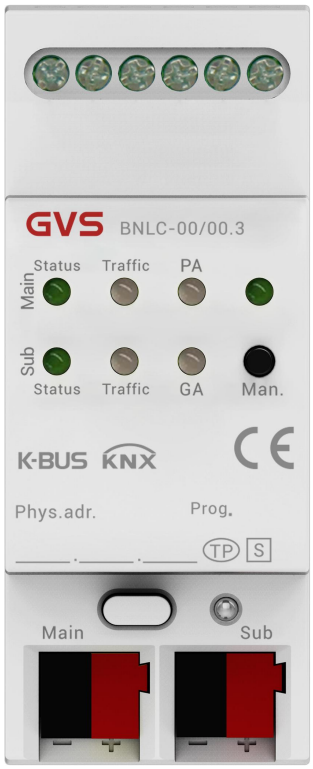
User Manual

K-BUS Line Coupler_V1.3

BNLC-00/00.3



KNX/EIB Home and Building Control System

Attentions

1. **Please keep devices away from strong magnetic field, high temperature, wet environment;**

2. **Do not fall the device to the ground or make them get hard impact;**

3. **Do not use wet cloth or volatile reagent to wipe the device;**

4. **Do not disassemble the devices.**

Contents

Chapter 1 Summary

The coupler can be used as line coupler, backbone coupler or repeater as well in existing KNX networks as in new KNX networks. It has a filter table with the help of which bus telegrams are either blocked off from one of the two lines or are passed on to another line thus reducing the bus load. The filter table is created by the ETS (KNX Tool Software) automatically on commissioning the system.

As there are no differences in hardware between the line coupler, the backbone coupler and the repeater they were given the same ordering number. After downloading the physical address, the functions of the coupler are configured automatically, as described in the following table:

Coupler function	Main line	Sub line
Backbone coupler	Backbone line	Main line 1-15
Line coupler	Main line 1-15	Sub line1-15
Repeater	Line 1-15	Segment 1-3

The power supply of the coupler electronics occurs via the connection to the main line.

Used as a line coupler when the physical address is “x.x.0”, otherwise it is a repeater.

Used as a line coupler, The basic functionality of the coupler is coupling a KNX-TP-main line with a KNX-TP-sub line. The coupler provides galvanic isolation between the two connected lines. Due to the flexibility of the coupler, it can be used as a line coupler to connect a line to a main line or as a backbone coupler to connect a main line to a backbone line. The main task of the coupler is filtering the traffic according the installation place in the hierarchy or according to the built in filter tables for group oriented communication. The the coupler provides outstanding features compared to other similar products, for example support for long messages (up to 250 byte length) and a configurable one button activation of special functions (e.g. transmit all group telegrams).These are helpful during installation, during run time and for trouble shooting. The high informative 6 duo LED display shows accurate the bus status on each line. This helps identifying common communication problems due to bus load or re-transmissions on both lines.

Used as a repeater, its function has the target to link two lines for data transfer. And it still provides galvanic isolation between the connected lines. Up to three line repeaters can be used behind a line coupler. As a result, up to four lines can form a complete line. Each line must be supplied by a dedicated KNX power supply.

This manual provides the technical information about the coupler as well as assembly and programming in detail for users, and explains how to use the coupler by the application examples.

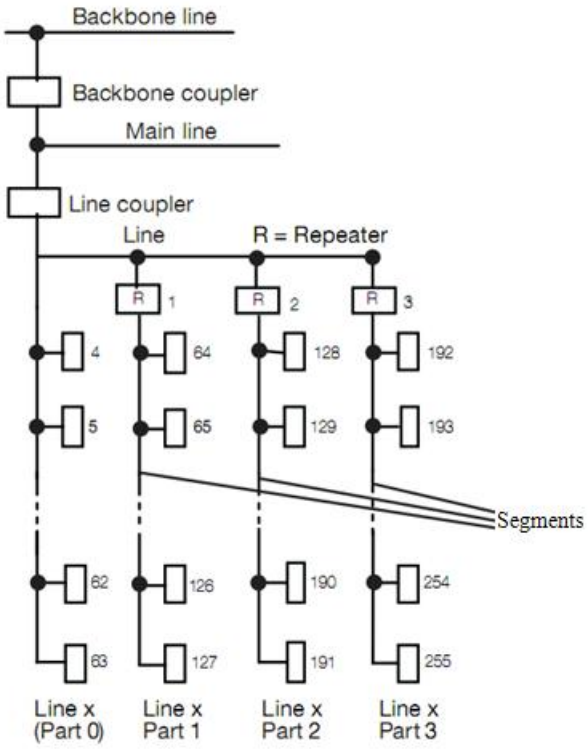


Fig.1 Connection of repeaters to a bus line

Application Programs ：

The coupler can be programmed with the ETS up from version ETS5. Used as a line/backbone coupler the application program “KNX Line Coupler” and used as a repeater the application program “KNX Line Repeater” has to be downloaded.

