



## ATLAS 152

### Installation Manual

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### Warranty

This publication is subject to change.

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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 an information guideline. Some small modification can 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.

# Chapter 1 Installing the Router

## 1.1 Introduction

The **ATLAS 152** is a modular device incorporating encryption hardware and designed with network convergence in mind, as it supports IP Telephony and the possibility to encode video.

Teldat proposes the **ATLAS 152** for wireless technology, both for the local network, with wireless access point functionality, as well as for the wide area network as this device supports the following interface cards: GSM, GPRS, EDGE, UMTS, HSDPA, CDMA2000, EV-DO and WiMAX.

The **ATLAS 152** executes the Teldat CIT (Teldat Internetworking Code), which runs in all the Teldat router families and is characterized by a wide variety of functionalities, especially designed to satisfy the access needs to corporate data networks. The capacity of the Teldat Internetworking Code for remotely managing devices, the possibility of implementing Quality of Service mechanisms, security mechanisms and the possibility to create Virtual Private Networks, together with the wide range of protocols and IP routing functionalities, make this an outstanding feature.

In addition, the **ATLAS 152** covers the access needs through ADSL, ADS2+ (both over PSTN as well as over ISDN). As regards local area networks, this router incorporates an 8 port Switch LAN Ethernet and a Wireless LAN MINI-PCI Module.

This manual shows you how to install and connect these devices.



Fig. 1: **ATLAS 152: External Aspect**

## 1.2 Connections



### Caution

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

### Workplace Conditions. Main Characteristics


- Areas with excessive humidity and dust should be avoided.
- Direct exposure to sunlight should be avoided as well as other heat sources. The device should not be placed amongst books, papers, magazines or other element 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.

### Power Supply

The **ATLAS 152** communications device does not require special conditions as regards voltage stability or protection


against power malfunctions as it is already protected.

To avoid electric shocks, residual current circulation and other unwanted effects, also affecting data 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.

 **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
Ensure that the on/off power supply switch is in the OFF position.	Place the on/off power supply switch in the OFF position.
Connect all data cables.	Disconnect the power supply from the device.
Connect the power supply to the device.	Disconnect the data cables.
Place the device's on/off power supply switch in the ON position.	

To connect the power source to the device, follow the steps listed in the previous table: ensure that the switch is OFF (0) and the power supply is NOT connected to the main electricity supply; find the POWER plug (located on the rear panel of the device) and plug it into the power source. Both the connector and the receptacle are designed so it is only possible to insert it in the correct position.

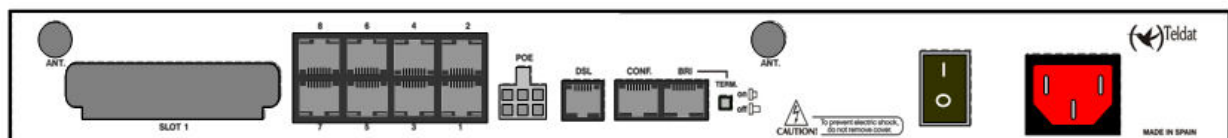


Fig. 2: Power Supply Connection

## 1.2.1 Data Connection

The **ATLAS 152** router has the following available connectors:

### SWITCH:

The **ATLAS 152** incorporates an 8 port Switch 10/100BaseT with automatic MDI/MDIX to connect to the LAN. It has a 100 LED, indicating connection at 100 Mbps, and a 10 LED, indicating connection at 10 Mbps

Please pay close attention to the labeling. This is important in order to avoid confusing the switch with other types of ports.

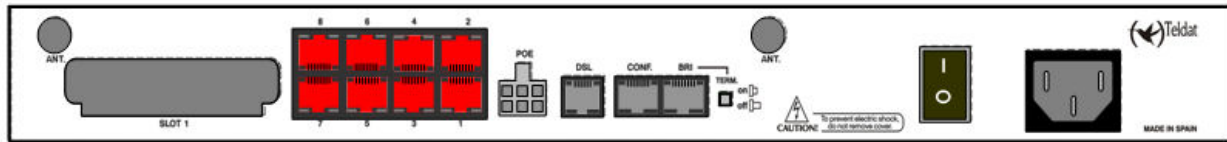


Fig. 3: Port Switch

#### DSL:

ADSL and ADSL2+ interface (both over PSTN as well as ISDN).

