



USER MANUAL

SENSOR FEATHERWING

2501000201291

VERSION 1.4

OCTOBER 22, 2024

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

MUST READ

Check for firmware updates

Before using the product, make sure you use the most recent firmware version, data sheet, and user manual. This is especially important for Wireless Connectivity products that were not purchased directly from Würth Elektronik eiSos. A firmware update on these respective products may be required.

We strongly recommend including the possibility of a firmware update in the customer system design.

Revision history

Manual version	HW version	Notes	Date
1.0	2.0	Initial version	November 2020
1.1	2.2	Correction of typo in article number in schematic	February 2021
1.2	2.2	Updated GitHub repository links	February 2021
1.3	2.2	New corporate design	June 2023
1.4	2.2	Actualize part number of humidity sensor. Formating	October 2024

Abbreviations

Abbreviation	Name	Description
CISPR	Comité International Spécial des Perturbations Radioélectriques	International Special Committee on Radio Interference
EV	Evaluation	
ESD	Electro Static Discharge	
EMC	Electro Magnetic Compatibility	
GND	Ground	
HIGH	High signal level	
IDE	Integrated development environment	
IEC	International Electrotechnical Commission	
JST	Japan Solderless Terminal	
JTAG	Joint Test Action Group	
LED	Light Emitting Diode	
LGA	Land Grid Array	
Li-Po	Lithium-Polymer	
LOW	Low signal level	
MEMS	Micro-Electro Mechanical Systems	
PC	Personal Computer	
PCB	Printed Circuit Board	
SCL	Serial clock	
SDA	Serial data	
SDK	Software Development Kit	
SPI	Serial Peripheral Interface	
VCC		Supply voltage
VDD	Voltage Drain Drain	Supply voltage

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1 General description

1.1 Introduction

The Würth Elektronik eiSos Sensor FeatherWing is a sensor development board fully compatible to the popular Adafruit Feather line of development boards. It consists of the following four sensors,

- WSEN-PADS - Absolute pressure sensor (2511020213301)
- WSEN-ITDS - 3-axis acceleration sensor (2533020201601)
- WSEN-TIDS - Temperature sensor (2521020222501)
- WSEN-HIDS - Humidity sensor (2523020210001)

All four sensors are connected over the shared I²C bus and hence can be connected to any of the Feather microcontroller boards. The Arduino (C/C++) drivers and examples (see chapter 4) made available makes it easy to build a prototype to kick-start the application development.

The Sensor FeatherWing also has the 4-pin JST QWIIIC[®] connector on-board. This enables easy connection to the QWIIIC[®] ecosystem of development boards. Additionally, a 6 pin connector enables extension of the FeatherWing with a host of EV-Boards from Würth Elektronik eiSos.

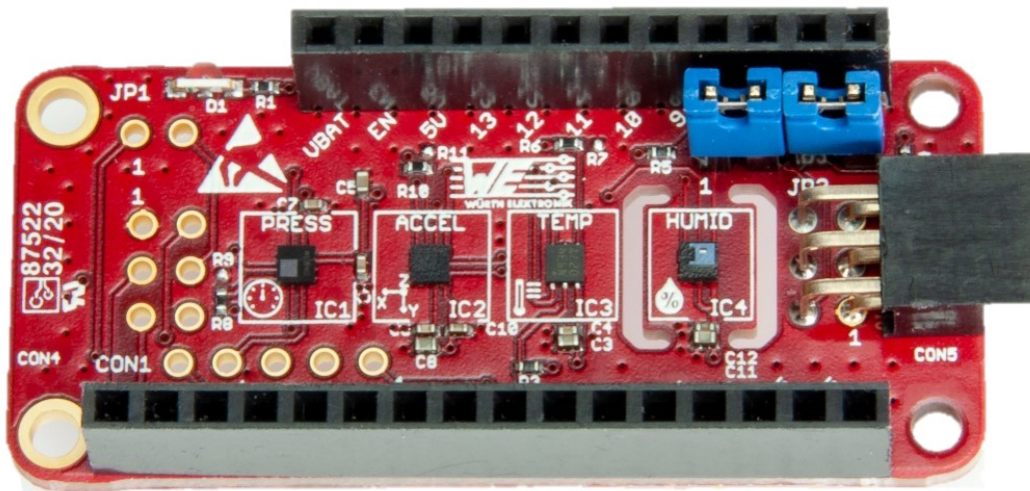


Figure 1: The WE Sensor FeatherWing (2501000201291)

