



NCV7052x Evaluation Kit

Test Procedure

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This document describes the test procedure for the NCV7052x Evaluation Kit. All parts described below need to be tested before the Evaluation Kit can be shipped to a customer. It's important to follow the test procedure as given below to ensure a completely working Evaluation Kit.

1. ECUSIM MKII 500-SERIES

The test description of EcuSim MkII 500-Series can be found in the EcuSim MkII Production Guide.

2. CAN AND SPI CABLE

If tested cables are bought, the cables do not need to be re-tested. If the cables are custom/hand made, the cables need to be tested. Testing can be done by means of a cable tester or by doing the *NCV7052x Evaluation Kit Test*.

3. MOTHERBOARD

The Motherboard needs to be tested by doing the *NCV7052x Evaluation Kit Test*.

4. DAUGHTERBOARD

The Daughterboard(s) can be tested by doing the *NCV7052x Evaluation Kit Test*.

5. NCV7052X EVALUATION KIT TEST

Follow next steps to test the NCV7052x Evaluation Kit.

Step 1: Install the Stepper Motor Driver GUI.

Go to the ON Semiconductor website (www.onsemi.com) to download the Stepper Motor Driver GUI. Click Design Support (1). Go to the Design Resources page (2) and select Software (3). Download the Stepper Motor Driver GUI.

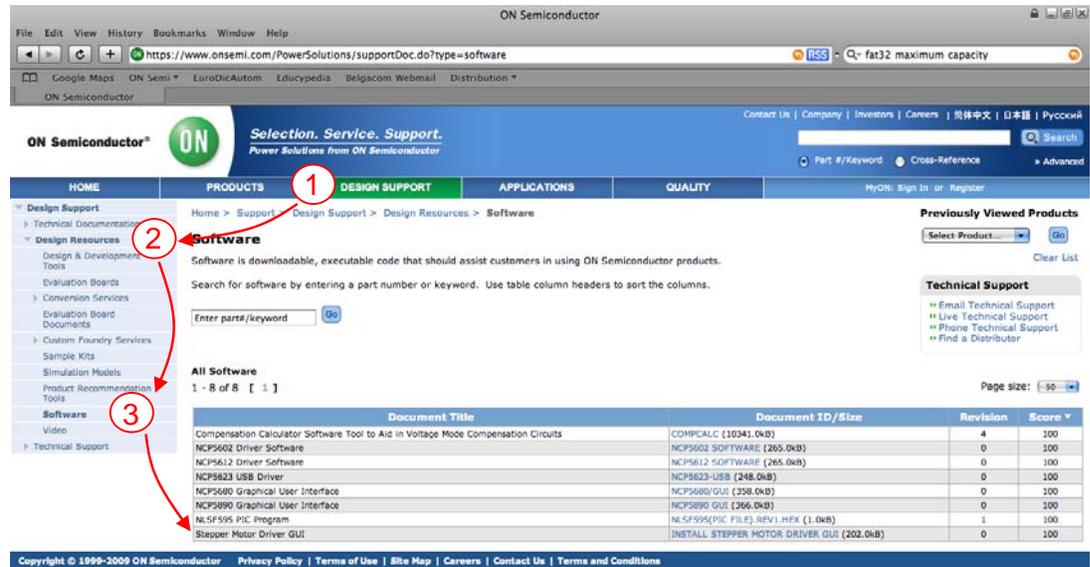


Figure 1: Download the Stepper Motor Driver GUI

Once downloaded, run the downloaded executable to start the installation process. The Installation Wizard will guide you through the complete installation of the Stepper Motor Driver GUI.

Step 2: Start the Stepper Motor Driver GUI.

To run the Stepper Motor Driver GUI, click the icon on the Desktop.



A welcome screen will open¹.

¹ Depending on the software version installed, the given screen plots can be different.

Step 3: Select Evaluation Kit and click Next Step.

