



SIM7020 Series_Ayla_Application Note

Version: 1.01

Release Date: May .10, 2019

About Document

Document Information

Document	
Title	SIM7020 Series_Ayla_Application Note
Version	1.01
Document Type	Application Note
Document Status	Released/Confidential

Revision History

Revision	Date	Owner	Status / Comments
1.01	May 10, 2019	Wenjie.lai	First Release

Related Documents

[1] SIM7020 Series_AT Command Manual_V1.03

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

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1 Purpose of this document

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

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

2 Ayla Cloud AT commands

2.1 AT+CAYLACFG Set Various Configuration Parameters

AT+CAYLACFG Set various configuration parameters	
Test command AT+CAYLACFG=?	Response +CAYLACFG: "feature","Value/mode"[,"mod_name","log_level"] OK Parameters See Write Command
Write command AT+CAYLACFG=<feature>,<value/mode>[,<mod_name>,<log_level>]	Response OK or ERROR Unsolicited result code: If fail, return: +CAYLACFG: <error code>
	Parameters This command is used to configure various parameters. The device number is determined by writing dsn and pubkey, and the oem is configured by writing oemid, oem model, and oem key, and the log level can also be set by the log command. <feature> "fdsn" Set DSN for factory production "fpubkey" Set up Pubkey for factory production "oem" Set oem id "model" Set oem model "key" Set oem key "region" Input area. In China, Unicom Elayun is set to "CNCU", others are set to "CN", and other countries in the world are set to "US".

	<p>"mfg_model" Writing production models</p> <p>"mfg_serial" Write the production serial number</p> <p>"uid" Set uid, the length cannot exceed 10.</p> <p>"time" Set the time in the format "YYYY-MM-DDThh:mm:ss"</p> <p>"log" Set the level of the log. The second parameter is "--mod" or "save". If it is "--mod", it must have a third and fourth parameter to set the log level. If it is "save", it means that the currently set log level has been saved to NVRAM, and the saved log level will be read when the Ayla connection is initialized.</p> <p><value/mode> Configure different values directly according to different features when <feature> is not "log".</p> <p>When <feature> is "log", this parameter must be one of "--mod" or "save". The save command will save the set log level to flash, and the next boot is also valid. If you do not execute save, The log level adjustment is only valid for this connection.</p> <p><mod_name> Refers to the log level of which unit needs to be configured. It can be mod, client, conf, dnss, notify, ssl, sched, test or all. all indicates that the log level of all units should be configured.</p> <p><log_level> The log level of a specific unit. The log levels that can be set include pass, fail, info, debug, debug2, metric, all, and none. All means to open all the cells of a unit or all units (<mod_name> is all), and none means to remove all logs. Note: ayla will have a minimum log level, including error and warning, even in the case of none, there will be log of error and warning level.</p> <p><error code> Use a numeric code to indicate the type of error.</p> <p>-1 indicates a time setting error.</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

2.2 AT+CAYLACFGCHECK Configuration Parameter Check

AT+CAYLACFGCHECK Configuration parameter check	
Test command	Response
AT+CAYLACFGCHECK=?	+CAYLACFGCHECK: "feature", "value"
	OK
	Parameters
	See Write Command

Write command AT+CAYLACFGCHE CK=<feature>,<value>	Response +CAYLACFGCHECK: <n> OK or ERROR
	parameters <n> Integer type, indicating the result of the check. 1 Check pass 0 Check failed <feature> string, check the name of the parameter. "fdsn" Check the DSN set at the time of factory production "fpubkey" Check the set pubkey "oem" Check the OEM id of the settings "model" OEM model for checking settings "key" OEM key used to check the settings "region" Check the input area "mfg_model" Check the written production model "mfg_serial" Check the written production serial number "uid" Check the written uid <value> string, check the value of the parameter.

