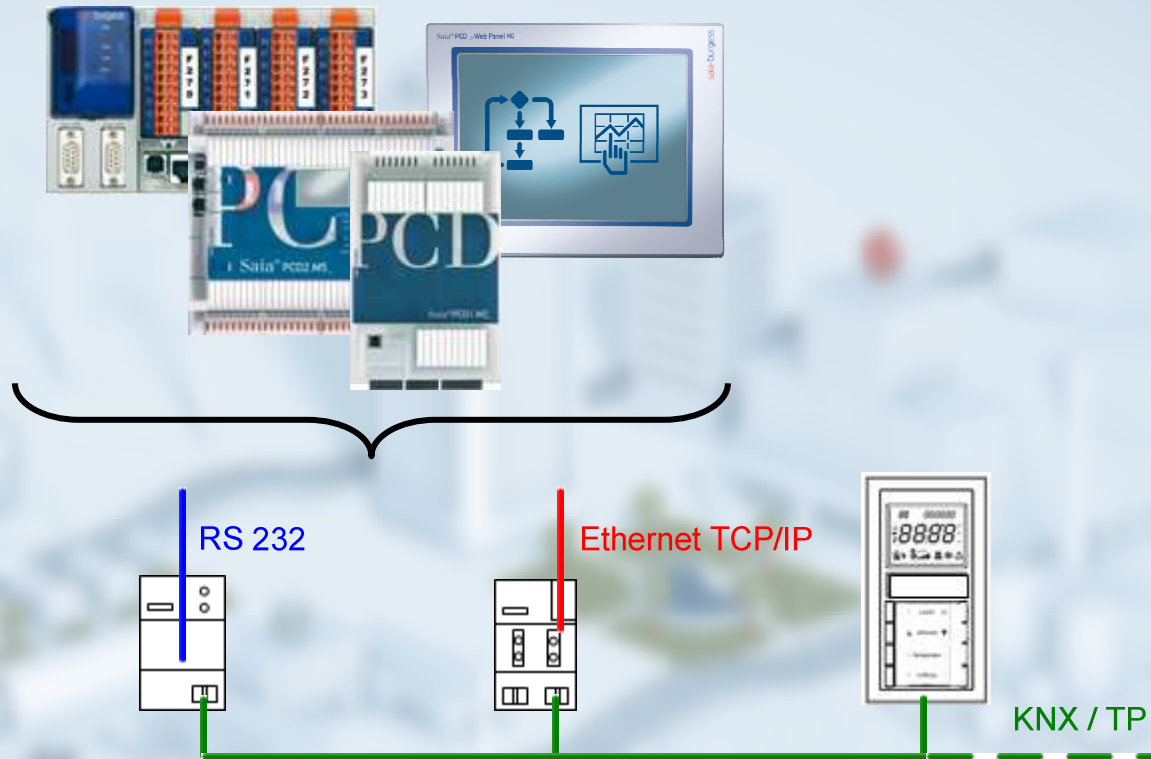


PG5



saia-burgess

Control Systems and Components

Step by Step with SBC Products and KNX Information and Getting Started

09.07.2013, Daniel Keinath / TPM



Topics

General Information

- KNX (EIB)
- SBC Products and KNX
- Debugging

Getting Started

- Components
- ETS
- PG5





KNX Scope

The Konnex **KNX** (standard) was developed as a result of the convergence between EIB, BCI and EHSA.

Instabus, is a decentralized open system to manage and control electrical devices within a facility. It is developed by Berker, Gira, Jung, Merten and Siemens AG. There are about 200 companies of electrical supplies using this communication protocol. The EIB (European Installation Bus) allows all electrical components to be interconnected through an electrical bus. Every component is able to send commands to other components, no matter where they are. A typical EIB network is made of electrical components such as switches, pulsers, electric motors, electrovalves, contactors and sensors.

This electrical bus is made of a 2x2x0,8mm twisted pair cable, that connects all devices within the network. The theoretical maximum number of components is 57375.

EIB system was developed to increase power savings, security, comfort and flexibility.

Source: [http://en.wikipedia.org/wiki/KNX_\(standard\)](http://en.wikipedia.org/wiki/KNX_(standard)) Link
http://en.wikipedia.org/wiki/European_Installation_Bus Link





KNX Strength and weakness

Strength

- License free usage
- Optimized for electrical installations like lightning ...
- Easy to install
- Standard data communication
- Event oriented communication

Weak points

- Fixed baud rate of 9600 for the KNX bus
- Restricted data volume caused by the low bandwidth
- For engineering special software tool (ETS) and training are needed





SBC Products and KNX Schema Products

SBC Products

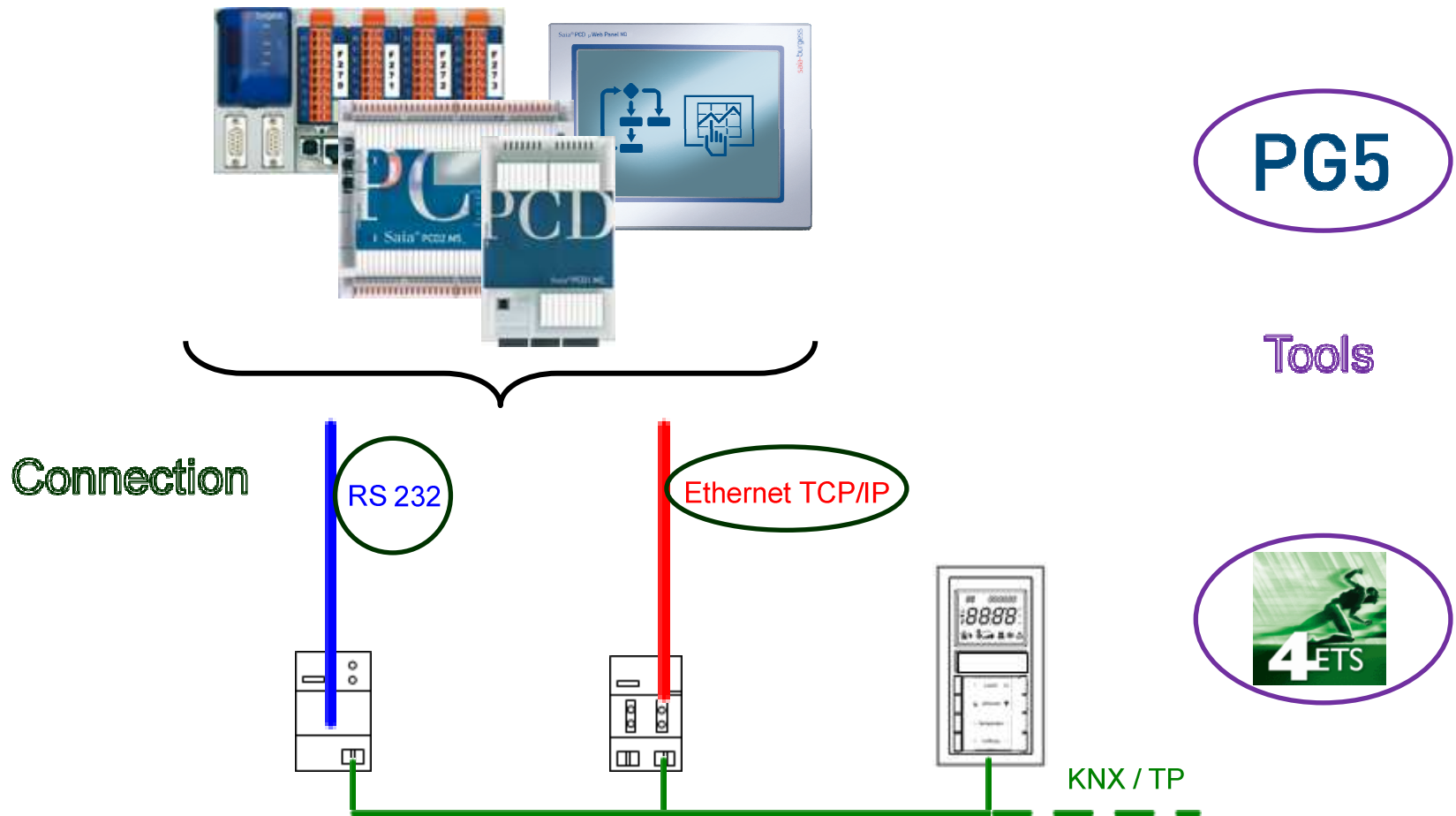


KNX Components





SBC Products and KNX Schema Tools and connection





SBC Products and KNX Connection

Connection with a external Bus-Coupler- Hardware

- IP Interface / Router
- BCU2 with Serial FT1.2
- *BCU1 (FT 1.1) not recommended for new designs !*

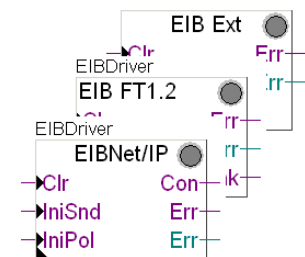


we recommend this external Bus Interface Hardware:

Weinzierl KNX IP Interface 730 (www.weinzierl.de)	KNXnet/IP-Gateway
Weinzierl KNX IP Router 750	KNXnet/IP incl. Router use
ABB IPS/S2.1 EIB/KNX IP Interface	KNXnet/IP-Gateway
ABB IPS/R2.1 EIB/KNX IP Router	KNXnet/IP incl. Router use
Weinzierl KNX BAOS 870	Serial (RS-232) KNX interface with BCU-2 protocol

Engineering with PG5 F-Boxes for PCS/PCD

- Interface Driver F-Box (BCU1 Serial, BCU2 Serial or IP Interface)
- Send / Receive / Pol Function F-Box



KNX S-Mode (EIB) Standard only!

