

PCU 4000



User manual

MADE IN GERMANY

0901778 V2

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1. Hazards and safety instructions

Before working on the PCU 4000 please read the following safety precautions and the safety

Power supply and power cord

The device must be operated only at a power supply with a voltage of 230 V / 50 Hz.



Connection cable

Place the connection cable always trip proof !

Replace the power cord only with an original power cord.

Potential equalization / grounding

Proper grounding and installation of the device must be carried out according to EN 60728-11 / VDE 0855-1 regulations.

Operation without grounding or potential equalization of equipment is not allowed.

Humidity and placement location

The device must not be exposed to dripping or splashing water. If water condensation occurs, wait until the device is completely dry. The device must be installed on a vibration-free location.

Ambient temperature and heat effect



The maximum allowable ambient temperature is 45 ° C.

The ventilation holes of the device must **NOT** be covered under any circumstances. Too much heat or heat accumulation affect the life of the device and can be a source of danger.

To prevent heat buildup and to ensure good ventilation, the device must be mounted horizontally (eg. on a wall). The device must not be mounted above, on top, or near heat sources (e.g radiators, heating plants), where the device is exposed to heat radiation or oil vapors. The installation must be done **only** in rooms that ensure compliance with the permissible ambient temperature range, even under changing climatic conditions.



If the device exceeds the maximum operating temperature, it automatically switches to a reduced power consumption. The device is out of function during that time.

Once the temperature has reached again the allowable range, it automatically switches back on.

Warning:

When installed in rooms such as storage or attic one should pay particular attention on compliance with the ambient temperature. Because of the danger of fire due to overheating or lightning strike, it is recommendable to install the device on a noncombustible surface. Combustible surfaces are wood beams or bars, wood boards, plastic materials, etc.

Conditions to ensure electromagnetic compatibility (EMC)

All covers, screws and connectors must be securely mounted and tightened, contact springs must not be bent or oxidized.

Opening the case

ATTENTION Device's case opening and repairs must be performed only by authorized staff. First to be done is to pull the network plug. Replacing of fuses must be done only with fuses of same type, value and melting characteristics.



No maintenance work during storms



ATTENTION

This module contains ESD components! (ESD = Electrostatic Sensitive Device). An electrostatic discharge is an electrical current pulse, which can flow also through an electrically insulated material, when triggered by large voltage difference.

To ensure the reliability of ESD components, it is necessary to consider their most important handling rules: Electrostatic sensitive components can be processed only on electrostatic protected area (EPA)!

- Pay attention permanently to potential equalization (equipotential bonding)!
- Use wrist straps, approved footwear for personnel grounding!
- Avoid electrostatically chargeable materials such as normal PE, PVC, polystyrene!
- Avoid electrostatic fields >100 V/cm !
- Use only labeled and defined packing and transportation materials!

Damage caused by faulty connections and / or improper handling are excluded from any liability.

Waste disposal

Electronic equipment is not household waste but should be properly disposed on electrical and electronic equipment waste - in accordance with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL.

Please take this device at the end of its use for proper disposal at the designated public collection points.



WEEE-Reg.-Nr. DE 51035844

2. General Information

The PCU 4000 is a modern, compact transmodulator converting 4 DVB-S/S2, DVB-T/T2 or DVB-C signals into 4 DVB-C/DVB-T channels. The headend can decode encoded programmes using a suitable CI module. Its simple and quick assembly, configuration and programming enable commissioning without problems. Up to 4 transponders from up to 4 different signals can be transmitted. This makes it possible to transmit SD and HD programmes via all transponders, regardless of whether these are encoded or non-encoded.

3. Description

The compact headend PCU 4000 from POLYTRON converts four signals (DVB-S/S2, DVB-T/T2 or DVB-C) into DVB-C/DVB-T signals. The four inputs are each provided with a CI interface for decoding encoded signals. With this, QAM communal installations can be simply and cheaply supplemented with centrally decoded ranges. Also conceivable is use as free-to-air basic supply in a small boarding house or hotel, because around 20 programmes of 4 transponders are already made available. The headend can be simply and quickly programmed via the USB interface. No knowledge whatsoever the assigning and administration of IP addresses is required for this. The selected settings can be printed and saved and also transferred to other devices with a USB-stick. Due to the integrated LAN connection, it is possible to remotely control all parameters. The headend works in the frequency range 112 to 862 MHz and converts the selected satellite transponders completely including the additional services Teletext, EPG etc. The output is also suitable for adjacent channels and has a level of 90 dB μ V. The PCU 4000 is equipped with an energy-saving switching power supply which also serves for the supply of the LNB (tuner 1 and tuner 2). At tuner 4, a 12V supply is available on the terrestrial input. The supply voltages can be switched on or off by means of jumpers.

PCU 4111 = DVB-C at the output

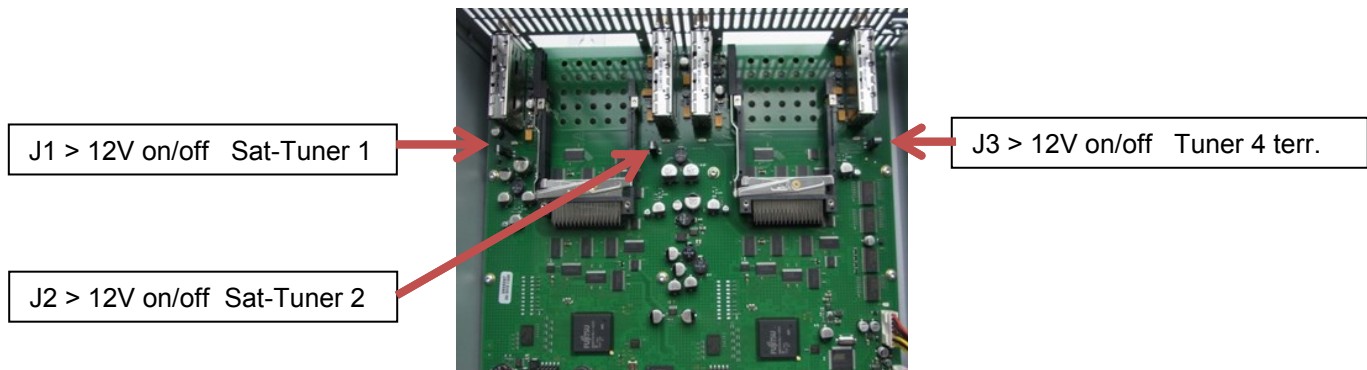
PCU 4121 = DVB-T at the output

4. Scope of delivery

- 1 x PCU 4000
- 1 x Power cable
- 1 x USB-cable
- 1 x USB-Stick (Programming software)
- 1 x Operating instructions
- 1 x Installation accessories
- 1 x Drilling template
- 1 x LAN patch cable

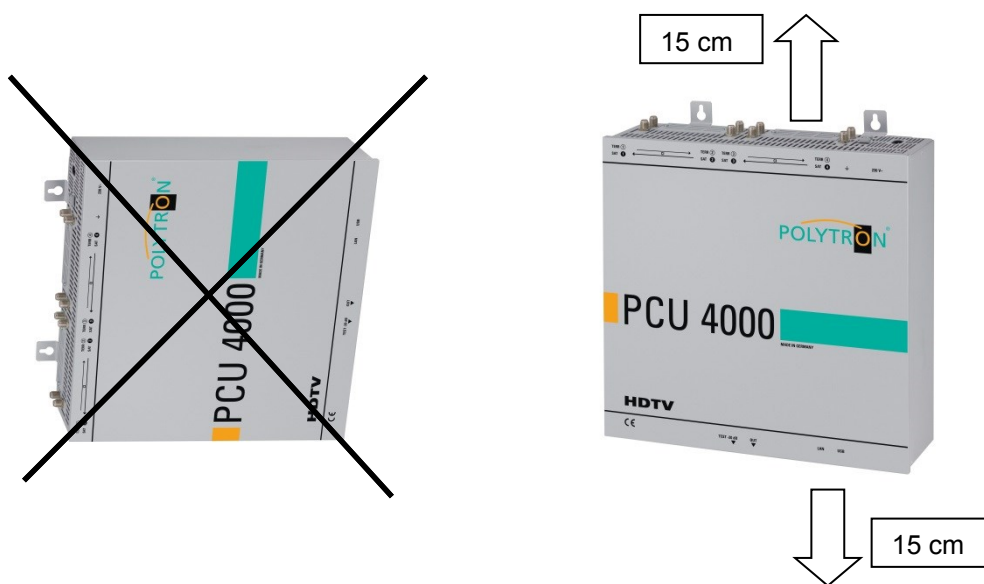
5. Input Circuit

In the PCU 4000, signals are directly fed to the input tuners. Due to the triple tuner, there are 4 ports for SAT signals and 4 ports for terrestrial signals (DVB-T/T2 or DVB-C). As factory default, there is an additional 12V DC input for LNB supply on the SAT input tuner 1 and tuner 2. This input can be switched off using the jumpers J1 and J2. On tuner 4, 12V supply voltage for the terrestrial range can be connected by plugging in the jumper J3. The operating states are indicated by LEDs.



