Monarch Platform - GM01Q-STMOD

GM01Q-STMOD Test Kit User Guide

Rev4 Draft

SEQUANS

Preface

Legal Notices

Copyright © 2019, SEQUANS Communications

All information contained herein and disclosed by this document is confidential and the proprietary property of SEQUANS Communications, and all rights therein are expressly reserved. Acceptance of this material signifies agreement by the recipient that the information contained in this document is confidential and that it will be used solely for the purposes set forth herein. Acceptance of this material signifies agreement by the recipient that it will not be used, reproduced in whole or in part, disclosed, distributed, or conveyed to others in any manner or by any means – graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems – without the express written permission of SEQUANS Communications.

All Sequans' logos and trademarks are the property of SEQUANS Communications. Unauthorized usage is strictly prohibited without the express written permission of SEQUANS Communications. All other company and product names may be trademarks or registered trademarks of their respective owners. Products and services of SEQUANS Communications, and those of its licensees may be protected by one or more pending or issued U.S. or foreign patents.

All STMicroelectronics™' logos and trademarks are the property of STMicroelectronics. Unauthorized usage is strictly prohibited without the express written permission of STMicroelectronics. Please see www.st.com.

ST Micro Electronics All rights reserved © 2019 STMicroelectronics

Because of continuing developments and improvements in design, manufacturing, and deployment, material in this document is subject to change without notification and does not represent any commitment or obligation on the part of SEQUANS Communications. SEQUANS Communications shall have no liability for any error or damages resulting from the use of this document.
OEMs are advised this product contains FCC and IC IDs. This user manual provides guidelines about how to use FCC and IC IDs in final product.

Document Revision History

Revision	Date	Product Application
1	February 2019	First edition of the GM01Q-STMOD Test Kit User Guide.
2	June 2019	Second edition of the GM01Q-STMOD Test Kit User Guide.
3, 4	July 2019	Third, fourth edition of the GM01Q-STMOD Test Kit User Guide. Please see details in Changes in this Document on page iii.

About this Manual

Purpose and Scope

The purpose of this guide is to:

- Help GM01Q-STMOD Test Kit users to understand their kit.
- Provide them with the set of procedures to start and configure the Test Kit, connect to the network and setup a data connection.

Note:	GM01Q-STMOD Test Kit is dedicated to LTE Category M1 networks only.

Who Should Read this Document

This document is intended for any user of the Sequans' GM01Q-STMOD Test Kit.

Changes in this Document

The following changes occured since the previous edition of the document:

- Added FCC-ID in Section 4.2 Federal Communication Commission Interference Statement on page 19.
- Added Section 4.3 Industry Canada Statement on page 21.

References

Reference	Document Title
AT Commands Reference Manual	*AT Commands Reference Manual*
ITU-T V.250 http://www.itu.int/rec/T-REC-V.250-200307-I/en	SERIES V: DATA COMMUNICATION OVER THE TELEPHONE NETWORK - Control procedures - Serial asynchronous automatic dialling and control
3GPP TS 27.007-13.5.0 http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/27007-d50.zip	AT commands set for User Equipment
3GPP TS 27.005-13.0.0 http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/27005-d00.zip	AT commands set for Short Message Service (SMS) and Cell Broadcast Service (CBS)
3GPP TR 21.905-13.1.0 http://www.3gpp.org/ftp/Specs/archive/21_series/21.905/21905-d10.zip	Vocabulary for 3GPP Specifications

Documentation Conventions

The following typographic conventions are used in this document.

General Conventions	
Note	Important information requiring the user's attention.
Caution	A condition or circumstance that may cause damage to the equipment or loss of data.
Warning	A condition or circumstance that may cause personal injury.
Italics	Italic font style denotes • Emphasis of an important word; • First use of a new term; • Title of a document.
Screen Name	Sans serif, bold font denotes • On-screen name of a window, dialog box or field; • Keys on a keyboard; • Labels printed on the equipment.

