Want unique HIL simulation to de-risk product lifecycle?

Highlights

Speed up and de-risk

> Cut down test and commissioning time from days to hours
> De-risk project execution to avoid issues early
> Assess product and system performance before prototyping
> Reduce risk of equipment damage

Design and operate efficiently

> Always maximal high fidelity and speed
> Extend system productivity by reducing energy consumption, downtime, and wear

Powerful simulation replaces the test lab

With MyDrive® HIL you get a powerful toolchain to de-risk and save time, with a hardware-in-the-loop simulator that replaces the test lab. This is your new all-in-one toolchain for testing and validation of control systems – with a rich feature set for electric motor drives, microgrid applications, and much more.

Get maximal power of simulation: real time and with the highest possible fidelity available.

Learn more about iC7 series

In every phase of system lifecycle

MyDrive® HIL can optimize every phase of the product or system lifecycle, from development and testing, to commissioning and lifetime monitoring. MyDrive® HIL supports continuous integration and continuous development by simulating individual applications using drives or power converters; or entire systems.

Get going faster

Configure a setup in just 15 minutes. Cut down test and commissioning time from days to hours.

Fast

test and validation in just hours

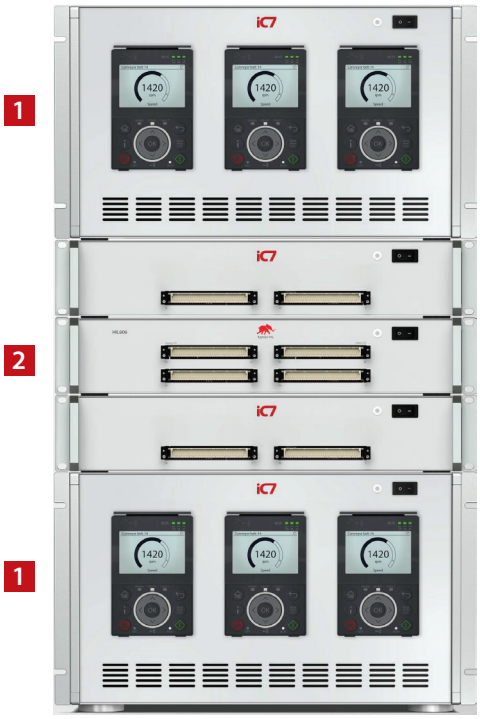
Feature	Benefit
Replace physical testing with virtual testing	Cut testing time from days to hours
De-risk project execution in an early phase	Greater reliability in business model
Run end-to-end system simulations	Improve uptime and de-risk project execution
Easily simulate different component sizes and combinations for early integration	Quickly find the optimal solution both cost and performance-wise
Assess configuration efficiency	Reduce energy consumption in the application Save cost and reduce carbon emission
in the design phase	Reduce energy consumption in the application
Optimize parameters in the design phase	Reduce commissioning time
– Test with a high level of automation – Test critical scenarios in a low-stress environment – Eliminate risk of equipment damage	Protect equipment and secure safety
– Monitor and improve performance using a digital twin – Validate software updates virtually	Efficiently maintain and improve the application over its lifetime

What are the components of MyDrive® HIL?

MyDrive® HIL is a Hardware in the Loop (HIL) system comprising

- Actual control boards and option cards from the drive or power converter, and signal connector
- Real-time HIL simulator
- PC user interface

The virtual application, running in the HIL simulator, controlled by real iC7 control units gives the highest possible fidelity in simulation of a drive or power converter, or even a whole system.



iC7 drive control units 1
Real-time HIL simulator 2

Illustration 1:
Components of MyDrive® HIL for iC7 system modules

Compatibility

Danfoss MyDrive® HIL supports iC7 drives in the entire power range from kW to multi-MW.

The table Key specifications MyDrive® HIL explains the compatibility between

- one or more HIL-compatible Danfoss control units
- the real-time HIL simulator

Each Danfoss control unit includes a dedicated control board for the specific iC7 products and a variety of functional extension options such as relays, digital and analog I/O, encoder/resolver feedback, line voltage measurement, and functional safety I/O.

The setup includes a wide variety of preconfigured models for iC7 products, from industrial motor drives to grid-connected battery energy storage systems.

