Teldat

Teldat H Automotive+ Router

Installation Manual

Legal Notice

Warranty

This publication is subject to change.

Teldat S.A. offers no warranty whatsoever for information contained in this manual.

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Table of Contents

Chapter 1 About This Guide

This installation guide for the **Teldat H Automotive+** router family contains the instructions that you need to follow in order to correctly install the device in the environment where it is going to operate.

1.1 Supported Devices

The information contained in this installation guide only applies to the **Teldat H Automotive+** router family.

1.2 Who should read this manual?

This manual should be read by personnel who are experienced in aftermarket installation and familiar with the general practices for installing electronic devices in vehicles.

1.3 When should I read this manual?

Read this guide as soon as you are ready to familiarize yourself with the device and its components.

This manual will help you understand your new device in greater depth.

1.4 What is in this manual?

This installation guide contains the following information:

- A description of the general characteristics available in the **Teldat H Automotive+** router family.
- Technical specifications.
- Power supply requirements.
- Description of the LEDs and the pinouts for the device.
- Troubleshooting.

1.5 What is not in this manual?

This manual does not contain information on the device software nor information on its configuration. For information on how to configure the device, please see the manuals for the different protocols by visiting the following website: http://www.teldat.com

1.6 How is the information organized?

Each chapter focuses on a specific part of the device hardware and its components. All the descriptions, technical specifications and information on a component can be found in the relevant chapter.

1.7 Technical Support

Teldat S.A. offers a technical support service. Device software can be upgraded on a regular basis for maintenance purposes and for new features.

Contact information:

>   Web: http://www.teldat.com

>   Tel.: +34 918 076 565

>   Fax: +34 918 076 566

Email: support@teldat.com

1.8 Related documentation

Teldat-Dm704-I *Configuration Monitoring* .

Teldat-Dm748-I *Software Updating* .

Teldat-Dm771-I *Wireless LAN Interface.*

Teldat-Dm781-I *Cellular Interface.*

Teldat-Dm812-I *GPS*.

Caution

The manufacturer reserves the right to make changes and improvements to the appropriate features in both the software and hardware of this product, modifying the specifications of this manual without prior notice.

The images presented on the front and back panels of the device are provided as information guidelines only. Some small modifications may exist in the actual device.

Chapter 2 Teldat H Automotive+ Router

2.1 Characteristics

The **Teldat H Automotive+** router family is a range of IP routers especially designed to operate in hostile and extreme environments. Thanks to their ruggedized mechanics and ability to withstand extreme temperatures, they are particularly suited for: automotive applications, industrial environments, industrial telecontrol, distribution installations for electricity, gas, water, etc.

The main characteristic of this router family lies in the possibility of accessing data networks through cellular or mobile telephony technologies. Thanks to its modular design, the device can quickly adapt to the latest technologies in the field. Therefore, the **Teldat H Automotive+** family is compatible with technologies such as GPRS, EDGE, UMTS, HSDPA, HSUPA, HSPA, HSPA+, LTE, CDMA 2000 1xRTT, CDMA Ev-Do, etc.

This router family can incorporate a second module, thus permitting simultaneous connections to different carrier networks and backing up the main module using a different technology.

In addition, the latest technology in internal GPS (SiRF® Start IV) can be incorporated for positioning tasks in onboard environments.

> **Note**
>
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>
> Other products, services and names used in this document may have been registered by their respective proprietors.

The **Teldat H Automotive+** router family includes an integrated four-port Ethernet LAN Switch to access LAN networks and, optionally, can also have a Wireless LAN MINI-PCI module.

This manual will show you how to install and connect these devices.

> **Note**
>
> Please note that when this device operates for prolonged periods of time under extreme conditions (including temperature and humidity) its service life shortens significantly.

2.1.1 Power supply

For further information on the different power supplies in the **Teldat H Automotive+** router family, please see chapter *Components and Power Supply* on page 4, and section *Power Source* on page 8 .

2.1.2 Hardware Monitoring

The only way to monitor the **Teldat H Automotive+** router family hardware is through the LEDs on the rear panel. The LEDs provide visual information on what is happening in the device. These indicate the state of the hardware components, if there is connectivity, data flow, etc.

For further information on the LEDs panel, please see section *Components* on page 4 in the following chapter.

Chapter 3 Components and Power Supply

The following chapter provides detailed information on the chassis of the **Teldat H Automotive+** router family and its components. This information includes:

- Components.
- Information on assembly.
- Power supply.
- RESET button.
- Data connection.
- SIM card installation.

3.1 Components

3.1.1 Front Panel

The following figure shows the front panel.
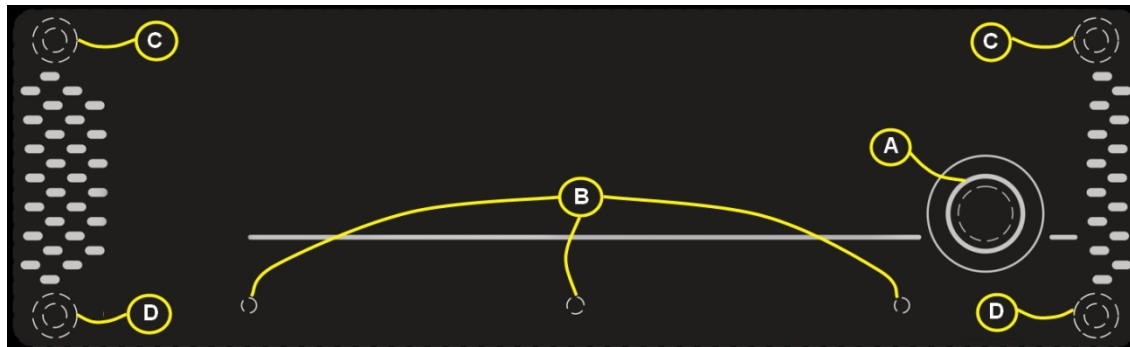
Fig. 1: **Front panel**

The front panel elements are as follows:
Front panel elements table

Item	Description
A	ON. Illuminated indicator showing that the device is switched on or not.
B	Holes to install the accessory to secure the device.
C,D	Screws to remove the device's upper and underside panels.

3.1.2 Rear Panel

The following figure shows the rear panel.
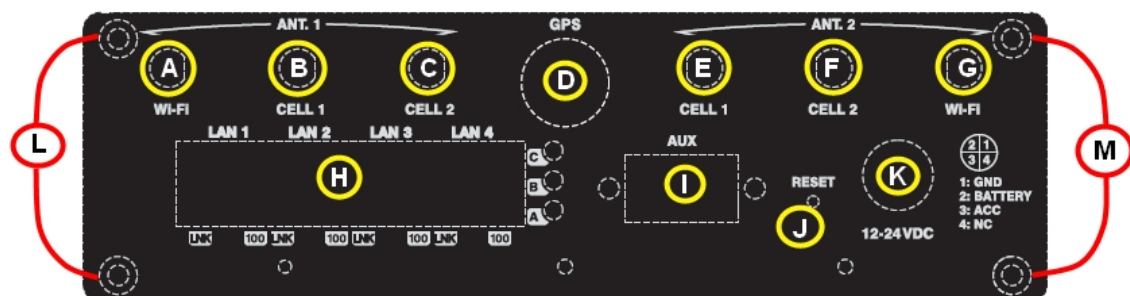
Fig. 2: **Rear panel**

The rear panel elements are as follows:
Rear panel connectors table

Item	Description
A	ANT. 1 Wi-Fi. WiFi antenna for the Wireless LAN module. This module is optional; therefore it's possible that your device doesn't have any antennas.
B	ANT. 1 CELL 1. Main antenna for the **Teldat H Automotive+** cellular Module 1 (cellular10/xinterface).
C	ANT. 1 CELL 2. Main antenna for the **Teldat H Automotive+** cellular Module 2 (cellular11/xinterface).
D	GPS. External GPS antenna for the GPS module. This module is optional; therefore it's possible that your device doesn't have internal GPS and, therefore, no antenna.
E	ANT. 2 CELL 1. Auxiliary antenna for the **Teldat H Automotive+** cellular Module 1 (cellular10/xinterface).
F	ANT. 2 CELL 2. Auxiliary antenna for the **Teldat H Automotive+** cellular Module 2 (cellular11/xinterface).
G	ANT. 2 Wi-Fi. WiFi antenna for the Wireless LAN module. This module is optional; therefore it's possible that your device doesn't have any antennas.
H	4-port Ethernet Switch.
I	AUX. DB9 connector that provides access to the device's local console for configuration and monitoring.
J	RESET. Reset button. For further information on how the reset button operates, please see section *RESET Button* on page 15 in this chapter.
K	12 - 24 V DC Power supply connection (DC).
L,M	Screws to remove the device's upper and underside panels.

In addition to the connections, you can see a set of luminous indicators, or LEDs, on the rear panel that provide information on what is happening in the router.

The LEDs on the rear panel of the router are shown in the following figure:
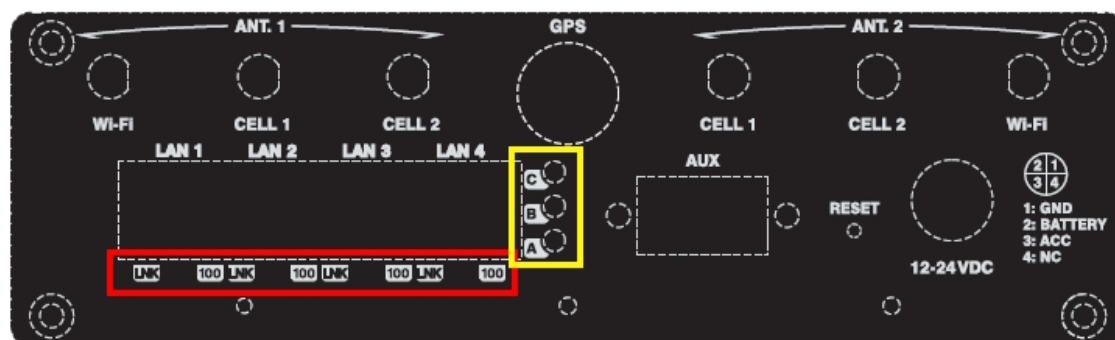
Fig. 3: **Rear panel LEDs**
Rear panel LEDs table

LED	Associated Interface	Statue	Description
A	Wireless WAN channel 0	Monochrome	OFF -> Interface is not

	(cellular10/1).	green	available, not installed or not registered. ON -> Registering or registered and connected to the SIM carrier network: - Steady: Is not transferring data. - Blinking: Transferring data.
B	Wireless WAN channel 1 (cellular11/1).	Monochrome green	OFF -> Interface is not available, not installed or not registered ON -> Registering or registered and connected to the SIM carrier network: - Steady: Is not transferring data. - Blinking: Transferring data.
C	The device has a MINI-PCI slot where a Wireless LAN daughter can be installed.	Monochrome green	OFF -> Interface is not available, not installed or not established ON -> Connecting or connected and communications established: - Steady: Is not transferring data. - Blinking: Transferring data.
LNK	Associated to each Ethernet switch (LAN1, LAN2, LAN3 and LAN4)	Monochrome green	ON -> Ethernet connection (link) established: - Steady: Is not transferring data. - Blinking: Transferring data.
100	Associated to each Ethernet switch (LAN1, LAN2, LAN3 and LAN4)	Orange	ON -> Connection at 100 Mbps OFF -> Connection at 10 Mbps

3.2 Mounting options

The **Teldat H Automotive+** device can be mounted in various vehicles on the wall, ceiling or on a horizontal surface.

