EVALUATION BOARD MANUAL

FOR RADIO MODULES

EV order code	Module order code	Marketing Name
2610019225001	261001102500x	Calypso

VERSION 1.4

JUNE 27, 2019

Revision history

Document version	HW version	Notes	Date
1.0	1.0	• Initial version	November 2018
1.1	2.0	• editorial changes	January 2019
1.2	2.0	• Added chapter `Regulatory compliance information`	February 2019
1.3	2.0	• Added Marketing name • Added Product image in chapter `Supported radio modules`	March 2019
1.4	2.0	• Improved description of CON8 • Added paragraph `BootUp` for controlling the APP_MODE pins on the EV board (depending on Calypso firmware version)	June 2019

Abbreviations and abstract

Abbreviation	Name	Description
FSE	Field Sales Engineer	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	Universal Asynchronous Receiver Transmitter allows communicating with the module of a specific interface.
VDD	Supply voltage	

Contents

1 Supported radio modules

The Calypso evaluation board is exclusively for the Calypso module:

WE order code	Description
261001102500x	WLAN IEEE 802.11 b/g/n radio module with smart antenna configuration

Table 1: Compatibility
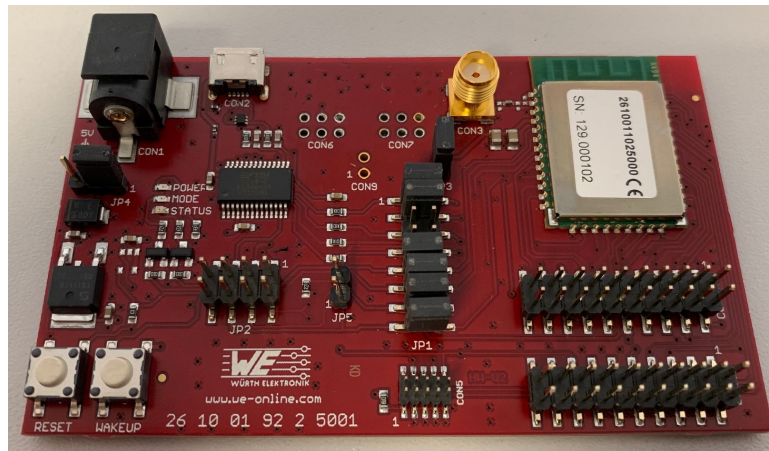
Figure 1: Product image

2 Functional description

The evaluation board offers the user the possibility to develop hard- and software for the compatible radio module. It can be connected to an USB port of a PC and provides a serial (virtual) COM port for interfacing the communication interface of the module.

> **STOP** Due to high peak power consumption of the Calypso radio module, this evaluation board must be operated with external power supply or an external powered USB Hub that can provide the peak current.

For the connection to a micro controller 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 such as the USB interface which are not required in the customers end application.

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 Taking into operation

Before starting to work with the evaluation board make sure that,

- The jumpers on the EV board are placed on the default locations.

- FTDI driver package is installed on the PC. The latest version of the drivers can be downloaded from (*www.ftdichip.com/Drivers/VCP.htm*). Please use the setup executable package or follow the install instructions from FTDI.

- A stable and adequately dimensioned voltage source is connected to the power jack or external power source.

- Evaluation board is connected to the PC via USB-cable.

- COM port is detected and installed on the PC. The (COM) port name of the evaluation board can be found using the device manager on Windows and the display message (dmesg) on Linux. For example, the evaluation board might appears as "COM12" on windows and "/dev/ttyUSB0" on Linux.

- A terminal program like hterm for Windows has to be run and the corresponding COM port chosen and opened using the default UART settings of the mounted radio module (e.g. 921600 baud, 8e1).

- To ensure a proper start-up of the module after applying VCC to the evaluation board the reset button should be pressed to perform a reset and clean restart before proceeding.

A detailed module specific quick start instruction is available in the module reference manual.

