Certificato n. 9110.ESTI

# SIM.GATE 4G.VoLTE

**User's manual**

01/04/2025 7IS-80541

# TABLE OF CONTENTS


GENERAL INSTALLATION INSTRUCTIONS ..... 4
General Notes ..... 4
Making the installation ..... 4
DESCRIPTION ..... 5
Features ..... 6
LEDs ..... 7
Hardware description ..... 8
INSTALLATION ..... 9
Inserting the SIM card ..... 9
Connecting the antenna ..... 9
Connection to the telephone line ..... 10
Connection to the power supply ..... 11
Turning the gateway on ..... 12
Gateway mounting operations ..... 13
Installation recommendations ..... 14
Current consumption chart ..... 14
PROGRAMMING ..... 15
Programming by telephone ..... 15
(1) SIM card expiration check ..... 21
(2) Battery check ..... 21
(3) External power failure control ..... 22
(4) Relay-based notification of external power failure and/or mobile network loss ..... 22
(5) Periodic test ..... 22
(6) Automatic converter of selected telephone number ..... 23
Programming via SMS ..... 25
Message format ..... 25
Notification message format ..... 28
SERVICES ..... 29
Incoming calls ..... 29
Outgoing calls ..... 29
Measuring the signal level ..... 30
Reading the days missing to SIM card expiration ..... 31
Reading the battery status ..... 31

Relay use ..... 32
Activation/Deactivation ..... 32
Pulse ..... 32
Reading advanced device and radio cell parameters ..... 33
SMS/DTMF CONVERTeR ..... 34
Notification message ..... 35
SIGNALS ..... 37
Tones ..... 37
Call signals ..... 38
LED ..... 38
4G LTE/GSM signal indicator LED (GREEN) ..... 38
Device status indicator LED (RED) ..... 39
Line status indicator LED / Data transmission indicator LED (WHITE) ..... 39
Power supply status indicator LED (BLUE) ..... 40
TROUBLE SHOOTING GUIDE ..... 41
FREQUENCIES ..... 42
EU DECLARATION OF CONFORMITY ..... 43

# GENERAL INSTALLATION INSTRUCTIONS

## GENERAL NOTES

Carefully read the notes contained in this section as they provide important information on safe correct installation, use and maintenance of the product.

- The product must be EXCLUSIVELY used for the purpose it was designed for. Esse-ti shall not be responsible for damages arising from improper use.
- The product has been designed in compliance with the regulations in force and must be installed in systems that comply with the provisions of law.
- Always disconnect power supply before performing internal or external operations on the product (cleaning, maintenance, etc.).
- Always refer to an authorized service centre for repair.
- The device must be installed in a ventilated place, making sure that the ventilation slots are never obstructed.
- Do not install the product in environments with risk of explosion.
- Make sure that the product has been installed as required.
- Do not introduce objects, liquids or powders inside the product. Do not use sprays inside the product.
- Packing components (such as plastic bags, foam polystyrene, etc.) must be kept out of the reach of children because potentially dangerous.

**CAUTION**
**Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries in accordance with current regulations.**

## MAKING THE INSTALLATION

Internal telephone installations must be carried out by specialised personnel.
The installation and connection of telephone terminals to the telecommunications network that do not comply with the regulations in force is not permitted.

# DESCRIPTION

*SIM.GATE 4G.VoLTE*

**SIM.GATE 4G.VoLTE** is a device that, connected to a fixed telephone or to the PSTN input terminals of a PABX or autodialer, allows you to make and receive calls over the 4G LTE/GSM network.

**SIM.GATE 4G.VoLTE** gateway comes with built-in backup batteries and a relay output which can be activated either locally or remotely via SMS.

**WARNING**
**Check with your network provider that VoLTE service is active on the SIM card you are using.**

# Features

- Local programming via telephone (DTMF tones)
- Remote programming via SMS
- Reading of programming codes via SMS
- Data connection and voice call simultaneously
- 2G fallback
- Display of caller identification
- Automatic country setting
- Clock setting
- CLIR
- Roaming setting
- SIM card expiration control
- Battery check
- External power failure control
- Periodic test
- Relay-based notification of external power failure
- Relay-based notification of 4G LTE/GSM network loss
- SMS notifications (SIM card expiration, battery, external power failure/restore, 4G LTE/GSM network restore)
- Measurement of 4G LTE/GSM signal level
- Automatic converter of selected telephone number
- Receiver and transmitter gain adjustment
- Remote reboot function
- SMS/DTMF converter
- Remote firmware update
- 4G LTE/GSM signal indicator LED
- Device status indicator LED
- Line status indicator LED / Data transmission indicator LED
- Power supply status indicator LED
- 4G LTE/GSM module

- 2 W transmission power
- 230 Vac external adapter input
- 12 Vdc power supply input
- NiMH 800 mAh 7,2 V back up battery
- Relay output
- External antenna (cable length = 2 m)
- External adapter (230 Vac 50 Hz input; 12 Vdc 500 mA output; CE mark)

## LEDs

The gateway is equipped with 4 visible LEDs.
LEDs flashing is described at chapter "Signals" (see page 38).

Green LED: 4G LTE/GSM signal indicator LED

Red LED: Device status indicator LED

White LED: Line status indicator LED /
Data transmission indicator LED

Blue LED: Power supply status indicator LED

# Hardware description

- Remove the cover.

