

USER MANUAL

EVALUATION BOARD FOR HUMIDITY
SENSOR HIDS

2525020210092

VERSION 1.1

OCTOBER 16, 2024

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

Revision history

| Manual version | Product version | Notes | Date |
|----------------|-----------------|--|----------------|
| 1.0 | 1.0 | <ul style="list-style-type: none">• Initial release of the manual | September 2023 |
| 1.1 | 1.0 | <ul style="list-style-type: none">• Updated chapter Important notes• Updated chapter Legal notice | October 2024 |

Abbreviations

| Abbreviation | Description |
|------------------|---------------------------------|
| I ² C | Inter Integrated Circuit |
| LSB | Least Significant Bit |
| MEMS | Micro Electro Mechanical System |
| SMD | Surface Mount Device |

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1 General description

1.1 Introduction

The EV-Board of the humidity sensor provides the opportunity to verify the sensor performance and develop a prototype using an external processor, e.g. sensor shield for Arduino (Part No. 2501000101291). It can be directly plugged into a sensor shield for Arduino using the mounted I²C pins. The EV-Board can also be mounted on a bread board using through-hole pin header connections. The humidity sensor (Part No: 2525020210002) is a 16-bit digital ultra-low-power module with an integrated temperature sensor.



Figure 1: EV-Board of the humidity sensor

1.2 Pin header compatibility

6-pin right angle headers mounted on this EV-Board can be directly plugged into the sensor shield for Arduino. This provides a plug-and-play solution to quickly take the EV-Board into operation.



Sensor shield for Arduino is a stackable extension board for Arduino UNO and DUE to connect the sensor EV-Boards. More information can be found on our website [here](#).

2 Functional description

The humidity sensor EV-Board supports I²C communication interfaces.

- A positive supply voltage is applied to the sensor through the *VDD* pin and negative supply voltage through the *GND* pin.

