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INDI4.0

## **PNOZmulti - Programming and Service**

### **Appendix B** General Issues

**PILZ**  
THE SPIRIT OF SAFETY



PILZ | B-2

## Modul program

Macro

Migration tool

- ▶ The user program always consists of a main program
- ▶ In 2<sup>nd</sup> generation, complex modules are configured in their own sub-program, the module program.
  - Motion monitoring (1MM or 2MM)
  - Analog modules (4AI)
  - Output module for presses (8DI2DOT)
- ▶ The structure of a module program is identical to the main program.
  - Only those elements are made available that are required for the module to be configured.
- ▶ The module programs are linked to the main program via:
  - Program connector inputs
  - Program connector outputs

# ▶ Module Program

## Program connector in- and outputs

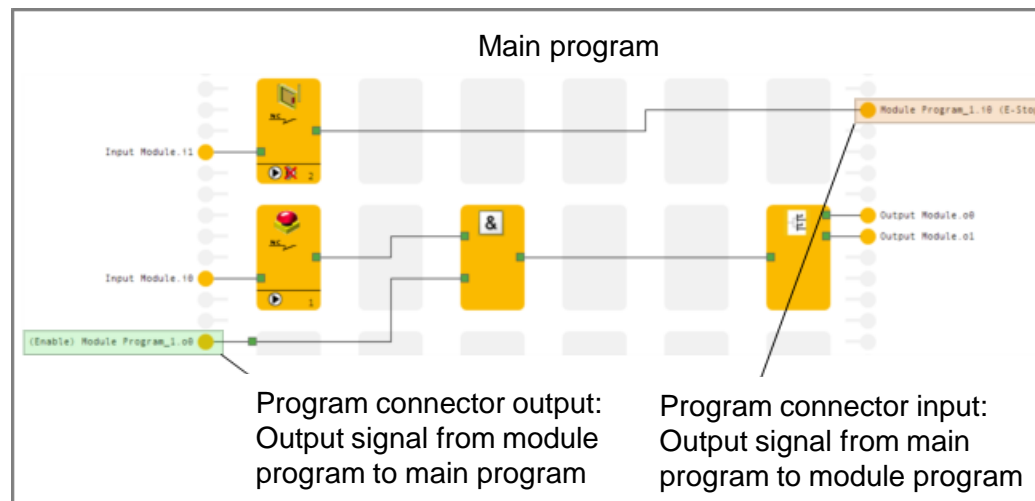
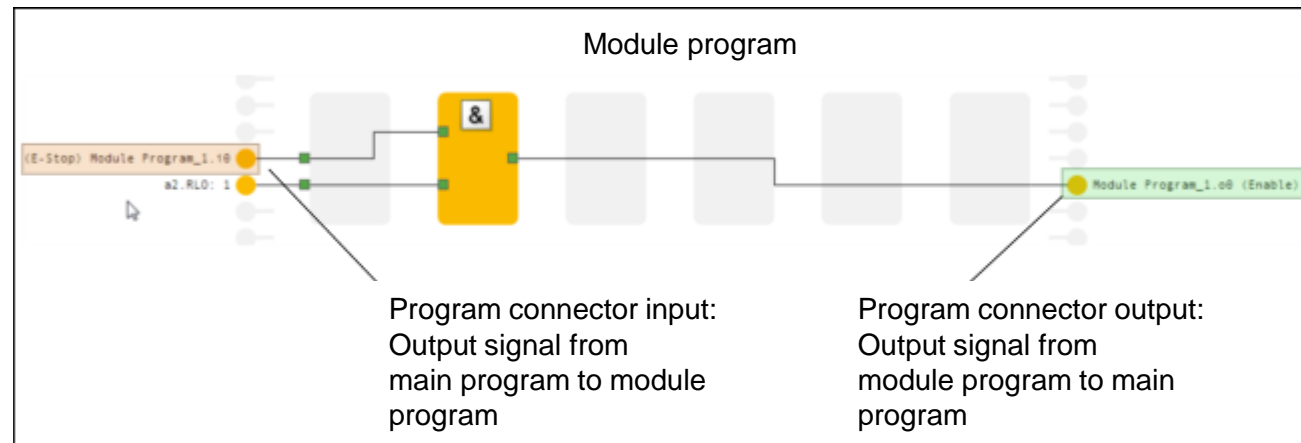


