FEIG

Application example for using an RCCA-B/C/D without HMI

Contents

Preconditions

To understand this example, the following components are required: RCCA-B/C or D with current firmware (V1.0.21 or newer) GSMDL file for the TST RCCA, Siemens S7-1200F PLC, Siemens TIA Portal development environment not older than version V15.

TST FUF2/FU3F with activated RCCA functionality and activated parameter P.804 = 1.

To simplify the interaction between PG, PLC and RCCA, the use of an Ethernet switch is recommended. The address range of the adapter used in the PG must be set to 192.168.0.xxx/24.

Hardware configuration

Create a new project and add your control unit to the project. A Siemens S7-1212F DC/DC/DC is used in the example. A safety PLC is mandatory for communication via an RCCA from expansion stage -B!

If you have already integrated the GSDML into your project, select the corresponding hardware variant "TST-RCCA-" from the hardware catalogue under "Other field devices" -> "PROFINET IO" -> "I/O" -> "FEIG ELECTRONIC GmbH" -> "Door control" and add it to your project.

Establish the ProfiNet connection between the control unit and RCCA under "Network view".

Program blocks

Tags

To simplify the subsequent wiring, create a variable table with the control flags for open, stop and close commands in a suitable flag area.

		Name	Data type	Address
DoorControl				
1		Move_Open	Bool	%M200.0
2		Move_Stop	Bool	%M200.1
3		Move_Close	Bool	%M200.2

Figure 1: Control variables

Also create the required variables for the safety part of the sequence control.

		Name	Data type	Address
Safety				
1		F-Open	Bool	%Q2.0
2		F-Stop	Bool	%Q2.1
3		F-Close	Bool	%Q2.2
4		Mask_F-Open	Bool	%Q2.4
5		Mask_F-Stop	Bool	%Q2.5
6		Mask_F-Close	Bool	%Q2.6
7		Q-EM_Stop	Bool	%Q3.0
8		ACK	Bool	%M100.0
9		Trigger_E-Stop	Bool	%M100.1
10		ACK_Req	Bool	%M100.2

Figure 2: Safety variables

Example library

Open "Feig RCCA V1.1" under "Global libraries" and copy "Module" and "PLC data types" from the templates to the appropriate place in your project.

Figure 3: Global library

Program sequence

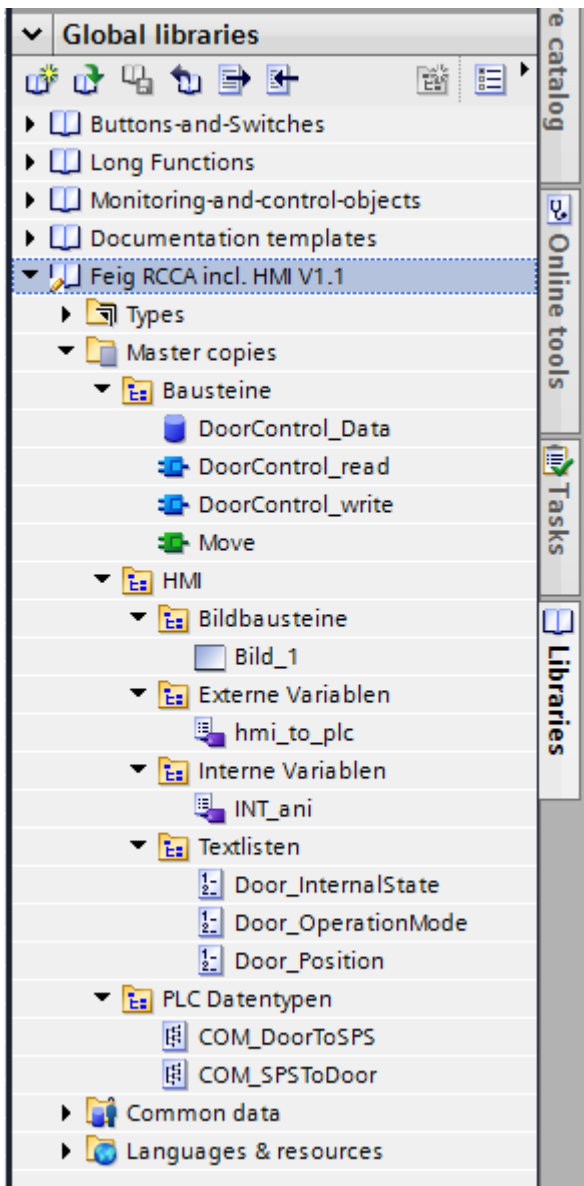Cyclical communication with the door control module is not required for simple movement commands. The structure is mentioned here for the sake of completeness. Movement commands for RCCA variants B, C and D are executed exclusively via the fail-safe part of the control unit.

