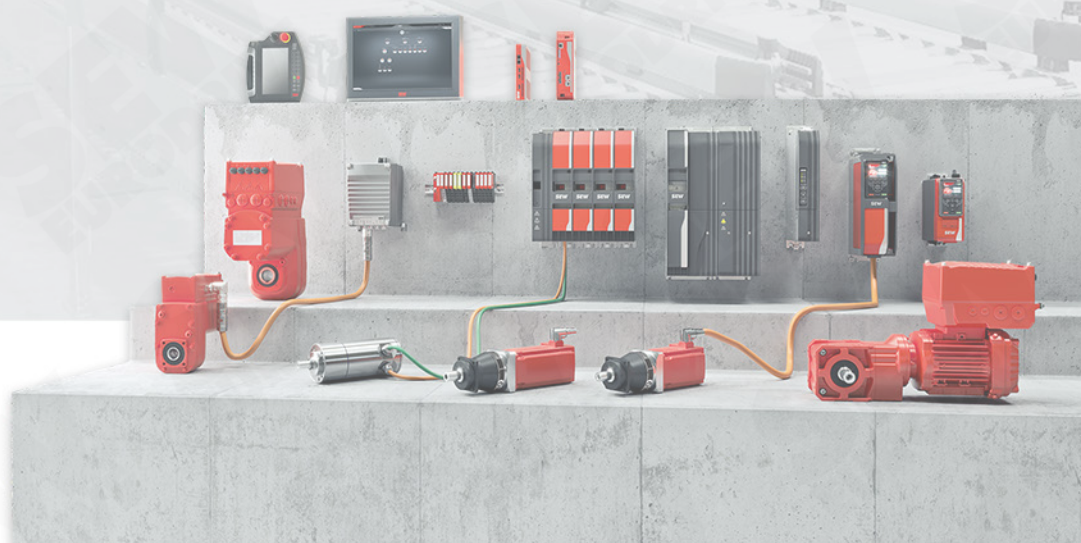


Product Training Workbook

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MOVI-C® Automation System
MOVIKIT® FlyingSaw Software Module
Parameterization and Diagnostics

C141

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Objectives of this training document

- In this workbook, you will learn to start up the flying saw application on a training model and control it via the process data interface.

Additional documents

- MOVIKIT FlyingSaw software module manual, PDF version
- MOVIKIT® FlyingSaw software module manual, HTML version
- MOVIKIT® FlyingSaw brief information

The product training team will be happy to assist you if you have any questions or suggestions.

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Meaning of the symbols:



Operating notes



Information



Safety-relevant information



Tip



Diagnostics and troubleshooting



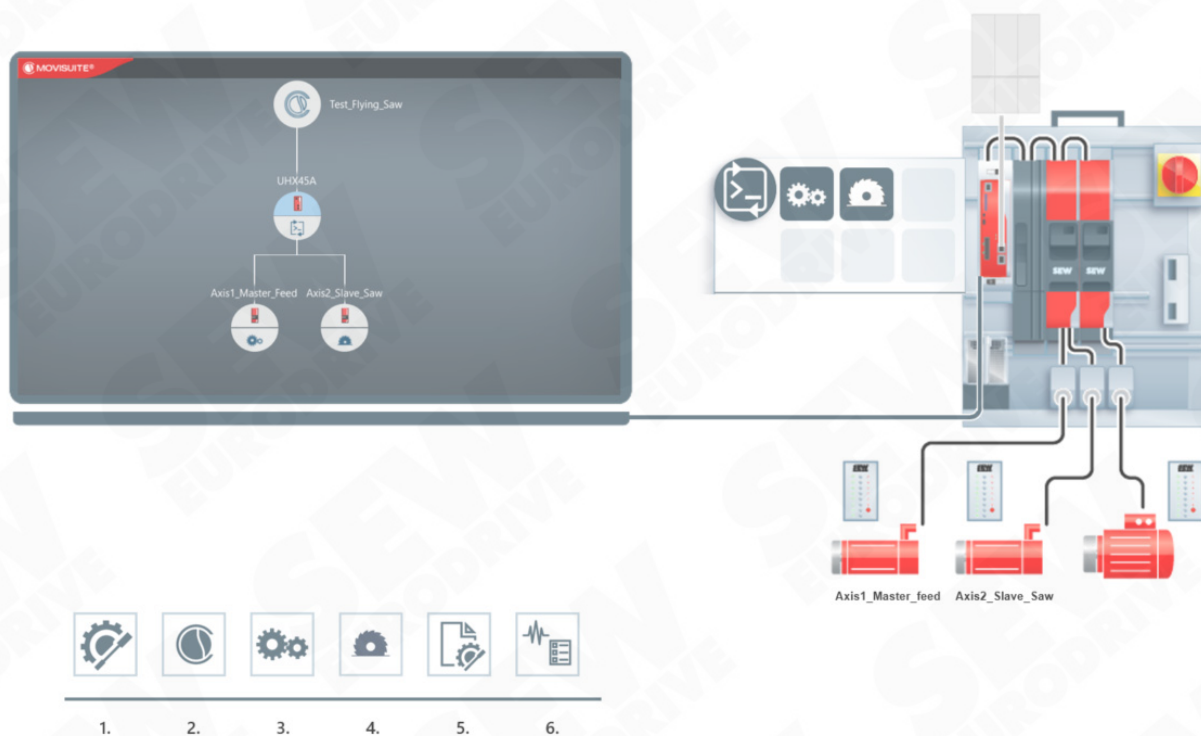
Practical task



Additional documentation

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Workbook steps



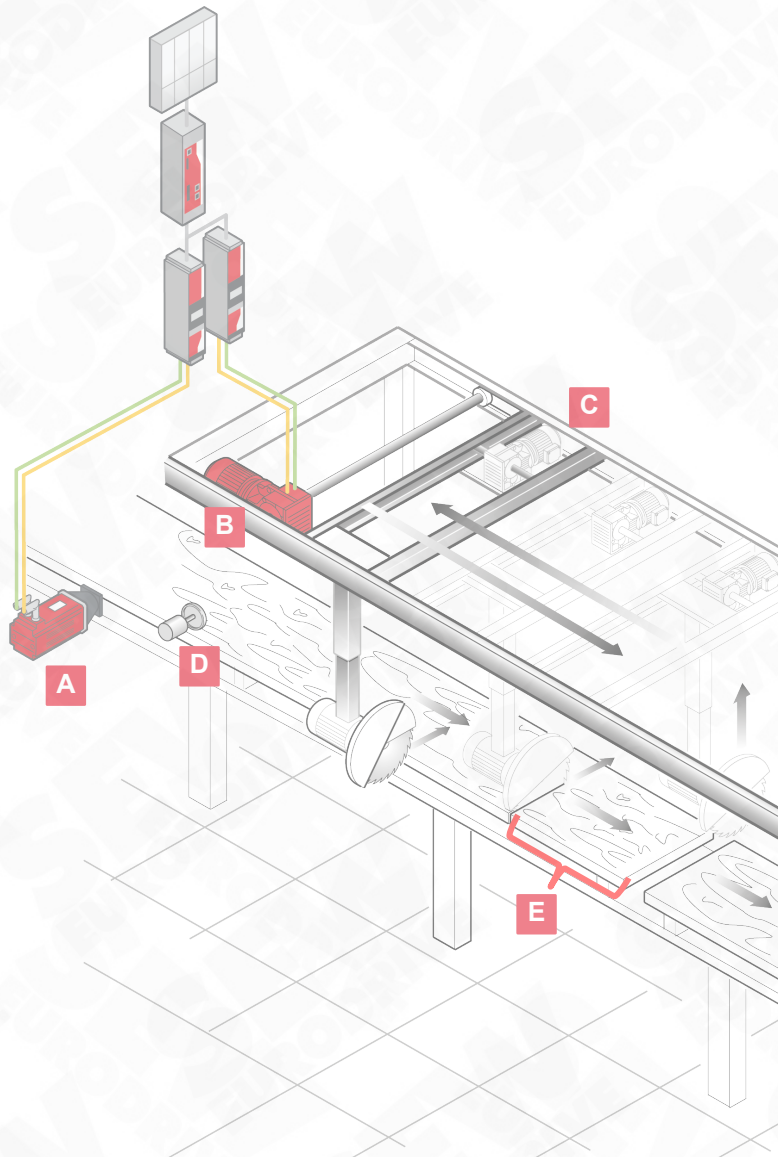
1. Introduction
2. Project setup and basic startup in MOVISUITE®
3. Configuring the master axis (Axis1_Master_Feed)
4. Configuring the slave axis (Axis2_Slave_Saw)
5. Creating an IEC project and starting an IEC program
6. Control via the process data monitor

1 Introduction

- Objectives:**
- Being familiar with the flying saw application with cut length control
 - Being familiar with the system configuration with the training model and software used



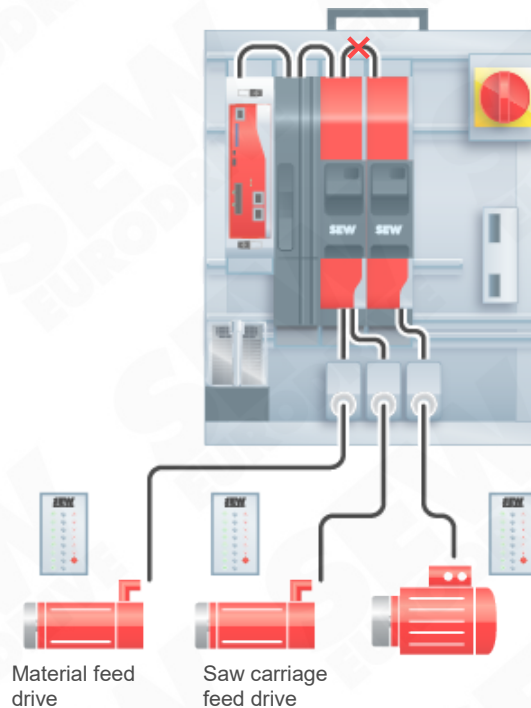
1.1 Flying saw application



Application: A common industrial application for the MOVIKIT® FlyingSaw is the woodworking industry. In the application example, long pressed particle boards are cut to length. The software module controls the drive for the feed of the saw carriage along the longitudinal axis.

- A** Material feed drive
The material feed drive is commonly not part of the SEW-EURODRIVE drive solution. In the standard case, the material speed is only recorded via an external encoder. This setup is too hardware-dependent for the workbook. For this reason, an SEW-EURODRIVE axis will be used instead of an external encoder for the simulation of the material feed here.
- B** Saw carriage feed drive
- C** Saw feed drive
This drive is not controlled by the MOVIKIT® FlyingSaw software module. For simplification, it is disregarded in the application example.
- D** External encoder: The external encoder provides the speed of the material.
- E** Cutting length

1.2 Training model



Axis 1 = **Axis1_Master_Feed** drive with motor encoder => MOVIKIT® Gearing
 Axis 2 = **Axis2_Slave_Saw** drive with motor encoder => MOVIKIT® FlyingSaw
 Axis 3 = not used

Software:

MOVISUITE® 2.40

- IEC Editor 3.5.18.2
- MOVIKIT® Gearing V8.0.41.200
- MOVIKIT® FlyingSaw V8.0.40.200

Hardware:

2 x MOVIDRIVE® modular or system or technology, double axis is also possible.

2 x synchronous or asynchronous motor with encoder. Mixes are also possible.

1 x MOVI-C® UHX CONTROLLER...All classes are possible

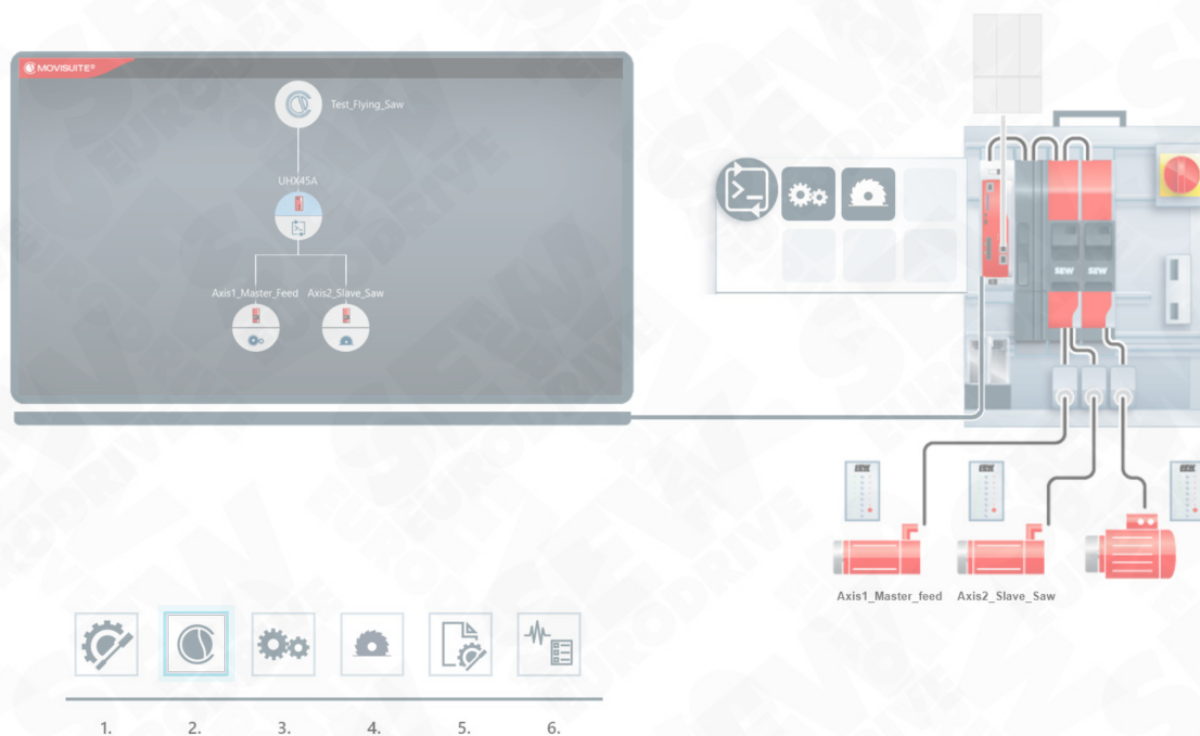


If the training model is not available, the exercises can also be done using any MOVI-C® CONTROLLER and MOVIDRIVE® modular/system with drive.

The hardware configuration must then be adapted according to the hardware being used. If no inverter/drive hardware is available, the axes must be operated in a simulation.

2 Project setup and basic startup in MOVISUITE®

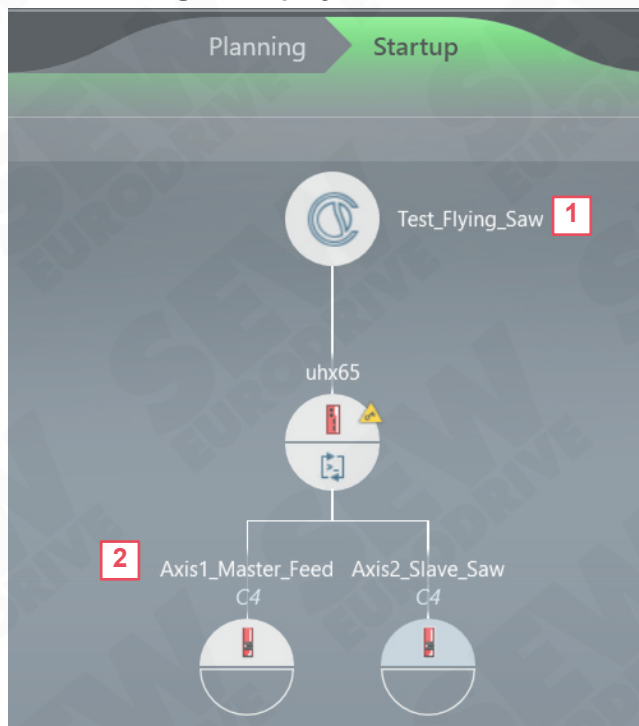
Objectives: ■ Being able to set up a project and perform basic startup of the axes



2.1 Project setup

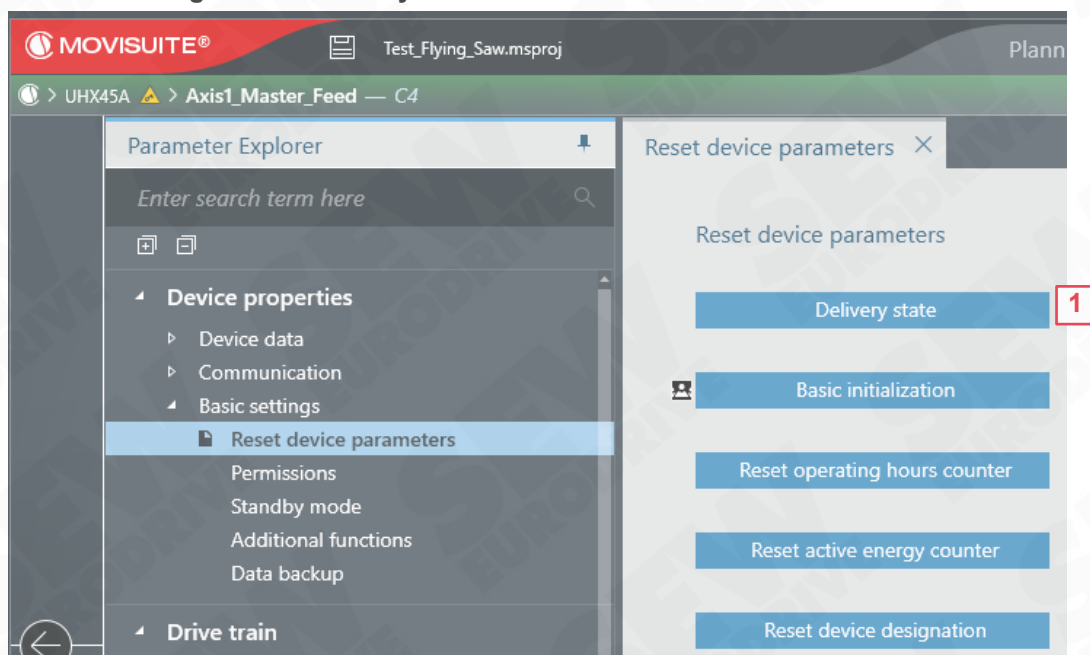


1. Creating a new project



- 1 Create a new project from the network scan and save it under the name "Test_FlyingSaw."

