EPM 300(C) Installation Test Tool

User Manual Template for OEM Manufacturers/First Marketer

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REVISION HISTORY
The following major modifications and improvements have been made to the first version of this document:

No	Major Changes
1.0	Initial version
1.1	New image of antenna area
1.2	Approval chapter added

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Important notes!

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.

EPM 300 and EPM 300C are designed and produced as OEM products. They will be brought to market by local OEM manufacturers. They are not considered to be finished end products in terms of documentation, packaging and WEEE (electronic waste regulation). EnOcean will not be reliable for consequences of any HW or SW changes/modifications of the EPM 300(C) done by the first marketer. Product warranty and support will be covered by the OEM.

Content

1. Introduction

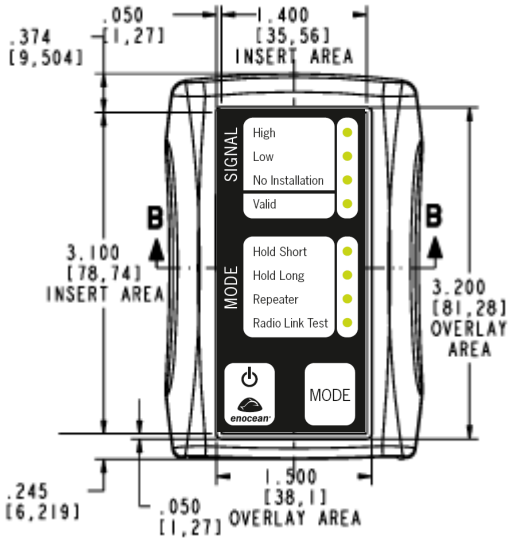
EPM 300(C) is a mobile tool for radio link range testing. It helps electrical installers to find the right position to mount products supporting EnOcean protocol.

EPM 300(C) is available for original equipment manufacturers (OEM's) using EnOcean technology within there products.

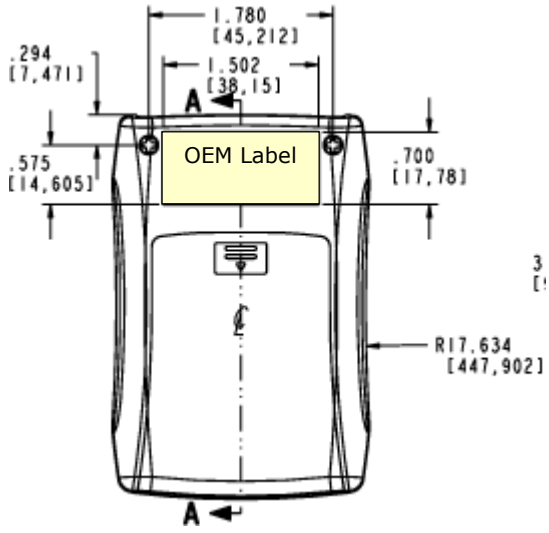
2. Technical Data

▪ Housing size:	110 x 70 x 25 mm
▪ OEM label size:	43 x 20 mm
▪ Weight:	85 g (w/o battery)
▪ Battery:	AA/LR06 cell (recommended Energizer L91)
▪ Operation temperature:	0°C - +45°C
▪ Storage temperature:	-15°C - +65°C
▪ Operation humidity:	0% - 95% r.h.
▪ Storage humidity:	0% - 98% r.h.
▪ Product category:	IP54
▪ R&TTE:	EN 300 220 (868 Mhz)
▪ FCC / IC:	CFR-47 Part15 (315 Mhz)
▪ RoHS:	yes

Front side

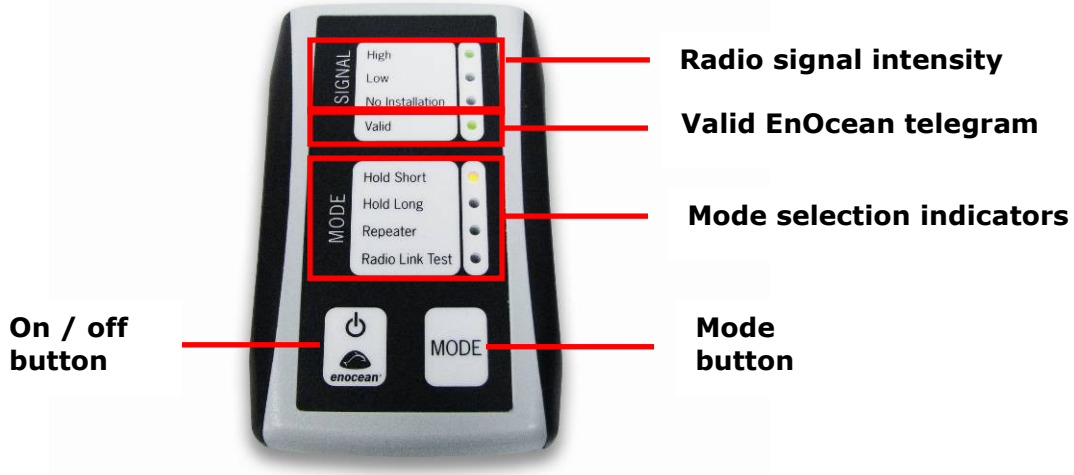


Back side



3. Overview

EPM 300(C) can be switched on and off via finger touch on the left sensor button for more than 2 s. Operation modes will be changed via finger touch (1 s) on right sensor button. Current mode will be indicated by four indicator LEDs. The device can be switched off via on/off sensor button on the left side.