Software Conventions	
`Code`	Regular Courier font denotes code or text displayed on-screen.
`Code`	Bold Courier font denotes commands and parameters that you enter exactly as shown. Multiple parameters are grouped in brackets [ ]. If you are to choose only one among grouped parameters, the choices are separated with a pipe: [parm1 | parm2 | parm3] If there is no pipe separator, you must enter each parameter: [parm1 parm2 parm3]
`Code`	Italic Courier font denotes parameters that require you to enter a value or variable. Multiple parameters are grouped in brackets [ ]. If you are to choose only one among grouped parameters, the choices are separated with a pipe: [parm1 | parm2 | parm3] If there is no pipe separator, you must enter a value for each parameter: [parm1 parm2 parm3]

Table of Contents

1 GM01Q-STMOD Test Kit Presentation

1.1 Test Kit Environment

The requirement environment to run tests is as follows:

- One GM01Q-STMOD board (included in GM01Q-STMOD Test Kit)
- One STM32 Discovery™ Board (not included in GM01Q-STMOD Test Kit). You can use your existing Discovery Board or buy one from https://www.st.com/en/evaluation-tools/stm32-mcu-discovery-kits.html
- One mini USB cable (not included in GM01Q-STMOD Test Kit)
- One antenna (included in GM01Q-STMOD Test Kit)
- The GM01Q-STMOD Test Kit requires a Serial Terminal Emulator running under Windows, required to interact with the Test Kit through AT Commands. In the example used in this document we use TeraTerm software (see https://osdn.net/projects/ttssh2/releases/ or other reliable download sources).

1.2 Hardware Presentation

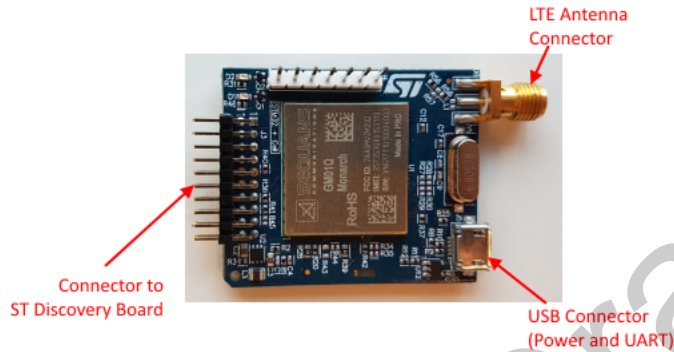| Important:	Please note that when the GM01Q_STMOD board is used as standalone and not plugged to any MCU discovery boards, the SIM card will not be detected, unless you connect manually the SIM multiplexer pins in the STMOD connector. Refer to Section 3.6 SIM Interface Multiplexing on page 15 for details.

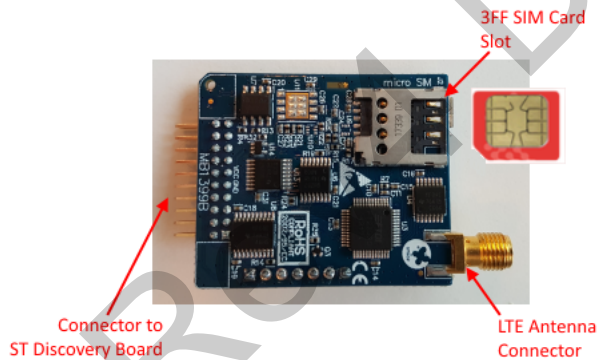**Figure 1-1: Connectors, Top View**

Figure 1-2: Connectors, Bottom View

1.3 List of Supported Operators

The list of the operators predefined in the software and automatically configured when inserting their SIM card is presented in Table 1-1.

Note:	The SIM card will be read when the UE is in `+CFUN=1` or `+CFUN=4` states. When the SIM card is read for the first time, the modem will be reconfigured automatically and will reboot.

If the operator you are trying to connect does not appear in the above list, or if you are working with a test equipment, please refer to section 3.5 Connect to an Unsupported Operator or to a Test Equipment on page 14.

