



Komponenty pro průmyslovou automatizaci

BECKHOFF

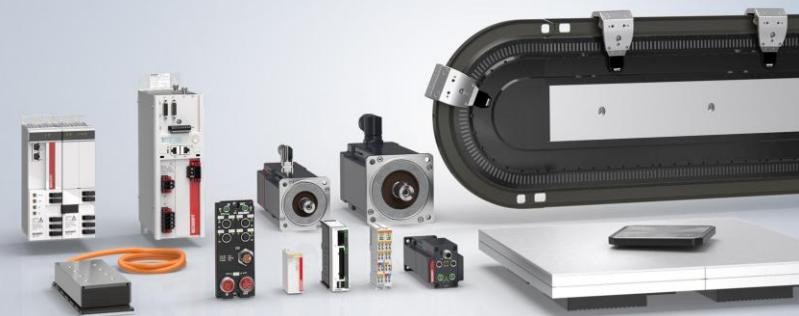
Průmyslové počítače



I/O



Pohony



Software



MX System



Vision



Flow reálného experimentu

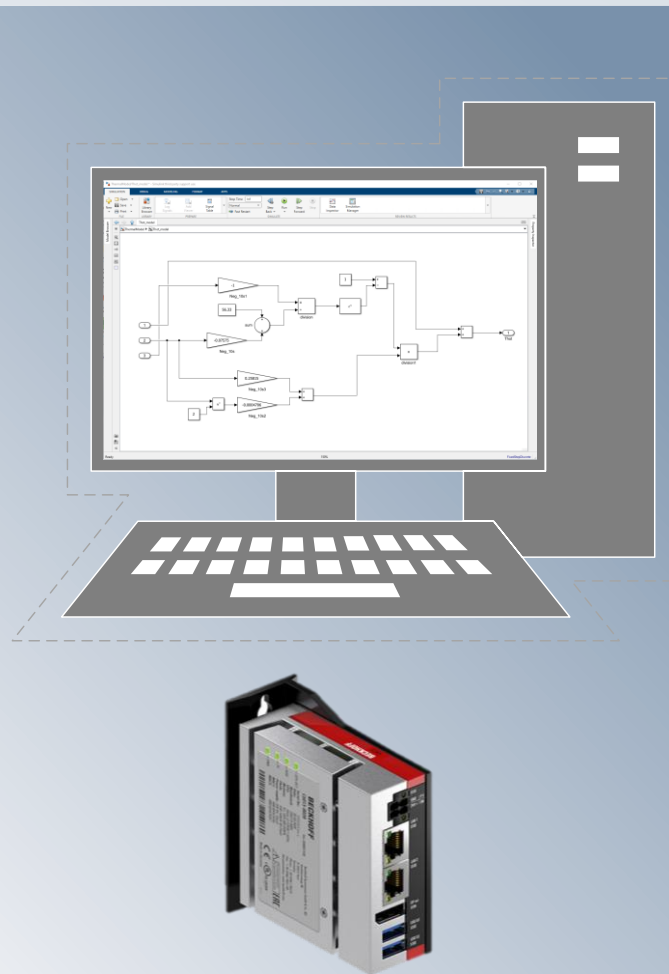
BECKHOFF

Snímání vstupů

EtherCAT



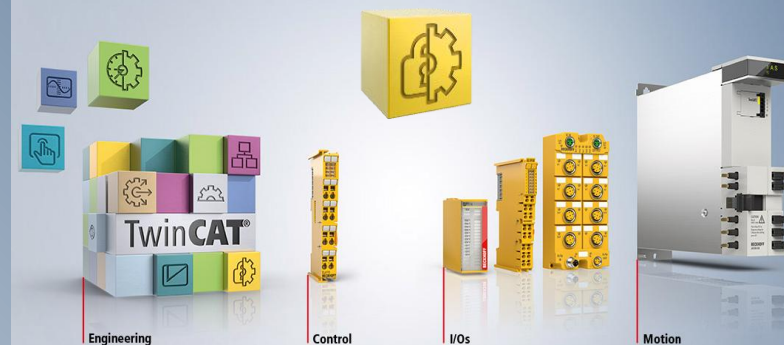
Výpočet experimentu



Ovládání aktuátorů



HMI



SAFETY

Flow reálného experimentu

BECKHOFF

Snímání vstupů

EtherCAT[®]



