GC864-QUAD-C2 / PY-C2
Product Description

80273ST10023a Rev. 5 - 29/07/08

Making machines talk.

This document is related to the following products:

Model	P/N
GC864-QUAD-C2	3990250681
GC864-PY-C2	3990250686

Contents

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1 Overview

Aim of this document is the description of features, functions and interfaces of the **Telit modules GC864-C2**.

The Telit **GC864-QUAD-C2 / PY-C2** is formed by a PCB that contains: 60 pin connector, antenna connector and **GE864-QUAD / PY** module.

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

The **Telit GE864 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 **Telit GE864** modules include all state-of-the-art features like GPRS Class 10, Voice, Circuit Switched Data transfer, Fax, Phonebook and SMS support and 'EASY GPRS' embedded TCP/IP stack.

The **GC864-PY-C2** module integrates the "***EASY SCRIPT"*** on top of all other features of the **GC864-QUAD-C2**. The PYTHON, is an engine script interpreter, allowing self controlled operations. With the ***EASY SCRIPT*** feature the **GC864-PY-C2** become a finite product, they just needs your script to be run.

The **GC864-C2** is 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**
- **PDAs and Mobile Computing**
- **Phones and Payphones**
- **Automotive and Fleet Management applications**
- **Return channel for digital broadcasting**

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)**

In order to meet the competitive OEM and vertical market stringent requirements, Telit supports its customers with a dedicated Support Policy with:

- **Telit Evaluation Kit EVK2** to help you develop you application;
- A Website with all updated information available;
- an high level specialist technical support to assist you in your development;

For more updated information concerning product Roadmap and availability, technical characteristics, commercial and other issues, please check on the Telit website www.telit.com > Products > Modules.

NOTE: Some of the performances of the **Telit modules** depend on SW version installed on the module itself.
The **Telit modules** SW group is continuously working in order to add new features and improve the overall performances.
The **Telit modules** are easily upgradeable by the developer using the **Telit** Flash Programmer.
Furthermore, all the **Telit modules** have the conformity assessment against R&TTE.

2 General Product Specification

To get detailed information about **Telit GE864 modules** consult the GE864 Product Description 80273ST10008a.

2.1 Size

The GC864-C2 Telit is soldered on PCB with has the following dimension:

- Overall dimensions (excluding connectors) : 50 x 33 x 7.2 mm

2.2 PCB characteristics

- Material FR4
- Thickness 0,95 mm
- Surface finishing Chemical gold plate Ni 5um/ Au 0,1um

2.3 Product features

2.3.1 Operating Frequency

The Telit **GC864-C2** Quad Band GSM radio device (850/900/1800/1900 MHz) GPRS class 10 (4 down 2 up).
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

2.3.2 Power supply and consumptions

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

- Nominal operating voltage 3.7 V
- Operating voltage range 3.4 V - 4.2 V (in every condition)
- Switch off voltage 3.3V

NOTE: Operating voltage range must never be exceeded; care must be taken in order to fulfil min/max voltage requirements.

The typical current consumption of the **Telit GC864-C2** is:

Power off current (typical)	< 26 μA;
Stand–by current (GSM Idle)	< 22 mA (< 3 mA using command AT+CFUN=5)
Operating current in voice channel	<200 mA @ worst network conditions
Operating current in GPRS class 10	< 370 mA @ worst network conditions

2.3.3 Operating temperature

Temperature in normal operating conditions	–10°C ÷ +55°C
Temperature in extreme operating conditions*	–30°C ÷ +80°C
Temperature in not functional conditions	–40°C ÷ +85°C

* Reduction of sensitivity into the ETSI limits.

2.3.4 Features

- Voice, Data, Short Message Service (SMS)
- Voice features
- Data features
- Short Messages Service (SMS) features
- GSM Supplementary Services

For more detailed information about the features consult the GE864 Product Description 80273ST10008a.

2.3.5 Interfaces

- Single antenna interface (MMCX p/n: 9765NR502BD002B Right Angle Female Jack)
- The **GC864-C2** use a 60 pins board-to-board mini-berg male connector Kontek Comatel P/N 6739702560411, for the connections with the external applications, which includes:
    - Power supply connection
    - 1.8V / 3V SIM interface with SIM detection
    - 2 microphone inputs and 2 speaker outputs
    - 10 x General Purpose (2.7V) I/Os
    - Full RS-232 serial link[1] (2.7V) supporting remote control by AT commands and software upgrade
    - 1 x General Purpose Serial Interface (rx and tx only ; 2.7V) (trace)
    - 3 x Analogue to Digital Converter
    - 1 x Digital to Analogue Converter
    - 1 x buzzer output (control signal; external buffer required)
    - IIC bus

This 60 pins board-to-board mini-berg male connector matches the Kontek Comatel P/N 6779707560471 female model.