Table 1-1: Supported Operators and Bands

Operator's Name	LTE Bands	Comments
Truphone (MVNO)	B1, B2, B4, B8, B12, B20	See https://iot.truphone.com/support/lpwa/ for updated list
Verizon (USA)	B13	Tested
AT&T (USA)	B2, B4, B12	Tested
Softbank (Japan)	B1, B8	Tested
Docomo (Japan)	B1, B19	Tested
SKT (Korea)	B3, B5, B26	Tested
Telstra (Australia)	B3, B28	Tested
KDDI (Japan)	B18, B26	Tested
Chunghwa (Taiwan)	B3, B8	Tested
AIS (Thailand)	B1, B3, B8	Untested
APTG (Taiwan)	B1, B8	Untested
Bell (Canada)	B4	Untested
Dialog Axiata (Sri Lanka)	B3, B8	Untested
Etisalat (UAE)	B3, B20	Untested
KPN (The Netherlands)	B3, B20	Untested
Orange (France and Belgium)	B3, B20	Tested
Singtel (Singapore)	B3, B8	Untested

Table 1-1: Supported Operators and Bands (Continued)

Operator's Name	LTE Bands	Comments
Spark (New Zealand)	B1, B3, B28	Untested
Swisscom (Switzerland)	B3, B20	Untested
Telenor (Norway)	B3, B8, B20	Untested
Turkcell (Turkey)	B20, B1, B3, B8	Untested
Vodafone (New Zealand and The Netherlands)	B3, B8, B28, B20	Untested

2 **Getting Started**

2.1 Prepare the Test Kit

1. Before plugging the discovery board for the first time to your laptop, install the `en.stsw-link009` driver that can be downloaded on https://www.st.com/en/development-tools/stsw-link009.html.

2. Connect the antenna or your SMA RF cable to the board LTE RF connector

3. Insert your 3FF SIM card in the SIM slot.

4. Connect the GM01Q-STMOD board to the STM32 discovery board (GM01Q module on the upper side and SIM slot on the bottom) as shown on Figure 2-1.
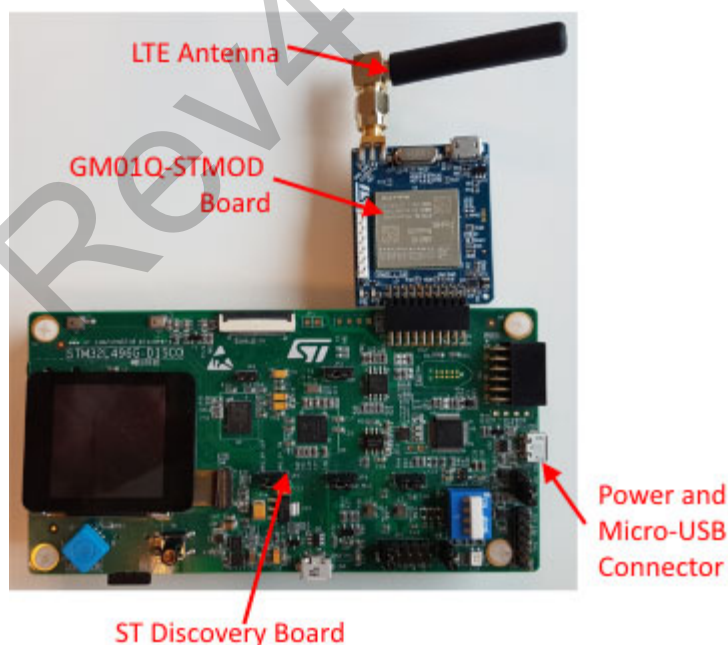

Figure 2-1: GM01Q-STMOD Test Kit Connected to Discovery Board

5. Plug the USB cable from the Discovery Board to your PC.

2.2   Flash STM32CUBE to Discovery Board

Please refer to
https://www.st.com/en/embedded-software/x-cube-cellular.html for
instructions to download the STM32 software and the related documentation.

2.3   Connect to the Network

Note: This section applies when you have access to a LTE network or
               simulator.

2.3.1   Initial Operations

1. Connect the RF cable or the Antenna in the RF port of the Kit

2. Insert your SIM card in the SIM slot as shown on Figure 1-2 on page 2.

3. The default STMCUBE binary will automatically configure and connect the
   modem to the Terminal.

   a) It first sends: AT+CEREG=2.
      This command will allow getting notification every time there is a
      change of the network registration status

   b) It sends then: AT+CFUN=1

   The response will be OK , followed by +CEREG=<stat>.