A ANTENNA cable connector
B SIM CARD housing with front panel
C LED indicating signal strength (green), LED indicating device operation status (red), LED indicating line status / data transmission (white) and LED indicating power supply status (blue)
D Telephone line output (RJ11 connector) for telephone set connection or autodialer/PABX analogue line connection
E 230 Vac external adapter input
F Telephone line output (terminal block) for telephone set connection or autodialer/PABX analogue line connection
G 12 Vdc power supply terminal block
H Relay terminal block
I Backup battery connector

# INSTALLATION

## Inserting the SIM card

Before inserting or replacing the SIM card, always make sure that the gateway has been disconnected from the mains and battery and that no electrostatic discharge is present in order to avoid damaging it.
Take all necessary measures to avoid electrostatic discharge.

- Slide the SIM card housing cover downward until it unblocks and lift it.
- Carefully slide the SIM card into its housing cover.
- Lower the SIM card housing cover and slide it upwards until it locks.

**WARNING**
**The SIM card PIN must be DISABLED. If the PIN is enabled, it must be disabled through a mobile phone.**

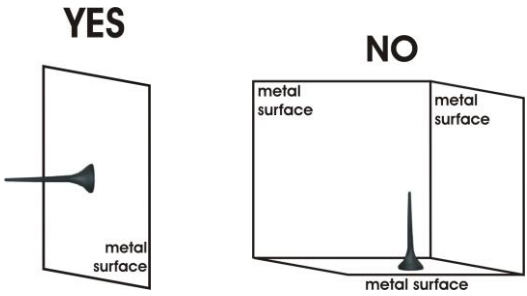
## Connecting the antenna

- Screw the antenna cable in to the connector on the top of the module.

**WARNING**
**NEVER connect the gateway without having previously connected the antenna. The gateway may get damaged.**

**WARNING**
**Do not install the product near other electric or electronic devices that were not especially designed to be used with it. They could be subjected to RF interference from the module.**

- Position the antenna with magnetic base so that any metal surfaces do not block the signal.




## Connection to the telephone line

- Connect the gateway to a standard telephone or to the PSTN input terminals of a PABX or autodialer via the RJ-11 connector (D in the picture at page 8).

or

- Connect the gateway to a standard telephone or to the PSTN input terminals of a PABX or autodialer using the TEL terminal (F in the picture at page 8).

# Connection to the power supply

*Power supply via 230 Vac / 12 Vdc external adapter*

- Connect the external adapter to the specific input (E in the picture at page 8).
- Connect the backup batteries to the dedicated input (I in the picture at page 8).
- Close the gateway cover.

or

*12 Vdc power supply*

- Connect the power supply cable to the specific terminal (G in the picture at page 8) taking care to respect the polarity.
- Connect the backup batteries to the dedicated input (I in the picture at page 8).
- Close the gateway cover, paying attention to the power supply cable.

**WARNING**
**Backup batteries may be connected only after gateway has been powered up.**

*Note: the max voltage to be supplied to the 12 Vdc terminal is 17 Vdc.*

*Note: the min voltage required to supply the gateway by the 12 Vdc terminal is 10 Vdc.*

*Note: a protection cut-out switch must be installed upstream to interrupt power supply in case of fault.*

# Turning the gateway on

- Power-up the gateway.
- Wait 30 seconds after power-up to give time for the gateway to register correctly with the 4G LTE/GSM network.
- Make sure the red LED (device status) flashes as shown in chapter "Signals" (see page 39).

If the red LED stays lit permanently, the gateway has not properly registered with the 4G LTE/GSM provider:

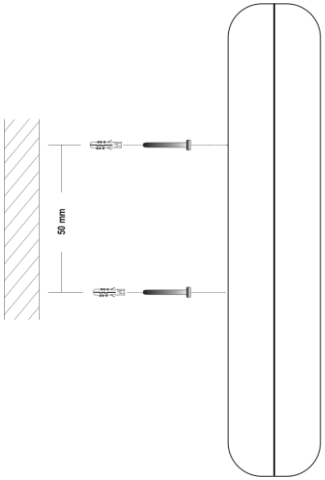
- Disconnect the gateway and make sure the SIM card is inserted correctly and that the PIN is not locking it.
- See chapter "Trouble shooting guide" (page 41).

# Gateway mounting operations

- Check the 4G LTE/GSM signal strength through the green indicator LED (see chapter "Signals", page 38) and identify an area where the signal is strong enough.

  *Note: the signal strength may vary according to the network provider.*

- Drill two holes with 5 mm diameter on the wall at a distance of 50 mm.
- Insert the 2 wall plugs and screws down until the screws are at a 5 mm distance from the wall.
- Place the gateway onto the two screws through the two back slots.



# Installation recommendations

- The gateway must be installed in a location where the radio signal allows for using the 4G LTE/GSM network.
- It is advisable to leave plenty of space around the gateway for maintenance operations.
- Do not install the gateway outdoors, since it lacks protection against weather conditions that can damage the gateway (water, humidity, etc.).
- Do not install the gateway near electronic (radio or TV sets, Personal Computers, wired radio systems, etc.) or magnetic devices that could be subjected to RF interference from the module: recommended distance from the antenna is min. 2,5 m.
- Do not install the gateway near medical devices. Its operation may cause damage to hearing aids or pacemakers.
- Always make sure that the device operation is permitted in the place of installation (e.g. installation is not allowed in hospitals, airplanes, etc.).

