Q64 software user guide

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Revision: 003
Date: February 27th, 2008
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Overview

The aim of this document is to provide Wavecom customers with a functional user guide of the Q64 Wireless CPU® on the software point of view, with or without the usage of GR plug-in.
## Document history

<table>
<thead>
<tr>
<th>Level</th>
<th>Date</th>
<th>History of the evolution</th>
<th>Writer</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>November 1 2007</td>
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<td>Wavecom</td>
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<td>January 14 2007</td>
<td>Changed GPIO30 to GPIO28</td>
<td>Wavecom</td>
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<td></td>
<td></td>
<td>Added audio filter coefficients</td>
<td></td>
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<tr>
<td>003</td>
<td>February 27 2008</td>
<td>Added synchronization with Wavecom tools</td>
<td>Wavecom</td>
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1 Introduction

1.1 Related documents

[1] AT Commands Interface Guide for Open AT® Firmware v6.5 (Ref:WM_DEV_OAT_UGD_035) *
   (Ref:WI_DEV_Gx64_UGD_001-003)
[3] GR64 & GS64 Wireless CPU® Release Note – R4B to R4C (Ref:WI_DEV_Gx64_DVD_003)
[4] AT commands delta between GR plug-in and GR64 (Ref: WA_DEV_Q64_UGD_001)

* Please refer to the manual corresponding to the Open AT Software Suite that you are using.
Introduction

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**Abbreviations and glossary**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>Attention</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
</tr>
<tr>
<td>OS</td>
<td>Operating System</td>
</tr>
</tbody>
</table>
2  Q64 with GR plug-in

2.1  GR plug-in concept

GR plug-in is an Open AT® application that translates GR64 AT commands into WMP100 AT commands to help GR64 users porting their application by providing the same syntax for 88% of the existing GR64 AT Commands.

The following figure describes the different cases that are handled by GR plug-in.

![Figure 1: GR plug-in concept](image)

**Case ①**

The AT command is specific to GR64 and is processed by the GR plug-in, which uses the equivalent WMP100 AT command to perform the functional translation. The resulting Q64 AT command can be fully or partially compatible with the original GR64 AT command, depending on the degree of compatibility between WMP100 and GR64. See [4] for more details.

**Case ②**

The AT command is specific to GR64 but is not processed by the GR plug-in, either because the functionality has no equivalent on WMP100, or because the AT command translation will be achieved in a future release of the GR plug-in. In this case, the Q64 AT command will return ERROR. See [4] for more details.

**Case ③**

The AT command is common to both GR64 and WMP100 and is processed by the GR plug-in, which translates the differences (if any) in number of parameters, parameters range… The resulting Q64 AT command is then fully or partially compatible with the original GR64 AT command, depending on the degree of compatibility between WMP100 and GR64. Some of these AT commands may only be translated in a future release of the GR plug-in, therefore case ③ will apply. See [4] for more details.
Q64 with GR plug-in

Q64 synchronization with Wavecom tools when using GR plug-in

Case ②

Through the GR plug-in, Q64 users still have access to the WMP100 AT commands set, except for AT commands common to GR64 and WMP100 that have already been translated as in case ③. See [4] for more details.

2.2 Q64 synchronization with Wavecom tools when using GR plug-in

In order to match GR64 behavior, GR plug-in internally sets CPU®UART1 in auto-baud mode as factory settings. This mode is not compatible with Wavecom tools as Target Monitoring Tool, Terminal Emulator.

To be able to use Wavecom tools with GR plug-in, users have first to set Q64 to a specific baud rate (115200 for example) using AT+IPR command issued from any type of terminal (HyperTerminal for example). Then, Wavecom tools can synchronize to Q64 Wireless CPU®.
3 Q64 without GR plug-in

Some of the Q64 interfaces or functionalities are internally handled by GR plug-in. But without GR plug-in, these interfaces or functionalities must be handled by Q64 users.

3.1 Q64 / WMP100 signals matching table

The following table describes the signals matching between Q64 and WMP100. To access Q64 signals, Q64 users must use WMP100 signals and WMP100 AT commands (see [1]).

