

# ***User Manual***

## ***4G MODEM***

### ***TekFast Model: CM-1011Q***



#### Document History

Revision	Date	Remark
Rev.01-1120		CM-1011Q

All specifications are correct at the time of release.

## TABLE OF CONTENTS

1	Introduction	3
2	Specifications	4
2.1	Technical Specification	4
2.2	Electrical Characteristic	6
2.3	Environmental Characteristics	6
2.4	More Characteristic	6
3	Technical Hardware	7
3.1	Overview	7
3.2	Status Indicator	8
3.3	Cable Interface	9
3.4	Power Supply Interface	10
3.5	RJ-45 Link Interface	10
3.6	SIM Interface	12
3.7	Antenna Interface	13
3.8	Mounting Base	14
4	Getting Started	15
4.1	Setting up the modem	15
4.2	Interfacing Modem with HyperTerminal Software	16
5	Troubleshooting	20
6	Safety Information	21

## 1. INTRODUCTION

TekFast 4G modem is designed for reliable communication LTE-FDD LTE-TDD UMTS/HSDPA HSPA+ GSM/GPRS/EDGE.

It provides the wireless communication link for applications such as remote-control purposes and remote data monitoring and acquisition. This durable and high performing modem can be deployed in myriad Machine-to-Machine (M2M) applications including automotive systems, fleet management, automated meter reading, smart meter, vending and retail, security and surveillance, industrial systems, information display, etc.

This manual provides an overview of the operation of TekFast 4G modem. It includes technical Information.

## 2. SPECIFICATIONS

### General Feature

CM-1011Q 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 and Status indicators (LED)
- Control via AT commands
- SIM card (1.8V/3V interface)
- RS-232 with RJ45 Interface
- 1 SMA External antenna connector
- 1 SMA External GPS connector
- Industrial grade components
- Dust-proof type
- GPS build-in
- Battery Backup/Power Management (Option)
- Connector for Primary, Rx-diversity

## 2.1 Technical Specification

Feature	Specifications	
Network System	LTE-FDD LTE-TDD WCDMA GSM/EDGE	B1/B3/B5/B7/B8/B20 B40 B1/B2/B5/B8 B2/B3/B5/B8
Serial Interface	UART USB SIM Card Serial	2 UART 1 Port USB 2.0 with High Speed 1 SIM 1.8V/3.0V (U) RS-232 with RJ45 Interface
Software	Work Mode Protocol  AT Command	Transparent Transmission TCP/IP/IPv4/IPv6/UDP/FTP/FTPS/ HTTP/ HTTPS Serial Port/Network
Antenna	GPS Antenna  GSM 3G/4G  V.S.W.R	1575.42MHz±1.023MHz SMA Connector 600-2700MHz 50 Ohm Gain 7 dBi Antenna SMA Connector ≤2
Data Transfer	LTE-FDD LTE-TDD DC-HSPA WCDMA EDGE GPRS	Max 10Mbps/ 5Mbps Max 8.96Mbs/3.1Mbps Max 42Mbps/5.76Mbps Max 384Kbps / 384Kbps Max 296Kbps/ 236.8Kbps Max 107Kbps/ 85.6Kbps

## 2.2 Electrical Characteristic

<b>Power Supply</b>	<b>Specifications</b>
Operating Voltage Range	DC 5 to 24 V
Battery	3.6V 300mA (Option)

## 2.3 Environmental Characteristics

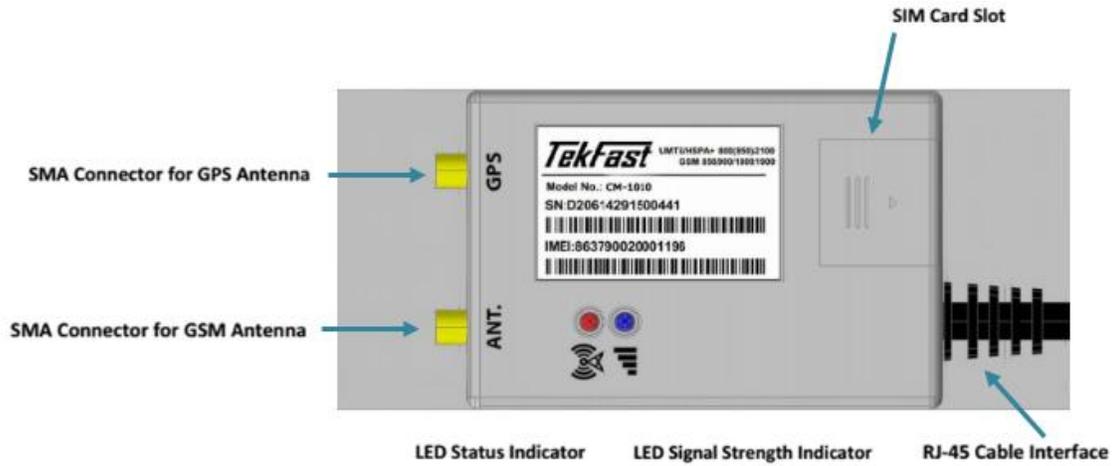
<b>Feature</b>	<b>Specifications</b>
Temperature Operating	-40°C ~ +85°C
Humidity Operating	5 to 95% RH

