



FTP/sFTP Protocol

Teldat-Dm 724-I

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Chapter 1 Introduction

1.1 FTP Protocol

One of the main advantages of the Internet is that it allows files to be transferred from one terminal to another from anywhere in the world. To do so, we use the File Transfer Protocol (FTP).

If we have access to remote files via Telnet, FTP allows us to share (receive and send) our files with other devices as long as their administrator approves.

The objectives of FTP are:

- (1) To promote the sharing of files (programs or data).
- (2) To promote the use of remote hosts.
- (3) To protect the user from variations in file storage systems used by different hosts.
- (4) To carry out data transfer safely and efficiently.

Our devices' FTP server allows you to remotely download code and configurations from FTP clients in remote terminals. This way, codes can be loaded and configurations set without having to directly connect devices to our PC.

1.2 FTP Model

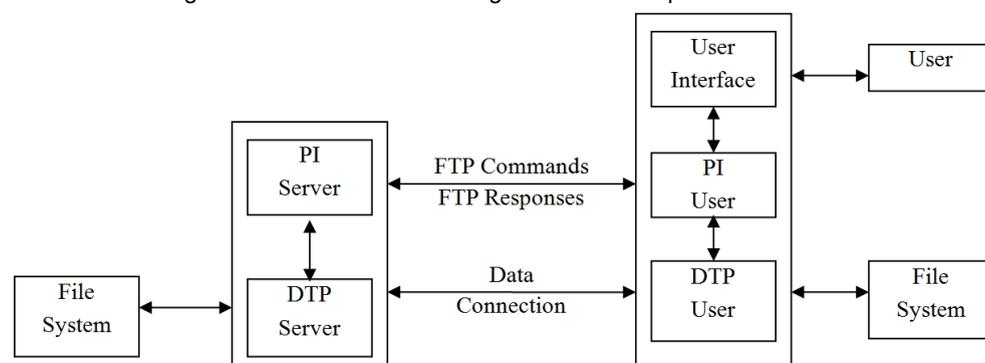
There are two types of connection in an FTP session:

Control connection: established between the PI Server and PI User. FTP commands are sent by the PI User (client) and replies are sent by the PI Server. TCP/IP port 21 is used.

FTP commands specify the type of operation you wish to carry out in the file system, as well as the parameters needed for data connection.

The control connection must remain open while data is being transferred. Generally, the client is the one who asks for the control connection to be closed (once he has finished using the FTP service) and the server the one who undertakes the task of closing.

Data connection: established between the DTP Server and the DTP User. The DTP User 'listens' at the default port (unless another one has been specified through the PORT command) and waits for the server to initialize data connection according to whatever is specified through the connection control. Data is simultaneously exchanged in both directions through the data connection between the DTP User and Server. A communication between the DTP User and the PI User gives rise to the latter sending confirmation replies to the PI Server.



There may be other situations where the client wishes to transfer files between two non-local hosts. To do this, the client needs to create a control connection with each server and establish a data connection between the two. This way, the control information is passed from the client to the PI User, but the data is transferred through the DTP of both servers.

Our FTP server supports this case.

1.3 FTP Server Implementation

The implemented server fully supports RFCs 959, 1123, 2389 and 2428, with the following modifications:

Not supported:

Command	Response
---------	----------

<i>ALLO</i> (temporary storage reserve)	Superfluous
<i>TYPE A C</i> (Type ASCII Carriage)	Not supported
<i>TYPE E</i> (Type EBCDIC)	Not supported
<i>TYPE E N</i> (Type EBCDIC Non Print)	Not supported
<i>TYPE E C</i> (Type EBCDIC Carriage)	Not supported
<i>TYPE E T</i> (Type EBCDIC Telnet)	Not supported
<i>STRU P</i> (Struct Page)	Not supported
<i>MKD</i> (create new directory)	Not supported
<i>RMD</i> (delete new directory)	Not supported
<i>STOU</i> (store unique)	Not supported

Changed:

ACCT: This is used to activate the server's TEST accounts or modes.

SMNT: This activates the file system to be used by the server. You need to name the file system.

CDUP: Changes the work directory to the current root directory. Now, it can only be used to deal with the file systems implemented as directories in the server.

CWD: Changes the work directory to the directory indicated by the parameter. Now, it can only be used to manage the file systems as directories. It also allows '.' or '/' to be used to go up to the root directory.

REST: This is not valid in some file systems. It can also work in stream mode.

APPE: This is not valid in some file systems.

TYPE LOCAL: Only supports LOCAL 8, considered as IMAGE.

TYPE A T: Supported as TYPE A N.

This also complies with part of the RFC 2577 recommendations.

These commands have been implemented to allow you to optimize file transfer to clients that support this function:

Command	Argument	Description
<i>MDTM</i>	<filename>	Returns the file modification date.
<i>SIZE</i>	<filename>	Returns the length of the file in bytes.
<i>XCRC</i>	[["<filename>"] [<offset> [<size>]]	Returns the calculated CRC-32 to the file. The file name can be inserted between quotation marks. As optional parameters, the start can be initiated with an offset where the CRC is calculated over the selected part of the file length.
<i>XMD5</i>	[["<filename>"] [<offset> [<size>]]	Returns the MD5 checksum calculation for the file. The file name can be put between quotation marks. As optional parameters, the initiation can be given from where the MD5 checksum is calculated and the partial length of the file.

1.4 FTP Commands and Responses

The commands implemented in the FTP server are the following:

1.4.1 Commands accepted for all user types

Command	<i>Open FTP Connection</i> : (This is a TCP command, not FTP) It connects to the device's FTP server through TCP/IP. In the response, the device indicates the number of connected clients and the maximum number of permitted clients allowed with simultaneous connection.
Responses	220-<Banner configured> (If the banner is configured) 220 FTP server ready, %ld active clients of %ld simultaneous clients allowed.
Command	<i>ACCT</i> :

	<p>Account Information. This command, used to activate a transfer mode to carry out tests so that disasters are avoided, operates when a user has carried out a login process. This mode blocks the server and only allows transfers to and from Test directories. In these transfers, file names are admitted as numbers so that as many octets as indicated by the figure specified in the file name are sent. The following commands are admitted:</p> <p>ACCT TEST0 Activates test mode over the /TST directory</p> <p>ACCT TEST1 Activates test mode over the /TS1 directory</p>
Responses	<p>450 Error, system busy.</p> <p>200 FTP server test account enabled.</p> <p>202 Command superfluous at this site.</p>
Command	<p><i>QUIT:</i></p> <p>Terminates and closes the FTP session</p>
Responses	<p>221 Goodbye.</p>
Command	<p><i>REIN:</i></p> <p>Restarts the FTP session (Only if User Logout is executed)</p>
Responses	<p>450 Error, system busy.</p> <p>220 OK.</p>
Command	<p>NOOP:</p> <p>No operation (Only replies with O.K.)</p>
Responses	<p>450 Error, system busy.</p> <p>200 OK.</p>
Command	<p><i>SYST:</i></p> <p>Responds with the name of the operating system. In this case, it informs the client about the directory's format. When it comes to the device's disk control effects, this can be either UNIX or MS-DOS. The name is obtained from the RFC 1700 OPERATING SYSTEMS NAMES section.</p>
Responses	<p>450 Error, system busy.</p> <p>215 MSDOS system type.</p> <p>215 UNIX system type.</p>
Command	<p><i>HELP:</i></p> <p>Responds with the general help message or help for a specific command. The response depends on the problem.</p>
Responses	<p>450 Error, system busy.</p> <p>502 Help not available. (In cases where this is not integrated).</p> <p>504 Command help not available. (In cases where this is not integrated).</p> <p>214 HELP: Command not recognized</p> <p>214 HELP: Command recognized but not implemented</p> <p>214 HELP: See ...</p> <p>214 LIST: Syntax: LIST[<path-name>]<CRLF>...</p>
Command	<p><i>USER:</i></p> <p>Identifies the user at LOGIN. The parameter is the user name. If the access control system to the device is not active, the following commands are admitted:</p> <p>USER ANONYMOUS Login anonymous with viewer level.</p> <p>USER FTP Login anonymous with viewer level.</p> <p>USER GUEST Login anonymous with display level.</p>

	<p>USER ROOT Login Manager with ROOT or administrator level.</p> <p>In cases where the device access control system through users is active, the command parameter will have to be a registered and active user.</p>
Responses	<p>450 Error, system busy.</p> <p>530 User name too long.</p> <p>331 User name accepted, password needed. (Login is correct; you must introduce a password to complete the operation)</p>
Command	<p><i>PASS:</i></p> <p>Checks the LOGIN password</p>
Responses	<p>411 Unable to get DTP (authentication phase)</p> <p>421 Service not available.</p> <p>450 Error, system busy.</p> <p>530 User login refused.</p> <p>530 Password too long.</p> <p>531 User name required.</p> <p>230 User login successful.</p> <p>230 User login complete.</p>
Command	<p><i>STAT:</i></p> <p>Displays the state of the server.</p>
Responses	<p>211 Server Status: READY / BUSY</p> <p>211 Direct mode : ON / OFF</p> <p>211 Immediate : ON / OFF</p> <p>211 Keepalive : ON / OFF</p> <p>211 Reply 119 : ON / OFF</p> <p>211 Reload code : ON / OFF</p> <p>211 Savebuffer : ON / OFF</p> <p>211 Checks : ALL / NONE / PCLBFVRDSUH</p>
Command	<p><i>FEAT:</i></p> <p>RFC-2389 Returns a FEATURES list and displays the extensions implemented in the server.</p>
Responses	<p>450 Error, system busy.</p> <p>211-Extensions supported:</p> <p>MDTM</p> <p>REST STREAM</p> <p>SIZE</p> <p>XCRC</p> <p>XMD5</p> <p>211 End</p>

1.4.2 Commands only accepted for registered users

Command	<p><i>PORT:</i></p> <p>Changes the defined default IP address and PORT. The parameters consist of 6 numbers separated by commas. The first 4 numbers indicate the network address and the last two the port number. Users categorized as viewers can only employ the network address they used to connect.</p>
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get DTP</p> <p>501 IP Address error.</p> <p>501 IP Address delimiter error.</p> <p>501 TCP port error.</p> <p>501 TCP port delimiter error.</p> <p>504 Command not implemented for that parameter.</p> <p>504 IP Address not allowed.</p> <p>530 Access denied, not logged in.</p> <p>530 Only EPSV commands admitted.</p> <p>200 PORT is set to IP ADDR = %d.%d.%d.%d PORT = %d</p>
Command	<p><i>PASV:</i></p> <p>Requests passive mode operation from the server for the data connection of the subsequent command. The response gives the IP address and the port number the server will use for the next command.</p>
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get passive mode</p> <p>530 Access denied, not logged in.</p> <p>530 Only EPSV commands admitted.</p> <p>227 Entering Passive Mode. (%d,%d,%d,%d,%d,%d)</p>
Command	<p><i>EPRT:</i></p> <p>Changes the IP address and PORT defined by default. The parameters are made up of a series of delimiters that separate the protocol fields, IP address and PORT used. Users categorized as viewers can only employ the network address they used to connect.</p>
Responses	<p>411 Unable to get DTP.</p> <p>450 Error, system busy.</p> <p>501 Bad First EPRT delimiter.</p> <p>501 Bad Second EPRT delimiter.</p> <p>501 Bad Third EPRT delimiter.</p> <p>501 Bad Fourth EPRT delimiter.</p> <p>501 IP address error.</p> <p>501 IP address delimiter error.</p> <p>501 TCP port value error.</p> <p>504 Command not implemented for that parameter.</p> <p>504 IP Address not allowed.</p> <p>522 Protocol not supported, use (1,2).</p> <p>530 Access denied, not logged in.</p>

	<p>530 Only EPSV commands admitted.</p> <p>200 Extended PORT is set to 1 %u.%u.%u.%u </p> <p>200 Extended PORT is set to 2 %X:%X:%X:%X:%X:%X:%X:%X </p>
Command	<p><i>EPSV:</i></p> <p>This command asks the server to operate in an extended passive mode when it comes to the next command's data connection. A parameter indicating the protocol to be used may come up. If it does and contains the word ALL (for example), the connection will then reject any PORT, PASV and EPRT command.</p>
Responses	<p>411 Unable to get extended passive mode</p> <p>450 Error, system busy.</p> <p>522 Protocol not supported, use (1,2)</p> <p>530 Access denied, not logged in.</p> <p>200 Extended Passive ALL processed.</p> <p>229 Entering Extended Passive Mode (l %u)</p>
Command	<p><i>TYPE:</i></p> <p>Defines the type of coding in the data link. The following types are acknowledged:</p> <p>TYPE A N TYPE ASCII NON PRINT. Used to transfer text files:'N' is optional and may not exist.</p> <p>TYPE A T TYPE ASCII TELNET. Used to transfer text files (Not supported).</p> <p>TYPE A C TYPE ASCII CARRIAGE. Used to transfer text files (Not supported).</p> <p>TYPE I TYPE IMAGE. Used to transfer binary files.</p> <p>TYPE E TYPE EBCDIC. (Not supported).</p> <p>TYPE L 8 TYPE LOCAL. Only LOCAL 8 = IMAGE supported.</p>
Responses	<p>450 Error, system busy.</p> <p>501 TYPE argument error.</p> <p>501 TYPE format not recognized.</p> <p>501 TYPE ASCII format error.</p> <p>504 TYPE ASCII CARRIAGE not supported.</p> <p>504 TYPE LOCAL size not supported.</p> <p>504 TYPE EBCDIC not supported.</p> <p>530 Access denied, not logged in.</p> <p>200 TYPE is set to ASCII NON PRINT.</p> <p>200 TYPE is set to ASCII TELNET.</p> <p>200 TYPE is set to IMAGE.</p> <p>200 TYPE is set to LOCAL 8.</p>
Command	<p><i>MODE:</i></p> <p>Defines the transfer mode. The following modes are acknowledged:</p> <p>MODE S Mode defined as STREAM.</p> <p>MODE B Mode defined as BLOCK</p> <p>MODE C Mode defined as COMPRESSED.</p>
Responses	<p>450 Error, system busy.</p> <p>501 MODE argument error.</p>

	<p>501 MODE format not recognized.</p> <p>504 MODE BLOCK not supported. (In cases where this is not integrated).</p> <p>504 MODE COMPRESSED not supported. (In cases where this is not integrated).</p> <p>530 Access denied, not logged in.</p> <p>200 MODE is set to STREAM.</p> <p>200 MODE is set to BLOCK.</p> <p>200 MODE is set to COMPRESSED.</p>
Command	<p><i>STRU</i>:</p> <p>Defines type of structure. The following structures are acknowledged:</p> <p>STRU F Structure defined as FILE.</p> <p>STRU R Structure defined as RECORD.</p> <p>STRU P (Not supported). Structure defined as PAGE.</p>
Responses	<p>450 Error, system busy.</p> <p>501 STRU argument error.</p> <p>501 STRU format not recognized.</p> <p>504 STRU PAGE not supported.</p> <p>504 STRU RECORD not supported. (In cases where this is not integrated).</p> <p>530 Access denied, not logged in.</p> <p>200 STRU is set to FILE.</p> <p>200 STRU is set to RECORD.</p>
Command	<p><i>ABOR</i>:</p> <p>Aborts current operation and closes the data link if necessary.</p>
Responses	<p>Depends on the command canceled. Some responses are shown below. If the server is executing a command at the time, it gives two responses. The first indicates that it is canceling the command and the second message confirms the ABOR command has been executed. If the server is in idle, only the second message is sent.</p> <p>530 Access denied, not logged in.</p> <p>(1 response)</p> <p>426 Aborting RNFR command...</p> <p>426 Aborting RNT0 command...</p> <p>426 Aborting DELE command...</p> <p>426 Aborting LIST command...</p> <p>426 Aborting NLST command...</p> <p>426 Aborting RETR command...</p> <p>426 Aborting STOR command...</p> <p>426 Aborting APPE command...</p> <p>426 Aborting MDTM command...</p> <p>426 Aborting SIZE command...</p> <p>426 Aborting SITE command...</p> <p>(2 Responses)</p>