# Current consumption chart

| Power supply | 12 Vdc (battery not connected) | 12 Vdc (battery connected) |
|---|---|---|
| Telephone handset on hook | 45 mA | 70 mA |
| Telephone handset off hook | 90 mA | 115 mA |
| Conversation established | 140 mA | 165 mA |

# PROGRAMMING

Programming can be carried out locally via a multi-frequency telephone or remotely via SMS.

## *PROGRAMMING BY TELEPHONE*

- Connect a standard telephone to the gateway via the RJ-11 connector (D in the picture at page 8) or using the TEL terminals (F in the picture at page 8).
- Lift the handset and dial the desired programming code (see table "Programming by telephone").

*Note: at the end of each programming carried out correctly, you will hear a confirmation tone, while an error tone will be heard in case of error. In any case, the dialling tone will follow, after which you can proceed with the programming or make a call.*

*Note: during programming, the inter-digit dialling time must not exceed 5 seconds (see the programming "Inter-digit dialling time"). Once 5 seconds has elapsed without digits you will hear the dissuasion tone and you will have to wait the dialling tone or to hang up.*

*Note: programming can be carried out even if the signal is absent. After the confirmation or the error tones, the dissuasion tone will follow, after which you can proceed with programming or hang up.*

*Note: in the table "Programming by telephone" factory default values are highlighted in **bold**.*

| PROGRAMMING BY TELEPHONE | | |
|---|---|---|
| TELEPHONE LINE VOLTAGE (TEL terminals and RJ-11 connector) | ****061*X#** | X: option, from 0 to 1<br>0= 36 Vdc<br>1= **52 Vdc**<br>2= 36 Vdc with polarity reversal<br>3= 52 Vdc with polarity reversal |
| COUNTRY SETTING (LINE TONES) | ****009*X…X#** | X…X: country calling code of the country where the gateway is installed |
| | Default: the gateway automatically recognises the country in which it is installed and sets the corresponding line tones | |
| INTER-DIGIT DIALLING TIME | ****108*X#** | X: seconds, from 1 to 9; 0= 10 seconds<br>**5** factory default |
| CLOCK SETTING | ****107*DDMMYY*HHMM#** | Enabling<br>DD: day, MM: month, YY: year;<br>HH: hour, MM: minutes |
| | ****107*#** | Disabling |
| | Default: disabled | |
| CLIR PERMANENT SETTING | ****106*X#** | X: option, from 0 to 2<br>0= **the sending of your number to the called user depends on the settings of the telephone operator**<br>1= your number is not sent to the called user<br>2= your number is sent to the called user |
| CLIR TEMPORARY SETTING | ****016*X#** | X: option, from 0 to 1<br>0= your number is sent for a single call<br>1= your number is not sent for a single call |

| PROGRAMMING BY TELEPHONE | | |
|---|---|---|
| ROAMING | ****105*#** | Enabling |
| | ****105*XXXY…Y#** | Disabling<br>XXX: MCC of your telephone operator<br>Y…Y: MNC of your telephone operator<br>(when roaming is disabled, in case the gateway registers with a different provider than the programmed, it is not possible to make or receive any calls) |
| | Default: roaming enabled | |
| NOTIFICATION TELEPHONE NUMBER | ****040*X…X#** | X…X: telephone number appointed for:<br>- SMS or call notifications of SIM card expiration, low or dead battery, external power failure/restore, mobile network restore<br>- SMS reading SIM card expiration |
| | ****040*#** | Deleting |
| | ****045*X#** | X: option, from 0 to 2<br>0= notification sent via CLI call<br>1= **notification sent via SMS**<br>2= notification sent via P100 call |
| | ****047*X#** | Test sending notification<br>X: option, from 0 to 4<br>0= dead battery<br>1= low battery<br>3= external power failure<br>4= external power restore |
| P100 SETTINGS | ****044*X…X#** | X…X: P100 identifier (8 digits) |
| ADMINISTRATOR TELEPHONE NUMBER | ****018*X…X#** | X…X: telephone number with country code (if set, it is the only number from which programming via SMS is allowed) |
| | ****018*#** | Deleting |

| PROGRAMMING BY TELEPHONE | | |
|---|---|---|
| PROGRAMMING PASSWORD | ****019*X…X*Y…Y#** | X…X: old password (max. 3 digits)<br>Y…Y: new password (max. 3 digits)<br>**0** factory default |
| SIM CARD EXPIRATION CHECK (1) | ****053*X…X#** | Enabling<br>X…X: days before SIM expiration, from 1 to 330 |
| | ****053*#** | Disabling |
| | Default: check disabled | |
| BATTERY CHECK (2) | ****050*X#** | X: option, from 0 to 1<br>0= **check enabled**<br>1= check disabled |
| | ****052*X#** | X: option, from 0 to 7<br>0= 7 h<br>1= 6 h e 30'<br>2= 6 h<br>3= 5 h e 30'<br>4= **4 h**<br>5= 2 h e 30'<br>6= 1 h e 30'<br>7= 1 h<br>(minimum number of operating hours, in idle mode, guaranteed by the battery charge; below this threshold, a notification SMS is sent out) |
| EXTERNAL POWER FAILURE CONTROL (3) | ****081*XXYY#** | XX: minutes of external power failure, from 01 to 99<br>YY: minutes of external power restore, from 01 to 99 |
| | ****081*#** | Disabling |
| | Default: control disabled | |

