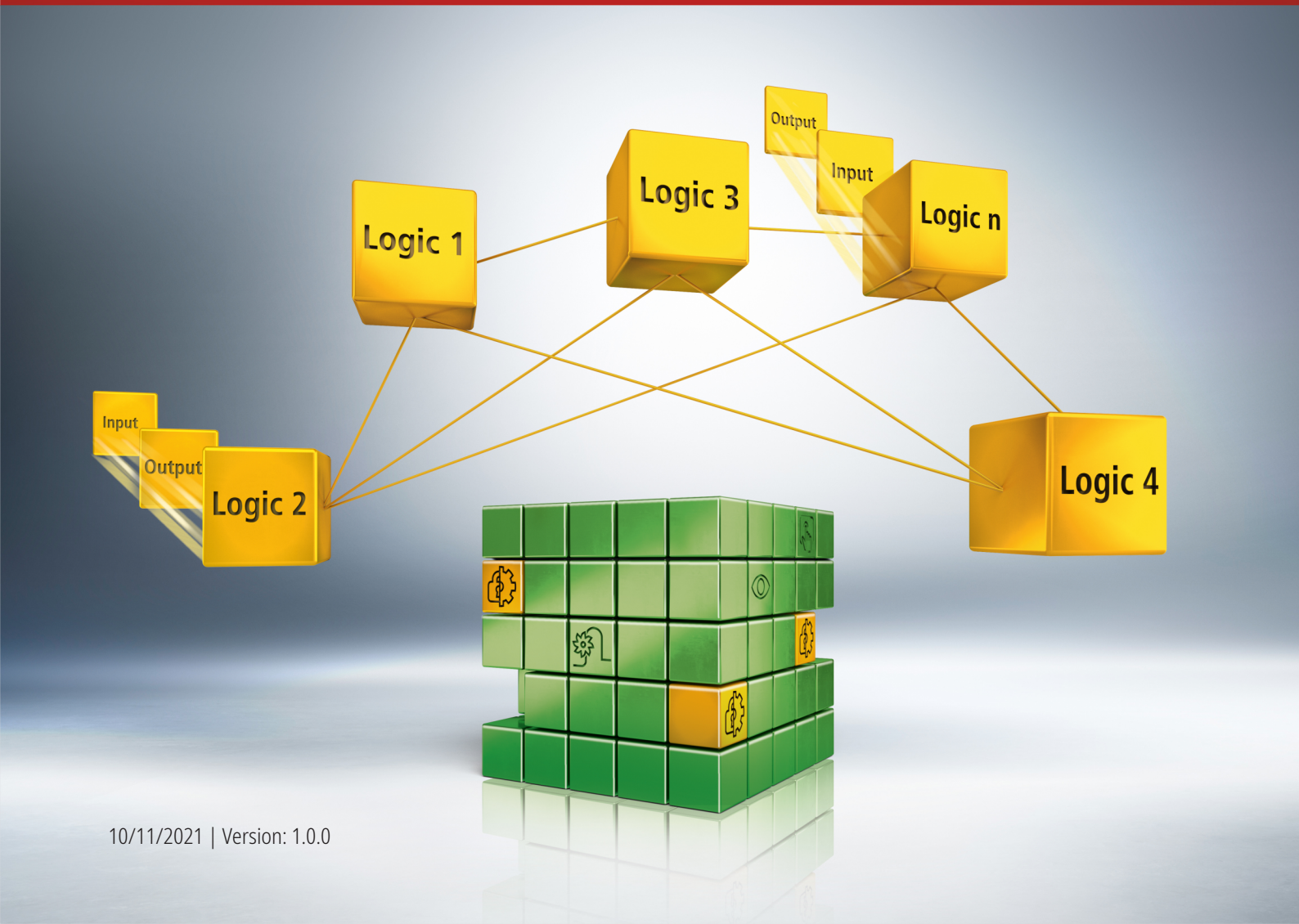
BECKHOFF New Automation Technology

TwinSAFE Tutorial 14 | EN

SafeMotion Wizard

Retargeting of a SafeMotion Wizard project



10/11/2021 | Version: 1.0.0

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1 Introduction

TwinSAFE includes several innovations that bring more functionality and performance to your safety controller. A major innovation is that the functionality of the safety controller is integrated in each TwinSAFE component. This means that you can, for example, use a TwinSAFE input component both as an input component and the safety control integrated on it to use application-specific pre-processing.

This is tutorial 14 of a tutorial series.

The aim of this tutorial series is to familiarize you with the TwinSAFE innovations using individual examples.

This tutorial is about the transfer of an EL6910 project to an EL1918 as a new target.

1.1 Edition status

Edition	Comment
1.0.0	• First released edition
0.0.1	• First draft

1.2 Requirements

Meet the following requirements for this tutorial:

- TwinCAT 3 version ≥ 3.1.4024.11
- TwinCAT Safety Editor TE9000 ≥ 1.2.1.1
- TwinSAFE firmware ≥ 03 → irrelevant
- AX8000 firmware ≥ 0104; with default module ID active → irrelevant

1.3 Starting point

At the starting point of the tutorial

- a TwinCAT 3 project with standard PLC exists,
- an EL6910 project exists,
- a SafeMotion Wizard project exists.

1.4 Demo system

1.4.1 Hardware

The demo system of this tutorial consists of the following hardware:

- CX for EtherCAT communication and the standard PLC controller
- EL6910 as master TwinSAFE Logic
- EL1918 with safe inputs for reading light barrier signals
- Light barrier
- AX8000-x2xx

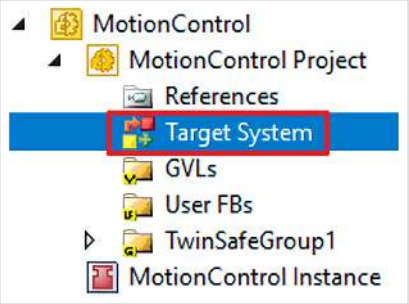
1.4.2 Desired functionality

This tutorial describes the realization of the following functionality:

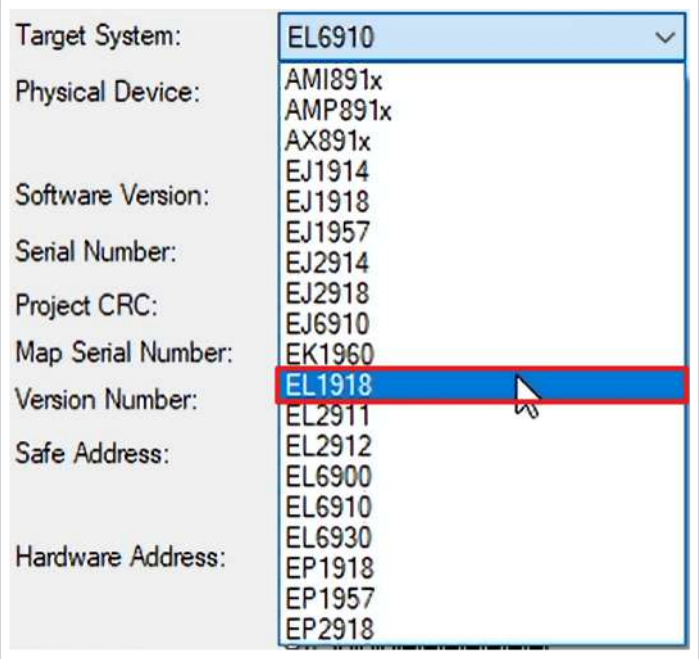
- Transferring the safety project of the EL6910 to the EL1918 as a new target system.

