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Nadzorna oprema za parkirišča - Zahteve in preskusne metode za parkirne avtomate

Vehicle parking control equipment - Requirements and test methods for a parking terminal

Einrichtungen zur Parküberwachung von Fahrzeugen - Parkautomaten - Anforderungen und Prüfverfahren

Équipement de contrôle du stationnement des véhicules - Exigences et méthodes d'essai pour un terminal de stationnement

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Vehicle parking control equipment - Requirements and test methods for a parking terminal

Équipement de contrôle du stationnement des véhicules - Exigences et méthodes d'essai pour un terminal de stationnement

Einrichtungen zur Parküberwachung von Fahrzeugen - Anforderungen und Prüfverfahren für Parkautomaten

This European Standard was approved by CEN on 3 May 2020.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 12414:2020 (E)**European foreword**

This document (EN 12414:2020) has been prepared by Technical Committee CEN/TC 226 “Road equipment”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.

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

This document supersedes EN 12414:1999.

The significant technical changes incorporated in this revision are:

- new requirements depending on the different modes of operation (Pay and Display, Pay and Go, Pay on Departure) which justify the change in the title and the scope of this standard where “pay and display ticket machine” has been replaced by “parking terminal”;
- test method described for each of the requirements in annex, which justify the change in the title and scope where “test methods” has been added;
- accessibility requirements taking into account new EN 301549:2018;
- requirement for user interface taking into account new technologies (display, keyboards, touch screen...);
- requirements and definition of categories of terminals depending on the level of connectivity with a centralised system (centralised system requirement being out of the scope of this standard);
- requirements for minimum information to be exchanged with the centralised system for connected terminals;
- requirements for payment means taking into account banknotes and new electronic means of payment;
- energy autonomy requirement for terminal powered by mains supply or solar energy or combination of solar energy and non-rechargeable battery, with detailed test procedure in annex;
- protection against theft or burglary with detailed test procedure in annex and introduction of security classes P0 to P4, with a minimum of P0 required;
- update of operation and management requirements;
- update of normative references.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a revision of the EN 12414 issued in 1999. This is not a harmonized standard. This document has been written for those called upon to manufacture, operate, maintain and use a parking terminal with the aim of providing requirements and test methods, especially for parking terminals in addition to the applicable European Directives.

This document takes the different modes of operation of parking terminal into account:

- pay and display mode;
- pay and go mode;
- pay on departure mode;

and the different configurations of:

- user interface;
- means of payment;
- power supply;
- connectivity;
- protection against theft or burglary;

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in order to provide measurable minimum requirements and associated test methods to standardize and qualify:

- ease of use; [SIST EN 12414:2020
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- ease of operation;
- accessibility;
- security;
- energy autonomy;
- resistance to environment;
- protection against theft or burglary.

A terminal conformity to this document is understood as a conformity to all minimum requirements applicable to the mode and configuration of the said terminal. This standard is for the terminal only, it does not cover the centralised system. Regarding protection against theft or burglary, conformity to the minimum requirement is reached with class P0, but in addition, classes P1-P4 have been defined to allow terminal suppliers to verify the effectiveness of additional measures to increase the protection against theft or burglary above P0.

EN 12414:2020 (E)**1 Scope**

This document specifies the technical and functional requirements including test methods for parking terminals. It applies to unattended terminals used to obtain the right to park for visual and/or electronic control of multiple road vehicles, with payment where applicable.

This document only covers parking terminals.

For parking terminals connected to centralised system, this document covers the minimum information to be exchanged with a centralised system. It does not define a standard protocol between parking terminals and centralised systems. It does not define the centralised system.

This document does not cover pay-on-foot terminals.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1332-3:2008, *Identification card systems - Man-machine interface - Part 3: Keypads*

EN 60068-2-1, *Environmental testing - Part 2-1: Tests - Test A: Cold*

EN 60068-2-2, *Environmental testing - Part 2-2: Tests - Test B: Dry heat*

EN 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

EN 60068-2-61, *Environmental testing - Part 2: Test methods - Test Z/ABDM: Climatic sequence*

EN 60529, *Degrees of protection provided by enclosures (IP Code)*

EN 60904-1, *Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics*

EN 61009-1, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules*

EN 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

EN 301549:2018, *Accessibility requirements suitable for public procurement of ICT products and services in Europe*

EN ISO 9241-305:2008, *Ergonomics of human-system interaction - Part 305: Optical laboratory test methods for electronic visual displays (ISO 9241-305:2008)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

EN ISO/IEC 17065, *Conformity assessment — Requirements for bodies certifying products, processes and services (ISO/IEC 17065)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

token

medium accepted by a terminal and used as a substitute for currency or for test purposes