The front and rear device panels have three apertures so you can add a bracket with slots to firmly hold the device.
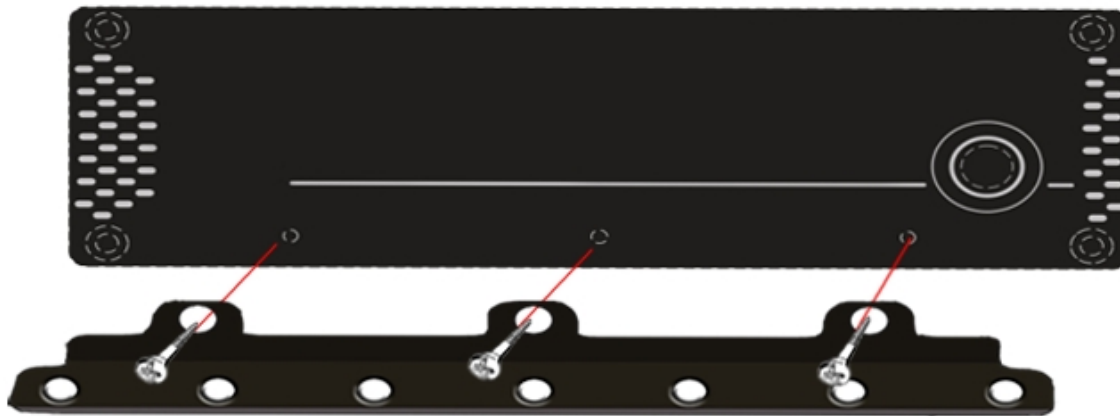
Fig. 4: **Front panel bracket mounting**

3.2.1 Assembly: Recommendations

We recommend that the device is mounted on a horizontal surface and the device is screwed to the said surface using the bracket slots.

> ⚠ **Warning**
>
> If the screws are not properly anchored, the strain of the cables connected to the router could pull the router out.

> 👉 **Note**
>
> The screws for mounting the device are not provided in the package, and have to be acquired separately.

> ⚠ **Warning**
>
> This equipment has been designed to run in a wide range of room temperatures, up to 70ºC (150ºF). Under these conditions, the metal surface can reach dangerously high temperatures that may cause injuries.
>
> The equipment must be placed in a Restricted Access Location if it is installed in an environment where the room temperature exceeds 50ºC (122ºF). Only qualified personnel may have access to this area that, in addition, has to be secured by means of a lock, key, tool or by other safety means. The location will also be monitored by the relevant authorities
>
> Consider Restricted Access Location the spaces and cavities in the vehicle secured through a lock, key, tool or by some other means of security, where only trained personnel can access. The vehicle trunk is a non-Restricted Access Location.
>
> If the equipment is going to be installed in a non-Restricted Access Location where untrained service personnel can access, the equipment must be mounted inside a separate compartment like a Security Lock Box

Fig. 5: **Security LockBox**

3.2.2 Outline drawing

An outline drawing is provided for proper installation.

Fig. 6: **Outline drawing**

3.3 Power Source

The **Teldat H Automotive+** router family is powered using direct current (DC).

Workplace Conditions. Main Characteristics:

- Avoid humid and or dusty locations.

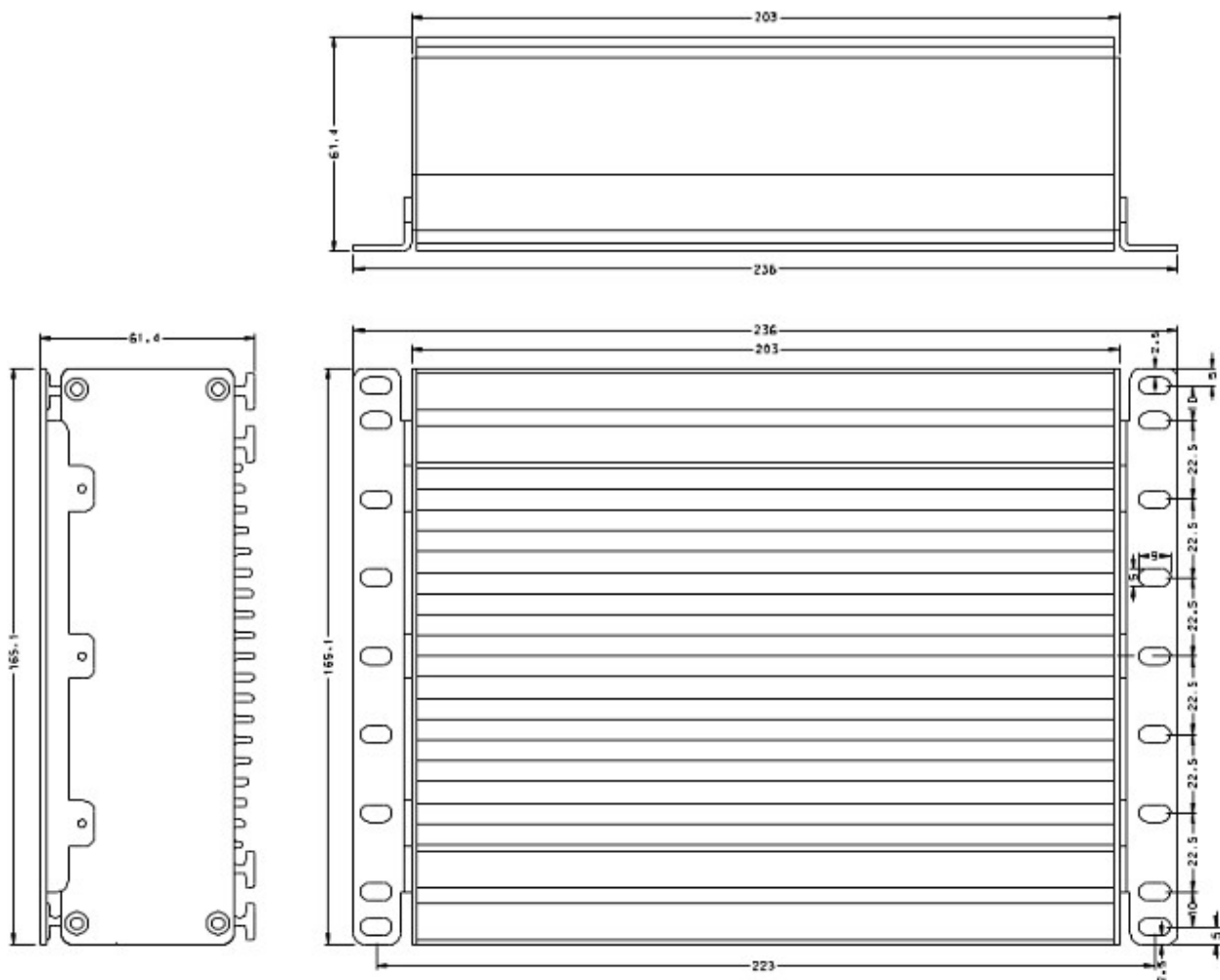- Direct exposure to sunlight should be avoided as well as other heat sources. The device should not be placed amongst papers, magazines or other elements that could hinder natural air circulation.

- The device should not be placed very close to strong electromagnetic fields such as speakers, engines, etc.

- The device should not be mounted in the driver's area of the vehicle or areas where it can distract the driver.

- Knocks and/or strong vibrations should be avoided during transport, operation and storage.

- The device should be mounted in accordance with accepted aftermarket practices and materials.

> ⚠️ **Warning**
>
> The electric current in power cables, telephone lines and communication cables is dangerous. To pre-vent electric shocks, before installing, handling or opening the equipment covers, connect and discon-nect the cables following the steps set forth in *Connecting* on page 10 and section *Disconnecting* on page 10 .

3.3.1 Connecting the power cable to the vehicle

The device power supply cable must be connected to the vehicle's fuse box. Always follow the vehicle manufac-turer's recommendations for electrical accessories connection.

Generic connection guidelines are:

- Disconnect the positive battery cable from the vehicle's battery post.

- Locate an empty fuse slot with fuse ratings in the range 5 A - 10 A.

- Terminate the cable conductors with suitable crimp connectors, fuse tap or bare wires (depending on the fuse box connectors).

- Connect the BATTERY conductor to the fuse connector.

- Connect the GND conductor to a battery ground connector.

- Optionally, IGNITION conductor can be connected to the vehicle ignition switch if available.

- It is recommended to install an approved vehicle circuit breaker.

- Insert the new fuse into the fuse slot.

