



Software Updating

Teldat -Dm 748-I

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Table of Contents

I	Related Documents.	1
Chapter 1	Introduction	2
1.1	Introduction	2
1.2	How the Software is distributed	2
1.2.1	Distribution format and content	3
Chapter 2	Updating Process.	6
2.1	Distributing with BIOS, CIT and FWs files	6
2.1.1	Updating from BOOT	6
2.1.2	Updating from BIOS FLASH	10
2.1.3	FTP Updating	11
2.1.4	TFTP Updating	13
2.2	Distributing with the C.I.T. Image file (IMG).	14
2.2.1	Updating from BOOT	14
2.2.2	FTP Updating	20
Appendix A	FTP Commands for uploads	23
A.1	Loading a file through FTP	23
Appendix B	Flash Backup System	24
B.1	Distributing with BIOS, CIT and FWs files	24
B.1.1	Introduction	24
B.1.2	Flash Disk Formatting	24
B.1.3	Operating Flash Backup System	27
B.2	Distributing with the C.I.T. image file (IMG).	28
B.2.1	Introduction	28
B.2.2	Operating a system with double image in flash	28
Appendix C	Information required for updating	29
C.1	How to determine the appropriate distribution and the appropriate binary.	29
C.1.1	How to determine the necessary firmware	31

I Related Documents

Teldat-DM 724-I FTP Protocol

Teldat-DM 756-I TFTP Protocol

Chapter 1 Introduction

1.1 Introduction

Our routers execute software known as C.I.T. (Código Integrado Teldat – Teldat Integrated Code). This is made up of various elements:

- **BOOT**

This is a small start up program recorded in a read-only device. Loss of this program is practically impossible and it also permits you to recoup a device in extreme cases. This element cannot be updated via software.

- **BIOS FLASH**

Consists of the basic interface with the router hardware providing the C.I.T. with a more abstract view of this. In this way, the variations produced in the hardware (e.g. changing the integrated circuit used to control PSTN) are transparent to the C.I.T.

- **C.I.T.** (Código Integrado Teldat – Teldat Integrated Code)

This is the part of the code which handles the internetworking processes (IP routing, X.25, IPSec, ATM, etc) as well as the configuration and monitoring console. This is also known as “application”

- **Auxiliary Files** (*.BFW, ...)

To simplify our routers modular updating as well as reducing the size of the C.I.T., determined blocks are provided as isolated files. The need for these depends on the available hardware. E.g., our devices support various ADSL chipsets and depending on the type of chipset available in your device, will need one firmware (BFW) or another.

- **Image file**(*.img)

In some devices, the BIOS, CIT and FWs are distributed in a single file with extension img.

The process of updating our router software consists in substituting one or several of the previously mentioned elements. This manual explains all available options for the updating process.

1.2 How the Software is distributed

The router software is made up of various elements. In order to correctly execute updating to a determined version, you need all the archives that make up this version. In order to simplify version management and avoid errors, the router software is distributed in what we call **distributions**: a distribution consists of a **TGZ** file (TAR + GZIP) which contains all the archives required in order to update a device to a determined version, i.e. BIOS FLASH application(s) and auxiliary files are distributed in separate files; or an image file (extension img) which contains all the above.

Choosing the TGZ system guarantees content integrity and coherence at the same time as permitting management through standard tools.



Note

If a device is updated through a mixture of different distribution archives, this may disable the device. Should this occur, the updating process will have to be executed by first starting up the device from the BOOT, with the corresponding loss of information, configurations etc.



Note

We only guarantees compatibility to upgraded versions: i.e. provided you update your device to a more modern version, the device will run correctly, respecting the configuration; in cases where you update your device to an earlier release than the one being executed by the device, the device may not start up and it will be necessary to carry out updating from BOOT.

In devices whose software distribution contains the BIOS, CIT and FWs as separate files, the various archives are internally stored in the device Flash memory which the user sees as a traditional disk unit: all the files except the BOOT and BIOS FLASH are loaded in the files system over the said Flash memory, and can be deleted, renamed etc., and of course, the said disk can be consulted, formatted and filled up preventing new files being recorded.

In devices whose software distribution contains an image file (extension img), this file is internally stored in a partition of the flash reserved for the said image and not in the files system where the configuration and the rest of the data

handled by the CIT usually resides.



Note

Please bear in mind that the code permitting the device to run is stored in the Flash memory. Any operation over this should be analyzed before being carried out as this may leave the device inaccessible and consequently may need to be restarted from BOOT.

During the updating process, access to the device console may be needed; the serial port configuration is as follows:

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

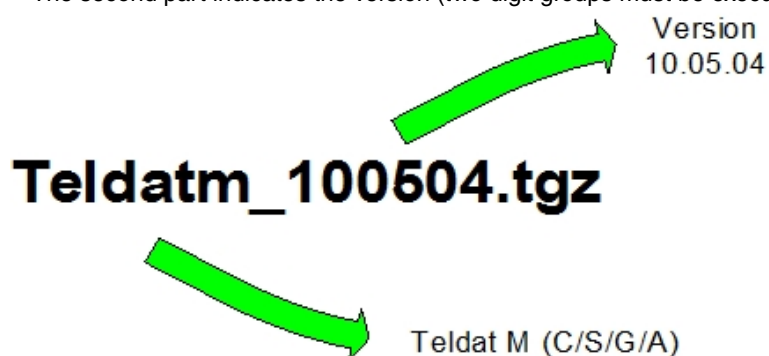
1.2.1 Distribution format and content

There are various distributions which generally represent different hardware platforms; e.g. there is a distribution for compact modular devices supporting Teldat C, Teldat G, Teldat S and Teldat A models; there is another distribution for corporate devices that support the ATLAS and Centrix models, etc.

1.2.1.1 Distributing BIOS, CIT and FWs files

The distribution name is variable, this however permits you to easily identify the devices to which this is destined and the corresponding version:

- The first part indicates to which devices this is destined.
- The second part indicates the version (two digit groups must be executed).



The file, in this case, contains the following archives:

bios.bin	teldatc_corp_mr.bin
fw000000.bfw	teldatc_pa_mr.bin
fw000001.bfw	teldatc_pai_mr.bin
fw000002.bfw	teldatc_pi_mr.bin
fw000003.bfw	teldatm_standard.bin
fw000004.bfw	els.rtf
readme.txt	version_map.txt
mibs.tgz	v100504.md5

The readme.txt" archive provides information on the distribution content as well as basic updating instructions; in this example:

```
DISTRIBUTION FILE CONTENTS
bios.bin                BIOS 01.09.01
teldatm_standard.bin    C.I.T. version 10.05.04 for Teldat S, Teldat G, Teldat C and
                        Teldat A with 4 Mbytes (or more) of FLASH and 32 Mbytes (or
                        more) of SDRAM
                        Release not suitable for underequipped FLASH / SDRAM routers
                        ---- Use the following versions only if ----
                        ---- your router has memory limitations ----
```

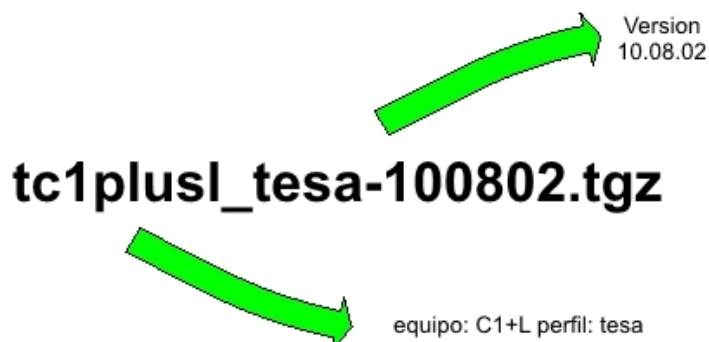
	---- (16 Mb SDRAM and/or 2Mb FLASH) -----
teldatc_corp_mr.bin	C.I.T. version 10.05.04 for C4B/C5B/C4/C5/C4i/C5i
teldatc_pai_mr.bin	C.I.T. version 10.05.04 for C2i/C3i
teldatc_pa_mr.bin	C.I.T. version 10.05.04 for C2/C2UP/C3/C3G
teldatc_pi_mr.bin	C.I.T. version 10.05.04 for C2B/C2BM/C3B
fw000000.bfw	Alcatel-SGS Thomson DynaMiTe ADSL over POTS v2.0
fw000001.bfw	MindSpeed ZipWirePlus SHDSL v2.2
fw000002.bfw	Analog Devices Eagle ADSL over POTS v2.1
fw000003.bfw	Analog Devices Eagle ADSL over ISDN Annex B v4.0
fw000004.bfw	Alcatel-SGS Thomson DynaMiTe ADSL over ISDN v2.0
version_map.txt	Help file for the selection of the suitable .bin for your router
mibs.tgz	MIB files and MIBS_Finder application
els.rtf	Event Logging System Manual
v100504.md5	MD5 checksum of binary files

1.2.1.2 Distributing the C.I.T. image file

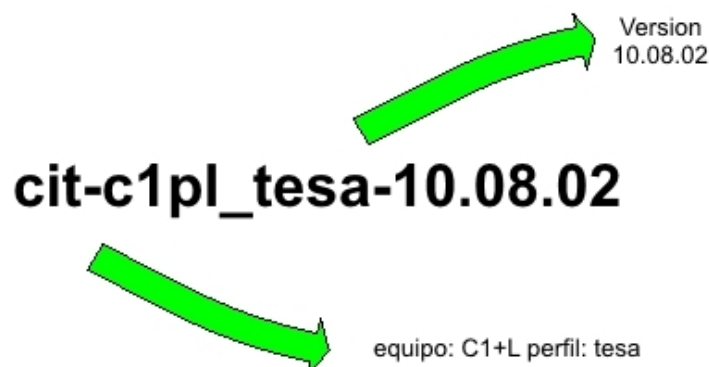
There are devices whose software distribution contains the BIOS, CIT and FWs in a single file with extension img which is known as a CIT image. This applies to the Teldat C1+L whose software distribution, for the “tesa” profile, contains the following files:

cit-c1pl_tesa-10.08.02.img	cit-c1pl_tesa-10.08.02.img.md5
mibs.tgz	dictionary.txt
version_map_tc1plusl.txt	readme.txt

The distribution name is variable; however it’s easy to determine the devices this is destined for and the correspond- ing version:



The same thing happens with the CIT image file name; this allows you to easily determine the devices this is destined for and the corresponding version:



The “readme.txt” file provides information on the distribution content as well as basic updating instructions: as in this example:

DISTRIBUTION FILE CONTENTS	

cit-c1pl_tesa-10.08.02.img	C.I.T. for Teldat tc1plusl tesa

mibs.tgz	MIB files and MIBS_Finder application
dictionary.txt	Radius Dictionary extensions

```

els.rtf                      Event Logging System Manual
cit-clpl_tesa-10.08.02.img.md5 MD5 checksum of image file cit-clpl_tesa-
                             10.08.02.img
version_map_tc1plus1.txt     Help file for the selection of the suitable
                             .img for your device

```

In cases where a profile doesn't appear in the distribution and the CIT image name, this means that the version is the default one or the standard and can be seen in the readme.txt file.