For details please check out support page <http://www.saia-support.com>





SBC Products and KNX Requirements, Restrictions, Documentation

KNX Standard

- S-Mode

PCD Types

- PCS, PCD any

PCD Firmware

- nothing special

PG5 Version

- PG5 1.4.x, PG5 2.0, PG5 2.1

Documentation / Information

- System Catalogue chapter 2.6.4 Page 209
- more Information

Support page <http://www.sbc-support.com/>

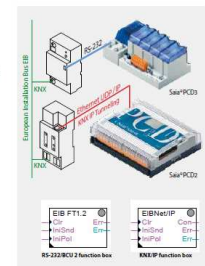
or FAQ Manager <http://faq.sbc-support.ch/>

System catalogue

2.6.4 KNX Communication drivers for electrical systems and room automation

Communication drivers

An efficient networking of building services requires multi-service functions and components for communicating with external devices. The Saia® KNX communication driver is a PG5 FUPA library with comprehensive function modules (FBoxes) for sending and receiving almost all of KNX data types (DPT). Depending on which interface is available for accessing the KNX network (RS-232 or Ethernet), the selected components can be linked to either Saia® PCD or Saia® PCS systems. The direct connection via Ethernet makes access to KNX data even quicker and more powerful.



Features

- Use of drivers for all Saia® automation stations
- Simple communication using FUpa modules
- Comprehensive support of KNX Data Point Types (DPT)
- The drivers support the simple restructuring of existing systems with KNX-BCU-1 on the KNX-BCU-2 interface
- Standard UDP/IP port: 8301
- Communication drivers for:
 - Serial KNX-BCU-1 interface via RS-232 (not recommended for new products)
 - Serial KNX-BCU-2 interfaces via RS-232
 - KNXNet/IP (Ethernet) communication

Order information

Model	Description
PG5-EB	PG5-KNX-EB (KNX standard) communication library for Saia® PCD and PCS controllers for serial and IP-based communication

Components of other providers	
Wanzel KNX IP Router 710	KNXNet/IP Gateway
Wanzel KNX IP Router 710	KNXNet/IP incl. Router use
ABB PSCD 1 EB-KNX IP interface	KNXNet/IP Gateway
ABB PSCD 1 EB-KNX IP Router	KNXNet/IP incl. Router use
Wanzel KNX EADS 870	Serial (RS-232) KNX interface with BCU-2 protocol

Compatibility

As of 2012, the tried and tested SIEMENS® Gamma Instabus interfaces are no longer available. The actual devices are no more fully compatible. The interface from Wanzel Engineering GmbH are recommended as a replacement.

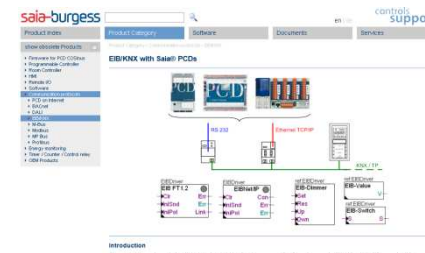
Ethernet Gateways

When planning, it is important to take into consideration that some available Ethernet gateways usually only support one communication channel. As a rule, every PCD or service tool, ETS for example, needs its own interface to the KNX bus.

Serial converter

However, connecting using BCU-1 protocols is strictly advised against. The BCU-1 protocol can cause telegrams to be lost between the gateway and the controller.

Support page



FAQ Manager

Why can't I build a Fupla containing the "EIB driver FT1.2" project with PG5 2.0.200?

FAQ #101573

When using the EIB/KNX driver FBox "EIB driver FT1.2" with PG5 2.0.200 (and the EIB FBox library SP2.6.210) the build of the project fails due to a fatal error. The accompanying error messages are:

Symptom

When using the EIB/KNX driver FBox "EIB driver FT1.2" with PG5 2.0.200 (and the EIB FBox library SP2.6.210) the build of the project fails due to a fatal error. The accompanying error messages are:

assembling C:\Programms and Settings\All users\saia-burgess\pg5_200\bin\sp26210\...

Assembly: ebdrv5.prl

Fatal error: LDR: ebdrv5.prl: Can't open file

Assembly complete: Error: 1 Warnings: 0

Linking: _driver5.lib + Fupla.obj + EIBDKM.lib + EIBdrv5.lib + ebdrv5.obj + ebdrv5.obj

Error: 2006: obj\ebdrv5.obj: Can't open file

LD: _driver5.prl: Fatal error: LDR: ebdrv5.prl: Can't open file

Error 2021: Fupla.obj: Unresolved external symbol: _eth_group.CH_1_FB_RECVPT12

Reason

The reason for this problem is a missing file in the EIB FBox library version SP2.6.210.

Solution

Please update your EIB / KNX driver FBox library to version \$2.6.212 (available on the support site) or later.





SBC Products and KNX additional topics

EIS (EIB Interworking Standard) vs. DPT (data point type)

- EIS can be transferred in DPT
- DPT is listed in more detail
- A data point type is defined by
 - one main type (of length, format and coding sets) and
 - an optional subtype (the additional information, such as containing the unit)

Example:

DPT 9 (2 byte float value) = EIS 5

Datapoint Types					
ID:	Name:	Range:	Unit:	Resol.:	Use:
9.001	DPT_Value_Temp	-273 °C ... 670 760 °C	°C ⁷⁾	0,01 °C	G
9.002	DPT_Value_Tempd	-670 760 K ... 670 760 K	K	0,01 K	G
9.003	DPT_Value_Tempa	-670 760 K/h ... 670 760 K/h	K/h	0,01 K/h	G
9.004	DPT_Value_Lux	0 Lux ... 670 760 Lux	Lux	0,01 Lux	G
9.005	DPT_Value_Wsp	0 m/s ... 670 760 m/s	m/s	0,01 m/s	G
9.006	DPT_Value_Pres	0 Pa ... 670 760 Pa	Pa	0,01 Pa	G





Debugging overview

ETS (Engineering Tool Software)

external software for programming and configuration for the KNX world

- ETS3 2004-2010
- ETS4 2010-

in practice both are still used



Recommendation Version: ETS4 Professional

There are two options for Debugging:

- Bus Monitoring
- Group Monitoring

both options work also with the ETS Demo version

ETS 4 Demo: free trial version to try, very small test projects,
per project maximum of 3 KNX devices

with a licensed version and a current open project are more details visible
for Example: device name [Source] and name of group address [destination]





Debugging Configured connections

Options

- BCU
- IP
- USB

with USB interface you can making a connection without large settings

Recommendation USB! (a USB interface in the bag)

Where and how can the settings be made?

- created new, edit or delete Communication
- choice available options / interface
- Setting parameters (IP address, Port,...)
- Test Communication build

ETS3: Extras → Options → Communication

ETS4: Settings → Communication

See next page!

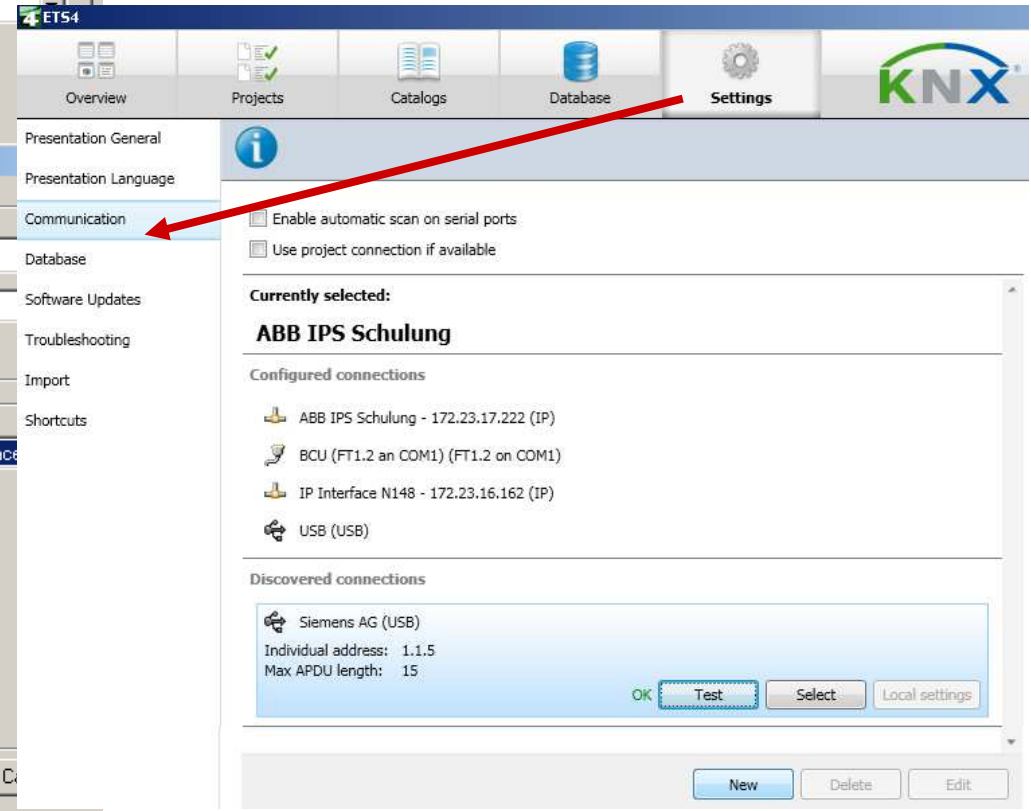
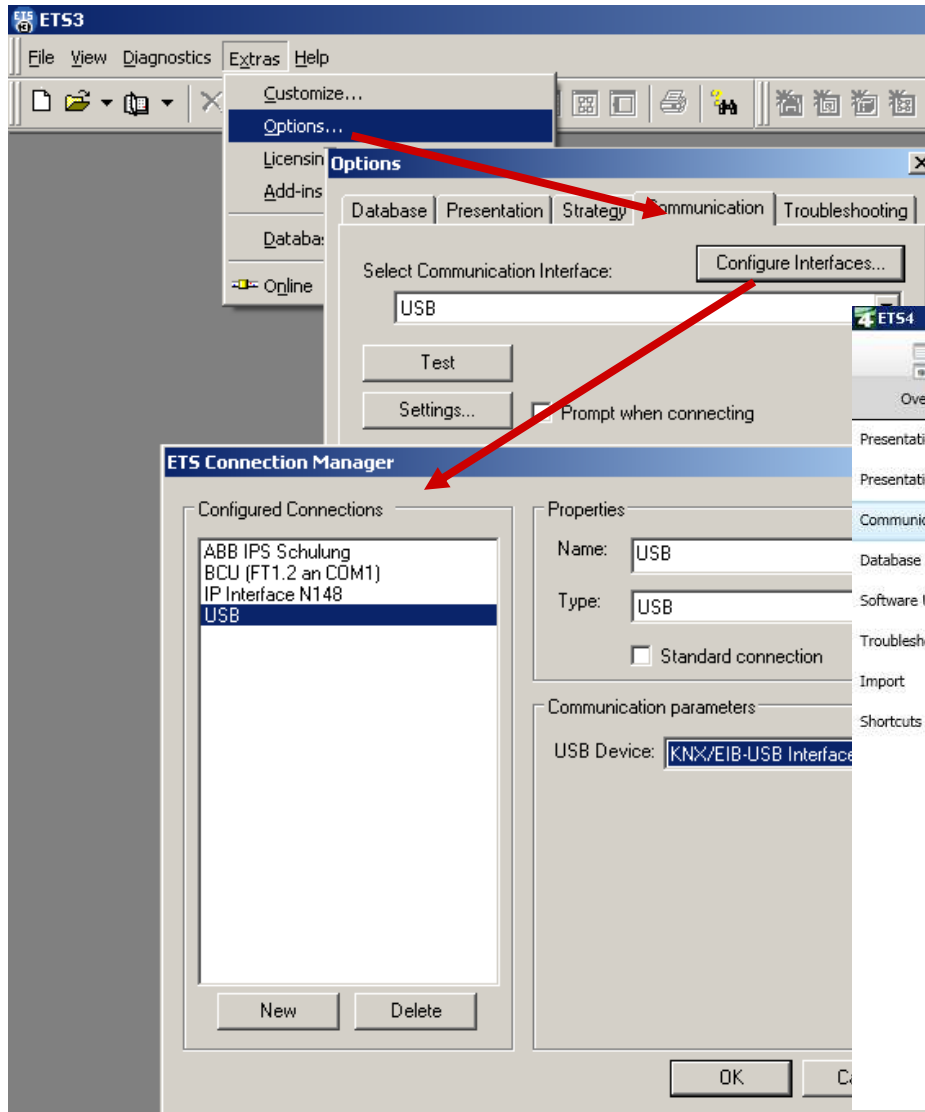