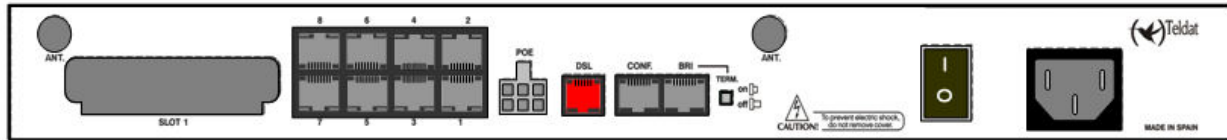


Fig. 4: ADSL Connector

#### ISDN:

Basic ISDN 2B+D interface; this has an activation mechanism and a power switch (TERM).

This requires a software license for operating purposes.

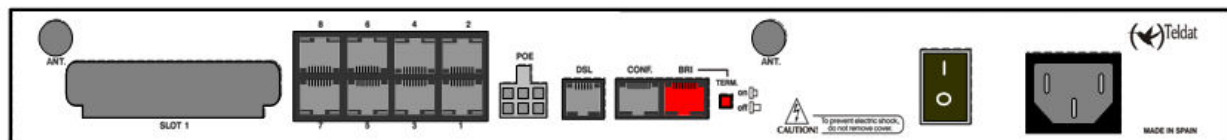


Fig. 5: ISDN Connector and TERM Switch

#### ANT.:

RF antenna connectors.

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 the Wireless LAN module incorporated, you can obtain this later on. The manual provided will show you how to install the module and its corresponding antenna cables in the device.

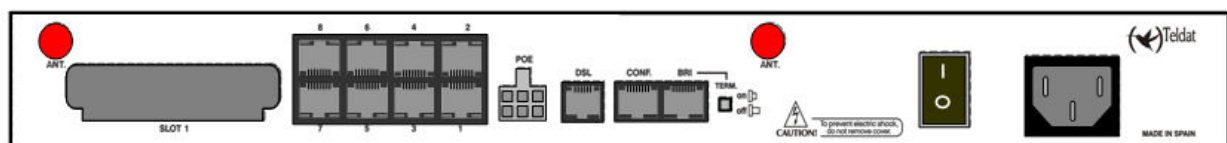


Fig. 6: Antenna Connectors for Wireless LAN

### 1.2.1.1 ADSL Connection

The ADSL interface has a 4-wire RJ11 female connector. **Only the central pair** is used for data transmission / reception.

To connect, use the telephone cable with RJ11 male connectors provided with the device.

#### Splitter

The Full Rate ADSL (ITU G.dmt or G.922.1) operating mode uses a higher transmission capacity, preventing the use of telephones directly connected to the same line. To be able to transmit data, you need to use a device known as a splitter, which separates the frequency bands for voice telephony from those used for the ADSL connection (preventing interferences between the telephone service and the ADSL service and vice-versa).

Fig. 7 shows a typical installation with a splitter



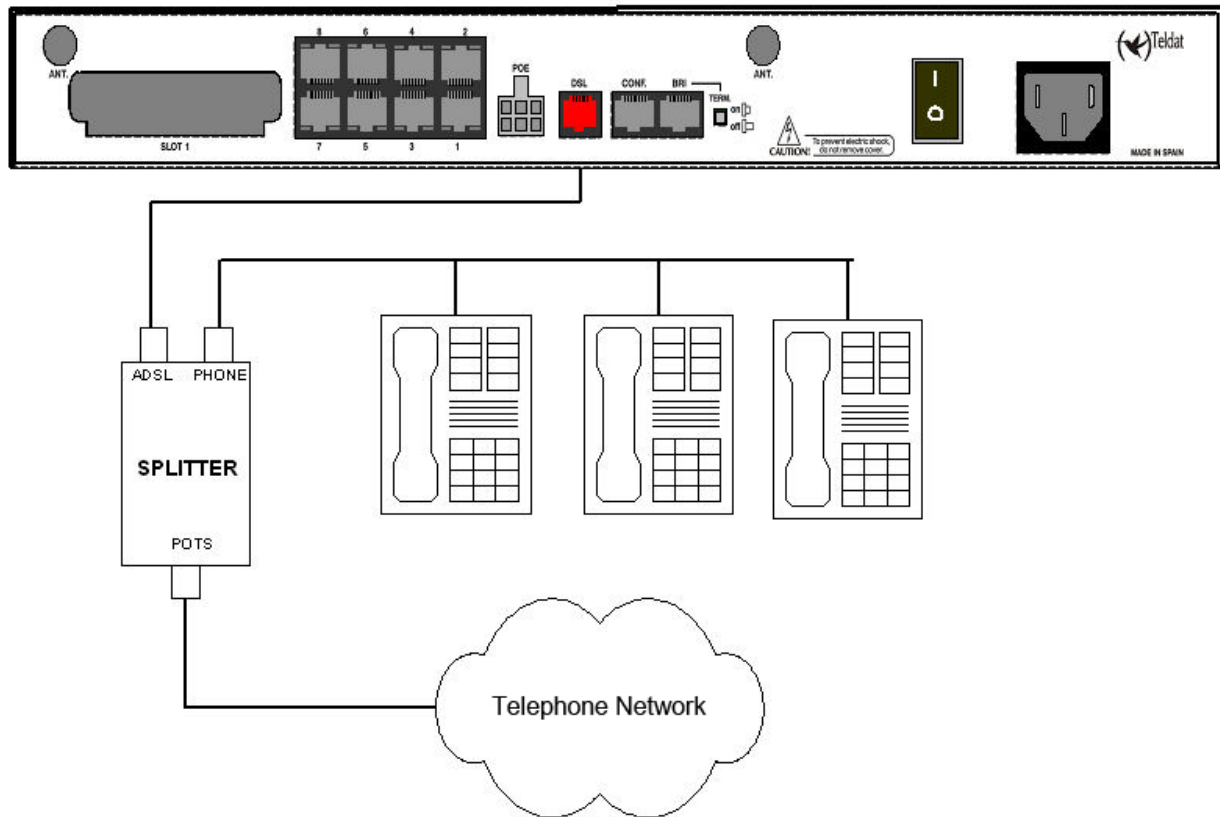


Fig. 7: ADSL Installation with splitter

#### The Micro-filters

The G. Lite (ITU G.922.2) operating mode uses reduced transmission power, thereby allowing telephones connected to the same line to be used via the installation of a device known as a micro-filter. This prevents the ADSL signal from reaching the telephone and any undesired signals generated by the telephone from interfering with the ADSL signal.

Fig. 8 shows a typical installation with micro-filter

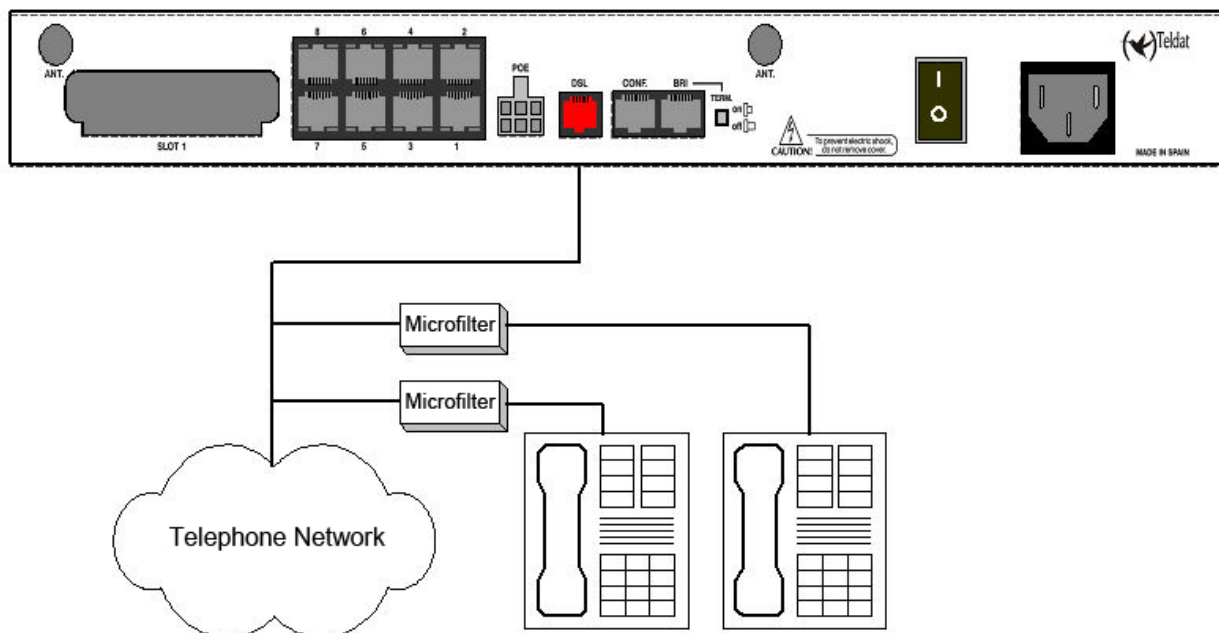


Fig. 8: ADSL installation with micro-filter

In cases of ADSL over ISDN, the above information for operations over PSTN is applicable. However, you must bear in mind that the frequency bands used are different and therefore you must use specific splitters and micro-filters for ADSL over ISDN.

