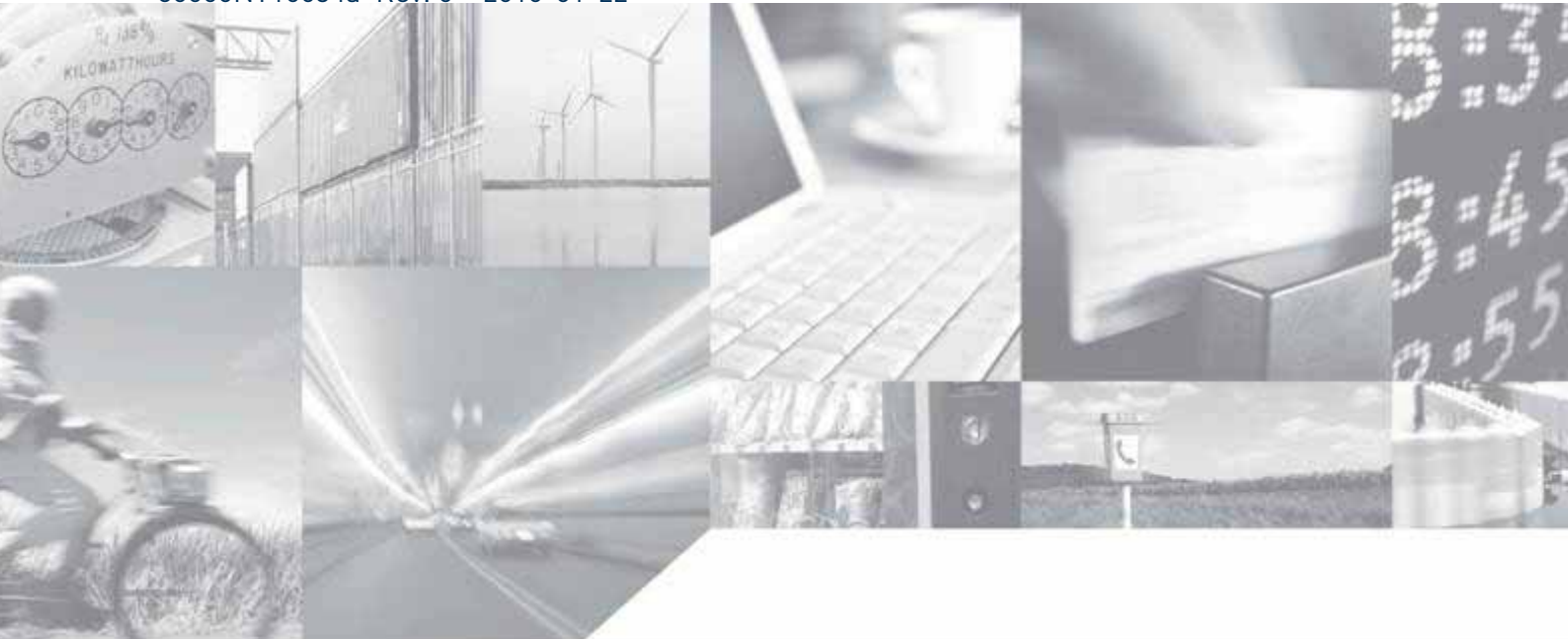


# GC864-QUAD vs GC864-QUAD V2 and GC864-DUAL V2 Application Note

80000NT10034a Rev. 0 - 2010-01-22



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This document is related to the following products:

## APPLICABLE PRODUCTS

| PRODUCT       |
|---------------|
| GC864-QUAD/PY |
| GC864-QUAD V2 |
| GC864-DUAL V2 |



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## 1. Introduction

### 1.1. Scope

This application note is intended to highlight the differences from the hardware point of view, between the GC864-QUAD/PY, GC864-QUAD V2 and GE864-DUAL V2 with the aim to help the system integrator in the design an host application and therefore a PCB, which might host all the GE864 variants. However, this option might require a minimum part list change of the host PCB.

