



HUAWEI MU509-b HSDPA LGA Module  
V100R003

# **IPSTACK Application Guide**

Issue 01

Date 2014-10-10

## **Copyright © Huawei Technologies Co., Ltd. 2014. All rights reserved.**

No part of this manual may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd. and its affiliates ("Huawei").

The product described in this manual may include copyrighted software of Huawei and possible licensors. Customers shall not in any manner reproduce, distribute, modify, decompile, disassemble, decrypt, extract, reverse engineer, lease, assign, or sublicense the said software, unless such restrictions are prohibited by applicable laws or such actions are approved by respective copyright holders.

## **Trademarks and Permissions**



HUAWEI,

HUAWEI, and



are trademarks or registered trademarks of Huawei Technologies Co., Ltd.

Other trademarks, product, service and company names mentioned may be the property of their respective owners.

## **Notice**

Some features of the product and its accessories described herein rely on the software installed, capacities and settings of local network, and therefore may not be activated or may be limited by local network operators or network service providers.

Thus, the descriptions herein may not exactly match the product or its accessories which you purchase.

Huawei reserves the right to change or modify any information or specifications contained in this manual without prior notice and without any liability.

## **DISCLAIMER**

ALL CONTENTS OF THIS MANUAL ARE PROVIDED "AS IS". EXCEPT AS REQUIRED BY APPLICABLE LAWS, NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE MADE IN RELATION TO THE ACCURACY, RELIABILITY OR CONTENTS OF THIS MANUAL.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL HUAWEI BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, OR LOSS OF PROFITS, BUSINESS, REVENUE, DATA, GOODWILL SAVINGS OR ANTICIPATED SAVINGS REGARDLESS OF WHETHER SUCH LOSSES ARE FORSEEABLE OR NOT.

THE MAXIMUM LIABILITY (THIS LIMITATION SHALL NOT APPLY TO LIABILITY FOR PERSONAL INJURY TO THE EXTENT APPLICABLE LAW PROHIBITS SUCH A LIMITATION) OF HUAWEI ARISING FROM THE USE OF THE PRODUCT DESCRIBED IN THIS MANUAL SHALL BE LIMITED TO THE AMOUNT PAID BY CUSTOMERS FOR THE PURCHASE OF THIS PRODUCT.

## **Import and Export Regulations**

Customers shall comply with all applicable export or import laws and regulations and be responsible to obtain all necessary governmental permits and licenses in order to export, re-export or import the product mentioned in this manual including the software and technical data therein.

## **Privacy Policy**

To better understand how we protect your personal information, please see the privacy policy at <http://consumer.huawei.com/privacy-policy>.



## About This Document

---

### Revision History

Document Version	Date	Chapter	Descriptions
01	2014-10-10		Creation



---

# Contents

---

<b>1 FTP Application Scenarios .....</b>	<b>6</b>
1.1 Creating an FTP Control Link.....	6
1.1.1 Reference Process .....	6
1.1.2 Troubleshooting .....	6
1.2 Configuring Data Transmission Mode .....	7
1.2.1 Reference Process .....	8
1.3 Configuring FTP Data Channel Mode .....	8
1.3.1 Reference Process .....	8
1.4 Getting FTP File Size .....	9
1.4.1 Reference Process .....	9
1.4.2 Troubleshooting .....	9
1.5 Downloading File Using "GET" Command in Transparent Mode .....	9
1.5.1 Reference Process .....	9
1.5.2 Troubleshooting .....	10
1.6 Downloading File Using "GET" Command in Command Mode .....	10
1.6.1 Reference Process .....	10
1.7 Downloading File Using "GET" Command in Buffer Mode .....	11
1.7.1 Reference Process .....	11
1.8 Uploading File Using "PUT" Command in Transparent Mode .....	12
1.8.1 Reference Process .....	12
1.9 Uploading File Using "PUT" Command in Command Mode and Buffer Mode .....	13
1.9.1 Reference Process .....	13
1.10 Error Codes .....	15
<b>2 HTTP Application Scenarios .....</b>	<b>16</b>
2.1 Creating an HTTP Server Link .....	16
2.1.1 Reference Process .....	16
2.1.2 Troubleshooting .....	16
2.2 Configuring Data Transmission Mode .....	17
2.2.1 Reference Process .....	17
2.3 Downloading File Using "GET" Command in Transparent Mode.....	17
2.3.1 Reference Process .....	17
2.3.2 Troubleshooting .....	18



2.4 Downloading File Using "GET" Command in Command Mode .....	18
2.4.1 Reference Process .....	18
2.5 Downloading File Using "GET" Command in Buffer Mode .....	19
2.5.1 Reference Process .....	19
2.6 Uploading File Using "POST" Command in Transparent Mode .....	19
2.6.1 Reference Process .....	19
2.7 Uploading File "POST" Command in Command Mode and Buffer Mode .....	20
2.7.1 Reference Process .....	20
2.7.2 Troubleshooting .....	22
2.8 Error Codes .....	22
<b>3 SMTP Application Scenarios .....</b>	<b>24</b>
3.1 Creating an SMTP Server Link .....	24
3.1.1 Reference Process .....	24
3.1.2 Troubleshooting .....	24
3.2 Sending Mail Through "emsend" Without Attachment .....	25
3.2.1 Reference Process .....	25
3.3 Sending Mail Through "emsend" with Attachment Using 7 bit .....	25
3.3.1 Reference Process .....	25
3.4 Sending Mail Through "emsend" with Attachment Using base 64 .....	26
3.4.1 Reference Process .....	26
3.4.2 Troubleshooting .....	27
3.5 Error Codes .....	28
<b>4 FTPS, HTTPS and SMTPS in Secure Mode .....</b>	<b>30</b>
4.1 Create a Secure Control Link .....	30
4.1.1 Preliminary Operations .....	30
4.1.2 IP Configuration .....	30
4.1.3 SSL And TLS .....	31
4.1.4 Certificates .....	31
4.2 Configure SSL .....	31
4.2.1 Initialize SSL Library .....	31
4.2.2 Enable CyaSSL .....	31
4.2.3 Configure CyaSSL Socket .....	32
4.2.4 Manage SSL Certificates .....	33
4.3 Examples .....	39
4.3.1 FTPS .....	40
4.3.2 HTTPS .....	40
4.3.3 SMTPS .....	41
<b>5 Abbreviations .....</b>	<b>42</b>

# 1 FTP Application Scenarios

## 1.1 Creating an FTP Control Link

### 1.1.1 Reference Process

Command	Description
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2 1,,"username", "password"</b>	Create a normal FTP control link; an FTP user is successfully logged in to FTP server.
<b>OK</b>	
<b>^IPSRVST:1,10,230</b>	



#### NOTE

- Only one FTP service can be enabled at a time.
- Before an FTP service is enabled, Internet configuration and FTP configuration must be completed.
- PDP must be activated.

### 1.1.2 Troubleshooting

Scenario	Possible Error Information	Solution
Create the link. <b>AT^IPOPEN=1,"FTP", "192.166.63.41", 21,,"username", "password"</b>	<b>+CME ERROR: The network has not been established yet</b>	Initialize the internal protocol stack before sending the command to create the link.
	<b>+CME ERROR: The link has been established already</b>	Try to open an already established link.



## 1.2 Configuring Data Transmission Mode

In FTP, data can be transferred (PUT or GET) in three different modes.

