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1 Overview

The **Telit GE864** and **GC864 modules** are small, lightweight, low power consumption and RoHS compliant devices that allow digital communication services wherever a GSM 850, 900, DCS 1800 or PCS 1900 network is present.

The **GE864** is a low cost connector-less best solution for medium to high quantity projects.

The **GC864** is provided with a 80 pin Molex board to board connector and a 50 Ohm Murata RF connector.

The **GE864-PY** and **GC864-PY** models integrate the “**EASY SCRIPT**” on top of all other features of the **GE864-QUAD** and **GC864-QUAD**. The Python, is an engine script interpreter, allowing self controlled operations. With the **EASY SCRIPT** feature the **GE864-PY** and **GC864-PY** become a finite product, they just needs your script to be run.

All **GE864** and **GC864** models includes features like GPRS Class 10, Voice, Circuit Switched Data transfer, Fax, Phonebook and SMS support, ‘EASY GPRS’ embedded TCP/IP stack and battery charging capabilities.

The **GE864** and **GC864** are specifically designed and developed by **Telit** for OEM usage and dedicated to portable data, voice and telemetric applications such as:

- **Telemetry and Telecontrol (SCADA applications)**
- **Security systems**
- **Automated Meter Reading (AMR)**
- **Vending machines**
- **POS terminals**
- **PDA's and Mobile Computing**
- **Phones and Payphones**
- **Automotive and Fleet Management applications**
- **Battery powered applications needing a battery charger**
- **Return channel for digital broadcasting**
- **Applications, where the external application processor can be replaced by the PYTHON engine provided by the GE864-PY or GC864-PY**

All four models support the following functionalities

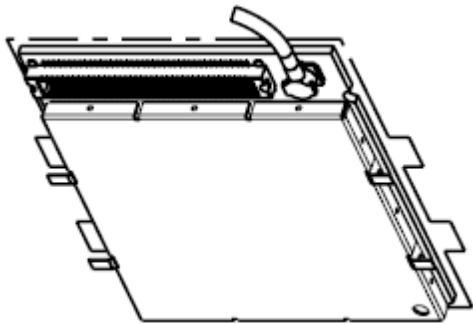
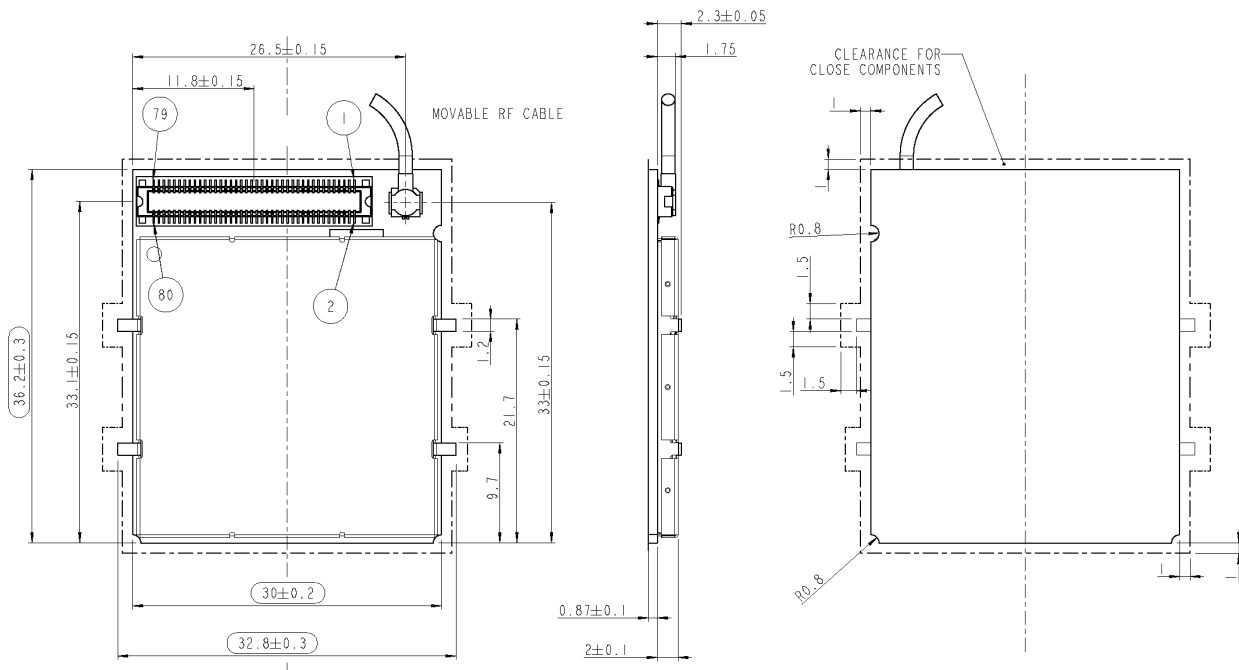
- **EASY GPRS (AT driven embedded TCP/IP protocol stack)**
- **EASY SCAN (full GSM frequency scanning)**
- **JAMMING DETECT & REPORT (detect the presence of disturbing devices)**



2.1.2 GC864

The **Telit GC864 module** overall dimensions are:

- **Length:** 36.2 mm
- **Width:** 30 mm
- **Thickness:** 3.2 mm



2.4 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
850	824.2÷848.8	869.2÷893.8	0 ÷ 124	45 MHz
E-GSM-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

2.5 Transmitter output power

GSM–850/900

The [Telit GE864](#) and [GC864](#) transceiver modules in GSM–850/900 operating mode are **class 4** in accordance with the specifications which determine the nominal 2W peak RF power (+33dBm) on 50 Ohm.

DCS–1800/PCS–1900

The [Telit GE864](#) and [GC864](#) transceiver modules in DCS–1800/PCS–1900 operating mode are **class 1** in accordance with the specifications which determine the nominal 1W peak RF power (+30dBm) on 50 Ohm.

2.6 Reference sensitivity

GSM–850/900

The sensitivity of the [Telit GE864](#) and [GC864](#) modules according to the specifications for the class 4 GSM 850/900 portable terminals are **–107 dBm** typical in normal operating conditions.

DCS–1800/PCS–1900

The sensitivity of the [Telit GE864](#) and [GC864](#) module according to the specifications for the class 1 portable terminals DCS-1800/PCS 1900 are **–106 dBm** typical in normal operating conditions.



2.11.1 Speech Coding

The **GE864** and **GC864** voice codec support the following rates:

- Half Rate
- Full rate
- Enhanced Full Rate
- Adaptive Multi Rate

2.11.2 SIM Reader

The **GE864** and **GC864** support phase 2 GSM11.14 - SIM 1.8V and 3V ONLY with an external SIM connector. For 5V SIM operation an external level translator can be added.

2.11.3 SMS

The **GE864** and **GC864** support 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, memorize in SIM and sending
- Cell Broadcast compatible with CB DRX with signaling of new incoming SMS.

2.11.4 Real Time Clock and Alarm

The **Telit GE864** and **GC864** support the Real Time Clock and Alarm functions through AT commands, furthermore an alarm output pin (GPIO6) 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 to increase the RTC autonomy.

