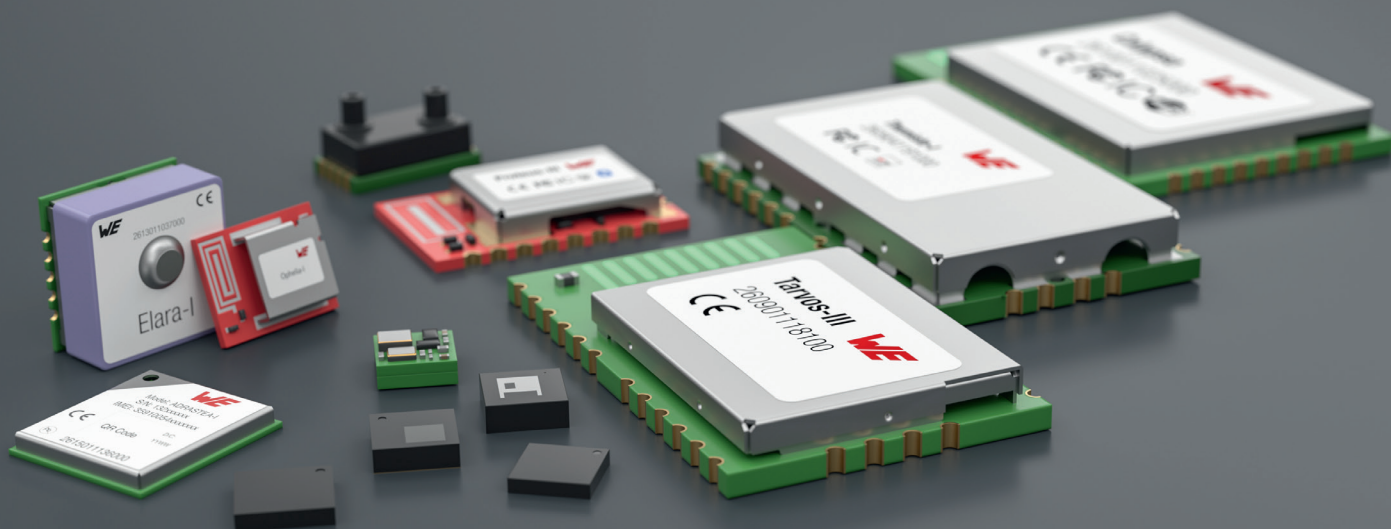




USER MANUAL

METIS-I USB RADIO STICK

AMB8465-M / 2605056083001

VERSION 1.5

AUGUST 24, 2026

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.

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1 Abbreviations

Abbreviation	Name	Description
BDM	Business Development Engineer	Support and sales contact person responsible for limited sales area
HIGH	High signal level	Digital voltage level that is detected as high by the module
LOW	Low signal level	Digital voltage level that is detected as low by the module
RF	Radio frequency	Describes everything relating to the wireless transmission
UART		Universal Asynchronous Receiver Transmitter allows communicating with the module of a specific interface
VDD	Voltage Drain Drain	Supply voltage

2 Revision history

Manual version	HW version	Notes	Date
1.0	2.0	Initial version of the manual	April 2019
1.1	2.0	Updated address of Division Wireless Connectivity & Sensors location	October 2019
1.2	2.0	Updated Declaration of EU conformity Regulatory compliance information	February 2021
1.3	2.0	- Updated document style - Function description is part of the Metis-I user manual [1]	April 2023
1.4	2.0	- Added chapter "Supported UART baud rates" - Added chapter "Important notice UKCA" - General maintenance e.g. fixed typos and rephrasing.	October 2024
1.5	2.0	Update Regulatory compliance information	August 2026

3 Introduction

The Metis-I is a radio sub module that provides wireless M-BUS capabilities in the S-,T- and C-mode. The Metis-I USB radio stick incorporates the Metis-I in a USB stick form factor enabling easy interfacing with any USB enabled device like personal computer or laptop. The Metis-I USB radio stick allows quick set-up of a radio link between PC and any wireless M-BUS enabled system using the respective mode, e.g. wireless meters.

