



USER MANUAL

THYONE-I USB RADIO STICK

2611036021001

VERSION 1.4

OCTOBER 8, 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	1.1	<ul style="list-style-type: none">Initial version of the manual	February 2020
1.1	1.1	<ul style="list-style-type: none">Updated Declaration of EU conformity to latest Version of EN 300 328 after successfully passing corresponding delta test in chapter Regulatory compliance information.	November 2020
1.2	1.1	<ul style="list-style-type: none">Updated Declaration of EU conformity in chapter Regulatory compliance information.	December 2020
1.3	1.1	<ul style="list-style-type: none">Updated document styleFunction description is part of the Thyone-I user manual [1]	April 2023
1.4	1.2	<ul style="list-style-type: none">Added chapter Supported UART baud rates and Important notice UKCA	October 2024

Abbreviations

Abbreviation	Name	Description
API	Application Programming Interface	
BDM	Business Development Engineer	Support and sales contact person responsible for limited sales area
COM Port	Communication Port	
FCC	Federal Communications Commission	
FTDI	Future Technology Devices International	USB-to-Serial converter chip
GPIO	General Purpose Input/Output	
HIGH	High signal level	
LOW	Low signal level	
MCU	Micro Controller Unit	
PC	Personal Computer	
RED	Radio Equipment Directive	
RF	Radio frequency	Describes everything relating to the wireless transmission.
UART		Universal Asynchronous Receiver Transmitter allows communicating with the module of a specific interface.
USB	Universal Serial Bus	
VCP	Virtual COM Port	
VDD	Supply voltage	
WE	Würth Elektronik	

Contents

1	Introduction	4
1.1	Ordering information	4
2	Functional description	5
2.1	Typical Setup	5
2.2	Taking into operation	6
2.2.1	Supported UART baud rates	7
2.2.2	Usage of CBUS pins	8
2.2.2.1	Resetting the Thyone-I USB radio stick using the CBUS pin	8
2.2.2.2	Switching from command mode to transparent mode and vice versa	9
3	Regulatory compliance information	10
3.1	Important notice EU	10
3.2	Important notice UKCA	10
3.3	Important notice FCC	10
3.4	EU Declaration of conformity	11
3.5	FCC - Federal Communications Commission	12
3.6	IC - Industry Canada	12
4	References	13
5	Important notes	14
6	Legal notice	14
7	License terms	15

1 Introduction

The Thyone-I is a radio module that provides wireless connectivity capabilities in the 2.4 GHz frequency band. The Thyone-I USB radio stick incorporates the Thyone-I in a USB stick form factor enabling easy interfacing with any USB enabled device like personal computer or laptop. The Thyone-I USB radio stick allows quick set-up of a radio link between PC and any system with integrated Thyone-I radio module.

1.1 Ordering information

WE order code	Description
2611036021001	Radio dongle including Thyone-I

Table 1: Ordering information

2 Functional description

The Thyone-I USB radio stick consists of Thyone-I radio module along with a serial-to-USB adapter that enables direct connection to any USB compatible device. An FTDI serial-to-USB converter chip **FT231X** connects the USB interface to the UART pins of the integrated radio module. Besides UART, additional digital GPIO pins (CBUS) are connected to the radio module to provide special functions like reset. Figure 1 illustrates all the functional components of Thyone-I USB radio stick.

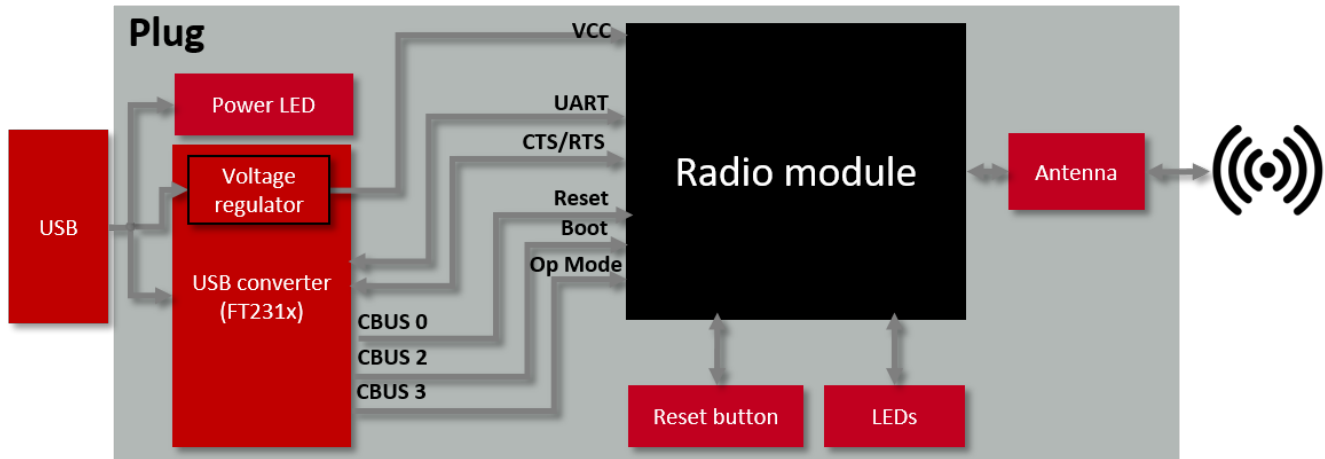


Figure 1: Block diagram of the Thyone-I USB radio stick



For detailed function description of the Thyone-I USB radio stick, please refer to the user manual of the underlying radio module Thyone-I [1].

