

KIPI SC v2

Secure KNX-IP Interface

ZSYKISCV2

Application Program version: [1.4]
User Manual version: [1.4]_a

www.zennio.com

USER MANUAL

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1 INTRODUCTION

1.1 KIPI SC V2

KIPI SC v2 is the solution from Zennio with **KNX Secure** for the **interconnection** of **KNX twisted-pair lines** and **Ethernet**. It also provides a **connection point** for ETS to enable programming (up to five parallel connections) and monitoring the KNX line via IP.

KIPI SC v2 can **synchronize the date and time with an NTP server** in order to send this information to the KNX bus and serve as the **clock master** of the installation.

To ensure the exchange of KNX data in both IP and TP medium, the KIPI SC v2 has been provided with **KNX Secure**. For detailed information about the functionality and configuration of the KNX security, please refer to the specific user manual "**KNX Secure**", available in the KIPI SC v2 product section of the Zennio web portal (www.zennio.com).

These are the most outstanding features of this device:

- Maximum APDU length of 254 bytes.
- Up to **5 parallel connections from ETS** for programming and monitoring (via group monitor).
- No external power required.
- **High capacity buffer** for the reception of telegrams from the Ethernet network.
- **4 lighting indicators (LEDs)**: two state indicators for the lines (bus and Ethernet), one more IP factory reset indicator, and one additional indicator for the programming mode.
- Installation **Clock master** functionality, synchronized with **NTP servers**.
- **Heartbeat** or periodical “still-alive” notification.

1.2 LED INDICATORS

KIPI SC v2 incorporates four LED lights on the top of the device that make it easy to monitor the status of the buses and to detect typical communication problems, as detailed next.

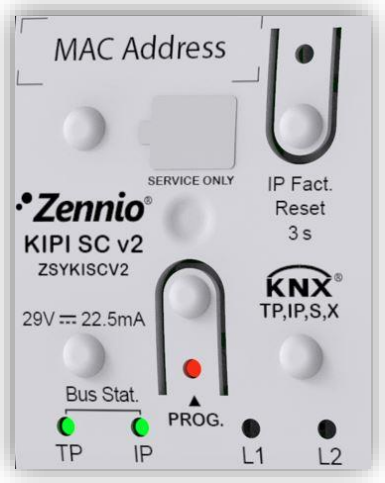

Figure 1. LEDs

- **KNX Line Status LED (TP)**: shows the status of the primary bus.
  - OFF: error or KNX line not connected or not powered.
  - ON (green) = TP connection OK.

  Note: *the update of the LED status can be delayed a few seconds after the trigger event, e.g., after the disconnection of the main line.*

- **Ethernet Line Status LED (IP)**: shows the status of the secondary bus.
  - OFF: error or IP line not connected.
  - ON (green): Ethernet connection OK

- **Programming LED**:
  - OFF = normal operation.
  - ON (red) = programming mode active.

- **IP Factory Reset LED:**
  - OFF: normal operation.
  - ON (red): factory IP is restored (300 ms active).

  Note: *L1 and L2 LEDs are not in use.*

1.3 HARD RESET TO FACTORY DEFAULTS

If “IP Fact. Reset” button is **pressed for three seconds**, the device restores its default parameters (obtain an IP address via DHCP server). Thus, if a device becomes inaccessible on the local network due to the loss of its IP configuration, the device can be located again. The default configuration will persist until a new download is made.

When a long press is detected, the associated LED will light up in red for 300 ms. After this time, LED will switch off again.

2 CONFIGURATION

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by entering the Parameters tab of the device.

2.1 KNX TO IP INTERFACE

KIPI SC v2 can be allocated within the project topology in ETS, as any other device. This step can be omitted when it is going to be used as interface, because there is no need to modify the default configuration (see previous section). However, when requiring modifying any property of KIPI SC v2, an individual address should be assigned in order to download.

2.1.1 PROGRAMMER

KIPI SC v2 can be used in ETS as a **programming interface**. In addition to an IP address, they must be assigned a KNX individual address for this purpose.

Up to five simultaneous connections are allowed for performing downloads or for bus monitoring (via group monitor).

Note: *to detect the KIPI SC v2 as a programmer in ETS, it needs to be connected to the same IP network as the PC*.

To use a device as a programmer:

- For **ETS6** must be selected from the drop-down list of “Connection bus”.

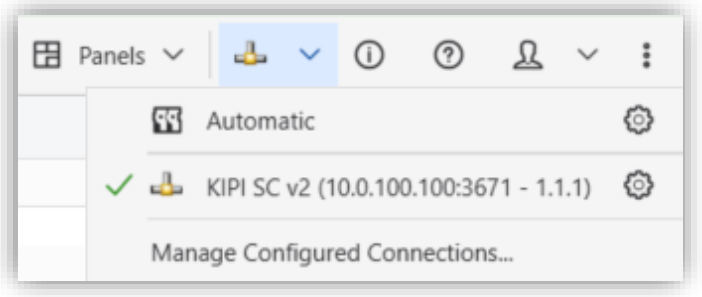

Figure 2. Selection of KIPI SC v2 in the Bus Connection’s drop-down list in ETS6

- For **ETS5** select it in the ETS "Bus" tab under Connections → Interfaces.

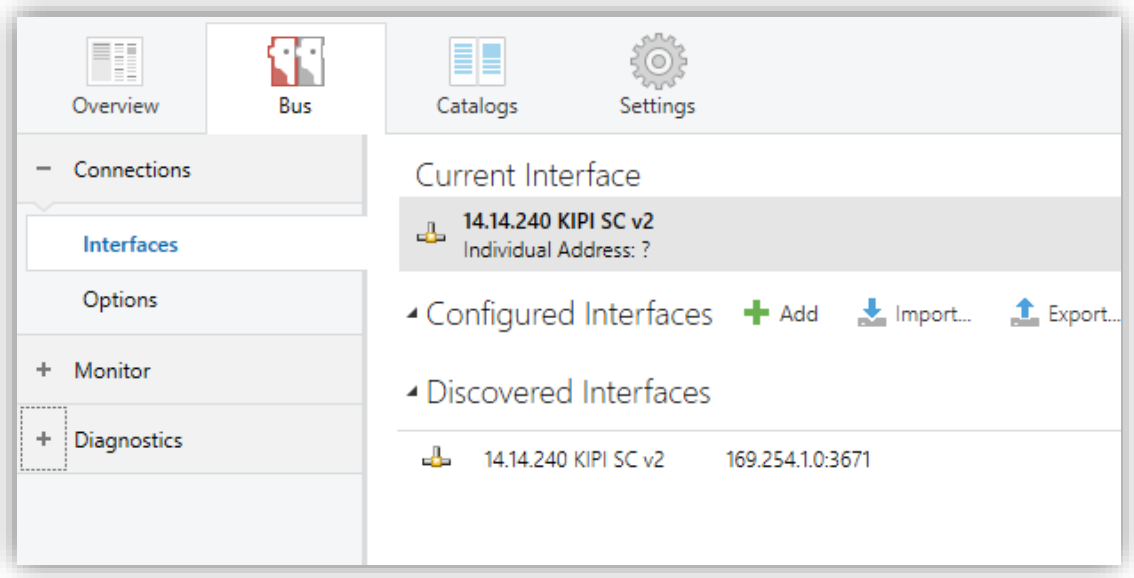

Figure 3. Selection of KIPI SC v2 in the Bus Connection's tab in ETS5

Or by selecting it at the bottom left after opening a project in ETS.