2 Demonstration

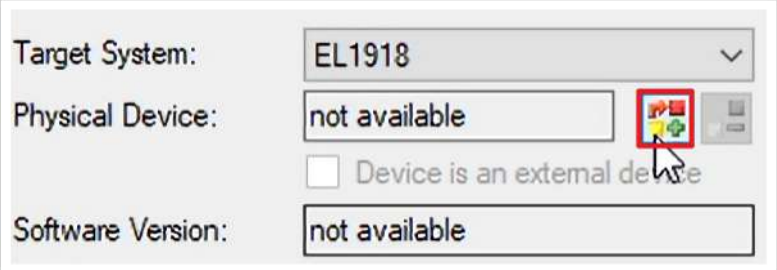
2.1 Select new target system



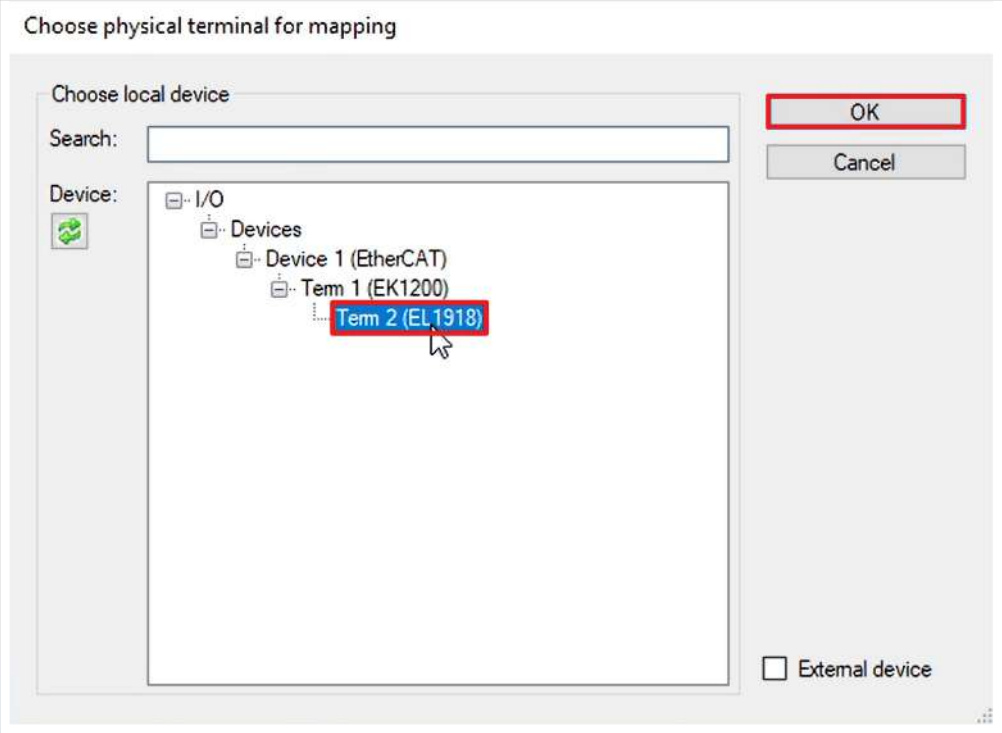
1. Open Target System



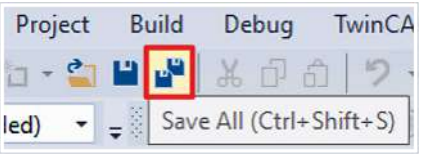
2. Select EL1918 in the drop-down menu of “Target System” to select EL1918 as new target system



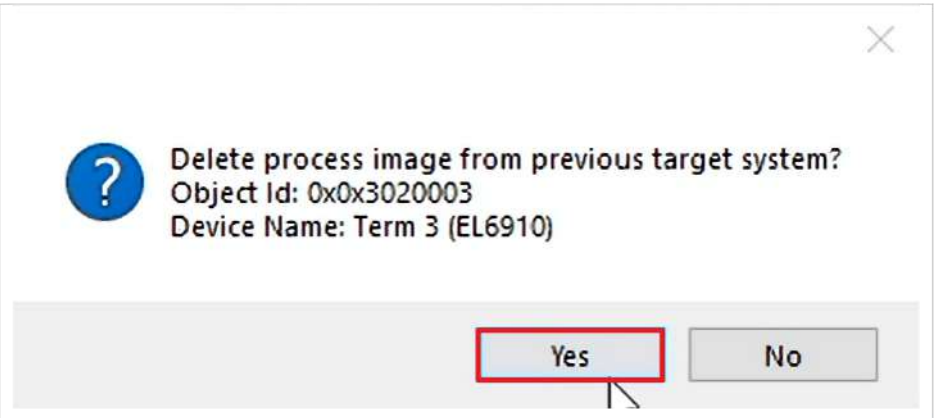
3. Click on the link field at “Physical Device”



4. Select EL1918 in the “Choose physical terminal for mapping” window
5. Confirm selection with “OK”

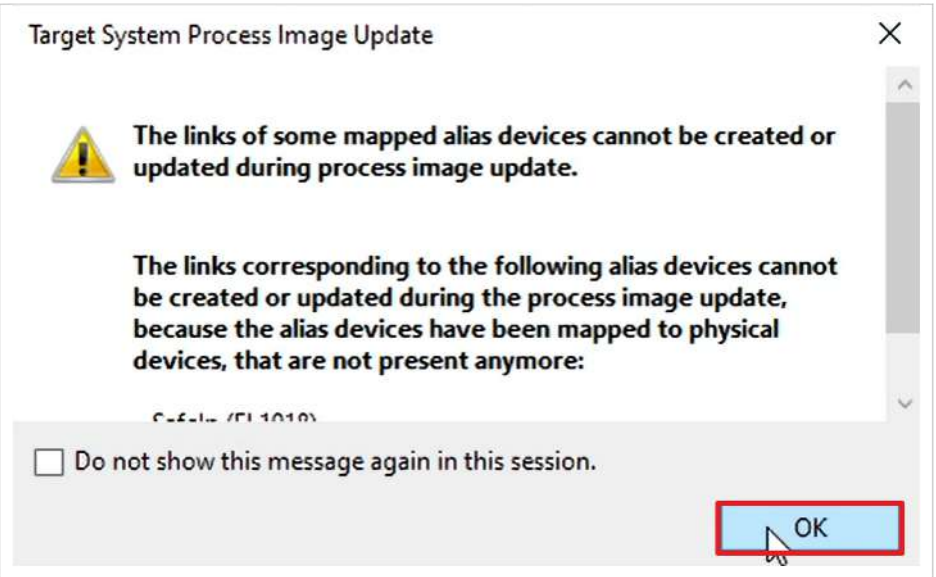


6. Click on “Save all” in the menu bar to save the settings

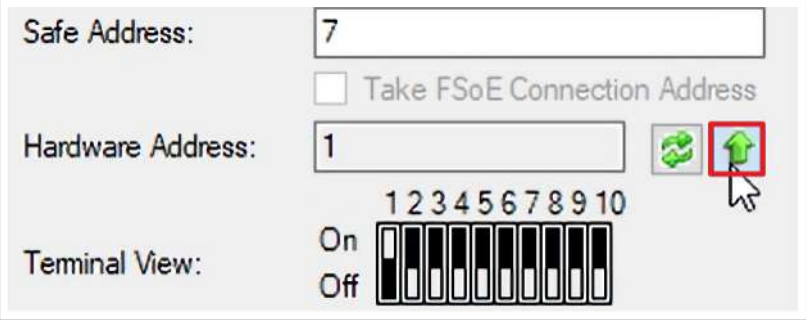


A control window appears asking whether you want to delete the process image of the previous target system.

