



SIM7020 Series_HTTP(S) _Application Note

LPWA Module

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About Document

Version History

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V1.00	2018.4.10	Linshu.Guan	First Release
V1.01	2018.6.7	Albert	Revised
V1.02	2018.12.25	Jin.Zhang	Revised
V1.03	2020.6.10	Wenjie.Lai	All

Scope

This document applies to the following products

Name	Type	Size (mm)	Comments
SIM7020C	NB1	17.6*15.7	Band 1/3/5/8
SIM7020E	NB1	17.6*15.7	Band 1/3/5/8/20/28
SIM7030	NB1	16*18	Band 1/3/5/8
SIM7060	NB1+GNSS	24*24	Band 5/8
SIM7020G	NB2	17.6*15.7	Band 1/2/3/4/5/8/12/13/17/18/19/20/25/26/28/66/70/71/85
SIM7060G	NB2+GNSS	24*24	Band 1/2/3/4/5/8/12/13/17/18/19/20/25/26/28/66/70/71/85

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1 Introduction

1.1 Purpose of the document

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

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

1.2 Related documents

[1] SIM7020 Series_AT Command Manual

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 AT Commands for HTTP(S)

Command	Description
AT+CHTTPCREATE	Create a HTTP client instance
AT+CHTTPCREATEEXT	Create a HTTPS client instance by multi packages for a long size command
AT+CHTTPCON	Establish the HTTP(S) connection
AT+CHTTPDISCON	Close the HTTP(S) connection
AT+CHTTPDESTROY	Destroy the HTTP(S) client instance
AT+CHTTPSEND	Send HTTP(S) package
AT+CHTTPSENDEXT	Send HTTP(S) package by multi packages for a long size command
AT+CHTTPPARA	Set parameter for AT command of AT+CHTTPSEND
AT+CHTTPTOFS	Download File to Module System
AT+CHTTPCLRMULCRTBUF	Clear multi create buffer of AT+CHTTPCREATEEXT
AT+CHTTPCLRMULSNDBUF	Clear multi send buffer of AT+CHTTPSENDEXT
AT+CHTTPRESUMESSEND	Set resume send package or not when HTTP(S) disconnected
+CHTTPNMIH	Header of the response from host
+CHTTPNMIC	Content of the response from host
+CHTTPERR	HTTP(S) client connection error indicator
+CHTTPTOFS	HTTP(S) download indicate from host
+CHTTPTOFSOK	HTTP(S) download finished indicate

For detail information, please refer to "SIM7020 Series_AT Command Manual".

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3 Bearer Configuration

Usually module will register PS service automatically.

3.1 PDN Auto-activation

//Example of PDN Auto-activation.

```
AT+CPIN? // Check SIM card status
+CPIN: READY

OK
AT+CSQ // Check RF signal
+CSQ: 27,99

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

OK
AT+CGACT? // PDN active success
+CGACT:1,1

OK
AT+COPS? // Query Network information, operator and
+COPS:0,0,"CHN-UNICOM",9 network mode 9, NB-IOT network

OK
AT+CGCONTRDP // Attached PS domain and got IP address
+CGCONTRDP: automatically
1,5,"shnbiot","10.250.0.213.255.255.255.0"

OK
```

3.2 APN Manual configuration

//Example of APN Manual configuration.

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

OK
AT*MCGDEFCONT="IP","3GNET" // Set the APN manually

OK
AT+CFUN=1 // Enable RF

OK
+CPIN:READY
AT+CGATT? // Inquiry PS service
+CGATT: 1

OK
AT+CGCONTRDP // Attached PS domain and got IP address
+CGCONTRDP: automatically
1,5,"3GNET","10.250.0.253.255.255.255.0"

OK
```

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4 HTTP(S) Examples

4.1 HTTP GET Service

//Example of HTTP GET Service

```

AT+CHTTPCREATE="http://www.sim.com/" //Create HTTP host instance
+CHTTPCREAT: 0

OK
AT+CHTTPCON=0 //Connect server

OK
AT+CHTTPSEND=0,0,"/index.html"
OK

+CHTTPNMIH:0,0,800,Date: Tue, 10 Apr 2018 //send HTTP request
07:24:25 GMT First parameter 0 is HTTP instance id, second
Server: Apache/2.0.58 (Win32) PHP/5.2.11 parameter 0 is HTTP get method, third parameter
Last-Modified: Fri, 16 May 2014 01:01:31 GMT is file, not include root path.
ETag: "282e-45-f4410fef"
Accept-Ranges: bytes
Content-Length: 69 //If succeed, will report incoming data
Content-Type: text/html +CHTTPNMIH is header
+CHTTPNMIC:0,0,69,138,3c736372697074206c6 +CHTTPNMIC is content
16e67756167653d6a6176617363726970743e6c6
f636174696f6e2e687265663d27657370636d732f
696e6465782e706870273c2f7363726970743e
AT+CHTTPDISCON=0 //Disconnected from server
OK
AT+CHTTPDESTROY=0 //Destroy HTTP instance
OK

```

4.2 HTTP POST Service

//Example of HTTP POST Service

