

# QCOM TOOL USER GUIDE

QCOM Tool User Guide



## **Purpose of the Document**

The purpose of this document is to explain the QCOM tool and how to use it with different wireless modules such as BG96, B95, BG77, EG91, EG95, or Raspberry PI HAT.

## **Document History**

Version	Author	Date	Description
Α	5G HUB	10.05.2020	Initial Document

## Table of Contents

Purpos	se of the Document	. 2
Docum	nent History	. 2
1	Introduction	.4
2	Install LTE&GNSS Windows Driver	.5
3	Use QCOM tool with BG96/BG95/EG91/EG95	.6
4 4.1	How to Use the QCOM Tool COM Port Configuration	.8 .8
4.2	Open and Close COM Port	.9
4.3	Send Data	10
4.4	Send Data Continuously	11

# **1** Introduction

This document describes how to use "QCOM" tool. The tool can run without installation. And it supports the following OS:

• Window 10/Windows 95/Windows 98/Windows 2000/Windows ME/Windows XP

This document is applicable to all GSM, UMTS LTE, and GNSS modules. Install the following tools from the GitHub repository:

LTE & GNSS driver: <u>5G-NB-IoT/Driver at master · 5ghub/5G-NB-IoT (github.com)</u>

QCOM Tool: <u>5G-NB-IoT/Tools at master · 5ghub/5G-NB-IoT (github.com)</u>

## 2 Install LTE&GNSS Windows Driver

On Windows Operating System (OS), install the following Windows driver for LTE&GNSS modem: <u>5G-NB-IoT/Driver at master · 5ghub/5G-NB-IoT (github.com)</u>

Have the Nano SIM ready:



Follow the following steps:

- 1- Insert a USIM card into the USIM card slot on the hardware board.
- 2- Connect a USB cable between the hardware board and the computer as in the following diagram (Note: the hardware board is an example and other USB dongle or Raspberry PI HAT can be used. You can also use different antennas if needed)



If you are using the HAT board with any of the BG96/BG95/EG95/EG91 miniPCIe module, make sure to insert the SIM card as shown below:



3- Connect the board to a USB cable to PC, then you shall see the ports and modem in the Windows device manager as in this screenshot:



# 3 Use QCOM tool with BG96/BG95/EG91/EG95

Install the QCOM tool from this location:

5G-NB-IoT/Tools at master · 5ghub/5G-NB-IoT (github.com)

To use the QCOM tool with LTE&GNSS modem, connect the computer USB port to the USB port on the hardware board and make sure all modem serial ports are enumerated in the Windows device manager as in figure below.

The serial ports below can be used for the following purposes:

- **USB Modem**: The USB modem interface is used for AT commands, data transmission, GNSS data and NMEA sentences output.
- USB AT Port: It is used for AT commands and data transmission.
- USB NMEA Port: It is used for GNSS data and NMEA sentences output.



Figure 3: Windows device manager enumerated all serial ports of the modem.

Each serial port, as in Figure 3, shows the serial port number uses as in format **COMXX**. If the **USB Modem** port is used, you can find its COM port number, by **right-click** on it, select **Properties**, then select **Modem**. You will find the port number displayed for this USB modem. It shows up as **COM47** in the figure below. You can use this port number in QCOM tool.

Quectel USB I	Modem #7 Pro	operties		×
Details		Events	Power Manag	gement
General	Modem	Diagnostics	Advanced	Driver
Port: COM Speaker v Maximum	Off	High		
Dial Contr	ol	one before dialing	ОК	Cancel

Figure 4: Port number for the USB modem.

## 4 How to Use the QCOM Tool

The tool is used to send and receive data with serial port. You can use it to send/receive AT commands, data transmission and reception, or GNSS control and NMEA sentences

Q QCOM V1.6			
About			
COM Port Setting	Command List		
COM Port: [ Bandrata: [15000 + StarBite: ] + Parity Mass +	Choose All Commands	HEX 🗌 Ente	r Delay(mS)
com rott, pr	□ 1: □		
ByteSize: 8 - Flow Control: No Ctrl Flow - Close Port	2:		
	□ 3: □	Тгг 🗔	
	4:		
	5:		
	6:		
	J 3. ]		
			2
	□ 13:		3
	14:		4
	15:		5
	T 16:		6
	E 17:		7
	18:		8
	19:		9
	20:		
[2015-03-26_17:14:07:368] Open COM Port Success			
			<u></u>
Uperation	C 25:		<u>-</u>
Clear Information 🔽 DTR 🔽 RTS 🔽 View File 🔽 Show Time	26:		6
THEX String Show In HEX Send With Enter	<b>[</b> 27:		7
input string.	28:		8
Send Command	<b>29:</b>		9
		Run Tim	es: 10
Select File Send File	Load Test Script Clear All Commands	Delay Time (m	s): 1000
Save Log     D:\QCOM_V1.6_02\QCOM_LOG. txt	Save As Script	Run	Stop

Figure 5 shows the tool when is launched and different controls in the tool.

