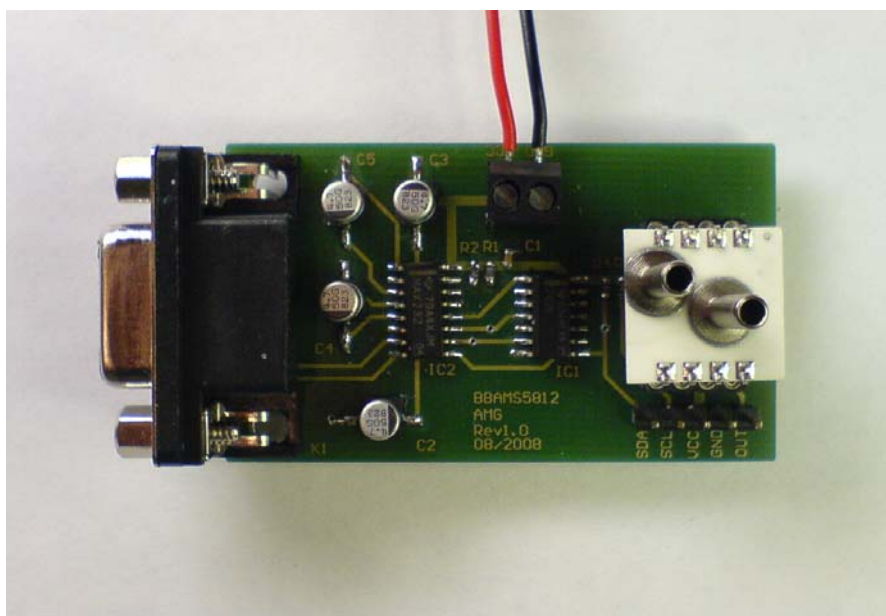


AMS 5812 starter kit

User guide

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INTRODUCTION

The AMS 5812 starter kit enables quick and easy operation concerning the I2C digital output on AMS 5812 pressure sensors with a standard PC with Windows XP operating system. It permits current digital pressure and temperature values to be read out via the I2C sensor interface and displayed on the PC.

The starter kit can also be used to program an individual I2C address into each AMS 5812 pressure sensor. This customized I2C address, valid in addition to the I2C address programmed at the factory (0x78_{Hex}), is prerequisite for the operation of several AMS 5812 pressure sensors together on one I2C bus.

The starter kit consists of a BBAMS5812 motherboard (PCB breadboard) and the relevant I2C_AMG communication software. A Windows PC with an RS232 interface is required for operation. If no RS232 interface is available, a USB-to-RS232 adapter can be used.

NB: We recommend that you read the AMS 5812 sensor datasheet before putting the starter kit into operation.

HARDWARE: BBAMS5812

The starter kit is supplied with the BBAMS5812 and I2C_AMG communication software (on the starter kit CD).

The BBAMS5812 board provides the hardware which enables a PC to read out the continuous digital pressure and temperature values from the output register of the mounted AMS 5812 pressure sensor. The BBAMS5812 acts as both a base for the pressure sensor and supplies it. At the same time, digital pressure and temperature information at the sensor's I2C interface (details on the data format are contained in the AMS 5812 datasheet) is converted to RS232 format, enabling data to be read out and processed via the RS232 interface of a PC.

Figure 1 shows a photo of the BBAMS5812.

The BBAMS5812 has:

- A 9-pin D-sub socket to connect the board to the RS232 interface of a PC using an RS232 cable
- A DIP socket into which an AMS 5812 pressure sensor is mounted
- A connector with all electrical connections (out, GND, VCC, SCL, SDA) for the DIP-mounted AMS 5812 lead out separately
- A screw terminal block for the connection of an external supply voltage of +5 V DC.

An external supply voltage of +5 V DC is always needed to operate the BBAMS5812.

