1. Product description

The devices are transmodulators with 8 DVB-S/S2 input channels and 8 DVB-T (tdx481), 4 DVB-T (tdx441), 8 DVB-C (tdq481), 4 DVB-C (tdq441) output channels. The devices are designed for digital transmodulation with Transport Stream Processing of TV or Radio programs issued from FTA (Free to air) or encrypted digital reception. Devices filter services, modify SI (Service Information), generate NIT (Network Information table), LCN (Local Channel Number), can remultiplex services from any input to any output. All of the configurations can be changed by using the Web Interface.

tdx441 – quad transmodulator - with eight DVB-S/S2 input channels and four DVB-T output channels.

tdx481 – octal transmodulator - with eight DVB-S/S2 input channels and eight DVB-T output channels.

tdq441 – quad transmodulator - with eight DVB-S/S2 input channels and four DVB-C output channels.

tdq481 – octal transmodulator - with eight DVB-S/S2 input channels and eight DVB-C output channels.

Transmodulators can be used as stand alone devices.

The product is intended for indoor usage only.

2. Safety instructions

Installation of the transmodulator must be done according IEC60728-11 and national safety standards.

Any repairs must be made by skilled personnel.

Avoid placing the transmodulator next to heat sources such as central heating components or in areas of high humidity.

Keep the transmodulator away from naked flames.

If the transmodulator has been kept in cold conditions for a long time, bringing it into a warm environment may cause condensation, so allow it to warm up for no less than 2 hours before plugging into the mains.

Ventilation should not be impeded by covering the transmodulator, such as newspapers, table-cloths, curtains etc.

Mount the transmodulator in a vertical position only. If installing in a 19” rack system additional forced air cooling fans may be required (see table "Technical specifications" - operating temperature range).

Always allow 10 cm of free space from the top, front and bottom of the unit to enable any heat to be dissipated.

This product complies with the relevant clauses of the European Directive 2002/96/EC. The unit must be recycled or discarded according to applicable local and national regulations.

Equipment intended for indoor usage only.

This product is in accordance to following norms of EU: EMC norm EN50083-2, safety norm EN IEC62368-1, RoHS norm EN50581.

This product is in accordance with Custom Union Technical Regulations: “Electromagnetic compatibility of technical equipment“ CU TR 020/2011, “On safety of low-voltage equipment“ CU TR 004/2011.

This product is in accordance with safety standard AS/NZS 60065 and EMC standards of Australia.

Manual in .pdf

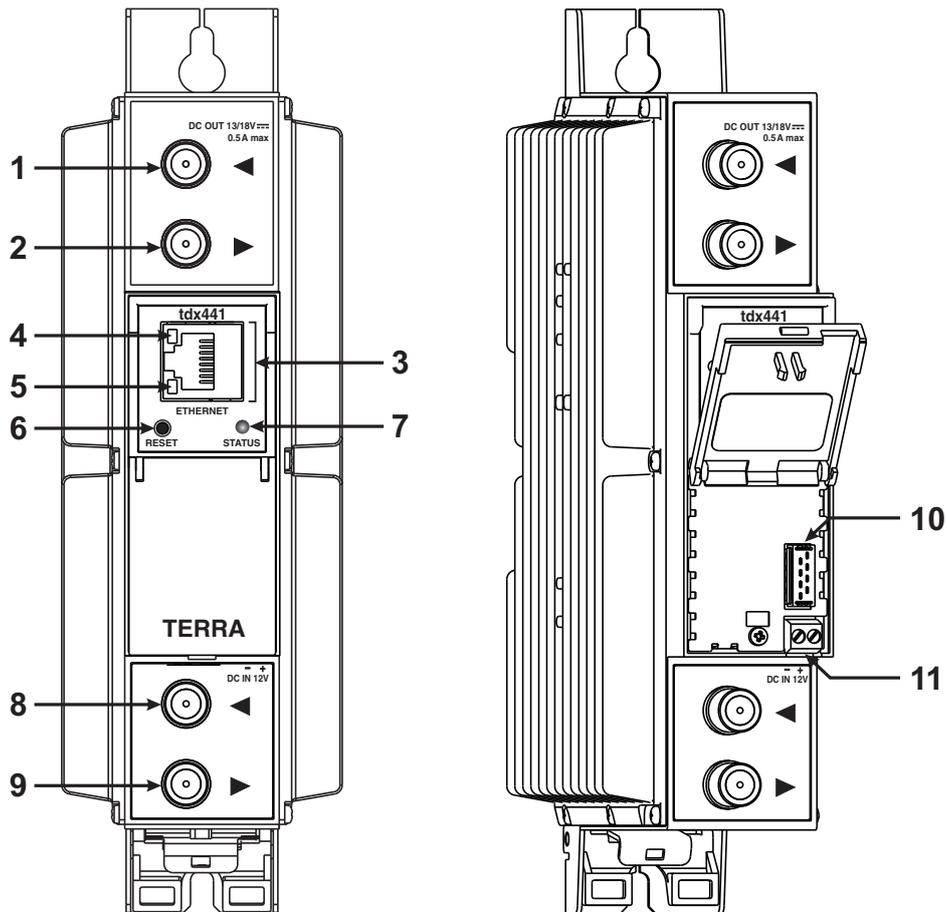**Vers. 1.02**

3. External view

Figure 1. External view of the transmodulator

1 - ◄ - RF input of SAT IF signal, DC output for LNB. F socket.

2 - ► - RF output (input signal loop-through). F socket.

3 - **ETHERNET** - control Ethernet interface. RJ45 socket.

4 - ACTIVITY (yellow) indicator of the control Ethernet interface.

5 - LINK (green) indicator of the control Ethernet interface.

6 - **RESET** - reset and default IP button.
Press button for more than three seconds to set default IP address of the control Ethernet interface. Ethernet led indicators "activity" [4] and "link" [5] will start to toggle to inform, that the reset IP address request has been accepted. Device will be restarted with default IP address.
To restore all parameters to default values (including password), keep pressing the button for additional 4 seconds. The green (link) indicator will start blinking after that time indicating, that a "restore defaults" command has been accepted. Now the button can be released. Yellow (activity) indicator will light on while resetting parameters. After that device will restart with all default values.

7 - **STATUS** - device status LED indicator.
Green light indicates that module operates normally.
Red light indicates device errors and user attention is needed.

8 - ◄ - RF input (output signal loop-through). F socket.

9 - ►- RF output. F socket.

10 - Power distribution bus connector.

11 - +12 V DC powering input. Screw terminal.

4. Installation instructions

Read the safety instruction first.

All settings can be changed using the web browser via control Ethernet interface.

Disconnect power supply unit from the mains before making any changes in the connections of the module. Fasten the module on DIN RAIL or individual holder.

Connect all necessary RF, powering and control cables. Shielded Ethernet cable is recommended.

Connect the 75 Ω load to the unused RF output F sockets.

Connect power supply in to the mains.

