1. Product description

DVB-S/S2/S2X to IP streamers (in text - module) designed to broadcast in multicast on an IP network the services (TV or Radio programmes) issued from FTA or encrypted digital reception. The IP streams can be viewed using an IPTV set-top box or a software video player. The sdi482C and SDI516C streamers can descramble encrypted services by two conditional access (CA) modules.

Modules are intended for indoor use only.

2. Characteristics

<u>Input</u>: sixteen (sdi416, SDI516C) or eight (sdi482C) DVB multi program transport streams (MPTS).

<u>Output</u>: up to 512 simultaneous, IP-encapsulated services (TV or Radio programs), with individual multicast addresses and 16 (sdi416, SDI516C) or 8 (sdi482C) MPTS streams.

• Information filtering of DVB tables.

• UDP & RTP transmission protocols.

• Web interface for configuration and setting.

• SAP & SDP protocols that facilitate automatic service selection on the user's STB and provide information to external servers.

• PID filtering.

• PSI/SI parsing.

• Transparent ECM & EMM messaging.

• PAT, PMT and SDT table regeneration.

• Routing of CAT, EIT, TDT tables.

• Configurable QoS marking.

• Configurable Time To Live.

• TS file streaming from USB flash.

• Single cable interface (EN50494, EN50607) support.

3. Safety instructions

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

Any repairs must be made by skilled personnel.

Do not expose this module to moisture or splashing water.

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

Keep the module away from naked flames.

If the module 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 powering.

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

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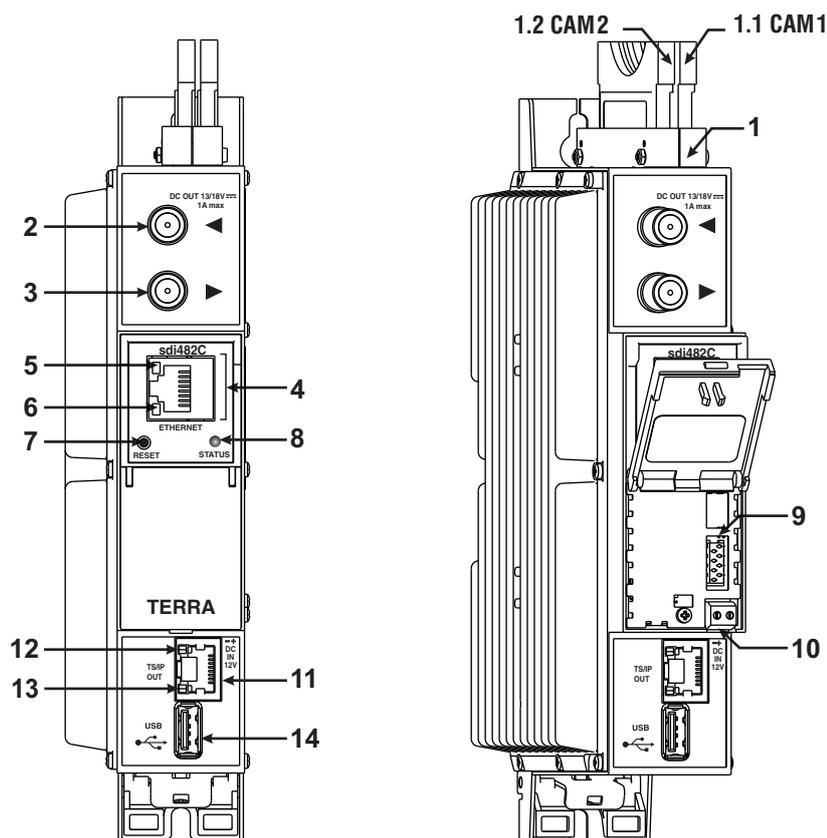
This product is in accordance with safety standard AS/NZS 60065 and EMC standards of Australia.

Manual in .pdf

4. External view sdi482C

Figure 1. External view of the streamer

1 - CA modules slots. Double PCMCIA sockets

   1.1 - first module CAM 1

   1.2 - second module CAM 2

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

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

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

5 - ACTIVITY (Yellow) indicator of the control Ethernet interface.

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

7 - **RESET** button. Press this button shortly to restart the module.

   Press this button for more than three seconds to set default IP address of the control Ethernet interface.

8 - **STATUS** - device status LED indicator:

   • green light indicates that module operates normally

   • red light indicates device error

9 - Power distribution bus connector.

10 - +12 V powering input (screw terminal).

11 - **TS/IP OUT** - streaming Ethernet interface. RJ45 socket.

12 - ACTIVITY (Yellow) indicator of the streaming Ethernet interface.

13 - LINK (green) indicator of the streaming Ethernet interface.

14 - **USB** - USB-A connector for USB flash.
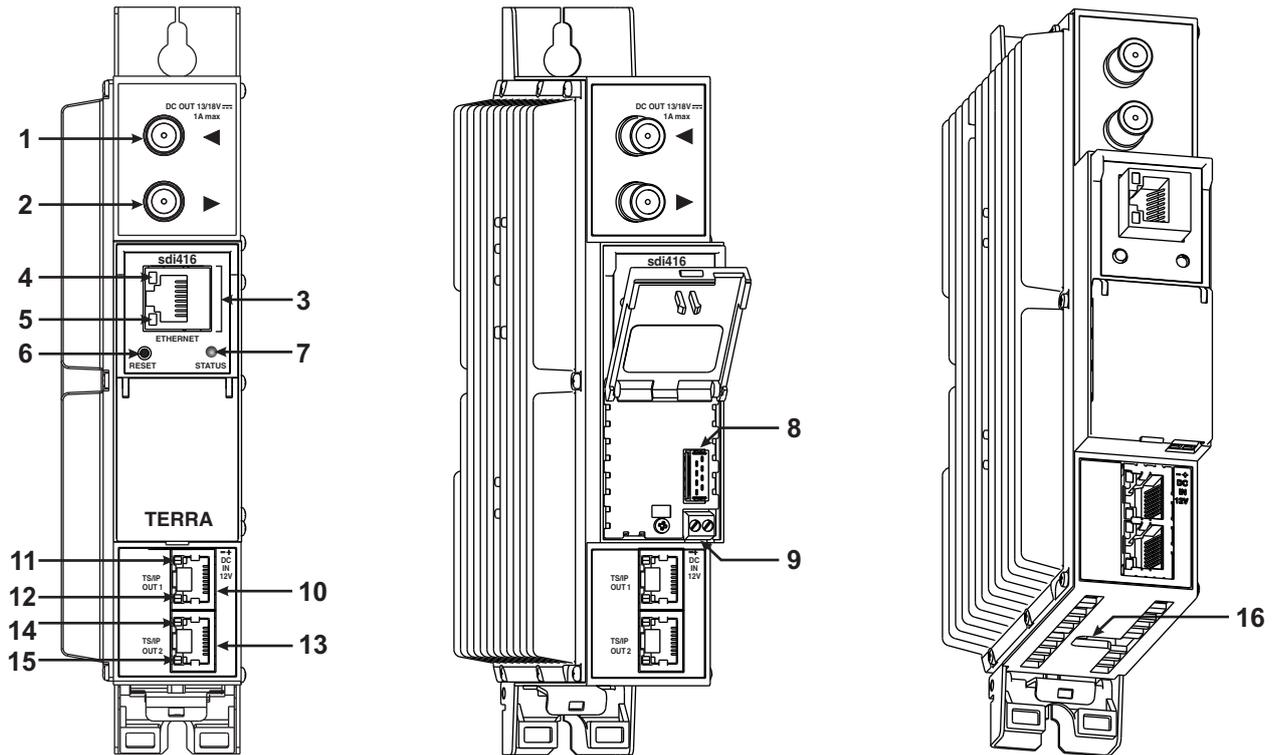
5. External view sdi416

Figure 2. External view of the streamer

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** button. Press this button shortly to restart the module.

Press this button for more than three seconds to set default IP address of the control Ethernet interface.

7 - **STATUS** - device status LED indicator:

- green light indicates that module operates normally
- red light indicates device error

8 - Power distribution bus connector.

9 - +12 V powering input (screw terminal).

10 - **TS/IP OUT 1** - streaming Ethernet interface. RJ45 socket.

Transport streams from 1-8 demodulators are automatically routed to the Ethernet OUT1 output.

11/14 - LINK (green) indicator of the streaming Ethernet interface.

12/15 - ACTIVITY (Yellow) indicator of the streaming Ethernet interface.

13 - **TS/IP OUT 2** - streaming Ethernet interface. RJ45 socket.

Transport streams from 9-16 demodulators are automatically routed to the Ethernet OUT2 output.

16 - **USB** - USB-A connector for USB flash.
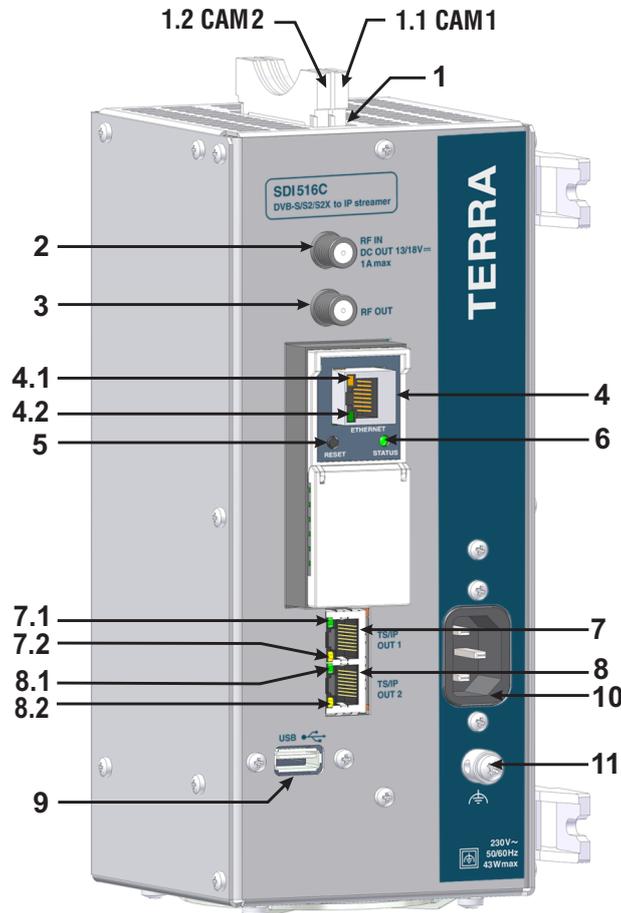
6. External view SDI516C

Figure 3. External view of the streamer

1 - CA modules slots. Double PCMCIA sockets

    1.1 - first module CAM 1

    1.2 - second module CAM 2

2 - **RF IN / DC OUT** - RF input of SAT IF signal / DC output for LNB. F socket.