	226 Command ABOR successfully processed.
Command	<p><i>LIST:</i></p> <p>Sends the active file system directory to the client through the data link. The file selection mask is admitted as the parameter.</p>
Responses	<p>The directory is sent through the data link in text form, using UNIX or MSDOS format (depending on the configuration). This way, it can be acknowledged and interpreted by the majority of the graphic clients. Each entry in the directory ends with CR-LF.</p> <p>The following responses can appear through the control link:</p> <p>411 Unable to get DTP.</p> <p>425 Unable to open data transport.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Pathname too long.</p> <p>501 Invalid pathname.</p> <p>530 Access denied, not logged in.</p> <p>550 Error ending search.</p> <p>550 Error closing device.</p> <p>125 Data connection already open, list transfer in process... (Initial)</p> <p>150 Data connection open, list transfer in process... (Initial)</p> <p>225 List transfer completed, data connection is open. (Final)</p> <p>226 List transfer completed, data connection is closed. (Final)</p>
Command	<p><i>NLIST:</i></p> <p>Sends the list of file names and the active file system directory to the client through the data link. The file selection mask is admitted as the parameter.</p>
Responses	<p>The list of names from the directory file separated by CR-LF is sent through the data link.</p> <p>The following responses can appear through the control link:</p> <p>411 Unable to get DTP.</p> <p>425 Unable to open data transport.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Pathname too long.</p> <p>501 Invalid pathname.</p> <p>530 Access denied, not logged in.</p> <p>550 Error ending search.</p> <p>550 Error closing device.</p> <p>125 Data connection already open, list transfer in process... (Initial)</p> <p>150 Data connection open, list transfer in process... (Initial)</p>

	<p>225 List transfer completed, data connection is open. (Final)</p> <p>226 List transfer completed, data connection is closed. (Final)</p>
Command	<p><i>PWD</i>:</p> <p><i>XPWD</i>:</p> <p>Sends the name of the work directory. The FTP server can only operate in the file system's root directory. This also indicates the file system used.</p>
Responses	<p>450 Error, system busy.</p> <p>530 Access denied, not logged in.</p> <p>257 "/%s" is the current directory.</p>
Command	<p><i>SMNT</i>:</p> <p>MOUNT structure. Activates the file system the server is going to use. You need to give the file system the same name as the argument.</p>
Responses	<p>450 Error, system busy.</p> <p>501 File system not recognized.</p> <p>530 Access denied, not logged in.</p> <p>550 File system is not available.</p> <p>200 File system mounted.</p>
Command	<p><i>OPTS</i>:</p> <p>RFC-2389. Negotiates the options of some of the commands implemented in the server.</p>
Responses	<p>450 Error, system busy.</p> <p>501 No options available</p> <p>530 Access denied, not logged in.</p>

1.4.3 Commands accepted only for users with ROOT access level

Command	<p><i>RETR</i>:</p> <p>Sends the file to the client through the data link. The parameter indicates the file name in the current directory.</p>
Responses	<p>The file is sent according to the type, structure and mode (TYPE, STRU and MODE) selected through the data link.</p> <p>The following responses can appear through the control link:</p> <p>411 Unable to get DTP.</p> <p>425 Unable to open data transport.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>501 Invalid pathname.</p> <p>530 Access denied, not logged in.</p> <p>550 Unable get file length.</p> <p>550 Unable to open file.</p> <p>550 Error reading file.</p> <p>550 Error closing file.</p> <p>550 Error closing device.</p> <p>554 Unable to seek in file.</p> <p>125 Data connection already open, file transfer in process... (Initial)</p> <p>150 Data connection open, file transfer in process... (Initial)</p> <p>225 RETR completed, %lu bytes processed, data connection is open. (Final)</p> <p>226 RETR completed, %lu bytes processed, data connection is closed. (Final)</p>
Command	<p><i>STOR</i>:</p> <p>Receives a file from the client and overwrites the one in the active file system if it already exists. The parameter indicates the file name. If the server is operating in safe mode, the file is written in the temporary memory buffer instead of in the active file system. This means that, if there are any problems in the transmission, the files being sent do not destroy the existing ones. This is to avoid a failed program from being remotely loaded and having the device reset only to be unable to re-start by itself.</p>
Responses	<p>The file is received according to the type, structure and mode (TYPE, STRU and MODE) selected through the data link.</p> <p>The following responses can appear through the control link:</p> <p>411 Unable to get DTP</p> <p>425 Unable to open data transport.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p>

	<p>501 Invalid pathname.</p> <p>503 Version older than the stored one.</p> <p>503 Application not supported by hardware level (rcvd. %lu, reqd. %lu).</p> <p>503 Application older than the one stored.</p> <p>503 Application incompatible with the stored profile.</p> <p>503 Application not supported by present BIOS.</p> <p>503 Firmware not supported by hardware level (rcvd. %lu, reqd. %lu).</p> <p>503 Firmware older than the one stored.</p> <p>503 BIOS not supported by hardware level (rcvd. %lu, reqd. %lu).</p> <p>503 BIOS older than the one stored.</p> <p>503 Unknown file type checked.</p> <p>530 Access denied, not logged in.</p> <p>530 File system for secure transfer not loaded.</p> <p>535 Unexpected end of checked file.</p> <p>530 Alternate file system not loaded.</p> <p>550 Unable to open file.</p> <p>550 Error writing file.</p> <p>550 Error closing file.</p> <p>550 Error closing device.</p> <p>550 Internal file rename failed.</p> <p>551 Firmware unknown.</p> <p>552 Firmware misbuilt.</p> <p>552 Firmware not required.</p> <p>554 Unable to seek in file.</p> <p>110 MARK %s = %lu (Intermediate possible in MODE B or C)</p> <p>125 Data connection already open, file transfer in process... (Initial)</p> <p>125 Data connection already open, checked file transfer in process... (Initial)</p> <p>150 Data connection open, file transfer in process... (Initial)</p> <p>150 Data connection open, checked file transfer in process... (Initial)</p> <p>225 STOR completed, %lu bytes processed, data connection is open. (Final)</p> <p>226 STOR completed, %lu bytes processed, data connection is closed. (Final)</p>
Command	<p><i>APPE:</i></p> <p>Receives a file from the client.</p> <p>If the server is operating in safe mode, the data received is added at the end of the temporary buffer content. Should this be empty, this command behaves as a STOR command.</p> <p>If the server is not operating in a secure mode and the files do not exist, this command behaves as the STOR command.</p> <p>If the server is not operating in a secure mode and the file already exists, the data received is simply added to the end of this.</p>
Responses	<p>The file is received according to type, structure and mode (TYPE, STRU and MODE) selected through the data link.</p>

	<p>The following responses can appear through the control link:</p> <p>411 Unable to get DTP</p> <p>425 Unable to open data transport.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>501 Invalid pathname.</p> <p>530 Access denied, not logged in.</p> <p>530 File system for secure transfer not loaded.</p> <p>550 Unable get file length.</p> <p>550 Unable to open file.</p> <p>550 Error writing file.</p> <p>550 Error closing file.</p> <p>550 Error closing device.</p> <p>554 Unable to seek in file.</p> <p>110 MARK %s = %lu (execution possible in MODE B or C)</p> <p>125 Data connection already open, file transfer in process... (Initial)</p> <p>150 Data connection open, file transfer in process... (Initial)</p> <p>225 APPE completed, %lu bytes processed, data connection is open. (Final)</p> <p>226 APPE completed, %lu bytes processed, data connection is closed. (Final)</p>
Command	<p><i>ALLO</i>:</p> <p>(Not supported). Temporary storing reserve.</p>
Responses	<p>450 Error, system busy.</p> <p>530 Access denied, not logged in.</p> <p>202 Command not implemented, superfluous at this site.</p>
Command	<p><i>DELE</i>:</p> <p>Deletes a file from the disk if the unit is operative. The parameter is the file name.</p>
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get DTP.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>530 Access denied, not logged in.</p> <p>550 Unable to delete file.</p> <p>550 Error closing device.</p> <p>250 File deleted.</p>
Command	<p><i>RNFR</i>:</p>

	Allows you to rename a file from the disk. The parameter is the current name. Through this command, you can store the current name of the file. To rename it, you must send the name after the RNTD command.
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get DTP.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>530 Access denied, not logged in.</p> <p>550 File not found.</p> <p>550 Error ending search.</p> <p>550 Error closing device.</p> <p>350 Rename pending information.</p>
Command	<p><i>RNTD</i>:</p> <p>Allows you to rename a file in the disk. The parameter is the new file name. To carry this out, you need to have previously received an RNFR command.</p>
Responses	<p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>503 Bad sequence of RNFR and RNTD commands.</p> <p>530 Access denied, not logged in.</p> <p>550 Unable to rename file.</p> <p>550 Error closing device.</p> <p>250 File successfully renamed.</p>
Command	<p><i>SITE</i>:</p> <p>It groups a set of non-standard commands acknowledged by the server at this SITE. Admits commands from section 3.</p>
Responses	<p>411 Unable to get DTP for BACKUP</p> <p>411 Unable to get DTP for COHERENCE</p> <p>411 Unable to get DTP for SAVEBUFFER</p> <p>411 Unable to get DTP for GETFILEVER</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>450 Temporal internal error.</p> <p>500 SITE command not recognized.</p> <p>500 SITE COMPATIBLE mode not recognized.</p> <p>500 SITE DIRECT mode not recognized.</p> <p>500 SITE IMMEDIATE mode not recognized.</p> <p>500 SITE KEEPALIVE mode not recognized.</p>

500 SITE RELOAD mode not recognized.
500 SITE REPLY mode not recognized.
500 SITE SYSTMODE mode not recognized.
500 SITE CHECK control not recognized.
500 SITE CHECK %s control mode not recognized.
500 DTP cannot process this SITE command.
501 File system not recognized.
501 File system not allowed in test mode.
501 Invalid filename.
503 No Temporal buffer present.
503 Temporal buffer is locked.
503 Temporal buffer is already locked.
503 Temporal buffer is empty.
503 Target file system not supports SAVEBUFFER.
504 Feature not present.
504 Info not available.
530 Access denied, not logged in.
530 File too short.
530 Info not available.
550 Coherence checker is busy.
550 Not enough memory for command.
550-COHERENCE results
< coherence results >
550 COHERENCE results end
550 Disk not available
550 Unable to get freespace.
550 Unable to get filelength.
550 Unable to open file.
550 Unable to read file.
550 Unable to write file.
550 Unable to backup operation.
550 Error closing file.
550 Error closing device.
550 File system is not available.
552 Error saving slaves.
550 Unable to create order.
550 Unable to get message.
550 Unknown (Response from SYSTID when this is unknown).
552 Not enough space to save file.

	<p>119 Backup in process...</p> <p>119 Checking firmware coherence...</p> <p>119 Saving temporal buffer...</p> <p>119 Saving temporal buffer over slave devices...</p> <p>200 COMPATIBLE mode is set to %s</p> <p>200 DIRECT is set to %s.</p> <p>200 IMMEDIATE mode is set to %s.</p> <p>200 KEEPALIVE mode is set to %s.</p> <p>200 RELOAD mode is set to %s.</p> <p>200 REPLY mode is set to %s.</p> <p>200 CHECK %s control is set to %s.</p> <p>200 SYST is set to %s.</p> <p>200 SAVEBUFFER ordered. Please, close connection to proceed.</p> <p>200 SAVEBUFFER completed O.K.</p> <p>200 SAVESLAVES completed O.K.</p> <p>200 None (Response from LISTFIRMWARES when they are unnecessary)</p> <p>204 <NNNNNNNN.EEE> (Response from GETAPPNAME and GETCFGNAME)</p> <p>211 Temporal buffer cleared and deallocated.</p> <p>211 %s: is permanent storage device, direct mode is %s.</p> <p>211 Buffer status: MAX-REQ-BUSY %lu-%lu-%lu filename: "%s.%s".</p> <p>211 <NNNNNNNN.EEE;...> (Response from LISTFIRMWARES when they are necessary)</p> <p>211 <systid> (Response from SYSTID depending on the device)</p> <p>211-COHERENCE results</p> <p>< coherence results ></p> <p>211 COHERENCE results end</p> <p>213-BIOS: <NNNNNNNN> (Response from GETHDWLVL)</p> <p>213 APPL: <NNNNNNNN> (Response from GETHDWLVL)</p> <p>214 <NNNNNN> (Response from GETBIOSVER)</p> <p>214 <NNNNNN.SSSSS> (Response from GETFILEVER)</p> <p>250 Backup successful.</p>
Command	<p><i>CDUP:</i></p> <p><i>XCUP:</i></p> <p>Changes the work directory to the current root directory.</p> <p>It now only supports the use of file systems as directories.</p>
Responses	<p>450 Error, system busy.</p> <p>550 Top of tree.</p> <p>530 Access denied, not logged in.</p> <p>200 CDUP command successful.</p>
Command	<p><i>CWD:</i></p>

	<p><i>XCWD:</i></p> <p>Changes the work directory to the directory indicated by the parameter.</p> <p>It now only supports the use of file systems as directories. It also allows '..' or '/' to be used to go up to the root directory.</p>
Responses	<p>450 Error, system busy.</p> <p>501 No pathname defined.</p> <p>501 Invalid pathname.</p> <p>501 Pathname not allowed in test mode.</p> <p>550 Pathname not available.</p> <p>200 CWD current dir successful.</p> <p>200 CWD root dir successful.</p> <p>200 CWD command successful.</p>
Command	<p><i>MKD:</i></p> <p><i>XMKD:</i></p> <p>(Not supported). Creates a new directory in the disk. The name is indicated by the parameter.</p>
Responses	<p>450 Error, system busy.</p> <p>502 Command not implemented.</p> <p>530 Access denied, not logged in.</p>
Command	<p><i>RMD:</i></p> <p><i>XRMD:</i></p> <p>(Not supported). Deletes a directory from the disk. The name is indicated by the parameter.</p>
Responses	<p>450 Error, system busy.</p> <p>502 Command not implemented.</p> <p>530 Access denied, not logged in.</p>
Command	<p><i>REST:</i></p> <p>Allows you to reestablish a file transfer as long as the file system supports this.</p>
Responses	<p>450 Error, system busy.</p> <p>530 Access denied, not logged in.</p> <p>200 Restore offset set to 0.</p> <p>350 Restore offset set to %lu, use RETR, STOR or APPE to init transfer.</p>
Command	<p><i>STOU:</i></p> <p>(Not supported). It behaves as the STOR command but does not send the file name. The device assigns a unique name to the file.</p>
Responses	<p>450 Error, system busy.</p> <p>502 Command not implemented.</p> <p>530 Access denied, not logged in.</p>
Command	<p><i>MDTM:</i></p> <p>Non-standard command which returns the date and the time for a file modification. The parameter is the file name.</p>
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get DTP.</p> <p>450 File system not available.</p>

	<p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>530 Access denied, not logged in.</p> <p>550 File not found.</p> <p>550 Error ending search.</p> <p>550 Error closing device.</p> <p>213 YYYYMMDDHHMMSS</p>
Command	<p><i>SIZE:</i></p> <p>Non-standard command which returns the file length. The parameter is the file name.</p>
Responses	<p>450 Error, system busy.</p> <p>411 Unable to get DTP</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>530 Access denied, not logged in.</p> <p>550 File not found.</p> <p>550 Error ending search.</p> <p>550 Error closing device.</p> <p>213 nnnnnnnnn</p>
Command	<p><i>XCRC:</i></p> <p>Non-standard command which returns the CRC-32 sum for a file. The parameters are the file name between quotation marks, the start offset (optional) and the file length to calculate (optional).</p>
Responses	<p>411 Unable to get DTP.</p> <p>426 Unexpected data link close.</p> <p>450 Error, system busy.</p> <p>450 File system not available.</p> <p>450 Error opening File System.</p> <p>501 Invalid filename.</p> <p>501 Invalid pathname.</p> <p>504 Feature not present. (In cases where this is not integrated).</p> <p>530 Access denied, not logged in.</p> <p>550 CRC offset past eof.</p> <p>550 CRC size past eof.</p> <p>550 Unable get file length.</p> <p>550 Unable to open file.</p> <p>550 Error closing file.</p> <p>550 Error closing device.</p> <p>550 Error reading file.</p> <p>554 Unable to seek in file.</p> <p>250 XXXXXXXXX</p>

Command	<i>XMD5:</i> Non-standard command that returns the MD5 sum for a file. The parameters are the file name between quotation marks, the start offset (optional) and the file length to calculate (optional).
Responses	411 Unable to get DTP. 426 Unexpected data link close. 450 Error, system busy. 450 File system not available. 450 Error opening File System. 501 Invalid filename. 501 Invalid pathname. 530 Access denied, not logged in. 550 CRC offset past eof. 550 CRC size past eof. 550 Unable get file length. 550 Unable to open file. 550 Error closing file. 550 Error closing device. 550 Error reading file. 554 Unable to seek in file. 250 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Command	<i>Possible new commands:</i> Not implemented.
Responses	221 Inactivity Timer Expired. Goodbye. 450 Error, system busy. 500 DTP cannot process this command. 500 Syntax error, command line too long. 500 Syntax error, command delimiter error. 500 Syntax error, command unrecognized. 502 Command not implemented. 503 Unexpected data connection indication. 530 Access denied, not logged in.