### 1.2.1.2 ISDN Connection

The ISDN interface has a female RJ45 connector in order to connect to the 4-wire S bus coming from the ISDN (NT1 or TR1) network terminator.

For this connection, you can use the cable with male RJ45 connectors handed with the device.

#### Passive-Bus termination resistors

The **ATLAS 152** routers have a pushbutton (labeled TERM.) to connect the BUS-S termination resistors.

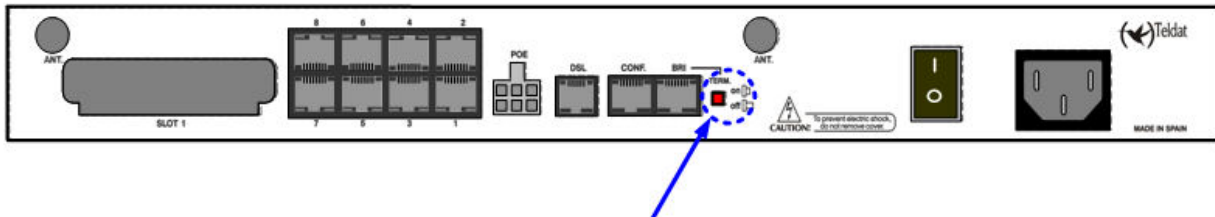


Fig. 9: Switch for the BUS-S termination resistors

- **Single or last terminal in the ISDN “S” bus**

The TERM. pushbutton must be in the ON position if the router is the only element connected to the network (NT1, TR1, etc.) terminator, or if it is the last in the ISDN “S” bus. The device is configured in this position by default.

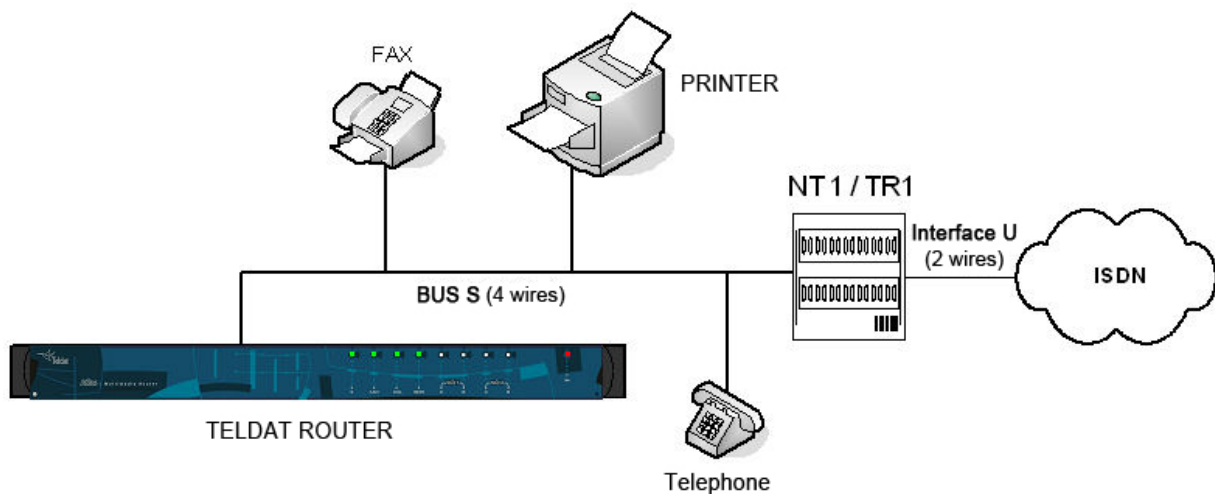


Fig. 10: Single or last terminal

- **Intermediate position in the ISDN “S” bus**



#### Note

The TERM pushbutton must be in the OFF position if the router occupies an intermediate position in the ISDN “S” bus.

