

NSHT30-EVM User Guide

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NSHT30-EVM User Guide

Description

NSHT30 is a relative humidity and temperature sensor with I2C Interface. It is a CMOS-MEMS sensor chip based on NOVOSENSE's new humidity and temperature platform. NSHT30 integrates a capacitor-based relative humidity sensor, a CMOS temperature sensor, a signal processor, and a high-speed I2C interface in a single chip and is packed in a small LGA package. The outline of the LGA package is only of 2.5mm in length, 2.5mm in width and 0.9mm in height. This allows NSHT30 to be more widely integrated into a variety of applications. In addition, the I2C interface makes the NSHT30 more compatible in various applications, with two distinctive and selectable I2C addresses, communication speed up to 1 MHz, and the wide supply voltage range from 2V to 5.5V. Besides, the NSHT30 includes new integrated digital feature with programmable interrupt thresholds to provide alerts and system wake-up without requiring a microcontroller to continuously monitor the system.

Related Products

- NSHT30-CLAR(LGA8)
- NSHT30-QDNR(DFN8)

Features

- ✓ Fully calibrated and linearized
- ✓ Relative humidity and temperature compensated digital output
- ✓ Wide supply voltage range, from 2V to 5.5V
- ✓ Typical accuracy of 3 %RH and 0.3 °C
- ✓ I2C Interface with communication speed up to 1MHz
 - Two selectable addresses
 - Data protection with CRC checksum

Applications

- Washer & dryer
- Smart Thermostats and Room Monitors
- White Goods
- Printers
- Humidifier/dehumidifier
- Air quality detection
- Wireless Sensor
- Home appliances

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1.Introduction

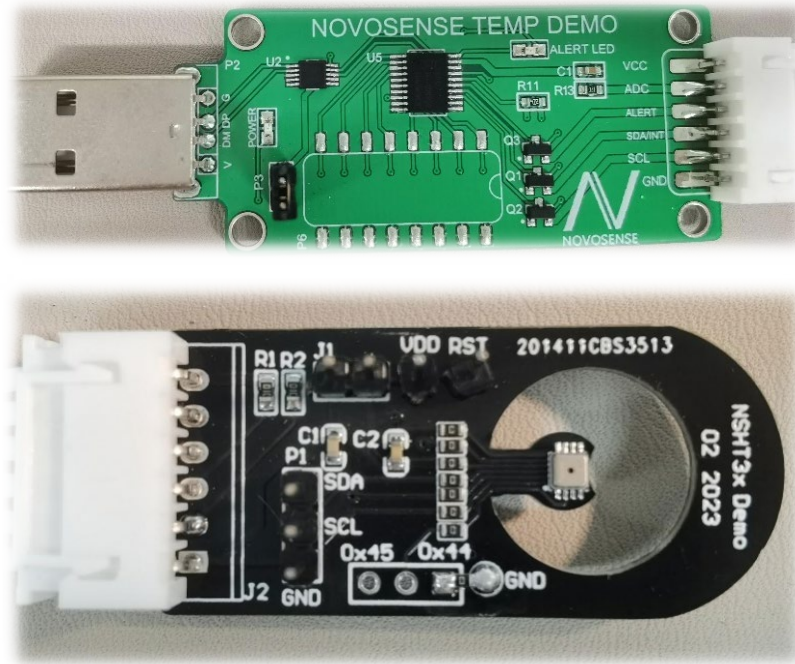


Figure 1.1 Humidity sensor NSHT3x_EVK

The NOVOSENSE NSHT3x_EVM evaluation module enables designers to evaluate the operation and performance of the NSHT3x Relative Humidity and Temperature sensor.

The EVM contains one NSHT3x (see Table 1).

Table 1. Device and Package Configurations

Device	IC	Package
NSHT3x Demo	NSHT30-CLAR/NSHT30-QDNR	LGA (8)/DFN (8)

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2.Setup

This section describes the connectors on the EVM and how to properly connect, set up and use the NSHT3x_EVM.

2.1.Hardware Setup

The NSHT3x Demo power is supplied through the USB connector. The LDO converts the 5V power from the USB to 3.3V used by the NSHT3x. The EVM may be directly inserted into a USB port on a PC or laptop, or connected to the latter using the appropriate USB cable. The I2C address of the NSHT3x is 1000100xb and is fixed by design.

2.2.Software Setup

The NOVOSENSE NSHT Demo GUI and EVM driver installer is packaged in a zip file. Please contact sales to obtain the file.

2.3.GUI Operation

The section describes how to use the GUI.

2.3.1.Start the GUI

- 1.Open the NSHT3x_DEMO folder.
- 2.Click NSHT.exe.
- 3.The main window will open. Note: Only one instance of the GUI may be open at a time!
- 4.To select the correct port, you can go to the computer device management to confirm the right port number, such as COM4.