Flow reálného experimentu

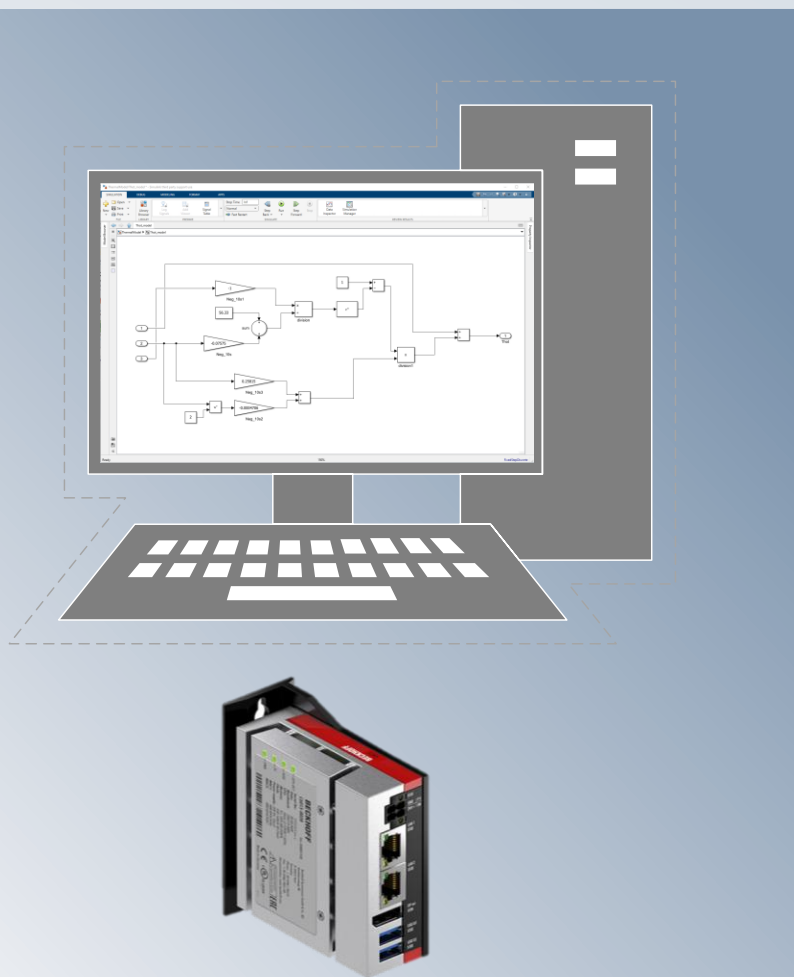
BECKHOFF

Snímání vstupů

EtherCAT



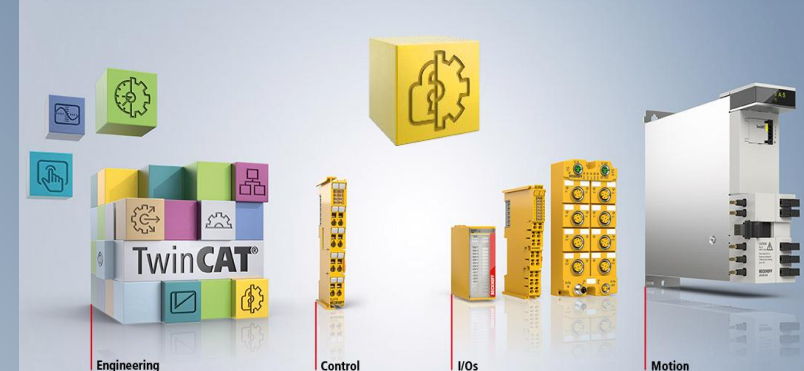
Výpočet experimentu



Ovládání aktuátorů



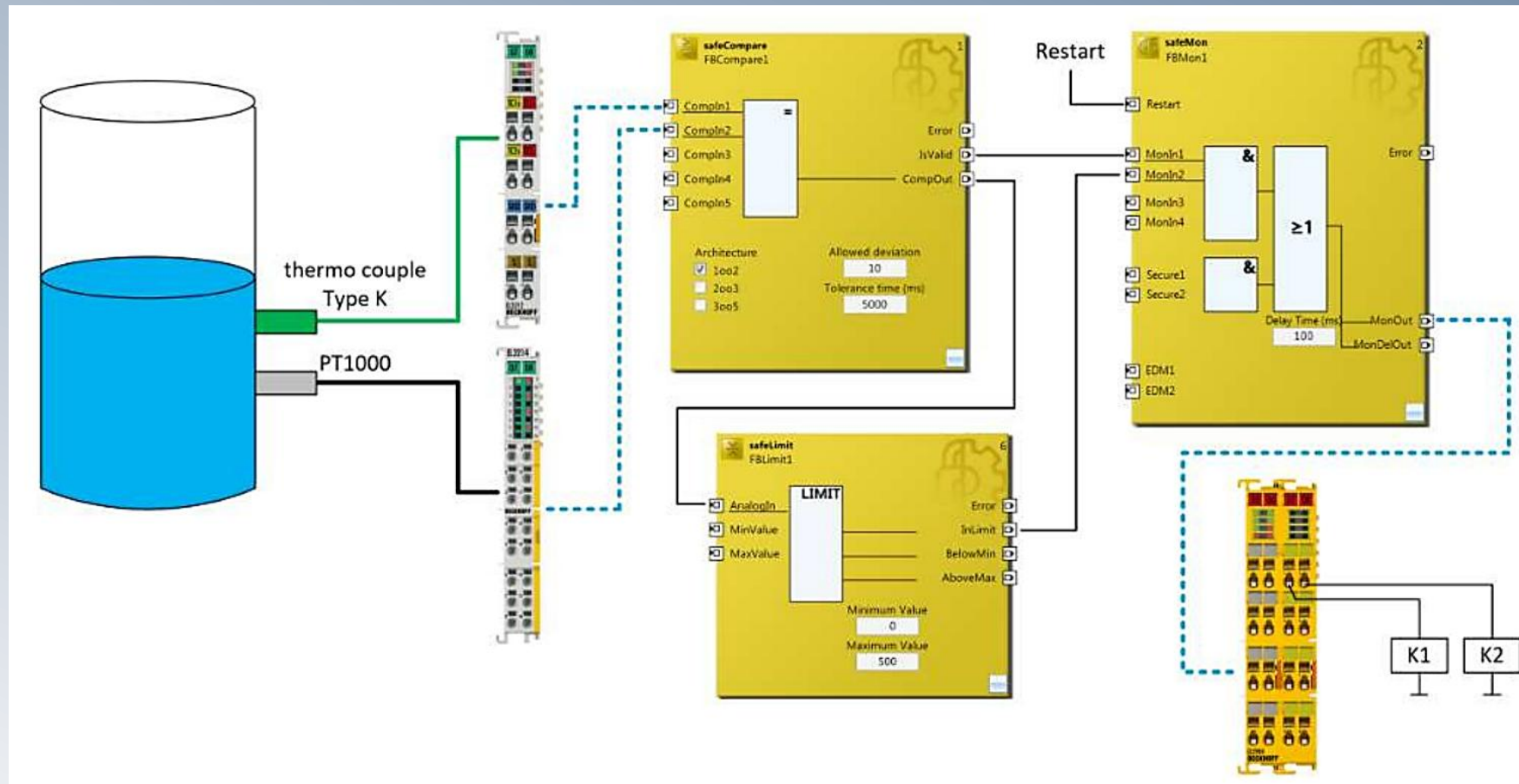
HMI



SAFETY

Flow reálného experimentu

BECKHOFF



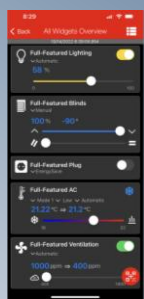
SAFETY

Flow reálného experimentu

BECKHOFF

Snímání vstupů

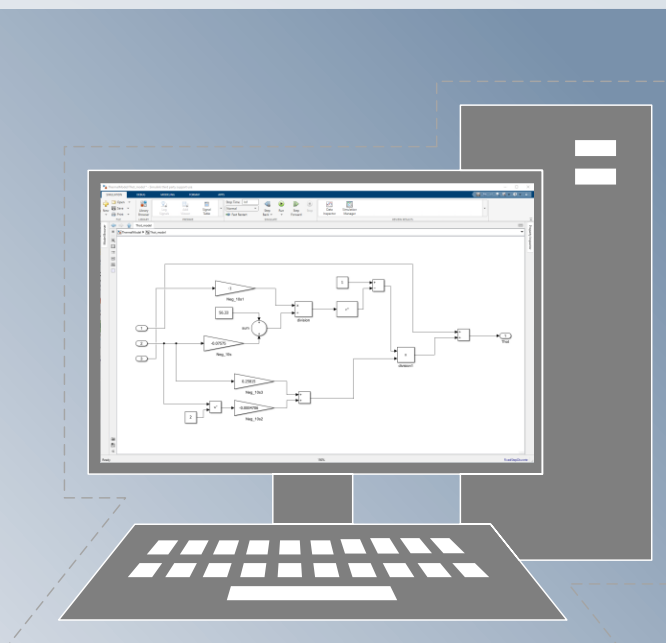
EtherCAT



MQTT

HMI

Výpočet experimentu



Ovládání aktuátorů



Control



I/Os



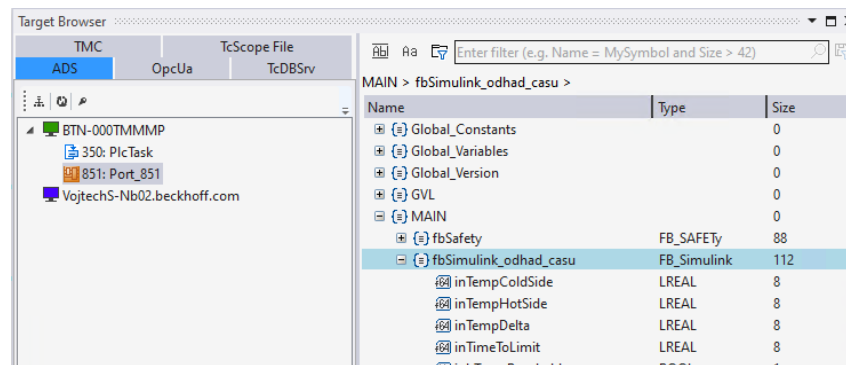
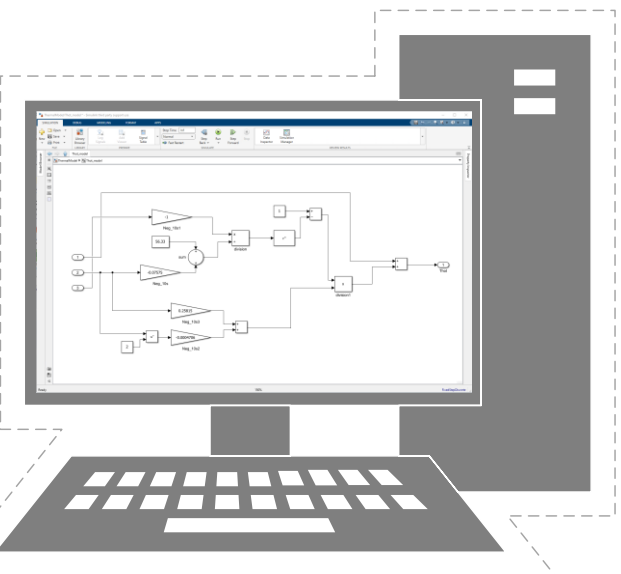
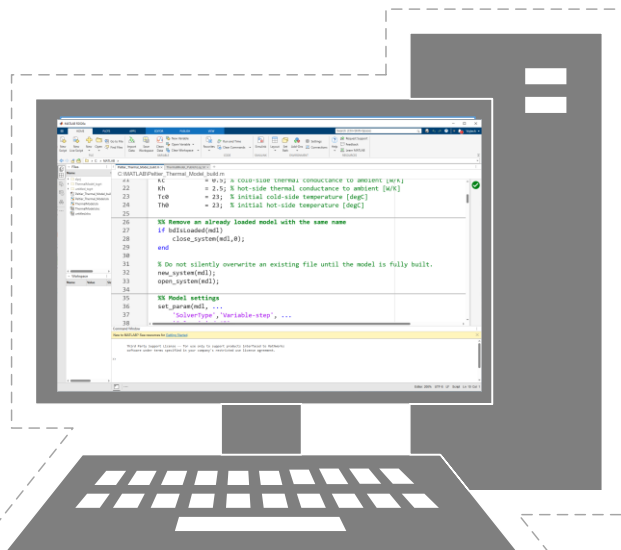
Motion



