

N25

DFOTA Upgrade Guide

Issue 1.0 Date 2020-03-18



Copyright © Neoway Technology Co., Ltd 2020. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Neoway Technology Co., Ltd.

neoway is the trademark of Neoway Technology Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

This document provides guide for users to use N25.

This document is intended for system engineers (SEs), development engineers, and test engineers.

THIS GUIDE PROVIDES INSTRUCTIONS FOR CUSTOMERS TO DESIGN THEIR APPLICATIONS. PLEASE FOLLOW THE RULES AND PARAMETERS IN THIS GUIDE TO DESIGN AND COMMISSION. NEOWAY WILL NOT TAKE ANY RESPONSIBILITY OF BODILY HURT OR ASSET LOSS CAUSED BY IMPROPER OPERATIONS.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE DUE TO PRODUCT VERSION UPDATE OR OTHER REASONS.

EVERY EFFORT HAS BEEN MADE IN PREPARATION OF THIS DOCUMENT TO ENSURE ACCURACY OF THE CONTENTS, BUT ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS DOCUMENT DO NOT CONSTITUTE A WARRANTY OF ANY KIND, EXPRESS OR IMPLIED.

Neoway provides customers complete technical support. If you have any question, please contact your account manager or email to the following email addresses:

Sales@neoway.com

Support@neoway.com

Website: <http://www.neoway.com>

Contents

1 Overview.....	4
2 Making Incremental OTA Package	5
3 Upgrade Through FTP Server	6
3.1 AT Process	6
3.2 AT Example	7
4 Upgrade Through Serial Tool.....	8
5 AT+FTPGETF	11

About This Document

Scope

This document is applicable to N25 series.




Audience

This document is intended for [system engineers \(SEs\)](#), [development engineers](#), and [test engineers](#).

Change History

Issue	Date	Change	Changed By
1.0	2020-03	Initial draft	Cenny Xiao

Conventions

Symbol	Indication
	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
	Means note or tips for readers to use the module

Related Documents

Neoway_N25_Hardware_User_Guide

Neoway_N25_AT_Command_Mannual

1 Overview

Firmware Over The Air (FOTA) is a method that allows mobile devices to upgrade firmware via cellular data connections. For cellular IoT modules, FOTA is applicable to the upgrade of firmware inside chipset to optimize functionalities and meet customization demands.

FOTA upgrade can be implemented in two ways: incremental OTA and full OTA. The previous method is called delta FOTA (DFOTA). During DFOTA upgrade, you can use the differential algorithm to compute and compress an upgrade package that contains the version differences only and update the firmware of a module remotely. Compared to FOTA upgrade with full OTA packages, DFOTA has the following advantages:

- An increment OTA package is smaller than a full OTA package and consumes less data traffic to download.
- Less space in the module is required for upgrade.

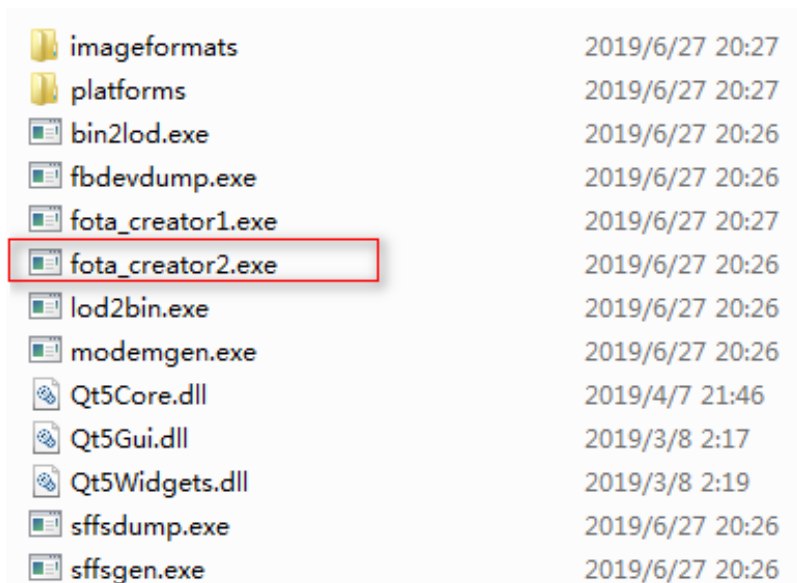
The FOTA scheme of N25 adopts the incremental OTA. The incremental OTA package can be downloaded to the module remotely through a wireless network or downloaded through a local serial tool and the UART port.