USB Interface



Debugging Steps Configured connections

Where can the settings be made?



Debugging Bus / Group Monitoring

How can they be started?

- ETS3: click to relevant Button*
or Diagnostics and then Monitoring

- ETS4: click directly to Monitoring

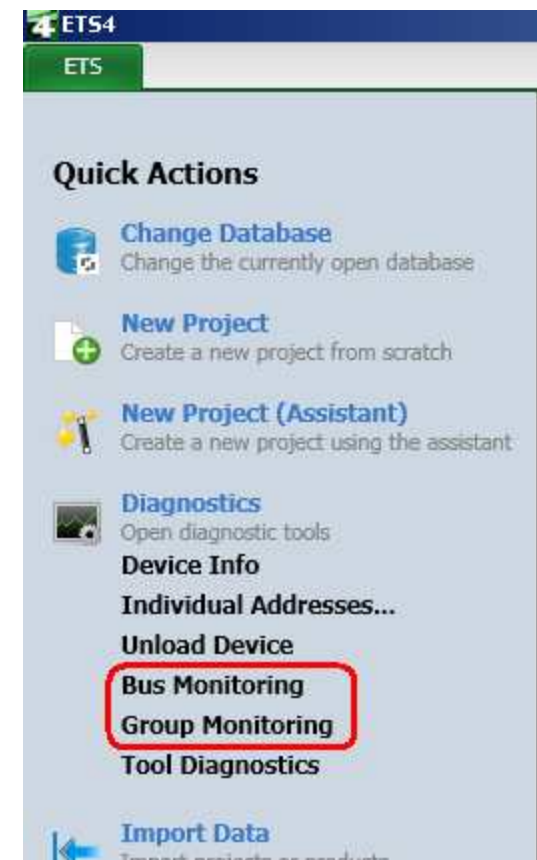
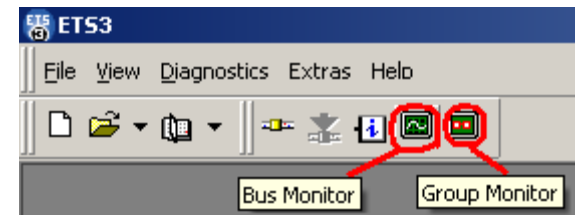
* when the Button is not visible:

View → Toolbars → make a hook at „Commissioning/Test“

The difference ETS 3 to ETS 4 are hardly.

In ETS4 exist additional setting functions and it is easier to use.

The key information are the same.





Debugging Bus / Group Monitoring Key Information

Bus Monitor

Telegrams can be divided into three categories:

1. network management telegrams (broadcast communication)
2. device management telegrams (point-to-point communication)
3. “run time” telegrams (group communication)

Bus Monitor can be „linked“ with the currently active ETS project. This is realised through the ‘Group Address Name’ field in the ETS project. E.g. information like ‘light in kitchen’ can be seen besides the actual numeric value e.g. ‘1/1/20‘.

Group Monitor

This monitor is typically used to test the correct working (run- time) of an installation.

The advantage in comparison to Bus Monitor is that telegrams can be sent on the bus even during the process of capturing telegrams.

Source: help file ETS3





Debugging Bus Monitoring

BusMonitor1 (Test_Versuchstafel)

Mode: Project bus monitor Connection Current: Siemens AG (USB) AutoScroll

#	Time	BFlags	P	Src. addr	Source	Dest. addr	Destination	Route	Type	DPT	Data	IACK
3	08:07:17.375	S=0	L	1.1.9	Not Found	1/1/81	Dimmer_dim_WohnZ_1	6	Write	4 bit	\$09	LL-ACK
4	08:07:17.406	S=2	L	1.1.7	Not Found	1/1/84	Not Found	6	Write	6 Bit	\$01	LL-ACK
5	08:07:18.296	S=4	L	1.1.9	Not Found	1/1/61	TempWI_ti_WohnZ_1	6	Write	°C	22.86 °C	LL-ACK
6	08:07:18.453	S=6	L	1.1.9	Not Found	1/1/81	Dimmer_dim_WohnZ_1	6	Write	4 bit	\$00	LL-ACK

Bus Monitor ETS3 with a Projekt

- 1 step counter (number of steps since recording)
- 2 the recording time
- 3 sequence number (S = 0,2,4,6,0,2,...)
- 4 Prio (is priority of the telegramm: low, high, alarm)
- 5 the source address (physical address for device)
- 6 name for device [Displayed only with a Projekt]
- 7 destination address (group address)
- 8 name for the Group [Displayed only with a Projekt]
- 9 routing counter
- 10 telegramme type (write, read, response)
- 11 datapoint type [Displayed detailed with a Projekt]
- 12 displays the actual data of the telegrams
- 13 possible values ACK, NAK, BUSY





Debugging Group Monitoring

#	Time	Service	Flags	Prio	Source.adr	Dest.adr	Rout	Type	DPT	Info
46	2011-10-25 08:12:44.453	from bus		Low	15.15.255	0/2/9	6	Write	2 Byte	0C CC | 24.56
47	2011-10-25 08:12:46.406	to bus		Low	1.1.5	1/1/81	6	Write	3.007 dimmi \$03	| Decrease, 25 %

Group Monitor ETS4 without a Projekt

- 1 which group address? main point
- 2 define DPT
- 3 define Value
- 4 Parameters for sending / reading

More Information see help file ETS !!!





Topics

General Information

- KNX (EIB)
- SBC Products and KNX
- Debugging

Getting Started

- Components
- ETS
- PG5





Components Overview used Components and Software

SBC Components

- PCD1.M2110R1 (PCD1.Room)
- Power supply (e.g. Q.PS-AD2-2405F)



KNX Components

- KNX Power supply (e.g. 5WG1 125-1AB01)
- USB interface (e.g. 5WG1 148-1AB11)
- IP interface (e.g. Weinzierl KNX interface 730)
- KNX Room thermostat switch (e.g. Feller EDIZIOdue 900-4774.FMI.L.65)



Software

- PG5 V2.1.200.0
- ETS4 Professional

PG5





Components installation



Steps

- 230 VAC
to Power supply and KNX Power Supply
- 24 VDC
from Power supply to PCD1.Room and IP interface
- KNX network
from KNX Power supply to all KNX components
- IP network
from PCD1.Room to IP interface

Exercise

- 1.The Fupla program receives a button signal from the room unit and sends a feedback to the LED of the button.
- 2.Receive the actual temperature form the room unit.





