Catan C1 KNX IP router

Instructions for using the KNX IP router in the Catan C1 and Catan C1 EN building controllers

Application note/quick start guide
112376_en_03

1 Description

Catan is the new product family for building automation from Phoenix Contact. The Catan C1 controller is the central component of the product family and has a wide range of hardware and software functions. The controller integrates, among other things, the functionality of a KNX IP router device for forwarding KNX telegrams from and to the integrated KNX TP connection. It can therefore be used as part of the KNX IP backbone infrastructure in a KNX installation. The device can also be used for programming KNX TP devices using ETS. It can also be used as a KNX IP interface to establish tunneling connections to the connected KNX TP devices.

Observe these notes

Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.com/product/1371432.

This document is valid for the products listed in Section “Ordering data” on page 3.

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2 Ordering data

Products

Description	Type	Item No.	Pcs./Pkt.
Catan – Controller for building and room automation	Catan C1 EN	1371432	1
Catan – Controller for building and room automation	Catan C1	1886438	1

3 Revision history

Documentation	Firmware	Contents/changes
112376 Rev. 00	KNX application version 1.0	Initial release
112376 Rev. 01-02		Bugfixes / network adapter settings
112376 Rev. 03		Update on the network configuration and the WBM for Catan C1

4 Connection and operation of the controller

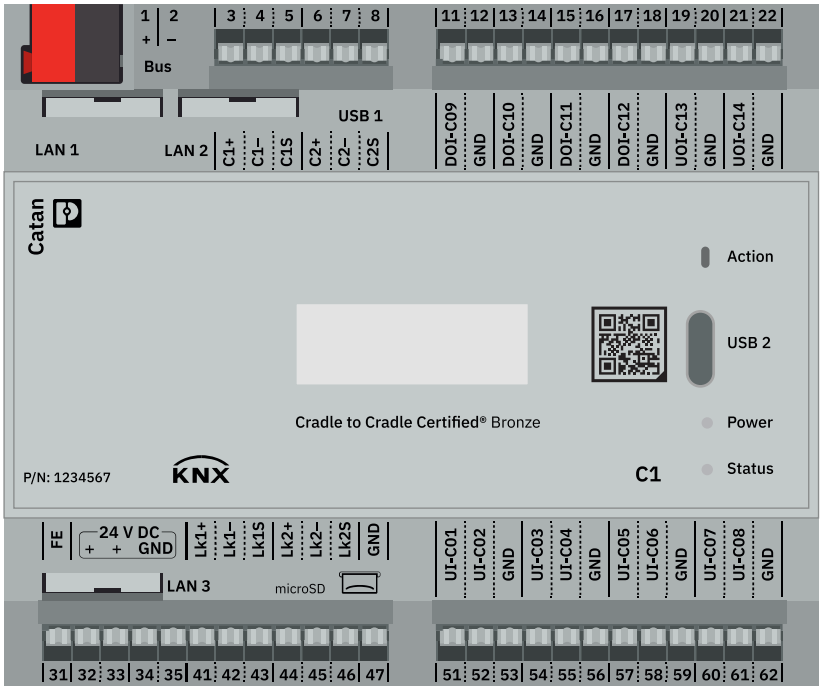

Figure 1 Catan C1 controller (housing cover open)

Main power supply

Connect a 24 V DC power supply to pins 32...35.

If the controller is used without any other external load (KNX IP router only), a power supply of 500 mA is sufficient.

Note: Refer to the controller data sheet for the sizing of the power supply.

KNX TP bus connector

Connect a standard KNX power supply for the KNX TP line to pins 1 and 2. Wire the KNX TP devices to the same connection.

Ethernet connectors

Catan C1 has three Ethernet ports that can be assigned to two different network interfaces. In the default configuration, ports LAN1 and LAN2 are used for the LAN interface (en0) and port LAN3 for the WAN interface (en1).

USB connectors

Catan C1 has two USB ports, USB 1 on the side and USB 2 on the top. Only USB 1 can be used as a network device of a connected PC.

Status LEDs and programming button

The cover on the top of the controller can be opened to reveal the “Power” and “Status” LEDs and a button marked “Action”.

5 Network integration of the KNX IP router in the Catan C1 controller

The block diagram (Figure 2) illustrates the interaction of automation and KNX IP router in the Catan C1 controller. The controller has two independent network adapters, **en0** and **en1**. In the Catan C1 EN WBM, these are labeled LAN and WAN. In the Catan C1 WBM, they are labeled Port X1 and X2.

The KNX IP router works completely independently of the automation software. An internal IP tunnel enables the automation system to access the KNX-TP line.

