

INTRODUCTION

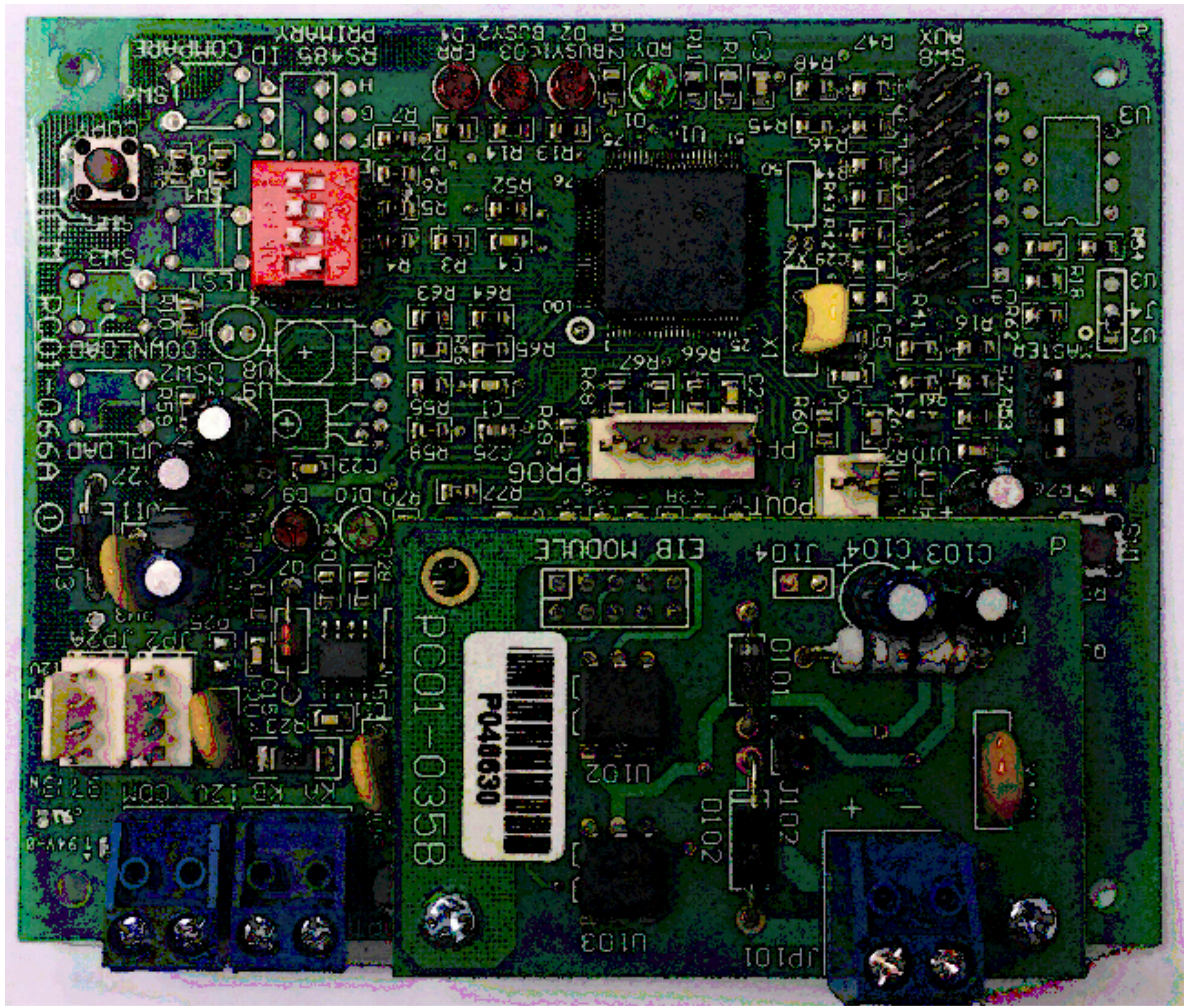


Figure 1.1 UCM/KNX2

The Comfort system can be interfaced to the KNX Bus products manufactured by members of the KNX Association. The UCM/KNX2 is a 3rd generation interface between Comfort and the KNX Bus, replacing the UCM/KNX which was introduced in 2009. This allows Comfort to communicate with the KNX Bus via Group Addresses mapping. Comfort provides the following benefits to a KNX system:

- allows control of KNX from Comfort's keypads, Time Programs, iOS/Android apps, telephone voice menu, SMS (using UCM/GSM4)
- allows scheduling control by Comfort's 32 Time Programs.
- allows alarm inputs, alarm conditions and armed/disarmed status to be mapped to KNX group addresses.
- allows KNX buttons to map to Comfort Counters, Flags and Outputs, allowing control of non-KNX appliances like air-conditioners, home entertainment systems, and linking to all of Comfort's security and control functions.
- Allows a simulated keypad on a KNX touchscreen to arm (Away, Night, Day) and disarm the security system using the users security code by mapping 1-byte objects to Keypad keys.
- Synchronise Comfort's real time clock to KNX devices. Comfort has automatic Daylight saving adjustments and Sunrise/Sunset times based on locations. Comfort's UCM/ETH03 is synchronised to Internet Time Servers.
- Read Temperature and other sensors on the KNX bus or supply temperature readings or setpoints to KNX.
- allows KNX switches and inputs (e.g. temperature, light sensors) to trigger alarms to dial-out to programmed telephones when preset levels are exceeded.
- Bypass security zones and view the status of bypassed zones by mapping to 1-bit group addresses.
- Functions as a central controller for an KNX network. In an intelligent home or office environment, it is desirable to have a controller which is able to coordinate the functions of all the subsystems including security, lighting, HVAC, and others. Comfort is able to take action based on conditional logic,

UCM/KNX2 - Comfort to KNX Interface

for example, when the time is between 7 PM and 7 AM and the security system is armed, and when the front door is opened, turn on the hall lights for 3 minutes.

Improvements over UCM/KNX

1. Improved Mapping of KNX to Comfort objects (see below). Separate mapping for KNX to Comfort registers and Comfort registers to KNX support KNX objects having different control and feedback addresses.
2. Comfort Inputs can be mapped to KNX 1-bit objects so Comfort Input changes (On/Off) can provide feedback for KNX, for example for status of Airconditioners by Current sensor. A different KNX address can be mapped to Output, Flag or Counter to control the Airconditioner or appliance.
3. 1-bit KNX group addresses can be mapped to Output, Output Pulse and Output toggle.
4. Flags to KNX allow Comfort Flags to be mapped to KNX 1-bit objects. A different KNX address can be mapped to the same flag in KNX to Comfort. This allows different KNX control group address and Status group address. Flags can be used to control other devices in Comfort which act on the same flag.
5. Counters to KNX (1-bit) allow Comfort Counters to be mapped to KNX 1-bit objects to send On/off command or status. Counters to KNX (1-byte) allow Comfort Counters to be mapped to KNX 1-byte objects to send levels. Different KNX addresses can be mapped to the same Counter in KNX to Comfort. For example, a KNX 1-bit address can be mapped to a Comfort Counter. The same KNX device can send a 1 byte value which is mapped to the same Comfort Counter as dimming level, as well as map a 4-bit group address to the same counter for relative dimming. The Comfort counter can be mapped to a 1-bit KNX address for on/off feedback as well as to a KNX 1 byte address for absolute dim level.
6. Sensors to KNX allow Comfort sensors to be mapped to KNX 2-byte Floating Point objects.
7. Entering of KNX group addresses is simplified, the 3-level group addresses eg 1/2/3 can be entered directly instead of selecting main group, mid group and subgroup in separate dropdown lists. The KNX group address selected in any mapping screen is unique, ie it can be selected only 1 time.
8. It is possible to disarm the security system via a 1 bit group address (but installers should take care if security risks in doing so)
9. With the new mapping capability, there is less need to use custom Responses to send commands to KNX thus simplifying programming.

Changes in Mapping KNX Objects

Description	Length	Map To Comfort
Null	-	-
1 bit switching (EIS1)	1	Counter, Flag, Output, Output Pulse, Output Toggle, Virtual Input, Arm Security Mode (Security Off, Away, Night, Day, Vacation), Bypass zone, Panic
4 bits dimming (EIS2)	1	Counter
Time 3 Bytes (EIS3)	4	Comfort Time
Date 3 Bytes (EIS4)	4	Comfort Date
2 Byte Floating Point (EIS5)	3	Sensor (signed 16 bit value)
1 Byte Scaling/Value (EIS6)	2	Counter, Keypad Key
2 byte Counter (EIS10)	3	Counter (16 bits)

KNX to Comfort Mapping Table

Specifications

- Size 108 x 88 mm UCM baseboard with 60 x 40 mm daughterboard.
- Power Supply: 12V 30 mA (supplied from Comfort), isolated from KNX.
- Connected to KNX Bus via bus cable (2 wires)
- Physical addresses can be assigned to UCM/KNX2, Area 0 to 15, Line 0 to 15, Physical Address 1 to 200
- KNX to Comfort allows 256 Group addresses to be mapped to Comfort.

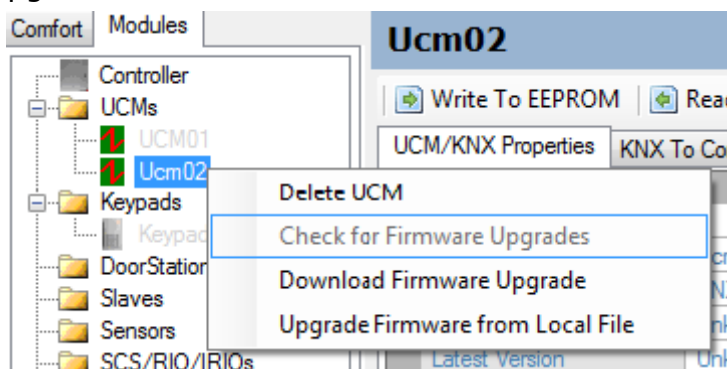
Requirements

The following is required

- UCM /KNX2 Module (minimum firmware KNX2 7.087)
- Comfort II, UCM/LOGIC or Logic Engine controller with firmware version "7.100" or above
- Configurator 3.11.6 software or above which can be downloaded from www.cyttech.biz/software.html

Upgrading from UCM/KNX2

The UCM/KNX2 is an improved version of UCM/KNX. In order to upgrade from UCM/KNX, first, do a firmware Upgrade of UCM/KNX to the latest firmware UCM/KNX 7.079 or above by right-clicking on UCM/KNX and selecting Check for Upgrades.



After the upgrade, download the UCM/KNX2 firmware from http://www.cyttech.biz/ucmknx2_firmware.html

Unzip the knx2 *.cbf file into a local folder.

In the Modules Tab, right click on UCM/KNX and select Upgrade firmware from Local file and select the KNX2 cbf file that was downloaded.

Only UCM/KNX 7.079 and above can be upgraded to UCM/KNX2. UCM/KNX2 firmware can also be reverted to UCM/KNX via the same process.

INSTALLATION AND SETUP

UCM/KNX2 Settings

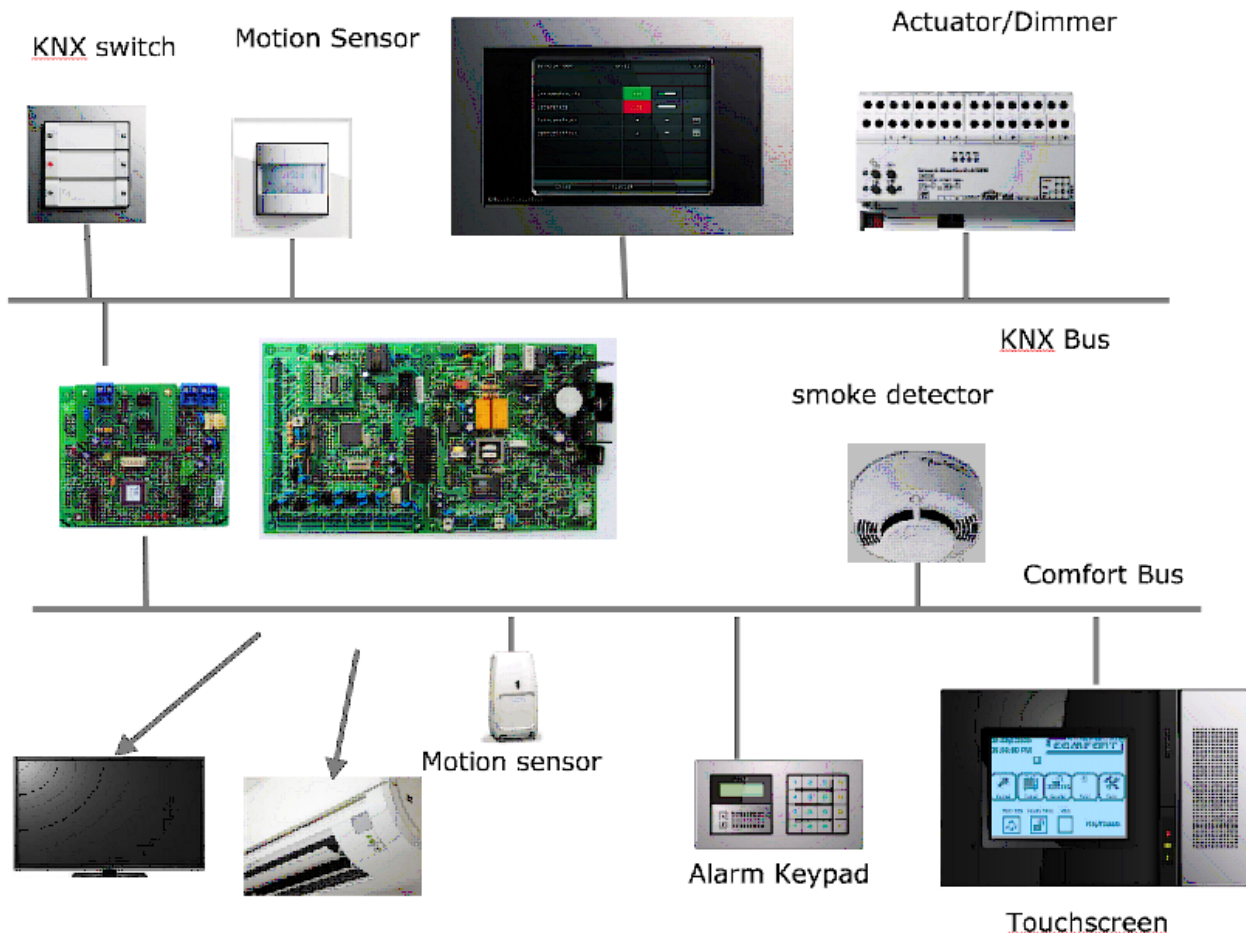


Figure 2.1 - UCM/KNX2 in Comfort and KNX Network

Connections

- JP2/JP2A - 4 way latched header for 3 way cable connecting to Comfort J6. These signals are the same as 12V/COM (JP3) and KA/KB (JP4)
- 12v/COM (JP3) - 2 way terminal block for 12V supply and ground from Comfort. Connect this terminal block by CAT5 cable to Comfort 12V/Ground if the UCM/KNX2 is located a distance away from Comfort. Otherwise use JP2/JP2A
- KA/KB (JP4) - 2 way terminal block for RS485 Comfort Bus from Comfort. Connect this terminal block by CAT5 cable to Comfort KA/KB if the UCM/KNX2 is located a distance away from Comfort. Otherwise use JP2/JP2A
- JP101 - 2 way terminal block for connection to KNX Bus.
- PP1 - 6 way latched header to connect the Programming cable from the UCM/USB or /ETH03 for firmware upgrading by UCM Programming cable. **This cable should NOT be connected in normal operation.**

Buttons

- SW1 - RESET UCM. This restarts the UCM/KNX but does not affect any of the programmed parameters in EEPROM

UCM/KNX2 - Comfort to KNX Interface

LED Indicators

- D1 "RDY" (Green) should be on at all times.
- D2 "BUSY1" (Red) blinks if there is an incoming telegram from KNX
- D3 "Busy2" (Red) blinks when the UCM transmits a telegram to the KNX Bus which is acknowledged. If there is no acknowledgment from the target group address, D2 remains on.
- D4 "ERR" (Red) Turns on if the KNX Bus is not connected or power for the KNX bus is off. It also blinks when there is an error on the KNX bus. D4 turns off when the KNX bus is connected to the UCM/KNX2 JP101 terminal block. If the U2 EEPROM IC is missing, the ERR LED will flash continuously.
- D9 (Red) RS485 Transmit to Comfort. This should blink at a slower rate than D10. If its remains off that means the UCM ID (SW7) and /or the Number of UCMs in Comfigurator is not set correctly
- D10 (Green) RS485 Receive from Comfort. This should be blinking fast so it may appear to be steady. If this is off, that means the UCM is not connected to Comfort's RS485 bus.