2.1 Typical Setup

The Thyone-I USB radio stick offers either a Command API (default) or a Transparent Mode on it's UART interface.

Two modules or USB dongles can communicate with each other if they share the same radio configuration (radio profile and channel). Based on the network configuration, data can be broadcast, multicast to a group or unicast to a specific module. The default module settings are selected in such a way that an plug and play experience is possible by using 2 dongles and the PC tool WE UART Terminal [2].

2.2 Taking into operation

The serial-to-USB FTDI converter chip **FT231X** requires special drivers to be installed for proper operation. The Virtual COM Port (VCP) drivers have to be installed by following the "Installation Guides" found under: <https://www.ftdichip.com/Drivers/VCP.htm>



It is recommended to restart the PC after installation of drivers.

On proper installation of the drivers, the module appears as a virtual COM port on the PC (ttyUSBx on Linux, COMx on Windows) in case of the VCP driver use. This COM port can be opened in any serial emulator program or user written software to communicate with the radio module.

The radio module responds to commands in a specific format. Please refer to the corresponding Thyone-I user manual [1] for the complete description of the command set.



When connecting the USB radio stick to the PC, it is recommended to reset the USB radio stick once. This can be done using the USB radio stick's reset button or using the CBUS0 pin (see chapter 2.2.2.1). This reset procedure is also recommended after each reboot of the PC.

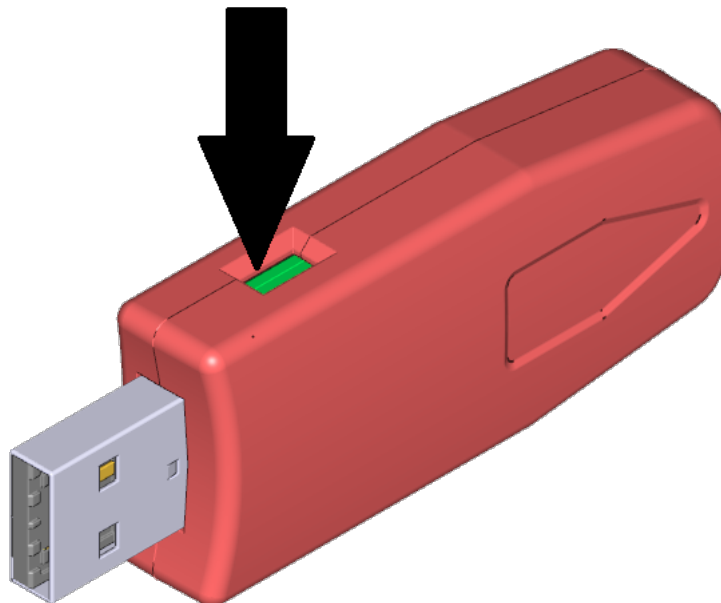


Figure 2: Reset button on the Thyone-I USB radio stick

2.2.1 Supported UART baud rates

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 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

2.2.2 Usage of CBUS pins

To switch the CBUS pins static HIGH or LOW and thus to use the provided pins functions of the Thyone-I radio module, the D2XX driver of FTDI has to be used. This driver is part of the previous mentioned VCP driver installation in case of Windows OS. In case of Linux a manual installation is required.

Please follow FTDI's "Installation Guides" for proper D2XX install:

<https://www.ftdichip.com/Drivers/D2XX.htm>

Examples codes and tutorials for "how to use the D2XX driver within your own software tool" can be found in the software example section of:

<https://www.ftdichip.com/Support/SoftwareExamples/CodeExamples.htm>

2.2.2.1 Resetting the Thyone-I USB radio stick using the CBUS pin

The */RESET* pin of the Thyone-I can be used to reset the integrated radio module. As the */RESET* pin is connected to the CBUS0 pin of the integrated FTDI chip, the radio module can be reset by pulling the CBUS0 pin low for at least 100 ms and releasing it to high level again. By default, the CBUS0 pin of the FT231X is configured as FT_CBUS_GPIO (bit bang), such that the FTDI D2XX driver function `SetBitMode` can be used.

```

/* prep: create and connect an FTDI device instance */

/* set CBUS0 to output level LOW */
SetBitMode(0x10, FTDI.FT_BIT_MODES.FT_BIT_MODE_CBUS_BITBANG);

/* hold CBUS0 for at least 100~ms on LOW level */
wait_ms(100);

/* clear FTDI receive and send buffers */
Purge(FTDI.FT_PURGE.FT_PURGE_RX | FTDI.FT_PURGE.FT_PURGE_TX);

/* set CBUS0 to output level HIGH */
SetBitMode(0x00, FTDI.FT_BIT_MODES.FT_BIT_MODE_RESET);

/* a delay according to the reset timing parameter will occur (see manual) */

/* disconnect and close the FTDI device instance */

```

Code 1: Pin reset via CBUS0 using the D2XX driver

2.2.2.2 Switching from command mode to transparent mode and vice versa

The operation mode of the Thyone-I USB radio stick can be defined by applying the right voltage level at the *OP_MODE* pin of the Thyone-I during its start-up phase. As this pin is connected to the CBUS3 pin of the built-in FTDI converter chip, the CBUS3 pin can be controlled by the host.



