

***WLL550 Pro***  
***Operating manual***  
***REV 2*** *and higher*



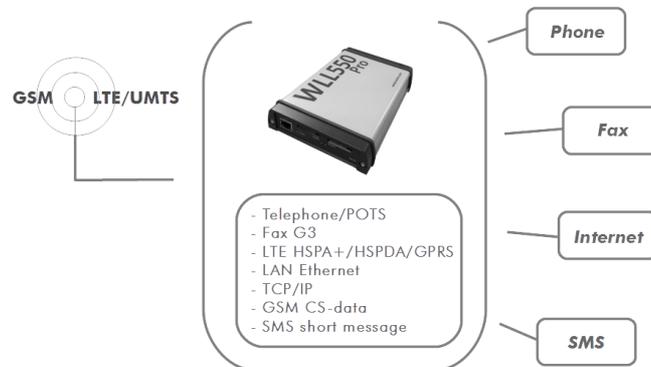
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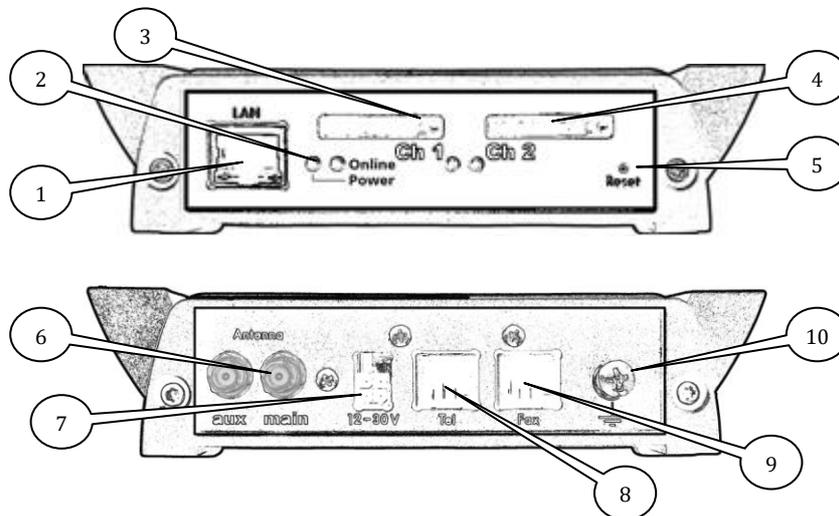


# 1 Basic Functions

The *WLL550 Pro* is a triple services gateway. It supports voice and G3-fax calls via the mobile phone network in combination with a broadband internet access via LTE or UMTS with HSPA+ or HSDPA and a SMS short messaging option. Fully equipped with two radio modules all services are available at the same time.



The sockets for an analogue fax and telephone are located on the back panel. To connect a G3 fax machine use the connector tagged with 'Fax'. Please consider that you need a SIM-card with an extra number for fax service (multi numbering). Telephone devices are connected to the 'Tel' connector. Please use this connection for voice calls. The 'Tel' connector is also used if the *WLL550 Pro* is setup as a local loop interface on a PABX. The internet connection uses the LAN jack on the front panel. A SIM card with high speed data capabilities is mandatory for this service.



1. Network connector: LAN 10/100 Mbit/s  
(For configuration setup and internet access)
2. Power LED / Online status LED
3. SIM card reader with status LED – channel 1 (LTE/UMTS/i-net, phone)
4. SIM card reader with status LED – channel 2 (GSM/fax, phone)
5. RESET button
6. SMA connector main antenna, auxiliary SMA connector for LTE diversity
7. Power supply: 12V – 30V DC
8. Telephone-/PBX-connector (FXS)- RJ11
9. G3 fax connector (FXS) - RJ11
10. Earth terminal, GND

## 1.1 Phone

The *WLL550 Pro* supplies an analogue local loop interface (FXS). This is designed for the use with custom telephone and PABX devices (FXO/POTS). It is the basic function of all types of *WLL550 Pro*. To use this basic function you need a valid SIM card, a suitable antenna and a power supply. If your SIM is PIN protected you can execute the PIN request by entering DTMF digits on the telephone device or within the *WLL550 Pro* service session with '*AS55X-Service*' software of course.

For further settings please refer to 2.1

## 1.2 Fax G3

The second basic feature of *WLL550 Pro* is a separate local loop interface which supports the operation of an analogue G3 fax machine to transmit and receive facsimiles via the GSM mobile network.

Generally fax transmissions over the GSM network are difficult to handle because the handshake is very time critical. For better results the *WLL550 Pro* splits the transmission into two phases:

First the fax is submitted from the sending fax station to the *WLL550 Pro* buffer to be forwarded from the *WLL550 Pro* buffer to the receiving fax station with a time-delay. The *WLL550 Pro* tries up to three attempts to submit a fax document. During this time the '*Ch2*' LED is flashing continuously and no further fax or voice call is possible via this radio channel. However a fax transmission can fail for some reason and by splitting the transmission handshake it might happen that the first phase of the transmission is successful but the second phase fails. To ensure that the sender gets information about an unsuccessful transmission the *WLL550 Pro* can generate a receipt for all successful and failed fax transmissions via a response receipt.

A SIM card with an additional fax number is mandatory for fax transmissions via mobile phone network. Incoming fax calls to this number are automatically forwarded to the analogue fax port. Outgoing fax calls are send via radio channel two (*WLL550 Pro* with two channels). All settings in global and individual call setup are exclusively for voice calls and do not concern fax calls.

*Hint: There is no fax service available within the LTE and UMTS networks.*

For programming instruction see 2.2

## 1.3 Internet

To fulfil the requirements for a mobile office use the *WLL550 Pro* can work as a broadband-internet access which is the third basic function of the *WLL550 Pro*. The related LTE or UMTS/HSPA+/HSDPA radio channel is the radio channel one *Ch1*. A SIM card with high speed data capabilities is mandatory in this case. Please also check the details of your mobile phone contract for a special data tariff to avoid unexpected high charges.

The available internet speed depends on various parameters, such as the capabilities of your mobile phone network, the local field strength quality and the operating grade of the shared medium. Providing you have the optimal conditions an internet speed of 7,2 MB/s is possible with UMTS and up to 40 MB/s with LTE.

The *WLL550 Pro* connects to the internet, if valid APN information is configured manually or when the '*Go online*' box is checked in the '*Internet*' settings or the DTMF code #721# is entered on the POTS interface.

For the use with a single computer you can connect the *WLL550 Pro* directly to the LAN interface of the *WLL550 Pro*. But you need an external NAT-router if the internet access should be available for further network devices.

