SIM7070_SIM7080_SIM7090 Series_Email_Application Note

LPWA Module
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About Document

Version History

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<th>Owner</th>
<th>What is new</th>
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<tr>
<td>V1.00</td>
<td>2019.10.12</td>
<td>Wenjie Lai</td>
<td>First Release</td>
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<tr>
<td>V1.01</td>
<td>2020.2.26</td>
<td>Yulong Zheng</td>
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<td>V1.02</td>
<td>2020.7.8</td>
<td>Wenjie Lai</td>
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Scope

This document applies to the following products

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<td>N/A</td>
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1 Introduction

1.1 Purpose of the document

Based on module AT command manual, this document will introduce Email application process.

Developers could understand and develop application quickly and efficiently based on this document.

1.2 Related documents

[2] SIM7070_SIM7080_SIM7090 Series_SSL_Application Note

1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:

- ME (Mobile Equipment);
- MS (Mobile Station);
- TA (Terminal Adapter);
- DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface. The controlling device at the other end of the serial line is referred to as following term:

- TE (Terminal Equipment);
- DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;
2 Email Introduction

2.1 Introduction

Electronic mail (email or e-mail) is a method of exchanging messages ("mail") between people using electronic devices. Invented by Ray Tomlinson, email first entered limited use in the 1960s and by the mid-1970s had taken the form now recognized as email. Email operates across computer networks, which today is primarily the Internet. Some early email systems required the author and the recipient to both be online at the same time, in common with instant messaging. Today's email systems are based on a store-and-forward model. Email servers accept, forward, deliver, and store messages. Neither the users nor their computers are required to be online simultaneously; they need to connect only briefly, typically to a mail server or a webmail interface for as long as it takes to send or receive messages or to download it.

Originally an ASCII text-only communications medium, Internet email was extended by Multipurpose Internet Mail Extensions (MIME) to carry text in other character sets and multimedia content attachments. International email, with internationalized email addresses using UTF-8 (which you can send Chinese email body), has been standardized, but as of 2017 it has not been widely adopted.

The history of modern Internet email services reaches back to the early ARPANET, with standards for encoding email messages published as early as 1973 (RFC 561). An email message sent in the early 1970s looks very similar to a basic email sent today.

2.2 Email Address

The format of an email address consists of three parts: User identifier + @ + domain name

The first part "USER" represents the account of the user's mailbox. For the same mail receiving server, this account must be unique;

The second part "@" is a separator. @ is the symbol of "at", which means "at".

The third part is the domain name of the mail receiving server of the user mailbox. The domain_name here is the identifier of the domain name, that is, the domain name of the mail destination to which the mail must be delivered. Somebody is the email address on the domain. The suffix generally represents the nature of the domain name and the region code. The domain name is really
2.3 Email Protocol

There are several common email protocols: SMTP, POP3, IMAP. These several protocols are defined by the TCP / IP protocol family.

SMTP (Simple Mail Transfer Protocol): SMTP is mainly responsible for how the underlying mail system transfers mail from one machine to another. The normal and startSSL port is 25, and the SSL port is 465.

POP (Post Office Protocol): The version is POP3. POP3 is a protocol for transmitting mail from an email box to a local computer. The normal port is 110, and the SSL port is 995, no startSSL.

IMAP (Internet Message Access Protocol): The version is IMAP4, which is an alternative protocol to POP3. It provides new functions of mail retrieval and mail processing, so that users can see the summary of the title of the mail without downloading the body of the mail. The client software can operate on the mail and folder directories on the server. The IMAP protocol enhances the flexibility of e-mail, and also reduces the direct harm of spam to the local system, and at the same time saves users the time to check the e-mail. In addition, the IMAP protocol can remember the user's operations on the mail in the offline state (such as moving mail, deleting mail, etc.) will be automatically executed the next time the network connection is opened. The normal port is 143, and the SSL port is 993, no startSSL.

Support for SSL connections is integrated into most popular email client programs. In addition, many encryption technologies are also applied to the sending and receiving and reading of e-mail. They can provide encryption strengths ranging from 128 to 2048 bits. Both unidirectional and symmetric key encryption are widely supported.