6. Assembly

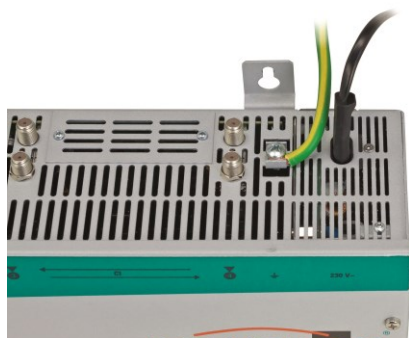
The installation of the compact headend must take place in a well ventilated room. The ambient temperature must not be more than 45°C. It must be ensured that the air can circulate through the ventilation holes. There must be at least 15 cm of space around the device, so that the air can circulate properly. The plug must be pulled from the socket before installation or work on the cabling.



6.1. Earthing

The device must be earthed in accordance with EN 60728-11.

- Strip approx. 15 mm of the cable insulation of the earthing cable (4mm²).
- Push stripped end under the earth screw and tighten the screw.



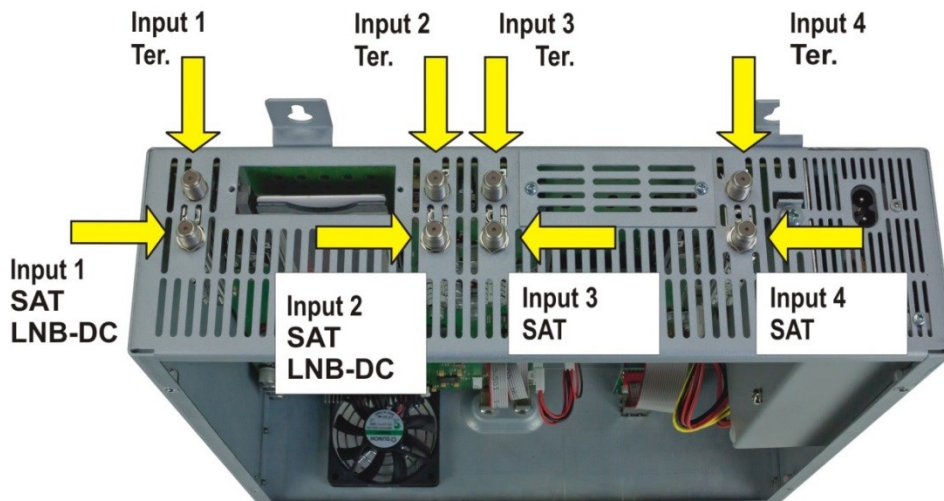
7. Installation

Connection of the Inputsignals

Connect SAT signals directly or via splitter to the sat tuner inputs. At input 1 and 2 there are 12 V DC for the supplying of the LNB. DVB-T and DVB-C need to be connected to the terrestrial inputs. At the terrestrial input 4 there are 12 V DC for a terrestrial pre-amplifier.

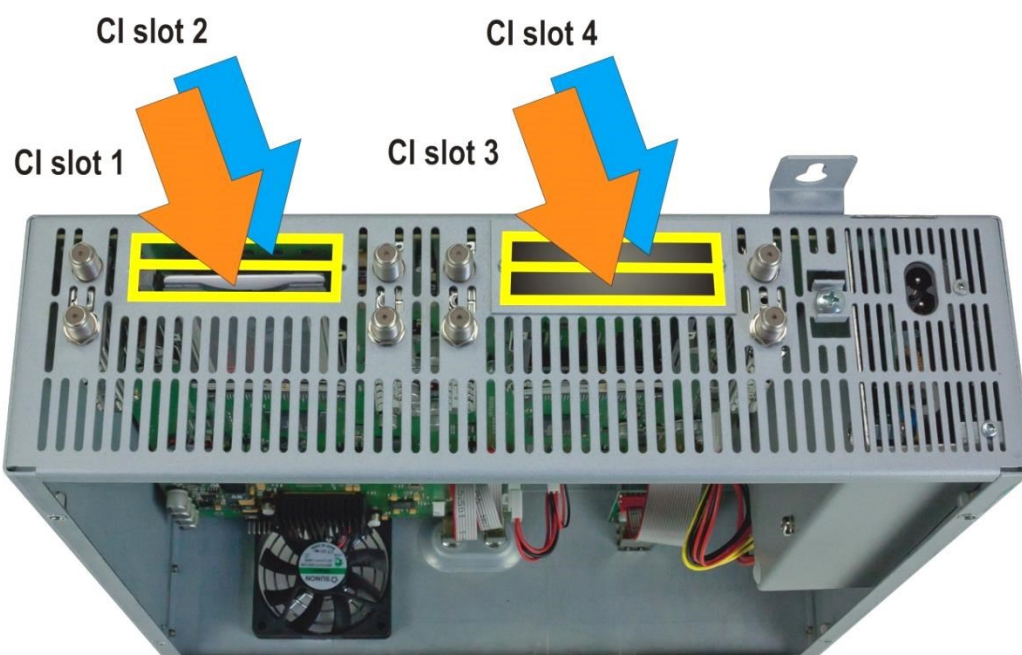


Please note that the consumption of each input must not exceed 250 mA.



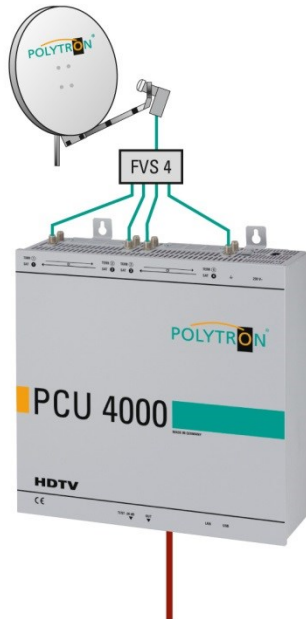
Insertion of the CI Modules

To insert the CI modules, the covers must be removed. Use the picture to see how the CI slots are assigned to the SAT inputs. Always insert the module with the address facing forwards (in the direction of the lid).



7.1. Pre-programming

The inputs and outputs of the device are pre-programmed ex-factory with a german standard frequency allocation. In order to receive the pre-programmed ASTRA transponder, the SAT inputs must be connected with the "horizontal high" level in accordance with the following picture.



Platz/ Slot	1	2	3	4
Transponder	ARD Digital HH 11836	ZDF Vision HH 11954	SAT1 / Pro7 HH 12545	RTL World HH 12188
Symbolrate	27500 kSym	27500 kSym	22000 kSym	27500 kSym
ASTRA	Das Erste BR FS Süd HR SWR BW WDR Köln BR FS Nord	ZDF 3 Sat Ki.Ka ZDF Info ZDF neo ZDF kultur	Sat. 1 Pro 7 Kabel 1 N24 Sat. 1 Gold etc.	RTL RTL 2 VOX Super RTL N-TV etc.
Ausgang/ Output	306 MHz	314 MHz	322 MHz	330 MHz

7.2. Input Level

In order to ensure flawless reception, make sure that the level at the inputs is between **50** and **80 dB μ V**.



When receiving digital signals it is advantageous to have a lower rather excessively high level.

If the input level is too high, an attenuator is to be used.

7.3. Output Level

Upon delivery, the output level is **90 dB μ V**. This can be changed via the device programming. There is an output level reduced by 20 dB at the TEST socket.



8. General Programming

After the mains cable is connected, the device runs through an internal routine and all 4 channels are set with the previously stored data. During this, the **status LED** next to the USB socket flashes green.

Only after the **status LED** is continuously green or orange, contact is possible between PCU 4000 and Laptop/PC.

8.1. Software Installation

Download the software package from the homepage www.polytron.de (**satc12_Vxxx.zip**) and unzip in the directory of your choice (e.g. **C:\ PCU 4000**).

The software can also be loaded from the enclosed USB stick.

8.1.1. Installation of the Driver

Start **Instal_driver.cmd**

Follow the instructions on the screen.

