



MANO MOBILE DIVERSITY RECEIVER
MANUAL V9.9
SW V9_1502162807570-20



Accessories included with the MANO:



AC/DC Power supply to
XLR-4



Omnidirectional antennas 3
dBi gain x 2



Neck Strap

Accessories not included with the MANO:



CC-MANO Transport Case



VL-2000S Battery Charger



DUO-C198 Battery

Contents

Chapter 1: Introduction

The first chapter provides a general description of the Mobile MANO receiver.

Chapter 2: Technical features

The second part offers the physical and environmental characteristics of the receiver.

Chapter 3: How to order

The third part provides the user with information on ordering and different configurations available for these receivers.

Chapter 4: Receiver Operation and Menus

The fourth part provides the user with all the necessary information to control and operate the equipment properly. The function of each button on the keyboard is detailed. It also outlines how the information is shown on the display, receiver's menus, alarms, etc.

Chapter 5: Autotracking Antenna

In this chapter the Autotracking antenna control and how to configure this option is explained.

Chapter 6: Web Server/SNMP

This chapter provides a detailed description of the Web Server tool. This feature allows the control of the receiver through a website.

Chapter 7: Block Diagram

This chapter provides a block diagram of the internal performance of the receiver.

Chapter 8: Equipment Installation

This chapter indicates the available connections of the receiver, the characteristics and the installation.

Chapter 9: Preventive maintenance

This chapter gives all the information about the antennas included with this receiver.

Chapter 10: Preventive maintenance

This chapter explain the procedure that should be followed during the receiver's live.

Chapter 11: Warranty

This chapter contains warranty considerations and conditions.

Annex A. Video over IP Monitoring on a PC

Here how to use the video over IP output connection to a computer is explained.

Dear Customer,

We would like to thank you for selecting this equipment and welcome you to the SVP's growing family of products.

We are sure that the addition of this equipment will give complete satisfaction to you with your existing installation.

Please read these instructions carefully and keep them to hand in case you need to refer to them.

About this manual

This user's guide provides indications and explanations about how to set up the receiver easily in the most common cases.

This document is intended to help first time users:

- To find their way around the GUI.
- To understand the different possibilities of the receiver.
- To configure the MANO for their specific configurations.

Symbols

The symbols that appear in this manual are:



An information message which indicates explanations for the proper operation of the equipment.



It advises users that if they do not avoid, make or take specific actions, the device could be damaged.



In places where this symbol appears it means that by pressing the Down button the user can access the next screen.



In the options where this symbol appears, means that pressing the OK button, the user can access the submenu related to that option or can change the value of the parameter.



These symbols mean that the parameter can be modified on the same screen with the right and left keys.

Important Notes

- The MANO is MPEG2/H.264 4:2:2 – 10 bits – DVB-T2/T/ and ISDB-T with 2 diversities receiver, this receiver is fully compatible with the DVB-T2 standard included in ETSI EN30075, with DVB-T standard included in European Standard ETSI EN300744 and ISDB-T included in ARIB STD-B31 standard.
- This receiver has several different configuration and options which are explained in this document. Please, make sure that you choose the correct option for your application.
- On the receiver site it is important to determine if the channel in which the transmission will be done has interference, if any other transmission is being done in that channel.
- The receiver must be well ventilated. Some space must be left next to the sides of the receiver for ventilation purposes.
- Special care should be taken with SDI cables. Quality and length are very important especially with HD-SDI or 3G-SDI signals.
- It is not advisable to use a power supply lead with a cross-section less than that of the lead supplied, since this would cause a drop in the supply voltage and a deficiency in the operation of the equipment.
- Only authorized personnel should open the unit. Any repair or warranty will be invalidated if the seals are broken.

First Aid in Case of Electric Shock

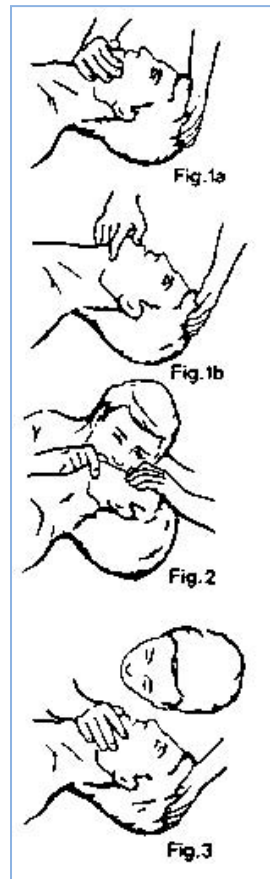
DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken. SWITCH OFF ELECTRIC CURRENT FOR MAINS. If this is not possible, PROTECT YOURSELF with DRY insulating material and pull the victim clear of the conductor.

If breathing has stopped, indicated by unconsciousness, lack of respiratory movements and a 'blue' look to cheeks, lips, ears and nails, START RESUSCITATION AT ONCE.

EMERGENCY RESUSCITATION – THE EXPIRED AIR METHOD

(Approved by the Royal Life Saving Society)

1. If possible, lie the victim on his back with his head slightly higher than his feet. Clear the mouth and throat of any obvious obstruction.
2. Kneel on one side of the victim, level with his head. LIFT THE JAW AND TILT THE HEAD BACK AS FAR AS POSSIBLE (Figs. 1a and 1b)
3. One of the following may happen:
4. Breathing may begin and consciousness returns.
5. Breathing may begin but consciousness NOT returns. Turn the victim on his side and ensure that the airway is kept clear.
6. Breathing may return but be NOISY which means that the airway is not fully clear. Try to clear the airway.
7. IF THERE NO SIGN OF BREATHING:
8. Check that the head is still tilted back.
9. Take a deep breath.
10. Pinch the victim's nose and blow firmly into his mouth (Fig. 2). As you do, the chest will RISE.
11. Turn your head away and take another breath, watching for the chest to FALL (Fig. 3).
12. Start with four quick breaths and then continue with one breath every five seconds (i.e. 12 times a minute). This should be continued until the victim revives or a doctor certifies death.
13. As consciousness returns the victim will start to breathe on his own, and a 'pink' color replaces the 'blue' look: this is the time to stop resuscitation. Continue to hold his chin up and so keep the airway clear.
14. In the case of injuries to the mouth, it may be necessary to use mouth-to-nose resuscitation. Seal the victim's mouth with your cheek and blow firmly into his nose, proceeding as above.



15. In the case of severe facial injuries, it may be necessary to do a manual method of artificial respiration (Silvester-Brosch or Holger Nielsen). Briefly, these methods apply compression to ribcage with the victim lying on his back (S-B) or face down (H.N.) with associated movement of his arms up and out. The cycle of movement should take about five seconds, i.e. the normal breathing phase.
16. Whatever the method, it is ESSENTIAL to commence resuscitation WITHOUT DELAY and to send for medical assistance immediately.

TREATMENT FOR BURNS

If the victim is also suffering from burns, then, without hindrance to resuscitation, observe the following:

1. DO NOT ATTEMPT TO REMOVE CLOTHING ADHERING TO THE BURN.
2. If possible, alleviate the pain from the burnt part by immersing in cold water.
3. If help as available or as soon as resuscitation is no longer required, the wound should be covered with a DRY clean dressing.
4. Oil or grease in any form should not be applied.
5. If severely burnt, get the victim to hospital immediately.

Index

Index	8
Chapter 1: Introduction	11
Chapter 2: Technical features	13
Chapter 3: How to order	17
Chapter 4: Receiver Operation and Menus	18
4.1 Display	18
4.1.1 1 st Main Screen for the DVB-T2	19
4.1.2 1 st Main Screen for the DVB-T	21
4.1.3 1 st Main Screen for the ISDB-T	22
4.1.4 1 st Main Screen for the ASI Input	23
4.1.5 1 st Main Screen for the IP Input	24
4.1.6 2 nd Main Screen (For the DVB-T2/T)	25
4.2 LCD Screen	26
4.3 Speaker & Headphones audio outputs	27
4.4 LEDs	28
4.5 Front panel	29
4.5.1 ON/OFF Button	29
4.5.2 OK Button	29
4.5.3 Cross Button	30
4.5.4 Left and Right Button	30
4.5.5 Up and Down Button	30
4.6 Menus	31
4.6.1 Menu Navigation	35
4.6.2 Menu Structure	36
Chapter 5: Autotracking Antenna (optional)	88
5.1 Autotracking Multisector AMS Antenna	89
5.1.1 How it works	89
5.1.2 Installation and Configuration	90
5.2 Autotracking Parabolic Antenna	92
5.2.1 How it works	92
5.2.2 Installation and Configuration	93
Chapter 6: Web Server / SNMP	102
6.1 Introduction	102
6.2 Web Page Overview	105

6.2.1 DVB-T INPUT	105
6.2.2 DVB-T2 INPUT	107
6.2.3 ISDB-T INPUT	109
6.2.4 ASI INPUT	111
6.2.5 TS over IP INPUT.....	112
6.2.6 DECODER.....	114
6.2.7 TSoverIP Output.....	118
6.2.8 UNIT	120
6.3 Web Page Setup Notes.....	126
6.4 SNMP	127
6.4.1 SNMP commands.....	127
6.4.2 MIB	128
Chapter 7: Block Diagram	131
Chapter 8: Equipment Installation	133
8.1 Introduction	133
8.2 Connections	133
8.2.1 Power supply	133
8.2.2 Antenna Inputs	135
8.2.3 DVB-ASI Transport Stream.....	136
8.2.4 Video Outputs	137
8.2.5 Transport Stream over IP (optional)	137
8.2.6 Autotracking connector (Optional)	139
8.2.7 Remote control.....	146
8.2.8 USB.....	146
Chapter 9: Omnidirectional Antennas	147
Chapter 10: Preventive Maintenance	149
10.1 Maintenance Schedule.....	149
10.2 Maintenance Procedures	149
Chapter 11: Warranty	150
11.1 Warranty information.....	150
11.2 Claim for damage in shipment.....	150
11.3 Return procedures.....	150
11.4 Transportation and packaging	151
11.5 Authorization for evaluation	151
Annex A: Video over IP Monitoring on a PC	152
A.1 Introduction.....	152

A.2 VLC media player.....	152
A.2.1 VLC as a player	152
A.2.2 VLC as a recorder	157
Glossary.....	160

Chapter 1: Introduction

The MANO performs DVB-T2, DVB-T and ISDB-T demodulations. It enables compatibility with nearly all types of COFDM transmitters. The DVB-T2 modulation outperforms other modulation and offers much higher data rate and therefore, higher quality or much more robust signal than DVB-T and ISDB-T, making longer and more difficult links possible.

It integrates 2 diversities in DVB-T2, DVB-T and ISDB-T demodulations. This allows the user to install different antennas to take advantage of their combined characteristics or employ antennas with similar characteristics orientated in different directions in order to offer wider coverage.

This receiver features H.264 and MPEG-2 decoding for high definition (HD) and standard definition (SD) signals. H.264 compression makes possible HD signal transmission and reception using 40% lower bit-rate than conventional MPEG-2 systems. Moreover, it works in 4:2:2 with 10 bits.

Based on the ultimate and most advanced NTT H.264 compression technology, it offers the highest video quality with the minimum end to end latency available in the market, 33 ms. For added security, it is compatible with BISS-1, BISS-E and optionally AES-128 and AES-256 encryption technologies.

ASI input and Transport Stream over IP input make it possible to use this receiver as a standalone decoder. Besides, the ASI output and the Transport Stream over IP output enable the user to handle the receiver as a demodulator.

This new generation of receivers has several outputs: 3G/HD/SD-SDI, HDMI and Transport Stream over IP outputs. The received signal is simultaneously reproduced in all the outputs while it can be shown in the 13.3-inch LCD screen. The integrated speakers can be used to hear the audios and they are also available embedded in the SDI and HDMI outputs.

The easy control, operation and monitoring make these receivers very manageable.

The easy control, operation and monitoring make these receivers very manageable.

The autonomy of the MANO is 5 hours with the maximum brightness and powered by IDX batteries (model DUO-C190).



Figure 1.1 MANO Mobile Diversity Receiver

Chapter 2: Technical features

RF Stage DVB-T2, DVB-T and ISDB-T:

Frequency Bands (RF):	1.30 to 1.55 GHz
	1.70 to 2.10 GHz
	2.00 to 2.10 GHz
	2.21 to 2.38 GHz
	2.00 to 2.40 GHz
	3.30 to 3.80 GHz
	4.50 to 4.98 GHz
	4.90 to 5.38 GHz
	5.30 to 5.78 GHz
	6.20 to 6.68 GHz
	6.60 to 7.08 GHz
	6.70 to 7.18 GHz
Tuning Step:	10 kHz
Diversity:	2

Typical Receiver Threshold:

Bitrate	Frequency Band	
	<i>5 GHz</i>	<i>2 GHz</i>
<i>4 Mbps</i>	-101 dBm	-102 dBm
<i>5 Mbps</i>	-100 dBm	-102 dBm
<i>6 Mbps</i>	-99 dBm	-100 dBm
<i>7 Mbps</i>	-98 dBm	-99 dBm
<i>8 Mbps</i>	-97 dBm	-98 dBm
<i>9 Mbps</i>	-96 dBm	-98 dBm
<i>10 Mbps</i>	-95 dBm	-97 dBm
<i>12 Mbps</i>	-94 dBm	-96 dBm
<i>14 Mbps</i>	-94 dBm	-95 dBm
<i>20 Mbps</i>	-90 dBm	-92 dBm
<i>30 Mbps</i>	-85 dBm	-86 dBm
<i>46 Mbps</i>	-76 dBm	-78 dBm

IF Range:

Fixed:	70 MHz to 1000 MHz
Mobile:	150 MHz to 980 MHz

Demodulation:

DVB-T2:	COFDM 1K, 2K, 4K, 8K and 8K_ext QPSK, 16QAM, 64QAM, 256QAM LDPC FEC: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6 IG: 1/4, 19/128, 1/8, 19/256, 1/16, 1/32 Bandwidth: 1.7, 5, 6, 7, 8 MHz Max. bitrate: 46.4 Mbps Min. bitrate: 1 Mbps
DVB-T:	COFDM 2K and 8K QPSK, 16QAM, 64QAM FEC: 1/2, 2/3, 3/4, 5/6, 7/8 IG: 1/4, 1/8, 1/16, 1/32 Bandwidth: 5, 6, 7, 8 MHz Max. bitrate: 31.67 Mbps
ISDB-T:	OFDM 2K, 4K and 8K QPSK, 16QAM, 64QAM FEC: 1/2, 2/3, 3/4, 5/6, 7/8 IG: 1/4, 1/8, 1/16, 1/32 Bandwidth: 6, 7, 8 MHz Max. bitrate: 31 Mbps

Decoder:

H.264:	Profiles: Baseline, Main, High High 422 Support 10 bits Level: 4.1 – 4.2 Latency: 33 ms
MPEG-2:	Profiles: 422P@HL, MP@HL, 422P@ML, MP@ML Latency: 33 ms
Audio Decoder:	MPEG-1 Layer I/II
Max. audio input bitrate:	384 kbps per channel

Decryption:

BISS: BISS-1 and BISS-E
 AES: AES-128 and AES-256

Video:

Outputs: 3G-SDI
 HD-SDI
 SD-SDI
 HDMI (1.4)

Formats: **1080p** (1920x1080) – 23.98/ 24/ 25/ 29.97/ 30/ 50/ 59.94/ 60 Hz
1080i (1920x1080) – 50/ 59.94/ 60 Hz
720p (1280x720) – 23.98/ 24/ 25/ 29.97/ 30/ 50/ 59.94/ 60 Hz
576i (720x576) – 50 Hz
480i (720x480) – 59.94 Hz

Audio:

Output: HDMI/ SDI embedded/ Speakers
 SDI embedded: 1 Group (4 audio channels)

Data:

Output Fixed at 115000 baud rate

ASI and IP:

Outputs and Inputs: ASI Transport Stream (EN50083-9)
 Transport Stream over IP
 (SMTP2022/CoP3) - FEC
 Max. TS packets / IP packet: 7

Control and Monitorization of the device:

Control Interfaces: Front panel & display
 Web Server interface
 SNMP

Monitoring:	Decoder parameters Demodulation parameters Frequency and input level MER, BER, C/N Alarms, warnings, logbook and clock
Video & Audio:	LCD Video screen 13.3" 2x Stereo loud-speakers Earphone output

Antenna Control:

Parabolic:	Autotracking with positioner in 2 axis Remote polarization control
Multisector:	Autotracking with panel switching

Power Supply:

DC input:	11 to 36 V
Max. Consumption	3.2 A at 12 V
(Max. Brightness)	1.5 A at 24 V 1.3 A at 28 V 1.05 A at 36 V

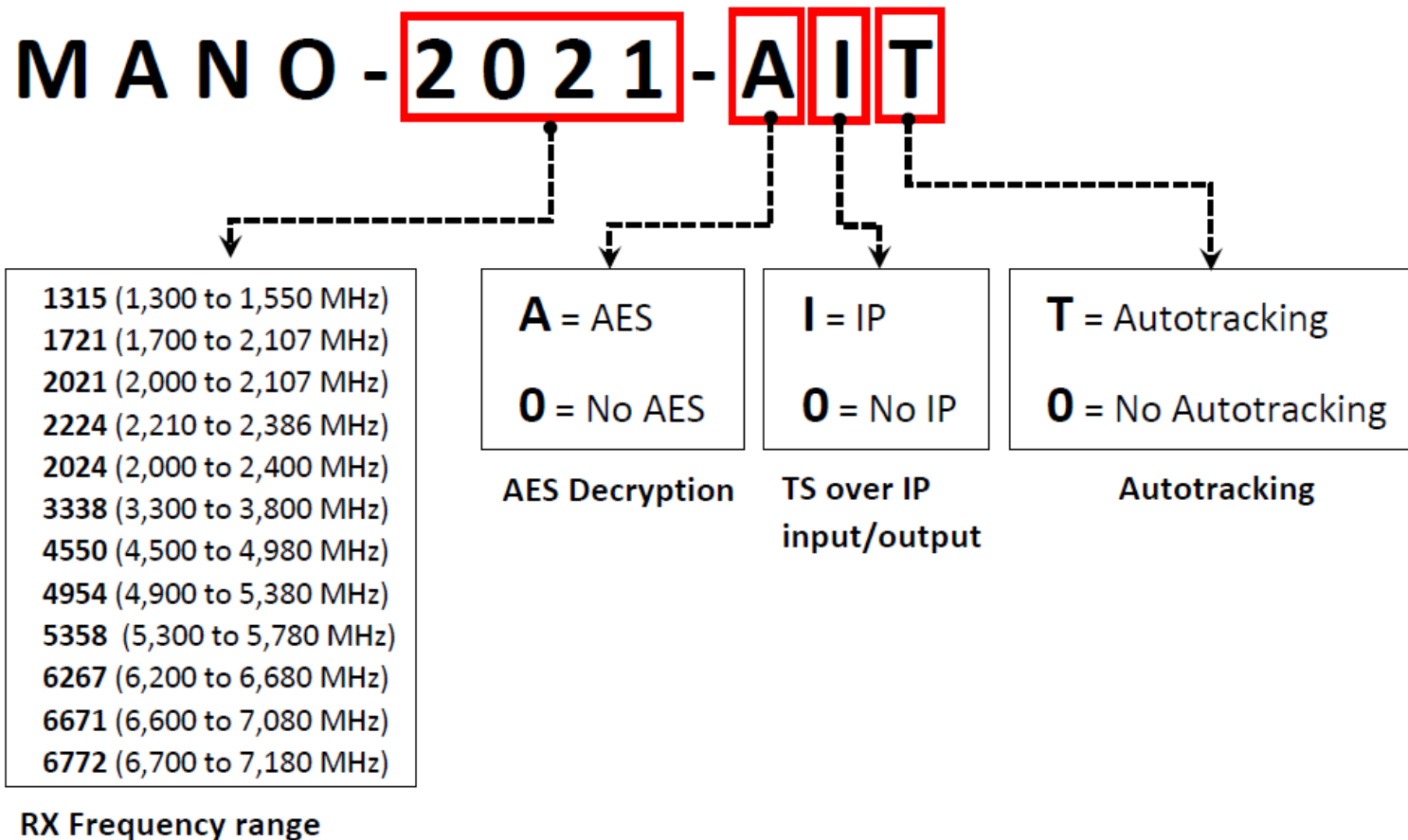
Mechanical:

Size:	394 x 205 x 46 mm
Weight:	3 kg (6.6 lb)

Environmental:

Temperature range:	-20 to 55 °C
Humidity:	95%

Chapter 3: How to order



Chapter 4: Receiver Operation and Menus

This section contains all the necessary information to operate, control and configure the *Receiver*.

4.1 Display

To switch the equipment on and off, press ON/OFF button. When the equipment is turned on, the display will show a start-up, and then it will display the first main screen. To change from one main screen to another, the OK button must be pressed.

- 1st main screen: displays the most important parameters of the received signal.
- 2nd main screen: shows signal reception conditions, level and quality (for DVB-T2, DVB-T and ISDBT).



It is important to consider that the 1st main screen is different depending on the standard of the received signal and the selected input.

Next, the main screen for each input type (DVB-T2, DVB-T, ISDB-T, ASI and IP) is shown:

4.1.1 1st Main Screen for the DVB-T2

In the table below, the function of each parameter is explained.

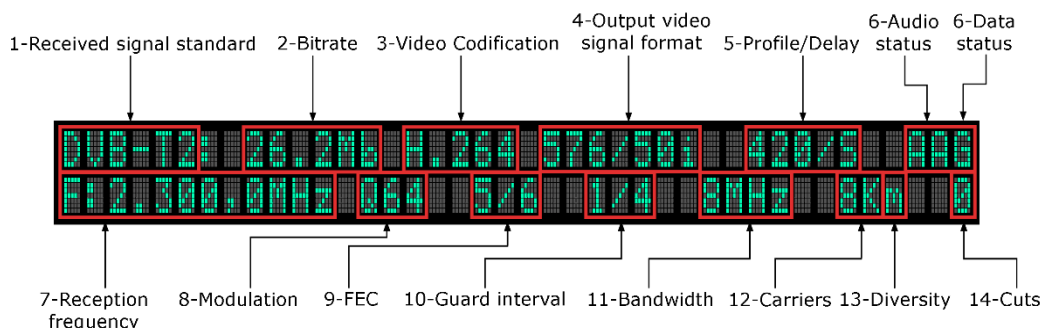


Figure 4.1: 1st Main screen DVB-T2

Parameter nº	Function
1	Received standard (DVB-T2)
2	Received bitrate (Mbps)
3	Video Codification (H.264 / MPEG-2)
4	Video Format (1080p, 1080i, 720p, 576i, 480i)
5	Video options: - Profile (4:2:0 or 4:2:2) - Delay (Standard (S), Super Low delay (UL) or Ultra Low delay (UL))
6	Characters 1 (Audio 1) and 2 (Audio 2): - Audio status indication (Audio 1 and 2 not darkened -> audio received darkened -> audio not received) Character 3: - Data status indication (not darkened -> data received darkened -> data not received)
7	Reception frequency (MHz)
8	Modulation (QPSK, 16QAM, 64QAM, 256QAM)
9	LDPC FEC (1/2, 3/5, 2/3, 3/4, 4/5, 5/6)
10	Guard Interval (1/4, 19/128, 1/8, 19/256, 1/16, 1/32)
11	Bandwidth (1.7, 5, 6, 7, 8 MHz)
12	Carriers (1K, 2K)
13	Diversity Technique: Mobile (m) or Fixed (f)
14	Number of cuts occurred to the input RF signal: In case there is a cut in the RF received signal, the number of cuts counter will increase its value in 1. To reset and set to 0 this value, press left button.

Table 1: Main screen for DVB-T2 standard



Before the audio status field, there could be a padlock depending on the encryption mode. If the input signal is encrypted, then a padlock will appear in this field.



If a flicking "s" is shown in diversity technique field, means that MRC technique has been selected by user but, due to MRC restrictions, the equipment has changed automatically to Switching mode.

4.1.2 1st Main Screen for the DVB-T

In the table below, the function of each parameter is explained. These values are numbered in the order they appear on the main screen.

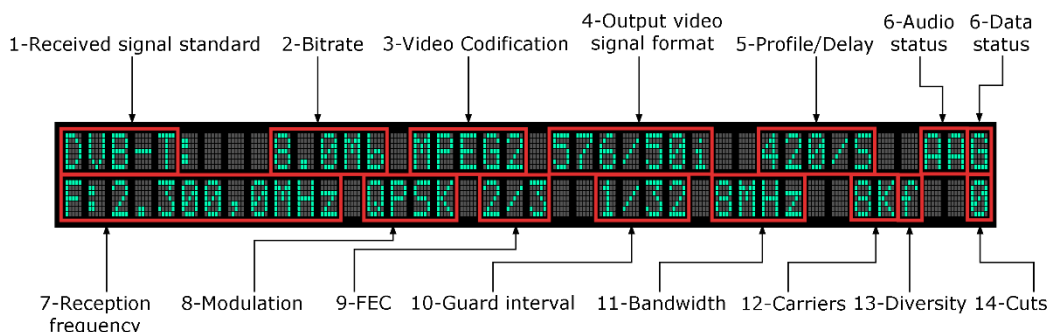


Figure 4.2: 1st Main screen DVB-T

Parameter n°	Function
1	Received standard (DVB-T)
2	Received bitrate (Mbps)
3	Video Codification (H.264 / MPEG-2)
4	Video Format (1080p, 1080i, 720p, 576i, 480i)
5	Video options: • Profile (4:2:0 or 4:2:2) • Delay (Standard (S), Super Low delay (UL) or Ultra Low delay (UL))
6	Characters 1 (Audio 1) and 2 (Audio 2): • Audio status indication (Audio 1 and 2 not darkened -> audio received / darkened -> audio not received) Character 3: • Data status indication (not darkened -> data received / darkened -> data not received)
7	Reception frequency (MHz)
8	Modulation (QPSK, 16QAM, 64QAM)
9	FEC (1/2, 2/3, 3/4, 5/6, 7/8)
10	Guard Interval (1/4, 1/8, 1/16, 1/32)
11	Bandwidth (5, 6, 7, 8 MHz)
12	Carriers (2K and 8K)
13	Diversity Technique: Fixed (f) or Mobile (m)
14	Number of cuts occurred to the input RF signal: In case there is a cut in the RF received signal, the number of cuts counter will increase its value in 1. To reset and set to 0 this value, press left button.

Table 2: Main screen for DVB-T standard

4.1.3 1st Main Screen for the ISDB-T

In the table below, the function of each parameter is explained. These values are numbered in the order they appear on the main screen.

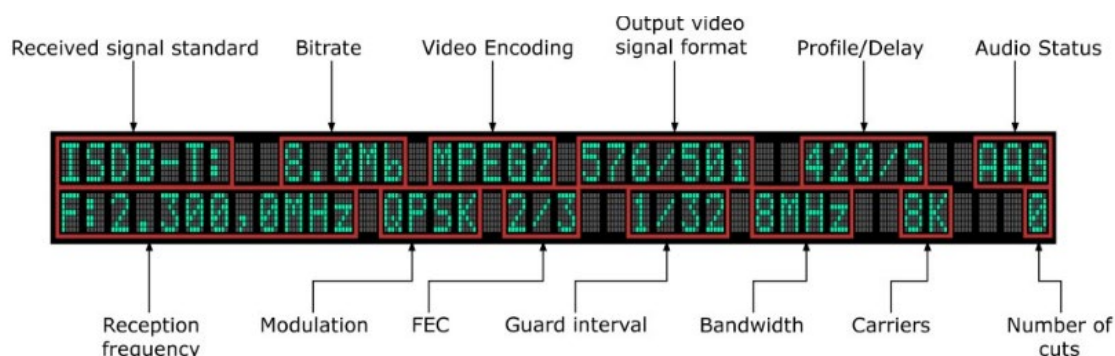


Figure 4.3: 1st Main screen ISDB-T

Parameter n°	Function
1	Received standard (ISDB-T)
2	Received bitrate (Mbps)
3	Video Codification (H.264 / MPEG-2)
4	Video Format (1080p, 1080i, 720p, 576i, 480i)
5	Video options: • Profile (4:2:0 or 4:2:2) • Delay (Standard (S), Super Low delay (UL) or Ultra Low delay (UL))
6	Characters 1 (Audio 1) and 2 (Audio 2): • Audio status indication (Audio 1 and 2 not darkened -> audio received / darkened -> audio not received) Character 3: • Data status indication (not darkened -> data received / darkened -> data not received)
7	Reception frequency (MHz)
8	Modulation (QPSK, 16QAM, 64QAM)
9	FEC (1/2, 2/3, 3/4, 5/6, 7/8)
10	Guard Interval (1/4, 1/8, 1/16, 1/32)
11	Bandwidth (6, 7, 8 MHz)
12	Carriers (2K, 4K and 8K)
13	Diversity Technique: Fixed (f) or Mobile (m)
14	Number of cuts occurred to the input RF signal: In case there is a cut in the RF received signal, the number of cuts counter will increase its value in 1. To reset and set to 0 this value, press left button.