Jumper Settings

- J2 (RS232/RS485) - Not Present
- SW7 (RS485 ID Primary) - set according to ID of the UCM (see "UCM ID Switch" settings below)
- J102 (on KNX2 Daughterboard) - do not shunt - for testing purposes

UCM ID Switch (SW7)

Comfort is able to support up to 8 UCMs. SW7 is a set of 4 DIP switches which determines the UCM ID, according to the table below:

ID	SW7- 1	SW7 - 2	SW7 - 3	SW7-4
1	On	On	On	On
2	Off	On	On	On
3	On	Off	On	On
4	Off	Off	On	On
5	On	On	Off	On
6	Off	On	Off	On
7	On	Off	Off	On
Use COPY	Off	Off	Off	On

Table 1 - UCM ID

By convention, UCM ID=1 is used for UCM/USB or ETH03 for Comfigurator. The KNX UCM should preferably be set to ID 2 or above so that any RS485 communications failure can be reported by Comfort. The ID should not conflict with any other UCM ID in the system - make sure each UCM has a unique ID.

Press RESET on the UCM after changing the ID settings.

AUX Switch (SW8)

This has no function in the UCM/KNX2.

Setup and Connections

1. Before connecting the UCM/KNX2 to Comfort, set the ID on SW7 to the ID of the UCM according to Table 1 in the previous section. If there is only 1 UCM,

UCM/KNX2 - Comfort to KNX Interface

set the ID to 2. By convention, UCM 1 is for UCM/USB or UCM/Ethernet used for programming Comfort, which is not reported when there is a Communications Failure. Up to 8 UCMs can be connected to the Comfort network.

2. The UCM/KNX2 is connected to Comfort via the supplied 4 way white RS485 cable from 4 pin header JP2 to Comfort 's header J6 or JP2 from another UCM. This supplies power to the UCM, as well as allowing communications between Comfort and the UCM. It is not necessary to switch off the power to Comfort before plugging in this connection. Alternately if the UCM is far from Comfort, use a CAT5 cable connected to the terminal blocks 12V/GND and KA/KB.
3. The Green RDY led on the UCM (D1) should light up and remain on.
4. The LEDS D9 (red) and D10 (green) should blink rapidly showing that RS485 communications has been established between Comfort and the UCM. D10 (green) flashing shows that it is receiving messages from Comfort (polling). D9 (red) comes on when the UCM responds to a poll from Comfort.
5. The ERR LED should come on if the KNX Bus is not connected. BUSY1 and BUSY2 LEDs should remain off.
6. Screw in the green KNX Bus cable to the JP101 terminal block, taking care to ensure correct polarity (+ and -). Plug in the terminal block to JP101 when the termination of the KNX Bus cable is completed. Wrong polarity of the KNX bus connection will not damage the KNX components or the UCM/KNX2.
7. The ERR LED should go off if the KNX bus is connected and is powered on. If the KNX bus is disconnected or the KNX power supply is turned off, the ERR LED will come on. Hence the ERR led indicates a problem with the connection or the bus.
8. D2 (BUSY1) LED blinks when there is an incoming telegram from the KNX Bus which corresponds to one of the monitored Group addresses according to the settings in SW8. D3 (BUSY2) LED turns on when a telegram is sent to the KNX Bus and turns off when an Acknowledgment is received from KNX, hence an acknowledged transmission will blink the BUSY2 LED.

PROGRAMMING UCM/KNX2

Configurator software (3.11.2 or above) can be used for programming the UCM/KNX2. Please download the latest version of Configurator from <http://www.cytech.biz/configurator.html>

Make sure the ID DIP switches (SW7) are set correctly according to Table I above. UCM id 1 should be reserved for the UCM/USB/Eth which is used to program using Configurator. Reset the UCM by pressing the reset button on the UCM.

Go to the Modules Tab as shown below and right click on UCMs or Controller. Select "Scan for All Modules" as shown below.

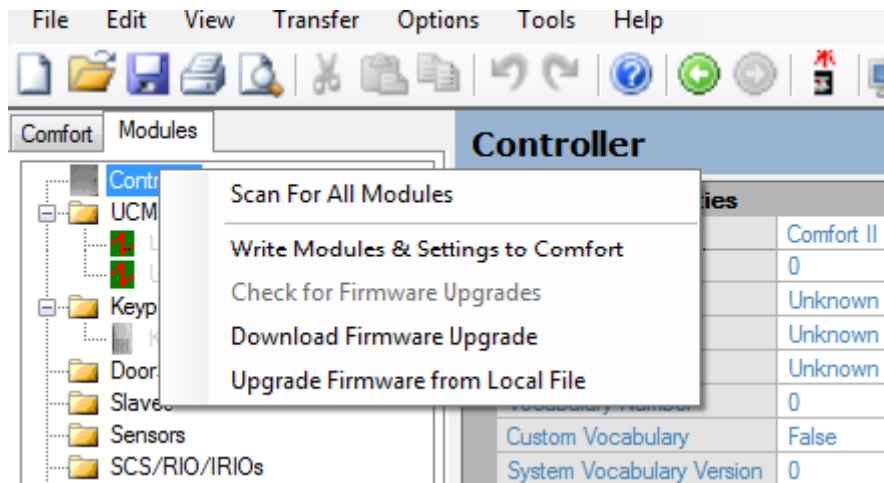


Figure 3.1 - Modules Tab - Scan

"Scan for All Modules" instructs Comfort to scan all connected modules to determine their Type and Firmware version. An example of the result is shown in the screen below, where there are UCMs for KNX2, CBUS, GSM, ZWave etc in the system (In most systems there will not be so many UCMs used).

UCM/ETH03 or UCM/USB firmware must be version 7.xxx or above

The left pane shows the UCMs discovered

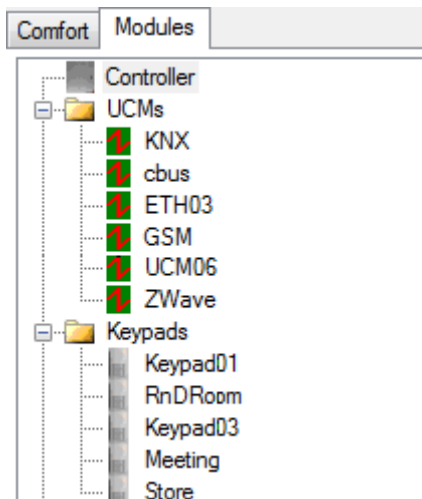


Figure 3.2 - UCM List

UCM/KNX2 - Comfort to KNX Interface

Instead of “Scan for Modules”, you can also choose “Add UCM” to manually add the UCM/KNX2 to the system if Comfort is not connected at this time. Select KNX2 from the drop-down list as shown below.

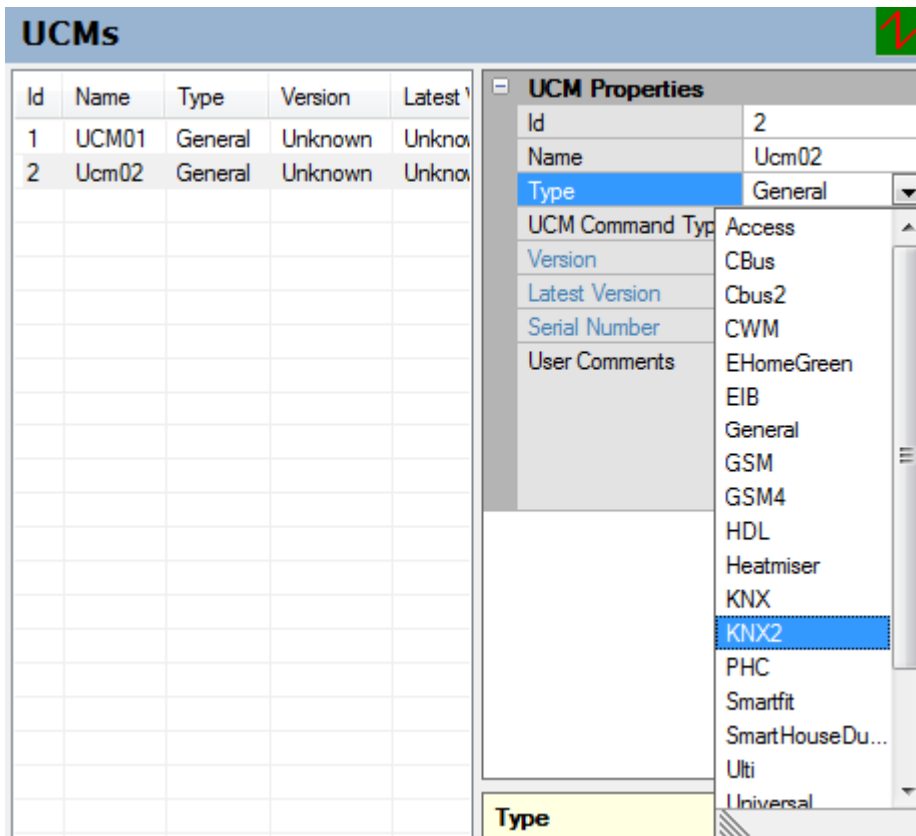


Figure 3.3 - Add UCM/KNX2 Manually

The Names of the UCMs are labels which can be renamed in the UCM Properties pane on the right, above the Type field.

Click on UCM02 in the LEFT pane (NOT the center) to show the screen below

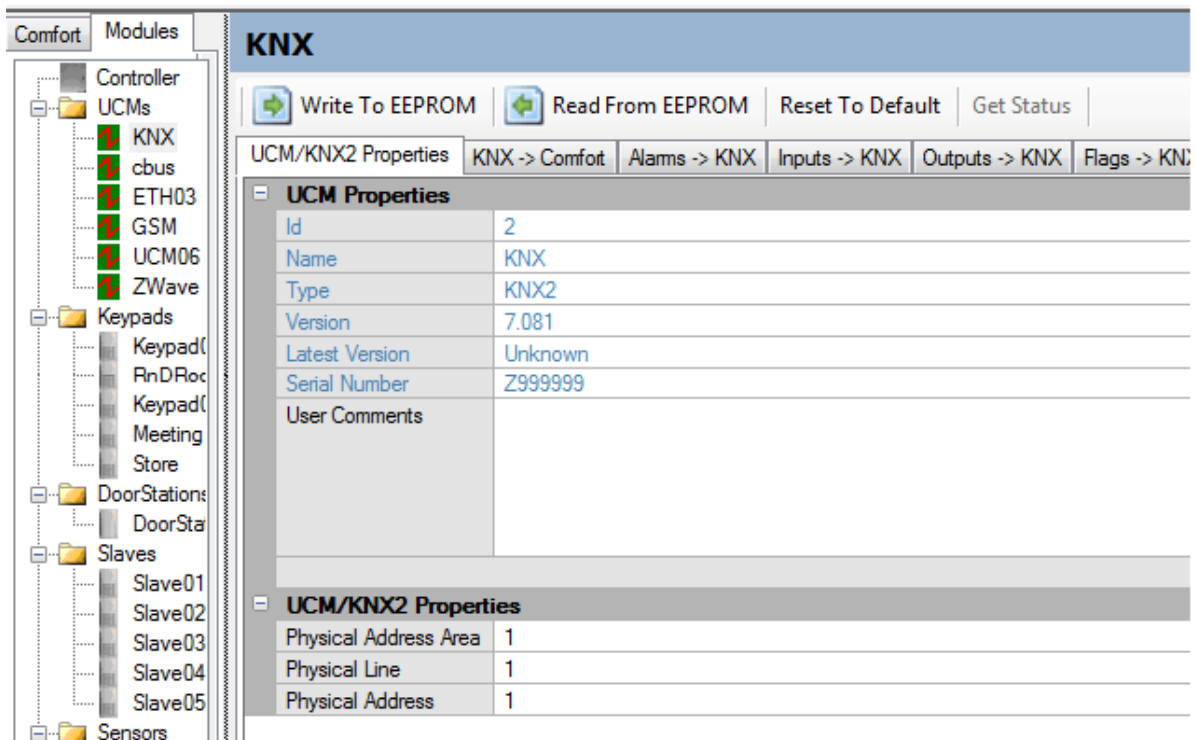


Figure 3.4 - UCM/KNX2

UCM/KNX2 - Comfort to KNX Interface

The tabs in the right pane are; UCM/KNX2 Properties, KNX to Comfort, Alarms to KNX, Inputs > KNX, Outputs > KNX, Flags > KNX, Sensors > KNX. Counters > KNX 1-bit, Counters > KNX 1-byte, and Monitor Mode. Each of the tabs are explained below

“WRITE to EEPROM” button in the screenshot above must be pressed after configuring the KNX settings in order to save the configuration in UCM/KNX2. “Write to Comfort” in the Transfer Menu does NOT do a Write to EEPROM.

UCM/KNX2 Properties

Refer to the figure above for the UCM/KNX2 Properties Tab

UCM Properties

- Id: This is the ID of the UCM on the Comfort RS485 bus.
- Name: This is the name of the UCM used by Configurator. To change the name, select UCM's (folder icon) in the left pane and type the new name in the right pane.
- Type: This shows the UCM Type. In this case the Type is KNX2.
- Version is the firmware version of the UCM/KNX2
- Latest Version is the latest UCM/KNX2 firmware available on the Cytech Server. This will be seen after Scan for modules.
- Serial Number. This is the serial number if any.

UCM/KNX2 Properties

- Physical Address Area: This is the area of the UCM/KNX2 on the KNX Bus (0 to 15).
- Physical Line: This is the Line number of the UCM/KNX2 on the KNX Bus (0 to 15).
- Physical Address: This is the physical address of the UCM/KNX2 on the KNX Bus (1 to 200). Configurator will be limited to 200 to allow compatibility with older firmware.

The Physical address is usually expressed as Area.Line. Address e.g. 1.1.200 means Area 1, Line 1, Address 200 This address should be unique on the KNX Bus to avoid conflicts.

Write To EEPROM/ Read from EEPROM

The UCM/KNX2 programmed configuration is saved in the U2 EEPROM on the UCM/KNX2. To write the configuration into the UCM/KNX2 select the button “Write To EEPROM”. You will be asked for the Comfort login code (default 1234).

To read the configuration from the UCM/KNX2, press “Read From EEPROM” This loads the configuration from the UCM/KNX2.

The read and write process should take a few seconds or longer, depending on the number of group addresses in the KNX to Comfort table.

The UCM/KNX2 configuration is saved with the Configurator cclx file. However when you Write to Comfort, this operation does NOT write the UCM/KNX2 Configuration to its EEPROM . Also when you Read a configuration from Comfort this does not Read from the

UCM/KNX2 - Comfort to KNX Interface

UCM/KNX2 EEPROM. Write to EEPROM and READ from EEPROM must be done independently of Write and Read to Comfort.

Monitor Mode

In this mode, any telegram received by the UCM/KNX2 is displayed on the screen for diagnostic purposes. The meaning of the telegram is beyond the scope of this document. Please consult your KNX documentation for a description of the KNX telegrams.

