

NAME

gpioiic - GPIO I2C bit-banging device driver

SYNOPSIS

To compile this driver into the kernel, place the following lines in your kernel configuration file:

```
device gpio
device gpioiic
device iicbb
device iicbus
```

Alternatively, to load the driver as a module at boot time, place the following line in loader.conf(5):

```
gpioiic_load="YES"
```

DESCRIPTION

The **gpioiic** driver provides an IIC bit-banging interface using two GPIO pins for the SCL and SDA lines on the bus.

gpioiic simulates an open collector kind of output when managing the pins on the bus, even on systems which don't directly support configuring gpio pins in that mode. The pins are never driven to the logical value of '1'. They are driven to '0' or switched to input mode (Hi-Z/tri-state), and an external pullup resistor pulls the line to the 1 state unless some other device on the bus is driving it to 0.

HINTS CONFIGURATION

On a device.hints(5) based system, such as MIPS, these values are configurable for **gpioiic**:

hint.gpioiic.%d.at The **gpiobus** you are attaching to. Normally just gpiobus0 on systems with a single bank of gpio pins.

hint.gpioiic.%d.pins This is a bitmask of the pins on the **gpiobus** that are to be used for SCLOCK and SDATA from the GPIO IIC bit-banging bus. To configure pin 0 and 7, use the bitmask of 0b10000001 and convert it to a hexadecimal value of 0x0081. Please note that this mask should only ever have two bits set (any other bits - i.e., pins - will be ignored). Because **gpioiic** must be a child of the gpiobus, both gpio pins must be part of that bus.

hint.gpioiic.%d.scl Indicates which bit in the *hint.gpioiic.%d.pins* should be used as the SCLOCK source. Optional, defaults to 0.

hint.gpioiic.%d.sda Indicates which bit in the *hint.gpioiic.%d.pins* should be used as the SDATA source. Optional, defaults to 1.

FDT CONFIGURATION

On an FDT(4) based system, such as ARM, the DTS node for **gpioiic** conforms to the standard bindings document `i2c/i2c-gpio.yaml`. The device node typically appears at the root of the device tree. The following is an example of a **gpioiic** node with one slave device on the IIC bus:

```
/ {
    gpioiic0 {
        compatible = "i2c-gpio";
        pinctrl-names = "default";
        pinctrl-0 = <&pinctrl_gpioiic0>;
        scl-gpios = <&gpio1 5 GPIO_ACTIVE_HIGH>;
        sda-gpios = <&gpio7 11 GPIO_ACTIVE_HIGH>;
        status = "okay";

        /* One slave device on the i2c bus. */
        rtc@51 {
            compatible="nxp,pcf2127";
            reg = <0x51>;
            status = "okay";
        };
    };
};
```

Where:

compatible Should be set to "i2c-gpio". The deprecated string "gpioiic" is also accepted for backwards compatibility.

scl-gpios sda-gpios

These properties indicate which GPIO pins should be used for clock and data on the GPIO IIC bit-banging bus. There is no requirement that the two pins belong to the same gpio controller.

pinctrl-names pinctrl-0

These properties may be required to configure the chosen pins as gpio pins, unless the pins default to that state on your system.

SEE ALSO

fdt(4), gpio(4), iic(4), iicbb(4), iicbus(4)

HISTORY

The **gpioic** manual page first appeared in FreeBSD 10.1.

AUTHORS

This manual page was written by Luiz Otavio O Souza.