



SIM7600E-H 4G HAT

Overview

The SIM7600E-H 4G HAT is a 4G/3G/2G communication and GNSS positioning module, which supports LTE CAT4 up to 150Mbps for downlink data transfer. it is pretty low power consumption.

You can connect this 4G module with computer to surf the Internet, or attach it onto Raspberry Pi to enable functions like 4G high speed connection, wireless communication, making telephone call, sending SMS, global positioning, etc.

Note: this is a region-specific module, please check the supported bands before placing order.

Features

- Raspberry Pi connectivity, compatible with Raspberry Pi Zero/Zero W/Zero WH/2B/3B/3B+
- Supports dial-up, telephone call, SMS, MMS, mail, TCP, UDP, DTMF, HTTP, FTP, etc.
- Supports GPS, BeiDou, Glonass, LBS base station positioning
- Onboard USB interface, to test AT Commands, get GPS positioning data, and so on
- Onboard CP2102 USB to UART converter, for serial debugging
- Breakout UART control pins, to connect with host boards like Arduino/STM32
- SIM card slot, supports 1.8V/3V SIM card
- TF card slot for storing data like files, messages, etc.
- Onboard audio jack and audio decoder for making telephone call
- 2x LED indicators, easy to monitor the working status
- Onboard voltage translator, operating voltage can be configured to 3.3V or 5V via jumper
- Baudrate: 300bps ~ 4Mbps (default: 115200bps)
- Autobauding baudrate: 9600bps ~ 115200bps
- Control via AT commands (3GPP TS 27.007, 27.005, and V.25TER command set)
- Supports SIM application toolkit: SAT Class 3, GSM 11.14 Release 99, USAT
- Comes with development resources and manual (examples for Raspberry Pi/Arduino/STM32)





Note: Does not contain Raspberry Pi

Communications Specifications

	LTE	WCDMA / TD-SCDMA / CDMA 2000	EDGE	GSM/GPRS	
Band	LTE-FDD B1/B3/B5/B7/B8/B20 LTE-TDD B38/B40/B41	UMTS/HSPA+ B1/B5/B8	GSM/GPRS/EDGE 900/18	00 MHz	
Generation	4G	3G	2.5G	2G	
Emitting power	0.25W		0.5W@EGSM900 0.4W@DCS1800	2W@GSM900 1W@DCS1800	
Data Speed	LTE CAT 4 Uplink≤50 Mbps Downlink≤150 Mbps	UMTS Uplink≤384Kbps Downlink≤384Kbps HSPA+ Uplink≤5.76Mbps Downlink≤42Mbps	EDGE Uplink≤236.8kbps Downlink≤236.8kbps	GPRS Uplink≤85.6kbps Downlink≤85.6kbps	
SIM Card	Normal SIM (Not Included)				
Applicable Region	Southeast Asia, West Asia, Europe, Africa				

GNSS Specifications

- Receiver type
 - 16-channel
 - C/A code

- Sensitivity
 - Tracking: -159 dBm (GPS) / -158 dBm (GLONASS) / TBD (BD)
 - Cold starts: -148 dBm
- Time-To-First-Fix (open air)
 - Cold starts: <35s
 - Hot starts: <1s</p>
- Accuracy
 - Position: <2.5m CEP

SMS and Audio Specifications

- SMS
 - Supported types: MT, MO, CB, Text, PDU
 - Storage: USIM card and ME (default)
- Audio feature
 - Supports echo cancellation
 - Supports noise reduction

Other Specifications

- Power supply: 5V
- Operating voltage: 5V/3.3V (configured via jumper)
- Operating temperature: -30°C ~ 80°C
- Storage temperature: -45°C ~ 90°C
- Dimension: 56.21mm x 65.15mm

What's on Board





- 1. SIM7600E-H
- 2. CP2102 USB to UART converter
- 3. NAU8810 audio decoder
- 4. TXS0108EPWR voltage translator: translates 3.3V/5V into 1.8V
- 5. MP2128DT power chip
- 6. MP1482 power chip
- 7. Raspberry Pi GPIO header: for connecting with Raspberry Pi
- 8. SIM7600 control interface: for connecting with host boards like Arduino/STM32
- 9. SIM card slot: supports 1.8V/3V SIM card
- 10. TF card slot: allows file/SMS/... storage
- 11. 3.5mm earphone/mic jack
- 12. USB interface: for testing AT Commands, getting GPS positioning data, etc.
- 13. USB to UART interface: for serial debugging, or login to Raspberry Pi
- 14. MAIN antenna connector
- 15. AUX antenna connector
- 16. GNSS antenna connector
- 17. Power switch
- 18. Network status indicator
- 19. Power indicator
- 20. Operating voltage selection jumper:

VCCIO - 3.3V: set operating voltage as 3.3V

VCCIO - 5V: set operating voltage as 5V

21. UART selection jumper:

A: access Raspberry Pi via USB to UART

B: control the SIM7600 by Raspberry Pi

C: control the SIM7600 via USB to UART



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1. Hardware configuration

1.1. Hardware configuration

This module comes with GSM antenna, LTE antenna and micro USB cable. Besides these you should prepare a 4G sim card and a microphone cable with microphone:

- 1) Insert the SIM card to the card slot, Insert the headphone cable and connect the LTE antenna.
- 2) Connect the USB interface of SIM7600E-H 4G HAT to PC with a micro USB cable. Then the PWR indicator will keep bright.
- 3) Press the PWRKEY button and hold for 1s, the NET indicator will blink as below. Generally, the NET indicator will fast flash firstly (1 time per second), which means that the module has not logged in the Network. After logging in, the indicator become to flash slowly (1 time every three seconds). Up to the local LTE network, this process that logging in will last several seconds to dozens of seconds.



