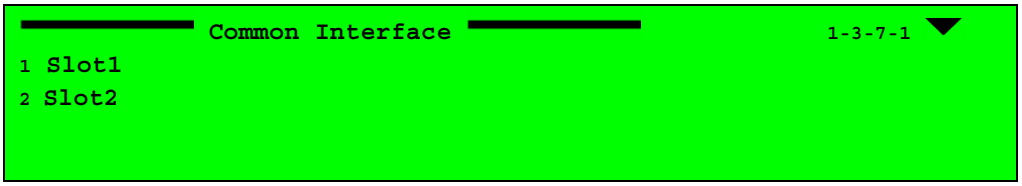
The Conditional Access Status menu must be handled by qualified users who are familiar with the DVB-C2 standard and protocols.

COMMON INTERFACE

The Common Interface Menu displays information on the CAMs inserted to the PVR 6000 CI Slot. The status menu for Slot 1 and Slot 2 is identical unless one of the CI Slots is not equipped with a CAM.

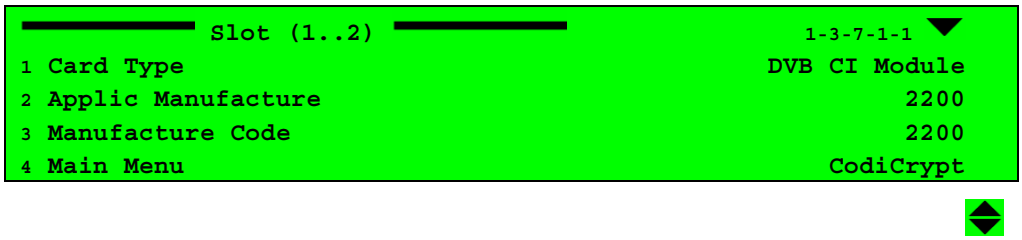
To access the **Common Interface** Menu in the front panel control interface go to ***Status→Conditional Access→Common Interface***.

The following screen displays the Common Interface Status menu:



SLOT (1..2)

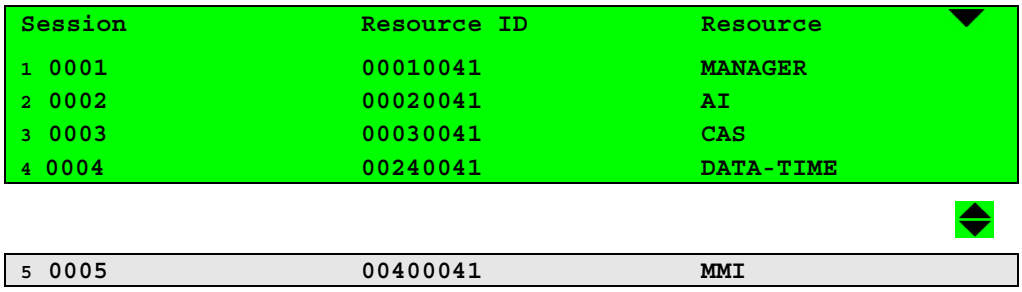
The **Slot (1..2)** Menu displays information on a CAM in Slot (1..2).
To access the **Slot 1** Menu in the front panel control interface go to ***Status→Conditional Access→Common Interface→Slot 1***.
The following screen displays the **Slot 1** Status menu:



The available options are:

- **Card Type** – Displays card type
- **Applic Manufacture** – Displays application manufacturer value
- **Manufacture Code** – Displays the manufacturer code, defined by the CAM manufacturer.
- **Main Menu** – Displays CA vendor name
- **Available Sessions** – Displays currently available sessions.

The following screen displays the Available Sessions Table menu:



- **Supported CA SysID -** Displays supported CA SysID.

The following screen displays the Supported CA SysID Table menu:

System ID	CA Specifier
01 2200	Scopus
02 2201	Scopus
03 2202	Scopus
04 2203	Scopus
05 2204	Scopus
06 2205	Scopus
07 2206	Scopus
08 2207	Scopus
09 2208	Scopus
10 2209	Scopus
11 220A	Scopus
12 220B	Scopus
13 220C	Scopus
14 220D	Scopus
15 220E	Scopus
16 220F	Scopus

NOTE

*To see Available Sessions and supported CA SysID values, select an item and press **[Enter]**.*

B. BISS

This feature will be supported in future software releases.

C. EMBEDDED

This feature will be supported in future software releases.

4.3.8. Unit Status Menu

This menu displays the Unit Menu parameters status.
To access the **Unit** menu in the front panel control interface go to ***Status→Unit.***
T he following screen displays the **Unit** Status menu:

```
Unit                                    1-3-8
1 Identity
2 Versions
3 Monitoring
```

Figure 4-43 displays the corresponding Web management screen.

Unit Identity			
Configuration ID	Serial Number	Decoder Board	Front-End Board
IRD-2980	00000332	SPN-29 REV-D	DVB-S2 REV-A
Unit Versions			
Boot Application	Main Application	Main Application Date and Time	
00.80	1.60.1	Sep 20 2006 16:41:18	
Unit Monitoring			
Temperature [°C]	Management Link Status		
+41	Up/100Base-T/Full		

Figure 4-43: PVR 6000 Unit Status Screen

4.3.8.1. Identity

The **Identity** Menu displays information regarding the PVR 6000 hardware.
To access the **Identity** Menu in the front panel control interface go to
Status→Unit→Identity
The following screen displays the Identity Status menu:

```
Identity                                1-3-8-1
1 Configuration ID                      PVR 600x
2 Serial Number                         00000920
3 Decoder Board                         SPN-29 REV-C
4 Front-End Board                       QPSK-29 REV-A
```

The available options are:

- **Configuration ID** – Displays the PVR 6000 software configuration model as recognized by the software. Note that the configuration ID may not be identical to the PVR 6000 model number as printed on the front panel.
- **Serial Number** – Displays the PVR 6000 serial number

- **Decoder Board** – Displays the hardware revision of the PVR 6000 main board
- **Front-End Board** – Displays the hardware revision of the PVR 6000 Front-End

Figure 4-44 displays the corresponding Web management screen.

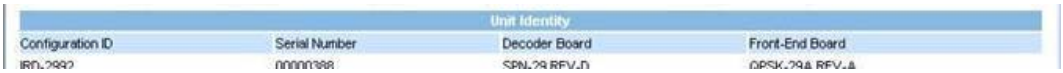
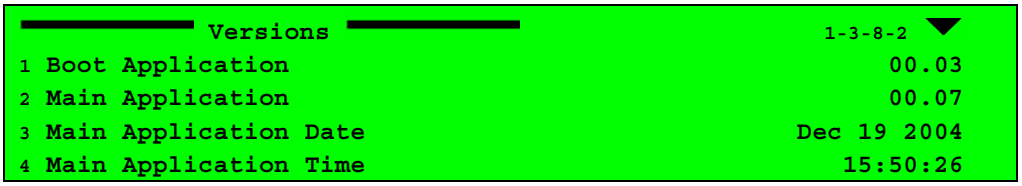


Figure 4-44: Unit – Identity (Status Screen)

4.3.8.2. Versions

The **Version** Menu displays information on the PVR 6000 software versions.
To access the **Versions** Menu in the front panel control interface go to ***Status→Unit→Versions***.
The following screen displays the Versions Status menu:



The available options are:

- **Boot Application** – Displays the boot application software version
- **Main Application** – Displays the main application software version
- **Main Application Date** – Displays the date when the main application was created
- **Main Application Time** – Displays the time when the main application was created

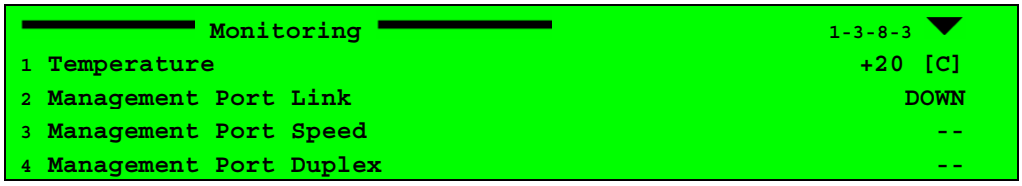
Figure 4-45 displays the corresponding Web management screen.

Figure 4-45: Unit – Versions (Status Screen)

4.3.8.3. Monitoring

The **Monitoring** Menu displays temperature and management port statuses.
To access the **Monitoring** Menu in the front panel control interface go to ***Status→Unit→Monitoring***.

The following screen displays the Monitoring Status menu:



The available options are:

- **Temperature** – Displays the internal temperature of the PVR 6000 as measured by the temperature sensor
- **Management Port Link** – Displays the status of the Management Port link.