Figure 5: QCOM tool graphical user interface (GUI).

- Red area displays the received data.
- Blue area displays status information.
- Purple area is used to send data or files.
- Green area is used to send data continuously.

#### 4.1 COM Port Configuration

According to the connection between PC and the hardware board, select the right serial port as shown Figure 6. Select the COM port number corresponds to either the **USB AT Port** or **USB Modem** as appears in the Windows device manager and as explained in the previous Sections.

	COM Port Setting	
COM Port: 1 -	Baudrate: 115200 💌 StopBits: 1	▼ Parity: None ▼
ByteSize:	Flow Control: No Ctrl Flow 💌	Open Port

Figure 6: Selecting COM port.

Choose an appropriate baud rate. Please refer to Figure 7.

		-COM Port	Setting	
COM Port: 1 💌	Baudrate:	115200 💌	StopBits: 1 💌	Parity: None 🔻
ByteSize: 8 💌	Flow Contr	4800 9600 19200 38400 57600	Flow 💌	Open Port
		115200 230400 460800 921600		

Figure 7: Selecting Baud rate.

Choose appropriate Stop Bits, Parity, Byte Size, and Flow Control, shown as Figure 8.

COM Port Setting						
COM Port: 1 💌	Baudrate: 115200 💌 StopBits: 🚺 💌	Parity: None 💌				
ByteSize: 8 💌	Flow Control: No Ctrl Flow	Open Port				

Figure 8: Selecting Other parameters for the COM port.

#### 4.2 Open and Close COM Port

Click **Open Port** to open the selected COM port. Please refer to Figure 9.

COM Port Setting						
COM Port: 1 💌	Baudrate: 115200 💌 StopBits: 1 💌	Parity: None 💌				
ByteSize: 8 💌	Flow Control: No Ctrl Flow	Open Port				



Click "*Close Port*" to close the selected COM port. Please refer to Figure 10.

COM Port Setting	
Baudrate: 115200 💌 StopBits: 1 💌	Parity: None 💌
Flow Control: No Ctrl Flow 💌	Close Port
	COM Port Setting Baudrate: 115200 💌 StopBits: 1 💌 Flow Control: No Ctrl Flow 💌

Figure 10: Clicking "Close Port" button.

#### 4.3 Send Data

To send data from the QCOM tool, follow the following steps:

- 1) Red area is used to input data which would be sent.
- 2) Green area is used to choose file needed and send a whole file.
- 3) Blue area is used to save received data as a file.
- 4) DTR: Enable the DTR pin of COM port.
- 5) RTS: Enable the RTS pin of COM port.
- 6) View File: Show the data of the file which has been sent.
- 7) Show Time: Show the time of each received data.
- 8) HEX String: The input string is HEX string.
- 9) Show in HEX: The received data is shown in HEX.
- 10) Send with Enter: Send data with "Enter".
- 11) Clear Information: Clear all received data and status information.
- 12) Send Command: Start to send the data which you input.
- 13) Select File: Select the file which would be sent.
- 14) Send File: Start to send the file that you have selected.
- 15) Save Log: Select the file of which the Log data was saved.

	Operat	ion		
Clear Information	DTR RTS	└ View File └ Show In HEX	📄 Show	<sup>,</sup> Time l With Enter
			< <	Send Command
Select File				Send File
Save Log D:\QCOM	_V1.6_02\QCOM_LOG.txt	L		

Figure 11: Sending data.