2.11.5 Data/fax transmission

The **Telit GE864** and **GC864** support:

- GPRS Class 10, MS Class B
- CSD up to 14.4 Kbps
- Fax service, Class 1 Group 3



2.11.6 Local security management

The local security management can be done with the lock of Subscriber Identity module (SIM), and security code request at power-up.

2.11.7 Call control

The call cost control function is supported.

2.11.8 Phonebook

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

2.11.9 Characters management

The **Telit GE864** and **GC864** supports the IRA characters set (International Reference Alphabet), in TEXT and PDU mode.

2.11.10 SIM related functions

Activation and deactivation of the numbers stored in phone book FDN, ADN and PINs are supported. Extension at the PIN2 for the PUK2 insertion capability for lock condition is supported.

2.11.11 Call status indication

The call status indication by AT commands is supported.

2.11.12 Automatic answer (Voice, Data or FAX)

After a specified number of rings, the module will automatically answer with a beep. The user can set the number of rings by means of the command `ATS0=<n>`.

2.11.13 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)

2.11.14 Acoustic signaling

The acoustic signaling of the **GE864** and **GC864** 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.

2.11.15 Buzzer output

The General Purpose I/O pin GPIO7 can be configured to output the BUZZER output signal, with only an external MOSFET/transistor and a diode a Buzzer can be directly driven.

The ringing tone and the other signaling tones can be redirected to this Buzzer output with a specific AT command.

2.11.16 RF Transmission Monitor

As alternate function of the GPIO5, the **GE864** and **GC864** provide the RF transmission monitor. When the alternate function is activated, the pin of GPIO5 changes to HIGH every time the module transmits an RF signal and remains HIGH for the duration of the transmission sequence, i.e. it does not change with every GSM signal burst.



2.12 Logic level specifications

Where not specifically stated, all the interface circuits work at 2.8V CMOS logic levels. To get more detailed information about the logic level specifications used in the [Telit GE864](#) and [Telit GC864](#) interface circuits please consult the Hardware User Guide.

2.12.1 Reset signal

Signal	Function	I/O	GE864 ball	GC864 pin
RESET	Phone reset	I/O	A2	54

RESET is used to reset the [GE864](#) and [GC864](#). Whenever this signal is pulled low, the [GE864 / GC864](#) is reset. When the device is reset it stops any operation and after the release of the reset it is unconditionally rebooted, without doing any detach operation from the network where it is registered to. This behavior is not like a proper shut down because any GSM device is requested to issue a detach request on turn off. For this reason the Reset signal must not be used to normally shutting down the device, but only as an emergency exit in the rare case the device remains stuck waiting for some network response.

The RESET is internally controlled on start-up to achieve always a proper power-on reset sequence, so there's no need to control this pin on start-up. It may only be used to reset a device already on that is not responding to any command.

NOTE: do not use this signal to power off the [Telit GE864 / GC864 module](#). Use the ON_OFF* signal to perform this function or the AT#SHDN command.



2.14 Converters

2.14.1 ADC Converter

The on board ADCs are 11-bit converter. They are able to read a voltage level in the range of 0-2 volts applied on the ADC pin input, store and convert it into 11 bit word.

	Min	Max	Units
Input Voltage range	0	2	Volt
AD conversion	-	11	bits
Resolution	-	< 1	mV
Sampling rate	1 (idle)	60 (on traffic)	sec

2.14.2 DAC Converter

The on board DAC is a 10 bit converter, able to generate an analogue value based a specific input in the range from 0 up to 1023. However, an external low-pass filter is necessary. See the HW User Guide for the details.

	Min	Max	Units
Voltage range (filtered)	0	2,6	Volt
Range	0	1023	Steps

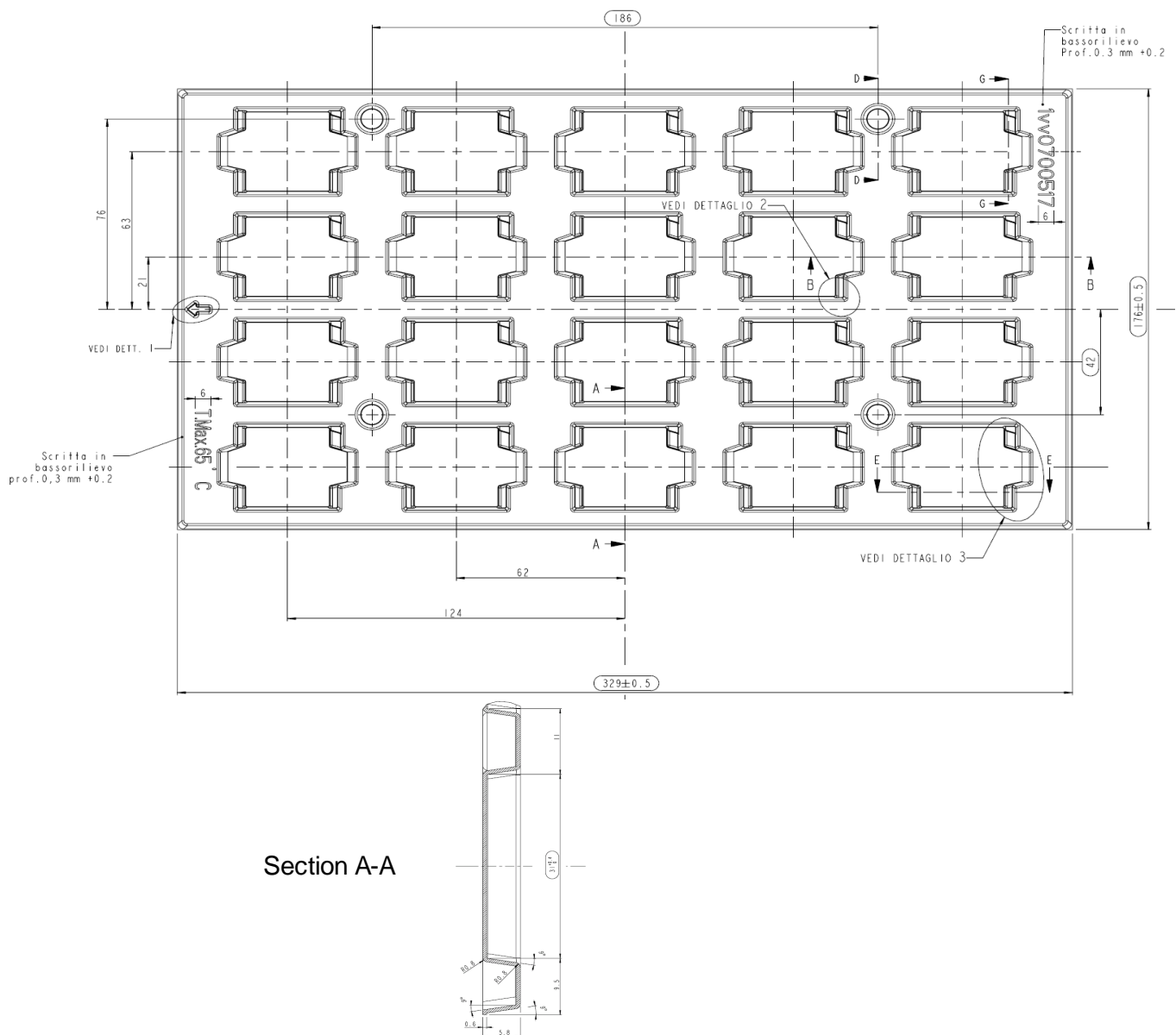


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NOTE: metal tabs present on GC864 should be connected to GND

2.17 Packing system

The **Telit GE864** and **GC864** are packaged on trays of 20 pieces each. This is especially suitable for the GE864 according to SMT processes for pick & place movement requirements.