- **Transparent transmission mode:**

For GET operation, files will be downloaded from the server and the content will be displayed to the user.

For PUT operation, users shall enter the data to be transferred to the server followed by "+++" to indicate the end of file.

During the data transfer process, we cannot execute other AT commands.

- **Command transmission mode:**

For GET operation, contents of downloaded file from server will be displayed to users through **^IPDATA** report.

For PUT operation, users shall enter the data to be transferred using **AT^IPSENDEX** command

During the data transfer process, we can execute any other AT commands than GET and PUT.

- **Buffer mode:**

For GET operation, contents of downloaded file from server will be stored in a buffer.

And a **^IPSRV** report will be displayed which indicates whether there is data to be read. After that, users need to issue

**"AT^IPRCV=<link\_id>,<reqReceiveLength>"** to read the data from buffer. For more information on **AT^IPRCV**, please refer AT command document.

The size of the buffer is 65536 bytes.

PUT operation is similar as in command transmission mode.

During the data transfer process, we can execute any other AT commands than GET and PUT.

## 1.2.1 Reference Process

Command	Description
<b>AT^IPCFL=14,0</b>	Set data transmission mode to transparent transmission mode.
<b>OK</b>	
<b>AT^IPCFL=14,1</b>	Set data transmission mode to command transmission mode.
<b>OK</b>	
<b>AT^IPCFL=14,2</b>	Set data transmission mode to buffer transmission mode.
<b>OK</b>	

The **AT^IPCFL** command is used to set the processing mode for FTP file data. By default, transparent transmission mode is set. Users can change the data transmission mode as per the need specified in section 1.2 .

## 1.3 Configuring FTP Data Channel Mode

### 1.3.1 Reference Process

Command	Description
<b>AT^FTPCMD=1,PORT</b>	Configure the connection mode in PORT mode for downloading and uploading data.
<b>OK</b>	
<b>AT^FTPCMD=1,PASV</b>	Configure the connection mode in PASV mode for downloading and uploading data. The default mode is PASV mode.
<b>OK</b>	

- In PORT mode, the client creates the control channel and provides the data port number which it will be listening on. The server then creates the data channel with the client provided port.
- In PASV mode, the client creates both control channel and data channel.

PASV mode is generally used in scenarios where the server will not be able to setup the data channel; one of the major reasons for this would be the network firewall limitation.



## 1.4 Getting FTP File Size

### 1.4.1 Reference Process

Command	Description
<b>AT^FTPCMD=1,FILESIZE,"ftp.txt"</b>	Get the size of the file.
<b>^FTPCMD: "FILESIZE",25490</b>	
<b>OK</b>	

### 1.4.2 Troubleshooting

Scenario	Possible Error Information	Solution
File Size Command <b>AT^FTPCMD=1,FILESIZE,"ftp.txt"</b>	<b>+CME ERROR: The link has not been established yet</b>	Make sure that the file size operation link ID is established.
Get File Size for a big file (> 4GB) <b>AT^FTPCMD=1,FILESIZE,"ftp.rar"</b>	<b>ERROR</b>	The file size command will return ERROR if the file size is greater than 4 GB.

## 1.5 Downloading File Using "GET" Command in Transparent Mode

### 1.5.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^IPCFL=14,0</b>	Set data transmission mode to transparent mode. By default it will be in transparent mode only.
<b>OK</b>	
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2,1,"username","password"</b>	Create the link.

OK

**^IPSRVST:1,10,230**

**AT^FTPCMD=1,PORT**

Set the FTP data channel mode to PORT mode for downloading and uploading the data. By default it will be PASV mode. For more information on when to use PORT or PASV mode refer section 1.3.1 .

OK

**AT^FTPCMD=1,GET,"ftp.txt"**

Give the FTP Get command for downloading data.

**CONNECT**

Hello

OK

**^IPSRVST: 1,11,1**

## 1.5.2 Troubleshooting

Scenario	Possible Error Information	Solution
<b>AT^FTPCMD=1,GET,"ftp.txt"</b>	<b>+CME ERROR: The link has not been established yet</b>	Make sure that the get operation link ID is established.

## 1.6 Downloading File Using "GET" Command in Command Mode

### 1.6.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
OK	
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2 1,"username","password"</b>	Create the link.

---

OK

**^IPSRVST:1,10,230**

**AT^IPCFL=14,1**

Set data transmission mode to command mode.

OK

**AT^FTPCMD=1,PORT**

Set the FTP data channel mode to PORT mode for downloading and uploading the data. By default it will be PASV mode. For more information on when to use PORT or PASV mode refer section 1.3.1 .

OK

**AT^FTPCMD=1,GET,"ftp.txt"**

Give the FTP Get command for downloading data.

OK

**^IPDATA: 1, 5, Hello**

**^IPSRVST: 1,11,1**

---

## 1.7 Downloading File Using "GET" Command in Buffer Mode

### 1.7.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
OK	
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2 1,,"username","password"</b>	Create the link.
OK	
<b>^IPSRVST:1,10,230</b>	
<b>AT^IPCFL=14,2</b>	Set data transmission mode to buffer mode.
OK	

---

**AT^FTPCMD=1,PORT**

Set the FTP data channel mode to PORT mode for downloading and uploading the data. By default it will be PASV mode. For more information on when to use PORT or PASV mode refer section 1.3.1 .

OK

**AT^FTPCMD=1,GET,"ftp.txt"**

Give the FTP GET command for downloading data.

OK

**^IPRCV: 1, 1****^IPSRVST: 1,11,1****AT^IPRCV=1,5**

This command is used to receive the data stored in the buffer.

**^IPRCV: 1,5**

Hello

OK

## 1.8 Uploading File Using "PUT" Command in Transparent Mode

### 1.8.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
OK	
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2 1,,"username","password"</b>	Create the link.
OK	
<b>^IPSRVST:1,10,230</b>	
<b>AT^IPCFL=14,0</b>	Set data transmission mode to transparent mode.
OK	

**AT^FTPCMD=1,PORT**

Set the FTP data channel mode to PORT mode for downloading and uploading the data. By default it will be PASV mode. For more information on when to use PORT or PASV mode refer section 1.3.1 .

OK

**AT^FTPCMD=1,PUT,"ftp.txt"**

Upload the data using this command. After completion of uploading, send +++ to terminate from the server.

Any character is forbidden in 900 ms before and after inputting "+++", and it must be less than 900 ms between two '+' input.

CONNECT

&lt;Enter the data&gt;

&lt;Type "+++" to terminate from the server&gt;

OK

**^IPSRVST: 1,11,1**

## 1.9 Uploading File Using "PUT" Command in Command Mode and Buffer Mode

There is no difference in PUT operation of "Command mode and Buffer mode". In both modes, **AT^IPSENDEX** is used to enter the data.