SAFETY

Implementace MATLAB / Simulink pomocí ADS komunikace

BECKHOFF



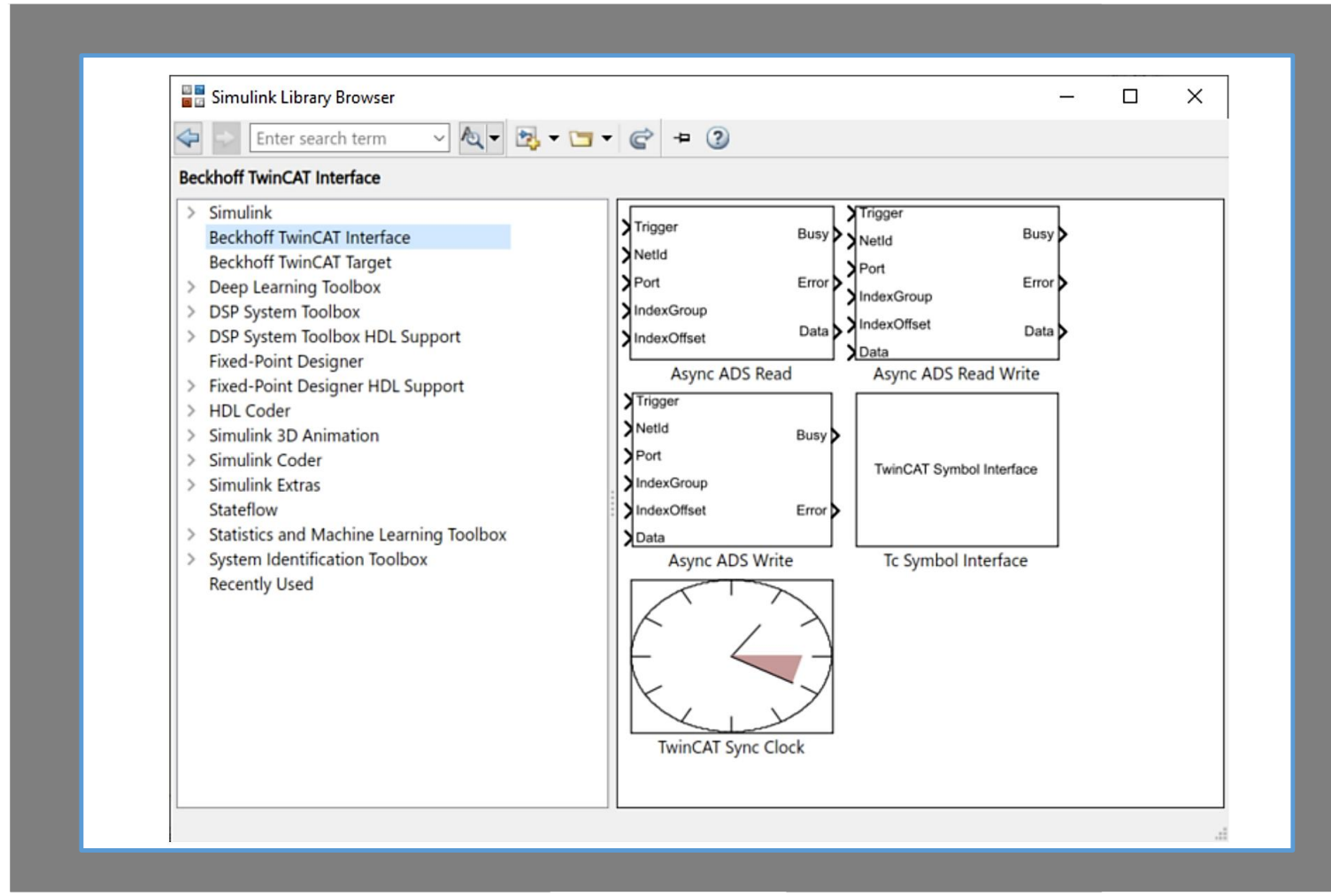
TwinCAT 3
ADS



EtherCAT



ADS Target browser je implementován do prostředí MATLAB® / Simulink®
TE1410 – Interface for MATLAB® and Simulink®



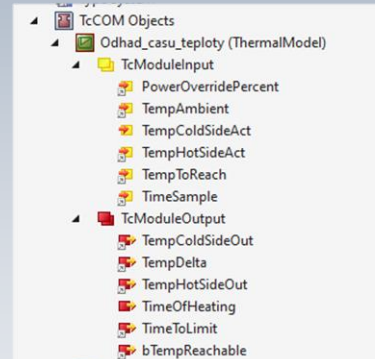
ADS Target browser je implementován do prostředí MATLAB® / Simulink®
TE1410 – Interface for MATLAB® and Simulink®