## 2.4 More Characteristic

<b>Feature</b>	<b>Specifications</b>
Certificate	EMI Standard Class B
Mounting	Wall Mount

## 3. TECHNICAL HARDWARE

### 3.1 Overview



**Model: CM-1011Q**

### 3.2 Status Indicator

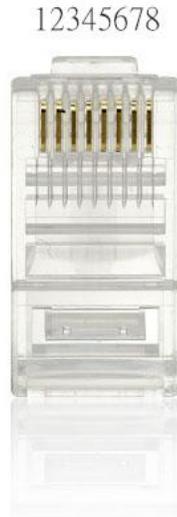
<b>Status Indicator (Green LED)</b>	<b>Modem Status</b>
LED ON Permanently	Modem is switched on but is not registered on the network
LED ON and blinking slowly	Modem is switched on and registered to the network . However, there is no active communication in progress.
LED ON and blinking quickly	Modem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

<b>Signal Strength Indicator (Red LED)</b>	<b>Modem Status</b>
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

### 3.3 Cable Interface

The modem communicates with other devices via the RJ-45 cable. The 8-pin RJ-45 plug consists of:

1. Power input and Ground (Pin 1 and pin 4)
2. RJ-45 (RS-232) serial connection



PIN Number	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

### 3.4 Power Supply Interface

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

<b>PIN Number</b>	<b>Description</b>
1	VDC Power Input
4	Ground

The power supply rating is :

<b>Power Supply</b>	<b>Voltage</b>
Minimum Voltage Input	5 V
Maximum Voltage Input	24V

A regulated 5V DC input voltage is recommended for operating the modem. A power voltage exceeding 24V supplied to the modem may result in permanent damage.

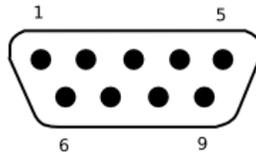
### 3.5 RJ-45 Link Interface

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

<b>Item</b>	<b>Setting</b>
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:

Sub-D 9 male  
(Looking at the pins)



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

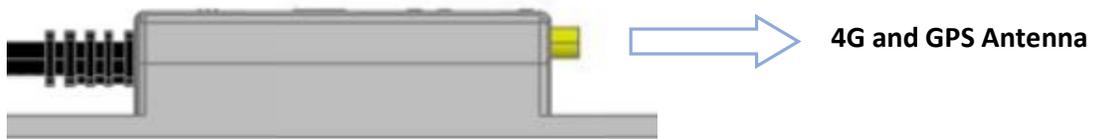
### 3.6 SIM Interface

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.



### 3.7 Antenna Interface

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



### 3.8 Mounting Base

Modem can be mounted onto your application by attaching it to the back of the modem using four M3 screws

## 4. GETTING STARTED

### 4.1 Setting up the modem

**Step 1** 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.

**Step 2** Insert SIM card into the modem. Please refer to Chapter 3.6 "SIM Interface" for more detailed information.

**Step 3** Connect the antenna to the modem. Please refer to Chapter 3.7 "Antenna Interface" for more detailed information.

**Step 4** Connect the modem communication interface to your device. Connect the modem serial link interface Pin 2 to Pin 8 to your device. Please refer to Chapter 3.3 Cable Interface for more detailed information.

**Step 5** Power up the modem. Connect Pin 1 and Pin 4 of the interface cable RJ-45 plug to the input voltage and ground respectively. The status indicator LED will light up instantly. The modem is now ready to use.