Within 30-40 seconds of powering the module will run in normal operation mode.

Comments of the front panel indicators:

the LINK [5] green indicator is on when the link with the control Ethernet interface is established. Indicator is off when there is no link.

the ACTIVITY [4] indicator blinks, if communication via the control Ethernet interface is active.

5. MOUNTING

■ The module or mounting bracket must be fixed with steel screws Ø 3.5-4 mm. The screws are not included in a package.
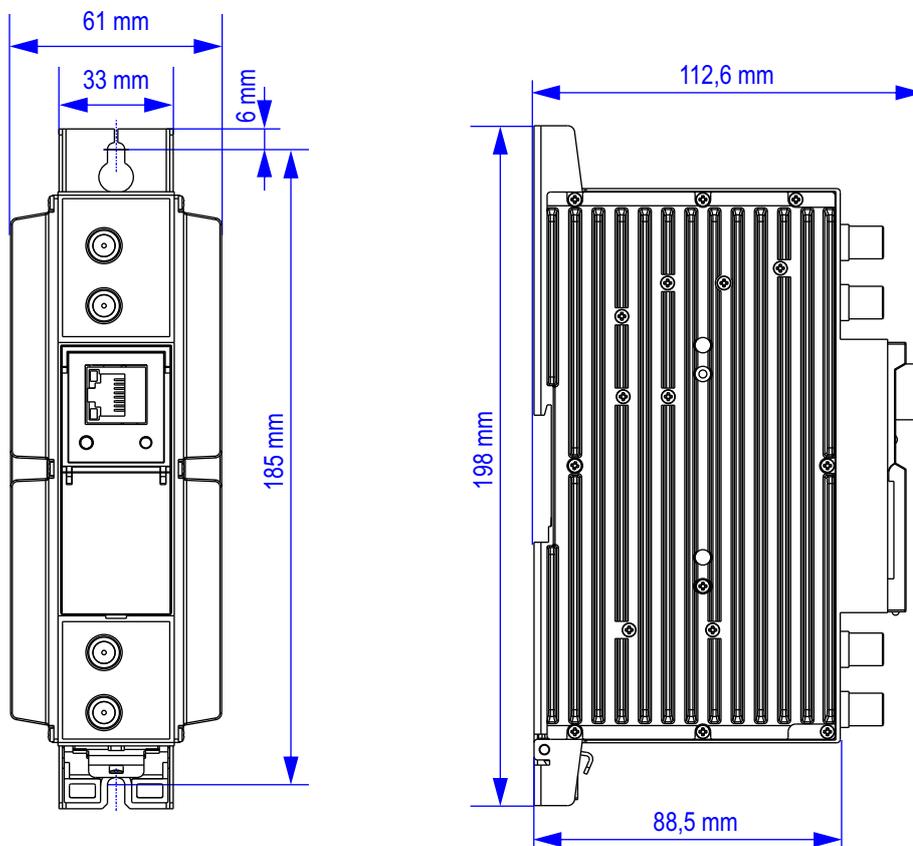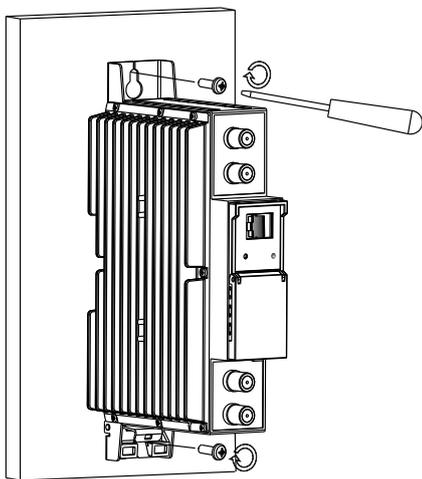
■ Free space of installed amplifiers must be at least 10 cm.
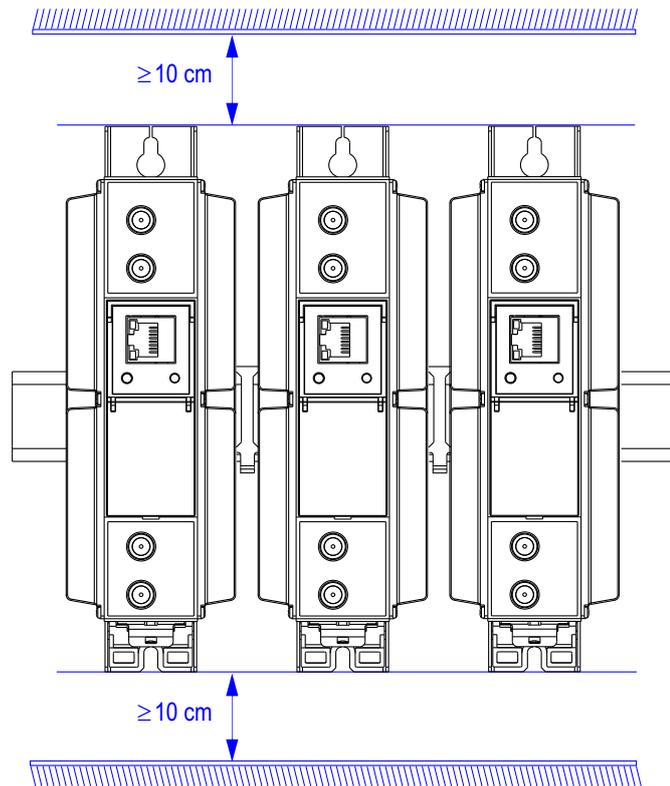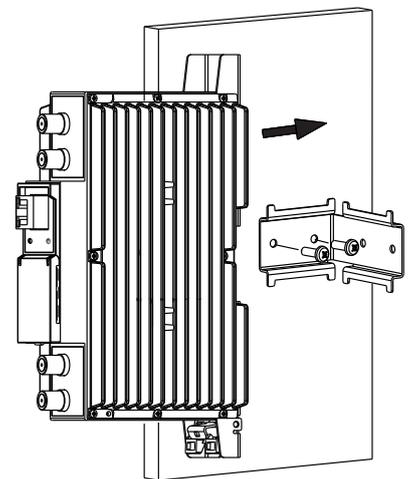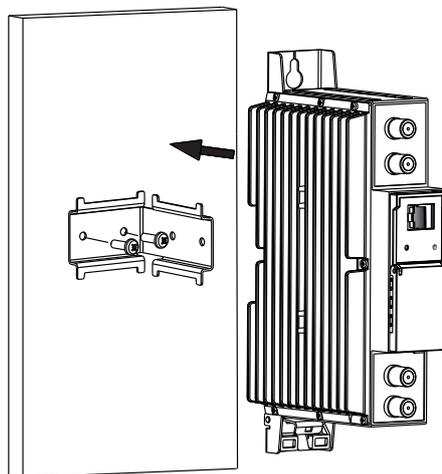

■ Mounting bracket on DIN rail should be connected to main potential equalization bus.