Key specifications: MyDrive® HIL

Specification	iC7 Frequency Converter (FC)	iC7 System Module (SM)
Compatible drives	iC7-Automation	iC7-Automation iC7-Marine iC7-Hybrid
How to specify the required iC7 product in simulation and control card firmware	Enter model code from Danfoss Product Store	Enter model code from Danfoss Product Store
Number of iC7 products per HIL simulator	1 FC per HIL404/506 Up to 2 FCs per HIL606	1 SM per HIL404 Up to 3 SMs per HIL506 Up to 6 SMs per HIL606
Maximum number of setups in parallel	HIL404: 4 HIL506/606: 16	HIL404: 4 HIL506/606: 16
Options		
• Control Panel (OPX20)	Yes	Yes
• Basic I/O (OC7C1)	Yes	2 pcs OC7C1 per iC7 SM 1]
• Encoder / Resolver option (OC7M0)	Yes	Yes
• Voltage measurement (OC7V0)	No	Yes
• Temperature measurement (OC7T0)	No	Yes

1] One of the Basic I/O OC7C1 options is available to connect to external equipment, the other is connected to the simulator.

Software: Application simulator HIL system for frequency converters

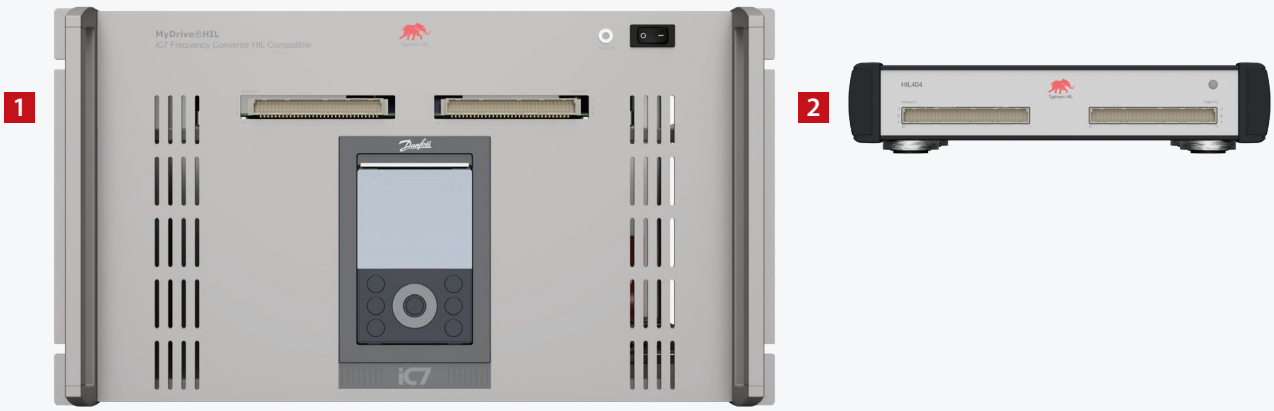


Illustration 2:
Components of MyDrive® HIL for iC7 frequency converters

iC7 drive control unit 1
Real-time HIL simulator 2

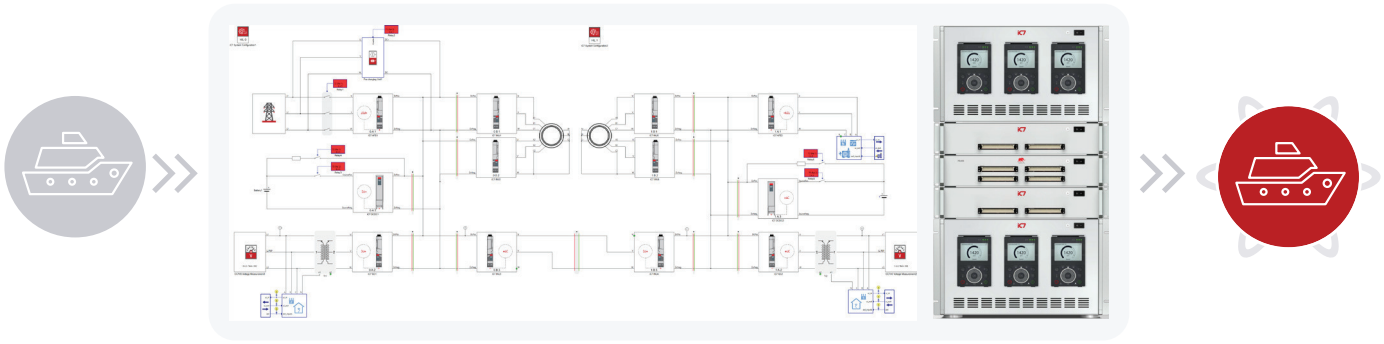


Illustration 3:
Example: Simulation of vessel propulsion system using virtual vessel

What does high fidelity mean?

