

User Guide

GenPro 30e



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Document history

Revision	Modifications	Author	Date
000	CREATION	S. DUCHESNE F. LE BRETON	20/06/08
001	Cancelation Error Code page 27	F. LE BRETON	04/11/08
002	Added limitation using USB page 15	F. LE BRETON	01/10/09

The main modifications in this document compared to its previous version are easily identifiable on a screen by the blue color of the text.

TABLE OF CONTENTS

PRESENTATION..... 5

WARNING 6

COPYRIGHT 6

1 REFERENCES 7

 1.1 REFERRED DOCUMENTS 7

 1.2 ABBREVIATIONS 7

2 PACKAGING 9

 2.1 CONTENT 9

 2.2 PACKING CASE..... 9

 2.3 MODEM LABELS 10

3 GENERAL PRESENTATION 11

 3.1 DESCRIPTION 11

 3.2 EXTERNAL CONNECTIONS..... 12

 3.2.1 Connections 12

 3.2.1.1 GSM antenna connector 12

 3.2.1.2 Female Micro FIT connector with 4 male pins..... 12

 3.2.1.3 Mini USB B connector (5 contacts) 12

 3.2.2 Cables supplied 13

 3.2.2.1 Micro FIT 2-wire supply cable 13

 3.2.2.2 USB 2.0 Cable with connectors A Male and mini B Male..... 13

4 CHARACTERISTICS AND SERVICES 14

5 USING THE MODEM 15

 5.1 STARTING WITH THE MODEM 15

 5.1.1 Mounting the modem 15

 5.1.2 Installation of the modem..... 15

 5.1.3 USB Driver installation 15

 5.1.4 Verification of the communication with the modem 17

 5.1.5 SIM card Extraction..... 20

 5.2 GSM LED..... 21

 5.3 ECHO FUNCTION OF AT COMMANDS DEACTIVATED 21

 5.4 CHECKING THE QUALITY OF THE GSM RECEPTION SIGNAL..... 22

 5.5 VERIFICATION OF THE PIN CODE..... 23

 5.6 VERIFICATION OF THE MODEM REGISTRATION ON THE GSM NETWORK..... 23

 5.7 MAIN AT COMMANDS (HAYES)..... 24

 5.8 TURNING OFF THE MODEM 25

 5.9 MODEM UPDATING PROCEDURE 25

6 TROUBLE SHOOTING 26

 6.1 COMMUNICATION PROBLEM BETWEEN THE MODEM AND THE USB LINK 26

 6.2 "ERROR" MESSAGE 26

 6.3 "NO CARRIER" MESSAGE..... 27

7 FUNCTIONAL DESCRIPTION..... 27

 7.1 ARCHITECTURE..... 27

 7.2 POWER SUPPLY 28

 7.2.1 General presentation 28

 7.2.2 Protections 29

 7.3 USB INTERFACE 29

8 TECHNICAL CHARACTERISTICS 30

8.1 MECHANICAL CHARACTERISTICS 30

8.2 ELECTRICAL CHARACTERISTICS 31

 8.2.1 Power supply 31

 8.2.2 SIM interface 32

 8.2.3 RF characteristics 32

 8.2.3.1 RF functioning 32

 8.2.3.2 External antenna 32

8.3 ENVIRONMENTAL CHARACTERISTICS 33

8.4 STANDARDS/CONFORMITIES 33

9 SECURITY RECOMMENDATIONS 34

9.1 GENERAL SECURITY 34

9.2 SECURITY IN A VEHICLE 35

9.3 CARE AND MAINTENANCE 35

9.4 YOUR RESPONSIBILITY 35

10 RECOMMENDED ACCESSORIES 36

11 CLIENT SUPPORT 36

DECLARATION OF CONFORMITY 37

Presentation

Entirely dedicated to the wireless markets throughout the world, the GenPro 30e modem allows a simple and quick integration of 3G and 3G+ tri-bands (850/1800/1900 MHz) as well as GSM/GPRS/EDGE Quad-Bands (850/900/1800/1900 MHz) connectivities in a M2M application.

The GenPro 30e is a robust, reliable and long life product. Its very compact metallic casing makes it ideally adapted to the world of embedded applications.

Its USB interface allows it to manage and optimise the performances of 3G and 3G+ high-speed networks.

The GenPro 30e is dedicated to high speed IP markets and must be associated to an external application with an IP stack.

The GenPro 30e provides an external use via the 3G Display graphic interface or via an AT commands set (see Commands List of ERCO & GENER).

This document describes the modem and provides the following information:

- General presentation,
- Functional description,
- Available basic services,
- Installation and use of the modem (first level),
- Trouble shooting,
- Recommended accessories for the use of the modem.

For more information concerning this document, ERCO & GENER puts at your disposal the following elements:

- Commands List
- Application Note
- Release Note
- Client support (Hot-Line)

Warning

- To avoid any risk of electrocution, do not open the casing.
- No internal part can be repaired by the user. The modem must be returned to the factory for any repair.
- The modem must be placed in a normally ventilated area, out of sources of heat.
- In order to guarantee the electromagnetic compatibility, the length of the RS232/USB cable and the power supply cable must not exceed 3 meters.
- The modem must not be connected directly to the mains supply; a voltage adapter must be used.

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1 References

1.1 Referred documents

AT Commands Lists:
EG_GenPro30e_1006_CL_000_FR

Software update procedure:
EG_GenPro30e_1006_UP_000_FR

GSM reference documents:
3GPP 27.007.

1.2 Abbreviations

Abbreviations Definition

AC	Alternative Current
ACM	Accumulated Call Meter
AMR	Adaptative Multiple Rate
AT	Attention (prefix for modem commands)
BTS	Base Transceiver Station
CLK	Clock
CMOS	Complementary Metal Oxide Semiconductor
CS	Coding Scheme
CTS	Clear To Send
dB	Decibel
dBc	Decibel relative to the Carrier power
dB_i	Decibel relative to an Isotropic radiator
dB_m	Decibel relative to one milliwatt
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
EDGE	Enhanced Data rates for GSM Evolution
EEPROM	Electrically Erasable Programmable Read-Only Memory
EFR	Enhanced Full Rate
E-GSM	Extended GSM
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
ESD	ElectroStatic Discharges
ETSI	European Telecommunications Standards Institute
FIT	Series of connectors (micro-FIT)
FR	Full Rate
FTA	Full Type Approval
GCF	Global Certification Forum
GND	GrouND
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
HR	Half Rate

HSDPA	High Speed Downlink Packet Access
HSUPA	High-Speed Uplink Packet Access
I	Input
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identification
I/O	Input / Output
LED	Light Emitting Diode
MAX	MAXimum
ME	Mobile Equipment
MIC	MICrophone
Micro FIT	Family of connectors from Molex
MIN	MINimum
MNP	Microcom Networking Protocol
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
NOM	NOMinal
O	Output
Pa	Pascal (for speaker sound pressure measurements)
PBCCH	Packet Broadcast Control Channel
PC	Personal Computer
PCL	Power Control Level
PDP	Packet Data Protocol
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PUK	Personal Unblocking Key
RF	Radio Frequency
RFI	Radio Frequency Interference
RI	Ring Indicator
RMS	Root Mean Square
RTS	Request To Send
RX	Receive
SIM	Subscriber Identification Module
SMA	SubMiniature version A RF connector
SMS	Short Message Service
SNR	Signal-to-Noise Ratio
SPI	Serial Peripheral Interface
SPL	Sound Pressure Level
SPK	SpeaKer
SRAM	Static RAM
TCP/IP	Transmission Control Protocol / Internet Protocol
TDMA	Time Division Multiple Access
TU	Typical Urban fading profile
TUHigh	Typical Urban, High speed fading profile
TX	Transmit
TYP	TYPical
UMTS	Universal Mobile Telecommunications System
UTC	Universal Time Clock
USB	Universal Serial Bus
VSWR	Voltage Stationary Wave Ratio
WCDMA	Wideband Code Division Multiple Access

2 Packaging

2.1 Content

The GenPro 30e is delivered with:

- a GenPro 30e cardboard packaging,
- a GenPro 30e modem,
- 2 fixing brackets,
- A technical sheet (Instructions Sheet),
- a mini USB 2 cable (type A Male / type mini B Male),
- a 2-wire stripped cable (Red/Black) with fuse.



