erco&gener

L'esprit Modem

User Guide

GenIP 20i

Reference: EG_GenIP20i_1010_UG_000_UK

Revision: 000

Date: 27/10/2009

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Document History

Revision	Modifications	Author	Date
000	CREATION	Fabien LE BRETON Loïc GODINEAU	27/10/09

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

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Presentation

Entirely dedicated to the most critical and sensible industrial applications, the GenIP 20i with its aluminum Din-rail casing assiciates the wired connections of high and very high speed (Ethernet / USB) with the wireless world (GSM / GPRS).
Autonomous, simple to configure (intuitive and multi-language interface) and with a high performance (ARM9 processor), it will help you all along your industrial phases concerning alarm and events management, network interconnexion (Ethernet, Modbus), command interpreter and secure storage of critical information.
It provides a communication interface GSM / GPRS (GenIP 20i) or PSTN (GenIP 40i) and knows how to be available and/or how to monitor your sensitive equipments (Notification by email / SMS / MP3 / GPRS).
It is also able to interconnect your ASCII protocols to your new Ethernet platforms (Modbus RTU to Modbus TCP conversion).
5 years warranty, it has the same qualities as all our products: Robustness, Reliability and Long Life.

The GenIP 20i belongs to the DIN-rail range of ERCO & GENER.

This document describes the product and provides the following information:

- General presentation,
- Functional description,
- Available basic services,
- Installation and use of the GenIP 20i (first level),
- Trouble shooting,
- Recommended accessories for the use of the product.

For more information concerning this document, ERCO & GENER puts at your disposal (on the Internet www.ercogener.com or upon request) 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 manufacturer 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 Ethernet / RS232 / RS485 / 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

Software update Procedure:
EG_GenIP20i_1010_UP_xxx_UK

GSM reference documents:

- GSM 07.05.
- GSM 07.07.

1.2 Abbreviations

Abbreviations Definition

AC	Alternative Current
ACM	Accumulated Call Meter
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
dBi	Decibel relative to an Isotropic radiator
dBm	Decibel relative to one milliwatt
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment as Modem...
DCS	Digital Cellular System
DSR	Data Set Ready
DTE	Data Terminal Equipment as Computer...
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
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
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
PDU	Protocol Description Unit
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
UTC	Universal Time Clock
VSWR	Voltage Stationary Wave Ratio

2 Packaging

2.1 Content

The GenIP 20i is supplied with:

- a cardboard packaging,
- a GenIP 20i ,
- a straight RJ45 Ethernet cable,
- a Male/Female 9 pin cable,
- a 2-pin female screw connector 5.08mm,
- a 3-pin female screw connector 5.08mm,
- a technical sheet (Instructions Sheet).

2.2 Packing case

The external dimensions of the GenIP 20i packing case are:

- Width: 163 mm,
- Height: 66 mm,
- Length: 295 mm.

An identification label is put on the box side. It shows:

- The product reference (GenIP 20i),
- The CE mark,
- The IMEI bar code with 15 digits.

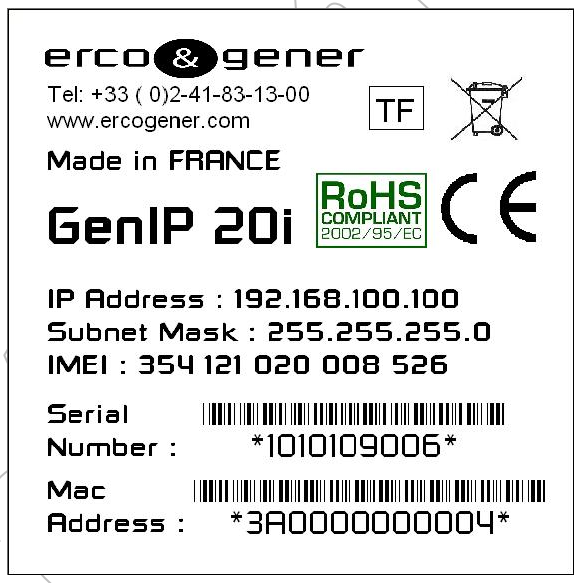
The dimensions of the label are:

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

2.3 Modem labels

Under the GenIP 20i, there is a label providing the following information:

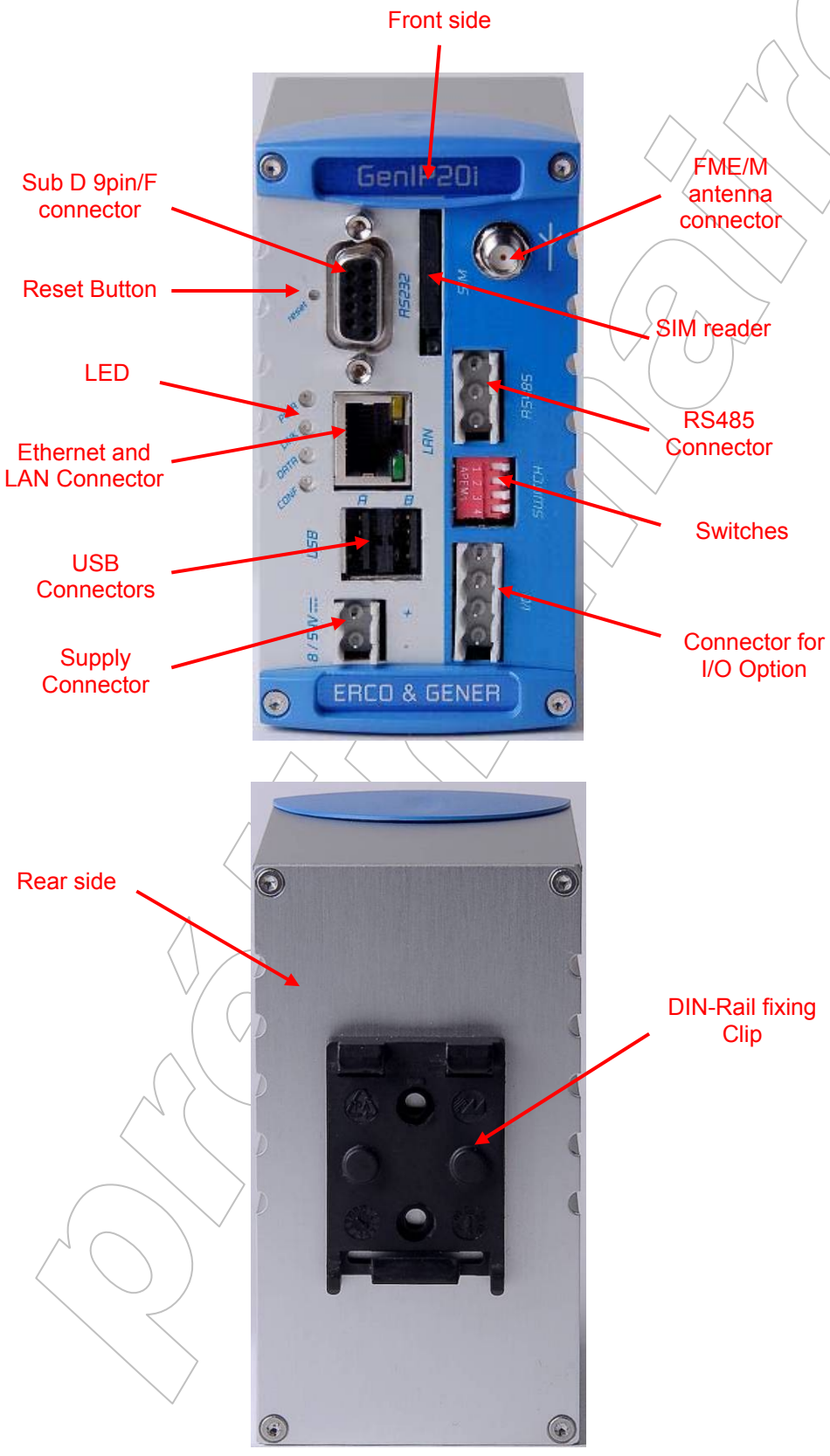
- The ERCO & GENER logo,
- The product name,
- The IP address and the subnet mask by default,
- The IMEI number with 15 digits,
- The serial number,
- The Mac address,
- The CE and RoHS Compliant marks,
- The crossed wheelie-bin mark (DEEE standards).



3 General presentation

3.1 Description

Description of the GenIP 20i:



3.2 External connections

3.2.1 Connections

3.2.1.1 Antenna connector

GSM antenna connector:

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

3.2.1.2 Screw connectors

Screw connectors with 2 male pins:

This connector is for the power supply.

Pin N°	Signal
1	+ VDC
2	- GND

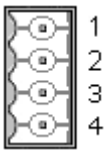
Screw connectors with 3 male pins:

This connector is for the RS485.

Pin N°	Signal
1	B– RS485
2	A+ RS485
3	GND

Screw connectors with 8 male pins:

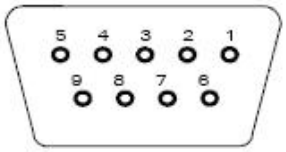
This connector is for the connection of the I/O option (Inputs/Outputs).



Pin N°	Signal
1	ND
2	ND
3	ND
4	ND

3.2.1.3 Sub D 9-pin connector

The Sub D 9-pin female connector is used for the RS232 serial link connection.