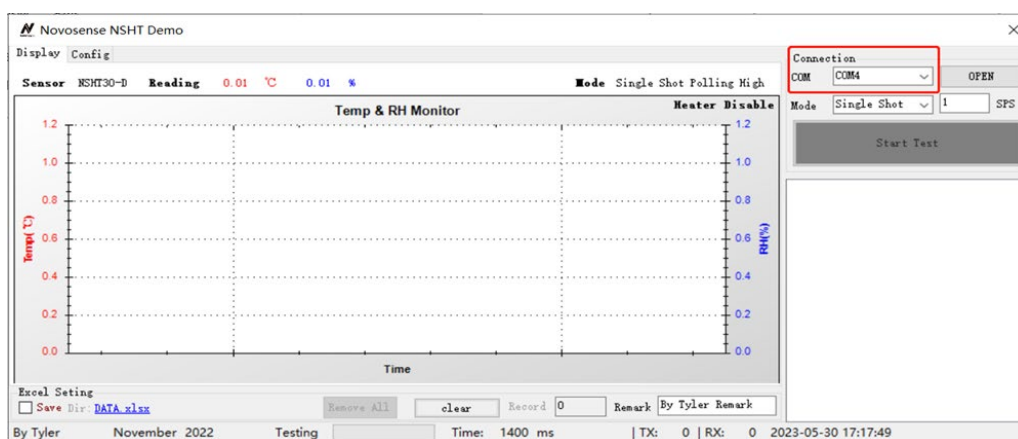


Figure 2.1 NOVOSENSE NSHT Demo GUI

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- 5. In the Single Shot Mode column, you can select the conversion time of demos; currently 0 to 100 SPS are supported. For example, 10 SPS means the NSHT30 performs the measurement of environmental Temperature and Relative Humidity once a second.
- 6. Choose to configure different operating modes in the Config page. NSHT30 supports Single Shot Mode (single data conversion) and Periodic Mode (periodic data conversion).
 - ▶ Single Shot Mode can be configured with 3 modes of Low/Medium/High repeatability.
 - ▶ Periodic Mode can be configured with 0.5/1/2/4/10mps (number of conversions per second), and after determining Sample Rate, a total of 15 modes can be configured with Low/Medium/High repeatability.

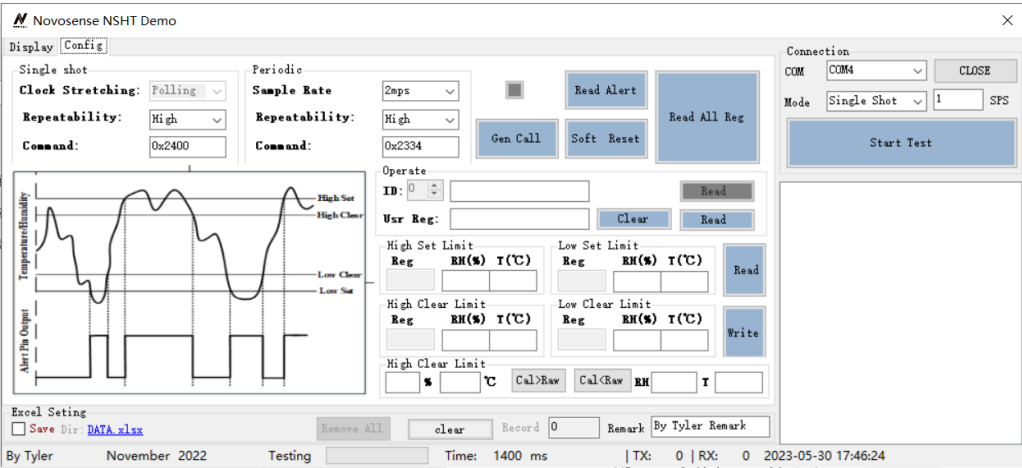


Figure 2.2 To set parameters on Config page

- 7. After configuring the working mode, click Start Test in the Display page to display the real-time temperature and related humidity detected by the demo board.