In some first installations the following dialog can appear. This depends on the operating system. Carry out the following instructions and select the selection fields:



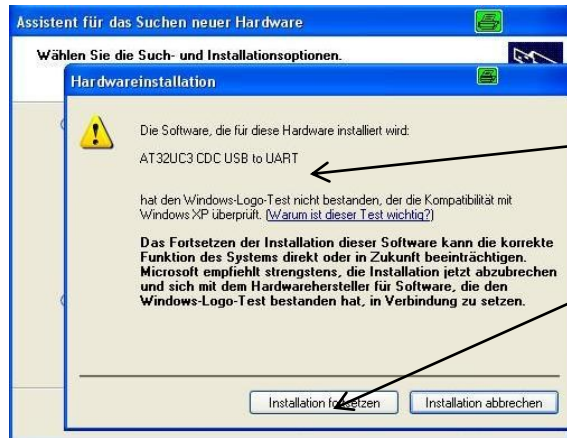
no, not this time

next



install Software automatically

next



If this notice is displayed:
Continue the installation



The software was installed for the following hardware

finish

The installation of the driver software is now complete.

8.1.2. Installation of the Programming Software

Install the software by starting the "Setup.exe" program in the desired folder.

Follow the instructions on the screen.

Close the screen displays once the installation has ended.



After the installation of the programming software on the PC, the PCU 4000 can be connected to the PC with the USB cable.

Only connect the device to the PC once the software installation has been completed.

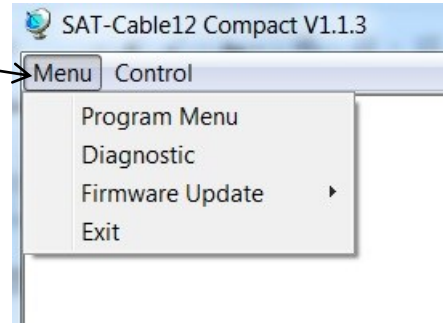


8.2. Programming of the Device Parameters

Start the program – **SATC12** –



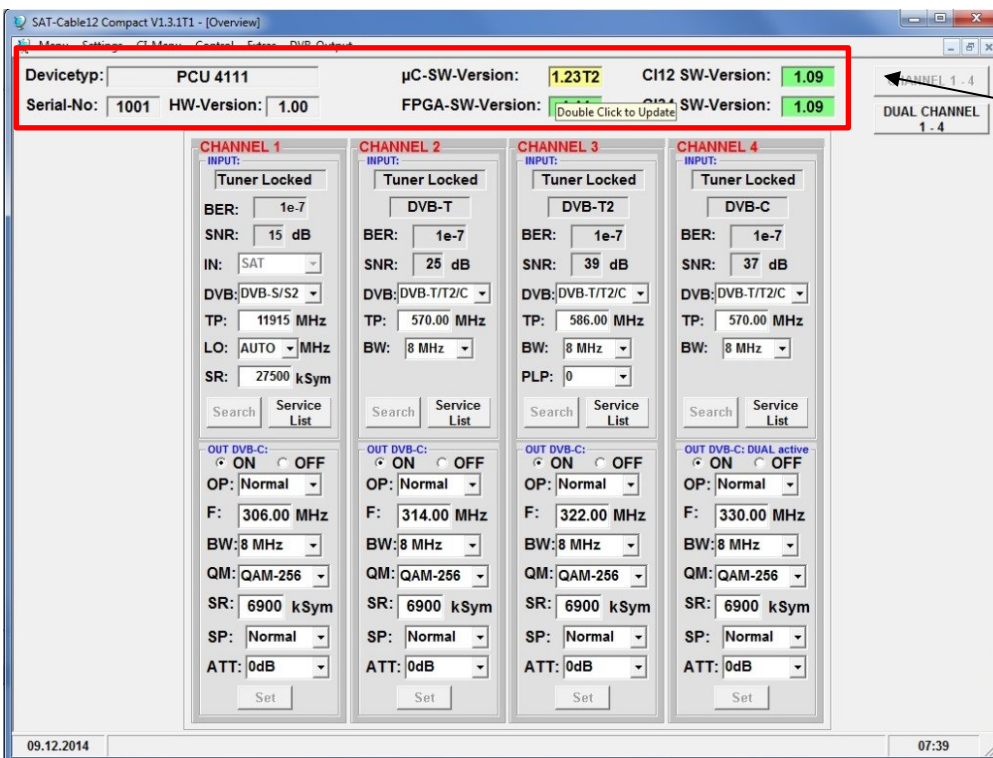
Click on **Menu** at the top left



The following menu points are available:

- **Program Menu**
- **Diagnostic**
- **Firmware Update**
- **Exit**

Select **Program Menu**: all adjustments of the input and output parameters are carried out here. After the calling of the menu, all 4 channels are and the respective *adjusted parameters are displayed*.



In the top part of the menu, the device data is displayed, such as type, serial number, hardware version and the software statuses for CPU and FPGA.

8.2.1. Input parameters SAT reception

DVB > Input signal

Chosse the kind of signal

If DVB-T/T2 or DVB-C is choosen, go further in the passage TER. reception

TP > Transponder frequency

Enter transponder frequency

Auto > LO. -frequency

AUTO sets the required frequency automatically.

Can however be set to **09750**,

10600 or another

OTHER frequency.

SR > Symbolrate

Enter symbol rate

Search >

After the button **Search** has been activated, the data is accepted and the desired transponder is set.

Tuner Locked

If the tuner finds the transponder **Tuner Locked** is displayed in the upper field.

Receiving Conditions

The quality of the input signal can be evaluated using the bit error ratio

BER and the signal-to-noise ratio **SNR**.

The guidelines shown apply to the signal-to-noise ratio SNR. The corresponding values of the FEC (forward error correction) are to be taken from the tables of the satellite operators. If e.g. the transponder has an FEC of 5/6, the SNR display must be at least 9 dB to guarantee good signals.

FEC	gut	sehr gut
1/2	5-7dB	8-11dB
2/3	7-9dB	10-13dB
3/4	8-10dB	11-14dB
5/6	9-11dB	12-15dB
7/8	10-12dB	13-16dB

8.2.2. Input parameters for the terrestrial range

TP > Input Frequency

The kind of input signal will be identified automatically.

Select input frequency

BW > Channel Bandwidth

7 or 8 MHz

PLP > Select Service (DVB-T2)

Select PLP

Search > Searching

After the button **Search** has been activated, the data is accepted and the desired channel is set.

If the tuner finds the channel **Tuner Locked** is displayed in the upper field.

Receiving Conditions

The quality of the input signal can be evaluated using the bit error ratio **BER** and the signal-to-noise ratio **SNR**.

Recommendation: bit error ratio **BER** should be $\leq 1e-6$

The guidelines shown apply to the signal-to-noise ratio SNR. DVB-T should have a min. SNR of 26 dB and DVB-T2 of 32 dB.

8.2.3. Output Parameters DVB-C

OP > Operating Mode

Normal > normal mode

Single > single carrier for level measurement with an analog antenna measuring device

Zero > digital channel with content 0 (constant level without fluctuations)

F > Output Frequency

Frequency freely selectable. It is recommended to stick to the corresponding TV standard channel spacing. The frequency of the channel middle is set. (e.g. channel 21, 410- 478 MHz, set 474 MHz)

BW > Bandwidth

Choose bandwidth depending on output frequency between 7 MHz and 8 MHz

QM > QAM Mode

Setting of the possible QAM mode (16, 32, 64, 128, 256) dependent on the data rate of the input transponder. Only the QAM mode that is possible is displayed

SR > Symbol Rate

up to 7,200 kilosymbols/ sec. is dependent on the selected QAM mode (used setting in cable networks: 256 QAM / SR 6.900). Only the symbol rates that are possible are accepted.

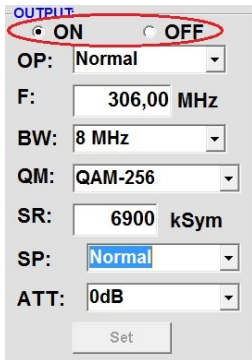
SP > Spectrum

Normal > normal mode

Inverted > Useful signal can be inverted in its spectral position. Inversion is only necessary in exceptional cases.

On **OFF** >

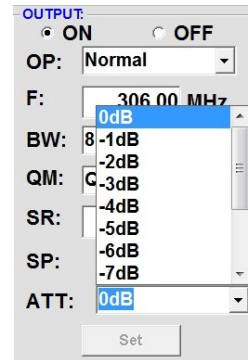
Switching Off Output Channel



OUTPUT:
 ON OFF
 OP: Normal
 F: 306,00 MHz
 BW: 8 MHz
 QM: QAM-256
 SR: 6900 kSym
 SP: Normal
 ATT: 0dB
 Set

If not all 4 output channels are to be assigned, each channel can be switched off individually with **OFF**.