### 1.9.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
OK	
<b>AT^IPOPEN=1,"FTP","192.166.63.41",2 1,,"username","password"</b>	Create the link.
OK	
<b>^IPSRVST:1,10,230</b>	



<b>AT^IPCFL=14,2</b>	Set data transmission mode to buffer mode.
<b>OK</b>	
<b>AT^FTPCMD=1,PORT</b>	Set the FTP data channel mode to PORT mode for downloading and uploading the data. By default it will be PASV mode. For more information on when to use PORT or PASV mode refer section 1.3.1 .
<b>OK</b>	
<b>AT^FTPCMD=1,PUT,"ftp.txt"</b>	Upload the data using this command.
<b>OK</b>	
<b>AT^IPSENDEX=1,2,1500,0</b>	It can send maximum 1500 data at a time. The last parameter <eof> is 0 where 0 means can send more data.
<b>OK</b>	
<b>&lt;Enter the data&gt;</b>	
<b>^IPSENDEX:1</b>	
<b>OK</b>	
<b>AT^IPSENDEX=1,2,1500,1</b>	It can send maximum 1500 data at a time. The last parameter <eof> is 1, where 1 means end of packet and the file upload will be completed.
<b>OK</b>	
<b>&lt;Enter the data&gt;</b>	
<b>^IPSENDEX: 1</b>	
<b>OK</b>	
<b>^IPSRVST: 1,11,1</b>	
<b>AT^IPCLOSE=1</b>	Close the link.
<b>OK</b>	

## 1.10 Error Codes

<state code>	Meaning
100	The server has not responded
110	Restarts the mark reply
120	Prepares in n minutes
125	The connection opens the preparation to transmit
150	Opens the data connection
200	Command Execution Success
202	Command Execution Failure
211	System Status
212	List Status
213	FILE SIZE
214	Help information
215	Name system type
220	The new client prepared
221	Service closure pilot connection, may withdraw registers
225	The data connection opens, does not have the transmission to be in progress
226	That the closure data connection, requested file operation successfully
227	Enters the passive pattern
230	Successful Login
250	File operation of request completes
257	Setup PATH NAME
331	A user correctness, needs the password
332	When registers needs the account information
350	Next order
421	Cannot provide the service, closes the pilot connection
425	Cannot open the data connection
426	The closure connection, stops transmitting

# 2 HTTP Application Scenarios

## 2.1 Creating an HTTP Server Link

### 2.1.1 Reference Process

Command	Description
<code>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</code>	Open a normal HTTP server link, an HTTP user is successfully logged in to HTTP.
OK	



**NOTE**

- Only one HTTP service can be enabled at a time.
- Before an HTTP service is enabled, Internet configuration and HTTP configuration must be completed.

### 2.1.2 Troubleshooting

Scenario	Possible Error Information	Solution
Create the link. <code>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</code>	<b>+CME ERROR: The network has not been established yet</b>	Initialize the internal protocol stack before sending the command to create the link.
	<b>+CME ERROR: The link has been established already</b>	Try to open an already established link.



## 2.2 Configuring Data Transmission Mode

### 2.2.1 Reference Process

Command	Description
<b>AT^IPCFL=14,0</b>	Set data transmission mode to transparent transmission mode.
<b>OK</b>	
<b>AT^IPCFL=14,1</b>	Set data transmission mode to command transmission mode.
<b>OK</b>	
<b>AT^IPCFL=14,2</b>	Set data transmission mode to buffer transmission mode.
<b>OK</b>	

The **AT^IPCFL** command is used to set the data processing mode for HTTP, which is same as FTP.

By default, the transparent transmission mode is set. Users can change the data transmission mode as per the need specified in section 1.2 .

## 2.3 Downloading File Using "GET" Command in Transparent Mode

### 2.3.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawe1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^IPOPEN=1,"HTTP","m2m.huawei.com192.166.63.41",9001</b>	Create the link.
<b>OK</b>	
<b>AT^IPCFL=14,0</b>	Set data transmission mode to transparent mode. By default it will be in transparent mode only.
<b>OK</b>	
<b>AT^HTTPCMD=1,GET,http://m2m.huawei.com:9001/n_index.txt</b>	Download the file from the HTTP server n_index.txt (In the following example, <link_id> is 1).

**CONNECT**

hello123

OK

^IPSRVST: 1,12,200

## 2.3.2 Troubleshooting

Scenario	Possible Error Information	Solution
AT^HTTPCMD=1,GET,http://m2m.huawei.com:9001/n_index.html	+CME ERROR: The link has not been established yet	Make sure that the get operation link ID is established.

## 2.4 Downloading File Using "GET" Command in Command Mode

### 2.4.1 Reference Process

Command	Description
AT^IPINIT="mhahuawe1.com"	Initialize the internal protocol stack.
OK	
AT^IPCFL=14,1	Set data transmission mode to command mode
OK	
AT^IPOPEN=1,"HTTP","www.m2m.huawei.com",9001	Create the link.
OK	
AT^HTTPCMD=1,GET,http://m2m.huawei.com:9001/n_index.txt	Download the file from the HTTP server n_index.txt (In the following example, <link_id> is 1).
OK	
^IPDATA: 1,5,hello123	
^IPSRVST: 1,12,200	

## 2.5 Downloading File Using "GET" Command in Buffer Mode

### 2.5.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawe1.com"</b> OK	Initialize the internal protocol stack.
<b>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</b> OK	Create the link.
<b>AT^IPCFL=14,2</b> OK	Set data transmission mode to buffer transmission mode.
<b>AT^HTTPCMD=1,GET,http://m2m.huawei.com:9001/n_index.txt</b> OK	Download the file from the HTTP server n_index.txt (In the following example, <link_id> is 1)
<b>^IPRCV: 1,1</b> <b>AT^IPRCV=1,5</b> <b>^IPRCV: 1, 5</b> Hello	Receive the data stored in the buffer.
OK	

## 2.6 Uploading File Using "POST" Command in Transparent Mode

### 2.6.1 Reference Process

Command	Description
<b>AT^IPINIT="mhahuawe1.com"</b> OK	Initialize the internal protocol stack.
<b>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</b>	Create the link.

---

<b>OK</b>	
<b>AT^IPCFL=14,0</b>	Set data transmission mode to online mode.
<b>OK</b>	
<b>AT^HTTPCMD=1,POST,HTTP://m2m.huawei.com:448/cgi-bin/textarea.cgi,20,"text/plain"</b>	Upload the data using this command .If the upload has to be cancelled, then give +++ to terminate.
<b>CONNECT</b>	
<b>textcontext=hello123</b>	
<b>Enter 20 bytes of data</b>	
<b>&lt;phtml&gt;&lt;head&gt;&lt;title&gt;Text Area - Fifth CGI Program&lt;/title&gt;&lt;/phead&gt;&lt;body&gt;&lt;h2&gt;EnteredText Content is hello123&lt;/h2&gt;&lt;/body&gt;&lt;/html&gt;</b>	
<b>OK</b>	
<b>^IPSRVST: 1, 12,200</b>	

---

## 2.7 Uploading File "POST" Command in Command Mode and Buffer Mode

There is no difference in HTTP POST operation of "Command mode and Buffer mode". In both modes, **AT^IPSENDEX** is used to enter the data.

### 2.7.1 Reference Process

---

Command	Description
<b>AT^IPINIT="mhahuawe1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</b>	Create the link.
<b>OK</b>	
<b>AT^IPCFL=14,1</b>	Set data transmission mode to command mode.
<b>OK</b>	
<b>AT^HTTPCMD=1,POST,HTTP://m2m.huawei.com:448/cgi-bin/textarea.cgi,20,"text/plain"</b>	Upload the data content to the post script <b>textarea.cgi</b> .
<b>OK</b>	

---

**AT^IPSEND=1,"textcontext=hello123"** Transmit the data through the link established (in this case, <link\_id> is 1).

**^IPSEND: 1**

**OK**

**^IPSRVST: 1,12,200**

**AT^IPSENDEX=1,0,"textcontent=hello123"** Transmit the data through the link established in IPSENDEX Mode 0 (in this case, <link\_id> is 1).

