



REBLE610



User Manual

1 Summary

USER MANUAL	1
2 FIGURE INDEX.....	3
3 SAFETY REGULATIONS.....	7
3.1 TREATMENT OF ELECTRICAL SHOCKS.....	7
3.2 TREATMENT OF ELECTRICAL BURNS.....	8
4 GENERAL DESCRIPTION.	9
5 TECHNICAL SPECIFICATIONS.....	9
5.1 MODEM DETAILS.	10
5.2 I/O SIGNALS.	10
5.3 GENERAL SPECIFICATIONS.....	10
5.4 MECHANICAL SPECIFICATIONS.....	11
6 INSTALLATION	11
7 USER INTERFACE.	11
7.1 MAIN MENU.	12
7.2 SUMMARY MENU.....	12
7.3 MENU UPROCESSOR (UP).	13
7.3.1 <i>MicroProcessor submenu.</i>	13
7.3.2 <i>Menu Setup - System Time.</i>	13
7.3.3 <i>Menu Setup - Touch Screen Calibration.</i>	13
7.3.4 <i>Menu Setup - Reset.</i>	14
7.3.5 <i>Menu Net - Network parameters.</i>	14
7.3.6 <i>Menu Misc - General information 1/2</i>	15
7.3.7 <i>Menu Misc - General information 2/2</i>	15
7.3.8 <i>Menu Misc - Modules.</i>	16
7.4 MENU MODEM (MODEM UC).....	18
7.4.1 <i>Modem submenu.</i>	19
7.4.2 <i>Modem configuration menu</i>	19
7.4.3 <i>Modem measurements menu.</i>	19
7.4.4 <i>Modem alarms menu.</i>	21
7.4.5 <i>Modem general menu.</i>	23
7.5 MENU I/O (IO).....	24
7.5.1 <i>I/O submenu.</i>	24
7.5.2 <i>Ethernet menu</i>	24
7.5.3 <i>ASI/E1 menu.</i>	25
7.5.4 <i>Single connector menu.</i>	25

7.6	MENU TRANSMITTER (TX).	26
7.7	MENU RECEIVER (RX).	26
7.8	MENU POWER SUPPLY (PS).	27
8	WEB INTERFACE.....	28
8.1	STATUS.....	29
8.1.1	Status-Controller.....	29
8.1.2	Status-Modem.....	30
8.2	STATUS-INTERFACE.....	31
8.2.1	Status-Transmitter.....	32
8.2.2	Status-Receiver.....	33
8.3	TAB CONTROLLER.....	33
8.3.1	Controller – Coil fans.....	34
8.3.2	Controller – Customer.....	34
8.3.3	Controller – Network.....	35
8.3.4	Controller – Trap Manager.....	36
8.3.5	Controller – Tools.....	38
8.3.6	Controller – Password management.....	39
8.4	TAB SLOT.....	39
8.4.1	Slot – Modem.....	39
8.4.2	Slot – Interface.....	43
8.4.3	Slot – TX.....	45
8.4.4	Slot – Rx.....	46
8.5	TAB UPGRADE.....	48
8.6	TAB LOG.....	49
9	PANELS.....	51
9.1	FRONT PANEL.....	51
9.2	BACK PANEL.....	52

2 Figure Index

FIGURE 1: RESUSCITATION DETAIL – 1.....	7
FIGURE 2: RESUSCITATION DETAIL – 2.....	7
FIGURE 3: MAIN MENU FD.....	12
FIGURE 4: MAIN MENU TX.....	12
FIGURE 5: MAIN MENU RX.....	12
FIGURE 6: SUMMARY MENU FD.....	12
FIGURE 7: MICROPROCESSOR SUBMENU.....	13

FIGURE 8: SYSTEM TIME SETTING MENU.	13
FIGURE 9: VIRTUAL KEYPAD.	13
FIGURE 10: TOUCH SCREEN CALIBRATION MENU.....	14
FIGURE 11: RESET MENU.	14
FIGURE 12: NETWORK PARAMETERS MENU.....	15
FIGURE 13: GENERAL INFO MENU 1/2.	15
FIGURE 14: GENERAL INFO MENU 2/2.	16
FIGURE 15: GENERAL PURPOSE INFORMATION CONTROLLER.....	16
FIGURE 16: GENERAL PURPOSE INFORMATION MODEM.....	17
FIGURE 17: GENERAL PURPOSE I/O INTERFACE INFORMATION.....	17
FIGURE 18: GENERAL PURPOSE INFORMATION RX.	18
FIGURE 19: GENERAL PURPOSE INFORMATION TX.	18
FIGURE 20: MODEM SUBMENU.	19
FIGURE 21: MODEM FD CONFIGURATION MENU.	19
FIGURE 22: MODEM FD MEASUREMENT MENU.	20
FIGURE 23: MODEM Tx MEASUREMENT MENU.....	20
FIGURE 24: MODEM Rx MEASUREMENT MENU.	20
FIGURE 25: MODEM FD MEASUREMENTS MENU (2).	20
FIGURE 26: MODEM Tx MEASUREMENTS MENU (2).	20
FIGURE 27: MODEM Rx MEASUREMENTS MENU (2).....	20
FIGURE 28: MODEM XPIC MEASUREMENTS MENU FD.....	21
FIGURE 29: MODEM XPIC MEASUREMENTS MENU Tx.....	21
FIGURE 30: MODEM XPIC MEASUREMENTS MENU Rx.....	21
FIGURE 31: MODEM ALARMS MENU FD.....	21
FIGURE 32: MODEM ALARMS MENU Tx.	21
FIGURE 33: MODEM ALARMS MENU Rx.	21
FIGURE 34: MODEM GENERAL MENU FD.....	23
FIGURE 35: MODEM GENERAL MENU Tx.	23
FIGURE 36: MODEM GENERAL MENU Rx.....	23
FIGURE 37: I/O SUB-MENU.	24
FIGURE 38: MENU ETHERNET.....	24
FIGURE 39: GENERAL ASI/E1 MENU.	25
FIGURE 40: BNC CONNECTOR CONFIGURATION AND STATUS MENU.....	25
FIGURE 41: TRANSMITTER MENU.	26
FIGURE 42: RECEIVER MENU.	27
FIGURE 43: POWER SUPPLY MENU.	27
FIGURE 44: ICON POWER SUPPLY WITH CONTINUOUS CURRENT, PRIMARY POSITION.	27
FIGURE 45: ICON POWER SUPPLY WITH CONTINUOUS CURRENT, SECONDARY POSITION.....	27
FIGURE 46: ICON POWER SUPPLY WITH ALTERNATING CURRENT, PRIMARY POSITION.	28

FIGURE 47: ICON POWER SUPPLY WITH ALT ALTERNATING CURRENT, SECONDARY POSITION.....	28
FIGURE 48: WEB INTERFACE LOGIN PAGE.....	28
FIGURE 49: WEB STATUS FORM – CONTROLLER.	29
FIGURE 50: WEB STATUS FORM – CONTROLLER FANS.	30
FIGURE 51: WEB STATUS FORM – MODEM LOCKED.	30
FIGURE 52: WEB STATUS FORM – MODEM UNLOCKED.	30
FIGURE 53: WEB STATUS FORM – INTERFACE ASI/E1.	31
FIGURE 54: WEB STATUS FORM – INTERFACE LOOP.	32
FIGURE 55: WEB STATUS FORM – TX.....	32
FIGURE 56: WEB STATUS FORM – RX.	33
FIGURE 57: WEB CONTROLLER FORM – FANS.	34
FIGURE 58: WEB CONTROLLER FORM – CUSTOMER INFO.	34
FIGURE 59: WEB CONTROLLER FORM – NETWORK PARAMETERS.	35
FIGURE 60: WEB CONTROLLER FORM – MODEM SNMP TRAPS CONFIGURATION.	36
FIGURE 61: WEB CONTROLLER FORM – DATA INTERFACE SNMP TRAPS CONFIGURATION.....	36
FIGURE 62: WEB CONTROLLER FORM – BASEBAND SIGNALS SNMP TRAPS CONFIGURATION.....	36
FIGURE 63: WEB CONTROLLER FORM – RECEIVER SNMP TRAPS CONFIGURATION.....	36
FIGURE 64: WEB CONTROLLER FORM – TRANSMITTER SNMP TRAPS CONFIGURATION.....	37
FIGURE 65: WEB CONTROLLER FORM – CONTROLLER SNMP TRAPS CONFIGURATION.	37
FIGURE 66: WEB CONTROLLER FORM – ALARM RELAY CONFIGURATION.....	37
FIGURE 67: WEB CONTROLLER FORM – TRAP DESTINATION CONFIGURATION.....	37
FIGURE 68: WEB CONTROLLER FORM – GENERAL INFO AND TOOLS.....	38
FIGURE 69: WEB CONTROLLER FORM – PASSWORD MANAGEMENT.....	39
FIGURE 70: WEB SLOT MODEM FORM – STATUS.	40
FIGURE 71: WEB SLOT MODEM FORM – MSE GRAPHIC.....	40
FIGURE 72: WEB SLOT MODEM FORM – TEMPERATURE MANAGEMENT.....	41
FIGURE 73: WEB SLOT MODEM FORM – PROFILE MANAGEMENT.	41
FIGURE 74: WEB SLOT MODEM FORM – PROFILE MANAGEMENT EXPANDED.	41
FIGURE 75: WEB SLOT MODEM FORM – OPERATIONAL MODE MANAGEMENT.....	42
FIGURE 76: WEB SLOT MODEM FORM – OPERATIONAL MODE MANAGEMENT EXPANDED.....	42
FIGURE 77: WEB SLOT INTERFACE FORM – STATUS.....	43
FIGURE 78: WEB SLOT INTERFACE FORM – INPUT/OUTPUT PORTS MANAGEMENT.....	43
FIGURE 79: WEB SLOT INTERFACE FORM – INTERNAL LOOP MANAGEMENT.....	44
FIGURE 80: WEB SLOT INTERFACE FORM – ETHERNET PORT MANAGEMENT.....	44
FIGURE 81: WEB SLOT INTERFACE FORM – ETHERNET PORT MANAGEMENT.....	44
FIGURE 82: WEB SLOT TX FORM – STATUS.	45
FIGURE 83: WEB SLOT TX FORM – TEMPERATURE MANAGEMENT.....	45
FIGURE 84: WEB SLOT TX FORM – POWER MANAGEMENT.	46
FIGURE 85: WEB SLOT TX FORM – FREQUENCY.	46

FIGURE 86: WEB SLOT RX FORM – STATUS.....	46
FIGURE 87: WEB SLOT RX FORM – RSSI GRAPHIC.....	47
FIGURE 88: WEB SLOT RX FORM – FREQUENCY.	47
FIGURE 89: WEB SLOT RX FORM –TEMPERATURE MANAGEMENT.	47
FIGURE 90: WEB UPGRADE FORM – CONFIGURATION FILE UPLOADER.....	48
FIGURE 91: WEB UPGRADE FORM – MACHINE UPGRADE.....	48
FIGURE 92 : WEB LOG FORM – AVAILABLE LOG.....	49
FIGURE 93: WEB LOG FORM – AVAILABLE LOG EXPANDED.	49
FIGURE 94: WEB LOG FORM – LOG.	50
FIGURE 95: WEB LOG FORM – FILTERS.....	50
FIGURE 96: WEB LOG FORM – FILTERS (SELECTION OF NUMBER OF LINES PER PAGE).....	51
FIGURE 97 : REBLE610 FRONT PANEL.....	51
FIGURE 98: REBLE610 BACK PANEL.	52

3 Safety regulations.

The personnel engaged with the installation, the use and the maintenance of the equipment has to be familiar with the theory and practice of first aid.

3.1 Treatment of electrical shocks.

When the victim loses his consciousness:

Put into practice the following first aid principles.

- Position the victim lying down on his back on a rigid surface.
- Open the respiratory airways lifting up the neck and pushing down the front (Fig. 1).
- If necessary, open the mouth to check the respiration.
- In case the victim doesn't breathe, start immediately the artificial respiration (figure 2): bend the head, close the nostrils, attach the mouth to the victim one's and do 4 quick mouth-to-mouth respirations

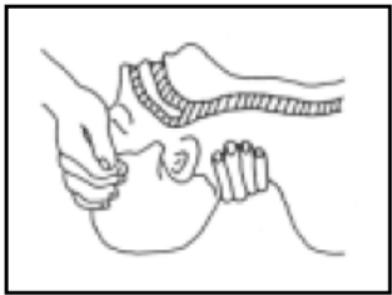


Figure 1: Resuscitation detail – 1.



Figure 2: Resuscitation detail – 2.

- Check the pulsation (Figure 3); in case of absence of pulsation, start immediately the cardiac massage (Figure 4) pressing the breastbone in the middle of the thorax (Figure 5).



Figure 1: Resuscitation detail – 3.

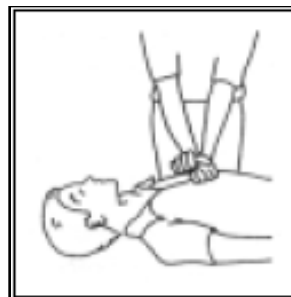


Figure 2: Resuscitation detail – 4.

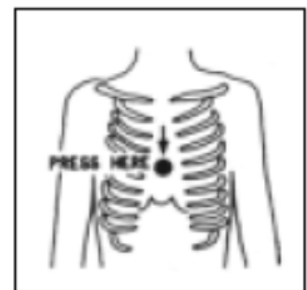


Figure 3: Resuscitation detail – 5.