Table 3: Main screen for ISDB-T standard

4.1.4 1st Main Screen for the ASI Input

In the table below, the function of each parameter is explained. These values are numbered in the order they appear on the main screen (the first one is the one allocated in the first line beginning from the left, the second one the next on the right ...).

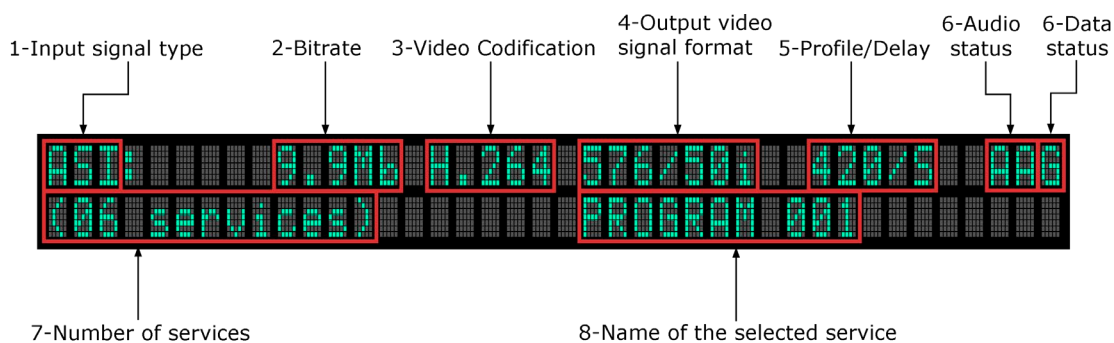


Figure 4.4: 1st Main screen ASI

Parameter n°	Function
1	Input signal type (ASI)
2	Received bitrate (Mbps)
3	Video Codification (H.264 / MPEG-2)
4	Video Format (1080p, 1080i, 720p, 576i, 480i)
5	Video options: • Profile (4:2:0 or 4:2:2) • Delay (Standard (S), Super Low delay (UL) or Ultra Low delay (UL))
6	Characters 1 (Audio 1) and 2 (Audio 2): • Audio status indication (Audio 1 and 2 not darkened -> audio received / darkened -> audio not received) Character 3: • Data status indication (not darkened -> data received / darkened -> data not received)
7	Number of services available
8	Name of the selected service

Table 4: Main screen for ASI input

4.1.5 1st Main Screen for the IP Input

In the table below, the function of each parameter is explained. These values are numbered in the order they appear on the main screen (the first one is the one allocated in the first line beginning from the left, the second one the next at the right ...).

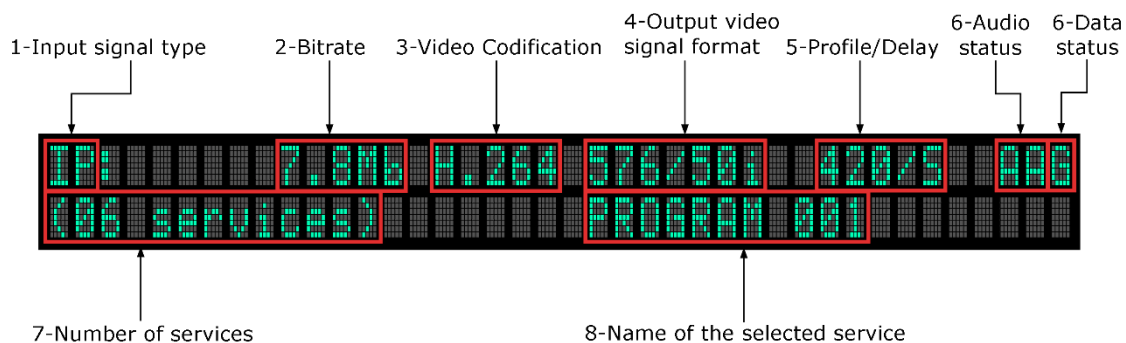


Figure 4.5: 1st Main screen IP

Parameter n°	Function
1	Input signal type (IP)
2	Received bitrate (Mbps)
3	Video Codification (H.264 / MPEG-2)
4	Video Format (1080p, 1080i, 720p, 576i, 480i)
	Video options:
5	• Profile (4:2:0 or 4:2:2) • Delay (Standard (S), Super Low delay (UL) or Ultra Low delay (UL))
	Characters 1 (Audio 1) and 2 (Audio 2):
6	• Audio status indication (Audio 1 and 2 not darkened -> audio received / darkened -> audio not received) Character 3: • Data status indication (not darkened -> data received / darkened -> data not received)
7	Number of services available
8	Name of the selected service

Table 5: Main screen for IP input

4.1.6 2nd Main Screen (For the DVB-T2/T)

On this second screen, the levels and the carrier to noise ratio values of the 2 IF inputs are shown. To see the parameters of the IF inputs, press the Up, Down arrow buttons.

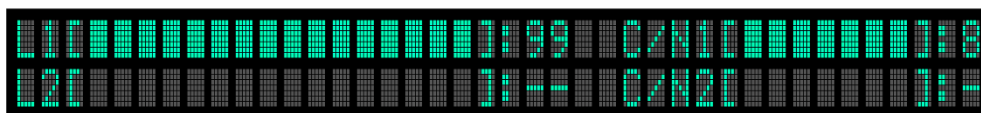


Figure 4.6: 2nd Main screen

The second main screen displays this information for each IF input:

- **Input signal level:** The possible values in this field are from 1 to 99 where a received signal of value 1 is a very weak signal and a signal of 99 means a very strong received signal.
- **C/N (Carrier to Noise Ratio):** The possible values in this field are from 1 to 9 where a received signal of value 1 is a very noisy signal whereas a received signal of value 9 means a very clean received signal.

4.2 LCD Screen

The *Receiver* has a 13.3 inches LCD screen which allows the user to watch the received video signal.

Next, it is shown a figure in which the LCD screen appears.

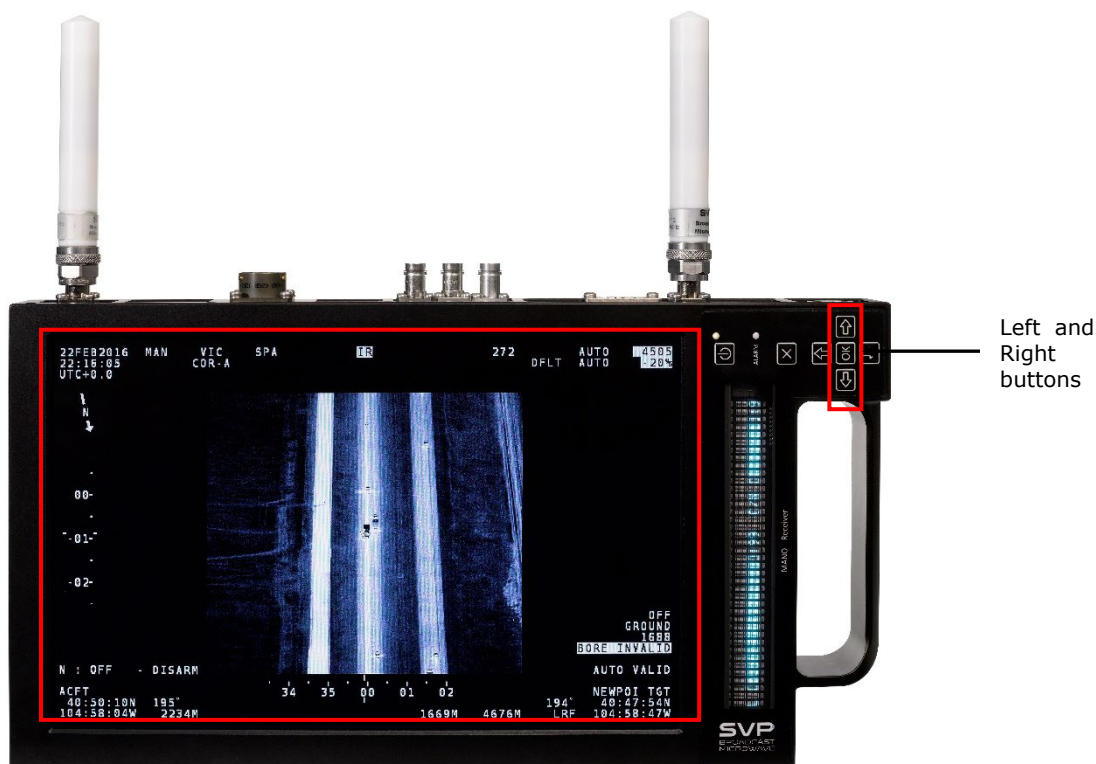


Figure 4.7: 13.3 inches LCD screen

While there is no video signal received, the LCD screen will show a company image.

The brightness of the LCD screen can be controlled with the Left and Right arrow buttons. Maintain pressed the Right button to increase the brightness of the screen or maintain pressed the Left button to decrease the brightness of the screen.

When the Left and Right arrow buttons are pressed, in the screen appears LCD BRIGHT menu with a level bar and indication, with number, of the bright level configured. There are 10 levels of brightness.

4.3 Speaker & Headphones audio outputs

The *Receiver* has two possible direct audio outputs from which the user can hear the audio signal directly. These outputs consist of a connector to which headphones can be connected and two speakers, one situated on the right side of the device and the other one on the left side. These audio outputs can be configured following these steps:

1. Go to the Unit menu.
2. Go to the Audio Monitor option and select Audio 1 or Audio 2 with right and left keys.
3. Press the OK button to configure the Audio Volume and the Audio Speaker.
4. Select Audio Volume and press right and left keys to configure the intensity of the volume.
5. Select Audio Speaker and press right and left keys to enable or disable the two speakers

4.4 LEDs

The *Receiver* has 2 LEDs on its front panel that show the information detailed below.

The **ON/OFF** provides the following information:

- If the LED is off, the equipment is not being fed.
- If the LED blinks in red, there is power to the equipment, but it is turned off.
- The LED lights up in green when the equipment is turned on.

The **ALARM LED** provides the following information:

- The LED lights up in red when any alarm occurs.
- The different alarms that can appear in the decoder are:
 - Input signal not present.
 - Decoder is not decoding.

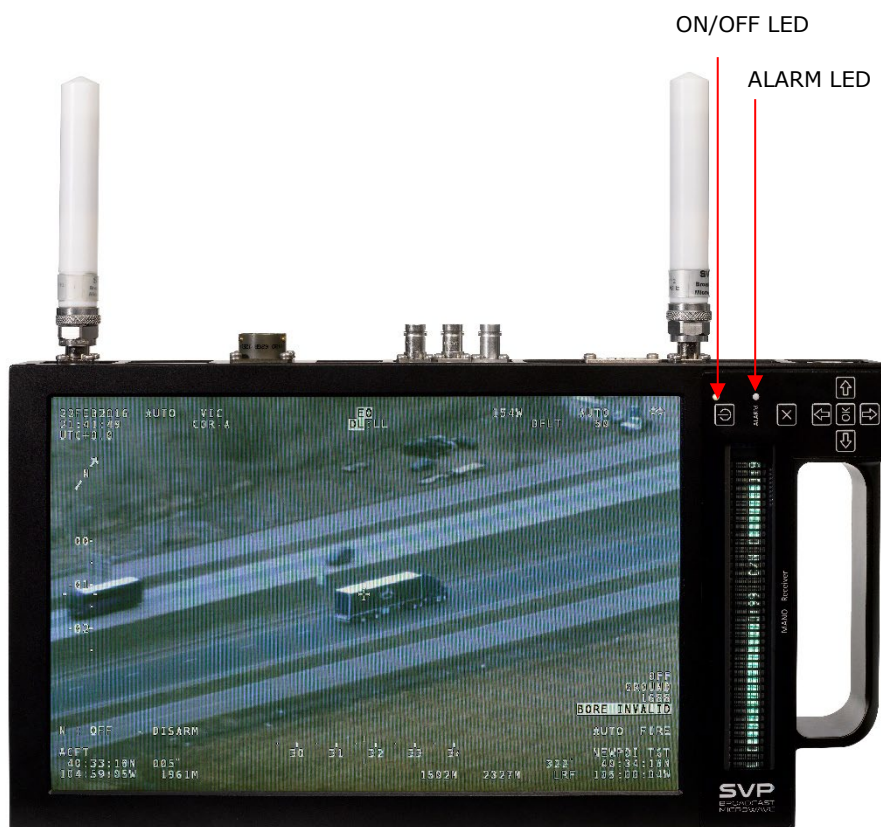


Figure 4.8: *Receiver LEDs*

4.5.3 Cross Button

This button is used to:

- Enter from the unit's main screen to the setup menu and vice versa.
- Exit equipment's submenus.



Figure 4.12: Cross button

4.5.4 Left and Right Button

These buttons are used to:

- Once the parameter to be changed has been selected, they are used to move the cursor towards the digit immediately on the left or right and to select a parameter from different options.



Figure 4.13: Left and Right buttons

4.5.5 Up and Down Button

These buttons are used to:

- Navigate on the main menu and the rest of submenus. These buttons allow the selection of a submenu to enter to. Press OK to enter it.
- Change, for example, the frequency and PID parameter's values. By pressing up and down arrows, the value of those parameters can be changed, increased or decreased respectively. To save the parameter's value, press OK.



Figure 4.14: Up and Down buttons

4.6 Menus

Using the menu of this receiver the user can change receiver's parameters and configure them.

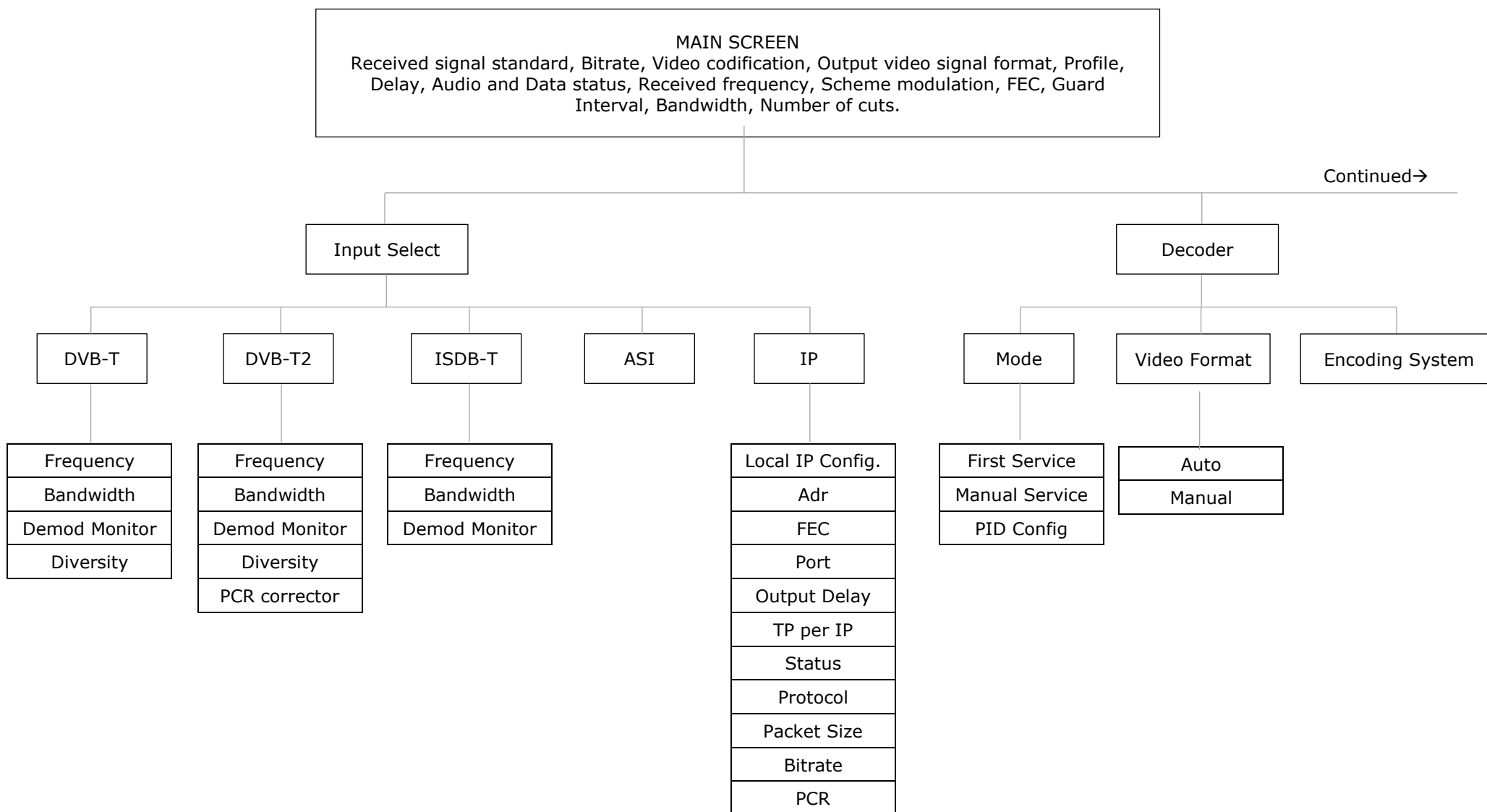
When the receiver is switched on, the main screen appears. There are two main screens that show the parameters of the received signal/s and the quality of these signals (to change from one of these screens to another one, press the OK button):

- The first one shows the parameters of the received signal/s.
- The second one shows the level and quality of the received signal/s selected by user (for DVB-T2, DVB-T and ISDB-T).

To enter the menu of this unit the cross button must be pressed.

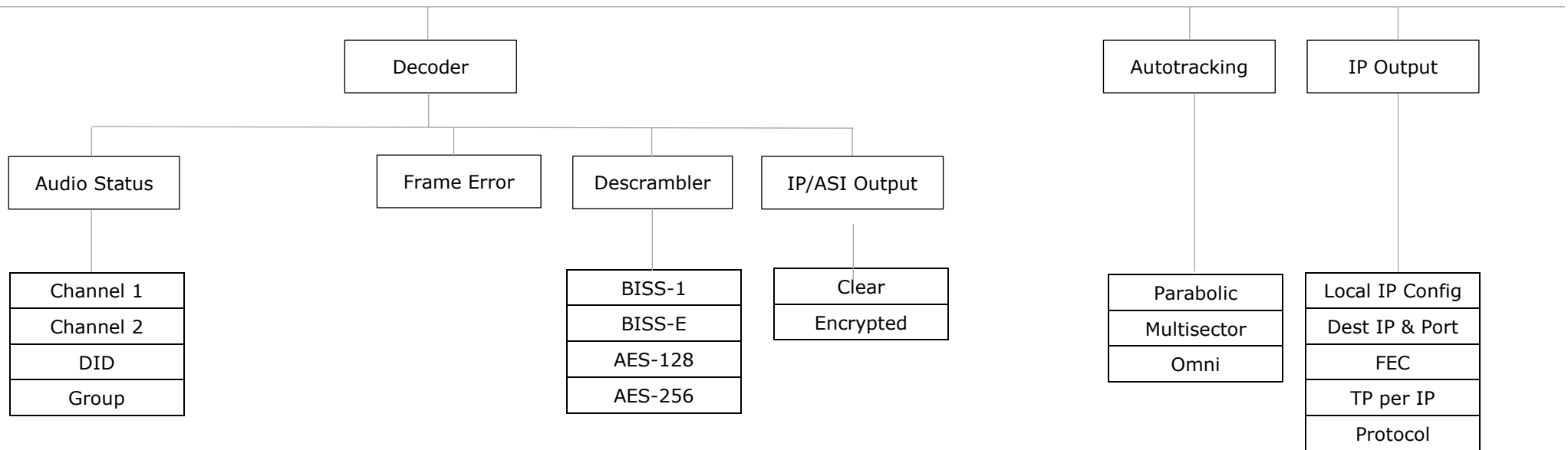
If you want to return to the main screen from the menu, the cross button must be pressed again. Furthermore, when in the submenus area, returning to the main screens is achieved by pressing the cross button as many times as it is needed.

On the next page, a scheme that specifies the menu structure is shown.

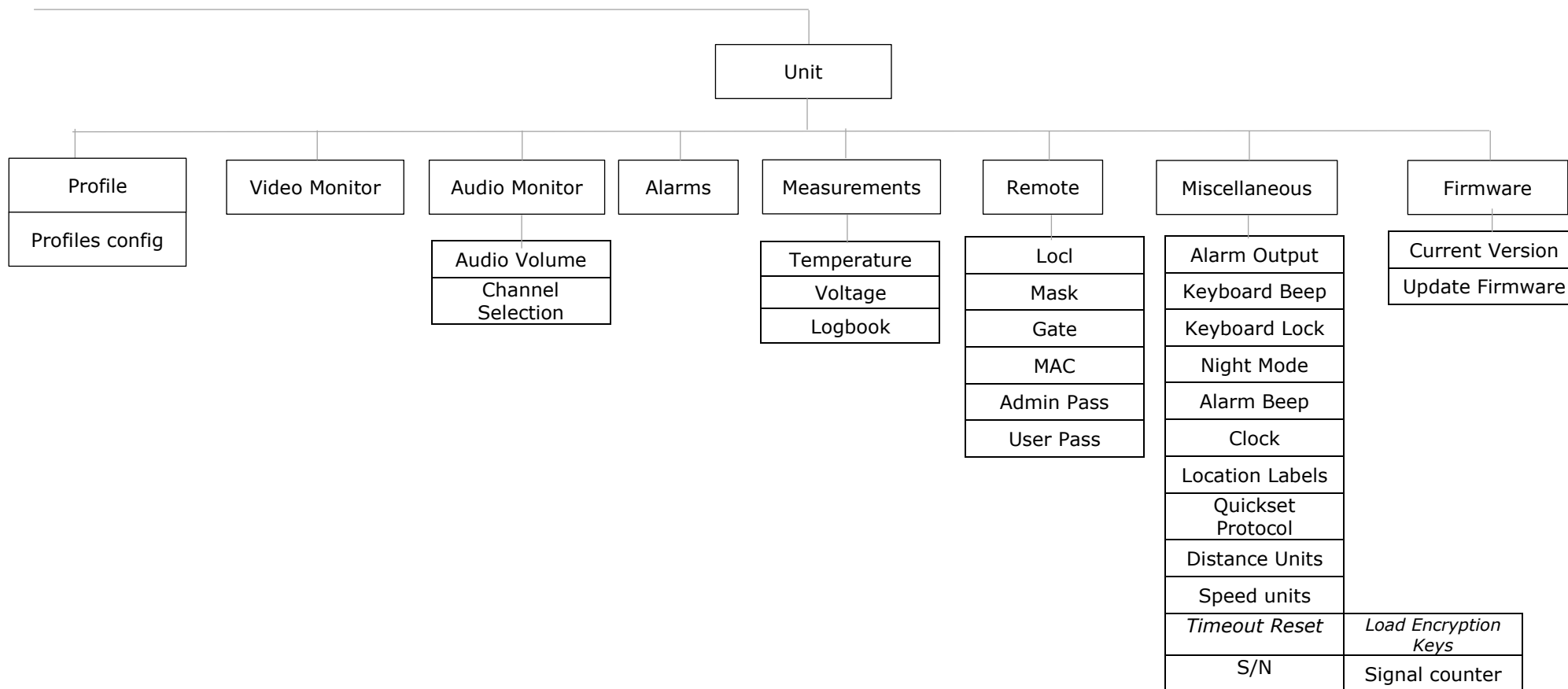


←Continued

Continued→



←Continued



4.6.1 Menu Navigation

This section contains a detailed description of each parameter that can be configured in the *Receiver* via the menu.

To enter the menu, press the Cross button if in the principal screen or in any submenu.

To select a parameter or a submenu use Up, Down arrows. Once selected press OK button to access to a submenu or to edit a parameter. To exit a submenu or a parameter press Cross button.



Symbols < > mean that the parameter can be modified in the same screen with the right and left keys.

Symbol # means that pushing the OK button allows entering to the options of the submenu.

Several types of parameters are available:

- **Eligible:** When the user can choose between predetermined states. (They have the symbols < > near them)
- **Editable:** When the user can enter a value in that option. (The # symbol is displayed on the right of the name). To save the introduced value, the OK button must be pressed.
- **Reading:** When the value of that parameter is a monitored parameter that can't be changed.

Next, the different menus and submenus with the options and the different parameters available are explained. Furthermore, in each figure, example parameters are shown.

4.6.2 Menu Structure

The following menu screen can be accessed by pressing the Cross key from the main screen.

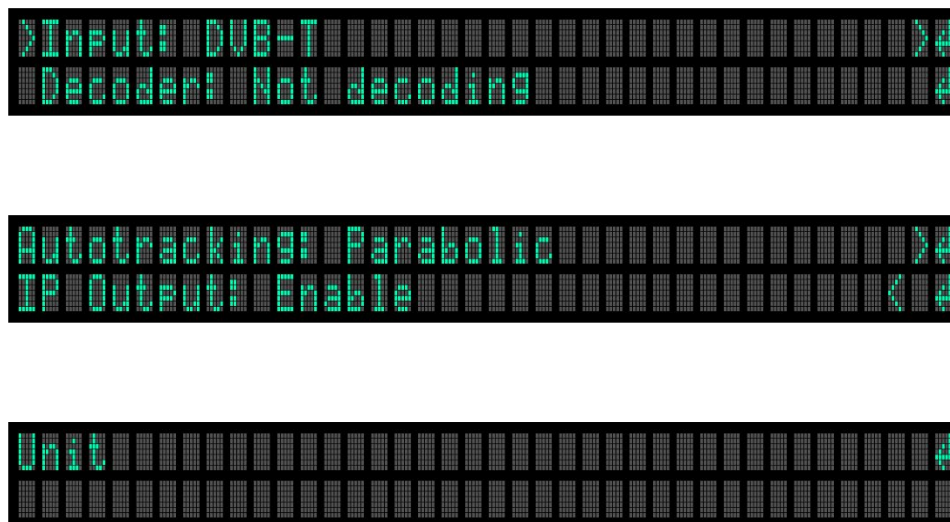


Figure 4.15: Setup Menu

- **Input:** All the parameters related to the received signal/s can be modified here as well as the selection of the input type.
- **Decoder:** All video, audio and data decoding parameters are accessible here.
- **Autotracking:** All the options and parameters related to the Autotracking configuration are shown in this option.
- **IP Output:** Configuration parameters of the output signals are set in this option.
- **Unit:** Parameters related to the Web Server, UART and other internal options of the *Receiver* are configured.

4.6.2.1 Input Select Menu

By using the Up, Down arrow keys, select the **Input** option. To change between inputs, press Left and Right keys. To enter the input submenu, press the OK key. Five inputs can be selected:

- DVB-T
- DVB-T2
- ISDB-T
- ASI
- IP (optional)

4.6.2.1.1 DVB-T



Figure 4.16: DVB-T Input Select Menu

Line n°	Function
	DVB-T → Frequency:
1	In this field, the frequency of the received signal must be set. To establish the frequency value, first press the OK button and then, with the Up, Down arrows buttons select the desired value. To save the introduced value, press the OK button. (editable parameter)
	DVB-T → Bandwidth:
2	In this option, the bandwidth of the received signal must be specified. To select the bandwidth value, Right, Left buttons must be pressed. (eligible parameter) The available options are: • 5 MHz • 6 MHz • 7 MHz • 8 MHz
	DVB-T → Demod Monitor:
3	In this field, the number of the IF input which you want to be monitor must be selected. Once it has been selected, the OK button must be pressed to access the monitor screen where the parameters of the received signal shown below are displayed. (reading parameters) The available options are: • Const (QPSK, 16QAM, 64QAM) • FEC (1/2, 2/3, 3/4, 5/6, 7/8) • TG (1/4, 1/8, 1/16, 1/32) • Level (dBm) • MER (dB) • C/N (dB) • BER

DVB-T → Diversity:

In this field, the diversity technique can be selected.

The available options are:

- Mobile (MRC^[1] technique)
- Fixed (Switching technique)

4

[1] MRC limitations to take into account:

- MRC doesn't work when LO is superior to the RF
- MRC doesn't work if the IF is lower than 150 MHz

In both cases, the unit changes automatically to "Fixed" mode and a flicker "f" appears on DVB-T2 main screen of receiver unit.

Table 6: DVB-T Input Select menu options

On Demodulation Monitor screen, the monitor parameters (Constellation, FEC, Time Guard, Level of the received signal, MER, C/N and BER) are shown.

