Typhoon HIL Quick Start

T-UG006 (v2.1) December 25, 2019

Abstract

The instructions in this document should help the user quickly install all necessary software tools and setup hardware components in order to run the example model “Induction Machine Open-loop Control”. For detailed guidance on how to make one’s own emulation, we strongly recommend reading the documents of the manual included in Typhoon HIL Software Package.

Table of Contents

1 System Requirements

Typhoon HIL Software system requirements:

1. Windows 7, Windows 8/8.1, Windows 10
2. Minimum 2GB of RAM
3. Minimum screen resolution 1366 x 768

All other dependencies are included in Typhoon HIL Control Center installation.

2 Software Download

This section explains how to download the Typhoon software tools.

To begin, open an internet browser and navigate to http://subscription.typhoon-hil.com/download/.

If you already have a account you can log in by clicking on **Login** button (Figure 2.1).

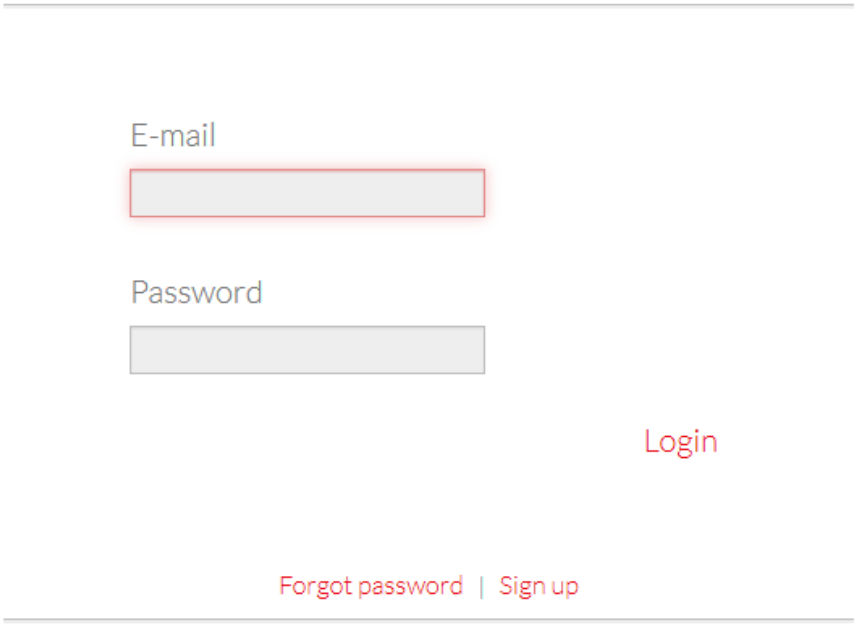

Figure 2.1. Login form

If you do not have Typhoon customer account please create one following the steps from User registration section.

By logging in with customer account you gain access to download pages.

Typhoon HIL Downloads site is consisting of four sections (pages) with appropriate content to download. There you can download latest software, firmware and documentation.

When you successfully login to Typhoon HIL Downloads, you will see **Software** download section (Figure 2.2. Typhoon HIL software download page). On this page you can download Typhoon HIL software with appropriate dependencies.

For more information about installing, configuring and using Typhoon HIL software consult *Typhoon HIL Software Manual* or *Typhoon HIL Quick Start* document.

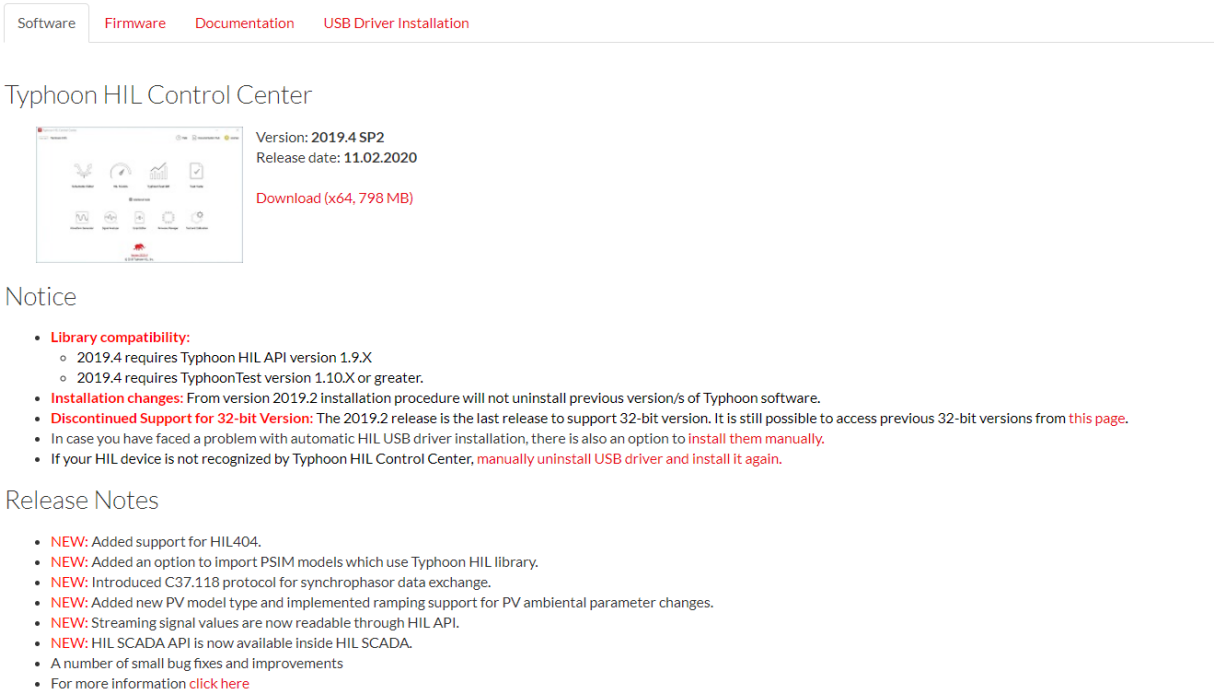

Figure 2.2. Typhoon HIL software download page

All device firmware files are packed together with the Typhoon HIL Control Center installation and additional firmware download is not required.
For more information about updating firmware on HIL consult *HIL Firmware updater* section in *Typhoon HIL Software Manual* document.

Documentation section contains appropriate *User Guides* and *Technical notes* documentation files.

3 User registration

To access Typhoon HIL download page you need to register first. This section explains registration steps for new users.

3.1 Customer registration

Registration is consisted of few steps and you only need to have appropriate **activation key** during activation process. You will receive activation key after purchase of HIL unit is finished.

With single activation key you can create multiple customer accounts.

