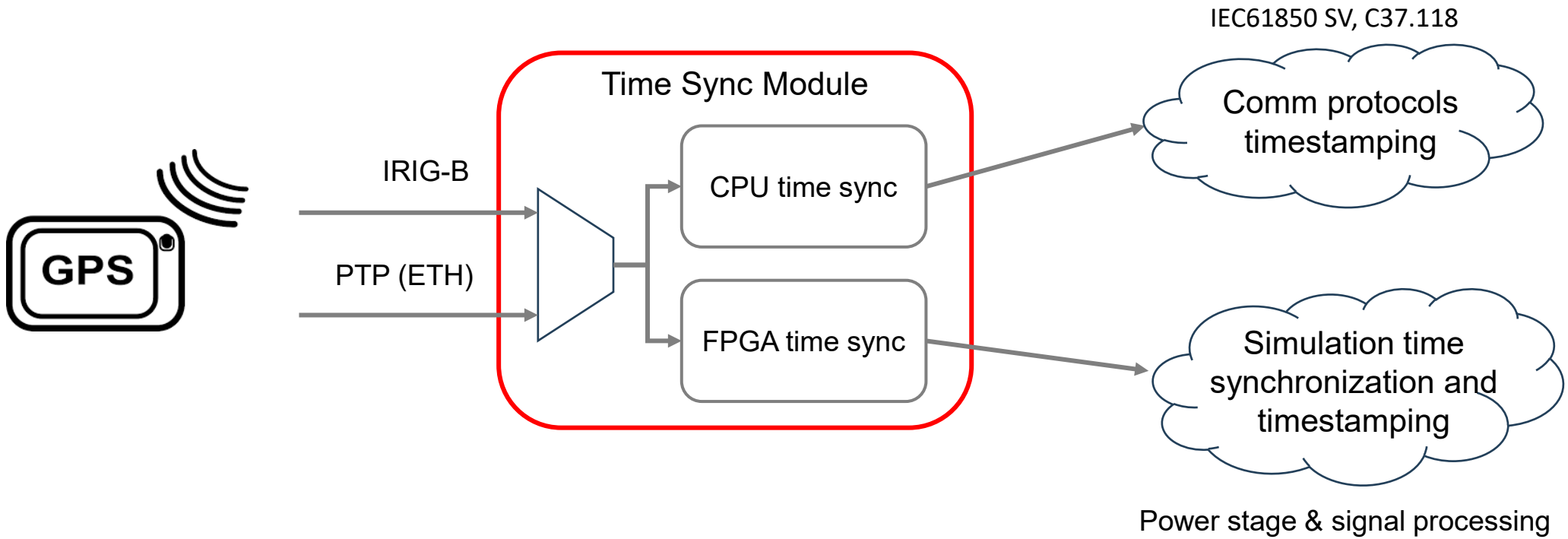
2024.2 Software Release Highlights

- **HIL Global Time Synchronization**
  - C37.118 time synchronization
- **Train Real-Time Data Protocol (TRDP)**
- **Six Phase PMSM with saturation effects**
- **Additional Features**
  - Up to four execution rates on 4th generation devices
  - Sinusoidal sources API function enhancement
  - Flexible Ethernet port selection
- **UX Improvements**
  - Component Bypassing
  - Add Schematic Area

HIL Global Time Synchronization

Synchronize your HIL device with the World Clock

- Global time synchronization
- Typically required when other equipment in the setup are also time synchronized
  - Particularly important for power systems applications



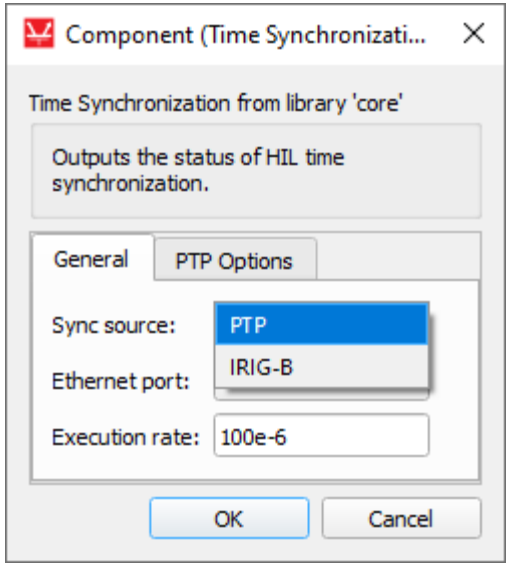
HIL Global Time Synchronization

Set your time synchronization source in one place

- Time synchronization component
  - Source selection and configuration
  - Synchronization status

