GEMALTO
3G - 4G Modem

User guide (V 2)

1 CONTENTS

2   INTRODUCTION

data collection   warnings   bikes

The Gemalto 3G (EHS6) or 4G (PLS62) is an optional 3G or 4G modem device dedicated to transferring the Icoms Detections products data measurements to an FTP or HTTPS server.

3   PRODUCT DESCRIPTION

Figure 1: content of the delivery

4   THEORY OF OPERATION

1. Unpack the unit and check the following items are in the box (please refer to Figure 1, p. 2) :
    A. Modem unit
    B. USB cable
    C. User's guide
2. Connect the cable from the radar to the modem (see the user's guide of the specific product for more information).
3. Power the modem (see the user's guide of the specific product for more information).

5   LED indicator

The modem has two LEDs indicating its operating states through the semitransparent casing:
*   The green LED indicates whether the modem is ready to operate and reports certain watchdog operations. A permanent green LED means that the modem is properly powered on.
*   The orange LED indicates the network registration state of the modem:
    o   Limited Network Service: blinking LED, 500 ms on and 500 ms off
    o   Modem registered on the network, ready to send data: 10 ms on, 3.99 seconds off
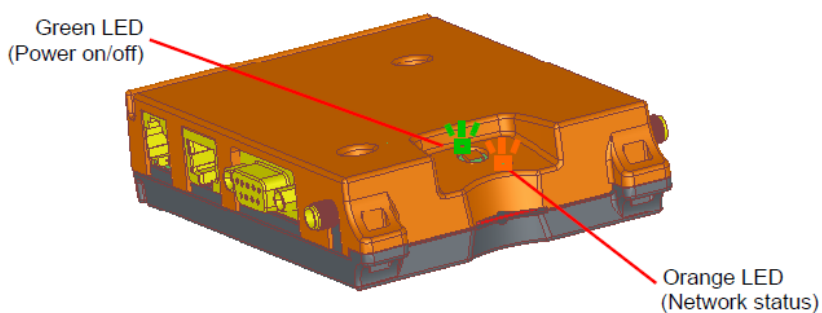

Figure 2: graphical representation of the modem and the status LEDs

Figure 3: modem picture with status LEDs

6   CABLING

6.1   CONNECTIONS

Figure 4: modem sockets and connectivity

- A: RJ12 socket for power
- B: DB9 socket for serial communication with the radar
- C: slot for SIM card
- D: USB socket for modem configuration

6.2   RS-232 COMMUNICATION

The Gemalto 3G or 4G modem includes a DB9 (D-sub 9-pole female) connector with the pin assignment provided in Figure 3 and Table 1.

Table 1: DB9 pin assignment

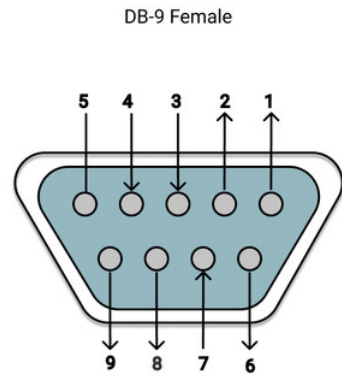| Pin no.	Signal name	I/O	Function
1	DCD0	O	Data Carrier Detected
2	RXD0	O	Receive Data
3	TXD0	I	Transmit Data
4	DTR0	I	Data Terminal Ready
5	GND	-	Ground
6	DSR0	O	Data Set Ready
7	RTS0	I	Request To Send
8	CTS0	O	Clear To Send
9	RING0	O	Ring Indication