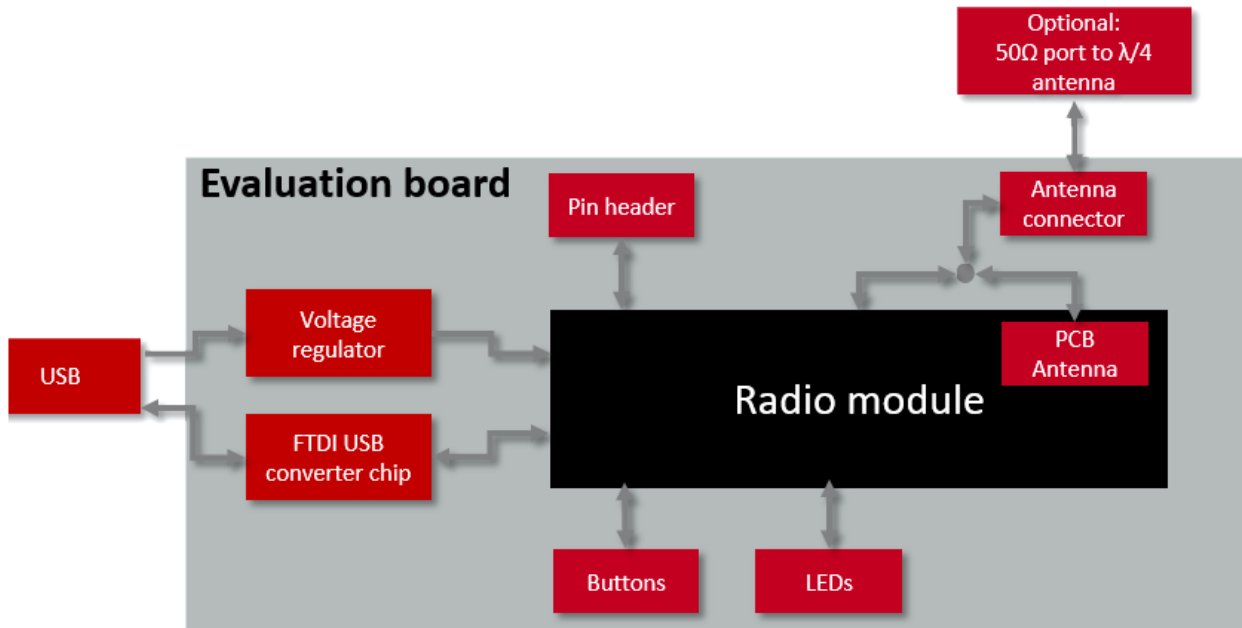# 3 Development board

3.1 Block diagram

Figure 2: Block diagram

3.2 Overview

The evaluation board is equipped with a number of jumpers and connectors. This allows the user to access to every signal/pin enabling complete evaluation of the radio module. In the following a detailed description of the jumpers and connectors is provided. As a quick reference, a table of all jumpers and connectors with the corresponding signals are printed on the back of the evaluation board.

```
---------------          -------------
CON1                     CON6
5V POWER SUPPLY          WE-SPI-SENSOR
===============          =============
CON2                     CON7
MICRO USB                WE-I2C-SENSOR                         JP1
==============           ================----                 ... <-> MODULE
CON3                     CON8                                  1: TXD_FTDI <-> 2: UART0_RX
SMA RF-SIGNAL            SPI/I2C/GPIO                           3: RXD_FTDI <-> 4: UART0_TX
==============           -----------------                     5: RTS#_FTDI <-> 6: UART0_CTS
CON4                     1: GND - 2: SPI_CLK                    7: CTS#_FTDI <-> 8: UART0_RTS
SERIAL_FLASH_INTERFACE   3: SPI_MISO - 4: SPI_CS_N             9: LED_G <-> 10: STATUS
--------------           5: SPI_MOSI - 6: VCC                  11: LED_Y <-> 12: MODE
1: VCC- 2: NC            7: GND - 8: I2C_SCL                   13: WAKEUP <-> 14: GPIO4
3: NC - 4:GND            9: I2C_SDA - 10: VCC                  15: BOOT <-> 16: BOOT
5: SFL_DOUT - 6: GND     11: GPIO12 - 12: GPIO22
7: SFL_CS - 8: GND       13: GPIO0 - 14: GPIO30               JP2
9: SFL_CLK- 10: GND      15: GPIO3 - 16: GPIO4                1: CBUS0_FTDI <-> 2: NRESET
11: NC 12: GND           17: GPIO5 - 18: NC                   3: CBUS1_FTDI <-> 4: WAKEUP
13: SFL_DIN - 14: NC     19: GND - 20: NC                     5: CBUS2_FTDI <-> 6:BOOT
15: NRESET 16: NC        -------------------                  7: NC <-> 8: NC
17: NC - 18: NC          CON9
19: NC - 20: NC          DIRECT POWER SUPPLY                  JP3
---------               -------------------                   CURRENT MEASUREMENT
CON5                     1: GND
JTAG                     2: VCC 3.3V                          JP4
---------                                                     SUPPLY SELECTION
1: VCC - 2: TMS                                               1-2 USB SUPPLIED
3: GND - 4: TCK                                               2-3 CON1 SUPPLIED
5: GND - 6: TDO
7: GND - 8: TDI                                               JP5
9: GND - 10: NRESET                                           Connect Boot to pull up
```

Figure 3: Quick Reference - Table of connectors and jumper

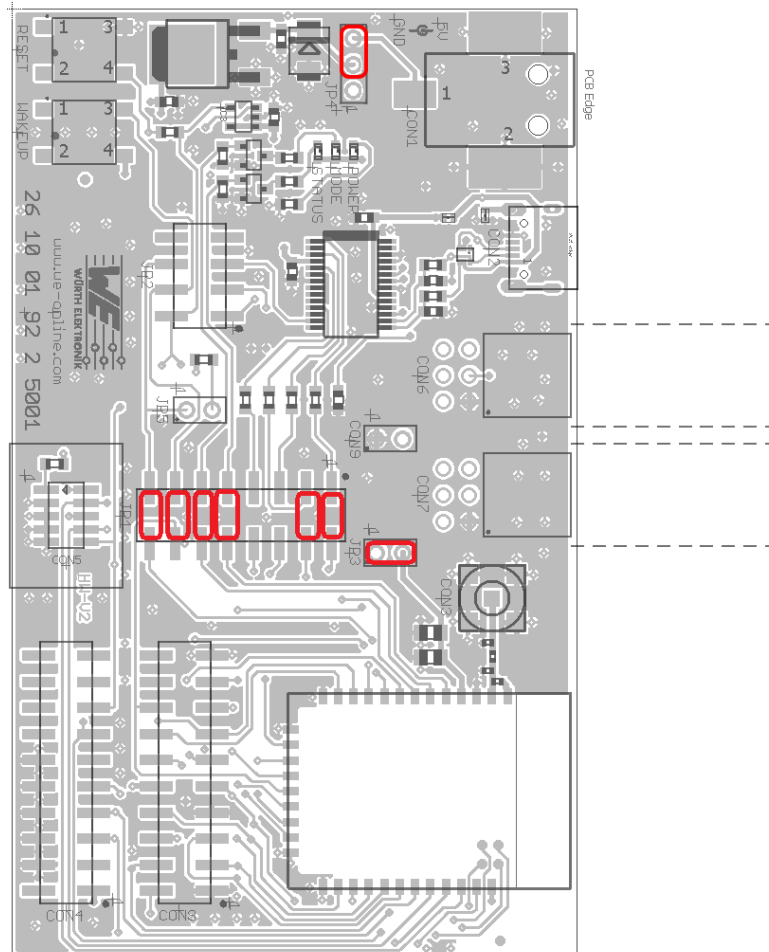## 3.3 Jumpers

Figure 4: Jumpers, defaults

3.3.1 JP1

JP1 enables connection to functionally essential signals including the primary UART interface, *BOOT*, *WAKE_UP* as well as the status indication signals *STATUS_IND_x*. In its default configuration, the UART interface is connected to the USB via serial-USB (FTDI) adapter, *BOOT* to the push button and the *STATUS_IND_x* to the two LEDs.