Time Synchronization

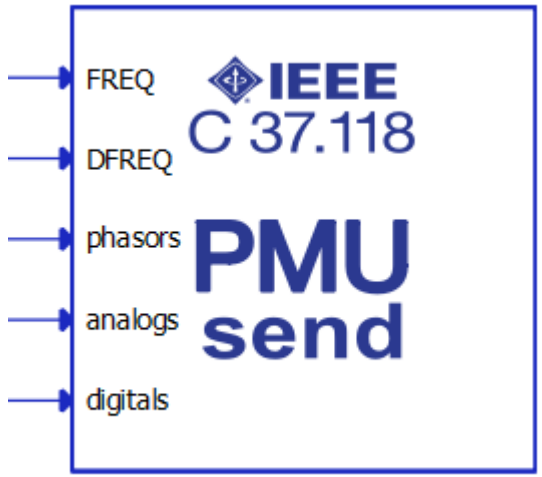
- Capture function can now provide absolute trigger time
  - API support
  - GUI support



HIL Global Time Synchronization

Support for C37.118 time synchronization enabled

- Data transmission now aligned with system time
- Time between messages now optimized to prevent time drift

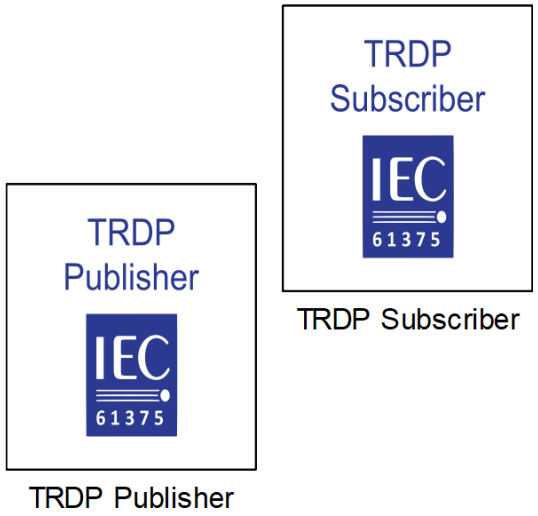


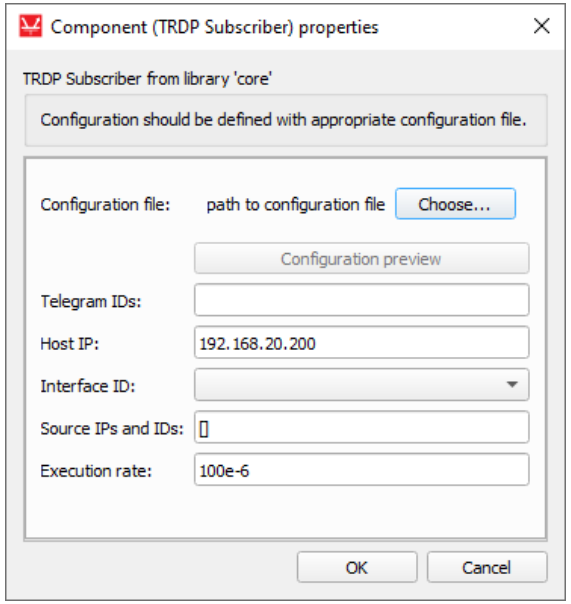
PMU Send

Train Real-Time Data Protocol (TRDP)

Expanded communication protocol support for rail applications

- Communication protocol for IP-based communication in trains
- Based on IEC61375-2-3 Train Communication Network (TCN) communication profile
- Realized through dedicated Publisher and Subscriber components