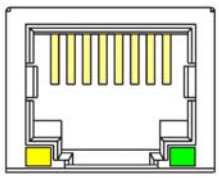


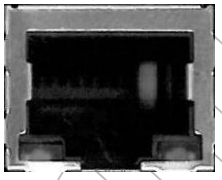
Pin N°	Description	Circuit (V24 – RS232C)	I/O
1	Signal detection	109 – DS – DCD	O
2	Data reception	104 – RD – RXD	O
3	Data transmission	103 – ED – TXD	I
4	Data terminal ready	108/2 – TDP – DTR	I
5	Signalization ground	102 – TS – GND	-
6	Data set ready	107 – PDP – DSR	O
7	Request to send	105 – DPE – RTS	I
8	Clear to send	106 – PAE – CTS	O
9	Ring indicator	125 – IA – RI	O

By default, all the outgoing signals are in high level. To dialog with the GenIP 20i, only the TXD, RXD and ground signals are essential. The other signals are not necessary.

3.2.1.4 RJ45 Ethernet LAN connector

The RJ45 connector is used for the Ethernet LAN connection. The LAN speed is 100 Mbits.





Pin N°	Signal
1	TD+
2	TD-
3	RD+
4	CT
5	CT
6	RD-
7	NC
8	GND

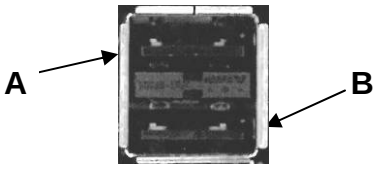
GenIP 20i accepts straight or crossed Ethernet cables.

Status of the connector leds

Action	LED	Status
At powering on	Green and yellow	Off
When LAN is electrically connected	Yellow	Fixed
Exchanges of information on LAN	Green	Flashing

3.2.1.5 USB Device and USB Host connectors

The GenIP 20i provides 2 connectors USB Device (A) and Host (B).



Pin name	Status	Signal
A	Slave	Device
B	Master	Host

The USB function is not available for the moment

3.2.1.6 Reset Button

The Reset button is under the Sub-d 9pin connector of the RS232.

This button has two functions:

- Reloading the factory configuration,
- Reloading the reference configuration.

Procedure for reloading the factory configuration:

- Turn the GenIP 20i off,
- Press the Reset button,
- Turn the GenIP 20i on,
- Wait until the Power led flashes,
- Release the Reset button,
- From now on, the factory parameters are reloaded.

Procedure for reloading the reference configuration:

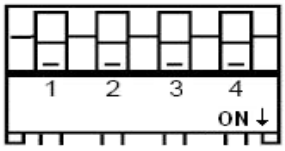
To work, there must have been a reference configuration saved in the GenIP 20i.

If there was no reference configuration saved, then the factory configuration will be loaded.

- The GenIP must be powered on and the Power led must be flashing,
- Press during 5 seconds the Reset button,
- After a few seconds, the led Power is fixed,
- Then the Power led flashes, indicating that the procedure is now finished,
- From now on, the GenIP 20i has reloaded the reference configuration parameters (IP address, mask...).

3.2.1.7 Switch

The Micro-Switches allow to configure the GenIP 20i actions.



Status	Level
ON	1
OFF	0

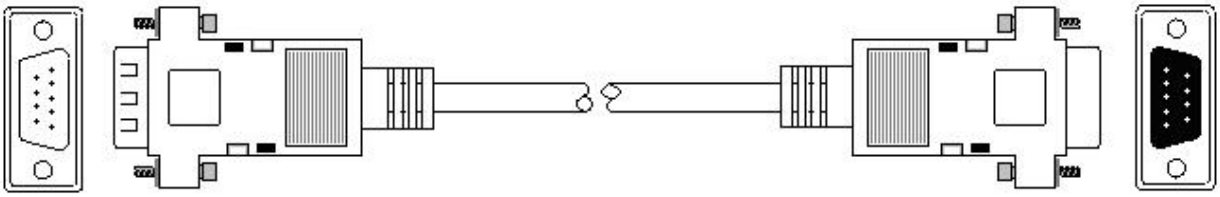
The possible actions with the GenIP 20i occur from the status OFF to ON or from the status ON to OFF.

It takes 1 second to be taken into account (this parameter cannot be changed).

3.2.2 Accessories supplied

3.2.2.1 Straight cable 9pin M/F

The straight cable 9pin M/F allows to dialog via the RS232.



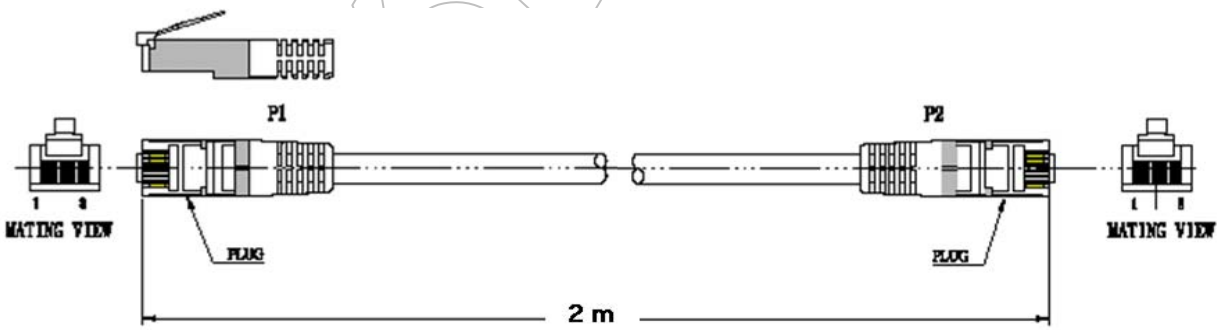
DB9M DB9F

Component	Characteristics
Straight cables 9pin Male/Female	Supplier : ASSMANN
	Length ≈ 2m
	9 wires
	Lockings

Pin N°	Designation	Circuit (V24 – RS232C)
1	Signal detection	109 – DS – DCD
2	Data reception	104 – RD – RXD
3	Data transmission	103 – ED – TXD
4	Data terminal ready	108/2 – TDP – DTR
5	Signalization ground	102 – TS – GND
6	Data set ready	107 – PDP – DSR
7	Request to send	105 – DPE – RTS
8	Clear to send	106 – PAE – CTS
9	Call indicator	125 – IA – RI

3.2.2.2 Ethernet RJ45 straight cable

The RJ45 Ethernet cable allows to dialog via the LAN Ethernet.



Component	Characteristics
RJ45 straight Ethernet cables	Supplier : ASSMANN
	Length ≈ 2m
	8 wires
	RJ45+S/R (YUS-01)

3.2.2.3 GSM hinged antenna (SMA-M)

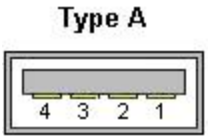
A GSM hinged antenna (SMA Male connection) is supplied with the GenIP 20i.

It is possible and advised to use an antenna with cable for swerving needs.

Component	Characteristics
GSM hinged antenna	Supplier : CTI
SMA-M	Dimension straight : 90 mm Dimension bent at 90°C : 30 x 70 mm
	GSM 850 / 900 / 1800 / 1900 / 3G

3.2.2.4 Cable USB 2.0 A Male / A Male (Option)

The USB cable allows to dialog via the USB connectors (Host or Device).



Pin N°	Designation
1	Power supply +5V (VBUS) 500mA max.
2	Data (D-)
3	Data (D+)
4	Ground (GND)

Component	Characteristics
Cable USB 2.0	Supplier : INGELEC
	Length ≈ 2m
	USB type A Male USB type A Male

4 Technical characteristics and Options

The GenIP 20i is a gateway Ethernet GSM / GPRS.

4.1 Technical characteristics

The GSM / GPRS characteristics and the functions are summarized in the table hereunder.

GSM / GPRS Characteristics
- E-GSM Quad-Bands 850/900/1800/1900 MHz
- ETSI GSM Phase 2+ Class 4 (2W @ 850 / 900 MHz) Class 1 (1W @ 1800 / 1900 MHz)
- GPRS Class 10 (Up to 4Rx / 2Tx)
Functions
Secured parameters interface (HTTPS / Login / Password)
Multi-language parameters interface (FR / UK)
Multi-Language hotline (FR / UK)
Embedded Web server: APACHE
SSH Server
Parameters interface accessible via the Ethernet and GSM / GPRS link
Back-up of a configuration in a text file
Port Forwarding
Firewall integrated with automatic management
Alarms management : Transmission of email / SMS / GSM frame / GPRS frame / MP3
Converter ModBus TCP / ModBus RTU
Information storage
Routing like RIP
Linux IP Stack: TCP / UDP / FTP, DHCP client and server, SMTP / POP3 (Via Ethernet and/or GPRS), HTTPS / HTTP Client : DYNDNS / SNTP
GPRS connection automatic, systematic or upon events
Complete set of Macro Commands
Diagnostic and administration tools integrated
Events diary
Interfaces
RS232 : Sub-D 9-M
RS485 : Connector
USB (1 USB Host / 1 USB Device)
RJ45 Ethernet Port (10 / 100 Mbps)
Antenna connector SMA-F
Large band supply : 8 to 54 Vdc
Connector for I/O block (Block available as an option)
SIM reader with holder (3V – 1.8V)
Micro Switch 4 positions
4 Leds : PWR / CONF / GSM / OPTION (configurable)

4.2 Accessories and Options

The Accessories and Options are described in the table hereunder.