JP1	Module Pin Function	Jumper set (default)
1,2	*URXD*	Yes
3,4	*UTXD*	Yes
5,6	*/RTS*	No
7,8	*/CTS*	No
9,10	*STATUS_IND_0*, *LED_G*	Yes
11,12	*STATUS_IND_1*, *LED_Y*	Yes
13,14	*WAKE_UP*	Yes
15,16	*BOOT*	Yes

3.3.2 JP2

JP2 allows *nReset*, *WAKE_UP* and the *BOOT* to be optionally driven from PC via the FTDI *CBUSx* pins.

JP2	Module Pin Function	Jumper set (default)
1,2	*nReset*, *CBUS0*	No
3,4	*WAKE_UP*, *CBUS1*	No
5,6	*BOOT*, *CBUS2*	No
7,8	not connected	No

3.3.3 JP3

JP3 allows connection of an ammeter in series with the power supply to measure the current consumption of the radio module.

JP3	Module Pin Function	Jumper set (default)
1,2	Connect VCC to voltage regulator output	Yes

3.3.4 JP4

JP4 determines the source of the supply voltage.

JP4	Module Pin Function	Jumper set (default)
1,2	Connect LDO to USB 5V	No
2,3	Connect LDO to CON1 (barrel socket)	Yes

3.3.5 JP5

JP5 connects the *BOOT* pin to a logic HIGH level.

With JP5 set, the module will not start any of it's implemented application modes and will not behave as explained in the manual.

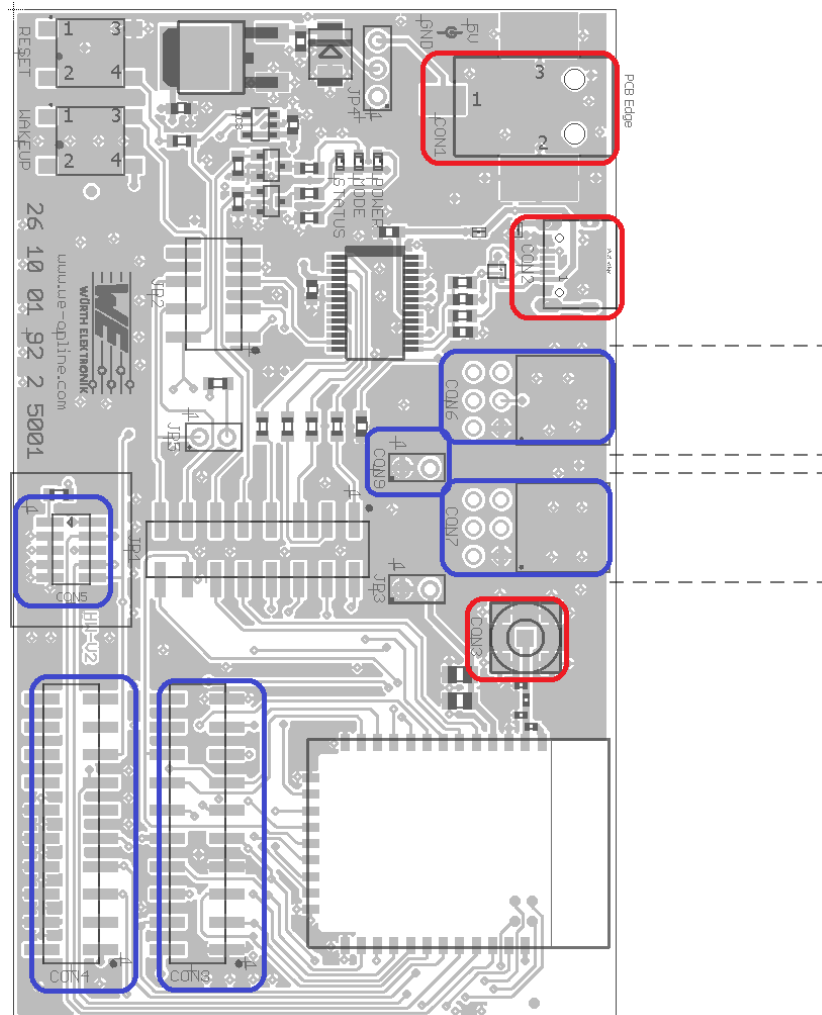| JP5	Module Pin Function	Jumper set (default)
1,2	BOOT Pin to pull up	No

3.4 Connectors and pin headers

Figure 5: Connectors

The connectors marked red in figure 5 needs to be connected appropriately to ensure essential functionality of the module. The connectors marked blue can be optionally connected to additional equipment and/or are reserved future functions.

> **STOP** In this chapter, all available pins and connectors are described. This does not mean that these functions are or can be enabled in the firmware version currently running on the module.

3.4.1 CON1

CON1 is a barrel connector socket that can be used to provide the supply voltage through a 5.5 x 2.1 mm barrel connector plug.

CON1	Function
Inner	5V
Outer	GND

3.4.2 CON2

Connector CON2 is a micro-USB socket that enables connection to PC via standard micro-USB cable.

CON2	Function
	Micro-USB connector for host connection and VCC bus supply

3.4.3 CON3

Connector CON3 (SMA receptacle) is used to connect an external antenna.

> **!** Capacitor C1 has to be populated and C13 not populated to be able to use the external antenna.

> **!** In order use the on-board PCB antenna, capacitor C13 has to be populated and C1 not populated to be able to use the external antenna.