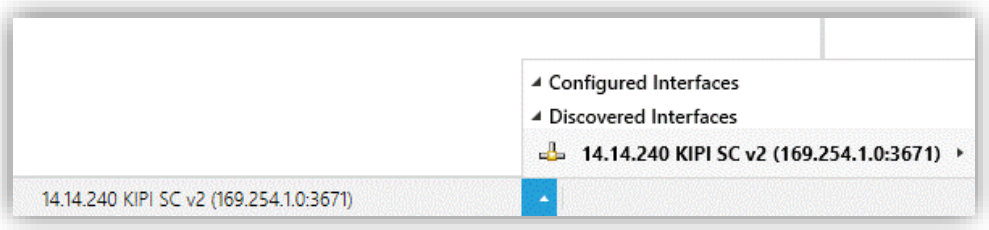

Figure 4. Selection of KIPI SC v2 in a ETS project

Important: *If the KIPI SC v2 is selected as the programming interface to program itself it is recommended to first perform individual address download and then application download, rather than complete download (complete download causes a device restart and therefore communication with ETS is lost and the download is cancelled).*

2.1.1.1 PROPERTIES

Once the desire Interface KIPI SC v2 has been selected, its configuration will be carried out in the "IP" panel of "Properties" tab in ETS:

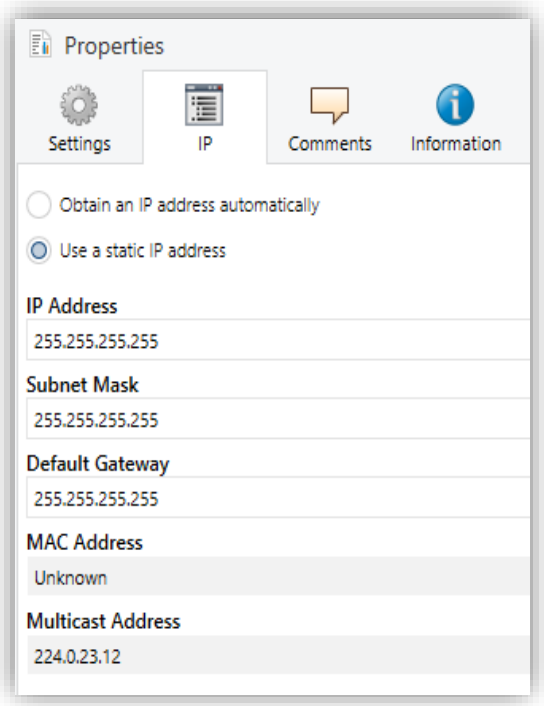

Figure 5. IP Configuration

- *Obtain an IP address automatically*[1]: **KIPI SC v2** will automatically acquire an IP address whenever there is a DHCP server in the local network to which it is connected.
- *Use a static IP address*. The following properties must be set manually:
  - **IP Address** [*0.0.0.0…255.255.255.255*]**.**
  - **Subnet Mask** [*0.0.0.0…255.255.255.255*]**.**
  - **Default Gateway** [*0.0.0.0…255.255.255.255*]**.**

Note: *If a static IP is configured, it is important to make sure that no other device on the network has this IP assigned to it and that it does not belong to the DHCP range configured for the router, otherwise connection problems with the KIPI SC v2 will be observed.*

[1] The default values of each parameter will be highlighted in blue in this document, as follows: [*default / rest of options*].

In addition, the following information will be shown:

- **MAC Address**.
- **Multicast Address** [*224.0.23.12*]: IP address (reserved by the IANA organization for the KNXnet/IP protocol) used by ETS in this case, for discovering the available KNX-IP interfaces within the same network.

Once these properties have been entered an ETS programming is required to download the configuration to the device.

2.1.1.2 PARALLEL DOWNLOADS

ETS offers the option to perform multiple parallel downloads within the same project. This option is only available for connections via a KNX-IP router or a KNX-IP interface. Certain conditions must be met:

- Each download must be performed on a different line.
- For the **ETS6** version, under “Connection bus” it is necessary to select the option *Automatic*.

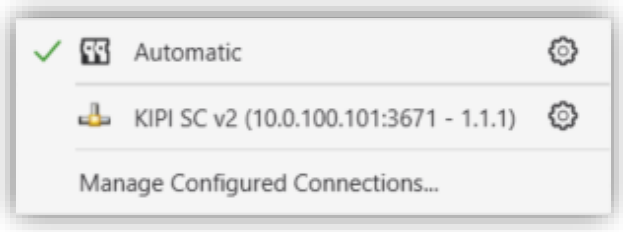

Figure 6. ETS6 parallel downloads configuration

- For the **ETS5** version, for each line it is necessary to select one **KIPI SC v2** to perform the download. It is configured in the line properties.