5.1 Settings for the controller Catan C1 EN

The integrated web-based management (WBM) can be used to define which Ethernet sockets (LAN1, LAN2 and LAN3) are assigned to the respective adapters. The settings can be found in the WBM menu "Network/Switch".

The network connection of the KNX IP router can also be set in the WBM. Depending on the setting, routing and tunneling is carried out either via en0 or en1, or this function can be deactivated completely (see section 6.4).

5.2 Settings for the controller Catan C1

For the Catan C1, the network connection of the KNX IP router can also be set in the WBM (X1 or X2).

X1 is permanently connected to LAN1/LAN2 and X2 to LAN3.

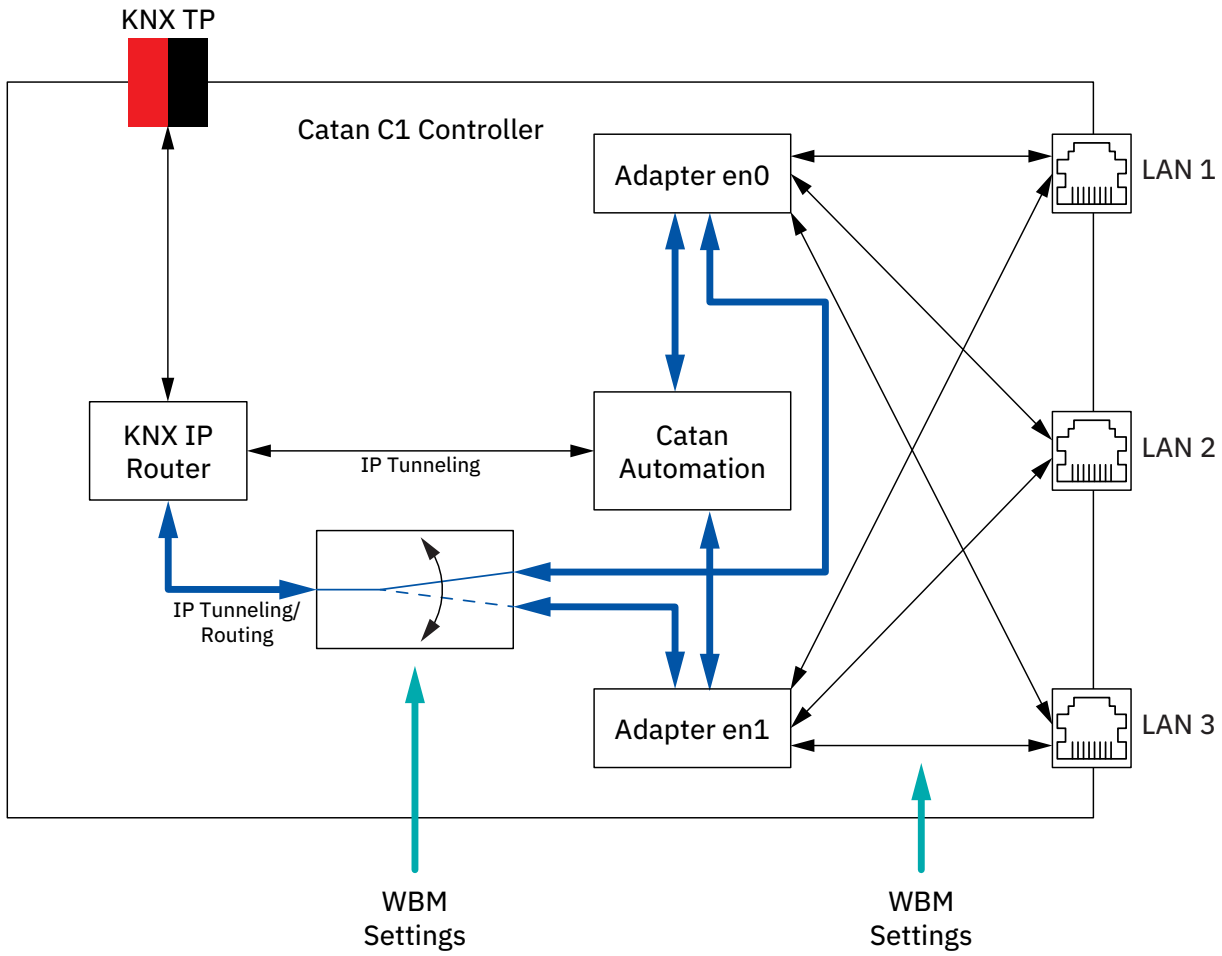

Figure 2 Catan C1 KNX IP router block diagram

6 Network configuration of the KNX IP router

6.1 Starting the WBM

The controller has two independent network adapters, **en0** and **en1**.

