



Checkbox CHB-C-N Telnet communication

This Application Note give an example for the Checkprogram selection by telnet communication.

Further on it shows how to influence different system parameter setting by telnet access.

CHB-C-N

Pn: 3501040

TitleCheckbox Telnet Communication
Version 1.00
Document no. 1
Originalen
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Last saved 28.02.2018

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1 Components/Software used

Type/Name	Version Software/Firmware	Date of manufacture
Checkbox CHB-C-N pn 3501040	3.6.1.0	H202
CDPX-X-A-S-10 pn 574412		C7
CDPX-EA-V1 pn 575300		E4
CheckKon	4.3 rel. 06	
Codesys	V3.5 SP 7 Patch 2	
Designer Studio	2.6 Build 309	

Table 1.1: 1 Components/Software used

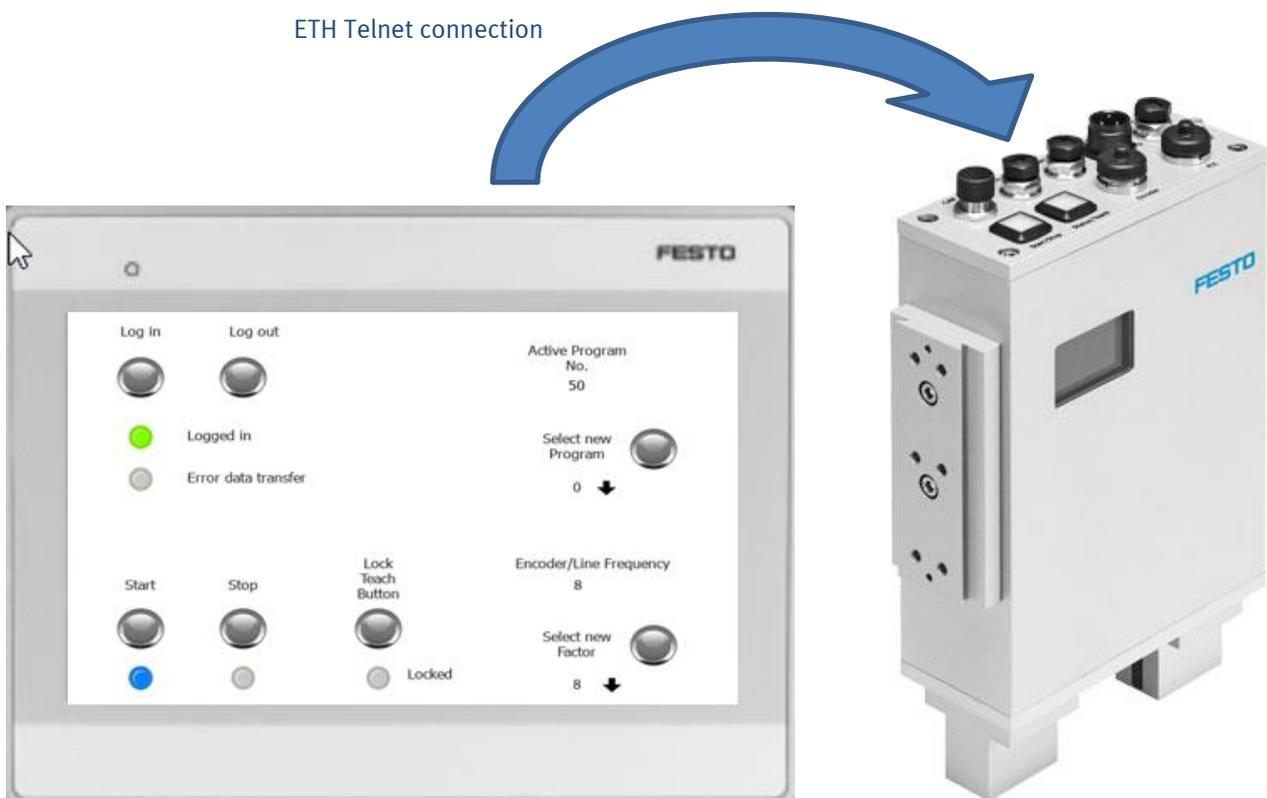
2 Introduction

2.1 Description of the example

The example allow to change the checkprogram by manual edit of a programno. on the CDPX panel. The program change is executed by the integrated PLC of the panel.

The Checkbox must be in STOP-mode when the communication is active. Therefore the Checkbox could be switched to RUN and STOP mode by telnet command.

A second part show how to change parameter setting of the Checkbox. So global parameters could be individually influenced by external access from PLC. These are new functions provided by the CHB-C-N. In the example we can lock the TEACH function and set-up another Encoder/line frequency factor.



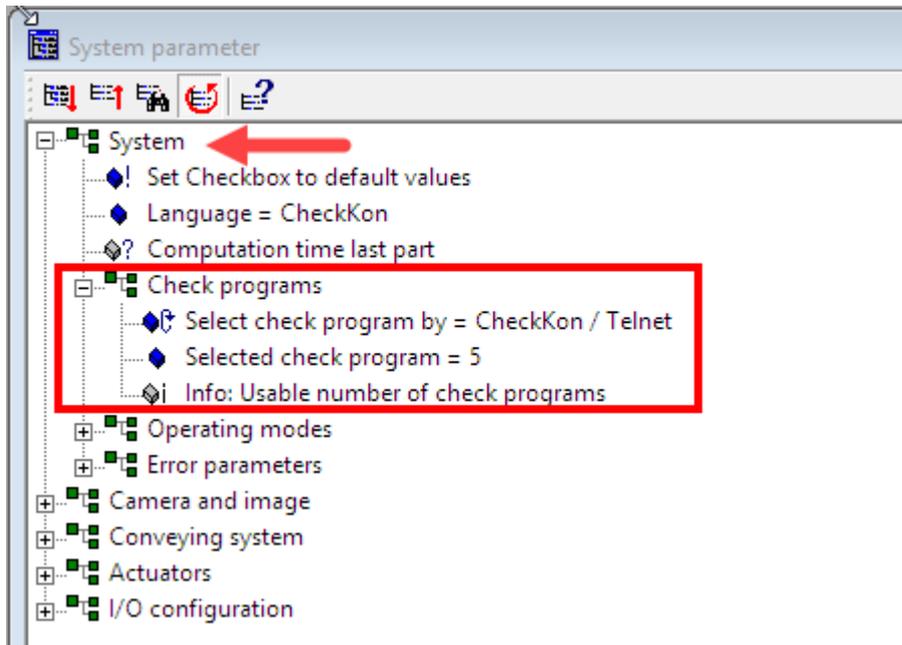
The panel could be connected direct with the ETH communication cable of the checkbox.
(pn 8040452)