This document describes how to make an incremental OTA package and how to download it to the module for firmware update.

2 Making Incremental OTA Package

You can request an incremental OTA package from Neoway or make one by following steps below:

Step 1: On a Windows OS, decompress **fota.7z** and find **fota_creator2.exe** in the **xxx\fota_creator_v1.0-11\fota**.

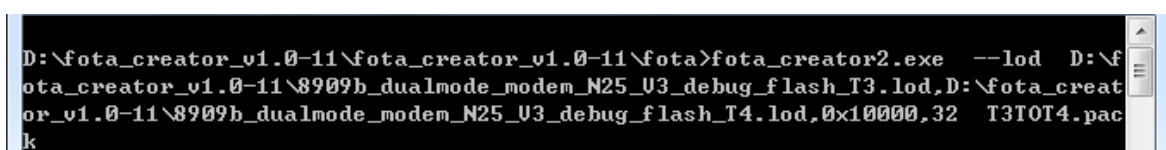


Step 2: In the CLI, run the **fota_creator2.exe** command to make an incremental OTA package.

```
fota_creator2.exe --lod old_version,new_version,0x10000,32 output.pack
```

- **old_version**: the path of the source firmware version
- **new_version**: the path of the target firmware version
- **0x10000**: the size of block, default value
- **32**: the number of blocks in each bundle, default value
- **output.pack**: indicates the file name and extension. Output is the file name and can be custom.

After running the command, wait till the incremental OTA package is completed. The package is saved in the path of the FOTA tool.