Registration is consisting of few steps shown below:

1. Open an internet browser and navigate to http://subscription.typhoon-hil.com/download/
2. Click on **Sign up** button in right bottom corner (Figure 3.1)

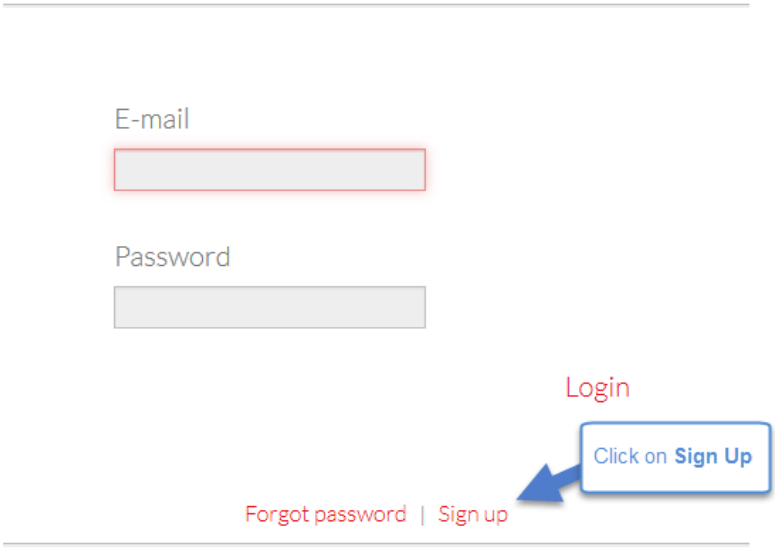

Figure 3.1. Open user login panel

3. Registration web page with registration form will be opened (Figure 3.2). You need to enter all requested information including **activation key** that you received upon HIL unit purchase.

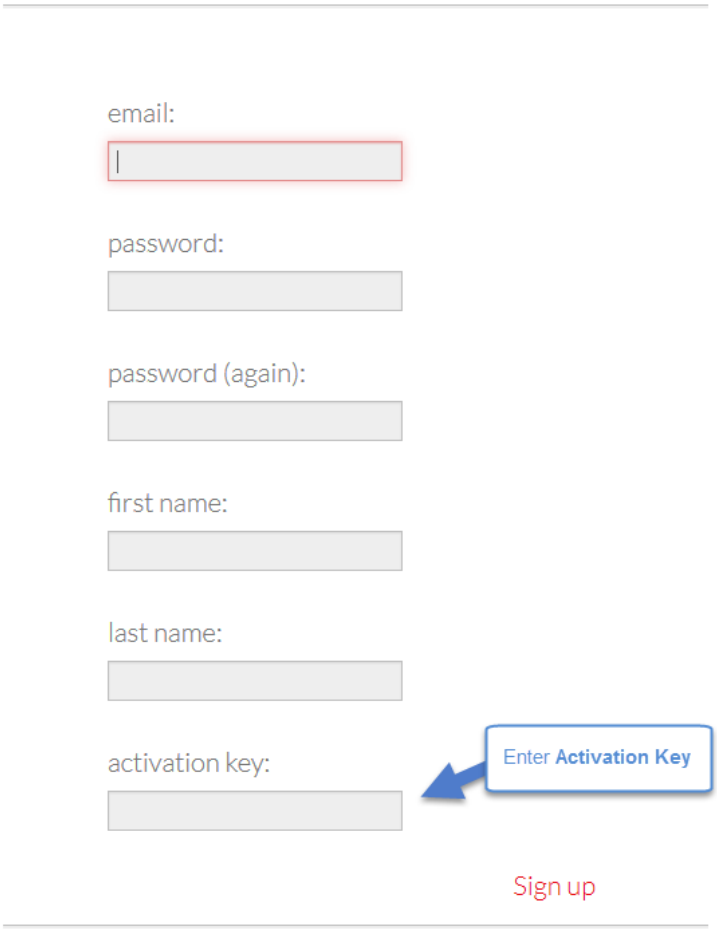

Figure 3.2. Registration form

4. You will receive confirmation message (Figure 3.3). You need to check email from the registration form, and follow the instructions in the email message to activate your account.

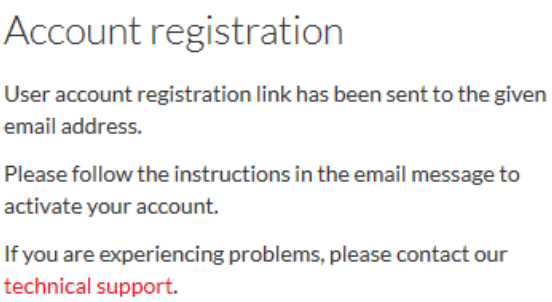

Figure 3.3. Registration confirmation message

5. After you followed instruction from email that you received, you will be redirected to new web page that will inform you that account is successfully activated (Figure 3.4).

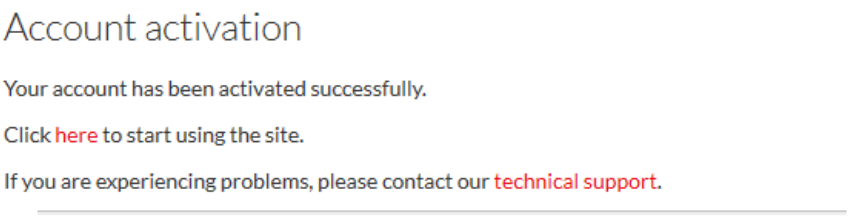

Figure 3.4. Successfully finished account activation

6. Now you can return on Typhoon HIL Download web page (http://subscription.typhoon-hil.com/download/ and login in User login panel (Figure 3.1.

4 Software Installation and Configuration

To install software, you will need a PC running Windows 7 or higher, and the Typhoon HIL *Control Center* installation file available for download on http://subscription.typhoon-hil.com/download/.

Installation steps:

1. Login to your Typhoon HIL account and download the latest version of the *Typhoon HIL Control Center* installation file (http://subscription.typhoon-hil.com/download/). In case that you do not have a user account please register using the provided activation key.
2. Start the installation.
   Note: During the installation, you can select the destination folder for the *Typhoon HIL Control Center*. By default, it will be installed on C:\Program Files\Typhoon HIL Control Center 2019.3 (Figure 4.1.).

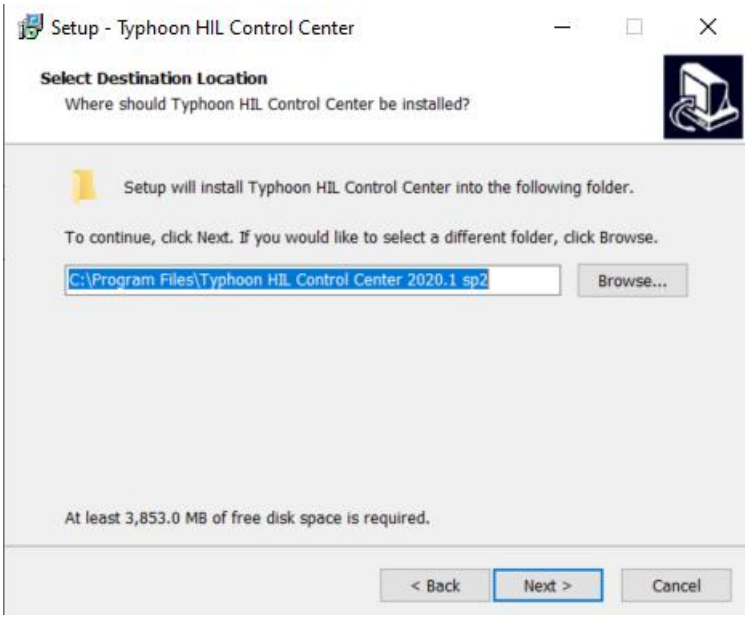

Figure 4.2. Destination window

3. At the end of the installation process, you will be asked to launch the *Typhoon HIL Control Center* (Figure 4.3). Do not choose that option yet, but finish the installation.

