

User's handbook
Digital radio link

EK-MFR/1

EK-UNM/2 board

REGULATORY COMPLIANCE (USA)

This equipment requires licensing for operation under FCC Title 47 part 101

This equipment generates, uses and radiates electromagnetic fields that could cause interference to radio communications, is more important that it is installed and used in accordance with the instruction that are explained in this manual.

It is in conformity with the limits for a Class A computing device pursuant to Subpart B of Part 15 of the FCC Rules, that fixed and guarantee the reasonable protection against such interference when it is used in a commercial environment.

When this equipment is installed in a residential area it could cause interference, in which case the user must provide itself to avoid the interference.

The test results show compliance with the Class A limits for radiated emissions.

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is expressly forbidden by the law and can lead to serious civil and penal sanctions.



Warning!

The socket utilized for the unit supply must have the appropriate ground conductor.

The connection of the unit , to a socket without the ground conductor, will make the whole equipment dangerous for people safety.

About the repairing of the units please refer to specialized personnel only .

Inside the devices there are voltages which could be dangerous to people.
Before opening the cover switch off the unit, disconnect the connection and the supply cables.

In case of electrical shock please follow the instructions of first aid listed on page 4

Substitute the fuses interrupted with others of the same type and voltage.



The waste disposal of the devices must be executed in the respect of the enforced laws in the country uses.
Eurotek not assumed responsibility for waste disposal in contrast with enforced laws.

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Eurotek's products are not designed for use as critical components in life support devices or system without the express written approval of the Eurotek S.r.l. As used herein.

- *Life support devices or system are devices or system which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.*
- *A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.*

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First aid: artificial breathing(mouth to mouth)

1	<p>In case of electric shock you have to ensure the first aids to the patient, but to do this you have to consider two very important things:</p> <ul style="list-style-type: none">- interrupt immediately the electric circuit;- if the circuit has not been interrupted, do not touch the patient with bare hands; <p>After doing this, without delay contact the nearest mobile unit of first aid and practice to the patient, in case of loss of consciousness, the breathing mouth to mouth as described below.</p>	
2	<p>Put the patient lying on his back with the arms parallel to the body, ensure that he does not have the breathing tracts obstructed (chewing-gum, dental prosthesis, etc.), otherwise set him free from foreign bodies.</p> <p>Kneel near the patient's head and putting a hand under his neck, incline as possible his/her head backwards.</p>	
3	<p>Going on with keeping the patient's head inclined with one hand, use the other one to occlude the nostrils, if you are going to practise the breathing through the oral cavity, or occlude the mouth if you want to do it through the nasal cavity.</p> <p>While doing this begin the auto-oxygenation, with deep breathing.</p> <p>Then practice the artificial breathing blowing in the chosen cavity beginning with ten expirations each minute to go on them with twelve and fifteen.</p>	
4	<p>During the breathing procedure you have to control that the patient's chest dilates, otherwise change cavity where to blow the air because the previous one could be obstructed.</p>	
5	<p>Do not ever stop the artificial breathing until the patient has recovered or the first aid unit has come.</p>	

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1. GENERAL DESCRIPTION

The EK-UNM/2 board allows a without precedents versatility in the point to point connection. The “transmodem” allows the modulate and the demodulate process for single carrier signal and OFDM signal.

The more innovative feature is the possibilities to use different type of modulation also in transmission and in receiving process. It is possible, for example, to receive a DVB-S satellite and to transmit the same signal or an other signal with DVB-T mode.

The DVB-S configuration allows to transport E3 signal, transport stream (TS) signal with bit-rate till 145 Mbit/s using QPSK or QAM (16, 32, 64, 128, 256) constellations.

It is possible to set a lot of modulation parameters, for example, the symbol rate is selectable from 2.5 to 32 Msym/s with a step of 100 Kbit/s.

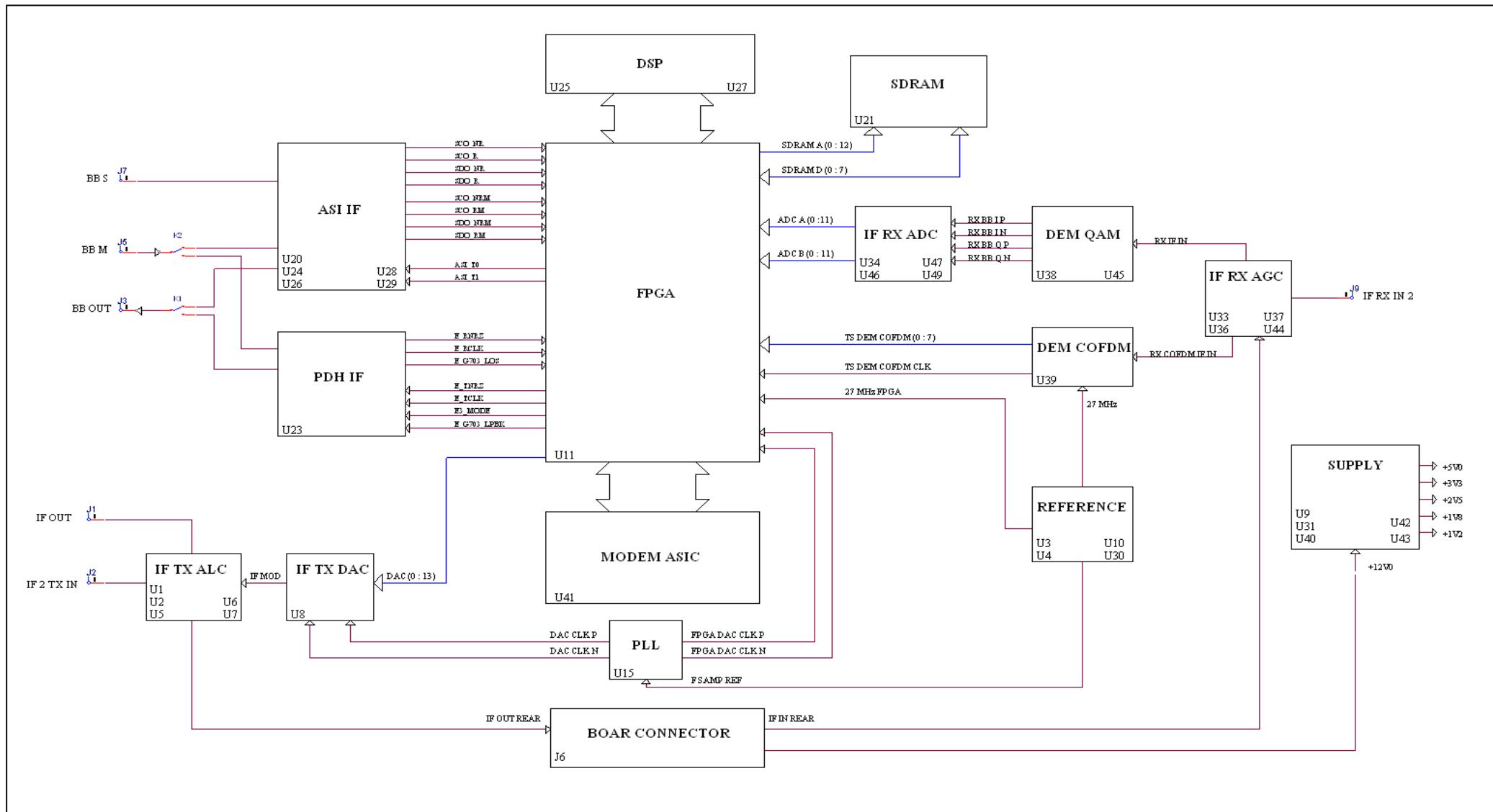
The EK-UNM/2 allows to manage an aggregate signal for the telecontrol and the telemetry in all operation modalities (SFN not included).

