Electricals
SEAWIN

KNX/IP Router

Manual -Ver2.1

MG0401

Catalog

1 Overview

1.1 Product description

MG0401is a KNX IP router that integrates KNXnet / IP gateway and KNX router functions. Its main features are as follows:

Function Description:

(1) Following the standard KNXnet / IP protocol, it can provide standard bus device configuration, management, download and other functions as KNX net / IP server;

(2) Can be used as a KNX branch line coupler to filter messages and reduce bus load;

(3) Can be used as a KNX area coupler to filter messages and reduce bus load;

(4) Can be used as a multi-zone coupler to expand the capacity of the system;

(5) Support database VDX download function

(6) Supports 5 clients for connection and communication, 100M communication speed, suitable as KNX high-speed trunk communication interface.

(7) Standard KNX / IP gateway, support KNX communication software such as Control4, winsitch, Elvis, Net x Automation

1.2 Topology

1.2.1 Branch-line coupler

The MG0401 IP router can be used as a KNX branch line coupler to filter messages and reduce the load on the bus. When used as a branch line coupler, its physical address is X.Y.0 (X = 0 ~ 15, Y = 0 ~ 7). There will no longer be any area coupler above the current branch line.
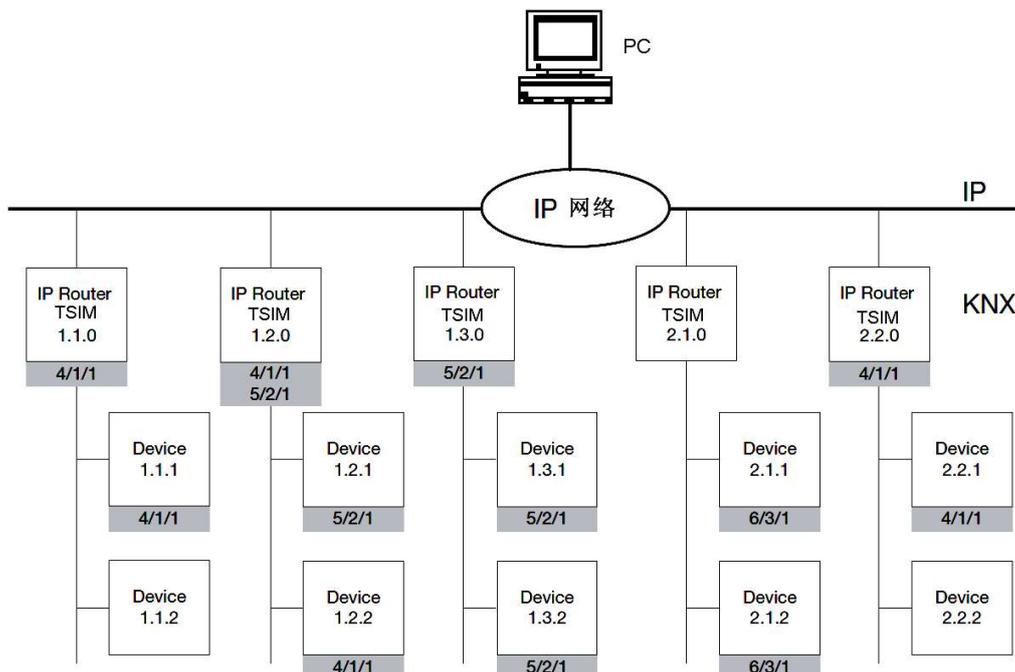
Figure 1.1 Branch-line coupler topology

