

	Technical Product Information	
	Product reference	Product designation
	TH210	IP/KNX Router

Product and Applications Description



The IP/KNX Router TH210 is a DIN rail mounted device.

The device connects KNX lines via data networks using the Internet Protocol (IP). Also this device offers communication of KNX devices with PC's or other data processing equipment.

The physical connection to the KNX is established via a bus connector terminal block. For connection to the data network (IP via 10BaseT) the device contains an RJ45 socket.

To operate the IP/KNX Router requires AC/DC 24 V, which is provided via a second terminal block. The IP/KNX Router is powered via this operating voltage terminal connector. This allows the IP/KNX Router to send a bus voltage failure notification onto the data network.

The IP/KNX Router implements the KNXnet/IP standard for routing of KNX telegrams between lines and for concurrent access to the bus line from any PC.

By using a LAN modem a KNX installation can be remotely accessed even if there is no direct data network connection between a PC and an IP/KNX Router. LAN modems are available on the market for standard telephone, ISDN or DSL connections.

The IP/KNX Router has these characteristics:

- Simple connection to hierarchically superimposed systems via Internet Protocol (IP)
- Direct access to the KNX installation from any access point to the IP network (KNXnet/IP Tunneling)
- Fast communication between KNX lines, KNX areas and systems (KNXnet/IP Routing)
- Communication between buildings and facilities
- Filtering and routing of telegrams depending on
 - individual address
 - group address
- LED display of
 - operation
 - KNX communication
 - IP communication
- Simple configuration with standard ETS
- Easy connection to SCADA and Facility Management systems (see: Supported Software)

Using the existing data network for communication between bus lines in non-residential buildings is a logical step. The advantages are: fast communication between KNX lines, extension of an KNX system beyond one building by using LAN and WAN connections, direct transmission of KNX data to any network user, KNX remote configuration from any network access point.

The IP/KNX Router TH210 logically connects KNX bus lines by transmitting KNX telegrams between them via a data network but separates them galvanically. This allows to run each bus line independently from other bus lines.

The TH210 can be used as line coupler or area coupler in existing KNX networks as well as in new KNX networks. The TH210 holds a filter table determining, which bus telegrams are transmitted or blocked from or to the bus line thus reducing the bus load. The filter table is automatically generated by the ETS (EIB Tool Software) during configuration and start-up of the system.

The physical address of the IP/KNX Router assigned by ETS automatically determines the IP/KNX Router function as a line coupler or area coupler. The definition follows these assignments:

Coupler function	Line
Area coupler	Main line 1- 15
Line coupler	Line 1- 15

Note

When assigning the physical address take care that IP/KNX Router and line couplers receive the topologically correct physical address (Fig. 1, IP/KNX Router as area coupler and line coupler). Adhere to these rules:

Rule 1:

In general an IP/KNX Router TH210 is used as a line coupler or an area coupler. The physical address has the format x.y.0, with x=1...15, y=1...15.

Rule 2:

If an IP/KNX Router TH210 is applied as an area coupler with the physical address x.0.0 then no other IP/KNX Router with the line coupler address x.y.0 (y=1...15) shall be placed topologically „below“ this IP/KNX Router (Fig. 2, IP/KNX Router TH210 as area coupler).

Rule 3:

If an IP/KNX Router TH210 is applied as a line coupler (e.g. with physical address 1.2.0) then no other IP/KNX Router TH210 shall be used with a superior area coupler address (e.g. 1.0.0) in this installation (Fig. 3, IP/KNX Router TH210 as line coupler).

