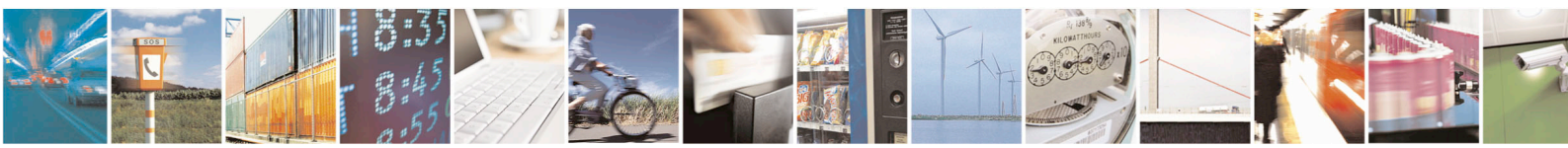
GE910 AUTO Product Description

80411ST10584A Rev.0 – 2013-11-05

Making machines talk.

APPLICABILITY TABLE

PRODUCT
GE910-QUAD AUTO



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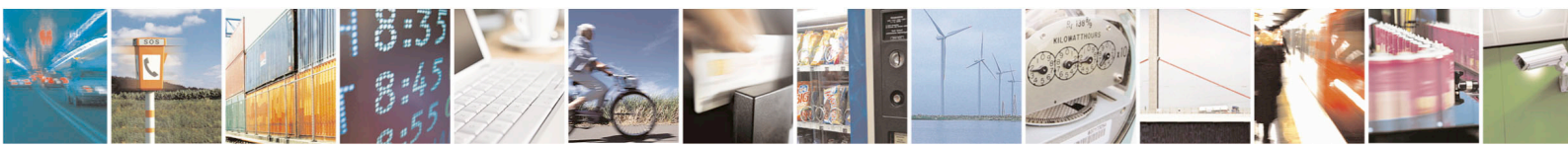

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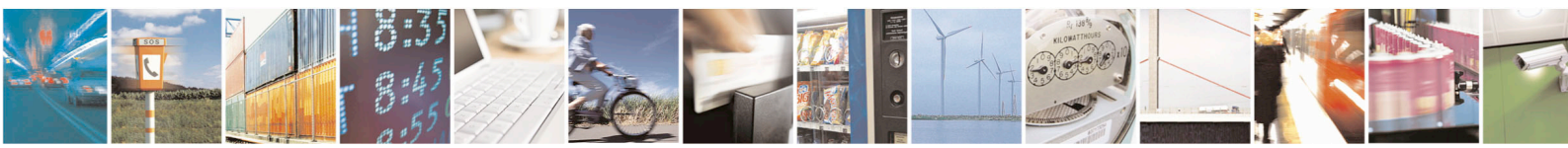

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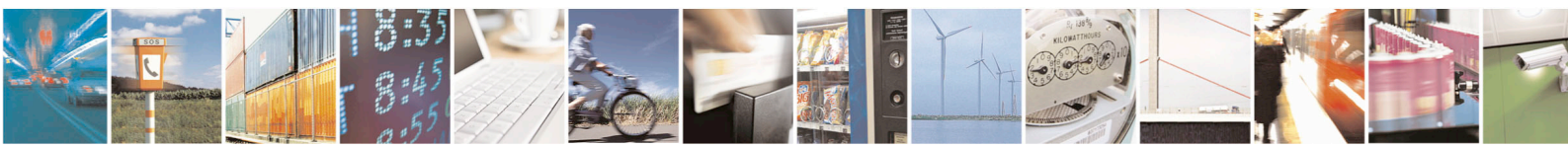

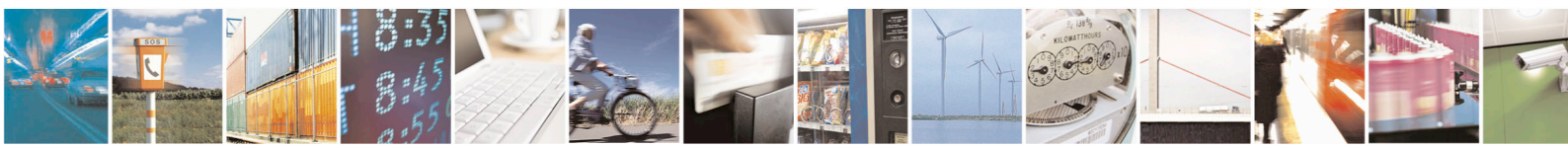

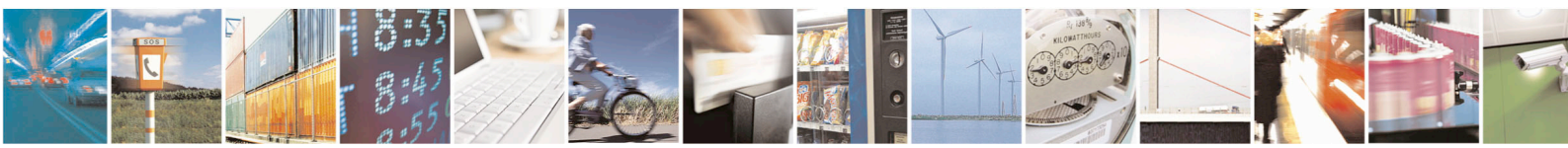

1. Introduction

1.1. Scope

Scope of this document is to give an overview of the Telit GE910 AUTO, which can support GSM/GPRS with data/voice capabilities.

1.2. Audience

This document is intended for customers who are evaluating the GE910 AUTO.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

TS-EMEA@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

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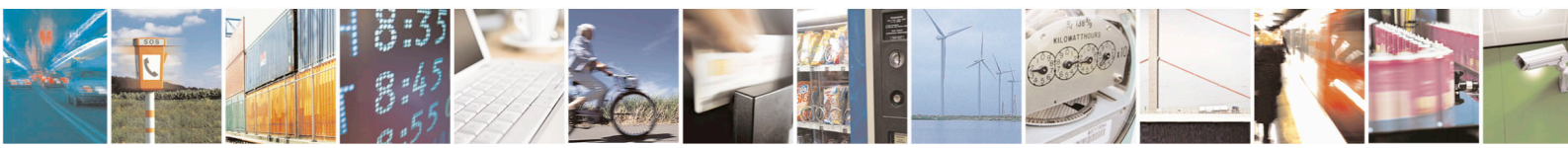


1.4. Document Organization

This document contains the following chapters:

"Chapter 1: "Introduction" provides a scope for this document, target audience, contact and support information, and text conventions.

"Chapter 2: "The GE910 AUTO" gives an overview of the features of the product.

"Chapter 3: "Product Description" describes in details the characteristics of the product.

"Chapter 4: "Evaluation Kit" provides some basic information about the Evaluation Kit.

"Chapter 5: "Software Features" provides an overview of the software features of the products.

"Chapter 6: "Conformity Assessment Issues" provides some fundamental hints about the conformity assessment that the final application might need.