- When there is only one rescuer, he has to maintain a rhythm of 15 compressions alternated with 2 quick respirations.
- In case there are two rescuers, the rhythm should be one respiration each 5 compressions.
- Do not interrupt the cardiac massage during the artificial breathing
- Call a doctor as soon as possible

When the victim is conscious

- Cover up the victim with a blanket.
- Try to calm down the victim.
- Unbutton the cloche and lay down the victim.

- Call a doctor as soon as possible.

3.2 Treatment of electrical burns.

Large burns and cuts of the skin

- Cover up the interested area with a clean sheet or cloth.
- Do not open the blisters; remove the fabric and the parts of the clothes attached to the skin; apply a suitable ointment.
- Treat the victim according to the type of accident.
- Take the victim to the hospital as soon as possible.
- When the arms and legs are affected keep them raised.

When there is no doctor available within an hour and the victim is conscious and does not retch, give a liquid solution containing salt and sodium bicarbonate: 1 teaspoon of salt and half a teaspoon of sodium bicarbonate for each 250 ml of water.

Have the victim sip half a glass of the solution for four times and for 15 minutes.

Stop when retching.

Do not give any alcoholics

Less serious burns

- Apply cold (not frozen) gauzes using a clean as possible cloth.
- Do not open the blisters; remove the fabric and the parts of the clothes attached to the skin; apply a suitable ointment.
- When necessary, put on clean and dry clothes.
- Treat the victim according to the type of accident.
- Take the victim to the hospital as soon as possible.
- When the arms and legs are affected keep them raised.

4 General Description.

The **REBLE610** is a very flexible microwave link that offers heterogeneous signals transport adapting transmitting capacity to data stream.

It is the evolution of the already innovative and performing REBLE310, from which is distinguished by an accurate hardware design, with particular care in the modularity and in avoiding any internal cabling.

The equipment is composed by a basic chassis and four swappable parts that make easy the maintenance process and the always critical frequency change; a dual redundant power supply, hot swappable, is present, available both in AC and DC version. A slot with the digital part (modem and data interface) has been realized, as well as a module hosting the whole RF part (transmitter, receiver and channel filters).

The transmitters (at different frequencies) have been improved, being able to give always at least 1W at output flange in any modulation scheme, introducing pre-correction and wideband calibration (up to 1 GHz, depending on the frequency).

Data interface is equipped with 10 ASI/BTS ports on BNC connectors, configurable as input or output; this feature let have in a single chassis the functions of an ASI matrix and an ASI distributor, both in input and output. The link let also transfer IP traffic on a GbE port, an E1 2.048 Kbps signal and a “transit” connection (just not to use too many coaxial cables for the transit).

With the optional XPIC module (and another REBLE610), it is possible to double the capacity of the link, transmitting both in polarization H and V, erasing the undesired signal with special algorithms.

The compactness (1U rack 19”) is one of the main features, together with the care in the details for an easy installation and maintenance, and the outstanding performances in terms of power, sensitivity and notch tolerance.

The equipment can be half duplex (transmitter or receiver) or full-duplex.

5 Technical Specifications.

Table 1

	2-4.2	4.4-5.0	5.0-5.5	5.8-7.1*	7.1-7.7	7.7-8.5	10.0-10.7*	10.7-11.7	12.7-13.2	14.0-15.5
Power [QPSK] after circulator [dBm] (*dielectric resonator filters)[1 dB less for standard filters]	35						34	30		
Power out [256 QAM after circulator [dBm] (*dielectric resonator filters)	30						29	26		
RF connectors/flanges	N		N or UER70		N		UBR120		UBR140	

Table 2

Configuration	Full-duplex or Half-duplex
Conversion	Direct
RF Output Return Loss	> 23 dB
RF Input Return Loss	> 23 dB
Spurious suppression	> 65 dBc

Frequency stability	± 1 ppm
Standard channels	1.75/3.5/7/14/20/28/29,65/30/40/56 MHz
Modulation scheme	QPSK; 8PSK 16-32 APSK 16-32-64-128-256QAM
Capacity*	Up to 310 Mbit/s

Table 3: Performances examples in a 28 MHz channel.

Modulation	Sensitivity	Payload
QPSK	-88 dBm	36.665 Mbit/s
8PSK	-82 dBm	54.998 Mbit/s
16QAM	-81 dBm	73.331 Mbit/s
32QAM	-78 dBm	91.664 Mbit/s
64QAM	-74 dBm	123.384 Mbit/s
128QAM	-71 dBm	148.409 Mbit/s
256QAM	-68 dBm	173.726 Mbit/s

5.1 Modem details.

All modem parameters are tied to configuration released by Elber s.r.l.; parameters cannot be manually modified.

Table 4

Modulation schemes	QPSK; 8PSK 16-32 APSK 16-32-64-128-256QAM
Protection codes *	1. Low Density Parity Check (LDPC) encoder 2. Reed-Solomon with K from 6 to 255 and t from 0 to 16 and Convolutional Trellis or Block codes (1/2-13/14). Programmable internal interleaver
Max Symbol rate	49.5 MBaud
Bandwidth*	1.75 ÷ 56 MHz
Roll-off shaping filter *	0.15 ÷ 0.30

5.2 I/O signals.

Table 5

Access	10xASI/BTS 1xE1 1xGbE
ASI/BTS, E1 Connectors	BNC 75 Ohm unbalanced
Connector GbE, 1+1, XPIC, Transit	RJ-45

5.3 General Specifications

Table 6

Operative Temperature Range	-10°C ÷ 55°C
Management	Front panel (Display TFT touchscreen) SNMP Web browser
Firmware upgrade	USB, WEB, FTP
Power supply	Two, hot swappable. AC 90-260 V~ 50/60 Hz IEC 320 DC 22 ÷ 65 V 2 pins socket

Max power consumption	100 W
Max dissipation	110 W

5.4 Mechanical Specifications.

Table 7

Rack	Standard 19" 1U
Width	482.6 mm
Height	43.6 mm
Depth	554.85 mm (with circulator and hangings) 512.85 mm without circulator
Max Weight	8 Kg

6 Installation.

- Unpack the equipment and check first of all check if there are any damages due to the transport.
- The box should contain:
 - The REBLE610
 - 1 or two AC supply cable (depending on number and type of power supplies purchased)
 - 1 or two DC supply cable, equipment adapted connector on one side, free wires at other end (depending on number and type of power supplies purchased)
 - The user manual
- Install the equipment in a rack cabinet. A one-unit space is requested. Verify that there is enough space between other functioning equipment generating high temperatures and that there are no obstructions in the ventilation. (The functioning is guaranteed in a temperature range from -10 °C ÷ +55 °C).
- The equipment must be correctly grounded, to guarantee a secure functioning.
- Connect to the correct power tension reading the information on the manual or on the label attached to each equipment, containing the serial number.
- Connect the network cable to the plug on the rear of the equipment or connect the battery cable to the related connector. The last used configuration will be loaded.
- Connect the flange(s) on the rear panel (or N connectors, depending on frequencies) of the equipment to the waveguide/cable for the connection to the branching system and the antenna.
- Setup the equipment according to the needs consulting the user manual.

7 User interface.

The user interface consists of a general alarm led and a graphical TFT display with **TOUCH SCREEN** function (for more comfortable use, a stick is available in a compartment located in the front panel , see 9.1).

According to equipment configuration (Half-duplex transmitter[Tx], Half-duplex receiver [Rx], Full-duplex[FD]), just the related menu are shown.

In order to have a read/write privilege and thus modify the configuration of the equipment, it's required the connection of a USB pen with the right token to the USB port in the front panel; on the other end, it's required to digit a numeric password while trying to modify one parameter (the password is tied to the customer's name and it's notified at delivery).

7.1 Main menu.

At equipment switch on, after embedded software boot, display shows the main menu, according to the configuration, as can be seen in Figure 3, Figure 4 and Figure 5.

This menu shows the equipment block diagram, for an easy and intuitive access to modules parameters according to their function; on every active area, one or more circles symbolizing alarm led are shown, eventually red or green depending on the status of the related block.

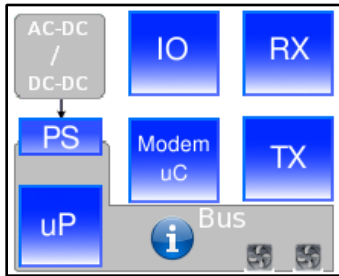


Figure 3: Main menu FD.

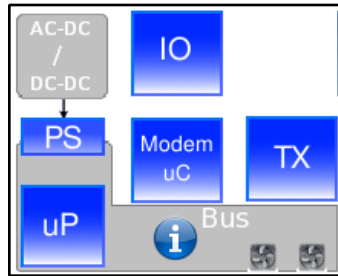


Figure 4: Main menu Tx.

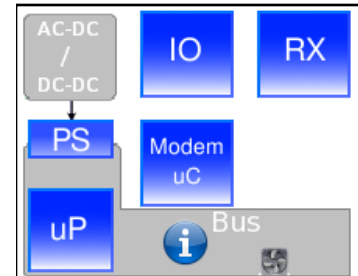


Figure 5: Main menu Rx.

Active areas:

- Rx
- Tx
- Modem uC
- I/O
- uP
- PS
- Bus
- 

7.2 Summary menu.

Summary menu reports the most important information for a fast check of the equipment functioning; indeed following measurements and indications are shown:

- Equipment *Power out* (FD and Tx)
- *RSSI Received Signal Strength Indication* (FD and Rx)
- *MSE Mean Square Error* (FD and Rx)
- Modulator locking status *Timing Loop* (FD and Tx)
- Demodulator locking status *Dem Lock* (FD and Rx)

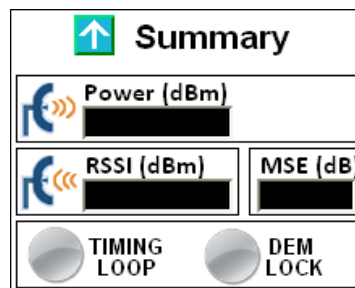


Figure 6: Summary menu FD.

Active areas:

- Directional arrow "UP"  to go back to main menu.

7.3 Menu uProcessor (uP).

7.3.1 MicroProcessor submenu.

The submenu let a fast access to the elements to be controlled; icons meaning, concerning different sections, is intuitive.



Figure 7: Microprocessor submenu.

7.3.2 Menu Setup - System Time.

This menu let the user set right time and date, used by the system for alarm logging. Information about system time is preserved by the battery of the *Real Time Clock*.

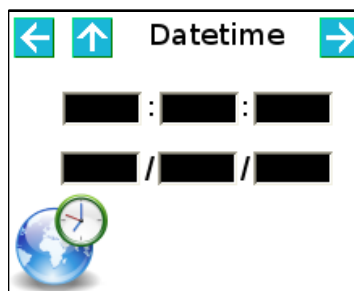


Figure 8: System time setting menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.
- Every text box which opens a virtual keypad to enter information.

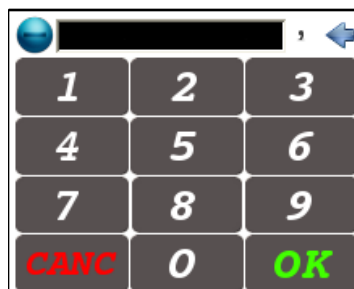


Figure 9: Virtual keypad.

7.3.3 Menu Setup - Touch Screen Calibration.

This menu let the user calibrate the Touch Screen function. It's recommended to use the stick provided with the equipment to touch the red cross, three time as required by the system, after **Calibrate** button pushing.



Figure 10: Touch Screen Calibration menu.

Active areas:

- Directional arrow "UP"  to go back to main menu.
- Directional arrows "LEFT"  and "RIGHT"  to browse microprocessor menu.

7.3.4 Menu Setup - Reset.

This menu let the user reset each microcontroller and FPGA of the equipment.

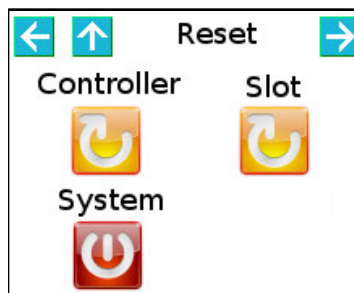


Figure 11 : Reset menu.

Active areas:

- Directional arrow "UP"  to go back to main menu.
- Directional arrows "LEFT"  and "RIGHT"  to browse microprocessor menu.
- Reset icons.

SLOT reset will eventually restart modem and data interface; CONTROLLER reset just reboot system supervisor, SYSTEM reset is the complete reset of the equipment.

7.3.5 Menu Net - Network parameters.

This menu let the user modify management port network parameters; in detail, it is possible to set IP address, Subnet Mask and Gateway IP. MAC Address is read-only.

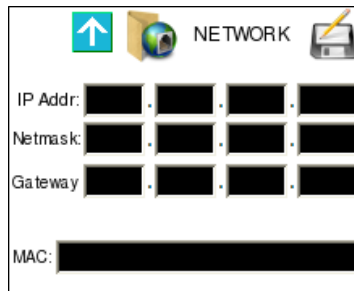


Figure 12: Network parameters menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.
- Every text box, which opens the virtual keypad to insert characters.

7.3.6 Menu Misc - General information 1/2.

This menu shows general purpose information, such as:

- Model
- Serial Number
- Part Number

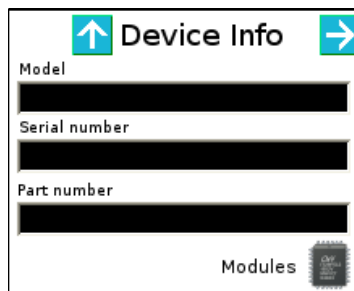


Figure 13: General info menu 1/2.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrow “RIGHT”  to browse microprocessor menu.
- Modules icon.