The programme is processed cyclically in OB1 of the control programme.

Create a sequence according to the scheme: Read data, edit commands, write data.
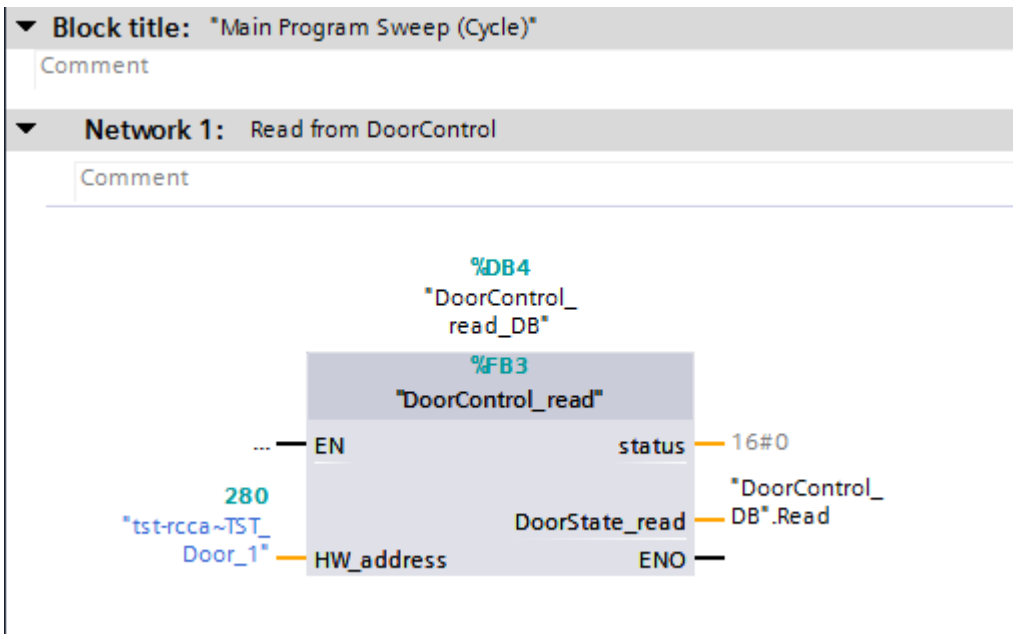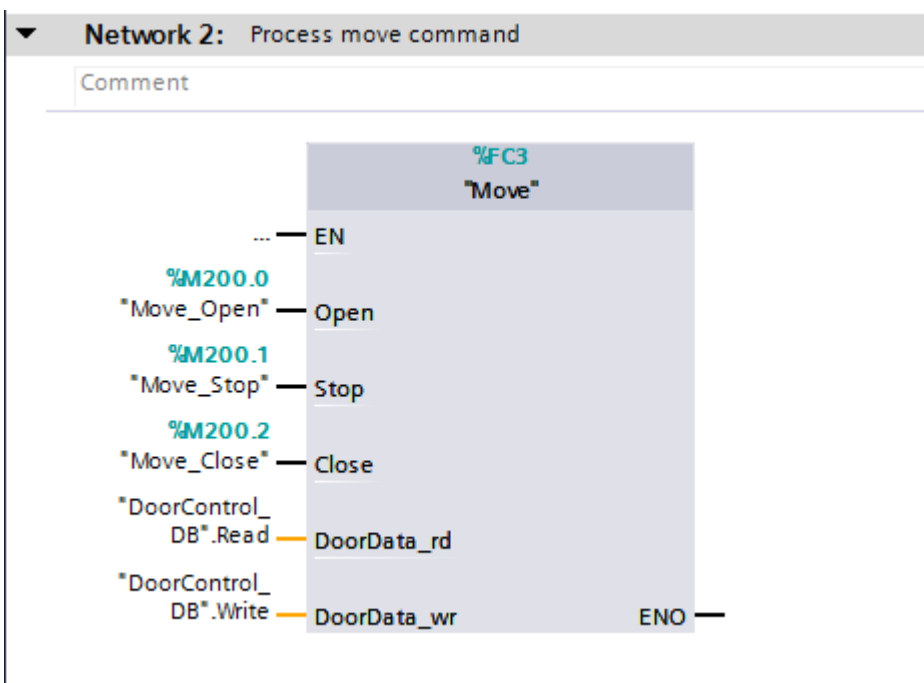