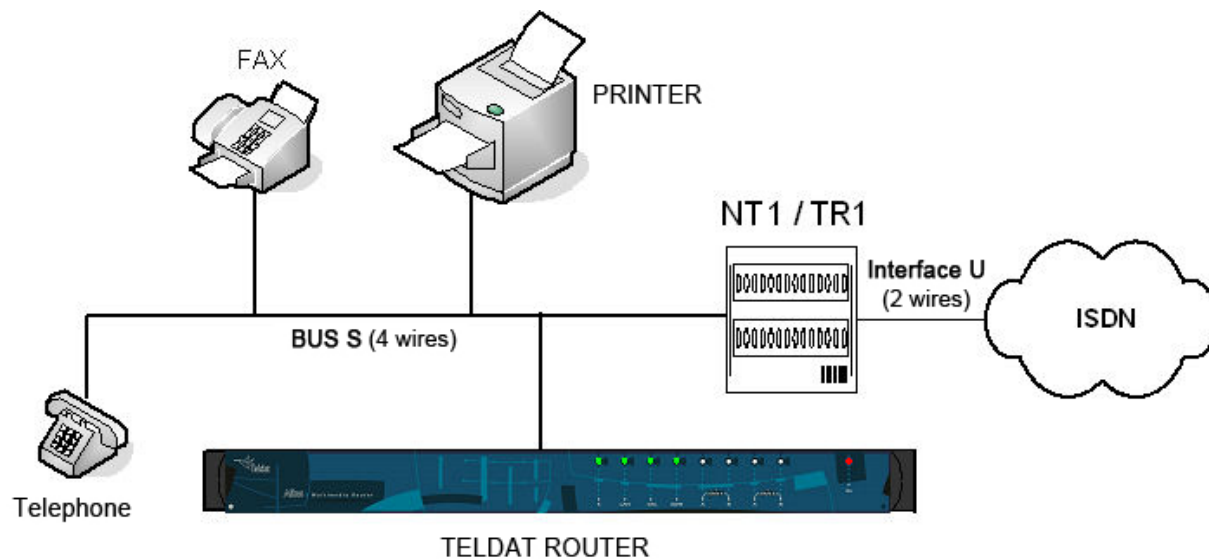


Fig. 11: Intermediate position in the bus

### 1.2.1.3 Antenna Connection

The **ATLAS 152** routers have two connectors for an external antenna, which improves the quality of the signal received and transmitted by the Wireless LAN module. This module is optional and your device may not have it, or the antennas. To assemble and remove the antennas, simply screw them into the connectors labeled ANT (located at the rear of the device).

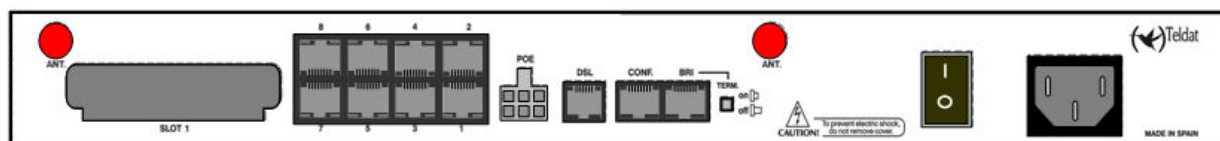


Fig. 12: Antenna connectors for Wireless LAN

### 1.2.1.4 Configuration Connection

The **ATLAS 152** routers have a female RJ45 connector on the rear panel labeled as “**Conf.**”, which provides access to the device’s local console. For configuration, you must connect the “**Conf.**” port to an asynchronous terminal (or to a PC with terminal emulation).

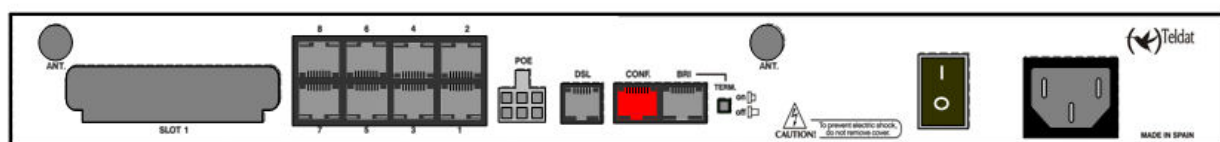


Fig. 13: Configuration connector



#### Note

The configuration of the terminal must be:

- Speed: 9600 bps.
- Eight data bits.
- One stop bit.
- No bit parity.
- No type of flow control.

The connection to the configuration port can be carried out with RJ45 cable connectors provided with the device to-

gether with the Female RJ45-Female DB9 adapter, also provided with the device. In cases where the terminal has DB25 connectors, you must use an additional adapter.

