



2025.3 Software Release Highlights

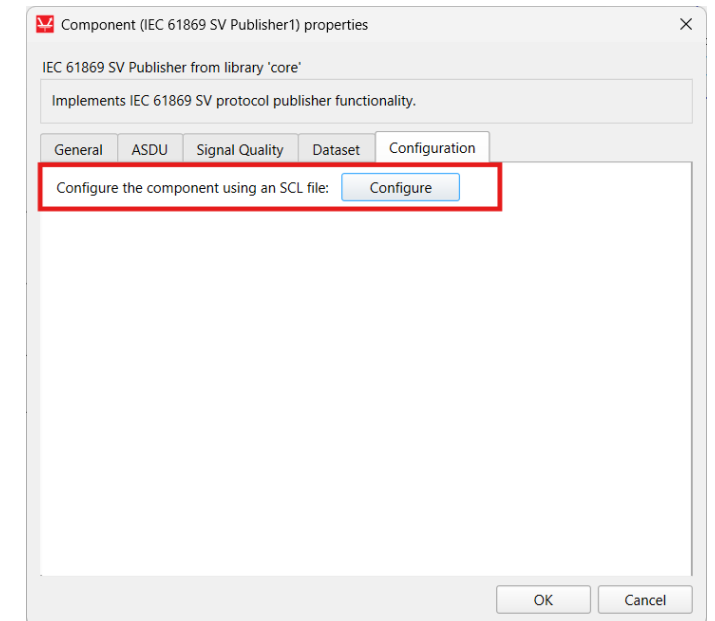
- ☐ IEC 61869 Sampled Values protocol
- ☐ Communication interface updates
- ☐ Battery Cell Emulation HW support
- ☐ Additional features
 - FMU Import updates
 - Code Editor autocompletion
- ☐ TyphoonSim updates



IEC 61869 Sampled Values protocol

New communication protocol in the Grid Modernization domain

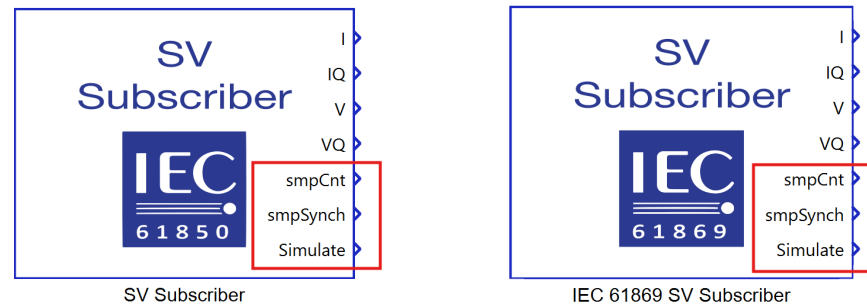
- ❑ Standardization of IEC 61850 SV communication protocol for low power instrument transformers (LPIT)
- ❑ New communication protocol that improves digital substation testing capabilities
 - [IEC 61869 SV Publisher](#)
 - [IEC 61869 SV Setup](#)
 - [IEC 61869 SV Subscriber](#)
- ❑ Configuration of SV Publisher using standard IEC 61850 files (.icd, .ied, .scd, .scl, .cid)