SIM7070_SIM7080_SIM7090 Series support SMTP and POP3 protocols.
## 3 AT Commands for Email

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+EMAILCID</td>
<td>Set Email bearer profile identifier</td>
</tr>
<tr>
<td>AT+EMAILTO</td>
<td>Set timeout value of SMTP/POP3 server response</td>
</tr>
<tr>
<td>AT+SMTPSRV</td>
<td>Set SMTP server address and port</td>
</tr>
<tr>
<td>AT+SMTPAUTH</td>
<td>Set user name and password for SMTP authentication</td>
</tr>
<tr>
<td>AT+SMTPFROM</td>
<td>Set sender address and name</td>
</tr>
<tr>
<td>AT+SMTPRCPT</td>
<td>Set the Email recipient(to/cc/bcc) address and name</td>
</tr>
<tr>
<td>AT+SMTPSUB</td>
<td>Set the Email subject</td>
</tr>
<tr>
<td>AT+SMTPBODY</td>
<td>Set the Email body</td>
</tr>
<tr>
<td>AT+SMTPFILE</td>
<td>Set the Email attachment</td>
</tr>
<tr>
<td>AT+SMTPSEND</td>
<td>Send the Email</td>
</tr>
<tr>
<td>AT+SMTPFT</td>
<td>Transfer the Email attachment</td>
</tr>
<tr>
<td>AT+SMTPCS</td>
<td>Set the Email charset</td>
</tr>
<tr>
<td>AT+POP3SRV</td>
<td>Set POP3 server and account</td>
</tr>
<tr>
<td>AT+POP3IN</td>
<td>Log in POP3 server</td>
</tr>
<tr>
<td>AT+POP3NUM</td>
<td>Get Email number and total size</td>
</tr>
<tr>
<td>AT+POP3LIST</td>
<td>Get the specific Email size</td>
</tr>
<tr>
<td>AT+POP3UIDL</td>
<td>Get the specific Email unique-id</td>
</tr>
<tr>
<td>AT+POP3CMD</td>
<td>Get multi-line response</td>
</tr>
<tr>
<td>AT+POP3READ</td>
<td>Read multi-line response</td>
</tr>
<tr>
<td>AT+POP3DEL</td>
<td>Mark the specific Email to delete</td>
</tr>
<tr>
<td>AT+POP3RSET</td>
<td>Unmark the emails that be marked as deleted</td>
</tr>
<tr>
<td>AT+POP3OUT</td>
<td>Log out POP3 server</td>
</tr>
</tbody>
</table>

For detail information, please refer to “SIM7070_SIM7080_SIM7090 Series_AT Command Manual “.
4 Bearer Configuration

Usually module will register PS service automatically.

4.1 PDN Auto-activation

//Example of PDN Auto-activation.

```
AT+CPIN?               //Check SIM card status
+CPIN:READY
OK
AT+CSQ                //Check RF signal
+CSQ: 20,0
OK
AT+CGATT?             //Check PS service. 1 indicates PS has attached.
+CGATT: 1
OK
AT+COPS?              //Query Network information, operator and network.
+COPS: 0,0,"CHN-CT",9 //Mode 9 means NB-IOT network.
OK
AT+CGNAPN             //Query the APN delivered by the network after the CAT-M or NB-IOT network is successfully registered.
+CGNAPN: 1,"ctnb"   //"ctnb" is APN delivered by the CAT-M or NB-IOT network. APN is empty under the GSM network.
OK
AT+CNCFG=0,1,"ctnb" //Before activation please use AT+CNCFG to set APN\user name\password if needed.
OK
AT+CNACT=0,1         //Activate network, Activate 0th PDP.
OK
+APP PDP: 0 ACTIVE
```
4.2 APN Manual Configuration

If not attached automatically, could configure correct APN setting.

//Example of APN Manual configuration.

AT+CFUN=0 //Disable RF
+CPIN: NOT READY
OK

AT+CGDCONT=1,"IP","ctnb" //Set the APN manually. Some operators need to set APN first when registering the network.
OK

AT+CFUN=1 //Enable RF
OK

+CPIN: READY
AT+CGATT? //Check PS service. 1 indicates PS has attached.
+CGATT: 1
OK

AT+CGNAPN //Query the APN delivered by the network after the CAT-M or NB-IOT network is successfully registered.
+CGNAPN: 1,"ctnb" //"ctnb" is APN delivered by the CAT-M or NB-IOT network. APN is empty under the GSM network.
OK

AT+CNCFG=0,1,"ctnb" //Before activation please use AT+CNCFG to set APN\user name\password if needed.
OK

AT+CNACT=0,1 //Activate network, Activate 0th PDP.
OK
+APP PDP: 0,ACTIVE
AT+CNACT? //Get local IP
+CNACT: 0,1,"10.94.36.44"
+CNACT: 1,0,"0.0.0.0"
+CNACT: 2,0,"0.0.0.0"
+CNACT: 3,0,"0.0.0.0"
OK
5 Email Examples

5.1 Synchronize time

To ensure that the received email has the correct time, first the time must be synchronized.