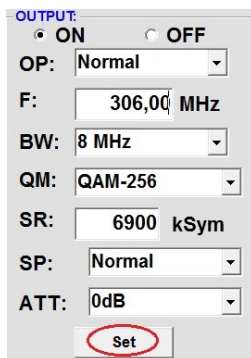
ATT > Output Level



OUTPUT:
 ON OFF
 OP: Normal
 F: 306,00 MHz
 BW: 8 MHz
 QM: QAM-256
 SR: 6900 kSym
 SP: Normal
 ATT: 0dB
 Set

The output level at the output is 90dB μ V and can be weakened in each channel by up to 12 dB in 1dB steps.

Set > Accept Programming



OUTPUT:
 ON OFF
 OP: Normal
 F: 306,00 MHz
 BW: 8 MHz
 QM: QAM-256
 SR: 6900 kSym
 SP: Normal
 ATT: 0dB
 Set

After the setting of all parameters press the **Set** button. With this, the adjusted data is accepted. Repeat steps for other channels.



N.B.: The DVB-C / QAM receivers must be programmed in accordance with the set parameters (search)

8.2.4. Output Parameters DVB-T

OP > Operating Mode

Normal > normal mode

Single > single carrier for level measurement with an analog antenna measuring device

Zero > digital channel with content 0 (constant level without fluctuations)

F > Output Frequency

Frequency freely selectable. It is recommended to stick to the corresponding TV standard channel spacing. The frequency of the channel middle is set. (e.g. channel 21, 410- 478 MHz, set 474 MHz)

BW > Bandwidth

Choose bandwidth depending on output frequency between 7 MHz and 8 MHz

CR > Code Rate

Setting of the possible Code rate (1/2, 2/3, 3/4, 5/6, 7/8)

GI > Guard Interval

Setting of the possible Guard interval (1/4, 1/8, 1/16, 1/32)

CM > Carrier Modulation

Setting of the possible carrier (2k, 8k)

QM > QAM Mode

OUTPUT: ON OFF

OP: Normal

F: 306,00 MHz

BW: 8 MHz

CR: 5/6

GI: 1/32

CM: 2k

QM: 64QAM

SP: Normal

AT: 0dB

Set

Setting QAM mode (16, 32, 64)

SP > Spectrum

OUTPUT: ON OFF

OP: Normal

F: 306,00 MHz

BW: 8 MHz

CR: 5/6

GI: 1/32

CM: 2k

QM: 64QAM

SP: Normal

AT: 0dB

Set

Normal > normal mode

Inverted > Useful signal can be inverted in its spectral position. Inversion is only necessary in exceptional cases.

On **OFF** >

Switching Off Output Channel

OUTPUT: ON OFF

OP: Normal

F: 306,00 MHz

BW: 8 MHz

CR: 5/6

GI: 1/32

CM: 2k

QM: 64QAM

SP: Normal

AT: 0dB

Set

If not all 4 output channels are to be assigned, each channel can be switched off individually with **OFF**.

ATT > Output Level

OUTPUT: ON OFF

OP: Normal

F: 306,00 MHz

BW: 8 MHz

CR: 5/6

GI: 1/32

CM: 2k

QM: 64QAM

SP: Normal

ATT: 0dB

Set

The output level at the output is 90dB μ V and can be weakened in each channel by up to 12 dB in 1dB steps.

Set > Accept Programming

OUTPUT: ON OFF

OP: Normal

F: 306,00 MHz

BW: 8 MHz

CR: 5/6

GI: 1/32

CM: 2k

QM: 64QAM

SP: Normal

AT: 0dB

Set

After the setting of all parameters press the **Set** button. With this, the adjusted data is accepted. Repeat steps for other channels.

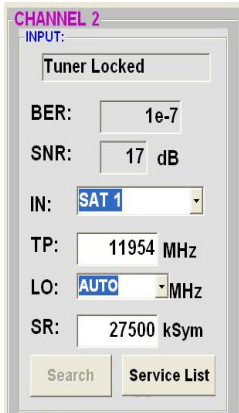


N.B.: The DVB-T / COF receivers must be programmed in accordance with the set parameters (search)

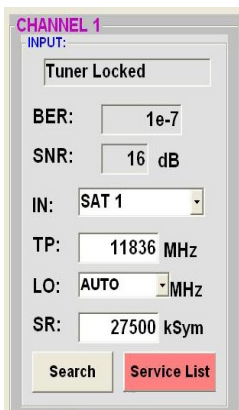
8.3. Function "Service List"

If certain services within a transponder are not desired at the output, they can be removed. Encoded services can still be selected for decoding via this function.

8.3.1. Deletion and Addition of Services



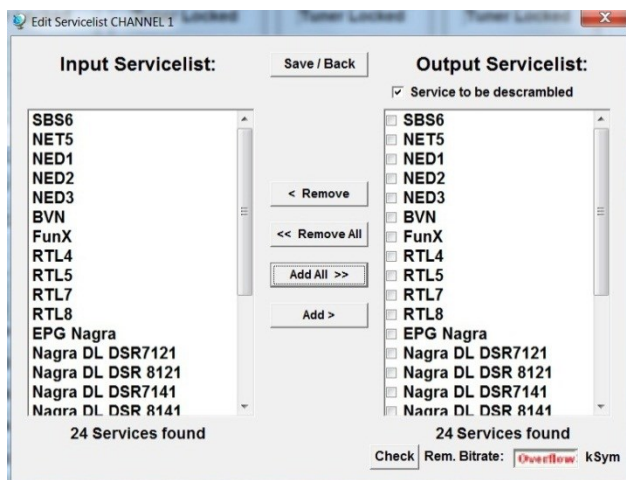
In addition to the "Search Button" another button - "Service List" - is displayed. This is only active if the tuner is locked.



If the data rate at the input is higher than the data rate that is possible at the output due to the set parameters an error message appears and the button for the Service List turns red. In this case, a reduced selection of the desired services must be made.

The field Bitrate is marked by colors.
Green means: The remaining bitrate is higher than 10000 kSym.
Yellow means: The remaining bitrate is less than 10000 kSym.
Red means: The remain bitrate is less than 5000 kSym.
Overflow mean: The datarate is to big for the adjusted DVB-C parameters.

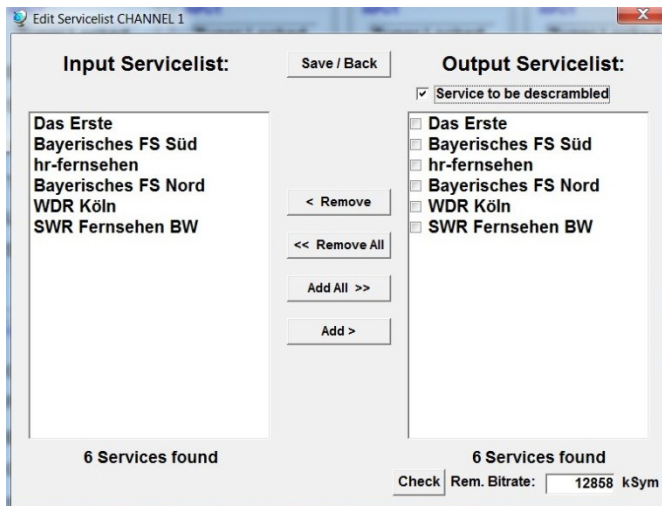
Clicking on this button opens the following window. The list of services available at the input is shown on the left. On the right, one can see the services contained in the output signal. The standard setting after scanning is always "Transparent" i.e. everything that is there at the input also appears at the output.



If the data rate at the output is too high, the word "Overflow" appears in the field Rem. Bitrate. This means that the data rate is too high for the set parameters, and services must be removed.

Undesired services can of course also be deleted if there is no overflow.

