

IPR-K

BD930000

Programming manual



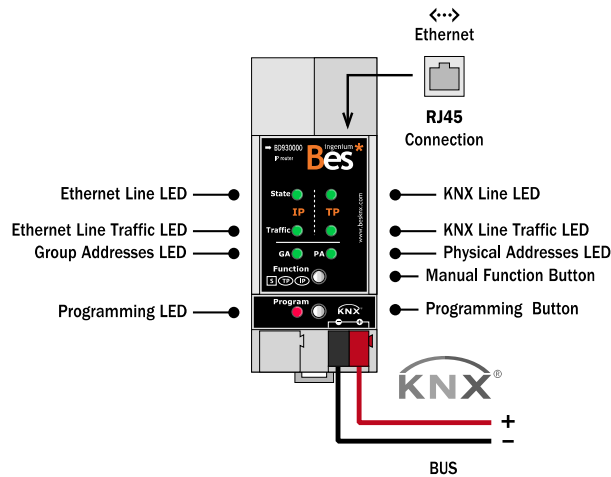
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1 General description

Device with support for IP routing and tunneling without the need for auxiliary power. It allows the connection between an upper KNX / IP line and a lower KNX TP (twisted pair) bus line. It includes support for KNX tunneling that allows addressing, programming, monitoring and diagnosing KNX devices via ETS

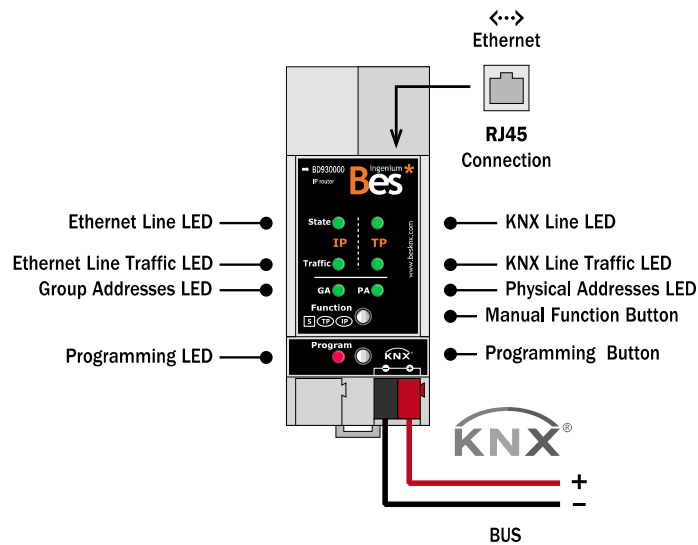


- Allows messages of up to 240 bytes.
- Up to 4 simultaneous connections can be made from the ETS software for diagnosis and/or programming.
- Support for group addresses in the range 14 to 31.
- It has a web application to update the firmware or display configuration aspects.
- Allows filtering of telegrams between areas or lines, including device programming traffic.
- Activation and deactivation of manual mode from the button on the front of the device.

2 Technical information

Power supply	29 Vdc from KNX BUS
Current consumption	5 mA from KNX BUS
Connections	Terminal de conexión al bus KNX RJ45 connector
Mounting/Size	DIN rail / 2 modules
Environment temperature range	Operation: -10°C to 55°C Storage: -30°C to 60°C Transportation: -30°C to 60°C
Regulation	According to the directives of electromagnetic compatibility and low voltage. EN 50090-2-2 / UNEEN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010- 1

3 LED status



- Ethernet line LED: shows the status of the IP line. If it is off, there is an error or the line is not connected; if it is lit green, the connection is correct; If, on the other hand, it is lit orange, the device is operating in manual mode or the factory settings are being restored.
- KNX line LED: shows the status of the KNX TP line. If the LED is off, there is an error, the line has no power, or is disconnected. If the LED is lit green, the line connection is correct; if it is lit red, a factory reset is in progress; while, if it is flashing green, the device is updating its firmware.
- Ethernet line traffic LED: if it is flashing green, there is traffic on the IP line; if it is off, there is no traffic; If the LED is lit red, there are transmission errors on the line.
- KNX line traffic LED: if it is flashing green, there is traffic on the TP line; if it is off, there is no traffic; If the LED is lit red, there are transmission errors on the line.
- Group addresses LED (GA): if it is off, there is a different configuration on the Ethernet line and on the TP line; if it is green, the device is filtering telegrams; if the LED is orange, no group address is filtered; while, if it is red, all group addresses are blocked.
- Physical addresses (PA) LEDs: if it is off, there is a different configuration on the Ethernet line and on the TP line; if it is green, the device is filtering telegrams; if the LED is orange, no physical address is filtered; while, if it is red, all physical addresses are blocked.