Figure 5: female DB9 pin assignment

6.3   POWER SUPPLY

The power supply to the modem uses a RJ12 connector (see Figure 4 mark A) with the pin assignment provided in Figure 6.
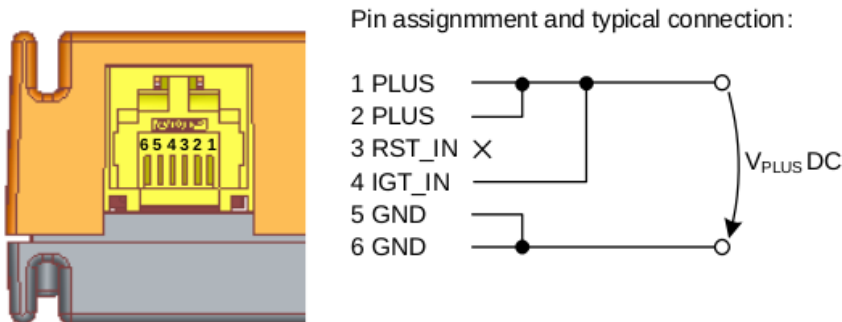

Figure 6: RJ12 pin assignment for power supply, ignition and reset

7   SIM CARD

When inserting the SIM card in the card slot, please ensure the SIM card is completely inserted and fastened in the slot. Use a screwdriver or a pen to push the card in the slot.

8   MODEM CONFIGURATION

To configure the modem, install first the driver (see 8.1), connect then the USB cable (Figure 1, mark B) in the modem USB socket (Figure 4, mark D) and in a free USB port of your computer.

8.1   INSTALLATION OF THE DRIVER GIVING ACCESS TO « SETUP.INI »

For local software installation and configuration, install the software provided by your dealer :
- EHS6 terminal (3G), install MESsetup.exe.
- PLS62 terminal (4G), install MESsetup-4G.exe.

If Windows asks for additional software drivers, please contact your dealer.
After successful installation you should have this green Module icon under "My Computer".
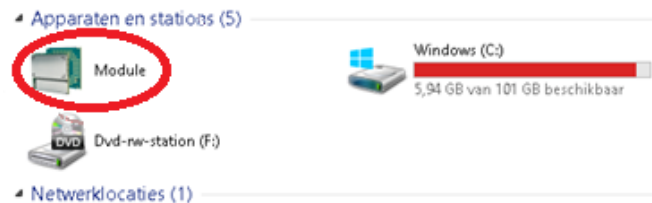
Right-click on it and make sure the proper COM port is selected in the properties screen where Gemalto terminal is connected.
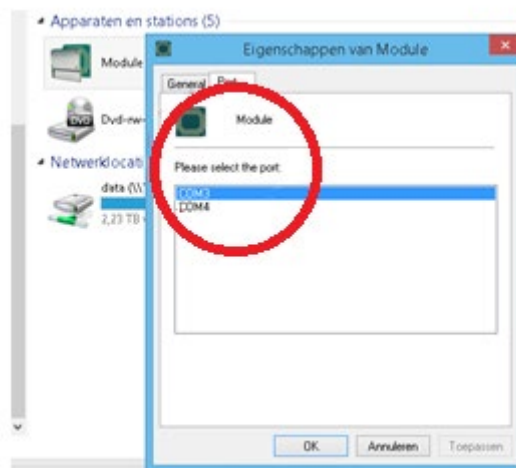
Make sure that Hyperterminal or other programs that use this COM port are not connected and then double-click on the module icon. You then will see the drive. Double-click on it again and you will see the contents of the flash drive inside the modem.

8.2   CHANGING PARAMETERS IN THE "SETUP.INI" FILE AND ACCESSING "LOG" FILES

Now, if you double-click on the module, you'll see the "setup.ini" file. It cannot be edited in place. To modify it, copy it elsewhere, make the necessary changes and copy it back into the module.

It is necessary to reboot the system after a configuration change by unplugging and plugging the power supply.

8.3   CHANGING THE PARAMETERS

The configuration parameters can be changed in the setup.ini file. The configuration file consists of <parameter>=<value> pairs on each row and closed every time by <CR><LF>.

