

CAR-A-WAN.automotive

Optimized vehicle 2G/3G router
with integrated WLAN-Hotspot



Manual

CAWv3MC8790 / CAWv3MC8790P
CAWv3MC8700 / CAWv3MC8700P

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1 Description

The abbreviation CAW is used in this manual for CAR-A-WAN.automotive. The version v3 is not used in the manual.

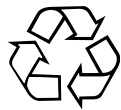
The following pictographs will be used in this manual:



Marked warning advice symbol, during their neglect your health, operability or safety is endangered.



Marked symbol additional Information und Tips.



Recycling Symbol



Marked symbol absolutely all components and those parts are subject to disposal. Never throw these components into the rubbish

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Technical and optical alterations as well as print errors accepted

2 Terms of Guarantee

The receipt is considered as proof of first purchase and should be well kept. It is needed in the case of guarantee claims.

If the product is sold to another user, then the remaining guarantee period will still be valid. The proof of purchase as well as this explanation should be passed on together with the product.

We guarantee that this equipment is in a fully functional condition and agrees that of the technical description regarding to the attached documentation

The guarantee period for electronic vehicle components corresponds to the minimum period given by the legislator.

This guarantee is not valid in the following cases:

- Defects through: freight damage, accident, natural catastrophes, abuse, vandalism, inappropriate use, incorrect maintenance or wrong third party repair.
- Unauthorized changes/ interferences, faulty operation, other equipment or accessories, wrong installation, or otherwise modification not authorized by us.
- Ignoring the instructions provided in the documentation.
- Product incompatibility after purchase due to possible technical innovations or regularizations.
- Incompatibility or malfunctioning caused through product components not used by us.
- Parts which arise in connection with the normal ageing procedure of the product (wear and tear).
- Defects which are caused by external devices.

The guarantee terms for the context of this guarantee replaced and/or repaired parts expires together with the original guarantee for the product.

Faulty devices, which are returned without accessories, are replaced without accessories. A device return is only accepted providing that the device is placed in the original packaging to avoid transport damages.

Incidental transport costs are generally excluded from the guarantee.

The IPmotion GmbH gives neither explicit nor implicit guarantees regarding this equipment and its quality, marketability, or suitability for a certain purpose.

In some countries the exclusion of an implicit guarantee is legally illegal. In this case the validity of all requirements and implicit warranties is limited to the warranty period.

At the end of this period all warranties lose their validity. In some countries a delimitation of the validity period of implicit warranties is legally illegal, so that above restriction does not step into force Legal liability constraint.

3 Limitation of product liability

Claims for damages are ruled out, only when, they are based on resolution or rough negligence of the IPmotion GmbH or their employees. The adhesion after the product liability law remains untouched. We are under no circumstances responsible for:

- Third party demands due to losses or damages.
- Loss or damage of your recordings, files or data or the costs of the replacement of data.
- Economic damages (including lost profits or savings) or accompanying damage, also in the case, which the employees of the IPmotion GmbH were informed about the possibility of such damage.

In no case is the IPmotion GmbH responsible for any coincidental, indirect, special, following or other damage of any kind (inclusively without each delimitation damage concerning loss of profit, business interruption, loss of business information or any other losses), which is by the use of the CAR A WAN.automotive or in any relationship with the equipment, based on contract, payment of damages, carelessness, strict liability, or other demands develop, even if the IPmotion GmbH were informed in advance about the possibility of such damage.

This exclusion contains also each liability, which can develop from demands of third parties opposed on the first buyer.

In some countries the exclusion or the delimitation of accompanying- or damages is legally illegal, so that the above explanation does not step into force.

4 Safety

4.1 General safety advice



Read the user manual and the safety references specified in this chapter attentively, before you take out further steps (transport, storage, connection, start-up, etc.).



Work made to the router and antennas are to be exclusively carried out by authorized technical personnel.

4.2 Incorrect installation

Inappropriate installation can lead to damage to the equipment or to the vehicle!

For the installation of the equipment special knowledge and abilities are necessary. It is highly recommended; that the installation is carried out by an authorized workshop.

4.3 12V- connection

Use only the adaptor cable provided for the connection to the 12V DC onboard power supply of your vehicle.

When connecting the CAR- A- WAN.automotive without adaptor cables the current supply of the CAR A WAN.automotive must be secured with a non-switchable 1A (T) fuse.

4.4 Mobil communication aerial

The assembly of portable antenna cables in vehicles is not recommended without expertise and suitable tools.

Badly manufactured or arbitrarily shortened or extended high frequency antenna cables can cause bad reception and could disrupt the transmitting powers of other devices.

Unseen antenna cables with a minimum kink radius can lead to core breakup of the antennas. Bad reception and poor transmitting powers can be the result.

4.5 Device fitting

The router is intended for the attachment in vehicles. There is special side mounting plates available, into which the CAR- A-WAN.automotive clicks into.

Depending upon location and position you need one (outside of the passenger space, e.g. in the trunk or glove compartment) or two (within the passenger space) on side mounting plates.

Never leave the equipment in damp areas, set up and/or operate. Likewise liquids are to be kept away from the equipment.

The router should not be secured close to heat sources, since the aluminum housing must be able to circulate the warm air.

Pay attention to not block the ventilation openings of the CAR- A- WAN.automotive and unhindered air circulation.

4.6 Risk of Injury

Unsuitable locations, missing or not sufficiently fixed mounting plates can cause injuries and could cause a traffic accident.

4.7 Danger of material damage & injury risk during assembly

When levering out claddings, pointed or sharp tools can lead to injuries and material damages.

Lever parts carefully. Do not exert direct pressure on leads

4.8 Damaging the airbags

If the designated area is located too close to the airbag, the Airbag could be damaged or its function could be impaired.

Mount the components outside the effective range of the airbags

4.9 Damaging important vehicle parts

Important vehicle parts or wiring can be damaged while drilling holes or driving of tapping screws.

Make sure sufficient space is behind the screw and boreholes.

4.10 Maintenance, Service und Faults



Repairs should be carried out only by qualified personnel.

Only spare parts should be used which do not change the safety regulations of the CAR-A-WAN.automotive.

Software updates should be carried out only under instruction and during update the device must be under a permanent current supply. An interruption of the current supply can lead to a total failure of the CAR- A -WAN.automotive.

Software updates should only be carried out when there is a sufficient mobile coverage supply, since the transmission time can be longer due to the size of the updates than those of the follow-up time of CAR- A- WAN.automotive and could be prematurely broken off.

5 Introduction

This manual has fundamental information over the vehicle-connected router with integrated Wireless LAN Hotspot, i.e. the operational principle, the application of the different functions and the handling of operational disturbances.

Further, this manual contains references to the configuration, handling and installation.

Contents of this technical manual can change due to progressive technology. We will try to make contents as correct and clear as possible.

Should errors nevertheless occur, we would be grateful for references.

We are not liable for any errors from this description and/or their resulting consequence.

The CAR-A-WAN.automotive is designed to connect computers, laptops, notebooks and Smart phones, electronic cash registers with Internet-Cash-function and other TCP / IP-enabled devices such as webcams from the vehicle to the Internet:

- Via wired LAN
- Via wireless WLAN

The CAR-A-WAN.automotive autonomously perform dialing into the Internet and any required Re-connect in case of disconnection. Furthermore, dialing rules are taken into account, such as a roaming lock or minimum signal quality.

With the Plus version, the second WAN link

- parallel or
- alternative

Can be used to secure the connection in terms of their availability:

Two concurrent connections are used as a parallel connection and new connection requests are distributed to the two compounds, with a chosen path is maintained until the end of each, previously used WAN connection.

When the two WAN connections as 2G connection are established (GPRS / EDGE) and switches to connect 3G, so can all data traffic on the faster, alternative route to be diverted, while the slower connection is disabled.

6 System description

The Linux Router CAR-A- WAN.automotive connects via LAN or wireless local-connected devices using up to two data modem to the Internet. Rules control the dial-in behavior, such as user defined rules.

The power management controls the delay time and almost complete shutdown of the 12V DC power supply or to correct cold start or restart when manually triggered watchdog of the Embedded PCs.

The SIM card is directly connected to a 2G / 3G modem, connected LEDs indicate operating status, a speaker can make beeps, and a tactile switch can cause the reset of the router.

The modems give their operating temperature to the aluminum housing, connectors for connecting power supply and antennas make installation easy and enable installation and removal without tools.