PILZ | B-2

### Modul program

Macro

Migration tool



# ► Macro General



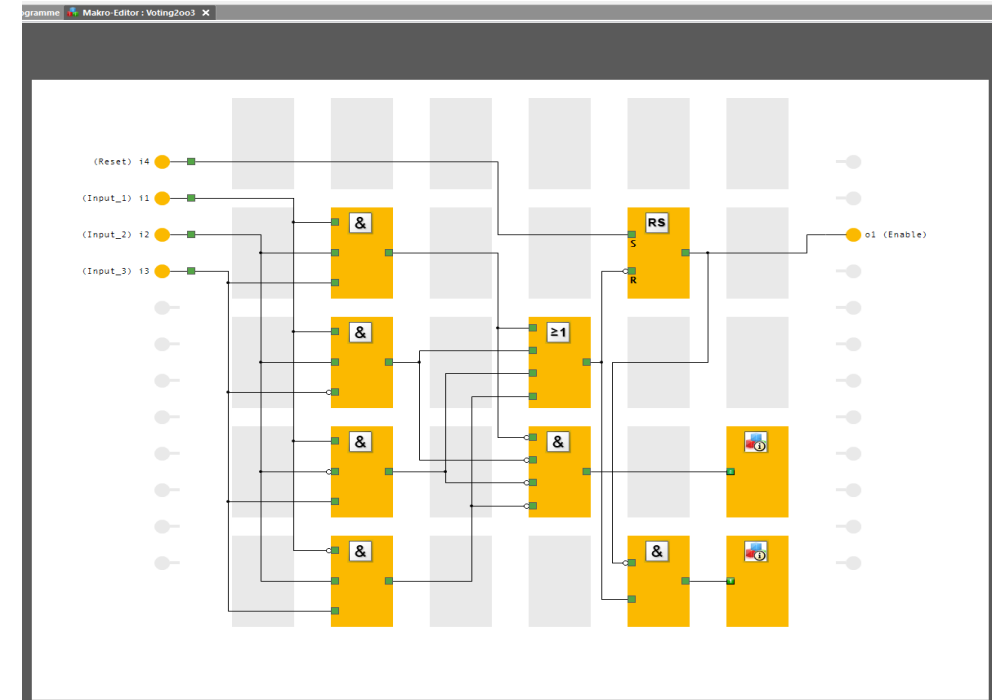
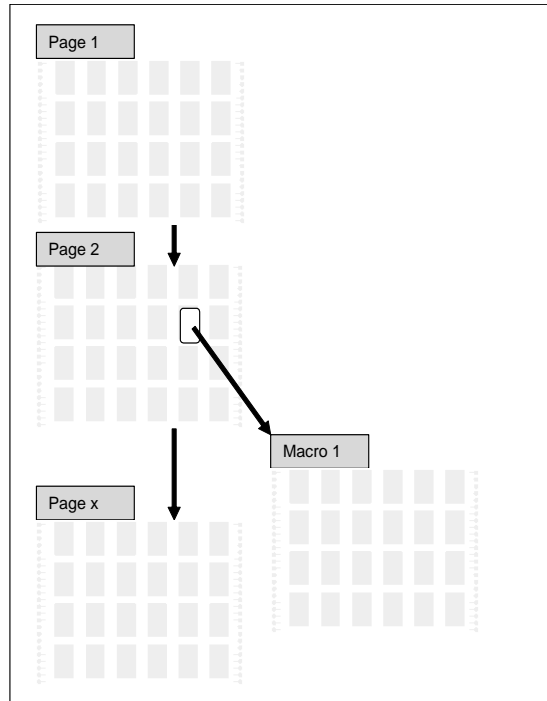
PILZ | B-3 +

Modul program

**Macro**

Migration tool

Macros are used for:  
Improvement of the program structure / Library (example: voting 2oo3)



Macros can be read or write protected

Protection

Write-Protect Macro  Read-Protect Macro



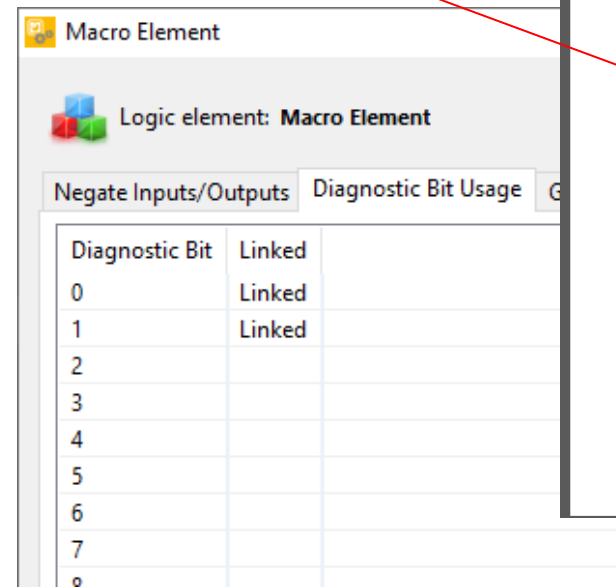
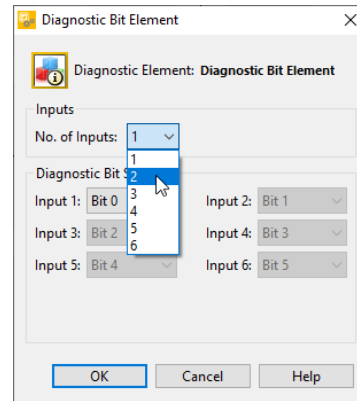
PILZ | B-4

Modul program

**Macro**

Migration tool

## Diagnosis via: Macro diagnostic bit element



The diagnostic messages of the macro can:

- displayed in online mode of the PNOZmulti configurator
- displayed on a PVIS device

## ► Migration Tool General



PILZ | B-6

Modul program

**Macro**

Migration tool

- Tool to easily switch from 1<sup>st</sup> generation and Mini to 2<sup>nd</sup> generation
- Simple operation and handling
- Fully automatic change of hardware configuration
- Acceptance of the complete program with the exception of complex modules (e.g. speed and analog modules) **CANNOT** be accepted



PILZ | B-6

Modul program

Macro

**Migration tool**

FROM		TO
Base units (1st generation): PNOZ m0p (ETH) PNOZ m1p (ETH) PNOZ m2p (ETH)	⇒	Possible base units: PNOZ m B0 PNOZ m B1
Base unit (1st generation): PNOZ m3p (ETH)	⇒	Possible base unit: PNOZ m B1 Brenner
Base units (mini): PNOZ mm0p PNOZ mm0.1p PNOZ mm0.2p	⇒	Possible base units: PNOZ m B0 PNOZ m B1
Base unit (2nd generation): PNOZ m B0	⇒	Possible base unit: PNOZ m B1



PILZ | B-7

Modul program

Macro

**Migration tool**

I/O modules that are not supported:

- Speed monitoring modules ms1p - ms4p (speed monitoring elements)
- Analog input module PNOZ ma1p (analog input element)
- Standard input module PNOZ mi2p (currently not available)
- Two-pole output module PNOZ mo3p (output element with the "two-pole" option. (Currently not available))



# Migration Tool

## Start the tool



PILZ | B-11

Modul program

Macro

**Migration tool**

The screenshot displays the Migration Tool software interface. On the left, a 'Modules' list is expanded to show 'Base Units (Ethernet)' and 'Base Units (PNOZmulti 2)'. The 'Base Unit PNOZ m B1' is highlighted in blue. A red arrow points from this selection to a workspace area. The workspace, titled 'Adding New Module', contains a large yellow module (PNOZ m1p ETH) and three smaller modules (PNOZ m1p ETH, PNOZ m1p ETH, and PNOZ m1p ETH). A blue box highlights the top of the large module, and a red arrow points from the 'Base Unit PNOZ m B1' selection to this box. The workspace also contains an information icon and the text: 'Drop module anywhere on workspace or place between required modules'.