Implementace MATLAB / Simulink pomocí ADS knihovny

BECKHOFF

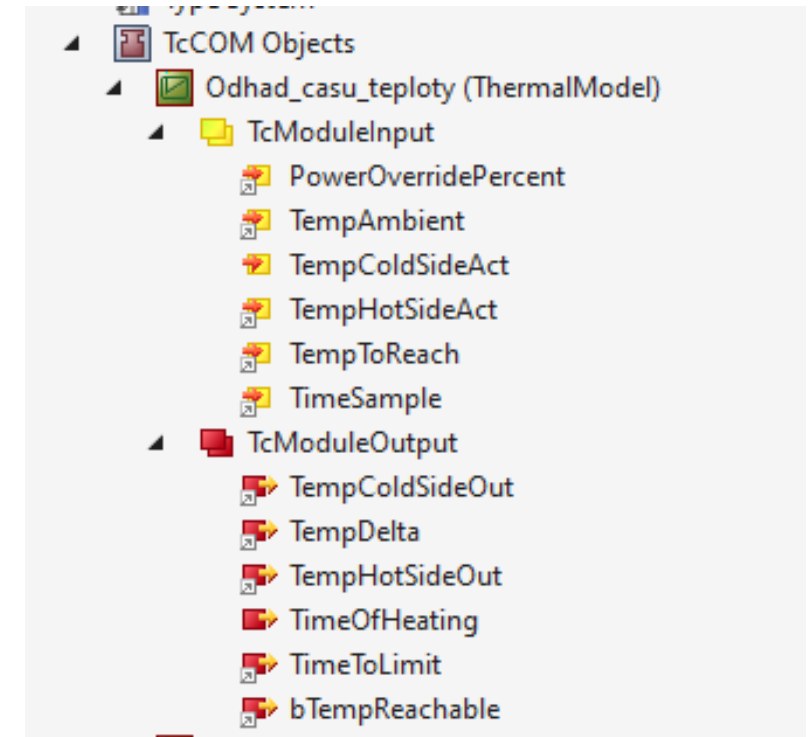
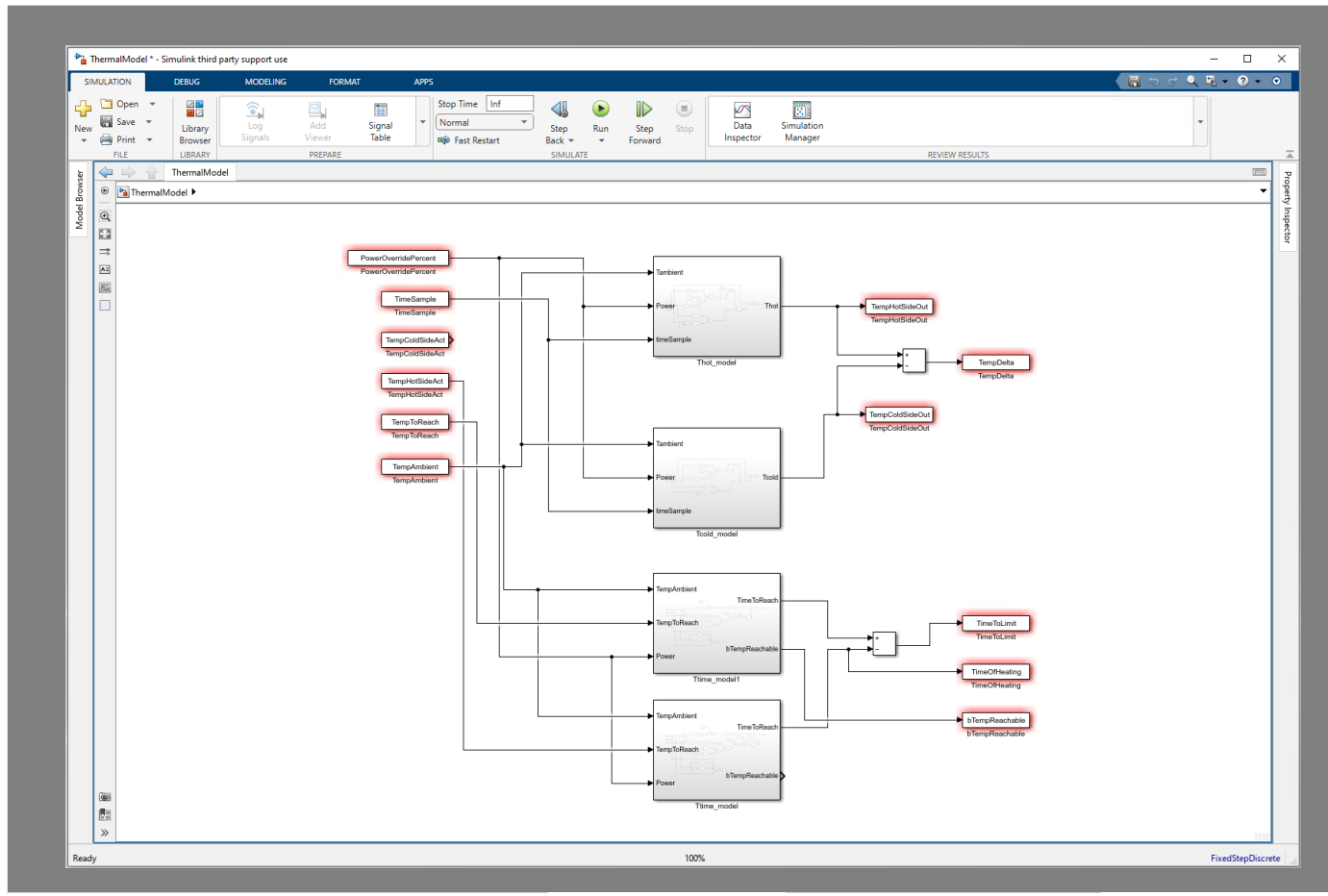
TwinCAT 3 TcCOM Object

