ALF user manual

```
Art.Nr. 9352-ALF
```

documentation of version XX

1 Description

Connecting of a network or a network-user via wireless to an access point;
also works as an access point-router or PPPoE.

2 System Requirements

2.1 Operating system(s)

Windows

- 10
- 8
- 7
- Vista
- XP

2.2 Software

PLC - programming software (eg PG 2000, Step © 7, S7 for Windows, Microwin) Webbrowser

2.3 Hardware

NIC 10/100MBit

3 Operational-/deployment Modes

AP Router	In this mode, ALF is an access point for the wireless network and through the WAN port connected to a DSL modem provides Internet access.
AP Bridge	In this mode, ALF is an access point for your wireless network. There is no connection to a DSL modem and therefore to the Internet
Client Router	In this mode, ALF is a client to an existing access point. It provides additional router functionality.
Client Bridge	In this mode, ALF is a client to an existing access point.

4 Installation

4.1 Hardware

Connect the external 24 V power adapter into the Phoenix socket.

ALF to network users
Connect a network cable with one end to the “PoE LAN” jack of the ALF and the other end into the network port of your networks-Switchs/ network-users.

ALF to Switch/Hub
In this case, the network cable is connected from port “PoE LAN” of the ALF to the port of the Switch / Hub. If you use a crossover cable, please connect it to the Uplink port of your Switch / Hub. If you have an Switch with capable auto-negotiation, you can connect the crossover cable into any available port on the Switch.

4.2 Software

To work with a PLC you need a programming software (eg PG 2000, Step© 7, S7 for Windows, MicroWIN).

5 Control elements

5.1 Display LEDs

Power LED off:	ALF is turned off
Power LED on:	ALF is turned on
WAN LED off:	Link off (no connection to the network)
WAN LED on:	Link on (A connection exists to the network)
WAN LED is blinking:	Transmission (data transmission in progress)

LAN LED off:	Link on (A connection exists to the network)
LAN LED on:	Link off (No connection to the network)
LAN LED is blinking:	Transmission (data transmission in progress)

5.2 WPS button

With the WPS button, you can quickly and easily set up a wireless connection to an existing access point. This access point must support WPS.

5.3 Webbrowser

Open the web browser on your computer and type in the address bar the IP address of your ALF (default IP of LAN / WLAN: 192.168.2.1) and confirm with <Enter>. It will open the login screen of the ALF in which you must enter the user name and password.

Login data (default):

User Name: admin
Password: admin

5.4 Web browser Categories

In the menu above you can choose between three categories in which you can make various adjustments to your ALF.

5.4.1 Status

Here you can see an overview of the Internet and LAN configuration, some system information, statistics,

the DHCP list and the list of stations.

5.4.2 Easy Setup

Here you can make quickly and easily the most important settings to maintain your ALF operational.

5.4.3 Advanced

Here you find menus to change configurations and parameters.
Furthermore, you can here call up the management system with which you can change, among other things, the login data or perform a firmware upgrade.

Further steps to configure your router are described in the chapter Configuration.

6 Configuration

6.1 Web-Interface

Start your Web browser and type in the address bar the IP address of the router. Confirm with the key to load the start page.

6.1.1 Status

Here you can get a general overview of the connections established.

Status:	Shows the current WAN and LAN parameters. moreover, the firmware version and the operating mode.
Statistics:	Showing the memory state of the router and the statistics of the received / sent packets.
DHCP Clients:	This table shows all the DHCP clients with their respective IP addresses and MAC.
Station-List:	This table lists all stations with their MAC addresses, speed and RSSI.

6.1.2 Easy Setup

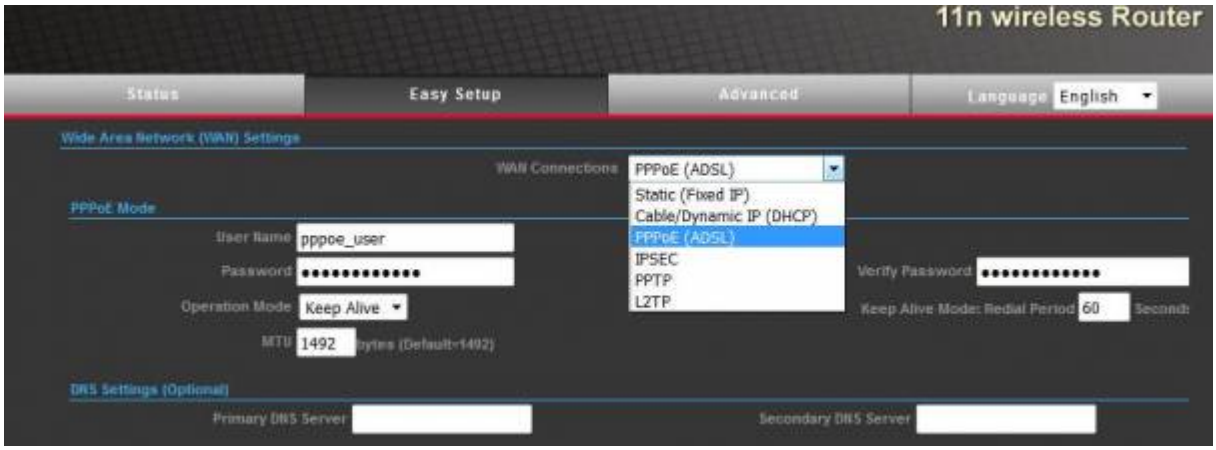
First, you must select a “Operation mode” from the list and subsequently click “Next” to the next page.

6.1.2.1 Operation mode

Here you select the operating mode of the ALF.

6.1.2.1.1 AP Router

When configuring the AP router, you must first parameterize the WAN. First you must select the WAN connection that apply to you and parameterize them.



By clicking on “Next” you come to the next page.

Now configure your wireless network giving first an SSID to it. You can optionally check the box “Hide” to hide the SSID assigned. You can also enable and parameterize the WPS option to quickly configure a WPS supporting client on your wireless network.

Then select and configure an encryption for your wireless network. You can choose from different types of encryptions.

By clicking on “Done” the ALF is now configured according to your specifications.

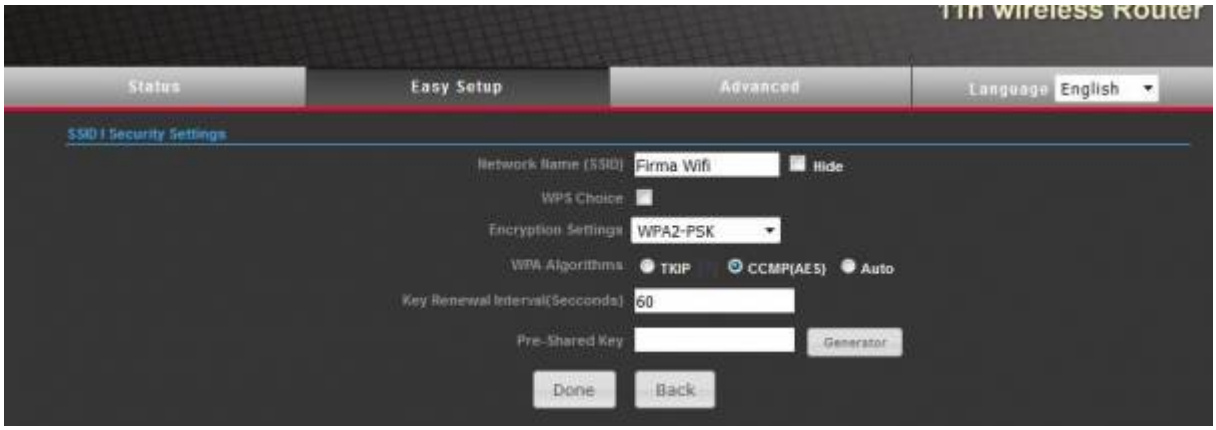
6.1.2.1.2 AP-Bridge

The configuration of AP-Bridge-mode is similar to the configuration in AP-Router-mode except for the missing WAN.

Attention: In operation-mode AP-Bridge the DHCP-function is disabled by default. You should before you switch your PC in this operation-mode assign a fixed IP-address in the address-space of the ALF or adjust the LAN-settings of the ALF to your network.

Here you must configure only your WLAN when configuring the AP-Bridge.

