



REBLE610-M



User Manual

System: REBLE610-M Fully indoor Microwave Link

Release: 1.0

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Dichiarazione di Conformità.

Con la presente Elber S.r.l. dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla Direttiva 2014/53/UE.

Al link seguente è scaricabile la Dichiarazione di conformità completa

3 http://www.elber.it/download/PR/Elber~Certificazioni~CE_REBLE610-M.pdf

Restrizioni d'uso.

4

				
AT	BE	BG	CZ	DK
EE	FR	DE	IS	IE
IT	EL	ES	CY	LV
LI	LT	LU	HU	MT
NL	NO	PL	PT	RO
SI	SK	TR	FI	SE
CH	UK			

Questa apparecchiatura radio deve essere messa in servizio e gestita solo da o per conto di titolari di autorizzazioni ministeriali, nel rispetto della legislazione vigente.

Sicurezza e Avvertenze.



Warning!

5

Questo apparecchio deve sempre essere collegato a un interruttore esterno da attivare prima di effettuare operazioni sull'apparato.

L'interruttore deve sempre essere installato in posizione facilmente accessibile.

La presa di alimentazione utilizzata deve disporre di appropriato conduttore di massa.

Il collegamento a una presa senza conduttore di massa renderà l'intero apparecchio pericoloso per la sicurezza delle persone.

Per la riparazione dell'apparato per favore rivolgersi solamente a personale qualificato.

All'interno ci sono tensioni che potrebbero essere pericolose per le persone.

Prima di rimuovere il coperchio assicurarsi di aver spento l'apparecchio e disconnesso opportunamente i cavi di alimentazione.

In caso di shock elettrico fare riferimento alle Norme di primo soccorso riportate nel capitolo seguente.



Lo smaltimento dell'apparato deve essere eseguito nel rispetto delle leggi in vigore nella Nazione di utilizzo.

Elber non si assume responsabilità per uno smaltimento in contrasto con le leggi in vigore.

APPLICAZIONI DI SUPPORTO VITALE

I prodotti ELBER non sono progettati per essere utilizzati come componenti critici in dispositivi di supporto vitale senza espressa autorizzazione scritta di ELBER S.r.l.

- I dispositivi di supporto vitale sono apparati o sistemi che sono intesi (a) per utilizzo chirurgico nel corpo, o (b) di supporto e sostegno alla vita, e il cui fallimento di uso, quando propriamente utilizzati nel rispetto delle istruzioni fornite nell'etichettatura, può ragionevolmente risultare in un significativo infortunio all'utente.
- Un componente critico è un qualsiasi componente di un dispositivo di supporto vitale il cui fallimento d'uso può ragionevolmente causare il fallimento del dispositivo di supporto vitale o compromettere la sua sicurezza o efficienza.

Le informazioni fornite in questo documento potrebbero subire variazioni senza preavviso.

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ELBER S.r.l. non si considera responsabile per possibili errori che potrebbero essere riscontrati in questa documentazione.

Norme di primo soccorso.

Il personale impegnato nell'installazione, nell'uso e nella manutenzione dell'apparecchiatura deve avere familiarità con la teoria e le pratiche di primo soccorso.

6.1 Trattamento degli shock elettrici.

Se la vittima ha perso conoscenza:

Seguire i principi di primo soccorso riportati qui di seguito.

- Posizionare la vittima sdraiata sulla schiena su una superficie rigida.
- Aprire le vie aeree sollevando il collo e spingendo indietro la fronte (Figura 1).
- Se necessario, aprire la bocca e controllare la respirazione.
- Se la vittima non respira, iniziare immediatamente la respirazione artificiale (Figura 2): inclinare la testa, chiudere le narici, fare aderire la bocca a quella della vittima e praticare 4 respirazioni veloci.

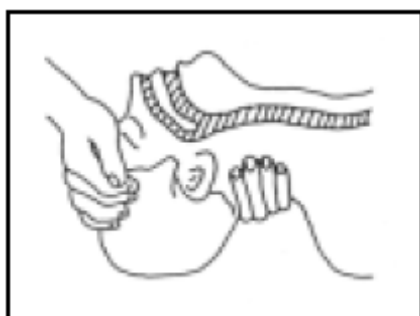


Figura 1: Dettaglio rianimazione – 1.

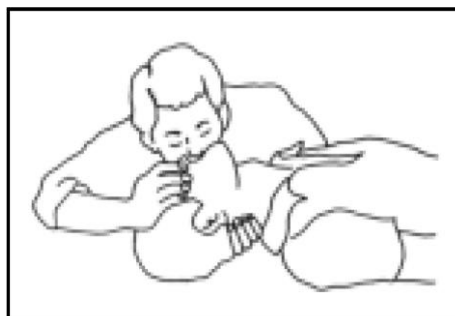


Figura 2: Dettaglio rianimazione – 2.

- Controllare il battito cardiaco (Figura 3); in assenza di battito, iniziare immediatamente il massaggio cardiaco (Figura 4) comprimendo lo sterno approssimativamente al centro del torace (Figura 5).



Figura 3: Dettaglio rianimazione – 3.

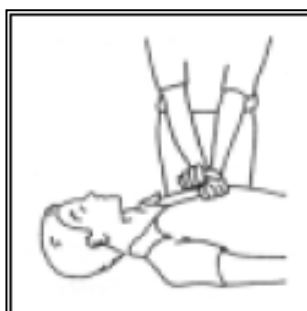


Figura 4: Dettaglio rianimazione – 4.

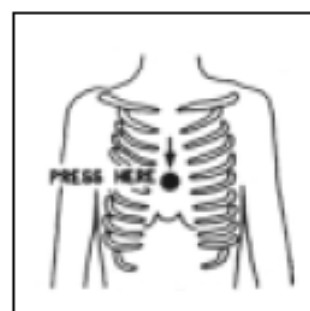


Figura 5: Dettaglio rianimazione – 5.

- Nel caso di un solo soccorritore, questo deve tenere un ritmo di 15 compressioni alternate a 2 respirazioni veloci.
- Nel caso in cui i soccorritori siano due, il ritmo deve essere di una respirazione ogni 5 compressioni.
- Non interrompere il massaggio cardiaco durante la respirazione artificiale.
- Chiamare un medico prima possibile.

Se la vittima è cosciente

- Coprire la vittima con una coperta.
- Cercare di tranquillizzarla.
- Slacciare gli abiti e sistemare la vittima in posizione coricata.
- Chiamare un medico prima possibile.

6.2 Trattamento delle ustioni elettriche.

Vaste ustioni e tagli alla pelle

- Coprire l'area interessata con un lenzuolo o un panno pulito.
- Non rompere le vesciche; rimuovere il tessuto e le parti di vestito che si fossero attaccati alla pelle; applicare una pomata adatta.
- Trattare la vittima come richiede il tipo d'infortunio.
- Trasportare la vittima in ospedale il più velocemente possibile.
- Se le braccia e le gambe sono state colpite, tenerle sollevate.

Se l'aiuto medico non è disponibile prima di un'ora e la vittima è cosciente e non ha conati di vomito, somministrare una soluzione liquida di sale e bicarbonato di sodio: 1 cucchiaino di sale e mezzo di bicarbonato di sodio ogni 250 ml d'acqua.

Far bere lentamente mezzo bicchiere circa di soluzione per quattro volte e per un periodo di 15 minuti.

Interrompere qualora si verificassero conati di vomito.

Non somministrare alcolici

Ustioni Meno gravi

- Applicare compresse di garza fredde (non ghiacciate) usando un panno il più possibile pulito.
- Non rompere le vesciche; rimuovere il tessuto e le parti di vestito che si fossero attaccati alla pelle; applicare una pomata adatta.
- Se necessario, mettere abiti puliti e asciutti.
- Trattare la vittima come richiede il tipo d'infortunio.
- Trasportare la vittima in ospedale il più velocemente possibile.
- Se le braccia e le gambe sono state colpite, tenerle sollevate.

7

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.

7.1 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

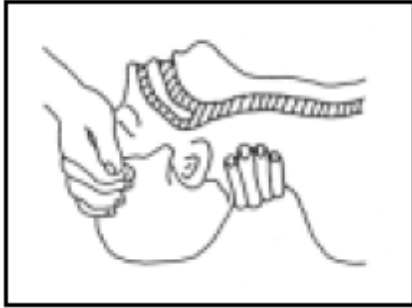


Figure 1: Resuscitation detail – 1.



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 3: Resuscitation detail – 3.

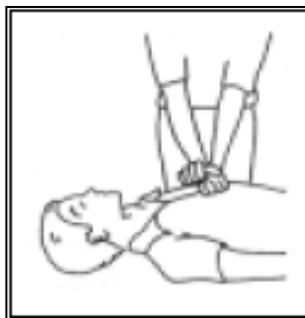


Figure 4: Resuscitation detail – 4.

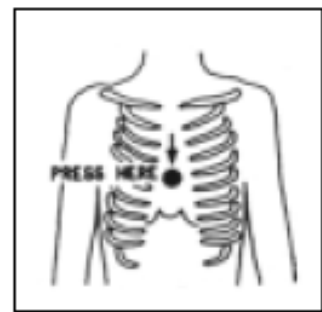


Figure 5: Resuscitation detail – 5.

- 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.

7.2 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.

General Description.

The **REBLE610-M** 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.

- 8 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-M), 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.

9 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 UDR70		N		UBR/UDR120		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

9.1 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

9.2 I/O signals.

Table 5

Access	1xE1 1xGbE (without Layer 2 Switch optional card)
Connector GbE, 1+1, XPIC, Transit	through SFP either Optical or Electrical
Connector XPIC, Transit	RJ-45

9.3 General Specifications

Table 6

Operative Temperature Range	-10°C ÷ 55°C
Management	Http (embedded http server) SNMPv2
Firmware upgrade	WEB FTP (factory reserved)
Power supply	Single or dual redundant, hot swappable. AC 90-260 V~ 50/60 Hz IEC 320

	DC 22 ÷ 65 V 2 pins socket
Max power consumption	130 W
Typical power consumption [10 GHz version]	120 W for full duplex 110 W for transmitter 65 W for receiver
Max dissipation	> 200 W

9.4 Mechanical Specifications.

Table 7

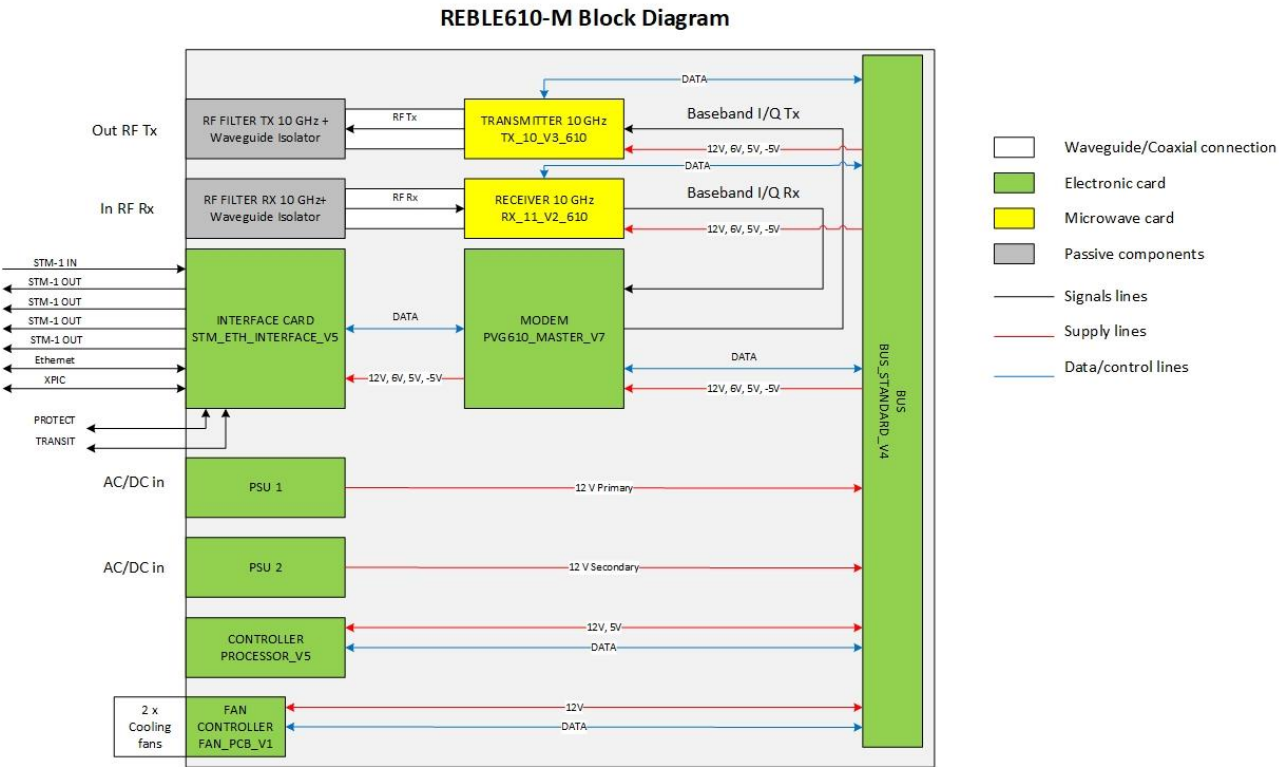
Rack	Standard 19" 2U
Width	482.50 mm 436.80 mm without handles
Height	88.15 mm
Depth	425.50 mm (front panel to back panel) 452,26 mm (front panel to UDR/UBR120 rigid waveguide end)
Max Weight	10 Kg

Installation.