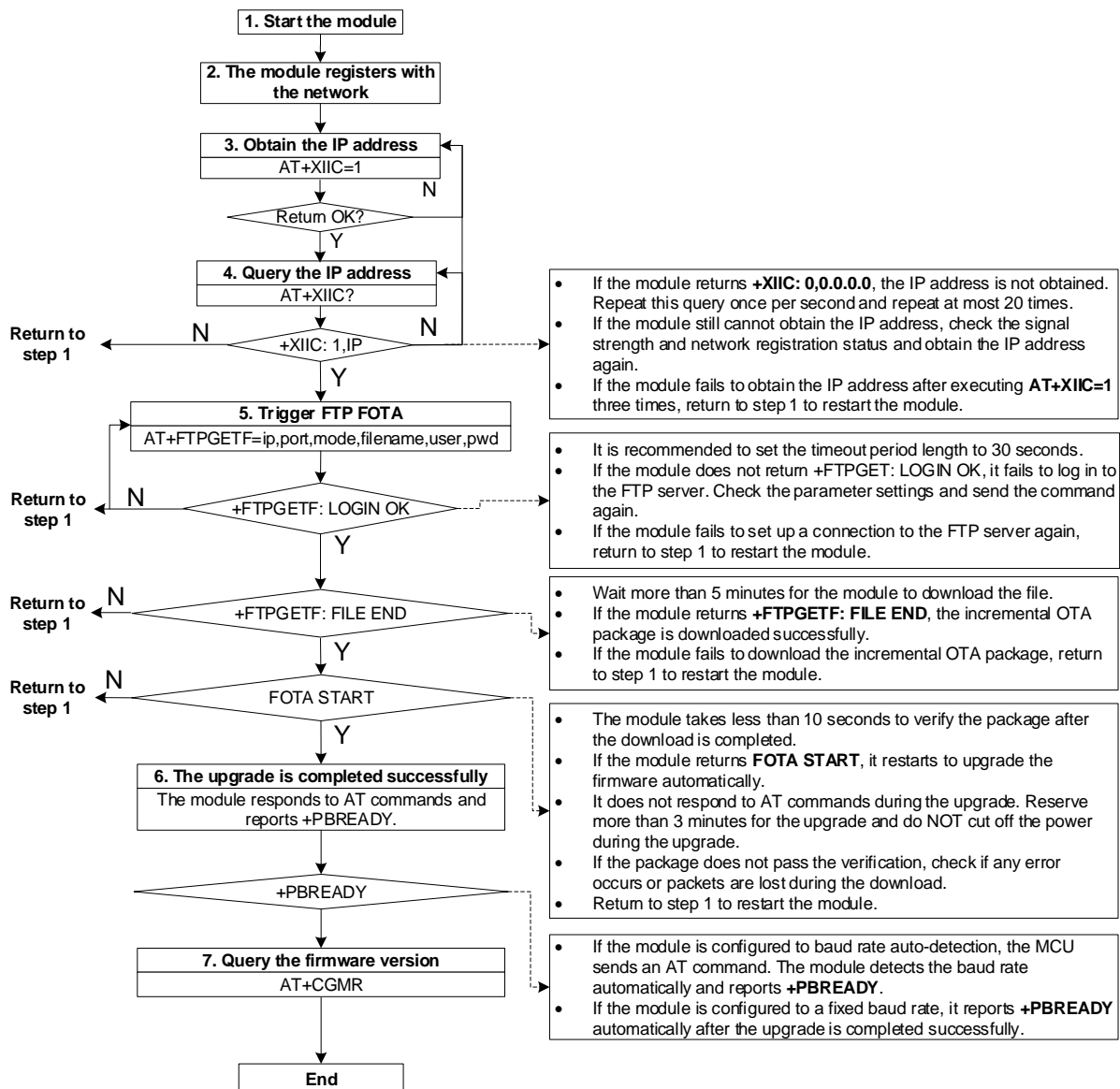


3 Upgrade Through FTP Server

After the incremental OTA package is completed, deploy it on the FTP server. After the module connects to the network, the MCU issues the FTP download command. The module downloads the incremental OTA package from the FTP server. After the package is downloaded to the file system of the module, the module verifies the incremental OTA package automatically and starts to upgrade the firmware automatically if the package passes the verification.

3.1 AT Process

The following figure shows the upgrade process.



3.2 AT Example

The following terminal display shows an example of upgrade the module firmware through an FTP server.

```
[18:14:42.022]OUT->AT+CGMR
[18:14:42.026]IN->
+CGMR: N25-R04-STDEU-02_T4
OK

[18:14:45.749]OUT->AT+CREG?
[18:14:45.753]IN->
+CREG: 0,1
OK

[18:14:47.509]OUT->AT+XIIC=1
[6:14:47 PM.513]IN->
OK

[18:14:55.262]OUT->AT+FTPGETF=58.60.184.213,10108,0,T4TOT3.pack,admin,admin
[18:14:55.274]IN-> //Trigger FTP FOTA. Change the FTP server address and other
parameters depending on the actual settings.
OK

[6:14:56 PM.694]IN->
+FTPGETF: LOGIN OK

[6:15:11 PM.487]IN->
+FTPGETF: FILE END

[6:15:15 PM.066]IN->
FOTA START

[18:17:16.212]OUT->ATE0
[6:17:16 PM.218]IN->
+PBREADY //The module completes the upgrade and can respond to AT
commands.

[18:17:18.164]OUT->AT+CGMR //Query the firmware version.
[18:17:18.167]IN->AT+CGMR
+CGMR: N25-R04-STDEU-02_T3
OK
```



- During the FOTA upgrade, the module stops other services.
- If a power cutoff causes download failure, restart the module and download the incremental OTA package again. The module can resume the interrupted download.
- After the incremental OTA package is downloaded to the file system of the module successfully, the module restarts automatically to upgrade the firmware. If the power is cut off during the upgrade, the module can resume the interrupted upgrade after it restarts again.