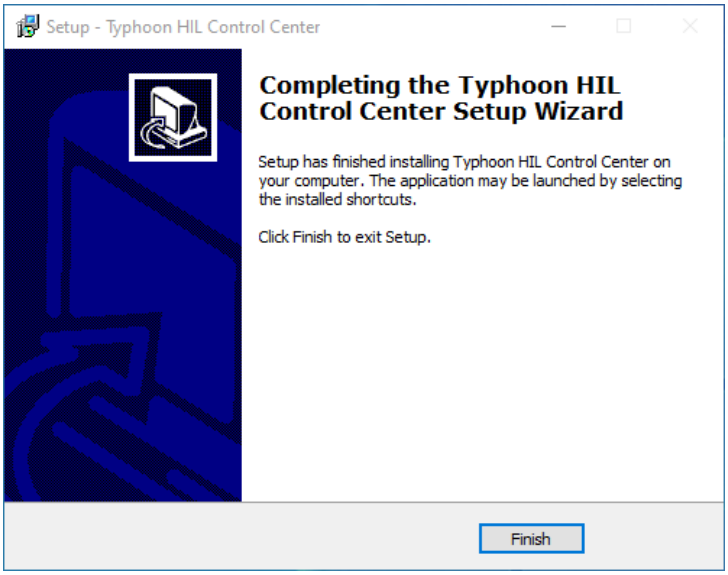

Figure 4.3. Complete the installation by clicking on Finish

5 HIL Driver Installation

At this point you can connect your HIL device to the PC using the USB cable you received in the Typhoon HIL package, and turn your HIL on. The driver installation process will start automatically.

On Windows 7/8/8.1/10 drivers will be automatically installed when you first attach your HIL40x/60x, and other user actions won't be required. During the installation and when the installation finishes, Windows will show a small tool-tip in the lower right corner of the screen (Figure 5.1 and Figure 5.2) and Windows 8/8.1/10 will display dialog shown on Figure 5.3.

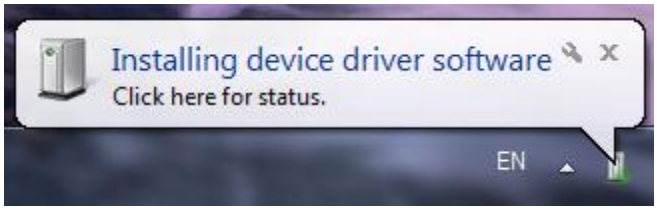

Figure 5.1. HIL40x/60x USB driver installation example under Windows 7

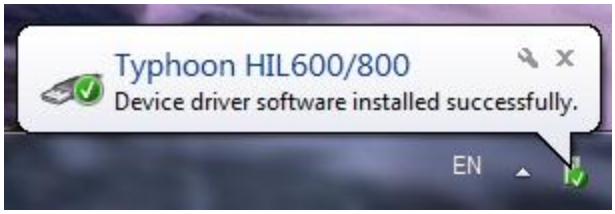

Figure 5.2. Successfully finished installing HIL60x USB driver

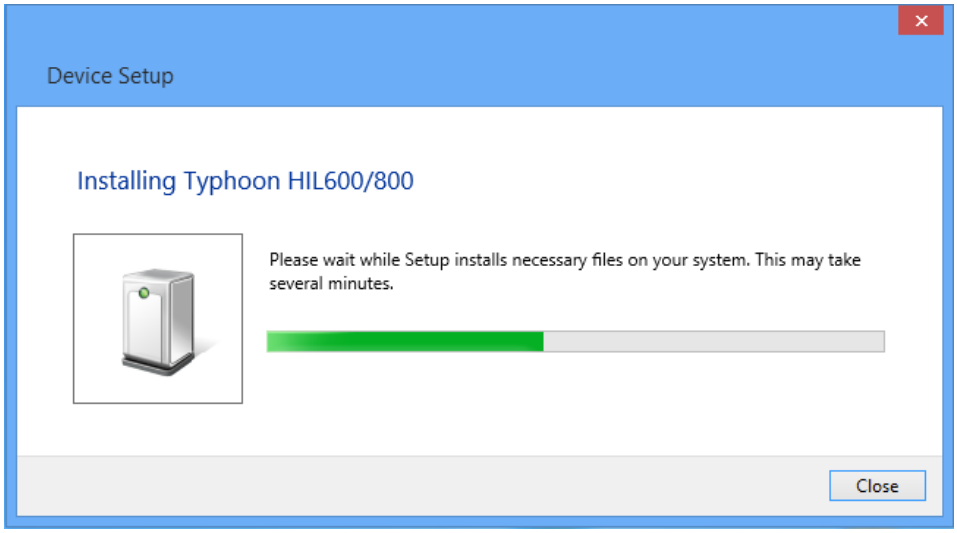

Figure 5.3. HIL60x USB driver installation example under Windows 8/8.1/10

(New text) Start *Typhoon HIL Control Center* and check if your HIL device is detected by opening **Device Manager**. If detection is successful you should be able to see your HIL device in "Detected on network" section. If you get a message shown on Figure 5.4 you must install the driver manually. The procedure for manual driver installation is available on http://subscription.typhoon-hil.com/download/.

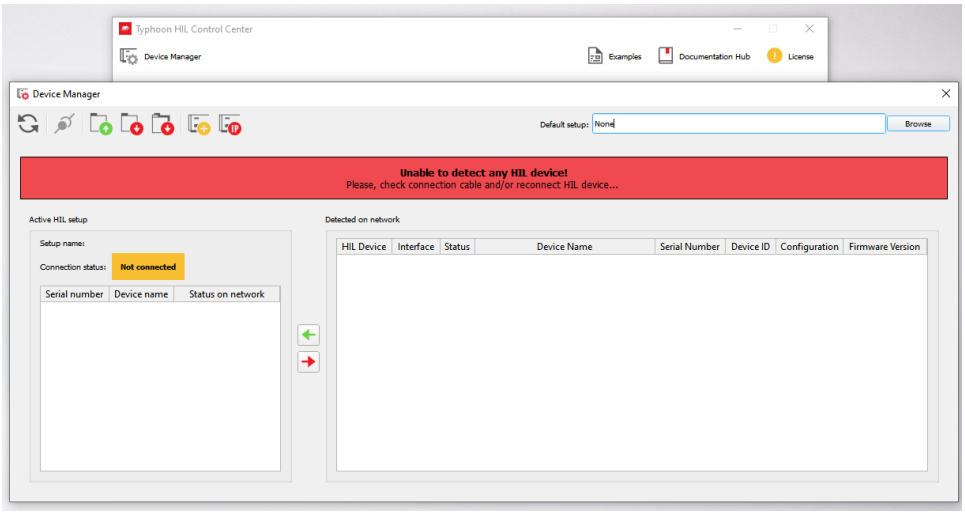

Figure 5.4. HIL device not detected

6 Licensing

The license file can be imported by using the **License** panel in the *Typhoon HIL Control Center* (Figure 6.1. License panel in Typhoon HIL Control Center).

