libmcp23s17

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Chapter 1

libmcp23s17 - A simple C library for the MCP23S17 port expander.

mcp23s17.h

1.1 Links

- piface.org.uk
- piface product source code
- Source code on GitHub

1.2 Using the library

Download:

```
$ git clone https://github.com/piface/libmcp23s17.git
```

Build the library:

```
$ cd libmcp23s17/
$ make
```

This creates the library `libmcp23s17.a`. Build the example (using PiFace Digital):

```
$ make example
```

Include the library in your project with:

```
$ gcc -o example example.c -Isrc/ -L. -lmcp23s17
```

`-I` directories to search for header files. `-L` directories to search for libraries. `-l` libraries to link.

1.3 Todo

Feel free to contribute!

- Debian install
- Interrupts (using epoll?)

Chapter 2

File Index

2.1 File List

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

/home/tom/Work/pifacehome/libmcp23s17/src/mcp23s17.h
A simple static library for controlling an MCP23S17 port expander over SPI 5

Chapter 3

File Documentation

3.1 /home/tom/Work/pifacehome/libmcp23s17/src/mcp23s17.h File Reference

A simple static library for controlling an MCP23S17 port expander over SPI.

```
#include <stdint.h>
```

Macros

- #define **WRITE_CMD** 0
- #define **READ_CMD** 1
- #define **IODIRA** 0x00
- #define **IODIRB** 0x01
- #define **IPOLA** 0x02
- #define **IPOLB** 0x03
- #define **GPINTENA** 0x04
- #define **GPINTENB** 0x05
- #define **DEFVALA** 0x06
- #define **DEFVALB** 0x07
- #define **INTCONA** 0x08
- #define **INTCONB** 0x09
- #define **IOCON** 0x0A
- #define **GPPUA** 0x0C
- #define **GPPUB** 0x0D
- #define **INTFA** 0x0E
- #define **INTFB** 0x0F
- #define **INTCAPA** 0x10
- #define **INTCAPB** 0x11
- #define **GPIOA** 0x12
- #define **GPIOB** 0x13
- #define **OLATA** 0x14
- #define **OLATB** 0x15
- #define **BANK_OFF** 0x00
- #define **BANK_ON** 0x80
- #define **INT_MIRROR_ON** 0x40
- #define **INT_MIRROR_OFF** 0x00
- #define **SEQOP_OFF** 0x20
- #define **SEQOP_ON** 0x00
- #define **DISSLW_ON** 0x10

- #define **DISSLW_OFF** 0x00
- #define **HAEN_ON** 0x08
- #define **HAEN_OFF** 0x00
- #define **ODR_ON** 0x04
- #define **ODR_OFF** 0x00
- #define **INTPOL_HIGH** 0x02
- #define **INTPOL_LOW** 0x00

Functions

- int mcp23s17_open (int bus, int chip_select)
- uint8_t mcp23s17_read_reg (uint8_t reg, uint8_t hw_addr, int fd)
- void mcp23s17_write_reg (uint8_t data, uint8_t reg, uint8_t hw_addr, int fd)
- uint8_t mcp23s17_read_bit (uint8_t bit_num, uint8_t reg, uint8_t hw_addr, int fd)
- void mcp23s17_write_bit (uint8_t data, uint8_t bit_num, uint8_t reg, uint8_t hw_addr, int fd)

3.1.1 Detailed Description

A simple static library for controlling an MCP23S17 port expander over SPI. Datasheet: http://ww1.microchip.com/downloads/en/devicedoc/21952b.pdf

3.1.2 Function Documentation

3.1.2.1 int mcp23s17_open (int *bus*, int *chip_select*)

Returns a file descriptor for the SPI device through which the MCP23S17 port expander can be accessed.

Parameters

bus	The SPI bus.
chip_select	The SPI chip select.

3.1.2.2 uint8_t mcp23s17_read_bit (uint8_t *bit_num*, uint8_t *reg*, uint8_t *hw_addr*, int *fd*)

Reads a single bit from the register specified. Must also specify which hardware address and file descriptor to use.

Parameters

bit_num	The bit number to read.
reg	The register to read from (example: IODIRA, GPIOA).
hw_addr	The hardware address of the MCP23S17.
fd	The file descriptor returned from <mcp23s17_open>"()".

3.1.2.3 uint8_t mcp23s17_read_reg (uint8_t *reg*, uint8_t *hw_addr*, int *fd*)

Returns the 8 bit value from the register specified. Must also specify which hardware address and file descriptor to use.

Parameters

reg	The register to read from (example: IODIRA, GPIOA).
hw_addr	The hardware address of the MCP23S17.
fd	The file descriptor returned from <mcp23s17_open>"()".

3.1.2.4 void mcp23s17_write_bit (uint8_t *data*, uint8_t *bit_num*, uint8_t *reg*, uint8_t *hw_addr*, int *fd*)

Writes a single bit to the register specified. Must also specify which hardware address and file descriptor to use.

Parameters

data	The data to write.
bit_num	The bit number to write to.
reg	The register to write to (example: IODIRA, GPIOA).
hw_addr	The hardware address of the MCP23S17.
fd	The file descriptor returned from <mcp23s17_open>"()".

3.1.2.5 void mcp23s17_write_reg (uint8_t *data*, uint8_t *reg*, uint8_t *hw_addr*, int *fd*)

Writes an 8 bit value to the register specified. Must also specify which hardware address and file descriptor to use.

Parameters

data	The data byte to be written.
reg	The register to write to (example: IODIRA, GPIOA).
hw_addr	The hardware address of the MCP23S17.
fd	The file descriptor returned from <mcp23s17_open>"()".

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