USER MANUAL - ComPoint Enterprise

TRANSPORT AND
TRAFFIC CONTROL

HEALTHCARE

WAREHOUSE LOGISTICS

AUTOMOTIVE INDUSTRIE

AUTOMATION ENGINEERING

EDUCATION

WIRELESS HOSPITALITY

OFFICE COMMUNICATION

artem
funkwerk

ALL YOU NEED IN A WIRELESS WORLD

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Preface

With the products of the ComPoint family, Artem offers a complete range of infrastructure solutions to enable wireless communications between a variety of mobile devices as well as entire networks. Utilizing the latest wireless LAN technology, the ComPoint platform has been specifically designed to match the performance requirements of the most demanding professional applications.

Whether deployed as an extension of the existing wired infrastructure or to form an independent wireless network, ComPoint meets the ever-increasing communication needs of your corporate workforce.

Introduction

Flexibility and mobility have become crucial factors in today's business environment, stipulating the need to provide highly efficient and ubiquitous access to data. A wireless infrastructure, as provided by Artem with the Onair product family, serves to offer new opportunities to the most diverse target groups.

New Flexibility

Your decision to build a wireless infrastructure with the Artem ComPoint will result in many benefits beyond the mere use of a wireless network. Now, you are much more flexible. Within the wireless infrastructure provided by Artem, end devices are able to access the network at any given site, the network can grow with the demands made and according to the requirements of the users, and even bridging to other networks is possible. Without complicated installation and the hassle of wiring. At any location you choose. Right where and when you need it.

New Mobility

Modern work processes and new forms of collaboration rely more and more on the mobility and self-sufficiency of the workforce, but also on instant and ubiquitous access to critical data. Wireless communication with your ComPoint offers you the option in demand:

Speaking with your colleague Onair. In the meeting Onair. In the warehouse Onair. On the production site Onair. In the seminar room Onair. In the hotel room Onair.

At the airport Onair. On your garden bench Onair.

—Congratulations, the future of efficient workflows has just begun for you!

Objectives

Simply send your data along the most efficient route—directly over the air. The Artem Onair product family provides the ideal set of options for all of your demands. The modular concept and versatility of the ComPoint family offer you the freedom and investment protection you'd expect from a cutting-edge wireless infrastructure solution.

Whether you plan to implement a large-scale wireless network spanning multiple sites, enhance the operational efficiency of your small- or medium-sized office with wireless connectivity, or wirelessly network your home:

With the Onair family, Artem offers solutions appropriate for each and every wireless user.

Knowledge Prerequisites

It is assumed that the reader possesses or is in the process of acquiring the following knowledge:

- Basic knowledge of the setup of networks,
- Knowledge of the basic networking terms and concepts, such as server, client, and IP address,
- Basic understanding of Microsoft Windows operating systems.

Manual Conventions

This manual uses the following text styles for the purpose of guiding through the instructions:

- References to other manuals, chapters, or sections are represented in blue (in the online help screen and the PDF version of the manual) and are underlined.

  Example:
  See Manual Conventions.

- Menus, folders, functions, hardware labels, switch settings, system messages, etc. are represented in *italics*.

  Example:
  Push the switch to the *off* position.

- Menus, functions, and subfunctions are separated from each other by the “>” character.

Example:
Select *File* > *Open...*

- Keys you need to press simultaneously are indicated by a “+” character preceding the second key.

  Example:
  Press Alt+A.

Important Text Passages

Important text passages are marked with symbols in the margin, which have the following meanings:

Caution!

Contains information which has to be observed in order to avoid damaging the hardware or software.

Note:

Contains important general or additional information on a specific topic.

Prerequisite:

Advises you of any prerequisites which have to be fulfilled to perform the subsequent steps.

Artem Service

Do you have any questions on our products or do you require specific information on ComPoint?

You can contact us, as follows:

- Internet: http://www.Artem.de
- E-Mail (Service): contact@Artem.de
- E-Mail (Hotline): techsupp@Artem.de

The ComPoint Product Package

The following components should be contained in your ComPoint product package.

- ComPoint
- Power supply (12 V/220 V)
- Wall mounting for assembling the ComPoint on the wall
- Self-adhesive feet, for use of ComPoint as desktop device
- 2 external standard antennas (to be screwed on)
- Quick start flyer
- Installation CD-ROM
- Flyer with information for the user and declaration of conformity

Note:

If your ComPoint product package does not meet your demands, please contact our Artem Service (see Section Artem Service).

You can find a description of the standard components of the ComPoint product package in Section Hardware Description and Commissioning.

Hardware Description and Commissioning

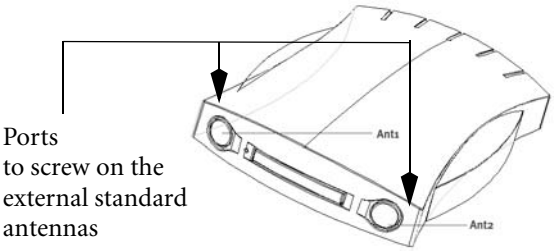
This section contains photographs and figures of the individual components of the ComPoint product package, as well as further information on the parts in question.

The ComPoint

ComPoint can be equipped with various antenna systems. Optionally, external standard antennas, which are screwed on, can be used. ComPoint can either be employed as a desktop device or be mounted on the wall with the help of the wall mounting contained in the product package.

Front View of the ComPoint

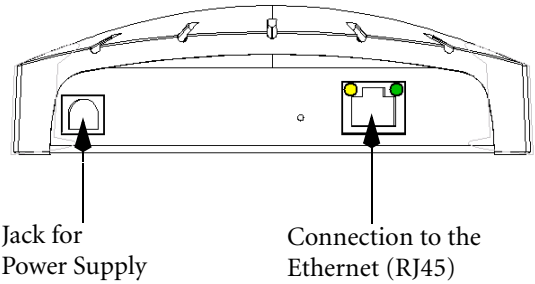
The front side of the ComPoint accomodates the two ports to screw on the external standard antennas.



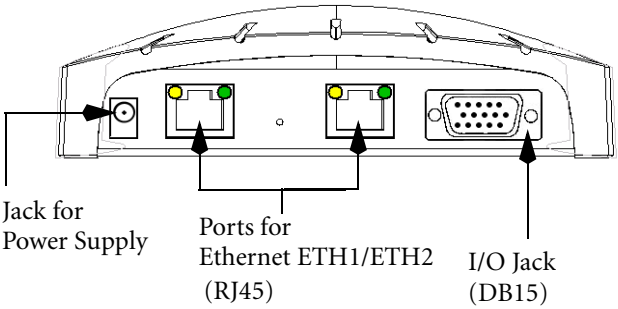
Rear View of the ComPoint

The rear side of the ComPoint accommodates the jack for the power supply and an RJ45 jack for the Ethernet connection.

Compoint (until 2003/01/31)



Compoint II (from 2003/02/01)

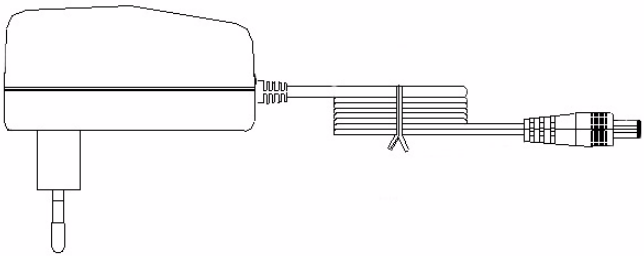


Note:

Please use exclusively ETH 1 or ETH2 for the connection of the ComPoint.

The Power Supply

The power supply is shipped as plug-in power supply.



Optionally, a UK adapter (UK set) is available.

The ComPoint product package contains a power supply with the following specifications:

- Input voltage: 90V–264 V
- Input frequency: 47Hz-63Hz
- Output voltage: 12 V DC
- Output current: maximally 1 A

The Wall Mounting

The wall mounting delivered with the package serves to mount the ComPoint on the wall. The required screws and dowels are contained in the product package.

Commissioning

The following section describes how to commission the ComPoint. This procedure is performed in several steps:

1. Screwing on the external standard antenna(s) (optionally)
2. Gluing on the feet if you wish to use the ComPoint as desktop device, respectively assembly on the wall
3. Connection to the power supply
4. Connect the ComPoint to the Ethernet. Select either port ETH1 or ETH2. The second port serves to cascade several devices.

Screwing on the External Standard Antennas

If you wish to use external standard antennas to set up a radio link via the ComPoint, these have to be screwed in into the corresponding ports at the front.

1. Screw in the external standard antenna, respectively both external standard antennas at the corresponding ports. Please adjust the antenna to the desired position before tightening the screw nut. Once you have tightened the screw nut, the radiator can no longer be rotated.
2. If 2 antennas are connected to the device, the antennas must be adjusted in an angle of 90° as a rule. Adjust the standard antennas in V form.

The ComPoint as Desktop Device

1. To use the ComPoint as desktop device, attach the four self-adhesive feet at the lower side of the ComPoint.

Mounting the ComPoint on the Wall

To mount the ComPoint on the wall, use the supplied wall mounting. The required screws and dowels are contained in the product package.

Connection to the Power Supply

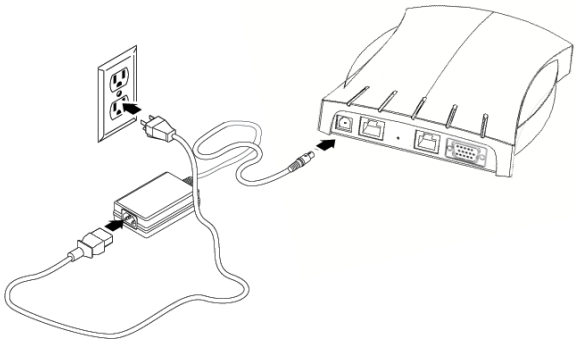
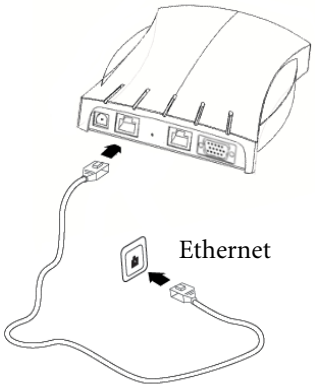


Figure: ComPoint with Desktop Power Supply

1. Take the power supply unit and insert the corresponding plug into the respective jack of the ComPoint.
2. Subsequently, insert the mains plug of the power supply into the mains socket (110–240 V).
3. The status LEDs indicate whether the ComPoint is properly connected to the mains power supply.

Connection to the Ethernet



1. Take one end of an RJ45 patch cable and insert it into the ETH1 or the ETH2 jack of the ComPoint. Please only use an Ethernet port for the connection or configuration of the device.

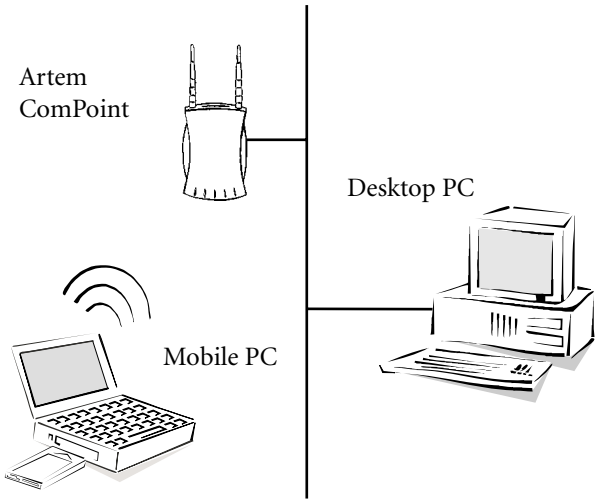
Note:

The standard patch cable (RJ45-RJ45) is constructed symmetrically. It is therefore not possible to confuse the cable ends.

2. Insert the other end into a free Ethernet port.

After the Successful Commissioning

After connecting the ComPoint to the mains power supply and setting up a connection to your Ethernet, the ComPoint is ready for use if the following prerequisites are fulfilled:



Prerequisite:

If you are using a PC with an Artem radio client, e.g. a laptop with an Artem ComCard, you can immediately access your Ethernet via the ComPoint, since the communications parameters match in this configuration.

You may also use any other standard-compatible radio card. In this case, the radio card ought to be in the state of the first commissioning, i.e. it ought not to be preconfigured.

Note:

To adapt the radio client to already existing configurations of wireless networks, specific settings of the communications parameters are required.

Prerequisite:

To make the required settings, you have to assign an IP address to the ComPoint via the Artem ComPoint Manager (Artem_CPM.exe) (see Section The Basic Configuration on page Page 1–8). Afterwards, you can start the configuration via a terminal program (e.g. Telnet) or a browser.

The Basic Configuration

To be able to configure your ComPoint, you have to assign an IP address to it. Only then will you be able to access the configuration interface. This chapter describes which steps have to be performed in order to assign an IP address to your ComPoint via the Artem ComPoint Manager.

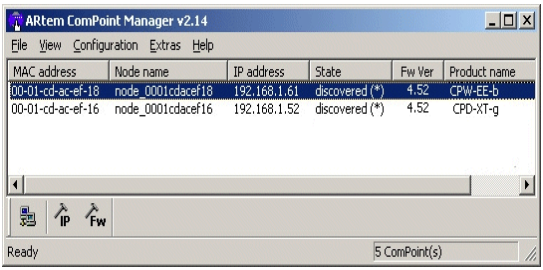
Prerequisite:

The PC which you use to configure the IP address for your ComPoint has to be connected to the same network as the ComPoint to be configured.

To assign an IP address to your ComPoint, carry out the following steps:

1. Insert the supplied CD into the drive of the corresponding computer.
2. Carry out the instructions of the CD wizard and install the ComPoint Manager.
3. Start the Artem ComPoint Manager from the *Start* > *Programs* > *Artem* > *ComPoint Manager* menu.

The following dialog box appears:

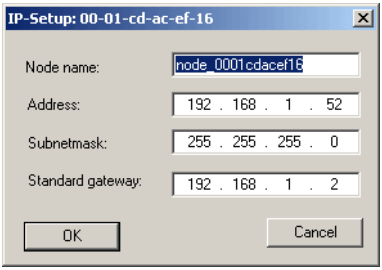


The Artem ComPoint Manager identifies the ComPoints installed in the network.

4. Double-click the MAC address of the ComPoint to be configured in the list.

   The MAC address is indicated on the bottom of the device. There, you will find a label specifying the essential device data. These comprise: the MAC address of the Ethernet interfaces, antenna connections, firmware version in the state of delivery, and the device type.

   The following dialog box is displayed:



5. Enter the network parameters (*Node name*, *Address*, *Subnetmask*, and *Standard gateway*) and confirm them with *OK*.

Note:

The network name (also called SSID) is an unambiguous network name which has to be identical for all subscribers of the same wireless network. Capital and lower case writing are distinguished. As a maximum, the network name consists of 32 alphanumerical characters.

We recommend only to use letters, digits, underscores, and hyphens for the *name* to avoid errors caused by other systems when interpreting the *name*.

Your ComPoint can now be addressed via the Ethernet with the help of its IP address, e.g. using Telnet. ComPoint can now be configured (see Section The User Interface via Telnet, Page 3–1).

Conventions for Interface Names

This chapter illustrates the conventions for the ComPoint interface names.

The following table shows the connections between the LEDs and the radio cards of the ComPoint.

Symbol	Function	Slot Number of the Radio Card	Position of Radio Card	Designation in the User Interface
—1— ((ϕ))	Radio activity	1	(see figure above)	wl1_xxx
[S]	Radio status			
—2— ((ϕ))	Radio activity	2	(see figure above)	wl2_xxx
[S]	Radio status			
	Ethernet activity	-	-	eth1/eth2

Note:

Please observe that in the case of older ComPoint casings, the labels of the ports are reversed.

Note:

With ComPoints which are only equipped with the one card, the card is designated *wl1_xxx* on the interface.

Name Conventions for the Wireless Ports

The names of the wireless ports on the user interface of the ComPoint consist of the following elements:

1. wl, *wl* stands for *wireless*
2. Number of the physical port (1 or 2)
3. _ap, *ap* stands for AccessPoint port type

4. _br, br stands for bridge port type

For example:

- wl2_ap

In the following descriptions, the designation <Wireless Port> will be used.

Name Conventions for the Ethernet Port

The name of the Ethernet port on the user interface of the ComPoint consists of the following elements:

1. eth, *eth* stands for *Ethernet*

The name of the Ethernet port is:

- eth1 (1oo Mbps)

In the following descriptions, the designation <Ethernet Port> will be used.

Name Conventions for the Interfaces

The names of the interfaces on the user interface of the ComPoint consist of the following elements:

1. le
   for the *Ethernet interface type*
2. Number of the interface
   (e.g. le0 or le1)

Selecting the Frequency

Although wireless networks can be logically separated by setting the *Network Name*, they can still physically interfere with each other if they are operated on the same radio channel or on channels which are close together.

Consequently, if you operate two or more wireless networks within short distance, it is advisable to assign different channels to the networks. Since a network also allocates a part of its adjacent channels, these channels should be at least 4 channels apart from each other.

To select the channel frequency, proceed as follows:

1. In order to set up a Telnet connection, boot the ComPoint Manager and select Configuration > Telnet.
2. When the password prompt appears, log in as an administrator by entering the password admin. This password has been preset for the admin user level as a factory default.
3. Select Config > Ports > <Wireless Port> > RF settings, select the entry DS channel, and confirm by pressing Enter or the right arrow key.
4. On the right side of the table, a list of channels or frequency options will be displayed.

```
                          Onair ComPoint             by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
                  Config Ports wl1_ap RF settings

     Command                              Channel
-------------------------------------|------------------------------
1 - DS channel   [01_2412]           |01 2412             10 2457
2 - BcstSSID     [disabled]          |02 2417             11 24562
3 - Repeating    [enabled]           |03 2422             12 2467
4 - Speed mode   [Auto_fallback}]    |04 2427             13 2472
3 - Tx Power     [100_mW_20dBm]      |05 2432
                                     |06 2437
                                     |07 2442
                                     |08 2447
                                     |09 2452
                                     |
                                     |
Direct Sequence operating channel.


Enter a number or name. "=" main menu, [ESC] previous menu.
0:24:59[admin]
```

5. The factory-set value for port wl1 channel 1 is 2,412 MHz, i.e. 2.412 GHz. The preset value for port wl2 is channel 11 with 2,462 MHz. If you wish to use channels 12 and 13, please make sure beforehand that the corresponding clients do support these channels. As a rule, this applies to products which can also be operated in the USA, since there only channels 1 to 11 are admitted (e.g. our USB adapter).

Note:

The number of the available channels is not identical for all device generations. You should therefore also refer to the current data sheet for your ComPoint. As a rule, however, channels 1 to 11 are available.

6. Select the desired frequency by using the arrow keys and confirm by pressing *Enter*.

Configuring the Ethernet

With the basic configuration of the ComPoint Manager, you have already configured the IP address, the subnet mask, and the gateway for the ComPoint.

You will find further parameters for configuring the Ethernet port under *Config > Ports > <Ethernet Port> (e.g. Port_eth1)*.

These parameters are:

- Interface
- Auto neg mode
- Actual value

You will find the description of the individual parameters in section Config > Ports > Port <Ethernet-Port> on Page 3–25.

Security Measures for your Wireless LAN

In order to prevent unauthorized access to your wireless LAN, you ought to take the following measures:

Changing the Passwords for the User Levels

In order to prevent unauthorized access, you should immediately change the passwords of the three user levels *admin*, *user*, and *view*. In chapter Initiating the Telnet Connection and Login on Page 3–2, you will find a detailed description of the user-specific rights for each user level.

The following provides a brief introduction on how to determine the passwords of the user levels. If required, chapter Control > Security provides more detailed information on Page 3–69.

1. In order to set up a Telnet connection, boot the ComPoint Manager and select *Configuration > Telnet*.

2. When the password prompt appears, log in as an administrator by entering the password *admin*. This password has been preset for the *admin* user level as a factory default.
3. On the Telnet interface, select *Control* > *Security* > *User info* > *Edit*.
4. In the list of available user levels on the right side of the table, select the user level for which you want to change the password (*view*, *user*, or *admin*) and confirm by pressing *Enter*.
5. Enter the admin password into the prompt once more and press *Enter*.
6. Now you have to enter the desired new password twice and confirm by pressing *Enter*.
7. The new password will become valid upon the next log-on attempt.

Note:

In case you forget the admin password, you can reset it to the factory default yourself. Proceed as described in Section How to Reset the Password.

Setting the Network Name

In contrast to LANs which have been configured via Ethernet, a wireless LAN does not provide cabling to permit a permanent connection between server and clients. This is why malfunctions or access violations can occur in directly adjacent wireless networks.

In order to prevent this, there is a parameter comparable to a domain name in each wireless network which clearly identifies the network. Only clients whose network configuration matches that of the ComPoint can communicate in this WLAN.

The corresponding parameter of the ComPoint is *Network Name*. In the network environment, it is sometimes also called SSID.

In order to set the *network name* on your ComPoint, proceed as follows:

1. Set up a Telnet connection (as described above) and log in as an administrator.
2. Select *Config* > *Ports* > *<Wireless Port> (e.g. wl1_ap)*, select *Network name,* and confirm by pressing *Enter* or the right arrow key.
3. Enter the desired network name (*Network name*) into the prompt and press *Enter.*
4. Deactivate Bcst SSID under *Status* > *Ports* > *<Wireless Port>* *RF Settings*. Thus, you prevent the ComPoint from sending the SSID and making it available to hackers.

Merely clients on which this network name (Network name) has been set will now be able to access this WLAN.

Activating the Encryption

To prevent the data transmitted via radio technology from being eavesdropped easily, you should activate the encryption. There are three options for encryption, WEP, WPA 802.1x, and WPA-PSK. WPA 802.1x offers the highest degree of security, but since encryption is performed via a central encryption server it is suitable mainly for enterprises. Private users should use the WEP encryption method or rather WPA-PSK, which provides a higher degree of security.

1. Set up a Telnet connection (as described above) and log in as an administrator.
2. Select *Config* > *Ports* > *<Wireless Port> (e.g. wl1_ap)* > *Security* > *AuthMethod.*
3. Select the desired encryption method and press *Enter.*
4. According to the encryption method you have selected, enter the *key* or the password.

5. In order to activate the encryption, select *Config* > *Ports* > *<wireless port> (e. g. wl1_ap)* > *Security* > *Enable state* , and select *enable.*
6. Enter the password or the key on the clients you wish to operate with the ComPoint.

The data transmitted between the ComPoint and the associated clients is now transmitted in encrypted form.

You can find more details on encryption in Section Config > Ports > <Wireless Port> > Security on page Page 3–31.

Creating a Security Access Control List

By creating an access control list, you can control which clients are allowed to access your wireless LAN via the ComPoint. In the access control list, specify the MAC addresses of the clients which are allowed to access to your wireless LAN. Access will be denied for all other clients.

To create an access control list, proceed as follows:

1. Set up a Telnet connection (as described above) and log in as an administrator.
2. Select *Control* > *Security* > *Authenticate* > *ACL local* > *Add.*
3. Specify the MAC addresses of the clients which are allowed to access to your wireless LAN.

For more details on the access control list, refer to Section Control > Security > Authenticate on Page 3–71.

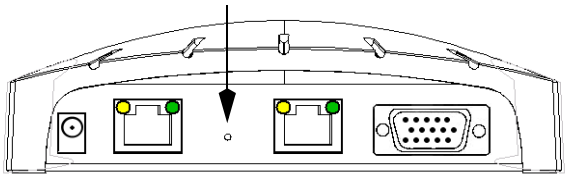
How to Reset the Password

If you have forgotten your password, you do not have to return the device to the manufacturer. Please consult our support. The support staff will perform the further steps together with you. For this purpose, keep the serial number and the MAC address of your device at hand.

To obtain this information, you have to stop the ComPoint in the monitor status. Proceed as follows:

At the rear of the ComPoint, there is a little hole. The monitor button is accommodated behind this hole:

Monitor Button



1. Keep the monitor button pressed for approximately 4 seconds with the help of a small object, e.g. a paper clip, while booting the device.

   The monitor button must be pressed before connecting the ComPointto the mains supply.

2. The monitor status will then be displayed via a special LED status.

Our Support will inform you of further steps to be taken.

The Artem ComPoint Manager

This chapter describes additional configuration options for the Artem ComPoint Manager, which go beyond the basic configuration:

- Setting up a *Telnet connection*
- Setting up a *Web connection*
- *Firmware Upgrading*
- *Restart* (restarting the ComPoint)
- Resetting the ComPoint to *factory defaults*

Prerequisite:

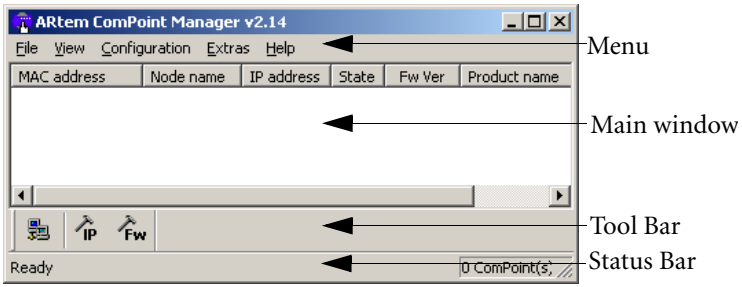
The PC which you use to configure your ComPoint has to be connected to the same network as the ComPoint to be configured.