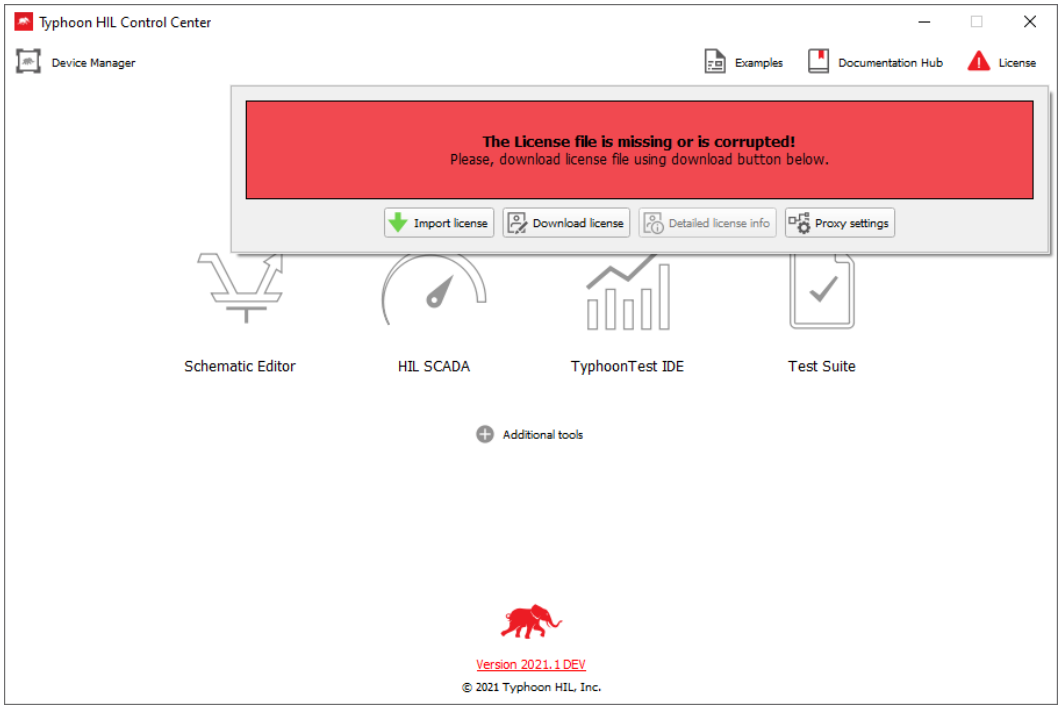

Figure 6.1. License panel in Typhoon HIL Control Center

6.1 Import license

1. Start the *Typhoon HIL Control Center*
2. Click **Download license** button
3. Enter your activation key.
4. The license is automatically downloaded and imported and proceed to step 8.
5. Alternatively, you can download license file from https://subscription.typhoon-hil.com/accounts/login/
6. Click on **License ->Import license**
7. Navigate to and select the license file
8. If the license file is successfully imported, the following message will popup (**Error! Reference source not found.**2).

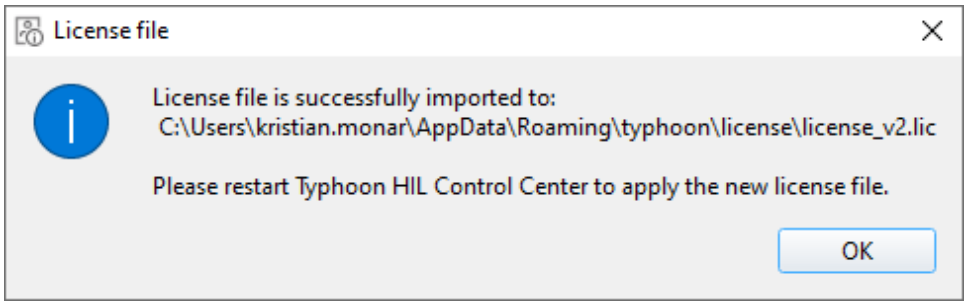

Figure 6.2. Successfully imported license file message

9. Restart the *Typhoon HIL Control Center* to apply the new license file.
10. If the license file is correctly imported license button will be green as in the Figure 6.3:

Figure 6.3. Successfully imported license

The license will be downloaded and placed in the license folder (C:\Users\<name_of_user>\AppData\Roaming\typhoon\license).

If the procedure fails this is most likely due to missing or wrong proxy settings. Please double check them.

Important note: License file content changes may result in inability to compile schematic model and/or inability to run certain compiled models on HIL devices.

6.2 Change license

This button allows you to manage/switch between multiple licenses. This is useful when a Virtual HIL user becomes a user of a HIL device, as well as for companies/users who have multiple sites.

1. Start the *Typhoon HIL Control Center*
2. Click on **License ->Change license**
3. Enter activation key
4. The new license will be automatically applied