  Link statuses are:

  - **Down** - Link is down
  - **Up** - Link is up and connection established
- **Management Port Speed** – 10 Base-T, 100 Base-T

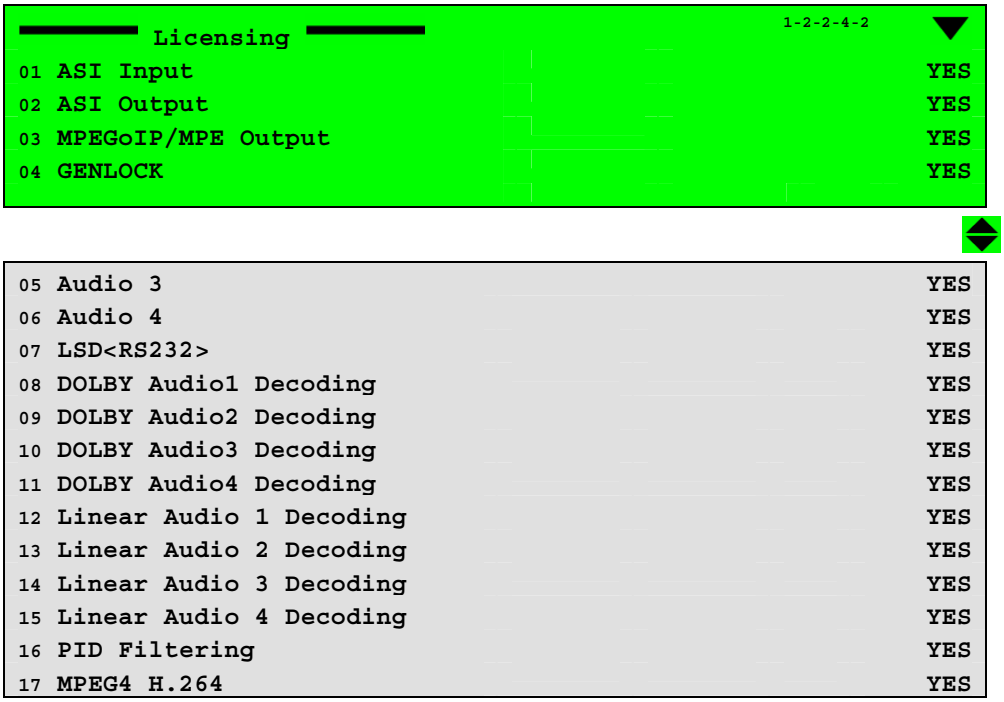
  Management Port Duplex:

  - **Full** - Full duplex
  - **Half** - Half duplex

The horizontal bars **[--]** are displayed when the Management Port link status is down or when the IP Data Port is disconnected.

4.3.8.4. Licensing

The Licensing screen displays all features and their operational status.



Appendix A
SOFTWARE DOWNLOAD

A.1 DOWNLOADING SOFTWARE USING FTP

A.1.1 Introduction

A.1.1.1 PVR 6000 SETUP IP

Configure the PVR 6000 IP Management Port according to local network specifications. The PVR 6000 IP Management is configured from the front-panel by accessing ***Configuration→Unit→Ethernet Management Port***.
The IP Management must set the following parameters: IP Address, Network Mask, and Gateway.

A.1.1.2 PC FTP Application

There are many PC Software Applications that support FTP.
In this document, software download procedure is performed using the built-in MS Windows FTP utility.

NOTE

Viewing the PVR 6000 version is available through the front-panel by selecting ***Status→Unit→Versions→Main Application***.

A.1.2 Installation

A.1.2.1 Loading Through FTP

To open an FTP session, perform the following:

1. Click **Start**. The **Start Menu** is displayed.

From the **Start Menu** click **Run**. The **Run** dialog box is displayed.

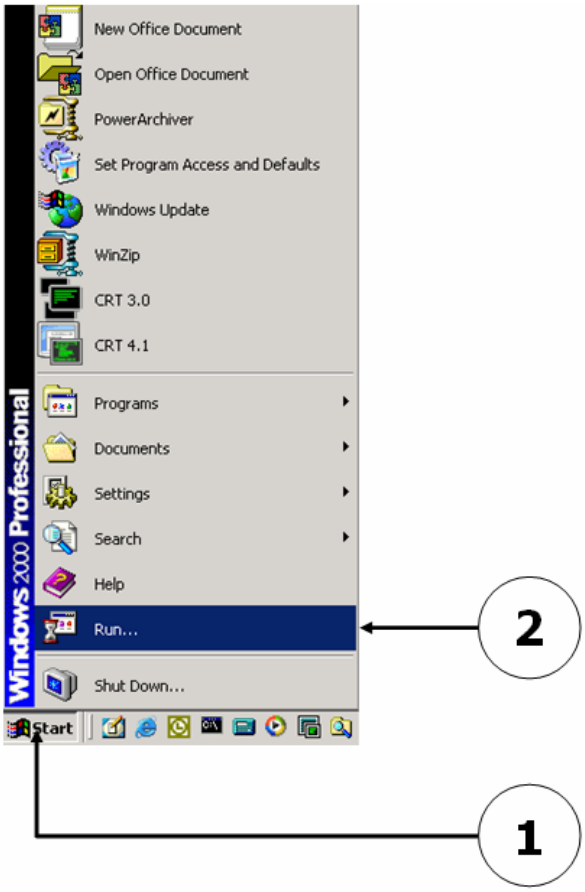


Figure A-1: Start Menu – Select Run

3. Type "cmd" in the combo-box and click **OK**. The terminal window is displayed.

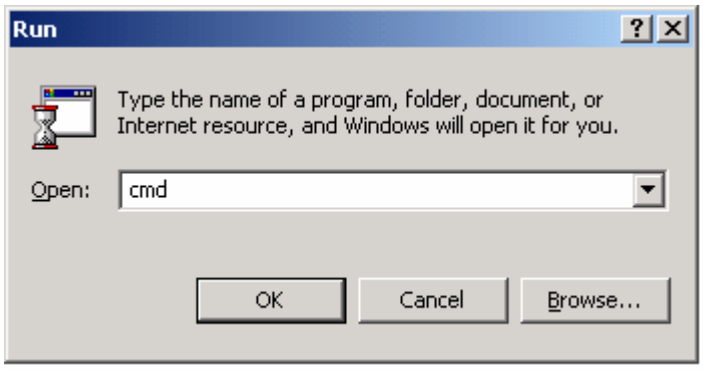


Figure A-2: Run Dialog Box

4. Type **"ftp <PVR 6000 Management IP address>"** and press **[Enter]**. FTP session is displayed. See the following example.

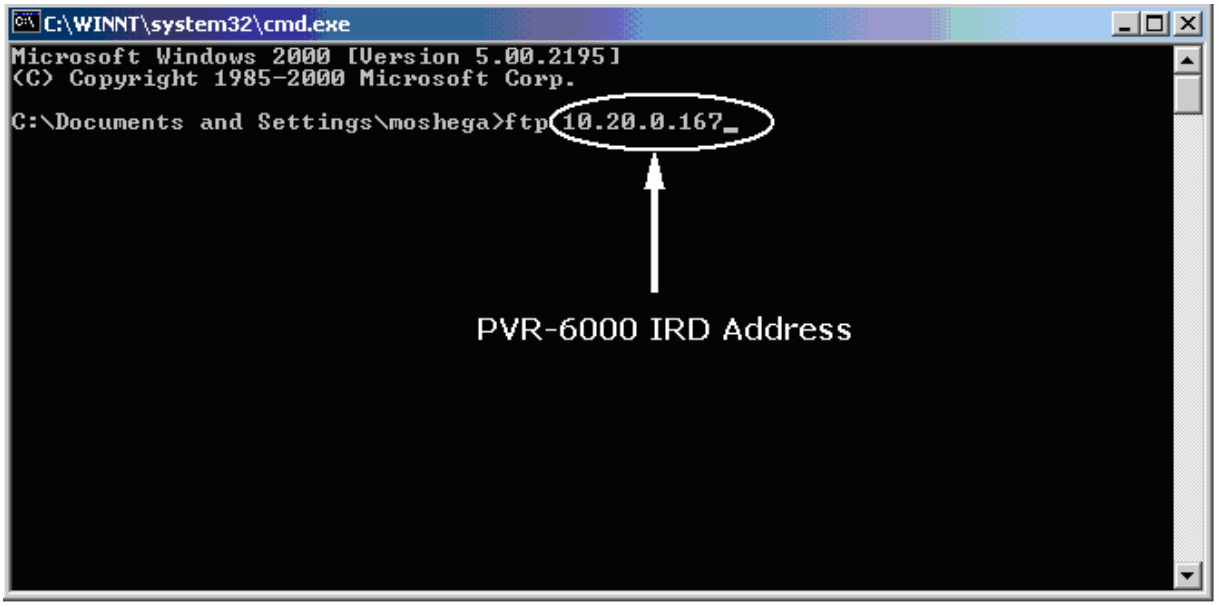


Figure A-3: Open FTP Session

LOG ON

1. Log on to the PVR 6000 with the user name and password, both are empty for the IRD.
2. Reply with **[Enter]** for both user and password requests.