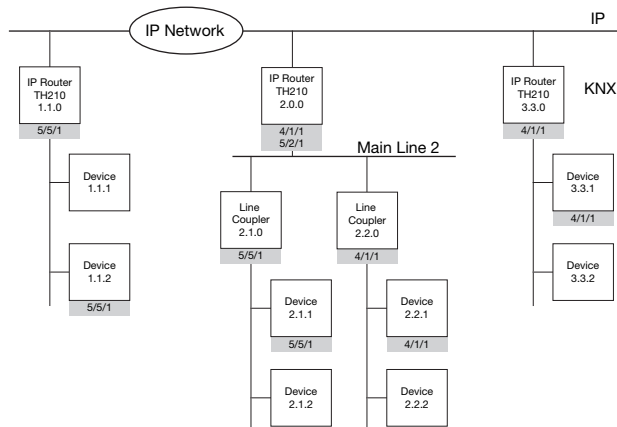


Figure 1. IP/KNX Router TH210 as area and line coupler

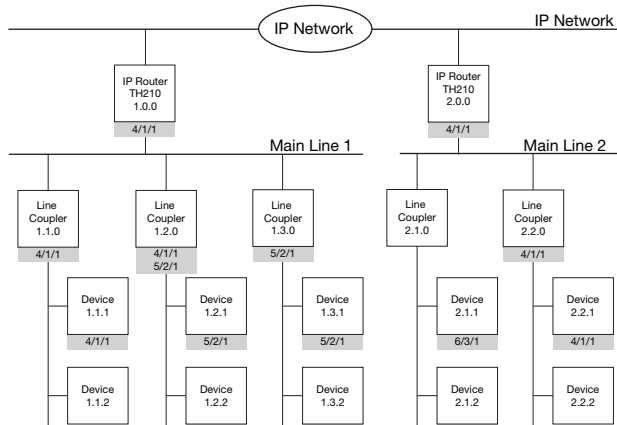


Figure 2. IP/KNX Router TH210 as area coupler

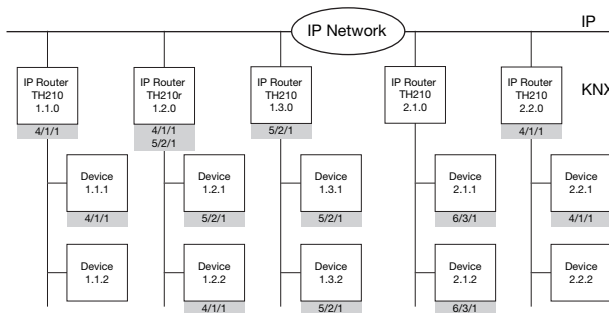


Figure 3. IP/KNX Router TH210 as line coupler

Note

Smooth operation of the IP/KNX Router TH210 as line coupler or back-bone coupler using KNXnet/IP Routing requires LAN network components that support IP multicasting. In particular, network / LAN routers must be configurable respectively configured to forward IP multicast datagrams.

The IP multicast address 224.0.23.12 was specifically reserved for KNXnet/IP internationally for this purpose.

IP/KNX Router as interface to the bus (KNXnet/IP Tunneling)

A direct connection between a networked PC and the bus can be established via a data network and the IP/KNX Router TH210. This allows for accessing the bus from any access point in the data network.

IP address assignment

The IP address of the IP/KNX Router TH210 is assigned manually using ETS or automatically by a DHCP server in the IP network. Assignment of the IP address by a DHCP server allows for changes of the device IP address without using ETS. Configuration of the DHCP server may require the MAC address, which is printed on the device.

Please consult your network administrator regarding configuration of the parameters device IP address, subnet mask, and DHCP.

Default factory settings

By default the KNXnet/IP Routing function is active. When two KNXnet/IP Routers are connected with each other via a cross-over cable or via a network hub, bus telegrams are routed by the KNXnet/IP Router without any configuration.

The IP/KNX Router ships with these default factory settings:

- Physical address of the IP/KNX Router: 15.15.0 (= FF00 hex)
- Filter group telegrams
- All bus telegrams are repeated in case of transmission errors
- The IP/KNX Router acknowledges routed telegrams only
- Support for devices with mis-matching physical address
- Route broadcast telegrams
- Monitor the bus line
- IP address assignment via DHCP

Behavior on bus voltage loss / recovery on the bus line

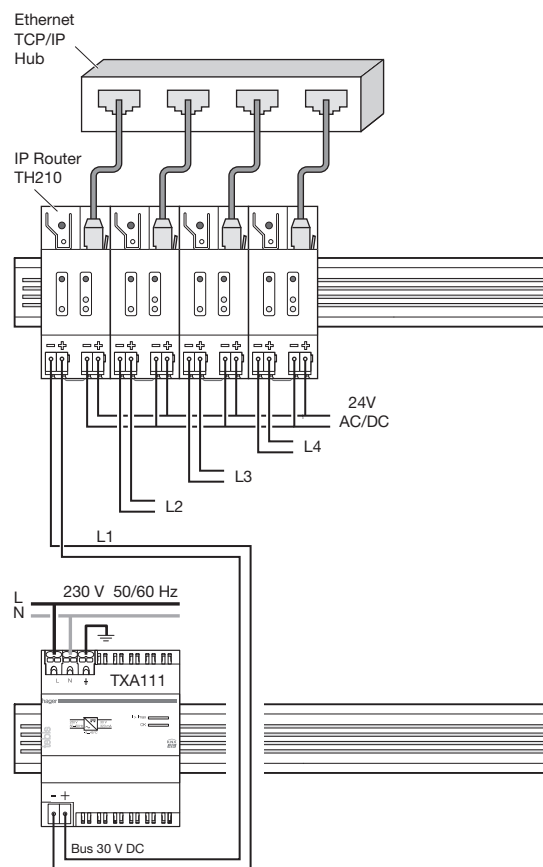
When the IP/KNX Router detects a loss of bus voltage on the bus line, this error is saved and annunciated via KNXnet/IP. When the IP/KNX Router detects recovery of bus voltage on the bus line, the error flag is deleted and the resumption of bus voltage is annunciated via KNXnet/IP.

