



SLOVENSKI STANDARD
SIST ENV 13321-2:2004
01-november-2004

Izmenjava podatkov v aplikacijah HVAC – Omrežje med elementi avtomatike – 2.
del: EIBnet

Data communication for HVAC application - Automation net - Part 2: EIBnet

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Ta slovenski standard je istoveten z: ENV 13321-2:2000

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97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

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EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
EUROPÄISCHE VORNORM

ENV 13321-2

February 2000

ICS 35.240.99; 97.120

English version

Data communication for HVAC application - Automation net - Part 2: EIBnet

This European Prestandard (ENV) was approved by CEN on 22 December 1999 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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1 Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 247 "Controls for mechanical building services", the secretariat of which is held by SNV.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Prestandard (ENV) is part of a series of standards for system-neutral data communications in HVAC systems. Together with prENV 13221-1 BACnet, Profibus and WorldFIP® this Prestandard covers the data communication on the Automation level.

The position of this standard in the whole range of standards for mechanical building services is illustrated in figure 1.

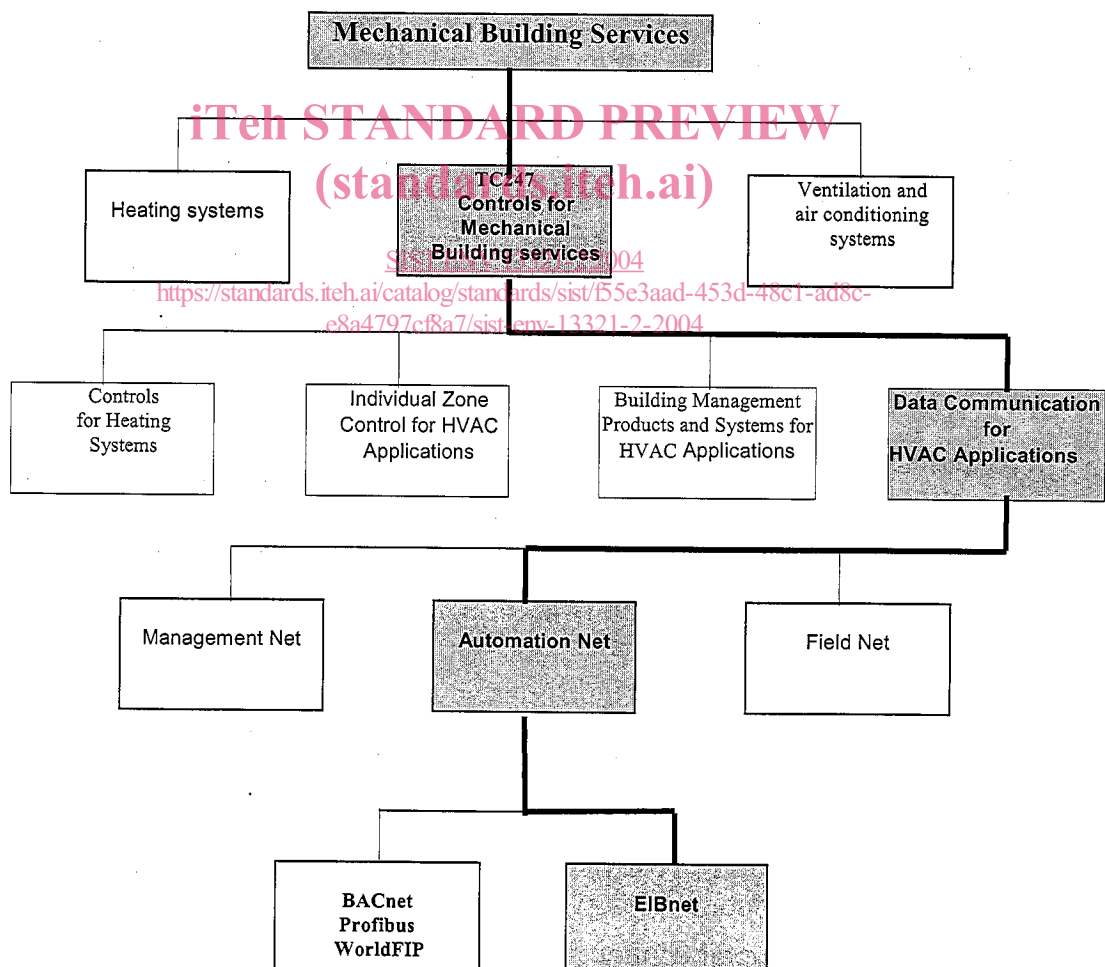


Figure 1 :Relationship to TC247

The shaded boxes in figure 1 indicate the contents and the hierarchy of this standard. The plain areas show the positioning of this standard in relationship to other relevant mechanical building services standards