1.2 Block diagram

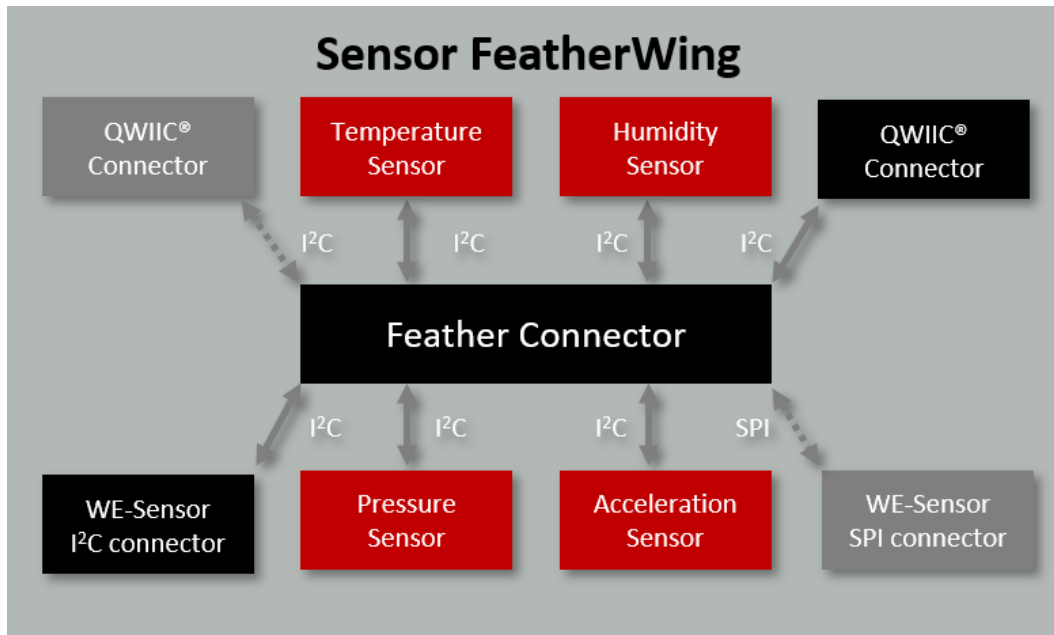


Figure 2: Block diagram - Sensor FeatherWing

1.3 Contents

Description	Quantity
WE Sensor FeatherWing	1
QWIIC® connector	1
2×3 WE-sensor connector (right angled)	1
Packaging: ESD safe bag	2

Table 1: Contents 2501000201291

2 Functional description

The Sensor FeatherWing was designed with rapid prototyping in mind. Being fully compatible with the Adafruit ecosystem, this FeatherWing allows the user the flexibility to choose the preferred host microcontroller. The inherent modularity of the ecosystem allows the FeatherWing to be easily integrated into any project.

The next sections provide a brief introduction to Adafruit's Feather ecosystem and details on the sensors present on the FeatherWing.

Feel free to check our YouTube channel:

www.youtube.com/user/WuerthElektronik/videos for video tutorials, hands-ons and webinars relating to our products.

2.1 Adafruit Feather

The Adafruit Feather ecosystem consists of two types of boards apart from a host of accessories:

- **Feather:** Adafruit Feathers are a complete line of development boards from Adafruit that are standalone and stackable. They can be powered either over the on-board micro-USB plugs or using a Li-Po battery. Feathers are portable, flexible and light as their namesake.
- **FeatherWings:** FeatherWings are stackable boards that when used along with a Feather add a certain functionality to the system.

The Feather system with more than 50+ Wings, several different types of accessories and arduino/circuit python based code support provides a perfect ecosystem for rapid prototyping. Please refer to adafruit.com/feather for more details on the Adafruit Feather ecosystem.

2.2 Sensor FeatherWing

The Sensor FeatherWing consists of four sensors. This section provides details regarding the key features of these sensors.

2.2.1 WSEN-PADS (2511020213301)

The WSEN-PADS is a MEMS based piezo-resistive absolute pressure sensor with an integrated ASIC and an embedded temperature sensor. The fully molded holed LGA package and low current consumption makes this sensor suitable for a range of applications including weather stations, barometers, altimeters and indoor navigation.

Key features

- Absolute pressure range : 26 to 126 kPa
- Output data rate : 1 to 200 Hz
- Pressure data resolution : 24-bits
- Current consumption : 4 μ A

- Programmable pressure threshold and data-ready interrupt

Further details about this sensor can be found under we-online.de/katalog/en/WSEN-PADS

2.2.2 WSEN-ITDS (2533020201601)

The WSEN-ITDS sensor is a 14-bit digital ultra-low-power and high-performance three-axis accelerometer with a digital output interface. Capability of detecting events like free fall, tap recognition, wake up, stationary/motion, activity/inactivity and 6D orientation make the sensor suitable for applications like vibration monitoring, tilt measurement, impact detection and many more.

Key features

- Selectable full scale : $\pm 2g$, $\pm 4g$, $\pm 8g$, $\pm 16g$,
- Bandwidth : 400 Hz
- Output data rate : Up to 1600 Hz
- Noise density : $90 \mu g / \sqrt{Hz}$
- Operating modes : High-performance, Low-power, Normal
- Current consumption : 16 μA (Low-power mode)

Further details about this sensor can be found under we-online.de/katalog/en/WSEN-ITDS

2.2.3 WSEN-TIDS (2521020222501)

The WSEN-TIDS is a high precision silicon-based digital temperature sensor IC with an integrated ASIC and a digital I²C interface. A compact UDFN package and fast thermal response make this sensor ideal for a range of applications like environmental monitoring, HVAC, PCB thermal monitoring, industrial control and many more.

Key features

- Temperature range : -40 to 125 °C
- Output data rate : 25 to 200 Hz
- Temperature data resolution : 16-bits
- Current consumption : 1.75 μA
- Programmable temperature threshold interrupt

Further details about this sensor can be found under we-online.de/katalog/en/WSEN-TIDS

2.2.4 WSEN-HIDS (2525020210001)

The WSEN-HIDS is a 16-bit ultra-low power and high-performance humidity sensor with a digital interface. The pre-calibrated sensor in a compact LGA package is suitable for a variety of applications including HVAC systems, white goods, building automation and air conditioning. For the final design we recommend to switch to the successor part 2525020210002.

Key features

- Humidity range : 0 to 100 % rH
- Humidity noise : 0.35 % rH RMS
- Output data rate : 1 Hz, 7 Hz and 12.5 Hz
- Current consumption : 8.9 μ A
- Integrated temperature sensor

Further details about this sensor can be found under we-online.de/katalog/en/WSEN-HIDS

3 Hardware description

This sections contains a detailed description of the hardware features of the Sensor FeatherWing. The design files for this hardware can be downloaded from github.com/WurthElektronik/FeatherWings.