Firstly, the user must introduce the I.F. input to be monitored (1 or 2).



Figure 4.17: DVB-T Demodulation monitor selection

Secondly, the user must press the OK button to access the demodulation monitor screen.

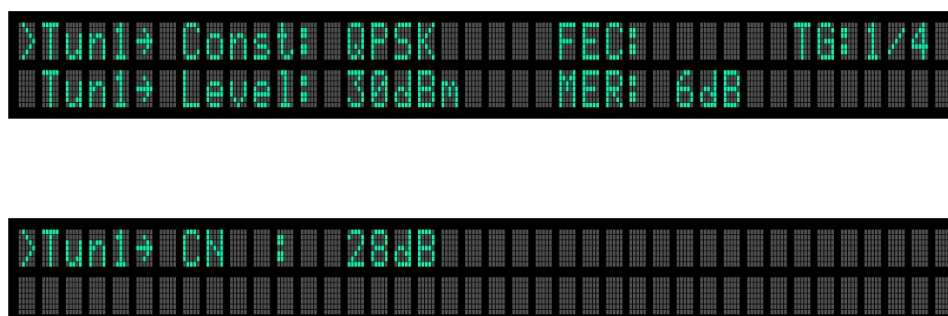


Figure 4.18: DVB-T Demodulation Monitor Screen

4.6.2.1.2 DVB-T2



Figure 4.19: DVB-T2 Input Select Menu

Line nº	Function
1	DVB-T2 → Frequency: In this field, the frequency of the received signal must be set. To establish the frequency value first, press the OK button and then, with the Up, Down arrows buttons select the desired value. To save the introduced value, press the OK button. (editable parameter)
	DVB-T2 → Bandwidth: In this option, the bandwidth of the received signal must be specified. To select the bandwidth value, Right, Left buttons must be pressed. (eligible parameter) The available options are:
2	• 1.7 MHz • 5 MHz • 6 MHz • 7 MHz • 8 MHz

DVB-T2 → Demod Monitor:

In this field, the number of the IF input which you want to be monitored must be selected. Once it has been selected, OK button must be pressed to access the monitor screen where the parameters of the received signal shown below are displayed. (reading parameters)

The available options are:

3

- Level (dBm)
- SNR (dB)
- MER (dB)
- Const (QPSK, 16QAM, 64QAM, 256QAM)
- FEC (1/2, 3/5, 2/3, 3/4, 4/5, 5/6)
- TG (1/4, 19/128, 1/8, 19/256, 1/16, 1/32)
- Mod (1K, 2K)
- Spec (spectrum normal or inverted)
- Rot (constellation rotation enabled or disabled in the received signal)
- Time IL Type (time interleaving mode)
- Length (number of frames in one interleaving frame)

DVB-T2 → Diversity:

In this field, the diversity technique can be selected.

The available options are:

4

- Mobile (MRC^[1] technique)
- Fixed (Switching technique)

[1] MRC limitations to take into account:

- MRC doesn't work when LO is superior to the RF
- MRC doesn't work if the IF is lower than 150 MHz

In both cases, the unit changes automatically to "Fixed" mode and a flicker "f" appears on DVB-T2 main screen of receiver unit.

Table 7: DVB-T2 Input Select menu options

Next, it is shown the layout of the monitor parameters (Level of the received signal, Signal to Noise Ratio, Constellation, FEC, Time Guard, Mod, Spectrum and Rotation).

First, the user must introduce the I.F. input to be monitored (1 or 2).

```
>DVBT2> Demod Monitor: 1
DVBT2> Diversity: Fixed
```

Figure 4.20: DVB-T2 Demodulation Monitor

Secondly, the user must press the OK button to access the demodulation monitor screen.

```
>Tun1> Level: -30dBm SNR: 20dB MER: --dB
Tun1> Const: 16QAM FEC: 3/5 TG: 1/4
```

```
>Tun1> Mod: --- Spec: --- Rot: ---
Tun1> Time IL Type: - Length: ---
```

Figure 4.21: DVB-T2 Demodulation Monitor Screen

4.6.2.1.3 ISDB-T

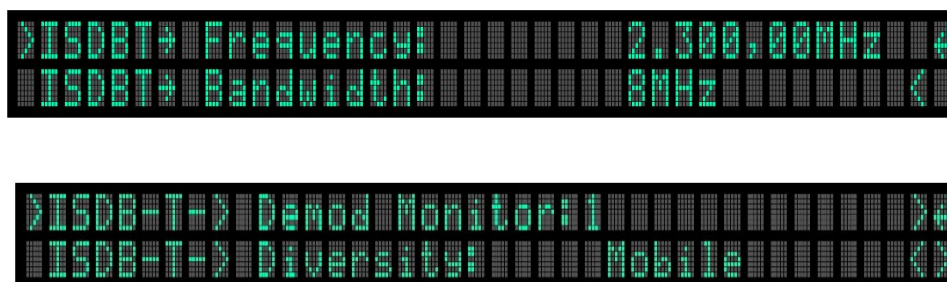


Figure 4.22: ISDB-T Input Select Menu

Line nº	Function
1	ISDB-T → Frequency:
	In this field, the frequency of the received signal must be set. To establish the frequency value first, press the OK button and then, with the Up, Down arrow buttons select the desired value. To save the introduced value, press the OK button. (editable parameter)
2	ISDB-T → Bandwidth:
	In this option, the bandwidth of the received signal must be specified. To select the bandwidth value, Right, Left buttons must be pressed. (eligible parameter) The available options are: • 6 MHz • 7 MHz • 8 MHz

ISDB-T → Demod Monitor:

In this field, the number of the IF input which you want to be monitored must be selected. Once it has been selected, OK button must be pressed to access the monitor screen where the parameters of the received signal are displayed. (reading parameters)

The available options are:

3

- Level (dBm)
- SNR (dB)
- MER (dB)
- Const (QPSK, 16QAM, 64QAM)
- FEC (1/2, 3/5, 2/3, 3/4, 4/5, 5/6)
- TG (1/4, 19/128, 1/8, 19/256, 1/16, 1/32)
- Mod (1K, 2K)
- Spec (spectrum normal or inverted)
- Rot (constellation rotation enabled or disabled in the received signal)
- Time IL Type (time interleaving mode)

ISDB-T → Diversity:

In this field, the diversity technique can be selected.

The available options are:

4

- Mobile (MRC^[1] technique)
- Fixed (Switching technique)

[1] MRC limitations to take into account:

- MRC doesn't work when LO is superior to the RF
- MRC doesn't work if the IF is lower than 150 MHz

In both cases, the unit changes automatically to "Fixed" mode and a flicker "f" appears on DVB-T2 main screen of receiver unit.

Table 8: ISDB-T Input Select menu options

Next, is shown the layout of the monitor parameters (Level of the received signal, Signal to Noise Ratio, Constellation, FEC, Time Guard, Mod, Spectrum and Rotation).

First, the user must introduce the I.F. input to be monitored (1 or 2).



Figure 4.23: ISDB-T Demodulation Monitor

Secondly, the user must press the OK button to access the demodulation monitor screen.



Figure 4.24: ISDB-T Demodulation Monitor Screen

4.6.2.1.4 ASI

By using the right and left arrow keys, select the **ASI Input** option.



Figure 4.25: ASI Input Screen

Then press the Cross button and these ASI options will appear on the main screen:

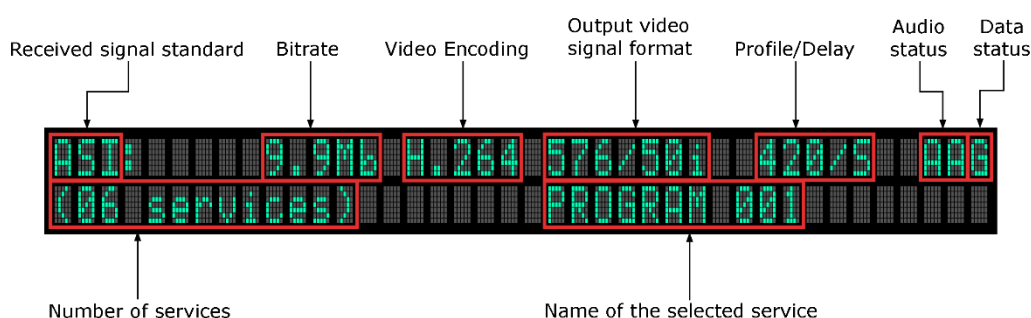


Figure 4.26: ASI Main Screen



Bitrate is only visible if you have video over IP option in your equipment.

Pressing the OK button on the main screen and having the Manual Service option selected in the Decoder menu, the user can access the different services available and see the number of each service.

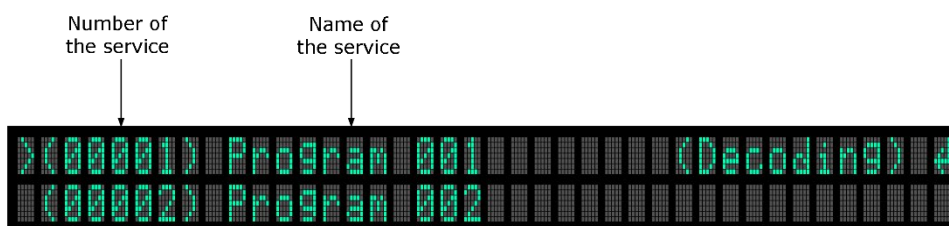


Figure 4.27: Number and name of the services

If the user wants to change the service, select the desired service on the list and press the OK button. This message will appear on the screen:



Figure 4.28: Change the service

Then, press the OK button again to change the service or the cross button not to change it.

4.6.2.1.5 IP

By using the right and left arrow keys, select the **IP Input** option.



Figure 4.29: IP Input selected

Then press the Cross button and these IP options will appear on the main screen:

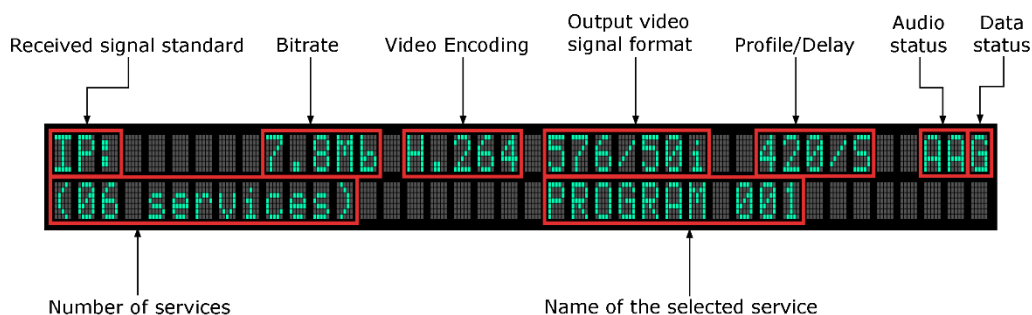


Figure 4.30: 1st Main screen IP

Pressing the OK button on the main screen and having the Manual Service option selected in the Decoder menu, the user can access the different services available and see the number of each service.

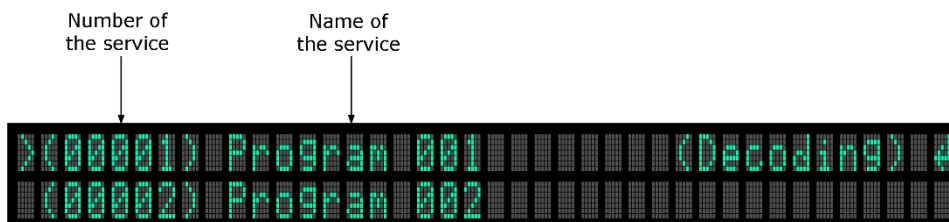


Figure 4.31: Number and name of the services

If the user wants to change the service, select the desired service on the list and press the OK button. This message will appear on the screen:



Figure 4.32: Change the service

Then, press the OK button again to change the service or the cross button not to change it.

To configure the different parameters related to the IP Input option, select IP Input option and press the OK button.

```
>Local IP Config
  Adr:Unicast (192.168.001.039): 5678
```

```
>FEC:Disable
  Output Delay:128 [1..9942]ns
```

```
>IP per IP:1 Status:Channel ENABLE
  Protocol:UDP Packet Size:188
```

```
>BitRate:9.00Mb PCR:No Present
```

Figure 4.33: IP Input Select Menu

To setup the local IP address, network and gateway, select Local IP Config and press OK. The configuration menu is:

```
>Local IP: 192.168.001.008
  Mask: 255.255.255.000
```

```
>Gateway: 192.168.001.001
  MAC: F6-35-81-E5-A6-88
```

Figure 4.34 : Local IP Configuration menu

Line nº	Function
	InpIP → Local IP Config: To configure the network parameters, press the OK button. (editable parameters) The available options are: - Local: To establish the Local IP address, press the OK button and then, with the UP, Down buttons change the value. If the user wants to change from one character to another, press the Right, Left buttons. To save the introduced value, press the OK button. If this IP is the same as the IP for remote control (Webserver / SNMP), the device will show a warning message. - Mask: In this field the Subnet Mask address must be specified. To establish the Subnet Mask address, press the OK button and then, with the UP, Down buttons change the number value. If the user wants to change from one character to another, press the Right, Left buttons. To save the introduced value, press the OK button. - Gateway: In this field the Gateway address must be specified. To establish the Gateway address, press the OK button and then, with the UP, Down buttons change the value. If the user wants to change from one character to another, press the Right, Left buttons. To save the introduced value, press the OK button. - VoIP MAC: In this field the MAC address of the Video over IP card is displayed (reading parameter)
1	
	InpIP → Adr: To select the short of address from which IP information is received, press Right, Left buttons. (eligible parameters) The available options are: - Unicast: In case you want to receive the signal from any single IP address to this device, unicast option must be chosen. - Multicast: In case the signal is received from a multicast address, that multicast address must be configured in this field. To enter the multicast address, press OK button to configure the multicast address. (editable parameter)
2	
	InpIP → Fec: Col: / Row: The IP Forward Error Correction is composed by a number of FEC columns and rows. In this field, it is shown the number of FEC columns and rows of the received signal. (reading parameter)
3	

4	InpIP → Output Delay [1..9942]ms: Delay from IP input to ASI output which is the delay between the obtaining of the IP input and the delivery to the decoder and to the ASI output. To edit this parameter, press the OK button and then, select the desired port with the Up, Down and Right, Left buttons. To save the introduced value press the OK button. (editable parameter)
5	InpIP → TP per IP: This field displays the number of TS packets per IP packet. (reading parameter)
6	InpIP → Status: This field displays the status of the IP input. (reading parameter)
7	InpIP → Protocol: This field displays the protocol used for the communication. (reading parameter) The possible options are: • UDP • RTP
8	InpIP → Packet Size: This field shows the size in bytes (188 or 204 bytes) of the IP received packets. (reading parameter) The available values are: • Channel is enabled • Channel is disabled • Channel is enabled but there is a problem with the processing of the received IP stream.
9	InpIP → BitRate: This field displays the bitrate of the received signal. (reading parameter)
10	InpIP → PCR: Program Clock Reference. To enable a decoder to present synchronized content, such as audio tracks matching the associated video, at least once each 100 ms. This parameter indicates if PCRs are found in incoming TS. (reading parameter)

Table 9: IP Input Select menu options

4.6.2.2 Decoder Menu

By using the Up and Down arrow keys, select the **Decoder** option and press the OK key.

```
>First Service: Program 001
Video Format: Auto (720/50p)
```

```
>Encoding System: 420/S [H.264]
Audio Status: CH1: 256KB CH2: 256KB
```

```
Frame Error: Continue
Descrambler: AES-256
```

```
IP/ASI Output: Encrypted
```

Figure 4.35: Decoder Menu

4.6.2.2.1 Decoder Mode Screen

In this field, the mode for the decoding process is selected. Use Right, Left arrows buttons to select the appropriate option. (eligible parameters).

The available options are:

- **First Service Mode**

If the First Service option is selected, the first available service will be decoded.



Figure 4.36: Decoder First Service Mode Screen

- **Manual Mode**

If Manual mode is selected, then, the user can select a service from the list by clicking the OK button.

Figure 4.37: Decoder Manual Mode Screen



If the OK button is pressed, the user can access the different services



available and see the name and number of each service. The selected service is the one which has the Decoding word on the right.

Figure 4.38: Number and name of the services

If you want to change the service, select the desired service on the list and press the OK button. This message will appear on the screen:



Figure 4.39: Change the service

Then, press the OK button again to change the service or the cross button not to change it.

- **PID Config Mode**

Selecting the PID Selection option and pressing the OK button, the user can configure the parameters shown below.

```
>Manual->Video PID: 134
Manual->Audio1 PID: 234
```

```
>Manual->Audio2 PID: 134
Manual->Data PID: 234
```

```
Manual->GPS PID: 336
Manual->Alarm PID: 337
```

```
>Manual->PMT PID: 678
Manual->PCR PID: 679
```

Figure 4.40: Decoder PID Config Mode Screen

Line nº	Function
	Video PID:
1	Here the video packet identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	Audio1 PID:
2	Here the audio1 packet identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	Audio2 PID:
3	Here the audio2 packet identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	Data PID:
4	Here the data packet identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	GPS PID:
5	Here the GPS data packet identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	ALARM PID:
6	Here the transmitter alarm identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	PMT PID:
7	Here the program map tables identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)
	PCR PID:
8	Here the program clock reference identifier must be entered. To change its value first, press the OK button and then, with the UP, Down arrows select the desired number. To save the introduced value the OK button must be pressed again. (editable parameter)

Table 10: PID Config menu

4.6.2.2.2 Decoder Video Format Screen

This file allows the user to select the format of the receiver signal.



Figure 4.41: Decoder Video Format screen

There are many options available. Press the Right and Left button to select the desired option:

Auto	1080/60i
525/59i	1080/59i
620/50i	1080/50i
720/60p	1080/30p
720/59p	1080/29p
720/50p	1080/25p
720/30p	1080/24p
720/29p	1080/23p
720/25p	1080/60p
720/24p	1080/59p
720/23p	1080/50p

For Auto detection mode, the video format is detected automatically. This option only works with SVP latest transmitter versions (V7 and V9).

For MPEG-2 signals, the auto option is not available. It is necessary to select one of the other options for the received signal.

4.6.2.2.3 Decoder Encoding System Screen

In this field, the next parameters are displayed in the screen.



Figure 4.42: Decoder Encoding System screen

Line nº	Function
	Profile: The profile of the received signal is displayed in this option. (reading parameter) The possible options are 4:2:0 and 4:2:2.
1	Delay: The delay of the received signal is displayed in this option. (reading parameter) The possible options are: • Standard (S) • Low Delay (L) • Super Low Delay (SL)
	Video Codification: The video codification is shown in this option. (reading parameter) The available options are: H.264 and MPEG-2.

Table 11: Decoder Encoding System Menu



In case the transmitter device is configured in Ultra Low Delay, the receiver will indicate Super Low Delay. This means that the receiver is not capable of distinguishing between Super Low Delay and Ultra Low Delay.

4.6.2.2.4 Decoder Audio Status Screen



Figure 4.43: Audio Data

To access the decoder audio screen, the OK button must be pressed. The parameters that appear are:



Figure 4.44: Decoder Audio Screen

Line n°	Function
	Channel 1:
1	In this option, the bitrate of the audio channel1 signal and the audio decoder standard are shown: MPEG1 Layer 1 or 2. (reading parameters)
	Channel 2:
2	In this option, the bitrate of the audio channel2 signal and the audio decoder standard are shown: MPEG1 Layer 1 or 2. (reading parameters)
	DID:
3	Selects the audio group or DID in which the 4 audio channels are going to be embedded in the SDI output signal. To select the desired group, press the Right, Left buttons. (eligible parameters)

Table 12: Decoder Audio Status menu

4.6.2.2.5 Descrambler

In this option, you can choose the encryption mode.



Figure 4.45: Decoder Descrambler screen

There are four options available. Press the Right and Left button to select the desired option:

- BISS-1 (Uses an unencrypted key for the BISS key)
- BISS-E (Uses an encrypted key)
- AES-128 (Optional)
- AES-256 (Optional)

4.6.2.2.6 IP/ASI Output: Encrypted

In this option, you can choose the encryption mode.



Figure 4.46: Decoder IP/ASI Output screen

There are two options available. Press the Right and Left button to select the desired option:

- Encrypted (IP and ASI output signals are encrypted if the input signal is encrypted)
- Clear (IP and ASI output signals are not encrypted)

4.6.2.3 Autotracking Menu

In this section, it is explained how to configure the Autotracking with different types of antenna. The possible options are:

- Parabolic
- Multisector AMS
- Omni

4.6.2.3.1 Parabolic antenna

Next, how to configure the Autotracking with a **parabolic antenna** and the different parameters related to it is explained. Press the OK button to enter to the configuration menu.



Figure 4.47: Parabolic Antenna option

Once the user is inside the parabolic section, there are five possible options (selected with the Right and Left button) which are detailed below:

- **Auto**



Figure 4.48: Parabolic Autotracking (Auto)

When the Auto option is selected, it means that the Parabolic Antenna is aimed automatically at the Transmitter device throughout the GPS coordinates of the Transmitter and the Receiver.

Once user has accessed to the **Auto** screen, three options to choose will appear:

- Transmitter Position
- Receiver Position
- Receiver Configuration

First, press the OK button to access the Transmitter Position screen.

There are different options to select and configure:

```

Transmitter GPS Source: GPS Channel1
>TX Distance: 82.2Km 175° H: 147m
  
```

```

TX Position: 57° 0km 072° 255m
>TX Position: N43°10.459' W002°28.255'
  
```

Figure 4.49: Transmitter Position screen

Line nº	Function
	Transmitter GPS Source: The Transmitter's GPS information can be taken from four different sources: - Externally via UHF transmission. - Internally via Data Channel. - Internally via GPS Channel. - Embedded in ASI input. When ASI input is selected, please press OK key and configure the PID number of the data embedded in the ASI signal. The identifier must be configured between 8180 and 8188 numbers.
1	
	TX Distance: In this option, different parameters are shown (reading parameters): - Distance between Transmitter & Receiver (km) - Direction from Transmitter to Receiver (degrees) - Height difference (m)
2	
	TX Position: In this option, different parameters are shown (reading parameters): - Number of satellites - Speed of the Transmitter (kn) - Direction of the Transmitter (degrees) - Height of the Transmitter (m)
3	

TX Position:	
4	In this option, different parameters are shown (reading parameters):
	• Latitude of the Transmitter
	• Longitude of the Transmitter

Table 4.13: Transmitter Position menu

Secondly, press the OK button to access the Receiver Position screen.



Figure 4.50:GPS Information options

There are different options to select and configure:



Figure 4.51: Receiver Position screen

Line n°	Function
Local Manual or Local GPS:	
1	In this line, the user can set the GPS coordinates of the Receiver. These coordinates are editable when no GPS information is received from an external GPS source. In that case, this option is named Local Manual.
	When GPS information is given by an external source, the GPS information is automatically updated and not editable. In that case, this option is named Local GPS.
	When we have been receiving GPS from an external GPS source but we have lost it, the last GPS position received will be saved and the SAVED word will appear on the second line.

2 **Local Altitude/ Speed/ Satellite number:**

In this line, the user can read the local altitude, speed and satellite number information provided by the external GPS source.

When there is no GPS information, the local altitude is editable parameter by the user.

Heading and Inclinometer compensation:

In this file are shown the measured values for the True North Heading, Pitch and Roll.

The True North Heading can be introduced manually or automatically by the use of an external Compass (Novatel Flexpak6). When the Heading is being provided by an external Compass, immediately after the degree symbol, an alarm indicator is displayed indicating the following:

- **Static capital C** will indicate that we are receiving the Compass information correctly.
- **An intermittent signal between lowercase c and uppercase C** will indicate that we have the Compass connected but that the information we receive from the Compass is not correct. HDT information is received but the fields are empty.
- **A flashing capital C** will indicate that we have lost the Compass. After 10 seconds, the capital C will become in a **capital S** which indicates that the Heading has been saved from the last information received by the Compass. And it will show which Heading is saved.

The Heading can be manually edited in all the cases unless when there is a static capital C, that means that the external Compass has priority over the editable Heading.

When the Heading is a manually edited value and we have saved it, the indicator will be a **static capital M** that indicates that this is the manually edited value.

Pitch and Roll values are provided by the external Inclinometer (CTI Sensors TILT-30A). These are reading only parameters, at the end of the line, the compensation applied by the Pitch and Roll measurements is shown.

Go to True North:

This option points the positioner to the True North. It is used to guarantee the correct configuration of the tracking system once all the configurable parameters have been set (GPS position, North Heading, Pan and Tilt measurements and Antenna Calibration).

4

Once the positioner has been pointed to the North, please make sure that the calibration is correct by comparing it with an external Compass.

Table 4.14: Receiver Position menu

To finish, press the OK button to access the Receiver Configuration screen.



Figure 4.52: Receiver Configuration Option

There are different options to select and configure:



Figure 4.53: Receiver Configuration Screen

Line nº	Function
	Antenna Vertical Angle:
1	The Antenna Vertical Angle must be set as the vertical beam width of the antenna used (this angle will determine the vertical increase done while the unit is in Search Profile mode).

Polarization and Search Profile:	
	The Polarization can be controlled when an APO-75 with multiple Polarization antenna is being used, the polarization of the antenna can be remotely controlled from this menu. For more information, please go to section 9.2.9.2 APO-75 Antenna Polarity control. Another parameter to be configured in this line is the Search Profile: • Profile 1: When only a Parabolic Antenna is used for reception. It makes sweeps in all vertical and horizontal angles. In increments of 10° for the horizontal and in predefined vertical angle for the vertical. • Profile 2: When we use the tracking system in combination with other antennas. The positioner will look for the helicopter on the horizon (0°, +VA and -VA) and will increase the horizontal sweep to 45° in each sweep. This profile makes the H and V sweeps at the same time. • Profile 3: When we use the tracking system in combination with other antennas. The positioner will look for the helicopter in the horizon (0°, +VA and -VA) and will increase the horizontal sweep in 45 each sweep. This profile makes the H sweep first and then the V, forming a square. • NONE: None Search Profile is applicable.
Maximum RF:	
2	If Maximum RF is enabled, when the receiver receives RF signal, but this signal does not include GPS information, the receiver will start tracking the Transmitter by following the maximum RF signal level. If RF signal is not received, the receiver will look for signal following the Search Profile selected. This option is used when no GPS signal is available. On the other hand, if Maximum RF is disabled, the receivers only track the transmitter based on the GPS signal received.
Antenna Calibration:	
3	It is recommended to calibrate the antenna to receive the maximum signal level by compensating any vertical or horizontal deviation introduced during the installation or by any other external causes. Before starting the Antenna Calibration, please make sure that the GPS position of the Receiver, GPS position of the Transmitter, North Heading and Inclinometer compensation are correctly set, these parameters are set in Transmitter Position and Receiver Position menus. For a correct calibration of the antenna, please point the Receiver Positioner to the Transmitter's position and calibrate the antenna until you receive the highest signal level possible.
Level and C/N Indicator:	
4	In this line the level of the signal received is shown, this measurement is used to guarantee the maximum signal received while Antenna Calibration is made.

Table 4.15: Receiver Configuration menu

- **Manual**



Figure 4.54: Parabolic Autotracking (Manual)

If the Manual option is selected by pressing the OK button the user can select manually the position of the Parabolic Antenna. To change the azimuth (H) position of the antenna, press the Right, Left buttons. To change the elevation (V) position of the antenna, press the Up, Down buttons.

The Level and C/N information of the signal are shown to be used for pointing the antenna to the maximum level received.

- **Fold**



Figure 4.55: Parabolic Autotracking (Fold)

Line n°	Function
	Fold Tilt:
1	In this file, the number of degrees that are needed to fold the antenna is displayed. The limits for the fold angle are -30° and +90°. (editable parameter)
	Fold the antenna:
2	In this file, the user can fold the antenna.

Table 4.16: Fold menu



Make sure that when you fold the antenna, the dish does not make contact with anything.

4.6.2.3.2 Sectorial Antenna

Next, how to configure the Autotracking with a **sectorial antenna** is explained.

```
>Autotracking: Multisector AMS <>#
IP Output: Enable <>#
```

Figure 4.56: Sectorial Antenna option

Once the user is inside the sectorial option, there are two possible options (eligible with the Right, Left keys) which are detailed below:



Value T means the top antenna.

- **Auto**

```
1 2 3 4 5 T Δd: ---. -km Auto>#
L1C 0:-- C/N 0:-
```

Figure 4.57: Sector Autotracking (Auto)

When the Auto option is selected, it means that the sector antenna is automatically selected. The selected sector is marked with the square brackets.

