2024.3 Software Release Highlights

- **Support for new HIL devices**
  - HIL101
  - HIL506
- **Support for unconstrained SP execution rates**
- **Help support for Library Widgets in SCADA**
- **Communication interface updates**
  - EtherCAT Master component
  - Modbus Server pipelining feature
  - Extension of ABS encoder protocols
- **Differential protection example**

Support for new HIL devices

HIL101

- New, entry-level 4th generation device for Academia
- Tailored to elevate academic research and education
- Versatile tool capable of both rapid control prototyping (RCP) and advanced real-time simulations

Support for new HIL devices

HIL101

- Up to 3 Standard Processing Cores (SPCs)
- 4.5 ns GDS oversampling on all digital inputs
- Down to 250 ns simulation step for general circuits
- 50 ns DC-DC solver simulation step
- Real-time emulation of non-linear machines with spatial harmonics
- Real-time emulation of semiconductor switches power losses
- Connectivity capabilities
  - Ethernet, CAN, RS232, GPIO, HSSL, JTAG, USB 3.0

Device Configuration Table

HIL Device: HIL101

Param name \ Configuration	1	2	3
Standard Processing Cores	2	3	2
SPC peak processing power [GMACS]	0.88	0.88	0.88
SPC matrix memory [KWords]	16.0	16.0	16.0
Max converter weight (ideal switches)	3	3	4
Contactors (ideal switches)	6	6	6
Non-ideal switches	0	0	8
Time varying elements	16	16	16
Global GDS oversampling	yes	yes	yes
Switch-level GDS oversampling	no	no	yes
GDS switching delay	yes	yes	yes
Converter power loss calculation	yes	yes	yes
Converter forward voltage drop	yes	yes	yes
Machine solvers	1	0	0
Nonlinear machine support	yes	no	no
Nonlinear machine LUT size [KWords]	32	0	0
Absolute encoder protocol support	yes	no	no
DC-DC converter solvers	0	0	1
Signal generators	12	12	12
Look Up Tables	8	8	8
PWM modulators	12	12	12
PWM analyzers	4	0	0
Parallel DTV detectors	0	0	0
Interfaces			

Support for new HIL devices

HIL506

- New, mid-range 4th generation device
- More flexibility in tailoring your HIL setup
- Can be paralleled with HIL606 devices

Support for new HIL devices

HIL506

- Up to 6 Standard Processing Cores (SPCs)
- 3.5 ns GDS oversampling on all digital inputs
- Down to 200 ns simulation step for general circuits
- 25 ns DC-DC solver simulation step
- Real-time emulation of non-linear machines with spatial harmonics
- Real-time emulation of semiconductor switches power losses
- Connectivity capabilities same as HIL606

Device Configuration Table

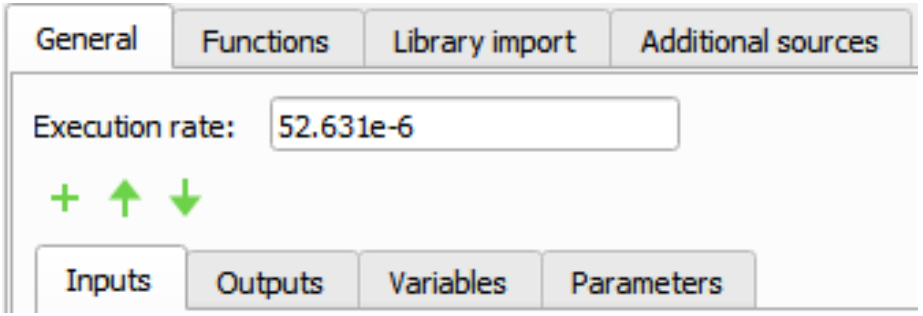
HIL Device: HIL506

Param name \ Configuration	1	2	3
Standard Processing Cores	4	6	2
SPC peak processing power [GMACS]	1.12	1.12	1.12
SPC matrix memory [KWords]	16.0	16.0	64.0
Max converter weight (ideal switches)	3	3	4
Contactors (ideal switches)	6	6	6
Non-ideal switches	32	32	32
Time varying elements	16	16	16
Global GDS oversampling	yes	yes	yes
Switch-level GDS oversampling	no	no	yes
GDS switching delay	yes	yes	yes
Converter power loss calculation	yes	yes	yes
Converter forward voltage drop	yes	yes	yes
Machine solvers	1	0	0
Nonlinear machine support	yes	no	no
Nonlinear machine LUT size [KWords]	32	0	0
Absolute encoder protocol support	yes	no	no
DC-DC converter solvers	0	0	2
Signal generators	12	12	12
Look Up Tables	8	8	8
PWM modulators	12	12	12
PWM analyzers	4	0	0
Parallel DTV detectors	3	3	3
Interfaces			