Components concept addressing



PCD1.Room
IP address: 192.152.23.1
S-Bus Station: 1



IP Interface
IP address: 192.152.23.11
Physical address: 1.1.1



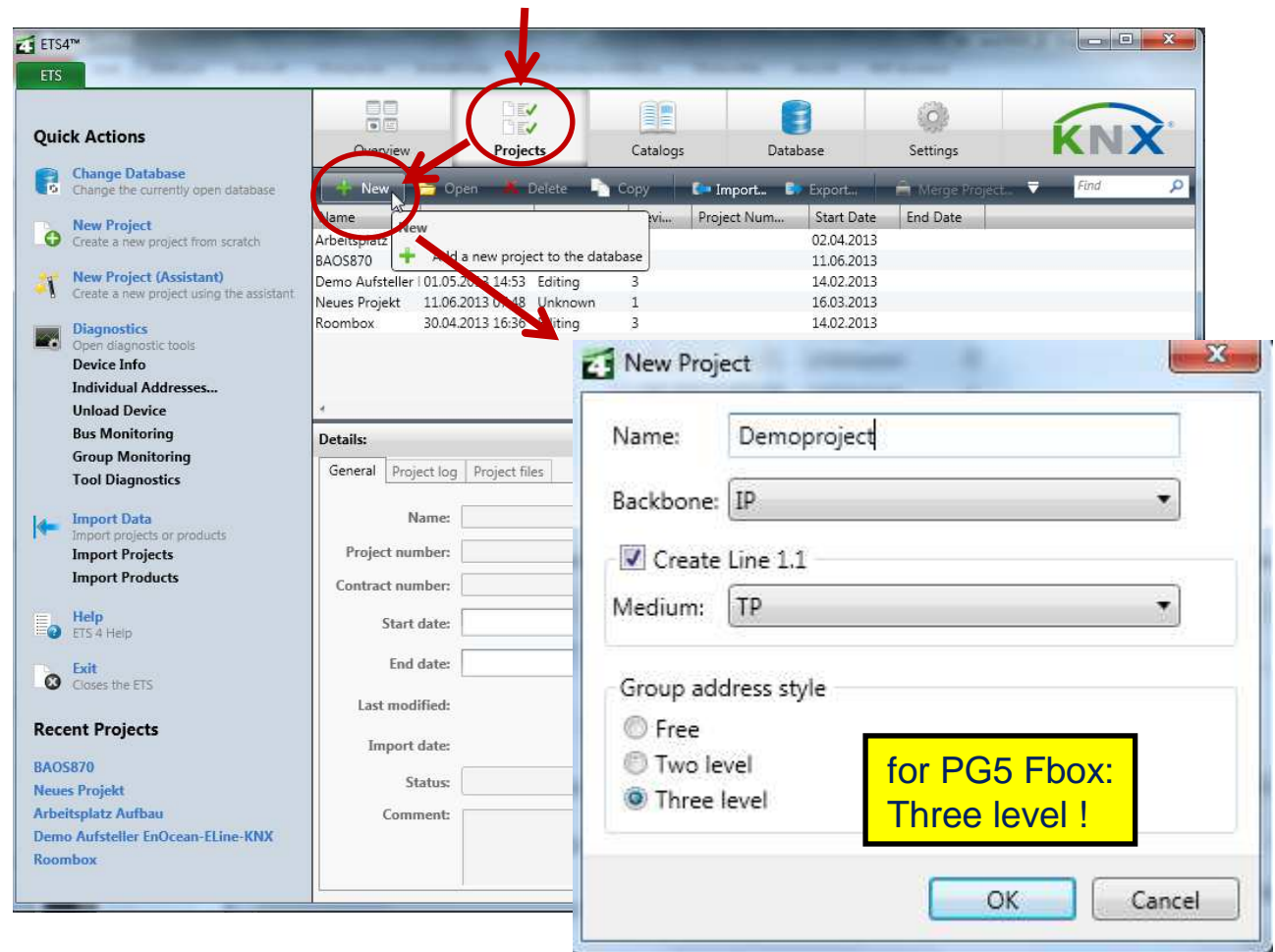
KNX Room thermostat switch (Rth switch)
Physical address: 1.1.11

Group addresses:
For switching Push-button 3: 1/1/1
signal LED, Push-button 3: 1/1/2
actual temperature: 1/2/1



ETS Start a new project

- Start ETS 4 
- make a new Project for example Name: "Demo project"



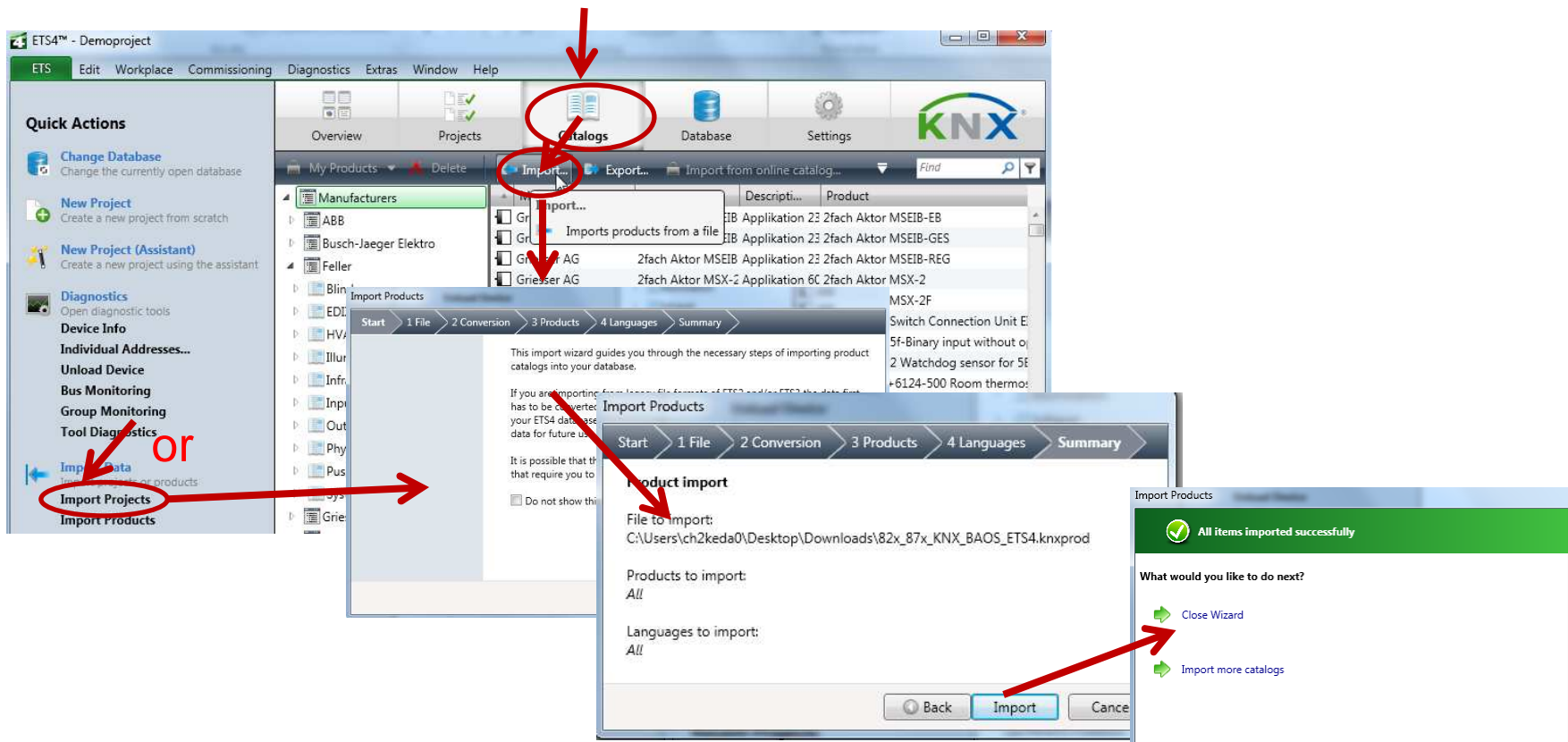
The screenshot shows the ETS4 software interface. The 'New Project' dialog box is open, and the 'Name' field contains 'Demoproject'. The 'Backbone' is set to 'IP' and the 'Medium' is set to 'TP'. The 'Group address style' section has 'Three level' selected. A yellow box highlights the 'Three level' option with the text 'for PG5 Fbox: Three level !'. Red arrows point to the 'New' button and the 'Projects' tab.

Name	Project Num...	Start Date	End Date
Arbeitsplatz		02.04.2013	
BAOS870		11.06.2013	
Demo Aufsteller	01.05.2013 14:53	Editing	3
Neues Projekt	11.06.2013 09:48	Unknown	1
Roombox	30.04.2013 16:36	Editing	3
		14.02.2013	
		16.03.2013	
		14.02.2013	



ETS import KNX device in Catalog

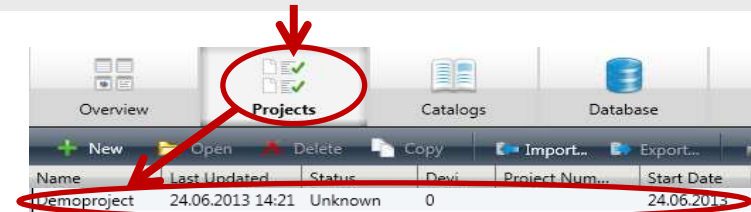
- As the required devices are not in the (ETS-) Catalog (Database), please hold the special product database from the homepages by the manufacturers.
For example IP Interface 730 from weinzierl http://www.weinzierl.de/download/products/730/730_KNX_IP_Interface_ETS4.zip
- Import this Device and all other for the project