It is possible to obtain a signal commutation between the 70MHz IF signal internal generated, a carrier (Clean Carrier) and an external auxiliary signal (digital or analogue) that can be used in order to obtain an automatic switch over.

1.1 Technical features

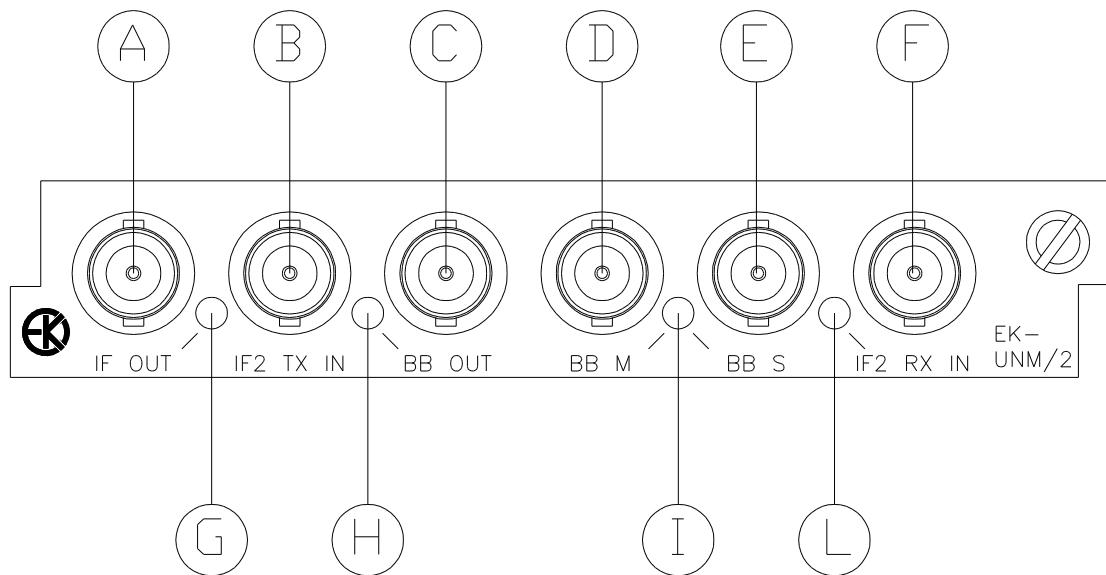
Common Specifications	
BB Input selection	ASIm, ASIs, E3, Internal, BaseBand Remote Loop Back
BB Output selection	Demodulator output, BaseBand Local Loop Back
Demodulator input selection	Internal, IF2, Local Loop Back
Modulator input selection	Modulator, External, Clean carrier (CW), Off
Readings	Input Bit rate, Output Bit rate, IF Tx Level, IF Rx Level, MER, RS error rate, Demodulator status, Fifo status, Frequency error, Configuration, Board Temperature
IF Frequency	70 MHz
Frequency Error	5 ppm
Reference	External (10 MHz / 1 pps), Internal, Data
Input Level	-25.0 / 5.0 [dBm]
Output Level	-20.0 / 0.0 [dBm]
DVB-S	
Reference	EN 300 421 EN 301 210
Constellation	QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Roll-Off	0.15, 0.20, 0.25, 0.30, 0.35
Viterbi rate	QPSK (1/2, 2/3, 3/4, 5/6, 7/8), 16QAM (3/4, 7/8), 32QAM (9/10), 64QAM (5/6, 11/12), 128QAM (6/7, 13/14), 256QAM (7/8)
Symbol rate	2.5 ÷ 31.5 Msym/s in 100Ksym/s steps
DVB-T	
Reference	EN 300 744
Constellation	QPSK, 16QAM, 64QAM
Viterbi rate	1/2, 2/3, 3/4, 5/6, 7/8
Guard interval	1/4, 1/8, 1/16, 1/32
Channel Bandwidth	6 MHz, 7MHz, 8 MHz
Carriers	2K, 4K, 8K

1.2 EK-UNM/2 block scheme



2 BOARD PANEL

2.1 Board panel representation



2.2 Board panel description

- A) IF frequency output connector (BNC)
- B) IF transmission frequency input connector (BNC)
- C) Data (ASI/E3) output connector (BNC)
- D) Data (ASI/E3) main input connector (BNC)
- E) Data (ASI) secondary input connector (BNC)
- F) IF receiver frequency input connector (BNC)
- G) Yellow led. (see LEDs and ALARMS section)
- H) Green led. (see LEDs and ALARMS section)
- I) Green led. (see LEDs and ALARMS section)
- L) Yellow led. (see LEDs and ALARMS section)

3 LEDs and ALARMS

The following table allows to obtain a complete view of the status of the leds and the alarms that can be occurred during working conditions. The letters in the led status colum indicates the led position in the board panel (*see board panel description*).

