

Platform MX6

Software option S116

CODESYS KNX-IP

1 Identification

Identification	
Option ID	S116
Order number	S-05000316-0000
Short name	CODESYS KNX-IP
Brief description	With software option/license it is possible to operate the controller in a KNXnet/IP network
Revision ID document	V1.0

2 System requirements and restrictions

System requirements and restrictions	
Supported platforms and devices	Berghof PLC devices of the MX6 platform (e.g.: MCs, CCs, DCs). Further information regarding availability and compatibility can be found in the section - compatibility tables - of the price list.
Firmware	MX6-PLC from Version 1.22.4, CODESYS from 3.5 SP14 Patch 4
Additional requirements	<ul style="list-style-type: none">— CODESYS IDE >= 3.5.14.40— ETS5 and Berghof DCA for ETS5
Restrictions	---

3 Product description

With this interface/option it is possible for the controller to access all KNX EA's as a KNX participant.

The KNX-IP interface is based on a standard Ethernet interface and the software KNX Stack from 3S.

The KNX-IP interface is fully integrated into the CODESYS development environment. The installation of an additional hardware is therefore not necessary.

To use the function, the integrated data channels of the CODESYS controller are exported in an XML format, imported in the ETS5, integrated from there into an overall configuration and the required data ("associations") are transferred to the CODESYS runtime system. The input and output data thus integrated can be provided with an intelligent logic function in CODESYS. At the same time, users can transfer the data to other bus protocols, such as BACnet or OPC UA. With the Industry 4.0 features of the tool, building automation can thus be networked with SmartFactory or SmartEnergy systems.

CODESYS KNX consists of a configurator for I/O channels, a KNXnet/IP protocol stack in the form of a runtime system component, and a data exchange function with the ETS5 configuration system. This allows any CODESYS-compatible device to be extended so that it functions as a KNX device and can communicate with KNX E/As.

- **Maximale Anzahl Kommunikationsobjekte: 2.000**
- **Unterstützte Datenpunkttypen**

KNX Function	Length	DPT	Value
Switch	1 Bit	DPT 1	0,1
Dimming (Position, Control, Value)	1 Bit, 4 Bit, 8 Bit	DPT 3	[0,0]...[1,7]
Time	3 Byte	DPT 10	
Date	3 Byte	DPT 11	
Floating point	2 Byte	DPT 9	-671088,64 - 670760,96
IEEE Floating Point	4 Byte	DPT 14	4-Octet Float Value IEEE 754
8-bit unsigned value	1 Byte	DPT 5	0...255
8-bit signed value	1 Byte	DPT 6	-128...127
16-bit unsigned value	2 Byte	DPT 7	0...65535
16-bit signed value	2 Byte	DPT 8	-32768...32767
32-bit unsigned value	4 Byte	DPT 12	0...4294967295
32-bit signed value	4 Byte	DPT 13	-2147483648...2147483647
ASCII character	1 Byte	DPT 4	
14 character ASCII	14 Byte	DPT 16	
Scene	1 Byte	DPT 17	0...63
Scene Control	1 Byte	DPT 18	
Date Time	8 Byte	DPT 19	Date & Time
HVAC/Generic 8 Bit	1 Byte	DPT 20	0...255
Color	3 Byte	DPT 232	RGB [0,0,0]...[255,255,255]

4 Technical data

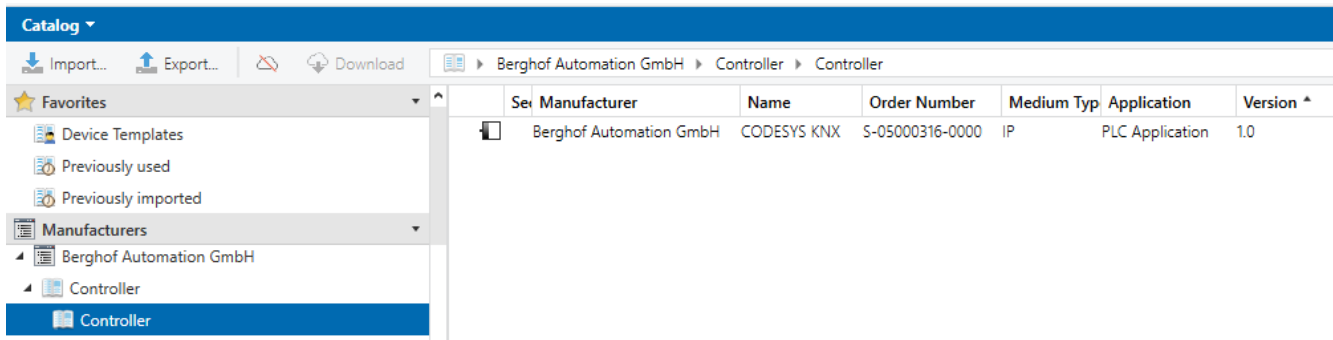
Technical data	

5 Quick Start Guide

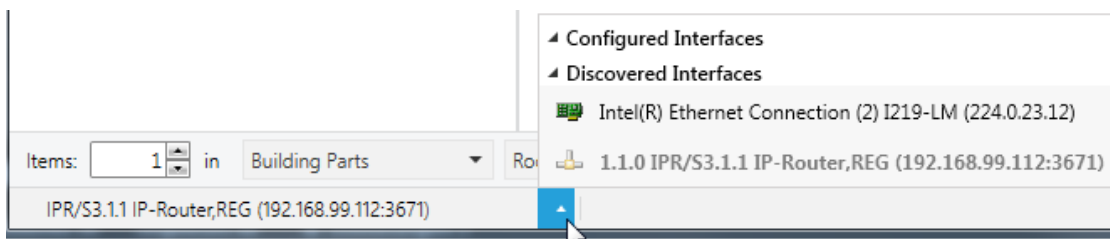
The ETS is available in Version 5.6.5 Build 1109.

Installation of the product file *Berghof_ETS5_KNX_CDS_Gateway.knxprod* for the CODESYS controller

The file will be part of your order.



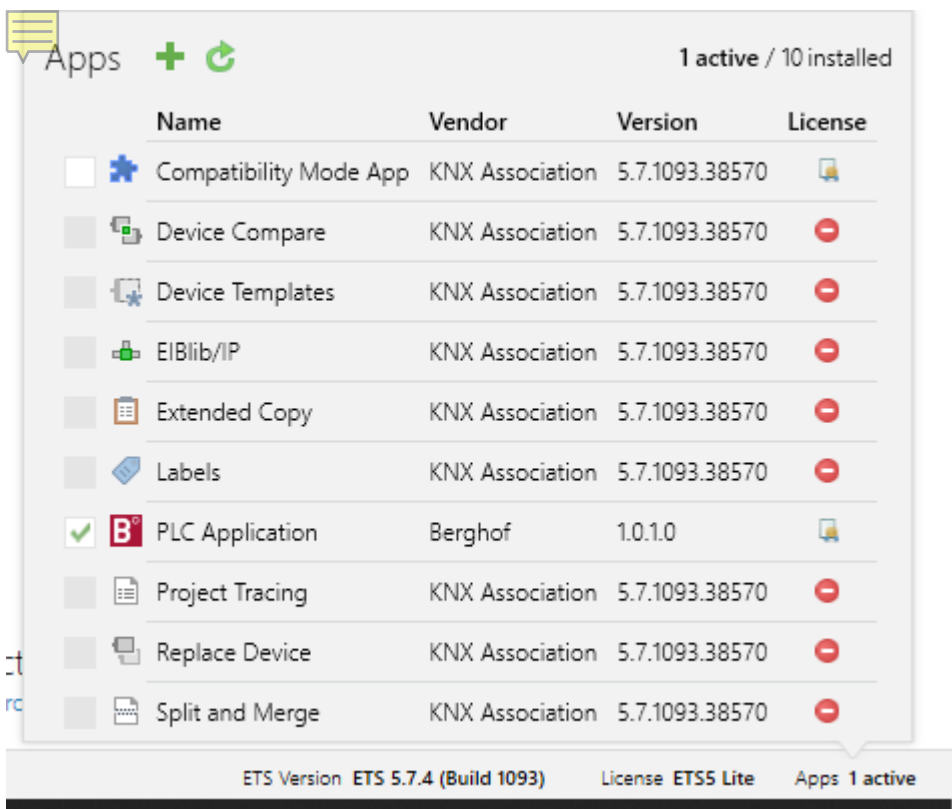
IP interface specified as communication interface



Installation and activation of the "PLCApplication" DCA plug-in.

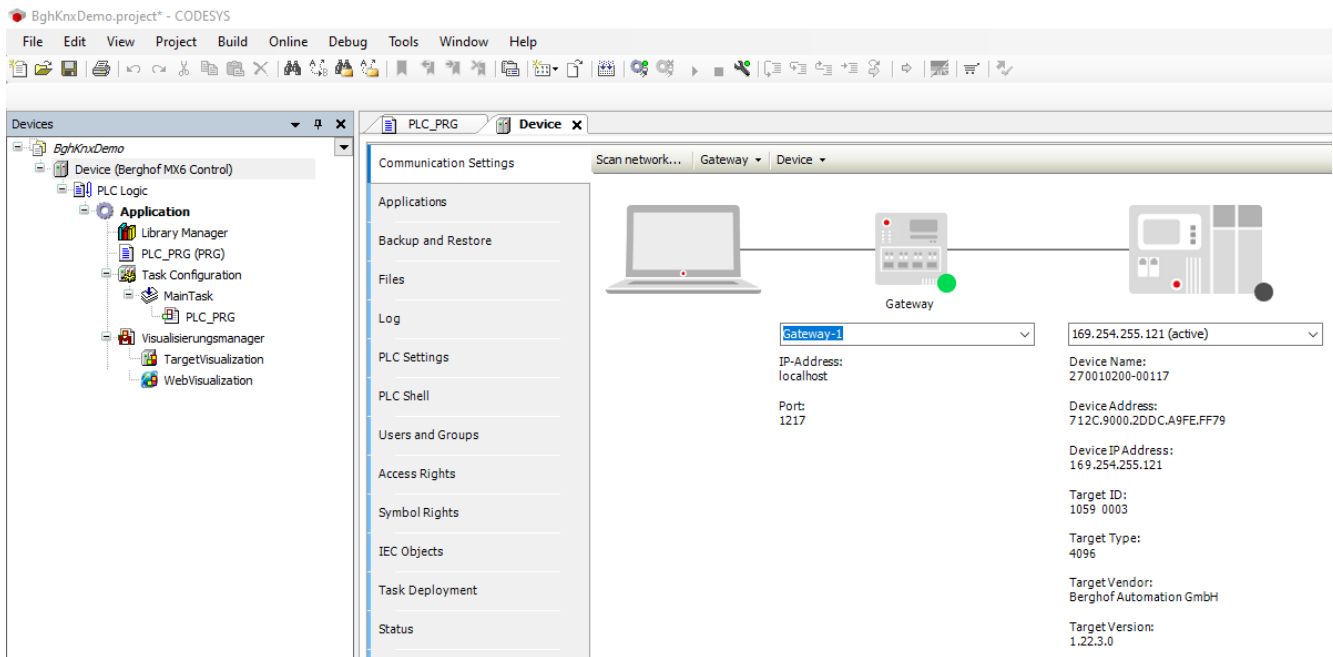
The file will be part of your order.

Installation and activation of the "Compatibility Mode App"