- Connect the positive battery cable to the vehicle's battery post.
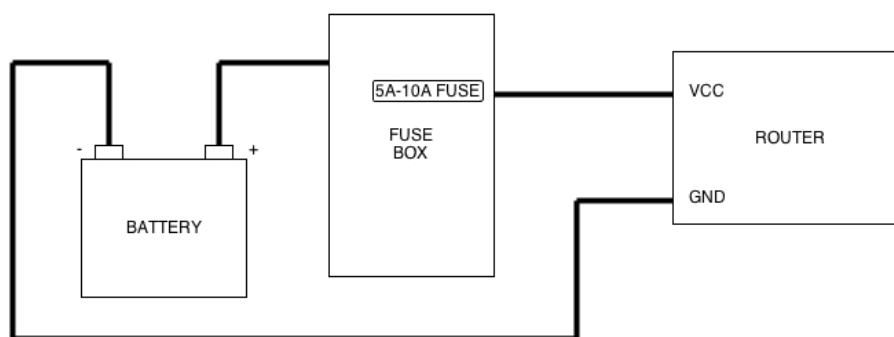
Fig. 7: **Connection of Cable to vehicle power source**

All components used in the connection to the vehicle should be UL Listed and comply with the regulations of the country where the installation takes place.

The cabling should be separated from other wiring in the vehicles and should be routed away from sharp edges.

The power supply cable goes from the fuse panel to the router along the vehicle wall, ALWAYS inside the vehicle cabin and WITHOUT crossing the vehicle's firewall protection.

3.3.2 Connecting the power cable to the device

To terminate the cable into the connector follow the instructions below:

Strip the cable, shorten the shield, strip the single wires, and push the pressure nut onto the cable. Slide the wires through the sleeve housing and connect, stick shielding foil around the shortened shield, in the case of straight sleeve housing, gently twist the wires together, screw sleeve housing to the plug insert, screw the pressure nut tight.
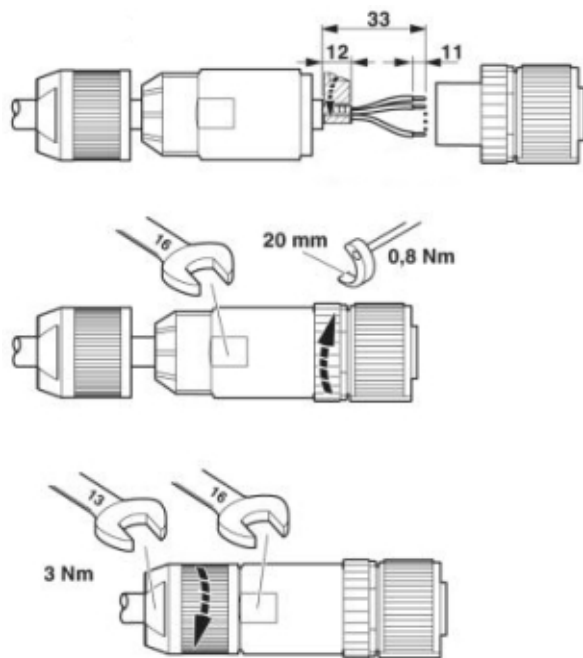
Fig. 8: **Terminate the cable into the connector**

To connect the power supply source to the device, please follow the steps given in section *Connecting* on page 10.

> ⚠ **Warning**
>
> To avoid electric shocks, residual current circulation and other unwanted effects, also affecting communications, the following is recommended:
>
> All interconnected communication devices should be plugged to THE SAME GROUNDED POWER OUTLET, which should at the same time be of good quality (lower than 10 ohms).
>
> Whether the workplace is provided with an uninterrupted power supply system (UPS), regulated supply or it is independent from the rest (such as lighting, etc.); it is highly recommended that all data devices should be connected to the same power source. This will avoid operating and premature aging problems of drivers and other components.

3.3.2.1 Connecting

• Make sure that the power supply cable is not connected to the device.

• Connect the data cables.

• Locate the 12 - 24 V DC connector, which is found on the rear part of the device.

• Insert the power cable connector.

3.3.2.2 Disconnecting

• Disconnect the power supply cable from the device.

• Disconnect the data cables.

3.3.2.3 Power connector pinout

PIN	Signal
1	GND
2	BATTERY / VCC
3	ACC / IGNITION
4	NC

3.3.3 Cable features

In the United States and Canada, the cable used should be a UL Listed, SAE type GPT Cable, min 18AWG.

> **Note**
>
> The cable approvals may depend on the requirements set in the country where the equipment is going to be installed. The cable must always be 18 A WG or greater.

3.3.4 Replacing the lithium battery

The router has an internal lithium battery to maintain the internal clock.

To replace said battery, you need to open the device's upper casing. To do this, you need to remove the screws located in the upper part of the front and rear panels.

> **Warning**
>
> There is a risk of the battery exploding if it is replaced with one that is not recommended or one of a different type. Please dispose of the used batteries in accordance with the environmental recycling instructions given in this document.

3.3.5 Configuring Power Management

The **Teldat H Automotive+** is endowed with a power management system that allows the following:

- the device will only switch on when the vehicle has been switched on.

- when installed, the device switches off a short time after the vehicle has been switched off, i.e. there is a slight delay with respect to the vehicle being switched off. The purpose of this is that the device, when installed, does not disconnect during short stops.

This feature is configured through the internal microswitches (**SW100**): the duration of the delay however is configured through the configuration command.

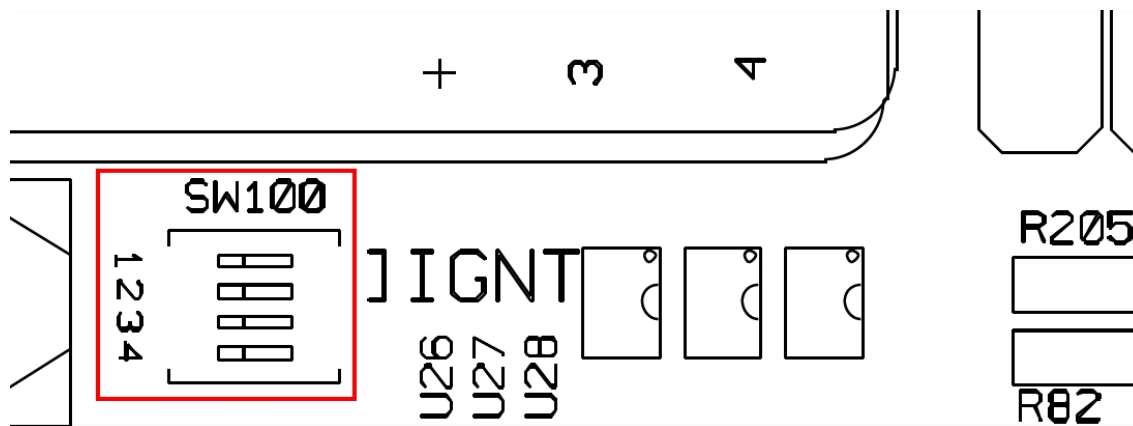The microswitches are located in the device, as shown in *Fig. 9* on page 12.

Fig. 9: **Power management switch**

3.3.6 Deactivating Power Management

The SW100 microswitches 1 and 2, labeled as IGNITION, must be in the OFF position.

3.3.7 Activating the Power Management

The SW100 microswitches 1 and 2, labeled as IGNITION, should be in the ON position

> ⚠️ **Caution**
>
> This is a factory setting (i.e. the devices are already configured in this mode on exiting the factory).

In this operating mode, the device expects to be constantly powered and the ACC / IGNITION signal operates as a switch. When power is applied to the device (BATTERY /VCC) the device remains switched off. It will only switch on when the signal (+12 V or +24 V) is applied by the ignition pin (ACC / IGNITION).

Similarly, if the ignition signal deactivates once the device has switched on, the device remains switched on for the period of time configured through the "**set ignition-off-powerdown-timer <value>**" command.

```
*
*p 4

Config>set ?
  application-active         Permits you to select the code used to boot the router
  console                    Set console configuration
  contact-person             Assign a name or identification to the contact-person
  data-link                  Type of data link for a WAN line
  default-conf               Restores the default configuration
  file-cfg                   Configure a configuration file as active
  ftp                        Permits you to access the FTP configuration menu
  host-location              Physical location of the router
  hostname                   Assign a name to a device
  ignition-off-powerdown-timer  Configure the time to router power down after car
                             ignition off
  inactivity-timer           Configure the maximum inactivity time
  login                      Configure login options
  password                   Configure the device access password
  pool                       Number of bytes assigned to each memory pool
  schedule-restart           Allows to configure router reset schedule
  telnet                     Access the TELNET protocol configuration
  web-probe                  Access the Web probe configuration
Config>set ignition-off-powerdown-timer ?
  <1..1440>    Power down timeout in minutes
  disabled     Disable ignition off power down timer
Config>set ignition-off-powerdown-timer 10
Config>
```

For further information on this command, please see manual Teldat- Dm704-I Configuration and Monitoring.

3.4 Protection Fuse

The **Teldat H Automotive+** router family has an internal protection fuse incorporated with the aim of preventing damage to the device and to the surrounding area

The following image shows where the protection fuse is located (F1).
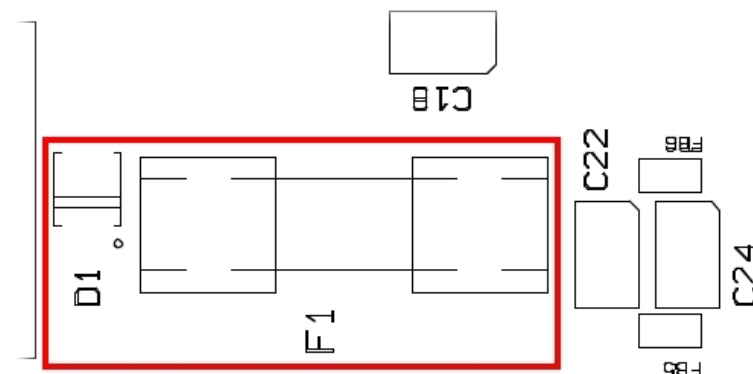
Fig. 10: **Protection Fuse**

In cases where the device is not functioning, please check that the fuse is correctly installed and has not blown.

Protection fuse: Characteristics	
Normal current value	3,15A
Voltage	250V
Type	FSF

> ⚠️ **Warning**
>
> The fuse must have the characteristics indicated by Teldat S.A..

3.5 Microswitches

The **Teldat H Automotive+** routers have a block of 8 microswitches available that are used for maintenance and test tasks. In this case, they are only used to load the default configuration.

This block of microswitches can be found inside the **Teldat H Automotive+** routers. You need to remove the top casing in order to handle them.

These switches should not be handled by the user other than to establish the default configurations.

> 👉 **Note**
>
> In order for the device to operate correctly, all the microswitches must be in the OFF position.