Figure 4: Read control data
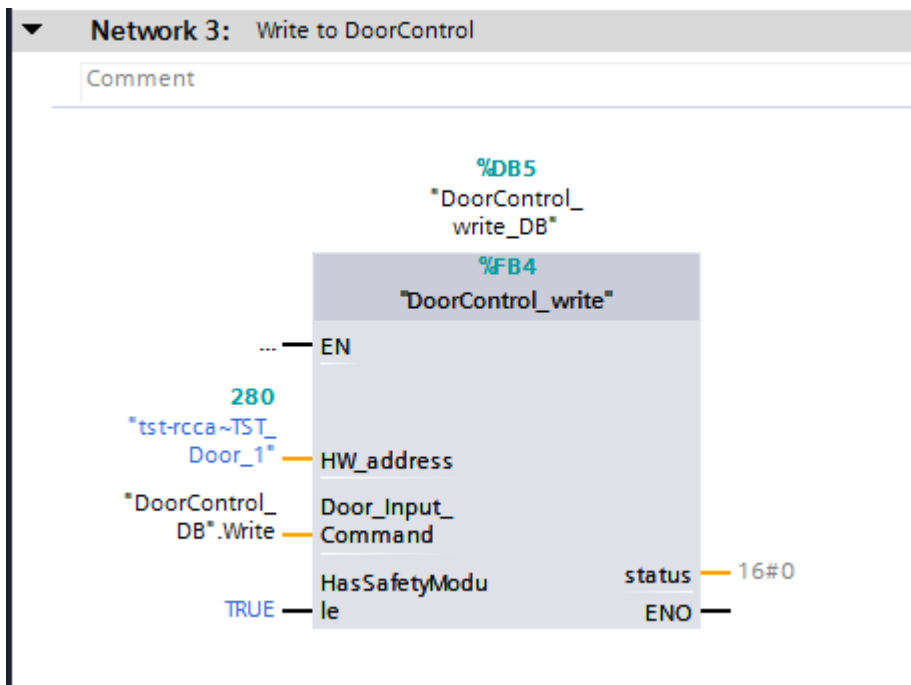

Figure 5: Edit movement command

Figure 6: Write control data

The hardware address of the module "tst-rcca~TST_Door_1" can be found in the PLC variables under "Standard variables".
First, select a global reintegration module from the standard library and drag it to the programme processing.

