

USER MANUAL

EVALUATION BOARD/KIT FOR RADIO
MODULES 260701XXXXXX,
260503XXXXXX, 260504XXXXXX,
260702XXXXXX, 260901XXXXXX,
260903XXXXXX

VERSION 2.8

OCTOBER 23, 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 - 1.11	-	<ul style="list-style-type: none">• Initial version	July 2017
2.0	4.1	<ul style="list-style-type: none">• New corporate design and structure	December 2018
2.1	4.1	<ul style="list-style-type: none">• Corrected article number of Thebe-II• Added hint to use Thebe-II with external power supply	January 2019
2.2	4.1	<ul style="list-style-type: none">• Added chapter Regulatory compliance information	February 2019
2.3	4.1	<ul style="list-style-type: none">• Added Marketing name	March 2019
2.4	4.1	<ul style="list-style-type: none">• Added Themisto-I• Specified Hardware Version of the EV-Board in detail.	October 2019
2.5	4.1	<ul style="list-style-type: none">• Schematic is updated in chapter 3.6.• Bill of materials is added in chapter 3.8.• FCC exemption information is added in chapter 5.	January 2021

2.6	5.0	<ul style="list-style-type: none">• Updated chapter 3.6 and 3.8.• Added radiation characteristics in chapter 3.9.• New corporate design.	May 2023
2.7	5.1	<ul style="list-style-type: none">• Updated chapter 1 and added Thebe-II-IN.• Updated chapter 3.8: new FTDI chip part number.	July 2024
2.8	5.1	<ul style="list-style-type: none">• Added description of supported FTDI baud rates	October 2024

Abbreviations

Abbreviation	Name	Description
BDM	Business Development Manager	Support and sales contact person responsible for limited sales area
HIGH	High signal level	
LOW	Low signal level	
RF	Radio frequency	Describes everything relating to the wireless transmission.
UART	Universal Asynchronous Receiver Transmitter	Interface which allows communication with the module.
VDD	Supply voltage	

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1 Supported radio modules

The EV-Board described in this manual can be used to evaluate the following WE eiSos wireless connectivity modules:

Order code	Former order code	Marketing Name	Description
260701111100x	AMB3626(-TR)	Titania	169 MHz proprietary
260701111300x	AMB3626-M(-TR)	Mimas-I	169 MHz wireless M-BUS
260503114100x	AMB4426(-TR)	Thadeus	434 MHz proprietary
260504118100x	AMB8426(-TR)	Tarvos-I	868 MHz proprietary
260504118300x	AMB8426-M(-TR)	Metis-I	868 MHz wireless M-BUS
260702118100x	AMB8626(-TR)	Tarvos-II	868 MHz proprietary
260702118300x	AMB8626-M(-TR)	Metis-II	868 MHz wireless M-BUS
260901108100x	AMB8826(-TR)	Tarvos-III	868 MHz proprietary
260901118100x	AMB8826-1(-TR)	Tarvos-III	868 MHz proprietary, PCB antenna
260702119100x	AMB9625(-TR)	Telesto-I	915 MHz proprietary, -2 dBm tx power for FCC
260702119101x	AMB9626(-TR)	Telesto-II	915 MHz proprietary, FHSS for FCC
260901109100x	AMB9826(-TR)	Telesto-III	915 MHz proprietary, broadband for FCC
260901119100x	AMB9826-1(-TR)	Telesto-III	915 MHz proprietary, broadband for FCC, PCB antenna
260903118100x	AMB8836(-TR)	Thebe-II	868 MHz proprietary, 500 mW
260903118100x		Thebe-II-IN	868 MHz proprietary for India, 500 mW

Table 1: Compatibility

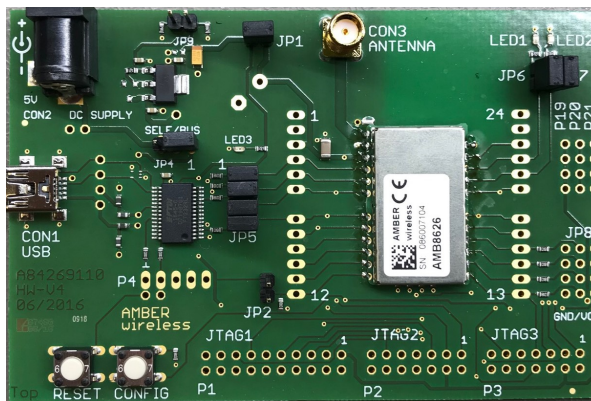


Figure 1: Product image

2 Functional description

The EV-Board offers the user the possibility to develop hard- and software for the compatible radio module. It can be connected to a USB port of a PC.

For the connection to a microcontroller system, the development board is equipped with a multi-pin connector, which is connected to all pins of the RF module. Jumpers allow the module to be disconnected from components which are not required, such as the USB interface.

Check our YouTube channel for video tutorials, hands-ons and webinars related to our products:
www.youtube.com/user/WuerthElektronik/videos

2.1 Taking into operation

To run the EV-Board, place the jumpers on default position, as described in chapter 3.2. The corresponding FTDI driver package (www.ftdichip.com/Drivers/VCP.htm) has to be installed on your PC.

Connect the power jack or external power supply to the EV-Board and make sure the VDD is stable and able to reliably supply the module's static and peak current consumption, as specified by the module manual.

The next step is to connect the EV-Board to the PC using an USB-cable. In that way, a COM port can be detected and installed on your PC. Check the device manager to acquire the COM port name of the EV-Board. A typical name is "COM12" in Windows systems or /dev/ttyUSB0 in Linux systems.

A terminal program (like hterm for Windows) has to be run and the corresponding COM port has to be opened using the default settings of the mounted radio module.

After the module is powered through the USB jack or an alternative power supply, the reset button should be pressed to ensure a clean start-up of the module.

Refer to the module user manual to get the detailed module's specific quick-start instructions.

3 Development board

3.1 Block diagram

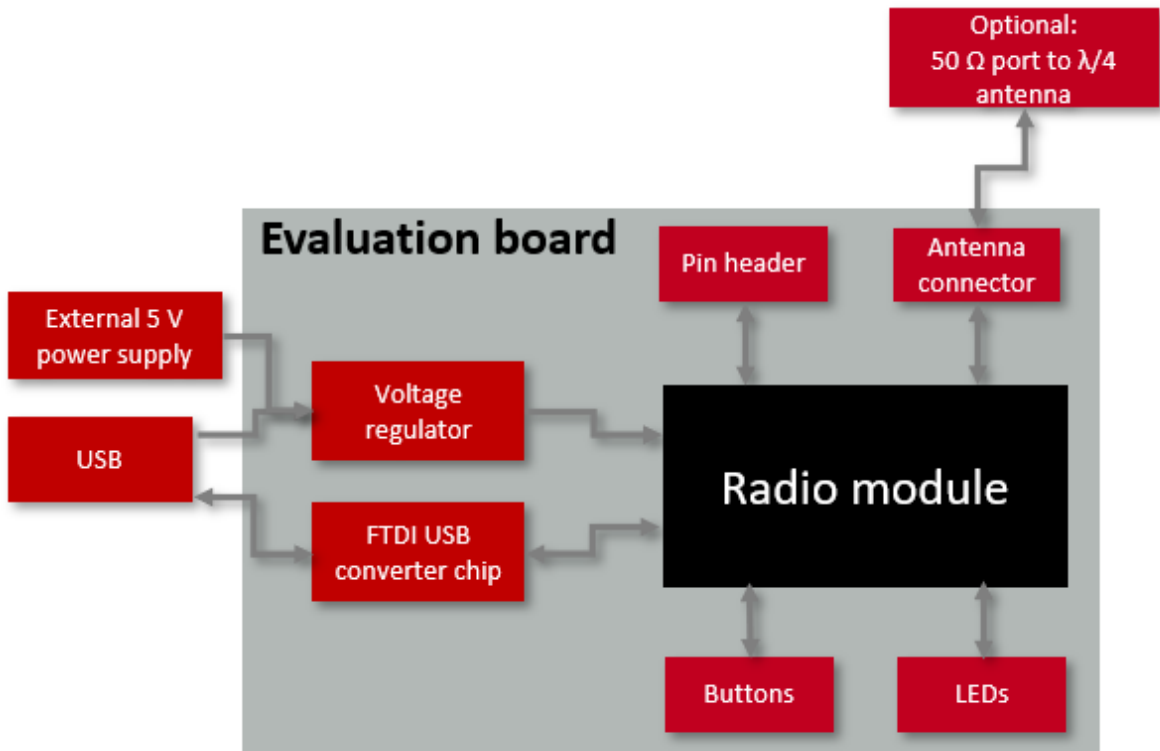


Figure 2: Block diagram

3.2 Jumpers

The following figure shows the default positioning (marked in red) of all jumpers on the EV-Board.

