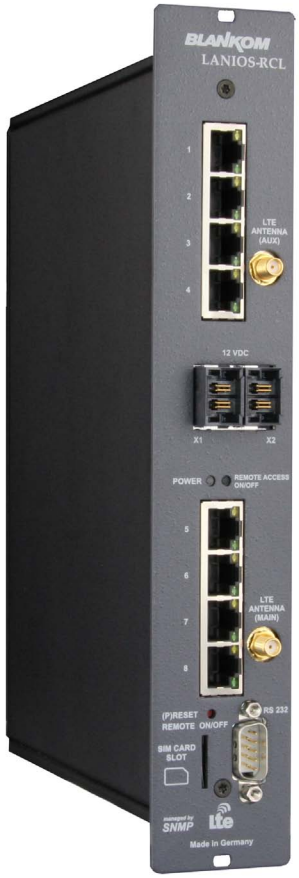
BLANKOM®

Professional Headend Solutions

Operating instructions



8-port Ethernet switch with remote connection

LANIOS-RCL
Part N°: 5161.2x

...Setting Signals

Contents

1. Safety and operating instructions

When assembling, starting-up and adjusting the modules, it is necessary to consider the system specific references in the instruction manual.

The modules may only be installed and started up by authorized technical personnel. There are only permitted the mounting styles indicated in the quick start guide, included with each module.

When assembling the modules into the receiving points, the adherence of the EMC regulations is to be ensured.

The assembly and wiring have to be done without voltage. For installation, only the supplied accessories (DIN rail clip with screws and 19“ accessories) may only be used.

All active modules may only be powerd by the power supplies of the HELIOS family or QUASARIOS. Only connect the module with the accessory cables provided.

The mains voltage and the operating voltage of the modules working by DC have to be in compliance with the operating parameters described in the technical data.

With all work the defaults of the DIN EN 50083 have to be considered. It is especially important to follow DIN EN 60728-11[1].

The unit must only be mounted vertically. The ventilation slots as well as the circulation perforation of the modules is not be obstructed in any way.

If installed in mounting cabinets a adequate heat circulation must be guaranteed. The mounting in closed cabinets without air sufficient flow is **not allowed**.

For **DIN rail mounting** is important to note that between the heat sink and a neighboring module, a distance of 2 cm is required. If the modules mounted on top of each, so they must be spaced 20 cm apart.

For **19“ mounting** all devices in the rack must be fitted with 19“ Edge Guide. Mounting the device using only the screw holes at the front panel is insecure and discouraged. Furthermore, the operation of a fully occupied rack is only allowed with an underlying 1-U fan box (at least 3 fans, 176 mm deep).

WEEE-Reg.-Nr. DE 50389067

2. Device variants

LANIOS-RCL	5161.20	8-port Ethernet switch with remote connection and RS 232 interface (3 pole stereo jack-TRS)
LANIOS-RCL	5161.21	8-port Ethernet switch with remote connection and RS 232 interface (9 pole D-subminiature)

3. Software options

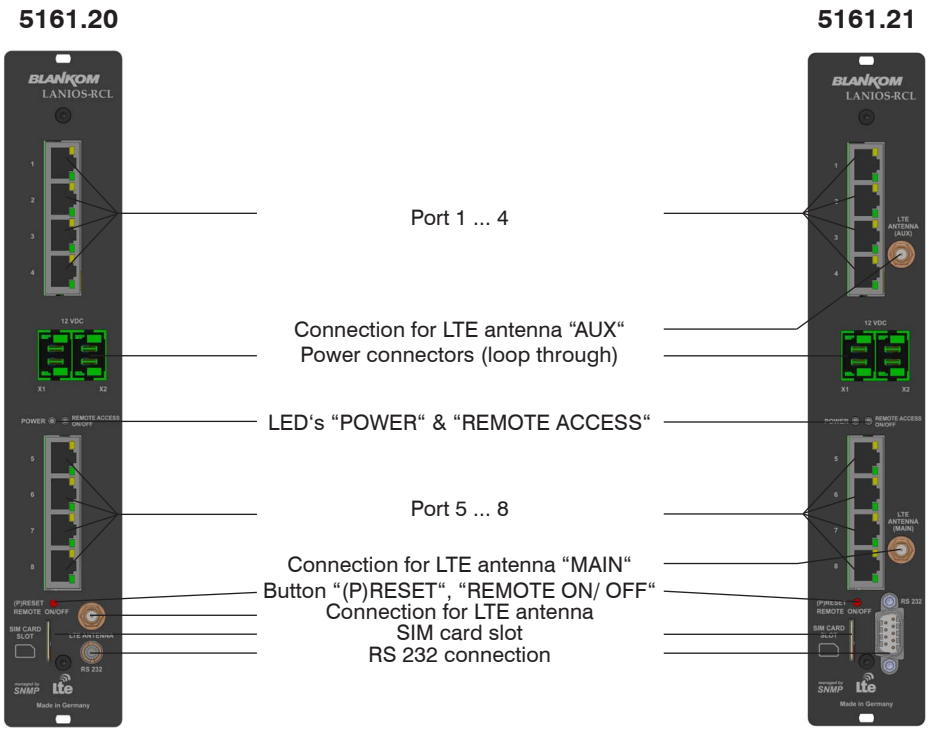
CKB 200	5100.50	activation SNMP v3

4. General

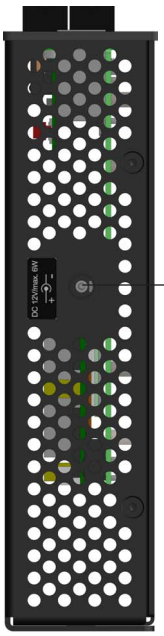
The Smart Business Line (SBL) is a modern head end system, that is distinguished by its modular and compact design. A userfriendly operating concept facilitates setup, configuration and maintenance of the system.
The LANIOS-RCL is the 8-port Ethernet switch with remote connection created for the SBL system. The integrated modem supports the communication via LTE, UMTS and GSM/ GPRS.

5. Explanation of the operating elements

5.1 Front view



5.2 View from above



6. Functional description

The LANIOS RCL module is an 8-port 10/ 100 Base-T Layer 2 Ethernet switch with remote connection, which was developed for the SBL system. It fits seamlessly into the SBL case, control and quality concept. With the switch up to 7 SBL modules can be controlled via a PC/ laptop. If more ports are needed, cascading is possible. Due to its excellent properties, the switch is also applicable for simple IP streaming tasks. The device also includes a UMTS and LTE modem with an embedded server, which is responsible for the mapping of the communication modem.
Auto negotiation and auto MDI/ MDIX crossover are integrated, IGMP snooping is supported.