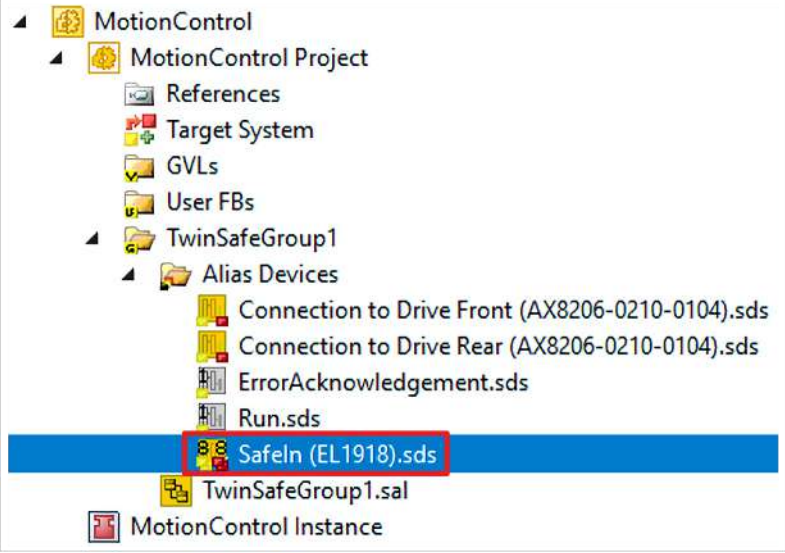
7. Close the window with "Yes



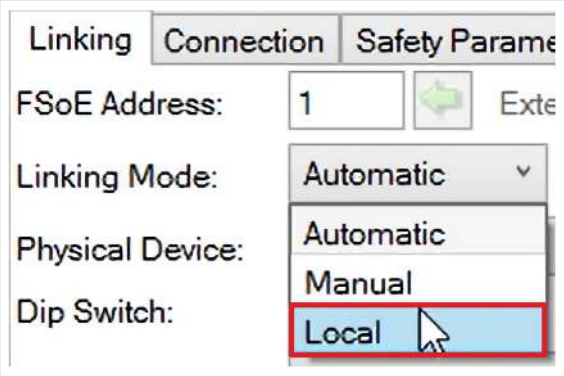
8. Close the window “Target System Process Image Update” with “OK”



9. Click the left arrow symbol to load the hardware address of the EL1918
10. Click the right arrow symbol to accept the displayed hardware address for the EL1918



11. Open file “SafeIn (EL1918).sds”



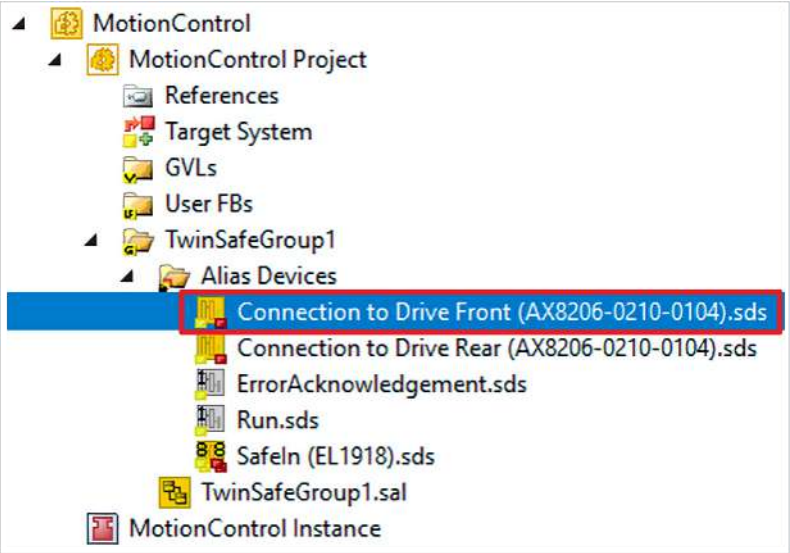
In the linking tab you have the possibility to select different linking modes. The linking modes have the following functions:

Linking Mode	Function
Automatic	• When selecting a component from the I/O configuration, the links are created automatically
Manual	• The mapping is created • Links must be created manually
Local	• Link to a local component • Access to the internal process image

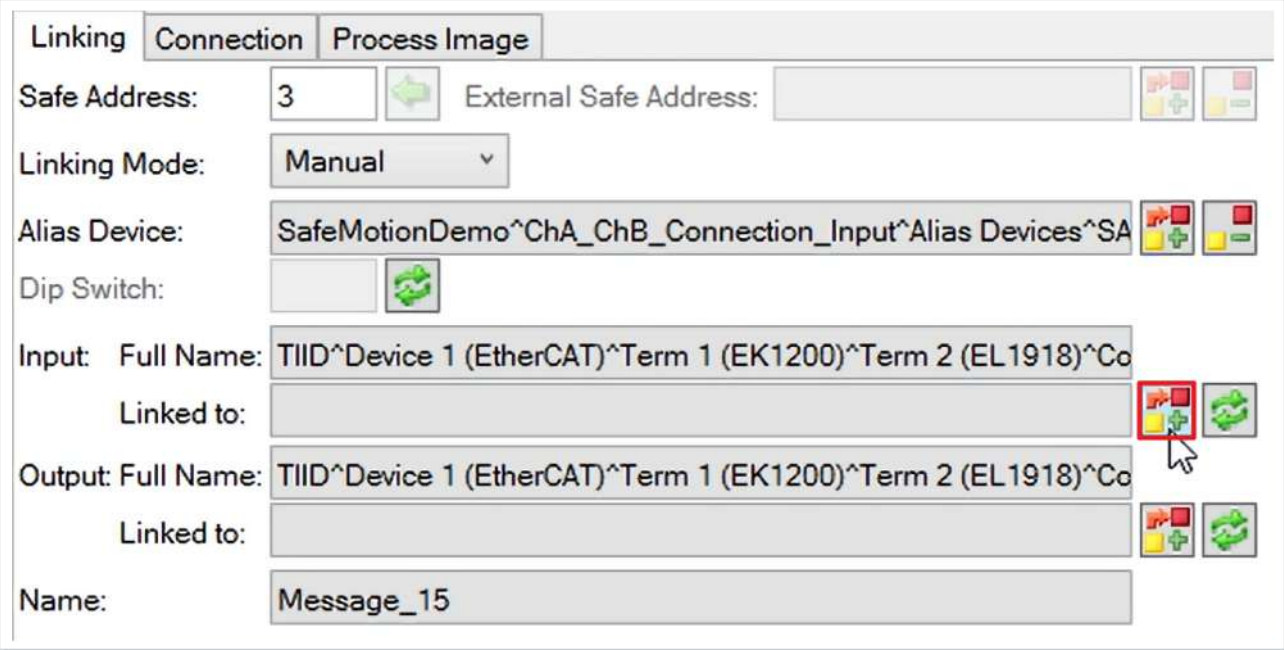
12. Select “Local” as the linking mode
13. Click “Save all” in the menu bar to save the settings

