

# **EC2x&AG35-Quecopen**

# **RTC Alarm Clock User**

# **Guide**

**LTE Standard/Automotive Module Series**

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# About the Document

## History

Revision	Date	Author	Description
1.0	2018-04-28	Gale GAO	Initial
1.1	2018-09-30	Gale GAO	Updated the method of setting the system time

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# 1 Introduction

This document mainly introduces the software driver layer and application layer etc. from users' development perspective to help them carry out RTC related development easily and quickly.

This document mainly applies for global market. Currently LTE Standard/Automotive module that supports this includes:

- EC2x: EC20 R2.1/EC25/EC21
- AG35

## 2 Brief Description of EC2x/AG35 RTC

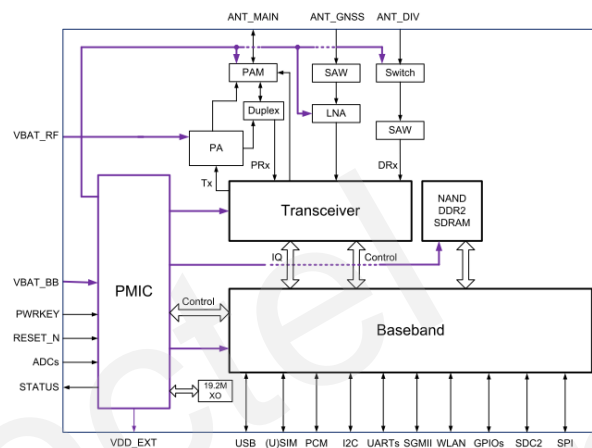
EC2x&AG35 owns one RTC (Real Time Clock) device. Based on the RTC device, users can configure to wake up the module from sleep mode and can also resume the module by alarm or use it as an ordinary timer. Do not directly operate the RTC device, please use it correctly according to this document.

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## 3 Hardware Circuit Design Recommendation

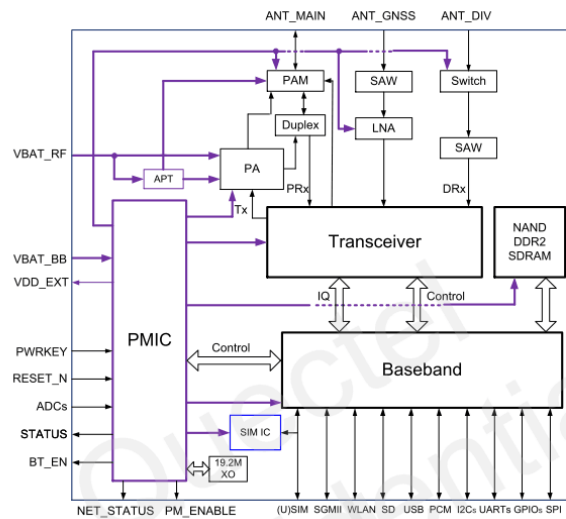
### 3.1. EC2x RTC Hardware Circuit Reference Design



**Figure 1: EC2x RTC Hardware Circuit Reference Design**

Since no dedicated power control pin is provided, the hardware RTC that has already inserted in the PMIC of EC2x platform is powered by VBAT\_BB pin in Figure 1. Therefore, it is important to ensure that VBAT\_BB can provide power normally when EC2x platform is powered off.

### 3.2. AG35 RTC Hardware Circuit Reference Design



**Figure 2: AG35 RTC Hardware Circuit Reference Design**

Since no dedicated power control pin is provided, the hardware RTC that has already inserted in the PMIC of AG35 platform is powered by VBAT\_BB pin in Figure 2. Therefore, it is important to ensure that VBAT\_BB can provide power normally when EC2x platform is powered off.

For more detailed information, please refer to *Quectel\_EC20\_R2.1-QuecOpen\_Hardware\_Design* and *Quectel\_AG35-QuecOpen\_Hardware\_Design*.

## 4 Setting the System Time

In QuecOpen, the background process `ql_time_daemon` will automatically synchronize the system time and maintain the hardware RTC of the module. If it is necessary to modify the time manually, please update the system time as follows:

Write the time information into file `/tmp/ql_time_set_pipe`. Writing format: user: UTC Time (Unit: millisecond)

For example, to set the system time to 20180101 01:01:10, users can do as follows:

```
echo "user: 1514768470000" > /tmp/ql_time_set_pipe
```

Please refer to *Quectel\_EC2x&AG35-QuecOpen\_Linux System Time Description*.

# 5 RTC Shutdown Alarm Clock

## 5.1. Instruction of RTC Shutdown Alarm Clock

Please make the modification referring to the example of "example\_timer.c" in the path of *ql-ol-sdk/ql-ol-extsdk/example/posix\_timer/* according to the specific needs.

## 5.2. Functional Test Verification

Decompress the SDK package. Enter folder *ql-ol-sdk* and compile the example. Reference commands are as follows:

```
$ source ql-ol-crosstool/ql-ol-crosstool-env-init
$ cd ql-ol-extsdk/example/posix_timer/
$ make clean
$ make
```

Generate an executable program named "example\_timer" under the folder path "*ql-ol-sdk/ql-ol-extsdk/example/posix\_timer*" in the SDK. The executable program can be pushed to EC2x/AG35 module file systems via ADB. Reference commands are as follows:

```
$ adb push example_timer /data/
$ adb shell chmod a+x /data/example_timer
```

Enter Linux Shell terminal, and input the following commands to execute the example:

```
$ cd /data/
$ ./example_timer &
```

Then execute the command "**poweroff**" in Linux terminal to shut down the module. About 100s later, the module will automatically boot.

# 6 RTC Wake-up Alarm Clock

## 6.1. Instruction of RTC Wake-up Alarm Clock

Please make the modification referring to the example of "example\_suspend\_alarm.c" in the path of *ql-ol-sdk/ql-ol-extsdk/example/posix\_timer/* according to the specific needs.

## 6.2. Functional Test Verification

Decompress the SDK package. Enter folder *ql-ol-sdk* and compile the example. Reference commands are as follows:

```
$ source ql-ol-crosstool/ql-ol-crosstool-env-init
$ cd ql-ol-extsdk/example/posix_timer/
$ make clean
$ make
```

Generate an executable program named "example\_suspend\_alarm" under the folder path "*ql-ol-sdk/ql-ol-extsdk/example/posix\_timer*" in the SDK. The executable program can be pushed to EC2x/AG35 module file systems via ADB. Reference commands are as follows:

```
$ adb push example_suspend_alarm /data/
$ adb shell chmod a+x /data/example_suspend_alarm
```

Enter Linux Shell terminal, and input the following commands to execute the example:

```
$ cd /data/
$ ./example_suspend_alarm &
```

Then execute the command "**echo mem > /sys/power/autosleep**" in Linux terminal to configure the module to automatically enter the sleep mode, in which case the Linux terminal cannot interact. It can be observed that the system will be awakened in every 5s, at which point Linux terminal can interact.

# 7

## Appendix A References

Table 1: Related Documents

SN	Document Name	Remark
[1]	Quectel_AG35-QuecOpen_Hardware_Design	AG35 Hardware Design Guide
[2]	Quectel_EC20_R2.1-QuecOpen_Hardware_Design	EC20 Hardware Design Guide

Table 2: Terms and Abbreviations

Abbreviation	Description
RTC	Real Time Clock