3 - **RF OUT** - RF output (input signal loop-through). F socket.

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

    4.1 - ACTIVITY (Yellow) indicator of the control Ethernet interface.

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

5 - **RESET** button. Press this button shortly to restart the module.

    Press this button for more than three seconds to set default IP address of the control Ethernet interface.

6 - **STATUS** - device status LED indicator:

    • green light indicates that module operates normally

    • red light indicates device error

7 - **TS/IP OUT 1** - streaming Ethernet interface. RJ45 socket.

    7.1 - LINK (green) indicator of the streaming Ethernet interface.

    7.2 - ACTIVITY (Yellow) indicator of the streaming Ethernet interface.

    Transport streams from 1-8 demodulators are automatically routed to the Ethernet OUT1 output.

8 - **TS/IP OUT 2** - streaming Ethernet interface. RJ45 socket.

    8.1 - LINK (green) indicator of the streaming Ethernet interface.

    8.2 - ACTIVITY (Yellow) indicator of the streaming Ethernet interface.

    Transport streams from 9-16 demodulators are automatically routed to the Ethernet OUT2 output.

9 - **USB** - USB-A connector for USB flash.

10 - Mains connection

11 - Functional ground clamp

7. Installation instructions

Read the safety instruction first.

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

Disconnect power supply unit from the mains before make all connections of modules.

Fasten the module on DIN RAIL or individual holder.

Connect all necessary RF, powering and control cables.

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

Connect power supply in to the mains.

Within 5-20 seconds of powering the module will run in normal operation mode.

Comments of the front panel indicators:

if the link with the Ethernet interface is established - the LINK indicator glows;

if the data flows thru the Ethernet interface - the ACTIVITY indicator blinks;

when the module operating normally - the status indicator glows in green, when the module has some diagnostic messages - the status indicator glows in red.

8. MOUNTING sdi416, sdi482C

■ The module or mounting bracket must be fixed with steel screws Ø 3.5-4 mm. The screws are not included in a package.

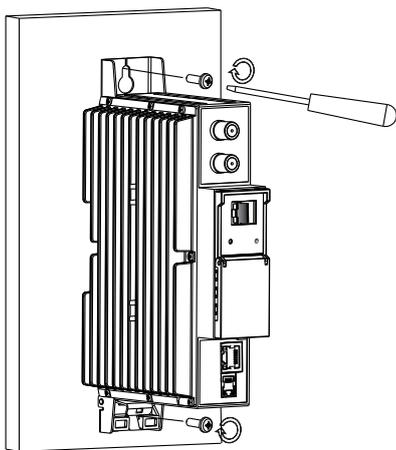■ Free space of installed streamers must be at least 10 cm.
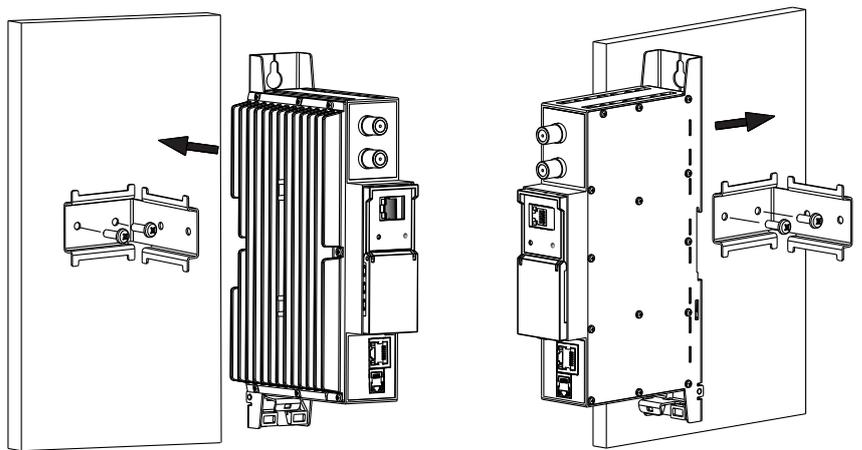
sdi482C

sdi416
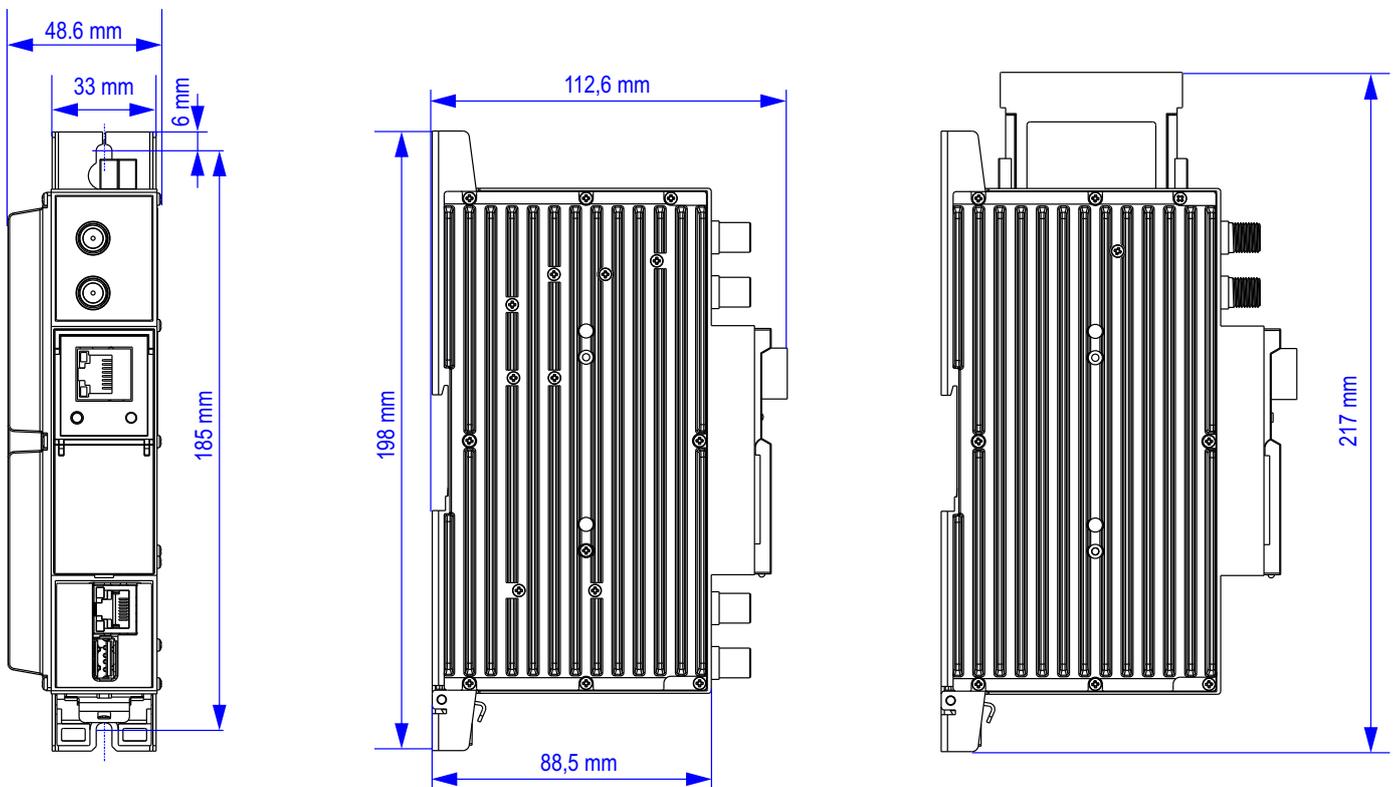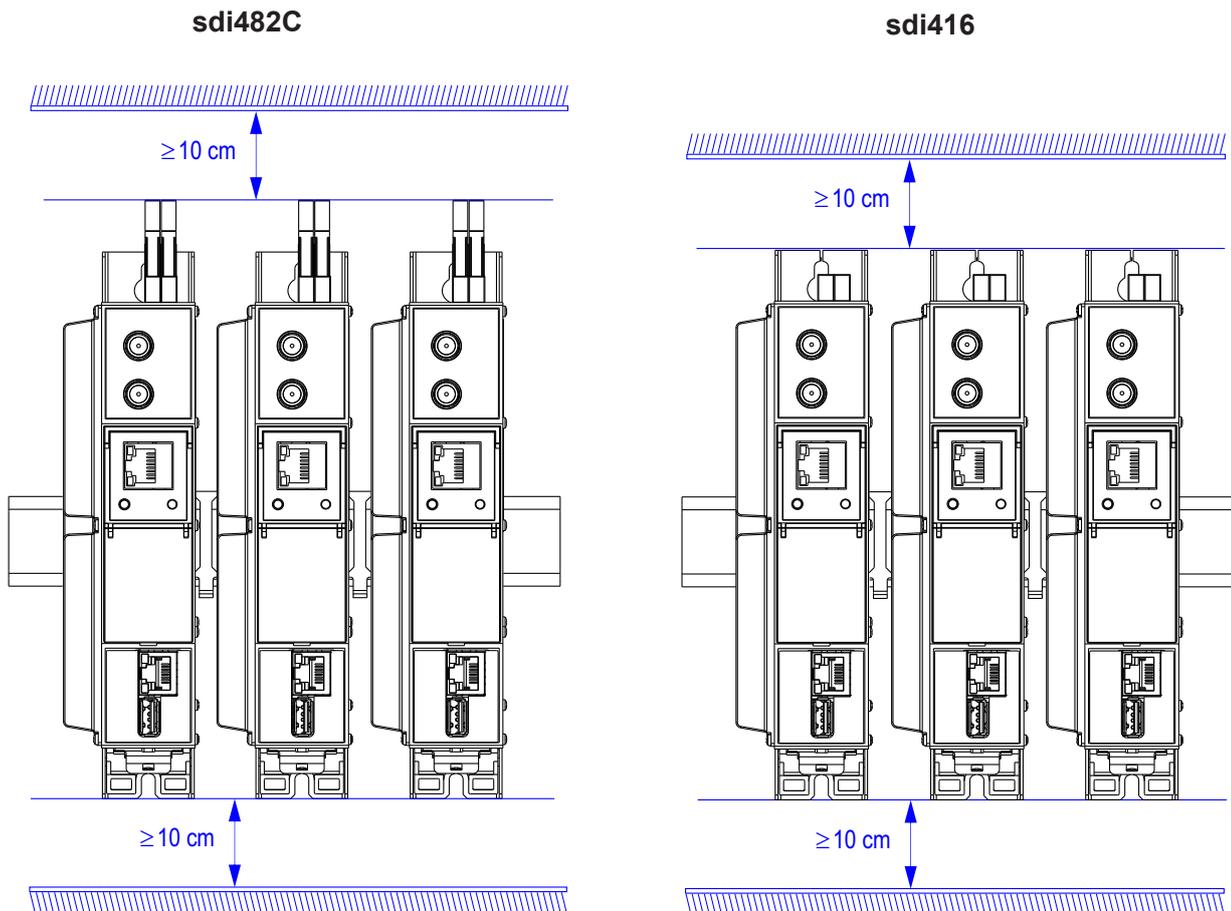
■ Mounting bracket on DIN rail should be connected to main potential equalization bus.

