Kernel driver bh1770glc

Supported chips:

- ROHM BH1770GLC
- OSRAM SFH7770

Data sheet: Not freely available

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Description

BH1770GLC and SFH7770 are combined ambient light and proximity sensors. ALS and proximity parts operates on their own, but they shares common I2C interface and interrupt logic. In principle they can run on their own, but ALS side results are used to estimate reliability of the proximity sensor.

ALS produces 16 bit lux values. The chip contains interrupt logic to produce low and high threshold interrupts.

Proximity part contains IR-led driver up to 3 IR leds. The chip measures amount of reflected IR light and produces proximity result. Resolution is 8 bit. Driver supports only one channel. Driver uses ALS results to estimate reliability of the proximity results. Thus ALS is always running while proximity detection is needed.

Driver uses threshold interrupts to avoid need for polling the values. Proximity low interrupt doesn't exists in the chip. This is simulated by using a delayed work. As long as there is proximity threshold above interrupts the delayed work is pushed forward. So, when proximity level goes below the threshold value, there is no interrupt and the delayed work will finally run. This is handled as no proximity indication.

Chip state is controlled via runtime pm framework when enabled in config.

Calibscale factor is used to hide differences between the chips. By default value set to neutral state meaning factor of 1.00. To get proper values, calibrated source of light is needed as a reference. Calibscale factor is set so that measurement produces about the expected lux value.

SYSFS

chip_id

RO - shows detected chip type and version

power_state

RW - enable / disable chip

Uses counting logic

- 1 enables the chip
- 0 disables the chip

lux0_input

RO - measured lux value

sysfs_notify called when threshold interrupt occurs

lux0_sensor_range

RO - lux0_input max value

lux0_rate

RW - measurement rate in Hz

lux0_rate_avail

RO - supported measurement rates

lux0_thresh_above_value

RW - HI level threshold value

All results above the value trigs an interrupt. 65535 (i.e. sensor_range) disables the above interrupt.

lux0_thresh_below_value

RW - LO level threshold value

All results below the value trigs an interrupt. 0 disables the below interrupt.

lux0_calibscale

RW - calibration value

Set to neutral value by default. Output results are multiplied with calibscale / calibscale_default value.

lux0_calibscale_default

RO - neutral calibration value

prox0_raw

RO - measured proximity value

sysfs_notify called when threshold interrupt occurs

prox0_sensor_range

RO - prox0_raw max value

prox0_raw_en

RW - enable / disable proximity

Uses counting logic

- 1 enables the proximity
- 0 disables the proximity

prox0_thresh_above_count

RW - number of proximity interrupts needed before triggering the event

prox0_rate_above

RW - Measurement rate (in Hz) when the level is above threshold i.e. when proximity on has been reported.

prox0_rate_below

RW - Measurement rate (in Hz) when the level is below threshold i.e. when proximity off has been reported.

prox0_rate_avail

RO - Supported proximity measurement rates in Hz

prox0_thresh_above0_value

RW - threshold level which trigs proximity events.

Filtered by persistence filter (prox0_thresh_above_count)

prox0_thresh_above1_value

RW - threshold level which trigs event immediately