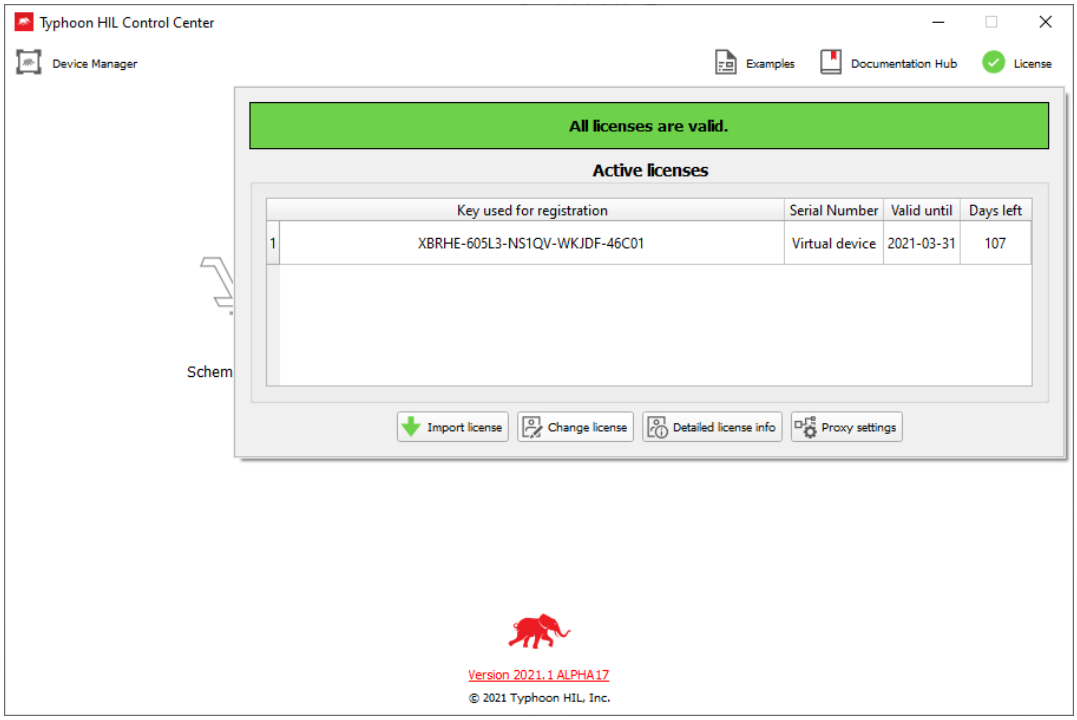

Figure 6.4. Change license window

6.3 Global license on a shared desktop

It is possible to define a global license which will be shared among all users on a given PC. To do this, create the following folder structure on your operating system drive root: .typhoon_hil\license\ (example: C:\.typhoon_hil\license) and place the license file into that license folder. This global license will always take priority over the license in the user folder. To stop using the global license, just delete the folder structure of the global license.

7 Firmware Update

Every software version comes with the corresponding firmware version. It is highly recommended to update the device's firmware after the software installation. This will ensure that your current software version is compatible with your device's firmware.

Important note: Do not turn off or unplug your HIL device during the firmware update procedure as it may result in the HIL device being unusable.

Important note: During the firmware update procedure, all other Typhoon HIL applications should be closed.

All device firmware files are packed together with the Typhoon HIL Control Center installation and additional firmware download is not required.

The firmware update procedure is as follows:

- Power up and connect the HIL device
- Run the **HIL Firmware Manager** application. Upon start the Firmware Manager will automatically detect all connected HIL devices and their firmware status.

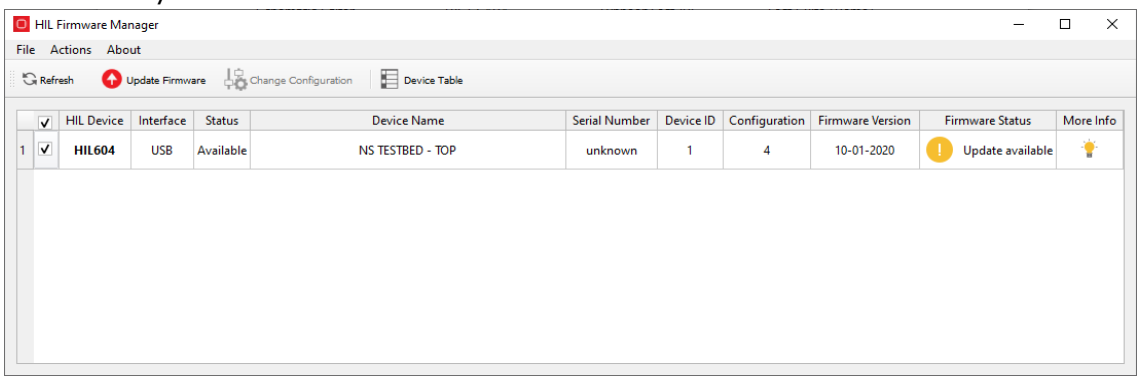

Figure 7.1. Firmware manager

- Select the desired HIL device and click on the **Update Firmware** button. The Firmware Manager will select the appropriate firmware file and start the update process automatically.

Firmware Update option is available for multiple devices only if all selected devices are of the same type.

Change Configuration option is available for multiple devices only if all selected devices are of the same type and their firmware is up to date.

- Firmware update progress for each selected device is shown in separate window.

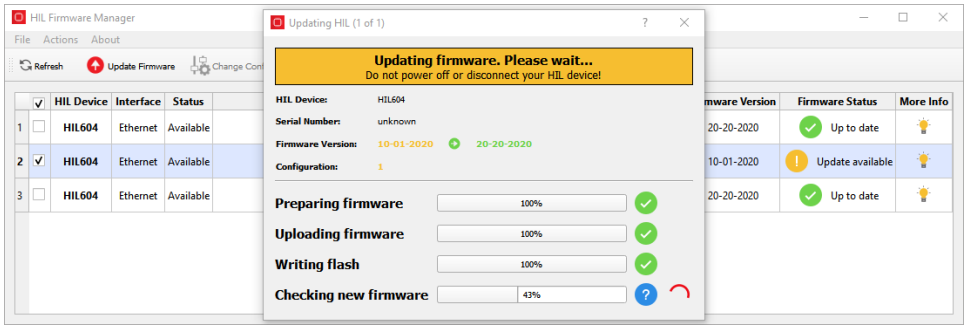

Figure 7.2. Updating firmware

- Firmware update or configuration change procedure can take more than a minute to complete. After update is finished on all devices, appropriate message is shown.

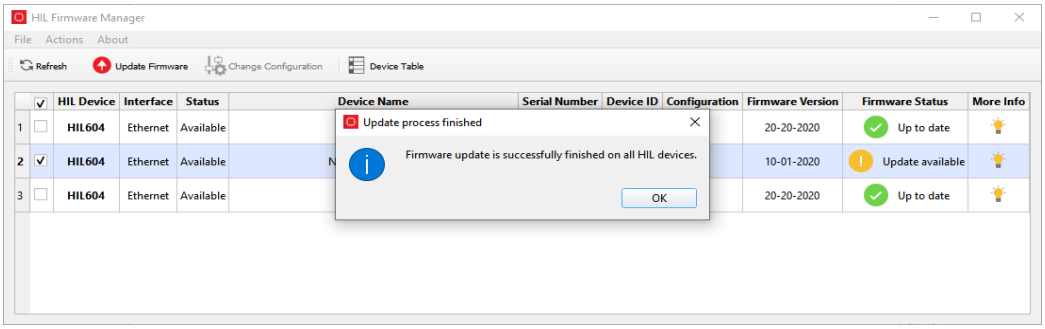

Figure 7.3. Successfully finished updating firmware

8 Running Your First Simulation

After you have installed the software on the PC and connected the hardware, you are ready to run your first simulation. We will use a model of an induction machine variable speed motor drive with built-in controller to get you familiar with Typhoon HIL software environment.

8.1 Running the Induction Machine Open-loop Control Example

1. Power on your HIL device
2. After opening Typhoon HIL Control Center, select the Example explorer icon and find Induction machine with open loop control model.