Please note that commissioning straight at delivery status means:

- The line coupler does block all telegrams because the filter table is not defined,

- The fallback time after manual operation is 120 min

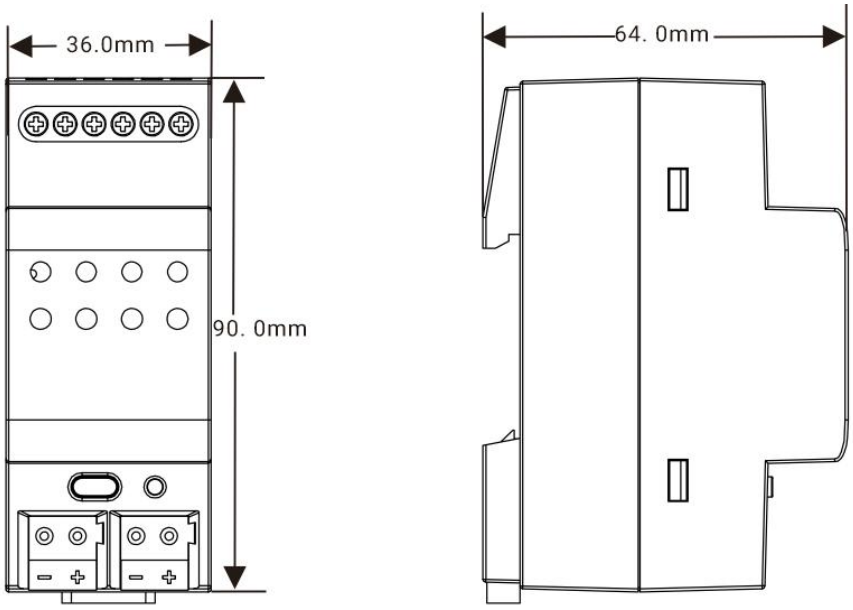
- The physical address is 15.15.0.

Chapter 2 Technical Data

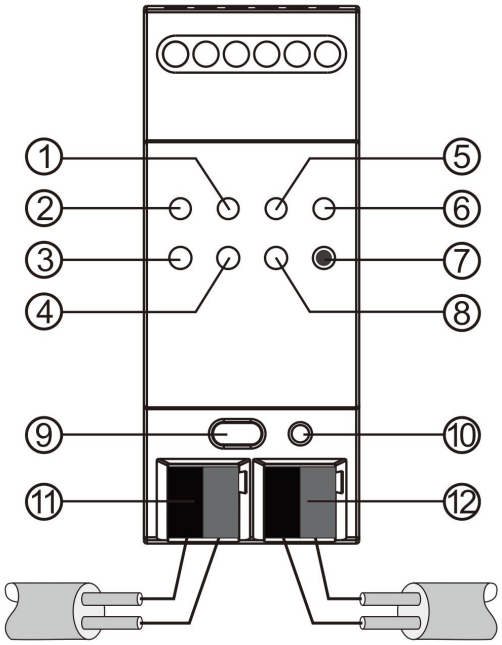
Power supply	Bus Main line	21-30V DC, used for power supply of the device
	Bus Sub line	21-30V DC
	Bus current	Main: <10mA/30V DC, Sub: <5mA/30V DC
	Bus consumption	Main: <300mW, Sub: <150mW
Connections	KNX Main/Sub line	Left bus connection terminal(Red/Black)
Operating and display	LED Bus State Main	Green on: Main line OK Off: main line error
	LED Bus State Sub	Green on: sub line ok Off: sub line error or not connected
	Traffic Main LED	Green: Bus traffic on sub line Red: flashing: Traffic error on main line
	Traffic Sub LED	Green: Bus traffic on sub line Red flashing: Traffic error on sub line
	GA LED(Routing group telegrams, indicate according to the configuration of ETS parameter “Group telegrams (main groups 0...13)”)	Used as a line coupler: Green: Filter table active Red: Block; Green and Red: Route all Off: Main and sub different Used as a repeater: Green and Red: Route all
	PA LED(Routing physical addressed telegrams)	Green: Filter table active Red: Block; Green and Red: Route all Off: Main and sub different
	Programming/Running LED	Red: For assignment of the physical address Green: flashing: The device running normally
	Programming button	For assignment of the physical address
	Function LED	Green: Enter manual override Off: Exit manual override
	Function button	Switch to manual override
Temperature	Operation	−5 °C ... + 45 °C
	Storage	−25 °C ... + 55 °C
	Transport	− 25 °C ... + 70 °C
Ambient	Humidity	<93%, expect dewing
Protection	IP 20	to EN 60529
Dimensions	36×90 ×64mm	
Weight	0.1KG	
Housing	Plastic housing, beige	
Design	Modular installation device, on 35mm mounting rail	

