AMS 8607 - Wireless Bluetooth Low Energy 4.1 Multi-Sensor

FEATURES

- **Calibrated and temperature compensated for mobile wireless operations**
- **Pressure ranges: 300 mbar to 1200 mbar**
- **Extended pressure range: 10 mbar to 2 bar**
- **Humidity range: 0 to 100 %RH**
- **Temperature range: -15 to +85 °C**
- **Adjustable measuring interval**
- **Logging function**
- **Readable via App (iPhone/Android)**
- **Supply voltage: 2 V to 3 V**
- **Battery powered (2x AA)**
- **Indoor and outdoor use**
- **Ready to use**
- **RoHS und REACH compliant**

GENERAL DESCRIPTION

The AMS 8607 is a battery powered Bluetooth Low Energy (BLE) multi-sensor for measuring relative humidity, barometric pressure and temperature. The data is transmitted via Bluetooth 4.1 and can be read out and configured via a smartphone app. The sensor is calibrated and temperature compensated. The humidity range to be measured is 0 to 100 %RH. The pressure operating range is from 10 to 2000 mbar and the temperature range is -15 to 85 °C. The accuracy for the relative humidity is ±3 %RH, ±2 mbar for the pressure and ±1 °C for temperature. The sensor has integrated a 24 bit ADC which offers a 24 bit digital output value for the pressure and temperature and a 12 bit digital value for the relative humidity. The resolution of the ADC is set to the highest possible OSR value of 8192. The supply voltage is 3 V. The power supply is ensured by two AA batteries. The measured values can be swapped out over the app in a CSV file. The signal transmission distance is about 100 m in the open field.

TYPICAL APPLICATIONS

- **Climate monitoring**
- **Weather station**
- **Cabinet monitoring**
- **Environmental control**
- **Static pressure sensing**
- **Dynamic pressure sensing**
- **Room monitoring**
- **HVAC applications**

AMSYS GmbH & Co. KG
An der Fahrt 4
55124 Mainz
Germany

Phone: +49 6131 469 8750
Fax: +49 6131 469 87566
Email: info@amsys-sensor.com
Internet: www.amsys-sensor.com

AMS 8607 - Wireless Bluetooth Low Energy 4.1 Multi-Sensor

TECHNICAL DATA

All parameters apply to V_{cc} = 3 V, T = 25 °C

Parameter		Pressure (mbar)			Temperature (°C)			Rel. Humidity (%RH)		
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Operating range Extended Range[1)]		300 10		1200 2000	-15		85	0		100
Absolute Accuracy		300 .. 1100 mbar			@25 °C			20 .. 80 %RH		
@25 °C		-2		2	-1		1	-3		3
Absolute Accuracy		300 .. 1100 mbar, 0 .. 85 °C			0 .. 85 °C			5 .. 95 %RH		
		-4		4	-2		2	-5		5
Relative Accuracy		300 .. 1000 mbar[3)]								
@25 °C		±0.1								
Resolution RMS [4)]	OSR 8192		0.016			0.002			0.04	
	4096		0.021			0.003			-	
	2048		0.028			0.004			-	
	1024		0.039			0.006			0.7	
	512		0.062			0.009				
	256		0.11			0.012				
Max. error with supply voltage (Condition)			±0.5			±0.3			±0.25	
		(V_{cc} = 2.0 V .. 3.6 V)								
Long term stability		±1 / year			±0.3 / year			±0.5 / year		

***Table 1*: Technical data**

MAXIMUM RATINGS

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{cc}		2	3	3.6	V
Storage temperature	T_s	Without Battery	-20		+85	°C
Overpressure	P_{max}			6		bar
ESD		Human Body Model	-2		+2	kV
Latch up		JEDEC Standard Nr. 78	-100		+100	mA

***Table 2*: Maximum ratings**

NOTES

1) Linear range of ADC.
2) Auto-zero at one pressure point.
3) Characterization performed sequentially, first P & T, followed by RH.