Mounting on a wall by screws

Mounting on a bracket (ordering number 01960)

Perpendicular to the wall

Parallel to the wall
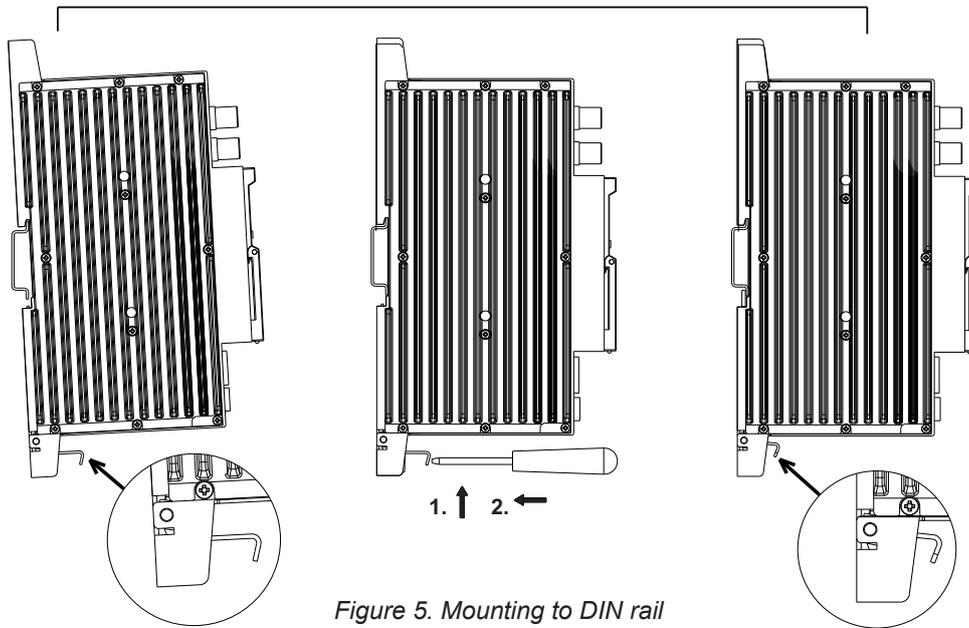
Figure 4. Mounting of the streamer
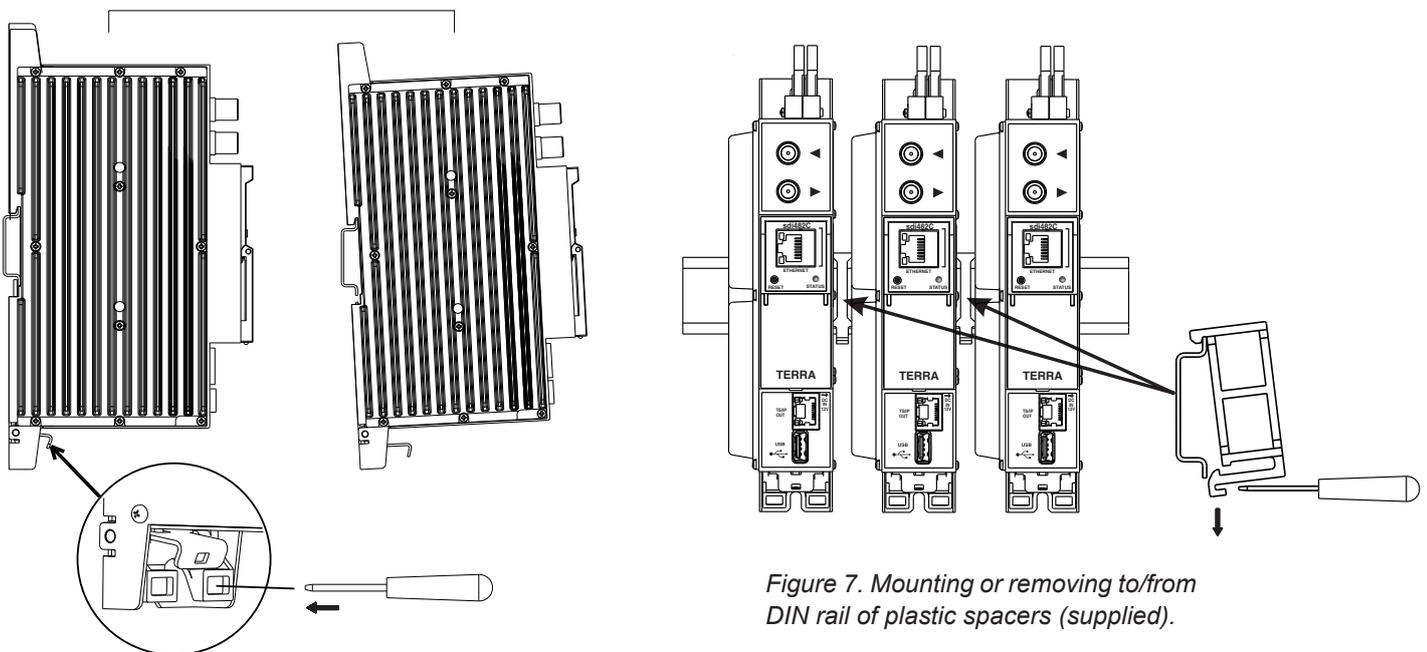
Mounting on DIN rail

Figure 5. Mounting to DIN rail

Figure 6. Mounting from DIN rail

Figure 7. Mounting or removing to/from DIN rail of plastic spacers (supplied).

Requirements for power supply unit (PSU)

Recommended power supplies UP410S, UP413 (for modules sdi416, sdi482C)

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

- Output voltage $+12\ V \pm 0.5\ V$
- Ripple at single and/or double mains frequency $< 10\ mV\ p\text{-}p$
- Ripple & noise $< 100\ mV\ p\text{-}p$
- Short circuit protection
- Double insulated (marked ▢)
- Meet EN 55022 class B conducted emissions requirements, measuring with grounded load

Package contents

1. Streamer..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.

9. MOUNTING SDI516C

■ Mount the streamer on the wall in vertical position. Fix the streamer with steel screws Ø 4-5 mm. The screws are not included in a package.