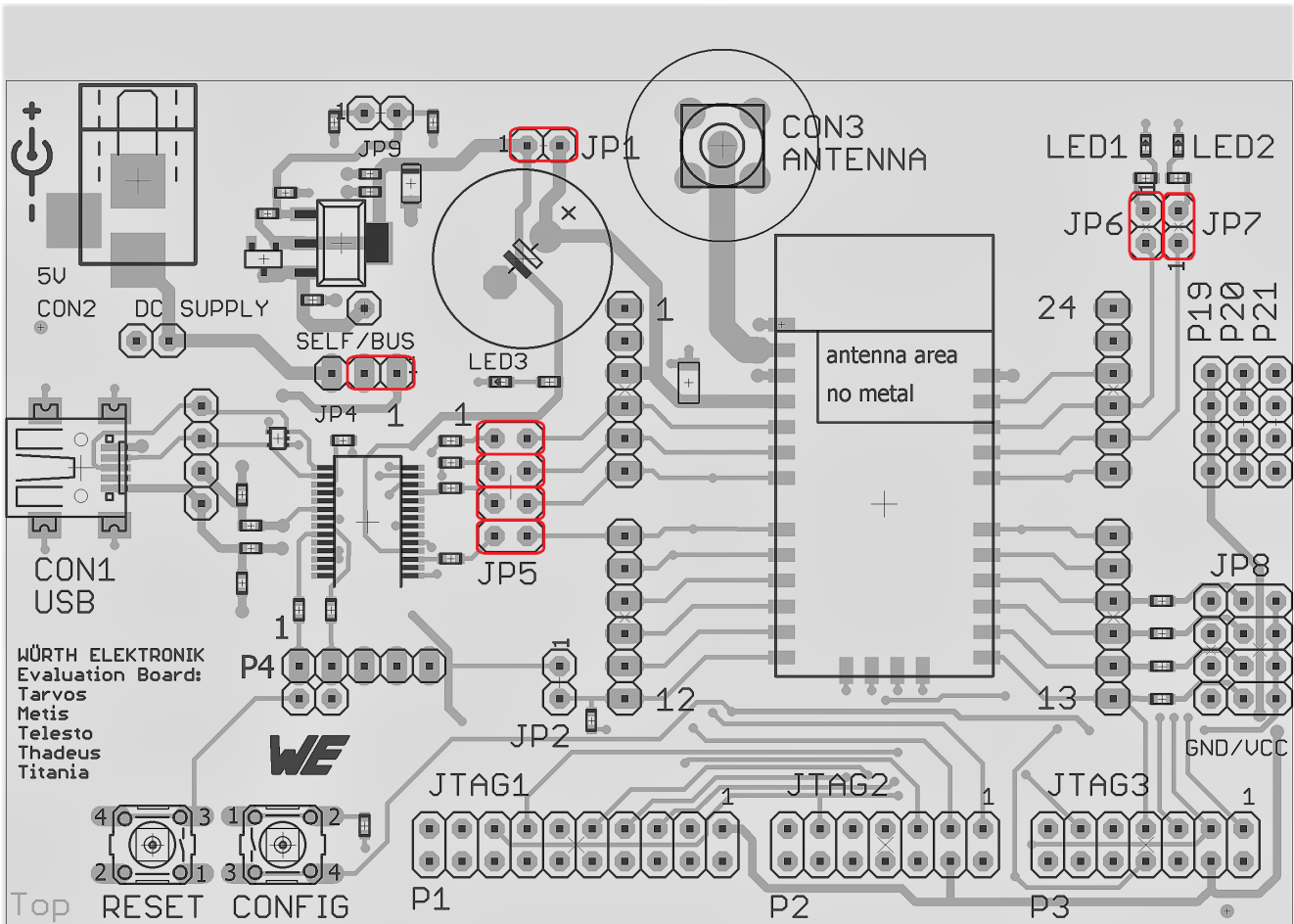


Figure 3: Jumpers in default position

JP1	Jumper placed (default)	Description
1,2	Set 1-2	Connection of the power supply (current measurement)

JP2	Jumper placed (default)	Description
1,2	Not set	Connects module pin to VDD level. Only to be used in case of a module of the Tarvos-III, Telesto-III and Thebe-II family: set jumper and press reset to start the bootloader.

JP4	Jumper placed (default)	Description
1,2,3	Set 1-2	Selection of the power supply, set left for external power supply, otherwise USB powered. 500 mW high power modules shall only use ext. power supply as the USB is not guaranteed to deliver the required current.

JP5	Jumper placed (default)	Description
1,2	Set 1-2	Connects module pin UTXD to USB converter
3,4	Set 3-4	Connects module pin URXD to USB converter
5,6	Set 5-6	Connects module pin RTS to USB converter
7,8	Set 7-8	Connects module pin CTS to USB converter

JP6	Jumper placed (default)	Description
1,2	Set 1-2	Connection of the red status LED (TX_LED)

JP7	Jumper placed (default)	Description
1,2	Set 1-2	Connection of the green status LED (RX_LED)

JP8	Jumper placed (default)	Description
-	Not set	Pulling module pins to high or low level

JP9	Jumper placed (default)	Description
1, 2	Not set	Set jumper to reduce supply voltage to 2.2 V instead of 3.3 V. You shall take the module specific electrical characteristics into account when changing VDD to 2.2 V.