Table 2-1: +CEREG=<stat> Response Details

<stat> Value	Meaning	Comment
0	Modem is not registered and is not currently searching an operator to register to	Possible cause : SIM card error or registration ongoing
1	Modem is registered on network	Kit connected
2	Modem is not registered, but is currently trying to attach or is searching for an operator to register to.	Possible causes:- No network available- Available networks have bad coverage - PLMN available but the registration is rejected

Table 2-1: +CEREG=<stat> Response Details (Continued)

<stat> Value	Meaning	Comment
3	Registration denied	Possible causes:- Illegal mobile equipment- IMSI unknown at HLR- PLMN not allowed- Location area not allowed- Roaming not allowed in this location area- Network failure- Network congestion
4	Unknown.	Transitory value
5	Modem Registered in roaming mode	

c) It finally checks the SIM Card state with AT+CPIN.

Response can be one of:

+CPIN: Ready : SIM card is present and unlocked

+CPIN: SIM PIN : Modem is waiting SIM PIN to be entered

+CPIN: SIM PUK : Modem is waiting SIM PUK to be given

ERROR, when SIM is not inserted or not detected

4. Please refer to Sequans' LR5.2.1.0 AT command reference manual for more details on +CEREG URC.

2.4   Send Data through the Test Kit

When your kit is connected to a network, you can send and receive data through it to/from the network.

Please refer to section 5 of the STM32 User Manual https://www.st.com/resource/en/user_manual/dm00511019.pdf.

3 Setup and Troubleshooting

3.1 Setup Details

In order to have access to the UART COM ports for troubleshooting, connect the USB port of the GM01Q-STMOD board to your computer with a micro USB cable.

3.1.1 Software Driver Installation

When you plug the USB connector for the first time in your PC, you need to wait for approximatively one minute, to allow the drivers auto-install on Windows.

The USB is used to power the board. It also connects the on-board UART-USB Bridge IC (FTDI® FT4232HL) to provide ACM interfaces (virtual COM) in order to access the board through UART.

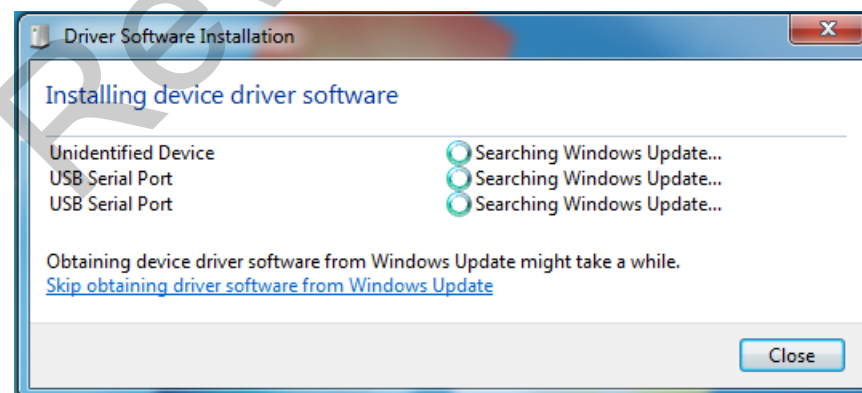You should see a window similar to Figure 3-1 on page 8 opening.

Figure 3-1: Driver Auto-Install

If, for some reasons, the driver fails to auto-install on Windows, you can install them manually from www.ftdichip.com, where you can find the FTDI driver labelled UART/USB.

After the driver installation, please unplug the Test Kit and reboot your PC.