Application programs

The IP/KNX Router TH210 can be configured with ETS3.

It requires the application program "IP/KNX Router TH210".

Example of Operation



Installation Instructions

- The device may be used for permanent interior installations in dry locations within distribution boards or small casings with DIN rail EN 60715-TH35-7,5.



CAUTION

- The device must be mounted and commissioned by an authorised electrician.
- Free DIN rail areas with stuck-in data rails must be covered with covers, order no. TG007.
- The prevailing safety rules must be heeded.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.

Technical Specifications

Network communication

- Ethernet:
 - 10BaseT (10 Mbit/s)
- Supported Internet Protocols:
 - ARP, ICMP, IGMP, UDP/IP, DHCP
- KNXnet/IP according to Konnex System Specification:
 - Core, Routing, Tunneling, Device Management

Rated voltage

- Bus: DC 24V (DC 21...30V)
- Auxiliary power supply:
 - AC/DC 24V (AC/DC 12...30V)

Power supply

- Bus voltage: via KNX bus line
- Operating voltage:
 - from external SELV power supply AC/DC 24V nominal, permissible input voltage range:
 - AC/DC 12 ... 30 V



CAUTION

- The device connects the external safety extra low voltage with the LAN potential. If the LAN shield is connected to earth ground then the isolation to ground is lost.
- It is recommended to use the external low voltage power supply for the IP/KNX Router TH210 only.

Power usage

- From the bus line: max. 10mA at DC 29V
- From the auxiliary power supply: max. 800mW (25mA at DC 24V)

Control elements

1 learning button:
for switching between normal operating mode and addressing mode

Display elements

- 1 green LED: device ready (ON)
- 1 yellow LED: Communication on bus line
- 1 green LED: Ethernet Link Signal available (Lk)
- 1 yellow LED: Receiving data from Ethernet (Rx)
- 1 red LED: Transmitting data to Ethernet (Tx)
- 1 red LED: for monitoring bus voltage and displaying mode, selected with the learning button)

Connections

- bus line:
 - screwless bus connection block (red-black)
 - 0,6...0,8mm Ø single core
 - remove approx. 5mm of isolation
- Ethernet / IP network: RJ45 socket
- auxiliary power:
 - screwless extra low voltage terminal (yellow-white)
 - Ø 0,6 ... 0,8 mm Ø single core
 - remove approx. 5mm of isolation

Physical specifications

- housing: plastic
- DIN-rail mounted device,
 - width: 2 SUs (1SU = 18mm)
- installation: rapid mounting on EN 60715-TH35-7,5 rail
- weight: approx. 100g

Electrical safety

- degree of pollution (according to IEC 60664-1): 2
- protection (according to EN 60529): IP 20
- protection class (according to IEC 61140): III
- overvoltage class (according to IEC 60664-1): III
- bus: safety extra low voltage SELV DC 24 V
- the device complies with EN 50 090-2-2

Electromagnetic compatibility

complies with EN 61000-6-2 and EN 61000-6-3 and EN 50090-2-2

Environmental specifications

- climatic conditions: EN 50090-2-2
- ambient temperature operating: - 5 ... + 45 °C
- storage temperature: - 25 ... + 70 °C
- relative humidity (non-condensing): 5 % to 93 %

Markings

KNX, CE

CE mark

complies with the EMC regulations (residential and functional buildings), and low voltage regulations

Location and Function of the Display and Operator Elements

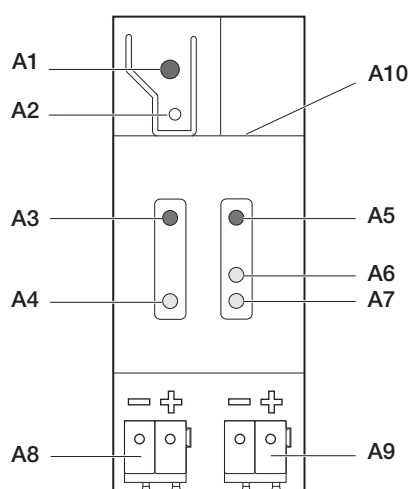


Figure 4: Location of the display and operator elements

- A1** LED red: indicating normal operating mode (LED off) and addressing mode (LED on)
- A2** learning button for switching between normal operating mode and addressing mode for receiving the physical address
- A3** LED green: Operation
- A4** LED yellow: data transmission on bus line (Line)
- A5** LED green: Ethernet Link signal (Lk)
- A6** LED yellow: Ethernet Receive signal (Rx)
- A7** LED red: Ethernet Transmit signal (Tx)
- A8** extra low-voltage bus terminals (red-black)
- A9** extra low-voltage terminals (yellow-white)
- A10** RJ45 socket for data network cable

Mounting and Wiring

General description

The N-system DIN-rail device can be installed in N-system distribution boards, surface or flush mounted, or on any DIN rail complying with EN 60715-TH35-7,5. The connection to the bus line is established via the bus connector terminal (red-black) on the top side. The RJ45 socket on the device front side provides the connection to the Ethernet-IP data network.