Accessories
Screw connection (Power supply, RS485)
RS232 cable (Sub-D 9-M / Sub-D 9-F)
Straight Ethernet cable
GSM hinged antenna (SMA-M)
Options (*)
High output GSM / GPRS antenna
Din-Rail I/O block : 6 digital I/O, 6 analog I/O
DIN-Rail Power supply with spare battery
USB cable
Standard mains block
Tropicalization

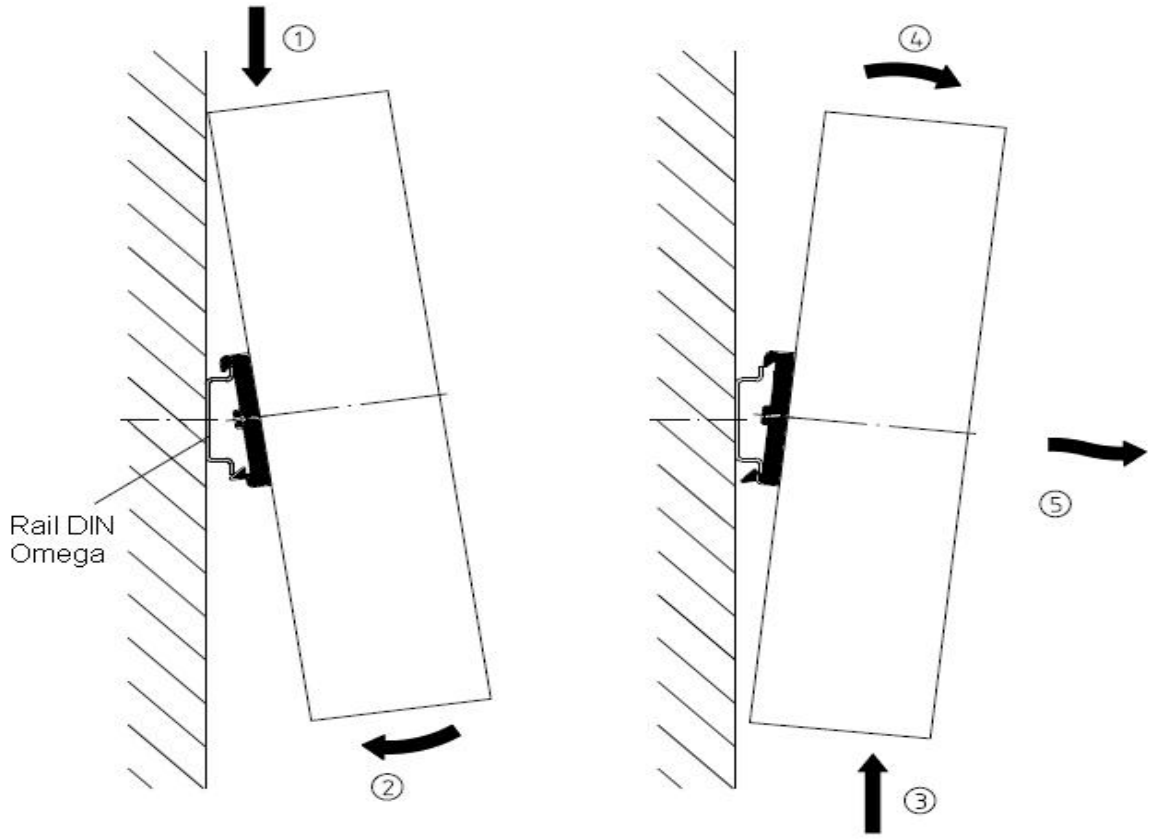
(*) Options, contact us.

5 Using the GenIP 20i

5.1 Starting with the GenIP 20i

5.1.1 Assembling and disassembling the GenIP 20i

By default, the modem is provided with a Din-Rail fixing clip (35mm) directly assembled on the modem.
The Din-Rail fixing clip (35mm) allows a quick assembling/disassembling on a DIN-Rail (35mm) OMEGA (IEC/EN 60715 / DIN (35mm) 7.5mm).
To mount the modem on a DIN-Rail (35mm), follow the step 1 (pressure) and the step 2 (turn).



To remove the modem from the DIN-Rail (35mm), follow the step 3 (pressure) and the steps 4-5 (turn and remove).

5.1.2 Installation of the GenIP 20i

To install the GenIP 20i, it is recommended to do the following operations with the modem turned off:

- Press the button of the SIM holder with something pointed (lead of pencil for example).
- Insert the SIM card in the drawer respecting the direction, and carefully insert them in the reader.
- Check that the SIM card is correctly positioned.
- Screw the GSM hinged antenna in the SMA connector.
- For the connection to the DTE, connect the LAN link via the straight Ethernet RJ45 cable.

- Screw the supply cable in the 2-pin connector, respecting the polarities, and connect to the external power DC supply source, stabilized and regulated.
- Connect the 2-pin connector with the supply cable in the GenIP 20i and turn the external supply source on (the LED PWR must turn on).

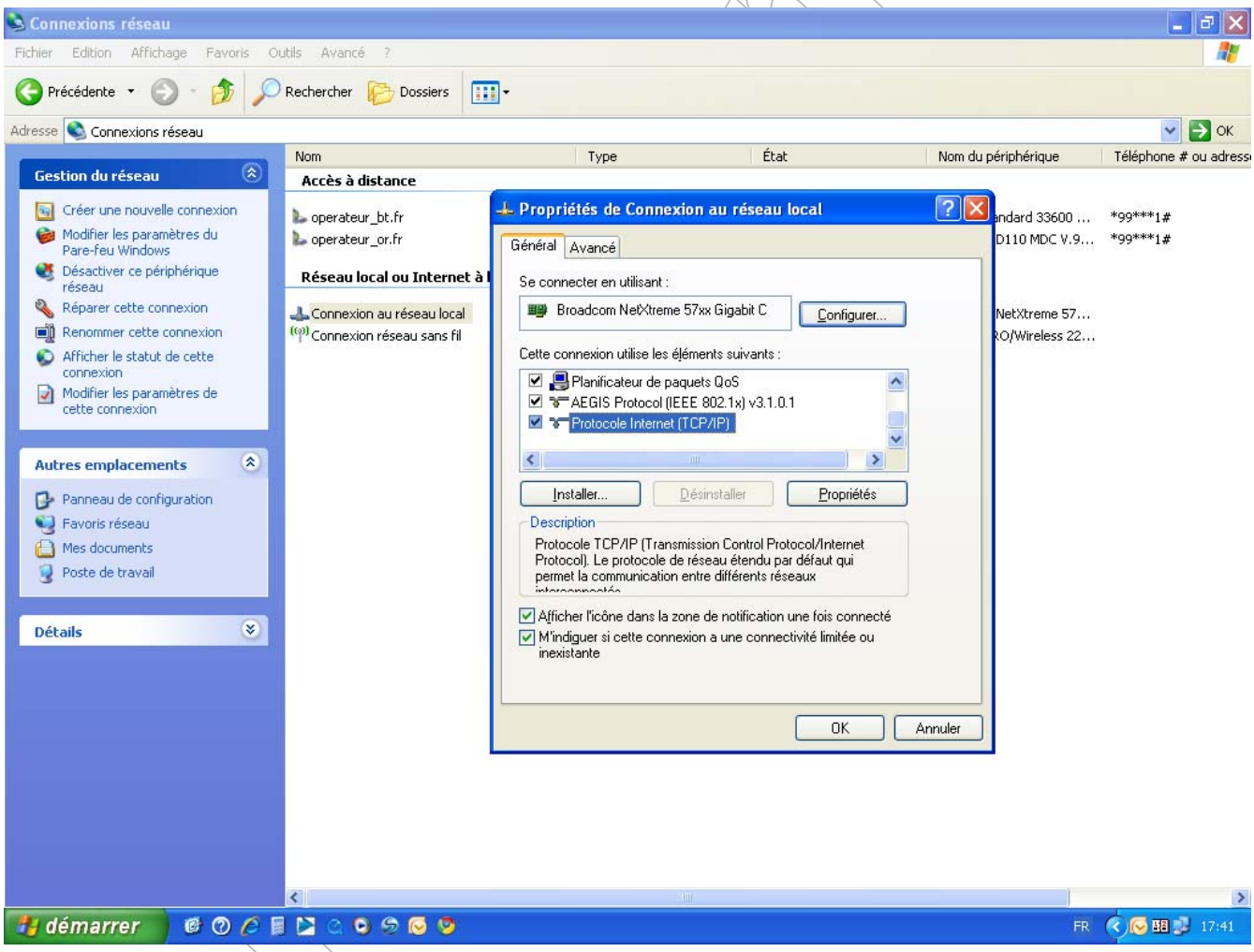
The GenIP 20i is now ready.

To set the parameters of the different functions of the GenIP 20i, the use of an internet browser is advised.