C1+L standard version

- Distribution file name: tc1plusl-100802.tgz
- CIT image file name: cit-c1pl-10.08.02.img

The "readme.txt" file is as follows:

```

DISTRIBUTION FILE CONTENTS
*****
cit-clpl-10.08.02.img          C.I.T. for Teldat tc1plusl standard
*****
mibs.tgz                      MIB files and MIBS_Finder application
dictionary.txt                Radius Dictionary extensions
els.rtf                       Event Logging System Manual
cit-clpl-10.08.02.img.md5     MD5 checksum of image file cit-clpl-
                             10.08.02.img
version_map_tc1plus1.txt      Help file for the selection of the suitable
                             .img for your device

```

Chapter 2 Updating Process

2.1 Distributing with BIOS, CIT and FWs files

2.1.1 Updating from BOOT

In cases where your device does not have a BIOS FLASH available (Flash memory is corrupted due to incorrect updating, formatting etc.) the system will automatically start up the BOOT program; also a forced startup from BOOT may be required if the BIOS FLASH is present but is corrupt and consequently cannot successfully start: in this latter case, set all the microswitches to the OFF position with the exception of switch “2” or “b” and the device will pause in BOOT.



Note

“All-OFF / 2-ON” combination forces startup from BOOT. The normal status for the microswitches is “All-OFF”.



Note

Only activate startup from BOOT when absolutely essential.

The BOOT process automatically stops and ONLY permits downloading of the BIOS FLASH archive: load the “bios.bin” archive found in the distribution through any of the methods offered by BOOT.



Note

In releases prior to 01.02.00, BOOT is exactly the same as BIOS FLASH; in this case you need to stop the startup process when two symbols “>” appear on the console followed by a number of increasing “.” symbols, through the “CTRL.-T” key combination.

```
.
.
WAN: DCE
ADSL
UTOPIA
Current production date: xx xx
Current software license: x x
Current serial number: xxx/xxxxx
>>
.....
=== INITIAL MENU ===
a) Change Time
b) Change Date
c) Change Code to Run
d) Change Licence
e) Load from console (pc_load)
f) Disk menu
g) Set default name for file loaded from console
l) Load from lan
x) Load from console (xmodem)
r) Reset
0) Exit
>>
```

Once the transfer has been executed, deactivate microswitch “2” and reboot the system in order to execute BIOS FLASH; continue with the updating process as if you had started from BIO FLASH.

2.1.1.1 Loading a file through XModem

In various phases of the updating process you can use the XModem protocol to transfer a file to the router via the configuration port, commonly known as console, which consists of an asynchronous serial line with a transfer speed limited to 115200 bps. The XModem is available in the majority of terminal emulators (**HyperTerminal**, **Tera Term**, etc.), the version used by the routers is XModem with CRC testing version.

Bear in mind that the storage device behaves as a disk; the name used to record the transferred file via XModem depends on various factors:

- In BIOS FLASH releases prior to 01.07.00, this is recorded with the name configured when transferred.
- In BIOS FLASH releases 01.07.00 or later, files considered as critical (CIT and firmware) are recorded with pre-defined names independently of the configured file name (the system recognizes the file and records it with the appropriate name). This behavior can be deactivated; however we strongly suggest that you do not. This can cause updating malfunction or the device may not start up if it is not carried out correctly. Files not considered critical are recorded with the configured name.



Note

The BIOS FLASH file is stored in a special form and does not appear in the system files system; therefore the send name and the recording name are unsubstantial.

To execute a transfer via the XModem protocol, carry out the following steps:

- (1) Select the “x” option in the router (loading via XModem).
- (2) A message will appear on the device console giving information on the name used to record the file being sent (this name is not applied in cases of critical files provided that the default behavior has not been modified). If this name is incorrect, press the key combination indicated on the console to change it. Contrariwise, wait for the next message.
- (3) A message will appear on the device console giving information on the protocol and speed to use. If the speed is incorrect, press any key and select the correct speed. Contrariwise, wait for the next message.
- (4) A message will appear on the device console giving information on the protocol and speed at which the transfer is produced. Check that LED 1 begins to flash in orange and LED 6 remains green.
- (5) Initiate the transfer (the steps to carry out depend on your terminal emulator).

The various load process phases are reflected in the status of the LEDs:

State	LEDs
Idle	All LEDs (except the ON) are off.
Waiting	Led 1 slowly flashing in orange. Led 6 in green.
Receiving	Led 1 rapidly flashing in orange. Led 6 in green.
Recording	Led 1 slowly flashing in orange. Leds 5 and 6 in green.
Recording finalized	Leds 1, 5 and 6 in green.
Error	Led 1 in red. Leds 5 and 6 in green. (Generally due to lack of space in the Flash disk).

2.1.1.2 Loading a file through CARGA_PC

In the various updating process phases, you can use Teldat’s own protocol known as **CARGA_PC** to transfer a file towards a router through the configuration port, commonly known as console. This consists of an asynchronous serial line with a limited transfer speed of 115200 bps. You will find a program in the documentation CD supplied with your router allow you to use the CARGA_PC protocol.

The existence of the CARGA_PC protocol is due to the fact that this was implemented before the XModem protocol came into use, therefore older Teldat software releases only support updating through CARGA_PC.

To carry out a transfer through the CARGA_PC protocol, execute the following steps:

- (1) Execute the CARGA_PC program and select the required port, the speed (select a rate of less than 115200 if

you have already tried this and it was unsuccessful) and the file to be transferred.

- (2) Select the "e" option in the router (loading via console).
- (3) Check that LED 1 begins to flash in orange and LED 6 lights up in green.
- (4) Disconnect the terminal emulator so the serial port can be used for the CARGA_PC program.
- (5) Initiate the transfer and wait.

The various load process phases are reflected in the status of the LEDs:

State	LEDs
Idle	All LEDs (except the ON) are off
Waiting	Led 1 slowly flashing in orangeLed 6 in green
Receiving	Led 1 rapidly flashing in orange Led 6 in green
Recording	Led 1 slowly flashing in orange Leds 5 and 6 in green
Recording finalized	Leds 1, 5 and 6 in green
Error	Led 1 in red Leds 5 and 6 in green (Generally due to lack of space in the Flash disk)

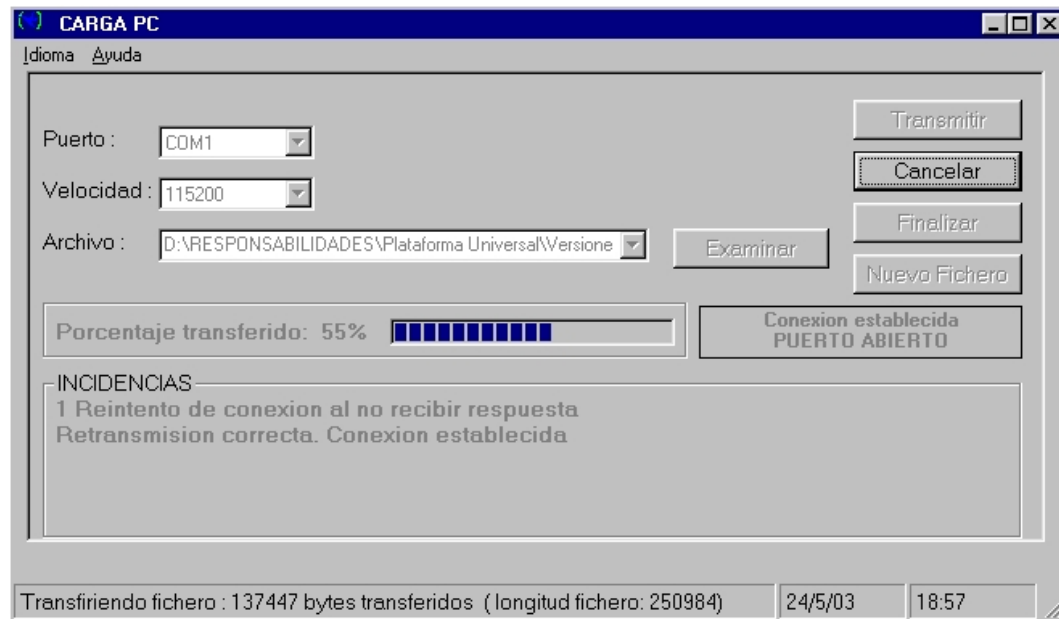


Fig. 1: Aspect of the CARGA PC program during archive transfer.