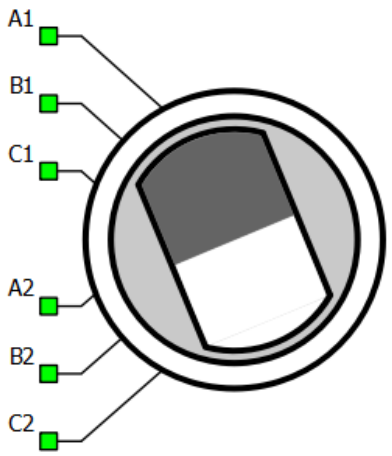




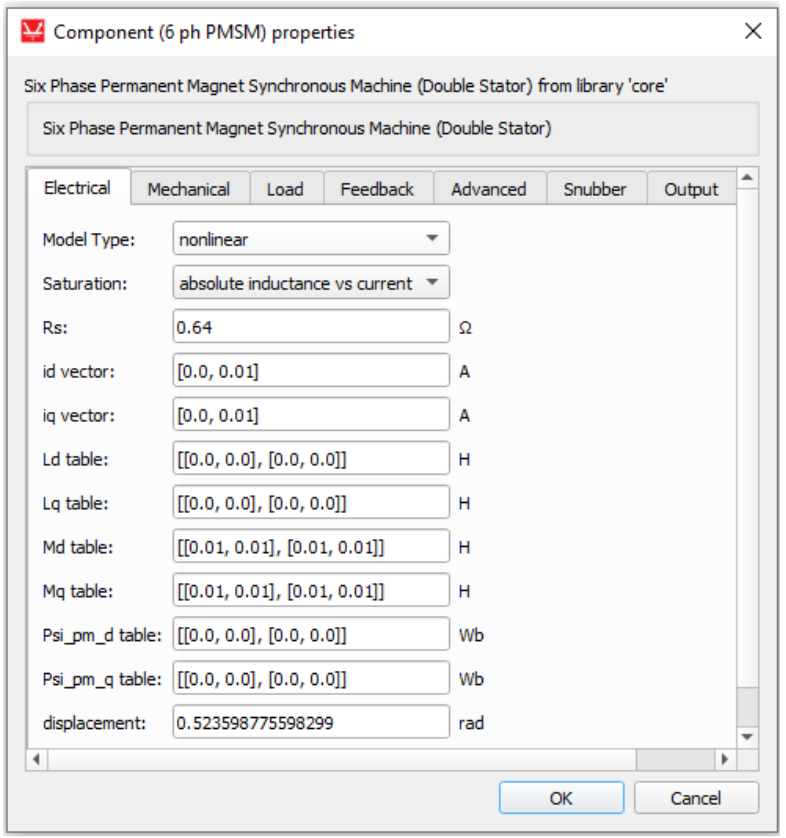
Six Phase PMSM model with saturation effects

Model 6-phase PMSMs with greater fidelity

- Six Phase PMSM nonlinear model developed, including magnetic saturation effects
- Machine self and mutual inductances, as well as the permanent magnet's fluxes, are functions of d- and q- components of the machine stator currents



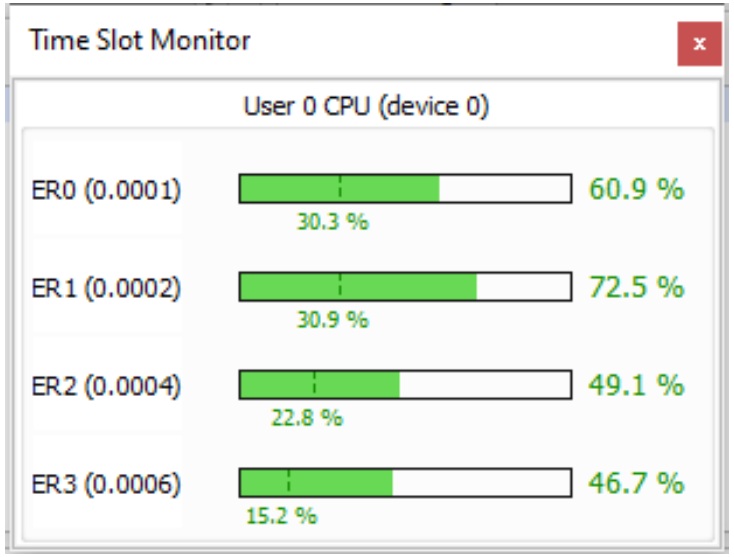
6 ph PMSM



Additional Features

Increased maximum number of execution rates on 4th generation devices

- Number of Execution rates in the model now increased from 2 to 4 on HIL404 and HIL606 User CPUs
- Signal processing-domain modeling now more flexible