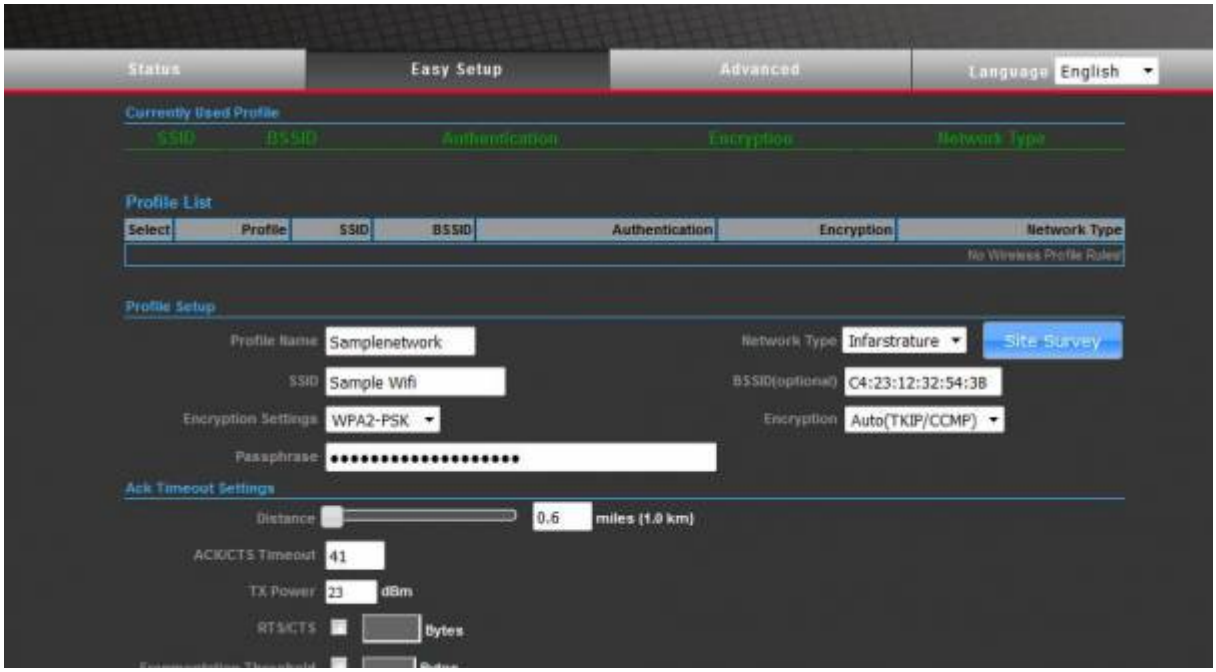
Now configure your wireless network giving first an SSID to it. You can optionally check the box “Hide” to hide the SSID assigned. You can also enable and parameterize the WPS option to quickly configure a WPS supporting client on your wireless network. Now you have to select a WLAN encryption method and parameterize them. You can choose between different types of encryption.



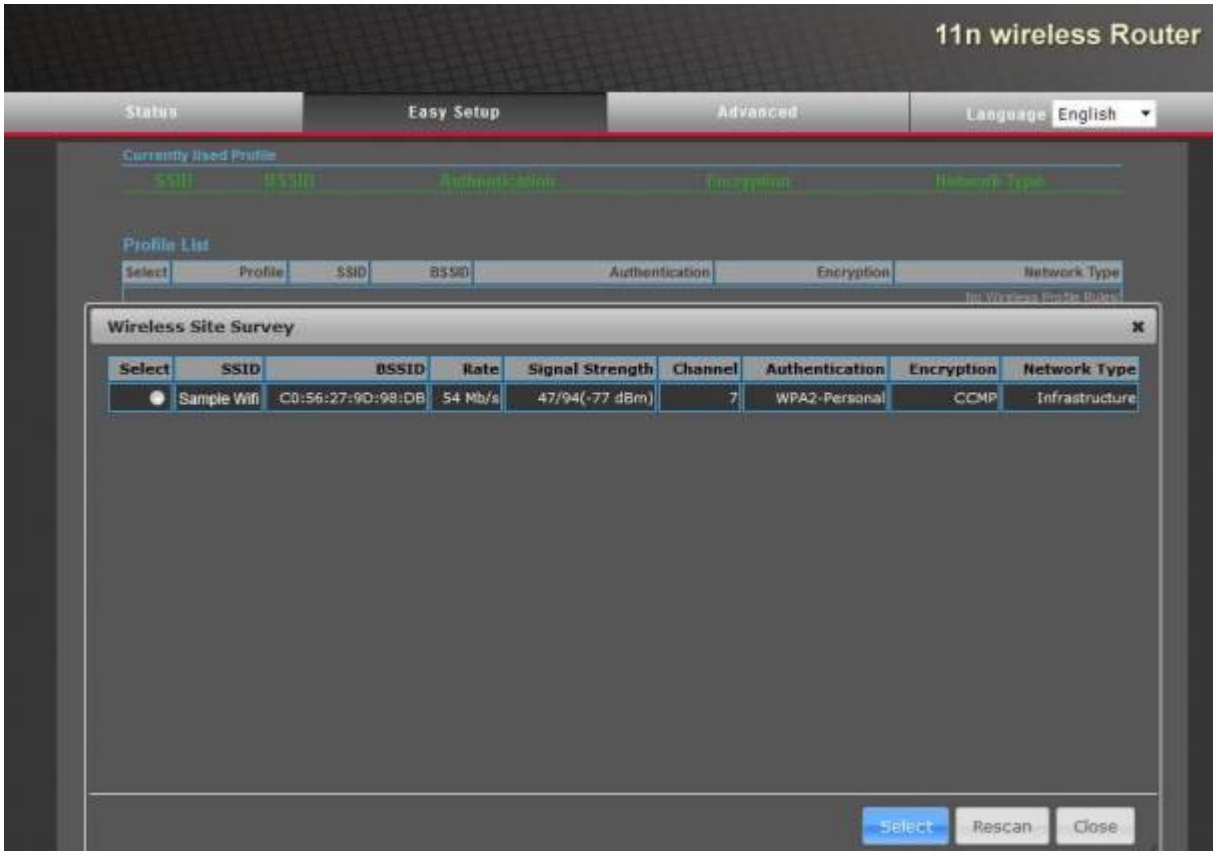
By clicking on “Done” the ALF is now configured according to your specifications.

6.1.2.1.3 Client Router

The configuration as client-router requires the creation of a profile or use of an existing profile. The first step to create a new profile is assigning a name and specify the parameters of an existing wireless network.



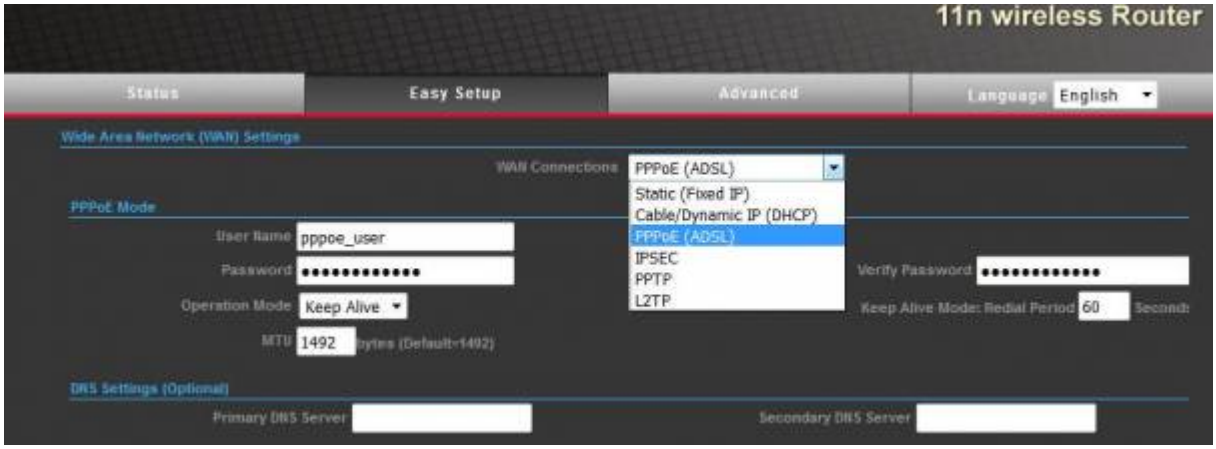
By clicking on “Site Survey” you can alternatively view a list of available wireless networks, select one of them and take over its parameters by clicking “Select”. In order to refresh the list click “rescan”.



Last you need to configure the “Ack Timeout” settings.

ACK/CTS Timeout:	Enter the timeout. It must be between 35 and 409.
Fragmentation Threshold:	Please enter a value between 256 and 2345 if needed.
RTS/CTS:	Please enter a value between 256 and 2345 if needed. Click “Next” to go to the next page.

When configuring the client-Router you must now also parameterize its WAN. To do so please select your WAN connection and parameterize it.