1.5 sFTP Protocol

The SSH File Transfer Protocol (sFTP) provides secure access to the device's files system over a reliable data link. This is the transfer protocol used with the SSH2 protocol.

This protocol has been designed in order to implement an access service for remote file systems, as well as a file transfer service.

The protocol assumes that it operates over a secure channel, that the server has identified the user at the client end and that the user identity is externally available to the server.

This protocol follows a simple model of command/response. Each command and response contains a sequence number and multiple commands can be sent simultaneously. While there is a wide range of command messages, the number of responses is quite limited. Each command message has one (or several) response messages that return

the result (e.g. read or error result).

Although this protocol is described in the context of the SSH2 protocol, it is generic and independent from the rest of the SSH2 protocol.

When used with SSH2, this protocol is used as a subsystem. It complies with the sse described under the "Starting a Shell or a Command" section from SSH2. The name of the subsystem used for this protocol is "sftp".

1.6 sFTP Server Implementation

The implemented server supports version 3 of the protocol, with the following modifications:

Command	Response
<i>OPEN</i> (simultaneous Read and Write)	Not supported
<i>FSTAT</i>	Not supported
<i>SETSTAT</i>	Not supported
<i>FSETSTAT</i>	Not supported
<i>MKDIR</i>	Not supported
<i>RMDIR</i>	Not supported
<i>READLINK</i>	Not supported
<i>SYMLINK</i>	Not supported
<i>EXTENDED</i>	Not supported
(Unknown)	Ignored

To simultaneously read and write operations over the files is not allowed, as file systems don't support this. Clients must open the files as read or as write.

1.7 sFTP Commands and Responses

The commands implemented in the sFTP server are as follows:

Command	<i>Open sFTP Connection:</i> This connects to the device's sFTP server through SSH2.
Responses	Connection is established.
Command	<i>Close sFTP Connection :</i> This disconnects from the device's sFTP server through SSH2.
Responses	Connection is released.
Command	<i>INIT:</i> Initializes the protocol. This is the first command that should be received after the connection has been established in order to negotiate the protocol version and other aspects in the session.
Responses	VERSION: x (x = 3 or less, depending on the versions sent by the client).
Command	<i>OPEN:</i> Opens a file.
Responses	STATUS: OPERATION-UNSUPPORTED "R/W operation not defined" "READ/WRITE simultaneous not supported by this system" STATUS: NO_SUCH_FILE "Invalid Path" STATUS: FAILURE "Invalid filename" "Unable to allocate handler"

	<p>"Unable to open device"</p> <p>"Unable to open file"</p> <p>STATUS: PERMISSION_DENIED</p> <p>"Check target path for possible bios/application file"</p> <p>"Check target path for possible firmware file"</p> <p>"Check target path for possible image file"</p> <p>"Check target path for possible boot file"</p> <p>"Operation denied to this client"</p> <p>"Filesystem busy"</p> <p>HANDLE:</p> <p>Obtained handler identifier.</p>
Command	<p><i>CLOSE:</i></p> <p>Closes a file or a directory.</p>
Responses	<p>STATUS: FAILURE</p> <p>"Invalid handler"</p> <p>STATUS: OK</p> <p>"File/Dir closed OK"</p>
Command	<p><i>READ:</i></p> <p>Reads a portion of an opened file.</p>
Responses	<p>STATUS: FAILURE</p> <p>"Invalid handler"</p> <p>"Illegal operation"</p> <p>"Unable to seek offset in file"</p> <p>"Unable to allocate read buffer"</p> <p>"Unable to read file"</p> <p>STATUS: EOF</p> <p>"Offset not supported"</p> <p>"Read end of file"</p> <p>DATA:</p> <p>Data read from the file</p>
Command	<p><i>WRITE:</i></p> <p>Writes a portion in an opened file.</p>
Responses	<p>STATUS: FAILURE</p> <p>"Invalid handler"</p> <p>"Illegal operation"</p> <p>"Unable to allocate write buffer"</p> <p>"Unable to set offset past eof"</p> <p>"Unable to seek offset in file"</p> <p>"Unable to write file"</p> <p>STATUS: EOF</p>

	<p>"Offset not supported"</p> <p>STATUS: OK</p> <p>"Write file OK"</p>
Command	<p><i>LSTAT</i> :</p> <p>Returns the file's attributes and information.</p>
Responses	<p>STATUS: NO_SUCH_FILE</p> <p>"Invalid Path"</p> <p>"File not found"</p> <p>STATUS: FAILURE</p> <p>"Path too long"</p> <p>"Unable to allocate handler"</p> <p>"Unable to open device"</p> <p>STATUS: PERMISSION DENIED</p> <p>"Filesystem busy"</p> <p>ATTRS:</p> <p>File information.</p>
Command	<p><i>STAT</i> :</p> <p>Returns the file's attributes and information.</p>
Responses	<p>STATUS: NO_SUCH_FILE</p> <p>"Invalid Path"</p> <p>"File not found"</p> <p>STATUS: FAILURE</p> <p>"Path too long"</p> <p>"Unable to allocate handler"</p> <p>"Unable to open device"</p> <p>STATUS: PERMISSION DENIED</p> <p>"Filesystem busy"</p> <p>ATTRS:</p> <p>File information.</p>
Command	<p><i>OPENDIR</i>:</p> <p>Opens a directory.</p>
Responses	<p>STATUS: NO_SUCH_FILE</p> <p>"Invalid Path"</p> <p>STATUS: FAILURE</p> <p>"Path too long"</p> <p>"Unable to allocate handler"</p> <p>"Unable to open device"</p> <p>STATUS: PERMISSION_DENIED</p> <p>"Filesystem busy"</p> <p>HANDLE:</p>

	Obtained handler identifier.
Command	<i>READDIR</i> : Reads the file's attributes from the directory.
Responses	STATUS: FAILURE "Invalid handler" "Not enough memory to process READDIR" "This must never occur" STATUS: EOF "No more files" NAME: File name, attributes and information.
Command	<i>REMOVE</i> : Removes files.
Responses	STATUS: NO_SUCH_FILE "Invalid Path" "File not found" STATUS: FAILURE "Path too long" "Unable to allocate handler" "Unable to open device" "Unable to remove file" STATUS: PERMISSION_DENIED "Filesystem busy" STATUS: OK "File removed OK"
Command	<i>REALPATH</i> : Returns the full path for the last name.
Responses	STATUS: NO_SUCH_FILE "Invalid Path" NAME: Full path for the directory or file
Command	<i>RENAME</i> : Renames or moves files.
Responses	STATUS: NO_SUCH_FILE "Invalid Old Path" "Invalid New Path" "File not found" STATUS: FAILURE "Old Path too long" "New Path too long"

	<p>"Unable to allocate source handler"</p> <p>"Unable to allocate target handler"</p> <p>"Unable to allocate handler"</p> <p>"Unable to allocate read/write buffer"</p> <p>"Unable to open source device"</p> <p>"Unable to open target device"</p> <p>"Unable to open device"</p> <p>"Unable to open source file"</p> <p>"Unable to open target file"</p> <p>"Unable to check source file"</p> <p>"Computed paths are identical"</p> <p>"Unable to reset check file"</p> <p>"Bad length of checked file"</p> <p>"Unable to check source file crc"</p> <p>"Bad crc of checked file"</p> <p>"Internal file rename failed"</p> <p>"Unable to read source file, operation aborted..."</p> <p>"Unable to write target file, operation aborted..."</p> <p>"Unable to remove source file"</p> <p>"Unable to rename file"</p> <p>STATUS: PERMISSION_DENIED</p> <p>"Source filesystem busy"</p> <p>"Target filesystem busy"</p> <p>"Filesystem busy"</p> <p>"Application not supported by present BIOS"</p> <p>"Application older than the one stored"</p> <p>"Application not supported by hardware level (rcvd. %lu, reqd. %lu)"</p> <p>"Firmware misbuilt"</p> <p>"Firmware not required"</p> <p>"Firmware unknown"</p> <p>"Firmware older than the one stored"</p> <p>"Firmware not supported by hardware level (rcvd. %lu, reqd. %lu)."</p> <p>"BIOS older than the stored one"</p> <p>"BIOS not supported by hardware level (rcvd. %lu, reqd. %lu)."</p> <p>"Unknown checked file type"</p> <p>STATUS: OK</p> <p>"File moved OK"</p> <p>"File renamed OK"</p>
Command	<i>FSTAT</i> :

	Returns the attributes and information from an open file.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>SETSTAT</i> : Modifies a file's attributes and information.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>FSETSTAT</i> : Modifies the attributes and information from an open file.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>MKDIR</i> : Creates a directory.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>RMDIR</i> : Removes a directory.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>READLINK</i> : Reads the destination for a symbolic link.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>SYMLINK</i> : Creates a symbolic link.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>EXTENDED</i> : Extended command.
Responses	STATUS: OP_UN SUPPORTED "Operation not supported by this system"
Command	<i>Protocol violation</i> : Any message that is incorrectly constructed can produce the following responses:
Responses	STATUS: BAD_MESSAGE "Bad message length" "String too long for this system"

Chapter 2 Configuration

2.1 Configuration Commands

This section describes the commands used to configure the FTP protocol. To access the FTP protocol configuration environment, enter the following commands:

```
*P 4
Config> SET FTP
-- FTP user configuration --
FTP config> ?
```

The following table is a summary of the FTP protocol configuration commands.

Command	Function
? (HELP)	Lists the commands or their options.
ACCOUNTING	Configures the accounting options.
AUTHORIZATION	Configures the authorization options.
CHECK	Selects the checks to execute over the received files.
CLIENTS	Establishes the maximum number of clients that can be simultaneously connected.
CONTROL-PORT	Configures the FTP session control TCP port.
DATA-PORT	Configures the data transfer TCP port.
DEFAULT	Deletes the current configuration and restores the default configuration.
DIRECT	Selects normal mode operation and saves the file received in the files system activated for this session.
IMMEDIATE	Selects reception via TCP for data using direct indications.
KEEPALIVE	Activates the keepalive feature in the data link.
LIST	Lists the FTP configuration.
LOGIN	Configures the login options.
MSS	Configures the maximum TCP segment size.
NO	Disables the distinct FTP possibilities.
OS	Sets the format the server uses when returning the file name on executing the LIST command.
PRIORITY	Sets the FTP tasks priority.
REPLY	Activates reply sending when a command executes slowly.
RX-BUFF	Configures the sizes of the buffers used to receive TCP from DTP.
SYST	Specifies the files system to activate by default.
TEMP-BUFF	Configures the size of the temporary buffers.
TIMER	Configures the idle timer.
TX-BUFF	Configures the sizes of the buffers used to transmit TCP from DTP.
EXIT	Returns to the previous prompt.

2.1.1 ? (HELP)

Displays all the available commands and their options.

Syntax:

```
FTP config> ?
```

Example:

```
FTP config> ?
  accounting      Set accounting options
  authorization   Set authorization options
  check          Set checks to perform to firmware received
  clients        Sets the maximum number that can be simultaneously connected
  control-port   Configures the FTP session control TCP port
```

data-port	Configures the data transfer TCP port
default	Sets default configuration
direct	Saves the received file in the active file system
immediate	Selects Rx data by the TCP based on direct indications
keepalive	Activates the keepalive in the data link
list	Lists current configuration
login	Set login options
mss	Configures the maximum TCP segment size
no	Disables the FTP server capabilities
os	Determines the format used by the server
priority	Establishes the FTP task priority
reply	Activates the sending of replies when there are delays
rx-buff	Sets the size of the buffers used to receive TCP from DTP
syst	Specifies the file system to activate by default
temp-buff	Configures the temporary buffer size
timer	Configures the inactivity timer
tx-buff	Sets the size of the buffers used to receive TCP from DTP
exit	

2.1.2 [NO] ACCOUNTING

Associates an *accounting exec* methods list defined using the AAA feature. As a result, the FTP service applies the *accounting exec* methods list when registering an access to the Shell.

Syntax:

```
FTP config>accounting exec <listname>
```

<listname>: Identifier for the accounting methods list.

Example:

```
FTP config>accounting exec AccExec
FTP config>
```

In this example, the *AccExec* methods list has been configured so that it can be used when accounting is executed once the FTP Shell is accessed.

Method lists can only be applied if the AAA feature is enabled. For lists to be applied to different services, you must enable the AAA feature after configuring it. For further information on how to configure the AAA feature, please see manual “Dm800-I AAA Feature.”

2.1.3 [NO] AUTHORIZATION

Associates an *authorization exec* methods list defined using the AAA feature. As a result, the FTP service applies the *authorization exec* methods list when it requires authorization from the Shell.

Syntax:

```
FTP config>authorization exec <listname>
```

<listname>: Identifier for the authorization methods list.

Example:

```
FTP config>authorization exec AuthorExec
FTP config>
```

In this example, the *AuthorExec* methods list has been configured so that it can be used when authorization from the FTP Shell is required.

Method lists can only be applied if the AAA feature is enabled. For the lists to be applied to the different services, you must enable the AAA feature after configuring it. For further information on how to configure the AAA feature, please see manual “Dm800-I AAA Feature.”

2.1.4 CHECK

Selects the checks to execute over the binary files received in the device. All the operations from the old “COMPATIBILITY” command have been broken down so they can be independently controlled. However, new checks that the old command is not capable of controlling have been introduced.

Syntax:

```
FTP config> [no] check ?
  all           All checks
  bios         Check min BIOS version support
  crc          Check file CRC
  delete       Auto delete temporal buffer
  firmware     Check firmware files
  hardware     Check min hardware history support
  hw-supported Check hardware supported
  length       Check file length
  path         Auto adjust BIOS path
  profile      Reject incompatible profile extension
  rename       Auto rename file
  system       Auto adjust default file system
  unknown      Reject unknown binary files
  version      Reject older versions
```

2.1.4.1 [NO] CHECK ALL

Activates or deactivates all checks executed over the received files.