| PROGRAMMING BY TELEPHONE | | |
|---|---|---|
| RELAY-BASED NOTIFICATION OF EXTERNAL POWER FAILURE AND/OR MOBILE NETWORK LOSS (4) | ****094*X#** | X: option, from 0 to 6<br>0= **notifications disabled**<br>1= the relay is deactivated in case of external power failure<br>2= the relay is deactivated in case of mobile network loss<br>3= the relay is deactivated in case of external power failure or in case of mobile network loss<br>4= the relay is activated in case of external power failure<br>5= the relay is activated in case of mobile network loss<br>6= the relay is activated in case of external power failure or in case of mobile network loss |
| PERIODIC TEST (5) | ****072*X…X#** | X…X: telephone number appointed for periodic test SMS or calls |
| | ****072*#** | Deleting telephone number |
| | ****073*X#** | X: periodic test mode, from 0 to 1<br>0= **CLI call**<br>1= SMS |
| | ****074*XX#** | XX: frequency, from 1 to 99<br>1-10: days<br>11-99: hours<br>**3** factory default |
| | ****075*HHMM#** | Time of periodic test<br>HH: hour, MM: minutes<br>**0400** factory default |
| | ****076*XX#** | XX: seconds duration of the CLI call, from 01 to 99<br>**20** factory default |
| | ****077*X#** | X: option, from 0 to 2<br>0= **periodic test disabled**<br>1= periodic test enabled<br>2= force periodic test manually |

| PROGRAMMING BY TELEPHONE | | |
|---|---|---|
| AUTOMATIC CONVERTER OF DIALED TELEPHONE NUMBER (6) | ****026*X*Y…Y#** | ENTERING NUMBER TO CALL<br>X: table position, from 1 to 6<br>Y…Y: telephone number |
| | ****026*X*#** | DELETING NUMBER TO CALL<br>X: table position, from 1 to 6 |
| | ****026*#** | DELETING ALL NUMBERS TO CALL |
| | ****025*X*Y…Y#** | ENTERING DIALED NUMBER<br>X: table position, from 1 to 6<br>Y…Y: telephone number |
| | ****025*X*#** | DELETING DIALED NUMBER<br>X: table position, from 1 to 6 |
| | ****025*#** | DELETING ALL DIALED NUMBERS |
| TRANSMITTER GAIN ADJUSTMENT | ****010*X#** | X: value, from 1 (min.) to 7 (max.)<br>**4** factory default<br>(do not change unless it is strictly necessary) |
| RECEIVER GAIN ADJUSTMENT | ****011*X#** | X: value, from 1 (min.) to 5 (max.)<br>**3** factory default<br>(do not change unless it is strictly necessary) |
| COMMUNICATION TECHNOLOGY SETTING | ****033*X#** | X: option, from 0 to 2<br>0= GSM<br>1= LTE<br>2= **GSM / LTE** |
| RESTORING DEFAULT SETTINGS | ****099#** | Restoring factory default does not modify the programming password and the settings entered for the "Automatic converter of selected telephone number" |
| RESET | ****098#** | Resetting the gateway does not modify its programming profile |

## (1) SIM card expiration check

If the SIM card expiration check is enabled, when the preset days have passed, a notification SMS is sent with the following text message: "*SIM expiring*".

*Note: the days internal counter stops when the gateway is powered off and restarts at the next power on.*

## (2) Battery check

If the battery check is enabled, in case of power failure the gateway constantly checks the battery status. When the charge goes below the previously-programmed threshold ensuring the minimum number of operating hours in idle mode, a notification SMS is sent with the following text message: "*Low battery*". The gateway sends out one notification SMS only. A new SMS will be sent out if the charge status rises and goes again below the previously-set threshold.
The built-in backup batteries ensure 8 operating hours in idle mode and 2 operating hours in conversation mode.

If the battery check is enabled, the gateway detects the presence of the battery. If the battery is absent or in case of disconnection, a notification SMS is sent to the programmed number with the following text message: "*Dead battery*".

*Note: by means of code 045, a CLI (unanswered call) or P100 call can be set instead of the SMS notification.*

## (3) External power failure control

If the control on external power failure is enabled, the gateway constantly controls the external power supply (230 Vac or 12 Vdc). If the external power failure lasts longer than the preset time interval, a notification SMS is sent with the following text message: "*External power failure*".
If the external power supply is restored for a time interval equal to the preset threshold a new SMS will be sent with the following text message: "*External power restored*".

*Note: by means of code 045, a CLI (unanswered call) or P100 call can be set instead of the SMS notification.*

## (4) Relay-based notification of external power failure and/or mobile network loss

If the relay-based notification of mobile network loss is enabled, when the mobile network is restored, a notification SMS is sent with the following text message: "*Mobile network restored*".