Mounting on a wall by screws   **Mounting on a bracket (ordering number 01960)**

Perpendicular to the wall   Parallel to the wall

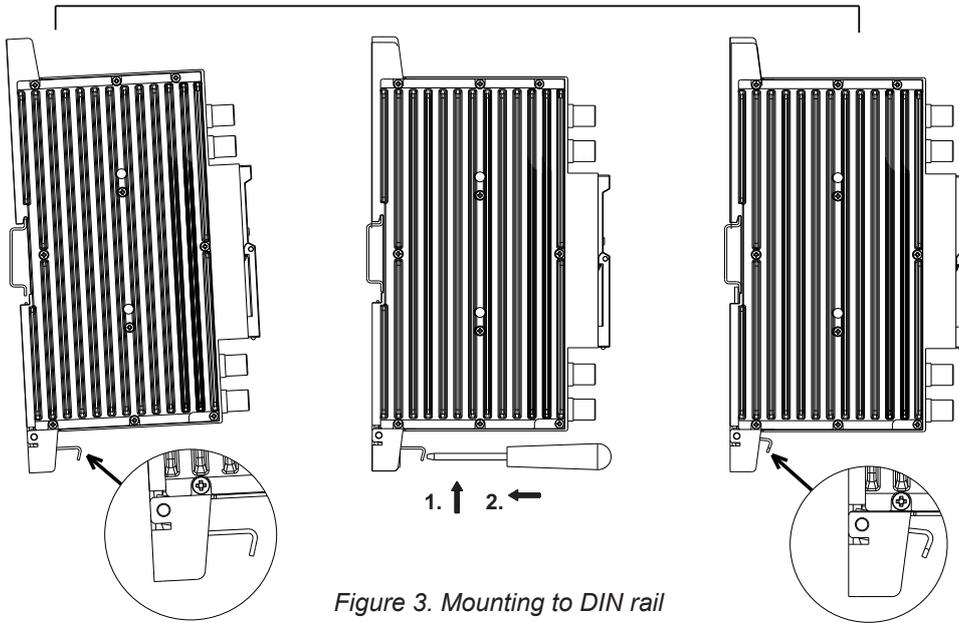*Figure 2. Mounting of the transmodulator*

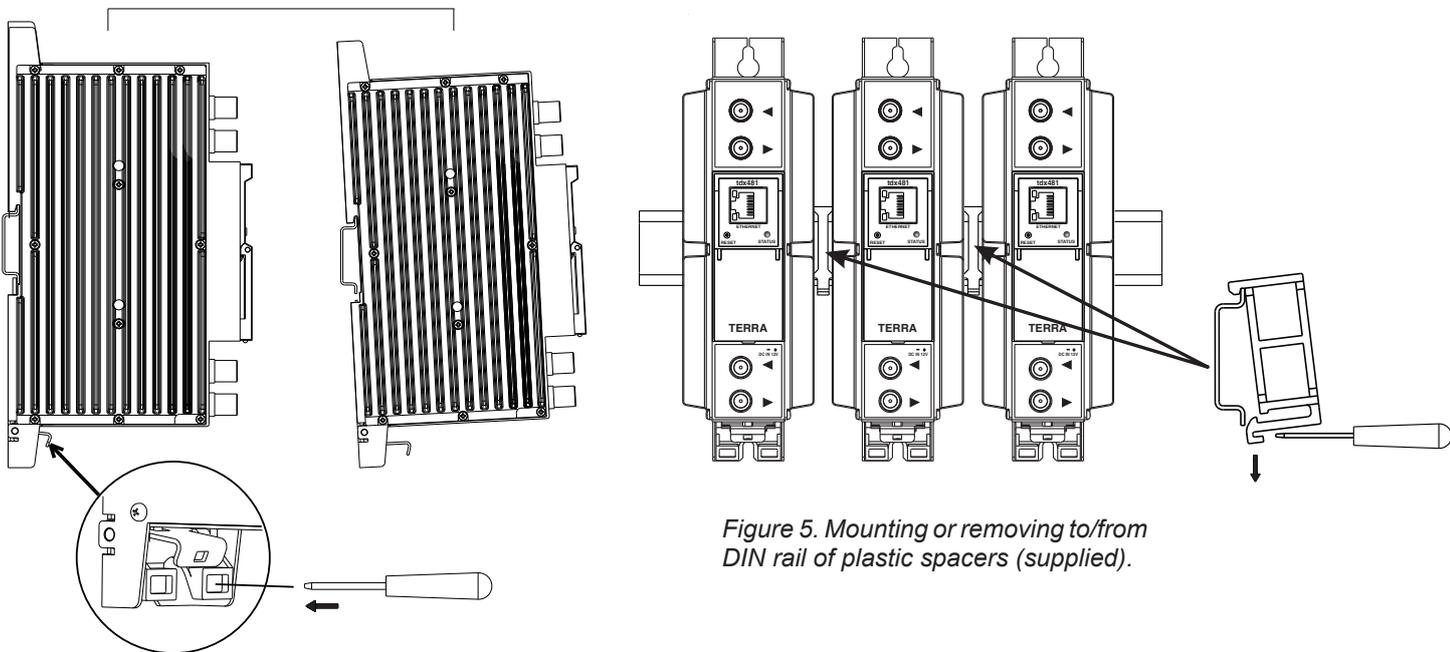## Mounting on DIN rail

Figure 3. Mounting to DIN rail

1. ↑ **2.** ←

Figure 4. Mounting from DIN rail

Figure 5. Mounting or removing to/from DIN rail of plastic spacers (supplied).

Requirements for power supply unit (PSU)

Recommended power supplies UP410S, UP413.

It is allowed to use an external PSU that meets the next requirements:

- Output voltage   +12 V ± 0.5 V
- Ripple at single and/or double mains frequency   < 10 mV p-p
- Ripple & noise   < 100 mV p-p
- Short circuit protection
- Double insulated (marked ▣)
- Meet EN55022 class B conducted emissions requirements, measuring with grounded load

Package contents

1. Transmodulator ....1 pcs.
2. Spacer ....1 pcs.
3. 75 Ω terminator ....1 pcs.
4. Bridge F quick to F quick ....1 pcs.
5. Short user manual ....1 pcs.

6. Operating

6.1 Initial configuration

All modules leave the factory with this control over Ethernet interface IP address: 192.168.1.10. In order to avoid conflicts with other IP addresses, it is necessary to perform an initial configuration in the local mode. Subsequently, it will be possible to access the module via local area network (LAN), either to change the configuration or to check the operating status.

The modules leave the factory with the following control over Ethernet interface TCP/IP configuration:

IP address of the module: **192.168.1.10**
Subnet mask: **255.255.255.0**
Default Gateway: **192.168.1.1**

To access each module, use a personal computer (PC) equipped with an Ethernet card and RJ-45 cable (CAT-5E or CAT-6). The IP address of the PC/MAC must be configured within the following range: 192.168.1.2 - 192.168.1.254 (do not use 192.168.1.10, since this is the IP address of the module to be configured). To start the configuration of the module, open your web browser and type in the following direction: http://192.168.1.10. The login prompt will appear on the screen (see Figure 6).