- 10 ■ Unpack the equipment and check first of all check if there are any damages due to the transport.
- The box should contain:
 - The REBLE610-M
 - 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; grounding screw is located in the front panel, right side. See 14.2 for detail.
- Connect the RF connectors or flange(s) [rear panel] to the waveguide/cable for the connection to the branching system and/or the antenna.
 - If the equipment is to be used in laboratory, a dummy load is required for transmitter output.
 - **Do not** feed signals with levels > 0dBm to receiver input or the device may be damaged.
 - **Do not** switch on the equipment if transmitter output is not matched.
- Be sure of the correct power ratings reading the information in this manual or on the label attached to each equipment.
- Connect the AC supply cable to the plug on the equipment front panel and/or connect the battery cable to the related connector. The equipment will switch on and the last configuration used will be loaded.
- Setup the equipment according to the needs consulting the user manual, Section 0.

Equipment block diagram.

11



User interface.

Equipment monitoring and configuration are possible through the user interface, offered by the Controller Card installed in the front panel, right-side. The card replacement can be done without interruptions of the link operation; the card is hot-swappable.

User interface is composed by three components:

- 12
- LEDs (described in this section)
 - Web interface (described in Section 0)
 - SNMP (see MIB file provided by manufacturer. Ask to support@elber.it if not available)

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

LEDs' light may be green (if no alarms are present), yellow (if warning conditions are present but no alarms) and red (one or more alarm condition is present).

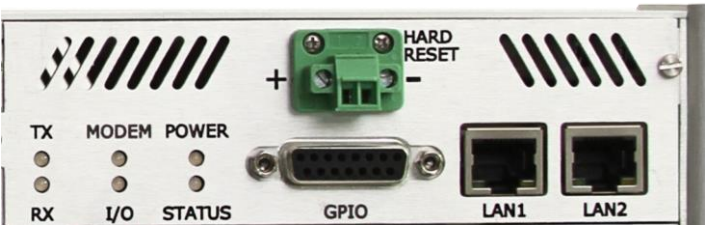


Figure 6: Controller Card front panel

Name	Function/Description
Tx	Alarm led for Transmitter module (off if not present/not detected)
Rx	Alarm led for Receiver module (off if not present/not detected)
Modem	Alarm led for Modem card (off if not present/not detected)
I/O	Alarm led for I/O card (off if not present/not detected)
Power	Led for Power On indication / PSU alarms
Status	General alarm led

WEB interface.

The REBLE610-M 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 *Web browser* (like Microsoft Edge, Internet Explorer, Mozilla Firefox, Google Chrome, Opera, Safari...) it is possible to check equipment status and verify performances even remotely simply connecting to the equipment. You will just need the equipment IP address and login data to have access granted. Equipment is delivered with default IP address 192.168.10.150/24 for LAN1 and the user can modify it to connect it to its network; in order to modify the IP address, please refer to par.13.2.3. LAN2 has a fixed IP address 192.168.168.168/24 and it cannot be modified.

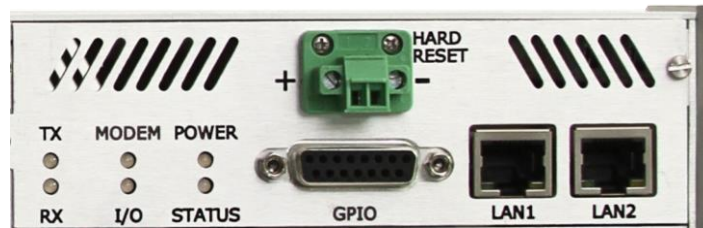


Figure 7: Controller card front panel

Figure 8 show the login page of the Web interface, which let the user access after successful insertion of username and password.

Username and password default values are related to customer name, as configured by factory; it means that each equipment with the same customer name has a common set of passwords, delivered in an envelope with the equipment.

There are three access levels:

- **user**, with just read-only privileges
- **puser** (power user), with read/write privileges
- **admin** with Firmware upgrade privileges

If customer modifies and lose default passwords, factory is to be contacted for new setup.

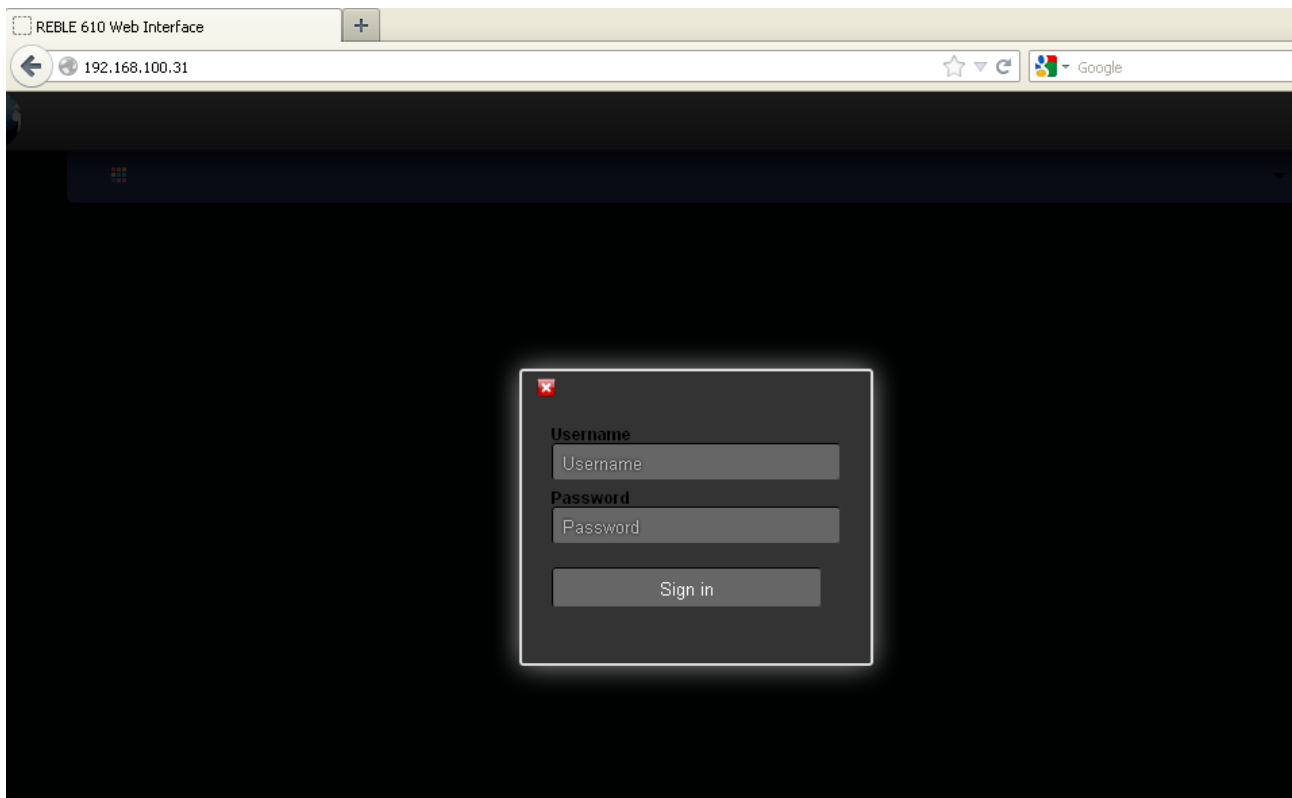


Figure 8: Web interface login page.

13.1 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.

Every module can be refreshed, collapsed or enlarged clicking on the icons at right-upper side of the module.



Figure 9: Status window commands (with detail)

13.1.1 Status-Controller.

Controller

Information

Board Model	Reble Controller
Version	1.0.0
Revision	2257:2258
Customer	Telecom Italia Media Broadcasting
Location	Maiella
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 10: 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.: M/REB610/10/00002/2019
Part Number	Ex.: M/REB610/FD1010-C/HP
Link Model	Ex.: REBLE610-M/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.

Status

Power Supply **Fans**

Left Fan	8022 rpm
Right Fan	7916 rpm
PSU 1	13431 rpm
PSU 2	15040 rpm

Figure 11: Web Status form – controller fans.

Table 10: Fans status.

Left Fan	Front panel left fan speed.
----------	-----------------------------

Right Fan	Front panel right fan speed.
PSU 1	Main power supply fan speed.
PSU 2	Backup power supply fan speed (if installed).

13.1.2 Status-Modem.

Modem / uC

Model	Reble modem uC	FPGA Model	MODEM FPGA
Version	2.00	FPGA Version	0.00
Revision	2647	FPGA Revision	4390

Primary Modem

Temperature	35 °C
Mod Configuration in use	Index: 0 (Type:151 Revision: 69)
Dem Configuration in use	Index: 0 (Type:151 Revision: 69)
Config Options	STM1
TX Profile	128 QAM
TX Bitrate	156558 kbps
TX Symbol rate	25.830 MBaud
DEM Acquire status	Locked
Normalized MSE	-27.90 dB
RX Profile	128 QAM
RX Bitrate	156558 kbps
RX Symbol rate	25.830 MBaud
LDPC stress	4.5E-05
BER	7.8E-06
BER Time Period	0 day 0:42:41
BER LOS counter	5165
Carrier offset	359 Hz
Internal AGC	-4.8 dB

Figure 12: Web Status form – modem locked.

Modem / uC

Model	Reble modem uC	FPGA Model	MODEM FPGA
Version	2.00	FPGA Version	0.00
Revision	2647	FPGA Revision	4390

Primary Modem

Temperature	36 °C
Mod Configuration in use	Index: 0 (Type:151 Revision: 69)
Dem Configuration in use	Index: 0 (Type:151 Revision: 69)
Config Options	STM1
TX Profile	128 QAM
TX Bitrate	156558 kbps
TX Symbol rate	25.830 MBaud
DEM Acquire status	Unlocked

Figure 13: Web Status form – modem unlocked.

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. Index is related to the configurations order loaded in the system and checkable in page Tab Upgrade . Type and Revision identifies factory configuration release.
Dem Configuration in use	Details of the configuration in use for the demodulator. Index is related to the configurations order loaded in the system and checkable in page Tab Upgrade . Type and Revision identifies factory configuration release.
Config Options	Shows special options such as STM1 or ETH or both
TX Profile	Profile (constellation) in use in the modulator.
Tx Bitrate	Modulator Bitrate [Net].
Tx Symbol Rate	Modulator Symbol Rate.
Dem Acquire status	Demodulator Locking status. Line is green if locked, red if unlocked. If Unlocked, no additional information about demodulator are shown
Normalized MSE	Mean Square Error measurement, normalized according to the used modulation. Line is green if value is between limits, red otherwise.
RX Profile	Profile (constellation) 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</i>

	Check) decoder. Line is green if value is between limits, red otherwise.
BER	Indication of the Bit Error Rate calculated for the below indicated Time Period. This value can be reset in Slot – Modem.
BER Time period	Indication of the observance time for BER calculation; calculated since equipment start-up or since BER Reset.
BER LOS counter	Indication of the Number of Signal Loss occurred during the Time Period mentioned above
Carrier Offset	Carrier Offset compared to central frequency. Line is green if value is between limits, red otherwise.
Internal AGC	Internal AGC level.

13.1.3 Status-Interface.

The I/O interface status windows is “options” dependant. That is, in case of STM-1, related measurements, indications, alarms are shown; in case of Ethernet, a different set of variables is shown.

The upper part of the window shows general info related to the Hardware and Firmware of the I/O card.

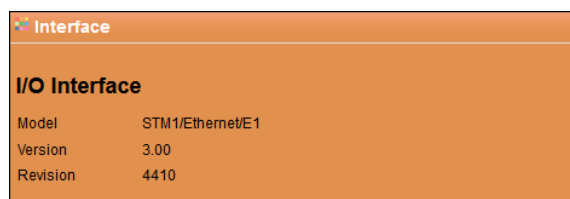


Table 12: I/O Interface status.