**^IPSEND: 1**

**OK**

**^IPSRVST: 1,12,200**

**AT^IPSENDEX=1,2,20,1,textcontext=hello123** Transmit the data through the link established in IPSENDEX Mode 2 (in this case, <link\_id> is 1).

**^IPSEND: 1**

**OK**

**^IPSRVST: 1,12,200**

**AT^IPSENDEX=1,1,"74657874636F6E74656E743D68"** Transmit the data through the link established in IPSENDEX Mode 1 (in this case, <link\_id> is 1)

**^IPSEND: 1**

**OK**

**^IPSRVST: 1,12,200**

**AT^IPCLOSE=1** Close the link.

**OK**

**NOTE**

The <textcontent> specifies the corresponding field in the POST Script.

## 2.7.2 Troubleshooting

Scenario	Possible Error Information	Solution
Close the specified link. <b>AT^IPCLOSE=&lt;link_id&gt;</b>	<b>+CME ERROR: Normal error</b>	The command is terminated. Run the <b>AT^IPCLOSE</b> command again.
Create the link. <b>AT^IPOPEN=1,"HTTP","m2m.huawei.com",9001</b>	<b>+CME ERROR: The network has not been opened yet</b>	Initialize the internal protocol stack before sending the command to create the link.
	<b>+CME ERROR: The link has been established already</b>	Run <b>AT^IPCLOSE</b> to close the corresponding link. Alternatively, change the link ID and send the command to create the link.
	<b>+CME ERROR: Fail to bind the specified port</b>	Change the local port number, or leave the local port number blank.
Query link information. <b>AT^IPOPEN?</b>	<b>OK</b>	No link information is available. Create a link, or accept the link as a server, and then query the link information again.
<b>AT^HTTPCMD=?</b>	<b>^HTTPCMD: (1-5),("GET","POST")</b>	Get the current HTTP command
<b>AT^HTTPCMD=1,GET,http://m2m.huawei.com:9001/n_index.html</b>	<b>+CME ERROR: The link has not been established yet</b>	Run <b>AT^IPOPEN</b> to open the link and then perform the download operation.
<b>AT^HTTPCMD=1,POST,"http://m2m.huawei.com:9001/cgi-bin/textarea.cgi",20,"text/index.html"</b>	<b>+CME ERROR: The link has not been established yet</b>	Run <b>AT^IPOPEN</b> to open the link and then perform the upload operation.

## 2.8 Error Codes

<state code>	Meaning
200	Operation successful
301	Moved permanently
302	Moved temporarily



<state code>	Meaning
401	Requested action requires authorization
403	Forbidden
404	Resource not found
405	Method not allowed on resource
406	Requested representation not accepted
408	Request timed out
410	Requested source is no longer available server
500	Internal server error
501	Requested HTTP operation not supported
505	HTTP version not supported

# 3 SMTP Application Scenarios

## 3.1 Creating an SMTP Server Link

### 3.1.1 Reference Process

Command	Description
<code>AT^IPOPEN=1,"smtp","192.166.63.41", 25,, "m2mtest@m2m.huawei.com", "M2 mhuawei"</code>	An SMTP user is successfully logged in to SMTP.
<code>OK</code>	
<code>^IPSRVST: 1,13,235</code>	



#### NOTE

- Only one SMTP service can be enabled at a time.
- Before an SMTP service is enabled, Internet configuration and SMTP configuration must be completed.

### 3.1.2 Troubleshooting

Scenario	Possible Error Information	Solution
Create the link. <code>AT^IPOPEN=1,"smtp","192.166.63.41", 25,, "m2mtest@m2m.huawei.com", "M2 mhuawei"</code>	<b>+CME ERROR: The network has not been established yet</b>	Initialize the internal protocol stack before sending the command to create the link.
	<b>+CME ERROR: The link has been established already</b>	Try to open an already established link.





## 3.2 Sending Mail Through "emsend" Without Attachment

### 3.2.1 Reference Process

Command	Description
<code>AT^IPOPEN=1,"smtp","192.166.63.41",25,,,"m2mtest@m2m.huawei.com","M2mhuawei"</code>	Create the link.
OK	
<code>^IPSRVST: 1,13,235</code>	
<code>AT^EMSEND=1,"m2mtest@m2m.huawei.com", "test with attachment", "utf-8",0</code>	Send mail without attachment.
>	
<ENTER THE BODY OF THE MAIL>	
<Press Ctrl+Z to end input>	
OK	
<code>^IPSRVST: 1,14,250</code>	

## 3.3 Sending Mail Through "emsend" with Attachment Using 7 bit

### 3.3.1 Reference Process

Command	Description
<code>AT^IPOPEN=1,"smtp","192.166.63.41",25,,,"m2mtest@m2m.huawei.com","M2mhuawei"</code>	Create the link.
OK	
<code>^IPSRVST: 1,13,235</code>	
<code>AT^EMSEND=1,"m2mtest@m2m.huawei.com", "test with attachment", "utf-8",1,"test.txt"</code>	Send mail with attachment using 7 bit algorithm.

---

>  
<ENTER THE BODY OF THE MAIL>  
<Press Ctrl+Z to end input>

OK

^IPSRVST: 1,14,250

AT^IPSENDEX=1,2,1500,0

It can send maximum 1500 data at a time. The last parameter i.e. <eof> can be 0 and 1, where 0 means can send more data and 1 means the last data to be send. This is an example on how to send 3000 bytes of attachment.

^IPSENDEX: 1

OK

AT^IPSENDEX=1,2,1000,0

Send 1000 bytes of data. The last parameter is 0, which means not end of file.

^IPSENDEX: 1

OK

AT^IPSENDEX=1,2,500,1

Send 500 bytes of data. The last parameter is 1, which means end of file.

^IPSENDEX: 1

OK

^IPSRVST: 1,14,250

---

## 3.4 Sending Mail Through "emsend" with Attachment Using base 64

### 3.4.1 Reference Process

Command	Description
AT^IPOPEN=1,"smtp","192.166.63.41",25,,"m2m	Create the link.

```

test@m2m.huawei.com","M2mhuawei"

OK

^IPSRVST: 1,13,235
AT^EMSEND=1,"m2mtest@m2m.huawei.
com","test with attachment", "utf-8",2,"test.txt"
Send mail with attachment
using base 64 algorithm.

>
<ENTER THE BODY OF THE MAIL>
<Press Ctrl+Z to send>

OK

^IPSRVST: 1,14,250
AT^IPSENDEX=1,2, 4,1
It can send maximum 1500
data at a time. The last
parameter i.e. <eof> can be
0 and 1, where 0 means
more data can be sent and 1
means the last data to be
send.

^IPSENDEX: 1

OK

^IPSRVST: 1,14,250
AT^IPCLOSE=1
Close the link.

OK

```

### 3.4.2 Troubleshooting

Scenario	Possible Error Information	Solution
Close the specified link. <b>AT^IPCLOSE=&lt;link_id&gt;</b>	<b>+CME ERROR: Normal error</b>	The command is terminated. Run the <b>AT^IPCLOSE</b> command again.
Create the link. <b>AT^IPOPEN=1,"smtp","192.166.63.41"</b>	<b>+CME ERROR: The network has not been opened yet</b>	Initialize the internal protocol stack before sending the command to create the link.