Figure 6. Login window

Access to the module is protected by user name and password. The default user name and password is **admin**. Enter the user name and password and click on "**Login**" button.

NOTE: the default password - **admin** - can (and must) be changed as explained in the section **6.11**.**5 "User management"**. During initial configuration you need to change the default control interface TCP/IP configuration as explained in the section **6.8** "**IP settings**".

NOTE: If you are using Internet Explorer Web browser, supported versions are version 10 or higher.

Control interface IP address reset to default procedure: press the "**RESET**" [6] button for more than 3 seconds. When the LINK [5] indicator will start blinking, release it. After this operation the control interface IP address will be set to **192.168.1.10**, for more information see section **6.8** "**IP settings**".

6.2 General configuration

Initial Web interface screen

The first screen that appears when the module accessed is the "Main" window, which gives general information on the device.

Figure 7. General information screen

In the top of each configuration screen you will see a main menu tabs [1]. Using it, you can switch between the different configuration menu. The tab highlighted in yellow shows which menu is active at a given moment. The "System menu" tab contains several submenu items. Common elements for all screens are module title [2] and login information strings [3]. Pressing on the "Logout" string you can logout from module control.

Device information table

This shows the following data of the module:

"Device model": a model of the module.

"Serial number": serial number of the module.

"Title": the user may assign a title to the device for easier management. Press the button "Change" to modify it. This title will be written at [2] place. Also, it will be visible in other devices, and by computers in network devices (if PC supports SSDP).

"Region": the device supports several preinstalled regions. The RF channel list depends on which region is selected. The region can be changed without restarting the device. Just select the needed region by pressing the "Change" button in "the Device information" table. Additional regions can be installed under request. Contact our distributors for such possibility.

"Software version": module software version number.

"Bootloader version": module's firmware bootloader version.

"IP": the IP address which is currently assigned to the module.

"System time": current time, synchronized from the TDT table of the input stream or NTP server. Local time offset can be selected in the System menu/Date,Time.

"Up time": time passed from the last power-up or restart of the module.

Output bitrates table

It displays the output bitrate status of each channel in real time, Horizontal bar shows the percentage of used available bandwidth in the channel. The 1st number right to the bar shows the actual bitrate in Mbps. The next number shows the maximum allowed bitrate in the channel and it depends on modulation parameters. Ensure that the actual bitrate would not reach more than 95% of the available bandwidth. Otherwise, bitrate overflow may occur.

System status table

It represents the following parameters at real time:

- Internal temperature - in degrees of Celsius
- Processor load - in percents
- Main supply voltage - module power voltage in Volts
- DC input current - module current consumption in Amperes

Other devices in the network

If there are any modules in the network their status and diagnostic information will be displayed as it is in Figure 7 "General information screen". If modules status is red press the down arrow and diagnostic errors will be displayed. Make sure, that Ethernet router is configured properly to pass SSDP packets (239.255.255.250:1900 and 239.255.255.246:7900). Also make sure that all modules are connected to the same Ethernet network.

Diagnostic information table

It displays all module errors and comments (if possible) how to eliminate them.

Figure 8. Diagnostic information tables with errors and without errors

6.3 RF inputs

Figure 9. Input type selection

The Figure 9 "Input type selection" table consists of the following parameters:

"Source type" - the LNB types, there are several:

- Power off

No power for external equipment (for example in case using multiswitch in static mode).

- Universal LNB

"LNB LO frequency" - the LNB local oscillator lower frequency in megahertz. Use 9750 MHz for the universal LNB.
"LNB HI frequency" - the LNB local oscillator upper frequency in megahertz. Use 10600 MHz for the universal LNB.
"Polarization" - the polarization of converter. Can be "Horizontal" or "Vertical".

Power supply voltage of the LNB is chosen according to the selected polarization – 18 V Horizontal, 13 V Vertical; the 22 kHz is set depending on given "LNB HI frequency" "LNB LO frequency" and "Input frequency" parameters.

For example:

LNB input frequency range, MHz	10700 – 11700	11700 – 12750
LNB local oscillator frequency, MHz	Lo = 9750	Hi = 10600
Downconverted input IF range, MHz	950 – 1950	1100 – 2150
Tone	-	22 kHz

- Quatro LNB

"LNB Power" - power supply of the converter – can be set to "0", "13V", "18V", "13V/22kHz", "18V/22kHz".
"LNB LO frequency" - LNB local oscillator frequency in MHz.

- DiSEqC

"LNB LO frequency" - the LNB local oscillator lower frequency in megahertz. Use 9750 MHz for the universal LNB.
"LNB HI frequency" - the LNB local oscillator upper frequency in megahertz. Use 10600 MHz for the universal LNB.
"Polarization" - the polarization of converter. Can be "Horizontal" or "Vertical".
"Satellite" - can be set to "Satellite A", "Satellite B", "Satellite C", "Satellite D".

Figure 10. Input source types "SCR"

- SCR (EN50494)

"SCR" - first select source type as shown in Figure 10, then select "SCR/dSCR mode" Master or Slave (Master for module which has direct connection to Unicable multiswitch or LNB and Slave for modules connected by loop through). If Slave was selected, additionally type the IP address of Master module. All the modules in the SCR/dSCR group must be in the same Ethernet network.

Next select "SAT input", "User band", type "Input frequency", "Symbol rate", press "Update" button (see Figure 12).
You can change UB frequencies manually if need.

Figure 11. Input source types "dSCR"

- dSCR (EN50607)

"dSCR" - similar to "SCR" mode, just the total UB, used UB and UB frequencies module receive from connected dSCR multiswitch or LNB.

Figure 12. Demodulator settings table

"Title" - field is intended for assigning the name for input transponder for easier channels management.

"SAT input" - a parameter that can switch demodulator on/off or select necessary satellite and sub band in SCR/dSCR modes.

"User band" - parameter used in SCR/dSCR mode. UB number and its frequency according connected SCR/dSCR multiswitch or LNB.

"DVB-S2 options" - for advanced "DVB-S2 options", press "Configure" link and "Advanced DVB-S2 parameters" will be displayed (see Figure 12.1).

Figure 12.1 DVB-S2 advanced parameters

"PLS" - Physical Layer Scrambling used in DVB-S2 as a way to improve data integrity. A number called the "scrambling sequence index" is used by the modulator as a master key to generate the uplink signal. This same number must be known by the receiver so that demodulation would be possible.

PLS mode - "Root" or "Gold".

"Stream" - parameter needed for multistream transponders.

NOTE: If advanced parameters is not needed make sure to leave them as shown in Figure 12.1.