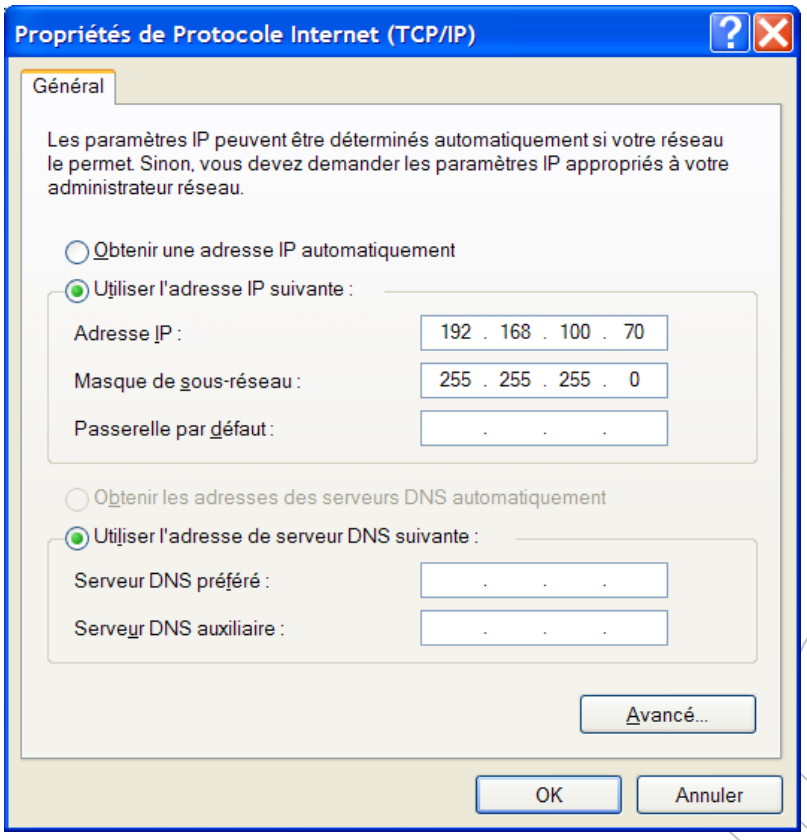
5.1.3 Using the GenIP 20i with the browser

To use and configure the GenIP 20i, the IP address and the subnet mask must be entered.

This window is in the Control Panel / Internet and Network Connections / Connection to local network / Internet Protocol (TCP/IP) / Properties

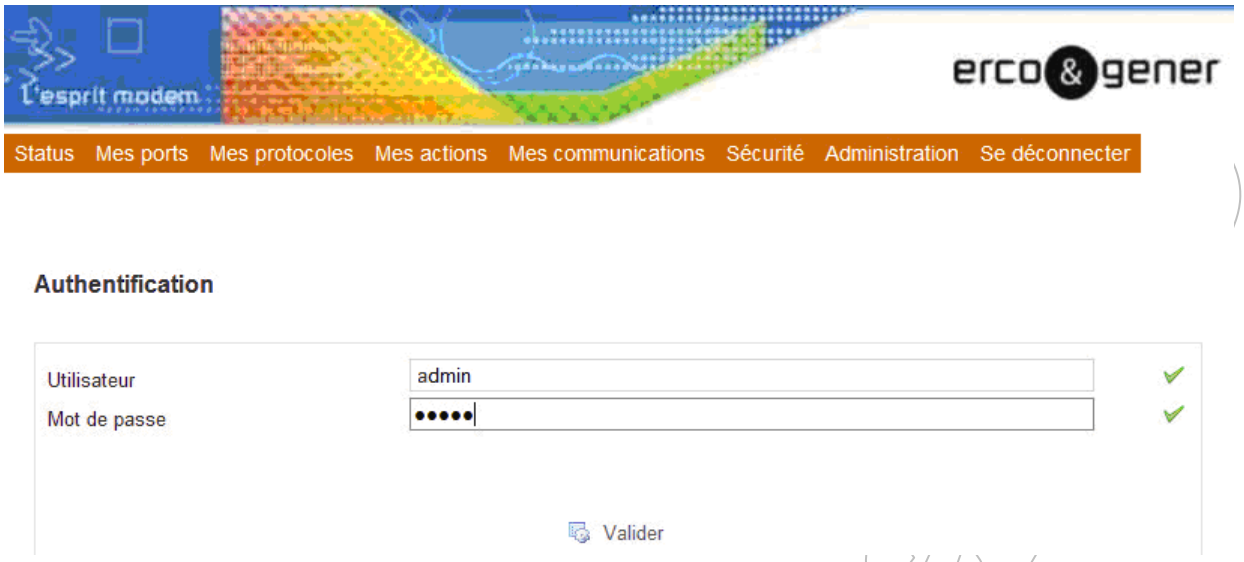


In the window Internet Protocol Properties (TCP/IP), enter an IP Address and the subnet mask (see hereunder) and validate with OK

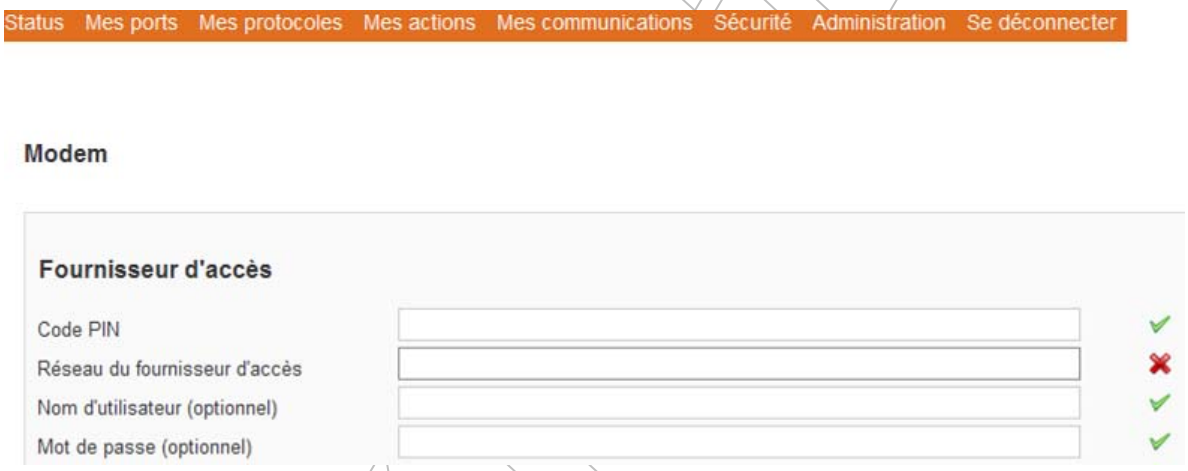


Use a browser (Internet Explorer for example) and enter the IP address by default of the GenIP 20i.

To authenticate, enter the user name (admin) and the password (admin) and validate.



To be able to validate a GPRS connection, in the section “Mes Communications / Modem” enter the parameters of the access supplier.



Note:

To be taken into account it has to be validated.

The GenIP 20i will warn you that it has to be restarted so that the new parameters can be taken into account.

Once the GenIP 20i has restarted, it is advised to make a GPRS connection and to send a SMS.

GPRS Connection

In the section “Mes actions / Paramétrage des actions / Effectuer cette action”, validate GPRS_connect.

The page refreshes, then click on the section “Status” and place the mouse on the section “Mes Communications”.

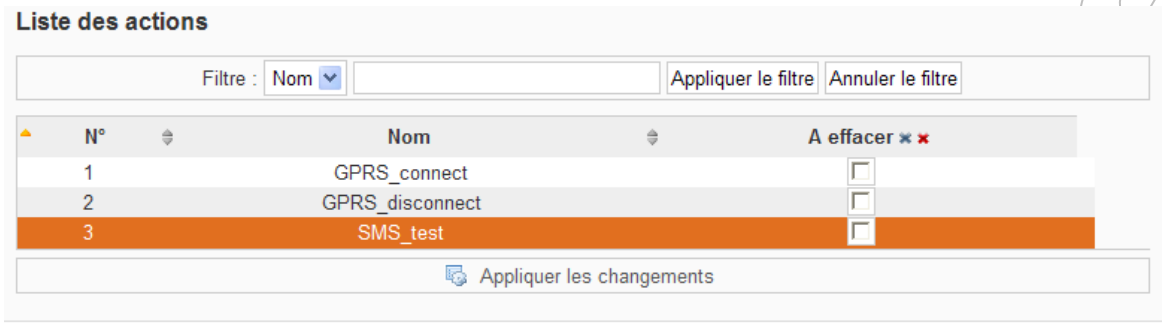
Once connected to the GPRS network, a dynamic IP address is given (for example hereunder: 90.95.80.240)