Security program

Open the "Main_Safety_RTG1" module. This module is created automatically when a fail-safe control unit is used and contains the programme for safety sequence group 1. This part of the programme takes over the actual control of the fail-safe components and thus the final movement commands to the RCCA.
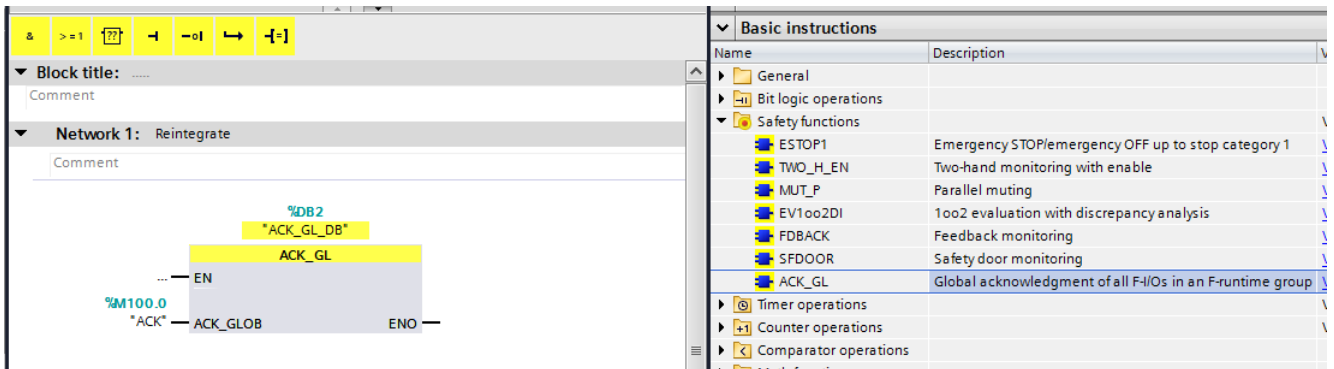
Figure 7: Network 1 - ACK_GL

Network 2 contains the handling of the fail-safe output of the RCCA. This is connected to the internal emergency stop of the door control unit. To control it, select the standard module "ESTOP1" from the standard library and insert it in network 2. The variables for control can be found in the "Safety[10]" variable table.

Figure 8: Network 2 - ESTOP1

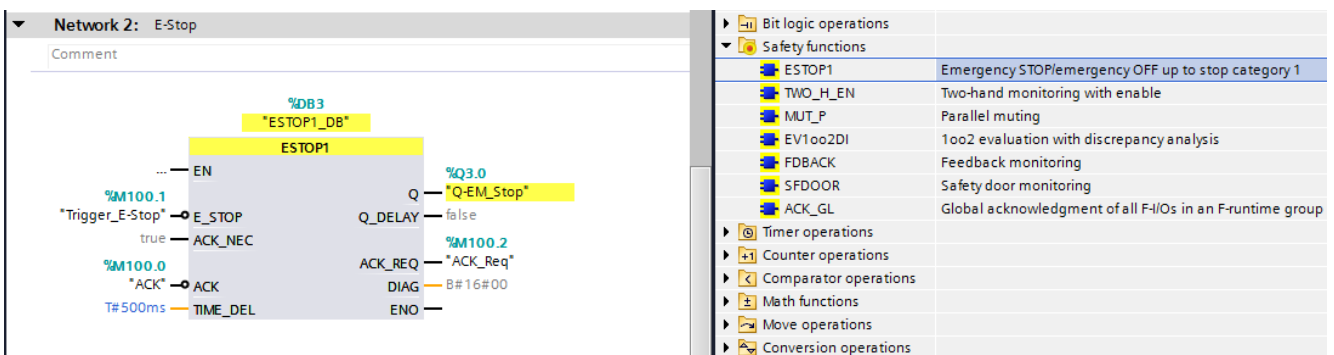In network 3, all movement masks are permanently set to the value "TRUE". A separate evaluation is not necessary for this example. Insert the module as shown in the figure:
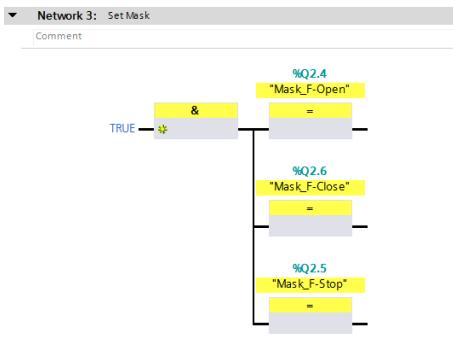
Figure 9: Mask bits of the movement commands