3.1 Jumpers

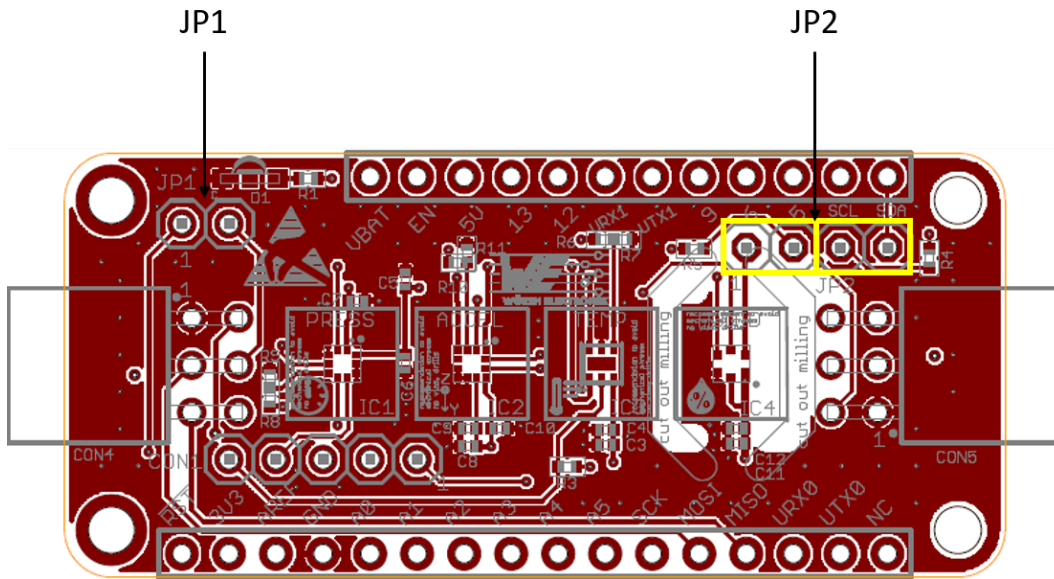


Figure 3: Jumpers and their default state

3.1.1 JP1

This jumper has to be mounted and set when the CON4 is used to connect to a sensor using the SPI interface.

JP1	Function	Jumper set (default)
1,2	SPI_CE(CON4) to GPIOA5	No (Not mounted)

Table 2: Jumper JP1

3.1.2 JP2

The standard I²C interface requires the SCL and SDA lines to be pulled up with resistors. These jumpers can be removed in cases where the pull-ups already exist on the I²C bus.

JP2	Function	Jumper set (default)
1,2	Connect I ² C SCL line to a 4.7 kΩ Pull up resistor	Yes
3,4	Connect I ² C SDA line to a 4.7 kΩ Pull up resistor	Yes

Table 3: Jumper JP2

3.2 Connectors and pin headers

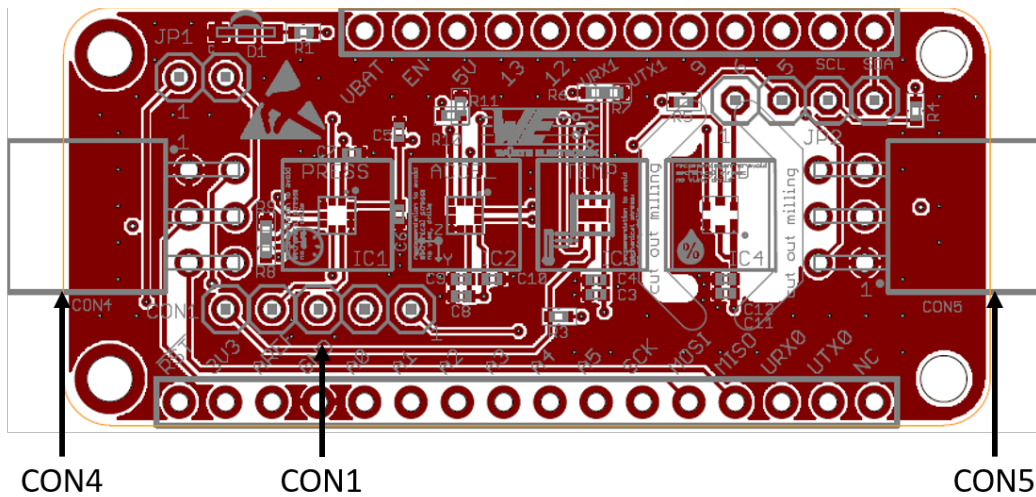


Figure 4: Connectors on the top

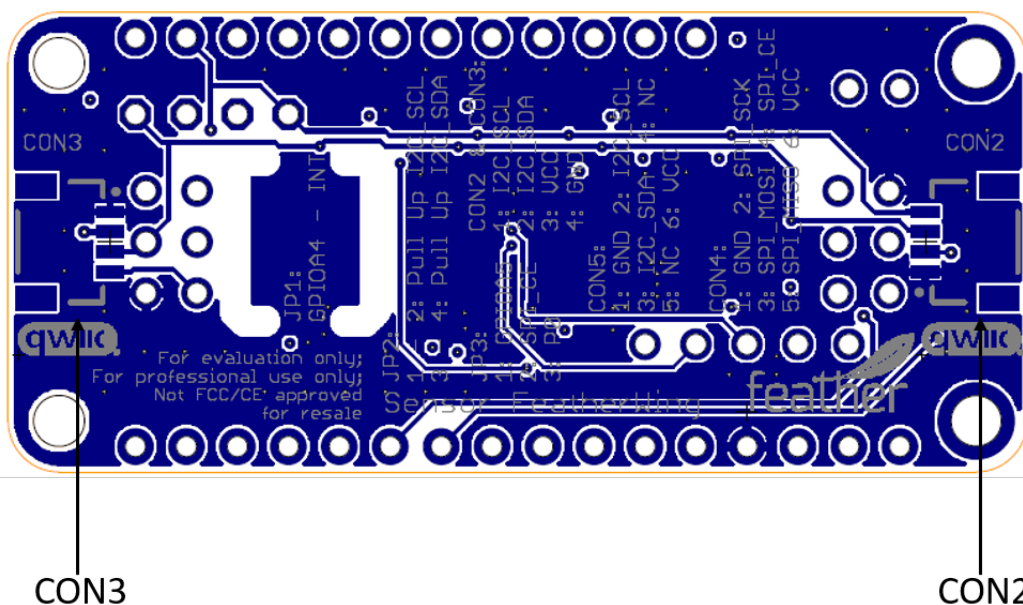


Figure 5: Connectors at the bottom

Connector	Function
CON1	Pin header for interrupt lines of the sensors
CON2	QWIIC® connector
CON3	QWIIC® connector
CON4	2×3 connector for WE sensor EV-boards for SPI
CON5	2×3 connector for WE sensor EV-boards for I ² C
Feather connector	Standard 16 and 12-pin headers for the Feather ecosystem

Table 4: Connector overview

3.2.1 CON1

Connector CON1 is a 1×5 2.54 mm pin header and provides all the interrupt lines that can be optionally connected to the host. This connector is not mounted.