[1] Note that the DSR pin is not connected so in order to avoid problems in communication between controller (or PC) and module remember to disable DSR management in the serial port configuration.

2.3.6 Board to Board connector PINOUT

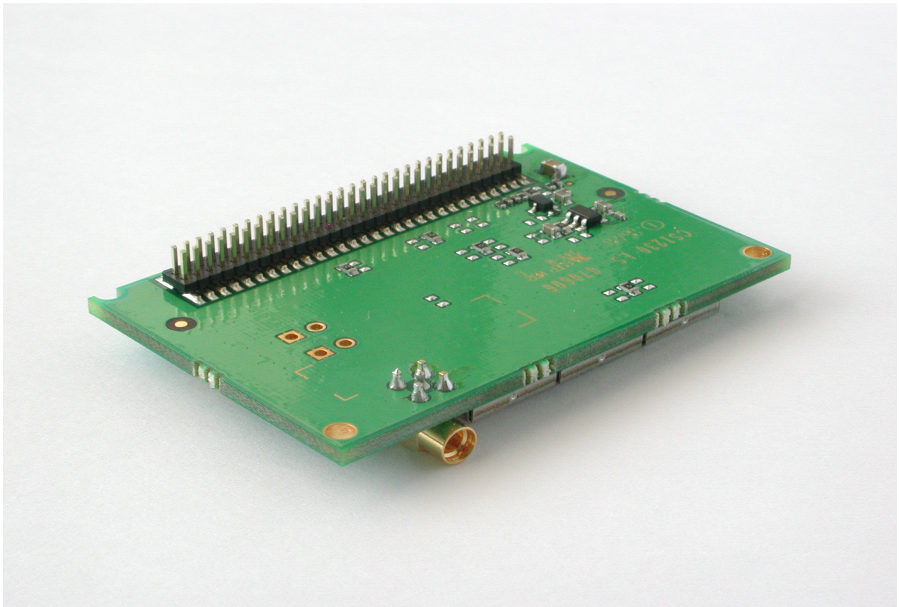
Pin	Signal	Type	Function
1	VBATT	DC voltage	Power
2	GND	DC voltage	Power
3	VBATT	DC voltage	Power
4	GND	DC voltage	Power
5	VBATT	DC voltage	Power
6	GND	DC voltage	Power
7	VBATT	DC voltage	Power
8	GND	DC voltage	Power
9	VBATT	DC voltage	Power
10	GND	DC voltage	Power
11	VBATT	DC voltage	Power
12	GND	DC voltage	Power
13	NC[2]	-	-
14	ON_OFF*	DC voltage	Input command for switching power ON or OFF
15	SIMVCC	1.8V / 3V	External SIM Power
16	SIMIN	1.8V / 3V	External SIM inside detector
17	SIMRST	1.8V / 3V	External SIM Reset
18	SIMIO	1.8V / 3V	External SIM Data I/O
19	SIMCLK	1.8V / 3V	External SIM Clock
20	DAC_OUT	Digital Output	Digital/ Analog converter output
21	TGPIO_01	Digital In/Out	General purpose
22	TGPIO_02/JDR	Digital In/Out	General purpose/Jammer detect report
23	TGPIO_03	Digital In/Out	General purpose
24	TGPIO_04	Digital In/Out	General purpose
25	VRTC	DC voltage	VRTC Backup capacitor
26	ADC_IN1	AC input	Analog/Digital converter input
27	ADC_IN2	AC input	Analog/Digital converter input
28	ADC_IN3	AC input	Analog/Digital converter input
29	-	-	RESERVED
30	-	-	RESERVED
31	TGPIO_07/BUZZER	Digital In/Out	General purpose/Buzzer
32	OUT	Digital Output	General purpose
33	LED	DC voltage	Status indicator led
34	VAUX1	DC voltage	Power output for external accessories
35	TGPIO_05/RFTXMON	Digital In/Out	General purpose/Transmitter ON monitor
36	C125/RING	Digital Output	Output for Ring indicator signal (RI) to DTE
37	C108/DTR	Digital Input	Input for Data terminal ready signal (DTR) from DTE
38	C109/DCD	Digital Output	Output for Data carrier detect signal (DCD) to