2.2 Packing case

The external dimensions of the GenPro 30e packing case are:

- Width : 54.5 mm,
- Height : 68 mm,
- Length: 108 mm.

An identification label is put on the top of the packing case. It shows:

- The ERCO & GENER logo,
- The product reference (GenPro 30e),
- The CE and RoHS Compliant marks,
- The IMEI bar code with 15 digits.

The dimensions of the label are:

- Height: 37 mm,
- Length: 70 mm.

2.3 Modem labels

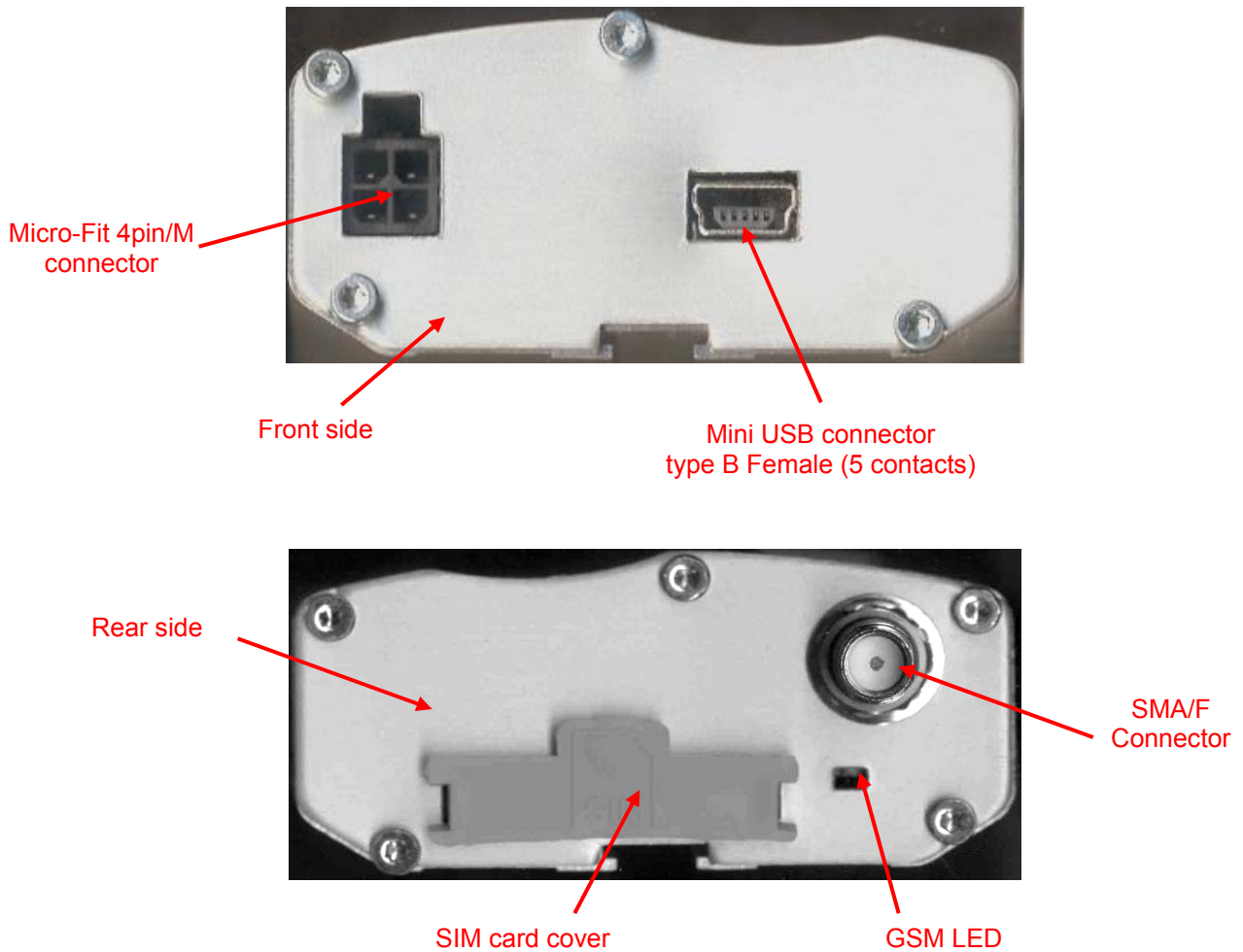
On the casing, there is a label that shows the following information:

- The CE mark,
- The crossed wheelie-bin mark (DEEE standards),
- The direct current mark (VDC),
- The IMEI bar code with 15 digits.

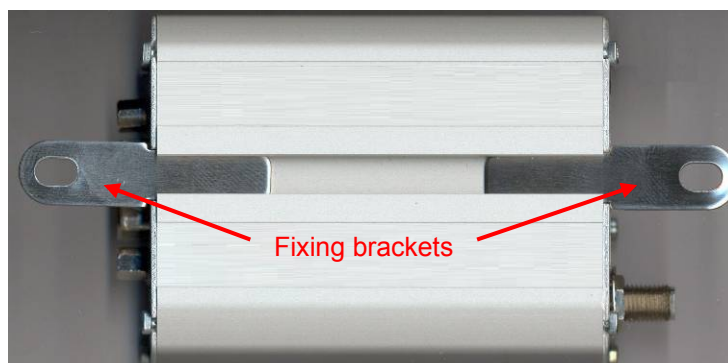
3 General Presentation

3.1 Description

Description of the GenPro 30e modem:



2 fixing brackets to fix the modem on a support.



3.2 External connections

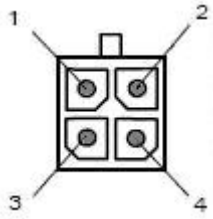
3.2.1 Connections

3.2.1.1 GSM antenna connector

The GSM antenna connector is SMA female with a 50Ω impedance.

3.2.1.2 Female Micro FIT connector with 4 male pins

This connector is used to connect the external DC supply.

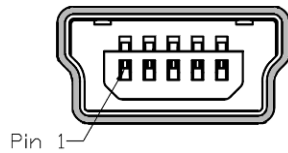


Pin N°	Signal
1	+VDC
2	GND
3	NC
4	NC

Note: The pins 3 and 4 are not used

3.2.1.3 Mini USB B connector (5 contacts)

The mini USB 2.0 connector is B Female (5 contacts).



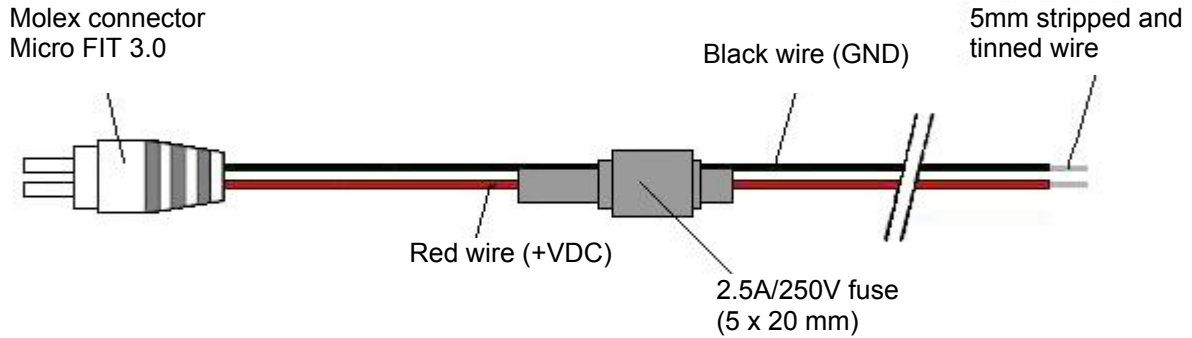
Pin N°	Appellation	Description
1	NC	Not Used
2	Data -	USB_D-
3	Data +	USB_D+
4	NC	Not Used
5	Ground	GND

Note: The pins 1 and 4 are not used

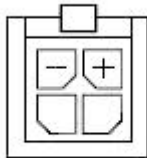
3.2.2 Cables supplied

3.2.2.1 Micro FIT 2-wire supply cable

The 2-wire micro FIT cable allows to supply the modem.