Working with the ComPoint Manager

- TCP/IP has to be installed on the computer and configured reasonably
- If the router does not forward multicasts, the ComPoint Manager will merely find the ComPoints located in the subnetwork of the PC where the ComPoint Manager is installed.
- From 2.35 firmware and 1.18 monitor version, the ComPoint can only be configured with a password. Older versions do not have this function yet.
  For safety reasons, it is recommended to change the preset passwords as soon as possible.
- If your computer is provided with various network interfaces, you can configure a special multicast interface with which you want to search for the ComPoints in the Artem ComPoint Manager (see How to Determine a Multicast Interface on Page 2–6).

The Interface of the ComPoint Manager

The interface of the ComPoint Manager consists of four components which will be illustrated in the following:



The Main Window

When you start the ComPoint Manager, the main window will be empty at first. It is designed like a table and is divided into the columns *MAC address*, *Node name*, *IP address*, and *State*. According to the configuration, it also contains the columns *FwVer* and *Product name*. As soon as ComPoints have been searched for and identified in the network, the corresponding data on the respective device will appear in these columns.

The Menu

The menu is located at the upper margin of the ComPoint Manager and contains the menu items *File*, *View*, *Configuration*, *Extras*, and *Help* with up to five items. The numerous functions which can be activated via this menu will be discussed in detail later on in this chapter.

The Tool Bar

The tool bar is located directly below the main window and provides fast access to *Discovery, IP-Setup*, and *Load firmware*, the two main functions of the ComPoint Manager. These functions, which can also be selected via the menu, will be illustrated in detail in the following.

1. Select *View* > *Tool Bar* to show or hide the tool bar.

The Status Bar

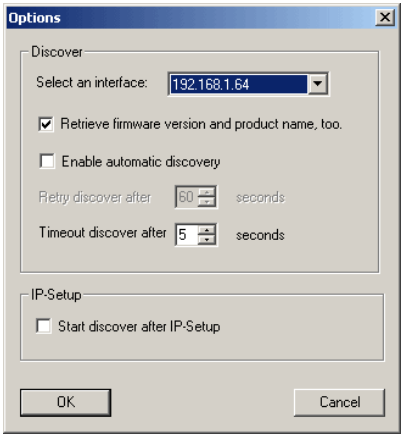
The status bar at the lower margin of the window displays the current status of the ComPoint Manager, as well as a short description of the menu item above which the mouse pointer is currently located. The window shows the number of ComPoints found and the progress of the search. The latter applies only to menu items which were called via a function, e.g. *Discovery*.

1. Select *View* > *Status Bar* to show or hide the status bar.

The Functions of the ComPoint Manager

Searching for Available ComPoints

1. To set the search options, select the *Extras* > *Options* menu item.



2. If you want the information on product name and version of the device to be displayed, tick the check box next to *Retrieve firmware version and product name, too* .

3. If you want to enable automatic discovery, tick the check box next to Enable automatic discovery. In the drop-down list below, you can select values from 10 to 60 seconds. After the expiration of this time interval, the ComPoint Manager is automatically restarted.

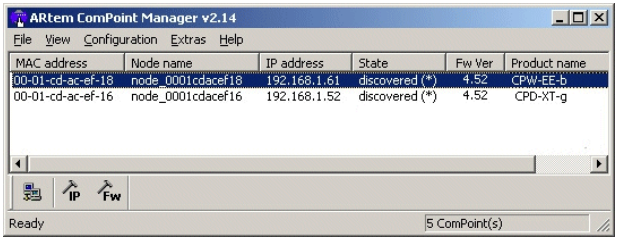
   You can abort the discovery process after a determined time interval. In small networks with only a few ComPoints, for instance, you can reduce this time span to 3 seconds. The maximum value is 10 seconds.

4. If you wish to search for a ComPoint directly after specifying the IP setup for this ComPoint, tick the check box next to *IP-Setup* > *Start discover after IP-Setup*.

5. After performing all settings, click *OK* to take over these settings.
6. Activate the discovery via *File* > *Discovery* or directly via the *Discovery* button in the tool bar.

The ComPoint Manager will automatically identify those ComPoints which have been connected in the network and display them in the main window together with the corresponding parameters (*MAC address*, *Node name*, *IP address*). According to the setting of the options, the firmware version (*Fw Ver*) and the product name (*Product name*) will also be displayed.

The Search Result



In the *State* column, the following entries are possible:

- discovered = discovered by the ComPoint Manager
- not found = ComPoint was not found in new search.

The subsequent brackets may contain the following additional specifications:

- (MAC):
  Means that a ComPoint was found via the Artem Discovery protocol (proprietary MAC-based protocol), but is not reachable via IP. For instance, this will happen if the ComPoint still has the default setting 0.0.0.0 or an invalid IP configuration.

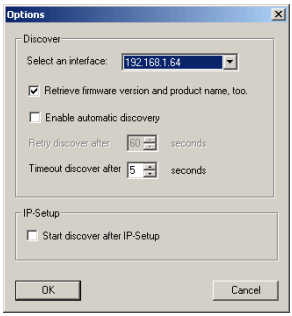
- (IP):
  Means that the device is not reachable via the Artem Discovery protocol, but can be addressed via IP. This will mostly happen if the IP configuration of the ComPoint does not correspond to the current subnetwork, e.g. because a ComPoint has been entered manually.
- (*):
  Means that the device was found via the Artem Discovery protocol and is reachable via IP.
- [Time] (only if not found):
  Specifies the period of time passed since the last successful search process. This time specification is only updated when a search process is carried out either manually or automatically, according to the individual settings.

How to Determine a Multicast Interface

If the PC on which the ComPoint Manager is installed is provided with various network interfaces, you can determine with which interface the search for ComPoints is to be performed.

1. To select a multicast interface manually, go to *Extras* > *Options* in the *ComPoint Manager*.

   The following dialog box is displayed:

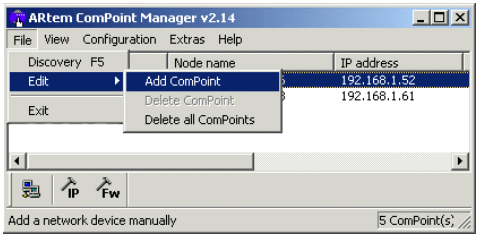


2. Select the IP address of the NIC which you want to use as a multicast interface and confirm by pressing *OK*.

If the multicast interface 0.0.0.0 is defined, the search is performed via all network interfaces of the PC.

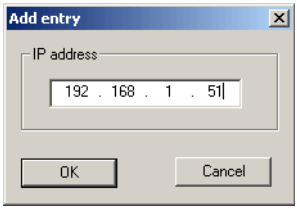
Editing Entries Manually

Under *File* > *Edit*, you can choose between the functions *Add ComPoint*, *Delete ComPoint*, and *Delete all ComPoints*.



How to Add a ComPoint Manually

1. Select *File* > *Edit* > *Add ComPoint*. A dialog box appears in which you can enter the IP address of the ComPoint to be added.



2. Confirm the entry by clicking *OK*. The manually added ComPoint will now be added to the list displayed in the main window.

artem funkwerk

How to Delete a ComPoint Entry

Manually added ComPoints and all ComPoints marked as *not found* can be deleted from the list.

1. Select the MAC address of the entry to be deleted.
2. Select *File* > *Edit* > *Delete ComPoint*. Alternatively, you can also press the *"Del"* button on your keyboard.

Note:

Entries (state: *discovered*) which have been created automatically via the *Discovery* function cannot be deleted in this way.

How to Delete all ComPoint Entries of the "not found" state.

Select *File* > *Edit* > *Delete all ComPoints* to simultaneously delete all entries marked as *not found* from the list in the main window.

How to Save and Load the Configuration

The ComPoint Manager, version 2.08 and higher, additionally offers you the option to save the configuration of the device and to load it on demand. Please note that this function works in a trouble-free way with firmware version 3.10 and higher. Select *Configuration* > *Save config or Configuration* > *Load config* in the ComPoint Manager menu.

Note:

Passwords and IP settings which you have already assigned will not be considered in this process.

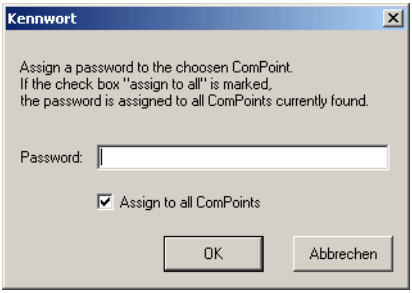
How to Enter the Password

The password is required for the following actions:

- Load firmware
- Restart ComPoint
- Resetting the ComPoint to factory defaults
- Setup

To enter the password, proceed as follows:

1. Select the ComPoint in the list and select *Extras* > *Password*.



2. Enter the password for the admin user level.

   The factory-set password for the admin user level is *admin*.
   If the function field *Assign to all ComPoints* is activated, the password is assigned to all other ComPoints, as well.
   If the ComPoint Manager is terminated, the password has to be reentered when restarting the ComPoint Manager.

You can change the password on the ComPoint user interface under *Control* > *Security* > *User info* > *Edit* (see section Changing the Passwords for the User Levels in chapter Hardware Description and Commissioning).

How to Set Up a Telnet Connection

1. In the main window, select the ComPoint you wish to access via Telnet.
2. Select *Configuration* > *Advanced* > *Telnet*. Alternatively, you can select the *Telnet* function with the right mouse button.

The Telnet connection will be established. Refer to Initiating the Telnet Connection and Login, Page 3–2.

How to Set up a Web Connection

1. In the main window, select the ComPoint you want to access via the Web (browser-based interface) and select *Configuration* > *Advanced* > *Web*. Alternatively, you can select the *Web* function with the right mouse button.
2. A browser window is opened. Click the ComPoint graphic.

   The following dialog box appears:

3. Enter the *user name* and the *password*. The user name corresponds to the user level you want to access.
   (see chapter The User Interface via Telnet in section Control > Security)

   This is factory-set for the admin user interface.

   User name: admin

   Password: admin

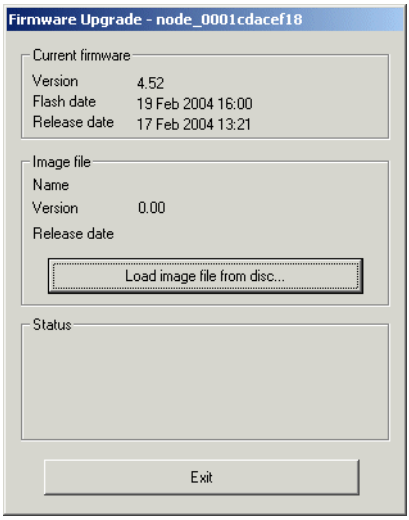
Note: You can change the password on the ComPoint user interface under *Control* > *Security* > *User info* > *Edit* (see section Changing the Passwords for the User Levels in chapter Hardware Description and Commissioning). Refer to The Browser-Based User Interface, Page 4–1.

How to Upgrade the Firmware

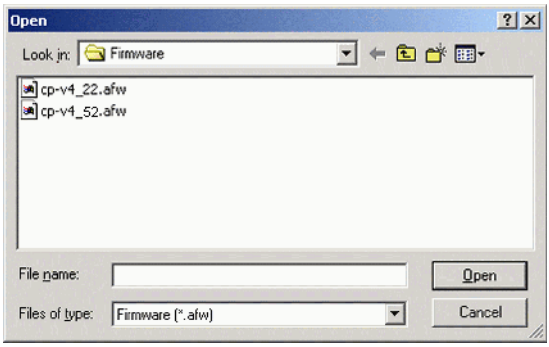
Caution!

During the ComPoint upgrade, you must neither turn off the ComPoint nor interrupt the data connection. Otherwise, the ComPoint software will be damaged. You will then have to return the ComPoint to the manufacturer.

1. Before upgrading, make sure that the new firmware version (files ending with *.afw) is available on your hard disk or on another data carrier.
2. Under *Extras* > *Password*, enter the password of the admin user level if this has not been done yet. Otherwise, an update will not be possible.
3. In the main window of the ComPoint Manager, select the ComPoint which you want to upgrade and select *Configuration* > *Firmware upgrade...* Alternatively, you can right-click the *Load firmware* option or activate the *Firmware* function from the tool bar.
4. In the new dialog box, activate the *Load image file from disc...* button.

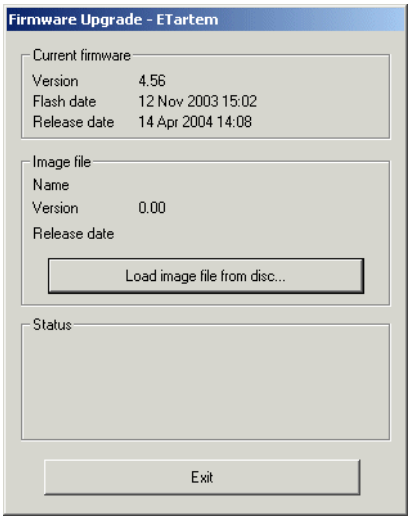


5. Select the file which contains the new *Firmware*. In our example, this is the file *cp-v4_52.afw* .

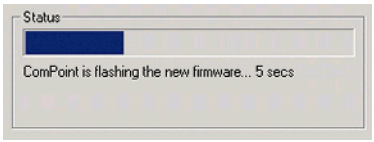


6. Confirm by clicking the *Open* button.

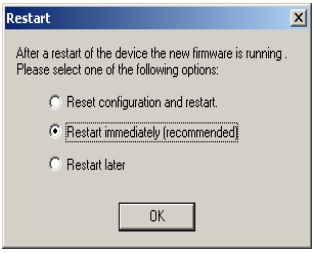
   The path for the firmware in the control box under *Image file* is automatically updated, and the ComPoint Manager checks whether an upgrade is possible and sensible.



7. Boot the firmware upgrade by clicking the *Load firmware file* button. Under *Status*, a progress bar and the current process are displayed.



8. As soon as the firmware upgrade has been finished successfully, the following dialog box appears:



You can choose between a simple restart of the ComPoint or a restart with a reset of the configuration to the factory defaults.

Note:

The ComPoint Manager has already selected the option you require. If the *Restart immediately (recommended)* option is activated, you can also check the *Reset configuration and restart.* option to reset the ComPoint to the factory settings.

Caution!

If the ComPoint Manager proposes the *Reset configuration and restart* option, you must never select the *Restart immediately (recommended)* option.

9. To reboot the ComPoint, confirm by clicking *Yes*.

Note:

The restart of the ComPoint takes about 20sec. It is not displayed on your computer screen. With the help of the LEDs of your ComPoint, however, you can check the radio activity, the radio status, and the Ethernet activity.

10. Finally, check the functionality of the ComPoint, for instance by searching for ComPoints installed in the network via the ComPoint Manager.

How to Reset the ComPoint to the Factory Defaults

1. To cancel configurations made and to reset the ComPoint to the factory defaults, select *Configuration* > *Factory default*.

   A reset will be performed automatically.

Note:

The complete configuration of the ComPoint will be reset to the factory default settings. Only password which have already been assigned will be maintained.

How to Restart the ComPoint

1. Select *Configuration* > *Restart* to restart the ComPoint.

How to Exit the ComPoint Manager

1. Select *File*> *Exit* to close the ComPoint Manager.

The User Interface via Telnet

This chapter describes the setup of the Telnet interface, as well as the functions offered when using Telnet. These functions include, for example:

- Displaying of various ComPoint status values
- Configuration of system, interface, and filter settings
- Access rights control

Prerequisite:

The PC which you use to configure your ComPoint has to be connected to the same network as the ComPoint to be configured.

Note:

All settings made via the ComPoint Manager can be made via routers, as well.

Note:

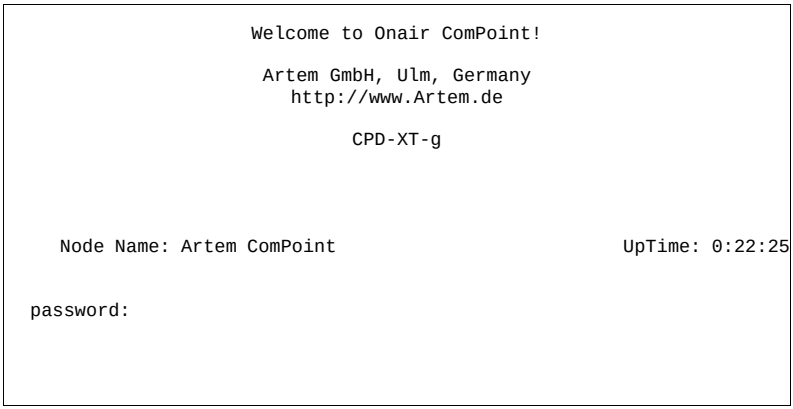
The Artem ComPoints are operated with different technologies. Depending on which technology is used, the configuration interface varies at some points. The differences are indicated by means of the following symbol:

Symbol	Meaning
	Menu item or option only applies to devices operating according to IEEE 802.11a.
	Menu item or option only applies to devices operating according to IEEE 802.11b.
	Menu item or option only applies to devices operating according to IEEE 802.11g.

Initiating the Telnet Connection and Login

1. In the Artem ComPoint Manager, initiate your Telnet connection via *Configuration* > *Advanced* > *Telnet* (see section How to Set Up a Telnet Connection on Page 2–9).

   The initial screen of the terminal opens in a new window. You are requested to enter a password to log on to one of the user levels.



   Basically, there are three user levels for Artem Onair: *Admin*, *user*, and *view*.

   The *admin* user level allows unlimited access to all ComPoint functions.

   The factory default for the password of this user level is *admin*.

If you log on as a *user*, the access to specific system-relevant configuration options will be denied. In particular, the *user* user level does not allow you to make any settings leading to the termination of the network connection between ComPoint and clients.

The factory default for the password of this user level is *user*.

The *view* user level does not allow you to configure the ComPoint in any way. You can merely view some status screens.

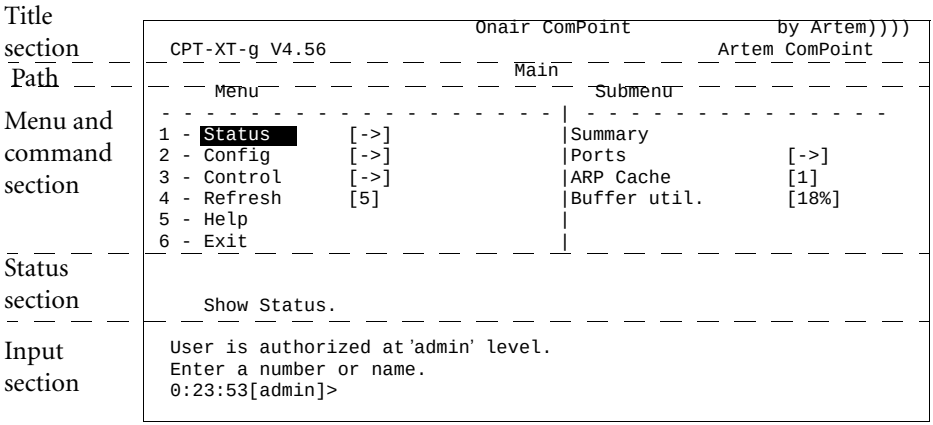
The factory default for the password of this user level is *view*.

2. Enter the password for the desired user level and confirm with *Enter*. Now you have access to the main menu.

Note:

For safety reasons, it is recommended to change the preset passwords as soon as possible. You can learn how to change the passwords in section Control > Security > User info > Edit on Page 3–70.

Setup of the User Interface

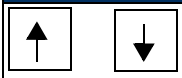


The user interface is divided into five main sections:

- Title section
  Provides general information, such as the ComPoint version used (in our example: *V4.52*) and the node name of the ComPoint to be configured (in our example: *Artem ComPoint*).
- Path
  The path (e.g. *Main*) indicates your current position on the user interface.
- Menu and command section
  Displays the individual menus and commands in the form of a table. The left-hand column of the table indicates the menu you are currently in. The currently selected menu item is highlighted. In our example, *Status* has been selected. The right-hand side of the table displays the submenu of the currently selected menu item, if available. This means that the *Status* menu item has a submenu with the following options: *Summary*, *Ports*, *ARP cache*, and *Buffer util.*

Menu items (e.g. *Config*) or commands (e.g. *Exit*) are represented by a number, a name, and, if applicable, by a value stated in square brackets. If an arrow is displayed next to the name of a menu item instead of a value, this means that a submenu exists.

As Telnet does not support the use of the mouse, you have to use the arrow keys of your keyboard to navigate the individual menus.

Key	Meaning
	Move upwards or downwards in the menu item list or command list.
	Move to the submenu of the selected menu item.
	Return to the previous menu.

You can also directly call a menu item or command by typing its number or name. You will find a detailed list of all keyboard commands under the *Help* command.

- Status section
  Shows information on the menu item or command you have selected at present, as well as the status of currently performed actions.
- Input section (Prompt)
  Displays the currently available keyboard commands as well as the active user level. Here, you will also find the prompt where you can enter the keyboard commands.

The Status Menu

The information on the ComPoint summarized in the *Status* menu can only be displayed but not configured by the user. The values displayed as statistical values can be reset to ZERO by the authorized user logged in at the ADMIN user level.

This does not apply to information given in the summary view.

```
                                Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                              Artem ComPoint
                                     Main
     Menu                                  Submenu
 - - - - - - - - - - - - - - - - - - -|  - - - - - - - - - - - - - - - -
1 - Status       [->]                 |Summary
2 - Config       [->]                 |Ports                [->]
3 - Control      [->]                 |ARP Cache            [1]
4 - Refresh      [5]                  |Buffer util.         [18%]
5 - Help                              |
6 - Exit                              |


    Show status.


User is authorized at 'admin' level.
Enter a number or name.
0:23:53[admin]>
```

Status > Summary

1. Select *Status* > *Summary* to get an overview of all important network parameters.

```
                                Onair ComPoint                          by Artem))))
 CPT-XT-g V4.56                                                        Artem ComPoint
                                      Status
    ------------------------------------------------------------------------------
Primary If  IP config          DHCP        SNMP   Filter         Uptime
----------  ---------------    --------    ----   -------------  -------
 IP         192.168.001.005    disabled    on     Prot: macFlt   0:26:51
 address
 Subnet     255.255.255.000                       Mflt: forward
 mask
 Gateway    000.000.000.000
                                                                        Sessions
                                                                               1

 Port       MAC address        Speed       Mode   Link                   Info
 ----       -----------        -----       ----   - ----------- -------------------
 eth1       00:01:CD:0A:00:4A  10          HD     +
 eth2       00:01:CD:0A:00:4B  100         HD
 wl1_ap     00:60:1D:22:E4:AC  54@01-2412  AP     +              ArtemComPoint 0 Cl.
 wl2_br1    00:60:1D:22:E4:AC  54@11-2462  BR     - S ---N --- dBm S/N -- dB


 Enter [SPACE] refresh, [q]quit
```

The following table gives an explanation of the terms and parameters used on the screen.

Parameter	Meaning
Primary If	Displays the IP address, the subnet mask and the gateway of the ComPoint.

Parameter	Meaning
DHCP	States whether the IP address was requested from a DHCP server, or if a preconfigured IP address is used. • *disabled*–A preconfigured IP address is used. • *enabled* –The IP address was requested at a DHCP server. You can make your DHCP settings under Config > Interfaces > DHCP.
SNMP	Shows whether SNMP is active (*on*) or inactive (*off*). See Section Control > SNMP, Page 3–64.
Filter	Displays the filter settings (see Config > Filtering, Page 3–42).
Uptime	Displays the period of time since the last reset. A reset restores the factory defaults of the ComPoint and restarts the device. You can initiate a reset of the ComPoint under Control > Config reset.
Sessions	Number of active user connections.
Port	Displays all active ports.
MAC address	Displays the MAC addresses of the individual ports.
Speed	Displays the preset speed of the individual ports in Mbps. In the case of wireless ports, the channel number and frequency are displayed as well. You can set the transmission speed under Config > Ports > <Wireless Port>.

Parameter	Meaning
Mode	Displays the transmission mode for the Ethernet port and the wireless port. The following modes are possible for the individual ports: **Ethernet port** • *FD* stands for full duplex mode. • *HD* stands for half duplex mode. **Wireless port** • *AP* stands for AccessPoint mode. • *BR* stands for bridge mode. • *DBR* stands for double bridge mode. You can set the transmission mode under Config > Ports > <Wireless Port>.
Link	Specifies whether a connection is currently active at the corresponding port. • + connection is active • - connection is inactive • no symbol: the Ethernet port is disconnected.
Info	Provides general information on the status of the ComPoint, such as: • Swung dash (~): Bcst SSID is enabled. For safety reasons, we recommend to disable Bcst SSID. • S: Reception strength of the signal at the wireless port in dBm • N: Reception strength of the noise at the wireless port in dBm • S/N: Signal-to-noise ratio. Indicator of the transmission quality. • Cl.: Number of wireless clients currently connected to the ComPoint.

