Teldat H Automotive Family

Installation Manual

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I Important Information

> ⚠️ **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 devices are provided as information guideline only. Some small modifications may exist in the actual device.

> ⚠️ **Warning**
>
> 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.
>
> 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.

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

Chapter 1 Description

1.1 Introduction

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 special characteristics, that allow them to bear extreme temperatures, these routers 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 to access data networks through cellular or mobile telephony technologies. Thanks to their modular design, these devices can quickly adapt to the latest technologies. The **Teldat H Automotive** family is, therefore, compatible with GPRS, EDGE, UMTS, HSDPA, HSUPA, CDMA 2000 1xRTT, CDMA Ev-Do, etc.

The **Teldat H Automotive** routers are suitable for a wide variety of IP scenarios: from providing simultaneous access to Internet for users of a private local area network, to adapting to teleprocess networks and SNA support. Their most common applications are:

• Access routers

• Backup for WAN networks

The **Teldat H Automotive** family offers access features for cellular technologies (GPRS, UMTS, HSDPA, HSUPA, etc.). The routers incorporate a four port Ethernet LAN Switch for local area networks and can incorporate a Wireless LAN MINI-PCI Module.

There are several **Teldat H Automotive** models, depending on the type of cellular technology incorporated:

• Teldat H1 HSDPA

• Teldat H1 HSUPA

• Teldat H1 EV-DO

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

Fig. 1: **Teldat H1 Automotive: External aspect**

Chapter 2 Installation

2.1 Connections

⚠️ **Caution**

Before connecting the router, please read the following instructions carefully!

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

⚠️ **Warning**

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 as follows:

To Connect	To Disconnect
Make sure that the power supply cable is not connected to the device.	Disconnect the power supply cable from the device
Connect all data cables	Disconnect the data cables
Connect the power supply cable to the device	

2.1.1 Power Source Connection

The **Teldat H Automotive** router family is powered with an external DC source.

To avoid electric shocks, residual current circulation and other unwanted effects, also affecting communications, the following is recommended:

⚠️ **Warning**

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.

The following image, shown in red, shows where the power connector is located.
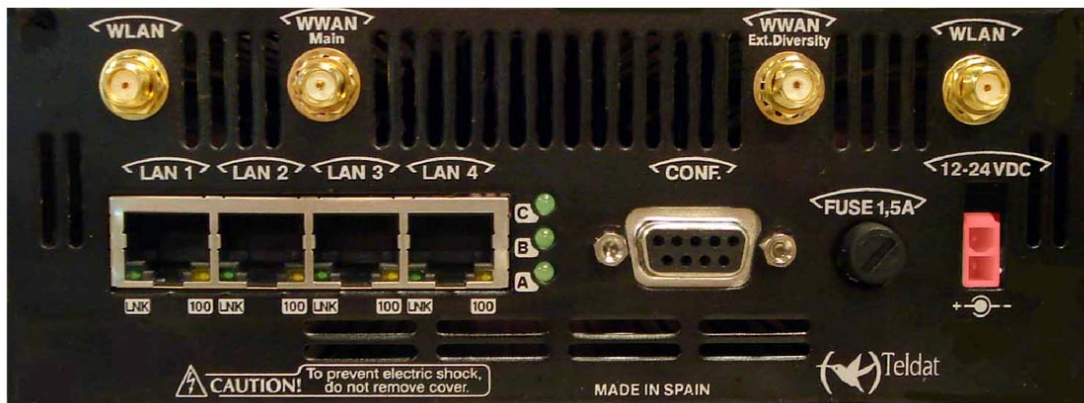
Fig. 2: **Power supply connection with external source**

To connect the power source to the device, follow the steps listed in the previous table: find the 12-24 V DC connector (located on the front panel of the device) and insert the power cable.

2.1.2 Protection Fuse

The **Teldat H Automotive** router family has a protection fuse to stop the device and its surrounding area from being damaged.