Blockschaltbild / block diagram / diagramme de bloc

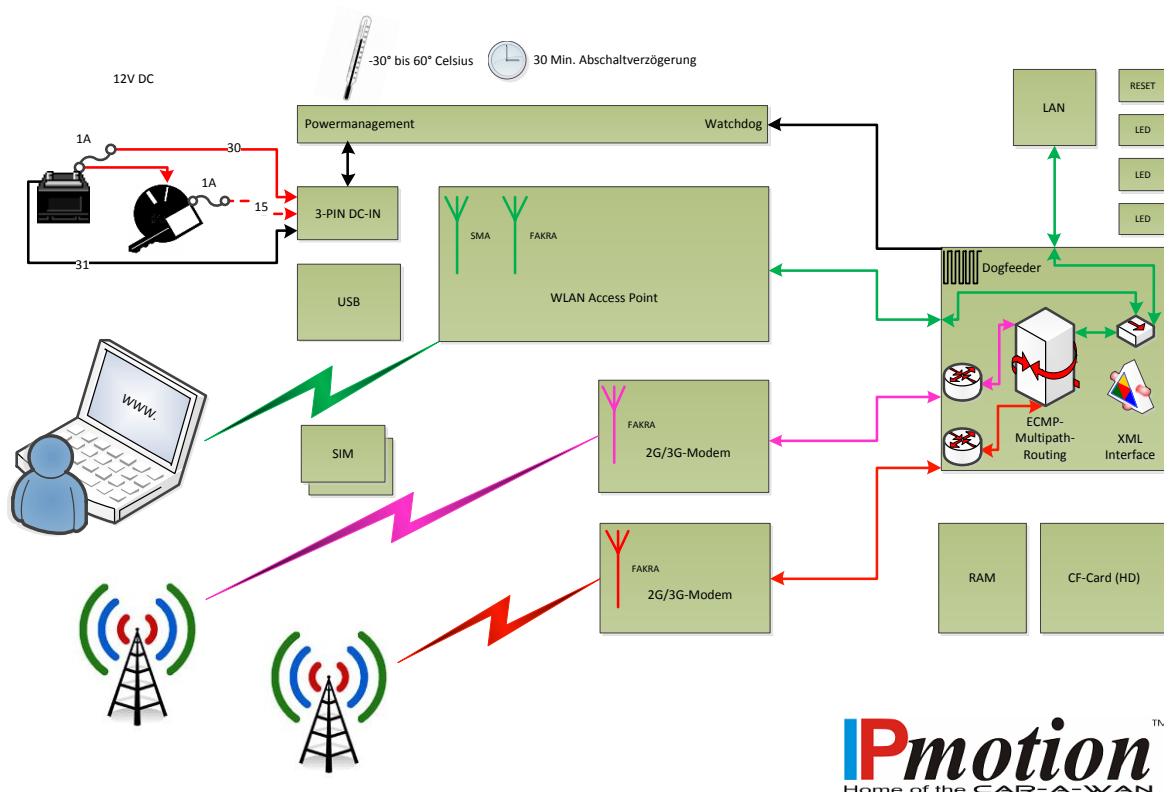


Fig. 1: Block diagram

7 Device description CAR-A-WAN.automotive

In this chapter you will be confronted with the appropriate equipment items, find instructions for the operation as well as all the information to the unit connections.

7.1 Front Panel Elements

Fig. 2:
Front view



On the front (left to right) ports for LAN (RJ45 100 MBit / s), the mobile antenna (left module 2, right module 1), including the SIM slots (up for module 1, below for module 2), USB 2.0 and to find power supply.



a) LAN-Connection (RJ45):

The LAN interface and wireless are bridged to each other, so you can connect your devices in place to wireless LAN also. Devices that are connected to the LAN can communicate with devices on the WLAN. Two LEDs provide information about the state of the connection:

The left green LED lights for an existing cable connection and flashes when receiving data, the right orange LED lights up when the router is on and flashes when sending data.



b) FAKRA Main connector for mobile phone antennas

The burgundy colored connectors are vibration-proof and reliable contact, but must be handled carefully when plugging in the socket. Rough handling can bend the spine in the center, which results in severe interference.

Please check therefore; essentially before connecting the antenna side FAKRA jack, the position of the contacts, if necessary, take a magnifying glass.



c) SIM-Cards

SIM/U-SIM-Cards	
CAR-A-WAN.automotive	1-fold, SIM 1 in the top slot
CAR-A-WAN.automotive Plus	2-fold, SIM 1 in the upper slot
CAR-A-WAN.automotive Plus	2-fold, SIM 2 in the lower slot



We recommend roaming lock and turn off the SIM-pin.



Hinweis

Please slide the SIM card for **module 1** with the sloping side first, gold contact surfaces **faced down**, the same with SIM card for **module 2** with the beveled side first, gold contact surfaces, however, **facing up**.



b) Backup 12V-Input:

The CAR-A-WAN.automotive has no device fuses. Therefore, both potential leading supply lines are secured, each with a 1A time-relay fuse.

The optional car adapter cable with connector for 12V accessory outlet has an internal 1A fuse.

The one-sided cables for vehicle assembly mounting are to be protected in the fuse box.



If this is not possible, the lines are to be inserted and insulated in the automotive fuse holder using displacement technique.

7.2 Display and ports on the back

Fig. 3:
Rear view



On the back is (left to right) the connection of wireless LAN (FAKRA / SMB-A beige), three status LEDs located (circle, triangle and square), Wireless LAN stub antenna (behind an SMA connector with pin, screw).

The following operating conditions are read from the LEDs:

- only □ lights:
ready, but not dialed in
- O(1) or ▲(2) flashing, □ On:
Module is selected, slow flashing 2G, fast flashing 3G

- ○ (1) or ▲ (2) flashing, □ flashing:
As above, but roaming, at least one module
- only □ flashing:
Ready, but not dialed in, as no roaming desired
- ○(1) or ▲(2) On, □ On:
Ready, but lighted module not ready to dial
- Continuous light from ○,▲ and □:
Software Update taking place, by no means switch of the power unit
- No LED lights, not even to the RJ45 port on the front:
Device not turned on

7.3 Identification label

- Contains information on:
- Manufacturer
 - Device Model
 - IMEI-Number(s)
 - Serial Number
 - CE- und Barcode- Labeling

7.4 Wall bracket

Fig. 4:
cross section

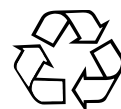
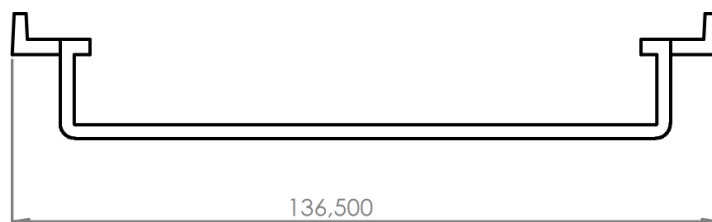
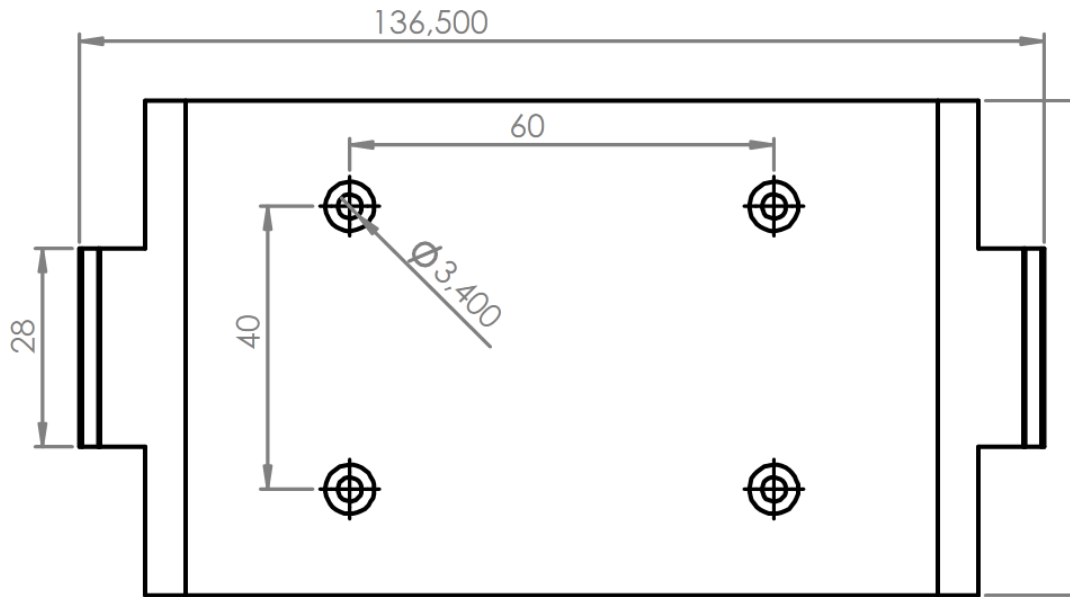


Fig. 5:
View with drilled
holes



The CAR-A-WAN.automotive is available in a plastic wall mount (PVC) that provides a secure attachment. (to achieve more security on the passenger side, a second wall bracket can be fixed, when both wall brackets are at a maximum distance they can be attached to each other).

