

**Electricity metering - Data exchange for
meter reading, tariff and load control - Part
21: Direct local data exchange**

Electricity metering - Data exchange for meter
reading, tariff and load control - Part 21: Direct
local data exchange

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

<p>Käesolev Eesti standard EVS-EN 62056-21:2003 sisaldab Euroopa standardi EN 62056-21:2002 ingliskeelset teksti.</p>	<p>This Estonian standard EVS-EN 62056-21:2003 consists of the English text of the European standard EN 62056-21:2002.</p>
<p>Standard on kinnitatud Eesti Standardikeskuse 05.02.2003 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p>	<p>This standard is ratified with the order of Estonian Centre for Standardisation dated 05.02.2003 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p>
<p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on .</p>	<p>Date of Availability of the European standard text .</p>
<p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>The standard is available from Estonian standardisation organisation.</p>

ICS 17.220.20, 35.100, 91.140.50

Võtmesõnad: accountings * computer hardware * currents * data

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English version

**Electricity metering -
Data exchange for meter reading, tariff and load control
Part 21: Direct local data exchange
(IEC 62056-21:2002)**

Equipements de mesure
de l'énergie électrique -
Echange des données pour la lecture
des compteurs, le contrôle des tarifs
et de la charge
Partie 21: Echange des données
directes en local
(CEI 62056-21:2002)

Messung der elektrischen Energie -
Zählerstandsübertragung,
Tarif- und Laststeuerung
Teil 21: Datenübertragung für festen
und mobilen Anschluss
(IEC 62056-21:2002)

This European Standard was approved by CENELEC on 2002-05-01. CENELEC 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 Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 13/1271/FDIS, future edition 1 of IEC 62056-21, prepared by IEC TC 13, Equipment for electrical energy measurement and load control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62056-21 on 2001-05-01.

This European Standard supersedes EN 61107:1996.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2003-02-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-05-01

The International Electrotechnical Commission (IEC) and CENELEC draw attention to the fact that it is claimed that compliance with this International Standard / European Standard may involve the use of a maintenance service concerning the stack of protocols on which the present standard IEC 62056-21 / EN 62056-21 is based.

The IEC and CENELEC take no position concerning the evidence, validity and scope of this maintenance service.

The providers of the maintenance service have assured the IEC that they are willing to provide services under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the providers of the maintenance service are registered with the IEC. Information may be obtained :

Manufacturer's identification, item 12) of 6.3.2: from

The FLAG Association, UK
www.dlms.com/flag

Enhanced identification character, item 24) of 6.3.2: from

DLMS ¹⁾ User Association
Geneva / Switzerland
www.dlms.ch

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B, E and ZA are normative and annexes C and D are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62056-21:2002 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62056-61	NOTE	Harmonized as EN 62056-61:2002 (not modified).
IEC 62056-62	NOTE	Harmonized as EN 62056-62:2002 (not modified).

¹⁾ Device Language Message Specification

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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 (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-300	2001	International Electrotechnical Vocabulary - Electrical and electronic measurements and measuring instruments Part 311: General terms relating to measurements Part 312: General terms relating to electrical measurements Part 313: Types of electrical measuring instruments Part 314: Specific terms according to the type of instrument	-	-
IEC/TR 62051	1999	Electricity metering - Glossary of terms	-	-
IEC 62056-42	2002	Electricity metering - Data exchange for meter reading, tariff and load control Part 42: Physical layer services and procedures for connection-oriented asynchronous data exchange	EN 62056-42	2002
IEC 62056-46	2002	Part 46: Data link layer using HDLC protocol	EN 62056-46	2002
IEC 62056-53	2002	Part 53: COSEM application layer	EN 62056-53	2002
ISO/IEC 646	1991	Information technology - ISO 7-bit coded character set for information interchange	-	-
ISO/IEC 1155	1978	Information processing - Use of longitudinal parity to detect errors in information messages	-	-
ISO/IEC 1177	1985	Information processing - Character structure for start/stop and synchronous character-oriented transmission	-	-
ISO/IEC 1745	1975	Information processing - Basic mode control procedures for data communication systems	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO/IEC 7480	1991	Information technology - Telecommunications and information exchange between systems - Start/stop transmission signal quality at DTE/DCE interfaces	-	-
ITU-T Recommendation V.24	2000	List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)	-	-
ITU-T Recommendation V.28	1993	Electrical characteristics for unbalanced double-current interchange circuits	-	-

INTERNATIONAL STANDARD

IEC
62056-21

First edition
2002-05

**Electricity metering –
Data exchange for meter reading, tariff and
load control –**

**Part 21:
Direct local data exchange**

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



Reference number
IEC 62056-21:2002(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

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INTERNATIONAL STANDARD

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Electricity metering – Data exchange for meter reading, tariff and load control –

Part 21: Direct local data exchange

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICITY METERING –
DATA EXCHANGE FOR METER READING,
TARIFF AND LOAD CONTROL –****Part 21: Direct local data exchange****FOREWORD**

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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The IEC takes no position concerning the evidence, validity and scope of this maintenance service.