If you take too much time to log in and failed, please check that whether the LTE antenna is connected correctly, and whether the SIM card is usable and insert correctly.

4) Install SIM7600 driver (windows driver: www.waveshare.com/wiki/File:SIM7X00-Driver.7z) Open Device Manager to get the corresponding COM port number of SIM7600. For example, the AT Port is COM19 as below. Users need to choose the correct port according to the Manager. Figure: Devices Manager

- SimTech HS-USB AT Port 9001 (COM25)
- SimTech HS-USB Audio 9001 (COM24)
- SimTech HS-USB Diagnostics 9001 (COM28)
- SimTech HS-USB NMEA 9001 (COM27)

2. At Test Instructions

2.1. General AT commands

Commands	Description	Return
АТ	AT test command	ОК
ATE	ATE1: Enable echo ATE0: Disable echo	ОК
AT+CGMI	Module manufacturers	ОК
AT+CGMM	Module model	ОК
AT+CGSN	Serial number	ОК
AT+CSUB	Module revision	ОК
AT+CGMR	Firmware revision	ОК
AT+IPREX	Set baud rate	+IPREX: OK
AT+CRESET	Reset module	ОК
AT+CSQ	Check signal quality	+CSQ: 17,99 ОК
AT+CPIN?	SIM Card Status	+CPIN: READY
AT+COPS?	Operator selection	+COPS: OK
AT+CREG?	Network registration	+CREG: OK
AT+CPSI?	UE system infor	



Mode selection:	
2: Automatic	
13: GSM only	OK
38: LTE only	
48 : Any modes but LTE	

For more details, please refer to the documentation: Series_AT Command Manual_V1.07

SSCOM V5.13.1 Serial/Net data debugger,Author:Tintin,2618058@qq.com(Newest version)		– 🗆 ×
PORT COM_Settings Display Send_Data Multi_Strings Tools Help PCB打样那家强?		
AT	Send Multi Char etm32/GD32 TSP STC/TAP15 TSP	
OK		<u> </u>
OK STATE	CUrag split Koundbend help import	order delay
AT +CGMI	DEX Data [DbClick to Write notes]	
SIMCUM INCORPORATED	AT Seneral AI commands	<u>一一一六进制资源集1 1 1000</u>
OK		Enable acho 2 1000
AT +CGML	AT +CONE	Module manufacturers0 1000
2TWCOW_2TW1000CE_1	AT +COM	Module model 0 1000
OK	AT +COSH	Serial number 0 1000
AT +CGSN 861477036455739	AT+CSUB	Module revision 0 1000
001411000400100	AT+COR	Firmware revision 0 1000
OK	AT *IPREX?	Baud rate 0 1000
AT +CSUB +CSUB : BDBVD3	AT +CRESET	Reset module 0 1000
+CSUB: MDM9x07_AP_S_22_V1.36_180402	AT +CSQ	Signal quality 0 1000
	AT+CPIN?	SIM Card Status 0 1000
UN AT +COMB	AT+COPS?	Operator selection 0 1000
+CGMR: LE11B08SIM7600M22	AT *CREG?	Network registration 0 1000
07	AT+CPSI?	UE system infor 0 1000
UK AT+TPREX?	AT+CN0EP=13	auto mode selection 0 1000
+IPREX: 115200	ATOY	factory settings 0 1000
	Phone Calls AT commands	18无注释 0 1000
UK AT HTSD	AT*CNUR	Phone number 0 1000
+CSQ: 21,99		handset output 0 1000
07		where have a statistic of 1000
UK AT+CPTN?	AI (LYLT2	22Ware 0 1000
+CPIN: READY	ATD(phonepupher)	
or	AT+CHUP	Hang up call 0 1000
AT+COPS?		26None 0 1000
+COPS: 0, 0, "CHINA MOBILE CMCC", 7	AT+CLIP=1	Phone ring 0 1000
or	Serial output: RING-	Phone ringing 0 1000
AT +CREG?	ATA	Call answer 0 1000
*CREG: 0, 1	AT +CHUP	Hang up call 0 1000
or	AT+CFUN=1	31None 0 1000
AT+CPSI?	SMS AT commands-	32None 0 1000
+CPSI: LTE, Online, 460-00, 0x27B4, 45847298, 468, EUTRAM-	AT +CMGL="ALL"	List all messages 0 1000
BAND39, 38400, 5, 5, -121, -1060, -722, 9	AT +CMGR=0	Read message 0 1000
OK	AT+CMGD=0	Delete message 0 1000
AT+CHMP=2	AT+CNOLL=2, 1	message indications 0 1000
AU AU		37None 0 1000
	Sending English meassage	38None 0 1000
		select message formalU 1000
	AT 1000- 000	elect IE character sU 1000
	AT 47872 = "(a) an annual an "	Sectore and Sector
	Walls Weyerbare	Send nessage 0 1000
		Ressage 0 1000
v		o 1000 v
ClearData OpenFile SendTile SendTile SendTile	DnTop I English SaveConfi e Hide -	
ComMum COMM25 SinTech HS-USB AT Port	dEvery 1000 ns/Tin AddCrLf	
Bronfine A More Settings Show Time and Packe OverTime 20 mm Nol1 BytesTo # 5	▼ VerifyNone ▼	
RIS F DIR BaudRat 115200	^	
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【升级到新版本SSCOM5.13.1】 嘉立包SMU贴片工程费50元,每焊盘1分钱!▲Wi-Fi Gprs GPS Lora 射频	真组,在找性价比最高的?	
www.daxia.com S:0 R:0 COM25 Closed 115200bps.8,1,None,None		