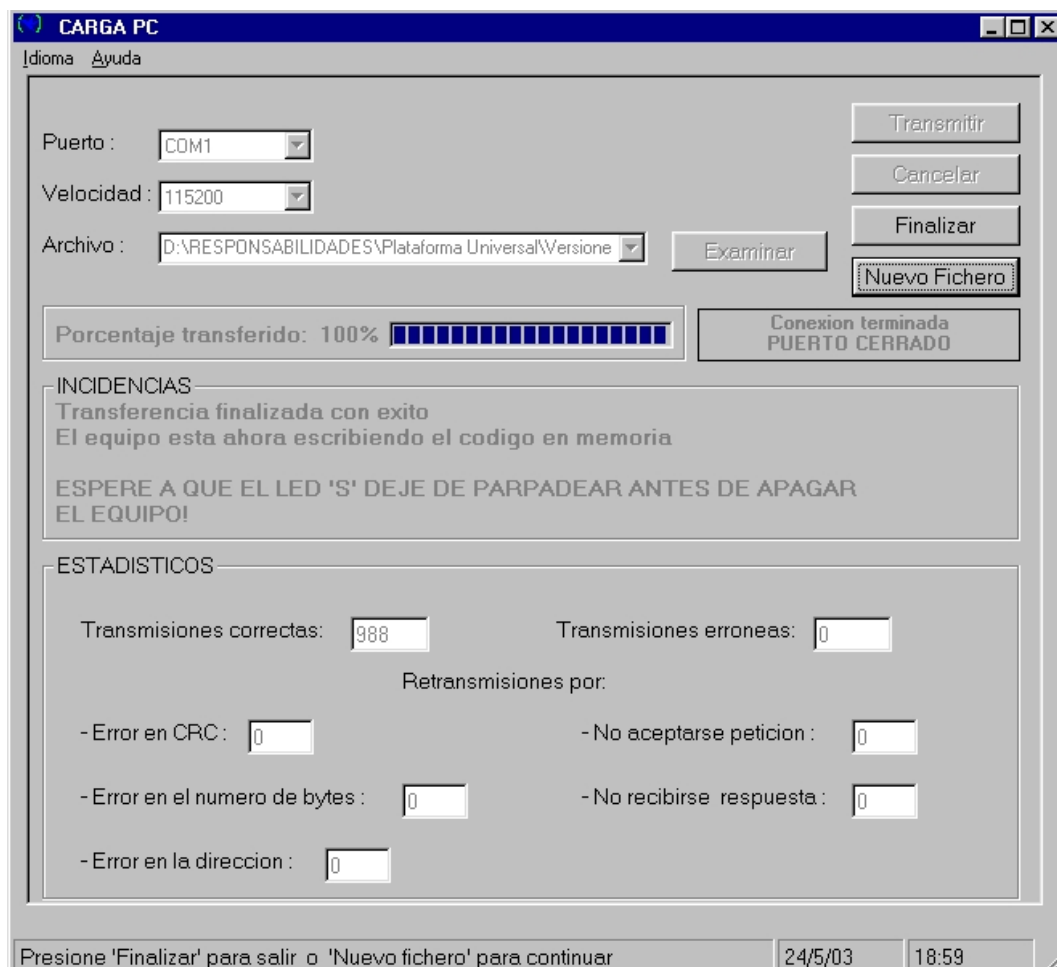


Fig. 2: Aspect of the CARGA PC program on terminating a file transfer

2.1.1.3 Loading a file through CARGA_LAN

In the various updating process phases, you can use Teldat's own protocol known as **CARGA_LAN** to transfer a file towards a router through the Ethernet interface. You will find a program in the documentation CD supplied with your router allow you to use the CARGA_LAN protocol. The CARGA_LAN protocol permits you to transfer at speeds higher than those used by protocols using the configuration port, reducing the time required for this.

Bear in mind that the storage device behaves as a disk; the name used to record the transferred file via CARGA_LAN depends on various factors:

- In BIOS FLASH releases prior to 01.07.00, this is recorded with the sent file's original name.
- In BIOS FLASH releases 01.07.00 or later, files considered as critical (CIT and firmware) are recorded with pre-defined names independently of the sent file name (the system recognizes the file and records it with the appropriate name). This behavior can be deactivated; however we strongly suggest that you do not. This can cause updating malfunction or the device may not start up if it is not carried out correctly. Files not considered critical are recorded with the original name (without including the path).



Note

The BIOS FLASH file is stored in a special form and does not appear in the system files system; therefore the send name and the recording name are unsubstantial.

To execute a transfer via the CARGA_LAN protocol, carry out the following steps:

- (1) Execute the CARGA_LAN program and select the file you wish to transfer (this program permits you to consecutively transfer various files).
- (2) Select the "l" option in the router (*lower case L*)
- (3) Check that LED 1 is flashing in orange and the router returns a message indicating the MAC address to be configured in the CARGA_LAN program.
- (4) Configure the MAC address, initiate the transfer, wait and check the messages that will appear on the device console and the CARGA_LAN program progress bars.

The various load process phases are reflected in the status of the LEDs:

State	LEDs
Idle	All LEDs (except the ON) are off
Waiting	Led 1 slowly flashing in orange, the following message appears on the console: "Waiting for LAN loading..."
Receiving	Led 1 rapidly flashing in orange (flashing may be almost imperceptible given the high rate of reception).
Recording	Led 1 in orange, the following message appears on the console: "Saving file on flash..."
Recording finalized	Leds 1 in green, the following message appears on the console: "OK xx.x seconds."
Error	Led 1 in red, an explanatory message appears on the console.

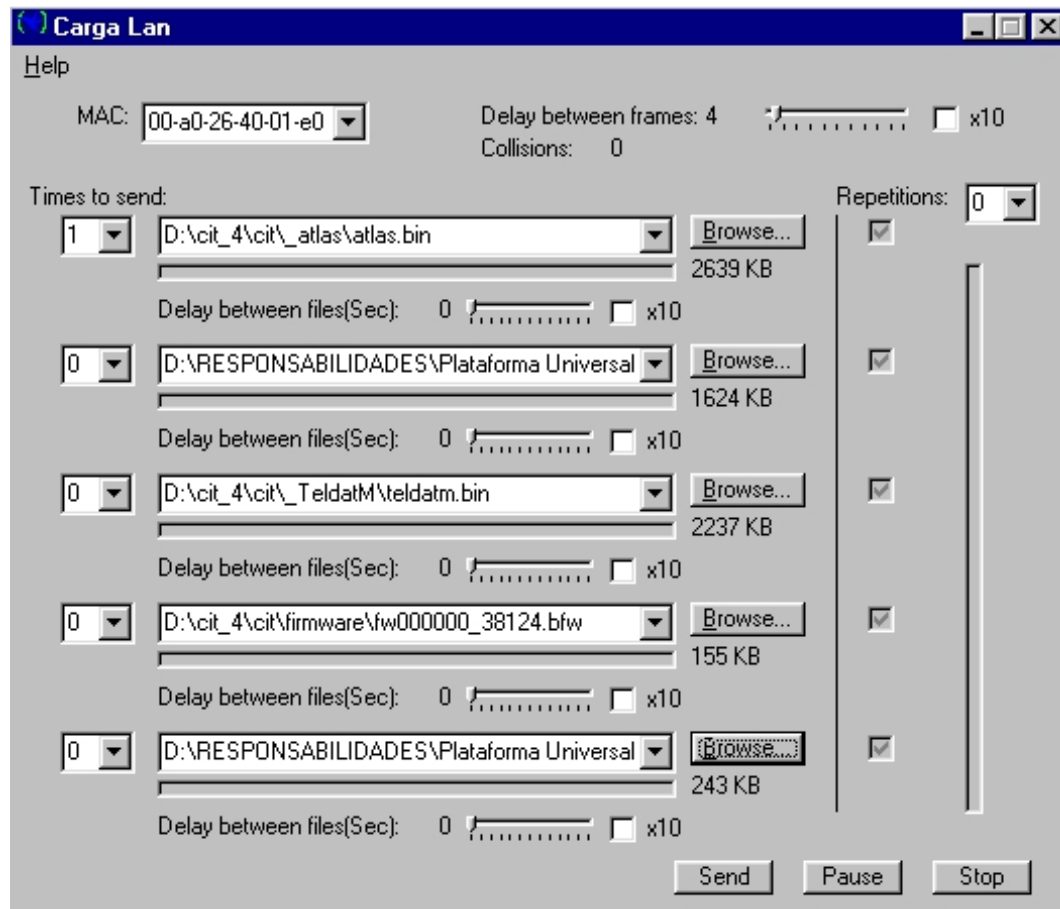


Fig. 3: Aspect of the CARGA LAN program

2.1.2 Updating from BIOS FLASH

This method should be used when you wish to update a device that won't startup correctly or because it doesn't have FTP access.

To access the BIOS FLASH menu, pause the device's normal startup through the "CTRL.-T" key combination when the device dumps a series of periods after two ">" symbols on the console.

```
*****
***** Router Teldat *****
*****
BOOT CODE VERSION: 01.06.09   Apr  4 2003 10:20:32
  gzip Mar 17 2003 10:39:55
P.C.B.: 0A MASK:0501 Microcode:0000
START FROM FLASH
BIOS CODE DUMP.....
BIOS DATA DUMP....
End of BIOS dump
```

```

=====
      BIOS Teldat                                (c)Teldat
=====
BIOS CODE VERSION: 01.06.09
CLK=49152 KHz   BUSCLK=49152 KHz
Date: 01/01/00, Monday           Time: 00:00:00

SDRAM size: 16 Megabytes
  BANK 0: 16 Megabytes (detected)
Caches: ON      Write-Back
FLASH: 4 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 4096 Bytes.
LAN SCC1
WAN: DCE
ADSL
UTOPIA
Current production date: xx xx
Current software license: x x
Current serial number: xxx/xxxxxx
>>
.....
    === INITIAL  MENU ===
    a) Change Time
    b) Change Date
    c) Change Code to Run
    d) Change Licence
    e) Load from console (pc_load)
    f) Disk menu
    g) Set default name for file loaded from console
    l) Load from lan
    x) Load from console (xmodem)
    r) Reset
    0) Exit
    >>

```

Once you have accessed the menus system, you need to update all the necessary archives through whichever process you prefer to use (see Procedure to send files.):

- BIOS FLASH (bios.bin contained in the distribution).
- C.I.T.

In cases where the distribution provides various binary files, the “readme.txt” file, together with the hardware and license information on your device (this information can be found on the label on the underside of the device) will help to find out which file is required.

- Auxiliary Files.

To determine the necessary files, you need to know what hardware your device contains and check the “readme.txt” file.