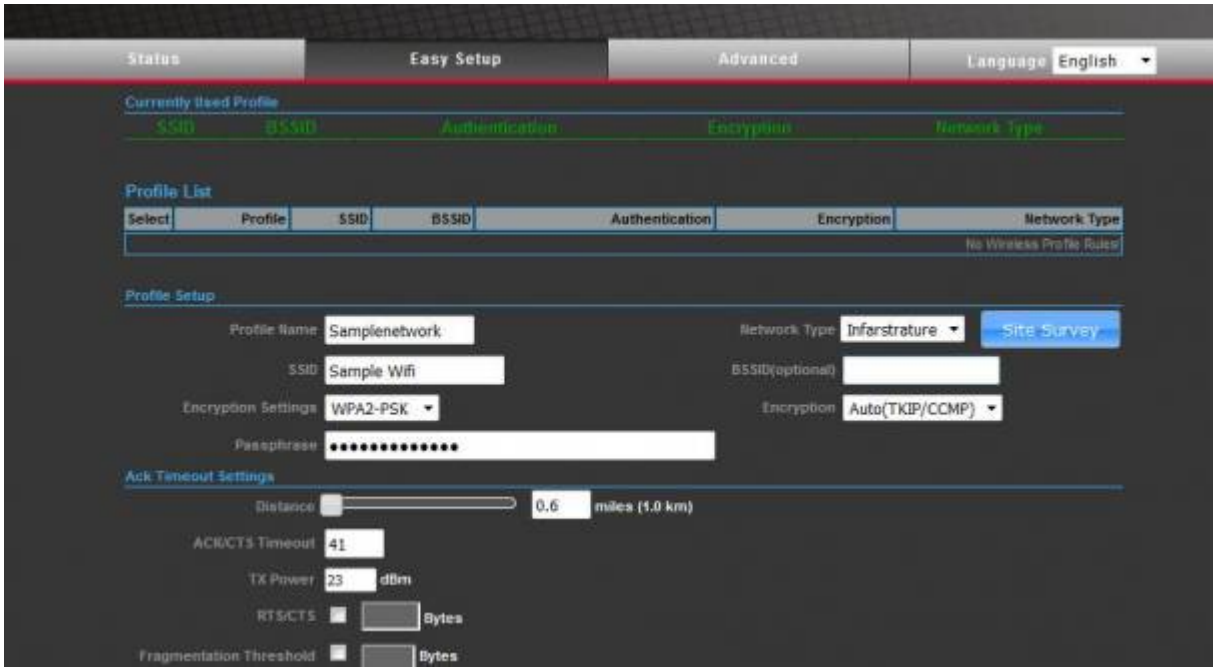
By clicking on “Next” the ALF is now configured according to your specifications.

6.1.2.1.4 Client Bridge

The configuration of the client bridge mode is similar to the client router mode except for the missing WAN.
Attention: In operation-mode Client-Bridge is the DHCP-function not available. You have before you switch your PC in this operation-mode to assign a fixed IP-address in the address space of the ALF or adjust the LAN-settings of the ALF to your network.

Hence you must configure only your WLAN when configuring the client bridge.

The configuration as client-bridge requires the creation of a profile or use of an existing profile. The first step to create a new profile is assigning a name and specify the parameters of an existing wireless network.



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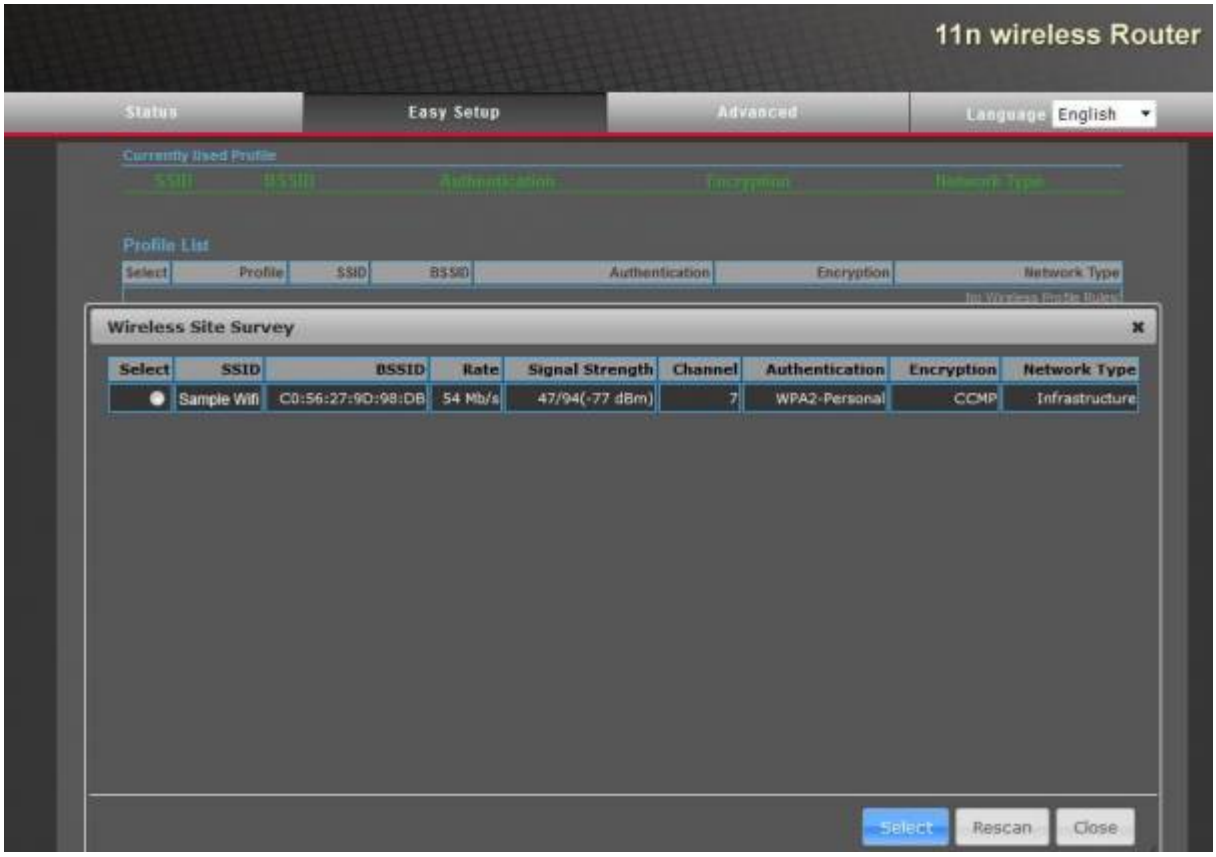


Last you need to configure the “Ack Timeout” settings.

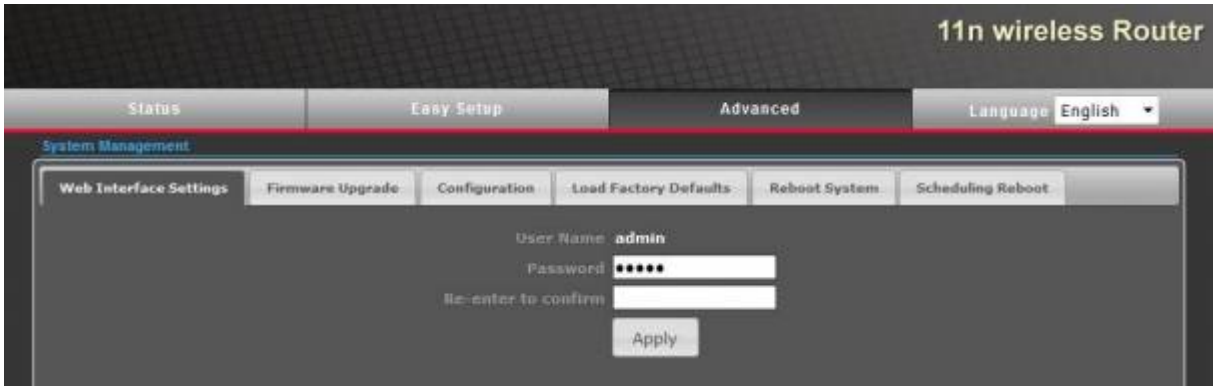
ACK/CTS Timeout:	Enter the timeout. It must be between 35 and 409.
Fragmentation Threshold:	Please enter a value between 256 and 2345 if needed.

RTS/CTS:	Please enter a value between 256 and 2345 if needed.
WDS Client:	If the ALF is be used as a WDS client, select the check-button. By clicking on “Done” the ALF is now configured according to your specifications.

6.1.3 Advanced

In case your network requires any special settings or you want to change the configuration of the ALF you can edit the parameters using the following setup pages.
According to which “Operation mode” is chosen it may be that some of the setup pages are not active.

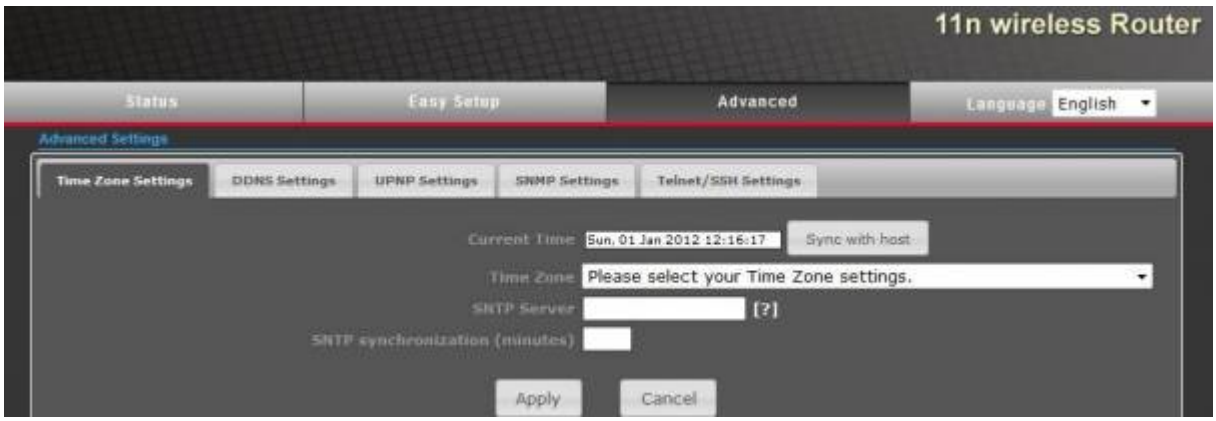
6.1.3.1 Management



Web Interface Settings:	Here you can change the password for the web interface and accept the change by clicking “Apply”.
Load Factory Defaults:	To reset to factory settings click “Load Default” and confirm the safety query with “OK”.
Firmware Upgrade:	Here you can see the current software version of ALF. You can also specify a path to a file to update the software or search for it using the “Browse…”. Click on “Upload” to start updating the Software. **Reboot System:** To restart the system, click on “Reboot Now” and confirm the safety query with “OK”.
Configuration:	In this menu you can export a configuration file to your PC as well as import these files from your PC to the ALF. To export a file click on “Export”. To import a file you must first specify a path to the file or search these by clicking the “Browse” button to select. By clicking “Import” the configuration file gets loaded to ALF.