The size of the tray is: 329 x 176mm

NOTE: These trays can withstand at the maximum temperature of 65°C.

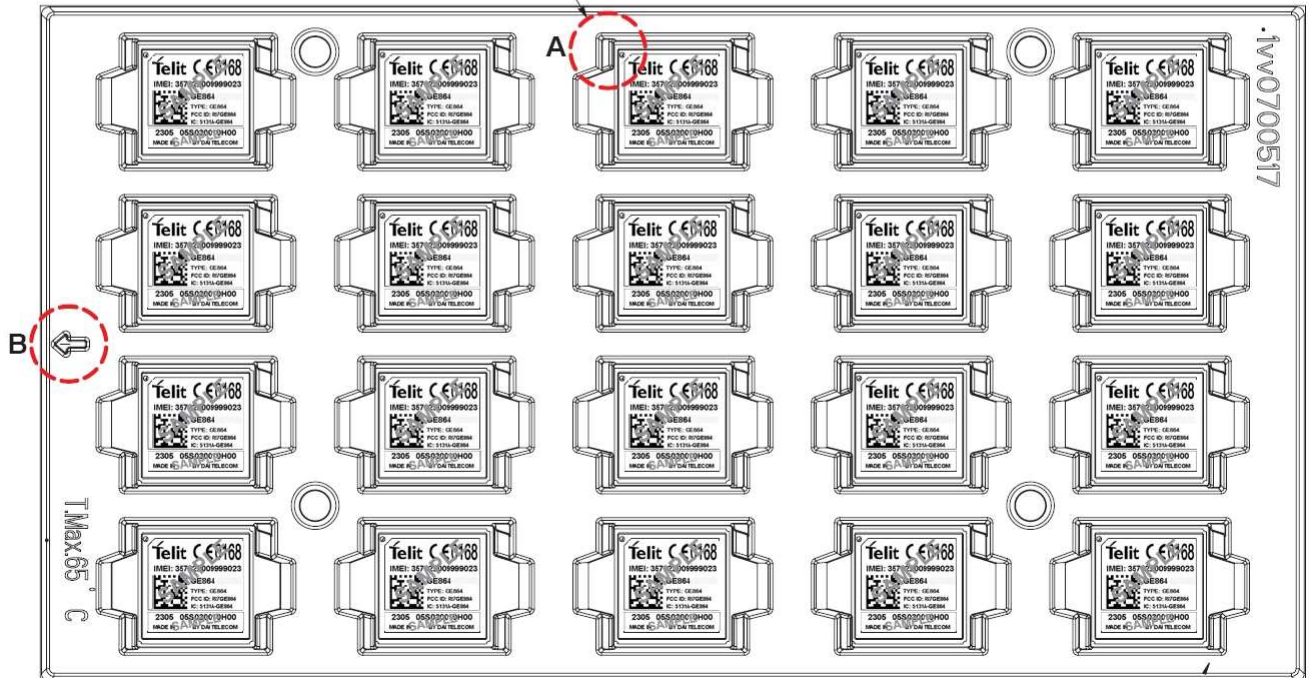
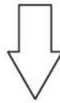


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Ref. No rounded corner on module's printed circuit board

The modules on the tray are oriented as shown in **A** and the tray is oriented toward left as shown in **B**.



3 Evaluation Kit

In order to assist you in the development of your **Telit GE864 / GC864 module** based application, Telit can supply the **EVK2 Evaluation Kit** with appropriate power supply, SIM card housing, RS 232 serial port level translator, direct UART connection, Handset, Headset and Hands-free (car kit) audio, antenna. The **EVK2** provides a fully functional solution for a complete data/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 GE864 / GC864 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 performances 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.



GE864 Evaluation Kit

For a detailed description of the **Telit Evaluation Kit** refer to the documentation provided with the Telit **GE864 / GC864** Hardware User Guide and EVK2 User Manual.



4 Software Features

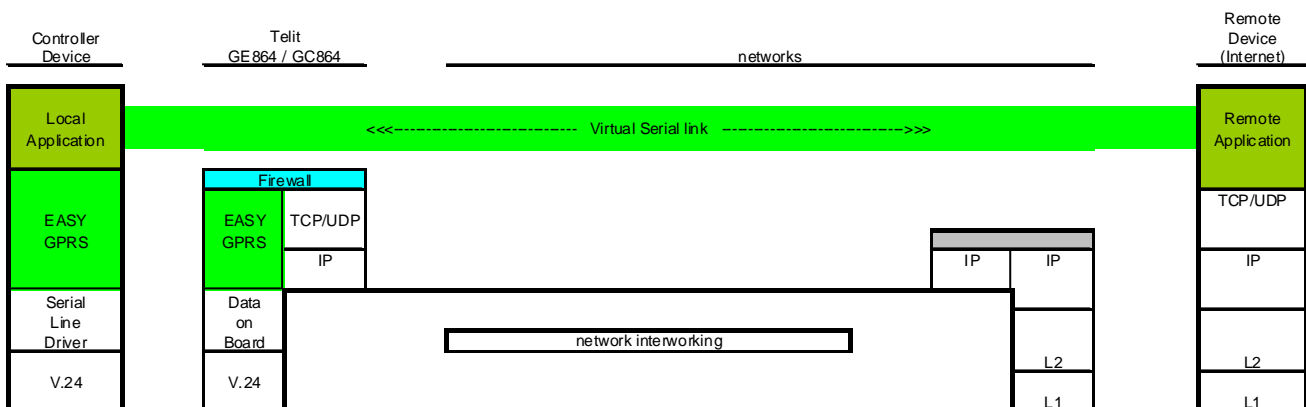
4.1 Enhanced Easy GPRS Extension

4.1.1 Overview

The Easy GPRS feature allows the [Telit GE864 / GC864](#) 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 GE864 / GC864](#) module, regardless of all the software stacks underlying.

An example of the protocol stack involved in the devices is reported:



This particular implementation allows to the devices interfacing to the [Telit GE864 / GC864](#) 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 inside the module.

