Kernel driver pcf8591

Supported chips:

- Philips/NXP PCF8591

  Prefix: 'pcf8591'

  Addresses scanned: none

  Datasheet: Publicly available at the NXP website

  http://www.nxp.com/pip/PCF8591_6.html

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Description

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

- 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

The PCF8591 is plainly impossible to detect! Thus the driver won't even try. You have to explicitly instantiate the device at the relevant address (in the interval [0x48..0x4f]) either through platform data, or using the sysfs interface. See Documentation/i2c/instantiating-devices.rst for details.

Directories are being created for each instantiated PCF8591:

/sys/bus/i2c/devices/<0>-<1>/
  where <0> is the bus the chip is connected to (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.