Scheduling Reboot:	To allow the router to periodically restart at a specific time, you must select “Enable” and specify a time. Otherwise this setting stays on “Disable”.

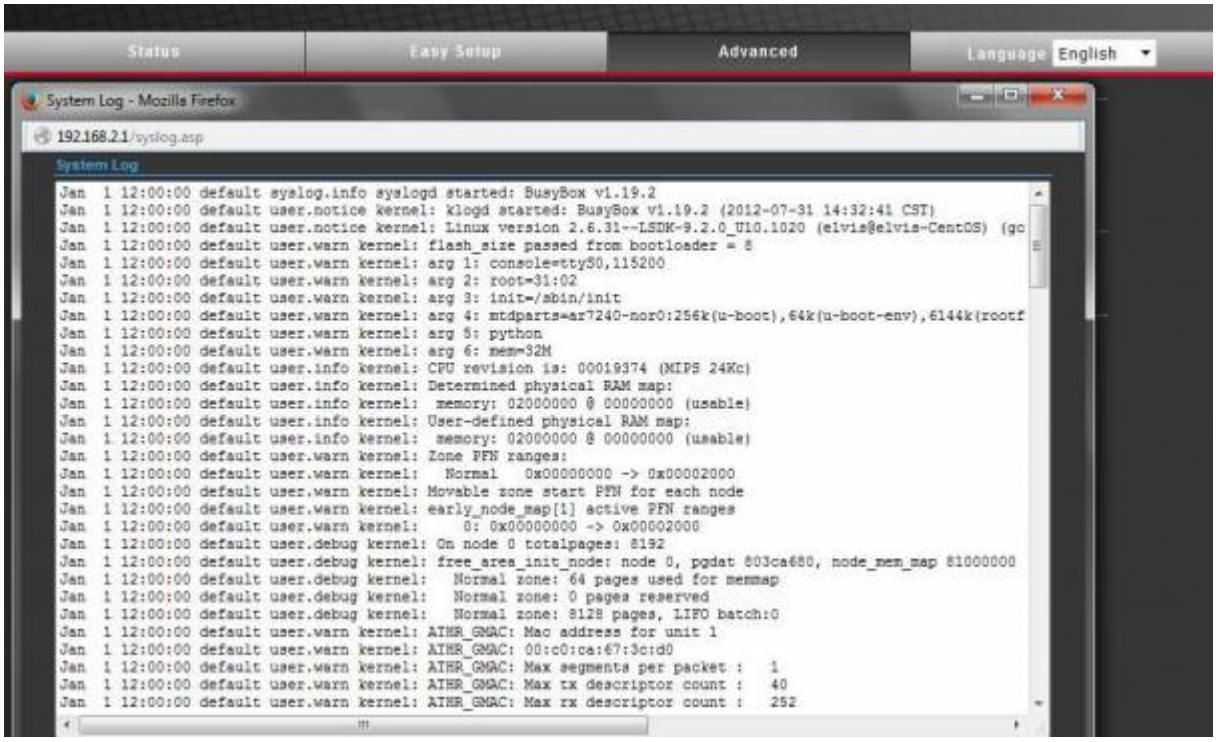
6.1.3.2 Advanced Settings



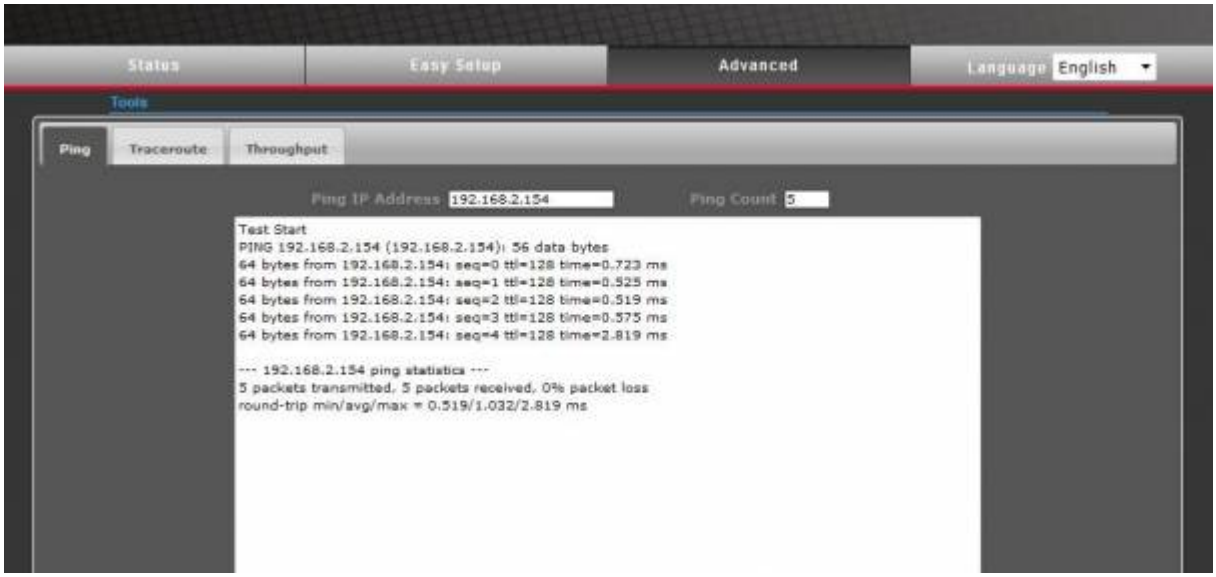
Time Zone Settings:	Here you can see the current time and date. You can also choose the time zone, SNTP server and synchronization intervals. Accept by clicking “Apply”. By clicking on “Sync with host” you can initiate an immediate synchronization.
SNMP Settings:	Here you can enable and disable SNMP. If you want to enable, you must parameterize “Get Community” or “Set Community”. Then accept with “Apply”.
DDNS Settings:	Within this menu you can select a DDNS provider, enter your login details and accept with “Apply”.
Telnet/SSH Settings:	Here you can enable or disable Telnet and SSH and take over the settings with “Apply”. Also you have to enter the password for Telnet / SSH and save it with “Apply”.
UPNP Settings:	Here you can enable or disable UPNP and save with “Apply”.
Operation Mode	If you wish, you can change here manually the operating mode (without Easy Setup). Click “Apply” to change to the new mode.

6.1.3.3 System Log

Once you click “System Log” a new window will pop up where you can see a detailed record of the System-Log.
This record can be updated by using “Refresh” and can also be deleted with the “Clear” button.



6.1.3.4 Tools



Ping:	You can use this tool to send a Ping to a specific IP address. To do this you have to enter above in the text box the destination IP address and in the box to the right the number of ping requests. To send the Ping click on “Start”.
Throughput:	Here you will find a “VISIT THE SITE TO SPEED TEST” button, this leads you to an external website where you can test your Internet speed (you will need a current Adobe Flash Player version).
Traceroute:	With this tool you can run a traceroute on a URL. To do this you must enter the URL in the box above and click “Start”.