## (5) Periodic test

If the periodic test is enabled, the gateway sends, with programmable frequency, an SMS or a CLI call to the set number.
The SMS is sent with the following text message: "*Periodical test message*".

*Note: the CLI call is a call that does not need to be answered.*

*Note: for the correct operation of the Periodic test, to program the internal clock of the device is required (see the programming "Clock setting").*

*Note: the internal clock must be programmed each time the device is switched off.*

# (6) Automatic converter of selected telephone number

If the function is enabled the gateway, instead of calling the telephone number dialed from the connected telephone (autodialer or other telephone device), forwards the call to a previously set number.

It is possible to pre-set up to 6 telephone numbers to call, each of which can be combined, through programming and / or automatic learning procedure, a dialed number.

When dialed number is not associated with any preset number, the call will be automatically forwarded to the first preset telephone number.

*Note: to enable the "Automatic converter" service, you simply need to preset one telephone number; to disable this service, all preset telephone numbers must be deleted.*

*Example: preset table:*

| Location | Selected tel. number (code 025) | Preset tel. number (code 026) |
|---|---|---|
| 1 | 3331234567 | 0717506065 |
| 2 | 3339876543 | 0717506066 |
| 3 | 0733434343 | 0717506067 |
| 4 | 0733445566 | 0717506068 |
| 5 | 0733778899 | 0717506069 |
| 6 | 0733001122 | 0717506070 |

*- when selecting tel. number 3331234567, the gateway will make a call to 0717506065*

*- when selecting number 3339876543 , the gateway will make a call to 0717506066*

*- etc.*

*- when selecting any number not included in the "Selected telephone number" column, the gateway will send a call to the first telephone number included in the "Preset telephone number" column.*

*Matching telephone numbers automatically*

- Enter the number to be called in a table location using programming code 026.
- Enter the dialed number, to be associated, in the same table location using programming code 025.

*Automatic learning procedure*

The auto-learning procedure allows to match automatically each preset number with the numbers dialed by the connected telephone (autodialer or other telephone device) with the gateway.

- Enter the number to be called using programming code 026.
- Dial a telephone number by the connected telephone (autodialer or other telephone device) with the gateway.

The gateway will check if the number is already matched with a preset telephone number.

If so, it will send a call to the preset number.

If not, it will match the dialed number to the first available preset number and will make a call to it.

In case there are not available preset numbers, but it's still possible to make associations, the dialed number will be automatically matched with the first preset number.

In case all 6 possible associations have been effected, the call will be sent to the first preset number.

An SMS containing the dialed number and the preset number is sent out to the administrator number (if present) upon creating any new matching.

An SMS is also sent out every time a different selection from the 6 preset ones is effected.

# *PROGRAMMING VIA SMS*

Programming via SMS is possible by any mobile phone or other device supporting SMS. In case the administrator number has been previously set, programming via SMS is only allowed from such telephone number. An SMS notifying that programming has been completed will be sent back by the gateway to the same telephone number that forwarded the programming SMS.

**WARNING**
**Programming outgoing SMS from the Internet may not be successful if the requested format is not respected.**

## Message format

The message format is required to be as follows:

**ET-IL3*xxx#c…cc…cc…c**

where:

ET-IL3 programming string start
*xxx# password string (default xxx = 0)
c...c programming code as per table below

| Programming | Code (c…c) |
|---|---|
| Telephone line voltage | 061*X# |
| Reading telephone line voltage | 061?# |
| Country setting | 009*X…X# |
| Reading country setting | 009?# |
| Inter-digit dialling time | 108*X# |
| Reading inter-digit dialling time | 108?# |
| Clock enabling | 107*DDMMYY*HHMM# |
| Clock disabling | 107*# |
| Clock enable reading | 107?# |
| CLIR permanent setting | 106*X# |
| Reading CLIR permanent status | 106?# |

| Programming | Code (c...c) |
|---|---|
| CLIR temporary setting | 016*X# |
| Enabling roaming service | 105*# |
| Disabling roaming service | 105*XXXY...Y# |
| Reading roaming service status | 105?# |
| Setting telephone number for notification service | 040*X...X# |
| Deleting notification number | 040*# |
| Reading notification number | 040?# |
| Notification mode setting | 045*X# |
| Reading notification mode | 045?# |
| Notifications test | 047*X# |
| P100 identifier setting | 044*X..X# |
| Deleting P100 identifier | 044*# |
| Reading P100 identifier | 044?# |
| Setting administrator number | 018*X...X# |
| Deleting administrator number | 018*# |
| Reading administrator number | 018?# |
| Setting programming password | 019*X...X*Y...Y# |
| Enabling SIM card expiration check | 053*X...X# |
| Disabling SIM card expiration check | 053*# |
| Reading SIM card expiration check status | 053?# |
| Battery check enabling | 050*0# |
| Battery check disabling | 050*1# |
| Reading battery check status | 050?# |
| Low-battery check minimum value | 052*X# |
| Reading low-battery minimum value | 052?# |
| External power failure control enabling | 081*XXYY# |
| External power failure control disabling | 081*# |
| Reading external power failure control status | 081?# |
| Relay-based notifications | 094*X# |
| Reading relay-based notification | 094?# |
| Setting periodic test number | 072*X...X# |
| Deleting periodic test number | 072*# |
| Reading periodic test number | 072?# |
| Periodic test mode | 073*X# |
| Reading periodic test mode | 073?# |
| Periodic test frequency | 074*XX# |
| Reading periodic test frequency | 074?# |
| Time of periodic test | 075*HHMM# |