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

13.1.3.1 STM-1.

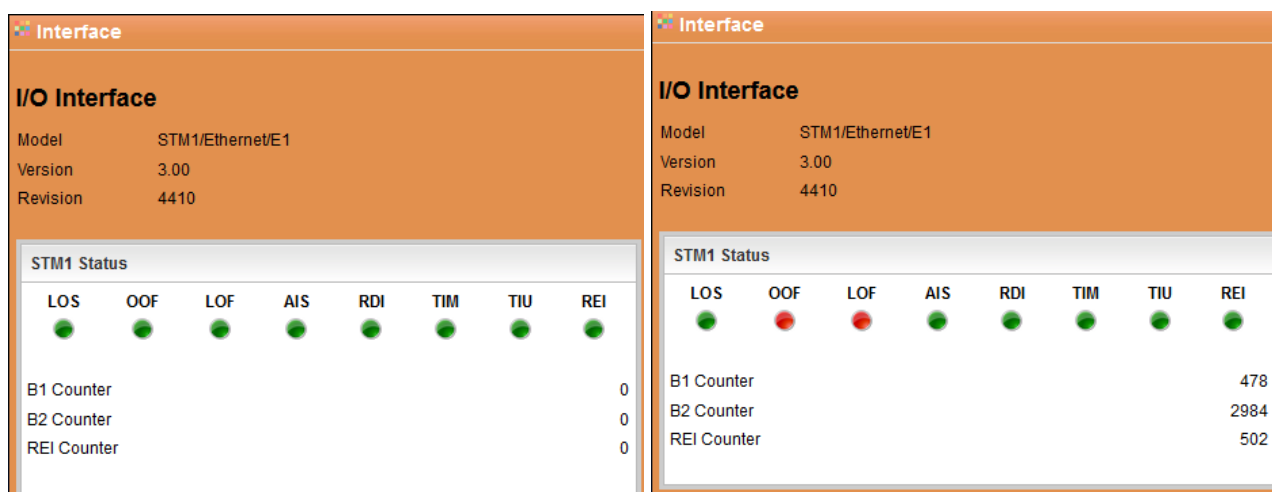


Figure 14: Web Status form – Interface STM1.

Table shown in Figure 14 shows STM-1 signal status and alarms; Table 13 describes the meaning.

Table 13: I/O details.

LOS	Loss of Signal indication
OOF	Out of Frame indication
LOF	Loss of Frame indication

AIS	Multiplexed Section Alarm Indication Signal / Line Alarm Indication Signal
RDI	Multiplexed Section Remote Defect Indication / Line Remote Defect Indication
TIM	Regenerator Section Trace Identifier Mismatch
TIU	Regenerator Section Trace Identifier Unstable
REI	Multiplexed Section Remote Error Indication / Line Remote Error Indication
B1 Counter	Counter showing the number of Section BIP-8 errors (B1) [Modem DS: The BIP-8 is computed over all bits of the previous STM-1 frame after scrambling and is placed in the B1 byte of the current frame before scrambling.]
B2 Counter	Counter showing the number of BIP-24 errors (B2) [Modem DS: The BIP-24 is computed over all bits of the previous STM-1 except for the first three rows and is placed in the b2 byte of the current frame.]
REI Counter	Counter showing the number of REI events (M1) [Modem DS: Used to send/detect MSD-REI/REI-L, carry the count of errors detected in B2 byte.]

13.1.3.2 Ethernet.

In case of an “Ethernet” Configuration, the measurements available are divided into 4 sub-frames:

- Link Status -> Figure 15
- Ingress Counters -> Figure 16
- Egress Counters -> Figure 17
- Frames Distribution Counters -> Figure 18

First frame shows the physical information of the SFP module. In case of SFP not detected or Link Loss, the related lines are in red, green if ok.

Interface

I/O Interface

Model STM1/Ethernet/E1
Version 3.00
Revision 4410

Ethernet Status

Ethernet Link Status

SFP Module	Not Present
SFP Link	Loss

Ethernet Ingress Counters

Ethernet Egress Counters

Frames Distribution Counters

Figure 15: Web Status form – Interface Ethernet – Ethernet Link Status.

Second frame shows some statistic counters related to the input signal.

Ethernet Status		Ethernet Status	
Ethernet Link Status		Ethernet Link Status	
Ethernet Ingress Counters		Ethernet Ingress Counters	
Total Good Bytes	0	Total Good Bytes	1800752504
Total Bad Bytes	0	Total Bad Bytes	0
Unicast	0	Unicast	0
Broadcast	0	Broadcast	86512
Multicast	0	Multicast	778791
Pause	0	Pause	0
Undersize	0	Undersize	0
Fragments	0	Fragments	0
Oversize	0	Oversize	0
Jabber	0	Jabber	0
RxError	0	RxError	0
FCSError	0	FCSError	0

Figure 16: Web Status form – Interface Ethernet – Ethernet Ingress Counters.

Table 14: Ethernet Ingress Counters Details

Ethernet Ingress counters	
Total Good Bytes	The sum of the lengths of all good Ethernet frames received, that is frames that are not bad frames
Total Bad bytes	The sum of the lengths of all bad Ethernet frames received
Unicast	The number of good frames received that have a Unicast destination MAC address
Broadcast	The number of good frames received that have a Broadcast destination MAC address
Multicast	The number of good frames received that have a Multicast destination MAC address
Pause	The number of good frames received that have a Pause destination MAC address
Undersize	Total Frames received with a length of less than 64 bytes but with a valid FCS
Fragments	Total Frames received with a length of less than 64 bytes but with an invalid FCS
Oversize	Total Frames received with a length of more than MaxSize but with a valid FCS
Jabber	Total Frames received with a length of more than MaxSize but with an invalid FCS
RxError	Total Frames received with a an RxErr signal from the PHY
FCSError	Total Frames received with a CRC error not counted in Fragments, Jabber or RxError

Third frame shows some statistic counters related to the output signal.

Ethernet Status		Ethernet Status	
Ethernet Link Status		Ethernet Link Status	
Ethernet Ingress Counters		Ethernet Ingress Counters	
Ethernet Egress Counters		Ethernet Egress Counters	
Total Good Bytes	0	Total Good Bytes	1800752504
Unicast	0	Unicast	0
Broadcast	0	Broadcast	86512
Multicast	0	Multicast	778791
Pause	0	Pause	0
Collisions	0	Collisions	0
Deferred	0	Deferred	0
Single	0	Single	0
Multiple	0	Multiple	0
Excessive	0	Excessive	0
FCSError	0	FCSError	0
Late	0	Late	0

Figure 17 Web Status form – Interface Ethernet – Ethernet Egress Counters.

Table 15: Ethernet Egress Counters Details

Ethernet Egress counters	
Total Good Bytes	The sum of lengths of all Ethernet frames sent from this MAC
Unicast	The number of frames sent that have a Unicast destination MAC address
Broadcast	The number of frames sent that have a Broadcast destination MAC address
Multicast	The number of frames sent that have a Multicast destination MAC address
Pause	The number of flow control frames sent
Collisions	The number of collision events seen by the MAC not including those counted in Single, Multiple, Excessive or Late. (only in half duplex)
Deferred	The total number of successfully transmitted frames that experienced no collisions but are delayed because the medium was busy during the first attempts (only in half duplex)
Single	The total number of successfully transmitted frames that experienced exactly one collision (only in half duplex)
Multiple	The total number of successfully transmitted frames that experienced more than one collision (only in half duplex)
Excessive	The number of frames dropped in the transmit MAC because the frame experienced 16 consecutive collisions. (only in half duplex)
FCSError	The number of frames transmitted with an invalid FCS. Whenever a frame is modified during transmission (e.g. to add or remove a tag) the frame's original FCS is inspected before a new FCS is added to a modified frame. If the original FCS is invalid, the new FCS is made invalid too and this counter is incremented.
Late	The number of times a collision is detected later than 512 bit-times into the transmission of a frame. (only in half duplex)

Fourth frame shows some statistic counters related to the frame dimensions transmitted over the link.

Ethernet Status		Ethernet Status	
Ethernet Link Status		Ethernet Link Status	
Ethernet Ingress Counters		Ethernet Ingress Counters	
Ethernet Egress Counters		Ethernet Egress Counters	
Frames Distribution Counters		Frames Distribution Counters	
64 Bytes	0	64 Bytes	183
65-127 Bytes	0	65-127 Bytes	13168
128-255 Bytes	0	128-255 Bytes	26888
256-511 Bytes	0	256-511 Bytes	54111
512-1023 Bytes	0	512-1023 Bytes	107988
1024-Max Bytes	0	1024-Max Bytes	662965

Figure 18: Web Status form – Interface Ethernet – Frames Distribution Counters.

13.1.4 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 19: Web Status form – Tx.

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

Table 16: 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.

13.1.5 Status-Receiver.

 RX

RX Module

ModelR10

VersionV2-610

Revision00019/2012

RX status

Temperature39 °C

Frequency10574000 kHz

Rssi-94.10 dBm

Figure 20: Web Status form – Rx.

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

Table 17: 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.

13.2 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.

13.2.1 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 21: 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 18: 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).

13.2.2 Controller – Customer.

Customer info

Customer

Customer name:

Location:

Link type:

Relay station

Rx

Tx

Relay station

Bidirectional

Receive from:

Transmit to:

Apply

Figure 22: Web Controller form – Customer info.

Table 19: 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.

13.2.3 Controller – Network.

Network Management

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

Timezone (correction for NTP sync)

World map

Select your country and timezone

Time zone

Europe/Rome

Country

Italy

Apply

Figure 23: 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.

13.2.4 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 24: Web Controller form – Modem SNMP traps configuration.

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

TX Traps

Controller Traps

Apply

Figure 26: Web Controller form – Receiver SNMP traps Configuration.

Trap	Enable/Disable
Protection	☐
ETH Lock	☒
ETH Overflow	☒
ETH Pause Receive	☒
ETH Pause Sent	☒
FPGA Error	☒
ETH SFP Error	☐
ETH Data Loss Error	☐
STM1 Error	☐

Figure 25: Web Controller form – Data interface SNMP traps Configuration.

Trap	Enable/Disable
Temperature	☒
PLL1	☒
PLL2	☒
Over Current	☐
Low Power	☒

Controller Traps

Alarm Rele 1 management

Alarm Rele 2 management

Alarm Rele 3 management

Figure 27: Web Controller form – Transmitter SNMP traps configuration.

Trap	Enable/Disable
Modem Fan	☒
RF Fan	☒
PSU1 Fan	☒
PSU2 Fan	☒
RF Fan	☒
PSU1 12V	☒
PSU2 12V	☒
5 Volt	☒
6 Volt	☒

Apply

Figure 28: 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 29: Web controller form - Alarm Relay configuration.

Traps Receiver

Trap receiver

127.0.0.1

Apply

Figure 30: Web Controller form – Trap Destination configuration.

13.2.5 Controller – Tools.

Tools

Tools

Date & Time

System Time:

10.08.2015 13:44:08

Local Time:

10.08.2015 13:44:13

New Time:

10.08.2015 13:44:13

Stop refresh

Apply

Reset Command

Slot

Controller

System

TFT Calibration

USB Token

Customer Name

Create Token

Slave Mode

Slave Mode

☒

Apply

Figure 31: Web Controller form – general info and tools.

Table 20: 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).

The “Slave Mode” checkbox is used in case of 1+1 link cold-standby. When the checkbox is tagged, the “Squelch” function of the transmitter is not allowed as it’s managed by the external controller CLEBER.

13.2.6 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 32: 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.

13.3 Tab Slot.

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

- Modem
- Interface
- Tx
- Rx

13.3.1 Slot – Modem.

Web section of Modem board is composed by 5 windows, reporting information about both modulator and demodulator parts, if system configuration allows it [a Tx will not show the demodulator part and a Rx the modulator part].