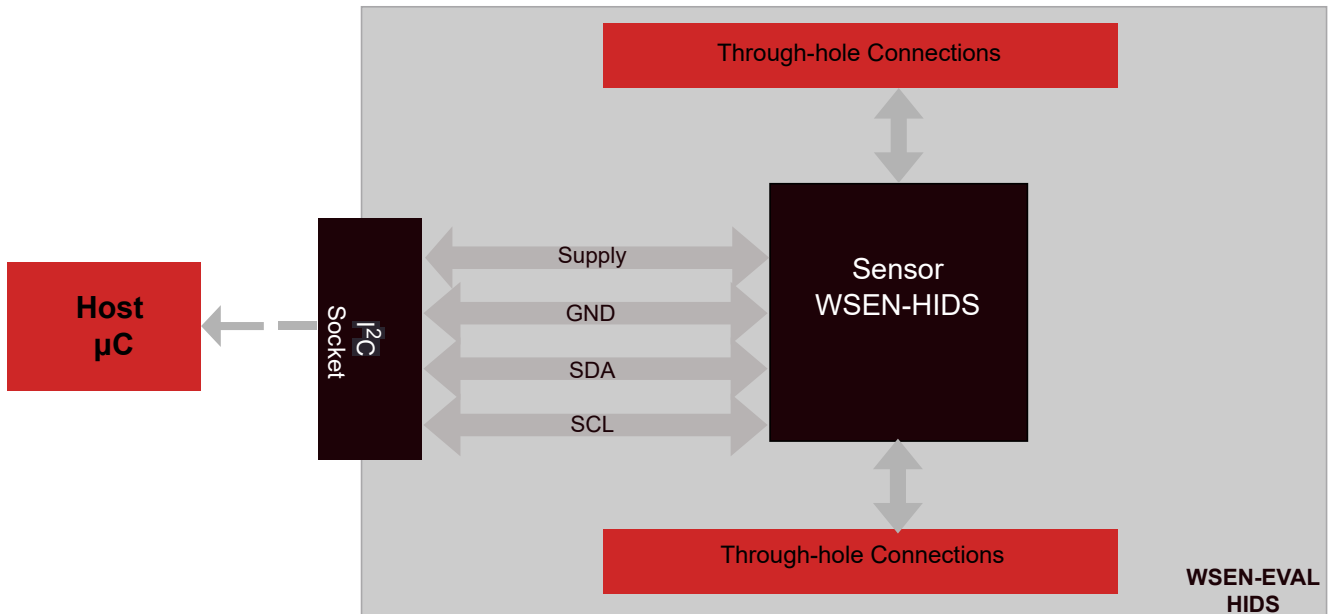


Figure 2: Block diagram



The 7-bit slave address of the humidity sensor is 1000100b (0x44)



Please refer to the datasheet and the user manual of the humidity sensor (Part No: 252502021002) for information about the electrical properties.

2.1 EV-Board in operation

2.1.1 I²C connection (CON1)

The pinning of connector CON1 provides an I²C communication interface which fits directly into the sensor shield for Arduino in section 1.2.

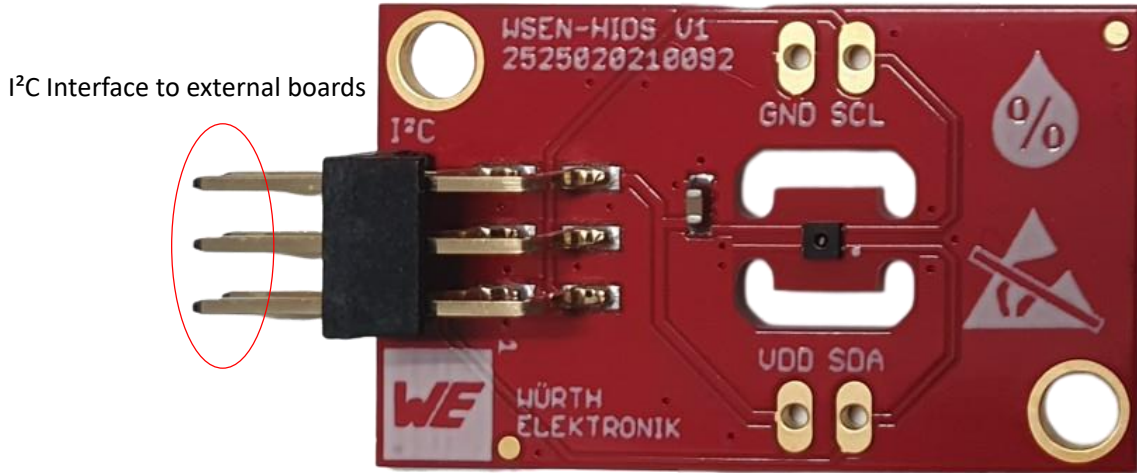
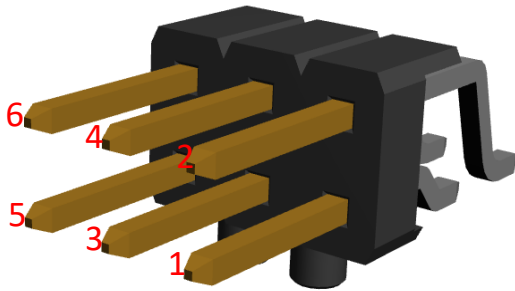


Figure 3: Pin header connection to the external boards



| Pin No | I ² C Pins (CON1) |
|--------|------------------------------|
| 1 | <i>GND</i> |
| 2 | <i>SCL</i> |
| 3 | <i>SDA</i> |
| 4 | <i>NC</i> |
| 5 | <i>NC</i> |
| 6 | <i>VDD</i> |

Table 1: Pin header to external boards



Please ensure to set pull-up resistors on the SDA and SCL bus lines on the master side.

2.1.2 Through-hole connection

The through-hole pin header connection gives direct access to each sensor pin. To use I²C via these through-hole connections, the SDA and SCL pins must be connected to VDD via pull-up resistors. Please refer to Table 2 for the pin description of the EV-Board.