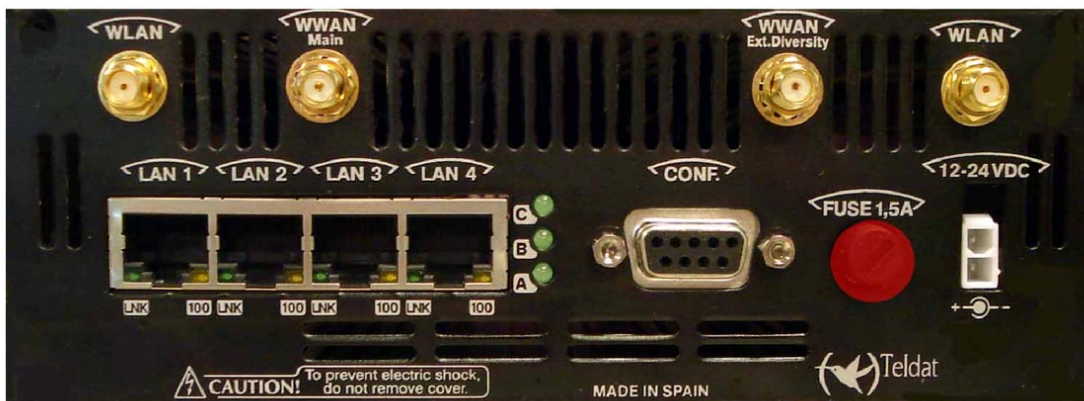The following image, shown in red, shows where the protection fuse is located.

Fig. 3: **Protection Fuse**

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

> ⚠️ **Warning**
>
> The fuse must have the characteristics indicated by Teldat. Its maximum current value is stated on the device's label or on its identifying label.

2.1.3 Data Connection

The **Teldat H Automotive** router family has the following available connectors. Depending on the model, some of these connectors may not be available:

SWITCH:

The **Teldat H Automotive** routers can incorporate a 4 port Switch, 10/100 BaseT with automatic MDI/MDIX to connect to a local area network (LAN); this device has a 100 LED indicating connection at 100 Mbps and a 10 LED indicating connection at 10 Mbps.

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

This is available depending on the model.

Fig. 4: **LAN Switch ports (4)**

2.1.4 Connecting to the WWAN antenna

The **Teldat H Automotive** routers can have one or two connectors in order to connect the WWAN antennas. To assemble and dismantle the antennas, simply screw them to the connectors labeled WWAN (located at 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, etc.).

> **Note**
>
> To obtain optimum performance, the router should always have the WWAN antenna(s) 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 signal received (HSUPA, CDMA EV-DO, etc...). Consequently, the **Teldat H Automotive** routers have two WWAN connectors incorporated.

The following image shows you where to find the antenna connectors in devices that use antenna diversity (DIVERSITY).
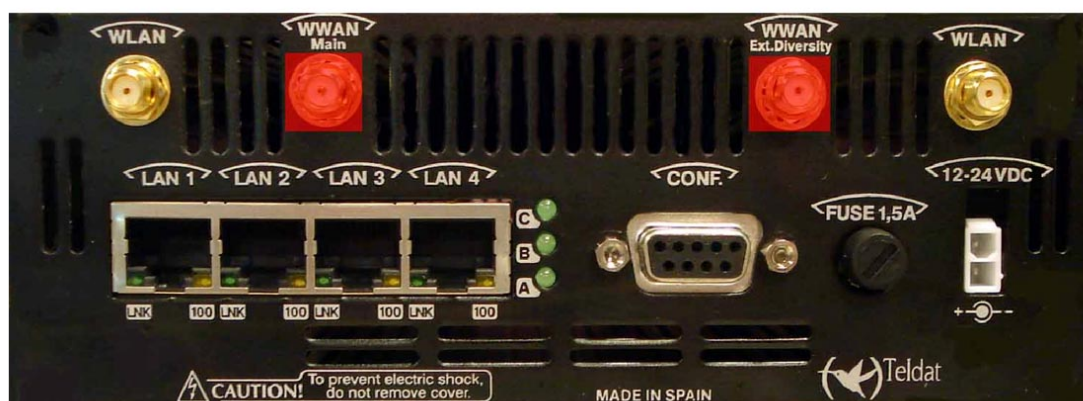
Fig. 5: **Antenna connectors for Wireless WAN (with diversity)**

The device incorporates two WWAN antenna connectors (**Main** and **Ext.Diversity**). As a general rule, we recommend that you always install both antennas. You must always install the antenna for the Main connector. The Ext.Diversity connector antenna is optional. If you are not going to install the Ext Diversity antenna, you need to suitably configure the router (disabling this antenna) to obtain optimum performance from the device.