#### 4.4 Send Data Continuously

To send data continuously, follow the following steps:

- 1) Red area is used to enable the data to be sent.
- 2) Blue area is used to input data which would be sent.
- 3) Green area is used to start data sending.
- 4) Choose All Commands: Enable all available commands which would be sent.
- 5) HEX: The input string is HEX string.
- 6) Enter: Send data with "Enter".
- 7) Delay: Delay time for each data.
- 8) Delay Time: Default delay time.
- 9) Run Times: The times of sending all selected data continuously.
- 10) Run: Start to send all selected data continuously.
- 11) Stop: Stop sending all selected data continuously.
- 12) Save As Script: Save all data and configure as \*.ini file.
- 13) Load Test Script: Load data and configure from an \*.ini file.

Command List					
Cho-	ose All Commands	HEX	Γ	Enter	Delay(mS)
<b>1</b> :			Γ	1	
🔲 2:			Г	2	
🔲 3:			Г	3	
<b>—</b> 4:			Γ	4	
5:			$\square$	5	
F 6:			$\square$	6	
<b>7</b> :			$\square$	7	
<b> </b> 8:			Г	8	
F 9:			Г	9	
<b>□</b> 10:			Г	10	
<b>[</b> 11:			Г	11	
🔲 12:			$\square$	12	
🔲 13:			$\square$	13	
<b>1</b> 4:			Г	14	
<b>1</b> 5:			Г	15	
🔲 16:			Γ	16	
🔲 17:			$\square$	17	
<b>[</b> 18:			$\square$	18	
🔲 19:			Г	19	
🔲 20:			Г	20	
☐ 21:			Γ	21	
<b>[</b> 22:			Γ	22	
🔲 23:			$\square$	23	
<b>[</b> 24:			Γ	24	
<b>[</b> 25:			Γ	25	
🔲 26 :			Г	26	
<b>[</b> 27:			Г	27	
<b>[</b> 28:			Г	28	
🔲 29:			Γ	29	
		Run Ti	mes:	10	<u>.                                    </u>
	Load Test Script Dels	y Time(	mS):	1000	
	Save As Script	Run		Sto	p

Figure 12: Sending data continuously.

Figure 13 shows how to connect the QCOM tool to USB modem on port COM47. Once you specify the COM port as 47, Baud rate as 115200, click **Open Port**. You can exchange AT commands with the modem including registering on mobile operator network, query the GPS location, signal strength.

<b>Q</b> QCOM_V1.6		- 🗆 X
About		
COM Port Setting	Command List	
COM Port: 47 💌 Baudrate: 115200 🖵 StopBits: 1 💌 Parity: None 💌	Choose All Commands	HEX Enter Delay(mS)
	T: AT+QGPSEND	
ByteSize: 8 💌 Flow Control: No Ctrl Flow 💌 Close Port	I 2: ati	□ 🔽 _2
		3
[2020-10-04_11:43:15:427]ati	✓ 4: AT+QGPSLOC=2	
[2020-10-04_11:43:15:427]Quectel [2020-10-04_11:43:15:427]BG96	▼ 5: AT+QGPSGNMEA	5
[2020-10-04_11:43:15:427]Revision: BG96MAR02A07M1G	✓ 6: AT+QGPSCFG="outport","usbnmea",115200	6
[2020-10-04_11:43:15:427]OK	✓ 7: AT+QGPS?	□ 🔽 7
[2020-10-04_11:43:19:699]AT+CGDCONT? [2020-10-04_11:43:19:701]_CGDCONT: 1 "IP" "m2mNR16.com attr" "0.0.0.0" 0.0.0.0		8
[2020/10/04_11.43.13.701]*CdDCD141.1, 1F ; In211140/10.Cdllt.att2 ; 0.0.0.0 ;0;0;0;0	9: AT+QGPSLOC?	9
[2020-10-04_11:43:19:701]OK [2020-10-04_11:43:23:354JAT+CREG2	✓ 10: AT+QGPSCFG="gnssconfig"	
[2020-10-04_11:43:23:356]+CREG: 1,1	✓ 11: AT+QGPSGNMEA="GSV"	E 🔽 11
(2020-10-04 11:43:23:356)DK	12: AT+CREG?	□ 🔽 12
[2020-10-04_11:43:26:244]AT+CSQ [2020-10-04_11:43:26:244]AT+CSQ	T 13: AT+CGDCONT?	T 🔽 13
[2020-10-04_11:43:26:244]+C5Q: 31,33	T 14: AT+CGDCONT=1,"IP","m2mNB16.com.attz	□ 🔽 14
[2020-10-04_11:43:26:244]0K [2020-10-04_11:43:29:03714T₄0GPSL0C=2	15: AT+CFUN=0	15
[2020-10-04_11:43:29:039]+QGPSLOC: 184416.0,47.82681,-122.20650,1.0,77.0,2,0.00,0.0,0.0,041020,06	□ 16: AT+CFUN=1	16
[2020-10-04 11:43:29:039]DK	T17: AT+CGDCONT=1	17
· ·- ·_ · · · · · · · · · · · · · ·	18: AT+CSQ	18
	□ 19: □	
	20:	
	□ <u>21</u> :	
	24	
Operation	<b>E</b> 25	
Clear Information VI DTR VI RTS View File View File		
LIEV Origa Chan In UEV Ed. Condition	27	
Input String:	□ 20·	
	□ 20 ] □ 29 □	
Send Command		
Select File Send File	Load Test Script Clear All Commands	Hun Times: 10 Delau Time(mS): 1000
		Longy rimo(mo). 1000
Save Log C:\Users\hossa\Documents\Mine\NB-I0T_Projects\PCB&GitHub\Quectel\BG77\QCC	Save As Script	Run Stop