7.3.7 Menu Misc - General information 2/2.

This menu shows general purpose information, such as:

- Customer name (two rows)
- Installation site (Loc.)
- Site from which it receives and site to which is transmitting (eventually filtered in half-duplex configuration).

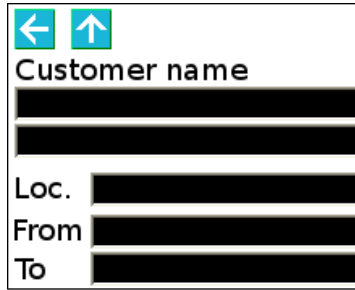


Figure 14: General info menu 2/2.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.3.8 Menu Misc - Modules.

7.3.8.1 Menu Misc - Modules - Controller.

This menu shows controller general purpose information such as:

- Model
- Version
- Revision



Figure 15: General purpose information controller.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.3.8.2 Menu Misc - Modules - Modem.

This menu shows modem general purpose information such as:

- Model
- Version
- Revision

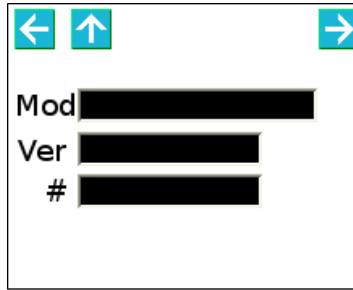


Figure 16: General purpose information modem.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.3.8.3 Menu Misc - Modules - Interfaces.

This menu shows I/O interface general purpose information such as:

- Model
- Version
- Revision

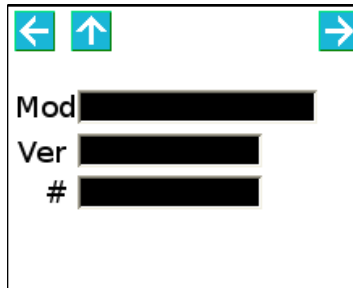


Figure 17: General purpose I/O interface information.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.3.8.4 Menu Misc - Modules - Rx.

This menu shows receiver general purpose information such as:

- Model
- Version
- Revision

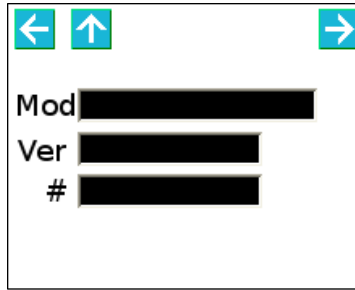


Figure 18: General purpose information Rx.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.3.8.5 Menu Misc - Modules - Tx.

This menu shows transmitter general purpose information such as:

- Model
- Version
- Revision

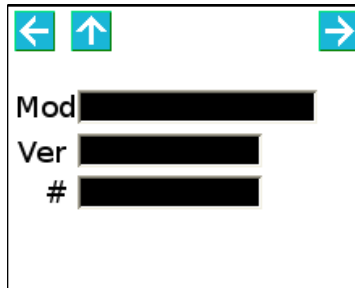


Figure 19: General purpose information Tx.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse microprocessor menu.

7.4 Menu Modem (Modem uC).

The modem menu is composed by a series of pages that let the user monitor and configure main parameters of both modulator and demodulator. Directional arrows allow the browsing in the menu.

The modem configuration is managed uploading configuration files that can be checked through user interface.

7.4.1 Modem submenu.

The submenu let a fast access to the elements to be controlled; icons meaning, concerning different sections, is intuitive.

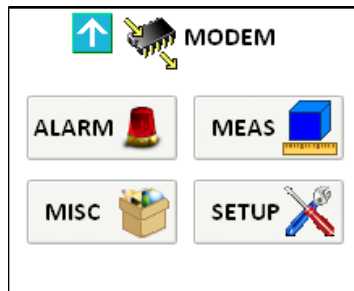


Figure 20: Modem submenu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Icons    

7.4.2 Modem configuration menu.

The modem configuration menu let the user change the transmitting profile of the modulator. Modifying numeric index in the **Profile** box, related modulation scheme and bitrate are shown. **XPIC** checkbox let the user enable the XPIC function (hw option is needed).

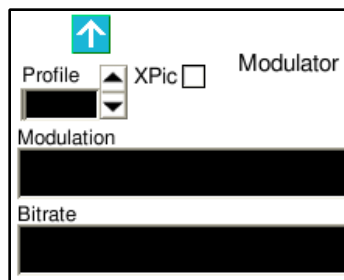


Figure 21: Modem FD configuration menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Checkbox **XPIC** to enable XPIC function.

7.4.3 Modem measurements menu.

The measurement menu is a summary of main functioning parameters of both modulator and demodulator sections.

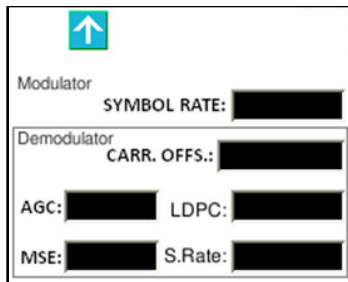


Figure 22: Modem FD measurement menu.

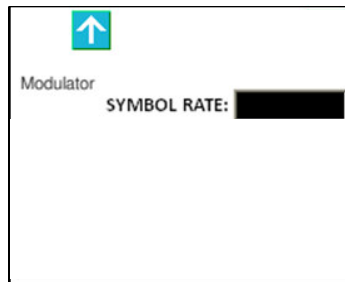


Figure 23: Modem Tx measurement menu.

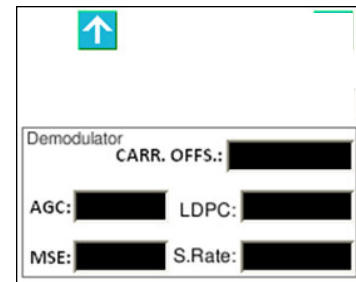


Figure 24: Modem Rx measurement menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.

Modulator section reports just the Symbol Rate measure, which should be the same of the database one. See par. 8.4.1 for more details.

Demodulator section reports 5 measurements:

1. **Carrier Offset** shows the difference in Hz from the frequency of the detected carrier and the reference (0 Hz). Being the system a direct frequency conversion system, this parameter is very important to avoid heavy imbalances of both I and Q baseband paths. An automatic frequency control process (AFC) is always active to compensate possible RF oscillator drifts due to aging, to the temperature or other factors.
2. **LDPC** shows the Bit Error Rate detected by the LDPC decoder.
3. **AGC** indicates the digital automatic gain control level. The measurement is not indicative in case of equipment bad functioning.
4. The **MSE** (*Mean Square Error*) is a measurement of the microwave link C/N. Depending on the modulation, there are different critical levels of MSE. Please contact the manufacture or refer to test reports to check the MSE limit of the desired configuration and profile.
5. **S. Rate** shows the demodulated raw data bitrate.

7.4.3.1 Modem measurements menu - XPIC.

If modem configuration includes the XPIC function, in every measurements page, located at the upper right corner, a directional arrow is shown (Figure 25, Figure 26 and Figure 27); clicking on this arrow, the user gets in menu shown in Figure 28, Figure 29 and Figure 30.

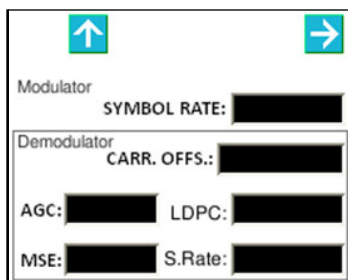


Figure 25: Modem FD measurements menu (2).

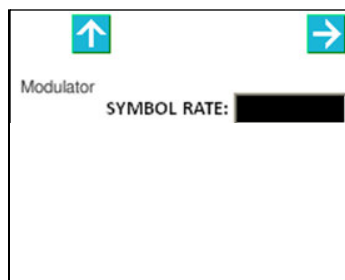


Figure 26: Modem Tx measurements menu (2).

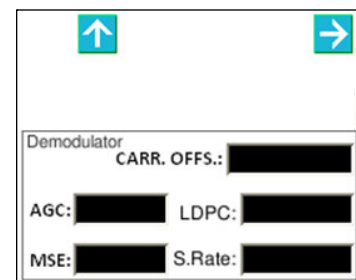


Figure 27: Modem Rx measurements menu (2).

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrow “RIGHT”  to browse between modem measurements page.

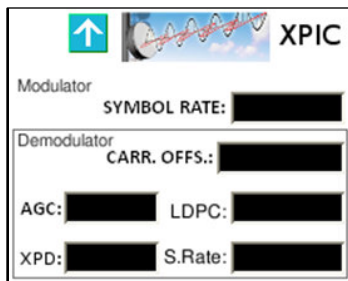


Figure 28: Modem XPIC measurements menu FD.

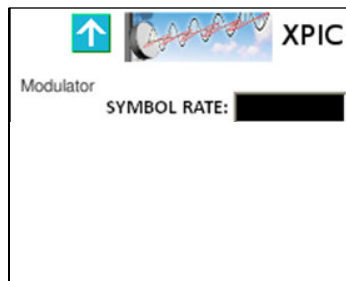


Figure 29: Modem XPIC measurements menu Tx.

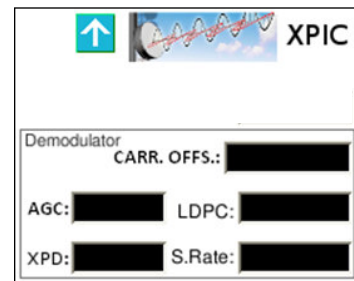


Figure 30: Modem XPIC measurements menu Rx.

Modulator section reports just the Symbol Rate measure, which should be the same of the database one. See par. 8.4.1 for more details.

Demodulator section reports 5 measurements:

1. **Carrier Offset** shows the difference in Hz from the frequency of the detected carrier and the reference (0 Hz). Being the system a direct frequency conversion system, this parameter is very important to avoid heavy imbalances of both I and Q baseband paths. An automatic frequency control process (AFC) is always active to compensate possible RF oscillator drifts due to aging, to the temperature or other factors.
2. **LDPC** shows the Bit Error Rate detected by the LDPC decoder.
3. **AGC** indicates the digital automatic gain control level. The measurement is not indicative in case of equipment bad functioning.
4. **XPD** (*Cross Polarization Discrimination*) is the value of the polarization decoupling detected by XPIC modem.
5. **S. Rate** shows the demodulated raw data bitrate.

7.4.4 Modem alarms menu.

The alarms menu summarizes main alarms of both modulator and demodulator sections.

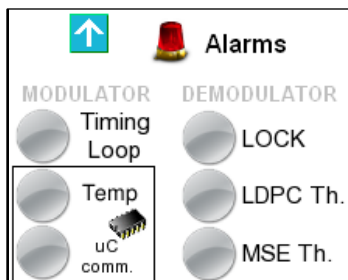


Figure 31: Modem alarms menu FD.

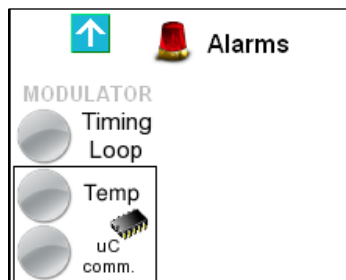


Figure 32: Modem alarms menu Tx.

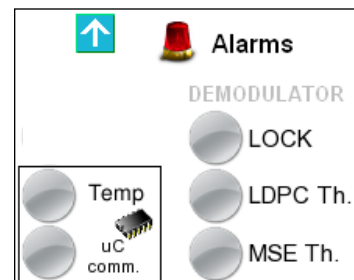


Figure 33: Modem alarms menu Rx.

Active areas:

- Directional arrow “UP”  to go back to main menu.

The modulator section presents just one alarm, the *Timing Loop*. If the modulator is not locked to data clock, this led is red. In this case the link cannot work properly.

The demodulator section presents 3 alarm conditions:

1. *Lock* alarm detects the demodulator locking status.
2. *LDPC Th.* alarm indicates that the *LDPC Stress* value is above the threshold set by the user. This threshold has a default value of 1×10^{-3} .
3. *MSE Th.* alarm indicates that the MSE value is below the alarm threshold for the modulation scheme adopted.

Furthermore there's the temperature alarm that is shared between the two sections and it indicates the left fan bad function.



Attention:

Alarm icon related to *uC Comm* indicates that modem board controller is not properly communicating with system supervisor. In this case, the equipment should be shipped back to factory for repair.

7.4.5 Modem general menu.

Modem general menu reports details of demodulator profile and configuration (the demodulator automatically lock on the profile). Just modulation scheme, occupied bandwidth and net bitrate are shown, but for further information the related section of the web interface can be seen.

Moreover it is possible to enable the internal Clean Carrier generator (**One tone** checkbox), the two tones generator (**Two Tone**) and the predistorsion (**Predistorsion**); by default, **Normal** and **Predistorsion** checkbox are enabled.

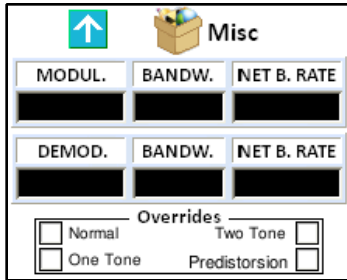


Figure 34: Modem general menu FD.

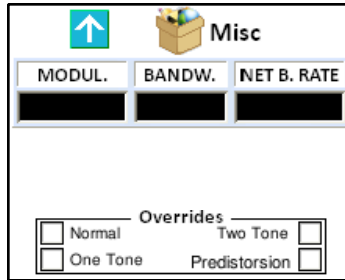


Figure 35: Modem general menu Tx.

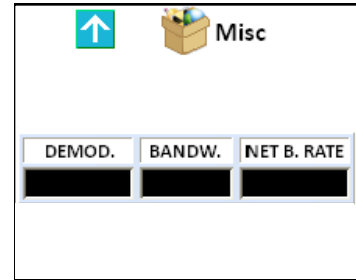


Figure 36: Modem general menu Rx.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- *Checkbox Normal* for normal functioning.
- *Checkbox Single tone* to enable Clean Carrier generator (link frequency + 10 MHz); this setting isn't stored, so it is to be enabled again in case of system restart.
- *Checkbox Two tone* to enable the two tone test signal ; this setting isn't stored, so it is to be enabled again in case of system restart.
- *Checkbox Predistorsion* to enable the non-linear precorrection of the amplifier; depending on the frequency of operation, the system load the calibration curve stored in factory.

7.5 Menu I/O (IO).

The I/O menu let the user check the equipment baseband inputs and outputs status. Directional arrows allow the browsing in the menu.

7.5.1 I/O submenu.

The submenu let a fast access to the three types of input/output signals available, that is Ethernet, ASI/BTS and loop management; icons meaning, concerning different sections, is intuitive.

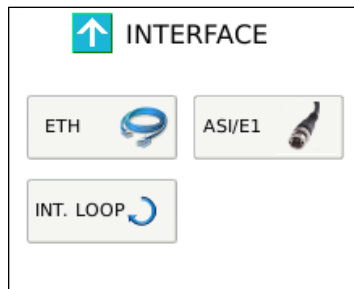
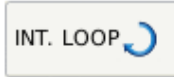


Figure 37: I/O Sub-menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Icons   .

7.5.2 Ethernet menu.

Ethernet menu let the user check the status of Gigabit Ethernet port.

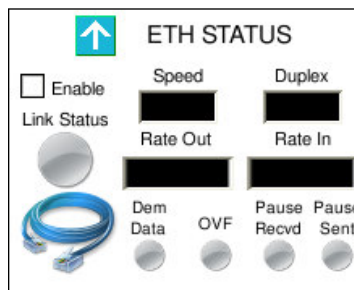


Figure 38: Menu Ethernet.

Active areas:

- Directional arrow “UP”  to go back to main menu.

Display shows following indications and measurements:

Tag	Type	Description
Link Status	Led	Link active status indication (the port is functioning and it's connected to another functioning port).
Speed	Casella	Connection speed (10/100/1000).
Duplex	Casella	Half-duplex or full-duplex connection indication.
Rate out	Casella	Output data speed.
Rate in	Casella	Input data speed.
Dem Data	Led	Indication of data received from demodulator.
OVF	Led	Overflow signaling.
Pause Recvd	Led	Pause frames received from an another device (output data bit rate is higher than

		destination port speed).
Pause Sent	Led	Pause frames sent to another device (input data bit rate is higher than the available capacity).

7.5.3 ASI/E1 menu.

The ASI/E1 menu let the user check the status of every BNC connector of the back panel (see par. 0).

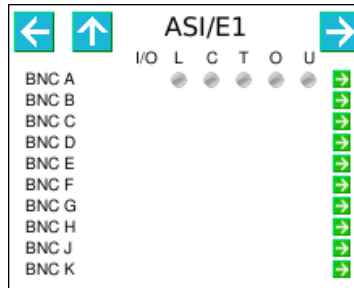


Figure 39: General ASI/E1 menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Directional arrows “LEFT”  and “RIGHT”  to browse between each connector page (A, B, C, D, E, F, G, H, J, K).
- Directional buttons “RIGHT”  for direct access to each connector status (A, B, C, D, E, F, G, H, J, K).

Moreover, the display shows following information:

Tag	Type	Description
I/O	Text	Input (I) or Output (O) indication.
L	Led	Input signal lock indication (valid only for inputs).
C	Led	Carrier detected indication, that is the ASI signal presence (valid only for inputs).
T	Led	Timing indication, that is interface data are locked to modulator or to demodulator.
O	Led	Overflow indication, that is buffer level is above “Almost Full” threshold.
U	Led	Underflow indication, that is buffer level is under “Almost Empty” threshold.

7.5.4 Single connector menu.

This menu let the user check the configuration and status of every connector.

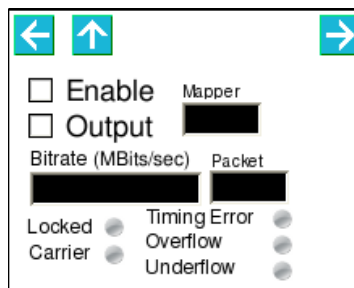


Figure 40: BNC connector configuration and status menu.

Active areas:

- Directional arrow “UP”  to go back to I/O menu.

- Directional arrows “LEFT”  and “RIGHT”  to browse between each connector page (A, B, C, D, E, F, G, H, J, K).

Moreover, the display shows following information:

Tag	Type	Description
Mapper	Text	Associated transport channel number indication (inputs should not use the same number, while outputs do).
Bitrate	Text	Bitrate indication.
Packet	Text	ASI packet format indication (188/204).
Locked	Led	Carrier detected indication, that is the ASI signal presence (valid only for inputs).
Carrier	Led	Timing indication, that is interface data are locked to modulator or to demodulator.
Timing Error	Led	Overrun indication, that is buffer level is above “Almost Full” threshold.
Overflow	Led	Underrun indication, that is buffer level is under “Almost Empty” threshold.
Underflow	Led	Carrier detected indication, that is the ASI signal presence (valid only for inputs).

7.6 Menu Transmitter (TX).

The Transmitter menu consists of a single page that allows monitoring and setting of the most important parameters of the transmitter module; the menu is accessible only for FD or Tx devices.

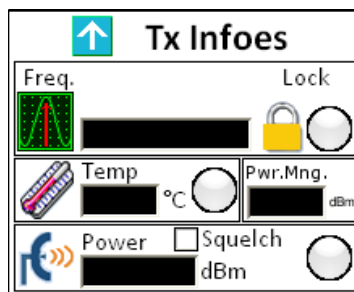


Figure 41: Transmitter menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.
- Checkbox for the squelch of the transmitter.

The page also shows three icons that correspond to the alarm led:

- An alarm for the oscillator status (in case of oscillator unlock, the transmitter is silenced through hardware pin).
- An alarm indicating low power at the transmitter output.
- An alarm indicating that the temperature of the module is higher than 60°C.

Moreover, the page reports temperature and power output measurements.

7.7 Menu Receiver (RX).

The Receiver menu consists of a single page that allows monitoring and setting of the most important parameters of the receiver module; the menu is accessible only for FD or Rx devices.

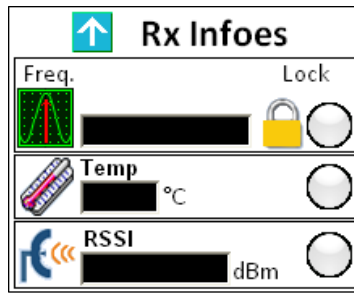


Figure 42: Receiver menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.

The page also shows three icons that correspond to the alarm led:

1. An alarm for the oscillator status
2. An alarm indicating the low field level received for the used modulation.
3. An alarm indicating that the temperature of the module is higher than 55°C.

The page reports as well the measurements of the registered temperature and received field level (RSSI).

7.8 Menu Power Supply (PS).

The Power Supply menu allows verifying whether both power supply modules are fed, what type of feeding they are receiving and whether the secondary voltages are correct (+5V and +6V).

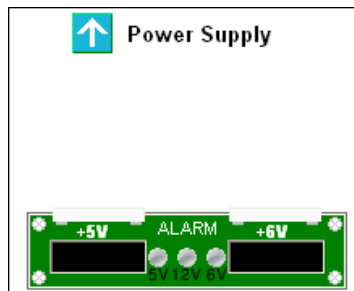


Figure 43: Power Supply menu.

Active areas:

- Directional arrow “UP”  to go back to main menu.

There is as well a general alarm indicator in case one of the voltage values is not being respected.

The upper zone of the menu is dynamically filled by the icon of the corresponding power supply module, which can be in alternating or continuous current. It is hence possible to see the different combinations reported in the following figures.

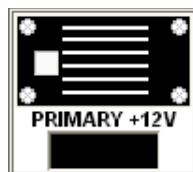


Figure 44: Icon power supply with continuous current, primary position.



Figure 45: Icon power supply with continuous current, secondary position.

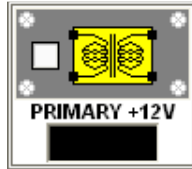


Figure 46: Icon power supply with alternating current, primary position.



Figure 47: Icon power supply with alt alternating current, secondary position.

8 WEB interface.

The REBLE610 is equipped with a WEB interface for an easier and intuitive monitoring and equipment configuration.

The Web server connection can be achieved through RJ-45 connector in the front panel; with a very common *Web browser* (like Internet Explorer, Mozilla Firefox, Google Chrome, Opera, Safari...) it is possible to check equipment status and verify performances even remotely simply writing in the address bar the IP address of the equipment. In order to check the IP address, please refer par.8.3.3.

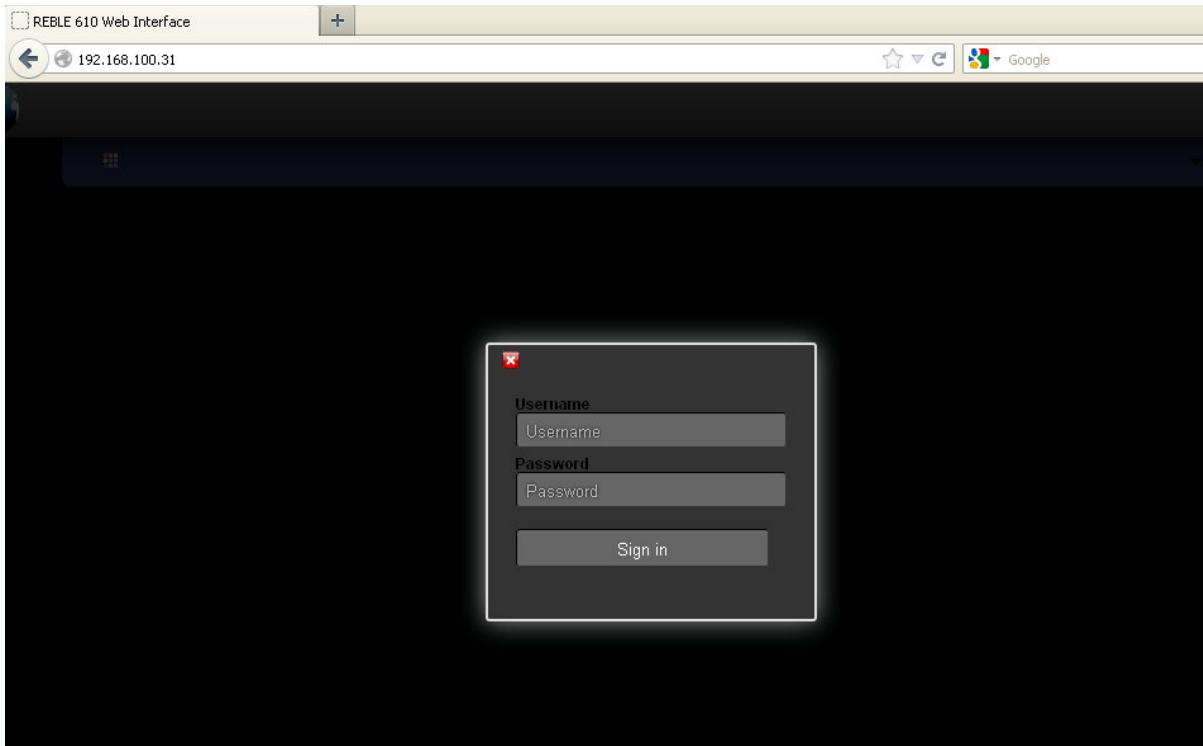


Figure 48: Web interface login page.

Figure 48 show the login page of the Web interface, which let the user access after successful insertion of username and password.

8.1 Status.

Once the login process has been validated, the general stats page opens; it let the user immediately check alarmed parts; the page is divided into 4 or 5 modules (depending on full duplex or half duplex configuration), hereunder described.

8.1.1 Status-Controller.

Controller	
Information	
Board Model	Reble Controller
Version	1.0.0
Revision	2257.2258
Customer	Telecom Italia Media Broadcasting
Location	Maella
Device	Bidirectional
From	Francavilla
To	Francavilla
Serial Number	REB610/10/00002/2012
Part Number	REB610/FD1010-C/HP
Link Model	REBLE610/10
Status	
Power Supply Fans	
Primary AC/DC	12.1 V
Secondary DC/DC	0.0 V
Voltage 2 (5V)	5.1 V
Voltage 3 (6V)	6.3 V

Figure 49: Web Status form – controller.

Table 8: Controller Information.

Board Model	Controller board model
Version	Firmware version
Revision	Firmware version revision
Customer	Customer name
Location	Installation site
Device	Equipment configuration (Full-duplex, Tx, Rx, Repeater)
From	Transmitting site
To	Receiving site
Serial Number	Ex.: REB610/10/00002/2012
Part Number	Ex.: REB610/FD1010-C/HP
Link Model	Ex.: REBLE610/10

Table 9: Power supply status.

Primary AC/DC	12V output of main supply measurements; indication if AC/DC or DC/DC. Line is green if value is between limits, red otherwise.
Secondary DC/DC	12V output of backup supply measurements; indication if AC/DC or DC/DC. Line is green if value is between limits, red otherwise.
Voltage 2 (5 V)	5 V level. Line is green if value is between limits, red otherwise.
Voltage 3 (6 V)	6 V level. Line is green if value is between limits, red otherwise.