Notes:

- *There is a restriction: parallel downloads are **not available to download physical addresses**. When performing this type of downloads, the link device used by ETS is not the one configured for the line but the general one.*
- *Once the connection has been selected, it will not be available for the other lines.*

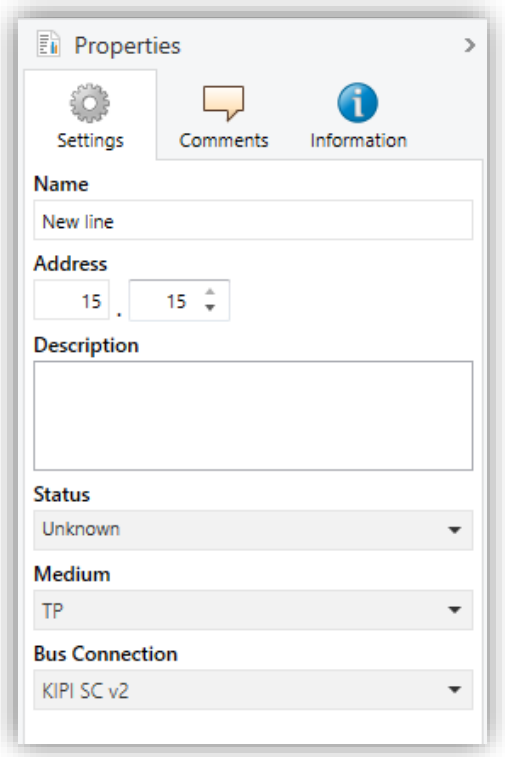

Figure 7. ETS5 Line properties.

2.1.2 ADDICIONAL INDIVIDUAL ADDRESSES (TUNNELING ADDRESSES)

KIPI SC v2 requires a specific individual address when acting as a programming interface (*tunneling*) other than the address of the device itself. Up to five simultaneous connections are possible, which implies that up to five different individual addresses must be configured.

Although, by default, the physical address of KIPI SC v2 is *15.15.255* and tunneling addresses are *15.15.250*, *15.15.251*, *15.15.252*, *15.15.253* and *15.15.254*, all of them can be configured in ETS after adding the device to the project, as shown in Figure 8.

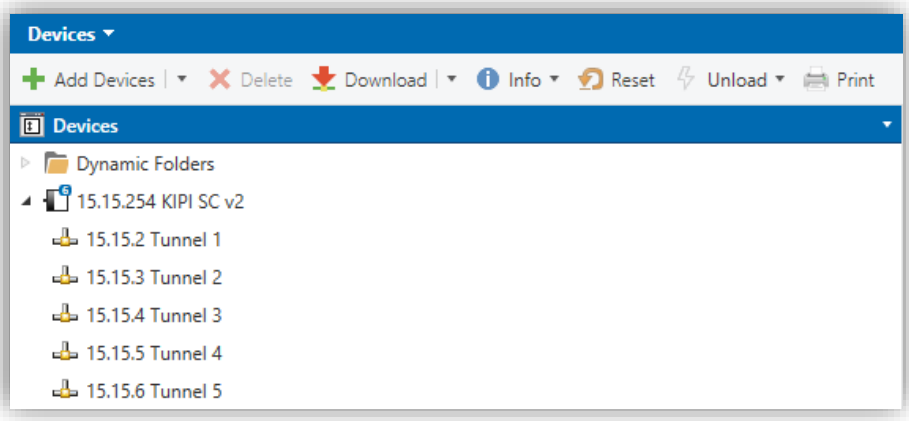

Figure 8. Set tunneling addresses.

After the individual KIPI SC v2 address has been set, the five tunneling addresses are automatically set with consecutive values. This can be changer at any time.