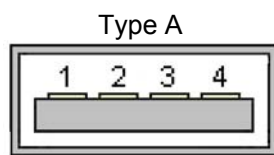
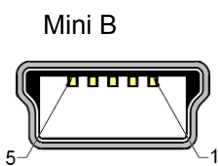
View from cable side



Component	Characteristics
4-pin Micro FIT connector	Supplier : MOLEX
Cable	Length ≈ 1.5m
Wire	Tinned copper 24 x 0.2 mm
	Section : 0.75 mm ²
Fuse	F2.5A L250V

3.2.2.2 USB 2.0 Cable with connectors A Male and mini B Male

The USB cable A Male and mini B Male allows the dialog via the USB port between the GenPro 30e and a communication terminal.



Pin N°		Description
Mini B	Type A	
1	1	NC
2	2	Data (D-)
3	3	Data (D+)
4	NC	NC
5	4	Ground (GND)

Component	Characteristics
Cable USB 2.0	Length ≈ 80cm
	USB A Male USB mini B Male

4 Characteristics and Services

The GenPro 30e functions are summarized in the table hereunder.

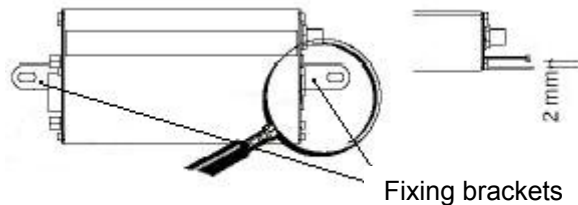
GenPro 30e modem	
GSM / GPRS / EDGE functions	
- ETSI GSM Phase 2+	Class 4 (2W @ 850 / 900 MHz) Class 1 (1W @ 1800 / 1900 MHz)
- GPRS / EDGE	Class 12
- Coding scheme :	CS1 to CS4 and MCS1 to MCS9
- SMS point to point	MT/MO and SMS Cell Broadcast
3G / 3G+ functions	
- UMTS (WCDMA) / HSDPA	category 6 (3,6Mbps downloading, 384 Kbps uploading)
- HSDPA	category 6 / 8 / 12 (3,6 / 7,2 / 1,8 Mbps downloading)
- HSUPA	category 3 / 5 (1,45 / 2,0 Mbps uploading)
Bands	
- 850/1900/2100 MHz	WCDMA Power Class 3
- 850/900 MHz	GSM/GPRS/EDGE Power Class 4/EDGE E2
- 1800/1900 MHz	GSM/GPRS/EDGE Power Class 1/EDGE E2
Interfaces	
- GSM antenna:	SMA-F connector
- Power supply :	+5.5 to +32 VDC (4-pin micro-FIT connector)
- USB 2.0 :	Mini USB female connector (5 contacts)
- AT commands	
- SIM reader	(SIM 3V – 1,8V)
Accessories supplied	
- Fixing brackets	(x2)
- 2-wire Micro FIT	power cable
- USB 2.0 cable	(A Male / Mini B Male)

5 Using the modem

5.1 Starting with the modem

5.1.1 Mounting the modem

To mount the modem on a support, use the fixing brackets as described hereunder.



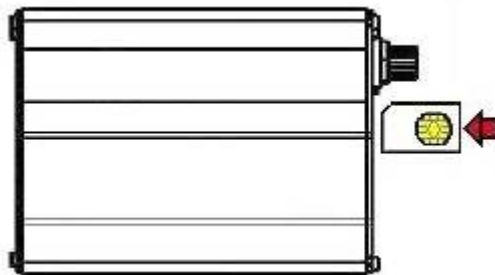
Note:

- Must be fixed on a flat surface
- Max. height of the screw head: 2 mm

5.1.2 Installation of the modem

To install the modem, it is recommended to do the following operations with the modem turned off:

- Remove the SIM card cover on the rear side.
- Carefully insert the SIM card into the reader.



- Push the SIM card until hearing a "clac" that ensures its correct positioning.
- Put the SIM cover back.
- Connect the GSM antenna to the SMA connector.
- For the connection to the DTE, connect the USB cable.
- Connect the supply cable to the continuous and regulated power source.
- Connect the supply cable to the modem and turn on the external power supply (the GSM LED must switch on).

The modem is now ready.

5.1.3 USB Driver installation

It is necessary to use the Drivers available on our website when using and installing the GenPro 30e modem associated to the USB port.

We advise you to install the driver before switching the modem on.

The installation of several GenPro 30e, on a PC with several ports USB is not supported.

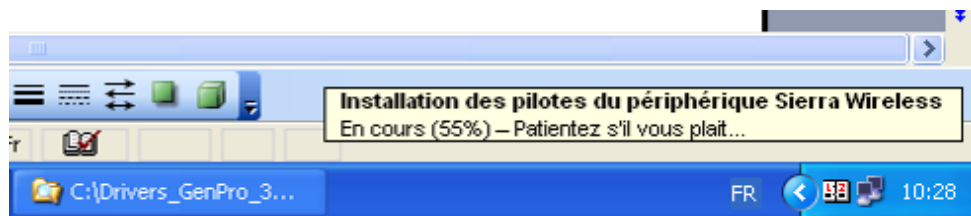
On a PC, only one GenPro 30e will be able to be connected at the same moment.

Uninstalling all the GenPro 30e drivers previously installed as well as 3G Display and restarting the PC may be necessary for a new installation of new 3G Display drivers (due to the evolution of the module heart used in the GenPro 30e).

It is preferable to wait for the complete starting of your PC before powering the GenPro 30e and connecting it to the USB port.

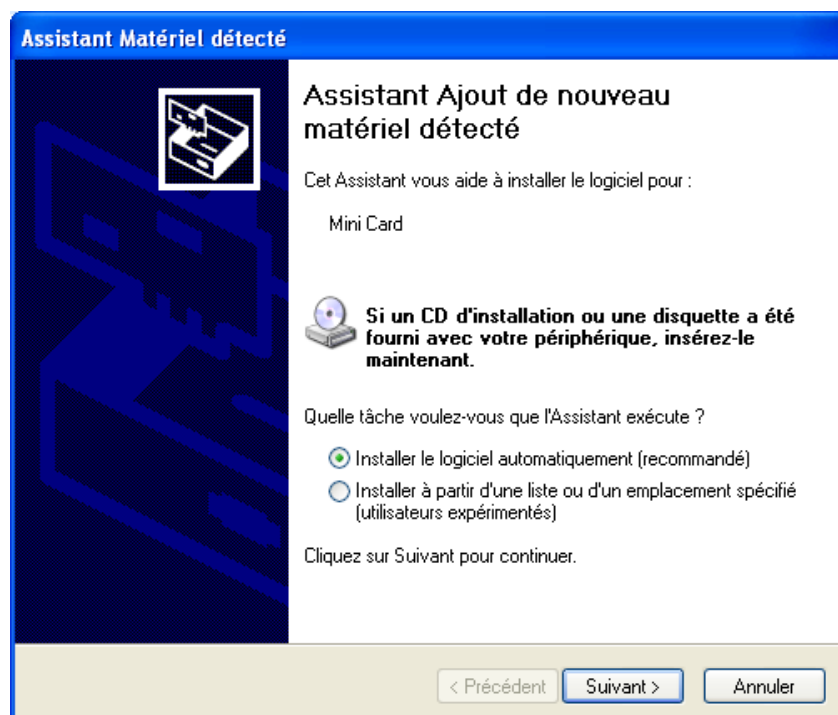
Depending on the installations of USB drivers already made on your computer, the installation of the USB Driver for the GenPro 30e will not be automatic and necessary.