The default configuration of the controller assigns the LAN connections LAN1 and LAN2 to the network adapter en0. The default IP address for this is 192.168.1.1.

The IP address of the controller can be changed only via the controller's integrated web-based management (WBM). It cannot be changed via the KNX programming tool ETS.

All other settings of the KNX IP router can be adjusted in a later step via the ETS.

To change the IP address of the controller, proceed as follows:

- Log in to the WBM by connecting your PC either via LAN (LAN 1 and LAN 2 connections) or USB port 1 on the side of the housing.

? Option A: Configuration via LAN

1. **Set the Ethernet adapter of your PC to the same subnet as the default configuration of the controller.**
   - IP address: 192.168.1.xxx
   - Subnet mask: 255.255.255.0
2. **For Catan C1 EN:**

– In your browser, enter the following default URL including the port number: https://192.168.1.1:8443

? Option B: Configuration via USB

– Enter the following URL in your browser: https://169.254.252.10:8443

3. **For Catan C1:**

– Enter the following default URL in your browser: https://192.168.1.1

? Option B: Configuration via USB

– Enter the following URL in your browser: https://169.254.252.10

Note: Connecting the controller via USB automatically installs a network adapter under Windows 11 (USB NCM Host Device). With Windows 10, the network adapter must be installed manually. Instructions can be found in a separate document (item number 111851: AH EN CATAN Quickstart) at phoenixcontact.com/product/1371432.

Accept the warning about an invalid certificate in the browser.

Use the following default login details:

For Catan C1 EN:

– User name: phoenix

– Password: catan

For Catan C1:

– User name: admin

– Password: An initial password is printed on the top of the device under the white insert label.

Note: During the first startup of the automation software on the controller, the user name and password for the WBM are usually changed. If the controller has already been started up before, the IP address of the KNX IP router has already been defined also.

6.2 Setting the IP adress

For Catan C1 EN, navigate to the "Network/LAN" menu and enter the desired values. Save your changes and restart the controller.

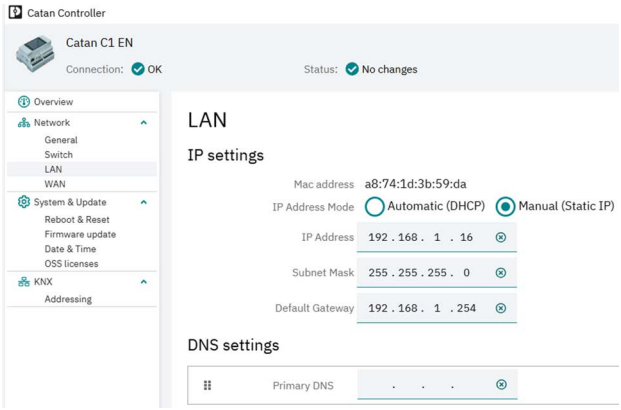

Figure 3 Catan C1 EN: IP settings

For Catan C1, you will find the settings in the "Configuration/Network" menu.

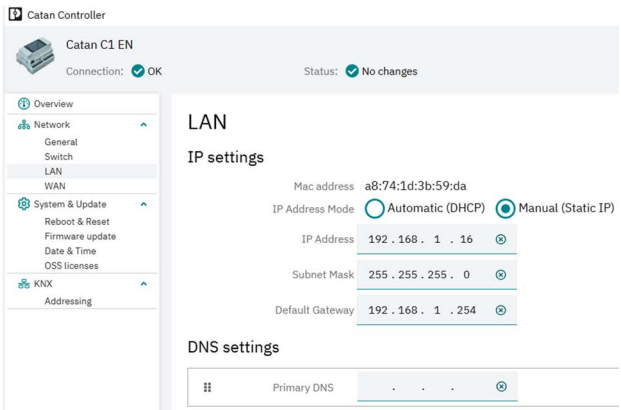

Figure 4 Catan C1: IP settings

6.3 Standard gateway

Please note that only one (1) standard gateway can be active for the device, although the configuration can be carried out separately for each interface.

The default gateway for the LAN (en0) or X1 interface has priority if both are configured. If the setting from the WAN (en1) or X2 interface is to be used, the entry for LAN (en0) or X1 must be deleted.

For Catan C1 EN, this also applies if the default gateway is to be obtained via DHCP for WAN.

6.4 Settings of the KNX IP router

For Catan CE EN navigate to the "KNX/Addressing" menu and define the KNX IP router settings (see Figure 5).

For Catan C1 navigate to the "Configuration/KNX" menu (see Figure 6).

The KNX function can be switched off completely.

The KNX IP router can be deactivated. In this case, only internal access to the connected TP line via IP tunneling is possible.