3.1.2 Control the Installation

After completing the drivers' installation, whenever you plug the USB cable you should be able to see the following, under Windows **Control Panel -> Device Manager**.
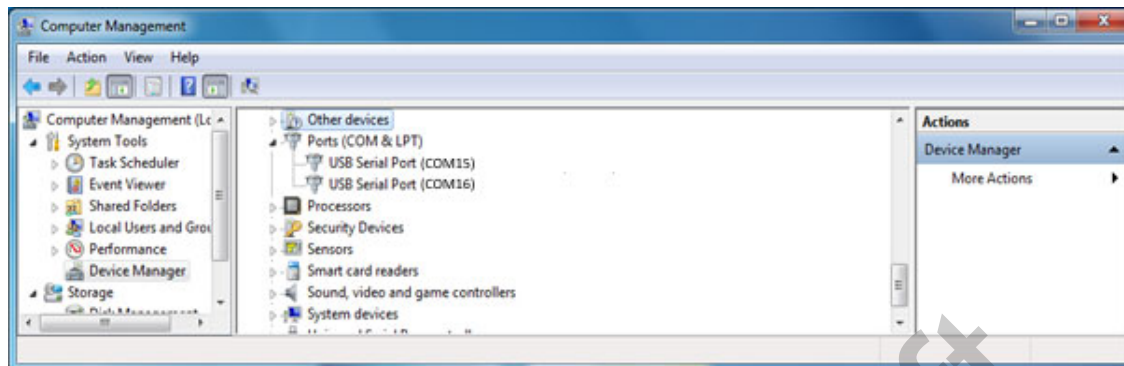

Figure 3-2: Device Manager after Driver Install

Note:	Port enumeration can be different on your PC from the given example, depending on your local settings.

3.1.3 Setting of the COM Ports

Table 3-1 summarizes the COM ports under Windows and their mapping and configuration to the Test Kit.

Table 3-1: COM Ports Setting

Port Enum	Sequans Mapping	Usage	Baudrate	Data Bits	Flow Control	Parity	Stop
COMa (here COM16)	Serial2	AT Command Data over PPP	921600	8	Hardware	None	1
COMb (here COM15)	Serial1	Test Kit Console	115200	8	None	None	1

Note:	COM ports cannot be shared between two different applications in the same time. One of the applications will be in error.

3.1.4   Configuring and Checking COM Ports

After COM drivers are installed, open the Windows device manager, expand Ports (COM & LPT) label and click on each one of the USB Serial Port (COMx), tab Port Settings and enter the appropriate values as described in the COM ports overview Table.
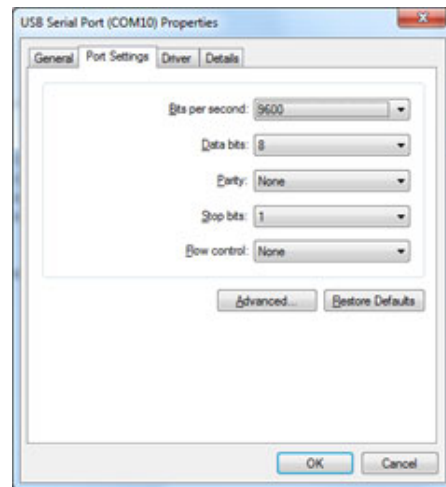

Figure 3-3: COM Port Properties

3.2 AT Commands

The test kit configuration and usage is all being done through AT commands

In order to send AT commands to the test kit, you need to use a serial terminal program under Window such as TeraTerm freeware.

To send an AT command to the kit, you need to connect your serial terminal to the "Serial 2" port, corresponding to COMa on Windows enumeration -please refer to the table in 4.1.3 to determine the exact COM port on your PC

Configure the correct baudrate 921600 and the other settings in the terminal.

Once the correct setting is done, you should be able to start sending AT commands and receiving their corresponding output.
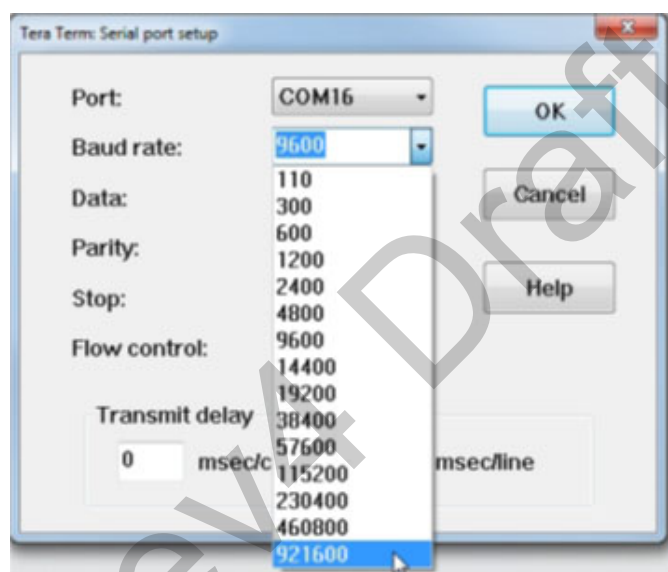

