



**FOTA application notes
TT8750FAN002**

FOTA application Notes

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SERIES

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In some instances, certain aspects of the product warranty may also be covered in a separate written agreement between SkyPatrol and the distributor or reseller, if any, from whom purchaser purchased the product. That agreement may provide, for example, a different product return procedure that may also be available to purchaser (e.g., the product may be returned to SkyPatrol through that distributor or reseller).

OTHER CONSIDERATIONS

This limited warranty shall be governed by the laws of the State of Texas, United States of America, without regard to conflict of laws principles. This limited warranty shall not be governed in any respect by the United Nations Convention on Contracts for the International Sale of Goods.

REGULATORY COMPLIANCE

FCC

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

This equipment has been tested and found to comply with the limits pursuant to Part 15 Subpart B, Part 22, and Part 24 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This equipment generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause harmful radiation to radio

communication. However, there is no guarantee that interference will not occur in a particular installation.

RF EXPOSURE

Your Spider AT is a radio transmitter and receiver. It is designed and manufactured not to exceed the emissions limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission (FCC) of the U.S. Government. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. These guidelines are based on the safety standards previously set by the U.S. and international standards bodies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless RF devices, such as the Spider AT, employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg. SAR values at or below that limit are considered safe for the general public.

Before a wireless RF device is made available for sale to the Public, it must be tested and certified to the FCC that it does not exceed the SAR limits established by the FCC. Tests for SAR are conducted using the positions and locations (e.g., at the ear or worn on the body) as required by the FCC for each device model. The Spider AT has been tested and meets the FCC RF exposure guidelines when used against the body under normal usage conditions.



The Spider AT modem has been fully tested and complies with all the requirements of EN301 489-1, EN301 489-7 and IEC60950-1. Compliance to EN301 511 has been demonstrated by testing on both the GSM5108 and the integrated LPP0108-40 module.

ROHS COMPLIANCE

The Spider AT modem has been fully tested and complies with all the requirements of EN301 489-1, EN301 489-7 and IEC60950-1. Compliance to EN301 511 has been demonstrated by testing on both the GSM5108 and the integrated LPP0108-40 module. The Spider AT complies with the European Union Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment ([RoHS) Directive (2002/95/EC), taking effect July 1, 2006.

DISCLAIMER


The information and instructions contained within this publication comply with all FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. SkyPatrol disclaims all responsibility for any act or omissions, or

for breach of law, code or regulation, including local or state codes, performed by a third party.

SkyPatrol strongly recommends that all installations, hookups, transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. SkyPatrol acknowledges that the installation, setup and transmission guidelines contained within this publication are guidelines, and that each installation may have variables outside of the guidelines contained herein. Said variables must be taken into consideration when installing or using the product, and SkyPatrol shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

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1 Introduction

1.0 OBJECTIVE

The intent of this document is to provide the user with a basic understanding of the FOTA capabilities, including configuration and use of the various AT Commands.

1.1 OVERVIEW

The embedded FTP client provides for file transfer support from a remote FTP server for transmission out the serial port. Connections and requests are initiated at the FTP client and sent to the remote FTP server over an IP connection. Since FTP operates exclusively over a TCP connection and the serial port is a byte stream interface, transferring the file data from the FTP server and out the serial port is a two-step process. When a file transfer is initiated, the file data is first sent via an IP packet stream to be stored in memory buffers in the SkyPatrol host, and then converted to a byte serial stream for output on the serial port.

1.2 BASIC FTP OPERATION

First, the embedded FTP client must first be configured to connect to the remote FTP server. Second, the FTP client will be directed to open a control connection to the FTP server. The user may then issue various data commands to get a file, list the directory contents, or change the current directory. When these data operations are complete, the user may close the connection with the FTP server.

1.2.1 FTP CONFIGURATION. (AT\$FTPCFG)

Configuration is accomplished with the AT\$FTPCFG command. Configuration parameters include the remote FTP server hostname, the IP port to connect to on the FTP server, the FTP username on the FTP server, and the FTP password for the previously specified username.

Follow the step in the Modem Setup section.

1.3 MODEM SETUP:

Set FTP configuration with

AT\$FTPCFG=<host>,<port>,<ftp-user>,<ftp-password>

Wait for "OK"

AT\$FOTAGET=<file>, 1, <mode>

Where *mode* is: 0 = FTP Get Active Mode (default mode), 1 = FTP Get Passive Mode

Wait for "OK" (AT command successfully received)

One should receive following status messages:

\$FTPOPEN: FTP CONNECTION OPEN (FTP connection status response)

The following is a list of possible status responses:

- FTP CONNECTION OPEN
- FTP INVALID CLIENT
- FTP INVALID TASK
- FTP STACK ERROR
- FTP INVALID USER
- FTP INVALID PASSWORD
- FTP INVALID TYPE CODE
- FTP BUFFER OVERRUN
- FTP BAD HOST
- FTP BAD RESPONSE
- FTP TIMEOUT
- FTP NEED PASSWORD
- FTP NEED ACCOUNT
- FTP INVALID ACCOUNT
- FTP INVALID STRU CODE
- FTP INVALID MODE CODE
- FTP INVALID BUFFER
- FTP TRANSFER ABORT
- FTP FILE ERROR
- FTP BAD MSG FORMAT
- FTP REPLY BUFFER OVERRUN
- FTP INVALID IP ADDR
- FTP BAD CMD FORMAT
- FTP BAD FILE DESCRIPTOR
- FTP WRITE FAILED

- FTP FILE NOT FOUND
- FTP NO FILE DESCRIPTOR AVAIL
- FTP FILE ALREADY EXISTS
- FTP SPECIAL ACCESS ATTEMPTED
- FTP INVALID FILE POINTER
- FTP UNKNOWN FILE ERROR
- FTP SYNTAX ERROR
- FTP REGISTRATION FAILURE
- FTP OPEN DRIVE FAILURE
- FTP CURRENT DIR FAILURE
- FTP MEMORY
- FTP SERVICE UNAVAILABLE
- FTP CMD NOT IMPLEMENTED
- FTP BAD CMD SEQUENCE
- FTP FILE UNAVAILABLE
- FTP INVALID FILE NAME
- FTP CMD UNRECOGNIZED
- FTP UNKNOWN NETWORK PROTOCOL
- FTP INVALID PARM
- FTPS CTASK STRU MALLOC FAILURE
- FTPS CTASK MALLOC FAILURE
- FTPS CTASK CREATE FAILURE
- FTPS CTASK KERNEL BIND FAILURE
- FTPS SERVER TERMINATED
- FTP CANT OPEN DATA CONNECTION
- FTP DNS ERROR

At this point, wait for the device to upgrade and receive next message (wakeup or normally configured message)

Query the SW version number with AT+GMR to ensure software version update

1.4 FTP SERVER REQUIREMENTS:

FTP server comes standard as part of Microsoft Windows Server 2003 R2

Be sure to secure it as part of the FTP setup process

Assign Username and Password to access the server

Use these to populate the \$FTPCFG command

1.4.1 DELTA FILE SIZE

On average, delta file size between two versions should be less than: **250 KBytes**

Max delta file size: **500 KBytes**

1.4.2 DOWNLOAD TIME

The actual download time would vary depending on the network connection

However, for a file size of **250 Kbytes**, the approximate download time would be **120 seconds @ 2 Kbytes/second**

1.4.3 UPGRADE TIME

The maximum upgrade process takes less than 4 minutes

The exact time would depend on the delta file size.

While the device is going through an upgrade process, it's recommended that power is not removed from the device. However if power is removed from the device during the upgrade process, the upgrade will continue when power is reapplied

1.4.4 DELTA FILES

Delta files will be provided on request. Customer has to submit a Support Ticket.

Support system will validate the customer with sales (similar systems)

Provide the requested delta file to customer.

If a delta file does not exist, then Support shall create a JIRA ticket against the request and engineering shall provide the needed file.

SkyPatrol would not be providing or hosting an FTP server

Delta files may(?) be available on our website for download by our customers

2 FOTA COMMANDS

2.1 AT\$FTPCFG

AT\$FTPCFG	Configure FTP parameters
Command Function	Configures FTP parameters required to open connection to FTP Server
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPCFG=?
Response	\$FTPCFG: "host", (0-65535), "username", "password" OK
Write Format	AT\$FTPCFG=<host>,<portnum>,<username>,<password>
Response	OK
Read Format	AT\$FTPCFG?
Response	\$FTPCFG: <host>, <port>, <username>, <password>
Execution Format	N/A
Response	N/A
Parameter Values	
<host>	Fully qualified domain name or dotted-decimal notation IP address of FTP server, character string up to 64 characters
<portnum>	FTP server port number, 0 - 65535
<username>	FTP server user name, character string up to 32 characters
<password>	FTP server password, character string up to 32 characters
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	AT\$FTPCFG must be entered initially before opening connection to FTP server. Configuration information will be saved to flash when flash write command is executed and will be re-used on subsequent FTP connections.

2.2 AT\$FTPOPEN

AT\$FTPOPEN	Opens FTP connection
Command Function	Opens FTP control connection to FTP server
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPOPEN=?
Response	\$FTPOPEN: ("ACTIVE,"PASSIVE") OK
Write Format	N/A
Response	N/A
Read Format	AT\$FTPOPEN?
Response	OK \$FTPOPEN: <status>
Execution Format	AT\$FTPOPEN=" <mode>"
Response	OK <status>
Parameter Values	
<mode>	ACTIVE or PASSIVE Mode is an optional parameter. If not specified, the FTP connection will be in the ACTIVE mode.
<status>	FTP CONNECTION OPEN FTP CONNECTION CLOSED FTP STACK ERROR Status will display the state of the control connection with the remote FTP server.
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	AT\$FTPOPEN must be entered after FTP configuration information has been entered. If any FTP configuration information has been saved to flash, it will be used to open the connection to the FTP server. After the FTP open completes successfully, FTP CONNECTION OPEN will be printed, otherwise an error string will be printed.