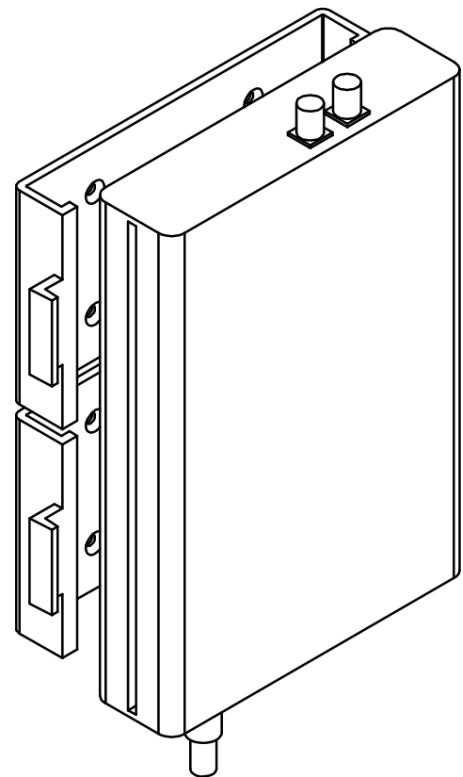
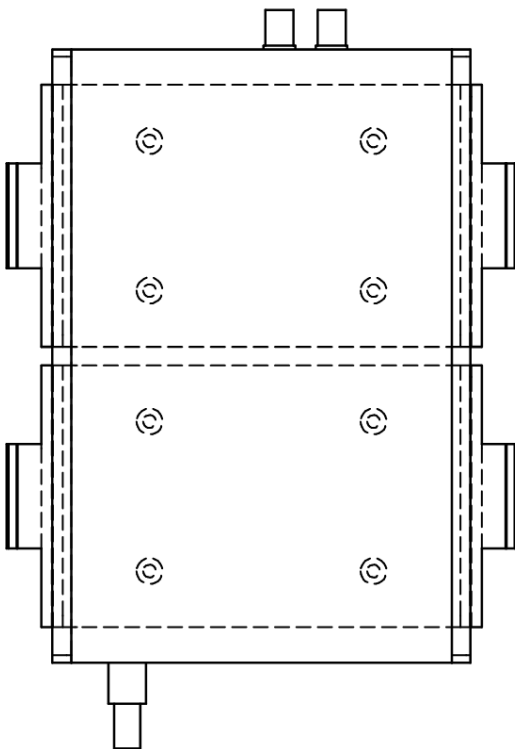


Fig. 6:
Fixation for vehicle interiors

7.5 Acoustic signals of the CAR-A-WAN.automotive



Currently no



Currently no

8 Storage and Unpacking

8.1 Storage of the CAR-A-WAN.automotive

If the device is not installed immediately, one should note the:

- The equipment and accessories should always be kept in the original packaging and warehousing.
- Recommended temperatures for storage in the package are: -30 °C +70 °C.
- The device and packaging should be protected from moisture.

8.2 Unpacking of the CAR-A-WAN.automotive

Remove shipping boxes and packing materials

Check the delivery against the delivery note to be complete. If the delivery is incomplete, or if you receive a delivery failure, the supplier shall be informed immediately about it.

Also check the shipment for transport damage. Damage during transportation should be claimed immediately:

- Shipping boxes and packing material for inspection. Keep together.
- Immediately notify the manufacturer or its suppliers.
- Immediately notify the forwarder/ shipping company.

9 Installation und connecting of the CAR-A-WAN.automotive

The listed technical requirements for the environmental and operating conditions must all be maintained to ensure the proper functioning of the CAR-A-WAN.automotive.

For the fitment of the CAR-A-WAN.automotive the following must be observed:

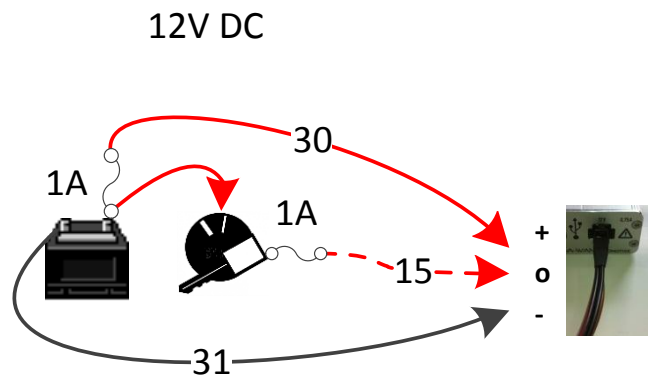
- Only change the vehicle on-board electrics yourself, when you have the necessary expertise.
- For simple installation without cutting the electric equipment, you will receive a prepared wire provided with a fuse for the accessory socket, see chapter „Accessories“.
- Make sure that the ventilation of the CAR-A-WAN.automotive is guaranteed.
- Pay attention to the radian of antenna cables. Knots and tight bending radii can lead to fractures in the antenna cables and conductors.
- The cables should be at room temperature before they are attached.
- The device is equipped with the exception of the stub antenna, which is threaded, only with color-coded system plug-in connections. It is therefore difficult to get a reverse polarity on the unit.

9.1 Voltage supply of the CAR-A-WAN.automotive

Please observe the connection diagram (Fig. 7) below:

Fig. 7: Connection on-board electrics

Fuse:	2 x 1 A slow, behind each terminal 30 and terminal 15
Cable section	min. 0,50 mm² / max. 0,75 mm²
Power consumption at 12V	Typical 550 mA, not more as 750 mA



9.2 Antenna connectors of CAR-A-WAN.automotive

The CAR-A-WAN.automotive has no built-in antennas, but has external antenna connectors to improve reception in the car (Faraday cage) and to reduce the radiation emitted in the interior.

They are supplied complete with disc mount antennas with prepared sockets. The cable of each antenna has a length of 3 meters and which is sufficient enough to get a reception in cities and on highways. It is made in RG174.

Nevertheless, it is worthwhile to measure out the course of the cable by means of a piece of rope before bonding the antenna to the relevant cable. Should the length already be less than 2 meters, it should be then cut by a qualified technician, equipped with a new FAKRA-D socket in the burgundy colour.

Figure 8 (left): 3G antenna with an adhesive bonding surface and alcohol wipe for cleaning the sticking area. The amplification is 0dBi, ie in areas with weak coverage should RG174 cables be cut to the minimum. Ideal for side window between C -& D-column.



Figure 8 (right): 3G Ronda antenna, due to the design is suited very well on vehicles with high roofs, such as tour buses, vans, emergency vehicles and general information on public transport. Amplification 3.15 dBi



9.3 Installing order

9.3.1 Wall bracket

Install a wall mount (outside the passenger compartment) and two wall brackets (inside the passenger compartment) so that the CAR-A-WAN.automotive is secure and can be reached with a power supply.

9.3.2 Power

Install the power cord, beginning with the bulk, then ignition, then permanent positive. Or do the same but put the plug into the prepared backup power supply cable with the provided accessory plug.

Check the device, max. 30 seconds by applying power to the device. The right, orange LED on the network must begin to glow. Disconnect the device back on the supply voltage by removing the connector by pressing on the top of the plug and pull it out. Turning off the ignition is not enough because the device has an electronic tracking.

9.3.3 Thoughts on SIM-Cards

Having the SIM cards at hand, it is recommended to decide on the allocation of SIM card and module number. The module 1 Plus version with a total of two modules is addressed about 30 seconds before the second module of which is prepared for dial-up.

When both modules are online, both are used for data transfer, as long as connections are not terminated (e.g. due to poor signal quality), embarked data paths will remain in operation.

Try to gain a stable data connection rather than a fast one; this should be activated first, if you need to start the VPN right after you start your PC.

CAR-A-WAN.automotive provides the SIM pin with factory settings and it is recommended that you disable the SIM query if only you have access to the router along with the SIM cards.

9.3.4 De-activating the SIM-Pin

Please disable now the SIM Pin of your SIM card in your phone. If this does not succeed (sometimes this is the case with some SIM cards), keep in mind that we have to tell CAR-A-WAN.automotive the PIN for permanent storage and only swap the SIM card under each other.