| Programming | Code (c...c) |
|---|---|
| Reading time of periodic test | 075?# |
| Duration of CLI call | 076*XX# |
| Reading duration of CLI call | 076?# |
| Enabling periodic test | 077*1# |
| Disabling periodic test | 077*0# |
| Forcing periodic test | 077*2# |
| Reading periodic test status | 077?# |
| Entering preset number | 026*X*Y...Y# |
| Deleting preset number | 026*X*# |
| Deleting all preset numbers | 026*# |
| Reading preset numbers | 026*X?# |
| Entering dialed number | 025*X*Y...Y# |
| Deleting dialed number | 025*X*# |
| Deleting all dialed numbers | 025*# |
| Reading dialed number | 025*X?# |
| Transmitter gain setting | 010*X# |
| Reading transmitter gain | 010?# |
| Receiver gain setting | 011*X# |
| Reading receiver gain | 011?# |
| Communication technology setting | 033*X# |
| Reading communication technology | 033?# |
| APN setting | 120*X...X# |
| Deleting APN | 120*# |
| Reading APN | 120?# |
| APN username setting | 121*X...X# |
| Deleting APN username | 121*# |
| Reading APN username | 121?# |
| APN password setting | 122*X...X# |
| Deleting APN password | 122*# |
| Reading APN password | 122?# |
| Restoring default settings | 099# |
| Reset | 098# |
| Measuring the 4G LTE/GSM signal level | 030# |
| Reading days to SIM card expiration | 054# |
| Reading battery status | 091# |
| Reading relay status | 092?# |
| Relay activation | 092*X# |
| Relay pulse | 093*XX# |

| Programming | Code (c...c) |
|---|---|
| Reading advanced device and radio cell parameters | 090# |

*Example:*
*it is required to enable battery check and to set the telephone number for notifications.*

*Outgoing message text:*
*ET-IL3*0#050#040*X..X#*

# Notification message format

The format of the message notifying the user or the administrator who previously sent out a programming SMS, is the same as the programming message format.

SMS notifying an accepted command:

**ET?IL3*xxx#c..c#**

SMS notifying a rejected command:

**ET?IL3*xxx#c..cERR#**

*Example:*
*outgoing SMS to enable battery check and to set the following incoming notification number: 3330123456.*

*Outgoing message text:*
*ET-IL3*0#050#040*3330123456#*

*Message text notifying accepted command:*
*ET?IL3*0#050#040*3330123456#*

# SERVICES

## *INCOMING CALLS*

Allows you to answer incoming calls.

Upon receiving a phone call, the LED indicating the line status (white) will blink shortly 4 times every 4 seconds as described at chapter "Signals" (see page 39) and the telephone will be ringing.

- Pick up the handset to answer the call.

The LED indicating the line status (white) will turn on and the communication with the calling party will be set up.

## *OUTGOING CALLS*

Allows you to dial over the 4G LTE/GSM network.

If the gateway is connected to a PABX, please refer to the switchboard's manual.

If the gateway is connected to a telephone:

- Pick up the handset.

The LED indicating the line status (white) will turn on and the dialling tone will be heard.

- Dial the telephone number to be called.

*Note: once you have dialled the number, you can either press # to send the number immediately, or you can wait for the call to be automatically forwarded once the inter-digit dialling time has elapsed (by default 5 seconds).*

*Note: in the event you receive the dissuasion tone picking up the handset, check if the signal is present and make sure the SIM card is working correctly.*

# MEASURING THE SIGNAL LEVEL

This procedure allows you to check the 4G LTE/GSM signal level through your telephone.

- Lift the handset and dial **030#.
- Wait for the signal reading.

The gateway will send a number of short tones corresponding to the signal level:

| Tones | Quality |
|---|---|
| No signal | No signal |
| 1 Tone | Low |
| 2 Tones | Medium |
| 3 Tones | Good |
| 4 Tones | High |

Since the signal can be subject to variations, we recommend repeating the code **030#, 2 or 3 times a few seconds apart, in order to have a reliable measurement.

*Note: in case of low signal, we recommend installing the gateway in a different area with a better signal.*

*Note: if you receive the "no signal" tone, it means that the gateway has not been registered correctly by the provider. We recommend trying again after a few moments, and in case of no result, make sure that the SIM card is working correctly.*

## READING THE DAYS MISSING TO SIM CARD EXPIRATION

This procedure allows you to check how many days until the SIM card expiration.

- Lift the handset and dial **054#.
- After the confirmation tone hang up.

After receiving the request, the gateway will send an SMS to the number programmed to be alerted.
The outgoing message text is the following: "*Days to upload reminder: xxx*".
The request will not be executed (an error tone will be received) if the SIM card expiration control is disabled, if the notification number to be alerted has not been previously entered or if the gateway is not correctly registered to the 4G LTE/GSM network.

## READING THE BATTERY STATUS

This procedure allows you to check the battery status through your telephone.