"Chapter 7: "Safety Recommendation" provides some safety recommendations that must be followed by the customer in the design of the application that makes use of the GE910.

1.5. Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

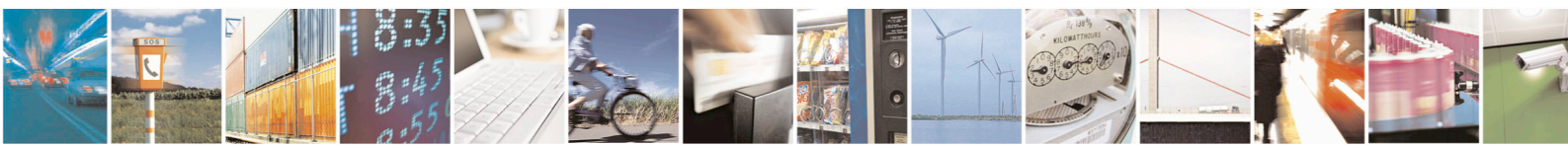
Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.6. Related Documents

- GE910 AUTO Hardware User Guide, 1vv0301088
- Telit Modules Software User Guide, 1VV0300784
- AT Command User Guide, 80000ST10025a
- Telit IP Easy User Guide, 80000ST10028A



2. The GE910 AUTO

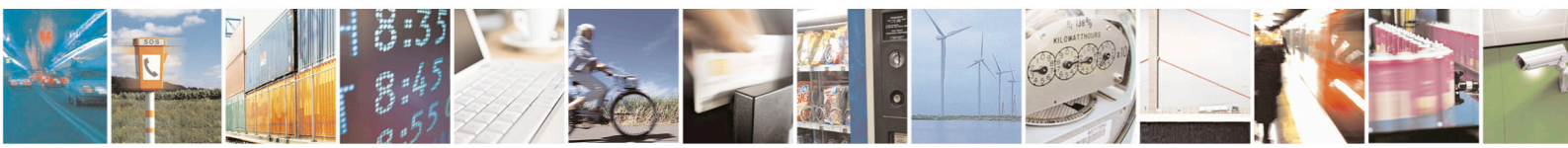
2.1. Product Overview

The GE910-QUAD AUTO is the automotive grade member of the GE910 GPRS product series. Developed and manufactured according to ISO TS16949 quality processes, it is targeted at the most demanding automotive applications.

2G member of Telit's xE910 Unified Form Factor Family, it is offered in a 28x28mm LGA packaging engineered for increased robustness. The GE910-QUAD AUTO provides both UART and USB Full Speed communication interfaces.

The GE910-QUAD AUTO features quad-band GPRS wireless data connectivity, as well as analog and digital voice. Standard plus extended AT command set and built-in TCP/IP and UDP protocol stacks provide augmented functionality, adding value to the end application.

Powered by an ARM11 core, the GE910-QUAD AUTO features an embedded Python Script Interpreter to run customer's applications inside the module without the need for any external microprocessor. Moreover, the GE910-QUAD AUTO is fully compliant with eCall Euopean Directive.



2.2. Target Market

The GE910 AUTO is specifically designed and tested for deployment in real-world automotive applications. It offers robust and proven in-vehicle connectivity even in the harshest environments to meet the high automotive OEMs requirements.

2.3. Product Features

- Quad-band EGSM 850 / 900 / 1800 / 1900 MHz
- GSM/GPRS protocol stack 3GPP Release 4 compliant
- Output power

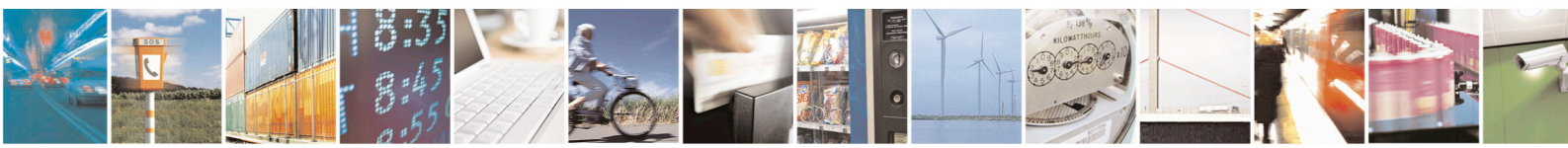
  - Class 4 (2W) @ 850 / 900 MHz

  - Class 1 (1W) @ 1800 / 1900 MHz
- Control via AT commands according to 3GPP 27.005, 27.007 and Telit custom AT commands
- Control via Remote AT commands
- Power consumption (typical values)

  - Idle (registered, power saving): 1.2 mA @ DRX=9
- Serial port multiplexer 3GPP 27.010
- SIM Application Toolkit 3GPP TS 51.014
- SIM Access Profile
- Extended Supply voltage range: 3.10 – 4.5 V DC (3.8 V DC nominal)
- TCP/IP stack access via AT commands
- Sensitivity:

  ≤- 107 dBm (typ.) @ 850 / 900 MHz

  ≤- 107 dBm (typ.) @ 1800 / 1900 MHz
- DARP
- Enhanced Measurement Report support
- Dimensions: 28.2 x 28.2 x 2.25 mm
- Weight: 3.6 grams
- Storage and Operating temperature range: -40°C to +85°C
- RoHS compliant



Interfaces

- 10 I/O ports
- Analog audio
- Digital Voice Interface
- 1 A/D
- USB 2.0 Full Speed
- ITU-T V.24 serial link through CMOS UART:

  - Baud rate from 300 to 115.200 bps

Audio

- Telephony
- Half rate, full rate, enhanced full rate and adaptive multi rate voice codecs (HR, FR, EFR, AMR)
- Superior echo cancellation & noise reduction
- Multiple audio profiles pre-programmed and fully configurable
- DTMF

Approvals

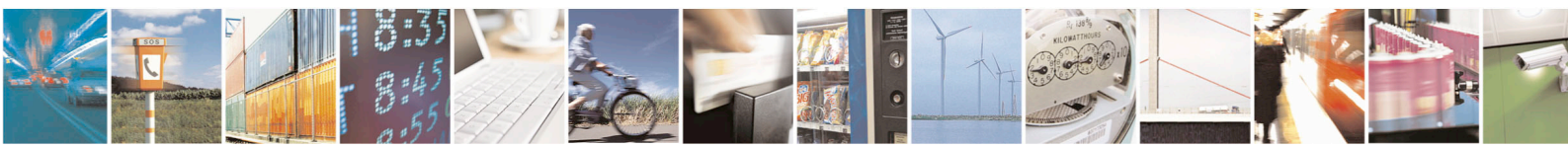
- Fully type approved conforming with R&TTE directive
-

SMS

- Point-to-point mobile originated and mobile terminated SMS
- Concatenated SMS supported
- SMS cell broadcast
- Text and PDU mode
- SMS over GPRS

GPRS data

- GPRS class 10
- Mobile station class B
- Coding scheme 1 to 4
- PBCCH support
- GERAN Feature Package 1 support (NACC, Extended TBF)