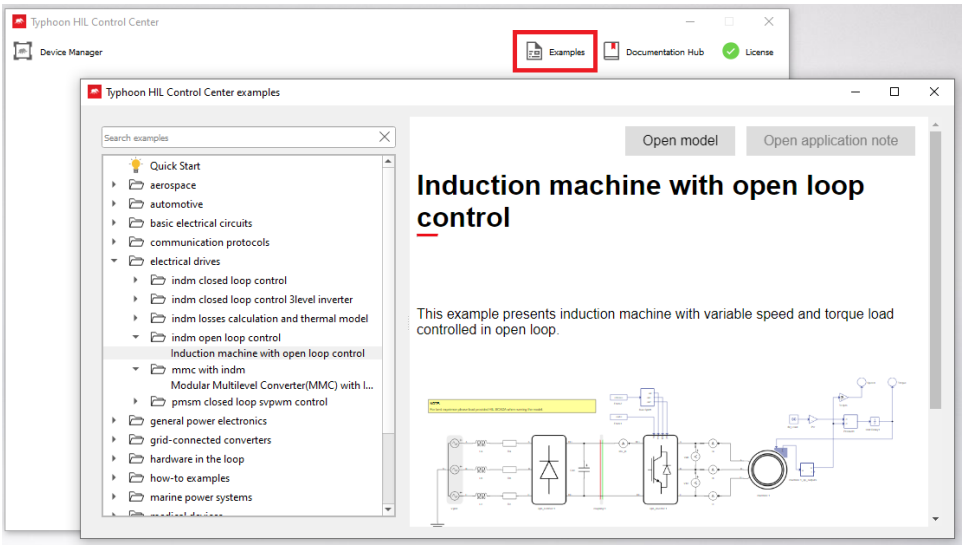

Figure 8.1. Typhoon HIL Control Center

3. In example explorer window select button Open model.

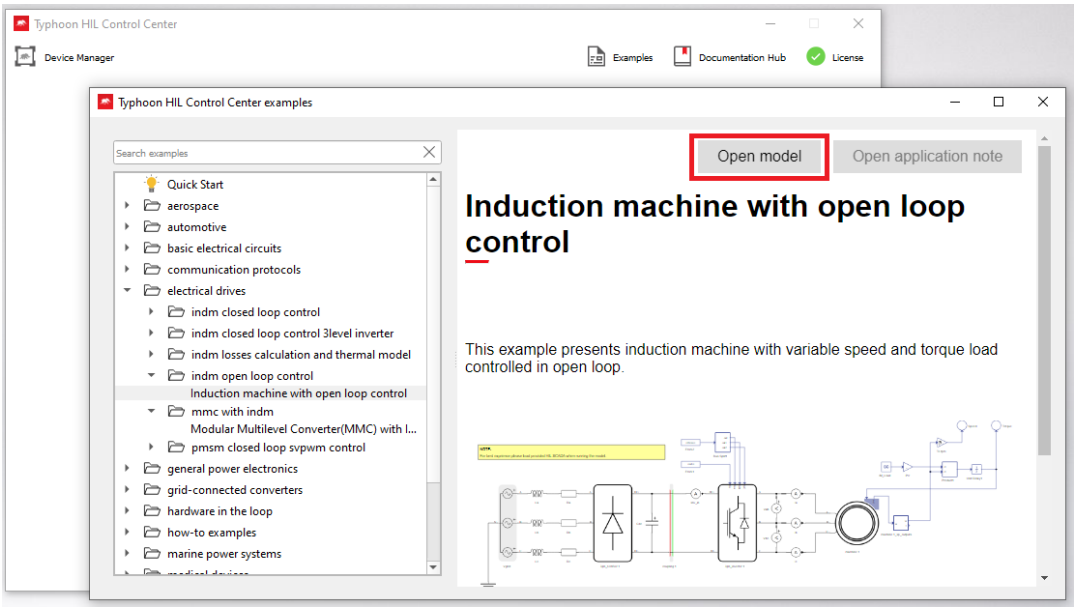

Figure 8.2. How to open example model

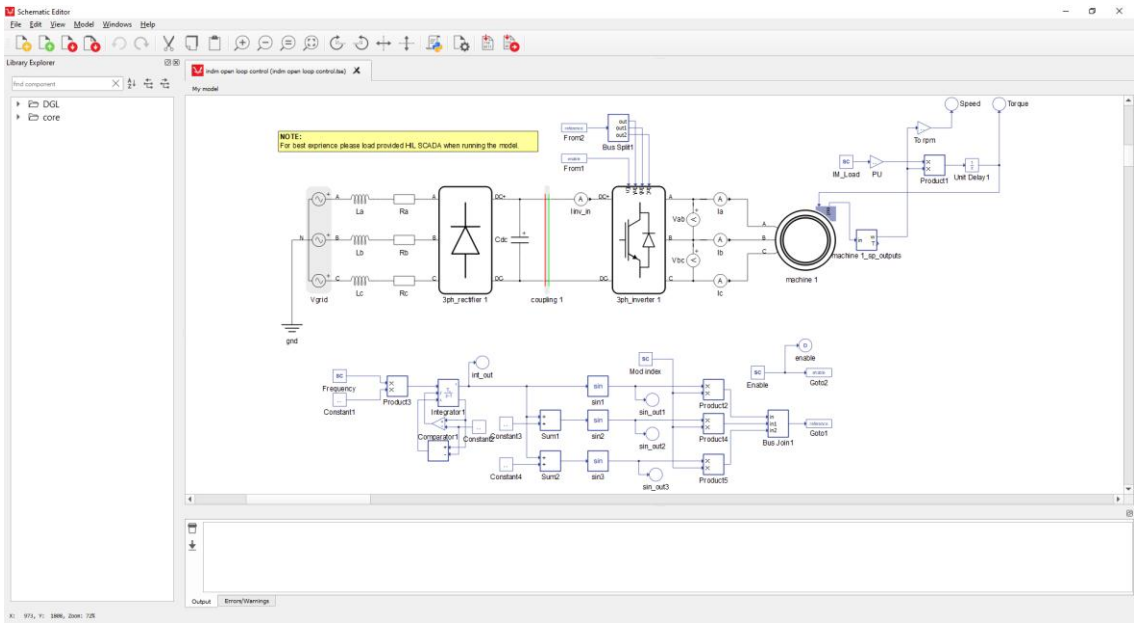

Figure 8.3. Schematic editor

To run the simulation, press the "Compile and load model in HIL SCADA" button. After the compilation has completed Typhoon HIL SCADA will open.

Figure 8.4. Compile and load model in HIL SCADA

4. When the compiled model is loaded into HIL SCADA, the appropriate SCADA panel file for the particular model will be automatically recognized and displayed below the label "Panels files found in Model directory". The SCADA Panel file can be found in the same folder where the model file is located.