Do not insert the SIM-card!

9.3.5 Laying antenna wire – do not damage!

Some important tips for finding the right place for the antenna (s):

- First try to find the optimal path with a cord for the antenna.
- If this is successful, you can now finally test the antenna, look at the chapter on this real-time monitoring with the JAVA-based CAR-A-WAN monitor.
- Measure the required length and if necessary have the cable cut back by a qualified technician.

- Clean the potential joint areas with the alcohol wipe and place the antenna (s) carefully in the final position and do not glue the antenna just yet.

9.3.6 Installation of Oracle's JAVA (formerly SUN JAVA)

You need JAVA™ to operate the CAR-A-WAN.automotive monitor. Please search for <http://www.java.com> to download the appropriate version for your operating system and install it.

9.3.7 Installation of CAR-A-WAN.automotive Monitor

You will find the actual version to locally install under: <http://www.ipmotion.de/support> or the Router under: <http://10.10.10.1:8888> (Standard setting)

Unpack the ZIP archive and look in the sub file: ***cawmonitor.jar***

10 Device Operation and Function

The operation of this router has different modes and messages that may be displayed by means of the JAVA program-A-CAR WAN.automotive.

The program you've already downloaded from the internal website of the CAR-A-WAN.automotive.

10.1 Usage of CAR-A-WAN.automotive Monitor

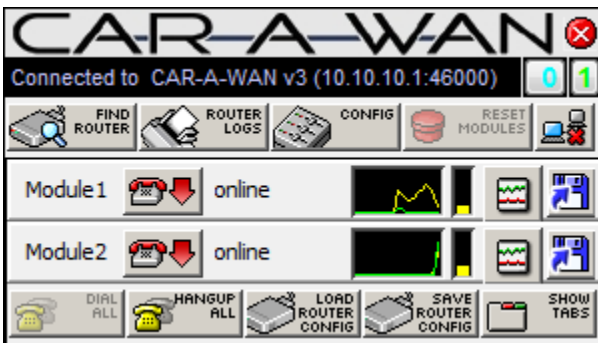


Fig. 9: CAR-A-WAN.automotive monitor dialed with two modules

The CAR-A-WAN.automotive Monitor appears after the call via a double click (Windows and Linux) or a single click (Apple) by cawmonitor.jar the mouse can be used anywhere on the screen.

The screen position remains stored even after ending CAR-A-WAN.automotive. The CAR-A-WAN.automotive monitor is connected, in the

Config. Settings dialog (display), the checkmark in *Save window positions and sizes after modifications* are set.

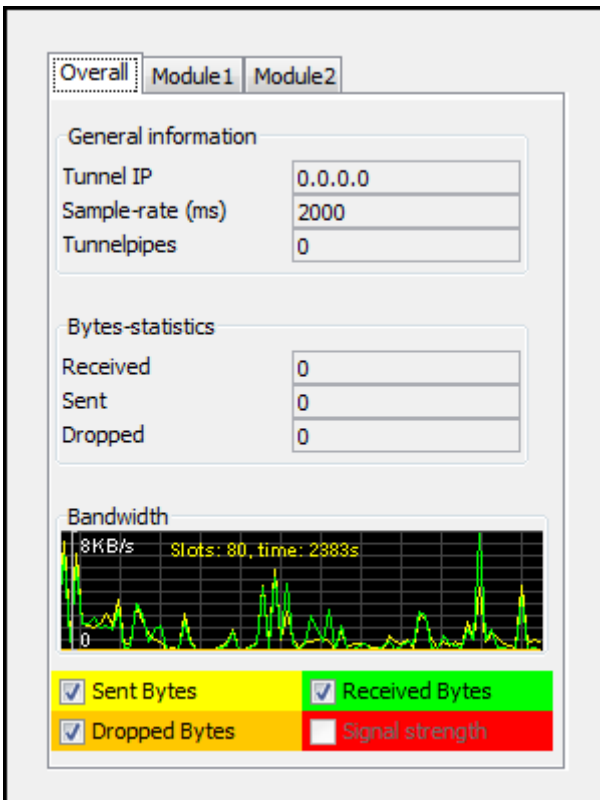


Fig. 10: The tabs show details of the connections.

Should *show tabs* be pressed, so will the detailed information be visible to the dialed-in modules: The CAR-A-WAN.automotive Monitor offers a docked connection details in addition to the total content summary including the display of the tunnel condition, individual information such as the IP address of each module.

When unfolded connection details appear below the monitor overview area, indicating for each module and for the Tunnel pipe (the channel bundling) information on IP address, connection status and data throughput. *Hide tabs* closes the connection details again.

10.1.1 Find Router

CAR-A-WAN.automotive, which are in the same subnet as the PC are automatically displayed. CAR-A-WAN.automotive is so configured that other subnets can be established here. The following dialog can be found *Router Discovery Dialog*.

10.1.2 Router Logs



For diagnostic purposes, and in coordination with the CAR-A-WAN.automotive support during the operation, detailed settings are read and analyzed. For this, a local syslog client is needed in the dialog, where necessary, adjustments made.

10.1.3 Reset Modules



If modules show no reaction or you want to force a Reconnect after a network-based service change or reactivation (e.g. to block on the card), you can trigger it here.

10.1.4 Disconnect CAR-A-WAN.automotive Control from CAR-A-WAN.automotive



This program button closes the connection between A-CAR-CAR-A-WAN.automotive and WAN.automotiveControl, for example, a new connection to another device.

10.1.5 Modules



Individual modules can be addressed, hang up or dialed directly.

Possible states of the modules are:

10.1.5.1 Power

The module is responsive, but not initialized completed: Common error: The SIM PIN is stored in the configuration dialog incorrectly, or the SIM card is blocked due to repeated false entry of the PIN

10.1.5.2 Ready

The module is initialized and the SIM PIN has been confirmed.

10.1.5.3 Dialing

The dialing process is started.

10.1.5.4 *Online*

The module is dialed in and connected to the network.

10.1.5.5 *Hang up*

The hang up process is initiated.

10.1.6 **Signal strength und Registration status**

After the initialization of the modules (all module states except power), the strength of the received signal and the currently available wireless technology can be read off. The signal strength, network operator and the registration status will be displayed as a tooltip, the level bar shows the actual level signal strength.



The registration status has four modes: Home, Roaming, Service amp; Registering Limited. The CAR-A-WAN can only go online when Home or Roaming appears. See also Chapter 12, Troubleshooting.

Furthermore, a colored vertical bar is shown, the amount of height and the color for the type of connection:

10.1.6.1 Yellow: 2G

GPRS / Edge can be received almost everywhere in Europe. When properly logging into a wireless network (SIM PIN disabled or correct SIM PIN stored, APN may be wrong, see Troubleshooting, Chapter 12) an intact cable as well as properly wired antennas a yellow bar should be visible after two minutes.

10.1.6.2 Green: 3G

UMTS or 3G can be very often received in cities and on highways. The reception strength falls regularly with weaker 3G, the achieved download speeds are in the stationary operation at up to 8 Mbps, while driving at 128Kbit / s to 1568 Kbit / s.

10.1.6.3 Blue: Bluetooth

After successful pairing, other modules are involved via personal Aerial network profile as gateways, a maximum of 8. The blue bar is not an indicator of transmission power, but is represented idealized.

10.1.7 Dial All



Initiates dial-up for the modules.

10.1.8 Hang up All



Initiates hang up for the modules.

10.1.9 Load Router Configuration.

Loads locally stored settings of the CAR-A-WAN.automotive monitor as well as default values.

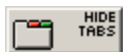
Warning: The setting of the CAR-A-WAN.automotive (Provider, SIM PIN etc.) will take place in the Web interface and is described in chapter 10.2.5.

10.1.10 Save Router Configuration.



Settings are stored from the CAR-A-WAN.automotive monitor in an archive in TAR format, a data format without data reduction.

10.1.11 Hide Tabs.



Hide/ displays enlarged images of module states, including the tunnel pipes. See also
▶ *CAR-A-WAN.automotive monitor opened connection details.*

10.1.12 Show Statistics.



Displays detailed connection statistics per module. See also *CAR-A-WAN.automotive Monitor Transfer Chart.*

10.1.13 Disconnect CAR-A-WAN.automotive



This program button closes the connection between CAR-A-WAN.automotive and CAR-A-WAN.automotive Control, for example, a new connection to another device, or to separate after a reset or restart a broken link.