Name	Value	CS	Type	PTCID
ModuleCaller	CyclicTask	☒	TcMgSdk.ModuleCaller	0x00000002
StepSizeAdaptation	RequireMatchingTaskCycleTime	☒	TcMgSdk.StepSizeAdap...	0x00000004
ExecutionSequence	UpdateBeforeOutputMapping	☒	TcMgSdk.ExecutionSeq...	0x00000005
Execute	☒ TRUE	☒	BOOL	0x00000006
TcModuleInput	...	☒	ThermalModel_TcMod...	0x00000000
.PowerOverridePercent	50.0		LREAL	
.TempAmbient	27.5		LREAL	
.TempColdSideAct	0.0		LREAL	
.TempHotSideAct	30.0		LREAL	
.TempToReach	32.0		LREAL	
.TimeSample	0.0		LREAL	



EtherCAT

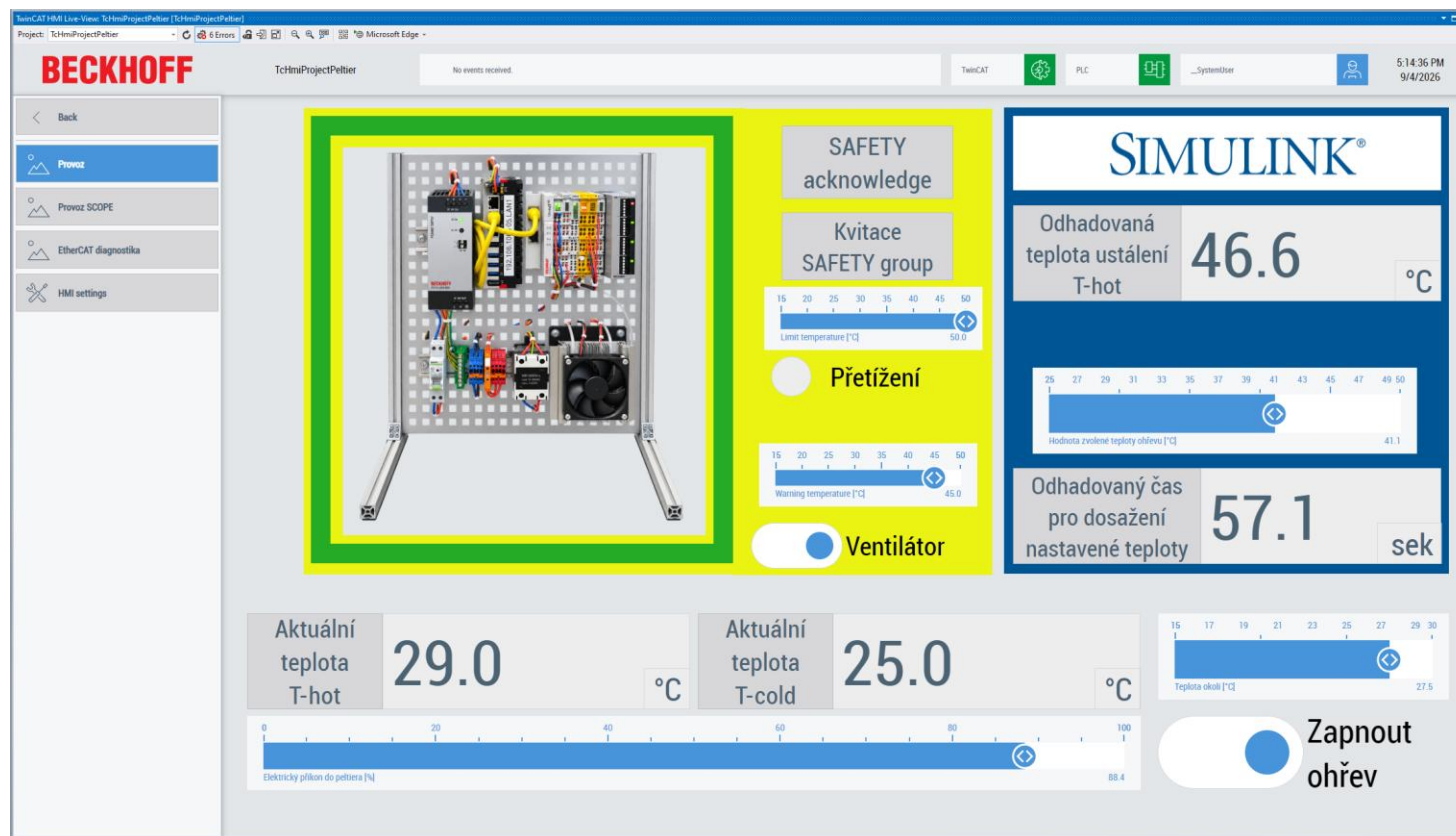
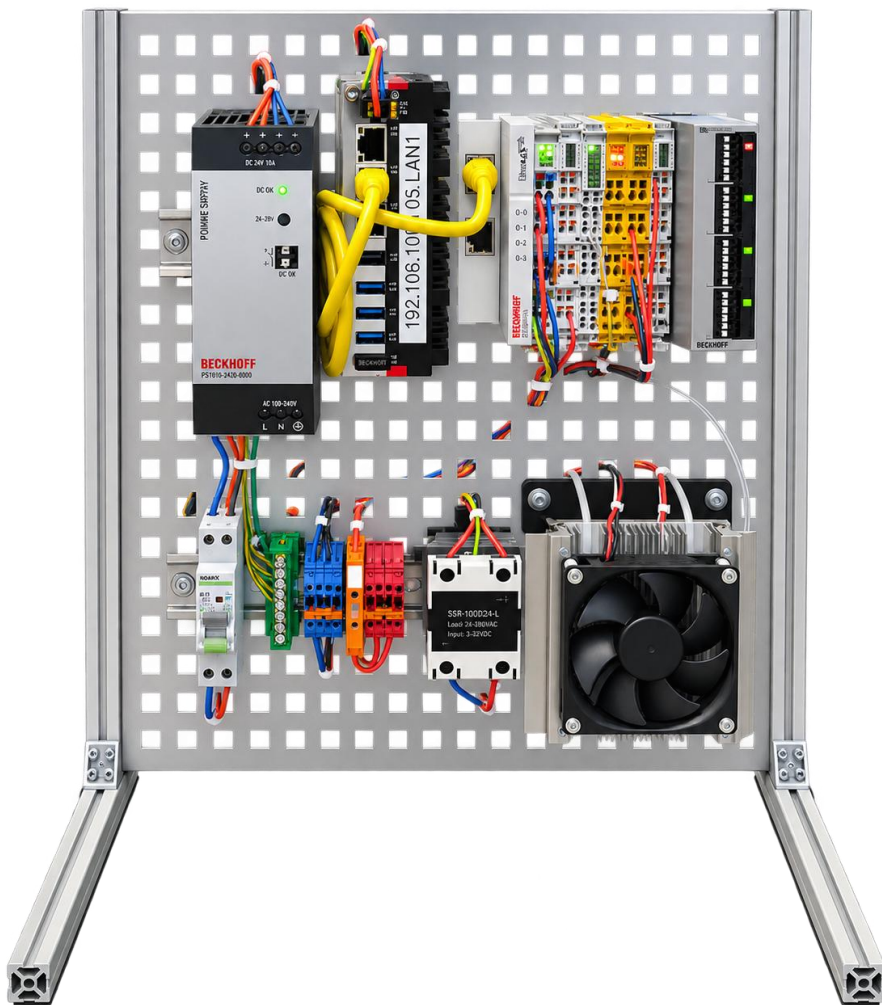
Model je zkompilován a nalinkován do realtime jádra systému TwinCAT
TE1400 (1401) – Target for MATLAB® (Simulink®)