2 Introduction

This specification of the EIB describe the usage of the EIB on the automation net level. The EIB on automation net level offers the possibility to use the EIB on faster Media. EIB devices for the automation net level use a homogeneous addressing method to the field net level. This allows to use the EIB with automation level devices like Application Specific Controller (ASC) and programmable controllers in home and light commercial building environment. EIB offers full compatibility for process communication and for monitoring, engineering and commanding of applications in ASC. Furthermore EIB on automation level is well suited for the interconnection of EIB-Networks. It supports the structured cabling approach.

The EIB system may be implemented on different media. Therefore this standard concerns only the media independent parts of the system called „protocol“.

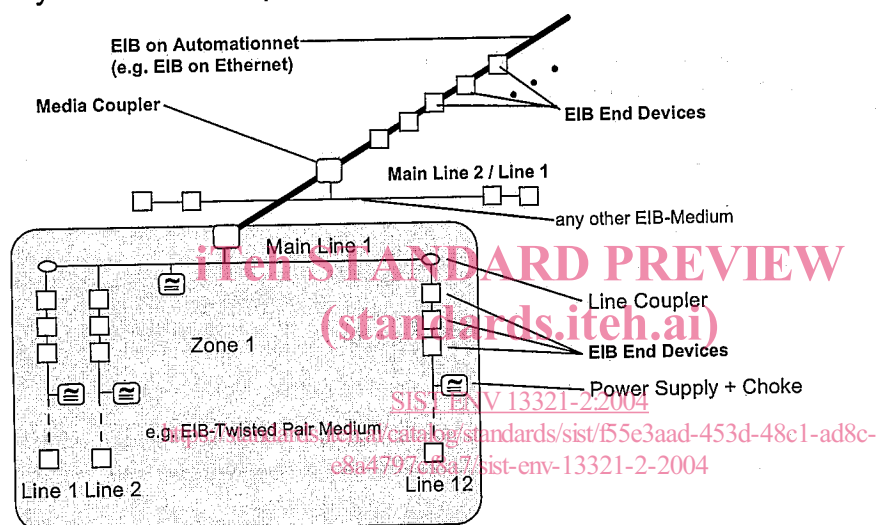


Figure 1: Relationship EIB to EIB on Automationnet

EIB	The EIB is a control system for all related applications in home and buildings.
Media Coupler	A Media Coupler connects a physical segment of EIB with a physical segment of an other EIB-Medium.
Device	A device is either a Coupler or an EIB end device. A device has a unique physical address.
EIB End Device	(EED) This is a device with a unique physical address, that performs an application in a heating, ventilating and air conditioning and related building management environment.
Line	A line may consist of up to 255 EIB end devices.
Line Coupler	A Line Coupler connects two lines.
EIB-System	An EIB-System is a number of EIB end devices using the same System-ID and being connected either to a line coupler or to a media coupler.
Network	A network or EIB network is a number of EIB-Systems.

3 Scope

This European Prestandard defines a system neutral data communication method for use at the automation level in heating, ventilating and air conditioning and related building management applications.

4 Normative references

This European Prestandard incorporates by 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 Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication applies.

ISO/IEC 8802-2 Information technology - Telecommunications and information exchange between systems -Local and metropolitan area networks - Specific requirements

5 General Requirements

Each of the following clauses describes an OSI layer. Each clause contains sub-clauses giving a survey about the remainder of the clause. Interoperations of a layer with its adjacent layers are described there.