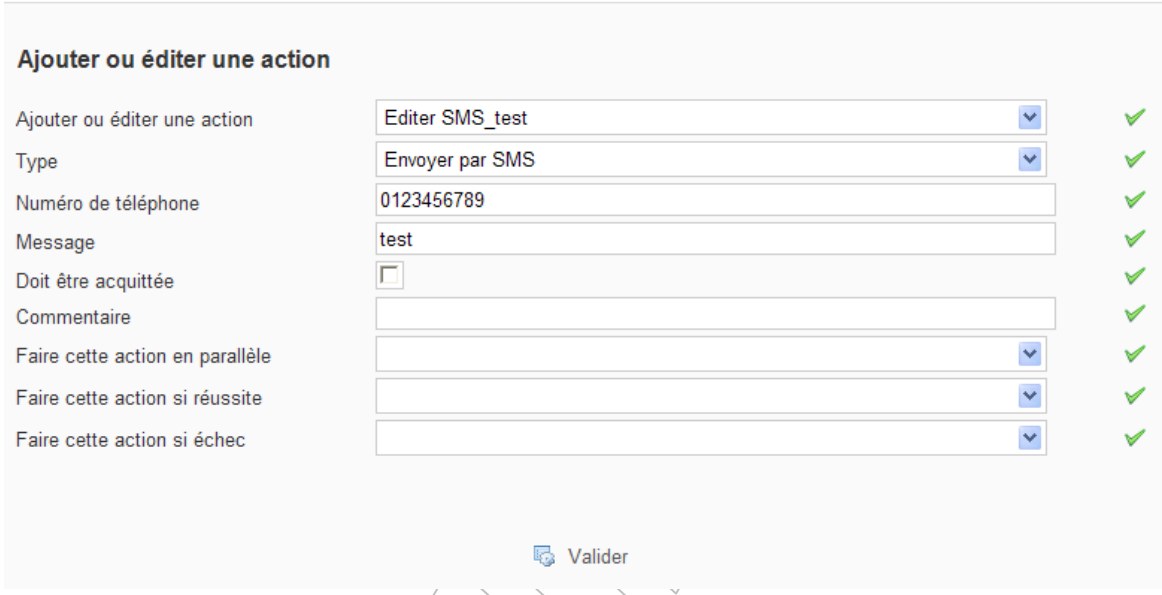
To disconnect, in the section “Mes actions” click on GPRS_disconnect.

Sending a SMS

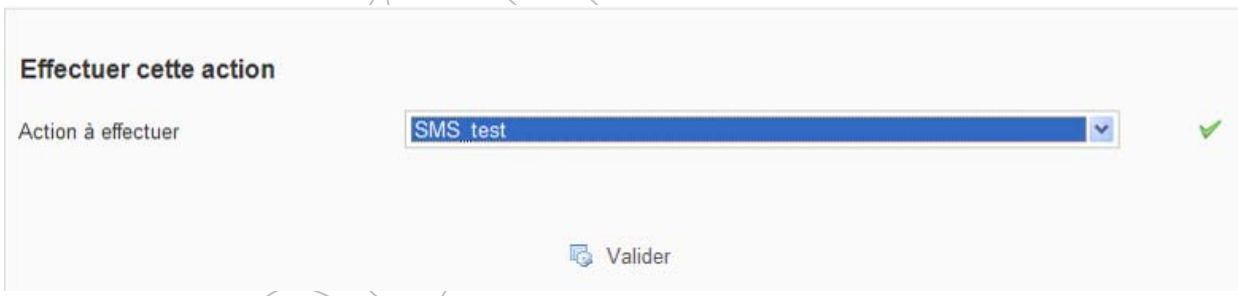
In the section “Mes actions / Paramétrage des actions / Liste des actions”, click on SMS_test.

In the window “Ajouter ou éditer une action”, enter the telephone number of the addressee and validate





In the section “Mes actions / Paramétrage des actions / Effectuer cette action”, validate SMS_test.



After a few seconds, the addressee will receive the following message: test.

5.2 Basic principle

The GenIP 20i is a device which can follow on with actions upon internal or external events.
These events can come from or be initiated:

- by the interfaces : Ethernet, RS232 or RS485,
- by the Micro-Switch,
- temporally,
- at powering on the GenIP 20i,
- by the external I/O block,
- from a distance via SMS, GPRS, GSM Data or GSM PPP.

The actions depend on the internal communicating module of the GenIP 20i or via the LAN interface.
The actions may be chained and acknowledged.
In case of chaining, the actions must be compatible between each other. For example, if you are in GPRS connection, you won't be able to receive at the same time a GSM Data communication.

5.2.1 Acknowledgements

The acknowledgements may be done by:

- GPRS via email, TCP connection on Service Port (by default : 1723) or via Web Interface,
- LAN via TCP connection on Service Port (by default: 1723) or directly in the Web interface,
- SMS
- GSM Data PPP in TCP connection on Service Port (by default: 1723) or via Web Interface,
- GSM Data directed to service Socket (by default: 1723).

For the acknowledgements syntax, see the table of Macro Commands (paragraph 5.16).

Example of acknowledgements:
The GenIP 20i is protected by a password adminremote and we want to acquitter the alarm code 1.

Through a command port, you will have to send the following information:

```
password adminremote;
ack 1;
end;
```

Do not forget **the semi colon** after each command and the **end** which marks the end of the actions to do.

Note:

- Action impossible via local RS232 and RS485.
- The e-mail reading is active by default in the case of an acknowledgement waiting. It happens 3 minutes before the end of the waiting time.
- The acknowledgements can come from different services or access authorized. For example sending a SMS with acknowledgement does not require an acknowledgement by SMS.

- Do not forget to activate the authorized sources; otherwise you won't be able to acknowledge the actions.
- Acknowledgements by e-mail :

Considering that the size and the content of the e-mail received are voluntarily limited, it is advised:

  - To work in text
  - To remove from your e-mail the business cards, signatures or other elements which unnecessarily take a lot of place and generate additional consumption of data when connecting in GPRS.

5.2.2 Macro Commands

The Macro Commands are aimed to make execute some actions to the GenIP 20i.
(See the Table Macro command hereunder).

The Macro commands may come from:

- GPRS via e-mail, TCP connection on Service Port (by default : 1723) or via Web Interface,
- LAN via TCP connection on Service Port (by default: 1723) or directly in the Web Interface,
- SMS
- GSM Data PPP in TCP connection on Service Port (by default: 1723) or via Web Interface,
- GSM Data directed to service Socket (by default: 1723).

Example of Macro Commands:
The GenIP 20i is protected by a password adminremote and we want to read the GenIP 20i version.

Through a command port, you will have to send the following information:

password adminremote;
version;
end;

Do not forget **the semi colon** after each command and the **end** which marks the end of the actions to do.

Note:

- Do not forget to activate the authorized sources; otherwise you won't be able to execute the Macro Commands.
- Macro Command by e-mail :

Considering that the size and the content of the e-mail received are voluntarily limited, it is advised:

  - To work in text
  - To remove from your e-mail the business cards, signatures or other elements which unnecessarily take a lot of place and generate additional consumption of data when connecting in GPRS.

Designation	Example	Message sent after execution of the action	Description	Notes
password	password adminremote	If OK password ***** then OK If NOK password ***** then rejected	At the level of the command channels, if a password was activated, it allows to accede the GenIP in order to send Macro Commands to it. It combines with the validated sources.	If a password is activated, it has to be entered before each action or chain of action. On the contrary case, the message password request is received.
end	end;	None	Marks the end of Macro Commands series	Instruction necessary
gprs connect	gprs connect;end;	gprs connect GPRS IP = X.Y.Z.W OK	Initiates a GPRS connection	Via the Data link, the action will occur after hanging up the Data communication.
gprs disconnect	gprs disconnect;end;	gprs disconnect OK	Initiates a GPRS disconnection	Does not work in Data mode because when we are in GPRS link, we cannot establish a Data communication
e-mail receive	email receive;end;	email receive OK	Initiates the e-mails reading	Via the Data link, the action will occur after hanging up the Data communication and in this case, there is no message sent.
set message	set message 0 TEST;end;	set message 0 TEST; OK	Programs the Custom message 0 with the content TEST	
get message	get message 0	get message 0 TEST OK	Sends back the content of the message 0 in the above example TEST	
do action	do action nom_action;end;	do action nom_action OK	Gives the order to the GenIP 20i to do a defined action	
version	version;end;	version 0.XX OK	Sends the software version of the GenIP 20i	
wait	wait 60;version;end;	wait 60 OK version 0.XX OK	Waits for 60 seconds and asks for software version of the GenIP 20i	
ack	ack 1;end;	ack 1 OK	Acknowledges the acknowledgement waiting of code 1	Different possibilities: ack x-y acknowledges the actions whose codes are between x and y included ack nom acknowledges the actions by name (Characters * and ? as jocker)
reboot	reboot;end;	reboot Rebooting in 60 s OK	Reboots the GenIP 20i after 60 seconds	
reboot now	reboot now;end;	None	Reboots the GenIP 20i after 2 seconds	
emergency reboot	emergency reboot;end;		Spare Reboot	Works only by SMS

5.2.3 Remarks about syntax of acknowledgements, Macro Commands, patterns or frames received upon action starting

Some of them are sensitive to the case (Respect of small letters and CAPITAL LETTERS).

In certain fields of the Web interface, the following characters are not accepted:

- Character like –
- Stressed character
- White character

When a character is not valid, a red cross in the Web interface or an error message in the case of acknowledgement or Macro Commands appear.

Frames and fields quantification

Designation	
Size Maxi accepted for e-mail file	The e-mail file must not exceed 35 Kilos.
Size Maxi accepted for e-mail content	The content (text, signs, business cards ...) must not exceed 1024 octets.
Size Maxi of the frame to program the dynamic messages	1024 bytes
Size Maxi for fields in the Web interface	1024 bytes
Size Maxi possible for diary	4,5 Mega bytes. (Careful, if you reach this size, the display of the page will take a long time)
Number of declarable users for the access to the Web interface	10 users

5.2.4 Static and dynamic messages

Static message:

The parameters of the static messages corresponding to the identification can be entered via the Web .