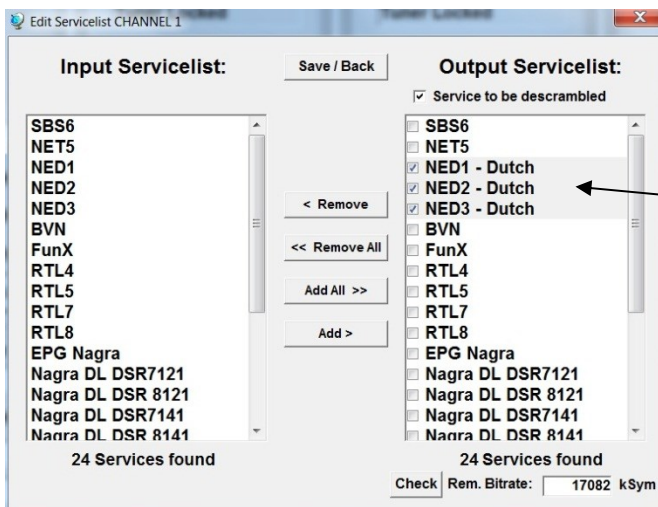
By clicking on a service in the input list and clicking on the command "Add", this service is added to the output list. (Double-clicking on a service in the input list automatically adds it to the output list).
 Clicking on a service in the output list and clicking on the command "Remove" removes this service from the output list. (Double-clicking on a service in the output list removes the service automatically).
 By single-clicking on the "Save/Back" button, the output list is saved and the window is automatically closed.
 If you only want to accept a few services from a transponder that has many, you can first click on "Remove ALL" and then select the required services.



The data rate still available is shown in the field Rem. Bitrate.
 This should be at least 5.000kSym.

8.3.2. Selection of the TV Channels to be decoded

After the CAM module with the appropriate smart card has been inserted in the CI slot, press the Service List button. All available services are displayed in the input and output list. In the output list, now select the desired services to be decoded by placing a tick.



In the output list, now select the desired services by placing a tick.

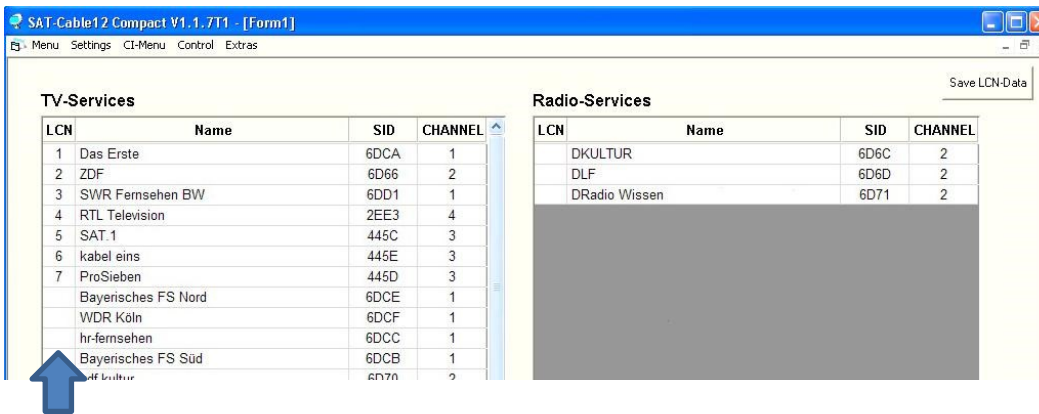
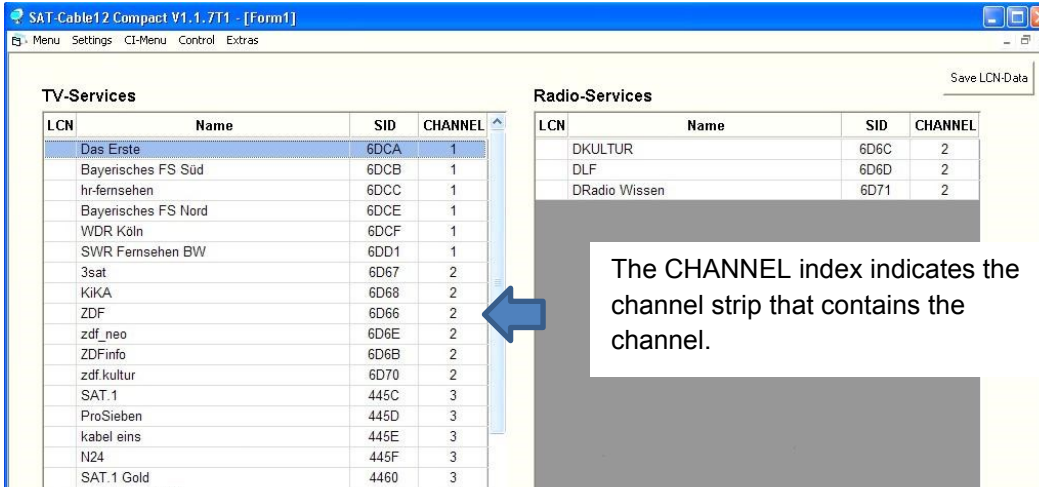
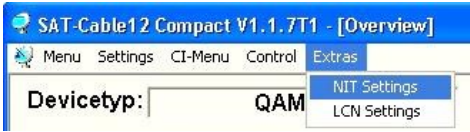
Encoded and non-encoded services can be output together. With a click on the "Save/Back" button the output list is saved and the window is automatically closed.



The CAM modules should always be in a switched-off state when inserted.

LCN function for the allocation of program positions

It is located under the menu item "Extras / LCN settings"



In the LCN column, you can enter the desired program position. These programs are then sorted in order in the table. Programs that didn't get a position code will follow behind the marked programs.

Premise is that the receivers support LCN

8.4. Saving of the Programming

It is possible to save existing programming on a PC and/or to load it from a PC. Program combinations can thus be archived.

The main program is opened with the menu point

Settings

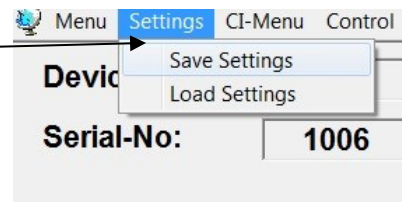


8.4.1. Saving of Settings

With the menu point

Save Settings

it is possible to save the programming onto the PC. A directory and file name (e.g. object) are to be entered for this. The file name must retain the ending .c12!!



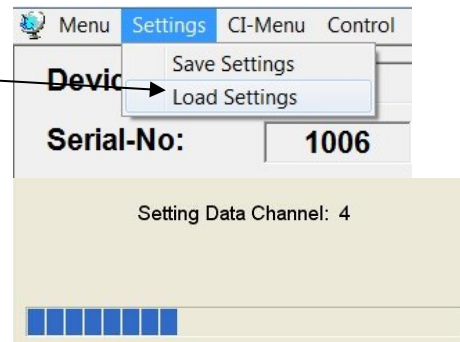
The settings are also saved in an rft file. This is located in the same folder as the PCU 4000 software. This file format can be opened, edited and printed with e.g. Microsoft Word, Open Office or wordpad.

8.4.2. Loading of Settings

With the menu point

Load Settings

it is possible to load existing programming from the PC onto a PCU 4000. For this, the desired file name is to be selected and opened in the register. The data is automatically loaded.



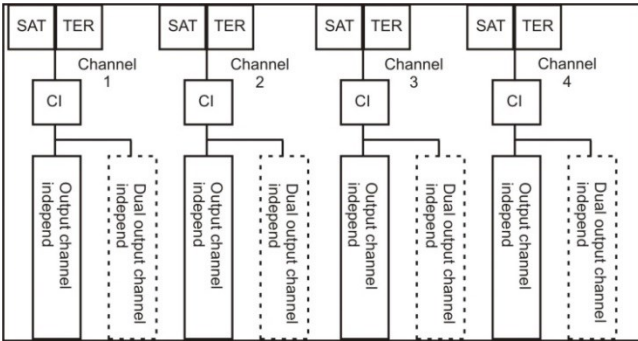
Dual Channel Function

For headend PCU 4000

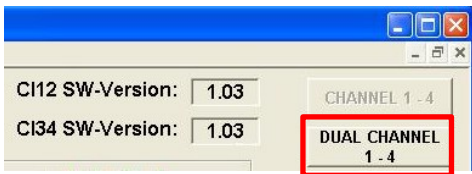
Application:

The data rate of a transponder is too high to place the TV programs in one 7 or 8 MHz DVB-C channel. With the dual channel function, it's possible to split an input signal into two DVB-C output channels.

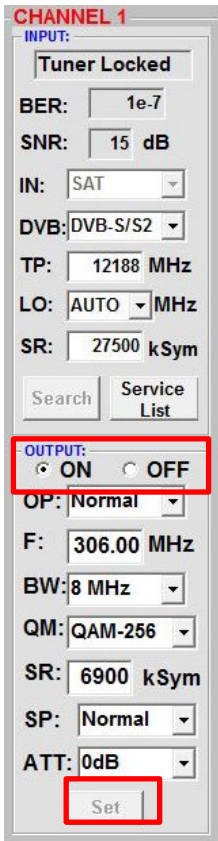
Block diagram of the dual channels function of the PCU 4111 (QAM output)



If the Dual Channel function is needed please click on following Button.