2.3 AT+CAYLASET Reporting Data and Reading Data Sent by the Cloud

AT+CAYLASET Reporting data and reading data sent by the cloud	
Test command AT+CAYLASET=?	Response +CAYLASET: "name",(0-2),"value",(4-1024) OK
	Parameters See Write Command
Write command AT+CAYLASET=<name>,<type>,<value>,<len>	Response OK
	Parameters <name> Attribute name of the dynamic template configuration <type> Attribute data type of dynamic template configuration, 0 is an integer, 1 is a String type, and 2 is a Boolean type. <value> The value of the data that needs to be sent to the cloud, which needs to be set according to different <type>. When the integer <type> is 0, the value ranges from -2147483648 to 2147483647. When the string

	<p>type <type> is 1, the string length is 1024. When the Boolean type <type> is 2, the value can be 0 or 1.</p> <p><len> Integer value, length of <value>, when type is 0 and 2, <len> needs to be set to 4. When type is 1, the size of <len> needs the length of the actual string.</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	<p>Note</p> <p>Note that this command needs to be executed in the state of connecting to the cloud, otherwise it returns error.</p>

2.4 AT+CAYLASTATUS Query Cloud Server Connection Status

AT+CAYLASTATUS Query cloud server connection status	
Read command AT+CAYLASTATUS ?	<p>Response</p> <p>+CAYLASTATUS: <status>[,<reason>]</p> <p>OK</p> <p>Parameters</p> <p><status> Integer, indicating the current connection status.</p> <ul style="list-style-type: none"> 0 Not connected 1 Connecting 2 Connected <p><reason> Integer type, indicating the reason for the current connection.</p> <ul style="list-style-type: none"> 0 Unknown reason 1 Failed to get DNS 2 Failed to establish SSL connection 3 User manually disconnected 4 Network reasons

2.5 AT+CAYLASERVICE Set the AYL System Operating Mode

AT+CAYLASERVICE Set the AYL system operating mode	
Test command AT+CAYLASERVIC E=?	<p>Response</p> <p>+CAYLASERVICE: <n></p> <p>OK</p>

	Parameters See Write Command
Write command AT+CAYLASERVIC E=<n>	Response OK or ERROR
	parameters <n> Integer, indicating the Ayla mode of operation. <ul style="list-style-type: none"> 0 Ayla cloud connection will not be started automatically after booting, and it will take effect after the next boot. 1 Start the Ayla cloud connection automatically after booting, and the next boot will take effect. 2 Connect to the Ayla cloud immediately, if it is currently connected, the return fails. 3 Disconnect the current Ayla cloud connection. If it is not currently connected, the return fails.

2.6 AT+CAYLATEMPLATE Dynamic Configuration Template

AT+CAYLATEMPLATE Dynamic configuration template	
Test command AT+CAYLATEMPL ATE=?	Response +CAYLATEMPLATE: "id","name/version/flag",(0-2),(0-1)] OK
	Parameters See Write Command
Write command AT+CAYLATEMPL ATE=<id>[,<name /version/flag>[,<t ype>,<direction>]	Response OK or ERROR Unsolicited result code: If fail, return: +CAYLATEMPLATE: <error code>
	Parameters <id> has the following four parameter behaviors to choose from: <ul style="list-style-type: none"> "add" Dynamically add an attribute, cannot be used alone, need subsequent parameters, including attribute name, type, direction "del" Delete attribute, can be used alone, means to delete the entire template, such as with parameters, just need to add a property name to be deleted "oem_host_version" The version number corresponding to the

configuration template. Which template needs to be connected to the device after connecting to ayla. It can be configured with "oem_host_version", followed by a parameter, the version number of "oem_host_version".

"save" When the parameter followed by save is 1, save the template to NVRAM, indicating that the template has been added, the client can connect to Ayla cloud, and set the flag of the modified template to 1, the client cannot modify the template in this state.

If the parameter added after "save" is 0, only the flag of the template is set to 0, and the client can modify the configuration dynamic template again.

Note that this command cannot be executed when the cloud is connected or the cloud is already connected, and error will be returned.

<name/version/flag> When <id> is "oem_host_version", this entry is <version>, indicating the version number. When <id> is "save", this entry is <flag>, which takes 0 or 1, <id > When "add" or "del", this item indicates the name of the attribute.