PORT SEL	VARIABLE	STATUS	ALARM	LED STATUS		
				On	Flash	Off
BB INPUT (DVBS, DVBT NOT HIERARCHICAL)	ASI M	<i>Input</i>	CD ASIM	*	I	*
	ASI M	<i>Input</i>	ERR ASIM	*	I	*
	ASI M	<i>Input</i>	OK	I	*	*
	ASI S	<i>Input</i>	CD ASIS	*	*	*
	ASI S	<i>Input</i>	ERR ASIS	*	I	*
	ASI S	<i>Input</i>	OK	I	*	*
	E3 (ONLY DVBS)	<i>Input</i>	LOS	*	I	*
	E3 (ONLY DVBS)	<i>Input</i>	OK	I	*	*
	INT	<i>Input</i>	LOS	I	I	*
	INT	<i>Input</i>	OK	I	*	*
	BBRL	<i>Input</i>	OK	I	*	*
BB INPUT (DVBT HIERARCHICAL)	ASI M	<i>Input</i>	CD ASIM	*	I	*
	ASI M	<i>Input</i>	ERR ASIM	*	I	*
	ASI M	<i>Input</i>	OK	I	*	*
	ASI S	<i>Input</i>	CD ASIS	*	I	*
	ASI S	<i>Input</i>	ERR ASIS	*	I	*
	ASI S	<i>Input</i>	OK	I	*	*
DEM IN	INT	<i>IF RX Level</i>	*	*	*	L
	IFLL	<i>IF RX Level</i>	*	*	*	L
	IF2	<i>IF RX Level</i>	Alarm	*	L	*
	IF2	<i>IF RX Level</i>	No Alarm	L	*	*
IF OUT	MOD	<i>IF TX Level</i>	*	*	*	G
	CW	<i>IF TX Level</i>	*	*	*	G
	OFF	<i>IF TX Level</i>	*	*	*	G
	IF2	<i>IF TX Level</i>	Alarm	*	G	*
	IF2	<i>IF TX Level</i>	No Alarm	G	*	*
*	*	Demod Lock	Locked	H	*	*
	*	Demod Lock	Unlocked	*	*	H

OK = no alarm.
 CD ASIM = not clock detected on the ASI M input signal.
 CD ASIS = not clock detected on the ASI S input signal.
 ERR ASIM = error in the TS (transport stream) present on the ASI M input.
 ERR ASIS = error in the TS (transport stream) present on the ASI S input.
 LOS = loss of signal.
 LOCKED = The demodulator is locked.
 UNLOCKED = The demodulator is unlocked.
 ALARM = The IF TX Level or the IF RX Level value do not respect the specified limit(*see menu description*)

4. BOARD MENU

4.1 Menu representation

The complete menu of the EK-UNM/2 board is reported below

<u>Variable name</u>	<u>Variable number</u>
<i>EK-UNM/2</i>	1
<i>>Status</i>	
<i>>>Out Bit Rate</i>	2
<i>>>Out Bit Rate LP</i>	3
<i>>>In Bit Rate</i>	4
<i>>>In Bit Rate LP</i>	5
<i>>>IF Tx Level</i>	6
<i>>>IF Rx Level</i>	7
<i>>>MER</i>	8
<i>>>RS Ber</i>	9
<i>>>Demod Lock</i>	10
<i>>>Input</i>	11
<i>>>Fifo</i>	12
<i>>>Freq Error</i>	13
<i>>>Configuration</i>	14
<i>>>Freq Ref</i>	15
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<i>>>Mode Rx</i>	18
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<i>>>Stuff PID</i>	21
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>Port Sel

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>Revision

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4.2 Menu description and keyboard guide

The content of every menu is described below. The values of every variable can be set using the modifying variable keys (EK-MFR/1 manual, *Board panel description*) and to confirm the change pressing the enter key.

>Status

>>Out Bit Rate

The value displayed in this field, indicates, the transport stream bit rate transmitted by the EK-UNM/2 board. The value is reported in Mbit/sec.

>>Out Bit Rate LP

The Out bit rate LP (low priority) can be read when the DVBT mode is enabled and the hierarchic variable is settled on alfa1 or alfa2 or alfa4 value. The value of this variable is reported in Mbit/sec. If the hierarchical variable is settled to the none value the Out Bit rate LP returns the “NA” value (not available).

>>In Bit Rate

The bit rate of the input transport stream received by the board is displayed on the EK-MFR/1 display when this variable is selected. The value is reported in Mbit/sec.

>>In Bit Rate LP

The In bit rate LP (low priority) can be read when the DVBT mode is enabled and the hierarchic variable is settled on alfa1 or alfa2 or alfa4 value. The value of this variable is reported in Mbit/sec. If the hierarchical variable is settled to the none value the In Bit rate LP returns the NA value (not available).

>>IF Tx Lev

The user can read the level of the IF signal transmitted with the relative unit of measurement. The value of this parameter can be included between a minimum of -20 dBm and a maximum of 0 dBm.

>>IF Rx Lev

The user can read the level of the IF signal received with the relative unit of measurement. The value of this parameter can be included between a minimum of -25 dBm and a maximum of 5 dBm.

>>MER

The MER (Modulation error ratio) indicates the mean squared error calculated on the received symbol.

>>RS Ber

It is possible to read the Ber value revealed by the Reed Solomon decoder, on the display. The measurement of this parameter compares the received bits with the wrong bits every 630 msec, if no errors are revealed the message LT (Lower Than) is showed before the number.

>>Demod lock

Demod lock menu gives information about the demodulator lock condition.
When the demodulator is unlocked an error occurs and on the EK-MFR/1 display it is possible to read the unlocked alarm active.
When the modem works in DVBS mode the unlocked alarms can be:

AGC: appears when the automatic gain control input is unlocked.
Timing: is revealed when the timing recovery is unlocked.
Viterbi: is active when the viterbi error correction is failed.
Sync byte: occur when the synchronism is not verified.
Unlocked: when the demodulator is unlocked but the unlocked status is not one of the above situations.
Locked: when the demodulator is locked.

When the modem works in DVBT mode the unlocked alarms can be:

AGC: appears when the automatic gain control input is unlocked.
Sym LOOP: is active when the symbol synchronism is not verified.
De-Interleave: an interleave alarm is detected.
Unlock: when the demodulator is unlocked but the unlocked status is not one of the above situations.
Locked: when the demodulator is locked.

>>Input

The input parameter is related with the input signal settled in the BB input menu.
When the CD Asim os CD ASIs is displayed, there is not an ASI signal present on the BB M or BB S input connector and a Carrier Detector error is active.
When the Err ASIm or Err ASIs is active, the ASI transport stream is present on the BB M or BB S connector but the Transport stream contains errors.

>>FIFO

This menu supplies the information about the status of the FIFO devices implemented on the FPGA.

When the DVBS mode is enabled the fifo alarms can be:

FULL: appears when the transport stream bit rate input of the board is highest than the EK-UNM/2 DVBS transport stream settled by the menu.
Agg: appear when a generic error is reveleated on the PPP link.
During the normal working condition the FIFO status variable displayed the OK value.

When the DVBT mode is selected the fifo alarms can be:

HP: appears when the transport stream bit rate input of the board is highest than the EK-UNM/2 DVBT transport stream (high priority) settled by the menu.
LP: appears when the transport stream bit rate input of the board is highest than the EK-UNM/2 DVBT transport stream (low priority) settled by the menu.
Agg: appear when a generic error is reveleated on the PPP link.

>>Freq Error

Indicates then error reported in kHz beetwen the 70 MHz IF received and the 70 MHz IF transmitted.