If the OK button is selected in this option, the parameters related to the transmitter GPS information (TX Distance and TX Position) and the local GPS information (Local Manual and Local Altitude) are shown.

- **Manual**

```
1 2 3 4 5 T Δd: ---. -km Man<>#
L1C 0:-- C/N 0:-
```

Figure 4.58: Sector Autotracking (Manual)

If the Manual option is selected then, by pressing the OK button the user can select manually the sector antenna from which you want to receive the signal.

4.6.2.3.3 Omni antenna

In this option, the Autotracking is configured with an **omnidirectional antenna**.



Figure 4.59: Omni Antenna option

4.6.2.4 IP Output Menu

By using the Up, Down arrow keys, select the **IP Output** option. This output can be enabled or disabled pressing the right and left buttons.



Figure 4.60: IP Output

To configure the different parameters related to this option, select the enable option and press the OK button.



Figure 4.61: IP Output Options

Line nº	Function
1	Local IP Config: In this field, different parameters related to the configuration of the local network can be set. The available parameters are: - Local: IP address of the device which is going to send the information. To change the IP address first press the OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. To save the value, press the OK button. (editable parameters) - Mask: Subnet address of the device which is going to send the information. To change the Subnet Mask address first press the OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. To save the value, press the OK button. (editable parameters) - Gateway: Gateway address of the device which is going to send the information. To change the Gateway address first press the OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. To save the value, press the OK button. (editable parameters) - Video over IP MAC: In this field the MAC address of the Video over IP card is displayed (reading parameter)
2	Dest IP & Port: In this option, the IP address and the number of the port of the device to which data is sent must be configured. In case you want to send data to a multicast address just enter the desired multicast address. To change the IP address and the number of the port, first press the OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. To save the value, press the OK button. (editable parameter)
3	FEC: In this field the Forward Error Correction can be enabled or disabled. When it is enabled, the number of columns and rows can be configured by pushing firstly the OK button and then, with the Up, Down arrows, the number of columns and rows wanted can be selected. If FEC option is enabled then, the only protocol which can be used is RTP. (eligible parameter and editable if enable option is chosen)
4	TP per IP: In this field the number of Transport Stream packets per IP (from 1 to 7) can be configured. To select the desired value, press the Right and Left buttons. (eligible parameter)

Protocol:	
5	The type of protocol used for the communication can be RTP or UDP. To select the desired protocol for the communication, use Right and Left buttons. (eligible parameter)

Table 17: IP Output menu options



The Local IP address and the destination IP address **MUST** be different.



When a parameter of the TS over IP menu options is changed, it takes 30 seconds for the device to be configured and work again.

4.6.2.5.1 Unit Profile

In this field, you can enable profiles mode in the receiver. In order to access the profiles mode, please select enable and reboot the receiver unit.

4.6.2.5.2 Unit Profile Config

In this field, you can configure up to 16 profiles.

The configurable parameters are:

- Input type:
 - DVB-T
 - DVB-T2
 - ISDB-T
 - ASI
 - IP
- Frequency
- Bandwidth

4.6.2.5.3 Unit Video Monitor Screen

In this option, the video monitor can be configured.



Figure 4.63: Video Monitor Menu

In this field, the LCD video screen can be enabled or disabled. To switch off the LCD video screen, select the Disable option with Right or Left buttons. If you want to switch on the LCD video screen, the enable option must be selected. (eligible parameter)

4.6.2.5.4 Unit Audio Monitor Screen

In this field, the speakers and headphone audio outputs can be enabled, disabled or configured.

The available options are Audio 1 and Audio 2. Each option has eligible parameters to configure the audio monitor. To configure them, the OK button must be pressed, and these options will appear:

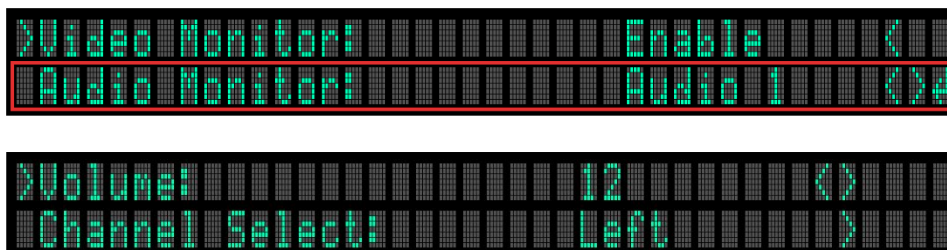


Figure 4.64: Audio Monitor Menu

Line nº	Function
Volume:	
1	Select the level of the audio output signal. The level range is from 0 to 15 where the higher one is the number 15 and the lower one is 0. (eligible parameter)
Channel select:	
In this field, the mode of the audio output can be selected with the Right, Left buttons. (eligible parameter)	
The available options are:	
2	• Left: Select this option to have the left channel of the audio output enabled and the right one disabled. • Right: Select this option to have the right channel of the audio output enabled and the left one disabled. • Right & Left: Select this option if you want to have both of the audio channels (right and left) enabled.

Table 18: Audio Monitor menu options

4.6.2.5.5 Unit Alarms Screen

In this section, you can View and Configure the Alarms shown by the Receiver.



Figure 4.65: Unit Alarms menu

To Configure the Alarms shown by the Receiver, press OK button while Config option is selected:

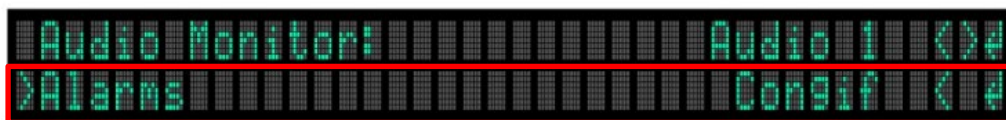


Figure 4.66: Alarms Configuration selection

Once inside Configuration menu, the Alarms which are wanted to be monitored can be enabled. Alarms which are disabled will not being monitored by the Receiver.

The available alarms are:

- Input Signal Not Present
- Decoder Is Not Decoding
- No Video Present
- DC Voltage Low
- DC Voltage High
- High Temperature
- Remote GPS Not Present
- Local GPS Not Present
- Compass GPS Not Present
- Inclinator Not Present
- QPT Not Present

By pressing OK button while View Alarms is selected, the different alarms which are present at this moment are shown:

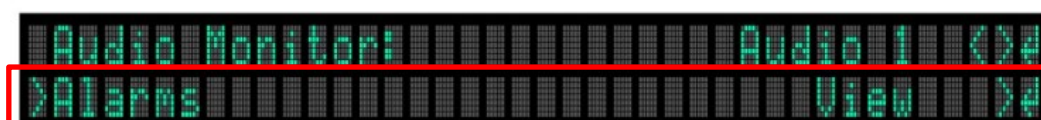


Figure 4.67: Alarms View selection

The alarms are shown as indicated below:

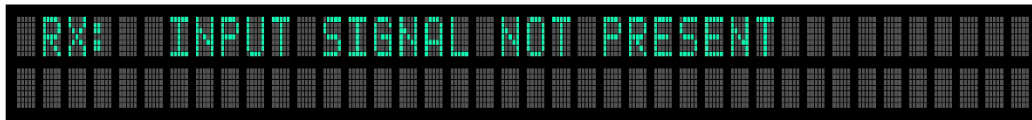


Figure 4.68: Present Alarms

4.6.2.5.6 Unit Measurements Screen

In this field, several monitor parameters of the device are displayed.

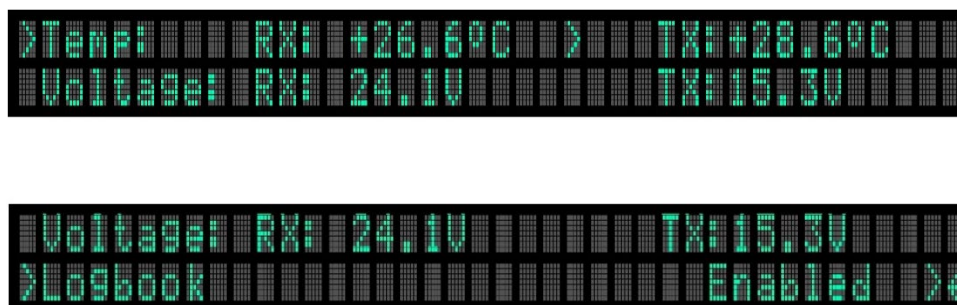


Figure 4.69: Monitor Menu

In this screen, several monitor parameters can be accessed:

Line n°	Function
1	Temperature:
	In this option, the internal temperature of the Receiver and Transmitter is shown. With the Right, Left keys, the user can select if the temperature is shown in °C or in °F. Also, the value which is between square brackets means the speed of the fans (values from 0 to 3) where 0 means that the fans are stopped and value 3 is the maximum speed. (reading parameter)
2	Voltage:
	In this option, the voltage of the Receiver and Transmitter is shown. (reading parameter)
3	Logbook:
	In this option, you can enable or disable the Logbook. Pressing the OK button allows the user to access the Logbook menu where the different events are shown. (reading parameter)

Table 19: Unit Monitor menu options

4.6.2.5.6.1 Monitor LogBook



Figure 4.70: Monitor LogBook Menu

In this option, the different actions that occurred in the device since the last time the logbook was cleared are saved. The total number of logs that can be saved are 4096. If the user wants to clear the LogBook, go to the LogBook → Clear option and press the OK button. If the user wants to see all the events

that have occurred, go to the option LogBook → View and press the OK button.

4.6.2.5.6.2 LogBook View

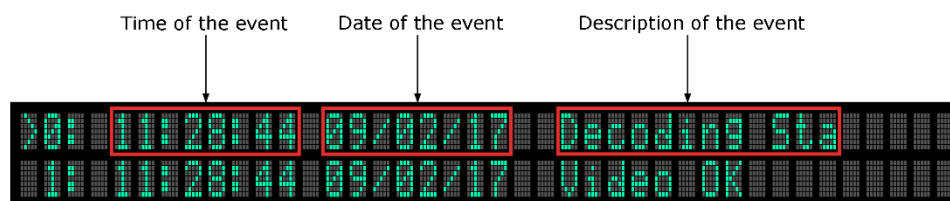


Figure 4.71: LogBook View Menu

On this screen, the different logs that have occurred during the operation of the device are shown. The time at which the event occurred is displayed, the date of the event and a brief description of that event.

4.6.2.5.7 Unit Remote (Webserver & SNMP Screen)

In this field, different parameters related to the configuration of the Webserver are shown.



Figure 4.72: Webserver & SNMP Menu

The available parameters are:

Line nº	Function
1	Loc1: In this option, the IP address of the device can be set in case you want to control the device remotely. This is the IP that must be set in the web browser to access the Webserver. To change the IP address first press OK button and then, with the Up and Down keys select the desired number. To change from one character to another, press Right and Left keys. (editable parameter)
	Mask: Here it can be written the Subnet Mask address of the device. To change the Subnet Mask address first press OK button and then, with the Up and Down keys select the desired number. To change from one character to another, press Right and Left keys. (editable parameter)
3	Gate: In this option, the address of the Gateway must be written. To change the Gateway address first press OK button and then, with the Up and Down keys select the desired number. To change from one character to another, press Right and Left keys. (editable parameter)
4	MAC In this field, the MAC address of the device is shown. (Reading parameter)

Admin Pass:	
5	The administrator's password is introduced. It is a list of 8 digits. It can be set an own password or restore the default password (00000000).
User Pass:	
6	In this option user's password is introduced. It is a list of 8 digits. It can be set an own password or restore the default password (00000000).

Table 20: Webserver & SNMP menu options



The IP address of the Webserver, the Local IP address and the destination IP address must be different.

4.6.2.5.8 Unit Miscellaneous Screen

In this field, several parameters related to the mode of operation of the device can be configured.

```
>Alarm Output: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Disable <
Keyboard Beep: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] OFF <
```

```
>Keyboard Lock: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] OFF <
Night Mode: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] 0 <
```

```
>Alarm Beep: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Disable <
Clock: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] 18:16:56 09/02/17 <
```

```
>Location Labels [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] <
QuickSet Protocol: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] PTCR-20 <
```

```
>Distance Units: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Miles <
Speed Units: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Knots <
```



Figure 4.73: Miscellaneous Menu

The available options are:

Line n°	Function
1	Alarm Output:
	In this option, the alarm output of the Aircraft connector can be enabled or disabled The available options are: • Enable • Disable
2	Keyboard Beep:
	If this option is OFF, then, when the user presses any key of the keyboard, there will be no sound. If the ON option is selected then, a beep sound appears each time a key is pressed. To select between ON and OFF options, press the Right, Left keys. (eligible parameter)
3	Keyboard Lock:
	If the On option is selected and then, the buttons of the equipment remain for 5 minutes without being pressed, a message will appear on the screen saying that the keyboard is locked. Pressing the cross button, the keyboard can be unlocked. If the Off option is selected there will be no messages in the screen. The available options are: • On • Off

Night Mode:	
	There are four possible states for the night mode. To lower the screen brightness, increase the value of this option. The maximum value of this option is 3, setting the brightness to the minimum. (eligible parameter)
4	The available options are: • 0 • 1 • 2 • 3
Alarm Beep:	
	If this option is enabled, then a beep noise will sound each time that an alarm occurs. (eligible parameter)
5	The available options are: • Enable • Disable
Clock:	
6	In this field the date and the current hour are displayed, and they can also be configured pressing the OK button and changing the values with Up, Down and Right, Left buttons. (reading and editable parameter)
Location Labels:	
7	In this field there can be configured several parameters such as the place in which the device is located as well as the position of the transmitter and the receiver device. (editable parameter)
QuickSet Protocol:	
8	In this field the type of QuickSet Protocol employed is shown (eligible parameter). The available options are: PTCR-20 and PTCR-96.
Distance Units:	
	If miles is selected, then, all the distances will be in miles and the same occurs if kilometers is selected. (eligible parameter)
9	The available options are: • Kilometers • Miles
Speed Units:	
	In this field, the desired parameter is selected to measure the speed (eligible parameter). There are three options available:
10	• Knots • Km/h • Mph

Timeout Reset:	
11	In this field the time that the receiver could be without receiving any signal is selected. After passing this time, the equipment is reset. To disable this option, 0 value must be written.
S/N:	
12	In this field the serial number of the device is shown (reading parameter).
Load Encryption Keys:	
13	In this field you can load the encryption keys for BISS and AES modes by USB. The file must have ".svp" extension and the content must be as it is indicated in the following example: <pre>AES128:1202A3412348C9127348FE2348971234 AES256:123AB89070F8097D897EE8970DE879879801098 9182918239182399AFFC123AE BISS1:89701234ABE1 BISSESW:0123AC1238907098 BISSEU:413809ABA12393</pre> Once the keys information has been loaded properly, "KEYS LOADED" message is shown in the screen.
Signal Lost Counter:	
14	In this field, the counter shown in the main page can be configure to count cuts in three different ways: • RF cuts • Video Cuts Video + RF cuts

Table 21: Miscellaneous menu options

4.6.2.5.9 Unit Firmware Screen

In this section, it is shown the firmware and changes can be made to the firmware. The steps to update the device are explained below.

The options are:



Figure 4.74:Firmware Menu

Line nº	Function
1	Current Version:
	In this field, the number of the firmware version installed in the device is shown. The characters which describe the number of the version are the one inside the red box shown in the figure above. The rest of the characters are important for the manufacturer but are not important for the user.
2	Update Firmware:
	This field is the one for updating the version of the device. To update the equipment properly, follow the instructions below.

Table 22: Unit Firmware menu options

In this section, the firmware of the device can be updated. Next, they are explained the necessary steps to make a successful update.

1. The latest firmware is allocated in the webpage of SVP Broadcast Microwave. To access the firmware file, first enter www.svpbm.com in your web browser.
2. Click on the Support tabs

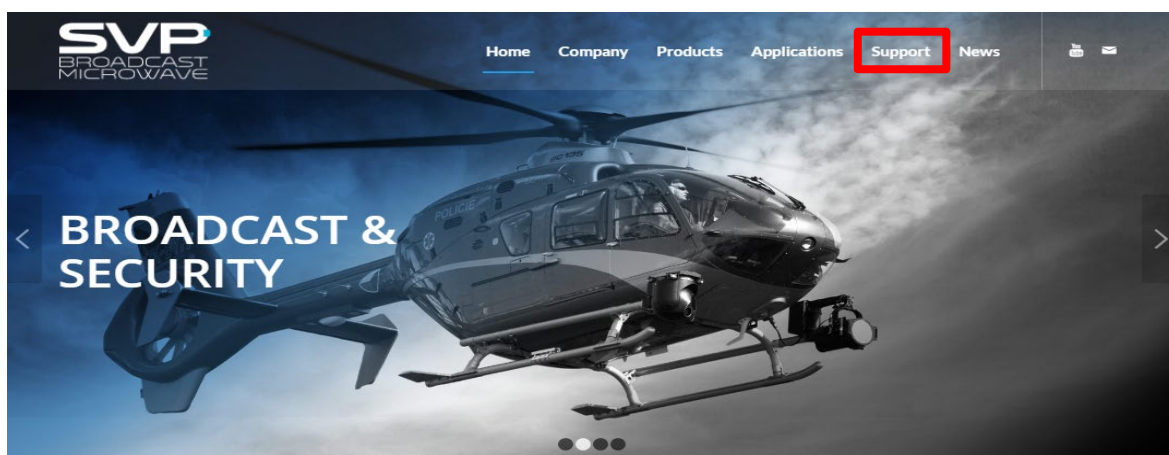


Figure 4.75: Updating firmware step 2

3. Click on Firmware.

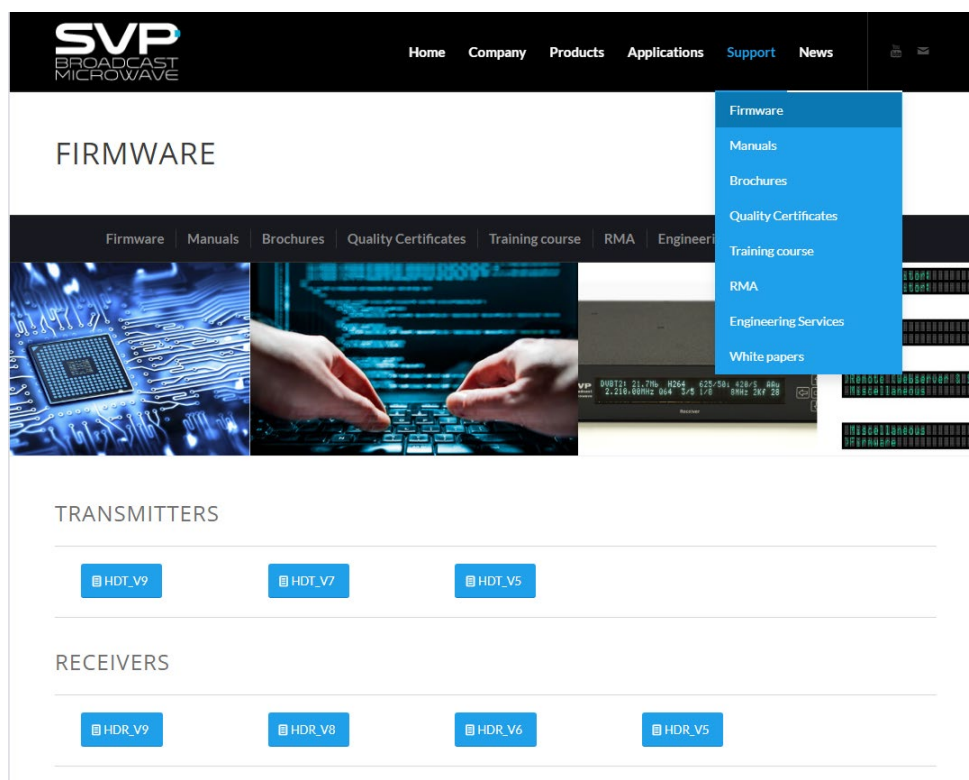


Figure 4.76: Updating firmware step 3

4. Go to RX_Firmware.

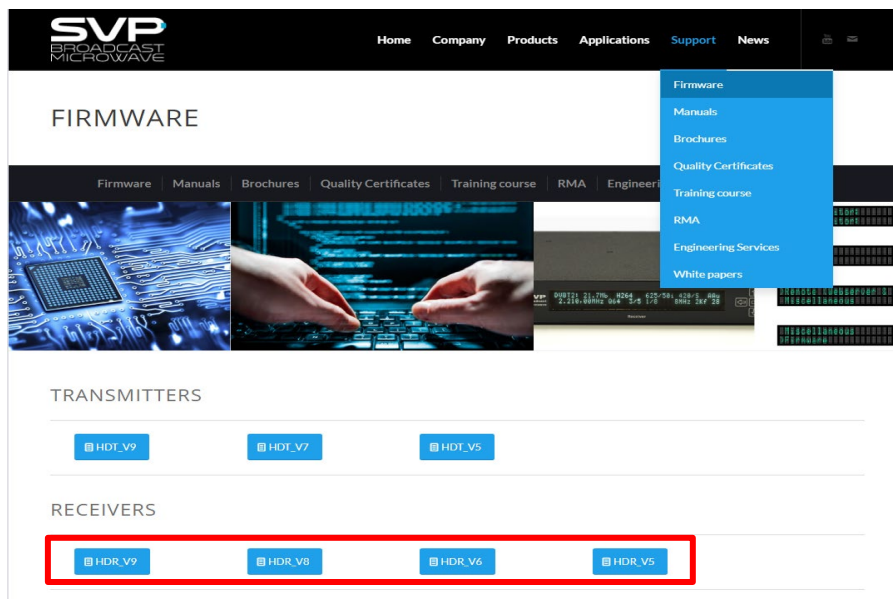


Figure 4.77: Updating firmware step 4

5. Press the version of the receiver model needed (version of the equipment) to download the file.

Go to Firmware field and then press the current version option to check the number of the version installed in the device (the first two digits).

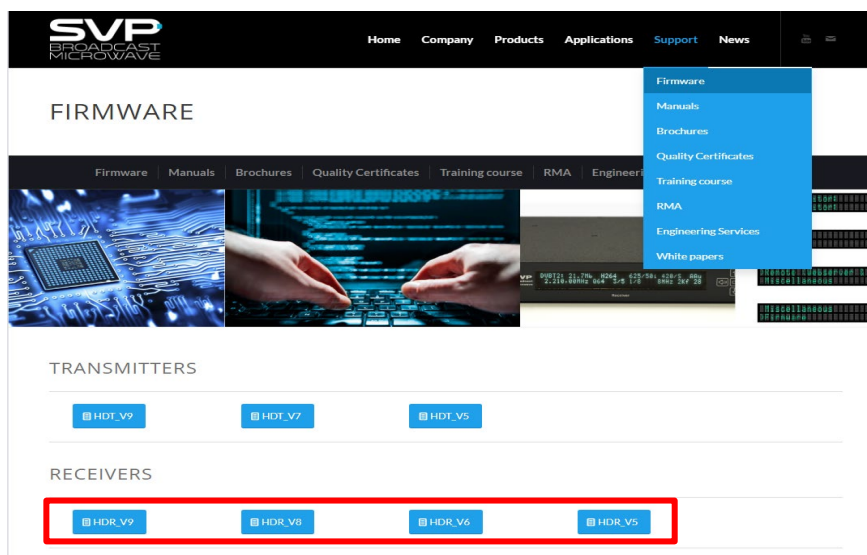


Figure 4.78: Updating firmware step 5

6. Once the firmware file has been downloaded, save it in a USB device.



In the USB device, the only file that can be allocated inside is the firmware file of the device to be updated.

7. With the equipment completely powered off (**with no power supply**), insert the USB device in the USB connector, situated in the rear panel.



Before introducing the USB device, remove the power supply of the equipment.



If there is no signal introduced in the device (RF, ASI or SDI), the updating stage will be quicker.

8. Now, switch on the device.
9. Go to Unit menu. In case of being on the main screen, press the cross button to access the menu. There, with the Up, Down buttons, select the Unit option.
10. Select Firmware by pressing the OK button.
11. Select Check USB Memory with the OK button.
12. Now, automatically the device updates the firmware. The screens which are shown below display the different steps that the device is makes while the updating process is taking place.



Don't power off the device during the updating process.

Figure 4.79: Updating process 1

Figure 4.80: Updating process 2

Figure 4.81: Updating process 3

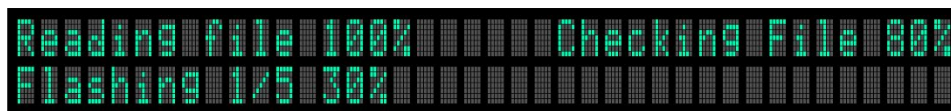


Figure 4.82: Updating process 4



Figure 4.83 Updating process 5

Chapter 5: Autotracking Antenna (optional)

In this section, what the Autotracking antenna control consists of and the detailed steps to follow to configure this option properly is explained.

The *Receiver* can control a sectorial and a parabolic antenna. This new feature constantly provides the highest signal level. The antenna points toward the transmitter all the time.

This feature is achieved with the GPS coordinates sent by the transmitter to the receiver and the GPS coordinates of the receiver. In the receiver, the GPS coordinates can be introduced manually or by an external sensor connected to the Autotracking connector, only NMEA commands are accepted.

In the next points, the two possible Autotracking systems are described.

5.1 Autotracking Multisector AMS Antenna

5.1.1 How it works

The **Autotracking with Multisectorial Switchable Antenna AMS** consist of a tracking system (with up to 5 possible panels and one possible up-down antenna), which has inside a relay controlled by the *Receiver*. This solution provides the *Receiver* with the best signal quality using the GPS coordinates of the transmitter and the receiver. With these GPS coordinates, the *Receiver* device sends a control signal to the relay which is inside the AMS antenna to switch on the most suitable antenna panel in which the level of the received signal is the highest.

With this control signal, the relay (through a circuit based on PIN diodes) allows the RF signal of the most suitable panel antenna passing through it. Then, this signal is sent to the *Receiver*. It is important to orientate the AMS antenna correctly, so please make sure that the blue line on the antenna is faced to the North.

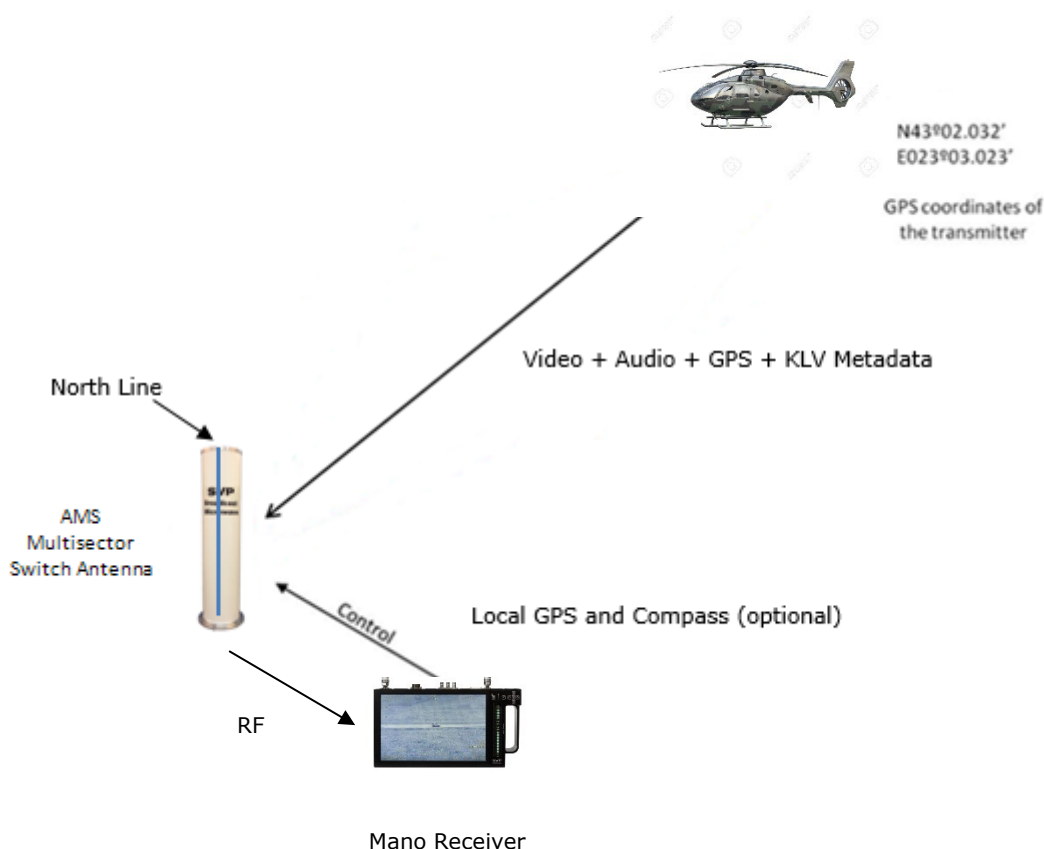


Figure 5.1: Autotracking with panel switching

5.1.2 Installation and Configuration

There are some notes that must be taken into account before starting with the operation of the Autotracking System.