GSM Supplementary Services

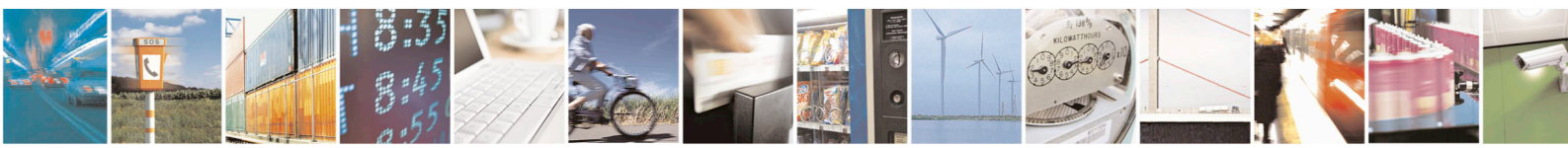
- Call forwarding
- Call barring
- Call waiting & call hold
- Advice of charge
- Calling line identification presentation (CLIP)
- Calling line identification restriction (CLIR)
- Unstructured supplementary services mobile originated data (USSD)
- Closed user group

Additional features

- SIM phonebook
- Fixed dialling number (FDN)
- Real Time Clock
- Alarm management
- Network LED support
- IRA, GSM, 8859-1 and UCS2 character sets
- Jamming detection
- Embedded TCP/IP stack, including TCP, IP, UDP, SMTP, ICMP and FTP protocols
- EASY SCAN ® automatic scan over GSM frequencies (also without SIM card)

Python* application resources

- Python* script interpreter (the module takes the application code directly in the Python* language)
- Over-the-air application SW update

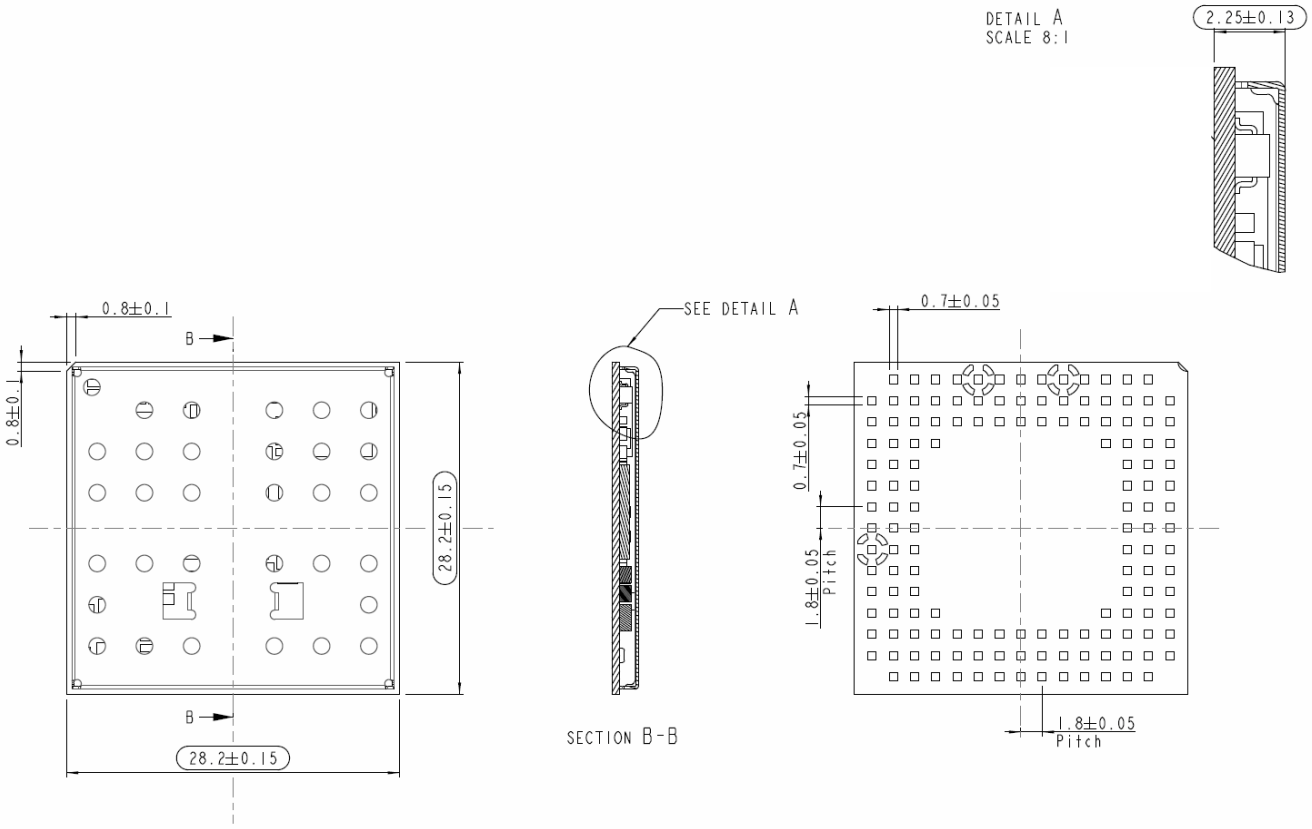


3. Product Description

3.1. Size and 2D mechanical drawing

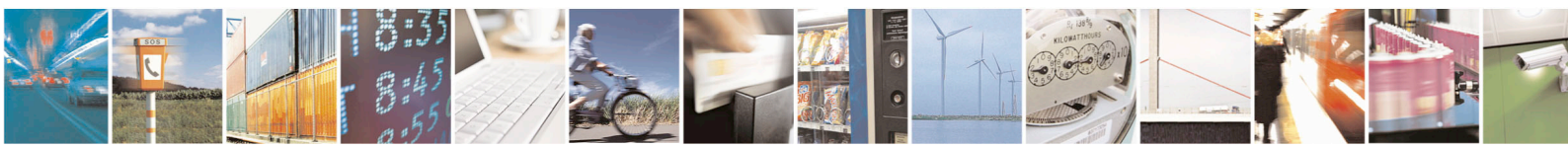
The GE910 AUTO overall dimensions are:

- Length: 28.2 mm
- Width: 28.2 mm
- Thickness: 2.25 mm



3.2. Weight

The weight of the GE910 AUTO is 3.6 grams.



3.3. Environmental requirements

3.3.1. Temperature range

Storage and Operating Temperature Range	–40°C ÷ +85°C

3.3.2. RoHS compliance

As a part of Telit's corporate policy of environmental protection, the GE910 AUTO complies with the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU Directive 2002/95/EG).

3.4. Operating Frequency

The operating frequencies in GSM, DCS, PCS modes are conform to the GSM specifications.