- 1- For the installation, download and extract the files that contain the Drivers in a directory on the root of the PC hard disk (example: C:\Drivers_GenPro_30e).
- 2- In the directory : C:\...\Drivers_GenPro_30e\DriverInstaller, run the file DriverInstaller.exe
The following window will appear and show the progressing state of the pilots installation:



- 3- Once the installation is made, do the following operations in the right order :
 - For the connection to the DTE (PC), connect the USB cable.
 - Connect the DC regulated external power source to the GenPro 30e.

WARNING: If the following window appears, cancel it and check that you have done correctly the operations 1 and 2.



5.1.4 Verification of the communication with the modem

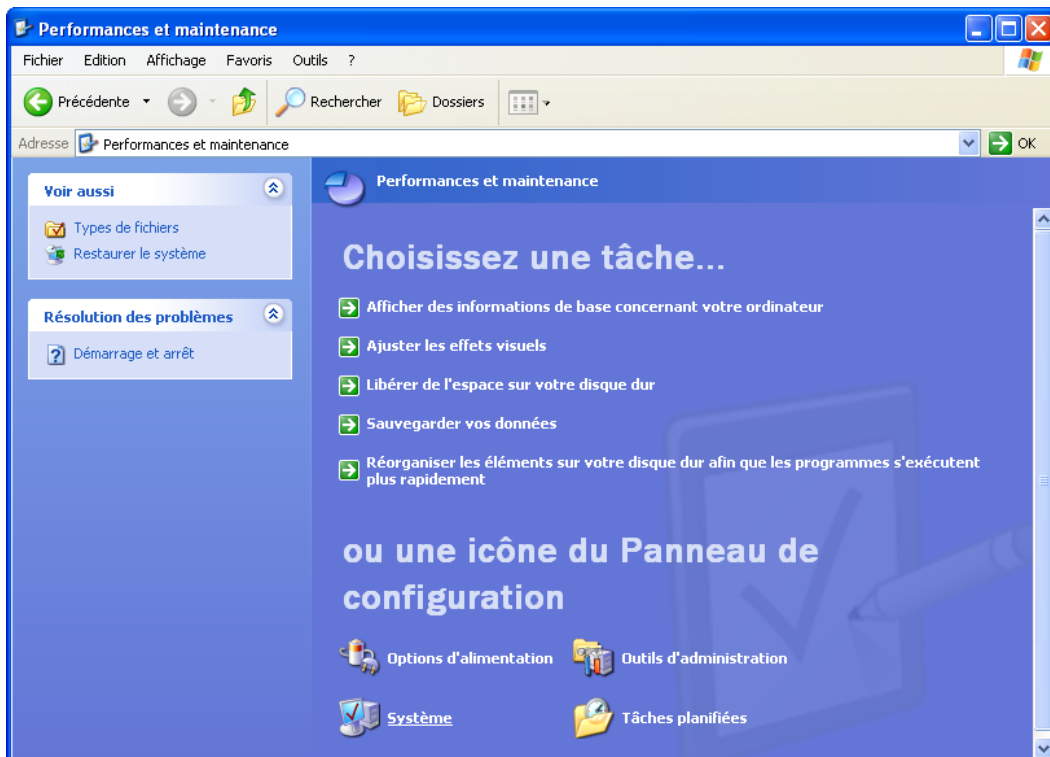
Once the driver is correctly installed, it is possible to dialog with the GenPro 30e and to use the GenPro 30e modem with a terminal.

At this moment, you must absolutely know the virtual USB port that was attributed to it.

For that, go to the Windows configuration board.

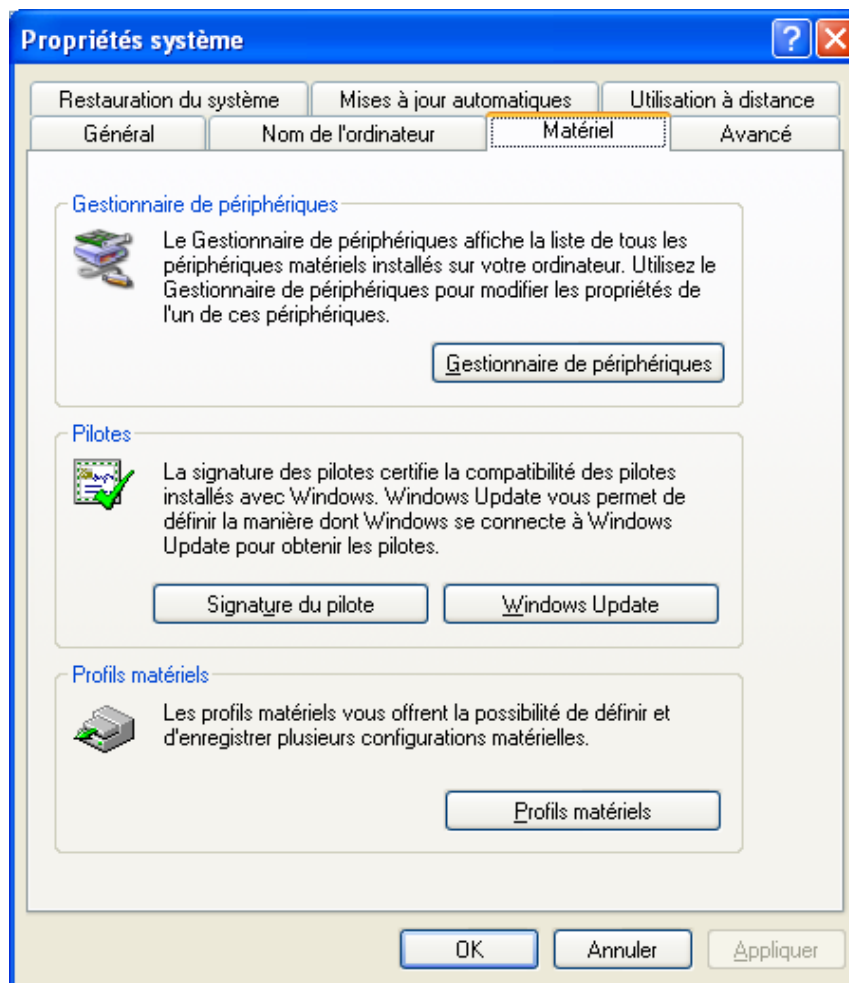


Choose "Performances and maintenance"

