Debugging and Development Process of series of SIM900 (A)
module development board

1 Summary:

SIM900(A) module uses a serial port (UART) to communicate, and all of our SIM900(A) development boards include TTL and a set of RS232 level interface.

Using the standard AT commands to control SIM900(A) module for calling, sending messages and other functions. So, what you have to do is using your controller (including the microcomputer and computer, etc.) to connect to TTL or RS232 interface of our SIM900(A) module.

You can send AT command via a serial port after connecting hardwares.

2 Debugging SIM900(A) Module With a Computer

We recommend to use a computer first and then a single-chip microcomputer to control the module.

2.1 Hardware connection instructions(See attached figure)

When using a computer to debug our module, you will (must) need an equipment to link SIM900(A) module with computer. Common debugging equipments are USB - TTL module and USB - 232 serial port line {as shown in the above}. In fact, all of the USB devices need different drive according to the system. So, when using the USB device for debugging module, you must make sure that you have installed the driver at first. If you don’t know which kind of driver is the right one, you can search it from sharing information of our QQ
group, or turn to Baidu. Searching with the specific name of USB device (must
be the name of the chip) and system name, such as “CH340 wln 7 64 - bit
drivers”, and then you tend to find the right driver.

After installing the driver, you need to test whether the driver corresponds
with the USB device. Method is clicking my computer - property - hardware
manager – COM with mouse, finding the generated COM (it will typically
contain the name of the USB device chip, such as * * * * * CH340 COM2) by
system after installing USB device, note that if the system don’t generate the
COM for this equipment, it is likely that the installed driver is not correct or USB
device has been damaged. Then you need to install the driver or replace USB
debugging equipment.

If finding corresponding COM, you can test USB device and driver with
software as serial debugging assistant. Put the USB device into a TTL
interface or RS232 interface, connect transceivers with lines, for example, link
the TXD and RXD of the USB - TTL device’s TTL interface together, or link
needle 2 and 3 of serial port in the USB – 232 device’s RS232 interface (there
are marked numbers in the right place) together. After configuring serial
assistant (including selecting corresponding COM and open the serial port),
then send any data to check whether it can receive the same data.

If the data received is the same as the sent one, it is sure that the USB
device and driver are OK, so you can continue to test SIM900(A) module; If the
data is missed or not correct, then check your USB device and driver again,
until pass the test until, and then you can continue the following test.

If the USB device has passed the test, you can test the SIM900(A) module
by the device. Having operated these method, please make sure the
device in your hand is USB - 232 or USB - TTL, because many customers
do not know their own equipment exactly and always mess up wires.

Hardware connection for USB-TTL and SIM900(A) module: (very
important)

TXD in TTL interface of USB-TTL------RXD in TTL interface of SIM900(A)
RXD in TTL interface of USB-TTL-----TXD in TTL interface of SIM900(A)  
GND of USB-TTL-----GND of SIM900(A)  

{If it is not passed according to the method above, you can keep GND and exchange T adnd R for some microcomputer has wrong definition it self, thus it will not damage the module. If you really don’t know how to do this, please contact 1145509517 – QQ and input KUNS Science and Technology to join in the group.}  

Hardware connection for USB-232 and SIM900(A) module: (This connection is only for V1 of SIM900(A) module series, because this series have a group of RS232 interface, and the RS232 port is simplified into three needles, namely: PCRXD, PCTXD and GND)  
TXD in 232 interface of USB-232-----RXD in 232 interface of SIM900(A)  
RXD in 232 interface of USB-232-----TXD in 232 interface of SIM900(A)  
GND of USB-232-----GND of SIM900(A)  

In addition, you need to power SIM900(A) module.  

![Image of SIM900(A) debugging setup](image)  
5V电源+USB转232测试  
【实景拍摄】  

**Note here: the +5V pin is to power the module.**  

Common hardware connection error:  
1: +5V is for module power supply pin, and it needs at least 1A power supply, do not literally lead a dupont line for power supply from the microcontroller.
2: Not understand your USB device clearly, don't know whether the USB device is USB-TTL or USB-232 module, or do not make sure the level of the SIM900(A) module interface. We commonly use TXD RXD to define TTL level interface, and use R900 T900 GND to define RS232 interface! (as shown in the right)

3: Not link GND (have not linked GND between modules)

4: The power supply is connected inversely. But this problem is very easy to find for our SIM900(A) module is almost self-starting, and there is a LED light on it. Once power on, the LED will light up.