Pin	Function
1	Interrupt of the WSEN-HIDS sensor
2	Interrupt 1 of the WSEN-ITDS sensor
3	Interrupt 0 of the WSEN-ITDS sensor
4	Interrupt of the WSEN-PADS sensor
5	Interrupt of the WSEN-TIDS sensor

3.2.2 CON2 and CON3

CON2 (mounted) and CON3 (not mounted) are 4-pin JST connectors that allow interfacing with SparkFun’s QWIIC® development board ecosystem. CON3 is not mounted and needs to be soldered on in order to be daisy chain-able. The QWIIC® ecosystem offers a wide range of development boards and accessories for quick prototyping. Please check sparkfun.com/qwiic for details on the QWIIC® ecosystem.

Pin	Function
1	I ² C SCL
2	I ² C SDA
3	VCC
4	GND

3.2.3 CON4

The connector 4 (not mounted) is a 2×2 2.54 mm pitch plug that is compatible with the EV-boards of sensors from Würth Elektronik eiSos using the SPI interface.

Pin	Function
1	GND
2	SPI_SCK (Clock)
3	SPI_MOSI (Master Out Slave In)
4	SPI_CE (Chip Enable)
5	SPI_MISO (Master In Slave Out)
6	VCC

3.2.4 CON5

The connector 5 is a 2×3 2.54 mm pitch plug that is compatible with the EV-boards of sensors from Würth Elektronik eiSos using the I²C interface.

Pin	Function
1	GND
2	I ² C SCL
3	I ² C SDA
4	Not connected
5	Not connected
6	VCC

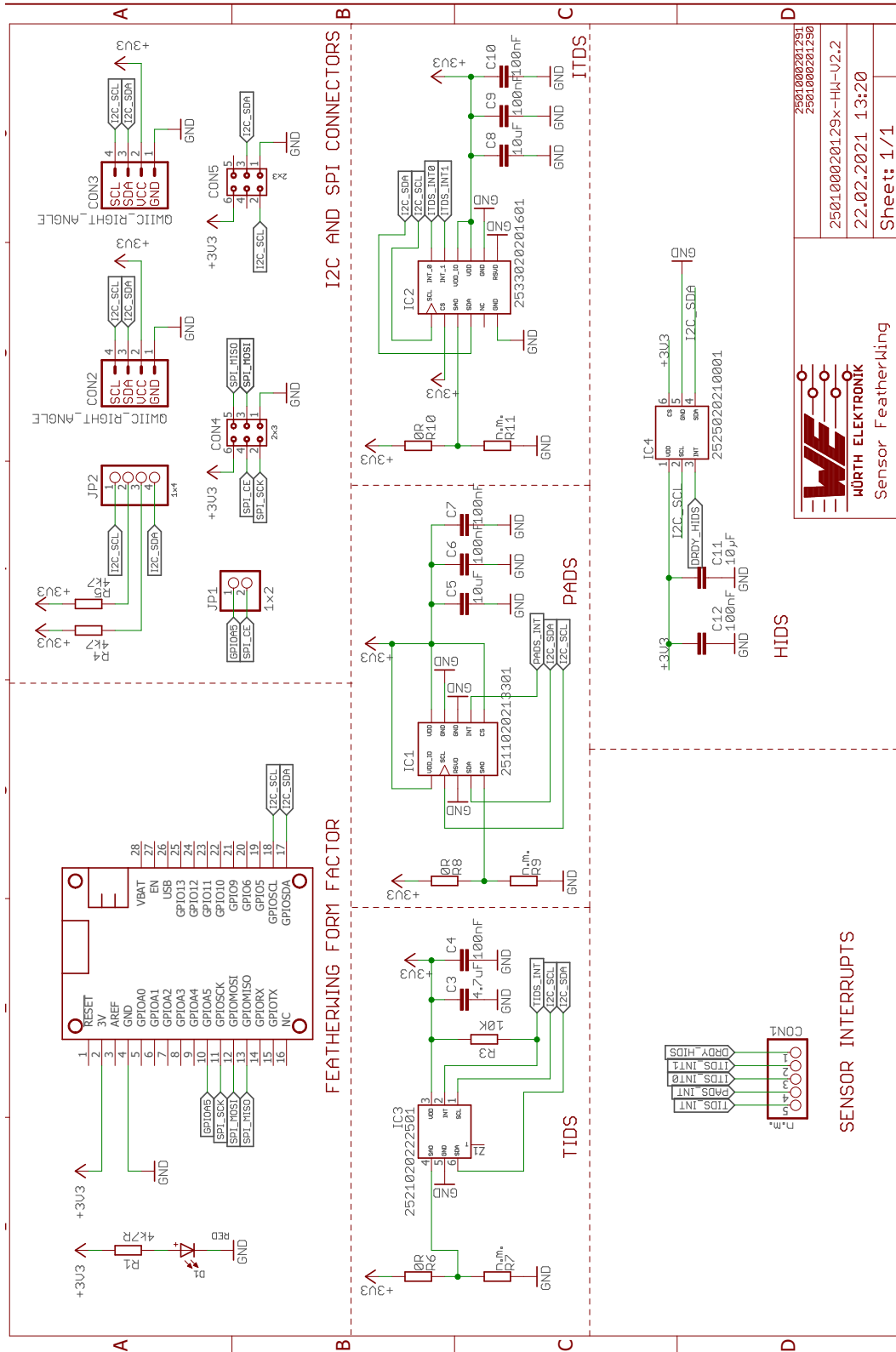
3.2.5 Feather connector

This is the standard set of connectors that is used across the Feather ecosystem. The table below describes the functions of each of the 28 pins as applicable to this FeatherWing.