3.5.1 Procedure to ignore the configuration

The following steps should be carried out if you have to discard the whole configuration of the device (for instance, if you cannot remember the password).

• Turn off the device through the ON/OFF switch.

• Using a screwdriver, move microswitch **'5'** to the ON position.

• Turn the device on with the ON/OFF switch.

When the device is switched on, a message similar to the one shown below will appear on the configuration console:

```
***************************************************
***************************************************
***************************************************


BOOT CODE VERSION: 04.09  Feb 13 2013 17:45:12
  gzip  Feb 13 2013 17:39:06
P.C.B.: 19  MASK:0C10  Microcode:00E1
START FROM FLASH
BIOS CODE DUMP....................
BIOS DATA DUMP....
End of BIOS dump



BIOS CODE VERSION: 04.09
CLK=400000 KHz   BUSCLK=100000 KHz   PCICLK=33333 KHz   L0
Date: 07/13/10, Tuesday          Time: 09:11:38


SDRAM size: 64 Megabytes
   BANK 0: 64 Megabytes (detected)
MMU Mode: Dynamic
I_Cache: ON
D_Cache: ON    Write-Back
FLASH: 16 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 8192 Bytes.
SWITCH 10/100
CELLULAR PCM
GPS
SECURITY ENGINE
PCI device: Host bridge
  (Bus: 0, Device: 0, Function: 0)
  (Vendor: 0x1057, Device: 0x18C1)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Slot 1 - PCI device: serial bus controller
  (Bus: 0, Device: 10, Function: 0)
  (Vendor: 0x1131, Device: 0x1561)
  (Subs. Vendor: 0x5444, Subs. Device: 0x3700)
Slot 1 - PCI device: serial bus controller
  (Bus: 0, Device: 10, Function: 1)
  (Vendor: 0x1131, Device: 0x1561)
  (Subs. Vendor: 0x5444, Subs. Device: 0x3700)
Slot 2 - PCI device: Ethernet controller
  (Bus: 0, Device: 29, Function: 0)
  (Vendor: 0x168C, Device: 0x0029)
  (Subs. Vendor: 0x168C, Subs. Device: 0x2096)
Current production date: 12 10
Current software license: 29 12
S/N: 777/000127
BIOS MAC Add: 00-a0-26-a4-00-1b
>>
........
TRYING APP CODE DUMP
   (CONFIGURED) APPCODE1.BIN ver.: 0.11.0.01 0.0.0.0.......
.......................................................
.......................................................
...................
APP DATA DUMP.......................
Running application
Default configuration used
Parsing text mode configuration ...
Configuration parsed
Initializing
```

```
Press any key to get started
```

At this point, you can set microswitch **'5'** in the OFF position (you don't have to turn off the device). Consequently, the next time you restart the device, the saved configuration is adhered to.

3.6 RESET Button

The **Teldat H Automotive+** router family has a button labeled RESET on the rear panel of the device. This button is physically protected so it isn't accidently pressed. A sharp pointed object is needed to activate it.

The features of the reset button are described below.

3.6.1 Rebooting the device

Once the device is operating normally, if you press the RST button, this will restart.

3.7 Data Connections

The **Teldat H Automotive+** router family has the following data connectors:

3.7.1 4-port Ethernet Switch

The **Teldat H Automotive+** router family incorporates a 4 port Switch, 10/100 BaseT with automatic MDI/MDIX to connect to a local area network (LAN). This device has a LNK LED indicating the connection status and a 100 LED indicating connection rate.

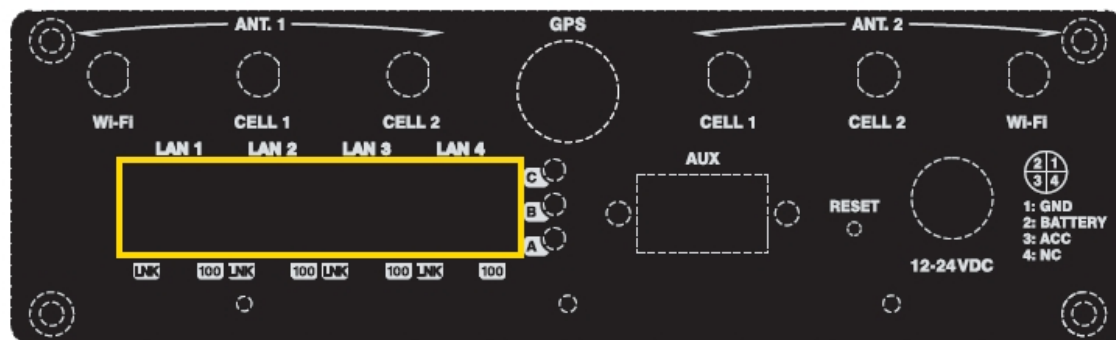Please pay careful attention to the labeling to avoid confusing this switch with other types of ports.

Fig. 11: **LAN switch ports (4)**

3.7.2 AUX Connector

The **Teldat H Automotive+** router family has a DB9 female connector on the front panel referred to as " **AUX.**", which can be used as a configuration port for the router or as a V.24 asynchronous serial port through a configuration command. The behavior or functionality of this interface must be previously configured. By default, this interface is configured in the router's configuration port mode. This section only refers to the connection to operate in asynchronous port mode.

This interface allows you to connect asynchronous serial devices that do not need hardware control signals. E.g. this permits the connection of external modems or an asynchronous PPP WAN.

Another interesting feature of this port is the possibility of using it as a GPS data source, in NMEA sentences (GPS-DATA).

This interface only operates in compliance with the V24 norm; it does not have control signals and only has data signals. Therefore, this interface cannot control hardware flow. It does, however permit software flow control (XON/XOFF).

You cannot configure parity in MARK and SPACE modes.

In order to configure this, you need to connect the **AUX** port to an asynchronous terminal (or to a PC with terminal emulation).

To use it as a configuration port for the router, please see section *Connecting to the device* on page 24.
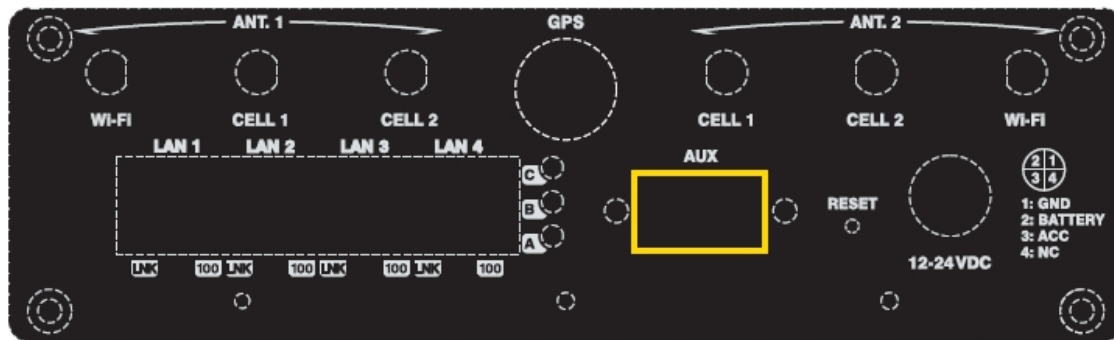

Fig. 12: **AUX connector**

3.7.3 Connecting to a WWAN Antenna (Cell connectors)

The **Teldat H Automotive+** routers may have two or four connectors to connect the WWAN antennas, depending on the number of WWAN modules incorporated in the device.

To assemble and dismantle the antennas, simply screw the antenna cable into the connectors labeled CELL1 and CELL2, which are located on the front of the device.

Antenna installation is essential in the **Teldat H Automotive+** routers in order to improve the quality of the signal received and transmitted by the Wireless WAN module (GPRS, UMTS, HSDPA, HSUPA, HSPA+, LTE, etc.).

> **Note**
>
> - To achieve optimum performance, the router should always have the WWAN antennas installed.
>
> - The device must have the corresponding software license installed to ensure the *Wireless WAN* interface is operative.

There are some cellular telephony technologies that use the antenna diversity mechanism to improve the quality of the received signal (HSUPA, HSPA+, LTE, CDMA EV-DO, etc.). Consequently, the **Teldat H Automotive+** routers have two connectors incorporated (ANT.1 and ANT.2) for each module installed in the device (CELL1 and CELL2).

• The MAIN antenna for each module (CELL1 and CELL2) is installed in the ANT.1 connector.

• The auxiliary or DIVERSITY antenna for each module (CELL1 and CELL2) is installed in the ANT.2 connector.

Module 1	Module 2
ANT.1 CELL1 -> MAIN Antenna	ANT.1 CELL2 -> MAIN Antenna
ANT.2 CELL1 -> DIVERSITY Antenna	ANT.2 CELL2 -> DIVERSITY Antenna

The following image shows you where to find the antenna connectors for the CELL1 module.
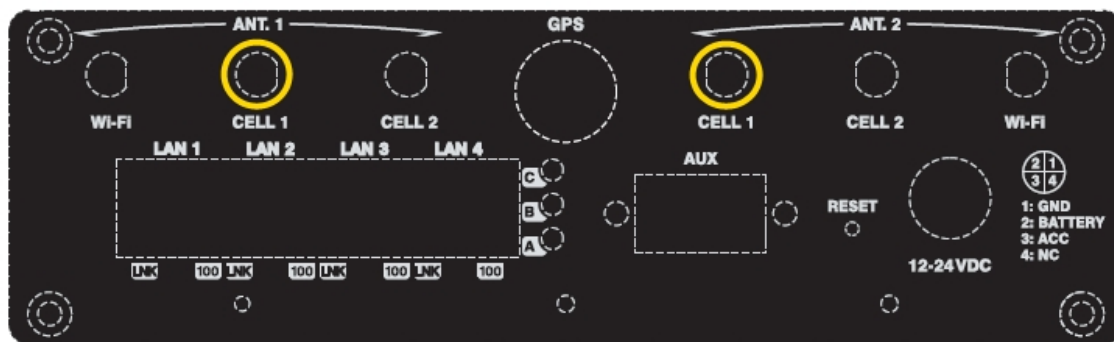
Fig. 13: **Antenna connectors for WWAN 1 (with diversity)**

The following image shows you where to find the antenna connectors for the CELL2 module.
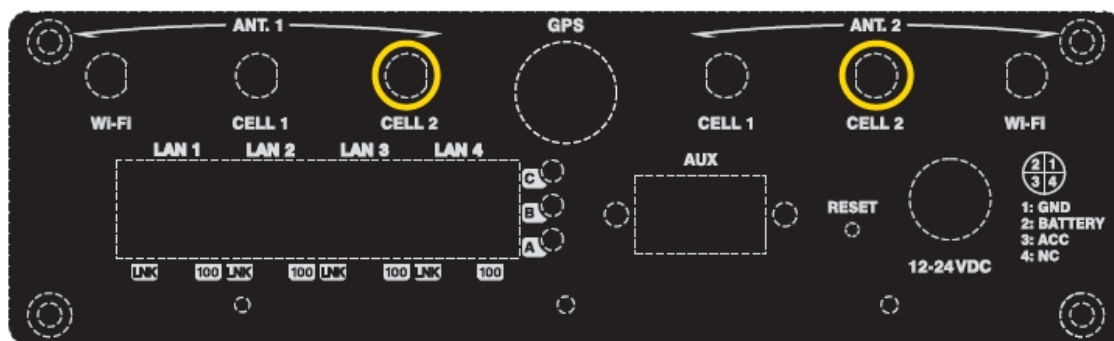

Fig. 14: **Antenna connectors for WWAN 2 (with diversity)**

The device incorporates two WWAN antenna connectors (**ANT.1** and **ANT.2**) for each module.