Easy GPRS overcomes some of the known limitations of the previous implementation and implements some new features such as:

- Keep the GPRS context active even after the closing of a socket, allowing the application to keep the same IP address;
- Also Mobile terminated (incoming) connections can be made, now it is possible to receive incoming TCP connection requests;

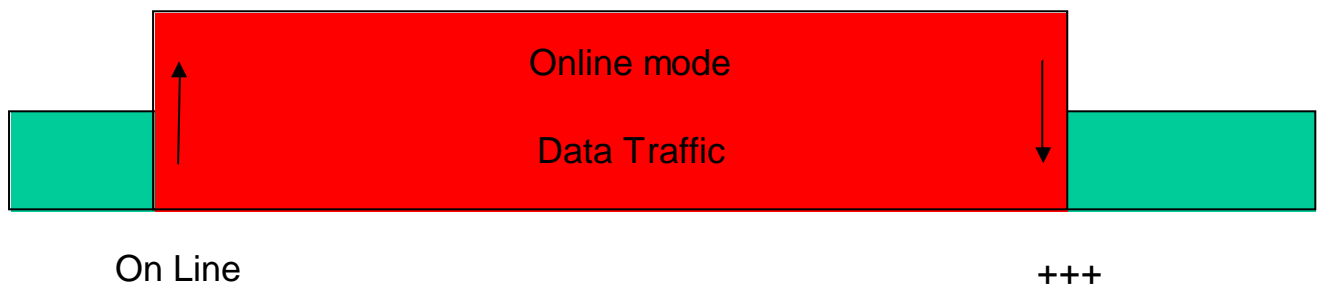


4.2 Multisocket

New functionality of the Telit modules, 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.

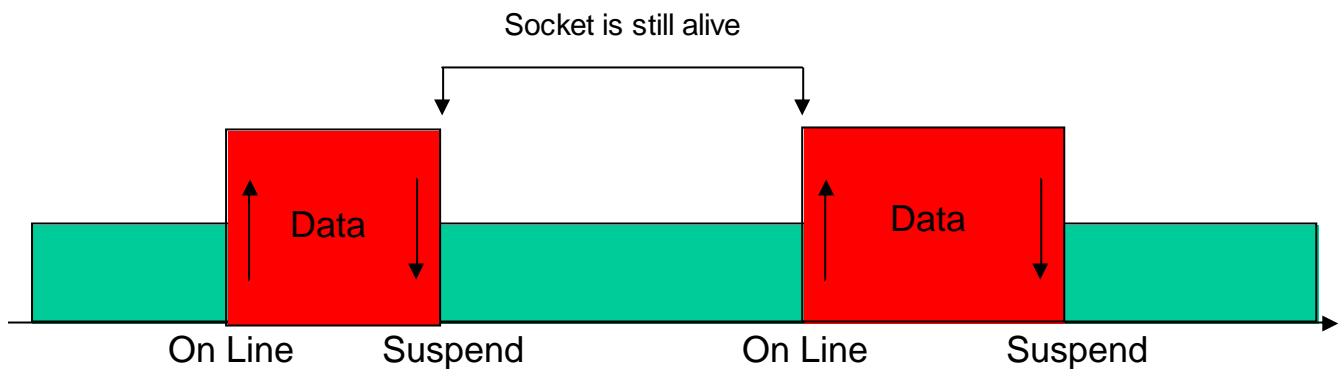
The basic idea of multisocket is the possibility of suspend a socket connection with the escape sequence +++.

With IP Easy we can use a SKTD to open a socket connection and go online. After online activities we use +++ sequence to close the connection (see the figure below).



Where the green part represents the module command mode while the red part is the online mode.

Now, the online mode can be suspended with the escape sequence by using the multisocket feature. During suspend mode the data received by the socket will be buffered. These data will be displayed after socket resumption, as shown in the figure below:



4.3 Jammed Detect & Report Extension

4.3.1 Overview

The Jammed Detect & Report feature allows a [Telit GE864 / GC864](#) to detect the presence of a disturbing device such as a Communication Jammer and give indication to the user and/or send a report of that to the network.

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 either to the local system for countermeasure actions or to the network providing remote actions.

An example scenario could be an intrusion detection system that uses the module for sending the alarm indication for example with an SMS to the system owner, and a thief income using a Jammer to prevent any communication between the GSM module and the network.

In such a case, the module detects the Jammer presence even before the break in and can trigger an alarm siren, other communication devices (PSTN modem) or directly report this condition to the network that can provide further security services for example sending SMS to the owner or police. Obviously this last service depends also from network infrastructure support and it may not be supported by some networks.



4.4 CMUX

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

4.4.1 Product 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 fax/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.

4.4.2 Implementation feature and limitation

- 7.10 CMUX Basic Option used
- CMUX implementation support four full DLC1 (Serial Port)
- CMUX can operate only at Fixed rate, if AT+CMUX is sent with IPR=0 an Error is returned, with a maximum rate of 115200
- Every instance has its own user profile storage in NVM
- Independent setting of unsolicited message.
- In case of GPS product one serial port can be dedicated to NMEA output.
- Every Instance has its own independent flow control.