If you either want to change the Flash memory partitioning to activate or deactivate the backup system, or because the file system in Flash is corrupt, you need to format the Flash disk before loading the files; please see appendix [Flash Backup System](#) on page 24 where formatting is explained.

2.1.3 FTP Updating

Our routers have an FTP server to which files for device software updating can be transferred. This server is only accessible if the device has started up correctly (application being executed).

The steps to execute updating are as follows:

- c) Under certain circumstances, the transfer command may fail because the device does not have enough free volatile memory. In this case, activate the direct mode through the **“quote site direct on”** command before carrying out the transfer and deactivate it as soon as the said transfer has finalized through **“quote site direct off”**. Direct mode is when the file being transferred is directly stored in the Flash memory instead of in the temporary buffer before recording. If you have a high speed connection, you will see that the transfer is carried out in bursts with pauses when recording is being executed in the Flash memory.

- (7) Once the transfer has completed, execute the recording command “**quote site savebuffer**” (this is unnecessary if direct mode has been used).
- (8) One by one transfer and store the required firmware (files with “**bfw**” extension) through the “**put <firmware.bfw>**” and “**quote site savebuffer**” commands. In order to determine the necessary firmware,

please see appendix [Information required for updating](#) on page 29.

- (9) Finally and optionally, there is a command that permits you to check if the device has all the required files and if the elements versions are coherent with each other.

```
ftp> quote site coherence
550-COHERENCE results
  CIT          v10.1.0 ID 0x00000002
  BIOS         v1.7.0
  fw000000.bfw file not found!
  fw000002.bfw v1.1
550 COHERENCE results end
ftp>
```

You can also check the integrity of a file by calculating its MD5 signature and contrasting it with that included in the distribution .md5 file.

```
ftp> quote xmd5 fw000008.bfw
250 f94acab0c2a16b63ec8a5fe65262f5f1
ftp>
```

- (10) Restart the device through the “quote site reload on”; if this is normally through FTP, the device will restart after 30 seconds; if this is through FTP the device will restart immediately using “CTRL.-C”. You can also restart the device using the console command “load immediate”

```
*load immediate
Are you sure to reload the device(Yes/No)?
```

For further information on FTP commands, see section [Loading a file through FTP](#) on page 23 (found further on in this manual).

For further information on the FTP server, please see manual *Teldat-Dm 724-I "FTP Protocol"*.



Note

There are commands in the FTP protocol, which due to their nature, take a considerable time to execute. Given this, some FTP clients decide to close the connection when they do not receive a response in an established time believing that there has been a problem with the server, as has occurred with the Windows FTP client. Specifically, this client has a non configurable 60 second time-out between the sending of a command and the reception of the response: when this time-out expires, the client understands that the session is closed.

```
226 STOR completed, 9414766 bytes processed, data connection is closed.
ftp: 9414766 bytes sent in 5.85Seconds 1609.64Kbytes/sec.
ftp> quote site savebuffer
Connection closed by remote host.
ftp>
```

If this situation occurs, please see manual *Teldat-Dm724-I "FTP Protocol"*.

2.1.4 TFTP Updating

Our routers have a TFTP client through which you can transfer files to/from a TFTP server. This client can only be accessed if the device has started up correctly (application in execution).



Note

Updating through TFTP means that no check is carried out regarding the versions, internal CRC, coherency, renaming, etc., and should only be used when well aware of the risks of an erroneous updating. We recommend that updating is carried out through FTP.

The steps to take to execute an updating are as follows:

- (1) Extract the distribution content in a subdirectory from the root directory managed by the TFTP server; if the extraction is successful, then you have some guarantees that the content has not undergone any changes.
- (2) Transferring the BIOS FLASH; to do this you need to activate the BIO files system and download the BIOS file (in our example, the BIOS file is known as b8260.bin and is located in the “new” TFTP server subdirectory, address 192.168.0.2; in cases regarding the BIO file system, as this only contains one file, the recording name is not important.).

```
TFTP+syst BIO
```

```
Current file system set to BIO
TFTP+get 192.168.0.2 new\b8260.bin
Receiving new\b8260.bin from 192.168.0.2...
  237184
File successfully received
```

- (3) Transferring the application; to do this you need to activate the DSK file system and download the application file: if the distribution includes various binaries, please see appendix [Information required for updating](#) on page 29 to determine the appropriate binary. So the file loaded through TFTP executes on the next device start up, the name of the recording given to the TFTP client must coincide with the name of the active application that can be configured through “set application-active.” Obviously, if the name of the recording coincides with a file stored in Flash, this will be overwritten (and if this coincides with the name of the active application, the loaded version will become the active one in the next start up).

```
Config>set application-active
Date           Time           Size           Name
-----
02/22/07       17:49           1655168       ATLAS2G.BIN
02/26/07       12:28           1655168       G.BIN
Current code filename : atlas2g.bin
Application to activate [atlas2g.bin]?
Code changed successfully
TFTP+syst DSK
Current file system set to DSK
TFTP+get 192.168.0.2 new\cit.bin atlas2g.bin
Receiving atlas2g.bin from 192.168.0.2\new\cit.bin...
  1655168
File successfully received
```

- (4) Transferring the necessary firmware (files with extension “bfw”): to do this you need to activate the DSK file system and execute the download. To determine the necessary firmware, please see appendix [Information required for updating](#) on page 29.

```
TFTP+syst DSK
Current file system set to DSK
TFTP+get 192.168.0.2 new\fw00000c.bin
Receiving new\fw00000c.bin from 192.168.0.2...
  155168
File successfully received
```

- (5) Restart the device with the “load immediate” console command.

```
*load immediate
Are you sure to reload the device(Yes/No)? y
```

For further information on the TFTP client, please see manual *Teldat-Dm 765-I "TFTP Protocol"*.

2.2 Distributing with the C.I.T. Image file (IMG)

2.2.1 Updating from BOOT

In cases where your device doesn't have a valid C.I.T. image available (Flash memory corrupt due to wrong updating or the unit has been formatted, etc), the system will automatically start up the BOOT program; it also might be necessary to force start up from BOOT if the C.I.T. image is there but is corrupt and incapable of successfully starting.



Note

Only activate start up from BOOT if it's absolutely essential.

2.2.1.1 Loading the file through TFTP (you need a connection to a local console)

You must have a local connection to the device console to access the BOOT menu. For further information on this please see the corresponding installation manual for the device. The steps to carry out to load the C.I.T. image file are as follows:

- (1) **Accessing the BOOT menu from the console.** To do this you need to simultaneously press the CTRL and T keys during the start up process when the text “***Press CTRL+T to stop DHCP and break into CFE menu ***” or “Press CTRL+T to stop auto run (X seconds)***”, appears, and before the indicated seconds run out. In this way the C.I.T. start up cancels and the device pauses at the BOOT prompt: “**CFE>**”. From this menu, you can access all the BOOT menu commands. Below you can see an example of a C1+L start up:

```
CFE version 1.0.37-102.9-01 for BCM96358 (32bit,SP,BE)
Build Date: Thu Dec  3 11:02:34 CET 2009 (jsirodey@orion)
Copyright (C) 2000-2008 Broadcom Corporation.

Parallel flash device: name AM29LV320MT, id 0x2201, size 16384KB
CPU type 0x2A010: 300MHz, Bus: 133MHz, Ref: 64MHz
CPU running TP0
Total memory: 67108864 bytes (64MB)
Boot Address 0xbe000000

Board IP address           : 192.168.1.1:ffffff00
Host IP address            : 192.168.1.100
Gateway IP address         :
Run from flash/host (f/h)  : f
Default host run file name :
Default host flash file name :
Boot delay (0-9 seconds)   : 3
Boot image (0=latest, 1=previous) : 0
Board Id (0-0)             : 96358C1PL
Number of MAC Addresses (1-32) : 4
Base MAC Address           : 00:a0:26:6e:00:58
PSI Size (1-64) KBytes     : 24
Main Thread Number [0|1]   : 0

DHCP running
*** Press CTRL+T to stop DHCP and break into CFE menu ***
*** Press CTRL+T to stop auto run (3 seconds) ***
Auto run second count down: 3
web info: Waiting for connection on socket 0.
CFE>
```

- (2) **Check the IP configuration for the device and the TFTP server where the image file resides .** By default, the device has its own IP address configured, 192.168.1.1 with mask 255.255.255.0 and IP address for the TFTP server is 192.168.1.100. You can change the configuration through the “c” command. Please see the following example where the IP address for the device has been configured as 192.6.2.23 with mask 255.255.255.0 and the IP address for the TFTP server as 192.6.2.50

```
CFE> c
Press: <enter> to use current value
      '-' to go previous parameter
      '.' to clear the current value
      'x' to exit this command

Board IP address           : 192.168.1.1:ffffff00 192.6.2.23:ffffff00
Host IP address            : 192.168.1.100 192.6.2.50
Gateway IP address         :
Run from flash/host (f/h)  : f
Default host run file name :
Default host flash file name :
Boot delay (0-9 seconds)   : 3
Boot image (0=latest, 1=previous) : 0
DHCP running
*** command status = 0
CFE>
```

- (3) **Connect the device to the TFTP server.** Through the Ethernet cable provided with the device, with a direct connection between the router's LAN1 port and the TFTP server Ethernet port or through an intermediate switch or hub.

- (4) **Prepare the TFTP server.** Configure the IP address the device expects and decompress the distribution content in a root directory subdirectory managed by the TFTP server. In the example the selected directory is "teldatcodes".
- (5) **Start the C.I.T. image file transfer.** Execute the "f" command followed by the name of the image file you wish to load; in our example this is cit-clpl-10.08.02.img. Once the transfer has finalized, the file will begin to be saved in Flash. Wait until the device tells you that it has finished doing this: *** Image flash done *** !

```
CFE> f teldatcodes/cit-clpl-10.08.02.img
Loading 192.168.1.100:teldatcodes/cit-clpl-10.08.02.img ...
Finished loading 6204416 bytes
Flashing root file system and kernel at 0xbel60000: .....
*** Image flash done *** !
Resetting board...
```

- (6) The device restarts automatically once the updating has finished.

The loading process executes the following checks:

- **CRC check:** The CRC is calculated before starting to save to flash. In cases where the check proves to be incorrect, an error message appears and the updating stops:

```
CFE> f teldatcodes/cit-clpl-10.08.02_badcrd.img
Loading 192.168.1.100:teldatcodes/cit-clpl-10.08.02_badcrd.img ...
Finished loading 6204419 bytes
Illegal image ! Image crc failed.
*** command status = -1
CFE>
```

- **C.I.T. version check:** when you try and update the device with a version which is prior to the one currently loaded, the device will pause and ask if you really want to execute this operation. The message that appears is shown below:

```
CFE> f teldatcodes/cit-clpl-10.08.01-boot-01.img
Loading 192.168.1.100:teldatcodes/cit-clpl-10.08.01-boot-01.img ...
Finished loading 6241536 bytes
Code version(10.08.01) is older than current(10.08.02). Continue?
(y/n):
```



Note

We do not recommend that you load versions prior (downgrade) to the one currently loaded in the device. The configuration may be incompatible with the version you're trying to load.

- **Compatibility with the BOOT version check:** when you try to update the device with a C.I.T. image which is incompatible with the currently loaded BOOT version, the device will pause and ask if you really want to execute this operation. The message that appears is shown below:

```
CFE> f teldatcodes/cit-clpl-10.08.01-boot-02.img
Loading 192.168.1.100:teldatcodes/cit-clpl-10.08.01-boot-02.img ...
Finished loading 6241920 bytes
Image is incompatible with boot code 01. Boot needed: 02. Continue?
(y/n):
```



Note

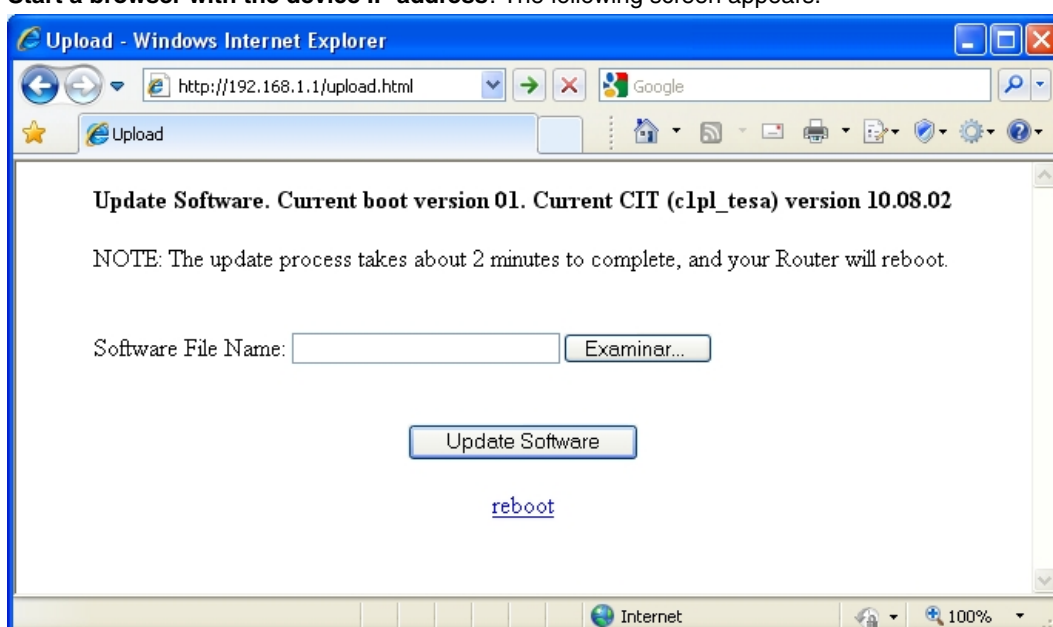
We do not recommend that you load CIT versions that are incompatible with the BOOT version. It's possible that the device won't operate correctly.

- **Other checks:** the BOOT executes another series of checks to verify the integrity and compatibility of the image you are trying to load.
 - Compatibility with the hardware.
 - Size compatibility.

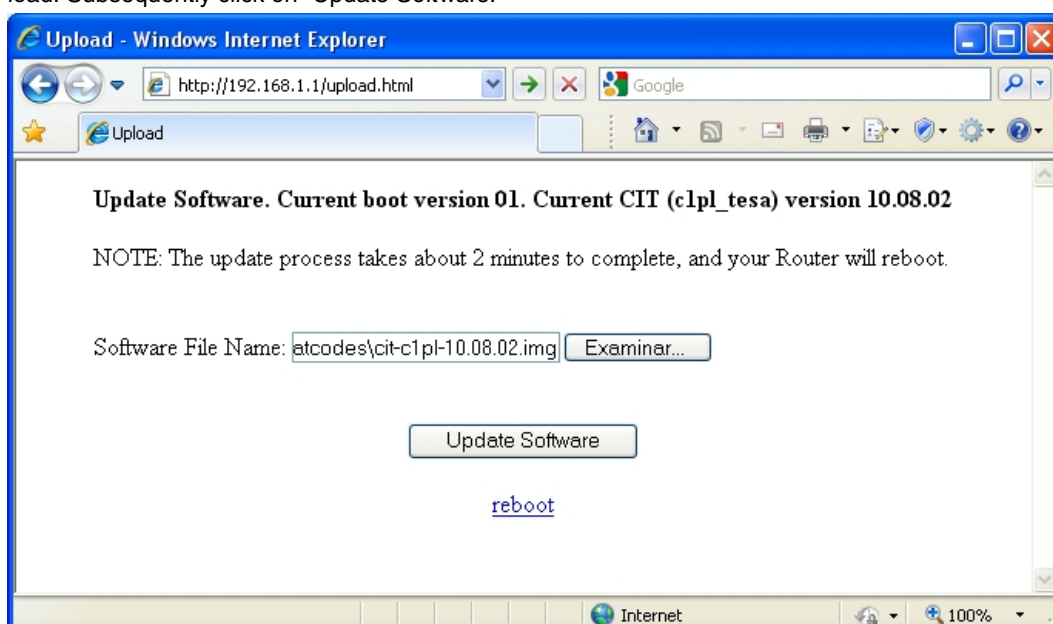
2.2.1.2 Loading the file through WEB (connection to a local console isn't required)

In this case, we do not need a local connection to the device console:

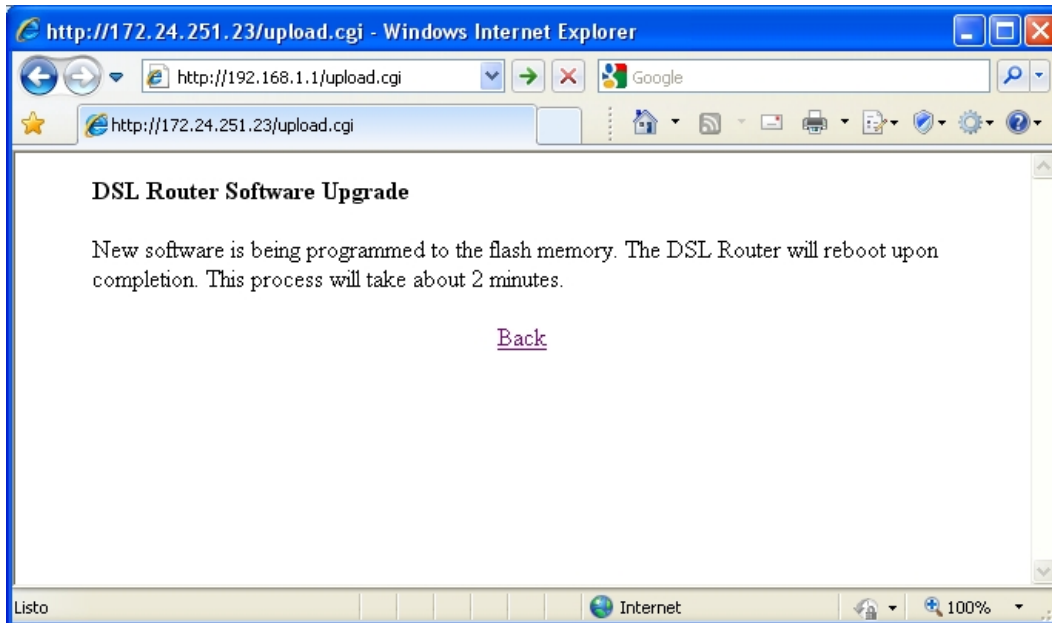
- (1) **Make the device start up in BOOT mode.** This process depends on the device model. You need to consult the corresponding section in the installation manual. We are going to take the C1+L device as our example:
 - Turn off the device.
 - Press the RST pushbutton, hold it down and switch on the device.
 - The WLAN LED will begin to flash. Keep the RST pushbutton held down.
 - After about 15 seconds, the WLAN LED goes out; keep the RST pushbutton held down.
 - After about 3 seconds, the WLAN LED lights up. Release the reset button at this point.
 - Wait for a few seconds until the device completes start up.
 - The device is now in BOOT mode with the default IP configuration from BOOT (IP address 192.168.1.1 and mask 255.255.255.0).
- (2) **Connect the device to a PC (any PC that has a browser).** Through the Ethernet cable provided with the device, with a direct connection between the router's LAN1 port and the HTTP client Ethernet port or through an intermediate switch or hub.
- (3) **Prepare the PC.** Configure the IP address in the same network as the device.
- (4) **Start a browser with the device IP address:** The following screen appears:



- (5) **Select the image to load and click on "Update Software".** Click on "Examine" and select the C.I.T. image to load. Subsequently click on "Update Software".