Figure 13: Connecting QCOM tool to USB modem on port COM47.

The following shows more examples of using AT commands.

LUM Port Setting	Command List			
COM Port: 47 V Baudrate: 115200 V StopBits: 1 V Parity: None V	Choose All Commands	HEX□	Enter	Delay(mS
	I: AT+QIACT=1		1	
ByteSize: 8 T Flow Control: No Ctrl Flow T Close Port	☑ 2 ATI		2	
	I AT+QGPS=1		3	
321-12-30_13:53:34:690)ATI	✓ 4: AT+QGPSLOC?		4	
021-12-30_13:53:34:690)Quectel 021-12-30_13:53:34:690)E.691	▼ 5: AT+QGPSGNMEA		5	
021-12-30_13:53:34:690]Revision: EG91NAFBR05A05M4G	I AT+QGPSCFG="outport","usbnmea",115200		6	
021-12-30_13:53:34:690)0K	▼ 7: AT+QGPS?		7	
121-12-30_13:53:37:297)AT+CPIN?	I AT+QGPSCFG?		8	
	I AT+QGPSLOC?		9	
J21-12-30_13:53:37:29/JUK J21-12-30_13:53:39:819JAT+QCCID	II: AT+QGPSCFG="gnssconfig"		10	
321-12-30_13:53:39:819j+QCCID: 89883070000004778443	✓ 11: AT+QGPSGNMEA="GSV"		11	
121-12-30_13:53:39:819]0K	12: AT+CEREG?		12	
	13: AT+CGDCONT?		13	
	14: AT+QCFG="roamservice",1		14	
	15: AT+CFUN=0		15	
	□ 16: AT+CFUN=1		16	
	Tr: AT+CGDCONT=1,"IP","super"		17	
	□ 18: AT+CSQ		18	
	19: AT+qcfg="NW/SCANMODE",3		19	
	20: AT+qcfg="IOTOPMODE",1		20	
(2021-12-30_13-53:33:412) Open COM Port Success	21: AT+QIOPEN=1,0,"TCP","220.180.239.212".		21	
	22: AT+qcfg="NW/SCANSEQ",020301		22	
	23: AT+QCFG="USBNET",0		23	
On surviva	24: AT+CGDCONT=2		24	
	25: AT+QCCID		25	
Clear Information IV DTR IV RTS I View File IV Show Time	□ 26: AT+CGDCONT=1,'1P'','m2mNB16.com.attz'		26	
nput String: HEX String Show In HEX 🔽 Send With Enter	27: AT+QDSIM?		27	
A	28: AT+CPIN?		28	
Send Command	29: AT+QCFG="NCCCONF",5		29	
*		R	un Times:	10
Coloring Constant	Load Test Script Clear All Commands			4000

Figure 14: More AT commands examples using QCOM tool.

At the same time, you can launch another instance of QCOM tool and connect to the **USB NMEA Port (COM49).** Once you open the port to COM49, you can see all GNSS NMEA sentences output as in the following figure.