Backgroundinformation:

The Checkbox CHB-C-N offers a memory for 256 different checkprogram. The selection of the current checkprogram could be done by 3 different possibilities.

1. Change by PC software CheckKon

This change has to be executed by an operator. In the software there is an menu "System parameter" to do the selection. So this is not suitable for an automatic process.

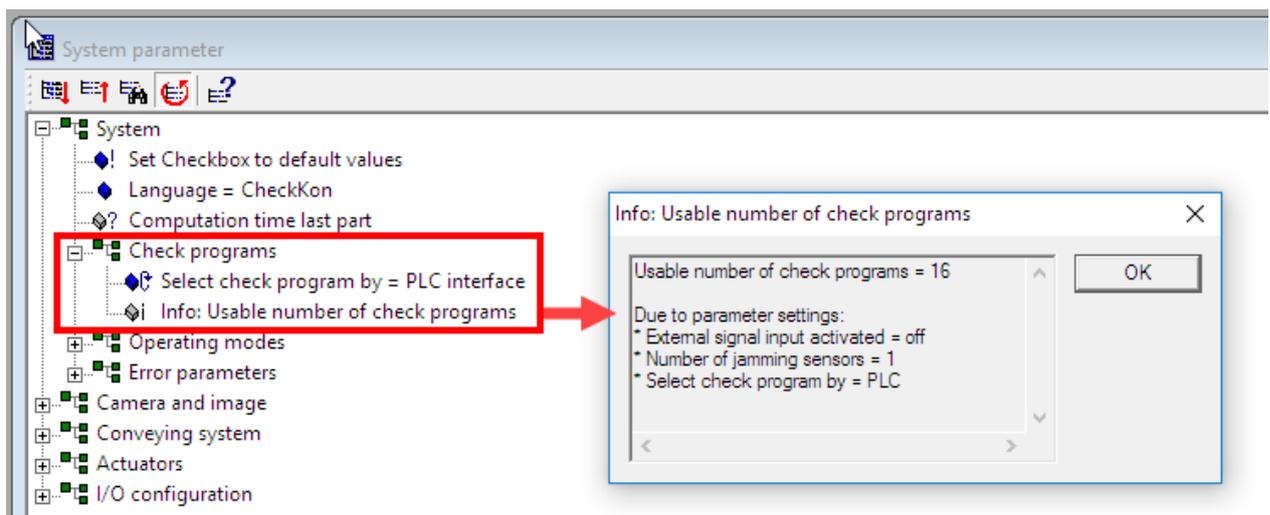


2. Change by 24V I/O signal on PLC interface of the checkbox.

> Check manual for details and pin assignment.

Depending on parameter setting the amount of selectable checkprogram is limited.

In Checkkon software you can ask for the max. accessible checkprogram:



The maximum number is limited to 16 program!

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3. Change by telnet communication

This is the topic of this Application Note. It shows how to change the checkprogram by Codesys PLC-controller. The selection is executed by telnet command on ETH interface. All of the 256 programs could be used. In this example the PLC-controller is integrated in an CDPX panel. This offers the possibility to initiate the program change by operator on the panel.

The Application Note describe the necessary components of the system. The Checkbox need the firmware 3.6.1. Only from this version and higher the telnet commands were implemented.

The other important topic is the library for the Codesys program. Here we use an “Special” version of the CameraControl.lib. The purpose of the CameraControl.lib was to organize the communication of SBO camera to Codesys controller. With the CHB-C-N were two new commands, in the telnet, implemented. This is the “START” and “STOP” command. These commands were not existing in the available CameraControl.lib. So the lib was updated, to deal with this new commands.

Unfortunately this update was not processed in the official release management. So we have to deal in the meantime with the special version:

  Festo_CameraControl_3 = TelnetCheckBoxControl_CS_NoSupport, 1.0.0.0 (Unbekannt)	CC	1.0.0.0
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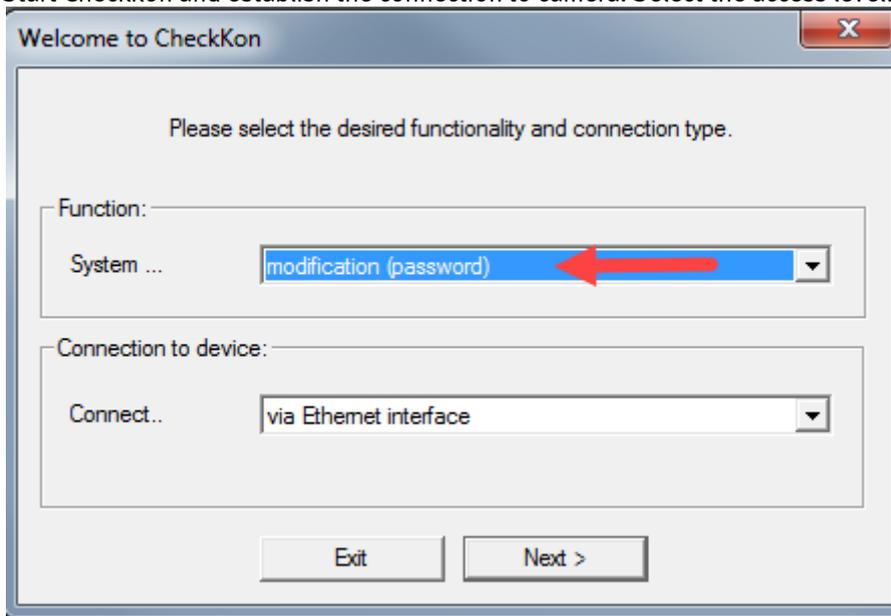
This library is included in the project archive of the sample project.

