SLOVENSKI STANDARD
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Terminalska oprema (TE) ï Digitalno omreģje z integriranimi storitvami (ISDN) ï Veļ toļ kovne komunikacije za avdiovizualne storitve ï Glavne funkcionalnosti in osnovne zahteve za veļ toļ kovne krmilne enote (MCU)

Terminal Equipment (TE); Integrated Services Digital Network (ISDN); Multipoint communications for audiovisual services; Main functionalities and basic requirements for Multipoint Control Units (MCUs)

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ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

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Foreword

This European Telecommunication Standard has been prepared by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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1 Scope

This ETS specifies the functional requirements applicable to a Multipoint Control Unit (MCU), or a set of interconnected MCUs, which allows several audiovisual terminals to communicate simultaneously using single or multiple digital channels up to 1 920 kbit/s when interconnected through the pan-European Integrated Services Digital Network (ISDN).

This ETS specifies the basic in-band signalling procedures to be supported to control the operation of MCU and audiovisual terminals involved in a simple multipoint communication or a basic video/ audiographic conference as specified in other standards.

This ETS includes an overall description of the basic and optional functionalities of a MCU, and lists the related requirements.

Annex A (informative) describes the various requirements which apply to audiovisual terminals in order to ensure their capability to take part in multipoint communications.

A MCU with any interface connected to the ISDN via a Channel Aggregation Unit (CAU) and/or special interface adapters may be used for multipoint communication when the composite equipment complies with all requirements specified in this ETS. However, the various related pieces of equipment are outside the scope of this ETS.

A MCU may establish conferences which include not only audiovisual terminals connected through an ISDN, but also some audiovisual terminals directly linked through digital leased lines.

A MCU may set up a conference where the connected terminals include not only videoconference and videotelephony terminals but also Audiographic conference, 7 kHz telephony or 3,1 kHz telephony terminals. The description of protocols and requirements is limited to the basic multipoint communication established between various terminals supporting 3,1 kHz telephony, 7 kHz telephony, or the Videotelephony teleservice. The protocols and requirements necessary to support more sophisticated services, such as Videoconference, Audiographic conference, or applications based on data transmission are not considered here.

NOTE 1: The T.120 series of ITU-T Recommendations presently developed by ITU-T SG 8 should be used to support such enhanced functionalities.

Use of the protocol specified in ITU-T Recommendation H.243 to support these functionalities should be precluded since it would result in incompatibilities between MCUs and/or terminals.

NOTE 2: In the case of interworking with Public Switched Telephone Network (PSTN) or mobile telephony terminals, echoes and/or transmission delays can degrade the audio communication quality to an unacceptable level.

A MCU may be owned either by a public service provider or by a private customer. In the latter case the equipment is part of a Private Telephone Network.

The D-channel signalling protocol used to set up, modify and clear a multipoint communication is outside the scope of this ETS.

On line procedure and/or protocol to be used by an end user to require, modify or cancel a conference reservation is outside the scope of this ETS.

Implementation of the T.120 series of ITU-T Recommendations for the support of the enhanced functions associated to various options of the videoconference service (e.g. Conference control, multipoint data communication service) is outside the scope of this ETS.

Conformance to this ETS will be demonstrated by checking that all mandatory functional requirements are supported during execution of a test suite which is specified in other ETSs.

2 Normative references

This ETS 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 listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 144: "Integrated Services Digital Network (ISDN); Audiovisual services; Frame structure for a 64 kbit/s to 1 920 kbit/s channel and associated syntax for inband signalling".

[2] ITU-T Recommendation G. 728 (1993): "Coding of speech at 16 kbit/s using low-delay code excited linear prediction".

[3] CCITT Recommendation G. 711 (1988): "Pulse code modulation (PCM) of voice frequencies".

[4] CCITT Recommendation G. 722 (1988): "7 kHz audio-coding within 64 kbit/s".

[5] ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

[6] ETS 300 011: "Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles".

[7] ETS 300 290: "Business TeleCommunications (BTC); 64 kbit/s digital unrestricted leased line with octet integrity (D64U); Terminal equipment interface".

[8] ETS 300 248: "Business Telecommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s unstructured leased line (D2048U); Terminal equipment interface".

[9] ETS 300 420: "Business TeleCommunications (BTC); 2 048 kbit/s structured leased line (D2048S); Terminal equipment interface".

[10] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[11] ETS 300 267: "Integrated Services Digital Network (ISDN); Telephony 7 kHz and videotelephony teleservices; Digital Subscriber Signalling System No. one (DSS1) protocol".

[12] ETS 300 164: "Integrated Services Digital Network (ISDN); Meet-Me Conference (MMC) supplementary service; Service description".