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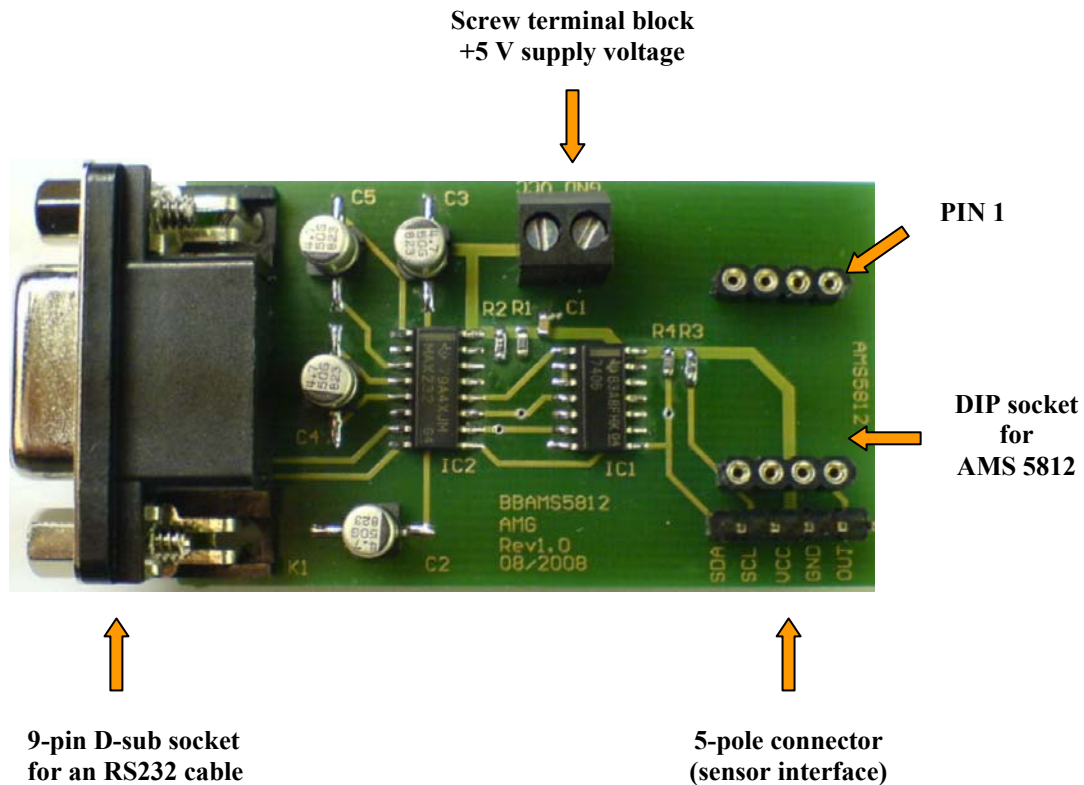


Figure 1: PCB BBAMS5812

If there is no PC with an RS232 interface available, the BBAMS5812 starter kit board can also be connected up to the PC's USB port using a standard USB-to-RS232 adapter.

SOFTWARE: I2C_AMG

The I2C_AMG software is required for communication between the PC and the pressure sensor AMS 5812 mounted onto the BBAMS5812.

The I2C_AMG software has been designed for the Windows XP operating system. It can only be used on a Windows PC, on which the Microsoft .Net Framework 2.0 program package has been installed.

Net Framework 2.0 is included on the starter kit CD and must be installed before the I2C_AMG software is spooled onto the computer (if not already on the PC). It is a software platform developed by Microsoft which provides the necessary operating system functions and class libraries (API: Application Programming Interface) to run the I2C_AMG program.

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Installing the software

The software for the starter kit is provided on a CD-ROM.