The KNX IP router can be activated and assigned to one of the two network adapters of the controller.

The physical addresses of the KNX IP router can be preset. The addresses are overwritten when programming with the ETS.

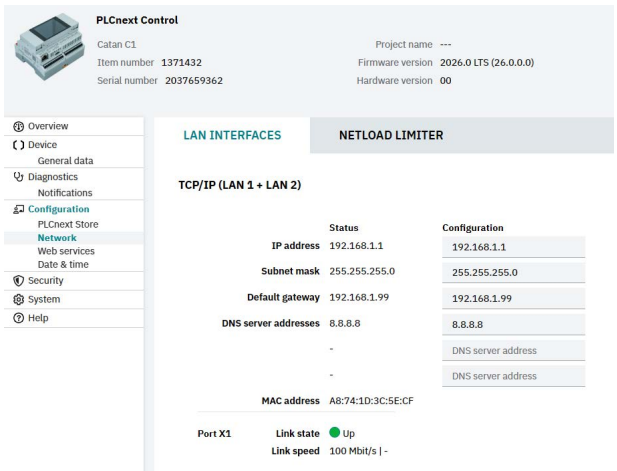

Figure 5 Catan C1 EN: KNX settings

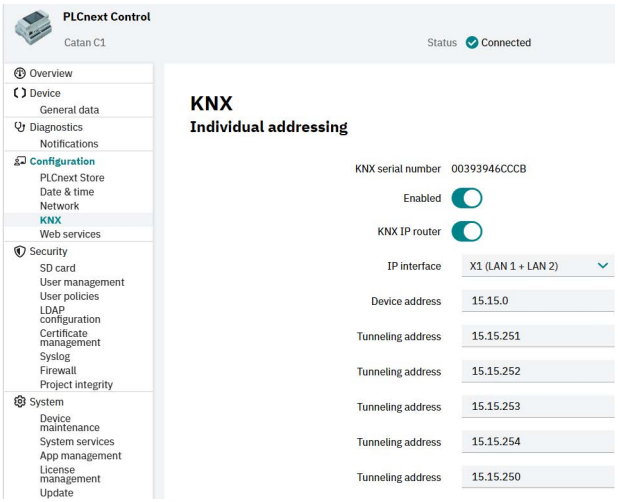

Figure 6 Catan C1: KNX settings

Note: If the KNX IP router is to be used on the WAN (en1) or X2 interface, this interface must be configured as the default gateway (see section 6.3).

7 Integrating the KNX IP router into a KNX network

The KNX IP router can be used as an IP line coupler or an IP area coupler. Information on the topologies of a KNX network can be found in the KNX standard documentation. The figure shows use as a line coupler.

