Irish Standard
I.S. EN 13321-2:2012

Open Data Communication in Building Automation, Controls and Building Management - Home and Building Electronic Systems - Part 2: KNXnet/IP Communication

I.S. EN 13321-2:2012

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Open Data Communication in Building Automation, Controls and Building Management - Home and Building Electronic Systems - Part 2: KNXnet/IP Communication

Réseau ouvert de communication de données pour l'automatisation, la régulation et la gestion technique du bâtiment - Systèmes électroniques pour la maison et le bâtiment - Partie 2: Communication KNXnet/IP

Offene Datenkommunikation für die Gebäudeautomation und Gebäudemanagement - Elektrische Systemtechnik für Heim und Gebäude - Teil 2: KNXnet/IP-Kommunikation

This European Standard was approved by CEN on 30 September 2012.

CEN 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 CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Foreword

This document (EN 13321-2:2012) has been prepared by Technical Committee CEN/TC 247 “Building Automation, Controls and Building Management”, the secretariat of which is held by SNV.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2013, and conflicting national standards shall be withdrawn at the latest by June 2013.

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

This document supersedes EN 13321-2:2006.

Whereas ENV 13321-2:2000 described the transmission of EIB packets over Ethernet including the frame encoding, this document describes the transmission of HBES packets using the Internet Protocol. Details of the HBES packet frames are covered in part 1 of EN 13321, removing the need to explicitly describe the HBES frames in this document.

This document is Part 2 of the EN 13321 series of European Standards under the general title *Open data communication in building automation, controls and building management — Home and building electronic systems*, which consists of the following parts:

— *Part 1: Product and system requirements;*

— *Part 2: KNXnet/IP communication*.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard is intended for the design of new buildings and the retrofit of existing buildings in terms of acceptable indoor environment, practical energy conservation and efficiency.

This standard defines the integration of KNX protocol implementations within the Internet Protocol (IP) named KNXnet/IP.It defines a standard protocol, which is implemented within KNX devices, Engineering Tool Software (ETS) and other implementations to support KNX data exchange over IP networks. In fact, KNXnet/IP provides a general framework, which accommodates several specialised “Service Protocols” in a modular and extendible fashion.

The KNXnet/IP standard consists of the following clauses:

— Clause 1, Overview

— Clause 2, Core Specification

— Clause 3, Device Management

— Clause 4, Tunnelling

— Clause 5, Routing

— Clause 6, Remote Diagnosis and Configuration

Additional clauses may be added to the KNXnet/IP standard in the future at which time Clause 1 “Overview” as well as Annex A will need to be updated.

KNXnet/IP supports different software implementations on top of the protocol. More specifically, these software implementations can be Building Management, Facility Management, Energy Management, or simply Data Base and SCADA (Supervision, Control and Data Acquisition) packages.

Most of these packages need to be configured for the specific user application. In order to simplify this process and cut costs for engineering, KNXnet/IP provides simple engineering interfaces, namely a description “language” for the underlying KNX system. This may be done off-line, e.g. generated as an ETS export file, or on-line by a mechanism that self-describes the underlying KNX system (reading data from the system itself).

In conjunction with the EIB/KNX-to-BACnet mapping described in EN ISO 16484-5, EIB/KNX installations can very easily be integrated into BACnet system environments.

KNXnet/IP supports:

— on-the-fly change-over between Operational modes (configuration, operation);

— event driven mechanisms;

— connections with a delay time greater than $t_{EIB\_transfer\_timeout}$ (e.g. network connection via satellite).

Clause 1, Overview

Clause 1 “Overview” provides a general overview of KNXnet/IP and covers security considerations.

Clause 2, Core specification

Clause 2 “Core Specification” defines a standard protocol which is implemented within KNXnet/IP devices and Engineering Tool Software to support KNX data exchange over IP networks.

This specific implementation of the protocol over the Internet Protocol (IP) is called KNXnet/IP.

This standard addresses:

— definition of data packets sent over the IP host protocol network for KNXnet/IP communication;

— discovery and self-description of KNXnet/IP servers;

— configuration and establishment of a communication channel between a KNXnet/IP client and a KNXnet/IP server.

Clause 3, Device Management

Clause 3 “Device Management” defines services for remote configuration and remote management of KNXnet/IP servers.

Clause 4, Tunnelling

Clause 4 “Tunnelling” defines services for point-to-point exchange of KNX telegrams over an IP network between a KNXnet/IP device acting as a server and a KNXnet/IP Client. This point-to-point exchange may be established by a super ordinate system for building automation or management functions or by an Engineering Tool Software. It supports all ETS functions for download, test, and analysis of KNX devices on KNX networks connected via KNXnet/IP servers. This includes changes of single KNX device object properties.

Tunnelling assumes that a data transmission round-trip between a KNXnet/IP Tunnelling client and KNXnet/IP servers takes less than $t_{KNX\_transfer\_timeouts}$.