>>Configuration

Revealed if a configuration error occurs. For example, if the DVBT mode is active and the DVBT constellation is settled on the QPSK value, the hierarchic value must be settled on the “none” value.

>>Freq ref

When the Freq ref menu (see settings menu) is switched on the Ext 10MHz and an external frequency reference is not present, an alarm is in progress (see *Freq Ref Set parameter in Settings menu*).

>>Board Temp

When this menu is on, the user can read the board temperature.

>Settings

>>Mode TX

The Mode Tx variable allows to set the transmission modality for the EK-UNM/2 board. The user can set the DVBS or the DVBT modality.

>>Mode RX

The Mode Rx variable allows to set the receiver modality for the EK-UNM/2 board. The user can set the DVBS or the DVBT modality.

>>IF Tx Level Set

IF Tx Level Set menu gives the possibility to set the transmit IF frequency level. The range values for this variable are included between a minimum of -15dBm and a maximum of 3 dBm.

>>Restamp

To enable the PCR restamping of the board, the user must set the Yes variable, while to disable the parameter the user must set the No variable.

>>Packet Filter

The packet Filter menu allows to filter the stuffing data bytes that are present on the output modulator. The user can set the variable “on” to filter the bytes with the stuffing pid selected by the stuff PID menu, or set the variable “off” so that the stuffing bytes are not filtered.

>>Stuff PID

It is possible to insert the Stuffing PID (decimal format). The user can choose the value of the stuffing PID between a minimum of 32 and a maximum of 8191.

>>Scrambler Key

The scrambler key is a scrambler / de-scrambler operation implemented on the board. When the scrambler key is settled to the zero value the scrambler is disabled.

The scrambler is active when a value is settled between 1 and 65535. The value settled must be the same for the transmission process and for the receiver process. It is not possible to have a scrambler operation in the transmission process and do not have a descrambler operation in the receiver process.

>>Freq Ref Set

This variable allows to set a reference frequency for the board. The reference can be an external 10 MHz frequency (present on the BNC connector located on the EK-MFR/1 front panel) or the 10 MHz frequency internally generated.

>>DVBS Params

When the DVBS modality is selected the following variable can be settled by the user:

>>>Symbol rate

The user can set the symbol rate of the board in the DVBS modality

It is possible to read the actual value of the variable with the relative unit of measurement, on the display, when the menu is selected.

>>>Const

Gives the possibilities to set the DVBS constellation. The available constellation are:

QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM.

For every constellation value is associated a viterbi rate value, so it possible to obtain the following constellation value:

- 4Q1/2 (QPSK Viterbi rate 1/2)
- 4Q2/3 (QPSK Viterbi rate 2/3)
- 4Q3/4 (QPSK Viterbi rate 3/4)
- 4Q5/6 (QPSK Viterbi rate 5/6)
- 4Q2/3 (QPSK Viterbi rate 7/8)
- 16Q3/4 (16QAM Viterbi rate 3/4)
- 16Q7/8 (16QAM Viterbi rate 7/8)
- 32Q9/10 (32QAM Viterbi rate 9/10)
- 64Q5/6 (64QAM Viterbi rate 5/6)
- 64Q11/12 (64QAM Viterbi rate 11/12)
- 128Q6/7 (128QAM Viterbi rate 6/7)
- 128Q13/14 (128QAM Viterbi rate 13/14)
- 2556Q7/8 (256QAM Viterbi rate 7/8)

>>>Roll-off

The roll-off parameter can be settled between five different value: 0.15, 0.20, 0.25, 0.30 and 0.35.

>>DVBT params

When the DVBT modality is selected the following variable can be settled by the user:

>>>Hierarchic

This variable menu is settled to the none value by default.

>>>*Const DVBT*

It is possible to choose the value for the DVBT constellation between three different value: QPSK, 16 QAM and 64 QAM.

>>>*Carriers*

This menu allows to configurate the numbers of the carrier for the DVBT constellation. It is possible to set 2K, 4K or 8K carriers from the board menu.

>>>*HP Viterbi BER*

Allows to set the high priority Viterbi BER. There are five available configurations: 1/2, 2/3, 3/4, 5/6, 7/8.

>>>*LP Viterbi BER*

Allows to set the low priority Viterbi BER. There are five available configurations: 1/2, 2/3, 3/4, 5/6, 7/8.

>>>*Interleaver*

There are two type of Interleaver, native and in-depth.

>>>*Guard interval*

The Guard interval variable allows to set four different values that are following grouped:
1/4, 1/8, 1/16, 1/32.

>>>*Ch Bw*

This variable indicate the spectrum bandwidth. It is possible to customize the bandwidth to select three different values: 6MHz, 7MHz and 8MHz.

>*Port Sel*

>>*BB Input*

BB Input is a software switch implemented on the Port sel menu that allows to send on the modulator section one of these signal:
ASIm, ASIs, E3, int, BBRL.

- ASIm is the ASI transport stream present on the BB M board connector. (*see board panel description*).
- ASIs is the secondary ASI transport stream present on the BB S board connector. (*see board panel description*).
- E3 is the G703 transport stream present on the BB M board connector (*see board panel description*).
- Int is the internal transport stream from the EK-MFR/1 interconnection matrix lines unit. Thank to the matrix connections lines system, implemented on the EK-MFR/1 unit, it is possible to send on the BB input a transport stream of another board inserted on the same EK-MFR/1.
- BBRL is the base band remote loopback transport stream. The output demodulator signal is directly send to the modulator input.

>>BB Output

BB output is the signal present on the BB out board connector (*see board panel description*).

On the BB output connector it is possible to send the ASI out transport stream or the E3 output transport stream of the board when the Dem option is selected.

If the BBLL is active, the signal present on the BB M connector is send on the BB OUT connector (Base Band Local Loopback).

>>Dem In

This menu allows to send one of these signals on the Demodulator input.

Int is the signal from the EK-MFR/1 unit. Thank to the matrix connections lines system, implemented on the EK-MFR/1 unit, it is possible to send on the demodulator input a transport stream of another board inserted on the same EK-MFR/1; so this signal is demodulated by the EK-UNM/2 board.