Status > Ports

The *Ports* menu item leads you to the status screen and to further data on the ComPoint ports.

Note:

Which ports are displayed here depends on the hardware configuration of the ComPoint.

Status > Ports > <Ethernet Port>

This menu item displays the MAC address, the maximum transmission speed, and the status screen with the most important parameters of an Ethernet port (e.g. eth1).

```
                              Onair ComPoint                by Artem))))
    CPT-XT-g V4.56                                         Artem ComPoint
                          Status Ports eth1

     Command
- - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - -
 1 - MAC          [00:01:CD:0A:00:63]|
 2 - Max speed    [100]              |
 3 - Port Stat                       |


    Show traffic statistics of this port.


Enter a number or name. "=" main menu, [ESC] previous menu.
0:24:59[admin]
```

The following table provides a detailed explanation of the commands.

Command	Meaning
MAC	Here, the MAC address of the Ethernet port is displayed. It cannot be changed at any user level, however.

Command	Meaning
Max speed	The number in brackets shows the maximum transmission speed of the Ethernet port in Mbps. This entry cannot be changed.
Port Stat	Under *Port Stat*, you can view statistics of the frames received, sent, and filtered at the Ethernet port.

Port stat

Via *Status* > *Ports* > *<Ethernet Port>* > *Port Stat*, you can go to the following screen:

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                          Status Ports eth1
 Parameters                                                    Value
-------------------------------------------------------------------------
  Received frames since last reset                             51
  Transmitted frames since last reset                          73
  Filtered frames since last reset                              0
  MULTICAST received frames since last reset                   51
  MULTICAST transmitted frames since last reset                73
  MULTICAST filtered frames since last reset                    0
  Filtered frames (on all ports) since last reset               0



 Enter [SPACE]refresh, [r]reset, [q]quit:
```

The following table gives an explanation of the terms and parameters used on the screen.

Parameter	Meaning
Received frames since last reset	Number of received frames since the last reset.
Transmitted frames since last reset	Number of sent frames since the last reset.

Parameter	Meaning
Filtered frames since last reset	Number of filtered frames since the last reset.
MULTICAST received frames since last reset	Number of received multicast frames since the last reset.
MULTICAST transmitted frames since last reset	Number of sent multicast frames since the last reset.
MULTICAST filtered frames since last reset	Number of filtered multicast frames since the last reset.
Filtered frames (on all ports) since last reset	Number of filtered frames of all ports since the last reset.

Status > Ports > <Wireless Port>

This menu item indicates the key parameters of a wireless port (e.g. wl1_ap).

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                          Status Ports wl1_ap

     Command
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - - -
1 - MAC          [00:60:1D:22:96:40]|
2 - Max speed    [54]               |
3 - Network name [Artem ComPoint]   |
4 - Card type    [->]               |
5 - Card firmware[1.0.4.3]          |
6 - Port stat                       |
7 - Wireless stat                   |
8 - Node table                      |


    Show traffic statistics of this port.
```

The table below provides a detailed description of the parameters.

Command	Meaning
MAC	MAC address of the wireless port Cannot be changed on any user level.
Max speed	Displays the maximum speed of the wireless port in Mbps. This entry cannot be changed. For devices of the new generation in accordance with IEEE 802.11g/a, entry 54 will be listed.
Network name	Network name (SSID) of the WLAN network of your ComPoint. Must be entered manually at all stations which are to be granted access to the WLAN network of your ComPoint.
Card type	Type of the radio card installed in the ComPoint.
Card firmware	Firmware version of the radio card installed in the ComPoint. At all user levels, this entry can be viewed only.
Port stat	Under *Port stat*, you can view statistics of the frames received, sent, and filtered at the wireless port. See Section Port stat, Page 3–13.
Wireless stat	Provides detailed information on sent and filtered frames. See Section Wireless stat, Page 3–15.
Node table	List of clients associated with this port, see Section Node table, Page 3–18

Port stat

Via *Status* > *Ports* > <*Wireless Port*> > *Port Stat* , you obtain an overview of the transmitted data packets:

```
                              Onair ComPoint              by Artem))))
 CPT-XT-g V4.56                                      Artem ComPoint
                          Status Ports wl1_ap
  Parameters                                                  Value
-----------------------------------------------------------------------
  Received frames since last reset                            880
  Transmitted frames since last reset                         596
  Filtered frames since last reset                             0
  MULTICAST received frames since last reset                  77
  MULTICAST transmitted frames since last reset               596
  MULTICAST filtered frames since last reset                   0
  Filtered frames (on all ports) since last reset              0



 Enter [SPACE]refresh, [r]reset, [q]quit:
```

The following table gives an explanation of the terms and parameters used on the screen.

Parameter	Meaning
Received frames since last reset	Number of received frames since the last reset.
Transmitted frames since last reset	Number of sent frames since the last reset.
Filtered frames since last reset	Number of filtered frames since the last reset.
MULTICAST received frames since last reset	Number of received multicast frames since the last reset.
MULTICAST transmitted frames since last reset	Number of transmitted multicast frames since the last reset.
MULTICAST filtered frames since last reset	Number of filtered multicast frames since the last reset.
Filtered frames (on all ports) since last reset	Number of filtered frames of all ports since the last reset.

Wireless stat

Via *Status* > *Ports* > <*Wireless Port*> > *Wireless stat* , you obtain a detailed overview of the type of data packets transmitted.

```
                                Onair ComPoint             by Artem))))
    CPT-XT-g V4.56                                      Artem ComPoint
                           Status Ports wl1_ap
 Parameters                                                    Value
-------------------------------------------------------------------------
Number of unicast MSDUs transmitted sucessfully                880
Number of multicast MSDUs transmitted sucessfully              596
Number of transmitted MPDUs
Number of unicast MSDUs recieved sucessfully                   77
Number of multicast MSDUs transmitted sucessfully              596
Number of unicast MPDUs transmitted sucessfully
Number of received frames (without any filter)
Number of MSDUs dropped before transmission
Number of MSDUs sucessfully sent after one retry
Number of MSDUs sucessfully sent after more retries
Number of MSDUs that could not be transmitted
Number of frame transmissions without ACK received
Number of duplicate received MSDUs
Number of CTS frames received in response to an RTS
Number of received MPDU without decryption key

Enter [SPACE]refresh, [r]reset, [q]quit, [+]next,[-]previous, [ESC]break:
```

Parameter	Meaning
Number of unicast MSDUs transmitted sucessfully	Number of MSDUs transmitted successfully to unicast addresses since the last reset. An acknowledgement has been received for each of these packets.
Number of multicast MSDUs transmitted sucessfully	Number of MSDUs transmitted successfully to multicast addresses (including the broadcast MAC address).
Number of transmitted MPDUs	Total number of packets (data and management) transmitted successfully. Refers to unicast and multicast packets transmitted and acknowledged, as well as to broadcast packets transmitted.

Parameter	Meaning
Number of unicast MSDUs recieved sucessfully	Number of MSDUs transmitted with an unicast address and received successfully.
Number of multicast MSDUs transmitted sucessfully	Number of MSDUs successfully received at multicast addresses.
Number of unicast MPDUs transmitted sucessfully	Number of MPDUs successfully transmitted to unicast addresses. An acknowledgement has been received for each of these packets.
Number of unicast MSDUs received sucessfully	Number of MSDUs transmitted with an unicast address and received successfully.
Number of multicast MPDUs received sucessfully	Number of MPDUs transmitted with a multicast address and received successfully.
Number of received frames without any filter	Number of frames received unfiltered.
Number of MSDUs dropped before transmission	Number of MSDUs lost before transmission.
Number of MSDUs sucessfully sent after one retry	Number of MSDUs transmitted successfully after one retry.
Number of MSDUs sucessfully sent after more retries	Number of MSDUs transmitted successfully after several retries.
Number of MSDUs that could not be transmitted	Number of MSDUs which could not be transmitted.
Number of frame transmissions without ACK received	Number of transmitted frames for which no acknowledgement frame was received.

Parameter	Meaning
Number of duplicate received MSDUs	Number of duplicate MSDUs received.
Number of CTS frames received in response to an RTS	Number of CTS (Clear to Send) frames received in response to an RTS (Request to Send).
Number of received MPDU without decryption key	Number of MPDUs received in unencrypted form

Press + to view the next page of the overview:

```
                              Onair ComPoint              by Artem))))
    CPT-XT-g V4.56                                     Artem ComPoint
                          Status Ports wl1_ap
 Parameters                                                    Value
-------------------------------------------------------------------------
Number of received MPDU that couldn't be decrypted
Number of RTS frames with no CTS received
Number of aborted frames
Number of unsuccessfully received frames
Number of MPDUs which could not be transmitted
Number of unicast MPDUs transmitted sucessfully
Number of rejected unencrypted MPDUs
Number of dropped received unicast and multicast MSDUs
Number of partially or erroneously received MSDUs
Number of MPDUs received without required encryption
MPDUs received without appropriate privacy configuration



Enter [SPACE]refresh, [r]reset, [q]quit, [+]next,[-]previous, [ESC]break:
```

Parameter	Meaning
Number of received MPDU that couldn't be decrypted	Number of received MPDUs that could not be decrypted. The reason for this might be that no appropriate key was entered.
Number of RTS frames with no CTS received	Number of RTS frames for which no CTS was received.

Parameter	Meaning
Number of aborted frames	Number of frames whose transmission was aborted, i.e. which were not transmitted completely.
Number of unsuccessfully received frames	Number of frames received incompletely or with errors.
Number of MPDUs which could not be transmitted	Number of MPDUs which could not be transmitted.
Number of rejected unencrypted MPDUs	With activated encryption: Number of unencrypted frames which were rejected.
Number of dropped received unicast and multicast MSDUs	Number of unicast and multicast MSDUs which were received and rejected. These may be frames received from unknown clients logged on to other access points.
Number of partially or erroneously received MSDUs	Number of MSDUs received incompletely or with errors.
Number of MPDUs received without required encryption	With activated encryption: Number of MPDUs received without encryption.
MPDUs received without appropriate privacy configuration	Number of received MPDUs without appropriate encryption settings, e.g. which arrive with encryption although encryption is disabled.

Node table

Via *Status* > *Ports* > *<Wireless Port>* > *Node table* , you can go to the following screen:

```
                                Onair ComPoint              by Artem))))
       CPT-XT-g V4.56                                     Artem ComPoint
                             Status Ports wl1_ap

 Name    MAC_address        IP_address Assoc_time       Type       Rate
-------------------------------------------------------------------------------
802.11 00:60:1D:22:96:64 192.168.001.001 00:27:10       Client      11
802.11 00:60:1D:1C:A9:EB 192.168.001.006 00:47:20       Client      5


Enter [SPACE]refresh, [q]quit:
```

The node table displays all clients currently accessing the ComPoint via radio link. The following table gives an explanation of the terms and parameters used on the screen.

Parameter	Meaning
Name	Indicates the name of the associated client.
MAC_address	Indicates the MAC address of the associated client.
IP_address	Indicates the IP address of the client.
Assoc_time	Indicates (in hours, minutes, and seconds) how long the client has been logged on.
Type	Displays the type of login at the ComPoint (for example: client, Spectralink)
Rate	Shows the current transmission rate to this client in Mbps. The following transmission rates are possible: IEEE 802.11b: 11, 5.5, 2 and 1 Mbps IEEE 802.11g/a: 54,48,36,24,18,12,9,6 Mbps

Status > ARP cache

The digit in square brackets next to *ARP cache* indicates the number of entries in the ARP table.

1. Select *Status* > *ARP cache* to view the ARP table of the ComPoint.

   All IP stations (such as routers and PCs), which have been in direct contact with this ComPoint (via telnet, http, or ping) within the last 20 minutes, are listed in this table. If an IP station has been inactive for 20 minutes, the corresponding entry will be deleted.

   The counter for the 20 minutes is reset every time a packet is sent or received.

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                                 Status

  IP address              MAC address             State        Timeout
-------------------------------------------------------------------------
  192.168.001.001         00:60:1D:22:96:64       Reply         19:54




 Enter [SPACE]refresh, [q]quit:
```

Parameter	Meaning
IP address / MAC address	IP address and MAC address of the client

Parameter	Meaning
State	To allow a client to communicate with the ComPoint, both sides must resolve the IP address for the MAC address. This information will be stored in the ARP cache. • Request: The ComPoint has transmitted an ARP request for this IP address in order to find out the MAC address. • Reply: the ComPoint has received an appropriate reply to the request. • Invalid: for instance, after timeout when waiting for a reply, in the case of erroneous or not available IP address (BLD on the opposite side or remote ACL or 1x server)
Timeout	Period of time during which the client is inactive. Starts with 20 minutes and counts down to 0. After 20 minutes, the entry for the client will be deleted from the ARP cache.

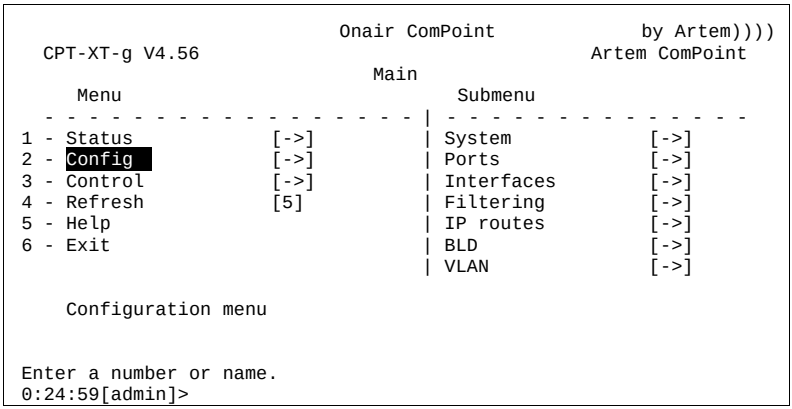
Status > Buffer util.

The value indicated here can be viewed at all user levels, but it cannot be changed.

It is a relative value referring to the utilization of the buffer pool. Normally, the values will be between 30% and 50%.

The Config Menu

In the *Config* menu, you can configure a variety of ComPoint parameters, depending on the user level at which you are logged on.



Config > System

Config > System > Node name

Under *Config* > *System* > *Node name*, you can view the name of the ComPoint if you are logged in at the *user* or *view* user level. If you are logged in at the *admin* user level, you are, in addition, allowed to modify it. However, this can be performed much more conveniently by means of the ComPoint Manager. Refer to Section The Artem ComPoint Manager on Page 2–1.

Config > System > Location

Under *Config* > *System* > *Location*, you can specify the location of the ComPoint. Example: “Second floor”

Config > System > Contact

Under *Config* > *System* > *Contact*, you can specify a contact person, e.g. an administrator, for the maintenance of the device. Moreover, you can specify how this contact person can be reached.

Config > System > Description

Under *Config* > *System* > *Description*, you can enter a description of the device. For example, you can specify the name of the device and the firmware version.

Config > System > Hardware

Under *Config* > *System* > *Hardware*, you can view the version number of the ComPoint circuit board, the serial number of the ComPoint circuit board, a list of the device ports (e.g. option connector, Fast Ethernet 1, PCMCIA A), and the MAC addresses of the two Ethernet ports of the ComPoint.

Config > System > Software

Under *Status* > *Software*, you will find a table providing information on the software available in the FLASH memory of the ComPoint.

```
                                Onair ComPoint              by Artem))))
      CPT-XT-g V4.56                                      Artem ComPoint
                               Config System

 Name             Version            Flash Date           Release Date
 ------------------------------------------------------------------------
Bootloader        6.02               Feb 19 12:05:32 2004 May 06 15:36:23 2003
VPD               3.08               Feb 19 12:05:32 2004 Feb 19 12:05:32 2004
Monitor           1.80               Feb 19 12:05:32 2004 Feb 17 12:05:32 2004
CM                4.52               {none}               Feb 17 12:05:32 2004
Firmware          4.52               Feb 19 12:05:32 2004 Feb 17 12:05:32 2004


Enter [SPACE]refresh, [q]quit:
```

The *Name* column indicates the individual firmware components, the version numbers of which you can find in the *Version* column to the right.

The date and time given in the *Flash Date* column indicate when the last upgrade of the corresponding software was carried out. The *Release Date* column indicates the release date of the version used.

Some entries do not indicate the FLASH date *{none}*, as they are generated by another firmware component. The release date of this generated software always corresponds to the release date of the generator software.

Config > System > Features

Under *Config* > *System* > *Features*, you can view the additional modes of the device. These are:

- Bridge
- Double bridge

This option is also directly available via the ComPoint Manager.

Note:

This option is only available with ComPoint II and higher, version I of the ComPoint merely indicates the current mode of the device (e.g. access point, bridge).

Config > Ports

In the *Config > Port* menu, you can configure the individual active ports.

Config > Ports > Port <Ethernet-Port>

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                           Config Ports eth1

     Command                            Parameters
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Interface      [le0]                | interface name
2 - Auto neg mode  [enabled]            |
3 - Actual value   [100BaseTX_HD]       |


   Interface assignment for this port.


Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

The following table provides an explanation of the terms and options used in the menu.

Option	Meaning
Interface	Interface name of the port
Auto neg mode	Using this function, you can *enable* and *disable* the auto negotiation mode. If the auto negotiation mode is enabled, the ComPoint automatically identifies the transmission rate and the duplex mode of the opposite side. As a default, this mode is activated. If you wish to adjust the transmission rate and the duplex mode of the port manually, set the auto neg mode to *disable*.
Actual value	Current transmission rate and duplex mode of the port. You can only change the indicated value if you have disabled the auto negotiation mode.

Config > Ports > <Wireless Port>

```
                              Onair ComPoint             by Artem))))
  CPT-XT-g V4.56                                       Artem ComPoint
                          Config Ports wl1_ap
     Command                              Parameters
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Interface    [le0]                  | interface name
2 - OperatingMode[AP]                   |
3 - Network name [Artem ComPoint]       |
4 - RF settings  [->]                   |
5 - Security     [->]                   |
6 - Extended     [->]                   |


     Interface assignment for this port.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:16:10[admin]>
```

The table below explains the options used in the menu.

Option	Meaning
Interface	Interface of the port
OperatingMode	At the *admin* user level, this menu item allows you to select the desired *OperatingMode* (access point or bridge) of the port from a list, or enter it manually into the prompt. At the *user* and *view* user levels, the *OperatingMode* cannot be changed.
Network name	Enter the network name (SSID) of the WLAN network of your ComPoint. This option is only displayed at the *admin* user level.

Option	Meaning
RF settings	• **DS channel** As *admin* or as *user*, you can set the radio channel frequency here. • **Bcst SSID** By deactivating this option, you can prevent the wireless clients which do not know the network name of the ComPoint from logging on to the WLAN network. This entry exists at the admin level only. • **Repeating** Allows direct communication between wireless clients connected to the same ComPoint. If the repeating is deactivated, the wireless clients logged in at this ComPoint will not be able to exchange data among each other. The drives of a user are thus protected from access by other hotspot users. At the *admin* level, the *Repeating* option can be changed. At the *user* level, the settings will be displayed, whereas, at the *view* level, the option is not available. • **Speed mode** Serves to configure automatic speed adaptation or a fixed value for the transmission speed. According to IEEE 802.11b, possible values are: Auto_fallback (automatic adaptation) 1_MbpsFixed, 2_MbpsFixed, 5.5_ MbpsFixed, 11_MbpsFixed. According to IEEE 802. 11g/a, possible values are: Auto_fallback (automatic adaptation) 54_MbpsFixed, 48_MbpsFixed, 36_ MbpsFixed, 24_MbpsFixed, 18_MbpsFixed, 12_MbpsFixed, 9_ MbpsFixed, 6_MbpsFixed.
	• **Mcast rate** Allows you to set the transmission rate for multicast frames. This item is displayed on all user levels, depending on the configuration. It can, however, only be changed at the *user* and *admin* level.
	• **Tx power** Allows you to set the maximum value for the radiated antenna power. The actually radiated antenna power may be lower than the maximum value set, depending on the data rate transmitted.

Option	Meaning
Security	Allows you to configure the encryption of the wireless traffic. The parameters are only available at the *admin* level and this is where they can be configured exclusively. For more details, refer to Section Config > Ports > <Wireless Port> > Security, Page 3–31.
	Note: For security reasons, you always ought to select an encryption method directly after commissioning the ComPoint.
Extended 	Specific settings • **MW robustness** Provides transmission security in environments with strong interferences through microwave ovens. Frames are fragmented in order to decrease the probability of interferences. This setting will be distributed to all associated clients, if *Medium distr.* is *enabled*. The prerequisite is that the clients support this function. • **RTS threshold** Here you can enter the threshold in bytes (1..2346), from which on the RTS/CTS mechanism is to be applied. This makes sense if several clients which are not able receive each other are operated at one access point. This mechanism can be enabled or disabled at any time. • **DTIM period** This value specifies the interval for the Delivery Traffic Indication Message (DTIM). The DTIM field is a countdown field which informs the clients via the window on the next broadcast or multicast transmission. If the clients are operated in the power-saving mode, they will wake up in time and will receive the data. The default value is 1. The value can be configured from 1 to 65535.

Option	Meaning
	• **AP distance** This function modifies the roaming behavior of the clients. The smaller the setting of the wireless cell, the sooner will the clients roam to the next ComPoint. The prerequisite is that *Medium distr.* is *enabled* and that the clients support this function.
	• **Load balanc.** Activate *Load balancing* if the clients are supposed to select their ComPoints dynamically depending on the load distribution. ComPoint transmits the corresponding information in the probe response and beacon frames.
	• **Mode 802.11g** Here you can make settings regarding the technology ComPoint is supposed to use. • 802.11b_only: ComPoint exclusively operates according to 802.11b and forces all clients to adapt themselves. • mixed: ComPoint adapts to the technology of the clients. • longrange_mixed: ComPoint adapts to the technology of the clients. Basic rates of 1 and 2 Mbps are supported. • shortrange_mixed: ComPoint adapts to the technology of the clients. Basic rates of 1 and 2 Mbps are NOT supported. • 802.11g_only: ComPoint exclusively operates according to 802.11g. 802.11b clients do not have access.

Option	Meaning
	• **Nitro mode** By activating this function, you can achieve higher transmission speeds for 802.11g via frame bursting. Several packets are transmitted in sequence without waiting periods. Particularly effective in 11b/g mixed operation.
	• **Ant. Diversity** Antenna diversity. Specifies how many and which antennas were used for transmitting and receiving. • none: Merely the main antenna transmits and receives. • receive: Two antennas receive, the better signal will be evaluated. • transmit: Both antennas transmit. • both: Both antennas transmit and receive. The better signals will be evaluated.
	• **Medium distr.** Activate this function if the parameters defined above (MW robustness, RTS threshold, AP distance, load balanc.) are to be distributed to clients. If the clients support this function, their local settings will be overwritten by the ones of the ComPoint.
	• **Encapsulation** This function can only be accessed at the *admin* user level after corresponding configuration. This menu item has several submenus, which will be explained in detail under Config > Ports > <Wireless Port> > Extended > Encapsulation, Page 3–35.

Config > Ports > <Wireless Port> > Security

Allows you encrypt the wireless traffic. The parameters are only available at the *admin* level and this is where they can be configured exclusively.

Command	Parameter
AuthMethod	Select an encryption method. Note: For security reasons, you always ought to select an encryption method directly after commissioning the ComPoint. • none: no encryption of the wireless traffic. • WEP: Wireless Equivalent Privacy • WPA-802.1x (WiFi Protected Access): Encryption method with high security. For this encryption method, you will need an encryption server. • WPA-PSK (WPA Pre-Shared Key): You can assign an access password, the so-called master key, for ComPoint and for all clients. Further secure keys will be created automatically from the master key.

Encryption according to WEP

1. Select the option *WEP* under *Config* > *Ports* > *<Wireless Port>* > *Security* > *AuthMethod*..

You will be led to the following screen:

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                         Config Ports wl1_ap
     Command                                Parameters
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1 - AuthMethod  [WEP]                    | method
2 - Enable state [disabled]              |
3 - Key number   [1]                     |
4 - Key 1        [* NOT SET *]           |
5 - Key 2        [* NOT SET *]           |
6 - Key 3        [* NOT SET *]           |
7 - Key 4        [* NOT SET *]           |


     Selected method for authentication and encryption.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:16:10[admin]>
```

2. For instance, enter a self-selected key for Key 1.

   The ComPoint is able to decrypt a radio frame encrypted with a key it knows. It is important to use the key of the corresponding entry for the decryption.

   If the client is encoded with key 3, this means that key 3 must have the same value on the ComPoint and on the client. Naturally, this applies to both directions.

   The length of the key used determines the encryption strength.

   If you enter 5 characters, a 40-bit long key will be generated and 64-bit encryption will be performed (effective cryptographic key + 24-bit initialization vector).

   If you enter 13 characters, a 104-bit long key will be generated and 128-bit encryption will be performed. The keys can be entered using ASCII (a-z, A-Z,0-9) or the hexadecimal number system (0x, followed by the corresponding number of hexadecimal numbers).

Examples:

64-bit encryption
"ABCDE" (ASCII) = "0x4142434445" (hexadecimal)

128-bit encryption
"1234567890123" (ASCII) =
"0x31323334353637383930313233" (hexadecimal)

Set keys are represented by the * character.