# Migration Tool

## Migration overview



PILZ | B-12

Modul program

Macro

Migration tool

Migration Preview

**Program Changes**  
⚠ 38 Main Program element(s) out of 39 migrated.

### Migrated VS Not Migrated Elements

Not migrated

Migrated

● Migrated ● Not migrated

**1 element (s) cannot be migrated and will be removed:**

Element	Grid Location	Page	
✘ Speed Monitor	3,2	3	

Help < Back Next > Finish Cancel

# ► Migration Tool

## The new hardware configuration



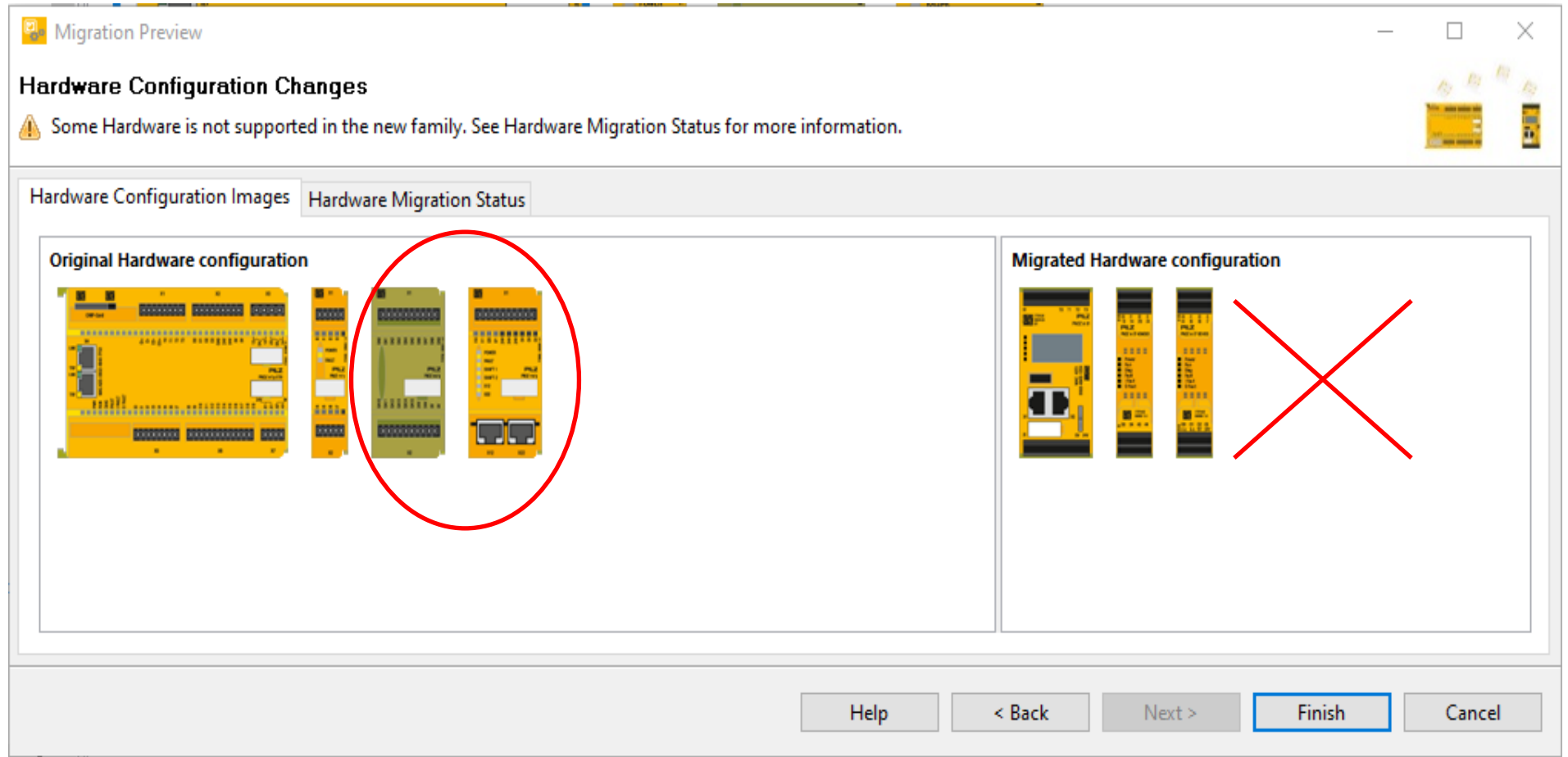
PILZ | B-12

Modul program

Macro

**Migration tool**

### Some modules have to be inserted manually



# ► Migration Tool

## Hardware configuration - migration status



PILZ | B-12

Modul program

Macro

**Migration tool**

### Hardware configuration log

**Migration Preview**

#### Hardware Configuration Changes

⚠ Some Hardware is not supported in the new family. See Hardware Migration Status for more information.

Hardware Configuration Images | **Hardware Migration Status**

Hardware Position	Original Project Hardware	Migrated Project Hardware
✓ 0	Base Unit PNOZ m1p ETH	Base Unit PNOZ m B1
✓	<i>Base Unit PNOZ m1p ETH (Program I/Os)</i>	<i>Equivalent module(s) added for Program I/Os as necessary.</i>
✓ 1	<i>Input Module PNOZ mi1p</i>	<i>Equivalent module(s) added for Program I/Os as necessary.</i>
✓ 2	<i>Output Module PNOZ mc1p</i>	<i>Equivalent module(s) added for Program I/Os as necessary.</i>
✗ 3	<i>Speed Monitor Module PNOZ ms1p</i>	<i>Not Supported</i>