IEC 61850 / 61869 SV Updates

New message monitoring options

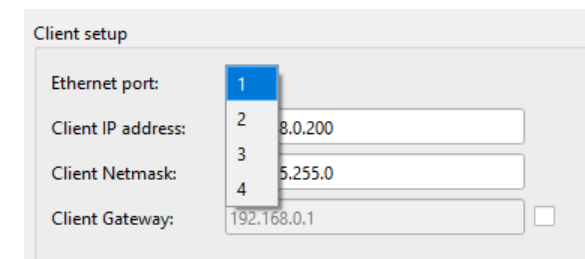
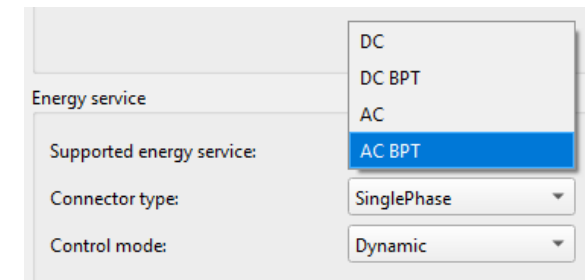
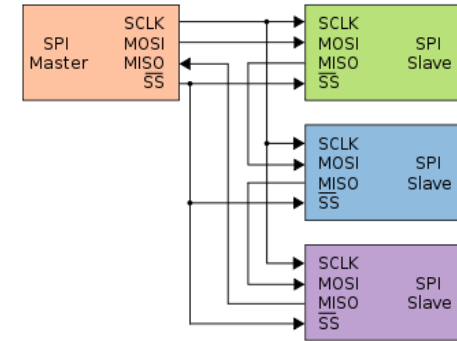
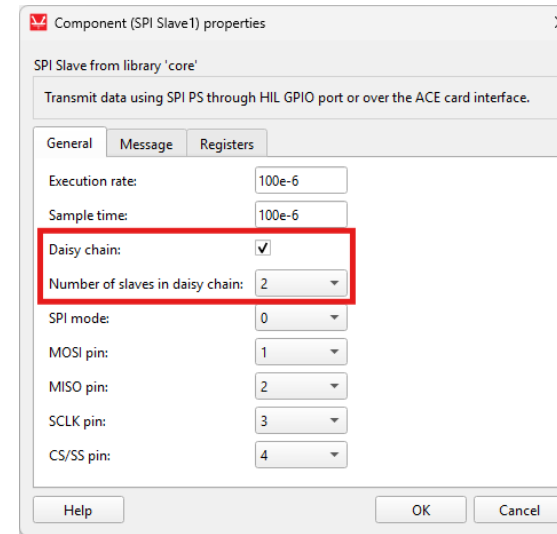
- New ports added for monitoring of SV message fields on SV Subscribers
 - *smpCnt* - Index of the Sampled Values message
 - *smpSynch* - Defines the synchronization mechanism of the clock used for receiving the SV messages
 - *Simulate* – Flag which indicates that the SV message is sent by a test device



Communication interface updates

Extended functionality of various interface components

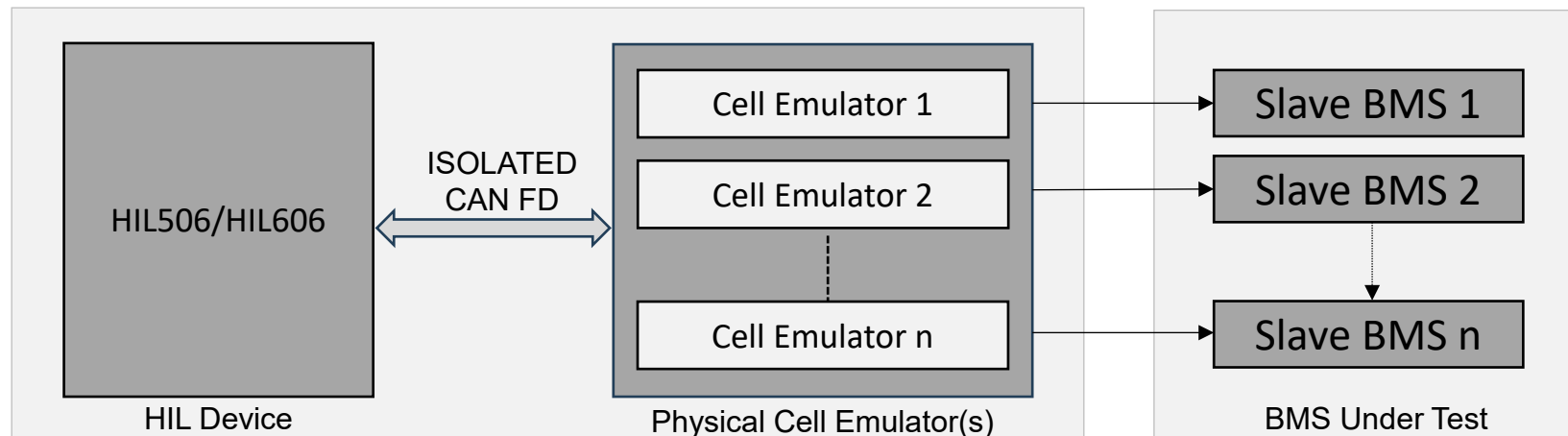
- ❑ SPI Slave - added daisy chain functionality
 - Enable SPI HIL controller to be connected in a daisy chain configuration
- ❑ ISO 15118-20 EVCC AC support
 - Added support for AC and AC BPT (Bidirectional Power Transfer) energy services
- ❑ Add ETH port selection for:
 - Modbus Client
 - ISO 15118-2 EVCC and SECC
 - ISO 15118-20 EVCC