Example:

```
FTP config> check all
FTP config>
```

2.1.4.2 [NO] CHECK BIOS

Activates or deactivates the compatibility check with BIOS. In this case, if the file received is identified as a device application, it is checked to see if it can operate with the active BIOS version to ensure that all the services requested by the application are correct. If this is active, an error message appears if an application received cannot support the current BIOS version.

Example:

```
FTP config> check bios
FTP config>
```

2.1.4.3 [NO] CHECK CRC

Activates or deactivates CRC checking. This command checks that the file received has the correct CRC in cases where it is identified as a known file. An error is produced if a file with incorrect CRC is received. From versions 10.6.69 and 10.7.41 onwards, this functionality cannot be controlled using the old COMPATIBILITY or the SITE COMPATIBLE OFF/ON commands.

Example:

```
FTP config> check crc
FTP config>
```

2.1.4.4 [NO] CHECK DELETE

Activates or deactivates temporary buffer deleting. Strictly speaking, this is not a check on the received files. In cases where this is active, the temporary buffer is deleted after executing a SITE SAVEBUFFER command where there is only 1 permitted client.

Example:

```
FTP config> check delete
FTP config>
```

2.1.4.5 [NO] CHECK FIRMWARE

Activates or deactivates firmware checking. Received files recognized as firmware are checked to see if they are necessary and suitable. An error message appears if this is not the case.

Example:

```
FTP config> check firmware
FTP config>
```

2.1.4.6 [NO] CHECK HARDWARE

Activates or deactivates hardware revision checking. In this case, if the received file is identified as known, a check is executed to ensure that its operation with the hardware revision currently in place is correct. The hardware revision is a code that enables certain hardware problems to be solved through basic software. This function cannot be deactivated using the old COMPATIBILITY or the SITE COMPATIBLE OFF commands.

Example:

```
FTP config> check hardware
FTP config>
```

2.1.4.7 [NO] CHECK HW-SUPPORTED

Activates or deactivates the check to see if the loaded software is compatible with the device. If the received file is identified as a device application, this command checks (without a review) that the hardware identifier of said device features among the supported hardware included in the file. This feature cannot be deactivated using the old COMPATIBILITY or the SITE COMPATIBLE OFF commands.

Example:

```
FTP config> check hw-supported
FTP config>
```

2.1.4.8 [NO] CHECK LENGTH

Activates or deactivates length checking. This checks that the length of the file received (whenever it is known) is correct. An error message appears if the length of the file received doesn't correspond to the one expected. The length must be a multiple of 128 bytes. From versions 10.6.69 and 10.7.41 onwards, this functionality cannot be controlled using the old COMPATIBILITY or the SITE COMPATIBLE OFF/ON commands.

Example:

```
FTP config> check length
FTP config>
```

2.1.4.9 [NO] CHECK PATH

Activates or deactivates the automatic path adjustment to save the BIOS. Strictly speaking, this is not a check on the received files. In cases where this is active, if the received file is identified as BIOS, the path is automatically adjusted on executing the SITE SAVEBUFFER so that the BIOS is saved in its place (BIO). From versions 10.6.69 and 10.7.41 onwards, this functionality cannot be controlled by using the old COMPATIBILITY or SITE COMPATIBLE OFF/ON commands.

Example:

```
FTP config> check path
FTP config>
```

2.1.4.10 [NO] CHECK PROFILE

Activates or deactivates the profile extension checking of the received file. In cases where this is active, if the received file is identified as a known file, then a check is carried out to see if the profile extension is the same as the one in the active file. If it isn't, then an error message is returned.

Example:

```
FTP config> check profile
FTP config>
```

2.1.4.11 [NO] CHECK RENAME

Activates or deactivates the automatic renaming of the received file. Strictly speaking, this is not a check on the received files. In cases where this is active, if the received file is identified as known (be it application or firmware) the name that is internally imprinted will be used to save it in the device, regardless of the name used to send it. From versions 10.6.69 and 10.7.41 onwards, this functionality cannot be controlled by using the old COMPATIBILITY or SITE COMPATIBLE OFF/ON commands.

Example:

```
FTP config> check rename
```

```
FTP config>
```

2.1.4.12 [NO] CHECK SYSTEM

Activates or deactivates the automatic triggering of the files system used when launching connections with clients. This is not a check on the received files. In cases where this is active and the configured system is NUL, the default files system adapted to the device are searched.

Example:

```
FTP config> check system
FTP config>
```

2.1.4.13 [NO] CHECK UNKNOWN

Activates or deactivates the checking process that rejects unknown files. When active, this command checks to see if the file with a known extension that is received is really a known file. In cases where it isn't, an error message appears. When inactive, any unknown files with BIN, BFW, or other extensions classified as known are accepted. This functionality cannot be deactivated with the old COMPATIBILITY command or with the SITE COMPATIBILITY OFF command.

Example:

```
FTP config> check unknown
FTP config>
```

2.1.4.14 [NO] CHECK VERSION

Activates or deactivates version checking. In cases where this is active, if the file received is identified as a file acknowledged by the device, this command checks that its imprinted version follows that of the active file. Otherwise, an error is generated.

Example:

```
FTP config> check version
FTP config>
```

2.1.5 CLIENTS

Establishes the maximum number of clients that can be simultaneously connected to the FTP server. The FTP service will run if the number of clients is greater than zero and will stop if the value is zero.

Syntax:

```
FTP config> clients <max-num>
```

Example:

```
FTP config> clients 2
FTP config>
```

2.1.6 CONTROL-PORT

Configures the FTP session control TCP port. By default, Port 21.

Syntax:

```
FTP config> control-port <control-port-num>
```

Example:

```
FTP config> control-port 21
FTP config>
```

2.1.7 DATA-PORT

Configures the TCP port used to transfer data. By default, it is port 20.

Syntax:

```
FTP config> data-port <data-pot-num>
```

Example:

```
FTP config> data-port 20
FTP config>
```

2.1.8 DEFAULT

Deletes the current configuration and restores the default one.

Syntax:

```
FTP config> default
```

Example:

```
FTP config> default
FTP config>
```

2.1.9 [NO] DIRECT

Selects a normal operating mode that, during the session, saves the received file in the active file system. Please note that this feature allows the user to operate in emergency situations, such as conditions of scant free memory. Some devices do not admit this operation mode in the FCO storing system because the code is executed from the flash memory itself. This feature ignores some server protections when recording the code in the storage systems and the code loading is not secure (i.e., in cases of unexpected disconnection, the code may not be sent completely and can leave the device unable to function). Use with extreme caution or under the supervision of Teldat personnel.

When deactivating this, the server operates in safe mode while teleloading. When the STOR command is executed, the file is stored in the temporary memory buffer. To save it in the active files system for this session, you need to use the SITE SAVEBUFFER command.

Syntax:

```
FTP config> [no] direct
```

Example:

```
FTP config> direct
FTP config>
```

2.1.10 [NO] IMMEDIATE

Selects data reception by the TCP based on direct indications. If this is deactivated, data reception by TCP is executed based on the indications queue.

Syntax:

```
FTP config> [no] immediate
```

Example:

```
FTP config> immediate
FTP config>
```

2.1.11 [NO] KEEPALIVE

Activates the *keepalive* option in the data link. If this is deactivated, *keepalive* messages are not sent through the data link.

Syntax:

```
FTP config> [no] keepalive
```

Example:

```
FTP config> keepalive
FTP config>
```

2.1.12 LIST

Displays the content of the FTP configuration.

Syntax:

```
FTP config> list
```

List corresponding to the default configuration:

Example:

```
FTP config> list
FTP configuration:
Operating System:      UNIX
Default File System:  NUL
Control port:         21
Data port:            20
Inactivity timer:     360 seconds
Number of clients:    1
Priority:              0
Maximum Segment Size: 1024
Transmission Buffer Size: 2048
Reception Buffer Size: 16384
Temporal Buffer Size:  0
Reply:                DISABLE
Keepalive:            DISABLE
Immediate:            ENABLE
Direct:               DISABLE
Checks:               ALL
FTP config>
```

2.1.13 [NO] LOGIN

Associates an *authentication login* methods list defined using the AAA feature. As a result, the FTP service applies the methods from the associated list when user authentication is required.

Syntax:

```
FTP config>login authentication <listname>
```

<listname>: Identifier for the authentication methods list.

Example:

```
FTP config>login authentication AutheLogin
FTP config>
```

In this example, the *AutheLogin* methods list has been configured so that it can be used when user authentication is required to access the FTP Shell.

Method lists can only be applied if the AAA feature is enabled. For lists to be applied to different services, you must enable the AAA feature after configuring it. For further information on how to configure the AAA feature, please see manual “Dm800-I AAA Feature”.

2.1.14 MSS

Configures the maximum TCP segment size.

Syntax:

```
FTP config> mss <segment-max-length>
```

Example:

```
FTP config> mss 1024
Maximum Segment Size[1024]?
FTP config>
```

2.1.15 OS

Allows you to determine the format used by the server when the file name is returned on executing the LIST command. This is equivalent to the SITE SYSTMODE MSDOS and SITE SYSTMODE UNIX commands, except these are not reflected when executing the configuration and the specified format is only valid for the session established.

Syntax:

```
FTP config> os ?
ms-dos    Dos format
unix      Unix format
```

Example:

```
FTP config> os unix
FTP config>
```

2.1.16 PRIORITY

Establishes the FTP task priority. If the value is set to 0, the priority is the same as the one given for the TCP tasks.

Syntax:

```
FTP config> priority <priority>
```

Example:

```
FTP config> priority 0
FTP config>
```

2.1.17 [NO] REPLY

Activates the sending of replies when there are delays in command execution. Sending a reply with 1xx indicates that the command is in progress. A subsequent reply of 2xx or 5xx indicates whether the command has executed successfully or not. This can cause problems with certain clients when the response "in progress" is taken as "successfully executed".

In our server, the 119 reply send is activated in the BACKUP, COHERENCE, SAVEBUFFER and SAVESLAVES. In cases where this is deactivated, the 119 reply in BACKUP, COHERENCE, SAVEBUFFER and SAVESLAVES is not sent.

Syntax:

```
FTP config> [no] reply
```

Example:

```
FTP config> reply
FTP config>
```

2.1.18 RX-BUFF

Configures the size of the buffers used to receive TCP from DTP.

Syntax:

```
FTP config> rx-buf <rx-buff-length>
```

Example:

```
FTP config> rx-buf 2048
FTP config>
```

2.1.19 SYST

Specifies the file system to activate by default.

Syntax:

```
FTP config> syst ?
```

```
bio    Handles the BIOS zone.Only the BIOS code files are saved here
dsk    Handles the disk.The code and configurations are stored here
fco    Handles the code Flash memory
fda    Handles the data Flash memory
mem    Temporary buffer
nul    Default file system when a system has not been loaded
smc    Handles the Smart Memory Card
tst    Checks that the FTP is operating correctly
```

Example:

```
FTP config> syst mem
FTP config>
```

2.1.20 TEMP-BUFF

Configures the temporary buffer size.

Syntax:

```
FTP config> temp-buf <temp-buff-length>
```

Example:

```
FTP config> temp-buf 0
FTP config>
```

2.1.21 TIMER

Configures the inactivity timer. Establishes a period of time (in seconds) after which, if no activity is detected, it disconnects.

Syntax:

```
FTP config> timer <inactivity-time>
```

Example:

```
FTP config> timer 300
FTP config>
```

2.1.22 TX-BUFF

Configures the size of the buffers used to transmit TCP from DTP.

Syntax:

```
FTP config> tx-buff <tx-buff-length>
```

Example:

```
FTP config> tx-buff 16384
FTP config>
```

2.1.23 EXIT

Returns to the previous prompt.

Syntax:

```
FTP config> exit
```

Example:

```
FTP config> exit
Config>
```

Chapter 3 FTP Features

3.1 File Systems

The **file systems** or storage systems implemented in the FTP server are:

- **BIO**

This handles the device's BIOS zone. Only the BIOS code files are saved here. If the system detects that this is a non-valid BIOS code, recording is not permitted. This is present in devices with BIOS teleloading features.

- **DSK**

This handles the disk. The code and configuration files are stored here. Present in devices with disk drive, RAM disk or FLASH disk.

- **FCO**

This handles the Flash memory code. The code file is stored here. Present in devices without a disk unit with FLASH. This is obsolete for current devices.

- **FDA**

This handles the Flash memory data. The configuration files are stored here. Present in all devices without a disk unit with FLASH. This is obsolete for current devices.

- **MEM**

This handles the temporary buffer. Present in all devices.

- **NUL**

This is used as a default file system when a system has not been loaded. Present in all devices. This also serves as a higher layer in the file system tree.

- **TS1**

Used to check that the FTP is working and also for operations in TEST mode. Present in all devices.

- **TST**

Used to check that the FTP is working and also for operations in TEST mode. Present in all devices.

- **SMC**

This manages the Smart Memory Card. This is only present in devices that have this storage unit.

The FTP server is capable of maintaining simultaneous connections involving various clients. The number of clients is configurable and limited. **However, simultaneous traffic can only be maintained in the case of clients who are accessing distinct file systems.**

3.2 Users (Login)

The device has the following access levels:

- **SUPERVISOR** Can access all functionalities.
- **GUEST** Can access part of the functionalities (please see the commands).
- **ANONYMOUS** Can only access the login process.

In order to discover the access level for a user, the FTP server accesses the authentication system that is part of the device. This can operate in two modes:

- **Local:** Users registered in the device for the distinct services.
- **Radius:** Authentication is requested from an external server through Radius (please see the "*Dm733-I RADIUS*" manual).

The server always requests user identification. In cases where the authentication system is not active, the users admitted by the server are as follows:

- **ROOT** Supervisor
- **ANONYMOUS** Guest
- **GUEST** Guest

- FTP Guest

Even though the system requests it, the password is blank by default.

3.3 TEST Mode

The TEST mode is a special device server operating mode. Instead of using SITE commands, it uses standard command sequences. This allows you to check the server functionality and execute transfers without putting the file system contents at risk. It uses the “TST and TS1” systems to execute transfers.

To activate TEST mode, you first need to execute your normal login (which can be either registered user or anonymous).

- USER <user>
- PASS <password>
- ACCT <test>

There are two commands:

- **ACCT TEST0**

Command required to activate the TEST mode over the “TST” system.

- **ACCT TEST1**

Command necessary to activate the TEST mode over the “TS1” system.

Once this mode has been activated, the server begins to operate as a standard FTP server, deactivating the various features implemented and preventing “risky” actions from being carried out over the files system.

The two storage systems (“TST” and “TS1”), are always completely functional, even if the TEST mode is not active, and they have the following characteristics:

- On sending the files towards the storage systems, these are sent to a sink and are not stored. Only the sent file name and the length are memorized. Only one file is allowed in the directory.
- On receiving the files from the systems, these send a file with aleatory data whose size is defined in the directory.
- Files can be received with a special name. This name is a number that can be from 1 to 100 million. In this case, the server sends a file whose size is indicated by the name with the aleatory data. This prevents the lines carrying out data compression from falsifying the transfer speed measurement.

Deactivating the TEST mode can be done by disconnecting the control session, or through the following command (which restarts the session login process):

- REIN

3.4 BACKUP Feature

This feature is present in some devices that have the file system duplicated. This allows you to execute backup for the active file system over the reserve system. In this way, you allow the start up system to recoup the device when faced with disasters while downloading, or with an anomalous device configuration. To do this, you need to execute the backup operation before loading remotely.



Note

If this command is executed after downloading and the correct start up has not been checked, the device may be impossible to restart and could require technical service.