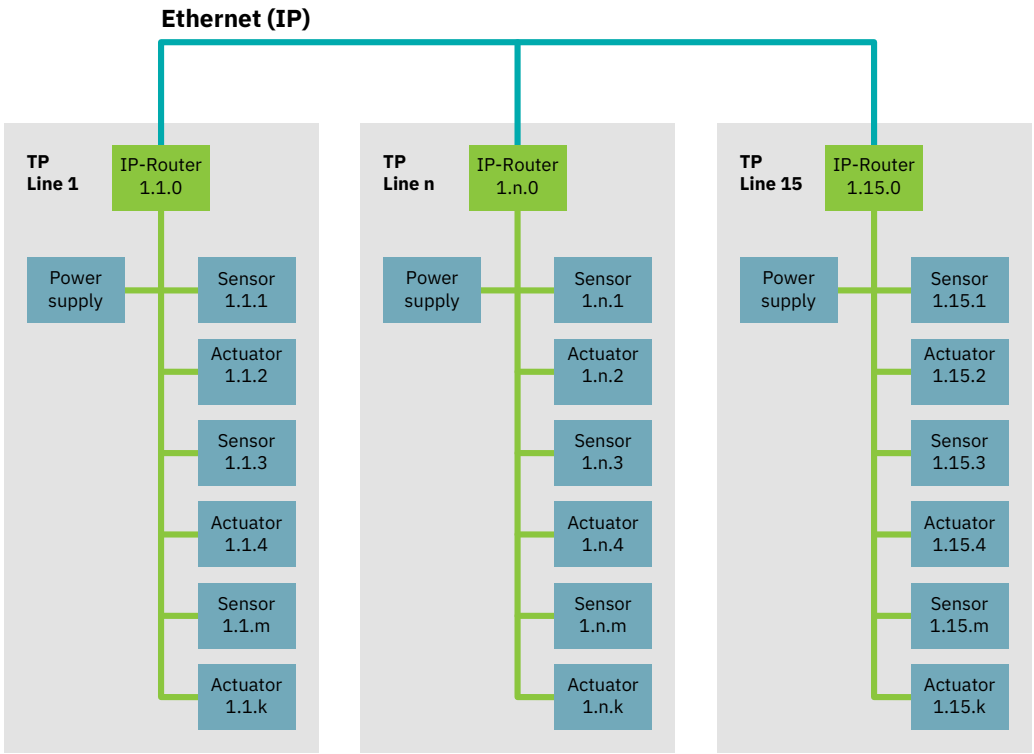

Figure 7 Use of KNX IP routers to set up a KNX network

8 ETS integration

The Catan C1 KNX IP router is integrated in the ETS online catalog. Alternatively, import the KNX product database file *PxC_Router.knxprod* into the ETS. Drag the device into your ETS project topology as required.

The example configuration shows the use of the Catan C1 KNX IP router as a line coupler. Catan C1 appears in the topology window as the first device on the TP line, as shown below. The physical device address 1.1.0 depends on your topology. The KNX IP router has five (5) additional addresses for five (5) tunneling interfaces.

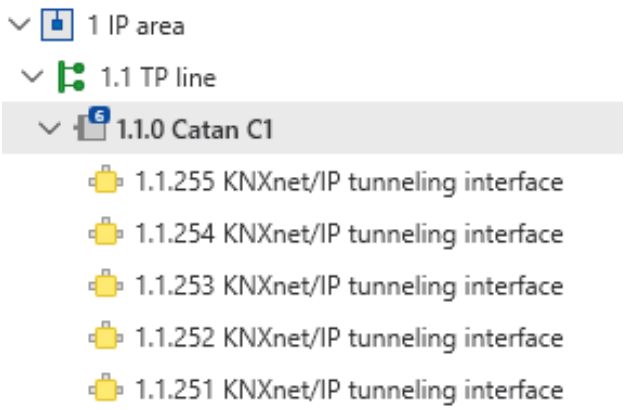

Figure 8 KNX line

The physical address and the device name are set up in the right-hand window area of the ETS. The last digit of the physical address of a KNX IP router must be 0.

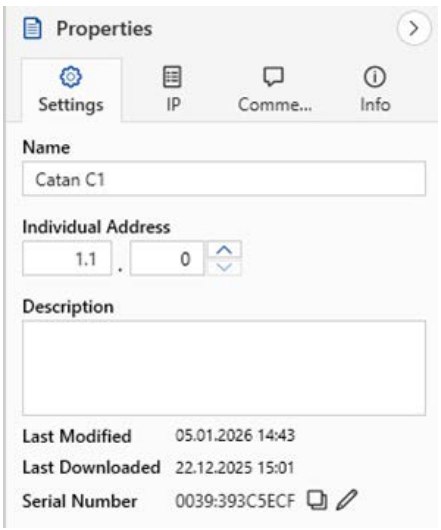

Figure 9 KNX properties

The IP configuration is displayed when you select the “IP” tab. It cannot be changed here. Necessary changes are only possible in the WBM, as described in section 6 on page 6.

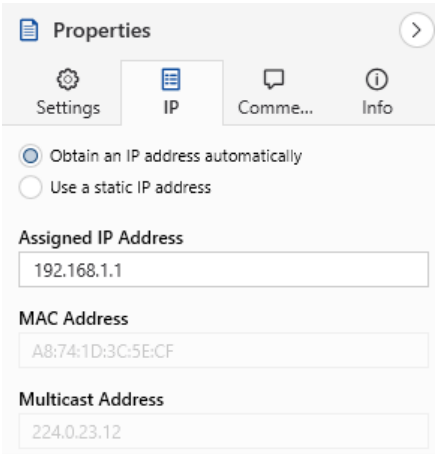

Figure 10 KNX IP properties

The physical addresses of the tunneling connections are also set in the right-hand window area when the respective interface is selected in the topology view.

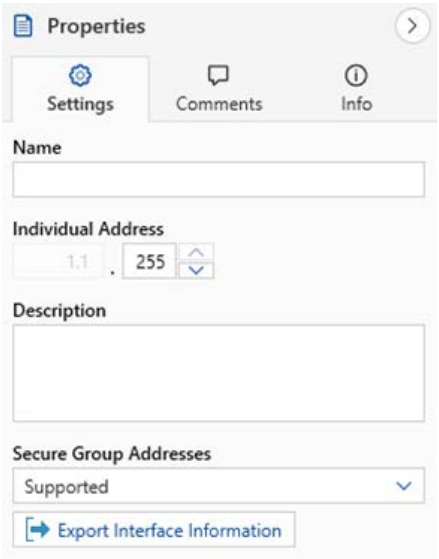

Figure 11 KNX tunnel address

After completing the address configurations, select the “Download” button of the ETS to carry out the initial programming. Make sure to select the network adapter of your PC in the “Connections” menu at the top of the ETS window.