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

13.3.1.1 Modem Status.

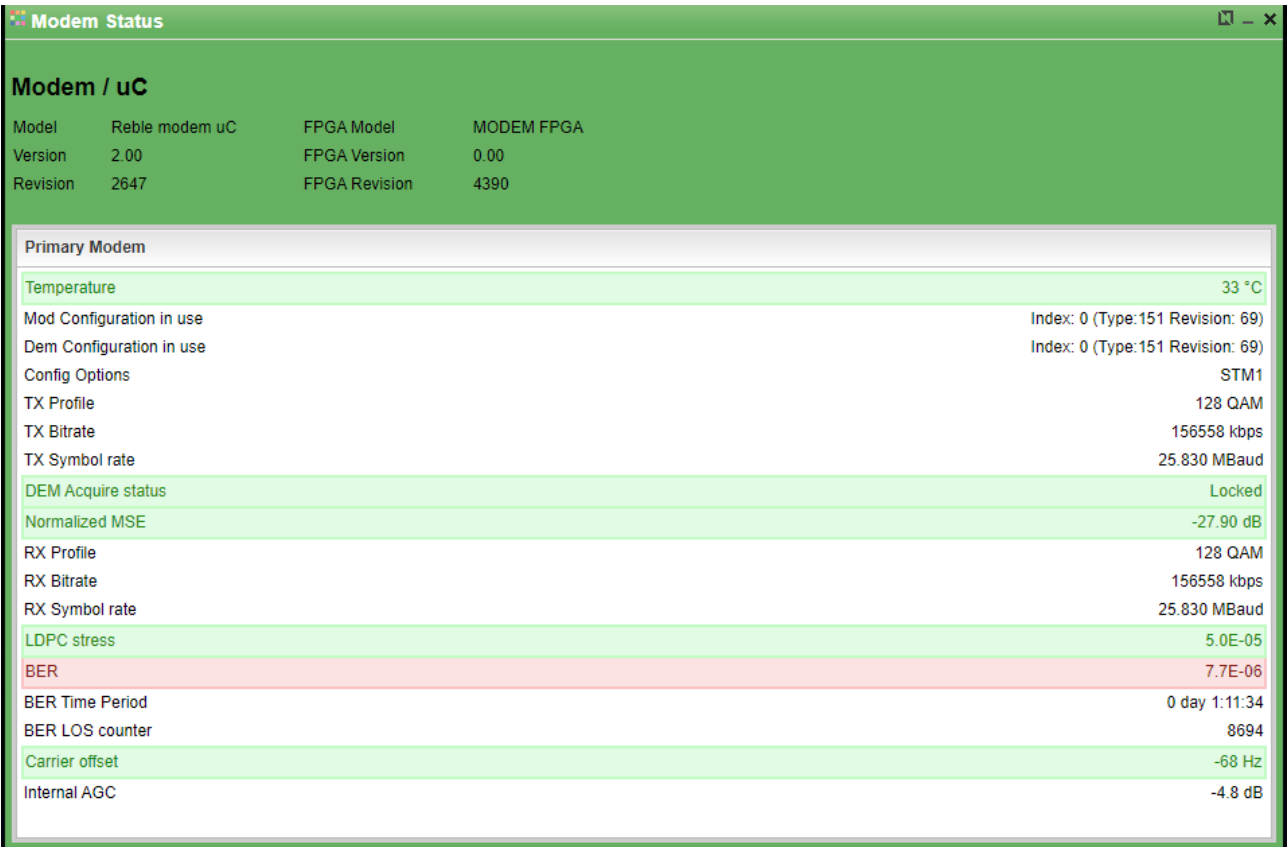


Figure 33: Web slot modem page – status.

Status frame reports the information already shown in the homepage of the web interface. (see par. 0).

13.3.1.2 Modem Management – MSE Graph

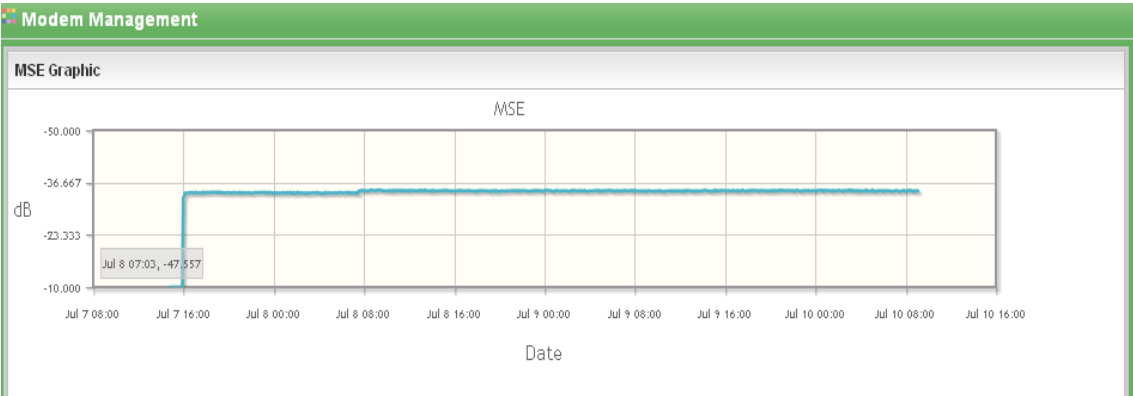


Figure 34: Web slot modem page – MSE Graphic.

MSE Graphic frame reports the MSE trend of last 10 days, with 5 seconds sampling time. User may zoom drawing a rectangle with the mouse and export or copy the image right-clicking on it. A double-click will restore the original view.

13.3.1.3 Modem Management – Temperature Graph

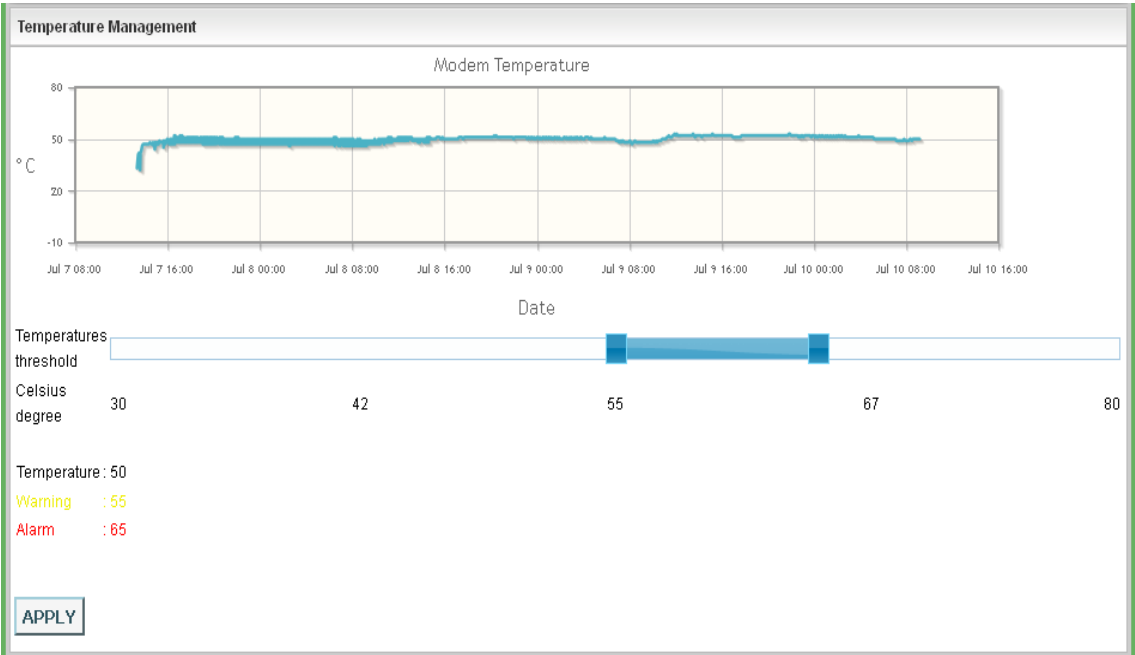


Figure 35: Web slot modem page – Temperature management.

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 check the actual temperature.

13.3.1.4 Modem Management – Profile

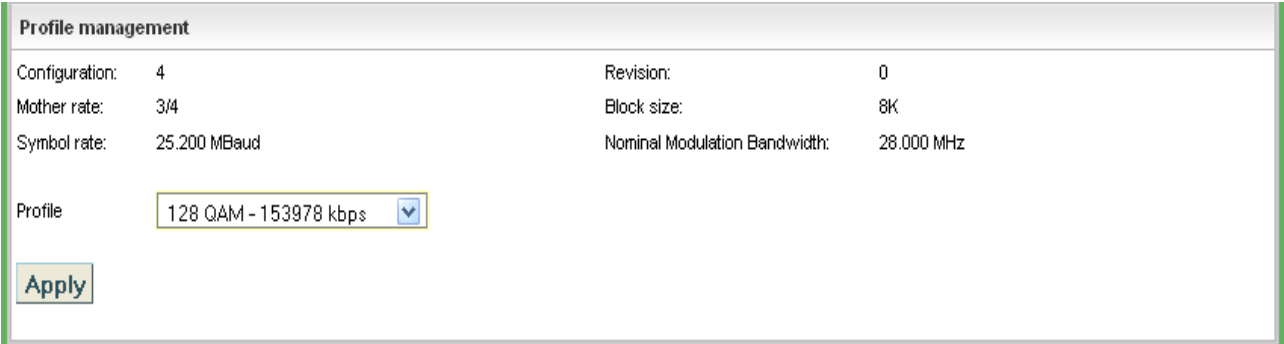


Figure 36: Web slot modem page – Profile management.

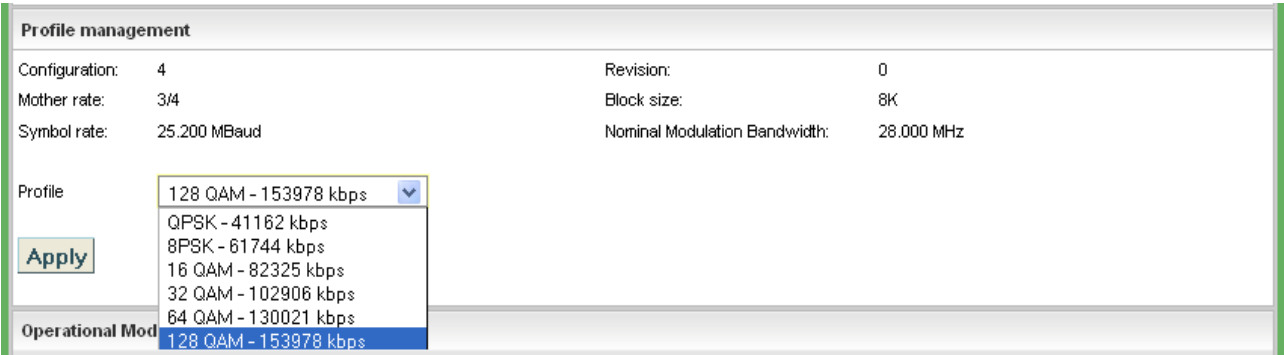


Figure 37: Web slot modem page – Profile management dropdown-list detail.

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

13.3.1.5 Modem Management – Operational Mode.

Figure 38: Web slot modem page – Operational Mode Management full window.

Figure 39: Web slot modem page – Operational Mode dropdown-list.

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)

13.3.1.6 Modem Management – Loopback.

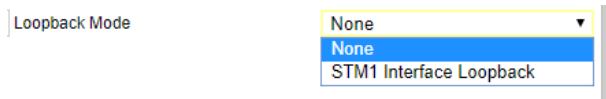


Figure 40: Web slot modem page – Operational Mode dropdown-list.

The right part of the window shows the Loopback Mode; user can select between None and STM1 Interface Loopback (local data loopback before any processing).

13.3.1.7 Modem Management – Sync.

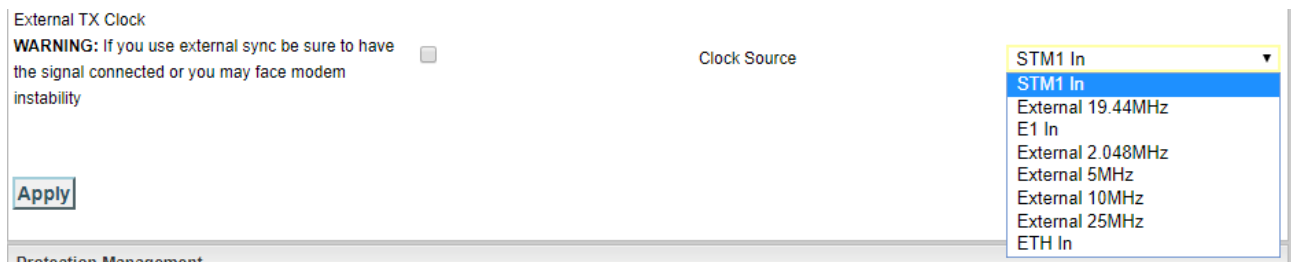


Figure 41 : Web slot modem page – Operational Mode Clock Source dropdown-list.

The lower part of the window shows the Sync parameters; user may need to synchronize the microwave link (basically modem data and symbol rates) to an internal or external clock.

If user enable the checkbox, an external reference signal is to be provided to front panel Sync1 connector as shown below.



Figure 42: I/O interface panel.