The command to carry out this operation is:

- **SITE BACKUP**

Once this has been correctly executed, the reserve file system contains the same data as the active system.

3.5 SECURE Downloading (DIRECT OFF /ON)

This server functionality allows you to carry out downloading. However, bear in mind that there could be problems on the lines and the file downloading may fail. In this case the file system content can appear corrupt and you may lose control over the device (which will become unusable and require technical help). To execute secure downloading you need a temporal storage buffer. This buffer is managed like a file system as it is also identified as "MEM".

In DIRECT ON mode, the server operates as a normal FTP server. This is the mode the server uses when the TEST mode is activated.

In SECURE (DIRECT OFF) mode, the server stores the files that it's going to send in the temporary buffer.

The following commands help manage secure downloads:

- **SITE CLEARBUFFER**

Empties the temporary storage buffer and releases the used memory.

- **SITE DIRECT OFF**

Deactivates direct mode. This activates secure downloads or the buffer mode in the device.

- **SITE DIRECT ON**

Activates the direct mode. This deactivates the secure downloads or the buffer mode. This is a normal FTP server operating mode.

- **SITE SAVEBUFFER**

Dumps the memory buffer content in the permanently selected storage device. This command must be executed when a file has been sent to the device and you wish to record, given that the STOR command records this in the temporary buffer when operating in the secure download mode (DIRECT OFF). By default, the file is recorded in the active file system. This admits an optional parameter that allows you to indicate which file system you want to record the file in. This is the name of the required system. During the time of operation, **you must not switch off the device**. If you do, the file system could be corrupted. In cases where the control connection disconnects in the middle of the operation, the device will continue processing the command until it is finished.

- **SITE SAVESLAVES**

This functionality is only available in certain device families. It orders software downloading for slave devices based on the equipment where the operation is executed. For further information, please see the manuals for the relevant devices.

- **SITE STATBUFFER**

Displays the status of the temporary buffer occupation. The following indications appear in the response:

- MAX

Maximum quantity of memory that the server can request from the system. This is configurable. By default, it is the size of the device's file system. In cases where the size of the file sent is greater, the system indicate a write error on sending.

- REQ

Quantity of memory requested from the system by the server to be used for the temporary storage buffer.

- BUSY

Current occupation of the temporary buffer.

- Filename

Name of the file occupying the temporary storage buffer.

- **SITE STOREDEVICE**

This shows which file system has been selected by default to permanently store. It also indicates whether its functionality is active or not. The file system selected by default is usually the active directory and can be changed through the CWD command. The PWD command can also be used to consult this information.

Command sequence to execute secure downloads.

STOR CIT.BIN (Sends the CIT.BIN file).

SITE STATBUFFER (Optional, allows you to check the buffer content).

SITE SAVEBUFFER (Dumps the file in the permanent device).



Warning

On executing the **SITE SAVEBUFFER** command, what is recorded in the storage device is the current content of the memory buffer. You need to bear in mind that the following may occur:

A user whom we shall call User1 executes the STOR command. When this finishes, the buffer is released. Then, User2 appears and, before User1 has been able to execute the SITE SAVEBUFFER command, User2 modifies the buffer content. When User1 executes SITE SAVEBUFFER, he will record everything that User2 has left in the buffer and not what he intended.

3.6 INTEGRITY Test

There is a system in the device that allows you to check the integrity or the coherency of the main file system contents (DSK). The command used to check if the device is capable of booting with the available software is as follows:

- **SITE COHERENCE**

This command returns the complete software check as a response. The response begins with a numerical figure (see the RFC). If the figure begins with a "2" this means that the checking is correct. If not, the device can indicate the problem in the response in order to correct it.



Note

This command only checks that all the necessary software is present and that the interdependence of the different modules is correct when it comes to the software release needs. A positive response does not indicate that the device is remotely accessible, as the configuration is not checked. Likewise, a negative response does not necessarily mean that the device cannot boot or is not remotely accessible.

The following commands allow you to obtain information:

- **SITE GETAPPNAME**

This returns the application file name used to boot the device. This tells you which file is used in cases where there are various files with a BIN extension.

- **SITE GETBIOSVER**

Returns the device BIOS version number.

- **SITE GETCFGNAME**

Returns the configuration file name used to boot the device. This tells you which file is used in cases where there are various files with a CFG extension.

- **SITE GETFILEVER**

This requires a parameter that is a file name. This returns the file version number in cases where it has the Teldat application format. This allows clients supporting this to know what the application release is.

- **SITE GETHDWLVL**

Returns the device hardware version number. This consists of two numbers, one corresponding to the BIOS and the other to the applications.

- **SITE LISTFIRMWARES**

Returns the firmware file list needed by the device so certain devices can operate. Provides clients who support this with the necessary information on firmware modules to make the device operate correctly.

- **SITE SYSTID**

Returns the system identifier. This identifier indicates the type of device you are dealing with. Allows clients who can support this to know what software has to be sent.

3.7 COMPATIBLE Mode



Note

This command is obsolete from releases 10.6.68, 10.7.33, 10.6.19.1.5 and 10.6.62.1.1 onwards. Although this mode still works, the operations from this command are now supported by the new SITE CHECK.

From versions 10.6.69 y 10.7.41 onwards, the COMPATIBLE OFF/ON functionality does not control the activation/deactivation of the functionalities given below. These must be controlled using the SITE CHECK commands:

PATH-> Adjusts the storage path for the acknowledged files.

CRC-> CRC control for the acknowledged binaries.

LENGTH-> Length control for the acknowledged binaries.

NAME -> Intrinsic automatic renaming.

Device evolution means that, as developments advance, modern devices have a series of functionalities that older equipment don't. Therefore, there is a mode in the device known as "COMPATIBLE" that allows old functionalities to keep operating in modern devices.

Depending on the compatibility mode status, the device behaves in a different way, making certain operations transparent when in the compatibility mode. There are two commands to control this mode:

- **SITE COMPATIBLE OFF**

Activates operating in Extended mode.

- **SITE COMPATIBLE ON**

Activates operating in Compatible mode.

The device behaves in the following ways in compatible mode:

- In DIRECT OFF or secure download mode, the BIOS files are acknowledged and are recorded in the "BIO" system when the SITE SAVEBUFFER command is executed.
- The temporary buffer content is deleted after the SITE SAVEBUFFER has been correctly executed when *accept connections from a single client* has been simultaneously configured.
- When sending files to the device (STOR command) with the TEST mode deactivated, files ending in *.BIN (applications) and *.BFW (firmware) are integrally checked. In cases where the file does not fulfill the necessary conditions in the header, the downloading will not be carried out and is suspended.



Warning

In cases where the the CRC of the *.BIN files is erroneous, files in DIRECT ON mode will register in the file system and eliminate the previous ones. The checked conditions are as follows:

- Software integrity (CRC).
- Compatibility with the device BIOS.
- More modern release that the one the device has.
- File has been renamed according to the header information.
- Firmware checking is correct.
- Firmware is needed.
- Firmware existence checking.
- In cases where the file system is not configured as active by default. When establishing the connection with a client, the first system according to availability in the device activates and priority, from bigger to smaller, is as follows:

DSK	FDA	SMC	FCO	BIO	MEM	TST	TS1	NUL
-----	-----	-----	-----	-----	-----	-----	-----	-----
- In devices with an active FDA system, the SAVEBUFFER command dumps the files with a CFG extension in the

FDA system by default.

- In devices with an active FCO system, the SAVEBUFFER command dumps the files with extensions X and XZ in the FCO system by default.

3.8 CHECK Mode



Note

This command has been introduced from releases 10.6.68, 10.7.33, 10.6.19.1.5 and 10.6.62.1.1 onwards, making the SITE COMPATIBLE command obsolete.

Through this command, the device can execute a series of automatic checks and actions aimed at managing the received files and helping them be more easily detected as known files. Files detected as known have either a .BIN or .BFW extension. There are various actions that can be controlled through this command. The checks on the files detected as known are only executed when the TEST mode is deactivated.

- **SITE CHECK ALL OFF | ON**

Activates or deactivates all the checks and actions.

- **SITE CHECK BIOS OFF | ON**

Activates or deactivates the rejection of applications whenever their minimum BIOS version needed is later than that of the BIOS currently in the system.

- **SITE CHECK CRC OFF | ON**

Activates or deactivates the software integrity checking (CRC).



Warning

In cases where the file CRC is erroneous, the file will have already been recorded in the file system and the old one eliminated.

- **SITE CHECK DELETE OFF | ON**

Activates or deactivates the automatic deleting of the temporary buffer content once the SITE SAVEBUFFER has finished executing correctly when this is configured to accept connections from only one client simultaneously. This operation affects all the files, not only those detected as known.

- **SITE CHECK FIRMWARE OFF | ON**

Activates or deactivates the checking on the necessity and compatibility of the firmware received with the applications and the current operating environment.

- **SITE CHECK HARDWARE OFF | ON**

Activates or deactivates the rejection of applications whose imprinted hardware version or “hardware level” is prior to that marked in the device. When this is activated, it ensures that the software received is capable of supporting or rectifying the known hardware problems in the device.



Caution

If this is deactivated, the device can malfunction after the restart and start up. This check cannot be controlled by the old SITE COMPATIBLE command.

- **SITE CHECK HW SUPPORTED OFF | ON**

Activates or deactivates the rejection of applications from the list of supported hardware that does not belong to the router itself. This prevents the loading of software from one device to another.

This checking system cannot be controlled through the former SITE COMPATIBLE command.

- **SITE CHECK LENGTH OFF | ON**

Activates or deactivates the software integrity check (Length).

**Caution**

In DIRECT ON mode, even if the file length is erroneous (different from a multiple of 128), the new file will be recorded in the file system and the old one eliminated.

- **SITE CHECK PATH OFF | ON**

When the system is in DIRECT OFF mode and the SITE SAVEBUFFER command is being executed, this option activates or deactivates the automatic sending of acknowledged files received (such as BIOS) to the "BIO" system, instead of sending them to the active system.

- **SITE CHECK PROFILE OFF | ON**

Activates or deactivates the dropping of files when their profile extension is different from the file currently active in the device.

- **SITE CHECK RENAME OFF | ON**

Activates or deactivates the automatic renaming of the file received. When this is active, it uses the name imprinted on the inside of the file instead of using the name received in the STOR command.

- **SITE CHECK SYSTEM OFF | ON**

Activates or deactivates the automatic selection of the files system that is active by default. In fact, this command has no effect (as the operation that establishes the connection with the client cannot be modified during the session). This is implemented as a mirror of the command that is in the effective configuration. When activated, if the files system is not configured when establishing the connection with the client, the first system activates depending on the availability in the device. The priority, from higher to lower, is as follows:

DSK FDA SMC FCO BIO MEM TST TS1 NUL

- **SITE CHECK UNKNOWN OFF | ON**

Activates or deactivates the rejection of files detected as unknown. These files have a .BIN or .BFW extension, but do not have the software format recognized by the device. When this rejection is active, these files are not accepted and an error message is sent when they are received. This check cannot be controlled by the old SITE COMPATIBLE command.

- **SITE CHECK VERSION OFF | ON**

Activates or deactivates the rejection of files whose version is previous to that currently active in the device.

The STAT command allows you to view the state of the checks. Each active check appears with the initial letter, and each inactive one is represented with a hyphen. In cases where all or none of them are active, ALL or NONE appears (respectively).

3.9 REPLY Mode

Certain commands take considerable time to execute due to their nature. These commands are:

- SITE COHERENCE
- SITE BACKUP
- SITE SAVEBUFFER
- SITE SAVESLAVES

Some clients, when they do not receive a response in an established time, decide to cut the connection as they believe there is a problem with the server. To avoid this problem, there is a feature in the standard that creates a provisional reply indicating that the command is being executed. This provisional reply begins with "1" (please see the RFC) and, once the command has finalized, the corresponding response is sent.

Unfortunately, there are some clients who can only receive this type of response with certain file transfer commands. In cases regarding the previously stated commands, the provisional reply is taken as a correct execution final response. This means that, on receiving the final reply, the response receiver desynchronizes. This forces the client to operate abnormally from that point onwards, and then to disconnect before reconnecting.

To avoid these problems, the following commands have been implemented:

- **SITE REPLY OFF**

Deactivates 119 reply sending in special commands.

- **SITE REPLY ON**

Activates 119 reply sending in special commands.



Note

The Windows FTP client cuts off the connection if a reply is not sent within a given period of time (REPLY OFF) because the command is slow to execute. However if the 119 reply is sent (REPLY ON), this is taken as a final response and from that point on the device cannot interpret the server's responses to its commands correctly. It needs to disconnect and reconnect the session to continue operating. This problem is a client problem and cannot be rectified from the device.

```
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>
```

In Appendix A, we have provided details on some FTP clients that can be used to transfer files to or from the router as an alternative. We have also explained how to update the software by using each of them.

3.10 RELOAD (COLD BOOT)

Just like from the console, a command that allows you to restart the device from an FTP session has been implemented. This allows you to boot with recently downloaded software. There are two commands for this:

- **SITE RELOAD OFF**

Deactivates the RELOAD mode. This is normal device operating.

- **SITE RELOAD ON**

Activates the RELOAD mode. Allows you to reset or reboot the device once the link or the control connection has been closed.

The reboot occurs once the control connection has closed.

There are two procedures to close a control connection:

- The client closes the TCP connection. In this case, rebooting is immediately produced after closing the control connection.
- The clients send the "QUIT" command. In this case, it's the server that closes the connection. Thanks to the way TCP operates, rebooting occurs a few seconds after the control connection is closed (normally 30 seconds).

3.11 MISCELLANEOUS

A few other SITE commands, apart from those already mentioned in the previous sections, are also implemented .

- **SITE IMMEDIATE OFF**

Deactivates the IMMEDIATE mode. The reception of data over the TCP data link is executed through an indications queue. This means that data reception is executed according to the configured priority. This command is used in old devices so downloading does not involve so much CPU consumption, which could penalize the performance of the rest of the systems (downloading can be slowed down).



Note

This must be used under technical supervision.

- **SITE IMMEDIATE ON**

Activates the IMMEDIATE mode. The reception of data over the TCP data link is directly executed. This is the normal system operating procedure and the downloading accelerates.

- **SITE KEEPALIVE OFF**

Deactivates the KEEPALIVE sending through the data link. This is used in devices where problems arise when the KEEPALIVE is not answered.

- **SITE KEEPALIVE ON**

Activates the KEEPALIVE sending through the data link. This detects when the data link is down.

- **SITE SYSTMODE MSDOS**

Uses the MS-DOS format to view the file systems content when a "LIST" command is ordered.

- **SITE SYSTMODE UNIX**

Uses the UNIX format to view the file systems content when a "LIST" command is ordered.

Chapter 4 sFTP Features

4.1 Configuration

The sFTP server does not have its own configuration as such. To activate it, you need to activate and configure the SSH system in a manner that is compatible with protocol version 2 (please see the documentation on SSH use).

4.2 File Systems

All the functionalities for the file systems explained in previous chapters are applicable to the sFTP server.

The sFTP server is capable of keeping established connections with various clients simultaneously. It is also capable of maintaining various operations open with each of them. **However, it can only execute simultaneous operations over different file systems.**

4.3 Users (Login)

The SSH2 protocol executes user authentication, so the concept of a user in the sFTP server isn't logical.

4.4 TEST Mode

The TEST mode doesn't exist as such, but it's still possible to use it without needing specific operations to activate it. This allows you to test the server functionality and execute transfers without endangering the contents of the file system. This command uses the "TST" and "TS1" systems to execute the transfers.

All the functionalities for the "TST" and "TS1" systems explained in previous chapters are applicable to the sFTP server.

4.5 BACKUP Feature

This function is not supported.