10.1.14 Router Discovery Dialog

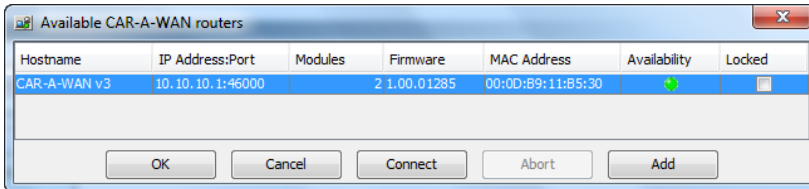


Fig. 8: Displays active CAR-A-WAN.automotive
This manual configuration is the dialogue that provides you with information on the IP address of the CAR-A-WAN.automotive,

number of modules, firmware version, MAC address and instant availability. Is your CAR-A-WAN.automotive not in the same subnet as the PC used to monitor and control, you can manually add an IP address and connect.

10.1.15 CAR-A-WAN.automotive-Monitor Transfer Chart

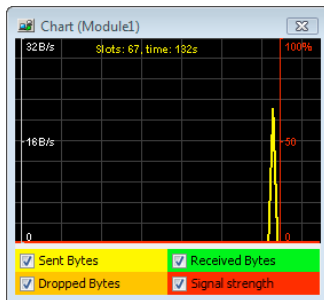


Fig. 12: Graph course from the data connection and signal strength of the current module.

A multicolor gradient graphic can be sent and received, as well as lost data can be read per module. The scale automatically adjusts to the recent average and displays it in the left side. In addition, the signal strength is displayed.

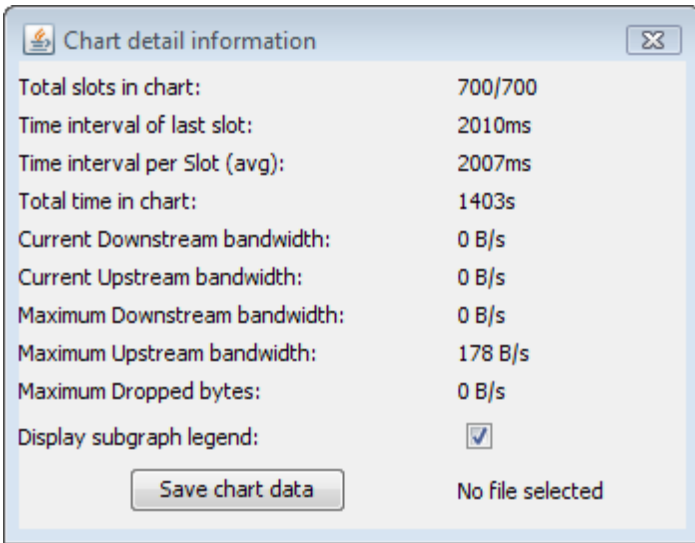


Fig.13 Detailed Information over the actual module

By double-clicking the chart a property page can also be accessed, the chart data values seen can also be saved.

10.1.16 Configuration Dialog (General)

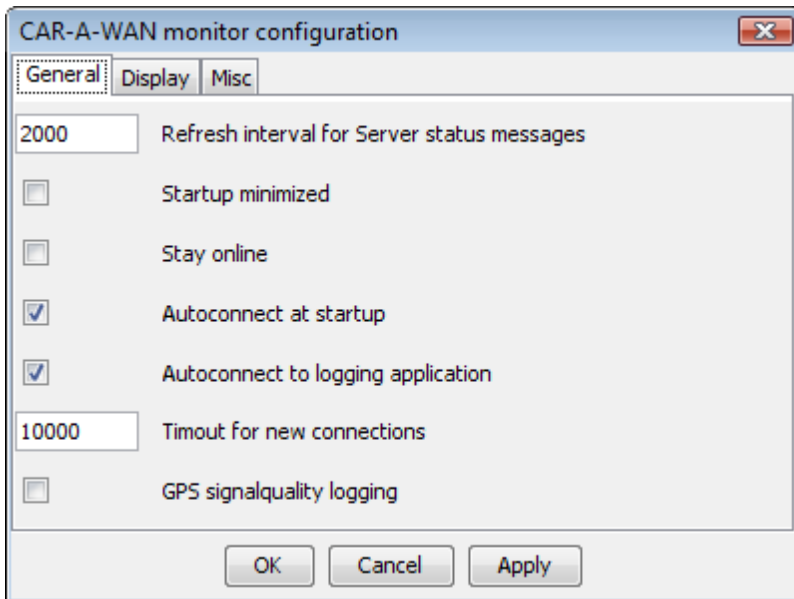


Fig. 9: Main Settings for CAR-A-WAN.automotive Monitoring-Client and CAR-A-WAN.automotive

GPS signal quality logging: Used to record values from test drives and compares the relationship between distance traveled and data throughput or signal strength, e.g. for display in Google Earth.

For use with USB GPS "cursor" tested with the GPS receiver from Holux GR-213.

The conversion of CSV data into KML for visualization is described here:

http://code.google.com/apis/kml/documentation/kml_tags_21.html

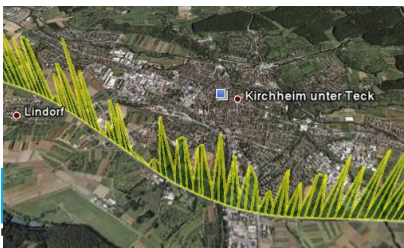


Figure 15: Data rates created with the use of CAR-A-WAN.automotive and Google Earth.

10.1.17 Configuration Dialog (Display)

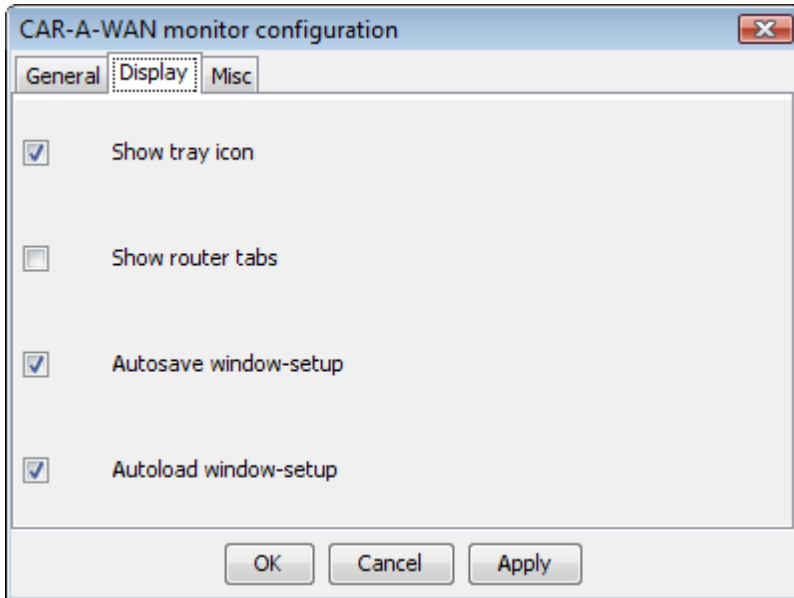


Fig. 10: Display settings for CAR-A-WAN.automotive Monitoring-Client

Show tray icon: Displays the Icon, when the CAR-A-WAN.automotive Monitor is minimized.

Show router tabs: Constantly displays the module details

Auto save window setup: Saves the window position

Auto load windows setup: Gets the previous window position when starting up again.

10.1.18 Configuration Dialog (Misc)

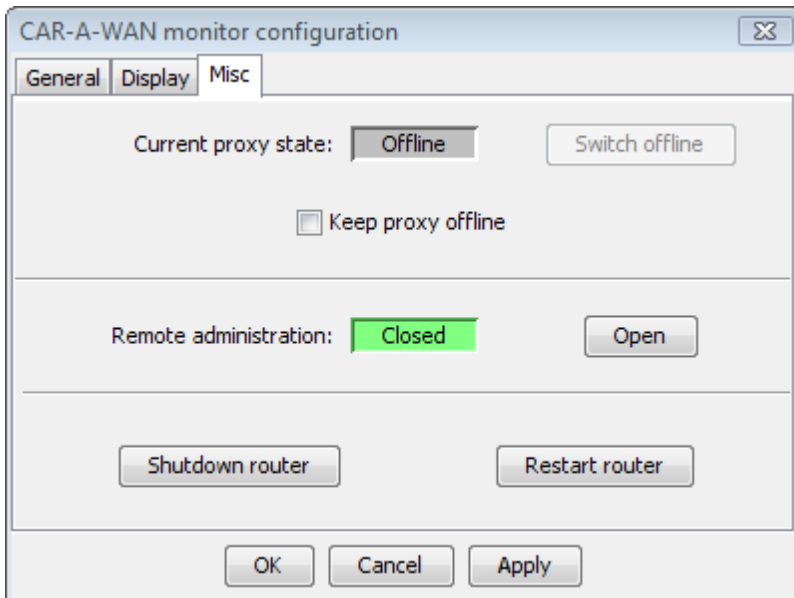


Fig. 11: Various settings for the CAR-A-WAN.automotive Monitoring-Client and CAR-A-WAN.automotive

Current Proxy state: Online or offline, offline by default in the CAR-A-WAN.automotive, due to RAM disk not being suitable for permanent auto-storage and is disabled here.