Mode	Freq. TX (MHz)	Freq. RX (MHz)	Channels (ARFC)	TX – RX offset
GSM 850	824.2 – 848.8	869.2 – 893.8	124 – 251	45 MHz
EGSM 900	890.0 – 914.8	935.0 – 959.8	0 – 124	45 MHz
	880.2 – 889.8	925.2 – 934.8	975 –1023	45 MHz
DCS-1800	1710.2 – 1784.8	1805.2 – 1879.8	512 – 885	95 MHz
PCS-1900	1850.2 – 1909.8	1930.2 – 1989.8	512 – 810	80 MHz

3.5. Transmitter output power

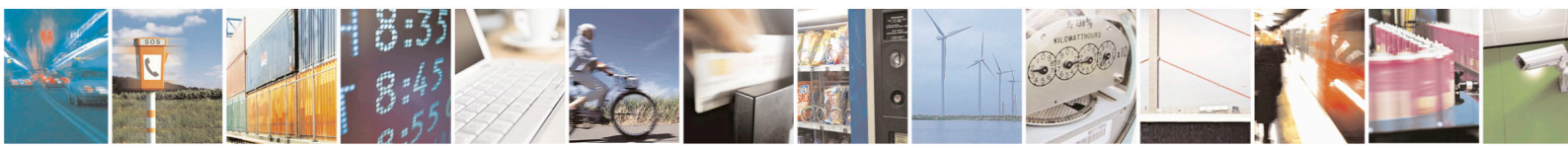
The GE910 AUTO transceiver module in GSM–850/900 operating mode is class 4 in accordance with the specifications which determine the nominal 2W peak RF power (+33dBm) on 50 Ohm. In the DCS–1800/PCS–1900 bands, the operating mode is class 1 in accordance with the specifications which determine the nominal 1W peak RF power (+30dBm) on 50 Ohm.

3.6. Receiver sensitivity

Sensitivity of GE910 AUTO in GSM 850/900 bands is better than –107 dBm (2.4% BER Class II – static channel) in normal operating conditions.

Sensitivity of GE910 AUTO in GSM 1800/1900 bands is better than –107 dBm (2.4% BER Class II – static channel) in normal operating conditions.

The GE910 AUTO supports also the Downlink Advance Receiver Performance (DARP) feature for single antenna interference cancellation (SAIC).



3.7. Antenna

The antenna that the customer chooses to use should fulfill the following requirements:

Frequency range	Depending by frequency band(s) provided by the network operator, the customer shall use the most suitable antenna for that/those band(s).
Bandwidth	80 MHz in EGSM 900, 70 MHz if GSM 850, 170 MHz in DCS, 140 MHz PCS band

For further information please refer to the GE910 AUTO Hardware User Guide.

3.8. Supply voltage

The external power supply must be connected to VBATT signal and must fulfill the following requirements:

Nominal Supply Voltage	3.8 V
Normal Operating Voltage Range	3.40 V – 4.20 V
Extended Operating Voltage Range (*)	3.10 V – 4.50 V

(*) Please refer to the GE910 AUTO Hardware User Guide for using the product with the extended operating voltage range.

3.9. Power consumption

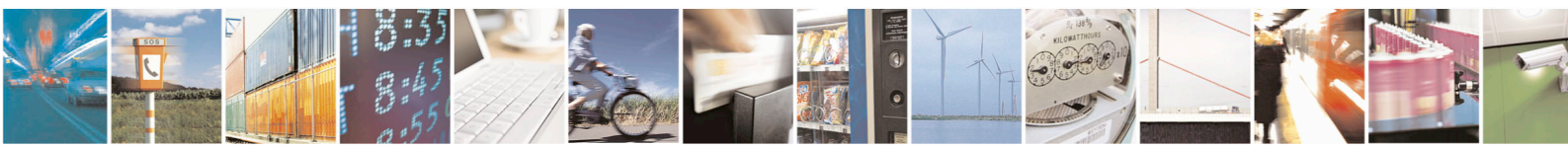
The current consumption of the Telit GE910 AUTO in idle mode (GSM only) is:

Idle registered, power saving	1.2 mA @ DRX=9 (AT+CFUN=5)

Please check the HW User Guide for further details about all other power consumption figures.

3.10. The user interface

The user interface is managed by AT commands according to ITU-T V.250, 3GPP 27.007 and 27.005 specifications. Moreover, custom AT commands are also available. Please refer to the AT Command User Guide for details.



3.11. Speech CODEC

The GE910 AUTO supports the following voice codec:

- HR – Half Rate
- FR – Full Rate
- EFR – Enhanced Full Rate
- AMR-HR, AMR Half Rate
- AMR-FR, AMR Full Rate

3.12. SIM Reader

The GE910 AUTO supports phase 2 SIM at 1.8V and 3V ONLY with an external SIM connector. For 5V SIM, an external level translator can be added.

3.13. SMS

The GE910 AUTO supports the following SMS types:

- Mobile Terminated (MT) class 0 – 3 with signaling of new incoming SMS, SIM full, SMS read
- Mobile Originated class 0 – 3 with writing, saving in SIM and sending
- Cell broadcast compatible with CB DRX with signaling of new incoming SMS.

The GE910 AUTO also supports SMS over GPRS

3.14. Real Time Clock and Alarm

The GE910 AUTO supports the Real Time Clock and Alarm functions through AT commands. An alarm output pin can be configured to indicate the alarm with a hardware line output.

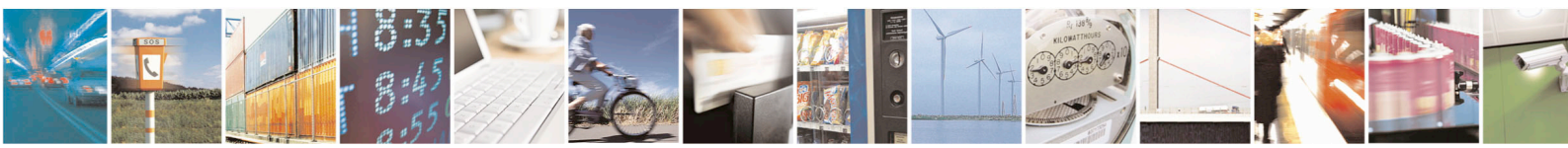
Furthermore the Voltage Output of the RTC power supply is provided so that a backup capacitor can be added externally to increase the RTC autonomy.

3.15. Enhanced Measurement Report

The GE910 AUTO supports the Enhanced Measurement Report on SACCH channel according to 3GPP TS 44.018 version 4.22.0 Release 4 (par. 3.4.1.2, 9.1.54, 9.1.55) and 3GPP TS 45.008 version 4.17.0 Release 4 (par. 8.4.8).

3.16. Data transmission capabilities

The Telit GE910 AUTO is a mobile station class B supporting GPRS Class 10, coding schemes 1 to 4 and PBCCH. Moreover, it supports GERAN feature package 1, which consist in supporting the Extended Uplink TBF and Network Assisted Cell Change (NACC).



3.17. Local security management

The local security management can be done with the lock of Subscriber Identity module (SIM). The security code will be requested at power–up.

3.18. Call control

The call cost control function is supported.

3.19. Phonebook

This function allows the storage of the telephone numbers in SIM memory. The capability depends on SIM version and its embedded memory.