2.2 Link Safe Motion component

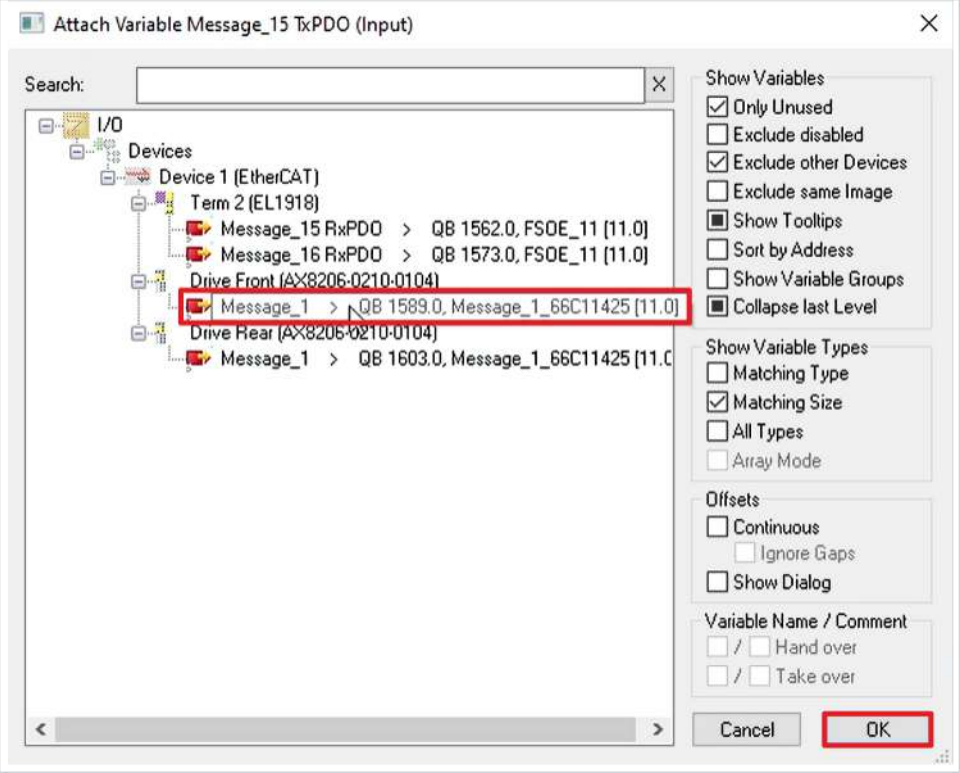
In the following you link the two AX8000 with the EL1918. This linking is only necessary because the AX8000 communicate via Custom Connections. If an I/O terminal is linked to the EL1918, the link is created automatically.



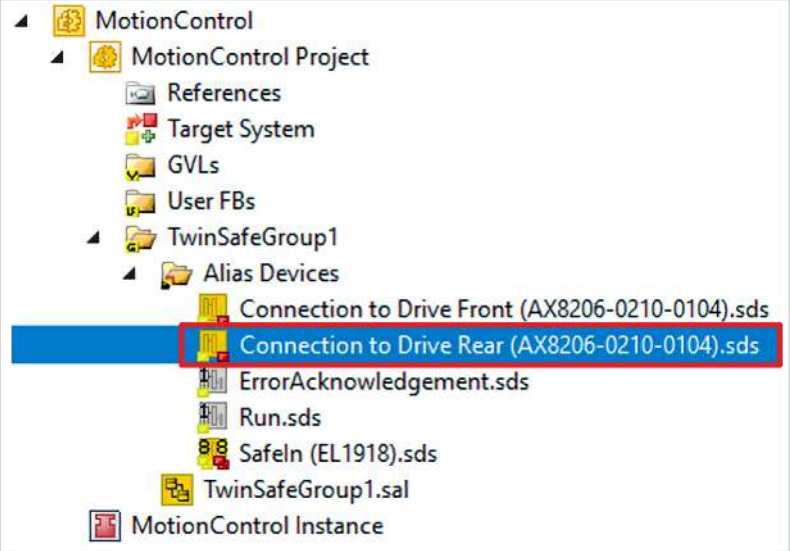
1. Open file “Connection to Drive Front (AX8206-0210-0104).sds”