CON3	Function
Inner	RF signal
Outer	GND

3.4.4 CON4

Connector CON4 is the serial flash interface used in the production for programming.

CON4	Function	CON4	Function
1	*VCC*	2	Not connected
3	Not connected	4	*GND*
5	*SFL_DOUT*	6	*GND*
7	*SFL_CS*	8	*GND*
9	*SFL_CLK*	10	*GND*
11	Not connected	12	*GND*
13	*SFL_DIN*	14	Not connected
15	*nRESET*	16	Not connected
17	Not connected	18	Not connected
19	Not connected	20	Not connected

3.4.5 CON5

Connector CON5 is the JTAG debugging interface. It can be used in case of custom firmware development with "debug" firmware and is locked when using a "production" firmware.

CON5	Function	CON5	Function
1	*VCC*	2	*TMS*
3	*GND*	4	*TCK*
5	*GND*	6	*TDO*
7	*GND*	8	*TDI*
9	*GND*	10	*nRESET*

3.4.6 CON6

Connector CON6 is the SPI interface to connect a Würth Elektronik Sensor Board. The interface is not yet enabled in the firmware.

CON6	Function	CON6	Function
1	*GND*	2	*SPI_CLK*
3	*SPI_MOSI*	4	*SPI_CS_N*
5	*SPI_MISO*	6	*VCC*

3.4.7 CON7

Connector CON7 is the I2C interface to connect a Würth Elektronik Sensor Board. The interface is not yet enabled in the firmware.

CON7	Function	CON7	Function
1	*GND*	2	*I2C_SCL*
3	*I2C_SDA*	4	Not connected
5	*GPIO*	6	*VCC*

3.4.8 CON8

On Connector CON8 several module pins are available.

CON8	Function	CON8	Function
1	*GND*	2	*SPI_CLK*
3	*SPI_MISO*	4	*SPI_CS_N*
5	*SPI_MOSI*	6	*VCC*
7	*GND*	8	*I2C_SCL*
9	*I2C_SDA*	10	*VCC*
11	*GPIO12*	12	*GPIO22, APP_MODE_0*
13	*GPIO0, APP_MODE_1*	14	*GPIO30*
15	*GPIO3*	16	*GPIO4*
17	*GPIO5*	18	Not connected
19	*GND*	20	Not connected

BootUp   For the Calypso firmware version 1.2.0 the application modes AT Command Default Mode, Provisioning, OTA mode and AT terminal mode the Calypso Pins 10 (APP_MODE_0, GPIO22) and 11 (APP_MODE_1, GPIO0) must be connected accordingly. To start the Calypso Default Operation mode no connection needs to be done on the evaluation board CON8 as both APP_MODE_0 and APP_MODE_1 use an internal weak pull-down leading to a LOW level ("0") during the check procedure.

For any other mode one or both APP_MODE pins need to be connected to logic HIGH (CON8_10) in order to achieve a "1" during the check procedure.

Connecting HIGH to an internal pull-down of one or both APP_MODE pins will lead to leakage current during the time the app mode evaluation takes place.

The following table shows the application modes as implemented in firmware version 1.2.0. Please check the Calypso manual for possible changes in other firmware versions.

APP_MODE_1, CON8_13	APP_MODE_0, CON8_12	Description
0	0	AT command normal mode
0	1	OTA mode
1	0	Provisioning mode
1	1	AT command terminal mode

3.4.9 CON9

Connector CON9 enables connection of an external power supply directly to the radio module and thereby the possibility to test the application power source.

STOP The supply voltage connected here has to be between 2.1V and 3.6V. Refer to the module specific manual for more details.

! When connecting power to CON9 the Jumper on JP4 should not be set.

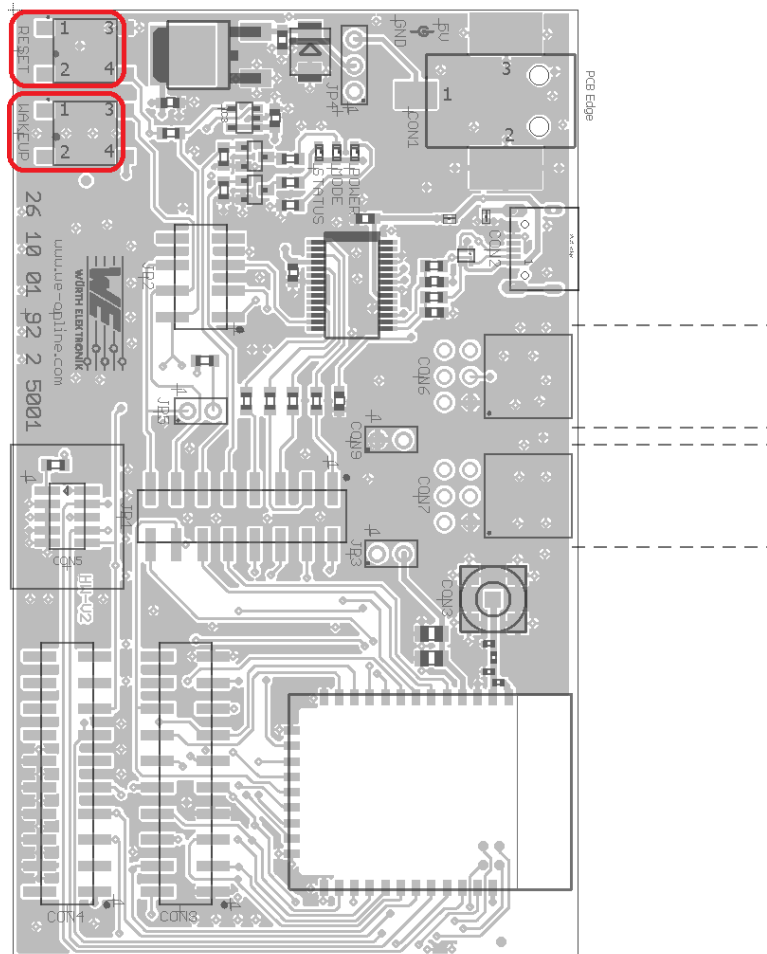| CON9	Function	CON9	Function
1	*GND*	2	*VCC*

3.5 Buttons

Figure 6: Buttons

3.5.1 *nRESET* button

Internally the active low reset input of the micro processor is connected via a RC combination with the power supply to ensure a proper startup of the module. Please refer to the module specific manual for detailed information.