Single radio channel versions of the *WLL550 Pro* usually do not support broadband internet access.

For further information please refer to 2.3 and 2.4

## 1.4 SMS short message

Due to the fact the *WLL550 Pro* has no display or keyboard an external controlling software is necessary to manage SMS short messages. There are 3 options:

- The '*SMS Server*' is a simple webUI for sending and receiving short messages via internet browser.
- An easy-to-use solution is the '*SMS Center*'- client software for Windows operating system. This is free software and it works similar to a custom messenger-client via the *WLL550 Pro* LAN interface.
- Use the *TELNET* connection or the short message-API for third party software to get direct access to the *WLL550 Pro* radio modules for SMS short messaging.

'*SMS Center*', '*SMS API*', '*SMS Server*' and '*TELNET*' are '*Extended feature*' that needs to be enabled within the *WLL550 Pro*.

For further information please refer to 2.5



## 2 Installation - configuration

The minimum requirements to put a *WLL550 Pro* into operation are a suitable power supply, an antenna and one valid SIM card. But to supply all services a *WLL550 Pro* two valid SIM cards are mandatory. One SIM for the broadband-internet access in SIM reader of the first radio channel *Ch1* with ability for LTE or UMTS/HSPA+ connections and a second SIM with an additional GSM fax service in SIM reader of radio channel *Ch2*.

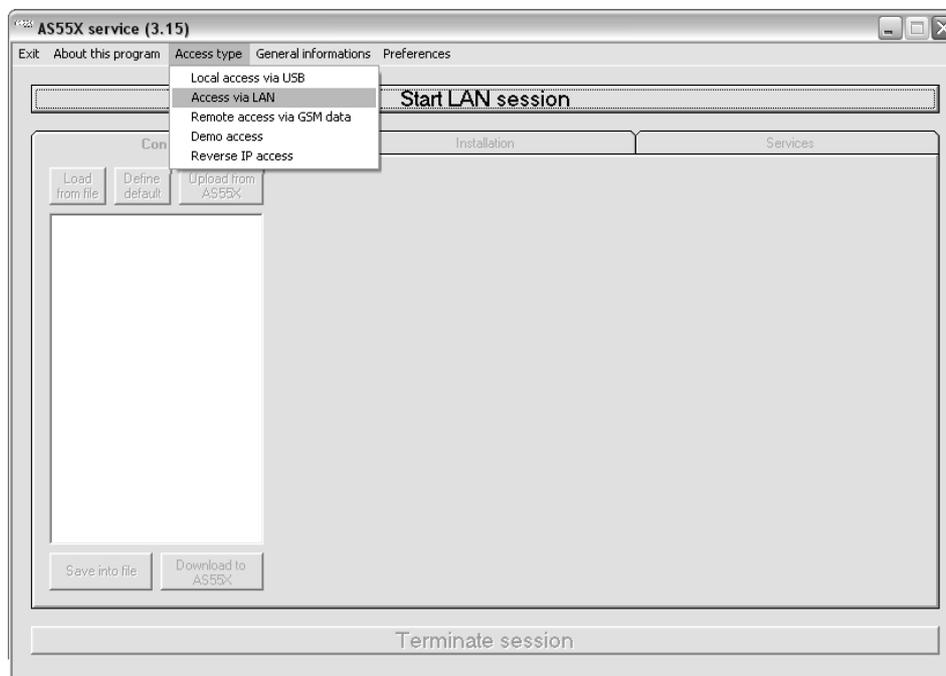
The connectors for the power supply, the antenna and the interfaces for phone and fax are on the back panel of the device. The SIM readers and the LAN interface are located on the front panel.

**Usually the basic configuration is made by DTMF sequences at the analogue telephone port (also refer to 2.8 DTMF Codes).**

Advanced settings and all maintenances work should to be done in a service session with the service tool '*AS55X-Service*' via a LAN connection.

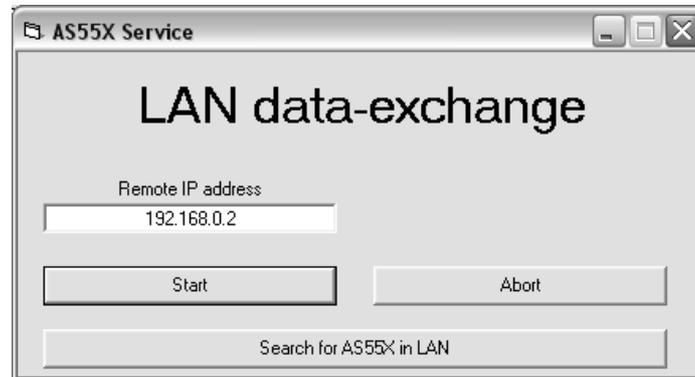
The service tool for *WLL550 Pro* '*AS55X-Service*' is available as a direct download at:  
> [www.kuhnt.com/down/55xwin32.zip](http://www.kuhnt.com/down/55xwin32.zip) < .

Set to factory defaults the *WLL550 Pro* works as a DHCP server that can be directly connected with the LAN of your computer. Check the network settings of your computers network interface and activate DHCP if it is not running already.



Now select from 'Access Type' > 'Access via LAN' from 'AS55X-Service' menu to start a service session. If you are not sure about the IP of the *WLL550 Pro* try to detect it in your LAN by using 'Search for AS55X in LAN'.

The default IP-address of the *WLL550 Pro* is: **192.168.0.2** .



If you cannot access your *WLL550 Pro* via LAN check your LAN setup or try to reset the *WLL550 Pro* to factory default by using the RESET button\*. Press and hold the button then plug in the power supply. Keep holding the button until the Power LED is on.

*\* Hint: Using the RESET button will delete all configuration and security data!*