Once entered and validated, these messages are automatically saved.

Dynamic message:

The dynamic messages named Custom Message on the Web interface, are aimed to be charged via the command port Service Port (by default : 1723).

Contrary to the static messages, these messages are not saved.

Concerning the 2 kinds of messages, it is possible to recover their content via the Macro Commands or by using the syntax *$nom_du_message$* (name of message) on the list of actions.

5.2.5 IP Information

GenIP 20i in DHCP server

In the case where the GenIP 20i is in DHCP server, the attributed lease is 2 days.
The IP addresses attributed are in the range 192.168.100.0 to 192.168.100.255.
The subnet mask is 255.255.255.0.
The GenIP 20i does not automatically provide the gateway address to use for the equipments connected on the LAN.

Ports management

For some services, there are some mirror ports. These mirror ports may be modified and are used in certain cases for remote accesses via GPRS or Data PPP. In local you have to use the ports by default.
The GenIP 20i provides the following functions:

- Redirection of port

  In this case, an external port is put in relation with a local port.
  In this case, the external equipment and the local equipment are clients for the GenIP 20i.

- Port Forwarding

  In this case, we put in relation an external port and a local port which is associated to a local IP address.
  This allows to put a server equipment on local ; then, via the GPRS IP address and the external port, we can access this equipment.
  Today it is not possible to put a client equipment on LAN side in the case of a Port monitoring rule.

Incoming PPP connection

The GenIP 20i provides the RAS Server function.
To accede it, a client RAS session has to be created on the remote side.
The user name is ppp_in
The password is the one defined in the Web interface on the section modem (by default: admin)

During the PPP connection, the addresses are:

- GenIP 20i : 192.168.222.222
- The RAS client: 192.168.222.223
- We can define a limit of lifetime of this connection via the Web interface.

Outgoing PPP connection

Today the email service is not available in Data PPP connection mode.

5.2.6 Time out of connection and disconnection on TCP service

Services	Time Out or Disconnection
Web	After 3 minutes with no action, the led CONF turns off and another user can connect on the GenIP 20i.
Service Port	After 5 minutes with no activity, the port released.
RS232 service Port	During a change of parameter on the Web interface, the TCP session is closed.
RS485 service Port	During a change of parameter on the Web interface, the TCP session is closed

5.2.7 PIN code and SIM card management

Today, it is advised to use a SIM card that does not request the PIN code when powering on (PIN code request deactivated).

In the case where the SIM card has a PIN code, it has to be entered in the field of the Web interface.
Then the GenIP 20i will cancel the request for PIN code.

Inserting the SIM card when the GenIP 20i is on, involves a rebooting of the GenIP 20i.

5.2.8 Reloading a configuration from a backup file

If we are for example in IP 192.168.100.104 and if we reload a configuration whose IP address was 192.168.100.147; we must wait for 3 minutes before controlling again the GenIP 20i.
A waiting message (period) is sent by the Web interface.

We observe the same behavior when we do only a change of IP address.
During a change of IP address, there is no message of end of loading.

Note:

- The led CONF turns off once the GenIP is available again.
- On the Web interface, each validation saves the information in the GenIP 20i.

5.2.9 Notes about the definition and the behavior of the actions

An action with no acknowledgement request can lead to one or several other actions in the following cases:

- Action in parallel
- Action if success (An action is considered as a success if it succeeded (Example SMS sent, GPRS connection established...). A non acknowledgement of an action does not consider the action as a failure.
- Action if failure. This action occurs when the action fails.

Warning: the chained actions must be possible to be done at the same time by the communicating module.
For example, in the case of a permanent GPRS connection, it is not possible to establish in parallel a GSM Data connection.

An action with acknowledgement request can lead to one or several other actions in the following cases:

- Action in parallel
- Action if success (An action is considered as a success if it succeeded (Example SMS sent, GPRS connection established...). A non acknowledgement of an action does not consider the action as a failure.
- Action if failure. This action occurs when the action fails.
- Spare action. This action occurs in case of a non acknowledgement of the action.

5.2.10 Loss and recovering of network (LAN)

The GenIP 20i waits for the time of filtering before doing an action in case of cut and recovering.

5.2.11 Remarks about GSM/GPRS/SMS connections

Firstly, these services are under a good GSM network.
In weak GSM reception mode, we can consider that the SMS service is the most adapted to send information. But careful, in SMS mode, we are subjected to a passage via a SMS server centre and in some cases, it can lead to a certain time for the information transmission.

Concerning the GSM Data, we are in point to point Data bi-directional (avis V32/9600) mode. In this case, check your subscription conditions with your operator.

In the case of GPRS, we are on a TCP/IP base with dynamic or fixed IP addresses depending on your subscription conditions with your operator.
In this case, your operator gives you an APN or a public or private access point.
It is advised to inform yourself about connection rules (time of connection limited as well as on ports supported in TCP/UDP/FTP/HTTP... depending on subscriptions and operators.).

5.3 Leds of the GenIP 20i

The GenIP 20i has 4 leds (LED) on the front side.

Only the PWR, CONF and GSM leds are described hereunder. The LED OPTION is not used.

5.3.1 PWR led of the GenIP 20i

The GenIP 20i status is given by the LED PWR status situated on the front side of the GenIP 20i.

The table hereunder explains the signification of the different available status of the LED PWR.

LED status	LED activity	GenIP 20i status
Off	LED off	The GenIP 20i is off.
Fixed on	LED fixed on	The GenIP 20i is on, in boot phase.
Flashing	LED flashing	The GenIP 20i is ready to work.

5.3.2 CONF led of the GenIP 20i

The table hereunder explains the signification of the different available status of the LED CONF.

LED status	LED activity	GenIP 20i status
Flashing	LED flashing	Someone is on the configuration web interface page of the GenIP 20i.
Off	LED off	Nobody is on the configuration web interface page of the GenIP 20i .

5.3.3 GSM led of the GenIP 20i

The attachment to the GSM network is given by the GSM Led status placed in front of the GenIP 20i.

The table hereunder describes the signification of the different available status for the LED GSM.

LED status	LED activity	GenIP 20i status
On	LED fixed on	The GenIP 20i is powered on and ready to work but it is not recognized by the network; the PIN code has not been entered or the antenna is not connected.
	LED flashing (once every 2 seconds)	The GenIP 20i is powered on, the PIN code has been activated, the GenIP 20i is recognized by the network and it is ready to call or receive calls (Idle mode).
	LED flashing (once every second)	The GenIP 20i is powered on and in connection : Vocal, Data or GPRS
Off	LED off	The GenIP 20i is off or in RESET phase.

5.4 Procedure for updating the GenIP 20i

In order to benefit of the latest functions of the GenIP 20i, an updating procedure can be used for the evolution of the software program incorporated in the GenIP 20i.
This procedure consists in downloading the Firmware of the GenIP 20i in the internal Flash memory of the GenIP 20i via the LAN link available via the RJ45 Ethernet connector.
See our website in "Software updating procedure" for a detailed description.

5.5 Trouble shooting

Problem of access for the GenIP 20i Web page

- Check that the PWR led flashes and that on the LAN side, the leds are correctly on.
- Check that the CONF led is off
- Check that you are on the same IP range as the GenIP 20i
- With the Ping command under Invite command, launch a Ping and check that you get a reply.

Problem of GSM/GPRS/SMS access

- Check the antenna connection
- Check that the SIM card is correctly inserted
- Via the Web interface, consult the Diary and via the tool menu check the reception level (CSQ).
- In the case of a GPRS connection, check that the APN (Access Supplier) is correctly entered.