3.3 Connectors and pin headers

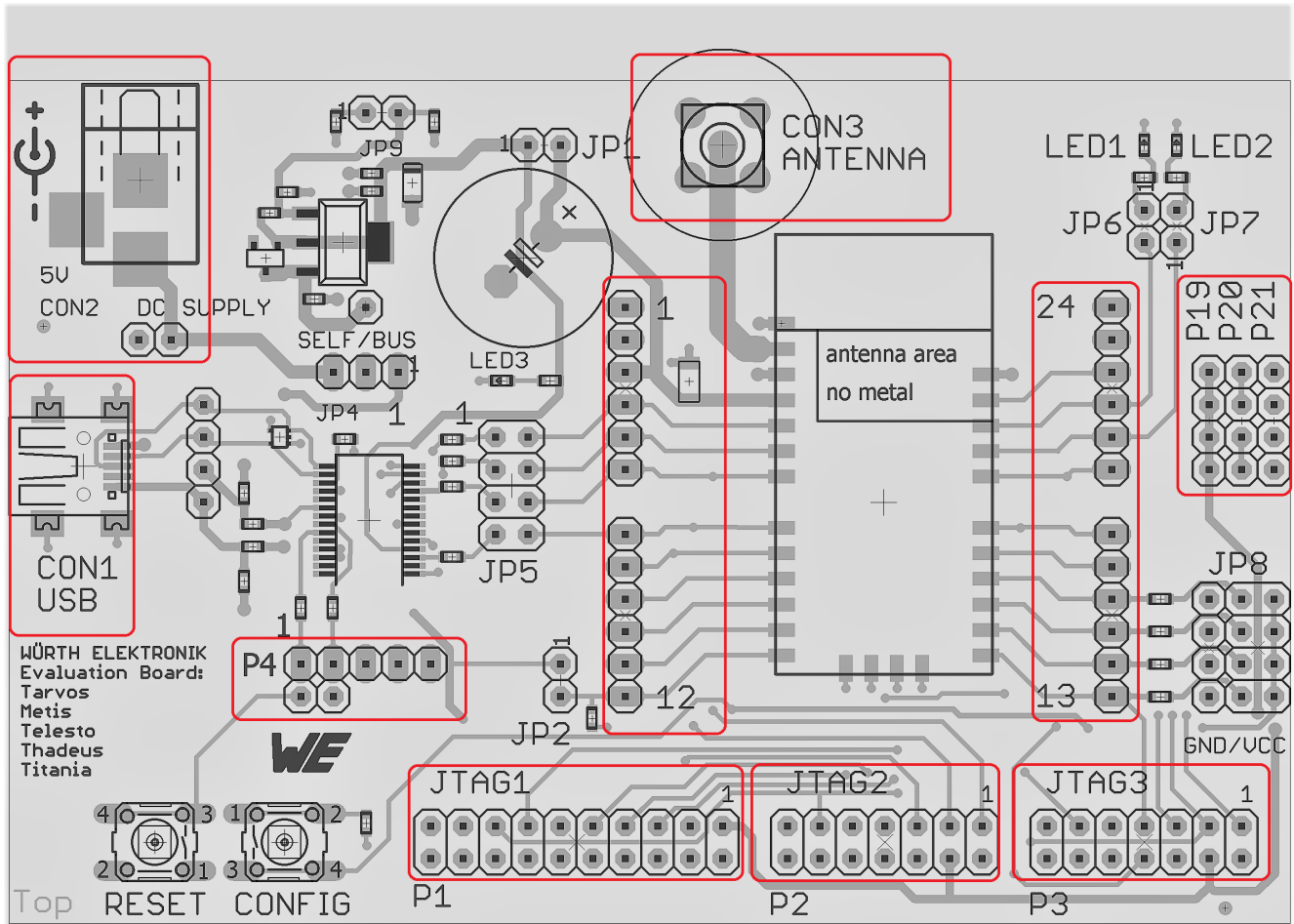


Figure 4: Connectors



All reserved pins shall be handled/terminated as described in the module specific manual.

-	Description
1-24	Direct access to the signals of the radio module

CON1	Description
-	Mini USB jack for USB interface

CON2	Description
-	Power jack, external 5 V power supply

CON3	Description
-	SMA antenna connector for modules variants wit RF pad (i.e. without integrated antenna)

P1	Function	Description
1-20	JTAG	2×10 pin JTAG interface access for ARM Cortex M

P2	Function	Description
1-20	JTAG	2×7 pin JTAG interface access for modules with MSP430x5xx

P3	Function	Description
1-20	JTAG	2×7 pin JTAG interface access for modules with MSP430x2xx

P4	Function	Description
1,2,3,4,5	FTDI CBUSx	Access to FTDI CBUSx lines

P19	Description
1,2,3,4	Access to VDD

P20	Description
1-2	Prototyping area, internally connected
3-4	Prototyping area, internally connected

P21	Description
1,2,3,4	Access to GND

3.4 Buttons

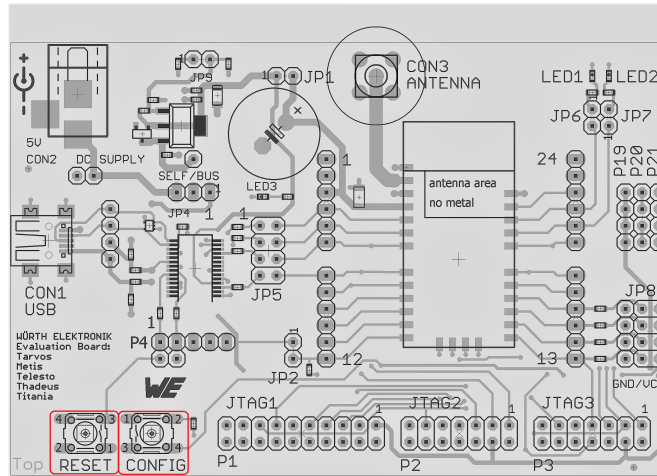


Figure 5: Buttons in layout

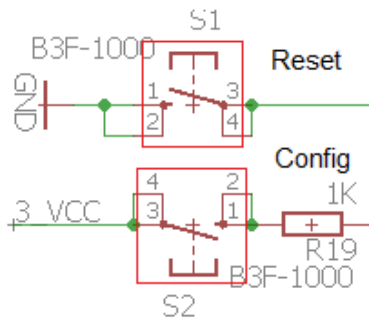


Figure 6: Buttons in circuit

3.4.1 Reset button

Every module provides a */RESET pin* that is connected to this **RESET** button so the module can be (re)started properly. A pressed button connects the */RESET* to LOW logic level and holds the module in reset until it is released. Most modules provide an internal pull-up resistor. Refer to the module specific manual for detailed information upon the module’s */RESET* pin and recommended start-up sequences for the module.

3.4.2 Config button

Some proprietary wireless connectivity modules use the **CONFIG** button connected to their */CONFIG* pin to toggle the OpMode of the module. Refer to the module’s specific manual for detailed information.

3.5 Function blocks

3.5.1 Power supply

3.5.1.1 Bus powered, power supply through USB

JP4 is to be set to 2-3 position.

The development board can be powered via USB. The integrated voltage regulator regulates the connected USB voltage 5 V down to 3 V and supplies the remaining parts of the circuit. If the EV-Board is power sourced, the power *LED1* lights up.

3.5.1.2 Self powered, power supply through power jack

JP4 is to be set to 1-2 position.

The USB for communication must be connected only after the power jack was connected and VDD is stable.

The development board can be powered via 5 V power jack. The integrated voltage regulator regulates the connected voltage 5 V down to 3 V and supplies the remaining parts of the circuit. If the EV-Board is power sourced, the power *LED1* lights up.



For 500 mW modules, such as Thebe-II, we highly recommend to use the power jack for power supply to avoid damage of the USB interface when pulling high transmission currents.

3.5.2 Current measurement

JP1 can be used to measure the power consumption of the module. By default, a bridge is set on JP1 to close the circuit. Remove the bridge and connect a current meter in place of the jumper to measure the power consumption of the module.

If the meter is not attached and the bridge is not set, the module will not receive any supply voltage. However, the power LED may be active, as it is connected prior to the current measurement bridge in order to not distort the module's power consumption.

Parts connected to the module, such as LEDs, can be separated from the module via JP6 and JP7.



To achieve the stated low power current the module pins must be terminated as stated in the module specific manual.

3.5.3 UART / USB

The UART of the module can be connected to the USB converter by setting the bridge JP5. In this case, it is available on the USB jack. Using the FTDI-driver, the PC will show a virtual

COM port, which can be used to communicate with the module.
 The FTDI converter IC has the VCCIO line connected to the module VDD line to match the logic-levels of both components.

The USB cable length must not exceed 3 meters.