2.2. Make calls and answer calls

- Insert the SIM card, connect the LTE antenna and connect the USB interface of SIM7600E-H 4G HAT to PC. Then press the PWRKEY to power on the board;
- 2) Check whether the indicators blink correctly (PWR's and NET's flashes).
- 3) Send AT commands as bellow:

Commands	Description	Return



AT+CNUM	Phone number (Not all SIM cards Support)	+CNUM OK
AT+CSDVC	AT+CSDVC=1: Handset output AT+CSDVC=3: Speaker output	ОК
AT+CLVL=?	check volume level	ОК
AT+CLVL=2	volume level set to 2	ОК
ATD <phone_number>;</phone_number>	Make calls	ОК
AT+CHUP	Hang up call	ОК
AT+CLIP=1	Phone ring	ОК
ΑΤΑ	Call answer	ОК

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PORT COM Settings Display Send Data Multi Strings Tools I	Help	PCB打样那家强?			
AT +CNUM	Ser	d Multi Char			
OK	_				
AI +USUVU=1		Phone Calls AT commands	18无注释	0	1000 ^
AT +CLVL=?		AT +CNUM	Phone number	0	1000
+CLVL: (0-5)		AT +CSDVC=1	handset outpu	: 0	1000
0F		AT +CLVL=?	check volume le	rel O	1000
AT +CLVL=2		AT +CLVL=2	volume level set	tingO	1000
OK			23None	0	1000
ATD10086;		ATD <phonenumber>;</phonenumber>	make a call	0	1000
JN .		AT +CHUP	Hang up call	0	1000
VOICE CALL: BEGIN			26None	0	1000
AT +CHUP		AT +CLIP=1	Phone ring	0	1000
VOICE CALL: END: 000007		Serial output: RING	Phone ringin	<u> </u>	1000
OK		ATA	Call answer	0	1000
AT+CLIP=1		AT +CHUP	Hang up call	0	1000
OK		AT +CFUN=1	31None	0	1000
RTNG		SMS AT commands	32None	0	1000
		AT +CMGL="ALL"	List all messag	es O	1000
+CLIP: "15 168", 161, , , , 0		AT +CMGR=0	Read message	0	1000
ATA VOTCE CALL: RECTN		AT +CMGD=0	Delete messag	, 0	1000
VOICE CALL. DEGIN		AT +CNMI=2, 1	message indicati	ons O	1000
OK			37None	0	1000
AT +CHUP		**Sending English meassage**	38None	0	1000
VUICE CALL: END: UUUUU7		AT +CMGF=1	Select message f	rma O	1000
ОК		AT +CSCS="GSM"	elect TE charact	r s O	1000
		AT +CSMP=17, 167, 0, 0	set text mode p	ara O	1000
		AT +CMGS=" <phonenumber>"</phonenumber>	Send message	0	1000
		Hello, Waveshare	message	0	1000
	₹.	1A	End sending	0	1000
			45None	0	1000
~ · · · · · · · · · · · · · · · · · · ·		**Sending Chinese message**	46None	0	1000 🗡
ClearData OpenFile Sen	lFil.	Stop ClearSend OnTop V English SaveConfig Hide -			
ComNum COM25 SimTech HS-USB AT Po: - HEXShow SaveData Receiv	redT	File SendHEX SendEvery: 1000 ms/Tim AddCrLf			
🔘 OpenCom 🥐 More Settings 🔽 Show Time and Packe OverTime	20	ms No 1 BytesTo 末尾 ▼ VerifyNone ▼			
□ RTS IV DTR BaudRat 115200 - abcdefg		~			
为了更好地发展SSCOM软件 请您注册嘉立创作结尾客户		~			
【升级到新版本SSCOM5.13.1】 嘉立创SMT贴片工程费50元,每焊盘1分钱!.	≜ ₩i	Fi Gprs GPS Lora 射频模组,在找性价比最高的?			
www.daxia.com S:0 R:0 COM25 Closed 115200bp	s,8,	,None,None			//

2.3. Send and receive messages

- Plug the SIM card, connect the LTE antenna and and connect the USB interface of SIM7600E-H 4G HAT to PC. Then press the PWRKEY to power on the board;
- 2. Check whether the indicators blink correctly (PWR's and NET's flashes).
- 3. Send AT commands as bellow:





	Commands	Description	Return
AT	+CMGF=1	select message format	ОК
A٦	F+CSCS="GSM"	Select TE character set: GSM	ОК
AT	+CSMP	set text mode para	ОК
AT ml	"+CMGS=" <phonenu per>"</phonenu 	Send message	ОК
AT	+CNMI=2,1	message indications	ОК
AT	+CMGR=1	Read message 1	ОК