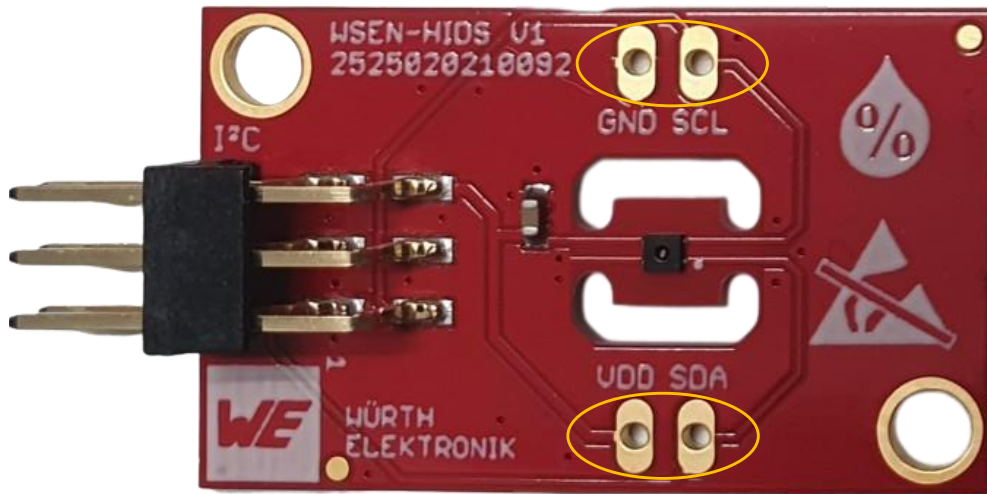


Figure 4: Through-hole connection

| Pin No. | EV-Board pins | Description | Input/Output |
|---------|---------------|-------------------------------|--------------|
| 1 | <i>GND</i> | Negative supply voltage | Supply |
| 2 | <i>SCL</i> | I ² C serial clock | Input |
| 3 | <i>VDD</i> | Positive supply voltage | Supply |
| 4 | <i>SDA</i> | I ² C serial data | Input/Output |