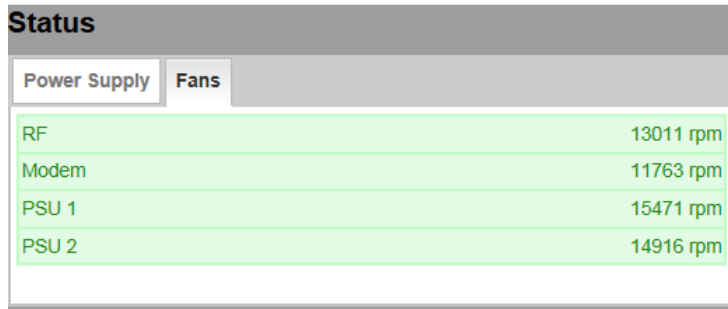


Figure 50: Web Status form – controller fans.

Table 10: Fans status.

RF	Front panel right fan speed.
Modem	Front panel left fan speed.
PSU 1	Main power supply fan speed.
PSU 2	Backup power supply fan speed.

8.1.2 Status-Modem.

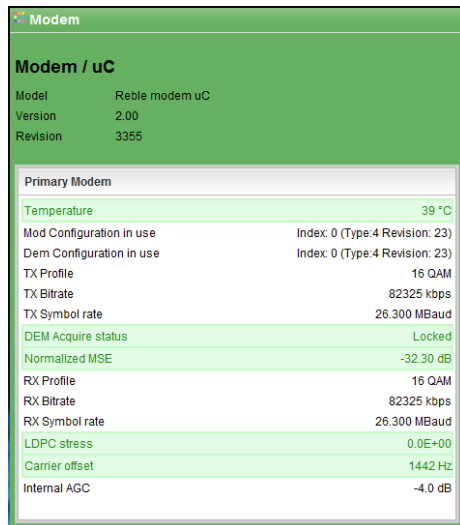


Figure 51: Web Status form – modem locked.

Table 11: Modem status.

Model	Modem board model.
Version	Modem board microcontroller firmware version.
Revision	Modem board microcontroller firmware revision.
Temperature	Temperature measurement on modem board. Line is green if value is between limits, red otherwise.
Mod Configuration in use	Details of the configuration in use for the modulator.
Dem Configuration in use	Details of the configuration in use for the demodulator.
TX Profile	Profile (modulation scheme) in use in the modulator.
Tx Bitrate	Modulator Bitrate.
Tx Symbol Rate	Modulator Symbol Rate.
Dem Acquire status	Demodulator Locking status. Line is green if value is between limits, red otherwise.
Normalized MSE	Mean Square Error measurement, normalized according to the used modulation. Line is green if value is between limits,

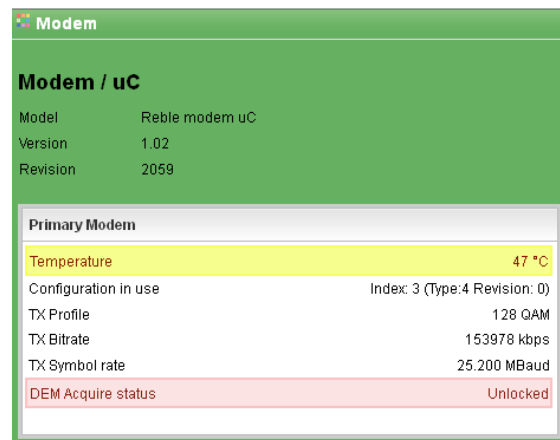


Figure 52: Web Status form – modem unlocked.

	red otherwise.
RX Profile	Profile (modulation scheme) in use in the demodulator (automatically detected).
Rx Bitrate	Demodulator bitrate.
Rx Symbol Rate	Demodulator Symbol Rate.
LDPC stress	Error Rate indication, detected by LDPC (<i>Low Density Parity Check</i>) decoder. Line is green if value is between limits, red otherwise.
Carrier Offset	Carrier Offset compared to central frequency. Line is green if value is between limits, red otherwise.
Internal AGC	Internal AGC level. Line is green if value is between limits, red otherwise.

8.2 Status-Interface.

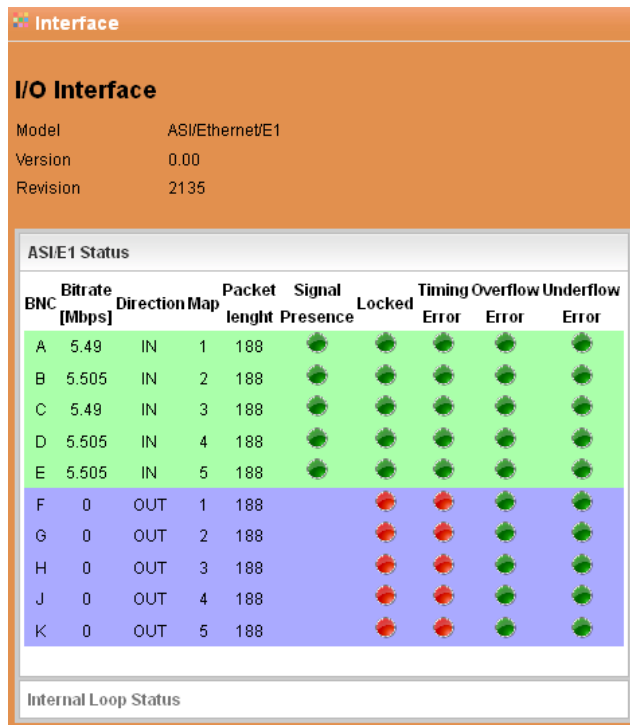


Figure 53: Web Status form – Interface ASI/E1.

Table 12: I/O Interface status.

Model	Data interface board Model.
Version	FPGA firmware version.
Revision	FPGA firmware revision.

Table shown in Figure 53 shows each BNC connector (A to K) status; Table 13 describes the indications.

Table 13: I/O details.

Bitrate [Mbps]	ASI data stream bitrate.
Direction	Connector (Input [IN] or output [OUT]).
Map	Transport channel of the TS associated to related connector.
Packet Length	ASI format detected (188 or 204).
Signal Presence	Signal presence detected indication.
Locked	ASI lock indication.
Timing error	Data stream locking error indication.

Overflow error	Data buffer overflow indication.
Underflow error	Data buffer underflow indication.

Interface

I/O Interface

Model ASI/Ethernet/E1
Version 0.00
Revision 2135

ASI/E1 Status							
Internal Loop Status							
LOOP	Bitrate [Mbps]	Map	Packet lenght	Locked	Timing Error	Overflow Error	Underflow Error

Figure 54: Web Status form – Interface Loop.

Furthermore, REBLE610 offers the possibility of an “internal loop” of data received by demodulation section, redirecting towards modulator section. In Figure 55 this function management is shown.

8.2.1 Status-Transmitter.

TX

TX Module

Model T10N
Version V2-610
Revision 00019/2012

TX status	
Temperature	55 °C
Frequency	10462000 kHz
Power	26.00 dBm

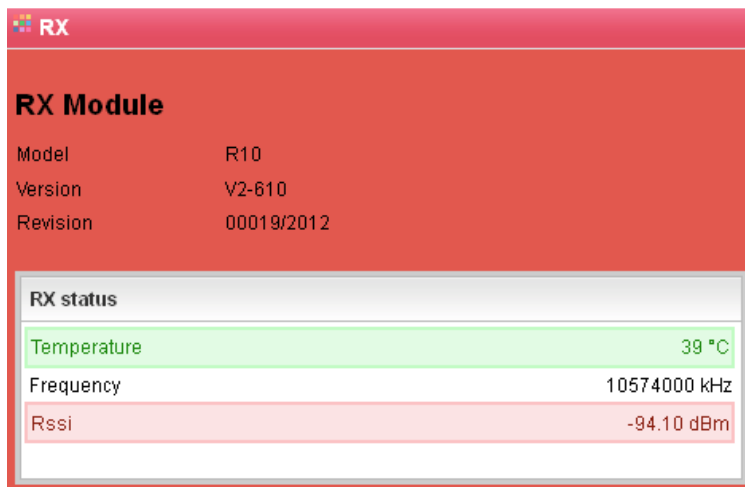
Figure 55: Web Status form – Tx.

This form is not available in half duplex configuration, receiver version.

Table 14: Status Transmitter.

Model	Transmitter board model.
Version	Transmitter board HW version.
Revision	Serial number transmitter board.
Temperature	Transmitter board temperature measurement. Line is green if value is between limits, red otherwise.
Frequency	Transmitting circuit operating frequency.
Power	Transmitter output power. Line is green if value is between limits, red otherwise.

8.2.2 Status-Receiver.



RX

RX Module

Model R10
Version V2-610
Revision 00019/2012

RX status

Temperature	39 °C
Frequency	10574000 kHz
Rssi	-94.10 dBm

Figure 56: Web Status form – Rx.

This form is not available in half duplex configuration, transmitter version.

Table 15: Status Receiver.

Model	Receiver board model.
Version	Receiver board HW version.
Revision	Serial number receiver board.
Temperature	Receiver board temperature measurement. Line is green if value is between limits, red otherwise.
Frequency	Receiving circuit operating frequency.
RSSI	Signal level detected by receiver. Line is green if value is between limits, red otherwise.

8.3 Tab Controller.

Tab web concerning Controller is composed by six frames:

1. Coil fans.
2. Customer.
3. Network.
4. Trap Manager.
5. Tools.
6. Password Management.

8.3.1 Controller – Coil fans.

Coil fans

Fans

Tx Module

Manual: ☒

Speed (rpm):

Temperature Target:

Rx Module and Modem

Manual: ☒

Speed (rpm):

Rx Temperature Target:

Modem Temperature Target:

Apply

Figure 57 : Web controller form – fans.

This frame let drive and monitor the functionality of front panel fans.

Checkbox **Manual** set in manual mode the configuration of the fans speed, measurable in Speed box in rpm. In this case, it is necessary to manually set the speed.

In case checkbox **Manual** is disabled, on the contrary, it is required to establish temperature targets for modules equipped with sensor, and the system controller will program fan controller so as to keep modules at temperature set by the user.

Right fan is managed according to transmitter board temperature (if installed, so not available in half duplex receiver configuration); left fan according to temperatures detected on modem and receiver boards. Modifications are validated pushing **Apply** button.

Table 16: Fan management.

Manual	Checkbox fan manual management.
Speed(rpm)	Only available in manual modality, shows the right fan speed in rpm.
Temperature target	Target temperature for transmitter board (available in automatic modality).
Rx Temperature target	Target temperature for receiver board (available in automatic modality and only for models with receiver).
Modem Temperature target	Target temperature for modem board (available in automatic modality).

8.3.2 Controller – Customer.

Customer info

Customer

Customer name:

Location:

Link type:

Receive from:

Transmit to:

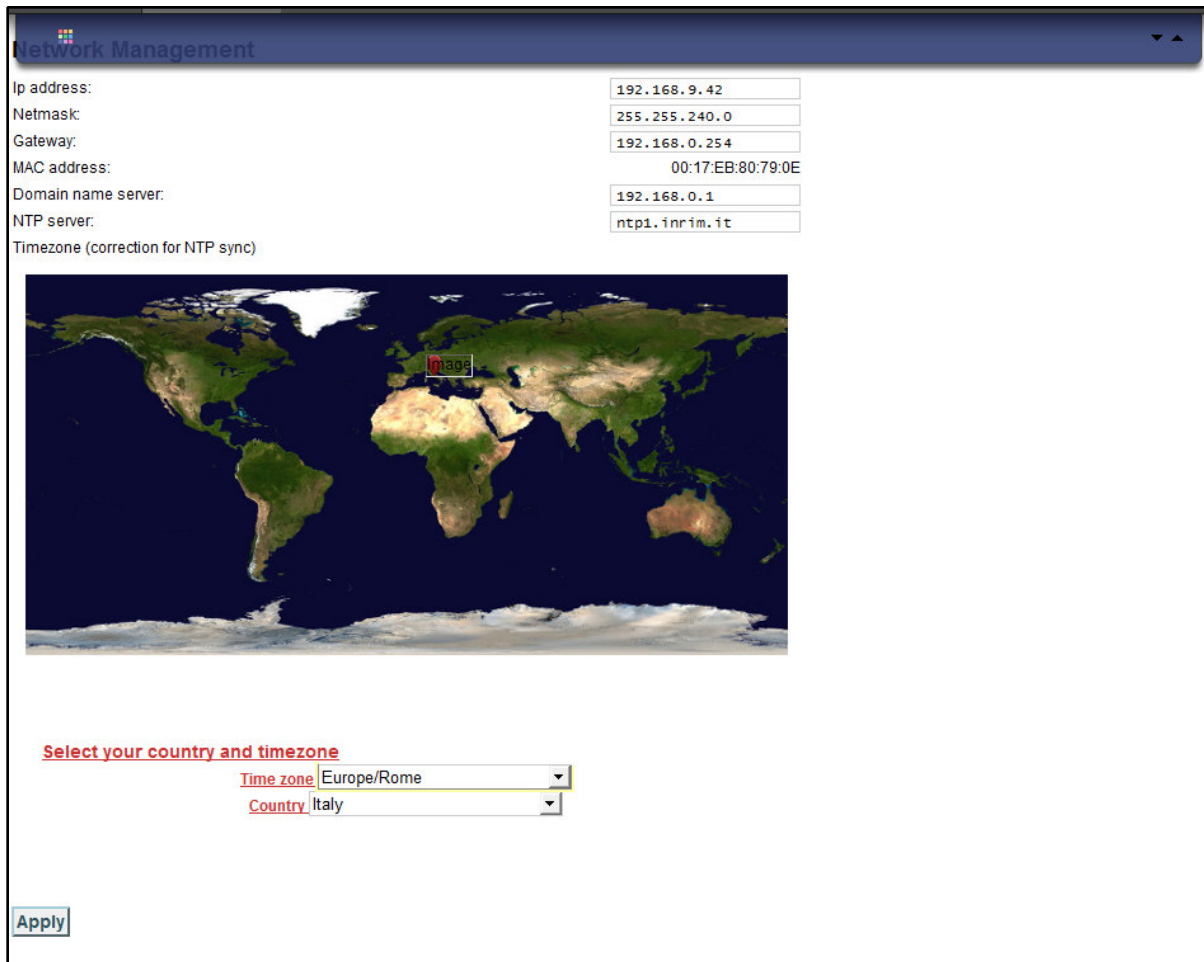
Apply

Figure 58 : Web Controller form – Customer info.