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PORT COM_Settings Display Send_Data Multi_Strings Tools	Help PCB打样那家强?		10	. 00 100	1704	\bigcirc
AT	Send Multi Char stm32/GD32 ISP STC/IAP15 ISP			+80 188	1704	U
AT+CMGF=1	SHS AT comands	32Hone 0 1000 ^				
OK	AT *CHGL="ALL"	List all messages 0 1000	SIM7	600CE-HAT 中芽	E I	
AT+CMGS="134. 101"	AT+CNGR=0	Read nessage 0 1000			•	
	AT+CR6D=0	Delete message 0 1000	又短1	言友达测试		
> Send message test:	AT+CHNE=2, 1	message indications 0 1000				
+CMGS: 15	- set and in a fault of an annual to	3/Hone 0 1000		PET 10-50		
	AT+THERE	Calleat persons forma 0, 1000		昨天 10-52		
OK	AT+CSCS="GSH"	sleet TE character x0 1000				
	AT+CSMP=17, 167, 0, 0	set text mode para 0 1000	Send	message test!		
	AT+CHGS=" <phonenumber>"</phonenumber>	Send nessage 0 1000				
	Hello, Waveshare	message 0 1000				
	IX 1A	End sending 0 1000				
		45None 0 1000				
	Sending Chinese message	46Hone 0 1000				
		select message forms 0 1000				
	AT+COP=17 167 2 26	slect IE character sto 1000				
	AT *CHES * 1011033003400330032003100310039003100300031 *	rending persona 0 1000				
	00530049004D00370036003000584E2D658777ED4FE16D488BD5	message 0 1000				
		End sending 0 1000				
		53Hone 0 1000				
	TCP/IP Comunication At commands	54None 0 1000				
	AT+CGDCONT=1, "IP", "CIDNET"	PBP context 0 1000				
	AT+CGRE0?	GPRS network status 0 1000				
	AT+CIPMODE=1	TCP/IP node 0 1000				
	AT+CSUCKETPS=1	PDP profile num 0 1000				
	AT +NETOPEN	0 1000 v				
ClearBata OpenFile	endFile Stop ClearSend OnTco Findish SaveConfig Hide -					
ConNew OWES SinTach HS-HSB AT Prov	aiwadTaBila SandBET SandBrave 1000 ns/Ting addrel f					
Contraction of the second seco	20 m Nol Britario to Tar Varify None					
BTS F DTB BaudRat 115200 - abodefg	ne to mpino, pyterio *K ◆retity tono		[O]	A) 短信/彩		
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PORT COM Settings Display Send Data Multi Strings Tools Help PCB打样耶密强?			
-CMT1: "SM", 20			
OK 26None		0 1	000
AT+CUIP=1	ng	0 1	1000
-CUNK: REC RELD , # 5010	ging	0 1	1000
7400650073007400200066006F0072002000530049004D0037003600300038FF01	/er	0 1	000
AT+CHUP Hang up o	all	0 1	000
OK		0 1	1000
SMS AT commands 32None		0 1	1000
AT +CMGL="ALL" List all me	sages	0 1	1000
AT+CMGR=0 Read mess	age	0 1	1000
AT 4CM6D=0 Delete mes	sage	0 1	1000
AT-CRUCT=2, 1 nessage indi	ations	0 1	1000
37None		0 1	,000
*Sending English meassage** 38None		0 1	.000
AT +CMCF=1 Salect messag	2 forma	0 1	.000
AT+CSCS= GSM sleet TE char	acter s	0 1	.000
AT+CSM2=17, 167, 0, 0 set text mod	e para	0 1	.000
AT+UMCS= (phonenumber) Send mess	age	0 1	.000
Hello, Waveshare messag			.000
	ng		.000
			.000
Sending Lhinese message 46None	_		.000
A Tundy=1 select message	2 forma		.000
A TOSLO-USZ sleet If char	acter s		.000
	e para		.000
	sage		1000
	Red an		
	End Ser	Iurn	<u>s</u>
ClearDate OpenFile SendFile Stop ClearSend OnTop Fights Severation file Hide -			
ComMun COM25 SinTech HS-USB AT Por			
Bore Setting Show Time and Packs OverTime 20 ms No1 Bytesto ≠ E v VerifyNone			
TOTE OF THE BANKBAT 115200 bbodefg			
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www.daxia.com S:0 R:0 COM25 Closed 115200bps.8,1,None,None			

2.4. GPS Debugging

Commands	Description	Return
	GNSS Power Control:	
AT+CGPS	AT+CGPS =1:Turn on	ОК
	AT+CGPS =0:Turn off	
	CNSS povigation information parced from NMEA contances	+CGNSINF:
AT+CGPSINFO	GNSS navigation information parsed from NIVIEA sentences	

- 1) Connecting the GPS antenna, and place the receiver on open area outdoor
- 2) AT+CGPS =1 //Turn on power of GPS
- 3) Open u-center and set the Port and Baudrate (NMEA Port,COM27)
 - SimTech HS-USB AT Port 9001 (COM25)
 - SimTech HS-USB Audio 9001 (COM24)
 - SimTech HS-USB Diagnostics 9001 (COM28)
 - SimTech HS-USB NMEA 9001 (COM27)
- 4) AT+CGNSINF // Print the GPS information
- 5) AT+CGPS =0 //Turn off power of GPS