Depending on the technology you use for the connection, you will need to use one (e.g. GPRS) or two antennas (e.g. LTE).

You must always install the antenna for the **ANT.1 (Main)** connector (mandatory). The **ANT.2 (Ext.Diversity)** antenna connector is optional.

For some models, in cases where you are not going to install the ANT.2 Ext Diversity antenna, you need to suitably configure the router, disabling this antenna, in order to obtain optimum performance from the device.

When you install both the ANT.1 Main and the ANT.2 Ext.Diversity antennas, the minimum distance between them must be 7 cm and the maximum recommended distance is 25 cm.

In order to achieve optimum features, the installed radio frequency accessories (antennas and cables) should be those recommended by Teldat.

Teldat has a series of accessories that allow the **Teldat H Automotive+** routers to be installed in different locations.

3.7.3.1 Positioning the antenna

The antenna orientation and its location with respect to other wireless devices and radiation devices (such as communication devices, personal computers, etc.) can significantly influence device performance.

The antennas transmit and receive radio signals. Performance is also affected by environmental factors such as the distance between the device and the base station, physical obstacles and other interferences due to radio frequencies (RF).

In order to achieve the best coverage, carry out the following instructions:

• Whenever possible, place the antenna where there are no physical obstacles. Obstacles between the antenna and the base station degrade the wireless signal. Place the antenna above ground level and ensure that it is suitably orientated towards the nearest base station.

• Density of materials also affects the antennas. Place them away from any type of wall, metal screens, mirrors, etc.

• Do not place the antenna near columns that can produce shadow areas and reduce the coverage zone.

- Keep the antenna away from metal pipes such as canals air-conditioning.

- Please bear in mind that other wireless devices such as telephones, microwaves, etc., can temporarily interfere with the quality of the wireless signal.

- We do not recommend that you install the antennas near or between racks containing communication devices, computers, etc. Use an extension cable and place the antenna outside.

The following recommendations are applicable to all wireless devices:

- Do not touch or move the antenna while the device is transmitting or receiving.

- Whenever the antenna is transmitting, do not touch any equipment that contains devices that radiate very close to, or touching, any exposed part of the body (particularly the face and eyes).

- Do not install the device in areas where the atmosphere is potentially explosive.

- Wireless devices can cause interference in other devices. Do not use the device in areas where medical equipment is installed.

3.7.4 Connecting the Wireless LAN Antenna (Wi-Fi connectors)

The **Teldat H Automotive+** routers have two connectors to connect an external antenna which improves the quality of the signal received and transmitted through the Wireless LAN module. This module is optional; it is possible that your device does not have Wireless LAN and consequently no antennas. To assemble and disassemble the antennas, simply screw antennas' cable connectors into the connectors labeled WI-FI.
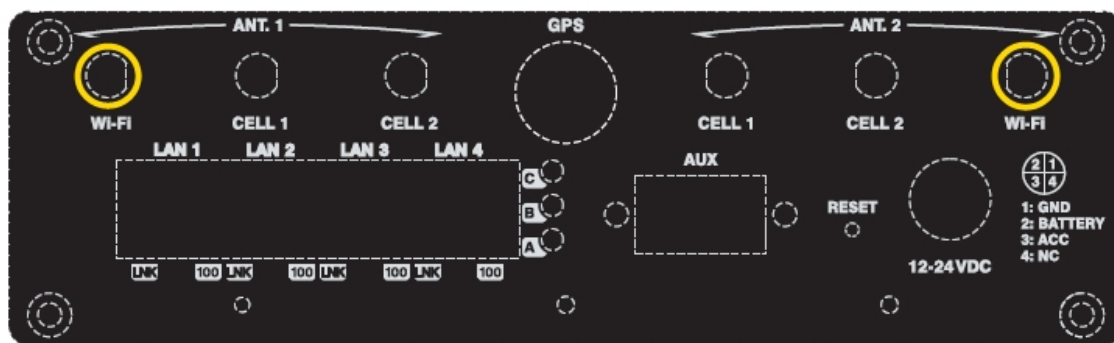

Fig. 15: **ANTENNA connectors for the Wireless LAN**

So that the Wireless LAN interface is operative, the device must have a plug-in Wireless LAN card and the corresponding software license. If your device does not have a Wireless LAN module, you can obtain this later on. The manual accompanying this module will indicate how to install it, as well as the corresponding antenna cables in the device.

3.7.5 Connecting the GPS antenna

The **Teldat H Automotive+** routers have an additional connector to connect a GPS external antenna. This module is optional, so your device may not have internal GPS and, consequently, no antenna. To assemble and disassemble the antenna, simply screw the antenna cable connector into the connector labeled GPS located on the device front panel.
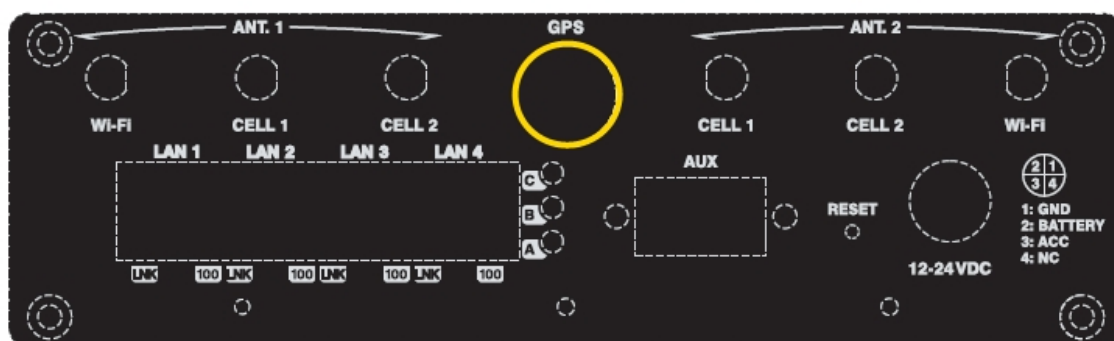

Fig. 16: **GPS Antenna connectors**

The device allows to connect both active and passive GPS antennas, with excellent filtering for incoming signals and provides 3.3 V power.

Chapter 4 Installing the SIM card

The **Teldat H Automotive+** routers have a Wireless WAN interface, which, in order to operate, may require at least one SIM card to be inserted in the device.

Certain services (CDMA) provided by some carriers in a few countries that do not require SIM cards. In installations where a SIM card is required, you must always insert at least one SIM card.

The **Teldat H Automotive+** has two SIM trays. Both are located inside the device.

The **Teldat H Automotive+** can incorporate one or two Wireless WAN modules.

• If the device has two modules, a SIM tray is automatically assigned to each module.

• In devices where there is only one WWAN module installed and only one SIM card is used, the latter can be placed in either one of the two SIM trays; however please must bear in mind it is essential that the router is configured to select the appropriate tray

In this case, in addition to having 2 SIM trays, you can carry out some special configurations. One example of this type of configuration is when you install two SIMs where one acts as backup to the other. In order to execute this type of configuration, it is essential that you identify the tray to be associated to each SIM (as each SIM requires different configuration parameters).

⚠️ **Warning**

This device is compatible with 1.8 V and 3 V SIMs. Do not install SIMs that do not support these voltages.

⚠️ **Warning**

Never install the SIM card when the device is switched on.

Always disconnect the device from the main power supply before inserting the internal SIM.

Always disconnect the device before removing the casing to get to the internal SIM.

When inserting the SIM card, please protect yourself against electrostatic discharges (ESD).

Do not touch the SIM card connectors.

To access the internal SIM, you need to open the upper casing of the device. To do this you need to undo the four screws: two are located on the upper corners at the front of the device and the other two on the upper corners at the rear.