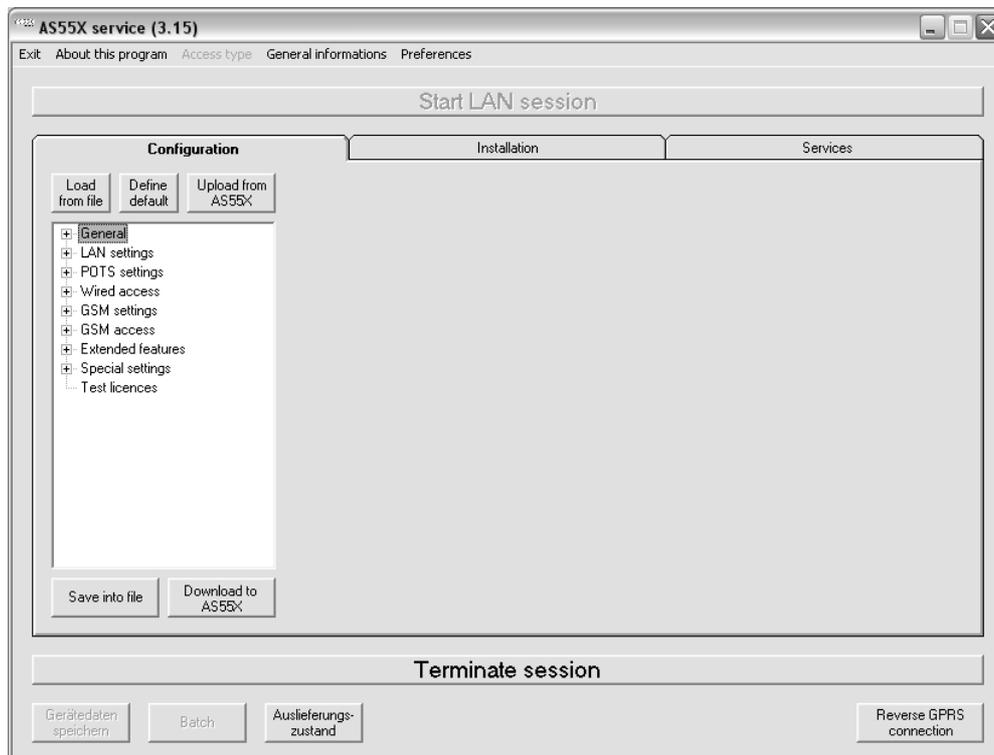
When you are successfully connected, you will first see this:



**There are no factory defaults for username and password!**

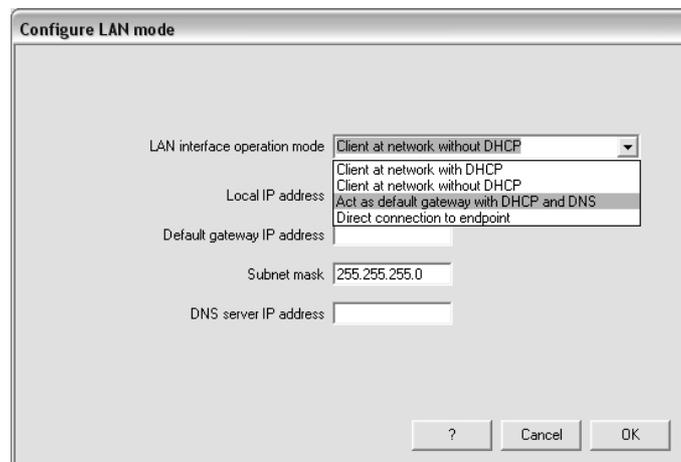
Just confirm with the 'ENTER' button or click 'OK' leaving both form fields empty.

Start with an upload of the configuration data from your device > 'Upload from AS55X'.  
Now you can adjust the basic configuration within the configuration menu:



- LAN settings for WLL550 Pro  
> Configuration > LAN settings > LAN interface mode

Usually the default setting as 'default gateway' works for all types of installations and setups.



- The amount of digits for autostart
  - > *Configuration > POTS settings > Interface settings > amount of digits*

The screenshot shows the 'POTS interface settings' dialog box. It contains the following fields and controls:

- Operation mode:** A dropdown menu set to 'Phone and FAX at different interfaces'.
- Timeout for autostart:** A dropdown menu set to '4 seconds' followed by the text 'seconds'.
- Amount of digits for autostart in international order:** A dropdown menu set to '11'.
- FAX call prefix:** A list box containing the numbers 14, 15, 16, 17, 18, 19, 20, and 21. The number 21 is currently selected.
- Buttons:** '?', 'Cancel', and 'OK' buttons are located in the bottom right corner.

The default is 21 digits. Please consider that smaller values than 13 may cause misdialing

- APN settings for the internet access
  - > *Configuration > GSM access > internet*

The screenshot shows the 'Wireless internet access' dialog box. It contains the following fields and controls:

- Go online:** A checked checkbox.
- Data roaming allowed:** A checked checkbox.
- Access point name (APN):** An empty text input field.
- Username:** An empty text input field.
- Password:** An empty text input field.
- Note:** A text box at the bottom stating: 'If internet access to different mobile networks should be possible, please use the internet access data list'.
- Buttons:** '?', 'Cancel', and 'OK' buttons are located in the bottom right corner.

Check the 'Go Online' box to activate automatic internet access or type in the APN settings manually by filling the form fields

- Country code for roaming

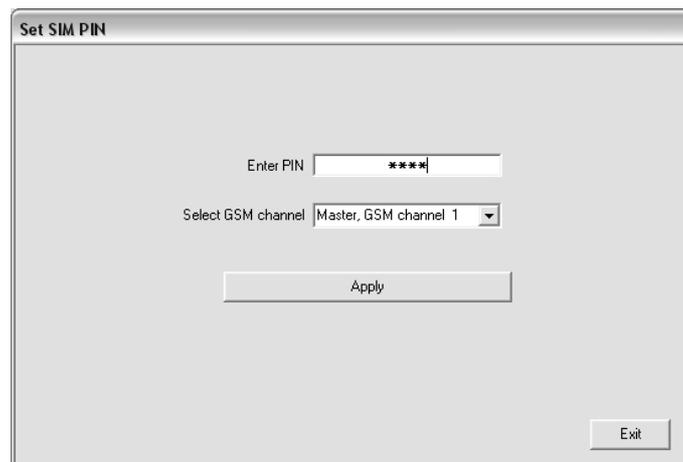
> *Configuration* > *Wired access* > *Country specific settings*



Set to the native country code of your mobile phone service provider.

- The PIN numbers of your SIM cards

> *Installation* > *Set SIM PIN*



If you did not use DMTF codes already to enter your PINs type in each PIN number for both radio channels here.

With this basic setting your WLL550 Pro should work fine already. Advanced users may continue with the configuration of some individual settings.

