

Electroics investigation test code - SPI ADC
v1.0-0

Generated by Doxygen 1.8.1.2

Fri Mar 22 2013 18:56:07

Contents

1	Class Index	1
1.1	Class List	1
2	File Index	3
2.1	File List	3
3	Class Documentation	5
3.1	voltageReader Class Reference	5
3.1.1	Detailed Description	5
3.1.2	Constructor & Destructor Documentation	6
3.1.2.1	voltageReader	6
3.1.3	Member Function Documentation	6
3.1.3.1	readMAX146	6
3.1.3.2	readVoltage	6
3.1.3.3	voltage	6
3.1.4	Member Data Documentation	6
3.1.4.1	fetch	6
4	File Documentation	7
4.1	voltageReader.cpp File Reference	7
4.1.1	Macro Definition Documentation	7
4.1.1.1	ARRAY_SIZE	7
4.2	voltageReader.h File Reference	8

Chapter 1

Class Index

1.1 Class List

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

voltageReader	5
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Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

voltageReader.cpp	7
voltageReader.h	8

Chapter 3

Class Documentation

3.1 voltageReader Class Reference

```
#include <voltageReader.h>
```

Signals

- void [voltage](#) (int adc, int chan, double volts)
Returns the channel voltage to the main event loop.

Public Member Functions

- [voltageReader](#) (QObject *parent=0)

Private Slots

- void [readVoltage](#) ()
- void [readMAX146](#) ()

Private Attributes

- QTimer * [fetch](#)
This timer controls the frequency at which the ADC is queried.

3.1.1 Detailed Description

This class reads a voltage from an ADC attached to the Raspberry PI's GPIO header. The class uses the QT framework to pass data back to the main event loop using the "voltage" signal. It is possible to use a QThread to run in this reader in a separate thread, thereby maintaining responsiveness elsewhere. A preset calibration is currently applied to channel 3. Clearly this should be changed (to a user-prescribed value) prior to use in production code. The following chips are currently supported:

IC Name	Manufacturer	Interface	Channels	Bits
MAX146	Maxim Semiconductors	SPI	8	12

3.1.2 Constructor & Destructor Documentation

3.1.2.1 `voltageReader::voltageReader (QObject * parent = 0)`

The constructor initialises and starts the timer to handle data fetches.

3.1.3 Member Function Documentation

3.1.3.1 `void voltageReader::readMAX146 () [private],[slot]`

This is the driver for the MAX146. It uses the SPI bus to read from the chip, and as such requires the "spi-bcm2708" module to be loaded. Currently this code only reads channel 3. Refer to the MAX146 datasheet for the correct control byte to send in order to read other channels. The chip-select line is not driven by this code, and so relies on it being held low at all times. This is fine for a single ADC, but not for a multiple setup. Any GPIO pin could be used as a chip-select line. When the channel has been read, the data is passed back to the main event loop using the "voltage" signal.

3.1.3.2 `void voltageReader::readVoltage () [private],[slot]`

This is a convenience function to read data from the currently configured ADC.

3.1.3.3 `void voltageReader::voltage (int adc, int chan, double volts) [signal]`

3.1.4 Member Data Documentation

3.1.4.1 `QTimer* voltageReader::fetch [private]`

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

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

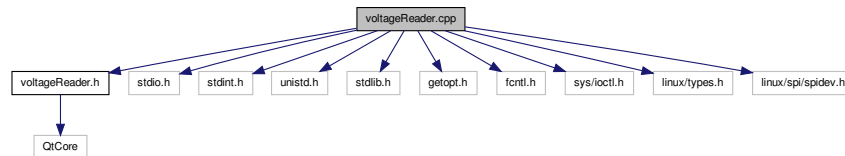
Chapter 4

File Documentation

4.1 voltageReader.cpp File Reference

```
#include "voltageReader.h"  
#include <stdio.h>  
#include <stdint.h>  
#include <unistd.h>  
#include <stdlib.h>  
#include <getopt.h>  
#include <fcntl.h>  
#include <sys/ioctl.h>  
#include <linux/types.h>  
#include <linux/spi/spidev.h>
```

Include dependency graph for voltageReader.cpp:



Macros

- #define [ARRAY_SIZE](#)(array) sizeof(array)/sizeof(array[0])

4.1.1 Macro Definition Documentation

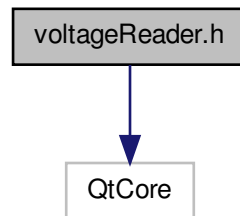
4.1.1.1 #define [ARRAY_SIZE](#)(array) sizeof(array)/sizeof(array[0])

This macro returns the number of elements in an array. It is used when sending SPI data to reduce the likelihood of reading or writing past the sent or received array.

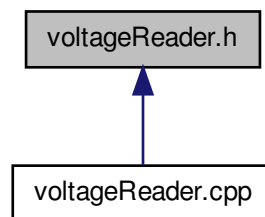
4.2 voltageReader.h File Reference

```
#include <QtCore>
```

Include dependency graph for voltageReader.h:



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



Classes

- class [voltageReader](#)

Index

ARRAY_SIZE
 voltageReader.cpp, [7](#)

fetch
 voltageReader, [6](#)

readMAX146
 voltageReader, [6](#)

readVoltage
 voltageReader, [6](#)

voltage
 voltageReader, [6](#)

voltageReader, [5](#)
 fetch, [6](#)

 readMAX146, [6](#)

 readVoltage, [6](#)

 voltage, [6](#)

 voltageReader, [6](#)

 voltageReader, [6](#)

voltageReader.cpp, [7](#)

 ARRAY_SIZE, [7](#)

voltageReader.h, [8](#)