The button is top right.



It's not possible to change the input parameters!

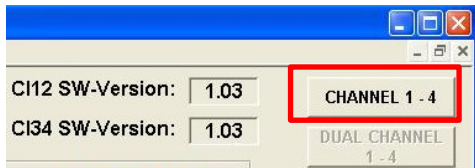
This is the information which transponder will be split.

To activate the dual channel function switch from OFF to ON.

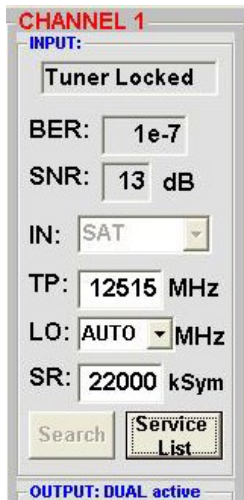
Now the output frequency and other parameters, for the second channel could be changed.

The second output channel is totally independent from the first output channel.

To save the parameters please click „Set“.

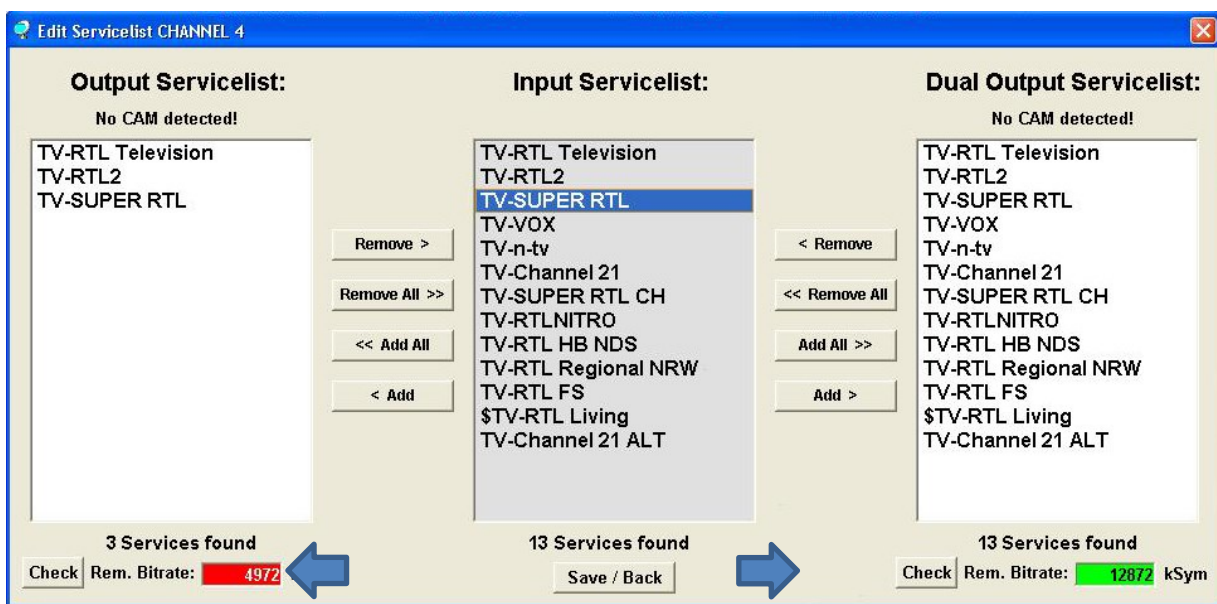


Back to the main menu.



To split the TV programs to both of the output channel, please click the Button „Service List“.

If the second DVB-C output channel is switched on, then a blue script appear „DUAL active“.



The table in the middle „Input Servicelist“ shows all channels of the transponder. With the button Add and Remove the TV programs can be allocate to the both outputs.

To control the Bitrate please click the button “Check”

The field Bitrate is marked by colors.

Green means: The remaining bitrate is higher than 10000 kSym.

Yellow means: The remaining bitrate is less than 10000 kSym.

Red means: The remain bitrate is less than 5000 kSym.

Overflow mean: The datarate is to big for the adjusted DVB-C parameters.

To decode the favored TV programs a hook must be placed in front of the TV program name

The Button „Save / Back“ the parameters will be saved and the main menu appears.

8.5. LAN Function

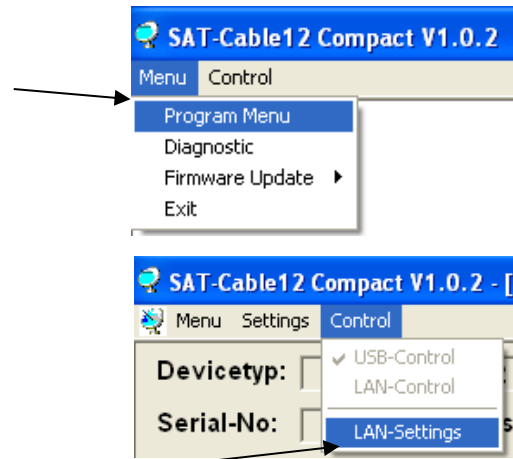
Click on **Program Menu** to open the programming environment. The basic settings are loaded and the user interface is started.

The PCU 4000 possesses the IP address: 192.168.1.227 as a standard setting.

If the system is used in a network with a different network address, the IP address of the PCU 4000 must be accordingly altered.

This change is carried out under the menu point

LAN-Settings.



Example:

The PC operated in the network has the following settings:

IP address: 192.168.010.068
 └───┬───┘
 network share host share

The IP address of the PCU 4000 must only differ in the last block (host share) compared with that of the connected PC. The figures 0, 255 and all figures already used are not permitted!

Example IP address: 192.168.010.100

All changes are saved with **Save**.

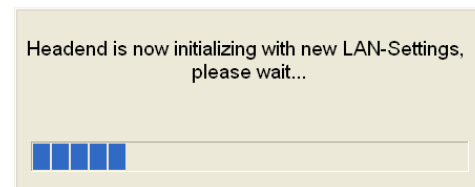
IP-Address:	192	168	001	225
Subnet-Mask:	255	255	255	000
Port:	10001			
	Save			

Please note:



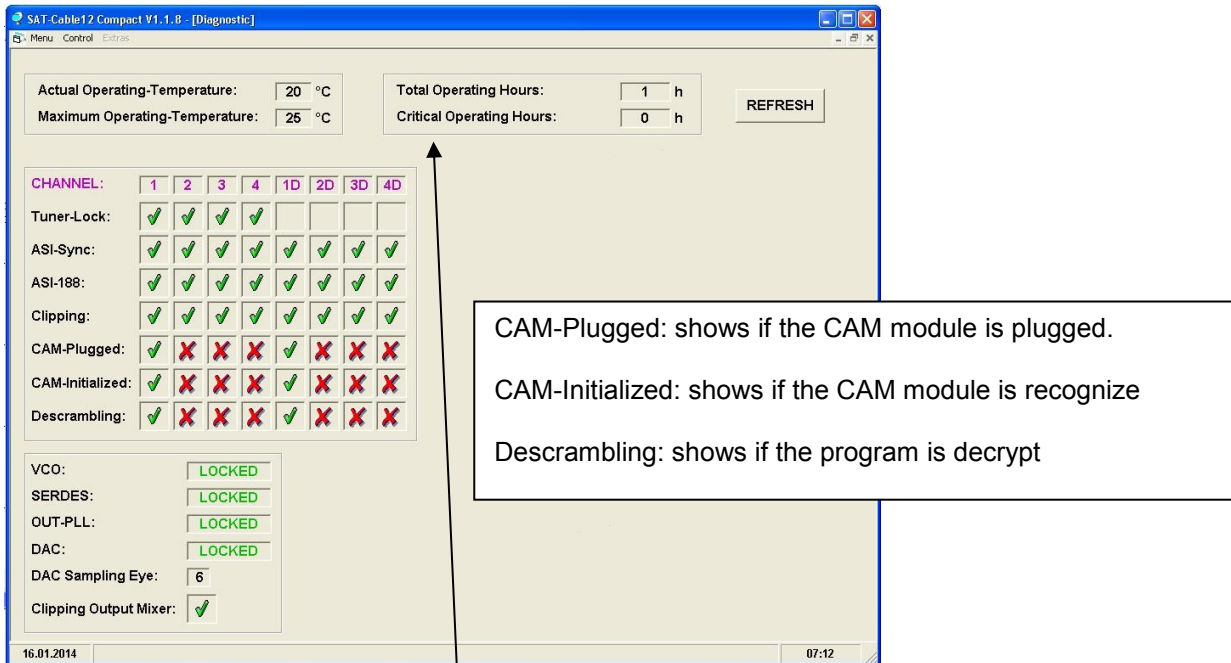
The listed IP addresses are intended as examples. All addresses must be adapted to the network at the location. If this information is not known, the responsible IT specialist should be contacted!