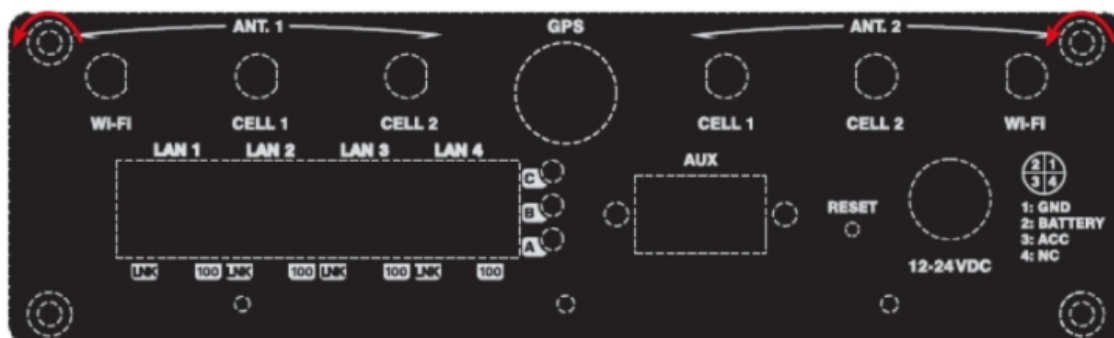*Fig. 17:* **Upper screws on the rear panel**

Fig. 18: **Upper screws on the front panel**

4.1 Identifying the SIM trays

When there are two modules installed, the SIMs' tray assignment is set and is as follows:

- Module MD1 -> SIM #1
- Module MD2 -> SIM #2

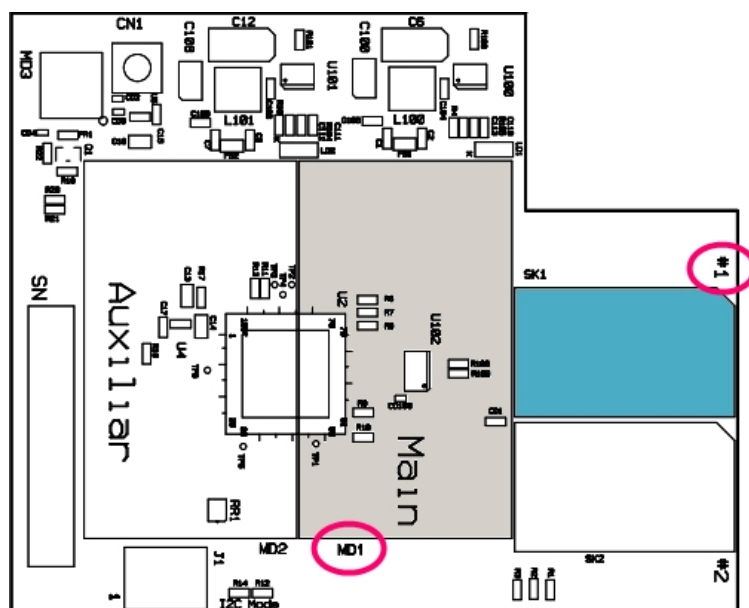The location of the modules and the SIM trays are shown in the following figures.

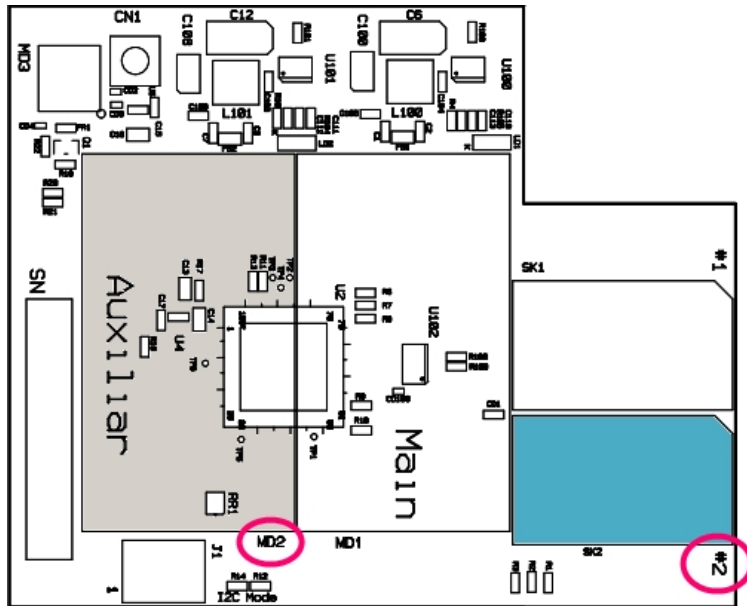*Fig. 19:* **SIM tray #1 for MD1 module (main)**

Fig. 20: **SIM tray #2 for MD2 module (auxiliary)**

In devices where a single WWAN module is installed (MD1) and when only one SIM card is going to be used, it can be inserted into either of the two SIM trays (#1 or #2). However, you must remember that you will need to suitably configure the router so it selects the appropriate tray.

• Module MD1 # SIM #1 (default) or SIM #2

4.2 Installing the SIM

In order to insert a SIM card in the internal tray, locate the retaining flange (metal fastening with OPEN and LOCK on it) so you can open the tray and place the SIM card on it. The steps are as follows:

(1)   Push the fastening in the direction indicated by the arrow with the Word OPEN.

(2)   Open the upper part of the tray.

(3)   Fully insert the SIM card using the guides.

(4)   Return the tray to its original position.

(5)   While pressing on the tray, push the fastening in the direction indicated by the word LOCK so it is firmly held in place.
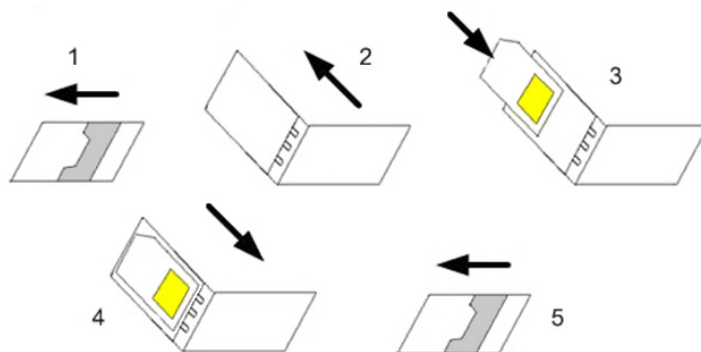

Fig. 21: **Instructions on how to insert the SIM in the internal tray**

4.3 Verizon Wireless SIM cards

Regarding Verizon Wireless, the APNs (*Access Point Name*) are provided OTA (*Over The Air*). To carry out APNs provided through OTA, you must insert the SIM card in the device, connect the antennas to the device and switch it on. Provisioning can take up to 10 minutes. You should not, at any point, either switch off the device or restart it during this time period. To verify that the APNs provisioning process has been successful, check the list of APNs through the "*module profile list*" command from the cellular base interface monitoring menu. If the SIM card has contracted a different service from the dynamic IP basic service, profile 3 will have a different APN to the *vzwinternet*, which is the default profile for dynamic IP connections to the Verizon Wireless network.

If, for any reason, the provisioning process is unsuccessful and the device doesn't connect to the Verizon network, you can repeat the process in the following way. First of all, restore the module profiles table to the manufacturers default values using the "*module profile restore*" command. Once the command has executed, switch off the device, remove the SIM card, insert it in another device (e.g. a USB modem) and connect it to the Verizon Wireless network through this device. Once connected, disconnect the USB modem, remove the SIM card and insert it in the router and switch it on in order to repeat the provisioning process. Remember that this can take up to 10 minutes and you shouldn't either switch off nor restart the device or the LTE module. Once the provisioning process has finished, the device registers in the network and the data call establishes.

Appendix A Technical Information

A.1 Troubleshooting

Below, you will find a table that will help you solve problems during the installation of the device. If you cannot solve the problem, please ask your distributor for further information.

Problem	Solution
None of the LEDs lights up on the device.	Check the power supply to the device (power supply cable, main power outlet).
The *LNK* LED does not light up in green.	Check that the LED after the LNK is lit up; if it isn't, check the Ethernet cable and the network connection.
LED *A* remains OFF.	Check that the SIM card has been inserted correctly, or Check that the SIM PIN is correct, or Check that the antenna is properly installed (been screwed in correctly), or Get your technical service to check that the device is in the optimum position for the service.

A.2 Upgrading the software

The **Teldat H Automotive+** routers can be upgraded to new releases. Please ask your distributor for further details on new releases.

There are several ways to upgrade one of our routers. Please read the corresponding manual on software "Teldat-Dm748-I Software Updating" for further information.

The software required to upgrade one of our routers is supplied in a format known as **distribution**. This consists of a single file which contains all the files needed to update your device as well as in-depth information on the contents of the files.

The **Teldat H Automotive+** incorporates independent modules for the Wireless WAN interface. You can use modules from various manufacturers, or even various modules from the same manufacturer, depending on the technology used. Generally the modules' firmware is independent of the device's software. There is an UPGRADE file for each Wireless LAN module. Please ask you distributor for the correct UPGRADE file for the module in your device. The document describing the Cellular interface (manual Teldat-Dm 781-I) explains how to UPGRADE the module.

A.3 Connecting to the device

There are two ways to access the device CLI:

- Through the AUX connector.
- Through the Telnet protocol.

A.3.1 Connecting through the local console (AUX connector)

The **Teldat H Automotive+** routers have a DB9 female connector on the rear panel referred to as " **AUX.**" which provides access to the device's CLI or this can operate as an asynchronous serial port. The behavior or functionality of this interface must be previously configured. By default, this interface is configured in local console mode. This section only refers to the connection to operate in local console mode.
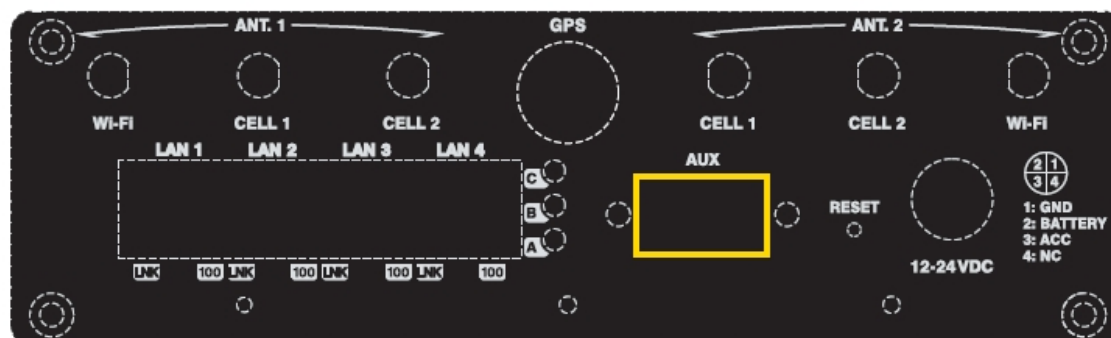

Fig. 22: **AUX connector**

In order to configure this, you must connect the "**AUX.**" port to an asynchronous terminal (or to a PC with terminal emulation).

> **Note**
>
> Configuration for the terminal must be as follows:
>
> - Speed: 9600 bps.
>
> - Eight data bits.
>
> - One stop bit.
>
> - No parity bit.
>
> - No type of flow control.