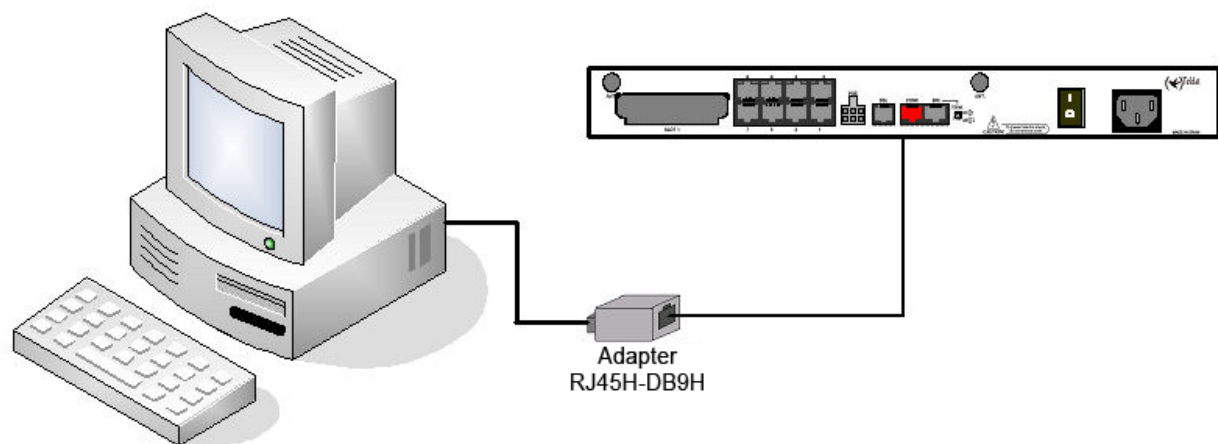


Fig. 14: Configuration connection

### 1.3 Meaning of the LEDs



Fig. 15: Front panel

<b>ON</b>	Power-on indicator, It lights when connected to the power.
<b>S</b>	Router operation <b>OFF:</b> System off. <b>GREEN:</b> System initialized and operating. <b>YELLOW:</b> System with established Telnet session.
<b>LAN</b>	Switch(es) LAN Ethernet: <b>OFF:</b> Switch(es) not available. <b>RED:</b> Switch(es) activated, there are no devices connected which are active. <b>GREEN:</b> Switch(es) activated, there is at least one connected device which is active. Flashing: "heartbeat".
<b>DSL</b>	DSL Interface: <b>OFF:</b> Interface not available (not supported). <b>RED:</b> Interface has not established, no data connection. Flashing: problems with the interface firmware <b>YELLOW:</b> Connecting. <b>GREEN:</b> Communication established. Flashing : Traffic in the interface.
<b>ISDN</b>	ISDN Interface: <b>OFF:</b> Physical level unavailable. <b>RED:</b> ERROR: Line errors (physical level) or call in progress. <b>YELLOW:</b> Physical level established. <b>GREEN:</b> Call established.
<b>SLOT 1</b>	<b>A</b> <b>OFF:</b> Slot empty. Does not contain a card. <b>RED:</b> ERROR: a card has been detected in the slot but it doesn't work properly. <b>YELLOW:</b> Initializing/configuration process. <b>GREEN:</b> Card initialized and operating correctly.
	<b>B</b> <b>OFF:</b> The card is not executing any operation. <b>RED:</b> Depends on the type of card. <b>YELLOW:</b> Depends on the type of card. <b>GREEN:</b> Depends on the type of card.
<b>SLOT 2</b> <b>A - B</b>	This device has a MINI-PCI slot where a Wireless LAN daughter card can be installed. Please see the manual for Wireless LAN for the meaning of the LEDs.

## 1.4 Programming the Microswitches

The **ATLAS 152** routers have a block of 8 micro-switches located on the underside of the device. These are useful for tasks such as maintenance and testing. In this case these are only used to ignore the configuration or establish the default configuration (in cases where you have the default configuration file "config.def").

These should not be handled by the user unless it is necessary to re establish the default configurations.



### Note

All the micro-switches must be in the OFF position to ensure it is functioning correctly.