In Monitor Mode, KNX telegrams will not activate mapped Comfort counters, sensors and virtual inputs etc. Remember to click away from the Monitor Tab to end Monitor mode when finished with monitoring. Otherwise if you close configurator or log out without leaving Monitor mode, the KNX telegrams will be ignored and will not trigger anything on Comfort.

KNX To Comfort

This is to map KNX Group addresses to Comfort's registers for sending commands and Status to Comfort

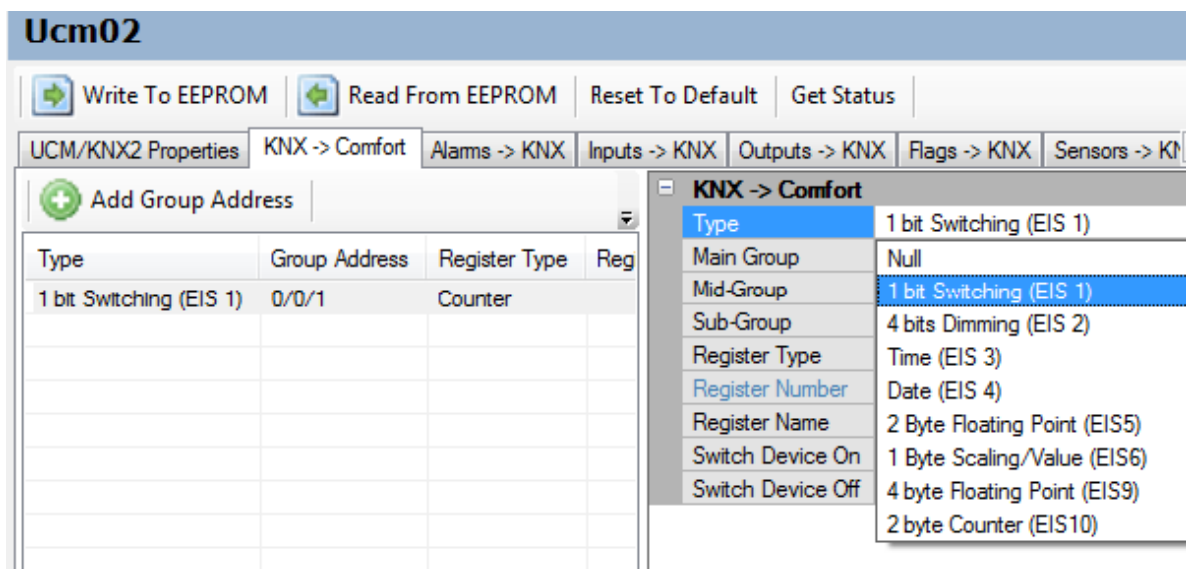
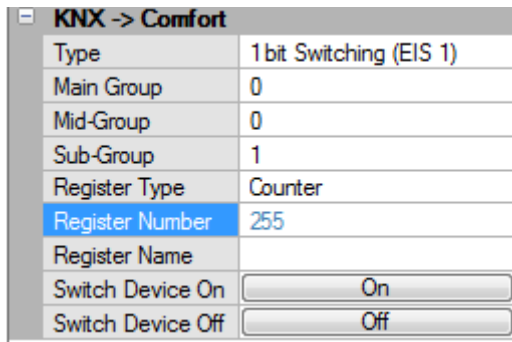


Figure 3.5 - KNX2 to Comfort Initial Screen

KNX Group addresses can be added to the list on this screen by selecting "Add Group Address" or "Learn"

When the "Add Group Address" button is pressed, the KNX to Comfort Right Pane properties appear as shown above. Click on Type to show the Drop-down list to select the KNX Types; Null, 1-bit Switching (EIS1), 4-bit switching (EIS2), Time (EIS3), Date (EIS4), 2 byte floating Point (EIS5), 1 byte Scaling (EIS6), 2 byte counter (EIS10)

UCM/KNX2 - Comfort to KNX Interface



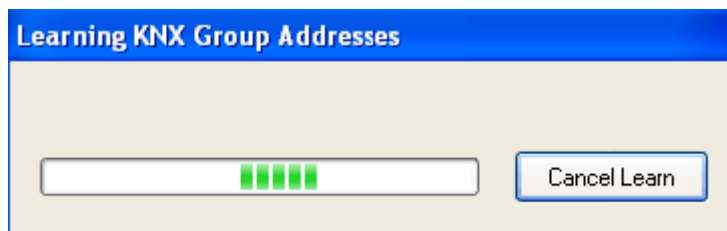
KNX -> Comfort	
Type	1 bit Switching (EIS 1)
Main Group	0
Mid-Group	0
Sub-Group	1
Register Type	Counter
Register Number	255
Register Name	
Switch Device On	On
Switch Device Off	Off

Figure 3.6 - KNX to Comfort - KNX Type properties

The right pane shows the properties of the new KNX group address.

- Type: This is the Type of telegram to be mapped to Comfort (described below). The Type can be selected from a drop-down list.
- MainGroup/MidGroup/SubGroup: These are the parts of the group address.
Note that the Group address selected must be unique in the KNX to Comfort and Comfort to KNX Tables, ie a Group Address can only appear once in any table.
- Switch Device On and OFF: these buttons test the KNX device if it is a 1 bit object by switching the device on or off.

The "Learn Group Address" button can be used when Comfort is connected at this time. You will be asked for a sign in code if you have not logged into Comfort yet. A pop-up window appears as shown below.



Learning KNX Group Addresses

Figure 3.7 - Learning Group Address

Press a KNX button to be learned into the KNX to Comfort list. The group address of the telegram received will be displayed in the right pane as in Figure 3.6. Be careful that other KNX buttons which are not to be learned are not pressed at this time.

When the Group addresses have been learned, press "Cancel Learn".

The following section shows how to select the KNX Types

When the group address has been learned, click on Type. A drop-down list will appear which will show the available types as shown below

KNX Types

-> KNX		Outputs -> KNX	Flags -> KNX	Sensors -> KNX
KNX -> Comfort				
Type	1 bit Switching (EIS 1)			
Main Group	Null			
Mid-Group	1 bit Switching (EIS 1)			
Sub-Group	4 bits Dimming (EIS 2)			
Register Type	Time (EIS 3)			
Register Number	Date (EIS 4)			
Register Name	2 Byte Floating Point (EIS5)			
Switch Device On	1 Byte Scaling/Value (EIS6)			
Switch Device Off	4 byte Floating Point (EIS9)			
	2 byte Counter (EIS10)			

Figure 3.8 - KNX Types

First, a KNX Type is selected, followed by the Comfort Register available for that type which is to be mapped to the KNX Group address.

1 Bit Switching (EIS1)

This refers to a EIS1 1-bit object associated with an on/off switch or Actuator.

KNX -> Comfort	
Type	1 bit Switching ...
Group Address	0/0/13
Register Type	Flag
Register Number	1
Register Name	Flag01
Switch Device On	Flag01
Switch Device Off	Flag02
	Flag03
	Flag04
	Flag05
	Flag06
	Flag065

Figure 3.9 - 1 bit Switching (EIS 1)

"Switch Device On" and "Switch Device Off" will switch on and off the Group address selected, for testing purposes. This shows that the communications with the KNX device is working correctly.

The 1-bit EIS 1 type can be mapped to a Counter, Virtual Input, Flag, Output, Output Toggle, Output Pulse, Arm Security, Panic, Bypass zone in Comfort. After selecting the Comfort Register type select the register number eg Counter number, flag number etc from a dropdown list.

UCM/KNX2 - Comfort to KNX Interface

1-Bit Switching (EIS1) > Counter

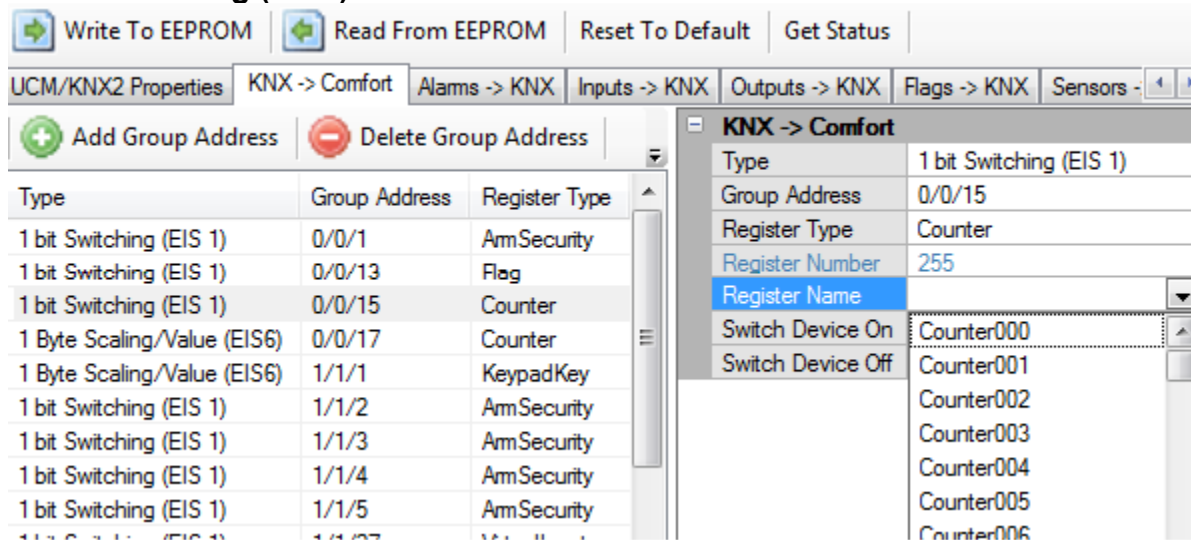


Figure 3.10 - KNX 1-bit to Counter

For mapping to Counters, when a telegram with this group address is received by the UCM/KNX2, the value of the object is saved in the Counter (0 for off, 255 for ON and 1 to 254 for level). This also activates a Counter Response corresponding to the counter number.

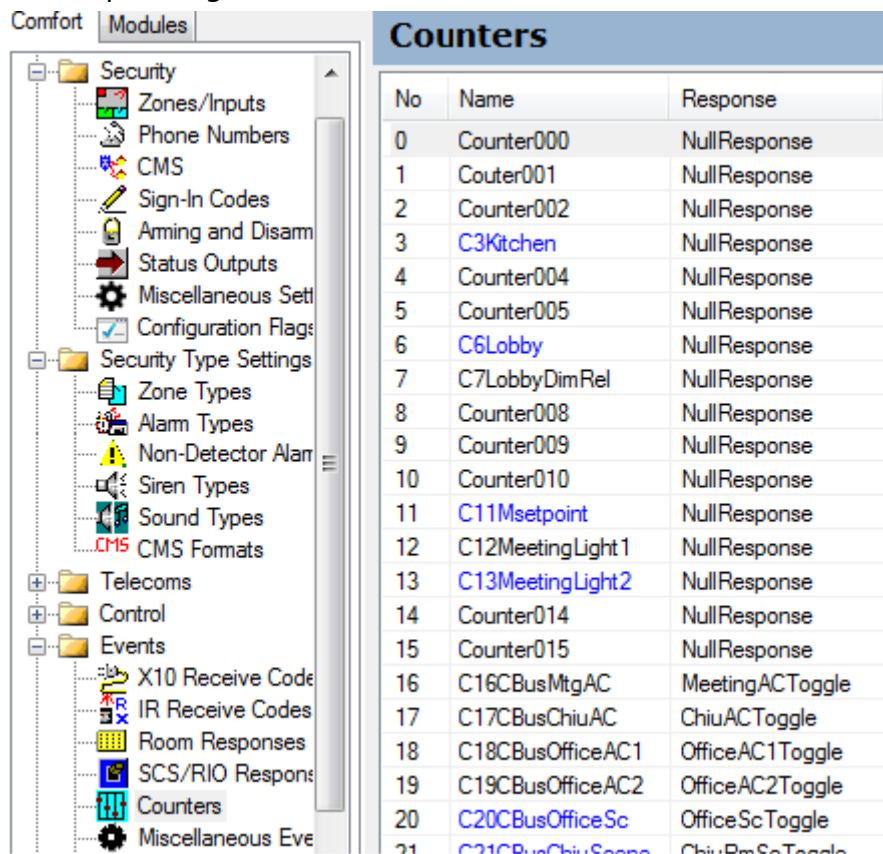


Figure 3.12 - Counter Responses

A Counter Response can be selected or created by selecting the Counter and selecting Response Name.

A typical Counter Response is shown below.

```
If LastUcmCounter = 0 Then
    Do IR1Output1
Else
    Do IR2Output1
End If
```


UCM/KNX2 - Comfort to KNX Interface

"LastUcmCounter" means the value in the counter which activated the Counter Response.

A 1-bit EIS 1 telegram will cause the mapped Comfort counter to be loaded with a value of 0 for OFF, or 255 for ON.

The example Response above means if the 1-bit telegram received has a value of 0 (Off), then the "IR1Output1" Response is activated. Otherwise if the telegram has a value greater than 0, (On) then the response "IR2Output1" is activated.

This allows KNX 1 bit group address to map to a Comfort counter. Changing the counter value in Comfort will also send a telegram to the same KNX group address. Hence the KNX Group address sends to and receives from a mapped counter. (This is the same behaviour as in UCM/KNX).

Additionally, in Counters (1-bit) to KNX and Counters (1-byte) to KNX, the same Comfort counter can be mapped to a different KNX group address if desired. This allows a Counter to provide status to a KNX object. The diagram below shows the scheme.

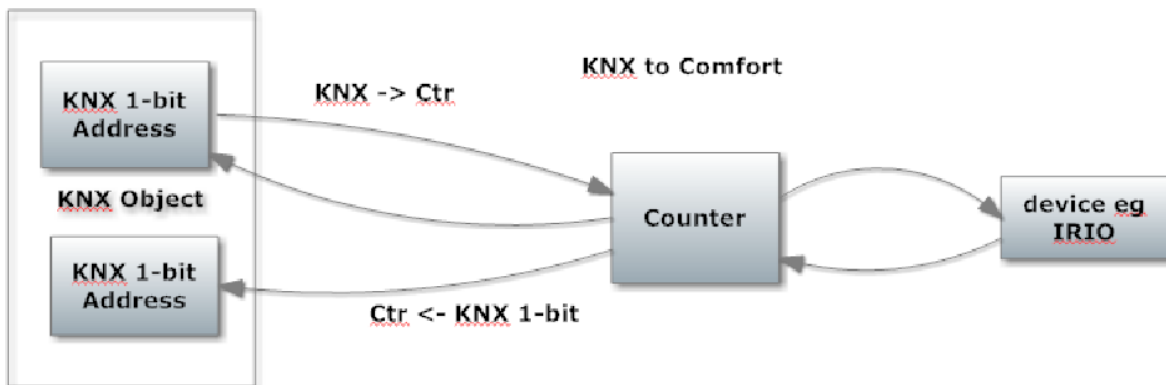


Figure 3.13 - KNX to Counter Flowchart

1-Bit Switching (EIS1) > Flag

A 1-bit switching (EIS1) group address can be mapped to a Comfort Flag, when a telegram with this group address is received by the UCM/KNX2, the state of the object is saved in the Flag (0 for off, 1 for ON)

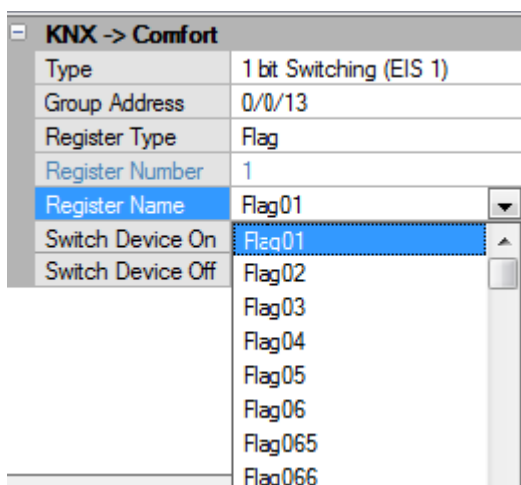


Figure 3.14 - KNX 1-bit to Flag

If a KNX object is mapped to a Flag, this can be used to send commands to other Comfort objects mapped to the same Flag. For example the flag may be mapped to a CBUS group address, a Zwave device, or an Infrared function on

UCM/KNX2 - Comfort to KNX Interface

IRIO. Changing the Flag causes all the objects mapped to the flag to be controlled simultaneously. If there is a CBUS Group address (via UCM/Cbus2) mapped to the same flag as a KNX group address, then the 2 systems could communicate with each other via the flag.