3.1 Ordering information

WE order code	Former order code	Description
2605056083001	AMB8465-M	Wireless M-BUS USB radio stick (S,T,C mode)

Table 3: Ordering information

4 Functional description

The Metis-I USB radio stick consists of Metis-I radio module along with an serial-to-USB adapter that enables direct connection to any USB compatible device. A FTDI serial-to-USB converter chip **FT232R** connects the USB interface of the Metis-I USB radio stick 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 Metis-I USB radio stick.

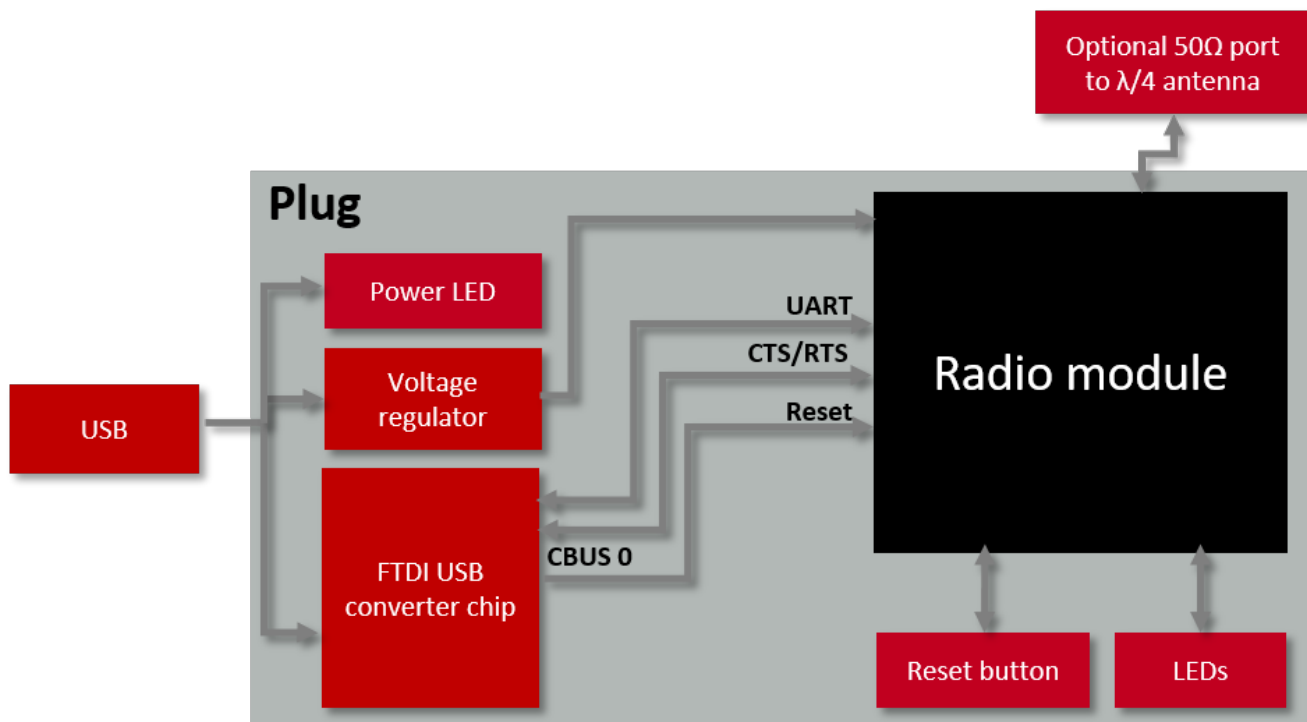


Figure 1: Block diagram of the Metis-I USB radio stick



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

4.1 Taking into operation

To use the Metis-I USB radio stick, the VCP driver of FTDI has to be installed by following the installation guides of FTDI:

<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. This COM port can be opened in any serial emulator program to communicate with the radio module. The radio module responds to commands in a specific format. Please refer to the corresponding user manual [1] for the complete description of the command set.