3.20. Characters management

The GE910 AUTO supports the IRA, GSM, 8859-1 and UCS2 characters sets, in TEXT and PDU mode.

3.21. SIM related functions

Fixed Dialing Numbers (FDN), Abbreviated Dialing Number (I) and PIN insertion are supported

Extension at the PIN2 for the PUK2 insertion capability for lock condition is supported too.

3.22. Call status indication

The call status indication is supported.

3.23. Automatic answer (Voice, Data)

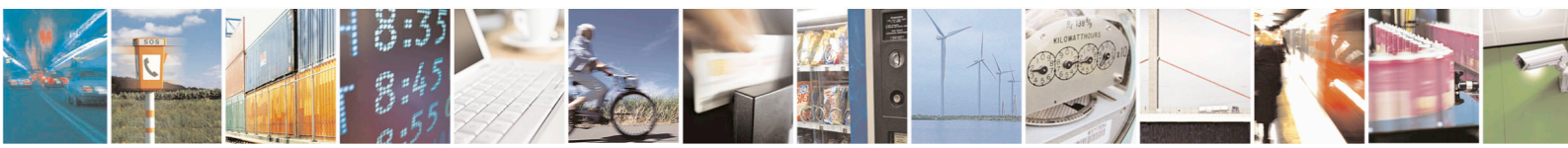
The automatic answer is supported. The user/application can specify the number of rings after which the module will automatically answer.

The user/application can set the number of rings by means of the command ATS0=<n>.

3.24. Supplementary services (SS)

The following supplementary services are supported:

- Call Barring,
- Call Forwarding,
- Calling Line Identification Presentation (CLIP),
- Calling Line Identification Restriction (CLIR),
- Call Waiting, other party call Waiting Indication,
- Call Hold, other party Hold / Retrieved Indication,
- Closed User Group supplementary service (CUG),



- Advice of Charge,
- Unstructured SS Mobile Originated (MO)

3.25. Acoustic signaling

The acoustic signaling of the GE910 AUTO on the selected acoustic device are the following:

- Call waiting;
- Ringing tone;
- SMS received tone;
- Busy tone;
- Power on/off tone;
- Off Hook dial tone;
- Congestion tone;
- Connected tone;
- Call dropped;
- No service tone;
- Alarm tone.

3.26. TTY (Telephone Text)

The TTY feature is supported. Please refer to 3GPP TS 26.226 and 3GPP TS 26.231 for details.

3.27. Logic level specifications

Where not specifically stated, all the interface circuits work at 1.8V CMOS logic levels. To get more detailed information about the logic level specifications used in the GE910 AUTO, please check with the Hardware User Guide.

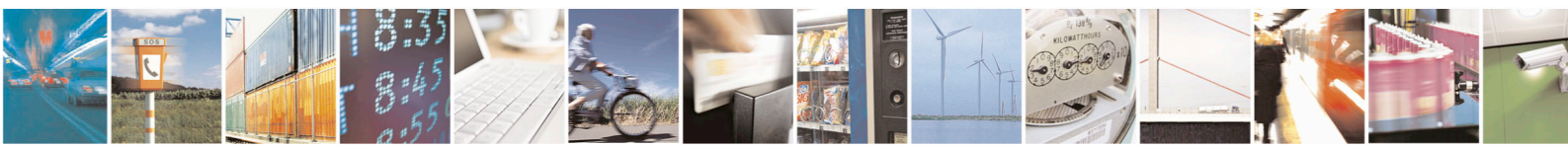
3.28. Audio

3.28.1. Analog

The Base Band Chip of the GE910 AUTO provides one differential input for audio to be transmitted (Uplink) and a balanced BTL output for audio to be received (downlink). The GE910 AUTO has a built-in echo canceller and a noise suppressor. For more details, please refer to the GE910 AUTO Hardware User Guide.

3.28.2. Digital

The GE910 AUTO offers the digital voice interface. For more details, please refer to the Digital Voice Interface Application Note.



3.29. Serial Ports

Two serial ports are available on the module:

- Main serial port (full RS232), up to 115,200 bps
- AUX serial port (RX & TX only), 115,200 bps

3.30. Converters

3.30.1. ADC Converter

The GE910 AUTO has two on board ADC, for further information please refer to the GE910 AUTO Hardware User Guide.

3.31. Mounting the GE910 AUTO on your Board

The Telit GE910 AUTO module has been designed to be compliant with a standard lead-free SMT process. For detailed information about PCB pad design and conditions to use in SMT process please check with the GE910 AUTO Hardware User Guide.

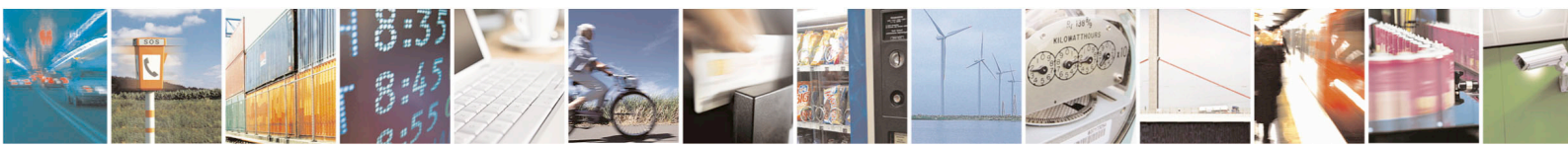
3.32. Packing system

According to SMT process, for picking & placing movement requirements, GE910 AUTO is packaged on trays. Each tray contains 20 pieces in size of 176 x 329.

The GE910 AUTO can be also packaged on reels of 200 pieces each.

For further information on GE910 AUTO packing system please refer to the GE910 AUTO Hardware User Guide.

The level of moisture sensibility of GE910 AUTO is “3”, according with standard IPC/JEDEC J-STD-020, take care of all the relative requirements for using this kind of components. Special care for handling is highly required.



4. Evaluation Kit

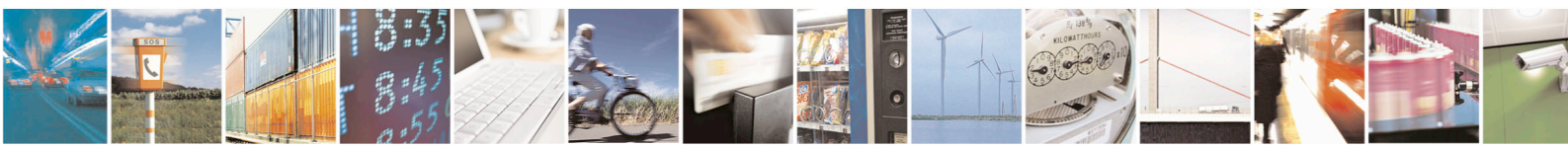
In order to assist the customer in the development of the application, Telit offers the EVK2 Evaluation Kit that can be ordered separately. The EVK2 has a SIM card holder, the RS 232 serial port level translator, a direct UART connection, audio and antenna connector.