The CD includes:

1. AMS5812 directory

dotnetfx.exe (.Net Framework 2.0)

langpack.exe (.Net Framework 2.0 language pack)

SETUP_I2C_AMG.exe (I2C_AMG installation program)

Proceed as follows:

1. Installing .NET Framework 2.0

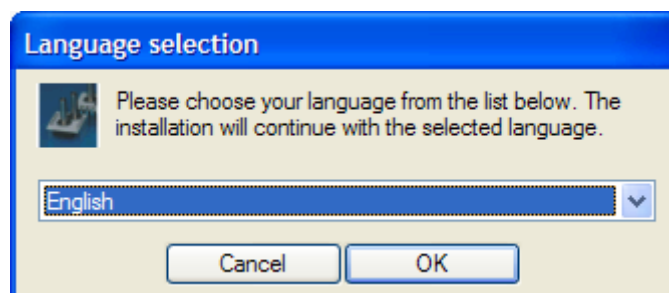
.Net Framework 2.0 must be installed as an administrator. When installing this software, *dotnetfx.exe* in the AMS5812 directory must be run as an administrator. The Framework language pack must then be installed. To do so run the *langpack.exe* program in the same directory, also as an administrator.

2. Installing I2C_AMG

Once .Net Framework 2.0 has been successfully installed, the I2C_AMG software can then be spooled onto the PC. To do so, run *SETUP_I2C_AMG.exe* in the AMS5812 directory as an administrator.

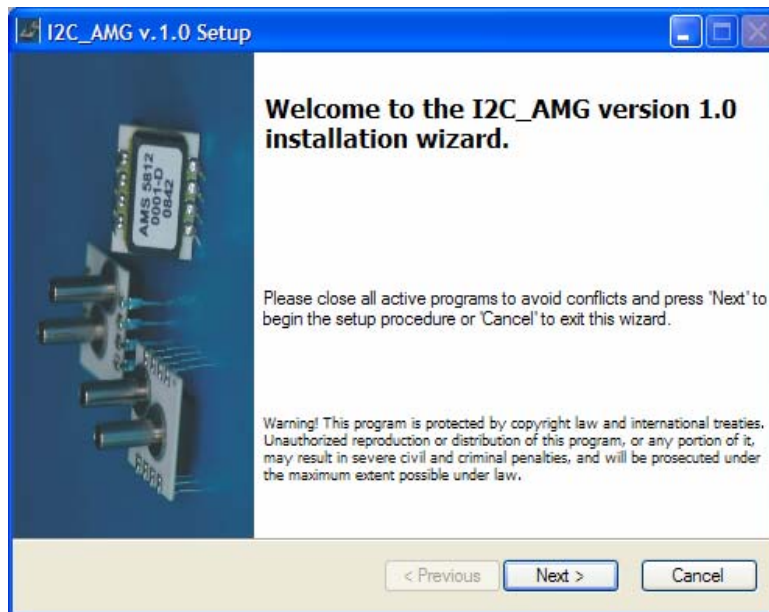
When *SETUP_I2C_AMG.exe* is started, installation proceeds as follows:

a) The language for installation is selected.

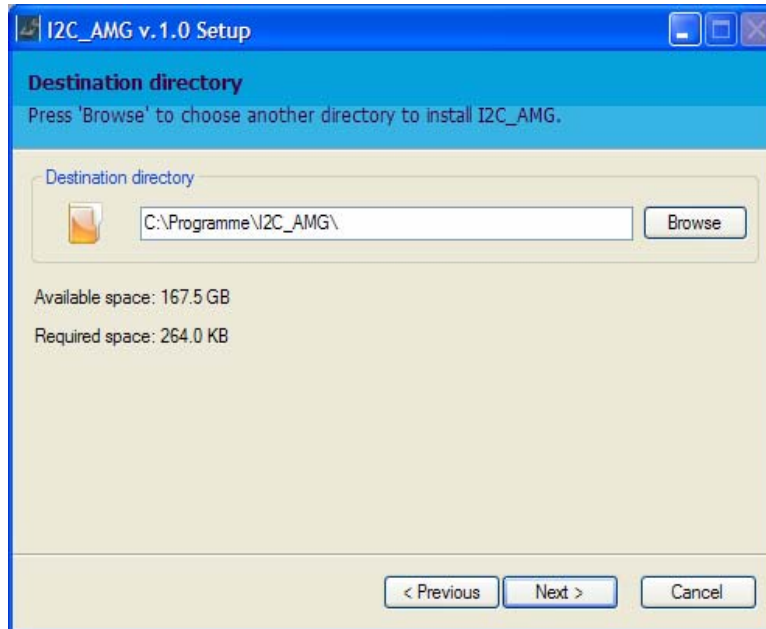


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b) The installation setup is started.