The dropdown-list shown in Figure 41 reports the Clock Sources that may be used:

- STM1 In: the system clock is recovered from the 155.52 Mbit/s input stream at STM1 IN connector
- External 19.44 MHz: the system clock is recovered from Sync1 connector; a 19.44 MHz signal [i.e. STM1 byte rate] is to be provided
- E1 In: the system clock is recovered from the 2.048 Mbit/s input stream at E1 connector
- External 2.048 MHz: the system clock is recovered from Sync1 connector; a 2.048 MHz signal [i.e. E1 bit rate] is to be provided
- External 5MHz: the system clock is recovered from Sync1 connector; a 5 MHz signal is to be provided
- External 10 MHz: the system clock is recovered from Sync1 connector; a 10 MHz signal is to be provided
- External 25 MHz: the system clock is recovered from Sync1 connector; a 25 MHz signal is to be provided
- Eth in: the system clock is recovered a 25MHz clock derived from Ethernet input [GbE connector]

13.3.1.8 Modem Management – Protection Management.

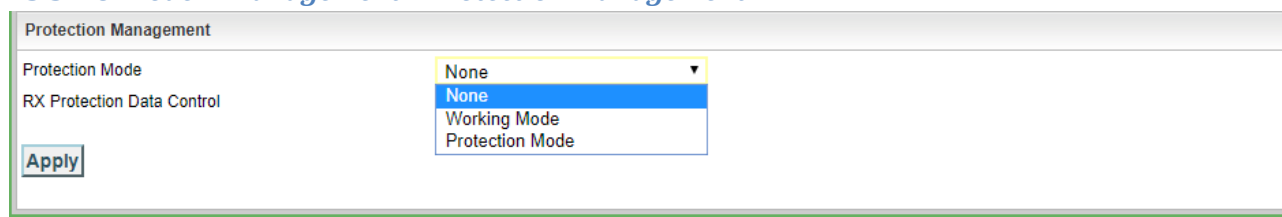


Figure 43: Web slot modem page – Protection Mode dropdown-list

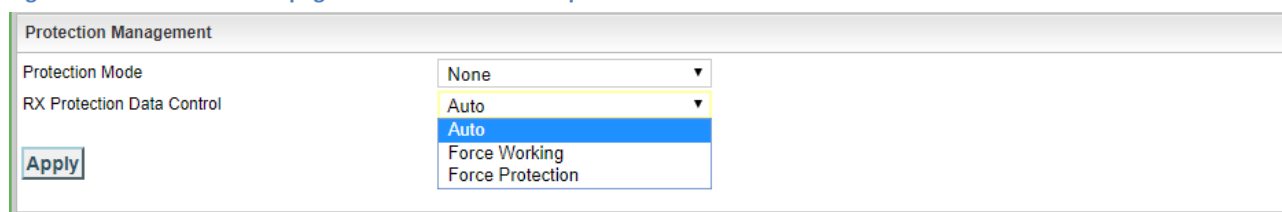


Figure 44: Web slot modem page – RX Protection Data Control dropdown-list

The last section of modem management window refers to protection system. To implement 1+1 configurations, the two dropdown-lists this section are to be configured accordingly.

Protection Mode let the user disable the protection (None) or configure the unit as Main (Working Mode) or Backup (Protection Mode). Basically, decides whether the modulator data to be used in 1+1 systems are the local unit's or the other unit's data.

RX Protection Data Control let the user decide whether output data are to be taken from local receiver [Force Working], redundant receiver [Force Protection] or from Automatic Switchover [Auto].

Note: Protection system require SFP module and Fiber optic connection between Local unit and Redundant Unit



Figure 45: I/O interface panel.

13.3.2 Slot – Interface.

The web page related to I/O interface is “Options” dependent.

13.3.2.1 Interface page – STM1

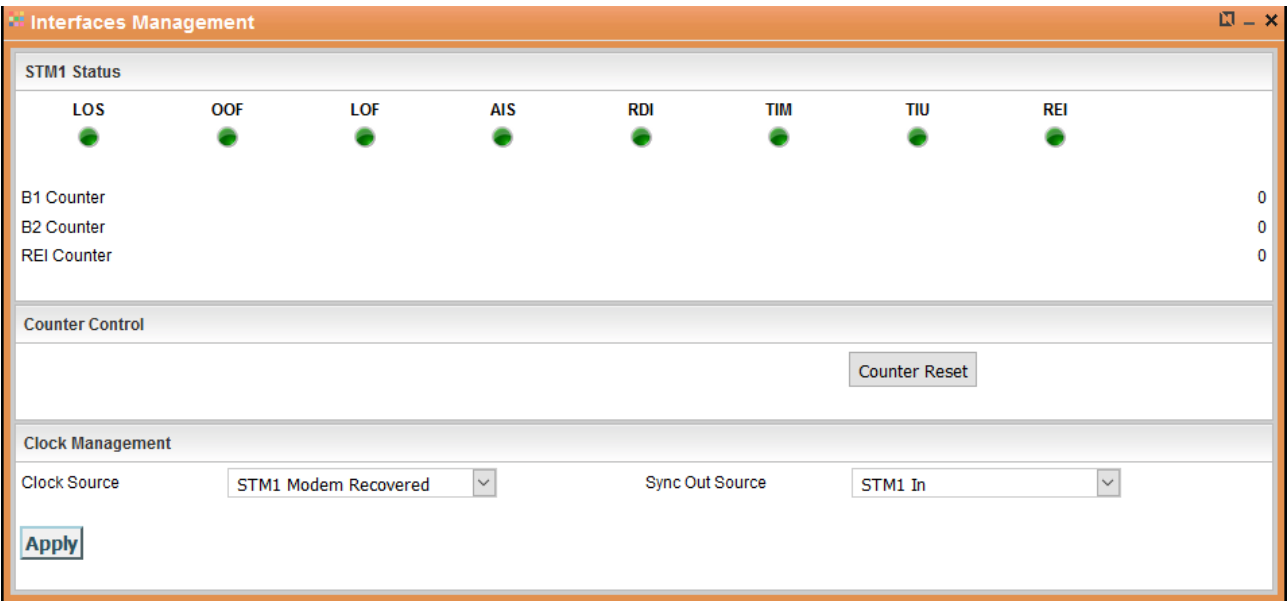


Figure 46: Web slot interface form – Status.

The page is divided into three sections.

- STM1 Status
- Counter Control
- Clock Management

Status frame reports information already shown in the homepage (see section 13.1.3 for details).

Counter Control shows a button to reset B1, B2, REI counters shown in status sections.

Clock Management frame let the user configure the clock source and the output sync signal source.

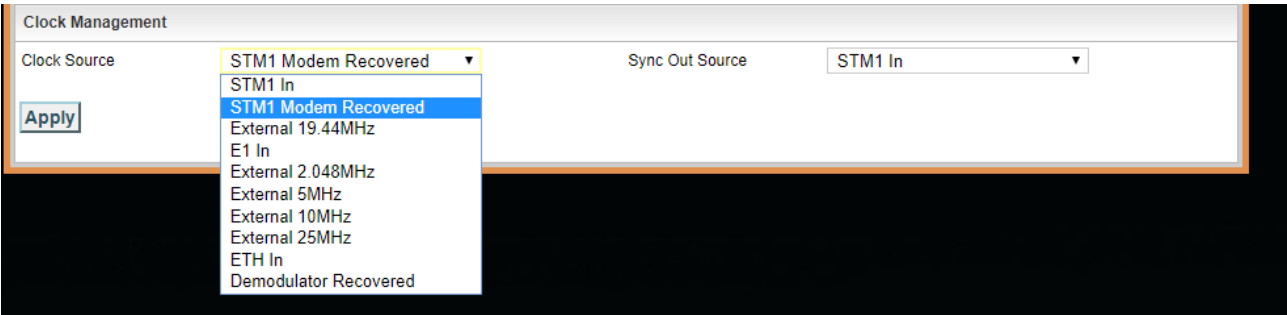


Figure 47: Web slot interface form – Clock Source dropdown-list.

The output data can be synchronized to different clock according to the choice made in this section.

- *STM1 In* Synchronize output data clock with STM1 In data clock
- *STM1 Modem Recovered* Synchronize output data clock with STM1 clock from radio link.
- *External 19.44 MHz* Synchronize output data clock with 19.44 MHz provided at Sync1 connector
- *E1 In* Synchronize output data clock with E1 In data clock
- *External 2.048 MHz* Synchronize output data clock with 2.048 MHz provided at Sync1 connector
- *External 5 MHz* Synchronize output data clock with 5 MHz provided at Sync1 connector
- *External 10 MHz* Synchronize output data clock with 10 MHz provided at Sync1 connector

- *External 25 MHz* Synchronize output data clock with 25 MHz provided at Sync1 connector
- *Eth In* Synchronize output data clock with Ethernet In 25 MHz data clock
- *Demodulator recovered* Synchronize output data clock with symbol rate

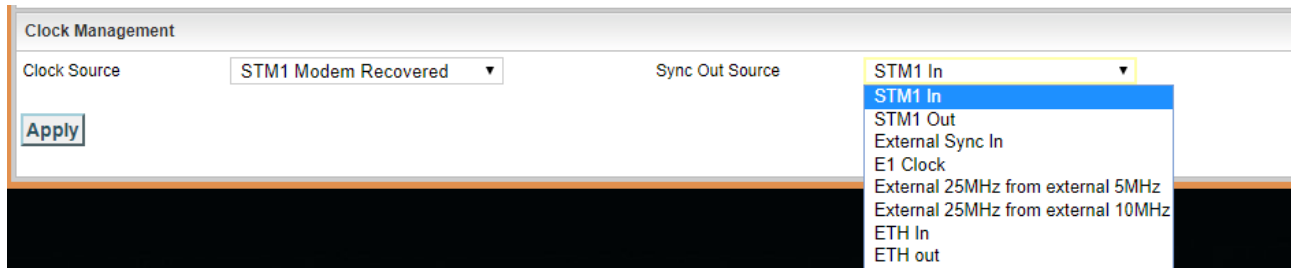


Figure 48: Web slot interface form – Sync out Source dropdown-list

The Sync out signal can be taken from different clocks according to the choice made in this section.

- *STM1 In* Redirect to Sync2 connector the STM1 Input recovered clock.
- *STM1 Out* Redirect to Sync2 connector the same clock of STM1 output.
- *External Sync In* Redirect to Sync2 connector the clock connected at Sync1 connector.
- *E1 Clock* Redirect to Sync2 connector the E1 data clock
- *External 25 MHz from external 5 MHz* Redirect to Sync2 connector a 25 MHz signal locked to 5 MHz input signal at Sync1 connector
- *External 25 MHz from external 10 MHz* Redirect to Sync2 connector a 25 MHz signal locked to 10 MHz input signal at Sync1 connector
- *Eth In* Redirect to Sync2 connector the E1 the Ethernet In 25 MHz data clock
- *Eth Out* Redirect to Sync2 connector the E1 the Ethernet In 25 MHz data clock

13.3.2.2 Interface page – Ethernet.

The page is divided into six sections.

- Ethernet link Status
- Ethernet Ingress Counter
- Ethernet Egress Counter
- Frame Distribution Counter
- Ethernet Port Management
- Clock Management

Ethernet link Status frame reports information already shown in the homepage (see section 13.1.3 for details).

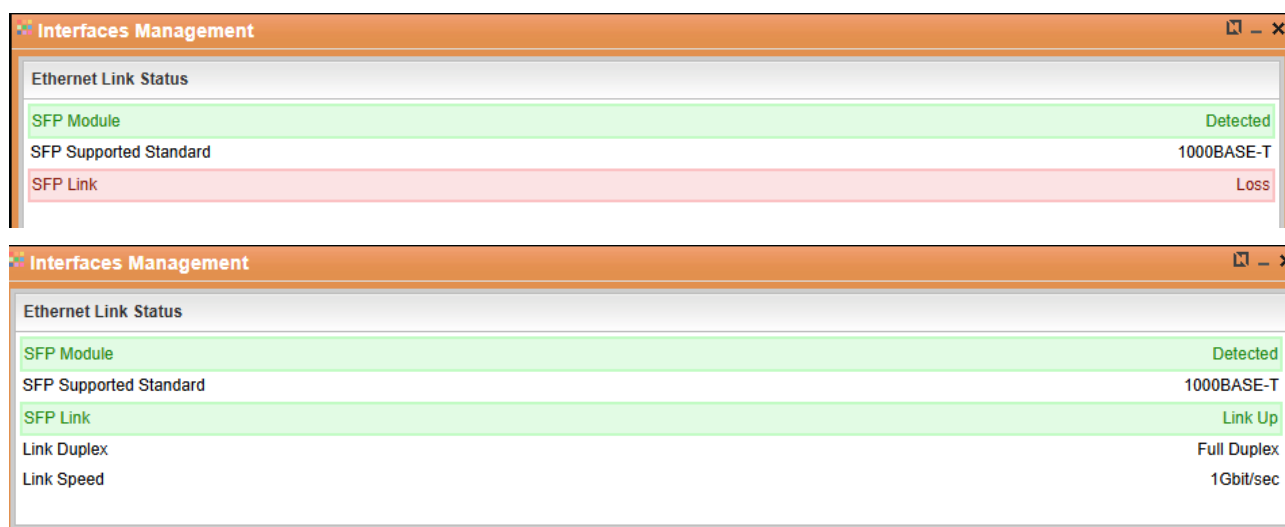


Figure 49: Web slot Ethernet interface form – Status 1/6.

Second frame shows some statistic counters related to the input signal.

Ethernet Ingress Counter	
Instant Bitrate	0.00 Mbps
Total Good Bytes	0
Total Bad Bytes	0
Unicast	0
Broadcast	0
Multicast	0
Pause	0
Undersize	0
Fragments	0
Oversize	0
Jabber	0
RxError	0
FCSError	0

Figure 50: Web slot Ethernet interface form – Status 2/6.