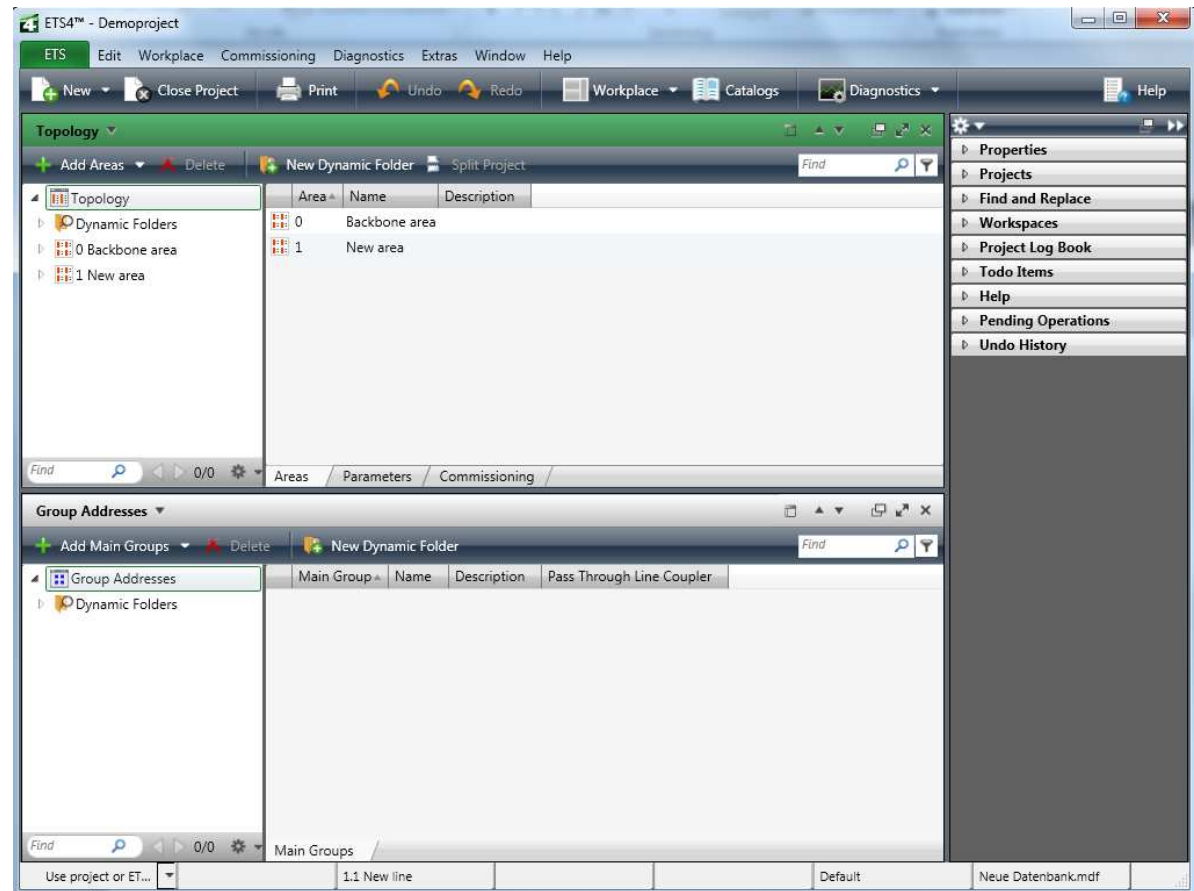


ETS project window

- Select “Demo project” and open it

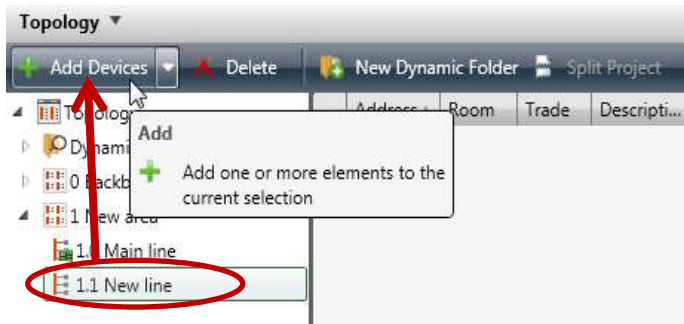


- A new window opens

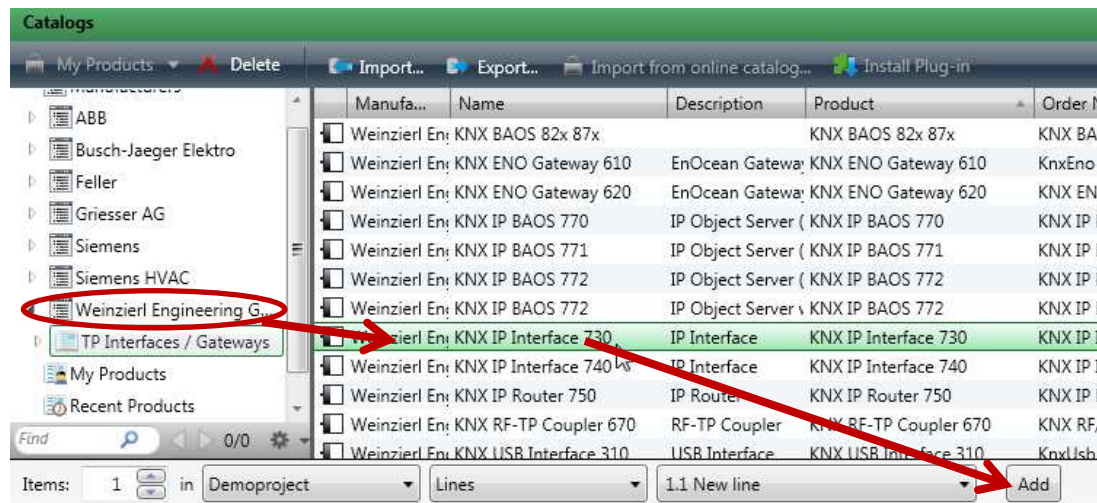


ETS add KNX Devices in the project

- Select new Line 1.1 and add a new device



- A new Window “catalogs” for selectable the Devices opens
- Add all devices to the project (for example in the picture the steps for the IP Interface)



When the Device is missing please import this. See steps before





ETS add KNX Devices and assign physical address

- 1.1.1 KNX interface 730 (IP interface)
- 1.1.11 Feller EDIZIOdue 900-4774.FMI.L.65 (KNX Room thermostat switch)

The screenshot shows the ETS software interface with a table of devices and two property windows. Red arrows indicate the workflow: from the table row 1.1.2 to the 'Individual Address' field in the first 'Properties' window, then to the 'Individual Address' field in the second 'Properties' window, and finally to the table row 1.1.11.

Ad...	...	...	Application Program	Adr Prq Par Grp Cfg	Manufactur...	Order Number	Product
1.1.1			KNX IP Interface 730	- - - - -	Weinzierl Engine	KNX IP Interface 7	KNX IP Interface 730
1.1.2			1-4fold switch / Rth V1.0	- - - - -	Feller	477x-x.FMI.L.x.x	Rth Switch EDIZIOdue

Properties Window 1 (for 1.1.2):

Name: Rth Switch EDIZIOdue 1-4fold
Individual Address: 1.1 . 2 Park

Properties Window 2 (for 1.1.11):

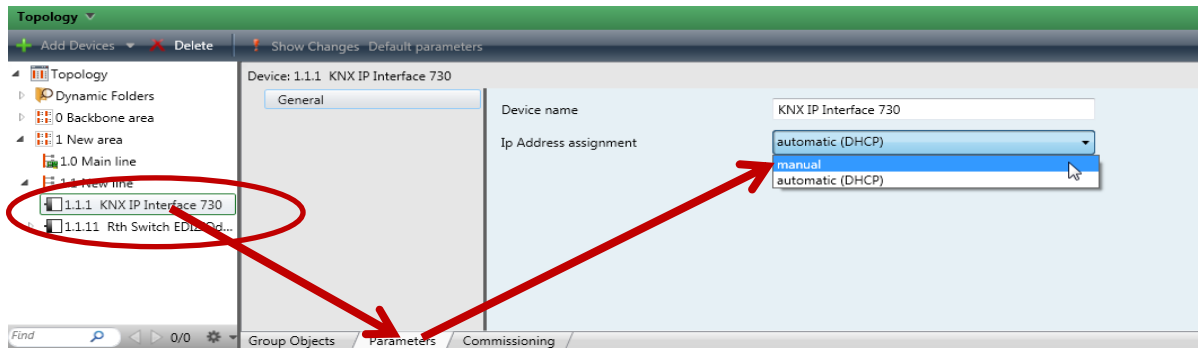
Name: Rth Switch EDIZIOdue 1-4fold
Individual Address: 1.1 . 11 Park

Ad...	...	...	Application Program	Adr Prq Par Grp Cfg
1.1.1			KNX IP Interface 730	- - - - -
1.1.11			1-4fold switch / Rth V1.0	- - - - -

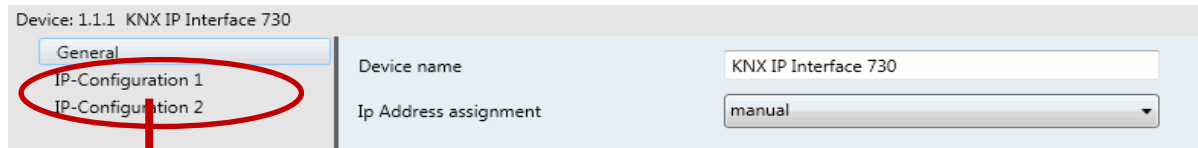


ETS configuration IP Interface 1.1.1

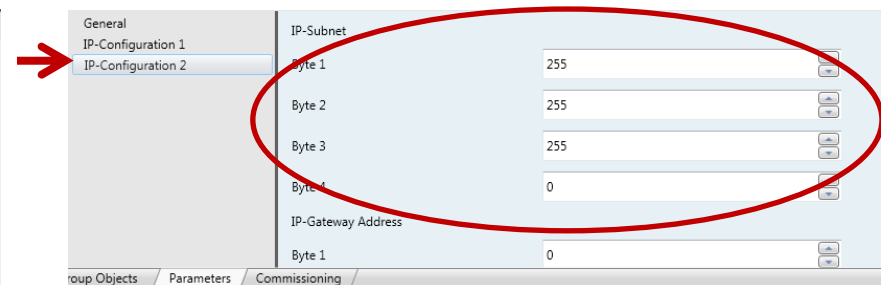
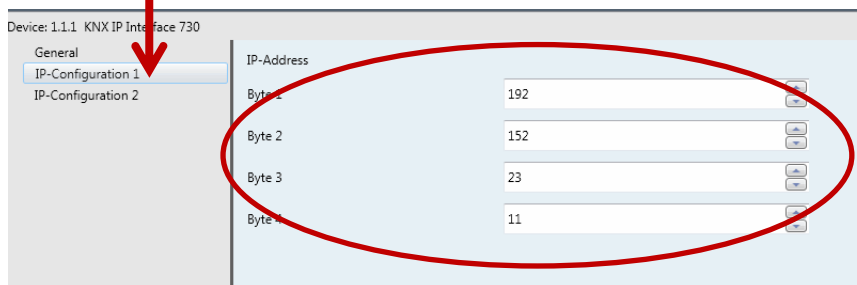
- Select KNX interface 730 (IP interface) and set the manual mode for the IP address



- Configured the IP Settings (IP address: 192.152.23.11 and IP Subnet: 255.255.255.0)