3 Configuration of CHB-C-N with software Checkkon

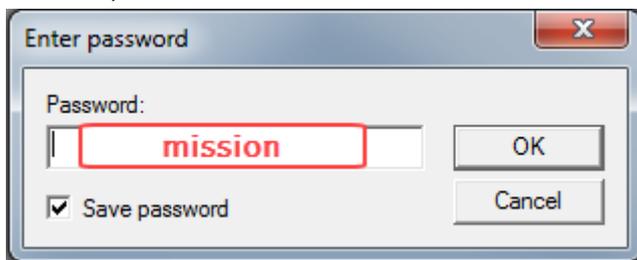
The Checkbox is configured with the software „Checkkon“ The software is available on the support portal. Before you connect to Checkkon you should check you ETH adapter setting on your PC and the camera. The demo work with fix IP addresses for the particular components. So adapt your PC setting to a fix ip-address in the same subnet as the camera. The camera has on default an address 192.168.2.20 255.255.255.0

The IP-setting of the Checkbox could be changed by the software FFT Festo Field Device Tool. > available on Support Portal.

Start Checkkon and establish the connection to camera. Select the access level: modification password



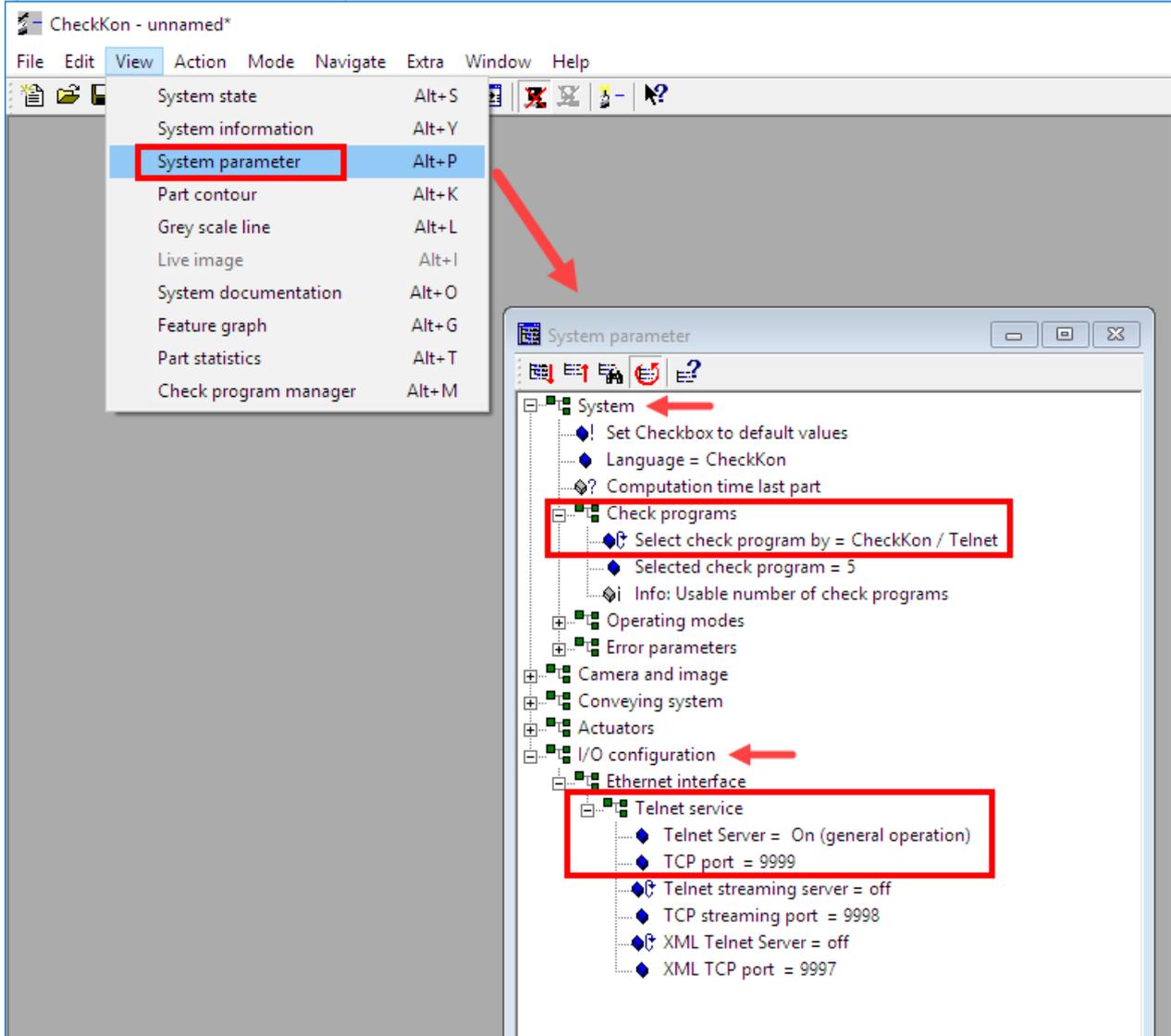
Enter the password:



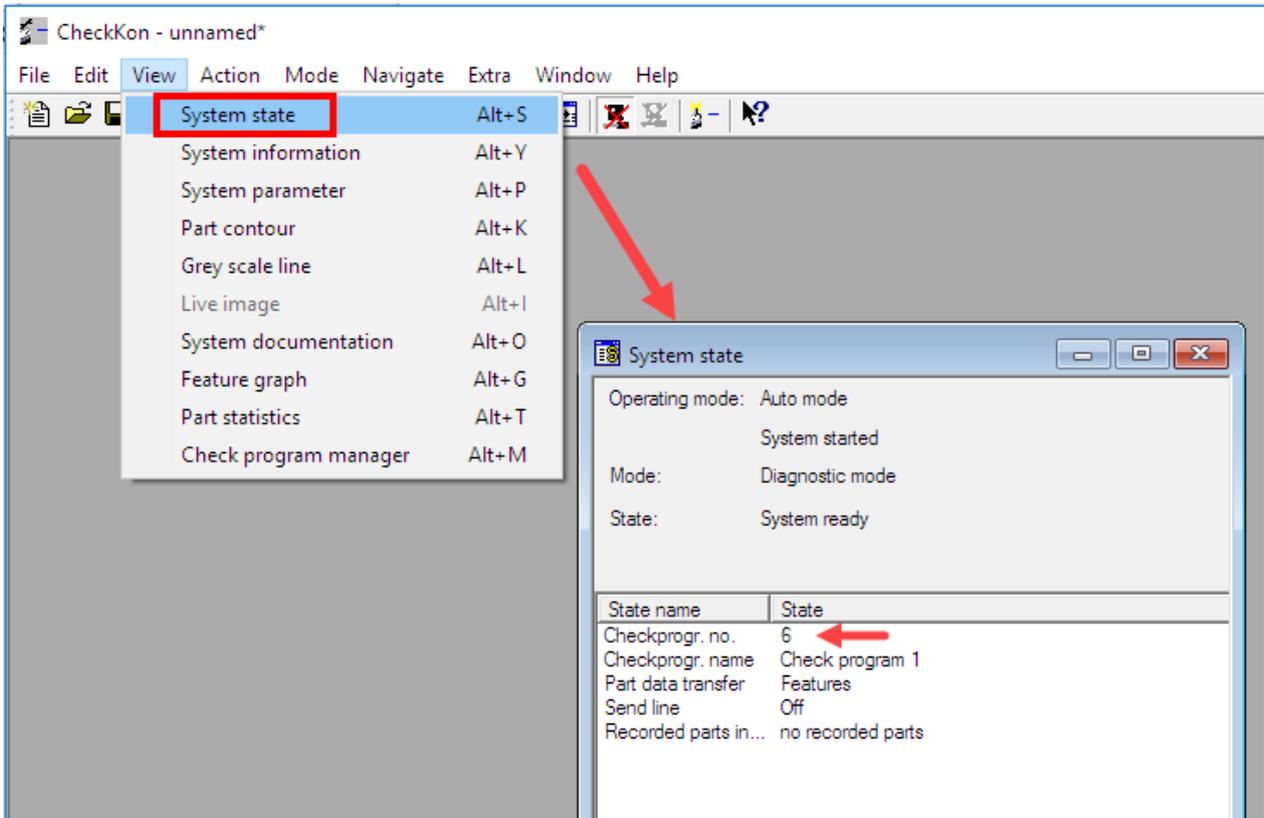
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Open the window: „System parameter“

Open the System and I/O configuration and do following important setting:



The active inspection program is shown in the window: „System state“



or in the display on the Checkbox:



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4 Function on CDPX

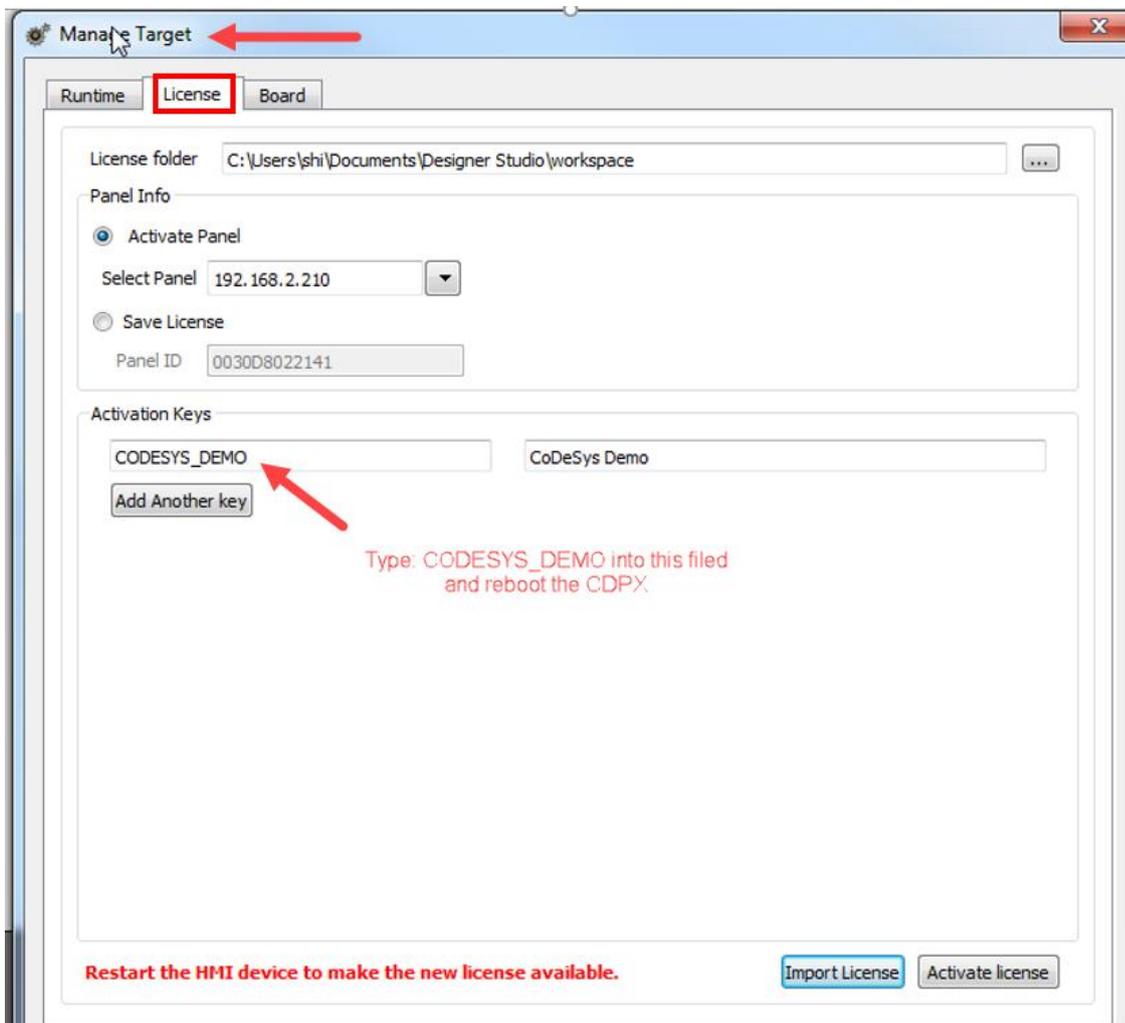
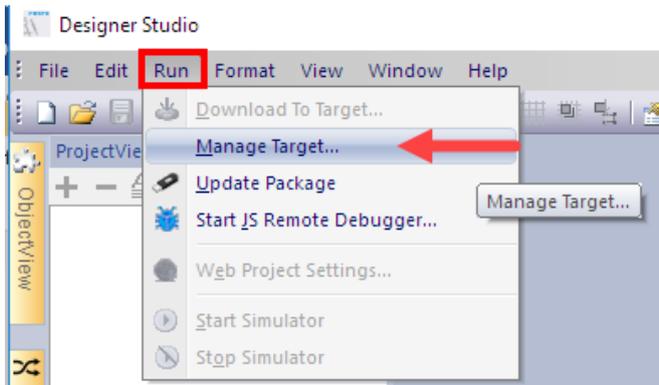
The CDPX is equipped with the Codesys licence to show the data transfer to the Checkbox by telnet. So the panel could be connected to the checkbox without any additional PC or controller.

For simulation purpose it is also possible to work with the “device” CODESYS Control Win V3 with the enclosed Codesys Visu in the project.

The page on the panel is built by the Designer Studio 2.6 software. The project is named: CDPX-Checkbox-C-N.

The CDPX panels are normally not equipped with Codesys Runtime. You have to buy Codesys licence (pn 576045) or you can use demo license for test purpose.

How to activate the demo licence on the panel. Open the Designer Studio. Select the IP address and edit the demo license:



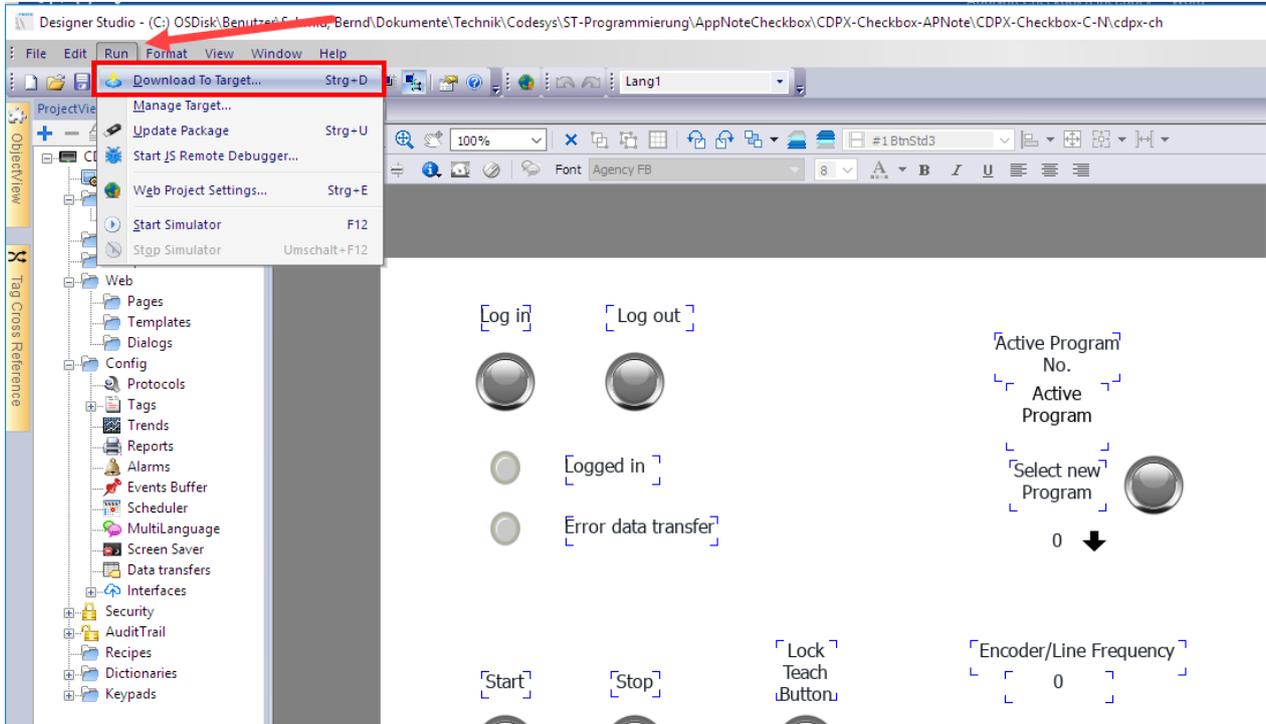
Open the Project:

cdpx-checkbox-c-n.jpr

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Designer Studio Pr...