How to mount mounting supports of the streamer is shown in pictures.
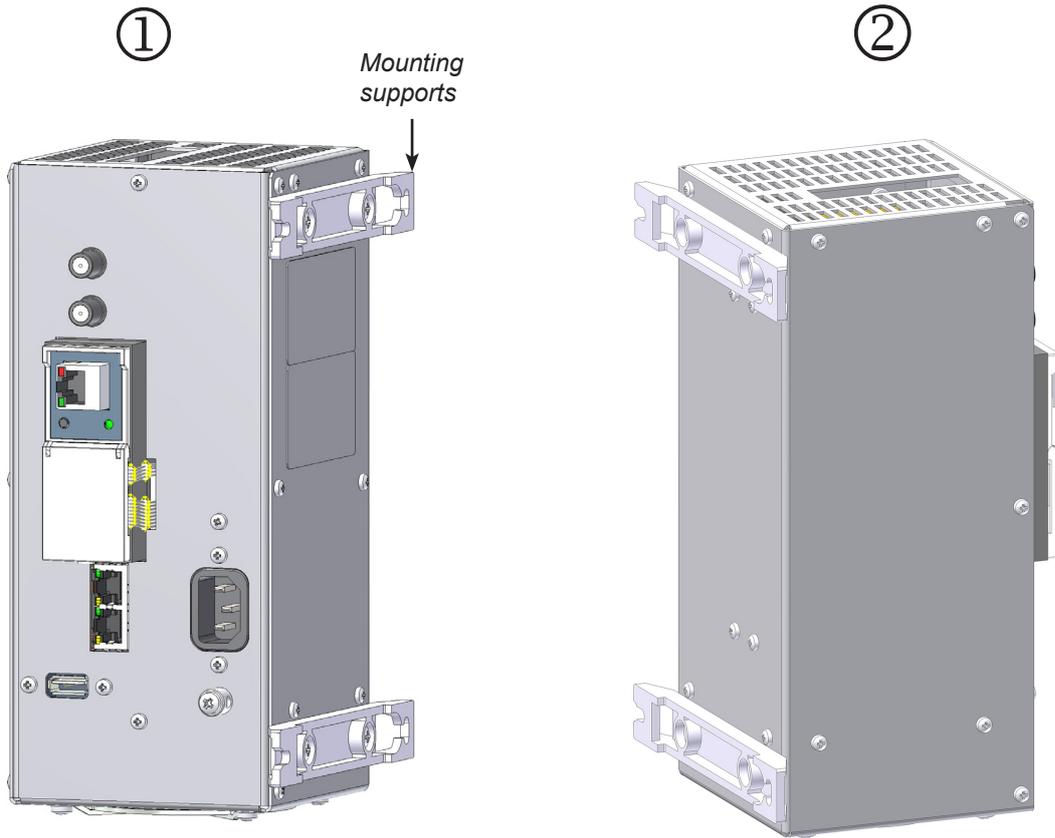
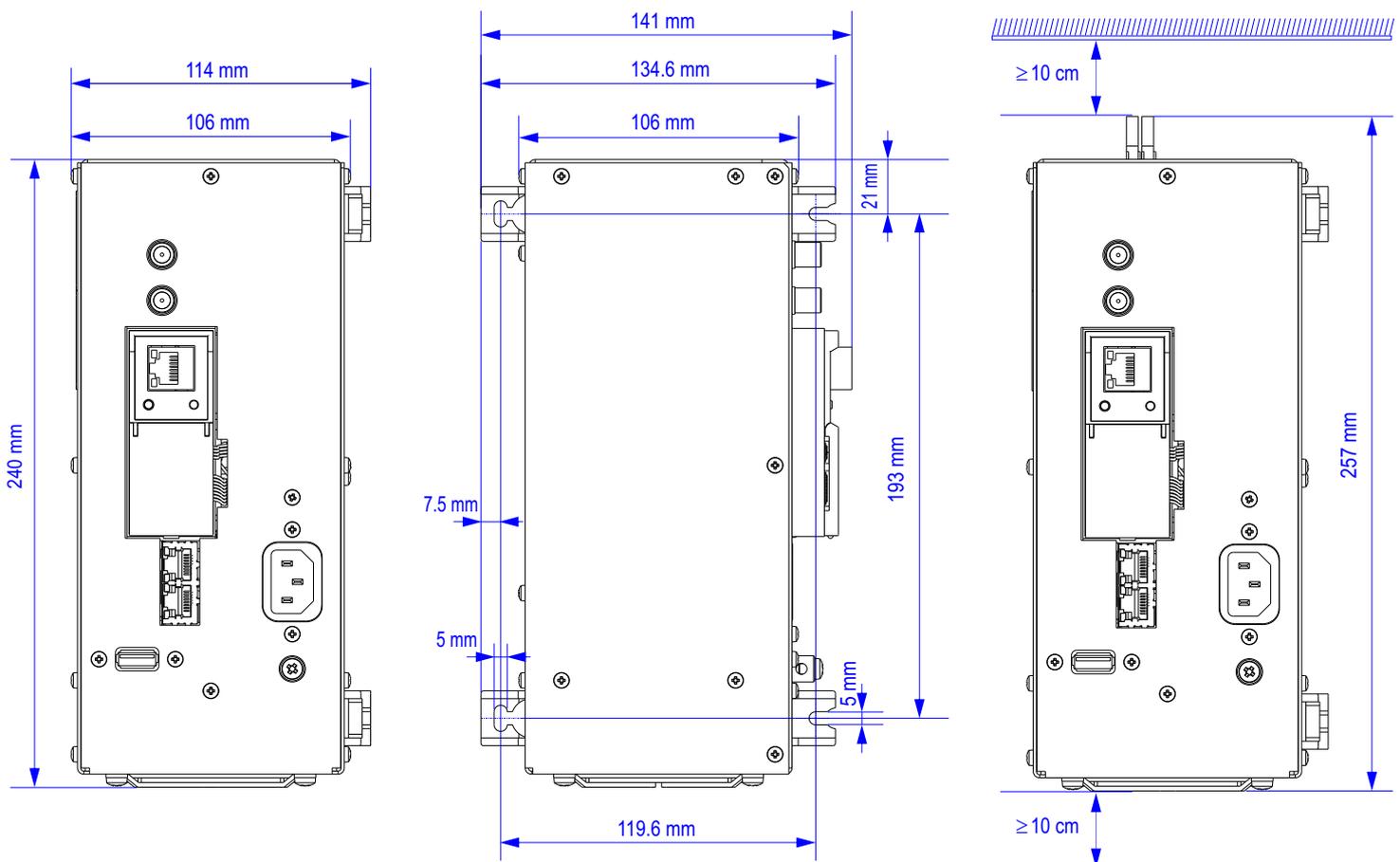■ Free space of installed streamers must be at least 10 cm.

Figure 8. Mounting of the streamer

10. Operating

10.1 Initial configuration

All modules leave the factory with this control 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 local mode. Subsequently, it will be possible to access the modules via the local area network (LAN), either to re-programme it or to check is operating status.

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

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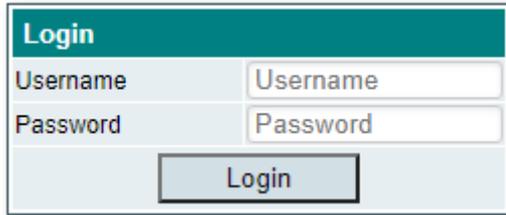*Subnet mask*: **255.255.255.0**
Default Gateway: **192.168.1.1**

To access each module, use a PC or MAC personal computer 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 9.). Module can be controlled using any modern web browser.

Figure 9. Login prompt

Access to the site 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.

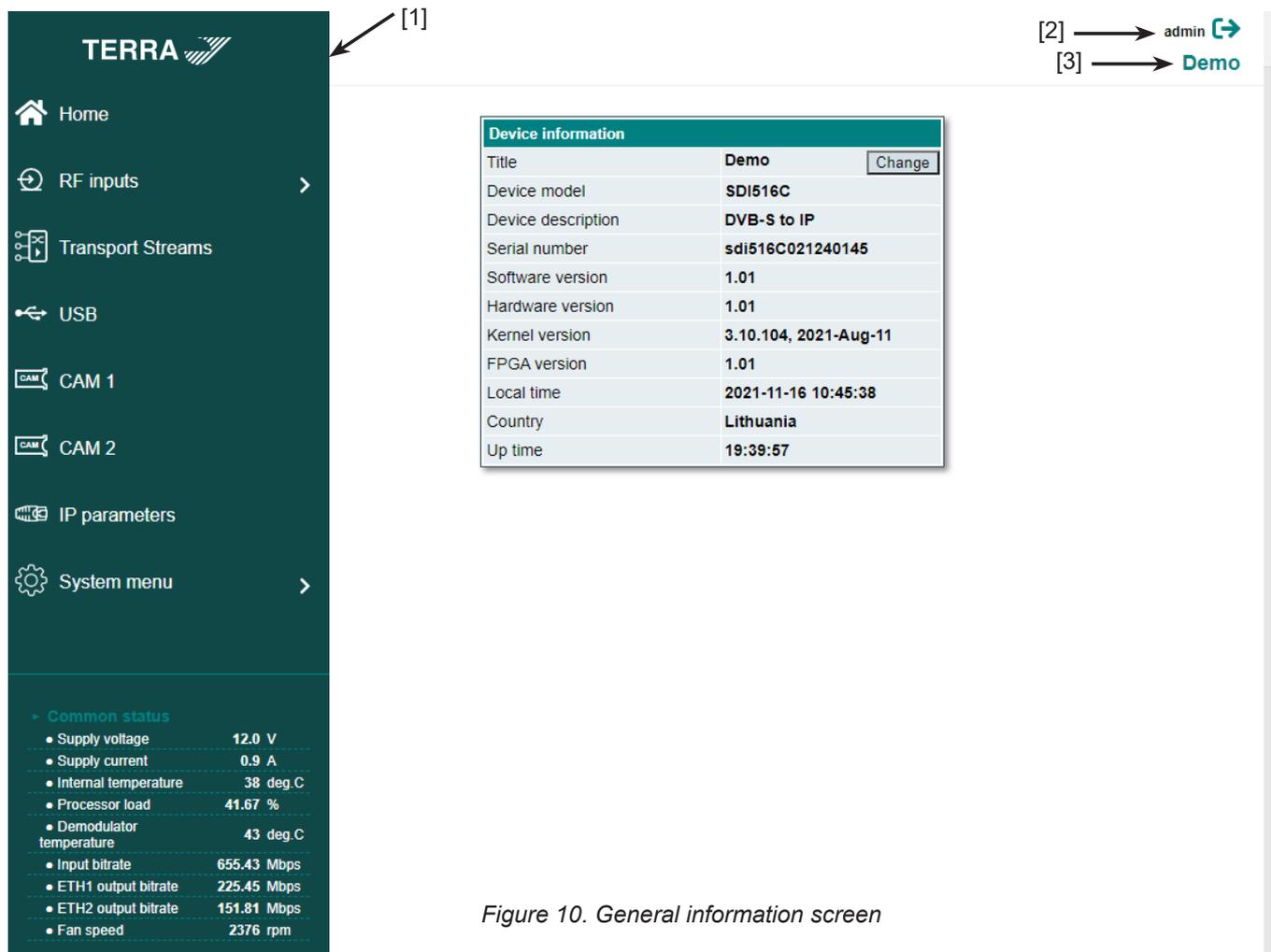*Note*: the default password - **admin** - can (and must) be changed as explained on section **10.8.2**.