3.2

transaction

process followed at the terminal to obtain the right to park

3.3

operator

person who is responsible for the operation of the parking terminal

3.4

supplier

terminal supplier or its representative

3.5

end-user

individual obtaining the rights to park [SIST EN 12414:2020](#)

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3.6

connected terminal

terminal communicating with a centralised system

3.7

cash

any currently valid coins or notes issued by an official banking system with a set monetary value

3.8

cash box

receptacle for the storage of cash and tokens until collection

3.9

coin validator

terminal component which identifies the validity of the coin/token inserted and accepts or rejects the coin or token

3.10

escrow device

unit to hold coins, tokens or banknotes, before confirmation or cancellation of the transaction

EN 12414:2020 (E)**3.11****embedded software**

terminal software provided by its supplier that allows:

- control of the terminal hardware components;
- control of the terminal behaviour when used;
- ability to set the operating parameters of the terminal

3.12**out of order**

state of a terminal or a part of a terminal that is not able to operate

3.13**out of service**

state of a terminal or a part of a terminal that has been voluntarily configured by the operator to not operate

3.14**credit note**

printed media issued by the terminal for refund purposes

3.15**ePurse**

electronic storage of value, which can be used in a manner similar to cash to pay for goods including the right to park

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3.16**private card**

electronic storage of prepaid value which can be used to pay for the right to park

3.17**cash safe compartment**

secure part of the terminal that stores cash

3.18**service compartment**

secure part of the terminal that contains technical components for operation and maintenance outside of the cash safe compartment

3.19**return cup**

receptacle that contains coins and tokens rejected or returned after cancellation

3.20**collection box**

external lockable receptacle used for collection of cash

3.21**ticket**

printed document for enforcement

4 Functional requirements

4.1 Modes of operation

4.1.1 General

The modes of operation describe how the right to park is provided to end-users, then inspected by enforcement personnel.

Three modes of operation are defined in this document:

- a) the Pay and Display mode (with ticket);
- b) the Pay and Go mode (without ticket);
- c) the Pay on Departure (with or without ticket).

Any parking terminal shall comply with one or more modes.

4.1.2 Pay and Display mode (with ticket)

4.1.2.1 General

In this mode, a ticket is printed by the parking terminal and is to be displayed in the vehicle to allow visual inspection by the enforcement agent. This ticket may be also used as a receipt by the end-user.

For a cash only offline transaction, a ticket with minimum printed information as detailed in 4.1.2.2, shall be issued within four seconds after confirmation of the transaction.

For pay and display, a printer shall be installed to deliver tickets and shall respect the requirements defined in 4.2.2.

4.1.2.2 Printed information (intended for enforcement)

This ticket shall as a minimum contain the following information on the same side of the ticket:

- amount paid (if applicable);
- parking expiry time and date (at least the month, day, hours and minutes);
- location of the parking terminal (identifier or address).

Where applicable, it shall be possible to add the following information:

- tariff category;
- unique transaction identifier;
- licence plate number;
- space number;
- issuing date and time;
- tax mandatory information;
- parking authority or operator reference.

EN 12414:2020 (E)**4.1.3 Pay and Go mode (without ticket)****4.1.3.1 General**

In this mode, the end-user does not need to display a ticket in a vehicle. Inspections are based on information that allows for identification either by the parking space or by the licence plate.

To obtain the right to park, the identification data has to be entered by the end-user into the terminal to be recorded locally or in a centralised system.

The parking terminal shall offer the end-user the capability to correct and confirm the identification data manually entered before payment.

The terminal shall always be able to deliver a receipt:

— by a printer that shall respect the requirements defined in 4.1.3.3 and 4.2.2

or,

— if applicable, digitally transferred to the end-user when allowed by local legislation, banks standards and card issuers and shall respect the requirements defined in 4.1.3.3.

4.1.3.2 Storage of transaction data (intended for enforcement)**4.1.3.2.1 General**

At least one of the means of storage described in 4.1.3.2.3 and 4.1.3.2.4 shall be used.

4.1.3.2.2 Stored information

Transactions shall be stored with the following information:

- parking expiry time and date (at least the month, day, hours and minutes);
- licence plate number or parking space number;
- amount paid (if applicable);
- location of the parking terminal (identifier or address);

Where applicable, it shall be possible to add the following information:

- tariff category;
- unique transaction identifier;
- date and time of issue.

4.1.3.2.3 Local storage of transaction

For terminals belonging to Category A (as defined in 4.3.2), when the transaction is confirmed by the end-user, the information defined in 4.1.3.2.2 shall be saved in the local memory of the parking terminal for local inspection by enforcement agent. The terminal shall have the capacity to store a minimum of 100 active transactions (currently valid parking rights) for enforcement purpose. If the maximum transaction capacity is reached the terminal shall block next transactions.