The center of the first sector must be orientated to the North. This center of the first sector is marked with a blue line from the up to the down side of the antenna.

Next, how to configure the Autotracking with a **Multisecotr AMS** is explained.

1. Go to the Autotracking option.



Figure 5.2: Antenna Control menu

In this option, there are three possible types of Autotracking (Multisector AMS, Parabolic and Omnidirectional). In this case, select the **Multisector AMS** option (the parabolic one is explained below) with the Right, Left keys. Once the option is selected, press the OK button to enter to the configuration menu.

2. Once the user is inside the **Multisector AMS** option, there are two possible options (eligible with the Right, Left keys) which are detailed below:
3. Auto



Figure 5.3: Sector Autotracking (Auto)

When the Auto option is selected, it means that the sector antenna is automatically selected. The selected sector is the one which is marked with the square brackets.



Value T means the antenna on the Top.

4. Manual



Figure 5.4: Sector Autotracking (Manual)

If the Manual option is selected then, by pressing the OK button the user can select manually the sector antenna from which you want to receive the signal.



Manual option can only be selected in case there is no remote GPS signal. If the option is configured in manual and the receiver recovers the GPS coordinates, then, the option will turn to Auto again.



If the option selected is Auto and the device is receiving a signal, but the GPS data disappears, the device will automatically be in a tracking mode. It will stay two seconds in each sector until GPS data is received.



In case there is no GPS signal, but the device is receiving the RF signal, the device will be kept in the same sector, it will not be tracking.

5.2 Autotracking Parabolic Antenna

5.2.1 How it works

The **Autotracking with Parabolic Antenna** consist of a directional antenna which is constantly aiming of the transmitter using a QPT Positioner. In this way, we obtain the highest level of the received signal. This is achievable with the GPS coordinates of the transmitter and the receiver device as well as with a communication between the QuickSet Positioner and the *Receiver*.

In addition, for more accuracy, an Inclinator should be used for the Pitch and Roll compensation. The positioner must be correctly orientated to the North; this can be done physically or by an external Compass.

The following diagram shows a typical configuration of Autotracking with MOOG QPT positioner and Inclinator on a tripod:

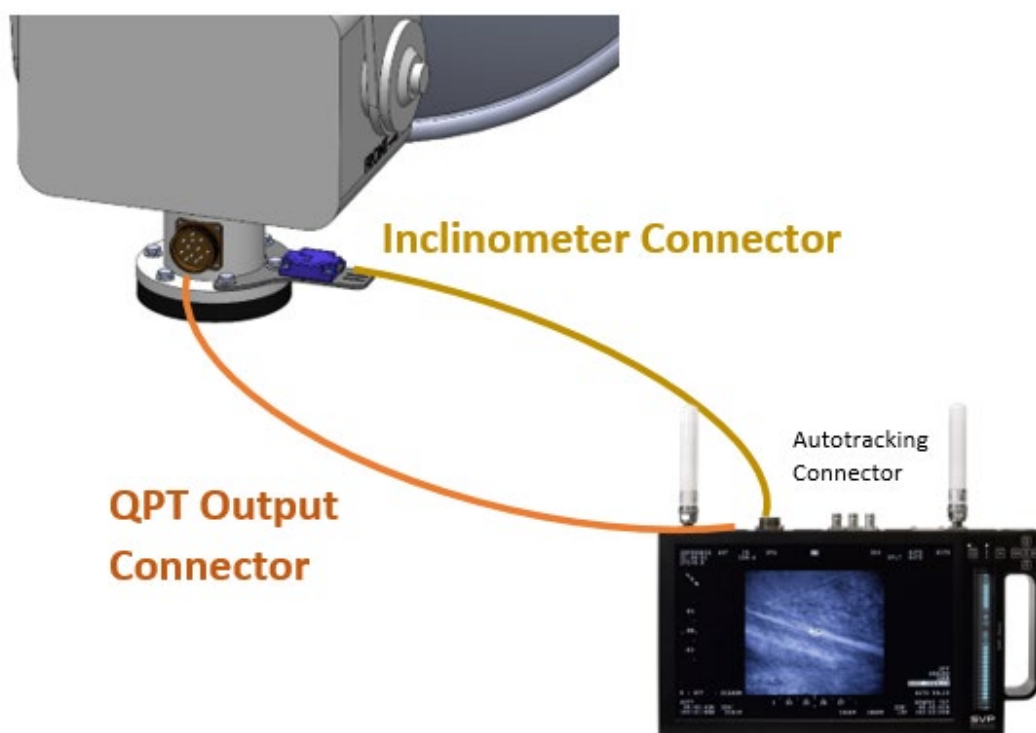


Figure 5.5: Configuration of the Autotracking system with positioner

5.2.2 Installation and Configuration

There are some notes that must be taken into account before starting with the operation of the Autotracking system.

To warranty that the Autotracking system installation has been correctly done and calibrated, the next steps must be followed:

First, make sure that the parabolic antenna is connected to the IF Input 1, it cannot be connected to the IF Input 2.

QPT Positioner must be calibrated. This means that it must be straightened and oriented 0 degrees to the North. The North orientation can be done via an external Compass and the unit can automatically be straightened by the use of an external Inclinator. In addition, for a correct operation, the QPT Positioner must be configured as RS-422 communication. Please note that Autotracking connector's RS-422 port communication speed is of 57600 baud rate.

QPT Positioner, Inclinator, Compass and Local GPS Receiver are connected to the AUTOTRACKING Bayonet 19 pins connector and can be powered directly by the receiver or by an external power supply. The power output provided is 24V when the receiver is powered by AC power. When the receiver is powered in DC, the same input voltage will be provided to the Positioner, Inclinator and Compass. Additional +5 V DC output is available for the Local GPS Receiver.

Next it is explained how must be configured the Inclinator:

- The QPT Positioner is connected via a RS-422 port and the Inclinator is connected via a second RS-422 port to the Autotracking connector.
- The Inclinator must be configured as a RS-422 port. The speed of the Inclinator must be configured at 4800 baud rate with 2 Hz data rate.
- The Inclinator and QPT Positioner can be powered by the Autotracking connector at 24 V.
- A compatible Inclinator example is the TILT-30A from CTI Sensors.
- The Inclinator must be installed on the base of the QPT Positioner for an accuracy measurement of PITCH and ROLL parameters as it is shown in the following diagram:

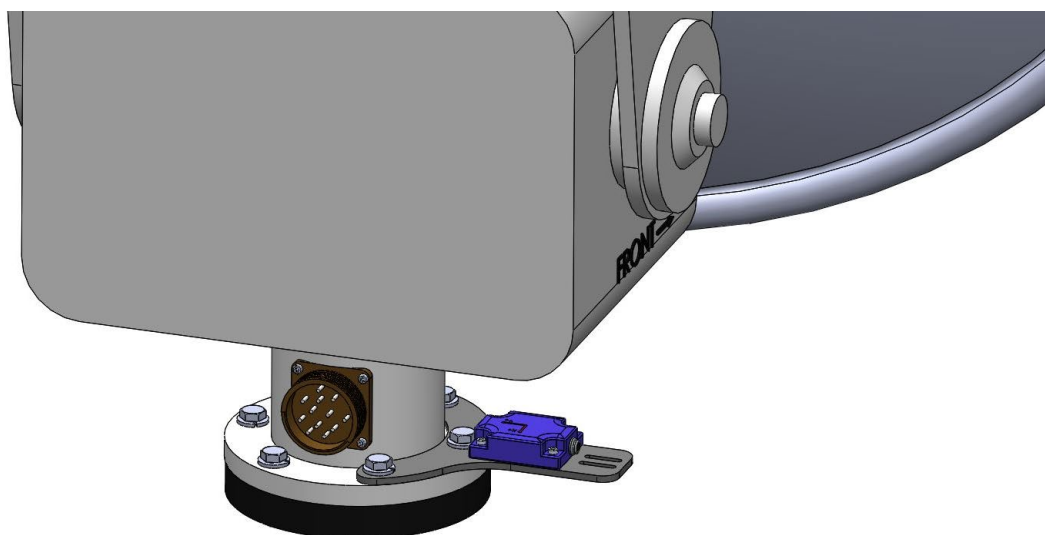


Figure 5.6: Inclinator installation Diagram

Next it is explained how must be configured the GPS Receiver and Compass:

- The standard supported NMEA commands for the GPS receiver and Compass are:
 - GGA (GPS). Provides the GPS position.
 - RMC (GPS Speed).
 - HDT (Compass). Provides heading relative to True North.
- For the GPS receiver and Compass, the serial port must be set at 4800 baud rate and N-8-1 setting.
- A compatible Compass example is the Novatel Flexpak6.
- The Compass can be powered directly by the Autotracking connector VCC voltage.
- The Local GPS Receiver and Compass must be installed in the base of the Van or Boat in line with the QPT Positioner Cable connector as it is shown in the following diagram:

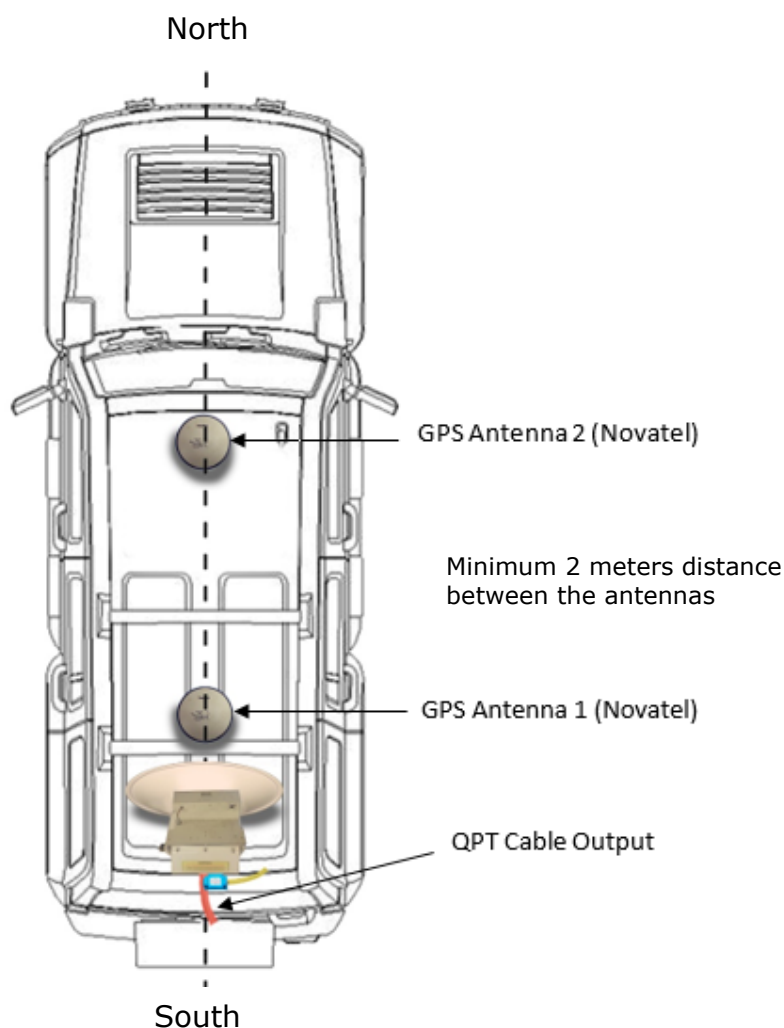


Figure 5.7:GPS Receiver and Compass Installation Diagram

Once we have made sure that the installation is correct, we can start with the configuration of the Parabolic Antenna Autotracking system.

Next, how to configure the Autotracking with a **Parabolic Antenna** is explained.

First, go to Autotracking option.



Figure 5.8: Parabolic Antenna Autotracking menu

In this option, there are three possible types of Autotracking (Parabolic, Multisector AMS and Omnidirectional). In this case, select the Parabolic option with the Right and Left keys. Once the option is selected, press the OK button to enter the configuration menu.

Once the user is inside the Parabolic Antenna option, there are three possible options (Auto, Manual and Fold) which are detailed below:

▪ **AUTO MODE**



Figure 5.9: Auto Menu

When the Auto option is selected, it means that the Parabolic Antenna is aimed automatically at the Transmitter device through the GPS coordinates of the Transmitter and the Receiver device.

Please note that, if for 30 seconds there is no GPS signal, the device will start looking for GPS signal. If there is no GPS signal but there is RF signal, then, the tracking will start looking for maximum RF signal received.

For a correct operation of the Auto mode, the Receiver Position must be set, and Receiver Configuration menu must be configured.

To start configuration please press OK on Auto mode.

Once user has accessed to the Auto mode screen, three options to choose will appear:

- Transmitter Position
- Receiver Position
- Receiver Configuration

- **Transmitter Position**

Inside Transmitter Position the parameters related to the Transmitter's GPS position are shown if any.

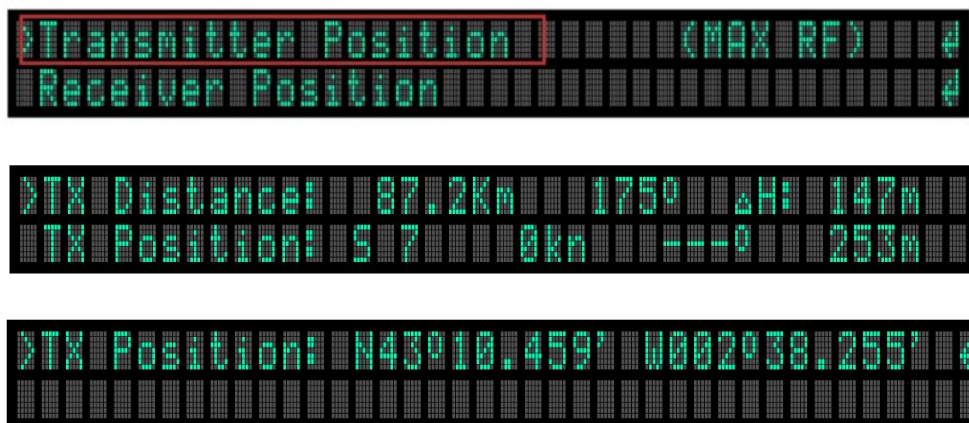


Figure 5.10: Transmitter GPS Information screen

- **Receiver Position**

To start Receiver Autotracking configuration press the OK button to access the Receiver Position screen.



Figure 5.11:GPS Information options

The following parameters are shown on the Receiver Position menu.



Figure 5.12: Receiver Position screen

- **Local Manual or Local GPS:**

In the first line, the user can set the GPS coordinates of the Receiver.

These coordinates are editable when no GPS information is received from an external GPS source. In that case, this option is named Local Manual.

When GPS information is given by an external source, the GPS information is automatically updated and not editable. In that case, this option is named Local GPS.

When we have been receiving GPS from an external GPS source, but we have lost it, the last GPS position received will be saved and the SAVED word will appear on the second line.

▪ Local Altitude and Speed:

In this line, the user can read the local altitude and speed information provided by the external GPS source.

When there is no GPS information, the local altitude is editable by the user.

▪ Satellite Number:

In this field, the number of satellites from which we are receiving signal are shown. For a correct operation of the Autotracking system, it is recommended to receive signal from at least 6 satellites.

▪ True North Heading:

In this file are shown the measured values for the True North Heading.

The True North Heading can be introduced manually or automatically by the use of an external Compass (Novatel Flexpak6). When the Heading is being provided by an external Compass, immediately after the degree symbol, an alarm indicator is displayed indicating the following:

- Static capital C will indicate that we are receiving the Compass information correctly.
- An intermittent signal between lowercase c and uppercase C will indicate that we have the Compass connected but that the information we receive from the Compass is not correct. HDT information is received but the fields are empty.
- A flashing capital C will indicate that we have lost the Compass. After 10 seconds, the capital C will become in a capital S which indicates that the Heading has been saved from the last information received by the Compass. And it will show which Heading is saved.

The Heading can be manually edited in all the cases unless when there is a static capital C, that means that the external Compass has priority over the editable Heading.

When the Heading is a manually edited value and we have saved it, the indicator will be a static capital M that indicates that this is the manually edited value.

- Pitch and Roll Compensation

Pitch and Roll values are provided by the external Inclinator (CTI Sensors TILT-30A). These are reading only parameters, at the end of the line, the compensation applied by the Pitch and Roll measurements is shown.

It is necessary the use of an Inclinator sensor when the QPT Positioner is installed on an irregular surface or in a mobile Car or Boat.

- Go to True North:

This option points the positioner to the True North. It is used to guarantee the correct configuration of the tracking system once all the configurable parameters have been set (GPS position, North Heading, Pan and Tilt measurements and Antenna Calibration).

Once the positioner has been pointed to the North, please make sure that the calibration is correct by comparing it with an external Compass.

- Receiver Configuration

To finish, press the OK button to access the Receiver Configuration screen.



Figure 5.13: Receiver Configuration Option

There are different options to select and configure:



Figure 5.14: Receiver Configuration Screen

- Antenna Vertical Angle:

The Antenna Vertical Angle must be set as the vertical beam width of the antenna used (this angle will determine the vertical increase done while the unit is in Search Profile mode).

- Polarization:

The Polarization can be controlled when an APO-75 with multiple Polarization antenna is being used, the polarization of the antenna can be remotely controlled from this menu. For more information, please go to section 9.2.9.2 APO-75 Antenna Polarity control.

- Search Profile:

Another parameter to be configured in this line is the Search Profile:

- Profile 1: When only a Parabolic Antenna is used for reception. It makes sweeps in all vertical and horizontal angles. In increments of 10° for the horizontal and in predefined vertical angle for the vertical.
- Profile 2: When we use the tracking system in combination with other antennas. The positioner will look for the helicopter on the horizon (0° , +VA and -VA) and will increase the horizontal sweep to 45° in each sweep. This profile makes the H and V sweeps at the same time.
- Profile 3: When we use the tracking system in combination with other antennas. The positioner will look for the helicopter in the horizon (0° , +VA and -VA) and will increase the horizontal sweep in 45 each sweep. This profile makes the H sweep first and then the V, forming a square.
- NONE: None search profile is applicable.

- Maximum RF:

If Maximum RF is enabled, when the receiver receives RF signal, but this signal does not include GPS information, the receiver will start tracking the Transmitter by following the maximum RF signal level. If RF signal is not received, the receiver will look for signal following the Search Profile selected. This option is used when no GPS signal is available.

On the other hand, if Maximum RF is disabled, the receivers only track the transmitter based on the GPS signal received.

- Antenna Calibration:

It is recommended to calibrate the antenna to receive the maximum signal level by compensating any vertical or horizontal

deviation introduced during the installation or by any other external causes.

Before starting the Antenna Calibration, please make sure that the GPS position of the Receiver, GPS position of the Transmitter, North Heading and Inclinator compensation are correctly set, these parameters are set in Transmitter Position and Receiver Position menus.

For a correct calibration of the antenna, please point the Receiver Positioner to the Transmitter's position and calibrate the antenna until you receive the highest signal level possible.

- Level and C/N Indicator:

In this line the level of the signal received is shown, this measurement is used to guarantee the maximum signal received while Antenna Calibration is made.

- **MANUAL MODE**



Figure 5.15: Manual Menu

If the Manual option is selected, then, by pressing the OK button the user can select manually the position of the Parabolic Antenna. To change the azimuth (H) position of the antenna, press the Right, Left buttons. To change the elevation (V) position of the antenna, press the Up and Down buttons.

- **FOLD MODE**



Figure 5.16: Fold Menu

When this option is selected, it means that the Autotracking system is not being used and the antenna is going to be fold.

The number of degrees that are needed to fold the antenna is configured here. The fold limits are -30° and +90°.

In the second line, by pressing the OK button, the antenna folds.

Chapter 6: Web Server / SNMP

6.1 Introduction

This equipment can be controlled using a PC connected control Ethernet connector, through the Internet or a local network. The Remote connector of the receiver is used for this purpose.

To configure the browser interface correctly, the IP address, Subnet Mask and Gateway need to be set correctly on this unit. Next, the steps to setup network parameters are shown:

1. Go to Unit → Webserver & SNMP

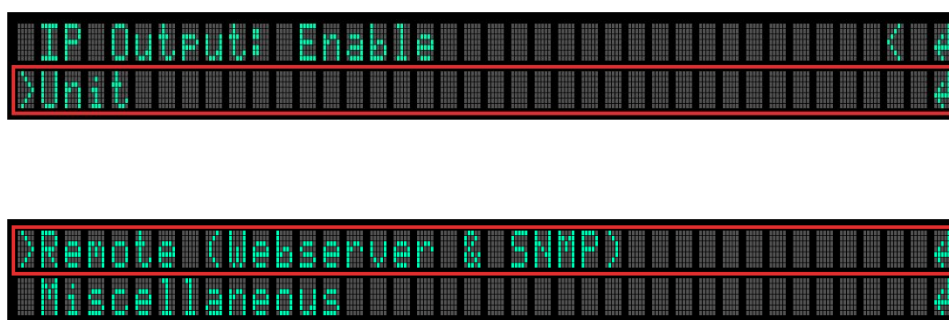


Figure 6.1: Web Server screen

2. Select Local option and set an IP address. To change the IP address first press the OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. Press the OK button to save the introduced value.



Figure 6.2: Local IP

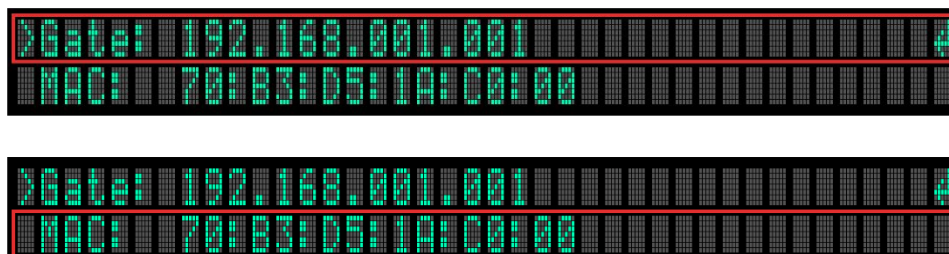
3. Select Mask option and set the Subnet Mask. To change the Subnet Mask address first press OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. Press the OK button to save the introduced value.



Figure 6.3: Subnet Mask

4. Select Gate option and set the Gateway. To change the Gateway address first press OK button and then, with the Up, Down keys select the desired number. To change from one character to another, press Right, Left keys. Press the OK button to save the introduced value.

Figure 6.4: Gateway



5. In this field, the MAC address of the device is shown (Reading parameter).

Figure 6.5: MAC address

6. Select Admin Pass option and set the administrator's password. If you want to access the Webserver directly without setting any password, the Admin Pass must be set to 0 (00000000). However, if you want to set an administrator's password, it is necessary to introduce 8 digits. In this way, with this password, the administrator can access the Webserver and make any configuration, modification or monitoring.

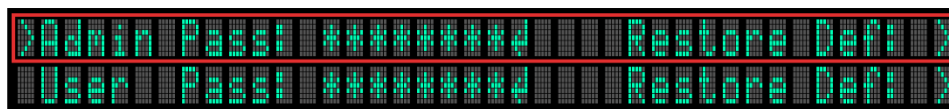


Figure 6.6: Admin Pass

7. Select User Pass option and set the user's password. If you want to access the Webserver directly without setting any password, the User Pass must be set to 0 (00000000). However, if you want to set a user's password, it is necessary to introduce 8 digits. In this way, with this password, the user can access the Webserver and make any monitoring.

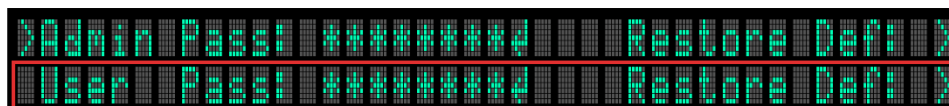


Figure 6.7: User Pass

Once the IP, Subnet Mask, Gateway, Admin Pass and User Pass are set and the laptop or PC is connected to the *Receiver*, open the web browser and enter the given IP to the receiver in the address bar of the browser.

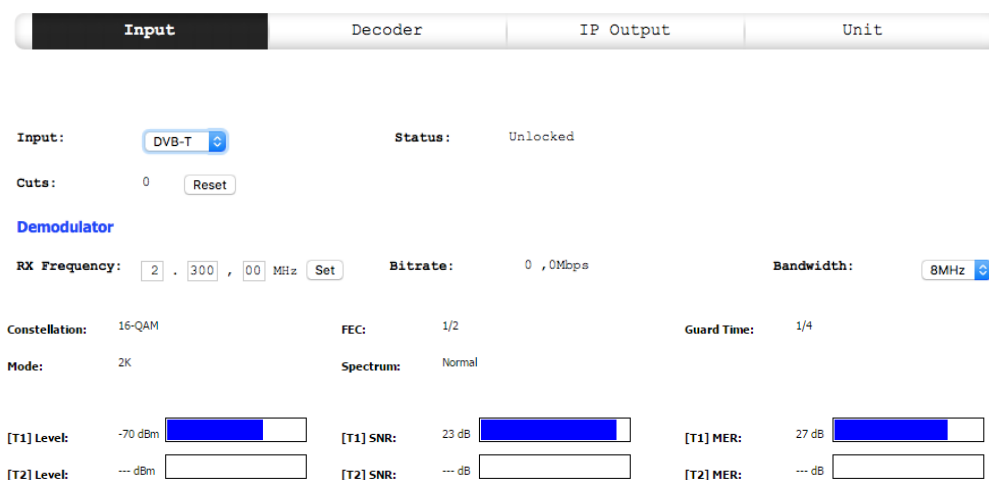
6.2 Web Page Overview

To access the Webserver, it is necessary to set the Webserver IP in the web browser and press Enter button. Then, the main menu will appear on the upper position of the screen. Once an option is chosen, it is possible to change any parameter allowed, or see the values of some options.

To modify any parameter, introduce or select the new one and press enter button. Then the change will be set in the receiver device.

Next, several screens of the web server and their features are shown.

6.2.1 DVB-T INPUT



The screenshot shows the 'DVB-T INPUT' web interface. At the top, there are four tabs: 'Input' (selected), 'Decoder', 'IP Output', and 'Unit'. Below the tabs, the 'Input' section shows 'Input:' set to 'DVB-T' and 'Status:' as 'Unlocked'. A 'Cuts:' section shows a value of '0' and a 'Reset' button. The 'Demodulator' section contains several parameters: 'RX Frequency:' (2,300,00 MHz with a 'Set' button), 'Bitrate:' (0,0Mbps), 'Bandwidth:' (8MHz), 'Constellation:' (16-QAM), 'FEC:' (1/2), 'Guard Time:' (1/4), 'Mode:' (2K), and 'Spectrum:' (Normal). At the bottom, there are six status bars with labels: '[T1] Level:' (-70 dBm), '[T1] SNR:' (23 dB), '[T1] MER:' (27 dB), '[T2] Level:' (--- dBm), '[T2] SNR:' (--- dB), and '[T2] MER:' (--- dB).

Figure 6.8: Web Server DVB-T Input screen

- **Input:**

Select the type of the signal that is received. The available options are DVB-T2, DVB-T, ASI, IP and ISDB-T. (eligible parameter)

- **Status:**

If this field shows the locked word then, it means that the signal is present in the input of the device. If this field displays the word unlocked then, it means that there is no signal in the input of the device. (reading parameter)

- **Cuts:**

In this field, the user can monitor or reset the RF cut counter.