Chapter 3 Dimension diagram and Connection diagram

3.1 Dimension diagram



3.2 Connection diagram



①Traffic Main LED
②Bus Status Main LED
③KNX Status Sub LED
④Traffic Sub LED
⑤PA LED
⑥Function Status LED
⑦Function Button
⑧GA LED
⑨Programming Button
⑩Programming LED
⑪KNX Connection: Main line
⑫KNX Connection: Sub line

Note:

The latest downloaded settings (parameters) and filter table are still available after switching back from “Manual operation” to “Normal operation”.

Chapter 4 Application Description Coupler

Application program	Max. number of communication objects	Max. number of group address	Max. number of associations
KNX Line Coupler/Repeater	**0**	**0**	**0**

4.1 Coupler

If the coupler receives telegrams (for example during commissioning) which use a physical address as destination address, it compares the physical addresses of the receiver with its own physical address and then decides whether it must route the telegrams or not.

The coupler reacts to telegrams with group addresses in accordance with its parameter settings. During normal operation (default setting), the coupler only routes those telegrams whose group addresses have been entered in its filter table.

If the coupler routes a telegram and does not receive an acknowledgement, or if a bus device finds a transmission error, the coupler retransmits the telegram. The parameters “Repetition of group telegrams”, “Repetition of physical addressed telegrams”, “Repetition of broadcast telegrams” allow you to select the type of telegram to be retransmitted. It is operation can be set separately for both lines. These parameters are usually set by default.

4.2 Repeater

As a line repeater, the filter table is ineffective. This means that a telegram is sent to all lines irrespective of whether it is processed in the corresponding line. It is therefore not important whether the telegram has been triggered within the lines or whether it has been sent from the main line to the lines via the line coupler.

If an error occurs during the transmission of a telegram with the physical address of a receiver, the line repeater can repeat the telegram. This behavior can be set separately for both line segments with the parameters “Repetition of physical addressed telegrams”.

If the line repeater routes a group telegram and does not receive an acknowledgement, or if a bus device finds a transmission error, the line repeater retransmits the telegram. With the parameters “Repetition of group telegrams”, this behaviour can be set separately for main line and sub line.

Chapter 5 Parameter setting description in the ETS

5.1 Coupler/Repeater

5.1.1Parameter window “General”

Parameter window is shown as follow:

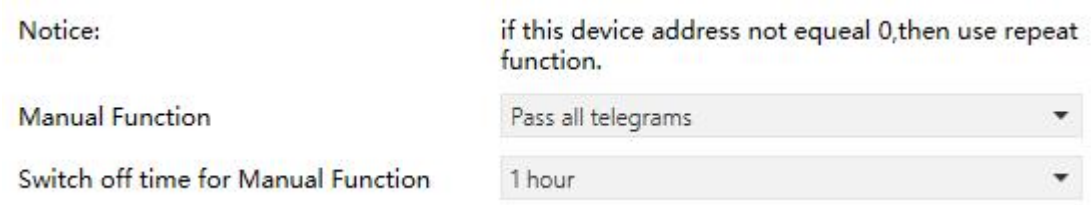


Fig.5.1.1 Parameter window “General

Parameter "Manual Function"

Telegram routing configuration for the manual function. Options:

Disabled

Pass all telegrams

Pass all Physical telegrams

Pass all Group telegrams

Parameter "Switch-off time for Manual Function"

Time duration required to exit from “manual operation”. Options:

10 min

1 hour

4 hours

8 hours

Please note that the parameter “transmit all” for Group or Physical telegrams is intended only for testing purposes and it should not be set for normal operation.