4.1.1 Supported UART baud rates

In order to establish a stable UART communication between the FTDI USB to UART converter 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 FTDI USB to UART converter (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 USB to UART converter, 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 4: Example baud rates

4.1.2 Usage of CBUS pins

To switch the CBUS pins high or low and thus to use the provided pins functions of the Metis-I radio module, the D2XX driver of FTDI has to be used. This driver is part of the previous mentioned VCP driver installation.

Examples codes 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>

5 Regulatory compliance information

5.1 Important notice EU

The use of RF frequencies is limited by national regulations. The Metis-I USB radio stick has been designed to comply with the RED directive 2014/53/EU of the European Union (EU).

The Metis-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.

Modifications (2014/53/EU article 3 (i))

Caution: Changes or modifications for this equipment not expressly approved by Würth Elektronik eiSos may void the CE conformity to operate this equipment.

5.2 EU Declaration of conformity



EU DECLARATION OF CONFORMITY

Radio equipment: 2605056083001

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: 2605056083001

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation: Directive 2014/53/EU.

Following harmonised norms or technical specifications have been applied:

EN 300 220-2 V3.3.1 (2025-03)
EN 301 489-1 V2.2.0 (Draft)
EN 301 489-3 V2.1.1 (Final draft)
EN 62479 : 2010
EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011
2011/65/EU

i.A. G. Eschardt

Trier, 24th of July 2026
Place and date of issue

5.3 RED-DA Cybersecurity statement

Cybersecurity as per articles 3.3d, 3.3e and 3.3f of the Radio Equipment Directive Delegated Act. The RED-DA mandates to comply to the EN 18031-1, 18031-2 and 18031-3 in order to fulfill the requirements of the cybersecurity chapters (d, e and f).

- EN 18031-1: Common security requirements for radio equipment - Part 1: Internet connected radio equipment
- EN 18031-2: Common security requirements for radio equipment - Part 2: Radio equipment processing data, namely internet connected radio equipment, childcare radio equipment, toys radio equipment and wearable radio equipment
- EN 18031-3: Common security requirements for radio equipment - Part 3: Internet connected radio equipment processing virtual money or monetary value

Requirements	Statement and conditions
(d) Radio equipment does not harm the network or its functioning nor misuses network resources, thereby causing an unacceptable degradation of service	"Not applicable": The product is not capable itself to communicate over the internet. The product is only able to communicate via the following protocols and interfaces. None of the protocols contained in the product are "internet-connectable". Radio communication protocols: EN13757-4 and EN13757-3 is a european standard that is used for smart meter reading applications. The product supports the role "meter" as well as the role "other" to send and receive data in a standard compliant way with wireless M-BUS devices of the complementary role on the wireless link. Host Interface, wired: The host interface of the product does not support internet connectivity. UART is used as a wired communication and control channel towards the customers host.
(e) Radio equipment incorporates safeguards to ensure that the personal data and privacy of the user and of the subscriber are protected	"Not applicable": The product is not internet connected. The product does not pose a risk to the users or subscribers privacy, as it does not store or process any personal data.

(f) Radio equipment supports certain features ensuring protection from fraud	"Not applicable": The product is not internet connected. The product does not pose a risk of fraud because it does not store or process financial data or enables financial transactions.
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5.4 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 Metis-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>

6 References

- [1] Würth Elektronik. User manual Metis-I. <https://www.we-online.de/katalog/de/manual/2605041183000>.

7 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.

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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.

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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 "General customer responsibility" and "Customer responsibility related to specific, in particular safety-relevant applications" remains unaffected.

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User manual Metis-I USB radio stick

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

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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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