Connection to the configuration port can be carried out using a DB9 Male connector to a DB9 Female. In cases where the terminal has DB25 connectors, you will need to use an additional adapter.
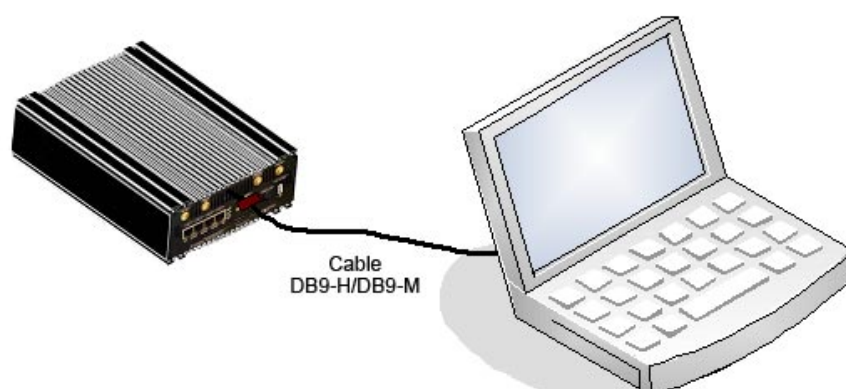

Fig. 23: **Connecting for configuration**

A.3.2 Connecting through OP terminal (LAN 1...4 connectors)

The **Teldat H Automotive+** router includes a default configuration that activates if the device has not been previous configured.

The router's default configuration establishes the following IP address and access mask:

- IP Address: 192.168.1.1
- IP Mask: 255.255.255.0

Note

Some devices leave the factory with a customized configuration for a specific client. This personalization can mean that the default configuration may be different from the one shown above.

This initial configuration means you can access the device's configuration console through the Telnet IP protocol. To do this, carry out the following steps:

- Configure the Ethernet interface on the IP terminal (normally a PC) using the IP address from the following range [192.168.1.2, 192.168.1.254] and mask 255.255.255.0. E.g. 192.168.1.2, 255.255.255.0.
- Connect the IP terminal's Ethernet interface to any of the Ethernet Switch ports on the **Teldat H Automotive+** router (the LAN1...4 connectors) through the Ethernet cable (RJ45) provided.
- Start a Telnet session from the IP terminal to IP address 192.168.1.1 (the **Teldat H Automotive+** router's default address).
- The default configuration does not ask for login credentials (user/password) to access the console.

For further information on how to fully configure the device, please see the manuals included on the CD supplied with the router.

A.4 Connectors

A.4.1 LAN Connector
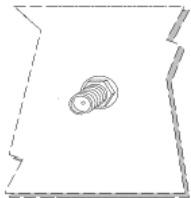
RJ45 LAN	RJ45 PIN	LAN
	1	Tx+(input)
	2	Tx- input)
	3	Rx+(output)
	4	--
	5	--
	6	Rx-(output)
	7	--
	8	--

A.4.2 WWAN Connectors

	PIN	ANT
	Internal	RF in/out
	External	GND
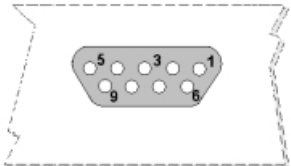
A.4.3 WLAN Connectors

	PIN	ANT
	Internal	RF in/out
	External	GND
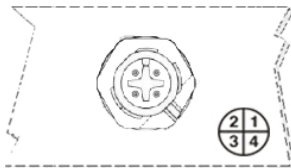
A.4.4 GPS Connector

	PIN	**ANT**
	Internal	RF in/out
	External	GND

A.4.5 AUX Connector

DB9 CONFIGURATION	**PIN**	**CONF**
	1	--
	2	RxD
	3	TxD
	4	--
	5	GND
	6	--
	7	--
	8	--

A.4.6 POWER Supply Connector

	PIN	**SIGNAL**
	1	GND
	2	BATTERY / VCC
	3	ACC / IGNITION
	4	-

A.5 Technical Specifications

A.5.1   Architecture hardware

PROCESSORS	FreeScale PowerPC MPC82xx
MEMORY	64 Mbytes in SDRAM
STORAGE UNIT	FLASH memory (16 Mbytes) EEPROM 2Kbytes, NVRAM 128Kbytes

A.5.2 LAN Interface

PROTOCOLS	Ethernet (802.3)
PORTS	4 port switch managed through MDI/MDX autodetection
SPEED	10/100 Mbps (BaseT)
CONNECTOR	RJ45 Female

A.5.3 Wireless WAN Interface

STANDARDS	GPRS, UMTS, HSDPA, HSUPA, HSPA+, LTE … Depending on the wireless WAN version the device has incorporated.
SPEED	Depends on the wireless WAN version the device has incorporated. Please see the manual on the appropriate module.
CONNECTOR	2 RF SMA Female per module.
ANTENNA	Depends on the type of wireless WAN. Please see the manual on the antennas for Cellular interfaces.

A.5.4 Independent GPS Interface

STANDARDS	NIMEA
TECHNOLOGY	SiRF® star IV
FREQUENCY	1.575,42 MHz
CONNECTOR	RF FME Male
ANTENNA	Active 3.3 V max 80 mA

A.5.5 Wireless LAN Interface

STANDARDS	802.11n a/b/g 2x2
FREQUENCY	2.4 GHz / 5 GHz
SPEED	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps 802.11b: 1, 2, 5.5, 6, 9, and 11 Mbps 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps 802.11n: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54, and m0-m15
CONNECTOR	2 RF SMA RP Female

A.5.6 Configuration Interface

INTERFACES	This can be configured in two modes: *Asynchronous Port:* V24 DCE. Does not permit Hardware flow control. *Local Console:* V.24 DCE only 8-N-1, without flow control.
PROTOCOLS	*Asynchronous Port:* AT, PPP, GPS-DATA
SPEED	*Asynchronous Port:* 300 to 115.200 bps *Local Console*: 9.600 bps (configurable up to 115.200)
CONNECTOR	DB9 female, on the front panel of the device.

A.5.7 Power Supply

INPUT VOLTAGE	Nominal: 12-24 V DC, Absolute minimum: 10.8 V DC
	Absolute maximum: 36 V DC
INPUT CURRENT	2 A@12Vdc
FUSE	3,15 A 250 V AC Type: FSF
MAXIMUM POWER	With a WWAN module installed: 12 W
	With a WWAN+WIFI module installed: 15 W
	With two WWAN+WIFI modules installed: 19 W
ACC/IGNITION	Input voltage: +12 - 24 V DC
	Current: 7 mA@12Vdc, 14mA@24Vdc
	Control Levels:
	- ON: the same level as the INPUT VOLTAGE (+12 or +24 V DC)
	- OFF: GND or not connected.
CONNECTOR	Male M12, 4 PIN, A Codification

A.5.8 Dimensions and Weight

TYPE	Ruggedized casing with multiple support positions...
LENGTH x WIDTH x HEIGHT	238 x 165 x 62 mm
WEIGHT	0.9 kg

A.5.9 Environmental Specifications

TEMPERATURE	Operating: -25 ºC to 70 ºC
RELATIVE HUMIDITY	ON: 8 % to 85 %. ("non condensing")
	OFF: 5 % to 90 %. ("non condensing")

Appendix B Regulatory compliance and safety information

B.1 Recycling and the Environment

Please do not, under any circumstances, throw away any **Teldat H Automotive+** with normal domestic waste. Ask your local town hall for information on how to correctly dispose of them in order to protect the environment against e-waste. Always respect the current laws regarding waste material. Anyone found violating the environmental laws will be subject to fines and any additional steps established by law.

All the packing materials i.e. the cardboard box, plastic and any other packaging, together with the pieces making up a **Teldat H Automotive+**, must be recycled complying with the current active laws regarding recycling materials.

The below symbol with a cross over the rubbish container can be seen on the device. This means that, when a device reaches the end of its life, it must be taken to the official recycling/disposal centers where it must be disposed of in an environmentally responsible manner and separately from normal domestic waste.

B.2 Translated Safety Warnings

If the screws are not properly anchored, the strain of the cables connected to the router could pull the router out.

Если винты крепления закручены недостаточно плотно, маршрутизатор может упасть из-за натяжения подключенных к нему кабелей.

Si les vis ne sont pas fixées correctement, la tension des câbles raccordés au routeur pourrait tirer le routeur.

Si los tornillos no están bien anclados, la tensión de los cables del router podría hacer que el router se cayera.

This equipment has been designed to run in a wide range of room temperatures, up to 70ºC (150ºF). Under these conditions, the metal surface can reach dangerously high temperatures that may cause injuries.

The equipment must be placed in a Restricted Access Location if it is installed in an environment where the room temperature exceeds 50ºC (122ºF). Only qualified personnel may have access to this area that, in addition, has to be secured by means of a lock, key, tool or by other safety means. The location will also be monitored by the relevant authorities.

Оборудование функционирует при температуре внутри помещения до 70ºC (150ºF). При высоких температурах металлические поверхности сильно нагреваются, что может привести к ожогам.

Если температура, при которой будет работать оборудование, превышает 50ºC (122ºF), оно должно устанавливаться в местах с ограниченным доступом. С таким оборудованием может работать только квалифицированный персонал. Кроме того, необходимо запереть оборудование на замок или ограничить к нему физический доступ иным способом. Такие места установки оборудования также должны контролироваться соответствующими органами.

Cet équipement a été conçu pour fonctionner avec une large gamme de température ambiante, jusqu'à 70 °C (158 °F). Dans ces conditions la surface métallique peut atteindre des températures dangereuses qui peuvent causer des blessures.

Lorsque l'appareil est installé dans des endroits qui pourraient atteindre des températures ambiantes supérieures à 50 °C (122 °F), il doit être installé dans un Emplacement à Accès Restreint. Seul le personnel qualifié devrait avoir accès à l'Emplacement à Accès Restreint, qui en même temps doit être assurée par un verrou, une clef, un outil ou par d'autres moyens de sécurité et en outre contrôlé par l'autorité chargée de l'emplacement.

Este equipo ha sido diseñado para funcionar en un amplio rango de temperaturas ambiente, hasta los 70ºC (158ºF). En estas condiciones, la superficie metálica puede alcanzar temperaturas peligrosas que pueden causar lesiones.

Cuando se instale en lugares que puedan alcanzar temperaturas superiores a los 50ºC (122ºF), el equipo ha de instalarse en una zona de acceso restringido. Sólo el personal capacitado puede tener acceso a dicha zona que, a su vez, deberá estar protegida mediante un candado, una cerradura con llave, una herramienta u otras formas de seguridad. Además, las autoridades del lugar la someterán a vigilancia.