### 1.4.1 Procedure to ignore the configuration or establish the default configuration

Follow the steps below when you have to reject 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:

```
*****
***** Router Teldat *****
*****

BOOT CODE VERSION: 01.06  Jan  2 2006 10:22:22
  gzip  Dec 28 2005 09:54:11
P.C.B.: A0  MASK:0C10  Microcode:00E1
START FROM FLASH
BIOS CODE DUMP.....
BIOS DATA DUMP...
End of BIOS dump
  Boot-stack used: 0x00000C38
  Boot-stack free: 0x000013C8

=====
          BIOS TELDAT                      (c)Teldat
=====

BIOS CODE VERSION: 01.06

CLK=262144 KHz   BUSCLK=65536 KHz   PCICLK=65536 KHz   L0
Date: 01/12/06, Thursday           Time: 12:40:13

SDRAM size: 32 Megabytes
  BANK 0: 32 Megabytes (detected)
Caches: ON      Write-Back
FLASH: 64 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 8192 Bytes.
ADSL2+
ISAC
RDSI_B
RDSI_B
SWITCH 10/100
SECURITY ENGINE
PCI device: Host bridge
  (Bus: 0, Device: 0, Function: 0)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Current production date: 00 00
Current software license: 12 15
Current serial number: 550/05646
BIOS MAC Add: 00-a0-26-a0-16-0e
>>
.....
TRYING APP CODE DUMP
  (CONFIGURED) ATLAS2G.BIN ver.: 0.10.6.12 0.0.0.0.....
.....
.....
.....
.....
APP DATA DUMP.....
```

```

Bios-stack used: 0x1490
Bios-stack free: 0x2B70
Aux-stack used: 0x124
Aux-stack free: 0x1EDC
Running application
[Default configuration used | Empty 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 (it is not necessary to turn off the device). This way, the saved configuration will run the next time you restart the device.

## 1.5 PMC-PCI Cards

The **ATLAS 152** features and interfaces can be amplified by inserting PMC boards (PCI mezzanine card). In order to correctly insert the card, please follow the steps given below.

### 1.5.1 Procedure to install PMC cards

- (1) Switch off the device and remove the cables as described in the section on connection in this manual.
- (2) Remove the device from the workplace and place it in a stable, safe place where it can be easily accessed and handled. Open up the device. To do this you need to remove the upper cover, which is secured through two screws located on the underside of the device.
- (3) Once the screws have been removed, in order to remove the cover, slide it towards the front panel and then remove it by lifting it. Place it in a safe place.
- (4) Find the place where the PMC board needs to be located. This slot has a set of elevated connectors with golden contacts and a pair of securing screws.
- (5) Remove the blind cover from the spot. This cover is located on the rear panel. Push this out.
- (6) Place PMC board securing posts over the securing screws. Secure these firmly.
- (7) Place the PMC card in the slot so that this firstly adjusts to the space on the device rear panel and subsequently to the two PMC connections. This operation must be carefully carried out without forcing any piece or part of the device. Check that the board is clearly settled over the PMC connectors.
- (8) Screw the PMC board to the posts. To do this, use two screws with their corresponding washers. Firmly tighten the screws without damaging the board.
- (9) Close the device with the cover. To do this, place the device upside down adjusting the three slots on the underside in the device's front panel and subsequently adjust the cover. Secure the cover with the screws.
- (10) Connect and switch on the device as explained in the connection section. Should you detect any problems, switch off the device and make sure that the above steps have been carried out correctly. If the problem persists, please contact your usual supplier.
- (11) Connect a terminal to the console and check that the device detects the PMC board.

```

*****
***** Router Teldat *****
*****

BOOT CODE VERSION: 01.06 Jan 2 2006 10:22:22
  gzip Dec 28 2005 09:54:11
P.C.B.: A0 MASK:0C10 Microcode:00E1
START FROM FLASH
BIOS CODE DUMP.....
BIOS DATA DUMP...
End of BIOS dump
  Boot-stack used: 0x00000C38

```

```
Boot-stack free: 0x000013C8

=====
          BIOS TELDAT                      (c)Teldat
=====

BIOS CODE VERSION: 01.06
CLK=262144 KHz   BUSCLK=65536 KHz   PCICLK=65536 KHz   L0
Date: 01/12/06, Thursday           Time: 12:40:13