Remote Administration: Opens the CAR-A-WAN.automotive temporarily for SSH, but requires the user information from the public IP address of the CAR-A-WAN.automotive. This displays the access status of SSH between the

WAN and router.

Shutdown Router: Shutting down the CAR-A-WAN.automotive. A restart can only take place when the current is cut off and is reconnected at the same time.

Restart Router: Starts the CAR-A-WAN.automotive (cold start) new start.

Switch offline: (user cache temporarily disabled)

Keep Proxy offline: (Permanent disconnection from the network until the next reboot of the CAR-A-WAN, regardless of dial-disabled state of the router)

10.2 CAR-A-WAN.automotive Web-Administration usage

For changes to the basic settings of the CAR-A-WAN.automotive you have an administration Web site that can be addressed directly and, unlike the CAR-A-WAN.automotive monitor, is executable without having to install JAVA. All you need is a Web browser (no JavaScript required) and a network connection to the CAR-A-WAN.automotive.

A computer user can change the configuration values, but should have available basic knowledge of the configuration of routers and wireless LAN access points. Before you configure the CAR-A-WAN.automotive or administration, you should have the following information available:

- SIM-PIN (See 9.3.4)
- APN, dial commando
- User / Password for PPP-authentication

10.2.1 CAR-A-WAN.automotive Web-Administration start up

[http://\[IP-Adress of the CAR-A-WAN.automotive\]:8888/](http://[IP-Adress of the CAR-A-WAN.automotive]:8888/)

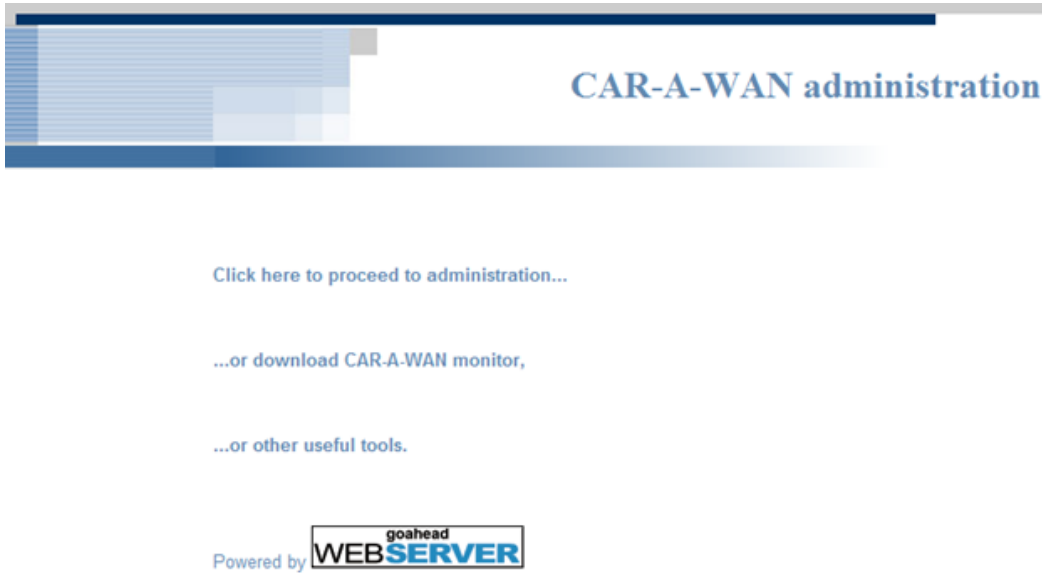
- Standard Setting:
- <http://10.10.10.1:8888>
- User: [Not displayed]/ Default-Password: [Not displayed]

This information is available in the documents accompanying CAR-A-WAN.

Find the paragraph of the equipment data form (here is the Web version), there can be found on the second page in the section notes, passwords for your device WLAN and website.

10.2.2 The Main page

Fig. 12: Splash screen with link to administration page



The main page refers to several links, including the administration menu. The third link points to the web within the IPmotion web server and on the opposite side with tools, including remote maintenance.

After clicking on “Click here to proceed to administration” you will be redirected to the configuration of the first module.

Fig. 13: Module configuration



10.2.3 User Management / Change Password

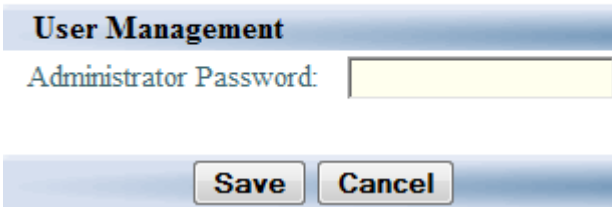


Fig. 14: Dialog to set the Web admin. Password

In this dialog you can change the password of the administrator. An empty password is not allowed.

Please note that the documentation of the CAR-A-WAN.automotive is downloadable through the website without verifying the person. If you do not modify the administrator password, any person can configure the router from the LAN.

User management

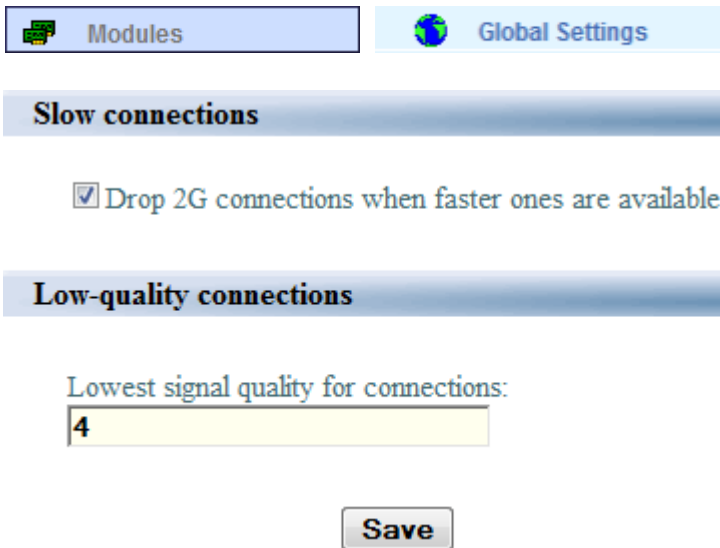


We strongly recommend setting a password so that abuse can be prevented.

Please write down this password and store the password in a safe place. The CAR-A-WAN.automotive does not have an integrated process for resetting the password of your choice.

Should a password reset be required, this has to be carried on the operating system of the CAR-A-WAN.automotive and charges will be made for these services.

10.2.4 Module Settings / Global Settings



Slow connections

Drop 2G connections when faster ones are available.

Low-quality connections

Lowest signal quality for connections:

4

Save

Fig. 15: Global Settings

The following module Settings are in principle independent of each other, i.e., the modules can be configured independently.

However, both can be set when a dial-up must be carried out.

In this example, an existing, slow 2G (GPRS / Edge) will be launched when the other module was able to build up a faster 3G connection (UMTS / HSDPA / HSUPA).

Furthermore, connections can be established only with a minimum signal quality and / or maintained.

A value of -1 (in words: minus one) deactivates minimum signal strength for the dial-up.

10.2.5 Module configuration



Fig. 16: Module configuration 1

Module configuration for module 1

Informational

SIM-PIN:

(if no SIM-PIN is needed please empty the PIN-string field, see Advanced)

Modem type: Provider name:

Basic

Provider APN: Dial-string:

Username: Password:

Allow auto-dialing:

Advanced

Serial device: Speed:

PIN-string: (with SIM-PIN: AT+CPIN=) Dial-string:

Hangup-string: ECHO-off-string:

APN-string: Authentication-type-string:

INIT1-string: INIT2-string:

The menu for the configuration data modules allows for changes that affect the authentication with respect to the dial-in and the type of command transfer between the CAR-A-WAN.automotive and integrated data modules. All other fields not described here should only be changed in response to the IPmotion support. Configuration changes could cause a malfunction of the CAR-A-WAN.automotive and as a result total loss.

