

Smart Plug

PSC234

*Wireless relay switch
with metering
near-to-zero-volt switching
and overload protection*



Features

- Wireless control
- Measurement of real/active power [W]
- Measurement/storage of real-time energy consumption data [Wh]
- Near-to-zero-volt switching of relay
- Switching up to 16A (max. 3680 W / max. 2500 W continuous)
- Standard IEC type F (Schuko) plug and socket
- Child-safety protection
- Small size
- Easy installation
- Enables manual (local switch) control
- Supports direct learn-in of PTM switches, movement detectors, occupancy sensors, door and window contacts
- Remote/central control
- Built-in repeater for range extension
- Low power consumption
- Protection with auto-reset against average overload and over temperature
- Very high surge-withstand capability (2.5kV, non-destructive / 6kV, no fire hazards)
- Certified according to IEC60884-1/-2-5, EN60730-1 (KEMA certificate)¹
- Based on proprietary ASIC technology

Related product²:

- Standard IEC type E (NF) plug and socket – PSC236

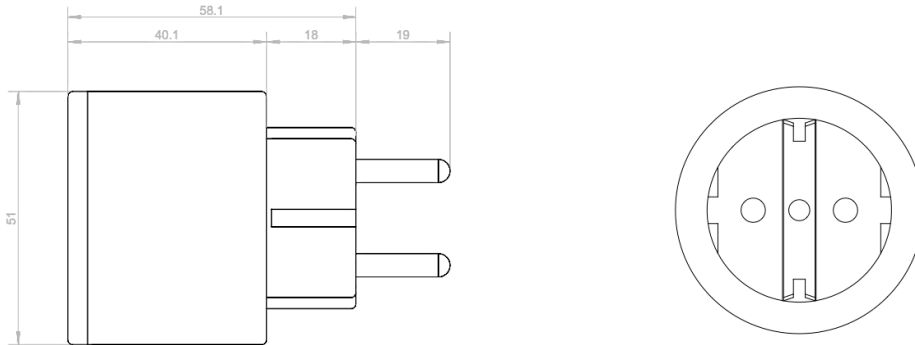
¹ Certification in progress

² Not included in the PSC234, only in different plug version

Specifications

Electrical ratings			
AC Supply Voltage (EU/EFTA)	207 - 253	V	
AC Frequency	43 - 67	Hz	
Maximum load power			
switching operation	3680	W	max. 16A, $\cos \phi = 1$
continuous	2500	W	
inrush capability	80	A	TV-5
Surge-withstand capability	2.5	kV	non-destructive
	6	kV	no fire hazards
Power dissipation standby	< 0.5	W	
Electrical life of relay contacts	>50*10 ³	cycles	
Operating conditions			
Operating temperature	-10 – 40	°C	
Relative humidity	0 – 85	%	non-condensing
Mechanical			
Dimensions (l x w x h)	77 x 51 x 51	mm	
Weight	approx. 70	g	
Material (case)	PC-ABS		white
Safety protection			action
Average-overload current			load switched off
Over-temperature			load switched off
Child-safety			
Power / energy measurement			
Power	real/active, in [W]		
Energy	cumulative and power-fail safe, in [Wh]		
Accuracy	5	%	minimum 0.5 W
Communication			
Standard	EnOcean-Dolphin		2-way
RF frequency	868	MHz	
Distance range indoor	approx. 30	m	
EnOcean Equipment Profile (EEP)	D2 01 09		
	A5 38 08		
	A5 12 01		

Dimensions



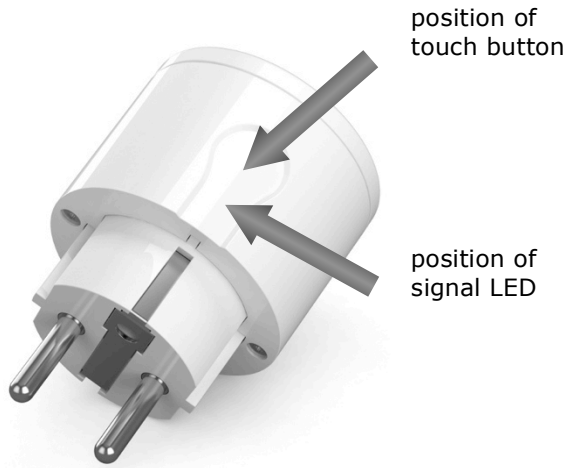
Standards

- conformable to IEC60884-1/-2-5, EN60730-1
- communication protocol: EnOcean-version based on Dolphin-platform (ISO/IEC 14543-3-10)