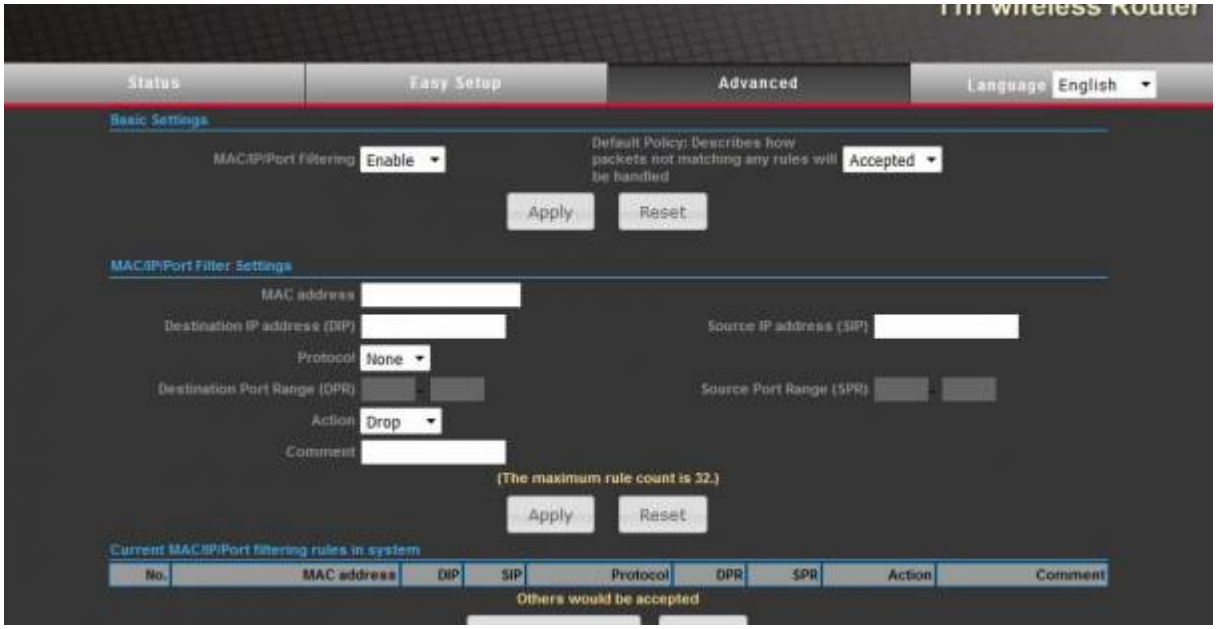
6.1.3.5 Firewall Settings

6.1.3.5.1 MAC/IP/Port Filtering

If you want to filter a MAC IP-Address or a port of your PC you must set the “MAC / IP / Port Filtering” to “Enable” and change the “Default Policy” to “Accepted” or “Dropped”, always depending on the filter

selected.
After clicking on “Apply” the “MAC / IP / Port Filter Settings” window will open where you must enter the object to be filtered.
By clicking on “Apply” the new rule is added to the system.

You can delete established rules by ticking the box in the rules table and clicking on “Delete Selected”.



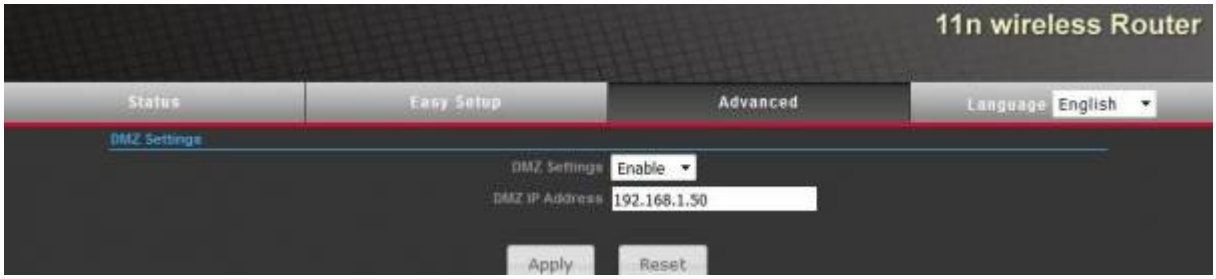
6.1.3.5.2 VirtualServer

To start a virtual server you must mark “Virtual Server” as “Enable” and accept with “Apply”. Now open the “Virtual Server Settings”. Here enter the IP address, private port, public port, protocol mode and optionally any comment. Click on “Apply”. The virtual server is now available.

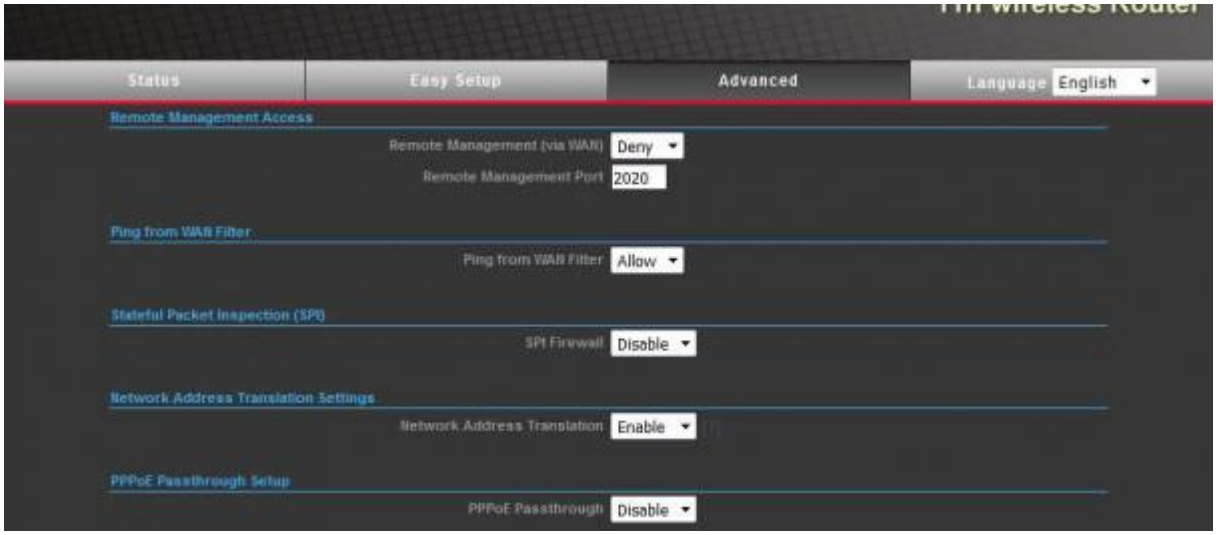
Virtual servers can be removed marking the corresponding checkbox in the server table and then clicking on “Delete Selected”.

6.1.3.5.3 DMZ

To establish a DMZ, you must set “DMZ Settings” to “Enable” and specify the associated IP address. By clicking on “Apply” the DMZ is now set up in the system.

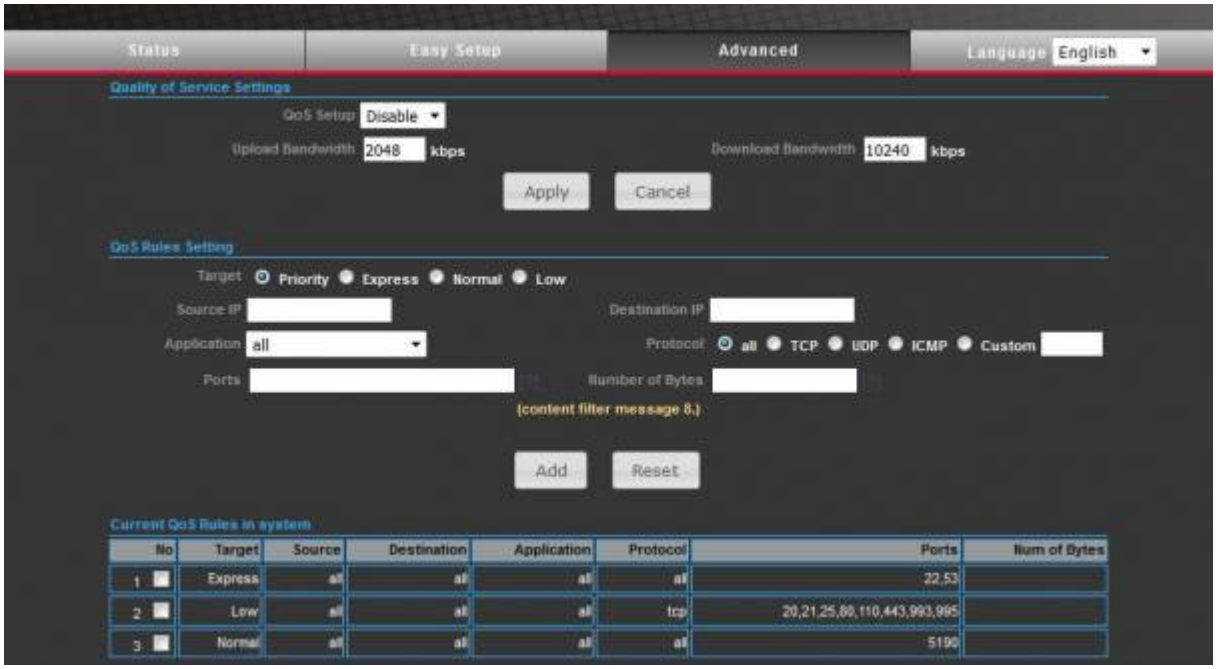


6.1.3.5.4 Firewall



Remote Management Access:	Here you can allow with “Allow” or refuse with “Deny” a remote access. Also a port must be set through which remote access is established.
Network Address Translation Settings:	To allow LAN-users to access the Internet you must set this box to “Enable”. To deny access to the Internet set the box to “Disable”.
Ping from WAN Filter:	To allow or prohibit a ping from the WAN filter you must select here “Allow” or “Deny”.
PPPoE Passthrough Setup:	Here you can “Enable” or “Disable” the PPPoE Passthrough.
Stateful Packet Inspection (SPI):	Within this setting you can “Enable” or “Disable” the SPI firewall.