CAUTION:

- **# sign is used for adding comment lines. <u>Don't use the # sign in parameter names or values</u> and <u>make sure that each line is ended with <CR><LF></u>**
- **Parameters in red must be configured by the final user for proper operation.**
- **The setup.ini file contains parameters that are not described here. Those other parameters must be left to their default value.**

- **GPRS-APN**
  - Defines GPRS APN name for internet connections. (See with your telecom provider)
  - No default value
- **GPRS-USER**
  - Defines GPRS user name for internet connections (See with your telecom provider)
  - Can be empty or have any value.
  - Default value is empty.
- **GPRS-PASS**
  - Defines GPRS password for internet connections. (See with your telecom provider)
  - Can be empty or have any value.
  - Default value is empty.
- **MODEM-PINCODE: please deactivate the SIM card pin code before booting the modem.**

- **ICOMS-RADAR-TYPE**
  - For I-SAFE signs, use ICOMS-RADAR-TYPE=ISAFE
  - For TMS-SA and TMA-3B3 devices, use ICOMS-RADAR-TYPE=TMSSA

TRANSFER PROTOCOL AND SERVER DETAILS
The transfer protocol can be either FTP or HTTPS. Please note the following **important** items:

  - **FTP**: The modem relies on "simple FTP connection" which is password protected but without encryption. The server needs to support "simple FTP connection".
  - **HTTPS**: The modem supports TLS v1.0 only, please ensure the server allows the modem to connect using TLS v 1.0

- **UPLOAD-METHOD**
  - For FTP, use UPLOAD-METHOD=1
  - For HTTPS, use UPLOAD-METHOD=7

- **FTP-SERVER**
  - Defines ftp server for uploading data files and logs
  - No default value
  - **Please note that no underscore characters are allowed in the host name**
  - The modem uploads a TMP file first and then renames it to csv. The permissions for the FTP user must be set accordingly.
- **FTP-USER**
  - Defines ftp server user for uploading files
  - No default value
- **FTP-PASS**
  - Defines ftp server password for uploading files
  - No default value
- **FTP-PATH-DATA**
  - Ftp server path for data files
  - No default value
  - **Please note the modem does not create the folder. The folder must exist on your server before the any file is sent.**
- **FTP-PATH-LOGS**
  - Defines path on ftp server for logs upload
  - No default value

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- o **Please note the modem does not create the folder. The folder must exist on your server before the any file is sent.**
- **FTP-PORT**
    - o Defines the ftp server port for uploading the files
    - o No default value

- o **HTTP-SERVER**
  The http server request follows the structure
  curl --location --request POST "<HTTP-SERVER>" --form "<HTTP-CUSTOM-FORM-VALUES>" --form <HTTP-FILE-KEY>=<filename>
    - ▪ Defines the http server for uploading data files and logs
    - ▪ No default value
    - ▪ **Please note that no underscore characters are allowed in the host name**
- o **HTTP-CUSTOM-FORM-VALUES**
    - ▪ <field>,<value>[;<field>,<value>] (optional), e.g. token,hdTs439k;other_field,other_value
    - ▪ No default value
- o **HTTP-FILE-KEY**
    - ▪ name given to field of the uploaded file
    - ▪ No default value

- **UTC-TIME-DELAY (from firmware version 1.2.7)**
    - o Defines the time zone
    - o Default value is 0 (UTC).
    - o Format : +X or -X where X is the number of hours to add or remove to/from UTC in order to adjust the time zone (example : UTC-TIME-DELAY=+2 for summer time CET)

- **FILE-PERIOD**
    - o File rotation period in seconds for rotating CSV data files. File can be only uploaded once new file is generated. So high rotation period will mean less often upload of data files.
    - o Min. value: 600
    - o Default value: 1800
    - o Please note a file is sent when the file size exceeds 60 KB (+/- 1 260 measurements).

The parameters hereunder are provided for information purpose only. They should be left at their default value.
- **UPLOAD-METHOD**
    - o Defines how data files are sent.
    - o Must be set to 1.
    - o Default value 1
    - 1: upload data files to FTP server
- **UPLOAD-LOGS**
    - o Defines flag for uploading logs.
    - o 0 - no logs will be uploaded
    - o 1 – logs will be uploaded on start-up of application
    - o Default value is: 0
- **LOG-LEVEL**
    - o Defines the level of logging.
    - o 0 – No logging
    - o 1 – Error logging
    - o 2 – Error + Warning
    - o 3 – Error + Warning + Info
    - o 4 – Error + Warning + Info + Debug
    - o Default value is: 2

8.4 CHANGING PARAMETERS IN THE "SETUP.INI" FILE AND ACCESSING "LOG" FILES

Now, if you double-click on the module, you'll see the "setup.ini" file. It cannot be edited in place. To modify it, copy it elsewhere, make the necessary changes and copy it back into the module.