4. Getting started

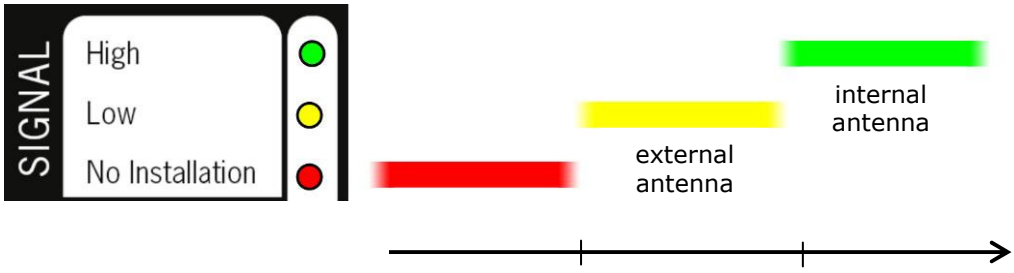
1. Open battery cover (backside) and insert two lithium or alkaline type AA/LR06 batteries.

2. Activate EPM 300(C) by pressing the on/off button. Battery low will be indicated by flashing mode LED.

3. Send EnOcean telegram by pushing a self-powered switch (e.g. PTM 200) or by pressing the learn button of a self-powered sensor.

4. Signal strength (RSSI value) will be shown by a reverse traffic light.

EPM 300 signal strength:



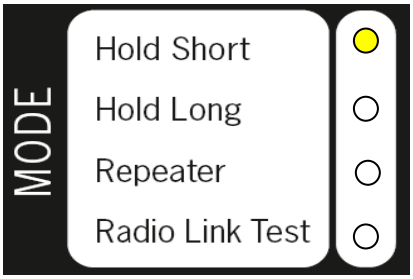
5. Valid LED shows if a valid telegram PTM switch or sensor teach-in telegram has been received:

Valid EnOcean PTM or teach-in telegram received

Signal indicators and interpretation:

- **Signal High & Valid** indicates a very well received radio telegram. All kind of EnOcean receivers/transceivers can be placed.
- **Signal Low & Valid** indicates a received telegram with medium field intensity (RSSI) level. An external antenna or repeater is recommended.
- **No installation** means there is no telegram received or the received telegram is received at a very low RSSI level without link budget.
- **Signal High without Valid** indicates a high level of background noise on the same carrier frequency. This could be from other This signal will disturb EnOcean telegrams.
- **Signal Low without Valid** indicates a medium level of background noise on the same carrier frequency. This "noise" can come from EnOcean sensor or system telegrams (no teach in) or other radio devices.

EPM 300(C) has following operation modes



Peak hold short for signal strength / range test

Peak hold long for signal strength / range test

Repeater mode (1-level)

Radio link test / automatic range test

Detailed description with application examples:

- **Hold short** mode will indicate every radio signal on the corresponding frequency band. Valid telegrams will have a peak hold for 1 s. This mode is used to track radio activities with a short period e.g. push and release telegrams of a PTM switch.

  Application example:
  - *Person 1 operates an EnOcean switch (e.g. PTM 200) installed at planned position.*
  - *Person 2 monitors the received signal strength of the EnOcean telegram at the desired mounting position of the actuator or gateway.*

  High & Valid -> An installation at the chosen positions is recommended.

  Low & Valid -> An installation at the chosen positions is possible for devices with external antenna. In case of an internal antenna the installation of a repeater is recommended.

- **Hold long** will indicate every signal for about 60s. This is used to test radio telegram range by a single person (installer).

  Application example:
  - *Position EPM 300(C) at desired actuator/receiver position.*
  - *Go to required switch or sensor position and push the button.*
  - *Go back to the EPM 300(C) and observe signal level held for 60s.*

  Attention: This mode only provides reliable information if no other switch or learn telegrams have been sent during the time period you needed to move from the switch to the EPM 300(C). Within the hold time no other telegram will be shown.

- **Repeater** mode can be used to find the best position for a 1-level repeater. A 1-level repeater will repeat a received telegram after a random delay if it is valid and original (i.e. not yet repeated). The repeated telegram will be marked as "repeated" by an increased repeater counter.

