System Specification

enocean alliance
Building Smarter Connectivity

Product ID and Standardized Labeling Specification

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Executive Summary

The concept of a unique reference to a manufacturer specific end-device emerged with the introduction of Generic Profiles and Remote Commissioning by the Technical Working Group of the EnOcean Alliance. End-devices should not only be referenced by a Communication Profile (EEP or GP) or Manufacturer ID (Man ID) but also by a unique reference to the end-device itself. This enables a standardized way to obtain valuable specific information about the end application from the manufacturer to operate the device (e.g. Remote Commissioning).

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1.0	MH	Moved coding to ANSI.	May 16, 2014
1.1	MH	Added comments by Vicos.	June 11, 2014
1.2	TR	QR-Code to be used for Standardized Product Label QR-Code extended with ReMan Security Code Editorial changes and clarifications	June 17, 2016
1.3	MH	Added 12Z as NFC code	April 19, 2018
1.4	MH	Added NFC Container and TWG review	May, 15, 2018
1.5	MH	Short Notation of ENOCEANALLICENCE string. Update Enocean Address.	Nov, 18, 2019
1.6	MH	31Z defined for NFC Pin	Feb, 2020
1.7	MH	10Z explanation extended	May 18, 2021

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1. Introduction

The Product ID is a unique product reference which is maintained by the product manufacturer. The Product ID enables the user (e.g. a commissioner) to identify a specific product with specific revision anywhere in the field. By identifying the product in field, the user can obtain an electronic datasheet which describes the full capabilities of the device and how to use it. Product ID is also aimed to automate the process of installing and commissioning, so an automated tool could obtain the Product ID and configure the device properly.

Today's EnOcean Devices in the field are identified through:

- EnOcean Unique Radio Identifier EURID – 32 / 48 bit ID, which is unique for every transmitting EnOcean device [2]
- Standardized Communication Profile Identification – EnOcean Equipment Profiles [1] / Generic Profiles [1]
- EnOcean Manufacturer Identification ManID – 11 bit ID provided by the EnOcean Alliance to manufacturers of EnOcean enabled products

The EURID is not application specific and is granted before the end application is known. The EURID is used to identify a device within the network and is not suitable as an application reference. The standardized communication profile description references to a description of the payload data format and is one of the basic principle for interoperability. ManID identifies the manufacturer of an EnOcean Device and – according to the EnOcean regulations and the principle of interoperability – shall not be used to define functionality of devices. Simple unidirectional sensor applications are well described with these two identifiers. As the EnOcean Energy Harvesting technology is gaining strength in the home and building automation market and is also emerging into new markets, new devices with advanced features and new benefits are being developed. There is a strong requirement to have a more detailed description of those devices.

The above listed identifications do not cover specific features nor detailed description of an end-product, although such information is very important for the user to know. This includes the description of the meaning of the data channels, application logic description of an end-device, commissioning capabilities and any other information which the manufacturer finds important to provide the user with.

The Product ID is a unique application reference which points to the electronic datasheet of an EnOcean enabled device that includes all of the above described information. The electronic datasheet is called Device Description File – DDF – and is defined by the EnOcean Alliance in a standardized way, so an electronic tool can read and use it [4].

The Device Description File is 1 to 1 paired with a specific Product ID. By changing the product features through updates and extensions, a new product ID must be issued. The product manufacturer defines the product ID values for its devices and maintains them properly according to the EnOcean Alliance specifications.

One aim of the EnOcean radio protocol is to be suitable for energy constrained and harvesting applications. This implies also limitations in the amount of data bandwidth. This means that the particular device cannot provide the electronic datasheet itself, but has to be stored at a third party. This will be defined and documented in a future release of this specification.

1.1. References

[1] EnOcean Wireless Standard
https://www.enocean-alliance.org/about-us/enocean-wireless-standard/

[2] EnOcean Unique Radio Identifier – EURID
https://www.enocean-alliance.org/EURID/

[3] EnOcean Manufacturer Identification – ManID
EnOcean Alliance Members Intranet
http://portal.enocean-alliance.org

[4] EnOcean Device Description File – DDF
Part of the Remote Commissioning Specification
https://www.enocean-alliance.org/recom-spec/

[5] NDEF Definition – WEBSITE. Visited 18.05.2021
https://help.gototags.com/article/nfc-ndef-text-record/

2. Product ID Use Cases

Product ID is mentioned in the Generic Profiles Specification and Remote Commissioning Specification as a reference to obtain the detailed datasheet that holds the details required to fully exploit the potential of the application.