Help < Back Next > Finish Cancel

# ► Migration Tool

## Migration report



PILZ | B-13

Modul program

Macro

**Migration tool**

PNOZmulti Report Migration Information



### Original Project Name

Migration.mpnz

### Migrated Project Name

MIGRATED\_Migration.mpnz2



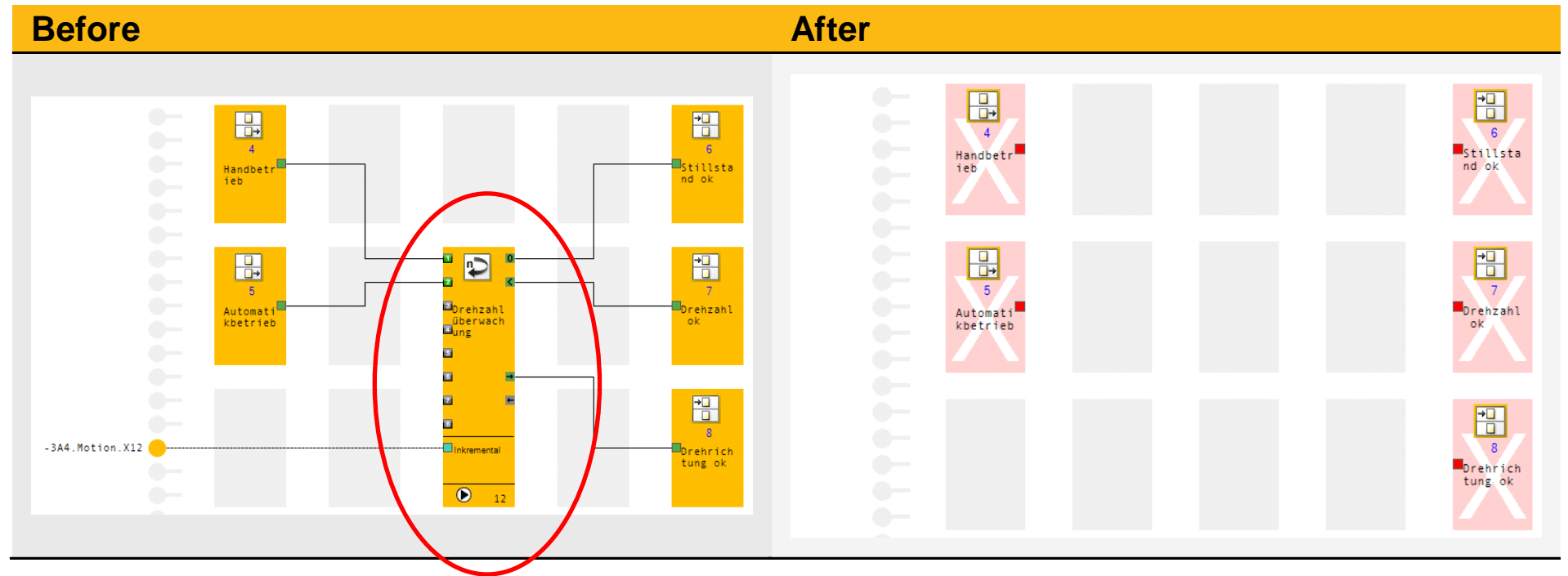
PILZ | B-13

Modul program

Macro

**Migration tool**

## Motion monitoring element from 1st generation



# ► Migration Tool

## Hardware configuration



PILZ | B-14

Modul program

Macro

**Migration tool**

Insert a new motion monitoring module:

Hardware Configuration x User Programs Migration Report

Modules

- Fieldbus module PNOZ m ES EtherNet/IP
- Fieldbus module PNOZ m ES Profinet
- Fieldbus module PNOZ m ES Powerlink
- Input Modules
  - Input Module PNOZ m EF 16DI
- Output Modules
  - Output Module for standard applications PNOZ m EF 16DO
- Relay Output Modules
  - Relay Output Module PNOZ m EF 4DI4DOR
- Semiconductor Output Modules
  - Input/Output Module PNOZ m EF 8DI4DO
  - Semiconductor Output Module Dual-Pole PNOZ m EF 16DO
- Motion Monitoring
  - Motion Monitoring Module PNOZ m EF 1MM
  - Motion Monitoring Module PNOZ m EF 2MM**
- Analogue Modules

Overview of hardware configuration

Double click on module or drag/drop onto the Preview Area

Preview Area: A rack of modules is shown. The selected module (Motion Monitoring Module PNOZ m EF 2MM) is highlighted in blue and circled in red. Red arrows point from the selected module in the sidebar to its position in the rack.