Changing the Flag state in Comfort will also send a 1-bit telegram back to the KNX group address. Hence the KNX Group address sends to and receives from a mapped Flag. (This is the same behaviour as in UCM/KNX).

Additionally, in Flags to KNX, the same Comfort Flag can be mapped to a different KNX group address if desired. This allows the Flag to provide status to a KNX object. The diagram below shows the scheme.

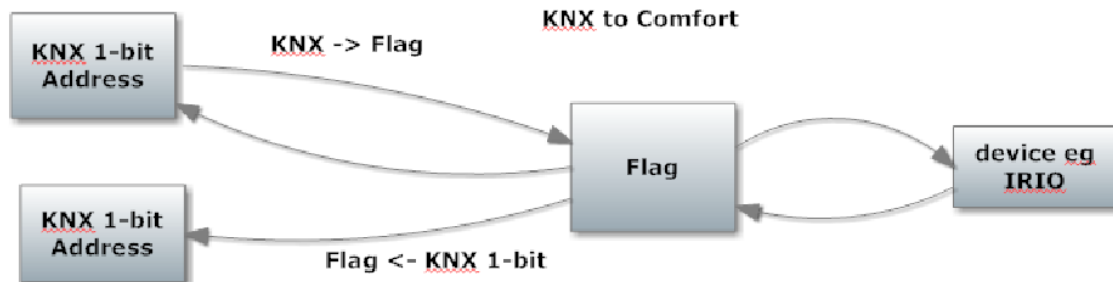


Figure 3.15 - KNX 1-bit to Arm Flowchart

The difference between mapping to Flags and Counters is that a Counter has Counter responses and Counters have 256 levels which can be used for dimming levels.

1-Bit Switching (EIS1) > Arm Security

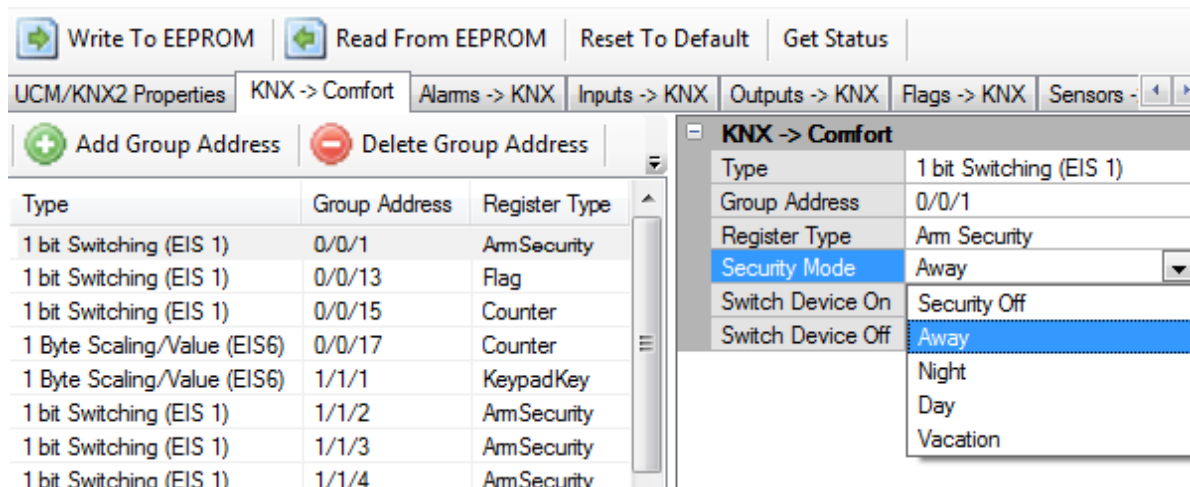


Figure 3.16 - KNX 1-bit to Arm Security

This is a 1-bit (EIS 1) group address which arms Comfort to Away, Night, Day, Vacation Mode just like the Keypad keys for Hard Arming. **Disarm to Security Off has been disabled due to the security risk.** Disarm should be by Keypad Keys KNX When Comfort is armed to the selected Mode using other means this group address on KNX will be turned on using a 1-bit telegram. When Comfort is disarmed or armed to a different mode, this group address will be turned off using a 1 bit telegram.

When Comfort is armed, it will send an On telegram to Alarms to KNX Armed state 1-bit address, and when disarmed it will send an Off telegram.

UCM/KNX2 - Comfort to KNX Interface

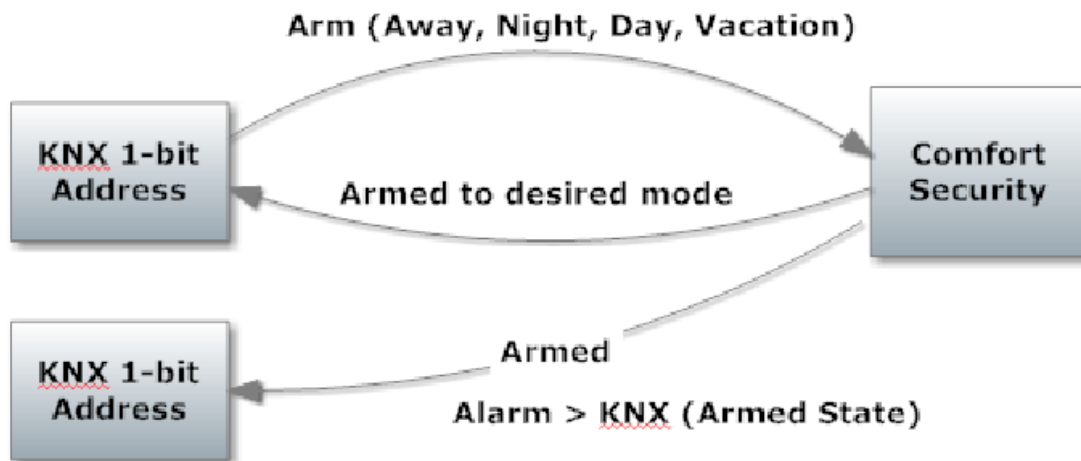


Figure 3.17 - KNX 1-bit to Arm Security

1-Bit Switching (EIS1) > Panic

This is a 1-bit (EIS 1) group address which activates an immediate panic in Comfort.

KNX -> Comfort	
Type	1 bit Switching (EIS 1)
Group Address	0/0/13
Register Type	Panic
Switch Device On	On
Switch Device Off	Off

Figure 3.18 - KNX 1-bit to Panic

A Panic state caused by other means in Comfort will also send the state to the same group address. Also the panic state will be sent to a different KNX address in Alarms to KNX (Panic state)

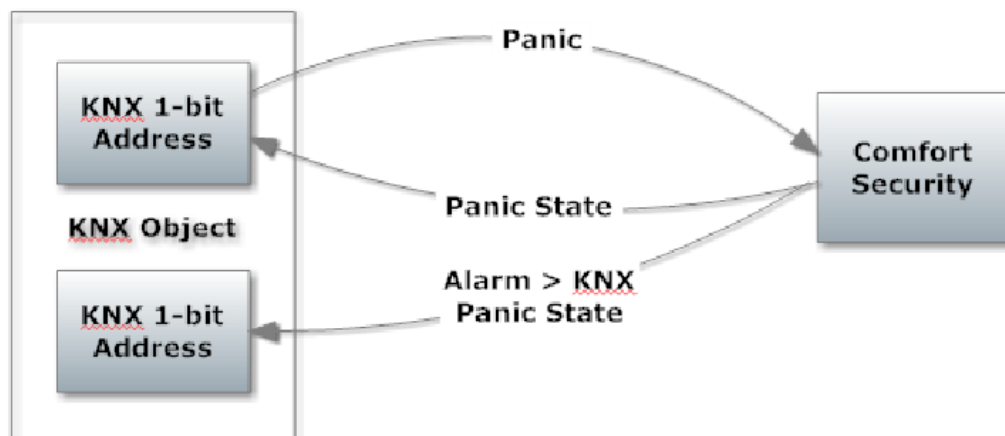


Figure 3.19 - KNX 1-bit to Panic flowchart

1-Bit Switching (EIS1) > Bypass Zone

This group address type is a 1 bit (EIS 1) which allows KNX devices, usually touchscreens to bypass and unbypass any Comfort zone by toggling the KNX button.

UCM/KNX2 - Comfort to KNX Interface

KNX -> Comfort	
Type	1 bit Switching (EIS 1)
Group Address	0/0/13
Register Type	Bypass Zone
Register Number	255
Register Name	
Switch Device On	FrontDoor
Switch Device Off	Zone02 Zone03 Zone04 Zone05

Figure 3.20 - Bypass Zone

Select the zone to be bypassed/unbypassed via the KNX group address. When the zone is bypassed by other means the bypass state will also be updated to the same KNX group address.

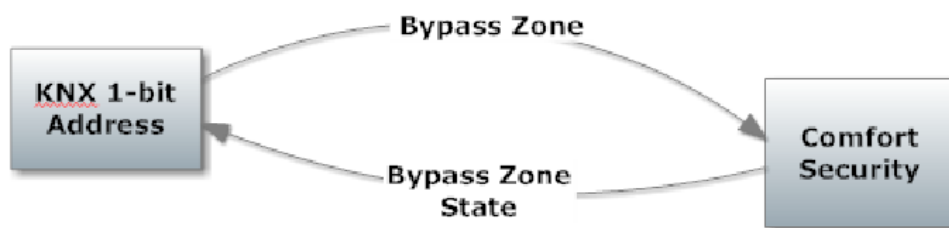


Figure 3.21 - Bypass Zone Flowchart

1-Bit Switching (EIS1) > Virtual Input

This group address type is a 1-bit object which is mapped to an unused zone on Comfort. Select the Zone Name to be mapped to the group address. The Zone selected can be any of the Comfort inputs, including those that are on the Comfort PCB. Local Expansion Modules and Slaves. If a zone is selected as a Virtual input, the physical zone will be ignored. A "non-existent" zone can be a Virtual Input, for example if there are no Slaves installed, zones 17 to 96 can still be mapped to Virtual Inputs. However it is recommended that the lowest numbered zones available should be assigned to Virtual Inputs.

KNX -> Comfort	
Type	1 bit Switching (EIS 1)
Group Address	0/0/20
Register Type	Virtual Input
Register Number	255
Register Name	
Switch Device On	FrontDoor
Switch Device Off	Zone02 Zone03 Zone04 Zone08 Zone09 Zone10 Zone11

Figure 3.21 - Virtual Input

In Security > Zone Inputs, the mapped zone will have the "Virtual Input" box Checked.

The Virtual Input box cannot be changed in this screen. It has to be mapped or unmapped in the KNX Configurator only. The other settings of the zone must be configured in the Security > Zones screen eg Zone Words, Zone Type, Entry Path, On Response and Off Response. In other words the KNX bus sensor will

UCM/KNX2 - Comfort to KNX Interface

behave as a real alarm sensor and can trigger an alarm if the system is armed, as well as activate Zone Responses.

This can be used to allow a KNX motion sensor to be used as an Alarm PIR.

KNX to Comfort Virtual Input



Figure 3.21 - Virtual Input Flowchart

No	Name	Zone Type	Phrase	Entry	Restore	Virtual Input
1	FrontDoor	EntryDoor [2]	Front Door	Yes	No	No
2	Zone02			No	No	No
3	Zone03			No	No	No
4	Zone04			No	No	No
5	Zone05	PIRAway [18]	Landing Movement	No	No	Yes
6	Zone06			No	No	No
7	Zone07			No	No	No
8	Zone08			No	No	No
9	Zone09			No	No	Yes
10	Zone10			No	No	No
11	Zone11			No	No	No
12	Zone12			No	No	No
13	Zone13			No	No	No
14	Zone14			No	No	No
15	Zone15			No	No	No
16	Zone16			No	No	No
17	Zone17			No	No	No
18	Zone18			No	No	No
19	Zone19			No	No	No
20	Zone20			No	No	No
21	Zone21			No	No	No
22	Zone22			No	No	No

Zone Properties
Number: 5
Name: Zone05
Zone Type: PIRAway
Zone Word 1: Landing
Zone Word 2: Movement
Zone Word 3:
Zone Word 4:
Entry Path: ☐ No
Restore: ☐ No
Virtual Input: ☒ Yes
Announce: ☐ No
On Response: NullResponse
Off Response: NullResponse
Show Status: ☐ No

Zone Word 1
For each zone, a phrase consisting of up to 4 words from the wordlist can be assigned to describe it.

Figure 3.22 - Zone Properties of Virtual Inputs

KNX PIRs should not be used as the primary alarm sensors because these have no battery backup like alarm PIRs connected to Comfort.

1-Bit Switching (EIS1) > Output, Output Toggle, Output Pulse

This 1-bit group address type is mapped to Outputs

KNX -> Comfort

Type	1 bit Switching (EIS 1)
Group Address	0/0/23
Register Type	Output
Register Number	255
Register Name	
Switch Device On	Output001
Switch Device Off	Output002

- Output003
- Output004
- Output005
- Output006
- Output007
- Output008

Figure 3.23 - KNX to Output

For Output, the 1 bit group address can turn on and off the selected Comfort Output.

UCM/KNX2 - Comfort to KNX Interface

For Output Toggle, the 1 bit group address On or Off value causes the selected Comfort output to toggle its state.

KNX -> Comfort	
Type	1 bit Switching (EIS 1)
Group Address	0/0/23
Register Type	Output Toggle
Register Number	5
Register Name	Output005
Switch Device On	On
Switch Device Off	Off

For Output Pulse, the 1 bit group address On or Off value causes the selected Comfort output to Pulse with a 1 second duration.

The Output state change from Comfort is also sent back to the KNX group address.

In Outputs to KNX tab, the output can be mapped to a 1-bit KNX address for status. The diagram below shows the scheme.

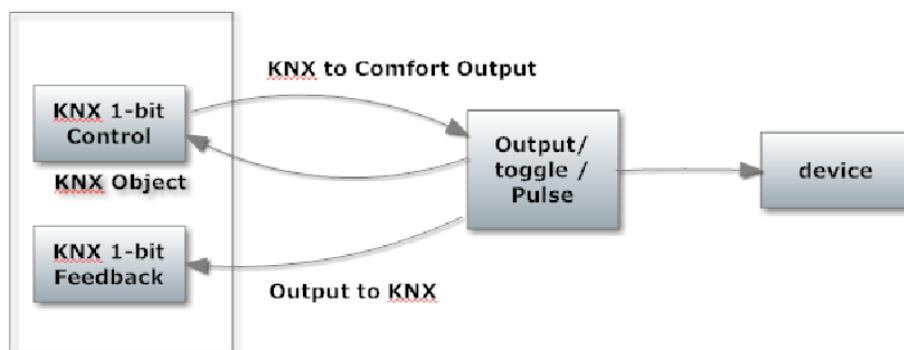


Figure 3.24 - KNX to Output Flowchart

4 Bits Dimming (EIS2)

Ucm02

Write To EEPROM Read From EEPROM Reset To Default Get Status

UCM/KNX2 Properties KNX -> Comfort Alarms -> KNX Inputs -> KNX Outputs -> KNX Flags -> KNX Sensors -> KNX

+ Add Group Address - Delete Group Address Learn

Type	Group Address	Register Type	Register Name
4 bits Dimming (EIS 2)	0/0/1	Counter	

KNX -> Comfort	
Type	4 bits Dimming (EIS 2)
Main Group	0
Mid-Group	0
Sub-Group	1
Register Type	Counter
Register Number	255
Register Name	
Switch Device On	On
Switch Device Off	Off

Figure 3.25 - 4 bit Dimming

The 4-bit dimming group address is used for a KNX button which is used for dimming. This can be mapped to a Counter. The KNX device is able to send a relative dimming value according to the percentage to dim or brighten. This will scale the value of the Counter according to the relative dimming value. The Counter response can trigger a counter response which can be used by Comfort to set different levels in other devices according to the counter value.