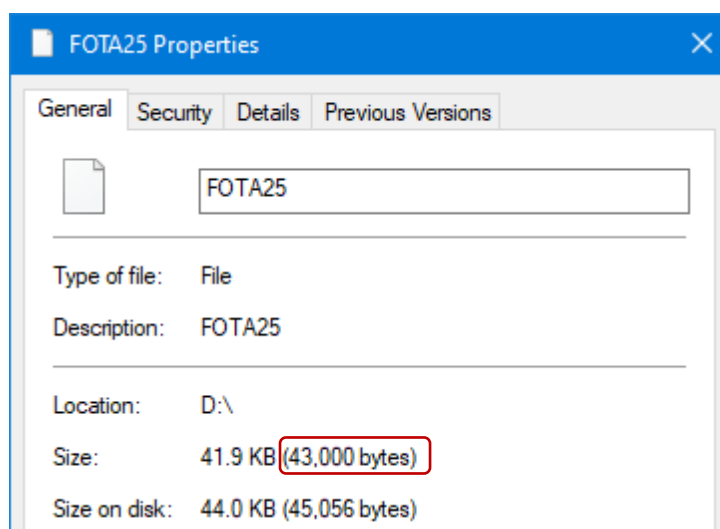
4 Upgrade Through Serial Tool

You can also use a local serial tool to download the package into the file system of the module through the UART port and then upgrade the firmware of the module. Perform FOTA upgrade through serial tool as below:

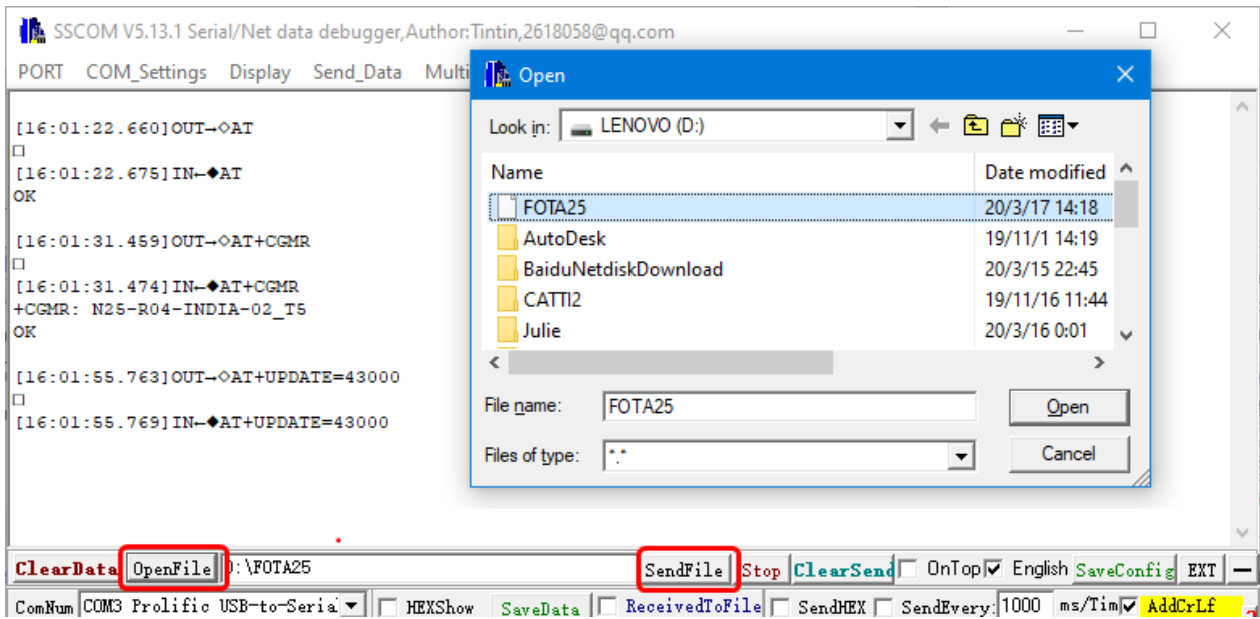
Step 1: Start the serial tool and the module. Send **AT+UPDATE=<size>** after the serial communication is ready.

```
PORT COM_Settings Display Send_Data Multi_Strings Tools
[16:01:22.660]OUT->AT
[16:01:22.675]IN->AT
OK
[16:01:31.459]OUT->AT+CGMR
[16:01:31.474]IN->AT+CGMR
+CGMR: N25-R04-INDIA-02_T5
OK
[16:01:55.763]OUT->AT+UPDATE=43000
[16:01:55.769]IN->AT+UPDATE=43000
```

Size indicates the size of the OTA package, unit: byte
Ensure that you input the correct file size.



Step 2: Click **OpenFile** to select the incremental OTA package and click **SendFile**.