3.5.2 Wake-up button

The wake-up button is connected to *WAKE_UP* pin in order to trigger wake up of the module from sleep mode. Please refer to the module specific manual for detailed information.

3.6 LEDs

This evaluation board has three LEDs

3.6.1 Power

An active power LED indicates that the power supply to the evaluation board is active. See Section `3.7.1` for more details.

3.6.2 Mode

The mode LED is connected to the *STATUS_IND_0* pin of the module and indicates specific events based on the application mode. Please refer to the module specific manual for detailed information.

3.6.3 Status

The status LED is connected to the *STATUS_IND_1* pin of the module and indicates specific events based on the application mode. Please refer to the module specific manual for detailed information.

3.7 Function blocks

3.7.1 Power supply

The development board can be run and supplied via USB when the module's current draw is not exceeding the USB specification. The integrated voltage regulator regulates the connected USB voltage 5V down to 3.3V and supplies the remaining parts of the circuit. If the evaluation board is power sourced the power *LED1* lights up.

3.7.2 JP3 - Current measurement

By default, JP3 is set for normal operation. If a current meter is connected in place of the jumper, the power consumption of the radio module can be measured.
If the meter is not attached and the bridge is not set, the module will not receive a supply voltage. However, the power *LED1* may be active, as it is connected prior to the current measurement bridge in order not to distort the module's power consumption measurement.

3.7.3 UART via USB

The UART of the module can be connected to the USB converter by setting the corresponding jumpers on JP1. 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 USB cable length shall not exceed 3 meters.

3.7.4 UART direct

If a micro-controller is to be connected to the module, remove the corresponding jumpers on JP1. The UART can be connected directly on pin 2 and pin 4 on JP1. 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).