Table 2: Pin description

3 EV-Board

3.1 Schematic diagram

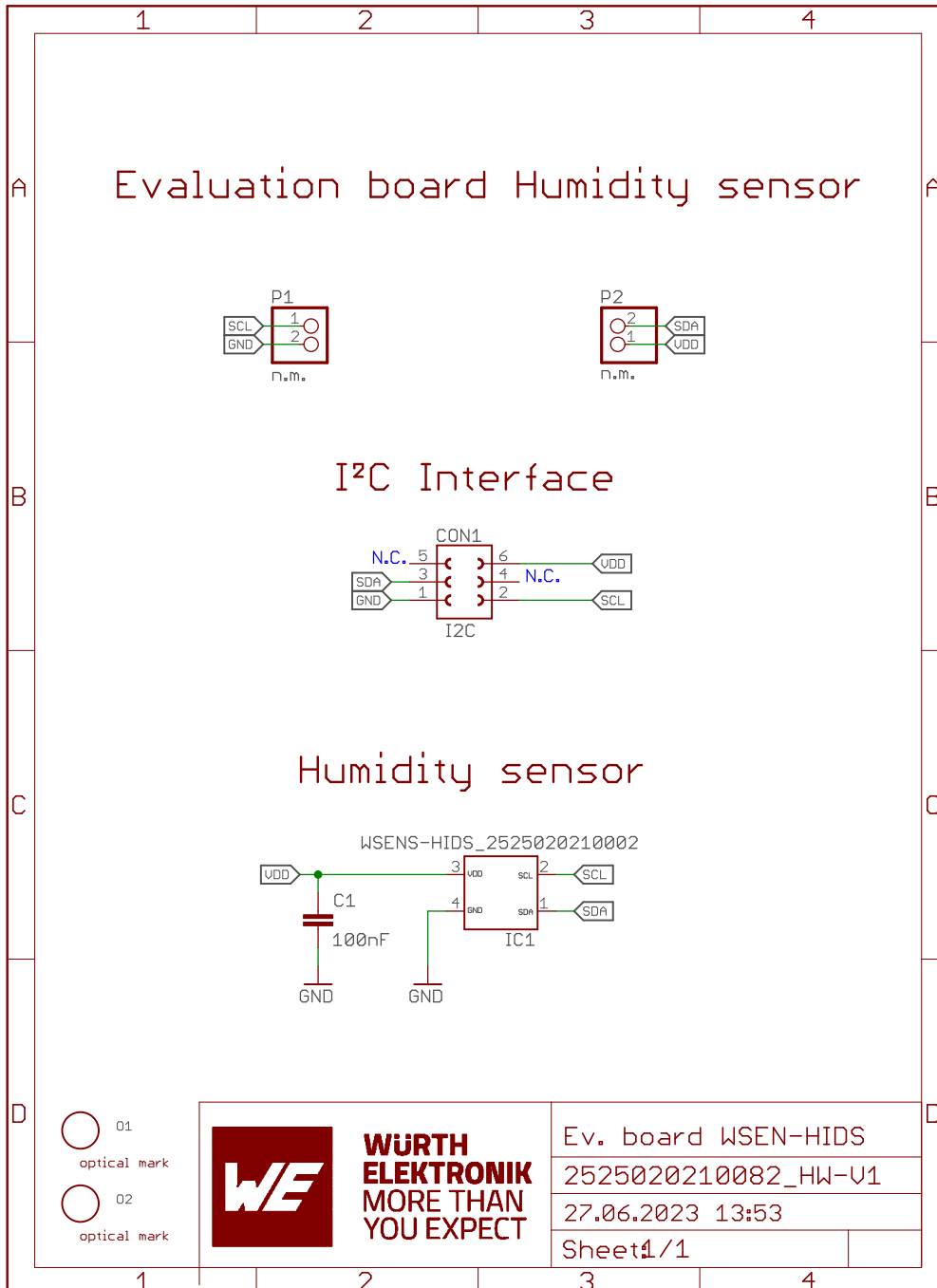


Figure 5: Schematic diagram

3.2 Layout

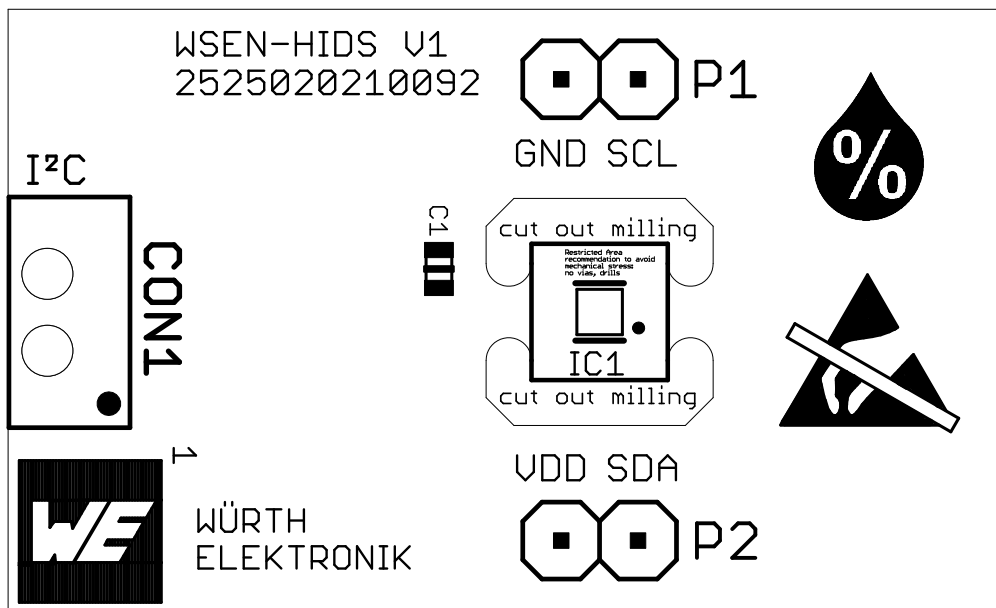


Figure 6: Assembly diagram

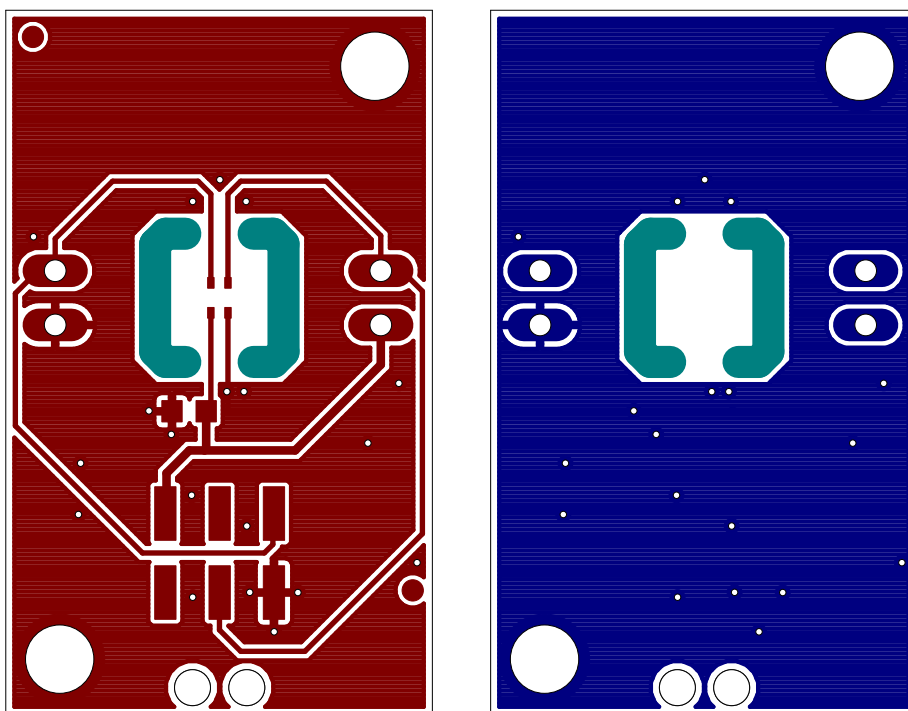


Figure 7: Top layer (left), bottom layer (right)

3.3 Bill of materials

| Part | Value | Pack | Manufacturer | NR |
|------|------------|------|------------------------|---------------|
| C1 | 100nF | 0603 | Würth Elektronik eiSos | 885012206095 |
| CON1 | 2x3 | SMT | Würth Elektronik eiSos | 610106249121 |
| IC1 | WSENS-HIDS | SMT | Würth Elektronik eiSos | 2525020210002 |
| P1 | n.m. | THT | n.m. | n.m. |
| P2 | n.m. | THT | n.m. | n.m. |

Table 3: Bill of materials



You can order the parts P1 and P2 from our website and the order code is *61300211121*

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Do not touch the EVB when it is live, and allow charged components, such as capacitors, to discharge completely before handling the EVB. Depending on the individual application, high voltages can occur on the EVB and some components can reach temperatures above 50 °C. Even after disconnecting the EVB from the power source, these conditions remain for a significant time. Please ensure that the appropriate safety precautions are taken when installing and operating this EVB, as one of the following may occur if you handle or use this EVB without observing the relevant safety precautions: - Death - Serious injury - Electric shock - Electric burns - Severe heat burns -

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- Do not touch the EVB while it is live.
- The EVB must be fully assembled and all devices to be tested must be connected before voltage is applied to the EVB.
- The EVB should never be left unattended during operation.
- Capacitors must be completely discharged. The capacitors must be actively discharged using a suitable resistor.

Protection against static electricity

Use the unpackaged product only in ESD protected areas. Wear the ESD personal protective equipment prescribed for these areas. Ground all conductive components, including personnel, as prescribed in ESD protected areas. Ensure that the product is only used by trained personnel.