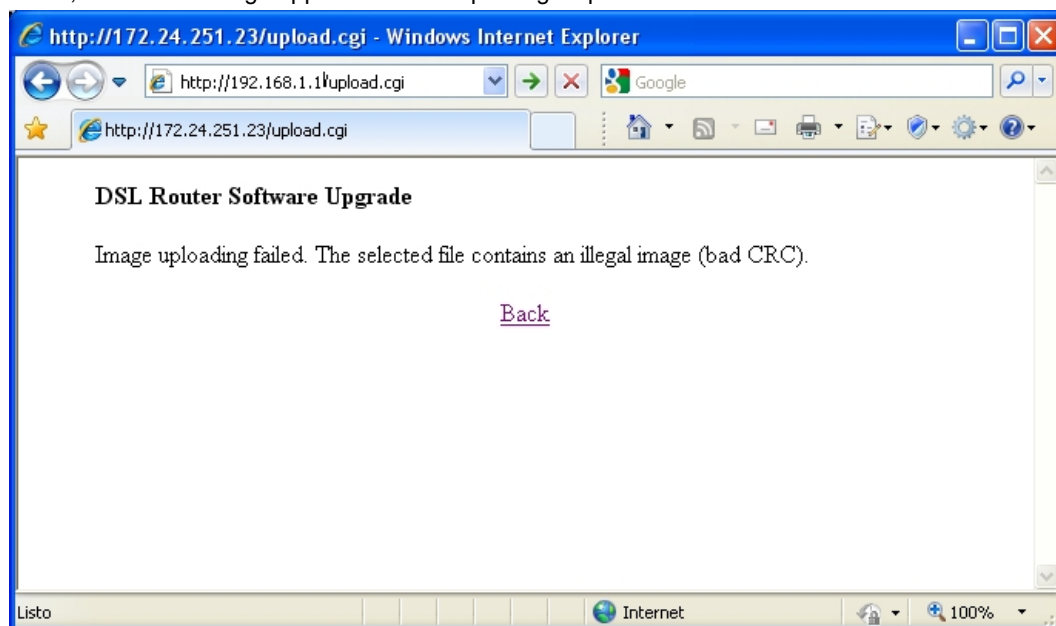


- (6) **Wait for the device to automatically restart.** In cases where no errors have been produced, the following screen appears:

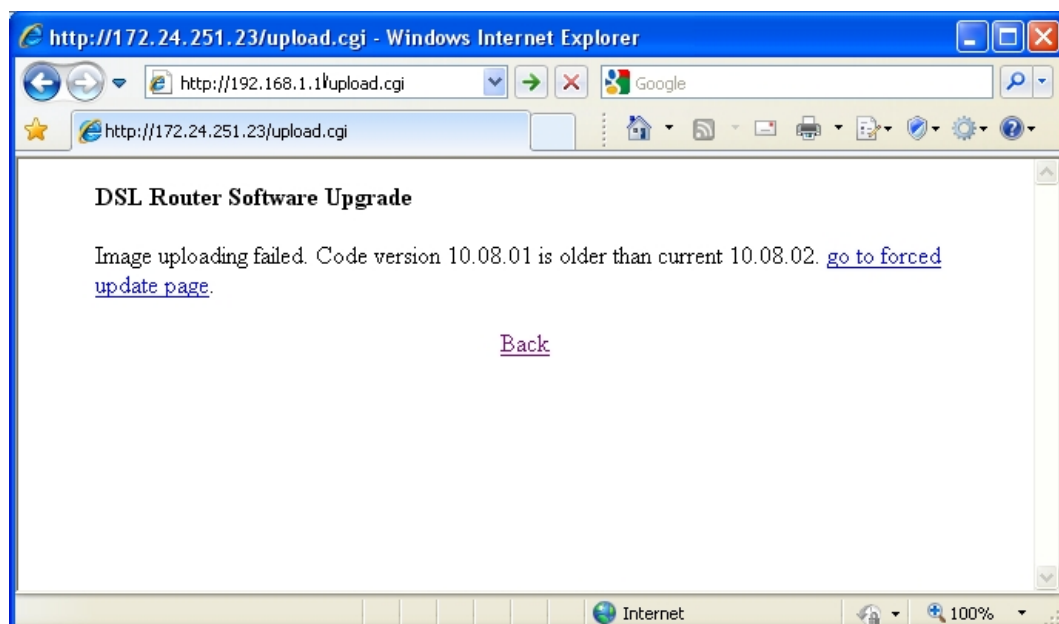


The loading process executes the following checks:

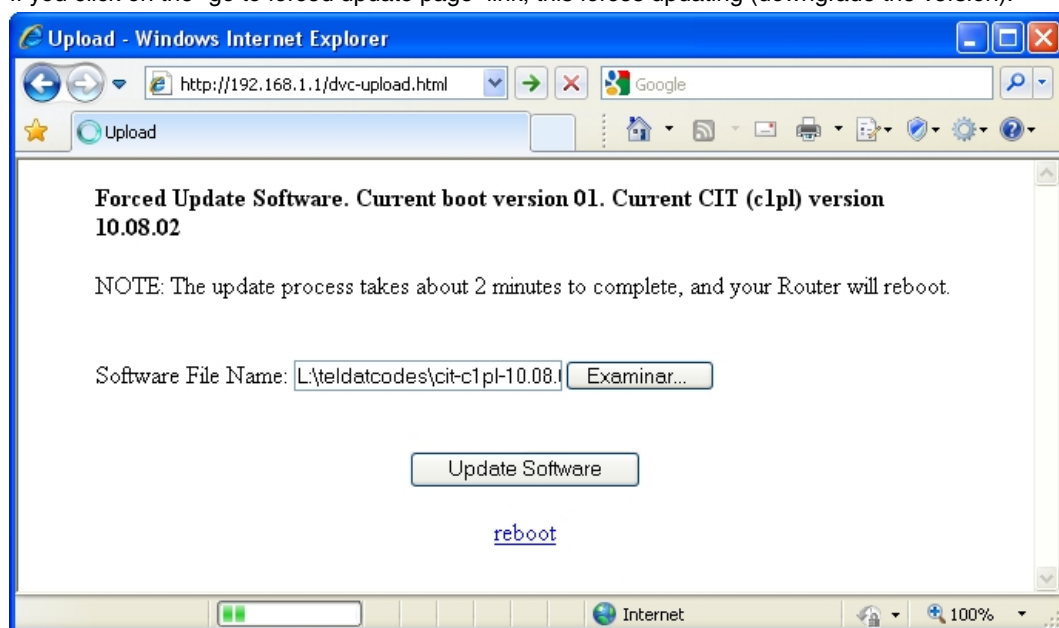
- **CRC check:** The CRC is calculated before starting to save to flash. In cases where the check proves to be incorrect, an error message appears and the updating stops:



- **C.I.T. version check:** when you try and update the device with a version which is prior to the one currently loaded, the device will detect this, stop the updating and report this through the message that appears below:



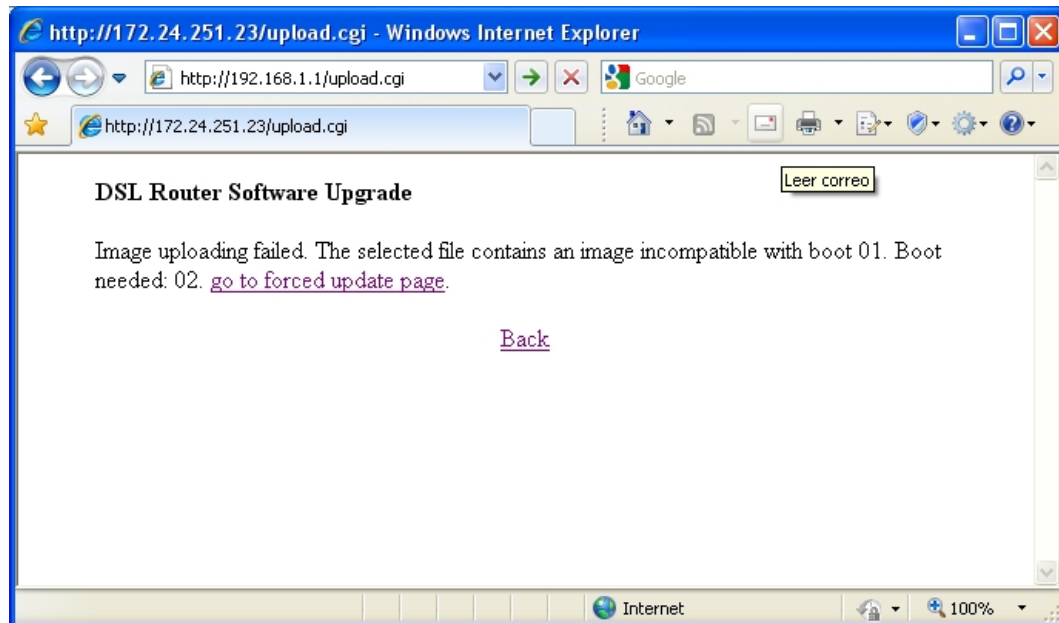
If you click on the “go to forced update page” link, this forces updating (downgrade the version).



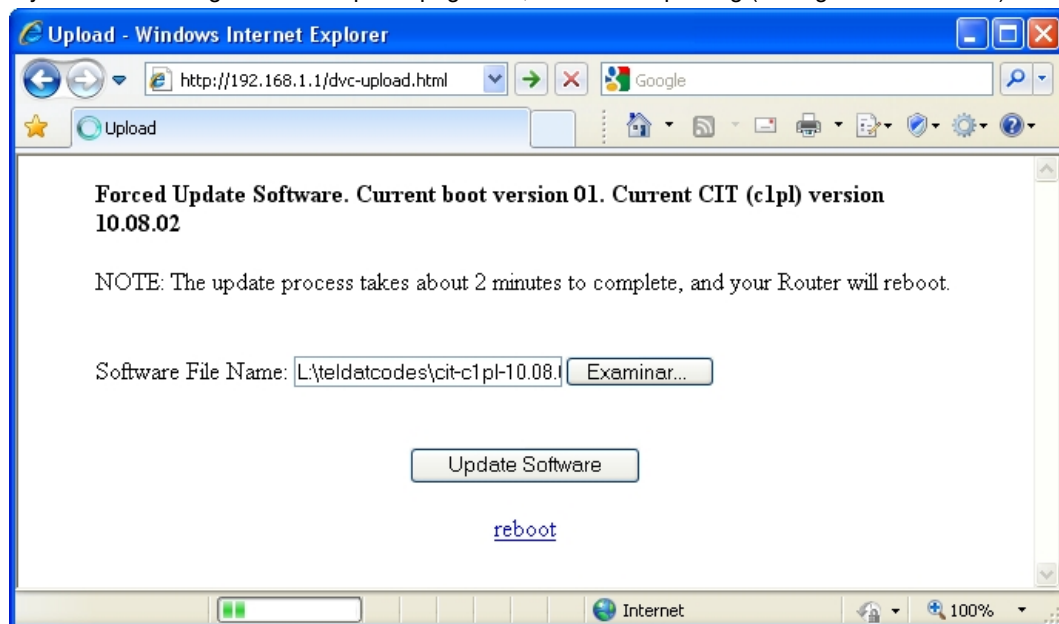
Note

We do not recommend that you load versions prior (downgrade) to the one currently loaded in the device. The configuration may be incompatible with the version you're trying to load.