During initial configuration you need to change the default control and streaming Ethernet interfaces TCP/IP configuration as explained on section **10.7**.

Control interface IP address reset to default procedure: press the "RESET" button (Figure 1, position [7]; Figure 2, position [6]; Figure 3, position [5]) for more than 3 seconds and release it. After this operation the control interface IP address will be set to **192.168.1.10**, user name and password set to **admin**.

10.2 General configuration

Initial program screen

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

Figure 10. General information screen

9

In the left of each configuration screen you will see a main menu table [1].
Using it, you can switch between the different configuration menus. The "RF inputs" and "System menu" lines contains several submenu.

Also common elements for all screens is module title [3] and login information strings [2]. The module title can be changed after pressing the "Change" button in the "Device information" table. Pressing on the ➡ icon you can logout from module control.

Device information table

This shows the data of module:

"Title": title of the module.

"Device model": model of the module.

"Device description": description of the module.

"Serial number": serial number of the module.

"Software version": module software version number.

"Hardware version": module hardware version number.

"Kernel version": Linux kernel, used in the module, version and date.

"FPGA version": module FPGA firmware version number.

 "Local time": current local time, synchronized from the date and time source selected in "System menu" → "Date, time" table. Local time offset can be selected in the "System menu" → "Language, country" table.

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

In the "Common status" table the following parameters are displayed at real time: supply voltage in Volts, supply current in Amperes, internal temperature in degrees of Celsius, processor load in percents, demodulator IC temperature in degrees of Celsius, input bit rate in Mbps, output bit rate in Mbps, output bitrate of streaming interface or interfaces in Mbps, fan speed in rpm (SDI516C only).

When the module has some diagnostic messages, a ⚠ icon with number of messages is shown. Click on this icon to see all messages.
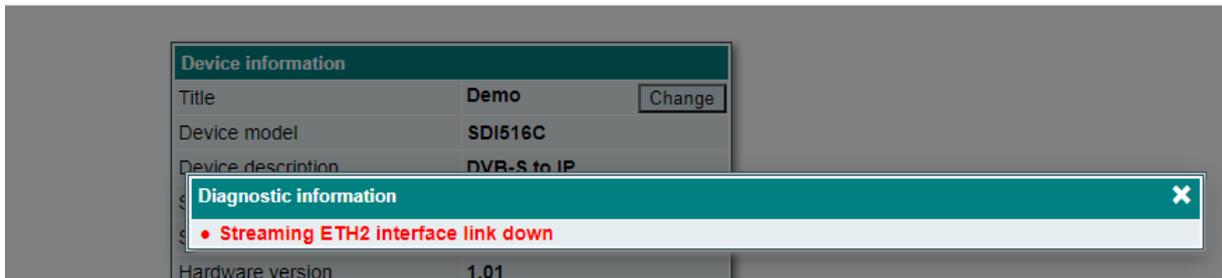

Figure 11. Diagnostic information table with errors

10.3 RF inputs

This menu consists of three submenus: "LNB Settings", "Input settings" and "Configure manufacturer dSCR".

10.3.1 LNB settings

Figure 12. LNB settings table when "Source type" set to "DiSEqC"

Figure 13. LNB settings table when "Source type" set to "dSCR"

Figure 14. LNB settings table when "Source type" set to "SCR"

The Figure 12 "LNB settings" table consists of the following parameters:

"LNB LO frequency" - the LNB local oscillator lower frequency in megahertz. Use 9750 MHz for the universal converter.

"LNB HI frequency" - the LNB local oscillator upper frequency in megahertz. Use 10600 MHz for the universal converter.

"LNB Power" - power supply of the converter – can be set to "0", "13V", "18V", "13V/22kHz", "18V/22kHz".

"Polarization" - the polarization of converter. Can be "Horizontal" or "Vertical".

"Source type" - the LNB types, there are several: Universal, QUATRO, DiSEqC, dSCR EN50607, SCR EN50494 - see Figures 12, 13, 14.

When the "Source type" is set to "dSCR" or "SCR" module can work in "Master" or "Slave" mode. The RF input of "Master" module is connected to the single cable interface (SCIF) switch, RF input of "Slave" module is connected to RF output of "Master" module. Both modules must be connected to the same subnet of Ethernet network and you must enter correct IP address of master module in "LNB settings" table of slave module.

The dSCR multiswich status, used and available user bands are displayed in the "dSCR status" table (Figure 13).

The Figure 14 "LNB settings" table is used for entering user band frequencies of the SCIF switch, supporting EN50494 standard.

10.3.2 Input settings

All demodulators of module can be set up in this section. See Figure 15.

"Enable" - used to activate the demodulator.

"SAT input" – used to select input of the SCIF switch.

"User band" - used to select the user band of SCIF switch.

The „SAT input" and "User band" columns are shown when the "Source type" set to "SCR" or "dSCR" (see section 10.3.1).

"Frequency" - the frequency of transponder in MHz. Ensure, that SAT IF frequency ($FR_{transponder}$ - LNB Lo/Hi) fits into demodulator's input frequency range.

"Symbol rate" - the symbol rate of transponder in kSym/s.

Press the "Update" button to set new parameters.

There are tree status columns in the "Input settings" table. "Lock status" can have following icons:
- empty, when the input channel (demodulator) is turned off;

- ✓ , when demodulator is locked to the transponder;

- ✕ , when demodulator is unlocked. This state generates error in diagnostic window as well. If the channel is not used, it's recommended to turn it off instead of leaving unlocked. It will save power consumption.
"RF level" and "LM" (Link Margin) are measured parameters of the input signal.

		Enable	SAT input	User band	Frequency, MHz	Symbol rate, Ks/s	Lock status	RF level, dBμV	LM,dB
Demod. 1	▶	✓	B V/Hi	UB 1	11766	29900	⊘	85	4.4
Demod. 2	▶	✓	B V/Lo	UB 2	10992	27500	⊘	81	9.4
Demod. 3	▶	✓	A H/Lo	UB 3	10891	22000	⊘	80	6.2
Demod. 4	▶	✓	A H/Lo	UB 4	11053	22000	⊘	83	8.3
Demod. 5	▶	✓	A V/Lo	UB 5	11229	22000	⊘	83	6.9
Demod. 6	▶	✓	A V/Lo	UB 6	11347	22000	⊘	80	7.5
Demod. 7	▶	✓	A H/Lo	UB 7	11362	22000	⊘	81	7.4
Demod. 8	▶	✓	A V/Lo	UB 8	11377	22000	⊘	82	5.9
Demod. 9	▶	✓	A H/Lo	UB 9	11523	22000	⊘	85	7.3
Demod. 10	▶	✓	A V/Lo	UB 10	11538	22000	⊘	86	6.5
Demod. 11	▶	✓	A H/Lo	UB 11	11553	22000	⊘	85	7.2
Demod. 12	▶	✓	A H/Lo	UB 12	11582	22000	⊘	86	8.2
Demod. 13	▶	✓	A V/Lo	UB 13	11597	22000	⊘	84	6.2
Demod. 14	▶	✓	A H/Lo	UB 14	11612	22000	⊘	85	7
Demod. 15	▶	✓	A V/Lo	UB 15	11627	22000	⊘	80	6.5
Demod. 16	▶	✓	A H/Hi	UB 16	11954	27500	⊘	83	8.7
Select all		☐							
					Update				

Figure 15. The "RF input" table

The advaced settings and status parameters of demodulators can be set after clicking on the ▶ icon in the "RF input" table. See Figure 16.

		Enable	SAT input	User band	Frequency, MHz	Symbol rate, Ks/s	Lock status	RF level, dBμV	LM,dB
Demod. 1	▼	✓	B V/Hi	UB 1	11766	29900	⊘	85	4.4
Input stream ID				5					
Physical Layer Scrambling (PLS)				GOLD	Code 1235				
Modulation standard				DVB-S2					
Modulation				8PSK					
FEC				3/4					
MER,dB				12.3					
VBER/LBER				<1.0E-07					
PER				<3.0E-08					
Bitrate, Mbps				65.16					
CC errors				3	Reset				

Figure 16. The advaced settings and status parameters of demodulators

In this table you can enter DVB-S2X parameters (when available): Input stream ID (ISI), Physical Layer Scrambling (PLS) mode and code. "MER" is the measured modulation error ratio of input signal, "VBER" is the Viterbi bit error ratio in the DVB-S signal, "LBER" is the LDPC Bit Error Rate in the DVB-S2 signal. PER (Packet Error Ratio) shows the ratio of invalid received packets and total received packet. A sign "<" before the value means, that there was no any errors within that number of packets. "Bitrate" is the transport stream's bitrate of the transponder with NULL packets. "CC errors" - mpeg2 transport stream continouty counter error count. To reset CC errors counter, the "RESET" button in the right.