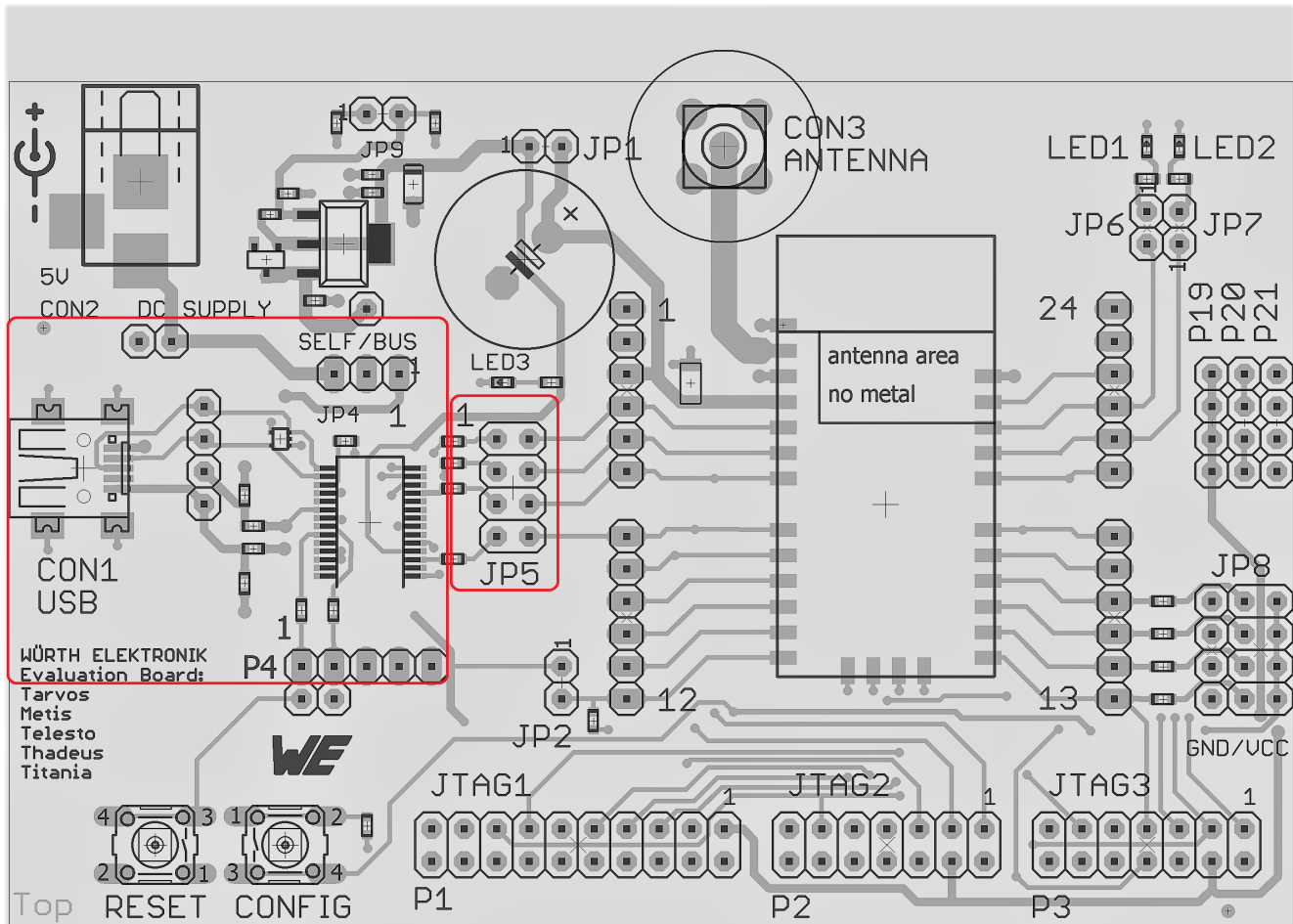


Figure 7: USB interface in layout

In order to establish a stable UART communication between the FTDI USB to UART converter chipset and the radio module’s chipset, the difference between the baud rates of each entity must not exceed the respective immunity level. Both devices use an internal clock to generate the configured UART baud rate. Due to the fixed clock frequency, only specific baud rates can be run without frequency error.

To figure out which baud rates of the radio module can be evaluated using the mounted FTDI chipset (FT232R or FT231X), it is important to know the real baud rate B with its introduced

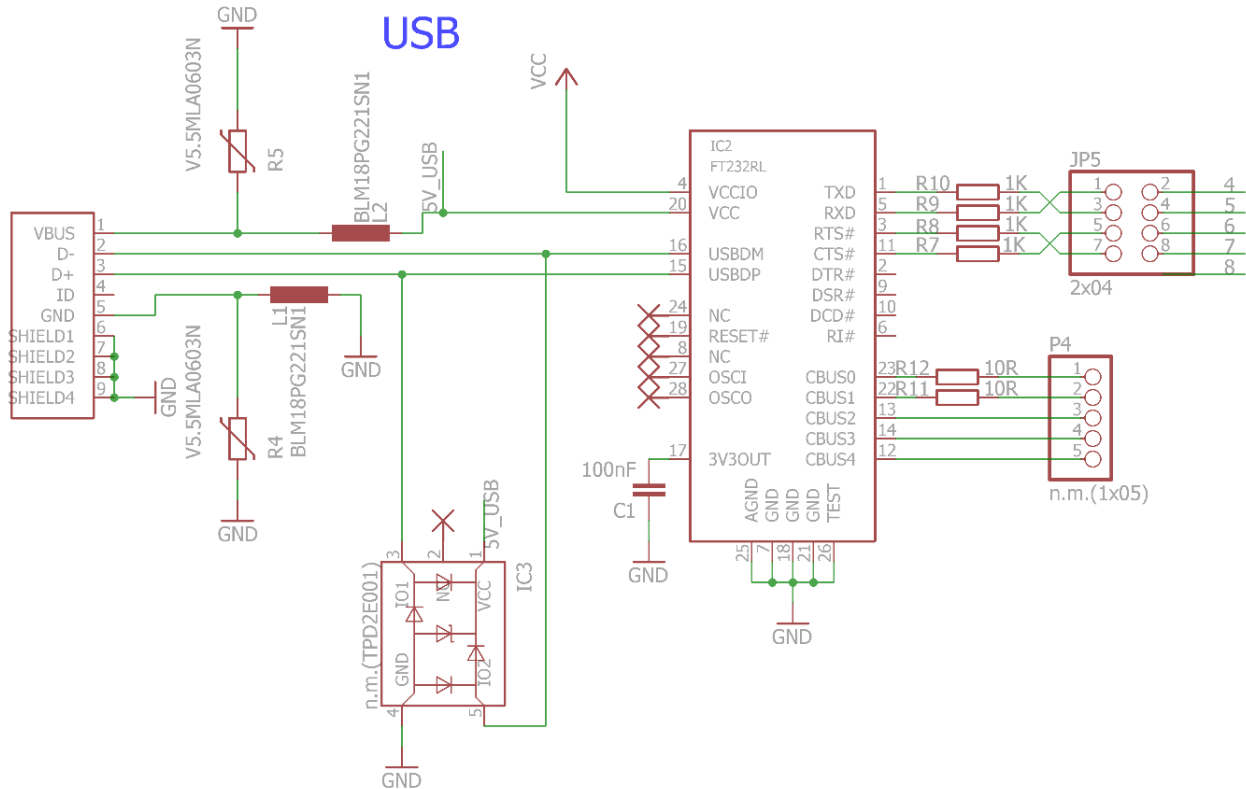


Figure 8: USB interface in circuit

error. To get them, the FTDI's clock of 3000 kHz must be divided by the respective prescaler P :

$$B = \frac{3000}{P} \text{ [kBaud]}$$

The supported prescalers P can be chosen as:

$$P \in \{1, 1.5\} \text{ or } P = 2 + (N \cdot 0.125) \text{ with } N \in \{0, 1, 2, 3, 4, \dots\}$$

When a baud rate is configured in the FTDI chip, the prescaler is chosen that meets the closest baud rate. In that case, the real baud rate differs from the configured one, introducing a UART clock error, which may lead to UART communication issues.