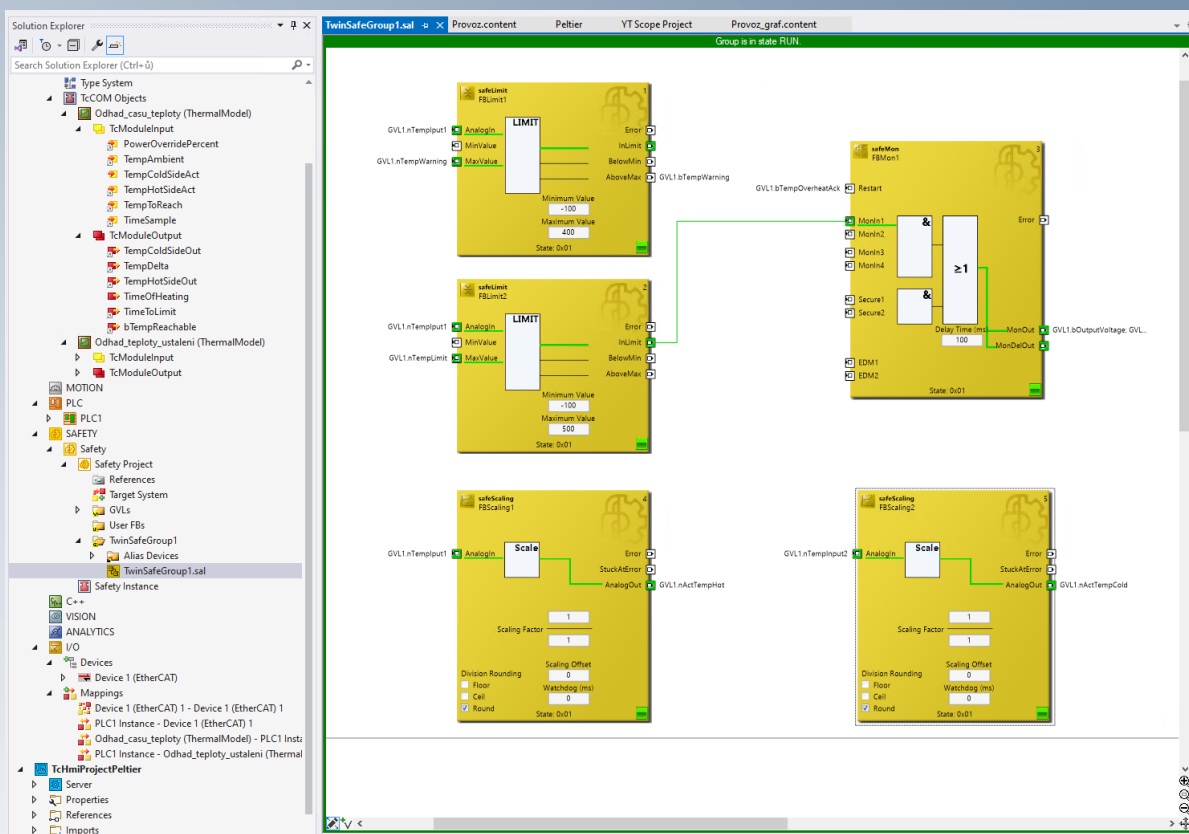
Model je zkompileován a nalinkován do realtime jádra systému TwinCAT
TE1400 (1401) – Target for MATLAB® (Simulink®)

