

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Åben datakommunikation inden for bygningautomation, bygningsregulering og bygningsadministration – Elektroniske systemer til boliger og bygninger (HBES) – KNXnet/IP-kommunikation

Open data communication in building automation,
controls and building management – Home and building
electronic systems – KNXnet/IP communication

DANSK STANDARD
Danish Standards Association

Göteborg Plads 1
DK-2150 Nordhavn

Tel: +45 39 96 61 01

Tel: +45 39 96 61 01

dansk.standard@ds.dk

www.ds.dk

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

DS projekt: M336735
ICS: 35.240.67; 91.040.01

Første del af denne publikations betegnelse er:
DS/ISO, hvilket betyder, at det er en international standard, der har status som dansk standard.

Denne publikations overensstemmelse er:
IDT med: ISO 22510:2019

DS-publikationen er på engelsk.

DS-publikationstyper

Dansk Standard udgiver forskellige publikationstyper.
Typen på denne publikation fremgår af forsiden.

Der kan være tale om:

Dansk standard

- standard, der er udarbejdet på nationalt niveau, eller som er baseret på et andet lands nationale standard, eller
- standard, der er udarbejdet på internationalt og/eller europæisk niveau, og som har fået status som dansk standard

DS-information

- publikation, der er udarbejdet på nationalt niveau, og som ikke har opnået status som standard, eller
- publikation, der er udarbejdet på internationalt og/eller europæisk niveau, og som ikke har fået status som standard, fx en teknisk rapport, eller
- europæisk præstandard

DS-håndbog

- samling af standarder, eventuelt suppleret med informativt materiale

DS-hæfte

- publikation med informativt materiale

Til disse publikationstyper kan endvidere udgives

- tillæg og rettelsesblade

DS-publikationsform

Publikationstyperne udgives i forskellig form som henholdsvis

- fuldtekstpublikation (publikationen er trykt i sin helhed)
- godkendelsesblad (publikationen leveres i kopi med et trykt DS-omslag)
- elektronisk (publikationen leveres på et elektronisk medie)

DS-betegnelse

Alle DS-publikationers betegnelse begynder med DS efterfulgt af et eller flere præfikser og et nr., fx **DS 383**, **DS/EN 5414** osv. Hvis der efter nr. er angivet et **A** eller **Cor**, betyder det, enten at det er et **tillæg** eller et **rettelsesblad** til hovedstandard, eller at det er indført i hovedstandard.

DS-betegnelse angives på forsiden.

Overensstemmelse med anden publikation:

Overensstemmelse kan enten være IDT, EQV, NEQ eller MOD

- **IDT:** Når publikationen er identisk med en given publikation.
- **EQV:** Når publikationen teknisk er i overensstemmelse med en given publikation, men præsentationen er ændret.
- **NEQ:** Når publikationen teknisk eller præsentationsmæssigt ikke er i overensstemmelse med en given standard, men udarbejdet på baggrund af denne.
- **MOD:** Når publikationen er modificeret i forhold til en given publikation.

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

First edition
2019-11-28

Open data communication in building automation, controls and building management — Home and building electronic systems — KNXnet/IP communication

Réseau ouvert de communication de données pour l'automatisation, la régulation et la gestion technique du bâtiment — Systèmes électroniques pour les foyers domestiques et les bâtiments — Communication KNX/IP



Reference number
ISO 22510:2019(E)

© ISO 2019

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	4
5 Requirements	5
5.1 Overview.....	5
5.1.1 KNXnet/IP document parts.....	5
5.1.2 Mandatory and optional implementation of IP protocols.....	7
5.2 Core.....	8
5.2.1 Use.....	8
5.2.2 KNXnet/IP frames.....	9
5.2.3 Host protocol independence.....	10
5.2.4 Discovery and self description.....	11
5.2.5 Communication channels.....	13
5.2.6 General implementation guidelines.....	15
5.2.7 Data Packet structures.....	19
5.2.8 IP Networks.....	38
5.2.9 Minimum supported services.....	47
5.3 Device management specification.....	48
5.3.1 Use.....	48
5.3.2 KNXnet/IP device management.....	48
5.3.3 Implementation rules and guidelines.....	59
5.3.4 Data packet structures.....	60
5.3.5 Minimum profiles.....	63
5.4 Tunnelling.....	64
5.4.1 Use.....	64
5.4.2 Tunnelling of KNX telegrams.....	64
5.4.3 Configuration and management.....	68
5.4.4 Frame structures.....	70
5.4.5 Minimum profiles.....	77
5.5 Routing.....	78
5.5.1 Use.....	78
5.5.2 KNXnet/IP routing of KNX telegrams.....	78
5.5.3 Implementation rules and guidelines.....	88
5.5.4 Configuration and management.....	91
5.5.5 Data packet structures.....	91
5.5.6 Minimum profiles.....	93
5.6 Remote diagnosis and configuration.....	94
5.6.1 Use.....	94
5.6.2 Remote diagnosis of KNXnet/IP devices.....	95
5.6.3 Configuration and management.....	95
5.6.4 Data packet structures.....	96
5.6.5 Certification.....	101
5.7 Secured communication.....	101
5.7.1 Use.....	101
5.7.2 Stack and communication.....	102
5.7.3 Management procedures.....	143
5.7.4 Synchronizing timers.....	146
Annex A (normative) List of codes	148
Annex B (informative) Binary examples of KNXnet/IP frames	155

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Annex C (normative) KNXnet/IP parameter object	175
Annex D (normative) Common external messaging interface (cEMI)	178
Annex E (normative) Coupler resources	210
Bibliography	221

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 247, *Building Automation, Controls and Building Management*, in collaboration with ISO Technical Committee TC 205, *Building environment design*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 16484 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Introduction

This document 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.