T 40/2827989=1	A Cond Walki Charal a co (anon you have for our you	1	
K Avantation	Send Multi Char stm32/GD32 ISP STC/IAPI6 ISP		
E	C-Drag split RoundSend help Import	ord	er delay _
GLGSV, 3, 1, 12, 86, 30, 033, 33, 87, 26, 326, 29, 71, 37, 059, 36, 78, 01, 330, *68	HEX Data (DbClick to Write notes)	Send(note) + -	ns.
6L63V, 3, 12, 65, 16, 177, 88, , 85, 02, 080, 72, 46, 133, 452	AT	AT test command	1 1000
GPOSV, 3, 1, 12, 02, 22, 268, 20, 05, 02, 210, 26, 06, 50, 307, 46, 09, 16, 125, 27*7C	ATEI	Enable echo	3 1000
ercos, 5, 2, 12, 11, 55, 016, 46, 13, 46, 46, 26, 51, 154, 52, 05, 13, 040, *74 ercos, 12, 12, 12, 12, 12, 10, 165, 24,, 30, 02, 178, *7C	ALEU	Bisable echo	2 1000
BDCSV 4, 1, 13, 01, 49, 127, 02, 46, 237, 03, 63, 188, 04, 31, 109, *68		e T:+ \$2	0 1000
BIOSY, 4, 2, 13, 09, 11, 182, 10, 52, 223, 11, 34, 064, 13, 47, 320, *6F		6天:注释	0 1000
BDOSV, 4, 4, 13, 17, 40, 142, #5F		7于注释	0 1000
			0 1000
GRVTG, 0, 0, T, 2, 3, M, 0, 0, N, 0, 0, K, A*3C GRVTME, 19221, 00 A, 2922, EDLAGE N, 11404, 602141, N, 0, 0, 0, 210518, 2, 3, M, A*3	AT+CHMP=38	LTE mode	0 1000
MRML, 102241.00, N, 2232.051636, N, 11404.655141, E, 0.0, 0.0, 210516, 2.3, N, W-3	AT +CMNB=2	NB-IoT mode	0 1000
GPGSA, A. 2, 03, 06, 09, 17, 19, 28, , , , , , 1, 4, 1, 1, 0, 9*37	AT+NBSC=1	Scrambling Feature	0 1000
BOSA, A. 2.,, 1.4, 1.1, 0.3424 BOSA, A. 2.,, 1.4, 1.1, 0.3424	AT+CSQ	Signal quality repor	0 1000
I+CGRSTST=0	AT +CGATT?	Check attach service	0 1000
+CGRSINF	AT+CPSI?	Inquiring UE info	0 1000
CONSINT:	AT +CGNAPN	Get network apn	0 1000
1, 201002, 102240, 000, 22, 042,00, 114, 010219, 00, 000, 0, 00, 0, 0, 1, 1, 1, 1, 4, 0	AT+CSTT="otn"	Set APN	0 1000
	AT+CIICR	Bring up connection	0 1000
+CGRSPWR=0	AT+CIFSR	Get local address	0 1000
<u>K</u>	AI*CIPSIANI* ICF , 113.81.232.178 , 1822	Start up connection	0 1000
	wills Hanshare STR7000V TCP Test	Send data	0 1000
	AT+CTPCIOSE=1	data .	0 1000
		Boostinets context	0 1000
		24平注释	0 1000
		GPRS-	0 1000
	AT+CHMP=13	GSM/GPRS mode	0 1000
	AT+NESC=1	Scrambling Feature	0 1000
	AT+COPS?	Signal quality repor	0 1000
	AT+CGATT?	Check attach service	0 1000
	AT+CSTT?	Query available APN	0 1000
	AT+CSTT="cmnet"	set APN	0 1000
	AT+CIICR	Bring up connection	0 1000
	AT+CIFSR	Get local address	0 1000
	AT+CIPSTART="TCP", "113. 81. 232. 178", 1822	Start up connection	0 1000
	AT+CIPSEND=33	Send data	0 1000
	Hello, Waveshare SIM7000X TCP Test	data	0 1000
		Close connection	0 1000
	AI CITSIOI	peactivate context	0 1000
			0 1000
	AT+CGRSPWR=1	Turn on GNSS nower	0 1000
	AT+CGRSINF	Get GPS info	0 1000
	AT+CGRSPWR=0	trun off GNSS power	0 1000
		44无注释	0 1000
		45无注释	0 1000
		46无注释	0 1000
		47无注释	0 1000
		48无注释	0 1000
		49无注释	0 1000
		50无注释	0 1000
	v	51无注释	0 1000
ClearData OpenFile Stop ClearSend OnTop English SaveConfig	Hi del —		
The COURSE State by December 1 and the Country D	1		
ongrun conco simicon is ose ni ro. I REShow SaveData Acceivediorile SendREA SendREA SendRevery SUU MS/11mg/ Add	3		
CloseCom C More Settings Show line and Facke Overline 20 mcMol Byteslo 末度 Verity/None			
RTS DTR BaudRat 9600 -	^		





		~
🕐 u-center 7.02 - [Text Console]		<u></u>
💽 File Edit View Player Receiver Tools Window Help		×
••• ▼ ™ ▼ ½ ¾ ≏ ■ Ⅱ ● ▶ ▶ ▼ ≫ ₩]	.]	
x 2/1 2/2 4/2 G15 G2 G24 G26 G29 G	G5 G21 G18	- 50 - 40 - 30 - 20 - 10 dB
08:14:10 \$GPGLL,2232.467426,N,11404.392523,E,0814 08:14:10 \$GPGSA,A,2,15,24,02,,1,25,45,029,.29 08:14:10 \$GPGSV,2,108,15,72,310,21,26,45,029,.29 08:14:10 \$GPGSV,2,108,15,72,310,21,26,45,029,.29 08:14:10 \$GPENC,081410.000,A,2232.467675,N,11404. 08:14:10 \$GPENC,081410.000,A,2232.467675,N,11404.39 08:14:11 \$GPGGA,081410.000,232,24,67675,N,11404.39 08:14:11 \$GPGGA,081410.000,232,24,67675,N,11404.39 08:14:11 \$GPGGA,081410.000,232,24,67675,N,11404.39 08:14:11 \$GPGGA,081410.000,232,24,67675,N,11404.39 08:14:11 \$GPGGA,08141.000,232,24,67675,N,11404.39 08:14:11 \$GPGGA,2,25,24,67675,N,11404.392685,E,0814 08:14:11 \$GPGSV,2,1,08,15,72,310,21,26,45,029,.29 08:14:11 \$GPGSV,2,10,81,57,29,063,21,25,321,02,2 08:14:11 \$GPGSV,0,07,M,0.000,N,000,N,000,K,A*0D 08:14:11 \$GPTGA,0,07,M,000,000,000,K,A*0D 08:14:11 \$GPZDA,081411.000,17,11,2014,,*5A	1410.000,A,A*5D 1.00*05 29,40,244,18,24,34,171,43*79 ,23,136,32,18,15,295,*78 4.392523,E,0.000,0.0,171114,,, 392685,E,1,3,3.01,2.029,M,-1.5 1411.000,A,A*57 1.00*05 29,40,244,17,24,34,171,42*77 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,171114,,, 4.392685,E,0.000,0.0,0,171114,,, 4.392685,E,0.000,0.0,0,0,0,0,0,0,0,0,0,0,0,0,0,0	[↑] 1) 11 28
		- /