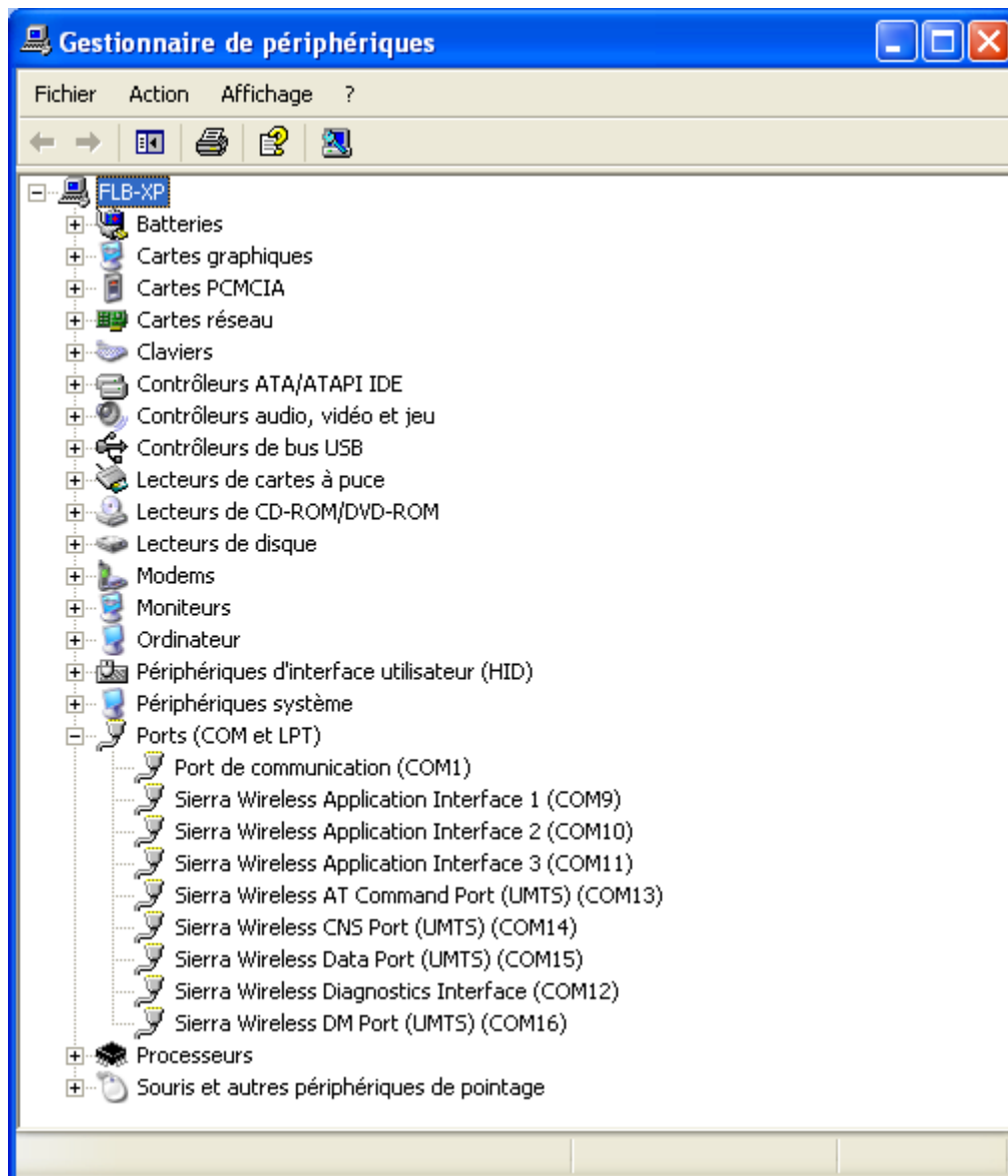


Select "System"

Select the tab "Material"



Choose "Peripheral management system" ("Gestionnaire de périphériques")



In the section "Ports (COM and LPT)", the COM port to send AT commands is AT Command Port (UMTS) (COM13). As the number of the port is virtual, it can change depending on the PC installations. You can close the window of Peripheral management system.

Use a communication software like HyperTerminal of Windows

Configure the COM port of the DTE as follows:

- Data rate: **115200 bps**,
- Data bits: **8**,
- Parity: **None**,
- Stop bits: **1**,
- Flow control: **hardware**.

Send the command **AT↵**. In HyperTerminal, the modem must reply **OK**.

In the case where no communication can be established with the modem:

- Check the USB connection between the DTE and the modem (DCE),
- Check the configuration of the DTE COM port.

Example of AT commands that can be sent once the communication with the modem is validated (commands detailed in the following paragraphs) :

- **AT+CGSN** : the reply of the modem must be a 15-digit number (beginning with "35411802xxxxxxx") when the serial link is correct.
- **AT+CPIN="xxxx"** : enter the code of the SIM card xxxx (if activated).
- **AT!BAND?** : check the selected frequency.
- **AT+CSQ** : check the reception level of the GSM signal received with the SIM card inserted.
- **AT+CREG ?** : check the registration of the modem on the network.
- **ATD<numéro de téléphone>** : start a data call.
- **ATH** : hang-up (end of the call).

For more information about these AT commands and their associated parameters, please refer to the "Commands List" document of ERCO & GENER.

5.1.5 SIM card Extraction

To remove the SIM card from the modem, it is recommended to do the following operations with the modem turned off:

- Remove the SIM card cover on the rear side.
- Press the SIM card (simple pressure) until hearing a "clac" that ensures its ejection.
- Remove delicately the SIM card from the reader.
- Replace the SIM cover.
- **Do a Reset or an On/Off to take it into account.**

5.2 GSM LED

The status of the modem is indicated by the status of the GSM LED located on the rear side of the modem. It is the LED situated next to the SIM reader (see paragraph 3.1).

The table hereunder shows the meaning of the different available status of the GSM LED.

GSM LED status	LED Activity	Modem status
On	LED on fixed	The modem is powered on. To be ready to work and recognized by the network the PIN code has to be entered and the antenna connected.
Flashing	LED flashing (every 2 seconds)	The modem is powered on, the PIN code is active, and the modem is recognized by the network and in communication (to make or receive calls).
Off	LED off	The modem is not powered on or in RESET phase.

5.3 Echo Function of AT commands deactivated

If no echo is returned when entering an AT command, it means that:

- the "local echo " of your communication software (like Hyperterminal) is not activated,
- the echo function of the modem has been deactivated.

The echo function can be configured with the command **ATE**. It requires a back-up with the command **AT&W**.

To activate the echo function of the modem, enter the command **ATE1**.

When sending AT commands to the modem using a communication software, it is recommended to:

- Deactivate the "local echo" parameter in your communication software (like Hyperterminal),
- Activate the echo function of the modem (the command **ATE1**).

For a Machine to Machine communication with the modem, it is recommended to deactivate the echo function of the modem (the command **ATE0**) in order to avoid the CPU receiving redundant responses.

For more information about the **ATE** commands, see the "Commands List" document of ERCO & GENER.

5.4 Checking the quality of the GSM reception signal

To know the reception level, the GenPro 30e must absolutely have its activated SIM card inserted.

The modem will be able to make a call only if the received GSM signal is sufficient.

The command **AT+CSQ** allows to know the reception level (*rs*) of the signal sent by the closest GSM Base Transceiver Station (BTS), as well as the receive bit error rate (*ber*).

When the SIM card is inserted and the PIN code entered, the command **AT+CSQ** allows to measure the signal from the BTS of the subscribed operator network.

This command can also be used without the SIM card, it indicates in this case the nearest BTS which can be ORANGE, SFR or BOUYGUES for France (Without the SIM card, the device does not recognize the current subscription). It is therefore advisable to do the measure when the SIM card is present.

To check the quality of the GSM signal, do the following operations:

With a communication software like Hyperterminal, enter the command **AT+CSQ**.

The response is in the following format:

+CSQ : <rs>, <ber> with :

<rs> = indicates the reception level,

<ber> = receive bit error rate.

Check the answered value **<rs>** with the help of the table hereunder.

<rs> value	Gain (dbm)	Interpretation	<ber> value	Interpretation
0	-113 dbm	Insufficient	0 to 7	See ETSI GSM 05.08 standards
1 to 10	-111 to -95 dbm	Insufficient		
11 to 30	-93 to -53 dbm	Sufficient		
31 (max)	-51dbm	Perfect		
99		Unknown/not detectable	99	Unknown/not detectable

The GSM modem works normally with a minimum **<rs>** between 11 and 15.