Table 21: Ethernet Ingress Counters Details

Ethernet Ingress counters	
Total Good Bytes	The sum of the lengths of all good Ethernet frames received, that is frames that are not bad frames
Total Bad bytes	The sum of the lengths of all bad Ethernet frames received
Unicast	The number of good frames received that have a Unicast destination MAC address

Broadcast	The number of good frames received that have a Broadcast destination MAC address
Multicast	The number of good frames received that have a Multicast destination MAC address
Pause	The number of good frames received that have a Pause destination MAC address
Undersize	Total Frames received with a length of less than 64 bytes but with a valid FCS
Fragments	Total Frames received with a length of less than 64 bytes but with an invalid FCS
Oversize	Total Frames received with a length of more than MaxSize but with a valid FCS
Jabber	Total Frames received with a length of more than MaxSize but with an invalid FCS
RxError	Total Frames received with a an RxErr signal from the PHY
FCSError	Total Frames received with a CRC error not counted in Fragments, Jabber or RxError

Third frame shows some statistic counters related to the output signal.

Ethernet Egress Counter	
Instant Bitrate	118.47 Mbps
Total Good Bytes	33460926256224
Unicast	0
Broadcast	4086026942752143
Multicast	0
Pause	0
Collisions	0
Deferred	0
Single	0
Multiple	0
Excessive	0
FCSError	0
Late	0

Figure 51: Web slot Ethernet interface form – Status 3/6.

Table 22: Ethernet Egress Counters Details

Ethernet Egress counters	
Total Good Bytes	The sum of lengths of all Ethernet frames sent from this MAC
Unicast	The number of frames sent that have a Unicast destination MAC address
Broadcast	The number of frames sent that have a Broadcast destination MAC address
Multicast	The number of frames sent that have a Multicast destination MAC address
Pause	The number of flow control frames sent
Collisions	The number of collision events seen by the MAC not including those counted in Single, Multiple, Excessive or Late. (only in half duplex)
Deferred	The total number of successfully transmitted frames that experienced no collisions but are delayed because the medium was busy during the first attempts (only in half duplex)
Single	The total number of successfully transmitted frames that experienced exactly one collision (only in half duplex)
Multiple	The total number of successfully transmitted frames that experienced more than one collision (only in half duplex)
Excessive	The number of frames dropped in the transmit MAC because the frame experienced 16 consecutive collisions. (only in half duplex)
FCSError	The number of frames transmitted with an invalid FCS. Whenever a frame is modified during transmission (e.g. to add or remove a tag) the frame's original FCS is inspected before a new FCS is added to a modified frame. If the original FCS is invalid, the new FCS is made invalid too and this counter is incremented.
Late	The number of times a collision is detected later than 512 bit-times into the transmission of a frame. (only in half duplex)

Fourth frame shows some statistic counters related to the frame dimensions transmitted over the link.

Frames Distribution Counters	
64 Bytes	0
65-127 Bytes	0
128-255 Bytes	0
256-511 Bytes	0
512-1023 Bytes	0
1024-Max Bytes	4086026759054696

Figure 52: Web slot Ethernet interface form – Status 4/6.

Fifth frame shows some configuration details.

Ethernet port management

Ethernet Data Loss Threshold

b/s

Force Link Up

WARNING: use only with optical connection

Enable

Disable

Eth Counter Reset

Apply

Figure 53: Web slot Ethernet interface form – Status 5/6.

Table 23: Ethernet Port Configuration

Ethernet Data Loss Threshold	This value is the minimum net throughput expected; if detected bitrate is below this threshold, the system activates the related TX DATA LOSS alarm or RX DATA LOSS ALARM
Force Link Up	This button let the user “Force” the indication of “link Up” in case of optical connection when it is not possible to get such information from the SFP module.
Eth Counter Reset	This button let the user reset the counters

Clock Management frame let the user configure the clock source and the output sync signal source.

Clock Management

Clock Source

▼

Sync Out Source

▼

Apply

STM1 In

STM1 In

STM1 Out

External Sync In

E1 Clock

External 25MHz from external 5MHz

External 25MHz from external 10MHz

ETH In

ETH out

Figure 54: Web slot Ethernet interface form – Status 6/6.

13.3.3 Slot – TX.

Web section of transmitter board is composed by 4 frames:

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

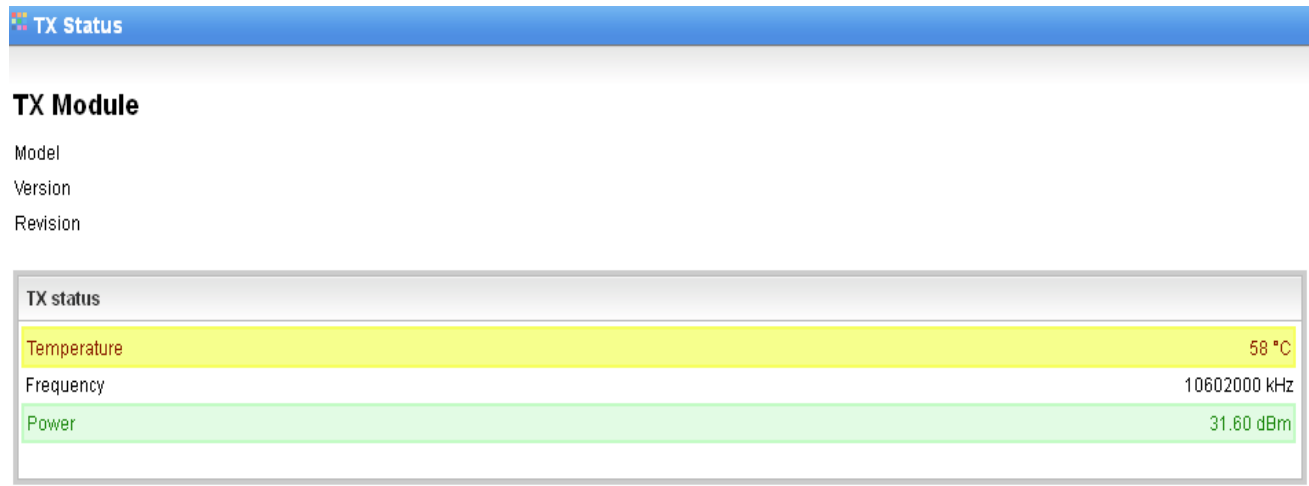


Figure 55: Web slot TX form – status.

Status frame reports information already shown in homepage (see par.13.1.4).

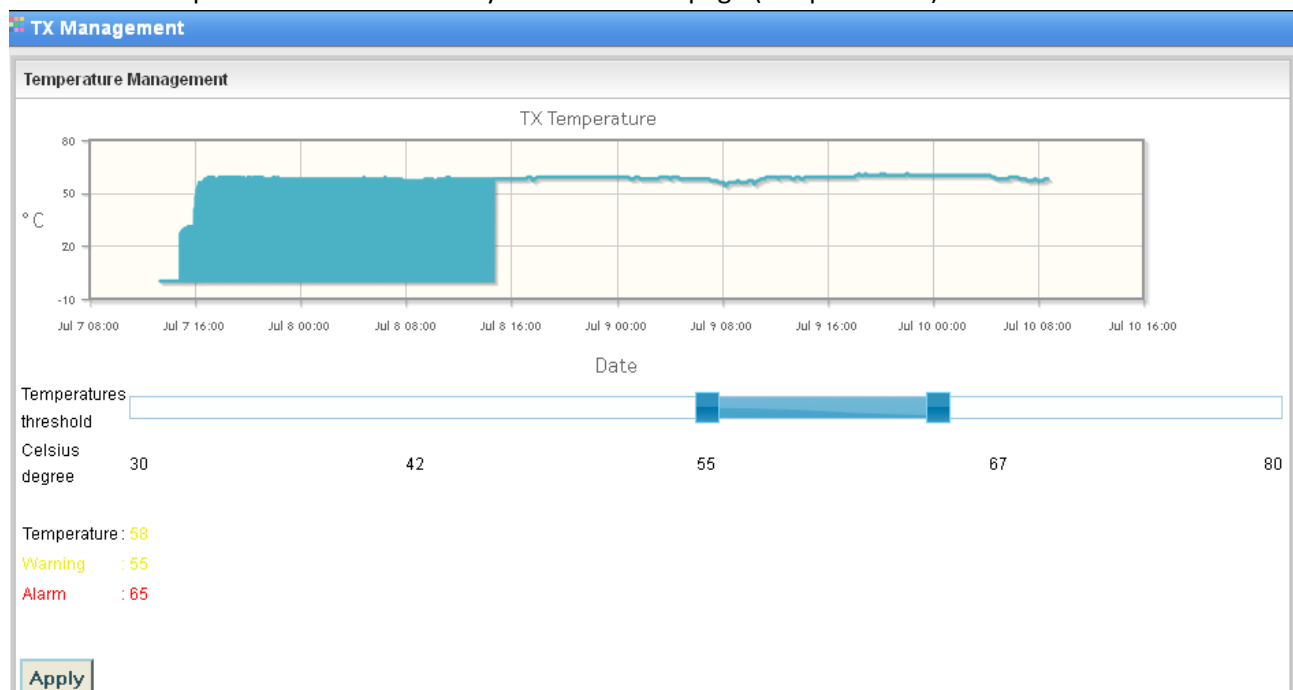


Figure 56: Web slot TX form – Temperature management.

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.

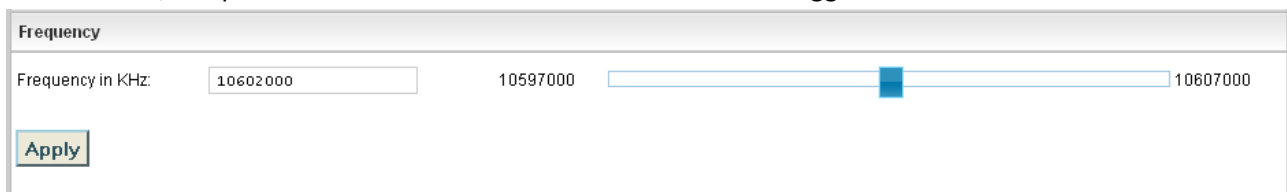


The interface is titled "Power management". It contains three input fields on the left: "Power Management in dB [-12.0:+0.0]" with a value of 0, "Current (dBm):" with a value of 30.9, and "Low Power Threshold (dBm):" with a value of 20. On the right, there is a "Squelch" label above a graphical slider control. An "Apply" button is located at the bottom left.

Figure 57: 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 following line and measured in dBm, can be adjusted in a -12 to +0 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.

Furthermore, it is possible to set a Low Power Threshold in dBm. Suggested value is 20 dBm.



The interface is titled "Frequency". It shows "Frequency in KHz:" with a value of 10602000. To the right, there is a range from 10597000 to 10607000 with a graphical slider bar. An "Apply" button is located at the bottom left.

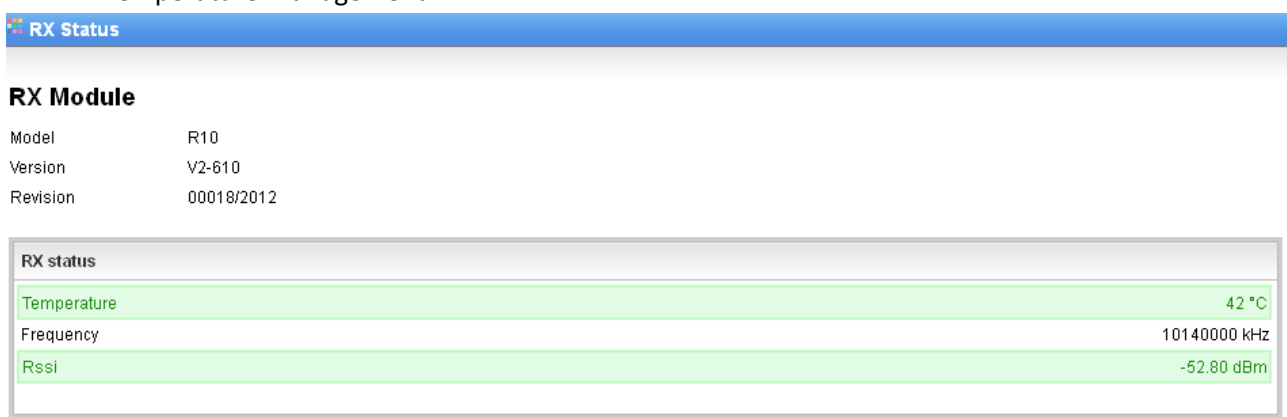
Figure 58: Web slot TX form – Frequency.

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).

13.3.4 Slot – Rx.

Web section receiver board is composed by 4 frames:

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



The interface is titled "RX Status". It has a section "RX Module" with the following details: Model R10, Version V2-610, and Revision 00018/2012. Below this is a table titled "RX status" with three rows: Temperature (42 °C), Frequency (10140000 kHz), and Rssi (-52.80 dBm).