2.5. TF Card Test

- 1. Plug the SIM card, connect the LTE antenna and and connect the USB interface of SIM7600E-H 4G HAT to PC. Then press the PWRKEY to power on the board;
- 2. Check whether the indicators blink correctly (PWR's and NET's flashes).
- 3. Send AT commands as bellow:

Commands	Description	Return
AT+FSCD=D:	Select directory	ОК
AT+FSLS	list directories	+FSLS: OK
AT+CFTRANRX	write data into files	> OK
AT+CFTRANTX	open file	+CFTRANTX: OK



🆺 SSCOM V5.13.1 Serial/Net data debugger,Author:Tintin,2618058@qq.com(Newest version)		- 🗆 ×
PORT COM_Settings Display Send_Data Multi_Strings Tools Help PCB打样那家强?		
AT+FSCD=D:	Send Multi Char stm32/GD32 ISP STC/IAP15 ISP	
*F368. 8.7	AT+NETOPEN	Open socket 0 1000 🔺
OK AT-FOLC	AT+CIPOPEN=0, "TCP", "113.81.233.65", 2317	establish connection 0 1000
+FSLS: SUBDIRECTORIES:	AT+CIPSEND=0, 9	send data 0 1000
overlays	Waveshare	data 0 1000
Nyur System Volume Information	AT+CIPCLOSE=0	close connection 0 1000
·	AT+NETCLOSE	Close socket 0 1000
bon2708-rpi-0-w. dtb		66None 0 1000
COPYING Linux	TF Card Test	67None 0 1000
issue txt	AT+FSCD=D:	Select directory 0 1000
bom2708-rpi-b-plus. dtb	AT+FSLS	list directories 0 1000
bom2708-rpi-b.dtb bom2708-rpi-cm.dtb	AT+CFTRANRX="D:/MyDir/t1.txt",10	write data into file 0 1000
ben2709-rpi-2-b. dtb	waveshare.	data 0 1000
bom2710-rpi-3-b-plus.dtb	AT+CFTRANTX="D:/MyDir/t1.txt"	open_file0 1000
bcm2710-rpi-cm3. dtb		0 1000
bootcode. bin	GPS Test	0 1000
ondline.txt	AT+CGPS=1	Turn on GPS 0 1000
fixup. dat	AT+CGPSINFO	Get GPS information 0 1000
fixup_cd. dat fixup_db. dat	AT+UGPS=U	Turn off GPS 0 1000
fixup_x.dat		0 1000
kernel.ing barnal7 ing		79None 0 1000
start. elf		80None 0 1000
start_cd.elf		81None 0 1000
start_x.elf		0 1000
LICENSE. or acle		0 1000
OK		25W 0 1000
AT+CFTRANRX="D:/MyDir/t1.txt",10		0 1000
ok		87None 0 1000
AT+CFTRANTX="D:/MyDir/t1.txt"		88None 0 1000
*CFTKANTX: DATA, ULU wavesbare		89None 0 1000
		90None 0 1000
+CFTKANTX: U		91None 0 1000
ок 🗸		92None 0 1000 -
ClearData OpenFile Stop ClearSend OnTop	English SaveConfig Hide -	
ComNum COM25 SimTech HS-USB AT Po: - HEXShow SaveData ReceivedToFile SendHEX SendEvery:	1000 ms/Tim AddCrLf	
More Settings Show Time and Packe OverTime 20 ms No1 BytesTo 末屋 - Ver	ifyNone	
RTS V DTR BaudRat 115200 v abcdefg	^	
为了更好地发展SSCOm欧件		
请您注册嘉立创作结尾客户	×	
【升级到新版本SSCOM5.13.1】 嘉立创SMT贴片工程要50元,每焊盘1分钱! ▲Wi-Fi Gprs GPS Lora 射频模组,在	E技性价比最高的?	
www.daxia.com S:98 R:711 COM25 Opened 115200bps,8,1,None,None	CTS=0 DSR=0 RLSD=0	1

2.6. GPRS Debugging

LOCAL VIRTUAL SEVERS SETTINGS

Virtual servers define the mapping between service ports of WAN and web servers of LAN. All requests from Internet to service ports of WAN will be redirected to the computer (web servers of LAN) specified by the server IP. (see your router's guide manual)

- 4) Log in Management Console of your router with browser (read your router's guide manual for specific address)
- 5) Set Port: 1822 (The Port can't be conflict to other's. Here we set 1822)

Set LAN IP address of your computer (you can run CMD on your computer, and execute command ipconfig to enquiry the address of IPv4), 192.168.6.168 as examples

-							
	4.2			0047 0047	2247 2247	100 100 1 100	
	12	SIMI/X00 TEST	WAN1	2317-2317	2317-2317	192.168.1.168	ALL
L							

6) You can search "IP" on browser to get your WAN IP address.