3.8 Schematic
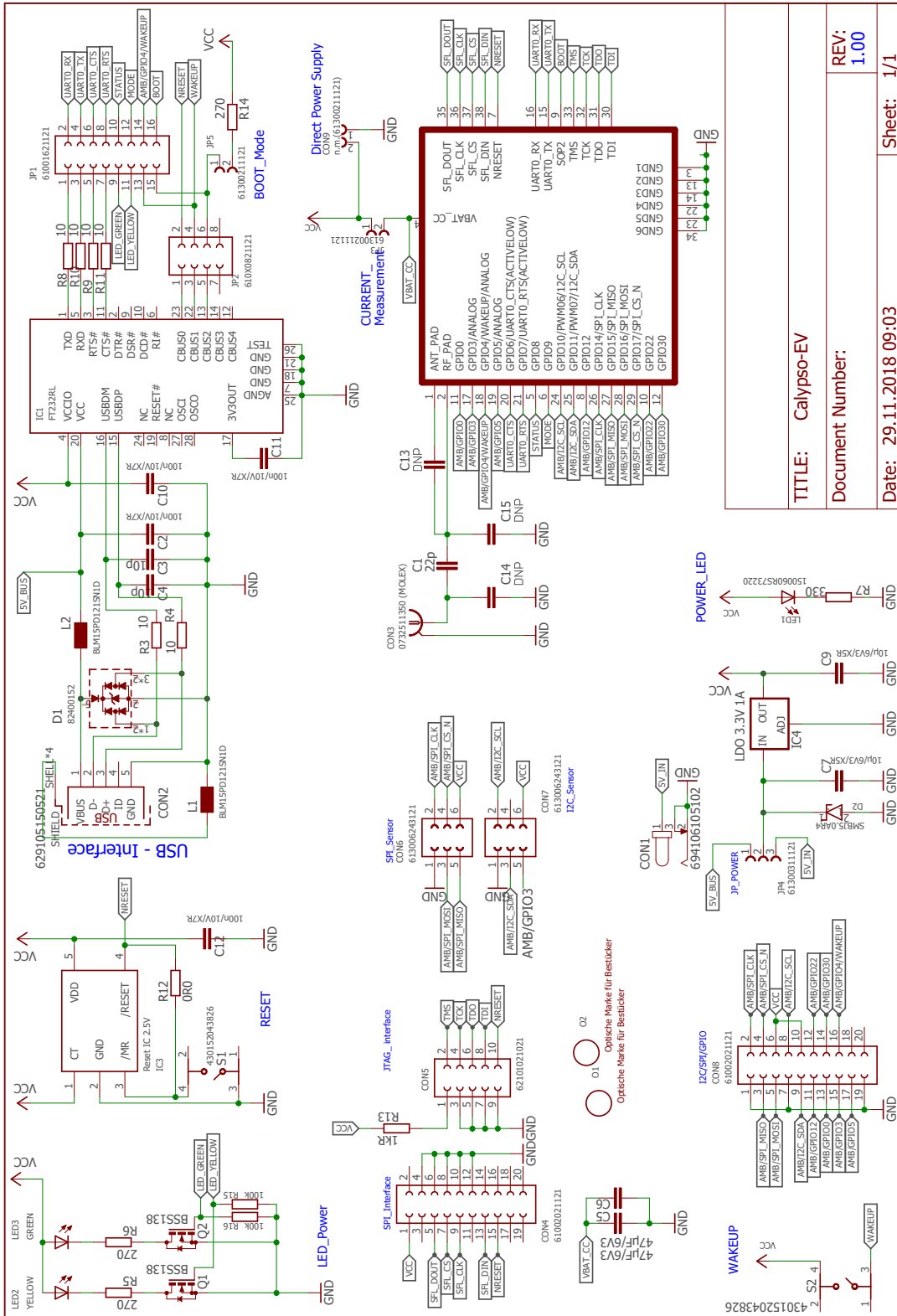
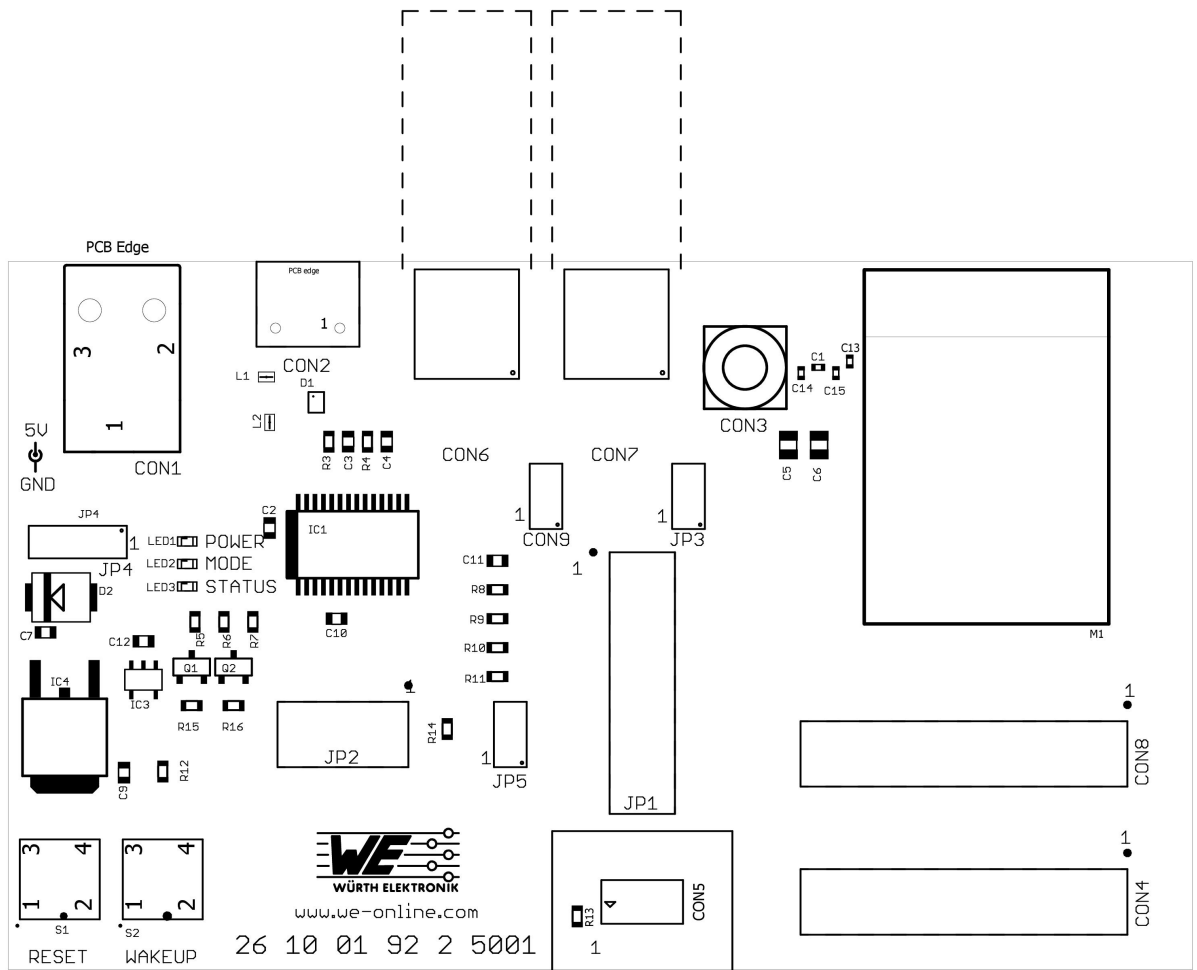Figure 7: Circuit diagram

3.9 Layout
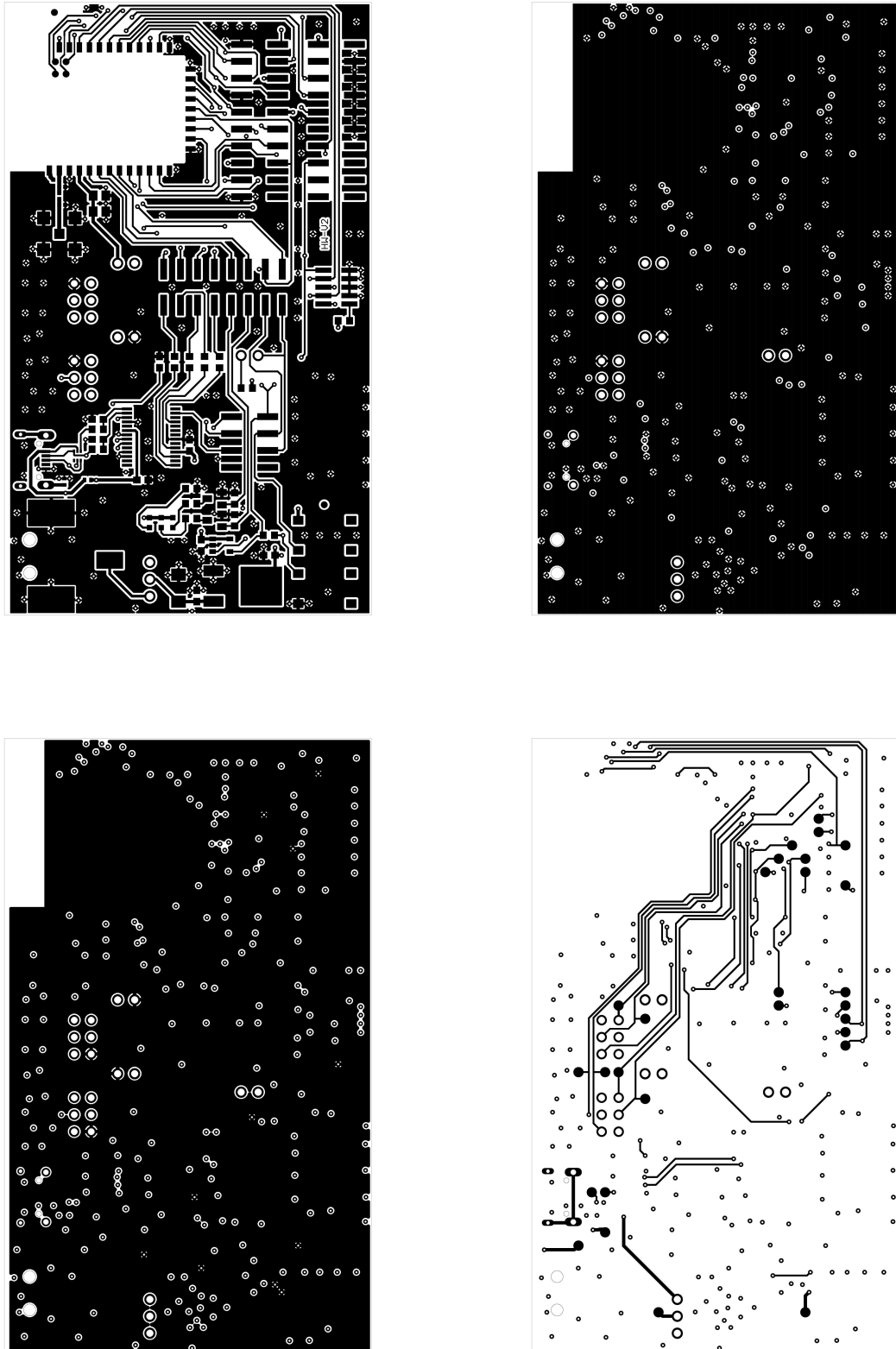

Figure 8: Assembly diagram

Figure 9: Top, inner & bottom Layers

4 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 evaluation kits destined for professionals to be used solely at research and development facilities for such purposes.

4.1 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.

5 Important notes

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

5.1 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.

5.2 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 sourcecode 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.

5.3 Best care and attention

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

5.4 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 field sales engineer or the internal sales person in charge should be contacted who will be happy to support in this matter.

5.5 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 field sales engineer, the internal sales person or the technical support team in charge should be contacted. The basic responsibility of the customer as per section 5.1 and 5.2 remains unaffected. All wireless connectivity module driver software ¨wireless connectivity SDK¨ and it's source codes as well as all PC software tools are not subject to the Product Change Notification information process.

5.6 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 field sales engineer 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.

5.7 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.

5.8 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*.

6 Legal notice

6.1 Exclusion of liability

Würth Elektronik eiSos GmbH & Co. KG considers the information in this document to be correct at the time of publication. However, Würth Elektronik eiSos GmbH & Co. KG reserves the right to modify the information such as technical specifications or functions of its products or discontinue the production of these products or the support of one of these products without any written announcement or notification to customers. The customer must make sure that the information used corresponds to the latest published information. Würth Elektronik eiSos GmbH & Co. KG does not assume any liability for the use of its products. Würth Elektronik eiSos GmbH & Co. KG does not grant licenses for its patent rights or for any other of its intellectual property rights or third-party rights.