# ► Migration Tool Modul program



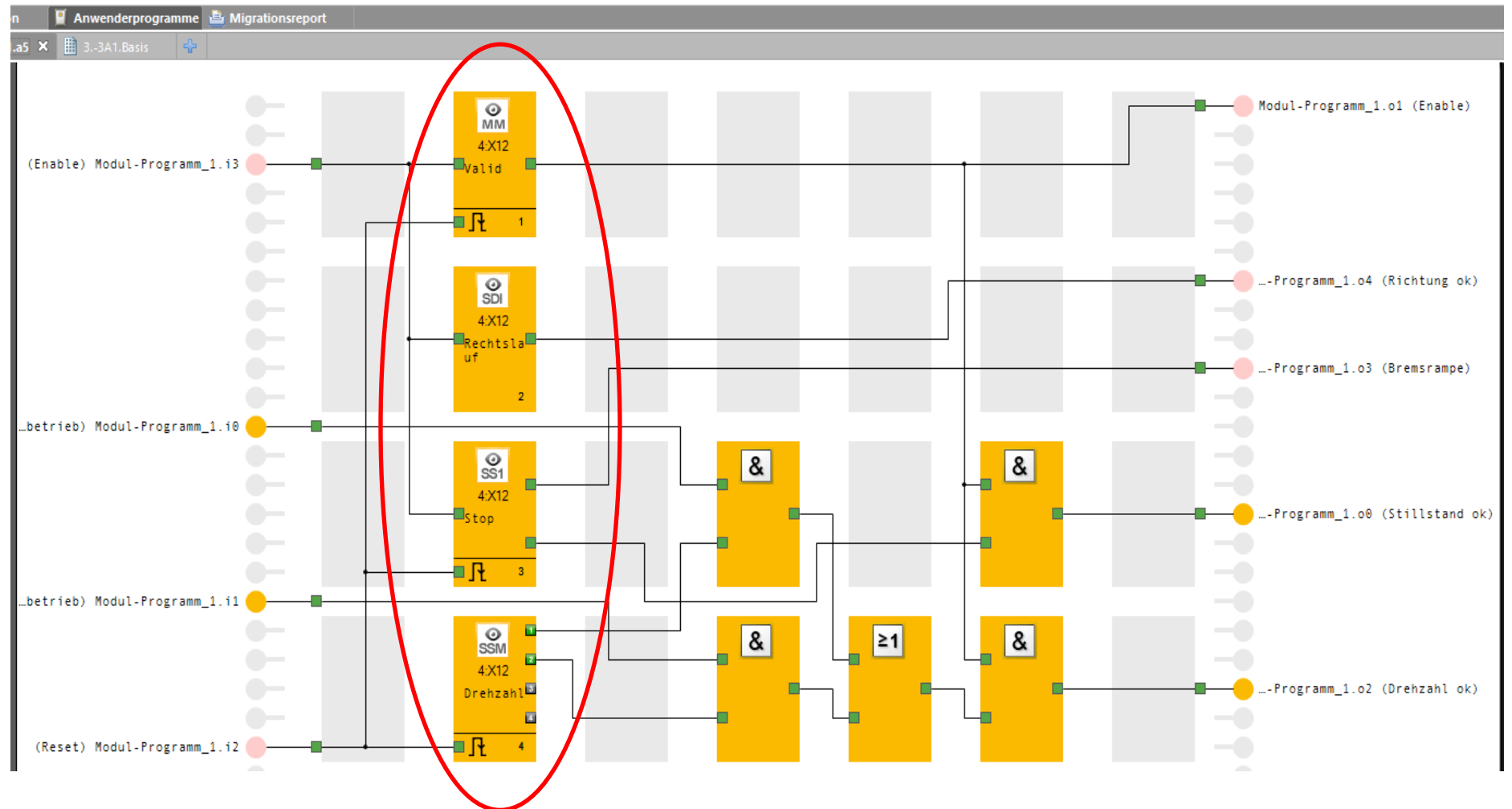
PILZ | B-15

Modul program

Macro

**Migration tool**

## New elements of the motion module (in the module program)





# Migration Tool

## Main program



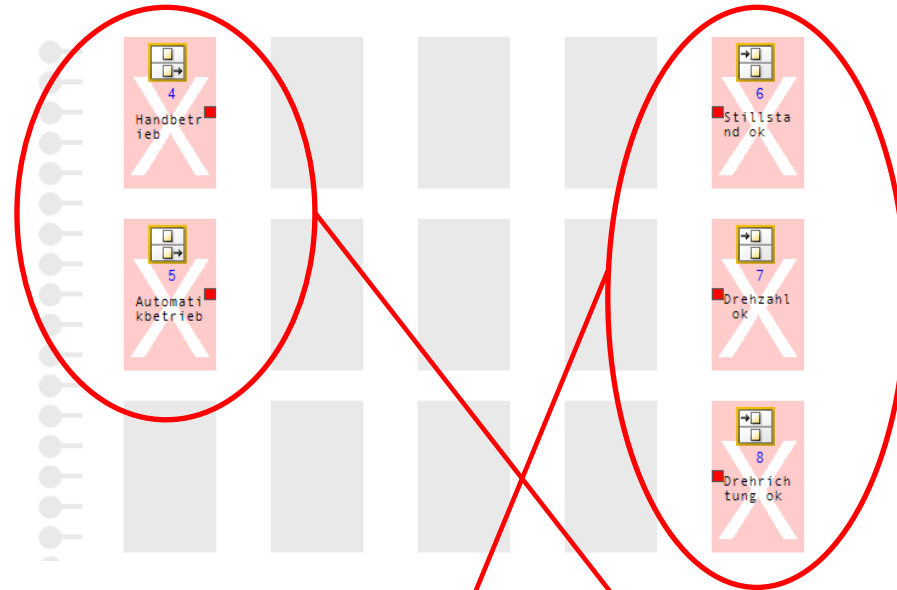
PILZ | B-15 +

