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Winter and road service area maintenance equipments - Part 2: Protocol for data transfer between information supplier server and client application server

Matériel de viabilité hivernale et d'entretien des dépendances routières - Partie 2: Protocole de transfert des données entre le serveur fournisseur d'information et les serveurs d'applications clients

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Winter and road service area maintenance equipments - Part 2: Protocol for data transfer between information supplier server and client application server

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 337.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents:

Foreword

This document (prEN 15430-2:2008) has been prepared by Technical Committee CEN/TC 337 “Winter maintenance and road service area maintenance equipment”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

1 Introduction

This document must be considered as the second part of the standard for data acquisition and transmission in the field of municipal vehicles. The goal of the standard is to allow interoperability between systems (hardware and software) of different vendors. A customer should be able to combine any:

- on-vehicle equipment (e. g. spreaders and ploughs)
- on-vehicle data acquisition systems (e. g. board computers or enhanced control boxes)
- client application software (e. g. data bases, analyzing or accounting software)

as long as they follow this standard.

The first part of the standard, as described in document EN15430-1, defines the on-board communication (flow 1) between on-vehicle equipment (data handler) and on-vehicle data acquisition systems (board computer). This document is meant to describe the data structure, types, ranges, protocol and initial settings required by the information supplier server (ISS) and client application server (CAS) including synchronized combining of the various data sources.

Figure1 represents the whole data flow chain from vehicle to office system.

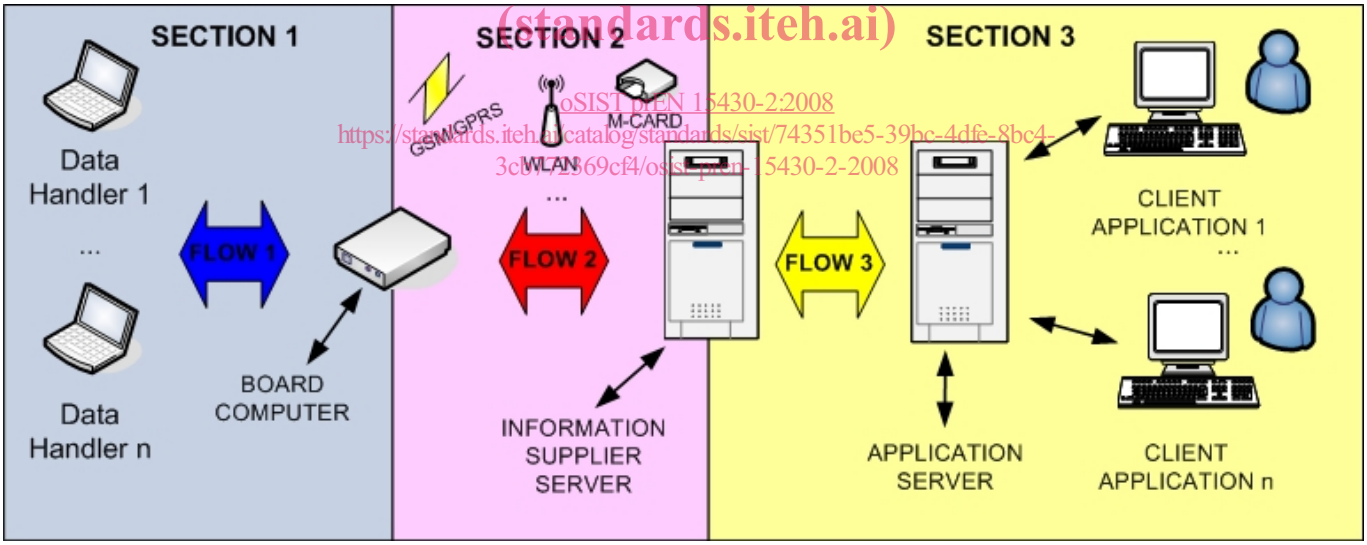

Figure 1: Transmission flow

The present standard doesn't define any specific rules for items like:

- optional compression, encryption and authentication of the data during data transfer (flow 2).
- data transmission between on-vehicle data acquisition system and information supplier server (flow 2).

Data transfer between on-vehicle data acquisition systems and the information supplier server has to be lossless.

Section 1 defines the interface between devices and board computer, as described in EN15430-1.

Section 2 addresses the combination of data from different streams and the transmission to a generic information supplier server.

Section 3 addresses the data transfer (Flow 3) between the information supplier server (ISS) and client application server (CAS) and it is the purpose of this document.

2 Scope

The function of the standard is to combine any vehicle equipment with different board computers to any client application server. The communication interface on vehicle is defined by part 1 of the standard. The interface between the information supplier server and the client application server is defined as a specific protocol (flow 3) object of the present document. This makes interchangeability possible on both sides of the communication without any restriction in the range of communication technology including memory card, WLAN, GPRS or any other communication media.