1.2.2 Zone coupler

The MG0401 IP router can be used as a KNX zone coupler to filter messages and reduce the load on the bus. When used as a zone coupler, its physical address is X.0.0 (X = 0 ~ 15). A standard KNX branch line coupler (with KNX buses on both sides) can be deployed under the current area.
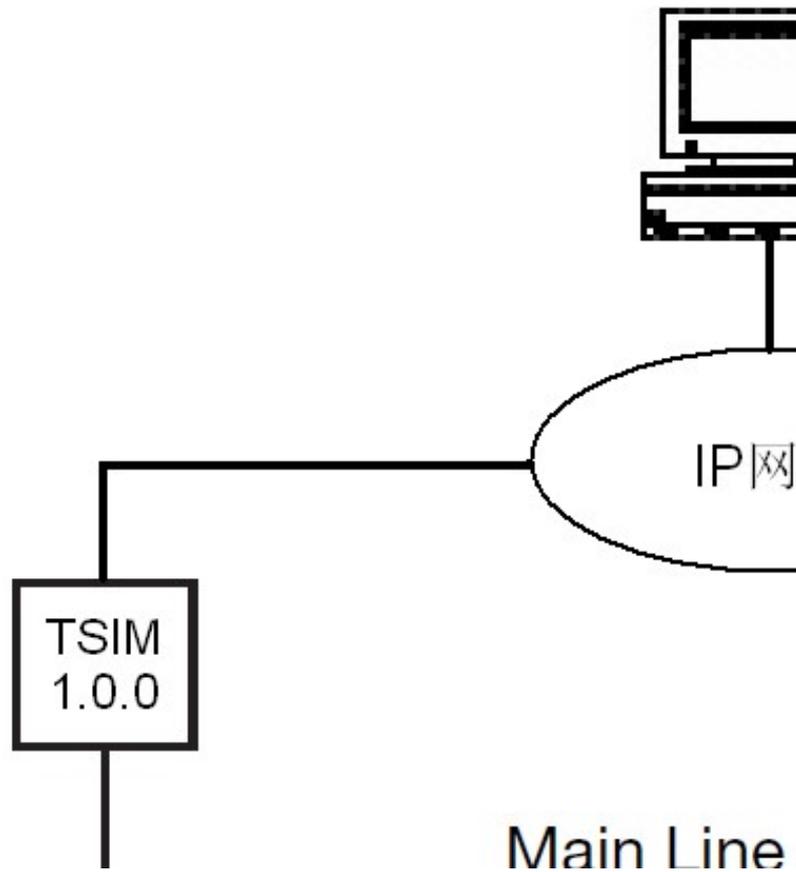
Figure 1.2 Zone coupler topology

1.2.3 Multi-Zone Coupler

MG0401 IP router can be used as a multi-zone coupler to expand the capacity of the system. When used as a multi-zone coupler, its physical address is 0.0.0 (X = 0 ~ 15), and the backend system uses the IP address of the IP router to distinguish multiple independent KNX systems.
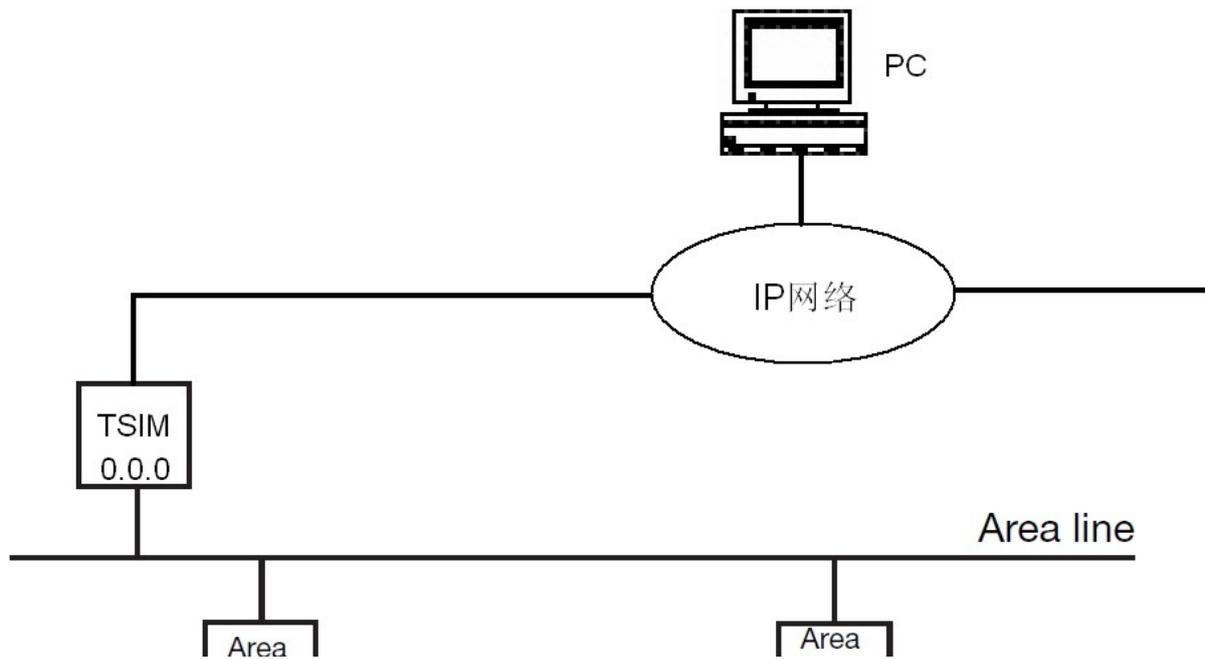
Figure 1.3 Multi-zone coupler topology