2. Resetting axes to delivery state



- 1 Reset each axis to the **delivery state**.
- 2 Assign the names for the axes exactly as shown here in the workbook.

**Important information:**

- The names of the axes must not contain any empty spaces between the words. Empty spaces between words lead to errors in the IEC editor.

Axis 1	Axis1_Master_Feed
Axis 2	Axis2_Slave_Saw

- Your project should encompass the controller and 2 axes. If there are more than two axes, disconnect all other axes.
- The left one is the master axis with MOVIKIT® Gearing and the right one is the slave axis with MOVIKIT® FlyingSaw.
- Make sure that the master axis is in the first position (to the left of all slave axes).

2.2 Basic startup of master and slave axes



In this example application, the master and slave axes are started up using the same parameters. Perform the following 3 steps for the master axis and the slave axis.

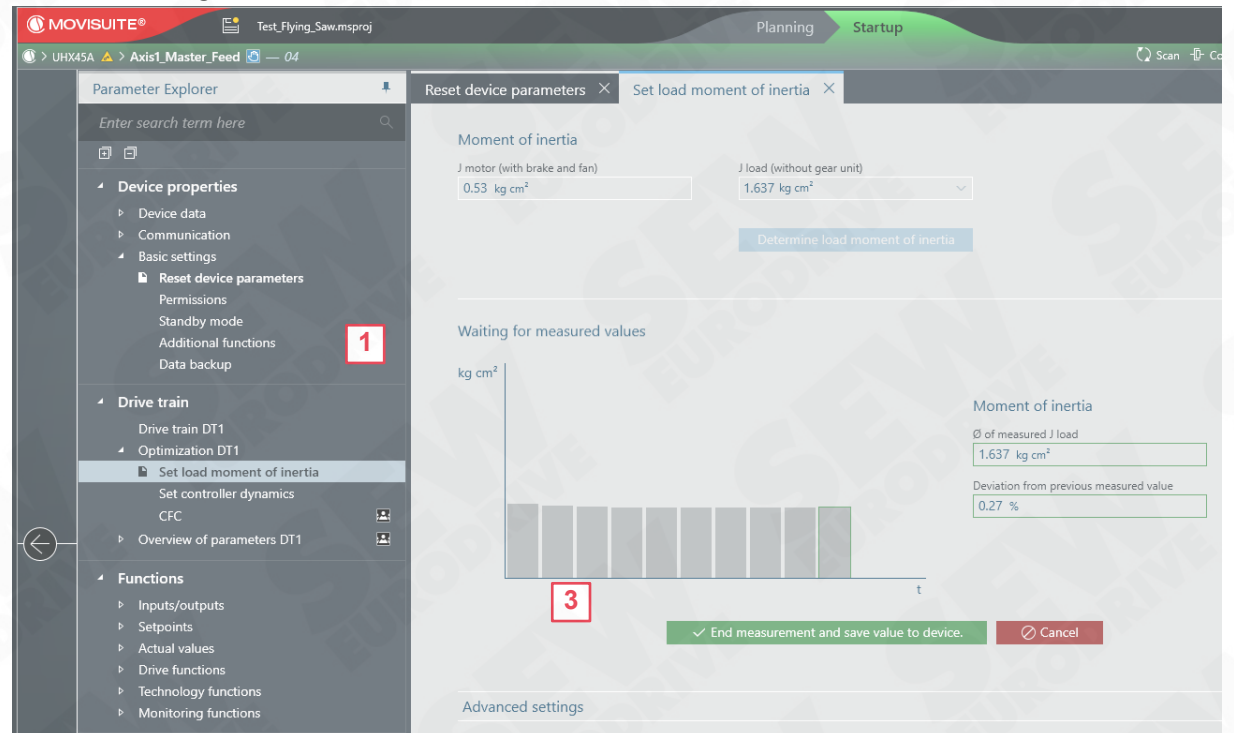
1. Setup of the drive train

- 1** Enter the depicted components into the drive train and parameterize them as follows:

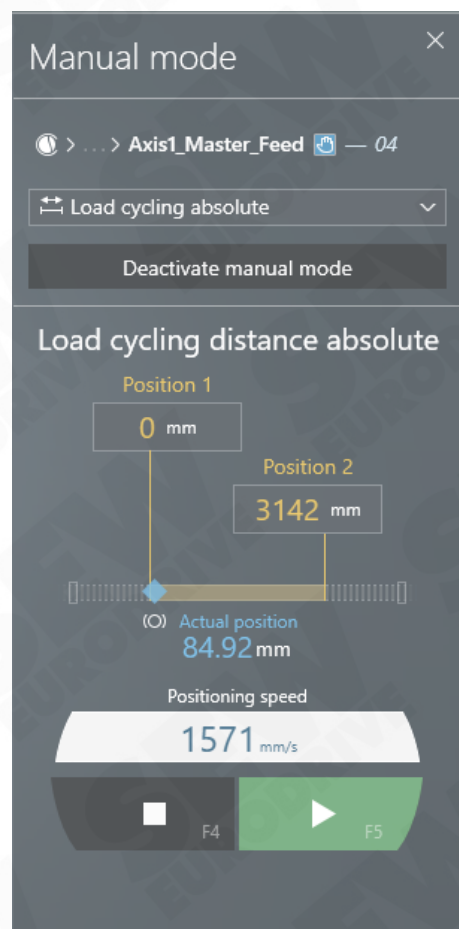
Component	
Additional transmission	i-total = 15
Drive wheel	Diameter = 150 mm
User unit	Distance, rotational speed, and acceleration must be in the same units: mm, mm/s, mm/s² Leave the decimal places unchanged. They will be automatically adjusted by MOVIKIT® Gearing

2. Optimization of the axis "Axis1_Master_Feed"

▪ Determining the load moment of inertia



- 1 Determine the load moment of inertia through a measurement



- 2 To do so, move the axis to the absolute position in manual mode using load cycling
- 3 Adopt the determined load moment of inertia of the load (without gear unit)

■ Setting the controller dynamics

The screenshot shows the MOVISUITE software interface. The left sidebar, titled 'Parameter Explorer', has a search bar and a tree view. Under 'Device properties', 'Basic settings' is expanded, and 'Set controller dynamics' is selected. The main window, titled 'Set controller dynamics', has a 'Dynamic behavior' section. It contains two sliders: 'Stiffness of the control system' (set to 0.5) and 'Zero clearance' (set to 100%). Below the sliders are icons for 'With backlash' and 'Zero backlash'. The 'Auxiliary tools' section has buttons for 'Open manual mode' and 'Open Scope', and a 'Use advanced settings' toggle.

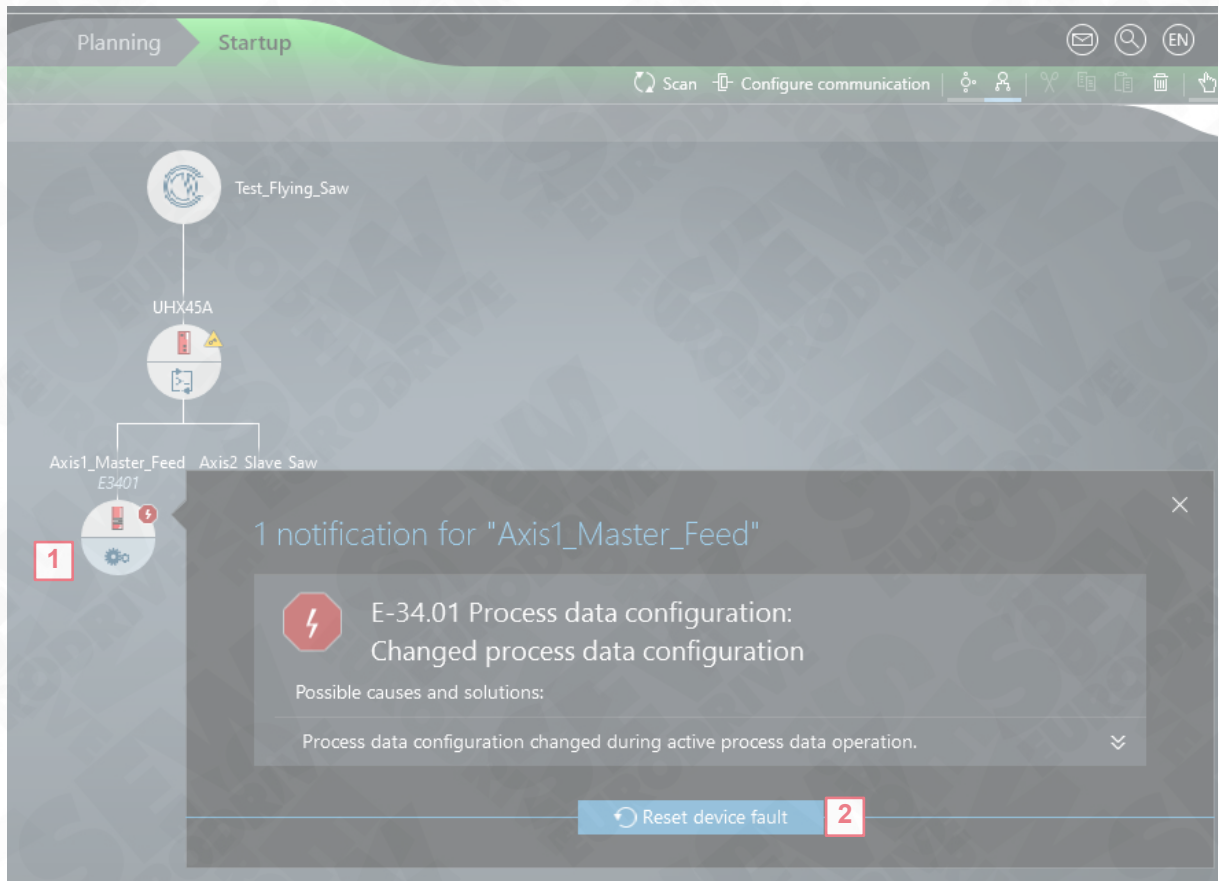
- 2 Set the controller dynamics and check the configuration in manual mode. The motor should be well optimized.

3 Configuring the master axis (Axis1_Master_Feed)

- Objectives:**
- Being able to assign the MOVIKIT® Gearing to the master axis
 - Being able to parameterize the master axis



3.1 Assigning the MOVIKIT® Gearing software module



- 1 Assign the MOVIKIT® Gearing from the catalog to the master axis
- 2 Acknowledge the "Changed process data configuration" message

3.2 Activating the fieldbus interface



1. Configuring the fieldbus interface

Fieldbus configuration

Parameter	Value
Activate fieldbus connection	Yes 1
Start address	1 2

Process data length

Parameter	Value
Basic process data	8
Process data of additional functions	0
Process data for additional process values of the inverter	0
Optional process data	0
Additional process data user program	0
Process data length	8

Decimal places via fieldbus

Parameter	Position	Speed	Acceleration	Jerk
Number of decimal places	2	0	0	0

PROFINET diagnostic alarms

Activate diagnostic alarms: ☐

Fieldbus interface

PLC	PLC output data	PLC input data	MOVIKIT®
	>>>>	<<<<	
Control word	PO 1	PI 1	Status word
Setpoint speed	PO 2	PI 2	Actual speed
Setpoint acceleration	PO 3	PI 3	Status or fault/subfault
Setpoint deceleration	PO 4	PI 4	Torque [0.1% nominal motor torque]
Digital outputs	PO 5	PI 5	Digital inputs
Setpoint application mode	PO 6	PI 6	Actual application mode
Target position – high word	PO 7	PI 7	Actual position – high word
Target position – low word	PO 8	PI 8	Actual position – low word

1 Activate the fieldbus interface by choosing **Yes**

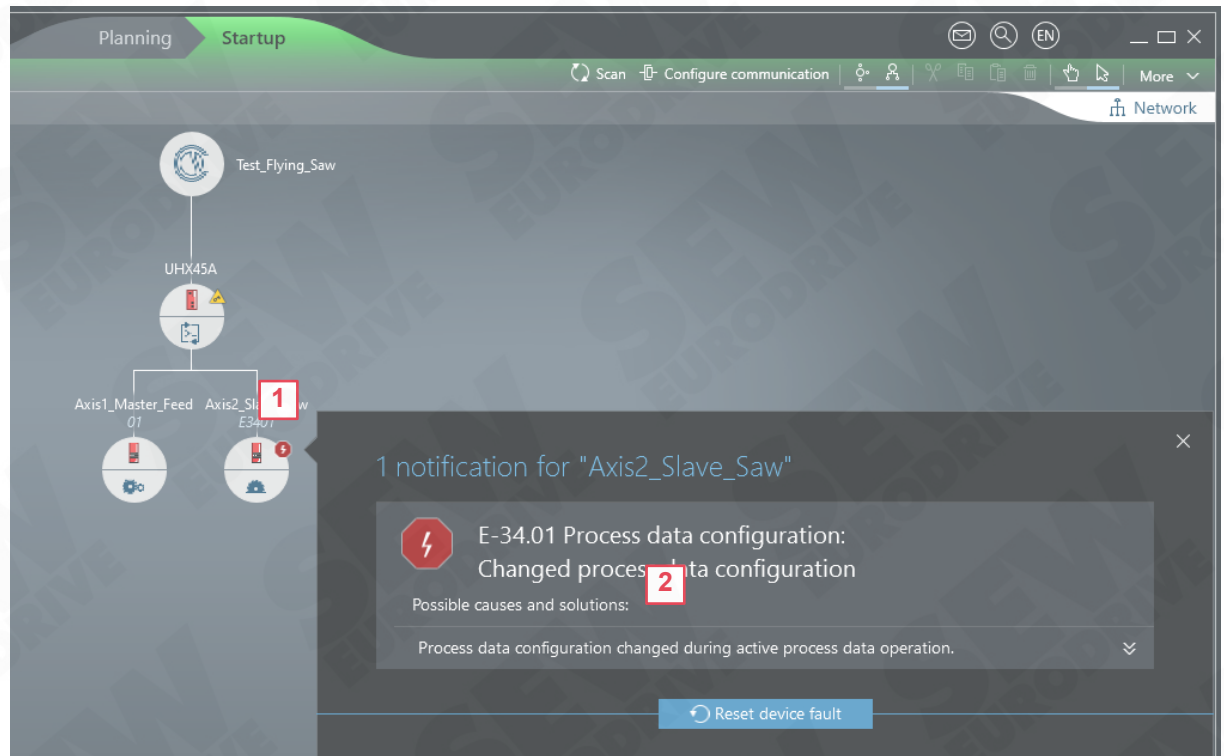
2 Set the start address to 1

4 Configuring the slave axis (Axis2_Slave_Saw)

- Objectives:**
- Being able to assign the MOVIKIT® FlyingSaw to the slave axis Axis2_Slave_Saw
 - Being able to parameterize the slave axis



4.1 Assigning the MOVIKIT® FlyingSaw software module



- 1 Assign the MOVIKIT® FlyingSaw from the catalog to the slave axis
- 2 Acknowledge the "Changed process data configuration" message

4.2 Configuring the master/slave connection



1. Configuring the master source

The screenshot shows the MOVISUITE software interface. On the left, the 'Parameterbaum' (Parameter tree) is expanded to '7 MOVIKIT® FlyingSaw' > '7.7.11 Flying saw', which is highlighted with a red box labeled '1'. The main area displays the 'Flying saw' configuration. Under 'Master source', the 'Master source' is set to 'Configured axis' (highlighted with a red box labeled '2'), 'Master axis name' is 'Axis1_Master_Feed', and 'Master axis type' is 'Linear axis – linearly increasing position'. Below this, the 'Flying saw' section shows 'Alignment of the flying saw' set to 'Parallel', 'Synchronicity return value' set to 'Distance', and 'Monitor repositioning' set to 'No'.