4 Devices programming with IPR-K

In order to download the configuration to KNX devices from the ETS through the BES IPR-K device, a physical address must be assigned to the device (although it is not necessary in case of use as an IP-TP interface, it is essential if it is used as a coupler, and it must also have a valid IP address through which it will communicate with the computer so that both must be on the same network. If the device has the DHCP option activated, the IP will be assigned by the router automatically.

Multiple application program downloads (not physical address assignments) can be made simultaneously on different lines through IPR-K devices. To do this, on each line you must select the IP router in charge of programming within the properties of the line. Each line will have an assigned IPR-K that cannot be shared between them.

5 IP-TP lines interface

The IPR-K can be used as an area or line coupler, depending on its location in the project. It is used as an area coupler when the middle of the backbone line is Ethernet (IP) and the line is twisted pair (TP). To couple lines, the same criteria is used, being the main line Ethernet type.

Regardless of the case for which it is used, telegrams can be filtered with the IPR-K. For filtering of group addresses, a table is generated which is downloaded to the device when doing a full download. This table allows the IP router, in its operation as a coupler, to block telegrams with destination addresses contemplated in its address table. This table, as has been said before, is downloaded to the device in a complete download, so any changes in the project must be updated by this means in the IPR-K. If the device is configured for group address filtering in both directions, the IPR-K will check if the received group address is linked to some communication object on the other line or if in the properties of the group address in The ETS has indicated the option to Pass Through the Line Coupler. In these cases, the IPR-K will pass the telegram.

In order to filter telegrams whose destination are physical addresses, the address table is not used, but the IPR-K will compare the destination address of the telegram with its own and thus determine if it should pass the telegram or carry out its filtering.

6 Line Coupler parameters

Parameterization of the device is done from the ETS. The description of each parameter is shown in this chapter.

6.1.1 General

Nombre	Manual function
Valores	Disabled / Pass all telegrams / Pass all Physical telegrams / Pass all Group telegrams
Descripción	Configuration setting for telegram routing when the Manual Function is active.
Nombre	Switch-off time for Manual Function
Valores	10 min / 1 hour / 4 hours / 8 hours
Descripción	After expiry of this time period the Manual Function is switched off automatically.

6.1.2 Main line

For Group Telegrams and Physical Telegrams the setting “transmit all” is intended only for testing purposes. Please do not use for normal operation.

Name	Telegram routing
Values	Group: filter, Physical: block / Group and Physical: filter / Group: route, Physical: filter / Group and Physical: route configure
Description	<ul style="list-style-type: none"> - Block: No telegrams are routed. - Filter: telegrams entered in the filter table are routed. - Route: all telegrams are routed - Configure: the following parameters must be set manually.
Name	Group telegrams: Main group 0...13
Values	Transmit all (not recommended) / Block / Filter
Description	<ul style="list-style-type: none"> - Transmit all: Group telegrams (main group 0...13) are all routed. - Block: Group telegrams (main group 0...13) are all blocked. - Filter: Group telegrams (main group 0...13) are routed if entered in the filter table
Name	Group telegrams: Main group 14...31
Values	Transmit all (not recommended) / Block / Filter
Description	<ul style="list-style-type: none"> - Transmit all: Group telegrams (main group 14...31) are all routed. - Block: Group telegrams (main group 14...31) are all blocked. - Filter: Group telegrams (main group 14...31) are routed if entered in the filter table
Name	Physical telegrams
Values	Transmit all (not recommended) / Block / Filter

Description	<ul style="list-style-type: none"> - Transmit all: Physical telegrams are all routed. It is used only for tests, it shouldn't be used for normal operations. - Block: Physical telegrams are all blocked. - Filter: Depending on the physical address Physical telegrams are routed..
Name	Physical/Group telegrams: Repetition if errors on main line
Values	No / Up to 3 repetitions / Only one repetition
Description	<p>After main line transmission error (e.g. due to missing receiver) Physical telegrams</p> <ul style="list-style-type: none"> - No: Are not repeated - Up to 3 repetitions: Are repeated max. 3 times - Only one repetition: Are repeated once
Name	Telegram confirmation on main line
Values	If routed / always
Description	<p>It establishes when the line coupler must confirm the reception of telegrams (by sending ACK or IACK).</p> <ul style="list-style-type: none"> - If routed: Routed telegrams to the subline are confirmed by an ACK on the main line. - Always: Each telegram on the mainline is confirmed by an ACK.
Name	Send confirmation on own telegrams
Values	Yes / No
Description	Allows the sending or not of the self-confirmation of telegrams

6.1.3 Subline

For Group Telegrams and Physical Telegrams the setting "transmit all" is intended only for testing purposes. Please do not use for normal operation.