2   Specification

Bus Voltage	21~30V DC via knx
Bus current	≤12mA
Auxiliary voltage	24V DC
auxiliary current	≤25mA
Power	≤360mW
Shell material	PA66
Size(H x W x D)	90×38×64mm
Weight(approx.)	0.08kg
Installation method	35mm DIN rail installation
Operation temperature	- 5°C...+45°C
Storage temperature	-25°C...+ 55°C
Transportation temperature	-25°C...+ 70°C
Relative humidity	max 90%

3   Dimensional drawings and wiring diagrams
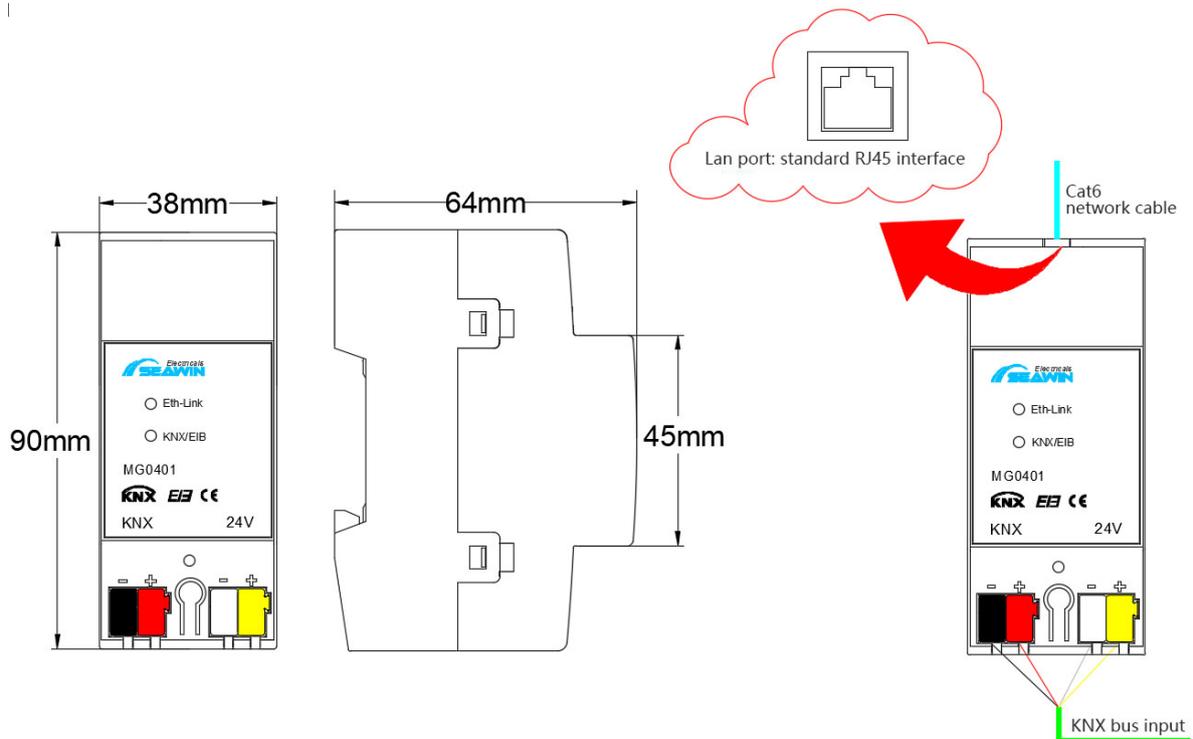
4   Installation guide

4.1 Installation instructions

(1) Please connect the wires according to the logo on the product shell, and do not connect the 24V power supply to the KNX communication interface in reverse.

(2) The 24V power supply should be provided by KNX special auxiliary power supply.

(3) Pay attention to construction dust during installation.

4.2 Installation Notes

(1) MG0401 adopts standard DIN rail installation, please install MG0401 reliably on the 35mm DIN rail according to the diagram.

(2) MG0401 is a modular installation device. In order to facilitate the rapid installation of the device in the distribution box, it is necessary to ensure that the operation, test, detection and maintenance of the device are correct.