- 1 Go to **Controller functions** **Flying saw**
- 2 Set the parameters for the flying saw as shown here

2. Configuring the Touchprobe

The screenshot shows the MOVISUITE software interface. On the left, the 'Parameterbaum' is expanded to '7 MOVIKIT® FlyingSaw' > '7.8 Additional functions' > '7.8.3 Touchprobe 1', which is highlighted with a red box labeled '1'. The main area displays the 'Touchprobe 1' configuration. Under 'General', 'Touchprobe source' is set to 'Configured axis' (highlighted with a red box labeled '2'), 'Name of touchprobe axis' is 'Axis1_Master_Feed', and 'Mode' is 'Single'. The 'Status' section shows 'Wait for trigger' (radio button), 'Trigger tripped' (radio button), and 'Detected value' set to '0'. Under 'Trigger', 'Source' is 'DI 04', 'Event' is 'Rising edge', 'Sensor dead time rising edge' is '0.000 ms', and 'Counter' is '0'. Under 'Data source', 'Data source' is 'PO data word 13' and 'PO data format' is '32 bit – Little Endian'.

- 1 Go to **Additional functions** **Touchprobe 1**
- 2 Enter the **Touchprobe source** and the **Name of touchprobe axis** as shown

4.3 Activating the fieldbus interface



1. Configuring the fieldbus interface

The screenshot shows the MOVISUITE software interface for configuring the fieldbus interface of a slave axis. The left sidebar shows the parameter tree with '7.1.2 Fieldbus interface' selected. The main area displays the 'Fieldbus configuration' and 'Fieldbus interface' sections.

Fieldbus configuration

Parameter	Value
Activate fieldbus connection	Yes
Start address	9

Decimal places via fieldbus

Parameter	Value
Number of decimal places	2
Position	0
Speed	0
Acceleration	0
Jerk	0

Process data length

Parameter	Value
Basic process data	21
Process data of additional functions	0
Process data for additional process values of the inverter	0
Additional process data user program	0
Process data length	21

PROFINET diagnostic alarms

Parameter	Value
Activate diagnostic alarms	<input type="checkbox"/>

Fieldbus interface

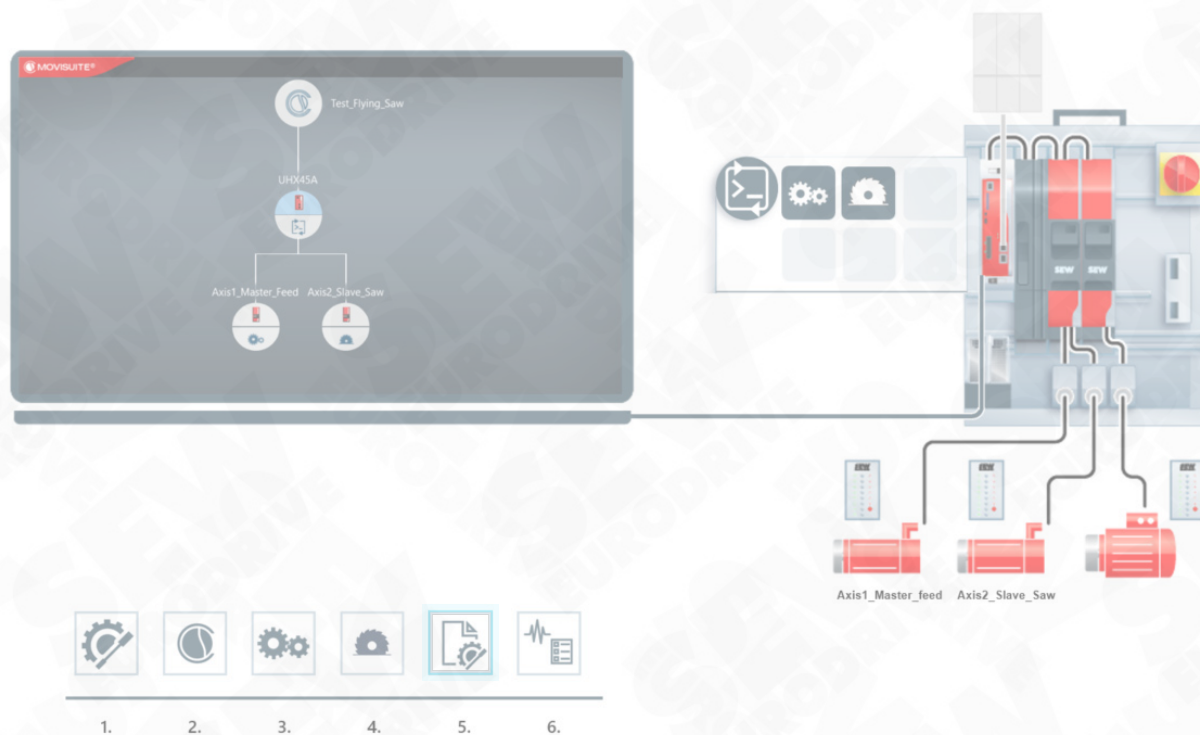
PLC	PLC output data	PLC input data	MOVIKIT®
	>>>>	<<<<	
Control word	PO 1	PI 1	Status word
Setpoint speed	PO 2	PI 2	Actual speed
Setpoint acceleration	PO 3	PI 3	Status or fault/subfault
Setpoint deceleration	PO 4	PI 4	Torque [0.1% nominal motor torque]
Digital outputs	PO 5	PI 5	Digital inputs
Setpoint application mode	PO 6	PI 6	Actual application mode
Target position – high word	PO 7	PI 7	Actual position – high word
Target position – low word	PO 8	PI 8	Actual position – low word
Control word application	PO 9	PI 9	Status word application
Nominal cutting length – high word	PO 10	PI 10	Active cut length – high word
Nominal cutting length – low word	PO 11	PI 11	Active cut length – low word

1 Activate the fieldbus connection by choosing **Yes**

2 Set the start address to **9**
 Start address = master axis 1 + 8PD = 9

5 Creating and starting the IEC project

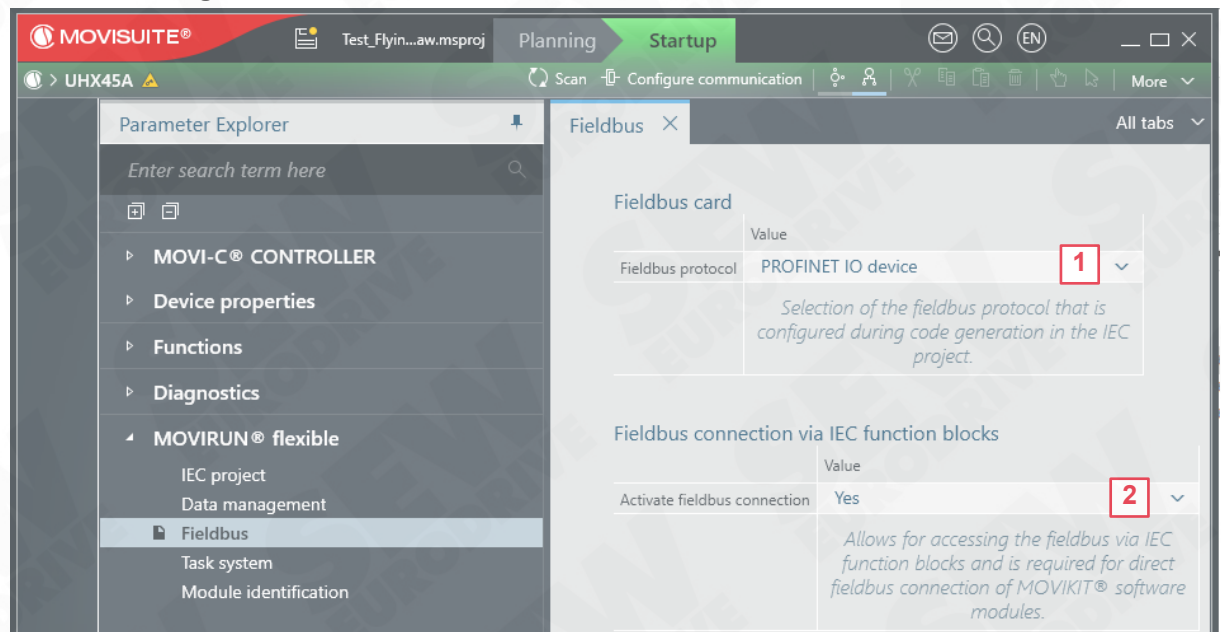
- Objectives:**
- Being able to parameterize the fieldbus
 - Being able to operate the license manager tool and select the appropriate licenses
 - Being able to activate the trial licenses and load them onto the MOVI-C® CONTROLLER
 - Be able to create an IEC project



5.1 Configuring the fieldbus of the MOVI-C® CONTROLLER



1. Activating the fieldbus interface



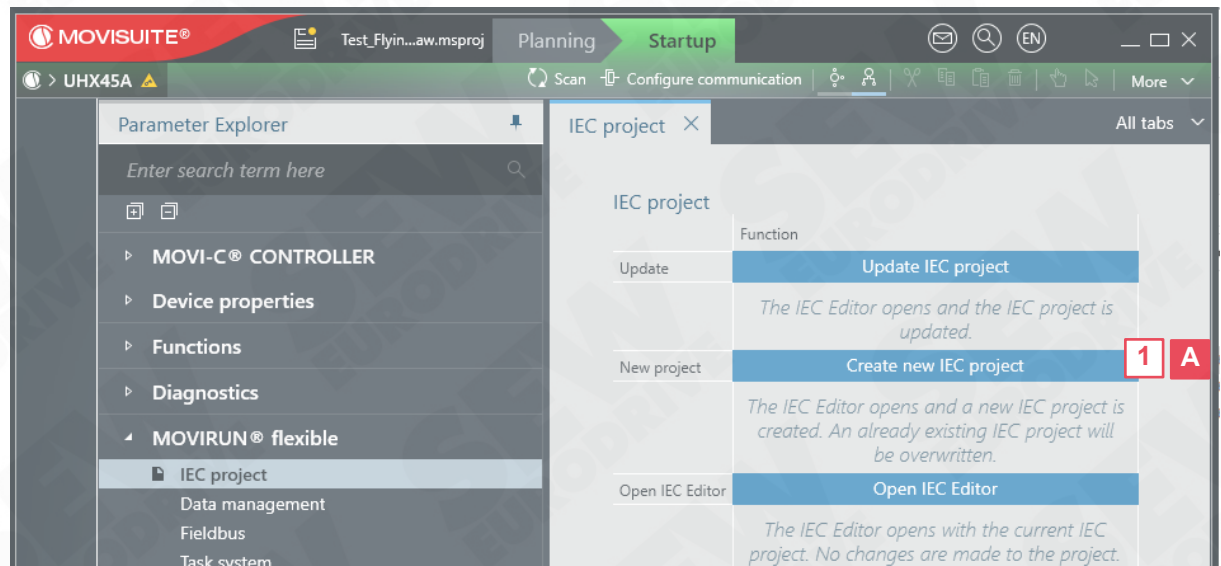
1 Select the **fieldbus protocol**

2 Activate **fieldbus connection via IEC function blocks: Yes**.

5.2 Creating the IEC project



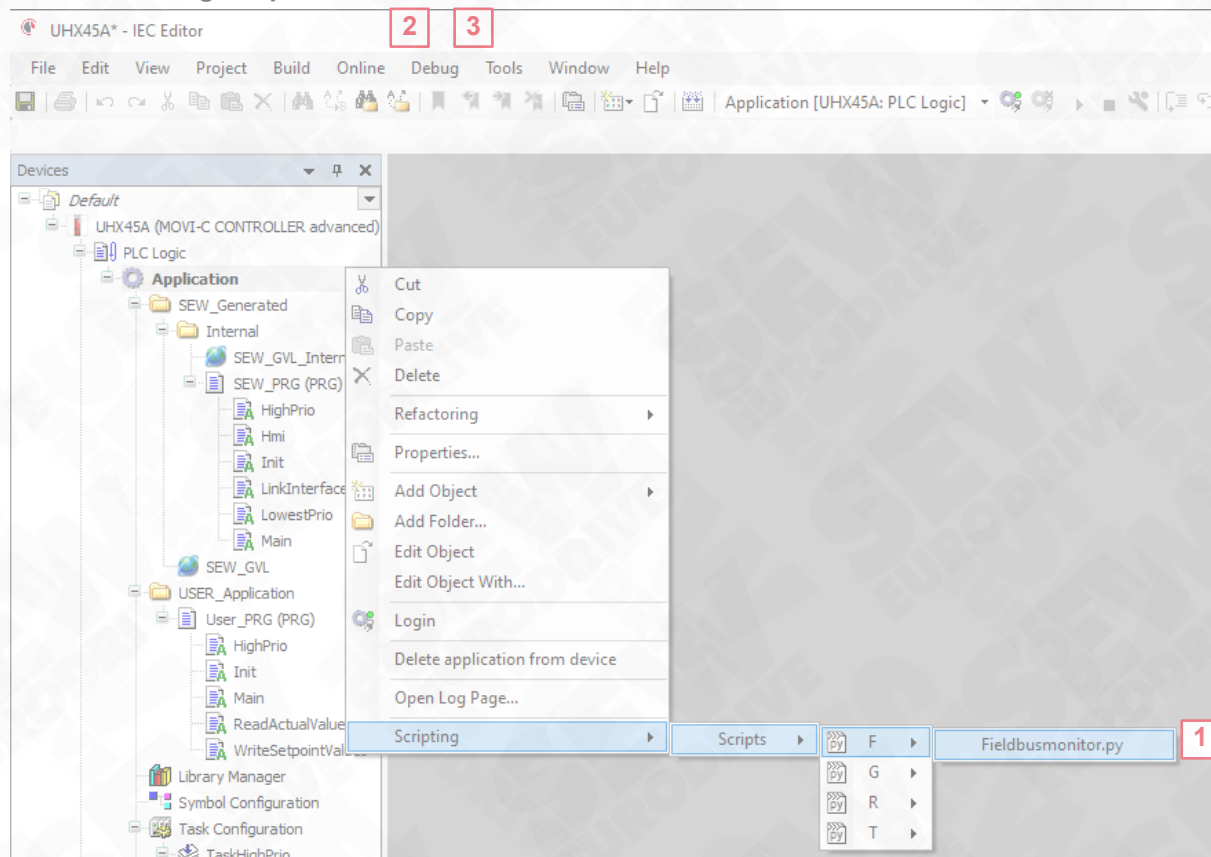
1. Creating a new IEC project



1 Click **Create new IEC project** to start the code creation process.

A When you create a new IEC project, the existing project is deleted. Even the self-programmed part is then overwritten/deleted.