Functionality

- switching of electrical loads
- measurement of
 - energy consumption ([Wh], power-fail safe storage),
 - real power ([W], interval 1 s)
- sending switch-on commands to other actuators (acting as a virtual PTM switch)
- repeating level 1 and level 2 EnOcean telegrams (range extender)
- direct learn-in of (PTM) switches, movement detectors and magnet contacts

Control and signaling



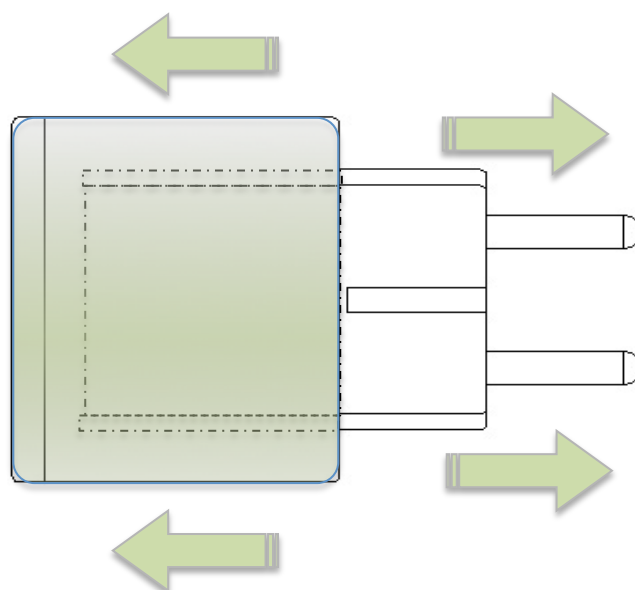
With the touch button the user can manually switch the load and configure the device. An RGB colour LED is used as indicator during testing of the installation and set-up. Details on test- and configuration settings and signals are listed in a separate section.

Safety instructions

If an electrical appliance connected to the PSC234 shows unexpected behavior, the power must immediately be switched off and the load must be disconnected.

Custom look

The outer ring of the Smart Plug is replaceable. By choosing a ring of different color or shape the appearance can be customized.



Appendix A

EnOcean devices supported

The PSC234 incorporates functionality of the following EnOcean Equipment Profiles (EEPs):

EEP	functionality
D2 01 09	electronic switch with energy measurement and local control (supports events)
A5 38 08	dimming actuator (relay is on for dimming value \neq 0)
A5 12 01	meter reading (electricity)

For further details about the EEPs, see appendices C, D and E.

The PSC234 supports the following EnOcean sensor devices:

- rocker switch, e.g. EnOcean PTM210 (EEP: F6 02 01)
- occupancy sensor, e.g. Servodan Minilux PIR 41-580 (EEP: A5 07 01)
- door/window contact, e.g. Thermokon SRW01 (EEP: D5 00 01)

The maximum number of devices is limited to 30.

The identification numbers of the learned devices are power-fail safely stored to flash memory.

Rocker switch

A (dual) rocker switch can be configured to work in 4 different modes with the PSC234:

- Mode 1: Both rockers (A and B) of the PTM are configured for switching the load on/off.
- Mode 2: Same as mode 1.
- Mode 3: Each single button (A0, A1, B0, B1) of the rocker switch can be learned to the PSC234 separately. Load is on until button is released.
- Mode 4: Each single button of the rocker switch can be learned to the PSC234 separately. If button is pressed, load is toggled (switches on or off).

The mode setting can only be configured when no rocker switch is connected (learned-in) yet to the PSC234.

The PSC234 can also act as a virtual PTM switch itself: Connecting the load (or operating the manual switch on the connected load) causes a switch-on telegram to be sent out for switching on another actuator device (e.g. another PSC234).

Occupany sensor

The default setting of the occupancy sensor is as an energy saver. The load can be turned on by any learned-in source (e.g. a PTM switch or a central gateway) and will be switched off by the occupancy sensor ('auto-off') if no movement is detected for a period of 15 minutes.

Door/window contact

The default setting of the switch is as a 'door' contact. The load is switched on when the door (or window) opens.

Central gateway

A central gateway, supporting the EnOcean Radio Protocol, can be used for central control and for monitoring purposes.

The PSC234 supports both simple profiles based on 4BS telegrams (EEP: A5 38 08 for central switching/dimming only in combination with EEP: A5 12 01 for meter readout) as well as a more advanced profile (EEP: D2 01 09) that is based on VLD/MSB telegrams.