GPRS TEST

- Plug the SIM card, connect the LTE antenna and and connect the USB interface of SIM7600E-H 4G HAT to PC. Then press the PWRKEY to power on the board;
- 2. Check whether the indicators blink correctly (PWR's and NET's flashes).
- 3. Send AT commands as bellow:

命令	说明	返回值
AT+CGDCONT=1,"IP"," CMNET"	PDP context	ОК
AT+CGREG?	GPRS network status	+ CGREG: OK
AT+CIPMODE=1	TCP/IP mode	ОК
AT+CSOCKSETPN=1	PDP profile number	ОК
AT+NETOPEN	Open socket	+NETOPEN:
AT+CIPOPEN=0,"TCP"," 113.81.233.65",2317	establish connection	+CIPOPEN:
AT+CIPSEND=0,9	Send data of a specific size	>
AT+CIPSEND=0,	Send data of a fixed size	>
1A	(HEX format) Tell module to send data	+CIPSEND:
AT+CIPCLOSE	close connection	+CIPCLOSE:
AT+NETCLOSE	Close socket	+NETCLOSE:





3. Using with Raspberry Pi

3.1. Interface overview

The default relationship between SIM7600 control pins and Raspberry Pi IOs is shown in Table 1.

SIM7600	IO of Raspberry Pi B+	Description
5V	5V	Power supply (5V)
GND	GND	Ground
TXD	RXD (BCM P15)	UART pin
RXD	TXD (BCM P14)	UART pin
PWR	P22 (BCM P6)	Power up the module
FLIGHTMODE	P7 (BCM P4)	Flight mode

Table 1: The relationship between SIM7600 control pins and Raspberry Pi IOs

3.2. UART configuration of Raspberry Pi

Because UART of Raspberry Pi is used for Linux console output by default, if we want to use the UART, we need to change the settings. Executing this command to enter the configuration page :

sudo raspi-config

Choose Advanced Options -> Serial -> no, to disable Linux's use of console UART





Open /boot/config.txt file, find the below statement and uncomment it to enable the UART. You can directly append it at the end of file as well.

enable_uart=1

Then reboot.

- 3.3. Init the Raspberry Pi
- 1. Download the raspberry pi demo code and copy the SIM7600X folder to /home/pi/ directory.
- 2、 Enter /home/pi/ directory,execute command:

chmod 777 sim7600_4G_hat_init

3、 Open the /etc/rc.local file, then add the context below:

sh /home/pi/SIM7600X/sim7600_4G_hat_init



• <u>1</u> Raspberry Pi 3 Model B+ × +			${}^{\triangleleft} {}^{\flat}$
GNU nano 2.7.4	文件:	/etc/rc.local	
<pre>#!/bin/sh -e # # rc.local # This script is executed at the end of each multiuser rur # Make sure that the script will "exit 0" on success or ar # value on error. # # In order to enable or disable this script just change th # bits. # # By default this script does nothing.</pre>	nlevel. ny other he execu	er	
<pre># Print the IP address IP=s(hostname -I) true if ["\$_IP"]; then printf "My IP address is %s\n" "\$_IP" fi #fbcp& /usr/bin/wvdial5 sh /home/pi/SIM7600X/sim7600_4G_hat_init Cxtt 0</pre>			

3.4. Minicom for UART debugging on Raspberry Pi

Inserting the module to Raspberry Pi and plug the jumper B,

Install minicom, minicom is a text-based modem control and terminal emulation program for Linux:

sudo apt-get install minicom

Execute command: minicom -D /dev/ttyS0 (ttyS0 is the UART of Raspberry Pi 3B)

Baud rate is 115200 by default. If you need to change the baud rate, for example 9600, you can add the parameter -b 9600.

The user UART device of Raspberry Pi 2B/Zero is ttyAMA0, and ttyS0 of Raspberry Pi 3B

Testing Bluetooth function as examples:



• <u>1</u> Raspberry Pi 3 Model B+ ×	• <u>2</u> Raspberry Pi 3 Mo	odel B+ × +			
AT OK					^
AT OK					
CTRL-A Z for help 115200 8M	N1 NOR Minicom	2.7 VT102	Offline ttyS0		
ssh://pi@192.168.6.134:22	🗄 SSH2	xterm ដ⁺ 94x2	27 🔟 5,1 2 会	话 ↑↓	

3.5. Examples

- 1. Download the demo code from wiki and copy to the Raspberry Pi (/home/pi/SIM7600X)
- 2. Enter the bcm2835 directory, compile and install the BCM2835 library:

chmod +x configure && ./configure && sudo make && sudo make install

4、 Compile and run the demo (for example:PhoneCall):

Clean up: sudo make clean

Recompile: sudo make

Run the program: sudo ./PhoneCall

Combination command: sudo make clean && sudo make && sudo ./PhoneCall

3.5.1. PHONECALL



① <u>1</u> Raspberry Pi 3 Model B+ × +	\leftrightarrow
<pre>pigraspberrypi:-/SIM7600X \$ cd PhoneCall/ pigraspberrypi:-/SIM7600X/PhoneCall \$ sudo make g++ -c -0 PhoneCall.o PhoneCall.cpp g++ -c -0/arduPi.o/arduPi.cpp g++ -c -0/sim7X000.o/sim7X00.cpp g++ -Wall -0 PhoneCall PhoneCall.o/arduPi.o/sim7x00.o -lbcm2835 -lrt -lpthread pigraspberrypi:-/SIM7600X/PhoneCall \$ sudo ./PhoneCall Starting up</pre>	
RDY	
+CPIN: READY AT OK AT+CREG? +CREG: 0,2	
OK AT+CREG? +CREG: 0,2	
OK AT-CREG? +CREG: 0,1 ATD10086; OK Call disconnected ^C	

