EWSxZ / EWSxZG

EASYFIT ZigBee Wall Switches

06.03.2020

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
1.0	AA	MKa	06.03.2020	Initial Release

Published by EnOcean GmbH, Kolpingring 18a, 82041 Oberhaching, Germany
www.enocean.com, info@enocean.com, phone +49 (89) 6734 6890

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.

Packing
Please use the recycling operators known to you.

EASYFIT
by EnOcean

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

TABLE OF CONTENT

EASYFIT
by EnOcean

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

1   GENERAL DESCRIPTION

1.1   Product Description, Difference between EWSxZ and EWSxZG

The EnOcean Easyfit single / double rocker wall switches EWSSZ, EWSDZ, EWSZG and EWDZG are universal energy harvesting ZigBee Green Power switches provided as finished product in the European 55 x 55 wall switch form factor.

The following list summarizes the properties of the different products:

- EWSSZ: Single rocker switch based on PTM 215ZE module

- EWSDZ: Double rocker switch based on PTM 215ZE module

- EWSSZG: Single rocker switch based on PTM 216Z module

- EWSDZG: Double rocker switch based on PTM 216Z module

This User Manual provides an overview about the four finished products listed above. The term "EWS" is used subsequently when referring to all products.

The difference between the two modules used is that PTM 215ZE module implements Zigbee Green Power SCENE and SWITCH commands while the PTM 216Z module implements the ZigBee Green Power Generic Switch model.

For detailed technical description of the module within these switches, please refer to the following documentation:

- PTM 215ZE module
  https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-215ze/

- PTM 216Z module
  https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-216z/

1.2 Basic Switch Functionality

The PTM modules within EWS contain an electro-dynamic energy transducer which is actuated by the rocker movement.

Whenever a rocker is pushed down or released, electrical energy is created and ZGP radio frame is transmitted identifying the rocker status (pushed or released).

„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 (EWSSZ or EWSSZG) and double rocker (EWSDZ or EWSDZG) product variants.

Figure 1 – EWSSZ / EWSSZG (single rocker) and EWSDZ / EWSDZG (double rocker)

1.3 Ordering Information

Type	Ordering Code
EWSSZ	E8271-A270
EWSDZ	E8271-A280
EWSSZG	E8271-A276
EWSDZG	E8271-A286

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

1.4 Technical Data

Antenna	Integrated PCB antenna
Output Power	Max. +7dBm / 5mW (measured)
Communication Range	Typ. 175 m free field / 20 m indoor (guidance only)
Radio Protocol	2.4 GHz, IEEE 802.15.4
Communication Standard	ZigBee Green Power
Default Radio Channel	Channel 11
Radio Channel Selection	Channel 11..26, user-selectable (commissioning)
Device Identification	Individual 32 Bit device ID (factory programmed)
Security	AES128 (CBC) authentication with sequence counter
Power Supply	Integrated Kinetic Energy Harvester
Inputs	Single or Double Rocker
Operating Travel / Operating Force	approx. 2 mm / 7 N (at room temperature)
Switching Cycles	> 50.000 operations according to EN 60669 / VDE 0632

1.5 Physical Dimensions, Mounting Options

Total Installation Height	14 mm (frame lies directly against the wall)
Dimensions of Single Rocker	50 x 50 mm
Dimensions of Double Rocker	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
Mounting	Gluing or screwing onto flat surface (double sided gluing tape enclosed)

1.6 Environmental Conditions

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

1.7 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 EWS are shown in Figure **2** below.
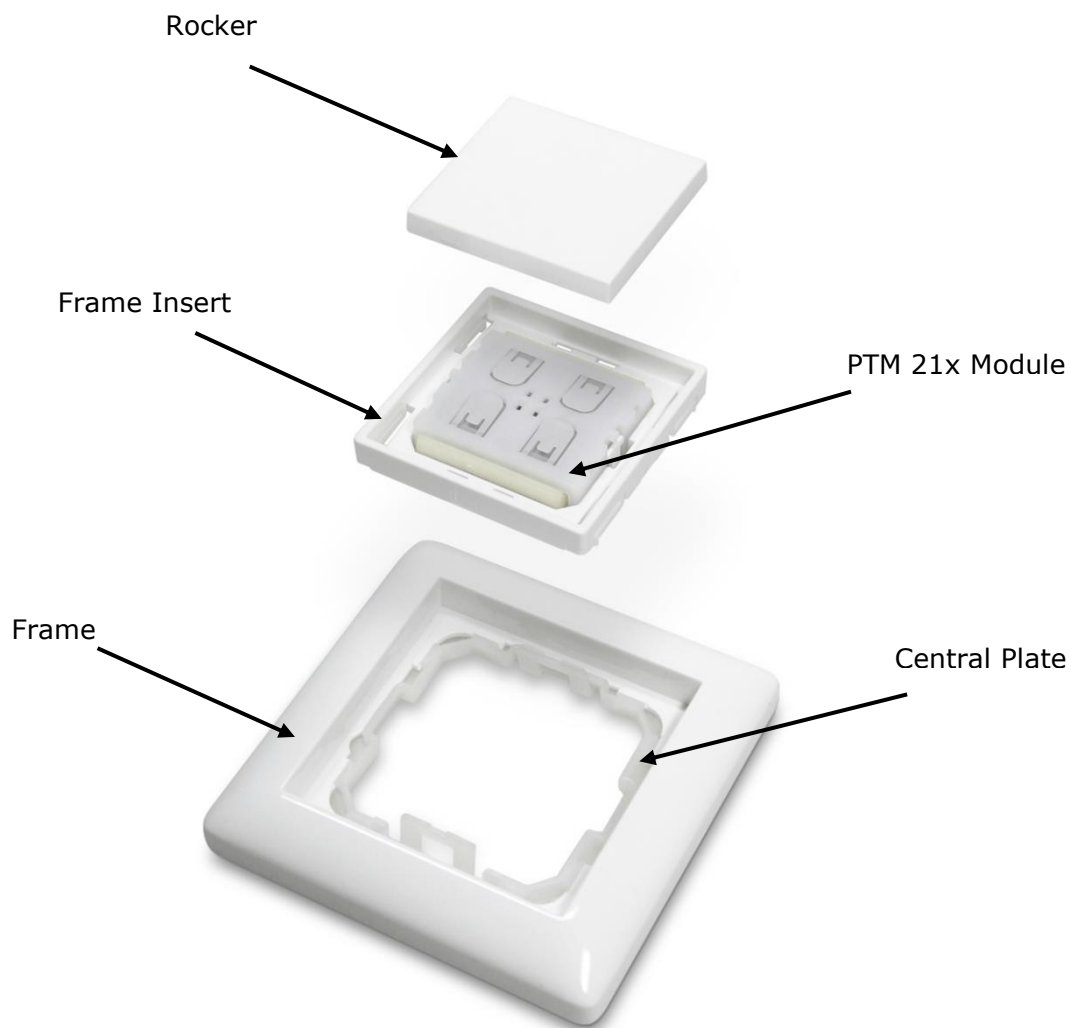

Figure 2 – Components of Easyfit Single Rocker Wall Switch (EWS)

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

2.2   Compatible Frames

Single and double rocker wall switch are shipped with an "Opus 55 Inform" 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	Standard 55, E2, E3, Event, Esprit, ClassiX
Jäger Direkt	Opus 55 Inform, Opus 55 Kubus, Opus 55 Fusion
JUNG	AS 500, A 500, A plus, A creation, A creation Glas
MERTEN	1-M, M-Smart, M-Arc, M-Plan, M-Creativ, M-Pure

Table 1 – EWS compatible switch frames

2.3   User Interface

EWS are implemented based on the EnOcean PTM 21x module which is shown below.

Figure 3 – PTM 21x module (shown with and without rocker)

The PTM 21x module provides four button contacts which are actuated by one (single) rocker (EWSSZ or EWSSZG) or two (double) rockers (EWSDZ or EWSDZG).

The button contacts of the PTM 21x module are grouped into two channels (Channel A and Channel B) with each channel containing two button contacts (State O and State I).

For the double rocker variant EWS, each channel is actuated by one of the two rockers. In case of the single rocker variant EWS, only channel B is actuated by the single rocker.

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

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

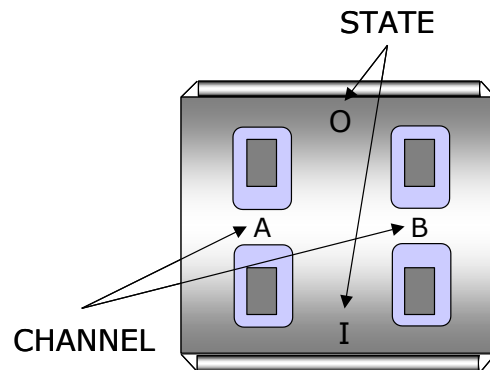Figure 4 below shows the arrangement of the four button contacts on the PTM 21x module and their designation.

Figure 4 – Button contact designation of the PTM 21x module

Please refer to the PTM 215ZE or to the PTM 216Z User Manual for additional technical information about the PTM module.

EASYFIT
by EnOcean

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

3   PRODUCT LABEL

3.1   Device Label Content

Each EWS product contains a device label which identifies the following parameters in writing:

- Product name (EWSSZ in following example)

- Product revision (DA-01 in following example)

- Manufacturing date (10/17 = week 10, 2017 in following example)

- Static Source Address (000001234567 in following example)

- Manufacturer and Serial Number (07123456 in following example)

The device label also encodes certain parameters within an automatically readable QR code in the lower right corner as described in chapter 3.2.

Figure 5 below shows the device label and highlights (green rectangle) the location of the QR code.

Figure 5 – Location of the commissioning QR code

EASYFIT
by EnOcean

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

3.2   QR Code Format

The QR code used on the EWS product label encodes the product parameters based on the following structure:

Data Identi-fier	Data Length (excluding identifier)	Data Content
30S	12 characters	Source Address (hexadecimal)
Z	32 characters	Security Key (hexadecimal)
30P	Up to 10 characters	Ordering Code
2P	4 characters	Step Code and Revision
S	8 characters (including leading zero)	First 2 characters: Manufacturer (07 = SEMD) Final 6 characters: Serial Number

Table 2 – EWS product QR code structure

3.3   QR Code Example

Figure 6 below shows an example of a QR code on EWS products.

Figure 6 – Example QR code

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

The content of this QR code is as follows:

30SE21501234567
+Z0123456789ABCDEF0123456789ABCDEF
+30PE8221-A270
+2PDA01
+S07123456

This content encodes the following product parameters:

Data Identi-fier	Data Content	Value in this example
30S	Source Address (hexadecimal)	0xE21501234567
Z	Security Key (hexadecimal)	0x0123456789ABCDEF0123456789ABCDEF
30P	Ordering Code	E8221-A270
2P	Step Code and Revision	DA-01
S	First 2 characters: Manufacturer Final 6 characters: Serial Number	Manufacturer: 07 (SEMD) Serial number: 123456

Table 3 – Example QR code content

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 10 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

EWS is powered by an electromagnetic harvester. Using magnets (e.g. for mounting) in close proximity to EWS will impact the performance of the harvester and therefore has to be avoided.

EASYFIT
by EnOcean

EWSXZ / EWSXZG - EASYFIT ZIGBEE GREEN POWER WALL SWITCHES

5 REGULATORY INFORMATION

The PTM 215ZE and the PTM 216Z modules within EWSxZ and EWSxZG plastic housings are certified according to the following regulations: CE/RED (Europe), FCC (United States) and IC (Canada). Changes or modifications not expressly approved by EnOcean could void the user's authority to operate the equipment.

5.1 CE / RED (European Union)

Regulatory Statement
The Radio Equipment Directive (2014/53/EU, typically referred to as RED) is the relevant regulatory framework for radio products in the European Union. All products sold to final customers after 12th of June, 2017 have to be compliant to RED. At the time of writing, the text of the RED legislation was available from this link:
http://eur-lex.europa.eu/eli/dir/2014/53/oj

It is the responsibility of the OEM manufacturer to demonstrate compliance to all applicable EU directives and standards. The attestation of conformity for PTM 21x module serves as input to the declaration of conformity for the full product. At the time of writing, guidance on the implementation of EU product rules – the so called "Blue Guide" – was available from this link:
http://ec.europa.eu/DocsRoom/documents/18027/

Specifically within the new RED framework, all OEM manufacturers have for instance to fulfill the following additional requirements:

- Provide product branding (on the product) clearly identifying company name or brand and product name as well as type, charge or serial number for market surveillance
- Include (with the product) documentation containing full postal address of the manufacturer as well as radio frequency band and max. transmitting power
- Include (with the product) user manual, safety information and a declaration of conformity for the final product in local language
- Provide product development and test documentation upon request

Please contact an accredited test house for detailed guidance.

Declaration of Conformity
Please find the Declaration of Conformity of EWSxZ and EWSxZG at this link:
https://www.enocean.com/en/products/enocean_modules_24ghz/easyfit-single-double-rocker-wall-switch-for-zigbee-ewsxz-ewsxzg/

5.2 FCC (United States)

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.

Certificates
Please find the FCC certicates that are relevant for EWSxZ and EWExZG in the User Manuals of the integrated modules PTM 215ZE and the PTM 216Z modules at this links:
    1.) https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-215ze/
    2.) https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-216z/

5.3 ISED (Canada)

Regulatory Statement
This device complies with Industry Canada licence-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.

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."

Certificates
Please find the IC certicates that are relevant for EWSxZ and EWExZG in the User Manuals of the integrated modules PTM 215ZE and the PTM 216Z modules at this links:
    1.) https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-215ze/
    2.) https://www.enocean.com/en/products/enocean_modules_24ghz/ptm-216z/