- **Compatibility with the BOOT version check:** when you try to update the device with an C.I.T. image which is incompatible with the currently loaded BOOT version, the following message appears and the updating stops:



If you click on the “go to forced update page” link, this forces updating (downgrade the version).



Note

We do not recommend that you load CIT versions that are incompatible with the BOOT version. It's possible that the device won't operate correctly.

- **Other checks:** the BOOT executes another series of checks to verify the integrity and compatibility of the image you are trying to load.
 - Compatibility with the hardware.
 - Size compatibility.

2.2.2 FTP Updating

Our routers have an FTP server to which they can transfer files to update the device software. This server is only accessible if the device has started up properly (application being executed).

The steps to follow to execute updating are as follows:

- (1) Decompress the distribution content to a directory; if the decompress has worked properly, then the content won't have undergone any alteration.
- (2) Connect to the device FTP server (you need a user and password: default is user “root” without any password).
- (3) Configure the binary mode through the “bin” command.

- [illegible]

- ```
ftp> quote site coherence
550-COHERENCE results
 CIT v10.8.1 ID 0x00000000 HDW LVL 3
 BOOT v01
550 COHERENCE results end
ftp>
```

- ```
*load immediate
```

```
Are you sure to reload the device(Yes/No)? y
```

For further information on the FTP commands, please see section [Loading a file through FTP](#) on page 23 (found further ahead in this manual).

For further information on the FTP server, please see manual *Teldat-Dm724-I "FTP Protocol"* .

**Note**

There are commands in the FTP protocol, which due to their nature, take a considerable time to execute. Given this, some FTP clients decide to close the connection when they do not receive a response in an established time believing that there has been a problem with the server, as has occurred with the Windows FTP client. Specifically, this client has a non configurable 60 second time-out between the sending of a command and the reception of the response: when this time-out expires, the client understands that the session is closed.

```
226 STOR completed, 9414766 bytes processed, data connection is closed.  
ftp: 9414766 bytes sent in 5.85Seconds 1609.64Kbytes/sec.  
ftp> quote site savebuffer  
Connection closed by remote host.  
ftp>
```

If this situation occurs, please see manual *Teldat-Dm724-I "FTP Protocol"* .

Appendix A FTP Commands for uploads

A.1 Loading a file through FTP

In cases where you have FTP access to the device, you can use this protocol to update files. This functionality is similar to a standard FTP server, including some special features. If some commands are not available in the currently executed version, please check the “readme.txt” file, the device hardware information and other sections in this manual to obtain the required information.

Command	Function
quote site savebuffer	Saves the temporary buffer in the disk; on executing “put”, information is not immediately stored in the disk instead it is saved in a temporary buffer.
quote site listfirmwares	Returns the firmware files list (*.bfw) required to ensure that the router runs correctly.
quote site systid	Returns information on the device, indicating the quantity of Flash and DRAM memory and license.
quote site compatible <offlon>	Deactivates or activates the BIOS and version checking. This is the same as site check version and site check bios.
quote site coherence	Carries out a check on the system’s critical files and produces information on the results.
quote site check <item> <offlon>	Through this command the device can execute a series of automatic checks and actions aimed at managing the received files so they can be detected more easily as known files. There are various actions that can be controlled using this command. (For further information, please see the FTP manual). The actions most commonly used in updating are as follows: • SITE CHECK VERSION OFF ON Activates or deactivates the rejection of files whose versions are older than that currently running in the device. • SITE CHECK BIOS OFF ON Activates or deactivates the rejection of applications whose minimum version of the required BIOS or BOOT is subsequent to the BIOS or BOOT version currently running in the system.
quote site direct on	Forces the system to store the sent file on the disk in the same way as received, without storing it in the temporary buffer. This command must be activated when the system does not have enough temporary memory to store the file before recording it.
quote xmd5 <filename.ext>	Calculates the MD5 signature for a file present in Flash to be contrasted with the signature of the same file provided in the distribution .md5 file.
quote site backup	In devices with Flash backup system, this copies the main partition information to the backup partition so, in cases where there are problems with the main partition, this restores the copy saved in the backup partition. For further information on the Flash backup system, please see appendix Flash Backup System on page 24.



Note

The “quote site direct on” and “quote site compatible off” commands should only be activated when absolutely necessary.

Appendix B Flash Backup System

B.1 Distributing with BIOS, CIT and FWs files

B.1.1 Introduction

The Flash backup system permits automatic restoration of the last successfully installed distribution when the device detects problems in some of the software elements (BIOS FLASH, application and firmwares).

The Flash backup system needs the Flash disk to be partitioned into two units, known as main and backup. This partitioning means that the available space for installation is less (half) and therefore should only be activated when considered necessary and the installation to be carried out can be fitted into the main unit.

B.1.2 Flash Disk Formatting

There are two ways to format the Flash disk:

- All of it as one partition, i.e. with maximum capacity.
- As two partitions, one as main and the other as backup, each one containing half of the capacity.

To find out how much Flash memory there is in the device, please see appendix [Information required for updating](#) on page 29.

Formatting the Flash disk is **destructive** and only available in the local console in order to guarantee that the user has local access to the device to load it adequately.

- (1) Pause device start up in the BIOS by pressing CTRL-T keys together when a series of periods appear after two ">" symbols.

```
*****
*****
*****
BOOT CODE VERSION: 01.10  Oct 30 2006 17:17:43
  gzip  Oct 30 2006 17:08:44
P.C.B.: 74  MASK:0A01  Microcode:0070
START FROM FLASH
BIOS CODE DUMP.....
BIOS DATA DUMP....
End of BIOS dump
  Boot-stack used: 0x00000788
  Boot-stack free: 0x00001878
BIOS CODE VERSION: 01.10
CLK=294912 KHz  BUSCLK=65536 KHz  PCICLK=32768 KHz  L1
Date: 02/26/07, Monday  Time: 17:14:20
SDRAM size: 128 Megabytes
  BANK 0: 128 Megabytes (detected)
I_Cache: ON
D_Cache: ON  Write-Back
FLASH: 16 Mb.
NVRAM: 128 Kb.
EEPROM: 2048 Bytes.
DPRAM: 16384 Bytes.
WAN1: DTE
WAN2: DTE
ISAC
RDSI_B
RDSI_B
FAST ETHERNET 1
FAST ETHERNET 2
PCI device: Host bridge
```

```
(Bus: 0, Device: 0, Function: 0)
(Subs. Vendor: 0x0000, Subs. Device: 0x0000)
Current production date: 06 10
Current software license: 6 89
Current serial number: 472/06332
BIOS MAC Add: 00-a0-26-70-18-bc
>>
...
```

(2) Access the Flash disk menu:

```
=== INITIAL MENU ===
a) Change Time
b) Change Date
c) Change Code to Run
d) Change Licence
e) Load from console (pc_load)
f) Disk menu
g) Set default name for file loaded from console
h) Change BIOS licence
l) Load from lan
v) Change version control for loading
x) Load from console (xmodem)
r) Reset
lram) Load from lan and run without saving
0) Exit
>>f
=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
```

(3) Select the formatting option: if you want a single partition, select the “A: (only one disc - Full size)” option; if you want two partitions, format the main partition through the “AH: (Main disc - Half size)” option and subsequently the backup through “B: (BK disc - Half size)”

```
=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
A: (only one disc - Full size)
AH: (Main disc - Half size)
B: (BK disc - Half size)
S: (Smart Card)
Drive: AH
Are you sure to format drive AH: ?(y/n):y
Drive formatted O.K.
=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
```

```

e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
  A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
  A: (only one disc - Full size)
  AH: (Main disc - Half size)
  B: (BK disc - Half size)
  S: (Smart Card)
Drive: B
Are you sure to format drive B: ?(y/n):y
Drive formatted O.K.

```

Here you can see how both partitions have the same size.

```

=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
  A:>>d
Enter path:
Volume label: FLASH_DISK
              0 File(s)
Free room in drive A:*. * = 7847936 Bytes.

=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
  A:>>a
Present drives:
  A:  FLASH_DISK
  B:  FLASH_DISK
Current active drive: A:
Select new active drive: B:  OK.
Current active drive: B:

=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
  B:>>d
Enter path:
Volume label: FLASH_DISK
              0 File(s)
Free room in drive B:*. * = 7847936 Bytes.

```

Here you can see how to format everything in the same partition, the size is double.

```

=== DISK MENU ===

```

```

a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
A:>>f
This operation can provoke important damages to equipment. Continue?(y/n): y
A: (only one disc - Full size)
AH: (Main disc - Half size)
B: (BK disc - Half size)
Drive: A
Are you sure to format drive A: ?(y/n):y
Drive formatted O.K.
=== DISK MENU ===
a) Change active drive.
c) Copy file.
d) Show files.
e) Erase file.
f) Format disk.
r) Rename archive.
0) Exit
A:>>d
Enter path:
Volume label: FLASH_DISK
0 File(s)
Free room in drive A:*. * = 16224256 Bytes.

```

B.1.3 Operating Flash Backup System

Once the Flash backup system has been enabled, the user must establish the restoration point, i.e. execute the copy of the main partition information to the backup partition. There are two commands available for this:

(1) Console

```

*config
Config>backup-files
Backup successful.
Config>

```

(2) FTP

```
ftp>quote site backup
```



Note

Depending on the FTP client used, you can close the session before finishing the operation.