[2] do not connect this pin; leave it OPEN

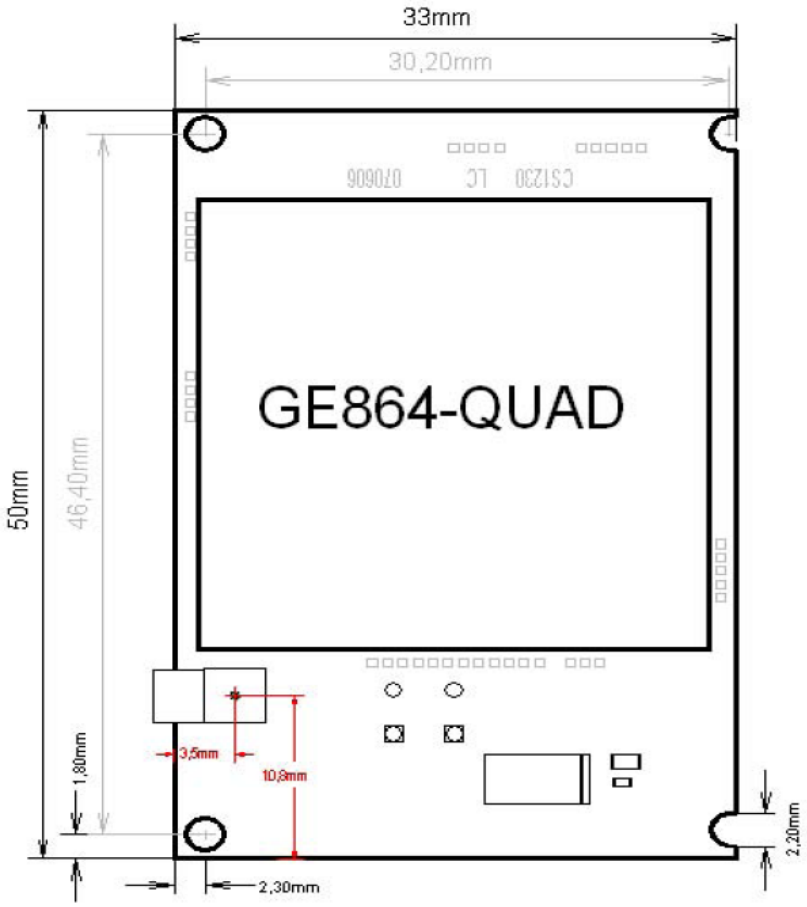
			DTE
39	C105/RTS	Digital Input	Input for Request to send signal (RTS) from DTE
40	C106/CTS	Digital Output	Output for Clear to send signal (CTS) to DTE
41	C103/TXD	Digital Input	Serial data input (TXD) from DTE
42	C104/RXD	Digital Output	Serial data output to DTE
43	NC	-	-
44	NC	-	-
45	NC	-	-
46	NC	-	-
47	-	-	RESERVED
48	-	-	RESERVED
49	-	-	RESERVED
50	-	-	RESERVED
51	-	-	RESERVED
52	-	-	RESERVED
53	MIC_MT+ DEC	Audio Input	Handset microphone signal input; phase+,
54	MIC_MT- DEC	Audio Input	Handset microphone signal input; phase-,
55	EAR_MT+	Audio Output	Handset earphone signal output, phase +
56	EAR_MT-	Audio Output	Handset earphone signal output, phase -
57	EAR_HF+ DEC	Audio Output	Handsfree ear output, phase +
58	-	-	RESERVED
59	MIC_HF+ DEC	Audio Input	Handsfree microphone input; phase +
60	ANALOG GND	AC voltage	

3 Component Layout

Top view



Bottom view


33mm
30,20mm
GE864-QUAD
50mm
46,40mm
1,80mm
3,5mm
10,8mm
2,30mm
2,20mm

4 Service and Firmware Update

You can update the Telit Module firmware through the serial cables (RS232 or USB 1.1) used for the communication with a PC. The firmware update can be done with a specific software tool provided by Telit that runs on windows based PCs.

All levels are conformed to RS232 and V.24 standard and a PC serial port can be directly connected to this connector.

5 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 carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of 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 people (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation EN 50360.

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

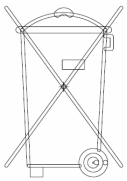
http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm

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

http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm

6 Disposal of old Electrical & Electronic Equipment (WEEE Mark)

This symbol, applied on our products and/or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.



7 Technical Support

Telit Communications S.p.A. technical support to **GC864-C2** customer is included into official website *www.telit.com*, which contains also all available technical documentation to download.

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

8 Document Change Log

Revision	Date	Changes
Rev draft	06/06/2006	First issue
Rev 0	13/09/2006	added P/N 2.3.6 Board to Board connector PINOUT: table updated 3 Component Layout: updated
Rev 1	30/10/2006	added product GC864-PY-C2 1 Overview: updated
Rev 2	23/03/2007	updated pin layout and power consumption
Rev 3	23/05/2007	Introduced new disclaimer Updated pinout table Updated temperature range values
Rev 4	04/09/2007	Updated paragraph 2.3.5 Interfaces
Rev 5	29/07/2008	Updated antenna P/N in the paragraph 2.3.5 Interfaces