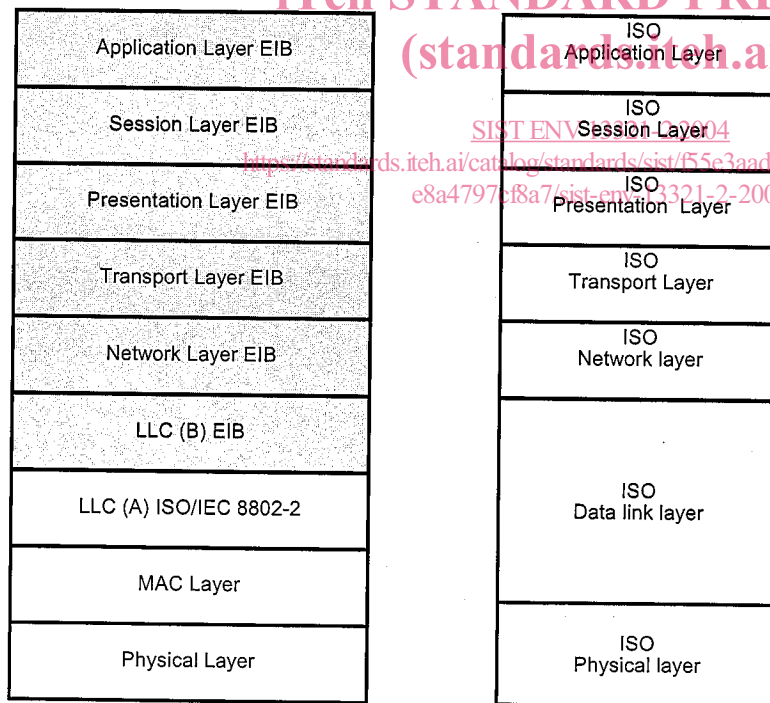


Figure 2: Relationship to LAN reference model

6 Physical Layer / MAC Layer / Logical Link Layer (A)

For the Physical Layer / MAC Layer all standards using the ISO/IEC 8802-2 Logical Link Layer can be used.

The International Standards for media access technologies using ISO/IEC 8802-2 as Logical Link Layer are as follows :

1. ISO/IEC 8802-3 / IEEE 802.3 a bus utilising CSMA/CD as the access method (Ethernet)
2. ISO/IEC 8802-4 / IEEE 802.4 a bus utilising token passing as the access method
3. ISO/IEC 8802-5 / IEEE 802.5 a ring utilising token passing as the access method
4. ISO/IEC 8802-6 / IEEE 802.6 a dual bus utilising distributed queuing as the access method
5. ISO/IEC 8802-7 / IEEE 802.7 a ring utilising slotted ring as the access method

Other types are under investigation.

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7 Logical Link Layer (B)

The EIB-Data Link Layer for automationnet level uses the Logical Link Layer from ISO/IEC 8802-2 with the DL-UNITDATA primitive only.

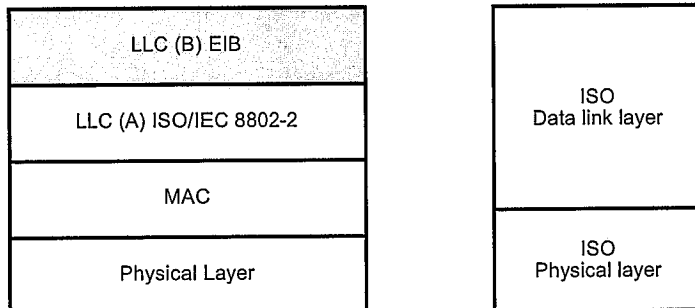


Figure 4: Relationship to LAN reference model

7.1 Address Types

7.1.1 MAC-Address

The MAC-Address is the physical device address of the used MAC-layer e.g. the Ethernet-Address. The MAC-address may be used as broadcast address.

7.1.2 System-Identifier

Only EIB-Devices with the same System-ID can communicate with each other. For communication between different systems there may exist EIB-Devices with more than one System-ID.

System-ID							
7	6	5	4	3	2	1	0

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Figure 5: System-Identifier

7.1.3 Physical Address

Each device, i.e. a router or an EIB end device shall have a unique physical address in an EIB-System. The physical address is a two octet value that consists of an eight bit device address, a four bit line address and a four bit zone address.

Physical Address															
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
zone address				line address				device address							

Figure 6: Physical Address

The device address shall be unique within a line. Routers shall always have the device address zero; EIB end devices may have addresses 1-255.

The line address shall be unique within a zone (0-15). The devices in the main line of a zone shall always have the line address zero.

The zone address shall be unique within an EIB network (0-15). The devices at the backbone-line shall always have the zone address zero.

The physical addressing uses the DL-UNITDATA primitive with broadcast addressing and with a specified MAC-address over the EIB for automationnet level.

7.1.4 Group Address

Group Address															
Dest. Address (high)							Dest. Address (low)								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

Figure 7: Group Address

The group address is a two byte value that doesn't need to be unique. An EIB end device may have more than one group address.

