4G MODEM
M463Q

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General Features

M463Q is 3G/4G cellular modem for data /networking communication over internet by remote control system.

- Support Thailand version
- Voltage Input 5V~24V
- 3GPP and Enhanced AT Commands
- Signal strength
- Status indicators
- Control via AT commands
- SIM card (1.8V/3V interface)
- RS-232 with RJ45 Interface
- 1 SMA External antenna connecter
- 1 SMA External GPS connecter
- Industrial grade components
- Dust-proof type
- GPS build-in
- Battery Backup (Option)
- Power Outage (Option)
- Connector for Primary,Rx-diversity

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Technical Specifications

RF Specifications

LTE-FDD   B1/B2/B3/B4/B5/B7/B8/B28
LTE-TDD   B40
WCDMA   B1/B2/B5/B8
GSM   B2/B3/B5/B8

Communication Interface

Port UART   2 UART
Port USB   1 Port USB 2.0 with High Speed
SIM Card   1 SIM 1.8V/3.0V (U)
Port Serial RS-232 with RJ45 Interface

Specifications for Data transfer

LTE-FDD   Max 10Mbps/ 5Mbps
LTE-TDD   Max 8.96Mbs/3.1Mbps
DC-HSPA   Max 42Mbps/5.76Mbps
WCDMA   Max 384Kbps / 384Kbps
EDGE   Max 296Kbps/ 236.8Kbps
GPRS   Max 107Kbps/ 85.6Kbps

Environmental

Temperature   -40° C ~ +85° C Operating
Humidity   5 to 95% RH Operating

Mounting

Certificate   EMI Standard Class B
Mounting   Wall Mount

Input power

Input   DC 5 ~ 24V
Battery   3.6V 300mA (Option)

Software

Work Mode Transparent Transmission
Protocol TCP/IP/IPv4/IPv6/UDP/FTP/FTPS/ HTTP/ HTTPS
AT Command Serial Port/Network

Antenna & GPS

GPS Antenna 1575.42MHz±1.023MHz SMA Connector
GSM 3G/4G 600-2700MHz 50 Ohm Gain 7 dBi Antenna SMA Connector
V.S.W.R ≤2

Composition Hardware

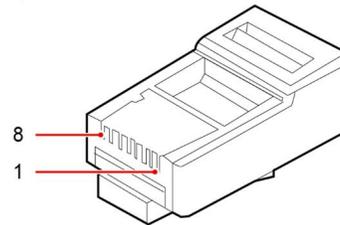| Item	Description
A	Communication cable
B	SIM card slot
C	Base station connects
D	Signal status
E	3G/4G antenna
F	GPS antenna

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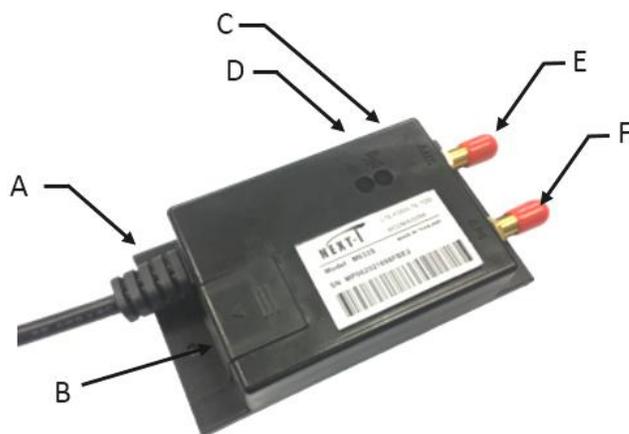
Status Indicator

LED Status (Green)	Description
LED ON Permanently	Modem is switched on but is not registered on the network
LED ON and blinking slowly	Modem is switched on and registered to the network. However, there is no active communication in progress.
LED ON and blinking quickly	Modem is switched on and registered to the network with active communication in progress.
LED OFF	Modem is switched off.

LED Status (RED)	Description
LED ON and 1 blinking	25% Signal Strength
LED ON and 2 blinking	50% Signal Strength
LED ON and 3 blinking	75% Signal Strength
LED ON and 4 blinking	100% Signal Strength

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RJ45 Connection

The modem to communicates with other devices via the RJ-45 connection.

The power supply to use pin 1 (+VCC) and pin 4 (Ground)

Pin	Name	Description	Input / Output
1	+ VCC	DC Voltage Power input	Input
2	DCD	Data Carrier Detect	Output
3	DTR	Data Terminal Ready	Input
4	GND	Ground	-
5	RXD	Receive Serial Data	Input
6	TXD	Transmit Serial Data	Output
7	RTS	Request To Send	Input
8	CTS	Clear To Send	Output

Power Source

The table below shows the power source pin assignment from the modem interface cable.

Pin	Description
1	+VDC
4	Ground

A regulated 5V-24V DC input voltage is recommended for operating the modem.