Table 17: Equipment information for customers.

Customer name	Customer name.
Location	Installation site.
Link type	Equipment typology
Receive from	Site which the equipment is receiving from.
Transmit to	Site which the equipment is transmitting to.

8.3.3 Controller – Network.



The screenshot displays the 'Network Management' web interface. At the top, there's a header bar with the title and navigation arrows. Below the header, the interface is divided into two main sections. The upper section contains a list of network parameters, each with a label and a corresponding input field. The parameters and their values are: Ip address (192.168.9.42), Netmask (255.255.240.0), Gateway (192.168.0.254), MAC address (00:17:EB:80:79:0E), Domain name server (192.168.0.1), NTP server (ntp1.inrim.it), and Timezone (correction for NTP sync). The lower section features a world map with a red pin indicating the location in Italy. Below the map, there's a section titled 'Select your country and timezone' with two dropdown menus: 'Time zone' set to 'Europe/Rome' and 'Country' set to 'Italy'. At the bottom left, there is an 'Apply' button.

Figure 59: Web Controller form – Network Parameters.

This frame let check and modify network parameters of the user interface.

Ip Address, Netmask and Gateway Address can be modified by the user writing in the dedicated text box while Mac Address is read-only. Moreover, it's possible to configure a DNS, a NTP server IP address, the Time Zone and the Country where the equipment is installed.

8.3.4 Controller – Trap Manager.

This frame let the user access to SNMP traps management; for every possible alarm is possible to enable or disable the traps sending. Besides, it is possible to set their destination address.

Trap	Enable/Disable
Temperature	☒
MSE	☒
Timing Loop	☒
LDPC decoder stress	☒
DEM Lock	☒
uC error	☒

Interface Traps

BNC/ASI Traps

RX Traps

TX Traps

Controller Traps

Apply

Figure 60: Web Controller form – Modem SNMP traps configuration.

Trap	Enable/Disable
ETH Lock	☒
ETH Overflow	☒
ETH Pause Receive	☒
ETH Pause Sent	☒
FPGA Error	☒

BNC/ASI Traps

RX Traps

TX Traps

Controller Traps

Apply

Figure 61: Web Controller form – Data interface SNMP traps Configuration.

BNC name	Signal Presence	Locked	Timing Error	Overflow Error	Underflow Error
A	☒	☒	☒	☒	☒
B	☒	☒	☒	☒	☒
C	☒	☒	☒	☒	☒
D	☒	☒	☒	☒	☒
E	☒	☒	☒	☒	☒
F	☒	☒	☒	☒	☒
G	☒	☒	☒	☒	☒
H	☒	☒	☒	☒	☒
K	☒	☒	☒	☒	☒
J	☒	☒	☒	☒	☒

RX Traps

TX Traps

Controller Traps

Apply

Figure 62: Web Controller form – Baseband signals SNMP traps configuration.

Trap	Enable/Disable
Temperature	☒
PLL1	☒
PLL2	☐
Low RSSI	☒

TX Traps

Controller Traps

Apply

Figure 63: Web Controller form – Receiver SNMP traps Configuration.

Traps Management	
Modem Traps	
Interface Traps	
BNC/ASI Traps	
RX Traps	
TX Traps	
Trap	Enable/Disable
Temperature	☒
PLL1	☒
PLL2	☒
Low Power	☒
Controller Traps	
Apply	

Figure 64: Web Controller form – Transmitter SNMP traps configuration.

Traps Management	
Modem Traps	
Interface Traps	
BNC/ASI Traps	
RX Traps	
TX Traps	
Controller Traps	
Trap	Enable/Disable
Modem Fan	☒
RF Fan	☒
PSU1 Fan	☒
PSU2 Fan	☒
RF Fan	☒
PSU1 12V	☒
PSU2 12V	☒
5 Volt	☒
6 Volt	☒
Apply	

Figure 65: Web Controller form – Controller SNMP traps configuration.

Traps Management	
Modem Traps	
Interface Traps	
BNC/ASI Traps	
RX Traps	
TX Traps	
Controller Traps	
Alarm Rele management	
Alarm	Enable/Disable
Modem Alarm	☒
Interface Alarm	☒
TX Alarm	☒
RX Alarm	☒
Controller Alarm	☒
Apply	

Figure 66: Web controller form - Alarm Relay configuration.

Traps Receiver	
Trap receiver	
127.0.0.1	
Apply	

Figure 67: Web Controller form – Trap Destination configuration.

8.3.5 Controller – Tools.

Tools

Date & Time

System Time: 9.7.2011 10:27:49

Local Time: 18.10.2012 11:47:09

New Time: 18.10.2012 11:47:09

Reset Command

USB Token

Customer Name

Figure 68: Web Controller form – general info and tools.

Table 18: General instruments.

System Time	
Local Time	
New Time	Text box to modify local time.

The “Reset Command” subsection let the user send a reset pulse to related subsections separately, i.e. the modem microcontroller, the system controller, the whole system or to TFT calibration.

“USB Token” subsection let the user generate a single-use password to be installed on a USB drive, which let the user modify equipment parameters through display (after connection of the drive to USB port on the front panel).

8.3.6 Controller – Password management.

Password Management		
Manage system Password		
User Password		Apply
Super User Password		Apply
Administrator Password		Apply
Display Password		Apply
SNMP Read Community		Apply
SNMP Write Community		Apply

Figure 69: Web Controller form –password management.

This form let modify the passwords for web interface, TFT and the SNMP communities.

Passwords should be composed of at least six characters and cannot overcome fifteen characters.

The password level that can be modified is subject to the rights of the user. The user “User” cannot change passwords. User “Super-User” can change its own and the “User” ones. The “Administrator” can change any password.

8.4 Tab Slot.

Web tab of the Controller board is composed by 4 sections:

- Modem
- Interface
- Tx
- Rx

8.4.1 Slot – Modem.

Web section of Modem board is composed by 5 frames, reporting information about both modulator and demodulator part.

1. Status
2. MSE Graphic
3. Temperature Management
4. Profile Management
5. Operational Mode Management

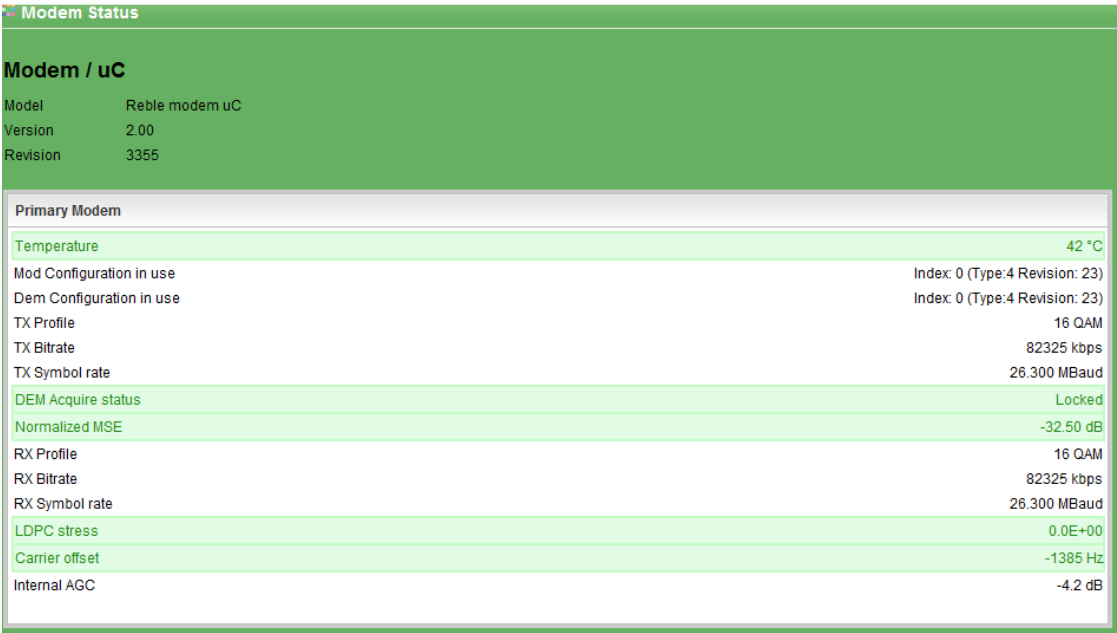


Figure 70: Web slot modem form – status.

Status frame reports the information already shown in the homepage of the web interface. (see par. 8.1.2).

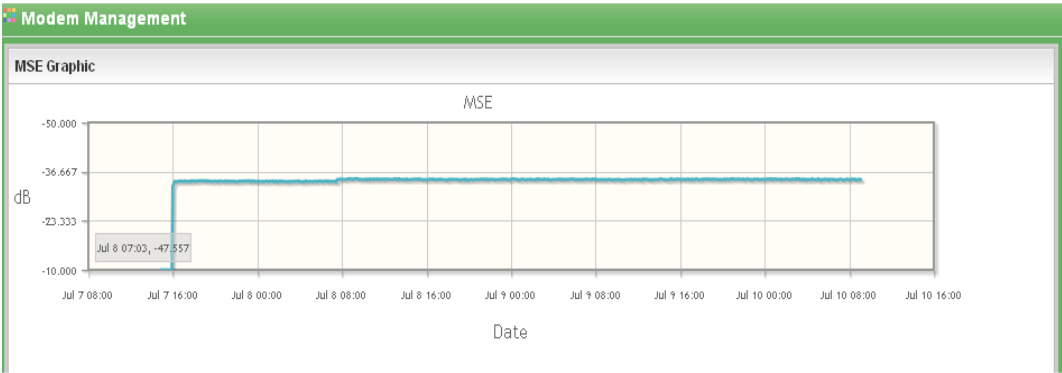


Figure 71: Web slot modem form – MSE Graphic.

MSE Graphic frame reports the MSE trend of last 10 days, with 5 seconds sampling time.

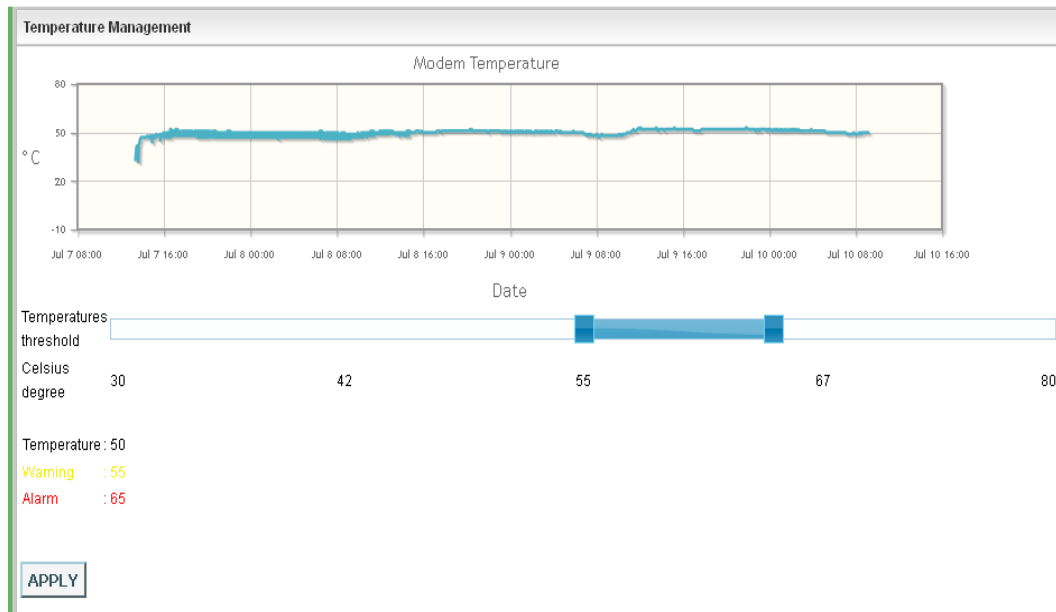


Figure 72: Web slot modem form – Temperature management.

Temperature management frame reports modem board temperature trend of last 10 days, with 5 seconds sampling time.

Furthermore, it is possible to set and check alarm and warning thresholds (through the interactive bar and the **Apply** button), and the actual temperature.