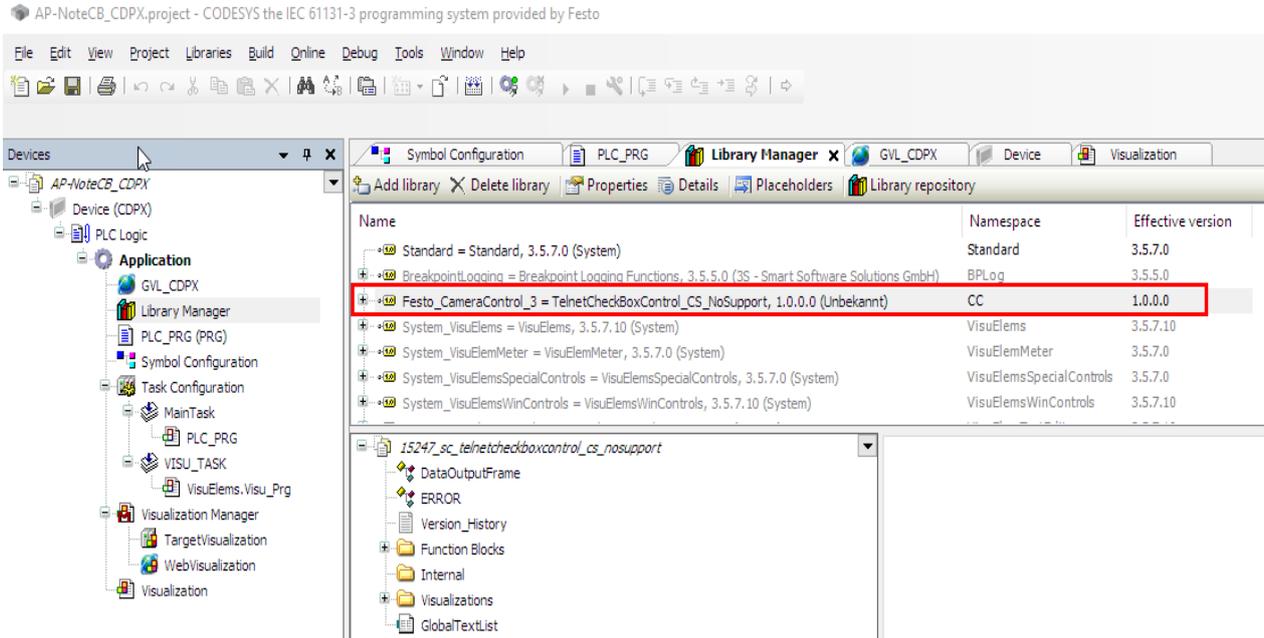
Then download the project to the panel.



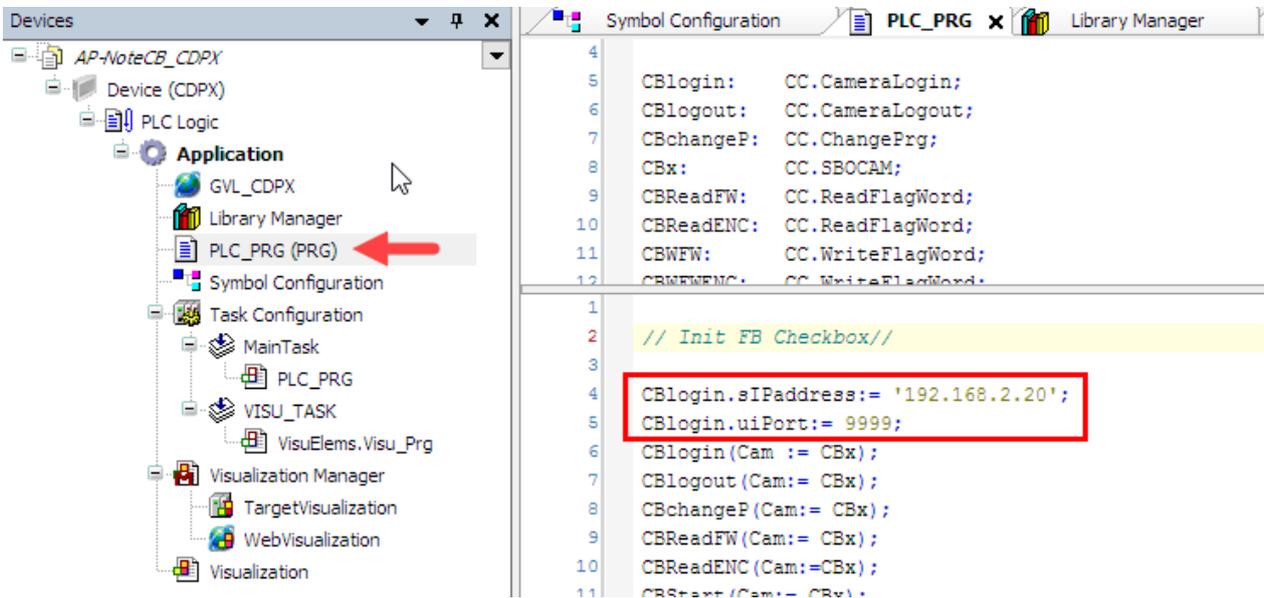
5 Codesys Program

Extract the project archive and open the project AP-NoteCB_CDPX.project.