The EVK2 provides a fully functional solution for a complete data or phone application. The standard serial RS232 9 pin connector placed on the Evaluation Kit allows the connection of the EVK2 system with a PC or other DTE.

The development of the applications utilizing the Telit GE910 AUTO module must present a proper design of all the interfaces towards and from the module (e.g. power supply, audio paths, level translators), otherwise a decrease in the performance will be introduced or, in the worst case, a wrong design can even lead to an operating failure of the module.

In order to assist the hardware designer in his project phase, the EVK2 board presents a series of different solutions, which will cover the most common design requirements on the market, and which can be easily integrated in the OEM design as building blocks or can be taken as starting points to develop a specific one.

For a detailed description of the Telit Evaluation Kit, please refer to the documentation provided with the Telit GE910 AUTO Hardware User Guide and EVK2 User Manual.



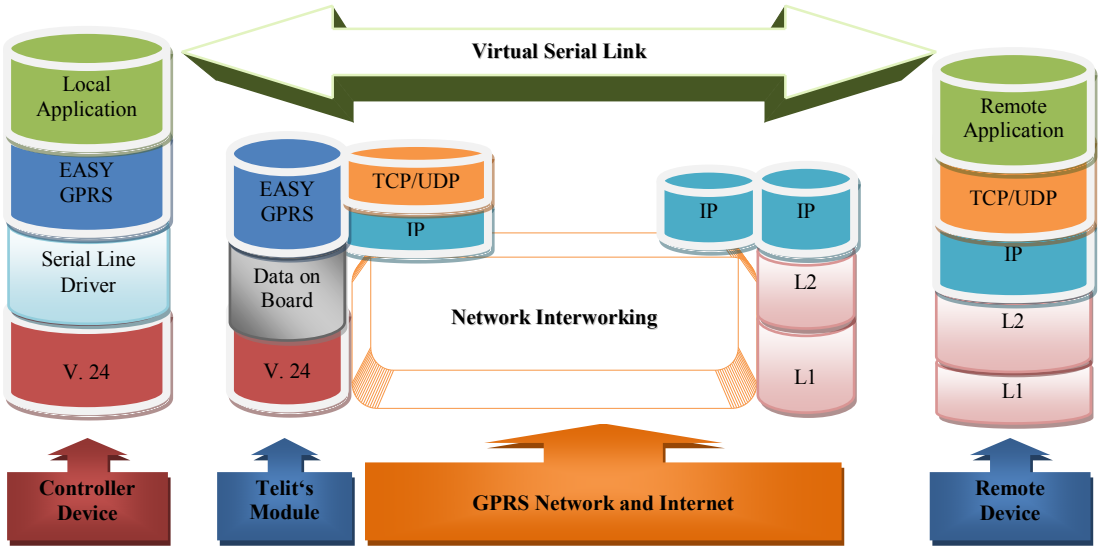
5. Software Features

5.1. Easy GPRS Extension

5.1.1. Overview

The Easy GPRS feature allows the Telit GE910 AUTO user to contact a device in internet and establish with it a raw data flow over the GPRS and Internet networks.

This feature can be seen as a way to obtain a "virtual" serial connection between the Application Software on the Internet machine involved and the controller of the Telit GE910 AUTO module, regardless of all the software stacks underlying.



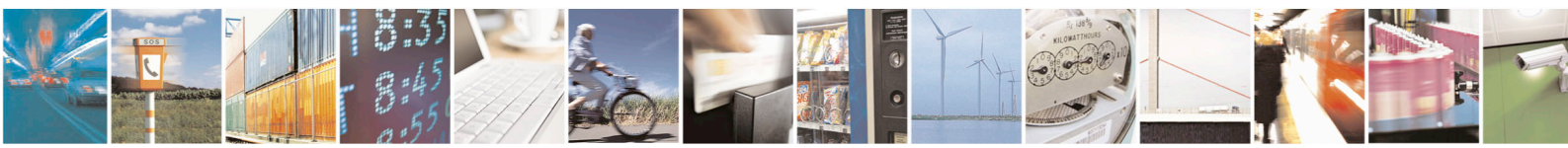
This particular implementation allows to the devices interfacing to the Telit GE910 AUTO module the use of the GPRS and Internet packet service without the need to have an internal TCP/IP stack since this function is embedded in the module.

For more detailed information regarding the use of the Easy GPRS feature, please consult Easy GPRS User Guide and AT Commands Reference Guide.

5.2. Multisocket

The multisocket is an extension of Telit Easy GPRS feature, which allows the user to have two contexts activated (that means two different IP address), more than one socket connection (with a maximum of 6) and simultaneous FTP client service.

For more detailed information please consult the Easy GPRS User Guide.



5.3. Jamming Detection

5.3.1. Overview

The Jammer Detect feature allows the GE910 AUTO to detect the presence of a disturbing device such as a Communication Jammer and give indication to the user.

This feature can be very important in alarm, security and safety applications that rely on the module for the communications. In these applications, the presence of a Jammer device can compromise the whole system reliability and functionality and therefore shall be recognized and reported to the local system for countermeasure actions.

5.4. CMUX

CMUX (Converter-Multiplexer) is a multiplexing protocol implemented in the GE910 AUTO that can be used to send any data, SMS, or TCP data.

5.4.1. Architecture

The Multiplexer mode enables one serial interface to transmit data to four different customer applications. This is achieved by providing four virtual channels using a Multiplexer (MUX).

This is especially advantageous when a data/GPRS call is ongoing. Using the Multiplexer features, e.g. controlling the module or using the SMS service, can be done via the additional channels without disturbing the data flow; access to the second UART is not necessary.

Furthermore, several accesses to the module can be created with the Multiplexer. This is of great advantage when several independent electronic devices or interfaces are used.

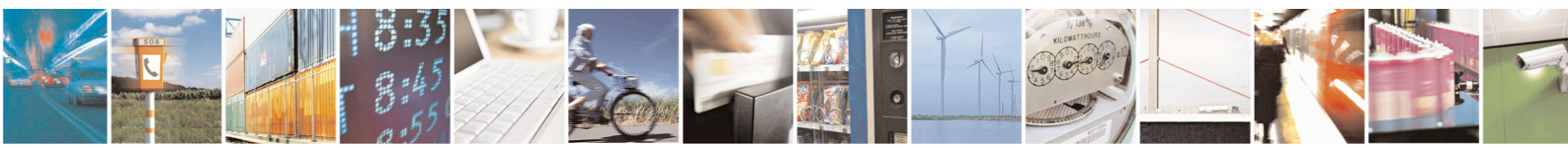
To access the three virtual interfaces, both the GSM engine and the customer application must contain MUX components, which communicate over the multiplexer protocol.

In Multiplexer mode, AT commands and data are encapsulated into packets. Each packet has channel identification and may vary in length.

5.4.2. Features

- 3GPP 27.010 CMUX Basic Option used
- CMUX implementation support four full DLCI (Serial Port)
- Every CMUX instance has its own user profile storage in NVM
- Independent setting of unsolicited message.
- Every CMUX instance has its own independent flow control

NOTE: More details about the Multiplexer mode are available in the CMUX User Guide.