Appendix B

Manual configuration and set-up

Local operation

When the PSC234 is powered the signal LED will blink once in red, followed by two green flashes to indicate that the PSC234 is ready.

After installation, the PSC234 can be tested using the touch button. A short press (100 – 400 ms) of the touch button toggles the load (on/off). It is important that the touch button is released quickly again, because a long press is reserved for other commands (see 'connecting wireless devices'). The green LED flashes once to confirm on/off input. The relay only switches if a load is connected to the PSC234.

Connecting wireless devices

Learn in

To connect any of the supported devices (see appendix A) to the PSC234, this device must be learned-in:

1. Long press (> 5 s) the touch button on the PSC234.
2. The LED blinks red once per second (→ Learn/Clear active)
3. Release the touch button.
4. Press the PTM switch once or press the learn button on the sensor device
5. LED blinks green 5 times slowly (about once per second) (→ Confirmation that device is connected).
The identification number of the device is stored to flash memory and the PSC234 changes back to idle state.
6. If maximum of 30 devices is reached or if an attempt is made to learn in a device which is not supported, the LED blinks red 5 times quickly (→ Error).
The PSC234 changes back to the idle state without doing anything; the device is not learned in.

Learn out

To disconnect any of the supported devices (see appendix A) from the PSC234, this device must be learned-out:

1. Long press (> 5 s) the touch button on the PSC234.
2. The LED blinks red once per second (→ Learn/Clear active)
3. Release the touch button.
4. Press the PTM switch once or press the learn button on the sensor device
5. LED blinks green 5 times quickly (→ Confirmation that device is disconnected).
The identification number of the device is removed from flash memory and the PSC234 changes back to idle state.

Configure rocker mode

A rocker switch can be used in 4 different modes (see appendix A). Mode selection can only be done before any rocker switch has been learned-in to the PSC234. As long as one or more rocker switches are connected, mode selection is deactivated. To configure the operation mode:

1. Long press the touch button (> 5 s). The PSC234 changes to Learn/Clear mode. Don't release the button but continue pressing the button for the next 10 s. The PSC234 changes now to rocker configuration mode (→ LED flashes red 1, 2, 3 or 4 times and then is off for a second; this indicates that respectively mode 1, 2, 3 or 4 is selected).
2. Release the touch button.
3. Change the operation mode with a short press (100 – 400 ms). With every press the operation modes changes. Flash sequence of the LED in red indicates which mode is active.
4. Confirm selected operation mode with a long press (> 5 s).
5. LED blinks green 5 times (→ Confirmation that mode is selected).

If user is inactive for more than 15 s (timeout) the configuration mode ends automatically. No changes are saved. If configuration ends by timeout, the LED is off.

Clear All / Factory Reset

Via the clear mode all learned devices and all configured operational modes are cleared (factory reset):

1. Long press the touch button (> 20 s). The PSC234 changes first to Learn/Clear mode, then to Configure rocker mode and then to Clear All mode. LED stays on in red continuously. (→ Clear All active)
2. Release the touch button.
3. Long press the touch button (> 5 s) to confirm the factory reset. LED blinks green 5 times quickly. (→ Confirmation that all devices are disconnected). All learned devices are deleted from memory. The PSC234 is set to default state.

If user is inactive for more than 15 s (timeout) the Learn/Clear mode ends automatically. In that case no changes are saved. If clear ends by timeout, the LED is off.

Configure repeater

The PSC234 can be configured to act as a range extender. In that mode it will repeat (retransmit) level 1 or level 2 EnOcean telegrams. To configure the repeater mode:

1. Long press the touch button (> 25 s). The PSC234 changes first to Learn/Clear mode (red LED blinking), then to Configure rocker mode (red LED blinking) then to Clear All mode (red LED on) and finally to Repeater mode (red LED blinking). Release the touch button.
2. Change the repeater mode with a short press (100 – 400 ms). With every press the repeater modes changes. Flash sequence of the LED in red indicates which repeater mode is active (→ LED flashes red 1, 2 or 3 times and then is off for a second; this indicates that respectively mode 1, 2 or 3 is selected). Mode 1: repeater off, mode 2: repeater level 1 on, mode 3: repeater level 2 on.
3. Confirm selected operation mode with a long press (> 5 s).