A KNX button is usually associated with a 1-bit dimming group address as well as a 4-bit relative group address. In this case the counter associated with the 1

UCM/KNX2 - Comfort to KNX Interface

bit and 4 bit group addresses for the same dimming actuator should be the same, so that the mapped counter can track the absolute value of the dimming level from 0 to 255.

The "Switch Device On" and "Switch Device Off" buttons have no function

Time (EIS3)/ Date (EIS4)

This is used to map a KNX group address to Comfort's Time or Date respectively. This allows KNX time or date to be sent to Comfort. The "Switch Device On" and "Switch Device Off" buttons have no function. KNX to Comfort for Time (EIS3) is shown below. Select the KNX group address that has the Time. KNX Type Date (EIS4) is similar where a KNX group address that supplies that date is selected. The Time and Date Group addresses do not allow Comfort time and date to be sent to KNX.

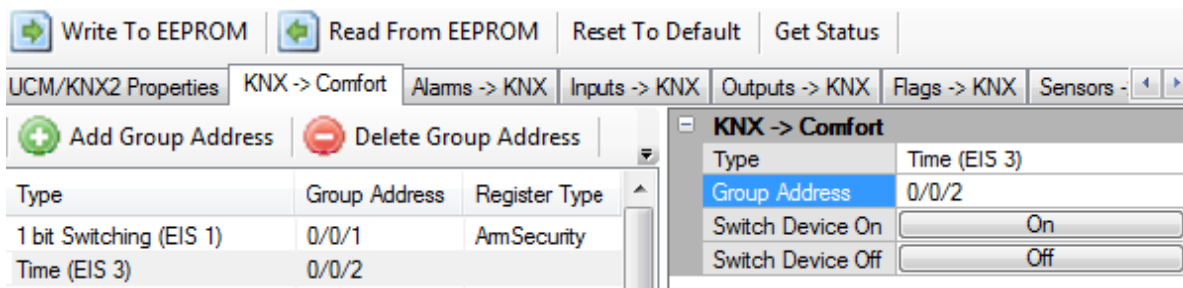


Figure 3.26 - Time /Date

To allow Comfort to send its date and time to KNX, use the Alarms to KNX tab and select different group addresses for Date and Time to KNX.

Floating Point Value (EIS5)

This refers to a EIS5 2-byte floating point object which can be associated with temperature or other value.

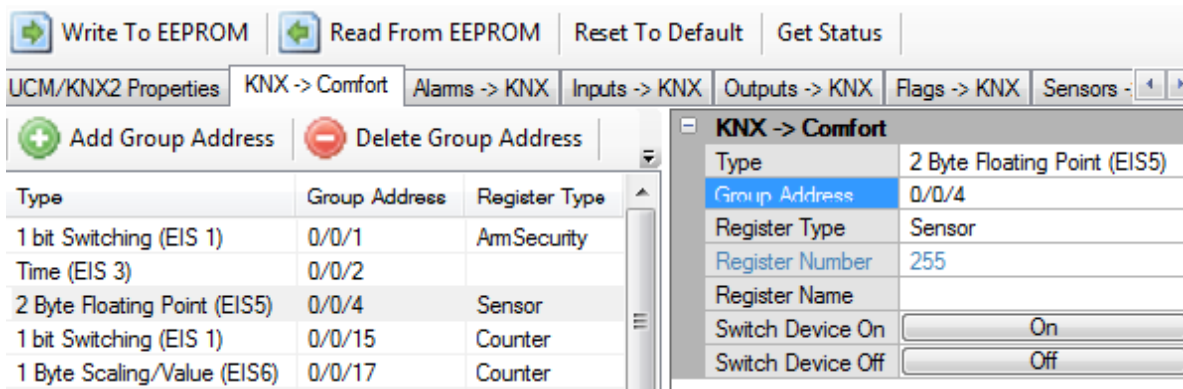


Figure 3.27 - Floating Point Value

The "Switch Device On" and "Switch Device Off" buttons have no function at present for this KNX group address Type.

Select a Comfort Sensor to be mapped to this group address. Comfort has 32 sensor registers which can store 16 bit signed values which can be used to keep sensor values. The sensor can be used to monitor the state of the KNX device as a value from -32768 to +32767. In the Control Menu, any control key can have feedback so that the user on the telephone can hear the sensor value. Select Feedback Type as Sensor and select the Feedback Name as the sensor which has been mapped to the group address. In the screen below, sensor 8 is the feedback for the control key called "Sensor 8" (which may be renamed "Bedroom temperature" for example).

UCM/KNX2 - Comfort to KNX Interface

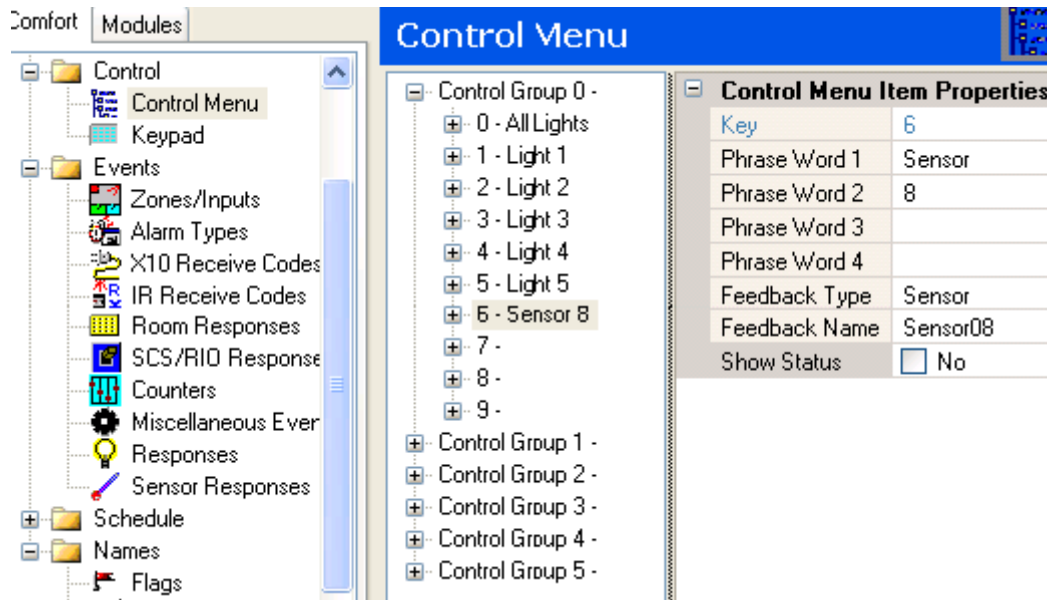


Figure 3.28 - Sensor Feedback

The value saved in the sensor register is a signed value from -32768 to +32767.

When a sensor register is changed by a KNX group address, a Sensor Response is activated as shown below in Events > Sensor Responses.

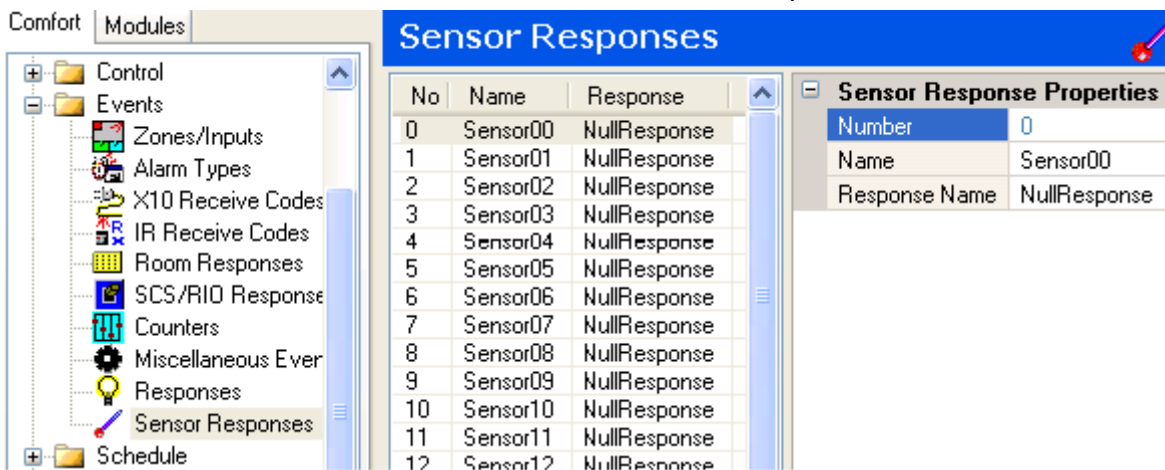


Figure 3.30 - Sensor Response

Click the Response Name on the right pane to select or create a Response for the sensor.

When a Floating Point EIS 5 group address is mapped to a Comfort Sensor, any change in the sensor value in Comfort results in sending an EIS 5 telegram to the same KNX group address to update the KNX value.

Additionally, the same Sensor may be optionally mapped to a different Group address to provide feedback to the object

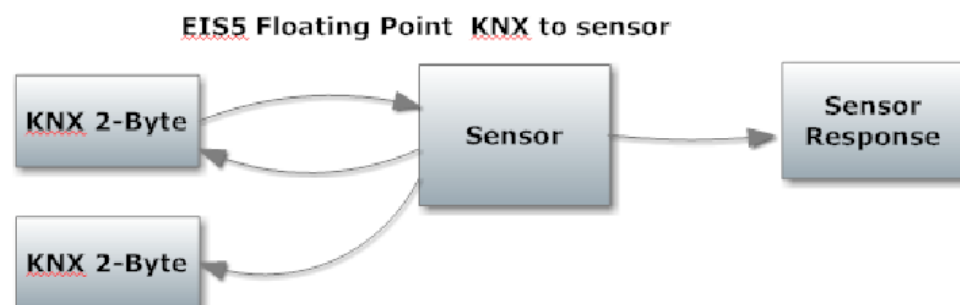


Figure 3.29 - Sensor Flowchart

UCM/KNX2 - Comfort to KNX Interface

Scaling (EIS6) - Map to Counter or Keypad Key

Scaling (EIS 6) is 1-byte absolute value object which can be mapped to a Counter or Keypad Key in Comfort. In the Register Type field, select either Counter or Keypad Key.

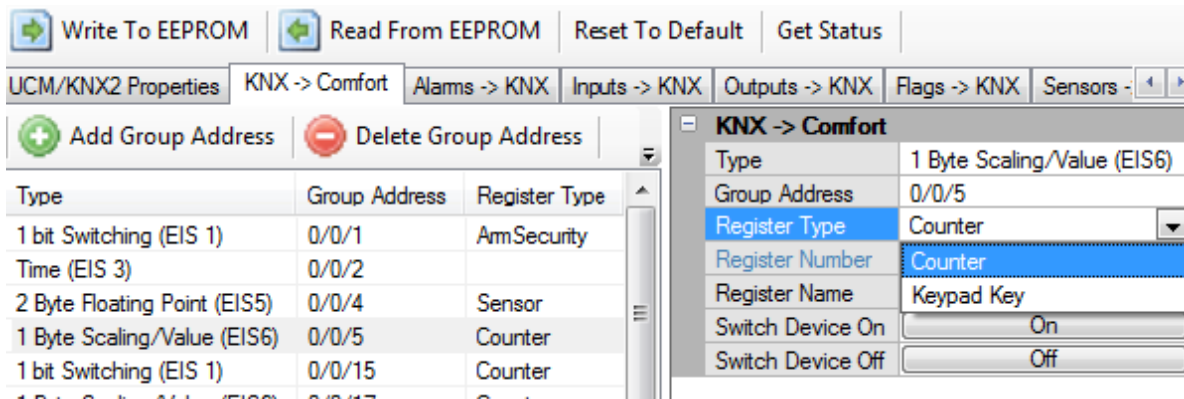


Figure 3.31 - Scaling (EIS6)

If Counter is selected, a Counter selection field appears. Click on "Counter Name" to reveal a drop-down list to select the Counter to be mapped to this group address.

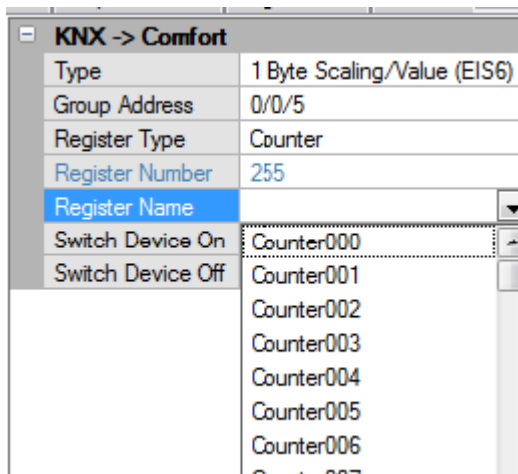


Figure 3.32 - Scaling (EIS6) to Counter

A EIS 6 telegram has a 1 byte value from 0 to 255 which is saved in the mapped counter.

The counter can be used to monitor the state of the KNX device as a value from 0 to 255. The received telegram mapped to a Counter can also trigger a **Counter Response** based on the counter value

Eg

```
If LastUcmCounter = 0 Then
  Do IR1Output1
End If
If LastUcmCounter = 1
  Do IR3Output1
End If
If LastUcmCounter = 2
  Do IR4Output1
End If
If LastUcmCounter > 2
  Do IR5Output1
End If
```

UCM/KNX2 - Comfort to KNX Interface

The "Switch Device On" and "Switch Device Off" buttons have no function at present for this KNX group address Type

In Counters to KNX (1 byte) and Counters to KNX (1 bit) , the same counter can optionally be mapped to the same KNX object at a different group address as shown below.

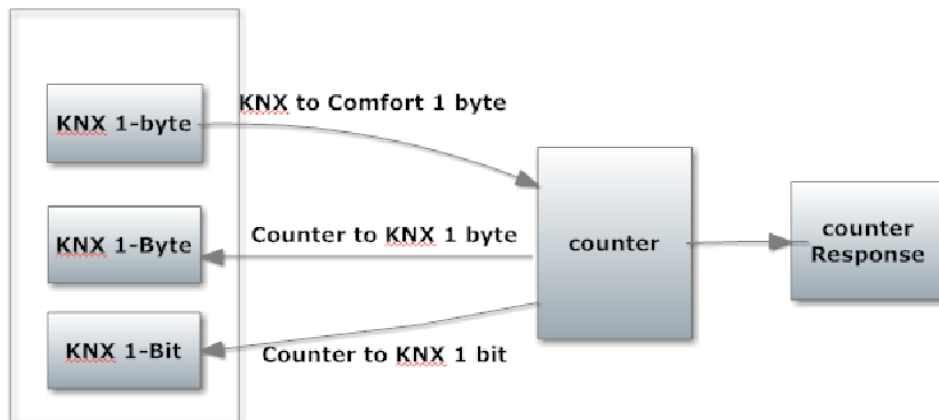


Figure 3.33 - Counters Flowchart

EIS6 Map to Keypad Key

The 1 byte EIS 6 (Scaling) group address can be mapped to the Comfort keypad so that a Comfort keypad can be simulated on a KNX touchscreen. In Figure 3.16A, select Type as Keypad Key. The 1 byte value in the telegram is associated to the keypad key according to the table below

Keypad Key	1 byte value	Keypad Key	1 byte value
0 - 9	0 - 9	F 0	32
F	10	F 1	33
*	11	F 2	34
		F 3	35
Away (soft)	13	F 4	36
Night (soft)	14	F 5	37
Day (Soft)	15	F 6	38
Panic	16	F 7	39
Fire	17	F 8	40
Away (hard)	18	F9	41
Night (hard)	19	-	42
Day (hard)	20	F *	43
Vacation (hard)	21	F #	44
Enter (#)	26		
End	27		

The * Key clears the keys previously entered while entering the code.