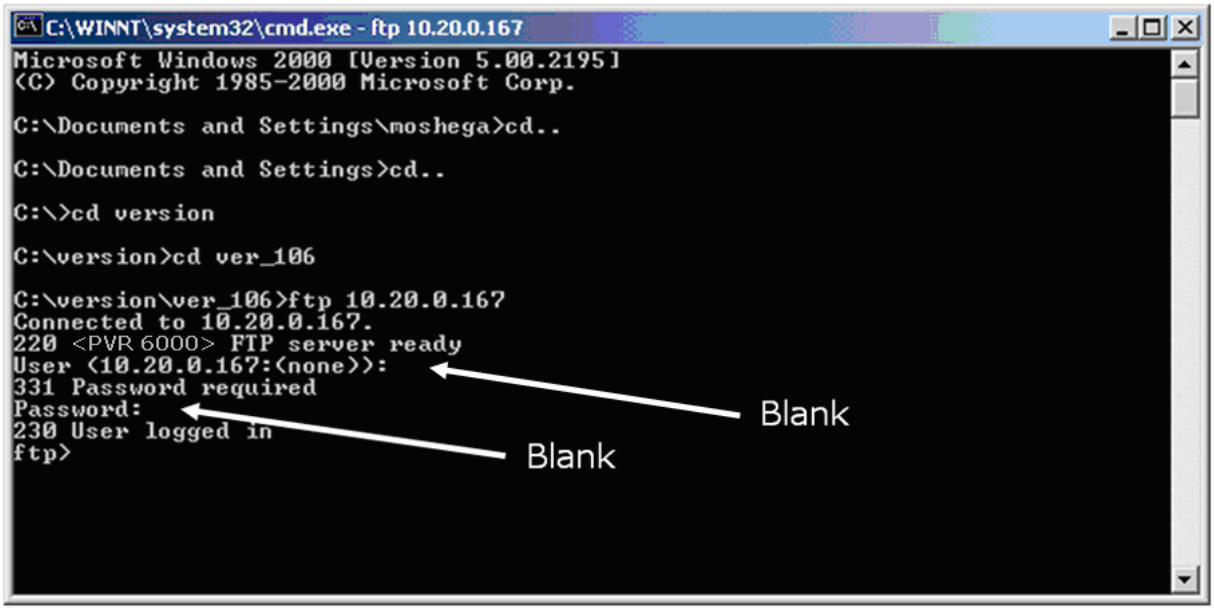


Figure A-4: Login to FTP

3. After connecting to the PVR 6000 through FTP, type "bin" and Click **[Enter]**.

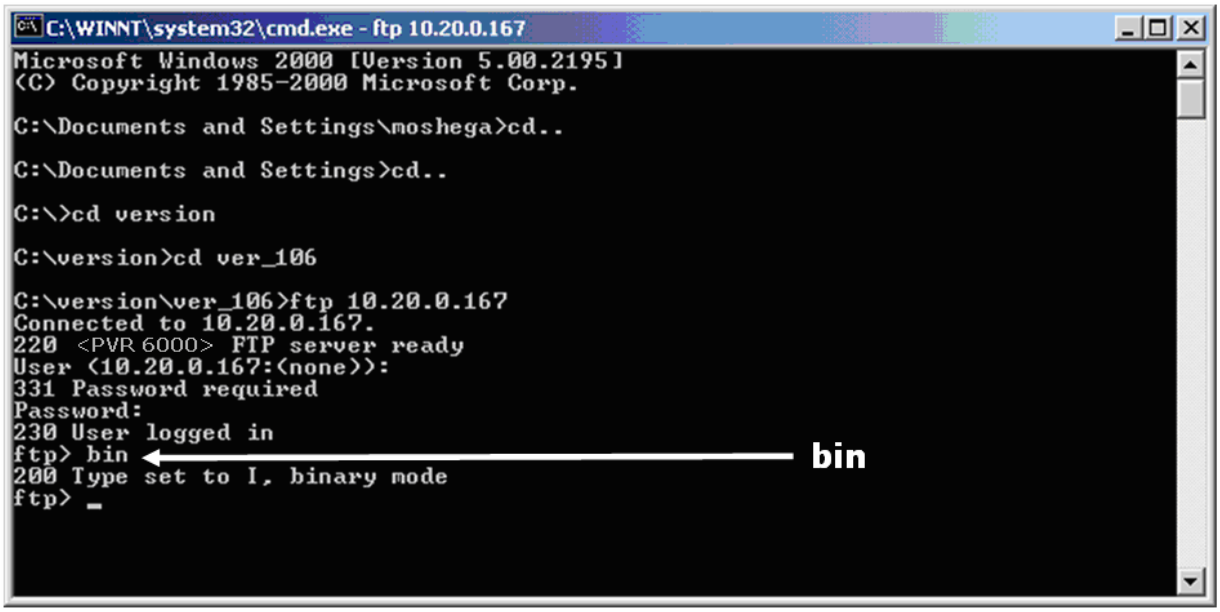


Figure A-5: Access Bin Folder

LOADING THE FILE

To load a source file from a local PC to the PVR 6000:

1. Type **put** and click **[Enter]**
2. After **Local File**, type the file name with the suffix (***Notice*** **-** the software file name and path in the PC should be known).
3. After Remote File, type '/rom/sw_image.bin'.

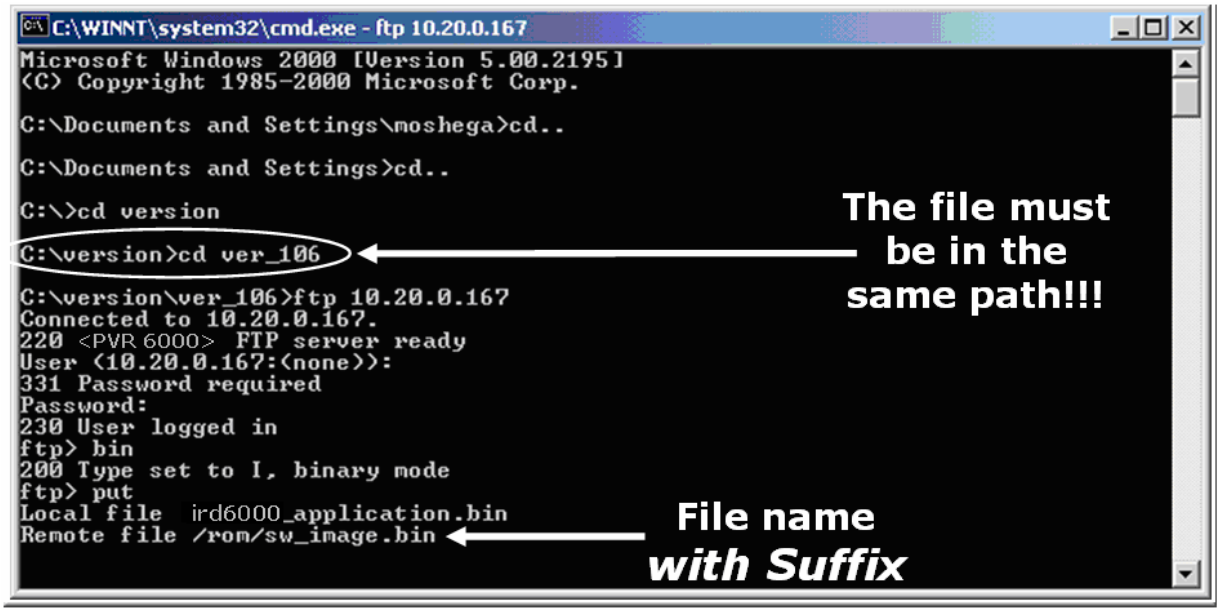
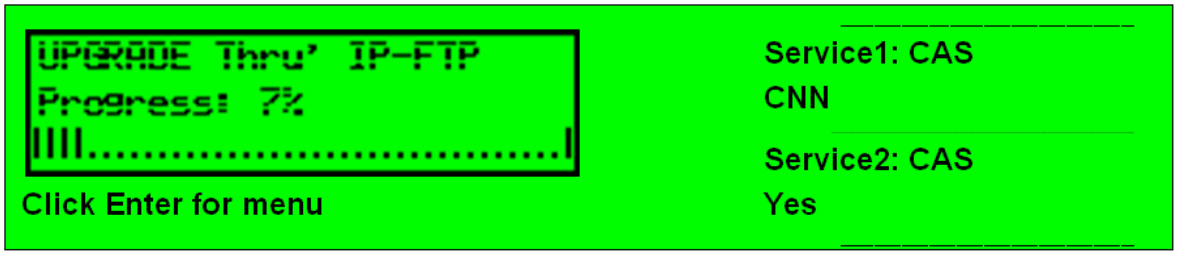


Figure A-6: Loading the File

After confirmation, the PVR 6000 progress is displayed in a loading screen on the PVR 6000 front-panel. In the left frame window the loading progress is indicated by a percentage and blinking progress bar. Following is the PVR 6000 loading screen:



WARNING

IF THE PVR 6000 IS, FOR ANY REASON, SHUT DOWN DURING SOFTWARE DOWNLOAD, THE PROGRAM MUST BE REINSTALLED THROUGH BOOT SOFTWARE DOWNLOAD. REINSTALLATION IS AVAILABLE THROUGH RS-232. SEE SECTION A.2.2.2.

A.2 LOADING SOFTWARE TO THE PVR 6000 THROUGH THE SERIAL PORT

A.2.1.1 PC Connection to the Serial Port

The PVR 6000 can be controlled from a standard PC through a serial RS-232 or RS-485 cable. Table A- and Table A-2 detail the pin-to-pin and signal assignments of the RS-232 and RS-485 cables, respectively.

Table A-1: RS-232 Control Cable Pin-to-Pin

9 PIN D-TYPE CONNECTOR (PC)	9 PIN D-TYPE CONNECTOR (IRD)	SIGNAL DESCRIPTION
2	3	Pc-RxD
3	2	Pc-RxD
5	5	GND

Table A-2: RS-485 Control Cable Pin-to-Pin Designations

PC RS-485 9 PIN D-TYPE CONNECTOR		PVR 6000 RS-485 9 PIN D-TYPE CONNECTOR	
PIN	**DESIGNATIONS**	**PIN**	**DESIGNATIONS**
1	RB	1	TX+
6	RA	6	TX-
8	TB	8	RX+
9	TA	0	RX-

A.2.1.2 PC Serial-COM (Terminal) Software

There are many Terminal Applications that support Serial-COM.
In this document Software download procedure is performed on the built-in MS Windows hyperterminal.