- Lift the handset and dial: **091#.

The gateway will send a number of short tones corresponding to the guaranteed number of operating hours in idle mode:

| Tones | Hours in idle mode |
|---|---|
| No tones | Absent or damaged battery |
| 1 Tone | 1 hour |
| 2 Tones | 2 hours |
| 3 Tones | up to 7 hours |
| 4 Tones | more than 7 hours |

# *RELAY USE*

This programming only applies when the relay is not used to signal the external power supply and/or 4G LTE/GSM network failure.

## Activation/Deactivation

Allows you to activate or deactivate the relay.

- Lift the handset and dial: **092*.
- Enter:

  0 to deactivate the relay;
  1 to activate the relay.

- Dial # to confirm.
- After the confirmation tone hang up.

## Pulse

Allows you to activate or deactivate the relay for a specific time.

- Lift the handset and dial: **093*.
- Enter the length of the pulse in seconds (01 ~ 99).
- Dial # to confirm.
- After the confirmation tone hang up.

# READING ADVANCED DEVICE AND RADIO CELL PARAMETERS

This procedure allows you to check advanced parameters of the device and the radio cell.

- Send the following SMS to SIM.GATE 4G.VoLTE:

**ET-IL3*xxx#090#**

where:

ET-IL3 programming string start

*xxx# password string (default xxx = 0)

SIM.GATE 4G.VoLTE will send one or two SMS to the number that sent the request with the following data:

| **String**<br>(the values shown are for illustrative purposes) | **Meaning** |
|---|---|
| ET?IL3*XXX#904GSIM* | String start |
| 451010011 Jun 30 2023 10:41:08 | SIM.GATE 4G.VoLTE software version |
| C01 Model: A7682E Revision: A011B08A768 2M7 A7682M7_B08V02_230523 | Radio module data |
| 862325053831127 | IMEI code |
| 4G | AcT (Access Technology) |
| 222 | MCC (Mobile Country code) |
| 01 | MNC (Mobile Network Code) |
| 0X4EEC | TAC (Tracking Area Code) /<br>LAC (Location Area Code) |
| 205792811 | CELL (Cell ID) |
| 21 | RSRP (Reference Signal Received Power) |
| 14 | RSRQ (Reference Signal Received Quality) |
| POW<br>BATT | POW (external power supply present)<br>BATT (external power supply absent) |
| ONH<br>OFH | ONH (line in use)<br>OFH (line not in use) |
| YES<br>NO | Roaming<br>Not roaming |
| VOLTE | (if present, gateweay connected in VoLTE) |

# SMS/DTMF CONVERTER

This function allows the remote programming, via SMS, of any device that can be programmed remotely via DTMF.

When an SMS containing the "DTMF" header arrives, SIM.GATE 4G.VoLTE simulates an incoming call to the autodialer (or other telephone device) connected to the RJ-11 connector (or TEL terminal) and, after the answer, converts the received SMS text into DTMF.

The received SMS format is required to be as follows:

**DTMF x…x x…x x…x**

where:

| | |
|---|---|
| DTMF | header characters |
| x…x | programming sequence of the device connected to SIM.GATE 4G.VoLTE |

Every space in the SMS text is converted into a 2-second pause.
The text of the SMS must not exceed 160 characters in length.

*Example:*
*SMS to enable battery control and to enable the filter in a Helpy autodialer*

*DTMF *0# 521 531*

*where:*

| | |
|---|---|
| *DTMF* | *header characters* |
| **0#* | *access sequence for programming Helpy autodialers* |
| *521* | *programming sequence to enable battery control* |
| *531* | *programming sequence to enable the filter* |

*Note: we recommend appropriate use of the spaces (pauses) between programming sequences so as not to superimpose new programming codes on any tones or messages of accepted/rejected programming generated by the autodialer (or telephone device).*

**WARNING**
**Successful programming is dependent on the status of the autodialer (or telephone device) and is in no way attributable to al SIM.GATE 4G.VoLTE.**

**WARNING**
**SIM.GATE 4G.VoLTE does not check in any way whether a transmitted programming code has been accepted or rejected.**

## Notification message

An SMS notification of the operation performed will be sent back by SIM.GATE 4G.VoLTE to the same telephone number that forwarded the programming SMS.

The SMS notification may contain the following information:

| | |
|---|---|
| DTMF | header characters |
| OFH | the device answered the simulated call from SIM.GATE 4G.VoLTE |
| ONH | the device stopped communicating with SIM.GATE 4G.VoLTE |
| Tx…x | SIM.GATE 4G.VoLTE transmitted to the device the sequence x…x |

*Example:*
*SMS sent: DTMF 12 34*

*Notification SMS: DTMFOFHT12T34*
*Meaning: the device answered the call and SIM.GATE 4G.VoLTE transmitted sequences 12 and 34*

*Notification SMS: DTMFOFH*
*Meaning: the device is already using the phone line and SIM.GATE 4G.VoLTE cannot simulate the incoming call*

*Notification SMS: DTMFOFHONH*
*Meaning: the device answered the call but interrupted the communication without receiving any sequence from SIM.GATE 4G.VoLTE*

*Notification SMS: DTMFONH*
*Meaning: the device did not answer the simulated call from SIM.GATE 4G.VoLTE*

*Notification SMS: DTMFOFHT12ONH*
*Meaning: the device answered the call but interrupted the communication after receiving sequence 12.*

# SIGNALS

## TONES

*Dialling*

It indicates that the gateway is ready for dialing.