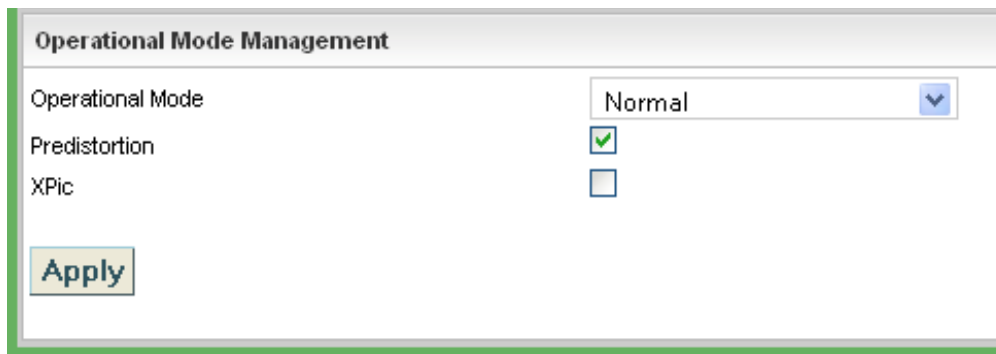
Figure 73: Web slot modem form – Profile management.

Figure 74: Web slot modem form – Profile management expanded.

Profile Management frame let the user change modulator profile, selecting it through dropdown-list; all profiles belonging to the same configuration share the parameters hereunder shown:

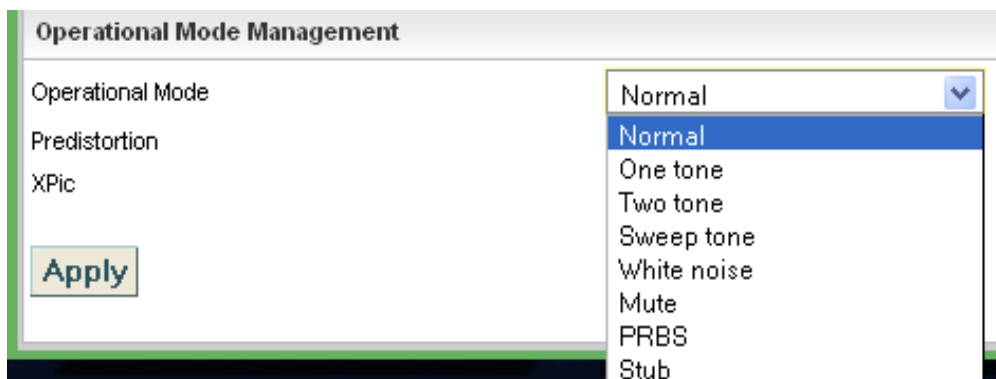
- LDPC Mother Rate
- Symbol Rate
- FEC blocks dimension

- Occupied bandwidth



The screenshot shows a web form titled "Operational Mode Management". It contains three fields: "Operational Mode" with a dropdown menu showing "Normal", "Predistortion" with a checked checkbox, and "XPic" with an unchecked checkbox. An "Apply" button is located at the bottom left of the form.

Figure 75: Web slot modem form – Operational Mode Management.



This screenshot shows the same web form as Figure 75, but with the "Operational Mode" dropdown menu expanded. The menu lists the following options: "Normal" (highlighted), "One tone", "Two tone", "Sweep tone", "White noise", "Mute", "PRBS", and "Stub". The "Apply" button remains at the bottom left.

Figure 76: Web slot modem form – Operational Mode Management expanded.

Operational Mode Management frame let the user modify some modem parameters:

- Operational Mode:
 - o Normal
 - o Clean carrier generator (for dish aligning)
 - o Two tones generator
 - o Sweep
 - o White noise
 - o Mute
 - o PRBS
 - o Stub
- Pre-distortion enabling (recall factory defaults for each frequency)
- XPIC function enabling (only with related hardware option)

8.4.2 Slot – Interface.

Web section of I/O Interface is composed by 4 frames:

1. Status
2. Input / Output port Management
3. Internal loop Management
4. Ethernet port Management

Interfaces Management										
ASI/E1 Status										
BNC	Bitrate [Mbps]	Direction	Map	Packet lenght	Signal Presence	Locked	Timing Error	Overflow Error	Underflow Error	
A	5.49	IN	1	188						
B	5.505	IN	2	188						
C	5.505	IN	3	188						
D	5.505	IN	4	188						
E	5.505	IN	5	188						
F	5.49	OUT	1	188						
G	5.49	OUT	2	188						
H	5.505	OUT	3	188						
J	5.505	OUT	4	188						
K	5.505	OUT	5	188						

Figure 77: Web slot interface form – Status.

Status frame reports information already shown in the homepage (see par.8.2).

BNC	Enable	Disable	IN/OUT	Input mapper	Output mapper
A	☒	☐	Input	1	1
B	☒	☐	Input	2	1
C	☒	☐	Input	3	1
D	☒	☐	Input	4	1
E	☒	☐	Input	5	1
F	☒	☐	Output	disabled	1
G	☒	☐	Output	disabled	2
H	☒	☐	Output	disabled	3
J	☒	☐	Output	disabled	4
K	☒	☐	Output	disabled	5

E1 ☒ Enable ☐ Disable

Figure 78: Web slot interface form – Input/Output ports management.

Input/output port management frame let the user configure signals on each BNC connectors of the back panel; connectors are identified with ten letters (A, B, C, D, E, F, G, H, J, K) as per serigraphy (see par. 0) and for each one it is possible to:

1. Enable or disable the port.
2. Configure the port as input or output

3. Associate a transport channel number (from 1 to 10; one number can be tied to only one input at a time).
4. Associate a channel to be extracted (from 1 to 10; outputs can be multiple).

A button to enable E1 channel it's available; the channel is available on connectors E and K, only if this function is enabled.

Loop port	Enable	Disable	Input mapper	Custom
1	Enable	Disable	disabled	☐
2	Enable	Disable	disabled	☐
3	Enable	Disable	disabled	☐
4	Enable	Disable	disabled	☐
5	Enable	Disable	disabled	☐
6	Enable	Disable	disabled	☐
7	Enable	Disable	disabled	☐
8	Enable	Disable	disabled	☐
9	Enable	Disable	disabled	☐
10	Enable	Disable	disabled	☐

Apply

Figure 79: Web slot interface form –Internal loop management

Internal loop management frame let the user configure the signals coming from demodulation section that can be forwarded to the modulator section, in case of a repeater configuration. Every transport channel present in the data stream (identified uniquely as Loop port, first column) can be enabled for the pass-through functions and even remapped on a different transport channel.

The only limitation is the number of channels available, ten, to be shared between local inputs and loop through signals.

Enable Port

Enable Disable

Apply

Figure 80: Web slot interface form – Ethernet port management.

Ethernet port management let the user configure the Ethernet transport port.

Enable Port

Enable Disable

Autonegotiation

Enable Disable

Full Duplex

Enable Disable

Speed

10 Mbps

Apply

Figure 81: Web slot interface form – Ethernet port management.

Enabling the management, buttons shown in right side of Figure 82 become available for the configuration of auto negotiation, full duplex mode and port speed. If auto negotiation is enabled, Full Duplex and Speed are not available.

8.4.3 Slot – TX.

Web section of transmitter board is composed by 4 frames:

1. Status
2. Temperature Management
3. Power Management
4. Frequency

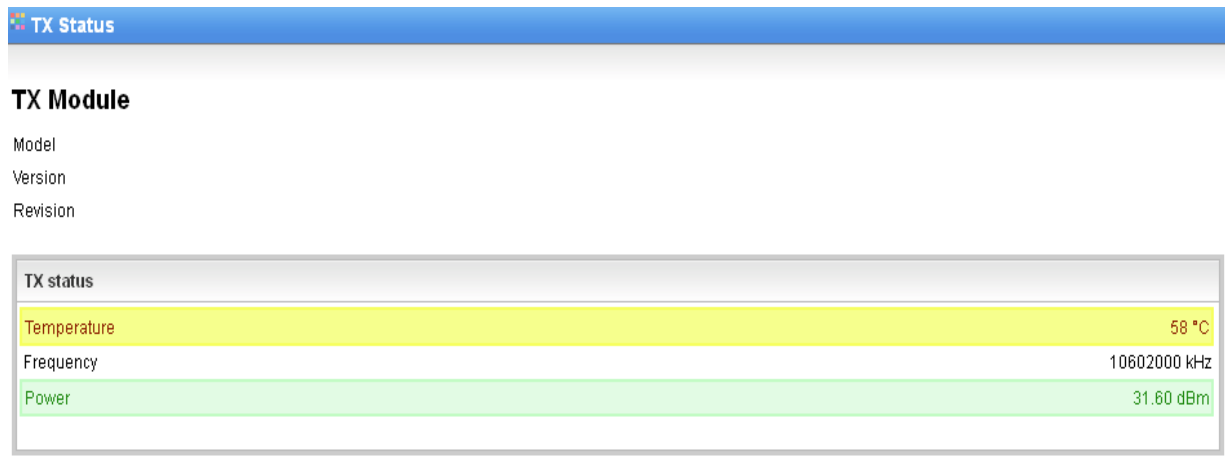


Figure 82: Web slot TX form – status.

Status frame reports information already shown in homepage(see par.8.2.1).

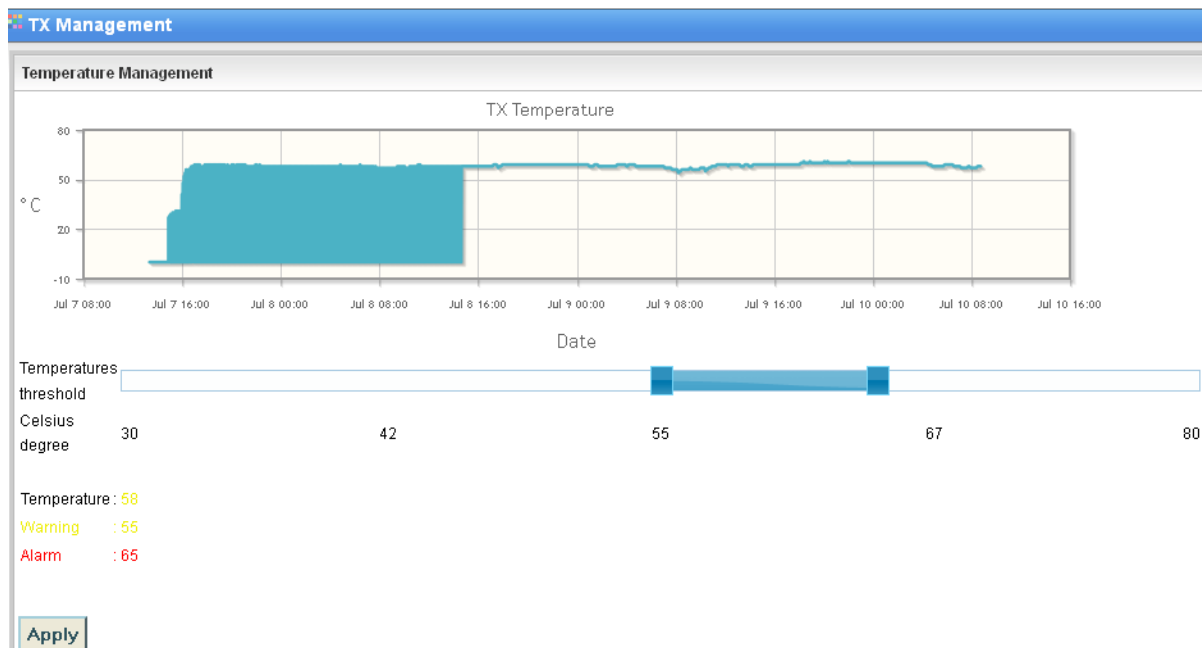


Figure 83: Web slot TX form – Temperature management.

Temperature management frame reports transmitter board temperature trend of last 10 days, with 5 seconds sampling time. Furthermore, it is possible to set and check alarm and warning thresholds (through the interactive bar and the **Apply** button), and the actual temperature.

Figure 84: Web slot TX form – Power management.

Power management frame let the user manage transmitter output power, modifying it from factory default calibration. Power, shown in lower part of the frame and measured in dBm, can be adjusted in a -2 to +2 dB range from the calibration value. It is possible to mute the transmitter by clicking on the related switch in the right part of the frame.

Figure 85: Web slot TX form – Frequency.

Frequency frame let the user change the transmitter frequency, depending on the factory limits (shown in the interactive bar); by default, it is possible to modify the frequency in a +/- 5 MHz range (channel filter is generally installed).

8.4.4 Slot – Rx.

Web section receiver board is composed by 4 frames:

1. Status
2. RSSI Graphic
3. Frequency
4. Temperature Management

RX status	
Temperature	42 °C
Frequency	10140000 kHz
Rssi	-52.80 dBm

Figure 86: Web slot Rx form – status.

Status frame reports information already shown in homepage (see par.8.2.2).

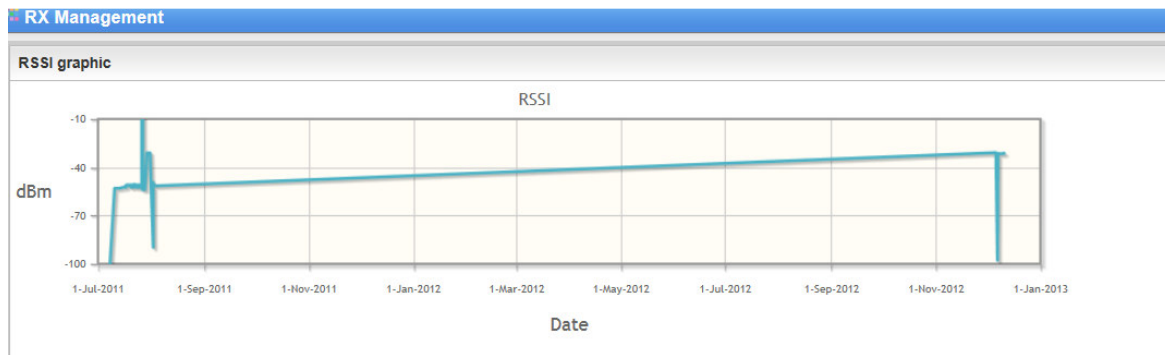


Figure 87: Web slot Rx form – RSSI Graphic.