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

Figure 59: Web slot Rx form – status.

Status frame reports information already shown in homepage (see par.13.1.5).

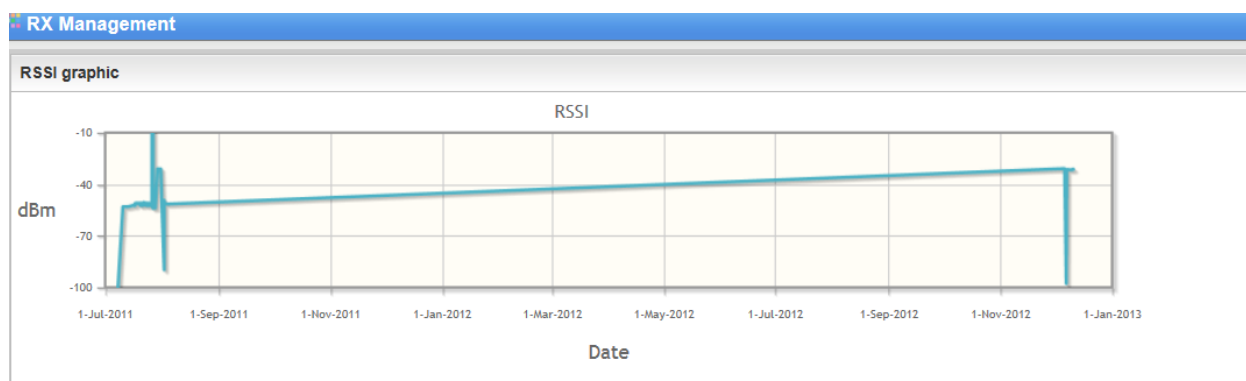


Figure 60: Web slot Rx form – RSSI Graphic.

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

Figure 61: 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).

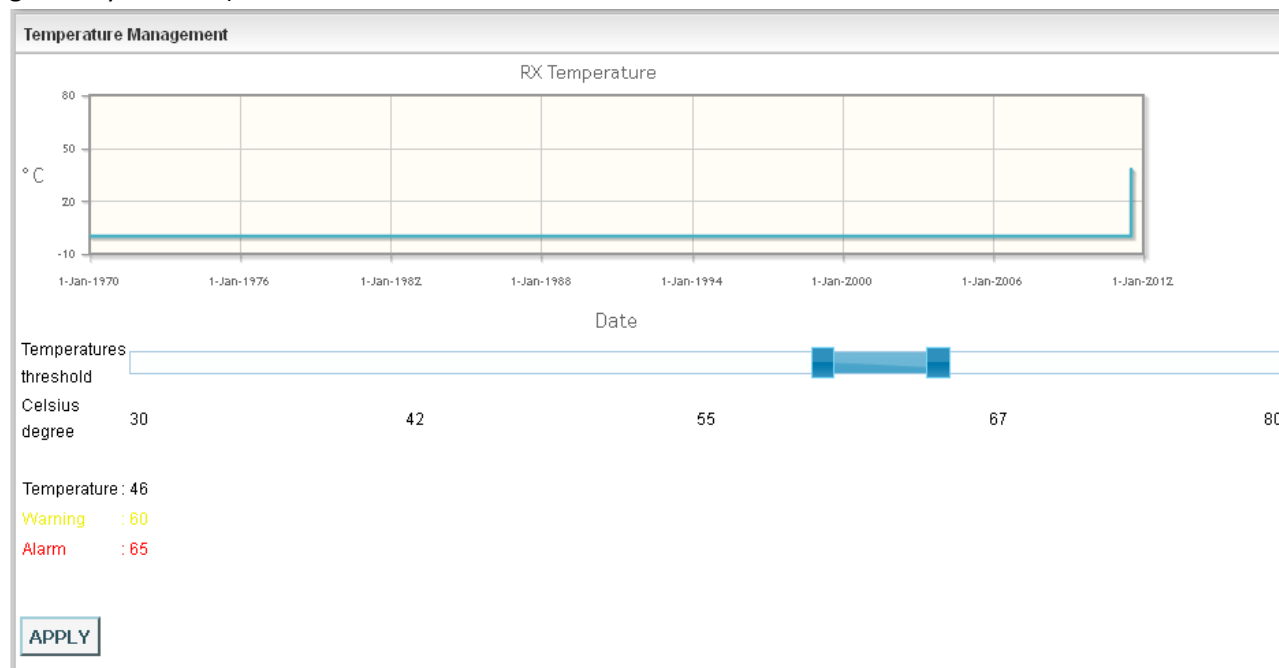


Figure 62: Web slot Rx form –Temperature Management.

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.

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13.4 Tab Upgrade.

Web tab Upgrade is shown just to administrator user and is composed by 2 sections:

- Configuration uploader
- Machine upgrade

Index	Type	Mod Symbol Rate	Mod Bandwidth	Dem Symbol Rate	Dem Bandwidth	Options	Run	Remove	Load	Progress
0	151 69/151 69	25830 kBaud	28 MHz	25830 kBaud	28 MHz	STM1			Upload	
1	152 68/152 68	25830 kBaud	28 MHz	25830 kBaud	28 MHz	ETH			Upload	

System Configuration

Figure 63: Web Upgrade form – Configuration File Uploader.

There are two types of configuration that can be played, uploaded, removed, downloaded:

- Modem configuration
- System configuration

The first section let the user select a modem configuration, remove it from database, upload a new one and check the stored ones. Customer can check main parameters and options. Playing a configuration stop the operations; **same modem configuration should be loaded at both equipment.**

The second section let the user download the equipment configuration (no network parameters are stored) or upload a new one. Clicking on “download File”, next window will show-up.

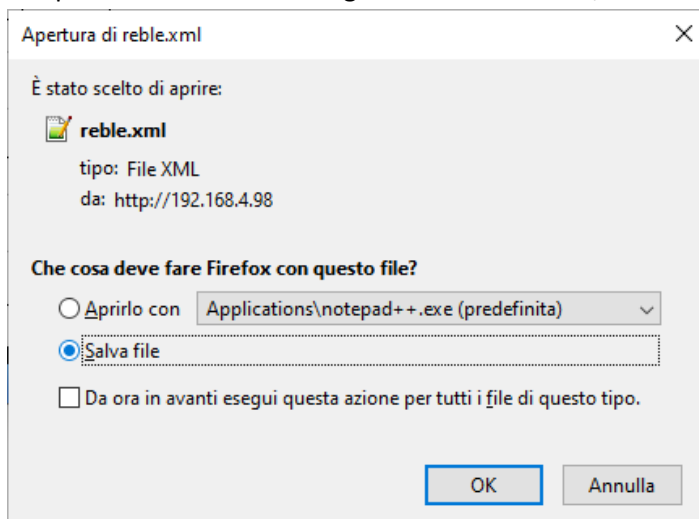


Figure 64: Configuration Download pop-up

Machine Upgrade

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

Full Upgrade

Figure 65: Web Upgrade form – Machine Upgrade.

This frame let the user upload equipment software upgrade; user can:

- Modem boot
- Modem FPGA firmware
- Interface FPGA firmware
- Modem board microcontroller firmware (Slot Software)

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

Any of these operations will stop the operation of the equipment.

13.5 Tab Log.

Available log

Log

- Today
- Yesterday
- Last Week
- Last Month

Erase Until

Yesterday

▼

APPLY

Log content

Today

Date	Event Type	Description	Origin
	Select Filter ▼		Select Filt ▼
2020-04-08 14:45:25	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:45:24	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:38:21	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:38:20	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:37:06	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:37:04	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:35:18	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:35:17	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:34:20	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:34:18	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR

Go to page: 1 Show rows: 10 ▼ 1-10 of 796

Save Log as:

xls

xml

csv

tsv

html

json

Figure 66 : Web Log form – available log.

Figure 67: 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 67). The dropdown-list shows the possibility to cancel also ALL STATISTICAL DATA (See Tab Statistics.).

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 2 different categories are shown with different colours for user facility:

1. Messages
2. Alarms

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 just writing in the filter line.

Log content			
Today			
Date	Event Type	Description	Origin
	Select Filter		Select Filt
2020-04-08 14:45:25	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:45:24	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:38:21	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:38:20	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:37:06	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:37:04	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:35:18	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:35:17	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
2020-04-08 14:34:20	MESSAGE	DEM Idpc ALARM RECOVERED	REBLE MONITOR
2020-04-08 14:34:18	ALARM	DEM Idpc ALARM OCCURRED	REBLE MONITOR
Go to page: 1 Show rows: 10 1-10 of 796			

Figure 68: Web Log form – log.

Log records can be saved as .xls, .xml, .csv, .tsv, .html and .json files clicking on the related button at the bottom of the page.

Save Log as:					
xls	xml	csv	tsv	html	json

Figure 69: Web Log form – filters (selection of number of lines per page).

13.6 Tab Statistics.

Performance monitor tool is available in Tab Statistics.

The upper part of the page shows the dropdown list to select the measurement to be shown, the graphs related to all statistical data available for the measurement and some export tools. The lower part shows all samples in a table with some statistic.



Figure 70: Web slot Statistic page – Full Page



Figure 71: Web slot Statistic page – Variable selection

With the dropdown-list shown in figure above, user can select the variable to be graphically shown in the graph section.

Variable available:

- Tx Power
- RSSI (Received Signal Strength Indication)
- UAS_24 (Unavailable Seconds according to G.826 - average over 24h)
- SES_24 (Severely Errored Second according to G.826 - average over 24h)
- ES_24 (Severely Errored Second according to G.826 - average over 24h)
- BBE_24 (BaseBand Errors according to G.826 - average over 24h)
- UAS (Unavailable Seconds according to G.826)
- SES (Severely Errored Second according to G.826)
- ES (Severely Errored Second according to G.826)
- BBE (BaseBand Errors according to G.826)
- BER (Bit error Rate)
- MSE (Mean Square Error)

According to the variable selected, the samples recorded every 15 seconds are shown in line graph showing the value, the mean value, the average value over 15seconds, the average value over 24h, the minimum

and the maximum value. Every trace has a different colour as shown in the legend hereunder and can be enabled/disabled clicking on each checkbox.



Figure 72: Web slot Statistic page – Graphs statistic selection and legend.

All data can be checked in the lower part of the page and downloaded for offline analysis or report. More than one file format is available, and user can select the desired one through the dropdown-list seen in Figure 73. Once selected the file format, file can be exported by clicking on the Download button

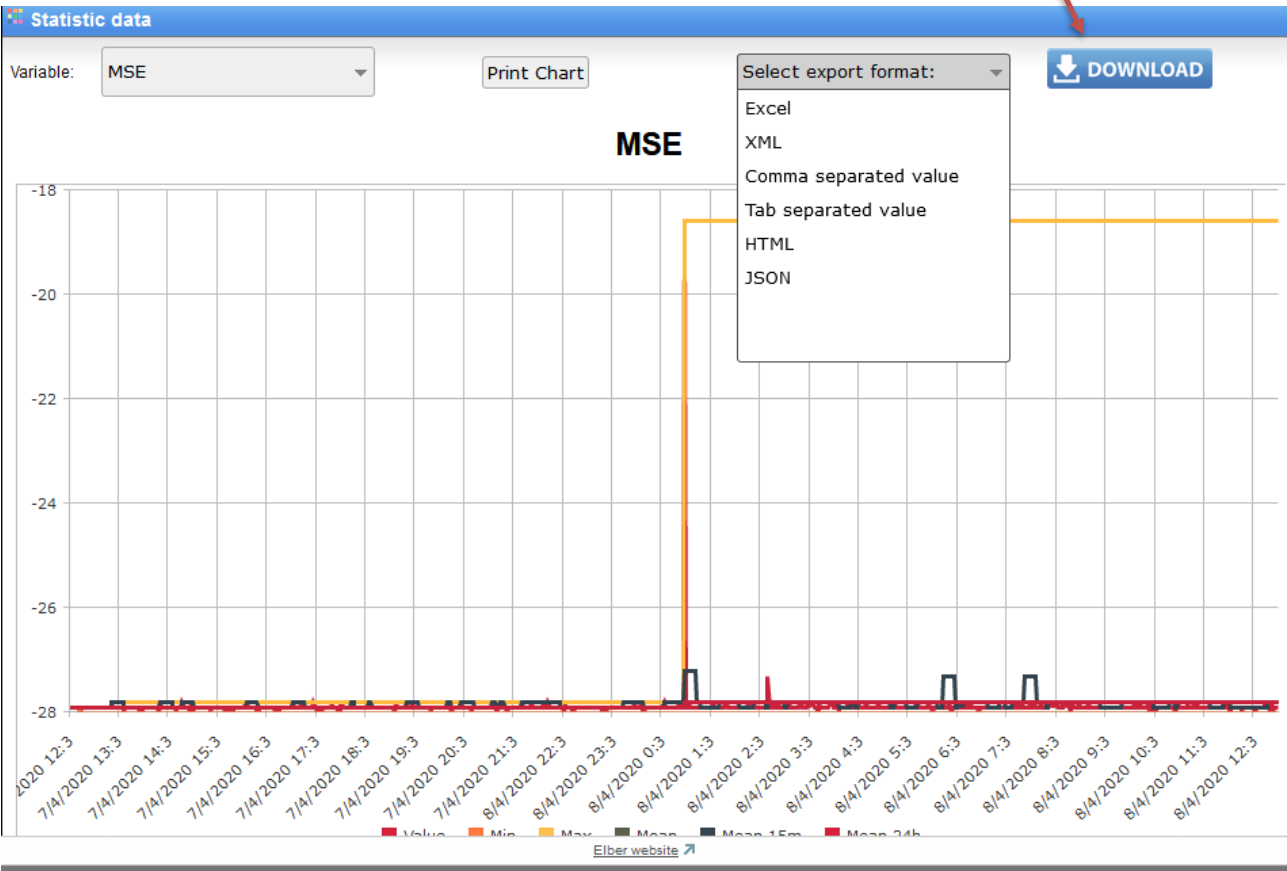


Figure 73: Web slot Statistic page – Graphs statistic export dropdown-list.