A.2.1.3 Opening Hyperterminal from MS Windows

1. Access HyperTerminal application, by selecting
   Start→Program→Accessories→Communication→HyperTerminal

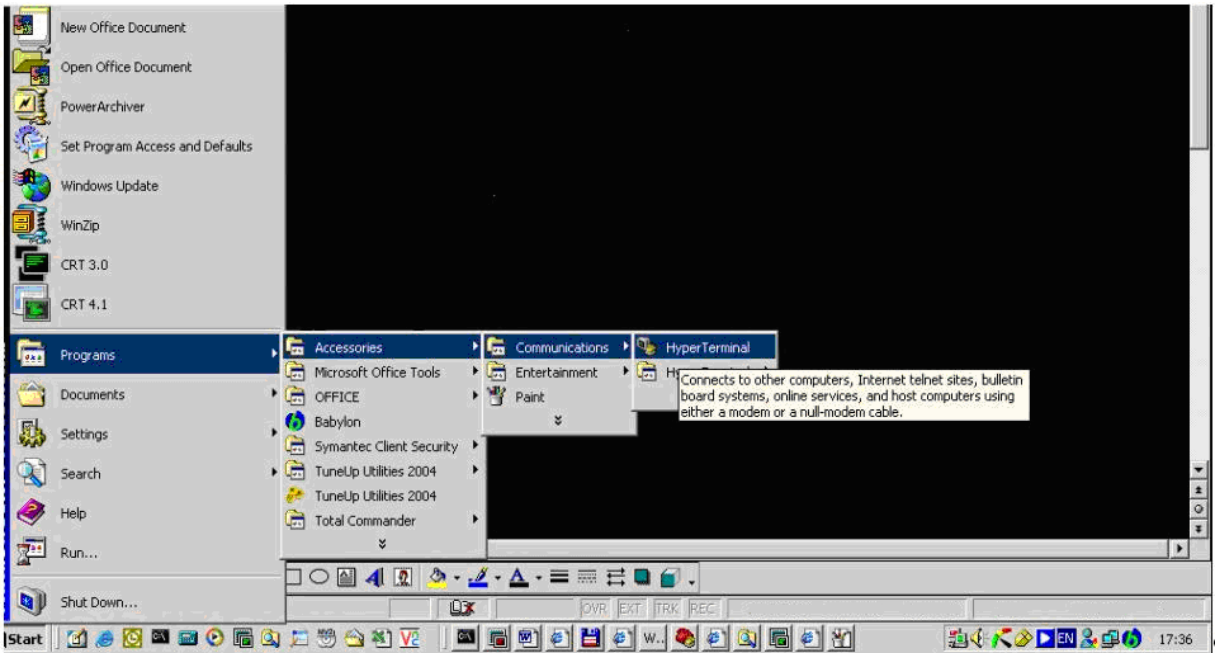


Figure A-7: Start Menu – Open HyperTerminal

A.2.1.4 Defining the Communication

When the HyperTerminal starts, the following window is displayed.

Enter a connection, for example PVR 6000 and lick **OK**.
Select a connection (Icon).

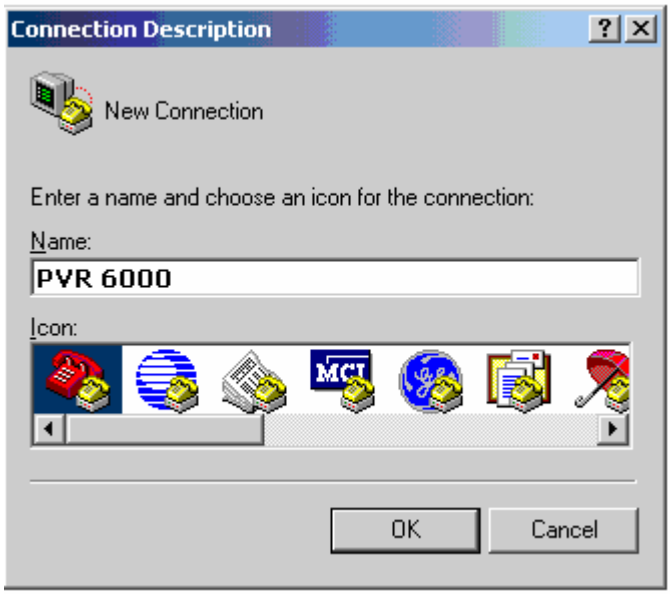


Figure A-8: HyperTerminal – Enter Connection

3. Select a PC COM port that is the specific PC COM to which the PVR 6000 is connected.

Figure A-9: Select PC COM Port

4. Select the Baud Rate. This must be identical to the PVR 6000 baud rate parameter. See ***Configuration→Unit→Serial Control Port→Baud Rate***.
5. Select Flow Control – None.

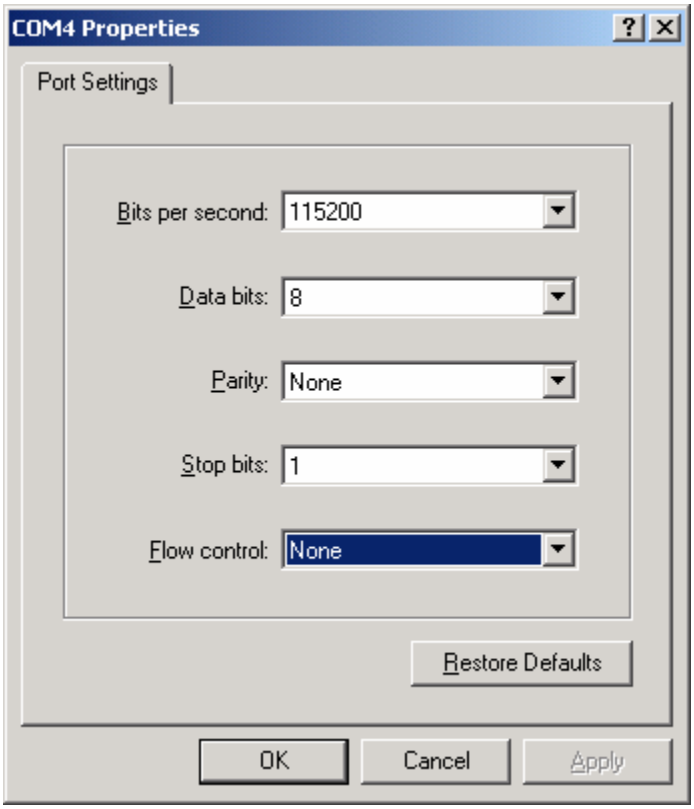


Figure A-10: Port Settings Tab

A.2.1.5 Checking PC Terminal Communication with the IRD

After setting the PC - HyperTerminal, the Terminal is opened and the user can check the connection to the IRD on the HyperTerminal.
Press **[Enter].** If the word **"Root"** appears on the terminal window, the user is connected with the IRD. **/root>** indicates the main path to the IRD.
The user can also type **"help"** to see the PVR 6000 help commands.

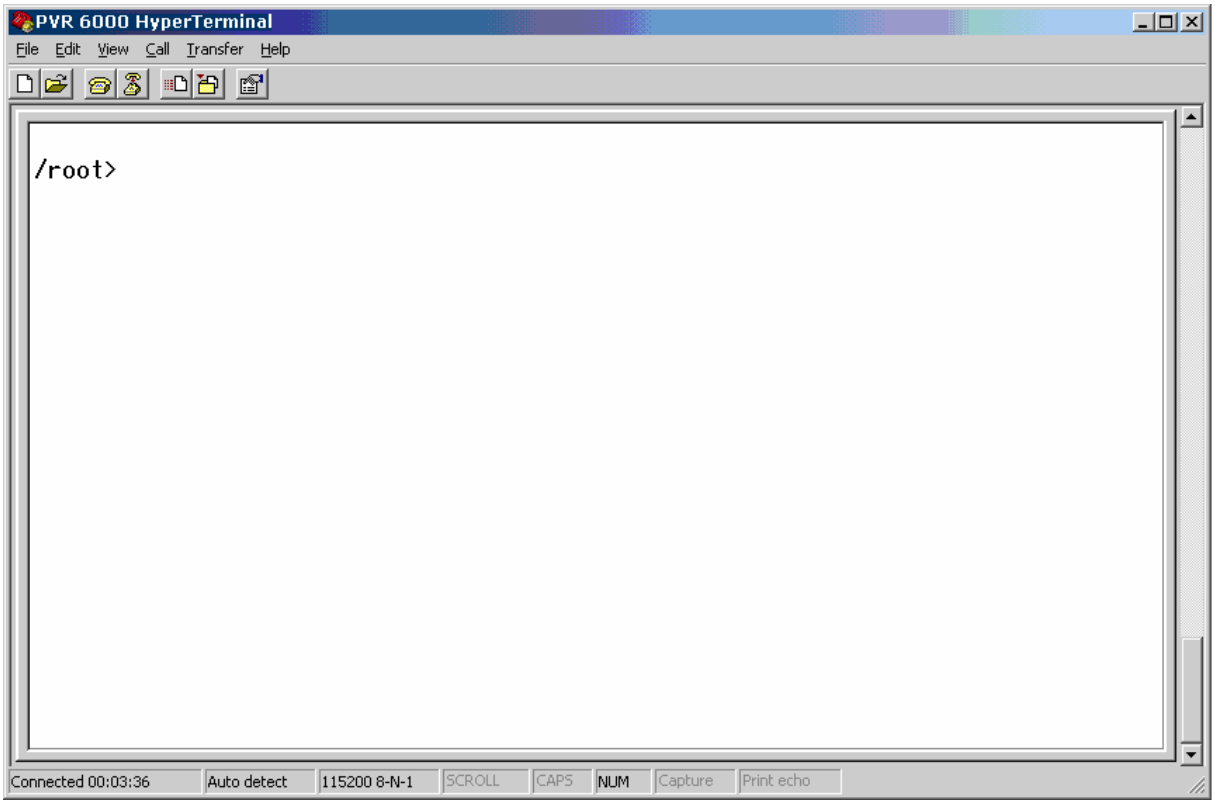


Figure A-11: HyperTerminal Window

The user can check the current PVR 6000 version with command **"status/unit/sw_info"** or select the ***Status→Unit→Versions→Main Application*** on the front panel.