2. Activating the process data monitor



- 1 Right-click **Application** and select **Scripting** **Scripts** **F** **Fieldbusmonitor** to insert the fieldbus monitor

3. Starting the IEC program

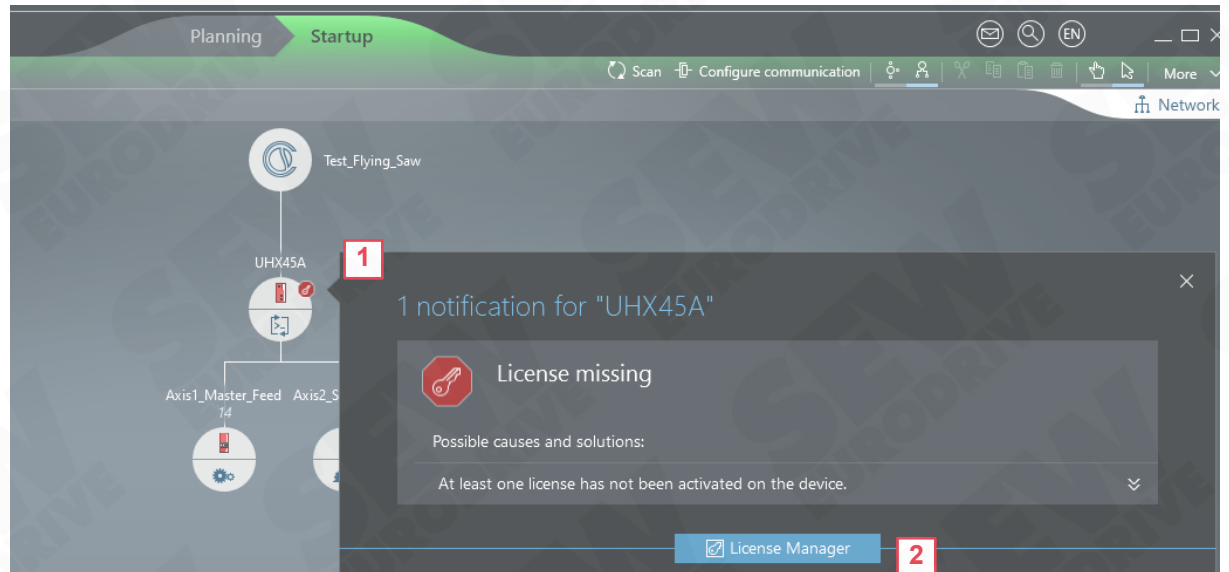
- 2 Compile the IEC program with **Online** **Log in**
- 3 Start the IEC program with **Debug** **Start**

5.3 Licensing the MOVI-C® CONTROLLER



1. Starting the License Manager

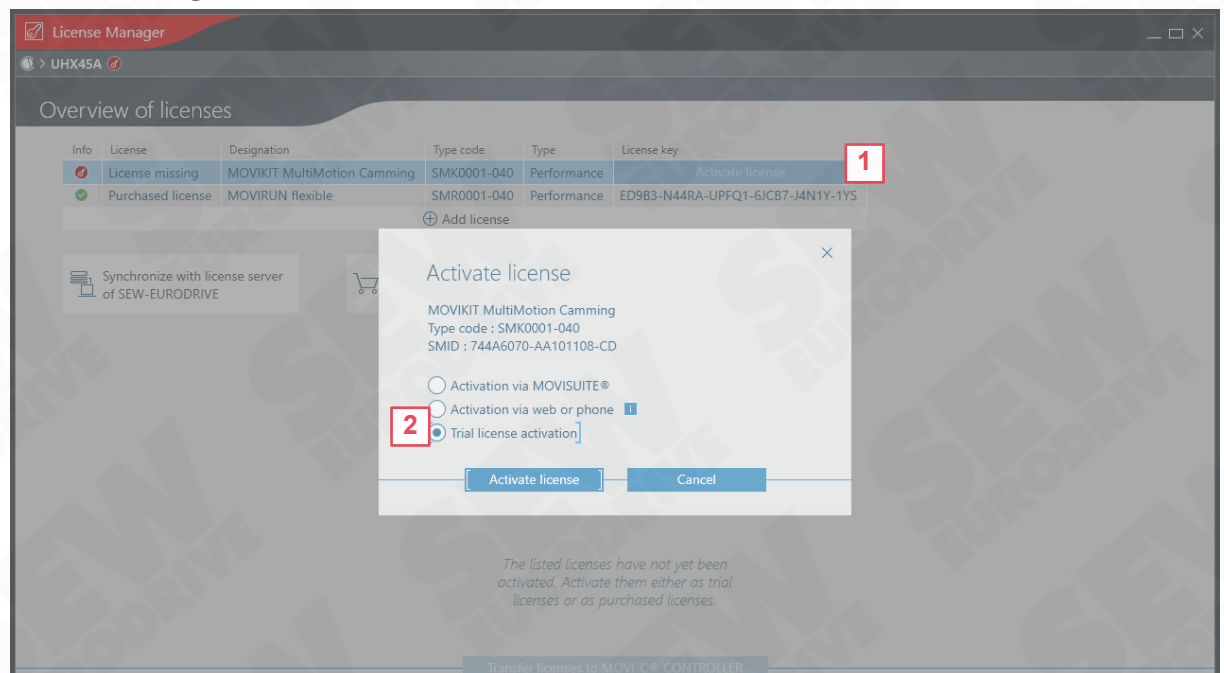
An Internet connection is required to activate the licenses.



1 Right-click the MOVI-C® CONTROLLER or select the symbol

2 Start the **License Manager** in **Tools**

2. Selecting the licenses



The missing license is automatically displayed in the License Manager

1 Click **Activate license** in the line of the missing license

2 Select **Trial license activation**

3 Click **Activate license**



A trial license allows for software functions to be tested before purchase. It is valid for 7 days and can be reactivated at any time. After the trial license expires, the program continues to run and is not shut down. A message regarding the expired trial license will be displayed on the MOVI-C® CONTROLLER.

3. Activating a license

License Manager

> UHX45A

Overview of licenses

Info	License	Designation	Type code	Type	License key
	Trial license	MOVIKIT MultiMotion Camming	SMK0001-040	Performance	Activate purchased license
	Purchased licen...	MOVIRUN flexible	SMR0001-040	Performance	ED983-N44RA-UPFQ1-6JCB7-J4N1Y-1...

Add license

Synchronize with license server of SEW-EURODRIVE

Open online license shop

The licenses on the controller are not up-to-date.

1 [Transfer licenses to MOVI-C® CONTROLLER](#)

0 Faulty licenses 1 Transferrable licenses 0 Active trial licenses 1 Active purchased licenses SMID: 744A6070-AA101108-CD

License Manager

> UHX45A

Overview of licenses

Info	License	Designation	Type code	Type	License key
	Trial license	MOVIKIT MultiMotion Camming	SMK0001-040	Performance	Activate purchased license
	Purchased licen...	MOVIRUN flexible	SMR0001-040	Performance	ED983-N44RA-UPFQ1-6JCB7-J4N1Y-1...

Add license

Synchronize with license server of SEW-EURODRIVE

Open online license shop

The licenses on the controller are not up-to-date.

[Transfer licenses to MOVI-C® CONTROLLER](#)

0 Faulty licenses 1 Transferrable licenses 0 Active trial licenses 1 Active purchased licenses SMID: 744A6070-AA101108-CD

License Manager

You want to transfer to at least one trial license to the controller. Free trial licenses are available for 7 days to evaluate the functions of the software.

After expiry of the trial period you will have to purchase a license from SEW-EURODRIVE to continue to use the software. If you do not purchase a license, SEW-EURODRIVE reserves the right to limit or terminate the availability of features after the free trial period expires.

I have understood that using these software modules is subject to a fee. I assure that I will not continue to use these software modules after expiry of the 7-day trial period unless I have purchased the respective licenses.

[Yes, I agree with the license terms](#) [No](#)

A The activated license must still be transferred to the MOVI-C® CONTROLLER

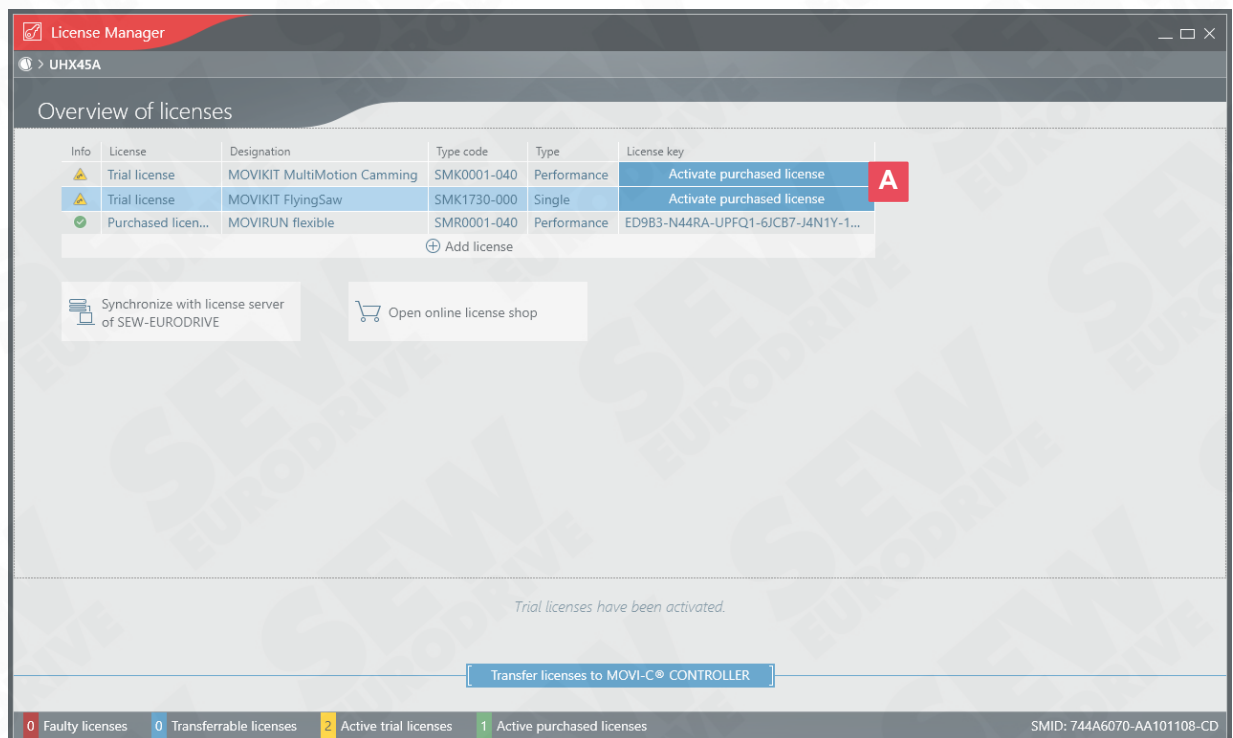
1 Click [Transfer licenses to MOVI-C® CONTROLLER](#).

2 Click [Yes, I agree with the license terms](#)

After activating the licenses, the controller must be reset. The IEC program must then be restarted.

When [updating an IEC project](#), the missing licenses are automatically displayed sequentially. Repeat the procedure for MOVIKIT® FlyingSaw.





Load and activate the shown licenses for the flying saw application:

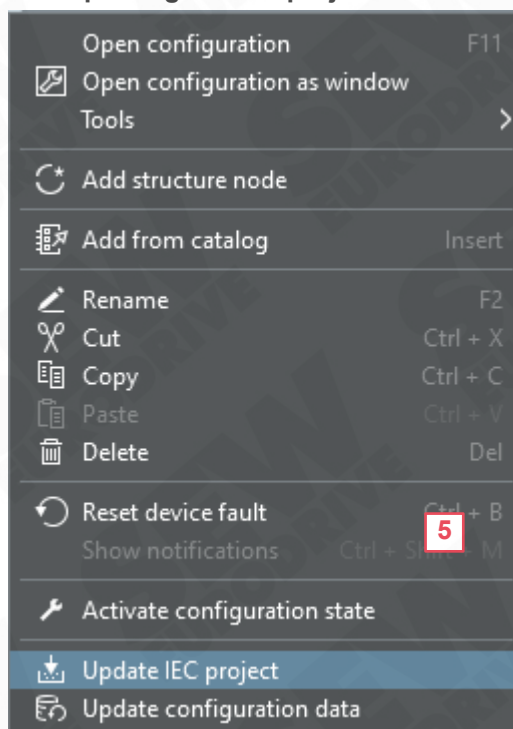
A

MOVIKIT® MultiMotion Camming: The MOVIKIT® MultiMotion Camming license is required because the MOVIKIT® FlyingSaw also contains a curve-based solution for cyclically operating flying saws. The license for MOVIKIT® Gearing is included in the MOVIKIT® MultiMotion Camming license.

MOVIKIT® FlyingSaw: One license is required for each rotation axis.

MOVIRUN® flexible: The MOVIRUN® flexible license contains the license for the EncoderInterface software module.

4. Updating the IEC project

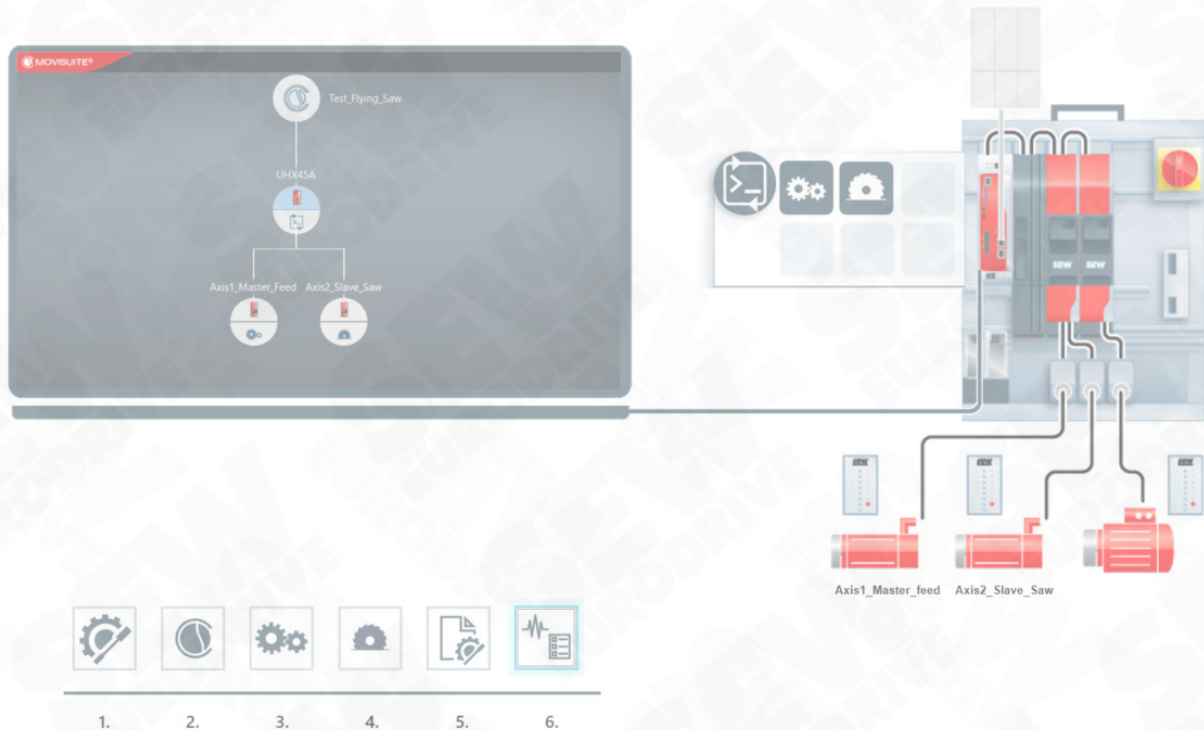


5

Then click **Update IEC project**

6 Control via process data monitor

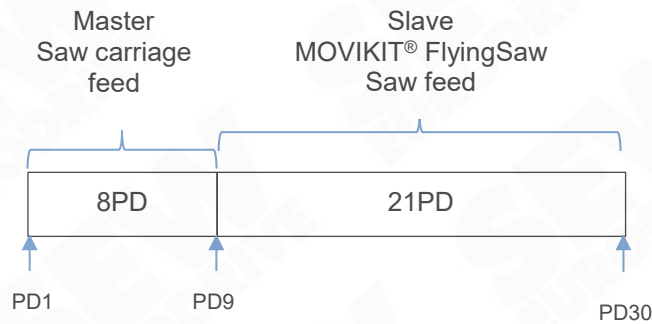
- Objectives:**
- Opening and operating the process data monitor
 - Controlling the flying saw application using the process data monitor



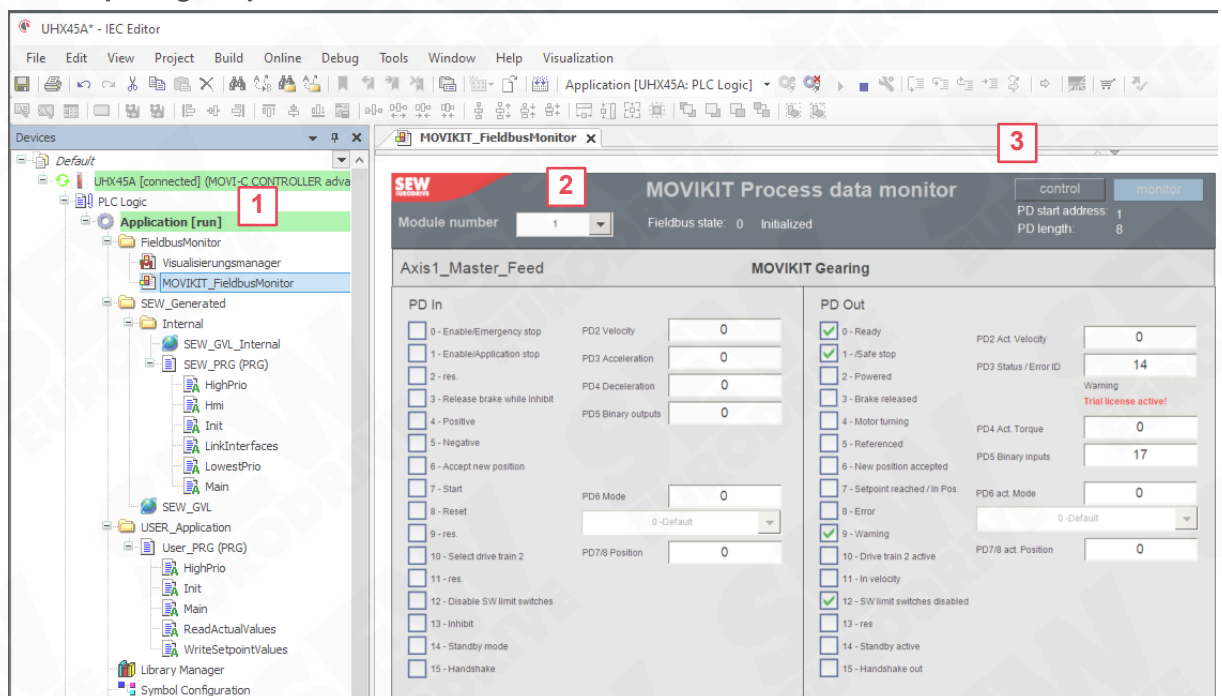
6.1 Opening and operating the process data monitor