ELECTRICAL SPECIFICATIONS (Operating range)

Parameter		General electrical specifications				
	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{cc}		2.0	3.0	3.6	V
Operating temperature	T_{op}		-15	25	+85	°C
Current consumption at standby		25 °C, Vcc = 3 V		0.03	0.24	µA
Current consumption in Advertising Mode[1)]		25 °C, Vcc = 3 V	0.18	0.24	0,3	mA
Current consumption in Advertising Mode[2)]		25 °C, Vcc = 3 V		0.18	0.3	mA
Current consumption in Connected Mode[3)]		25 °C, Vcc = 3 V	2.2	3.1	4.1	mA
Current consumption in Connected Mode[4)]		25 °C, Vcc = 3 V		2.8	3.4	mA
Battery life [5)]		25 °C, 2 x 2500 mAh	ca. 1 yeah			
Battery life [6)]		25 °C, 2 x 2500 mAh	ca. 1 month			

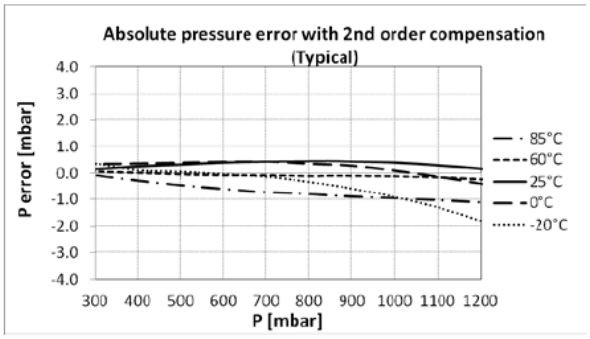
Parameter	Pressure and Temperature				Relative Humidity			
	Condition	Min.	Typ.	Max.	Min.	Typ.	Max.	Unit
ADC output word			24			16		bit
ADC conversion time	OSR 8192		16.44	17.2		13.82	15.89	ms
	4096		8.22	8.61		6.98	8.03	
	2048		4.13	4.32		3.55	4.08	
	1024		2.08	2.17		1.84	2.12	
	512		1.06	1.10		-	-	
	256		0.54	0.56		-	-	

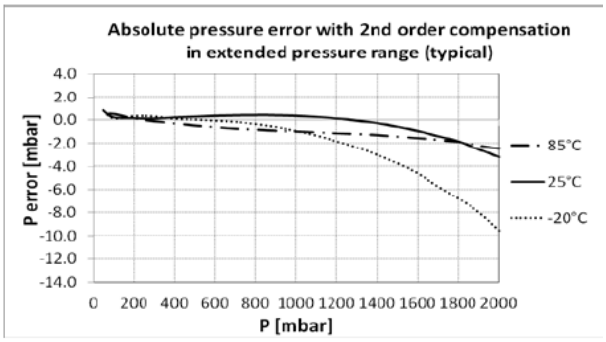
***Table 3*: Electrical specifications (Operating range)**

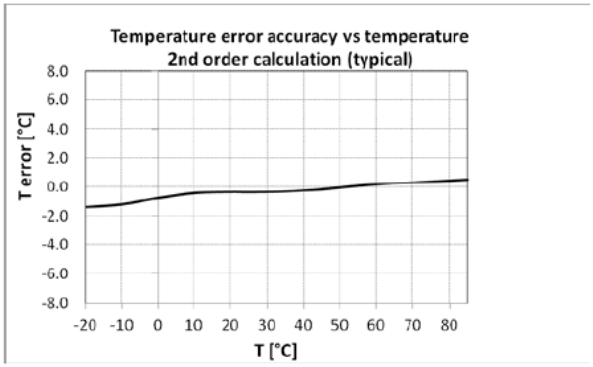
NOTES

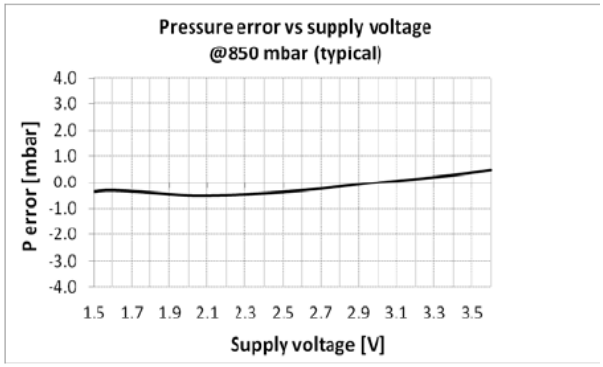
1) Averaged measured with an ampere meter over 1 s, with an advertising interval of 1 s and a measurement interval of 5s
2) Averaged measured with an ampere meter over 1 s, with an advertising interval of 1 s and a measurement interval of 60 s.
3) Averaged measured with an ampere meter over 1 s, with a min. connection interval of 7,5 ms and max. 4000 ms and a measurement interval of 5 s.
4) Averaged measured with an ampere meter over 1 s, with a min. connection interval of 7,5 ms and max. 4000 ms and a measurement interval of 60 s.
5) Only in Advertising Mode; is significantly reduced at T °<0 °C.
6) Only in Connected Mode; is significantly reduced at T °<0 °C.