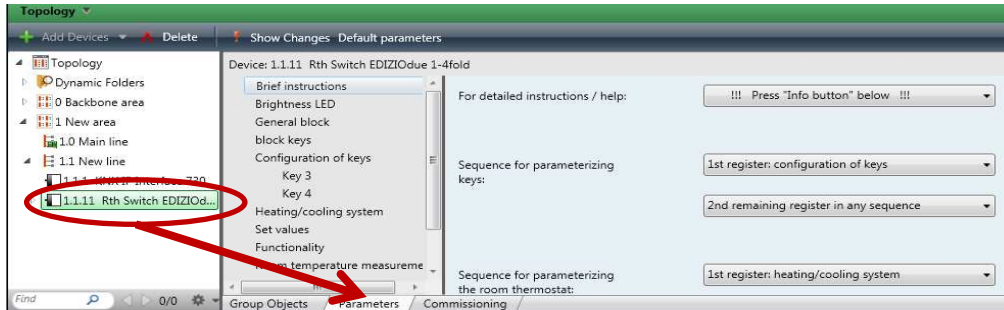


The IP Settings are as an example



ETS configuration Rth switch 1.1.11

- Select Rth switch

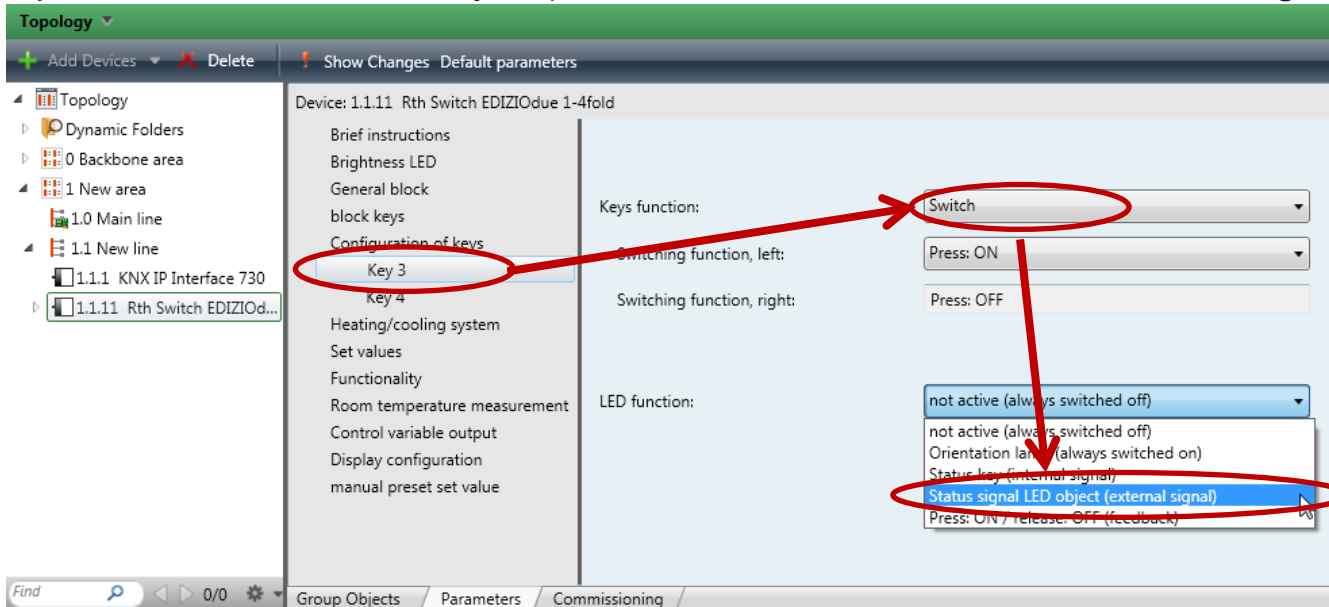


Group addresses:

- 1/1/1 for switching Push-button 3
- 1/1/2 signal LED, Push-button 3
- 1/2/1 actual temperature

In this window you can parameterize all parameters for this device

- parameterize button/key 3 (function switch, LED status external signal)



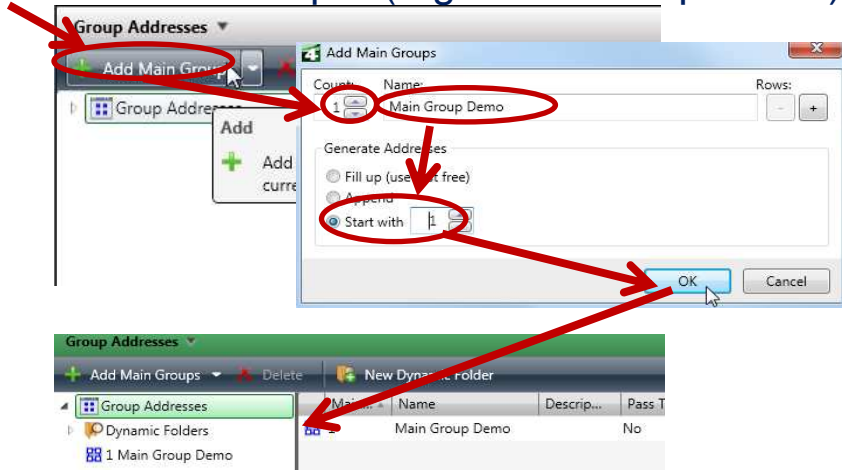
ETS

Creating the group address

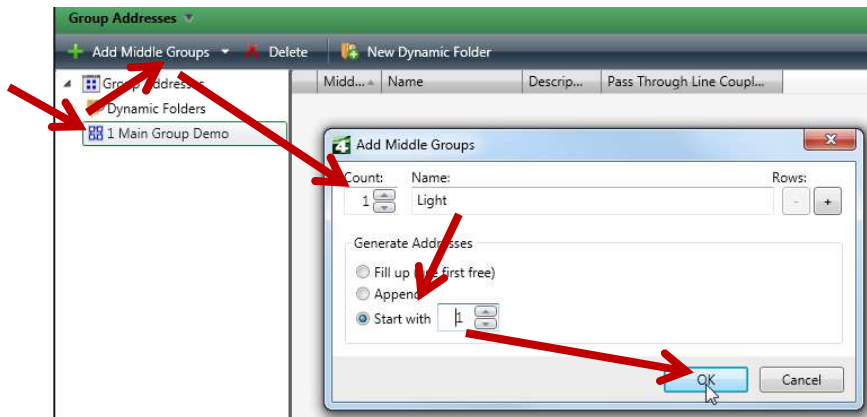
- Main Group 1 (e.g. Main Group Demo)

Group addresses:

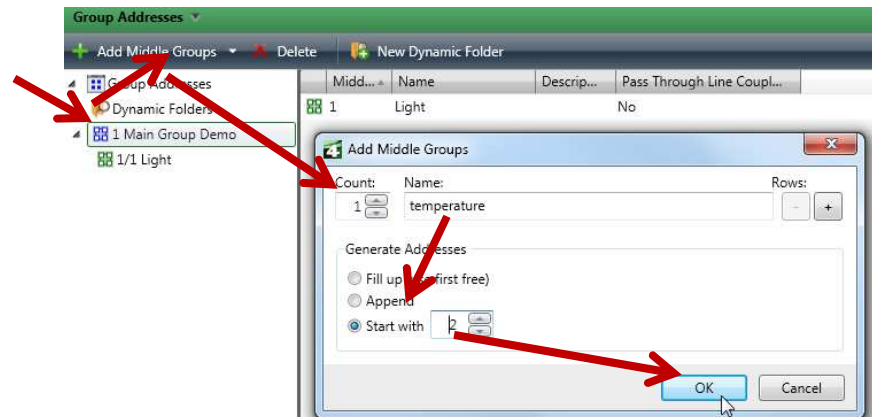
1/1/1 for switching Push-button 3
 1/1/2 signal LED, Push-button 3
 1/2/1 actual temperature



- Add Middle Group 1 (e.g. Light)



- Add Middle Group 2 (e.g. temperature)



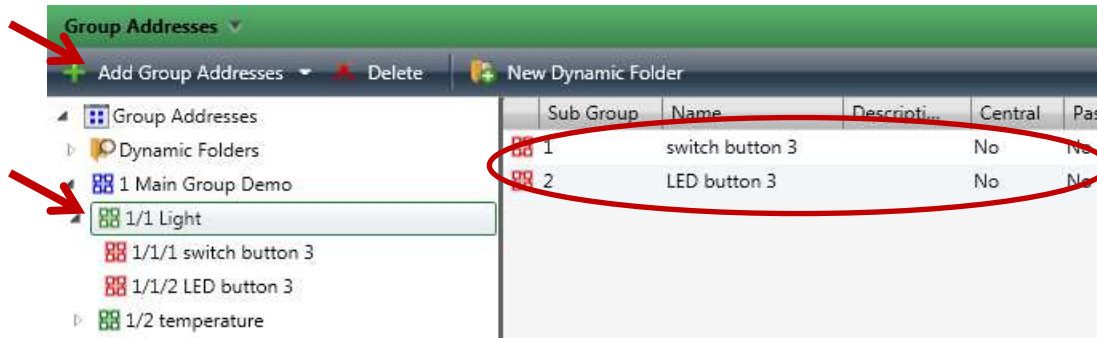
ETS

Creating the group address

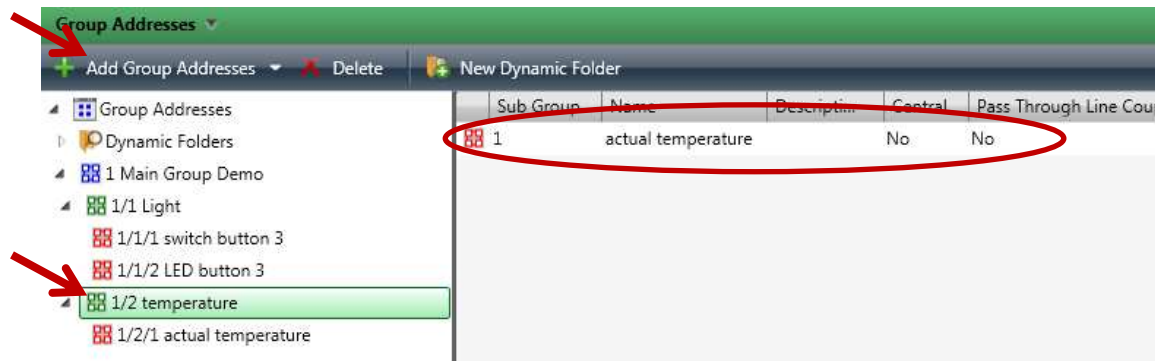
- Add in the Middle Group 1 (Light) the address 1 (e.g. switch button 3) and 2 (e.g. LED button 3)

Group addresses:

1/1/1 for switching Push-button 3
 1/1/2 signal LED, Push-button 3
 1/2/1 actual temperature



- Add in the Middle Group 2 (temperature) the address 1 (e.g. actual temperature)





ETS

associate the group address with the Rth Switch

- connect all three addresses “drag and drop” to the right functions

The screenshot shows the ETS software interface with two main panels: 'Topology' and 'Group Addresses'.