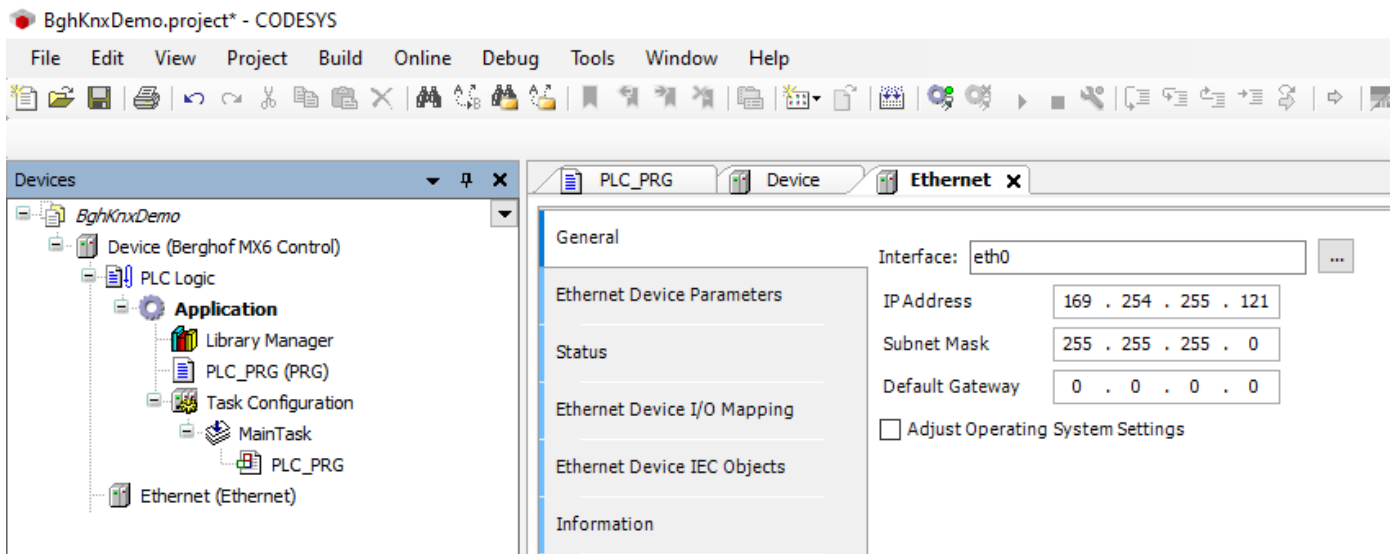


Preparation in the CODESYS project

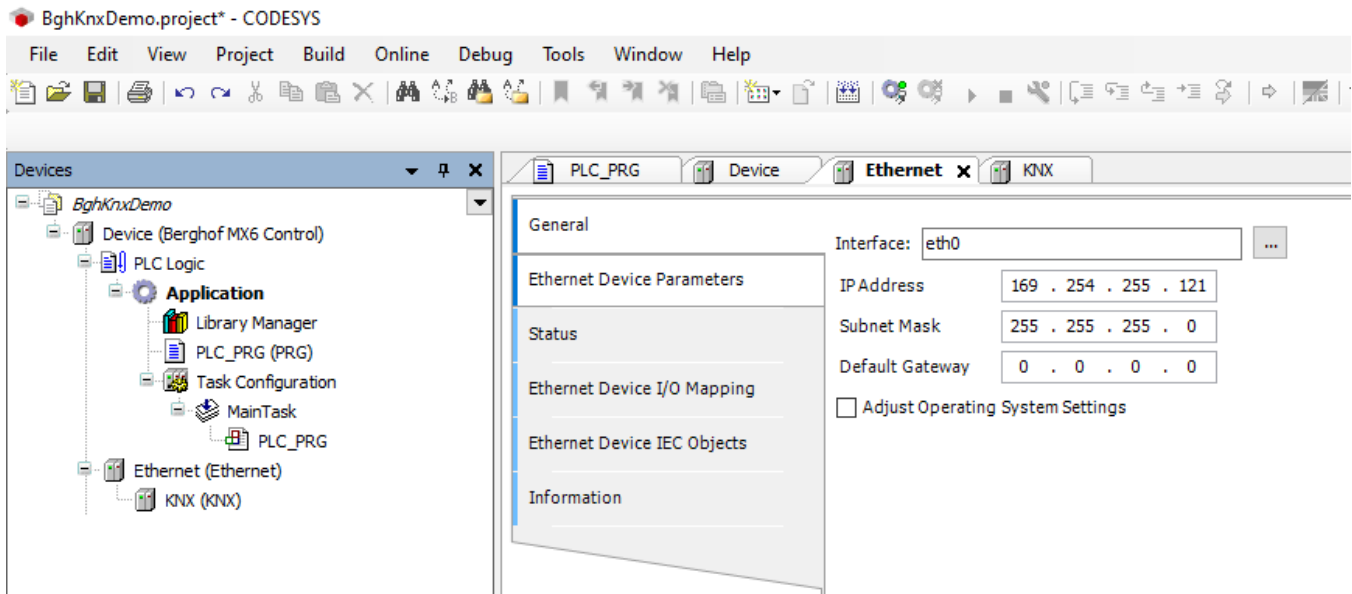
Create a "Standard project" and select *Berghof MX6 Control* as the device.
 Define the target system by means of the *Network Scan*.