The provider of the maintenance service has assured the IEC that he is willing to provide services under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the provider of the maintenance service is registered with the IEC. Information may be obtained:

Manufacturer's identification, item 12) of 6.3.2: from

The FLAG Association, UK
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Enhanced identification character, item 24) of 6.3.2: from

DLMS User Association
Geneva / Switzerland
www.dlms.ch

International Standard IEC 62056-21 has been prepared by IEC Technical Committee 13: Equipment for electrical energy measurement and load control.

This first edition IEC 62056-21 cancels and replaces the second edition of IEC 61107 published in 1996 and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
13/1271/FDIS	13/1277/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annexes A, B and E form an integral part of this standard.

Annexes C and D are for information only.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

IEC TC 13 has the task of preparing standards for data exchange for the purposes of meter reading, tariff and load control, and consumer information using various alternative communication media, with reference to ISO and ITU standards.

Meter data exchange can be local or remote. This part of IEC 62056 is restricted to local data exchange, whereas remote data exchange is covered by other standards of the IEC 62056 series.

ELECTRICITY METERING – DATA EXCHANGE FOR METER READING, TARIFF AND LOAD CONTROL –

Part 21: Direct local data exchange

1 Scope

This part of IEC 62056 describes hardware and protocol specifications for local meter data exchange. In such systems, a hand-held unit (HHU) or a unit with equivalent functions is connected to a tariff device or a group of devices.

The connection can be permanent or disconnectable using an optical or electrical coupling. An electrical interface is proposed for use with a permanent connection, or when more than one tariff device needs to be read at one site. The optical coupler should be easily disconnectable to enable data collection via an HHU.

The protocol permits reading and programming of tariff devices. It is designed to be particularly suitable for the environment of electricity metering, especially as regards electrical isolation and data security. While the protocol is well-defined, its use and application are left to the user.

This standard is based on the reference model for communication in open systems. It is enhanced by further elements such as an optical interface, protocol controlled baud rate switchover, data transmission without acknowledgement of receipt. The protocol offers several modes for implementation in the tariff device. The HHU or equivalent unit acts as a master while the tariff device acts as a slave in protocol modes A to D. In protocol mode E, the HHU acts as a client and the tariff device acts as a server.

As several systems are in practical use already, particular care was taken to maintain compatibility with existing systems and/or system components and their relevant protocols.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050-300:2001, *International Electrotechnical Vocabulary (IEV) – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*

IEC 62051:1999, *Electricity metering – Glossary of terms*

IEC 62056-42:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 42: Physical layer services and procedures for connection oriented asynchronous data exchange*

IEC 62056-46:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer using HDLC-protocol*

IEC 62056-53:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 53: COSEM application layer*

ISO/IEC 646:1991, *Information technology – ISO 7-bit coded character set for information interchange*

ISO/IEC 1155:1978, *Information processing – Use of longitudinal parity to detect errors in information messages*

ISO/IEC 1177:1985, *Information processing – Character structure for start/stop and synchronous character-oriented transmission*

ISO/IEC 1745:1975, *Information processing – Basic mode control procedures for data communication systems*

ISO/IEC 7480:1991, *Information technology – Telecommunications and information exchange between systems – Start-stop transmission signal quality at DTE/DCE interfaces*

ITU-T Recommendation V.24 (2000), *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)*

ITU-T Recommendation V.28 (1993), *Electrical characteristics for unbalanced double-current interchange circuits*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purpose of this part of IEC 62056 the terms and definitions given in IEC 60050-300 and IEC 62051, as well as the following apply:

3.1.1

tariff device

fixed data collection unit, normally linked or combined with an electricity meter, acting as a server

3.1.2

master

central station. Station which takes the initiative and controls the data flow

3.1.3**slave**

station responding to requests of a master station. The tariff device is normally a slave station

3.1.4**client**

a station, asking for services, normally the master station

3.1.5**server**

a station, delivering services. The tariff device (e.g. the meter) is normally the server, delivering the requested values or executing the requested tasks

3.2 Abbreviations

HHU hand-held unit

4 Physical properties**4.1 Electrical current loop interface**

a) Type of signal

20 mA current loop

Absolute limits:

Open-circuit voltage: max. 30 V d.c.

Loop current: max. 30 mA

Table 1 – Electrical interface

Current	Send (TX)	Receive (RX)
Zero, no loop current, SPACE	$\leq 2,5$ mA	≤ 3 mA
One, 20 mA loop current, MARK	≥ 11 mA	≥ 9 mA
Voltage drop	Send (TX)	Receive (RX)
One, 20 mA loop current, MARK	≤ 2 V	≤ 3 V
Maximum open-circuit voltage during operation		30 V d.c.

b) Power supply

On the tariff device side the interface is passive. The HHU supplies the necessary power.

c) Connections

Via terminals or suitable connectors. Polarity errors can prevent communication, but shall not harm the devices.