"Input frequency" - parameter is a frequency of transponder in MHz.

"Symbol rate" - parameter is a symbol rate of transponder in kSym/s.

Input status table

	Lock status	RF level	Modulation	FEC	SNR	VBER	PER	Input bitrate
Demod. 1 status	Locked	78 dBμV	8PSK	3/4	12.0 dB	<1.0E-08	<2.2E-06	47910 kbps
Demod. 2 status	Locked	77 dBμV	8PSK	2/3	13.2 dB	<1.0E-08	<2.4E-06	42590 kbps
Demod. 3 status	Locked	75 dBμV	8PSK	2/3	14.2 dB	<1.0E-08	<2.4E-06	42590 kbps
Demod. 4 status	Locked	70 dBμV	QPSK	3/4	14.5 dB	<1.0E-08	<2.9E-06	38020 kbps
Demod. 5 status	Inactive	<45 dBμV	-	-	-1.0 dB	-	-	0 kbps
Demod. 6 status	Inactive	<45 dBμV	-	-	-1.0 dB	-	-	0 kbps
Demod. 7 status	Inactive	<45 dBμV	-	-	-1.0 dB	-	-	0 kbps
Demod. 8 status	Inactive	<45 dBμV	-	-	-1.0 dB	-	-	0 kbps

Figure 13. Input status table

"Lock status" - shows tuner/demodulator input state. `Locked' - signal is received and demodulated. `Unlocked' - signal is not demodulated. `Inactive' - input channel is powered off.

RF level" - RF signal level at the module input. Level indication - approximate.

"Modulation" - modulation scheme of the input signal.

"FEC" - forward error correction.

"SNR" - RF signal/noise ratio at the input of module.

"VBER" - Viterbi bit error ratio.

"PER" - ratio of the MPEG2 transport error packets to the whole number of packets.

"Input bitrate" - bitrate of the input signal.

6.4 Transport Streams

One input channel at a time can be configured in this page. Select proper channel from the list at "Choose input" combobox. A list of services in the selected channel will appear (see Figure 14 "List of services").

Choose input
Demod. 1 ☐ Transparent mode ☐

List of services

Service title	Bitrate	LCN	Service ID	Descramble	Enable
📺 ANIXE HD	4.4 Mbps	0	21100		Output 1
📺 QVC HD	10.1 Mbps	0	21103		Output 1
📺 HSE HD	7.7 Mbps	0	21104		Off
📺 ShopLC HD	4.3 Mbps	0	21107		Off
📺 WELT HD	9.5 Mbps	0	21108		Off
📺 Nicer Dicer TV	1.9 Mbps	0	21112		Off
📺 Genius Plus	2.3 Mbps	0	21113		Off
📺 WELT HD Austria	9.5 Mbps	0	21118		Off
📺 No title	0.0 Mbps	0	21199		Off
📺 .	0.0 Mbps	0	21117		Off
📺 SES 75	0.0 Mbps	0	21111		Off

Select all to channel 1 ☐
Select all to channel 2 ☐
Select all to channel 3 ☐
Select all to channel 4 ☐
Select all to channel 5 ☐
Select all to channel 6 ☐
Select all to channel 7 ☐
Select all to channel 8 ☐

Update

Figure 14. List of services

"List of services" table shows a list of available services. Icon before the service name indicates service type. Bitrate of each service is measured in real time. Services that currently are not running will be displayed as grayed. They can be selected and will be outputted normally when the services starts running. „LCN" field is a Logical Channel Number. Every service can have a „channel number" and TV will sort channels according to it. Just ensure, that all services in all channels have different numbers. Value "0" means, that LCN for that service is not used at all and TV will sort these channels according to it's own rules.

Services can be passed to any output number, independing on the input demodulator number.

BISS scrambled services have a checkbox for descrambling.

Press onto ⊞ sign and service information will be extended (see Figure 15 "Service details").

Choose input

Demod. 4 ⌄ Transparent mode ☐

List of services

Service title	Bitrate	LCN	Service ID	Descramble	Enable
⊟ 📺 Das Erste	4.7 Mbps	0	28106		Output 4 ⌄

📁 Service title:	Das Erste	New service title:	Das Erste	
Service provider:	ARD	New service provider:	ARD	
Service ID:	28106	Scrambled flag: ☐	Other ID ☐ 28106	
PMT PID:	100	Service type: 1 - digital televi… ⌄	Other PID ☐ 100	
❖ MPEG2 Video PID:	101	Enable ▨	Other PID ☐ 101	
♫ MPEG1 Audio (deu) PID:	102	Enable ☑	Other PID ☐ 102	
♫ MPEG1 Audio (mis) PID:	103	Enable ☑	Other PID ☐ 103	
0110 1010 Teletext PID:	104	Enable ☑	Other PID ☐ 104	
♫ AC-3 Audio (deu) PID:	106	Enable ☑	Other PID ☐ 106	
Private data PID:	84	Enable ☑	Other PID ☐ 84	
0110 1010 Subtitles PID:	105	Enable ☑	Other PID ☐ 105	
ISO/IEC 13818-6 type C PID:	1176	Enable ☑	Other PID ☐ 1176	
Private section PID:	2070	Enable ☑	Other PID ☐ 2070	
ISO/IEC 13818-6 type B PID:	2171	Enable ☑	Other PID ☐ 2171	
PCR PID:	101	Parental control: Off ⌄		

Service title	Bitrate	LCN	Service ID	Descramble	Enable
⊞ 📺 BR Fernsehen Süd	8.6 Mbps	0	28107		Output 4 ⌄
⊞ 📺 hr-fernsehen	2.6 Mbps	0	28108		Output 4 ⌄
⊞ 📺 BR Fernsehen Nord	8.4 Mbps	0	28110		Output 4 ⌄
⊞ 📺 WDR Köln	2.9 Mbps	0	28111		Off ⌄
⊞ 📺 SWR Fernsehen BW	8.4 Mbps	0	28113		Off ⌄

Figure 15. Service details

"Service title" and "Service provider" can be edited (multilanguage character support). "Scrambled flag" will be inserted into SDT (Service Description Table). Unchecking this checkbox will not descramble the content. It only carries information about the scrambling status of the service.

BISS scrambled services have a BISS key input field "BISS Code". Enter the BISS code (12 or 16 characters) in hex format.

"Parental control": this selection enables ability to restrict certain content viewable by the user. For example, parental control field is set to "Less than 6 years", than all content with maturity rating above 6 years old will be filtered out.

Individual streams can be disabled as well. PID number can be remapped manually by selecting checkbox "Other PID". Keep in mind that PID must be unique, otherwise PID remapping is done automatically.

Press onto "Update" button to save changes and execute.

NOTE: If transparent mode is selected, all services of transponder will be passed to the output, including original PAT, SDT, PMT, EIT, CAT, NIT tables. All changes that were made to these tables (new titles, LCN) will be disregarded. No more than 95% of output bandwidth usage is recommended, otherwise bitrate overflow might occur.