4. LED blinks green 5 times (→ Confirmation that repeater mode is selected).

If user is inactive for more than 15 s (timeout) the configuration mode ends automatically. No changes are saved. If configuration ends by timeout, the LED is off.

If the PSC234 is configured as a repeater, all level 1 (or level 2 respectively) EnOcean telegrams it receives are repeated. For this function learn-in of devices is not required.

Gateway connection / Invoke UTE learn-in / 4BS learn-in

To learn the PSC234 to a gateway a Learn message (UTE or 4BS) has to be sent:

1. Prepare the gateway for learning (depends on gateway software; see gateway manual).
2. Long press the touch button (> 5 s) on the PSC234.
3. The LED blinks red once per second (→ Learn active).
4. Release the touch button.
5. Press the touch button for 2 – 3 seconds. The device will send a UTE request.
6.
 - a. If an appropriate UTE response is received from the gateway, the PSC234 will respond with 5 long green blinks of the LED.
 - b. Otherwise it will send a 4BS learn-telegram and the LED will blink green once for confirmation.

Internal load switch (virtual PTM switch)

It is possible to use the PSC234 as a virtual PTM switch when the load is connected. In this way a manual switch at the load can be programmed to switch on e.g. another PSC234.

1. Activate learn-in at receiver device
2. Disconnect and then re-connect the load to the PSC234
(or operate the manual switch at the load)

When the receiver device has been learned-in, switching-on the load connected to the PSC234 (or switching-on the manual switch at the load) will send a 'switch-on' command to the connected device. (Note: only switch-on commands can be sent with this method, not switch-off commands).

Appendix C

Wireless communication

The wireless RF communication with the PSC234 follows the EnOcean standard (Dolphin platform). This wireless standard (ISO/IEC 14543-3-10)¹ is dedicated for home and building automation applications with low power consumption. The standard covers the Open Systems Connection (OSI) layers 1 – 3, being the physical, data link and networking layers. Together with the EnOcean Equipment Profiles (EEP)², this international standard lays the foundation for fully interoperable open wireless technology.

The PSC234 has the **EEP: D2 01 09**.

Also the EEP: A5 38 08 (for central command 0x02 only) and A5 12 01 (for meter readout) are supported.

The following commands are supported from EEP D2 01 09:

- **Actuator Set Output**
This message is sent to the PSC234. It controls switching.
- **Actuator Status Query**
This message is sent to the PSC234. It requests the current status information (Output value).
- **Actuator Status Response**
This message is sent by the PSC234 when an Actuator Status Query is received or with every change of the load status.
- **Actuator Set Local**
This message is sent to the PSC234. It configures the PSC234.
- **Actuator Set Measurement**
This message is sent to the PSC234. It configures the energy and power measurement.
- **Actuator Measurement Query**
This message is sent to the PSC234 to request the energy and power measurement reading.
- **Actuator Measurement Response**
This message is sent by the PSC234 when an Actuator Measurement Query is received or when a measurement result triggers an automated transmission. The Actuator Measurement Response message supports the following parameters: Energy in Wh, Power in W.

The following command is supported from EEP A5 38 08:

- **Central Command**
This message is sent to the PSC234 from a gateway. It controls switching / dimming. (This 4BS command is an alternative for the VLD command Actuator Set Output.)

¹ The ISO/IEC 14543-3-10 standard can be downloaded from www.iso.org

² The EnOcean Equipment Profiles (EEP) specification can be downloaded from www.enocean-alliance.org

The following commands are manufacturer specific (i.e. not part of the profile):

- **Actuator Info Query**
This message is sent to the PSC234. It requests specific information (a 16-bit parameter) about the load or the actuator.
- **Actuator Info Response**
This message is sent by the PSC234 when an Actuator Info Query is received or when a status result triggers an automated transmission. It gives specific information (a 16-bit parameter) about the load or the actuator.

The PSC234 supports remote management via EnOcean Remote Management messages. The following functions are supported: Lock, Unlock, Set Code, Query ID, Action (green LED blinks once per second for ten seconds), Activate Learn, Deactivate Learn, Ping, Query function.

Appendix D

EnOcean message definitions

The EnOcean Radio Protocol (ERP) is optimized to transmit short (< 1 ms) information packages ('telegrams') with high reliability and using low power, while ensuring that the products applying EnOcean technology are compatible with each other. Depending on the telegram type and the function of the device the user data (payload) is defined in EEP (EnOcean Equipment Profiles).