Support for unconstrained SP execution rates

Increased fidelity of SIL simulations

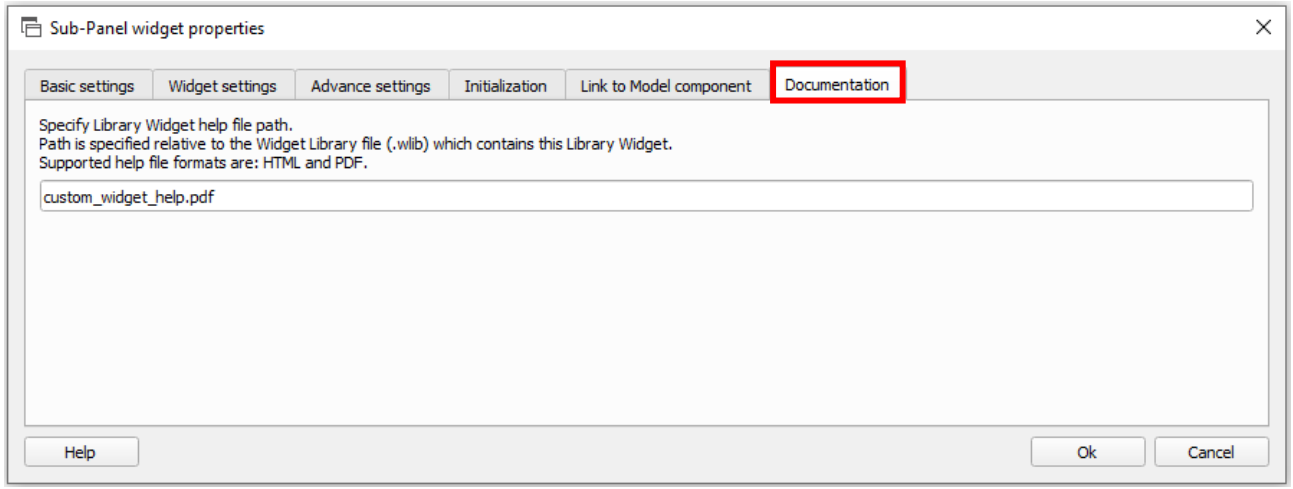
- Until now, signal processing execution rates had to be integer multiple of the simulation time step
- From now on, execution rate values are **no longer restricted by simulation time step** and can be defined as any value
- Increased fidelity of SIL (software in the loop) simulations for tests where control algorithms are executed at uncommon rates



Help support for Library Widgets in SCADA

Easy and intuitive access to Library Widget documentation

- Help button now available in the Widget Property dialogue:
  - Core Widgets: predefined documentation
  - Library Widgets: user-defined documentation
- Possibility to specify Library Widget help file path in the Documentation tab of the Library Widget
  - Supported help file formats: HTML and PDF
- Help context menu action in Library Explorer



Communication interface updates

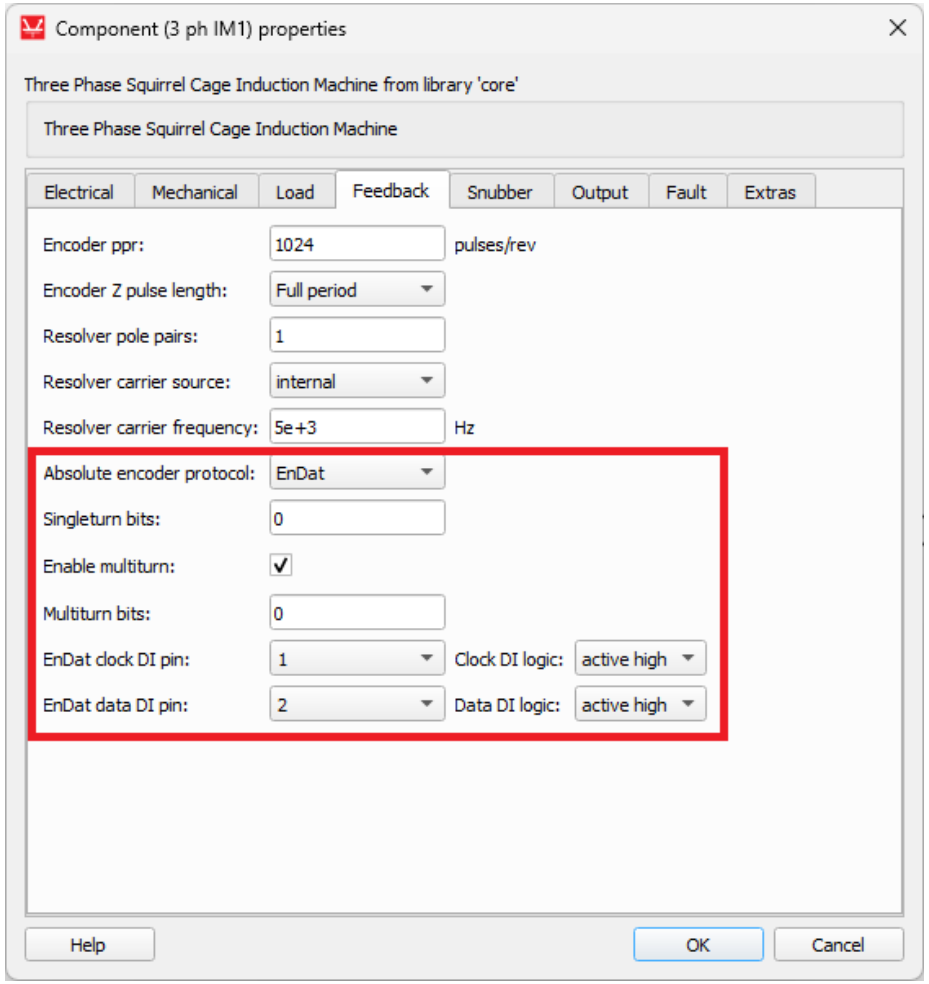
Expanded functionalities for Ethernet-based protocols