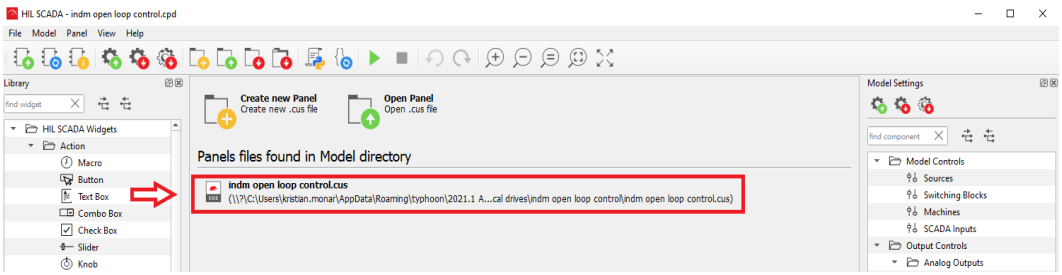

Figure 8.5. HIL SCADA

5. After loading the SCADA panel, the simulation can be started by pressing the "Run" button. The simulation will start and the signals observed from the simulation will be displayed in Capture/Scope widget.

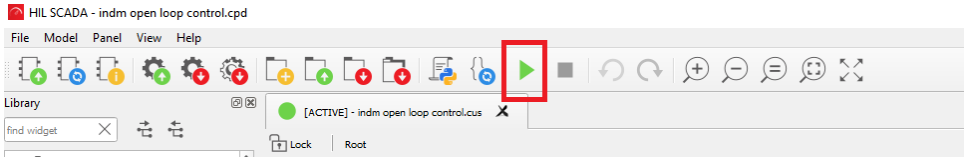

Figure 8.6. Start the simulation

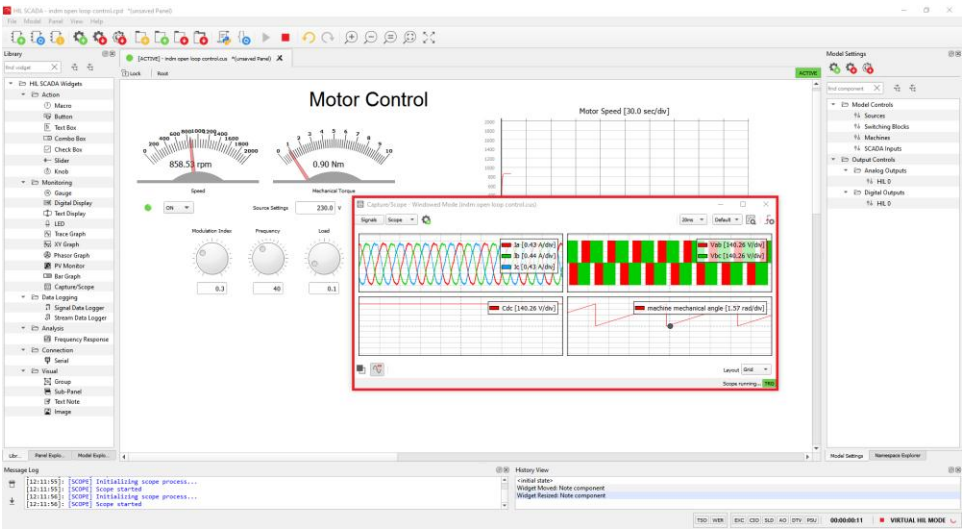

Figure 8.7. HIL SCADA panel

6. Capture/Scope widget is a powerful tool in which you can observe simulated signals. Signal settings and Display settings allow you to find and display a particular signal from the model and adjust its visual properties. For further details see Typhoon HIL Software Manual.

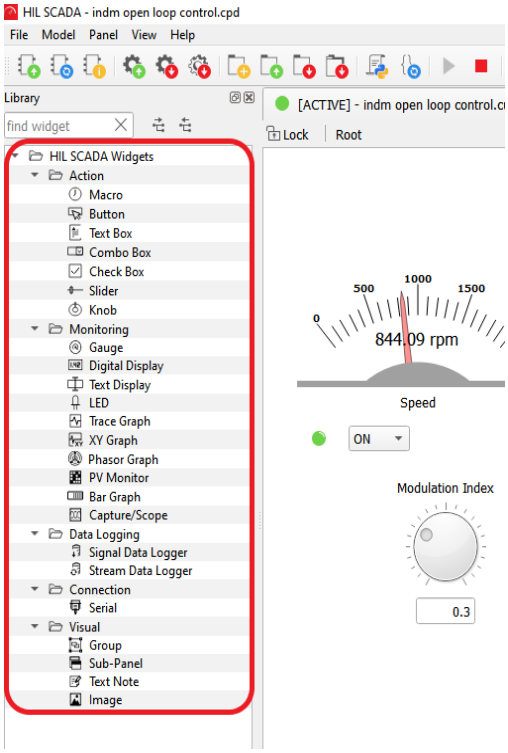

Figure 8.8. HIL SCADA widgets

The SCADA allows you to, create a fully customized user interface. With SCADA widgets you can monitor the simulation signals in many different ways using a wide selection of gauges and monitoring widgets. You can drag and drop widgets from the library, which is on left side of the window, and use the widgets to monitor or control model execution, either directly or by using a piece of Python code. Furthermore, SCADA can be used as an HMI towards external devices (controllers, laboratory equipment, etc.). For further details, please see Typhoon HIL Software Manual.

8.2 Select the virtual HIL Device

Using the Virtual HIL device there you can choose a different virtual device (e.g. HIL402 or HIL604). You can also choose different configurations for the chosen virtual device. Load model to the virtual device is possible only when HIL device is not connected to your PC.

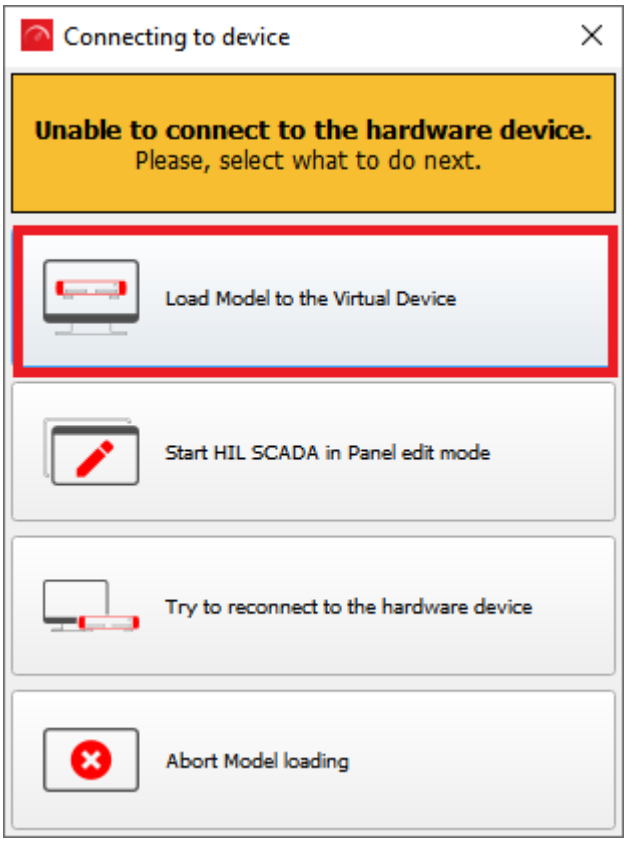

Figure 8.9 Connection to device

You choose both the Virtual HIL Device and its configuration in “Schematic settings”. You can do this even when the HIL device is not connected.