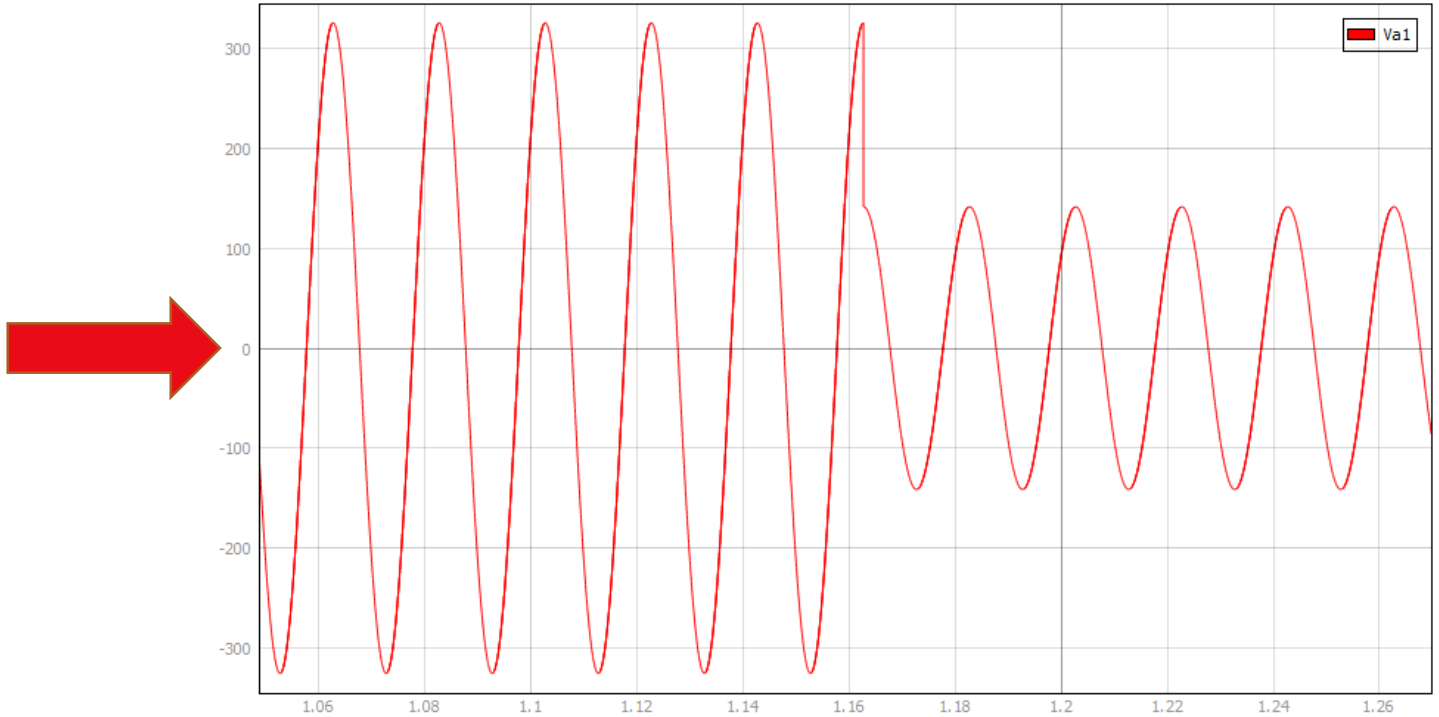


Additional Features

Sinusoidal sources API function enhancement

- New argument added to the set_source_sine_waveform() HIL API function: apply_at_phase
- Triggering transient events (dips, swells etc.) now made more convenient

```
hil.set_source_sine_waveform(name="Vs1",
                             rms = 100,
                             apply_at_phase = 90)
```