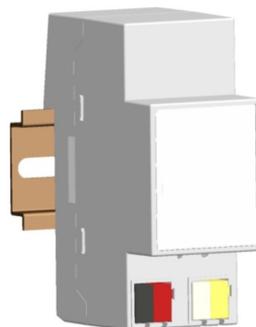

Figure 4.1 Schematic diagram of guide rail installation

5   Instructions and Operation
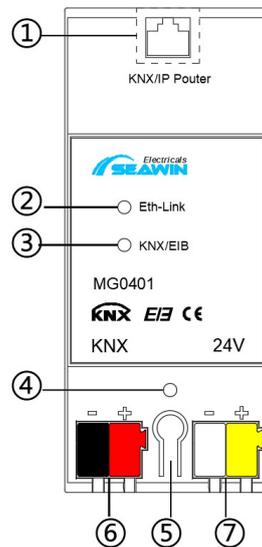
Nr.	Name	Function
1	IP Port	Connect the IP cable with a standard RJ45 socket.
2	IP side communication indicator	Steady on indicates that the IP side is connected normally, and blinking indicates that there is communication on the IP side.
3	KNX side communication indicator	Blinking means there is communication on the KNX side.
4	programming light	A solid light indicates programming mode.
5	Programming LED	The LED is on to indicate that it is in programming mode.
6	Programming button	The button is used to enter / exit KNX programming mode.
7	KNX terminal	Connect KNX bus, using standard KNX terminals.
8	24V power terminal	Connect auxiliary power, using standard KNX terminals.

6   Function configuration

MG0401 is configured through ETS4 / 5, which can be configured with parameters and associated with the address of the communication target group.

6.1 General parameter

Figure 6.1 General parameter setting

6.1.1 Device name

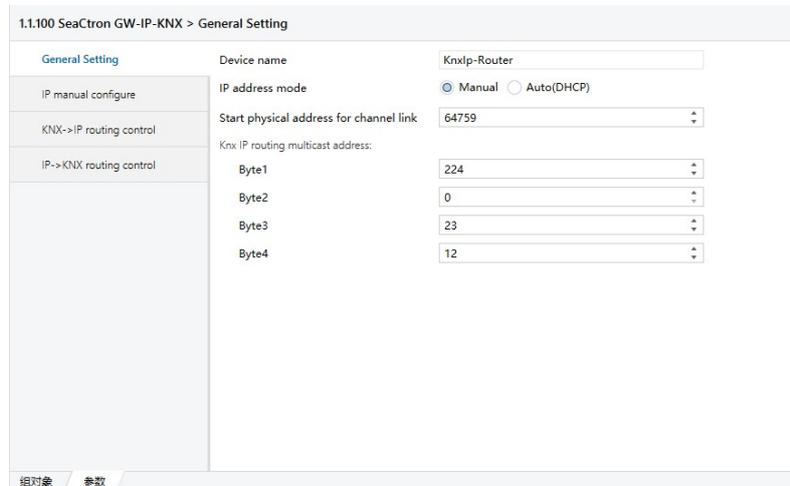This parameter is a character parameter. Up to 30 English letters and symbols