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



4.5 Easy Script Extension - Python interpreter

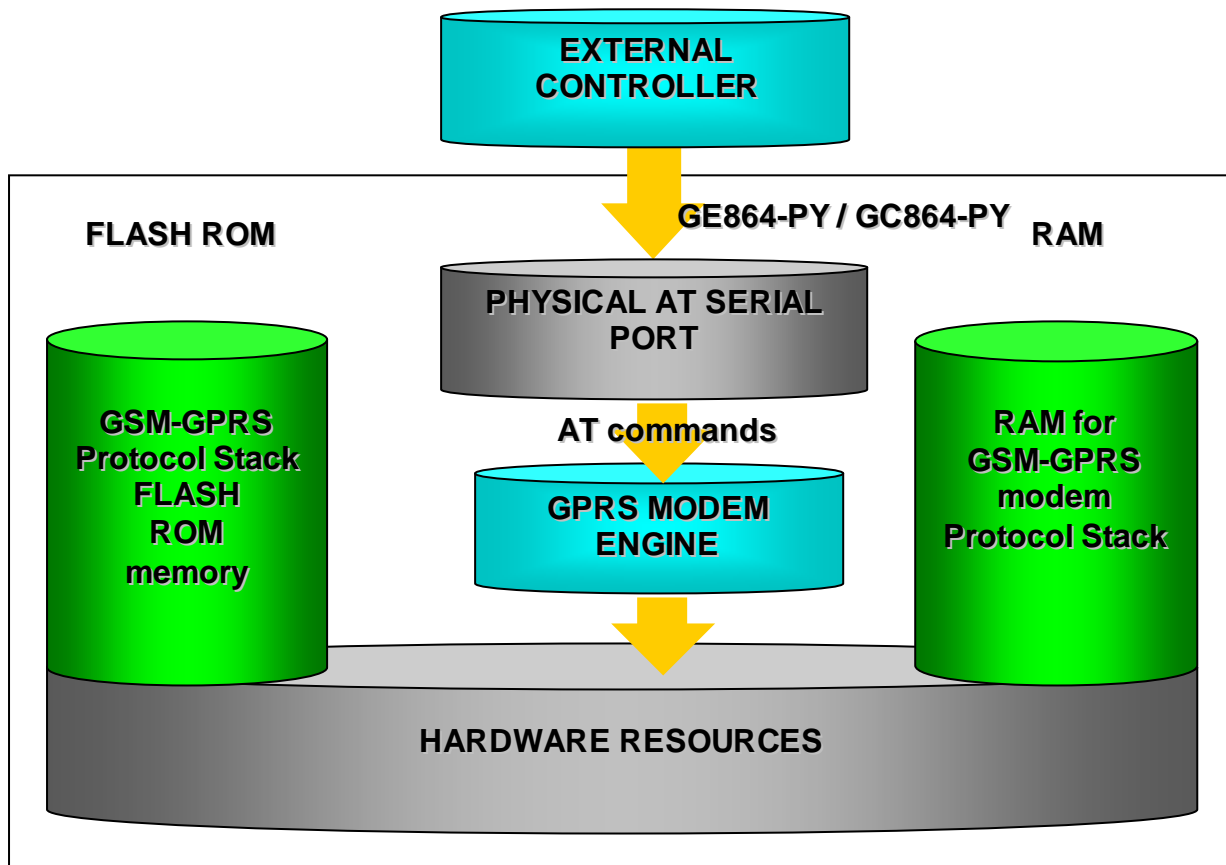
4.5.1 Overview

NOTE: This feature is available only for the [Telit GE864-PY](#) and [GC864-PY](#).

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 managed some I/O pins and the GE864-PY and GC864-PY through the AT command interface.

A schematic of such a configuration can be:

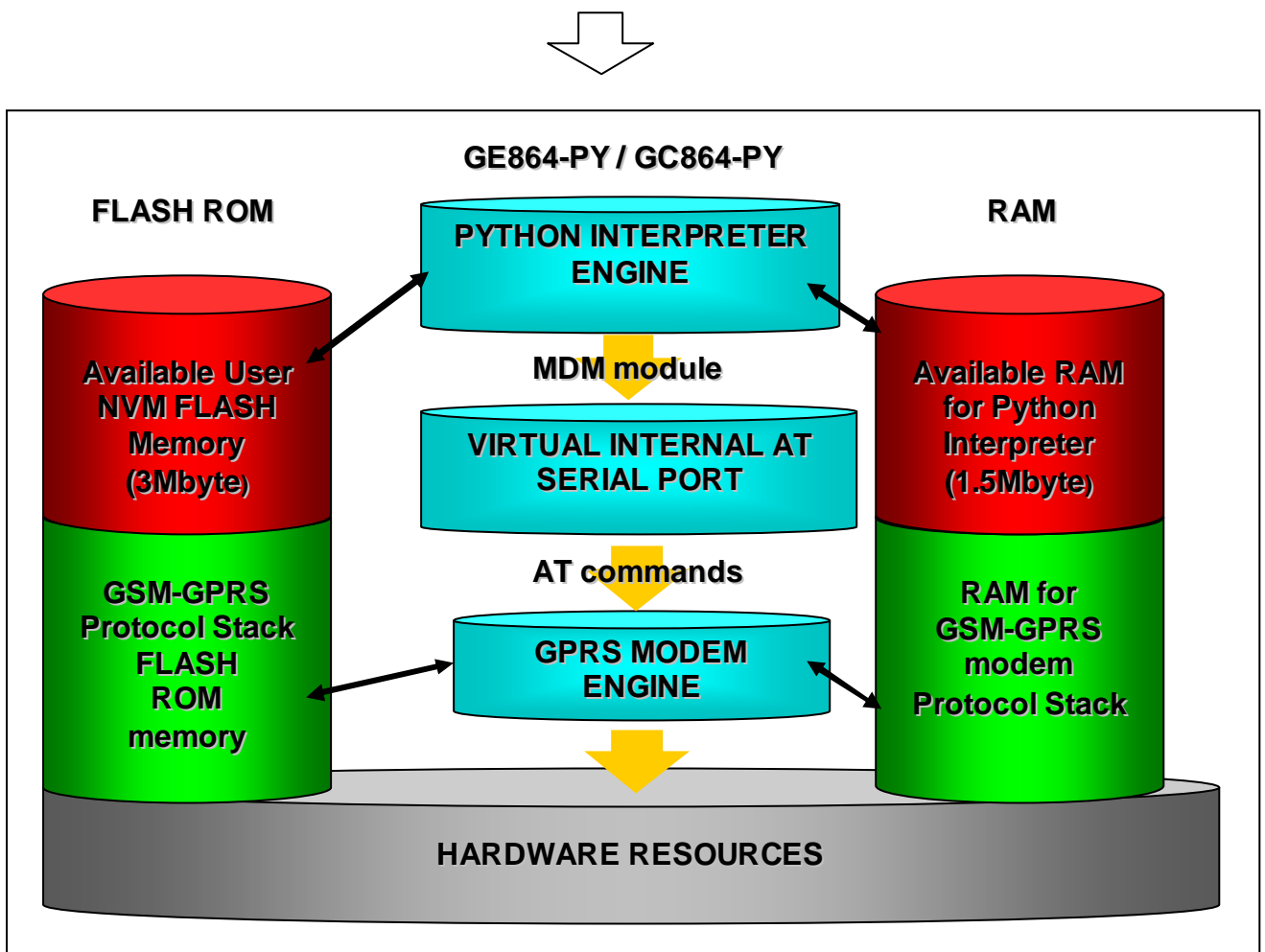


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In order to eliminate this external controller, and further simplify the programming of the sequence of operations, inside the GE864-PY / GC864-PY it is included:

- Python script interpreter engine v. 1.5.2+
- around 3MB of Non Volatile Memory room for the user scripts and data
- 1.2 MB RAM reserved for Python engine usage

A schematic of this approach is:



4.5.2 Python 1.5.2+ Copyright Notice

The Python code implemented into the **Telit module** is copyrighted by Stichting Mathematisch Centrum, this is the license:

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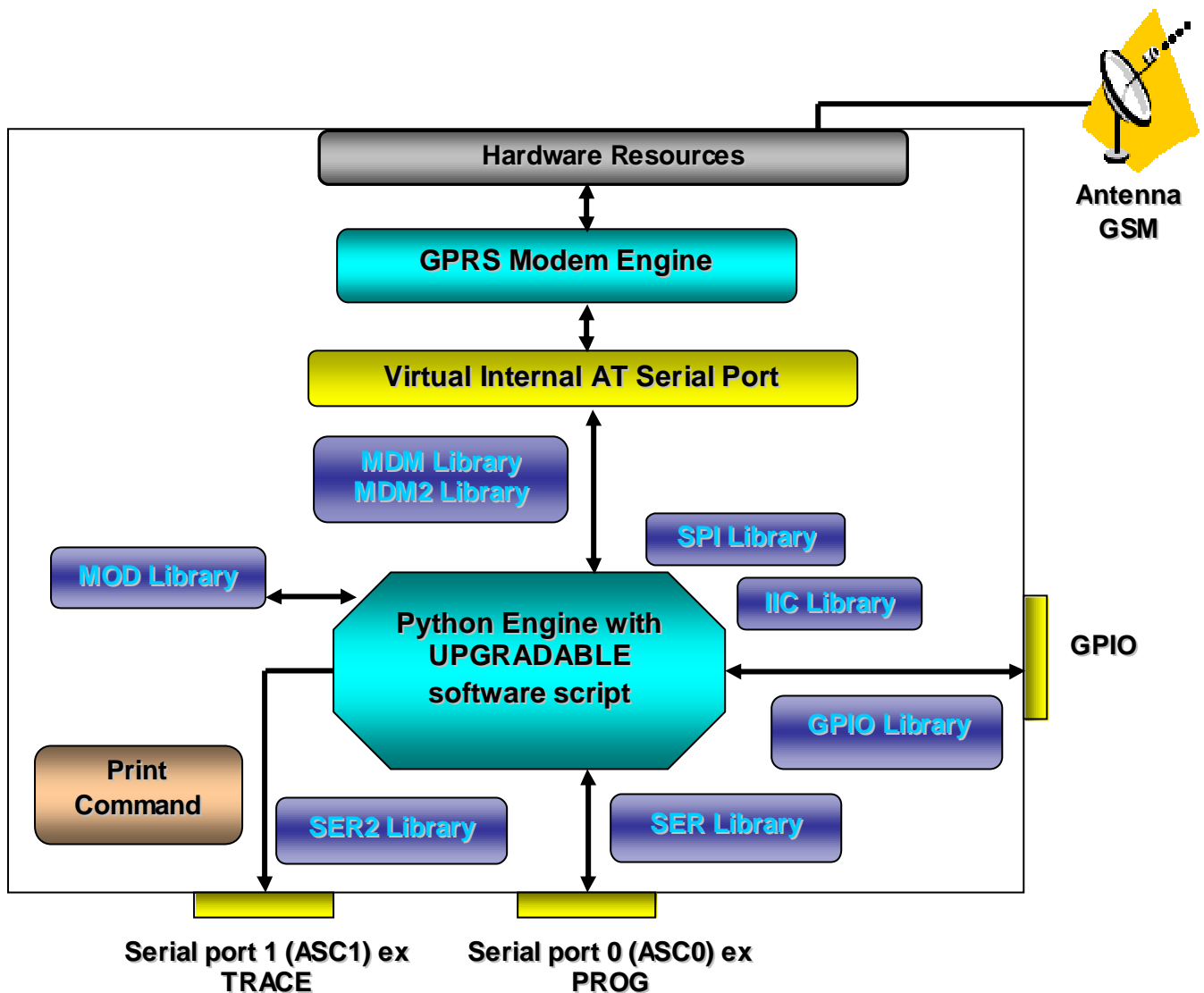
4.5.3 Python implementation description

Python scripts are text files stored in NVM inside the **Telit GE864-PY / GC864-PY**. There's a file system inside the module that allows to write and read files with different names on one single level (no subdirectories are supported).

Attention: it is possible to run only one Python script at the time.

The Python script is executed in a task inside the **Telit module** at the lowest priority, making sure this does not interfere with GSM/GPRS normal operations. This allows serial ports, protocol stack etc. to run independently from the Python script.

The Python script interacts with the **Telit module** functionality through four build-in interfaces.



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- **The MDM interface** is the most important one. It allows Python script to send AT commands, receive responses and unsolicited indications, send data to the network and receive data from the network during connections. It is quite the same as the usual serial port interface in the **Telit module**. The difference is that this interface is not a real serial port but just an internal software bridge between Python and mobile internal AT command handling engine. All AT commands working in the **Telit module** are working in this software interface as well. Some of them have no meaning on this interface, such as those regarding serial port settings. The usual concept of flow control keeps its meaning over this interface, but it's managed internally.
- **The MDM2 interface** is the second interface between Python and mobile internal AT command handling. It is used to send AT commands from Python script to mobile and receive AT responses from mobile to Python script when the classic MDM built-in module already in use.
- **The SER interface** allows Python script to read from and write to the *real*, physical serial port where usually the AT command interface resides, for example to read NMEA information from a GPS device. When Python is running this serial port is free to be used by Python script because it is not used as AT command interface since the AT parser is mapped into the internal virtual serial port. No flow control is available from Python on this port.
- **The SER2 interface** allows Python script to read from and write to the *real* physical serial port ASC1, that is usually available for trace and debug.
- **The GPIO interface** allows Python script to handle general purpose input output faster than through AT commands, skipping the command parser and going directly to control the pins.
- **The MOD interface** is a collection of useful functions.
- **The IIC interface** is an implementation on the Python core of the IIC bus Master. It allows Python to create one or more IIC bus on the available GPIO pins.
- **The SPI interface** is an implementation on the Python core of the SPI bus Master. It allows Python to create one or more SPI bus on the available GPIO pins.

For the debug, the print command is directly forwarded on the EMMI TX pin (second serial port) at baud rate 115200bps 8N1.

4.5.4 Python core supported features

The Python core version is 1.5.2+ (string methods added to 1.5.2).
You can use all Python statements and almost all Python built-in types and functions.

Built-in types and functions not supported	Available modules (all others are not supported)
complex	marshal
float	imp
long	<u>_main_</u>
docstring	<u>_builtin_</u>
	sys
	md5



4.6 SAP: SIM Access Profile

4.6.1 Product 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.

4.6.2 Implementation feature

- SAP is based on 7.10 CMUX Basic Option used
- Only SAP Client features
- Logic HW flow control is recommended on the Virtual instance selected for the SAP command.

4.6.3 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 sent to the module.

The module satisfies 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



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	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 AT Commands

The **Telit GE864 / GC864 module** can be driven via the serial interface using the standard AT commands¹. The **Telit GE864 / GC864 module** is compliant with:

1. Hayes standard AT command set, in order to maintain the compatibility with existing SW programs.
2. ETSI GSM 07.07 specific AT command and GPRS specific commands.
3. ETSI GSM 07.05 specific AT commands for SMS (Short Message Service) and CBS (Cell Broadcast Service)
4. FAX Class 1 compatible commands

Moreover the **Telit GE864 / GC864 module** supports also Telit proprietary AT commands for special purposes.

For a more information about AT commands supported by GE864/GC864 modules please refer to document AT Commands Reference Guide, code 80000ST10025a.

¹ The AT is an ATTENTION command and is used as a prefix to other parameters in a string. The AT command combined with other parameters can be set up in the communications package or typed in manually as a command line instruction.



Telit GE864 and GC864 Product Description
80273ST10008a Rev. 9 - 15/05/07

- The system antenna(s) used for this module must not exceed 3 dBi for mobile and fixed or mobile operating configurations.
- Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Manufacturers of mobile, fixed or portable devices incorporating this module are advised to clarify any regulatory questions and to have their complete product tested and approved for FCC compliance.