In cases where the Main and Ext.Diversity antennas are going to be connected through extension cables and not directly to the device, 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 (90º mount antennas, exterior antennas, ceiling antennas, extension cables, etc.) that allow the **Teldat H Automotive** to be installed in different locations.

2.1.4.1 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 influence significantly the 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, follow these steps:

- Whenever possible, place the antenna where there are no physical obstacles. Obstacles between the antenna and the base station degrade the wireless signal. Situate 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, etc.
- 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.
- When 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 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.
- In order to ensure that you are complying with the R&TTE 1999/5/EC norm, the device must be at least 15 cm away from any person when operating.

2.1.5 Connecting the WLAN antenna

The **Teldat H Automotive** routers have two connectors for external antennas that improve the quality of the signal received and transmitted through the Wireless LAN module. This module is optional. Your device may not have Wireless LAN and, consequently, no antennas. To assemble and disassemble the antennas, simply screw them into the connectors labeled WLAN (located at the front of the device).
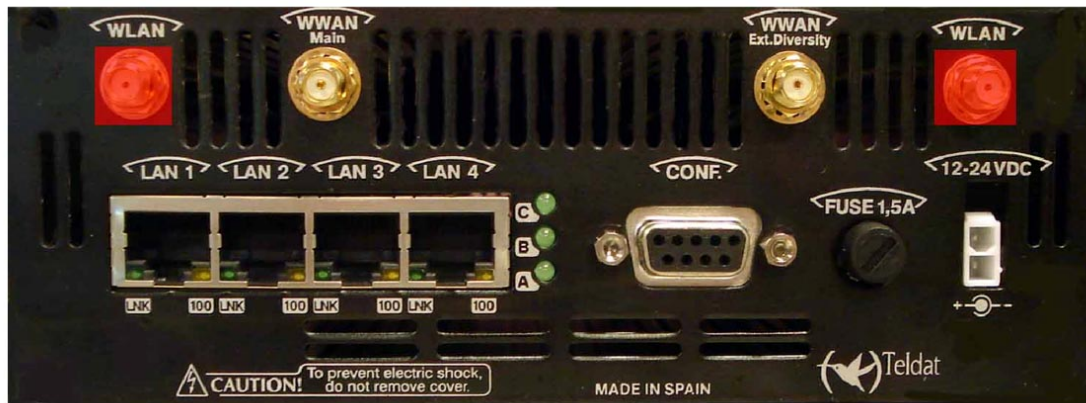
Fig. 6: **Antenna connectors for the Wireless LAN**

So that the Wireless LAN interface is operative, the device must have a plug-in Wireless LAN card and the corresponding software license. Depending on the model, the antennas may be a factory setting. If your device does not have the Wireless LAN module incorporated, 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.

2.1.6 Connecting for configuration

2.1.6.1 Configuring through the local console (CONF connector)

The **Teldat H Automotive** routers have a DB9 female connector on the front panel referred to as " **Conf.**", which provides access to the device local console. In order to configure this, you must connect the " **Conf.**" port to an asynchronous terminal (or to a PC with terminal emulation).
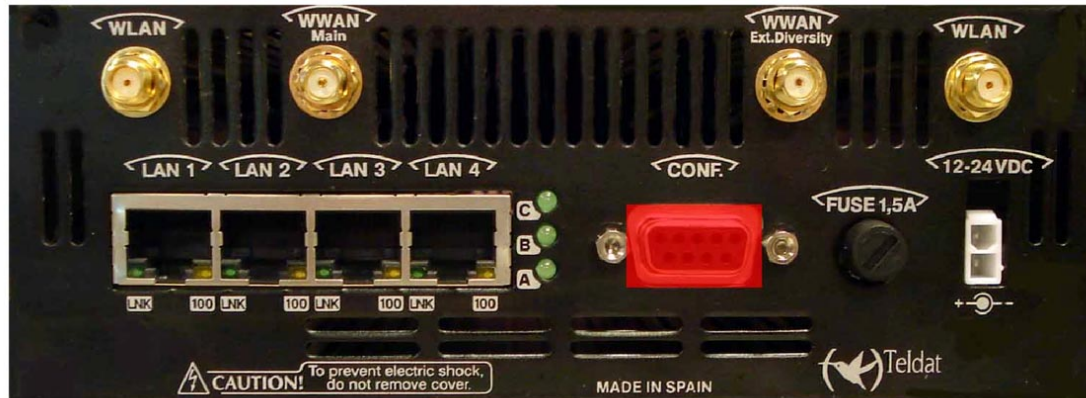