<type> Integer, which can be 0, 1, 2, indicating the data type.

- 0 Integer
- 1 String type
- 2 Boolean

<direct> Integer, can be 1 or 0.

- 0 One-way, only device to server
- 1 Two-way, from server to device and from device to server.

<error code> Use a numeric code to indicate the type of error.

-1 Indicates that the template is not currently in edit mode, and the template cannot be operated. If you need to operate the template, you need to execute "AT+CAYLATEMPLATE=save,0" first.

-2 Indicates that the current "Oem_host_version" value cannot be modified in edit mode. To modify, you need to execute "AT+CAYLATEMPLATE=save,1" first.

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

2.7 +CAYLARECEV Reporting data

+CAYLARECEV Reporting data

It indicates that the data received by the cloud is reported to the URC.

	Response +CAYLARECEV: <name>,<data>
	Parameters <name> Template attribute name. <data> The value corresponding to the attribute, which can be an integer, a string type, and a Boolean type.

2.8 +CAYLASTATUS Connection Status

+CAYLASTATUS Connection Status	
Indicates the current cloud server connection status and reports it to the URC.	
	Response +CAYLASTATUS: <status>
	Parameters <status> Integer type, indicating the current connection status. 0 not connected 1 Connecting 3 Connected

3 Bearer Configuration

Usually module will register PS service automatically.

3.1 PDN Auto-activation

AT Command	Response	Description
AT+CPIN?	+CPIN:READY OK	Check SIM card status
AT+CSQ	+CSQ: 20,0 OK	Check RF signal
AT+CGREG?	+CGREG: 0,1 OK	Check PS service
AT+CGACT?	+CGACT: 1,1 OK	Activated automatically
AT+COPS?	+COPS: 0,2,"46000",9	Check operator information 46000 is Numeric <oper>

	OK	9 is NB-IOT network
AT+CGCONTRDP	+CGCONTRDP: 1,5,"cmnbiot","100.80.73.123.255.255.0"	Attached PS domain and got IP address automatically
	OK	

3.2 APN Manual configuration

If not attached automatically, could configure correct APN setting.

AT Command	Response	Description
AT+CFUN=0	+CPIN: NOT READY OK	Disable RF
AT*MCGDEFCONT ="IP","cmnbiot"	OK	Set the APN manually
AT+CFUN=1	OK	Enable RF
	+CPIN: READY	
AT+CGREG?	+CGREG: 0,1 OK	Inquiry PS service
AT+CGCONTRDP	+CGCONTRDP: 1,5,"cmnbiot","100.80.73.123.255.255.0"	Attached PS domain and got IP address automatically
	OK	

4 Ayla Cloud Process

AT Command	Response	Description
AT+CAYLACFG="fdsn",SC000W000017745	OK	Configure dsn
AT+CAYLACFG="oem",528225f6	OK	Configure oem id
AT+CAYLACFG="model",ledevb	OK	Configure model
AT+CAYLACFG="key",17b0bdd6fe06f210f7faf c0d224317b3	OK	Configure oem key
AT+CAYLACFG="pubkey","MIIBCgKCAQEAtn 3WFFJtaZCpTOG/4CPje6QZw5U8j61aoDuvxg RDW33MBTzrI5fwR7VXAVKtSLvTZma3AZgzw Zp9XrmTcvEPN9t4vFam+/Y0bSKqoI3fEuGq8 0qH5G4+nkVvZcwoSak9Q8KpDrHjj0FLOZA5	OK	Configure pubkey, Note that there should be no line breaks in the middle of the key data string.