Pin Number	Pin name	Function
1	\overline{RST}	Not connected
2	3V3	3.3 V power supply
3	AREF	Not connected
4	GND	Ground
5	A0	Not connected
6	A1	Not connected
7	A2	Not connected
8	A3	Not connected
9	A4	Not connected
10	A5	(Optional) SPI_CE via JP1
11	SCK	SPI clock
12	MOSI	SPI MOSI
13	MISO	SPI MISO
14	U0RX	Not connected
15	U0TX	Not connected
16	NC	Not connected

Pin Number	Pin name	Function
17	SDA	I ² C SDA
18	SCL	I ² C SCL
19	5	Not connected
20	6	Not connected
21	9	Not connected
22	U1TX	Not connected
23	U1RX	Not connected
24	12	Not connected
25	13	Not connected
26	5 V	Not connected
27	EN	Not connected
28	VBAT	Not connected

3.3 Schematics



2501000201291
2501000201290
250100020129x-H1-U2.2
22.02.2021 13:20
Sheet: 1/1



Figure 6: Schematics

3.4 Layout

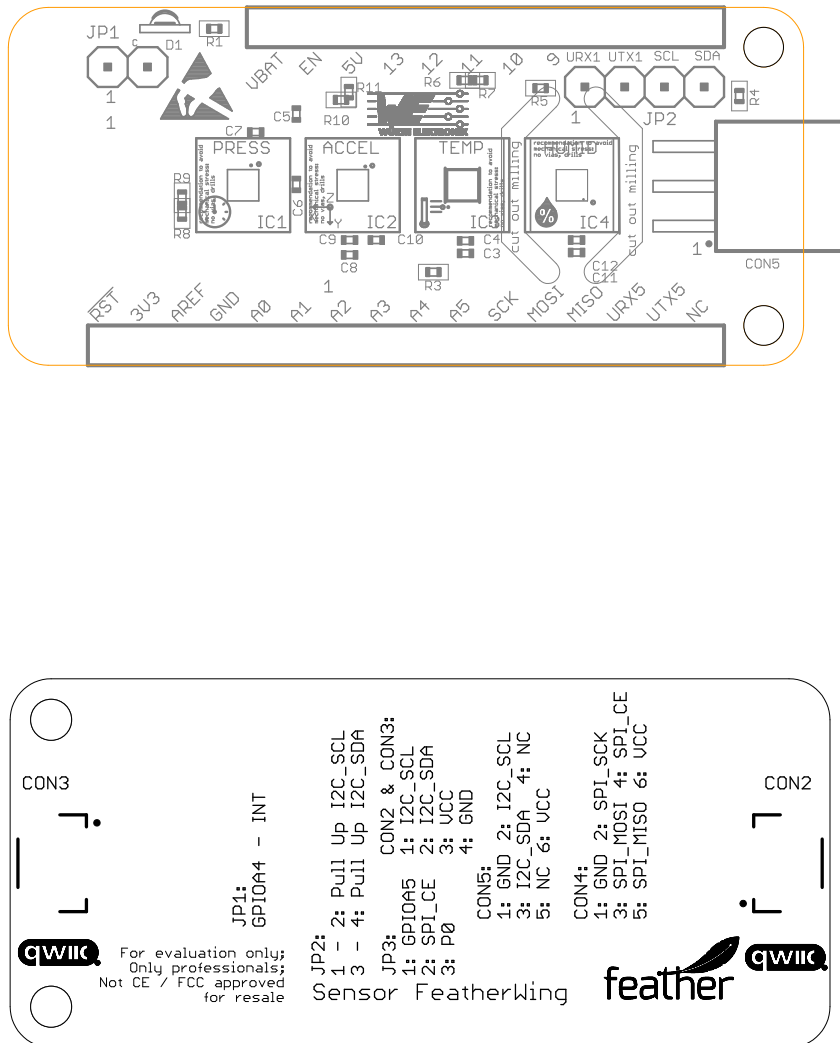


Figure 7: Assembly diagrams

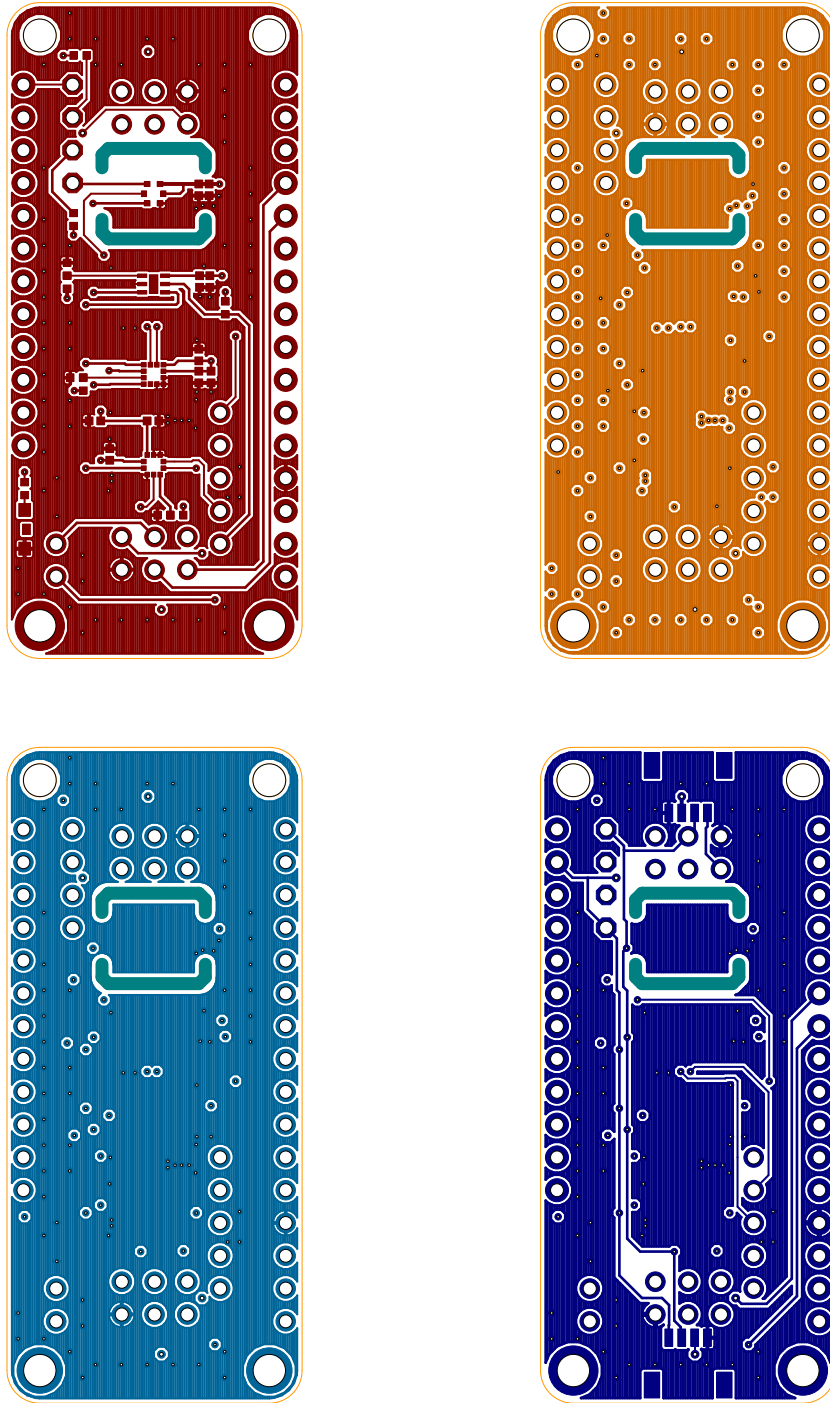


Figure 8: Top, bottom and internal layers

4 Software description

Würth Elektronik eiSos provides a software development kit (SDK) with examples to support all the WE FeatherWings. Here are the salient features of the WE FeatherWing SDK.

- The SDK is open-source and well documented.
- It uses popular open-source tool chain including an IDE.
- The examples are written in Arduino-styled C/C++ for quick prototyping.
- The core components of the SDK are written in pure C to enable easy porting to any microcontroller platform.
- Development platform independent (Windows, Linux or MAC).
- Modular structure of the software stack makes it easy to integrate into any project.

The SDK can be accessed on Github at github.com/WurthElektronik/FeatherWings.

4.1 Software architecture

The WE FeatherWing SDK is built up in a modular way using a set of open-source tools to enable complete flexibility for the user.

The figure 9 shows the architecture of the WE FeatherWing SDK.

- **PlatformIO:** is a cross-platform, cross-architecture, multiple framework professional tool for embedded software development. It provides the tool chain necessary for the software development including building, debugging, code-upload and many more. PlatformIO works well on all the modern operating systems and supports a host of development boards including the Feathers from Adafruit. Further details about PlatformIO can be found under platformio.org
- **Platform interface:** This layer provides abstraction to the peripheral drivers for the platform being used. Currently, this SDK implements an abstraction to the Arduino peripheral drivers for the Feather M0 express platform.
- **WE SDK:** This is a layer of platform-independent pure C drivers for sensors and wireless connectivity modules from Würth Elektronik eiSos. These drivers implement all the necessary functions to utilize full feature set of the sensors and wireless connectivity modules. More details on the SDK and downloads under, we-online.com/wcs-software.
- **Board files:** This layer provides abstraction at a board level and provides functions to configure and control individual FeatherWings from WE.
- **User application:** The SDK currently implements a quick start example for each of the FeatherWings.