- *PIN (PIN of the SIM card)*, displayed hidden, please make sure that the password manager of the web browser recognizes this value and not to be stored as a password. This is a common error of the module status “ Power“ instead of „ Ready“ or“ online“)
- *Provider APN*: Recognizes the provider network
- *Username & Password* (this information comes from your wireless provider)
- *Allow auto dialing* (This setting controls whether the module can dial when it is ready and has found a cell phone provider.
 - *Always* (re- dial will be always carried out again if the connection was interrupted.)
 - *Never* (manual dialing can only be performed by the CAR-A-WAN.automotive Monitor)
 - *When not roaming* -you can choose this option if you want to prevent dialing into a foreign network (international). This only prevents a new dial-up when a network already exists.
- *PIN-String* If no PIN for the SIM card is used, i.e., the PIN is disabled, then the content of this field will be deleted. „AT + CPIN =“(isn` t case sensitive).

10.2.6 Host-Access point

Accesspoint **Configuration**

Accesspoint configuration

Configuration parameters

Enable accesspoint:

ESSID: Channel:

TxPower:

WPA2 passphrase:

Submit configuration

Fig. 17: Configuration of Access points

The optional wireless LAN access point can be switched on or off, change the network ID and the channel number can then be set.

Please note there are free to use and unrestricted WLAN channels available in your country, see next page.

10.2.7 Permitted WLAN channels

Channel Number	Frequency (GHz)	Permitted in	Channel Number	Frequency (GHz)	Permitted in
1	2,412	Europe, USA, Japan	36	5,18	EU, USA, Japan
2	2,417	Europe, USA, Japan	40	5,2	EU, USA, Japan
3	2,422	Europe, USA, Japan	44	5,22	EU, USA, Japan
4	2,427	Europe, USA, Japan	48	5,24	EU, USA, Japan
5	2,432	Europe, USA, Japan	52	5,26	EU, USA
6	2,437	Europe, USA, Japan	56	5,28	EU, USA
7	2,442	Europe, USA, Japan	60	5,3	EU, USA
8	2,447	Europe, USA, Japan	64	5,32	EU, USA
9	2,452	Europe, USA, Japan	100	5,5	EU
10	2,457	Europe, USA, Japan	104	5,52	EU
11	2,462	Europe, USA, Japan	108	5,54	EU
12	2,467	Europe, Japan	112	5,56	EU
13	2,472	Europe, Japan	116	5,58	EU
14	2,484	Japan	120	5,6	EU
			124	5,62	EU
			128	5,64	EU
			132	5,66	EU
			136	5,68	EU
			140	5,7	EU
			147	5,735	USA
			151	5,755	USA
			155	5,775	USA

Quelle: http://de.wikipedia.org/wiki/Wireless_Local_Area_Network

10.2.8 Routing

Network **Routing**

First network device
IP-address: Netmask:

Second network device
IP-address:
Netmask:
 Activate NAT (outgoing) for this device

Default gateway
Gateway IP: Activate default gateway

Additional routes
network gateway active


Add new route
Destination network: Destination netmask:
Gateway-IP:


Fig. 18: Routing

In the CAR-A-WAN.automotive routing menu there is a configurable network interface.

A second, routing interface is not provided in the standard configuration, but in principle conceivable, for example, if the Host Access Point for WLAN is disabled then the wireless WLAN card is enabled to function as a transition to other networks.

10.2.9 DHCP

 Network

 DHCP server

DHCP configuration

DHCP Server Configuration

Subnet Address: Subnet Mask: Default Gateway:

IP-Address Range

From: To:

Nameserver (IP): Domain Suffix:

Lease Time Configuration

Max Lease Time: Days, Hours

10.2.10 DNS

The CAR-A-WAN has its own DNS server and is bound to the address of the router and is always switched on. This DNS server has the peculiarity that it does not direct retrieved data to the local cell phone server but directs to the root servers where the data is received and communicated further over the typical DNS server back to the hosts.

This communication is inherently slower than a communication at the mobile providers, but the advantages are the usage of multiple, parallel WAN Connections.

Alternatively, an external DNS server can deposit mediated group clients in the DHCP configuration menu, such as Google (8.8.8.8).

In addition, here is a short list of freely accessible, and unlike Google anonymous DNS servers: (see http://wiki.ak-zensur.de/index.php/Unzensierte_DNS_Server):

85.214.73.63 (anonymisierungsdienst.foebud.org)

194.150.168.168 (dns.as250.net, anycast DNS!)

213.73.91.35 (dnscache.berlin.ccc.de)

10.2.11 Port redirections

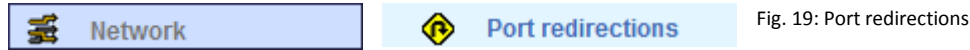


Fig. 19: Port redirections

Add a new redirection

Name:

Port: Protocol: **tcp** ▼

Destination-address: Destination-port:

Accept packets from any source

Source-address: Source-netmask:

Add Redirection

In this menu, port redirection can be forwarded by clicking on „Active“, the Port can be turned on/ off; External routing applications can only be reached when the routing provider enables this and has a public IP-Address available. This is usually not the

Port-Redirections

Name	Port	Proto	Destination	Source	Active		
WEBCAM	80	tcp	10.10.10.100:80	0/0	<input checked="" type="checkbox"/>	Delete	Edit

case; if you want a secure publish device-internal services on the Internet or intranet resort to special services such as MDEX.de.

10.2.12 Bluetooth PAN Devices

The screenshot shows a web interface for Bluetooth PAN devices. It is divided into two main sections: 'Bound devices' and 'Visible devices'. The 'Bound devices' section contains a table with two rows of device information. The 'Visible devices' section is currently empty and includes a 'Refresh' button.

Bound devices			
Name	Address	Visible	
HTC_TyTN_II	00:17:83:65:C6:11	No	<input type="button" value="Unbind"/>
HTC_TyTN_II	00:17:83:5F:FE:8C	No	<input type="button" value="Unbind"/>

Visible devices	
Name	Address
<input type="button" value="Refresh"/>	

Fig. 20: Bluetooth PAN

The CAR-A-WAN.automotive can be connected in addition to the built-in data via Bluetooth modules with up to eight other data modules when the following

conditions are met:

- The Bluetooth-Option has been purchased
- Bluetooth is plugged in before the start up (power on) directly into an available USB 2.0 port
- The Software Option is activated
- To the Bluetooth PAN Profile is available addressable data module (This can be a Microsoft Windows Mobile 6.0 Smartphone and newer version, an iPhone (IOS 4.1) or an android phone. For a list of tested devices, see <http://www.ipmotion.de/support>)

10.2.13 Power management



Fig. 22: Dialog Channel bundling

Stored rules

Name	Remote ip	Max fails	Pause	Action	Active	
CHECK SLEEPING CLIENT	10.10.10.100	5	60	shutdown	<input checked="" type="checkbox"/>	Delete

Insert a new rule

Activate this rule.

The rule's name:

The client's ip adress:

Max number of failed answers:

Seconds between requests:

Action to take:

Insert rule

10.2.14 Channel bundling

Channel bundling

Authentication for channel bundling server

Username: Password:

Server for channel bundling

IP Address:

Modules activated for channel bundling

Module 1 Module 2

Module 3 Module 4

Fig. 21: Dialog Channel bundling

The channel bundling combines individual data streams to a common failure-safe connection.

Enter the server address and your contract associated user Name and Password.

After review, you can choose to bundle the planned modules and summarize the data connections.

Without channel bundling outbound connections can only be transferred (per process) through a module. Incoming data connections without channel bundling, can also distribute the load by ECMP (Equal Cost Multi Path, a very fast, directly by Linux), but using a free access to public DNS servers.

10.3 Operating modes and notifications

The description of main modes of the router as follows:

- **Off**
- **On, Offline**
- **On, Online**
- **On, Roaming**
- **On, waiting for Shutdown**
- **Updating**

11 Starting up CAR-A-WAN.automotive

In order to guarantee an error-free operation, the following points should be observed:

1. Check the SIM-Cards.
2. Check the fit of the antenna.
3. Check input fuses and turn on the ignition (or insert the 12V electrical plug into a socket board).
4. Wait Approx. 60 Seconds.
5. Switch your computer on and connect WLAN or LAN.



Hinweis

If all steps have been carried out successfully, the router should be in status "ON".

6. Configure the device over the admin website.
7. Insert the following SIM cards in the corresponding slots:
 - SIM 1 for module 1 in slot 1 (which is closer to burgundy colored antenna connectors than the slot 2) insert with golden contact area faced down until it snaps into place.
 - SIM 2 insert with golden contact area facing up into slot 2 until it snaps into place and even with the front side
 - Restart the device via JAVA program-A-CAR WAN monitor (see Section 10.1.18) or just disconnect the power supply.
8. Check the online Connection via PC.