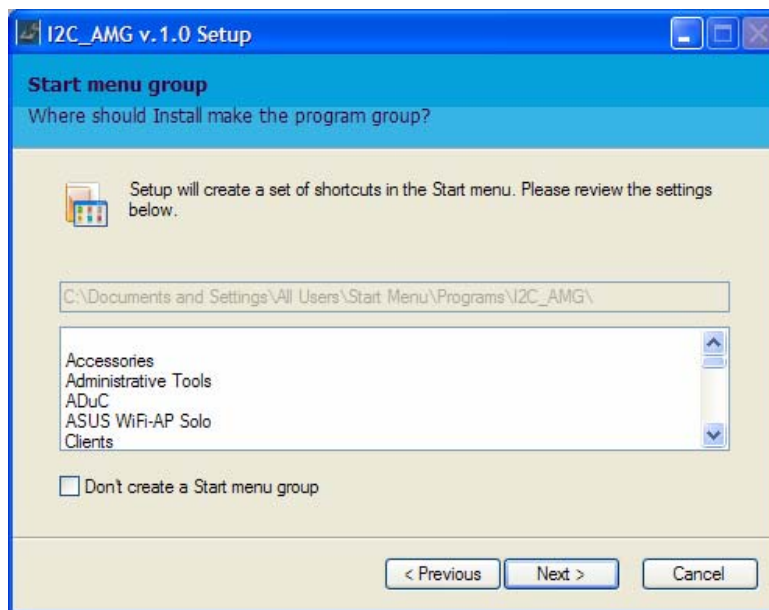


c) The directory for the installation of I2C_AMG is selected.

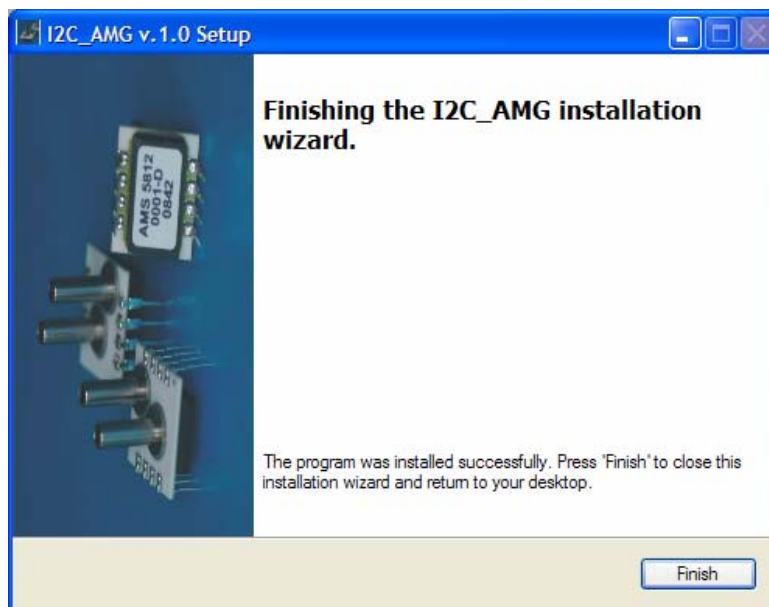


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d) Settings for the I2C_AMG start menu are made.



e) The I2C_AMG installation setup is completed.



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The I2C_AMG user interface

The I2C_AMG software is run via the I2C_AMG icon under *Programs* in the Windows start menu.

The I2C_AMG user interface (menu) is given in Figure 2. The menu has four subsections: *COM Port Select*, *Sensor Type Select*, *I2C Address Programming* and *Read Sensor Data*, all of which are detailed in the following.