REBLE610-M Fully indoor Microwave Link

Date	MSE	Mean	Mean 15m	Mean 24h	Min	Max
2020-04-07 16:56:53	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:55:53	-28	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:54:52	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:53:52	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:51:52	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:50:52	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:49:51	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:47:51	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:46:51	-27.9	-27.9	-27.9	-27.9	-28	-27.8
2020-04-07 16:45:50	-27.9	-27.9	-27.9	-27.9	-28	-27.8

Go to page: Show rows: 1-10 of 146

Figure 74: Web slot Statistic page – Raw values table.

All statistics can be cancelled in the Tab Log

Mechanics.

14.1 Front Panel.



Figure 75 : REBLE610-M front panel.

Item	Name/Description	Function
1	610M-FAN	Cooling Fan for RF section and related panel.
2	610M-MODEM	Modem & I/O Interface panel; swappable.
3	610M-CTRL	Controller Card panel; hot swappable
4	OPT.610M/AC/100W - Secondary	Secondary AC supply module; hot-swappable
5	OPT.610M/AC/100W - Primary	Primary AC supply module; hot-swappable

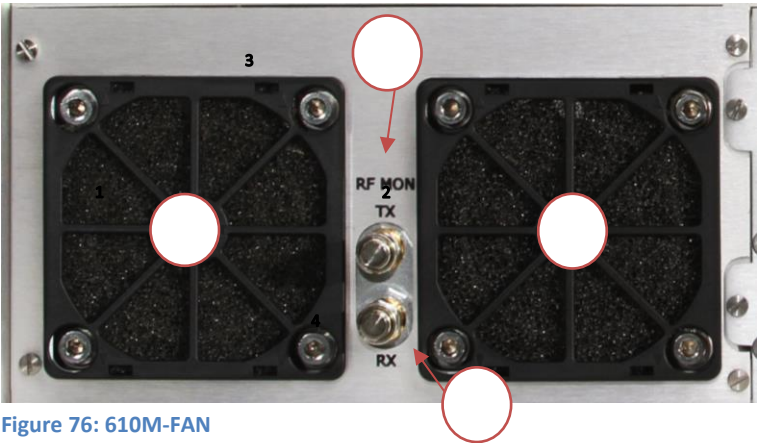


Figure 76: 610M-FAN

Remove 4 external screws to access to RF section for Transmitter or Receiver modules maintenance or fans replacement.

Item	Name	Function/Description
1	VENT-610M-FRONT	Cooling fan for Transmitter; unscrew the 4 fixing screws to remove the plastic cover to clean filter
2	VENT-610M-FRONT	Cooling fan for Receiver; unscrew the 4 fixing screws to remove the plastic cover to clean filter
3	RF MON TX	SMA(f) with cover; Transmitter module output monitor, before branching filter; coupling factor aro. -53dB±2 dB unless differently indicated in local labels
4	RF MON RX	SMA(f) with load; Receiver module input monitor, after branching filter and pre-amplification stage; coupling factor aro. -2dB±2 dB unless differently indicated in local labels

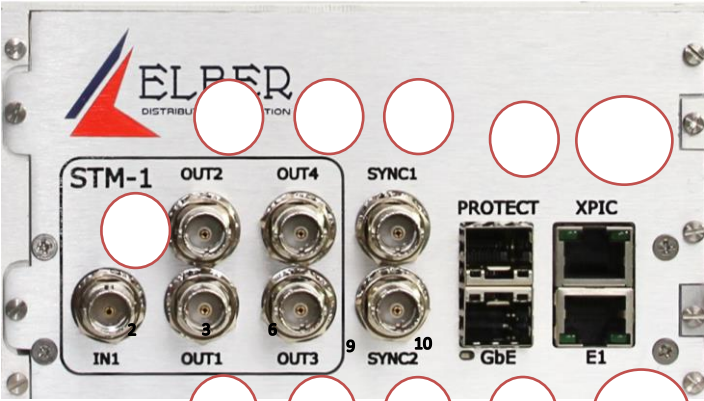


Figure 77: 610M-M

Item	Name	Function/Description
1	IN1	STM-1 Electrical input; BNC(f) 75 Ohm
2	OUT1	STM-1 Electrical output; BNC(f) 75 Ohm
3	OUT2	STM-1 Electrical output; BNC(f) 75 Ohm
4	OUT3	STM-1 Electrical output; BNC(f) 75 Ohm
5	OUT4	STM-1 Electrical output; BNC(f) 75 Ohm
6	SYNC1	Synchronization Signal input; BNC(f) 75 Ohm Signal can be 2.048 MHz, 10 MHz, 5 MHz, 19.44 MHz, 25 MHz selectable from Web Interface
7	SYNC2	Synchronization Signal output; BNC(f) 75 Ohm; see Web interface related section for details
8	GbE	Gigabit Ethernet Traffic port; SFP module needed
9	PROTECT	Protection Data Link for redundant configuration; SFP optical module needed
10	XPIC	XPIC (Cross Polarization Interference Cancellation) Data Link for co-polarized co-channel transmission/reception. RJ-45 connector 1000 BaseT
11	E1	2.048 Mbit/s PDH E1 line; RJ-45 connector 120 Ohm

7

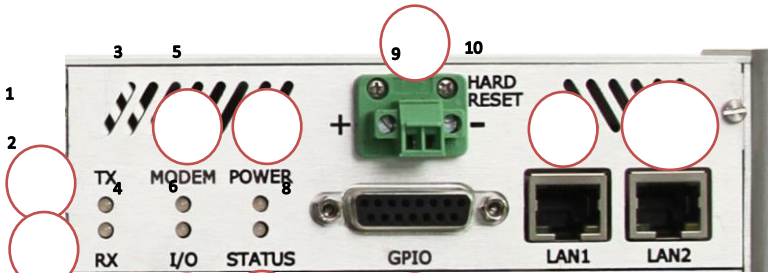


Figure 78

Item	Name	Function, Description						
1	Tx	Alarm led for Transmitter module (off if not present/not detected)						
2	Rx	Alarm led for Receiver module (off if not present/not detected)						
3	Modem	Alarm led for Modem card (off if not present/not detected)						
4	I/O	Alarm led for I/O card (off if not present/not detected)						
5	Power	Led for Power On indication / PSU alarms						
6	Status	General alarm led						
7	Hard reset	Two pins connector; +12V supplied at + - terminals makes equipment hardware reset						
8	GPIO	DB15(f) connector; pinout as follow: <table><tr><th>Pin</th><th>Function</th></tr><tr><td>1</td><td>Not used</td></tr><tr><td>2</td><td>Rx RS-232 Serial line for programming/debugging</td></tr></table>	Pin	Function	1	Not used	2	Rx RS-232 Serial line for programming/debugging
Pin	Function							
1	Not used							
2	Rx RS-232 Serial line for programming/debugging							

		<table><tr><td>3</td><td>Ground</td></tr><tr><td>4</td><td>Relay 2 dry contact Normally Open</td></tr><tr><td>5</td><td>Pin for ISP (In- System Programming)</td></tr><tr><td>6</td><td>+ 3.3 V</td></tr><tr><td>7</td><td>External input voltage 0-3.3V for eventual external measurements</td></tr><tr><td>8</td><td>RTS RS-232</td></tr><tr><td>9</td><td>Tx RS-232 Serial line for programming/debugging</td></tr><tr><td>10</td><td>Relays dry contact Common pin</td></tr><tr><td>11</td><td>Relay 1 dry contact Normally Open</td></tr><tr><td>12</td><td>Relay 3 dry contact Normally Open</td></tr><tr><td>13</td><td>Not used</td></tr><tr><td>14</td><td>Regulated output voltage 0-3.3V for eventual external measurements</td></tr><tr><td>15</td><td>CTS RS-232</td></tr></table> J2 CONNECTOR DB15 VIN_EXT UART_PROG 3.3V 3.3V RSA_RTS RSA_CTS VIN_EXT VOUT_EXT NA3 NA2 NA1 COM RSA_RXD RSA_TXD 8 15 7 14 6 13 5 12 4 11 3 10 2 9 1 P1 P2	3	Ground	4	Relay 2 dry contact Normally Open	5	Pin for ISP (In- System Programming)	6	+ 3.3 V	7	External input voltage 0-3.3V for eventual external measurements	8	RTS RS-232	9	Tx RS-232 Serial line for programming/debugging	10	Relays dry contact Common pin	11	Relay 1 dry contact Normally Open	12	Relay 3 dry contact Normally Open	13	Not used	14	Regulated output voltage 0-3.3V for eventual external measurements	15	CTS RS-232
3	Ground																											
4	Relay 2 dry contact Normally Open																											
5	Pin for ISP (In- System Programming)																											
6	+ 3.3 V																											
7	External input voltage 0-3.3V for eventual external measurements																											
8	RTS RS-232																											
9	Tx RS-232 Serial line for programming/debugging																											
10	Relays dry contact Common pin																											
11	Relay 1 dry contact Normally Open																											
12	Relay 3 dry contact Normally Open																											
13	Not used																											
14	Regulated output voltage 0-3.3V for eventual external measurements																											
15	CTS RS-232																											
9	LAN1	RJ45 connector for equipment LAN management; IP address to be set in Web interface. Default values: IP address 192.168.10.150 Subnet 255.255.255.0 Gateway 192.168.0.254																										
10	LAN2	RJ45 connector for equipment direct management; IP address is 192.168.168.168 Netmask 255.255.255.0																										

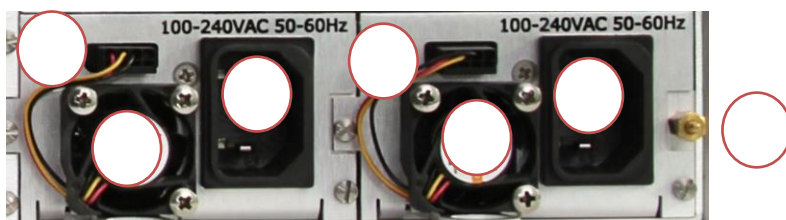


Figure 79: OPT.610M/AC/100W

Item	Function
1	2 pin socket PSU 2 Fan connector
2	PSU 2 cooling fan (Elber code VENT-610M-PSU)
3	IEC320 PSU 2 AC input
4	2 pin socket PSU 1 Fan connector
5	PSU 1 cooling fan (Elber code VENT-610M-PSU)
6	IEC320 PSU 1 AC input
7	Chassis Ground screw

14.2 Back Panel.

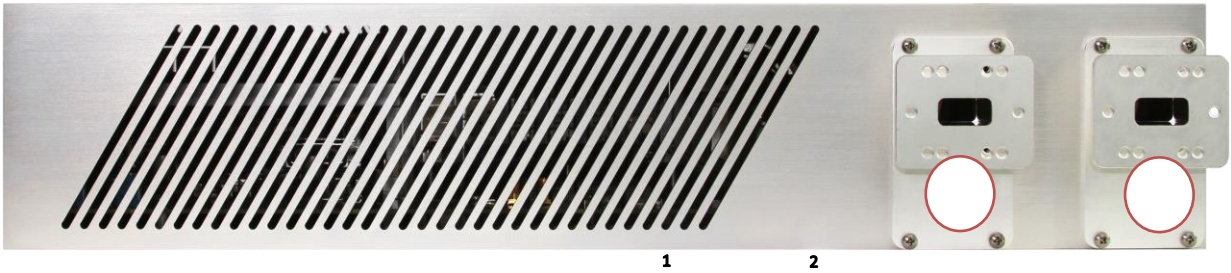


Figure 80: REBLE610-M/10 back panel.

Item	Function
1	Transmitter RF output (model REBLE610-M/10). UBR/UDR120
2	Receiver RF input (model REBLE610-M/10). UBR/UDR120