SIM7000 Series_NTP _Application Note

LPWA Module

SIMCom Wireless Solutions Limited
Building B, SIM Technology Building, No.633, Jinzhong Road
Changning District, Shanghai P.R. China
Tel: 86-21-31575100
support@simcom.com
www.simcom.com

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SIMCom Wireless Solutions Limited
Building B, SIM Technology Building, No.633 Jinzhong Road, Changning District, Shanghai P.R. China
Tel: +86 21 31575100
Email: simcom@simcom.com

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About Document

Version History

Version	Date	Owner	What is new
V1.00	2017.11.19	Ping.Zhang	First Release
V1.01	2020.07.16	Wenjie.Lai	All

Scope

This document applies to the following products

Name	Type	Size(mm)	Comments
SIM7000E/C/A/G	Cat-M1(/NB1/EGPRS)	24*24	
SIM7000E-N SIM7000C-N	NB1	24*24	

Contents

1 Introduction

1.1 Purpose of the document

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

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

1.2 Related documents

[1] SIM7000 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 NTP Function

2.1 NTP

Network Time Protocol (NTP) is used to make computer time synchronization protocol, which allows the computer to its server or clock source (such as quartz, GPS, etc.) do synchronization, it can provide high-precision time correction (LAN with standard deviation of less than 1 millisecond between, WAN tens of milliseconds), and can be accessed by way of confirmation encryption protocol to prevent malicious attacks.

2.2 SNTP

SNTP: Simple Network Time Protocol.

SNTPV4 adapted from the NTP is mainly used to synchronize computer clocks in the Internet. SNTP for NTP function without full use of the situation. Compare previous NTP and SNTP versions, SNTPV4 introduction does not change the original NTP specification and implementation process, it is a further improvement of NTP support in a simple, stateless remote procedure calls to perform accurate and reliable mode of operation, which is similar to in the UDP / TIME protocol.

Currently SIM7000 series modules only support SNTP function module.

3 AT Commands for NTP

Command	Description
AT+CNTPCID	Set GPRS bearer profile's ID
AT+CNTP	Synchronize network time

3.1 AT+CNTPCID Set GPRS Bearer Profile's ID

AT+CNTPCID Set GPRS Bearer Profile's ID	
Test Command AT+CNTPCID=?	Response **+ CNTPCID: (**range of supported **<cid>**s**)** **OK** Parameters See Write Command
Read Command AT+CNTPCID?	Response **+ CNTPCID: <cid>** **OK** Parameters See Write Command
Write Command AT+CNTPCID=<cid>	Response **OK** If error is related to ME functionality: **ERROR** Parameters **<cid>** Bearer profile identifier, refer to AT+SAPBR
Reference	

3.2 AT+CNTP Sychronize Network Time

AT+CNTP Synchronize Network Time	
Test Command	Response

AT+CNTP=?	**+CNTP: (**length of **<ntp server>**， range of **<time zone>)** **OK**
	Parameter See Write Command
Read Command **AT+CNTP?**	Response **+ CNTP: <ntp sever>,<time zone>** **OK**
	Parameter See Write Command
Write Command **AT+CNTP=<ntp server>[,<time zone>]**	Response **OK**
	Parameter **<ntp server>** NTP server's URL **<time zone>** Local time zone, the range is (-47 to 48), in fact, time zone range (-12 to 12), but taking into account that some countries and regions will use half time zone, or even fourth time zone, so the entire extended four time zones X, so that when the time zone of the input integers are used, without the need for decimal. Time zone in front of the West if it is a negative number indicates the time zone.
Execution command **AT+CNTP**	Response **OK** **+CNTP: <code>**
	Parameter **<code>** 1 Network time synchronization is successful 61 Network Error 62 DNS resolution error 63 Connection Error 64 Service response error 65 Service Response Timeout
Reference	Note ● After successful synchronization time, you can use AT+CCLK to query local time.

4 NTP Examples

AT+SAPBR=3,1, "Contype","GPRS"	//Configure bearer profile 1
OK	
AT+SAPBR=3,1, "APN","CMNET"	
OK	
AT+SAPBR=1,1	//Open a GPRS context.
OK	
AT+CNTPCID=1	//Set NTP Use bear profile 1
OK	
AT+CNTP="202.120.2.101",32	//Set NTP service URL and local time zone //Note: Here's 32 actually represent 32/4=8, which means that eight East region, Beijing.
OK	
AT+CNTP	//Start Sync Network Time
OK	
+CNTP: 1	
AT+CCLK?	//Query local time
+CCLK: "13/09/11,20:23:25+32"	//Here's time zone may different with that in CNTP setting.
OK	