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The EVB is not a finished product and is not intended for general use by the consumer. The EVB is intended exclusively for use in the evaluation of WE components in the lab or in development environments by highly qualified technicians or engineers, familiar with the risks involved in handling electrical or mechanical components, systems and subsystems. The use of the EVB is your full and independent responsibility. The EVB is expressly not intended to be installed in a terminal device or to be part of a terminal device in whole or in part. WE reserves the right, at its own discretion, to make corrections, improvements, adjustments or other changes to the EVB or to discontinue the EVB. The EVB is not intended for use in devices and applications for which a higher safety and reliability standard is prescribed. It is also not approved for use in safety-relevant applications or where personal injury or fatal consequences must be expected in the event of failure.

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The EVB may only be operated within the specifications and environmental parameters recommended by WE, as described in the instructions for use. Exceeding the specified parameters (including, but not limited to, input and output voltage, current, power, and ambient conditions) may result in damage to property. If you have questions about these electrical parameters, please contact WE at (regulatory-compliance@we-online.com) prior to connecting peripheral electronics (including the input voltage and intended loads). Any load outside a certain power range may lead to negative consequences, including, but not limited to, unintended or inaccurate evaluations or possibly permanent damage to the EVB or the electronics connected to it. Please ensure that the appropriate safety precautions are taken when working with the EVB, as serious injuries, including severe or even fatal injuries from electric shock or electric burns, may occur if you do not follow the appropriate safety precautions. Under no circumstances should the EVB be touched while live. When the EVB is connected to a power source, some of its components are electrically charged and/or have temperatures above 50 °C. This condition also applies for a short time after disconnecting from the supply voltage until the capacitors are completely discharged and hot components have cooled down. These components include connectors, linear regulators, switching transistors, heat sinks, resistors, diodes, inductors and other components, which can be identified from the documentation in the instructions for use. As with all electronic lab work, only qualified persons with knowledge of electronic performance evaluation, measurement and diagnostic tools, should use the EVB.

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Before putting the EVB into operation, please read the instructions for use and especially the various hazards and warnings described therein. The instructions for use contain important safety information on voltages and temperatures. You take full responsibility and liability for the proper and safe handling of the EVB. You agree to comply with all safety requirements, rules and regulations related to the use of the EVB. You also take full responsibility for: (1) establishing safeguards to ensure that the use of the EVB does not cause damage to property, personal injury or death, even if the EVB does not function as described, intended or expected, (2) the test setup in which the EVB is integrated, all safety requirements, rules and regulations and also that no damage to property, personal injury or other hazardous situation occurs even if the EVB fails, and (3) ensuring the safety of all activities performed by you or your employees when using the EVB. In particular, this means that the technical rules VDE [German Electrical Engineering, Electronic and Information Technology Association] 0105-100 and BGI [German trade association information] 891 (or corresponding applicable safety regulations outside Germany) for the operation of electrical test setups must be observed, the test area is protected against unauthorized access or accidental touching, current limitations, and emergency stop mechanisms are functional and test setups are never operated unattended. If you have any questions about the safe use of the EVB, please contact WE at regulatory-compliance@we-online.com for more information.

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- You are responsible for being sufficiently informed about and complying with all international, national, state and local applicable laws, rules and regulations that apply to the handling or use of the EVB by you or your employees.
- The EVB generates, uses and radiates radio frequency energy, but has not been tested for conformity with the limits applicable to the product category, which are applicable according to the European Union regulations for protection against radio frequency interference. Operation of the EVB may cause interference with radio communication. In this case, the costs incurred for necessary measures to remedy the interference are to be borne by the user.

As the EVB is not a finished product, it may not comply with applicable regulatory, safety or certification standards that are normally as-

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Contact

Würth Elektronik eiSos GmbH & Co. KG
Division Wireless Connectivity & Sensors

Max-Eyth-Straße 1
74638 Waldenburg
Germany

Tel.: +49 651 99355-0
Fax.: +49 651 99355-69
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