

Common Control Interface for networked digital audio
and video products - Part 7: Measurements

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 62379-7:2015 sisaldab Euroopa standardi EN 62379-7:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 62379-7:2015 consists of the English text of the European standard EN 62379-7:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 07.08.2015.	Date of Availability of the European standard is 07.08.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 33.160, 35.100

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

ICS 33.160; 35.100

English Version

**Common Control Interface for networked digital audio and video
products - Part 7: Measurements
(IEC 62379-7:2015)**

Interface de commande commune destinée aux produits
audio et vidéo numériques connectés en réseau - Partie 7 :
Mesures
(IEC 62379-7:2015)

Gemeinsame Steuerschnittstelle für netzwerkbetriebene
digitale Audio- und Videogeräte - Teil 7: Messungen
(IEC 62379-7:2015)

This European Standard was approved by CENELEC on 2015-07-21. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 100/2168/CDV, future edition 1 of IEC 62379-7, prepared by IEC/TC 100, "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62379-7:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-04-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-07-21

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

Endorsement notice

The text of the International Standard IEC 62379-7:2015 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 62379 (series)	NOTE	Harmonized as EN 62379 (series).
--------------------	------	----------------------------------

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here:
www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62379-1	-	Common control interface for networked digital audio and video products -- Part 1: General	EN 62379-1	-
IEC 62379-2	2008	Common control interface for networked digital audio and video products -- Part 2: Audio	EN 62379-2	2009
IEC 62379-3	-	Common control interface for networked digital audio and video products -- Part 3: Video	EN 62379-3	-

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	10
2 Normative references.....	10
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	10
4 Audio format definitions	11
5 Video format definitions	11
6 MIB definitions for measurement information blocks	11
6.1 General.....	11
6.2 Type definitions.....	12
6.2.1 General	12
6.2.2 Textual conventions	12
6.2.3 Sequences.....	13
6.3 Network measurement information blocks	14
6.3.1 Network measurement information block structure	14
6.3.2 nMtBlockTable	15
6.3.3 nMtBlockEntry.....	15
6.3.4 nMtBlockId.....	15
6.3.5 nMtIfIndex.....	15
6.3.6 nMtTxRxPoint	15
6.3.7 nMtNetworkType	16
6.3.8 nMtTransportType	16
6.3.9 nMtTxRxAddr	16
6.3.10 nMtPortNumber.....	16
6.3.11 nMtIGMPVersion	16
6.3.12 nMtSIPServerAddr	16
6.4 Audio measurement information blocks.....	17
6.4.1 Audio measurement information block structure	17
6.4.2 aMtBlockTable	17
6.4.3 aMtBlockEntry.....	17
6.4.4 aMtBlockId.....	18
6.4.5 aMtAudioComponentNumber	18
6.4.6 aMtNetworkBlockId	18
6.4.7 aMtAudioStatus.....	18
6.4.8 aMtAudioSignalFormat	18
6.4.9 aMtAudioPIId	18
6.4.10 aMtIfIndex.....	18
6.4.11 aMtFECType.....	19
6.4.12 aMtFECLengthDimension	19
6.5 Video measurement information blocks	19
6.5.1 Video measurement information block structure	19
6.5.2 vMtBlockTable	20

6.5.3	vMtBlockEntry	20
6.5.4	vMtBlockId	20
6.5.5	vMtAudioBlockId	20
6.5.6	vMtNetworkBlockId	20
6.5.7	vMtVideoStatus	20
6.5.8	vMtVideoSourceFormat	20
6.5.9	vMtVideoCodingType	21
6.5.10	vMtVideoBitRateType	21
6.5.11	vMtVideoBitRate	21
6.5.12	vMtVideoAspectRatio	21
6.5.13	vMtFECType	21
6.5.14	vMtFECLengthDimension	21
6.5.15	vMtTrickModeSupport	21
6.6	Receiver point measurement information block	21
6.6.1	Receiver measurement information block structure	21
6.6.2	rxPointTable	22
6.6.3	rxPointEntry	23
6.6.4	rxPointBlockId	23
6.6.5	rxPointNetworkBlockId	23
6.6.6	rxPointBufferSize	23
6.6.7	rxPointBufferOccupancyTime	23
6.6.8	rxPointBufferOccupancyPcnt	23
6.6.9	rxPointMDI	23
6.6.10	rxPointTSDF	23
6.7	Temperature measurement information block	23
6.7.1	Temperature measurement information block structure	23
6.7.2	temperatureTable	24
6.7.3	temperatureEntry	24
6.7.4	temperatureBlockId	24
6.7.5	temperatureLocnNumber	25
6.7.6	temperatureLocation	25
6.7.7	temperatureTrend	25
6.7.8	temperatureStatus	25
6.7.9	temperatureLowWarning	25
6.7.10	temperatureHighWarning	25
6.7.11	temperatureLowCritical	25
6.7.12	temperatureHighCritical	25
Annex A (informative)	Machine-readable measurement block definitions	26
Annex B (informative)	Machine-readable textual conventions definitions	44
Annex C (informative)	Worked example	48
C.1	Overview	48
C.2	Example 1	48
C.2.1	General	48
C.2.2	Block table	48
C.2.3	Mixer block	50
C.2.4	Multiple functionality device	51
C.2.5	Summary of tables	54
Bibliography	55