10.3.3 Configure Terra dSCR system

This table is for configuring Terra dSCR devices. It is especially useful when multiple dSCR devices are connected to a single module. The table with the scan button is displayed at the beginning. After pressing the button, all dSCR devices are scanned and displayed in the same table (see Figure 17).
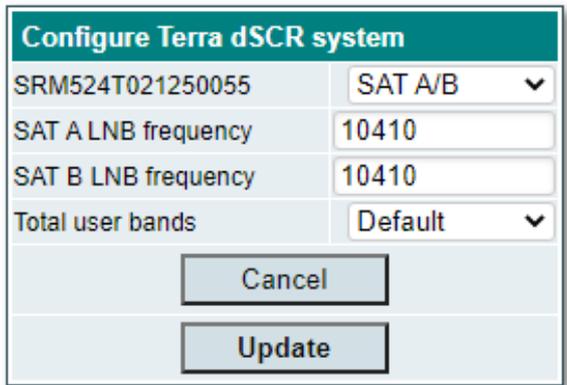
Figure 17. Scanning table with dSCR devices

The first rows of the table show the types and serial numbers of all connected dSCR devices. A satellite can be assigned to each device. The frequency of the satellite LNB can also be set. The last line allows you to set the number of user bands and bandwidth. By default, each dSCR device has two outputs of 16 user bands. You can select 32 bands with 37 MHz bandwidth, 24 bands with 50 MHz bandwidth and 20 bands with 60 MHz bandwidth. In this case, only the first output of the dSCR device will be active.

10.4 Transport Streams

Note: **sdi416 and SDI516C streamers with two TS/IP output interfaces use fixed data flow path from the demodulators to TS/IP outputs. Data received from the demodulators 1 to 8 is transmitted through TS/IP output 1 only. Data received from the demodulator 9 to 16 is transmitted through TS/IP output 2 only.**

1 Gbps Ethernet link on the TS/IP receiving end is supported only. 10/100 Mbps Ethernet link on the receiving end is not supported. This applies to modules sdi416, SDI516C and sdi482C. It is not recommended to select the same service in one or different demodulators in unit.

This is the home page (Figure 18) for configuring device output streams. It consists of two tables: "Input services" and "Output streams". At the top of the input services table, you can select the input sources whose services will be displayed at the bottom of the table. Press the "+" icon on the upper right corner of table to add the input source or the "x" icon on the input source to remove them.

Input services are grouped according to the selected input sources. The first row of the source's services shows its total bit rate. In the following lines - its services. Meanings of information icons of the "Input services" table:

- scrambled service

- free to air service

SD - standard definition TV service

HD - high definition TV service

4K - ultra high definition TV service

R - radio service

Press the ⊕ icon to add the input service as new stream to output streams. Also you can drag and drop the input service to the output streams table "Services" column. This method allows you to form a multiple program output transport stream.

Scrambled services in the devices with CA module support (sdi482C, SDI516C) are displayed with icon. After pressing on this icon additional submenu appears. This submenu allows to descramble service with selected CA module. When the service is selected for descrambling, the icon changes to .

The "Output streams" table is used to individually configure the output streams. The description of the table columns.

"Services" – service type icon and service name.

"IP address" - the multicast address required for the stream to be added. The available range is from 224.0.0.0 to 239.255.255.255, but it is recommended to reduce it from 224.0.1.0 to 238.255.255.255.

"IP port" - the IP port required for the stream to be added. The default value is 1234.

"Output bitrate" - current output bitrate of stream in kbps.

"Enable" - enable streaming of the service.

After change of service parameter the ⬳ icon appears. Press them to apply changes. In the last line on the "Output streams" table a list box with all input services, grouped by the input source, is displayed. You can select service from this list box, set required IP adress and port and press the "Append" button to add new stream to output streams. To remove the output stream from table press the recycle bin icon next to service name. This icon appears when mouse is over the "Services" column.

Figure 18. Transport streams page

10.4.1 Advanced output settings

For advanced users, the possibility exists of opening an additional table with further configuration options related to the output services. To open this table, click on the ▶ icon before the service title.

Output streams				
Services	**IP address**	**IP port**	**Bitrate**	**Enable**
▼ _HD_ Rai 1 HD	239.192.11.2	1234	9.77	✓

Transport stream ID: 5200	Original network ID: 318	Include EPG information: ✓	SAP/SDP group: HD ⌄	SAP/SDP channel number: 1

Service source:	**Demod. 1**	🔒 Scrambled	
Service title (Rai 1 HD):		Rai 1 HD	
Service provider (Rai):		Rai	
Service ID (3401):	3401	Program map table PID (1101):	1101
Video/PCR PID (501):	501	Scrambled flag:	☐
✦ H.264 Video PID (501):	501	Enable:	✓
♫ MPEG1 Audio (ita) PID (601):	601	Enable:	✓
♫ AC-3 Audio (oth) PID (611):	611	Enable:	✓
♫ MPEG1 Audio (eng) PID (621):	621	Enable:	✓
₀₁₁₀ Teletext PID (567):	567	Enable:	✓
Private section PID (2011):	2011	Enable:	✓
Private section PID (2012):	2012	Enable:	✓
ISO/IEC 13818-6 type B PID (3011):	3011	Enable:	✓
ISO/IEC 13818-6 type B PID (3012):	3012	Enable:	✓
ISO/IEC 13818-6 type C PID (3101):	3101	Enable:	✓

Figure 19. Extended settings of the output streams table

The description of the table rows:

"Transport stream ID", "Original network ID" – change output stream parameters.

"Include EPG information " - check this to include EPG information from the input stream.

"SAP/SDP group " - select from the drop down menu the SAP group to which you want to link the service. The group can be created by pressing "+" icon on this expanded list box.

"SAP/SDP channel number" - enter the order number you want to assign to the service on the subscriber's set-top box or reproducer, if the device supports SAP.

"Service title" - the name given to the service on the subscriber's set-top box or reproducer, if the device supports SAP/SDP protocol. The name that the service has on the input transport stream is the default name. Also this name will be used as the output service name.

"Service provider" - enter the provider name of the output stream. This name will be used in the SDT table.

You can change stream PIDs entering new values next to the stream PIDs,

Within the "Enable" checkboxes it is possible to select the streams to be broadcast for each service (the video PID cannot be disabled). By default, all the PIDs are selected and remain so until this configuration is altered.

When you have made your selection, confirm it by clicking on the ⮐ icon and close the advanced settings table by clicking on the ▶ icon.

10.5 USB

This screen (see Figure 20) is used to select a USB flash drive partition, browse files and select file for streaming. In a "File" list box selected file name is displayed. You can select them from this list box. Files with TS extention are marked by icon and can be selected for streaming by mouse click. **_Note_**: only files of MPEG2 transport stream are supported.

USB status parameters are displayed in table at right: file status, reading bitrate in Mbps; current time of file in hours:minutes: seconds format.

Files can be in MPTS or SPTS format. You can select services from played files in the "Transport Streams" page from the input sources named USB 1 – 4 (see section **10.4**). The USB numbers corresponds to channel numbers in the USB table.

USB disk partitions	
USB disk partition	● no label (vfat, max file size: 4GB)

	File		Active	Status	Bitrate, Mbps	Time
Channel 1	❖ 10744_H_22000.ts	× ▼	✓	Playing	33.8	0:00:11
Channel 2	❖ ltv_world.ts	× ▼	✓	Playing	3.6	0:00:11
Channel 3	❖ 33_H264.ts	× ▼	✓	Playing	19.8	0:00:11
Channel 4	❖ anixe.ts	× ▼	✓	Playing	8.4	0:00:11
		Update				

Figure 20. USB screen

10.6 CAM

Configuration of CA module	
CAM restart on descrambling error	☐
CAM restart now	Restart
TS speed to CA module	Auto ▼
TS speed to CA module	49 Mbps
	Update

CA module menu
SmarCAM-3.5 Tivusat Hospitality
SmarCAM-3.5 Tivusat Hospitality
Main Menu
Smartcard Information
Module Information
Module Settings
Software download
Descrambling Status
Diagnosis
Press OK to continue or EXIT to cancel
Exit

Services descrambled by CAM		
Services	**Bitrate**	**Status**
All TS	39.76	⊘
HD Rai 1 HD	7.81	⊘
HD Rai 2 HD	6.07	⊘
HD Rai 3 HD	6.93	⊘
HD Rai Sport + HD	5.97	⊘
HD Rai 4 HD	4.51	⊘
HD Rai Movie HD	4.72	⊘
SD Rai Movie	2.18	⊘
SD Rai 4	1.56	⊘

This screen (Figure 21) consists of three tables: "Configuration of CA module", "CA module menu" and "Services descrambled by CAM". In the "Configuration of CA module" table CAM restart function in case of descrambling error can be enabled. It is recommended to turn off this option if inactivated conditional access card has been inserted. Also in this table is possibility to restart CAM module manually by pressing the "Restart" button and set transport stream speed to CA module. In "Auto" mode the speed is calculated automatically according total speed of all services going via CA module. You can override this setting manually choosing required speed.

The content of the "CA module menu" depends on the inserted CA module.

Figure 21. CAM screen

As an example, above "CA module menu" table shows the menu for a particular CAM. Click on the corresponding band to access different options. Click on the "Exit" button to return to previous menu.

In the "Services descrambled by CAM" table are all services passed thru CA module. You can see bitrates and descrambling statuses of services. How to add service for descrambling – see section **10.4**.

10.7 IP parameters

Note: **sdi416 and SDI516C streamers with two TS/IP output interfaces use fixed data flow path from the demodulators to TS/IP outputs. Data received from the demodulators 1 to 8 is transmitted through TS/IP output 1 only. Data received from the demodulator 9 to 16 is transmitted through TS/IP output 2 only.**

1 Gbps Ethernet link on the TS/IP receiving end is supported only. 10/100 Mbps Ethernet link on the receiving end is not supported. This applies to modules sdi416, SDI516C and sdi482C.