This parameter is used to set a readable distinguished name for MG0401. When the client (ETS or background software) finds the MG0401 IP router, the IP router will provide this information to the client, and the client will display this information to help users to identify the specific IP router easily.

6.1.2 IP Address mode

This parameter is optional. Options:

(1) Auto（DHCP)

(2) Manual

This parameter is used to set how to obtain the IP address of the MG0401 IP router. MG0401 IP router supports "Dynamic allocation" and "Manual setting" to set the local IP address.

Option	Description
DHCP	Obtain IP address through dynamic allocation. When there is a DHCP server (such as a router) in the IP-side network, the DHCP server will automatically assign a suitable IP address to the IP router.
Manual	Set the IP address manually. After selecting this option, an additional IP address configuration page will appear on the ETS parameter configuration page. On this IP address configuration page you can manually set the IP address, IP router address, and mask address.

6.1.3 Tunnel Link starting address

As shown below:

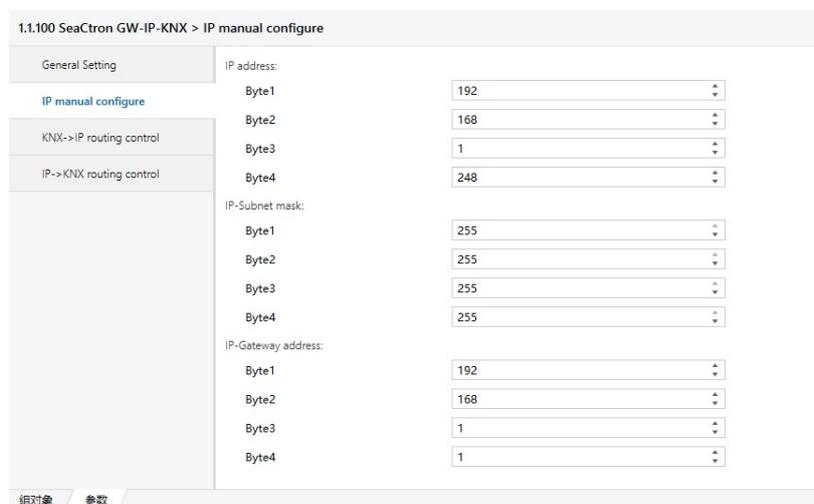Start physical address for channel link   64759

MG0401 supports 5 links. Each link needs to be assigned a physical address. These addresses are set here as the starting address and are automatically assigned in the order in which the links were established.

Note: The default address is relatively high, and generally does not need to be modified.

6.1.4 KNX IP Routing multicast address

This parameter is used to set the actual multicast address on the Ethernet side. The default is the KNX protocol system multicast address 224.0.21.31. When the actual system configuration needs to divide the multicast address, you can configure it through this.

6.2 IP Configure parameter

Figure 4.2 IP Configuration parameter setting

This tab is visible when the IP Address Assignment parameter is selected in the General tab.

6.2.1 IP address Byte X

This parameter is a numeric parameter. The value ranges from 0 to 255.

This parameter is used to set the IP address of MG0401 IP router, which must be unique and non-duplicate in the LAN.

For example, if the IP address is set to 192.168.1.248, the following settings are required:

> Byte 1 ： 192
> Byte 2 ： 168
> Byte 3 ： 1
> Byte 4 ： 248

6.2.2 Subnet mask Byte X

This parameter is a numeric parameter. The value ranges from 0 to 255.

This parameter is used to set the subnet mask address of MG0401 IP router, which is used to identify the subnet range.