Hinweis

The router should be after approx. one minute visible in the WLAN, and after approx. 90 seconds online.

The router can now remain operational in this state.

12 Troubleshooting



Troubleshooting work on the hardware of the CAR-A-WAN.automotive is exclusively to be carried out by authorized personnel.

If the router is not working properly, please try to resolve the problem with the aid of the following table:

Problem	Possible cause	Remedy
The router cannot be started, no warning.	The power current for the router is not connected or turned on.	Make sure that all connections are made and confirm this in corresponding voltage measurements. Check the mains input fuse of the CAR-A-WAN.automotive.
I cannot see the WLAN of the CAR-A-WAN, even though my operating system has wireless connections.	The WLAN of the CAR-A-WAN is turned off, or other WLAN occupy the same channel or adjacent channels.	Connect a LAN cable to the CAR-A-WAN and navigate to the Administration Web site and turn on the WLAN or change the channel (see Section 10.2.6).
I cannot reach the administration website.	You have set a Web proxy in the Internet connections of the Web browser.	Disable the Web Proxy or bypass the proxy server for local addresses.
The module(s) cannot dial in, even though the SIM PIN has been entered. The tooltip in the CAR-A-Home or Roaming WAN monitor displays (see Section 10.1.6).	The pin-string was not entered. The PIN-String is a requirement for the transfer of the PIN to the modem.	Fill in the module configuration in the Advanced String AT + CPIN PIN (without the "quotes") and save the change. Restart the router (see Section 10.1.18).

<p>The module(s) cannot dial in, but they seem to have reception, since they have signal strength (see Section 10.1.6). The tooltip in the CAR-A-WAN Monitor shows neither Home nor roaming (see Section 10.1.6)</p>	<p>It is Possible that the modules have found an available wireless networks, but cannot register in it.</p>	<p>Make sure that, → the data-enabled SIM cards are inserted correctly (see Chapter 7) → the SIM card might yet need a SIM PIN , but is not correctly configured. → After inserting the SIM card or the reconfiguration of the SIM PIN, the resetting of the router will restart (see Section 10.1.18).</p>
<p>The modules cannot successfully dial, although they are registered on the network and the signal strength is * sufficient.</p> <p>* The dial for adequate signal strength is individual and dependent on network technology (2G/3G), modem, antenna used together with cables and providers. You can set a global minimum value yourself, (see Section 10.2.4)</p>	<p>The APN is incorrect, the user / password combination is wrong; the SIM card provider side is still not unlocked or locked. The prepaid card has a zero balance.</p>	<p>Make sure that, → the provider-specific data (APN / Username / password / authentication method) were transferred correctly to the CAR-A-WAN. → the SIM card is suitable for use, please get in contact with the hotline cell provider.</p>
<p>The PC can dial into the VPN, but network resources are not accessible.</p>	<p>The IP address of the CAR-A-WAN.automotive is equal to the VPN server.</p>	<p>IP address of the CAR-A-WAN.automotive change in routing. Restart the router (see Section 10.1.18).</p>
<p>After a good 30 minutes, the WLAN is not available and network connections are interrupted.</p>	<p>The ignition voltage and the voltage were turned off and the accessories follow-up time has been exceeded.</p>	<p>Turn on the ignition key in the first position until you can switch the car radio on.</p>

The signal strength is weak, although a cell phone / USB stick with the same SIM card has a good signal strength display.	The burgundy colored FAKRA connector in the fuse box is defect or the antenna cable is broken or a too small bending radius of the aerial cable is available.	Visual inspections of the plug, if necessary, replace the router or the antenna or the antenna cable.
---------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------

If you cannot find the registered Error in the CAR-A- WAN.automotive table, contact our service department and have the following information:

1. Module number, Serial number
2. Date, when the problem appeared
3. Detailed description of the problem

13 Technical Data

13.1 Specification CAR-A-WAN.automotive

Size:	112 x 30 x 184 (164 without protruding connectors, only housing) mm
Power consumption:	7.6 Watt at 12 V
Closed circuit current:	0.9 μ A
Mass (with two Modems):	430 Gramm
Classification:	IP 20
Operating temperature:	-30 to 70 Degree Celsius
Storage temperature:	-40 to 85 Degree Celsius

13.2 Specification 12V-Power supply cable

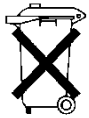
Length:	< 3 Meters
Flammability:	according EN 60332-1-2
Allocation:	1 = Black-red = Permanent plus 2 = brown = circuit plus 3 = Black = earth / ground
Plug:	tyco AMP 1-929169-1 (Daimler=0375456328)
Pin contact:	tyco AMP 965601-1
Tools:	tyco ERGOCRIMP Matrizze Rev A. (2476566077)

13.3 Accessories

Below are accessories which have been specifically approved and tested for this router by IPmotion GmbH:

Accessory:	Function:	Article number:
Ronde antenna	Flat roof antenna	707115
Cable Connectors amp; Accessories	Power supply	PLUG12VAMP-2
Remote WLAN antenna	Extension of the WLAN range	WLAN-ANT-EXT

14 Recycling of the CAR-A-WAN.automotive



The IPmotion GmbH takes back all CAR-A-WAN.automotive devices for recycling free of charge.

Our modular design allows material separation so that it can be broken down and sorted with re-use of individual components (Aluminium housing/PVC-brackets etc.), as well as electronic components.

Just ask for recycling at the email address recycling@IPmotion.de and on the back of the recycling kit fill out at least one IMEI number or serial number.

This kit will be sent out within Europe free of charge and consists of a package, a questionnaire and a return label. For your effort, we will refund you EUR 5, - plus VAT.

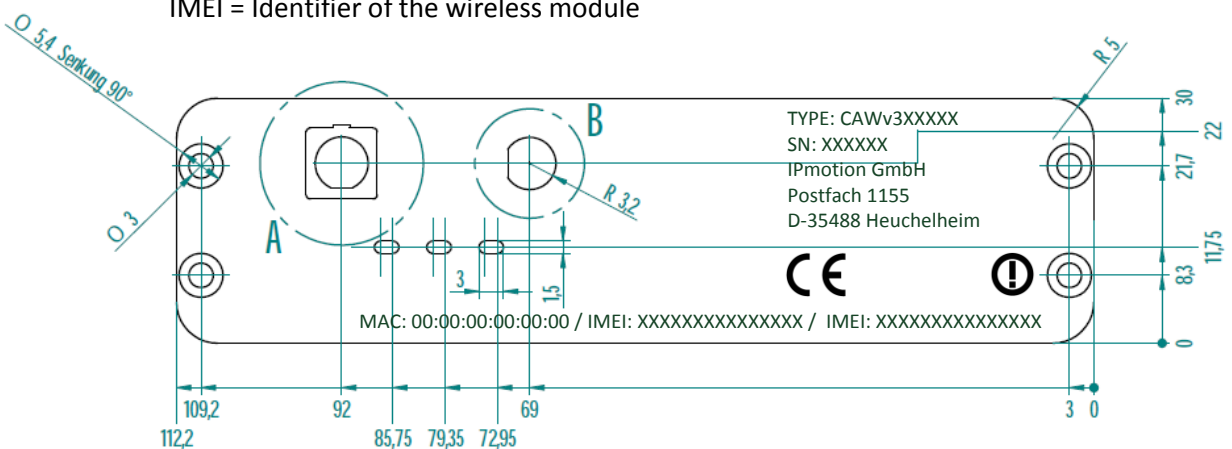
Without obligation, we can also offer an upgrade, of which after the first purchase within the first three years; a more powerful modem can be supplied and exchanged.

15 Identifying of CAR-A-WAN.automotive



The IPmotion GmbH identifies the product variants of a CAR-A-WAN.automotive v3 on the back as follows:

- TYP = Product variant
- SN = Serial number
- MAC = MAC-Address of the LAN-Interface
- IMEI = Identifier of the wireless module



Declaration of conformity

The CE-marked router of the CAR-A-WAN.automotive-series complies with the following corresponding standards and EU guidelines:

Electromagnetic Compatibility: **EN 301-489-1 V.1.8.1**

(Relating to the retrofitting in vehicles with 12V power supply /
for the initial supply of vehicles for connection to a type-tested
interface, e.g. a power supply or the connection with e-mark)

Product safety: **EN 60950** (terms of use in motor vehicles)

For the IPmotion GmbH



Florian Kempff
Geschäftsführender Gesellschafter

Further questions, please contact the manufacturer:

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