- **Demodulator**

- **RX Frequency:**

In this field, the frequency of the received signal must be set. (editable parameter)

- **Bitrate:**

In this field the bitrate of the received signal is displayed. (reading parameter)

- **Bandwidth:**

In this option, the bandwidth of the received signal must be specified. The available options are 5, 6, 7 and 8MHz for DVB-T. (eligible parameter)

- **Constellation:**

In this field the type of modulation of the received signal is displayed. The available options are QPSK, 16QAM and 64QAM for DVB-T. (reading parameter)

- **FEC:**

In this field the value of the FEC of the received signal is displayed. The available options are 1/2, 2/3, 3/4, 5/6, 7/8 for DVB-T. (reading parameter)

- **Guard Time:**

In this field, the value of the guard time of the received signal is displayed. The available options are 1/4, 1/8, 1/16, 1/32 for DVB-T. (reading parameter)

- **Mode:**

In this field, the number of carriers of the received signal is displayed. The available options are 2K, 8K for DVB-T. (reading parameter)

- **Spectrum:**

Here the type of the spectrum of the received signal is shown. The available options are inverted or normal spectrum. (reading parameter)

- **[Tw] Level:**

In this field, the level of the received signal, where w is the number of the demodulator is shown in dBm. (reading parameter)

- **[Tw] SNR:**

In this field, the Signal to Noise Ratio value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)

- **[Tw] MER:**

In this field, the Modulation Error value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

6.2.2 DVB-T2 INPUT

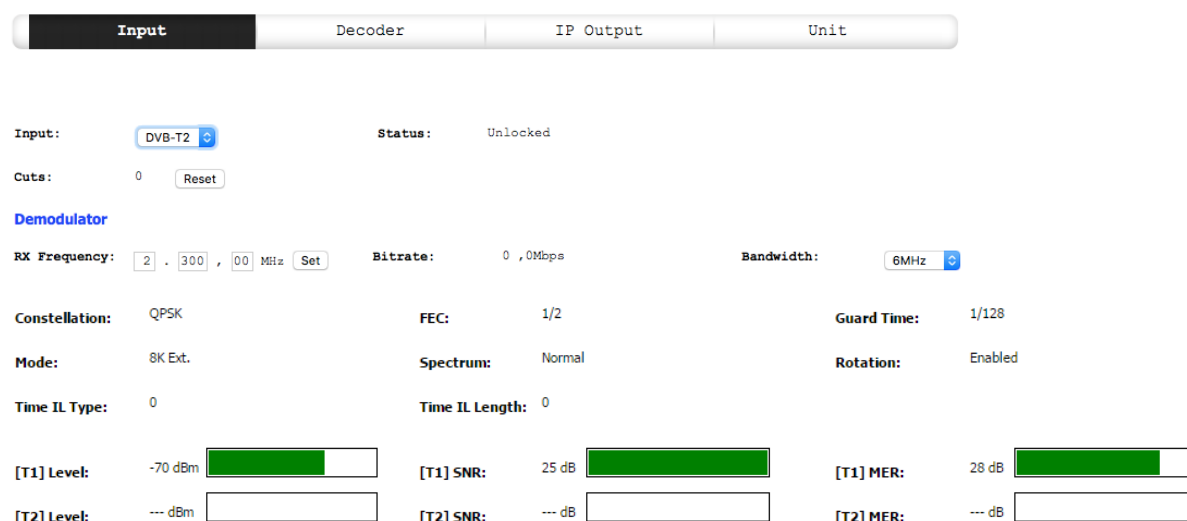


Figure 6.9 Web Server DVB-T2 Input screen

Demodulator

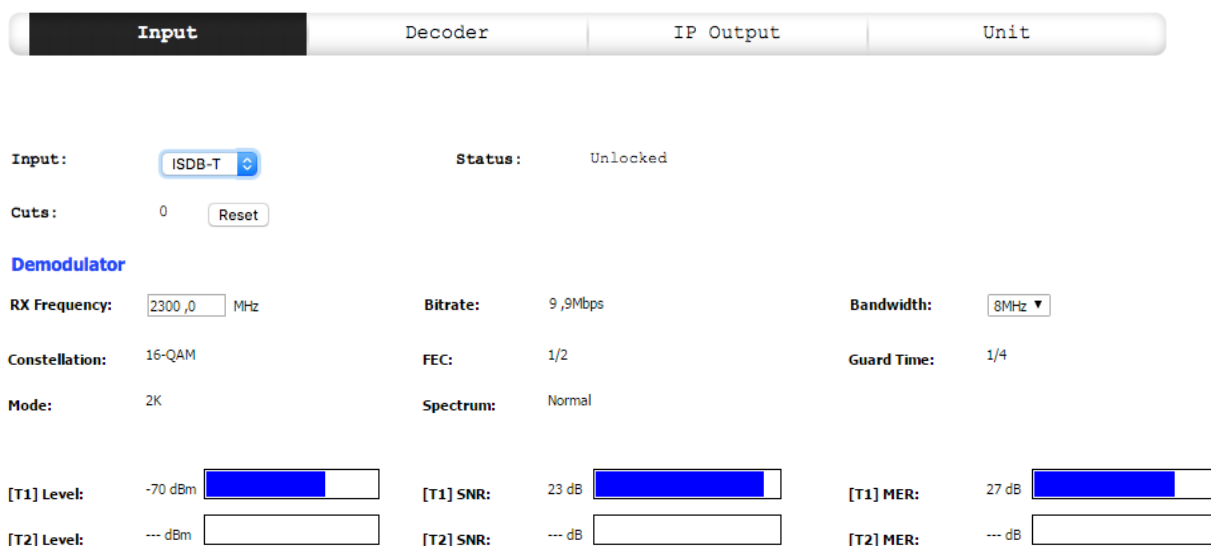
- **RX Frequency:**
In this field, the frequency of the received signal must be set. (editable parameter)
- **Bitrate:**
In this field, the bitrate of the received signal is displayed. (reading parameter)
- **Bandwidth:**
In this option, the bandwidth of the received signal must be specified. The available options are 1.7, 5, 6, 7 and 8MHz for DVB-T2. (eligible parameter)
- **Constellation:**
In this field, the type of modulation of the received signal is displayed. The available options are QPSK, 16QAM, 64QAM and 256QAM for DVB-T2. (reading parameter)
- **FEC:**
In this field, the value of the FEC of the received signal is displayed. The available options are 1/2, 3/5, 2/3, 3/4, 4/5 and 5/6 for DVB-T2. (reading parameter)

- **Guard Time:**
In this field, the value of the guard time of the received signal is displayed. The available options are 1/4, 1/8, 1/16 and 1/32 for DVB-T2. (reading parameter)
- **Mode:**
In this field, the number of carriers of the received signal are displayed. The available options are 1K, 2K, 4K and 8K for DVB-T2. (reading parameter)
- **Spectrum:**
Here the type of the spectrum of the received signal is shown. The available options are inverted or normal spectrum. (reading parameter)
- **Rotation:**
This field indicates if, in the received signal, the constellation is rotated or not. (reading parameter)
- **Time IL Type:**
In this field, the time interleaving mode is shown on the screen. (reading parameter)
- **Time IL Length:**
In this field, the number of frames in one interleaving frame is displayed. (reading parameter)
- **[Tw] Level:**
In this field, the level of the received signal, where w is the number of the demodulator is shown in dBm. (reading parameter)
- **[Tw] SNR:**
In this field, the Signal of Noise Ratio value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)
- **[Tw] MER:**
In this field, the Modulation Error value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

6.2.3 ISDB-T INPUT



The screenshot shows the 'Input' tab of the web server interface. At the top, there are four tabs: 'Input' (selected), 'Decoder', 'IP Output', and 'Unit'. Below the tabs, the 'Input' section shows a dropdown menu set to 'ISDB-T' and a 'Status' field displaying 'Unlocked'. A 'Cuts' field is set to '0' with a 'Reset' button. The 'Demodulator' section contains several parameters: 'RX Frequency' (2300.0 MHz), 'Bitrate' (9.9Mbps), 'Bandwidth' (8MHz), 'Constellation' (16-QAM), 'FEC' (1/2), 'Guard Time' (1/4), 'Mode' (2K), and 'Spectrum' (Normal). At the bottom, there are three rows of signal quality indicators: '[T1] Level' (-70 dBm), '[T1] SNR' (23 dB), and '[T1] MER' (27 dB), each with a corresponding bar chart. Below these are '[T2] Level', '[T2] SNR', and '[T2] MER', all showing '--- dBm' and empty bar charts.

Figure 6.9: Web Server ISDB-T Input screen

- **Input:**

Select the type of the signal that is received. The available options are DVB-T2, DVB-T, ASI, IP and ISDB-T. (eligible parameter)

- **Status:**

If this field shows the locked word then, it means that the signal is present in the input of the device. If this field displays the word unlocked then, it means that there is no signal in the input of the device. (reading parameter)

- **Demodulator**

- **RX Frequency:**

In this field, the frequency of the received signal must be set. (editable parameter)

- **Bitrate:**

In this field the bitrate of the received signal is displayed. (reading parameter)

- **Bandwidth:**

In this option, the bandwidth of the received signal must be specified. The available options are 6, 7 and 8MHz for ISDB-T. (eligible parameter)

- **Constellation:**

In this field the type of modulation of the received signal is displayed. The available options are QPSK, 16QAM and 64QAM for ISDB-T. (reading parameter)

- **FEC:**

In this field the value of the FEC of the received signal is displayed. The available options are 1/2, 2/3, 3/4, 5/6, 7/8 for ISDB-T. (reading parameter)

- **Guard Time:**

In this field, the value of the guard time of the received signal is displayed. The available options are 1/4, 1/8, 1/16, 1/32 for ISDB-T. (reading parameter)

- **Mode:**

In this field, the number of carriers of the received signal is displayed. The available options are 2K, 4K and 8K for ISDB-T. (reading parameter)

- **Spectrum:**

Here the type of the spectrum of the received signal is shown. The available options are inverted or normal spectrum. (reading parameter)

- **[Tw] Level:**

In this field, the level of the received signal, where w is the number of the demodulator, is shown in dBm. (reading parameter)

- **[Tw] SNR:**

In this field, the Signal to Noise Ratio value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)

- **[Tw] MER:**

In this field, the Modulation Error value of the received signal, where w is the number of the demodulator is displayed in dB. (reading parameter)

6.2.4 ASI INPUT

Input	Decoder	IP Output	Unit
Input: ASI			
Cuts: 1 Reset	Status: Locked		

Figure 6.10: Web Server ASI Input screen

This screen is showing if the ASI signal is being received through the status field.

If this field shows the locked word, it means that a signal is present in the input of the device. If this field displays the word unlocked, it means that there is no signal in the input of the device. (reading parameter)

6.2.5 TS over IP INPUT

Input	Decoder	IP Output	Unit
Input: IP Cuts: 2 Reset	Status: Unlocked		
TSoverIP Input			
Addressing: Multicast	Multicast Addr: 239.192.000.001		
FEC: Enable	FEC Cols: 0	FEC Rows: 0	
UDP Port: 5678	Output Delay: 128 ms		
Status: Channel Enable	Bitrate: 18 ,5 Mbps	Packet Size: 188 bytes	
TP per IP: 7	Protocol: RTP	PCR Present: PCR Present	

Figure 6.11: Web Server IP Input screen

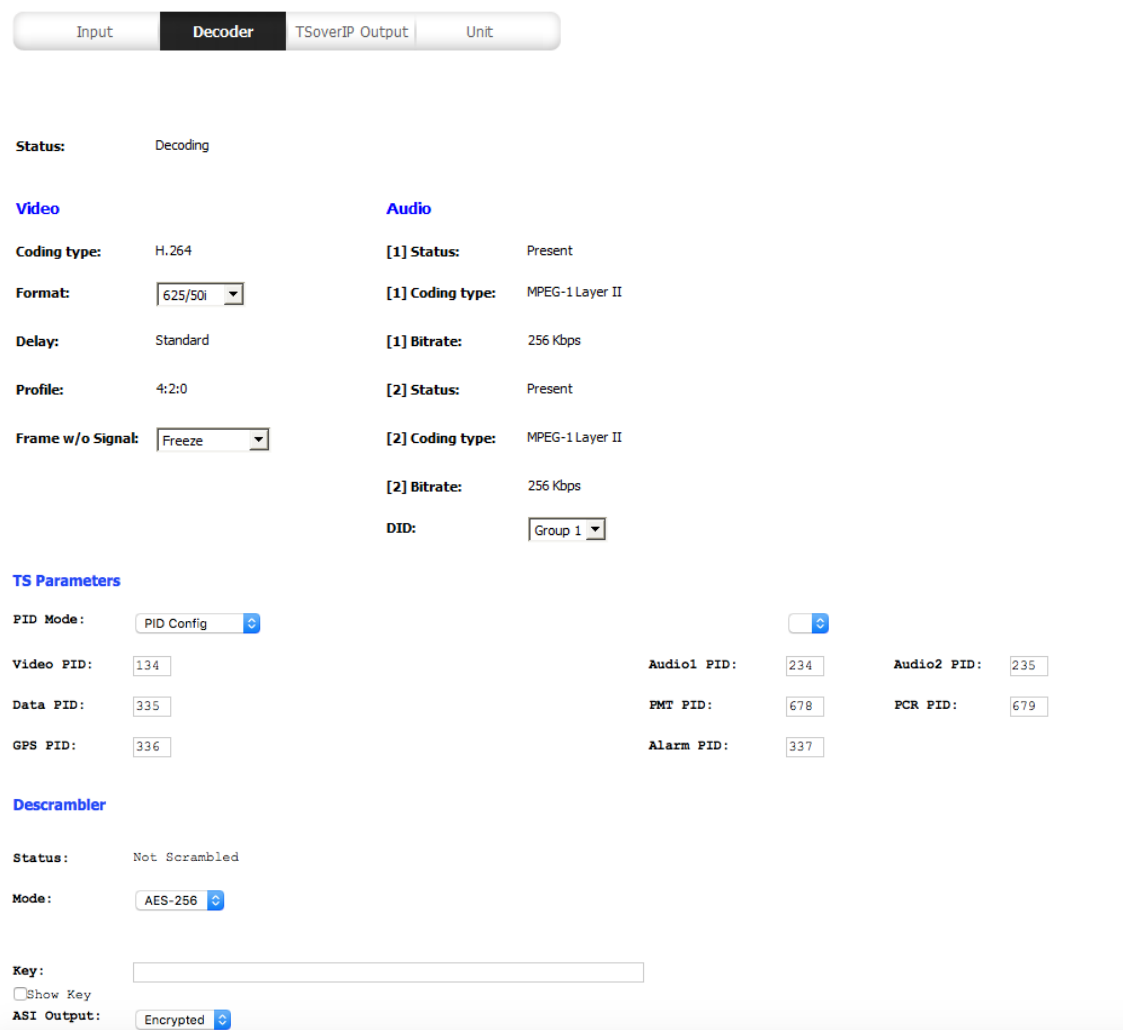
- **Addressing:**
This field is configured if the IP packets received come from a unicast address or from a multicast address. (eligible parameter)
- **Multicast Address:**
In this field, the multicast address must be specified to receive the information properly. (editable parameter)
- **FEC:**
In this field, the FEC option can be enabled or disabled. In case the enable option is selected, as the IP Forward Error Correction is composed by several FEC columns and rows, it is shown the number of FEC columns and rows of the received signal. (eligible parameter)
- **FEC Cols:**
In this field, the number of FEC columns of the received IP signal is displayed. (reading parameter)
- **FEC Rows:**
In this field, the number of FEC rows of the received IP signal is displayed. (reading parameter)
- **UDP Port:**
In this field, the port number of the device through which is going to receive the signal must be set. (editable parameter)
- **Output Delay:**
This delay means the time passed between the Transport Stream is obtained in the decoder and the signal is taken out from the decoder. (editable parameter)

- **Status:**
In this field, the status of the IP input is displayed. (reading parameter)
- **Bitrate:**
In this field, the bitrate of the received signal is shown. (reading parameter)
- **Packet Size:**
In this field, the size in bytes of the Transport Stream packets in the IP input is displayed. (reading parameter)
- **TP per IP:**
In this field, the number of Transport Stream packets per IP packet is displayed. (reading parameter)
- **Protocol:**
In this field, the protocol used for the communication is displayed. Two protocols are possible: UDP or RTP. (reading parameter)
- **PCR Present:**
Program Clock Reference. It indicates if PCR packets are found in incoming TS. (reading parameter)



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

6.2.6 DECODER



The screenshot shows the 'Decoder' tab of the web server interface. At the top, there are four tabs: 'Input', 'Decoder' (selected), 'TSoverIP Output', and 'Unit'. Below the tabs, the 'Status' is 'Decoding'. The 'Video' section shows 'Coding type' as 'H.264', 'Format' as '625/50i', 'Delay' as 'Standard', 'Profile' as '4:2:0', and 'Frame w/o Signal' as 'Freeze'. The 'Audio' section shows '[1] Status' as 'Present', '[1] Coding type' as 'MPEG-1 Layer II', '[1] Bitrate' as '256 Kbps', '[2] Status' as 'Present', '[2] Coding type' as 'MPEG-1 Layer II', '[2] Bitrate' as '256 Kbps', and 'DID' as 'Group 1'. The 'TS Parameters' section shows 'PID Mode' as 'PID Config', 'Video PID' as '134', 'Data PID' as '335', 'GPS PID' as '336', 'Audio1 PID' as '234', 'Audio2 PID' as '235', 'PMT PID' as '678', 'PCR PID' as '679', and 'Alarm PID' as '337'. The 'Descrambler' section shows 'Status' as 'Not Scrambled', 'Mode' as 'AES-256', 'Key' as an empty field, 'Show Key' as unchecked, and 'ASI Output' as 'Encrypted'.

Figure 6.12: Web Server Decoder screen

- **Status:**

In this field, the status of the decoder is displayed. If the decoder is not decoding, then the message "Not Decoding" appears. If the decoder is decoding, then the word "Decoding" appears in this field. (reading parameter)

Video:

- **Coding type:**

This field shows the video coding type of the received video signal. The available options are H.264 and MPEG-2. (reading parameter)

- **Format:**

This field shows the video format of the received signal. The available options are Auto, 1080p, 1080i, 720p, 576i and 480i. (reading parameter)

- Delay:

This field shows the video delay of the received signal. The available options are Standard, Low Delay and Super Low delay. In case the input video signal is coded in Ultra Low Delay mode, the device decodes it but in the screen appears as Super Low Delay. (reading parameter)

- Profile:

This field shows the video profile of the received signal. The available options are 4:2:0 and 4:2:2. (reading parameter)

- Frame w/o Signal

If there is an error, the last image is frozen in the screen until the signal works again. (eligible parameter)

The available options are:

- **Freeze:** The last image is frozen on the screen until the signal works again.
- **Color (10 sec):** After 10 seconds, if the error is caused by the lack of RF signal, the screen becomes RED. If the error is because there is no video, the screen becomes BLUE.
- **Black (0.5 sec):** The video becomes BLACK after 0.5 seconds.
- **Black (5 sec):** The video becomes BLACK after 5 seconds.

Audio:

- [1] Status:

This field shows the status of the Audio 1. If there is no audio in the Audio 1 input, this field displays the message "Not Present". If there is audio in the Audio 1 input, this field displays the word "Present". (reading parameter)

- [1] Coding type:

This field displays the type of coding of the received Audio 1 signal. (reading parameter)

The possible options are:

- MPEG-1 Layer I
- MPEG-1 Layer II

- [1] Bitrate:

This field displays the bitrate of the received Audio 1 signal in Kbps. (reading parameter)

- [2] Status:

This field shows the status of the Audio 2. If there is no audio in the Audio 2 input, this field displays the message "Not Present". If there is audio in the Audio 2 input, this field displays the word "Present". (reading parameter)

- [2] Coding type:
This field displays the type of coding of the received Audio 2 signal. (reading parameter)
The possible options are:
 - MPEG-1 Layer I
 - MPEG-1 Layer II
- [2] Bitrate:
This field displays the bitrate of the received Audio 2 signal in Kbps. (reading parameter)
- DID:
Indicates in which audio group the coded audios are going to be embedded. This DID is eligible from group 1 to group 4. (eligible parameter)

TS Parameters:

- PID Mode:
In this field the mode for the decoding process is selected. If First Service mode is selected, then, the device selects automatically the PID values to decode.
If the manual option is selected, then, the user can select one of the received services. (eligible parameter).
In addition, if you select PID Config mode, you can set your services PID manually there.
- Program Number:
The available programs are shown in this field. (eligible parameter)
- Video PID:
In this field, the video packet identifier must be introduced. (editable parameter)
- Audio1 PID:
In this field, the audio 1 packet identifier must be introduced. (editable parameter)
- Audio2 PID:
In this field, the audio 2 packet identifier must be introduced. (editable parameter)
- Data PID:
In this field, the data packet identifier must be introduced. (editable parameter)

- **PMT PID:**
In this field, the programme map table packet identifier must be introduced. (editable parameter)
- **PCR PID:**
In this field, the clock reference packet identifier must be introduced. (editable parameter)
- **GPS PID:**
In this field, the GPS packet identifier must be introduced. (editable parameter)
- **Alarm PID:**
In this field, the TX alarm identifier must be introduced. (editable parameter)

Descrambler:

- **Status:**
In this field, the status of the descrambling process is displayed. If the input signal is not encrypted, then the message Not Scrambled appears. If the device is descrambling, then the word Scrambled appears in this field. (reading parameter)
- **Mode:**
Select the encryption mode: BISS, BISS-E, AES-128 and AES-256. (eligible parameter)
- **Key:**
Key for encryption mode selected. The values of each character introduced can be from 0 to 9 and from A to F. (editable parameter)
- **ASI Output:**
In this field you can select if the ASI output is clear or encrypted.



When encryption is enabled, the bitrate is limited to under 105 Mbps.



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

6.2.7 TSoVerIP Output

Input	Decoder	IP Output	Unit
IP Output: Enable Dest IP: 239.192.000.001 Port: 5678 FEC: Disable TP per IP: 7 Protocol: RTP IP Output: Encrypted			

Figure 6.13: Web Server TSoVerIP Output screen



IP Output:

This option is available if the IP Input is not selected

- Destination IP:
In this option, the IP address of the device to which data is sent must be configured. In case you want to send data to a multicast address just enter the desired multicast address. (editable parameter)
- UDP Port:
In this option, the port number of the device to which data is sent must be configured. (editable parameter)
- FEC:
In this field the Forward Error Correction can be enabled or disabled. In case it is enabled, the number of columns and rows can be configured. If FEC option is enabled then, the only protocol which can be used is RTP. (eligible parameter)
- TP per IP:
In this field the number of Transport Stream packets per IP (from 1 to 7) can be configured. (editable parameter)
- Protocol:
In this field the type of protocol used for the communication is selected. The type of protocol used for the communication can be RTP or UDP. (eligible parameter)
- IP Output: the IP output can be encrypted or clear if the input signal is encrypted.



The destination IP address, the Webserver IP address and the TSoIP Local IP address must be different.



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

6.2.8 UNIT

Input

Decoder

IP Output

Unit

ON/OFF: ☒
RX ALARM: ☒
TX ALARM: ☐
REMOTE: ☒
STATUS: ☐

Restart

Standby Mode:

On

Timeout Reset:

1440

 min

Webserver IP:

192.168.001.191

Webserver Subnet:

255.255.000.000

Webserver Gateway:

192.168.001.001

Webserver MAC:

70-B3-D5-1A-C3-10

TSoIP Local IP:

192.168.001.008

TSoIP Subnet:

255.255.255.000

TSoIP Gateway:

192.168.001.001

TSoIP MAC:

00-14-F4-05-85-A4

Night Mode:

3

Distance Units:

Kilometers

Speed Units:

Knots

Voltage RX:

24.1

 V
Voltage TX:

--.-

 V

Temperature RX:

+43.7

 °C
Temperature TX:

---.-

 °C

Admin Password:

Default

 (Mandatory: 8 characters)

User Password:

Default

 (Mandatory: 8 characters)

S/N:

910011019

Firmware:

V9_1242142547468-

Alarms

RX: Input signal not present

Alarms configuration

☒ Input signal not present
☒ Decoder is not decoding
☒ No video present
☒ DC voltage low
☒ DC voltage high
☒ High temperature
☐ Remote GPS not present
☐ Local GPS not present
☐ Compass GPS not present
☐ Inclinometer not present
☐ QPT not present

Logbook

☒ Enabled

Save Logbook to File

Clear Logbook

Monitor File

Auto

Start

Clear

Save to File

Time Interval:

5

 sec (1-99)

Firmware Update

Seleccionar archivo

nada seleccionado

Submit

Activate

Restart

Select a file to upload

Figure 6.14: Web Server Unit screen

First, the status of the different LEDs available is presented. These LEDs provide specific information about the status of the receiver:

- **ON/OFF:**
The Led lights up GREEN when the equipment is turned on and it turns up in red if the equipment is turned off.
- **ALARM:**
The Led lights up RED when any alarm occurs.
- **REMOTE:**
The Led lights up RED when the user is connected remotely to the device.
- **STATUS:**
The Led lights up GREEN when a change in the configuration of the device is being processed.

Configuration:

- **Standby Mode:**
In this option, *Receiver* can be configured to be in Standby or in ON mode.
- **Timeout Reset:**
In this field, the time that the Receiver could be without receiving any signal is selected. After passing this time, the equipment is reset. To disable this option, 0 value must be written. (editable parameter)
- **Webserver IP:**
In this field, the IP address for the Webserver connection can be configured (editable parameter). This IP is the IP that has to be set in the web browser to access the Webserver and it must be different from the TSoIP Local IP and the Destin IP.
- **Webserver Subnet:**
In this field, the Subnet address for the Webserver connection can be configured. (editable parameter)
- **Webserver Gateway:**
In this field, the Gateway address for the Webserver connection can be configured. (editable parameter)
- **Webserver MAC:**
In this field, the MAC address of the device is shown. (reading parameter)
- **TSoIP Local IP:**
In this field, the IP address of this device for the Video over IP connection can be configured. This is the IP that you assign in your local LAN for the device (editable parameter).

- **TSoIP Subnet:**

In this field, the Subnet address of for the Video over IP connection device can be configured. (editable parameter)
- **TSoIP Gateway:**

In this field, the Gateway address of this device for the Video over IP connection can be configured. (editable parameter)
- **TSoIP MAC:**

In this field, the MAC address of this device for the Video over IP connection is shown. (reading parameter)
- **Night Mode:**

There are four possible states for the night mode. If night mode is in state 0 then the light in the screen will shine more than if it is in state 1. If the state is three then, the light in the screen will be the lowest of the four possible states. (eligible parameter)
- **Distance Units:**

If miles are selected then, all the distances will be in miles and the same occurs if kilometres are selected. (eligible parameter)
- **Speed Units:**

The speed can be measured in knots, km/h or Mph. (eligible parameter.)
- **Voltage:**

In this field, the power supply voltage of the RX and TX is shown. (reading parameter)
- **Temperature:**

If °C is selected then, the temperature value of the RX and TX will be shown in °C and the same occurs when F° is selected. (eligible parameter)
- **Admin Password:**

In this field, user can enter the administrator password. (eligible parameter)
- **User Password:**

In this field, user can enter the user password. (eligible parameter)
- **S/N:**

In this field, the serial number of the device is shown. (reading parameter)
- **Firmware:**

In this field, the firmware version of the equipment is shown. (reading parameter)

Alarms:

In this option, different alarms which are present in the Transmitter and Receiver are shown.

Alarms configuration:

In this field, the different alarms available in the Receiver are configured. The alarms are:

- Input signal not present
- Decoder is not decoding
- No video Present
- DC voltaje low
- DC voltaje high
- High Temperature
- Remote GPS not present
- Local GPS not present
- Compass GPS not present
- Inclinator not present
- QPT not present



The destination IP address, the Webserver IP address and the TSoIP Local IP address must be different.



When editable parameters are being set in the Web Server and new values are being introduced, the text remains in RED until the enter button is pressed. When the enter button is pressed, the new values are saved, and the text will appear in BLACK. It is necessary to press the enter button to keep and save the new values on the screen.

Logbook:

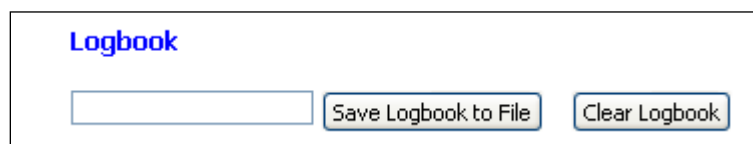


Figure 6.15: Logbook

This field allows the user to access the Logbook menu where the different events that have taken place are shown and send them to a text file.



This feature is supported using Firefox and Chrome navigators. Internet Explorer is not supported.



While the data is being saved, it is necessary to remain in the Unit section of the Webserver.

If it you want to send the different events to a file, type the name of the file and the extension and press Save Logbook to File. Then, open the file which has been downloaded on the computer and the information about the different events will be shown (time of the event, date of the event and description of the event).

```

Last 10 Events
00:00:04 11/12/14 ASI Locked
00:00:05 11/12/14
00:01:00 11/12/14 Decoding Stop
00:01:00 11/12/14 Decoding Start
00:01:03 11/12/14 Decoding Stop
00:01:00 11/12/14
00:01:00 11/12/14
00:01:00 11/12/14 Decoding Start
00:01:08 11/12/14 Decoding Stop
00:01:09 11/12/14
  
```

Figure 6.16: Logbook information

If you want to clear de Logbook, press Clear Logbook button.