The progress of saving is displayed on the bar diagram. This process can last up to a minute.



8.6. Diagnostics

The "Diagnostic" menu is for service purposes and can be helpful during error analysis by telephone on the **Hotline+49(0)7081-1702-0**. The displayed data can be updated with **REFRESH**.



Menu Header Display:

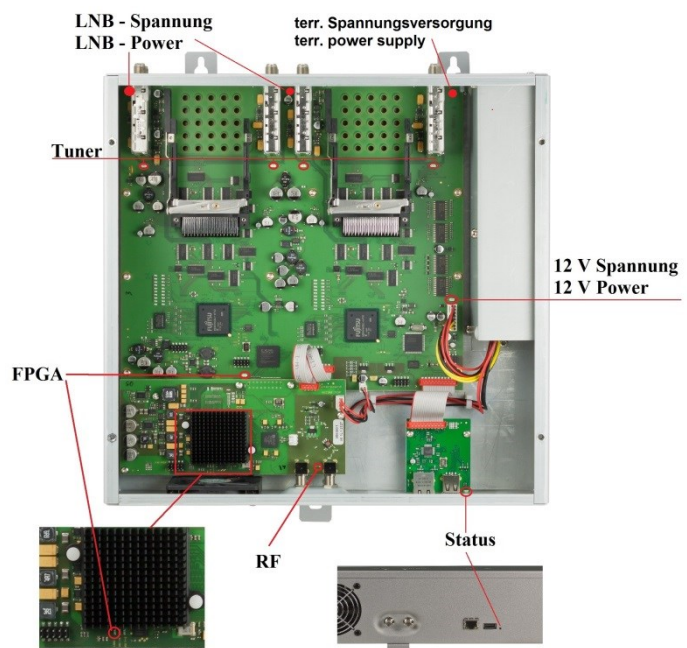
Actual Operating Temperature: approx. current ambient temperature
 Total Operating Hours: operating hours

Maximum Operating Temperature: maximum measured ambient temperature
 Critical Operating Hours: operating hours at ambient temperature of over 45°C

The temperatures shown only correspond to the actual values in the case of correct, vertical installation with a closed housing cover.

8.7. LED Key

- LNB** green: 12V output voltage
off: no output voltage
- Tuner** green continuous: tuner logged
green flashing: tuner not logged
- FPGA** green: configured, ready to operate
off: fault
- 12 V** green: 12 V power adaptor O.K.
off: power adaptor fault
- RF** green: output O.K.
off: fault
- Status** green: all tuners logged, ready for use
orange: different functions in programming



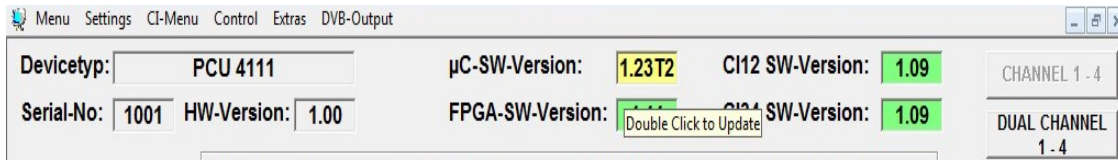
8.8. Firmware- Update

The menu firmware update is used to update the firmware of the device. This way, the devices basic software is brought up to date.

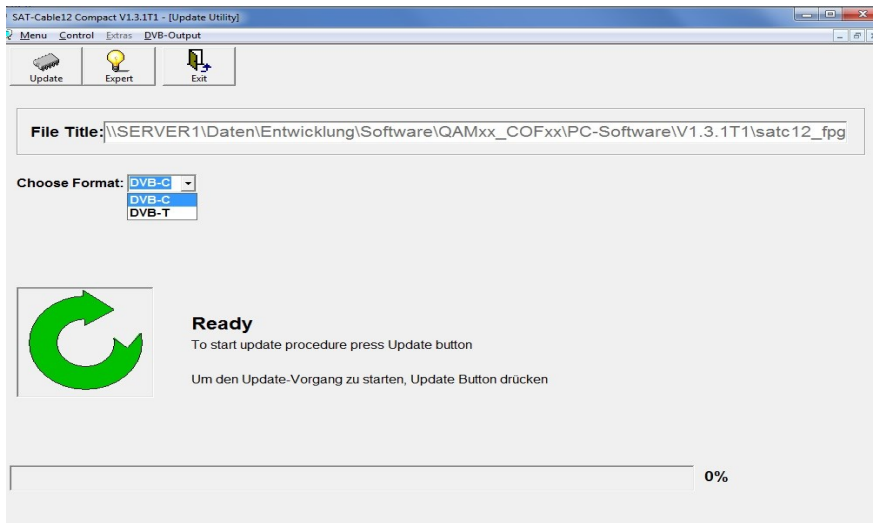
The programming of the input and output parameters carried out under 8.2 is not influenced by this.

8.8.1. Firmware version overview

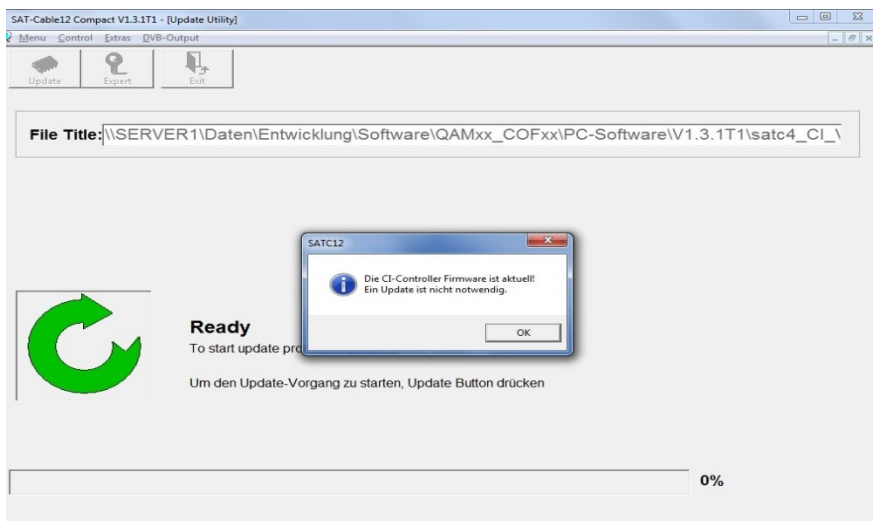
The field of the firmware overview are coloured.
Green signifies the firmware is up to date.
Yellow signifies there is a new firmware available.



Double click on the field which shows the firmware, open automatically the Update menu.



If the firmware is up to date, following picture appears:



8.8.2. Changing the output signal

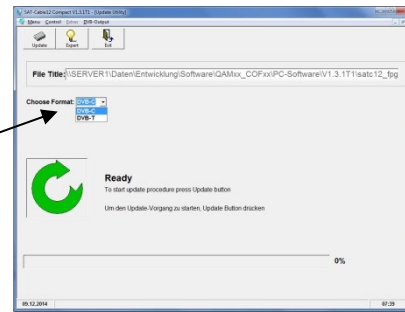
Software: SATC12_QAMxxx.RBF

Update by Laptop/PC:

- Select **Firmware Update**
- Select **QAM- FPGA**

Choose DVB-T or DVB-C

Click the **Update** buttons and new FPGA- Software will loaded.



The FPGA Update takes approx. 15 minutes!

New functionality „Password“:

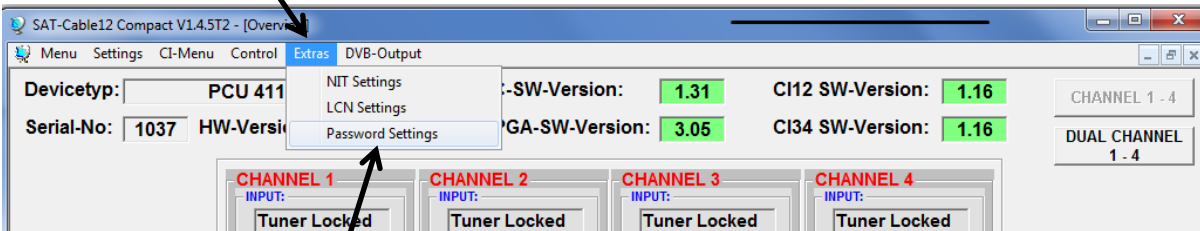
➔ Protection against unauthorized access to the Program-Menu.

The password function isn't activated in the factory settings and can be switched on from µC-SW-Version 1.31 on, like described as follows:

- Start program [SATC12]



- Klick on **Extras** in the upper row.



- Klick on **Password Settings**. It appears following pop-up window, **please urgently note the serial-number**, because this will be needed to reset the password, if required.



- Place a tick in the check-box to select **Use Password**.
- Enter the password (min.6 / max.10 digits) in the input field **Password** (consisting of letters, numbers or special characters in random sequence) and retype the password in the input field **Retype Password**.
- By clicking on **Change Password** a new password can be created.

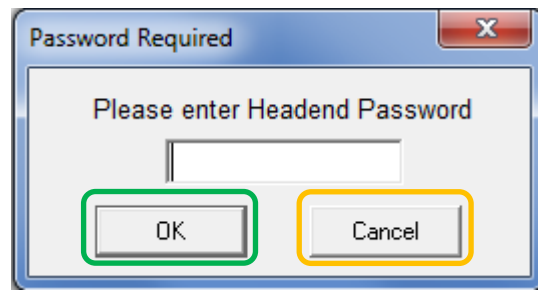


Klick on Save to store the password-settings.



- Exit the program [SATC12] or go on with the settings, if necessary.

After next time starting the program [SATC12] please enter the password in the input field and then click on **OK** to confirm the password or click on **Cancel** to correct the password, if required.



→ Please note: **In this pop-up window is no change of the password possible.**

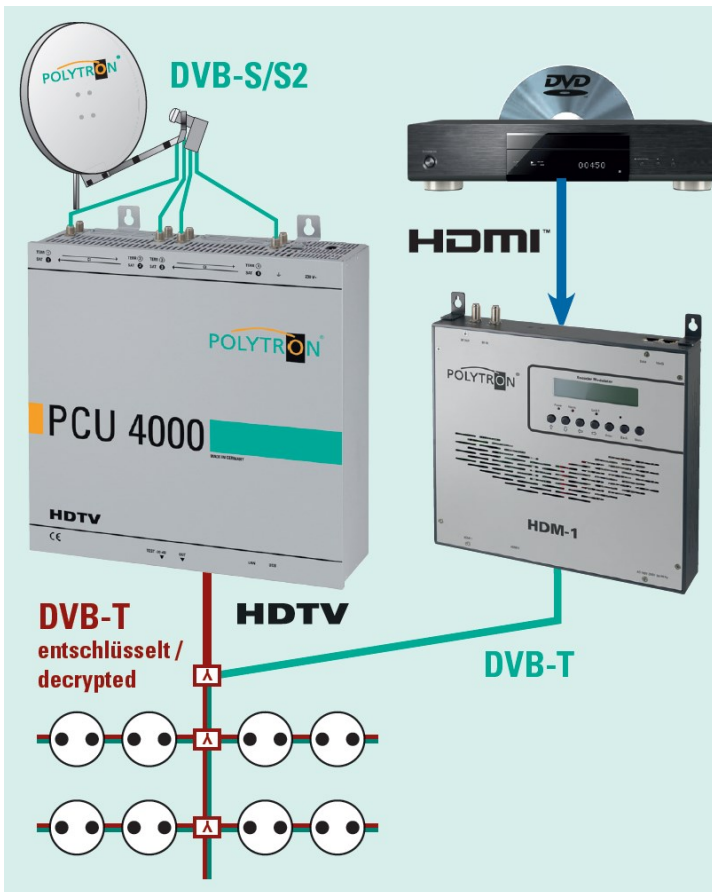
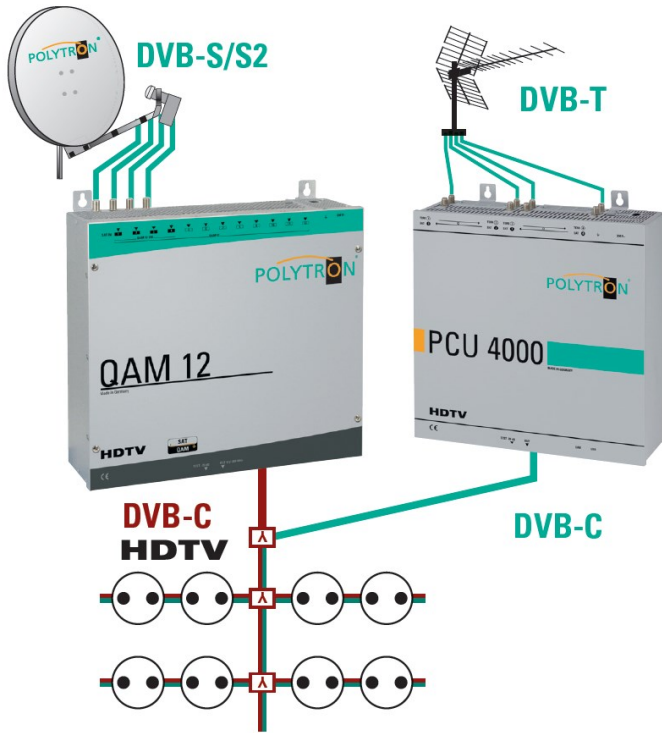
Should the password get lost or has fallen into oblivion we willingly help you relating to the generally password-reset. For this purpose we urgently need the serial-number of the device, as already mentioned on page 1. The serial-number you can also find on the label which is affixed on the outer side of the housing.

The generally password-reset can only be applied by POLYTRON, for this procedure you will get a new password to reactivate the access to the device again.

By removing the tick in the check-box **Use Password** you can certainly also deactivate the password function, but you will need the password to log on before.



9. Application example



10. Technical data

Typ / Type	PCU 4111	PCU 4121
Artikel-Nr. / Article no.	5552150	5552160
Eingänge / Inputs	4	
CI-Schnittstellen / CI slots	4	
Eingangsspegel / Input level	50–80 dB μ V	
Demodulator		
DVB-S2/S		
SR DVB-S / QPSK	1 - 45 MS/s	
SR DVB-S2 / QPSK	1 - 45 MS/s	
SR DVB-S2 / 8PSK	1 - 45 MS/s	
Modulation	8PSK / QPSK	
CR DVB-S / QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	
CR DVB-S2 / 8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	
Roll off	0.35, 0.25, 0.20	
DVB-T		
Modulation	QPSK, 16QAM, 64QAM	
FFT	2K, 8K	
Channel bandwidth	7, 8 MHz	
Code rate	1/2, 2/3, 3/4, 5/6, 7/8	
Guard interval	1/4, 1/8, 1/16, 1/32	
DVB-T2		
Modulation	QPSK, 16QAM, 64QAM, 256QAM	
FFT	1K, 2K, 4K, 8K, 16K, 32K	
Channel bandwidth	7, 8 MHz	
Code rate	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	
Guard interval	1/4, 5/32, 1/8, 5/64, 1/16, 1/32, 1/64, 1/128	
DVB-C		
Modulation	16QAM, 32QAM, 64QAM, 128QAM, 256QAM	
Symbol rate	7.2 MS/s	
Channel bandwidth	6, 7, 8 MHz	
Ausgangsmodulation im Auslieferungszustand	DVB-C	DVB-T
Output modulation ex works	umprogrammierbar auf / programmable to DVB-T	umprogrammierbar auf / programmable to DVB-C
Ausgangskanäle / Output channels	4 + 4	4 + 4
Frequenzbereich / Frequency range	112–862 MHz	112–862 MHz
Signal constellation	16, 32, 64, 128, 256 QAM	QPSK, 16, 32, 64 QAM
Symbol rate	1–7,2 MS/s	/
FEC	/	1/2, 2/3, 3/4, 5/6, 7/8
Bandbreite / Bandwidth	7 / 8 MHz	7 / 8 MHz
Anzahl der Träger / Number of carriers	/	2K
Ausgangspegel / Output level	90 dB μ V	
Regelbare Dämpfung je Kanal / Channel attenuation	0...12 dB	
MER	\geq 40 dB	typ. 38 dB
Leistungsaufnahme / Power consumption	45 W	40 W
Spannungsversorgung / Operating voltage	180–265 V, 50/60 Hz	
Maße (B x H x T) / Dimensions (W x H x D)	331 x 328 x 103 mm	

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Technische Änderungen vorbehalten

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