Please keep in mind to download the modifications into the *WLL550 Pro* before you quit the service session! > *Configuration* > *Download to AS55X*

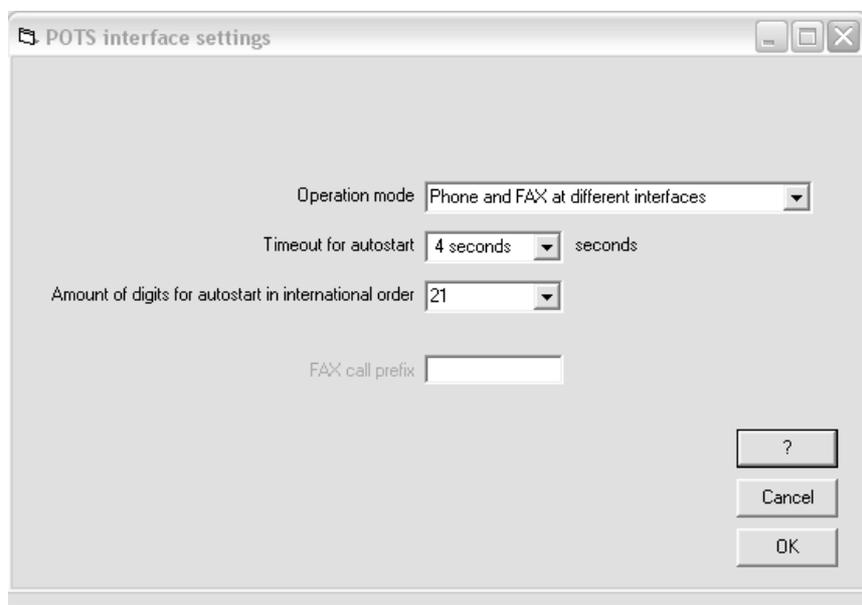


## 2.1 Phone/Fax (POTS settings)

By factory default incoming phone and fax calls are routed via different interface. A voice call is forwarded to the telephone interface 'Tel' and all fax calls are always signalled at the fax connector 'Fax'. Unless the *WLL550 Pro* is set to work in the 'trunk mode' at a PABX or with a Tel/Fax combination device. In the 'trunk mode' all fax calls are routed via the telephone socket 'Tel' as well.

An outgoing voice call chooses the next available radio channel by factory default. Generally fax calls use the radio channel two 'Ch2' (except *WLL550 Pro* equipped with just a single radio channel which uses the 'Ch1' channel only). By configuring the 'GSM groups' and the 'Global-' or 'Individual call setup' you can define your own routing for outgoing voice calls. .

The configuration of the analogue telephone interface is made within the FXS settings 'POTS interface settings':



- *Operation mode / Fax call prefix:*

There are two ways to run a fax machine with the *WLL550 Pro*. First you can attach your phone and fax directly to its dedicated connectors. The second way is to attach the *WLL550 Pro* to an analogue PBX or a Phone/Fax combo. With the factory defaults all incoming faxes and calls are routed to individual FXS interfaces. In 'trunk mode' all calls are routed to the phone connector 'Tel'. To separate outgoing fax calls from voice calls in 'trunk mode', you have to dial an additional fax prefix (e.g. \*8 004944130005...) for each fax to identify the service. This prefix (\*8) is not a part of the called number is deleted by the *WLL550 Pro*.

*Default value:* Phone and fax at different interfaces

Fax call prefix

*Default value:* not reported

- *Timeout for autostart / Amount of digits for autostart in international order –*

On a FXS interface all dialling is always made digit by digit but a GSM call setup is en bloc only. Therefore the *WLL550 Pro* must collect all digits until the dialled number is complete.

We have two ways to indicate the number to be complete:

- 1st: Define a fix amount of digits for dialling to the mobile phone network. Set this amount to the maximum number of digits referring to your destination numbers.
- 2nd: Define a timeout for waiting for the next digit. After this timeout expires, the call-setup to the mobile phone network starts immediately.

At the menu item '*Timeout for autostart*', the timeout for waiting for the next digit can be chosen.

*Default value:*                      4.0 seconds

At the menu item '*Amount of digits for autostart in international order*', the fix amount of digits can be chosen. Select the maximum length of the called numbers in international form. E.g. for the longest number +491234567890 select 12 digits.

Please note! If you are not sure about the maximum lengths of the number set it to a value higher than 15.

*Default value:*                      21

## 2.2 Fax function (fax settings)

To improve the fax transmission within the GSM network, the *WLL550 Pro* is buffering the fax data. Sending and receiving station do not communicate directly.

Due to this two step transmission all error indications must be generated by the *WLL550 Pro*. If you need to know if a fax transmission has been successful or not fill in this free form text boxes.

For further information about the fax function see also 1.2.

Configuration window of the *WLL550 Pro* service tool *AS55X-Service*

- *Positive acknowledge text to far FAX / Error feedback text to far FAX*  
Acknowledge receipt for the external (distant) fax machine
- *Positive acknowledge text to near FAX / Error feedback text to near FAX*  
Acknowledge receipt for the local fax machine

Please enter a text for each receipt in the form field. The function is activated by completing the form field. You can write free text and enter a placeholder for the destination number with the 'Insert destination number' button.

For further information please refer to 5. Special settings

## 2.3 Configuration internet

A basic function of the *WLL550 Pro* is supplying a mobile broadband internet access via LTE or UMTS with HSPA+ or HSPDA.

You can activate the internet access temporarily without the use of the service program by DMTF code at the FXS interface. Just enter #721# with the telephone device that is connected to the 'TEL' jack.

Otherwise please use the *AS55X-Service* software to activate the internet access or to enter the APN details settings manually.

*AS55X-service* menu:

'GSM access' / 'Internet' to check the 'Go Online' box or to enter the APN\* information manually.

### \* Glossary / Tips

The internet access is activated by checking the 'Go Online' box or by entering the APN information within the form fields. When the LTE/UMTS radio module is successfully logged into the mobile phone network and WAN connection is complete the *WLL550 Pro* is continuously *online*.

To check, whether the gateway is successfully connected to the internet or not, please open menu 'Services' / 'View WAN status'. The internet connection is ready when an IP address and the DNS server are assigned by the proxy.

All *WLL550 Pro* additionally indicate an active internet access with the 'Online' LED on the front panel.

To disconnect the *WLL550 Pro* from the internet the device must be switched off or all internet settings have be removed from the configuration setup.

Configuration of the *WLL550 Pro* internet access with the service program *AS55X-Service*:

Wireless internet access

Go online

Data roaming allowed

Access point name (APN)

Username

Password

If internet access to different mobile networks should be possible, please use the internet access data list

? Cancel OK

- *'Go Online'*

Checkbox. APN settings are made automatically

- *'Data roaming allowed'*

Checkbox. By setting this field international data roaming is activated.  
(Please consider that this might cause higher connection fees)

> Also refer to the extended APN list *'Internet access data'*

- *Access point name (APN settings)*

Please enter the APN information here. Ask your service provider for details.