RSSI Graphic frame reports the received signal strength trend of last 190 days with 5 seconds sampling time.

Figure 88: Web slot Rx form – Frequency.

Frequency frame let the user change the receiver frequency, depending on the factory limits (shown in the interactive bar); by default, it is possible to modify the frequency in a +/- 5 MHz range (channel filter is generally installed).

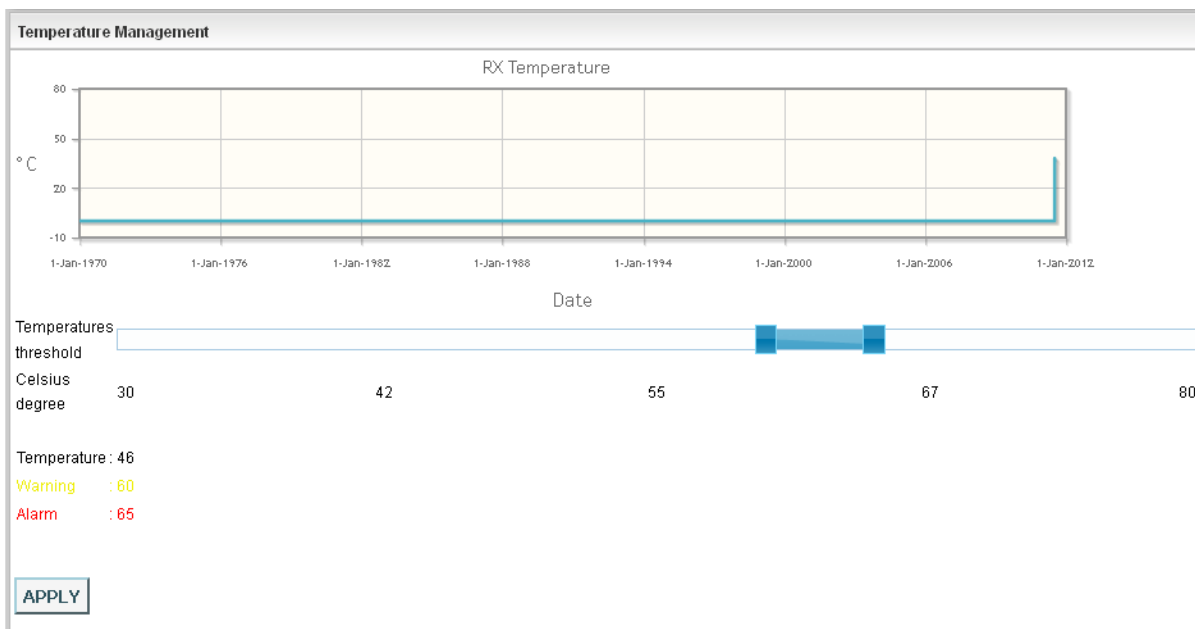


Figure 89: Web slot Rx form –Temperature Management.

Temperature management frame reports transmitter board temperature trend of last 10 days, with 5 seconds sampling time. Furthermore, it is possible to set and check alarm and warning thresholds (through the interactive bar and the **Apply** button), and the actual temperature.

8.5 Tab Upgrade.

Web tab of the Upgrade is composed by 2 sections:

- Configuration uploader
- Machine upgrade

Configuration file uploader

Index	Type	Mod Symbol Rate	Mod Bandwidth	Dem Symbol Rate	Dem Bandwidth	Run	Remove	Load	Progress
0	4 23/4 23	25.199 MBaud	28 MHz	25.199 MBaud	28 MHz			Upload	
1	6 23/6 23	26.3 MBaud	28 MHz	26.3 MBaud	28 MHz			Upload	
2	6 23/9 23	26.3 MBaud	28 MHz	22.3 MBaud	28 MHz			Upload	
3	6 23/12 23	26.3 MBaud	28 MHz	3 MBaud	3.5 MHz			Upload	
4	9 23/6 23	22.3 MBaud	28 MHz	26.3 MBaud	28 MHz			Upload	
5	9 23/9 23	22.3 MBaud	28 MHz	22.3 MBaud	28 MHz			Upload	
6	9 23/12 23	22.3 MBaud	28 MHz	3 MBaud	3.5 MHz			Upload	
7	12 23/6 23	3 MBaud	3.5 MHz	26.3 MBaud	28 MHz			Upload	
8	12 23/9 23	3 MBaud	3.5 MHz	22.3 MBaud	28 MHz			Upload	
9	12 23/12 23	3 MBaud	3.5 MHz	3 MBaud	3.5 MHz			Upload	
10	13 23/13 23	16 MBaud	20 MHz	16 MBaud	20 MHz			Upload	

Add Conf

Figure 90: Web Upgrade form – Configuration File Uploader.

This frame let the user select a modem configuration, remove it from database, upload a new one and check the stored ones.

Machine Upgrade

Module	File Extension	Restore	Load	Progress
Modem Boot	fw		Upload	
FPGA Firmware	bin		Upload	
Slot Software	ruc		Upload	

Full Upgrade

Figure 91: Web Upgrade form – Machine Upgrade.

This frame let the user upload equipment software upgrade; three kinds of upgrades exist:

- Modem boot
- FPGA firmware
- Modem board microcontroller firmware

Update status can be real time monitored through the Progress bar; moreover it is possible to make a complete update by pushing **Full Upgrade** button.

8.6 Tab Log.

Figure 92 : Web Log form – available log.

Figure 93: Web Log form – available log expanded.

The equipment offers an operation log service that can be checked in this tab of the web interface.

In left part of the web page, the form concerning available logs is present, grouped by:

- Daily report
- Last day
- Last week
- Last month

In order to avoid huge memory usage, it is recommended to delete old records using **Erase until** form and selecting desired interval (Figure 93).

In central part of the page, log messages are reported, organized in a table that can be ordered, filtered and resized in terms of number of rows per page.

Records belong to 4 different categories are shown with different colors for user facility:

1. Messages
2. Configurations
3. Alarms
4. Warnings

Every record has a time, a description and an origin; an alarm event is described in appendix with OCCURRED tag, while the alarm condition recovery is a Message with appendix RECOVERED. Records can be ordered in every column and filtered (with related checkbox).

Log can be saved as .csv file with button **SAVE TO DISK**.

Log content			
Today			
Event Type Filter		Description Filter	
☒ Alarms	☒ Warnings	☒ Messages	☒ Configurations
		Clear	Res
SAVE TO DISK			
Date Time	Event Type	Description	Origin
012-12-10 15:34:35	MESSAGE	INTERFACE OUTPUT MAP G overflow ALARM RECOVERED	REBLE MONITOR
2012-12-10 14:46:18	MESSAGE	LOG MANAGER STARTED	LOGMANAGER
2012-12-10 14:46:27	ALARM	PSU secondary ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:28	MESSAGE	PSU volt_12 ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:32	ALARM	INTERFACE fpga ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:32	ALARM	INTERFACE BNC J crd ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:32	ALARM	INTERFACE BNC J locked ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:32	ALARM	INTERFACE BNC E crd ALARM OCCURRED	REBLE MONITOR
2012-12-10 14:46:32	ALARM	INTERFACE BNC E locked ALARM OCCURRED	REBLE MONITOR
2012-12-10 15:31:38	ALARM	INTERFACE BNC D locked ALARM OCCURRED	REBLE MONITOR

Figure 94 : Web Log form – log.

Log content			
Today			
Event Type Filter		Description Filter	
☒ Alarms	☒ Warnings	☒ Messages	☒ Configurations
		Clear	Res
Date Time	Event Type	Description	Origin
LOG NOT FOUND			
« » 1/1 » « 30 per page v			

Figure 95 : Web Log form – filters.

The screenshot shows the 'Log content' interface. At the top, there's a 'Today' section with an 'Event Type Filter' containing checkboxes for Alarms, Warnings, Messages, and Configurations. A 'Description Filter' text box and 'Clear'/'Res' buttons are also present. Below this is a table header with columns: Date Time, Event Type, Description, and Origin. The table body is empty, showing 'LOG NOT FOUND'. At the bottom, there's a pagination control showing '1/1' and a dropdown menu for '30 per page' with options: 10 per page, 20 per page, 30 per page (selected), 50 per page, and 100 per page.

Figure 96: Web Log form – filters (selection of number of lines per page).

9 Panels.

9.1 Front Panel.

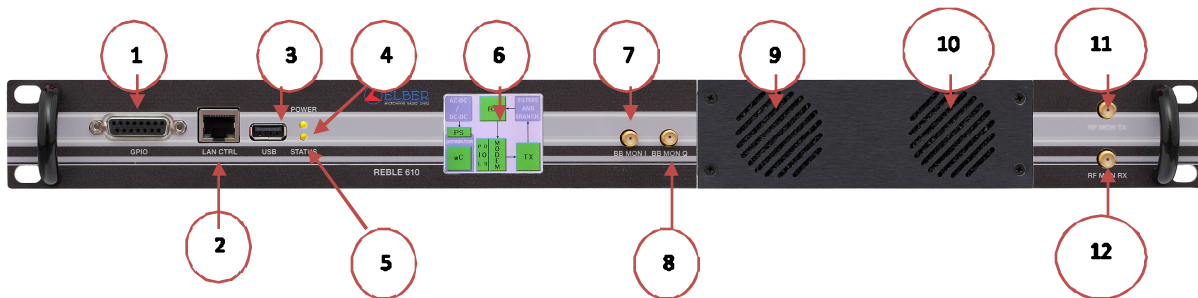


Figure 97 : REBLE610 front panel.

Item	Description	Function
1	Connector DB15	Remote control.
2	Connector RJ-45	Ethernet 10/100 port for Management.
3	Connector USB	Upgrade firmware and token connection for TFT access.
4	Green led	Power supply.
5	Three-colors led	Green: ok Yellow: warning Red: alarm
6	Display TFT touchscreen	User interface (needs token to access).
7	Connector SMA (f) 75 Ohm	I-path reception monitor out.
8	Connector SMA (f) 75 Ohm	Q-path reception monitor out.
9	Left fan	Modem, data interface and receiver cooling fan.
10	Right fan	Transmitter cooling.
11	Connector SMA (f) 75 Ohm	RF output monitor, before filter (coupling 50dB +/- 2 dB).
12	Connector SMA (f) 75 Ohm	RF input monitor, after filter (coupling with input level: 0dB +/-1dB)

9.2 Back Panel.

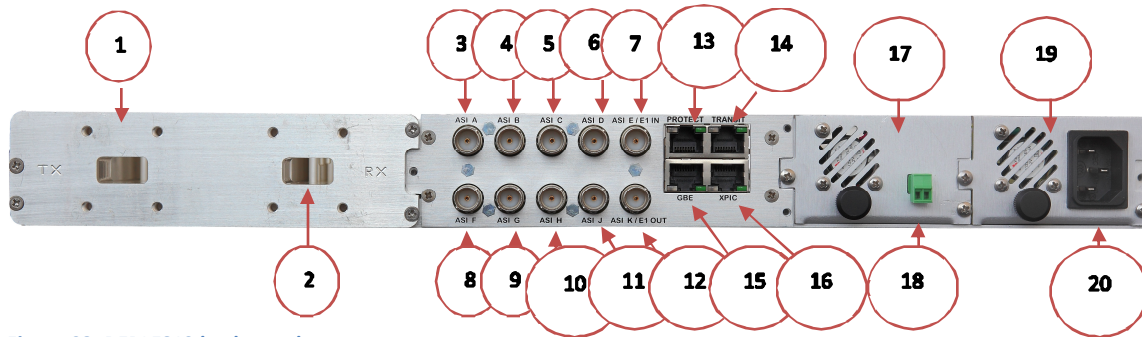


Figure 98: REBLE610 back panel.

Item	Description	Function
1	UBR120 Flange	Transmitter RF output (model REBLE610/10).
2	UBR120 Flange	Receiver RF input (model REBLE610/10).
3	Connector BNC 75 Ohm	In/out ASI A (software configuration).
4	Connector BNC 75 Ohm	In/out ASI B (software configuration).
5	Connector BNC 75 Ohm	In/out ASI C (software configuration).
6	Connector BNC 75 Ohm	In/out ASI D (software configuration).
7	Connector BNC 75 Ohm	In/out ASI E/E1 IN (software configuration).
8	Connector BNC 75 Ohm	In/out ASI F (software configuration).
9	Connector BNC 75 Ohm	In/out ASI G (software configuration).
10	Connector BNC 75 Ohm	In/out ASI H (software configuration).
11	Connector BNC 75 Ohm	In/out ASI J (software configuration).
12	Connector BNC 75 Ohm	In/out ASI K/E1 OUT (software configuration).
13	Connector RJ-45	Link for 1+1 configuration with paired REBLE610 for space diversity, frequency diversity and hot-standby.
14	Connector RJ-45	Baseband data transit between a receiving terminal and a transmitting terminal (software configuration).
15	Connector RJ-45	Ethernet 10/100/1000 "Gigabit Ethernet" for data transport.
16	Connector RJ-45	Link for XPIC configuration with paired REBLE610 (hw configuration) for exchange of data received and demodulated from different polarization than used, for opportune cancelling.
17	PSU	Backup Power supply, AC or DC; in Figure 98 the DC input model is shown. Hot swappable.
18	2 pin connector	Batteries connection, independent on polarity.
19	PSU	Main Power supply, AC or DC; in Figure 98 the AC input model is shown. Hot swappable.
20	Plug IEC320	AC supply plug.