It is necessary to reboot the system after a configuration change.

8.5 ACCESSING "LOG" FILES

Log files are stored at the same place as the setup.ini file.

9 DATA FORMAT

The data is sent to the specified FTP server as semi-colon separated CSV files. The file name uploaded consists of a sequence of characters as follows <series of characters>_<serial number>_<timestamp>.csv. Example: 359804080450847_24_23LC024_20200515115152.csv.

The fields are:

- **typ**: The type of the record, specified by a number:
    - o 100 for information (radar configuration, clock synchronization, etc.)
    - o 001 for a measurement,
    - o 20x for environmental measurement
        - ▪ 201 for battery voltage measurement.
- **date and time [UTC]**
- **speed [km/h]**
- **length [m]**
- **range [m]**: Target range (taken perpendicularly to the speed), not used in this version.
- **notes**: Additional information with format KEY = VALUE

Notes:

- The field separator is ";".
- The decimal separator is ",".
- Spacing is done with spaces, not tabs
- The time is in UTC.
- The speed in in km/h.
- The length is in m (and is fixed).
- The line termination is <CR><LF>.
- Environmental measurement with type "2xx" (currently only the non-operational battery monitoring) should appear periodically (about every 1 hour).
- Direction and sign:
    - o Positive speeds correspond to targets approaching the detector by its business end.
    - o Negative speeds are targets moving in the opposite direction (receding in the radar field of view).
- The "notes" field has the following format: KEY [= VALUE].
- The serial number has currently 7 characters, but it would be more future proof to decode it as generic string than a fixed length one.

TMA-3B3/TMS-SA data example:

```
typ;date and time [UTC];speed [km/h];length [m];range [m];notes
100; 2019/01/24 16:20:03,120;         ;        ;        ; Serial Number = 1234567
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x31 = ****************
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x33 = ****************
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x35 = ****************
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x37 = ****************
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x44 = 0000 0000 0000 0000 0000 0000 0000 0000
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0x2B = 0000 0000 0000 0000 0000 0000 0000 0000
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0xBB = 0000 0000 0000 0000 0000 0000 0000 0000
100; 2019/01/24 16:20:03,120;         ;        ;        ; 0xE1 = 0000 0000 0000 0000 0000 0000 0000 0000
001; 2019/01/24 16:21:03,440; +014,0; 001,8
001; 2019/01/24 16:22:03,990; -016,0; 001,8
001; 2019/01/24 16:24:04,550; +017,0; 001,8
001; 2019/01/24 16:30:02,480; +012,0; 001,8
001; 2019/01/24 16:35:03,020; +014,0; 001,8
201; 2019/01/24 16:40:03,260;         ;        ; Battery voltage = 12,3 V
001; 2019/01/24 16:45:03,570; +014,0; 001,8
001; 2019/01/24 16:50:04,130; +018,0; 001,8
001; 2019/01/24 16:52:05,020; +016,0; 001,8
```

```
100; 2019/01/24 16:55:05,060;        ;       ;       ; Radar time updated, previous =190124163003.980
100; 2019/01/24 16:59:05,460;        ;       ;       ; End of recording
```