The ERP specification defines the structure of the entire radio telegram. The user data embedded in this structure is defined by the EEP. Every EEP profile has a number, consisting of three components: (1) radio telegram type (RORG), (2) basic functionality of the data content (FUNC), and (3) type of device in its individual characteristics (TYPE). Every field is represented by a hexadecimal number.

Most of the radio-telegrams that are used by the PSC234 are of the organizational type (RORG): VLD (Variable Data Length), represented by hexadecimal number D2. VLD telegrams carry a variable payload (user defined data) between one and 14 bytes, depending on their design. The sequence of the data bytes is historically reversed, so that e.g. DB₁₄ appears first and DB₀ last on the radio interface.

Some commands are Manufacturer Specific Commands (MSC). The MSC telegram has the same structure as a VLD telegram. The only differences are that the organizational type is different (RORG type is D1) and the payload specification is not fixed.

The PSC234 also supports a limited set of radio-telegrams of RORG type 4BS, represented by the hexadecimal number A5. A 4BS telegram carries a payload of 4 bytes. See for a more extensive description the EEP specifications.¹

The configuration and set-up process for the PSC234 and other EnOcean devices in the same network can be done manually (see appendix B), but can also be centrally controlled via wireless communication. This so-called *teach-in* process applies EnOcean *Smart Ack* procedure (see EEP specifications). (To send a Learn (UTE) message to a gateway manually, see appendix B.)

The EnOcean message definitions for the commands that are supported by the PSC234 are given below:

Actuator Set Output	VLD	Addressed	CMD 0x1
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Description: This message is sent to the PSC234. It controls switching of one or all channels.

Response Timing: None

Length of Payload: 3 Bytes

¹ The EnOcean Equipment Profiles (EEP) specification can be downloaded from www.enocean-alliance.org

Payload:

DB_2.BIT_7...4:		not used
DB_2.BIT_3...0:	0x1	command identifier
DB_1.BIT_7...5:	0x0...0x3	switch ON/OFF depending on output value (DB_0)
	0x4...0x7	not used
DB_1.BIT_4...0:	0x00	output channel 0 (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
	0x1E	all output channels supported by the device
	0x1F	not applicable
DB_0.BIT_7:		not used
DB_0.BIT_6...0:	0x00	output value OFF
	0x01...0x7E	output value ON
	0x7F	output value not valid / not applicable

Example: The VLD telegram **01 60 32** is an Actuator Set Output command (**01**) which instructs the PSC234 actuator to switch channel 0 (**60** = 0x3, 0x00) ON (**32**).

Actuator Status Query	VLD	Addressed	CMD 0x3
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Description: This message is sent to the PSC234. It requests the status of one or all channels.

Response Timing: An Actuator Status Response message shall be received within a maximum of 300ms from the time of transmission of this message. In case no such response is received within this time frame the action is treated as completed without result.

Length of Payload: 2 Bytes

Payload:

DB_1.BIT_7...4:		not used
DB_1.BIT_3...0:	0x3	command identifier
DB_0.BIT_7...5:		not used
DB_0.BIT_4...0:	0x00	output channel 0 (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
	0x1E	all output channels supported by the device
	0x1F	not applicable

Actuator Status Response	VLD	Broadcast	CMD 0x4
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Description: This message is sent by the PSC234 if one of the following events occurs:

- Status of one channel has been changed locally
- Message Actuator Status Query has been received

Response Timing: This message shall be sent within a maximum of 50 ms from the time of reception of the Actuator Status Query message.

Length of Payload: 3 Bytes

Payload:

DB_2.BIT_7...4:		not used
DB_2.BIT_3...0:	0x4	command identifier
DB_1.BIT_7:	0b0	over current switch off: ready
DB_1.BIT_6...5:	0b11	error level not supported
DB_1.BIT_4...0:	0x00	output channel 0 (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
	0x1E...0x1F	not applicable, do not use
DB_0.BIT_7:	0b0	local control disabled
	0b1	local control enabled
DB_0.BIT_6...0:	0x00	output value OFF
	0x01...0x64	output value ON
	0x65...0x7E	not used
	0x7F	output value not valid / not set

Remark:

In case an Actuator Status Query message specifies a parameter that is not supported by the PSC234, the message is ignored and is not answered using the Actuator Status Response message.

Actuator Set Local	VLD	Addressed	CMD: 0x2
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Description: This message is sent to an actuator. It configures the actuator. Settings are power-fail proof.