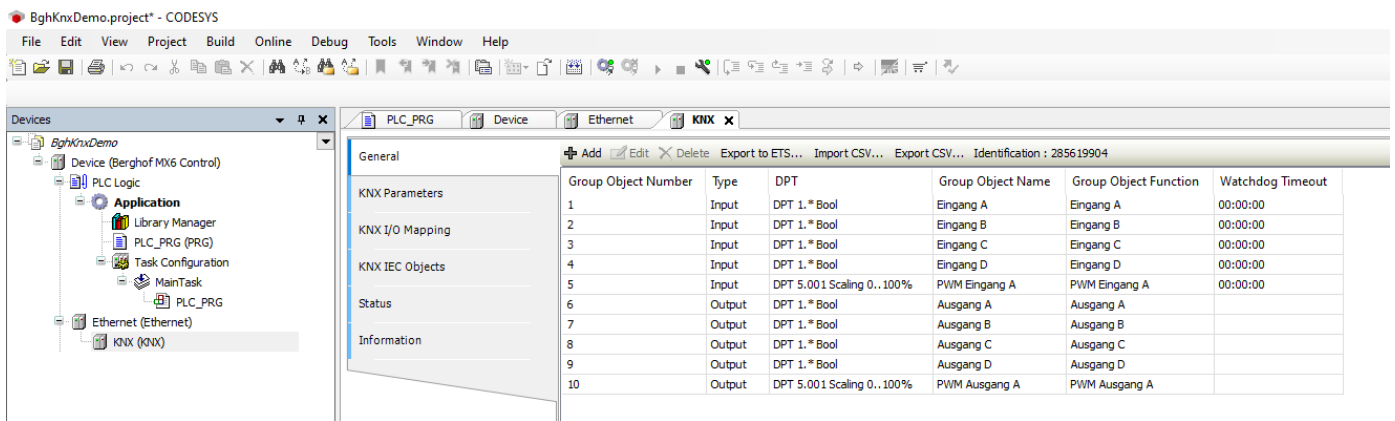
Insert an *Ethernet* adapter into the device tree and specify the interface to be used.
 If a target system has not been defined yet, then the error message "Gateway not configured" is displayed.



Insert a *KNX* below the *Ethernet* adapter in the device tree.

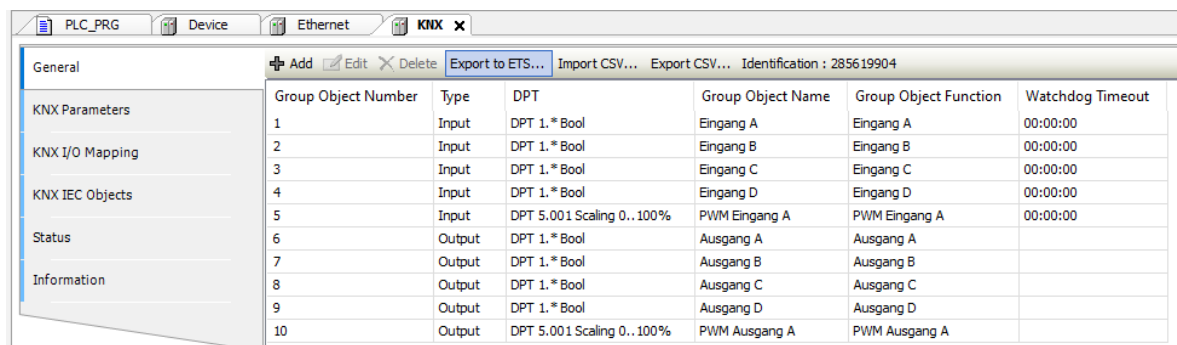


On the General tab, you can define any number of in- and outputs.



