

Ohbot I2C Sensor

23rd April 2016

Software

Versions 1.0.0.45 and later of Ohbot software support connection to an I2C sensor on the Arduino.

You need version 1.7 of the Arduino software. This has been preloaded on every Ohbot built since January 2016 but not on the original Kickstarter kits which shipped in December 2015.

If you have an original Kickstarter kit Ohbot version 1.7 of the Arduino code is here:

https://www.dropbox.com/sh/x5if8a1s92f20oz/AAAO1wsgzMyY_ubxoeXbDsV0a?dl=0

and instructions for installing it are here:

<https://www.dropbox.com/s/95pq53w4imarpim/OhbotArduino.doc?dl=0>

I2C Configuration

I2C configuration is controlled by a file called i2cdefinitions.oid which needs to be saved to library\documents\Ohbot on your computer.

The version of this file that you need in order to use the tilt sensor that's supplied with the Ohbot sensor pack can be downloaded from here:

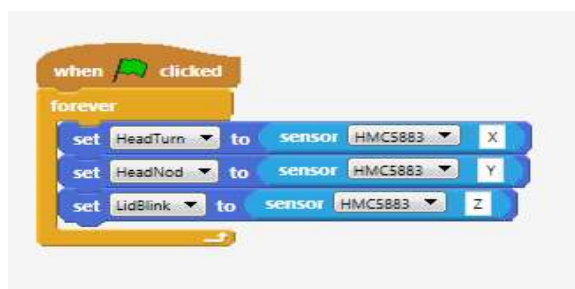
<https://www.dropbox.com/s/c7cbp78ifki9x9l/i2cdefinitions.oid?dl=0>

Once you've saved this file to library\documents\Ohbot this new block will appear on the sensors menu:

Sensor Pack



You can pass a parameter to the tilt sensor to read the X, Y or Z axis:



This example program can also be downloaded from here

<https://www.dropbox.com/s/90weazhaahvogeh/i2c.xml?dl=0>

www.ohbot.co.uk

@OhbotRobot

Ohbot I2C Sensor

Adding your own I2C sensors to I2cdefinitions.oid

You can open i2cdefinitions.oid in notepad and add your own definitions. Here's the existing file which is in XML format:

```
<I2Cs>
  <I2C Name="HMC5883" Start="ca,30|cw,2,0" Read="cw,3|cr,6" Input="4"
  Bytes="6">
    <Result Name="X" Pos="0" Offset="379" Divisor="120" />
    <Result Name="Y" Pos="2" Offset="579" Divisor="100" />
    <Result Name="Z" Pos="4" Offset="644" Divisor="100" />
  </I2C>
</I2Cs>
```

The HMC5833 is read as follows:

I2Cs means it's a list of I2C sensors

Each I2C entry defines a single sensor. Attributes are as follows:

Name	Defines the name that's displayed in the drop down list on the sensor block
Start	Sent once to the sensor on startup. In this example ca,30 sets the address to 30 and cw,2,0 sets the device to continuous reading mode. The character is used to separate this into two distinct commands.
Read	Sent every time the sensor is read. In this example cw,3 sets the next port read to 3 and cr,6 requests 6 bytes from the device. Again the character is used to separate this into two distinct commands.
Input	Defines the Arduino pin that the SDA pin of the sensor is connected to.
Bytes	How many bytes to read in the response from the sensor

Following the I2C entry is a set of entries defining how to interpret the response from the sensor. The HMC5833 returns a string with 6 digits – the first 2 define the value of the X axis, the second two define the value of the Y axis and the 3rd 2 define the value of the Z axis. The calibration of these is a bit odd so the range of each is different. The attributes allow the values to be normalised:

Name	Defines the name that needs to be used as a parameter in the sensor block
Pos	The position in the return string to take the result from
Offset	Subtracted from the raw return value. For example the Z axis ranges from 644 to 1644. Once this number is subtracted from the raw value it results in a range of 0 to 1000
Divisor	The raw value is divided by this once the offset has been subtracted.

Ohbot I2C Sensor

For example this changes the Z axis 0 to 1000 return value into a range of 0 to 10 which is correct for Ohbot readings.

Disclaimer

The I2C interface to Ohbot software was developed for the HMC5833 sensor. The interface has been made generic in order to support other devices but we haven't tried any yet so it's possible that further changes will be required in Ohbot software to support other devices. If you are trying to extend Ohbot software to others I2C devices and you find any problems please contact us through the website.