6.5 NIT

Several tables related to NIT generation exist in this section. Figure 16 "Global TS parameters" describes following TS parameters:

Global TS parameters	
Network ID	1
Private data specifier (hex)	0000233A
Network name	
	Update

Figure 16. Global TS parameters

"Network ID": is unique number within the geographical region defined by the "country code". For a cable network usually this is a single country code plus 0x2000 (8192). If there are more connected modules in the network, they must have the same Network ID.

Proper value depending on your country and operator can be found here:

http://www.dvbservices.com/identifiers/network_id?page=1

"Private data specifier (in hex format)": can be inserted in the NIT table for proper LCN description. This value is described in TS 101162 specification. NorDig standard requires 00 00 00 29 value, UK should use 00 00 23 3A value.

Other options can be found here:

http://www.dvbservices.com/identifiers/private_data_spec_id?page=1

The parameter will not be inserted into NIT if value is set to zero.

"Network name" is the name of the network.

The 2nd table in the page describes Transport stream ID and Original network ID of each channel (see Figure 17). Each stream in a network must have unique ID, called "Transport stream ID". An Original_Network_ID is defined as the "unique identifier of a network". It can be linked to NetworkID or used value from this location:

http://www.dvbservices.com/identifiers/original_network_id?page=1

	RF output parameters	Original network ID	Transport stream ID
Output 1	C21, 8MHz, QAM-64	1	1
Output 2	C22, 8MHz, QAM-64	1	2
Output 3	C23, 8MHz, QAM-64	1	3
Output 4	C24, 8MHz, QAM-64	1	4
Output 5	C66, 8MHz, QAM-64	1	5
Output 6	C67, 8MHz, QAM-64	1	6
Output 7	C68, 8MHz, QAM-64	1	7
Output 8	C69, 8MHz, QAM-64	1	8
		Update	

Figure 17. Transport stream and original network IDs

Description of other streams in the network							
Frequency, MHz	Constellation	Bandwidth	Guard interval	Code Rate	Modulation mode	Original network ID	Transport stream ID
177.5	QAM-64	7 MHz	1/32	7/8	2K	1	1
184.5	QAM-64	7 MHz	1/32	7/8	2K	1	2
205.5	QAM-64	7 MHz	1/32	7/8	2K	1	5
212.5	QAM-64	7 MHz	1/32	7/8	2K	1	6
	QAM-64 ⌄	8 MHz ⌄	1/32 ⌄	7/8 ⌄	8K ⌄			Add

Figure 18. Description of other streams in the network

Every channel in the network must be described in NIT. Otherwise TV automatic channel tuning function will not find all channels. All other modules in the network will be monitored via standard SSDP protocol. NIT tables will be regenerated if any change is detected in other modulators with the same Network ID. Make sure, that Ethernet router is configured properly to pass SSDP packets (239.255.255.250:1900 and 239.255.255.246:7900). Also make sure that control ports of all modules are connected to the same Ethernet network.

NOTE: If in the RF network exists transponders that are generated by old TERRA transmodulators/modulators, the frequencies and modulation parameters must be filled manually (Figure 18).

6.6 TS info

Figure 19. TS info

This menu window will help you to easily assign and track LCN numbers of different services and also allows displaying RF channels bandwidth usage.

"Choose outputs" - select which RF channel outputs should be displayed.

"Service title" - the list of services which are assigned to the RF output channel.

"Input source" - demodulator which is used to receive and demodulate the RF signal. This demodulator number shows which service is demodulated by which demodulator.

"Service ID" - unique service identification number.

"LCN" - Logical Channel Number which is assigned to the service.

6.7 RF outputs

Transmodulator has one (tdx441, tdq441) or two (tdx481, tdq481) independent groups of four adjacent channels.

	Constellation	Bandwidth	Guard interval	Code Rate	Cell ID	Output frequency, MHz (Channel)		Attenuator, dB		Enable
Output 1	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	474.0	C21 ∨	0 ∨	0.00	☑
Output 2	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	482.0	C22 ∨	0 ∨	0.00	☑
Output 3	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	490.0	C23 ∨	0 ∨	0.00	☑
Output 4	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	498.0	C24 ∨	0 ∨	0.00	☑
Output 5	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	834.0	C66 ∨	0 ∨	0.00	☑
Output 6	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	841.0	Manual ∨	0 ∨	0.00	☐
Output 7	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	848.0	Manual ∨	0 ∨	0.00	☐
Output 8	QAM-64 ∨	8 MHz ∨	1/32 ∨	7/8 ∨	0	855.0	Manual ∨	0 ∨	0.00	☐

Update

Select all ☐

Figure 20. DVB-T output parameters (tdx481)

"Output frequency" parameter can be entered manually or selected as a channel from combobox. Channels that can be selected from the list depend on which region is selected. If you need any other frequency – select "Manual" and type the needed frequency. Frequency step is 0.1 MHz. "Enable" checkbox will enable channel to the output. Global attenuator can be entered up to 15 dB. Also there is individual precise attenuator up to 2.5 dB in step of 0.5 dB.

Press "Update" to change settings. In case, if any modulation parameter was changed, both channels will be restarted with new settings. Exception is "Attenuator", changes in this parameter will not restart the modulator.

	Constellation	Symbol rate	Output frequency, MHz (Channel)		Attenuator, dB		Enable
Output 1	QAM-64 ∨	6875	474.0	C21 ∨	0 ∨	0.00	☑
Output 2	QAM-64 ∨	6875	482.0	C22 ∨	0 ∨	0.00	☑
Output 3	QAM-64 ∨	6875	490.0	C23 ∨	0 ∨	0.00	☑
Output 4	QAM-64 ∨	6875	498.0	C24 ∨	0 ∨	0.00	☑
Output 5	QAM-64 ∨	6875	834.0	C66 ∨	0 ∨	0.00	☑
Output 6	QAM-64 ∨	6875	841.0	Manu ∨	0 ∨	0.00	☐
Output 7	QAM-64 ∨	6875	848.0	Manu ∨	0 ∨	0.00	☐
Output 8	QAM-64 ∨	6875	855.0	Manu ∨	0 ∨	0.00	☐
Step			7.0 MHz ∨				

Update

Select all ☐

Figure 21. DVB-C output parameters (tdq481)

Figure 21 shows tdq481 DVB-C output settings. In case of tdq441, count of output channels will be 4. The step of RF channels can be selected to one of these values: 7.0, 7.5, 8.0, 8.3, 8.5 MHz. Actual bandwidth of each channel depends on the symbol rate, and can be calculated as SR x 1.15 (1.15 here is roll off factor of 15%). Symbol rates of all channels must be the same, from the range of 3500..7200 kSym/s.

Output channel enumeration depends on the region selected from the main page. However, it's allowed to enter any frequency you want in a range of 100..858 MHz (for tdq441, tdq481).