Figure 3-4: Serial 2 Terminal

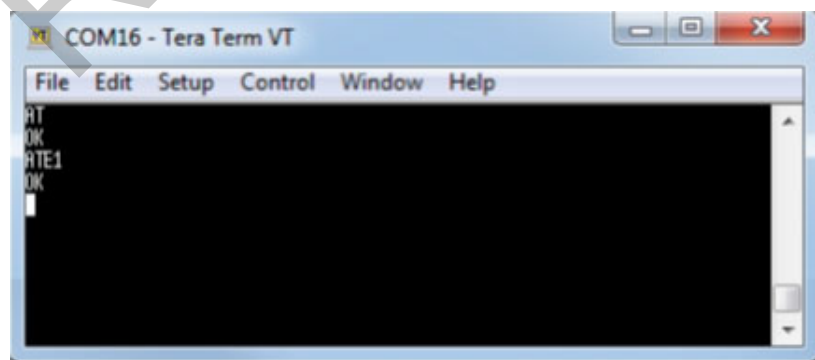You can start with ATE1 to enable the echo for the current session.

Figure 3-5: AT Command on Serial Interface

Note: Refer to AT Command Reference Manual which describe the complete list of AT commands supported by GM01Q Module firmware.

3.3 Console Terminal

Connecting a serial terminal to the COM port mapped on Serial 1 of the Test Kit, will allow you to access to the test kit Console. The console is a maintenance window, not necessary for regular operations, however it is useful to have it during maintenance phases, such as firmware upgrade or to observe the boot messages after hitting the reset button.
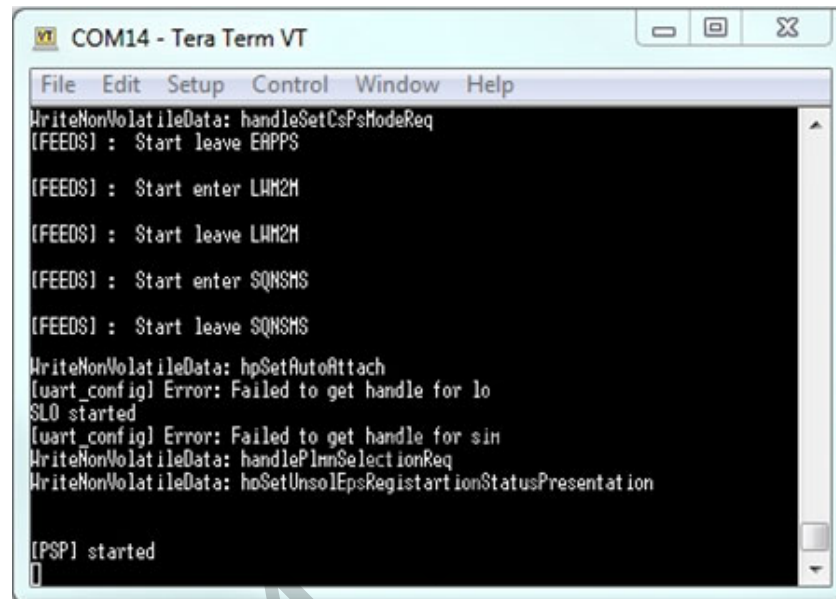

Figure 3-6: Serial 1 Terminal

3.4   Check the Signal Strength

When your Kit is connected to a network, you can check the signal strength and characteristics through the AT Command `AT+CSQ`. The response will be:

`+CSQ:<rssi>,<ber>`

where `<rssi>` represents the signal strength at the antenna and `<ber>` is the bit error rate in %.