> Also see Glossary / Tips

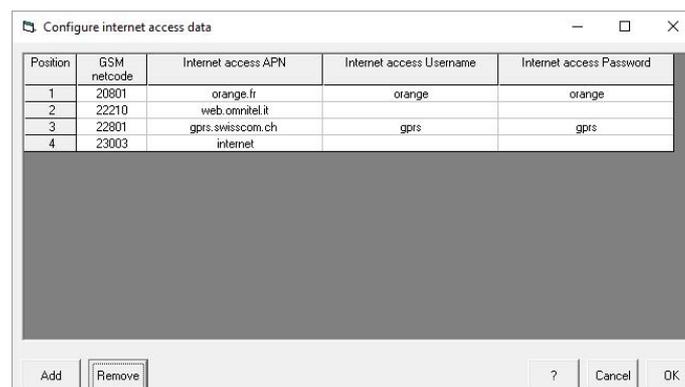
- *Username / Password*

Because the authentication is already done by the SIM card username and password are not mandatory. In the end it depends on the service provider.

- *'Configure internet access data' (extended APN list)*

Many popular APN settings are already pre-programmed within the WLL550 Pro's software. But it might happen that some SIM cards could not be identified by the system. In those cases the APN information need to be added manually in a table. See under

*'GSM access' > 'Internet access data list'*. You will need the netcode for the SIM, the providers APN name, and sometimes a pair of username and password.



-

Some *WLL550 Pro* are equipped with a single GSM radio module only. However to reduced access to the internet is possible by GPRS via Dial-up network and *Telnet\**.

\**Telnet* is optional, please ask your service partner for details.

## 2.4 Configuration network

To setup the internet connection some network skills are useful but not necessarily mandatory. Usually the factory settings of *WLL550 Pro* is 'default gateway with DHCP' which will suite to mostly all LAN configurations. Depending on the amount of computers that should use the internet access via the *WLL550 Pro* there are different scenarios for the LAN setup of the *WLL550 Pro*. This is caused by the fact that it has neither an integrated firewall nor any internal routing so all connections are directly relayed to the connected LAN device.

### - Single computer setup

If you want to connect a single computer to your *WLL550 Pro*, set the LAN-interface of the *WLL550 Pro* to 'default gateway with DHCP' and activate DHCP on your computer too. Otherwise you can configure the network interface of your computer manually. For a manual setup first define the computer's IP within the same IP range as the *WLL550 Pro* and enter a valid network mask e.g. (192.168.0.3/255.255.255.0). Then set the standard gateway and the DNS server to the IP-address of your *WLL550 Pro* (default: 192.168.0.2). Please note! You need a cross cable or a LAN-hub if the LAN interface of your computer does not support 'auto-sensing'.

### - Multi-computer/Router setup

To establish a small local network with the *WLL550 Pro* as internet gateway you need an external NAT-router. The routers WAN input must be connected to the *WLL550 Pro* and all computers and LAN devices to the LAN or WLAN of the router. If possible try to establish a point-to-point connection 'Direct connection to endpoint' between router and *WLL550 Pro*. But the *WLL550 Pro* will work as 'default gateway' as well if the routers WAN interface is set to DHCP client.

LAN settings within the *WLL550 Pro* service tool *AS55X-Service*:

> Configuration > LAN settings > LAN interface mode

## 2.5 Configuration short messaging

Please connect your *WLL550 Pro* to a computer via LAN network. Check the extended features (software options) of your *WLL550 Pro* for an '*SMS Center*', '*SMS Server*' or '*TELNET*' subscription. You need at least one of them.

The '*SMS Server*' (*beta*) is a simple webUI for the use with a custom web browser. Just configure a username(or client IP)/password combination for each channel. To send or receive short messages open a website with the IP address of your *WLL550 Pro*.

The '*SMS Center*' is a free client software that is available at [www.kuhnt.com](http://www.kuhnt.com). It uses the LAN to communicate with the *WLL550 Pro*. Basic requirements are a Microsoft Windows operation system with .NET Frameworks 2.0 or higher.

*TELNET* is a system-independent standard protocol to transmit modem commands via TCP. Some applications for managing SMS short messages like '*SMS comfort*' are able to access directly to the *TELNET* Ports of the *WLL550 Pro*. Others may additionally require a virtual COM-Port driver. *TELNET* based application work on Apple or Linux operation systems, too.

*Please look for further information at [www.kuhnt.com](http://www.kuhnt.com) or ask your dealer for support.*



## 2.6 ProviderSimSwitch

The *ProviderSimSwitch* is a modified *WLL550 Pro* hardware with additional SIM switch. The '*ProviderSimSwitch*' automatically changes the GSM and LTE/UMTS network to detect the best available service.

### How it works

With powering up the *WLL550 Pro* the '*ProviderSimSwitch*' starts testing the mobile phone networks by two criteria. First is the speed of the internet connection (LTE, UMTS, GPRS or no access). Second is the signal field strength quality of the mobile phone network itself. If a full working network is detected (100% signal quality and full LTE/UMTS internet service) any further testing is stopped immediately. The search is continuously repeated until a working GSM/UMTS/LTE network is found.

The time out for each SIM card logging into a mobile phone network is 45 seconds after the restart of the radio channel. For testing the APN setup there is an additional period of about 30 seconds to connect to the internet access point.

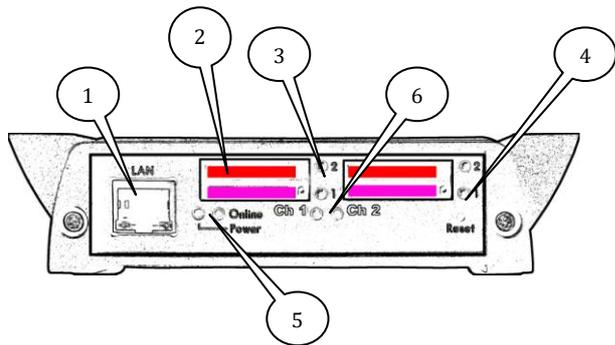
The '*ProviderSimSwitch*' remains at the SIM with the best available network until a network connection is lost for more than 10 seconds during normal operation or if a new search is triggered manually. The new network search restarts considering all previously detected network data.

A net search can be initialized manually by DTMF sequences entered on the telephone interface '*TEL*'. You can hear an acoustic acknowledgement when the restart sequence begins:

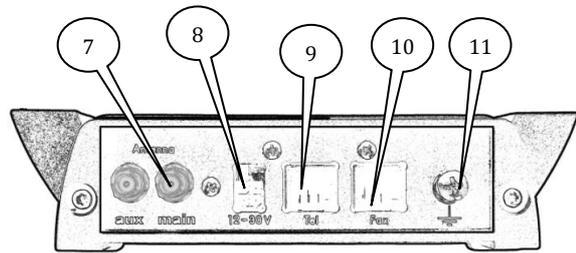
#77#	for both GSM/UMTS radio channels
#77n#	for a single radio channel $n = 1$ or $2$

It is helpful to define a minimum signal field strength for each radio channel to improve the quality of the various network services. A network search automatically starts if the field strength goes below that limit.