Example: In case the desired baud rate $B_{desired} = 1250$ kBaud, the desired prescaler is $P_{desired} = \frac{3000}{1250} = 2.4$. The closest prescaler P is determined by $P = 2 + (N \cdot 0.125) = 2.375$ with $N = 3$. This results in a real baud rate $B = \frac{3000}{2.375} = 1263$ kBaud, which introduces an error of $\frac{B - B_{desired}}{B_{desired}} = 1.04\%$ with respect to the desired baud rate.

Desired baud rate [kBaud]	Closest prescaler P	Real baud rate B [kBaud]	Error [%]
3000	1	3000	0
2500	1.5	2000	-20
2000	1.5	2000	0

1500	2	1500	0
1250	2.375	1263	1.04
1411.764706	2.125	1411.764706	0
⋮	⋮	⋮	⋮
1000	3	1000	0
921.6	3.25	923.0769231	0.16
⋮	⋮	⋮	⋮
230.4	13	230.7692308	0.16
⋮	⋮	⋮	⋮
115.2	26	115.3846154	0.15
⋮	⋮	⋮	⋮
38.4	78.125	38.4	0
⋮	⋮	⋮	⋮
19.2	156.25	19.2	0
⋮	⋮	⋮	⋮
9.6	312.5	9.6	0
⋮	⋮	⋮	⋮

Table 2: Example baud rates

3.5.4 UART direct

If a microcontroller is to be connected to the module, remove the bridges on JP5. The UART can be connected directly on the pin strip JP5 (all even numbered pins). The module RXD line must be handled accordingly by your host (i.e. pulled up while inactive and during module boot-up).

Beware of IO level incompatibility. The host must obey the values stated in the module’s manual. Especially the IO level restrictions must be implemented by a host system (i.e. using a level shifter to use the allowed IO levels).

3.5.5 Programming interface



The correct programmer connection pin header for the type of module mounted on the EV-Board needs to be selected.

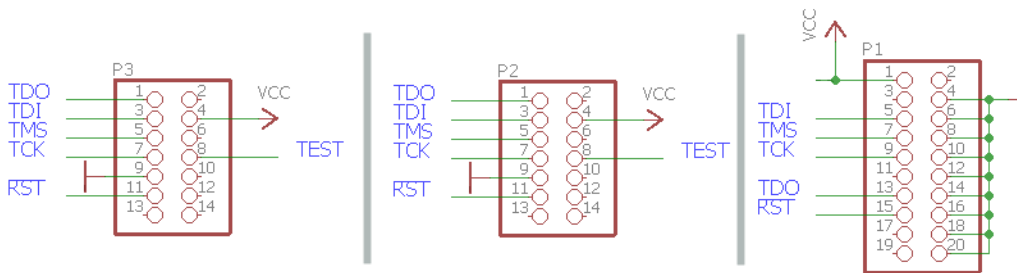


Figure 9: P1, P2 and P3 JTAG connectors

3.5.5.1 P1 ARM JTAG 2*10

The EV-Board provides a 2×10 pin connector in RM2.54 to connect directly to a JTAG flash adapter used for development. Take care of the correct mounting of the flash adapter. Depending on your flasher, an additional adapter may be required.

The recommended flash adapter is one of the "Segger J-Link" family with JTAG support.

3.5.5.2 P2 MSP430 JTAG connector 2*7

The EV-Board provides a 2*7 pin connector in RM2.54 to connect directly to a JTAG flash adapter used for development. Take care of the correct mounting of the flash adapter (pin 1 is marked as such). Depending on your flasher an additional adapter may be required.

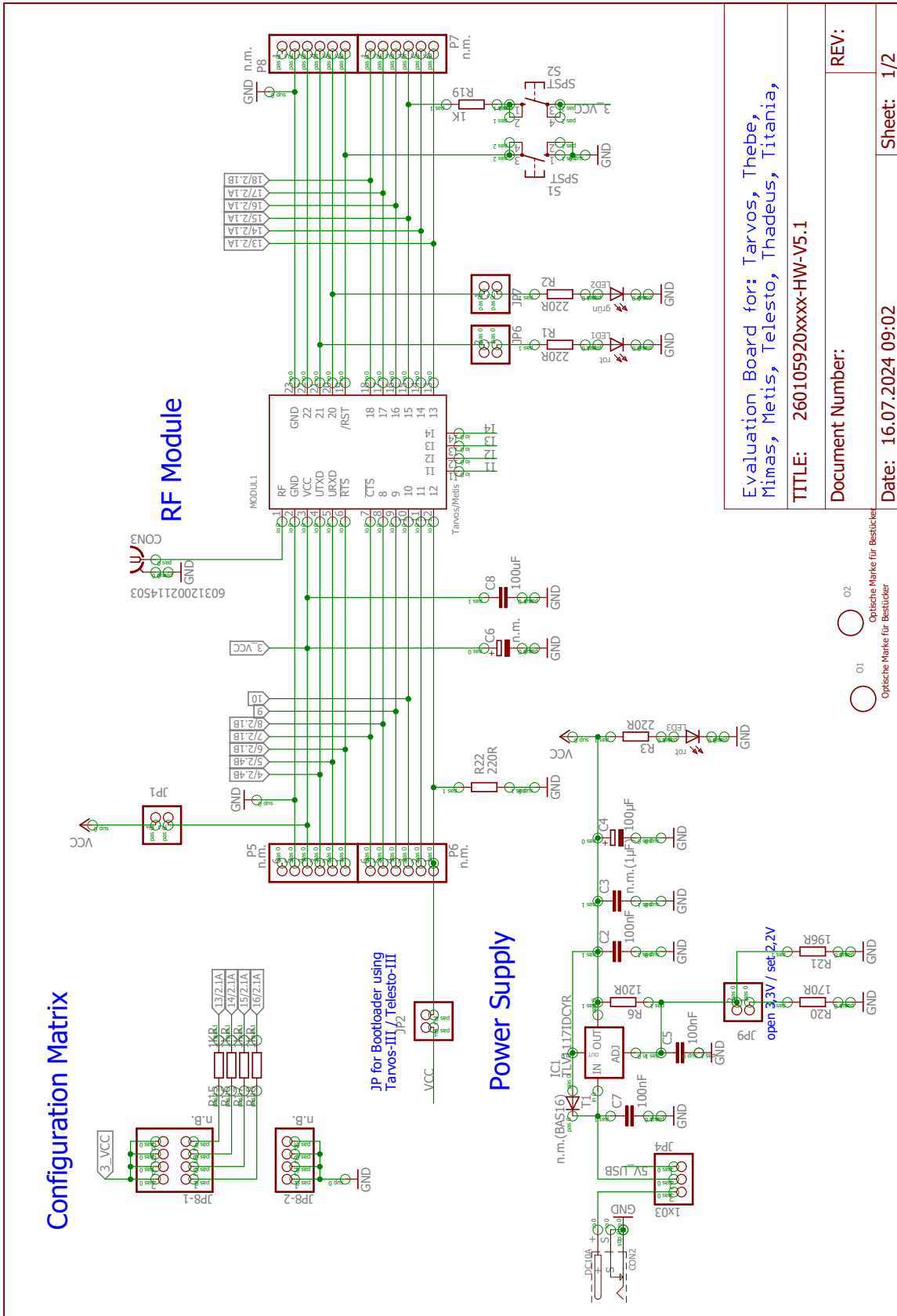
The recommended flash adapters are the "Elprotronic FlashPro-430" and "TI MSP-FET" family.

3.5.5.3 P3 MSP430 JTAG connector 2*7

The EV-Board provides a 2*7 pin connector in RM2.54 to connect directly to a JTAG flash adapter used for development. Take care of the correct mounting of the flash adapter (pin 1 is marked as such). Depending on your flasher an additional adapter may be required.

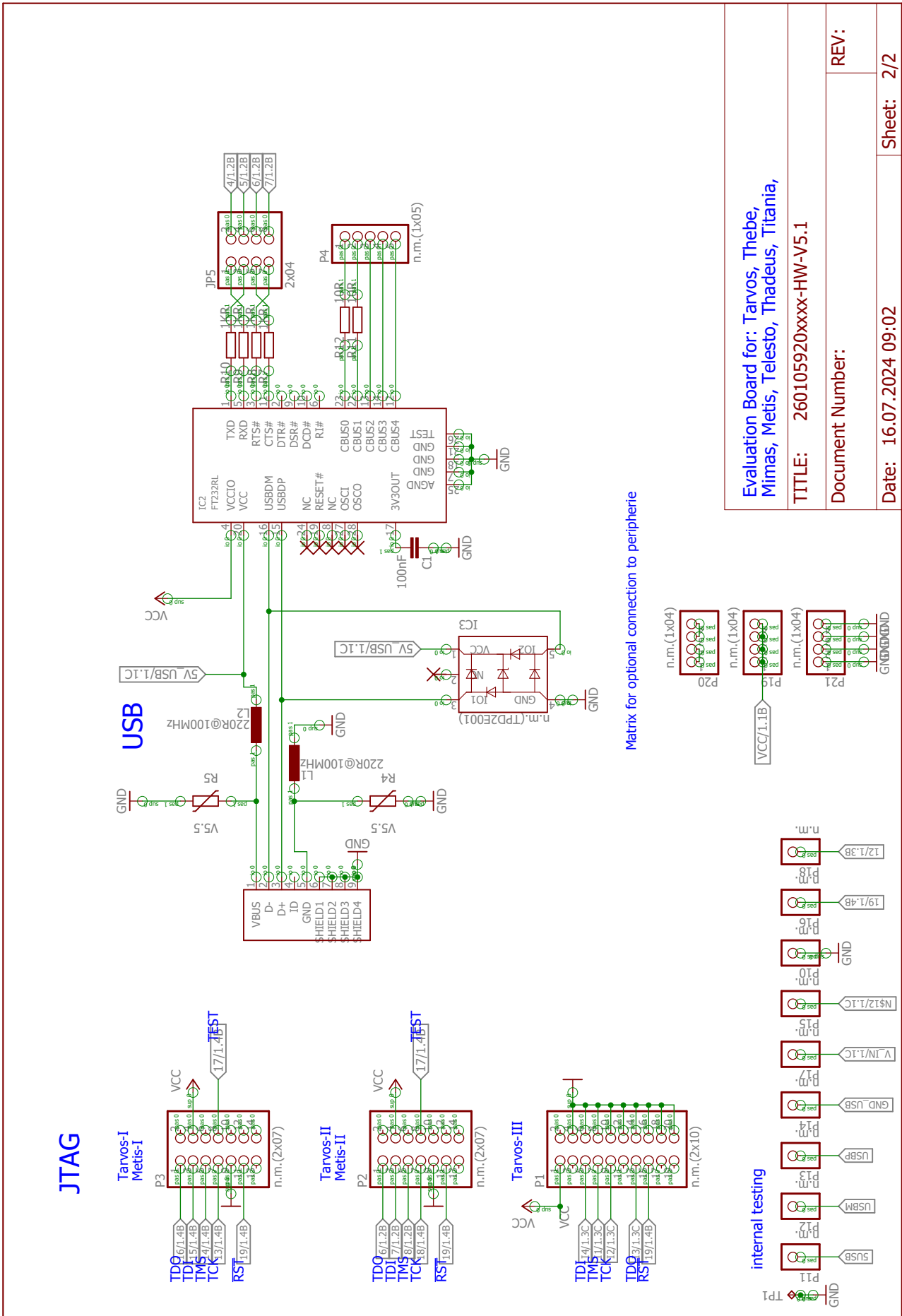
The recommended flash adapters are the "Elprotronic FlashPro-430" and "TI MSP-FET" family.

3.6 Schematic



Evaluation Board for: Tarvos, Thebe, Mimas, Metis, Telesio, Thadeus, Titania,
TITLE: 260105920xxxx-HW-V5.1
Document Number:
REV:
Date: 16.07.2024 09:02
Sheet: 1/2

01 Optische Marke für Bestucker
 02 Optische Marke für Bestucker



Evaluation Board for: Tarvos, Thebe, Mimas, Metis, Telesto, Thadeus, Titania,

TITLE: 260105920xxxx-HW-V5.1

Document Number:

REV:

Date: 16.07.2024 09:02

Sheet: 2/2

3.7 Full layout

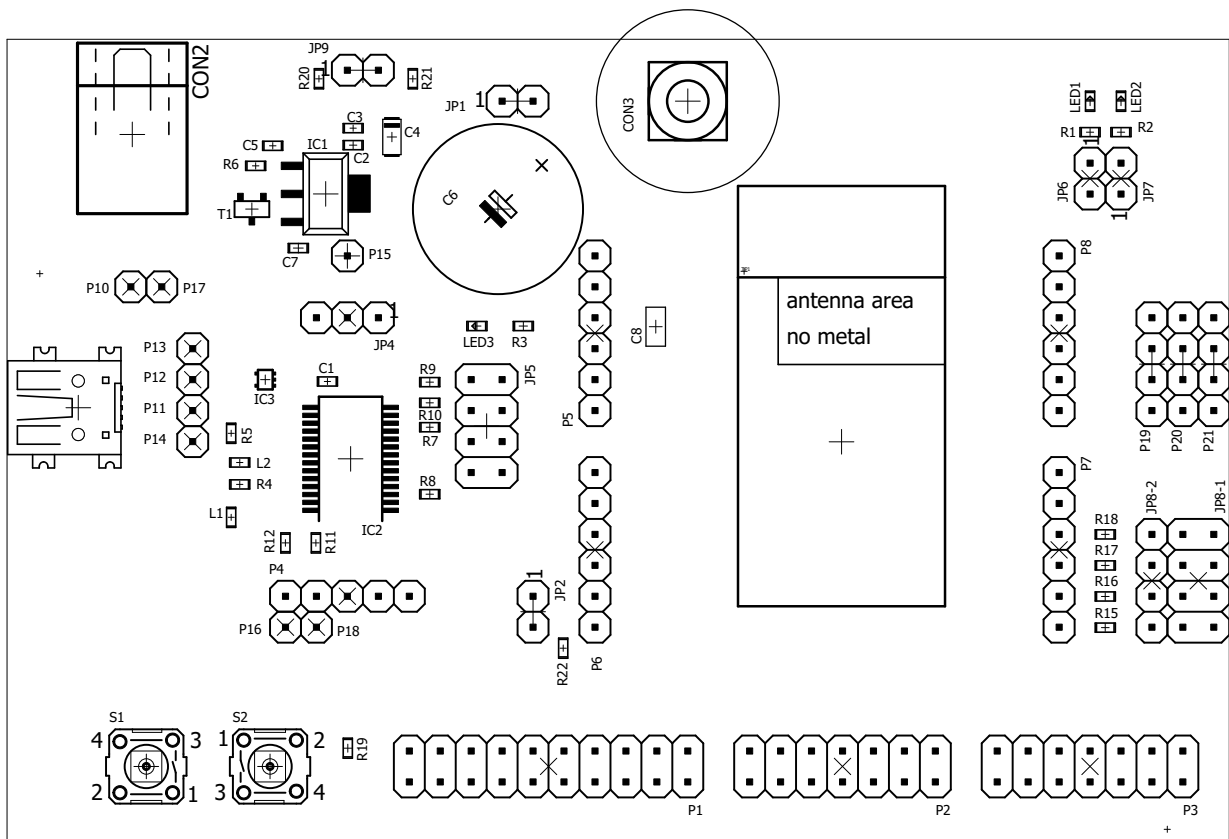


Figure 10: Assembly diagram

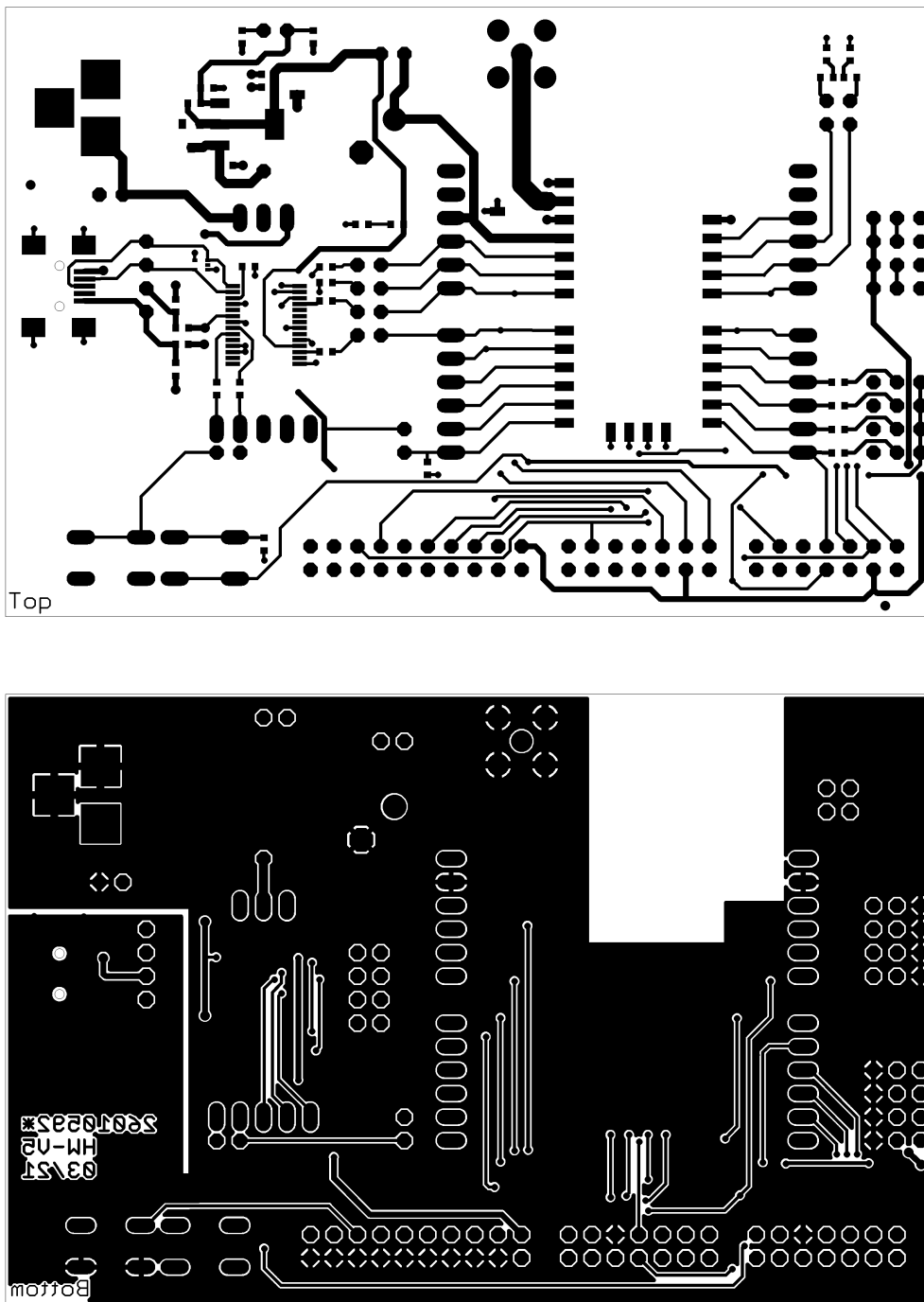


Figure 11: Top and bottom layer

3.8 Bill of materials

4	C1, C2, C5, C7	100nF	0603	885012206095	Würth Elektronik
1	C3	n.m.(1µF)		not mounted	
1	C4	100µF	A	TLJA107M006R0500	AVX
1	C6	n.m.			
1	C8	100uF	1206	885012108005	Würth Elektronik
1	CON1	USB-MINI_2486_01	SMD	65100516121	Würth Elektronik
1	CON2	DC10A		NEB 21 R	Lumberg
1	CON3	60312002114503	THT	60312002114503	Würth Elektronik
1	IC1	TLV1117IDCYR	SOT223-4	TLV1117IDCYR	Texas Instruments
1	IC2	FT232RNL	SSOP28	FT232RNL-REEL	FDTI
1	IC3	n.m.(TPD2E001)		not mounted	
5	JP1, JP2, JP6, JP7, JP9	1X2		61300211121	Würth Elektronik
1	JP4	1x03		61300311121	Würth Elektronik
1	JP5	2x04		61300821121	Würth Elektronik
2	JP8-1, JP8-2	n.m.		not mounted	
2	L1, L2	220R@100MHz		742863122	Würth Elektronik
1	LED1, LED3	rot	0603	150060SS75000	Würth Elektronik
1	LED2	grün	0603	150060VS75000	Würth Elektronik
1	MODUL1	Tarvos/Thebe/Metis...		* Variants	Würth Elektronik
1	P1	n.m.(2x10)		not mounted	
3	P19, P20, P21	n.m.(1x04)		not mounted	
2	P2, P3	n.m.(2x07)		not mounted	
1	P4	n.m.(1x05)		not mounted	
	P5, P6, P7, P8, P10, P11, P12, P13, P14, P15, P16,				
14	P17, P18, TP1, O1, O2	n.m.		not mounted	
4	R1, R2, R3, R22	220R	0603		
2	R11, R12	10R	0603		
1	R20	170R	0603		
1	R21	196R	0603		
2	R4, R5	V5.5		82536040	Würth Elektronik
1	R6	120R	0603		
	R7, R8, R9, R10, R15, R16,				
9	R17, R18, R19	1KR	0603		
2	S1, S2	SPST		430156043726	Würth Elektronik
1	T1	n.m.(BAS16)		not mounted	