To obtain details on Remote Commissioning and Generic Profiles please refer to the respective EnOcean Alliance technical specifications [1].

2.1. Generic Profiles

In Generic Profiles, data is represented in channels. Every channel represents one data value (e.g. humidity, temperature, occupancy). Generic profiles only define the format and unit of the channel and not the meaning of the application. Standardizing this meaning is not ideal due to the wide scope of the application, enabling future innovations and flexibility. In Generic Profiles, the Product ID references to the detailed description of any outbound and inbound channel.

If you have a device which can teach-in via Generic Profiles you know that it will provide certain data in the future, for example:

- two temperature signals
- one illumination
- two digital signals - occupancy.

This information may be enough to understand the device, but not enough to fully exploit the device potential. By obtaining the Product ID and the Electronic Datasheet, you will find out, for example, that:

- the first temperature is the outside temperature
- the second temperature is the inside temperature
- the illumination value is inside
- the first digital signal is occupancy outside
- the second digital signal is occupancy inside

In Generic Profiles, Product ID and Device Description File are not mandatory but recommended.

2.2. Remote Commissioning

Remote Commissioning defines the standard protocol to initially set up devices, maintain them and troubleshoot. The protocol defines a Device Description File (electronic datasheet), which provides information about the device parameters that can be set and other capabilities such as supported profiles and features.

In Remote Commissioning, Product ID and Device Description Files are mandatory. Without them the commissioning is not fully applicable.

3. Definition of Product ID

The Product ID shall be available:

- As a label on the end-device – in a machine readable form (QR code) or as a human readable plain text
- By radio request & response from the device itself – for details, refer to Remote Commissioning Specification, [1].

Along with the Product ID the EURID must also be available. The EURID identifies the device in the network and the Product ID identifies the application. By having this information, the Standardized Communication Profile Identification – EnOcean Equipment Profiles [1]/ Generic Profiles [1] – is no longer required to be transmitted by or labelled on an EnOcean enabled device as this information is derived from the DDF.

3.1. Product ID format

The product ID has 6 bytes in total. Two fields are defined:

- Manufacturer ID – 2 bytes
- Product Reference – 4 bytes

The Manufacturer ID is the same as the ManID provided by the EnOcean Alliance. The ManID's 11 bits are coded into 2 bytes by filling the most significant 5 bits with 0b0 e.g. 0x01B becomes 0x001B

The Product reference is free to be defined and used by the manufacturer.

Data structure

	7	6	5	4	3	2	1	0
0	Manufacturer ID							
1								
2	Product Reference							
3								
4								
5								

Table 1 Get Product ID Response data structure

Both Data fields are coded as big-endian. This means most significant byte of a word is stored in the smallest address and the least significant byte is stored in the largest address. e.g. Product ID 0x001B0000789A would be stored like this byte 0 = 0x00, byte 1 = 0x1B … byte 5 = 0x9A.

4. Standardized Product Label

Using labels with product information on the end-product is an important step towards an automated commissioning. The main purpose of having standardized labels on end-products is to identify the device without radio transmission (Product ID and EURID) and to be able to process the label information by an automated tool.

In case the end-product supports Remote Commissioning the ReMan Security code needs to be known to the user and / or the commissioning tool. Therefore, it is added to the standardized product label definition. However, it is optional for the manufacturer to include the ReMan Security Code to the label.

4.1. Product ID Field Coding

This chapter defines the Product ID related data contained in the Standardized Product Label. The definition relies on the standard ANSI MH10.8.2-2010.

Abstract definition:
[Container]+[Container]+…..