• Front panel



• Back panel



1. LAN network 10/100 Mbps connection for LAN/network (Internet and configuration)
2. 2 SIM slots for 3V mini-SIM cards.  
(channel 1 is marked with Ch1; channel 2 is marked with Ch2)
3. SimSwitch LED - display of the SIM switch
4. Reset - button to restore factory defaults
5. Power LED / Online status LED
6. Status LED of the radio channel
7. SMA connector main antenna, auxiliary SMA connector for LTE diversity
8. Power jack for external power supply
9. Phone jack for analogue telephone, PABX or Tel-Fax combination devices.
10. Phone jack for G3-fax machine
11. Earth terminal, GND

## Configuration of the ProviderSimSwitch

To configure the 'ProviderSimSwitch' activate the SIM reader of SIM 1 and 2 by setting it to 'Yes'. Please start with SIM 1. Each radio channel can manage different numbers of SIM cards. Entering the GSM netcode is optional to avoid international roaming for example.

> also see Glossary / Tips

This setup below is for WLL550 Pro with two SIM cards for each radio channel. For channel Ch1 APN information are necessary. Use the '?' question mark instead of APN information or if they are unknown. The channel Ch2 does not support any internet access.

GSM channel	SIM number	Inserted	GSM netcode	Internet access APN	Internet access Username	Internet access Password
Master / Ch. 1	1	Yes		?		
	2	Yes		?		
Master / Ch. 2	1	Yes				
	2	Yes				

? Cancel OK

The 'ProviderSimSwitch' cannot be used with a standard 'SimSwitch' at the same time. Entering data into 'ProviderSimSwitch' deactivates all standard 'SimSwitch' settings and vice versa.

*Default value:*                      *not reported*

General recommendation:

- Call forwarding for all services on channel Ch2 might be useful to improve your availability.
- Deactivate your mailboxes or turn off call forwarding to the mailboxes

## 2.7 Reset (Factory defaults)

The reset button on the front panel can be used to restore the factory default settings but additionally gives you access to some service modes as well. There are two restart modes and a remote service mode by *ReverseIP\*\**. To access these service modes the WLL550 Pro needs to be powered up.

While the reset button is pressed the power LED will start the following flashing sequence:

*> 2sec. off > 2 sec. alternating red/green > 2 sec. off > 2 sec. yellow > 2 sec. off > 2 sec. red > 2 sec. off > then turning to green again.*

Releasing the rest button after a determined time will cause a certain action like a *ReverseIP\*\** remote service session, a full warm or cold restart.

- **flashing red/green** > starts a **ReverseIP-connection\*\*** to the manufacturer's service unit via internet
- **flashing yellow** > causes a warm restart
- **flashing red** > causes a cold restart (all counters, the ARP-table etc. will be deleted)

To initialise to factory default settings, first disconnect the power supply. Then reconnect the power supply while the reset button is already pressed. Keep on holding it until the green power LED is on again. After the release of the button the WLL550 Pro will instantly restart with the factory default settings restored.

*Hint! Using the reset button will not just delete all configuration data, but also all security information, like PIN and passwords etc. !*

\*\* ReverseIP-connections are remote service session to a manufacturer's service computer. To protect your data it is recommended to init a remote service session by appointment only. An internet access via mobile phone network or LAN is mandatory!

## 2.8 DTMF Codes

DTMF tone sequences to configure the *WLL550 Pro* via telephone interface:

- Enter PIN for each SIM card by DTMF please use this code:

#\*1\*xxxx# for radio channel one and #\*2\*xxxx# for radio channel two.  
xxxx is placeholder of the PIN.

- To activate the internet access temporarily:

#721# activates the internet access (WAN)  
#720# deactivates the internet access

*Please note! This option is only available with the factory defaults.*

- To log into the home net of your SIM, you can force a restart of the radio module ,

#734# (REG) reset of all GSM/UMTS/LTE channels.  
#7341# reset of channel one and #7342# reset of channel two.

- In 'trunk mode' outgoing fax messages must be assign to the GSM fax service. Otherwise it is treated like a voice call which will fail. Each fax call must be prefixed (e.g. \*8 0044123456789 ...). This prefix (\*8) does not become part of the called number itself and is ignored during the connection setup by the *WLL550 Pro*.

- To restart the best net detection with the 'ProviderSimSwitch' , please use this codes

#77#	all GSM/UMTS/LTE radio channels
#771#	LTE/UMTS/GSM radio channel one only
#772#	radio channel two only

- Within 'ProviderSimSwitch' you can choose a dedicated SIM card for each channel

#78nm#	n is th placeholder for the channel (1 or 2) m is the placeholder for the SIM-card (1 or 2)
--------	--

Example: #7821# activates SIM card 1 of channel 2

- To initialize a remote service session via ReverseIP mode, enter the following code a on your phone:

*#78\*IP1\*IP2\*IP3\*IP4#*

IP1.IP2.IP3.IP4 is the IPv4 address of the remote service unit.

### Using GSM codes with your WLL550 Pro:

The WLL550 Pro itself uses DMF codes for configuration and programming. This means that all numbers starting with a \* (asterisk) or # (hash) even all GSM codes like call forwarding etc. are detected by the WLL550 Pro. But you can change the DTMF detection settings of the WLL550 Pro to make these GSM codes working again. One method is to deactivate it completely and the other is to set it for both, WLL550 Pro programming and GSM codes.

If you want to use custom GSM codes for setting a call forwarding etc. you need to change or deactivate DTMF recognition of the *WLL550 Pro*.

#### Method 1:

To deactivate the DTMF recognition of your *WLL550 Pro* change the following data in this bit/byte set within '*Special settings*' of the configuration window:

*bit 64 = Not set*  
*byte 9 = 0*

#### Hint:

Please, do not use this settings if the *WLL550 Pro* FXS is running in '*trunk mode*'!

#### Method 2: (requires a firmware revision 3.16 or higher)

You can use the *WLL550 Pro* DTMF control codes and GSM codes at the same time when the treatment of the hash '#' is changed in the configuration setup . Otherwise DTMF codes starting with a hash '#' cannot be interpreted correctly and call forwarding etc. will not work.