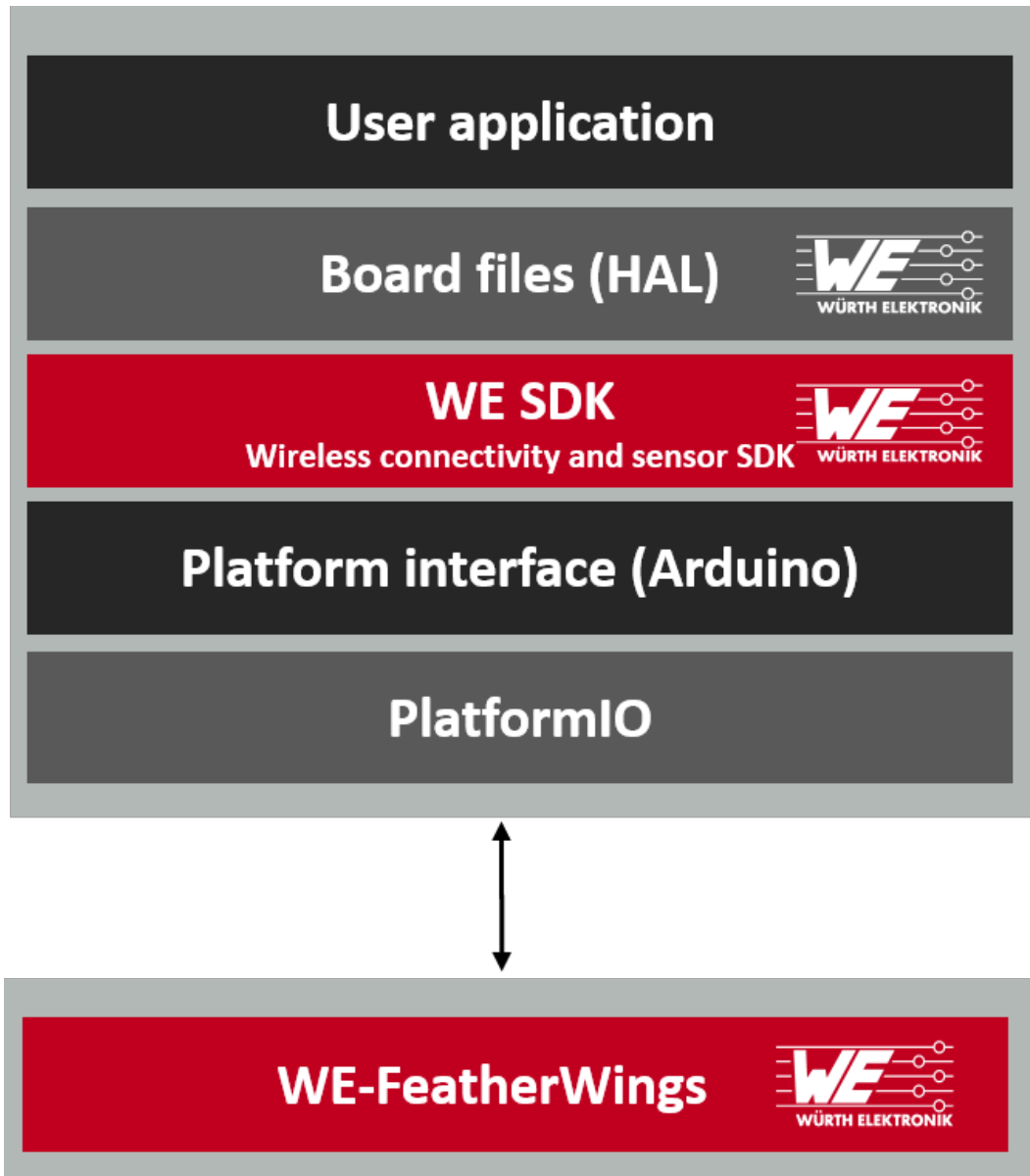


Figure 9: Software architecture

4.2 Installing the tools

4.2.1 IDE

Although, platformIO provides a versatile command line interface for development, the SDK provides quick start projects for the Visual Studio Code. This popular IDE makes for better code organization as well as code editing. Visual Studio Code is available on all modern operating systems. Support for extensions, built-in Git and a versatile code editor make it a well rounded tool for embedded software development. Please refer to code.visualstudio.com for more details on Visual Studio Code.

4.2.2 Installation steps

- Install Visual Studio Code on the platform of your choice following the instructions under code.visualstudio.com/docs
- Follow the instructions under platformio.org/install/ide?install=vscode to install PlatformIO IDE extension.

4.3 Hardware Setup

The quick start examples in the SDK are written to be run on *Adafruit's Feather M0 express*. The hardware setup is as simple as stacking up the FeatherWing on top of the M0 Feather and powering up the board.

4.4 Running the quick start example

- Clone or download the WE FeatherWing SDK from Github.
github.com/WurthElektronik/FeatherWings
- Open the workspace of interest with the filename <FeatherWing>.code-workspace in Visual Studio code.
- Build and upload the code from the PlatformIO tab as shown in the Figure 10
- After successful upload, click on Monitor to view the debug logs in the serial terminal (see Figure 10).