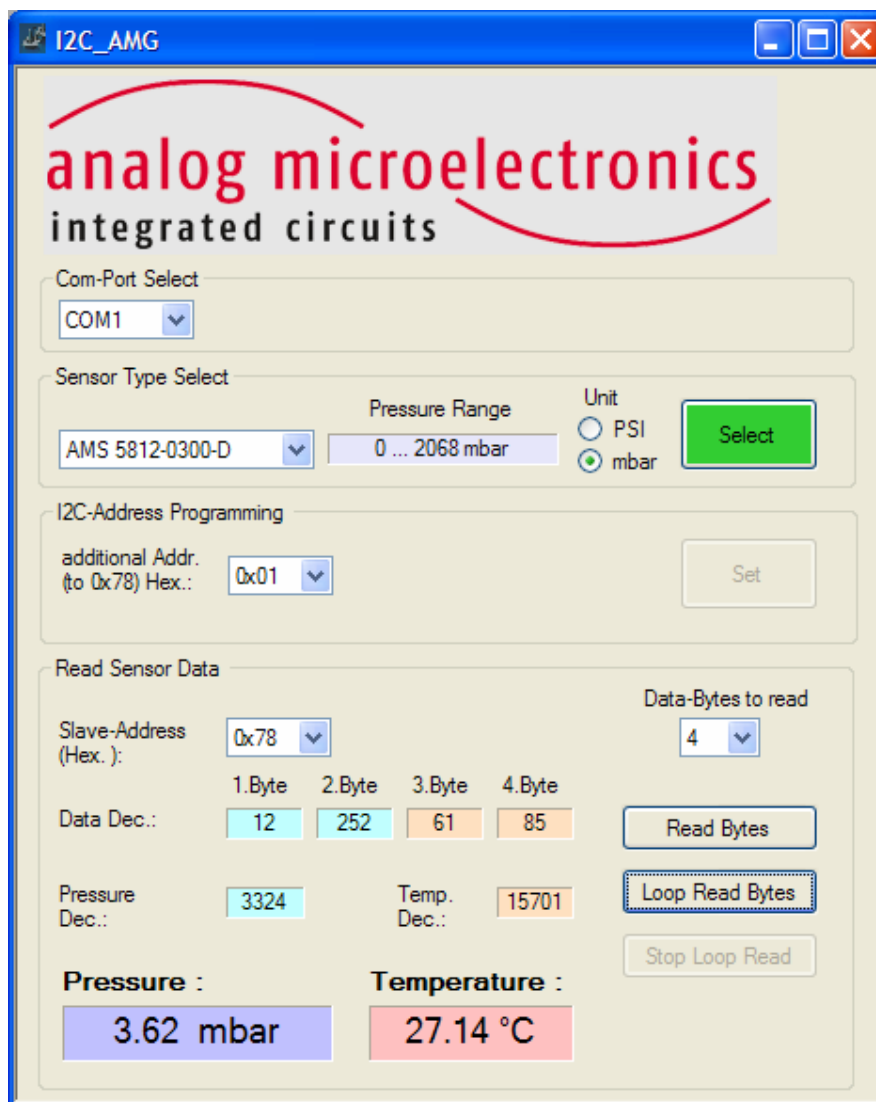


Figure 2: The I2C_AMG user interface

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COM-Port Select

The serial COM-Port for communication between the controller PC and the BBAMS5812 starter kit board is set in *COM-Port Select*. Here, the COM-Port, which is connected with the BBAMS5812 starter kit board has to be selected in the drop-down menu. Once the COM-Port has been stipulated and the BBAMS5812 starter kit board is enabled, further menus become available.

Sensor Type Select

The *Sensor Type Select* menu is used to select the specific type of AMS 5812 (such as AMS 5812-0300-D) which is to be addressed/read out by the starter kit board. Once this has been selected, the unit of pressure can be selected in PSI or mbar for calculation and display. The default is PSI. The process must be confirmed by the *Select* button. More menus then become active.

NB: If the wrong sensor type is selected, sensor measurement data cannot be accurately evaluated!