Problem of RS232 dialogue

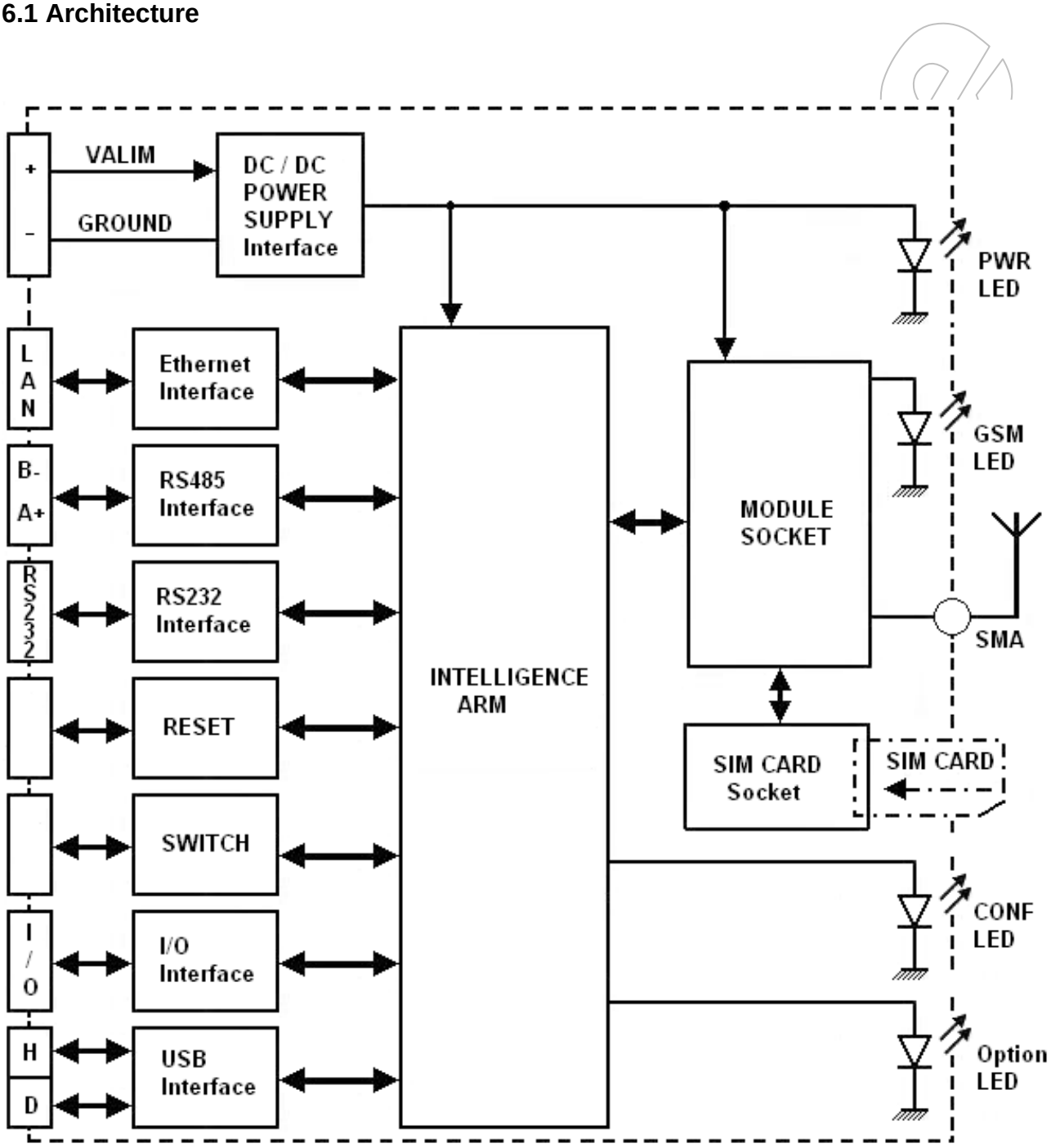
- Check the cable conformity
    - In the case of a DTE like a PC, a straight cable is needed (RX/TX/ Ground).
    - In the case of a DCE, a crossed cable is needed (RX/TX/Ground).
- Check the concordance between the speed programmed in the GenIP 20i and the one of your equipment.

Problem of RS485 dialogue

- Check A and B (inverted)
- Check the concordance between the speed programmed in the GenIP 20i and the one of your equipment.

6 Functional Description

6.1 Architecture



6.2 GenIP 20i Intelligence

The GenIP 20i intelligence is the heart of the de GSM/GPRS Ethernet gateway.

This part allows the GenIP 20i to work in autonomy thanks to the parameters saved in it through components like the Flash, EEPROM...

6.3 Power supply

The GenIP 20i must be powered by a DC external tension (VALIM) between +8 and +54VDC.
The regulation of the du GenIP 20i power supply is done with an internal DC/DC converter, in order to supply all the necessary internal DC tensions.
ERCO & GENER does not guarantee a correct functioning of the GenIP 20i in communication if the input tension falls below 8V. The GenIP 20i is protected against polarity inversions and internally protected against tension peaks up to 54V.
Filtering guarantees: EMI/RFI protection in input and output, and signals smoothing.

6.4 Ethernet LAN link

The Ethernet interface realizes the adaptation of tension levels between the LAN Port and the ARM intelligence.
The LAN signals available on the RJ 45 connector are standard.

RJ45 Pin	10Base-T Signal 100Base-TX Signal	1000Base-T Signal
1	Transmit+	BI_DA+
2	Transmit-	BI_DA-
3	Receive+	BI_DB+
4	Unused	BI_DC+
5	Unused	BI_DC-
6	Receive-	BI_DB-
7	Unused	BI_DD+
8	Unused	BI_DD-

6.5 RS485 link

The GenIP 20i provides a RS485 interface for a use in 2 wires.
For the ending resistance, see paragraph 8.2.2.

6.6 RS232 serial link

The RS232 interface realizes the adaptation of tension levels between the communication port of a PC (DTE) and the ARM intelligence. The RS232 interface is internally protected (by ESD protection) against electrostatic peaks coming via the RS232.
Filtering guarantees: EMI/RFI protection in input and output, and signals smoothing.

Signal	Connector Sub D Pin N°	I/O	RS232 standards	Description
CTXD/CT103	3	I	TX	Transmit serial data
CRXD/CT104	2	O	RX	Receive serial data
CRTS/CT105	7	I	RTS	Request To Send
CCTS/CT106	8	O	CTS	Clear To Send
CDSR/CT107	6	O	DSR	Data Set Ready
CDTR/CT108-2	4	I	DTR	Data Terminal Ready
CDCD/CT109	1	O	DCD	Data Carrier Detect
CRI/CT125	9	O	RI	Ring Indicator
CT102/GND	5			Ground

6.7 Reset

A Reset (Button) is possible on the GenIP 20i.

At powering on, if we press the Reset button until the leds flash, the factory configuration is reloaded in the GenIP 20i.

In normal operation, if we press the Reset button, the reference configuration is reloaded in the GenIP 20i.

6.8 SWITCH

Option not developed for the moment.

6.9 Input / Output Interface

Option not developed for the moment.

6.10 USB Interface (Device / Host)

The aim is to recover /reload the configuration file in local via the USB port.

6.11 Socket Module

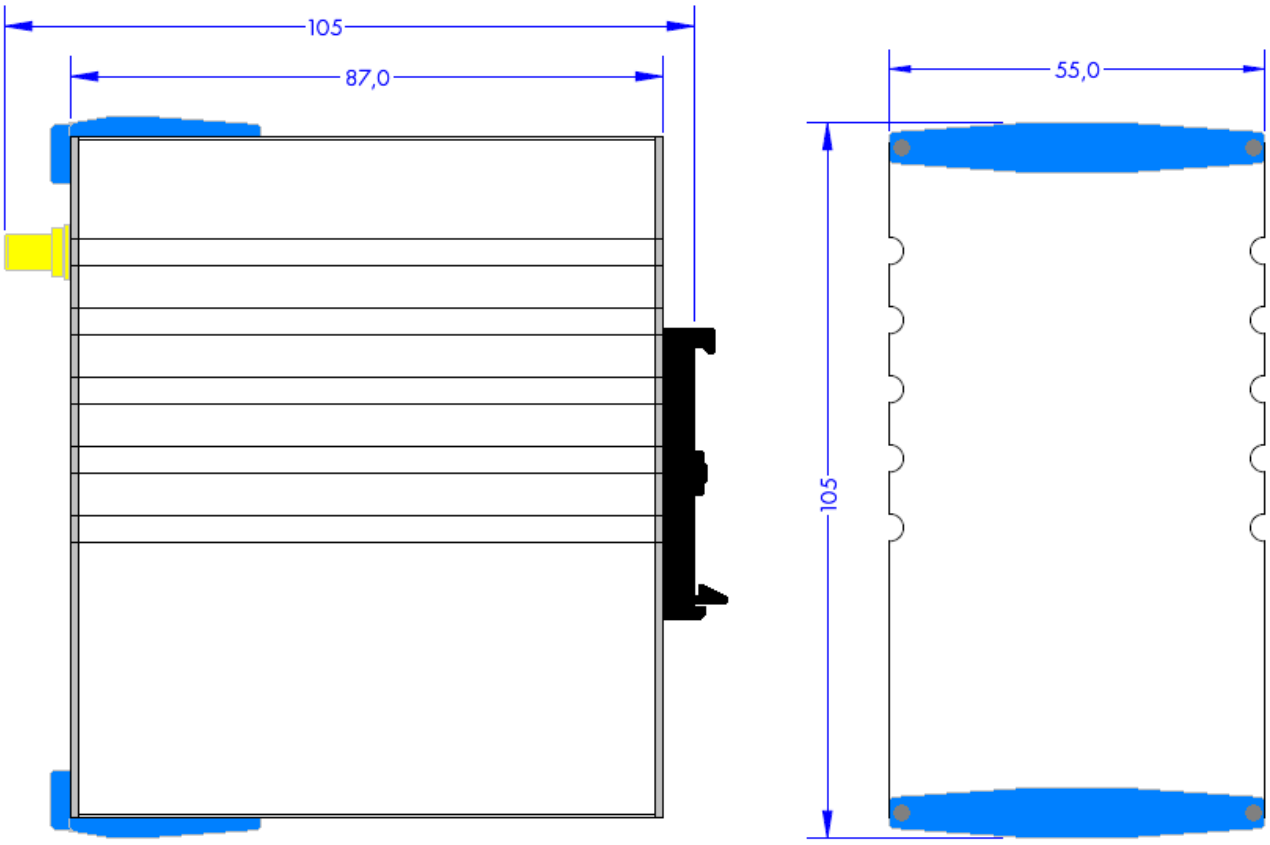
The Socket module of the GenIP 20i is Quad-bands 850/900/1800/1900 MHz (automatic detection of the band). The Socket module allows an automatic attachment to the GSM/GPRS network.