Scenario	Possible Error Information	Solution
,25,, "m2mtest@m2m.huawei.com", "M2mhuawei"	<b>+CME ERROR: The link has been established already</b>	Run <b>AT^IPCLOSE</b> to close the corresponding link. Alternatively, change the link ID and send the command to create the link.
	<b>+CME ERROR: Fail to bind the specified port</b>	Change the local port number, or leave the local port number blank.
Query link information. <b>AT^IPOPEN?</b>	<b>OK</b>	No link information is available. Create a link, or accept the link as a server, and then query the link information again.
<b>AT^SMTPCMD=?</b>	<b>^HTTPCMD: (1-5),("GET", "POS")</b>	Get the current HTTP command.
<b>AT^EMSEND=1, "m2mtest@m2m.huawei.com", "test with attachment", "ut f-8", 2, "test.txt"</b>	<b>+CME ERROR: The link has not been established yet</b>	Run <b>AT^IPOPEN</b> to open the link and then perform the download operation.

### 3.5 Error Codes

<state code>	Meaning
235	Authentication successful
250	Its typical side message is "Requested mail action okay completed": meaning that the server has transmitted a message.
354	The side message can be very cryptic ("Start mail input end <CRLF>.<CRLF>"). It's the typical response to the DATA command.
421	The service is unavailable due to a connection problem: it may refer to an exceeded limit of simultaneous connections, or a more general temporary problem.
450	"Requested action not taken – The user's mailbox is unavailable". The mailbox has been corrupted or placed on an offline server, or your email hasn't been accepted for IP problems or blacklisting.
451	"Requested action aborted – Local error in processing". Your ISP's server or the server that got a first relay from yours has encountered a connection problem.



<state code>	Meaning
452	Too many emails sent or too many recipients: more in general, a server storage limit exceeded.
500	A syntax error: the server couldn't recognize the command.
501	Another syntax error, not in the command but in its parameters or arguments.
502	The command is not implemented.
503	The server has encountered a bad sequence of commands, or it requires an authentication.
504	A command parameter is not implemented.
535	Authentication failure
550	It usually defines a non-existent email address on the remote side.
551	"User not local or invalid address – Relay denied". Meaning, if both your address and the recipient's are not locally hosted by the server, a relay can be interrupted.
552	"Requested mail actions aborted – Exceeded storage allocation": simply put, the recipient's mailbox has exceeded its limits.
553	"Requested action not taken – Mailbox name invalid". That is, there's an incorrect email address into the recipients line.
554	This means that the transaction has failed. It is a permanent error and the server will not try to send the message again.
555	Syntax error



# 4 FTPS, HTTPS and SMTPS in Secure Mode

---

## 4.1 Create a Secure Control Link

### 4.1.1 Preliminary Operations

Before initializing a secure socket and transmitting data over the secure channel, certain preliminary operations need to be performed which are mentioned below.

### 4.1.2 IP Configuration

CyaSSL requires IP configurations to be done to access the secure server over which data can be transmitted

#### To Configure APN

```
AT+CGDCONT=1,"IP","mhahuawei1.com"
```

```
OK
```

#### To check the APN settings

```
AT+CGDCONT?
```

```
+CGDCONT: 1,"IP","mhahuawei1.com","",0,0
```

```
OK
```

#### To get the Signal Strength

```
AT+CSQ
```

```
+CSQ: 28,99
```

```
OK
```

31 is the strongest, 0 is the weakest, and 99 for none.



## To get the registered network

AT+ COPS?

+COPS: 0,0,"Terminal MHA Net",2

OK

### 4.1.3 SSL And TLS

SSL and TLS are cryptographic protocols used over the Internet to provide secure data communication in client server architecture.

### 4.1.4 Certificates

The SSL module allows the storage of a server certificate. It is assumed that licensed version of CyaSSL contains certificates that will be unique for each device.

## 4.2 Configure SSL

Before opening an SSL socket and exchanging data through secure/normal socket, following steps need to be performed:

- Initialize SSL Library
- Enable the secure CyaSSL channel
- Configure the secure socket
- Certificate Management

### 4.2.1 Initialize SSL Library

Before opening a secure socket and exchanging data through it, the CyaSSL Library needs to be initialized. Once SSL service task is created, CyaSSL library is initialized internally and a CyaSSL context is created.

### 4.2.2 Enable CyaSSL

The first step to be done in order to exchange data through an SSL socket is enable the secure socket.

This can be done using the AT command AT^SSLEN:

**AT^SSLEN=<SSId>,<Enable>[,<Encode\_ok>]**

Where:

- <SSL\_id>: must be set to 1, for Security Socket ID available.
- <Enable>: indicates the desired status. 0 indicates to disable socket; 1 indicates to enable socket.
- <Encode\_ok>: This parameter is not useful in case of HTTPS, FTPS and SMTPS (optional, it will take the value as 1 by default).

Without entering this command, any attempt to set SSL parameters by means of an SSL command fails.

**Example**

Enable SSL socket 1:

AT^SSLEN=1,1

OK

### 4.2.3 Configure CyaSSL Socket

CyaSSL socket parameters can be configured using the AT command AT^SSLCFG.

**AT^SSLCFG=<SSL\_id>,<TimeOut>[,<cipher\_suit>,<security\_level>]**

Where:

- <SSL\_id>: must be set to 1, for Security Socket ID available.
- <TimeOut>: indicates default maximum blocking timeout. This is applicable only in case of non-blocking sockets. Time out may range from 1 to 60 seconds .
- <cipher\_suit>: set the value to 0, all the available cipher suites supported by CyaSSL are proposed to the server. It is responsibility of the remote server to select one of them.
- <security\_level>: the authentication mode
  - 0: SSL verify none: no authentication, no security data is needed at all.
  - 1: Server authentication mode: CA Certificate storage is needed (the most common case).
  - 2: Server or Client authentication mode: CA Certificate (server), Certificate (client) and Private Key (client) are needed.

The table below is the supported Cipher Suite List (currently Supported 15 Cipher Suites):

Value	Cipher_suites
0	All supported Ciphers
1	TLS_RSA_WITH_RC4_128_SHA
2	TLS_RSA_WITH_RC4_128_MD5
3	TLS_RSA_WITH_NULL_SHA
4	TLS_RSA_WITH_NULL_SHA256
5	TLS_RSA_WITH_AES_256_CBC_SHA
6	TLS_RSA_WITH_AES_128_CBC_SHA
7	TLS_RSA_WITH_AES_128_CBC_SHA256
8	TLS_RSA_WITH_AES_256_CBC_SHA256
9	TLS_RSA_WITH_3DES_EDE_CBC_SHA
10	TLS_DHE_RSA_WITH_AES_256_CBC_SHA



Value	Cipher_suites
11	TLS_DHE_RSA_WITH_AES_128_CBC_SHA
12	TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
13	TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
14	SSL_RSA_WITH_RC4_128_SHA
15	SSL_RSA_WITH_RC4_128_MD5

### Example

CyaSSL socket configuration:

```
AT^SSLCFG=1,60,0,1
```

OK

## 4.2.4 Manage SSL Certificates

If the server or peer authentication needs to be done, all root CA certificates of server, client certificate and private key are required (Refer <security\_level> in section 4.2.3 )

Certificates can be loaded using AT^SSLMNG AT command.