Moreover, this document might help also the system integrator to migrate its application from the use of one version of GC864 to another, for instance from the GC864-QUAD/PY to GC864-QUAD V2 or GC864 DUAL V2.

### 1.2. Contact Information, Support

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

[TS-EMEA@telit.com](mailto:TS-EMEA@telit.com)  
[TS-NORTHAMERICA@telit.com](mailto:TS-NORTHAMERICA@telit.com)  
[TS-LATINAMERICA@telit.com](mailto:TS-LATINAMERICA@telit.com)  
[TS-APAC@telit.com](mailto: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's 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.

Telit appreciates feedback from the users of our information.

### 1.3. 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 suggestion that may be useful when integrating the module.**

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

## 1.4. Related Documents

The following documents are related to:

- GC864-QUAD/PY Hardware User Guide,
- GC864-QUAD/DUAL V2 Hardware User Guide,

## 1.5. Document History

| Revision | Date       | Changes     | Location |
|----------|------------|-------------|----------|
| 0        | 2010-01-22 | First issue | Trieste  |
|          |            |             |          |



## 2. General considerations

Before start with a design of an application that makes use of the GC864-QUAD/PY, GC864-QUAD V2 or GC864-DUAL V2, all the contents of the HW User Guides of the relevant products must be known. This application note is intended to highlight only the differences between those products, and help on some project aspects.



### 3. Comparison table

The following table highlights ONLY the differences in the pin-out functions between the GC864-QUAD/PY, the GC864-QUAD V2 and the GC864-DUAL V2. All other pins that are not mentioned in the table, have maintained exactly the same function on all the product variants. For a complete pin-out table of each product, please consult the relevant Hardware User Guide.

**The yellow color highlights** pins that have common features on all the products, but that have lower tolerance on GC864-QUAD V2 and GC864-DUAL V2 products against the CMOS high level input as described in the paragraph 3.1.

**The green color highlights** pins that have features that are missing, or might have different feature (e.g. different GPIO #) on GC864-QUAD V2 and GC864-DUAL V2 products. Those pins have lower tolerance against the CMOS high level input as described in the paragraph 3.1.

**The blue color highlights** the signals/features that are missing on the GC864-QUAD V2 and GC864-DUAL V2 products.





GC864-QUAD, GC864-QUAD V2, GC864-QUAD Automotive and GE864-QUAD Automotive V2 Application Note  
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| Functions |             |     |   |                  |           | GC864-QUAD   | GC864-QUAD-V2 /DUAL V2      |
|-----------|-------------|-----|---|------------------|-----------|--|-----------------------------|
| Ball      | Signal      | I/O | Description   | Internal PULL UP | Type      |  |                             |
| 8         | AXE         | I   | Handsfree switching                                 | 100K             | CMOS 2.8V | available  | available                   |
| 24        |             |     |   |                  | CMOS 2.8V | TX Data for debug monitor / DVI1_CLK (Digital Voice Interface) | TX Data for debug monitor   |
| 23        |             |     |   |                  | CMOS 2.8V | RX Data for debug monitor / DVI1_WA (Digital Voice Interface)  | RX Data for debug monitor   |
| 47        |             |     |   |                  | CMOS 2.8V | Reserved   | SERVICE                     |
| 25        | C103 / TXD  | I   | Serial data input (TXD) from DTE                    |                  | CMOS 2.8V | available  | available                   |
| 26        | C104 / RXD  | O   | Serial data output to DTE                           |                  | CMOS 2.8V | available  | available                   |
| 29        | C108 / DTR  | I   | Input for Data terminal ready signal (DTR) from DTE |                  | CMOS 2.8V | available  | available                   |
| 31        | C105 / RTS  | I   | Input for Request to send signal (RTS) from DTE     |                  | CMOS 2.8V | available  | available                   |
| 28        | C106 / CTS  | O   | Output for Clear to send signal (CTS) to DTE        |                  | CMOS 2.8V | available  | available                   |
| 32        | C109 / DCD  | O   | Output for Data carrier detect signal (DCD) to DTE  |                  | CMOS 2.8V | available  | available                   |
| 27        |             |     |   |                  | CMOS 2.8V | C107 / DSR / DVI1_RX (Digital Voice Interface)                 | C107 / DSR                  |
| 30        | C125 / RING | O   | Output for Ring indicator signal (RI) to DTE        |                  | CMOS 2.8V | available  | available                   |
| 51        |             |     |   |                  |           | CHARGE, Charger input  | RESERVED                    |
| 51        |             |     |   |                  |           | CHARGE, Charger Input  | RESERVED                    |
| 50        |             |     |   |                  |           | VAUX1  | RESERVED                    |
| 49        | PWR MON     | O   | Power ON Monitor                                    |                  | CMOS 2.8V | available  | available                   |
| 36        |             | I   |   |                  | CMOS 2.8  | DVI2_CLK with internal PULL UP 4.7K                            | DVI_CLK no internal PULL UP |
| 35        |             |     |   |                  |           | DVI1_TX with internal PULL UP 4.7K                             | RESERVED                    |