Topology Panel:

- Left sidebar: Shows a tree structure under '1.1.1.11 Rth Switch EDIZIOdue 1-4fold'. Objects listed include:
 - 12: Key 3 - ON/OFF, switch
 - 14: Key 3, signal LED - Display per LED
 - 18: Key 4 - ON/OFF, switch
 - 46: Background lighting - On/Off
 - 47: Operating mode - Comfort
- Main table:

Number	Name	Object Function	Descripti...	Group Address...	Length
12	Key 3	ON/OFF, switch		1/1/1	1 bit
14	Key 3, signal LED	Display per LED		1/1/2	1 bit
18	Key 4	ON/OFF, switch			1 bit
46	Background lighting	On/Off			1 bit
47	Operating mode	Comfort			1 bit
48	Operating mode	Night			1 bit
49	Operating mode	Frost protection, he			1 bit
50	Operating mode	Dew point			1 bit
51	Control variable	Heating			1 bit
53	Room temperature, basic set value	Preset value			2 Byte
54	Room temperature, set value	set			2 Byte
55	Room temperature, actual value	Control variable		1/2/1	2 Byte

Group Addresses Panel:

- Left sidebar: Shows a tree structure under '1/1 Light'. Objects listed include:
 - 1/1/1 switch button 3
 - 1/1/2 LED button 3
- Main table:

Sub Group	Name	Descripti...	Central	Pass Through Line Coupl...	Last Value
1	switch button 3		No	No	
2	LED button 3		No	No	

Red arrows indicate the following actions:

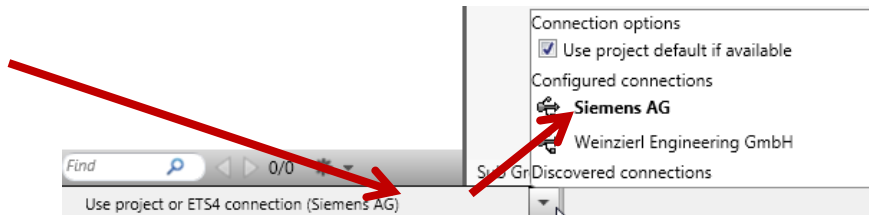
- From the 'Topology' table, the 'Group Address' '1/1/1' is circled and an arrow points to the '1/1/1 switch button 3' in the 'Group Addresses' table.
- From the 'Topology' table, the 'Group Address' '1/1/2' is circled and an arrow points to the '1/1/2 LED button 3' in the 'Group Addresses' table.
- From the 'Group Addresses' table, the 'Sub Group' '1' is circled and an arrow points to the '1/1/1 switch button 3' in the 'Topology' table.
- From the 'Group Addresses' table, the 'Sub Group' '2' is circled and an arrow points to the '1/1/2 LED button 3' in the 'Topology' table.



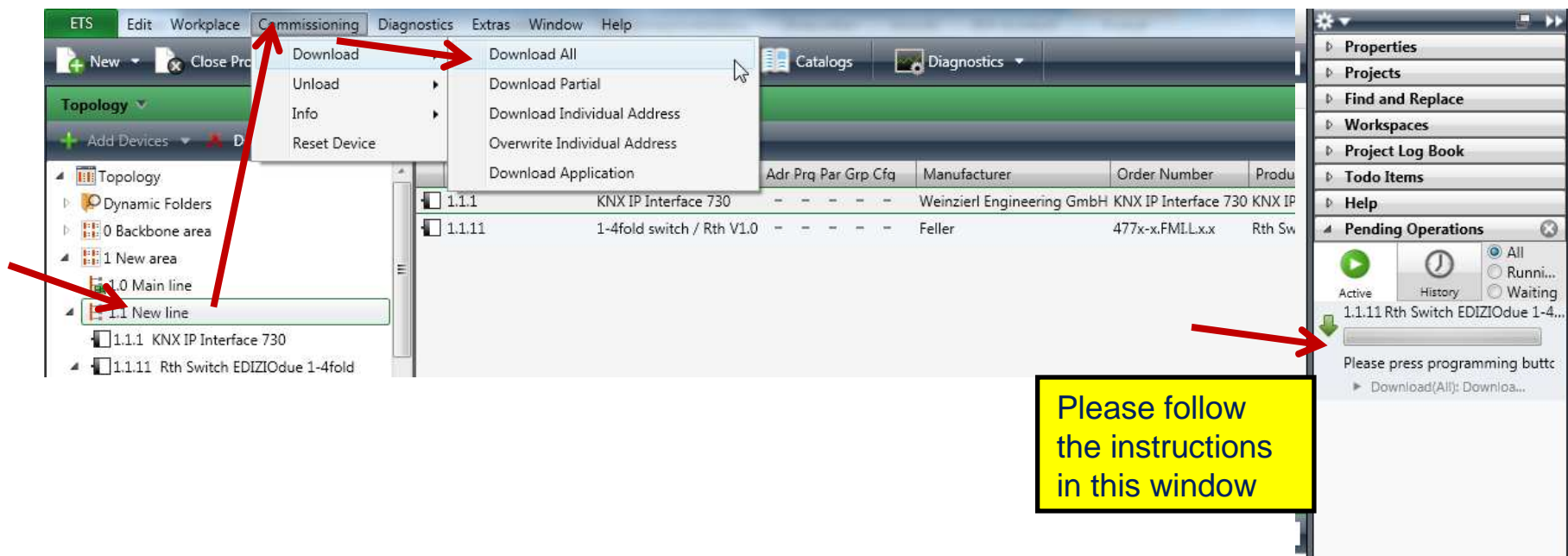


ETS commissioning and parameterization the devices

- establishing a connection between the PC and e.g. USB interface (see Configured connections) and select the right connection (bottom right)



- commissioning all devices



ETS commissioning and parameterization the devices

- Now you are ready with ETS

The screenshot shows the ETS4 software interface with the 'Commissioning' tab selected. A table lists devices with their status icons. A yellow callout box with the text 'check the status, if all is ok' has red arrows pointing to the status icons of two devices: '1.1.11 KNX IP Interface 730' and '1.1.11 Rth Switch EDIZIOdue 1-4fold'. The 'Pending Operations' panel on the right shows 'Download(A/I): Finished' for both devices.

Addr...	Application Program	Adr Prq Par Grp Cfg	Manufacturer	Order Number	Product
1.1.1	KNX IP Interface 730	✓ ✓ ✓ ✓ ✓	Weinzler Engineering GmbH	KNX IP Interface 730	KNX IP Interface 730
1.1.11	1-4fold switch / Rth V1.0	✓ ✓ ✓ ✓ ✓	Feller	477x-x.FMLL.x	Rth Switch EDIZIOdue 1-4fold

- For more control you can start e.g. the Bus monitor

The screenshot shows the ETS4 software interface with the 'Diagnostics' menu open and 'Bus Monitoring' selected. A yellow callout box with the text 'e.g. switch with the button and you can see the telegram' has a red arrow pointing to a telegram entry in the Bus Monitor window. The telegram entry is highlighted in green and shows a 'Write' command to 'switch button 3'.

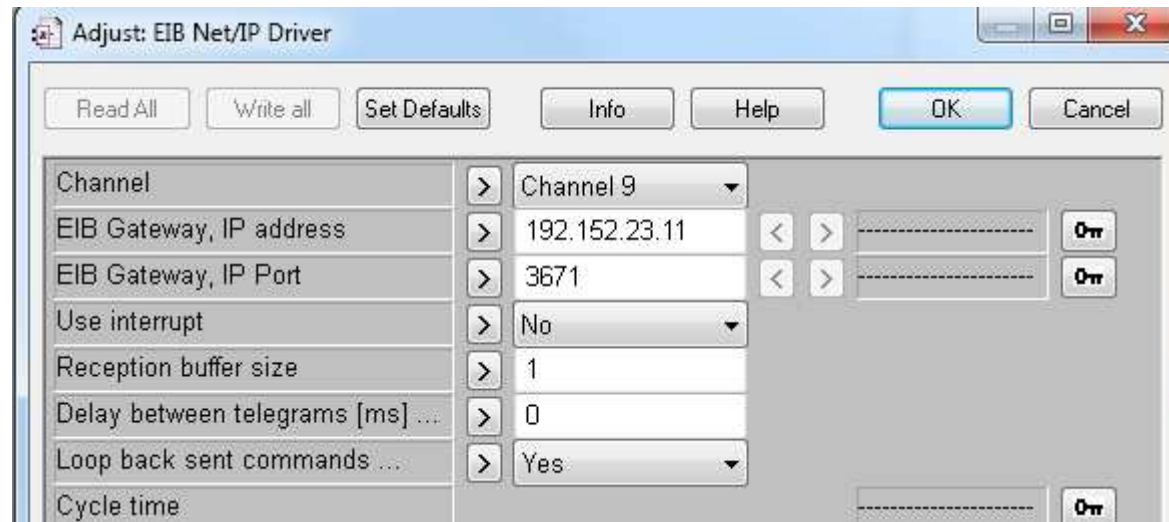
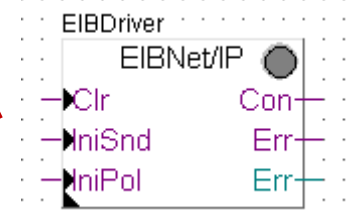
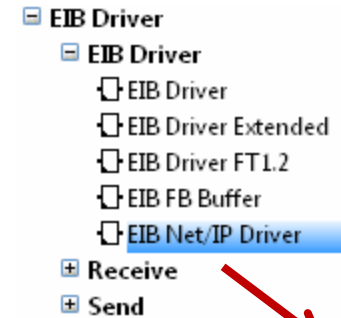
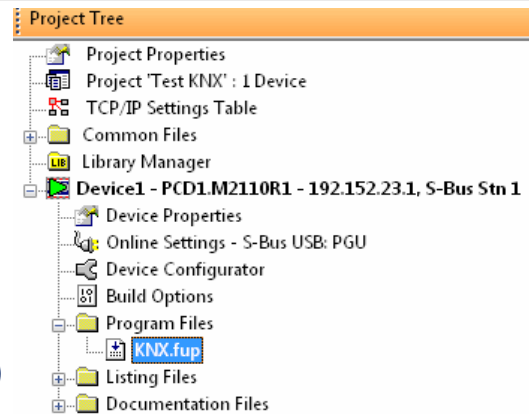
Bus Monitor