4.6 SECURE Downloading

This server functionality allows you to carry out downloading. However, bear in mind that there could be problems on the lines and the file downloading may fail. In this case the file system content can appear corrupt and you may lose control over the device (which will become unusable and require technical help). To execute secure downloading you need a temporal storage buffer. This buffer is managed like a file system as it is also identified as "MEM".

Normally, the server checks the extension of the sent files and (depending on their type) permits or prevents direct downloading. Known extensions are:

- BIN Binary files such as the OS file or BIOS.
- BFW Firmware files.

In cases where one of these types of files is recognized, if the CHECK system configured for the FTP server has a check activated to carry out a check on the received files, it will not permit direct downloading into the file systems (normally "DSK" or "BIO").

To execute safe downloading, the file is sent to the "MEM" system. As the SITE SAVEBUFFER command doesn't exist, the way to save the file in the corresponding system is to send an order from the client to rename the file.

This is the sequence of commands used to execute safe downloading from the clients with a command line.

```
put CIT.bin /mem/CIT.bin           (Sends the CIT.BIN file).
mv /mem/CIT.bin /dsk/CIT.bin      (Permanently dumps the file in the device).
```



Note

On executing the "mv" command, the content that is currently in the memory buffer is the one recorded in the storage device.

4.7 INTEGRITY Test

Feature not supported.

4.8 COMPATIBLE Mode

Feature does not exist.

4.9 CHECK Mode

This feature is supported but control is limited. There aren't any commands to modify the checks in connection (there aren't any SITE commands). Control over this is executed from the dynamic configuration menu and affects the new connections established after the configuration has been modified.

The device can carry out a series of checks and automatic actions for managing files that have been received and detected as known files. Files detected as known have the .BIN or .BFW extensions. There are various actions that can be controlled using this command.

These checks are executed when the file is dumped from the "MEM" system into the main system when a secure downloading is carried out. Depending on the configuration, the checks are as follows:

- **CHECK BIOS**

Rejects applications whose minimum BIOS requirements are prior to the BIOS currently running in the system.

- **CHECK CRC**

Software integrity (CRC).

- **CHECK FIRMWARE**

Check on the necessity and compatibility of the firmware received with the application and the current operating environment.

- **CHECK HARDWARE**

Rejects applications whose stamped hardware level is prior to the level marked in the device. This checks that the software received is capable of supporting or rectifying the known hardware problems in the device.



Caution

If this deactivates, the device may not operate correctly once rebooted.

- **CHECK LENGTH**

Checks the software integrity (Length).

- **CHECK PATH**

Known received files are automatically sent to the assigned system independently of the system selected to store them in when the secure downloading is carried out:

- BIOS to the "BIO" system.
- OS file to the "DSK" system.
- Firmware to the "DSK" system.

- **CHECK RENAME**

Automatic renaming of the received file. When this is active, it uses the name stamped on the inside of the file for secure downloading (instead of using the name received in the STOR command).

- **CHECK UNKNOWN**

Rejects unknown files. These files have a .BIN or BFW extension but do not have a software format that the device can recognize. When this is active, these files are not accepted and an error message appears if you try to save them in secure downloading.

- **CHECK VERSION**

Rejects files whose version is prior to the one currently active in the device.

4.10 REPLY Mode

Feature does not exist.

4.11 RELOAD (COLD BOOT)

Feature does not exist.

4.12 Miscellaneous

An “EXTENDED” command is defined in the sFTP protocol (similar to the FTP “SITE” command). However it is not often used as it’s specific to each manufacturer and it often can’t be supported by the clients. Consequently, the “SITE” features in the FTP server don’t exist in the sFTP server.

Chapter 5 Problems

5.1 Known Problems

5.1.1 Error writing file (550)

This error message is normally sent by the server to the client when the latter sends a file and the file system does not have enough space to store it, or when an internal error is produced.

- When this happens in DIRECT ON mode, this means that the file system does not have enough space to store the file. You need to see if it's necessary to delete files from the file system in order to send the new file.
- When this happens in DIRECT OFF mode (please see secure downloading), this means that the temporary memory buffer is full and is not capable of fully storing the file. To find out what is happening, you need to execute the following command.

```
SITE STATBUFFER
```

The information received is interpreted in the following way:

MAX

If the figure is less than the total file length, this indicates that the temporary buffer is not capable of storing the file and you will need to configure the temporary buffer size in order to store it (please see TEMP-BUFF configuration). You could also try to download again in DIRECT ON mode.

REQ

If the figure is less than the total file length, this indicates that the temporary buffer cannot get more memory from the system. This also implies that the device does not have sufficient memory to execute secure downloads. In this case, you need to deactivate the DIRECT ON mode and try to resend the file.

5.1.2 Connection closed by remote host

Error generated by the Windows FTP client. It indicates that the connection has been closed by the server, despite this not being the case. The real reason is the connection has been closed by the client himself. This error usually occurs under the following circumstances.

- The Server is executing a SITE SAVEBUFFER command. In this case, the device continues executing the operation normally even though the connection has been cut off. This occurs because the command execution time can be quite long and the client assumes that the server has lost the connection as the latter takes so long in replying (see SITE REPLY problems).



Note

The Windows FTP client cuts off the connection if a reply is not sent within a given period of time (REPLY OFF) because the command is slow to execute. However if the 119 reply is sent (REPLY ON), this is taken as a final response and from that point on the device cannot interpret the server's responses to its commands correctly. It needs to disconnect and reconnect the session to continue operating. This problem is a client problem and cannot be rectified from the device.

```
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>
```

In Annex A, as an alternative, we have provided details on some FTP clients that can be used to transfer files to or from the router. We have also explained how to update the software by using each of them.

- The problem occurs in the middle of transmitting a file. In this case, this could be a problem with traffic control systems (which halt transmission if one of the TCP ports involved is not port 20). In this case, the client needs to send the PORT command to the server, as the device tries to make sure that one of the ports is port 20.

5.1.3 File transfer has stopped

With some files, occasional problems can arise that stop the file from being sent. Despite this not affecting all files, once it happens with one, it will always happen. This problem occurs when the Windows FTP client sends TCP packets with an erroneous checksum, which prevents the file from being sent. We don't know why this behavior occurs with some specific files, but the problem can be solved by using a different FTP client.

5.1.4 Unable to open file (550)

This is an error message normally sent by the server to the client. It indicates that the file cannot be opened in the server.

Some clients that only send the file name to the remote server and others send both the name and the local path.

This message appears when the server is in DIRECT ON mode and the client includes the local path in the name of the file it's sending.

Example with a Linux client:

```
ftp > put ../85xx/CIT.bin
local: ../_85xx/CIT.bin remote: ../_85xx/CIT.bin
200 PORT is set to IP ADDR = 172.24.75.193 PORT 50021
150 Data connection open, checked file transfer in process...
#####
netout: Connection reset by remote peer
550 Unable to open file.
```

In this case, the storage system where the server is operating in DIRECT ON mode is "/DSK". When sending file name "../_85xx/CIT.bin", the device tries to open the file in "/_85xx/CIT.bin". Since it does not exist, the file cannot be opened. The available storage systems request the address from the root system.

To resolve this problem, you can use specific client commands to manage the file name in remote systems (each client has their management), or you can specify the name the remote system must use as shown below:

Example with Linux client:

```
ftp > put ../85xx/CIT.bin CIT.bin
local: ../_85xx/CIT.bin remote: CIT.bin
200 PORT is set to IP ADDR = 172.24.75.193 PORT 50021
150 Data connection open, checked file transfer in process...
#####...
226 STOR completed, 7214720 bytes processed, data connection is closed.
7214720 bytes sent in 41.73 secs (169.1 kB/s)
```

5.1.5 Unix Clients (ASCII mode)



Warning

FTP clients from the World of Unix, Linux and similar operating systems generally use the ASCII mode to send files. Binary files requested by devices must be sent in BINARY mode, which must be activated in the client through the corresponding command (usually "binary"). Although this is not necessary in Window environments, it's a good idea to always activate it.

In cases where the binary mode is not activated to transfer files to the device, the following problems may arise:

- DIRECT ON Mode:

- CHECK LENGTH | CRC ON Mode: If this is a binary file belonging to a known application or firmware, this is considered incorrect and a length error or a CRC error is generated. At this point, the file that has been sent and saved

is incorrect and the device may NOT BOOT.

- CHECK LENGTH | CRC OFF Mode: In this case, an error message is not generated so the problem is underlying. At this point, the file that has been sent and saved is incorrect and the device may NOT BOOT.
- DIRECT OFF Mode:
 - CHECK LENGTH | CRC ON Mode: If this is a binary belonging to a known application or firmware, this is considered incorrect and a length error or a CRC error message is generated. At this point, the temporary buffer is deleted and the corrupt file will not be saved in the device (even when executing the SITE SAVEBUFFER command), as the buffer is empty.
 - CHECK LENGTH | CRC OFF Mode: If this is a binary file belonging to a known application or firmware, this is considered incorrect and a length error or a CRC error message is generated. In this case an error is not produced consequently the problem is silent.

5.1.6 Checking the length and/or checksum

When you send a binary file with an erroneous length or checksum to the server, and the length and/or checksum checking modes are active, you may receive one of the following responses from the server.

- CHECK LENGTH ON mode:
 - 535 Unexpected end of checked file.
- CHECK CRC ON mode:
 - 536 Received checked file with bad checksum.

If the errors occur in DIRECT ON mode, the system has already saved the incorrect binary file and the device may NOT BOOT.

If the errors occur in DIRECT OFF mode (see safe teleloading), the temporary memory buffer is deleted and the corrupt file will not be saved in the device (even when executing the SITE SAVEBUFFER command), as the buffer is empty.

If the checksum or length checking modes are not active, the device will operate as under the DIRECT ON mode and may NOT BOOT.

Chapter 6 FTP Client Commands

Command history:

Release	Modification
11.00.06	FTP client commands added.
11.01.02	FTP client commands added.

6.1 Introduction

Simple client implementation is added to bring about some FTP commands. This client is available at the "Monitoring" menu. To access it, please execute the following command:

Syntax:

```
+feature ftp
```

Example:

```
+feature ftp
FTP Client
FTP+
```

At this menu, several FTP commands are available to the user:

```
FTP+?
  put      Copy file from current file system to server
  exit     Exit
FTP+
```

6.1.1 Put

Sends a file to a specific server. It is necessary to know the server's IP address, the FTP user and pass, and the file to be transferred. Also, client mode can be configured to be passive or active.

Syntax:

```
FTP+put <server_ip> <ftp_user> <ftp_pass> <file> {<cr> | passive}
```

Example:

```
FTP+put 192.168.214.58 root switch SONY_A390_DSC00372.JPG passive
2%, 9%, 15%, 19%, 26%, 32%, 39%, 46%, 52%, 59%, 66%, 73%, 79%, 86%, 93%, 99%, 100% transfer complete
FTP+
```

```
FTP+put 192.168.214.58 root switch SNAKE_RIVER_(5MB).JPG
15%, 31%, 42%, 57%, 73%, 90%, 100% transfer complete
FTP+
```

By pressing a key, the process could be aborted at any given time (if needed).

```
FTP+put 192.168.214.58 root switch SONY_A390_DSC00372.JPG passive
2%,
Operation aborted or timeout expired
CLI Error: Command error
FTP+
```

```
FTP+put 192.168.214.58 root switch SNAKE_RIVER_(5MB).JPG
15%, 32%,
Operation aborted or timeout expired
CLI Error: Command error
FTP+
```

If an error occurs, it is shown to the user. Possible errors are login error, connection error or timeout expired.

```
FTP+put 192.168.214.58 ot switch SNAKE_RIVER_(5MB).JPG
```

```
Login error  
CLI Error: Command error  
FTP+
```

```
FTP+put 192.168.214.58 root switch SNAKE_RIVER_(5MB).JPG  
Connection error  
CLI Error: Command error  
FTP+
```

6.1.2 Exit

Returns to the "Monitoring" menu.

Syntax:

```
FTP+exit
```

Example:

```
FTP+exit  
+
```

Appendix A FTP Clients

A.1 Introduction

As already mentioned in previous chapters, certain commands take considerable time to execute. Some FTP clients, when they do not receive a response in an established time, decide to cut the connection as they believe there is a problem with the server. The Windows FTP client is among these clients. The following sections offer a detailed explanation on how to use and configure certain FTP clients to avoid this problem in processes as critical as software updating. Here, the process is explained using the “*site savebuffer*” command. However, the same method can be applied if we activate the direct mode through the “*site direct on*” command.

A.2 FileZilla Client

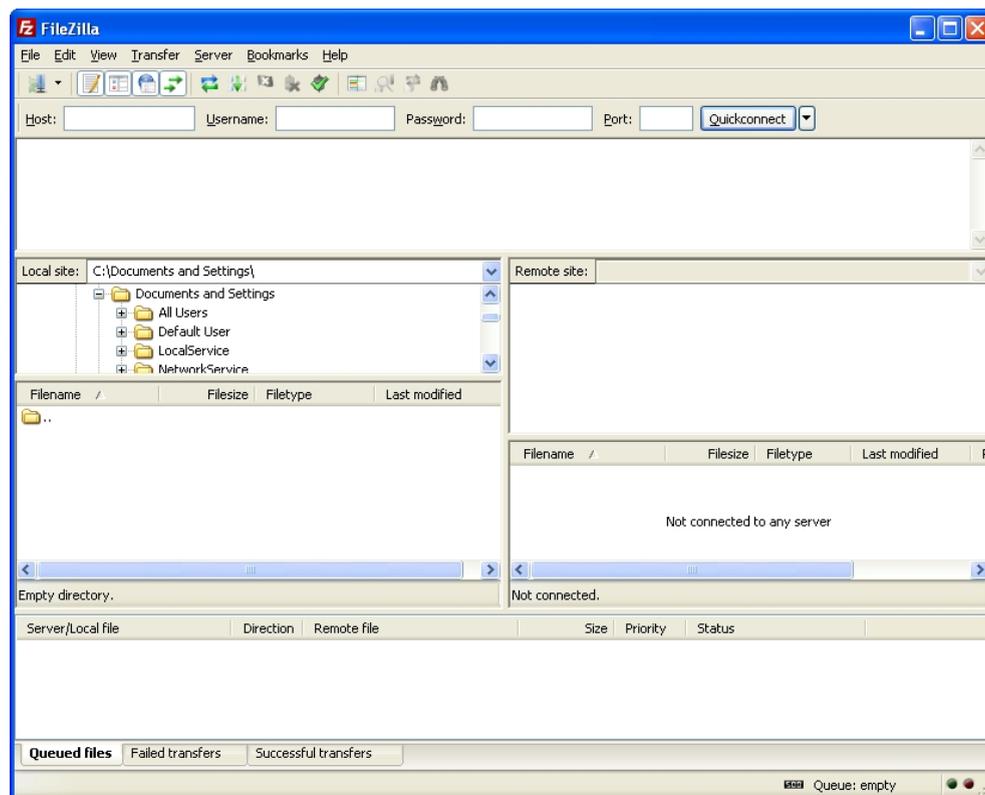
FileZilla is an open code multiplatform FTP client with free software, licensed under the GNU General Public License. It supports FTP, SFTP and FTP over SSL/TLS (FTPS) protocols.

Its user friendly and intuitive interface shows both the local window and the remote window, allowing files to be passed from one to another through multiple techniques including the “*drag and drop*” mechanism.