The configuration results in the following process data assignment:



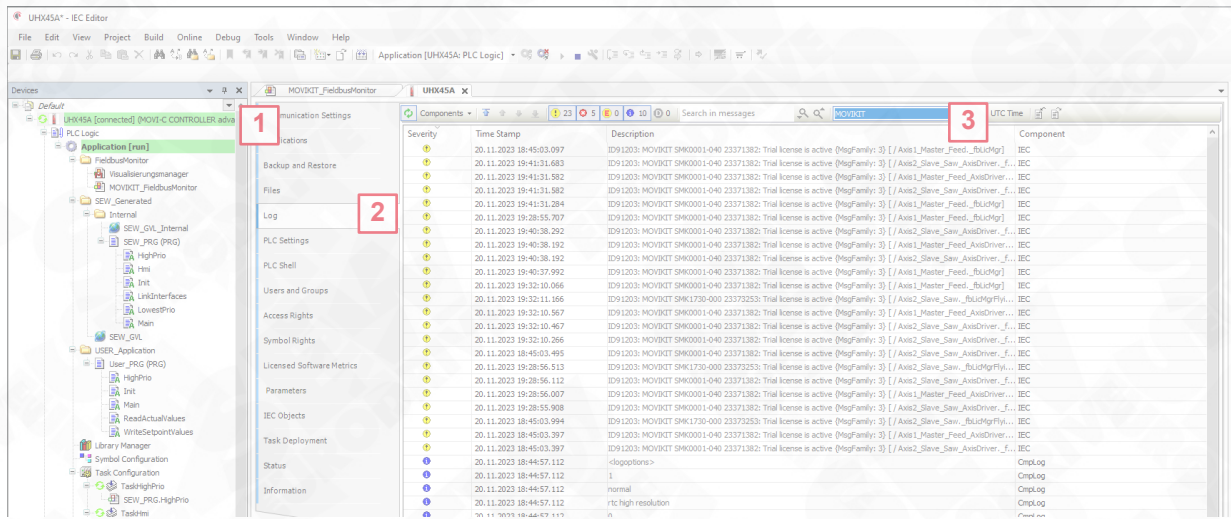
1. Opening the process data monitor



- 1 Double-click **MOVIKIT_FluidbusMonitor**.
- 2 Change the process data monitor by selecting the module number:
 Saw carriage feed: MOVIKIT® Gearing Module number: 1
 Saw feed: MOVIKIT® FlyingSaw Module number: 2
- 3 Click **control** to start the control mode



2. Opening the log file

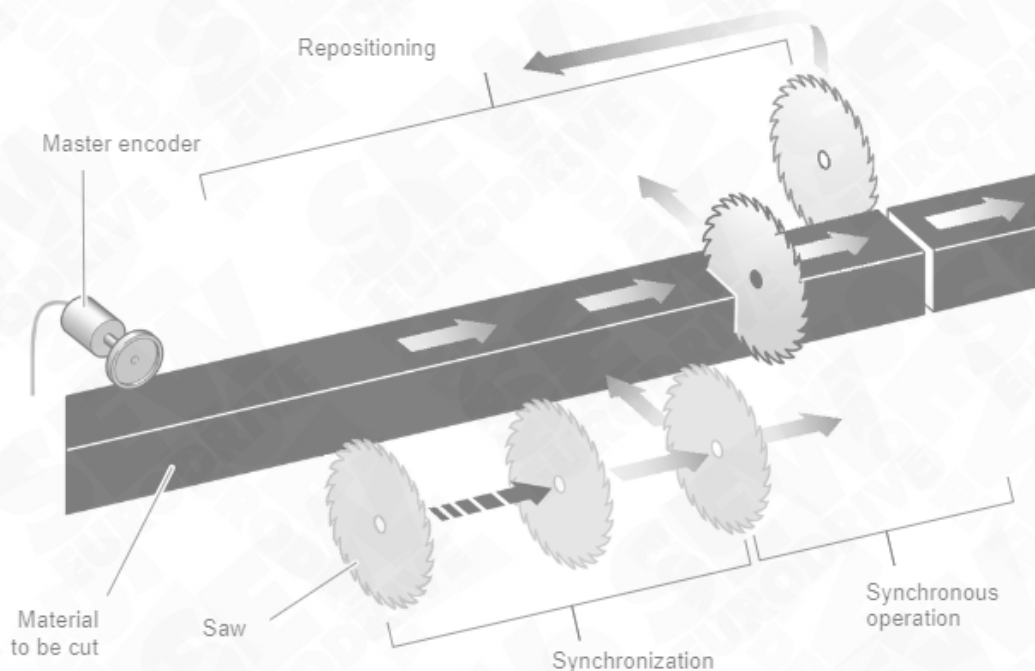


- 1 Double-click **UHX45A**
- 2 Click **Log**
- 3 Select **MOVIKIT** to display the error/status messages of the MOVIKIT® software module

6.2

Flying saw with cut length control

In cut length control, a master encoder measures the feed of the material to be cut. This information is processed by the inverter and is used for calculating the start position of the saw carriage. There need not be any cut marks on the material.



6.2.1 Testing the function



Module no. 1: Material feed (Axis1_Master_Feed) is the master axis with MOVIKIT® Gearing
Module no. 2: Saw carriage feed (Axis2_Slave_Saw) is the slave axis with MOVIKIT® FlyingSaw



1. Referencing the saw carriage feed slave axis

SEW EURODRIVE **MOVIKIT Process data monitor** control monitor

Module number: **2** Fieldbus state: 0 Initialized PD start address: 9 PD length: 21

Axis2_Slave_Saw **MOVIKIT FlyingSaw**

PD In	PD Out
<input type="checkbox"/> 0 - Enable/Emergency stop	<input checked="" type="checkbox"/> 0 - Ready
<input type="checkbox"/> 1 - Enable/Application stop	<input checked="" type="checkbox"/> 1 - /Safe stop
<input type="checkbox"/> 2 - res.	<input type="checkbox"/> 2 - Powered
<input type="checkbox"/> 3 - Release brake while inhibit	<input type="checkbox"/> 3 - Brake released
<input type="checkbox"/> 4 - Positive	<input type="checkbox"/> 4 - Motor turning
<input type="checkbox"/> 5 - Negative	<input checked="" type="checkbox"/> 5 - Referenced 3
<input type="checkbox"/> 6 - Accept new position	<input type="checkbox"/> 6 - New position accepted
<input checked="" type="checkbox"/> 7 - Start 2	<input type="checkbox"/> 7 - Setpoint reached / In Pos.
<input type="checkbox"/> 8 - Reset	<input type="checkbox"/> 8 - Error
<input type="checkbox"/> 9 - res.	<input checked="" type="checkbox"/> 9 - Warning
<input type="checkbox"/> 10 - Select drive train 2	<input type="checkbox"/> 10 - Drive train 2 active
<input type="checkbox"/> 11 - res.	<input type="checkbox"/> 11 - In velocity
<input type="checkbox"/> 12 - Disable SW limit switches	<input checked="" type="checkbox"/> 12 - SW limit switches disabled
<input type="checkbox"/> 13 - Inhibit	<input type="checkbox"/> 13 - res
<input type="checkbox"/> 14 - Standby mode	<input type="checkbox"/> 14 - Standby active
<input type="checkbox"/> 15 - Handshake	<input type="checkbox"/> 15 - Handshake out

PD2 Velocity: 0 PD3 Acceleration: 0 PD4 Deceleration: 0 PD5 Binary outputs: 0

PD6 Mode: 300 **1** 300 - Homing offset configured

PD7/8 Position: 0

PD2 Act. Velocity: 0 PD3 Status / Error ID: 14 Warning Trial license active! PD4 Act. Torque: 0 PD5 Binary inputs: 1 PD6 act. Mode: 300 300 - Homing offset configured PD7/8 act. Position: 0 **3**

FlyingSaw Parameters

PD9	PD9
<input type="checkbox"/> 0 - Direct cut	<input type="checkbox"/> 0 - Busy
<input type="checkbox"/> 1 - Move to start position	<input type="checkbox"/> 1 - In gear
<input type="checkbox"/> 2 - Reserved	<input type="checkbox"/> 2 - Reserved
<input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly	Gearing state: 0 STOPPED
PD10/11 Cutting Length [UserUnits Master]: 0	PD10/11 act. Cutting length [UserUnits Master]: 0
PD12 Cutting Angle [°]: 0	PD12/13 Elapsed cutting length [UserUnits Master]: 0
PD13 Reserved: 0	PD14/15 act. Sensor distance [UserUnits Master]: 0
PD14/15 Sensor Distance [UserUnits Slave]: 0	PD16 act. Master Velocity [UserUnits Master]: 0
PD16/17 Touchprobe Window [UserUnits Master]: 0	PD17 res.: 0
PD18/19 Synchronization Distance [UserUnits Master]: 0	PD18/19 act. Synchronization Distance [UserUnits Master]: 0
PD20/21 Synchronous Distance [UserUnits Master]: 0	PD20/21 act. Synchronous Distance: 0

- 1** Select the operating mode **PD6 Mode = 300**
- 2** Start the referencing with **PD7=1**
- 3** Check PD Out: **PD5 Referenced = 1** and **PD7/8 Position = 0**
- 5** Then reset the start bit to 0 **PD7=0**

2. Parameterizing the saw carriage feed slave axis

SEW **MOVIKIT Process data monitor** control monitor

Module number: Fieldbus state: 0 Initialized PD start address: 9 PD length: 21

Axis2_Slave_Saw **MOVIKIT FlyingSaw**

PD In		PD Out	
<input type="checkbox"/> 0 - Enable/Emergency stop	PD2 Velocity: <input type="text" value="0"/>	<input checked="" type="checkbox"/> 0 - Ready	PD2 Act. Velocity: <input type="text" value="0"/>
<input type="checkbox"/> 1 - Enable/Application stop	PD3 Acceleration: <input type="text" value="0"/>	<input checked="" type="checkbox"/> 1 - /Safe stop	PD3 Status / Error ID: <input type="text" value="1"/>
<input type="checkbox"/> 2 - res.	PD4 Deceleration: <input type="text" value="0"/>	<input type="checkbox"/> 2 - Powered	Warning: Trial license active!
<input type="checkbox"/> 3 - Release brake while inhibit	PD5 Binary outputs: <input type="text" value="0"/>	<input type="checkbox"/> 3 - Brake released	PD4 Act. Torque: <input type="text" value="0"/>
<input type="checkbox"/> 4 - Positive	PD6 Mode: <input type="text" value="300"/>	<input type="checkbox"/> 4 - Motor turning	PD5 Binary inputs: <input type="text" value="0"/>
<input type="checkbox"/> 5 - Negative	<input type="text" value="300 - Homing offset configured"/>	<input checked="" type="checkbox"/> 5 - Referenced	PD6 act. Mode: <input type="text" value="300"/>
<input type="checkbox"/> 6 - Accept new position	PD7/8 Position: <input type="text" value="0"/>	<input type="checkbox"/> 6 - New position accepted	<input type="text" value="300 - Homing offset configured"/>
<input type="checkbox"/> 7 - Start		<input type="checkbox"/> 7 - Setpoint reached / In Pos.	PD7/8 act. Position: <input type="text" value="0"/>
<input type="checkbox"/> 8 - Reset		<input checked="" type="checkbox"/> 8 - Error	
<input type="checkbox"/> 9 - res.		<input checked="" type="checkbox"/> 9 - Warning	
<input type="checkbox"/> 10 - Select drive train 2		<input type="checkbox"/> 10 - Drive train 2 active	
<input type="checkbox"/> 11 - res.		<input type="checkbox"/> 11 - In velocity	
<input type="checkbox"/> 12 - Disable SW limit switches		<input checked="" type="checkbox"/> 12 - SW limit switches disabled	
<input type="checkbox"/> 13 - Inhibit		<input type="checkbox"/> 13 - res	
<input type="checkbox"/> 14 - Standby mode		<input type="checkbox"/> 14 - Standby active	
<input type="checkbox"/> 15 - Handshake		<input type="checkbox"/> 15 - Handshake out	

FlyingSaw Parameters

PD9		Gearing state	
<input type="checkbox"/> 0 - Direct out		<input type="checkbox"/> 0 - Busy	<input type="text" value="0"/>
<input type="checkbox"/> 1 - Move to start position		<input type="checkbox"/> 1 - In gear	STOPPED
<input type="checkbox"/> 2 - Reserved		<input type="checkbox"/> 2 - Reserved	
<input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly			

PD10/11 Cutting Length [UserUnits Master]	<input type="text" value="100000"/> 1	PD10/11 act. Cutting length [UserUnits Master]	<input type="text" value="0"/>
PD12 Cutting Angle [°]	<input type="text" value="0"/> 2	PD12/13 Elapsed cutting length [UserUnits Master]	<input type="text" value="0"/>
PD13 Reserved	<input type="text" value="0"/>	PD14/15 act. Sensor distance [UserUnits Master]	<input type="text" value="0"/>
PD14/15 Sensor Distance [UserUnits Slave]	<input type="text" value="0"/>	PD16 act. Master Velocity [UserUnits Master]	<input type="text" value="0"/>
PD16/17 Touchprobe Window [UserUnits Master]	<input type="text" value="0"/>	PD17 res.	<input type="text" value="0"/>
PD18/19 Synchronization Distance [UserUnits Master]	<input type="text" value="10000"/> 3	PD18/19 act. Synchronization Distance [UserUnits Master]	<input type="text" value="0"/>
PD20/21 Synchronous Distance [UserUnits Master]	<input type="text" value="0"/>	PD20/21 act. Synchronous Distance	<input type="text" value="0"/>

Cutting length:	Start with 1000.00°mm
Cutting angle:	0°
Synchronization distance:	100 mm

- 1** Set the cutting length: **PD10/11 = 100000**
- 2** Set the cutting angle: **PD12 = 0**
- 3** Set the synchronization distance: **PD18/19 = 10000**

3. Activating automatic mode for saw feed slave axis

The setpoints for speed, acceleration, and deceleration are used when the flying saw returns to the start position.

SEW **MOVIKIT Process data monitor** control monitor

Module number: 2 Fieldbus state: 0 Initialized PD start address: 9 PD length: 21

Axis2_Slave_Saw **MOVIKIT FlyingSaw**

PD In		PD Out	
<input checked="" type="checkbox"/> 0 - Enable/Emergency stop	PD2 Velocity: 1000	<input checked="" type="checkbox"/> 0 - Ready	PD2 Act. Velocity: 0
<input checked="" type="checkbox"/> 1 - Enable/Application stop	PD3 Acceleration: 1000	<input checked="" type="checkbox"/> 1 - /Safe stop	PD3 Status / Error ID: 12
<input type="checkbox"/> 2 - res.	PD4 Deceleration: 1000	<input checked="" type="checkbox"/> 2 - Powered	Warning: Trial license active!
<input type="checkbox"/> 3 - Release brake while inhibit	PD5 Binary outputs: 0	<input checked="" type="checkbox"/> 3 - Brake released	PD4 Act. Torque: 8
<input type="checkbox"/> 4 - Positive		<input type="checkbox"/> 4 - Motor turning	PD5 Binary inputs: 1
<input type="checkbox"/> 5 - Negative		<input checked="" type="checkbox"/> 5 - Referenced	PD6 act. Mode: 300
<input type="checkbox"/> 6 - Accept new position	PD6 Mode: 300	<input type="checkbox"/> 6 - New position accepted	300 - Homing offset configured
<input checked="" type="checkbox"/> 7 - Start	PD7/8 Position: 0	<input type="checkbox"/> 7 - Setpoint reached / In Pos.	PD6 act. Mode: 300
<input type="checkbox"/> 8 - Reset		<input type="checkbox"/> 8 - Error	300 - Homing offset configured
<input type="checkbox"/> 9 - res.		<input checked="" type="checkbox"/> 9 - Warning	PD7/8 act. Position: 0
<input type="checkbox"/> 10 - Select drive train 2		<input type="checkbox"/> 10 - Drive train 2 active	
<input type="checkbox"/> 11 - res.		<input type="checkbox"/> 11 - In velocity	
<input type="checkbox"/> 12 - Disable SW limit switches		<input checked="" type="checkbox"/> 12 - SW limit switches disabled	
<input type="checkbox"/> 13 - Inhibit		<input type="checkbox"/> 13 - res	
<input type="checkbox"/> 14 - Standby mode		<input type="checkbox"/> 14 - Standby active	
<input type="checkbox"/> 15 - Handshake		<input type="checkbox"/> 15 - Handshake out	

FlyingSaw Parameters

PD9		PD9	
<input type="checkbox"/> 0 - Direct cut		<input type="checkbox"/> 0 - Busy	
<input type="checkbox"/> 1 - Move to start position		<input type="checkbox"/> 1 - In gear	
<input type="checkbox"/> 2 - Reserved		<input type="checkbox"/> 2 - Reserved	
<input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly		Gearing state: 0	STOPPED
PD10/11 Cutting Length [UserUnits Master]: 100000		PD10/11 act. Cutting length [UserUnits Master]: 0	
PD12 Cutting Angle [°]: 0		PD12/13 Elapsed cutting length [UserUnits Master]: 0	
PD13 Reserved: 0		PD14/15 act. Sensor distance [UserUnits Master]: 0	
PD14/15 Sensor Distance [UserUnits Slave]: 0		PD16 act. Master Velocity [UserUnits Master]: 0	
PD16/17 Touchprobe Window [UserUnits Master]: 0		PD17 res.: 0	
PD18/19 Synchronization Distance [UserUnits Master]: 10000		PD18/19 act. Synchronization Distance [UserUnits Master]: 0	
PD20/21 Synchronous Distance [UserUnits Master]: 0		PD20/21 act. Synchronous Distance: 0	

1 Select the operating mode **PD6 Mode = 1400**

2 Enter the dynamic values:
 Speed: 1000 mm/s
 Acceleration: 1000 mm/s²
 Deceleration: 1000 mm/s²

3 Enable the drive **PD0 and PD1 = 1**

4 Start automatic mode with **PD7 - Start = 1**

5 PD9 shows **WAITING_FOR_STARTPOSITION** -> The slave axis is waiting for a suitable master position.

4. Starting the material feed master axis

The master axis simulates a linear axis with endless material. The linear axis operates in speed mode. Set the speed to 100 mm/s for a gentle start.