The KNX connection is limited to a total of 1000 inputs and outputs.

You export this configuration to an XML format that can be read by the ETS.



In the I/O mapping, data areas are created automatically for each channel.

In addition, two data points have been created, allowing the physical address to be assigned from the ETS software for programming.

Variable	Mapping	Channel	Address	Type	Default...	Unit	Descrip...
ProgramLED		Program LED Status	%IX0.0	BOOL			Progra...
ProgramButton		Program Button	%QX0.0	BOOL			Progra...
		1 - Eingang A - Eingang A	%IB1			DPT 1. *	
		Control of 1 - Eingang A - Eingang A	%QB1	BYTE			
		2 - Eingang B - Eingang B	%IB3			DPT 1. *	
		Control of 2 - Eingang B - Eingang B	%QB2	BYTE			
		3 - Eingang C - Eingang C	%IB5			DPT 1. *	
		Control of 3 - Eingang C - Eingang C	%QB3	BYTE			
		4 - Eingang D - Eingang D	%IB7			DPT 1. *	
		Control of 4 - Eingang D - Eingang D	%QB4	BYTE			

Integrating the CODESYS device in the ETS

The controller can be added to the ETS project by means of the catalog.

Assign a physical address to the device:

Address	Room	Description	Application Program	Adr Prg Par Grp Cfg	Manufacturer	Order Num	Product
1.0.1	Room01.06		PLC Application	- - - - -	3S-Smart Software Sol...	23030000...	CODESYS KNX
1.1.0	Room01.06		IP Router/2.0	✓ - - - ✓	ABB	2CDG 110 1...	IPR/S3.1.1 IP Router,MDRC
1.1.6	Room01.06		Power Supply, Diagnosis, 640mA/1.1	✓ - - - ✓	ABB	2CDG 110 1...	SV/S30.640.5.1 Power Supply,Diag
1.1.7	Room01.06		Switch 4f 6M/3.2b	✓ ✓ ✓ ✓ ✓	ABB	2CDG 110 1...	SA/S4.6.2.1 Switch Actuator,4f6A,
1.1.8	Room01.06		Switching, dim., venet. blind, value, scene 10F...	✓ ✓ ✓ ✓ ✓	GIRA Giersiepen	5161 30	2-g water-prot surf-mnt push-but