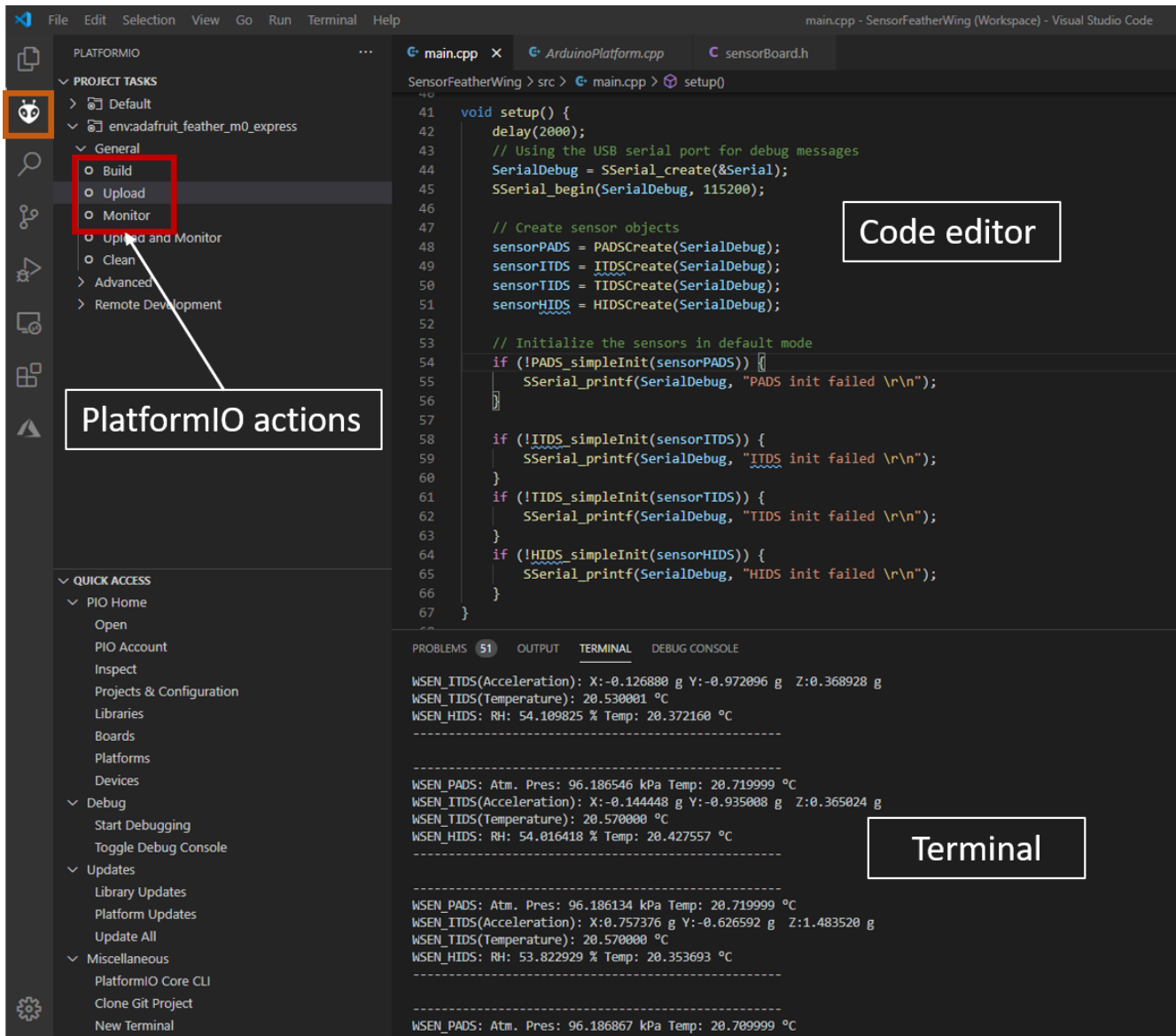


Figure 10: Running the quick start example

5 Regulatory compliance information

Pursuant to Article 1 (2.) of the EU directive 2014/53/EU, Article 1 (2.) the directive does not apply to equipment listed in Annex I (4.): custom-built EV-Kits destined for professionals to be used solely at research and development facilities for such purposes.

Nevertheless this EV-Board has been tested to satisfy general EMC requirements. Following standards have been applied:

- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-6
- CISPR 16-2-1
- CISPR 16-2-3

5.1 Exemption clause

Relevant regulation requirements are subject to change. Würth Elektronik eiSos does not guarantee the accuracy of the before mentioned information. Directives, technical standards, procedural descriptions and the like may be interpreted differently by the national authorities. Equally, the national laws and restrictions may vary with the country. In case of doubt or uncertainty, we recommend that you consult with the authorities or official certification organizations of the relevant countries. Würth Elektronik eiSos is exempt from any responsibilities or liabilities related to regulatory compliance.

Notwithstanding the above, Würth Elektronik eiSos makes no representations and warranties of any kind related to their accuracy, correctness, completeness and/or usability for customer applications. No responsibility is assumed for inaccuracies or incompleteness.

6 Important notes

The following conditions apply to all goods within the wireless connectivity and sensors product range of Würth Elektronik eiSos GmbH & Co. KG:

General customer responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact, it is up to the customer to evaluate, where appropriate to investigate and to decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not. Accordingly, the customer is cautioned to verify that the documentation is current before placing orders.

Customer responsibility related to specific, in particular safety-relevant applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. The same statement is valid for all software source code and firmware parts contained in or used with or for products in the wireless connectivity and sensor product range of Würth Elektronik eiSos GmbH & Co. KG. In certain customer applications requiring a high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health, it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component.

Best care and attention

Any product-specific data sheets, manuals, application notes, PCNs, warnings and cautions must be strictly observed in the most recent versions and matching to the products revisions. These documents can be downloaded from the product specific sections on the wireless connectivity and sensors homepage.

Customer support for product specifications

Some products within the product range may contain substances, which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case, the Business Development Engineer (BDM) or the internal sales person in charge should be contacted who will be happy to support in this matter.

Product improvements

Due to constant product improvement, product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard, we inform about major changes. In case of further queries regarding the PCN, the Business Development Engineer (BDM), the internal sales person or the technical support team in charge should be contacted. The basic responsibility of the customer as per section 6 and 6 remains unaffected.

All software like "wireless connectivity SDK", "Sensor SDK" or other source codes as well as all PC software tools are not subject to the Product Change Notification information process.

Product life cycle

Due to technical progress and economical evaluation, we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this, we cannot ensure that all products within our product range will always be available. Therefore, it needs to be verified with the Business Development Engineer (BDM) or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products. The approach named above does not apply in the case of EV-Boards. EV-Boards may be changed without any notification.

Property rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG. Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

General terms and conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at www.we-online.com.

7 Terms of Use for Würth Elektronik eiSos GmbH & Co. KG EV-Boards, evaluation kits and evaluation modules

Würth Elektronik eiSos GmbH & Co. KG provide you as a user with technical data (including data sheets), design resources (including reference designs), recommendations for use or other design recommendations, web tools, safety information and other information in the form of evaluation-boards, -kits or -modules (hereinafter jointly referred to as "EVB") in accordance with the terms and conditions contained here. The EVB is provided in the "as is" state. WE disclaims all express and implied warranties, in particular those concerning the suitability for a certain purpose, the absence of defects or non-violation of third-party rights. The EVB is intended for experienced developers to develop

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their application with WE components. As a user, you are solely responsible for: (1) selection of the appropriate WE components for the application, (2) design, validation and testing the application, and (3) assurance that the application meets the applicable standards and all other safety requirements and other applicable requirements. WE may change the EVB without prior notice. WE grants you permission to use the EVB only for developing an application suitable for using WE components. Any other duplication, representation or transfer of the EVB is expressly prohibited. WE does not grant any licenses for the use of the intellectual property rights from WE or third parties. WE is fully indemnified from all claims, damages, costs, losses and liabilities arising from the misuse of this EVB. The WE components are provided in accordance with WE's conditions of sale or other applicable conditions available either at <https://katalog.we-online.com> or in conjunction with such WE components. WE's provision of the EVB does not constitute an extended warranty in relation to the WE components.

General warnings

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 -

When using the EVB, you undertake to read the instructions for use in full together with the relevant information supplied and/or available on the homepage www.we-online.de/wcs-manuals before putting this EVB into operation. The following points have to be observed in particular:

- 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.

Purpose and use

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.

Operation of the EVB

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.

Hazards and warnings

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.

Your responsibility with regard to the applicable laws

- 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-

User manual Sensor FeatherWing

sociated with other products, such as Directive 2011/65/EC of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of hazardous substances and Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). You take full responsibility for compliance with such standards that apply to the EVB. You also take responsibility for the proper disposal of the components and materials of the EVB.

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