

Final Event  
24-25<sup>th</sup> of May 2022

Industrial feedback

## Typhoon HIL Industrial Feedback



Powerful Advanced **N**-Level Digital Architecture  
for models of electrified vehicles and their components



Dragan Zuber  
Senior Sales Specialist

[www.project-panda.eu](http://www.project-panda.eu)



# Typhoon HIL in PANDA



- 🐼 **Opportunity to learn** from and collaborate with key players in the Automotive/e-mobility market
- 🐼 **Real-time V&V solution provider for the project**
  - 🐼 Hardware solution for Power Hardware-in-the-Loop (P-HIL) tests
  - 🐼 Hardware innovations
- 🐼 **Software related development**
  - 🐼 EMR Library
  - 🐼 Demonstration of cloud-based co-simulation of a full electrical vehicle
  - 🐼 Work with multiple softwares - or standalone.



# HARDWARE - Building the real-time testbeds



- 🐼 **Modular solution that:**
  - 🐼 Fits in a standard testbed
  - 🐼 Works for both physical and cloud-based tests
  - 🐼 Meets partner-specific specifications
- 🐼 HIL Connect 1
  - 🐼 Support for connecting e-drive system substages
  - 🐼 Connection with dSPACE controllers
- 🐼 HIL Connect 2
  - 🐼 Support for Cinergia power amplifiers and thermocouples for battery testing
  - 🐼 Connection with dSPACE modules
- 🐼 Contributed to new [interface product](#) development.



# SOFTWARE - New ways of using components



- 🐼 Opportunity to develop the EMR formalism further
- 🐼 Collaboration on the EMR summer school
- 🐼 [EMR library](#) available for download for free
- 🐼 Simcenter AMESIM-Typhoon HIL EMR converter tool greatly reduced time to build HIL models

🐼 Fuel cell component in sources library

🐼 EV components library

🐼 Communications library

🐼 3rd party SW tools integration





# Looking beyond PANDA...



## NEW HW PRODUCTS

- 🐼 Voltage buffer interface card - UTCN
- 🐼 Modular HIL Connect interface



## Cooperation with partners outside PANDA

- 🐼 University partners HIL facilities
- 🐼 Showrooms and training rooms
- 🐼 Siemens-Amesim cooperation
- 🐼 Approaching joint existing EV customers with new functionalities





# Thank you for your attention!

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