The Enter Key enters the user code to disarm the system.

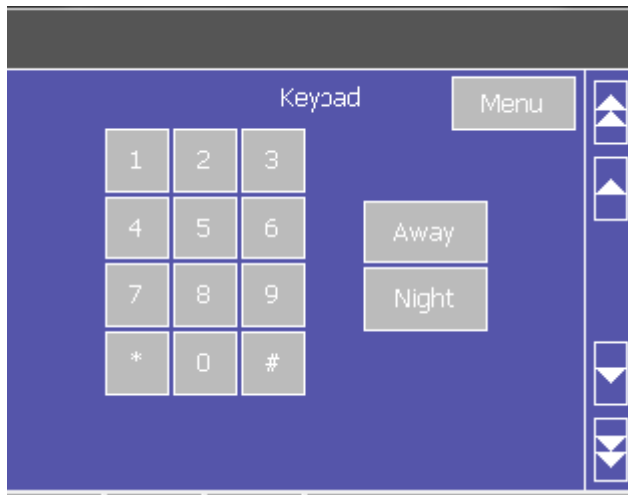
Away, Night, Day (soft) - These the keys corresponding to the 3 top left keys on the Comfort keypad. They are "soft" because these keys can be programmed by Configurator to other functions and not necessarily for arming to Away, Night and Day.

Away, Night, Day, Vacation (hard) - these keys always arm the system to the respective modes and do not depend on how the function keys are programmed.

Panic, Fire - These are "hard" keys which activate a Panic and Fire alarm respectively on Comfort.

Function 0 to Function # - These activate the programmed function F keys 0 to # on the Comfort keypad using 1 key only so facilitate the use on a KNX button or touchscreen.

End - The <END> key will end the voice menu on the keypad.



Alarms > KNX

These are for assignment of Comfort alarm conditions to KNX.

Zone Status (1-96)

This allows Comfort alarm zones to be reported to KNX group addresses whenever the state of each zone changes. At reset, Comfort will send the initial state of zones to KNX. This is suitable for visualising the state of the zones on a KNX touchscreen. Note that if there are many motion sensors in the alarm system and there is a lot of activity, it may cause a lot of traffic Ont. bus.

The Group address assigned to this event is that which is mapped to Comfort Zone 1. A block of group addresses corresponding to the number of zones active in Comfort has to be reserved for this purpose. Please note that KNX group addresses should be set up for all active zones even if they are not required to be shown, because a change in the zone status will result in a telegram to KNX which needs to be acknowledged according to the KNX rules on the bus.

In the screen shot above, the zone status is assigned to Group address 0/1/1. This means that zone 1 is mapped to 0/1/1 and zone 96 is mapped to 0/1/96. It is not necessary to program KNX group addresses for Comfort zones that are not used, e.g. if Comfort has 16 zones, then only 0/1/1 to 0/1/16 in the above example need to be configured by the ETS KNX software.

If this feature, is used, it is important to have KNX group addresses for all the zones that are used in Comfort so that any zone status is acknowledged by a KNX device. Otherwise this will cause excessive traffic on the KNX Bus.

RIO Status (129-248)

This allows RIO inputs to be reported KNX group addresses whenever the state of each input changes.

The Group address assigned to this event is that which is mapped to RIO Input 1. A block of group addresses corresponding to the number of RIO inputs active in Comfort has to be reserved for this purpose. Please note that KNX group addresses should be set up for all active RIO inputs even if they are not required to be shown, because a change in the RIO input status will result in a telegram to KNX which needs to be acknowledged according to the KNX rules on the bus.

UCM/KNX2 - Comfort to KNX Interface

In the screen shot above, the RIO status is assigned to Group address 0/3/1. This means that RIO Input 129 (RIO #1, Input 1) is mapped to 0/3/1 and RIO Input 248 (RIO 15, Input 8) is mapped to 1/1/120. It is not necessary to program KNX group addresses for RIO inputs that do not exist, e.g. if there are only 2 RIOs, then only 0/3/1 to 0/3/16 in the above example need to be configured by the ETS KNX software.

When the UCM/KNX2 or Comfort is reset, the RIO inputs are not reported until there is a change in each RIO input.

If this feature, is used, it is important to have KNX group addresses for all the RIO inputs that are used in Comfort so that any RIO status is acknowledged by a KNX device. Otherwise this will cause excessive traffic on the KNX Bus.

Armed State

This is a 1 bit EIS 1 group address to be mapped to Comfort's Armed state. When Comfort is armed to any mode (Away, Night, Day, Vacation), a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address. This group address is for status to KNX only, and cannot be used to arm the Security system.

Alarm State

This is a 1 bit EIS 1 group address to be mapped to Comfort's Alarm state. When an full alarm (alarm state 3) occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

Panic State

This is a 1 bit EIS 1 group address to be mapped to the Panic alarm. When a panic alarm occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

This is different from the Panic Button on KNX to Comfort as a this group address only monitors the panic alarm and is not able to trigger a Panic alarm.

Tamper State

This is a 1 bit EIS 1 group address to be mapped to the Tamper alarm. When a Tamper alarm occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the tamper condition is restored, an OFF telegram is sent to the group address.

Line Cut State

This is a 1 bit EIS 1 group address to be mapped to a telephone line cut state. When a line cut occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the line cut is restored, an OFF telegram is sent to the group address.

AC Failure State

This is a 1 bit EIS 1 group address to be mapped to a AC Failure state. When a power failure occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the Power failure is restored, an OFF telegram is sent to the group address.

Arm Failure State

UCM/KNX2 - Comfort to KNX Interface

This is a 1 bit EIS 1 group address to be mapped to Arm Failure on Comfort which occurs when the system fails to arm for any reason. When an arm failure Tamper alarm occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

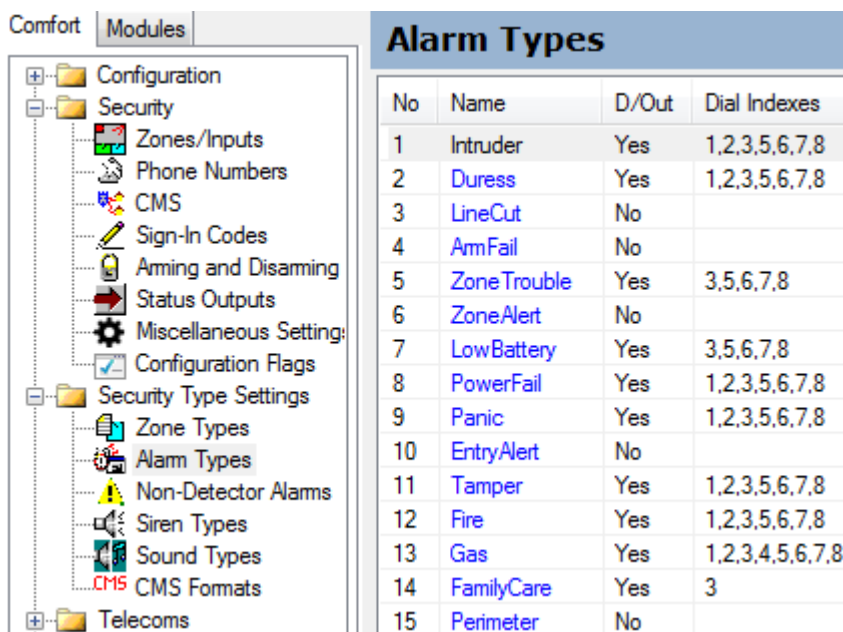
Low Battery State

This is a 1 bit EIS 1 group address to be mapped to a Low battery condition in Comfort's backup battery. When a low battery condition occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the Low battery is restored (by changing the battery), an OFF telegram is sent to the group address.

Alarm Type

This is a 1 byte EIS 6 group address which will receive the current Alarm Type as a value. The list of default Alarm Types are;

1 = Intruder, 2 = Duress, 3 = Phone Trouble, 4 = Arm Failure, 5 = Zone Trouble, 6 = Zone Alert, 7 = Low Battery, 8 = Power Failure, 9 = Panic, 10 = Entry Alert, 11 = Tamper, 12 = Fire, 12 = Gas, 14 = Family Care, 15 = Perimeter, 16 = Bypass Zone, 17 = System Disarmed, 18 = CMS Test, 19 = System Armed, 20 = Alarm Abort, 21 = Entry Warning, 22 = Siren Trouble, 23 = Unused, 24 = Comms failure, 25 = Doorbell (away), 26 = HomeSafe, 27 = Dial Test, 28 = SMS Trouble, 29 = New Message, 30 = Engineer Dial, 31 = Sign-in Tamper



No	Name	D/Out	Dial Indexes
1	Intruder	Yes	1,2,3,5,6,7,8
2	Duress	Yes	1,2,3,5,6,7,8
3	LineCut	No	
4	ArmFail	No	
5	Zone Trouble	Yes	3,5,6,7,8
6	ZoneAlert	No	
7	LowBattery	Yes	3,5,6,7,8
8	PowerFail	Yes	1,2,3,5,6,7,8
9	Panic	Yes	1,2,3,5,6,7,8
10	EntryAlert	No	
11	Tamper	Yes	1,2,3,5,6,7,8
12	Fire	Yes	1,2,3,5,6,7,8
13	Gas	Yes	1,2,3,4,5,6,7,8
14	FamilyCare	Yes	3
15	Perimeter	No	

Figure 3.34 - Alarm Types

Speaker On/Off

This is a 1 bit EIS 1 group address to be mapped to the keypad speaker when it is enabled/disabled by Comfort. When the KNX "keypad" speaker is activated, a telegram with ON status is sent to the mapped 1-bit group address. When the KNX "keypad" speaker is switched off, an OFF telegram is sent to the group address. **This is not implemented yet**

Mic On/Off

UCM/KNX2 - Comfort to KNX Interface

This is a 1 bit EIS 1 group address to be mapped to the keypad microphone when it is enabled/disabled by Comfort. When the KNX "keypad" microphone is activated, a telegram with ON status is sent to the mapped 1-bit group address. When the KNX "keypad" microphone is switched off, an OFF telegram is sent to the group address. **This is not implemented yet**

Bell/Siren On/Off

This is a 1 bit EIS 1 group address to be mapped to the Comfort Bell or siren. When the Bell or siren is activated, a telegram with ON status is sent to the mapped 1-bit group address. When the Bell or siren is switched off, an OFF telegram is sent to the group address. **This is not implemented yet**

Strobe On/Off

This is a 1 bit EIS 1 group address to be mapped to the Comfort Strobe. When the strobe is activated, a telegram with ON status is sent to the mapped 1-bit group address. When the strobe is switched off, an OFF telegram is sent to the group address. This is not implemented yet

Security Mode

This is a 1 byte EIS 6 group address to be mapped to the current Comfort Security Mode. The Security Mode Number (0 = Security Off, 1 = Away Mode, 2 = Night Mode, 3 = Day Mode, 4 = vacation Mode) is sent in the 1 byte telegram to the assigned group address.

Doorbell

This is a 1 bit EIS 1 group address to be mapped to the Comfort Doorstation button. When the Door station button is pressed/activated, a telegram with ON status is sent to the mapped 1-bit group address. When the door station is answered or times out, an OFF telegram is sent to the group address.

The doorbell function works for Comfort firmware 5.174 and above

Alarm Zone

This is a 1 byte EIS 6 group address to be mapped to the zone associated with an alarm. For example if there is a Zone Trouble, then the zone number is reported to this group address as a 1 byte value.

Alarm User

This is a 1 byte EIS 6 group address to be mapped to the user number associated with an alarm. For example if the system is armed or disarmed, then the user number is reported to this group address as a 1 byte value. The user numbers are 1 to 16, 90 for Keypad arm, 91 for Time program or arming by response.

Alarm ID (RS485)

This is a 1 byte EIS 6 group address to be mapped to the ID on the Comfort Bus associated with an alarm. For example if there is a Communications Failure on the Slave #2, then the RS485 ID (34) is reported to this group address as a 1 byte value.

The RS485 ids are;

- 17 to 24: UCM #1 to #8
- 33 to 35: Slave (SEM) #1 to #3
- 49 to 52: Door station #1 to #3
- 65 to 71: Keypad #1 to #8
- 81 to 95: SCS or RIO #1 to #15

UCM/KNX2 - Comfort to KNX Interface

- 113 to 127: TSM to 15
- 129 to 143: HIO 1 to 15

RS485 Comms Failure State

This is a 1 bit EIS 1 group address to be mapped to a RS485 Communications failure state. When a RS485 communications failure occurs a telegram with ON status is sent to the mapped 1-bit group address. When the Communications failure is restored, an OFF telegram is sent to the group address. The RS485 ID is sent to the group address associated with the Alarm ID above.

Zone Trouble State

This is a 1 bit EIS 1 group address to be mapped to a Zone Trouble state which is caused by short circuit or open circuit in a Double end-of-line resistors on a alarm zone. When a Zone Trouble occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the Zone Trouble is restored, an OFF telegram is sent to the group address. The Zone Number is sent to the group address associated with the Alarm Zone above.

Entry Alert

This is a 1 bit EIS 1 group address to be mapped to an Entry Alert state, ie when the Entry door is opened when the system is armed. When an entry alert occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

Fire

This is a 1 bit EIS 1 group address to be mapped to the Fire alarm. When a Fire alarm occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

Alarm State (value)

This is a 1 byte EIS 6 group address to be mapped to the numeric alarm state 0 to 3. The alarm states are 0 = Idle, 1 = Trouble, 2 = Alert, 3 = Alarm.

Intruder Alarm

This is a 1 bit EIS 1 group address to be mapped to the Intruder alarm. When an Intruder alarm occurs, a telegram with ON status is sent to the mapped 1-bit group address. When the system is disarmed, an OFF telegram is sent to the group address.

Inputs to KNX

In this tab, Comfort Inputs can be mapped to KNX 1-bit group addresses, so that the KNX addresses will be updated when the Inputs change State.

UCM/KNX2 - Comfort to KNX Interface

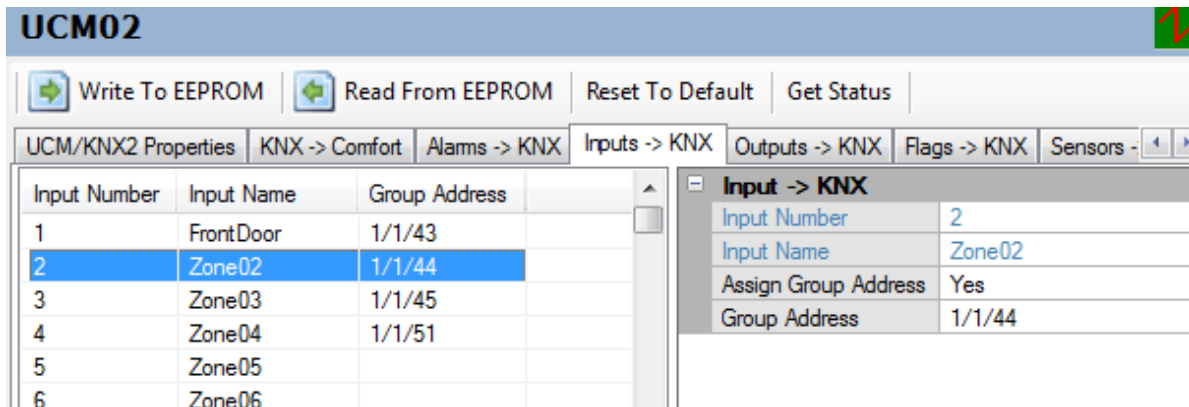


Figure 3.35 - Inputs to KNX

This is similar to Alarms to KNX Zones (1-96) except that individual zones can be selected for mapping while the Zones to KNX maps all the zones in a continuous block of group addresses. The Alarm Zones to KNX (1-96) mapping is suitable for displaying the zone states on a KNX touchscreen. The Inputs to KNX mapping is suitable for situations where KNX controls appliances handled by Comfort eg Airconditioners by Infrared signals or TWS On/Off lighting where the feedback for the appliances is by Current sensors connected to Comfort Inputs.