To program a new device, the ETS prompts you to press the programming button on the device. Press the small, recessed button (see Figure 1 on page 4) marked “Action” at the top of the controller to set the programming mode. The status LED lights up red. When the process is complete, the status LED lights up green again.

9 Device parameters in the ETS

Routing (IP => KNX)

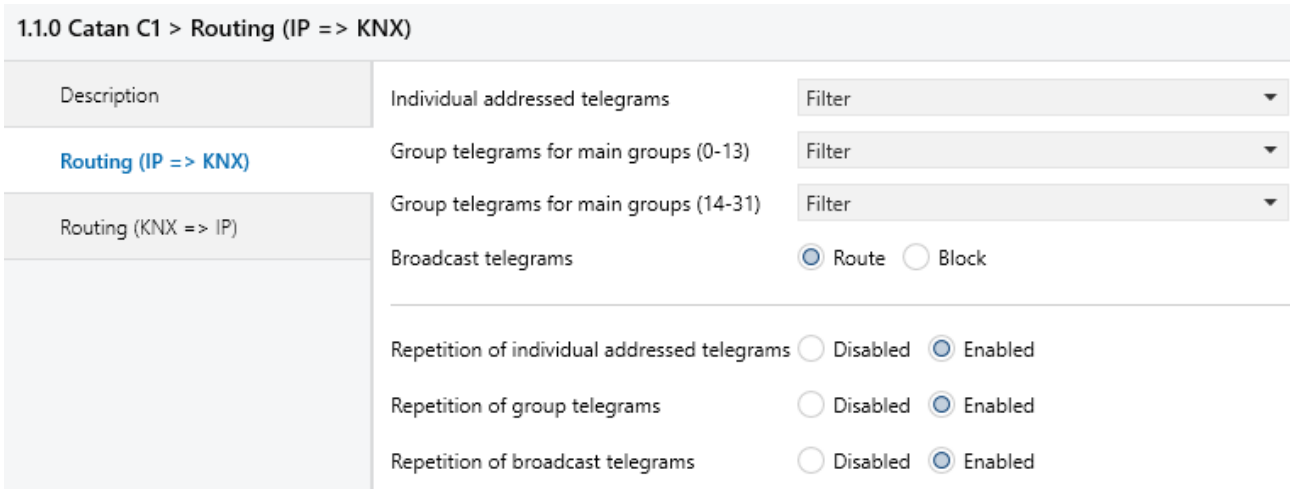

Figure 12 Filter settings for routing from IP to the KNX TP line

Individual addressed telegrams	
Block	No individual addressed telegrams are routed to KNX TP.
Route	All individual addressed telegrams are routed to KNX TP.
Filter	The physical address is checked to determine whether the received individual addressed telegram should be routed to KNX TP.

Group telegrams for main groups (0-13)	
Block	No group telegrams of these main groups are routed to KNX TP.
Route	All group telegrams of these main groups are routed to KNX TP regardless of the filter table. This setting is generally only used for test purposes.
Filter	The filter table is used to decide whether the received group telegrams should be routed to KNX TP.

Group telegrams for main groups (14-31)	
Block	No group telegrams of these main groups are routed to KNX TP.
Route	All group telegrams of these main groups are routed to KNX TP regardless of the filter table. This setting is generally only used for test purposes.
Filter	The filter table is used to decide whether the received group telegrams should be routed to KNX TP.

Broadcast telegrams	
Block	Received broadcast telegrams are not routed to KNX TP.
Route	All received broadcast telegrams are routed to KNX TP.

Repetition of individual addressed telegrams	
Disabled	In the event of an error, the received individual addressed telegram is not sent again to KNX TP.
Enabled	In the event of an error, the received individual addressed telegram is resent up to three times.

Repetition of group telegrams	
Disabled	In the event of an error, the received group telegram is not sent again to KNX TP.
Enabled	In the event of an error, the received group telegram is resent up to three times.

Repetition of broadcast telegrams	
Disabled	In the event of an error, the received broadcast telegram is not sent again to KNX TP.
Enabled	In the event of an error, the received broadcast telegram is resent up to three times.