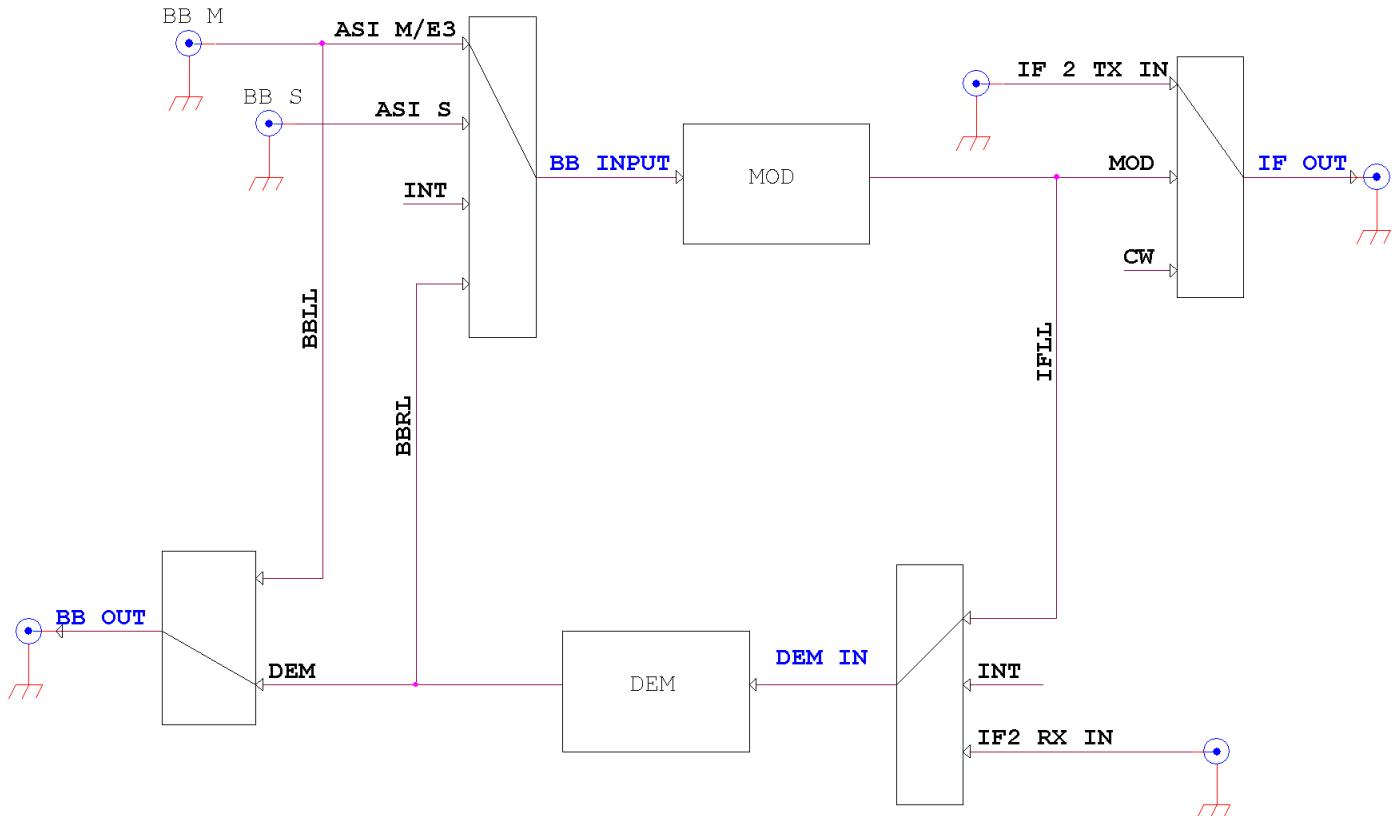
IF2 variable, when it is on, allows to demodulated the signal present on the IF2 RX IN board connector (*see board panel description*).

IFLL (IF Local Loopback) allows to send on the demodulator input the modulator output signal directly.

>>IF Out

The IF Out is the signal present on the IF OUT board connector (*see board panel description*). By the port sel menu it is possible to send on this connector the 70 MHz IF modulator output signal (Mod), the IF signal present on the IF2 TX IN board connector (IF2), a fixed IF 70 MHz signal (CW) . When the off variable is settled, the IF OUT port is disabled.

The figure below shows the Port sel menu signals path



PORT NAME

SIGNAL NAME

BB INPUT	<=	ASI M, ASI S, E3, INT, BBRL
IF OUT	<=	IF2 TX IN, MOD, CW
DEM IN	<=	IFLL, INT, IF2 RX IN
BB OUT	<=	BBLL, DEM

>*Revision*

>>*DSP*

It is possible to see the DSP software release on the EK-MFR/1 display.

>>*FPGA*

It is possible to see the FPGA software release on the EK-MFR/1 display.

>>*CPLD*

It is possible to see the CPLD software release on the EK-MFR/1 display.

>>*RamDisk*

It is possible to see the RamDisk software release on the EK-MFR/1 display.

The example below explains how to set the DVBS constellation of the board on the 256Q7/8 value. The procedure to set the DVBS constellation parameter is similar to set the other RW variable of the board.

The EK-UNM/2 board is loaded in the slot number four of the EK-MFR/1, so when the EK-MFR/1 is active on the display it is possible to see:

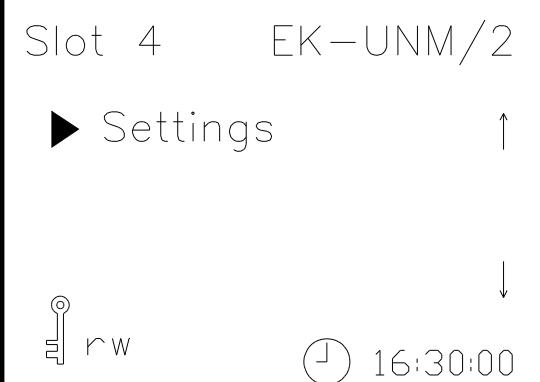
Eurotek EK-UNM/2
Main Menu ↑
Slot 4 EK-UNM/2
↓
RW 16:30:00

Pushing the “enter” key (EK-MFR/1 manual, *board panel description*), the user can enter on the EK-UNM/2 menu (*par 3.1*). The display shows the first menu of the board (*Status*)

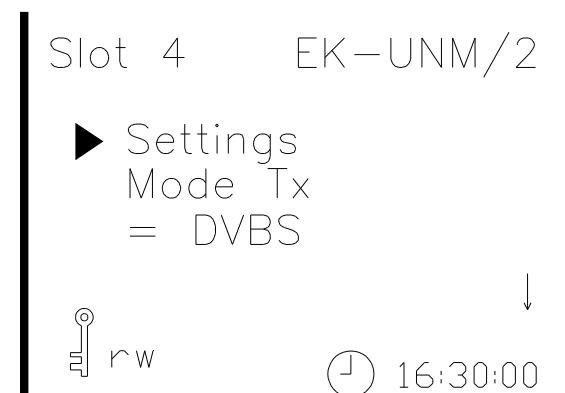
Slot 4 EK-UNM/2
► Status
↓
RW 16:30:00

Using the explore menu keys, it is possible to see every of the four main menu of the board, Status, Settings, Port Sel and Revision.

The DVBS constellation variable is located in the Setting menu, so the user must go on this menu.



The Setting menu is showed on the EK-MFR/1 display, so pushing the enter key it is possible to enter in every sub menu of the Setting main menu. The first sub-menu is Mode Tx (*par 3.1*) as the next figure shows.