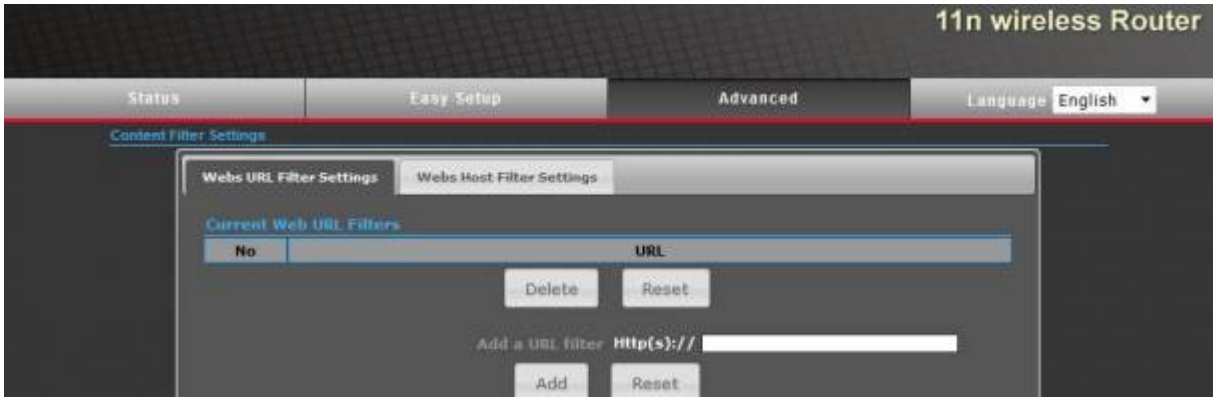
6.1.3.5.5 QoS



To use QoS, you must set the QoS settings to “Enable”, specify the bandwidth of Download and Upload and accept by clicking “Apply”.
In the setting “Setting QoS Rules” specify the application used, including the source IP and the destination IP, protocol and number of bytes. With a click on “Add” the new QoS rule is added to the system.

QoS rules can be eliminated by marking the appropriate box of the QoS table and a subsequent click on “Delete Selected”.

6.1.3.5.6 Content Filtering



Webs URL Filter Settings:	To add a URL to the URL filter click “Add a URL filter” and enter the appropriate URL. By clicking “Add” this URL is added to the filter. To remove the URL from the filter check the corresponding box on the URL table. With a subsequent click on “Delete Selected” the URL filter will be removed.
Webs Host Filter Settings:	To add a host to the filter click “Add a Host (keyword) filter” and enter the corresponding Host. By clicking “Add” this host is added to the filter. To remove the Host from the filter check the corresponding box on the host table. With a subsequent click on “Delete Selected” the Host will be removed from the filter.

6.1.3.6 Network Settings

6.1.3.6.1 WAN

In this menu, you must first select the WAN Connection applicable to you and then parameterize this with your details. By clicking on “Apply”, the WAN connection is established.

6.1.3.6.2 LAN

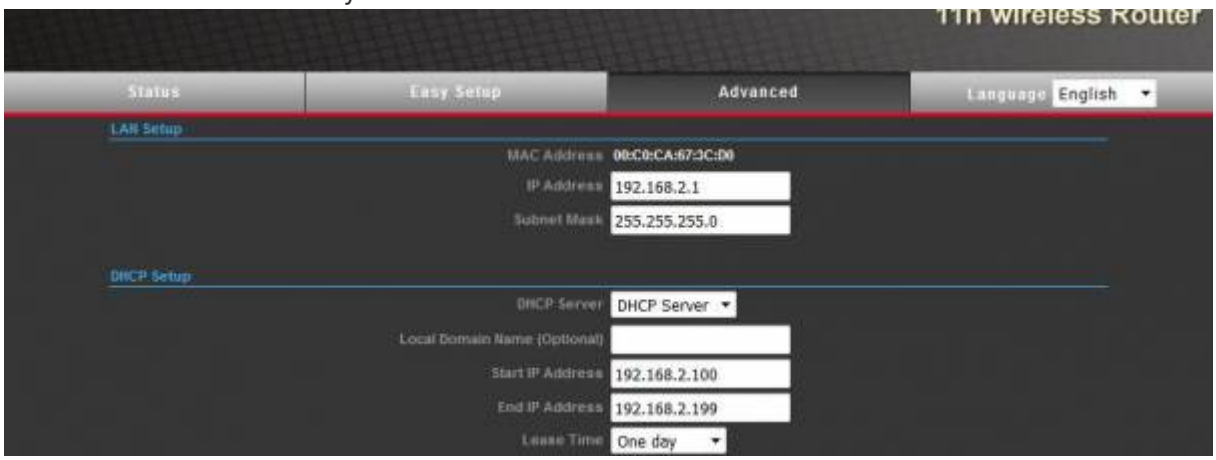
In the LAN setup, enter the IP address and subnet mask of the ALF. Additionally you can see the MAC address of the ALF.

In the DHCP setup you can choose between a DHCP server, a DHCP-Relay or the fully DHCP completely

disable.

On the DHCP server, you must specify the starting IP address, ending IP address and lease-time. For DHCP-Relay please enter the IP address of the relay. Click “Apply” and the DHCP will be integrated into the system.

Standard DHCP range: 192.168.2.100 up to192.168.2.199
Standard Lease Time: 1 day



6.1.3.6.3 VLAN

If you want to use VLAN check the box “VLAN Setup” to “Enable” and click “Apply”. Then enter on “VLAN ID” the ID and on “VLAN Members” the interface used. By clicking on “Add” the new ID is added to the system. There can be applied up to 8 ID's.

To remove the ID's, check the boxes for the ID's in the table and click “Delete Selected” and they will be removed from the system.

6.1.3.6.4 DHCP Static Leases

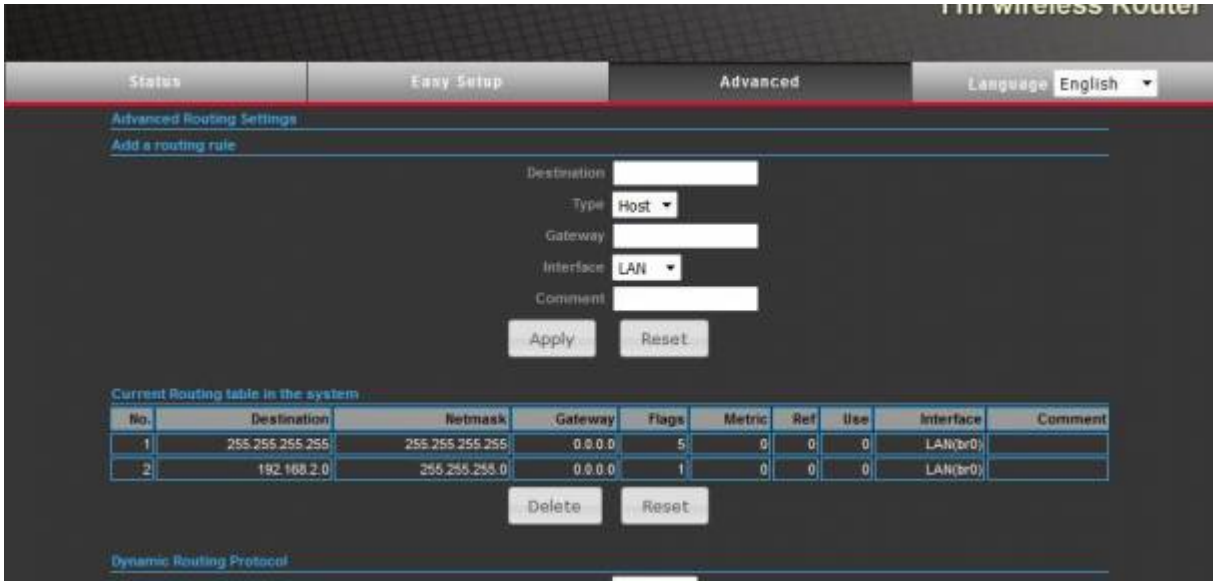
With this table you can manually assign up to five MAC addresses to a static IP within the DHCP range.

6.1.3.6.5 Advanced Routing

To create a new routing rule you must first define it. Therefore you need the destination IP address, the type, the Gateway and the interface. After clicking on “Apply” the rule is added to the routing table.

To delete the rules, check the boxes for the rules to be removed from the routing table and by clicking “Delete Selected” these rules will be erased from the system.

In “Dynamic Routing Protocol” can you adjust the “RIP”.



6.1.3.7 Wireless Settings

6.1.3.7.1 Basic

First you must choose a “Wireless Mode” in the list. Now configure your WLAN in which you first decide whether you want to set a “Multiple SSID”. Then insert the “Country Code” and confirm by clicking on “Set Country Code”. Now choose a frequency or a channel. By clicking “Site Survey”, you can see a list of available wireless networks. With “Rescan” can you update the list. Also select a “Network Mode”. The “ACK / CTS Timeout” should be between 35 and 409..