#	Time	Service	Flags	Prio	Source.addr	Source	Dest.addr	Dest	rout
1	2013-06-28 10:00:51.628	Stop							
2	2013-06-28 10:03:08.004	Start							
3	2013-06-28 10:03:14.763	from bus	S=0	low	1.1.11	1.1.11 Rth Switch EDIZIOdue 1-4fold 1/1/1	switch button 3	6	Write



PG5 Start

- Start PG5 2.1
- new Project (e.g. Tests KNX)
- Configuration the device
 - PCD1.Room
 - S-Bus Station: 1
 - IP Settings (e.g. 192.152.23.1)
- new FUPLA File (e.g. KNX)
- Place the EIB Net/IP Driver and make the following settings

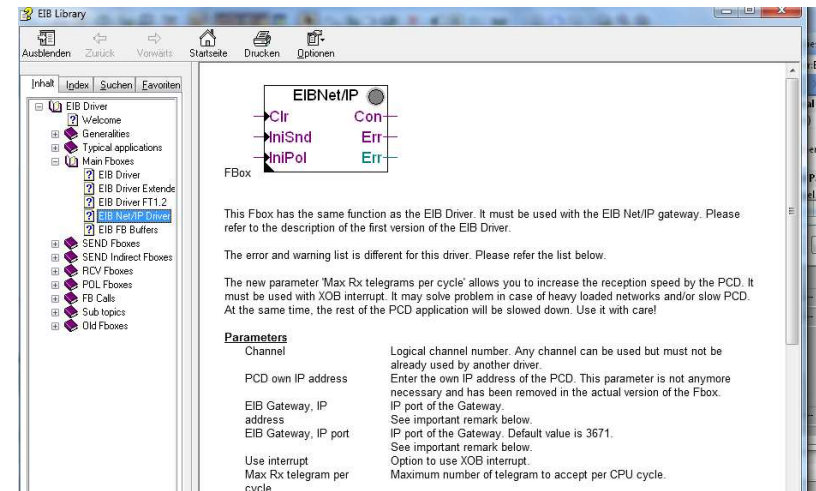
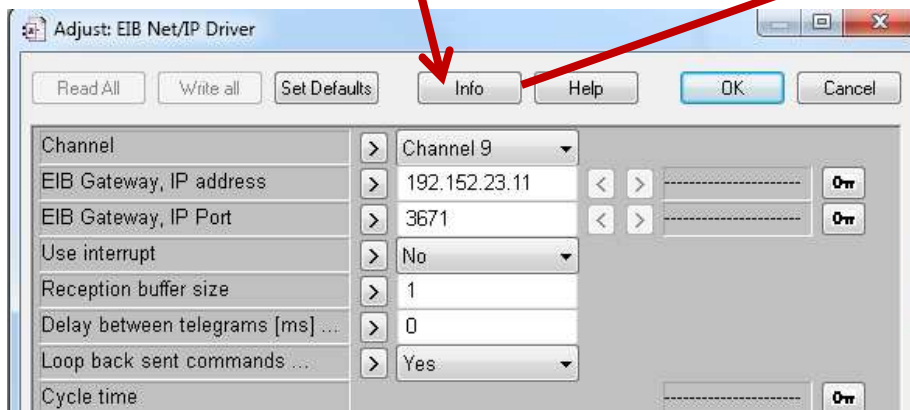




PG5 EIB Driver settings and Communication

EIB Net/IP Driver

“Info” you can find detail Information



The parameters “Use interrupt = Yes” in combination with “Reception buffer size” allows you to increase the reception speed by the PCD. It must be used with XOB interrupt. It may solve problem in case of heavy loaded networks and/or slow PCD. At the same time, the rest of the PCD application will be slowed down. Use it with care!

Reception buffer size: Maximum number of telegram to accept per CPU cycle.

Delay between telegrams: Minimum delay between sent telegrams in milisec.

Loop back sent commands: Sent commands are looped back to Rcv FBoxes

The EIB network uses a rather low transmission speed (9'600 bauds) and is based on event-triggered transmission. Therefore, permanent polling should **NOT** be performed

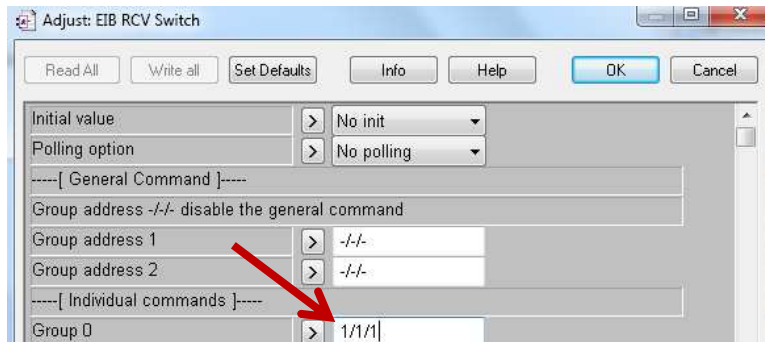


PG5 Functions

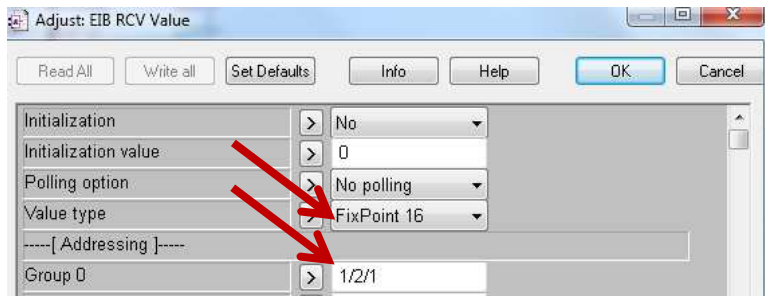
- Place the following FBoxes
 - EIB RCV Switch (Parameter intern Group 0 : “1/1/1”)

Group addresses:

1/1/1 for switching Push-button 3
 1/1/2 signal LED, Push-button 3
 1/2/1 actual temperature



- EIB Send Switch (Parameter intern Group 0: “1/1/2”, Send option “on-off”)
- EIB RCV Value (Parameter intern Group 0: “1/2/1”, Value type “FixPiont 16”)



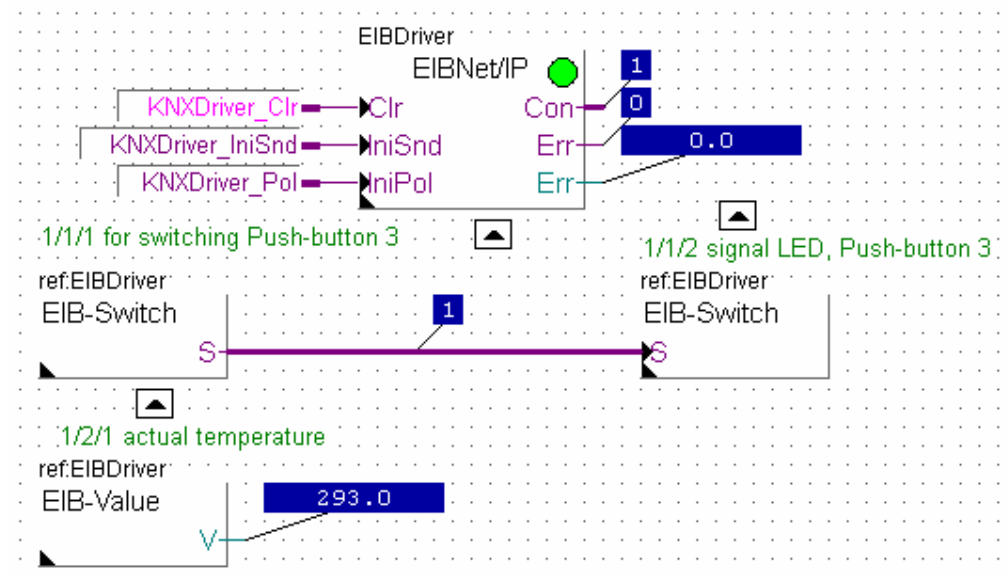
- Save, build and download the program



PG5 Function test

test the application /program

- Go online in Fupla
- Open the ETS Bus monitor



Exercise:

- 1.The Fupla program receives a button signal from the room unit and sends a feedback to the LED of the button.
- 2.Receive the actual temperature form the room unit.

Group addresses:

- 1/1/1 for switching Push-button 3
- 1/1/2 signal LED, Push-button 3
- 1/2/1 actual temperature

Bus Monitor												
#	Time	Service	Flags	Pr...	Source.addr	Source	Dest.addr	Dest	Rout	Type	DPT	Info
1	2013-07-08 16:15:02.819	Stop										Recording was stop
2	2013-07-08 16:15:08.157	Start										Recording was star
3	2013-07-08 16:15:21.002	from bus	S=0	Low	1.1.11	-	1/1/1	-	6	Write		\$01 On
4	2013-07-08 16:16:30.483	from bus	S=2	Low	1.1.11	-	1/2/1	-	6	Write		0D B9 29,3





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Control Systems and Components

Many thanks for your attention !