Figure 1 – Relationships between ECN groups ACIP, VCIP and IPM	8
Figure 2 – Network measurement information block	14
Figure 3 – Audio measurement information block	17
Figure 4 – Video measurement information block	19
Figure 5 – Receiver measurement information block	22
Figure 6 – Temperature measurement information block	24
Figure C.1 – Example of a modified audio device	48
Figure C.2 – Annotated connector diagram	49
Figure C.3 – Mixer section	50
Figure C.4 – Single device with multiple functionality	52
Figure C.5 – Measurement blockIds and their associated media components	52
Figure C.6 – Single device with multiple functionality	53
Table 1 – Managed objects for network measurement information blocks	15
Table 2 – Managed objects for audio measurement information blocks	17
Table 3 – Managed objects for video measurement information blocks	20
Table 4 – Managed objects for receiver measurement information blocks	22
Table 5 – Managed objects conveying temperature information about the unit	24
Table C.1 – Main block Id table	49
Table C.2 – Mixer related block Id table	50
Table C.3 – Mixer block tables	51
Table C.4 – Addition of measurement block Ids	52
Table C.5 – Video measurement table	53
Table C.6 – Network measurement table	53
Table C.7 – Audio measurement table	53
Table C.8 – Table summary	54

INTRODUCTION

IEC 62379 specifies the common control interface, a protocol for managing equipment which conveys audio and/or video across digital networks.

An introduction to the common control interface is given in IEC 62739-1.

This part of IEC 62379 specifies those aspects that are specific for using the block structure as defined in IEC 62379-1, for standardising the collection method of audio and video parameters for use by the European Broadcasting Union Expert Communities Networks – Internet Protocol (IP) Measurements (EBU ECN-IPM) Group.

The collection of network related parameters may be outside the scope of this standard. These are expected to be collected from the standard Internet Engineering Task Force (IETF) Management Information Base (MIBs) that are generally present in most (if not all) networked equipment. Some specific network parameters are included that are not obtainable from existing standard IETF MIBs.

Structure of the family of standards

IEC 62379 specifies the common control interface, a protocol for managing networked audiovisual equipment. It is intended to include the following Parts:

Part 1: General

Part 2: Audio

Part 3: Video

Part 4: Data

Part 5: Transmission over networks

Part 6: Packet transfer service

Part 7: Measurement

Part 1 specifies aspects which are common to all equipment.

Parts 2 to 4 specify control of internal functions specific to equipment carrying particular types of live media. Part 4 does not refer to packet data such as the control messages themselves.

Part 5 specifies control of transmission of these media over each individual network technology. It includes network specific management interfaces along with network specific control elements that integrate into the control framework.

Part 6 specifies carriage of control and status messages and non-audiovisual data over transports that do not support audio and video, such as RS232 serial links, with (as with Part 5) a separate subpart for each technology.

Part 7 specifies those aspects that are specific to the measurement requirements of the EBU ECN-IPM Group.

An introduction to the common control interface is given in IEC 62739-1.

Description, aims and requirements of the EBU ECN-IPM Group

In recent years, EBU members have been increasingly adopting IP networks for the contribution of audio and video in real-time. It is well known that although IP networks are of lower cost and provide more flexibility compared with circuit switched networks, they suffer

from longer delays and have much larger jitter, while broadcasters' tolerance to these variables is much less than that of normal business IT traffic.

To respond to Members' use of IP, EBU set up two groups, *Expert Communities Networks Audio contribution over IP (ECN-ACIP)* and *Expert Communities Networks – Video contribution over IP (ECN-VCIP)*, with the tasks of drawing up recommended codes of practice¹.