The typical subnet mask address is 255.255.255.0, and the following settings are required:

> Byte 1 ： 255
> Byte 2 ： 255
> Byte 3 ： 255

Byte 4 ： 0

6.2.3 IP gateway Byte X

This parameter is a numeric parameter. The value ranges from 0 to 255.

This parameter is used to set the IP-side default gateway address of the MG0401 IP router. The typical subnet mask address is 192.168.1.1, you need to set it as follows:

Byte 1 ： 192
Byte 2 ： 168
Byte 3 ： 1
Byte 4 ： 1

6.3 KNX->IP Parameter
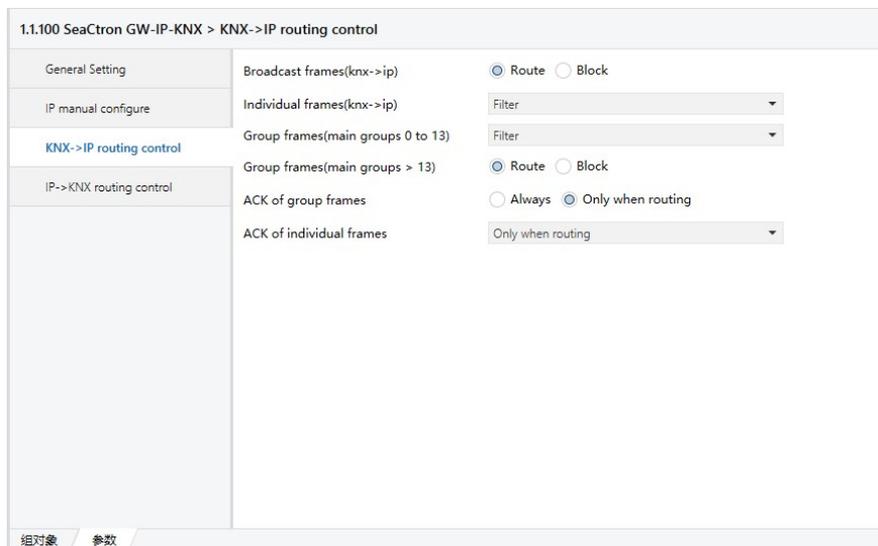
Figure 6.3 KNX->IP Parameter setting

6.3.1 Broadcast Frames

This parameter is optional. Options:

(1) Router(default)

(2) Block

This parameter is used to set the filtering behavior of the MG0401 IP router to the group telegrams whose group address (group address format is A / B / C, where A is the main groups) is 0 ~ 13.

Option	Description
Router	All broadcast messages are not filtered, and messages can be freely forwarded from the KNX side to the IP side.
Block	Block all broadcast messages, and the messages cannot be forwarded from the KNX side to the IP side

6.3.2 Group telegrams (main groups > 13)

This parameter is optional. Options:

(1) **Router(default)**

(2) Block

(3) Filter

This parameter is used to set the filtering behavior of MG0401 IP router addressing physical address unicast packets.

Option	Description
Router	All unicast messages addressed by physical addresses are not filtered, and messages can be freely forwarded from the KNX side to the IP side
Block	Block all unicast messages addressed by physical addresses, and the messages cannot be forwarded from the KNX side to the IP side
Filter	All unicast packets are filtered, and only unicast packets whose physical addresses do not belong to the branch line can be forwarded to the IP side.

6.3.3 Group Frames(main groups 0 to 13)

This parameter is optional. Options:

(1) **Router(default)**

(2) Block

(3) Filter

This parameter is used to set the filtering behavior of the MG0401 IP router for group address messages whose primary group address (the format of the group address is A/B/C, where A is the primary group address) is 0~13.

Option	Description
Router	Unicast packets of physical addressing are not filtered, and the packets can be freely forwarded from the KNX side to the IP side.
Block	Block all unicast packets of physical addressing, the packets cannot be forwarded from the KNX side to the IP side
Filter	Filter all unicast packets. Only unicast packets whose physical address does not belong to this branch line can be forwarded to the IP side.