To change the DTMF detection of hash '#' tone , change this bit/byte set within the '*Special settings*':

*bit 75 = set*  
*byte 9 = 0*

GSM codes for call forwarding must be entered as a short cut now:

Dial '1#' for all GSM codes starting with a single hash '#' and dial '2#' for all GSM codes starting with a double hash '##'

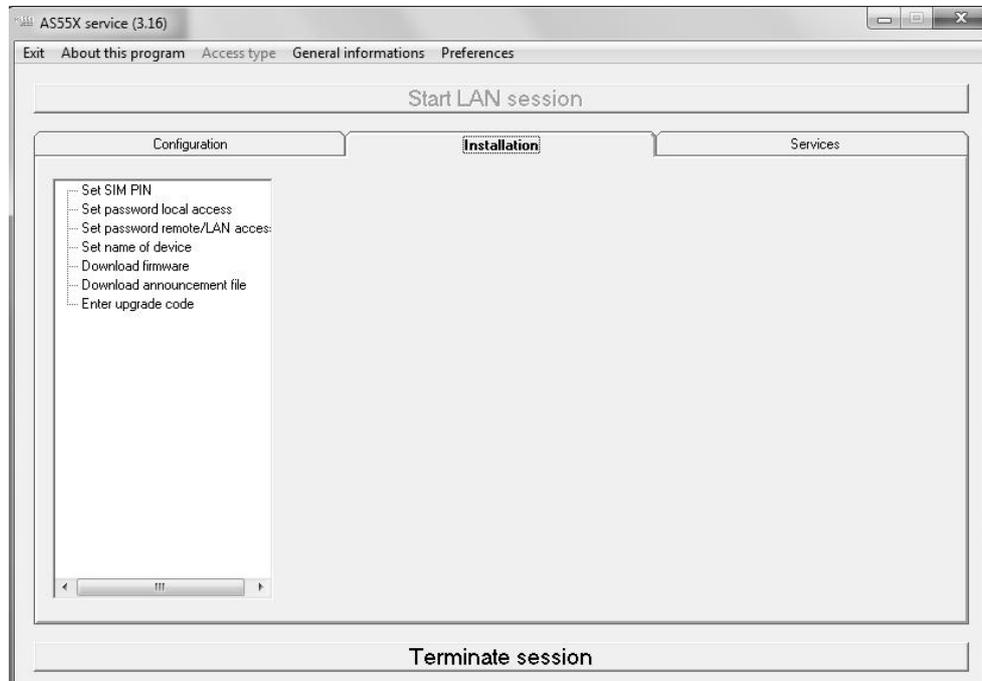
#### Example:

To cancel all call forwarding by the GSM code ##002# dial 2#002# instead



## 3 Installation

In the *'Installation'* - menu some basic settings can be done. Most of them must not to be done necessarily within a service session. e.g. the PIN numbers can be easily entered by DTMF code.



### *Hint!*

*Not all option that are visible are useful for the configuration of a WLL550 Pro. Have a look on the selection here:*

**Set SIM PIN** Enter PIN numbers for each SIM card individually by radio channel number

### **Set password remote/LAN access**

For higher security please set a Username/Password here

### **Set name of device**

To identify a *WLL550 Pro* within a network or remote sessions are done with several different *WLL550 Pro* devices. Set an individual name here.

### **Download firmware**

Local firmware updates of a *WLL550 Pro*. Firmware files are available from your service or at [www.kuhnt.com](http://www.kuhnt.com). Always use the newest *AS55X-Service* software to configure new firmware features .

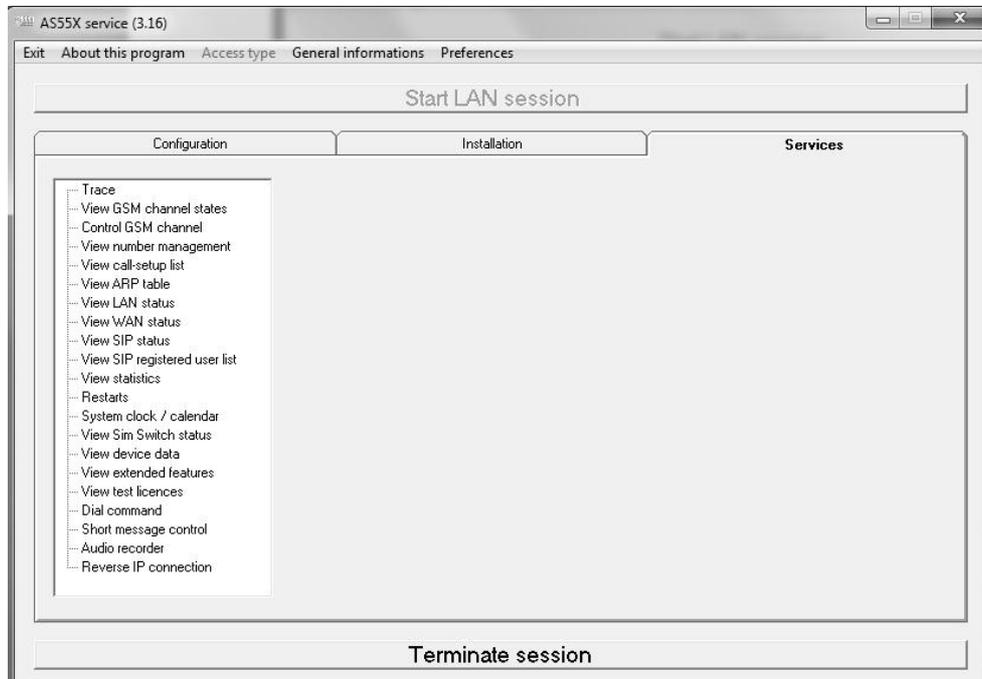
### **Enter upgrade code**

Software modules *'Extended features'* can be activated by a upgrade key



## 4 Services

Advanced users can use the tools in 'Services' menu for monitoring and maintenance work on a *WLL550 Pro* .



### Hint:

Not all tools that are visible are useful for the maintenance of a *WLL550 Pro*. Have a look on the selection here:

**Trace**        The 'Trace' function can record all internal events into a log-file. This log-files can be very helpful for any kind of trouble shooting and setup problems

### View GSM channel states

Shows the status of the GSM channels. This values are polled repeatedly.

### View LAN status

Shows the status of the network interface

### View WAN status

Shows the status of the WAN interface

### View statistics

Shows some statistical data about incoming and outgoing calls. This values are polled repeatedly.

**Restarts**      Various option to restart single GSM channels or the whole device

**System clock / calendar**

Adjust *WLL550 Pro* system clock or synchronizes it with your computer clock.

**View device data**

Shows various hard- and software information.