Fig. 7: **Teldat H Automotive configuration connector H**

> **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 linking a DB9 Male connector to a DB9 Female. In cases where the terminal has DB25 connectors, you will need to use an additional adapter.
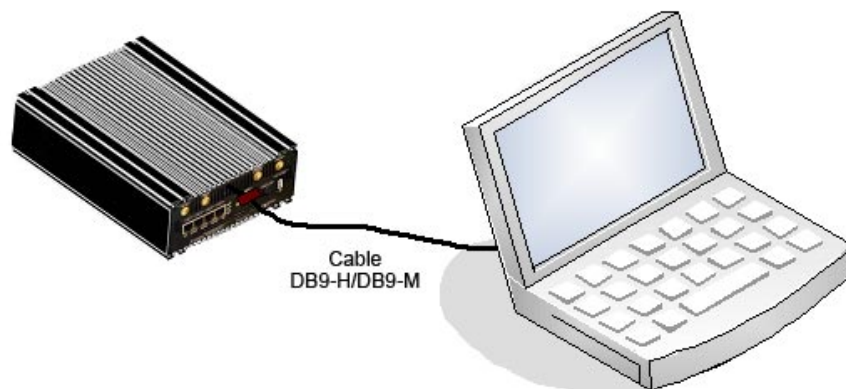
Fig. 8: **Connections for configuration**

2.1.6.2 Configuring through the IP terminal (LAN1..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 personaliza-
> tion can mean that the default configuration is 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.
- Conect the IP terminal's Ethernet interface to any of the Ethetnet Switch ports on the **Teldat H Automotive** router (the LAN1..4 connectors) through the Ethernet cable (RJ45) which is 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.

2.2 Installing the SIM card

The **Teldat H Automotive** routers have a Wireless WAN interface, which may require at least one SIM card to oper-ate. There are certain services (CDMA) provided by some carriers in several countries that do not require SIM cards.

The **Teldat H Automotive** routers have two SIM trays. Both are located inside the device.

In installations where a SIM card is required, you must always insert at least one SIM card. When only one SIM card is going to be used in these devices, it can be inserted into either of the two SIM trays. However, you must remember to configure the router correctly so it selects the appropriate tray.

> ⚠ **Warning**
>
> Never install the SIM cards when the device is switched on.

> Always disconnect the device from the main power supply before installing the SIM cards.
>
> Always disconnect the device before removing the casing to access the trays.
>
> When inserting the SIM cards, please protect yourself against electrostatic discharges (ESD).
>
> Do not touch the SIM cards connectors.

To access the SIM trays you need to open the upper casing of the device. To do this, you need to undo the two screws located on the upper corners of the device's front panel and the two located on the upper corners of the rear panel.

Fig. 9: **Location of the screws on the front of the casing**

Fig. 10: **Location of the screws on the rear of the casing**

2.2.1 Identifying the SIM trays

Once the upper casing has been removed, you can see the different elements inside the device.

The following image will help identify the location of the SIM trays. These are indicated by a blue circle.

Fig. 11: **Location of the SIM trays**

The **Teldat H Automotive** has 2 SIM trays which allow you to execute some special configurations. An example of this is installing two SIM cards so one acts as a backup to the other. To carry out this type of configuration, it's essential to identify the trays associated to each SIM as each of them requires a different configuration.

The SIM trays are identified as SK1 and SK2, i.e. socket 1 and socket 2.