Response Timing: None

Length of Payload: 4 Bytes

Payload:

DB_3.BIT_7:	0b1	enable learned-in devices (factory default)
	0b0	disable all learned-in devices except those already learned-in for EEP D2-01-09; any further learn-in is disabled
DB_3.BIT_6...4:	0x00	not used
DB_3.BIT_3...0:	0x2	command identifier
DB_2.BIT_7:	0b0	over-current shut down: actuator off
DB_2.BIT_6:	0b0	reset over-current shut down: not active
DB_2.BIT_5:	0b0	disable local control*
	0b1	enable local control* (factory default)
DB_2.BIT_4...0:	0x00	load output
	0x1E...0x1F	load output
	0x01...0x1D	not used
DB_1.BIT_7...4:	0x00	not used
DB_1.BIT_3...0:	0x00	not used
DB_0.BIT_7:	0b0	not used
DB_0.BIT_6:	0b0	not used
DB_0.BIT_5...4:	0b00	default state after power on: 0% or OFF
	0b01	default state after power on: 100% or ON
	0b10	default state after power on: remember previous state (factory default)

	0b11	not used
DB_0.BIT_3...0:	0x00	not used

Remark:

The local control* of the PSC234 which can be disabled/enabled by this command concerns both the control through the local touch button of the PSC234 as well as the automatic switch-on at load connect (or operating a manual switch at the load).

Actuator Set Measurement	VLD	Addressed	CMD: 0x5
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Description: This message is sent to an actuator. It configures the energy and power measurement of the actuator. This message can be used multiple times to define separate settings for energy and power. Settings are power-fail proof.

Response Timing: None

Length of Payload: 6 Bytes

Payload:

DB_5.BIT_7...4:		not used
DB_5.BIT_3...0:	0x5	command identifier
DB_4.BIT_7:	0b0	report measurement: query only (cancels previous auto-reporting setting)
	0b1	report measurement: query and auto reporting
DB_4.BIT_6:	0b0	no trigger signal
	0b1	trigger signal to reset measurement value (resets energy meter to zero)
DB_4.BIT_5:	0b0	energy measurement
DB_4.BIT_4...0:	0b1	power measurement
	0x00	output channel (to load)
	0x1E...0x1F	output channel (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
DB_3.BIT_7...4:		measurement delta to be reported (LSB)
DB_3.BIT_3:		not used
DB_3.BIT_2...0:	0x0	energy [Ws]
	0x1	energy [Wh]
	0x2	energy [kWh]
	0x3	power [W]
	0x4	power [kW]
	0x5...0x7	not used
DB_2:		measurement delta to be reported (MSB)
DB_1:		maximum time between two subsequent Actuator Measurement Response messages [10s]
DB_0:		minimum time between two subsequent Actuator Measurement Response messages [s]

Actuator Measurement Query	VLD	Addressed	CMD 0x6
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Description: This message is sent to the PSC234. The PSC234 replies with an Actuator Measurement Response message.

Response Timing: An Actuator Message Response message shall be received within a maximum of 300ms from the time of transmission of this message. In case no such response is received within this time frame the action is treated as completed without result.

Length of Payload: 2 Bytes

Payload:

DB_1.BIT_7...4:		not used
DB_1.BIT_3...0:	0x6	command identifier
DB_0.BIT_7...6:		not used
DB_0.BIT_5:	0b0	query energy
	0b1	query power
DB_0.BIT_4...0:	0x00	output channel 0 (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
	0x1E	all output channels supported by the device
	0x1F	not applicable

Actuator Measurement Response	VLD	Broadcast	CMD 0x7
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Description: This message is sent by the PSC234 if one of the following events occurs:

- Measurement results triggers an automated transmission
- Message Actuator Measurement Query has been received

Response Timing: This message shall be sent within a maximum of 50 ms from the time of receipt of the Actuator Measurement Query message.

Length of Payload: 6 Bytes

Payload:

DB_5.BIT_7...4:		not used
DB_5.BIT_3...0:	0x7	command identifier
DB_4.BIT_7...5:	0x1	energy [Wh]
	0x3	power [W]
	0x0, 0x02, 0x4...0x7	not used
DB_4.BIT_4...0:	0x00	output channel 0 (to load)
	0x01...0x1D	not applicable (PSC234 supports only channel 0)
	0x1E...0x1F	not applicable, do not use
DB_3:		measurement value byte 3 (MSB)
DB_2:		measurement value byte 2
DB_1:		measurement value byte 1
DB_0:		measurement value byte 0 (LSB)

Remark:

In case an Actuator Measurement Query message specifies a parameter that is not supported by the device addressed, such device ignores the message and does not answer using the Actuator Measurement Response message.