<p>KpCytXiwHUb00+gm54kxRleTmCix41kFCkTd +BcU/yo1eFGF9z2oJtCPXqJnADSb+v2/ChQQ TrPNnoWTj/p3UIVq/a/W4SdK5BITeJOTi2FOx 2JGEInxujKk10WFx8zykg5kaKZqEnasH+Ao1F 1lyql7Sr4RTOSouQw19AwrClk7y6X8TQcEycQ y0ldz1t1gE6pwwIDAQAB"</p>		
AT+CAYLACFG="region",CN	OK	Configure region (CN or US, Unicom Ella is set to "CNCU")
AT+CAYLACFG="uid",SIM1001	OK	Configure uid
AT+CAYLATEMPLATE=add,intinput,0,1	OK	<p>Create a template dynamically, and refer to the corresponding AT command for the detailed meaning of the parameters. The example shows that the created template has 5 attributes. The template created here must correspond to the one created in the Ayla cloud server. Otherwise, the connection will send and receive data.</p> <p>After the dynamic template is created, you must send a save command to save it to the flash. Otherwise, it will not be saved.</p> <p>After the template is saved, you must configure the template version number. Note that this version number must correspond to that created in the Ayla Cloud Server, otherwise the template will not match when connected.</p>
AT+CAYLATEMPLATE=add,boolinput,2,1	OK	
AT+CAYLATEMPLATE=add,stringinput,1,1	OK	
AT+CAYLATEMPLATE=add,version,1,0	OK	
AT+CAYLATEMPLATE=add,outputint,0,0	OK	
AT+CAYLATEMPLATE=save,1	OK	
AT+CAYLATEMPLATE=oem_host_version,"1.5_sim7020"	OK	
AT+CAYLACFGCHECK=fdsn,SC000W000017745	+CAYLACFGCHECK: 1	Check that the current configuration parameters are correct.
AT+CAYLACFGCHECK=oem,528225f6	OK	
AT+CAYLACFGCHECK=model,ledevb		
AT+CAYLACFGCHECK=key,17b0bdd6fe06f210f7fafc0d224317b3		
AT+CAYLACFGCHECK="fpubkey","MIIBCgKCAQEAtn3WFFjTaZCpTOG/4CPje6QZw5U8j61aoDuvxgRDW33MBTzrI5fwR7VXAVKtSLvTZma3AZgzWZp9XrmTcvEPN9t4vFAM+/Y0bSKqol3FEuGq80qH5G4+nkVvZcwoSak9Q8KpDrHjjJ0FLOZA5KpCytXiwHUb00+gm54kxRleTmCix41kF		

CkTd+BcU/yo1eFGF9z2oJtCPXqJnADSb+v2/C
hQQTTrPNnoWTj/p3UIVq/a/W4SdK5BITEjOti2
FOx2JGElInxujKk10WFx8zykg5kaKZqEnasH+A
o1F1lyql7Sr4RTOSouQw19AwrClk7y6X8TQcE
ycQy0ldz1t1gE6pwwIDAQAB"

AT+CAYLACFGCHECK="region",CN
AT+CAYLACFGCHECK=uid,SIM1001

AT+CLTS=1 or AT+CCLK="18/10/10,13:03:36+32"	OK	The setup module automatically synchronizes the base station time. Manually set the module clock time
AT+CAYLASERVICE=2	OK	Start connecting Ayla Cloud
	+CAYLASTATUS: 2	
AT+CAYLASERVICE=3	OK	Disconnect the current Ayla cloud connection
	+CAYLASTATUS: 3	
AT+CAYLACFG=log,--mod,all,all	OK	Configure the Ayla log level to see which logs need to be printed. The log level configuration needs to take effect after connecting the Ayla cloud.
AT+CAYLACFG=log,--mod,all,none	OK	
AT+CAYLACFG=log,--mod,all,debug	OK	
AT+CAYLACFG=log,--mod,all,debug2	OK	
AT+CAYLACFG=log,save	OK	
AT+CAYLASET="intinput",0,123,4	OK	The module reports various data to the cloud. For detailed format, please refer to the corresponding AT command.
AT+CAYLASET="boolinput",2,1,4	OK	
AT+CAYLASET="stringinput",1,"abcdef",6	OK	
AT+CAYLASET="outputint",0,456,4	OK	
AT+CAYLASET="version",1,"v1.0012",8	OK	
	+CAYLARECEV: intinput,666	Received data sent by the cloud and reported by the URC.
	+CAYLARECEV: boolinput,1	
	+CAYLARECEV: stringinput,abab	

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