3. Select the option *enable* for *Enable State*.
4. Also enter the key on your client which is to be granted access to the wireless LAN.

The data transmitted between ComPoint and client will now be encrypted. You should regularly enter a new key via clear_key.

Encryption according to WPA 802.1x

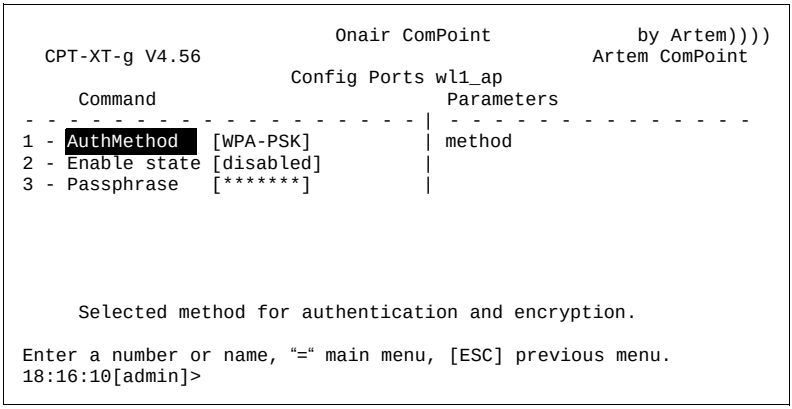
The encryption is performed via an external encryption server and provides increased security. To find out how to obtain a certificate from the encryption server, please refer to:

Encryption according to WPA-PSK

If your client supports this encryption method, you should activate it. It provides more security than WEP encryption.

1. Select the option *WPA-PSK* under *Config* > *Ports* > *<Wireless Port>* > *Security* > *AuthMethod.*.

You will be led to the following screen:



2. Enter a password with a length between 8 and 63 characters under *Passphrase*. For security reasons, the password should have a length of at least 20 characters.
3. Select the option *enable* for *Enable State*.
4. Enter the same password on your client.

Client and ComPoint will now generate a dynamic key.

Config > Ports > <Wireless Port> > Extended > Encapsulation

A wireless port can send LLC frames only. An LLC header has to be added to any other frame. The *Encapsulation* menu item allows the configuration of this procedure, and specifies the way it is reversed at the receipt.

Note:

The *Encapsulation* function should only be used by experienced administrators.

In the *Encapsulation* menu, you can choose between the options *Mode* and *Customize*.

1. By selecting *Mode Default*, you can undo all settings made regarding the frame processing, and the initial values will be restored.

Under *Customized*, you can specify the way incoming and outgoing data packets are to be processed.

1. Select *Config* > *Ports* > *<Wireless Port>* > *Extended* > *Encapsulation* > *Customize* > *Transmit* to process outgoing packets, or *Config* > *Ports* > *<Wireless Port>* > *Extended* > *Encapsulation* > *Customize* > *Receive*, to determine the configuration for incoming packets.

Config > Ports > <Wireless Port> > Extended > Encapsulation > Customize > Transmit

The table below explains the options used in the menu as well as the resulting setting options.

Option	Meaning
Encapsulation	Use this option to specify the default *encapsulation*, i.e. set the basic default for the transmission of frames without *LLC header*. The standards *RFC_1042* and *IEEE_802.1H* are available. You can select them from the list, or directly enter them into the prompt.
Exceptions	Here you can specify the protocols for which you want to define other than the *default encapsulation*. Using the *Show* option, you can view all the protocols excluded so far. The value in square brackets indicates the number of excluded protocols. Select *Add* to add further protocols to the list of exceptions (max. 10). These can either be selected from the list or entered into the prompt. Accordingly, you can remove protocols from the exception list using the *Remove* menu item. The *default encapsulation* will be then be applied again to these protocols.

Config > Ports > <Wireless Port> > Extended > Encapsulation > Customize > Receive

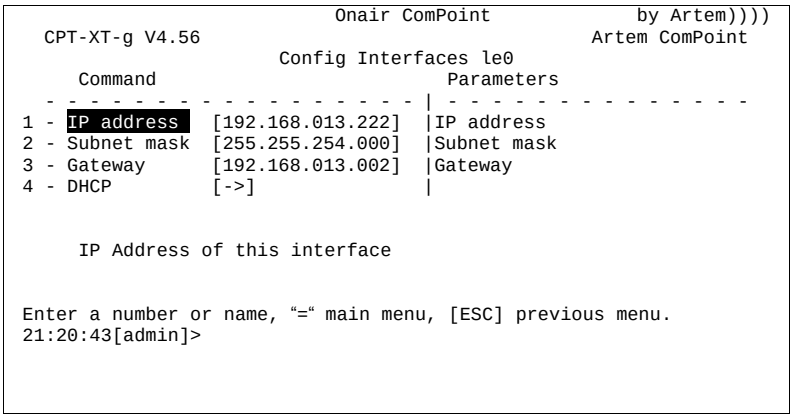
Under this menu item, select the standard for which you want to define an action to be performed when receiving a data packet. As a default, the specifications *RFC_1042* and *IEEE_802.1H* are available.

As the submenus of these two options are set up identically, they will both be explained in the following table.

Parameter	Meaning
Def. action	Here you can define whether the *LLC header* of incoming data packets is to be removed as a default. Select *remove* to have the header removed, or *unchanged* to leave the data packet unchanged.
Exceptions	Here you can specify the protocols for which the *default action* is not to be applied. Using the *Show* option, you can view all the protocols excluded so far. The value in square brackets indicates the number of excluded protocols. Select *Add* to add further protocols to the list of exceptions (max. 10). These can either be selected from the list or entered into the prompt. Accordingly, you can remove protocols from the exception list using the *Remove* menu item. The *default action* will then be applied again to these protocols.

Config > Interfaces

Use the *Interfaces* option at the *admin* level to configure the network interfaces.



For example, to modify the network parameters of the *le0* interface, select *Config* > *Interfaces* > *le0*.

You can set the IP address, netmask, and gateway.

At the *user* and *view* user level, this menu item is a static display only.

1. For example, in the *le0* menu, select *IP-address*, and enter the corresponding IP address into the prompt.

   The options for the DHCP menu are explained in the following.

Config > Interfaces > DHCP

```
                          Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                    Config Interfaces le0 DHCP
     Command                                  Parameters
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1 - Status       [enabled]          | operation
2 - Lease        [used]             |
3 - Requested IP [any]              |
4 - Client ID    [default]          |
5 - Server       [any]              |
6 - Vendor ID    [none]             |
7 - Duration     [any]              |

     Request, rebind or release a lease.


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

The table below explains the terms and parameters used in the menu and lists the available options of the individual menu items.

Option	Meaning
Status	You can enable or disable DHCP via this option. If DHCP is enabled, a request will automatically be sent to the DHCP server when booting the ComPoint, and the ComPoint will be assigned a valid IP address (lease). If DHCP is disabled, the ComPoint will be booted with the IP address defined in the ComPoint Manager.

Option	Meaning
Lease	Shows the status during the request for an IP address. • **idle** DHCP is not enabled. • **used** An IP address requested from a DHCP server is active. • **in process** A DHCP request is being processed. Possible actions • request Here you can request an IP address from a DHCP server if no address has been allocated yet. • release Releases the address. It may then be allocated again by the DHCP server. • rebind Corresponds to a *release* with a *request* following.
Requested IP (DHCP Option 050)	With this option, you can request a specific IP address (*current IP*) from the DHCP server.
Client ID (DHCP Option 061)	Serves to identify clients at the DHCP server unambiguously. As a default, the MAC address of the Ethernet port will be used (*default*). However, you can also use this option to allocate a client ID (*client ID*).
Server (DHCP Option 054)	Allows you to select a DHCP server (*IP address* of the DHCP server) from the network, in case there are several DHCP servers. This option is *disabled* as a default. This means that all DHCP servers in the directly adjacent network are contacted. If routers of external networks have relay agents, these are contacted as well.

Option	Meaning
Vendor ID (DHCP Option 060)	Also called ClassID with some manufacturers. Enables you to group devices and allocate various attributes to these groups.
Duration (DHCP Option 051)	Defines the time range during which an IP address assigned by a DHCP server will be used (lease time). A DHCP server can accept such a request or overwrite it with its own settings.

Config > Filtering

This menu enables you to configure the individual filters for an efficient data exchange.

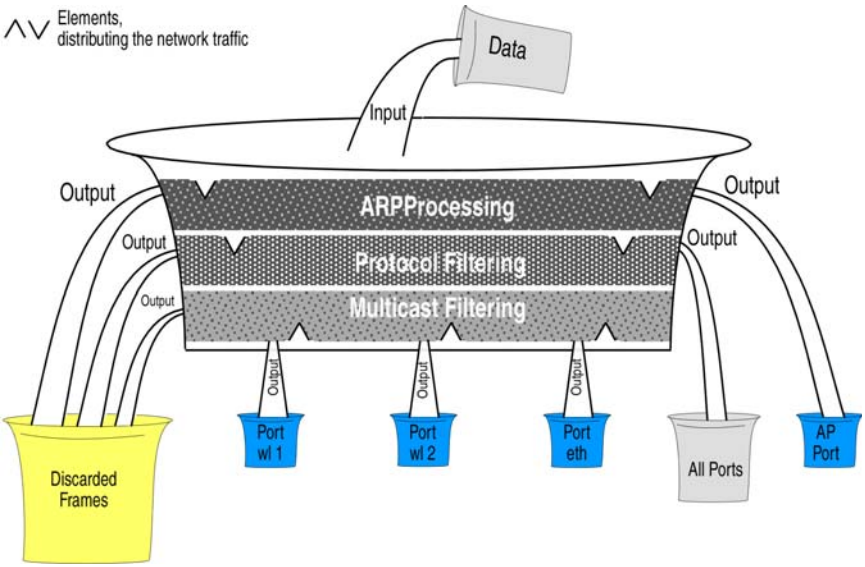
```
                          Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                        Config Filtering
     Command                                Parameters
  - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - -
1 - ARP process  [on]                     | mode
2 - Protocol     [->]                     |
3 - MAC filter   [->]                     |

    Turn special ARP processing ON or OFF.

Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

Note:

The *Filtering* function should only be used by experienced administrators.

As a rule, all packets used for direct communication with the ComPoint (e.g. Telnet session on the ComPoint) will (can) not be filtered in any case.

How the Filtering Process Works

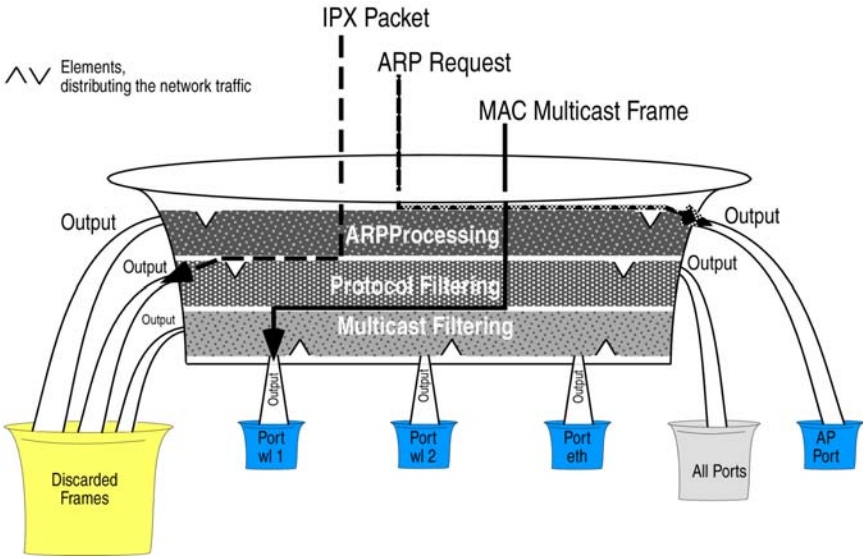


Example for the Filtering Process

- ARP process.: *on*
- Protocol: as a default *procMcstFlt*
- Protocol: IPX is to be discarded
- Multicast filter default rule:
  - Source=any;
  - Destination=any Multicast;
  - Destination Port=wl1_br

The incoming data traffic consists of:

1. IPX packet
2. ARP request to an associated client
3. Multicast frame


IPX Packet
ARP Request
MAC Multicast Frame
Elements, distributing the network traffic
Output
Output
Output
ARPProcessing
Protocol Filtering
Multicast Filtering
Output
Output
Output
Output
Output
Output
Discarded Frames
Port wl 1
Port wl 2
Port eth
All Ports
AP Port

Config > Filtering > ARP process.

If ARP Process is enabled (*on*), all ARP packets coming from or determined for associated clients will be led to the corresponding ports without filtering.

In the process, ARP requests for associated clients are converted from MAC multicast to MAC unicast.

At the same time, ARP requests not determined for associated clients are filtered.

An entry is generated in the protocol list, displaying ARP (0x806) in the "procARP" state. This entry cannot be changed.

ARP processing is configured separately for each ComPoint and does only apply to AccessPoint ports.

Config > Filtering > Protocol

The *Protocol* menu allows you to define, change, and delete rules for the forwarding or filtering of protocols.

```
                          Onair ComPoint             by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                    Config Filtering Protocol
     Command                                  Parameters
  - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Default mode       [forward]     | mode
2 - Show               [1]           |
3 - Add                [->]          |

        Processing rule for all those protocols, for which no
        specific actions are defined.


Enter a number or name, “=“ main menu, [ESC] previous menu.
21:20:43[admin]>
```

The table below explains the terms and parameters used in the menu and lists the available options of the individual menu items.

Option	Meaning
DefaultMode	Displays the DefaultMode, which will be applied to all protocols not indicated in the list. • **forward** All packets of not listed protocols will be forwarded according to the normal AccessPoint function, without being processed by the multicast filters. • **discard** All packets of not listed protocols will be discarded. • **MAC_filter** All packets of not listed protocols will be forwarded to the multicast filters. The multicast filters decide to which port(s) the packets will be led.
Show	Displays the protocol list. • **Protocol** The protocol name, the name of the protocol suite or the protocol numbers in hexadecimal code will be displayed and can be selected via *Add* or entered. • **Mode** forward, fwrd some, discard, MAC-filter, procARP (special case, with ARP process. on)

Option	Meaning
Add	Adds a protocol or a protocol suite to the list. For each added protocol, one action has to be chosen. The protocol list can contain a maximum of 32 entries. There are two ways to enter a protocol or suite: • Select a protocol or suite from the predefined list. **Predefined protocols and protocol groups** 1 – AppleTalk (AppleTalk, ARP for AppleTalk) 2 – Vines (protocols by Banyan Vines) 3 – DEC (DEC – Digital Equipment Corporation protocols) 4 – INET (IP, ARP) 5 – IPX (IPX protocol) 6 – SNAServices (IBM SNA Services on Ethernet protocol) 7 – IP 8 – ARP 9 – RARP or • Enter the protocol number as hexadecimal code into the prompt (e.g. 0x800 for IP, 0x806 for ARP).
Remove	Removes the selected protocol from the list. By selecting *all* from the list, you remove all protocols from the list. There are two ways to specify the protocol to be removed: • Select the protocol from the list. or • Enter the protocol number as hexadecimal code into the prompt (e.g. 0x800 for IP, 0x806 for ARP).

Config > Filtering > MAC filter

The *MAC filter* menu allows you to define, change, and delete rules for the forwarding or filtering of multicast frames on the *user* or *admin* user level.

1. Select *Config* > *Filtering* > *MAC filter* to go to the following screen:

```
                          Onair ComPoint            by Artem))))
  CPT-XT-g V4.56                                   Artem ComPoint
                    Config Filtering MAC_filter
     Command                              Parameters
  - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - -
1 - Rule table   [1]                    | default rule
2 - Edit Rule    [->]                   |
3 - Add                                 |


    Show all rules relating to the current configuration.

Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

The table below explains the terms and parameters used in the menu and lists the available options of the individual menu items.

Option	Meaning
Rule table	The number in brackets indicates the number of filter rules defined. Select *Rule table* in order to view an overview of all filter rules defined.
Edit rule	Edits a filter rule.
Add rule	Allows you to create a new filter rule.
Remove rule	Removes the selected filter rule.

Config > Filtering > MAC filter > Edit

Only on the admin and user level. Here, you can edit and delete filter rules.

Option	Description
Rule number	Select the filter rule you wish to edit.
Rule status	*Enable* or *disable* the selected filter rule.
Src MAC	Defines the source address of the multicast frames to be processed with this rule. any = any local = placeholder for the MAC address of the corresponding ComPoint (Config Interface)
Dst MAC	Defines the destination address for which the rule is to be valid. • Broadcast Frames addressed to all nodes (FF:FF:FF:FF:FF:FF). • IP-Multicast: Frames addressed to any group of devices belonging to an IP multicast group. • Multicast: Frames addressed to a group of devices on MAC basis (MAC address MSB = 1) • any: any frames In addition, you can enter any address as destination address in the prompt.

Option	Description
DST Ports	Use this menu to define for the selected rule to which ports the frames are to be forwarded. • **Show Ports** Displays a list of all ports to which the frames are forwarded according to the currently edited rule. • **Add port** Adds further ports which are to receive the forwarded frames. • **Remove port** Specific frames are removed from the list, i.e. excluded from the forwarding procedure.

Simple Example for Setting up Filter Rules

To ensure the functioning of your hotspot and to protect your hotspot users from unauthorized access, you must define a few filter rules. You can thus prevent the users within the hotspot from communicating with each other and to make their resources (shared permissions for directories) available to other hotspot users.

Proceed as follows:

1. Under *Config* > *Filtering* > *Protocol*, define which protocols are permitted for transmission.

To grant your users access to the Internet, the protocols IP and ARP have to be transmitted. Both protocols are contained in the INET suite.

2. Under *Add*, select the *INET* suite.

```
                          Onair ComPoint             by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                    Config Filtering Protocol
            Command                                protocol
  - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - -
1 - Default mode [MAC_filter]        |Apple Talk
2 - Show         [0]                 |Vines
3 - Add                              |DEC
                                     |INET
                                     |IPX
                                     |SNAServices
                                     |IP
                                     |ARP
                                     |RARP

Add a protocol or a suite to the list (or change its action) and define
a specific action to this protocol(s). Select from list or
enter the ISO protocol number in the prompt.

Select from list or enter “protocol“ in prompt. [ESC] break.
21:20:43[admin]>
```

3. Select the filter mode *MAC_filter* for the suite.

Finally, you just have to disable the forwarding of all other protocols:

4. To do so, set *Default mode* to *discard*.

```
                          Onair ComPoint             by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                    Config Filtering Protocol
              Command                                  mode
  - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - -
1 - Default mode [MAC_filter]        |MAC_filter
2 - Show         [2]                 |forward
3 - Add                              |discard
                                     |
                                     |
                                     |
                                     |
                                     |

Processing mode for all those protocols for which no specific actions
are defined.

Select from list or enter “mode“ in prompt. [ESC] break.
21:20:43[admin]>
```

With these settings, all protocols apart from IP and ARP, for which you have made special settings, will not be forwarded by ComPoint but discarded.

Note:

After having specified these rules, you will only be able to configure the ComPoint via the Ethernet interface (wired network).

Processing Order of the Rules

If more than one rule is allowed, the rules will be processed in a fixed order.

If the frame does not fulfil the conditions of the rules applied before, it will be compared to the conditions of the following rules. Frames which do not match with any of the rules added by the user, or any allowed rule, will be processed via the default rule.

Source MAC	Destination MAC	Destination Port	Order of processing
Specific	Specific	Specific	1
Specific	Specific	Any	2
Specific	Any	Specific	3
Specific	Any	Any	4
Any	Specific	Specific	5
Any	Specific	Any	6
Any	Any	Specific	7
Any	Any	Any	8

Example for Multicast Filtering

ComPoint with 2 wireless cards and 1 Ethernet port.

- *Show all* command

Rule_ number	Activity	Source_MAC	Dest_MAC	Dest port
0	enabled	ANY	Multicast	eth1
1	enabled	ANY	broadcast	wl1_ap
2	disabled	00:01:02:03:04:05 00:02:01:03:04:05	any	wl1_ap, wl2_ap

Processing Order

1, 0. Rule number 2 is not activated at the moment.

Effect

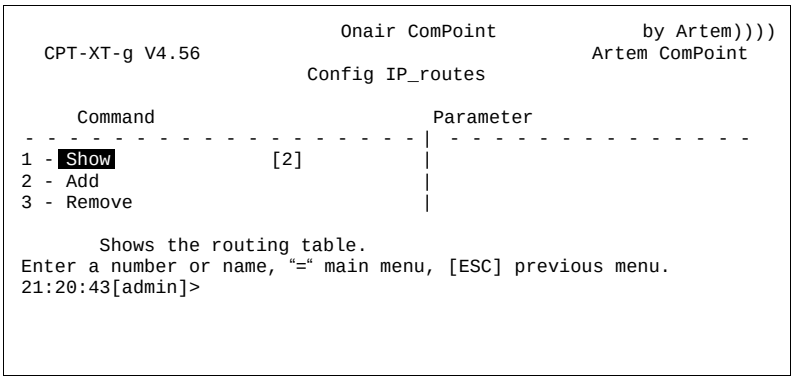
1. All broadcasts are only forwarded to port wl1_ap, irrespective of where they come from.
2. All other multicast frames are forwarded to port eth1 only.

In this case, the wireless network at port wl2_ap (and at port eth1, but it is not so important there, as the speed is very high) is fully relieved of all broadcasts. The wireless client registered at port wl2_ap, however, is not available for ARP requests (and for data communication as well).

Config > IP routes

This menu allows you to configure the routing table at the *admin* user level.

Here you can enter additional routes to networks accessible via other routers.



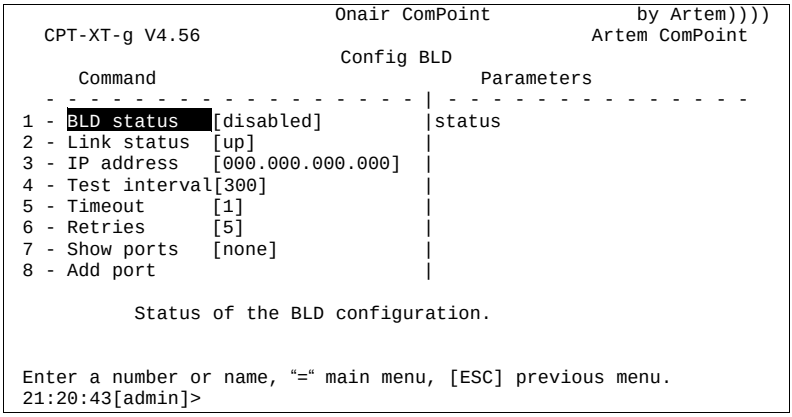
The table below provides a detailed description of the commands.

Command	Description
Show	Displays the routing table. Every entry consists of: • **destination** IP address of the destination network. • **mask** Netmask of the destination network. • **gateway** IP address of the router via which the data packets are routed into the destination network. • **if** Indicates the ComPoint interface. • **metric** Indicates the number of routers between ones own network and the destination network.
Add	Use this option to add routing entries to the routing table. For a routing entry, specify the following parameters: • **destination** IP address of the destination network. • **mask** Netmask of the destination network. The number of subnet bits is displayed. 32, for example, stands for 255.255.255.255. • **gateway** IP address of the router via which the data packets are routed into the destination network.
Remove	Use this option to remove routing entries from the routing table. The default route, the route to the local host, and the route to your own network cannot be deleted.

Config > BLD

You can use this menu to activate broken link detection, to request its status, and to configure it.

This function serves to detect a broken cable link and to switch off the wireless port.



The table below provides a detailed description of the commands.

Command	Description
BLD status	Enables or disables broken link detection as a whole. • **enabled** Enables BLD. • **disabled** Disables BLD.
Link status	Indicates whether the device is connected to an IP-based network. *Up* indicates a verified connection.
IP address	Displays the IP address used by the BLD agent for verification.
Test interval	Indicates the time interval (in seconds) between individual verifications of the connection.

Command	Description
Timeout	Indicates the time (in seconds) after which a link will be rated as broken.
Retries	Number of retries in the case of a broken link.
Show ports	Displays an overview of the wireless ports disabled during the link breakdown.
Add port	Adds a wireless port to the list of ports disabled during the link breakdown.
Remove port	Removes a wireless port from the list of ports disabled during the link breakdown.

Config > VLAN

You can use this menu to make settings for VLANs (virtual LANs), request their statuses, and configure them. Basic settings for setting up a VLAN are explained in Section VLAN Configuration on Page 6–1.

```
                          Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                          Config VLAN
     Command                                Parameters
  - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Admin          [->]               |Status              [disabled]
2 - VLANs          [->]               |Mgmt VID            [1]
3 - PVID           [->]               |


          Global VLAN administration of the devices.


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

The table below provides a detailed description of the commands.

Option	Description
Admin	Administrates global VLAN settings.

Option	Description
VLANs	Use this menu to configure and maintain a VLAN.
PVID	Configuration of the Port VIDs.

Config > VLAN > Admin

Use this option to make the following general settings for a VLAN:

Command	Description
Status	Enables or disables the ComPoint for VLAN.
Mgmt VID	Enter the VLAN ID of the VLAN in which the ComPoint is to be operated.