Battery Cell Emulation HW support

Expanded software support for BMS HIL testbeds

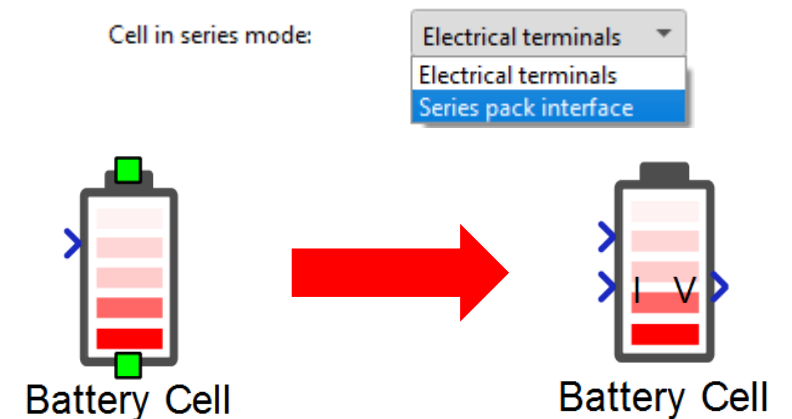
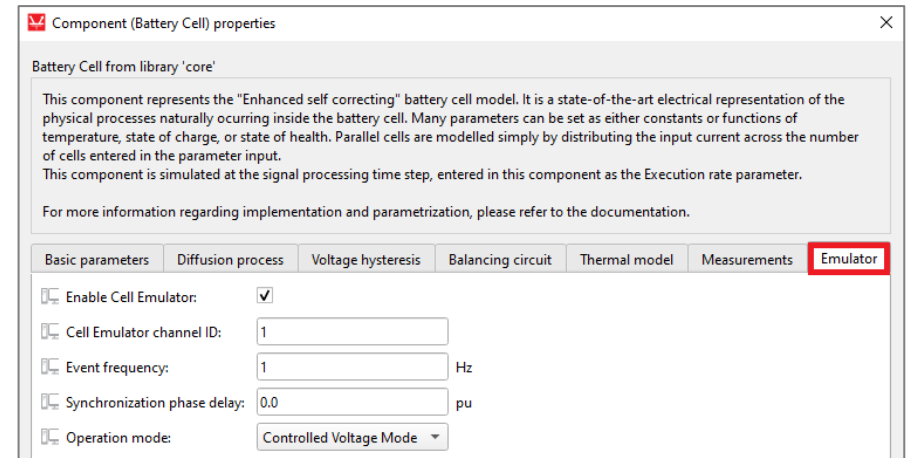
- ❑ Through battery cell emulation, the Typhoon HIL environment allows for [HIL testing of Battery Management Systems](#)
- ❑ Support for up to 256 emulated cells (systems up to 1000 V)
- ❑ Communication between the [cell models](#) and [smart cell emulator](#) channels realized through Isolated CAN FD
- ❑ Supported on HIL506 and HIL606



Battery Cell Emulation HW support

Battery Cell upgrades

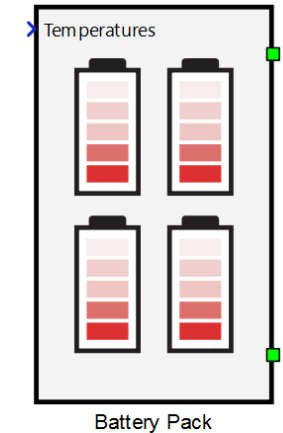
- ❑ *Emulator* tab added for easy linking of Battery Cell components to physical Cell Emulator channels
 - Done through Cell Emulator channel IDs (CAN FD)
 - Choose between Controlled Voltage and Controlled Current mode
- ❑ Emulator measurements (voltage, current, temperature) now available in the *Measurements* tab
- ❑ Choose between an Electrical-based (Electrical) or a Signal Processing-based (Series pack) interface
 - Reduces utilization of Voltage sources in the model