ZERTIFIKAT • CERTIFICATE • 認証証書 • CERTIFICADO • CERTIFICAT



Certificate

This certificate is issued to

TELIT Communications S.p.A.

of

Viale Stazione di Prosecco 5/B
34010 Sgonico
Trieste
Italy

to certify that the Equipment known as

GE864-QUAD

as described in the Annex to this certificate conforms to the essential requirements of Directive 1999/5/EC of the European Parliament and European Council on the basis of Technical Construction File number 22345_GE864-QUAD_rev1 in relation to the essential requirements of Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed:

On Behalf of BABT

Issue Date: 08 February 2006



Number: NC/12659 Issue: 01

This certificate is issued by BABT and represents a formal Notified Body opinion under Annex IV of Directive 1999/5/EC permitting the use of the BABT (60168) mark on the equipment described above subject to the equipment meeting the compliance requirements of all applicable EU directives. This certificate is not transferable and remains the property of BABT.

British Approvals Board for Telecommunications • TÜV SÜD Group •
Balfour House • Churchfield Road • Walton-on-Thames • Surrey • KT12 2TD • United Kingdom



6.4 GC864-QUAD: Conformity Assessment

	DECLARATION OF CONFORMITY
We, Telit Communications S.p.A	
Of: Via Stazione di Prosecco, 5/b 34010 Sgonico (TRIESTE) ITALY	
declare under our sole responsibility that the product GC864-QUAD	
to which this declaration relates is in conformity with all the essential requirements of Directive 1999/05/EC	
The conformity with the essential requirements of the European Directive 1999/05/EC has been verified against the following harmonized standards:	
<ul style="list-style-type: none">• ETSI EN 301 511 v.9.0.2;• CENELEC EN 60950:2001;• ETSI EN 301 489-1: v.1.4.1;• ETSI EN 301 489-7: v.1.2.1.	
The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body:	
BABT, Balfour House, Churchfield Road, Walton-on-Thames, Surrey, KT12 2TD, United Kingdom	
Identification mark:	0168
The technical documentation relevant to the above equipment will be held at:	
Telit Communications S.p.A Via Stazione di Prosecco, 5/b 34010 Sgonico (TRIESTE) ITALY	
Trieste, 28 July 2006	 Ing. Guido Walcher Quality Assurance Director
06DOC10 MOD.003 02/06 REV.9	



ZERTIFIKAT • CERTIFICATE • 認証証書 • CERTIFICADO • CERTIFICAT



Certificate

This certificate is issued to

TELIT Communications S.p.A.

of

Via Stazione di Prosecco 5/B
34010 Sgonico
Trieste
Italy

to certify that the Equipment known as

GC864-QUAD

as described in the Annex to this certificate conforms to the essential requirements of Directive 1999/5/EC of the European Parliament and European Council on the basis of Technical Construction File number 24383_GC864-QUAD_rev1 in relation to the essential requirements of Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed:


On Behalf of BABT

Issue Date: 28 July 2006

Number: NC/12869 Issue: 01

This certificate is issued by BABT and represents a formal Notified Body opinion under Annex IV of Directive 1999/5/EC permitting the use of the BABT 00168 mark on the equipment described above subject to the equipment meeting the compliance requirements of all applicable EU directives. This certificate is not transferable and remains the property of BABT.

British Approvals Board for Telecommunications • TÜV SÜD Group •
Balfour House • Churchfield Road • Walton-on-Thames • Surrey • KT12 2TD • United Kingdom



ZERTIFIKAT • CERTIFICATE • 認証証書 • СЕРТИФИКАТ • CERTIFICADO • CERTIFICAT



Certificate

This certificate is issued to

TELIT Communications S.p.A.

of

Via Stazione di Prosecco 5/B
34010 Sgonico
Trieste
Italy

to certify that the Equipment known as

GC864-PY

as described in the Annex to this certificate conforms to the essential requirements of Directive 1999/5/EC of the European Parliament and European Council on the basis of Technical Construction File number 23546_GC864-PY_rev1 in relation to the essential requirements of Articles 3.1(a), 3.1(b) & 3.2 of the Directive.

Signed:


On Behalf of BABT

Issue Date: 28 July 2006

Number: NC/12870 Issue: 01

This certificate is issued by BABT and represents a formal Notified Body opinion under Annex IV of Directive 1999/5/EC permitting the use of the BABT (C0163) mark on the equipment described above subject to the equipment meeting the compliance requirements of all applicable EU directives. This certificate is not transferable and remains the property of BABT.

British Approvals Board for Telecommunications • TUV SÜD Group •
Balfour House • Churchfield Road • Walton-on-Thames • Surrey • KT12 2TD • United Kingdom



6.6 GC864-QUAD/PY : RoHS certificate



DECLARATION OF EU RoHS Compliance

We, **Telit Communications S.p.A**

Of: **Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY**

declare under our sole responsibility that the products

GC864-PY (commercial name)
3990250676(internal code)

&

GC864-QUAD (commercial name)
3990250675(internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

**Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY**

Trieste, **12 July 2006**



Ing. Sandro Spanghero
R&D Technical Director



Ing. Guido Walcher
Quality Assurance Director



6.7 GE864-QUAD/PY: FCC Equipment Authorization

TCB

GRANT OF EQUIPMENT
AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, MD 21230-3432

Date of Grant: 07/13/2006
Application Dated: 07/13/2006

Telit Communications S.p.A.
Viale Stazione di Prosecco 5/b
Trieste, 34010
Italy

Attention: Andrea Fragiacomò , Ing.

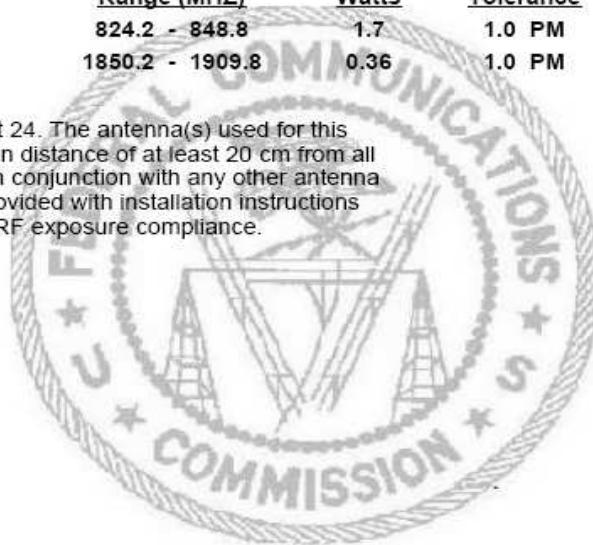
NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: RI7GE864
Name of Grantee: Telit Communications S.p.A.
Equipment Class: PCS Licensed Transmitter
Notes: GSM 850/1900MHz Module

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	22H	824.2 - 848.8	1.7	1.0 PM	290KGXW
	24E	1850.2 - 1909.8	0.36	1.0 PM	290KGXW

Power Output is ERP for Part 22 and EIRP for Part 24. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with installation instructions and transmitter operating conditions for satisfying RF exposure compliance.



6.8 GC864-QUAD/PY: FCC Equipment Authorization

TCB

**GRANT OF EQUIPMENT
AUTHORIZATION**

TCB

Certification

Issued Under the Authority of the
Federal Communications Commission

By:

MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, MD 21230-3432

Date of Grant: 07/28/2006

Application Dated: 07/28/2006

Telit Communications S.p.A.
Viale Stazione di Prosecco 5/b
Trieste, 34010
Italy

Attention: Andrea Fragiaco, Ing.