**AT^SSLMNG=<SSL\_id>,<data\_type>,<action>,<file\_name>,[<package\_id>,<total\_no\_of\_packages>,<cert\_info>],[<password>]**

- <SSL\_id>: SSL socket ID.  
1: Secure socket connection
- <data\_type>: identifies the certificate or key to be stored.  
0: Certificate of the client (module). It is needed when the Server or Client authentication mode has been configured.  
1: CA certificate of the remote server, it is used to authenticate the remote server. It is needed when <scur\_level> parameter of AT^SSLCFG command is set to 1 or 2.  
2: RSA private key of the client (module). It is needed if the Server or Client authentication mode has been configured.
- <action>:  
0: Store certificate  
1: Delete certificate  
2: Load certificate
- <file\_name>: the file name for "". The maximum length of the file name is 255. And we are supporting only \*.pem type files only.
- <package\_id>: package identification number (1–10).
- <total\_no\_of\_packages>: total number of packages after splitting the Base 64 encoded format certificate data of each package of size maximum of 1024 bytes (1–10).
- <cert\_info>: string type, broken certificate package (converted into Base 64 encoded format before splitting the package) data (1–1024 bytes).



- <password>: string type, password for Private Key (1-80 bytes) -plain text.

**Example**

- Store CA certificate:

```
AT^SSLMNG=1,1,0,"ca-
cert2.pem",1,7,"LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUVuakNDQT
RhZ0F3SUJBZ0lKQU9uUXAxOTVKZIE4TUEwR0NTcUdTSWlZRFFFQkRlRVFNSU
dRlTVFzd0NRWUQKVIFRR0V3SIZVekVRTUE0R0ExVUVDQk1IVFc5dWRHRnVZVE
VRTUE0R0ExVUVCeE1IUW05NlpXMWhiakVSTUE4RwpBMVVFQ2hNSVUyRjNkRz
l2ZEdneEV6QVJCZ05WQkFzVENrTnZibk4xYkhScGJtY3hGakFVQmdOVkBTBTRVRE
WGQzCmR5NTVZWE56YkM1amlyMHhIVEFiQmdrcWhraUc5dzBCQ1FFV0RtbHVhVa
bTIBZVdGemMyd3VZMj0TUlU0WERURXgkTVRBeU5ERTRNVGd4TIZvWERURTBN
RGN5TURFNE1UZ3hOVm93Z1pBeEN6QUpCZ05WQkFzVEFsVIRNUkF3RGdZRA
pWUUVFJRXdktmlyNTBZVzVoTVJBd0RnWURWUUVFIRXdkQ2lzcGxiV0Z1TVJFd0R3
WURWUUVFLRXdoVFIYZDBiMjkwcmFERVRNkVHQTFRUN4TUURMj1YzNWc2R
HbHVaeKvXTUJRR0ExVUVCeE1OZDNkM0xubGhM05zTG1OdmJURWQKTUJzR0
NTcUdTSWlZRFFFQkFzVU9hVzVtYjBCNVlYTnpiQzVqYjIwd2dnRWlNQTBlHQ1Nxr
1NjYjNEUUVVCQVVFVQkqBNEICRHdBd2dnRUtBb0lCQVFDL0RNB3RGTEllaEVKYn
pUZ2ZTdkpOZFJEeHRqV2YzOHA5QTVqVHJONERadTRxChkaXdmVzRlVkfzUW1
DRk5nTXNTSU9mTVQ5NUZmY2x5ZHpMcXlwQzdHvklRQXkrbzg1WEY4WXRpVmh
2dloyK2sKRUVHVnJRcWl0NlhBc05Kd2RsQXdxNmpvQ0N4ODdhZWllbzA0S1J5c3g
rM3lmSlD3bFIKOVNWdzR6WGNsNzcyQQpkVv9VUEQzS1kxdWZGYlhUSFJNdkdKR
"
```

OK

```
AT^SSLMNG=1,1,0,"ca-
cert2.pem",2,7,"TgyM1k2ekxoOXIIWEMxOXBByJlnaDNITWJRaTFUblA0YS9IMnJlalk
vCm1ONkVmQVZuem1vVU9JZXA4WXkxYU10b2YzRWdLL1dnWS9WV0w2TW0wc
mR2c1ZvWDF6aVpDUDZUV0cvK3d4TkoKQ0JZTHAwMW5BRkl4WnlOT21PMVJSU
jl1Qk5rTDDoZ29zMHU5N1RaNUFnTUJBQUdqZ2Znd2dmVXdlUUVIEVllwTwpCQIIFR
kNIT1p4RjB3eVlkUCswelk3T2syQjB3NwVqVkl1JSEZCZ05WsfNnrWdiMHdnYnFB
RkNIT1p4RjB3eVlkCIARMHpZN09rMklwdzVlZlZvWUdXcEIHVE1JR1FNuXN3Q1FZR
FZRuUdFd0pVvXpFUU1BNEdBmVVFQ0JNSFRXOXUKZEdGdVIURVFNQTRHQT
FVRUJ4TUhRbTk2WlCxaGjQrVJNQTThHQTFRUNoTUIVMkYzZEc5dmRHZ3hFekF
SQmdOVgpCQXNUQ2tOdmJuTjFiSFJwYm1jeEZqQVVCZ05WQkFNVERYZDNkeT
U1WVhOemJDNWpiMjB4SFRBYkNa3Foa2IHcj13MEJDUUUVXRG1sdVptOUFIV0Z6
YzJ3dVkyOXRNz2tBNmRDblgza2w5RHd3REFZRFZSMFRcQVv3QXdfQI96QU4K
QmdrcWhraUc5dzBCQVFRkFBT0NBuUUVBWDRZVTIGR0x2S1ZPTU5wZXJKcjRiT
mttUzVQNTR4eUpiNTd1czUxMwpQb2tnZHFQbTZJWVZJZHZpTTdJMDfKQ2Y4OE
draDVKYytkSC9NQytPQTd5elBBd3lvNUJmR3BBZXI1M3pudGNiCkFxbDIKmlpqTDY
4WTE2d1ltSXIEanpqekM2dzJFSFg3eW5ZVFVGC0NqM08vNDZEdWcxSWxWTTTRte
nB5OUwzbXIKRzJDNGt2RUR3UHc3Q05uQXJkVnIDQ1dBWVMzY242ZURZZ2RINE
FkTVN3Y3dCS21ISEZWL0J4TFF5MEpkeTg5bQpBUm9YN3ZrUF"
```

OK

```
AT^SSLMNG=1,1,0,"ca-
cert2.pem",3,7,"IMZmJiMmpsVGtGaWJ0TnZZRTIMSjk3UEdBZnhFMTNMUDZrbFJO
cFNyTWdFNFZZUzIcVFUdEhpCnJ3RzFJNkhzTWRwN1kybkV1UFBuenFFOXdOd
HQ4N0xaUnNpZnc3aHdXaDkveWc9PQotLS0tLUVORCBDRVJUSUZJQ0FURS0tLS
0tCkNlcnRpZmljYXRIOGogICAgRGF0YToKICAgICAgICBwZXJzaW9uOiAzICgweDlp
CiAgICAgICAgU2VyaWFsIE51bWJlcjoKICAgICAgICAgICAgZTk6ZDA6YTc6NWY6N
zk6MjU6ZjQ6M2MKICAgICAgICBtaWduYXR1cmUgQWxnb3JpdGhtOiBzaGEvV2l0a
FJTQUVvY3J5cHRpb24KICAgICAgICBjc3N1ZXI6IEM9VVMsIFNUPU1vbnRhbmlEsl
Ew9Qm96ZW1hbiwgTz1TYXd0b290aCwgT1U9Q29uc3VsdGluZywgQ049d3d3Lnlhc
```











