

# FuelTank Reference Manual

Generated by Doxygen 1.8.6

Fri Jan 10 2014 15:45:44



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# Chapter 1

## FuelTankLibrary

Library for the Fuel Tank BoosterPack

Library

Developed with [embedXcode+](#)

Author

Rei Vilo

<http://embeddedcomputing.weebly.com>

Date

Dec 20, 2013

Version

101

Copyright

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See Also

ReadMe.txt for references

- Fuel Tank BoosterPack
- Datasheet <http://www.ti.com/lit/gpn/bq27520-g3>
- White paper <http://www.ti.com/lit/wp/slpy002/slpy002.pdf>
- Reference <http://www.ti.com/lit/pdf/slua35>
- Comparison BQ27520-G3 to -G4 <http://www.ti.com/lit/pdf/slua658>



## Chapter 2

# Class Index

### 2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<a href="#">FuelTank</a>	
Class for the Fuel Tank BoosterPack . . . . .	<a href="#">7</a>





## Chapter 3

# File Index

### 3.1 File List

Here is a list of all documented files with brief descriptions:

<a href="#">FuelTank.ino</a>	
Main sketch . . . . .	13
<a href="#">FuelTankLibrary.h</a>	
Library header . . . . .	14



## Chapter 4

# Class Documentation

### 4.1 FuelTank Class Reference

Class for the Fuel Tank BoosterPack.

```
#include <FuelTankLibrary.h>
```

#### Public Member Functions

- [FuelTank](#) ()  
*Constructor.*
- void [begin](#) ()  
*Initialise.*
- String [WhoIAm](#) ()  
*Who I Am.*
- void [get](#) ()  
*Acquire all the measures.*
- uint16\_t [temperature\\_oCx10](#) ()  
*Temperature in units of 0.1 °C measured by the fuel gauge.*
- uint16\_t [voltage\\_mV](#) ()  
*Measured voltage of the cell-pack.*
- uint16\_t [flags](#) ()  
*Flags.*
- uint16\_t [nominalAvailableCapacity\\_mAh](#) ()  
*Uncompensated battery capacity remaining.*
- uint16\_t [fullAvailableCapacity\\_mAh](#) ()  
*Uncompensated capacity of fully battery.*
- uint16\_t [remainingCapacity\\_mAh](#) ()  
*Compensated battery capacity remaining.*
- uint16\_t [fullChargeCapacity\\_mAh](#) ()  
*Compensated capacity of fully charged battery.*
- int16\_t [averageCurrent\\_mA](#) ()  
*Average current flow.*
- uint16\_t [timeToEmpty\\_mn](#) ()  
*Predicted remaining battery life at the present rate of discharge.*
- int16\_t [standbyCurrent\\_mA](#) ()  
*Measured standby current.*
- uint16\_t [standbyTimeToEmpty\\_mn](#) ()

- Predicted remaining battery life at the standby rate of discharge.*
  - uint16\_t [stateOfHealth\\_Index](#) ()
- Percentage of the ratio of predicted calculated full charge capacity over nominal capacity of a new pack.*
  - uint16\_t [cycleCount](#) ()
- Number of cycles.*
  - uint16\_t [stateOfCharge\\_Percent](#) ()
- Predicted remaining battery capacity expressed as a percentage of full charge capacity.*
  - int16\_t [instantaneousCurrent\\_mA](#) ()
- Instantaneous current flow.*
  - uint16\_t [internalTemperature\\_oCx10](#) ()
- Internal temperature sensor in units of 0.1 °C measured by the fuel gauge.*
  - uint16\_t [resistanceScale](#) ()
- Resistance scale.*
  - uint16\_t [operationConfiguration](#) ()
- Operation configuration.*
  - uint16\_t [designCapacity\\_mAh](#) ()
- Theoretical or nominal capacity of a new pack.*

#### 4.1.1 Detailed Description

Class for the Fuel Tank BoosterPack.

Based on BQ27510

#### 4.1.2 Member Function Documentation

##### 4.1.2.1 int16\_t FuelTank::averageCurrent\_mA ( )

Average current flow.

Updated once per second

Returns

value in mA

##### 4.1.2.2 void FuelTank::begin ( )

Initialise.

Note

For compatibility only. No operation is performed.

##### 4.1.2.3 uint16\_t FuelTank::cycleCount ( )

Number of cycles.

Returns

number of cycles

#### 4.1.2.4 uint16\_t FuelTank::designCapacity\_mAh ( )

Theoretical or nominal capacity of a new pack.

##### Returns

value in mAh

#### 4.1.2.5 uint16\_t FuelTank::flags ( )

Flags.

##### Returns

See BQ27510 datasheet

#### 4.1.2.6 uint16\_t FuelTank::fullAvailableCapacity\_mAh ( )

Uncompensated capacity of fully battery.

##### Returns

value in mAh

#### 4.1.2.7 uint16\_t FuelTank::fullChargeCapacity\_mAh ( )

Compensated capacity of fully charged battery.

##### Returns

value in mAh

#### 4.1.2.8 int16\_t FuelTank::instantaneousCurrent\_mA ( )

Instantaneous current flow.