The following networks contain the forwarding of the movement commands to the input registers of the RCCA. Insert the networks as shown.
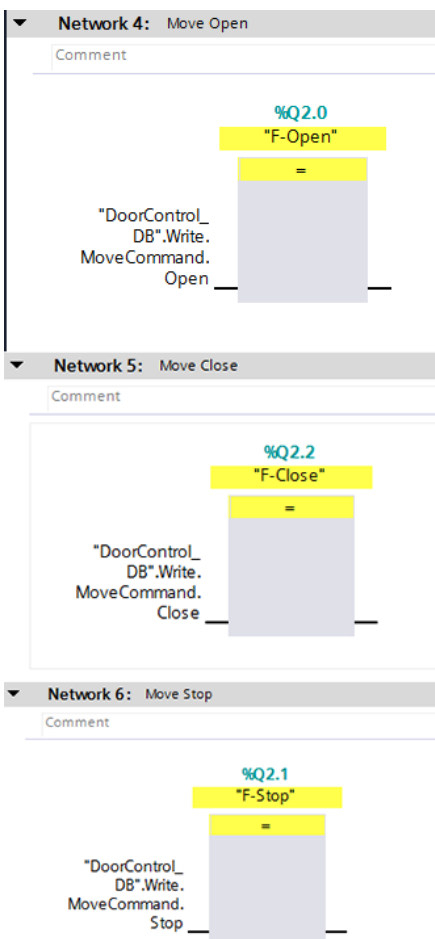
Figure 10: Input register control