OgoglCAGlCAGlGExOmViOmI0OjViOjY3OmNkOjMyOmU0OmI2OjExOjRiOjIhOjcyOj  
Y2OjBkOmEyOjRhOjc2OgoglCAGlCAGlDhmOmZlOjlyOmJjOjgzOmZkOmRiOmI3Om  
Q1OmE5OmVIOjA1OmM5OmlxOjcxOjdlOjFiOjJiOgoglCAGlCAGlGUxOmUzOmFmO  
mMwCi0tLS0tQkVHSU4gQ0VSVEIGSUNBVEUtLS0tLQpNSUIFbURDQ0E0Q2dBd0l  
CQWdJskFJZEtkYjZSWnRnOU1BMEdDU3FHU0liM0RRRUJCUVVBtUIHT01Rc3d  
DUVIECIZRUUdFd0pWVXpFUE1BMEdBmVVFQ0JNR1QzSmxaMjl1TVJfD0R3WUR  
WUVFIRXdoUWlZSjBiR0Z1WkRFT01Bd0cKQTFVRUNoTUZIV0ZUVtB3eEZEQVN  
CZ05WQkFzVEMxQnliMmR5WVcxGFXNW5NUlI3RkFZRFZRUURFdzEzZDNjdQpl  
V0Z6YzJ3dVkyOXRNUjB3R3dZSkTwwklodmNOQVFrQkZnNXBibVp2UUhsaGMzTn  
NMbU52YIRBZUZ3MHhNVEV3Ck1qUXhPREI4TIRWYUZ3MHhOREEzTWpBeE9ES  
XhOVFZhtUIHT01Rc3dDUVIEVIFRR0V3SIZVekVQTUEwR0ExVUUKQ0JNR1QzSm  
xaMjl1TVJfD0R3WURWUVFIRXdoUWlZSjBiR0Z1WkRFT01Bd0dBmVVFQ2hNRmV  
XRIRVMHd4RkRBUwpCZ05WQkFzVEMxQnliMmR5WVcxGFXNW5NUlI3RkFZRFZ  
RUURFdzEzZDNjdWVXRnpjMnd1WTI5dE1SMHdHd1IKCktWklodmNOQVFrQkZnN  
XBibVp2UUhsaGMzTnNMbU52YIRDQ0FTSXdEUVlKS29aSWH"

OK

```
AT^SSLMNG=1,0,0,"client-  
cert.pem",6,7,"2Y05BUUVCQIFBRGdnRVAKQURDQ0FRb0NnZ0VCQU1NRDBTditP  
YVF5UIR0VHIJUXJLbngwbXlycUtsSUhSOWFtTnJJSE1vN1F1bWw3eHNORQpudF  
NCU1AwdGFLS0xaN3VoZGNnMkxFclNHL2VMdXM4TitlL3M4WUVIZTVzRFI1cS9aY  
3gvWINSchB1Z1VpVnZrCk5QZkZzQINUOVdkN09ucDQ0UUXZVnBHbUUwS04wan  
hBbkV6djBZYmZOMUViREtFNzlmR2pTalhrNGM2VzN4dCsKdjA2WDBCRG9xQWd3  
Z2E4Z0MwTVV4WFJudERLQ2I0Mkd3b2hBbVRhRHVoNUFjaUIYMTFFkBEpIT3d6dT  
haemE3LwplR3g3d0JJRDFFNXIEVkJ0TzZNN281bGVuY2paREIXejJZclpWQ2JiYmZ  
xc3UvOGxUTVRSZVZSeDA0WkFHQk93Clk3VnlUakRFbDRTR0xWWXYxeFgzZjhD  
dTimeGI1ZnVodXRNQ0F3RUFBYU9COWpDQjh6QWRZCZ05WSFE0RUZnUVUKTTI  
oRlp0ZG9oeGgrVkExd0o1SEhKdGVGWmNBd2djTUdBMVvKsXdtQnV6Q0J1SUFV  
TTloRlp0ZG9oeGgrVkExdwpKNUHlSnRIRlpjQ2hnWINrZ1pFd2dZNHhDekFKQmdOV  
kJBWVRBbFZUTVE4d0RRWURWUUFJRXdauGNtVm5iMjR4CkVUUVBCZ05WQkF  
jVENGGnZjbJzWVc1a01RNHdEQVIEVIFRS0V3VjVZVvK5UVERFVU1CSUdBmVVF  
Q3hNTFVlSnYKWjNkaGJXMXBibWN4RmpBVUJnTIZCQU1URFhkM2R5NTVZWE5  
6YkM1amlyMHhIvEFiQmdrcWhraUc5dzBCQ1FFVwpEbWx1Wm05QWVXRnpjMnd1  
WTI5dGdna0FoMHAXdnBgbTJEMHdEQVIEVlWVEJBVXdBd0VCL3pBTkJna3Foa2l  
HCjI3MEJBUVVGQUFPQ0FRUFISHhDZ1NtZUljL1EyTUZVYjh5dU"
```

OK

```
AT^SSLMNG=1,0,0,"client-  
cert.pem",7,7,"ZBazQvMmlZbXBWVGRoaDc1aklyN0NnTmRhZmUKNE0yTzFWVWp  
ha2NyVG8zOGZRYWoyQSt0WHRZRXRIRQXorM2NuMDdVRHMzC2hkREVMU3E4dE  
dyT1Rqc3p6WHoyUQpQOHpqVIJtUmUzZ2tMa29KdXhoT1ITMmN4Z3FnTkpHSWN  
HczdTRWU4ZVpTaW9FMHISMVRDbzI3dTBsRk1LVGtSCi8rSVZYbGIYtNzicEJnYU  
dEbzJkbFFOeXNvc1pmT2tVYnFHSWMyaFliWEZld3RYVEU5SmYzdW9EdnVJQVf  
PWE8KL2VhU01WZkQ2N3Rtck1zdkd2cmdZcUpIOUpOREtrdHNYZ292K2VmbVnTt  
0dzS3dxb2V1MFcyZk5NdVMYRVV1YQpjbVIOb2twMmovNGI2SVA5MjdmVnFINEZ5  
YkZ4ZmhzcjRIT3Z3QT09Ci0tLS0tRU5EIEENFUIRJRklDQVRFLS0tLS0K"
```

