KNX – RS232 interface module instruction manual and integration notes for System Net touch screen applications
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1.0 Introduction

The KNX organization uses an open protocol for many registered manufacturers to communicate on the same data bus. The data standard was originally known as EIB, which many still refer to.

Systemline touch screens have the ability to operate lighting, curtains, blinds and temperature control on a KNX system using the System Net RS232-KNX interface. The Systemline configuration software has been designed to be as simple and intuitive as possible, with as much two way functionality possible. The installer must be fully convergent with KNX systems using ETS software to fully configure the KNX system in the way they require before interfacing the Systemline element.

This document does not explain KNX systems in detail, it only refers to elements of configuration required to make the interface work.

In essence you will be able to control the following features with the Systemline touch screens.

1. Lighting on / off, either toggle button or two separate buttons
2. Lighting scene, one scene per button
3. Lighting dim up and dim down on separate buttons
4. Motorised blind or curtain using one button to open, one to close sending a fixed data (1 bit) value each
5. Actual temperature of a zone
6. Actual outside temperature
7. Base set point temperature to write values to, adjusted in comfort mode only in 0.5 degrees Centigrade increments
8. Set point temperature to read
9. Comfort / Standby / Night and Frost mode in a one byte data point type

Some of the features require you to set up the correct read and flags within the object parameters of the KNX device you wish to control. This is mainly needed for the actual temperature, and base set point read and write objects where the manufacturer may not have set these active as factory defaults.
2.0 Hardware

2.1 System Net KNX-RS232 Gateway

You will need to install the System Net KNX-RS232 device in order to make the connection between the KNX bus and the System Net Hub or S6.

The unit requires a mains power outlet as well as the KNX bus cable and RS232 cable. We recommend that this unit be placed near the System Net Hub, or S6 unit to keep the RS232 cable as short as possible. You will need a null modem serial RS232 cable to connect from this to one of the Systemline configurable serial ports, the cable is included in the KNX-RS232 Gateway. The unit is DIN rail mountable (9TE=156mm) to match other KNX devices.

The Gateway needs to read and write data to all the group addresses you need to control so make sure you have configured any line couplers to send those group address telegrams through to the gateway. The unit supports up to 32767 group addresses simultaneously, and has a built in bus coupler for easy connection to the KNX bus.

2.2 System Net Hub

All Systemline Modular projects will need a six port System Net Hub to connect RS232 devices to the touch screens. KNX control is only possible using the colour touch screens, so six port hubs must be used. Simply connect the supplied null modem serial cable from the KNX-RS232 Gateway to one of the six ports once you have finished configuring the Gateway. This one cable allows both lighting and heating control of the KNX system through the Gateway from the touch screens.

Make sure you also have the necessary connections to the touch screens, speakers or ZAM unit as well as the PSM45 power supply to the Hub. Refer to the Hub instructions for more details of this.
2.3 S6

Systemline S6 has six configurable RS232 ports at the rear of the unit. You simply need to plug the null modem serial cable into one of these once you have finished configuring the KNX-RS232 Gateway.

3.0 Software

You will need to configure the KNX-RS232 Gateway as well as the System Net Hub or S6. The KNX-RS232 Gateway only transmits and reads group addresses you are interested in. This helps reduce the amount of data being sent to System Net, but means you do have to configure all the group addresses you wish to control in your project.

The System Net software has already been set up to display the correct buttons and layouts once you have configured what you wish to control and the group addresses associated with that function. You will need System Net software 7.7 or higher to include KNX, and it is only available for colour touch screens.

3.1 KNX-RS232 Gateway

You must load the Gateway configuration software onto your PC in order to set up the device with all the group addresses. You will need an RS232 serial connection between your PC and the gateway; you may use the supplied cable to do this. The 9 pin connections on the gateway are listed below if a custom cable is to be used.

<table>
<thead>
<tr>
<th>PIN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>RXD</td>
</tr>
<tr>
<td>3</td>
<td>TXD</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
</tr>
</tbody>
</table>

Once you have loaded the software and have connected your PC, you must check the communication settings in the ‘Settings’ tab and then ‘Communication Port / Generic settings’ option. The settings you must apply are:

Connection: Serial
Com port: COM1 (for direct serial connection, this may be different if using a USB/Serial adaptor)
Baud Rate: 38400
Data bits: 8
Stop Bits: 1
Parity: N (none)
Protocol: Hardware (RTS/CTS)

You must press ‘OK’ to confirm these settings, you can then connect to the gateway from the main page by pressing the green arrow button. To test communication between your PC and the gateway you can ask for its current firmware version. To do this type:

?v followed by a carriage return

You should see a response from the gateway giving you its current software version.
If so, you are now ready to proceed in configuring group addresses and data point types.

3.1.1 Physical address of gateway

You should set a physical address on the KNX-RS232 gateway so you can manage data on the bus and also recognize KNX telegrams using ETS software from the gateway. To do this, you must open up the settings tab, and then ‘KNX-RS232 gateway settings’. You can enter a suitable physical address in the space provided and then send this.

If you close the settings window you can check the gateway physical address by typing:

`?P` followed by a carriage return

You will get a response in the format

Phys.Addr=nn.nn.nnn

So an example is

Phys.Addr=01.01.254.

3.1.2 Generic Settings

You must set the following generic settings in order for all functions to operate correctly.

OE: Echo own write telegrams checked

All others not checked, see next picture.