Bellow 10, the signal level is insufficient; the modem cannot work depending on the geographical situation or the vehicle mobility. Above 15, the signal is sufficient.

For more information about AT commands, see the "Commands List" document of ERCO & GENER.

5.5 Verification of the PIN code

The PIN code is essential in order to make a call or to accept a response coming from the GSM network. This code is held in the SIM card and can be modified by the user.

To check that the PIN code has been entered, use a communication software like Hyperterminal, and enter the command **AT+CPIN?**

The table hereunder shows the main responses given by the modem:

Command	Response	Interpretation
AT+CPIN?	+CPIN : ERROR	The SIM card is absent or not recognized
	+CPIN : READY	The PIN code is correct
	+CPIN : SIM PIN	The PIN code is wrong or not entered yet
	+CPIN : SIM PUK	The PUK code is required

For more information about AT commands, see the "Commands List" document of ERCO & GENER.

5.6 Verification of the modem registration on the GSM network

1. Ensure that a valid SIM card has been inserted in the SIM card reader of the modem.
2. Using a communication software like Hyperterminal, enter the following AT commands:
 - a. **AT+CPIN="xxxx"** to enter the PIN code. The user has only 3 attempts to enter the PIN code.

After the third attempt, only a second code (code PUK) supplied by the operator, will allow you to chose a new PIN code.

b. **AT+CREG?** to check the registration status on the network. The response will be of the following format: **+CREG : <mode>, <stat>** with:

- <Mode>** = configuration of the registration message not solicited,
- <Stat>** = registration status.

3. Check the registration status according to the value given in the table hereunder.

Command	Response	Interpretation
AT+CREG?	+CREG : 0,0 or 0,3	The modem is not recognised by the network
	+CREG : 0,2	The modem is searching for a network operator.
	+CREG : 0,1	The modem is attached in GSM to the local operator.
	+CREG : 0,5	The modem is attached in GSM to the roaming operator.

If the modem is not registered: check the connection between the modem and the antenna or the reception level of the signal (cf. paragraph 5.5).

For more information about AT commands, see the "Commands List" document of ERCO & GENER.

5.7 Main AT commands (HAYES)

The table hereunder shows the main AT commands necessary for the control of the modem. Other AT commands are available, see the "Commands List" document of ERCO & GENER.

Table: Main AT commands used with the modem.

Description	AT Command	Response	Interpretation
Enter the PIN code	AT+CPIN="xxxx" (xxxx = PIN code)	OK	PIN code accepted
		+CME ERROR: 16	PIN code incorrect (1*)
		+CME ERROR: 3	PIN code already entered (1*)
Verification of registration on the network	AT+CREG?	+CREG : 0,1	The modem is attached in GSM to the local operator.
		+CREG : 0,5	The modem is attached in GSM to the roaming operator.
		+CREG : 0,2	The modem is searching for a network operator.
		+CREG : 0,0 or 0,3	The modem is not recognized by the network.
Reception of an incoming call (2*)	ATA	OK	Reply to the call
Make a voice call	ATD< telephone number >; (the ; at the end of the sequence is important; it allows to make a voice call)	OK	Communication established
		+CME ERROR: 11	PIN code not entered
		+CME ERROR: 3	The credit has run out or a communication has already been established.
Make an emergency call (112)	ATD112;	OK	Communication established
Lost communication		NO CARRIER	
Hang-up	ATH	OK	

(1*) with **+CMEE=1**. The command **AT+CMEE=1** allows the display of extended error codes; it is possible to save it with the command **AT&W**.

(2*) with **+CRC=1**. The command **AT+CRC=1** allows in the case of an incoming call to display an extended message that indicates the canal called. This message corresponds to the type of number called: voice, data or fax, it is possible to save it with the command **AT&W**.

Examples:

If the number VOICE is called, the modem replies: **+CRING : VOICE**

If the number DATA is called, the modem replies: **+CRING : REL ASYNC**

If the number FAX is called, the modem replies: **+CRING : FAX**

5.8 Turning off the modem

There is no particular AT command to send to the GenPro 30e Modem before turning it off.

5.9 Modem updating procedure

To be able to benefit from the latest functions of the GenPro 30e, an updating procedure can be used to upgrade the software program in the modem.

The procedure consists in downloading the software into the internal Flash memory of the modem via the USB link.

See the software update procedure for a detailed description.

6 Trouble Shooting

This section describes the problems that may be encountered when using the modem.

6.1 Communication problem between the modem and the USB link

If the modem does not respond to the AT commands via the USB, link, refer to the table hereunder to see the possible causes and the solutions.

Table: Solutions when there is no connection between the modem and the USB link

If the modem...	Check :	Action
Returns nothing	Is the modem correctly powered?	Ensure that the modem is connected to an external regulated power source and supplies a tension from 5.5V to 32V (§ 8.2.1).
	Is the USB cable connected at both ends (PC and Modem)?	Check the connection of the USB cable.
	Is the USB cable correctly cabled according to the paragraph 3.2.1.3?	Connect the USB cable according to the table of paragraph 3.2.1.3.
Returns nothing or random characters	Is the communications terminal correctly configured on the PC?	Ensure that the configuration of the communication terminal corresponds with the one of the modem. Factory configuration : Speed = 115200 bps Data bits = 8 Parity = none Stop bits = 1 Flow control = hardware
	Is there another application creating a conflict during the access to the communication port?	Close the conflicting application.
	Is the modem without echo and without message reporting?	Send the command ATE1Q0 followed by AT&W if a backup is necessary.

6.2 ERROR" message

The modem returns a message "**ERROR**" (in response to an AT command) in the following cases:

- The COM port is not directed to the GenPro 30e modem but to another modem. Enter **ATI**, and the response must be **Manufacturer: Sierra...** Any other response indicates a dialog with another modem. In this case, check the COM port used in the Hyperterminal.
- The syntax of the AT command is incorrect: check it (see the "Commands List" document of ERCO & GENER),
- The syntax of the AT command is correct, but transmitted with wrong parameters (see the "Commands List" document of ERCO & GENER).

6.3 "NO CARRIER" message

If the modem returns the message "NO CARRIER" after an attempted call (voice or data), check the table hereunder to see the possible causes and the solutions.