A.2.2 INSTALLATION:

A.2.2.1 Loading new Software Sequence

1. After the PC-to-PVR 6000 Communication is checked, in the Root directory type **"config/unit/upgrade_sw"** and confirm by typing **"yes"**.

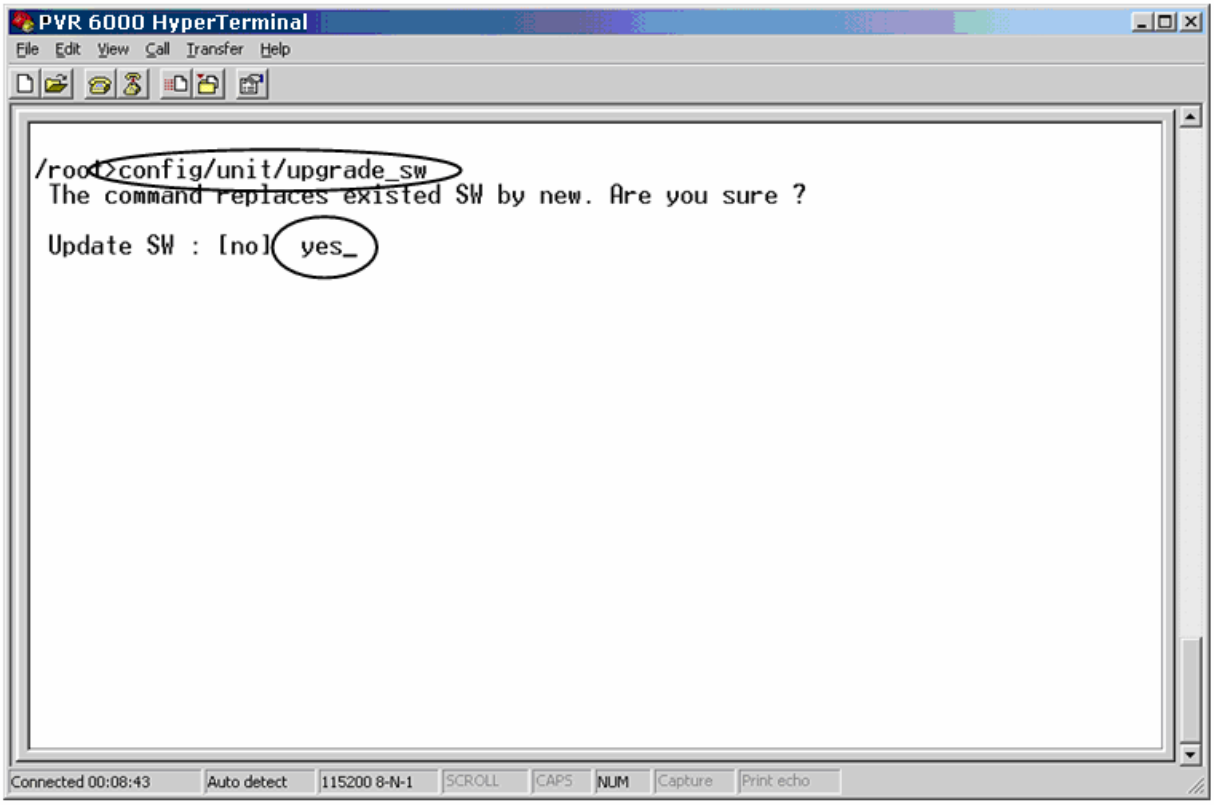


Figure A-12: Update Software Version Command

The PVR 6000 erases the previous software version when updating. This process can take approximately 30 seconds (see the following example).

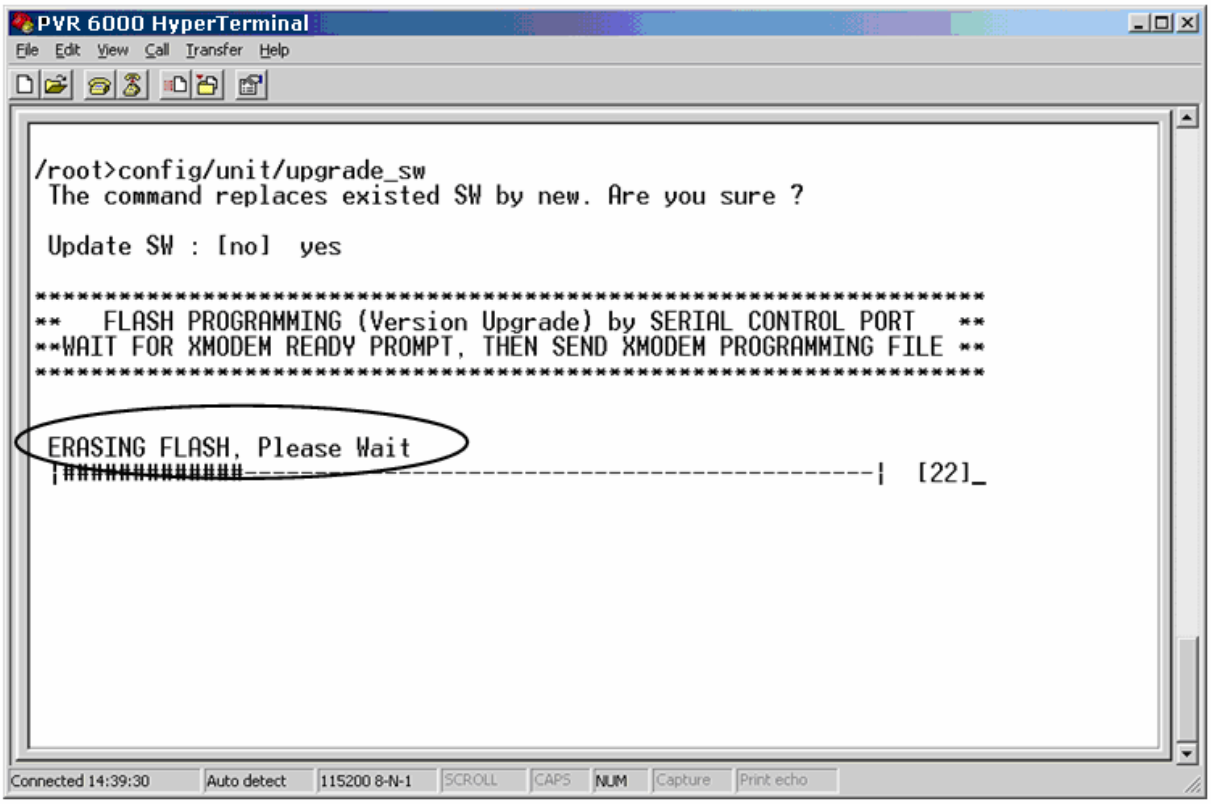


Figure A-13: Erasing Flash Process

After the previous software is erased, message **"Ready For Receive"** is displayed.