**View test licence**

Shows the status of the '*test licence*'

**Reverse IP connection**

Setup for a Remote IP session

## 5 Special settings

### 5.1 Unnamed bits

- *Unnamed bit 55, FAX speed restriction*

If this bit is set, FAX speed is limited to 4800bps. This setting only makes sense, if due to bad line quality, the training procedures often are too long.

*Default value:*                      *Not set*

- *Unnamed bit 56, no FAX function restriction*

Normally enhanced FAX modes like error correction, colour transmission etc. are disabled, as this is strongly recommended with FAX over GSM. These modes can be enabled by setting this bit.

*Default value:*                      *Not set*

- *Unnamed bit 59, do not store local parameters*

For faster synchronisation of both FAX devices during incoming calls, the parameters of the local FAX device will be stored in the WLL. If this bit is set, there is no storing and the parameters will newly be read from the local FAX device with every call.

*Default value:*                      *Not set*

- *Unnamed bit 60, do not store remote parameters*

For faster synchronisation of both FAX devices during outgoing calls, the parameters of some remote FAX devices will be stored in the WLL. If this bit is set, there is no storing and the parameters will newly be read from the remote FAX device with every call.

*Default value:*                      *Not set*

- *Unnamed bit 74, CLIR with FAX calls*

For Outgoing FAX calls present the voice number instead of the FAX number of the SIM. This can result into confusion by the recipient, which number should be used for a reply. If unnamed bit 74 is set, the presentation of the number will be restricted, even if it is requested for voice calls.

*Default value:*                      *Not set*

- Unnamed bit 75, convert DTMF hash codes

Dialing strings beginning with a '#' are used for programming or switching purposes. If dialing of star-hash codes to the network is required, this bit can be used. If it is set, the DTMF digit sequence '1#012345' will be converted to '#012345' and '2#012345' will be converted to '##012345'.

- Unnamed bit 76, ignore network selection result

See unnamed byte 126.

## 5.2 Unnamed bytes

- Unnamed byte 109, pause between FAX call-setup trials  
If a FAX call-setup failed, after this time in seconds, the WLL is trying again.  
*Default value:* 0, same as 60
- Unnamed byte 110, pause between FAX call-setup trials after connection  
If a FAX connection failed, after this time in seconds, the WLL is trying again.  
*Default value:* 0, same as 10
- Unnamed byte 113, maximum call trials to local FAX  
The maximal number of call trials to the local FAX device, that is connected to the analogue interface of the WLL.  
*Default value:* 0, same as 3
- Unnamed byte 114, maximum call trials to remote FAX  
The maximal number of call trials to the remote FAX device, that is connected via GSM to the WLL.  
*Default value:* 0, same as 3
- Unnamed byte 121, force UMTS or LTE modules to a dedicated network type  
  
Normally these modules preferably registers to the network with highest bandwidth. If byte 121 is set to a value other than zero, the channel rate will be fixed: 1 for GSM, 2 for UMTS and 7 for LTE. Other values depend on the module types. This setting is globally for all channels.  
*Default value:* 0
- Unnamed byte 126, network selection trials  
  
By default, this value is 8. It can be increased, if the registration of the TC63i GSM module to the network fails for a very long time, e.g. in the case of roaming. If the unnamed bit 76 is set, error results will be ignored

## 6 Technical data

- Power supply:
  - External power supply:
  - Voltage WLL550 Pro: 12V to 30V DC  
> Micro Mate-N-Lok connecting cord included <
  - Power consumption: 2 channel (TC63i / EU3-E):  
Min. approx. 4,5W / max. ca. 10W  
(With Mascot type 9619)
- Radio modules:
  - Gemalto/Cinterion TC63i  
Quad band GSM/CSD/GPRS/EDGE 850/900/1800/1900 MHz
  - Gemalto/Cinterion PH8  
Quad-band GSM/GPRS/EDGE 850/900/1800/1900MHz  
Five-band UMTS/HSPA+  
EDGE Class 12, GPRS Class 12 800/850/AWS/1900/2100MHz
  - Gemalto/Cinterion PLS8:  
Five Band LTE 800/900/1800/2100/2600 MHz,  
FDD-Band (20,8,3,7,1)
  - Tri Band UMTS (WCDMA) 900/1800/2100 MHz,  
FDD-Band (8,3,1)
  - Dual Band GSM/GPRS/EDGE 900/1800 MHz
- Antenna: One antenna combiner 2 in 1 - SMA female connector  
One auxiliary SMA connector for LTE diversity
- 3V mini-SIM cards
- Interfaces: LAN/Ethernet 10/100 Base-T, RJ45, 'auto sensing'  
Two analogue FXS (POTS): FXO fax and phone (CLIP),  
RJ11
- Network protocols: DHCP, DNS, ARP
- Maintenance: Service software *AS55X-Service*  
for WINDOWS operating systems  
(Download link: <http://www.kuhnt.com/down/55xwin32.zip>)  
Interfaces: LAN, Reverse IP or GSM CS-data  
(Secured by: username and password)
- Size/weight: Aluminium desktop case.  
Approx. width 125 (154\*) x height 35 x depth 185 mm  
\* with mounting bracket  
Approx. 810 g (2 radio modules)
- Environment: Operating temperature: -30°C to +70°C  
Storage temperature: -10°C to 70°C  
Humidity: 0% to 90%



## 7 Glossary / Tips

APN	'Access point name' is the name of the gateway in a mobile phone network when packet data with GPRS, HSDPA or HSPA+ is involved. Usually you need a server name, a user name and a password.
WAN	'Wide area network' global computer network. The 'Internet'
WWAN	(wireless wide area network) is the same as a WAN but physically based on wireless connection (e.g. mobile phone network)
LAN	'Local area network' local (wired) computer network
FXS	Foreign exchange service. Equivalent to a via a 'private line'
POTS	'Plain old telephone service' describes the classic telephone system based on local loop interfaces.
DHCP	DHCP (Dynamic Host Configuration Protocol) for dynamically distribution of network configuration parameters by a DHCP server.
TCP	'Transmission control protocol' is a protocol of the IP system and a basic part of the internet.
TELNET	'Telecommunication network' is a classic client/server-protocol, to establish modem connections via TCP/LAN.
Netcode	The Mobile Network Code MNC is a five-digit number and identifies a mobile phone network. The first three digits stand for the country the last two digits for the provider. E.g. >26202< is >262< for Germany and >02< for Vodafone.
CSD GPRS HSPDA HSPA+ LTE	Various methods for data transmission within a mobile phone network

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### General advices:

- Block roaming for the LTE/UMTS channel 'Ch1' by entering a 'netcode' if you are not sure about the roaming cost for data traffic
- Deactivate call forwarding into mail boxes for all SIM cards. Code: ##002#