**Step 6** 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.

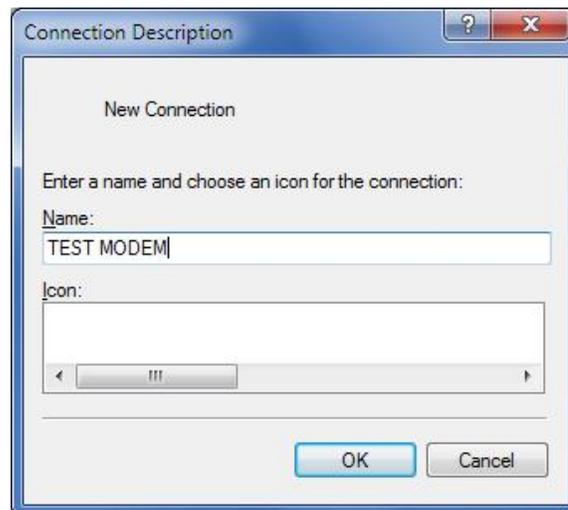
## 4.2 Interfacing Modem with HyperTerminal Software



Configuring HyperTerminal for Modem:

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

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

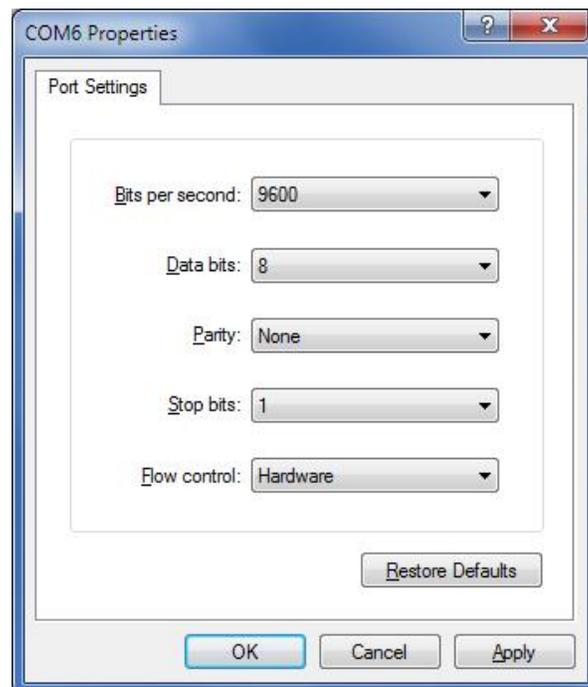


**Step 3** In the Connect to dialog box, select the PC COM port number, which is connected to the modem, and click OK to continue.



**Step 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:



**Step 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

Enter **AT**<Enter> command.

An **OK** response

```
at
OK
at+cpin?
+CPIN: READY

OK
at+csq
+CSQ: 25,99

OK
at+creg?
+CREG: 0,1

OK
at+cgmr
+CGMR: 35316B02SIM5360J_SIT_TH_160324

OK
```

This section suggests examples for some basic functions using HyperTerminal sending short messages (SMS):

**Step 1** Set short message format as Text mode.

```
AT+CMGF=1 <Enter>
```

**Step 2** Check whether SMS center (SMSC) number is set to SIM card.

```
AT+CSCA? <Enter>
```

**Step 3** Send a message to a phone number.

```
AT+CMGS= "Phone number" <Enter>
```

```
>Hello <Ctrl-Z>
```

**Step 4** Wait for +CMGS for the result of sending SMS.

```
+CMGS: <mr>
```

Indicates that the SMS has been sent successfully.

## 5. TROUBLESHOOTING

### 5.1 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.

### 5.2 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.

### 5.3 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.

### 5.4 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).

### 5.5 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.

## 6 Safety Information

### **SAR Requirement**

Based on the CE radiation exposure limits, and the standards EN50385 and EN50383, a minimum safety operating distance between the device and human body must be maintained. A 203mm (8inches) separation distance between the We modem and human body must be maintained at all times during device operation.

### **General 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.

**Vehicle Safety**

If incorrectly installed in a vehicle, the operation of the Modem could interfere with the proper functioning of vehicle electronics. Ensure that only qualified personnel perform the installation to avoid such problems. Verification of the protection of vehicle electronics should form part of the installation.

**Care and Maintenance**

Your Modem is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestions below will help you to enjoy this product for many years.

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.

Do not place the Modem alongside computer discs, credit or travel cards or other magnetic media. The information contained on discs or cards may be affected by the frequency emitted by the modem.