**GC864-QUAD, GC864-QUAD V2, GC864-QUAD Automotive and GE864-QUAD Automotive V2 Application Note**  
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| Functions |                     |     |  |                  |           | GC864-QUAD                      | GC864-QUAD-V2 /DUAL V2 |
|-----------|---------------------|-----|--|------------------|-----------|---------------------------------|------------------------|
| Ball      | Signal              | I/O | Description                                    | Internal PULL UP | Type      |                                 |                        |
| 62        |                     |     |  |                  |           | GPIO_12 Configurable, CMOS 2.8V | RESERVED               |
| 66        | TGPIO_03            | I/O | GPIO_03 Configurable                           |                  | CMOS 2.8V | available                       | available              |
| 59        | TGPIO_04            | I/O | GPIO_04 Configurable / RF Transmission Control |                  | CMOS 2.8V | available                       | available              |
| 58        |                     |     |  |                  |           | GPIO_20 Configurable, CMOS 2.8V | RESERVED               |
| 60        |                     |     |  |                  |           | GPIO_14 Configurable, CMOS 2.8V | RESERVED               |
| 57        |                     |     |  |                  |           | GPIO_11 Configurable, CMOS 2.8V | RESERVED               |
| 56        |                     |     |  |                  |           | GPIO_19 Configurable, CMOS 2.8V | RESERVED               |
| 70        | TGPIO_01            | I/O | GPIO_01 Configurable                           |                  | CMOS 2.8V | available                       | available              |
| 65        |                     | I/O |  |                  | CMOS 2.8V | GPIO_18 Configurable / DVI2_RX  | DVI_RX                 |
| 71        |                     | I/O |  |                  | CMOS 2.8V | GPIO_17 Configurable / DVI2_WA  | DVI_WA                 |
| 61        |                     |     |  |                  |           | GPIO_15 Configurable CMOS 2.8V  | RESERVED               |
| 67        | TGPIO_08            | I/O | GPIO_08 Configurable                           |                  | CMOS 2.8V | available                       | available              |
| 68        | TGPIO_06 / ALARM    | I/O | GPIO_06 Configurable / ALARM                   |                  | CMOS 2.8V | available                       | available              |
| 76        | TGPIO_09            | I/O | GPIO_09 Configurable                           |                  | CMOS 2.8V | available                       | available              |
| 74        | TGPIO_02 / JDR      | I/O | GPIO_02 Configurable / Jammer detect report    |                  | CMOS 2.8V | available                       | available              |
| 73        | TGPIO_07 / BUZZER   | I/O | GPIO_07 Configurable / Buzzer                  |                  | CMOS 2.8V | available                       | available              |
| 75        |                     |     |  |                  |           | GPIO_16 Configurable, CMOS 2.8V | RESERVED               |
| 77        |                     |     |  |                  |           | GPIO_13 Configurable, CMOS 2.8V | RESERVED               |
| 78        | TGPIO_05 / RFTXM ON | I/O | GPIO_05 Configurable / Transmitter ON monitor  |                  | CMOS 2.8V | available                       | available              |