3.9 Internal antenna radiation characteristics of Tarvos-III (2609011081000) and Telesto-III (2609011091000)

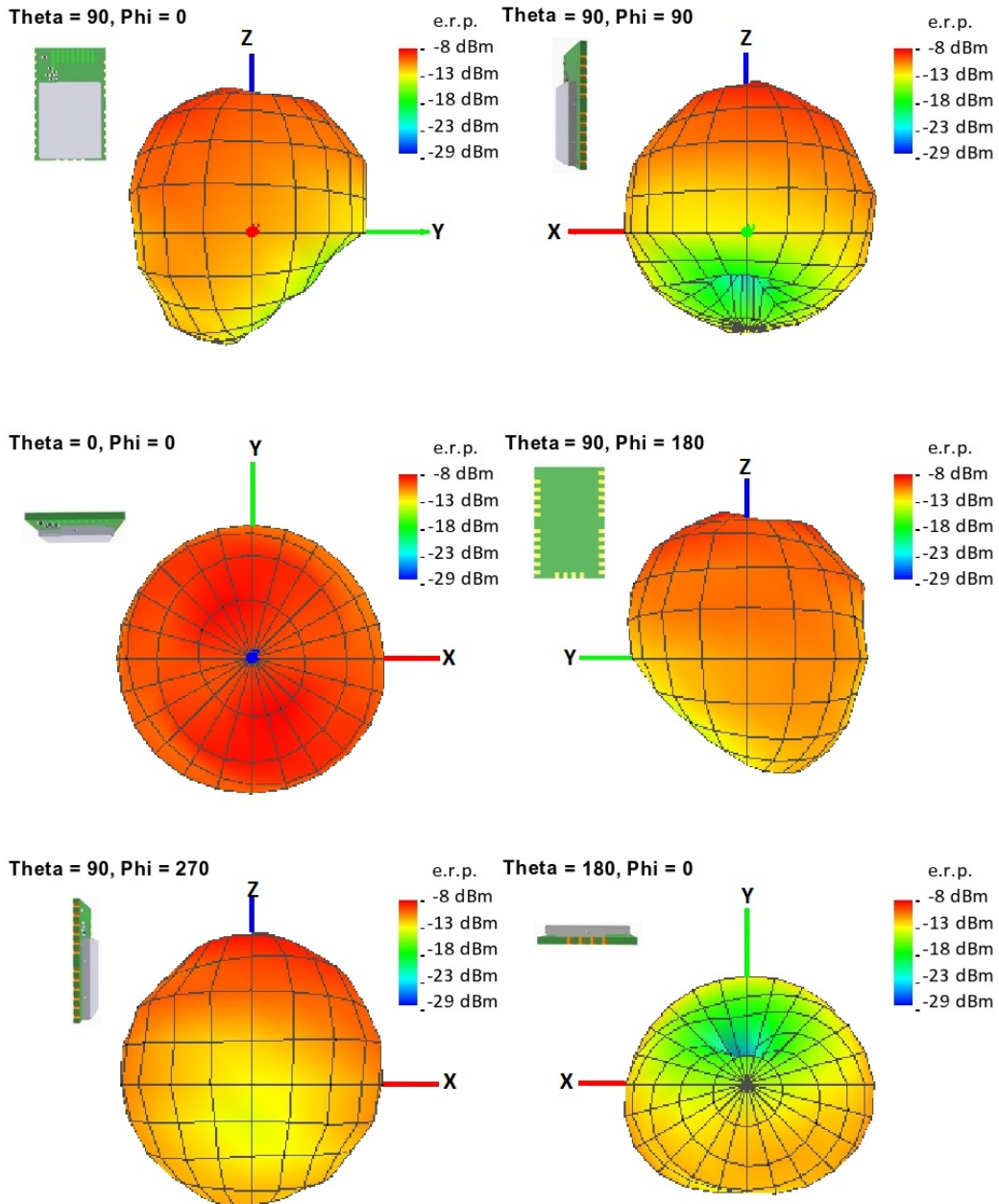


Figure 12: Antenna characteristic from integrated antenna measured on official EV-Board¹

¹Radiation characteristic shown is valid for the module on the EV-Board. It is important to be aware that size of groundplane and placement of module has influence on the radiation pattern.

4 Marking

4.1 Lot number

The 15 digit lot number is printed in numerical digits as well as in form of a machine readable bar code. It is divided into 5 blocks as shown in the following picture and can be translated according to the following table.

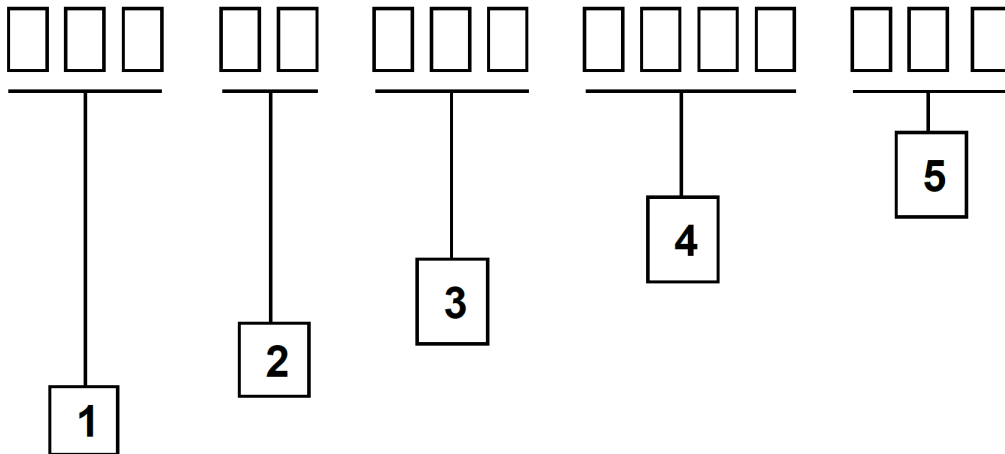


Figure 13: Lot number structure

Block	Information	Example(s)
1	eiSos internal, 3 digits	438
2	eiSos internal, 2 digits	01
3	Radio module hardware version, 3 digits	V2.4 = 024, V12.2 = 122
4	Date code, 4 digits	1703 = week 03 in year 2017, 1816 = week 16 in year 2018
5	Radio module firmware version, 3 digits	V3.2 = 302, V5.13 = 513

Table 3: Lot number details

As the user can perform a firmware update the printed lot number only shows the factory delivery state. The currently installed firmware can be requested from the module using the corresponding product specific command. The firmware version as well as the hardware version are restricted to show only major and minor version not the patch identifier.

5 Regulatory compliance information

5.1 European Conformity

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 designed for professionals to be used solely at research and development facilities for such purposes.

5.2 FCC

Pursuant to §2.803 (c) of Title 47 Chapter I Subchapter A Part 2 Subpart I, the EV-Kit falls under the FCC exception. Therefore it is marked as "For evaluation only; not FCC approved for resale".

5.3 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.

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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.

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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

Evaluation board/kit user manual

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-

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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WE ensures that the EVB meets the specifications given in the instructions for use (within the deviations stated therein) for a period of 12 months from the date of purchase and functions in accordance with the instructions for use. On the basis of the underlying statutory provisions, WE shall rectify defects or offer free replacement of the EVB to which damage occurs that is evidently attributable to a defect for which WE is responsible and is at fault. A warranty claim is subject to the user having complied with the statutory duties of inspection and notification of defects and that the EVB has been received by WE no later than ten (10) days after expiry of the warranty period. This warranty is not transferable to others. This warranty does not apply to defects or impairments in performance resulting from incorrect use, use contrary to WE's instructions, improper installation, improper operation or misuse. WE accepts no liability whatsoever for the failure of equipment or other items not manufactured by or for WE, including, but not limited to, equipment or items to which the EVB is attached or for which the EVB is used. WE DOES NOT GRANT ANY WARRANTIES OR ASSURANCES WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE EVB, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MARKETABILITY OR SUITABILITY FOR A PARTICULAR PURPOSE.

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9 License terms

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You are responsible for using the Würth Elektronik eiSos wireless connectivity product with the incorporated firmware in compliance with all applicable product liability and product safety laws. You acknowledge to minimize the risk of loss and harm to individuals and bear the risk for failure leading to personal injury or death due to your usage of the product.

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You have the opportunity to request the current and actual firmware for a bought wireless connectivity product within the time of warranty. However, Würth Elektronik eiSos has no obligation to update a modules firmware in their production facilities, but can offer this as a service on request. The upload of firmware updates falls within your responsibility, e.g. via ACC or another software for firmware updates. Firmware updates will not be communicated automatically. It is within your responsibility to check the current version of a firmware in the latest version of the product manual on our website. The revision table in the product manual provides all necessary information about firmware updates. There is no right to be provided with binary files, so called "firmware images", those could be flashed through JTAG, SWD, Spi-Bi-Wire, SPI or similar interfaces.

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We recommend you to be updated about the status of new firmware and software, which is available on our website or in our data sheet and manual, and to implement new software in your device where appropriate.

By ordering a product, you accept these license terms in all terms.

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