Monitor File:

In this file, the information related to the latitude, longitude and altitude of the Transmitter and Receiver, the decoding status and the LEVEL, MER and C/N of each signal is displayed.

To export this information in a text file, it is important to consider the following items:



This feature is supported using Firefox and Chrome navigators. Internet Explorer is not supported.



While the data is being captured, it is necessary to remain in the Unit section of the Webserver. If you change to another section, the captured data will be lost.

There are two modes to send the data to the text file: manual and automatic. Using the Auto/Manual button this mode can be changed.

In the text area related to the name of the file you must include the name plus the extension as it is indicated in the figure below.

The process to follow in **Auto Mode** is:

Monitor File

Time Interval:

sec (1-99)

Figure 6.17: Auto mode

- **First step:** Configure the time interval.
- **Second step:** Press the Start Button.
- **Third step:** Press the Stop Button when you want to stop capturing data.
- **Fourth step:** Write the name and the extension of the file to send the data.
- **Fifth step:** Press the "Save to file" button.

The process to follow in **Manual Mode** is:



Figure 6.18: Manual Mode

- **First step:** Press the Dump Button whenever you want to capture the data.
- **Second step:** Write the name and the extension of the file to dump the data.
- **Third step:** Press the "Save to file" button.

If you want to clear the captured data in one session, it is necessary to use the "Clear" button or change to another tab of the Webserver.

Once the data is captured, open the text file to access the information.

Firmware Update:

In this section, you can update the firmware of the receiver remotely.

Please select the latest SVP file available in the website for HDR V9 receiver and click on submit, it will take 20-30 minutes to finish, the receiver will be automatically rebooted once the upgrade has finished.

6.3 Web Page Setup Notes

For the data to be refreshed correctly, you may need to change some settings on your browser.

Please follow these instructions carefully.

For Google Chrome:

1. Click on the Chrome menu  situated in the toolbar of the browser.
2. Select tools.
3. Choose the option Delete navigation data.
4. Choose the option empty cache.
5. Click on Delete navigation data.

For Internet Explorer:

1. From the Tools menu, select Internet Options.
2. In the General tab, click the Settings button in the Browsing History section.
3. Select 'Every time I visit the webpage' then click the OK button.
4. Click the OK button.

For Mozilla Firefox:

1. Open a new tab, in the address bar enter about:config.
2. In the Filter box, enter disk.
3. Set the value for 'browser.cache.disk.enable' to false (double click to change the setting).
4. Close the about:config tab.

6.4 SNMP

Simple Network Management Protocol (SNMP) is an "Internet-standard protocol for managing devices on IP networks. SNMP exposes management data in the form of variables on the managed systems, which describe the system's configuration. These variables can then be queried (and sometimes set) by managing applications.

SNMP is an application-layer protocol and it runs over UDP at the transport level. SNMP is based on a manager / agent model as it is shown below:

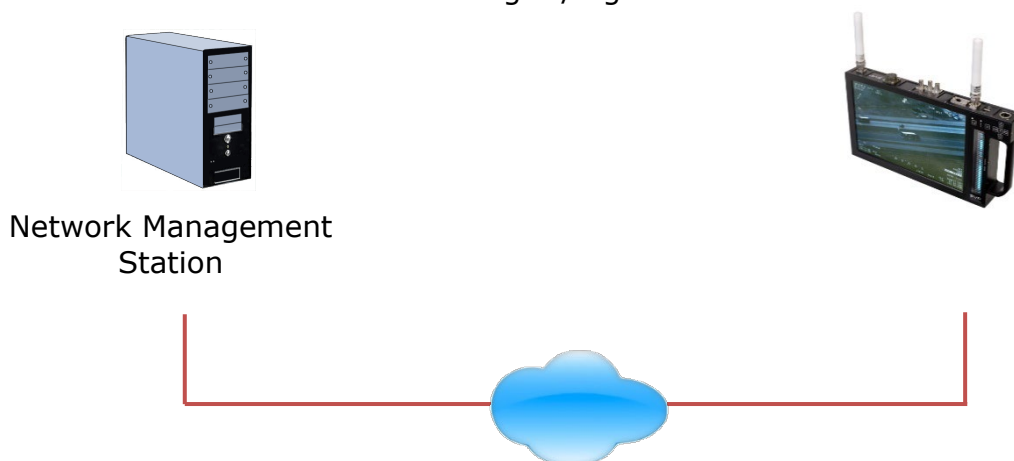


Figure 6.19: SNMP management system

The SNMP agent used is MIB-II compliant. The SVP MIB (Management Information Database) provides a standard representation of the SNMP Agent's available information and where it is stored. The MIB is defined according to the ASN.1.

6.4.1 SNMP commands

SNMP use the next commands:

Operation	Description	Sender
Get	Readout the current value of specific objects in the MIB.	NMS
Get next	Readout the current value of the next object in the MIB.	NMS
Set	Change a value of a specific object in the MIB.	NMS
Get response	Responds to a get, get next or set request.	Agent
Trap	A trap is a mechanism to trigger the NMS that a change in the device has occurred.	Agent

Table 23: SNMP commands

6.4.2 MIB

The Management Information Base of this device is shown below:

```
HDR70_RECEIVER-MIB DEFINITIONS ::= BEGIN

IMPORTS
    enterprises
        FROM RFC1155-SMI
    OBJECT-TYPE
        FROM RFC-1212
    DisplayString
        FROM RFC-1213;

svpbm          OBJECT IDENTIFIER ::= {enterprises 126}
hdr-70         OBJECT IDENTIFIER ::= {svpbm 1}
rf             OBJECT IDENTIFIER ::= {svpbm 2}
traps          OBJECT IDENTIFIER ::= {svpbm 16}

hdrInputSel OBJECT-TYPE
    SYNTAX  INTEGER{DVB-T(0), DVB-T2(1), ASI(2), IP(3)}
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "Input selected"
    ::= {hdr-70 1}

hdrDecoderMder OBJECT-TYPE
    SYNTAX  INTEGER(0..1)
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "Decoder mode"
    ::= {hdr-70 2}

hdrVoltage OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "Voltage"
    ::= {hdr-70 3}

hdrTemperature OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "Unit temperature"
    ::= {hdr-70 4}
```

```

hdrStatusONOFF OBJECT-TYPE
    SYNTAX  INTEGER{OFF(0), ON(1), FORCE_RESET(2)}
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "Unit status (ON/OFF)"
    ::= {hdr-70 5}

hdrStatusInput OBJECT-TYPE
    SYNTAX  INTEGER{OFF(0), ON(1)}
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "Unit input status"
    ::= {hdr-70 6}

hdrStatusDecoder OBJECT-TYPE
    SYNTAX  INTEGER{OFF(0), ON(1)}
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "Unit decoder status"
    ::= {hdr-70 7}

hdrLocationPlace OBJECT-TYPE
    SYNTAX  DisplayString
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "Location"
    ::= {hdr-70 8}

hdrTrapIpAddress OBJECT-TYPE
    SYNTAX  IpAddress
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "IP address where traps are sent"
    ::= {hdr-70 9}

rfIndex OBJECT-TYPE
    SYNTAX  INTEGER{INPUT1(1), INPUT2(2), INPUT3(3), INPUT4(4),
INPUT5(5), INPUT6(6)}
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "RF input index. This index is used for selecting
from/to which RF input the other objects from this category
are read/write"
    ::= {rf 1}

```

```
rfFreq OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-write
    STATUS  current
    DESCRIPTION
        "RF freq in KHz"
    ::= {rf 2}

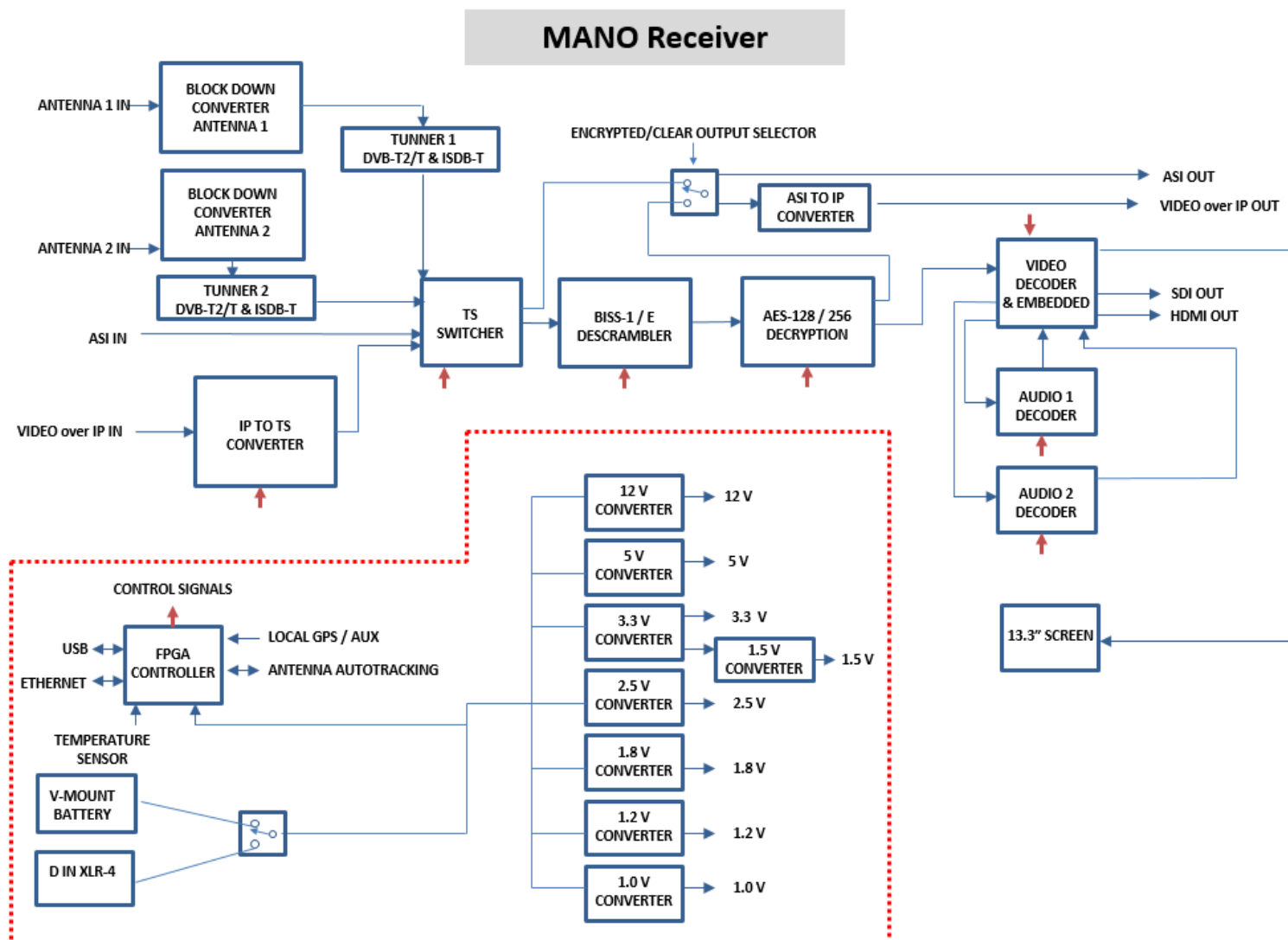
rfLevel OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "RF input level in percentage. From 0 to 99"
    ::= {rf 3}

END
```

Chapter 7: Block Diagram

In this chapter, the block diagram of the *Receiver* is explained.

This diagram has several parts related to the *Receiver* internal performance which are shown in blocks with different inputs and outputs.



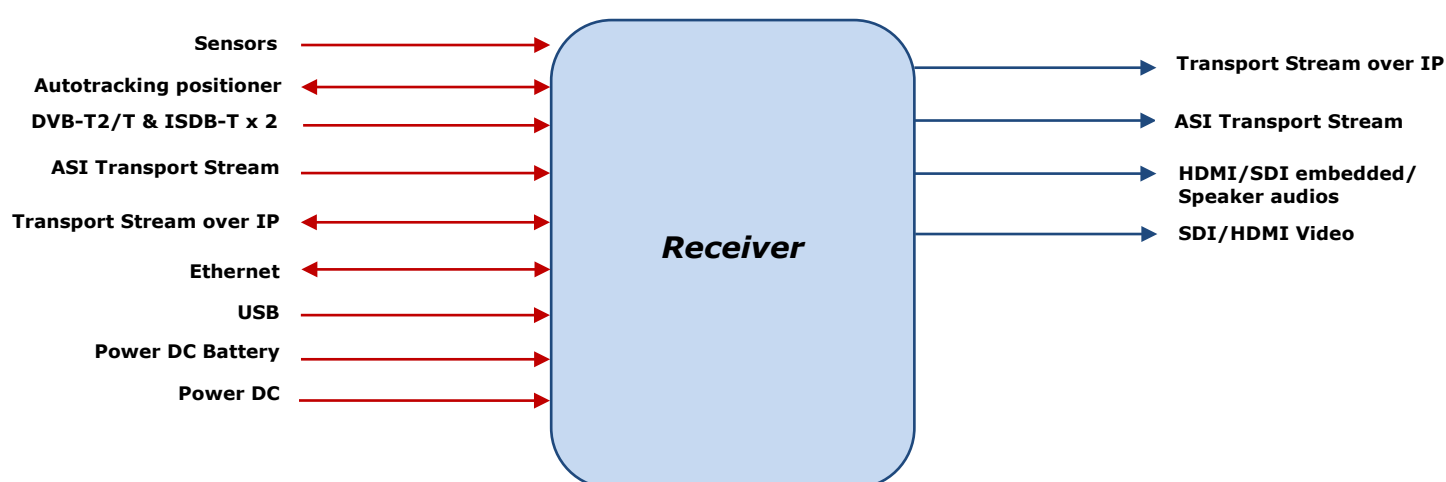
Chapter 8: Equipment Installation

8.1 Introduction

This chapter provides important information for the receiver system installation such as connections available in the top of the *Receiver* and their pinout, connectors needed and the accessories which are available with the receiver device.

8.2 Connections

All input and output connections of the *Receiver* are shown in the figure below:



8.2.1 Power supply

In this section, technical features about the power supply connections available and the connectors needed are described.

The equipment can be powered by the DC Power Supply input connector or by Batteries. The DC Power Supply has preference over the Battery Power Supply. When both Power Inputs are connected, the equipment will be fed by the DC Power Supply input.

The equipment is rebooted every time there is a change on the Power Supply inputs.

8.2.1.1 DC Power supply

The DC power supply is connected via a Neutrik 4-pin male XLR connector with a safety clip to prevent accidental disconnection.

Power supply DC connection technical features

Item	Features
Connector Label	POWER D.C.
Connector Type	XLR-4 male
Supply voltage	11-36 V.

Table 24: DC Power supply features

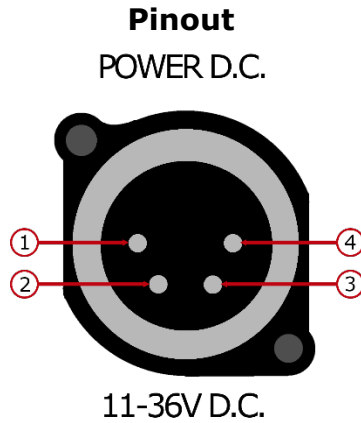


Figure 8.1: Connector pinout

Pin	Description
1	GND
2	GND
3	+ VCC
4	+ VCC

Table 25: DC Power supply connector pinout

Connector needed



Figure 8.2: Connector needed



The DC input is protected by a fuse (ATO model)

8.2.1.2 DC by Batteries

The Mano can be powered by V-Mount type batteries; there is a V mount interface on the back side of the MANO which makes this receiver a portable solution.



Figure 8.3: V-Mount Interface

Battery connector technical features

Item	Features
Connector Type	V-Mount Battery Plate
Supply voltage	11-36 V.

Table 26: Battery connector technical features



Batteries are not included with the MANO

8.2.2 Antenna Inputs

8.2.2.1 Antenna connector

There are 2 Antenna connectors. The connector used are described below:

Intermediate frequency connection technical features

Item	Features
Connector Label	ANTENNA 1 / ANTENNA 2
Connector Type	N female
Impedance	50Ω

Table 27: RF input features (DVB-T2/T and ISDB-T)

8.2.3 DVB-ASI Transport Stream

8.2.3.1 DVB-ASI Transport Stream Input

The *Receiver* has a DVB-ASI Transport Stream input, compatible with the EN50083-9 standard, available on 75Ω BNC connector on the rear panel of the *Receiver*.

The ASI input is used when the equipment is used as a decoder.

ASI connection technical features

Item	Features
Connector label	ASI IN
Connector Type	BNC female
Impedance	75Ω
Standard	EN50083-9s
Packet length	188/204Bytes
Maximum Bitrate	216 Mbit/s

Table 28: DVB-ASI Transport Stream input connection features

8.2.3.2 DVB-ASI Transport Stream Output

The *Receiver* has a DVB-ASI Transport Stream output, compatible with the EN50083-9 standard, available on an insulated 75Ω BNC connector on the rear panel of the *Receiver*.

This output might be useful if an intermediate ASI feed is required without needing to decode the audio and video signals and then modulate it in the transmitter equipment; therefore, there is no quality loss due to a new coding process.

ASI connection technical features

Item	Features
Connector label	ASI OUT
Connector Type	BNC female
Impedance	75Ω
Standard	EN50083-9
Packet length	188/204Bytes
Maximum Bitrate	216 Mbit/s

Table 29: DVB-ASI Transport Stream output connection features

8.2.4 Video Outputs

The *Receiver* includes one HDMI output and one digital 3G-SDI/HD-SDI/SD-SDI video output.

The output video signal on the receiver will be automatically configured to the same format as the received video signal, when the Auto option is selected in the Decoder menu

Each of these signals are available on 75Ω BNC connector located on the top of the receiver unit.

SDI output signals are compliant with SMPTE 424M, SMPTE-292M, SMPTE-259M and standards.

SDI connection technical features

Item	Features
Connector label	SDI
Connector Type	BNC female
Impedance	75Ω
Standard	SMPTE-424
	SMPTE-259
	SMPTE-292

Table 30: SDI output connections features

HDMI connection technical features

Item	Features
Connector label	HDMI
Connector Type	Type A

Table 31: HDMI output signal connection features

8.2.5 Transport Stream over IP (optional)

Transport Stream over IP Input and Output

The *Receiver* has an input that allows receiving and transporting video over IP.

TS over IP connection technical features

Item	Features
Connector Label	VIDEO over IP
Connector Type	RJ-45

Table 32: Transport stream over IP connection technical features



There is no recompression when the equipment sends the information through IP. At the level of ASI and IP, the device keeps the original coding generated in the transmitter.

Transport Stream over IP gives some benefits like:

- Ensured Quality of Service with highly reliable Video Gateways.
- Built-in intelligent monitoring and redundancy solutions.
- Create revenue-generating professional Wide Area Networks for video transport.

Technical features are described below:

- IP encapsulation and 2D FEC encoding and decoding as defined in SMPTE 2022.
- Persistent storage of configuration parameters.
- Unicast and multicast IP addressing.



It is not possible to configure the equipment as IP input and IP output at the same time.

For correct operation, it is recommended to use a Cat 5 or higher UTP cable.

8.2.6 Autotracking connector (Optional)

The Autotracking connector can be used either with a Parabolic Antenna, Antenna with Selectable Polarity or with a Multisector Antenna. This can be configured in the Autotracking menu.

For different applications different devices are connected to this connector:

- **Parabolic Antenna Autotracking:** MOOG QPT positioner + Inclinometer when the tracking is made with a Parabolic Antenna based on GPS position. This connector provides 24 V for the supply of the QPT Positioner and Inclinometer.
- **AMS Multisector Antenna Autotracking:** AMS Multisector Antenna is connected to this connector when Antenna Switching Tracking based on GPS information is made.
- **Multi Polarity Parabolic Antenna Control:** APO Parabolic Antenna with configurable polarity is connected to this connector and the control of the polarity is made through it.

The connector used for Autotracking is located on the rear panel of the *Receiver*.

Receiver Autotracking connector

Item	Features
Connector Label on <i>Receiver</i>	AUTOTRACKING
Connector type	Bayonet 19 pin female
Part number (cable connector)	ITT Canon: JMS3116F14-19P

Table 33: Autotracking connector

8.2.6.1 Parabolic Antenna Autotracking

8.2.6.1.1 Autotracking connector pinout

This section explains the pinout that must be made on the Autotracking Bayonet 19 pins connector cable when the Parabolic Antenna Autotracking is configured. This configuration is formed by one Parabolic Antenna, one QPT Positioner and one Inclinator. The Local GPS Receiver and Novatel's Flexpak6 Compass can be connected to the Autotracking connector in case of being needed.

The QPT Positioner is connected via a RS422 port and the Inclinator is connected via a second RS-422 port. The Local GPS Receiver and Compass are connected via a RS232 port.

For more information of installation and configuration of the QPT Positioner Inclinator, Compass and Local GPS Receiver, please go to section 5.2. Autotracking Parabolic Antenna.

The following table describes the pinout of the Receiver's Autotracking connector to a QPT Positioner, Local GPS Receiver, Compass and Inclinator sensor:

Connector pinout

Bayonet 19 pin (Receiver)	Description
A	+ VCC (24 V when AC input)
B	Local GPS and Compass Input
C	+ 5V DC (Max. 700mA)
K	Inclinator Sensor TX (+)
L	Inclinator Sensor TX (-)
M	MOOG Positioner TX (+)
N	MOOG Positioner TX (-)
P	MOOG Positioner RX (+)
R	Inclinator Sensor RX (+)
S	Power Return GND
T	Digital Signal GND
U	MOOG Positioner RX (-)
V	Inclinator Sensor RX (-)

Table 34: Autotracking cable pin relationship for the QPT Positioners and Inclinator sensor RS-422 interface

8.2.6.1.2 Autotracking connector to MOOG QPT-90 Positioner cable pinout

For the cable which connect the MOOG QPT-90 Positioner to the Receiver's Autotracking connector, the following pins relationship must be followed:

Receiver's Autotracking connector to MOOG QPT-90 Positioner cable pinout

Receiver's Autotracking (Bayonet 19 pin)		MOOG Positioner (D38999/20WJ43PN)	
Pin M	TX (+)	Pin X	RX (+)
Pin N	TX (-)	Pin Y	RX (-)
Pin P	RX (+)	Pin V	TX (+)
Pin U	RX (-)	Pin W	TX (-)
Pin A	+VCC (+24 VDC)	Pin b	Power Supply (+24 VDC)
Pin S	Power Supply GND	Pin m+p	Chassis GND and Power Return
Pin T	Signal GND	Pin Z	Signal GND

Table.35: Receiver's Autotracking connector to MOOG QPT-90 Positioner cable pinout

8.2.6.1.3 Autotracking connector to Inclinator TILT-30A (CTI Sensors) cable pinout

For the cable which connect CTI Sensors's TILT-30A inclinometer to the Receiver's Autotracking connector, the following pins relationship must be followed:

Receiver's Autotracking (Bayonet 19 pin)		Inclinometer TILT-30A (CTI Sensors)	
Pin K	TX (+)	Pin 5	Grey (RX+)
Pin L	TX (-)	Pin 6	Pink (RX-)
Pin R	RX (+)	Pin 3	Blue (TX+)
Pin V	RX (-)	Pin 4	Black (TX-)
Pin S	Power supply GND	Pin 2	White (GND)
Pin A	+VCC (24V)	Pin 1	Brown (+Vin)

Table 36: Receiver's Autotracking connector to Inclinator TILT-30A cable pinout



To connect any peripheral device to the Receiver's Autotracking connector via RS-422 port. Please note that the RX signals must be connected to TX signals and vice versa. While the polarity (+ or -) of the signal must be kept the same. For example, RX (+) signal must be connected to TX (+) signal and RX (-) signal must be connected to the TX (-) signal.

8.2.6.1.4 Autotracking connector to Novatel's Flexpak6 Compass cables pinout

For the communication cable which connect Novatel's Flexpak6 Compass to the Receiver's Autotracking connector, the following pins relationship must be followed:

Receiver's Autotracking connector to Novatel's Flexpak6 Compass communication cable pinout

Receiver's Autotracking (Bayonet 19 pin)		DB-9 Male (Novatel Flexpak6 COM 2)	
Pin B	Local GPS and Compass Input	Pin 3	RS-232 TX signal
Pin T	Digital Signal GND	Pin 5	GND

Table 37: Receiver's Autotracking connector to Novatel's Flexpak6 Compass communication cable pinout

To power Novatel's Flexpak6 Compass from the Receiver's Autotracking connector, the following pins relationship must be followed:

Receiver's Autotracking connector to Novatel's Flexpak6 Compass power supply cable pinout

Receiver's Autotracking (Bayonet 19 pin)		Lemo 4 FGG 0B (Novatel Compass)	
Pin A	+VCC (24V DC)	Pin 2,3	+VCC
Pin S	Power Return GND	Pin 1,4	GND

Table 38: Receiver's Autotracking connector to Novatel's Flexpak6 Compass power supply cable pinout

8.2.6.1.5 Autotracking connector to Local GPS Receiver cable pinout

To connect the Local GPS Receiver to the Receiver's Autotracking connector, the following pins relationship must be followed:

Receiver's Autotracking connector to Local GPS Receiver cable pinout

Receiver's Autotracking (Bayonet 19 pin)		DB-9 Male (GPS-02)	
Pin B	Local GPS and Compass Input	Pin 3	RS-232 TX signal
Pin C	+ 5V DC (Max. 700mA)	Pin 1	DC Power Input (5V DC)
Pin S	Power Return GND	Pin 5	GND

Table 39: Receiver's Autotracking connector to Local GPS Receiver cable pinout

8.2.6.2 APO-75 Antenna Polarity control

The following table describes technical features and model of the connector used for the control of APO Parabolic Antenna different polarities:

Item	Features
Connector type	Bayonet 6 pin female
Part number	KPT00E10-6P

Table 40: APO-75 Autotracking connection features

Cable pinout

Bayonet 19 pin (Receiver)	Bayonet 6 pin (APO-75)	Description
E	B	LHCP
F	E	RHCP
C	A	Vertical
G	F	Horizontal
T	C	GND
D	-	OMNI Selection
B	-	External fan

Table 41: Autotracking cable pin relationship for an antenna with polarity

8.2.6.3 AMS Multisector switch antennas

The following table describes technical features and model of the connector used in the AMS Multisectorial Antenna Autotracking. For more information about the installation and configuration of the AMS Multisector Switch Antennas, please go to section 5.1 Autotracking Multisector AMS Antenna.

Item	Features
Connector Type	Bayonet 8 pin male
Part number for the antenna	ITT KPT: 02E12-8P (female base and male pins)

Table 42: AMS Autotracking connection features

Cable pinout

Bayonet 19 pin (Receiver)	Bayonet 8 pin (AMS)	Description
D	A	Sector 1
E	B	Sector 2
F	C	Sector 3
G	D	Sector 4
H	E	Sector 5
J	F	Uplink
T	G	GND

Table 43: Autotracking cable pin relationship for an AMS multisector switch antenna

8.2.7 Remote control

8.2.7.1 Ethernet

The *Receiver* can be controlled and monitored remotely over an Ethernet link through a Web Server and SNMP.

The link is connected via an 8-pin RJ-45 connector with a 10/100 Base-T network interface. This connector is located on the rear panel of the rack-mount demodulator.

Remote connection technical features

Item	Features
Connector Label	REMOTE
Connector Type	RJ-45

Table 44: Ethernet remote connection technical features

8.2.8 USB

Through the USB connection, it is possible to update the firmware of the *Receiver* directly from an external USB device receiver. Also, it can be used to supply up to 2.5A @ +5V to a device.

USB connection technical features

Item	Features
Connector Label	USB
Connector type	Type A
Maximum output current	2.5 A

Table 45: USB input connection technical features

Chapter 9: Omnidirectional Antennas

This unit includes 2 omnidirectional antennas according to the frequency range ordered. The frequency range must be indicated in the P/N as it is explained on the How To Order document.