Check if the special IFesto_CameraControl_3xx library is available in the Library Manager.



Edit the IP address and the telnet port no. of the Checkbox at the CBlogin FB in the main program PLC_PLG:



The program use different FB from the camera control library. for different operation. The name of the function give information about action.

CC.CameraLogin;

CC.CameraLogout;

CC.ChangePrg;

CC.SBOCAM; (Structure of the camera)

CC.ReadFlagWord;

CC.ReadFlagWord;

CC.WriteFlagWord;

CC.WriteFlagWord;

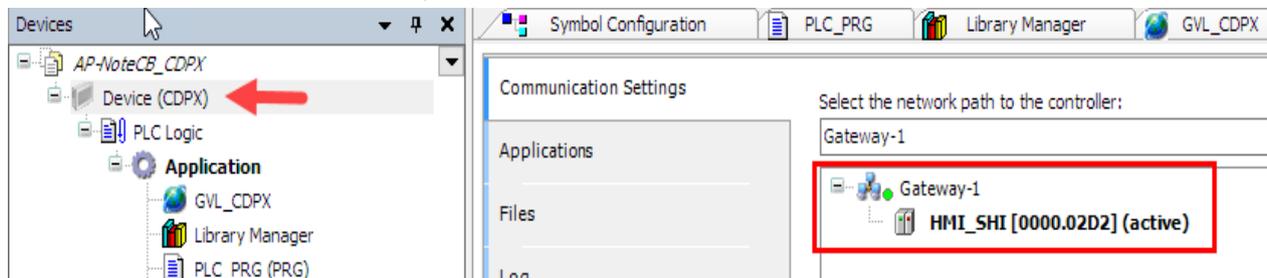
CC.Start;

CC.Stop;

See the help in the Library Manager for further details.

Beside the above mentioned FB the rising edge detection of R_TRIG is used from the Standard library.

Set the connected CDPX as an active path.



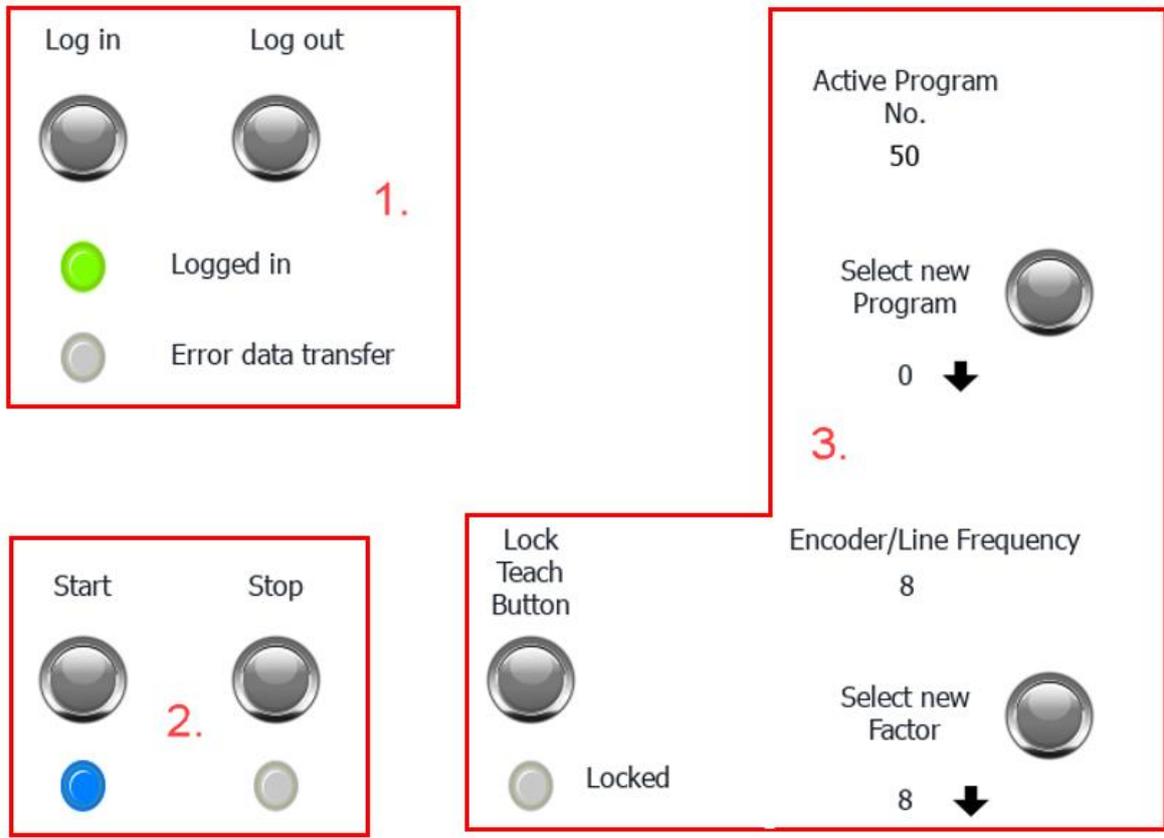
If the CDPX is not used as the controller, you have to do an update of the device to CODESYS Control Win V3. (right mouse button on Device > Update Device)

Then you go online and download the project to the controller. > Run the controller.

Now you have to connect the Checkbox Ethernet with the CDPX by suggested connection cable, or do all the ETH-connection by ETH switch. This allows to have an observing connection by PC.

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On the Display of the CDPX following control elements are available.