Important: *KIPI SC v2 tunnelling addresses must not match any of the addresses set to other devices on the system.*

2.2 GENERAL

The only parameterizable screen available is "General". All device functions can be activate/deactivate from this screen.

ETS PARAMETERISATION

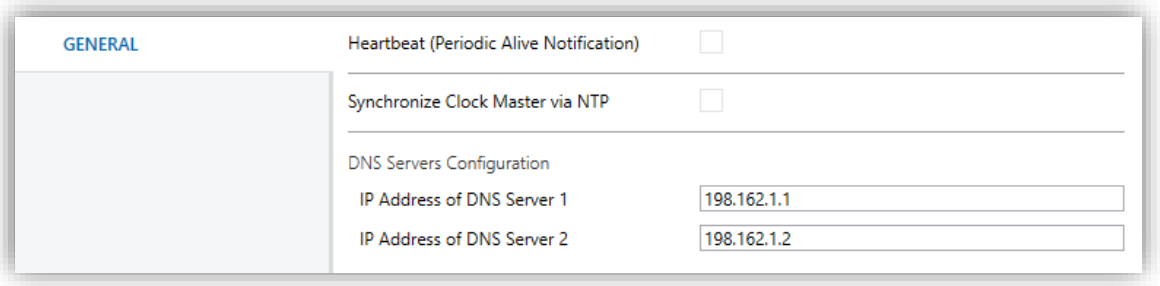

Figure 9. General

- **Heartbeat (Periodic Alive Notification)** [*disabled / enabled*]: incorporates a one-bit object to the project ("**[Heartbeat] Object to Send '1'**") that will be sent periodically with value "1" to notify that the device is still working (*still alive*).

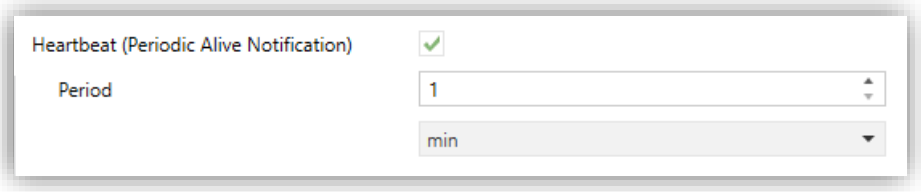

Figure 10. Heartbeat

Note: *the first sending after download or bus failure takes place with a delay of up to 255 seconds, to prevent bus overload. The following sendings march the period set.*

- **Synchronize Clock Master via NTP** [*disabled / enabled*]: enables or disables the "NTP" tab in the tree on the left. For more information, see section 2.3.

Note: *This parameter must be enabled in the device that will be clock master so that there is only one in the installation.*

- **DNS Servers Configuration:** numeric text fields to enter the IP address of two DNS servers:

  - **IP Address of DNS Server 1** and **2** [*198.162.1*, *198.162.2*].

  Note: *The connection to the DNS server is necessary to ensure the correct functioning of the NTP servers (see section 2.3). As long as there is no connection to a DNS server, the date and time information will not be synchronized.*

2.3 NTP CLOCK

KIPI SC v2 can be configured as the installation master clock, it will send the date and time information to the rest of the devices of the installation. This information will be obtained from an NTP server.

Please refer to the specific manual "**NTP Clock**" (available under the KIPI SC v2 product section at Zennio homepage, www.zennio.com) for detailed information about the functionality and the configuration of the involved parameters.

ANNEX I. COMMUNICATION OBJECTS

- "**Functional Range**" shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application programme itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		C - - T -	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically
2	3 Bytes	O	C R - T -	DPT_Date	01/01/1990 - 31/12/2089	[NTP] Date	Current Date
3	3 Bytes	O	C R - T -	DPT_TimeOfDay	00:00:00 - 23:59:59	[NTP] Time of Day	Current Time
4	8 Bytes	O	C R - T -	DPT_DateTime		[NTP] Date and Time	Current Date and Time
5	1 Bit	I	C - W - -	DPT_Ack	0/1	[NTP] Sending Request	0 = No Action; 1 = Request Date and Time Sending

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