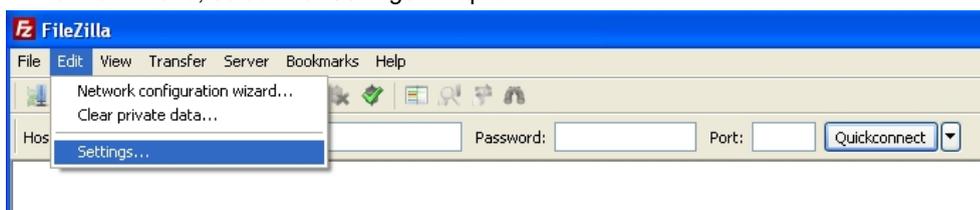
Note

The images shown here are for the Windows version. This said, the operating mode is the same for both the Windows and Linux operating systems.

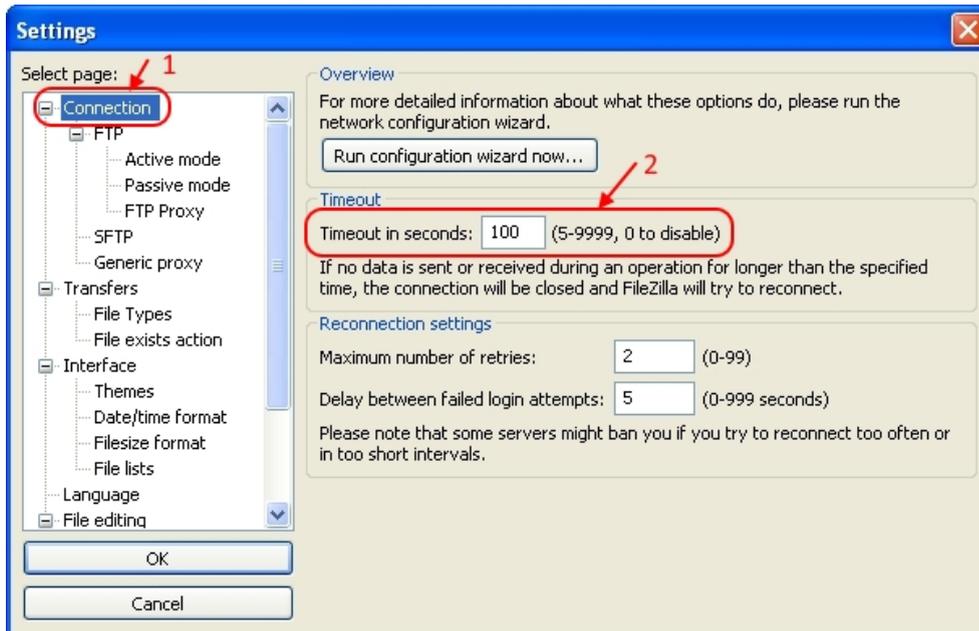


Before beginning the updating process, we need to increase the response wait time to prevent the connection being cut off while the “*site savebuffer*” command is being executed. To do this, you need to carry out the following:

- (1) In the “*Edit*” menu, select the “*Settings...*” option.



- (2) Using the mouse, click on the “*Connection*” option and modify the “*Timeout in seconds*” parameter (assigning it a value of at least 100 seconds).



(3) Click on the “OK” button.

Once this change has been made, you need to update the software by carrying out the steps given below:

Note

You should always use the FTP protocol.

(1) *Connecting to the router's FTP server*

To do this, use the “Quickconnect” bar. Here, specify the router’s IP address in the “Host” field, the user in the “Username” field (using user *root* when there are no users defined in the router) and the password, if necessary, in the “Password” field (user *root* does not have a password).

The “Port” field can be left empty, provided that you have not configured a port (other than 21) in the router’s FTP server.

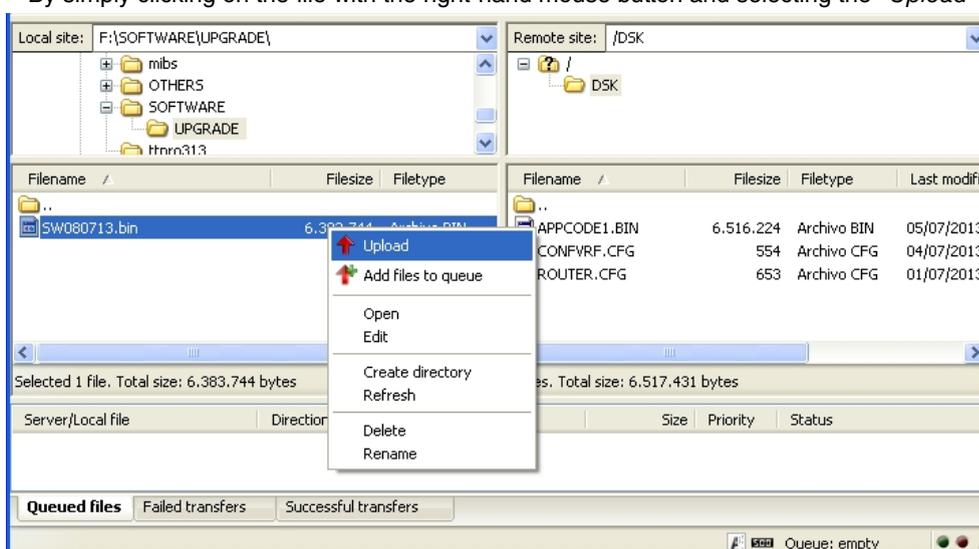
Subsequently, click on the “Quickconnect” button.



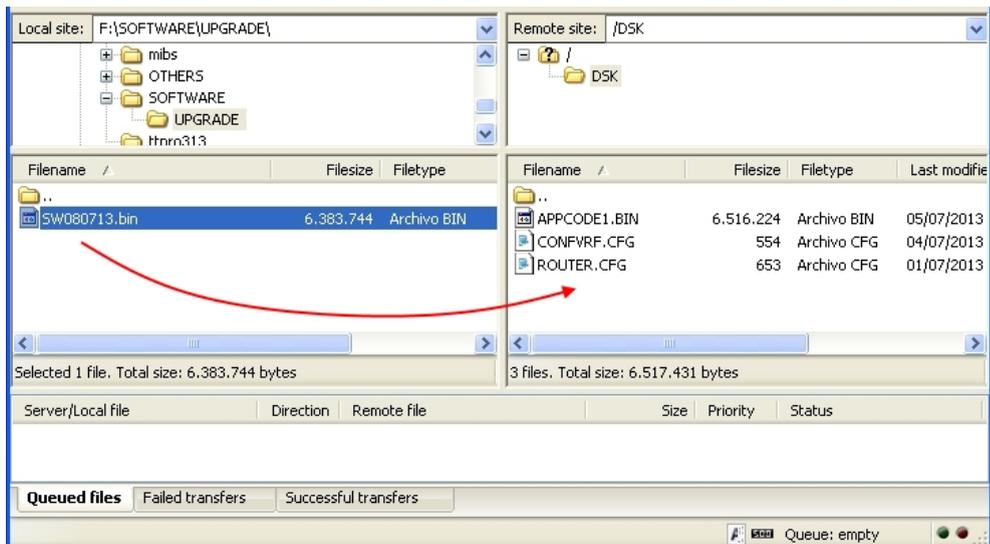
(2) *Transferring the file*

There are several alternatives to do this:

By simply clicking on the file with the right-hand mouse button and selecting the “Upload” option.

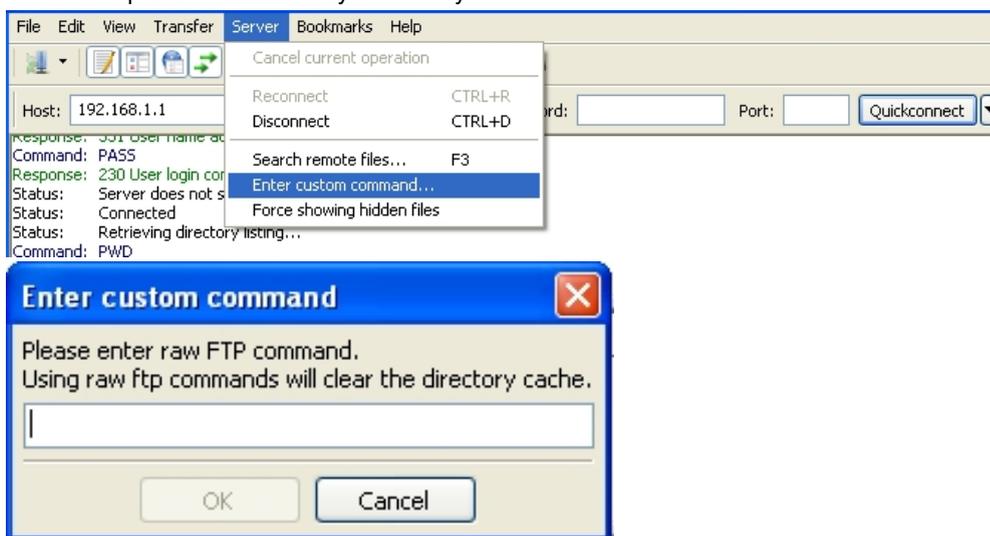


- By double clicking on the file.
- Or, through the “drag and drop” mechanism.



(3) *Order the file to be saved to disk and close the FTP connection*

To do this, and for each FTP command going to be executed, select the “*Enter custom command...*” from the “*Server*” menu and enter the command to be executed in the new window. Once entered, click on the “*OK*” button or press the “*Enter*” key on the keyboard.



The following commands need to be executed in the order listed:

“*site savebuffer*”

“*site reload on*”(optional command)

“*quit*”



Note

While executing the “*site savebuffer*” command, you may receive a response indicating that you are disconnected from the server. In this case, do not execute any action as after a certain amount of time you will receive an OK message associated to this command.

```
Command: LIST
Response: 150 Data connection open, list transfer in process...
Response: 226 List transfer completed, data connection is closed.
Status: Directory listing successful
Command: site savebuffer
Status: Disconnected from server
Response: 200 SAVEBUFFER completed O.K.
```

A.3 WinSCP Client

WinSCP is a Windows FTP client with free software that supports FTP, SFTP and SCP protocols. This application allows you to choose between two types of interfaces. We will be using the “*Commander Interface*” in this section.

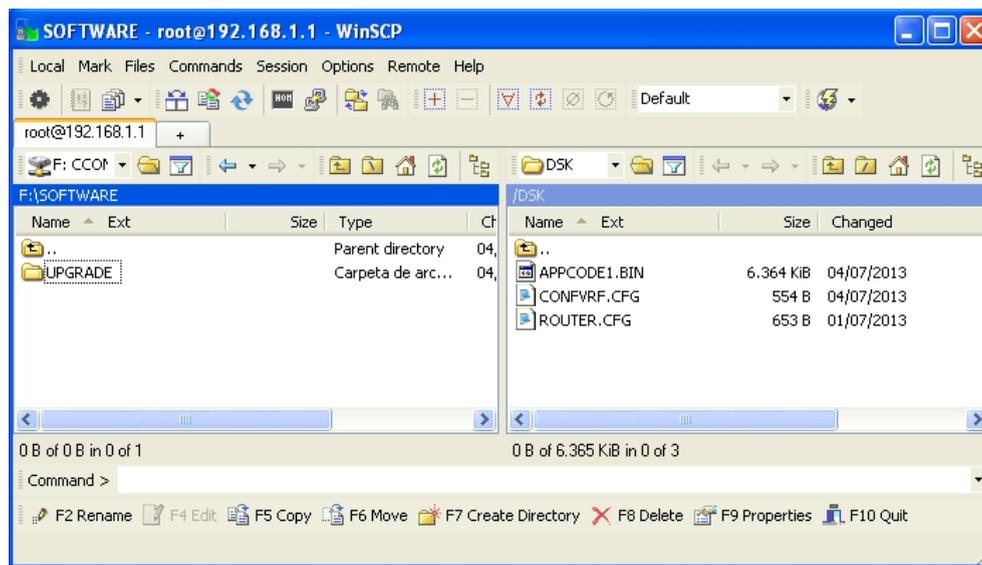
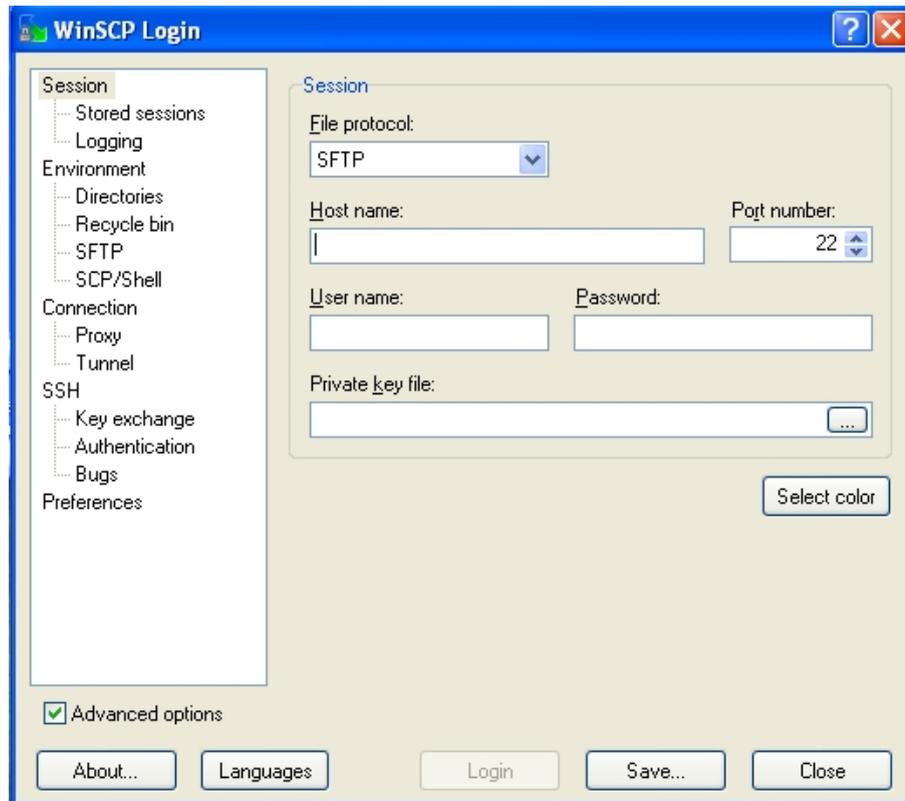