4.1.3.2.4 Online storage of transaction

For terminals belonging of Category B (as defined in 4.3.3), transactions completed by the end-users shall be transmitted to a centralised system to enable inspection by enforcement agent. If online transmission is not possible the terminal shall offer one of the two following possibilities:

- the transaction shall be blocked, or
- the transactions shall be allowed and stored locally until transmission to the centralised system.

4.1.3.3 Receipt

In case of a ticketless transaction, an offer shall be made to the end-user to obtain a receipt or it shall be automatically issued. An offer made at the end of the transaction shall remain for at least five seconds.

The minimum information contained on the receipt shall be the following:

- amount paid (if applicable);
- parking expiry time and date (at least the month, day, hours and minutes);
- the information that makes it possible to identify the vehicle either the licence plate or parking space number;
- location of the parking terminal (identifier or address).

Where applicable, it shall be possible to add the following information:

- tariff category;
- unique transaction identifier; [SIST EN 12414:2020](https://standards.iteh.ai/catalog/standards/sist/4eb668b0-cddf-488a-a338-a93bc9c1b0fc/sist-en-12414-2020)
- date and time of issue; <https://standards.iteh.ai/catalog/standards/sist/4eb668b0-cddf-488a-a338-a93bc9c1b0fc/sist-en-12414-2020>
- tax mandatory information;
- parking authority or operator reference;
- licence plate number;
- space number.

4.1.4 Pay on departure

4.1.4.1 General

This mode of operation applies only to terminal in category B (as defined in 4.3.3).

To obtain the right to park, the end-user needs to start the parking session at arrival. The parking session is either stopped by the user when departing or automatically by the system when reaching user selected or maximum defined parking end time.

Pay on departure mode can be managed with or without ticket.

The terminal shall always be able to deliver a receipt:

- by a printer that shall respect the requirements defined in 4.1.4.3.2 and 4.2.2,

or

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- if applicable, digitally transferred to the end-user when allowed by local legislations, banks standards and card issuers and shall respect the requirements defined in 4.1.4.3.2.

4.1.4.2 Transaction data**4.1.4.2.1 Parking session start data**

Parking session start data shall contain the following information:

- licence plate number and/or space number and/or unique identifier;
- parking start time (at least the month, day, hours and minutes);
- user selected or maximum defined parking end time.

Where applicable:

- tariff category;
- unique transaction identifier;
- location of the parking terminal (identifier or address).

4.1.4.2.2 Parking session end data

Parking session end data shall contain the following information:

- licence plate number and/or space number and/or unique identifier;
- parking start time (at least the month, day, hours and minutes);
- parking end time (at least the month, day, hours and minutes);
- amount paid.

Where applicable:

- tariff category;
- unique transaction identifier;
- location of the parking terminal (identifier or address).

4.1.4.3 Parking session procedure**4.1.4.3.1 Parking session starts**

- Terminals without ticket

When the parking session starts, a terminal shall transmit the data specified in 4.1.4.2.1 to a centralised system to enable online inspection for enforcement.

- Terminals with ticket

When the parking session starts, a terminal shall print a ticket with the data specified in 4.1.4.2.1 to the end-user to be displayed in the vehicle for online inspection for enforcement.

4.1.4.3.2 Parking session ends

The end-user can end the parking session before the selected or the default maximum parking end time is reached. The data specified in 4.1.4.2.2 shall be transmitted to a centralised system.

4.1.4.4 Receipt

An offer to obtain a receipt shall be made at the end of the parking session to the end-user or it shall be automatically issued. The offer shall remain for at least five seconds.

The minimum information contained on the receipt shall be the following:

- licence plate number and/or space number and/or unique identifier;
- parking start time (at least the month, day, hours and minutes);
- parking end time (at least the month, day, hours and minutes);
- amount paid;
- location of the parking terminal (identifier or address).

Where applicable, it shall be possible to add the following information:

- tariff category;
 - unique transaction identifier;
 - tax mandatory information;
 - parking authority or operator reference.
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4.2 User interface

4.2.1 Screen

To ensure that the information displayed on the main screen are legible, the minimum screen specification shall be as follows:

- size: 5000 mm²;
- definition: 16 ppc (pixels per centimetres), equivalent to 40 ppi (pixels per inch);
- height of the capital letters and numbers = 6,1 mm (see 5.4);
- luminance contrast ratio (C_R) during day and night, from a standing and a seated position shall be equal or greater than $C_{Rmin} = 1,5:1$ according to Annex C, 4.2.1.

4.2.2 Ticket and receipt attributes

When equipped with a printer the terminal shall be able to deliver a ticket or a receipt to the following specification:

- a) Ticket and receipt dimensions;

The minimum area of the ticket or receipt shall be 3 500 mm². The smallest dimension shall be minimum of 50 mm;