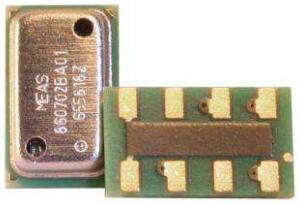


MEAS MS8607 FOR LINUX® DRIVER

Digital Pressure, Humidity and Temperature
Digital Component Sensor (DCS) Development Tools

The MS8607 Linux driver provides the necessary software to interface the MS8607 digital pressure, relative humidity and temperature sensor to any Linux driver system that supports the Industrial I/O ecosystem (IIO). The MS8607 sensor is a self-contained pressure, humidity and temperature sensor that is fully calibrated during manufacturing. The sensor can operate from 1.5V to 3.6V. The MS8607 is ideal for weather station applications embedded into compact devices and any applications in which pressure, humidity and temperature monitoring is required.

Refer to the MS8607 data sheet for detailed information regarding operation of the IC:

http://www.meas-spec.com/downloads/MS8607-02BA01.pdf

Specifications

- Operating pressure range: 300 to 1200 mbar
- Measures relative humidity from 0% to 100%
- Measures temperature from -40°C to 125°C
- Extended pressure range 10 to 2000 mbar
- Fast response time
- I^2C communication
- Very low power consumption

Project setup

Configuration

Linux driver running on any platform is relevant to access sensor information as long as appropriate patch is included in Linux Kernel.

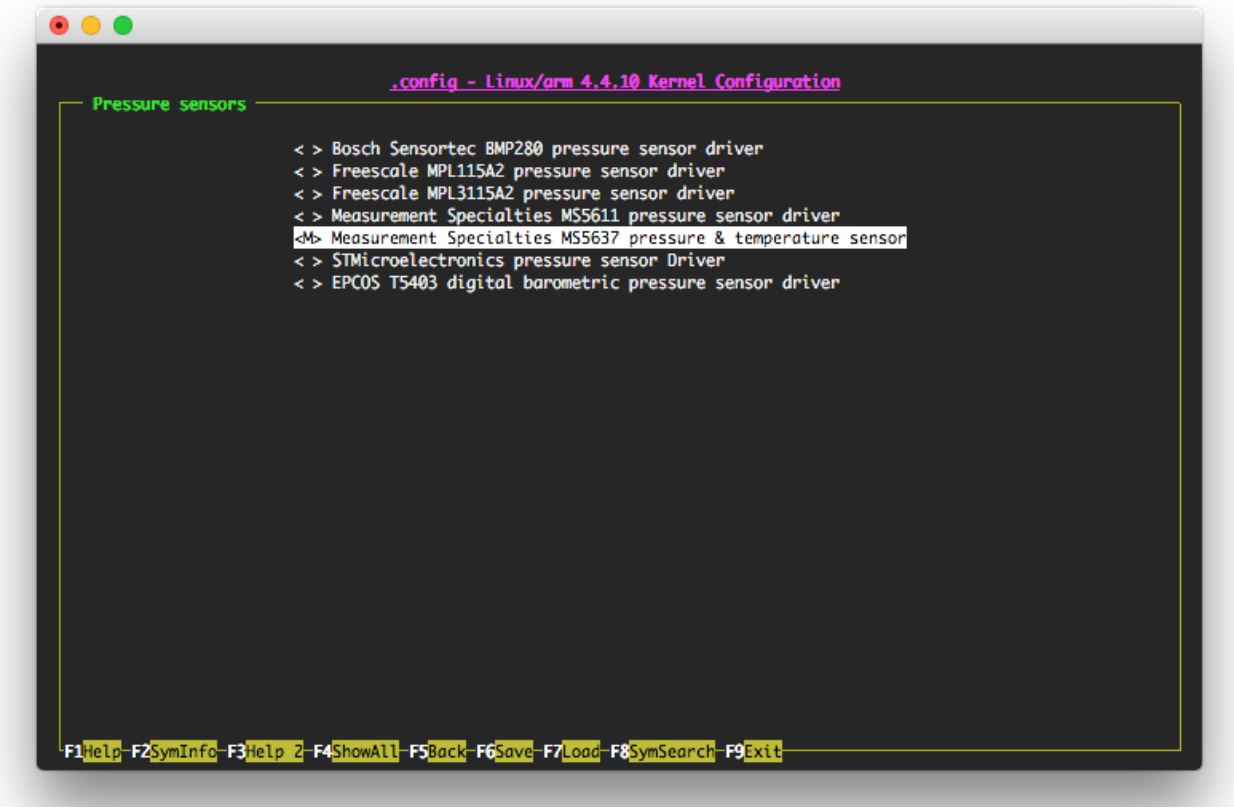
In order to properly use the sensor, it is necessary to describe HW configuration within device tree.
An example of device tree enabling the sensor is provided in next section.