- EtherCAT Master component
  - Flexible Ethernet port selection enabled
  - Communication with multiple EtherCAT Slave devices possible
  - Capability to reprogram a slave device using a binary file
  - Compatible with 4th generation devices
- Modbus Server pipelining feature
  - Issue multiple requests at once; subsequent requests are stored in a buffer until executed
  - No need to wait for a request to finish processing before sending the next one

Communication interface updates

Expanded functionalities for ABS encoder protocols

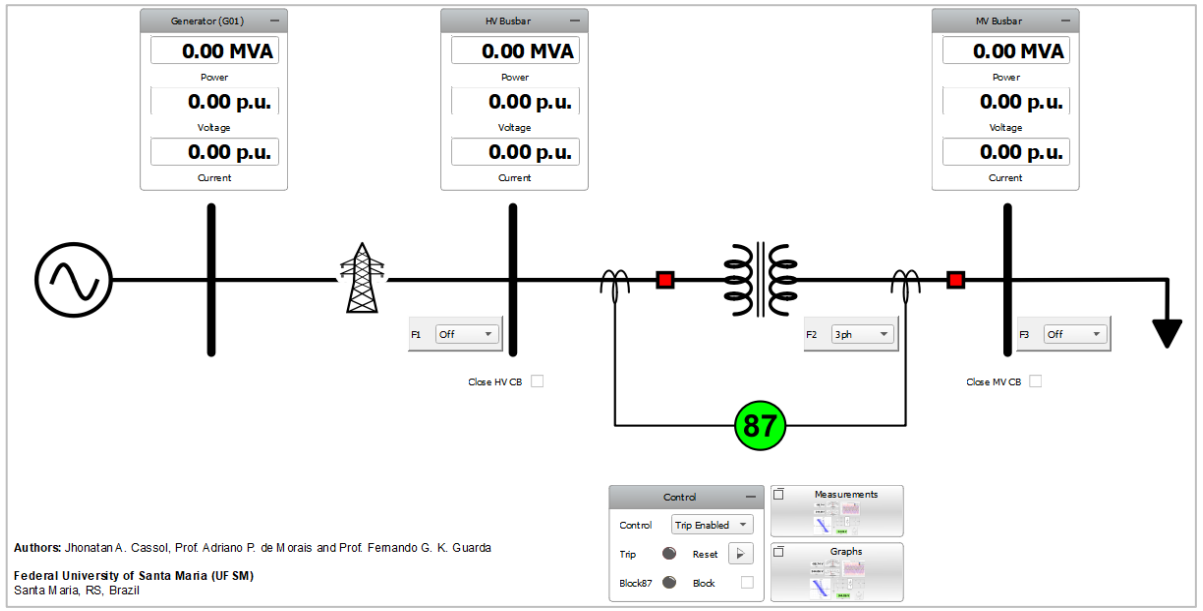
- Extension of ABS encoder protocols
  - Variable encoder data length
  - Add option to define multiturn data
    - Indicates the current number of machine rotor revolutions
    - Option to specify the number of multiturn bits
  - Available for EnDat, BISS, and SSI with Master functionality in SP



Differential protection example

Developed in collaboration with Federal University of Santa Maria (UFSM)

- ANSI 87 differential protection function example
- Protection scheme applied to a power transformer
  - Three-phase transformer: delta - wye grounded
  - High-voltage (HV) side: V = 69 kV
  - Low-voltage (LV) side: V = 13.8 kV
- Different fault types and locations
- Part of the HIL Simulation for Power System Protection course on HIL Academy



Learn More

- Visit: Software Release Page
- Contact Us: info@typhoon-hil.com

July 2024