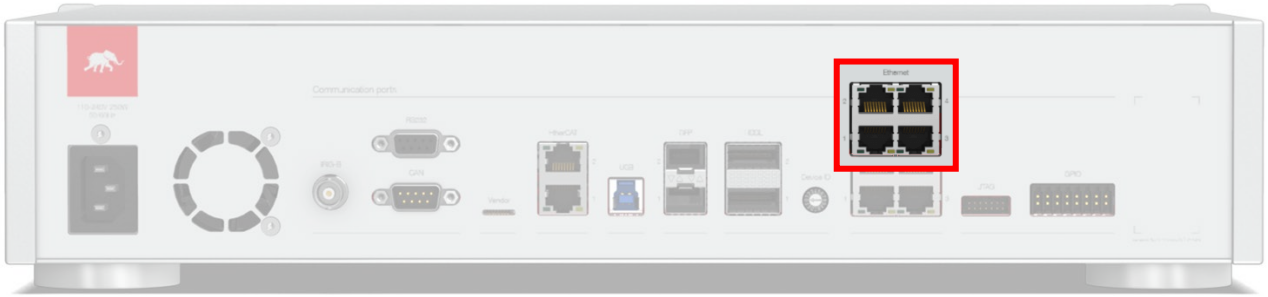


Additional Features

More options for your communication interfaces

- Flexible Ethernet port selection
  - Support for PROFINET added

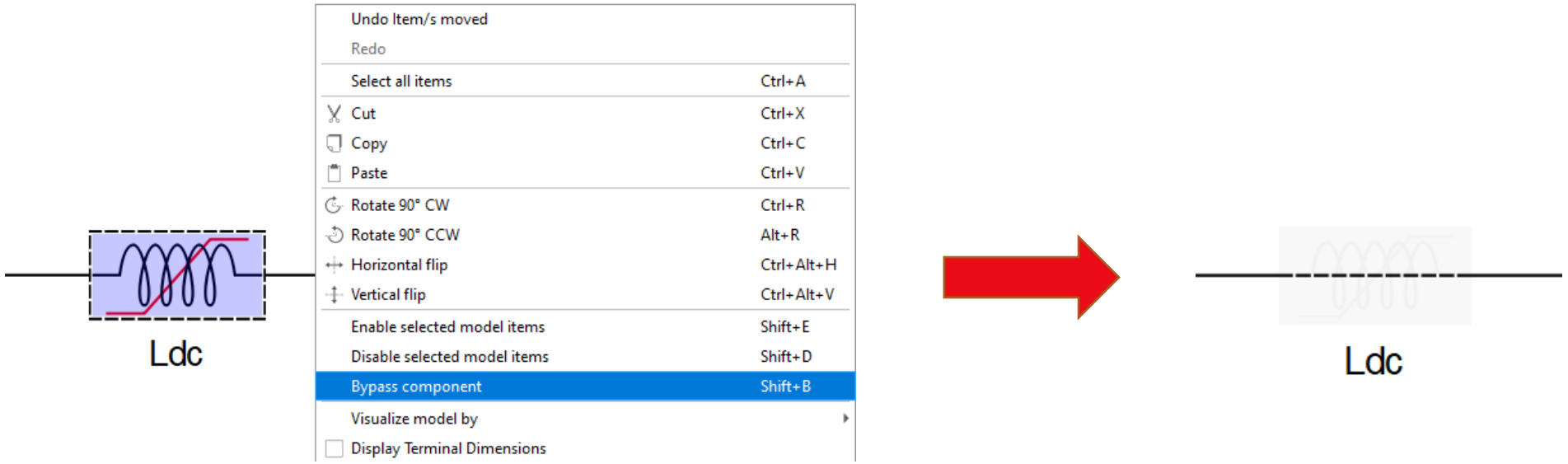
IO Device



UX improvements

Component Bypassing

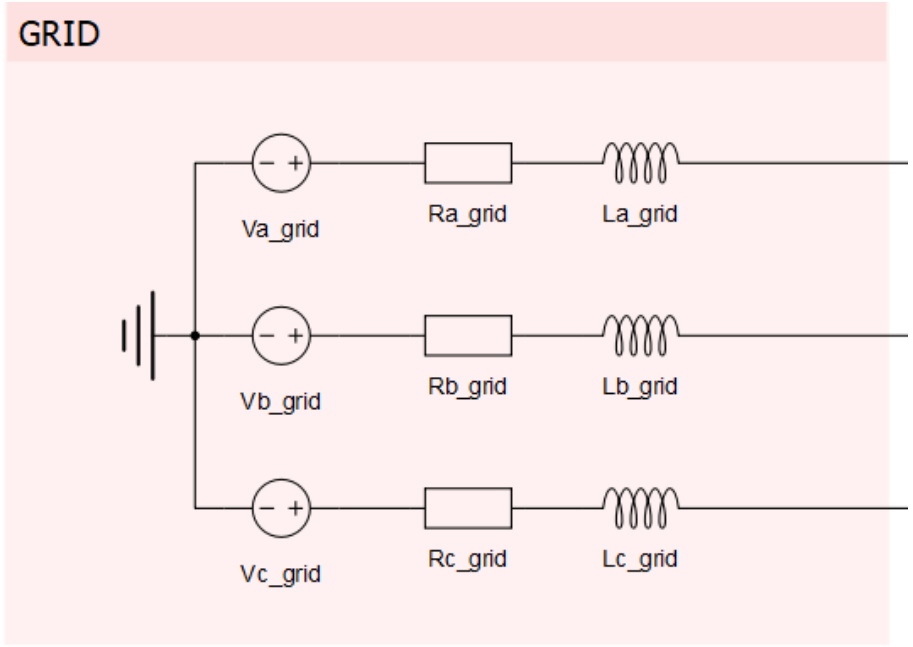
- Disable a component, without having to redo the wiring



UX improvements

Add schematic area

- Colored and named rectangular area-box to separate circuit sections
- Circuit sections can be easily dragged as a group throughout the model
- Circuit sections within the box can still be edited normally



Learn More

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

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