6.3.4 Group Frames(main groups > 13)

This parameter is optional. Options:

(1) **Router(default)**

(2) Block

This parameter is used to set the filtering behavior of MG0401 IP router for group address messages whose primary group address (the group address format is A/B/C, where A is the primary group address) greater than 13.

Option	Description
Router	No filtering is performed on group address messages whose main group address is greater than 13, and the messages can be freely forwarded from the KNX side to the IP side

Block	Block the group address message with the primary group address greater than 13, and the message cannot be forwarded from the KNX side to the IP side

6.3.5 ACK of group frames

This parameter is optional. Options:

(1) Only when routing(default)

(2) Always

This parameter is used to set the MG0401 IP router to send acknowledgement of group packet.

Option	Description
Only when routing	Send acknowledgements only when routing messages
Always	Always send confirmation

6.3.6 ACK of individual frames

This parameter is optional. Options:

(1) Only when routing(default)

(2) Always

This parameter is used to set the behavior of MG0401 IP router sending acknowledgment for unicast packets addressed by physical addresses

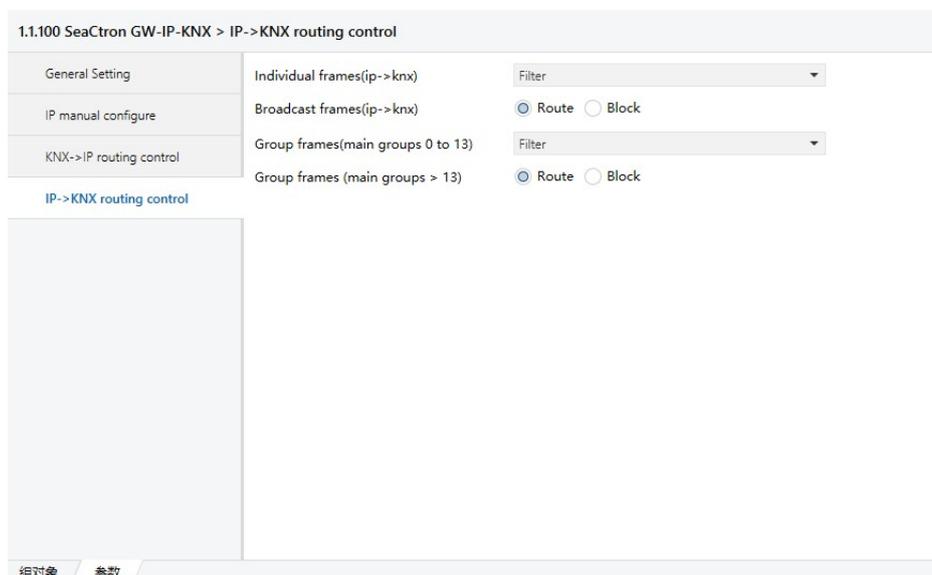| Option	Description
Only when routing	Send acknowledgements only when routing messages
Always	Always send confirmation
Always NACK	Always send no confirmation

6.4 IP->KNX Parameter

Figure 6.4 IP->KNX Parameter setting

6.4.1 Group frames (main groups 0 to 13)

This parameter is optional. Options:

(1) Router(default)

(2) Block

(3) Filter

This parameter is used to set the filtering behavior of MG0401 IP router addressing physical address unicast packets.

Option	Description
Router	All unicast messages addressed by physical addresses are not filtered, and the messages can be freely forwarded from the IP side to the KNX side
Block	Block all unicast messages addressed by physical addresses, and the messages cannot be forwarded from the IP side to the KNX side
Filter	The unicast message whose physical address belongs to the branch line or the area can be freely forwarded from the IP side to the KNX side

6.4.2 Broadcast frames

This parameter is optional. Options:

(1) Router(default)

(2) Block

This parameter is used to set the filtering behavior of MG0401 IP router for broadcast packets.