High fidelity in simulation means you achieve the greatest possible precision in recreating actual drive, converter, or system performance. MyDrive® HIL gives you absolute alignment between measured and simulated currents and voltages.

What does real time mean?

By simulating in real time, you recreate the exact response of the system to a disturbance. Real time simulation gives you the power to react fast to avoid downtime in an operational situation. For example, you can simulate recovery of the grid after a brownout and short power interruption.

How can MyDrive® HIL save cost?

The greater the variety of drive and motor sizes being tested with MyDrive® HIL (for example, ratings of 1.5 kW, 7.5 kW, and 355 kW over the course of the day), the higher the cost saving becomes. Ultimately, you can eliminate the need for a physical test setup.

How to buy

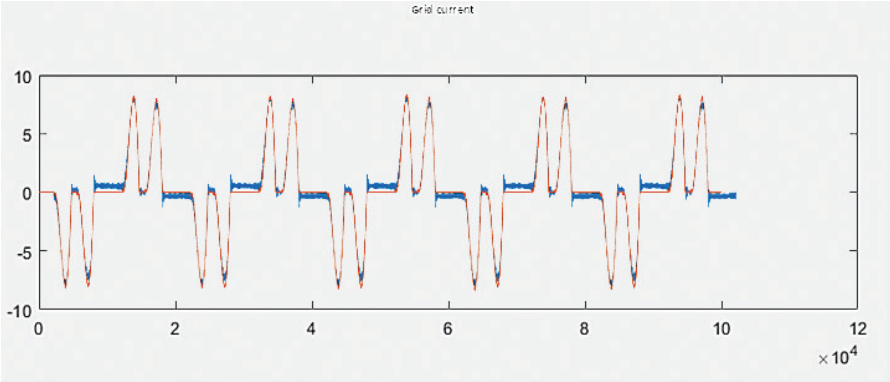
MyDrive® HIL from Danfoss is available as a combination of software package and hardware components, ready to support a frequency converter or a system drive.

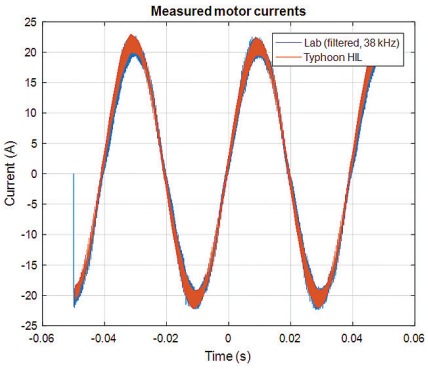
For ordering information and how-to videos, go to MyDrive® Suite/Shop

- Click on Simulation
- Scroll down to find MyDrive® HIL

- To obtain the software package, go to Typhoon HIL Marketplace
- Click on Download

MyDrive® HIL is powered by Typhoon HIL





"The MyDrive® HIL setup allows us to emulate dozens of drive variants, paired with any motor that is used in our equipment. The system is well integrated into Typhoon HIL environment and there is good documentation to get up and running quickly – within a few hours of opening the box.

I am impressed with how robust the system operation is. Simulations will often fail to run if conditions are changed too quickly or deviate too much from the nominal values. The MyDrive® HIL system runs and gives reasonable results even with aggressive commands and load profiles."

Ben Sykora,
Power Electronics Engineer at
Trane Technologies, Wisconsin USA

Discover more:

1. Article:

Danfoss Drives in association with Ansys: The journey to net zero and energy efficiency

2. Case story:

Danfoss Drives streamlines customer support with MyDrive® HIL

Some functionalities listed in this fact sheet are for future implementation