Only the first output frequency/channel of the group can be entered by the user. Other frequencies will be calculated automatically according to the selected step/bandwidth.

6.8 IP settings

IP parameters	
MAC address	00:1C:A3:00:00:00
IP address	192.168.1.10
Subnet mask	255.255.255.1
Gateway	192.168.1.1
DNS	8.8.4.4
WEB port	80
	Update

Figure 22. IP settings table

All device IP settings can be configured here – "IP address", "Subnet mask", "Gateway", "DNS" (Domain Name System), see Figure 22. "WEB port" number can be changed. Default is 80. You must restart the device for the port change to take effect. All other IP parameters will be updated immediately after pressing "Update" button and redirected to new location.

   NOTE: IP address can be reset to default (192.168.1.10) by pressing "RESET" button (Fig.1, pos.6) for at least 3 seconds. Ethernet led indicators "activity" [4] and "link" [5] will start to toggle to inform, that the reset IP address request has been accepted. Device will be restarted with default IP address. To restore all parameters to default values (including password), keep pressing the button for additional 4 seconds. The green (link) indicator will start blinking after that time indicating, that a "restore defaults" command has been accepted. Now the button can be released. Yellow (activity) indicator will light on while resetting parameters. Device will restart with all default values after that.

6.9 E-mail-settings

E-mail settings	
Enable e-mail error report	☐
SMTP server	192.168.1.1
SMTP port	25
Sender e-mail address	no_reply@domain.con
Receiver e-mail address	
Use authentication	☐
Username	
Password	
Use TLS	☐
Timeout for errors in minutes	5
	Send test message
	Update

Figure 23. E-mail-settings table

The device can send e-mail reports if errors were detected. SMTP protocol is used for that. Figure 23 "E-mail settings table" shows parameters related to this feature. "Enable e-mail error report" checkbox enables error monitoring. All errors within "timeout" period will be gathered, and send to the e-mail address, provided in "Receiver e-mail address" input box. Comma separated e-mail addresses can be used to send report to multiple addresses. The timer will be started as soon, as the first error is detected, and stopped when e-mail is sent. The timer will be restarted again if a new error will appear.

"Sender e-mail address" can be used as authentication in the SMTP server side.

SSL (SMTPS) protocol is not supported.

6.10 SNMP settings

SNMP settings	
Enable TRAP	☐
sysLocation	sysLocation
sysContact	sysContact
sysName	sysName
Trap community	public
Read community	public
Write community	private
Trap IP address 1	0.0.0.0
Trap IP address 2	0.0.0.0
Trap IP address 3	0.0.0.0
	Download MIB file
	Update

Figure 24. SNMP settings table

Figure 24 "SNMP settings table" is located in "IP parameters" tab.

The description of the SNMP configuration parameters:

"Read Community" - community name acts as a password that is shared by multiple SNMP agents and one or more SNMP managers. "Read Community" password is used for read-only access to the modules parameters.

"Write Community" - is the password used for read-write access to the modules parameters.

"Enable TRAP" - SNMP traps are alerts generated by agents on a managed device. Check this box to enable TRAP generation. The module generates traps when the diagnostic message occurs.

"TRAP Community" - is the password used for accessing of TRAPS.

"Host IP #1","Host IP #2", "Host IP #3" - IP addresses of hosts with SNMP managers, where TRAPS will be send.

6.11 System menu

This menu tab contains following submenu items: "Event logs", "Export parameters", "Import parameters", "Firmware upgrade", "User management", "Force BISS descrambler", "Restore defaults", "Restart the device", "Reset settings", "Date,Time", "Language". Mouse over to show the list of this submenu.
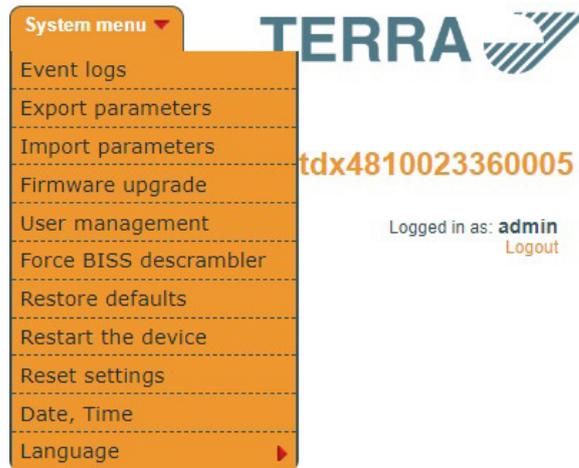

Figure 25. System menu

6.11.1 Event logs

Various important events, errors, warnings will be logged into the system Figure 26 "Event logs". Each record has an event type, which can be used to filter particular messages. Just select checkboxes in the "Logs filtering" table and press "apply". Other messages will be hidden.

"Erase logs" button will erase all logs from the system.

"Export logs" button forms the file (log.html) which will be downloaded to PC.

Each record has a log time when the event appeared. Refer to **6.11.8 "Date, Time"** settings for instructions how to configure time settings.

Date/Time	Event type	Event description
2023-09-26 09:21:31	Error	Tuner # 4 12 packets lost
2023-09-26 09:21:30	Event	Demodulator 8 locked
2023-09-26 09:21:30	Event	Demodulator 7 locked
2023-09-26 09:21:29	Event	PAT version change detected in channel 7
2023-09-26 09:21:29	Event	SDT version change detected in channel 7
2023-09-26 09:21:28	Event	Demodulator 6 locked
2023-09-26 09:21:28	Event	Demodulator 5 locked
2023-09-26 09:21:28	Event	Demodulator 4 locked
2023-09-26 09:21:28	Event	Demodulator 3 locked
2023-09-26 09:21:28	Event	PAT version change detected in channel 5
2023-09-26 09:21:27	Event	Demodulator 2 locked
2023-09-26 09:21:27	Event	Demodulator 1 locked
2023-09-26 09:21:22	Error	Demodulator 8 unlocked
2023-09-26 09:21:22	Error	Demodulator 7 unlocked
2023-09-26 09:21:22	Error	Demodulator 6 unlocked
2023-09-26 09:21:22	Error	Demodulator 5 unlocked
2023-09-26 09:21:22	Error	Demodulator 4 unlocked
2023-09-26 09:21:22	Error	Demodulator 3 unlocked
2023-09-26 09:21:22	Error	Demodulator 2 unlocked
2023-09-26 09:21:21	Error	Demodulator 1 unlocked
2023-09-26 09:21:21	Event	PAT version change detected in channel 5
2023-09-26 09:21:21	Event	PAT version change detected in channel 7
2023-09-26 09:21:07	Event	Logs erased

Figure 26. Event logs

6.11.2 Export parameters

All settings of transmodulator can be exported for backup or copying to another device. Press "Export parameters" and "parameters.xml" file will be downloaded to PC. This file can be imported only to the same type of device.