This screen (Figure 22) consists of tables with parameters of all available Ethernet interfaces of module, the "Streaming settings" table and "SAP/SDP settings" table.
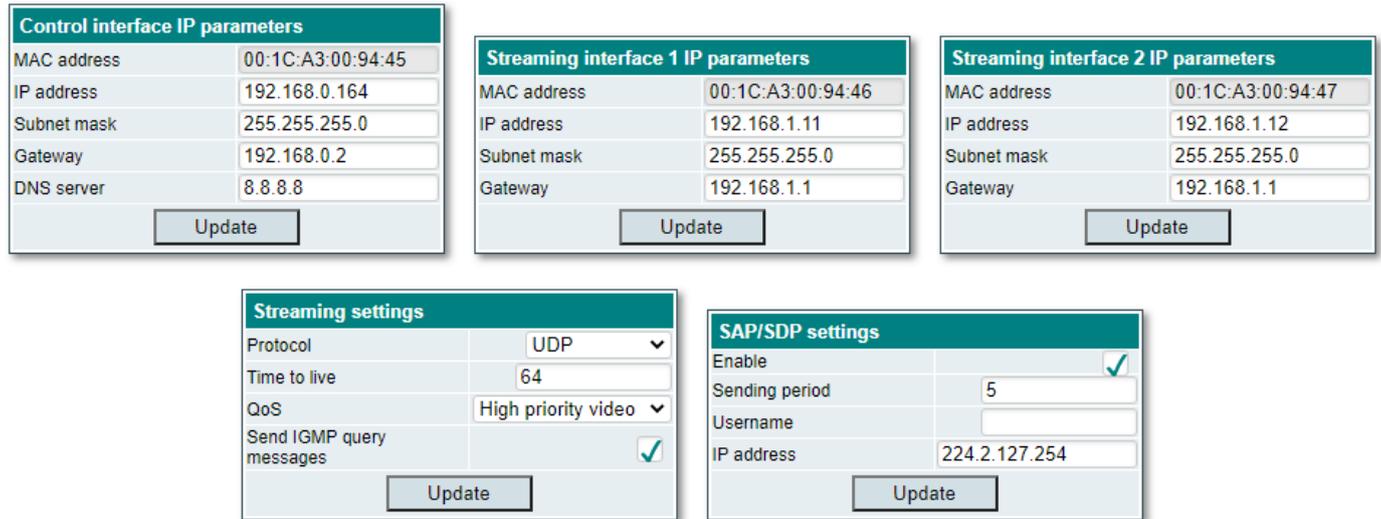

Control interface IP parameters	
MAC address	00:1C:A3:00:94:45
IP address	192.168.0.164
Subnet mask	255.255.255.0
Gateway	192.168.0.2
DNS server	8.8.8.8
Update	

Streaming interface 1 IP parameters	
MAC address	00:1C:A3:00:94:46
IP address	192.168.1.11
Subnet mask	255.255.255.0
Gateway	192.168.1.1
Update	

Streaming interface 2 IP parameters	
MAC address	00:1C:A3:00:94:47
IP address	192.168.1.12
Subnet mask	255.255.255.0
Gateway	192.168.1.1
Update	

Streaming settings	
Protocol	UDP
Time to live	64
QoS	High priority video
Send IGMP query messages	✓
Update	

SAP/SDP settings	
Enable	✓
Sending period	5
Username	
IP address	224.2.127.254
Update	

Figure 22. IP parameters screen

The description of the "IP parameters" tables rows.

"MAC Address" - the physical address of the module's Ethernet network card is displayed automatically.

"IP Address" - enter the IP address that you wish to assign to the module. This address must fall within the range of local network addresses.

"Subnet mask" - enter the local network mask.

"Gateway" - enter the IP address of this gateway.

The "Streaming settings" table is used specify common streaming parameters to all output streams.

This table consists of following lines.

"Protocol" - the drop down menu offers two options: UDP and RTP/UDP. UDP is a transport protocol which is not connection oriented and is particularly useful for streaming. RTP/UDP adds extra data fields so that the data flow is served at the correct speed for its projection in real time.

"Time To Live" - a parameter used to restrict the stream multicasting range. A number between 1 and 255 is entered in this box. Each time that an IP stream passes through a router, the TTL is reduced by one unit. The stream will be rejected by any router when the TTL value is reduced to zero.

"QoS" - quality of Service. The drop down list offers five differentiated service options or Diffserv. These options relate to the priority that you wish to assign to the streaming packets on their routes through switches or routers that are QoS management capable.

QoS values:
1 - Top priority
2 - High priority video
3 - Low priority video
4 - Video and voice
5 - Best effort (best effort made to correctly deliver the video data and the associated audio data)

"Send IGMP query messages" - enable of the IGMP query messages transmitting. Enable this function when the streaming output of module is connected to the manageable Ethernet switch with IGMP snooping support. In order for IGMP snooping to function, a multicast router must exist on the network and generate IGMP queries. The tables created for snooping are associated with the querier. Without a querier the tables are not created and snooping will not work. When the IGMP query messages send enabled, the module acts as the multicast router. It is sufficient to enable the IGMP query in one module per one Ethernet switch.

Once the different data values have been entered, click on "Update" to conclude the streaming settings.

The "SAP/SDP settings" table is used to configure the announcement and service description SAP/SDP channel.

"Enable" - check the box if you wish to transmit the service information by SAP/SDP protocol.

"Sending period" - introduce the time interval, in seconds, at which the transmitted information will refresh.

"Username" - the name entered will be transmitted on the SAP/SDP channel.

"IP address" - multicast address of SAP/SDP messages. It is need to be changed only when your IP receiving equipment use different address.

Click on "Update" to save the SAP/SDP channel configuration data.

10.8 System menu

This menu contains following submenu items: "Event logs", "Change password", "User management", "Export parameters", "Import parameters", "Firmware upgrade", "Restart the device", "Auto Restart", "Restore defaults", "Language, country", "Date, time".

10.8.1 Event logs

Click the mouse on the "System menu" line then click on the "Event logs" line. The event logs screen will appear. Various important events, errors, warnings will be registered in the log (see Figure 23). Each record has an event type that can be used to filter certain messages.

Date, Time	Event type	Event description
2021-11-18 10:13:23	Event	User admin logged in
2021-11-18 09:10:28	Event	Service Rai 4 descrambling started
2021-11-18 09:10:28	Event	Service Rai Movie descrambling started
2021-11-18 09:10:28	Event	Service Rai Movie HD descrambling started
2021-11-18 09:10:28	Event	Service Rai 4 HD descrambling started
2021-11-18 09:10:28	Event	Service Rai Sport + HD descrambling started
2021-11-18 09:10:27	Event	Service Rai 3 HD descrambling started
2021-11-18 09:10:27	Event	Service Rai 2 HD descrambling started
2021-11-18 09:10:27	Event	Service Rai 1 HD descrambling started
2021-11-18 09:10:24	Event	Service Rai 4 LAST descrambling requested from CAM #1
2021-11-18 09:10:23	Event	Service Rai Movie MORE descrambling requested from CAM #1
2021-11-18 09:10:22	Event	Service Rai Movie HD MORE descrambling requested from CAM #1
2021-11-18 09:10:21	Event	Service Rai 4 HD MORE descrambling requested from CAM #1
2021-11-18 09:10:20	Event	Service Rai Sport + HD MORE descrambling requested from CAM #1
2021-11-18 09:10:19	Event	Service Rai 3 HD MORE descrambling requested from CAM #1
2021-11-18 09:10:18	Event	Service Rai 2 HD MORE descrambling requested from CAM #1
2021-11-18 09:10:17	Event	Service Rai 1 HD FIRST descrambling requested from CAM #1
2021-11-18 09:10:17	Event	CA module #1 initialised
2021-11-18 09:10:13	Event	CA module #1 inserted
2021-11-18 09:10:13	Event	CA module #1 removed

Figure 23. Event logs table

Just check the "Log filtering" checkboxes. Messages will be filtered automatically. The "Erase Logs" button will delete all logs from the system. The "Download" button creates a logs.json file that can be added as an attachment for help. Messages will be exported in English, regardless of language selection.

Each entry has a log time when the event occurred. The time is displayed in the user's local time, which is set by the web browser. The device has 8 different event types, sorted by event severity. Only the event types selected in the "Log Filtering" table will appear here.

10.8.2 Change password

This submenu allows change a password for currently logged user.

10.8.3 User management

A user with "Administrator" privilege can see this menu and add / remove users who can log in to the system. Figure 24 shows the user control window.

Figure 24. User management window

Click "Add" to create a new user. A new pop-up window as shown in Figure 25 will appear. The Role parameter is a type of user access. You can select "Administrator", "User" or "Guest".

Figure 25. Entering a new user

"Admin" user has no restrictions. "User" is almost the same as "Admin", but user management is disabled. "Guest" has read-only access. No settings can be changed. An administrator access user can edit another user's password or change the role. Click "Edit" and change the details. Click "Remove" to remove the user. A confirmation prompt will appear confirming that you really want to remove the user.

10.8.4 Export parameters

Settings for the same type of device can be imported and exported from one device to another. Click the menu item "Export settings" and select the file path where the settings should be saved. Use this file to import settings to another device (of the same type) or to the same device.

10.8.5 Import parameters

Exported settings can be imported from one device to another. Parameters import can be done via the control Ethernet interface only. Click the "Click to select file" button (see Figure 26), select the file you want to import, and click "Upload."

Figure 26. Import parameters window

The web interface will check the contents of the file as soon as you select the file and prevent the import of invalid content. If the contents of the file are correct, the screen will display the type of device and its description from which the file was exported.