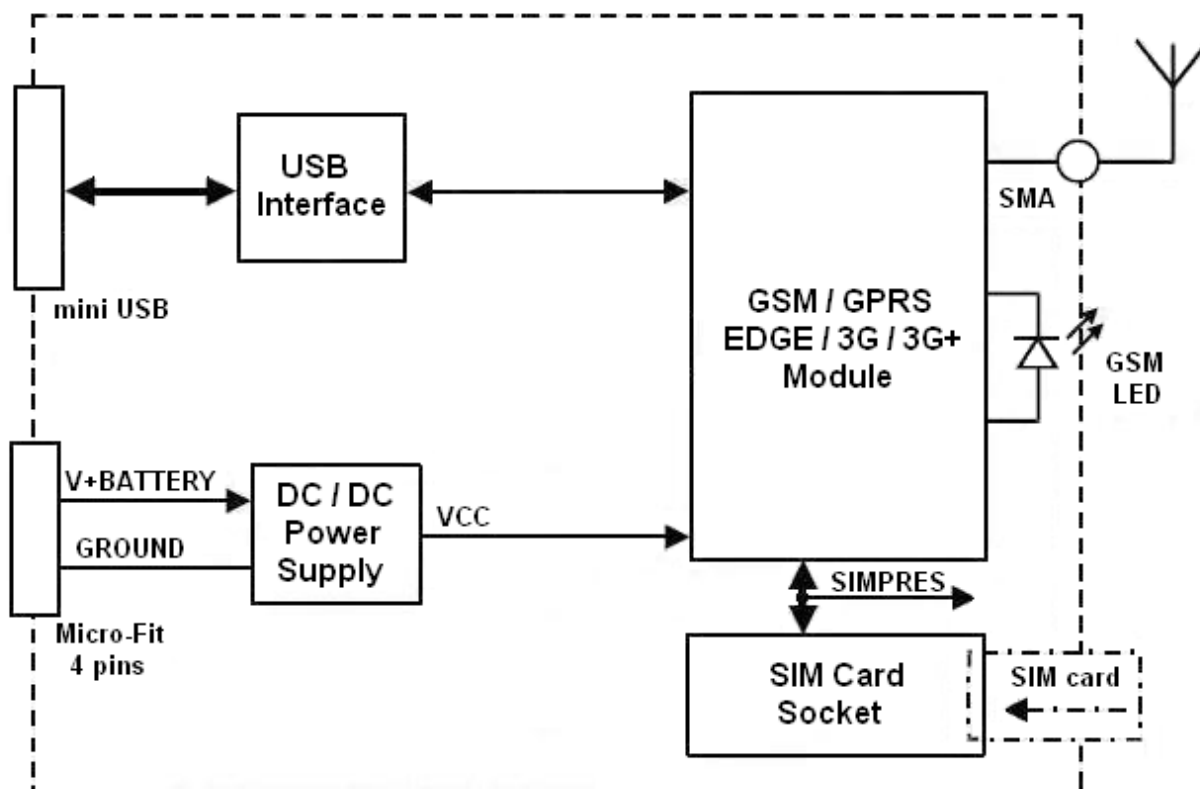
Table: Solutions when a message "NO CARRIER" is returned

If the modem...	Check :	Action
"NO CARRIER"	Is the received GSM signal strong enough?	See the paragraph 5.5 to check the quality of the received signal
	Is the modem registered on the network?	See the paragraph 5.7 to check its registration.
	Is the antenna correctly connected?	See the paragraph 8.2.6.3 for the recommendations about the GSM antenna installation.
"NO CARRIER" (when attempting a VOICE call)	Has the semi-colon (;) been entered immediately after the telephone number in the AT command?	Ensure that the semi-colon (;) has been entered immediately after the telephone number in the AT command. For example : ATD0123456789;
"NO CARRIER" (when attempting a DATA call)	Has the SIM card been configured for data / fax calls?	Ensure that the SIM card is allowed to make data / fax calls (check with your SIM card supplier)
	Is the selected modulation type supported by the called number?	Ensure that the selected modulation type is supported by the called number.
	Is the selected modulation type supported by the network?	Ensure that the selected modulation type is supported by the network. If not, select a compatible modulation type with the command AT+CBST=0,0,1 (1*)

(1*) For more information about this AT command, see the "Commands List" document of ERCO & GENER.

7 Functional Description

7.1 Architecture



7.2 Power supply

7.2.1 General presentation

The modem must be powered by an external DC tension (V+BATTERY) between +5.5V and +32V.

The regulation of the modem power supply is made with a DC/DC internal converter in order to supply all the necessary internal DC tensions.

A correct functioning of the modem in communication cannot be guaranteed if the input tension (V+BATTERY) falls below 5.5 V.

7.2.2 Protections

The modem is protected by a 2.5 A / 250 V fuse tly assembled on the power supply cable supplied with the modem.

The modem is also internally protected against tension peaks of more than 32 V.

Filter guarantees:

- EMI/RFI protection in input and output

- Signal smoothing.

7.3 USB Interface

The USB interface is the only link for the communication between Master USB (Host = USB COM port of the PC) and the modem.

The interface complies with the USB 2.0 specifications (Universal Serial Bus Specifications rev. 2.0).

Characteristics of the USB interface:

- Supports the max.output (full speed 12Mbps)

- Data general transfer between the modem and the Master USB

- Use with the Windows drivers of the modem like a COM port

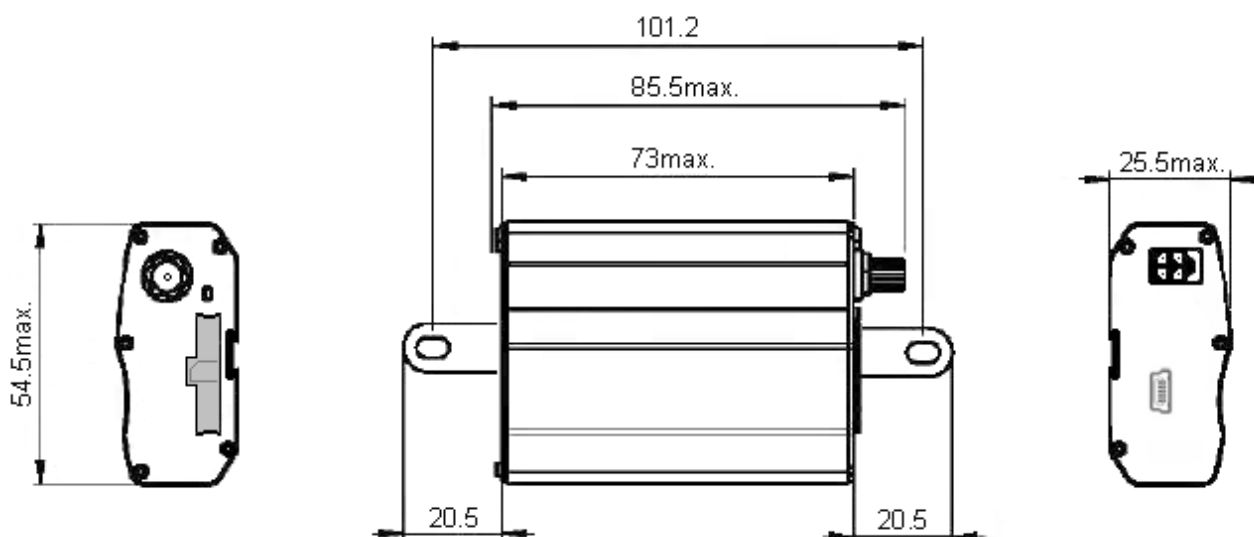
- Complies with USB emission/reception.

8 Technical Characteristics

8.1 Mechanical characteristics

Dimensions	73 x 54.5 x 25.5 mm (excluding the connectors)
Overall Dimensions	85.5 x 54.5 x 25.5 mm
Weight	≈ 88 grams max.(modem only) < 197 grams max.(modem + fixing brackets+ cables)
Volume	101.5 cm ³
Casing	Aluminum profile
Waterproof level	Class IP31

The illustration hereunder shows the dimensions of the modem including the clearances necessary for the installation of the modem.



8.2 Electrical characteristics

8.2.1 Power supply

Table: Electrical characteristics

Power supply range	- 5.5V to 32V DC (GSM or DCS or GPRS)
Average consumption	- GSM 850/900 MHz : 195mA @ 12V in communication - GSM 1800/1900 MHz : 160mA @ 12V in communication - 3G / 3G+ : 295mA @ 12V in communication

Note: once the power supply is connected, the modem is permanently consuming.

The following table describes the consequences of over-voltage or insufficient voltage on the modem.

Table: Effects of a power supply defect

	Then :
▪ Voltage falls below 5.5V	▪ The GSM communication is not guaranteed.
▪ Voltage above 32V (Punctual peaks)	▪ The modem guarantees its own protection.
▪ Voltage above 32V (Continuous over-voltage)	▪ The modem is protected by the fuse (The modem is short-circuited by an internal varistor).

The following table shows the modem consumptions without the USB connected.