The following command, which is an alternative for the Actuator Set Output command but using 4BS telegrams, is also supported by the PSC234:

Central command	4BS	Addressed	CMD 0x02
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Description: This message is sent to the PSC234 from a gateway. It controls switching / dimming.

Length of Payload: 4 Bytes

Payload:

DB_3.BIT_7...0:	0x02	command identifier
DB_2.BIT_7...0:	0x00	OFF
	1...255	ON
DB_1.BIT_7...0:		not used
DB_0.BIT_7...4:		not used
DB_0.BIT_3:	0x00	teach-in telegram
	0x01	data telegram
DB_0.BIT_2:	0x00	not applicable, set to 0
DB_0.BIT_1:	0x00	do not store final value
	0x01	store final value
DB_0.BIT_0:	0x00	switch OFF
	0x01	switch ON

Manufacturer Specific Commands (MSC):

Actuator Info Query	MSC	Addressed	CMD 0x03 0x31
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Description: This message is sent to the PSC234. It requests specific information (a 16-bit parameter) about the load or the actuator.

Length of Payload: 3 Bytes

Payload:

DB_2.BIT_7...0:	0x03	command identifier, part 1
DB_1.BIT_7...0:	0x31	command identifier, part 2
DB_0.BIT_7...0:		parameter number

Parameter number:

0x07 = Health Status

0x08 = Type of Load

0x09 = Effective Load Voltage

0x81 = Serial Number High (highest bits of PSC234 serial number)

0x82 = Serial Number Low (lowest bits of PSC234 serial number)

Remarks:

- 1) Any parameter code that is not valid will either result in not getting an answer or in getting an answer with random data.
- 2) After powering the PSC234 some values are undefined in the first few seconds. During this start-up time those values will be 0xFF or 0xFFFF (invalid).

Actuator Info Response	MSC	Addressed	CMD 0x03 0x34
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Description: This message is sent from the PSC234. It gives specific information (a 16-bit parameter) about the load or the actuator.

Length of Payload: 4 Bytes

Payload:

DB_3.BIT_7...0:	0x03	command identifier, part 1
DB_2.BIT_7...0:	0x34	command identifier, part 2
DB_1.BIT_7...0:		parameter value (highest 8 bits)
DB_0.BIT_7...0:		parameter value (lowest 8 bits)

Parameter: **Type of Load** (parameter number 08)

Parameter value (response):

BIT_15	"0"	
BIT_14	"1"	load is on
	"0"	load is off
BIT_13	"0"	3-wire operation
BIT_12	"1"	load is connected
	"0"	load is disconnected
BIT_11...8	"0"	
BIT_0...7	0x00:	no load classification information available

Parameter: **Health Status** (parameter number 07)

Parameter value (response):

BIT_15...8		internal temperature of device (scale 0.0 – 100.0 °C), 0xFF = invalid
BIT_7...4	"0"	
BIT_3		mains power failure
BIT_2		temperature warning (15 °C or less below maximum limit)
BIT_1		maximum temperature limit reached or exceeded

Parameter: **Effective Load Voltage** (parameter number 09)

Parameter value (response):

BIT_15...0		effective voltage at the load (scale 0.00 – 300.00 V)
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Parameter: **Serial Number High** (parameter number 81)

Parameter value (response):

BIT_31...16		of serial number of PSC234
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Parameter: **Serial Number Low** (parameter number 82)

Parameter value (response):