Notwithstanding anything above, Würth Elektronik eiSos GmbH & Co. KG makes no representations and/or warranties of any kind for the provided information related to their accuracy, correctness, completeness, usage of the products and/or usability for customer applications. Information published by Würth Elektronik eiSos GmbH & Co. KG regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof.

6.2 Suitability in customer applications

The customer bears the responsibility for compliance of systems or units, in which Würth Elektronik eiSos GmbH & Co. KG products are integrated, with applicable legal regulations. Customer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of Würth Elektronik eiSos GmbH & Co. KG components in its applications, notwithstanding any applications-related in-formation or support that may be provided by Würth Elektronik eiSos GmbH & Co. KG. Customer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences lessen the likelihood of failures that might cause harm and take appropriate remedial actions. The customer will fully indemnify Würth Elektronik eiSos GmbH & Co. KGand its representatives against any damages arising out of the use of any Würth Elektronik eiSos GmbH & Co. KG components in safety-critical applications.

6.3 Trademarks

AMBER wireless is a registered trademark of Würth Elektronik eiSos GmbH & Co. KG. All other trademarks, registered trademarks, and product names are the exclusive property of the respective owners.

6.4 Usage restriction

Würth Elektronik eiSos GmbH & Co. KG products have been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where

a failure of the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover, Würth Elektronik eiSos GmbH & Co. KG products are neither designed nor intended for use in areas such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. Würth Elektronik eiSos GmbH & Co. KG must be informed about the intent of such usage before the design-in stage. In addition, sufficient reliability evaluation checks for safety must be performed on every electronic component, which is used in electrical circuits that require high safety and reliability function or performance. By using Würth Elektronik eiSos GmbH & Co. KG products, the customer agrees to these terms and conditions.

7 License terms

This License Terms will take effect upon the purchase and usage of the Würth Elektronik eiSos GmbH & Co. KG wireless connectivity products. You hereby agree that this license terms is applicable to the product and the incorporated software, firmware and source codes (collectively, "Software") made available by Würth Elektronik eiSos in any form, including but not limited to binary, executable or source code form.