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Serial Interface RS232

The default RJ-45 link settings for the modem are:

Mode	Setting
Baud Rate	9600 bps
Data bits	8
Parity	None
Stop bits	1
Flow Control	Hardware

To interface modem to a DTE device via standard DB 9 Pin RS-232 serial port connector, map the interface cable pins as follow:

PIN RJ-45 RS-232	PIN DB-9 (male)	Description RS-232
2	1	DCD
3	4	DTR
4	5	Ground
5	2	RXD
6	3	TXD
7	7	RTS
8	8	CTS

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SIM Card

The SIM interface is intended for 1.8 / 3V SIM cards. A SIM detect pin is added to indicate whether or not a SIM card is inserted.

Antenna

The 3G/4G and GPS antenna interface uses a SMA connector. Attach the external antenna to the modem and tighten the connection.

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Setting up the modem

Prepare the SIM Card. Before using the modem, you must contact a network operator to get a personal SIM card. Do acquire the UMTS/GPRS APN, User-ID and Password from your network operator.

Insert SIM card into the modem.

Connect the antenna to the modem.

Connect the modem communication interface to your device. Connect the modem serial link interface to your device.

Power up the modem. Connect the interface cable RJ-45 plug to the input Power Supply respectively. The status indicator LED will light up instantly. The modem is now ready to use.

Communicate with the modem. The modem is now ready to communicate with your device. From your device, send AT<Enter> command to modem. If device received an OK response from modem, the communication is successfully established. The signal Strength LED ON and blinking.

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Basic Command

Configuring HyperTerminal for Modem:

1. Connect the Modem to the PC COM port and run the HyperTerminal software.

2. You will be prompted to enter a description for the new connection. Enter a name for the connection (e.g.   "TEST") and click OK to continue.

3. In the Connect to dialog box, select the PC COM port number, which is connected to the modem, and click OK to continue.

4. In the next prompted dialog box, enter the COM port settings which is configured in the modem and click OK to continue.

Note: Default settings for the modem are:

5. The Connected text in HyperTerminal status bar indicates that the PC is ready to communicate with the modem. Perform a simple check on the connection between HyperTerminal and the modem:

The following are some other AT command examples you can use:

AT Command	Description
AT+CPIN?	This command is used to send the ME a password which is necessary before it can be operated
AT+CSQ	This command is used to return received signal strength indication
AT+CREG?	This command is used to check on modem registration to the network
AT+CGMR	This command is used to query for modem firmware version number

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Enter AT Enter command.

An   OK   response

This section suggests examples for some basic functions using Text command sending short messages.

Set short message format as Text mode.

AT+CMGF=1 Enter

Check whether SMS center (SMSC) number is set to SIM card.

AT+CSCA?   Enter

Send a message to a phone number.

AT+CMGS= "Phone number" Enter

Hello   Ctrl-Z

Wait for +CMGS for the result of sending SMS.

+CMGS: mr

Indicates that the SMS has been sent successfully.

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Trouble shooting

The modem is not power up

Check whether the LED Status (Green) on the modem is lighted up. If it is not lighted up, check whether the modem is supplied with the correct voltage range between 5V to 24VDC.

The SIM Card is not ready

Check whether the LED Status (Green) on and blinking. Check whether the SIM Card to enabled.

Can use AT+CPIN? to request for PIN status. The status Ready is SIM Card complete.

Unable to register to the network

Check the modem status indicator. The LED should be blinking if the modem is registered to the network.

Use AT+CREG? Command to request for the registration status. Check the we strength of the network using AT+CSQ command. You should receive a +CSQ response (+CSQ: {rssi}, {ber}). If the rssi value is 99, it means the network is unknown or undetectable.

Cannot enter AT Commands or no communication between device and modem

Check whether the modem is powered up. Check whether the SIM Lock is turned on. Check whether the communication interface port is connected properly. Check whether the port settings are correct. Ensure that both modem and your device are communicating with the same settings (such as baud rate, data bits, stop bits and parity).

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Cannot connect to WCDMA/GPRS

Check whether the modem is powered up. Check whether the SIM Lock is turned on. Check whether the modem is registered to the network. Check whether the SIM card supports WCDMA/GPRS Service. You can verify it with the network service provider. If the SIM card supports WCDMA/GPRS service, check whether the APN settings are correct. Use AT+CGDCONT? command to query or assign the APN settings. Ensure that it is correct by confirming the APN with your network service provider.

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Safety

It is very important to follow any regulations regarding the use of radio equipment especially due to the possibility of Radio Frequency (RF) interference. Please follow the safety advice given below carefully:

Turn off your Modem when in an aircraft. The use of cellular telephones in an aircraft may endanger the operation of the aircraft, disrupt the cellular network and is illegal. Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, legal action or both.

Turn off your Modem when at a refueling point.

Turn off your Modem in hospitals and at any other place where medical equipment may be in use.

Respect restrictions on the use of radio equipment in fuel depots, chemical plants or where blasting operations are in progress.

There may be hazards associated with the operation of your Modem close to inadequately protected personal medical devices such as hearing aids and pacemakers. Consult the manufacturers of the medical device to determine if it is adequately protected.

Operation of your Modem close to other electronic equipment may also cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers recommendations.

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CAUTION

Do not expose the Modem to any extreme environment where the temperature or humidity is high.

Do not attempt to disassemble the Modem. There are no user serviceable parts inside.

Do not expose the Modem to water, rain or split beverages. It is not waterproof.

Do not abuse your Modem by dropping, knocking, or violent shaking. Rough handling can damage it.