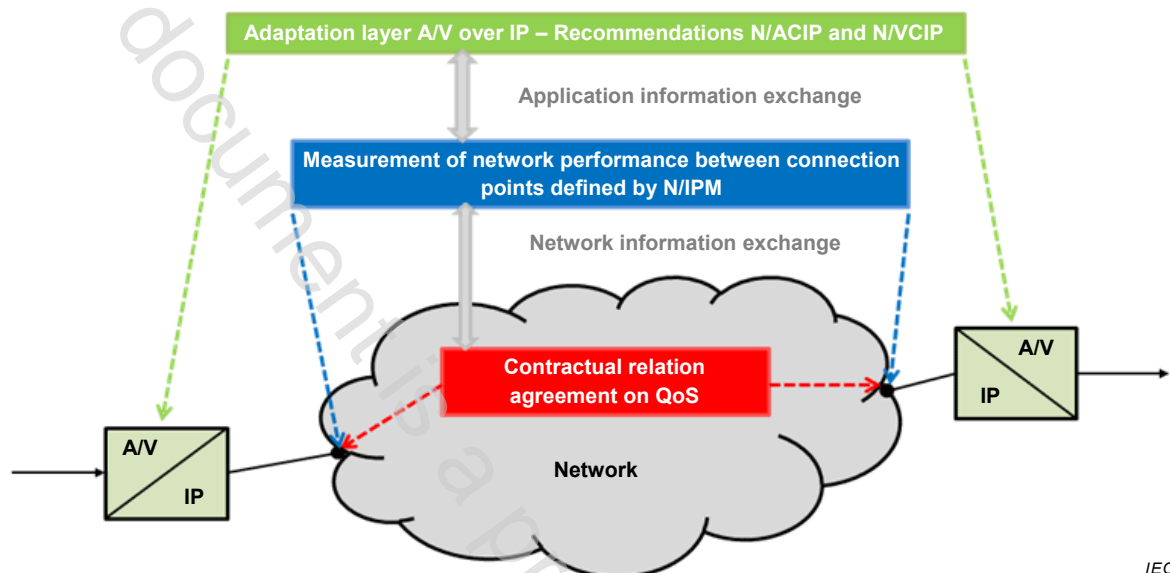


Figure 1 – Relationships between ECN groups ACIP, VCIP and IPM

It was also recognised that there would be a strong demand for tools that would enable broadcasters to measure and manage their IP networks properly to suit the many time-critical broadcast applications they would be subjected to. To this end, the ECN-IPM (IP measurement) group was set up. The relationships between these three groups are shown in Figure 1.

The goals of ECN-IPM Group were to

- define a quality of service classification to achieve requested A/V transmission quality for broadcast applications,
- standardise network information exchange between EBU members and Telecom suppliers,
- propose a method of collecting end-to-end performance information for management purposes.

In achieving these goals the ECN-IPM Group has specified a set of parameters that are important for broadcasters when using IP networks for audio and video transmission and has developed a software mechanism to probe a network for device and topology discovery, physical path tracing for both end-to-end communication and multicast streams, with the potential for multilayer monitoring for streams on a multi-vendor network with fully media-specific parameters.

The specified parameters cover both the network layer and application layer (for video and audio). SNMP is employed to collect information on the status of networked devices, such as the transmission rate, error rate, the codec used and multicast streams status.

¹ ECN-ACIP and ECN-VCIP were formerly known as N/ACIP and N/VCIP respectively.

To ensure that all the parameters can be recovered from a variety of different manufacturers' IP equipment, the group has designed a Management Information Base (MIB). Although many MIB files have been published over the years, especially on the network side, very little standardisation work has been done on Audio/Video (A/V) codec MIB files. The EBU ECN-IPM Group has therefore proposed a new standard, based upon the IEC 62379 series to address this issue.

Two EBU technical publications have been produced by the ECN-IPM Group.

The parameters and new MIB information may be found in EBU-Tech 3345, End-to-End IP Network Measurement for Broadcast Applications – Parameters & Management Information Base (MIB), Geneva, July 2011.

A description of the software mechanism, EisStream², may be found in EBU-Tech 3346, End-to-End IP Network Measurement for Broadcast Applications – EisStream Software package description, Geneva, July 2011. The software is written in Java and it provides physical path tracing for IP traffic using SNMP.

This part of IEC 62379 and other related parts of IEC 62379, constitute the standards upon which Section 3 of EBU-Tech 3345 is based.

If there is any inconsistency between this standard and Section 3 of EBU-Tech 3345, then IEC 62379-7 and other related parts of IEC 62379, take precedence.

2 EBU Integrated Monitoring Solution for Media Streams on IP Networks, <http://eisstream.sourceforge.net/>