Option	Description
Router	All broadcast messages are not filtered, and the messages can be freely forwarded from the IP side to the KNX side
Block	Block all broadcast messages, and the messages cannot be forwarded from the IP side to the KNX side

6.4.3 Group frames(main groups 0 to 13)

This parameter is optional. Options:

(1) Router(default)

(2) Block

(3) Filter

This parameter is used to set the filtering behavior of the MG0401 IP router for group address messages whose primary group address (the format of the group address is A/B/C, where A is the primary group address) is 0~13.

Option	Description
Router	No filtering is performed on group address messages whose main group

	address is 0~13, and the messages can be freely forwarded from the IP side to the KNX side
Block	Block the group address message with the main group address 0~13, and the message cannot be forwarded from the IP side to the KNX side
Filter	Filter the group address messages whose main group address is 0~13 according to the filter table, and the group address messages in the filter table can be freely forwarded from the IP side to the KNX side

6.4.4 Group frames(main groups > 13)

This parameter is optional. Options:

(1) Router(default)

(2) Block

This parameter is used to set the filtering behavior of MG0401 IP router for group address messages whose primary group address (the group address format is A/B/C, where A is the primary group address) greater than 13.

Option	Description
Router	No filtering is performed on group address messages whose primary group address is greater than 13, and the messages can be freely forwarded from the IP side to the KNX side.
Block	Block the group address message with the primary group address greater than 13, and the message cannot be forwarded from the IP side to the KNX side.

6.5 ETS Connection management

MG0401 IP router can be used for ETS programming interface, downloading device applications, reading bus messages, managing device information, etc.

(1) click to enter Extra ->Option ->Communication -> Configure Interfaces...

(2) Create a new connection in the ETS Connection Manager page and select the connection type as "KNXnet / IP"

(3) Click "Rescan", all IP routers under the same network segment will be scanned. All routers will display the device name (name of parameter configuration), IP address and MAC address.

(4) Click "OK" to return to the Communication page and click "Test". If "OK" is achieved, the connection is successful.

Note: ETS4 connection has its particularity, the connection method is as follows:

Step 1: Click Setting → Communication;

Step 2: Click New button, as shown below:

Step 3：After clicking the new button, the following dialog box appears：

In the above dialog box, the entries are as follow：

Name：Enter the name of the gateway, self-naming.

Type：Select KNXnet/IP。

IP address：Enter the IP address of the selected gateway。

Port：Fill in 61118。

NAT mode：Not selected。

6.6 Multi-connection function

MG0401 IP router supports up to 5 clients to connect at the same time.

After the first client connects to the IP router, the IP router will assign a "second physical address" for accessing the bus. This address can be set in ETS. When the second client tries to connect, the IP router will add 1 to the "second physical address" of the first client. For example, when the address of the first client is 15.15.201, the address of the second client is 15.15.202, the third client address is 15.15.203, the fourth client address is 15.15.204, and the fifth client address is 15.15.205. The "second physical address" is unique within the KNX network. Repeated conflicting physical addresses will affect normal communication

6.7 Engineering typical configuration

In engineering configuration, it is often required that the multicast data of the KNX branch line can be transmitted to the background or remote control terminal, and it is required to perform ETS configuration to the devices of other

branch lines through the gateway of one branch line. At this time, the typical configuration of the filtering rules of the gateway is shown in the following figure:

As shown in the figure above, the KNX-> IP-side multicast packets and physical packet filtering rules are set to the Router mode, which means that both KNX-side unicast packets and multicast are sent to the IP side, so that devices on the IP side can receive these messages.

The IP-> KNX-side multicast packets and physical packet filtering rules are set to Filter mode, so that both unicast packets and multicast packets that are not on this branch line are filtered out, reducing the load on the KNX branch line.

7　Safe use and maintenance

(1)　Read all instructions carefully before use。
(2)　Create a good ventilation environment.
(3)　During use, pay attention to moisture, shock and dust.
(4)　Strictly forbid to rain, contact with other liquids or corrosive gases.
(5)　If it is wet or attacked by liquid, it should be dried in time.
(6)　When the machine fails, please contact professional maintenance personnel or our company.

8　Contact

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