Config > VLAN > VLANs

Here, you can view all VLANs configured so far and edit their settings.

```
                          Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                       Config VLAN VLANs
     Menu                               Submenu
- - - - - - - - - - - - - - - - - - - -|  - - - - - - - - - - - - - - -
1 - Show          [4]                  |Select port          [eth1]
2 - Add                                |PVID                 [1]
3 - Edit          [->]                 |Drop Untagged        [disabled]
4 - Remove                             |Drop NonMemb.        [enabled]



          Edit VLAN configuration, i.e. configure the egress rules.


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

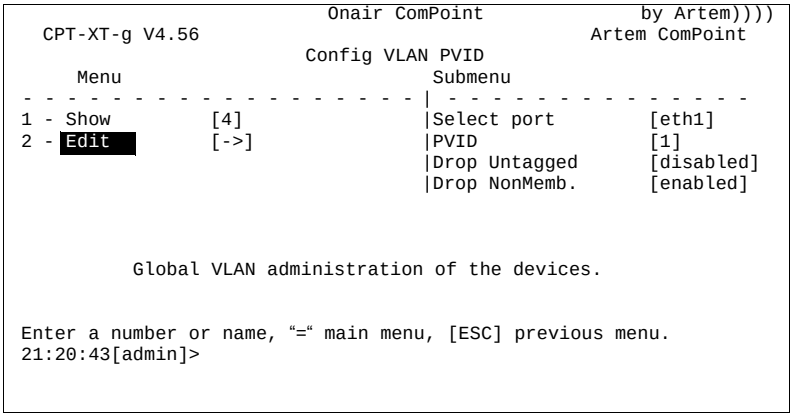
The table below provides a detailed description of the options.

Option	Description
Show	Shows all VLANs set up and their configuration properties. • **VID (VLAN-Identifier):** Number identifying the VLAN set up by the ComPoint. • **Name:** Name of the VLAN. Corresponds to the VLAN-SSID. • **Port:** Ports configured in this VLAN. • **Egress Rule:** Specifies whether the frames transmitted by this port are transmitted in tagged or untagged form.
Add	Here, you can set up a new VLAN. Specify a VLAN Identifier (VID) and a name (VLAN-SSID). Under *Mgmt VID*, you can decide in which VLAN your ComPoint is to operate.
Edit	Here, you can make the settings for a VLAN. • **Select VLAN:** Enter the VID of the VLAN which you wish to edit. • **Add TxRule:** Add a port to the VLAN and specify whether the frames transmitted by this port are to be transmitted in tagged form (i.e. including VLAN information) or in untagged form (i.e. without VLAN information). • **Edit TxRule:** Serves to edit the egress rule for a port at a later point in time. • **Del TxRule:** Deletes the egress rule for the selected port.

Option	Description
Remove	Removes a VLAN entry.

Config > VLAN > PVID

This menu allows you to determine and view rules for receiving frames on the ports of the VLAN.



The table below provides a detailed description of the options.

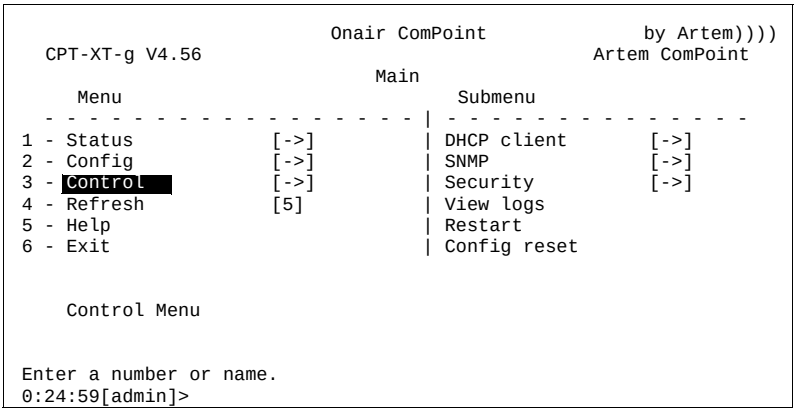
Option	Description
Show	Indicates the current receipt rules for the ports. You can make your settings under *Edit*.

Option	Description
Edit	Make your settings for the port rules. • **Select Port** Select the port whose rules you wish to edit. • **PVID** Allows you to assign a PVID to the selected port. • **Drop untagged frames** If this option is *enabled*, untagged frames will be discarded. If this option is disabled, untagged frames will be tagged with the PVID. • **Drop non Memb.** If this option is enabled, all frames tagged with the ID of a VLAN of which the selected port is not a member will be dropped.

The Control Menu

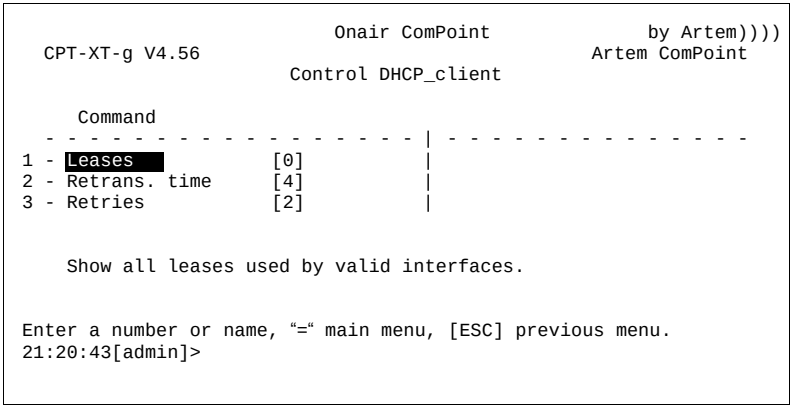
Use the *Control* menu to modify the passwords of the user levels, to carry out a System Restart, or to reset the parameters to factory default.

Moreover, you can access the Security and SNMP menus, view the ComPoint log files, and make additional settings for the DHCP communication.



Control > DHCP client

If the ComPoint is to request an IP address from a DHCP server during the start-up, you can configure the parameters for the request of an IP address using this option.



The table below provides a detailed description of the commands.

Command	Description
Leases	Number of interfaces which have an active IP address or whose request is still being processed at the DHCP server.
Retransm. time	Time interval (in seconds) between possible repetitions of the request at the DHCP server.
Retries	Maximum number of repetitions of the requests at the DHCP server.

Control > SNMP

Use this menu to configure the SNMP settings. ComPoint supports SNMP versions:

- SNMP V1
- SNMP V2c
- SNMP V3

and the management information base:

- MIBII.

```
                          Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                    Artem ComPoint
                         Control SNMP

     Command                                Parameters
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - -
1 - Status           [enabled]         | status
2 - SNMP port        [161]             |
3 - SysObject ID     [4280]            |
4 - Read access      [public]          |
5 - Write access     [private]         |
6 - Send trap    [trap community]|
7 - Manager          [->]              |


   Current status of SNMP agent.


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

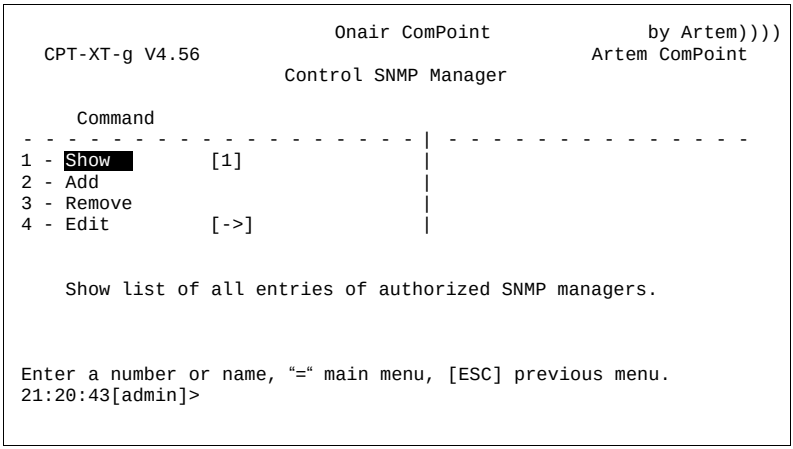
The table below provides a detailed description of the commands.

Command	Description
Status	Activates or deactivates SNMP as a whole. • **enabled** Activates SNMP. • **disabled** Deactivates SNMP.

Command	Description
SNMP port	Displays the IP port used by the SNMP agent. The default value is 161.
SysObject ID	This value cannot be modified, since it designates manufacturer and device. Serves to group devices and manufacturers.
Read access	Community for “read-only” access. Enter the password which the SNMP manager must transmit in order to obtain read access.
Write access	Community for read and write access. Enter the password which the SNMP manager must transmit in order to obtain write access.
Send trap	Community used to send news (traps) automatically. Allows access control at the receiving system (SNMP Manager).
Manager	Administrates the list of admitted managers.

Control > SNMP > Manager

Allows you to administrate the list of admitted managers.



The table below provides a detailed description of the commands.

Command	Description
Show	Displays the list of admitted manager systems and their access rights.
Add	Adds the IP address of a manager system into the list.
Remove	Removes a manager system from the list.
Edit	Configures the access options of a manager system.

Control > SNMP > Manager > Edit

Allows you to configure the access options of the manager systems.

```
                              Onair ComPoint                by Artem))))
  CPT-XT-g V4.56                                          Artem ComPoint
                        Control SNMP Manager Edit

     Command                                    Parameters
- - - - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Manager name [192.168.013.109]  | ElementNr
2 - IP address   [192.168.013.109]  |
3 - Mask         [255.255.255.255]  |
4 - Read access  [enabled]          |
5 - Write access [enabled]          |
6 - Send trap    [enabled]          |
7 - Trap port    [162]              |
8 - Timeout      [1500]             |
9 - Retries      [3]                |


   Specify the manager to be edit by selecting the IP address of
   this manager.


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

The table below provides a detailed description of the commands.

Command	Description
Manager name	Allows you to select the manager system to be edited.
IP address	Here you can enter or modify the IP address of the manager system.
Mask	Use this parameter, together with the IP address, to group manager systems. It works analog to the SubnetMask used with IP. Only bits set both in the IP address and in the mask will be evaluated. The default value is 255.255.255.255.
Read access	If this option is *enabled*, the manager system has read access.

Command	Description
Write access	If this option is *enabled*, the manager system has read and write access.
Send trap	If this option is *enabled*, the SNMP traps may be transmitted to this manager system.
Trap port	IP port to which the SNMP traps are sent. The default value is 162.
Timeout	Displays the waiting period for the acknowledge of traps in milliseconds.
Retries	Displays the maximum number of repetitions for the case that no acknowledge for the traps is received.

Control > Security

Use this menu to view the individual user levels, to change their passwords, and to edit the Access Control List (ACL).

```
                              Onair ComPoint                by Artem))))
  CPT-XT-g V4.56                                           Artem ComPoint
                            Control Security

     Menu                                    Submenu
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - -
1 - WL Admin       [allowed]            | WL Config forbidden
2 - User info      [->]                 |
2 - Authenticate   [->]                 |

Block access to administration via wireless port. A MAC filter rule
is generated that effectively prohibits wireless access to the Telnet
and Web configuration.

Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

Control > Security > WL Admin

For security reasons, activate the option *forbidden*. Consequently, no clients will be permitted access to the configuration interface of the ComPoint via WLAN.

Control > Security > User info

Use this menu to view the individual user levels.

If you know the password for the *admin* user level, you may change the passwords for all user levels.

Control > Security > User info > Show

Displays the names of the individual user levels. These are *admin*, *user*, and *view*.

The passwords of the user levels are displayed in encrypted form.

Control > Security > User info > Edit

This menu item allows you, as *admin* or as *user*, to change the passwords of the three user levels. This menu item is not available at the *view* level.

Prerequisite:

You have to know the password for the *admin* user level.

1. Select *Control* > *Security* > *User info* > *Edit*.
2. In the submenu on the right side of the table, select the user level (*view*, *user*, or *admin*) for which you want to change the password and confirm by pressing *Enter*.
3. Enter the admin password into the prompt and press *Enter*.
4. Now you have to enter the desired new password twice and confirm by pressing *Enter*.
5. From the next Telnet session onwards, you will be able to log in with the new password.

Note:

In case you forget the admin password, you can reset it yourself. Proceed as described in How to Reset the Password.

Control > Security > Authenticate

This menu allows you to configure the local access control list and the access to an external access control server. Moreover, the settings for IEEE802.1x are made in this menu. By activating these functions, you can limit the access to your data network via the ComPoint. Only clients whose MAC address is indicated in the local or remote access control list are permitted to access your LAN via the ComPoint. In addition, you can perform an authentication of the users via password and user name at an authentication server.

```
                              Onair ComPoint              by Artem))))
  CPT-XT-g V4.56                                        Artem ComPoint
                      Control Security Authenticate

     Menu                                    Submenu
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - - -
1 - wl1_ap       [->]                  | ACL local          [disabled]
2 - ACL local    [->]                  | ACL remote         [disabled]
3 - ACL remote   [->]                  | IEEE802.1x         [disabled]
4 - EAP          [->]                  |
5 - Auth. cache  [3]                   |


   Wireless authentication operating modes


Enter a number or name, "=" main menu, [ESC] previous menu.
21:20:43[admin]>
```

Note:

If you select *Acl local*, the list of MAC addresses is kept by the ComPoint. Consequently, you will have to keep a separate list in every ComPoint.

If you want to use *ACL remote* , you will need to purchase a Security Manager from Artem. It will centrally administrate the list for all wireless cells and all wireless networks. You will find further information on this topic on our homepage under www.Artem.de.

The table below provides a detailed description of the parameters.

Parameter	Meaning
wl1_ap	Use this parameter to configure the access control for the corresponding wireless port. • **ACL local** Here you can *enable* or *disable* a local access control list to be used. • **ACL remote** Here you can *enable* or *disable* the authentication via the Security Manager. • **IEEE802.1x** Here you can *enable* or *disable* an external authentication server to be used.

The priority of the three different options for access control corresponds to the sequence ACL local, ACL remote, IEEE802.1x. This means that the access control at the first position will be applied at first.

For example: all three access controls are enabled. A client will initially be compared to the entries in the local list. If it is found there, no request will be sent to the Security Manager. Instead, authentication according to IEEE will be performed.

The request to the Security Manager will only be carried out if the client is not found in the local list.

This means that only clients with a known MAC address and access permission will be authenticated according to IEEE802.1x.

Parameter	Meaning
ACL local	Configuring a local access control list. • **Show** Displays the local access control list. • **Add** Adds a new entry to the access control list. • client MAC addr Indicates the MAC address of the client to be added to the access control list. • port Select the wireless port of the ComPoint to which the client has access. - *all ports*, all wireless ports of the ComPoint - <*Wireless Port*>, the corresponding wireless port • **Remove** Removes an entry from the access control list. • client MAC addr Indicates the MAC address of the client to be removed from the access control list.

Parameter	Meaning
ACL remote	Serves to configure the communication settings with an external ACL server. • **IP address** Enter the IP address of the ACL server. • **Port number** Enter the IP port via which the ACL server is accessible. The default is 1112. • **Comm. state** Indicates the status of the connection to the ACL server. • Disconnected –Connection is not active. • Connected – Connection is active. • **Def. access** Indicates the access code used if the ACL server is not accessible. • denied – Access denied. • granted – Access granted. • **Sync period** Enter the time interval (in minutes) after which the ACL cache is to be updated. This interval is calculated separately for each client.

Parameter	Meaning
EAP	Make your entries for authentication according to IEEE 802.1x. • **Prim. server** Indicates the number of the primary authentication server. If several servers are entered, the primary server can be selected from a list. • **Server config** • Edit server Allows you to modify the settings for the authentication servers. The following options are available: *Select Server:* Selects the server to be edited from a list. *IP Address:* IP address of the server *Port number:* Number of the port where the communication with the server is to take place. The default value is 1812. *Shared secret:* Key with which the data packets transmitted between ComPoint and server are to be encrypted. Enter the same key as on the server. *Remove Server:* Deletes the currently selected server entry. • Add server Creates a new server entry. • **Comm. state** Indicates the status of the connection to the server. • Disconnected –Connection is not active. • Connected – Connection is active.

Parameter	Meaning
EAP (Continued)	• **Def. access** Specifies the behavior of the ComPoint in case the primary server is not available. • denied – access denied. • granted – access granted. • **Advanced** Here you can make further settings. • Max. reauth Maximum number of automatic reauthentication attempts. • EAPOL timeout Maximum waiting period of the access point port after a request has been sent to the client. • Serv. timeout Maximum waiting period of the access point port after a request has been sent to the authentication server. • Supp. timeout Timeout (in seconds) for requests sent to the access point by the client. • Max. requests Maximum number of user requests after which authentication will be aborted. • Quiet period Waiting period after an authentication abort.
EAP (Continued)	• Reauth. switch Serves to enable or disable automatic reauthentication of clients. Enabled: The user will be reauthenticated automatically after the specified time interval. Disabled: The user will not be reauthenticated. • Reauth period Interval after which a user will be reauthenticated automatically (in seconds).

Parameter	Meaning
Auth. cache	The number in square brackets indicates the current number of internal and external entries in the authentication list. This list contains entries by ACL and EAP. You can view this list by pressing <ENTER>. You will find information on the MAC address of the client, the port at which the client is registered, whether the access has been granted or denied (Error/InProgress/Granted/Denied), and the source of the authentication (ACL local, ACL remote, or EAP). In the case of ACL remote and EAP, the status of the request, as well as the time left until the next timeout will be displayed.

Control > View logs

Displays the stored system messages. The latest 50 messages since the last system boot are stored.

Control > Restart

Select *Control* > *Restart* to carry out a reboot of the ComPoint.

Control > Config reset

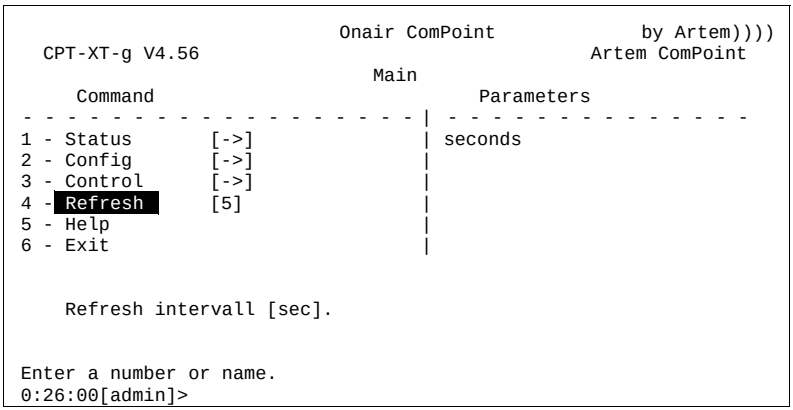
If you select the *Control* > *Config reset* option, the ComPoint will be rebooted. At the same time, the configuration will be reset to the factory defaults. This action can only be carried out at the *admin* user level.

Caution!

The passwords for the user levels and the IP configuration for the primary interface cannot be reset.

The Refresh Command

Using the *Refresh* command, you can define the time interval after which a table screen (e.g. *Status* > *Summary*) will be updated. The preset value is five seconds.



The Help Command

Use this command to launch the integrated help. The help can be called by pressing the <F1> key or the number <0> as well.

The Exit Command

Select the *Exit* command to terminate your Telnet connection.

The Browser-Based User Interface

This chapter describes the structure of the browser-based user interface and explains how to start it. The browser interface is dependent on the browser used (Internet Explorer, Netscape, Opera, etc.), not on the operating system. In the below example, the Internet Explorer was used for the purpose of configuration.

Starting the Browser-Based User Interface

You have 2 options to start the Web interface:

- Starting directly via the browser
- Starting via the *Configuration* menu in the ComPoint Manager

Option 1—Starting via the Browser

1. Start the browser which you normally use, e.g. Microsoft Internet Explorer.
2. Enter the following into the address line:

   http://<IP address of the ComPoint>

   e.g.: http://192.168.1.5

Option 2 – Starting via the ComPoint Manager

1. In the main window of the ComPoint Manager select the ComPoint which you want to access via the Web (browser-based interface) and select the *Configuration* > *Advanced* > *Web* menu or use the right mouse button and select the *Web* menu in the pop-up list.

The browser-based user interface of the ComPoint will now be displayed.

2. Click the ComPoint figure.

   The following dialog box appears:

3. Enter the *user name* and the *password*.

   This is factory-set for the admin user interface.

   User name: admin

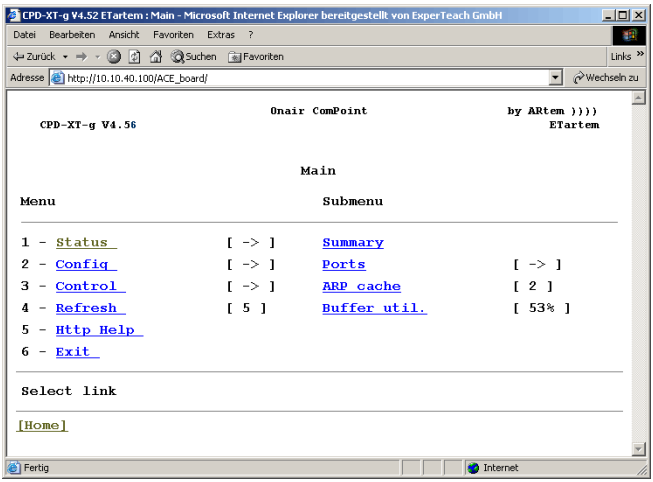
   Password: admin

You can change the password on the ComPoint user interface under *Control* > *Security* > *User Info* > *Edit* (see section Changing the Passwords for the User Levels, Page 1–15).

The Structure of the Browser-Based User Interface

The browser-based user interface is structured similarly to the Telnet user interface.

Section Setup of the User Interface in chapter The User Interface via Telnet provides further information on this matter.

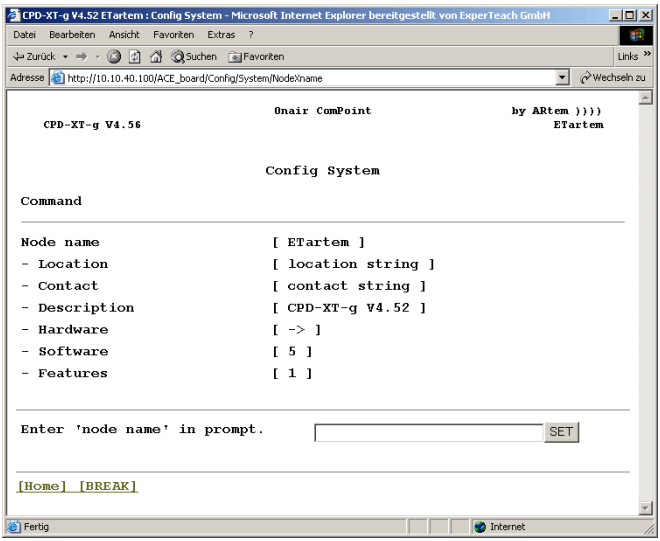


Navigating the Browser-Based User Interface

You can navigate the browser-based user interface like an Internet page.

By clicking links, you reach the next level.

If you have to enter values, an input window will be displayed where you can enter the values.



Menus and Parameters of the Browser-Based User Interface

You will find the illustrations and descriptions of all menus and commands as well as the corresponding parameters in chapter The User Interface via Telnet, starting with section The Status Menu.

ComPoint Bridge

If you have acquired an Artem Onair ComPoint with bridging functionality or a Bridge Upgrade Kit, you cannot only enable mobile clients to access your LAN, but also connect different LAN segments in wireless form.

Depending on the antennas used, this wireless connection can cover a distance amounting to some kilometers.

Note:

Always use the original antennas and antenna cables supplied in order to avoid breaking governing law inadvertently. If you have special requirements, e.g. with regard to the cable length, please contact your dealer or Artem GmbH.

The application of this technology is free of charge within the Federal Republic of Germany. If a radio link crosses the boundaries of your premises, you will merely have to indicate the existence of the radio link to the Reg TP (Regulierungsbehörde für Telekommunikation und Post). You can find the Reg TP in the Internet under www.regtp.de.

On our website www.Artem.de, you can find the registration form as PDF file.

Using the ComPoint Bridge

The section The User Interface via Telnet of the manual describes the function, application and configuration of the ComPoint as an access point.

Our ComPoint Bridges are a product family which by far exceeds this field of application. The ComPoint Bridges offer all the features described above, and many more.

Note:

Every wireless bridge port of a ComPoint can be run in the *Bridge* mode as well as in the *Access Point* mode.

Bridges are generally used to connect different LAN segments on layer 2 of the OSI 7 layer model. The special feature of the ComPoint Bridges is that although the distances between these segments can amount to several kilometers, no cable is required.

If you use a wireless port in the bridge mode, it can be used for a bridge link only. This means:

- The port does not have any network name.
- No wireless clients will be able to associate with (register at) this port.
- There is no node table for the port (as there are no clients).
- There is no Access Control List (ACL) for this port.

This port will only set up connections to the port of the partner bridge configured by you and will only accept connections from this port.