SDRAM size: 32 Megabytes
  BANK 0: 32 Megabytes (detected)
Caches: ON      Write-Back
FLASH: 64 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 8192 Bytes.
ISAC
RDSI_B
RDSI_B
SECURITY ENGINE
PCI device: Host bridge
  (Bus: 0, Device: 0, Function: 0)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Slot 1 - PCI device: CardBus bridge
  (Bus: 0, Device: 10, Function: 0)
  (Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Current production date: 00 00
Current software license: 12 15
Current serial number: 550/05646
BIOS MAC Add: 00-a0-26-a0-16-0e
```



## 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, ask your distributor for additional information.

Problem	Solution
None of the LEDs lights up on the device.	Check the power supply to the device (power source, ON/OFF switch, main power outlet).
The S LED does not light up.	Check that all the micro-switches are in the OFF position.
The local console doesn't respond	<p>Check that the console cable is the correct one and that it is connected to the device and to the asynchronous terminal.</p> <p>Check that the terminal has the correct port configured.</p> <p>Check that the terminal configuration is 9600 8N1. Check that the console is not processing events. Check that the device is not being remotely accessed by telnet.</p>
The local console is only showing rubbish.	<p>Check that the terminal has the correct port configured.</p> <p>Check that the terminal configuration is 9600 8N1.</p>
The device doesn't startup and the text WARM-UP appears on the console.	Check that micro-switch '1' is in the OFF position. In this situation you may have to reload the device BIOS and the routing application.
The device is taking a long time to display the application prompt.	Check that micro-switch '3' is in the OFF position.
You have forgotten the access password for the device.	Ignore the configuration through micro-switch '5' (as explained in the relevant section).
The LAN LED never lights up in green.	Check that the LED following the LINK is ON. If this is not the case, check the Ethernet cable and the connection to the network.
The DSL LED never lights up in green.	If the device has an available xDSL interface, check the connection to the telephone network or to the splitter and make sure that the telephone line you are connected to supports xDSL service.
The DSL LED persistently flashes in red.	If your device has an xDSL interface, check that the necessary firmware has been loaded for the said interface.
The ISDN LEDs never light up in yellow or green.	If the device has an ISDN interface available, check that the connection to the bus is correct and the termination switch from the S bus is in the correct position.
The LEDs indicate that the interfaces are established, but there is no connectivity at the data layer.	Check the configuration (routes, IP addresses, ATM VPIs/VCI, ATM encapsulation, serial interface speed, etc).

## A.2 Software upgrading

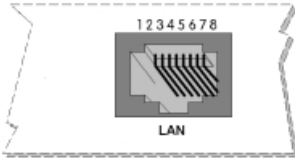
The **ATLAS 152** routers can be updated to new releases. Please contact your distributor for new releases.

There are various ways to update a Teldat router. Please see the software upgrading manual for further information.

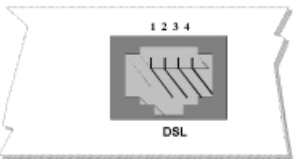
The software required to update the Teldat routers is provided in a format known as **distribution**. This consists of a single file containing all the necessary files to update your device, as well as detailed information on the content.

## A.3 Connectors

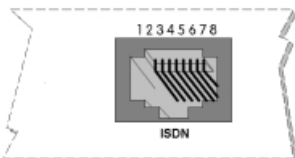
### A.3.1 LAN Connector

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


### A.3.2 DSL Connector

RJ11 DSL	RJ 1 PIN	DSL
	1	Joined to 2
	2	Line
	3	Line
	4	Joined to 3

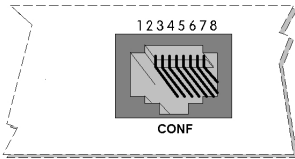
### A.3.3 ISDN Connector

RJ45 ISDN	RJ45 PIN	ISDN
	1	--
	2	--
	3	Tx+(output)
	4	Rx+(input)
	5	Rx-(input)
	6	Tx-(output)
	7	--
	8	--

### A.3.4 ANT Connector

	PIN	ANT
	<b>Internal</b>	RF in/out
	<b>External</b>	GND

### A.3.5 Configuration Connector

RJ45 CONFIGURATION	RJ45 PIN	CONF
	1	--
	2	RxD
	3	GND
	4	--
	5	--
	6	GND
	7	TxD
	8	--

## A.4 Technical Specifications

### 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

### LAN Interface

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

### DSL Interface

STANDARDS	Please see the manual on DSL
SPEED	Please see the manual on DSL
CONNECTOR	RJ11 female

### Wireless LAN Interface\*<sup>1</sup>

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

**ISDN\* Interface <sup>2</sup>**

ACCESS	Basic 2B+D
SPEED	2 x 64 Kbps (B channels)
CONNECTOR	RJ45 female

**Configuration Interface**

LOCAL TERMINAL	V.24 9.600-8-N-1- without flow control
CONNECTOR	RJ45 female on the rear part of the device

**Power supply**

INPUT VOLTAGE	100-240 V AC
INPUT CURRENT	1.5 A
INPUT FREQUENCY	47-63 Hz
MAXIMUM POWER	45 W

**Dimensions and weight**

TYPE	Desktop
LENGTH x WIDTH x HEIGHT	300 x 415 x 41.6 mm
WEIGHT	3.5 kg

**Environmental Specifications**

AMBIENT TEMPERATURE	On: 5° to 45 °C. Off: -20° to 60 °C
RELATIVE HUMIDITY	On: 8 % to 85 %. Off: 5 % to 90 %

[1] \* Depending on the model

[2] \* Depending on the model

## Appendix B Safety information

### B.1 Recycling and the Environment

Please do not, under any circumstances, throw away any **ATLAS 152** 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 an **ATLAS 152**, 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

	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>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).</p> <p>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.</p>
	<p>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).</p> <p>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.</p>
	<p>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 <a href="#">Connections</a> on page 2.</p>
	<p>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".</p>