5.1.2Parameter window “Line-->Main Line”

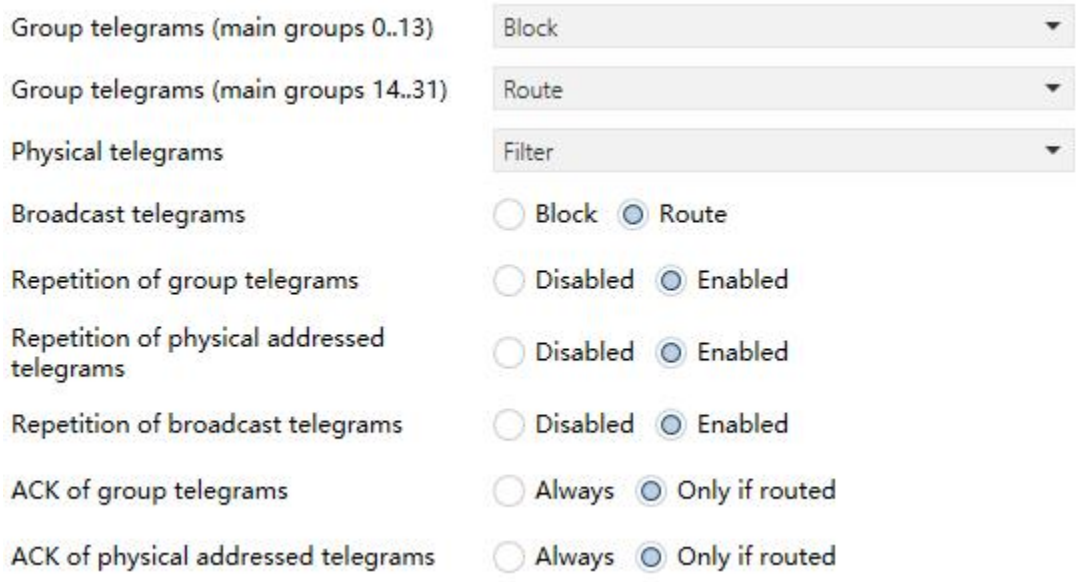


Fig.5.1.2 Parameter window “Line-->Main line”

Parameter "Group telegrams: Main group 0..13"

Options:

Block

Route

Filter

Block: No group telegrams of this main group 0 to 13 are routed to the main line.

Route: All group telegrams of this main group 0 to 13 are routed to the main line independent of the filter table. This setting is for test purposes only.

Filter: The filter table is used to check whether or not the received group telegram should be routed to the main line.

Parameter "Group telegram: Main group 14..31"

Options:

Block

Route

Filter

Block: No group telegrams of main groups 14 to 31 are routed to the main line.

Route: All group telegrams of main groups 14 to 31 are routed to the main line. This setting is for test purposes only.

Filter: The filter table is used to check whether or not the received group telegram should be routed to the main line.

Parameter "Physical telegrams"

Options:

Block

Route

Filter

Block: No physical telegrams are routed to the main line.

Route: All physical telegrams are routed to the main line. This setting is for test purposes only.

Filter: The physical telegram is used to check whether the received physical telegram should be routed to the main line.

参数 "Broadcast telegrams"

Options:

Block

Route

Block: No received broadcast telegrams are routed to the main line.

Route: All received broadcast telegrams are routed to the main line.

参数 "Repetition of group telegram"

Options:

Disabled

Enabled

Disabled: The received group telegram is not resent to the main line in case of a fault.

Enabled: The received group telegram is resent up to three times in case of a fault.

参数 "Repetition of physical addressed telegrams"

Options:

Disable

Enabled

Disabled: The received physical addressed telegram is not resent to the main line in case of a fault

Enabled: The received physical addressed telegram is resent up to three times in case of a fault.

参数 "Repetition of broadcast telegrams"

Options:

Disabled

Enabled

Disabled: The received broadcast telegram is not resent to the main line in case of a fault

Enabled: The received broadcast telegram is resent up to three times in case of a fault.

参数 "ACK of group telegrams"

Options:

Always

Only if routed

Always: A acknowledge is generated for every received group telegram (from the sub line).

Only if routed: A acknowledge is only generated for received group telegrams (from the sub line) if they are routed to the main line.

参数 "ACK of physical addressed telegrams"

Options:

Always

Only if routed

Always: A acknowledge is generated for every received physical addressed telegram (from the sub line)

Only if routed: A acknowledge is only generated for received physical addressed group telegrams (from the sub line) if they are routed to the main line.