I-SAFE data example:

```
yp;date and time [UTC];speed [km/h];length [m];range [m];notes
100; 2019/07/20 19:34:37,140;        ;       ;       ; Serial Number = 19H4001
100; 2019/07/20 19:34:37,140;        ;       ;       ; 0x31 = null
100; 2019/07/20 19:34:37,140;        ;       ;       ; 0x44 = 4831 0001 0C02 00CC 7E1B 0028 0120 01CA
100; 2019/07/20 19:34:37,140;        ;       ;       ; 0x2B = null
100; 2019/07/20 19:34:37,140;        ;       ;       ; 0xBB = 0004 0701 05C7 05C7 0100 00
100; 2019/07/20 19:34:37,140;        ;       ;       ; 0xE1 = null
001; 2019/07/20 19:34:39,140; -050,0; 000,0
001; 2019/07/20 19:34:45,140; +050,0; 000,0
001; 2019/07/20 19:34:54,140; +150,0; 000,0
001; 2019/07/20 19:34:57,140; -051,0; 000,0
001; 2019/07/20 19:35:03,140; -086,0; 000,0
001; 2019/07/20 19:35:13,140; +050,0; 000,0
001; 2019/07/20 19:35:16,140; -050,0; 000,0
001; 2019/07/20 19:35:22,140; +050,0; 000,0
001; 2019/07/20 19:35:31,140; -050,0; 000,0
001; 2019/07/20 19:35:40,140; -050,0; 000,0
001; 2019/07/20 19:35:49,140; -050,0; 000,0
001; 2019/07/20 19:36:26,140; +050,0; 000,0
001; 2019/07/20 19:36:35,140; +050,0; 000,0
001; 2019/07/20 19:36:38,140; -051,0; 000,0
001; 2019/07/20 19:36:44,140; +050,0; 000,0
001; 2019/07/20 19:36:53,140; -150,0; 000,0
001; 2019/07/20 19:36:54,140; +051,0; 000,0
001; 2019/07/20 19:37:03,140; -051,0; 000,0
```

From firmware version 1.2.7:

The format remains the same but additional information is provided under data TYP 100:

```
typ;date and time [UTC];speed [km/h];length [m];range [m];notes
100; 2021/03/11 11:07:26,200;        ;       ; ; Serial Number = 20H2122
100; 2021/03/11 11:07:26,200;        ;       ; ; Site Name = ?????????????????????????????
100; 2021/03/11 11:07:26,200;        ;       ; ; GPS = ??????????????????????????????
100; 2021/03/11 11:07:26,200;        ;       ; ; Status = 4831 0001 0B13 000C 8113 0028 0000 0000
100; 2021/03/11 11:07:26,200;        ;       ; ; Basic params = FFFF 07FF FFFF FFFF FFFF FF
100; 2021/03/11 11:07:26,200;        ;       ; ; 0x3000 = 040B 010B B8FF FFFF FFFF FFFF 34
100; 2021/03/11 11:07:26,200;        ;       ; ; 0x4000 = 040C 010F A0FF FFFF FFFF FFFF FF48
100; 2021/03/11 11:07:26,200;        ;       ; ; 0x5000 = 040C 0113 88FF FFFF FFFF FFFF FF5C
100; 2021/03/11 11:07:26,200;        ;       ; ; 0x6000 = 040C 0117 70FF FFFF FFFF FFFF FF70
100; 2021/03/11 11:07:26,200;        ;       ; ; 0x7000 = 040C 011B 58FF FFFF FFFF FFFF FF84
100; 2021/03/11 11:07:26,200;        ;       ; ; ISAFE version  = v11.19(12)
201; 2021/03/11 11:07:26,200;        ;       ; ; Battery voltage = 12,9 V
202; 2021/03/11 11:07:26,200;        ;       ; ; Timezone = UTC+0
203; 2021/03/11 11:07:26,200;        ;       ; ; Firmware = Gemalto I-SAFE 3G 1.2.7
100; 2021/03/11 11:07:25,810;        ;       ; ; Radar time updated, previous =210311131744.0
001; 2021/03/11 11:07:34,252; +020,0; 000,0
001; 2021/03/11 11:07:37,083; +030,0; 000,0
001; 2021/03/11 11:07:40,103; +040,0; 000,0
001; 2021/03/11 11:07:43,125; +050,0; 000,0
001; 2021/03/11 11:07:46,147; +060,0; 000,0
```

10 FAQ

There is no file on the server

- First check the modem configuration
  - Check the network (apn, network password) and sim configuration. If OK, the red led blinks on the 4 sec.
  - Check the ftp configuration on the modem (path, login …)
- Check the ftp and directories configuration
  - Underscore is not allowed in the host name
  - The ftp must be configured to allow writing of a tmp file and renaming it into csv
- The paths must be the same as in the modem config
- Does the radar measure?
  - Is it properly powered?
  - Connect to the radar and check if the measurements are ok.
  - Check param 50 (must be set on 8, for the message format)
  - Check other radar parameters

The time stamp is faulty

- If the modem could not synchronise immediately with its NTP server, the measurements can have a faulty timestamp.