7. Meaning of the LED‘s

7.1 LED’s at the 10/ 100 Mbit ports

Designation/ colour	Status	Meaning of display
Connect LED/ yellow	permanently on	network cable is connected
	off	no cable connection
Data LED/ green	flashing	data exchange
	off	no data exchange

7.2 Status-LED‘s

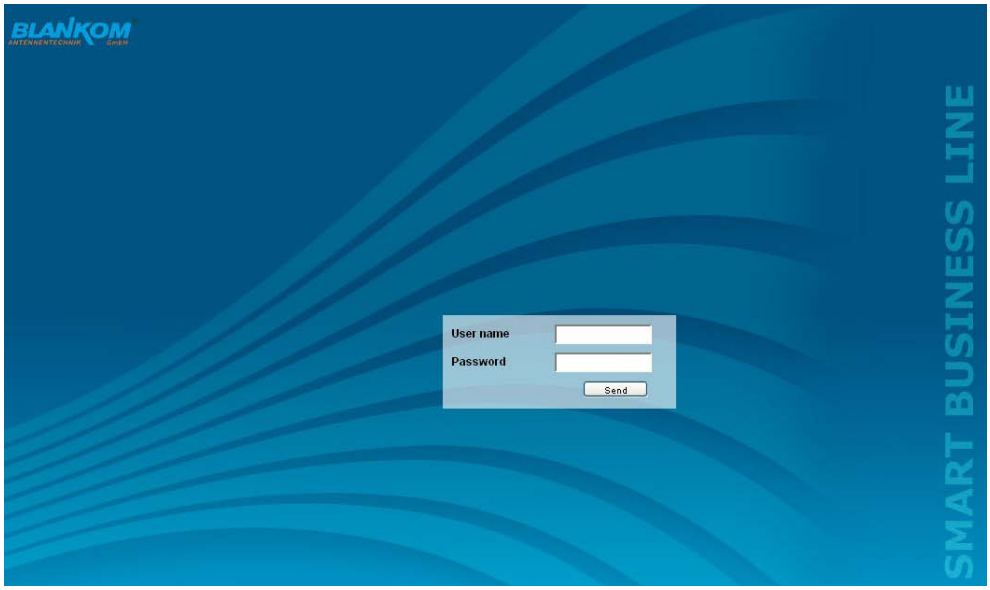
Designation	Colour	Status	Meaning of display
POWER	green	permanently on	module is ready for work
	amber	permanently on	module is in standby
		off	module is off, operating voltage is not applied
REMOTE ACCESS	green	permanently on	remote connection is active
		off	no remote connection

8. Adjusting by web server

8.1 Network connection to the computer

System requirements:
- PC/ laptop with 10/ 100 Mbit Ethernet interface
- Internet browser (e.g. Windows Internet Explorer), which accept JAVA script.

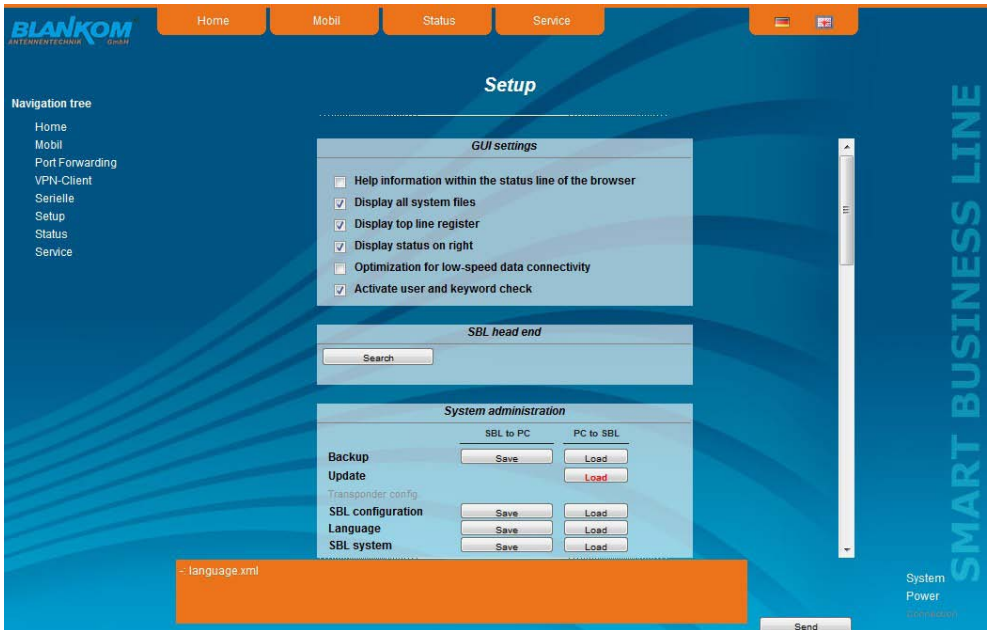
Setup the connection:
The LANIOS-RCL module has to be connected to PC network at one of the 8 ports using an Ethernet cable. The IP address of the LANIOS-RCL module is 192.168.1.100 on delivery. If several SBL modules should be controlled or adjusted via an Ethernet switch, each module must first be configured **individually** to its provided IP address within the network. To do so the address of the network port on the PC (temporary) must be adapted to the IP address of the SBL module (subnet mask: 255.255.255.0, IP address: 192.168.1.XXX, where XXX is not the same as the corresponding value of the SBL module IP address).
After the network configuration of the module(s) the IP address of the control PC is converted to the provided IP address and the modules can be accessed through the browser with their new IP addresses. The user must authenticate himself with his credentials (user name and password), if the password and user testing were activated on the setup page (see chapter 8.2.7):



After successful registration or successful connection establishment without password (default setting) the start page of the module is the menu “Home“ (see chapter 8.2.1).

8.2 Setting of individual parameters

Using the web site, you can set certain parameters of the module or perform configurations on the module or the user interface. The various setting menus can be selected in the navigation tree on the left side. The setting is supported by an online help. Hovering the parameters by the mouse in the lower part of the site an orange colored text box appears with explanations for each parameter. By setting in the “Setup“ menu (see chapter 8.2.7) may be selected so that the help appears in the status bar of your browser. If appropriate setting changes in the browser options are necessary.



In addition, in the lower part of the navigation tree status information for the module is displayed. By changing the “Setup“ menu, the status information can also be moved to the right (see also chapter 8.2.7). There gives information about the system parameters. An orange colored symbol indicates that an error has occurred, a green LED icon indicates an error-free working status.
The last displayed point indicates the connection status between the network interface and the module. Green means, that the connection is established. A transparent LED light indicates that there is no connection or the connection is failed.
Settings with the selection box or input fields are taken over by pressing the “send“ button and stored permanently, and the LANIOS-RCL module is set on these values after a restart too. Settings with a check box are usually performed immediately but not stored in memory, so they would be lost on a possible restart of the module. To save these settings the “send“ button must be pressed.
In all menus, the language selection is possible between German and English top right.