<table>
<thead>
<tr>
<th>Q64 signals</th>
<th>WMP100 signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPIO1</td>
<td>GPIO19</td>
</tr>
<tr>
<td>GPIO2</td>
<td>GPIO20</td>
</tr>
<tr>
<td>GPIO3</td>
<td>GPIO21</td>
</tr>
<tr>
<td>GPIO4</td>
<td>GPIO22</td>
</tr>
<tr>
<td>GPIO5/ADIN4</td>
<td>GPIO23 &amp; AUX-ADC1</td>
</tr>
<tr>
<td>GPIO6/LED</td>
<td>GPIO28 &amp; FLASHLED</td>
</tr>
<tr>
<td>GPIO7/DSR1</td>
<td>GPIO40/DSR1</td>
</tr>
<tr>
<td>GPIO8/R1</td>
<td>GPIO42/R1</td>
</tr>
<tr>
<td>GPIO9/RTS1</td>
<td>GPIO38/RTS1</td>
</tr>
<tr>
<td>GPIO10/DTR1</td>
<td>GPIO41/DTR1</td>
</tr>
<tr>
<td>GPIO11/DCD</td>
<td>GPIO43/DCD1</td>
</tr>
<tr>
<td>GPIO12/CTS1</td>
<td>GPIO39/CTS1</td>
</tr>
<tr>
<td>GPIO13/SDA</td>
<td>GPIO27/SDA</td>
</tr>
<tr>
<td>GPIO14/SCL</td>
<td>GPIO26/SCL</td>
</tr>
<tr>
<td>GPIO15</td>
<td>GPIO24</td>
</tr>
<tr>
<td>GPIO16</td>
<td>GPIO30</td>
</tr>
<tr>
<td>GPIO17/DFM1</td>
<td>GPIO37/RXD1</td>
</tr>
<tr>
<td>GPIO18/DTM1</td>
<td>GPIO36/TXD1</td>
</tr>
<tr>
<td>ADIN1</td>
<td>AUX-ADC2/BAT-TEMP</td>
</tr>
<tr>
<td>ADIN2</td>
<td>AUX-ADC0</td>
</tr>
<tr>
<td>ADIN3</td>
<td>AUX-ADC1</td>
</tr>
</tbody>
</table>
3.2 GPIO6/LED special case

The following figure describes the GPIO6/LED schematics

![GPIO6/LED schematics](image)

To avoid conflicts when using GPIO6, FLASH LED must be prior desactivated using AT+WHCNF=1,0 command.

For the same reason, when using LED, GPIO28 must be prior released using AT+WIOM=0,"GPIO28" command.
3.3 **ADIN3 and GPIO5/ADIN4 special case**

The following figure describes the ADIN3 and GPIO5/ADIN4 schematics.

![ADIN3 and GPIO5/ADIN4 schematics](image)

To read ADIN3, GPIO29 must be prior set as output and to 0 using `AT+WIOM=1,"GPIO29",1,0` command.

To read ADIN4, GPIO29 must be prior set as output and to 1 using `AT+WIOM=1,"GPIO29",1,1` command and GPIO23 must be prior released using `AT+WIOM=0,"GPIO23"` command.

3.4 **Power off**

Q64 internally emulates GR64 hardware power off functionality and GR plug-in automatically configures some interface to achieve this. Without GR plug-in, the power off functionality can be configured by entering the following AT commands:

```
AT+WFM=1,"OFFWHENUNPLUG"
AT+WIPC=1,"INT1",0,0
AT&W
```

3.5 **Audio filter coefficients**

Specific audio filter coefficients are required on Q64. These coefficients are automatically set by the GR plug-in and restored when AT&F command is issued. Without GR plug-in, these coefficients are set in production but if AT&F command is issued, WMP100 default audio filter coefficients will be restored. Therefore, if AT&F command is issued, the following AT commands need to be entered to set Q64 audio filter coefficients:

```
AT+WADF=1,1,1092,62123,63373,7314,1092,0,0,52749,3404,12787
AT+WADF=0,2,4032,61562,57484,8051,4032,0,0,61617,3742,3919
```
Q64 without GR plug-in
Audio filter coefficients

AT+WADF=1,3,0,0,1,826,4,43,1,826,0,0,0,0,0,4,096
AT+WADF=0,4,0,0,0,0,0,0,0,0,0,0,4,096