QCOM_V1.6	_	
bout		
COM Part Setting	Command List	
COM Part 40 - Pautrater 115000 - Shar 1 - Paulur Mars -	Choose All Commands HEX Enter	Delay(mS)
	▼ 1: AT+0GPSEND □ 1	
ByteSize: 8 - Flow Control: No Ctrl Flow - Close Port	▼ 2: ati □ ▼ 2	
	▼ 3: AT+QGPS=1 □ ▼ 3	i i —
16.0.M.,*68	▼ 4: AT+QGPSLOC=2	i i —
2020-10-04_11:48:59:821]\$GPVTG;0.0,T;341.5;M;0.0,N;0.0;K;A*20 2020-10-04_11:48:59:821]	▼ 5: AT+QGPSGNMEA	
GPRMC,184947.00,A,4749.608612,N,12212.390132,W,0.0,0.0,041020,18.5,E,A*16	G: AT+QGPSCFG="outport","usbnmea",115200 □    □ 6	
2020-10-04_11:48:59:821]\$GPG5A,A,2,08,10,16,18,20,21,23,27,32,,1.1,0.8,0.8*30 2020-10-04_11:49:00:797]\$GPG5V,4,1,15,08,27,310,33,10,72,262,42,18,40,109,29,20,67,059,37*76	▼ 7: AT+QGPS?	
2020-10-04_11:49:00:797)\$GPGSV,4,2,15,21,27,298,36,23,70,052,30,24,12,092,19,27,52,274,34*78 2020-10-04_11:49:00:797)\$GPGSV,4,3,15,32,19,188,33,1113,00,028_15,23,047*40		
2020-10-04_11:49:00:797]\$GPGSV,4,4,15,16,07,244,,46,,,32,51,,,40*4C	▼ 9:     AT+QGPSLOC?     □     ▼     9	
2020-10-04_11:49:00:797]\$GPGGA,184948.00,4749.608613,N,12212:390132,W,1,09,0.8,76.5,M,+ 16.0,M,,*65	IO: AT+QGPSCFG="gnssconfig" □ □ 10	
2020-10-04_11:49:00:844]\$GFVTG.0.0,T,341.5,M,0.0,N,0.0,K,A*20 2020-10-04_11:49:00:844]		
GPRMC,184948.00 A,4749.608613,N,12212.390132,W,0.0,0.0,041020,18.5,E A*18	□ 12: AT+CREG? □ ☑ 12	
2020-10-04_11:49:00:844)\$GPG5A,A,2,08,10,16,18,20,21,23,27,32,,1.1,0.8,0.8*30 2020-10-04_11:49:01:798]\$GPG5V,4,1,14,08,27,310,33,10,72,262,43,16,07,244,29,18,40,109,27*7A	□ 13: AT+CGDCONT? □ ☑ 13	
2020-10-04_11:49:01:798]\$GPGSV.4,2,14,20,67,059,38,21,27,298,37,23,70,052,33,24,12,092,19*78 2020-10-04_11:49:01:798]\$GPGSV.4,3,14,27,52,274,36,32,19,188,34,1115,23,047,*44	□ 14: AT+CGDCONT=1,"IP","m2mNB16.com.attz' □ ▼ 14	
2020-10-04_11:49:01:798]\$GPGSV.4.4,14.46,,,33,51,,,40*7E	□ 15: AT+CFUN=0 □ ☑ 15	
2020-10-04_11:49:01:798]\$GPGGA,184949.00,4749.608613,N,12212.390133,W,1,09,0.8,76.5,M,+ 16.0,M,,*65	□ 16: AT+CFUN=1 □ 🔽 16	
2020-10-04_11:49:01:827]\$GPVTG;0.0,T;341.5;M;0.0,N;0.0;K;A*20 2020-10-04_11:49:01:927]	□ 17: AT+CGDCONT=1 □ ▼ 17	
[2020-1004_11:4949.000,47445.608613.N,12212.390133,W,0.0,0.0,041020,18.5,E,A*18 [2020-10-04_11:49:01:827]\$GPGSA.4.2,08,10,16,18,20,21,23,27,32,,1,1,0,8,0.8*30	□ 18: AT+CSQ □ I8 18	
v		
2020-10-04_11:42:42:135] Open COM Port Success		
Operation		
Clear Information DTB V BTS View File V Show Time		
Input String: I HEX String I Show In HEX IV Send With Enter		
Sand Command		
	I Run Times:	10
Select File Send File	Load Test Script Clear All Commands Delay Time(mS):	1000
Save Log	Save As Script Run	Stop

Figure 15: Connecting QCOM tool to USB NMEA port on COM49.