  Application example: Distance between switch/sensor and receiver is too long or signal is not strong enough.
  - *EPM 300 #1 is placed as a repeater in between both devices.*
  - *EPM 300 #2 monitors repeated signal at receiver position. Signal level wil be show from the first sub-telegram.*

- **Radio Link Test** (RLT): There are two possible ways the RLT mode can be used in:

  1. **Basic**: if the EPM 300(C) is switched to RLT, it will send telegrams periodically every 2s. Valid LED will flash for every RLT telegram sent.

     Application example:
     - *EPM 300(C) #1 is placed at switch/sensor position and switched to mode "Radio Link Test".*
     - *EPM 300(C) #2 shows field intensity of RLT signal at receiver position with mode "hold short".,*

  2. **Advanced**: using an advanced field tester (e.g. PROBARE P30), the EPM 300(C) can be used in slave mode. If switched to RLT, it will automatically pair with an advanced field tester (AFT), where the AFT acts as RLT Master and the EPM 300(C) as RLT slave.

     Application example:
     - *EPM 300(C) is placed at switch/sensor position and switched to RLT mode.*
     - *AFT is placed at receiver position, also in RLT mode.*
     - *Start the test on the AFT - it will automatically show a detailed analysis of the connection.*

  For details see radio link test protocol specification at:
  http://www.enocean-alliance.org/de/downloads/

- **Mode LED flashing** indicates battery low. Please replace battery.

  For performance of different batteries, refer to the following estimates:

Battery Type	Continuous Measurement	Standby Time
Alkaline e.g. Varta High Energy AA/LR06	typ. 40 h	typ. 300 days
Lithium Mignon e.g. Energizer L91 AA/LR06	typ. 60 h	typ. 500 days

Use of secondary (rechargeable) batteries with 1.2 V cells (e.g. Ni-Cd / NiMH) is not recommended. If you don't use your EPM 300(C) for a longer period, remove the batteries from the device. This will increase the lifetime of both batteries and the product.

5. Approvals

5.1 CE and R&TTE conformity (European Union)

EPM 300 (868Mhz) conforms to CE and to the R&TTE EU directive on radio equipment. The device conforms to the European and national requirements of electromagnetic compatibility. The conformity has been proven and the according documentation has been deposited at EnOcean. The device can be operated without notification and free of charge in the area of the European Union and in Switzerland.
Labelling according to CE and WEE has to be done by the OEM manufacturer which will bring the product to the market.

5.2 FCC (US)

EPM 300C (315Mhz) is based on the EnOcean STM 300C radio module. This module has an limited modular approval according to FCC. The conformity has been proven and the according documentation has been deposited at EnOcean.

Contains FCC ID: SZV-STM300C
The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

5.3 IC (Canada)

EPM 300C (315Mhz) is based on the EnOcean STM 300C radio module. This module has an limited modular approval according to FCC. The conformity has been proven and the according documentation has been deposited at EnOcean.

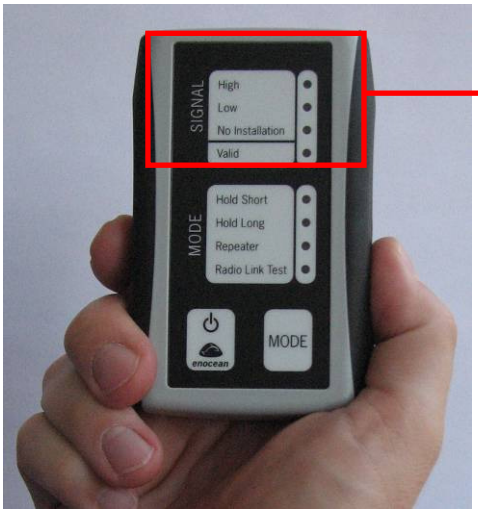
Contains IC: 5713A-STM300C
The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

5.3 RoHS

EnOcean certifies that to its knowledge, EPM 300 and EPM 300C, are RoHS compliant, conforming to the requirements of "Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment." This declaration is based on EnOcean's current understanding of the RoHS Directive and information provided through supplier material declarations pertinent to the ingredients and materials comprising EnOcean products.

6. Recommendations

EPM 300 and EPM 300C has an internal antenna. The described area should not be covered by metal or other shielding material. It is recommended to hold EPM 300(C) below this antenna area.



Internal antenna

Signal strength of radio signals decreases with increasing distance between transmitter and receiver. The transmission range also depends on the materials used in the building.

The transmission range is reduced by:

- increasing the distance between transmitter and receiver
- shielding by metal or massive walls
- mounting transmitter or receiver on the floor or close to the floor
- high humidity in materials
- devices generating RF interferences such as computers, audio & video equipment or electronic gear controls for lamps. A minimum distance of 0.5 m should be kept.

For more detailed recommendations please refer to the application note "Reliable Range Planning" at **www.enocean.com**.