With the explore menu keys, it is possible to see every sub-menu stored in the Setting menu, so the user can see the DVBS parameter.

Slot 4 EK-UNM/2

► DVBS Params ↑

↓

⊕ r w 16:30:00

The DVBS parameters sub-menu is composed by the Symbol rate, Constellation DVBS and Roll-Off variable. Pressing the enter key it is possible to view these variable. (the first is Symbol rate).

Slot 4 EK-UNM/2

► DVBS Params

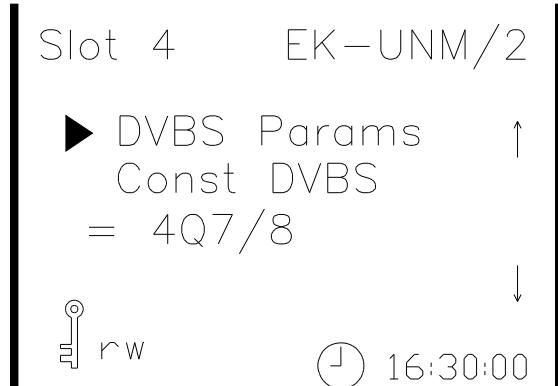
Symbol rate

= 10.3 MSym/s

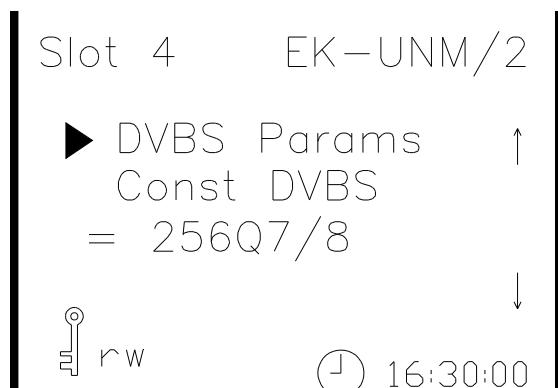
↓

⊕ r w 16:30:00

Using the explore menu keys it is possible to shows the DVBS params variable, the default value for this parameter is 4Q7/8 (QPSK constellation with a Viterbi rate of 7/8).



To change the default value displayed it is necessary pushing the enter key. The variable *vaklu* flashing and using the modify variable keys it is possible to set the parameter on the 256Q7/8. When the value is displayed, pressing the enter key it is possible to confirm the change (as the next figure shows). If the Esc key is pressed the display return the previous value.



5. WEB PAGE

The EK-UNM/1 board is supplied of a web page that allows to obtain a complete view of the status of the board variables. When the EK-MFR/1 system is connected to a terminal unit (PC) and the web pages of the system are loaded (*EK-MFR/1 user 's handbook, web interface chapter*), the user can see the following EK-MFR/1 main web page:

 **Eurotek** *All4Digit Software Tool* v1.1

EK-MFR/1

Password Power Loop Get Config Save Config Miscellaneous Relay Clock Set Network

Password Read Only

Password Read/Write

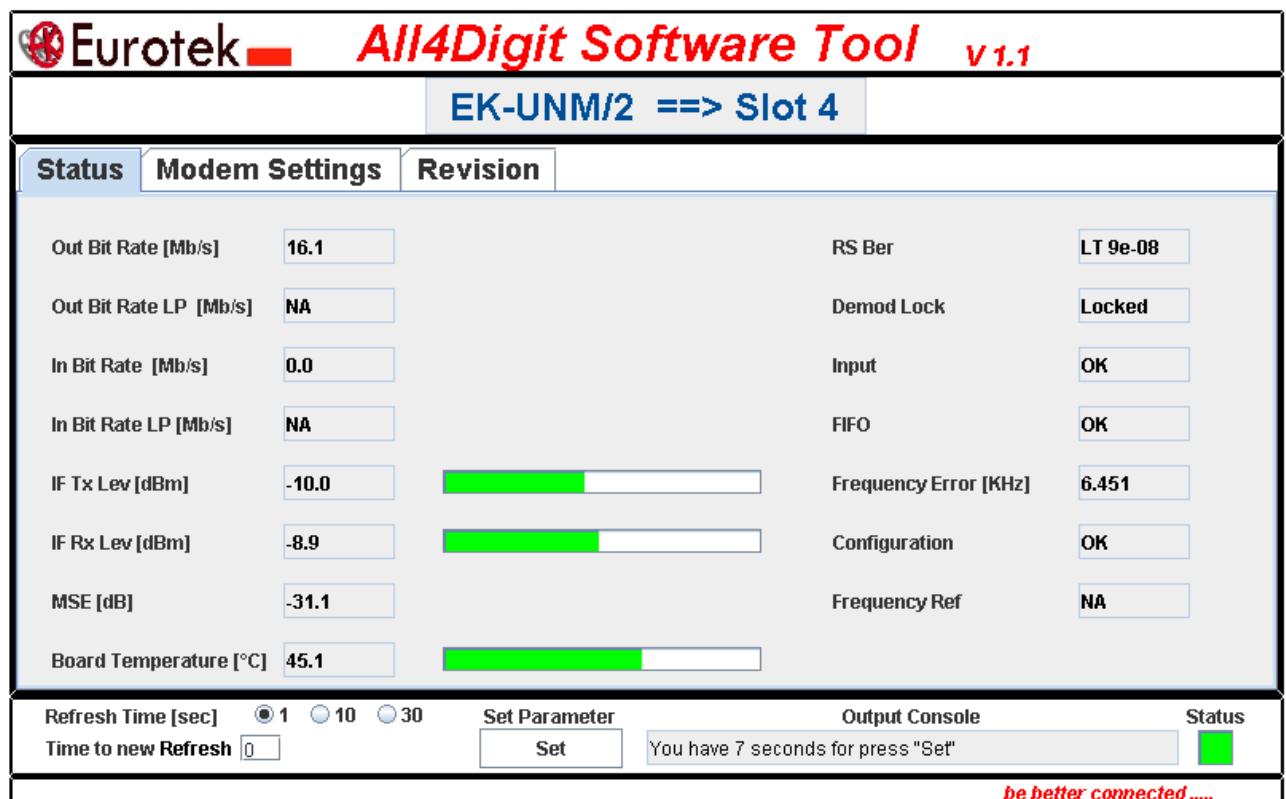
Refresh Time [sec] 1 10 30 Set Parameter Output Console Status

Time to new Refresh No Alarm

be better connected.....