SEW EURODRIVE **MOVIKIT Process data monitor** control monitor

Module number: 1 Fieldbus state: 0 Initialized PD start address: 1 PD length: 8

Axis1_Master_Feed **MOVIKIT Gearing**

PD In		PD Out	
<input checked="" type="checkbox"/> 0 - Enable/Emergency stop	PD2 Velocity: 100	<input checked="" type="checkbox"/> 0 - Ready	PD2 Act. Velocity: 100
<input checked="" type="checkbox"/> 1 - Enable/Application stop	PD3 Acceleration: 100	<input checked="" type="checkbox"/> 1 - /Safe stop	PD3 Status / Error ID: 10
<input type="checkbox"/> 2 - res.	PD4 Deceleration: 100	<input checked="" type="checkbox"/> 2 - Powered	Warning: Trial license active!
<input type="checkbox"/> 3 - Release brake while inhibit	PD5 Binary outputs: 0	<input checked="" type="checkbox"/> 3 - Brake released	PD4 Act. Torque: 35
<input type="checkbox"/> 4 - Positive		<input checked="" type="checkbox"/> 4 - Motor turning	PD5 Binary inputs: 1
<input type="checkbox"/> 5 - Negative		<input type="checkbox"/> 5 - Referenced	PD6 act. Mode: 200
<input type="checkbox"/> 6 - Accept new position	PD6 Mode: 200	<input type="checkbox"/> 6 - New position accepted	200 - Velocity
<input checked="" type="checkbox"/> 7 - Start	PD7/8 Position: 0	<input type="checkbox"/> 7 - Setpoint reached / In Pos.	PD7/8 act. Position: 43474
<input type="checkbox"/> 8 - Reset		<input type="checkbox"/> 8 - Error	
<input type="checkbox"/> 9 - res.		<input checked="" type="checkbox"/> 9 - Warning	
<input type="checkbox"/> 10 - Select drive train 2		<input type="checkbox"/> 10 - Drive train 2 active	
<input type="checkbox"/> 11 - res.		<input checked="" type="checkbox"/> 11 - In velocity	
<input type="checkbox"/> 12 - Disable SW limit switches		<input checked="" type="checkbox"/> 12 - SW limit switches disabled	
<input type="checkbox"/> 13 - Inhibit		<input type="checkbox"/> 13 - res	
<input type="checkbox"/> 14 - Standby mode		<input type="checkbox"/> 14 - Standby active	
<input type="checkbox"/> 15 - Handshake		<input type="checkbox"/> 15 - Handshake out	

1 Select the operating mode **PD6 Mode = 200**

2 Enter the dynamic values:
 Speed: 100 mm/s
 Acceleration: 100 mm*s²
 Deceleration: 100 mm*s²

3 Enable the drive **PD0 and PD1 = 1** and start the operating mode with **PD7 - Start = 1**

5. Slave axis (saw carriage feed) waits until master axis (material feed) cutting length is reached

FlyingSaw Parameters

PD9 <input type="checkbox"/> 0 - Direct cut <input type="checkbox"/> 1 - Move to start position <input type="checkbox"/> 2 - Reserved <input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly	PD9 <input checked="" type="checkbox"/> 0 - Busy <input type="checkbox"/> 1 - In gear <input type="checkbox"/> 2 - Reserved	Gearing state <input type="text" value="1"/> A WAITING_FOR_STARTPOSITION	
PD10/11 Cutting Length [UserUnits Master]	<input type="text" value="100000"/>	PD10/11 act. Cutting length [UserUnits Master]	<input type="text" value="100000"/>
PD12 Cutting Angle [°]	<input type="text" value="0"/>	PD12/13 Elapsed cutting length [UserUnits Master]	<input type="text" value="39100"/>
PD13 Reserved	<input type="text" value="0"/>	PD14/15 act. Sensor distance [UserUnits Master]	<input type="text" value="0"/>
PD14/15 Sensor Distance [UserUnits Slave]	<input type="text" value="0"/>	PD16 act. Master Velocity [UserUnits Master]	<input type="text" value="100"/>
PD16/17 Touchprobe Window [UserUnits Master]	<input type="text" value="0"/>	PD17 res.	<input type="text" value="0"/>
PD18/19 Synchronization Distance [UserUnits Master]	<input type="text" value="10000"/>	PD18/19 act. Synchronization Distance [UserUnits Master]	<input type="text" value="0"/>
PD20/21 Synchronous Distance [UserUnits Master]	<input type="text" value="0"/>	PD20/21 act. Synchronous Distance	<input type="text" value="0"/>

A The slave axis (saw carriage feed) waits until the master axis reaches the set cutting length. This is displayed by the state **Gearing state = 1** "WAITING_FOR_STARTPOSITION"

6. Slave axis (saw feed) synchronizes with the master axis (material feed)

FlyingSaw Parameters

PD9 <input type="checkbox"/> 0 - Direct cut <input type="checkbox"/> 1 - Move to start position <input type="checkbox"/> 2 - Reserved <input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly	PD9 <input checked="" type="checkbox"/> 0 - Busy <input type="checkbox"/> 1 - In gear <input type="checkbox"/> 2 - Reserved	Gearing state <input type="text" value="2"/> GEAR_IN	
PD10/11 Cutting Length [UserUnits Master]	<input type="text" value="100000"/>	PD10/11 act. Cutting length [UserUnits Master]	<input type="text" value="100000"/>
PD12 Cutting Angle [°]	<input type="text" value="0"/>	PD12/13 Elapsed cutting length [UserUnits Master]	<input type="text" value="91540"/>
PD13 Reserved	<input type="text" value="0"/>	PD14/15 act. Sensor distance [UserUnits Master]	<input type="text" value="0"/>
PD14/15 Sensor Distance [UserUnits Slave]	<input type="text" value="0"/>	PD16 act. Master Velocity [UserUnits Master]	<input type="text" value="100"/>
PD16/17 Touchprobe Window [UserUnits Master]	<input type="text" value="0"/>	PD17 res.	<input type="text" value="0"/>
PD18/19 Synchronization Distance [UserUnits Master]	<input type="text" value="10000"/>	PD18/19 act. Synchronization Distance [UserUnits Master]	<input type="text" value="0"/>
PD20/21 Synchronous Distance [UserUnits Master]	<input type="text" value="0"/>	PD20/21 act. Synchronous Distance	<input type="text" value="0"/>

A The slave axis (saw carriage feed) synchronizes with the master before the PD18/19 cut length setpoint = 100 mm. The cut begins as soon as the set length is reached.

Gearing state = 2 GEAR_IN -> Synchronization is active. To synchronize with the master, the slave axis follows a transition function.

7. Slave axis (saw carriage feed) is synchronized with master axis (material feed)

FlyingSaw Parameters			
PD9	<input type="checkbox"/> 0 - Direct cut <input type="checkbox"/> 1 - Move to start position <input type="checkbox"/> 2 - Reserved <input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly	PD9	<input checked="" type="checkbox"/> 0 - Busy <input checked="" type="checkbox"/> 1 - In gear <input type="checkbox"/> 2 - Reserved
		Gearing state <input type="text" value="3"/> A ACTIVE	
PD10/11 Cutting Length [UserUnits Master]	<input type="text" value="100000"/>	PD10/11 act. Cutting length [UserUnits Master]	<input type="text" value="100000"/>
PD12 Cutting Angle [°]	<input type="text" value="0"/>	PD12/13 Elapsed cutting length [UserUnits Master]	<input type="text" value="8470"/>
PD13 Reserved	<input type="text" value="0"/>	PD14/15 act. Sensor distance [UserUnits Master]	<input type="text" value="0"/>
PD14/15 Sensor Distance [UserUnits Slave]	<input type="text" value="0"/>	PD16 act. Master Velocity [UserUnits Master]	<input type="text" value="100"/>
PD16/17 Touchprobe Window [UserUnits Master]	<input type="text" value="0"/>	PD17 res.	<input type="text" value="0"/>
PD18/19 Synchronization Distance [UserUnits Master]	<input type="text" value="10000"/>	PD18/19 act. Synchronization Distance [UserUnits Master]	<input type="text" value="0"/>
PD20/21 Synchronous Distance [UserUnits Master]	<input type="text" value="0"/>	PD20/21 act. Synchronous Distance	<input type="text" value="0"/>

A

As soon as the cut length setpoint is reached, the gearing state changes to **Gearing state = 3** ACTIVE -> The slave axis is synchronized with the master axis and the processing/cutting can begin. The flying saw itself does not know the duration of the processing/cutting. As soon as the processing is completed and the tool is no longer in contact with the material, the higher-level controller must send the "MoveToStartPosition" signal to the flying saw.

8. Moving the slave axis (saw carriage feed) back to the start position

SEW
MOVIKIT Process data monitor

Module number: 2 Fieldbus state: 0 Initialized PD start address: 9 PD length: 21

Axis2_Slave_Saw **MOVIKIT FlyingSaw**

PD In		PD Out	
<input checked="" type="checkbox"/> 0 - Enable/Emergency stop	PD2 Velocity: 1000	<input checked="" type="checkbox"/> 6 - Ready	PD2 Act. Velocity: 0
<input checked="" type="checkbox"/> 1 - Enable/Application stop	PD3 Acceleration: 1000	<input checked="" type="checkbox"/> 1 - /Safe stop	PD3 Status / Error ID: 10
<input type="checkbox"/> 2 - res.	PD4 Deceleration: 1000	<input checked="" type="checkbox"/> 2 - Powered	Warning: Trial license active!
<input type="checkbox"/> 3 - Release brake while inhibit	PD5 Binary outputs: 0	<input checked="" type="checkbox"/> 3 - Brake released	PD4 Act. Torque: -12
<input type="checkbox"/> 4 - Positive		<input type="checkbox"/> 4 - Motor turning	PD5 Binary inputs: 1
<input type="checkbox"/> 5 - Negative		<input checked="" type="checkbox"/> 5 - Referenced	PD6 Act. Mode: 1400
<input type="checkbox"/> 6 - Accept new position	PD6 Mode: 1400	<input checked="" type="checkbox"/> 6 - New position accepted	1400 - Application automatic
<input checked="" type="checkbox"/> 7 - Start	PD7 Position: 0	<input checked="" type="checkbox"/> 7 - Setpoint reached / in Pos. (A)	PD7 act. Position: 0
<input type="checkbox"/> 8 - Reset		<input type="checkbox"/> 8 - Error	
<input type="checkbox"/> 9 - res.		<input checked="" type="checkbox"/> 9 - Warning	
<input type="checkbox"/> 10 - Select drive train 2		<input type="checkbox"/> 10 - Drive train 2 active	
<input type="checkbox"/> 11 - res.		<input type="checkbox"/> 11 - In velocity	
<input type="checkbox"/> 12 - Disable SW limit switches		<input checked="" type="checkbox"/> 12 - SW limit switches disabled	
<input type="checkbox"/> 13 - Inhibit		<input type="checkbox"/> 13 - res.	
<input type="checkbox"/> 14 - Standby mode		<input type="checkbox"/> 14 - Standby active	
<input type="checkbox"/> 15 - Handshake		<input type="checkbox"/> 15 - Handshake out	

FlyingSaw Parameters

PD9		PD9	
<input type="checkbox"/> 0 - Direct cut		<input type="checkbox"/> 0 - Busy	
<input checked="" type="checkbox"/> 1 - Move to start position (1)		<input type="checkbox"/> 1 - In gear	
<input type="checkbox"/> 2 - Reserved		<input type="checkbox"/> 2 - Reserved	
<input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly		Gearing state: 0	STOPPED (B)
PD10/11 Cutting Length (UserUnits Master)	100000	PD10/11 act. Cutting length (UserUnits Master)	100000
PD12 Cutting Angle [°]	0	PD12/13 Elapsed cutting length (UserUnits Master)	38020
PD13 Reserved	0	PD14/15 act. Sensor distance (UserUnits Master)	0
PD14/15 Sensor Distance (UserUnits Slave)	0	PD16 act. Master Velocity (UserUnits Master)	100
PD16/17 Touchprobe Window (UserUnits Master)	0	PD17 res.	0
PD18/19 Synchronization Distance (UserUnits Master)	10000	PD18/19 act. Synchronization Distance (UserUnits Master)	20000
PD20/21 Synchronous Distance (UserUnits Master)	0	PD20/21 act. Synchronous Distance	0

1 Set **Bit 9 Move to start position = 1**

2 The signal **Bit 9 Move to start position = 0** must be reset again as soon as the saw carriage has reached the start position **A PD 1.7 Setpoint reached / in Pos = 1** so that the slave axis moves back to the start position.

The saw carriage must reach the start position early enough before the material feed reaches the calculated synchronization position of the next cut. Otherwise the saw reports an error or the current product becomes longer than the setpoint. You can parameterize this with the "Monitor back-positioning" parameter in MOVISUITE®.

A Gearing state = 0 STOPPED -> The slave axis is desynchronized and does not follow the master axis

6.2.2 Activating and monitoring the FlyingSaw monitor



1. Opening the monitor in the IEC Editor

The screenshot shows the IEC Editor interface for a project named 'UHX45A* - IEC Editor'. The project tree on the left shows the 'Monitor_Axis2_Slave_Saw' component highlighted with a red box and the number '1'. The main window displays the 'FlyingSaw Monitor' for the 'Module: Axis2_Slave_Saw'. The monitor shows a state transition diagram with four states: 'Startposition', 'Synchronizing', 'Synchronus', and 'Moving to Start'. The diagram shows a cycle: 'Startposition' to 'Synchronizing', 'Synchronizing' to 'Synchronus', 'Synchronus' to 'Moving to Start', and 'Moving to Start' back to 'Startposition'. The diagram is labeled 'A' and 'B'.

1 Double-click **Monitor_Axis2Slave_Saw**.

A The current state of the automatic operation of the flying saw is displayed here.
The register can be depicted offset and simultaneously next to the MOVIKIT® FielbusMonitor.

