Adafruit_PWMServoDriver Class Reference

Class that stores state and functions for interacting with PCA9685 PWM chip. More...

`#include <Adafruit_PWMServoDriver.h>`

Public Member Functions

Adafruit_PWMServoDriver ()
Instantiates a new PCA9685 PWM driver chip with the I2C address on a TwoWire interface.

Adafruit_PWMServoDriver (const uint8_t addr)
Instantiates a new PCA9685 PWM driver chip with the I2C address on a TwoWire interface. More...

Adafruit_PWMServoDriver (const uint8_t addr, TwoWire &i2c)
Instantiates a new PCA9685 PWM driver chip with the I2C address on a TwoWire interface. More...

void **begin** (uint8_t prescale=0)
Setups the I2C interface and hardware. More...

void **reset** ()
Sends a reset command to the PCA9685 chip over I2C.

void **sleep** ()
Puts board into sleep mode.

void **wakeup** ()
Wakes board from sleep.

void **setExtClk** (uint8_t prescale)
Sets EXTCLK pin to use the external clock. More...

void **setPWMFreq** (float freq)
Sets the PWM frequency for the entire chip, up to ~1.6 KHz. More...

void **setOutputMode** (bool totempole)
Sets the output mode of the PCA9685 to either open drain or push pull / totempole. Warning: LEDs with integrated zener diodes should only be driven in open drain mode. More...

uint8_t **getPWM** (uint8_t num)
Gets the PWM output of one of the PCA9685 pins. More...

uint8_t **setPWM** (uint8_t num, uint16_t on, uint16_t off)
Sets the PWM output of one of the PCA9685 pins. More...

void **setPin** (uint8_t num, uint16_t val, bool invert=false)
Helper to set pin PWM output. Sets pin without having to deal with on/off tick placement and properly handles a zero value as completely off and 4095 as completely on. Optional invert parameter supports inverting the pulse for sinking to ground. More...

uint8_t **readPrescale** (void)
Reads set Prescale from PCA9685. More...

void **writeMicroseconds** (uint8_t num, uint16_t Microseconds)
Sets the PWM output of one of the PCA9685 pins based on the input microseconds, output is not precise. More...

void	**setOscillatorFrequency** (uint32_t freq) Setter for the internally tracked oscillator used for freq calculations. More...
uint32_t	**getOscillatorFrequency** (void) Getter for the internally tracked oscillator used for freq calculations. More...

Detailed Description

Class that stores state and functions for interacting with PCA9685 PWM chip.

Constructor & Destructor Documentation

◆ Adafruit_PWMServoDriver() [1/2]

Adafruit_PWMServoDriver::Adafruit_PWMServoDriver (const uint8_t addr)

Instantiates a new PCA9685 PWM driver chip with the I2C address on a TwoWire interface.

Parameters

addr The 7-bit I2C address to locate this chip, default is 0x40

◆ Adafruit_PWMServoDriver() [2/2]

Adafruit_PWMServoDriver::Adafruit_PWMServoDriver (const uint8_t addr,
TwoWire & i2c
)

Instantiates a new PCA9685 PWM driver chip with the I2C address on a TwoWire interface.

Parameters

addr The 7-bit I2C address to locate this chip, default is 0x40

i2c A reference to a 'TwoWire' object that we'll use to communicate with

Member Function Documentation

◆ begin()

void Adafruit_PWMServoDriver::begin (uint8_t prescale = 0)

Setups the I2C interface and hardware.

Parameters

prescale Sets External Clock (Optional)

◆ setExtClk()

void Adafruit_PWMServoDriver::setExtClk (uint8_t prescale)

Sets EXTCLK pin to use the external clock.

Parameters

prescale Configures the prescale value to be used by the external clock

◆ setPWMFreq()

void Adafruit_PWMServoDriver::setPWMFreq (float freq)

Sets the PWM frequency for the entire chip, up to ~1.6 KHz.

Parameters

freq Floating point frequency that we will attempt to match

◆ setOutputMode()

void Adafruit_PWMServoDriver::setOutputMode (bool totempole)

Sets the output mode of the PCA9685 to either open drain or push pull / totempole. Warning: LEDs with integrated zener diodes should only be driven in open drain mode.

Parameters

totempole Totempole if true, open drain if false.

◆ getPWM()

uint8_t Adafruit_PWMServoDriver::getPWM (uint8_t num)

Gets the PWM output of one of the PCA9685 pins.

Parameters

num One of the PWM output pins, from 0 to 15

Returns

requested PWM output value

◆ setPWM()

uint8_t Adafruit_PWMServoDriver::setPWM (uint8_t num,
uint16_t on,
uint16_t off
)

Sets the PWM output of one of the PCA9685 pins.

Parameters

num One of the PWM output pins, from 0 to 15

on At what point in the 4096-part cycle to turn the PWM output ON

off At what point in the 4096-part cycle to turn the PWM output OFF

Returns

result from endTransmission

◆ setPin()

```
void Adafruit_PWMServoDriver::setPin ( uint8_t  num,
                                       uint16_t val,
                                       bool     invert = false
                                     )
```

Helper to set pin PWM output. Sets pin without having to deal with on/off tick placement and properly handles a zero value as completely off and 4095 as completely on. Optional invert parameter supports inverting the pulse for sinking to ground.

Parameters

num One of the PWM output pins, from 0 to 15

val The number of ticks out of 4096 to be active, should be a value from 0 to 4095 inclusive.

invert If true, inverts the output, defaults to 'false'

◆ readPrescale()

```
uint8_t Adafruit_PWMServoDriver::readPrescale ( void )
```

Reads set Prescale from PCA9685.

Returns

prescale value

◆ writeMicroseconds()

```
void Adafruit_PWMServoDriver::writeMicroseconds ( uint8_t  num,
                                                  uint16_t Microseconds
                                                )
```

Sets the PWM output of one of the PCA9685 pins based on the input microseconds, output is not precise.

Parameters

num One of the PWM output pins, from 0 to 15

Microseconds The number of Microseconds to turn the PWM output ON

◆ setOscillatorFrequency()

void Adafruit_PWMServoDriver::setOscillatorFrequency (uint32_t freq)

Setter for the internally tracked oscillator used for freq calculations.

Parameters

freq The frequency the PCA9685 should use for frequency calculations

◆ getOscillatorFrequency()

uint32_t Adafruit_PWMServoDriver::getOscillatorFrequency (void)

Getter for the internally tracked oscillator used for freq calculations.

Returns

The frequency the PCA9685 thinks it is running at (it cannot introspect)

The documentation for this class was generated from the following files:

- **Adafruit_PWMServoDriver.h**
- **Adafruit_PWMServoDriver.cpp**