2. Click on the link symbol at Input

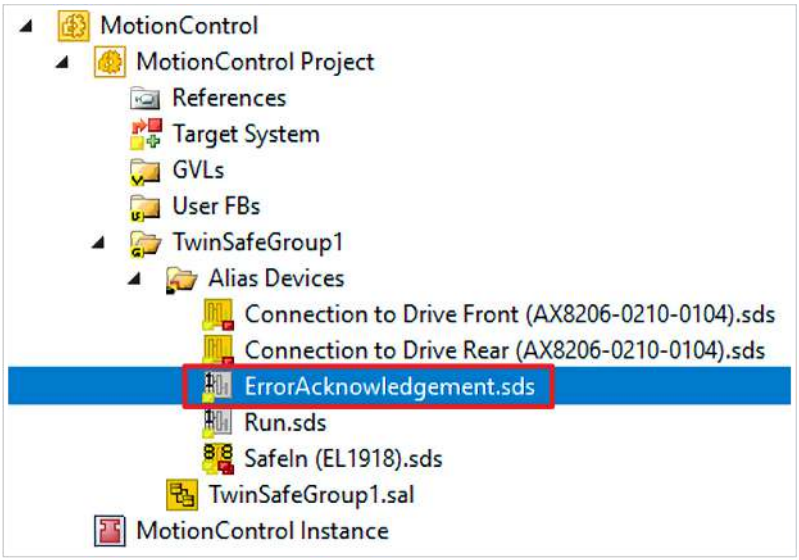


3. Select message 1 of the drive front
4. Confirm selection with “OK”
5. Go through steps 4 to 6 for output

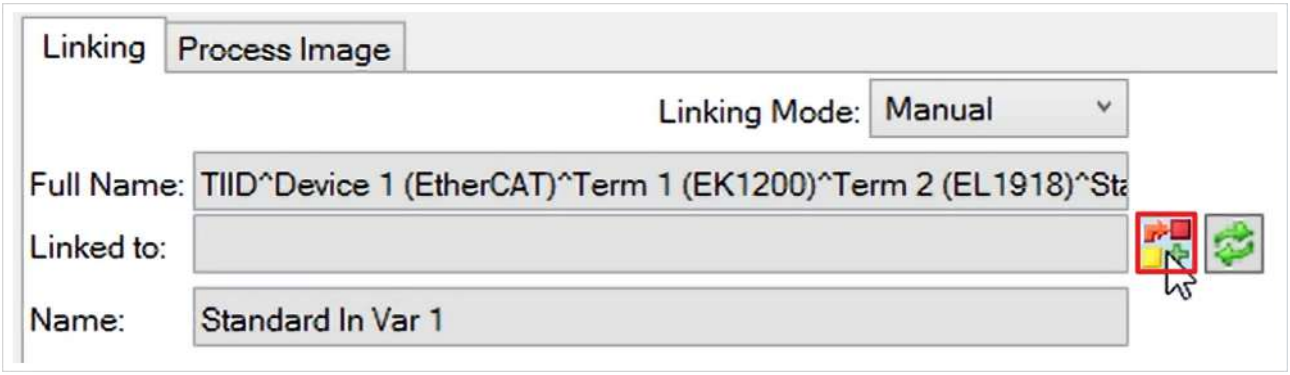


6. Open the file “Connection to Drive Rear (AX8206-0210-0104).sds”
7. Follow steps 4 to 7 for the Drive Rear

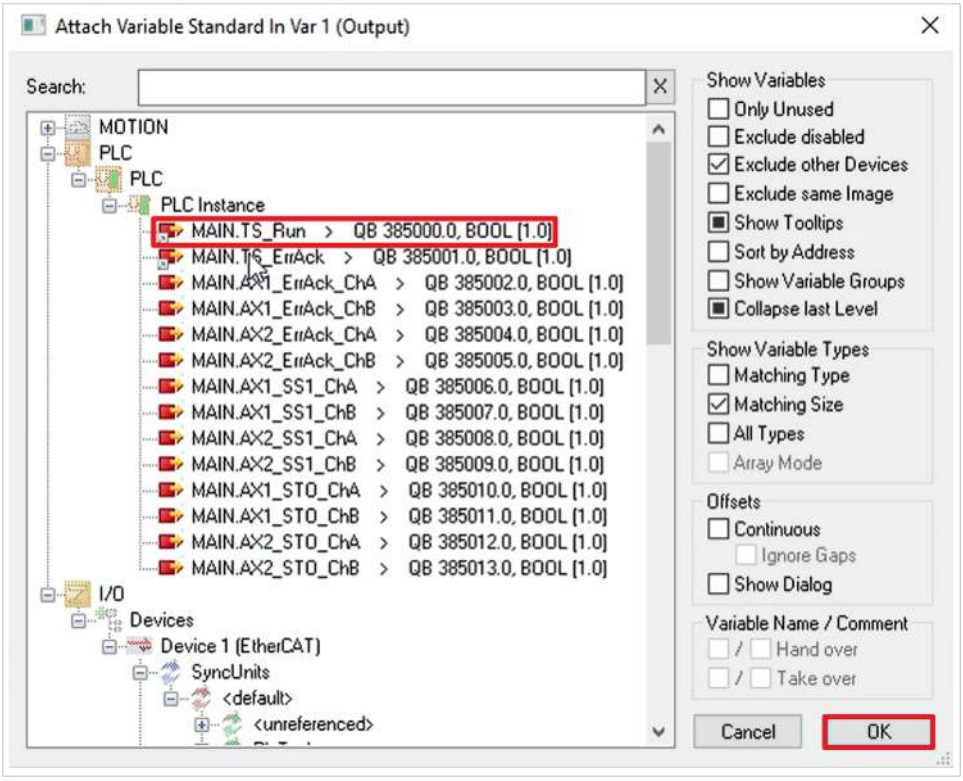
2.3 Link ErrAck and Run signal



1. Open file “ErrorAcknowledement.sds”

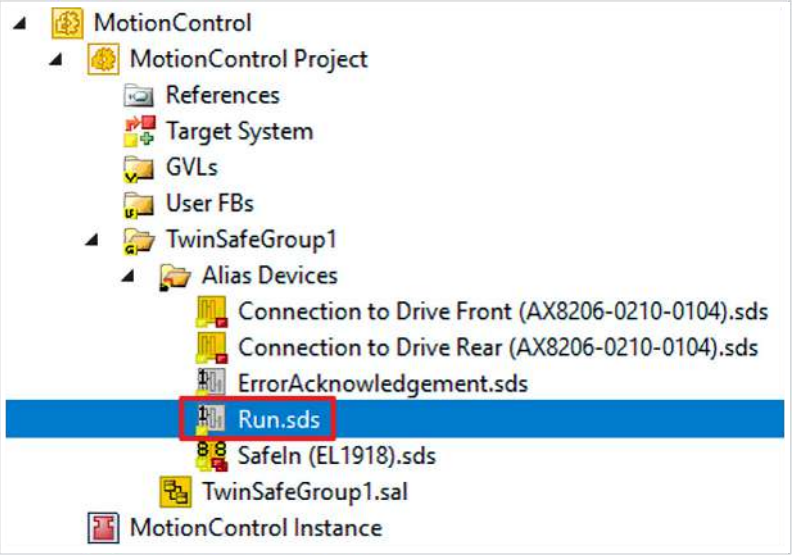


2. Click the link icon

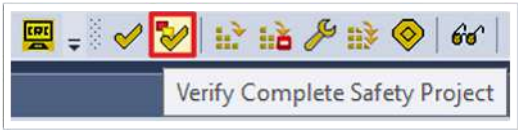


3. Select “MAIN.TS_ErrAck” as signal

4. Confirm selection with “OK”



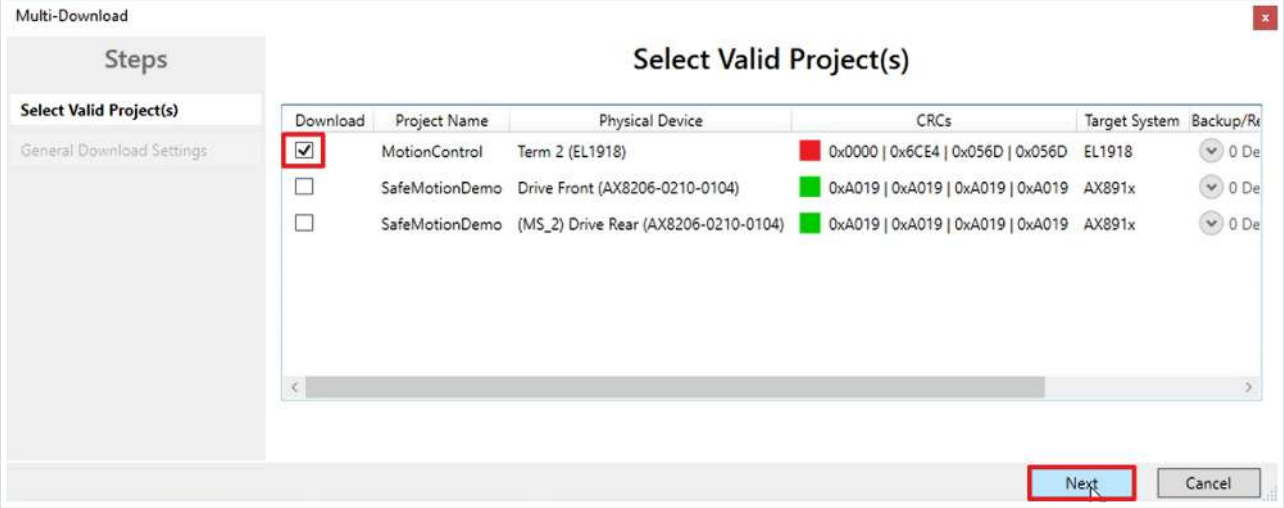
5. Open file “Run.sds”
6. Go through steps 2 to 4. Select "MAIN.TS_Run" as signal.
7. Click on “Save all” in the menu bar to save the settings



8. Click on “Verify complete safety project” in the menu bar to verify the project

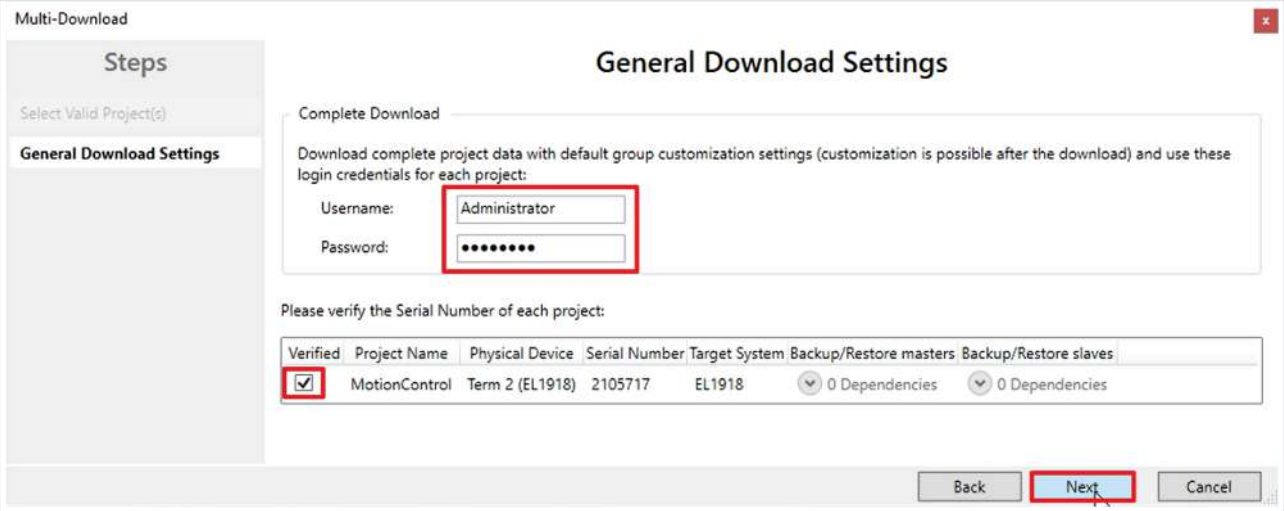
2.4 Download safety project

1. Click on “Multi-Download Safety Project(s)”



The “Select Valid Project(s)” window opens. Here you can see which safety projects you can download.