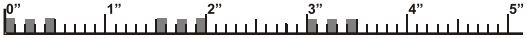
*Dissuasion*

It indicates that the gateway has not properly registered with the 4G LTE/GSM provider or a delay in dialling or the end of conversation or an access to services not permitted.

*Busy*

It indicates that the called party is busy.

*Confirmation*



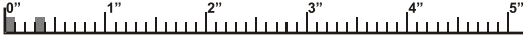

It indicates that the requested service or programming has been accepted.

*Error*

It indicates that the requested programming has not been accepted.

*Mobile signal level*

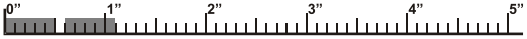
It indicates low signal level.




It indicates medium signal level.

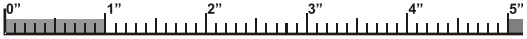
It indicates good signal level.

It indicates high signal level.




It indicates no signal.

## *CALL SIGNALS*




It indicates an incoming call.

# *LED*

## 4G LTE/GSM signal indicator LED (GREEN)

It indicates no signal.

It indicates low signal level (2G/4G network – VoLTE not available).

It indicates medium signal level (2G/4G network – VoLTE not available).

It indicates good signal level (2G/4G network – VoLTE not available).

It indicates high signal level (2G/4G network – VoLTE not available).

It indicates low signal level (4G network – VoLTE available).

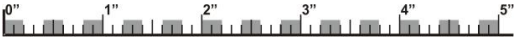
It indicates medium signal level (4G network – VoLTE available).

It indicates good signal level (4G network – VoLTE available).

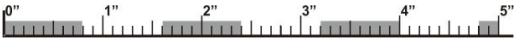
It indicates high signal level (4G network – VoLTE available).

## Device status indicator LED (RED)

It indicates the gateway has not been correctly registered with the network, the SIM card is protected by the PIN code or other problems.



It indicates the gateway is correctly registered to the 4G network.



It indicates the gateway is correctly registered to the 2G network.

## Line status indicator LED / Data transmission indicator LED (WHITE)

It indicates that the line is in use or that a data connection is in progress.

It indicates that the line is not in use.

It indicates an incoming call.

# Power supply status indicator LED (BLUE)

It indicates that the external power supply is connected and the battery guarantees more than 7-hour operation in idle state.

It indicates that the external power supply is connected and the battery guarantees up to 7-hour operation in idle state.

It indicates that the external power supply is connected and the battery guarantees 2-hour operation in idle state.

It indicates that the external power supply is connected and the battery guarantees 1-hour operation in idle state.

It indicates that the external power supply is connected and the battery is absent or damaged.

It indicates that the external power supply is NOT connected and the battery guarantees more than 7-hour operation in idle state.

It indicates that the external power supply is NOT connected and the battery guarantees up to 7-hour operation in idle state.

It indicates that the external power supply is NOT connected and the battery guarantees 2-hour operation in idle state.

It indicates that the external power supply is NOT connected and the battery guarantees 1-hour operation in idle state.

# TROUBLE SHOOTING GUIDE

This section shows a list of solutions to the most commonly encountered problems.

| Detected problem | Root cause | Solution |
|---|---|---|
| All LEDs are unlit | Gateway not supplied | Check power supply |
| The red LED lights up all the time | SIM card not present or not correctly inserted | Correctly insert the SIM card in the dedicated location |
| | SIM card locked by PIN code | Disable the PIN code through your mobile phone |
| | SIM card expired or damaged | Check the SIM card operation on your mobile phone |
| | Antenna not connected or damaged antenna cable | Check the antenna connection and the the cable |
| | Signal absence | Check the signal strength using your mobile phone |
| | Insufficient power supply | Check the power supply |
| | Generic SW problem | Turn the power off, wait 30 s and reconnect the power |
| The red LED flashes, but the green LED is off | Signal level is too low to allow outgoing calls | Move the gateway and the antenna into a better position |
| The autodialer connected to gateway does not detect the telephone line | Telephone line voltage on TEL terminals and on RJ-11 plug is insufficient | Increase the voltage (see programming "Telephone line voltage") |
| The autodialer connected to gateway does not succeed in forwarding a call | The autodialer performs a tone detection over the telephone line | Set the country of use correctly (programming 'Country setting (line tones)') |

# FREQUENCIES

Operating frequencies depend on the radio module installed in the gateway.

| | Market EMEA (Europe, Middle East and Africa) |
|---|---|
| 4G bands | B1, B3, B5, B7, B8, B20 |
| 2G bands | B3, B8 |
| LTE | Cat 1 |

# EU DECLARATION OF CONFORMITY

Hereby, Esse-ti S.r.l. declares that the equipment type SIM.GATE 4G.VoLTE is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available from the following Internet address:

https://www.esse-ti.it/en/dichiarazioni-di-conformita

Esse-ti s.r.l.
via G. Capodaglio, 9
62019 Recanati (MC), ITALY
+39 071 7506066
support@esse-ti.it
www.esse-ti.it