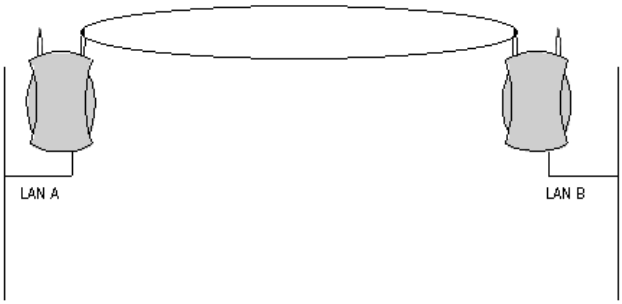
The ComPoint Bridges offer transmission rates far exceeding the capacities of ISDN S_0, ISDN S_{2M} and ADSL. The ComPoint High Speed Bridge even outshines standard Ethernet (10BaseT, 10Base2, 10Base5).

Caution!

Be sure not to plug two bridges connected by radio to the same LAN segment. This will inevitably cause to a network overload, leading to a total breakdown of your network traffic.

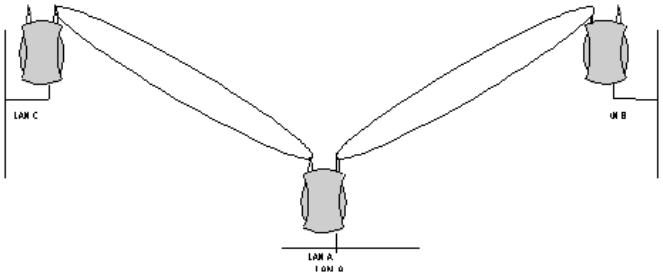
To give you an overview of the options offered by ComPoint Bridges, some possible network topologies will be described in the following.

1. Point-to-point topology



Interconnection of two LAN segments with 11/54 Mbps

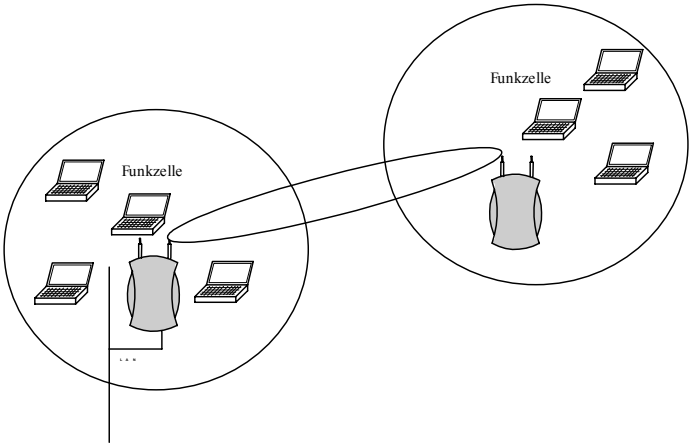
2. Point-to-Multipoint Topology



Interconnection of three LAN segments with 11/54 Mbps

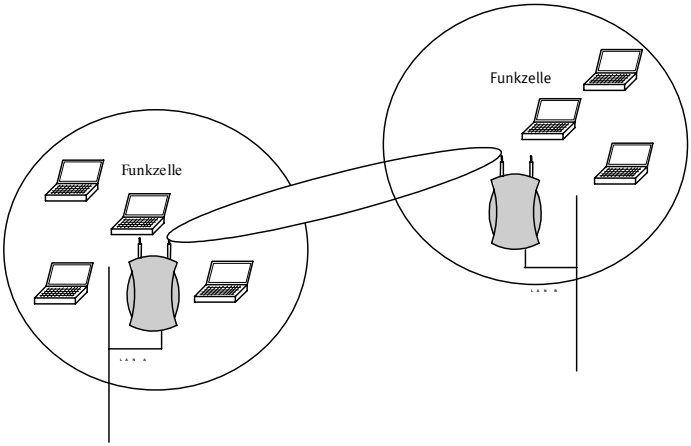
artem funkwerk

3. Wireless Backbone



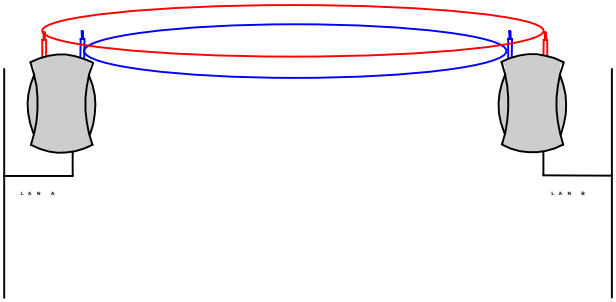
Access point with a wireless connection to the LAN, without losses in throughput

4. Wireless bridge connected to wireless clients



Interconnection of two wireless cells without LAN cable

5. High speed interconnection between two LAN segments

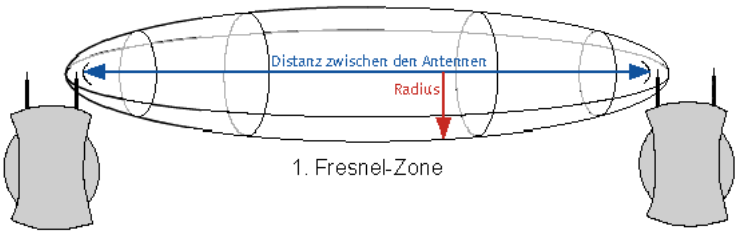


Double throughput by channel bundling. Possible configuration options are: 2x 11 Mbps.

Preconditions for links with ComPoint Bridges

To set up a wireless link with ComPoint Bridges, there has to be an unobstructed view between the antennas on both sides. Among experts, this is called LOS, i.e. line of sight.

The term “line of sight” does not merely refer to a straight visual line of sight, but to a kind of tunnel, which must not be hampered by obstacles.
This “tunnel” is the so called first Fresnel zone. The Fresnel zone has the form of an ellipsis rotating around a longitudinal axis. At least 60% of the first Fresnel zone have to be unhampered. The radius (or small semi-axis) depends on the frequency used and the distance between the antennas.



Example:
Radius of the first Fresnel zone as a function of the distance to the transmitting antenna, for an antenna spacing of 5 km at 2.45 GHz.

Distance to the Transmitting Antenna [km]	Radius of the First Fresnel Zone [m]	Radius at 60% First Fresnel Zone [m]
0.250	5.4	4.2
0.500	7.4	5.7
0.750	8.8	6.8
1.000	9.9	7.7
1.250	10.7	8.3
1.500	11.3	8.8
1.750	11.8	9.1
2.000	12.1	9.4
2.250	12.3	9.5
2.500	12.4	9.6
2.750	12.3	9.5
3.000	12.1	9.4
3.250	11.8	9.1
3.500	11.3	8.8
3.750	10.7	8.3
4.000	9.9	7.7
4.250	8.8	6.8
4.500	7.4	5.7
4.750	5.4	4.2

Example:
Radius of the Fresnel zone as a function of the distance to the transmitting antenna, for an antenna spacing of 700 m at 2.45 GHz.

Distance to the Transmitting Antenna [m]	Radius of the First Fresnel Zone [m]	Radius at 60% First Fresnel Zone [m]
100	1.6	1.25
200	2.1	1.6
300	2.3	1.75
400	2.3	1.75
500	2.1	1.6
600	1.6	1.25

Note:

When setting up a bridge link, please make sure that no obstacles (no trees, either) reach the Fresnel zone. If this is the case, the transmission rate will decline, or the link may even break down.

In the case of short distances within buildings, the LOS must not necessarily be taken into account, as the radius of the Fresnel zone is very small there.

If these preconditions are observed, the link can be set up and maintained without any further restrictions. Weather conditions, in particular, do not influence ComPoint Bridge links at all.

Configuring the ComPoint Bridge

Every bridge port of a ComPoint can be operated as a bridge or as an Access Point (AP).

If a bridge port is run in AP mode, all parameters are identical to the parameters described in the first part of the manual.

This is why these parameters will not be discussed here once more.

In some menus, there are only small differences between bridge and access point. The options for the contents of many parameters, as well as their meaning, remain unchanged. In this chapter, only the differences and new parameters will be discussed.

Note:

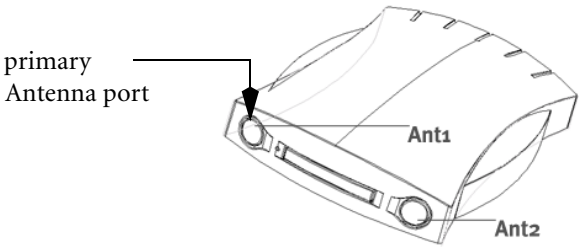
Please refer to Section The User Interface via Telnetof the manual. Many general parameters are explained there.

Note:

For better readability, the sequence of the discussed menus will be the same as in Section The User Interface via Telnet.

Note:

Always use the marked antenna port (see figure) for bridge links. This is the primary port of the device.



On the bottom of the device, there is a label with the names of both antennas. The primary antenna is called Ant 1.

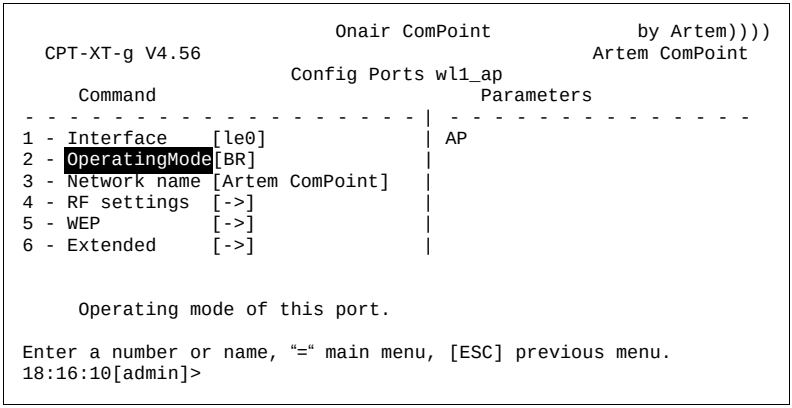
Initiating the Telnet Connection, Login, and Setup of the User Interface

The initiation of a Telnet connection, the login. and the setup of the user interface are explained in chapter The User Interface via Telnet.

Activating the Bridge Mode

In order to activate the bridge mode, proceed as follows:

1. Go to the menu *Section Status > Ports > <Wireless Port>, Page 3–12*.
2. Select the option *BR* under *Operating Mode* .



3. Answer the question *Are you sure* with *y*.

The ComPoint can now be operated as bridge.

The Status Menu

The information on the ComPoint Bridge summarized in the *Status* menu can only be displayed but not configured by the user. You can find further information in chapter The Status Menu.

Status > Summary

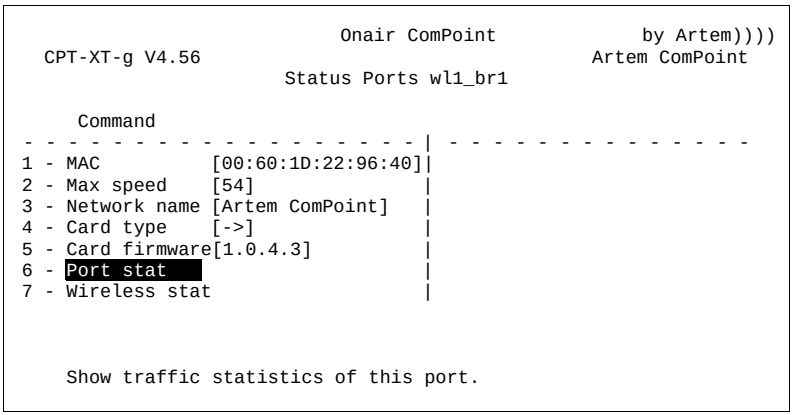
Ports operated in bridge mode do not have any network name. Under *Mode*, the value *Bridge* is displayed. Moreover, these ports do not have any associated clients. This is why you cannot use an Access Control List (ACL) on a bridge port.

Bridge ports are displayed as port wlx_br.

```
                                Onair ComPoint                          by Artem))))
 CPT-XT-g V4.56                                                        Artem ComPoint
                                      Status
    ------------------------------------------------------------------------------
Primary If  IP config          DHCP        SNMP   Filter         Uptime
----------  ---------------    --------    ----   -------------  -------
 IP         192.168.001.005    disabled    on     Prot: macFlt   0:26:51
 address
 Subnet     255.255.255.000                       Mflt: forward
 mask
 Gateway    000.000.000.000
                                                                 Sessions
                                                                         1

 Port       MAC address        Speed       Mode   Link                  Info
 ----       -----------        -----       ----   - ----------- --------------------
 eth1       00:01:CD:0A:00:4A  10          HD     +
 eth2       00:01:CD:0A:00:4B  100         HD
 wl1_ap     00:60:1D:22:E4:AC  54@01-2412  BR     - S ---N --- dBm S/N -- dB
 wl2_br1    00:60:1D:22:E4:AC  54@11-2462  BR     - S ---N --- dBm S/N -- dB


 Enter [SPACE] refresh, [q]quit
```

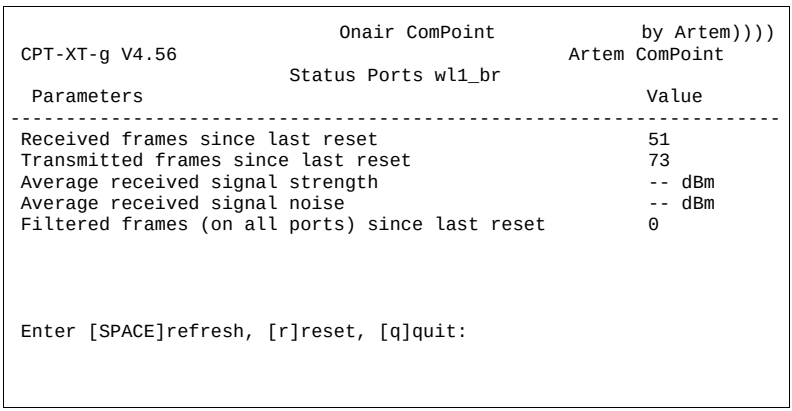
Status > Ports > wl1_br

Bridge ports do not have a NodeTable.



Port stat.

Via *Status* > *Ports* > *wl1_br* > *Port stat.* , you get to the following screen.



Parameter	Description
Average received signal strength	Reception strength of the signal at the receiver in dBm
Average received signal noise	Reception strength of the noise at the receiver in dBm

You can find further information under Port stat, Page 3–13.

The Config Menu

In the *Config* menu, you can configure a variety of parameters of the ComPoint Bridge, depending on the user level at which you are logged on.

Note:

The following descriptions presume that the user is logged in at the *admin* user level.

Config > Ports

Bridge ports are called wln_br.

Config > Ports > wl1_br

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
                          Config Ports wl1_br

     Command                                  Parameters
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - OperatingMode      [BR]             |
2 - RF settings        [->]             |
3 - Security           [->]             |
5 - Extended           [->]             |
7 - Bridge links       [->]             |

   Operating mode of this port.

Enter a number or name, "=" main menu, [ESC] previous menu.
```

The following table provides an explanation of the terms and options used in the menu.

Command	Meaning
Operating Mode	This menu item allows you to select the desired *OperatingMode* of the port from a list or to enter it manually into the prompt. • **DBR (depending on the device used)** Only for CPBR-2W11, a device purchased as double bridge. Allows channel bundling, i.e. a 22 Mbps link between two sides. Only possible on wl1, as wl2 follows automatically. This means that only one logical wireless port is left. • **BR** This port works in bridge mode. Wireless clients are not permitted to log in. The port can be used to interconnect two LANs. The preconditions are that there is a ComPoint Bridge in the other LAN segment, as well as the general preconditions (LOS) described on Page 5–6. • **AP** See Section The User Interface via Telnet.
RF settings	Merely contains the commands *DS channel*, *Speed mode*, and *Tx power* (only for devices operated with IEEE-g technology). The commands are described in Section Config > Ports > <Wireless Port> on Page 3–26.
Security	The configuration in the *Security* menu is described on Page 3–28 of the manual.
Extended	Allows you to make specific settings as described on Page 3–29 of the manual.

Command	Meaning
Bridge Links	Allows you to configure a bridge link manually, as described in the manual on Page 5–20 ff.

Config > Ports > wl1_brx > Security

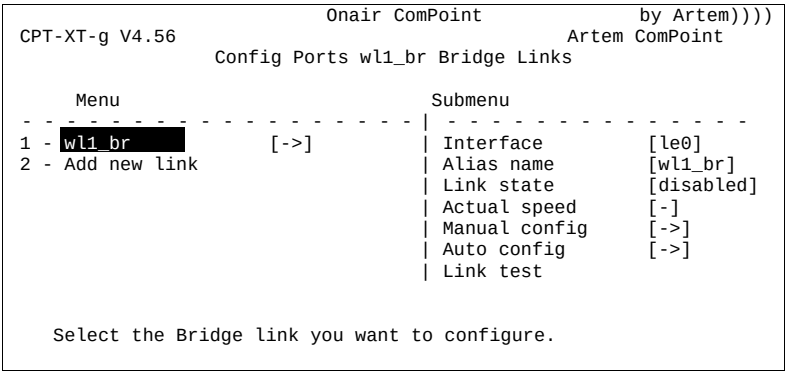
The configuration of the Wireless Equivalent Privacy is described on Page 3–28 of the manual.

Config > Ports > wl1_brx > Extended

Allows you to make specific settings as described on Page 3–29 of the manual.

Config > Ports > wl1_br > Bridge Links

Allows you to set up a new bridge link or configure an existing bridge link.



Menu	Submenu
wl1_br1 wl1_br1	Select the link you wish to configure.
Add new link	Adds a new bridge link. Up to 6 links can be set up.

Menu	Submenu
Remove link	Removes a bridge link.

Config > Ports > wl1_br > Bridge Links <Port>

Here, you can make the configuration settings for the selected port.

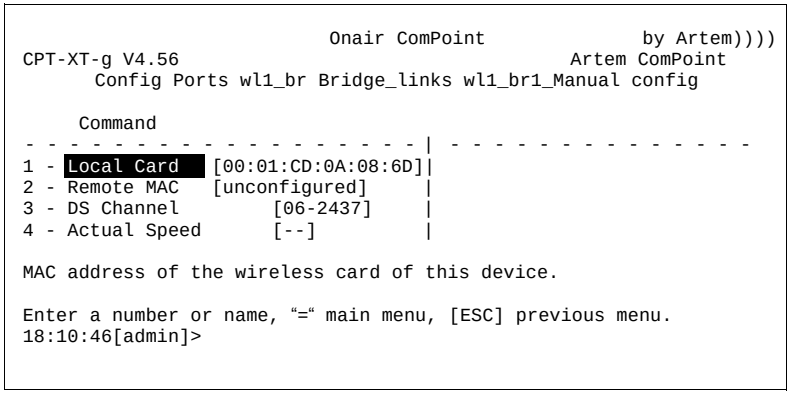
```
                          Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
              Config Ports wl1_br Bridge Links wl1_br1

     Command                          Parameters
- - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - -
1 - Interface          [le0]          |interface name
2 - Alias name         [wl1_br]       |
3 - Link state         [disabled]     |
4 - Actual speed       [-]            |
5 - Manual config      [->]           |
6 - Auto config        [->]           |
7 - Link test                         |


   Interface assignment for this port.

Enter a number or name, "=" main menu, [ESC] previous menu.
```

The following table provides an explanation of the terms and options used in the menu.

Command	Meaning
Interface	This option allows you to allocate an interface.
Alias name	Here you can assign a name to the link to simplify its identification. This name will replace the default name, e.g. wl1_br. Note: Alias names must not be assigned twice. If you wish to reset an alias name to the default name, select *Default*.

Command	Meaning
Link state	Enabling and disabling of the bridging function. Available values are: • enabled • disabled
Actual speed	Displays the current transmission rate.
Manual config	Allows you to configure a BridgeLink manually, as described on Page 5–28 of the manual.
Auto config	Allows you to configure a BridgeLink automatically, as described on Page 5–20 of the manual.
Link test	The link test provides all data required for the evaluation of the bridge link (or of both links, with high speed bridges). Moreover, the link test supports you when orienting the antennas.

Config > Ports > wl1_br > Manual config



The table below explains the options used in the menu:

Option	Meaning
Local Card	MAC address of the WLAN card of the ComPoint.
Remote MAC	Enter the MAC address of the partner device of the radio link.
DS channel	Allows you to set the channel (frequency).
Actual Speed	Displays the current transmission rate.

Config > Ports > wl1_br > Auto config

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                          Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br1_Auto config

     Command                          Parameters
- - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - - -
1 - Config state       [allowed]     | Config state
2 - Lock state         [unlocked]    |
3 - Settings           [->]          |


Show current status of remote configuration process. Select 'perform'
to scan for available bridge partners.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

The table below explains the options used in the menu:

Command	Meaning
Config state	Shows the current state of the configuration process. This parameter can have the following values: • **allowed** Only available if no settings have been made or if the settings have been reset to the factory defaults by Control > Config reset. The bridge may be configured from another bridge. • **perform** Enter perform in order to search for available bridges and perform an automatic configuration. • **done** The configuration has been performed. • **failure** The configuration has failed.
Lock state	Indicates whether a bridge is locked for autoconfiguration (*locked*). A lock applies to all links of a multi-point bridge.
Settings	Allows to check, and, if necessary, to correct the following parameters: • DS channel (=frequency) • Speed mode (transmission rate) • AuthMethod (authentication and encryption method)

Setting up a Bridge Link Automatically

Note:

The automatic bridge link setup for devices operated according to 802.11g will ignore 802.11b devices.

To set up a bridge link automatically, the following steps are required:

1. Under *Settings*, select the frequency (*DS channel*), the transmission rate (*Speed Mode*), and the security settings (*AuthMethod*) for the link on one of the partner bridges.

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
        Config Ports wl1_br Bridge_links wl1_br1_Auto config

     Command                          Parameters
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - -
1 - Speed mode   [Auto_fallback]      | method
2 - DS channel   [11_2462]            |
3 - Auth Method  [none]               |


Select method for authentication and encryption after succsessful remote
configuration.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>perform
```

The settings will be transferred to the partner bridge during configuration.

2. On the first bridge, set *Lock state* to *unlocked* .

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br1_Auto config

     Command                          Parameters
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - -
1 - Config state       [allowed]      | mode
2 - Lock state         [Unlocked]     |
3 - Settings           [->]           |


Bridge lock status. Locked bridge links cannot be accessed via remote
configuration. This setting affects all links of a multi-point bridge.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

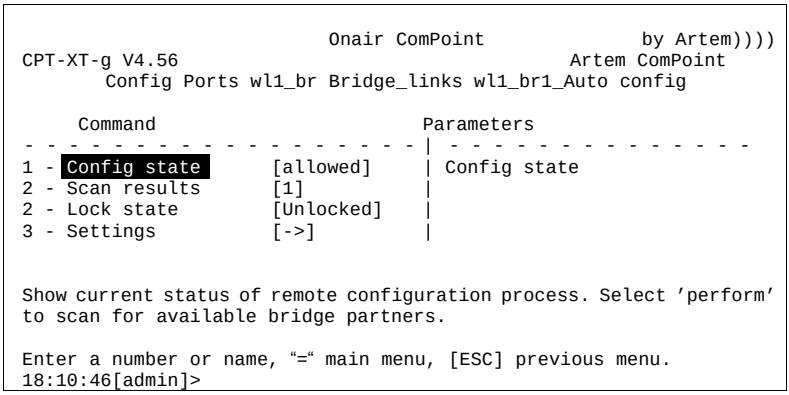
Note:

The default setting for every ComPoint Bridge is *unlocked* .