2. Select the safety project that you want to download
3. Confirm selection with “Next”

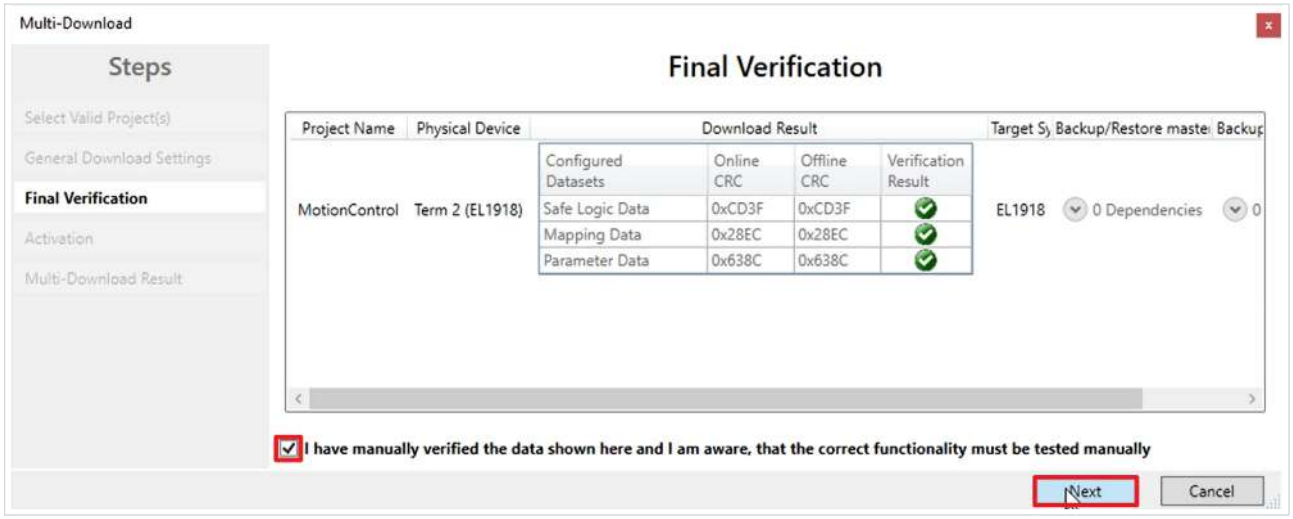


4. Enter the username and password in the “General Download Settings” window

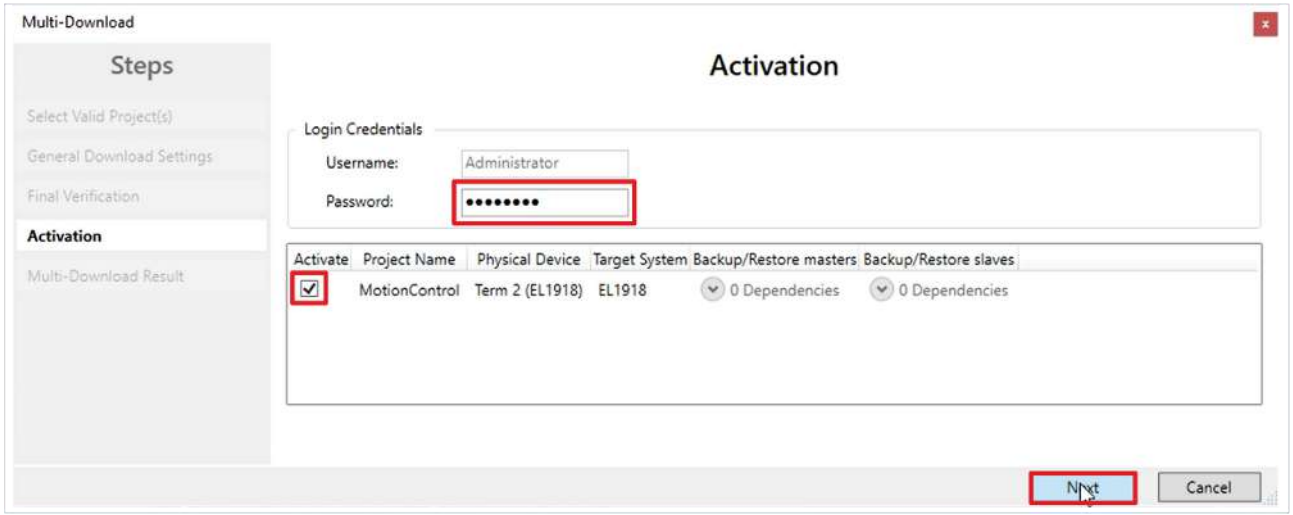
Default username: Administrator

Default password: TwinSAFE

5. Select the safety project that you want to download
6. Confirm selection with “Next”

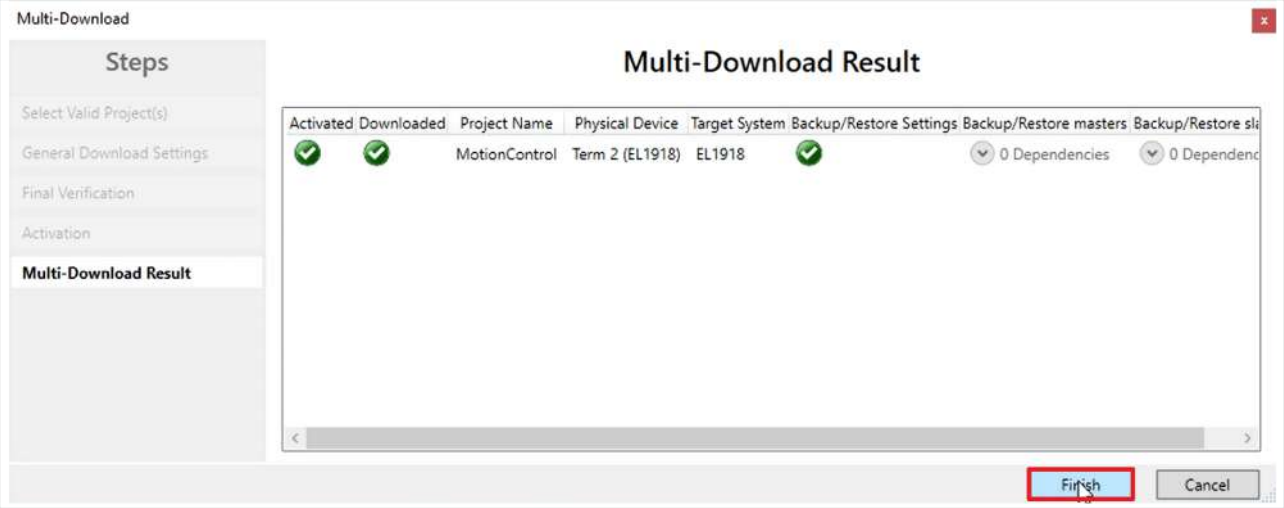


7. Check the CRCs in the “Final Verification” window
8. If the CRCs match, click on the box to confirm the verification
9. Confirm window with “Next”



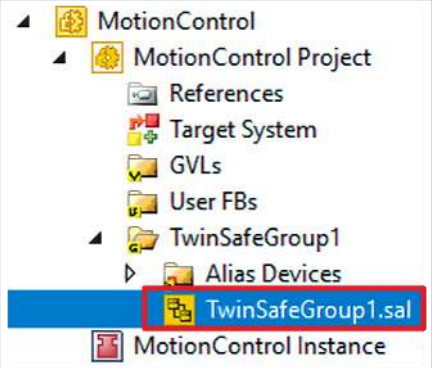
The “Activation” window opens, in which you activate the safety project.