I2C Address Programming

In *I2C Address Programming* a second, individual I2C slave address (in addition to the default address of 0x78_{Hex}) can be programmed into the AMS 5812 pressure sensor mounted on the BBAMS5812 board. Here, an address between 0x00_{Hex} and 0x7F_{Hex} can be selected from the *Additional addr.* drop-down menu and programmed to the AMS 5812 EEPROM with the *Set* button. Thus programmed, the sensor can be addressed using both the default and the second, additional I2C address.

NB: If several AMS 5812 sensors are to be operated together on one I2C bus, each sensor must first be allocated its own individual I2C address. 0x78_{Hex} cannot be used here.

Read Sensor Data (pressure and temperature)

In the *Read Sensor Data* menu, the current digital pressure and temperature values can be read out from the AMS 5812 pressure sensor output register connected to the PC by the starter kit.

To this end, the I2C address of the AMS 5812 to be read out must first be entered in the *Slave address* field. An address between 0x00_{Hex} and 0x7F_{Hex} can be selected; the default entry here is the standard AMS 5812 I2C address 0x78_{Hex}. Once the I2C address has been determined, the user must stipulate whether two or four data bytes are to be read out from the pressure sensor in the *Data bytes to be read* field. If "2" is selected in the drop-down menu, only the current digital pressure value is read out from the output register. If the setting is "4", both the current digital pressure and temperature values are read. The digital measurement values can then be read out and displayed by the *Read bytes* button.

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The four *Data DEC.* fields display decimal values of the data bytes from the AMS 5812 output register. The read data bytes are converted to decimal values in pairs: the first and second data bytes generate a decimal pressure and (if active) the third and fourth a decimal temperature value. In the *Pressure Dec.* and *Temp. Dec.* fields the read pressures and temperatures are given as decimal values. The fields *Pressure* and *Temperature* show the current pressure and temperature in the units selected above. These are calculated from the read decimal values according to the equations given in the datasheet.

Current digital pressure and temperature values can be read out in an endless loop using the button *Loop read bytes*. Data is then repeatedly read out and displayed at an interval of roughly 200 ms. The readout can be interrupted by the *Stop loop read* button and another selection made. During the repeated readout the number of bytes to be read out can be changed. All other selections are inaccessible.

INITIAL OPERATION

To put the sensor into operation it is first slotted into the DIP socket on the BBAMS5812 and the breadboard is connected to the RS232 COM port of the PC using an RS232 cable (1:1). A voltage source of +5 V is then applied to the screw terminal block.

NB: As there is no protective circuitry safeguarding against reverse polarity and overvoltage, the polarity and voltage of the external voltage supply of +5 V must be checked before voltage is applied.

If the AMS 5812 analog output signal is also to be read, a voltmeter can be connected up to the connector on the BBAMS5812 (sensor interface).

NB: The analog output signal is ratiometric to the supply voltage. If AMS 5812's specifications are to be tested, the supply voltage must be exactly 5.000 V. Any deviation in percent must be accounted for accordingly.

Before the software is booted, supply voltage must be applied to the BBAMS5812!

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IMPORTANT NOTES

1. The starter kit only functions with an external supply voltage of +5 V.
2. On a Windows PC country and number configurations (see *System settings – Regional and Language Options*) must be set to English before the software is started.
3. Before the software is booted, supply voltage must be applied to the BBAMS5812.

ADDITIONAL EQUIPMENT

2. 9-pin D-sub RS232 cable, female/male connectors (1:1)
(e.g. www.reichelt.de, order no. AK230)
3. USB to RS232 adapter (when operating the BBAMS5812 via a USB port)
(e.g. www.reichelt.de, USB converter, order no. USB2SERIELL)

FURTHER READING

- Datasheet: AMS 5812. Amplified pressure sensor with an analog and I²C output
(Internet: www.amsys.de)

Analog Microelectronics GmbH reserves the right to amend any dimensions, technical data or other information contained herein without prior notification.



Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 0730-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
Email: info@analogmicro.de

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