Name	Telegram routing
Values	Group: filter, Physical: block / Group and Physical: filter / Group: route, Physical: filter / Group and Physical: route configure
Description	<ul style="list-style-type: none"> - Block: No telegrams are routed. - Filter: telegrams entered in the filter table are routed. - Route: all telegrams are routed. - Configure: the following parameters must be set manually.
Name	Group telegrams: Main group 0...13
Values	Transmit all (no recomendado) / Block / Filter
Description	<ul style="list-style-type: none"> - Transmit all: Group telegrams (main group 0...13) are all routed. - Block: Group telegrams (main group 0...13) are all blocked. - Filter: Group telegrams (main group 0...13) are routed if entered in the filter table

Name	Group telegrams: Main group 14...31
Values	Transmit all (no recomendado) / Block / Filter
Description	<ul style="list-style-type: none"> - Transmit all: Group telegrams (main group 14...31) are all routed. - Block: Group telegrams (main group 14...31) are all blocked. - Filter: Group telegrams (main group 14...31) are routed if entered in the filter table
Name	Physical telegrams
Values	Transmit all (no recomendado) / Block / Filter
Description	<ul style="list-style-type: none"> - Transmit all: Physical telegrams are all routed. - Block: Physical telegrams are all blocked. - Filter: Depending on the physical address Physical telegrams are routed..
Name	Physical/Group telegrams: Repetition if errors on subline
Values	No / Up to 3 repetitions / Only one repetition
Description	<p>After subline transmission error (e.g. due to missing receiver) Physical telegrams:</p> <ul style="list-style-type: none"> - No: Are not repeated - Up to 3 repetitions: Are repeated max. 3 times - Only one repetition: Are repeated once
Name	Telegram confirmation on subline
Values	If routed / always
Description	<p>It establishes when the line coupler (by sending ACK or IACK) must confirm the telegram reception</p> <ul style="list-style-type: none"> - If routed: Routed telegrams to main line are confirmed by an ACK on the subline. - Always: Each telegram on the subline is confirmed by an ACK.
Name	Send confirmation on own telegrams
Values	Yes / No
Description	Allows the sending or not of the self-confirmation of telegrams
Name	Configuration from subline
Values	Allow / block
Description	If blocked an ETS download to the MECtp can occur only via main line.

7 Repeater mode parameters

Parameterization of the device is done from the ETS. The description of each parameter is shown in this chapter.

7.1.1 General

Nombre	Manual function
Valores	Disabled / Pass all telegrams / Pass all Physical telegrams / Pass all Group telegrams
Descripción	Configuration setting for telegram routing when the Manual Function is active.
Nombre	Switch-off time for Manual Function
Valores	10 min / 1 hour / 4 hours / 8 hours
Descripción	After expiry of this time period the Manual Function is switched off automatically.

7.1.2 Main line

For Group Telegrams and Physical Telegrams the setting “transmit all” is intended only for testing purposes. Please do not use for normal operation.

Name	Telegram routing
Values	Group and Physical: route / Configure
Description	<ul style="list-style-type: none"> - Route: all telegrams are routed - Configure: the following parameters must be set manually.
Name	Physical telegrams
Values	Transmit all (not recommended) / Block
Description	<ul style="list-style-type: none"> - Transmit all: Physical telegrams are all routed. It is used only for tests, it shouldn't be used for normal operations. - Block: Physical telegrams are all blocked.
Name	Physical/Group telegrams: Repetition if errors on main line
Values	No / Up to 3 repetitions / Only one repetition
Description	<p>After main line transmission error (e.g. due to missing receiver) Physical telegrams</p> <ul style="list-style-type: none"> - No: Are not repeated - Up to 3 repetitions: Are repeated max. 3 times - Only one repetition: Are repeated once
Name	Telegram confirmation on main line
Values	If routed / always

Description	It establishes when the line coupler must confirm the reception of telegrams (by sending ACK or IACK). - If routed: Routed telegrams to the subline are confirmed by an ACK on the main line. - Always: Each telegram on the mainline is confirmed by an ACK.
Name	Send confirmation on own telegrams
Values	Yes / No
Description	Allows the sending or not of the self-confirmation of telegrams

7.1.3 Subline

For Group Telegrams and Physical Telegrams the setting "transmit all" is intended only for testing purposes. Please do not use for normal operation.

Name	Telegram routing
Values	Group and Physical: route / configure
Description	- Route: all telegrams are routed. - Configure: the following parameters must be set manually.
Name	Physical telegrams
Values	Transmit all (no recomendado) / Block / Filter
Description	- Transmit all: Physical telegrams are all routed. - Block: Physical telegrams are all blocked.
Name	Physical/Group telegrams: Repetition if errors on subline
Values	No / Up to 3 repetitions / Only one repetition
Description	After subline transmission error (e.g. due to missing receiver) Physical telegrams: - No: Are not repeated - Up to 3 repetitions: Are repeated max. 3 times - Only one repetition: Are repeated once
Name	Telegram confirmation on subline
Values	If routed / always
Description	It establishes when the line coupler (by sending ACK or IACK) must confirm the telegram reception - If routed: Routed telegrams to main line are confirmed by an ACK on the subline. - Always: Each telegram on the subline is confirmed by an ACK.
Name	Send confirmation on own telegrams
Values	Yes / No
Description	Allows the sending or not of the self-confirmation of telegrams

8 Manual function

Using the button on the front of the device, you can activate manual mode, as well as restore factory settings or allow firmware updates.