10. Enter the default password
11. Check if the safety project is selected
12. Confirm selection with “Next”

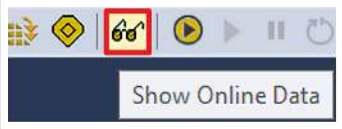


13. Close the window “Multi-Download Result” with “Finish”

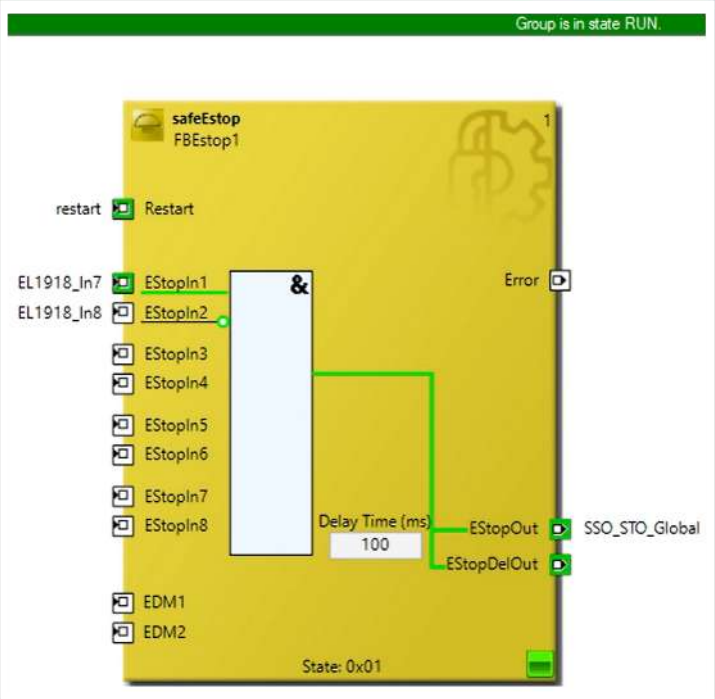
2.5 Check signals



1. Open file “TwinSafeGroup1.sal”

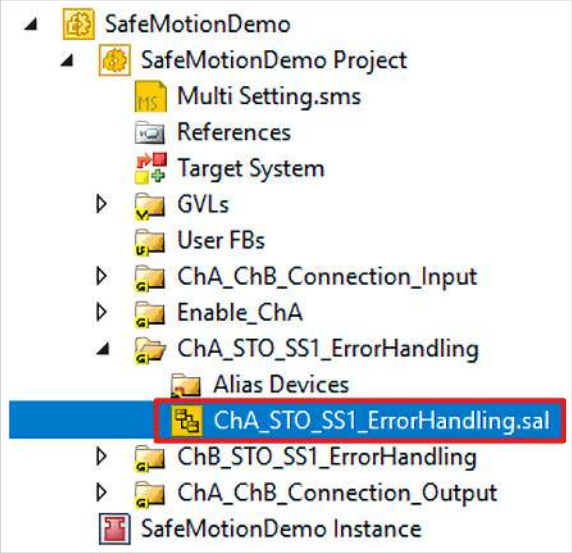


2. Click on “Show Online Data” in the menu bar to activate the online view

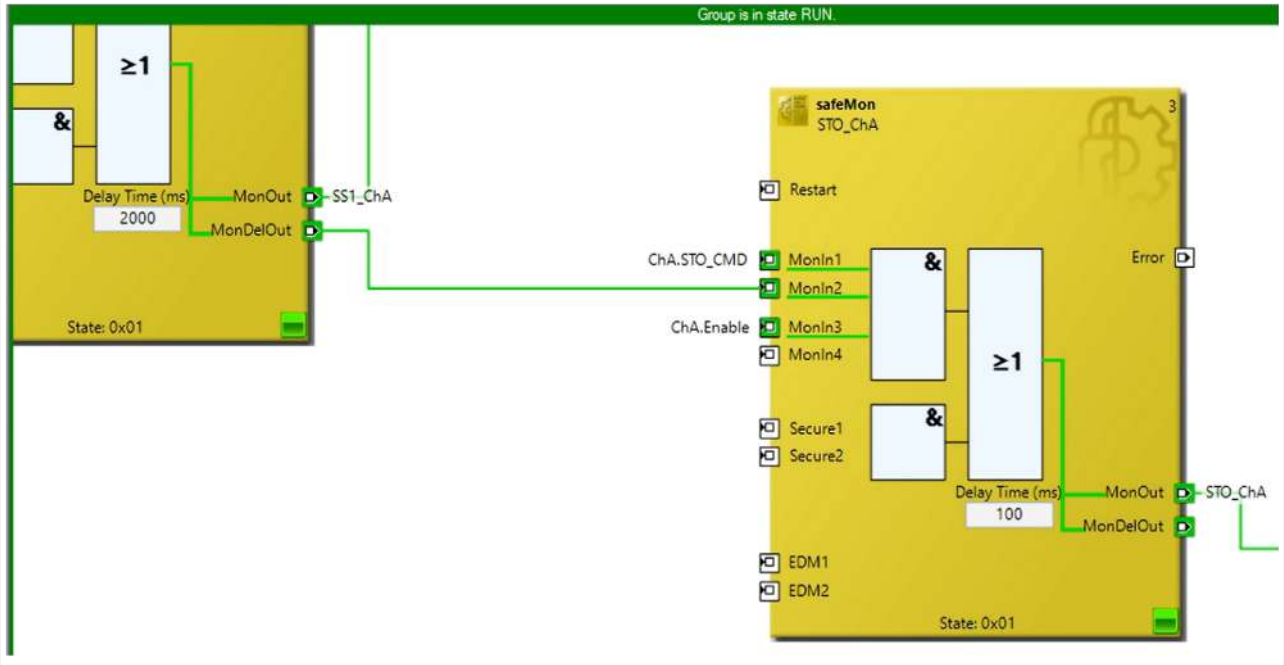


You will see that all signals arrive successfully.

3. Click on “Show Online Data” in the menu bar to deactivate the online view



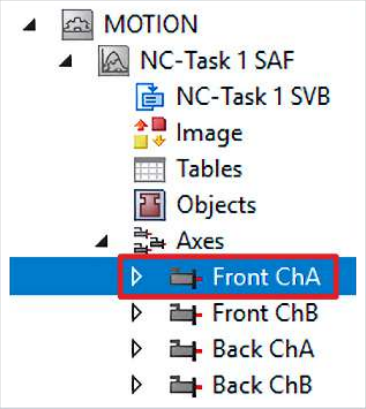
4. Open ErrorHandling
5. Click in the menu bar “Show Online Data” to activate the Online View