BIT_15...0		of serial number of PSC234
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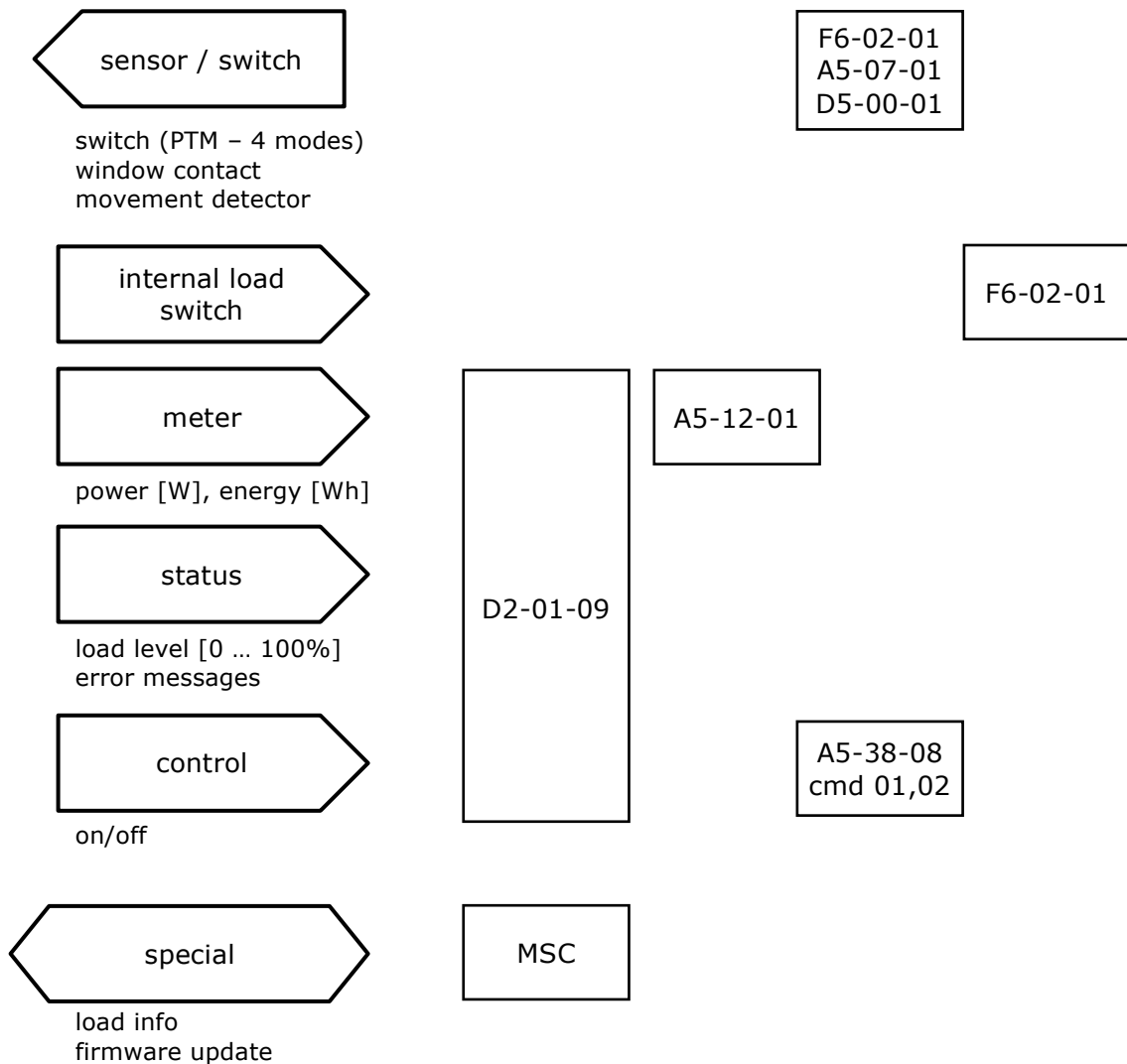
Appendix E

EnOcean Equipment Profiles supported by the PSC234

The following diagram gives an overview of the EnOcean Equipment Profiles (EEPs)¹ that are supported by the PSC234 and of the various learn-in methods for connecting devices:

Telegram type	VLD	4BS	RPS 1BS 4BS	RPS
Direction of communication	bidirectional	transmit	receive	transmit
Learn-in method	1	1	2	3

Command type



¹ The EnOcean Equipment Profiles (EEP) specification can be downloaded from www.enocean-alliance.org

Learn-in (teach-in) methods:**1. Bidirectional UTE (VLD) or 4BS**

Purpose: learn-in PSC234 into gateway

- a) Activate learn-mode at PSC234 by touching the sensor for more than 5 seconds until red LED blinks, then release touch button
- b) Activate touch button again and press for 2-3 seconds until green LED blinks

2. 1BS or 4BS

Purpose: learn-in external sensor or switch into PSC234

- a) Activate learn-mode at PSC234 by touching the sensor for more than 5 seconds until red LED blinks, then release touch button
- b) Activate learn telegram at the sensor or switch to be connected to the PSC234

3. RPS: internal load switch (virtual PTM switch)

Purpose: learn-in load-connect into external device (PSC234 acting as a PTM switch when load is connected)

- a) Activate learn-in at receiver device
- b) Disconnect and then re-connect the load to the PSC234

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