Battery Cell Emulation HW support

New Battery Pack component

- New Battery Pack component lets you easily build, parameterize, and interface with cell emulation channels
 - Specify pack configuration and generate hundreds of parametrized Battery Cells with the *Build* button
 - Parametrization kept the same as in the *Battery Cell* component, with parameters impacting all created cells
 - Interfacing with Cell Emulators done in the same manner as in the *Battery Cell* component



Component (Battery Pack) properties

Battery Pack from library 'core'

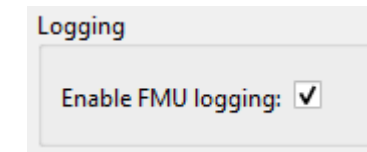
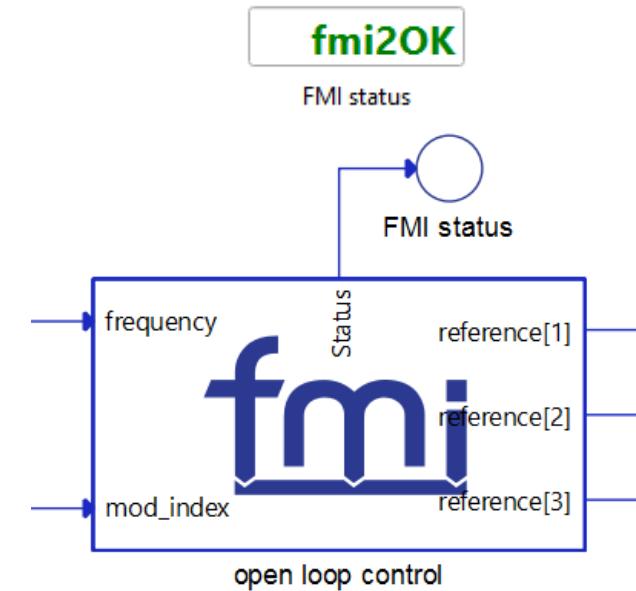
Easily parametrize and build a battery pack. Build button will iterate through Battery Cell components in the model starting with the name defined by the field Battery cell component base name and append the cell number until the Total Cell number is reached. For the fields specified in this component, each Battery Cell component field with the same name will be overwritten with these values except for Cell Emulator base ID which will be incremented by one for each different Battery Cell name. After changing any of the properties on the mask, the build button must be pressed again

Build	Basic parameters	Diffusion process	Voltage hysteresis	Thermal model	Measurements
Total Battery Cells in series:	4				
Total Battery Cells in parallel:	1				
Event frequency:	1		Hz		
First Cell CAN FD ID:	1				
Operating mode:	Controlled Voltage Mode				
Execution rate:	100e-6		s		
Build Battery Pack:	Build				

Additional features

FMU Import updates

- ☐ Status port added
 - Helps users detect potential FMU issues
 - Returns value from fmi2DoStep function
 - Status messages: Ok, Warning, Discard, Error...
- ☐ Logging option added
 - Record FMU log messages to a log file inside the Target Files folder
 - ☐ Includes: status messages, solver info, simulation time...
 - Logging can be enabled or disabled