Properties

CODESYS KNX

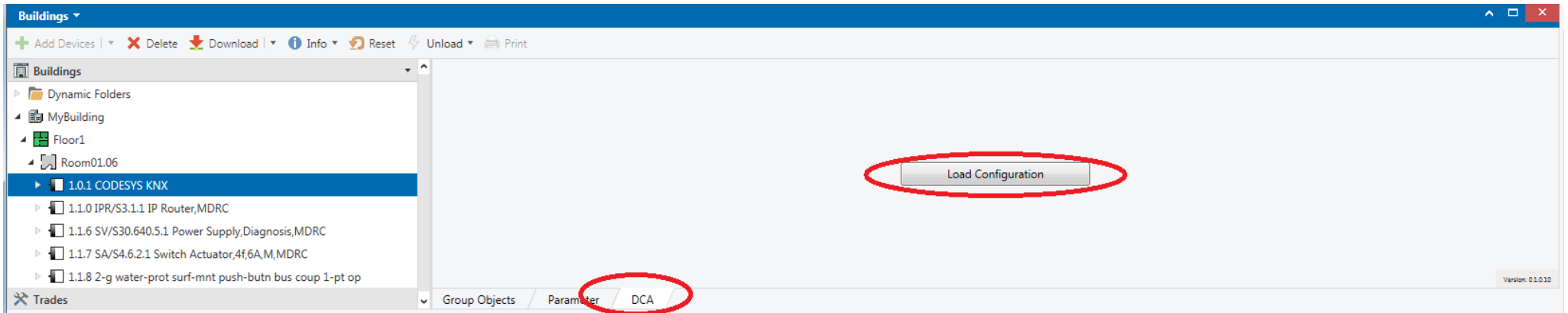
Name

Individual Address

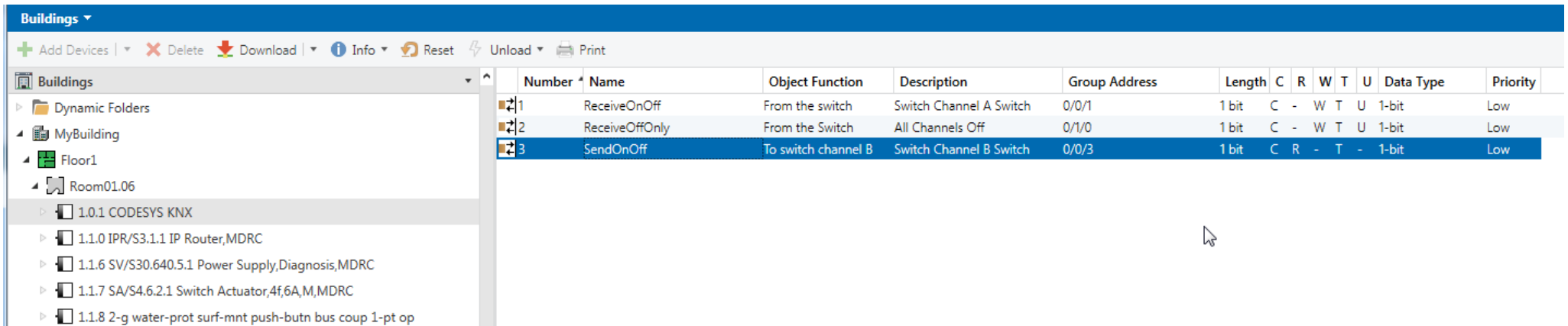
1.0 . 1

Description

On the *DCA* tab, the configuration previously exported in CODESYS can be read into the ETS.



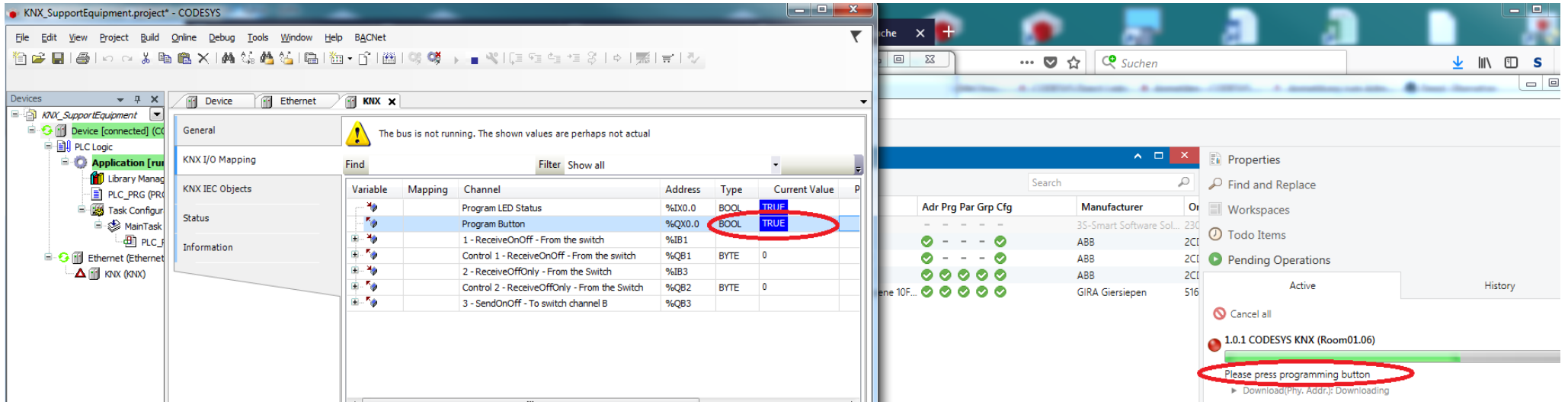
After the import, the inputs and outputs created in CODESYS can be connected with group addresses.