The software included in any Würth Elektronik eiSos wireless connectivity product is purchased to you on the condition that you accept the terms and conditions of this license terms. You agree to comply with all provisions under this license terms.

7.1 Limited license

Würth Elektronik eiSos hereby grants you a limited, non-exclusive, non-transferable and royalty-free license to use the software and under the conditions that will be set forth in this license terms. You are free to use the provided Software only in connection with one of the products from Würth Elektronik eiSos to the extent described in this license terms. You are entitled to change or alter the source code for the sole purpose of creating an application embedding the Würth Elektronik eiSos wireless connectivity product. The transfer of the source code to third parties is allowed to the sole extent that the source code is used by such third parties in connection with our product or another hardware provided by Würth Elektronik eiSos under strict adherence of this license terms. Würth Elektronik eiSos will not assume any liability for the usage of the incorporated software and the source code. You are not entitled to transfer the source code in any form to third parties without prior written consent of Würth Elektronik eiSos.

You are not allowed to reproduce, translate, reverse engineer, decompile, disassemble or create derivative works of the incorporated Software and the source code in whole or in part. No more extensive rights to use and exploit the products are granted to you.

7.2 Usage and obligations

The responsibility for the applicability and use of the Würth Elektronik eiSos wireless connectivity product with the incorporated Firmware in a particular customer design is always solely within the authority of the customer. Due to this fact, it is up to you to evaluate and investigate, where appropriate, and to decide whether the device with the specific product characteristics described in the product specification is valid and suitable for your respective application or not.

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.

Würth Elektronik eiSos' products with the incorporated Firmware are not authorized for use in safety-critical applications, or where a failure of the product is reasonably expected to cause severe personal injury or death. Moreover, Würth Elektronik eiSos' products with the incorporated Firmware are neither designed nor intended for use in areas such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. You shall inform Würth Elektronik eiSos about the intent of such usage before

design-in stage. In certain customer applications requiring a very high level of safety and in which the malfunction or failure of an electronic component could endanger human life or health, you must ensure to have all necessary expertise in the safety and regulatory ramifications of your applications. You acknowledge and agree that you are solely responsible for all legal, regulatory and safety-related requirements concerning your products and any use of Würth Elektronik eiSos' products with the incorporated Firmware in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by Würth Elektronik eiSos. YOU SHALL INDEMNIFY WÜRTH ELEKTRONIK EISOS AGAINST ANY DAMAGES ARISING OUT OF THE USE OF WÜRTH ELEKTRONIK EISOS' PRODUCTS WITH THE INCORPORATED FIRMWARE IN SUCH SAFETY-CRITICAL APPLICATIONS.

7.3 Ownership

The incorporated Firmware created by Würth Elektronik eiSos is and will remain the exclusive property of Würth Elektronik eiSos.

7.4 Firmware update(s)

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.

7.5 Disclaimer of warranty

THE FIRMWARE IS PROVIDED "AS IS". YOU ACKNOWLEDGE THAT WÜRTH ELEKTRONIK EISOS MAKES NO REPRESENTATIONS AND WARRANTIES OF ANY KIND RELATED TO, BUT NOT LIMITED TO THE NON-INFRINGEMENT OF THIRD PARTIES' INTELLECTUAL PROPERTY RIGHTS OR THE MERCHANTABILITY OR FITNESS FOR YOUR INTENDED PURPOSE OR USAGE. WÜRTH ELEKTRONIK EISOS DOES NOT WARRANT OR REPRESENT THAT ANY LICENSE, EITHER EXPRESS OR IMPLIED, IS GRANTED UNDER ANY PATENT RIGHT, COPYRIGHT, MASK WORK RIGHT, OR OTHER INTELLECTUAL PROPERTY RIGHT RELATING TO ANY COMBINATION, MACHINE, OR PROCESS IN WHICH THE WÜRTH ELEKTRONIK EISOS' PRODUCT WITH THE INCORPORATED FIRMWARE IS USED. INFORMATION PUBLISHED BY WÜRTH ELEKTRONIK EISOS REGARDING THIRD-PARTY PRODUCTS OR SERVICES DOES NOT CONSTITUTE A LICENSE FROM WÜRTH ELEKTRONIK EISOS TO USE SUCH PRODUCTS OR SERVICES OR A WARRANTY OR ENDORSEMENT THEREOF.

7.6 Limitation of liability

Any liability not expressly provided by Würth Elektronik eiSos shall be disclaimed.
You agree to hold us harmless from any third-party claims related to your usage of the Würth Elektronik eiSos' products with the incorporated Firmware, software and source code. Würth Elektronik eiSos disclaims any liability for any alteration, development created by you or your customers as well as for any combination with other products.

7.7 Applicable law and jurisdiction

Applicable law to this license terms shall be the laws of the Federal Republic of Germany. Any dispute, claim or controversy arising out of or relating to this license terms shall be resolved and finally settled by the court competent for the location of Würth Elektronik eiSos' registered office.

7.8 Severability clause

If a provision of this license terms is or becomes invalid, unenforceable or null and void, this shall not affect the remaining provisions of the terms. The parties shall replace any such provisions with new valid provisions that most closely approximate the purpose of the terms.

7.9 Miscellaneous

Würth Elektronik eiSos reserves the right at any time to change this terms at its own discretion. It is your responsibility to check at Würth Elektronik eiSos homepage for any updates. Your continued usage of the products will be deemed as the acceptance of the change.
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 wireless connectivity product, you accept this license terms in all terms.

List of Figures

List of Tables

WÜRTH ELEKTRONIK

more than you expect

Internet of Things

Monitoring & Control

Automated Meter Reading

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

Rudi-Schillings-Str. 31
54296 Trier
Germany

Tel.: +49 651 99355-0
Fax.: +49 651 99355-69
www.we-online.com/wireless-connectivity