11 TECHNICAL FEATURES

Dimension:	113.5 mm x 75.0 mm x 25.5 mm (excluding antenna and RS-232 connectors)
Weight:	120 g
Operating temperature	-30°C to +85°C
Environmental protection	IP 40
Casing	Plastic
Input power options	8-30 V DC (typical 12 V DC)
Current peak	1.2 A (@ 8 V)
Typical average power consumption for an upload period of 1 hour	40 mA @ 12 V Note: Average power consumption varies in function of the configuration and the network
WAN	3G: • Five bands UMTS (WCDMA/FDD ; 800, 850, 900, 1900 and 2100 MHz) 4G: • Seven bands UMTS/HSPA+ (WCDMA/FDD; 800, 850, 900, 1700/2100, 1800, 1900 and 2100 MHz) • Twelve bands LTE (700, 800, 8520, 900, 1700, 2100, 1800, 1900, 2100, 2600 MHz) 3G and 4G: • Region: Global • EDGE/GPRS Class 12 • Quad-band GSM (850, 900, 1800 and 1900 MHz)

12 WARRANTY

Icoms Detections warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for a period of two (2) years from the date of despatch from Icoms Detections premises, except for the batteries for which a warranty period of six (6) months applies.

If a product does not operate as warranted during the applicable warranty period, Icoms Detections shall, at its option, either repair the defective unit, either deliver to the buyer an equivalent product or part to replace the defective item. All products that are replaced become property of Icoms Detections.

The defective product must be returned to Icoms Detections within the applicable warranty period. The defective product must be shipped back to Icoms Detections pre-paid, insured and wrapped in the original or similar shipping package to ensure that it will not be damaged during transportation, and must be accompanied by appropriate paperwork (ask first for a **R**eturn **M**aterial **A**uthorisation number) detailing the nature of the defect experienced.

Icoms shall be under no liability in respect of any defect arising from normal wear and tear, wilful damage, negligence, damage due to inappropriate packaging, abnormal working conditions, failure to follow Icoms Detections instructions (whether oral or in writing), misuse, improper installation, alteration or repair without Icoms Detections approval.

13 FURTHER INFORMATION

13.1 LEGAL NOTIFICATION

The Gemalto 3G modem is in compliance with following requirements:
- RED Directive 2014/53/EU.
- RoHS 2 2011/65/EC
- WEEE 2003/108/EC
- FCC ID: QIPEHS6
- IC: 7830A-EHS6

The Gemalto 4G modem is in compliance with following requirements:

- RED Directive 2014/53/EU.
- RoHS 2 2011/65/EC
- WEEE 2003/108/EC
- FCC ID: QIPPLS62W
- IC: 7830A-PLS62W

13.2 VERSION

Issue n°	Date	Author	Comment
V1	October 1st, 2019	EVDB	First generic version
V1.2	December 17, 2020	EVDB	Additional SMS commands
V1.3	February 19, 2021	EVDB	Content of the delivery, sockets, configuration through USB port
V1.3.2	April 20, 2022	EVDB	Section on SIM card insertion
V1.4	May 4th, 2022	EVDB	HTTPS and radar type added
V1.5	September 9, 2022	EVDB	TLS 1.0 and FTP simple server connection specification
V2	November 22, 2022	CBA	Standardization and merging 3G and 4G versions

13.3 MANUFACTURER

Icoms Detections S.A.
Avenue Albert Einstein 11/B ▪ B-1348 Louvain-la-Neuve ▪ BELGIUM
Tel.: +32 (0) 10 45 41 02 ▪ Fax: +32 (0) 10 45 04 61
info@icomsdetections.com ▪ www.icomsdetections.com