7 Technical characteristics

7.1 Mechanical characteristics

Dimensions	103 x 55 x 90 mm (without the connectors)
Complete dimensions	105 x 55 x 109 mm (with the connectors)
Weight	≈ 420 grams (GenIP 20i only) < 885 grams (complete : GenIP 20i + cables ...)
Volume	510 cm³
Casing	Rail DIN OMEGA (EN 50022 / DIN 7.5mm)
Material	Aluminum
Waterproof level	IP31

The diagram hereunder shows the dimensions of the GenIP 20i including the clearances necessary for the installation of the GenIP 20i.



7.2 Electrical characteristics

7.2.1 Power supply

The GenIP 20i must be powered by a DC external tension regulated and stabilized (VALIM) between +8 and +54VDC.

Table: Electrical characteristics

Power supply range	● +8V to +54V DC
Average consumption	● Consumption in idle mode : 170mA @ 12Vdc 90mA @ 24Vdc ● Consumption in communication : 250mA @ 12Vdc 130mA @ 24Vdc

Note: once the power supply connected, the GenIP 20i is permanently consuming.
Moreover, the bursts for the GenIP 20i consumptions must absolutely be taken into account (see table of power supply consumption).
ERCO & GENER advises to use a referenced power supply for its GSM products (for example the power supply 12V 1A – order code 0471210700).

The following table describes the consequences of over-voltage or insufficient voltage on the GenIP 20i.

Table: Effects of a power supply defect

If :	Then:
▪ Voltage falls below 8V	▪ The GSM/GPRS communication is not guaranteed.
▪ Voltage above 54V	▪ The GenIP 20i guarantees its own protection up to 54V and against polarity inversions (short).

The following tables show the GenIP 20i consumption in different use conditions (with RS232 disconnected).

Table: Power supply consumption (1*)

CONDITIONS T=25°C and SIM card 3V		GSM 900MHz	GSM 1800MHz
Idle mode (1*)	@ 8V		
	@ 12V		
	@ 24V		
	@ 54V		
In GSM communication (1RX/1TX)	@ 8V		
	@ 12V		
	@ 24V		
I Max.(mA)	@ 54V		
During TX bursts (Max. power)	@ 8V		
	@ 12V		
	@ 24V		
I Max.(mA)	@ 54V		

The power supply consumption may vary by 5% depending on the temperature range (-20 °C to +60 °C).

(1*) Idle mode = GenIP 20i registered on network but not in communication.

7.2.2 RS485 link

The GenIP 20i provides a RS485 link on which we can shunt the ending resistance by moving the internal straps on the male header 2pts (J4).

By default, the strap is positioned (Ending resistance present).

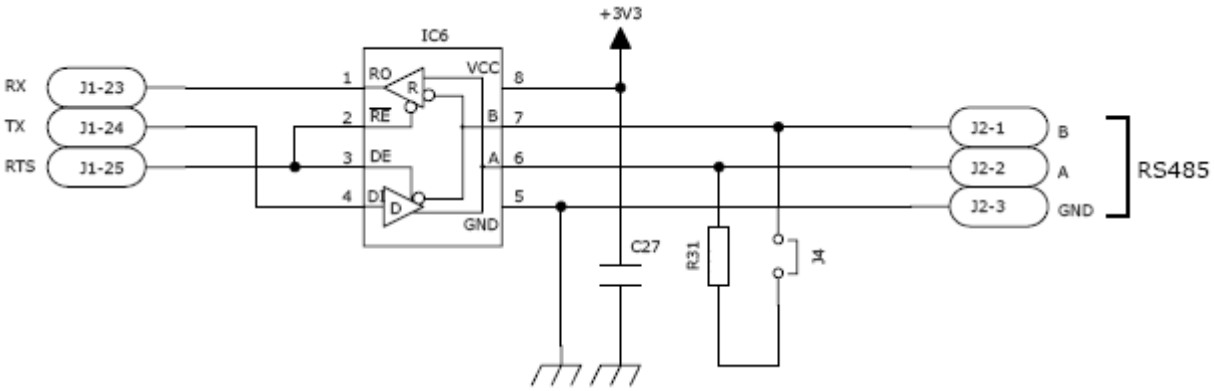
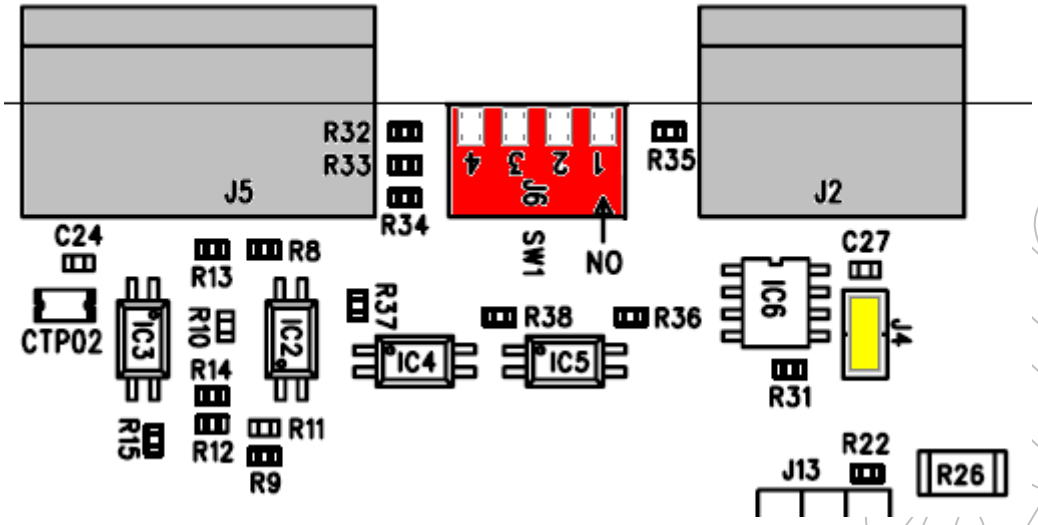


Table: Characteristics of the internal components of the RS485 interface

Component	Value
IC6	MAX6371 SUPERVISOR of MICRO IND SOT23-8
R31	RESISTANCE CMS 0603 100KOHMS 0.1W 5%
C27	CONDENSER CMS 0603 1NF 50V X7R (10%)



Strap J4 (present by default)

7.2.3 SIM Interface

Table: Characteristics of the SIM card supply tension

SIM card	3 V or 1.8 V

7.2.4 RF GSM/GPRS characteristics

7.2.4.1 Frequency band

The RF functioning complies with the ETSI GSM Standards.

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

Table: Parameters of the RF receiver and transmitter

Receiver	
Sensitivity in 850/900	- 106 dBm, GPRS Coding Scheme 1 (CS1)
Sensitivity in 1800/1900	- 106 dBm, GPRS Coding Scheme 1 (CS1)
Transmitter	
Maximum power (Power Class1 - 850/900) at ambient temperature	33 dBm +/- 2 dB @ antenna connection
Maximum power (Power Class4 - 1800/1900) at ambient temperature	30 dBm +/- 2 dB @ antenna connection

7.2.4.2 GSM external antenna

By default, the GenIP 20i is supplied with an antenna (hinged SMA-M antenna).

Other kind of GSM external antennas may be connected to the GenIP 20i via a SMA/M connector.

The external antenna must comply with the characteristics described in the table hereunder.

Table: Characteristics of the GSM external antenna

Frequency band	Quad-bands 850 / 900 / 1800 / 1900 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 9, for the GSM antennas recommended by ERCO & GENER.

7.3 Environmental characteristics

To ensure a correct functioning of the GenIP 20i, the limits listed in the table hereunder must be respected.

Table: Environmental characteristics

Operating temperature	-20 °C to +60 °C
Storage temperature	-40 °C to +85 °C
Humidity without condensation	5% < HR < 80%
Atmospheric pressure	normal

7.4 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.

CE

8 Security recommendations

8.1 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 GSM frequency 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 occuring,
- 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 device 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 device is designed to be used with "fixed" and "mobile" applications:

▪ Fixed" application: The GSM device is physically linked to a site and it is not possible to move it easily to another site.

▪ Mobile" application: The GSM device is designed to be used in various places (other than fixed) and is intended to be used in portable applications.

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

8.3 Your responsibility

This device 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.

9 Recommended accessories

The accessories recommended by ERCO & GENER for the GenIP 20i, are shown on our website in the section Products/Accessories. For more information, contact our sales department.

10 Client support

ERCO & GENER ensures the client support for all its products 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

erco & gener

L'esprit Modem

DECLARATION OF CONFORMITY

Manufacturer : ERCO & GENER

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

Website : http:www.ercogener.com

declares that the product :

Name : GenIP 20i Type : Gateway

Complies with : - R&TTE 1999/5/EC Directive

- Regulations of standard ETSI EN 301 489-7 (02)

Safety : EN 60950 : 2000 3rd Edition

EMC : EN 50204 : 1995 Radiated electromag. field from Digital Radio Telephone immunity

EN 55022 : 1994 Conducted disturbance measurement

EN 61000-4-2 : 1995 Electrostatic discharges immunity
EN 61000-4-3 : 1996 Radiated radiofrequency disturbances immunity
EN 61000-4-4 : 1995 Fast transient burst immunity
EN 61000-4-6 : 1996 Conducted radiofrequency disturbances immunity

CE

The corresponding marking appear under the appliance.

Saumur, October 9th 2009

Charles CHAUSSONNIER
Managing Director