

EWSSB / EWSDB

EASYFIT Bluetooth® Single / Double Rocker Wall Switch



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			
2.0	MKA	MKA	22.02.2017	Initial Release			
1.1	MKA	MKA	30.03.2017	Added step by step payload parsing example			
1.2	MKA	MKA	30.06.2017	Added product label information			
1.3	MKA	MKA	09.01.2018	Added Australia approval			
1.4	MKA	MKA	30.05.2018	PTM 216B DB-05 update			
1.5	MKA	MKA	20.12.2018	Separated EWSxB and PTM 216B product documentation			
1.6	MKA	MKA	25.05.2019	Added reference to PTM 216B User Manual			
1.7	MKA	MKA	08.12.2020	Improved description of device label			
1.8	MK	MK	25.04.2022	Added UKCA approval			
2.0	MKA	MKA	14.07.2023	Update for revision DD (using PTM 216B)			

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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.

Disposal

Product

Dispose of the used components at an official collection point for electronic waste or at your local dealer.

Packina

Please use the recycling operators known to you.





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1 GENERAL DESCRIPTION

1.1 Basic functionality

This user manual described the EnOcean Easyfit Bluetooth® Single / Double Rocker Wall Switch (EWSSB / EWSDB, jointly referred to as EWSxB) in product revision DD. EWSxB are energy harvesting Bluetooth Low Energy (BLE) wall switches in the European 55×55 wall switch form factor.

EWSxB are based on the maintenance free, self-powered Bluetooth push button transmitter module PTM 216B. This User Manual describes of specifics of EWSxB finished products.

The energy harvesting BLE switch functionality of EWSxB products is provided by an integrated PTM 216B module. For a description of the PTM 216B functionality, please refer to the PTM 216B User Manual available at: https://www.enocean.com/en/enocean-modules-24ghz-ble/details/ptm-215b/user-manual-pdf/ https://www.enocean.com/en/product/ptm-216b

The PTM 216B module within EWSxB contains an electro-dynamic energy transducer which is actuated by the EWSxB rocker movement. Whenever a rocker is pushed down or released, electrical energy is created and a set of Bluetooth advertising frames is transmitted by the PTM 216B radio transmitter which identifies the rocker status (pushed or released). Radio telegrams are protected with AES-128 security based on a device-unique private key.

"Long" or "Short" rocker press (the time between pushing and releasing the rocker) can be calculated by the receiver. This enables switching, dimming control or jalousie control including slat action

Figure 1 below shows the single rocker (EWSSB) and double rocker (EWSDB) product variants.



Figure 1 – EWSSB (single rocker) and EWSDB (double rocker) variants

1.2 Ordering information

Туре	Ordering Code
EWSSB	E8221-A270:DD
EWSDB	E8221-A280:DD



1.3 Technical data

Antenna	Integrated PCB antenna
Output Power	+4 dBm
Communication Range (Guidance Only)	75 m ideal line of sight / 15 m indoor environment
Communication Standard	Bluetooth Low Energy (Advertising)
Radio Frequency (min / max)	2402 MHz / 2480 MHz
Default Radio Channels	BLE CH 37 / 38 / 39 (2402 MHz / 2426 MHz / 2480 MHz)
Advertising Events per press or release (min / max)	2 / 3
Default Data Rate and Modulation	1 Mbit/s GFSK
Configuration Interface	NFC Forum Type 2 Tag (ISO/IEC 14443 Part 2 and 3)
Device Identification	Unique 48 Bit Device ID (factory programmed)
Security	AES128 (CBC Mode) with Sequence Code
Power Supply	Integrated Kinetic Energy Harvester
Inputs	Single (EWSSB) or Double Rocker (EWSDB)

1.4 Physical dimensions and mounting options

Dimensions of Single Rocker (EWSSB)	50 x 50 mm
Dimensions of Double Rocker (EWSDB)	25 x 50 mm (for each of the two rockers)
Dimensions of Frame Insert	55 x 55 mm
Dimensions of Central Plate	71 x 71 mm
Dimensions of Frame	81 x 81 mm

1.5 Environmental conditions

Operating Temperature	-25°C 65°C
Storage Temperature	-25°C 65°C
Humidity	0% to 95% r.h. (non-condensing)

1.6 Packaging information

Packaging Unit	10 units
Packaging Method	Each unit packed in a bag; 10 units packed in a box



2 FUNCTIONAL INFORMATION

2.1 Product overview

The different components of EWSSB are shown in Figure 2 below.

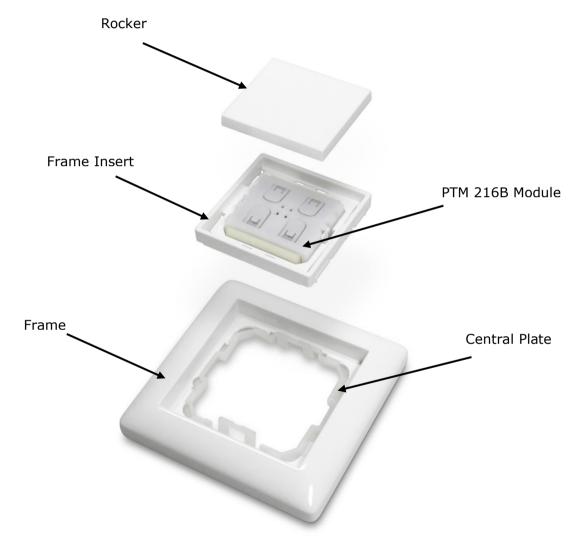


Figure 2 - Components of Easyfit Single Rocker Wall Switch EWSSB



2.2 Compatible frames

Single and double rocker wall switch are shipped with a Gira Standard55 frame. The switch frame can be replaced by frames of the design programs listed in Table 1 below.

Manufacturer	Product Program
BERKER	S1, B1, B3, B7 Glas
GIRA	Standard55, E2, Event, Esprit
JUNG	A500, Aplus
MERTEN	M-Smart, M-Arc, M-Plan

Table 1 - EWSSB / EWSDB compatible switch frames



2.3 User interface

EWSSB and EWSDB are implemented based on the EnOcean PTM 216B module which is shown in Figure 3 below.





Figure 3 - PTM 216B module (shown with and without rocker)

The PTM 216B module provides four button contacts. These button contacts re grouped into two channels (Channel A and Channel B) with each channel containing two button contacts (State O and State I).

The button contacts of the PTM 216B module are either actuated by one (single) rocker (EWSSB) or two (double) rockers (EWSDB). For the case of the single rocker variant EWSSB, only channel B is actuated by the single rocker (actuating either B0 or BI). For the case of the double rocker variant EWSDB, each channel (A or B) is actuated by one of the two rockers so that one rocker actuates A0 or AI while the other actuates B0 or BI.

The state of all four button contacts (pressed or not pressed) is transmitted together with a unique device identification (48-bit source address) whenever a rocker is pushed or released.

Figure 4 below shows the arrangement of the four button contacts on the PTM 216B module and their designation.

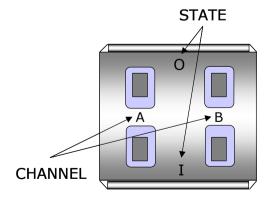


Figure 4 - Button contact designation of the PTM 216B module

Please refer to the PTM 216B user manual for detailed technical information about the PTM 216B module.



3 PRODUCT LABEL

Each EWSSB or EWSDB product contains a device label as shown in Figure 5 below. This example label identifies the following parameters in writing:

- Product name (EWSSB)
- Order number (E8221-A270)
- Product revision (DA-01)
- Manufacturing date (week 10, 2017)
- Static Source Address (E21501234567)
- Serial Number (07123456)

The device label also encodes certain parameters within an automatically readable QR code in the lower right corner as described in chapter 0.

Figure 5 below shows the device label incl. the QR code in the lower right corner.





Figure 5 – Example of product label



3.1 QR code format

The QR code used on the EWSSB / EWSDB product label encodes the product parameters according to the ANSI/MH10.8.2-2013 standard with the structure shown in Table 2 below.

Data Identifier	Data Length (excluding identifier)	Data Content	
30S	12 characters	Source Address (hexadecimal)	
Z	32 characters	Security Key (hexadecimal)	
31Z	8 characters	NFC PIN Code (0000E215)	
30P	Up to 10 characters	Ordering Code	
2P	4 characters	Step Code and Revision	
S	8 characters (including leading zero)	Serial Number (always starts with 07)	

Table 2 - EWSxB product QR code structure



4 APPLICATION INFORMATION

4.1 Transmission range

The main factors that influence the system transmission range are:

- Type and location of the antennas of receiver and transmitter
- Type of terrain and degree of obstruction of the link path
- Sources of interference affecting the receiver
- "Dead spots" caused by signal reflections from nearby conductive objects.

Since the expected transmission range strongly depends on this system conditions, range tests should always be performed to determine the reliably achievable range under the given conditions. The following figures should be treated as a rough guide only:

- Line-of-sight connections
 Typically 15 m range in corridors, up to 30 m in halls
- Plasterboard walls / dry wood
 Typically 10 m range, through max. 2 walls
- Ferro concrete walls / ceilings
 Typically 5 m range, through max. 1 ceiling (depending on thickness)
- Fire-safety walls, elevator shafts, staircases and similar areas should be considered as shielded

The angle at which the transmitted signal hits the wall is very important. The effective wall thickness – and with it the signal attenuation – varies according to this angle. Signals should be transmitted as directly as possible through the wall. Wall niches should be avoided.

Other factors restricting transmission range include:

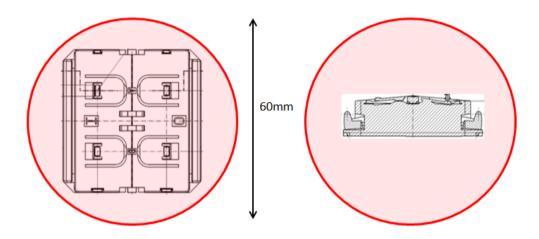
- Switch mounting on metal surfaces (up to 30% loss of transmission range)
- Hollow lightweight walls filled with insulating wool on metal foil
- False ceilings with panels of metal or carbon fibre
- Lead glass or glass with metal coating, steel furniture

The distance between the receiver and other transmitting devices such as computers, audio and video equipment that also emit high-frequency signals should be at least 0.5 m.



4.2 External magnets

EWSxB wall switches are powered by an electromagnetic energy generator. For proper function magnets or ferromagnetic materials are not permitted within a keep-out zone of 60mm around the center of the PTM 216B module as shown below.





5 Market Approval (Regulatory Information)

The PTM 216B module within EWSSB and EWSDB has been certified according to FCC (US), IC (CA), CE (EU), UKCA (UK) and ARIB (Japan) regulations. Changes or modifications not expressly approved by EnOcean could void the user's authority to operate the equipment.

5.1 Market Approval for European Union (CE)

Hereby, EnOcean GmbH declares that the radio equipment's EWSSB and EWSDB are in compliance with the technical requirements of the standards and the provisions of the essential requirements of the Directives listed in the EU Declaration of Conformity (DoC). The DoC is available for download at the product website. Test reports are available on request.



The final product package including EWSSB and/or EWSDB must meet all necessary application specific requirements for CE conformity (e.g., building automation application, branding, address, product safety information, WEEE registration and packaging). The OEM customer (B2B) is responsible for the final product documentation (local language) and must register at EU specific recycling organizations.

5.2 Market Approval for United Kingdom (UKCA)

During a transition period, the United Kingdom will continue to accept products using the EU (CE) market approval as described above. Test reports are available on request.



The final product package of EWSSZ, EWSDZ, EWSSZG and EWSDZG products must meet the necessary application specific requirements for UKCA conformity (e.g., building automation application, UK WEEE registration and packaging). The OEM customer is responsible for the final product documentation and must register at UK specific recycling organizations.



5.3 FCC (United States)

5.3.1 Certificate

TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification

Issued Under the Authority of the Federal Communications Commission

By:

Timco Engineering, Inc. 849 NW State Road 45 Newberry, FL 32669 Date of Grant: 04/07/2022

Application Dated: 04/07/2022

EnOcean GmbH Kolpingring 18a Oberhaching, 82041 Germany

Attention: Armin Anders , Director Product Marketing

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: SZV-PTM215BZ
Name of Grantee: EnOcean GmbH

Equipment Class: Digital Transmission System

Notes: Energy Harvesting Wireless Switch

Frequency Output Frequency Emission
Grant Notes FCC Rule Parts Range (MHZ) Watts Tolerance Designator

15C 2402.0 - 2480.0 0.0027 15C 2405.0 - 2480.0 0.0026

Power listed is conducted. Device must be installed and operated to provide a separation distance of at least 20cm from all persons and must not transmit simultaneously with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.



5.3.2 Regulatory Statement

This device complies with Part 15 of the FCC rules. 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.

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Warning

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



5.4 ISED (former Industry Canada)

5.4.1 Certificate







CANADIAN CERTIFICATION TECHNICAL ACCEPTANCE CERTIFICATE

Certification No.

Issued To

EnOcean GmbH Kolpingring 18A Oberhaching 82041 Germany ➤ IC: 5713A-PTM215BZ

Tested By

VPI Laboratories, Inc.
Company No.: 2041B
313 W. 12800 S.
Suite 311
Draper, UT 84020
United States
801-260-4050; jasons@vpitech.com

Type of Equipment

Type of Service

Hardware Version Id Number (HVIN)

Firmware Version Id Number (FVIN)

Product Marketing Name: (PMN)

▶ Other

New Family Certification

➤ PTM 215Z FOH (DB)

PTM 215ZE (DB)

➤ PTM 216B

PTM 216Z (DB)

N/A

PTM 215Z FOH (DB), PTM 215ZE (DB), PTM 216B, PTM 216Z (DB)

Host Marketing (HMN)

FREQUENCY RANGE	EMISSION	R.F. POWER	ANTENNA INFO	SPECIFICATION/ ISSUE & DATE
1	DESIGNATIONS			
	NECESSARY			
	BANDWIDTH &			
	EMISSION			
	CLASSIFICATION			

N E>N/AR

2402 – 2480 MHz	1M07F1D	0.0037 - 0.0039 W	Trace, 1.5dBi	RSS-247	Issue 2; Feb. 2017
2402 – 2480 MHz	2M08F1D	0.0036 - 0.0037 W	Trace, 1.5dBi	RSS-247	Issue 2; Feb. 2017
2405 – 2480 MHz	2M30F1D	0.0036 - 0.0037 W	Trace, 1.5dBi	RSS-247	Issue 2; Feb. 2017

Note 1: This equipment also complies with RSS-102, Issue 5 (March 2015) and RSS-Gen, Issue 5 (April 2018).

Certification of equipment means only that the equipment has met the requirements of the above-noted specification. Licence applications, where applicable to use certified equipment, are acted on accordingly by the ISED issuing office and will depend on the existing radio environment, service and location of operation. This certificate is issued on condition that the holder complies and will continue to comply with the requirements and procedures issued by ISED. The equipment for which this certificate is issued shall not be manufactured, imported, distributed, leased, offered for sale or sold unless the equipment complies with the applicable technical specifications and procedures issued by ISED.

I hereby attest that the subject equipment was tested and found in compliance with the above-noted specifications.

La certification de l'équipement signifie uniquement que l'équipement a satisfait aux exigences de la spécification susmentionnée. Les demandes de licence, le cas échéant pour utiliser un équipement certifié, sont traitées en conséquence par le bureau émetteur d'ISED et dépendront de l'environnement radio, du service et du lieu d'exploitation existants. Ce certificat est délivré à condition que le titulaire se conforme et continuera de se conformer aux exigences et procédures émises par ISED. L'équipement pour lequel ce certificat est délivré ne doit pas être fabriqué, importé, distribué, loué, mis en vente ou vendu à moins que l'équipement ne soit conforme aux spécifications et procédures techniques applicables émises par ISED.

J'atteste par la présente que le matériel a fait l'objet d'essai et jugé conforme à la spécification ci-dessus.

ISSUED UNDER THE AUTHORITY OF MINISTER OF INDUSTRY DÉLIVRÉ AVEC L'AUTORISATION DU MINISTRE DES INDUSTRIES



5.4.2 Regulatory Statement

5.4.2.1 English version

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 interference, and
- 2. This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to ICES-003. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



5.4.2.2 French version

PRUDENCE: Changements ou modifications pourraient annuler le droit de l'utilisateur à utiliser l'équipement non autorisées.

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.

Cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe B, conformément à la norme ICES-003. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle.

Cet équipement génère, utilise et peut émettre une énergie de radiofréquence et, s'il n'est pas installé et utilisé conformément a ux instructions, il peut causer des interférences nuisibles aux communications radio. Cependant, il n'existe aucune garantie que des interférences no se produiront pas dans une installation particulière.

Si cet équipement provoque des interférences nuisibles à la réception radio ou télévision, ce qui peut être déterminé en mettant l'équipement hors et sous tension, l'utilisateur est encouragé à essayer de corriger l'interférence par une ou plusieurs des mesures suivantes:

- Réorienter ou déplacer l'antenne de réception.
- Augmentez la distance entre l'équipement et le récepteur.
- Connecter l'équipement à une sortie sur un circuit différent de celui sur lequel le récepteur est branché.
- Consulter le revendeur ou un technicien radio / télévision expérimenté pour de l'aide



5.5 ARIB (Japan) Construction Type Conformity Certifaction



CETECOM GmbH RCB Identifier 215 Bundesnetzagentur

authorized by the German Federal Regulatory body BNetzh to act as a CAB(Conformity Assessment Body) in accordance with the MRA EU-Japan

BNetzA -CAB -18/25 -54

CONSTRUCTION TYPE CERTIFICATE

Certificate Holder Matthias Kassner

Kolpingring 18a 82041, Oberhaching Deutschland

CETECOM Registration No. 21-1-0155301T03

Model Name PTM 216B

Product Description Wireless Switch

Name of Manufacturer Katek GmbH

Körtingstraße 1 83224, Grassau Germany

This is to certify that the above-mentioned certification by type has been granted in accordance with the provisions of Article 38-24, Paragraph 1 of the Japan Radio Law.

This device must be labelled appropriately physically or electronically



215-JUK010

Place, date of issue

Essen, 2022-03-10 CETECOM GmbH

Tero Lehtinen / RCB