In the following image, you can see SK1 outlined in blue and SK2 outlined in red.
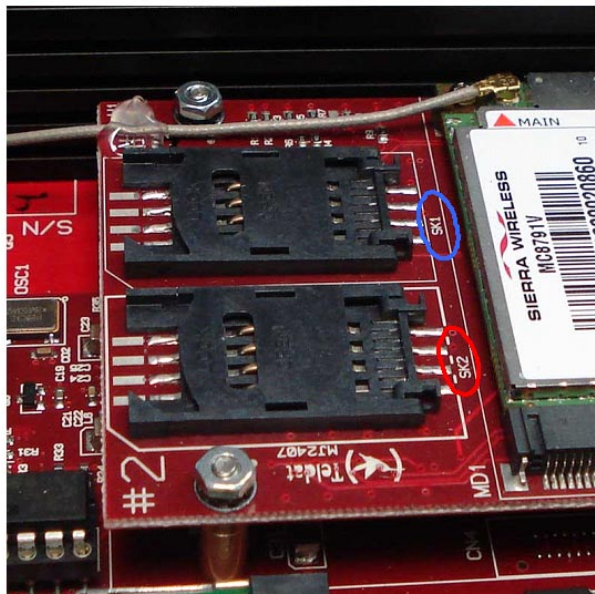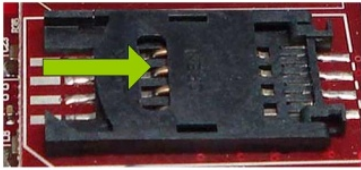

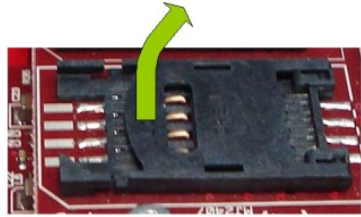Fig. 12: **Identifying the SIM trays**

2.2.2 Installing the SIM

In order to insert a SIM card in the 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:
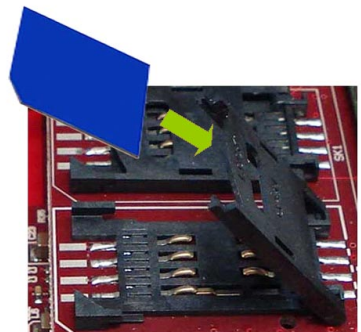
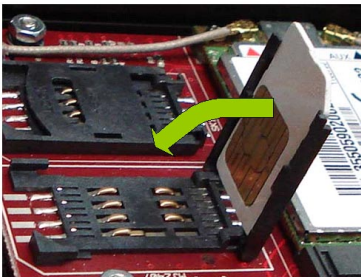(1) Push the fastening to the right (OPEN) until the tray is released.
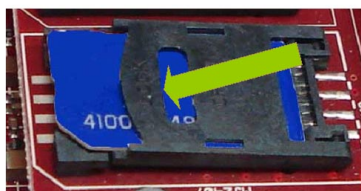
(2)   Open the upper part of the tray.

(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 towards the inside of the tray (LOCK).

(6)   The card should be completely held by the tray.

Chapter 3 Meaning of the LEDs

The following figure shows the positions of the LEDs on the front panel of the device:
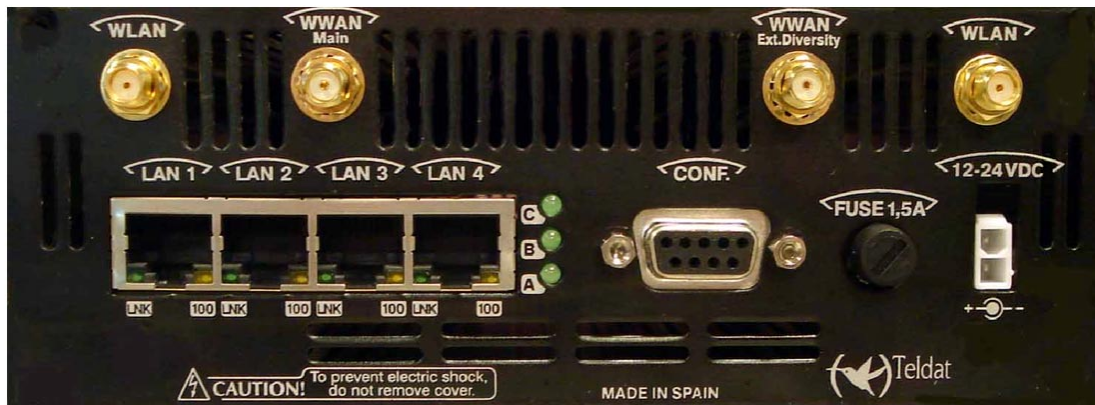