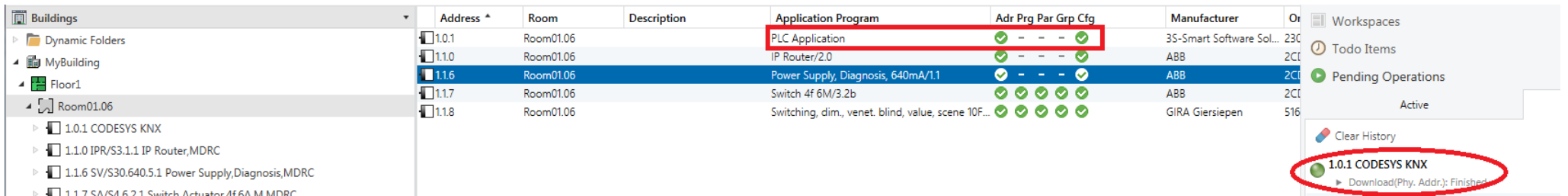
Transferring the ETS configuration to the controller

As with any other device, the physical address must also be assigned to the CODESYS controller.

Therefore the data point must be set after the request in the ETS:



If this is done promptly, then the assignment of the physical address is documented in the ETS.



Because the controller does not have a valid program yet, it must still be downloaded from the ETS.

1.0.1	Room01.06	PLC Application	✓ ✓ ✓ ✓ ✓	3S-Smart Software Sol...	2
1.1.0	Room01.06	IP Router/2.0	✓ - - - ✓	ABB	2
1.1.6	Room01.06	Power Supply, Diagnosis, 640mA/1.1	✓ - - - ✓	ABB	2
1.1.7	Room01.06	Switch 4f 6M/3.2b	✓ ✓ ✓ ✓ ✓	ABB	2
1.1.8	Room01.06	Switching, dim., venet. blind, value, scene 10F...	✓ ✓ ✓ ✓ ✓	GIRA Giersiepen	5

The screenshot displays the CODESYS interface for configuring a KNX system. On the left, the project tree shows the 'KNX (KNX)' option selected and circled in red. The main window shows the 'KNX I/O Mapping' table with the following data:

Variable	Mapping	Channel	Address	Type	Current Value	Prepared Value	Unit	Description
Program LED Status			%IX0.0	BOOL	FALSE			Program LED Status
Program Button			%QX0.0	BOOL	FALSE			Program Button
1 - ReceiveOnOff - From the switch			%IB1	BOOL			DPT 1.*	
Statusbyte			%IB1	BYTE	56			Status will be cleared in the next cycle
UpdateFlag			%IX1.3	BOOL	TRUE			
ValueChanged			%IX1.4	BOOL	TRUE			
ValueValid			%IX1.5	BOOL	TRUE			
Value			%IX2.0	BOOL	TRUE			
Control 1 - ReceiveOnOff - From the switch			%QB1	BYTE				
2 - ReceiveOffOnly - From the Switch			%IB3	BOOL			DPT 1.*	
Control 2 - ReceiveOffOnly - From the Switch			%QB2	BYTE	0			
3 - SendOnOff - To switch channel B			%QB3	BYTE			DPT 1.*	

At the bottom right of the interface, the 'Always update variables' dropdown menu is set to 'Enabled 2 (always in bus cycle task)', which is circled in red.

Likewise, the actuator (channel B) can be switched by means of I/O mapping.

Variable	Mapping	Channel	Address	Type	Current Value	Prepared Value	Unit	Description
Program LED Status			%IX0.0	BOOL	FALSE			Program LED Status
Program Button			%QX0.0	BOOL	FALSE			Program Button
1 - ReceiveOnOff - From the switch			%IB1				DPT 1.*	
Control 1 - ReceiveOnOff - From the switch			%QB1	BYTE	0			
2 - ReceiveOffOnly - From the Switch			%IB3				DPT 1.*	
Control 2 - ReceiveOffOnly - From the Switch			%QB2	BYTE	0			
3 - SendOnOff - To switch channel B			%QB3				DPT 1.*	
Trigger/Disable Cyclic, send on change			%QB3	BYTE	0			false -> true send once/true disable object
Value			%QX4.0	BOOL	TRUE			

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