2. In the HyperTerminal, select ***Transfer→send file***.

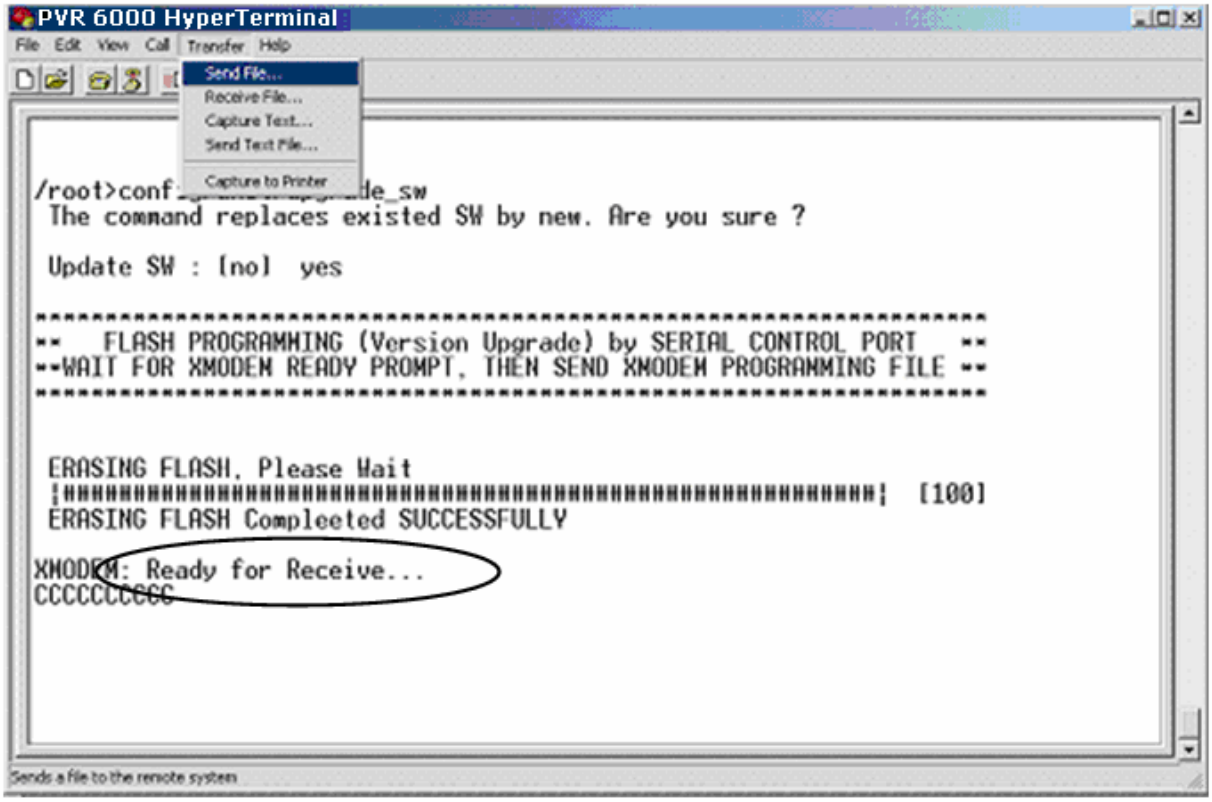


Figure A-14: Ready to Receive New Software

3. Specify to which used protocol to send the software file. It can be "**Xmodem"** or **"1K Xmodem"** protocol.

NOTE

"1K Xmodem" is faster than "XModem".

4. Specify the path of the software file on your PC, for example:

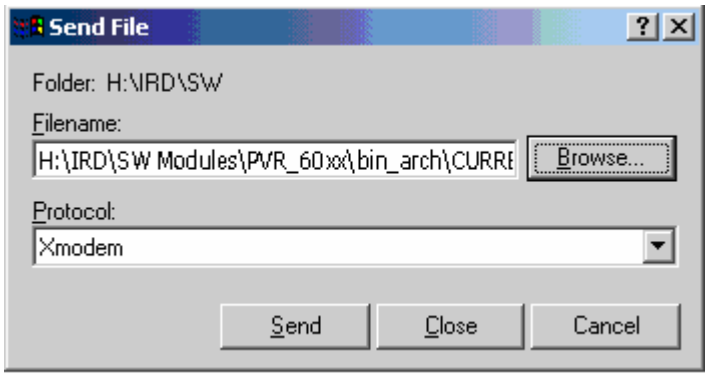


Figure A-15: Send File Dialog Box

5. Click **Send**. The loading starts. This may take a few minutes.

   The status is displayed in the following window below or on the PVR 6000 front panel main menu.

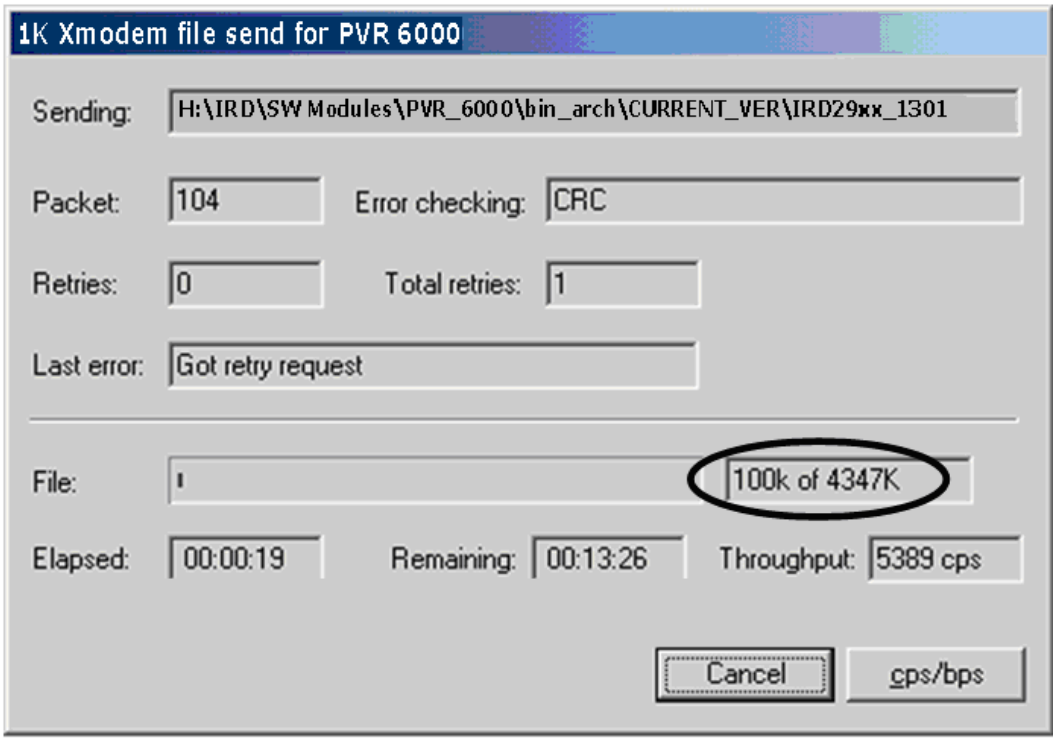


Figure A-16: Sending Status Dialog Box

When the process is complete, a confirmation is displayed, indicating that the file was loaded. Then the PVR 6000 performs reboot.

6. Wait until the PVR 6000 is finished rebooting the new software.
7. On the front panel, verify that the new version is installed.

A.2.2.2 Loading Software Version through PVR 6000 BOOT Application

When the PVR 6000 is shut down during software download, the PVR 6000 start up sequence is set with the boot application. Perform the following:

1. Stop the previous Hyper Terminal sending process and restart standard communication with the IRD.
2. When the PVR 6000 starts the BOOT application, the following hyperterminal window is displayed.

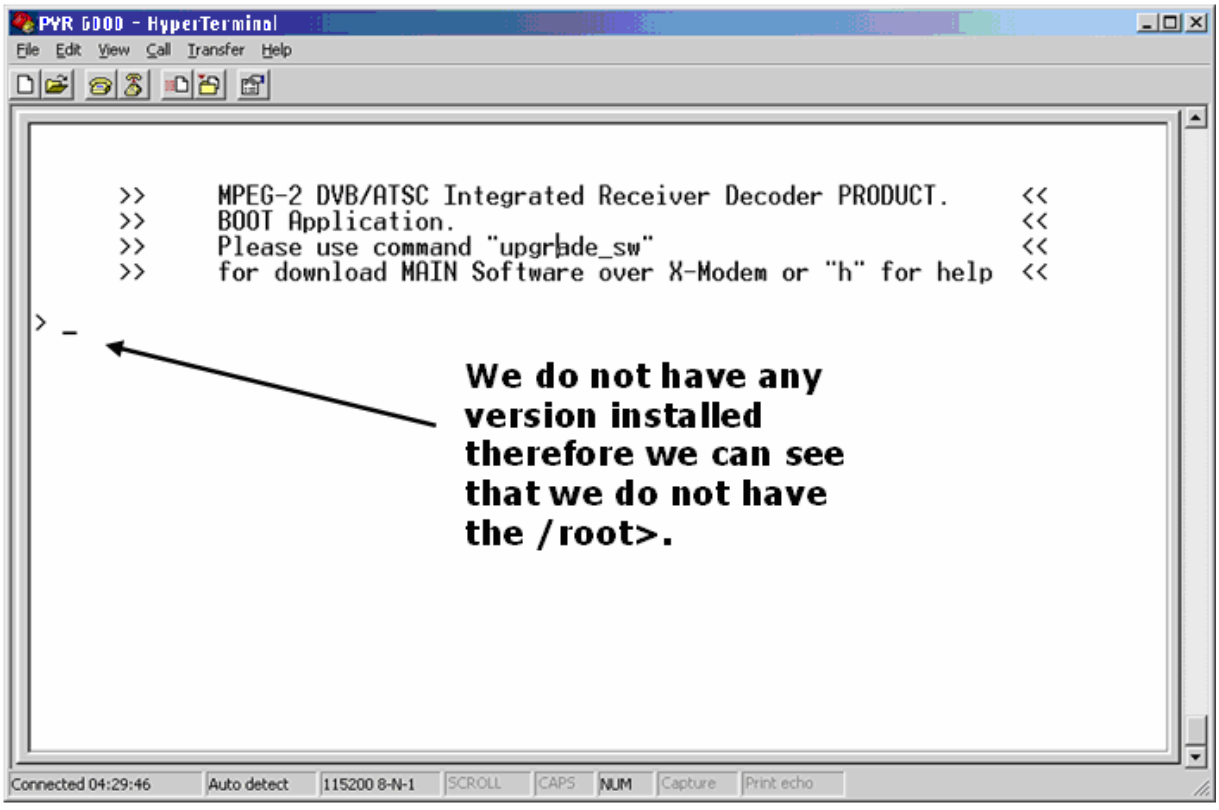


Figure A-17: IRD Boot Application Starts

The following screen displays the PVR 6000 Boot Software download menu:

```
MPEG-2 DVB/ATSC I.R.D - BOOT APPLICATION
UPGRADE Thru' SERIAL - Progress = 14%

 !!!!!!!!!!!!!!.....................................................!...
```

After download is complete, the PVR 6000 restarts the standard operation with the new software version.