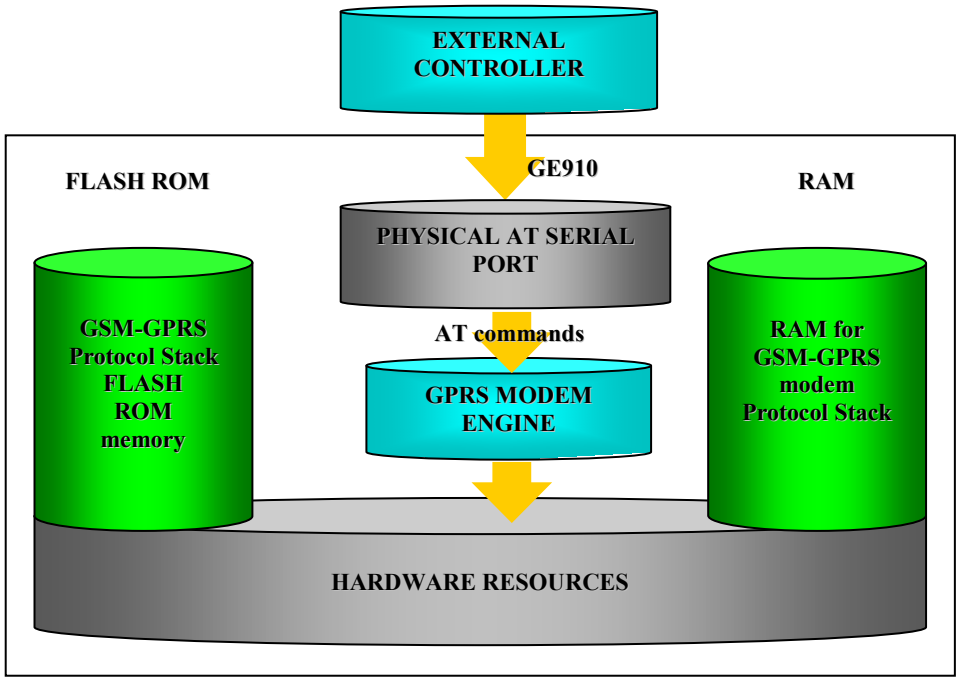
5.5. Easy Script Extension – Python interpreter

5.5.1. Overview

The Easy Script Extension is a feature that allows driving the modem "internally", writing the controlling application directly in a nice high level language: Python.

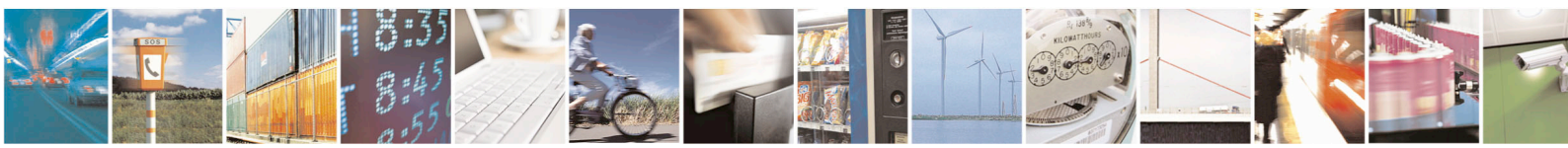
The Easy Script Extension is aimed at low complexity applications where the application was usually done by a small microcontroller that manages some I/O pins and the GE910 AUTO through the AT command interface.

A schematic of such a configuration can be:



In order to not use any external controller, and further simplify the programming of the sequence of operations, the customer can benefit of these features already embedded in the GE910:

- Python script interpreter engine: v. 2.7.2 multi thread
- Non Volatile Memory room for the user scripts and data: 2MB
- RAM reserved for Python engine usage: 2MB



5.6. SAP: SIM Access Profile

5.6.1. Architecture

The SAP feature allows the module to use the SIM of a remote SIM Server. This feature is implemented using special AT Command on a Virtual circuit of the CMUX interface.

5.6.2. Implementation features

- SAP is based on 3GPP 27.010 CMUX Basic Option used
- Only SAP Client features
- Logic HW flow control is recommended on the Virtual instance selected for the SAP command.

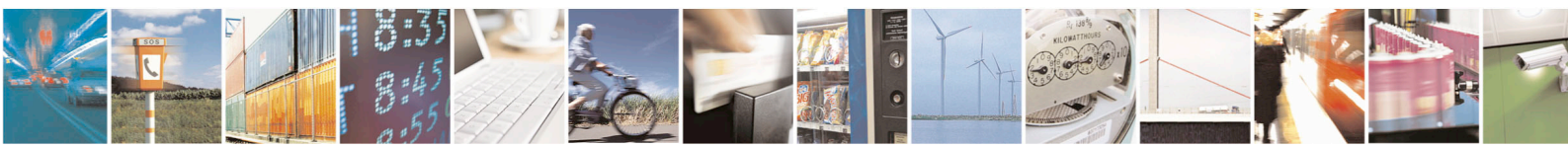
5.6.3. Remote SIM Message Command Description

The module sends request commands to the client application through a binary message that is crowned in the CMUX message. The client application shall extract the message and send it to the SAP server, through the appropriate protocols (e.g. by RFCOMM, that is the Bluetooth serial port emulation entity).

The client application shall extract all the messages sent by SAP server and put them in the CMUX message, to be sent to the module.

The module fulfills the following feature requirements:

- Connection management
- Transfer APDU
- Transfer ATR
- Power SIM on
- Report Status
- Error Handling



Every feature needs some procedures support:

Feature	Procedure
Connection Management	Connect
	Report Status
	Transfer ATR
	Disconnection Initiated by the Client
	Disconnection Initiated by the Server
Transfer APDU	Transfer APDU
Transfer ATR	Transfer ATR
Power SIM on	Power SIM on
	Transfer ATR
Report Status	Report Status
Error Handling	Error Response

Report Status, Disconnection Initiated by the Server and Error Response are independent messages sent by server. The other procedures consist of couples of messages, started by client.

NOTE: More details about the SAP are available in the SAP User Guide.

5.7. AT Commands

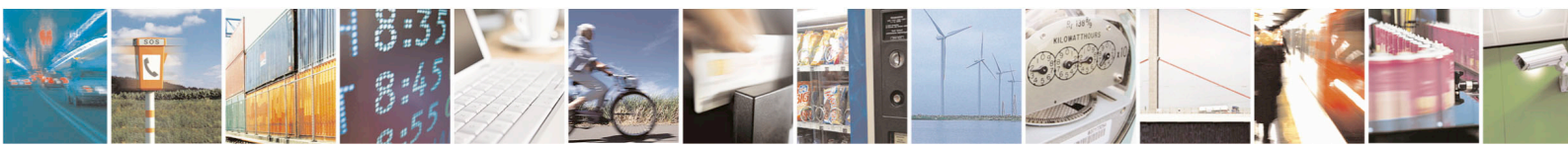
The Telit GE910 AUTO module can be driven via the serial interface using the standard AT commands.