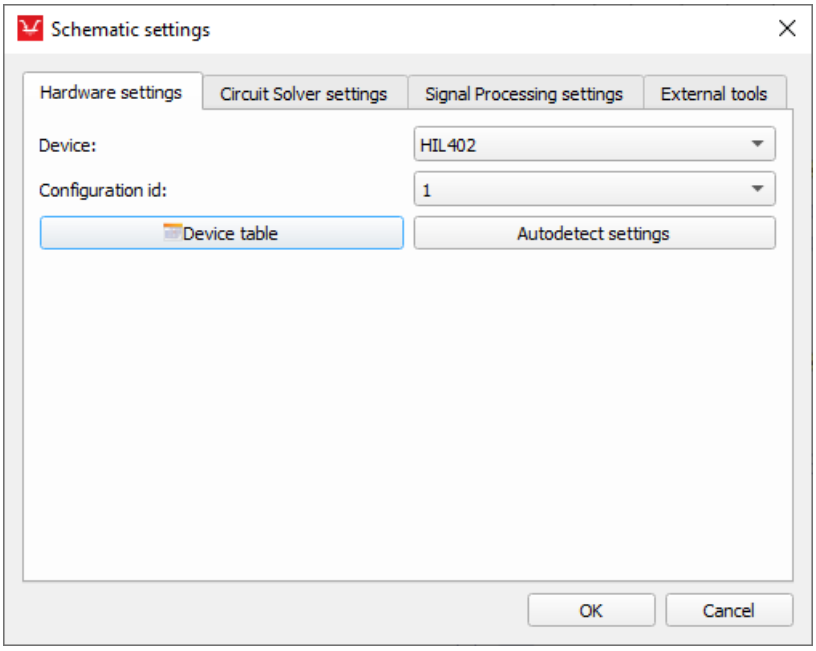

Figure 8.10 Schematic settings

8.3 More Examples

You can find more examples in the example explorer window. Certain example models do not require an external controller, which makes them especially suitable for simulating on the Virtual HIL Device.

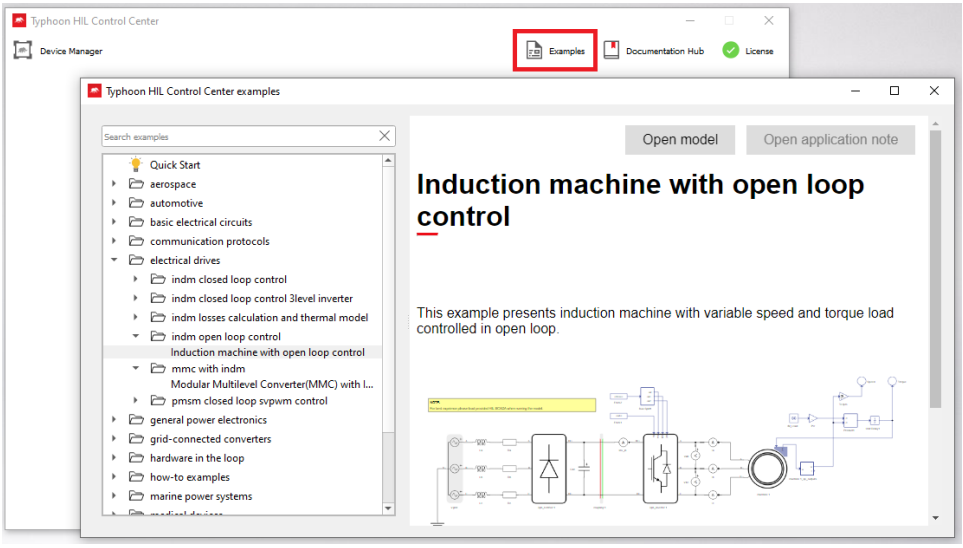

Figure 8.11 Example explorer

Such example models are:

- indm open loop control
- indm closed loop control
- boost_closed_loop
- mppt_boost_charger
- grid-connected converter pq
- battery storage
- marine hybrid concept
- 3ph_rectifier

8.4 More Information

For more information on Typhoon HIL software and hardware please refer to the provided documentation that can be easily accessed by clicking on the "Documentation Hub" button.

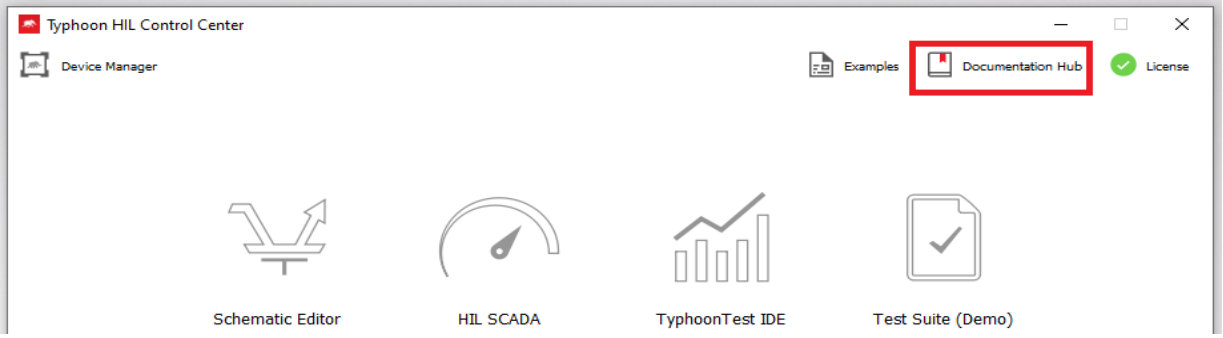

Figure 8.11. Documentation Hub

9 Revision History

Date	Version	Revision
26-01-12	1.0	Initial release.
11-04-12	1.1	Firmware update chapter added, HW setup slightly changed
20-12-13	1.2	Removed section about configuring Ethernet connection, inserted new section with USB Driver installation. System Requirements section inserted. Updated images.
07-04-14	1.3	Changed images to follow new version of software, changed system requirements
24-04-14	1.4	Analog Braking-out board removed. New compile and open model button added, with figure showing it edited. Some minor changes done and spelling errors corrected.
07-07-15	1.5	Changed Firmware Update section
24-12-15	1.6	Updated requirements and images
14-10-16	1.7	Licensing and First Simulation sections updated.
13-02-18	1.8	Updated complete document, discarded support for Windows XP, added SCADA description.
07-06-18	1.9	Redundant steps removed.
21-10-19	2.0	Updated default path of installation of software and images
25-12-19	2.1	New way how to add license file.