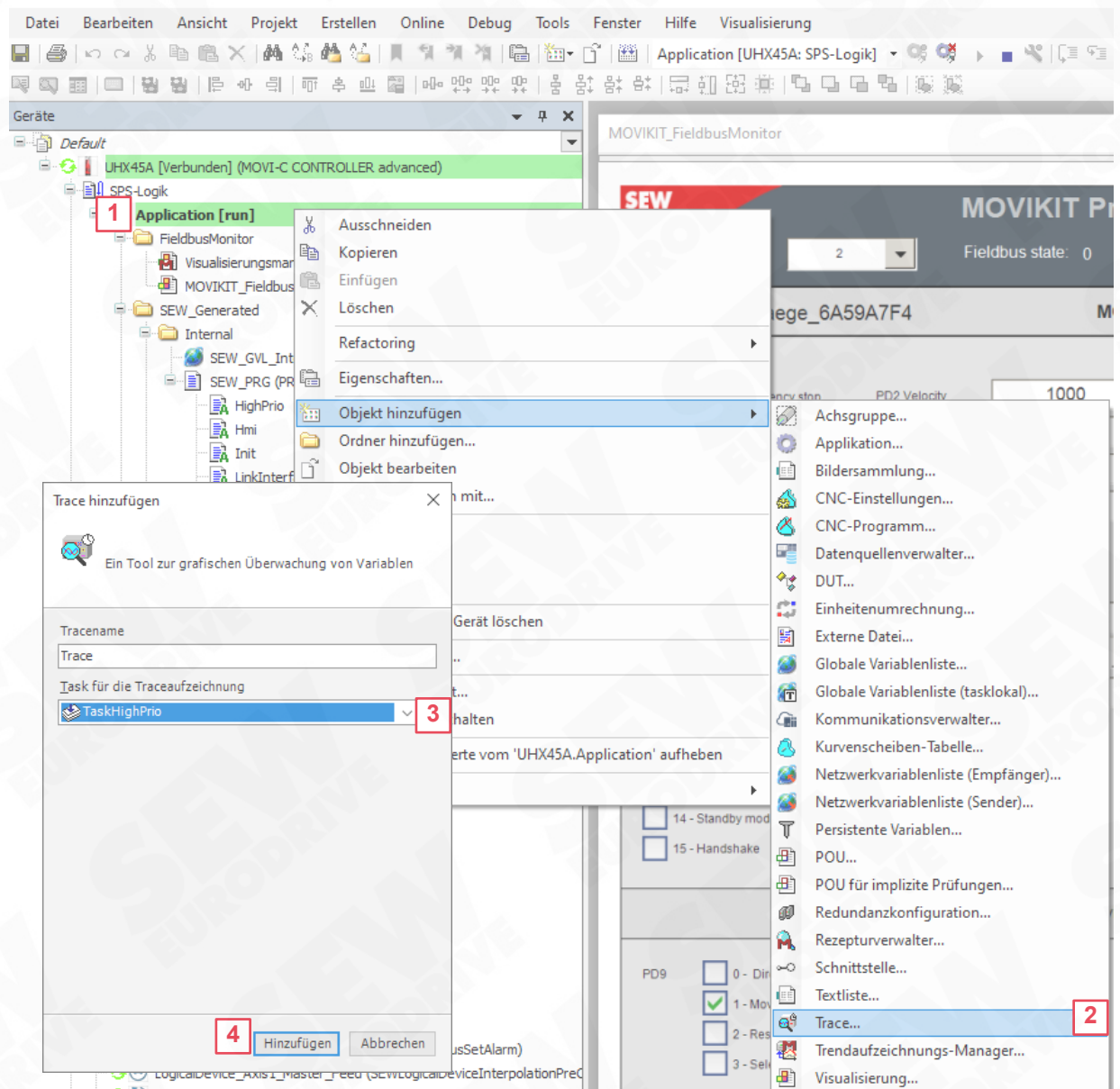
B When the master axis type is "modulo," the curve profile of the flying saw curve is shown next to it.

6.2.3 Performing a trace recording



1. Adding a trace

UHX45A - IEC Editor

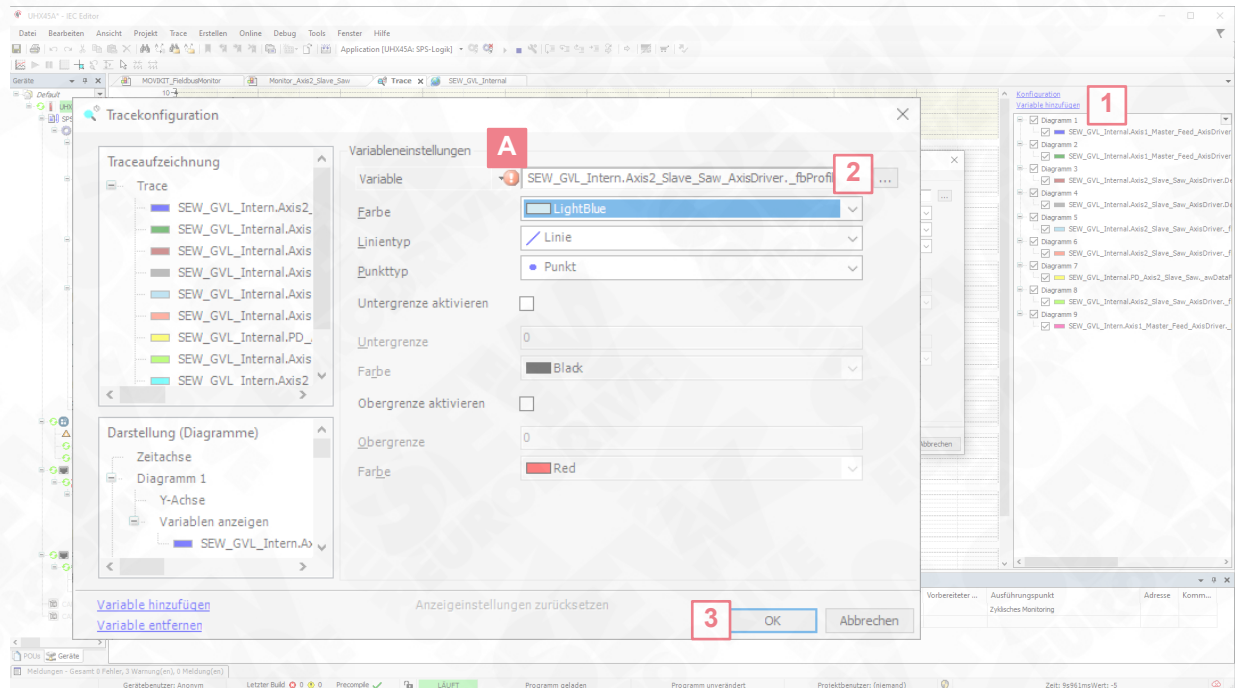


- 1 Right-click **Application**.
- 2 Select **Add object** **Trace**
- 3 Select **TaskHighPrio**
- 4 Click **Add**

2. Adding variables

There are multiple ways to add variables to the trace:

▪ Copying and pasting the text strings into the input assistant



1

Click **Add variable**

2

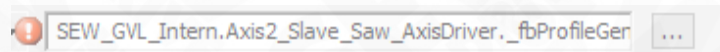
Copy the correct variable from the workbook and paste it into the Variable input field

3

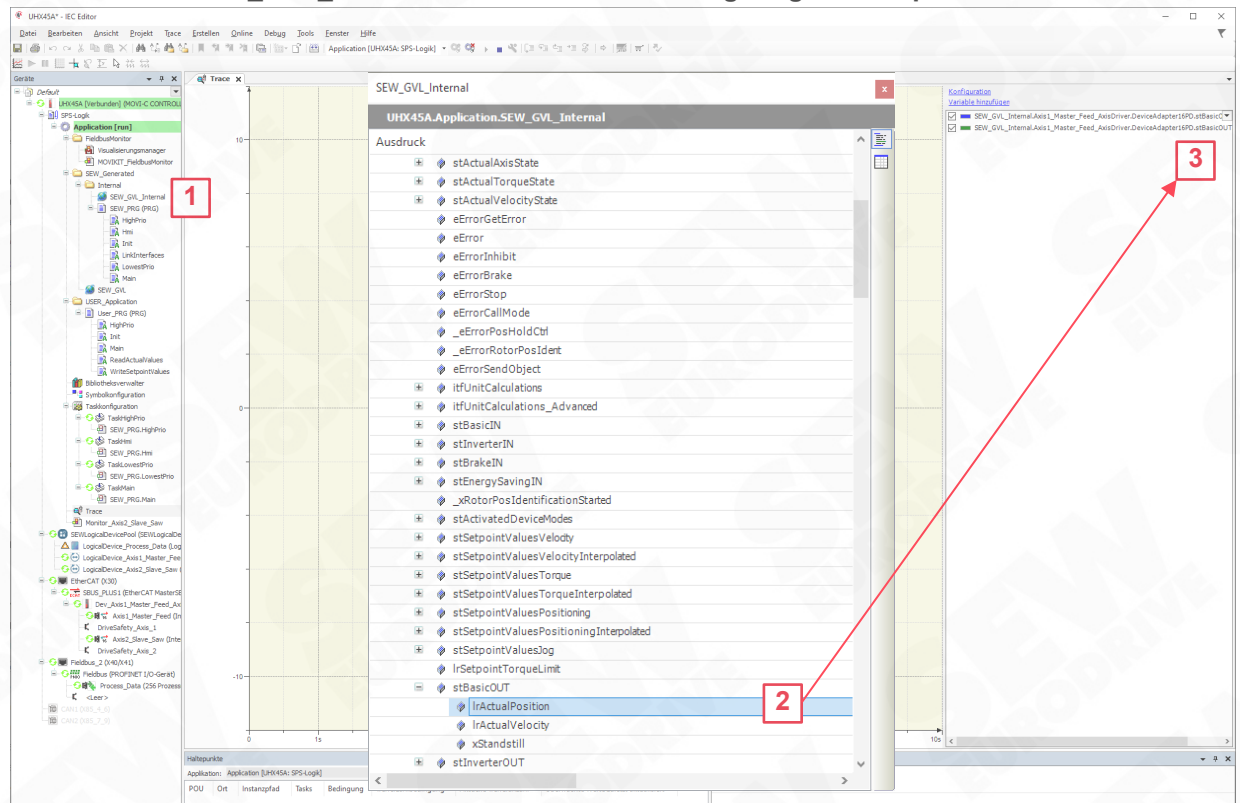
Click **OK**

A

The exclamation point symbol before the Variable input field is also displayed for traceable variables in Codesys Version V3.5.18.2 and is therefore irrelevant to the variables displayed below.



From the SEW_GVL_Internal variable structure using drag-and-drop



- 1 Double-click **SEW_GVL_Internal**
- 2 Choose the correct variable
- 3 Drag the variable into the trace

Variables:

Virtual linear axis, actual position, and speed:

SEW_GVL_Internal.Axis1_Master_Feed_AxisDriver.DeviceAdapter16PD.StBasicOUT.IrActualPosition
 SEW_GVL_Internal.Axis1_Master_Feed_AxisDriver.DeviceAdapter16PD.StBasicOUT.IrActualVelocity

FlyingSaw, actual position, speed, and machine state:

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.DeviceAdapter16PD.StBasicOUT.IrActualPosition
 SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.DeviceAdapter16PD.StBasicOUT.IrActualVelocity

FlyingSaw, setpoint position, and speed:

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbProfileGenerationControl.stOUTInterpolation.StSetpointsUserUnits.IrPosition
 SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbProfileGenerationControl.stOUTInterpolation.StSetpointsUserUnits.IrVelocity

Synchronous operation state:

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbGearingProfile.stOUTSignals.eGearingState
 Info: This variable can only be entered by copying and pasting it into the input assistant

Moving to start position:

SEW_GVL_Internal.PD_Axis2_Slave_SAW.awDataFromFBus[9]



3. Increasing the buffer size

1 Click **Configuration**

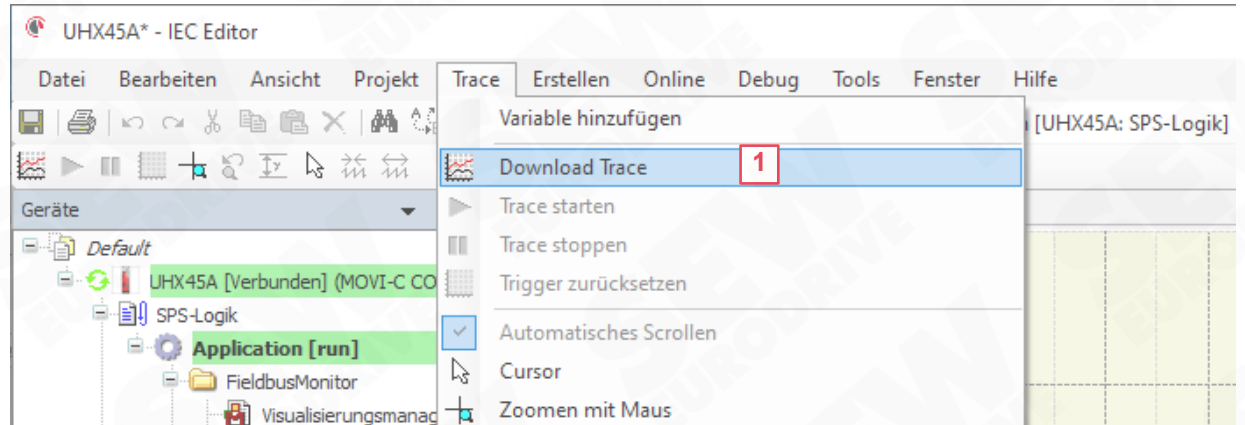
2 Click **Advanced**

3 Change the buffer size to **Buffer size = 10000**

4. Optimizing the view

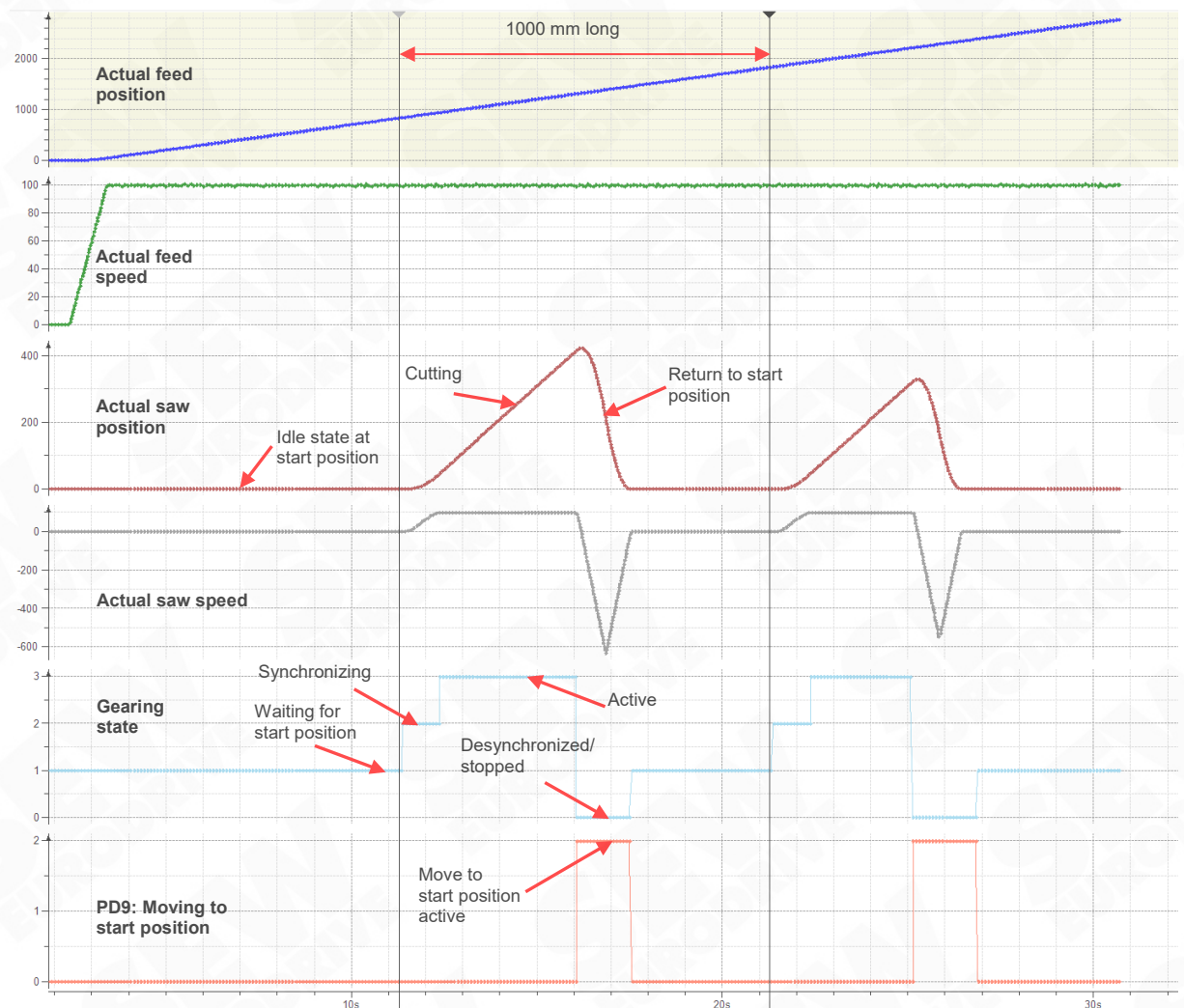
1 Click **Move all variables to individual diagrams**

5. Starting the trace



1 Click **Download trace**

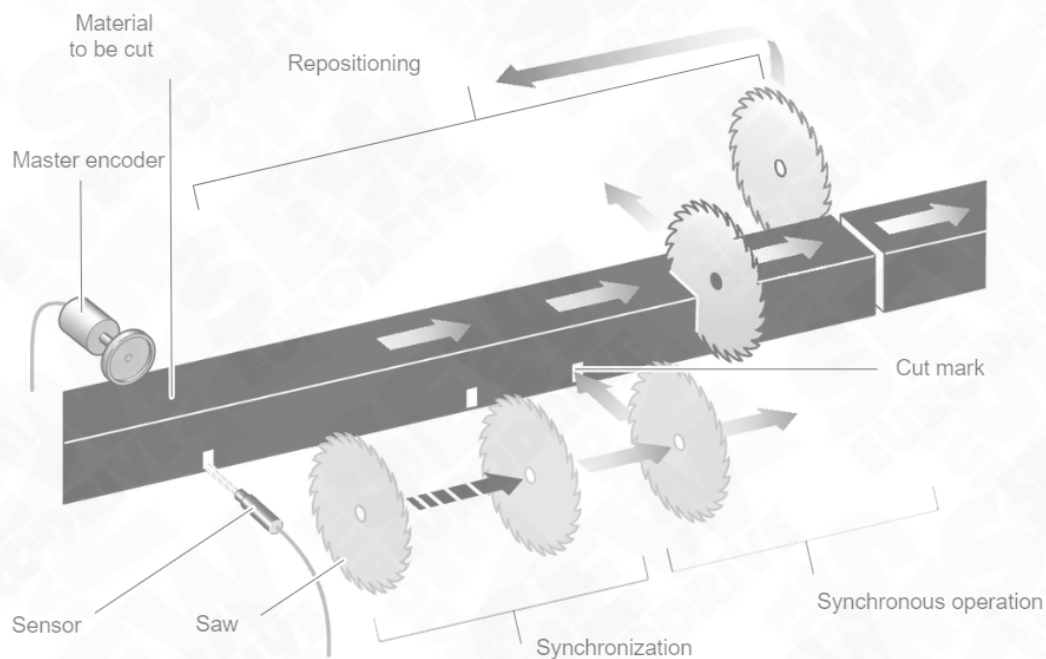
6. Results of the trace measurement



6.3 Flying saw with cut mark control



In cut mark control, a sensor detects the cut marks on the material. This sensor signal is processed in the MOVI-C® CONTROLLER and is used for starting the saw carriage.