Mounting DIN-rail devices (Figure 5)

- Slide the device (B1) onto the DIN-rail (B2) and
- swivel back the device until the slide clicks into place audibly.

Dismounting DIN-rail devices (Figure 5)

- Remove all connected wires,
- press down the slide (C3) with a screw-driver and
- swivel the device (C1) from the DIN-rail (C2).

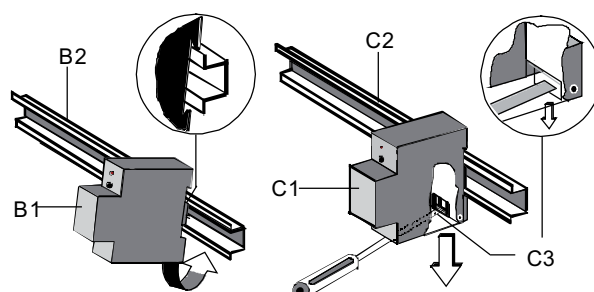


Figure 5: Mounting and dismounting a DIN-rail device

Slipping off bus connection blocks (Figure 6)

- The bus connection block (D2) is situated on the top of the device (D1).
- The bus connection block (D2) consists of two components (D2.1 and D2.2) with four terminal contacts each. Take care not to damage the two test sockets (D2.3) by accidentally connecting them to the bus cable or with the screw-driver (e.g. when attempting to unplug the bus connection block).
- Carefully put the screw-driver to the wire-inserting slit of the bus connection block's grey component and pull the bus connection block (D2) from the device (D1).

Slipping on bus connection blocks (Figure 6)

- Slip the bus connection block onto the guide slot and
- press the bus connection block (D2) down to the stop.

Connecting bus cables (Figure 6)

- The bus connection block (D2) can be used with single core conductors $\varnothing 0,6 \dots 0,8 \text{ mm}$.
- Remove approx. 5 mm of insulation from the conductor (D2.4) and plug it into the bus connection block (D2) (red = +, black = -).

Disconnecting bus cables (Figure 6)

- Unplug the bus connection block (E1) and remove the bus cable conductor (E1.4) while simultaneously wiggling it.

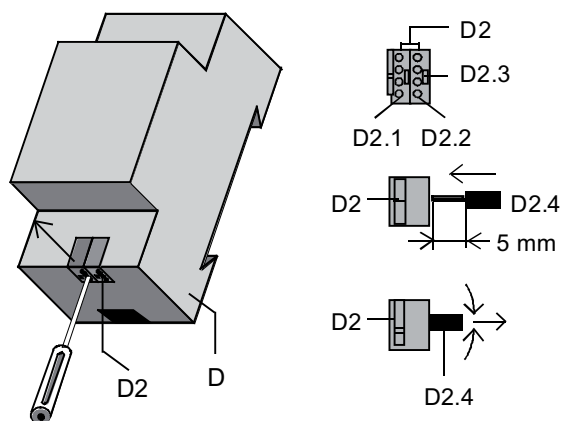


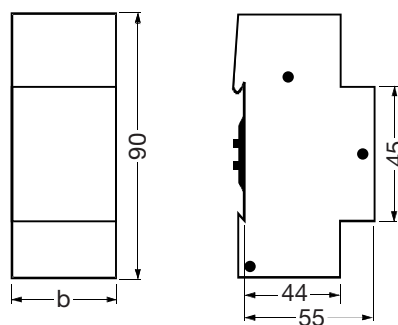
Figure 6: Connecting and disconnecting bus wires

Slipping off / on auxiliary power connection block

- Follow the instructions for the bus connection block when slipping off/on the auxiliary power connection block.

Dimension Diagram

Dimensions in mm



$b = 2 \text{ SU}$

1 Standard unit (SU) = 18 mm

Supported Software

Here is a list of software supporting the IP/KNX Router TH210

ComBridge Studio

IPAS GmbH
Grabenstr 149 a
D-47057 Duisburg
Germany
[<http://www.ipas-products.com>]

Visualization, Database interface,
Notification via email, OPC Server

ETS 3

EIBA s.c.r.l.
Bessenveldstraat 5
B-1831 Diegem
Belgium
[<http://www.eiba.com>]

Configuration of bus installations via existing
data networks (ETS 3.0c or higher)