Each EIB end device belongs to group zero, i.e. request frames with destination group address zero are broadcasts.

The group addressing uses the DL-UNITDATA primitive with broadcast addressing only over the EIB for automationnet level

7.1.5 Poll-Group Address

Group Address															
Dest. Address (high)							Dest. Address (low)								
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

Figure 8: Poll-Group Address

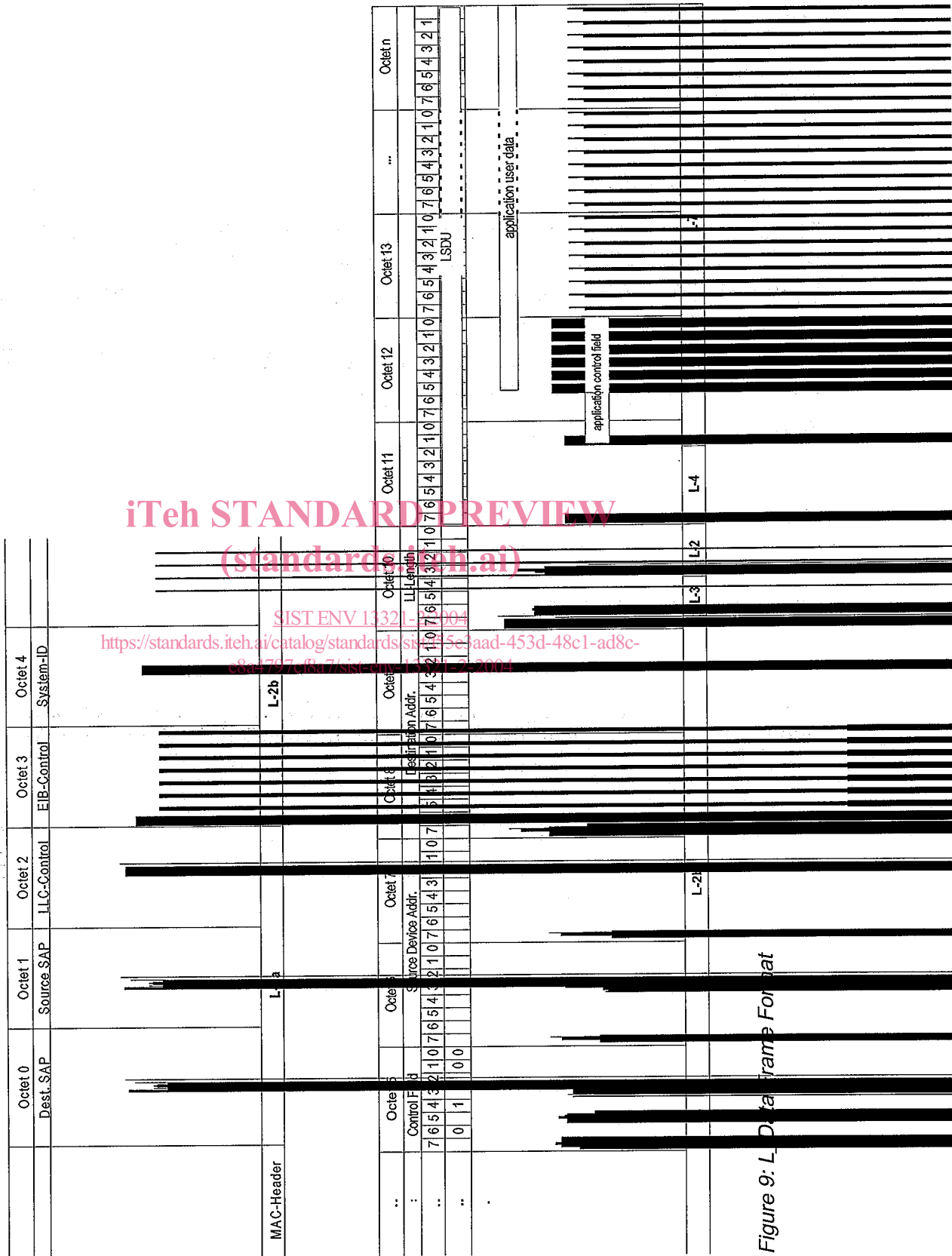
The Poll-Group Address is a two byte value that doesn't need to be unique. An EIB end device may have more than one Poll-Group Address.