5: Don't overvoltage or undervoltage. Common power supply voltage is 5V (except for special version), the current is 1A or above (recommended 2A or above). For the power adapter to provide current at least 1A, considering the parameters of the qi, we recommend 5V/2A power supply. Of course, power supply 5V/3A or more than 3A will be better, so that the power will not damage the module.

Some USB devices will provide a 5V power supply, but most adapter like this cannot meet the requirements. When power is not enough, the light keeping on will twinkle, the other light may keep on a few seconds and then begin to flicker. If you send instruction to the module, the replied data (which may be a few data) will be displayed on the left side of the alignment in the software, for the module will send some data when initiated and restart every some time if power can not meet the requirements, so the module will send data via a serial port, and the data you send will display after the content of the reply. The replied data don’t appear on the left side of the display in the software, this is obviously the performance of the power is not enough. The other method is calling the number of the module to check if it works normally, if you can dial and remain in the dial, it is clear that the module is working properly; if hang up immediately after dialing, it is likely to be not powered...
enough; If unable to dial, the module didn't work properly. At the same time, you can also approximately judge its working state according to the network LED on the module (the light always be flashing) to determining the of the module.

When power supply is no problem, if the network LED still fast blink, you can replace a using mobile or unicom card to try again, considering that the SIM card is not compatible with the module. (this case is rare)

2.2 Command Operation Instruction

We provide two documents for AT command, one is the AT command set (manufacturer), the other is the debug tutorial - detailed version (we write our own).

The AT instruction set written by manufacturer is the most authoritative, if having any questions about a command, you can find the instruction set to get answers. We offer a conclusion of common features of AT command set needed, that is to say, we put the different instructions together according to the realized function for helping you to master the module quickly.

we have provided some experience for the instructions to realize some functions needed, but it may still have problems.

Common problems while operating instructions:

1: Dialling instruction is ‘ATD * * * *;’, and ‘ * * * * ’ is other’s phone number, pay attention to ‘ ; ’ at the back of the instruction.

2: Message cannot be sent out. If there is error when executing the instruction, consider the module is not normally working.

The simple method is to dial the telephone number in the module, if get
through, generally speaking that module is normally working. If the tip is power off, the module don't work normally, you can use 'AT + CPIN?' to check whether the module read the card. If the reply display having not read card, check whether the power supply meet the requirements and then consider replacing the larger current adapter. Having replaced the adapter still appear this problem, Considering this SIM card may be not compatible with the module, change a SIM card. According to the manufacturer's reply, try to choose a SIM card with big chip rather than a new card (for internal firmware modules may not support).

If executing each instruction to the end and every one is OK, then consider to add the command 'AT + CSCA?' to set the SMS center number.

3: instruction without reply. ① The first instruction executed after module startup must be capital; ② Hardware connection is not correct, including no Commons and signal wire connection error; ③ Each instruction without carriage-return character. Using our serial assistants need to check sending the new line, and other serial assistant can press enter after instructions to be sent out all.

4: Command response error. ① Instruction format error. Must perform in accordance with instructions we provided. For example, the ‘AT + CPIN?’ must have ‘?’ behind, if not, it is wrong. ② Module performs an error. The instruction performs not successfully, for example, the module will reply ERROR after sending ‘AT + CPIN?’ if not read the card. The other example is Here should not execute this command. Some instructions are in the order, that is the premise of the successful execution of the current instruction is other instructions to run successfully.

5: Hex sending problem. Many functions' final instructions on the module are sending a hexadecimal 1A, while in a serial port assistant is to check the HEX, then input 1A to click on the send button. Here don't send 1A or 0X1A in string etc, these are all wrong.

3. Using single-chip microcomputer to control module
Hardware connection

3.1 MCU and SIM900(A) module has their own respective power supply system,

- TXD of MCU ---- TXD of the module
- RXD of MCU ---- RXD of the module
- GND of MCU ---- GND of the module
- +5V of the module connects DC5V
- GND of the module connects power ground

The MCU must be powered on by corresponding power supply.

3.2 MCU and SIM900(A) module be powered on by a 5V/2A adapter, as many clients often said, use MCU’s power to support the module.

- TXD of MCU ---- TXD of the module
- RXD of MCU ---- RXD of the module
- +5V of the module connects DC5V

MCU and SIM900(A) module be powered on by a 5V/2A adapter.

Specific wiring please turn over the appended drawing
MCU and SIM900(A) development board connection method.

1. Send a short message to call.
2. Receive short messages to control relays.

PC test (connect USB-TTL device testing) method.

Any other question can seek advice.

telephone: 15620323981 and QQ: 1145509517