3.1.2 On/Off

From the KNX-RS232 gateway settings window found under the settings tab, you can add group addresses you will need to monitor and control from Systemline.

If you wish to switch a light on and off, or a relay open/close you will need to add a group address with data point 1: 1-6 bit decimal.

For example, you wish to switch some lights on and off with a group address of 00/0/002. You must go to the settings tab and select ‘EIBWeiche ASCII-Terminal/Media gateway…’. This opens up a window with some settings, the
lower half referring to group address the interface is going to work with. You can enter the Group address, and then select the correct data format. In our case a 1 bit command will use 1: 1-6 bit decimal. Once this is defined correctly you can ‘Add’ to the list below and then ‘Send’ to the interface devise.

3.1.3 Scene control

To set up the gateway unit for scene control, you must set up and add each group address required with data point 5: I byte unsigned.

3.1.4 Raise / Lower lighting control

To set up the gateway unit for manual raise and lower of lighting control, you must set up and add each group address required with data point 1: I-6 bit decimal. This corresponds to the dimming group address set up within the ETS software.

3.1.5 Actual temperature

If temperature control is required by the Systemline system, then all the appropriate group addresses will need to be added to the gateway. To read
actual temperature in a room, you will need to add the group address with data point 9: EIB Float Value.

3.1.6 Base Set point temperature write

To change the base set point of a zone the system must write a new value to the correct group address. You must set up the group address with data point 9: EIB Float Value.

3.1.7 Set point temperature read

To read the current base set point of a zone the system must read a value to the correct group address. You must set up the group address with data point 9: EIB Float Value.

3.1.8 Comfort / standby / Night / Frost

In order to change the mode of a room temperature control unit, you must add the group address of comfort / standby with data point 5: 1 Byte Unsigned

You will need to add all group address for all functions available on the Systemline system with the correct data point type. Below is an example with on / off lights, actual temperature, base set point and heating modes added into the settings screen. Once you have added all the group address you must press the ‘Send’ button to apply these to the gateway.

![Image of Group address settings interface]

- GA: / / /
- Format: 1:1 - 6 bit decimal
- Receive: E: Enabled

GA List:
- 00/1/000 E 5: 1 byte unsigned
- 00/1/001 E 1:1 - 6 bit decimal
- 00/1/002 E 1:1 - 6 bit decimal
- 00/1/003 E 9: EIB float value
- 00/1/004 E 9: EIB float value
- 00/1/005 E 9: EIB float value

Load | Save
Import
3.1.9 Sending read and write commands

You can test the gateway by sending read or write commands directly from the PC to the KNX bus. On the main page, ensure the green online arrow is pressed; you can then type the following commands followed by a carriage return to write a value to a group address.

Wx/y/z=a

Where W is a write command, x y and z are the group address parameters and a is the value. So to turn a light on in group address 0/0/1 you would send:

W0/0/1=1

You should get a response from the gateway confirming the action.

0/0/1=1

If you wish to read a value you can send the following then a carriage return:

Rx/y/z

Where R is the read command and z,y and z are the group address numbers again. To read the actual temperature of a room temperature control unit with group address 0/1/3 you would send:

R0/1/3

You should then get a response like this:

0/1/3=21.00 So the temperature is 21 degrees centigrade.

Once you are happy that you have communication with the KNX bus and you have the correct data for the group addresses you can connect the Gateway to one of the System Net serial ports and proceed with the System Net configuration.

3.2 System Net Hub / S6

You must make sure that the Hub and all keypads firmware are updated to version 7.7 or higher through the System Net application program. You will then be able to select EIB / KNX as a configurable source and allocate it to the correct
You will see that lighting and heating control of KNX is available for colour touch screens. Monochrome touch screens are not able to control KNX.

### 3.2.1 Lighting

You can configure two pages of a maximum of eight buttons per page of lighting and blind, gate or curtain control. You simply have to choose a button icon from the drop down list then enter a group address for the desired function. There is also an option to define a default lighting action for the one press operation from the standby screen if the room is in darkness.

On / Off, On and Off buttons have no configurable value because they are fixed at transmitting 0 or 1.

Scene buttons allow you to enter the scene value for each button, this will then be transmitted to the configured group address.

Raise and Lower zones have no configurable value because they are fixed at 9 and 0 or 1 and 0 to start and stop the adjustment.

Open and close curtains or gates allow you to set the value to either 0 or 1 to open or close a relay.

Below is an example of lighting only with four scenes, off, raise and lower.
3.2.2 Heating

Once you have chosen KNX / EIB as an option for heating control, you are able to configure the group addresses for the heating zone on each touch screen. You simply put the correct group addresses in for actual temperature, write set point, read set point, zone status (comfort, night etc.) and outside temperature if available.

You can now upload the configuration to the touch screen.

4.0 Touch screen controls

Once you have uploaded the Systemline touch screens you will have operation of lighting and heating.

4.1 Lighting control

Lighting control pages are activated by pressing anywhere outside the alarm bell on the standby page, or the light bulb symbol on any other page. This will
activate an automatic scene if the room is in darkness if you have configured this option, see 3.2.1.

The screen will revert back to the previous page if no button is pressed after 15 seconds.

4.2 Heating control

Heating control can only be activated by pressing the temperature display within the top menu bar on all screens except the standby screen. This will allow adjustment of base set point, comfort / standby / night and frost mode as well as display outside temperature. The screen will revert back to the previous one if no button is pressed after 15 seconds.
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