Clause 5, Routing

Clause 5 “Routing” defines services for a point-to-multipoint exchange of KNX telegrams over an IP network between KNXnet/IP routers and/or KNX/IP devices.

Clause 6, Remote Diagnosis and Configuration

Clause 6 “Remote Diagnosis and Configuration” defines services for a point-to-point exchange of KNX telegrams over an IP network between KNXnet/IP routers and/or KNX/IP devices. The services provide means for diagnosing communication settings and for changing these remotely.

1 Scope

This European Standard defines the integration of KNX protocol implementations on top of Internet Protocol (IP) networks, called KNXnet/IP. It describes a standard protocol for KNX devices connected to an IP network, called KNXnet/IP devices. The IP network acts as a fast (compared to KNX transmission speed) backbone in KNX installations.

Widespread deployment of data networks using the Internet Protocol (IP) presents an opportunity to expand building control communication beyond the local KNX control bus, providing:

— remote configuration;

— remote operation (including control and annunciation);

— fast interface from LAN to KNX and vice versa;

— WAN connection between KNX systems (where an installed KNX system is at least one line).

A KNXnet/IP system contains at least these elements:

— one EIB line with up to 64 (255) EIB devices;
OR
one KNX segment (KNX-TP1, KNX-TP0, KNX-RF, KNX-PL110, KNX-PL132);

— a KNX-to-IP network connection device (called KNXnet/IP server);

and typically additional

— software for remote functions residing on e.g. a workstation (may be data base application, BACnet Building Management System, browser, etc.).

Figure 1 shows a typical scenario where a KNXnet/IP client (e.g. running ETS) accesses multiple KNX installed systems or KNX subnetworks via an IP network. The KNXnet/IP client may access one or more KNXnet/IP servers at a time. For subnetwork, routing server-to-server communication is possible.

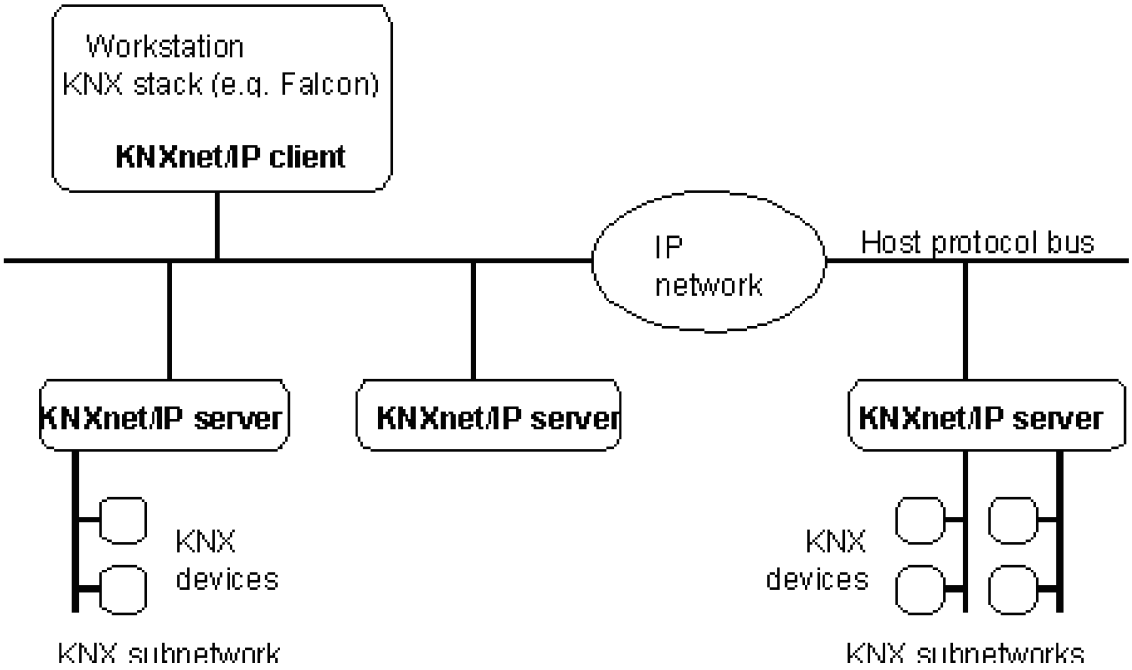

Figure 1 — Device types and configuration examples

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
subnet
portion of a network that shares a common address component known as the "subnet address"

Note 1 to entry: Different network protocols specify the subnet address in different ways.

3.2
Engineering Tool Software
ETS
software used to configure KNX devices

3.3
Host Protocol Address Information
HPAI
structure holding the IP host protocol address information used to address a KNXnet/IP endpoint on another KNXnet/IP device

3.4
communication channel
logical connection between a KNXnet/IP client and a KNXnet/IP server (or, in case of routing, between two or more KNXnet/IP servers)

Note 1 to entry: A communication channel consists of one or more connections on the definition of the host protocol used for KNXnet/IP.