Container:
XXXYYYYYYYYYY…
XXX container identifier, length variable
naming conventions according to ANSI MH10.8.2-2010
YYYYYYYYYY… container data, length defined by container identifier

Identifier	Identifier length	Length of data excluding identifier	Value
MANDATORY:			
30S	3 characters	12 characters	EURID
1P	2 characters	12 characters	Product ID
ADDITIONALY MANDATORY FOR USSAGE WITH NFC:			
6P	2 characters	15 characters or 3 characters	„ENOCEANALLIANCE" or „ENO"– identification of used standard
OPTIONAL:			
10Z	3 characters	2 characters	00 (zero zero)
11Z	3 characters	8 characters	ReMan Security Code
12Z	3 characters	8/14/20 characters	NFC TAG UNIQUE ID
13Z	3 characters	32 characters	Security AES code
14Z	3 characters	32 characters	Security PSK AES code
15Z-30Z	3 characters	32 characters	Maintenance code 1 to 15
31Z	3 characters	8 characters	NFC PIN for protected area.
32Z … 49Z	TBD	TBD	Reserved – Do not use

Table 2 Container definition, Version / 10Z = 00

There are no definitions by ANSI that specify various security codes or encryption keys. Therefore, we need to work with "Structured Free Text" for which ANSI specifies identifier 10Z as "Header Data" and identifiers 11Z … 99Z as "Line 1-89 Data".

Range of 10Z reserved for EnOcean Alliance purposes: 00 … 49

Identifiers reserved for EnOcean Alliance purposes: 11Z … 49Z

To gain maximum flexibility for future extensions and modifications 10Z shall be used as a version information for the interpretation of the identifiers 11Z ... 49Z.

If there is no 10Z field listed, then version 00 shall be applied as implicit definition.

Examples:

EURID plus Product ID (MANDATORY):

„30S123123123123+1P123123123123"

EURID plus Product ID (MANDATORY) plus ReMan Security Code (OPTIONAL):

„30S123123123123+1P123123123123+10Z00+11Z12312312"

If is recommended that fields keep the order in the Label as there are defined in specification (i.e. EURID first, Product ID second etc.)

4.2. Manufacturer Specific Fields

To limit the amount of labels on an end-device, the product label can carry also other specific fields according to ANSI MH10.8.2-2010. The manufacturer can use any other identifier from the standard for its values, besides the ones defined by the EnOcean Alliance in chapter 4.1. of this document.

Examples:

EURID plus Product ID (MANDATORY) plus manufacturer specific fields:

„30S123123123123+1P123123123123+30PEDWSUWEO+2PDA01+S03123456"

30S	EURID
1P	Product ID
30P	Ordering Code
2P	Step code and revision
S	Serial number

EURID plus Product ID (MANDATORY) plus ReMan Security Code (OPTIONAL) plus manufacturer specific fields:

„30S123123123123+1P123123123123+10Z00+11Z12312312+30PED-WSUWEO+10Z50+99ZEXAMPLE_REMARK "

30S	EURID
1P	Product ID
10Z	00 → Version of 11Z … 49Z

11Z	ReMan Security Code
30P	Ordering Code
10Z	50 → Version of 50Z … 99Z
99Z	MANUFACTURER SPECIFIC REMARK

4.3. QR Code considerations

To achieve machine readability of the standardized product label a QR code shall be used. Size and coding details may vary, but the field coding must be compliant with the definitions of this specification.

Error Correction:	M (at least)
QR Coding:	Alphanumeric (defined)
Resolution:	300x300dpi (minimum)

It is recommendation to test your resulting product for readability with phone cameras typically available on market.

4.4. NFC Tag considerations

For the purpose of the NFC Tag usage the standardized product label content shall be included inside the NFC Tag as NDEF, plain text of the unprotected area. The container must be available publicly.

The Product Label container is added without any other characters into the "Text" field. The standard coding – UTF-8 shall be used[1].

Considering NFC Tags as wide spread standard we defined mandatory usage of 6P identifier with value ENOCEANALLIANCE or ENO to provide information this is an Alliance related label. The identifier 6P shall be present always as first in NFC labels to enable undelaying computing system to identify the Alliance string faster.

Example:

```
[{"Text":"6PENOCEANALLI-
ANCE+30S123123123123+1P123123123123+10Z00+11Z12312312+30PED-
WSUWEO+10Z50+99ZEXAMPLE_REMARK","RecordType":"Text"}]
```

„30S123123123123+1P123123123123+10Z03+11Z12312312+30PED-WSUWEO+10Z50+99ZEXAMPLE_REMARK "

6P	ENOCEANALLIANCE
30S	EURID
1P	Product ID
10Z	03 → Version of 11Z … 49Z
11Z	ReMan Security Code
30P	Ordering Code
10Z	50 → Version of 50Z … 99Z
99Z	MANUFACTURER SPECIFIC REMARK

[1] Source (15.05.2018): https://gototags.com/nfc/ndef/plain-text/