Now assign a SSID. You can also check the box “Hidden” to set your SSID not to be displayed.

Now you have to select and parameterize the encryption mode of the wireless network. You can choose from different types of encryptions.

If you have set “Multiple SSID” you should do the security settings for each SSID, this can be configured individually and in different forms.

With a click on “Apply” your wireless network is now configured according to your data.

6.1.3.7.2 Advanced

If your wireless network requires special settings you can edit them on the next configuration page.

Within the “Wireless On / Off” option you can use the “Turn On / Off” button to turn on/off your wireless network. Below it shows the MAC address of the access point. Furthermore, it is possible to turn on/off the ” Packet Aggregate ” and the “WMM”.

Tx Power:	The value must be between 3 and 27.
Fragmentation Threshold:	Enter a value between 256 and 2345 if needed.
Beacon Interval:	The value must be between 40 and 3500.
Section Control (SSID I):	The value must be between 1 and 127.
DTIM:	This value must be between 1 and 255.
Wireless Isolate:	Specifies whether and how the WLAN is to be isolated. You can choose between “Disable”, “VAP Isolated” and “Wireless Client Isolated”.
RTS/CTS:	Enter a value between 256 and 2345 if needed.
Thresholds,dbm:	The threshold of the individual LEDs is specified in dbm here. By clicking on “Apply” the WLAN is now configured to your specifications.

6.1.3.7.3 Access Control

In this menu, you can allow or deny a MAC address to access the access point.

First you must select the SSID on the “SSID” box. Depending on the type of list you want create, you can set in “Access Control Mode” either “Allow Listed” or “Deny Listed”. After clicking on “Apply” opens up the “Wireless Access Control” in which you must enter the MAC address to be filtered. By clicking on “Apply”, the MAC address is added to the list.

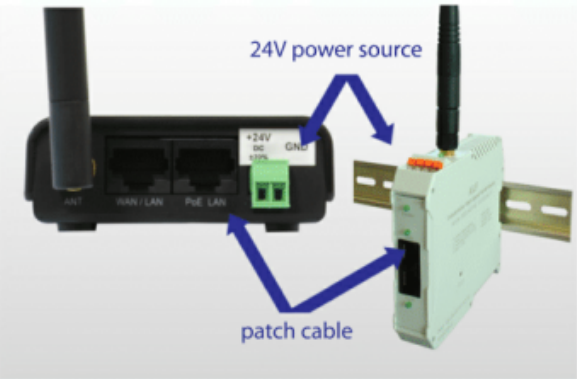
To delete one or more MAC addresses from the list, select the desired addresses in the list and click on “Delete” these will be deleted from the list.

6.2 Factory settings and Restart

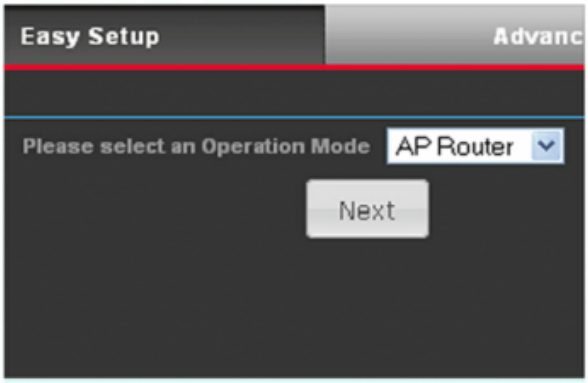
Press with a small paper clip or like the small red button at the bottom of the case for about 10 seconds to return the device back to the factory settings.
For a restart press the small red button for about 1-2 seconds.

7 Samples connect ALF with S5-/S7-LAN

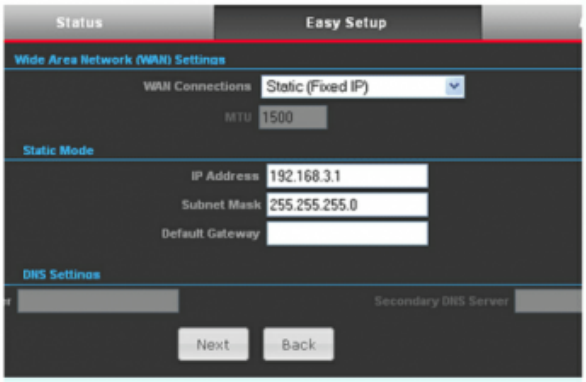
Using S7-LAN with an ALF as a WLAN Router



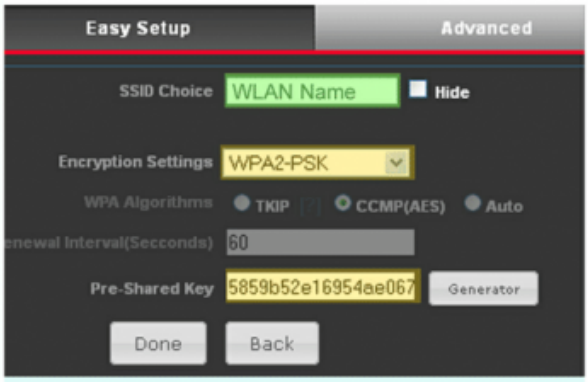
1 Connect the 24V power source and the computer to configure



2 Select „AP-Router“ on menu „Easy Setup“

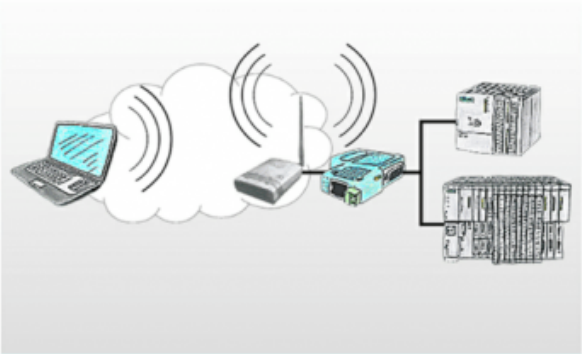


3 Configure your IP address and subnet mask



4 Now configure your networkname and encryption

Our recommended encryption is WPA2

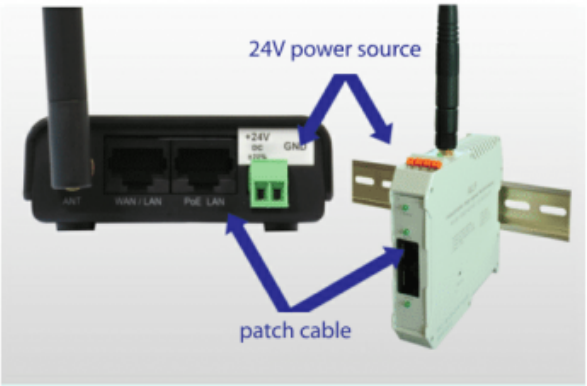


5 Connect the S7-LAN with a patch cable
Your S7-LAN is now available from every WLAN participants

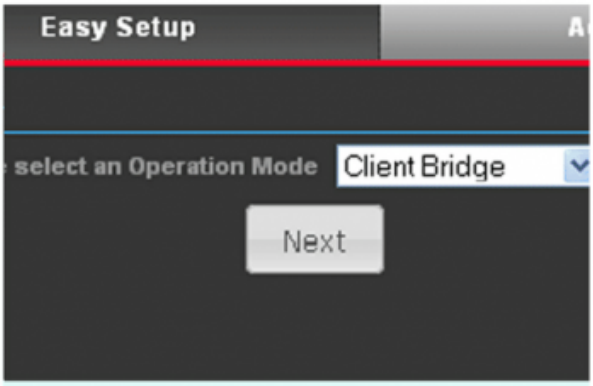
6 Installing TIC driver

TIC driver avaiable on our homepage

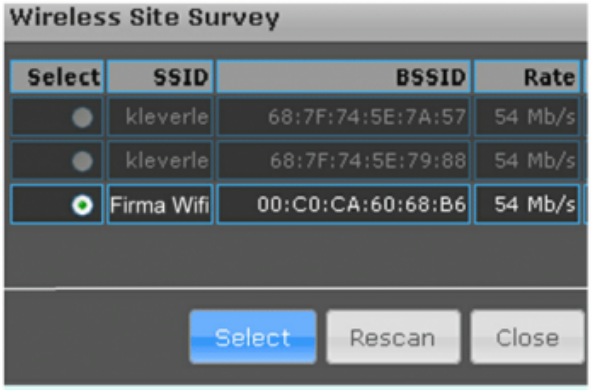
Integrate a S7-LAN in a avaiable WLAN with an ALF



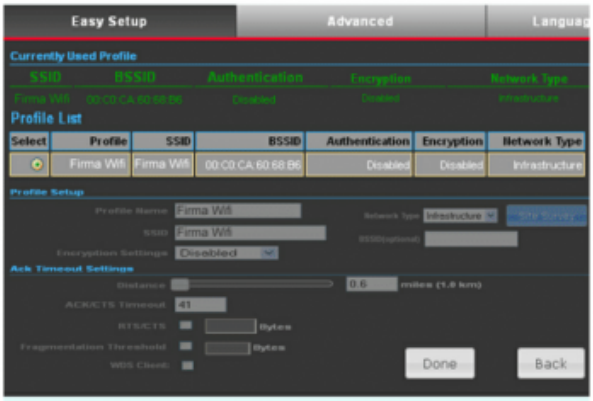
1 Connect the 24V power source and the computer to configure