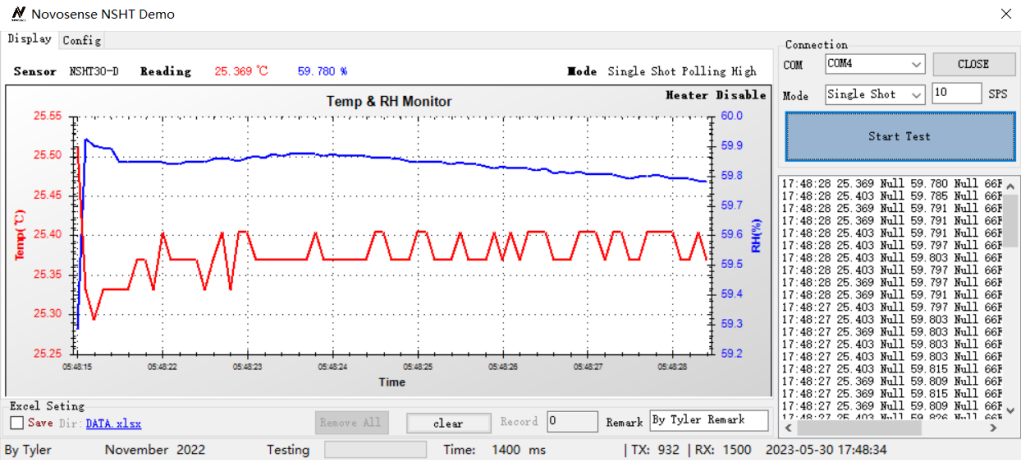


Figure 2.3 Real-time collected temperature and humidity information

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8. Click DATA.xlsx in the lower left corner, create a new .xlsx document, and then check the box before Save, you can export the original data to EXCEL.

3.Alert Function

When NSHT30 is working in Periodic Mode, it has Alert function. If triggered, the Alert pin goes high, which can be determined by reading the value of the status register.

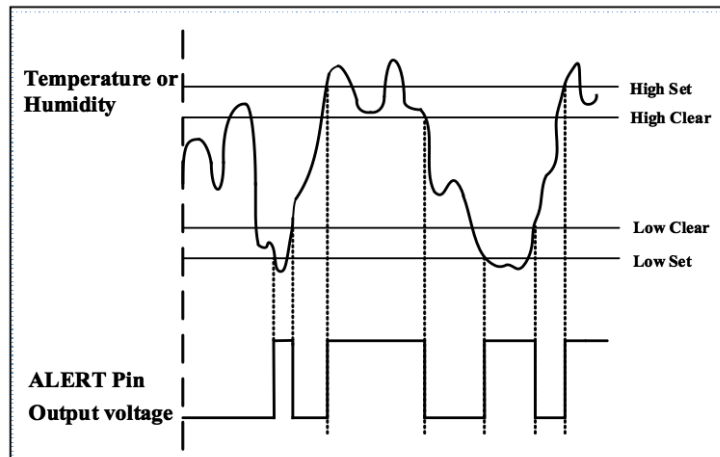


Figure 3.1 Different limits for the Alert Mode

1.Read All Reg operation.

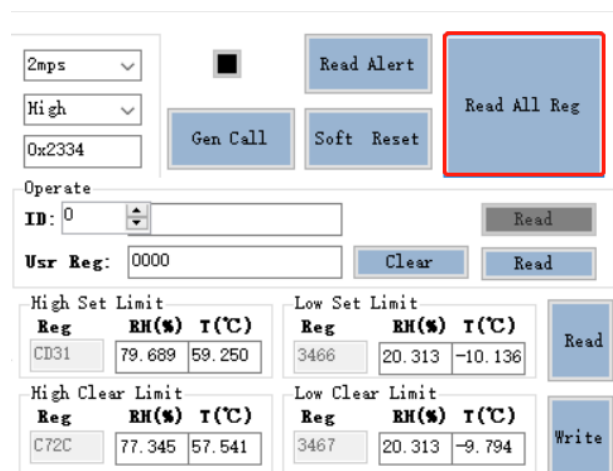


Figure 3.2 Read All Reg

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By clicking the **Read All Reg** button, you can read the register values and the default value of Limit. 2. By clicking **Read**: you can read the default value of Alert limits.

High Set Limit			Low Set Limit			Read
Reg	RH(%)	T(°C)	Reg	RH(%)	T(°C)	
CD33	79.689	59.933	3466	20.313	-10.136	
High Clear Limit			Low Clear Limit			Write
Reg	RH(%)	T(°C)	Reg	RH(%)	T(°C)	
C92D	78.126	57.882	3869	21.875	-9.111	

Figure 3.3 Read Button

3. By clicking **Write**: you can change the value of Alert limits as you want.

High Set Limit			Low Set Limit			Read
Reg	RH(%)	T(°C)	Reg	RH(%)	T(°C)	
CD33	79.689	59.933	3466	20.313	-10.136	
High Clear Limit			Low Clear Limit			Write
Reg	RH(%)	T(°C)	Reg	RH(%)	T(°C)	
C92D	78.126	57.882	3869	21.875	-9.111	

Figure 3.4 Write Button

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4.Revision History

Revision	Description	Author	Date
1.0	Initial version	Juanjuan Shao	23/8/2023

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