

PD CEN/TR 16815:2015



BSI Standards Publication

## CleANopen — Application profile for municipal vehicles

**bsi.**

...making excellence a habit.™

### **National foreword**

This Published Document is the UK implementation of CEN/TR 16815:2015.

The UK participation in its preparation was entrusted by Technical Committee B/508, Waste Management, to Subcommittee B/508/1, Waste containers and associated lifting devices on refuse collection vehicles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2015.

Published by BSI Standards Limited 2015

ISBN 978 0 580 88234 0

ICS 35.240.60; 43.040.15; 43.160

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2015.

### **Amendments/corrigenda issued since publication**

<b>Date</b>	<b>Text affected</b>
-------------	----------------------

---

TECHNICAL REPORT

**CEN/TR 16815**

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

November 2015

ICS 35.240.60; 43.040.15; 43.160

English Version

**CleANopen - Application profile for municipal vehicles**CleANopen - Profil d'application aux véhicules  
municipauxCleANopen - Anwendungsprofil für  
Kommunalfahrzeuge

This Technical Report was approved by CEN on 23 February 2015. It has been drawn up by the Technical Committee CEN/TC 183.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

<b>Contents</b>		Page
<b>European foreword</b> .....		<b>3</b>
<b>1</b>	<b>Scope</b> .....	<b>4</b>
<b>2</b>	<b>Normative references</b> .....	<b>4</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>4</b>
<b>4</b>	<b>Acronyms</b> .....	<b>5</b>
<b>5</b>	<b>Abbreviations</b> .....	<b>6</b>
<b>6</b>	<b>General architecture</b> .....	<b>6</b>
<b>7</b>	<b>Physical layer specification</b> .....	<b>13</b>
<b>8</b>	<b>Error handling</b> .....	<b>14</b>
<b>9</b>	<b>Data type specification</b> .....	<b>15</b>
<b>10</b>	<b>Object dictionary entries</b> .....	<b>15</b>
<b>11</b>	<b>Pre-defined TPDO communication</b> .....	<b>52</b>
<b>12</b>	<b>Manufacturer-specific TPDOs</b> .....	<b>493</b>
<b>13</b>	<b>Pre-defined RPDO communication</b> .....	<b>494</b>
<b>14</b>	<b>Manufacturer-specific RPDOs</b> .....	<b>902</b>
<b>15</b>	<b>Pre-defined additional SDO communication</b> .....	<b>902</b>
<b>16</b>	<b>Object dictionary</b> .....	<b>951</b>
<b>Annex A (normative) Manufacturer-specific TPDOs for unit-specific use</b> .....		<b>1094</b>
<b>Annex B (normative) Manufacturer-specific RPDOs for unit-specific use</b> .....		<b>1100</b>
<b>Annex C (informative) Measurement process</b> .....		<b>1106</b>
<b>Bibliography</b> .....		<b>1109</b>

## European foreword

This document (CEN/TR 16815:2015) has been prepared by Technical Committee CEN/TC 183 “Waste management”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document is based on the version 2.0 of the CiA 422 specification series describes the embedded body control network of refuse collecting vehicles (RCV). It specifies the CANopen (EN 50325-4) communication interfaces and the application functionality of several functional elements (virtual devices). It does not specify CANopen devices.

This document is structured as follows:

- the 1<sup>st</sup> part (Clauses 3 to 9) contains general definitions and describes the functionality of the virtual devices as well as the CANopen physical layer requirements and recommendations.
- the 2<sup>nd</sup> part (Clause 10) provides a detailed overview of communication and application parameters supported by the different virtual devices. Virtual devices include the body controller, and the change container, compaction, lifter, identification, measuring A and B, bin classification, washing, truck gateway as well as GPS units. Also a monitoring device is described
- the 3<sup>rd</sup> part (Clauses 11 to 15) and its sub-parts specify the pre-defined Process Data Objects (PDO) and the additional pre-defined SDOs. The pre-defined Transmit-PDOs for all virtual devices are specified in Clause 11. This includes the PDO communication parameter set as well as the PDO mapping parameter set. The corresponding Receive-PDOs are specified in Clause 13. The SDO communication between bin classification units and measuring units is specified in Clause 15.
- the 4<sup>th</sup> part (Clause 16) specifies the application parameters. This covers the process data (mainly mapped into PDOs), configuration data, and diagnostic information (both mainly transmitted by SDO communication services). In this clause are defined parameter pools for the measuring units, and the data read as well as write for identification units. Other introduced parameters include support profile version, extended status for measuring units and measuring ident controllers.

## 1 Scope

This Technical Report provides a set of CANopen application profile specifications that describes the *CleANopen* embedded body control network of municipal vehicles, e.g. refuse collecting trucks.

It specifies the CANopen communication interfaces and the application functionality of several functional elements (virtual devices).

It does not specify CANopen devices.

The *CleANopen* application profile specifications consist of several parts dealing with the following:

- general definitions;
- functionality of the virtual devices;
- pre-defined PDOs and SDOs;
- application objects.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 639-1, Codes for the representation of names of languages — Part 1: Alpha-2 code

ISO/IEC 646, Information technology — ISO 7-bit coded character set for information interchange

ISO 11898-2, Road vehicles — Controller area network (CAN) — High-speed medium access unit

SAE J1939-71, Recommended practice for a serial control and communication network — Vehicle application layer

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **CleANopen unit**

virtual device that provides functional elements specified in this application profile

### 3.2

#### **functional element**

atomic application function

### 3.3

#### **virtual device**

part of the logical device as defined in [CiA301]

### 3.4

#### **left side**

when viewing forward, the left side