6.11.3 Import parameters

Exported parameters can be imported back to the device. Press onto "Click to select file" button (see Figure 27 "Import parameters") to select exported file.
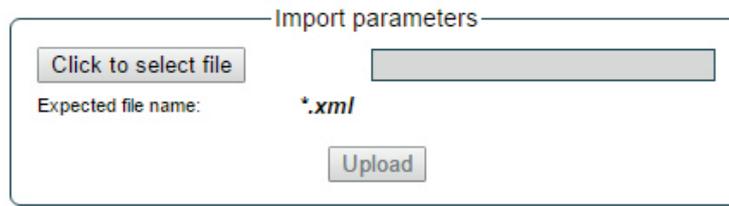

Figure 27. Import parameters

Press "Upload" button to send the file to the device. It will take several seconds to update all parameters after file upload. After that, device will function with new configuration. No restart is required.

6.11.4 Firmware upgrade

Device firmware can be upgraded via web browser. Press the "Click to select file" button and select firmware binary file. If valid file was selected, a version number of new firmware will be displayed. Otherwise an error message will appear. Press the "Upload" button to upload new firmware to the device. Upload progress bar will appear and may take several seconds to upload, depending on the size of a file and a network connection speed. A message will be displayed asking to restart the device when the file was sent to the device. New firmware will be programmed into the device only after restart. It may take additional minute or more to flash new program. Device will start up with a new firmware and continue to operate with previous parameters. Additional new firmware features (if any) may need to setup additionally to take effect.

Avoid power supply interruption when a programming process is going on.

Device has possibility to load software revision history and check availability for new software release. Click the "Check online" link. If computer (not device!) has internet access, it will show a list of all software releases with links to binary files. Binary file can be downloaded and saved to computer (see Figure 28 "Firmware upgrade"). After that, use the firmware upgrade method as described above.

Figure 28. Firmware upgrade

6.11.5 User management

User may change a password here. Length of the password is up to 16 symbols. Type current password and double enter new password to change it.

If logged in user has admin role, new users can be added (see Figure 29 "User management").
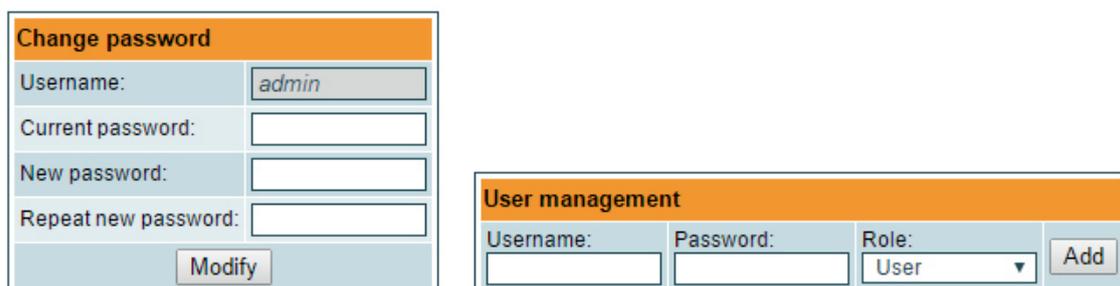

Figure 29. User management

Enter it's username, password, select a role and press "Add" button.

Only administrator (user with a role „admin") may manage other users.

NOTE: By giving your personal password or user access account for another person, you take full responsibility for all module settings modifications made by that person or anyone else they may give the password to.

6.11.6 Restore defaults

All parameters will be restored back to factory defaults after confirmation. The exception – IP address and users – these parameters will be unchanged. To restore IP address and system password to system defaults, see "**RESET**" button at section 3 **"External view"**, pos.6.

Several seconds can take to restore all parameters, so be patient.

6.11.7 Restart the device

Device will be restarted after confirmation to do it. This is an alternative to pressing a "**RESET**" button when the device is operating.

6.11.8 Reset settings

Configure reset options: Sheduled restart time, Periodic reset interval.

Configure reset button.

Figure 30. "Date, Time" settings table

6.11.9 Date, Time

System time can be configured manually or taken from NTP server (only if module can access NTP server). Also there is an option to select the time source from TS as shown in the Figure 31.

Figure 31. "Date, Time" settings table

6.11.10 Language

Device control panel supports several preinstalled languages. A change of language requires system restart. Note, that all previously logged records will remain in previous language.

Additional languages can be installed under request. Contact our distributors for such possibility.

6.11.11 Force BISS descrambler

If enabled, this checkbox allows BISS input field for all services. See Transport Streams (Figure 15.) menu where you can insert the BISS code.

7. Technical specifications

Type		tdx481	tdx441	tdq481	tdq441
Sections input/output		8/8	8/4	8/8	8/4
RF input	RF input count	1			
	frequency range (pr.)	950-2150 MHz			
	level / impedance	55-95 dBµV / 75 Ω			
	return loss	≥ 10 dB			
	loop through frequency range/loss	950-2150 MHz / ≤ 1.5 dB			
	LNB powering/control (pr.)	0/13/18 V & 22 kHz, 500 mA total, DiSEqC 1.0, EN50494, EN50607			
	standard (pr.)	DVB-S/S2*			
	modulation	QPSK, 8PSK, APSK 8/16/32			
	symbol rate (pr.)	2 ÷ 45 Ms/s			
RF output	standard (pr.)	**DVB-T**		**DVB-C**	
	modulation (pr.)	QPSK, QAM16, QAM64		QAM16, QAM32, QAM64, QAM128, QAM256	
	frequency range (pr.)	170 - 230 MHz, 470-862 MHz		96-862 MHz	
	channel allocation, adjac.	4 +4	4	4 +4	4
	level / impedance	90 ± 2 dBµV / 75 Ω			
	TS bit rate	< 31 Mbit/s		< 53 Mbit/s	
	MER	≥ 35 dB		≥ 40 dB	
	channel bandwidth (pr.)	7 MHz / 8 MHz		4...8.3 MHz	
	guard interval (pr.)	1/4, 1/8, 1/16, 1/32		-	
	code rate (pr.)	1/2, 2/3, 3/4, 5/6, 7/8		-	
	symbol rate (pr.)	-		3.5 ÷ 7.2 Ms/s	
	return loss	≥ 10 dB			
	roll off	-		15 %	
	transmission mode	2K		-	
	total output level adjustment range (pr.)	0 ÷ -15.0 dB by 1 dB step			
	loop through frequency range/loss	45-862 MHz / ≤ 2.5 dB			
Management port		standard IEE802.3 10/100 Base T			
Supply voltage		12 V ± 1 V			
Current consumption without external load		1.2 A	1.0 A	1.2 A	1.0 A
Current consumption with maximum external load		2.2 A	2.0 A	2.2 A	2.0 A
Operating temperature range		0º ÷ +35ºC			
Dimensions/Weight (packed)		63x198x112 mm / 1.26 kg			

* supports physical layer scrambling (PLS) and multiple input streams (MIS)

(pr.) software control