Fig. 13: **Teldat H Automotive: Front panel**

A	Wireless WAN interface channel 0 (cellular0/1).
	OFF: Interface not available, not installed or not registered.
	ON: Registered, or registered and connected in the SIM operator Network.
	- STEADY: Not transferring data.
	- FLASHING: Transferring data.
B	Wireless WAN interface channel 1 (cellular0/1).
	OFF: Interface not available, not installed or not registered.
	ON: Registered, or registered and connected in the SIM operator Network.
	- STEADY: Not transferring data.
	- FLASHING: Transferring data.
C	The device has a MINI-PCI slot where a Wireless LAN daughter card can be installed.
	OFF: Interface not available, not installed or not established.
	ON: Connecting, or connected and communication established.
	- STEADY: Not transferring data.
	- FLASHING: Transferring data.
LNK	Associated to each Ethernet switch connector (LAN1, LAN2, LAN3 and LAN4)
	ON Ethernet link established.
	- STEADY: Not transferring data.
	- FLASHING: Transferring data.
100	Associated to each Ethernet switch connector (LAN1, LAN2, LAN3 and LAN4)
	ON Connected at 100 MHz
	OFF Connected at 10 MHz

Chapter 4   Microswitches

The **Teldat H Automotive** router has a block of 8 available micro-switches that are used for maintenance and test tasks. In this case, they are only used to load the default configuration.

This block of micro-switches 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 micro-switches must be in the OFF position.

4.1 Procedure to ignore the configuration

Follow the steps below 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 micro-switch **'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: 03.02 Apr 28 2009 11:25:37
   gzip Apr 28 2009 11:19:34
P.C.B.: C8 MASK:0C10 Microcode:00E1
START FROM FLASH
BIOS CODE DUMP....................
BIOS DATA DUMP....
End of BIOS dump

BIOS CODE VERSION: 03.02
CLK=262144 KHz BUSCLK=65536 KHz PCICLK=32768 KHz L1
Date: 05/25/09, Monday        Time: 13:37:06