F parameter

Some safety-related settings must be made so that the ProfiSafe-capable RCCA card can be controlled correctly. Switch to the device view and select the RCCA card. For this example, leave the configuration of the safe inputs at the default setting.
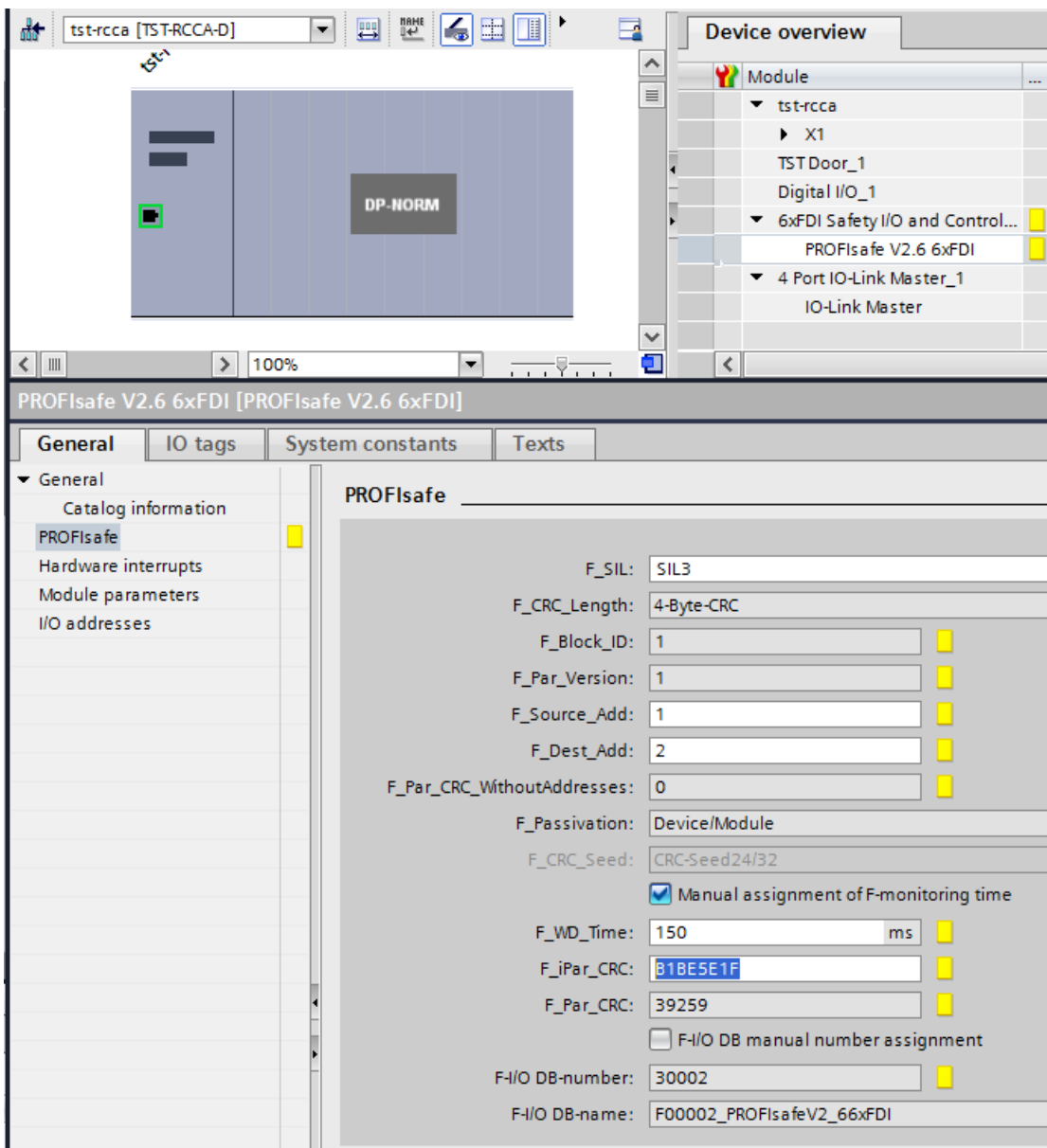Open the "Feig-iPar-CRC" programme by right-clicking on the RCCA module and selecting "Start device tool..."

Figure 11: iPar CRC - CRC calculation

Check that all settings are correct and tick them off in the "accepted" column.
Click on "calculate CRC" to obtain a checksum in the Decimal field. Insert this in the "F_iPar_CRC" field in the "General" tab -> "PROFIsafe" of the "PROFIsafe V2.6 6xFDI" module.

Watch and control

Now translate and transfer the hardware configuration and control programme.
Create a new monitoring table under "Monitoring and force tables", open it and add the Move_Close, Move_Open and Move_Stop control flags to it, as well as the ACK and Trigger_E_Stop flags.

The RCCA must be depassivated after the start process. This is achieved by a positive edge at the depassivation input on the "ACK_GL" module (ACK flag).
The door control unit now accepts movement commands via the force table.

	i	Name	Adresse	Anzeigeformat	Beobachtungswert	Steuerwert	⚡	
1		"Move_Close"	%M200.2	BOOL	☐ FALSE	FALSE	☑	⚠
2		"Move_Open"	%M200.0	BOOL	☐ FALSE	FALSE	☑	⚠
3		"Move_Stop"	%M200.1	BOOL	☐ FALSE	FALSE	☑	⚠
4		"ACK"	%M100.0	BOOL	☐ FALSE	FALSE	☑	⚠
5		"Trigger_E-Stop"	%M100.1	BOOL	☐ FALSE	FALSE	☑	⚠

Figure 12: Watch and force table

All other available door control information can be called up via the DB "DoorControl_DB".