2 Select „Client Bridge“ on menu „Easy Setup“



3 Press „Site Survey“ to search every WLAN and select your WLAN



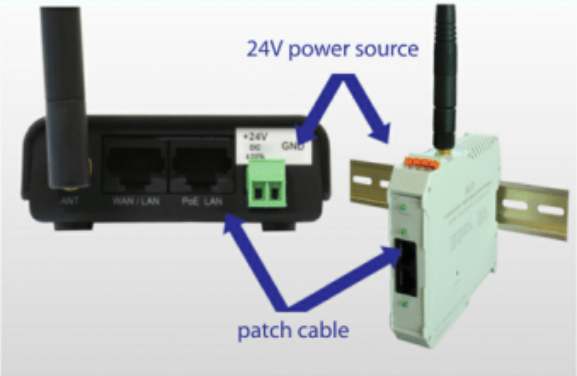
4 Select your WLAN and enter your passwort. Press „Done“ to confirm

5 Connect the S7-LAN with a patch cable
Every network has to be in the same IP area
Your Module is now integrated

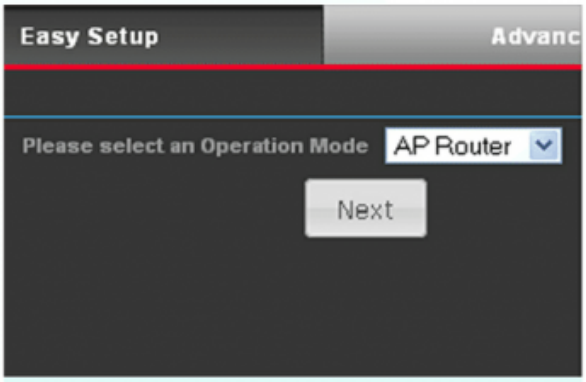
6 Installing TIC driver

TIC driver avaiable on our homepage

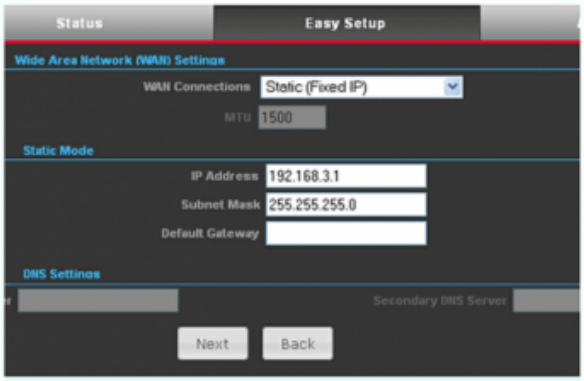
Using S5-LAN++ with an ALF as a WLAN Router



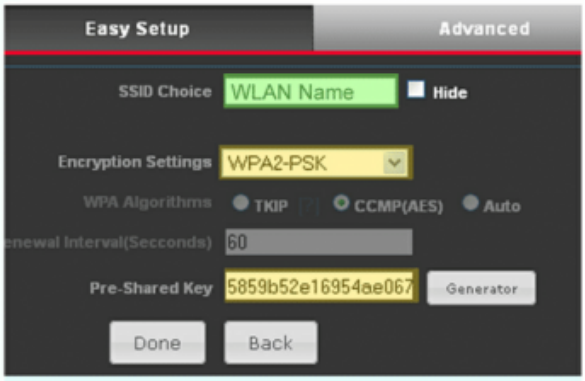
1 Connect the 24V power source and the computer to configure



2 Select „AP-Router" on menu „Easy Setup"



3 Configure your IP address and subnet mask



4 Now configure your networkname and encryption

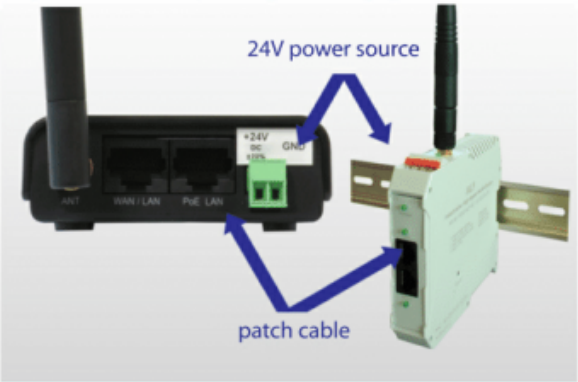
Our recommended encryption is WPA2

5 Connect the S5-LAN++ with a patch cable
Your S5-LAN++ will get an IP from the DHCP server and is now available from every WLAN participants

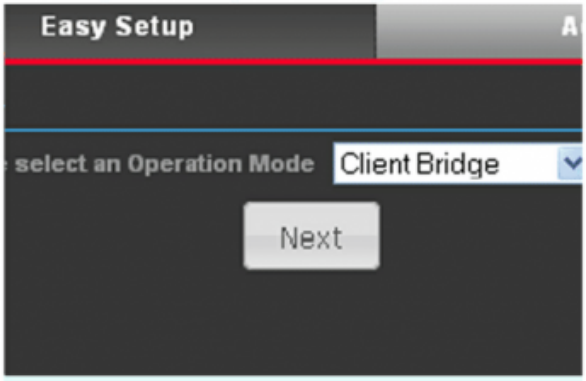
6 Installation:
- S5-Patch for original Step5
- PLCVCOM (virtual COM-Port)

Tools available on our homepage

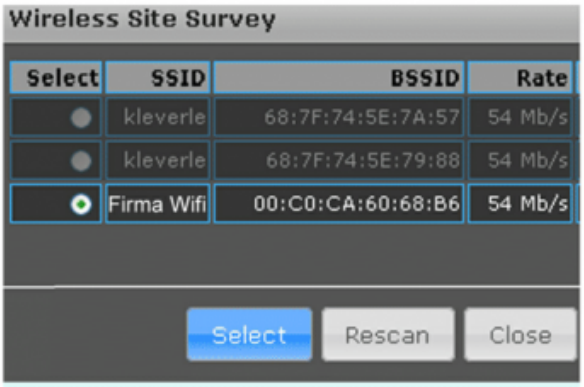
Integrate a S5-LAN++ in a avaiable WLAN with an ALF



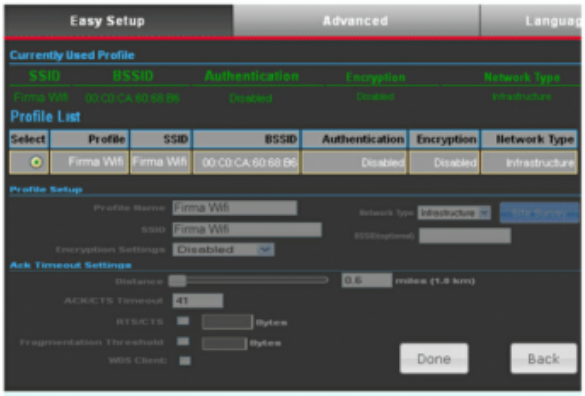
1 Connect the 24V power source and the computer to configure



2 Select „Client Bridge“ on menu „Easy Setup“



3 Press „Site Survey“ to search every WLAN and select your WLAN



4 Select your WLAN and enter your passwort. Press „Done“ to confirm

5 Connect the S5-LAN++ with a patch cable
Every network has to be in the same IP area
Your Module is now integrated

6 Installation:
- S5-Patch for original Step5
- PLCVCOM (virtual COM-Port)

Tools available on our homepage

8 Glossary

VLAN:	A “Virtual Local Area Network” separates the physical networks (eth0, eth1 SSID1, SSID2) into subnets, ensuring that the ALF does not forward data packets from one VLAN to another VLAN. A switch connected to ALF must support the VLAN standard.
Virtual Server:	“Virtual Server” is used to allow access from external networks or WAN to resources or services on the internal network.
DMZ:	The “Demilitarized Zone” (DMZ) can allow/deny access for a server connected to the ALF to any public reachable services and at the same time protect the LAN from outside access.
QoS:	With “Quality of Service” (QoS) the respective data packets are treated according to their labeling (priority, normal, low) and this controls the traffic.

9 Technical specifications

Technical Specifications:	
Supply voltage:	24V/DC +/- 20%
Power consumption:	1,2 watt
Display:	status-LEDs
Handling/Configuration:	with integrated webserver
Interfaces: to antenna:	RP-SMA-female connector (reverse polarity) with 5 dBi to the PLC: 10/100BaseTX RJ45-ethernetplug to the PD/PC: WLAN connection (802.11 b/g/n)
Security:	WEP 64/128bit WPA (TKIP with IEEE 802.1x) WPA2 (AES with IEEE 802.1x) WPA Mixed
Operating temperature:	-20 - 60°C
Case:	plastic case
Dimensions:	93 x 70 x 26 mm

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