

© Copyright SEK. Reproduction in any form without permission is prohibited.

## Elmätare – Datakommunikation för avläsning av elmätare och för styrning av tariff och belastning – Del 47: COSEM transportskikt för IPv4-nät

*Electricity metering –  
Data exchange for meter reading, tariff and load control –  
Part 47: COSEM transport layers for IPv4 networks*

Som svensk standard gäller europastandarden EN 62056-47:2007. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62056-47:2007.

### Nationellt förord

Europastandarden EN 62056-47:2007

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62056-47, First edition, 2006 - Electricity metering - Data exchange for meter reading, tariff and load control - Part 47: COSEM transport layers for IPv4 networks**

utarbetad inom International Electrotechnical Commission, IEC.

### *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

### *Stora delar av arbetet sker internationellt*

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

### *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

### **SEK Svensk Elstandard**

Box 1284  
164 29 Kista  
Tel 08-444 14 00  
[www.elstandard.se](http://www.elstandard.se)

**Electricity metering -  
Data exchange for meter reading, tariff and load control -  
Part 47: COSEM transport layers for IPv4 networks  
(IEC 62056-47:2006)**

Equipements de mesure  
de l'énergie électrique -  
Echange des données pour la lecture  
des compteurs, le contrôle des tarifs  
et de la charge -  
Partie 47 : Couches de transport COSEM  
pour réseaux IPv4  
(CEI 62056-47:2006)

Messung der elektrischen Energie -  
Zählerstandsübertragung,  
Tarif- und Laststeuerung -  
Teil 47: COSEM Transportschichten  
für IPv4 Netzwerke  
(IEC 62056-47:2006)

This European Standard was approved by CENELEC on 2006-12-01. 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, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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 13/1386/FDIS, future edition 1 of IEC 62056-47, prepared by IEC TC 13, Electrical energy measurement, tariff- and load control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62056-47 on 2006-12-01.

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) 2007-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2009-12-01

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 62056-47 / EN 62056-47 is based.

The IEC and CENELEC take 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 from:

DLMS <sup>1)</sup> User Association  
Geneva / Switzerland  
[www.dlms.ch](http://www.dlms.ch)

Annex ZA has been added by CENELEC.

---

## Endorsement notice

The text of the International Standard IEC 62056-47:2006 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62056-46      NOTE Harmonized as EN 62056-46:2002 (not modified).

---

---

<sup>1)</sup> Device Language Message Specification

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

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/TR 62051-1	2004	Electricity metering - Data exchange for meter - reading, tariff and load control - Glossary of terms - Part 1: Terms related to data exchange with metering using DLMS/COSEM	-	-
IEC 62056-53	2006	Electricity metering - Data exchange for meter reading, tariff and load control - Part 53: COSEM application layer	EN 62056-53	2007
IEC 62056-62	2006	Electricity metering - Data exchange for meter reading, tariff and load control - Part 62: Interface classes	EN 62056-62	2007
STD 0005	1981	Internet Protocol	-	-
STD 0006	1980	User Datagram Protocol	-	-
STD 0007	1981	Transmission Control Protocol	-	-



## CONTENTS

1	Scope.....	5
2	Normative references .....	5
3	Terms, definitions and abbreviations .....	6
4	Overview .....	6
5	The COSEM connection-less, UDP-based transport layer.....	8
5.1	General.....	8
5.2	Service specification for the COSEM UDP-based transport layer.....	9
5.3	Protocol specification for the COSEM UDP-based transport layer.....	12
6	The COSEM connection-oriented, TCP-based transport layer.....	14
6.1	General.....	14
6.2	Service specification for the COSEM TCP-based transport layer .....	15
6.3	Protocol specification for the COSEM TCP-based transport layer.....	25
	Annex A (informative) Converting OSI-style transport layer services to and from RFC-style TCP function calls .....	32
	Bibliography.....	38
	INDEX .....	39
	Figure 1 – COSEM as a standard Internet application protocol .....	7
	Figure 2 – Transport layers of the COSEM_on_IP profile .....	8
	Figure 3 – Services of the COSEM connection-less, UDP-based transport layer .....	9
	Figure 4 – The wrapper protocol data unit (WPDU).....	13
	Figure 5 – The COSEM connection-less, UDP-based transport layer PDU (UDP-PDU) .....	13
	Figure 6 – Services of the COSEM connection-oriented, TCP-based transport layer .....	16
	Figure 7 – The TCP packet format .....	26
	Figure 8 – Figure TCP connection establishment .....	27
	Figure 9 – Disconnecting a TCP connection.....	28
	Figure 10 – Data communication using the COSEM TCP-based transport layer .....	30
	Figure 11 – High-level state transition diagram for the wrapper sub-layer .....	30
	Figure A.1 – TCP connection state diagram .....	32
	Figure A.2 – MSC and state transitions for establishing a transport layer and TCP connection .....	33
	Figure A.3 – MSC and state transitions for closing a transport layer and TCP connection .....	34
	Figure A.4 – Polling the TCP sub-layer for TCP abort indication .....	35
	Figure A.5 – Sending an APDU in three TCP packets .....	36
	Figure A.6 – Receiving the message in several packets.....	37
	Table 1 – Reserved wrapper Port numbers in the UDP-based COSEM profile.....	14

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

## Part 47: COSEM transport layers for IPv4 networks

### 1 Scope

This part of IEC 62056 specifies the transport layers for COSEM communication profiles for use on IPv4 networks.

These communication profiles contain a connection-less and a connection-oriented transport layer, providing OSI-style services to the service user COSEM application layer. The connection-less transport layer is based on the Internet standard User Datagram Protocol. The connection-oriented transport layer is based on the Internet standard Transmission Control Protocol.

Although the major part of the COSEM transport layers is the UDP and TCP as they are specified in the relevant Internet standards, they include an additional sub-layer, called wrapper.

Annex A shows how the OSI-style transport layer services can be converted to and from UDP and TCP function calls.

### 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 (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 62051-1:2004, Ed.1., *Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms – Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM*

IEC 62056-53, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 53: COSEM application layer*<sup>3</sup>

IEC 62056-62, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 62: Interface classes*<sup>3</sup>

STD0005 – *Internet Protocol*

*Author: J. Postel*

*Date: September 1981*

*Also: RFC0791, RFC0792, RFC0919, RFC0922, RFC0950, RFC1112*