6.3.1 Testing the function



The Touchprobe input DI04 is wired to the flying saw. When the Touchprobe is activated (positive edge at DI04), the position of the master axis (Axis1_Master_Feed) is adopted. The following steps show how cut mark control mode is used.



SEW **MOVIKIT Process data monitor** control monitor

Module number: Fieldbus state: 0 Initialized PD start address: 9 PD length: 21

Axis2_Slave_Saw **MOVIKIT FlyingSaw**

PD In		PD Out	
<input checked="" type="checkbox"/> 0 - Enable/Emergency stop	PD2 Velocity: <input type="text" value="1000"/> 2	<input checked="" type="checkbox"/> 0 - Ready	PD2 Act. Velocity: <input type="text" value="0"/>
<input checked="" type="checkbox"/> 1 - Enable/Application stop	PD3 Acceleration: <input type="text" value="1000"/>	<input checked="" type="checkbox"/> 1 - /Safe stop	PD3 Status / Error ID: <input type="text" value="1"/>
<input type="checkbox"/> 2 - res.	PD4 Deceleration: <input type="text" value="1000"/> 3	<input type="checkbox"/> 2 - Powered	Warning: Trial license active!
<input type="checkbox"/> 3 - Release brake while inhibit	PD5 Binary outputs: <input type="text" value="0"/>	<input type="checkbox"/> 3 - Brake released	PD4 Act. Torque: <input type="text" value="0"/>
<input type="checkbox"/> 4 - Positive	PD6 Mode: <input type="text" value="1402"/> 1	<input type="checkbox"/> 4 - Motor turning	PD5 Binary inputs: <input type="text" value="0"/>
<input type="checkbox"/> 5 - Negative	<input type="text" value="1402 - Application automatic variant 2"/>	<input checked="" type="checkbox"/> 5 - Referenced	PD6 act. Mode: <input type="text" value="1402"/>
<input type="checkbox"/> 6 - Accept new position	PD7/8 Position: <input type="text" value="0"/>	<input type="checkbox"/> 6 - New position accepted	<input type="text" value="1402 - Application automatic variant 2"/>
<input type="checkbox"/> 7 - Start		<input checked="" type="checkbox"/> 7 - Setpoint reached / In Pos.	PD7/8 act. Position: <input type="text" value="0"/>
<input type="checkbox"/> 8 - Reset		<input type="checkbox"/> 8 - Error	
<input type="checkbox"/> 9 - res.		<input checked="" type="checkbox"/> 9 - Warning	
<input type="checkbox"/> 10 - Select drive train 2		<input type="checkbox"/> 10 - Drive train 2 active	
<input type="checkbox"/> 11 - res.		<input type="checkbox"/> 11 - In velocity	
<input type="checkbox"/> 12 - Disable SW limit switches		<input checked="" type="checkbox"/> 12 - SW limit switches disabled	
<input type="checkbox"/> 13 - Inhibit		<input type="checkbox"/> 13 - res	
<input type="checkbox"/> 14 - Standby mode		<input type="checkbox"/> 14 - Standby active	
<input type="checkbox"/> 15 - Handshake		<input type="checkbox"/> 15 - Handshake out	

FlyingSaw Parameters

PD9		PD9	
<input type="checkbox"/> 0 - Direct cut		<input type="checkbox"/> 0 - Busy	
<input type="checkbox"/> 1 - Move to start position		<input type="checkbox"/> 1 - In gear	
<input type="checkbox"/> 2 - Reserved		<input type="checkbox"/> 2 - Reserved	
<input type="checkbox"/> 3 - Select Gear-in-Gear-out on the fly		Gearing state: <input type="text" value="0"/> A	
PD10/11 Cutting Length [UserUnits Master]: <input type="text" value="10000"/> 4		PD10/11 act. Cutting length [UserUnits Master]: <input type="text" value="10000"/>	
PD12 Cutting Angle [°]: <input type="text" value="0"/>		PD12/13 Elapsed cutting length [UserUnits Master]: <input type="text" value="0"/>	
PD13 Reserved: <input type="text" value="0"/>		PD14/15 act. Sensor distance [UserUnits Master]: <input type="text" value="25000"/>	
PD14/15 Sensor Distance [UserUnits Slave]: <input type="text" value="25000"/> 5		PD16 act. Master Velocity [UserUnits Master]: <input type="text" value="0"/>	
PD16/17 Touchprobe Window [UserUnits Master]: <input type="text" value="0"/> 4		PD17 res.: <input type="text" value="0"/>	
PD18/19 Synchronization Distance [UserUnits Master]: <input type="text" value="10000"/> 6		PD18/19 act. Synchronization Distance [UserUnits Master]: <input type="text" value="0"/>	
PD20/21 Synchronous Distance [UserUnits Master]: <input type="text" value="0"/>		PD20/21 act. Synchronous Distance: <input type="text" value="0"/>	

- 1** Set the cut mark control with **PD6 Mode = 1402**
- 2** Set the speed setpoint **PD2 Velocity = 1000 mm/s**. This is the speed setpoint for returning to the start position.
- 3** Set the acceleration and deceleration to **PD3 Acceleration and PD4 Deceleration 1000 mm/s²**
- 4** Set **PD10/11 Cutting Length = 10000** and **PD 16/17 Touchprobe Window = 0** to receive all Touchprobe signals and simplify the exercise
- A** If no Touchprobe is activated when starting the saw, the axis reports an error after one cut length.
- 5** Set the sensor distance to the cut mark to **PD14/15 Sensor Distance = 25000**
- 6** Set the synchronization distance by which the saw is synchronized with the master axis before the cut to **PD18/19 = 10000**

MOVIKIT Process data monitor

control
monitor

Module number
1
Fieldbus state: 2
Communication
PD start address: 1
PD length: 8

Axis1_Master_Feed

MOVIKIT Gearing

☒ 0 - Enable/Emergency stop

☒ 1 - Enable/Application stop

☐ 2 - res.

☐ 3 - Release brake while inhibit

☐ 4 - Positive

☐ 5 - Negative

☐ 6 - Accept new position

☒ 7 - Start

☐ 8 - Reset

☐ 9 - res.

☐ 10 - Select drive train 2

☐ 11 - res.

☐ 12 - Disable SW limit switches

☐ 13 - Inhibit

☐ 14 - Standby mode

☐ 15 - Handshake

PD2 Velocity
50
2

PD3 Acceleration
100
3

PD4 Deceleration
100

PD5 Binary outputs
0

PD6 Mode
200
1

200 - Velocity

PD7/8 Position
0

☒ 0 - Ready

☒ 1 - /Safe stop

☒ 2 - Powered

☒ 3 - Brake released

☒ 4 - Motor turning

☒ 5 - Referenced

☐ 6 - New position accepted

☐ 7 - Setpoint reached / In Pos.

☐ 8 - Error

☒ 9 - Warning

☐ 10 - Drive train 2 active

☒ 11 - In velocity

☒ 12 - SW limit switches disabled

☐ 13 - res

☐ 14 - Standby active

☐ 15 - Handshake out

PD2 Act. Velocity
50

PD3 Status / Error ID
10

Warning
Trial license active!

PD4 Act. Torque
17

PD5 Binary inputs
1

PD6 act. Mode
200

200 - Velocity

PD7/8 act. Position
-20475089

- 1 Set your master axis to **Mode 200**: Speed
- 3 Set the speed setpoint to **50 mm/s** to get a slow feed.
- 4 Set the acceleration and deceleration to **100 mm/s²**

It is very important that the master axis is not too slow. If the master rotational speed is too slow, the Touchprobe function will not function.

MOVIKIT Process data monitor

control

monitor

Module number 2

Fieldbus state: 2 Communication

PD start address: 9
 PD length: 19

Axis2_Slave_Saw
MOVIKIT FlyingSaw

PD In

☒ 0 - Enable/Emergency stop
☒ 1 - Enable/Application stop
☐ 2 - res.
☐ 3 - Release brake while inhibit
☐ 4 - Positive
☐ 5 - Negative
☐ 6 - Accept new position
☒ 7 - Start
☐ 8 - Reset
☐ 9 - res.
☐ 10 - Select drive train 2
☐ 11 - res.
☐ 12 - Disable SW limit switches
☐ 13 - Inhibit
☐ 14 - Standby mode
☐ 15 - Handshake

PD2 Velocity

1000

PD3 Acceleration

1000

PD4 Deceleration

1000

PD5 Binary outputs

0

PD6 Mode

1402

PD7/8 Position

0

PD Out

☒ 0 - Ready
☒ 1 - /Safe stop
☒ 2 - Powered
☒ 3 - Brake released
☐ 4 - Motor turning
☒ 5 - Referenced
☐ 6 - New position accepted
☒ 7 - Setpoint reached / In Pos.
☐ 8 - Error
☒ 9 - Warning
☐ 10 - Drive train 2 active
☐ 11 - In velocity
☒ 12 - SW limit switches disabled
☐ 13 - res
☐ 14 - Standby active
☐ 15 - Handshake out

PD2 Act. Velocity

0

PD3 Status / Error ID

10

Warning
Trial license active!

PD4 Act. Torque

-28

PD5 Binary inputs

17

PD6 act. Mode

1402

PD7/8 act. Position

0

FlyingSaw Parameters

PD9 ☐ 0 - Direct cut
☐ 1 - Move to start position
☐ 2 - Reserved
☐ 3 - Reserved

PD10/11 Cutting Length [UserUnits Master]

100000

PD12 Cutting Angle [°]

0

PD13 Reserved

0

PD14/15 Sensor Distance [UserUnits Slave]

25000

PD16/17 Touchprobe Window [UserUnits Master]

100000

PD18/19 Synchronization Distance [UserUnits Master]

10000

PD9 ☒ 0 - Busy
☐ 1 - In gear
☐ 2 - Reserved

Gearing state

1

WAITING_FOR_STARTPOSITION

PD10/11 act. Cutting length [UserUnits Master]

0

PD12/13 Elapsed cutting length [UserUnits Master]

33175

PD14/15 act. Sensor distance [UserUnits Master]

25000

PD16 act. Master Velocity [UserUnits Master]

50

PD17 res.

0

PD18/19 act. Synchronization Distance [UserUnits Master]

0

- 1

Start the saw and activate the Touchprobe. The state of the synchronous operation of the axis changes to 1 "Waiting for start position."
- 2

As soon as the material feed axis reaches the calculated synchronization position, the state of the synchronous operation changes to 2 "Gear in" and then to 3 "Active."
- 3

As soon as the saw is synchronous, activate PD9 = 1 "Move to start position" to reset the saw for the next step.
- 4

Activate the Touchprobe again to start a second cut.

Product Training

07.10.2024

6.3.2 Performing a trace recording



Perform the trace recording as described in the chapter above. Enter the following variables into the trace for this:

Variables:

- **Virtual linear axis, actual position, and speed:**

SEW_GVL_Internal.Axis1_Master_Feed_AxisDriver.DeviceAdapter16PD.StBasicOUT.lrActualPosition

SEW_GVL_Internal.Axis1_Master_Feed_AxisDriver.DeviceAdapter16PD.StBasicOUT.lrActualVelocity

- **FlyingSaw, setpoint position, and speed:**

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbProfileGenerationControl.stOUTInterpolation.StSetpointsUserUnits.lrPosition

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbProfileGenerationControl.stOUTInterpolation.StSetpointsUserUnits.lrVelocity

- **Synchronous operation state:**

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbGearingProfile.stOUTSignals.eGearingState

Info: This variable can only be entered by copying and pasting it into the input assistant

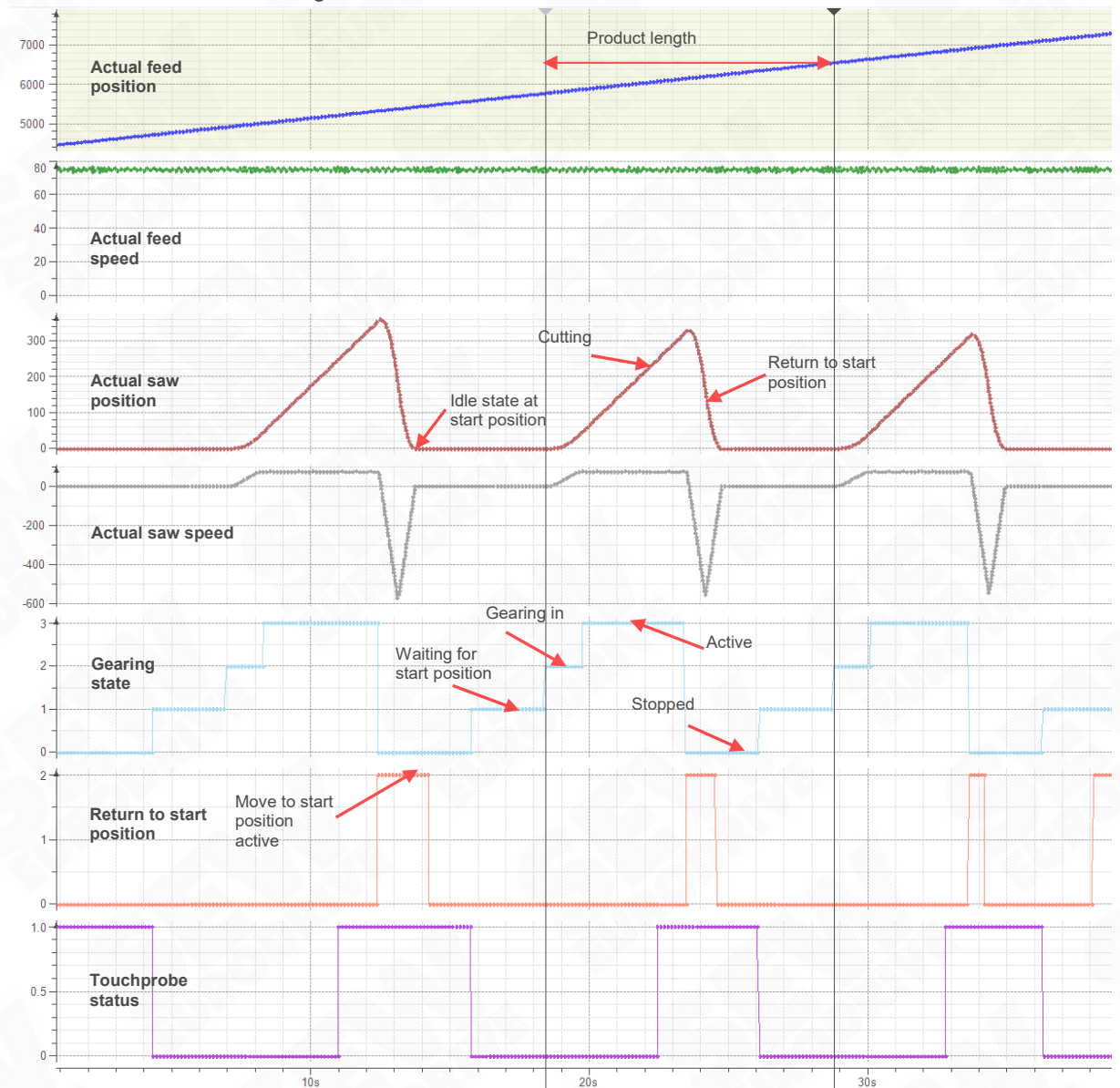
- **Moving to start position:**

SEW_GVL_Internal.PD_Axis2_Slave_SAW.awDataFromFBus[9]

- **Touchprobe signal:**

SEW_GVL_Internal.Axis2_Slave_Saw_AxisDriver.fbTouchprobe.stOUTSignals.xaktiv

Results of the trace recording:



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Version 1.3

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