5.1.3Parameter window “Main line-->Line”

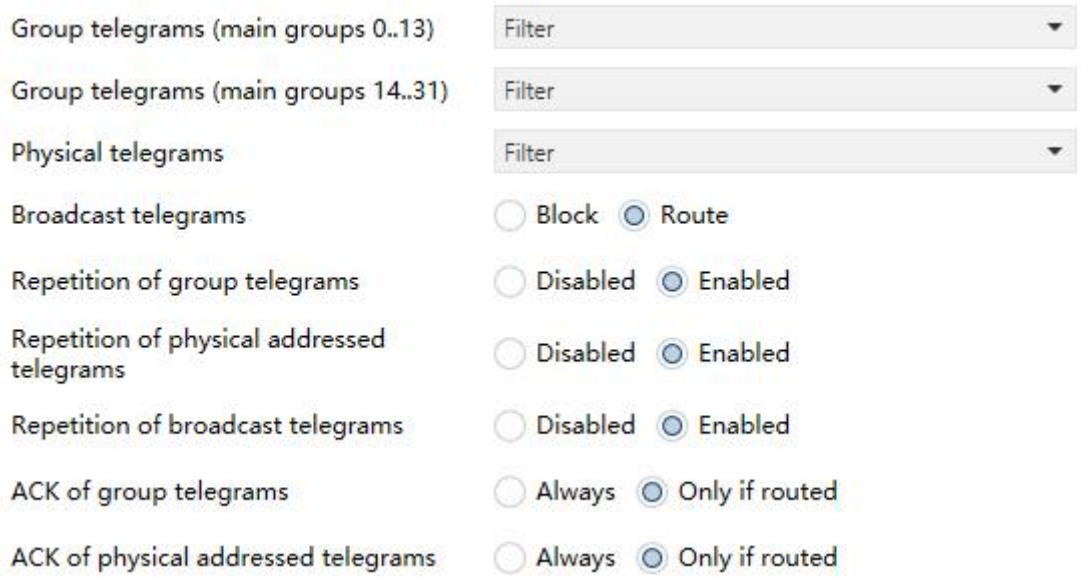


Fig.5.1.3 Parameter window “Main line-->Linee”

Parameter "Group telegrams: Main group 0..13"

Options:

Block

Route

Filter

Block: No group telegrams of this main group 0 to 13 are routed to the sub line.

Route: All group telegrams of this main group 0 to 13 are routed to the sub line independent of the filter table. This setting is for test purposes only

Filter: The filter table is used to check whether or not the received group telegram should be routed to the sub line.

Parameter "Group telegram: Main group 14..31"

Options:

Block

Route

Filter

Block: No group telegrams of main groups 14 to 31 are routed to the sub line.

Route: All group telegrams of main groups 14 to 31 are routed to the sub line. This setting is for test purposes only.

Filter: The filter table is used to check whether or not the received group telegram should be routed to the sub line.

Parameter "Physical telegrams"

Options:

Block

Route

Filter

Block: No physical telegrams are routed to the sub line.

Route: All physical telegrams are routed to the sub line. This setting is for test purposes only.

Filter: The physical telegram is used to check whether the received physical telegram should be routed to the sub line.

参数 "Broadcast telegrams"

Options:

Block

Route

Block: No received broadcast telegrams are routed to the sub line.

Route: All received broadcast telegrams are routed to the sub line.

参数 "Repetition of group telegram"

Options:

Disabled

Enabled

Disabled: The received group telegram is not resent to the sub line in case of a fault.

Enabled: The received group telegram is resent up to three times in case of a fault.

参数 "Repetition of physical addressed telegrams"

Options:

Disabled

Enabled

Disabled: The received physical addressed telegram is not resent to the sub line in case of a fault

Enabled: The received physical addressed telegram is resent up to three times in case of a fault.

参数 "Repetition of broadcast telegrams"

Options:

Disabled

Enabled

Disabled: The received broadcast telegram is not resent to the sub line in case of a fault

Enabled: The received broadcast telegram is resent up to three times in case of a fault.

参数 "ACK of group telegrams"

Options:

Always

Only if routed

Always: A acknowledge is generated for every received group telegram (from the main line).

Only if routed: A acknowledge is only generated for received group telegrams (from the main line) if they are routed to the sub line.

参数 "ACK of physical addressed telegrams"

Options:

Always

Only if routed

Always: A acknowledge is generated for every received physical addressed telegram (from the main line)

Only if routed: A acknowledge is only generated for received physical addressed group telegrams (from the main line) if they are routed to the sub line.