SDRAM size: 64 Megabytes
   BANK 0: 64 Megabytes (detected)
I_Cache: ON
D_Cache: ON Write-Back
FLASH: 16 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 8192 Bytes.
SWITCH 10/100
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: 0x2800)
Slot 1 - PCI device: serial bus controller
   (Bus: 0, Device: 10, Function: 2)
   (Vendor: 0x1131, Device: 0x1562)
   (Subs. Vendor: 0x5444, Subs. Device: 0x2800)
Slot 2 - PCI device: Ethernet controller
   (Bus: 0, Device: 29, Function: 0)
   (Vendor: 0x168C, Device: 0x0013)
   (Subs. Vendor: 0x185F, Subs. Device: 0x1012)
Current production date: 09 21
Current software license: 20 12
S/N: 682/00100
BIOS MAC Add: 00-a0-26-c8-00-64
>>
........
TRYING APP CODE DUMP
   (CONFIGURED) APPCODE1.BIN ver.: 0.10.7.32 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
```

On reaching this point, you can set micro-switch **'5'** in the OFF position (you don't have to turn off the device). This way, the saved configuration will run the next time you restart the device.

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 LAN LED does not light up in green.	Check that the LED after the LINK 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** router can be upgraded to new releases. Please contact your distributor for further details on new releases.
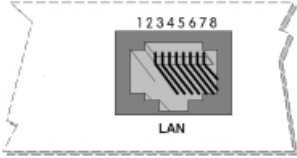
There are various ways to upgrade a Teldat router.

The software required to upgrade Teldat 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** router 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 depends on 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 Dm 781-I) explains how to upgrade the module.

A.3 Connectors

A.3.1 LAN Connector

RJ45 LAN	PIN	LAN
	1	(input)
	2	(input)
	3	Rx+(output)
	4	--
	5	--
	6	Rx-(output)
	7	--
	8	--
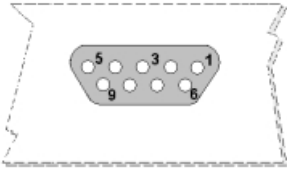
A.3.2 WWAN Connectors

	PIN	ANT
	Internal	RF in/out
	External	GND

A.3.3 WLAN Connectors

	PIN	ANT
	Internal	RF in/out
	External	GND

A.3.4 Configuration Connector

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

A.4 Technical Specifications

A.4.1 Hardware Architecture

PROCESSORS	Motorola PowerPC MPC8xx
MEMORY	32/128 Mbytes in SDRAM
STORAGE UNIT	FLASH Memory (8/32 Mbytes) EEPROM 2 Kbytes, NVRAM 128 Kbytes

A.4.2 LAN Interface

PROTOCOLS	Ethernet (802.3)
SPEED	SWITCH 10/100 Mbps (BaseT)
CONNECTOR	RJ45 Female

A.4.3 Wireless WAN Interface

STANDARDS	GPRS,UMTS,HSDPA, HSUPA,… Depending on the wireless WAN module that the device has.
SPEED	Depends on the wireless WAN module that the device has. Please see the manual on the appropriate module.
CONNECTOR	RF SMA Female
ANTENNA	Depends on the type of wireless WAN. Please see the manual on the antennas for cellular interfaces.

A.4.4 Wireless LAN Interface

STANDARDS	Please see the manual on Wireless LAN
SPEED	Please see the manual on Wireless LAN
CONNECTOR	2 RF SMA Female

A.4.5 Interface configuration

LOCAL TERMINAL	V.24 9.600-8-N-1-v
CONNECTOR	DB9 female, on the front panel of the device.

A.4.6 Power Supply

INPUT VOLTAGE	+12-24 V DC
INPUT CURRENT	0.8 A @ 12Vdc 0.4 A @ 24Vdc
MAXIMUM POWER	10 W

A.4.7 Dimensions and Weight

TYPE	Ruggedized casing with multiple support positions.
LENGTH x WIDTH x HEIGHT	180 x 160 x 55 mm
WEIGHT	0.9 kg

A.4.8 Environmental Specifications

AMBIENT TEMPERATURE	ON: -15º to 65 ºC. OFF: -30º to 85 ºC
RELATIVE HUMIDITY	ON: 8 % to 85 %. OFF: 5 % to 90 %

Appendix B 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

⚠️	The equipment is intended to be installed by Service Personnel and only handled by quali-fied personnel. If not, the device may be damaged and malfunction.
	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. There-fore, 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.
	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 electric current in power cables, telephone lines and communication cables is danger-ous. To prevent electric shocks, before installing, handling or opening the equipment covers, connect and disconnect the cables following the steps set forth in *Connections* on page 3.
	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 el apartado "Conexiones".
⚠️	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), regu-lated supply or it is independent from the rest (such as lighting, etc.); it is highly recommen-ded that all data devices should be connected to the same power source. This will avoid op-erating and premature aging problems of drivers and other components.
	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 prob-lemas de funcionamiento y envejecimiento prematuro de drivers y demás componentes.
⚠️	The fuse must have the characteristics indicated by Teldat. Its maximum current value is stated on the device's label or on its identifying label.
	El fusible deber tener las características indicadas por Teldat. Su valor de corriente máxima será siempre la indicada en la serigrafía del equipo o en la etiqueta identificativa del mismo.

	Never install the SIM cards when the device is switched on.
⚠️	Always disconnect the device from the main power supply before installing the SIM cards.
	Always disconnect the device before removing the casing to access the trays.
	When inserting the SIM cards, please protect yourself against electrostatic discharges (ESD).
	Do not touch the SIM cards connectors.
	No instale nunca las tarjetas SIM con el equipo encendido.
	Desconecte siempre el equipo de la red antes de instalar las tarjetas SIM.
	Desconecte siempre el equipo antes de desmontar la carcasa para acceder a las bandejas.
	Al insertar las tarjetas SIM, protéjase contra descargas electroestáticas (ESD).
	No toque los conectores de las tarjetas SIM.