The Telit GE910 AUTO module is compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. 3GPP 27.007 specific AT command and GPRS specific commands.
3. 3GPP 27.005 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)

Moreover the GE910 AUTO module supports also Telit proprietary AT commands for special purposes.

For more information about AT commands supported by the GE910 AUTO module please refer to the document AT Commands Reference Guide.



6. Conformity Assessment Issues

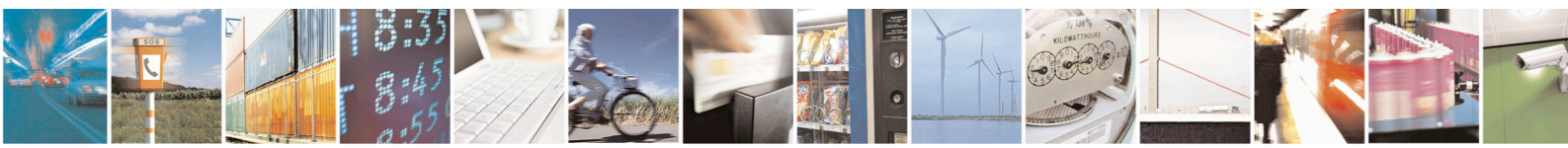
The Telit GE910-QUAD has been assessed to satisfy the essential requirements of the R&TTE Directive 1999/05/EC (Radio Equipment & Telecommunications Terminal Equipment) to demonstrate the conformity against the harmonized standards with the final involvement of a Notified Body.

CE1909

By using our certified module, the evaluation under Article 3.2 of the R&TTE is considerably reduced, allowing significant savings in term of cost and time in the certification process of the final product.

In all cases the assessment of the final product must be made against the Essential requirements of the R&TTE Directive Articles 3.1(a) and (b), Safety and EMC respectively, and any relevant Article 3.3 requirements.

This Product Description, the Hardware User Guide and Software User Guide contain all the information you may need for developing a product meeting the R&TTE Directive.



7. Safety Recommendations

READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc.
- Where there is risk of explosion such as gasoline stations, oil refineries, etc. It is responsibility of the user to enforce the country regulation and the specific environment regulation.

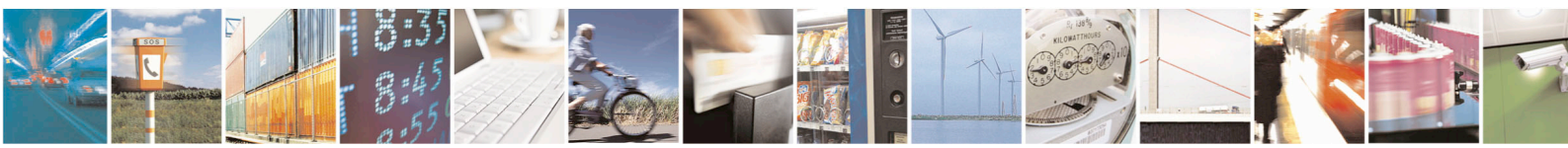
Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking the instruction carefully for its use. Do not insert or remove the SIM when the product is in power saving mode.
The system integrator is responsible for the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has
to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The European Community provides some Directives for the electronic equipment introduced on the market. All the relevant information's are available on the European Community website:

http://ec.europa.eu/enterprise/sectors/rtte/documents/

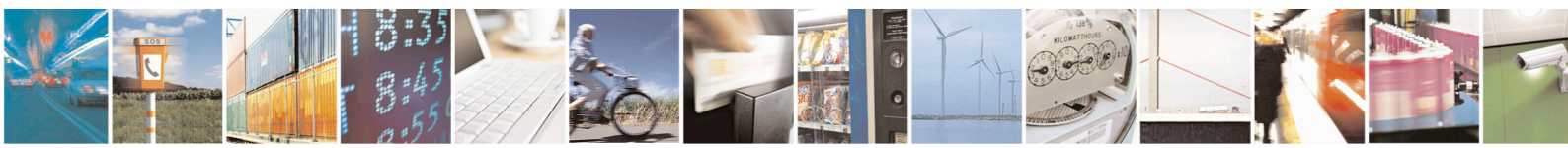
The text of the Directive 99/05 regarding telecommunication equipment is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://ec.europa.eu/enterprise/sectors/electrical/

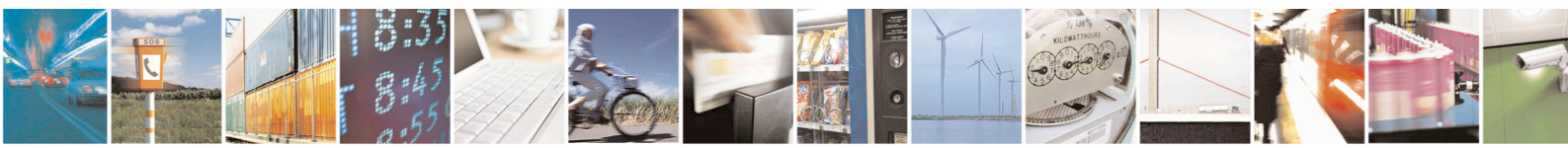


8. List of acronyms

ACM	Accumulated Call Meter
ASCII	American Standard Code for Information Interchange
AT	Attention commands
CB	Cell Broadcast
CBS	Cell Broadcasting Service
CCM	Call Control Meter
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CMOS	Complementary Metal-Oxide Semiconductor
CR	Carriage Return
CTS	Clear To Send
DAI	Digital Audio Interface
DCD	Data Carrier Detected
DCE	Data Communications Equipment
DRX	Data Receive
DSR	Data Set Ready
DTA	Data Terminal Adaptor
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Equipment Institute
FTA	Full Type Approval (ETSI)
GPRS	General Radio Packet Service
GSM	Global System for Mobile communication
HF	Hands Free
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IRA	International Reference Alphabet
ITU	International Telecommunications Union
IWF	Inter-Working Function
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LF	Linefeed
ME	Mobile Equipment
MMI	Man Machine Interface
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
OEM	Other Equipment Manufacturer
PB	Phone Book
PDU	Protocol Data Unit



PH	Packet Handler
PIN	Personal Identity Number
PLMN	Public Land Mobile Network
PUCT	Price per Unit Currency Table
PUK	PIN Unblocking Code
RACH	Random Access Channel
RLP	Radio Link Protocol
RMS	Root Mean Square
RTS	Ready To Send
RI	Ring Indicator
SCA	Service Center Address
SIM	Subscriber Identity Module
SMD	Surface Mounted Device
SMS	Short Message Service
SMSC	Short Message Service Center
SS	Supplementary Service
TIA	Telecommunications Industry Association
UDUB	User Determined User Busy
USSD	Unstructured Supplementary Service Data



9. Document History

Revision	Date	Changes
Rev.0	2013-11-05	First issue