3.5.2. SMS



3.5.3. GPS





<u>1</u> Raspberry Pi 3 Model B+ × +

<pre>pigraspberrypi:-/SIM7600X/GPS \$ sudo make clean && sudo make && sudo ./GPS rm -f *.o GPS g++ -c -o GPS.o GPS.opp g++ -vall -o GPS GPS.o/arduPi.o/sim7x00.o -lbcm2835 -lrt -lpthread AT OK AT+CREG? +CREG: 0,1 Start CPS session AT+CGPS=1,1 OK AT+CGPSINF0 +CGPSINF0 +CGPSINF0 +CGPSINF0:</pre>
OK AT+CGPSINFO +CGPSINF0:
OK AT+CGPSINFO +CGPSINFO: 2232.643279,N,11404.697531,E,300618,085520.0,96.0,0.0,0.0
OK Latitude is 22.544054 N Longitude is 114.078293 E Day Month Year is 300618 UTC time is 085520 AT+CGPS=0 OK

3.5.4. TCP

• <u>1</u> Raspberry Pi 3 Model B+ × +	\rightarrow
pigraspberrypi:-/SIN7600X/TCP \$ sudo make clean && sudo make && sudo ./TCP	
g++	
AT	
OK .	
AT+CBEG?	
+CREG: 0.1	
AT+CREG?	
+CREG: 0,1	
AT+CGREG?	
+CGREG: 0,1	
AT+CGSOCKCONT=1, "IP", "CMNET"	
OK	
AT+CSOCKSETPN=1	
OK	
AT+CIPMODE=0	
AT-HUE TOPEN	
AITLAUUD	
NK	
at+cTPSEND=0.	
>	
OK	
Send Message:Waveshare Successfully!	
AT+CIPCLOSE=0	
OK	
+CIPCLOSE: 0,0	
AT+NETCLOSE	
OK Contraction of the second se	

3.5.5. FTP



①1 Raspberry Pi 3 Model B+ × +	•
<pre>pigraspberrypi:-/SIM7600X/FTP \$ sudo make clean && sudo make && sudo ./FTP rm -f *.0 FTP g+ -c 0 FTP.0 FTP.0 FTP.cpp g++ -Wall -0 FTP FTP.0/arduPi.0/sim7x00.0 -lbcm2835 -lrt -lpthread AT OK AT+CFEG: 0,1 AT+CFTPORT=21 OK AT+CFTPPORT=21 OK AT+CFTPTPNE=A OK AT+CFTPN="13.81.235.52" OK AT+CFTPN="" OK AT+CFTPN="" OK</pre>	^
Downloading file form "113.81.235.52" Download file from FTP AT+CFTPGETFILE="index.htm",0 OK Upload file to "113.81.235.52" Upload file to FTP AT+CFTPPUTFILE="index.htm",0 OK	.~

4. Using with Arduino

4.1. Interface overview

The default relationship between SIM7600 control pins and Arduino is shown in Table 1.

SIM7600	Arduino UNO /UNO PLUS	Description
5V	5V	Power supply (5V)
GND	GND	Ground
TXD	0 (RX)	UART pin
RXD	1 (TX)	UART pin
PWR	2	Power up the module

Table 2: The relationship between SIM7600 control pins and Arduino

4.2. Install Arduino Library

- 1. Download the Arduino demo code and copy the Waveshare_SIM7600X_Arduino_Library folder to {the Arduino software installation path}/Library/ .
- 2. Run the Arduino IDE, then select the example code as below:



4.2.1. PHONECALL

© COM8	_		×
		Sen	d
AT			
Starting up			
AT			
AT +CREG?			
ATD10086;			
AT +CHUP			
Call disconnected			



💿 COM8			-		×
					Send
AT					
Starting up					
AT					
AT					
AT					
AT +CREG?					
Setting SMS mode					
AT +CMGF=1					
Sending Short Message					
AT +CMGS="15 168"					
www.waveshare.com					
Sent successfully					
Setting SMS mode					
AT +CMGF=1					
AT +CPMS="SM", "SM", "SM"					
AT +CMGR=1					
Autoscroll	Newline ~	9600 baud	~	Clear	output

💿 COM8		-	×
			Send
AT			^
Starting up			
AT			
AT +CREG?			
Start GPS session			
AT+CGPS=1, 1			
AT+CGPSINF0			
A.V.			
OK .			
AT+CGPSINF0			
,,,,,,,,			
ov			
AT CORTINES			
AI COISINFO			
OK			
AT +CGPST NF0			
OK			



4.2.4. TCP

∞ COM8				_		×
						Send
AT						
AT +CREG?						
AT +CSQ						
AT +CREG?						
AT+CPSI?						
AT +CGREG?						
AT+CGSOCKCONT=1, "IP", "CMNET"						
AT+CSOCKSETPN=1						
AT+CIPMODE=0						
AT+NETOPEN						
AT+IPADDR						
AT+CIPOPEN=0, "TCP", "118.190.93.84", 2317						
AT+CIPSEND=0,						
Waveshare						
,						
AT+CIPCLOSE=0						
Autoscroll	Newline \vee	9600	baud	~	Clear	output

4.2.5. FTP



💿 COM8				_		×
						Send
AT						^
AT						
AT +CREG?						
AT +CFTPPORT=21						
AT +CFTPMODE=1						
AT +CFTPTYPE=A						
AT +CFTPSERV="113.81.235.52"						
AT+CFTPUN="user"						
AT +CFTPPW="waveshare"						
Download file from FTP						
AT+CFTPGETFILE="index.htm",0						
Upload file to FTP						
AT+CFTPPUTFILE="index.htm",0						
						*
🗹 Autoscroll	Newline	\sim	9600 baud	\sim	Clear	output