The poll group addressing uses the DL-UNITDATA primitive with broadcast addressing for a request frame and with a specified MAC-address for any response frame over EIB.

7.2 Frame Formats

There exists two types of frames, the L-Data frame and the L-PollData frame. The L-Data frame is used for normal communication and the L-PollData frame is only used for polling mechanism.

7.2.1 Frame Format L-Data

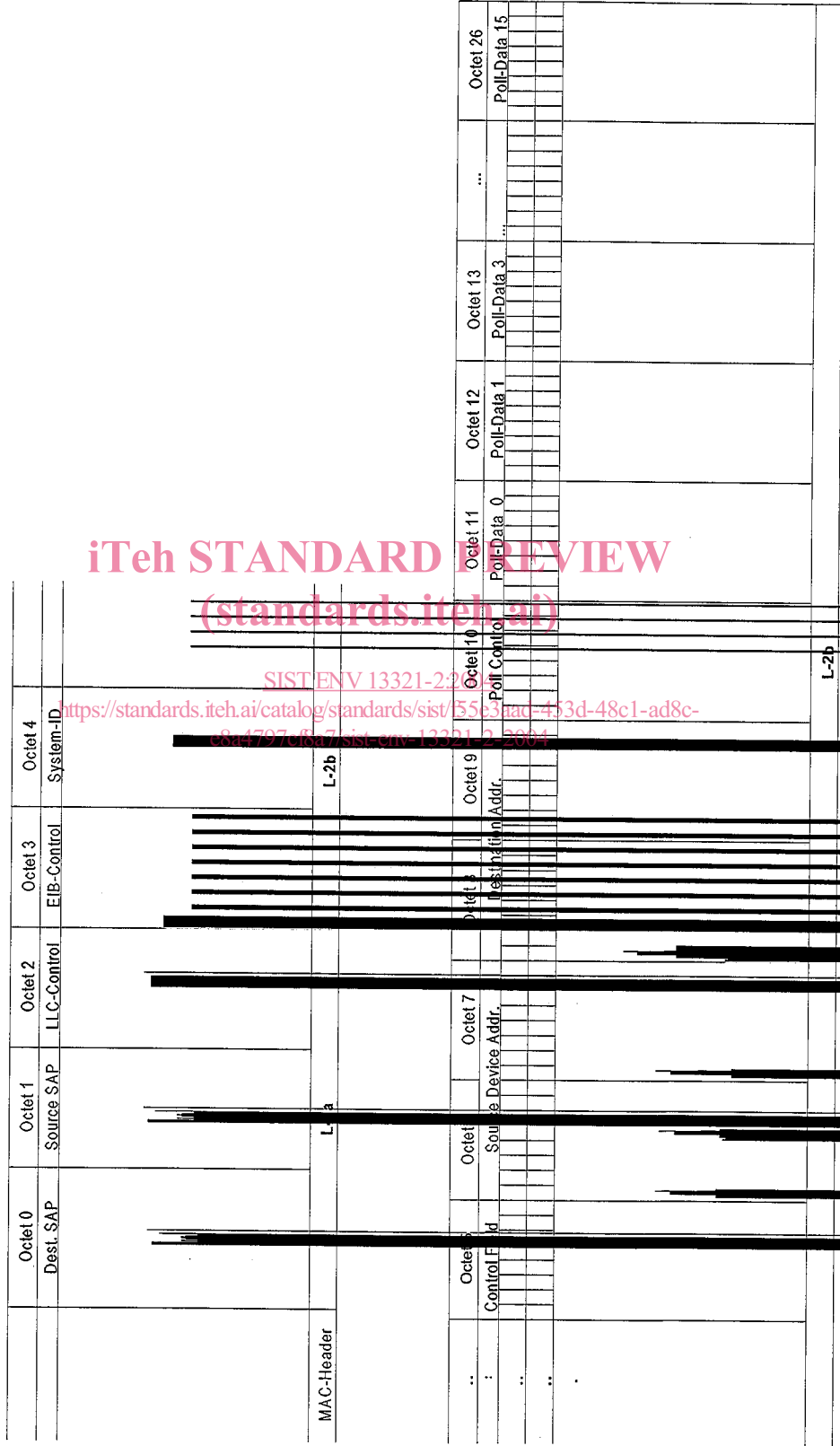


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Figure 9: L-Data Frame Format

7.2.2 Frame Format L-Poll-Data



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Figure 10: L-Poll-Data Frame Format