```

AT+CHTTPCREATE="http://139.217.9.49:8080/"
+CHTTPCREAT: 0 //Create HTTP host instance

OK
AT+CHTTPCON=0 //Connect server
OK
AT+CHTTPSEND=0,1,"/setBikeData",41636365
70743a202a2f2a0d0a436f6e6e656374696f6e3a2
04b6565702d416c6976650d0a557365722d4167
656e743a2053494d434f4d5f4d4f44554c450d0a,
"application/json",7b22646576534e223a223131
31313232323222c227370656564223a2232352e
36222c2226c6f6e676974756465223a2233362e32
222c2226c61746974756465223a2239382e36222c
22616c746974756465223a2231302e38222c2264
6972656374696f6e223a2231352e38222c227361
74656c6c697465223a2235222c22766f6c746167
65223a22342e32227d //send HTTP request

If succeed, will report incoming data
+CHTTPNMIH is header
+CHTTPNMIC is content

OK
AT+CHTTPDISCON=0 //Disconnected from server
OK
AT+CHTTPDESTROY=0 //Destroy HTTP instance
OK

```

4.3 HTTPS Instance Created by Long Command Multi-package

//Example of Long Command Multi-package to create an HTTPS instance

```

//First Packet //Multi-package creates an HTTPS host example
AT+CHTTPCREATEEXT=1,3268,998,"https://18 //where the parameter <server_cert> is split into
0.97.33.108/,,3232,2d2d2d2d2d424547494e204 four command packets.
3455254494649434154452d2d2d2d2d0d0a4d49 //The first parameter: 1 means that there is still
49456154434341314767417749424167494c4241 unpacked data to be sent later; 0 means the last
41414141414252453777516b63774451594a4b6f packet of data.
5a496876634e4151454c42514177567a454c4d41 //The second parameter: the total length of the
6b470d0a4131554542684d43516b55784754415 multi-packet data, here
842674e5642416f544545647362324a6862464e7 3268=998+1000+1000+270
05a323467626e5974633245784544414f42674e5 //The third parameter: indicates the data length of
64241735442314a760d0a6233516751304578477 the current unpacking command, that is, the
a415a42674e5642414d54456b647362324a68624

```

```
64e705a323467556d39766443424451544165467
730784e4441794d6a41784d4441770d0a4d4442
61467730794e4441794d6a41784d4441774d4442
614d475978437a414a42674e5642415954416b4a
464d526b77467759445651514b45784248624739
690d0a5957785461576475494735324c584e684d
5477774f67594456515144457a4e486247396959
57785461576475494539795a3246756158706864
476c76626942570d0a595778705a474630615739
7549454e4249433067553068424d6a5532494330
67527a4977676745694d41304743537147534962
334451454241515541413449420d0a4477417767
67454b416f494241514448446d772f49354e2f7a4
8436c6e534444446c4d2f6673424f7770684a796
b6656492b38444e495630794b4d"
```

OK

//Second Packet

```
AT+CHTTPCREATEEXT=1,3268,1000,"434c6b5
a630d0a4333334a694a3150692f44346e47794d5
6545862762f4b7a3676766a5675644b52746b544
9736f32315a7642714f4f5751355079444c7a6d2b
65626f6d63686a0d0a5348682f567a5a7047686b
645774485566634b6331482f6867424b75657571
49366c665979676f4b4f684a4a6f6d495a6567306
b397a667274484f536577556a0d0a6d784b317a7
573703336515541726b427064536d6e454e6b694
e37346676376a3952376c2f74796a714f526d4d6
46c4d4a656b5975596c5a436137706e5278740d0
a4e77394b486a55674b4f4b763143474c4163524
672573472593675536132454b545344746337703
87a763457746475666750445769327a5a43486c4
b5433686c0d0a32704b38766a5835733854354a3
4424f2f355a53356749673451647a365630727662
4c7841674d424141476a6767456c4d4949424954
414f42674e56485138420d0a4166384542414d43
4151597745675944565230544151482f42416777
426745422f7749424144416442674e5648513445
466751556c7435683862306346696c540d0a484d
444d665475444145446d476e7777527759445652
306742454177506a413842675256485341414d44
51774d6759494b77594242515548416745574a6d
68300d0a6448427a4f693876643364334c6d6473
62324a6862484e705a323475593239"
```

OK

length of the content in the quotation marks.

//The fourth parameter: HTTP host

//The fifth parameter: user name, Omitted here

//The sixth parameter: password, omitted here

//The seventh parameter: 3232 is the length of the server certificate

//The eighth parameter: the content of the server certificate, it includes:

1) server certificate part of the first packet data of

AT+CHTTPCREATEEXT "2d2d2d... 4b4d"

2) The second packet data content of

AT+CHTTPCREATEEXT "434c6b... 593239"

3) The third packet data content of

AT+CHTTPCREATEEXT "744c33... 534f6c"

4) server certificate part of the 4th packet of

AT+CHTTPCREATEEXT "43646a... 2d0d0a"

//The ninth parameter: client_cert_len , here 0, in the last package command.

//The 10th parameter: client_cert, omitted here, in the last package command

//The 11th parameter: client_pk_len, here 0, in the last package command.

//The 12th parameter: client_pk, omitted here, in the last package command

//Third Packet