Do NOT input any other information into the UART port when sending the package. The module is saving the upgrade file. The process might be affected if you send any other information, resulting upgrade failure.

Step 3: Wait till the module returns **OK**.

After the module returns OK, the incremental OTA package is downloaded successfully and the module starts the upgrade automatically.

```
File Size: 43000
BaudRate 115200bps
Time require: 3.16700005531311 S
Wait...
Send ok!
[16:07:10.924]IN->
OK
```

- After the incremental OTA package is downloaded to the file system of the module, the module verifies if it matches the source version of the module. The module returns **OK** if it matches. Otherwise, **ERROR** is returned.



```
File Size: 43000
BaudRate 115200bps
Time require: 3.16700005531311 S
Wait...
Send ok!
[16:20:05:915]IN->
ERROR
```

- If a power cutoff causes download failure, restart the module and download the incremental OTA package again.

The module upgrades its firmware automatically.

Step 4: After the upgrade is completed, send an AT command to query the firmware version.

```
Wait...
Send ok!
[16:07:10.924]IN-◆
OK

[16:10:54.739]OUT-◇AT
□
[16:10:54.751]IN-◆
+PBREADY

[16:11:10.274]OUT-◇AT+CGMR
□
[16:11:10.279]IN-◆AT+CGMR
+CGMR: N25-R04-INDIA-02_T6
OK
```



Reserve 3 minutes for the upgrade process and do NOT cut off the power during the upgrade.

If the power is cut off during the firmware upgrade, the module can resume the interrupted download till the upgrade is completed.

5 AT+FTPGETF

To control the FOTA upgrade.

Execute **AT+XIIC=1** before logging in to the FTP server.

If the module returns **+FTPGETF: ERROR ...**, you can send this command to resume the download.

After the module returns **+FTPGETF: FILE END**, wait 5 seconds and the module restarts for upgrade.

Format

Type	Format	Response
Execution	AT+FTPGETF=<ip>,<port>,<mode>,<filename>,<user>[,<pwd>]<CR>	<CR><LF>OK<CR><LF> <CR><LF>+FTPGETF: LOGIN OK <CR><LF>+FTPGETF: FILE END Or <CR><LF>+FTPGETF: <ERROR1><CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+FTPGETF: LOGIN OK <CR><LF>+FTPGETF: <ERROR2>

Timeout

The command times out if the module does not respond in 30 seconds.

Parameter

- <ip> IP address or domain name of the FTP server
- <port> Port number of the FTP server, 21 in general
- <mode> 0: module upgrade
1: other upgrade
- <filename> Name of the upgrade file on the FTP server
- <user> User name used to log into the FTP server and its length should not exceed 100 ASCII codes. No comma (,) is allowed in the user name.
- <pwd> Password used to log into the FTP server and its length should not exceed 100 ASCII codes. No comma (,) is allowed in the password.
- <ERROR1>
 - ERROR LOGIN: failed to log in to the FTP sever

- ERROR PPP: PDP context is not activated
- ERROR SOCKET: failed to obtain the socket
- ERROR EVENT: failed to set the properties of the socket
- ERROR DISCONNECT: link is interrupted exceptionally.
- ERROR ADDR: failed to connect to the IP address
- ERROR DOMAIN: failed to connect to the domain
- ERROR TIMEOUT: timeout
- <ERROR2>
- ERROR CONNECT: failed to connect
- ERROR FSIZE: failed to obtain the size of the file
- ERROR PASV: failed to obtain the address of data link
- ERROR HEADER: failed to verify the header of the downloaded file
- ERROR LENGTH: failed to verify the length of the downloaded file

Example

AT+FTPGETF =58.60.184.213,12006,0,111.h,test,test	Startup upgrade
OK	
+FTPGETF: LOGIN OK	Log in to the FTP server successfully.
+FTPGETF: FILE END	Download completed
AT+FTPGETF =58.60.184.213,12006,0,111.h,test,test	Execute the command if no PPP connection is set up
+FTPGETF: ERROR PPP	Report ERROR.
AT+FTPGETF =58.60.184.213,12006,0,111.h,test,test	Startup upgrade
OK	
+FTPGETF: LOGIN OK	Log in to the FTP server successfully.
+FTPGETF: ERROR CONNECT	Report ERROR.