

INTERNATIONAL STANDARD

IEC
62056-61

First edition
2002-02

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

**Part 61:
Object identification system (OBIS)**



Reference number
IEC 62056-61:2002(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.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site (www.iec.ch/catlg-e.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications (www.iec.ch/JP.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: custserv@iec.ch

Tel: +41 22 919 02 11

Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC
62056-61

First edition
2002-02

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

**Part 61:
Object identification system**

© IEC 2002 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission 3, rue de Varembé Geneva, Switzerland
Telefax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

T

For price, see current catalogue

CONTENTS

| | |
|---|----|
| FOREWORD..... | 4 |
| INTRODUCTION..... | 6 |
| 1 Scope..... | 7 |
| 2 Normative references | 7 |
| 3 Terms, definitions and abbreviations | 8 |
| 4 OBIS structure..... | 8 |
| 4.1 Value group A | 8 |
| 4.2 Value group B | 8 |
| 4.3 Value group C | 8 |
| 4.4 Value group D | 9 |
| 4.5 Value group E | 9 |
| 4.6 Value group F..... | 9 |
| 4.7 Manufacturer specific codes | 9 |
| 5 Value group definitions | 9 |
| 5.1 Value group A | 9 |
| 5.2 Value group B | 10 |
| 5.3 Value group C | 10 |
| 5.3.1 Abstract objects..... | 10 |
| 5.3.2 Quantities for electrical energy related objects | 11 |
| 5.4 Value group D | 13 |
| 5.4.1 Electricity related objects..... | 13 |
| 5.4.2 Value group D for country specific identifiers | 15 |
| 5.5 Value group E | 16 |
| 5.5.1 Usage of value group E for current and voltage measurements | 17 |
| 5.5.2 Usage of value group E for measuring angles..... | 17 |
| 5.6 Value group F..... | 17 |
| 5.6.1 Usage of value group F for billing periods..... | 18 |
| 5.7 Abstract objects..... | 18 |
| 5.8 Electricity -related general purpose objects | 19 |
| 5.9 List objects..... | 21 |
| 5.10 Electricity data profile objects..... | 22 |
| Annex A (normative) Code presentation..... | 23 |
| A.1 Reduced ID codes (e.g. for IEC 62056-21) | 23 |
| A.2 Display..... | 23 |
| A.3 Special handling of value group F..... | 24 |
| A.4 COSEM..... | 24 |
| Figure 1 – OBIS code structure..... | 8 |
| Figure 2 – Quadrants for power measurement | 12 |
| Figure A. 1 – Reduced ID code presentation..... | 23 |

| | |
|---|----|
| Table 1 – Value group A codes | 9 |
| Table 2 – Value group B codes | 10 |
| Table 3 – Value group C codes (abstract objects) | 10 |
| Table 4 – Value group C codes (electricity objects) | 11 |
| Table 5 – Value group D codes (electricity) | 13 |
| Table 6 – Value group D codes (country specific) | 15 |
| Table 7 – Value group E codes (electricity) | 16 |
| Table 8 – Extended current/voltage measurement | 17 |
| Table 9 – Extended angle measurement | 17 |
| Table 10 – Abstract object codes | 18 |
| Table 11 – General error messages | 19 |
| Table 12 – General purpose codes (electricity) | 19 |
| Table 13 – General list objects | 22 |
| Table 14 – Profile codes (electricity) | 22 |
| Table A. 1 – Example of display code replacement | 23 |
| Table A.2 – Values of billing periods | 24 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICITY METERING – DATA EXCHANGE
FOR METER READING, TARIFF AND LOAD CONTROL –****Part 61: Object identification system (OBIS)**

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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this International Standard may involve the use of a maintenance service concerning the stack of protocols on which the present standard IEC 62056-61 is based.

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 (see also chapter 5.1) may be obtained from:

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

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

International Standard IEC 62056-61 has been prepared by IEC technical committee 13: Equipment for electrical energy measurement and load control.

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

| FDIS | Report on voting |
|--------------|------------------|
| 13/1269/FDIS | 13/1275/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.

¹ Device Language Message Specification.

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

Annex A forms an integral part of this standard.

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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The competitive electricity market requires an ever-increasing amount of timely information concerning the usage of electrical energy. Recent technology developments enable to build intelligent static metering equipment, which are capable of capturing, processing and communicating this information to all parties involved.

For further analysis of this information, for the purposes of billing, load-, customer- and contract management, it is necessary to uniquely identify all data in a manufacturer independent way collected manually or automatically, via local or remote data exchange.

The definition of identification codes is based on DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System*

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

Part 61: Object identification system (OBIS)

1 Scope

The Object Identification System (OBIS) defines the identification codes (ID-codes) for commonly used data items in electricity metering equipment. This part of IEC 62056 specifies the overall structure of the identification system and the mapping of all data items to their identification codes.

OBIS provides a unique identifier for all data within the metering equipment, including not only measurement values, but also abstract values used for configuration or obtaining information about the behaviour of the metering equipment. The ID codes defined in this standard are used for the identification of

- logical names of the various instances of the interface classes, or objects, as defined in IEC 62056-62;
- data transmitted through communication lines (see clause A.1);
- data displayed on the metering equipment (see clause A.2).

This standard applies to all types of electricity metering equipment, such as fully integrated meters, modular meters, tariff attachments, data concentrators etc.

To cover metering equipment measuring energy types other than electricity, combined metering equipment measuring more than one type of energy or metering equipment with several physical measurement channels, the concept of channels and medium are introduced. This allows meter data originating from different sources to be identified. While this standard fully defines the structure of the identification system for other media, the mapping of non-electrical energy related data items to ID codes needs to be completed separately.

NOTE CEN TC 294, "Communication systems for meters and remote reading meters" have implemented some non-electrical energy related codes in draft prEn 13757.

2 Normative references

The following referenced documents are indispensable for the application 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.

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 instrument – Part 314: Specific terms according to the type of instrument*

IEC 61268:1995, *Alternating current static var-hour meters for reactive energy (classes 2 and 3)*

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

IEC 62056-21, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange*¹

IEC 62056-62, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 62: Interface classes*¹

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:

3.2 Abbreviations

COSEM COmpanion Specification for Energy Metering

IC Interface Class

OBIS OBject Identification System

4 OBIS structure

OBIS codes are a combination of six value groups, which describe – in a hierarchical way – the exact meaning of each data item (see figure 1).

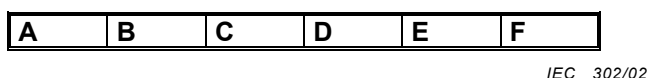


Figure 1 – OBIS code structure

4.1 Value group A

The value group A defines the characteristic of the data item to be identified (abstract data, electricity-, gas-, heat-, water-related data).

4.2 Value group B

The value group B defines the channel number, i.e. the number of the input of a metering equipment having several inputs for the measurement of energy of the same or different types (e.g. in data concentrators, registration units). Data from different sources can thus be identified. The definitions for this value group are independent from the value group A.

4.3 Value group C

The value group C defines the abstract or physical data items related to the information source concerned, e.g. current, voltage, power, volume, temperature. The definitions depend on the value of the value group A. Measurement, tariff processing and data storage methods of these quantities are defined by value groups D, E and F.

For abstract data, the hierarchical structure of the 6 code fields is not applicable.

¹ To be published

4.4 Value group D

The value group D defines types, or the result of the processing of physical quantities identified with the value groups A and C, according to various specific algorithms. The algorithms can deliver energy and demand quantities as well as other physical quantities.

4.5 Value group E

The value group E defines the further processing of measurement results identified with value groups A to D to tariff registers, according to the tariff(s) in use. For abstract data or for measurement results for which tariffs are not relevant, this value group can be used for further classification.

4.6 Value group F

The value group F defines the storage of data, identified by value groups A to E, according to different billing periods. Where this is not relevant, this value group can be used for further classification.

4.7 Manufacturer specific codes

If any value group C to F contains a value between 128 and 254, the whole code is considered as manufacturer specific.

5 Value group definitions

5.1 Value group A

The range for value group A is 0 to 15 (see table 1).

Table 1 – Value group A codes

| Value group A | |
|---|-------------------------------------|
| 0 | Abstract objects |
| 1 | Electricity related objects |
| | |
| 4 | Heat cost allocator related objects |
| 5 | Cooling related objects |
| 6 | Heat related objects |
| 7 | Gas related objects |
| 8 | Cold water related objects |
| 9 | Hot water related objects |
| All other possible values are reserved ¹ . | |

¹ Administered by the DLMS User Association (see Foreword).

5.2 Value group B

The range for value group B is 1 to 255 (see table 2).

Table 2 – Value group B codes

| Value group B | |
|---------------|-----------------------------|
| 0 | No channel specified |
| 1 | Channel 1 |
| ... | |
| 64 | Channel 64 |
| 65...127 | Reserved |
| 128 .. 254 | Manufacturer specific codes |
| 255 | Reserved |

With implementations that contain one channel only, even non-channel-specific data can be assigned to channel 1.

5.3 Value group C

The range for value group C is 0 to 255 (see table 3 and table 4).

5.3.1 Abstract objects

Abstract objects are data items, which are not related to a certain type of physical quantity.

Table 3 – Value group C codes (abstract objects)

| Value group C Abstract objects (A = 0) | |
|--|---|
| 0...89 | Context specific identifiers ^a |
| | |
| 94 | Country specific identifiers |
| | |
| 96 | General service entries, see 5.7 |
| 97 | General error messages, see 5.7 |
| 98 | General list objects, see 5.9 |
| | |
| 127 | Inactive objects ^b |
| 128...254 | Manufacturer specific codes |
| All other | Reserved |
| | |
| ^a Context specific identifiers identify objects specific to a certain protocol and/or application. For the COSEM context the identifiers are defined in IEC 62056-62 Clause D.1. ^b An inactive object is an object, which is defined and present in a meter, but which has no assigned functionality. | |

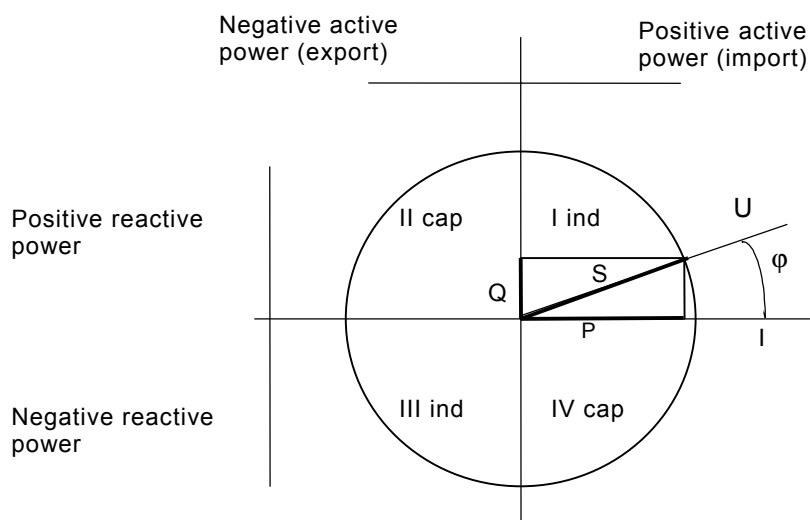
5.3.2 Quantities for electricity related objects

Table 4 – Value group C codes (electricity objects)

| Value group C | |
|--|---|
| Electricity related objects (A = 1) | |
| 0 | General purpose objects (see 5.8) |
| 1 | ΣL_i Active power+ |
| 2 | ΣL_i Active power– |
| 3 | ΣL_i Reactive power+ |
| 4 | ΣL_i Reactive power– |
| 5 | ΣL_i Reactive power QI |
| 6 | ΣL_i Reactive power QII |
| 7 | ΣL_i Reactive power QIII |
| 8 | ΣL_i Reactive power QIV |
| 9 | ΣL_i Apparent power+ |
| 10 | ΣL_i Apparent power– |
| 11 | Current : any phase |
| 12 | Voltage : any phase |
| 13 | Average power factor |
| 14 | Supply frequency |
| 15 | ΣL_i Active power QI+QIV+QII+QIII |
| 16 | ΣL_i Active power QI+QIV-QII-QIII |
| 17 | ΣL_i Active power QI |
| 18 | ΣL_i Active power QII |
| 19 | ΣL_i Active power QIII |
| 20 | ΣL_i Active power QIV |
| | |
| 21 | L_1 Active power+ |
| 22 | L_1 Active power– |
| 23 | L_1 Reactive power+ |
| 24-30 | L_1 etc. (see 4-10) |
| 31 | L_1 Current ^a |
| 32 | L_1 Voltage |
| 33 | L_1 Power factor |
| 34 | L_1 Frequency |
| 35-40 | L_1 Active power ... etc. (see 15-20) |
| | |
| 41 | L_2 Active power+ |
| 42 | L_2 Active power– |
| 43 | L_2 Reactive power+ |
| 44-60 | L_2 etc. (see 24-40) |
| | |
| 61 | L_3 Active power+ |
| 62 | L_3 Active power– |
| 63 | L_3 Reactive power+ |
| 64-80 | L_3 etc. (see 24-40) |
| | |
| 81 | Angles ^b |
| 82 | Unitless quantity (pulses or pieces) |
| | |

Table 4 (continued)

| | |
|---|--|
| 91 | L_0 current (neutral) |
| 92 | L_0 voltage (neutral) |
| | |
| | |
| 96 | Electricity-related service entries, see 5.7 |
| 97 | Electricity-related error messages |
| 98 | Electricity list |
| 99 | Electricity data profile see 5.10 |
| ...127 | Reserved |
| | |
| 128 .. 254 | Manufacturer specific code |
| 255 | Reserved |
| | |
| NOTE 1 L_i Quantity is the value (to be measured) of a measurement system connected between the phase i and a reference point. In 3-phase 4-wire systems, the reference point is the neutral. In 3-phase 3-wire systems, the reference point is the phase L_2 . | |
| NOTE 2 ΣL_i quantity is the total measurement value across all systems. | |
| ^a For details of extended codes, see 5.5.1. | |
| ^b For details of extended codes, see 5.5.2. | |



IEC 303/02

NOTE The quadrant definitions are according to IEC 61268:1995 – Annex E, Figure E.1.

Figure 2 – Quadrants for power measurement

5.4 Value group D

The range for value group D is 0 to 255 (see table 5 and table 6).

5.4.1 Electricity related objects

Table 5 –Value group D codes (electricity)

| Value group D | |
|---|---|
| Electricity related objects A = 1, C <> 0, 96,97,98,99 | |
| 0 | Billing period average (since last reset) |
| 1 | Cumulative minimum 1 |
| 2 | Cumulative maximum 1 |
| 3 | Minimum 1 |
| 4 | Current average 1 |
| 5 | Last average 1 |
| 6 | Maximum 1 |
| 7 | Instantaneous value |
| 8 | Time integral 1 |
| 9 | Time integral 2 |
| 10 | Time integral 3 |
| 11 | Cumulative minimum 2 |
| 12 | Cumulative maximum 2 |
| 13 | Minimum 2 |
| 14 | Current average 2 |
| 15 | Last average 2 |
| 16 | Maximum 2 |
| | |
| | |
| | |
| 21 | Cumulative minimum 3 |
| 22 | Cumulative maximum 3 |
| 23 | Minimum 3 |
| 24 | Current average 3 |
| 25 | Last average 3 |
| 26 | Maximum 3 |
| | |
| 27 | Current average 5 |
| 28 | Current average 6 |
| 29 | Time integral 5 |
| 30 | Time integral 6 |
| | |
| 31 | Under limit threshold |
| 32 | Under limit occurrence counter |
| 33 | Under limit duration |
| 34 | Under limit magnitude |
| 35 | Over limit threshold |
| 36 | Over limit occurrence counter |
| 37 | Over limit duration |
| 38 | Over limit magnitude |
| 39 | Missing threshold |
| 40 | Missing occurrence counter |
| 41 | Missing duration |
| 42 | Missing magnitude |

Table 5 (continued)

| | |
|---|-----------------------------|
| | |
| 55 | Test average |
| | |
| 58 | Time integral 4 |
| | |
| 128 .. 254 | Manufacturer specific codes |
| all other | Reserved |
| | |
| <p>NOTE</p> <p>Averaging Scheme 1</p> <p>Controlled by measurement period 1 (see 5.8), a set of registers is calculated by a metering device (codes 1..6). The typical usage is for billing purposes.</p> <p>Averaging Scheme 2</p> <p>Controlled by measurement period 2 (see 5.8), a set of registers is calculated by a metering device (codes 11..16). The typical usage is for billing purposes.</p> <p>Averaging Scheme 3</p> <p>Controlled by measurement period 3 (see 5.8), a set of registers is calculated by a metering device (codes 21..26). The typical usage is for instantaneous values.</p> <p>Averaging Scheme 4</p> <p>Controlled by measurement period 4 (see 5.8), a test average value. (code 55) is calculated by the metering device.</p> <p>Last average</p> <p>The value of the demand register at the end of the last measurement period.</p> <p>Current average 5</p> <p>The value of a current demand register using recording interval 1 as a time base.</p> <p>Current average 6</p> <p>The value of a current demand register using recording interval 2 as a time base.</p> <p>Time integral 1</p> <p>Without the inclusion of a billing period code ($F \neq 255$): time integral of the <i>quantity</i> calculated from the origin (first start of measurement) to the instantaneous time point.</p> <p>With a billing period code included ($0 \leq F < 100$): time integral of the <i>quantity</i> calculated from the origin to the end of the billing period given by the billing period code.</p> <p>Time integral 2</p> <p>Without the inclusion of a billing period code ($F \neq 255$): Time integral of the <i>quantity</i> calculated from the beginning of the current billing period to the instantaneous time point.</p> <p>With a billing period code included ($0 \leq F < 100$): Time integral of the <i>quantity</i> calculated over the billing period given by the billing period code.</p> <p>Time integral 3</p> <p>Time integral of the positive difference between the <i>quantity</i> and a prescribed threshold value.</p> <p>Time integral 4 ("Test time integral")</p> <p>Time integral of the <i>quantity</i> calculated over a time specific to the device or determined by test equipment.</p> <p>Time integral 5</p> <p>Used as a base for load profile recording: Time integral of the <i>quantity</i> calculated from the beginning of the current recording interval to the instantaneous time point for recording period 1.</p> <p>Time integral 6</p> <p>Used as a base for load profile recording: Time integral of the <i>quantity</i> calculated from the beginning of the current recording interval to the instantaneous time point for recording period 2.</p> | |

Table 5 (continued)

| |
|---|
| Under limit values Values under a certain threshold (e.g. dips). |
| Over limit values Values above a certain threshold (e.g. swells). |
| Missing values Values considered as missing (e.g. interruptions). |

For identifiers of abstract objects see 5.7.

For identifiers of electricity related general-purpose objects, see 5.8.

5.4.2 Value group D for country specific identifiers

Table 6 specifies the identifiers for country specific applications. Wherever possible, the phone codes are used. In this table there are no reserved ranges for manufacturer specific codes. The usage of value group E and F are defined in country specific documents.

Table 6 – Value group D codes (country specific)

| Value group D Country specific identifiers ^a (A = 0, C = 94) | |
|--|---------------------------|
| 00 | Finnish identifiers |
| 01 | USA identifiers |
| 02 | Canadian identifiers |
| 07 | Russian identifiers |
| 10 | Czech identifiers |
| 11 | Bulgarian identifiers |
| 12 | Croatian identifiers |
| 13 | Irish identifiers |
| 14 | Israeli identifiers |
| 15 | Ukraine identifiers |
| 16 | Yugoslavian identifiers |
| 27 | South African identifiers |
| 30 | Greek identifiers |
| 31 | Dutch identifiers |
| 32 | Belgian identifiers |
| 33 | French identifiers |
| 34 | Spanish identifiers |
| 35 | Portuguese identifiers |
| 36 | Hungarian identifiers |
| 38 | Slovenian identifiers |
| 39 | Italian identifiers |
| 40 | Romanian identifiers |
| 41 | Swiss identifiers |
| 42 | Slovakian identifiers |

Table 6 (continued)

| | |
|---|----------------------------|
| 43 | Austrian identifiers |
| 44 | United Kingdom identifiers |
| 45 | Danish identifiers |
| 46 | Swedish identifiers |
| 47 | Norwegian identifiers |
| 48 | Polish identifiers |
| 49 | German identifiers |
| 55 | Brazilian identifiers |
| 61 | Australian identifiers |
| 62 | Indonesian identifiers |
| 64 | New Zealand identifiers |
| 65 | Singapore identifiers |
| 81 | Japanese identifiers |
| 86 | Chinese identifiers |
| 90 | Turkish identifiers |
| 91 | Indian identifiers |
| NOTE 1 All other codes reserved. | |
| NOTE 2 Objects that are already identified in this document but not included in 5.4.2 must not be re-identified by a country specific identifier. | |
| ^a Must be limited to two characters. | |

5.5 Value group E

The range for value group E is 0 to 255.

Table 7 – Value group E codes (electricity)

| Value group E Electrical energy related objects (A = 1) | |
|--|----------------------------|
| 0 | Total |
| 1 | Rate 1 |
| 2 | Rate 2 |
| 3 | Rate 3 |
| .. | ... |
| 9 | Rate 9 |
| .. | ... |
| 63 | Rate 63 |
| | |
| 128...254 | Manufacturer specific code |
| all other | Reserved |

This table is not valid if one of the following separate specifications for value group E apply.

5.5.1 Usage of value group E for current and voltage measurements

Table 8 show the meaning of the group E value while measuring current or voltage.

Table 8 – Extended current/voltage measurement

| Value group E | |
|---|--|
| Electrical energy related objects (A = 1); current /voltage measurement (C = 31, 51, 71, 32, 52 or 72; D = 7) | |
| 0 | Total |
| 1 | 1 st harmonic (fundamental) |
| 2 | 2 nd harmonic |
| ... | n^{th} harmonic |
| 127 | 127 th harmonic |
| | |
| 128...254 | Manufacturer specific |
| 255 | Reserved |

5.5.2 Usage of value group E for measuring angles

The following table shows the meaning of the group E value while measuring angles.

Table 9 – Extended angle measurement

| Value group E | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|------------|
| Electrical energy related objects (A = 1); angle measurement (C = 81; D = 7) | | | | | | | | |
| Angle | U(L1) | U(L2) | U(L3) | I(L1) | I(L2) | I(L3) | I(L0) | <= From |
| U(L1) | (00) | 01 | 02 | 04 | 05 | 06 | 07 | |
| U(L2) | 10 | (11) | 12 | 14 | 15 | 16 | 17 | |
| U(L3) | 20 | 21 | (22) | 24 | 25 | 26 | 27 | |
| I(L1) | 40 | 41 | 42 | (44) | 45 | 46 | 47 | |
| I(L2) | 50 | 51 | 52 | 54 | (55) | 56 | 57 | |
| I(L3) | 60 | 61 | 62 | 64 | 65 | (66) | 67 | |
| I(L0) | 70 | 71 | 72 | 74 | 75 | 76 | (77) | |
| ^ To (reference) | | | | | | | | |

For identifiers of abstract objects, see 5.7.

For identifiers of electricity related general purpose objects, see 5.8.

5.6 Value group F

The range for value group F is 0 to 255.

In all cases, if value group F is not used, it is set to 255.

5.6.1 Usage of value group F for billing periods

Value group F specifies the allocation to different billing periods (sets of historical values) for the objects with following codes:

- Value Group A: 1
- Value Group C: 1 to 99
- Value Group D: 0 to 3; 6; 8 to 13; 16; 21 to 23; 26.

This allocation is valid for $0 \leq F < 100$. See table A.2.

5.7 Abstract objects

Table 10 – Abstract object codes

| Abstract objects , general service entries | OBIS code | | | | | |
|--|-----------|---|-----|-----|-----|---|
| | A | B | C | D | E | F |
| Device ID numbers (non-energy/channel related) | | | | | | |
| Complete device ID | 0 | 0 | 96 | 1 | | |
| Device ID 1 (manufacturing number) | 0 | 0 | 96 | 1 | 0 | |
| | | | ... | ... | ... | |
| Device ID 10 | 0 | 0 | 96 | 1 | 9 | |
| Parameter changes, calibration and access | | | | | | |
| Number of configuration program changes | 0 | x | 96 | 2 | 0 | |
| Date of last configuration program change | 0 | x | 96 | 2 | 1 | |
| Date of last time switch program change | 0 | x | 96 | 2 | 2 | |
| Date of last ripple control receiver program change | 0 | x | 96 | 2 | 3 | |
| Status of security switches | 0 | x | 96 | 2 | 4 | |
| Date of last calibration | 0 | x | 96 | 2 | 5 | |
| Date of next configuration program change | 0 | x | 96 | 2 | 6 | |
| Number of protected configuration program changes ^a | 0 | x | 96 | 2 | 10 | |
| Date of last protected configuration program change ^a | 0 | x | 96 | 2 | 11 | |
| Input/output control signals | | | | | | |
| State of the input control signals | 0 | x | 96 | 3 | 1 | |
| State of the output control signals | 0 | x | 96 | 3 | 2 | |
| State of the internal control signals | 0 | x | 96 | 4 | 0 | |
| Internal operating status | 0 | x | 96 | 5 | 0 | |
| Battery entries | | | | | | |
| Battery use time counter | 0 | x | 96 | 6 | 0 | |
| Battery charge display | 0 | x | 96 | 6 | 1 | |
| Date of next change | 0 | x | 96 | 6 | 2 | |
| Battery voltage | 0 | x | 96 | 6 | 3 | |
| Number of power failures | | | | | | |
| Total failure of all three phases longer than internal autonomy | 0 | 0 | 96 | 7 | 0 | |
| Phase L1 | 0 | 0 | 96 | 7 | 1 | |
| Phase L2 | 0 | 0 | 96 | 7 | 2 | |
| Phase L3 | 0 | 0 | 96 | 7 | 3 | |

Table 10 (continued)

| Abstract objects, general service entries | OBIS code | | | | | |
|---|-----------|-----|-----|-----|-----|---|
| | A | B | C | D | E | F |
| Operating time | | | | | | |
| Time of operation | 0 | x | 96 | 8 | 0 | |
| Time of registration rate 1 | 0 | x | 96 | 8 | 1 | |
| Time of registration rate 2 | 0 | x | 96 | 8 | 2 | |
| ... | ... | ... | ... | ... | ... | |
| Time of registration rate 63 | 0 | x | 96 | 8 | 63 | |
| Environmental related parameters | | | | | | |
| Ambient temperature | 0 | x | 96 | 9 | 0 | |
| Manufacturer specific | 0 | x | 96 | 50 | x | x |
| | | | | | | |
| Manufacturer specific | 0 | x | 96 | 96 | x | x |
| NOTE If a value field is shaded, then this value group is not used. "x" is equal to any value within the range. | | | | | | |
| ^a Protected configuration is characterized by the need to open the main meter cover to modify it, or to break a metrological seal. | | | | | | |

In the manufacturer-specific objects, only those values which are not represented by another defined code, but need representation on the display as well shall be placed. If this is not required, the code shall use the possibilities of a value group above 127.

Table 11 – General error messages

| Abstract objects, general error messages | OBIS code | | | | | |
|---|-----------|---|----|----|----------------|---|
| | A | B | C | D | E | F |
| Error object | 0 | x | 97 | 97 | x ^a | |
| NOTE If a value field is shaded, then this value group is not used. "x" is equal to any value within the range. | | | | | | |
| ^a If only one object is instantiated, the value shall be 0. | | | | | | |

5.8 Electricity-related general purpose objects

Table 12 – General purpose codes (electricity)

| Electricity-related general purpose objects | OBIS-code | | | | | |
|---|-----------|---|---|---|---|---|
| | A | B | C | D | E | F |
| Free ID-numbers for utilities | | | | | | |
| Complete combined electricity ID | 1 | x | 0 | 0 | | |
| Electricity ID 1 | 1 | x | 0 | 0 | 0 | |
| ... | | | | | | |
| Electricity ID 10 | 1 | x | 0 | 0 | 9 | |
| Billing period values/reset counter entries | | | | | | |
| Billing period counter | 1 | x | 0 | 1 | 0 | |
| Number of available billing periods | 1 | x | 0 | 1 | 1 | |

Table 12 (continued)

| Electricity-related general purpose objects | OBIS-code | | | | | |
|--|-----------|---|-------|-------|-------|------------------------------|
| | A | B | C | D | E | F |
| Time stamp of the billing period VZ (last reset) | 1 | x | 0 | 1 | 2 | VZ |
| Time stamp of the billing period VZ ₋₁ | 1 | x | 0 | 1 | 2 | VZ ₋₁ |
| | | | | | | |
| Time stamp of the billing period VZ _{-n} | 1 | x | 0 | 1 | 2 | VZ _{-n} |
| Program entries | | | | | | |
| Configuration program version number | 1 | x | 0 | 2 | 0 | |
| Parameter record number | 1 | x | 0 | 2 | 1 | |
| Time switch program number | 1 | x | 0 | 2 | 2 | |
| RCR program number | 1 | x | 0 | 2 | 3 | |
| Meter connection diagram ID | 1 | x | 0 | 2 | 4 | |
| Output pulse constants | | | | | | |
| R _{LW} (Active energy, metrological LED) | 1 | x | 0 | 3 | 0 | |
| R _{LB} (Reactive energy, metrological LED) | 1 | x | 0 | 3 | 1 | |
| R _{LS} (Apparent energy, metrological LED) | 1 | x | 0 | 3 | 2 | |
| R _{AW} (Active energy, output pulse) | 1 | x | 0 | 3 | 3 | |
| R _{AB} (Reactive energy, output pulse) | 1 | x | 0 | 3 | 4 | |
| R _{AS} (Apparent energy, output pulse) | 1 | x | 0 | 3 | 5 | |
| Ratios | | | | | | |
| Reading factor for power | 1 | x | 0 | 4 | 0 | |
| Reading factor for energy | 1 | x | 0 | 4 | 1 | |
| Transformer ratio – current (numerator) ^b | 1 | x | 0 | 4 | 2 | V _{-y} ^a |
| Transformer ratio – voltage (numerator) ^b | 1 | x | 0 | 4 | 3 | V _{-y} ^a |
| Overall transformer ratio (numerator) ^b | 1 | x | 0 | 4 | 4 | V _{-y} ^a |
| Transformer ratio – current (denominator) ^b | 1 | x | 0 | 4 | 5 | V _{-y} ^a |
| Transformer ratio – voltage (denominator) ^b | 1 | x | 0 | 4 | 6 | V _{-y} ^a |
| Overall transformer ratio (denominator) ^b | 1 | x | 0 | 4 | 7 | V _{-y} ^a |
| Nominal values | | | | | | |
| Voltage [V] | 1 | x | 0 | 6 | 0 | |
| Basic/nominal current [A] | 1 | x | 0 | 6 | 1 | |
| Frequency [Hz] | 1 | x | 0 | 6 | 2 | |
| Maximum current [A] | 1 | x | 0 | 6 | 3 | |
| Reference voltage for power quality measurement | 1 | x | 0 | 6 | 4 | V _{-y} ^a |
| Input pulse constants | | | | | | |
| R _{EW} [Imp/kWh] (active energy) | 1 | x | 0 | 7 | 0 | |
| R _{EB} [Imp/kvarh] (reactive energy) | 1 | x | 0 | 7 | 1 | |
| R _{ES} [Imp/kVAh] (apparent energy) | 1 | x | 0 | 7 | 2 | |
| Measurement-/registration-period duration | | | | | | |
| Measurement period 1, for average value 1 | 1 | x | 0 | 8 | 0 | V _{-y} ^a |
| Measurement period 2, for average value 2 | 1 | x | 0 | 8 | 1 | V _{-y} ^a |
| Measurement period 3, for instantaneous value | 1 | x | 0 | 8 | 2 | V _{-y} ^a |
| Measurement period 4, for test value | 1 | x | 0 | 8 | 3 | |
| Recording interval 1, for load profile | 1 | x | 0 | 8 | 4 | V _{-y} ^a |
| Recording interval 2, for load profile | 1 | x | 0 | 8 | 5 | V _{-y} ^a |
| Billing period | 1 | x | 0 | 8 | 6 | V _{-y} ^a |

Table 12 (continued)

| Electricity-related general purpose objects | OBIS-code | | | | | |
|--|-----------|---|---|----|----|------------|
| | A | B | C | D | E | F |
| Time entries | | | | | | |
| Time expired since last end of billing period | 1 | x | 0 | 9 | 0 | |
| Local time | 1 | x | 0 | 9 | 1 | |
| Local date | 1 | x | 0 | 9 | 2 | |
| Reserved | 1 | x | 0 | 9 | 3 | |
| Reserved | 1 | x | 0 | 9 | 4 | |
| Week day (0..7) | 1 | x | 0 | 9 | 5 | |
| Time of last reset | 1 | x | 0 | 9 | 6 | |
| Date of last reset | 1 | x | 0 | 9 | 7 | |
| Output pulse duration | 1 | x | 0 | 9 | 8 | |
| Clock synchronization window | 1 | x | 0 | 9 | 9 | |
| Clock synchronization method | 1 | x | 0 | 9 | 10 | |
| Coefficients | | | | | | |
| Transformer magnetic losses | 1 | x | 0 | 10 | 0 | V_{-y}^a |
| Transformer thermal losses | 1 | x | 0 | 10 | 1 | V_{-y}^a |
| Line resistance losses | 1 | x | 0 | 10 | 2 | V_{-y}^a |
| Line reactance losses | 1 | x | 0 | 10 | 3 | V_{-y}^a |
| Measurement methods | | | | | | |
| Algorithm for active power measurement | 1 | x | 0 | 11 | 1 | |
| Algorithm for active energy measurement | 1 | x | 0 | 11 | 2 | |
| Algorithm for reactive power measurement | 1 | x | 0 | 11 | 3 | |
| Algorithm for reactive energy measurement | 1 | x | 0 | 11 | 4 | |
| Algorithm for apparent power measurement | 1 | x | 0 | 11 | 5 | |
| Algorithm for apparent energy measurement | 1 | x | 0 | 11 | 6 | |
| Algorithm for power factor calculation | 1 | x | 0 | 11 | 7 | |
| NOTE If the value field F is shaded, then value group F is not used. | | | | | | |
| ^a y can be set at any value between –1 and n ; for current values group F is not used. | | | | | | |
| ^b If a transformer ratio is expressed as a fraction the ratio is numerator, divided by denominator. If the transformer ratio is expressed by an integer or real figure, only the numerator is used. | | | | | | |

It should be noted, that some of the codes above are normally not used, as the related data items are covered by attributes of already defined objects (application dependent). See IEC 62056-62.

5.9 List objects

Lists – identified with one single OBIS code – are defined as a series of any kind of data (e.g. measurement value, constants, status, events).

Annex A (normative)

Code presentation

Depending on the environment used, the presentation of codes can be slightly different.

A.1 Reduced ID codes (e.g. for IEC 62056-21)

To comply with the syntax defined for protocol modes A to D of IEC 62056-21, the range of ID codes is reduced to fulfil the limitations which are usually applied to the number of digits and the ASCII representation of them. All value groups are limited to a range of 0 .. 99 and within that range, to the limits given in the relevant chapters.

Some value groups may be suppressed, if they are not relevant to an application:

Optional value groups: A, B, E, F

Mandatory value groups: C, D

To allow the interpretation of shortened codes delimiters are inserted between all value groups, see figure A.1:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| A | - | B | : | C | . | D | . | E | * | F |
|---|---|---|---|---|---|---|---|---|---|---|

IEC 304/02

Figure A.1 – Reduced ID code presentation

The delimiter between value groups E and F can be modified to carry some information about the source of a reset (& instead of * if the reset was performed manually).

For compatibility with existing implementations, in value group A an identifier for an energy type may be used even for abstract objects.

NOTE The manufacturer shall ensure that the combination of the OBIS code and the interface class (see IEC 62056-62) uniquely identifies each COSEM object as specified in this standard and in IEC 62056-62.

A.2 Display

The usage of OBIS codes to display values is normally limited in a similar way as for data transfer, e.g. according to IEC 62056-21.

Some codes may be replaced by letters to clearly indicate the differences from other data items:

Table A. 1 – Example of display code replacement

| Value group C | |
|---------------|--------------|
| OBIS code | Display code |
| 96 | C |
| 97 | F |
| 98 | L |
| 99 | P |

A.3 Special handling of value group F

Identifying values from previous billing periods uses the group F field to indicate the actual time periods/point.

Table A.2 – Values of billing periods

| Value group F | |
|------------------------|--|
| VZ₊₁ | Future period |
| VZ | Period 1 |
| VZ₋₁ | Period 2 |
| VZ₋₂ | Period 3 |
| VZ₋₃ | Period 4 |
| VZ₋₄ | ... |
| etc. | |
| | |
| 101 | Most recent value |
| 102 | Two most recent values |
| | |
| 125 | 25 most recent values |
| 126 | unspecified number of most recent values |

The value of the most recent (youngest) billing period is identified using the ID-code VZ (state of the billing period counter), and the second youngest is identified by the code VZ₋₁ etc. The operating mode of the billing period counter can differ, e.g. modulo-12 or modulo-100. The value that is represented after reaching the limit of the billing period counter, contains the billing period value code 0 for modulo-100, and 1 for other (e.g. modulo-12).

Values above 100 allow to identify profiles which contain values of more than one billing period. The maximum allowed value for this is 125.

The value 126 identifies a profile with values of an unspecified number of billing periods.

For thresholds the value group F contains a reference into several threshold levels for the same quantity (if applicable).

A.4 COSEM

The usage of OBIS codes in the COSEM environment is defined in IEC 62056-62.

Index

- Abstract objects, 9, 10, 18, 19
 - Active, 11, 20
 - Angle, 17
 - Angles, 11
 - Apparent, 11, 20
 - Battery, 18
 - Billing period, 14, 19, 20, 21, 24
 - Calibration, 18
 - Channel, 10
 - Control signals, 18
 - Country specific, 10, 15
 - Current, 7, 8, 12, 11, 13, 14, 17, 20, 21
 - Device ID, 18
 - Electricity, 6, 8, 9, 11, 12, 13, 19, 20, 21
 - Error, 10, 12, 19
 - Frequency, 11
 - Gas, 9
 - General purpose, 11, 15, 17, 19
 - General service, 10
 - Harmonic, 17, 22
 - Heat, 9
 - Limit, 13, 15, 23
 - Load profile, 22
 - Losses, 21
 - Manufacturer specific, 9, 10, 12, 14, 16, 19
 - Maximum, 13, 24
 - Minimum, 13
 - Power factor, 11, 20
 - Power failures, 18
 - Program, 18, 20
 - Quadrant, 12
 - Rate, 16
 - Reactive, 11, 20
 - Time, 13, 14, 18, 19, 20
 - Time integral, 13, 14
 - Total, 16, 18
 - Value group A, 8, 9
 - Value group B, 8
 - Value group C, 8, 10, 11, 22
 - Value group D, 9, 13, 15
 - Value group E, 9, 16, 17
 - Value group F, 9, 17, 23
 - Voltage, 8, 11, 16, 18, 20, 22
 - Water, 9
-



Standards Survey

The IEC would like to offer you the best quality standards possible. To make sure that we continue to meet your needs, your feedback is essential. Would you please take a minute to answer the questions overleaf and fax them to us at +41 22 919 03 00 or mail them to the address below. Thank you!

Customer Service Centre (CSC)

International Electrotechnical Commission

3, rue de Varembé

1211 Genève 20

Switzerland

or

Fax to: **IEC/CSC** at +41 22 919 03 00

Thank you for your contribution to the standards-making process.

A Prioritaire

Nicht frankieren
Ne pas affranchir



Non affrancare
No stamp required

RÉPONSE PAYÉE

SUISSE

Customer Service Centre (CSC)

International Electrotechnical Commission

3, rue de Varembé

1211 GENEVA 20

Switzerland



Q1 Please report on **ONE STANDARD** and **ONE STANDARD ONLY**. Enter the exact number of the standard: (e.g. 60601-1-1)

.....

Q2 Please tell us in what capacity(ies) you bought the standard (tick all that apply). I am the/a:

- purchasing agent ☐
librarian ☐
researcher ☐
design engineer ☐
safety engineer ☐
testing engineer ☐
marketing specialist ☐
other.....

Q3 I work for/in/as a:
(tick all that apply)

- manufacturing ☐
consultant ☐
government ☐
test/certification facility ☐
public utility ☐
education ☐
military ☐
other.....

Q4 This standard will be used for:
(tick all that apply)

- general reference ☐
product research ☐
product design/development ☐
specifications ☐
tenders ☐
quality assessment ☐
certification ☐
technical documentation ☐
thesis ☐
manufacturing ☐
other.....

Q5 This standard meets my needs:
(tick one)

- not at all ☐
nearly ☐
fairly well ☐
exactly ☐

Q6 If you ticked NOT AT ALL in Question 5 the reason is: (tick all that apply)

- standard is out of date ☐
standard is incomplete ☐
standard is too academic ☐
standard is too superficial ☐
title is misleading ☐
I made the wrong choice ☐
other

Q7 Please assess the standard in the following categories, using the numbers:

- (1) unacceptable,
(2) below average,
(3) average,
(4) above average,
(5) exceptional,
(6) not applicable

- timeliness.....
quality of writing.....
technical contents.....
logic of arrangement of contents
tables, charts, graphs, figures.....
other

Q8 I read/use the: (tick one)

- French text only ☐
English text only ☐
both English and French texts ☐

Q9 Please share any comment on any aspect of the IEC that you would like us to know:

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....



ISBN 2-8318-6160-8



9 782831 861609

ICS 91.140.50; 33.040.50

Typeset and printed by the IEC Central Office
GENEVA, SWITZERLAND