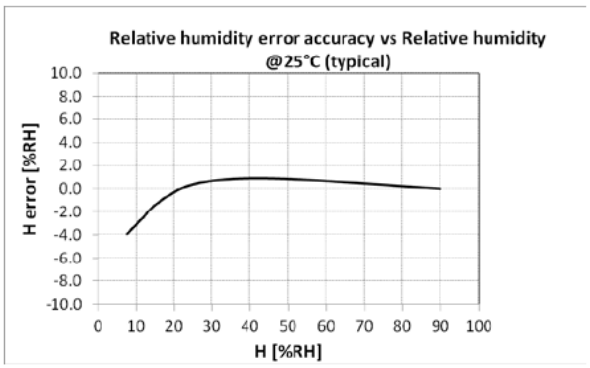
ACCURACY AND PHT ERROR











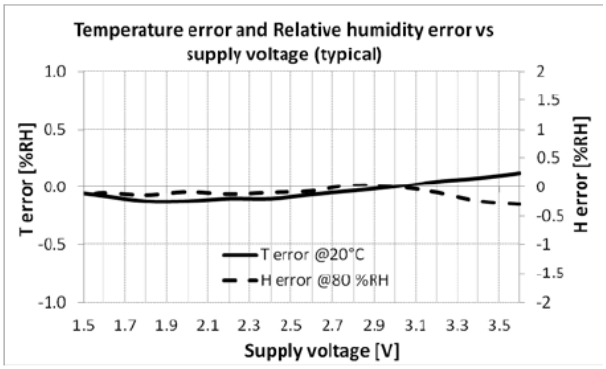


Figure 1: **Error of the sensors components**

AMS 8607 - Wireless Bluetooth Low Energy 4.1 Multi-Sensor

FUNCTIONAL DESCRIPTION

The AMS 8607 BLE includes two sensors with distinctive MEMS technologies to measure pressure, humidity and temperature. This sensor values are written into an 8 Mbit EEPROM. If the memory is full, the oldest data will be deleted and gradually replaced by new ones (ring memory or ring buffer). Communication takes place via Bluetooth Low Energy 4.1 (2.4 GHz bandwidth).

After inserting the batteries, the name and the sensor data are sent to the client (advertising). Additionally the relative high is calculated and display using the measured values via the general altitude formula. For connecting with the displayed sensor, the user must click on it. The sensor then transmits the measured values to the smartphone app with the user settable measuring interval (min. 5 s to max. 32767 s) via Bluetooth notifications. Under Settings the time can be determined in the app when these notifications are sent.

Over the smartphone app it is possible to configure the sensor individually. The measured values can be swapped out over the app and further processed at any time in a CSV file. The lifetime depends strongly on the transmission mode and the way of using the sensor.

In Connected Mode the sensor sends the data via Bluetooth notifications to the client. The time can be determined via the configuration side in the app when these notifications are sent.
There are basically three possibilities of data processing:

1) Readout and configuration of the sensor via the AMS 8607 App

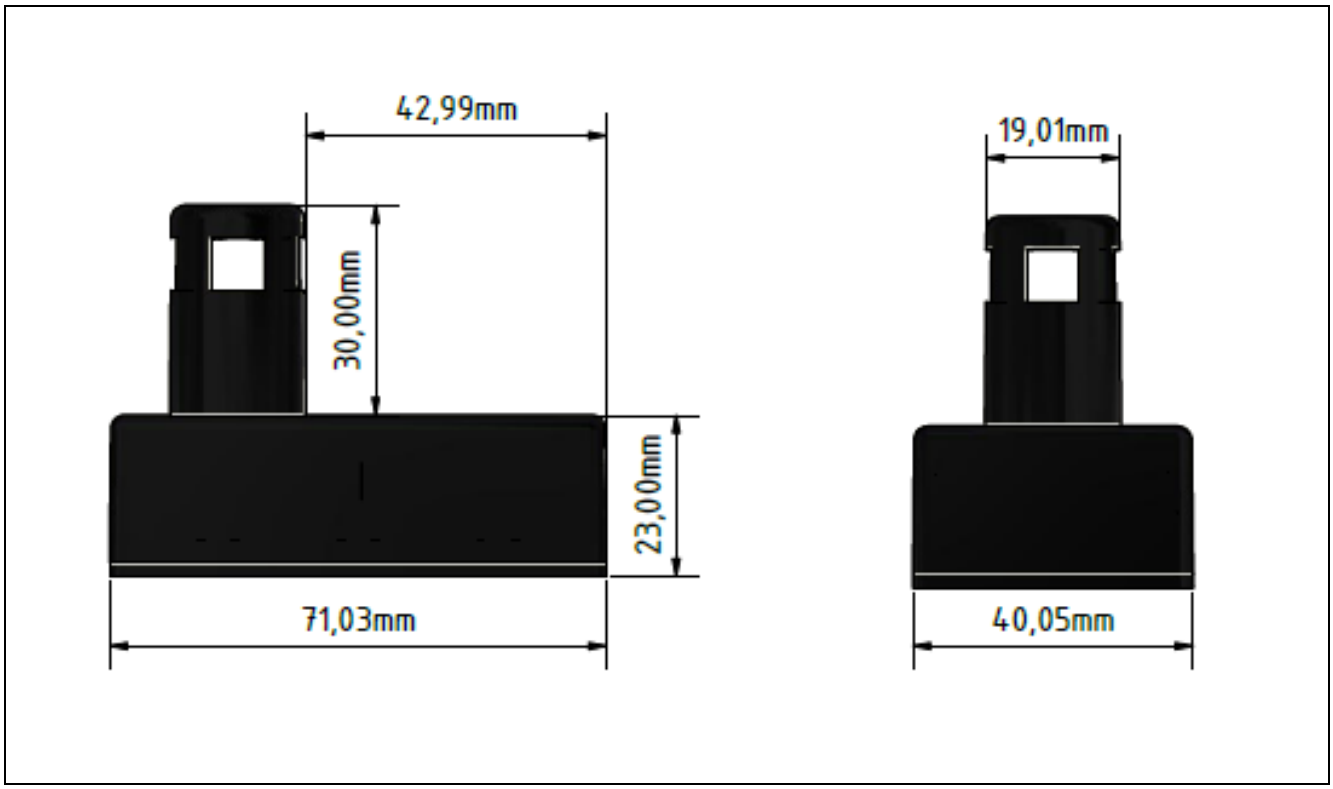
2) Readout and configuration of the sensor via USB Bluetooth development dongle.

3) Readout and configuration of the sensor via the software manual.

GENERAL NOTES

Factory default data transmission rate is 5 s, which can be adjusted from 5 s to 32767 s in the android smartphone AMS 8607 app or over a Bluetooth USB Dongle.
The advertising interval can be changed by the manufacturer from 20 ms to 10,24 s.
The connection interval can be changed by the manufacturer from 7,5 ms to 4 s.
The ADC' resolution can be changed by the manufacturer as you can read above.
On request a software manual can be provided by the manufacturer, so a sensor readout and configuration can be made without the AMS 8607 app.
Battery life depends on its capacity, operating temperature and signal transmission interval.
Temperature can impact battery capacity retention even in idle. Check battery specifications for more details.

PACKAGE DIMENSIONS



PACKAGE NOTES

1) The housing was manufactured in the SLS process and consists of three components: sensor cap, basic housing and battery lid.
2) The housing is made of PA 6.6 and is suitable for outdoor installation.

ORDERING INFORMATIONS

Ordering code: AMS 8607 BLE

ADDITONAL EQUIPMENT

Ordering code	Description
App	Android or IPhone App for readout and configuring the sensors
Software Manual	For own software development

AMS 8607 - Wireless Bluetooth Low Energy 4.1 Multi-Sensor

Contact

AMSYS GmbH & Co. KG
An der Fahrt 4
55124 Mainz
GERMANY

phone: +49 (0) 6131/469 875 0
fax: +49 (0) 6131/469 875 66
email: info@amsys-sensor.com
internet: www.amsys-sensor.com