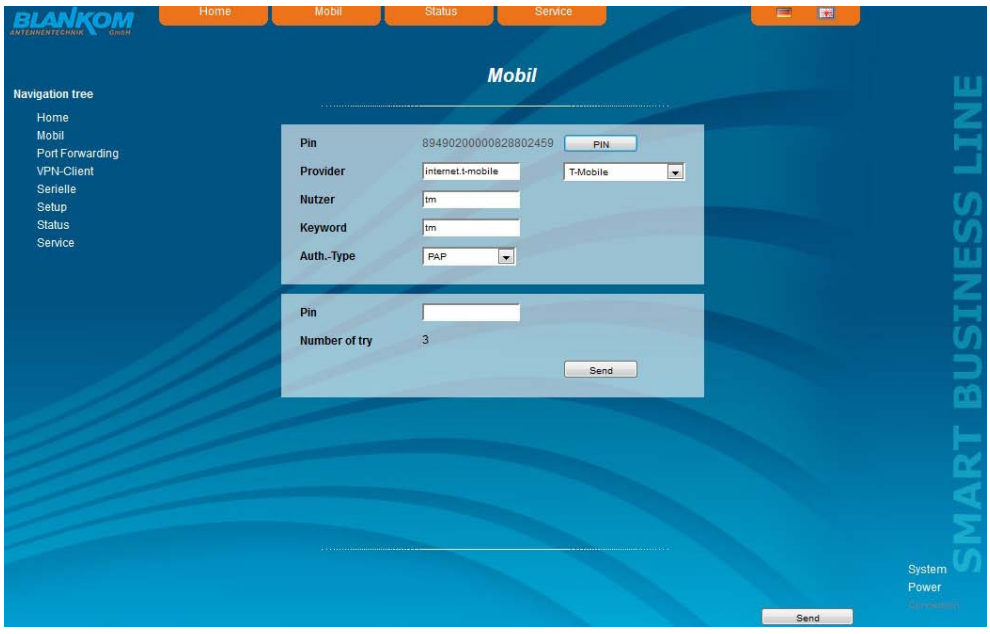
8.2.1 Menu ”Home”

This page provides a status overview of the LANIOS-RCL. Displayed are the IP address of the module, assigned by the mobile operators, the online status, the level in dBm and, if you also use a VPN connection, then the assigned IP address,

In addition, below the status window the head end display is visible. There all SBL modules are listed, which are in the same network and which have been associated with the head end in the “Setup“ menu (see 8.2.7). This is significant because functions over all modules such as the NIT processing between modules of the QAMOS product group can be extended to all components of the head end. The individual components of a head end are listed with their IP address, which is also provided with a link to this address, so you can switch easily to the next module. If no head end was configured, a “Search“ button appears, which forwards to the “Setup“ menu and scans the network for other SBL modules. Then all available modules are listed and can be selected and added to the head end.

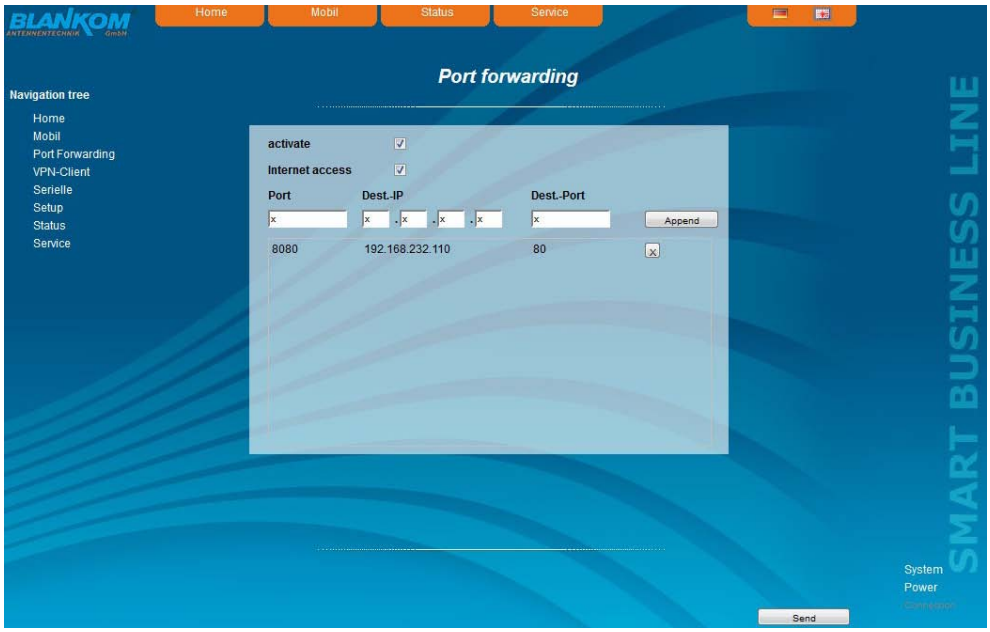
8.2.2 Menu ”Mobil”

In this menu the parameters for the mobile connection of the switch are set. For this purpose, it is first necessary to select the provider and its connection data. Some mobile operators are given in the right selection, with a selection the data is automatically transferred. If the provider is not included in the selection, the connection data must be entered manually and then confirm with “Send“. In the line „PIN“ the SIM card PIN (ICCID) appears to avoid confusion when setting up multiple devices, especially when entering the PIN. By pressing the “PIN“ button a submenu appears to enter the SIM card PIN. It also shows how many attempts to enter the PIN has already taken place, so you have this important information by entering an incorrect PIN, to prevent possible blocking of the card. The PIN must be verified separately for security with the “send“ button in this box.



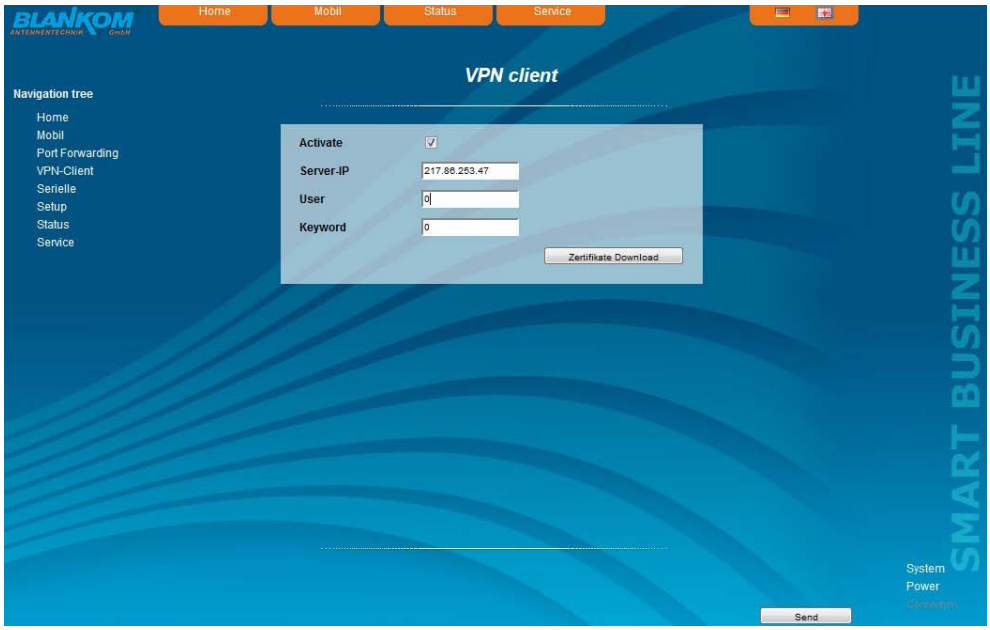
8.2.3 Menu ”Port Forwarding”