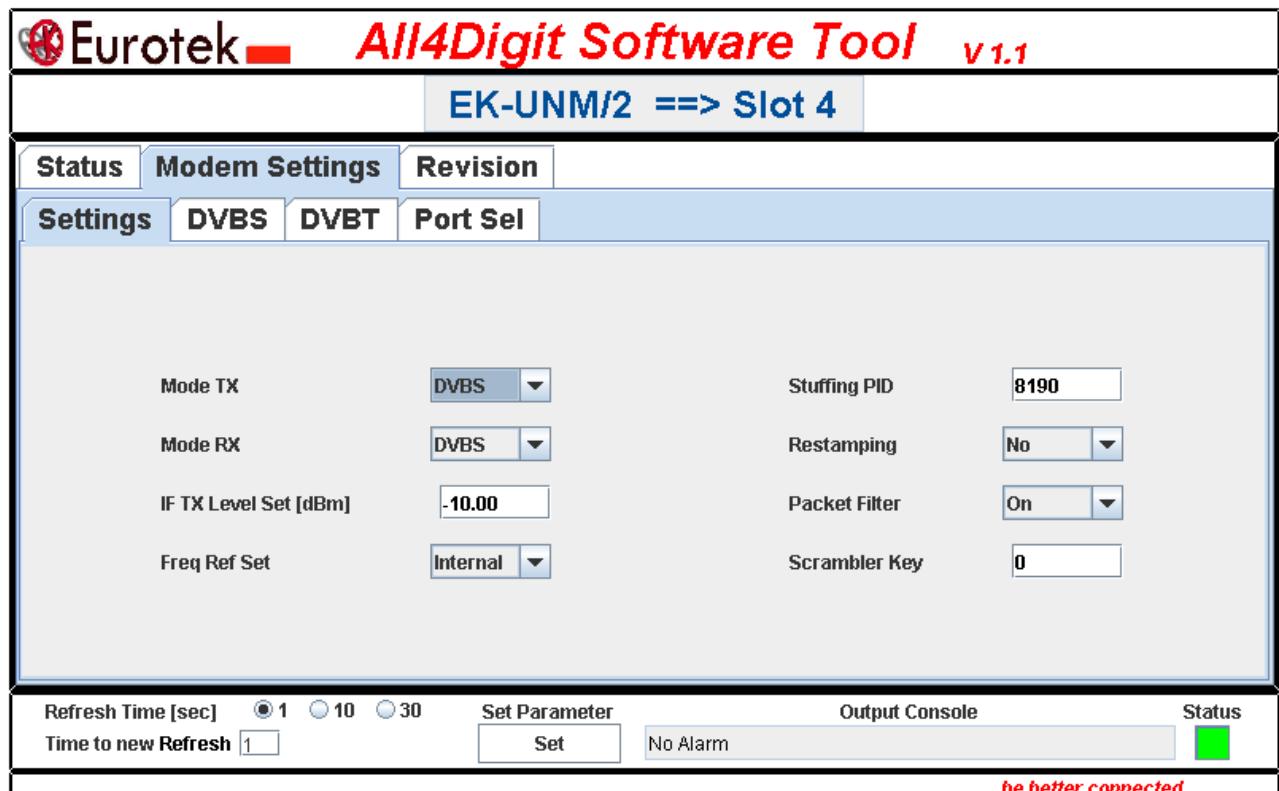
The EK-UNM/2 board is loaded in the slot number four; to visualize the web page of the board is necessary to move, using a mouse, the cursor on the slot associated to the board (slot 4) and then to click the left mouse button on its. So we obtain the following image:



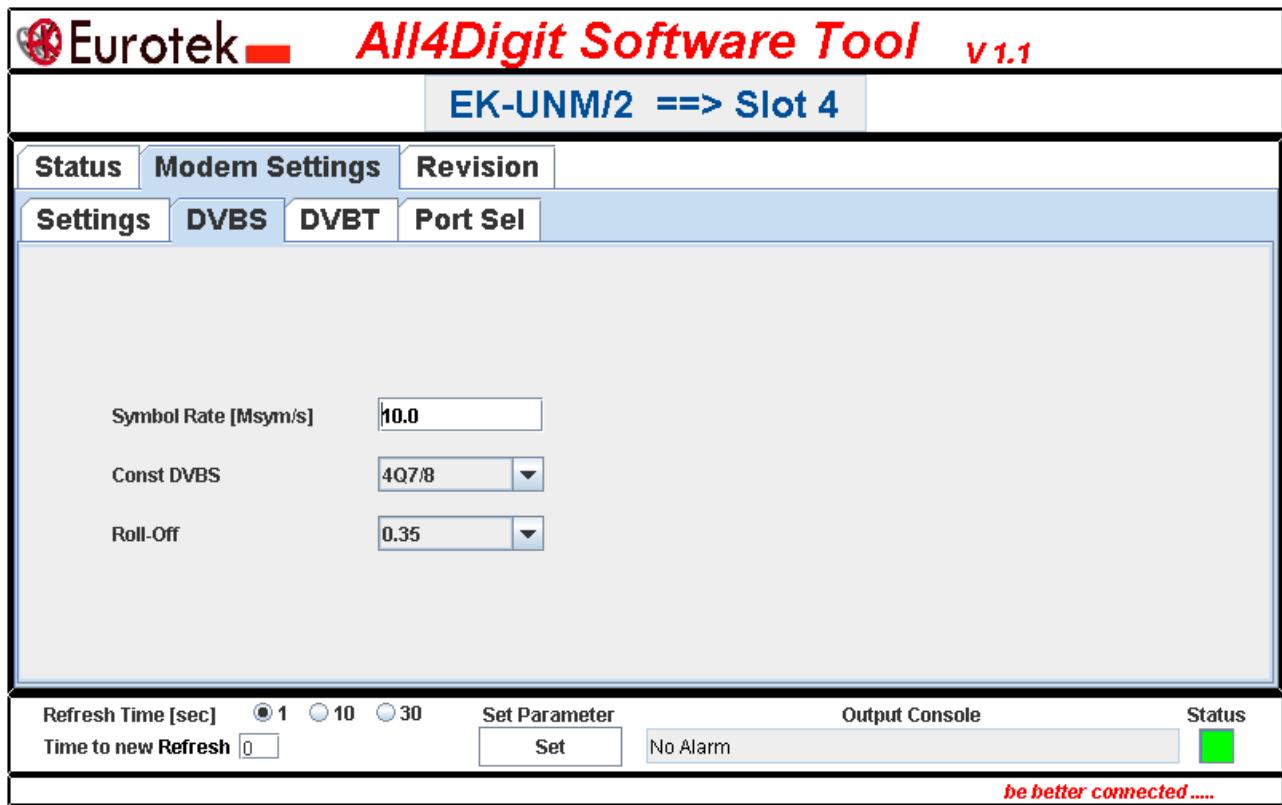
The web page of the EK-UNM/2 board is showed above. In the top section, are reported the version of the software tool (v 1.1) and the name of the board with the associated slot number (EK-UNM/2 = => slot 4). Under the name, of the board, are indicated every menu in dark colour, while the selected menu is in light colour and its variables are displayed on the centre of the page. The down side of the page is featured by the following parameter: the *refresh time* variable allows to set the useful time to confirm the setting of a menu variable. The *time to new refresh* windows gives information about the countdown of the refresh time. The *Set parameter* box allows to confirm the setting of a menu variable. The *output console* line with the *status* square are used to obtain a view of the alarm conditions of the entire system. During the normal working conditions, the output console line returns the No Alarm value; if an alarm is in progress, the following message appears: <<Alarm Active. "n" variables in alarm>>, where n is the number of the variables in alarm. When a menu variable is affected by an alarm, the value of the variable, in the related window, is showed in red colour and also the name of the board became red.