Figure 9.1: 3 dBi gain omnidirectional antenna

Electrical & Mechanical Specifications

Item	Features
Frequency Ranges	1.3 - 1.5 GHz 2.0 - 2.7 GHz 2.7 - 2.9 GHz 3.0 - 3.7 GHz 4.4 - 5.9 GHz 6.0 - 7.5 GHz
Input Impedance	50 ohms
VSWR	Less than 1.3:1
Polarisation	Vertical
Gain	+3dBi
Dimensions	L 100mm x D 18mm*
Weight	80 gr
Colour	White or Black
Connector	N-Type

Table 46: Omnidirectional antenna specifications

* 2 GHz antennas are provided on extra length version of 400 mm

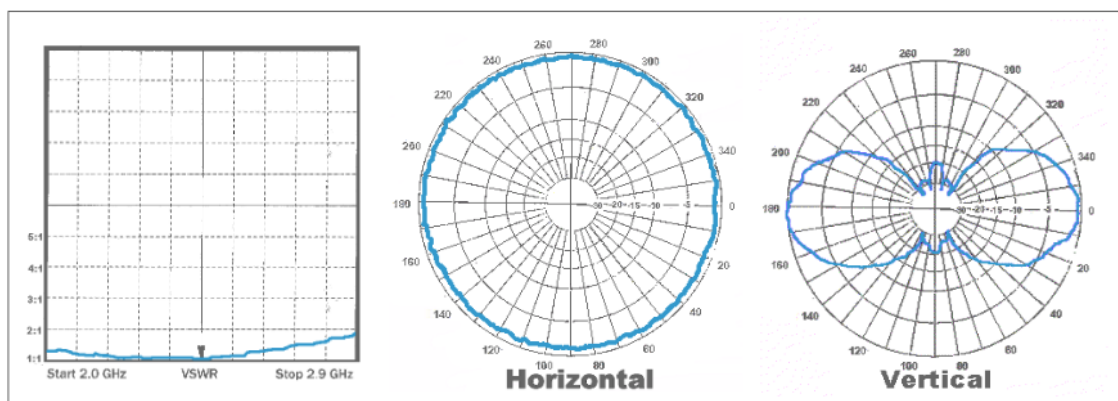


Figure 9.2: Antenna radiation pattern

Chapter 10: Preventive Maintenance

In order to ensure system longevity, it is highly recommended that the following preventive maintenance procedures are carried out at the appropriate time.

10.1 Maintenance Schedule

Procedure	Yearly	Quarterly	Monthly	Prior each use
Inspect Wiring		✓		
Inspect the cables connection		✓		
Inspect the screws of reception antenna/s and clean the connectors	✓			

Table 9.1. Maintenance Schedule table

10.2 Maintenance Procedures

Quarterly, the following inspections should be done:

- Inspect antenna installation to ensure all components are secure and in good conditions.
- Inspect cables and connections.
- It's recommended to replace the fans after 70.000 hours of use.
- Check ambient temperature.

Chapter 11: Warranty

11.1 Warranty information

Under recommended use and service, all SVP Broadcast Microwave products are warranted against defects in material and workmanship to twenty-four (24) months from the date of original shipment.

SVP Broadcast Microwave's obligation is limited to repairing or replacing, at our plant, products, which prove to be defective during the warranty period.

Under no circumstances shall the warranty be transferred or assigned to any third party unless the consent in writing has first been obtained from SVP Broadcast Microwave. SVP Broadcast Microwave shall not be under any liability for warranty in respect of any equipment, which shall be sold by the Customer to any third party unless otherwise agreed in writing.

SVP Broadcast Microwave is not liable for consequential damage resulting from the use of SVP Broadcast Microwave equipment.

11.2 Claim for damage in shipment

Your unit should be inspected and tested as soon as it is received. Claims for damage should be filed with carrier.

11.3 Return procedures

All claims under warranty must be made promptly after occurrence of circumstances giving rise to the claim and must be received within the applicable warranty period by SVP Broadcast Microwave or its authorized representative. SVP Broadcast Microwave reserves the right to reject any warranty claim not promptly reported. After expiration of the applicable warranty period, products are not subject to adjustment.

Before any Product is returned for repair and / or adjustment, authorization from SVP Broadcast Microwave for the return and instructions as to how and where the Product should be shipped must be obtained. The Product type, serial numbers, and a full description of the circumstances giving rise to the warranty claim should be included. Such information will help establish the cause of failure and expedite adjustment or repair.

Important

Any Product returned without complete information will be considered not to have met all contractual requirements. Information required includes (as a minimum): Model Number, Serial Number, Description, Hours of Use, Type of Failure, and Operating Conditions during failure.

11.4 Transportation and packaging

Any Product returned for examination must be sent prepaid via the means of transportation indicated as acceptable by SVP Broadcast Microwave. SVP Broadcast Microwave reserves the right to reject any warranty claim on any item that has been altered or has been shipped by non-acceptable means of transportation. Returned Products should be carefully packed and unless otherwise indicated, shipped to:

SVP Broadcast Microwave
Arriluzea 3
48200 Durango
Vizcaya
Spain

11.5 Authorization for evaluation

When any Product is returned for examination and inspection, or for any other reason, Customer and its shipping agency shall be responsible for all damage resulting from improper packing or handling, and for loss in transit, notwithstanding any defect or nonconformity in the Product. By returning a Product, the owner grants SVP Broadcast Microwave permission to open and inspect the returned Product to determine the cause of failure, and SVP Broadcast Microwave's determination with regard thereto shall be final.

If it is found that the Product has been returned without cause and is still serviceable, the Customer will be notified and the Product returned with appropriate inspection charges billed, at SVP Broadcast Microwave's discretion, to the Customer.

Annex A: Video over IP Monitoring on a PC

A.1 Introduction

This section provides information about how to display the IP video of the *Receiver* on the computer's or laptop's screen and how to record a video and display it on the PC. In this way, the user can analyse the desired video on the screen which could be more convenient and comfortable for testing. For this purpose, the VLC media player program is used. It can be used as a player and as a recorder.

A.2 VLC media player

VLC is a multimedia player that is capable of sending video data to a network connection, accepting video data from a network connection, and displaying the video. It can be used as a player and as a recorder.

There are several steps that must be carried out in order to have a successful process. Firstly, they are explained for the use of VLC as a player and secondly, for the use of VLC as a recorder.

It is important to verify that the IP address that has been set in the *Receiver* is the same as the IP of the PC. Moreover, the type of input that has to be set in the device is DVB-T2 and the PC and the receiver have to be connected via an Ethernet cable.

A.2.1 VLC as a player

Step 1

Download the VLC, version 2.2.4 from <http://www.videolan.org>, then, install it on the host computer.



Figure A.A.1: VLC Media Player

Step 2

Once the VLC has been downloaded, the *Receiver* must be configured as it is shown below:

- **Select the ASI input:**



Figure A.A.2: Type of input selection

- **Go to the IP Output option of the main menu to configure the destination IP and port and the desired protocol.**



Figure A.A.3: Configuration of the Dest IP & Port

In this case, the selected IP belongs to the unicast IP range.

Press the OK button again to configure these parameters. The destination IP must be the IP of the computer where you want to display the video and the port is the number of the port that you choose for it (eligible parameter).

Then, go to Protocol option and select the desired type of protocol. It can be RTP or UDP.



Figure A.A.4: Configuration of the type of protocol

- **Once these parameters have been configured, it is necessary to verify the connection between the *Receiver* and the computer.**

An Ethernet cable must be used to connect the receiver with the computer. The output of the receiver that has to be used for this purpose is the Video over IP output, so the Ethernet cable must be connected to it.



It is very important to verify that the selected destination IP address is different from the IP address of the Webserver and the Local IP address. They cannot be the same.

Step 3

Once the configuration of the parameters has been done, start the VLC Media Player on the PC. This picture will appear on the screen.

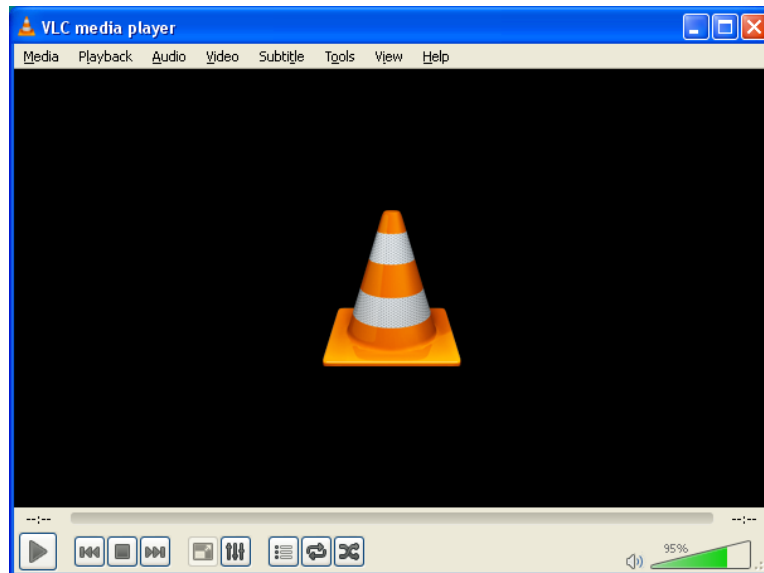


Figure A.5: VLC Media Player main screen

Step 4

From the VLC media player window, go to Media -> Open Network Stream.

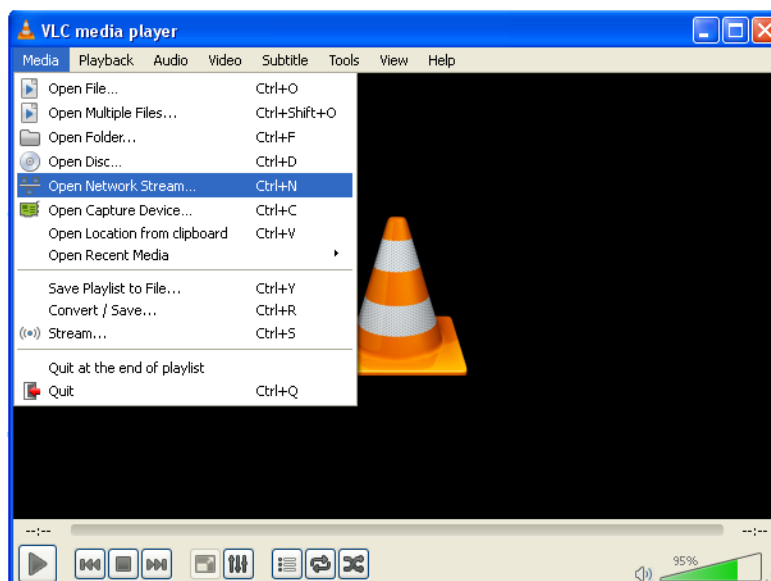


Figure A.A.6: Open Network Stream

Step 5

Then, go to Network section and enter the network URL as it is shown in the figure below.

The network URL has different parts:

Protocol → **udp**://@:**5678** ← Port

- **Protocol:** The type of protocol selected for the communication. It can be RTP or UDP.
- **Port:** Number of port of the device. (Port set on the *Receiver*)

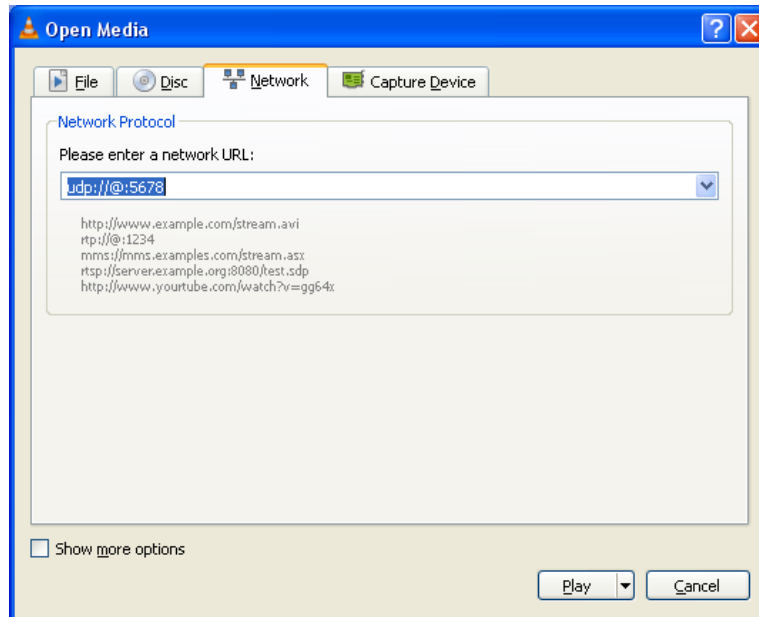


Figure A.7: Network URL

Step 6

Finally, press Play and the desired IP video will appear on the screen.

In the figure below, a connection diagram is shown. The aim of this diagram is to explain to users how to connect the *Receiver* and configure its parameters if you want to use the VLC media player and the Webserver at the same time. The meaning of the parameters is:

- **Local IP:** IP address of the device for the Video over IP connection.
- **Webserver IP:** IP address of the device for the Webserver connection.
- **Destination IP:** IP address of the device to which data is sent.
- **Destination Port:** Port Number of the device to which data is sent.
- **Protocol:** Type of protocol selected for the communication.

The transmitter must be configured in Standard delay and 4.2.0 profile.

Encryption is not supported by the VLC

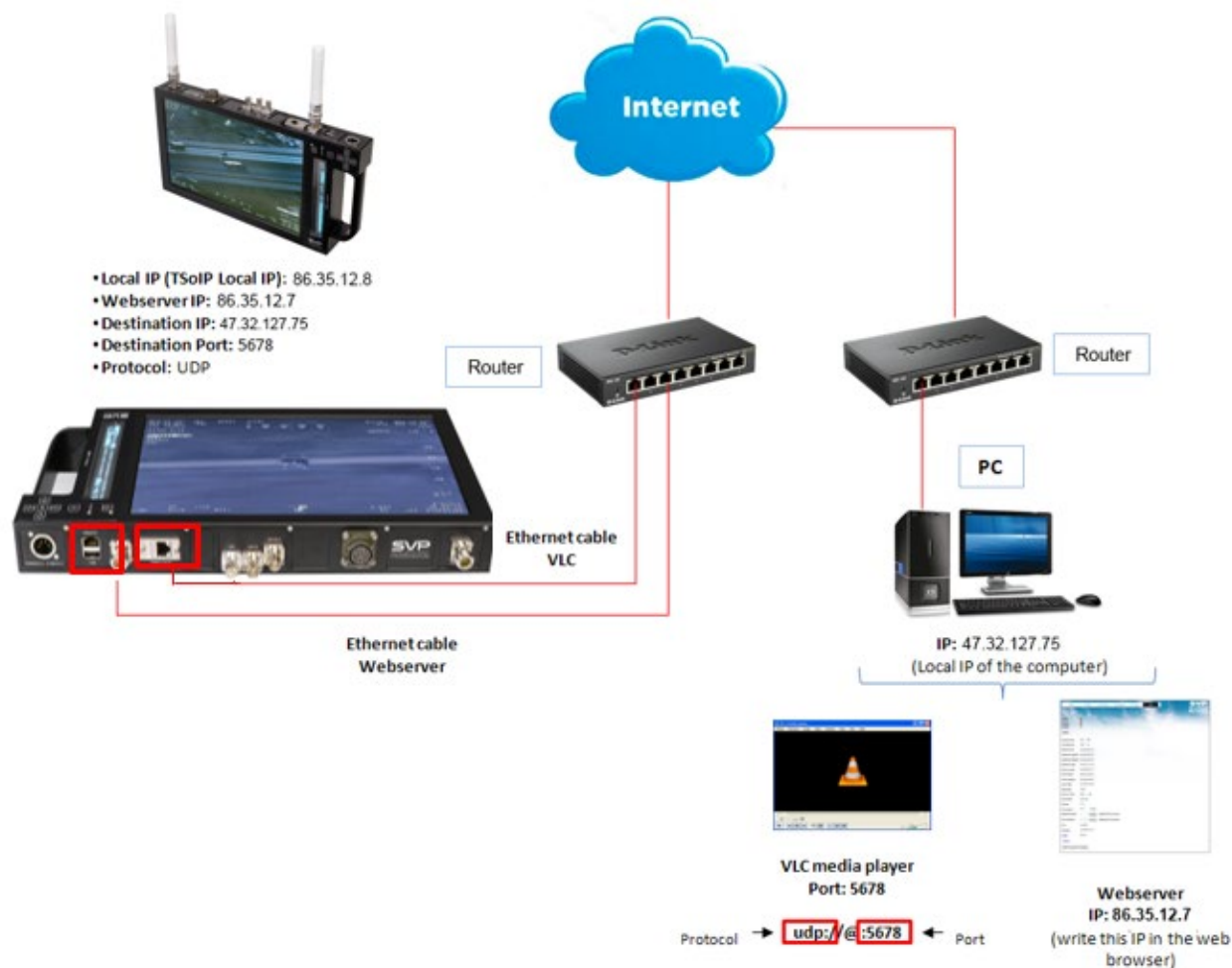


Figure A.8: Connection diagram example



Note that with private networks, the routers must be configured with port forwarding to be able to receive traffic from the Internet. Refer to the manual of the router or the administration in charge of the organization gateways.

A.2.2 VLC as a recorder

There are several steps that have to be carried out in order to record a TS video using VLC media player.

Step 1

Start VLC Media Player on the PC. This picture will appear on the screen.

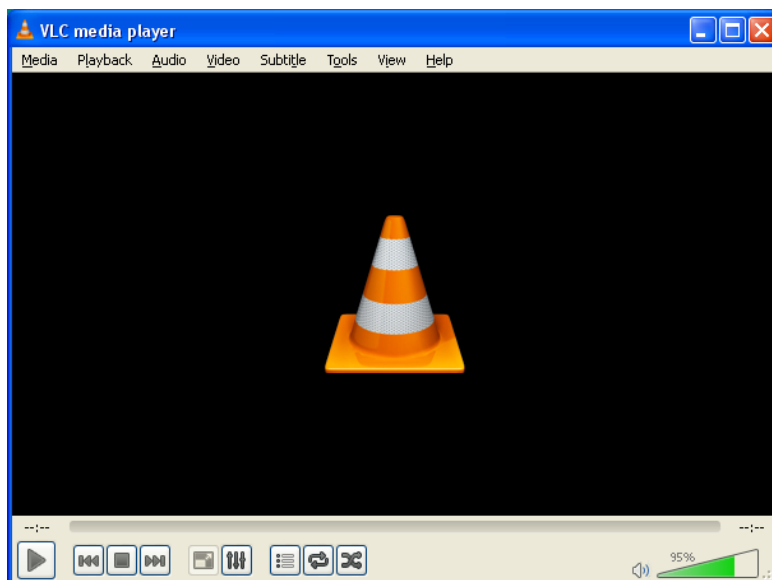


Figure A.9: VLC Media Player main screen

Step 2

From the VLC media player window, go to View -> Advanced Controls.

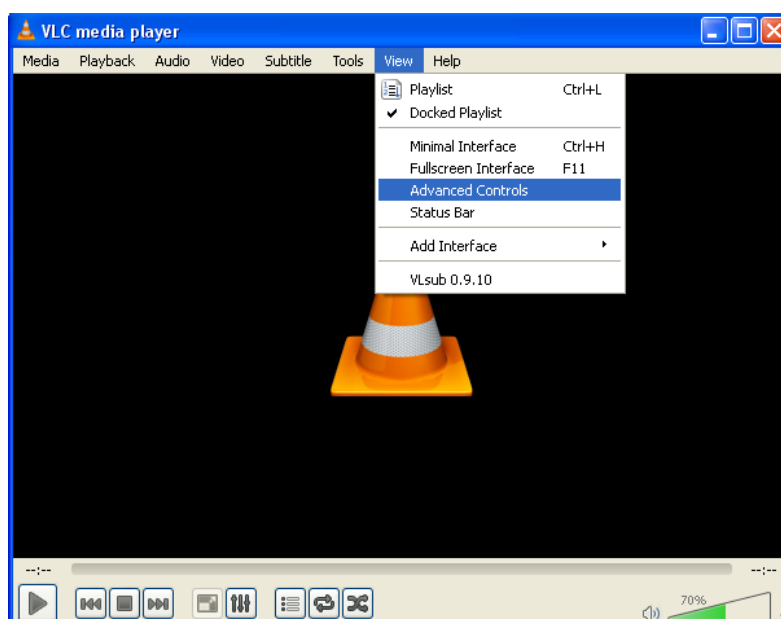


Figure A.10: VLC Media Player Advanced Controls

The buttons in red will be added to the main screen:

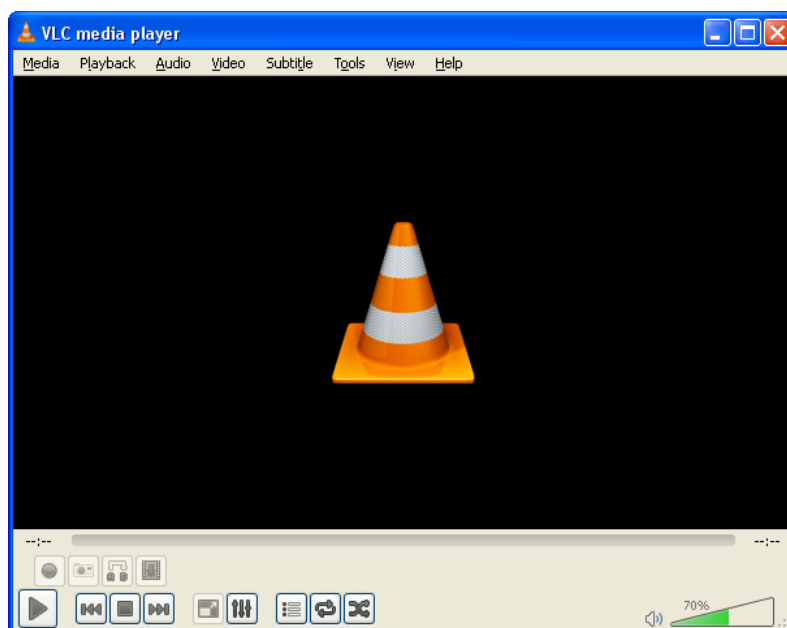


Figure A.11: VLC Media Player Advanced Controls buttons

Step 3

Press play button to play the desired video and select a file from your computer pressing Add button.

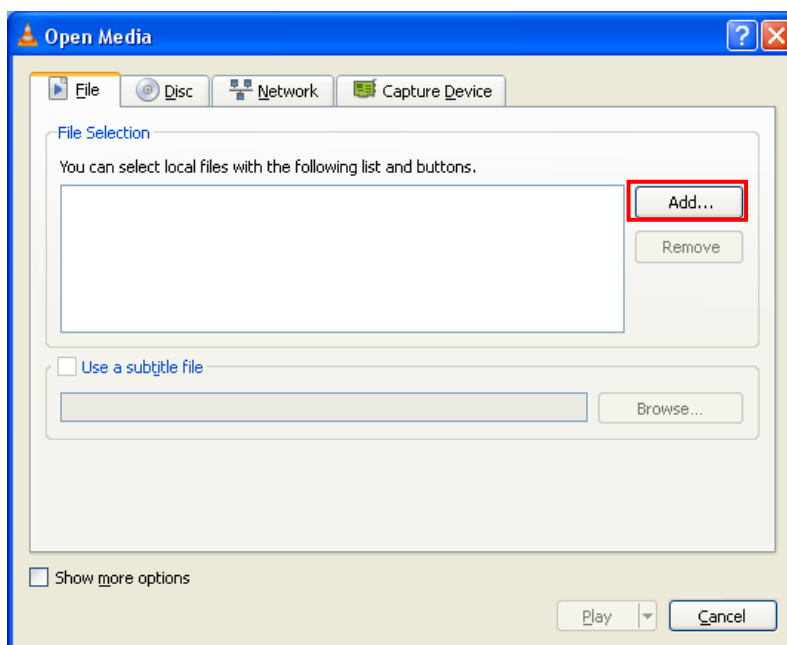


Figure A.12: Open Media

Step 4

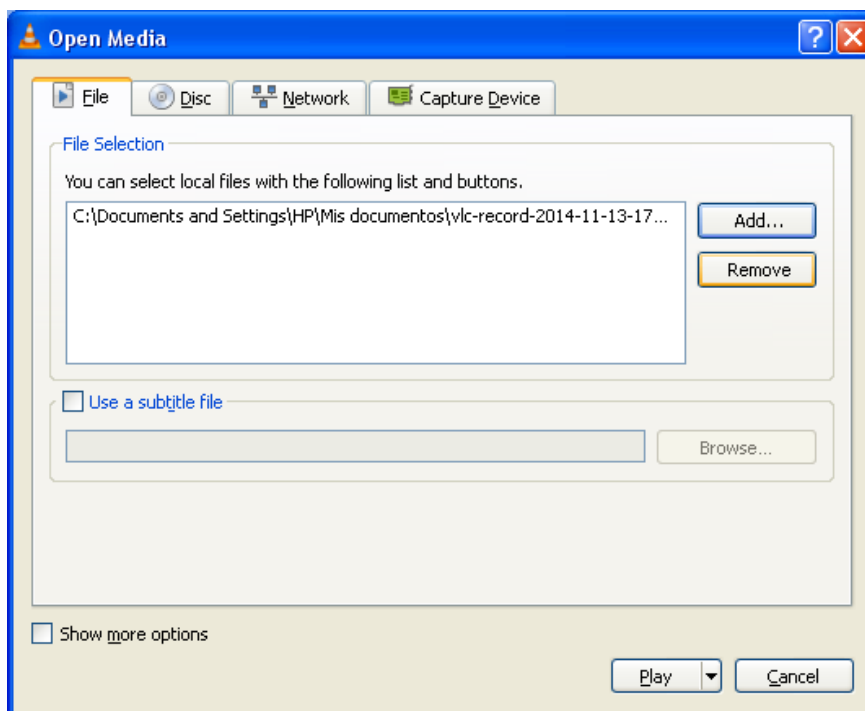


Figure A.13: Open Media

Once a file has been selected, press Play option and the video will be displayed in the VLC media player.

Step 5

Press Record button to start recording and then press Record button again to stop it. A .ts file will be saved automatically in the user's file "Documents" with "VLC record" name, the date and the hour.

 vlc-record-2014-11-13-17h48m44s-udp____5678-.ts

Glossary

AES/EBU	Audio Engineering Society/European Broadcasting Union
AES-128/ AES-256	Advanced Encryption Standard of 128 or 256 bits key
AM	Multisectorial Antenna
APSK	Amplitude and phase-shift keying or asymmetric phase-shift keying
ASI	Asynchronous Serial Interface
BNC	Bayonet Neill-Concelman
BR	BitRate
CA-BISS	Conditional Access-BISS
COFDM	Coded Orthogonal Frequency Division Multiplexing
DC	Direct current or Down Converter
DVB-T	Digital Video Broadcasting – Terrestrial
DVB-T2	Digital Video Broadcasting – Terrestrial Second Generation
ETSI	European Telecommunications Standards Institute
FEC	Forward Error Correction
FFT	Fast Fourier transform
GPS	Global Positioning System
HD	High Definition
HDMI	High-Definition Multimedia Interface
HDR	High Definition Receiver
HDT	High Definition Transmitter
IF	Intermediate Frequency
IG	Interval Guard
IP	Internet Protocol

IP3	3 rd order Intermodulation Product
ISDB-T	Integrated Services Digital Broadcasting
LCD	Liquid Crystal Display
LD	Low Delay
LED	Light-Emitting Diode
LNA	Low Noise Amplifier
MPEG	Moving Picture Experts Group
NLOS	Non Line of Sight
PAL	Phase Alternating Line
PLL	Phase Locked Loop
PID	Packet Identification
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase-Shift Keying
RF	Radio Frequency
RTC	Remote Control
SD	Standard Delay
SDI	Serial Digital Interface
SNMP	Simple Network Management Protocol
TFT	Thin-Film Transistor
TS	Transport Stream
UDP	User Datagram Protocol
UHF	Ultra-High Frequency
USB	Universal Serial Bus
VSWR	Voltage Standing Wave Ratio

Certificate of Conformance

Certificate No.: S 2012012
Description: MANO H.264 Hand Held Receiver
Model: MANO

This declaration of conformity is issued under the exclusive responsibility of the manufacturer.
The equipment has been designed and tested to meet the following standards applicable to the 2014/53/UE directive:

EN 62368-1	Audio/video, information and communication technology equipment (Safety requirements)
EN 50566	Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz.
EN 62368-1:2024	Audio/video, information and communication technology equipment (Safety requirements).
EN 62479:2010	Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
UNE-EN 303340	Digital Terrestrial TV Broadcast Receivers; Harmonised Standard for access to radio spectrum
EN 50663: 2017	Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields
EN 301 489-1:2020	Electromagnetic Compatibility (EMC) standard for radio equipment and services; clause 8.2: Radiated emission clause 8.3&8.4: Conducted emission clause 8.5: Harmonic current emissions clause 8.6: Voltage fluctuations and flicker clause 8.7: Conducted emission

RoHS Directive 2011/65/EU Restriction of the use of certain hazardous substances

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Notes

*** Compatibility with other manufacturer's codecs is not guaranteed.**

Final note

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