//Example of Synchronize time

```
AT+CNTPCID?
+CNTPCID: 1  //Query GPRS bearer profile’s ID

OK
AT+CNTP="ntp1.aliyun.com",32  //Set server and time zone
OK
AT+CNTP  //Synchronize Network Time
OK

+CNTP: 1,"2018/12/26,10:36:49"
AT+CCLK?
+CCLK: "2018/12/26,10:36:57+32"  //Query clock time

OK
```

5.2 Send an Email

//Example of Send an Email

```
AT+EMAILCID=0  //Set parameters of Email
OK
AT+EMAILTO=30  //Set the timeout value of SMTP/POP3 server response is 30 seconds.
OK
AT+SMTPSRV="mail.sim.com",25  //Set SMTP server address and port
OK
```
AT+SMTPAUTH=1,"john","123456" //Set user name and password
OK
AT+SMTPFROM="john@sim.com","john" //Set sender address and name
OK
AT+SMTPRCPT=0,0,"john@sim.com","john" //Set the recipient (To:)
OK
AT+SMTPRCPT=1,0,"john@sim.com","john" //Set the recipient (Cc:)
OK
AT+SMTPRCPT=2,0,"john@sim.com","john" //Set the recipient (Bcc:)
OK
AT+SMTPSUB="Test" //Set the subject
OK
AT+SMTPBODY=19 //Set the body
OK
DOWNLOAD
This is a new Email

OK
AT+SMTPSEND //Send the Email
OK

+SMTPSEND: 1

5.3 Send an Email with an attachment

//Example of Send an Email with an attachment

AT+EMAILCID=0 //Set parameters of Email
OK
AT+EMAILTO=30 //Set parameters of Email
OK
AT+SMTPSRV="mail.sim.com",25 //Set SMTP server address and port
OK
AT+SMTPAUTH=1,"john","123456" //Set user name and password
OK
AT+SMTPFROM="john@sim.com","john" //Set sender address and name
OK
AT+SMTPRCPT=0,0,"john@sim.com","john" //Set the recipient (To:)
OK
AT+SMTPRCPT=1,0,"john@sim.com","john"  //Set the recipient (Cc:)
OK
AT+SMTPRCPT=2,0,"john@sim.com","john"  //Set the recipient (Bcc:)
OK
AT+SMTPSUB="Test"  //Set the subject
OK
AT+SMTPBODY=19  //Set the body
DOWNLOAD
This is a new Email
OK
AT+SMTPFILE=1,"test.txt",0  //Set the attachment
OK
AT+SMTPSEND  //Send the Email
OK
+SMTPFT: 1,1360  //URC indicates that the attachment may be send. 1360 is the max length of data which can be sent at a time. It depends on the network status.
AT+SMTPFT=100  //SMTP client requests to send 100 bytes. Response will indicates that user must input 100 bytes for transferring now.
+SMTPFT: 2,100  ......  //Input data
OK
+SMTPFT: 1,1360  //URC indicates that more data can be sent
AT+SMTPFT=0  //The attachment has been transferred completely.
OK
+SMTPSEND: 1  //URC indicates that the entire email has been send successfully

5.4 Send a UTF-8 Email

//Example of Send UTF-8 Email
AT+EMAILCID=0  //Set parameters of Email
OK
AT+EMAILTO=30  //Set parameters of Email
OK
AT+SMTPCS="UTF-8"  //Set the mail charset
5.5 Retrieve the Email

//Example of Retrieve an Email

AT+EMAILCID=0
OK
//Set parameters of Email

AT+EMAILTO=30
OK
//Set parameters of Email

AT+POP3SRV="mail.sim.com","john","123456",110
OK
//Set POP3 server and account

AT+POP3IN
OK
//Log in POP3 server
### 5.6 Delete the Email

#### //Example of Delete an Email

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+EMAILCID=0</td>
<td>Set parameters of Email</td>
</tr>
<tr>
<td>AT+EMAILTO=30</td>
<td>Set parameters of Email</td>
</tr>
<tr>
<td>AT+POP3OUT</td>
<td>Log out POP3 SERVER</td>
</tr>
</tbody>
</table>
### 5.7 Get the Email’s size and unique-id

#### //Example of Get Email’s size and unique-id

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+EMAILCID=0</td>
<td>//Set parameters of Email</td>
</tr>
<tr>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>AT+EMAILTO=30</td>
<td>//Set parameters of Email</td>
</tr>
<tr>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>AT+POP3SRV=&quot;mail.sim.com&quot;,&quot;john&quot;,&quot;123456 &quot;,110</td>
<td>//Set POP3 server and account</td>
</tr>
<tr>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>AT+POP3IN</td>
<td>//Log in POP3 server</td>
</tr>
<tr>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>+POP3IN: 1</td>
<td></td>
</tr>
<tr>
<td>AT+POP3NUM</td>
<td>//Get Email number and total size</td>
</tr>
<tr>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>+POP3NUM: 1,2,35797</td>
<td></td>
</tr>
<tr>
<td>AT+POP3LIST=1</td>
<td>//Get the specific Email’s size</td>
</tr>
</tbody>
</table>

```
OK

+POP3LIST: 1,1,16601
AT+POP3UIDL=1
OK

+POP3UIDL: 1,1,
AAAFOpdCAAAv60+tksFqRqk3/6ogog+g
AT+POP3OUT
OK

+POP3OUT: 1

5.8 Email Send Encrypted Mail with Normal Port

//Example of Send an Encrypted Email with Normal Port

AT+EMAILCID=0
OK
AT+EMAILTO=30
OK
AT+EMAILSSL=2,0,"email.cer","email.pem"
OK
AT+SMTPSRV="SMTP.GMAIL.COM"
OK
AT+SMTPAUTH=1,"account","password"
OK
AT+SMTPFROM="account@GMAIL.COM","account"
OK
AT+SMTPSUB="Test"
OK
AT+SMTPRCPT=0,0,"john@sim.com","john"
OK
AT+SMTPBODY=19
DOWNLOAD
This is a new Email
### 5.9 Email Send Encrypted Mail with Encryption Port

//Example of Send an Encrypted Email with Encryption Port

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT+EMAILCID=0</td>
<td>Set parameters of Email</td>
</tr>
<tr>
<td>AT+EMAILTO=30</td>
<td>Set parameters of Email</td>
</tr>
<tr>
<td>AT+EMAILSSL=1,0,&quot;email.cer&quot;,&quot;email.pem&quot;</td>
<td>Set EMAIL begin encrypt transmission with normal port. &lt;ssltype&gt;=1 means SSL.</td>
</tr>
<tr>
<td>AT+SMTPSRV=&quot;SMTP.GMAIL.COM&quot;</td>
<td>Set SMTP server address, port is omitted, means use the default ports: 465</td>
</tr>
<tr>
<td>AT+SMTPAUTH=1,&quot;account&quot;,&quot;password&quot;</td>
<td>Set user name and password</td>
</tr>
<tr>
<td>AT+SMTPFROM=&quot;<a href="mailto:account@GMAIL.COM">account@GMAIL.COM</a>&quot;,&quot;account&quot;</td>
<td>Set sender address and name</td>
</tr>
<tr>
<td>AT+SMTPSUB=&quot;Test&quot;</td>
<td>Set the subject</td>
</tr>
<tr>
<td>AT+SMTPRCPT=0,0,&quot;<a href="mailto:john@sim.com">john@sim.com</a>&quot;,&quot;john&quot;</td>
<td>Set the recipient (To:)</td>
</tr>
<tr>
<td>AT+SMTPBODY=19</td>
<td>Set the body</td>
</tr>
</tbody>
</table>

DOWNLOAD
This is a new Email

OK
AT+SMTPSEND
OK
+SMTPSEND: 1
5.10 Email Receive Encrypted Mail with Encryption Port

//Example of Receive an Encrypted Email with Encryption Port

AT+EMAILCID=0  //Set parameters of Email
OK
AT+EMAILTO=30  //Set parameters of Email
OK
AT+EMAILSSL=1,0,"email.cer","email.pem"  //Set EMAIL begin encrypt transmission with normal port
OK
AT+POP3SRV="mail.sim.com","john","123456"  //Set POP3 server and account, port is omitted, means use the default ports 110
OK
AT+POP3IN  //Log in POP3 server
OK
+POP3IN: 1
AT+POP3NUM  //Get Email number and total size
OK
+POP3NUM: 1,2,11124
AT+POP3LIST=1  //Get the specific Email’s size
OK
+POP3LIST: 1,1,5556
AT+POP3CMD=4,1  //Retrieve the specific Email
OK
+POP3CMD: 1
AT+POP3READ=1460  //Get the Email content
+POP3READ: 1,1460
...
OK
AT+POP3READ=1460  //The Email’s content is read completely
+POP3READ: 2,1183
...
OK
AT+POP3OUT  //Log out POP3 SERVER
OK
+POP3OUT: 1