##### Returns

value in mA

#### 4.1.2.9 uint16\_t FuelTank::internalTemperature\_oCx10 ( )

Internal temperature sensor in units of 0.1 °C measured by the fuel gauge.

##### Returns

value in oC x 10

#### 4.1.2.10 uint16\_t FuelTank::nominalAvailableCapacity\_mAh ( )

Uncompensated battery capacity remaining.

##### Returns

value in mAh

#### 4.1.2.11 uint16\_t FuelTank::operationConfiguration ( )

Operation configuration.

##### Returns

See BQ27510 datasheet

#### 4.1.2.12 uint16\_t FuelTank::remainingCapacity\_mAh ( )

Compensated battery capacity remaining.

##### Returns

value in mAh

#### 4.1.2.13 uint16\_t FuelTank::resistanceScale ( )

Resistance scale.

##### Returns

See BQ27510 datasheet

#### 4.1.2.14 int16\_t FuelTank::standbyCurrent\_mA ( )

Measured standby current.

##### Returns

value in mA

#### 4.1.2.15 uint16\_t FuelTank::standbyTimeToEmpty\_mn ( )

Predicted remaining battery life at the standby rate of discharge.

##### Returns

value in minutes

#### 4.1.2.16 uint16\_t FuelTank::stateOfCharge\_Percent ( )

Predicted remaining battery capacity expressed as a percentage of full charge capacity.

##### Returns

value in %

#### 4.1.2.17 uint16\_t FuelTank::stateOfHealth\_Index ( )

Percentage of the ratio of predicted calculated full charge capacity over nominal capacity of a new pack.

##### Returns

value in %

#### 4.1.2.18 uint16\_t FuelTank::temperature\_oCx10 ( )

Temperature in units of 0.1 °C measured by the fuel gauge.

##### Returns

in oC x10

#### 4.1.2.19 uint16\_t FuelTank::timeToEmpty\_mn ( )

Predicted remaining battery life at the present rate of discharge.

##### Returns

value in minutes

#### 4.1.2.20 uint16\_t FuelTank::voltage\_mV ( )

Measured voltage of the cell-pack.

##### Returns

in mV

#### 4.1.2.21 String FuelTank::WhoIAm ( )

Who I Am.

##### Returns

Short description, String

The documentation for this class was generated from the following files:

- [FuelTankLibrary.h](#)
- [FuelTankLibrary.cpp](#)





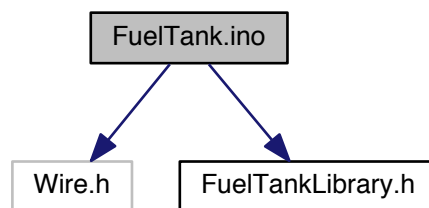
## Chapter 5

# File Documentation

### 5.1 FuelTank.ino File Reference

Main sketch.

```
#include "Wire.h"
#include "FuelTankLibrary.h"
Include dependency graph for FuelTank.ino:
```



#### Functions

- void `display` (String message, int32\_t value, int16\_t unit=1)  
*Display routine.*
- void `setup` ()  
*Setup code.*
- void `loop` ()  
*Loop code.*

#### Variables

- `FuelTank myFuelTank`  
*Fuel tank instantiation.*

### 5.1.1 Detailed Description

Main sketch. Example for the Fuel Tank BoosterPack libray

Developed with [embedXcode+](#)

#### Author

Rei Vilo

<http://embeddedcomputing.weebly.com>

#### Date

Dec 20, 2013

#### Version

101

#### Copyright

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#### See Also

ReadMe.txt for references

### 5.1.2 Function Documentation

#### 5.1.2.1 void display ( String *message*, int32\_t *value*, int16\_t *unit* = 1 )

Display routine.

Based on integers to save memory!

#### Parameters

<i>message</i>	message, string
<i>value</i>	actually value x unit
<i>unit</i>	1=default, otherwise 10, 100, ...

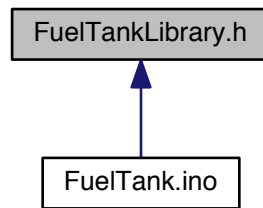
#### Note

value=12, unit=10 means  $12/10 = 1.2$

## 5.2 FuelTankLibrary.h File Reference

Library header.

This graph shows which files directly or indirectly include this file:



## Classes

- class [FuelTank](#)  
*Class for the Fuel Tank BoosterPack.*

## Macros

- #define [FuelTankLibrary\\_RELEASE](#) 101  
*Library release.*
- #define [BQ27510\\_RELEASE](#) 3  
*BQ27510 release.*

### 5.2.1 Detailed Description

Library header.

**Project** FuelTankLibrary

*Developed with* [embedXcode+](#)

#### Author

Rei Vilo  
Rei Vilo

#### Date

20/12/2013 16:49

#### Version

101

#### Copyright

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#### See Also

ReadMe.txt for references

## 5.2.2 Macro Definition Documentation

### 5.2.2.1 `#define BQ27510_RELEASE 3`

BQ27510 release.

2 to BQ27510-G2, 3 for BQ27510-G3

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