3 Terms and abbreviations

ISS	Information Supplier Server: entity able to store information coming from board computers and distribute these information to external applications (CAS) using server process.
CAS	Client Application Server: entity able to retrieve information.
ASCII	American national Standard Code for Information Interchange
FTP	File Transfer Protocol
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HTTP	Hyper Text Transfer Protocol
M-Card	Memory Card
P2P	Point-2-Point
RFC	Request For Comments
UMTS	Universal Mobile Telephone System
WAN	Wide Area Network
WLAN	Wireless Local Area Network
h	Number before h is in hexadecimal notation
XML	Extended Markup Language

4 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard. Only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 8859-1 Character encoding table by the International Organization of Standardization; in the lower 128 codes identical to the old ASCII standard

RFC The Requests for Comments (RFCs) form a series of notes, started in 1969, about the Internet (originally the ARPANET). The notes discuss many aspects of computer communication, focusing on networking protocols, procedures, programs, and concepts.

RFC 0959 File Transfer Protocol (FTP). J. Postel, J. Reynolds. Oct-1985. This obsolete the preceding RFC 765 and earlier FTP RFCs back to the original RFC 114.

5 Tasks of the board computer

5.1 Classification

In EN15430-1 a data acquisition system like a board computer has been presented as black-box with implemented at least the following main features:

- Receive data from a generic vehicle/equipment data transmission handler (e.g. through RS232 serial interface)
- Store any incoming information in reports.
- Generate one time stamp for every data message.

According to the time gap between record time stamp and ISS time stamp one board computer can be classified as follows:

1. On-line devices: devices where the time gap between generation at the board computer and acquisition by the ISS is within 60 seconds. (e.g: radio, GPRS, UMTS). The ISS has to provide an on-line status information to the CAS for every connected device.

2. Off-line device: devices where the time gap between generation at the board computer and acquisition by the ISS is 60 seconds or more.

Every board computer has to ensure 24 hours of non volatile data storage.

5.2 Data receiving and merging

The board computer receives data from one or more device handlers. In addition, it can generate records, e. g. by receiving GPS data, evaluating sensors or converting non-standard data sources. (described in part 1 of the standard). Then, the board computer merges the data flow from different devices into one data stream without applying and modification to the records (record code >= 1). All records should remain in the same order in which they were generated. The order of records coming from different sources is free. The delay probably introduced by the data transmission handler can be ignored.

5.3 Time information handling

Time information received from board computers are stored on the ISS without any modification. The ISS has to add its local time information to the data files.

6 Report interface

6.1 Data record definition

A data record is a structure of coherent variables in a predefined order according to the record definition (EN15430-1).

6.2 Interface level

The present standard defines a XML file structure containing one or more records as defined in EN15430-1. The XML file has to be provided by the information supplier server (ISS).

The present standard set forth that a board computer or a fleet management manufacturer has to provide a suitable information supplier server to ensure the **XML file structure** described in this chapter and the **CEN-service interface** as described in chapter 7.

The definition of the XML file contents is:

```
<?xml version='1.0' encoding='UTF-8'?>

<response protocol="CEN 15430-2 1.0">

      <ISS_ID  id='id number'  LocalTime = 'ISS time reference'  LocalDate = 'ISS date reference'  >

     <msg id='id number'  BC_ID = 'board computer id'  RecordCode = 'record number' ManufID = 'P1'  EquipID='Eq1'>

      <SysTime>   board computer time  </SysTime>

      <SysDate>  board computer date  </SysDate>

       <Source> source  </Source>

       <GeoTime>  GPS time  </ GeoTime >

      <GeoDate>  GPS date  </GeoDate>

       <GeoLat> GPS latitude </GeoLat>

       <GeoLon> GPS longitude </GeoLon>

       <GeoAlt> GPS altitude </GeoAlt>

       <GeoSQ> GPS quality </GeoSQ>

        <data>

              …

       </data>

</msg>

</ISS_ID>

   <ISS_ID  id='id number'  LocalTime = 'ISS time reference'  LocalDate = 'ISS date reference'  >
```

```
   < msg id='id number'  BC_ID = 'board computer id'  RecordCode = 'record number' ManufID = 'P2' EquipID='Eq2'>

        ……

     </msg>

     </ISS_ID>

     ……

  <ISS_ID  id='id number'  LocalTime = 'ISS time reference'  LocalDate = 'ISS date reference'  >

< msg id='id number'  BC_ID = 'board computer id'  RecordCode = 'record number' ManufID = 'P3' EquipID='Eq3''>

        ……

     </msg>

     </ISS_ID>

</response>
```

Remarks:

1. Geo information is optional depending on local facility.
2. The client application server (CAS) is responsible for time synchronisation.

The complete field description is:

PARAMETER	DESCRIPTION	TYPE
Protocol	Protocol version.	String
ISS_ID	Information supplier server identification. The ISS provider has to ensure a unique identification string (e.g serial number combining to manufacture name).	String
LocalTime	ISS time reference.	BASIC_TIME (as defined in EN15430-1)
LocalDate	ISS date reference.	BASIC_DATE (as defined in EN15430-1)
Id	Message identification. Increasing number starting at 0 auto incremented by one with wrap around. (0..64255 → 0 …)	unsigned short