⚠️	Consider Restricted Access Location the spaces and cavities in the vehicle secured through a lock, key, tool or by some other means of security, where only trained personnel can access. The vehicle trunk is a non-Restricted Access Location. If the equipment is going to be installed in a non-Restricted Access Location where untrained service personnel can access, the equipment must be mounted inside a separate compartment like a Security Lock Box.
	Зона ограниченного доступа может являться местом или углублением в транспортном средстве, защищенном с помощью замка, ключа, инструмента или других средств защиты, доступ к которым может иметь только специально подготовленный персонал. Багажник транспортного средства не является зоной ограниченного доступа. Если оборудование устанавливается в месте, которое не является зоной ограниченного доступа, к которому имеет доступ персонал без надлежащей подготовки, оборудование должно устанавливаться внутри отдельного отсека, к примеру, в сейфе с кодовым замком.
	Considérez Emplacement à Accès Restreint les espaces et les cavités dans le véhicule assurés par un verrou, une clef, un outil ou par d'autres moyens de sécurité, où seul le personnel qualifié peut accéder. Le coffre du véhicule est un Emplacement à Accès Sans Restriction. Si l'équipement va être installé dans un Emplacement à Accès Sans Restriction où personnel de service non qualifié peut accéder, l'équipement doit être monté dans un compartiment séparé comme une boîte de serrure de sécurité.
	Considere como lugar de acceso restringido a los espacios y cavidades en el vehículo cerrados con llave u otros sistemas de seguridad, donde sólo personal capacitado pueda acceder. El maletero no se considera como una zona de acceso restringido. Si el equipo va a ser instalado en una zona de acceso público donde personal no capacitado pueda acceder, ha de montarse dentro de un compartimento separado como una caja de seguridad.
⚠️	The electric current in power cables, telephone lines and communication cables is dangerous. To prevent electric shocks, before installing, handling or opening the equipment covers, connect and disconnect the cables following the steps set forth in *Connecting* on page 10 and *Disconnecting* on page 10 .
	Электрический ток в кабелях и проводах может быть опасен для жизни и здоровья. Чтобы предотвратить поражение током, перед установкой оборудования, его обслуживанием и снятием панелей необходимо отсоединять кабели в соответствии с правилами, изложенными в соответствующем разделе.
	Le courant électrique qui circule dans les câbles d'alimentation, les lignes téléphoniques et les câbles de communication est dangereux. Afin d'éviter tout choc électrique, brancher, puis débrancher les câble en suivant les consignes préconisées dans chaque section avant d'installer, de manipuler ou d'ouvrir les caches de l'équipement.
	La tensión eléctrica de los cables de alimentación, de los cables de la línea telefónica y de los cables de comunicación es peligrosa. Para evitar descargas, antes de instalar, mover o abrir las cubiertas de este equipo, conecte y desconecte los cables siguiendo el orden que se detalla en los apartados "Conectar" y "Desconectar".

⚠	All interconnected communication devices should be plugged to THE SAME GROUNDED POWER OUTLET, which should at the same time be of good quality (lower than 10 ohms). Whether the workplace is provided with an uninterrupted power supply system (UPS), regulated supply or it is independent from the rest (such as lighting, etc.); it is highly recommended that all data devices should be connected to the same power source. This will avoid operating and premature aging problems of drivers and other components.
	Убедитесь в том, что все связанные устройства связи подключены к ОДНОЙ И ТУ ЖЕ ЗАЗЕМЛЕННОЙ ШТЕПСЕЛЬНОЙ РОЗЕТКЕ высокого качества (сопротивление не превышает 10 Ом). Проверьте, оборудовано ли рабочее место источником бесперебойного питания (ИБП), источником регулируемого питания, или оно является независимым от других систем (таким как освещение и т.п.); строго рекомендуется подключать все информационные устройства к одному источнику питания. Это поможет предотвратить эксплуатационные проблемы и преждевременное старение приводов и других деталей.
	Tous les dispositifs de communications interconnectés doivent être branchés sur la même prise correctement mise à la terre, qui doit être de bonne qualité (moins de 10 ohms). Soit le lieu de travail équipé d'un système d'alimentation sans interruption (ASI), alimentation régulée ou indépendante du reste (comme l'éclairage, etc), il est fortement recommandé que tous les dispositifs de données soient reliés à la même source d'alimentation. Cela permettra d'éviter des problèmes de fonctionnement et de vieillissement prématuré de drivers et d'autres composants.
	Todos los equipos de comunicaciones interconectados deberán estar unidos a UNA MISMA TOMA DE TIERRA, a ser posible de buena calidad (inferior a 10 ohmios). Si la instalación está dotada de un Sistema de Alimentación Ininterrumpida (SAI), alimentación estabilizada, o bien es independiente del resto (alumbrado, etc.), conecte todos los equipos de comunicaciones a la misma fuente de alimentación. Así, se ahorrará problemas de funcionamiento y envejecimiento prematuro de drivers y demás componentes.
⚠	There is a risk of the battery exploding if it is replaced with one that is not recommended or one of a different type. Please dispose of the used batteries in accordance with the environmental recycling instructions given in this document.
	Существует риск взрыва батареи, если она заменяется батареей, которая не была рекомендована или батареей другого типа. Утилизируйте использованные батареи в соответствии с указаниями по экологически безопасной переработке отходов, указанными в настоящем документе.
	Il y a risque d'explosion de la batterie si elle est remplacée par une autre qui n'est pas recommandée ou d'un type différent. S'il vous plaît disposez des piles usagées conformément aux instructions de recyclage de l'environnement figurant dans ce document.
	Existe el riesgo de que la batería explote si se reemplaza por una no recomendada o de un tipo diferente. Por favor, deshágase de las baterías usadas conforme a las instrucciones de reciclaje medioambiental que se incluyen en este documento.
⚠	This device is compatible with 1.8 V and 3 V SIMs. Do not install SIMs that do not support these voltages.

	Данное устройство совместимо только с SIM-картами 1,8 и 3 В. Не устанавливайте карты, не поддерживающие такое напряжение.
	Cet appareil est compatible avec des cartes SIM 1,8 V et 3 V. Ne pas installer de cartes SIM qui ne supporte pas ces tensions.
	Este equipo es compatible con SIMs de 1,8 V y 3 V. No instale SIMs que no soporten estas tensiones.
⚠️	Never install the SIM card when the device is switched on.
	Always disconnect the device from the main power supply before inserting the internal SIM
	Always disconnect the device before removing the casing to get to the internal SIM.
	When inserting the SIM card, please protect yourself against electrostatic discharges (ESD).
	Do not touch the SIM card connectors.
	Никогда не устанавливайте SIM-карты, когда устройство включено.
	Всегда отключайте устройство от сети электропитания перед установкой внутреннего SIM.
	Всегда отключайте устройство перед снятием обшивки, чтобы добраться до внутреннего SIM.
	При установке SIM-карты, пожалуйста, защитите себя от электростатических разрядов (ESD).
	Не прикасайтесь к контактам SIM-карты.
	N'installez jamais la carte SIM lorsque l'appareil est allumé.
	Débranchez toujours l'appareil de l'alimentation électrique principale avant d'insérer la carte SIM interne.
	Débranchez toujours l'appareil avant de retirer le boîtier pour accéder à la carte SIM interne.
	Lors de l'insertion de la carte SIM, protégez-vous contre les décharges électrostatiques (ESD).
	Ne touchez pas les connecteurs de la carte SIM.
	No instale nunca la tarjeta SIM con el equipo encendido.
	Desconecte siempre el equipo de la red antes de instalar el SIM interno.
	Desconecte siempre el equipo antes de desmontar la carcasa para acceder al SIM interno.
	Al insertar la tarjeta SIM, protéjase contra descargas electroestáticas (ESD).
	No toque los conectores de la tarjeta SIM.
⚠️	The equipment is intended to be installed by Service Personnel and only handled by qualified personnel. If not, the device may be damaged and malfunction.
	Оборудование должно эксплуатироваться квалифицированным персоналом; в противном случае устройство может быть повреждено и впоследствии работать неисправно.

	L'équipement est destiné à être installé par le Personnel de Service et seulement manipulé par du personnel qualifié. Sinon, l'appareil risque d'être endommagé et dysfonctionner.
	El equipo está diseñado para ser instalado por personal del servicio técnico y su manejo debe realizarlo personal cualificado. De lo contrario, el equipo puede resultar dañado y quedar inservible.
⚠️	This device contains elements that are sensitive to electrostatic surges and shocks. Therefore, it is essential when handling the equipment that an antistatic wriststrap is connected to the device chassis and that this is placed on an antistatic mat. Furthermore, it is crucial to avoid any kind of contact between the device components and necklaces, bracelets, rings, ties, etc.
	Это устройство содержит элементы, чувствительные к электростатическому скачков и ударов, поэтому очень важно при работе с оборудованием, антистатический браслет подключен к устройству шасси, и это находится на антистатический человека, и, кроме того избегая любого контакта между устройством компонентов и ожерелья, браслеты, кольца, галстуки и т.д.
	Cet appareil contient des éléments qui sont sensibles aux surtensions et les chocs électrostatiques. Il est donc essentiel lors de la manipulation de l'équipement de porter un bracelet antistatique relié au châssis de l'appareil et celui-ci placé sur un tapis antistatique, et éviter en outre toute forme de contact entre les composants du dispositif et des colliers, bracelets, bagues, cravates, etc.
	Este equipo contiene componentes sensibles a las sobrecargas y descargas electroestáticas. Por eso, durante la manipulación del equipo, utilice una pulsera antiestática conectada al chasis del equipo y colóquelo sobre una esterilla antiestática. Evite también el contacto de colgantes, pulseras, anillos, corbatas, etc.con cualquier componente del equipo.
⚠️	The fuse must have the characteristics indicated by Teldat S.A..
	Предохранитель должен иметь характеристики, указанные компанией Teldat S.A..
	Le fusible doit avoir les caractéristiques indiquées par Teldat S.A..
	El fusible debe tener las características indicadas por Teldat S.A..

B.3 Compliance

B.3.1 FCC Statement

B.3.1.1 Federal Communications Commission Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance

with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This product complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

B.3.2 IC Statement

B.3.2.1 CAN ICES-3 (A)/NMB-3(A)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par le ministère des Communications.