By dialing the modem to the mobile network the LANIOS-RCL is assigned an IP address by the network operator. The port forwarding is required if you want to access remotely via wireless network to the modules of the local network, which is connected to the LANIOS-RCL. To enable this, the “activate“ field is to be marked. If you want to have additional access from the local SBL network to the outside, the “Internet access“ box is to be marked. In the following ports are entered, over which the requests are to be realized. In the field “Port“ enter the port through which you want to access from the outside. The port number must be in the range between 1024 and 65535 there. **It should be noted that the following port addresses should not be used: 1194, 4224, 5000-5100, 8000.** In the field “Dest.-IP“ the address of the module in the local network is entered, on which is to be accessed. In the field “Dest.-Port“ the value of the standard TCP/ IP port of the access mode is then entered (e.g. port 80 for HTTP access). For different types of access (eg HTTP, FTP, Telnet, ...) different ports per module (destination IP) are set accordingly. By pressing the “Append“ button, the settings will be added to the list. In the list included settings can be removed by pressing the “x“ button. The settings are activated by pressing the “send“ button.
In the figure below has been awarded the 8080 for the existing local network module, to access it from outside via internet.
The local module is achieved by calling the browser IP address (LANIOS-RCL):port. For example, if you have assigned the IP address 192.168.2.97 for the LANIOS-RCL (see chapter 8.1), so you can reach the local assembly in the figure below with the call http://192.168.2.97:8080.



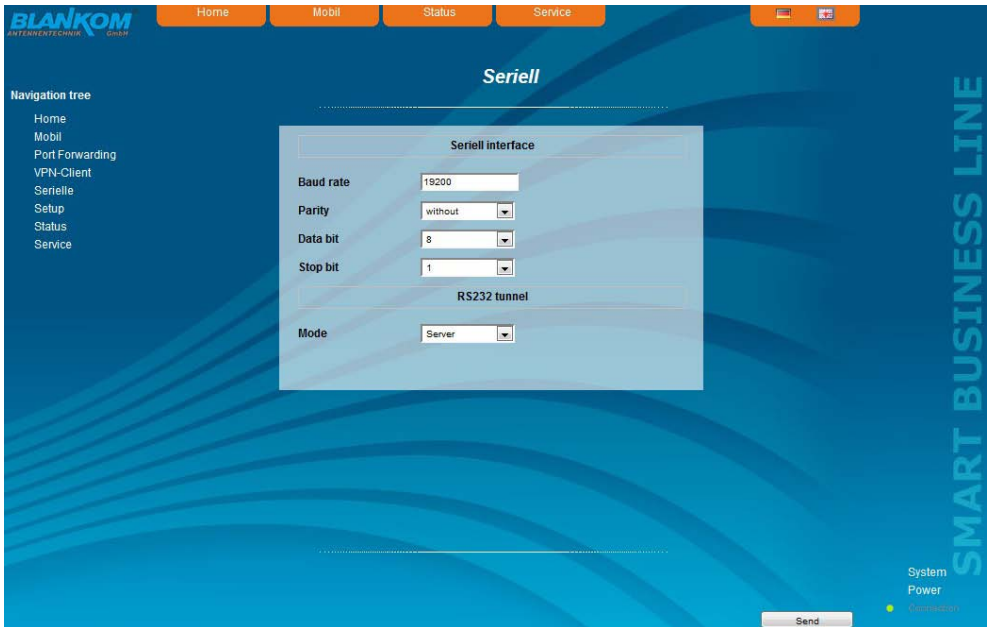
8.2.4 Menu ”VPN-Client”

The settings in this menu are only necessary if you want to use a VPN connection. Currently, this is only suitable for systems that automatically provide the necessary certificates.
First, the use of VPN must be identified by marking the “Activate“ field. In the field “Server-IP“ the IP address of the server is to be entered, which realizes the VPN connection. If the network supports it, the name of the server on the network can be entered there instead of the IP address. By pressing the “Certificate download“ button, a connection will be automatically taken to the server, so that the necessary certificates for VPN access can be transferred.
Finally, user and password for the VPN access shall be entered. The settings are activated by pressing the “send“ button. If the connection was successful, the IP address of the VPN connection in the “Home“ menu or in the “Status“ menu is displayed in the appropriate place. Otherwise there, the IP address 0.0.0.0 is displayed.



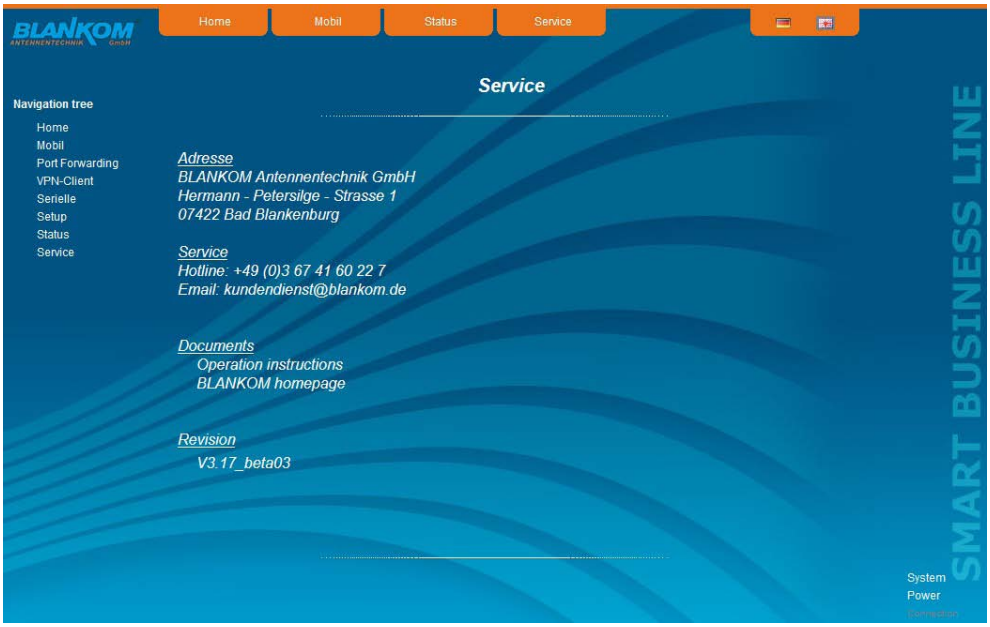
8.2.5 Menu ”Serial”