Once the restoration point has been established, the system is automatic:

- (1) On start up, the BIOS search for the application established as active.
- (2) If it doesn't find it (searching by name) or the CRC is incorrect, it searches for the next existing application file (*.bn) in the main partition.
- (3) If it doesn't find the next application file or the CRC is incorrect, it makes a copy from the backup partition to the main partition: i.e. it executes a "backup restoring".
- (4) Once the application has started up, when a determined firmware has been requested (*.bfw files), the application checks that the file is in the main partition and if it has a valid CRC; if the **"firmware-checking"** command is configured, and some of the requested firmwares fail (or do not exist or the CRC is invalid), the application requests a "backup restoring" and makes the router reset.
- (5) Once the BIOS or the application has provoked a "backup restoring", the flag, which indicates that this has started up from backup and which can only be deactivated when you successfully re-execute the **"backup-files"** or the **"quote site backup"** command, activates.

All the executed actions are registered in the log which is accessible through the **nvrlog list** command:

```
*monitor
Console Operator
*event
-- ELS Monitor --
+nvrlog list
05/17/06 12:35:50 -5- Files backup OK
05/17/06 12:34:33 -1- Loading from backup
05/17/06 12:33:15 -1- Backup restored by flag
05/17/06 12:32:16 -1- Invalid file (fw000008.bfw). Restoring backup
05/17/06 12:24:10 -3- Restart issued by the user
05/17/06 12:24:08 -5- Configuration saved on Flash
05/17/06 12:18:16 -5- FTP Reset
```

B.2 Distributing with the C.I.T. image file (IMG)

B.2.1 Introduction

Devices with C.I.T. image file distribution do not implement the backup flash functionality although it does allow you to save two C.I.T. images. It's the BOOT that automatically maintains the last two loaded images, provided that the total sum of the image sizes does not exceed the available amount of Flash.

B.2.2 Operating a system with double image in flash

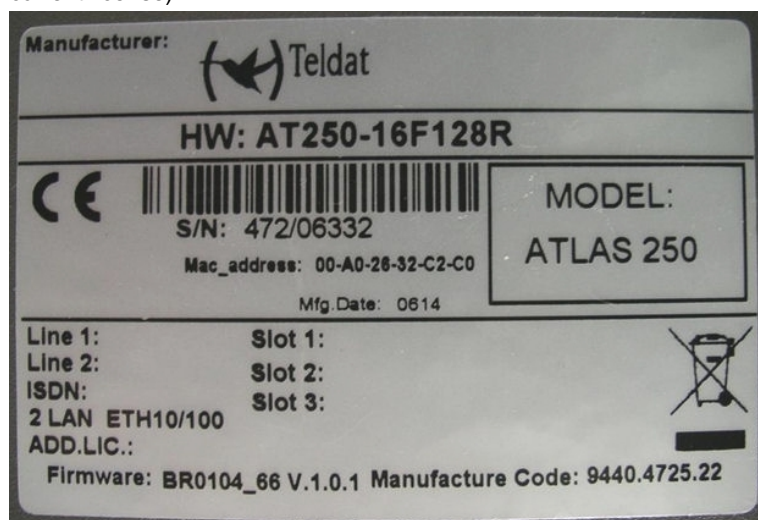
- (1) On start up, the BOOT searches for the application established as active.
- (2) If it finds it, the device boots. If it doesn't or the CRC is wrong, it looks for the second image.
- (3) If it finds it, the device boots. If it doesn't or the CRC is wrong, this causes the router to restart.

Appendix C Information required for updating

C.1 How to determine the appropriate distribution and the appropriate binary

To update a device, you need to know its identifier and the current license. This information can be obtained by:

- Checking the label found on the underside of the device (this is only valid to determine the device identifier, not the current license).



- In console (local or Telnet) through the monitoring command “configuration” (in this case **TC-4F32R-W2AI L1.87**).

```
*monitor
+configuration
Teldat's Router, C6 SNA IPSec CR 1 87 S/N: 427/00127
P.C.B.=48 Mask=0502 Microcode=0000 CLK=49152 KHz BUSCLK=49152 KHz
      ID: TC-4F32R-W2AI L1.87
Boot ROM release:
  BIOS CODE VERSION: 01.09.01 Feb 1 2005 13:25:25
  gzip Feb 1 2005 12:42:37
  io1 Feb 1 2005 13:24:56
  io2 Feb 1 2005 12:41:45
  io3 Feb 1 2005 13:24:56
START FROM FLASH L1 Watchdog timer Enabled

Software release: 10.5.4-Alfa TM Feb 11 2005 13:12:12
Compiled by sfont on SFONT
Hostname: Active user:
Date: Friday, 02/11/05 Time: 16:33:20
Router uptime: 4s
Num Name Protocol
0 IP DOD-IP
3 ARP Address Resolution Protocol
6 DHCP Dynamic Host Configuration Protocol
11 SNMP SNMP
13 RIP Route Information Protocol
10 interfaces:
Conn Interface MAC/Data-Link Hardware Status
LAN1 ethernet0/0 Ethernet/IEEE 802.3 Quicc Ethernet Up
WAN1 serial0/0 ASTM system Async Line Testing
DSL1 atm0/0 ATM ATM SAR Device Down
ISDN1 bri0/0 BRI Net ISDN Basic Rate Int Up
--- x25-node internal Router->Node Up
```

```
SNMP OperStatus:
Interface      OperStatus
ethernet0/0    Up
serial0/0      Down
atm0/0         Down
bri0/0         Up
x25-node       Up
+
```

- Via FTP, using the “quote site systid” command.

```
ftp> quote site systid
211 TC-4F32R-WAI L1.2
ftp>
```

To identify the distribution corresponding to the device, simply check the initial part of the identifier:

- TC # Teldat M distribution (the Teldat C software is contained in the Teldat Modular).
- TM # Teldat M distribution
- AT # ATLAS distribution
- AT2G # ATLAS 2G distribution
- ...

To determine how much available Flash there is, check the number preceding the letter F (for Flash) and to determine how much SDRAM is available, check the number preceding the letter R (for RAM), both quantities are expressed in Megabytes.

To identify what application binary should be downloaded in your device, check the “version_map.txt” file included in the distribution and find the first condition this fulfills.

For example, if we have various devices where the corresponding distribution is Teldat M, the “version_map.txt” file contained there is as follows:

```
L1.5, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4 (MR)
L1.6, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4 SNA (MR)
L1.10, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4 IPSEC (MR)
L1.11, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4 SNA IPSEC (MR)
L1.13, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4i (MR)
L1.14, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4i SNA (MR)
L1.16, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4i IPSEC (MR)
L1.17, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4i SNA IPSEC (MR)
L1.21, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4B (MR)
L1.22, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4B SNA (MR)
L1.26, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4B IPSEC (MR)
L1.27, 4F, 16R, *, teldatac_corp_mr.bin, Teldat C4B SNA IPSEC (MR)
L1.12, 4F, 16R, *, teldatac_pai_mr.bin, Teldat C2i (MR)
L1.15, 4F, 16R, *, teldatac_pai_mr.bin, Teldat C2i IPSEC (MR)
L1.33, 4F, 16R, *, teldatac_pai_mr.bin, Teldat C3i IPSEC (MR)
L1.1, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C2 (MR)
L1.2, 2F, 16R, *, teldatac_pa_mr.bin, Teldat CSW (MR)
L1.7, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C2 IPSEC (MR)
L1.8, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C3 IPSEC (MR)
L1.29, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C3G IPSEC (MR)
L1.30, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C2 (no TMS) (MR)
L1.42, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C2UP (MR)
L1.43, 2F, 16R, *, teldatac_pa_mr.bin, Teldat C2UP IPSEC (MR)
L1.18, 2F, 16R, *, teldatac_pi_mr.bin, Teldat C2B (MR)
L1.19, 2F, 16R, *, teldatac_pi_mr.bin, Teldat C2BM (MR)
L1.23, 2F, 16R, *, teldatac_pi_mr.bin, Teldat C2B IPSEC (MR)
L1.24, 2F, 16R, *, teldatac_pi_mr.bin, Teldat C2BM IPSEC (MR)
L1.35, 2F, 16R, *, teldatac_pi_mr.bin, Teldat C3B IPSEC (MR)
L1.37, 2F, 16R, *, teldatac_pi_mr.bin, Teldat MASTER ROUTER (MR)
L1.*, *F, *R, *, teldatm_standard.bin, Teldat C
```

```
L4.*, *F, *R, *, telatm_standard.bin, Teldat S
L5.*, *F, *R, *, telatm_standard.bin, Teldat G
L8.*, *F, *R, *, telatm_standard.bin, Teldat A
```

- if the device identifier is TC-4F32R-W2AI L1.87, the first (and in this case only) condition this must fulfill is: "L1.*, *F, *R, *" (L1.87, 4F, 32R, W2AI), consequently, the binary to be loaded is telatm_standard.bin.

- if the device identifier is TC-4F16R-WAI L1.27, the first condition this must fulfill is: "L1.27, 4F, 16R, *" (L1.27, 4F, 16R, WAI), consequently, the binary to be loaded is telatc_corp_mr.bin.

- if the device identifier is TC-4F32R-WAI L1.27, the first condition this must fulfill is: "L1.*, *F, *R, *" (L1.27, 4F, 32R, WAI), consequently, the binary to be loaded is telatm_standard.bin.

C.1.1 How to determine the necessary firmware

To determine what firmwares a device needs, you have two options:

- (1) The FTP server command "**quote site listfirmwares**" which returns a list with the firmware file names included in the distribution which must be sent.

```
ftp> quote site listfirmwares
211 fw000000.bfw;fw000002.bfw
ftp>
```

- (2) The "**system firmwares**" command.

```
*monitor
Console Operator
+system firmwares
List of required firmwares for detected hardware
-----
      Filename                Description
-----
fw000000.bfw  Alcatel-SGS Thomson DynaMiTe ADSL over POTS
fw000002.bfw  Analog Devices Eagle ADSL over POTS
```