2.3 AT\$FTPDIR

AT\$FTPDIR	Directory listing
Command Function	Prints a directory listing of the current working directory on the FTP server
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPDIR=?
Response	OK
Write Format	N/A
Response	N/A
Read Format	AT\$FTPDIR?
Response	OK \$FTPDIR: <current directory information>
Execution Format	AT\$FTPDIR
Response	OK <directory listing information>
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	AT\$FTPDIR can only be entered after the connection to the FTP server has been established. Directory listing information may be delayed due to the latency of the data connection to the FTP server.

2.4 AT\$FTPGET

AT\$ FTPGET	Retrieve a remote file
Command Function	Retrieves a remote file from the FTP server for either output on the serial port or storage to the local flash file system.
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPGET=?
Response	\$FTPGET: "remotefile", "localfile" OK
Write Format	AT\$FTPGET=<remotefile>,<localfile>
Response	OK
Read Format	AT\$FTPGET?
Response	\$FTPGET: <remotefile>, (SERIAL, <localfile>), <output>/<available>, <eof>
Execution Format	N/A
Response	N/A
Parameter Values	
<remotefile>	File name on the remote FTP server.
<localfile>	Filename to use for storage of the retrieved file in the local flash file system
<output>	Number of bytes which have been transferred out the serial port
<available>	Number of bytes of file which are available for output to the serial port
<eof>	0 = file currently being transferred 1 = complete file has been transferred to FTP client
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	If local file is not specified, the remote file will be maintained in memory buffers until a subsequent FTP read request is performed to output a block of bytes onto the serial port. As the file is transmitted out the serial port, the FTP client will refill the memory buffers with additional file data from the FTP server.

2.5 AT\$FTPDIR

AT\$ FTPR	Outputs block of file data onto serial port
Command Function	Outputs the requested number of bytes of a retrieved file from the remote FTP server onto the serial port.
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPR=?
Response	\$FTPR: (0-1500) OK
Write Format	N/A
Response	N/A
Read Format	AT\$FTPR?
Response	\$FTPR: <available>
Execution Format	AT\$FTPR=<blocksize>
Response	OK
Parameter Values	
<blocksize>	Number of bytes to output to serial port. This number is limited to the current number of bytes of the remote file which have been transferred from the FTP server.
<available>	The number of bytes available for output to the serial port.
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	This command is only available after an FTP get operation has been initiated using the serial port as the file destination. It directs buffered file data from the FTP server to be transmitted in blocks out the serial port. This command is repetitively issued until the complete file is transmitted from the FTP server out the serial port.

2.6 AT\$ FTPCLOSE

AT\$ FTPCLOSE	Closes the connection to FTP server
Command Function	Closes the current connection with the remote FTP server.
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPCLOSE=?
Response	OK
Write Format	N/A
Response	N/A
Read Format	AT\$FTPCLOSE?
Response	ERROR
Execution Format	AT\$FTPCLOSE
Response	OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	This command is only available when a connection to the an FTP server is active. If a connection to an FTP server is not active, FTP INVALID CLIENT is returned.

2.7 AT\$ FTPABORT

AT\$ FTPABORT	Closes the connection to FTP server
Command Function	Interrupts the current data operation with the FTP server.
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPABORT=?
Response	OK
Write Format	N/A
Response	N/A
Read Format	AT\$FTPABORT?
Response	ERROR
Execution Format	AT\$FTPABORT
Response	OK
Parameter Values	N/A
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	If a data operation is not in operation, no action is performed. If a connection to an FTP server is not active, FTP INVALID CLIENT is returned.

2.8 AT\$ FTPCHDIR

AT\$ FTPCHDIR	Change current working directory
Command Function	Changes the current working directory on the FTP server.
Command Functional Group	SkyPatrol Specific
Command Format Query	AT\$FTPCHDIR=?
Response	\$FTPDIR: "directory" OK
Write Format	AT\$FTPCHDIR=<directory>
Response	OK
Read Format	AT\$FTPCHDIR?
Response	ERROR
Execution Format	N/A
Response	N/A
Parameter Values	
<directory>	Directory name on remote FTP server
Reference	N/A
Standard Scope	Optional
Implementation Scope	Full
Notes	AT\$FTPCHDIR can only be entered after the connection to the FTP server has been established. To navigate up a directory, use the ".." directory notation.