It is also allowed to import settings from one software release to another. Just keep in mind that a new version of the software may miss some of the previous ones or have new additional parameters. In this case, a warning will appear stating that some parameters have not been imported.

10.8.6 Firmware upgrade

When you click the "Firmware Upgrade" menu, your web browser will check for the latest software version. Firmware upgrade can be done via the control Ethernet interface only. The table in Figure 27 with a list of the latest firmware releases will appear on the screen.

Figure 27. Software revision history

To download the firmware from the server to your computer, click on the "download" icon (indicated by an arrow in the picture). Note "Current software version" will be written if the device already has this firmware version.

Various notes will be provided here for each firmware release. Notes will be written in English only, regardless of language choice.

After downloading the firmware file, click the "Select firmware file" button in the Firmware upgrade table (see Figure 28).
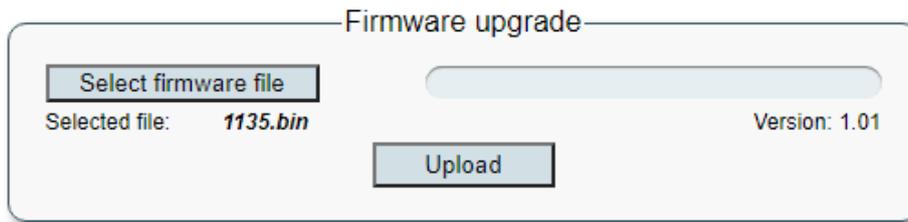

Figure 28. Firmware upgrade

If valid firmware files have been selected, the firmware version number will be displayed as shown in Figure 28. Click the "Upload" button to upload the file to your device. A confirmation message appears on the screen asking you to reboot the device. Do not disconnect the power supply from the device during programming.

The login window will appear on the screen as soon as the firmware update is completed. No need to refresh the browser. All device settings will remain unchanged.

10.8.7 Restart the device

The device can be restarted by selecting the "Restart the device" menu. A confirmation message, shown in Figure 29, will appear on the screen confirming that you really want to do this.

Figure 29. Restart the device

There are two types of restart – full or application restart. „Full restart" means, that the whole system will be restarted. Application restart option takes less time, but will restart main application only.

After confirmation, the device will restart. As soon as the device is ready, a login window will appear on the screen.

10.8.8 Auto Restart

The device can be restarted automatically in a sheduled time. Configuration of the auto restart shown in Figure 30.
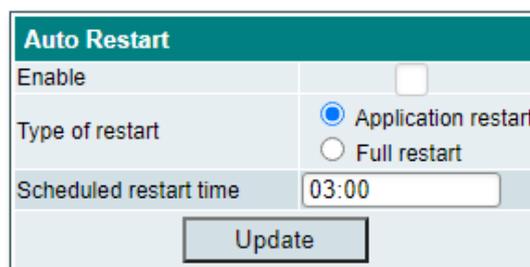

Figure 30. Auto Restart

You can enable/disable the auto restart function, select type of restart (see section **10.8.7**), set sheduled time of restart.

10.8.9 Restore defaults

All settings, except IP parameters, can be reset to factory defaults by selecting the Restore defaults menu. A confirmation message will appear on the screen asking if you really want to do this. Once confirmed, settings will be restored to their default values, and all streams and logs will be deleted.

10.8.10 Language, country

The icon for the item in the "Language, country" menu shows the two-letter code for the active country. See Figure 31.
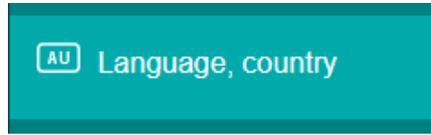

Figure 31. Language, country menu item

Figure 32. Language, country window

When you click an item, a pop-up window as shown in Figure 9 will appear, prompting you to select the language, country, and region where your device is located. Incorrect country selection can affect the time zone and other important settings. Make sure the setting is set correctly. The choice of language affects the language of the control interface. Different browsers can have different languages at the same time. The language selection is saved in the browser as a cookie.

The time zone is selected based on Wikipedia information for the selected region. (+ DST) note means that the time zone contains winter and summer time, which will be selected automatically. In the future, governments may change the time reversal rules, or the time zone of the region. Inform the manufacturer of this device if the time zone information does not correspond to reality.

10.8.11 Date, time

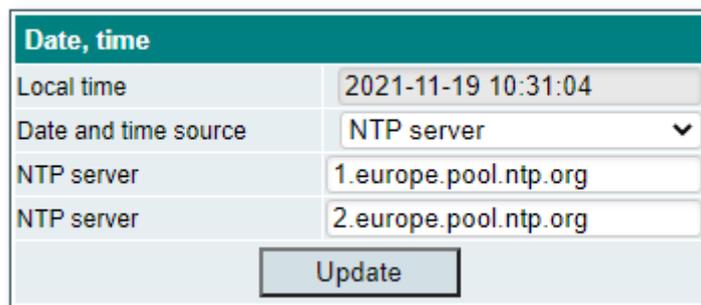Figure 33 shows the two NTP servers as a date / time source.

Figure 33. Date, time

"Local Time" shows the time the device currently has, estimating possible DST offset. If the time on this line is not correct, make sure you select the correct country (see section **10.8.10**). Date and Time Source has three options: NTP Server, Manual Input and Transport stream from demodulator. In the case of an NTP server, at least one server URL must be specified. Make sure the IP settings (see section **10.7**) are correct and the device can access the server. After clicking "Update", the device will try to connect to the server and update the "Local Time" line. The device will synchronize the time automatically later.

"TS input no" option selects a transport stream from demodulator for a source of time. It has no effect to streaming. All original TDT/TOT (Time Data Table/ Time Offset Table) PID 20 pass directly from input to each output without modification.

The Manual Input option can only be used for testing, as it will never be synchronized with any external time source and the time will be reset if the power supply is disconnected.

11. "RESET" button

"RESET" button (Figure 1, position **[7]**; Figure 2, position **[6]**; Figure 3, position **[5]**) has different functions, which mainly depend on the duration of the press.

- **Device reset**
  A short press (less than 2 seconds) will restart the entire system. Red "STATUS" LED (Figure 1, position **[8]**; Figure 2, position **[7]**; Figure 3, position **[6]**) indicates acceptance of this command.
  This corresponds to the section **10.8.7** "Restart the device" execution "Full restart" function.

- **IP reset**
  Pressing the button for 2-5 seconds will activate the IP reset function. A flashing red-green status LED will indicate an activated IP reset command. It will set the control Ethernet interface address to default value (192.168.1.10) and reset the WEB interface port to 80. A full reboot of the device will then be performed.

- **Restore defaults**
  Pressing the button for longer than 7 seconds will activate the "Restore defaults" function. Green blinking status LED will indicate an activated command. After releasing the button, all parameters will be restarted to their default values and application will be restarted.

- **Full erase**
  This command is intended for use in critical situations where it is not possible to use other recovery method. The command will delete all files from the device and restore the original application from read-only memory. All firmware upgrades will be lost, so you will need to perform the "Firmware upgrade" (see section **10.8.6**) feature to have the latest software version.
  The device must be switched off to call this function. Press the "RESET" button and turn on the power. Hold down the button for a few seconds until the status LED starts flashing red-green. When it starts flashing, keep it pressed for a further 3 seconds until the LED lights up green. After this point, releasing the button will start the deletion procedure. If you change your mind and want to cancel this procedure, but holding down the button for life is not an option - you can turn off the power. The operation will be canceled.

Technical specifications

Type		sdi416	sdi482C
Number of channels		16	8
RF input		DVB-S/S2/S2X	
	frequency range	950-2150 MHz	
	AGC range/impedance	45-85 dBμV / 75 Ω	
	symbol rate	2 ÷ 45 Ms/s	
	loop through frequency range/loss	950-2150 MHz / ≤ 1.5 dB	
LNB powering/control		0/13/18 V & 1 A max. DiSEqC 1.0, EN50494, EN50607	
IP output	standard	IEEE 802.3 1000 Base T*	
	bit rate	up to 1.2 Gbps	up to 0.6 Gbps
	transmission protocols	UDP/RTP	
	multicast	Yes	
	MPTS	Yes	
	SPTS	Yes	
CA modules		No	Yes
Control port		standard IEEE 802.3 10/100 Base T	
Current consumption		12 V⎓ 0.8 A**	12 V⎓ 1.0 A***
Operating temperature range		0° ÷ +50° C	
Dimensions/Weight (packed)		48.5x198x112 mm/0.97 kg	

*   IEEE 802.3 10/100 Base T standard is not supported

**   without external DC feeding, with maximal external load 3.0 A

*** without external DC feeding and CAM, with two CAM's and maximal external load 3.2 A

Type		SDI516C
Number of channels		16
RF input		DVB-S/S2/S2X
	frequency range	950-2150 MHz
	AGC range/impedance	45-85 dBμV / 75 Ω
	symbol rate	2 ÷ 45 Ms/s
	loop through frequency range/loss	950-2150 MHz / ≤ 1.5 dB
LNB powering/control		0/13/18 V & 1 A max. DiSEqC 1.0, EN50494, EN50607
IP output	standard	IEEE 802.3 1000 Base T*
	bit rate	up to 1.2 Gbps
	transmission protocols	UDP/RTP
	multicast	Yes
	MPTS	Yes
	SPTS	Yes
CA modules		Yes
Control port		standard IEEE 802.3 10/100 Base T
Power consumption**		230 V∼ 50/60 Hz 16 W
Operating temperature range		0° ÷ +50° C
Dimensions/Weight (packed)		114x240x141 mm/2.8 kg

*   IEEE 802.3 10/100 Base T standard is not supported

** without external DC feeding and CAM, with two CAM's and maximal external DC feeding 43 W max.