3. To use the Boot Application, type **"upgrade_sw applic".** The PVR 6000 starts "erasing flash" and after few minutes (after Erasing Flash Completed Successfully) the **"Ready for Receive..."** message is displayed. Continue loading the new version according to the standard procedure.

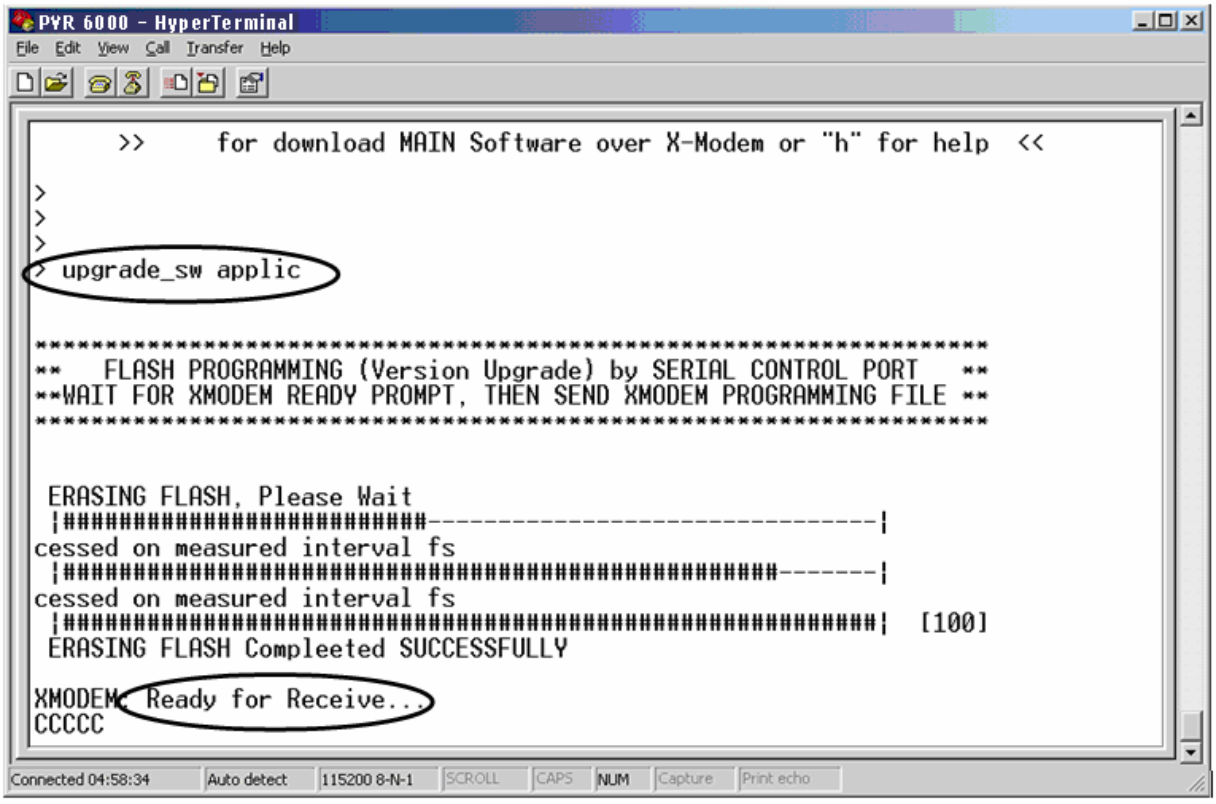


Figure A-18: Complete Software Loading

Appendix B
IP-FRONT END SOFTWARE UPGRADE PROCEDURE

This appendix details the software upgrade procedure in an IP front end PVR 6000 device. This procedure is different than in other front end devices.
To perform the IP Front End software upgrade, perform the following steps:

1. The watchdog feature must first be disabled in the PVR 6000 for correct SW upgrade. To disable the watchdog feature, perform the following steps:
   - In the PVR 6000 front panel, go to ***Configuration→ Stream→Source*** and select ***Serial RS422***
   - In the command prompt (Start→Run) on the PC enter **'telnet <device IP address> 1023**. Note: To obtain the <device IP address> in the PVR 6000 front panel, go to ***Configuration→Receiver→MPEGoIP Input 1 (or 2)→Physical Link*** and copy the number from the IP Address parameter.
   - In the Telnet prompt, press Enter.
   - In the Telnet prompt, type **'*dwd*'**.
   - Power off the PVR 6000
   - After a few seconds, power on the PVR 6000. The watchdog function is now off.
2. For each new SW upgrade obtain a self extracting software upgrade file.
3. Create a new directory under drive C:\ and name it NEW_VER.
4. Copy the self extracting file into the NEW_VER directory.
5. Go to ***Start→Run*** and enter '*cmd'.*
6. In the command prompt window enter '*cd \NEW_VER*'.
7. Type the name of the SW upgrade self-extracting EXE file and press Enter
8. Answer any questions that may be displayed on the command prompt window with 'Y' followed by **Enter**
9. After the self extracting file has finished the self extraction, run the file called 'update.bat' from this same directory, then enter the PVR 6000 IP address. Obtain the IP address by accessing ***Configuration→Receiver→MPEGoIP Input 1 (or 2)→Physical Link*** in the front panel. Then copy the address from the IP Address parameter. For example **'update 10.100.1.26'**.

10. In the Telnet prompt window, type 'telnet <unit IP Address> 1023' (use the same IP Address as in step 9).
11. Type **'exit'** and then Enter.
12. Type **' burn "vxw" '** and then Enter.
13. Type **' "burn "ird" '** and then Enter.
14. Power off the PVR 6000.
15. After a few seconds, power on the PVR 6000.
16. On the PVR 6000 front panel, go to ***Configuration→ Stream→Source*** and select **FRONT END (IP)**
17. Verify the correct upgrading of the new SW version by going in the PVR 6000 front panel to ***Status→Receiver→General*** and checking the *SW Version dd/mm/yy mj.mn* parameter value

NOTE

If power failure occurs during upgrade, repeat the upgrade from step 1

Appendix C
ASPECT RATIO CONFIGURATION PROCESS

C.1 GENERAL

This Appendix details PVR 6000 configuring for the fitting of Aspect Ratio (A/R) of the incoming Video to the A/R of the destination monitor.

C.2 ASPECT RATIO CONVERSION MACHINE

The PVR 6000 provides the ability, using interpolation, to produce different image formats, enabling the display of the incoming Video on either a 4:3 or a 16:9 monitor.
16:9 Video Streams can be fitted for display on 4:3 monitors, and vice versa, in more than one format, as summarized in Table C-1 and Table C-2.
A/R fitting is referred to as **Conversion**. The PVR 6000 contains an "Aspect Ratio Conversion Machine" responsible for all image conversions.
Figure C-1 displays a simplified illustration of this machine.

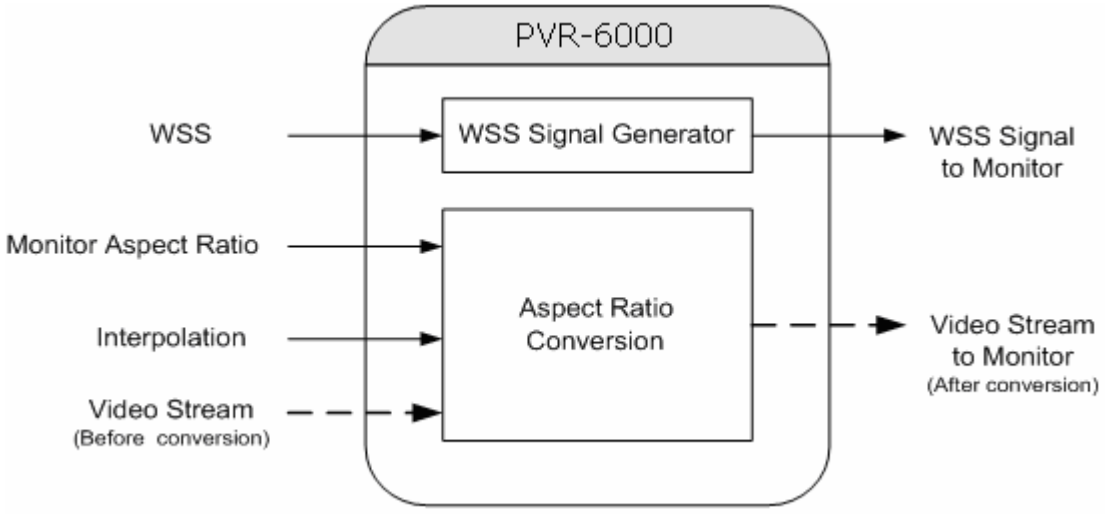


Figure C-1: Aspect Ratio Conversion Machine

When fitting the received Video signal A/R to the monitor A/R, the following three PVR 6000 parameters values must be set to achieve the required conversion:

- WSS
- Monitor Aspect Ratio
- Interpolation

WSS (WIDE SCREEN SIGNALING)

The purpose of the WSS signal is to inform the destination monitor of the received Video A/R. The PVR 6000 extracts the WSS information from an operator-selected source, generates a new WSS signal (see '*WSS Signal Generator*' in Figure C-1), and outputs it to the monitor.
The WSS menu in the PVR 6000 contains two items:

- **Source** – from which the PVR 6000 extracts the WSS information. The available options are: **DISABLE, TV MONITOR, E.S. (EN-301-775),** and **VIDEO** (see WSS explanation in Section 4.2.6.2 for further details).
- **Line1** – Video line into which the PVR 6000 inserts the generated WSS signal (see *WSS* explanation in Section 4.2.6.2 for further details).