If pressed for three seconds, the IPR-K will go into manual mode, turning the Ethernet LED at least orange or red (depending on whether it was green or paid before). To exit this manual mode, the button must be pressed for another three seconds.

The operation of the manual function is selected by means of parameters in the configuration catalog of the IPR-K device, as shown in the following image:

1.1.0 BES KNX-IP Router > General

General	Host name	BES KNX IP Router
IP configuration	Slow tunneling connections support	<input type="radio"/> yes <input checked="" type="radio"/> no
KNX multicast address	Manual Function	pass all telegrams
Main line (IP)	Switch-off time for Manual Function	disabled
Subline (KNX TP)		pass all telegrams ✓
		pass all Physical telegrams
		pass all Group telegrams

A timer after which the manual function will be automatically deactivated can be also selected.

9 Device reset

If a restore to the factory settings is desired, press the button on the front of the device (the same that allows manual mode activation) for 15 seconds. The LEDs will light orange or red and the physical address filtering led will change to yellow or orange. After this, the button must be pressed again for another 3 seconds.

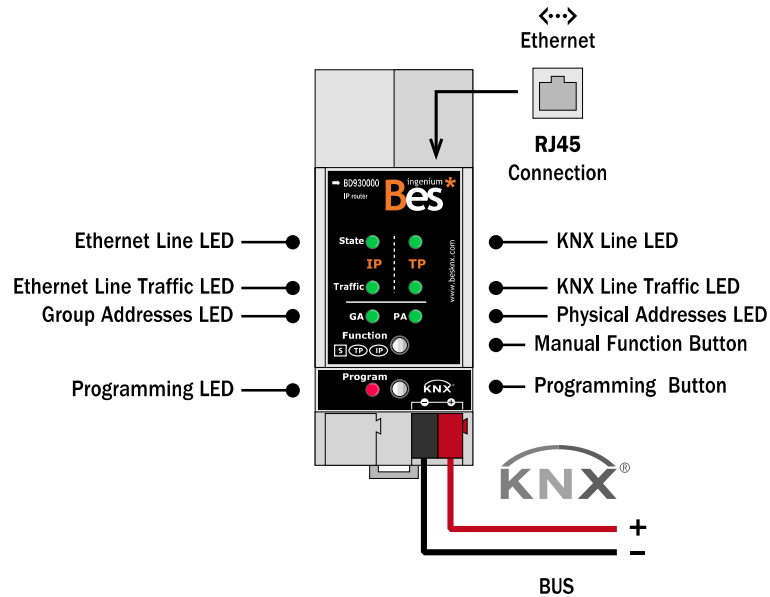
10 Web application

To access the device's web application, the IP of the device must be known and, in the browser, access through port 8080. To know the IP address, if the IPR-K is on the same network, you can find in the ETS.

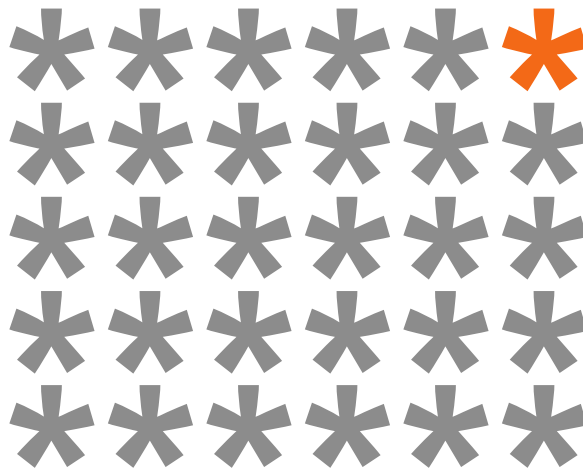
In the web application, information about the device can be found as well as the TP bus line, change tunneling addresses or find a graph of the KNX bus load.

The device uses a different address when it is used to program devices, which is called tunneling. Since IPR-K allows up to four simultaneous connections, up to four different physical addresses can be established. The first of these addresses is assigned in the Interfaces tab of the ETS while the rest are assigned consecutively to it.

11 Installation



Feed low voltage lines (BUS and inputs) in ducts separate from the main power supply (230V) and outputs to ensure there is enough insulation and to avoid interference. Do not connect mains voltage (230V) or any other external voltage at any point on the bus or inputs.



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