The diagram below shows control of an airconditioner by IR signals. A KNX 1 bit address is mapped to a Counter which triggers a Counter Response to send an IR code to the device to control it. A current sensor monitors the AC current on the device and is connected to a Comfort Input. The Input is mapped to a KNX 1 bit address to provide feedback to the KNX button to give the real time status of the device.

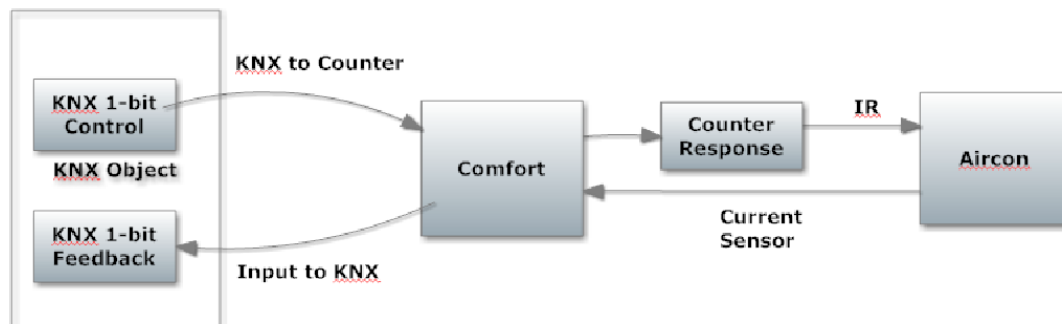


Figure 3.36 - Inputs to KNX Flowchart

Outputs to KNX

In this tab, Comfort outputs can be mapped to KNX 1-bit group addresses, so any output state change will update the status of a KNX 1-bit group address.

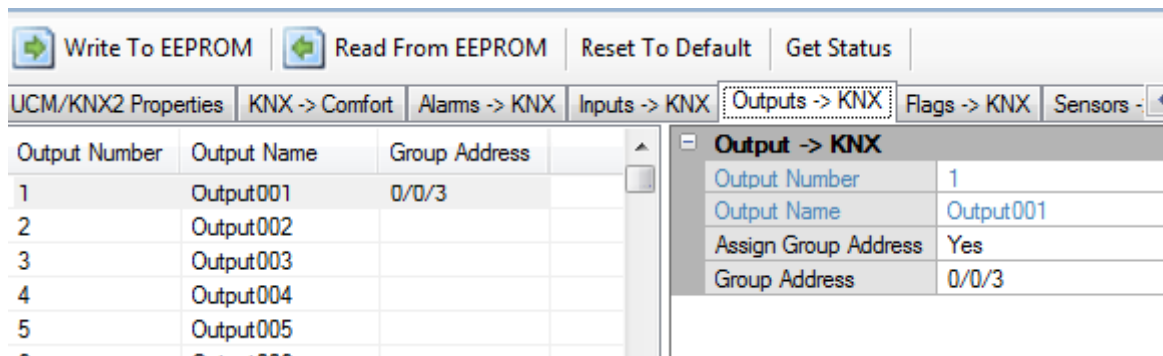


Figure 3.37 - Outputs to KNX

UCM/KNX2 - Comfort to KNX Interface

This is useful when a Comfort Outputs is used to control an appliance. A KNX address can send on/off commands to the Comfort Output. When the output state is changed by Comfort, the status can be sent to a KNX feedback address by Outputs to KNX. See the diagram below.

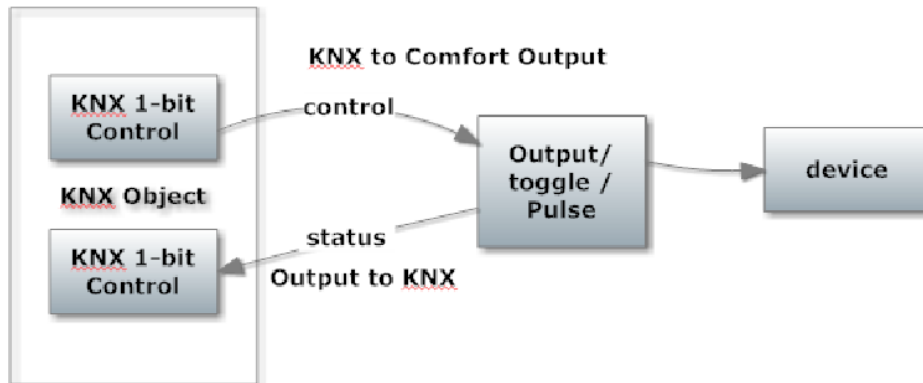


Figure 3.38 - Outputs to KNX Flowchart

Flags to KNX

In this tab, Comfort Flags can be mapped to KNX 1-bit group addresses, so any Flag state change will update the status of a KNX 1-bit group address.

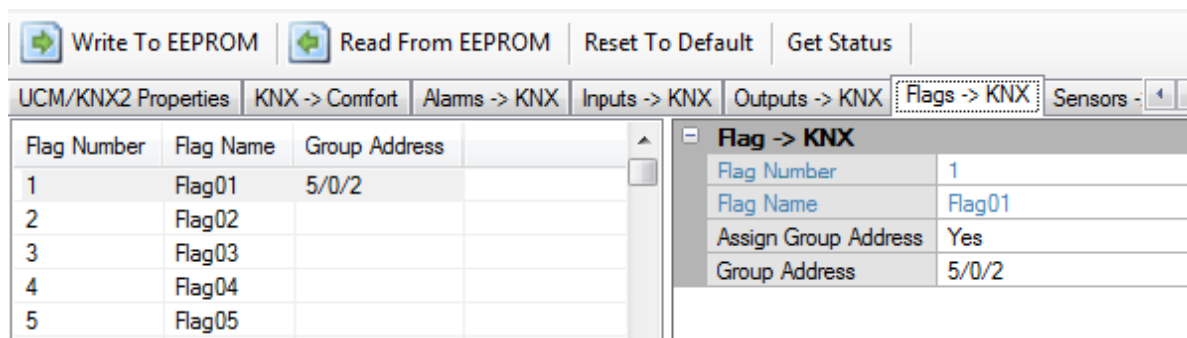


Figure 3.39 - Flags to KNX

Flags can be used to control external devices like KNX, C-Bus, Zwave, IRIO etc.

For example, an IRIO with ISM03 Infrared submodule is used to control and monitor the status of an airconditioner with Infrared signals. A Current sensor is connected from the Aircon to the ISM03 to detect the state of the aircon. The IR signal and feedback is mapped to a Flag. The diagram below shows how a KNX button can be used to control the aircon and receive status by mapping to a Flag.

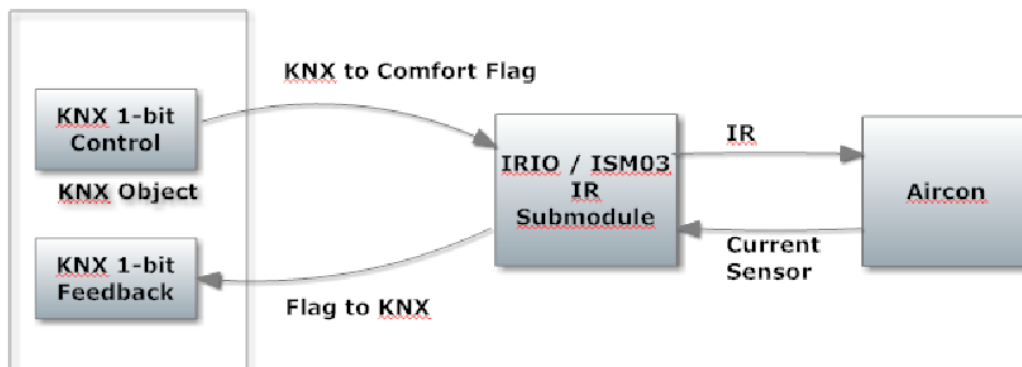


Figure 3.40 - Flags to KNX Flowchart

Sensors to KNX

In this tab, Comfort sensors can be mapped to KNX 2 byte floating point addresses.

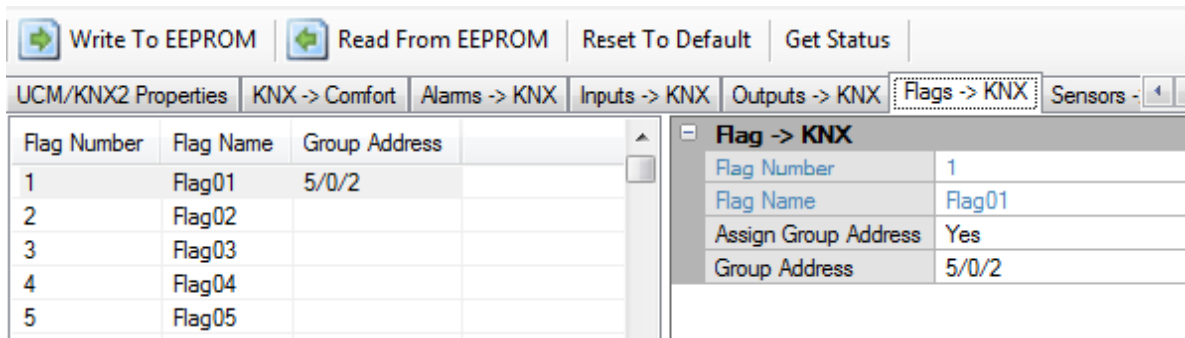


Figure 3.41 - Sensors to KNX

Counters to KNX (1-bit)

In this tab, Comfort Counters can be mapped to KNX 1-bit addresses.

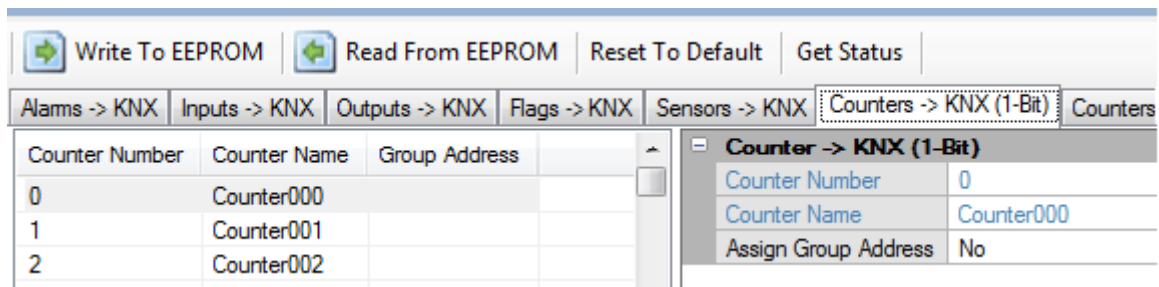


Figure 3.42 - Counters to KNX (1-bit)

If the value of the counter is more than 0, the 1-bit KNX address is in the ON state. If the value of the counter is 0, the bit KNX address is in the OFF state.

Counters to KNX (1-byte)

In this tab, Comfort Counters can be mapped to KNX 1-byte addresses. The value of the counter (0-255) is send to the 1 byte KNX address.

The same Counter can be mapped to a 1-byte address and to another 1-bit address as shown below.

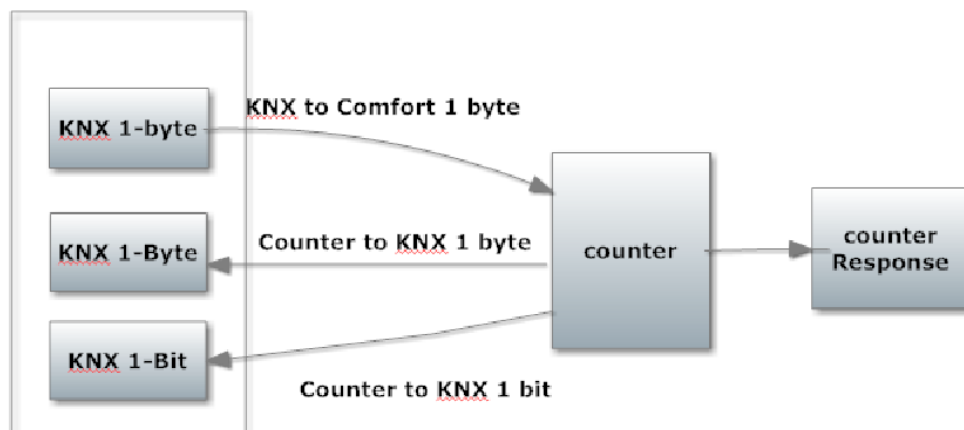


Figure 3.43 - Counters to KNX Flowchart

The Response Wizard - Sending Telegrams to KNX

Comfort sends telegrams to KNX based on the flags, counters and sensors mapped to KNX addresses. This is the preferred and easier way to communicate with KNX addresses, both for sending and receiving values.

Comfort can also be programmed to send telegrams to any KNX group address to do control in the Control Menu (accessed by telephone or keypad), or Time Programs or as a Response to any event or condition. This works without mapping or assigning the KNX address to Comfort flags or counters.

Configurator has a Response Wizard which helps to program the Actions which make up a Response. Select Events -> Responses, Right click anywhere on the Responses and select Add Response to create a new Response as shown below, or you can edit an existing Response by selecting Response Wizard.

Add New Response	
Response Properties	
Number	26
Description	Send Telegram to KNX 0/1/1
Name	SendTelegramToKN
Name	
This is a name which may be assigned to the Response to provide a meaningful 16 characters (A-Z, a-z, 0-9, - or _).	

Figure 3.22 - Add New Response

Enter a Description of the Response. Press Enter when complete. This automatically generates a Name for the Response, which is used to reference this Response. Press OK. The Response Wizard opens.