[13] ETS 300 185: "Integrated Services Digital Network (ISDN); Conference call add-on (CONF) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol".

[14] ETS 300 143: "Integrated Services Digital Network (ISDN); Audiovisual services; Inband signalling procedures for audiovisual terminals using digital channels up to 2 048 kbit/s".

[15] ETS 300 145: "Integrated Services Digital Network (ISDN); Audiovisual services; Videotelephone systems and terminal equipment operating on one or two 64 kbit/s channels".

[16] ITU-T Recommendation H. 261: "Video codec for audiovisual services at p x 64 kbit/s".

3 Definitions

For the purposes of this ETS, the following definitions apply:

Conference control: The capability conferred to one terminal to control operation of the MCU. This function requires a specially designed terminal. The terminal user may be the actual chairman of the meeting or the conference controller.

Directly connected terminal or **Local terminal**: A terminal connected to a given MCU (this wording should be used only in case of multiple MCU configuration).

Master MCU: The MCU selected to control the system operation in case of multiple MCU configuration.

Multipoint Control Unit (**MCU)**: A functional entity which is used to establish a multipoint communication between several audiovisual (or audio only) terminals. A MCU may be owned by the customer (and located in its premises) or may be offered by a service provider/network operator.

MCU Port: The bi-directional access point of the digital link established between a terminal (or another MCU) and a MCU. It is a logical entity; a port may eventually require several MCU-Network physical interfaces, but several ports may also share a MCU-Network physical interface.

Primary Port: A MCU Port where the connected terminal can support the SCM.

Secondary Port: A MCU Port where the connected terminal has a lower capability than the SCM.

Selected Communication Mode (**SCM)**: Common operating mode of most terminals during the conference. It defines symmetrical rates for audio, video and any data path.

token: A virtual token which may be allocated by a controlling entity (MCU or Conference-control terminal) to confer, to a requesting terminal, authorisation to initiate a special activity (e.g. video broadcast, data transmission) which otherwise would be in conflict with normal or similar activities of other terminals. Such a token may be allocated or "passed" successively from one terminal to another.

4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

APU	Audio Processor Unit
BAS	Bit-rate Allocation Signal
C&I	Control and Indication
cap-set	capability set
CAU	Channel Aggregation Unit
CLIP	Calling Line Identification Presentation
CPU	Control Processor Unit
DPU	Data Processor Unit
ECS	Encryption Control Signal
FAS	Frame Alignment Signal
ISDN	Integrated Services Digital Network
MBE	Multiple Byte Extension (BAS codes)
MCS	Multipoint Communication Service
MCU	Multipoint Control Unit
MDU	Multiplexer/Demultiplexer Unit
MLP	Logical data sub-channel which may contain various data protocols (also referred to as Multi-Layer Protocol in ETS 300 144 [1])
NIU	Network Interface Unit
OA&MT	Operation, Administration and Maintenance Terminal
ONP	Open Network Provision
PIN	Personal Identification Number
PSTN	Public Switched (analogue) Telephone Network
SBE	Single Byte Extension (BAS codes)
SCM	Selected Communication Mode
SCM-cap	SCM capability set

VPU Video Processor Unit

NOTE: A complementary list of abbreviations used for C&I (typed in bold characters) can be found in tables 5 and A.2.

5 Functional requirements for a MCU

5.1 Basic functions

A MCU includes several types of functional entities. An overall description is given by the schematic of figure 1 (see subclause 5.1.5). The various functional entities are listed and briefly described below. The two first types shall be provided for every individual port, while the others are common to all ports involved in a multipoint communication (conference).

NOTE: There is no particular limit set to the maximum number of ports involved in a conference, however it is practically limited, taking into account cost, set-up difficulty and audio performance degradation (noise).

A same piece of equipment called a MCU, may simultaneously handle several independent videoconferences.

5.1.1 Network Interface Unit (NIU)

The Network Interface Unit (NIU), supported by a local call control facility, has two basic tasks:

- the establishment and release of the digital link related to the port;
- the adaptation of the composite signal (audio + video + signalling + etc.) to the ISDN interface.

NOTE: The network access may use an external standard interface adapter.

5.1.2 Multiplexer/Demultiplexer Unit (MDU)

The Multiplexer/Demultiplexer Unit (MDU) performs the following tasks:

- the generation/recovery of in-band frame and multiframe synchronisation signals;
- the buffering and ordering of audio, video, data and in-band signalling signals;
- the transmission/reception of Bit-rate Allocation Signal (BAS) codes;
- the transmission/reception of optional data sub-channel(s).

This unit is also used to split/aggregate several "64 kbit/s channels" which may be necessary for a given port, when this is required by the selected transfer rate capability.

NOTE: Splitting/aggregation may be achieved in an external piece of equipment.