Additional care has to be taken when configuring the pins on the FTDI converter. The EEPROM content of the chip is changed by this action. Any misconfiguration may prevent the normal operation of the USB dongle. This method is not intended for periodic use. The factory defaults of the CBUS pins are: CBUS0 to CBUS2 - GPIO, CBUS3 - CBUS_Drive_0

By default, the CBUS3 pin of the FT231X is configured as FT_CBUS_Drive_0 (static LOW) such that the Thyone-I USB radio stick starts in command mode. To start the USB radio stick in transparent mode, configure the CBUS3 pin as FT_CBUS_Drive_1 (static HIGH) and perform a reset of the device, as specified in chapter 2.2.2.1 .

In case the USB radio stick shall start in command mode again, configure the CBUS3 pin as FT_CBUS_Drive_0 (static LOW) and perform a reset of the device, as specified in chapter 2.2.2.1.

3 Regulatory compliance information

3.1 Important notice EU

The use of RF frequencies is limited by national regulations. The Thyone-I USB radio stick has been designed to comply with the RED directive 2014/53/EU of the European Union (EU). The Thyone-I USB radio stick can be operated without notification and free of charge in the area of the European Union. However, according to the RED directive, restrictions (e.g. in terms of duty cycle or maximum allowed RF power) may apply.

3.2 Important notice UKCA

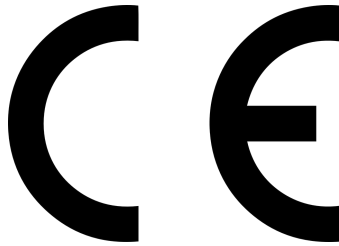
The UK's government has laid legislation to continue recognition of current EU requirements for a range of product regulations, including the CE marking. The Radio Equipment Regulation 2017/1206 is within the scope of this announcement, among others. Consequently, the Thyone-I USB radio stick can be sold and utilized in the UK with the CE marking, without the need of UKCA declaration of conformity or UKCA marking.

Source: <https://www.gov.uk/guidance/ce-marking>

3.3 Important notice FCC

The use of RF frequencies is limited by national regulations. The Thyone-I USB radio stick has been designed to comply with the FCC Part 15. The Thyone-I USB radio stick can be operated without notification and free of charge in the area of the United States of America. However, according to the FCC Part 15, restrictions (e.g. in terms of maximum allowed RF power and antenna) may apply.

3.4 EU Declaration of conformity



EU DECLARATION OF CONFORMITY

Radio equipment: 2611036021001

The manufacturer: Würth Elektronik eiSos GmbH & Co. KG
Max-Eyth-Straße 1
74638 Waldenburg

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of the declaration: 2611036021001

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation Directive 2014/53/EU and 2011/65/EU with its amending Annex II EU 2015/863 . Following harmonised norms or technical specifications have been applied:

EN 300 328 V2.2.2 (2019-07)
EN 301 489-1 V2.2.3
EN 301 489-17 V3.2.4 (2020-09)
EN 62479 : 2010
EN 62368-1:2014 + AC:2015

i.A. G. Exlerdt

Trier, 21th of December 2020

Place and date of issue

3.5 FCC - Federal Communications Commission

The device has been FCC Part 15 B tested.

Contains FCC ID: R7T1101102

The enclosed device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (i.) this device may not cause harmful interference and
- (ii.) this device must accept any interference received, including interference that may cause undesired operation.

3.6 IC - Industry Canada

This device contains ISED: 5136A-1101102

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

4 References

- [1] Würth Elektronik. Thyone-I user manual. <https://www.we-online.de/katalog/de/manual/2611011021000>.
- [2] Würth Elektronik. WE UART Terminal PC tool (Smart Commander). <https://www.we-online.de/wcs-software>.

5 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 5 and 5 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.

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.

6 Legal notice

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.

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 information 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. KG and its representatives against any damages arising out of the use of any Würth Elektronik eiSos GmbH & Co. KG components in safety-critical applications.

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.

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

These 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 these license terms are 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 these license terms. You agree to comply with all provisions under these license terms.

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 these 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 these 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 these 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.

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.**

Ownership

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

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.

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.

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.

Applicable law and jurisdiction

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

Severability clause

If a provision of these 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.

Miscellaneous

Würth Elektronik eiSos reserves the right at any time to change these 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 product, you accept these license terms in all terms.

List of Figures

1	Block diagram of the Thyone-I USB radio stick	5
2	Reset button on the Thyone-I USB radio stick	6

List of Tables

1	Ordering information	4
2	Example baud rates	8



Contact

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

Max-Eyth-Straße 1
74638 Waldenburg
Germany

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

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT