PTM ROCKER SWITCH-
Designing customer specific rockers for PTM 200(C)

1. ABSTRACT

Contains additional notes to PTM 200(C) user manual for designing customer specific switch rockers; basic overview of the construction and handling characteristics of the PTM switch is presented. Finally, the most important aspects regarding rocker design are pointed out.

1.1. References (mandatory!)

[1.] Drawings: EnOcean A07-M01, A02-C23 and IGS (3D) Data:
http://www.enocean.com/en/enocean_modules/PTM200_mounting_instructions_07.zip/

[2.] EnOcean PTM 200C User Manual, mechanical interface and applications information:
http://www.enocean.com/en/enocean_modules_315mhz/PTM_200C_User_Manual_V1.1.pdf/

[3.] EnOcean PTM 200 User Manual, mechanical interface and applications information:
http://www.enocean.com/en/enocean_modules/PTM_200_User_Manual_V1.30.pdf/

Please make sure that you always use the current EnOcean documentation.
Up-to-date documentation download http://www.enocean.com

1.2. Revision History

No	Major Changes
Sep. 11	Initial version

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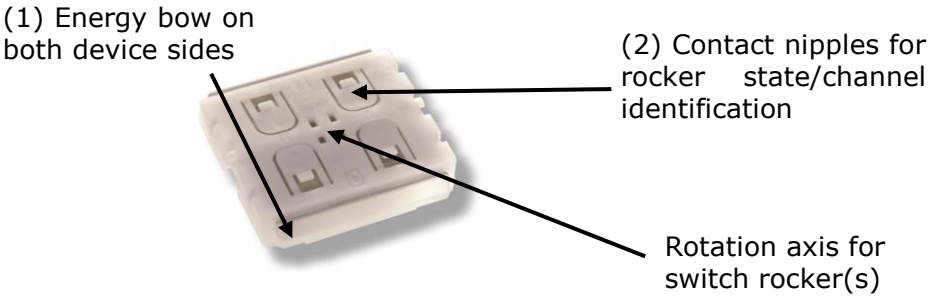
2. PTM 200(C) SHORT DESCRIPTION AND TYPICAL APPLICATION

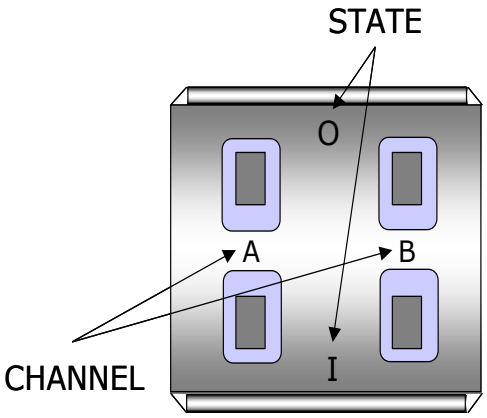
The radio transmitter device PTM 200(C), from EnOcean, see picture below, enables the implementation of wireless remote controls without batteries. Typical applications are: wireless switches for building automation, wireless position switches for industrial automation, call button transmitters, key fobs.



PTM 200(C) Basic Functionality

An EnOcean integrated electro-dynamic energy transducer is actuated by a bow (1), which can be pushed/released from outside the device by appropriate push buttons or switch rockers.

When the energy bow is pushed down respectively released, electrical energy is generated and a radio telegram is transmitted. Releasing the energy bow generates different telegram data, so every PTM telegram contains the information that the bow was pressed or released. Additionally the corresponding contact nipple channel/state information is also transmitted. It is important that by pushing down the rocker, first the nipple contact (determined channel/state) is made before bow actuation (energy generation). That is already foreseen and is assured in the recommended drawings.



3. PTM 200(C) MECHANICAL INTERFACE (ACCORDING CURRENT USER MANAUAL)

Module dimensions (inclusive rotation axis and energy bow)	40.0 x 40.0 x 11.2 mm
Device weight	20 g ± 1 g
Energy bow travel / operating force	1.8 mm / approx. 7 N *
* @ room temperature, only one energy bow may be actuated at the same time!	
Restoring force at energy bow	0.5 N to 4 N
For the correct function of the application, the specified minimal restoring force of 0.5 N must be considered!	
Number of operations	typ. 50.000 actuations tested according to VDE 0632 / EN 60669

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4. PTM 200(C) ROCKER MATERIAL AND FURTHER DESIGN RECOMENDATIONS

- For CAD system development support, 3D construction data is available from EnOcean (IGS data). Using this data, the mechanical interface is fixed, and the shape and surface of the rocker(s) can be changed according to requirements.
- Recommendation for suitable rocker material is PC, polycarbonate (buckling resistant and wear-proof material), to minimize wear between the PC rocker and the energy bows, which consist out of 60% GF Grivory. It is recommended to apply teflon varnish in the areas of actuation.

Please note that the rockers should be of nonmetal for best transmission range! For best results please also avoid metalized plastics respectively plastic materials with conducting ingredients like e.g. graphite!

5. IMPORTANT NOTES

Designing of well fitting, high quality rockers for PTM devices needs a strong attention to follow all the available design guides and it requires to satisfy all the mentioned tolerance numbers exactly! Regarding the references mentioned in chapter 1.1 please pay special attention to the following critical dimensions:

- The specified minimum wall thickness to counteract twisting effects should be observed (see IGS data)
- Pivot dimensions Ø 2.60 ± 0.03, see drawing A02-C23
- The 1.30 ± 0.05 measure between the rocker pivot point and the surface of the actuation bars, see drawings A07-M01 and A02-C23
- The 2.48 ± 0.05 measure between the actuation bars and the coding bars (radius center, see drawing A02-C23)
- Thicknesses of the hinge blocks: 1.20 ± 0.05, see drawing A02-C23
- Inner distance between the hinge blocks : 16.05 +0.05 / -0, .1, see drawing A02-C23
- The dimensions of the catwalks (actuation bars) should follow the measures in drawings A07-M01 and A02-C23
- With a two rocker design the tolerances should always allow some clearance between the two rockers, else one rocker may take along the other by friction
- The support frame for the PTM 200(C) module should firmly support the PTM 200(C) at the indicated four symmetrical support areas, see drawings A07-M01 – "Auflageebene")