KNXnet/IP is a protocol designed to transport KNX home and building electronic system (HBES) control frames over an IP network. It is used as an infrastructure backbone for connecting KNX sub-networks, as a communication medium for KNX-IP devices and to provide IP based services for clients (e.g. connecting a tool software to a KNX installation). The main advantages of using IP for these purposes are that IP network infrastructure is inexpensive, available almost everywhere and that the distance of two communication parties on an IP network is virtually unlimited.

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);
- an interface to super ordinate building management and energy management systems.

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-RF, KNX-PL110);
- 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.).

KNXnet/IP differentiates between unicast and multicast services. KNXnet/IP unicast services are used to connect a single client to a single KNXnet/IP server (e.g. KNXnet/IP Tunnelling). KNXnet/IP multicast services are mainly used to connect different KNX sub-networks using IP communication on the KNX backbone. The KNXnet/IP routing services are defined for this purpose. KNXnet/IP multicast services build on top of IP multicast.

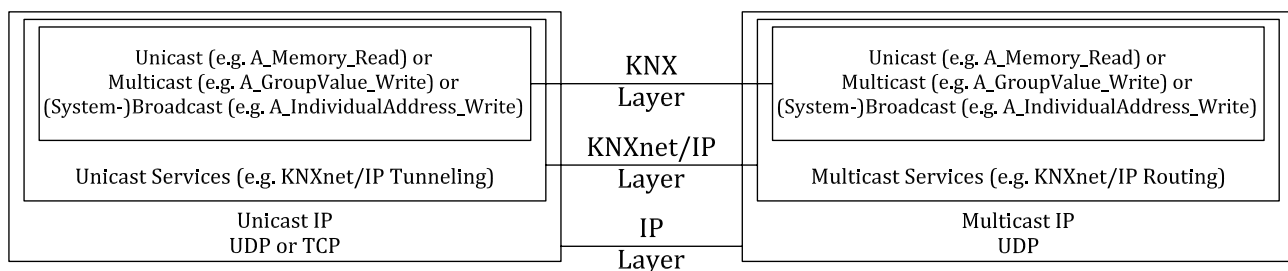


Figure 1 — Unicast and multicast in the sense of KNX, KNXnet/IP and IP

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.

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

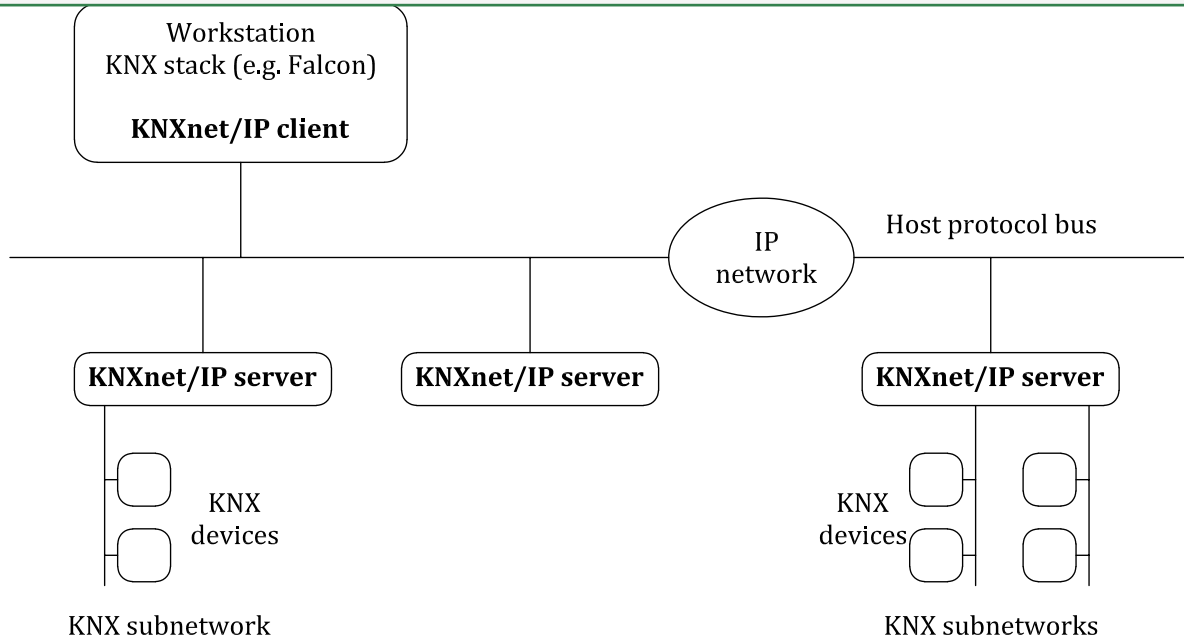


Figure 2 — Device types and configuration examples

[Figure 2](#) shows device types and configuration examples. This document 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.

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

This is a preview of "DS/ISO 22510:2019". [Click here to purchase the full version from the ANSI store.](#)

Open data communication in building automation, controls and building management — Home and building electronic systems — KNXnet/IP communication

1 Scope

This document 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 twisted pair transmission speed) backbone in KNX installations.

2 Normative references

There are no normative references in this document.