Fig. 1: "Commander Interface" Interface

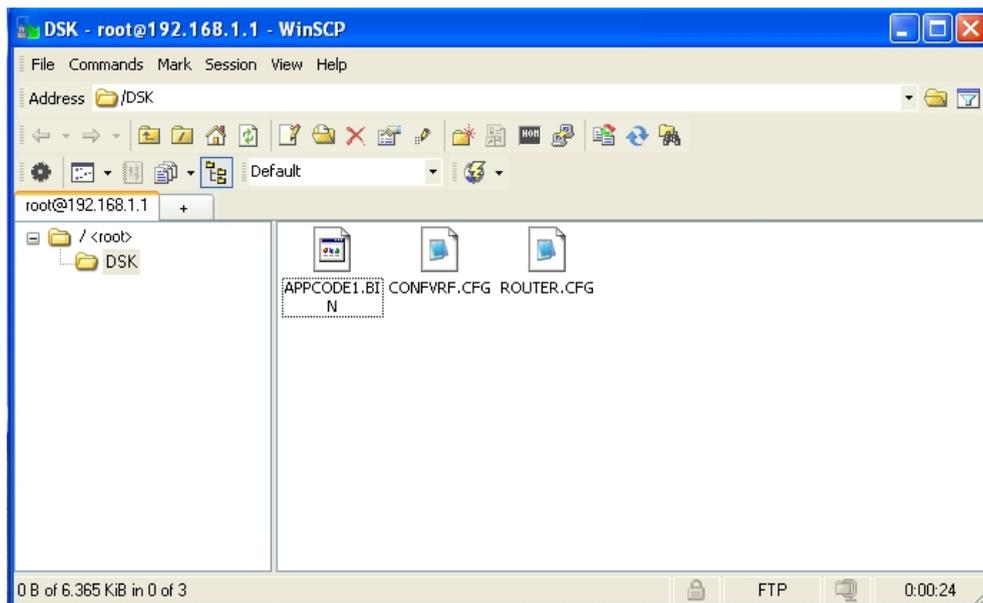
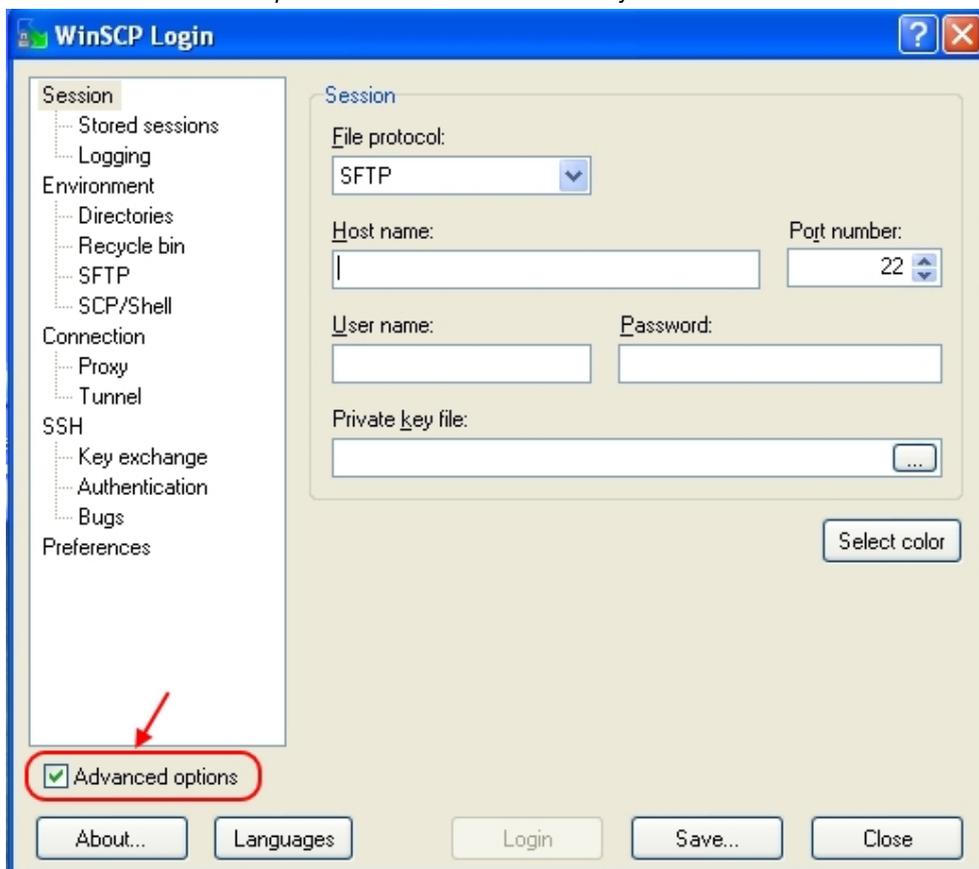


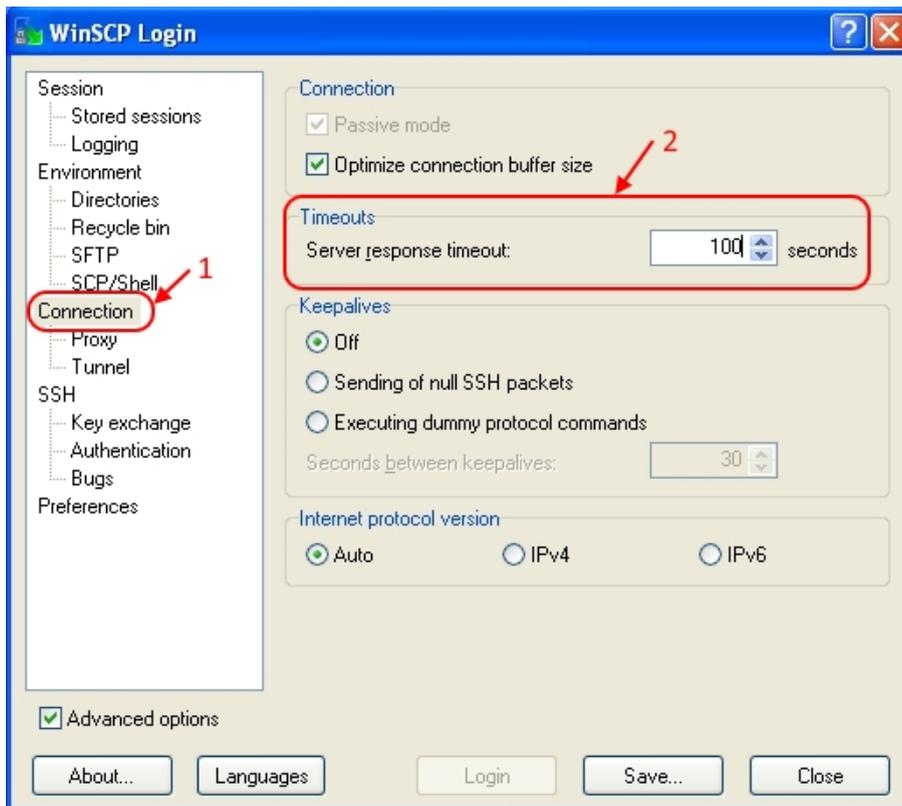
Fig. 2: "Explorer Interface" Interface

Before beginning the updating process, you need to increase the response wait time to prevent the connection from being cut off while the "site savebuffer" command is being executed. To do this, you need to carry out the following:

- (1) Activate the "Advanced options" checkbox if it isn't already activated.



- (2) Using the mouse, click on the "Connection" option and modify the "Server response timeout" parameter (assigning it a value of at least 100 seconds).



Once this change has been made, you can now update the software by carrying out the steps listed below:

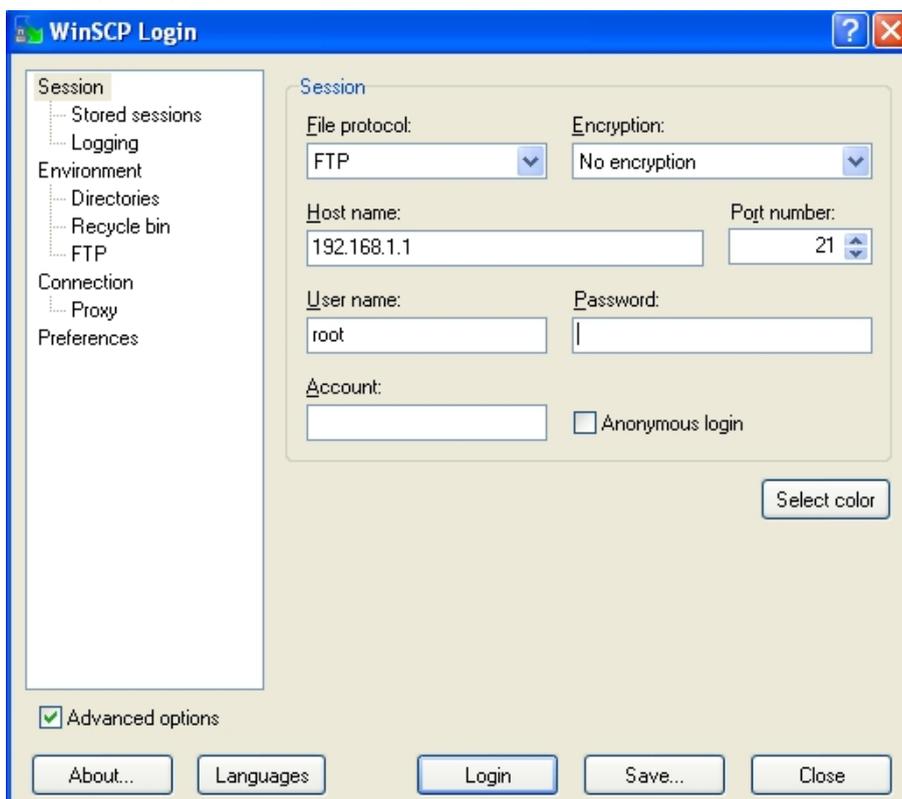
Note

You should always use the FTP protocol.

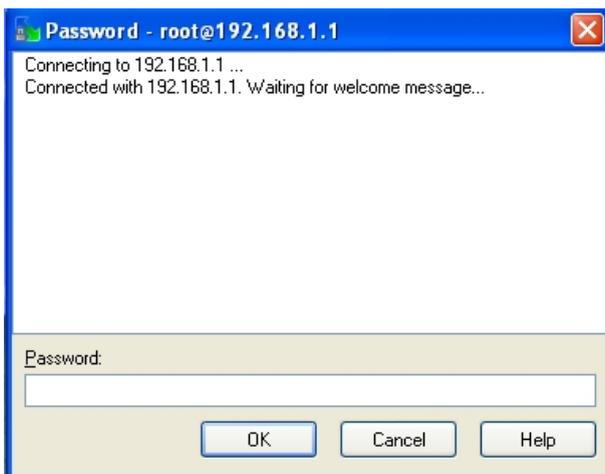
(1) Connecting to the router's FTP server

To do this, select FTP in the "File protocol" field and enter the router's IP address in the "Host name" field. The "User name" and "Password" fields need to be filled out with the username and the access password, respectively. In cases where the router does not have any defined users, specify "root" as the user without a password.

The "Port number" field should only be modified if a specific port, other than 21, has been configured in the router's FTP server.

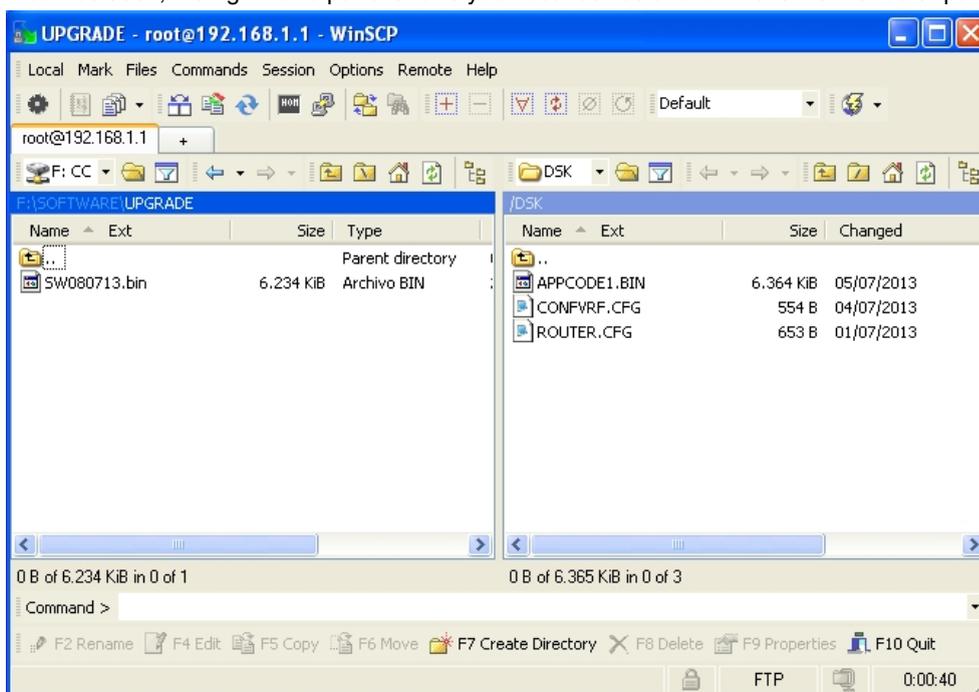


During connection, you may be asked for the access credentials again. If this happens, reenter the requested data and click on the “OK” button.

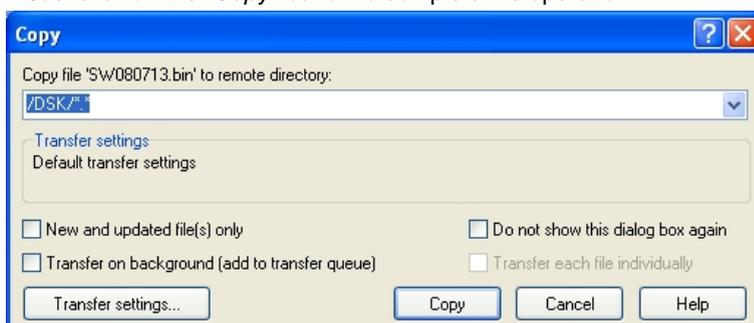


(2) Transferring the required file

Once the connection has been established, the application will display the following window where two panels can be seen; the right hand panel shows your local device and on the left is the router panel.

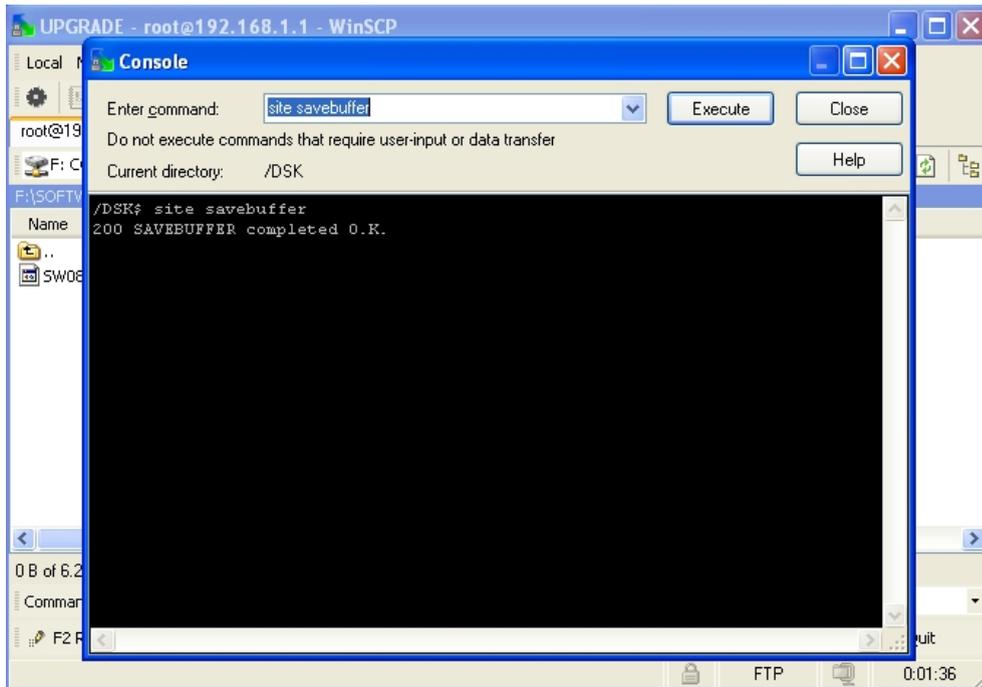


To transfer a file, use the “*drag and drop*” option. On releasing the mouse, the following dialog box appears. Just click on the “Copy” button to complete the operation.



(3) Order the file to be saved to disk and close the FTP connection

To do this, select “*Open Terminal*” under the “*Commands*” menu. It then opens a new window.



Here, on the upper part of the window, enter and execute the necessary commands one by one. To execute a command, simply click on the “Execute” button or press the “Enter” key on your keyboard. In the lower part of the window, the application will display the results of each command.

The following commands need to be executed in the order listed:

- “site savebuffer”
- “site reload on”(optional command)
- “quit”

A.4 FTP client through Linux console

You may also update the software using the FTP client through the Linux console. Please follow the steps set forth under the “Updating FTP” section associated to the type of software you wish to update.