3. Select the option *perform* for *Config state*.

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br1_Auto config

     Command                          Parameters
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - -
1 - Config state       [allowed]      | Config state
2 - Lock state         [Unlocked]     |
3 - Settings           [->]           |


Show current status of remote configuration process. Select 'perform'
to scan for available bridge partners.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>perform
```

If the antennas are installed correctly on both sides, and the LOS is unhampered (see Section Preconditions for links with ComPoint Bridges), the bridge will be able to find available bridges and display them under *Scan results* :



If the partner bridge cannot be found, check the line of sight and the antenna installation. Subsequently, run *perform* once more. The partner should now be found.

4. Select the desired partner bridge.

   The link between the two bridges will now be set up automatically. As soon as the configuration has been completed, the parameter *done* appears under *Config state*.

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br1_Auto config

     Command                          Parameters
- - - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - - -
1 - Config state       [done]          | Config state
2 - Scan results       [1]             |
2 - Lock state         [Unlocked]      |
3 - Settings           [->]            |


Show current status of remote configuration process. Select 'perform'
to scan for available bridge partners.

Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

5. For security reasons, you should set the *Lock state* of both partner bridges to *locked*. This will prevent the autoconfiguration of the two bridges.

Now, the bridge link is active, and the data is transmitted between the LAN segments.

Checking a Bridge Link (Link Test)

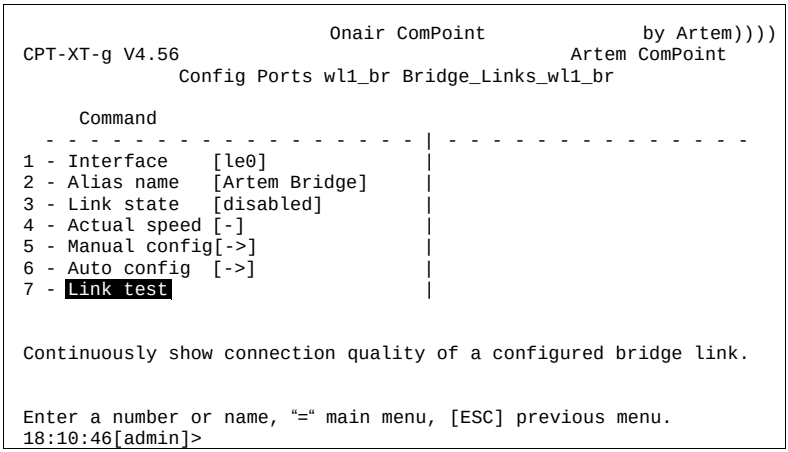
The link test provides all data required for the evaluation of the bridge link (or of both links, with high speed bridges). Moreover, the link test supports you when orienting the antenna.

Performing a Link Test

Prerequisite:

Before you perform a link test, you ought to shorten the display interval from 5 seconds to 1 second (see The Refresh Command).

1. Log on to your local bridge via Telnet or http at the *admin* user level.
2. Select *Config* > *Ports* > < *Wireless Port* > *Bridge Links* > <*Wireless Port* > > *Link test* to open the *link test* menu.



The data of the link test will be displayed.

Screen of a single bridge:

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                      Artem ComPoint
                Config Ports wl1_br Bridge_links wl1_br

                                    Local Bridge          Remote Partner
 ------------------------------------------------------------------------
                                    Link quality
                                          excellent           excellent
                                       SNR:    51 dB       SNR:    53 dB
                                     Signal: -37 dBm    Signal: -39 dBm
                                      Noise: -96 dBm     Noise: -96 dBm

                                    Received at rate
                                      54 Mbps: 561        54 Mbps: 561
                                      48 Mbps: 0          48 Mbps: 0
                                      36 Mbps: 0          36 Mbps: 0
                                       1-24Mbps:0         1-24 Mbps:0

                                         Frames Sent:          561
                                    Frames Recieved:           560
                                        Frames Lost:             0

 Enter [SPACE] refresh, [r]reset, [q]quit
```

Screen of a double bridge:

```
                              Onair ComPoint              by Artem))))
 CPT-XT-g V4.56                                      Artem ComPoint
                 Config Ports wl1_brx Bridge_links wl1_bx

  Local Card 1      Remote Partner    Local Card 2        Remote Partner
 ------------------------------------------------------------------------
  Link Quality                          Link Quality
        excellent         excellent         excellent         excellent
     SNR:  54 dB       SNR: 52 dB        SNR: 51 dB        SNR: 53 dB
  Signal: -40 dBm Signal: -38 dBm     Signal: -37 dBm   Signal: -39 dBm
  Noise: -96 dBm   Noise: -96 dBm      Noise: -96 dBm     Noise: -96 dBm

  Received at Rate                      Received at Rate
  11 Mbps: 565      11 Mbps: 565      11 Mbps: 561      11 Mbps: 561
  5.5 Mbps:    0    5.5 Mbps:    0    5.5 Mbps:    0    5.5 Mbps:    0
    2 Mbps:    0    2 Mbps:    0    2 Mbps:    0    2 Mbps:    0
    1 Mbps:    0    1 Mbps:    0    1 Mbps:    0    1 Mbps:    0

      Frames Sent:        566              Frames Sent:       561
  Frames Recieved:        565           Frames Recieved:      560
      Frames Lost:          0              Frames Lost:         0

 Enter [SPACE] refresh, [r]reset, [q]quit
```

This display is updated at every refresh interval.

Per interval, 5 test frames are sent to the partner and answered there. These responses will then be evaluated and the results will be displayed.

3. By pressing r(eset), you can reset the counters.

The table below explains the parameters displayed in the evaluation of the link test:

Parameter	Meaning
Link Quality	Constitutes the title of the parameters indicating the link quality.
Evaluation of the quality	This parameter can have the following values: • **excellent** • **good** • **marginal** • **poor**
SNR	The Signal to Noise Ratio (in dB) is an indicator of the radio link quality. Values — Evaluation > 25 dB — excellent 15 – 25 dB — good 2 – 15 dB — marginal 0 – 2 dB — poor
Signal	Reception strength of the signal at the receiver in dBm
Noise	Reception strength of the noise at the receiver in dBm
Received at Rate	Constitutes the title of the parameters indicating the number of received frames.
54 Mbps	Number of frames received at a transfer rate of 54 Mbps.
48 Mbps	Number of frames received at a transfer rate of 48 Mbps.

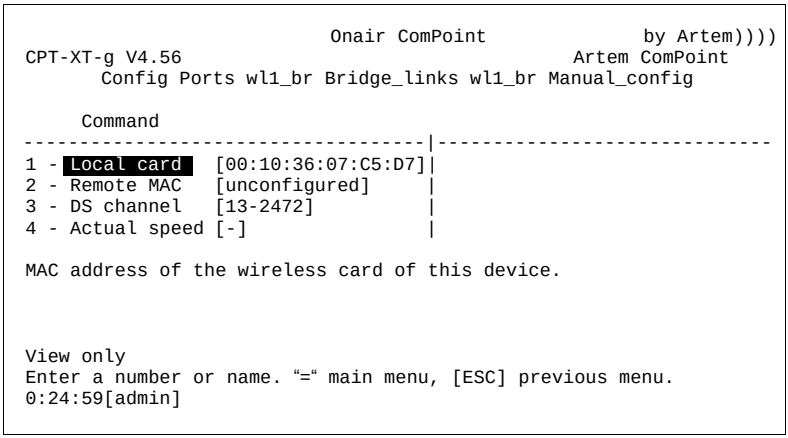
Parameter	Meaning
36Mbps	Number of frames received at a transfer rate of 36 Mbps.
1 - 24 Mbps	Number of frames received at a transfer rate of 1 to 24 Mbps.
11 Mbps	Number of frames received at a transfer rate of 11 Mbps.
5.5 Mbps	Number of frames received at a transfer rate of 5,5 Mbps.
2 Mbps	Number of frames received at a transfer rate of 2 Mbps.
1 Mbps	Number of frames received at a transfer rate of 1 Mbps.
Frames Sent	Number of frames sent by this device since the start of the LinkTest.
Frames Received	Number of frames received by this device since the start of the LinkTest.
Frames Lost	Number of frames lost in this link since the start of the LinkTest.

4. If you want to quit the link test, press <ESC> or <q> (telnet), or select <BACK> (web interface).

Setting up a Bridge Link Manually

We generally recommend you to select the automatic setup of a bridge link, since it is easier to implement and less error-prone. For manual configuration, proceed as follows:

1. Select *Config* > *Ports* > < *Wireless Port*> > *Bridge Links* > <*Wireless Port*> *Manual config*.
2. Determine the MAC address for each bridge under *Local card* and note it down.



3. Enter the MAC address of the wireless port of the respective partner bridge at every bridge under *Config* > *Ports* > <*Wireless Port*> > *Bridge Links* > < *Wireless Port* > *Manual config* > *Remote MAC* .

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br Manual_config

     Command
-------------------------------------|------------------------------
1 - Local card   [00:10:36:07:C5:D7]|remote MAC addr
2 - Remote MAC   [unconfigured]      |
3 - DS channel   [13-2472]           |
4 - Actual speed [-]                 |

MAC address of the wireless card of the remote device.



Enter a number or name. "=" main menu, [ESC] previous menu.
0:24:59[admin]
```

4. Set the wireless ports of both bridges to the same channel. You can select the channel under *Config* > *Ports* > <*Wireless Port*> > *RF Settings* > *DS channel* .

```
                              Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
       Config Ports wl1_br Bridge_links wl1_br Manual_config

     Command                          Channel
-------------------------------------|------------------------------
1 - DS channel   [11_2462]           |01 2412            10 2457
2 - Speed mode   [Auto_fallback]     |02 2417            11 24562
3 - Tx Power     [13-2472]           |03 2422            12 2467
4 - Actual speed [100_mW_20dBm]      |04 2427            13 2472
                                     |05 2432
                                     |06 2437
                                     |07 2442
                                     |08 2447
                                     |09 2452
Direct Sequence operating channel.


Enter a number or name. "=" main menu, [ESC] previous menu.
0:24:59[admin]
```

5. Set the *Link state* on both bridges to *enabled*.

```
                          Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
             Config Ports wl1_br Bridge Links wl1_br1

     Command                          Link state
- - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - -
1 - Interface          [le0]         |[disabled]
2 - Alias name         [wl1_br]      |
3 - Link state         [enabled]     |
4 - Actual speed       [-]           |
5 - Manual config      [->]          |
6 - Auto config        [->]          |
7 - Link test                        |


Enable or disable bridge link.

Enter a number or name, "=" main menu, [ESC] previous menu.
```

As soon as both ports are *enabled*, the link will be set up. The *Actual speed* indicates the current transmission rate.

```
                          Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
             Config Ports wl1_br Bridge Links wl1_br1

     Command                          Link state
- - - - - - - - - - - - - - - - - - -| - - - - - - - - - - - - - -
1 - Interface          [le0]         |[disabled]
2 - Alias name         [wl1_br]      |
3 - Link state         [enabled]     |
4 - Actual speed       [11]          |
5 - Manual config      [->]          |
6 - Auto config        [->]          |
7 - Link test                        |


   Enable or disable bridge link.

Enter a number or name, "=" main menu, [ESC] previous menu.
```

As soon as you have set up a link by means of one of the procedures (automatically or manually), both LAN segments are connected. This means that computers from one segments can establish a connection with computers from the other segment.

Checking a Bridge Link (Link Test)

The link test provides all data required for the evaluation of the bridge link (or of both links, with high speed bridges). Moreover, the link test supports you when orienting the antenna.

You can learn how to perform a link test in section Performing a Link Test.

Installation note:

As a rule, one of both antennas has to be rotated by 90° during installation in order to achieve an optimum performance of the double bridge link.

High Speed Bridge (Double Bridge)

The difference between a high speed bridge and a “normal” bridge is that it uses two wireless links simultaneously. Traffic arriving at Ethernet is automatically distributed among both wireless ports, depending on the available capacity.

Note:

A supplementary upgrade to a High Speed ComPoint Bridge link is not available. If you want to use this function, you need to acquire the corresponding devices right from the start.

Note:

Please observe that this device can manage higher data throughput than standard Ethernet. To be able to use its functions completely, connect the device to a 10BaseT-Full duplex port of a switch, at least. We recommend you to connect it to a 100BaseT switch port.

Configuration of the ComPoint Double Bridge

Please make sure that your devices are configured as double bridges.

```
                                Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
                             Config Ports wl1_brx

     Command                                  Parameters
 - - - - - - - - - - - - - - - - - - - - -|  - - - - - - - - - - - - - - -
1 - OperatingMode      [DBR]          | operating mode
2 - RF settings        [->]           |
3 - Bridge ports       [->]           |
4 - Security           [->]           |
5 - Extended           [->]           |
6 - Bridge links       [->]           |
                  |

Operating mode of this port.


Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

If this is not the case on one of your devices, set the device to D-Bridge mode:

```
                                Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                    Artem ComPoint
                             Config Ports wl1_ap

     Command                                  Parameters
 - - - - - - - - - - - - - - - - - - - - -|  - - - - - - - - - - - - - - -
1 - OperatingMode      [AP]           | AP
2 - RF settings        [->]           | BR
3 - Bridge ports       [->]           | DBR
4 - Security           [->]           |
5 - Extended           [->]           |
6 - Bridge links       [->]           |
                  |

Operating mode of this port.


Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

artem funkwerk

Particularities in the Configuration of the Double Bridge

Although the double bridge physically always has two wireless modules, the two modules logically represent one port. The two wireless modules and the two Ethernet ports are therefore displayed as one port on the configuration interface.

Therefore, only two ports will be displayed on the configuration interface for a double bridge.

- 1 - eth 1 for the Ethernet port
- 2 - wl1_brx for the wireless port

Additionally, the features described for bridge ports in Section Configuring the ComPoint Bridge apply to this port.

- No network name
- No wireless clients are allowed to log in
- No node table
- No ACL

The channels used are set in the *Config* > *Ports* > *wl1_brx* > *Bridge ports* menu. If you select manual configuration, this is where you enter both *Remote MAC*, as well.

Under *Status* > *Summary*, the logical bridge port is displayed only. This means you cannot view the MAC addresses of both wireless modules there. These will be displayed under *Config* > *Ports* > *wl1_brx* > *Bridge ports*.

Besides the manual configuration, you can also select automatic configuration.

Description of the Modified Config > Port Menu

```
                                  Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
                              Config Ports wl1_brx

     Command                                  Parameters
- - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - OperatingMode      [DBR]           | operating mode
2 - RF settings        [->]            |
4 - Security           [->]            |
5 - Extended           [->]            |
6 - Bridge links       [->]            |
                  |

Operating mode of this port.


Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

Option	Meaning
Operating mode	See Section Config > Ports > wl1_br
RF settings	Menu for the configuration of both channels and the transmission rate. See Config > Ports > <Wireless Port>, Page 3–26. Additionally contains the MAC addresses of both wireless cards.
Security	The configuration of the security settings is described on Page 3–28 of the manual.
Extended	Allows you to make specific settings as described on Page 3–29 of the manual.
Bridge links	Allows you to configure a bridge link manually, as described in the manual on Page 5–20 ff.

Config > Ports > wl1_brx > Bridge Links

Allows you to set up a new bridge link or configure an existing bridge link.

In addition to the parameters described under Config > Ports > wl1_br > Bridge Links, Page 5–15 you can view the current transmission rate for both wireless ports.

Performing the Configuration

Automatic Configuration

The automatic configuration works exactly as described with the single bridge in Section Setting up a Bridge Link Automatically.

Manual Configuration

For the manual configuration, carry out the following steps.

Finding out the MAC Addresses of the Wireless Modules

1. To do so, go to *Config* > *Ports* > *wl1_brx1* > *Bridge links* > *wl1_brx1* .

```
                                Onair ComPoint              by Artem))))
CPT-XT-g V4.56                                        Artem ComPoint
          Config Ports wl1_brx Bridge links wl1_brx Manual config

     Command                                        Submenu
  - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - -
1 - Local card1  [00:02:2D:21:E9:70]|
2 - Remote card2       [unconfigured]|
3 - DS channel1        [13-2472]     |
4 - Actual speed 1[    11]           |
5 - Local card2  [00:02:2D:21:E9:11]|
6 - Remote card1       [unconfigured]|
7 - DS channel2        [01-2412]     |
8 - Actual speed 2     [11]          |


Enter a number or name, "=" main menu, [ESC] previous menu.
18:10:46[admin]>
```

2. Note down the MAC address of Local card1 and Local card2.

   Perform this step for both bridges.

Entering the Corresponding Addresses at the partner bridge

3. Enter the addresses of *Local card1* and *Local card2* of bridge 1 under *Remote card1* and *Remote card2* of bridge 2.
4. Analogously, enter the addresses of bridge 2 at bridge 1.

Determining the Radio Channels

5. Configure the channels at bridge 1.

   Make sure you are using two decoupled channels. The best thing to do is to use channel 1 for *Local card1* and channel 13 for *Local card2*.

6. Now you have to set the channels on the second bridge.

Make sure that Card1 is connected to Card2 of the partner bridge each time. In our example, you would have to set channel 13 at *Local card1* of bridge 2 and, respectively, channel 1 at *Local card2* of bridge 2.

Activating the Link

1. To set up the connection, activate the *Link state* at bridge 1 and bridge 2.
2. To do so, set *Link state* to *enable*.

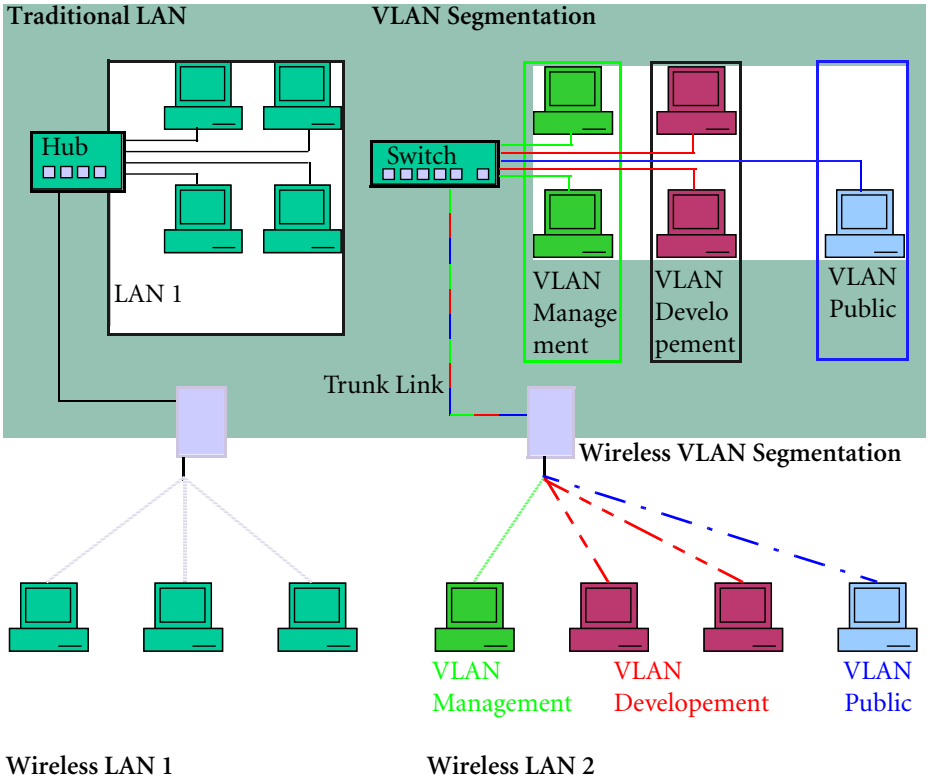
Checking a Bridge Link (Link Test)

The link test provides all data necessary for the evaluation of both links of the high speed double bridge. Moreover, the link test supports you when orienting the antenna.

You can learn how to perform a link test in section Performing a Link Test.

VLAN Configuration

The implementation of the VLAN tagging/untagging functionality according to 802.1q allows the configuration of a VLAN on the ComPoint. The wireless ports of an access point are able to remove the VLAN tag of a frame sent to the clients and to tag received frames with a predefined VLAN ID. With this functionality, an access point is nothing less than a VLAN-aware switch with the extension of summarizing clients in groups. Segmentation per radio module is not yet feasible in firmware version 4.56. This functionality will presumably be available in the next release.

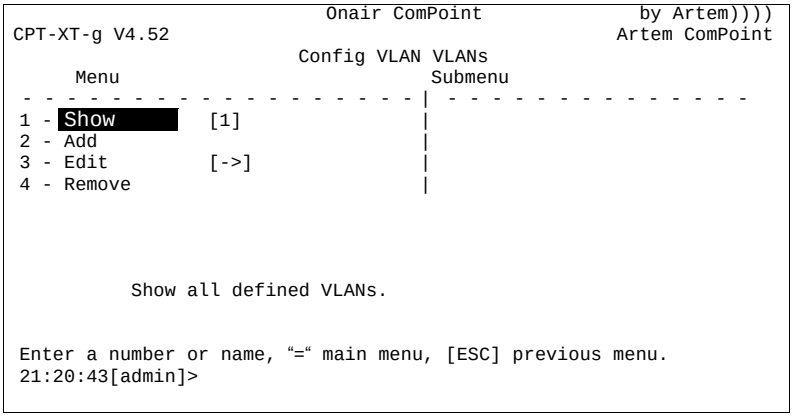


To set up a VLAN, proceed as follows:

Setting up a VLAN

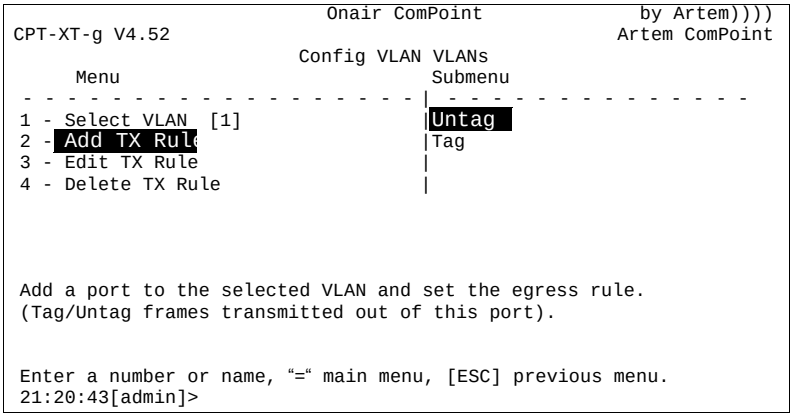
1. Select the menu *Config* > *VLAN* > *VLANs* > *Add*.
2. Enter a VLAN ID and click RETURN.
3. Enter a name for the VLAN and click RETURN.

The freshly created VLAN will now be displayed under *Show*.



Adding a Port to a VLAN

1. Select the menu *Config* > *VLAN* > *VLANs* > *Edit* > *Select VLAN*.
2. Enter the VLAN ID of the VLAN to which you want to add a port. Subsequently, click RETURN.
3. Select the menu *Config* > *VLAN* > *VLANs* > *Edit* > *Add TxRule*.
4. Select the port you want to add to the VLAN and click RETURN.
5. If you want to remove the VLAN information from all frames transmitted via the port: Select *Untag*.



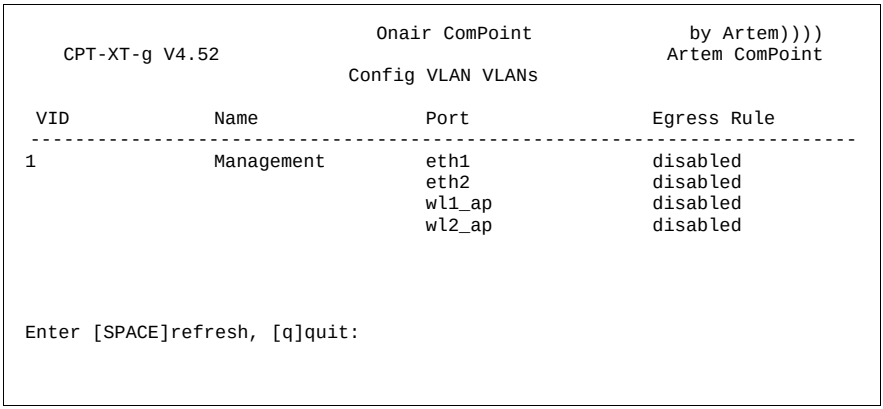
If you do NOT want to remove the VLAN information from any frames transmitted via the port: Select *Tag*.

6. Subsequently, click RETURN.

You have just added a port to the VLAN and defined its transmission mode. Under *Config* > *VLAN* > *VLANs* > *Edit* > *Edit TxRule* you have the option to modify the transmission mode for each port at a later point in time.

Viewing the VLAN Configuration

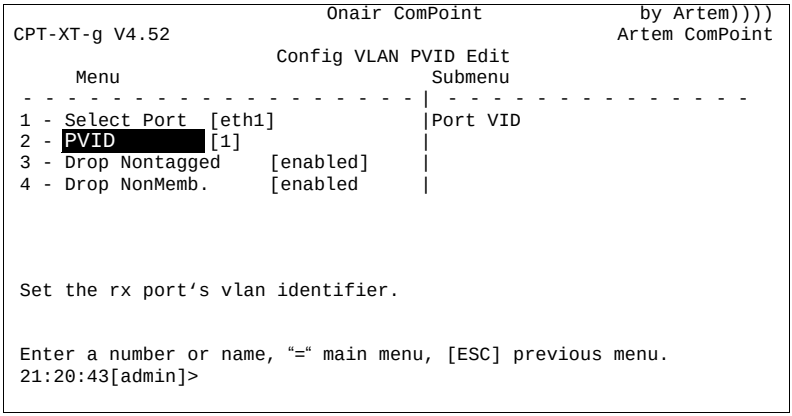
Under *Config* > *VLAN* > *VLANs* > *Show* you can view the defined VLAN configuration .



Defining Rules for Receiving Frames on Individual Ports

1. Select the menu *Config* > *VLAN* > *PVID* > *Edit* > *Select Port*.
2. Select the port to be configured for receiving frames and click RETURN.

You can now make your settings for receiving frames:



If untagged frames are to be tagged by ComPoint:

3. Select the menu *Config* > *VLAN* > *PVID* > *Edit* > *PVID*.
4. Select the VLAN ID with which you want to tag any untagged frames and click RETURN.

If all untagged frames received via a port are to be dropped:

5. Select the menu *Config* > *VLAN* > *PVID* > *Edit* > *Drop untagged* .
6. Select *enable*.

If all frames tagged with the ID of a VLAN of which the selected port is not a member are to be dropped:

7. Select the menu *Config* > *VLAN* > *PVID* > *Edit* > *Drop NonMemb*.
8. Select *enable* and click RETURN.

Viewing the Receive Rules

Under *Config* > *VLAN* > *PVID* > *Show* you can view the defined receive rules.