The next example shows how to set a variable value of the board. The procedure to set every variable value is similar to this.

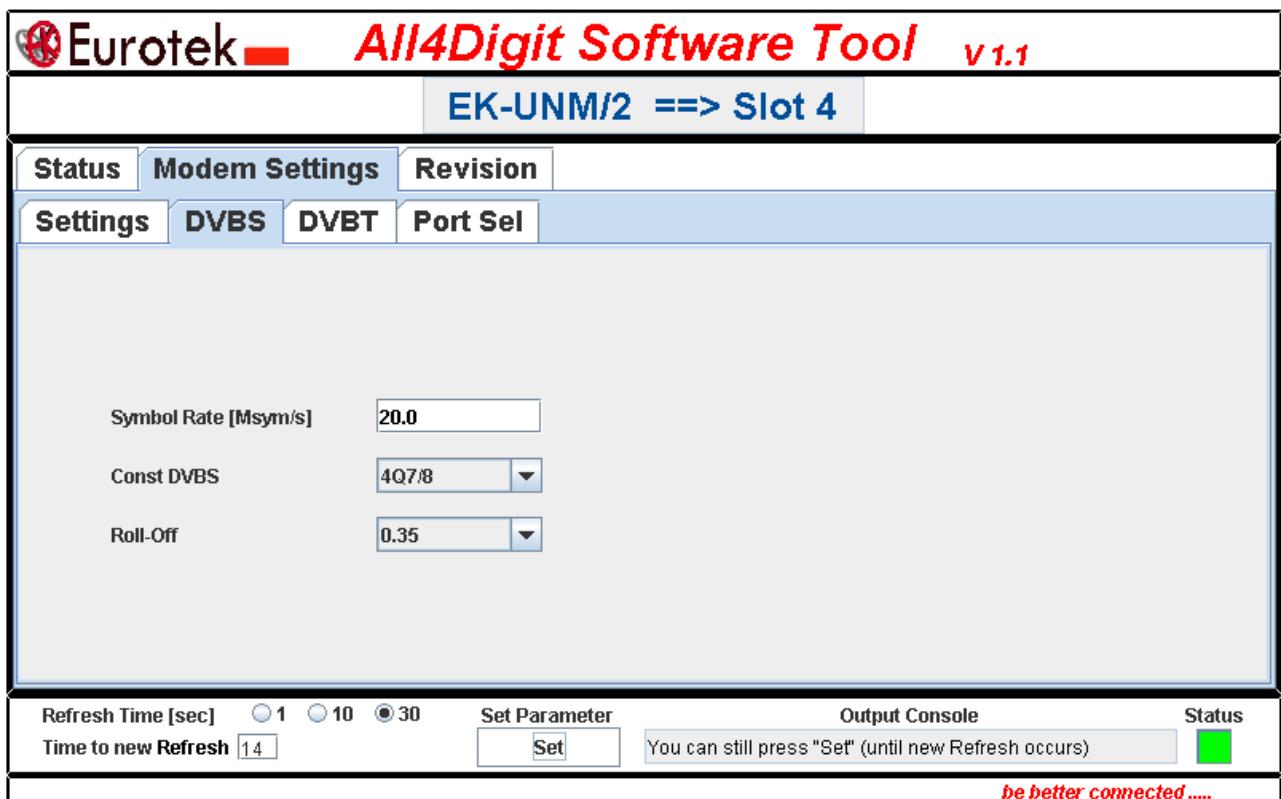
We suppose to change the DVBS symbol rate variable. This parameter is located in the Modem Setting menu under the DVBS parameter. So, the first step to change the DVBS symbol rate is to enter on the Modem settings menu. To do this it is necessary to push the left mouse key on the Modem setting windows, the following page is displayed:



Now it is necessary to enter in the DVBS menu to set the desired symbol rate. Pushing again the left mouse button on the DVBS windows to view:



To change the symbol rate menu, pushing the left mouse key on the symbol rate dialog box, a cursor flashing, now by the keyboard it is possible to insert the new numeric symbol rate value (the value must be included between 2.5 Msym/sec and 32.0 Msym/sec), for example 20.0 Msym/sec. The new value inserted is displayed:



We have settled, for example, the refresh time parameter on the 30 seconds indicator, so every thirty seconds the system variables are refreshed. When the refresh countdown is complete the refresh label is flashing. When a new value is loaded in the variable window (in the example DVBS Symbol rate = 20.0 Msym/sec) the user has then seconds for to confirm the value pushing, using the left mouse button, the Set box (a message is showed on the output console line). At the end of the then seconds, if the refresh time is not finished, it is again possible pushing the set box (you can still press set (until new refresh occurs) is showed on the output console line); if also the refresh time is at the end, the system reloaded the previous variable value.

When the settings operations are complete, the new loaded value is visible on the EK-MFR/1 display.

APPENDIX A

HIGH_SPEED_DATA table

Matrix Ref	PIN	DESCRIPTION	DIRECTION
D0	HIGH_SPEED_DATA_0	Clock	out
D1	HIGH_SPEED_DATA_1	Not Used	-
D2	HIGH_SPEED_DATA_2	Data	out
D3	HIGH_SPEED_DATA_3	Not Used	-
D4	HIGH_SPEED_DATA_4	Clock	in
D5	HIGH_SPEED_DATA_5	Not used	-
D6	HIGH_SPEED_DATA_6	Data	in
D7	HIGH_SPEED_DATA_7	Not used	-
CK	HIGH_SPEED_CLK	Not used	-
RF	10 MHZ_REF	Clock 10 MHz	in

The table reported above shows the description of the high_speed_data signals of the board. The high_speed_data connections are implemented in the matrix file loaded in the EK-MFR/1 unit. So the board is interfaced with the EK-MFR/1 (*EK-MFR/1 user's handbook, appendix A*) and thanks to the matrix file, it is possible to obtain a complete routing of the electrical high_speed signals. So with the EK-MFR/1 matrix configuration it is possible to obtain the transit of a signal from a board to another one.

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