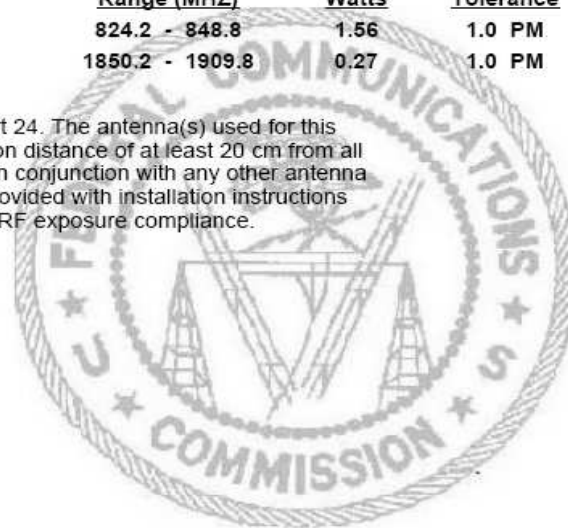
NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: RI7GC864
Name of Grantee: Telit Communications S.p.A.
Equipment Class: PCS Licensed Transmitter
Notes: Quad-Band GSM/GPRS module - Type: GC864

<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
	22H	824.2 - 848.8	1.56	1.0 PM	290KGXW
	24E	1850.2 - 1909.8	0.27	1.0 PM	290KGXW

Power Output is ERP for Part 22 and EIRP for Part 24. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with installation instructions and transmitter operating conditions for satisfying RF exposure compliance.



6.9 GE864-QUAD/PY: IC Equipment Authorization



GRANT OF EQUIPMENT CERTIFICATION

THE FOLLOWING EQUIPMENT HAS BEEN TESTED
AND CERTIFIED UNDER
INDUSTRY CANADA
RSS 132 ISSUE 1 PROVISIONAL AUG. 2002, RSS 133 ISSUE 3, JUNE 2005

CB

Issued By:
MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, Maryland 21230
Laboratory Number: 2043

CB

Equipment Certification is hereby issued to the Identified Certificate Holder and is VALID ONLY for the equipment identified herein.
NOT TRANSFERABLE

FILE/CERTIFICATE NUMBER: 074-07-2006-20240

CERTIFICATION NUMBER: 5131A-GE864

Issued to: Telit Communications S.p.A. **Date of Grant:** July 11, 2006
Address: Viale Stazione di Prosecco 5/B
I-34010 Trieste, Italy

Nature of Application: Original
Equipment Description: GSM 850/1900MHz Module
Equipment Category: Category I

Model Number(s)

GE864-QUAD
GE864-PY

Conducted RF Power or Field Strength: 1.7 Watts and 0.36 Watts
Frequency Range: 824.2-848.8MHz and 1850.2-1909.8 MHz
Bandwidth(s): 290 KHz
Emission Designations: 290KGXW
Antenna Information: NA

Test Lab: Cetecom S.A. Parque Tecnológico de Andaluci, C/Severo Ochoa 2, 29590 Campanillas, Malaga, Spain
rorejas@cetecom.es Tel: 34-952-61-93-57

Test Lab IC Site Number: IC-4621

Notes: Power Output is ERP for Part 22 and EIRP for Part 24. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Certification of equipment means only that the equipment met the requirements of the above noted specification(s). License applications, where applicable to use certified equipment, are acted on accordingly by the issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with requirements and procedures issued by Industry Canada.

ISSUED UNDER THE AUTHORITY OF THE MINISTER OF INDUSTRY


Kevin Mehaffey
Manager, EMC Laboratory
Printed: July 11, 2006



DOC-ICR001 3/11/2005



6.10 GC864-QUAD/PY: IC Equipment Authorization



GRANT OF EQUIPMENT CERTIFICATION

THE FOLLOWING EQUIPMENT HAS BEEN TESTED
AND CERTIFIED UNDER
INDUSTRY CANADA
RSS 132 ISSUE 1 PROVISIONAL AUG. 2002, RSS 133 ISSUE 3, JUNE 2005

CB

Issued By:

MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, Maryland 21230
Laboratory Number: 2043

CB

Equipment Certification is hereby issued to the Identified Certificate Holder and is VALID ONLY for the equipment identified herein.
La certification d'équipement est par ceci publiée au support identifié de certificate et est VALIDE SEULEMENT pour l'équipement identifié ci-dessus
NOT TRANSFERABLE / NON TRANSMISSIBLE

FILE/CERTIFICATE NUMBER: 081-07-2006-20414

CERTIFICATION NUMBER: IC: 5131A-GC864

Issued to/Développé a:	Telit Communications S.p.A	Date of Grant:	July 28, 2006
Address:	Viale Stazione di Prosecco 5/B I-34010 Trieste, Italy		
Nature of Application/Nature d'Application:	Original		
Equipment Description/Genre de Matériel:	Quad-Band GSM/GPRS module		
Equipment Category/Catégorie de Matériel:	Category I		
Model Number(s)/Marque et Modele	GC864-QUAD GC864-PY		
Conducted RF Power or Field Strength/Puissance H.F.:	1.56 Watts(eirp) and 0.27 Watts(erp)		
Frequency Range/Bande de Fréquences:	824.2-848.8MHz and 1850.2-1909.8 MHz		
Bandwidth(s)/ largeurs de bande:	290 KHz		
Emission Designations/Genre D'Émission:	290KGXW		
Antenna Information/ l'information d'antenne:	N/A		
Test Lab:	rorejas@cetecom.es Tel: 34-952-61-93-57 IC-4621		

Notes: Power Output is ERP for Part 22 and EIRP for Part 24. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Certification of equipment means only that the equipment met the requirements of the above noted specification(s). License applications, where applicable to use certified equipment, are acted on accordingly by the issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with requirements and procedures issued by Industry Canada.

L'homologation de matériel terminal signifie seulement qu'il est conforme aux exigences du cahier des charges mentionné ci-dessus. Les demandes de licence, le cas échéant en vue de l'utilisation de matériel certifié seront traitées en conséquence par le bureau chargé de délivrer les dites licences, en tenant compte du milieu radioélectrique ambiant, du service radio existant et de l'emplacement de la station. Le présent certificate est délivré à condition que le détenteur se conforme et continue à se conformer aux cahiers des charges et procédures sur les norms radioélectriques publiées par le ministère.

ISSUED UNDER THE AUTHORITY OF THE MINISTER OF INDUSTRY
DELIVRE AVEC L'AUTORISATION DU MINISTRE DES INDUSTRIES


Kevin Mahaffey
Manager, EMC Laboratory
Printed: July 28, 2006



DOC-ICR001 3/11/2005



8 GE864 and GC864 Technical Support

Telit's technical support to **GE864** and **GC864** wireless modems customers consists in:

- Technical documentation: available for download into the Website www.telit.com >Products >Modules > selected model.
- Engineering support: accessible via E-Mail service with 48 hr replies assured under normal conditions.



9 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
CSD	Circuit Switched Data
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