Table 3-2: rssi Parameter Description

<rssi> Parameter	Signal Description with RSSI Value Range
0-9	Marginal: -113 dBm to -95 dBm
10-14	OK: -93 dBm to -85 dBm
15-19	Good: -83 dBm to -75 dBm
20-30	Excellent: -73 dBm to -53 dBm
31	Excellent: -51 dBm or greater
99	Unknown or not detectable

Table 3-3: ber Parameter Description

<ber> Parameter	Bit Error Rate (in %)
0	Less than 0.2%
1	0.2% to 0.4%
2	0.4% to 0.8%
3	0.8% to 1.6%
4	1.6% to 3.2%
5	3.2% to 6.4%
6	6.4% to 12.8%
7	More than 12.8%
99	Unknown or not detectable

3.5 Connect to an Unsupported Operator or to a Test Equipment

When inserting test SIM card or a SIM card from an operator that is not part of the ones pre-configured and listed in Section 1.3 List of Supported Operators on page 3, the modem will automatically reconfigure itself in standard mode and reboot.

Notes:

- The mode can be checked with `AT+SQNCTM?`

- AT commands can be sent from the STMicroelectronics terminal using the `"atcmd"` command

- This configuration will be persistent at reboot

Once configured in standard mode after reboot, the UE will scan the following bands in that order:

1. B20, B12, B13, B8, B18, B19, B28

   If no CATM cell is found on these bands, the UE will then continue scanning the other set of bands.

2. B1, B2, B3, B4, B26, B5, B17, B25, B66, B14

Note: The first attach procedure can take some time due to the large number of bands to be scanned. Once the UE has attached to a cell, it will save its settings into memory and scan for this cell first on the next attach to allow speeding up the connection.

3.6 SIM Interface Multiplexing

This section describes the different SIM interfaces available to GM01Q on GM01Q-STMOD Test Kit. These options are managed by a dedicated SIM multiplexer

The SIM multiplexer of the GM01Q-STMOD Test Kit can be used to configure 3 different SIM cards:

- LOCAL SIM: this is the plastic SIM card slot located on the GM01Q-STMOD board (J2 connector)
- LOCAL eSIM: Not currently supported
- HOST eSIM: Not supported

Table 3-4 describes how to configure each SIM slot with SIM multiplexer signals SIM_SEL0 and SIM_SEL1.

Table 3-4: SIM Multiplexer Configuration Table

Selection	SIM_SEL0	SIM_SEL1
LOCAL_SIM	0	0
LOCAL_eSIM (not supported)	1	0
HOST_eSIM (not supported)	0	1
No SIM Hi-Z	1	1

Figure 3-7 represents the GM01Q-STMOD Test Kit connector to ST Discovery board, where the SIM multiplexer signals SIM_SEL0 and SIM_SEL1 are located (positions 8 and 18).
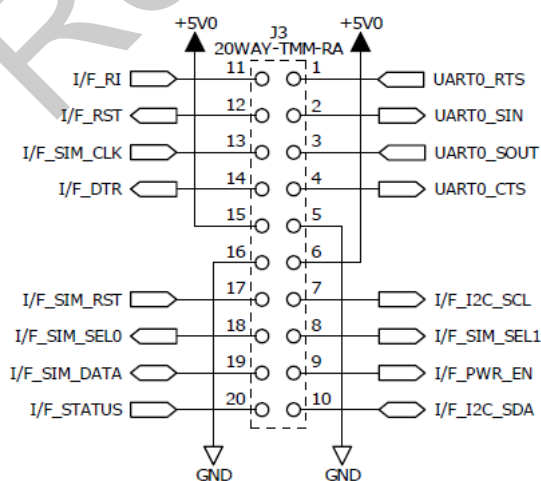

Figure 3-7: Connector to ST Discovery Board

When the GM01Q-STMOD Test Kit is used in standalone, the SIM multiplexer is in `No SIM Hi-Z` state by default. The user has to connect SIM_SEL0 and 1 to the ground to be able to use the local SIM.

When the GM01Q-STMOD Test Kit is connected to a ST Discovery board, the SIM multiplexer is managed directly by the MCU. The configuration can be checked as follows. The corresponding logs are shown on Figure 3-8.