MONITOR ASPECT RATIO

This parameter informs the Conversion Machine of the destination monitor's A/R. This is one of two parameter values which the Conversion Machine needs for its operation (see Figure C-1).
The available options are: **VIDEO SOURCE, 16:9, 16:9 BOX,** and **4:3** (see *Monitor Aspect Ratio* explanation in Section 4.2.6.1 for further details).

INTERPOLATION

This parameter sets the method of interpolation which the Conversion Machine will use when converting the Video Stream.

C.3 TABLE OF CONVERSIONS

After setting the values of **WSS**, **Monitor Aspect Ratio**, and **Interpolation**, the PVR 6000 receives all required A/R information for re-creating the image.
Table C-1 and Table C-2 details the format of the image after conversion in all PVR 6000 available settings combinations, and depending upon the incoming signal's A/R.

The resulting image is affected by the combination of four variables displayed in the A/R Conversion Table:

- The actual Video Stream A/R (**Stream** column)
- Destination Monitor A/R (**Monitor** Column)
- Interpolation value, set in the Conversion Machine (**Interpolation** Column)
- Monitor Aspect Ratio value, set in the Conversion Machine (**WSS** Column)

The following Video Bar figures are used in the table to demonstrate the image format changes.
Figure C-2 illustrates a **normal 4:3** Video image

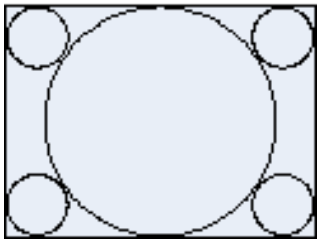


Figure C-2: Normal 4:3 Aspect Ratio

Figure C-3 illustrates a **normal 16:9** Video image

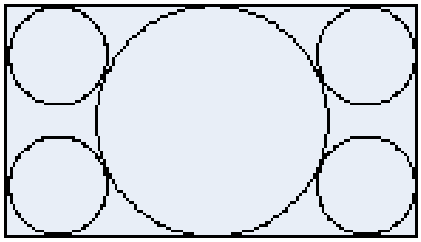


Figure C-3: Normal 16:9 Aspect Ratio

Table C-1: Table of Conversions - 4:3 Stream Option

STREAM	**4:3**
MONITOR	16:9 **or** 4:3
INTERPOLATION	Pan Scan **or** Letter Box

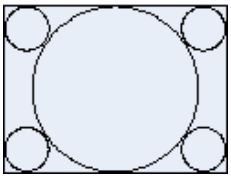
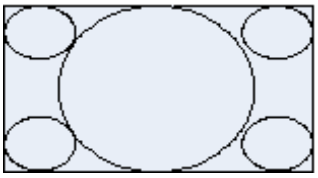
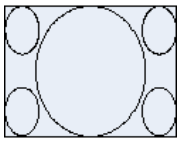
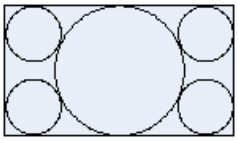
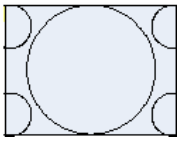
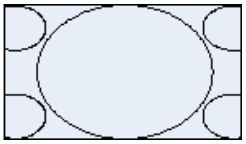
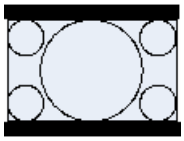
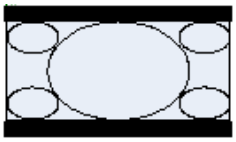
WSS	TV Monitor **or** Video Stream
OUTPUT DESCRIPTION	Conversion is not available. Always displays **Normal picture** on 4:3 TV and **short and fat** on the 16:9 TV **WSS** – **4:3** Full Format 0001.0000.000.000 Can be output if WSS is set as Video Stream
OUTPUT DISPLAY	***4:3***  ***16:9*** 

Table C-2: Table of Conversions - 16:9 Options

STREAM	16:9	16:9	16:9
MONITOR	16:9	4:3	4:3
INTERPOLATION	Pan Scan	Pan Scan	Letter Box
WSS	TV Monitor **or** Video Stream	TV Monitor **or** Video Stream	TV Monitor **or** Video Stream

OUTPUT DESCRIPTION	• No conversion • Always displays **Normal picture** on 16:9 and **tall and thin** on the 4:3 TV **WSS** – • **16:9** Full Format 1110.0000.00.000 Can be output if WSS is set as Video Stream	• Conversion horizontally up-samples the central portion of the picture to fill the 720 **WSS** – • **4:3** Full Format 0001.0000.000.000 Can be output if WSS is set as Monitor. • **16:9** Full Format 1110.0000.000.000 can be output if WSS is set as Video Stream	• Conversion vertically down-stamps the picture and applies black bar to the top and bottom of the screen **WSS** – • **4:3** Full Format 0001.0000.000.000 can be output if WSS is set as Monitor • **16:9** Letter Box 1101.0000.000.000 can be output is WSS is set as Video Stream ***NOTE*** *With 16:9 L/B signalling as auto sense, 16:9 monitor can convert the picture to Normal 16:9*

OUTPUT DISPLAY			
	4:3  *16:9* 	*4:3*  *16:9* 	*4:3*  *16:9* 

Appendix D
WARNING MESSAGES

D.1 GENERAL

This Appendix details all error notifications available for the PVR 6000. Errors can be caused by ether hardware or software malfunctions. An error is indicated by the **Warning Leds** located right to the front panel screen, followed by an **Error Message** on the front panel screen.

D.2 WARNING LEDS

The PVR 6000 provided with two warning LEDs located right to the front panel screen. These LEDs indicate errors when detected.
Figure D-1 shows the warning LEDs as located on the front panel.

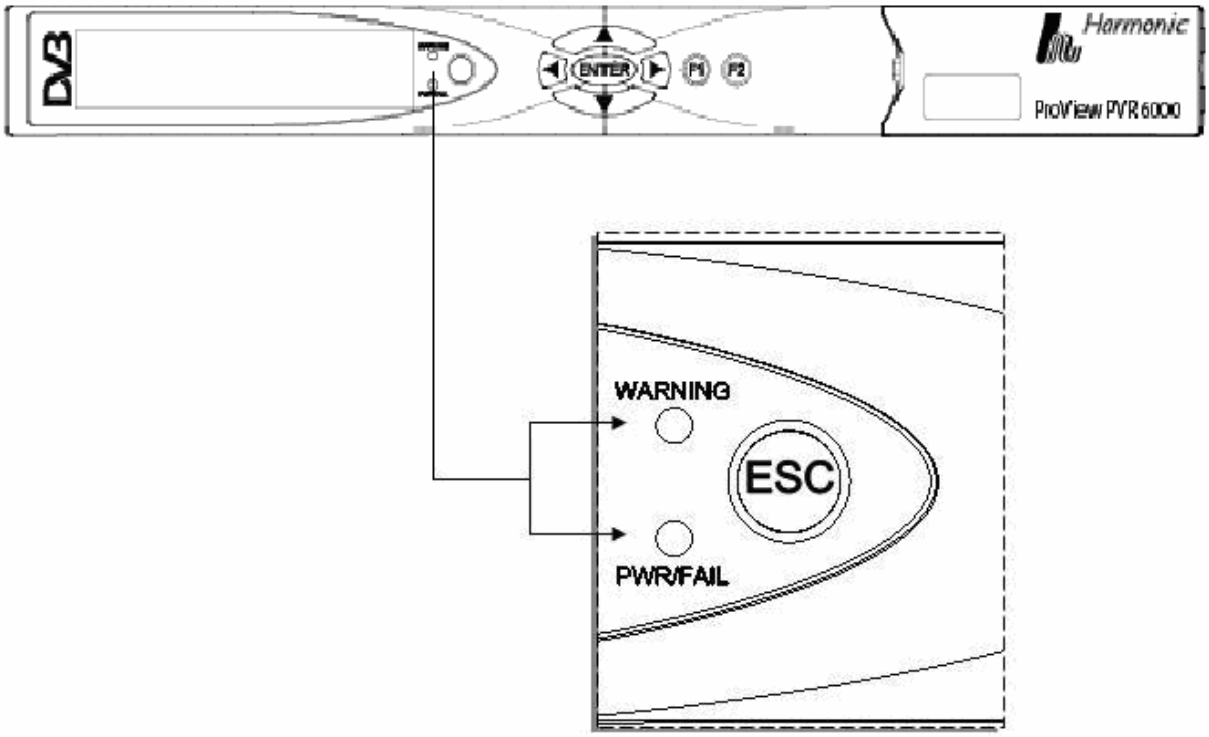


Figure D-1: Front panel warning LEDs

The available LEDs are:

- **WARNING** – indicates any detected error by an **orange** light.
- **PWR/FAIL** – indicates hardware errors by a **red** light.

When the PVR 6000 is properly functioning, both LEDs light **green**.

D.3 WARNING MESSAGES

Warning messages appears on the front panel screen when an error is detected. The warning message briefly describes the level of the malfunction.

The following are Satellite front-end warnings:

- **Signal Not Received**
- **Demodulator Not Sync**
- **Viterbi Not Sync**

- **Deinterleaver Not Sync**
- **Front End Not Locked**

The following are IP front-end warnings:

- **IP Config' Error**

The following are Satellite/IP bit-stream warnings:

- **No Sync-0x47 Detected**
- **PSI Not Detected**