Routing (KNX => IP)

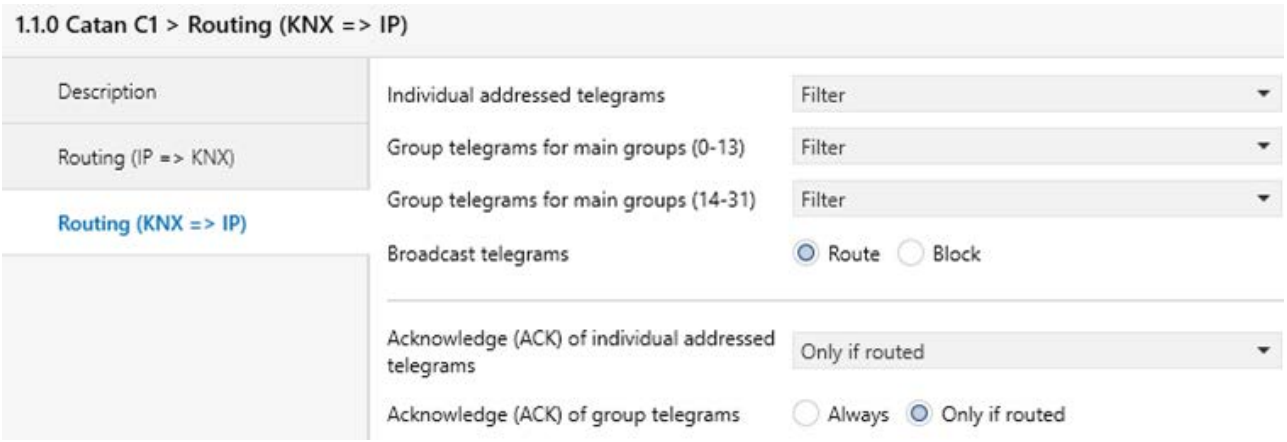

Figure 13 Filter settings for routing from the KNX TP line to the IP network

Individual addressed telegrams	
Block	No individual addressed telegrams are routed to KNX IP.
Route	All individual addressed telegrams are routed to KNX IP.
Filter	The physical address is checked to determine whether the received individual addressed telegram should be routed to KNX IP.

Group telegrams for main groups (0-13)	
Block	No group telegrams of these main groups are routed to KNX IP.
Route	All group telegrams of these main groups are routed to KNX IP regardless of the filter table.
Filter	The filter table is used to decide whether the received group telegrams should be routed to KNX IP.

Group telegrams for main groups (14-31)	
Block	No group telegrams of these main groups are routed to KNX IP.
Route	All group telegrams of these main groups are routed to KNX IP regardless of the filter table.
Filter	The filter table is used to decide whether the received group telegrams should be routed to KNX IP.

Broadcast telegrams	
Block	Received broadcast telegrams are not routed to KNX IP.
Route	All received broadcast telegrams are routed to KNX IP.

Acknowledge (ACK) of individual addressed telegrams	
Only if routed	An acknowledgment telegram is sent for received individual addressed telegrams (from KNX) only if these are routed to IP.
Always	An acknowledgment telegram is generated for each individual addressed telegram received (from KNX).
Answer with NACK	Each individual addressed telegram received (from KNX) is answered with a “not acknowledged” telegram. This means that communication with individual addressed telegrams is not possible on the corresponding KNX TP bus.

Acknowledge (ACK) of grouped telegrams	
Always	An acknowledgment telegram is generated for each group telegram received from KNX TP.
Only if routed	An acknowledgment telegram is generated for group telegrams received from KNX TP only if these are routed to IP.

10 Support for KNX Data Secure

The current version of the Catan C1 KNX IP router is not a KNX Secure device. However, it is possible to transmit encrypted KNX TP telegrams (KNX Data Secure) via both routing and tunneling between the TP connection and the IP connection.

This allows KNX TP Secure devices to be started up on the line, and allows encrypted data transmission between the connected KNX TP Secure devices and with KNX TP Secure devices on other lines in the KNX network. An IP tunneling client with encryption functionality can also exchange encrypted KNX group telegrams with KNX TP Secure devices on the integrated TP line.