| Functions |        |     |             |                  |           | GC864-QUAD                            | GC864-QUAD-V2 /DUAL V2           |
|-----------|--------|-----|-------------|------------------|-----------|---------------------------------------|----------------------------------|
| Ball      | Signal | I/O | Description | Internal PULL UP | Type      |                                       |                                  |
| 72        |        |     |             |                  |           | GPIO_21<br>Configurable, CMOS<br>2.8V | RESERVED                         |
| 64        |        |     |             |                  |           | GPIO_22<br>Configurable, CMOS<br>1.8V | RESERVED                         |
| 63        |        | I/O |             |                  | CMOS 2.8V | GPIO_10 Configurable<br>/ DVI2_TX     | GPIO_10<br>Configurable / DVI_TX |

**NOTE:**

For a compatible design, all the pins corresponding to “RESERVED” MUST NOT be connected.



### 3.1. GPIO Logic levels

The GC864-QUAD V2 and GC864-DUAL V2 have a lower tolerance against the high level input compared to the GC864-QUAD, which are highlighted in red in the following subparagraphs. **The same levels must be applied on the serial port pins also.**

#### 3.1.1. GC864-QUAD V2 and GC864-DUAL V2

Where not specifically stated, all the interface circuits work at 2.8V CMOS logic levels. The following table shows the logic level specifications used in the GC864-QUAD V2 and the GC864-DUAL V2 interface circuits:

##### Absolute Maximum Ratings - Not Functional

| Parameter                              | Min   | Max    |
|--|-------|--------|
| Input level on any digital pin when on | -0.3V | +3.1V  |
| Input voltage on analog pins when on   | -0.3V | +3.0 V |

##### Operating Range - Interface levels (2.8V CMOS)

| Level             | Min  | Max   |
|-------------------|------|-------|
| Input high level  | 2.1V | 3.1V  |
| Input low level   | 0V   | 0.5V  |
| Output high level | 2.2V | 3.0V  |
| Output low level  | 0V   | 0.35V |

##### Operating Range - Interface levels (1.8V CMOS)

| Level             | Min   | Max   |
|-------------------|-------|-------|
| Input high level  | 1.6V  | 2.2V  |
| Input low level   | 0V    | 0.4V  |
| Output high level | 1,65V | 2.2V  |
| Output low level  | 0V    | 0.35V |



### 3.1.2. GC864-QUAD / PY

Where not specifically stated, all the interface circuits work at 2.8V CMOS logic levels. The following table shows the logic level specifications used in the GC864-QUAD / PY interface circuits:

#### Absolute Maximum Ratings -Not Functional

| Parameter                              | Min   | Max    |
|--|-------|--------|
| Input level on any digital pin when on | -0.3V | +3.6V  |
| Input voltage on analog pins when on   | -0.3V | +3.0 V |

#### Operating Range - Interface levels (2.8V CMOS)

| Level             | Min  | Max   |
|-------------------|------|-------|
| Input high level  | 2.1V | 3.3V  |
| Input low level   | 0V   | 0.5V  |
| Output high level | 2.2V | 3.0V  |
| Output low level  | 0V   | 0.35V |

#### Operating Range - Interface levels (1.8V CMOS)

| Level             | Min   | Max   |
|-------------------|-------|-------|
| Input high level  | 1.6V  | 2.2V  |
| Input low level   | 0V    | 0.4V  |
| Output high level | 1,65V | 2.2V  |
| Output low level  | 0V    | 0.35V |



#### NOTE:

For a compatible design, the narrower logic levels of the GC864-QUAD V2 / GC864-DUAL V2 MUST be chosen; otherwise there is the risk to damage the unit.



### **3.2. Application SW GPIO configuration**

According to the pin-outs of the products, (see paragraphs 3), the name of GPIO pins are not the same between the products. Therefore, Telit recommends managing this diversity making use of two different initialization files implemented in the software application running on the host PCB.