Here you can configure the serial interface for a desired use. Currently, three lines of the RS232 are used: RX, TX and GND.
In the menu, the individual parameters of the interface (baud rate, parity, data bits and stop bits) are first selected. When entering the baud rate a free entry is possible, the input value is rounded to the next lower value that is supported. The following baud rates are supported: 921,600, 576,000, 500,000, 460,800, 230,400, 115,200, 57,600, 38,400, 19,200, 9,600, 4,800, 2,400, 1,800, 1,200, 600, 300, 200, 150, 134, 110, 75, 50, 0.
Then, it selects for the RS232 tunnel, if you want to run the module in the server or client mode. If the client mode has been selected. the IP address of the remote site is entered as the server IP. A use case for the use of the serial interface is, for example, that the re-mote access/ remote maintenance of a module/ head end is only accessible via RS 232. In this case, an RS 232 tunnel is being built from the PC via 2 LANIOS-RCL to the module/ head end. The two LANIOS-RCL are connected via wireless network and thus provide access from the PC to the module/ SBL head end. It is recommended that the LANIOS-RCL on the PC is to set up as a client and that to the module/ head end as a server.
Alternatively, the RS 232 tunnels are also realized with one LANIOS-RCL. For this it is necessary, however, that a virtual serial port is set up on the PC, which then connects to the LANIOS-RCL via TCP. The establishment is supported by a software of the company Fabula Tech (www.fabulatech.com). The following settings must be made here:
mode: client, TCP port: 5002, serial mode: raw
The LANIOS-RCL on the module/ head end is then set up as a server.



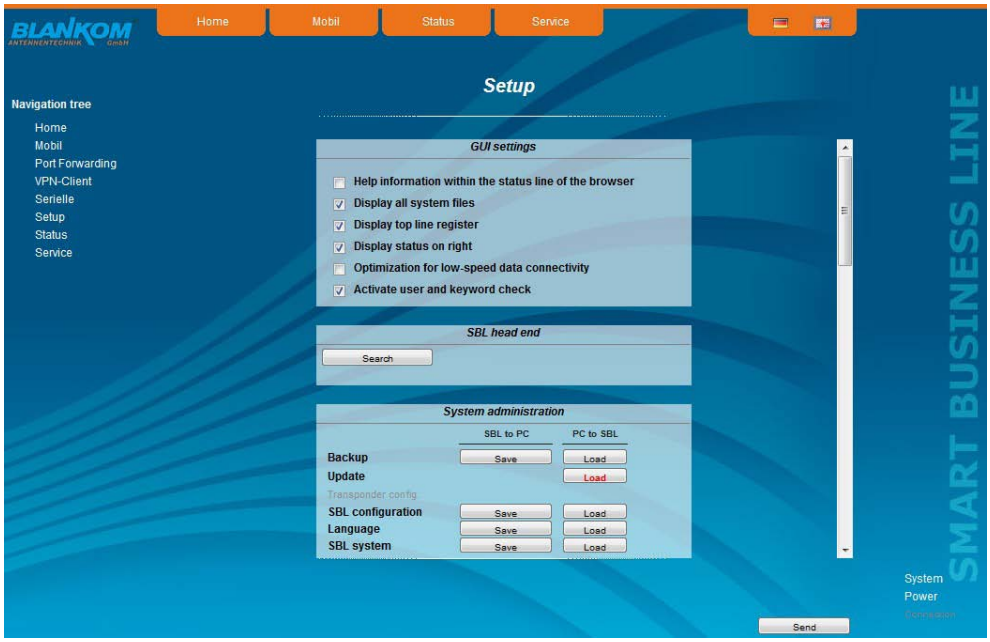
8.2.6 Menu "Service"

In this menu you will find all information about the service for the LANIOS-RCL module in particular the BLANKOM service hotline and the service email address. In addition, the implemented operating instructions may be downloaded or viewed as PDF. If there is an internet connection the BLANKOM homepage can be started, offering the latest software release or descriptions. Finally, the currently installed software release is displayed.

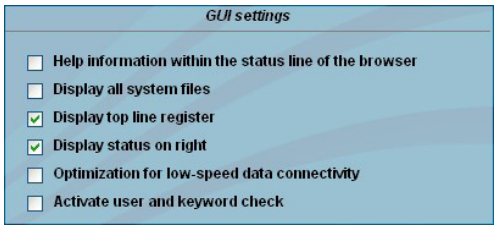


8.2.7 Menu "Setup"

In this menu, various administrative and system settings are made.



Specifically, the following can be configured:



GUI settings

Help information within the status line of the browser
By default, the online help is displayed in an orange text box at the bottom of the page. If you click this option, the help texts are displayed in the status bar of your browser. Depending on your browser sometimes such use has to be allowed in the browser settings.

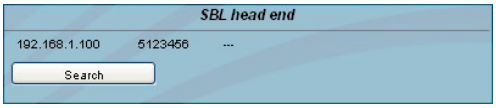
Display all system files
The default is, that the system files can be subjected to upload or download as a package under “Backup“ in the submenu “System administration“. If you click this box, the system files are listed individually and can be individually subjected to an up- or download.

Display top line register
By default, the registers are shown in the upper part of the user interface, to move more quickly to the most frequently used menus. By removing the box marking the registers are hidden.

Display status on right
By clicking the box, the status of the system is shifted to the right of the user interface.

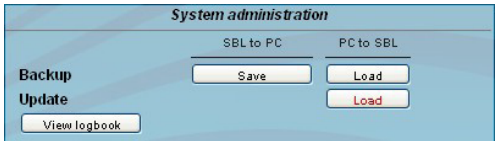
Optimization for low-speed data connectivity
By clicking the box the data volume of the browser pages is greatly reduced. So it is possible to adjust the module, if there is only a low-speed connectivity (GSM). The available reduction is achieved by reducing image size.

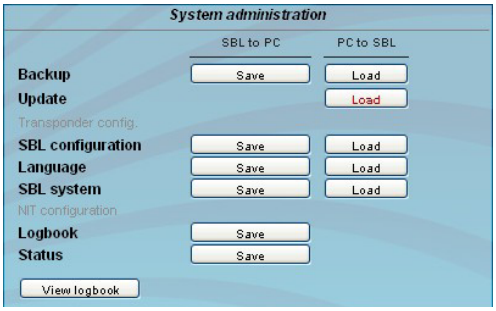
Activate user and keyword check
This selection is only available if you are logged in as administrator. If the box is disabled, the log-in is skipped after each GUI reboot. Otherwise, user login and password are required (see chapter 8.1).