The driver can be compiled with Linux Kernel by selecting it in Linux driver menu configuration (`make nconfig` as shown below in the Linux kernel directory). You can search by driver name, and then enable the appropriate setting the configuration menu.
The driver can also be used as a module, and loaded dynamically (this is done using `insmod` command).

```
make nconfig
```

You need to enable the Industrial I/O subsystem support in the Device Drivers and then you can enable your driver support.
The MS8607 humidity measurement will be supported by the HTU21 driver:

The MS8607 pressure and temperature measurement will be supported by the MS5637 driver:



Device Tree

In order to have Linux driver properly configure hardware to access the sensor, you have to inform it where the device is connected on the platform. This is done using device tree.
The example below applies to Raspberry Pi but can be done on any other hardware supporting the Linux driver. You will have to do the same kind of change in the appropriate corresponding file.

`<linux kernel directory>/arch/arm/boot/dts/bcm2708_common.dtsi`

```
i2c1: i2c@7e804000 {
        [...]
        htu21: htu21@40 {
                compatible ="measspec,ms8607-humidity";
                reg = <0x40>;
        };

        ms5637: ms5637@76 {
                compatible ="measspec,ms8607-temppressure";
                reg = <0x76>;
        };
};
```

Once this is done, the device tree shall be recompiled and installed using following commands:

```
make -j4 modules dtbs
sudo make modules_install
sudo cp arch/arm/boot/dts/*.dtb /boot/
sudo reboot
```

And appropriate dtb device tree file shall be used when booting Linux driver.

Driver description

The driver is based on Linux IIO (Industrial I/O) framework. This framework provides services intended to provide support for devices that in some sense are analog to digital converters (ADCs).
See `<Linux Kernel directory>/drivers/staging/iio/Documentation/overview.txt`
Within that framework, some generic attributes are defined that are applicable to same class of sensors (in our case, pressure, humidity and temperature).
The driver is also based on I²C client that provides services to send / receive data on I²C interface. This part is somehow transparent from application standpoint.

The MS8607 is a single chip pressure, temperature and humidity sensor.
The driver returns a kPa pressure value, milli-degre celius and %RH relative humidity value using the IIO framework.

Via the IIO sysfs interface (`/sys/bus/iio/devices/`), there are several attributes available:

Humidity IIO Attributes	
Signal	**Description**
battery_low	Returns whether sensor VDD is above 2.25V or below ('0' : VDD > 2.25V)
heater_enable	Enable/Disable the on chip heater (0 to disable, 1 to enable)
in_humidity_relative_input	Current relative humidity from MS8607 sensor (hundredth %RH)
sampling_frequency	Set the desired sampling frequency
sampling_frequency_available	Returns all available sampling frequencies

Pressure and temperature IIO Attributes	
Signal	**Description**
in_pressure_input	Current pressure from MS8607 sensor (kPa)
in temp_input	Current temperature from MS8607 sensor (milli-°C value)
sampling_frequency	Set the desired sampling frequency
sampling_frequency_available	Returns all available sampling frequencies

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PRODUCT SHEET

MEAS France SAS,
a TE Connectivity company.
Impasse Jeanne Benozzi CS 83 163
31027 Toulouse Cedex 3, FRANCE
Tel:+33 (0) 5 820 822 02
Fax: +33 (0) 5 820 821 51
customercare.tlse@te.com