OK

- Store client-Key certificate

```
AT^SSLMNG=1,2,0,"client-  
key.pem",1,3,"LS0tLS1CRUdJTiBSU0EgUFJJVkFURSBLRVktLS0tLQpNSUIFcEFJQ  
kFBS0NBUUUVBd3dQUksvNDVwREpGTzFQSWHdC3FmSFNhdmFvcVvNzEGxcVkyC  
2djeWp0QzZhWHZHCncwU2UxSUZJL1Mxb29vdG51NkYxeURZc1N0SWI5NHU2en  
czNTcrenhnUjU3bXdOSG1yOWx6SDIsSkdtbTZCU0oKVytRMDk4V3dGSIAxWjNzNm
```



```
VuamhBVlpXa2FZVFFvM1NQRUNjVE8vUmh0ODNVUnNNb1R2MThhTktOZVRoen
BiZgpHMzYvVHBmUUVPaW9DRENCcnIBTFF4VEZkR2UwTW9KdmpZYkNpRUNaT
m9PNkhrQnlJaGZyVW1Va2M3RE83eG5OCnJ2OTRiSHZBRWdQVVRuSU5VRzA3
b3p1am1WNmR5TmtNaGJQWml0bFVKdHR0K3F5Ny95Vk14TkY1OUhIVGhrQVkk
RTdCanRYSk9NTVNYaEIZdFZpL1hGZmQvd0s3MS9GdmwrNkc2MHdJREFRQUJB
b0ICQVFDaTV0aGZFSEZrQ0o0dQpiZEZ0SG9YU0NyR01SODRzVVdxZ0VwNVQzc
EZNSFczcVdYdnkNnJaeHRtS3E5amhGdVJqSnYrMWJCTlp1T09sCnIISVhMZ3lmYi
tWWIAzWnZTYkVSd2xvdUZpa04zcmVPM0VEVm91N2dlcUgwdnBmYmhtT1dGTTJ
ZQ1dBdE1IYWmkUE0zbWIPNUhrbmtMV2dEaVhsOFJmSDM1Q0xjZ0Jva3FYZjBBc
XIMaDhMTzhKS2xISmc0ZkFDMytJWnBUVzlvVApLNnVZ21oRE50ajJMOFlpL0xW
QlHRMHPZT3FrZlg3b1MxV1JWdE5jVjQ4ZmxCY3ZxdDdwbNfQmHO0cE1qcURrClZu
T3l6MctHeFdrODh5UWdpMXIXRFBwckVqdWFAOEhmeHBheXBkV1NEWnNKUW1
na0VFWFVVT1FYT1VqUU5ZdVUKYIJIZWo4cFpBb0dCQU9va3AvbHB"
```

OK

```
AT^SSLMNG=1,2,0,"client-
key.pem",2,3,"NK2x4M0ZKOWIDRW9MMG5ldW5JVzZjeEhIb2dObEZIRVdCWTZnYk
EVB3MrbQpiQjZ3QmlrQWorZDNkcXpieXNmWlhwcY9KcEJTcnZ3NGtBQVV1N1FQV
0pUbkWycCtIRtICSWRReFdSOU9paHFOCnAxZHNJdGpsOUg0eXBoRExaS1ZWQ
TRlBUp3V013OWUySjdKTnVqRGFSNDIVMHoyTGhJMIVtRmlsQW9HQkFOVTQKRz
hPUHhaTU1Sd3R2TlpMRnNJMUd5SkIZai9XQUN2ZnZvZjZBdWJVcXVzb1IzRjJsQjI
DVGpkaWNCQnpVWW82bQpKb0VCLzG2S0ttTBOVUNxYIIEZWITnFWMDJIYnEy
VFRsYVfDMjJkYzRzTXJpYzKzazd3cXNWc2VHZHNSRktjCk4yZHNMZSs3cjkrbWtE
ekVSOCtObHA2WXFiuZ24YVpRM0xQdyszUVhBb0dBWg9NSllyMjZmS0svUW5UM
WZCeIMKYWNrRURZvitQajBrRXNNWWUvTXA4MThPZG14WmRIUkJor21kTXZQ
TkIxdXdOYnBLc2p6bDJWaTJZazlkM3VXZQpDc3BUc2l6M25yTnJDbHQ1WmV4dWt
VNINJUGI4L0JidDAzWU00dXgvc21rVGEzZ09Xa1prdEY2M0phQmFkVHBMJCj4Yzh
QdmY5SnJnZ3hKa0ttbk8rd3hrQ2dZRUF1a1NURkt3MEdUdGZrV0NzOTdUV2dRVt
JVvK05NkdYY3J5N2MKWVQ3SmZiaC9oL0E3bXdPQ0tUZk9jazRSMWJlQkRBZwdt
WkZLalgvC2VjL3hPYlhwaGV4aTk5cDI2R1JOSWp3Two4dFpSOVImWW1jQVJJRjBQ
S2YxYjRxn1pITmtoVm0zOGhOQmY3UkFWSEJnaDU4UTITOWZRbm1xVnp5TEpB
M3VICjQyQUivQzhDZ1IBUjBFdIBHMmU1bnhCMVI0WmxyakhDeGpDc1dRWIEyUs
xY0FiMzhOUEIZbnlvMm03MkiUL1QKZjEvcWlxcy"
```

OK

```
AT^SSLMNG=1,2,0,"client-
key.pem",3,3,"8yU3BIODFIU3dqQTM0eTJqZFewZVRTRTAxVmR3WEItL2N1eEtiBw
pWelJoME0wNk1Pa1dQNXBaQQo2MIA1R1IZNIVkMkpTN0R6K1o5ZEtKVTR2aldye
Wx6bmsxTTBvVVZkRXpsbFFrYWhuODMxdnc9PQotLS0tLUVORCBSU0EgUJFJJV
FURSBLRVktLS0tLQo="
```

OK

Once the configuration is done, we can perform FTPS, HTTPS and SMTPS operations.

### 4.3 Examples

Examples given are showing how to make secure connection for FTPS, HTTPS and SMTPS.



### 4.3.1 FTPS

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^SSLEN=1,1,1</b>	Enable a secure socket.
<b>OK</b>	
<b>AT^SSLCFG=1,30,0,1</b>	Configure the properties of a secure socket.
<b>OK</b>	
<b>AT^IPOPEN=2,"FTPS","192.166.63.41", 990,,"username","password"</b>	Create a secure FTP control link, an FTP user is successfully logged in to FTP server.
<b>OK</b>	
<b>^IPSRVST:1,10,230</b>	

GET and PUT operations are the same as in normal FTP.

### 4.3.2 HTTPS

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^SSLEN=1,1,1</b>	Enable a secure socket.
<b>OK</b>	
<b>AT^SSLCFG=1,30,0,1</b>	Configure the properties of a secure socket.
<b>OK</b>	
<b>AT^IPOPEN=3,"HTTPS","m2m.huawei. com",448</b>	Create a secure HTTP server link, an HTTP user is successfully logged in to HTTP server.
<b>OK</b>	

GET and POST operations are the same as in normal HTTP.





### 4.3.3 SMTPS

Command	Description
<b>AT^IPINIT="mhahuawei1.com"</b>	Initialize the internal protocol stack.
<b>OK</b>	
<b>AT^SSLEN=1,1,1</b>	Enable a secure socket.
<b>OK</b>	
<b>AT^SSLCFG=1,30,0,1</b>	Configure the properties of a secure socket.
<b>OK</b>	
<b>AT^IPOPEN=1,"smtps","192.166.63.41",25,,"m2mtest@m2m.huawei.com", "M2mhuawei"</b>	Create a secure SMTP server link, an SMTP user is successfully logged in to SMTP server.
<b>OK</b>	
<b>^IPSRVST:1,13,235</b>	

Sending emails (EMSEND) operation is the same as in normal SMTP.



# 5 Abbreviations

Abbreviations	Full spelling
APN	Access Point Name
FTP	File Transfer Protocol
HTTP	Hyper Text Transfer Protocol
SMTP	Simple Mail Transfer Protocol
SSL	Secure Socket Layer
TLS	Transport Layer Security