Modul program

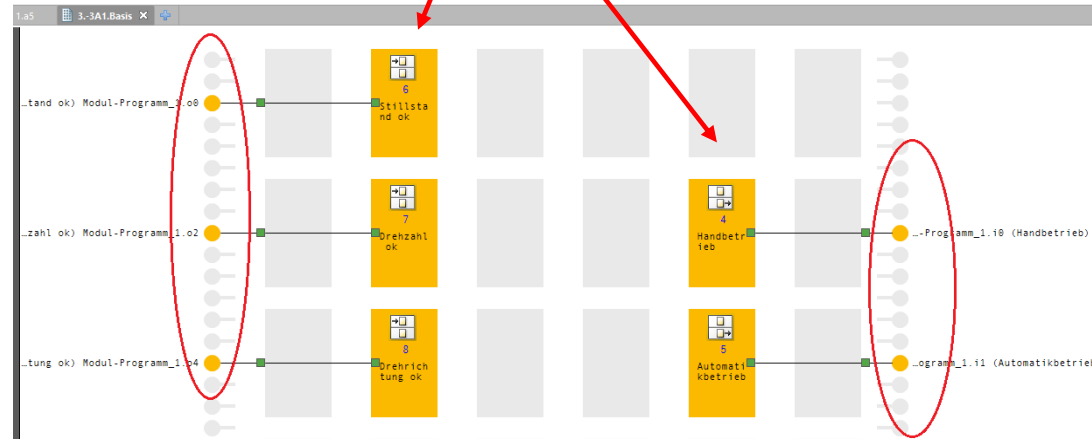
Macro

**Migration tool**

Old:



New:

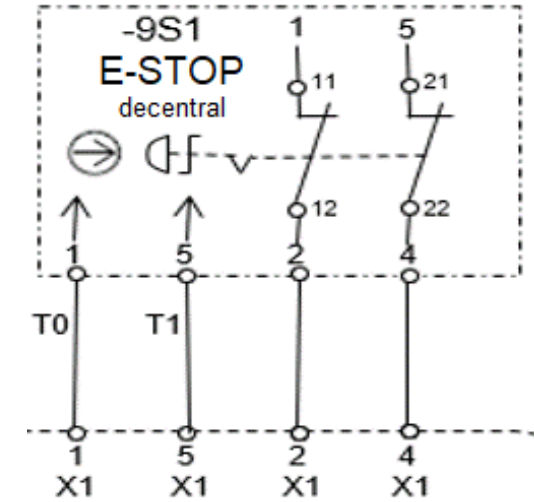


## ► Programming Exercise (optional)



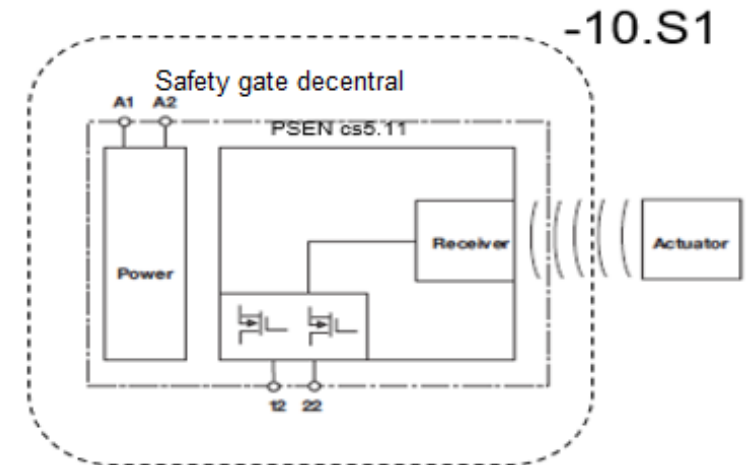
### Programming exercise (part 1)

► Page B-17



### Programming exercise (part 2)

► Page B-20



## Automatisierungs- technik

COMPONENTS  
SYSTEMS  
SERVICES

innovativ    ökologisch  
sicher        wirtschaftlich

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THE SPIRIT OF SAFETY

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