

Kernel driver pcf8591

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Supported chips:

- \* Philips/NXP PCF8591

- Prefix: 'pcf8591'

- Addresses scanned: I2C 0x48 - 0x4f

- Datasheet: Publicly available at the NXP website

- [http://www.nxp.com/pip/PCF8591\\_6.html](http://www.nxp.com/pip/PCF8591_6.html)

Authors:

- Aurelien Jarno <aurelien@aurel32.net>

- valuable contributions by Jan M. Sendler <sendler@sendler.de>,

- Jean Delvare <khali@linux-fr.org>

Description

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The PCF8591 is an 8-bit A/D and D/A converter (4 analog inputs and one analog output) for the I2C bus produced by Philips Semiconductors (now NXP). It is designed to provide a byte I2C interface to up to 4 separate devices.

The PCF8591 has 4 analog inputs programmable as single-ended or differential inputs :

- mode 0 : four single ended inputs

- Pins AIN0 to AIN3 are single ended inputs for channels 0 to 3

- mode 1 : three differential inputs

- Pins AIN3 is the common negative differential input

- Pins AIN0 to AIN2 are positive differential inputs for channels 0 to 2

- mode 2 : single ended and differential mixed

- Pins AIN0 and AIN1 are single ended inputs for channels 0 and 1

- Pins AIN2 is the positive differential input for channel 3

- Pins AIN3 is the negative differential input for channel 3

- mode 3 : two differential inputs

- Pins AIN0 is the positive differential input for channel 0

- Pins AIN1 is the negative differential input for channel 0

- Pins AIN2 is the positive differential input for channel 1

- Pins AIN3 is the negative differential input for channel 1

See the datasheet for details.

Module parameters

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\* input\_mode int

Analog input mode:

- 0 = four single ended inputs

- 1 = three differential inputs

- 2 = single ended and differential mixed

- 3 = two differential inputs

Accessing PCF8591 via /sys interface

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! Be careful !

The PCF8591 is plainly impossible to detect! Stupid chip.  
So every chip with address in the interval [0x48..0x4f] is detected as PCF8591. If you have other chips in this address range, the workaround is to load this module after the one for your others chips.

On detection (i.e. insmod, modprobe et al.), directories are being created for each detected PCF8591:

/sys/bus/i2c/devices/<0>-<1>/

where <0> is the bus the chip was detected on (e. g. i2c-0)  
and <1> the chip address ([48..4f])

Inside these directories, there are such files:

in0\_input, in1\_input, in2\_input, in3\_input, out0\_enable, out0\_output, name

Name contains chip name.

The in0\_input, in1\_input, in2\_input and in3\_input files are RO. Reading gives the value of the corresponding channel. Depending on the current analog inputs configuration, files in2\_input and in3\_input may not exist. Values range from 0 to 255 for single ended inputs and -128 to +127 for differential inputs (8-bit ADC).

The out0\_enable file is RW. Reading gives "1" for analog output enabled and "0" for analog output disabled. Writing accepts "0" and "1" accordingly.

The out0\_output file is RW. Writing a number between 0 and 255 (8-bit DAC), send the value to the digital-to-analog converter. Note that a voltage will only appears on AOUT pin if aout0\_enable equals 1. Reading returns the last value written.