1. Connect a USB cable to the ST Discovery board (select the USB connector labelled `ST-LINK`)

2. Open a serial terminal on the STMicroelectronics STLink Virtual COM Port at 115200 bauds.

3. At start up, press 1 to select the application "`1: Setup configuration Menu`"

4. Then press 2 to configure the cellular service: "`2: Configuration: Cellular Service`"

5. In the Cellular Service configuration Menu, press 1 to check the current configuration "`1 : list current configuration`"

6. Check the first line: `Sim Slot 0: 0 (MODEM SOCKET)`

7. If the selected SIM slot is not 0, press c to update the configuration "`c : update configuration by console and store it in FEEPROM`"

    a) Press 4 when prompted for the Version
    b) Then press 0 when prompted for the SIM Slot

    c) For the other values, copy the figure in parenthesis

Figure 3-8: Logs of ST Discovery Board Configuration in Standalone Mode

4 Regulatory Statements

4.1 European Union

Notice applicable to Evaluation Boards according to European Regulation For the European Regulation of the Evaluation Board, the applicable EU directives are considered, with a particular attention to the Low Voltage Directive (LVD) 2014/35/EU, the Electromagnetic Compatibility (EMC) Directive 2014/30/EU, and the Radio Equipment Directive (RED) 2014/53/EU. If the Evaluation Board is outside the scope of the foregoing Directives, then the General Product Safety Directive (GPSD) 2001/95/EC and Council Directive 93/68/EEC, amending Directive 73/23/EEC on electrical equipment designed for use within certain voltage limits, areapplicable.

The Evaluation Board meets the requirements of the Restriction of Hazardous Substances (RoHS 2 or RoHS recast) Directive 2011/65/EU, Annex II, as amended by Directive 2015/863/EU.

4.2 Federal Communication Commission Interference Statement

Contains FCC ID: 2AAGMGM01QA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

-> Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

-> This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2. The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further <u>transmitter</u> test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AAGMGM01QA". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

4.3 Industry Canada Statement

Contains IC: 12732A-GM01QA

This device complies with ISED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

CAN ICES-3(A)/ NMB-3(A)

4 - This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.

4 - Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.

5 - The County Code Selection feature is disabled for products marketed in the US/ Canada.

5 - La fonction de sélection de l'indicatif du pays est désactivée pour les produits commercialisés aux États-Unis et au Canada.

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet émetteur radio (identifier l'appareil par numéro de certification) a été approuvé par l'industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec le gain maximum admissible indiqué. Types d'antennes non inclus dans cette liste, ayant un gain supérieur au gain maximum indiqué pour cette type, sont strictement interdits pour une utilisation avec cet appareil.

List of antenna information				Gain	
Component	Frequency (MHz)	Antenna type	Brand	Main	Aux
LTE	700-960; 1710-2700	External Antenna	South Star	Variable	N/A

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2. The transmitter module may not be co-located with any other transmitter or antenna.
   As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

1. L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et

2. Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.
   Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 12732A-GM01QA".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 12732A-GM01QA".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

4.4 Japan Regulatory Certification

GM01Q is certified by regulatory authorities in Japan for both JATE and TYPE (TELEC).

JAPAN

T D180158003

R 003-180007
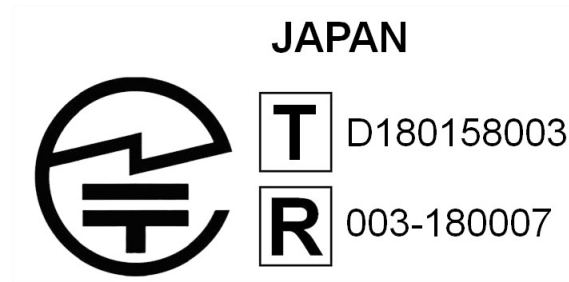
A Glossary and Abbreviations

Acronym	Definition
ACM	Access Control Mechanism
AT	Abbreviation for "Attention", prefix of modem commands.
COM	Communication port on a PC
FCC	Federal Communications Commission (USA)
HLR	Home Location Register
IMSI	International Mobile Subscriber Identity
LTE	Long Term Evolution, or 4G. Standard is developed by the 3GPP www.3gpp.org.
MCU	Micro Controller Unit
MVNO	Mobile Virtual Network Operator
PC	Personal Computer
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PPP	Point to Point Protocol
PUK	Pin Unlocking Key
RF	Radio Frequency
RSSI	Received Signal Strength Indicator
SIM	Subscriber Identity Module
UART	Universal Asynchronous Receiver Transmitter
UE	User Equipment

Acronym	Definition
URC	Unsolicited Response Code
USB	Universal Serial Bus