



lib_i2c: I²C library (README)

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vendor

XMOS

version

6.4.0

scope

General Use

description

I²C controller and peripheral library

category

General Purpose

keywords

IQ, I²C

devices

xcore.ai, xcore-200

1 Summary

I²C (Inter-Integrated Circuit) is a multi-master, multi-slave, synchronous, serial communication protocol used for communication between integrated circuits on the same board. Developed by Philips, it requires only two lines: the *SDA* (Serial Data Line) for data transfer and *SCL* (Serial Clock Line) for clock signals. I²C is popular in applications for connecting low-speed peripherals like sensors, EEPROMs, and ADCs. It supports various data rates, typically up to 3.4 Mbps in Fast Mode Plus and Ultra-Fast Mode, and allows multiple devices to share the same bus.

lib_i2c contains a software defined, industry-standard, I²C library that allows control of an I²C bus via *xcore* ports.

lib_i2c provides both controller (“master”) and peripheral (“slave”) functionality.

The I²C master component can be used by multiple tasks within the *xcore* device (each addressing the same or different peripheral devices).

The library can also be used to implement multiple I²C physical interfaces on a single *xcore* device simultaneously.



2 Features

- ▶ I²C controller (master) and I²C peripheral (slave) modes
- ▶ Supports speed up to 400 Kb/s (I²C Fast-mode)
- ▶ Clock stretching support
- ▶ Synchronous and asynchronous APIs

3 Known issues

- ▶ The library has functions that wait on SCL high, through either an event or a polling loop. If these are called on a system where the pull up isn't present then the application can hang forever.

4 Development repo

- ▶ https://github.com/xmos/lib_i2c

5 Required tools

- ▶ XMOS XTC Tools: 15.3.0

6 Required libraries (dependencies)

- ▶ lib_xassert (www.github.com/xmos/lib_xassert)

7 Related application notes

The following application notes use this library:

- ▶ AN00156: How to use the I²C master library
- ▶ AN00157: How to use the I²C slave library
- ▶ AN00181: xcore-200 explorer accelerometer demo

8 Support

This package is supported by XMOS Ltd. Issues can be raised against the software at www.xmos.com/support



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