Table: Power supply consumption without USB (1*)

CONDITIONS T=25°C		GSM/GPRS/EDGE Bandes		UMTS Bandes	
		I Nom.(mA)	I Max.(mA)	I Nom.(mA)	I Max.(mA)
Idle mode (2*)	@ 5,5V	43	47	39	43
	@ 12V	19	21	17	19
	@ 24V	10	11	9	10
	@ 32V	8	9	7	8

CONDITIONS T=25°C		I Nom.(mA)	I Max.(mA)	I Bursts Max.(mA)
In GSM/GPRS / EDGE communication	@ 5,5V	176	442	2 063
	@ 12V	81	195	945
	@ 24V	41	100	488
	@ 32V	32	76	373
In UMTS communication	@ 5,5V	342	638	825
	@ 12V	158	295	378
	@ 24V	81	151	195
	@ 32V	62	115	149

(1*) The consumptions may vary by 5% depending on the temperature range (-25 °C to +60 °C).

(2*) Idle mode = modem registered on network but not in communication.

8.2.2 SIM interface

Table: Characteristics of the SIM card supply tension

SIM Card	3 V or 1.8 V
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8.2.3 RF characteristics

8.2.3.1 RF functioning

The RF functioning complies with the ETSI GSM Phase 2+ standards.

The RF performances for the receiver and the transmitter are described hereunder.

Table: Parameters of the RF receiver and transmitter

Band	Frequencies (MHz)	Conducted Rx Sensitivity (dBm)		Conducted Transmit Power (dBm)
		Typical	Maximum	
GSM 850 (2%) CS	Tx: 824-849 Rx: 968-894	-107.5	-106	+32 ± 1 (GSMK) +27 ± 1 (8PSK)
EGSM 900 (2%) CS	Tx: 880-915 Rx: 925-960	-107.5	-106	+32 ± 1 (GSMK) +27 ± 1 (8PSK)
DCS 1800 (2%) CS	Tx: 1710-1785 Rx: 1805-1880	-106.5	-105	+29 ± 1 (GSMK) +26 ± 1 (8PSK)
PCS 1900 (2%) CS	Tx: 1850-1910 Rx: 1930-1990	-106.5	-105	+29 ± 1 (GSMK) +26 ± 1 (8PSK)
Band I UMTS 2100 (0.1%) 12.2Kbps	Tx: 1920-1980 Rx: 2110-2170	-110.5	-109	+23 ± 1
Band II UMTS 1900 (0.1%) 12.2Kbps	Tx: 1850-1910 Rx: 1930-1990	-110.5	-109	+23 ± 1
Band V UMTS 850 (0.1%) 12.2Kbps	Tx: 824-849 Rx: 968-894	-111.5	-110	+23 ± 1

8.2.3.2 External antenna

The external antenna must be connected to the modem via the SMA/M connector.

The external antenna must have the characteristics described in the table hereunder.

Table: Characteristics of the external antenna

Frequency band	850/900/1800/1900/2100 MHz
Impedance	50 Ohms nominal
DC impedance	0 Ohm
Gain	0 dBi in a minimum direction
VSWR (Rx max TX max)	1.5:1
Polarization	Linear

Note : see chapter 10 for the GSM antennas recommended by ERCO & GENER.

8.3 Environmental characteristics

To ensure a correct functioning of the modem, the limits listed in the table hereunder must be respected.

Table: Environmental characteristics

Operating temperature	-25 °C to +60 °C
Storage temperature	-30 °C to +85 °C
Operating humidity without condensation during 48h	HR < 85% @ +85°C

8.4 Standards/Conformities

The product complies with the following requirements:

- R&TTE 1999/5/EC Directive,
- Regulations of standard ETSI EN 301 489-7 (02),
- ROHS Compliant : Directive 2002/95/CE,
- 2002/96/CE DEEE (crossed out wheelie bin).

The following marking appears under the device.



9 Security recommendations

9.1 General security

It is important to respect the specific regulations concerning the use of radio equipment, in particular with the possible risks of interference due to radio frequency (RF). Please respect carefully the following security advices.

Turn off your GSM modem:

- On an aircraft, the use of cellular telephone can endanger the plane operations; disturbing the cellular network is illegal. The non-observance of this instruction can lead to the suspension or the exclusion of the cellular phone services, or even to a trial, or both,
- At a refueling station,
- In any area with a potential explosive atmosphere that could cause an explosion or a fire,
- In hospitals and other places where medical equipment may be used.

Restrictions of use of radio equipments in:

- Fuel warehouses,
- Chemical factories,
- Places where destruction operations are in the running,
- Other places where signs indicate that the use of cellular phones is prohibited or dangerous.
- Other places where you should normally turn off the engine of your vehicle.

There can be a danger associated with the use of your GSM modem close to insufficiently protected medical devices such as acoustic devices and pacemakers.

Consult the manufacturers of medical equipment to know if it is adequately protected.

Using your GSM modem close to other electronic equipments may also cause interferences if the equipment is insufficiently protected.

Pay attention to the warnings and the recommendations of the manufacturers.

The modem is designed to be used with "fixed" and "mobile" applications:

- "Fixed" application: The GSM modem is physically linked to a site and it is not possible to move it easily to another site.
- "Mobile" application: The GSM modem is designed to be used in various places (other than fixed) and is intended to be used in portable applications.

9.2 Security in a vehicle

Do not use your Modem whilst driving, unless equipped with a correctly installed ear-piece/hands-free kit. Respect the national regulations concerning the use of cellular telephones in vehicles. Road safety is always a priority.

An incorrect installation of the GSM modem in a vehicle could cause an incorrect functioning of the vehicle electronics. To avoid such problems, ensure that the installation was made by a qualified person. During the installation, a verification of the electronic protection system of the vehicle must be made.

The use of a warning equipment that activate the headlights or the horn of a vehicle on public highway is not authorized.

9.3 Care and maintenance

The suggestions hereunder will help you to preserve this product for many years.

Do not expose the modem to the extreme environments, to high temperature or high humidity.

Do not use or store the modem in dusty or dirty places, it could be damaged.

Do not try to disassemble the modem, at the risk of cancelation of the guarantee.

Do not expose the modem to water, rain or spilled beverage, it is not impermeable.

Avoid dropping, striking, or shaking the modem violently. The lack of care can damage it.

Do not place the modem next to computer disks, credit or travel cards or other magnetic supports. The information contained on disks or cards can be affected by the modem.

The use of other equipments or accessories not made or not authorized by ERCO & GENER can cancel the guarantee of the modem.

9.4 Your responsibility

This modem is under your responsibility. Treat it with care, it is not a toy. Keep it always in a secure place and out of the reach of children.

Try to remember your PIN and PUK codes. Familiarize yourself with the modem and use the security functions to lock it in case of non authorized using or in case of theft.

10 Recommended Accessories

The accessories recommended by ERCO & GENER for the modem GenPro 30e, are shown on our website in the section Products/Accessories. For more information, contact our sales department.

11 Client support

ERCO & GENER ensures the client support for all its modems sold. You will then have access to:

- The latest version of this document
- The datasheet of the product
- The latest versions of the OS user guides
- Certificates
- Application notes

DECLARATION OF CONFORMITY

Manufacturer: ERCO & GENER

Address: Rue des Petites Granges
Z.I. de Saint Lambert des Levées
B.P. 30163
49412 SAUMUR CEDEX – France

Website: <http://www.ercogener.com>

Declares that the products:

Name: GenPro 30e Type: Modem

Complies with:

- R&TTE Directive 1999/5/EC of 09 March 1999,
- Council Recommendation 1999/519/EC of 12 July 1999,
- Regulations of standard ETSI EN 301 489-7 V1.3.1 (05),
- ROHS Compliant: Directive 2002/95/CE,

Safety : EN 60950-1 : 2006

EMC : EN 301511



The corresponding markings appear under the appliance.

Saumur, May 28th 2008

Charles CHAUSSONNIER
Managing Director

A handwritten signature in blue ink, appearing to be 'Charles Chaussonnier', written over a faint circular stamp.