Select "Append New Action" This opens a drop-down list as shown below

UCM/KNX2 - Comfort to KNX Interface

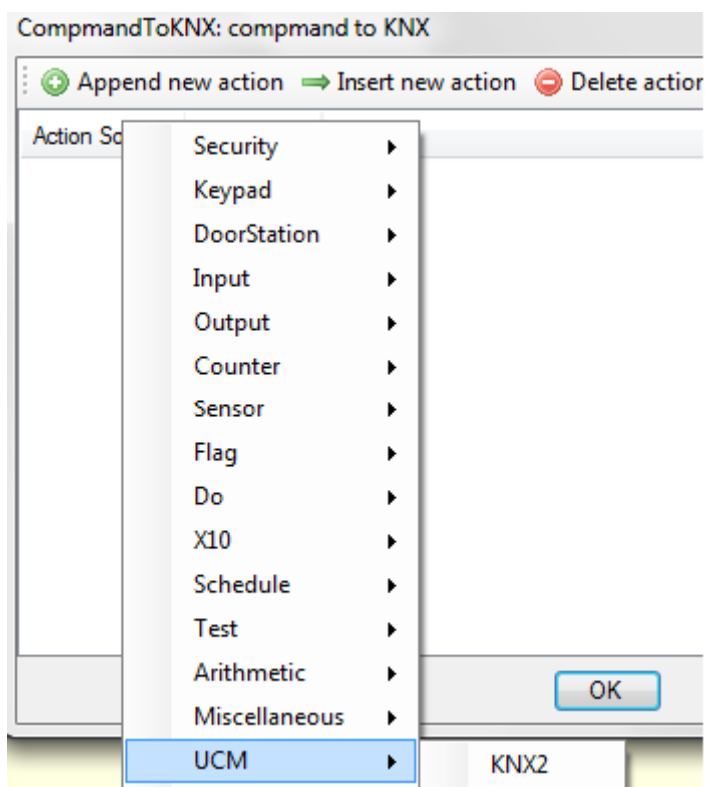


Figure 3.23 - "Send Telegram to KNX" Action

The Response Wizard has a list of categories of Actions to select the actions to be used in the Response. Note that the KNX tab is available when a UCM of type KNX is in the system. Select KNX2. The Dialog to select the properties of the telegram to send to KNX appears, as shown below;

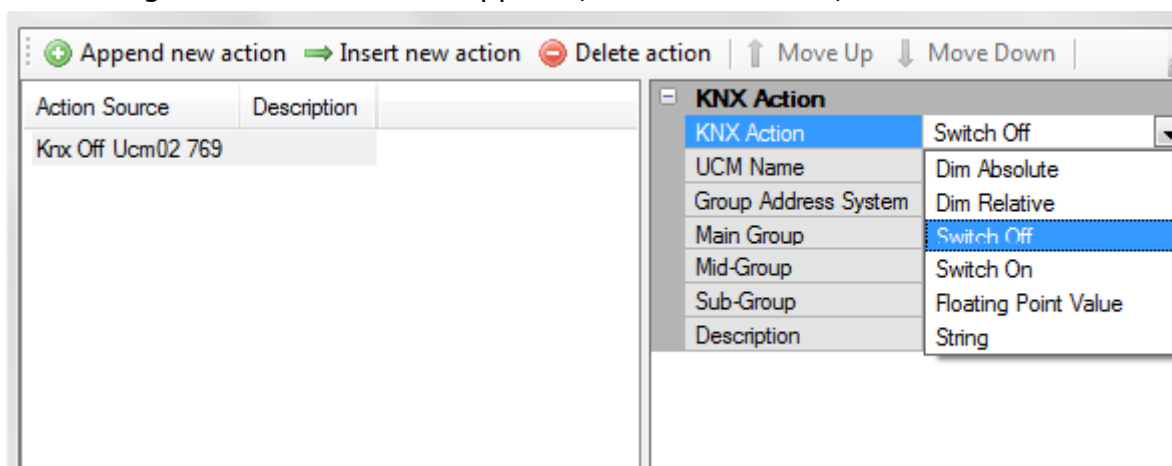


Figure 3.22 - KNX Actions

The list of KNX commands which can be sent in a telegram are listed. Select the appropriate command.

The UCM Name is the name of the UCM/KNX2 in the system. If there is more than 1 UCM/KNX2, be careful to select the correct one.

Group Address system selects the display of 2-level or 3-level group addresses.

Main Group/Mid Group and Subgroup selects the group address for the telegram

Description is an optional comment for this action.

Press OK to accept this action

UCM/KNX2 - Comfort to KNX Interface

You can continue to add more KNX telegrams to the Response. A Response can have an unlimited number of actions combined together, but this will reduce the total number of Responses available (maximum 1023)

When a command is sent to a KNX group address which is in the KNX to Comfort Table, the Counter or Sensor which is mapped to that group address is also updated with the new state or value so as to maintain synchronisation between the two systems.

Control Menu

The Control Menu is used by the keypad and phone voice menu to control automation. It also determines what is controlled by the Comfort iOS and Android apps. In the Control Menu, any control key can have feedback so that Keypad or phone menu can hear the value or the Comfort app can display the feedback value. Select Feedback Type (Counter, Input, Output, Flags, Sensor) and select the Feedback Name as the register number.

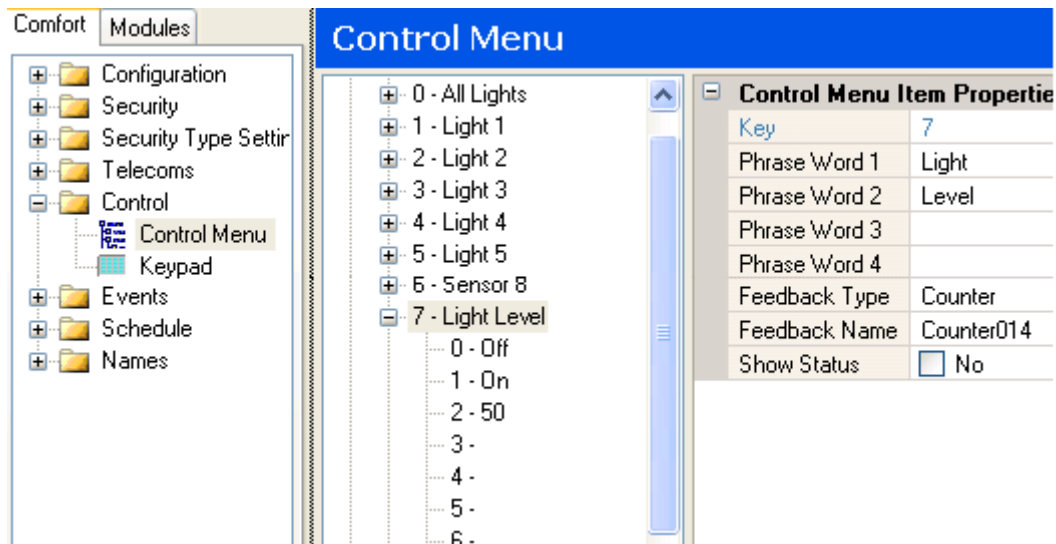


Figure 3.24 - Counter Feedback for Scaling 1 byte value

TECHNICAL DETAILS

Limitation of Commands to KNX Bus by Response

When sending commands to the KNX Bus using Responses, do not string together more than 10 KNX commands in a single Response. This is because of the limitation of the transmit buffer and to prevent the KNX bus from being too busy. Use Timers to introduce a delay between groups of KNX Commands. This gives the UCM/KNX2 time to clear the messages before the next set of commands is received from Comfort

For example

KNX Commands 1:

KNX On 2 1
KNX On 2 2
KNX On 2 3
KNX On 2 4
KNX On 2 5
KNX On 2 6
KNX On 2 7
KNX On 2 8
KNX On 2 9
KNX On 2 10
Wait 2 Seconds Using Timer01

KNX On 2 11
KNX On 2 12
KNX On 2 13
KNX On 2 14
KNX On 2 15
KNX On 2 16
KNX On 2 17
KNX On 2 18
KNX On 2 19
KNX On 2 20

Wait 2 Seconds Using Timer01

etc

KNX Commands from Comfort updates Counters

When Comfort sends a telegram the KNX Group Address which is in the KNX to Comfort table mapped to Counters, Flags Sensors, Comfort also updates the mapped Counter, FlagSensor with the changed value, except that this does not activate a Counter Response. Thus Comfort maintains the current value of each Group address in the corresponding counters and sensors regardless of whether the change in Group address value is initiated by KNX or by Comfort.

Telegram Acknowledgment

Comfort acknowledges all telegrams from KNX which are mapped to Comfort Registers (Counters, Flags, Inputs, Outputs)

Troubleshooting

Cannot Send or Receive Commands to/from KNX

Assuming the programming is correct, the most probable cause is the ID of the UCM/KNX2 is not set correctly. The UCM/KNX2 is usually set to ID=2 in the examples in this manual. In these cases, the telegram is not sent to the UCM/KNX2, and hence is ignored. The BUSY2 LED will not blink at all when Comfort sends messages to the KNX.

UCM/KNX2 Does not Respond

The UCM/KNX2 may not be connected to Comfort via the 4 way cable (KA/KB/12V/GND). In this case the RDY green LED will not be on. RDY should be on at all times. Another cause of the problem is the KNX Bus cable may not be connected to the UCM/KNX2.

KNX Not Connected

The ERR (D4) Red LED remains on if the KNX Bus is not connected to the UCM/KNX2 (JP101). When the KNX Bus is connected, the ERR LED turns off and the status line will display "Bus not connected"

Troubleshooting Strategy

Comfort to KNX communications is stable and predictable. Use the following steps to identify the symptoms and solve problems

1. Check the UCM/KNX2 ID. It is normally set to 2.
2. Check that Comfigurator > Modules and Settings > Number of UCMs includes the UCM/KNX2, ie at least 2.
3. If the ERR LED is ON, check that the KNX bus wires are connected to JP101, and that the KNX power supply is switched on. Once the KNX bus is connected to JP101, the ERR led should switch off.
4. When a telegram is send from Comfort to KNX, that the BUSY2 LED should blink. If the LED remains on, it means that the telegram is not acknowledged by KNX. The telegram is acknowledged by a KNX device with the target group address, so if there is no KNX device with the group address, the BUSY2 LED remains on until another telegram is acknowledged. If the BUSY2 Led does not blink, the UCM ID does not correspond with the ID addressed by Action 197.
5. For KNX to Comfort telegrams, the BUSY1 LED should blink. If it does not, the Bus cable may not be connected correctly (check polarity).
6. Go to the Monitor Mode page. Press any KNX button. The telegram contents should be displayed on the screen

Technical Details Action 197 send telegrams to KNX

This section provides technical information about the contents of the Action 197 command which sends telegrams to KNX. It is not necessary to know this in order to use the UCM/KNX2

For an understanding of the KNX concepts, please refer to the appropriate KNX documentation. It is beyond the scope of this manual to provide details of KNX telegrams, operation and programming.

UCM/KNX2 - Comfort to KNX Interface

Action 197 is used to send telegrams to the KNX Interface. Configurator Response wizard creates the action 197 action codes so it is not necessary to have detailed knowledge of the action

The format of Action 197 is as follows;

Format: 197, ID, Header, AddrHi, AddrLo, data1, [data2], 255

The parameters within the square brackets [] are optional depending on the message.

This format differs from the old UCM/EIB (up to 5.132) in that UCM/EIB did not have the Header character. Configurator will detect the older version UCM/EIB and adjust the action codes accordingly. However if UCM firmware is lower than 5.178 and Comfort firmware is older than 5.145, Comfort will not be able to determine the UCM/EIB firmware, and will assume that a UCM/EIB is installed. Do NOT install UCM/EIB and UCM/KNX2 together in the same system.

ID

ID is the address of the UCM/KNX2 on the Comfort RS485 bus, i.e.. 17 = ucm 1, 18 = ucm 2.., 24 = ucm 8. The UCM ID must correspond with the ID settings on SW7.

Header

The possible values for this are

00 = Value Read

01 = Value Response

02 = Value Write. Command) this is the default header which is used for the KNX/EIB commands

0A = Memory Write

81 (Learn/Monitor) : this is the command to enter monitor/learn mode - 197, ID 81H, yy where yy is the ID of the originating UCM

82 (End Learn/Monitor) This is the command to leave the monitor/Learn mode. 197, ID 82H, yy where yy is the ID of the originating UCM

The normal action 197 commands will be 197, ID, 02, AddrHi, AddrLo, data1, [data2], [data]....255 with the additional 02 header

AddrHi, AddrLo

For the 3-level Group address system,

AddrHi = Main Group * 8 + Mid Group, AddrLo = subgroup

	Main Group 0-15				Midgroup 0-7			Subgroup 0-255							
0	M	M	M	M	m	m	m	S	S	S	S	S	S	S	S
AddrHi								AddrLo							

Table 4B: 3-level Group Address Example: 197,18, 2, 10,8,1,255 sends to UCM 2 (ID=18) telegram for Group address 1/2/8 with value = On

Comfort can send telegrams to any Group Address on the KNX. The KNX Group address is a 2-byte value which can be structured logically as 2-level or 3-level as shown above. In fact, this is only a notational convenience, as in either system, the group address is just a 16-bit value. For example, actions

UCM/KNX2 - Comfort to KNX Interface

197,18,10,8,1,255 can be group address 1/2/8 in the 3-level notation or 1/520 in the 2-level notation.

Data1

The Data value gives the specific value for the KNX command sent. The value used depends on the EIS (KNX Interworking Standard). It is normally 1 for ON/ Open/True/Alarm, 0 for OFF/Close/false/Restore. The data may also be a relative dimming code. Only 6 bits of the data are applicable, ie 0 to 63.

[data2]

More data can be sent if necessary. The Absolute Dimming EIS command uses this for the absolute dimming level 0 to 255.

Commonly Used Commands

The KNX Internetworking Standards (EIS) have been established to ensure proper communications between KNX devices. The following EIS Types can be implemented with Comfort;

EIS Type 1 “Switching”

197, id, 02, addrHi,addrLo, onoff

Where “onoff” is 0 for Off, 1 for On

Example:

197,20, 02 ,8,156,1

Main Group 0-15					Sub Group 0-2047										
0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0
AddrHi								AddrLo							

UCM 4 (ID=20), Group address 1/156 or 1/0/156, Value = On

EIS Type 2 “Relative Dimming”

197, id, 02, 16,65, relative-value (group address 2/65)

Where “relative-value” can take the following values

Relative Value	Meaning
0	Stop Dimming
1	Dim by 100%
2	Dim by 1/2
3	Dim by 1/4
4	Dim by 1/8
5	Dim by 1/16
6	Dim by 1/32
7	Dim by 1/64
8	Stop brightening
9	Brighten by 1
10	Brighten by 1/2
11	Brighen by 1/4
12	Brighten by 1/8
13	Brighten by 1/16
14	Brighten by 1/32
15	Brighten by 1/64

Table 5: EIS Type 2 “Relative Dimming” values

Example:

197, 21, 02, 16, 10, 3

Main Group 0-15					Sub Group 0-2047									
-----------------	--	--	--	--	------------------	--	--	--	--	--	--	--	--	--

UCM/KNX2 - Comfort to KNX Interface

0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0
AddrHi								AddrLo								

UCM ID 5 (ID = 21), Group address 2/10 or 2/0/10, dim by ¼ (25%)

197, 18, 02, 35, 1, 11

Main Group 0-15								Sub Group 0-2047								
0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1
AddrHi								AddrLo								

UCM ID 2 (ID = 18), Group address 4/769 or 4/3/1, brighten by ¼ (25%)

Status announcement for relative dimming Group addresses on the Control Menu is not recommended, as the status value which is according to Table 5, is interpreted as a percentage and will confuse.

EIS Type 5 “Floating Point”

The floating point value is represented by 2 bytes

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
S	E	E	E	E	M	M	M	M	M	M	M	M	M	M	M
0	0	0	0	1	1	0	0	0	0	0	1	1	0	1	0

S is the sign of the mantissa where 1 is negative and 0 is positive

EEEE is the exponent to base 2

MMMMMMMMMMMM is the 11 bit mantissa with units 0.01

Eg 0C1AH in the example above is 21 (which may be temperature or other unit)

The range of values represented is $-2048 * 2^{15}$ to $+2047 * 2^{15}$

The conversion to floating point should maximise the number of significant bits in the mantissa

Action code format is

197, id, 02, addrHi, addrLo, 0, bits 15-8, bits 7-0

Where addrHi and addrLo is the group address of the destination

Eg send the value 21 to EIB group address 1/0/100 or 1/100 for UCM #2

Main Group 0-15								Sub Group 0-2047								
0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0
AddrHi								AddrLo								

actions

197,18,2, 8, 64, 0, 0C, 1A

EIS Type 6 “Scaling”

197, id, 02, addrHi, addrLo, 0, absolute-value

Where “absolute-value” can be from 0 (0%) to 255 (100%), which is a 1-byte value.

Example:

197,18, 02, 8,100,0, 200

Main Group 0-15								Sub Group 0-2047								
0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0
AddrHi								AddrLo								

UCM/KNX2 - Comfort to KNX Interface

UCM 2 (ID=18), Group address 1/100 or 1/0/100, absolute value 200.

EIS Type “String”

Up to 14 ASCII characters can be sent in this format

The Action format is

197, id, 2, addrHi, addrLo, 0, char1, char2,.... char14

Where addrHi and addrLo is the group address of the destination

If less than 14 bytes are sent the unused bytes must be NULL characters.

Firmware Revision History

For details of firmware please see Comfort Forum at
<http://www.comfortforums.com/forum89/>

Document Revision History

Size	A6 Booklet
<i>Document Title:</i>	<i>UCM/KNX2</i>
<i>Filename</i>	<i>knx2man.odt</i>
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