

# SHTxx

## Humidity & Temperature

### Sensmitter

## Application Note

### Status Register

## 1 Introduction

Some of the advanced functions of the SHTxx are available through the status register. This document describes the required communication and the features available through the status register.

## 2 The Status Register

### 2.1 Status Register

Bit	Type	Description	Default	
7		reserved	0	
6	R	End of Battery (low voltage detection) '0' for Vdd > 2.47 '1' for Vdd < 2.47	X	No default value, bit is only updated after a measurement
5		reserved	0	
4		reserved	0	
3		For Testing only, do not use	0	
2	R/W	Heater	0	off
1	R/W	no reload from OTP	0	reload
0	R/W	'1' = 8bit RH / 12bit Temperature resolution '0' = 12bit RH / 14bit Temperature resolution	0	12bit RH 14bit Temp.

#### 2.1.1 Heater

An on chip heating element can be switched on. It will increase the temperature of the sensor by approximately 5°C. Power consumption will increase by 8mA @ 5V.

Applications:

- By comparing temperature and humidity values before and after switching on the heater, proper functionality of both sensors can be verified.
- In high RH environments heating the sensor element will avoid condensation.

**Warning:** The built-in calibration is not correct while the SHT11 is heated!

#### 2.1.2 End Of Battery (EOB, low voltage detector)

The SHT11 End of Battery (EOB) function detects VDD voltages below 2.47V. Accuracy is  $\pm 0.05V$

Low voltage is indicated by a '1' high bit.

**Warning:** This bit is only updated during a measurement.

#### 2.1.3 Calibration reload before measurement

To save power and gain speed the OTP reload before every measurement may be bypassed. This saves ~8.2ms from each measurement time.

Explanation:

In rare ESD environments the SHT11 may temporarily lose the calibration data from the volatile memory. Default is therefore to reread it from the OTP memory before every measurement.

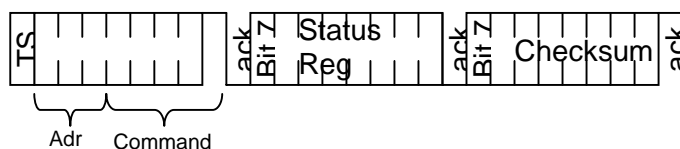
#### 2.1.4 Measurement resolution

The measurement resolution of 14bit (temperature) and 12bit (humidity) can be reduced to 12 and 8 bit. This is especially useful in high speed or extreme low power applications

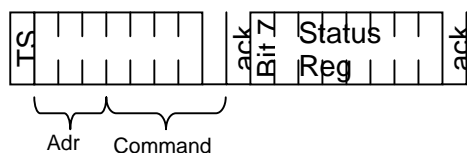
"0" is 12/14bit "1" is 8/12bit.

All readout values are MSB first, two byte right justified. (e.g. the 5th SCK is MSB for a 12bit value, for a 8bit result the first byte is not used).

## 2.2 Status Register read



## 2.3 Status Register write



## 2.4 Digital state machine

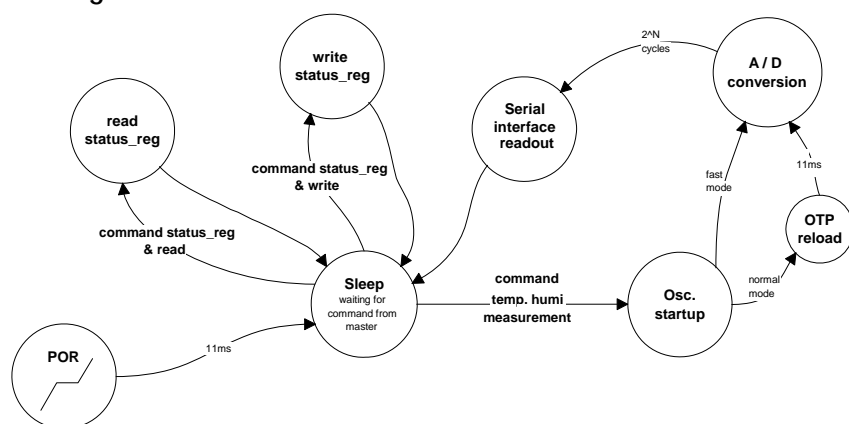


Figure 1 Digital Finite State Machine State Diagram

### 3 Revision history

Date	Revision	Changes
August 27, 2001	0.9 (Preliminary)	Revision 0.9 (Preliminary)
November 12, 2001	1.0	added status register bit for resolution
November 22, 2001	1.11	corrected polarity of resolution bit
January 24, 2002	1.1	default values bit 4-7, EOL paragraph, small typos
February 7, 2002	1.21	enhanced EOL paragraph
July 2, 2002	1.22	Renamed EOL to EOB "End of Battery", improved resolution paragraph, layout
Oct. 17, 2003	1.23	Changed download link
May 25, 2005	1.24	Changed company address
Oct 3, 2006	1.3	Sensirion Inc. address added

All datasheets and application notes can be found at:

[www.sensirion.com/humidity](http://www.sensirion.com/humidity)

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