```
AT+CHTTPCREATEEXT=1,3268,1000,"744c334
a6c6347397a61585276636e6b764d444d4741315
564487751734d436f770d0a4b4b416d6f4353474
96d6830644841364c79396a636d77755a3278765
96d467363326c6e626935755a585176636d39766
443356a636d7777505159494b7759420d0a42515
548415145454d5441764d4330474343734741515
546427a41426869466f644852774f69387662324e
7a6343356e624739695957787a615764754c6d4e
76d0a6253397962323930636a45774877594456
52306a42426777466f41555948746d476b554e6c
38714a55433939424d303071502f382f557377445
1594a4b6f5a490d0a6876634e4151454c4251414
46767454241455971376c3639726746674e7a455
2686e4630746b5a4a794241572f6939694978657
2483466346775334b337734730d0a333252316a7
555596371654d4f6f764a724b5633555066766e7
154676f49385556364d71582b782b6252446d756
f327743496432446b79793256473745514c790d0
a584e306376664e566c672f554273443834694f4b
4a484454752f42354771646863494f4b727762464
94e696859394273726b387931363538474556314
2536c330d0a33304a415a4753477669703243544
676485354306d6443462f76496843506e4739764
85157653357566a77494b414e6e75764435385a4
1575236356e357279410d0a534f6c"
```

OK

//Fourth Packet

```
AT+CHTTPCREATEEXT=0,3268,270,"43646a53
5856576b6b446f50576f43323039664e35696b6b
6f644270426f634c544a4967314d4743554637546
8424349785054737646776179754a32470d0a4b3
17070373450315338537174437234664b4778685
a534d39417948445053735150685a535a673d0d0
a2d2d2d2d2d454e442043455254494649434154
452d2d2d2d2d0d0a,0,,0,"
```

OK

4.4 HTTP POST Created by Long Command Multi-package

//Example of Long Command multi-package to HTTP post

```

AT+CHTTPCREATE="http://139.217.9.49:8080/" //Create HTTP host instance
+CHTTPCREAT: 0

OK
AT+CHTTPCON=0 //Connect server
OK
//First Packet //Multi-packet sending HTTP request
AT+CHTTPSENDEXT=1,949,177,0,1,12,"/setBikeData",128,4163636570743a202a2f2a0d0a436f6e6e6563746966f6e3a204b6565702d416c6976650d0a557365722d4167656e743a2053494d434f4d5f4d4f44554c450d0a,16,"application/json", //The first parameter: 1 means that there is still
//The second parameter: the total length of the data of the multi-package command, here
949=177+404+368
OK //The third parameter: the length of the current
//The fourth parameter: 0, which means HTTP
client_id
//Second Packet //The fifth parameter: 1, HTTP method: post
AT+CHTTPSENDEXT=1,949,404,768,7B22646576534E223A3836383333343033303030393730322C22646174614C697374223A205B5B302E3137303030302C3131332E3633323737352C33342E3734383832372C3131332E35302C302E3030303030302C31322C302E33382C312C313532353538333938355D2C5B333938335D2C5B302E3436303030302C3131332E3633323737382C33342E3734383832312C3131352E31302C302E3030303030302C31322C302E33382C312C313532353538333938355D2C5B302E3635303030302C3131332E3633323737392C33342E
//The sixth parameter: 12, the length of HTTP
path "/setBikeData"
//The seventh parameter: HTTP path
OK //The eighth parameter: HTTP header length
//Third Packet //The ninth parameter: HTTP header
AT+CHTTPSENDEXT=0,949,368,3734383831332C3131362E37302C302E3030303030302C31322C302E33362C312C313532353538333938375D2C5B302E3730303030302C3131332E3633323830332C33342E3734383830342C3131372E33302C302E3030303030302C31302C302E33362C312C313532353538333939315D2C5B302E3338303030302C3131332E3633323830322C33342E3734383830342C3131372E39302C302E3030303030302C31302C302E33382C312C3135323535383339393
//The 10th parameter: the length of the Content
type
//11th parameter: Content type
//The 12th parameter: 768
//The length of the Content content, in the second

```

35D5D7D

package command

OK

//The 13th parameter: Content content, included in the 2nd and 3rd package commands

AT+CHTTPDISCON=0

OK

//Disconnected from server

AT+CHTTPDESTROY=0

OK

//Destroy HTTP instance

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