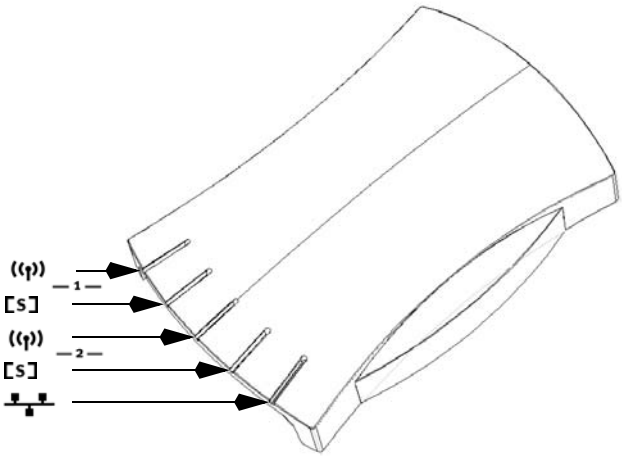
```
                                Onair ComPoint                  by Artem))))
   CPT-XT-g V4.52                                              Artem ComPoint
                              Config VLAN PVID

 Port            PVID              Drop non members     Drop untagged frames
 ------------------------------------------------------------------------------
eth2             1                 enabled              disabled
wl1_ap2          1                 enabled              disabled
wl1_ap1          2                 enabled              disabled
eth1             2                 enabled              disabled



Enter [SPACE]refresh, [q]quit:
```

The LED States

By means of the five LEDs, you can determine the radio status, the radio activity, the Ethernet activity and the LED states of the ComPoint. The LED states are displayed by means of LED combinations which will be discussed in detail in this chapter.

Assignment of LEDs to Ports

This figure shows the assignment of the LEDs on the ComPoint.



The following table describes the LEDs and their functions at the am Compoint Revision 1 (until 2003/01/31).

LED	— 1 —		— 2 —		
	((ᵍ))	[S]	((ᵍ))	[S]	
Color	Yellow	Green	Yellow	Green	Yellow
Wireless Port	This LED displays the activity of Wireless Port 1.	This LED displays the status of Wireless Port 1.	This LED displays the activity of Wireless Port 2.	This LED displays the status of Wireless Port 2.	This LED displays the Ethernet activity.
Display	This LED displays the quantity of wireless data. It flashes shortly if few data is being transferred; with a high data stream it shines permanently.	This LED flashes if no wireless client is logged into the ComPoint. As soon as a client logs in, it shines permanently.	This LED displays the quantity of wireless data. It flashes shortly if few data is being transferred; with a high data stream it shines permanently.	This LED flashes if no wireless client is logged into the ComPoint. As soon as a client logs in, it shines permanently.	This LED flashes shortly with low Ethernet activity and shines permanently if the activity is high.

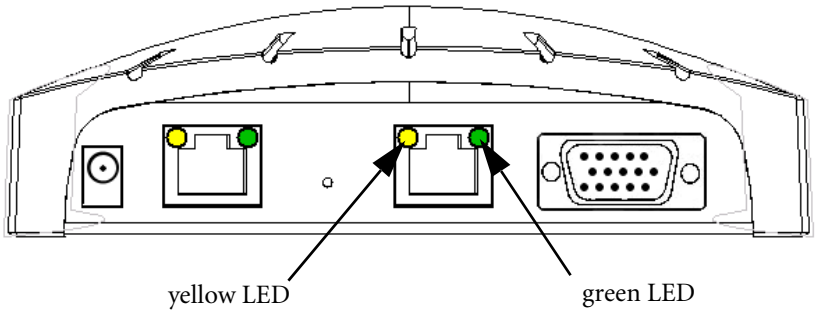
The following table describes the LEDs and their functions at the am Compoint Revision 2 (from 2003/02/01 onwards).

LED	— 1 —		— 2 —		
	((ᵩ))	[S]	((ᵩ))	[S]	
Color	Orange	Green	Yellow	Green	Green / Red
Wireless Port	This LED displays the activity of Wireless Port 1.	This LED displays the status of Wireless Port 1.	This LED displays the activity of Wireless Port 2.	This LED displays the status of Wireless Port 2.	This LED displays the Ethernet activity.
Display	This LED displays the quantity of wireless data. It flashes shortly if few data is being transferred; with a high data stream it shines permanently.	This LED flashes if no wireless client is logged into the ComPoint. As soon as a client logs in, it shines permanently.	This LED displays the quantity of wireless data. It flashes shortly if few data is being transferred; with a high data stream it shines permanently.	This LED flashes if no wireless client is logged into the ComPoint. As soon as a client logs in, it shines permanently.	This LED flashes shortly with low Ethernet activity and shines permanently if the activity is high. Red refers to eth1, while green refers to eth2.

The LEDs of the Ethernet Jack

The Ethernet jack at the rear side of the ComPoint is also provided with two LEDs.

Revision 2 (from 2003/02/01 onwards)



If the yellow LED shines permanently, the speed is 100 Mbps; whereas if the green LED shines permanently, the speed is 10 Mbps.

If both LEDs are turned off, the ComPoint does not detect any functional network connection.

Note:

The LEDs of both Ethernet ports work in the same way.

Note:

Please use merely one Ethernet port for connecting the device to your network. The second port serves for cascading.

LED States when Booting

With each booting process, you can determine which action is being performed by means of the LED activity. The following table, which displays the different LEDs as circles, provide an overview on this matter. The color code mentioned below is used:

The LED is turned off.

The green LED shines.

The yellow LED shines.

LED States in Wireless Operation

By means of the LED activity during the normal operation of the ComPoint, you are able to identify specific error conditions in the firmware. The following table provides an overview on this matter.

Error condition	— 1 —		— 2 —		
	((ᵞ))	[S]	((ᵞ))	[S]	
Program error has occurred: LED of the radio activity of Port 1 shines permanently.	●	●	●	●	
Operating system error has occurred: LEDs of the radio activity and status of Port 1 shine permanently.	●	●	●	●	
Fatal operating system error has occurred: The LEDs of the radio activity and status of Port 1 as well as the LED of the radio activity of Port 2 shine permanently.	●	●	●	●	

Technical Data and Specifications

Frequencies and channels

Worldwide, there is a number of different approval regulations. Basically, the ETSI and FCC regulations apply. ETSI is mainly valid for Europe, FCC for the USA and Canada. Please observe the regulatory flyer (enclosed to the product and contained on the product CD), as well as the Declaration of Conformity (Page 1). These documents contain important information on the countries where the ComPoint Workgroup may be used.

Channel	Frequency (GHz)	ETSI	FCC	IL
1	2412	X	X	
2	2417	X	X	
3	2422	X	X	
4	2427	X	X	X
5	2432	X	X	X
6	2437	X	X	X
7	2442	X	X	X
8	2447	X	X	X
9	2452	X	X	-
10	2457	X [1)]	X	-
11	2462	X [1)]	X	-
12	2467	X [1)]	-	-
13	2472	X [1)]	-	-

[1)] If operated in France, limited to these 4 channels.

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Specifications

Standards	IEEE802.11b bzw. IEEE802.11g, IEEE802.3
Channels	11 channels (USA), 13 channels (Europe)
Antenna Connection	RSMA jack
Transmission Capacity	max. 100 mW (20 dBm) eirp.
Receiver Sensitivity	IEEE802.11g 54 Mbps:-65 dBm, 48 Mbps:-66 dBm, 36 Mbps:-70 dBm, 24 Mbps:-74 dBm, 18 Mbps:-77 dBm, 12 Mbps:-79 dBm, 9 Mbps:-81 dBm, 11 Mbps:-80 dBm, 5,5 Mbps: -83 dBm, 2 Mbps: -84 dBm, 1 Mbps: -87 dBm IEEE802.11b: 11 Mbps:-82 dBm, 5,5 Mbps: -87 dBm 2 Mbps: -91 dBm, 1 Mbps: -94 dBm
Modulation	IEEE802.11b and IEEE802.11g: DSSS: BPSK, QPSK, CCK IEEE802.11g: OFDM: BPSK, QPSK, QAM
Network Port	2 10BaseT RJ45 ports
Monitor Button	1 monitor button
LEDs	2 x radio, 1 x I/O jack 2 x Ethernet
Security Features	WEP, WPA, access control list, network name broadcast can be deactivated
WEP Key Lengths (Bits)	40 (64) or 104 (128)
Dimensions	145 mm x 208 mm x 37 mm (WxLxH)

Power Supply	AC: 100–230 V, 47Hz-63Hz DC: 12V (+/- 1V), max. 1 A
Power Input	approximately 4 Watt
Approvals	CE
Operating Temperature	0°C to +55°C
Storage Temperature	-10°C to +70°C
Relative Air Humidity	0% to +95%, not condensing

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Declaration of Conformity (Page 1)

CE

Declaration of conformity for the following artem products

ComCards:	**CC-W54g-STD**	**CC-W54g-PCI**	**CC-PC-b-H2-STD**	**CC-CF-b-H2-STD**
ComPoints:	**CPS-AP-b**	**CPS-AP-b-PoE**	**CPS-AP-g**	**CPS-AP-g-PoE**
	CPD-XT-b	**CPD-XT-b-PoE**	**CPD-XT-g**	**CPD-XT-g-PoE**
	CPT-BR-g	**CPT-BR-g-PoE**	**CPT-BR-g**	**CPT-BR-g-PoE**
	CPT-XT-b	**CPT-XT-b-PoE**	**CPT-XT-g**	**CPT-XT-g-PoE**
ComPoint Workgroup:	**CPW-b-EE**	**CPW-b-EE-GA**	**CPW-b-ES**	

The Wireless LAN products are wireless network products that use Direct Sequence Spread Spectrum (DSSS) or Orthogonal Frequency Division Multiplexing (OFDM) radio technology. These products are designed to be interoperable with any other wireless DSSS/OFDM type product that complies with:

- The IEEE 802.11 Standard on Wireless LANs (Revision b / g), as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity (Wi-Fi) certification as defined by the Wireless Fidelity Alliance.

European Union Notice

Radio products which contains radio transmitters are labeled with CE 0560 respectively CE 0336 or CE and comply with the R&TTE Directive (1999/5/EC) issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European norms (in brackets are the equivalent international standards).

EN 60950:2000 (IEC60950) - Product Safety

EN 300 328-1/2 V1.4.1:2003 Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques;

ETSI EN 301 489-1/17 Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;

Part 1 V1.4.1:08/2002: Common technical requirements

Part 17 V1.2.1:08/2002: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

The radio card PC-W11-STD is furthermore compliant to the following European norms:

EN 55011:1991 Group1 Class B

EN 60601-1-2:1993 (IEC601-1-2:1993)

Ulm, 14.05.2004

Dipl.-Ing. (FH) Rolf Leukel
Technical Product Manager

Wireless LAN and your health

ARtem Onair Wireless LAN products, like other radio devices, emit radio frequency electromagnetic energy. The level of energy emitted by Wireless LAN devices however is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.

Because Wireless LAN products operate within the guidelines found in radio frequency safety standards and recommendations, ARtem believes Wireless LAN is safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.

Regulatory information

This device must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

For country-specific radio and telecommunications approvals, please consult page 2 of this flyer.

In some situations or environments, the use of wireless devices may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may for example include:

Using the wireless equipment on board of airplanes, or in any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies on the use of wireless equipment in a specific organization or environment (e.g. airports), you are encouraged to ask for authorization to use this device prior to turning on the equipment.

The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this kit, or the substitution or attachment of connecting cables and equipment other than specified by manufacturer.

The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The manufacturer and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guidelines.

Declaration of Conformity (Page 2)

Radio Approvals

To determine whether you are allowed to use your device in the countries listed below, please check the number of the transmitter number that is printed on the identification label of your device.

Approval Reference and Radio Type	Country	Remarks
	Austria	
R&TTE Directive 1999/5/EC : CE 0336 Ⓒ **ComCard CC-PC-b-H2-STD** CE 0560 Ⓒ **ComPoint CPS-AP-b** **ComPoint CPS-AP-b-PoE** **ComPoint CPD-XT-b** **ComPoint CPD-XT-b-PoE** **ComPoint CPD-BR-b** **ComPoint CPD-BR-b-PoE** **ComPoint CPT-XT-b** **ComPoint CPT-XT-b-PoE** **ComPoint CPS-AP-g** **ComPoint CPS-AP-g-PoE** **ComPoint CPD-XT-g** **ComPoint CPD-XT-g-PoE** **ComPoint CPT-XT-g** **ComPoint CPT-XT-g-PoE** **ComCard CC-CF-b-H2-STD** CE Ⓘ **ComPoint CPW-b-EE** **ComPoint CPW-b-EE-GA** **ComPoint CPW-b-ES** **ComCard CC-W54g-STD** **ComCard CC-W54g-PCI**	Belgium	For outdoor usage you may only use channels 10 and 11(2457 and 2462 MHz). *Private* usage outside buildings across less than 300m public grounds requires no special registration. *Private* usage outside buildings across more than 300m public grounds require special registration at IBPT/BIPT. *Public* usage outside buildings requires an IBPT/BIPT licence. For registration and license please contact IBPT/BIPT, www.bipt.be.
	Denmark	
	Finland	
	France	Restricted frequency band: In France exist different regulatories, depending on departments (please contact ART for procedure to follow: http://www.art-telecom.fr).
	Greece	
	Germany	Notification at RegTP required for outdoor installations. Check with reseller or at www.artem.de for procedure to follow.
	Iceland	
	Ireland	
	Italy	a) within own ground (indoor and outdoor if no public soil is crossed): free use - no licence required b) across public ground: subject to "autorizzazione generale" (general authorization: notification to the Ministry of Communications, yearly fees). Please check with http://www.comunicazioni.it/it/ for more details.
	Liechtenstein	
	Luxembourg	
	Netherlands	
	Norway	
	Portugal	
	Spain	
	Sweden	
	Switzerland	
	United Kingdom	
CC-W54g-STD: **FCC-ID: M4Y-XG-300** **CC-W54g-PCI:** **FCC-ID: M4Y-XG-900**	USA	

The Radio Type Number has the format CC-xx-b-H2-STD, resp. CC-W54g-STD:

CC-xx-b identifies the type of transmitter: a 2.4 GHz radio, compliant with the IEEE 802.11b Standard for Wireless LANs.

xx identifies the type of card:
PC: PC Card
CF: Compact Flash card
Antgenna:
STD: internal antennas (PC Card: with additional proprietary ComCard connector.)

CC-W54-STD identifies the type of transmitter: a 2.4 GHz radio, compliant with the IEEE 802.11g Standard for Wireless LANs.
Internal antennas without additional antenna connector.

Glossary

- **802.11a/b/g**

  See IEEE802.11b and IEEE802.11a/g.

- **Ad-Hoc Network**

  An ad-hoc network is the designation for a number of computers which form an independent wireless 802.11 WLAN together with a wireless adapter. Ad-hoc networks work independently and without access point on a peer-to-peer basis. The ad-hoc mode is also referred to as IBSS mode (Independent Basic Service Set) and can be sensibly used in small-scale networks, for instance if two notebooks are to be networked without access point.

- **Default Gateway**

  Designates the address of the router to which the complete traffic is sent which is not intended to go over the proper network.

- **DHCP, Dynamic Host Configuration Protocol**

  A protocol which performs the IP configuration for individual computers in the network automatically and centrally. If a networked computer is to be integrated into the network or the Internet via the Internet protocol (TCP/IP), it requires a number of basic settings which are essential for any communication. This process can be performed without the interaction of a user via a DHCP server, since the DHCP server knows the settings and forwards them to the clients. Without such a DHCP server, the user has to perform the settings manually. Each time he changes the network, e.g. when he takes his notebook from one location to another, he has to enter the settings again. If a DHCP server is used, this process is automatically performed each time.

- **DNS**

  DNS means Domain Name System and administrates the allocation of IP addresses to domain names. DNS is used, for instance, to allocate the corresponding IP address to the domain www.Artem.de.

- **DSSS**

  Direct Sequence Spread Spectrum is a radio technology which was originally developed for the military sector and offers a high resistance against interferences, as the payload signal is spread over a wide sector. The signal is spread via a spread sequence or a chipping code,

which consists of 11 chips on a bandwidth of 22 MHz. If one or several chips are disturbed during the transmission, the information can be reliably regained form the rest of the chips.

- **Dynamic IP Address**

  In contrast to a static IP address, a dynamic IP address is temporarily assigned via DHCP. Network components, such as Web servers or printers, usually have static IP addresses. Clients, such as notebooks and workstations, normally receive dynamic IP addresses.

- **ESS**

  The Extended Service Set refers to several BSS (several access points) which form a single virtual wireless network.

- **FHSS, Frequency Hopping Spread Spectrum**

  Frequency spread is attained in a FHSS system by means of continuously changing frequencies, which are altered according to specific hopping patterns. In contrast to DSSS systems, there are no fixed frequencies, but definable hopping patterns. The frequency is frequently changed within one second.

- **Firmware**

  Software code which contains all functions of a device. This code is written in a PROM (Programmable Read-Only Memory) and is stored there even after switching off the device. The firmware can be upgraded by the user if a new software version is available (firmware upgrade).

- **IEEE**

  Institute of Electrical and Electronics Engineers (IEEE). Worldwide cooperation of engineers. The IEEE is continuously developing and improving standards to ensure the connectivity and interoperability of the most diverse devices.

- **IEEE802.11b**

  One of the IEEE standards for wireless network hardware. Products corresponding to the same IEEE standard are able to communicate with each other, even if they were produced by different hardware manufacturers. The IEEE802.11b Standard specifies data rates of 1, 2, 5.5, and 11 Mbps, a working frequency in the range of 2.4 to 2.4835 GHz, and WEP encryption. IEEE802.11 wireless networks are also referred to as Wi-Fi networks.

- **IEEE802.11a/g**

  Specifies data rates of 54, 48, 36, 24, 18, 12, 9, and 6 Mbps as well as a working frequency in the range of 5 GHz (with IEEE802.11a) or 2.4 GHz (with IEEE802.11g). IEEE802.11 g can be configured in such a way that it additionally supports 11b or 11b and 11.

- **Infrastructure Mode**

  A network in the infrastructure mode is a network which contains at least one access point as communications and control center. In a network in the infrastructure mode, all clients will exclusively communicate with each other over access points. There is no direct communication between the individual clients. Such a network is also referred to as BSS (Basic Service Set). A network which consists of several BSSs is called ESS (Extended Service Set). Most wireless networks work in the infrastructure mode to set up connections to the wired network.

- **IP address**

  The Internet Protocol (IP) in its most frequently used form has a 32-bit address which is used to identify the senders and receivers of packets unambiguously. You can send requests in the Web to remote servers or send e-mails, and the opposite terminal will know from where the request or the e-mail comes. There are public and private IP addresses. Private IP addresses are preferably assigned by routers if a group of computers is used in a private or enterprise network. Such addresses may read, for instance, 192.168.0.1.

- **IPCONFIG**

  This is an auxiliary program used by Windows computers to check or modify the proper IP settings.

- **ISP**

  An Internet Service Provider (ISP) is a provider of Internet services or related services, such as the hosting of websites or website creation.

- **LAN**

  A LAN (Local Area Network) is a local network which is usually set up within a building. Here, all computers involved share local services (e.g. DHCP or file server). With the help of a WLAN, a LAN may also comprise and network several buildings.

- **MAC address**

  The MAC (Media Access Control) address is the unambiguous hardware address of a network interface. Each hardware manufacturer assigns his proper MAC addresses from his own number pool. As a result, manufacturers can be assigned on the MAC address level.

- **NAT, Network Address Translation**

  Translation of an IP address in one network into another IP address in another network. As a result, many computers in one network can be displayed to the outside with a single IP address. NAT is often used by SOHO routers or in ComPoint Workgroup ACs if several clients are connected via a switch.

- **Network Mask**

  see Subnet Mask

- **PCMCIA**

  The PCMCIA (Personal Computer Memory Card International Association) is an industrial association founded in 1989 which produces and sells I/O cards with the size of credit cards, e.g. WLAN cards.

- **Ping**

  Ping means Packet INternet Grouper and is a tool which serves to check whether a computer is online. Ping is used to search for errors in a network (troubleshooting). The person who carries out the check waits for replies of other computers.

- **PVID, Port VLAN ID**

  Also refer to VLAN, Virtual Local Area Network. Default VLAN-ID of the corresponding port of the ComPoint. Each port of the system has to be assigned precisely one Port VLAN Identifier (PVID).

  The PVID is necessary if a frame without VLAN identifier / a “VLAN-untagged” frame is received on this port.

  The PVID setting of each port corresponds to the VLAN Management Identifier.

- **RJ-45**

  A plug-in connector as it is also used for ISDN telephones. It serves to connect computers via Ethernet. In contrast to ISDN where only 4 pins are used, all 8 pins are used in the case of an Ethernet cable.

- **Roaming**

  In WLANs with several cells, clients can move freely through the cells. When doing so, they can log out at one access point and log on to another without the user noticing it. This capacity is called roaming.

- **SOHO**

  Small Office/Home Office

- **Static IP Address**

  A permanently configured IP address, in contrast to dynamic IP addresses.

- **Subnet Mask**

  A method to divide several IP networks into a number of subgroups or subnetworks. The mask is a binary pattern which has to correspond to the IP addresses in the network. By default, the subnet mask is 255.255.255.0. In this case, 254 different IP addresses could occur in a subnetwork, from x.x.x.1 to x.x.x.254.

- **TCP, Transmission Control Protocol**

  A method used in the IP protocol to transfer messages as units (datagrams) between the network subscribers within a LAN or WLAN. While IP is concerned with the packet transfer via IP addresses, TCP controls which packets belong together. TCP is a connection-oriented protocol which transfers acknowledgments on the receipt of the packets to the sender.

- **TCP/IP, Transmission Control Protocol / Internet Protocol**

  TCP/IP is the basic protocol in the Internet. It does not consist of TCP and IP only, but also contains a number of protocols.

- **Temporal Key Integrity Protocol (TKIP)**

  see WPA, Wi-Fi-Protected Access

- **UDP, User Datagram Protocol**

  In contrast to TCP, UDP does not send receipts on received packets and is used in LANs and WLANs for the transmission of audio and video data. If a packet is lost, it is not resent, since it would already be obsolete by then.

- **WEP, Wired Equivalent Privacy**

  Encryption mechanism standardized by the IEEE in the scope of passing the WLAN standard. Based on symmetrical encryption, i.e. both partners use the same key for encryption and decryption. The

key length can be 64 bits (corresponds to a 40-bit-effective key) and 128 bits (corresponds to a 104-bit-effective key). As long as all used clients support 128-bit encryption, we recommend you to select this encryption mechanism since it offers increased security.

- **WINIPCFG**

  A graphic tool under Windows 95, 98, and Millennium, which uses the Win32 API to view and perform the address configuration of computers.

- **WLAN, Wireless Local Area Network**

  A group of computers which is networked wirelessly (WLAN).

- **WPA, Wi-Fi-Protected Access**

  The Wi-Fi Alliance (an alliance of several WLAN manufacturers) has developed its own encryption in order to enhance security in wireless LAN environments. The so-called WPA protocol (Wi-Fi-Protected Access) replaces the static encryption keys of the WEP by dynamic keys which are more difficult to crack. The Temporal Key Integrity Protocol (TKIP), which is part of standards 802.11i, is used for this purpose. Just like the WEP encryption procedure, the TKIP encryption is based on the RC4 algorithm. The new thing about it is the dynamic. For instance, TKIP can be configured either on the basis of the data volume or a time range. This means that the key is not valid long enough for being cracked by the familiar procedures.

- **WPA 802.1x**

  Addresses the requirements of enterprises and offers secure encryption and authentication. Utilizes 802.1x and the Extensible Authentication Protocol (EAP) and therefore offers an efficient option to authenticate users.

  Not ComPoint, but a central authentication server such as RADIUS authenticates each client before granting access to the network. ComPoint merely serves as the initial contact for the clients. The actual decision with respect to the authentication is made on the authentication server.

- **WPA-PSK, WPA Pre-Shared Key**

  Addresses private users or small enterprises which do not operate a central authentication server. PSK stands for Pre-Shared Key and means that you have to define an access password (the so-called master key) yourself for the ComPoint and all clients. Afterwards, TKIP

uses the master key in order to generate further secure keys. The key is valid for only one session each time. After that, a new key will be used. The key for the new session is negotiated at the beginning of the current session between ComPoint and the client. This is where the designation “pre-shared key” is derived from.

- **VLAN, Virtual Local Area Network**

  Mapping of a logical structure to the actual physical structure of a LAN, as defined, among others, in standard IEEE 802.1Q1.

  Networks are set up with the help of active components, switches, and routers. Sometimes, two or more independent networks are to be set up with identical physical components. These differing networks are to be set up in such a way that the users of the networks do not interfere with each other. Example: One network for the Finance Department and one for Production.

  VLANs are the solution to this problem. Each VLAN is assigned an unambiguous number. This number is called VLAN ID. A device belonging to the VLAN with ID=1 can communicate with each other device operated within the same VLAN, but not with a device belonging to one of the other VLANs ID=2,3,..

- **VID, VLAN ID**

  See VLAN, Virtual Local Area Network

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