1. These are the buttons for the Log-in and Log-out sequence
The Log-in initiates the telnet connection on the port 9999. A successful connection is displayed by the green LED at Logged in. Log-in could be done when the Checkbox is in Run mode.
2. Here the Checkbox could be started and stopped. That's where the special function of the particular CameraControl.library is used.
3. These buttons control the setting of the system parameter of the Checkbox. For parameter setting it is important and a necessity that the Checkbox is in Stop-mode!

“Lock Teach Button” is the Key-Lock of the Teach functionality. When the Teach button is locked an existing checkprogram could not be influenced by the operator at the device. If the Teach button will be pressed in the display of the Checkbox “Keyfield Teach LOCK” appears. On the CDPX the yellow LED shows if the button is locked.

The “Active Program No.” shows the active Program on the Checkbox. It is updated with the Log-in to the Checkbox. If you press on the figure below the “Select new Program” a menu opens, and a new value for the program could be edited. With the button beside the “Select new Program” the new selected program could be set to active. The “Active Program No.” will change to the new value. If “Start” is pressed the device will start with new settings.

“Encoder/Line Frequency” is the display of the current setting of this important parameter. This parameter influences the horizontal resolution of the image generation.

If you press on the figure below the “Select new Factor” a menu opens, and a new value for the factor could be edited.

With the button beside the “Select new Factor” the new selected factor could be set to active. The “Encoder/Line Frequency” will change to the new value. If “Start” is pressed the device will start with new settings.

General behaviour on testing

In this example we show the control by telnet connection. It is not possible to get the current operation mode of the Checkbox by telnet. So it is not visible on the CDPX if the Checkbox is in RUN or STOP mode when the CDPX log-in the device.

As suggested to log-in only in STOP mode the display show the red Stop LED after connection. But when the Checkbox is in RUN mode while Log-in, then the LED is indicating a wrong operational mode.

To overcome this situation, the operation mode could be indicated by the 24V signal on the PLC interface of the Checkbox. So it is necessary to connect the signal "OUT_24Power" pin no. 21 to an input of the CDPX. Then the real status of the Checkbox could be monitored. This hw based feedback of the status is recommended for real application.

When Log-out is proceeded the Start and Stop Led will be reset.

Remarks on Codesys Program

All variables are commented in the program file. The names/comments should stand for the function and explain itself.

Every action to control the Checkbox by telnet commands use an on function block of the CameraControl library.

e.g.: CC.CameraLogin, CC.CameraLogout, CC.Start, CC.ChangePrg ...etc.

Most parameter were controlled and changed by particular flagword values. A table of the available flagword no. are enclosed in the appendix.

There are 2 function blocks to read and write flagword values. CC.ReadFlagWord and CC.WriteFlagWord. In the enclosed Codesys example we show how to create an instance of the function block. Especially for a better overview, we have used 2 different instances of the CC.ReadFlagWord and CC.WriteFlagWord fb. Normally only one instance would be enough. And the different flagword no. and values would be referenced by variables.

Example of 2 instances of the same function block.

```
CBReadFW:      CC.ReadFlagWord; > read flagword value in general
CBReadENC:     CC.ReadFlagWord > read only the Encoder/Line frequency factor
CBWFW:         CC.WriteFlagWord;
CBWFWENC:      CC.WriteFlagWord;
```

Important: Only one instance of a function block is allowed to be active during the program processing!

Table of most common Checkbox Flagwords:

Flagword Basic Information

Current Checkprogram No. 250 only Read Access!

System

Check programs

Selected Checkprogram 5008 Range: 1 .. 256

Operating mode

Lock Teach Button 5011 not locked(0) / locked(1)

Counter settings

Counter Mode 5020 off(0) / on(1)

Counter Reached Position 5021 range: 1 .. 5000 mm

Camera and Image

Line Rate 5451 range: 1002 .. 8539 (Hertz)

Encoder To Line Frequency Ratio 5452 range: 1 .. 64

Greylevel Threshold 5455 range: 0 .. 255

Upper Limit Viewing Area 5456 range: 8 .. 2055 (on default Resolution)

Lower Limit Viewing Area 5457 range: 8 .. 2055 (on default Resolution)

Forced stop of analysis

Forced Stop of Analysis Mode 5600 off(0) / on(1)

Max. Part Length 5601 range: 10,0(100) .. 1000,0(10000) mm (real Value = digit /10)

Ignore Center Area of Part 5620 off(0) / on(1)

Conveying System

part feeding system

Activate FeedingSystemTeachMode 5802 off(0) / on(1)

Blow-Free Process 5830 off(0) / on(1)

Extension of Blow-Free Process 5831 range: 10 .. 10000 mm

Minimum Distance between Good Parts 5840 range: 0 .. 10000 mm

Minimum Distance AllOrientationsMode 5841 check only good parts in orientation_1(0) / check all good parts(1) / check only good parts in orientation 2 .. X(2) / check all good parts, optimized for turning station (3)

Actuators

Correlation check results and actuator number

First Actuator Good Parts	5900	range: off(0) / 1 .. 4
Second Actuator Good Parts	5901	range: off(0) / 1 .. 4
Actuator Jamming Area Full	5902	range: 1 .. 4
Actuator Counter Reached	5903	range: 1 .. 4
Good Part is wrong orientated as from Orientation X	5904	range: 1 .. 8
Actuator Wrong Orientation	5905	range: 1 .. 4
Actuator Bad Part	5906	range: 1 .. 4
Actuator Teach Parts	5907	range: 1 .. 4
Actuator Parts by Forced Stop of Analysis	5909	range: 1 .. 4
First Actuator Blow-Free Process	5910	range: 1 .. 4
Second Actuator Blow-Free Process	5911	range: 1 .. 4
Actuator Parts Inside of Minimum Distance	5912	range: 1 .. 4
Lenght-Factor Referring Activating Time Part Length	5950	range: 0,00 .. 500 (real Value = digit /100)