

USB 500T
USB Gateway for EnOcean Radio

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PRELIMINARY



Observe precautions! Electrostatic sensitive devices!

Patent protected:
WO98/36395, DE 100 25 561, DE 101 50 128,
WO 2004/051591, DE 103 01 678 A1, DE 10309334,
WO 04/109236, WO 05/096482, WO 02/095707,
US 6,747,573, US 7,019,241

REVISION HISTORY

The following major modifications and improvements have been made to this document:

Version	Author	Reviewer	Date	Major Changes
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Important!

This information describes the type of component and shall not be considered as assured characteristics. No responsibility is assumed for possible omissions or inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications, refer to the EnOcean website: <http://www.enocean.com>.

As far as patents or other rights of third parties are concerned, liability is only assumed for modules, not for the described applications, processes and circuits.

EnOcean does not assume responsibility for use of modules described and limits its liability to the replacement of modules determined to be defective due to workmanship. Devices or systems containing RF components must meet the essential requirements of the local legal authorities.

The modules must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

Components of the modules are considered and should be disposed of as hazardous waste. Local government regulations are to be observed.

Packing: Please use the recycling operators known to you.

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1. INTRODUCTION

USB 500T is an EnOcean transceiver module with gateway controller software and USB interface. It can be directly connected to PC's or smart home servers. Example picture of USB 500T.



The USB stick provides bidirectional EnOcean radio protocol to devices with USB interface. Radio messages are sent and received through a virtual serial interface (FTDI Virtual COM Port). In addition the USB stick provides detailed telegram information like signal strength (RSSI).

Available frequencies:

- 921.4 MHz USB 500T

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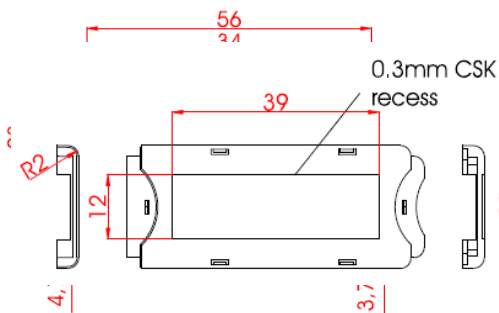
2. TECHNICAL DATA & ENVIRONMENTAL CONDITIONS

Features overview

Frequency/antenna	921.4 MHz USB 500T / PCB antenna
Data rate	125 kBit/s
Modulation type	USB 500T: FSK 921.4 MHz ¹⁾
Receiver Sensitivity (at 25°C) ²⁾	USB 500T: typ. -98 dBm ²⁾
Receiver Category (RED, EN 300 220)	2 (standard performance)
Output Power	USB 500T: typ. 0 dBm (conducted)
Dimensions (incl. cap)	70 x 23 x 9 mm
OEM label size	39 x 12 mm
USB connector	Typ A
Operating temperature	-20°C to +50°C (max. 90% r.h.)

- 1) According to ISO/IEC 14543-3-1x
- 2) 0.1% telegram error rate (based on the combination of 3 received sub-telegrams).
USB extension cable is recommended for best performance.

Housing:



OEM Label

12 (+/- 0.5)



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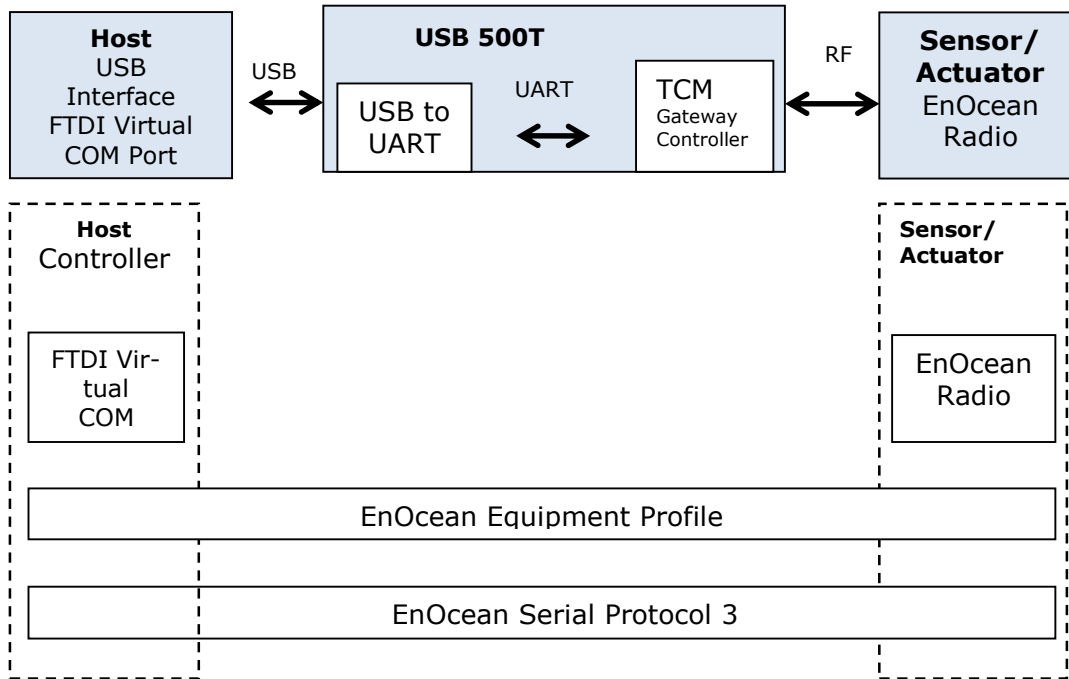
USB 500T:



- USB Power LED
- USB transfer active

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3. BLOCK DIAGRAM AND PROTOCOL LAYERS



4. DOCUMENTATION OF PROTOCOLS AND ENOCEAN PROFILES

- Plug'n play device drivers are available from USB chip manufacturer FTDI for the operating systems Microsoft Windows, Linux and Apple Mac OS:
<http://www.ftdichip.com/FTDrivers.htm>
- If you want to develop for other host platforms, you can use or adapt available C-source code for Linux OS from FTDI Website:
<http://www.ftdichip.com/Drivers/VCP.htm>
- USB stick uses EnOcean Serial Protocol 3 for control commands and data communication. A description of ESP 3 is available at:
<http://www.enocean.com/en/knowledge-base/>
- The content of EnOcean radio telegrams is standardized by the EnOcean Alliance. You will find the latest definition of EnOcean Equipment Profiles (EEP) at:
<http://www.enocean-alliance.org/>

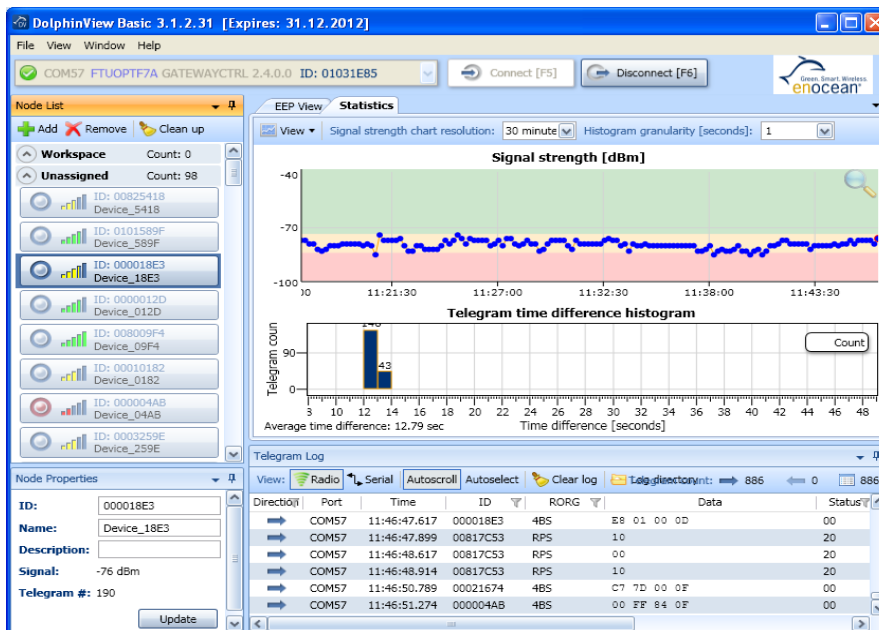
5. ADDITIONAL FEATURES OF USB 500T

- The USB stick can be configured as repeater of EnOcean telegrams; this will expand the range of radio devices. In addition the USB stick can filter EnOcean telegrams; this can avoid heavy data load for the host system.
- 500T will store repeater configurations in a flash memory. For details see ESP3 command description.
- The USB stick supports remote management of self-powered radio nodes. For details see ESP3 command description of REMOTE_MAN command.
- The USB stick supports smart acknowledge of self-powered radio nodes internally. This feature enables bidirectional communication for self-powered radio nodes.
- Commands are defined within TCM Gateway Controller and ESP3 documentation, this is available at: <http://www.enocean.com/en/knowledge-base/>
- For advanced analysis and protocol debugging we recommend EnOcean Developer Kit EDK with DolphinView Advanced and DolphinSniffer.

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6. FIRST STEPS WITH USB 500T AND DOLPHINVIEW

1. Register download and install DolphinView:
<http://www.enocean.com/en/download/>
2. Plug USBstick to an USB port of the PC.
(USB extension cable is recommended for best performance)
3. Start DolphinView and connect to COM port
4. Press self-powered switch or learn button of sensor,
DolphinView will display telegram



7. PRODUCT SAFETY AND ADITIONAL HINTS

- USB stick should not be exposed to rapid temperature changes shortly before or during operation. Condensation of moisture might damage the device.
- USB stick is not intended to be used in rough environment with heavy vibrations or mechanical shocks.
- The USB stick front cap is used as handling protection during delivery.
- In order to optimize radio performance use an USB extension cable.
- Installation location of radio nodes should be carefully planned. Application note AN001 at <http://www.enocean.com/en/application-notes/> will explain basic rules.
- Any USB stick configurations done by ESP3 commands (e.g. repeater on, filter, maturity time) will be lost in case of power off. If you need these configurations permanent, make sure USB stick has continues power or re-send commands after power down.
- USB stick has been designed for usage with DolphinView. For advanced protocol analysis and debugging we recommend the usage of EnOcean Developer Kit with DolphinView Advanced and DolphinSniffer.
- USB stick has been optimized for cyclic sending/receiving status values and not for continuous data communication; therefore the radio interface is limited to receive approx. 90 telegrams per second. Higher traffic can lead to telegram loss.
- Microsoft Windows increases the COM port number for every installed USB stick (FTDI virtual COM port device). If the number reaches 255, you have to reset the device driver and follow the instructions from the company FTDI.