SBL head end

All SBL modules, which are located in the same network, are listet. By pressing the “Search“ button the list is updated. All marked modules belong to the head end and are displayed on the “Overview“ page.





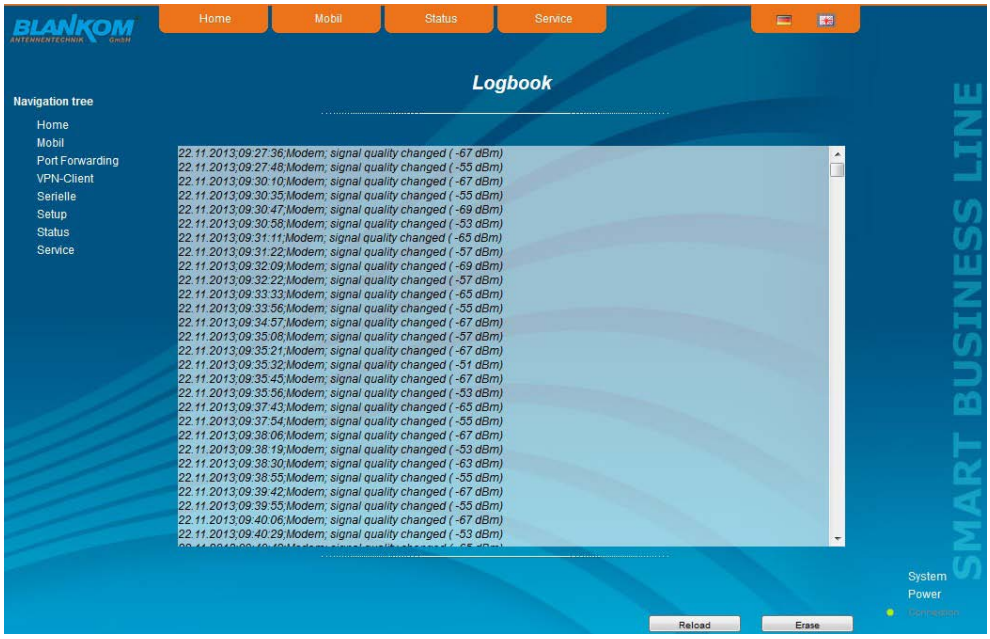
System administration

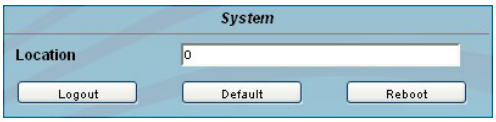
The default is displaying of the shortened list of files (top).

Backup
Here the system files can be loaded or saved as a package (except Logbook and Status). Thus, it is possible, for example in a simple way to copy the system files from a LANIOS-RCL module to another. If under “GUI setup“ “Display all system files“ is selected, the system files can also be loaded or saved separately (see figure below). Moreover, additional system files can be added.

Update
By clicking the “Load“ button, the internal software components can always be brought up to date.

Pressing the button “View logbook“ leads to an overview, in which all the processes have been documented since the start of the GUI. Each operation is listed by date, time and description. If operations have been executed, the logged on user, who initiated the action, is saved too. The logbook contains data for changing the connection quality and disconnections and re-dialers. By pressing the “Erase“ button all entries are deleted, when you are logged in as administrator.





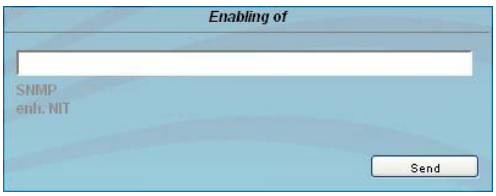
System

Location In this field a name for the LANIOS-RCL is be made to identify the module easily. This name appears on the top right of the web site under the language selection box and is provided via SNMP with the question of the field: Iso(1)org(3). dod(6).internet(1).mgmt(2).mib.2(1).system(1). sysLocation(6).

Logout restart the user interface

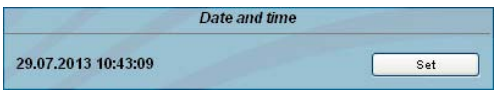
Default delete the settings and reset to default values (including IP address), available only if you have logged in as administrator

Reboot restart of the LANIOS-RCL module



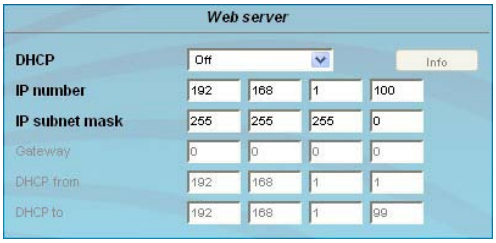
Enabling of

In this field, possible software options for the LANIOS-RCL module can be enabled. The registration code must be entered in the input field and by pressing the “Send“ button the option will be activated. Activated options are displayed in black, inactive are grayed out.



Date and time

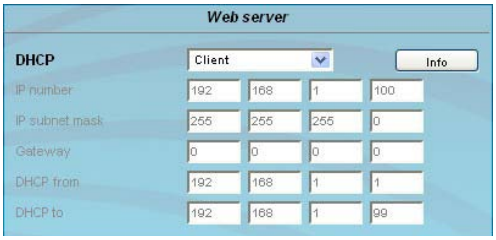
Clicking the “Set“ button, the date and time will be set to that of the PC.



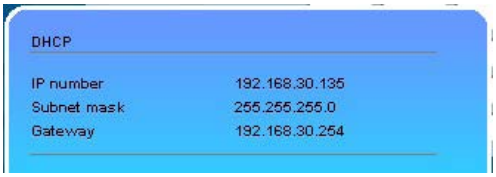
Web server

This setting appears only when you are logged in as administrator, so also has the authority to make administrative changes.
The LANIOS-RCL supports the DHCP functionality. There DHCP-Client is factory default. Note, that after each factory reset the LANIOS-RCL is set “DHCP-Client“.

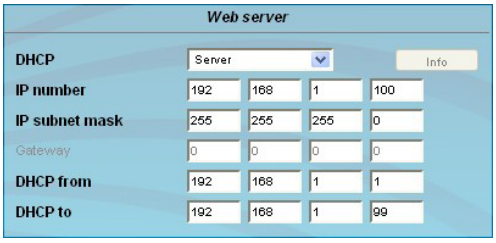
If the **DHCP functionality** is set to **“Off“**, in the appropriate fields the IP number, subnet mask and gateway can be manually entered and then the settings of the QAMOS-4CI/ -8CI module are adapted to the network. The gateway address is fixed by the mobile phone connection and therefore can not be changed.



If the module is set to **“DHCP-Client“**, so it is automatically obtained on the network an IP address from the DHCP server. The manual network settings are grayed out and are therefore disabled.



By pressing the “Info“ button the automatically assigned network configuration of the module is displayed.



Please note if the device is set to **“DHCP-Server“**, that the IP address 192.168.1.100 should not be set. If you select this address, you will get an error message. In addition to the IP settings you can configure the DHCP range from which the IP addresses of the connected clients are assigned. The address range must match the address range according to IP address and subnet mask of the server and should not be too small. The default is the area 192.168.1.1 to 192.168.1.99.
Additionally with the DHCP server will also set up a local DNS (Domain Name Server). To use it in full extend a connected PC/ laptop must be configured as a DHCP client. Please note, that the client unit not only get its IP address from the DHCP server, but also its DNS server.

If the module is configured as a DHCP server or client and the client has received an IP address successfully, so the module can be accessed via a web browser with a name. This name is composed of the prefix “sbl“ and the device number that is printed on the back of the module and on the packaging. For example, the device with the number 0123456 is be called under “sbl0123456“. Should there be problems with it among the local network conditions, the domain can be added. In the case that the above module is configured as a server, the call using the domain is then “sbl0123456.sbl“. If another DHCP server is used, ask your administrator for the domain name.

An example of the simplification of the configuration or operation of the head end via DHCP, is, that a SBL module is as a server, the remaining modules and the connected PC/ laptop are configured as a client. By calling the browser “dhcp.sbl“ the GUI of the server module is loaded. If not already done so, now the head end can be read. So all connected components are found and listed. The head end can now be stored in the “Setup“ menu under the item “System administration“. The head end overview can be changed quickly to the user interface of any other module by selecting the respective modules links.

SNMP option

The SNMP adjustment is only available after the "SNMP" option was enabled (see chapter "Enabling of").
In the first section, the SNMP functionality, including the sending of traps is enabled or disabled with the "Mode" selection field. With the selector "Version" you can select the SNMP version (version 1, 2 or 3). In the two boxes below it, the communities for versions 1 and 2 are given separately for reading and writing via SNMP. With version 3, these two fields are disabled. There, all registered users of the module (see menu "Passwords") have an automatic read access to SNMP. The write access can be enabled or disabled for each user by clicking the SNMP check box in the "Passwords" menu.
By clicking the "MIB" button the MIB of the module is generated and offered for download.

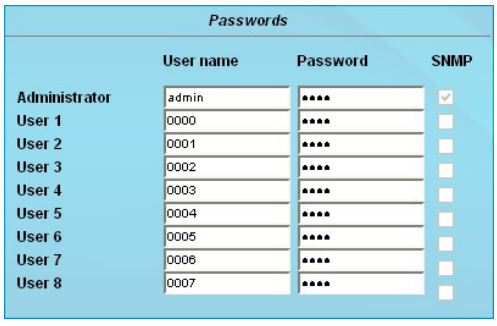
In the second section the trap settings are done. First, the trap version is selected:
V1 trap - normal traps according SNMPv1 with specified community
V2 trap - normal traps according SNMPv2 with specified community
V2 inform - sends information traps according SNMPv2 and waits for an acknowledgment
V3 trap - normal traps according SNMPv3
V3 inform - sends information traps according SNMPv3 and waits for an acknowledgment

The community can be configured for traps of SNMP versions v1 and v2. User/ password and the using of the network MAC address as the engine ID can be configured for traps of SNMP version v3. These settings must correspond with the configuration of the trap receiver, so traps are successfully transferred. For this purpose a test trap can be sent by clicking the button "Test" to test the transmission of traps. If a test trap triggered, all pre-preserved traps discarded.

There up to 256 IP addresses to receive the traps can be created or enabled. These are listed under "Receiver IP". Below, the events can be configured, whether and partly with what thresholds they should trigger traps. There are three ways to configure a trap:
- without parameters, e.g. fan on/ off
- with a freely selectable parameter for a medium priority
- with a selectable parameter from a list for a medium priority

References and notes:
All users using SNMPv3 must use passwords with at least 8 characters. For SNMPv3 the SBL supports only the authentication password, not the privacy password. The SBL only supports the MD5 algorithm for authentication password in SNMPv3.
Information traps are specific traps that are possible up to SNMPv2. If there is no acknowledgment of the receiver, the transmitter attempting to transmit later, until the confirmation is received.
A SBL module holds up to 256 before information traps that could not be sent successfully. If there are more unconfirmed traps, the older traps are discarded and noted in the logbook as having failed. A successful sent trap is also registered as such in the logbook. In case of power failure or reboot of the module reproached traps are lost.
Details may be found in the help text for each event. The critical priorities are each covered with fixed values that can not be changed.
If the web site of LANIOS-RCL module is open, no changes are possible via SNMP

Passwords



Again, this setting appears only when you are logged in as administrator, having the authority to make administrative changes. In addition the box "User and keyword check" in the submenu "GUI settings" has to be clicked. The user ID and password for the administrator can be set in then the first line. The fixing of up to 8 user identification and passwords is possible. The limitations of user rights exist only in the fact that they are not authorized to change web server settings, user rights and password changes and default settings.
The default **password** for the **admin** is: 1111
and for the **users**: 0000
If the SNMP option is enabled, to the right of each user appears an SNMP check box. By clicking the box, the writing rights for individual users can be awarded for the SNMP version 3 (see also section "SNMP option").

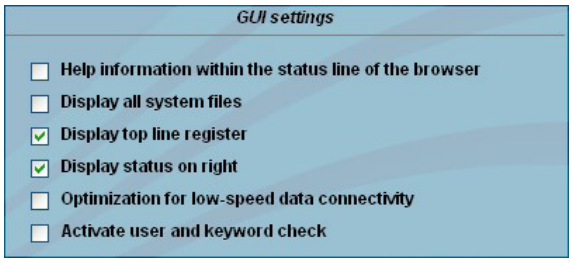
8.2.8 Menu "Status"

It presents an overview of the status of the various components of the module, which is updated every 5 seconds.

9. Factory settings

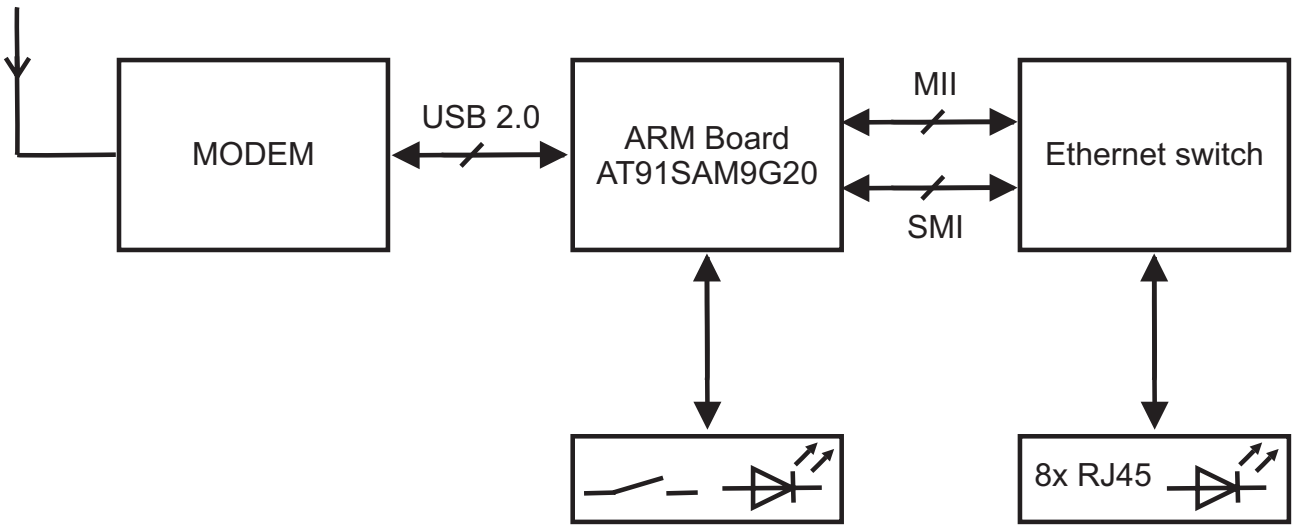
A short pressing (< 2 sec) of the "(P)RESET/ REMOTE ON/ OFF" button on the front of the module causes a switching on or off of the modem, which is signaled by the "REMOTE ACCESS" LED. Pressing the switch 2 to about 10 seconds, a reboot of the module is performed, i.e. it will restart the module and all stored values are adjusted. If the module is to be reset to factory settings, the reset button must be pressed more than 10 seconds. In this case the module is set to the following:

Setup settings

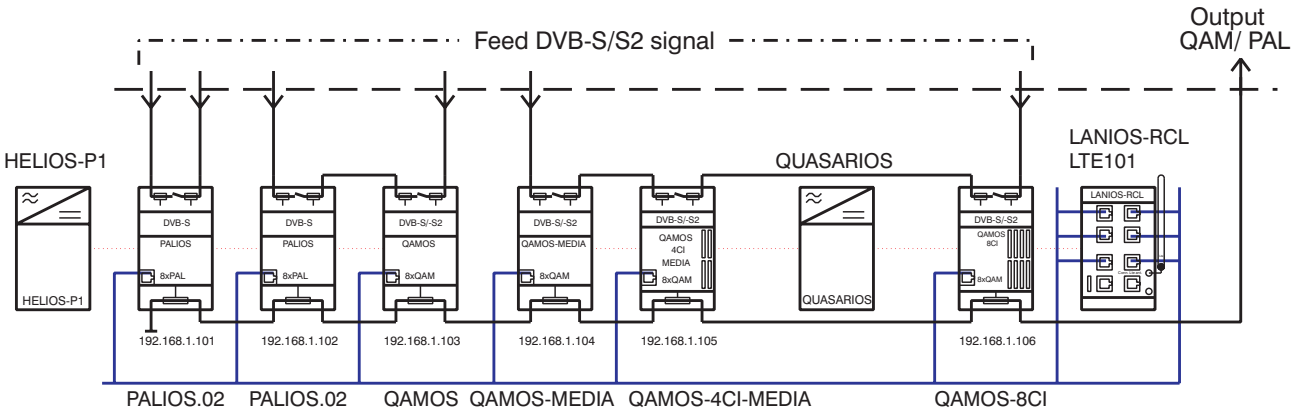


Network settings

10. Block diagram



11. Application example



12. Technical data

Network ports

Link attributes	8x Ethernet, 10/ 100 Base-T according IEEE 802.3, IEEE 802.3u, IEEE 802.3x
Connectors	8x RJ 45

Device parameters

Properties	DHCP (swtchable), WEB, SNMP, PING, ARP, firewall (swtchable), NTP (swtchable), port forwarding
Mode	direct access via the internet, VPN via internet (router as server), VPN via internet (router as client), RS232 (optional, mode: terminal, tunnel)

Mobile functionality

Communication standards	LTE, UMTS, GSM, GSM fallback
frequency bands	
LTE	850/ 900/ 1800/ 2100/ 2600 MHz
UMTS	900/ 2100 MHz
GSM	900/ 1800/ 1900 MHz

Connections

Antenna connector	SMA
SIM card slot	standard SIM
serial interface (RS 232)	
(5161.20)	3 pole stereo jack-TRS
(5161.21)	9 pole D-subminiature

Operating parameters

Voltage range	7 ... 15 V DC
Max. current consumption	650 mA at 12 V DC
Power consumption	about 8 W

Environmental conditions

Temperature range	-10 … +55 °C
Relative humidity	≤ 80 % (non condensing)
Method of mounting	vertical
Location of mounting	splash-proof and drip-proof

Miscellaneous

Dimensions (w x h x d)	46 x 262 x 167 mm
Weight	850 g

Delivery contents

1x power cord
1x DIN rail clip
1x mounting accessories
1x screw driver

13. Bibliography

[1] EN 60728-11: Cable networks for television signals, sound signals and interactive services Part 11: Safety (IEC 60728-11:2005); German version EN 60728-11:2005

[2] EN 50083-2 : Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equipment; EN 50083-2:2001

14. Notes on the device software

Device Software of the LANIOS-RCL

This device software based on top of Linux 3.6.8 is free software: you can redistribute it and/ or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 2 of the License, or (at your option) any later version.

You should have received a copy of the GNU General Public License along with Foobar. If not, see <http://www.gnu.org/licenses/>.
The source code is available upon request.
Please address requests to:

BLANKOM Antennentechnik GmbH
Hermann-Petersilge-Straße 1

07422 Bad Blankenburg

15. Document history

Version	Date	Modification	Author
1.00	31.07.2013	preliminary document	Häußer
1.01	05.09.2013	revision	Häußer
1.02	15.01.2014	basic document	Häußer

Options available upon request. Subjects to changes due to technical progress.

CE Declaration of Conformity

Manufacturer: BLANKOM Antennentechnik GmbH
Hermann – Petersilge – Straße 1
07422 Bad Blankenburg
Germany

Product Name: 8-pole Ethernet switch with remote connection

Type Name: LANIOS-RCL

Type N°: 5161.20, 5161.21

BLANKOM Antennentechnik GmbH confirms that the mentioned products meet the guideline(s) of the Council for the approximation of legislation of the member states.

Electromagnetic compatibility (2004/ 108/ EC)
The following standards are met: DIN EN 50083-2: 2007-04 (EN 50083-2:2006-06)

Low voltage guideline (2006/ 95/ EC)
The following standards are met: DIN EN 60950-1: 2006-04 (EN 60950-1:2006-11)
Information technology equipment -Safety-

Restriction of hazardous substances (2011/ 65/ EC)
The following standards are met: DIN EN 50581: 2013-02 (EN 50581:2012)

Bad Blankenburg, Germany, 2013-07-31

Dr. Piero Kirchner
(Managing Director)