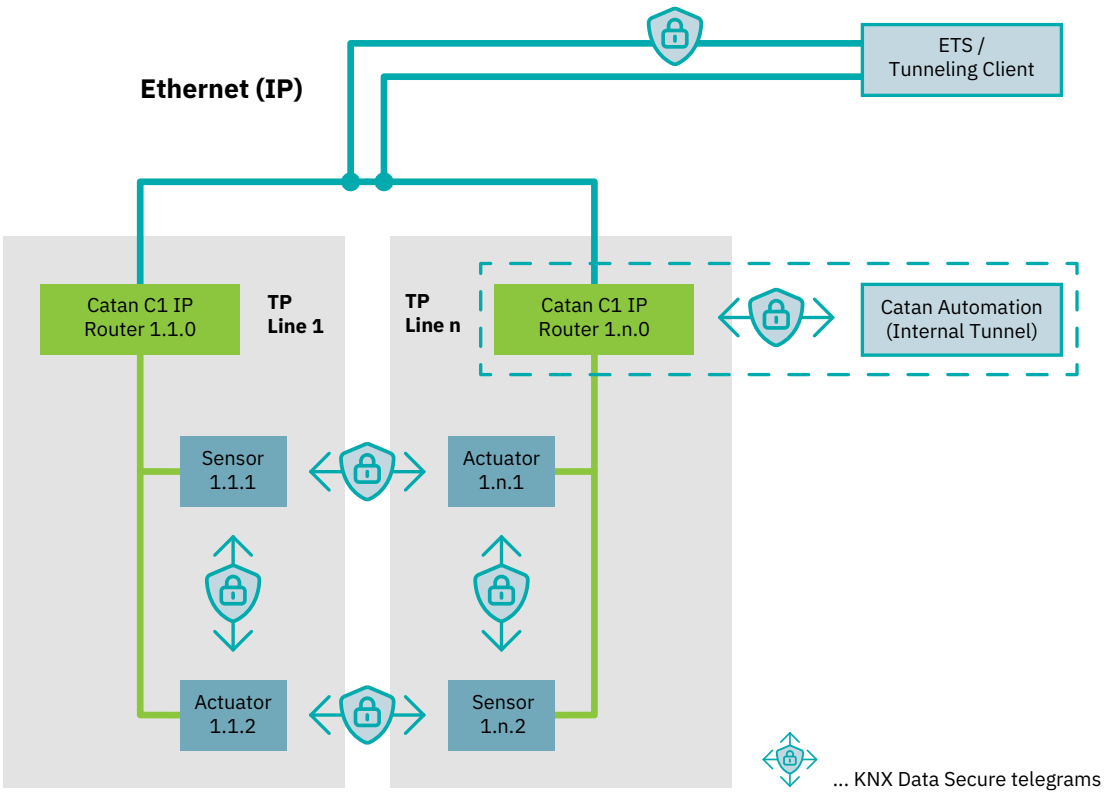

Figure 14 Catan C1 KNX IP router: KNX Data Secure support

When starting up a KNX Secure project in the ETS, a special feature must be observed. As usual, a tunnel connection must be associated with all the group addresses that are to access the TP line via the tunnel. If the tunneling client does not support specific selection of a tunnel address, all encrypted group addresses relevant for tunneling must be associated with each of the five (5) tunnel addresses of the Catan C1 KNX IP router.

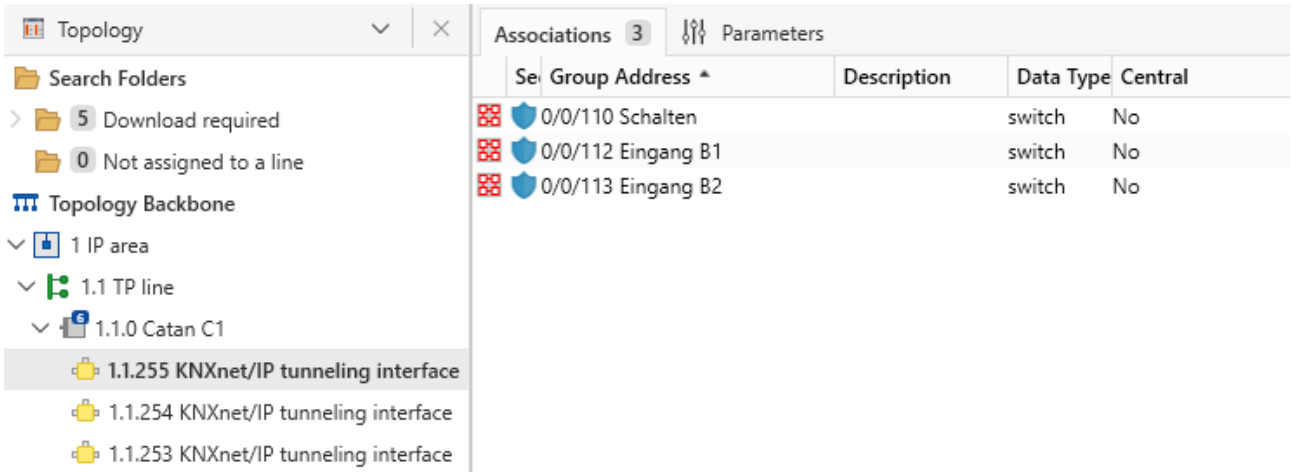

Figure 15 Association of encrypted group addresses with a tunnel address