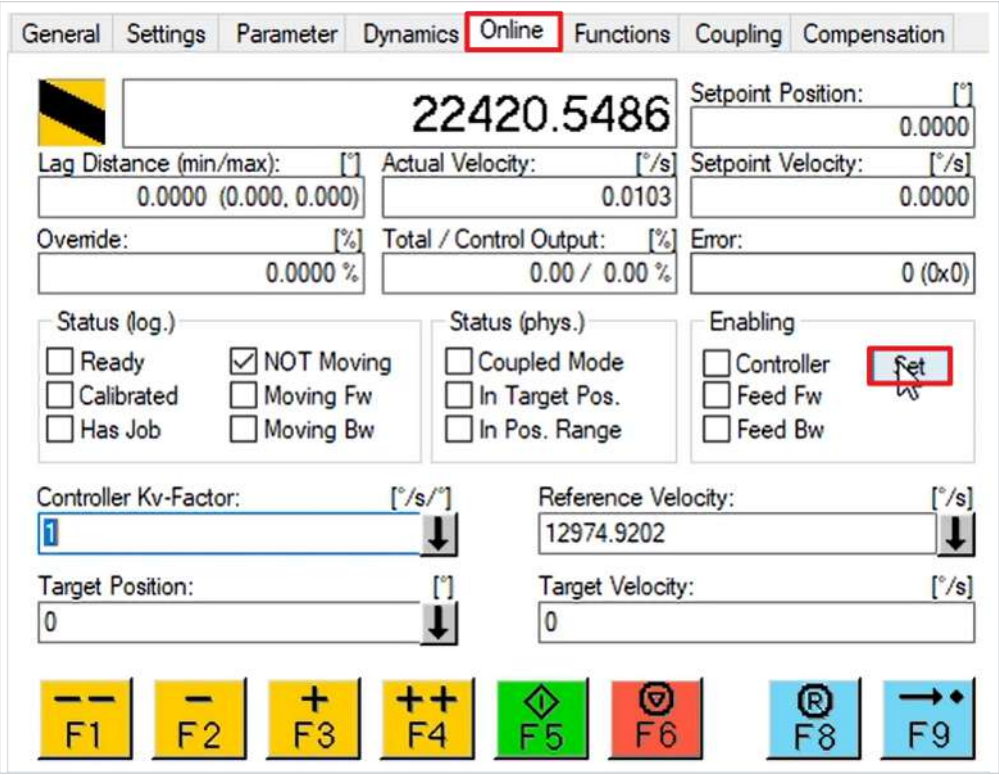
You can see that the STO signal has arrived successfully and the AX8000 is enabled.

6. Click on "Show Online Data" in the menu bar to activate the Online View

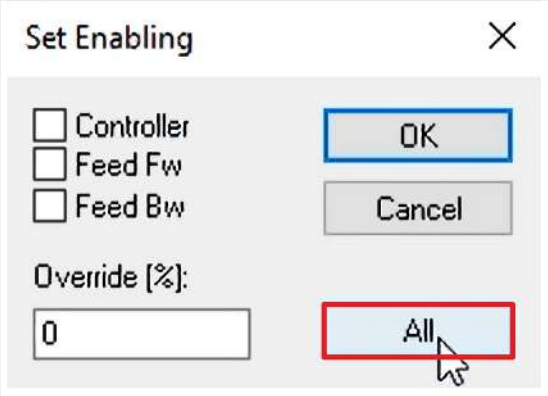
2.6 Let drive traverse



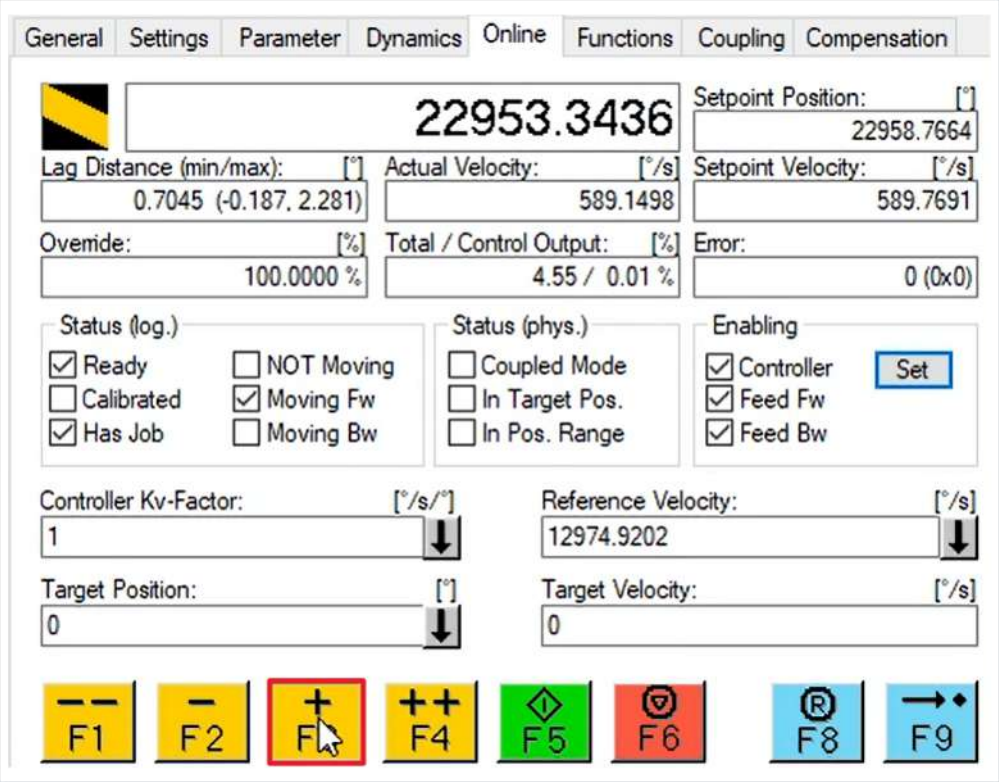
1. Open “Front ChA”



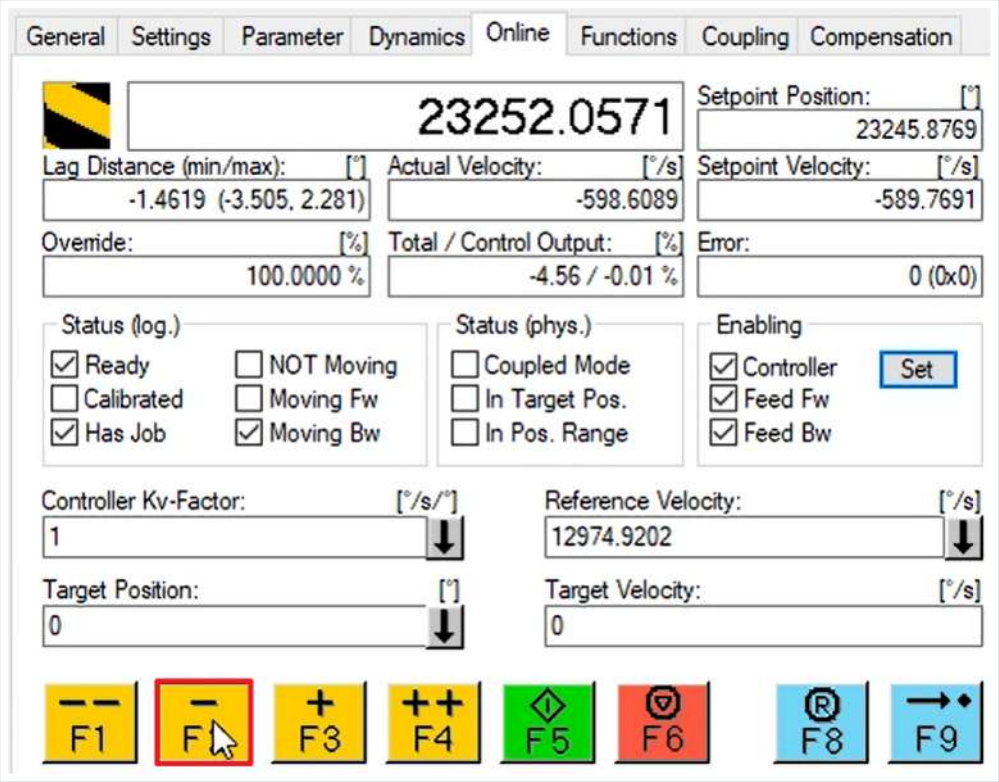
2. Open tab “Online”
3. Click on “Set”



4. Close window with “All”



5. Click “F3” to move the drive manually into the plus range



6. Click on “F2” to move the drive manually into the minus range

You see that you can move as expected.

There is now no connection to the EL6910. You can remove the EL6910 from your I/O configuration. This is only possible in a combination with the EL1918 and an AX8000.

More Information:
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