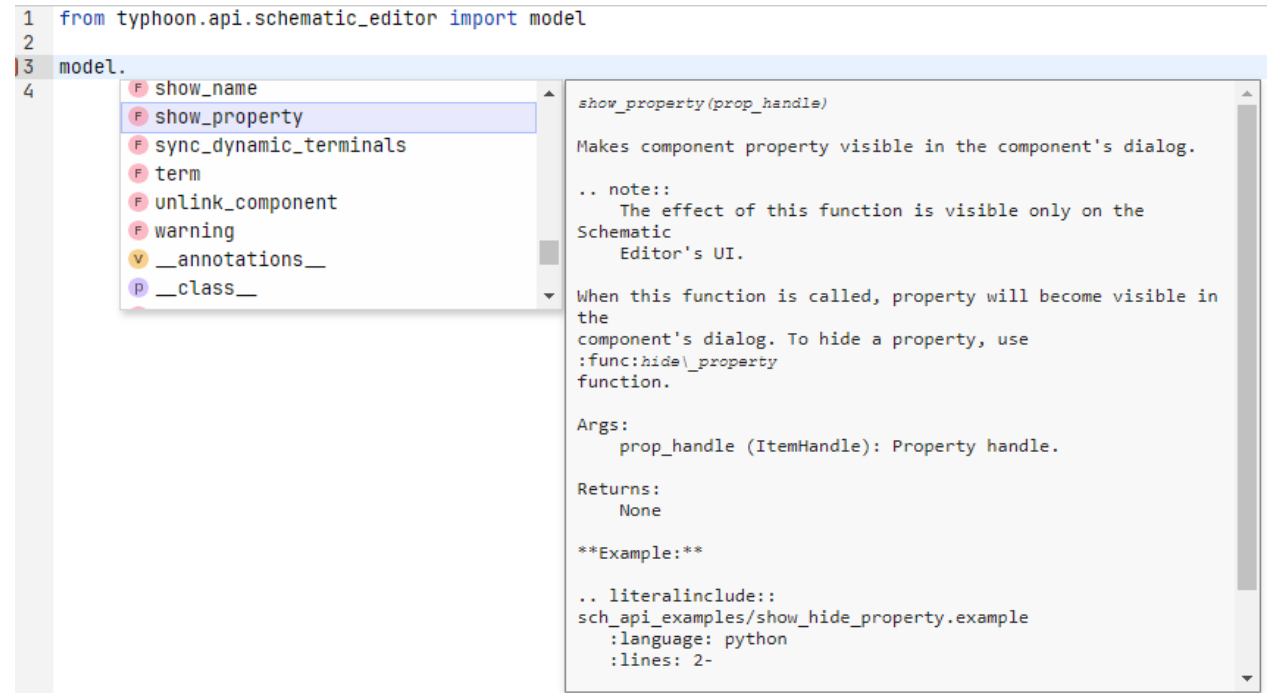


d:\fmu import Target files			
↑ Name	Ext	Size	[
↑ [..]			<DIR>
📄 _open_loop_control	log	0	

Additional features

Code Editor autocomplete

- ❑ Integrated Typhoon API autocomplete for Python code editors
- ❑ Available in Schematic Editor, HIL SCADA and TyphoonTest IDE
- ❑ Display function docstrings, documentation, and code examples while typing



The screenshot shows a code editor with a Python file. The first three lines are:

```
1 from typhoon.api.schematic_editor import model
2
3 model.
```

A dropdown menu is open below the third line, listing the following attributes and methods:

- show_name
- show_property
- sync_dynamic_terminals
- term
- unlink_component
- warning
- __annotations__
- __class__

The 'show_property' method is selected. To the right of the dropdown, a tooltip displays the function's documentation:

```
show_property(prop_handle)
Makes component property visible in the component's dialog.

.. note::
    The effect of this function is visible only on the
    Schematic
    Editor's UI.

When this function is called, property will become visible in
the
component's dialog. To hide a property, use
:func:hide\property
function.

Args:
    prop_handle (ItemHandle): Property handle.

Returns:
    None

**Example:**

.. literalinclude::
    sch_api_examples/show_hide_property.example
    :language: python
    :lines: 2-
```

TyphoonSim updates

Extended library support

- ☐ Semi-Ideal switches now supported
- ☐ 20 new converters supported
 - Quadratic Boost regular, Active Clamp Flyback, Bidirectional Cuk, Phase Shifted Full Bridge, Four/Five/Nine Level Flying Capacitor Inverter Leg...
- ☐ Star/delta stator windings connection support for all machines
- ☐ Full Saturation support for PMSM VBR type machine model
 - flux vs current;
 - incremental inductance vs current and
 - absolute inductance vs current saturation types
- ☐ Incremental inductance mode for PMSM now supported
- ☐ Saturable leakage inductance support for DFIM





Thank you for your attention!