Demo aplikace s Peltierovým článkem

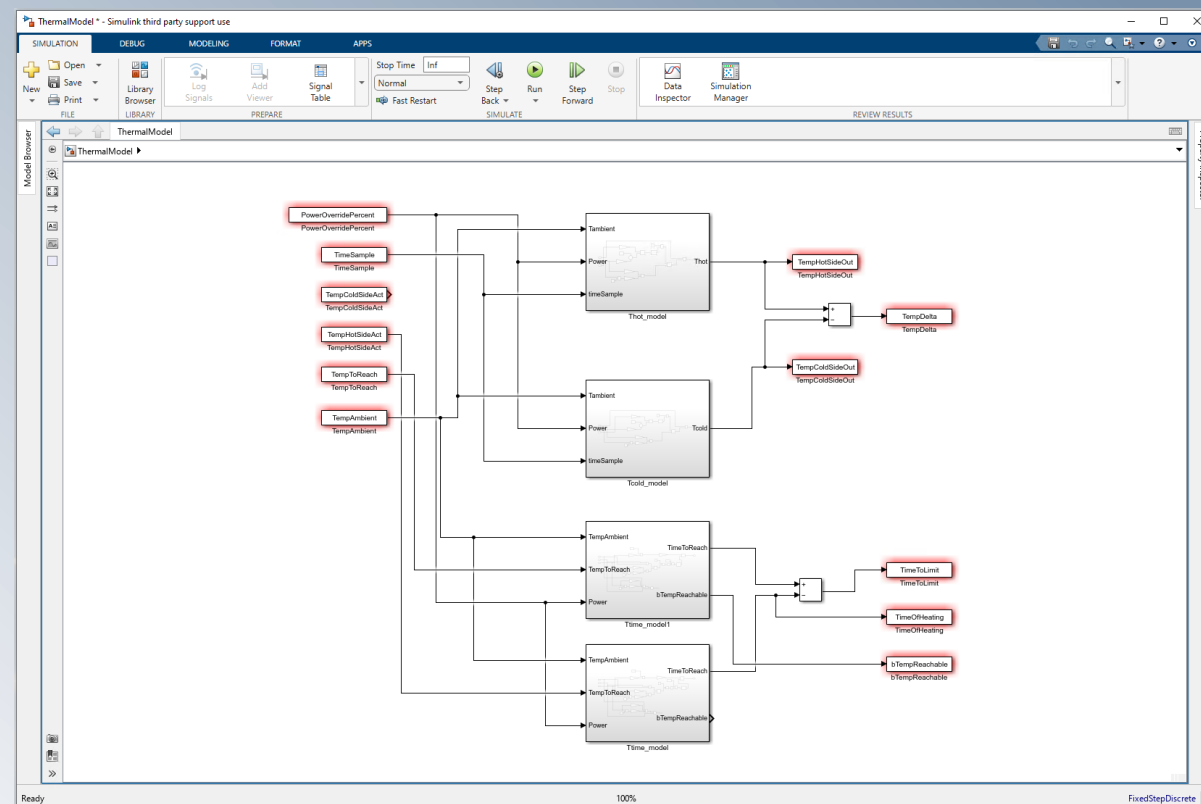
BECKHOFF



Demo aplikace s Peltierovým článkem



SIMULINK®



Vision inspekce s využitím TwinCAT Interface for MATLAB

BECKHOFF

The screenshot displays the MATLAB App Designer environment for an application titled "PLC Integrated Hexnut Quality Control". The interface is divided into several sections:

- Component Library:** A sidebar on the left containing various UI components like Axes, Button, Check Box, Date Picker, Drop Down, Edit Field (Numeric), Edit Field (Text), HTML, Hyperlink, Image, Label, List Box, Radio Button Group, Slider, Spinner, State Button, Table, Text Area, Toggle Button Group, Tree, Tree (Check Box), Grid Layout, Panel, Tab Group, Context Menu, Menu Bar, Toolbar, Gauge, Gauge (90 Degree), Gauge (Linear), Gauge (Semicircular), Knob, Knob (Discrete), Lamp, Switch, and Switch (Rocker).
- Canvas:** The central workspace where the application is built. It features a title bar "PLC Integrated Hexnut Quality Control" and a central image of a monitor displaying "MATLAB & SIMULINK" and a stack of blocks labeled "TwinCAT".
- Component Browser:** A sidebar on the right showing a list of components used in the application, including "app.CPUUsagePanel", "app.CPUUsageEditField", "app.ClassifierExecutionTimePanel", "app.msEditField", "app.DeepLearningClassifierPanel", "app.ClassificationLamp", "app.ClassificationEditField", "app.ProbabilityEditField", "app.Label", "app.MotionPanel", "app.MovementEnableButtonGroup", "app.StopButton", "app.StartButton", "app.MovementModeButtonGroup", "app.Lamp_4", "app.Lamp_3", "app.Lamp_2", "app.Lamp_1", "app.Position4Button", "app.Position3Button", "app.Position2Button", "app.Position1Button", "app.AutomaticButton", "app.PLCIntegratedHexnutQualityControl", "app.ImageStart", and "app.ImageAxes".
- Application Panels:**
 - Motion:** Includes "Movement Enable" (Start/Stop buttons) and "Movement Mode" (Automatic button, Position 1-4 buttons).
 - Communication:** Includes "Vision" (Vision state input, Capture Image/Error - ACK buttons) and "ADS" (ADS state input, Initialize ADS button).
 - Deep Learning Classifier:** Includes "Classification" (input field, green indicator light) and "Probability" (input field, 0 [%]).
 - PLC Benchmark:** Includes "Classifier Execution Time" (0.000 [ms]), "CPU Usage" (0.0 [%]), and "CPU Temperature" (0.0 [°C]).

At the bottom of the interface, the logos for **BECKHOFF** and **MathWorks** are displayed.

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