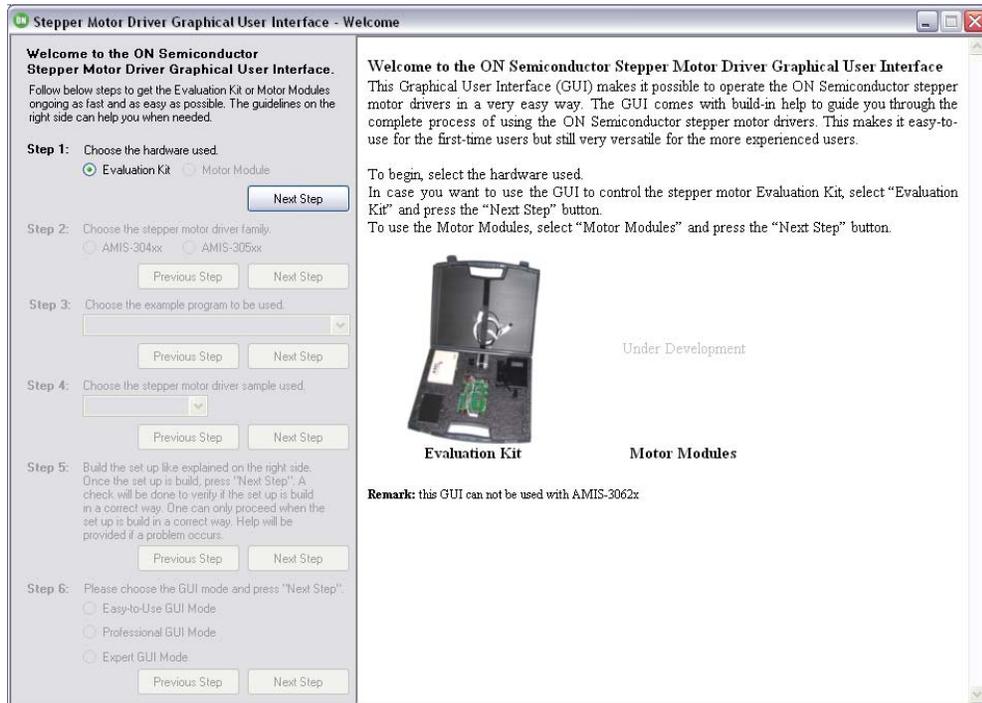


Figure 2: Select Evaluation Kit

Step 4: Select AMIS-305xx and click Next Step.

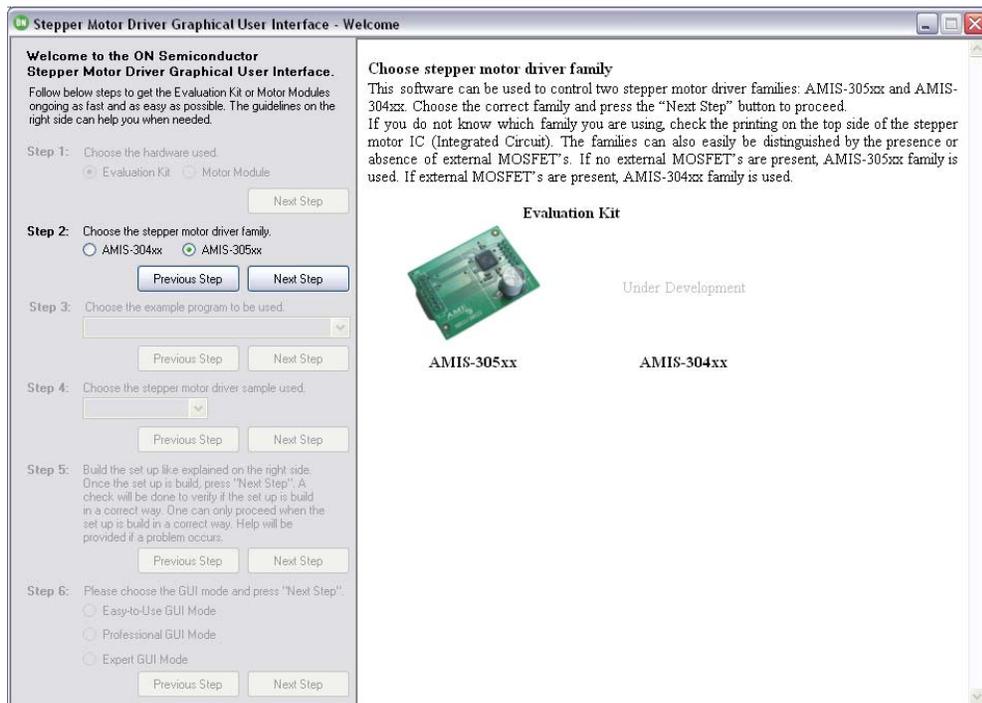


Figure 3: Select motor driver family

Step 5: Select SPI Bus from the drop-down list and click Next Step.

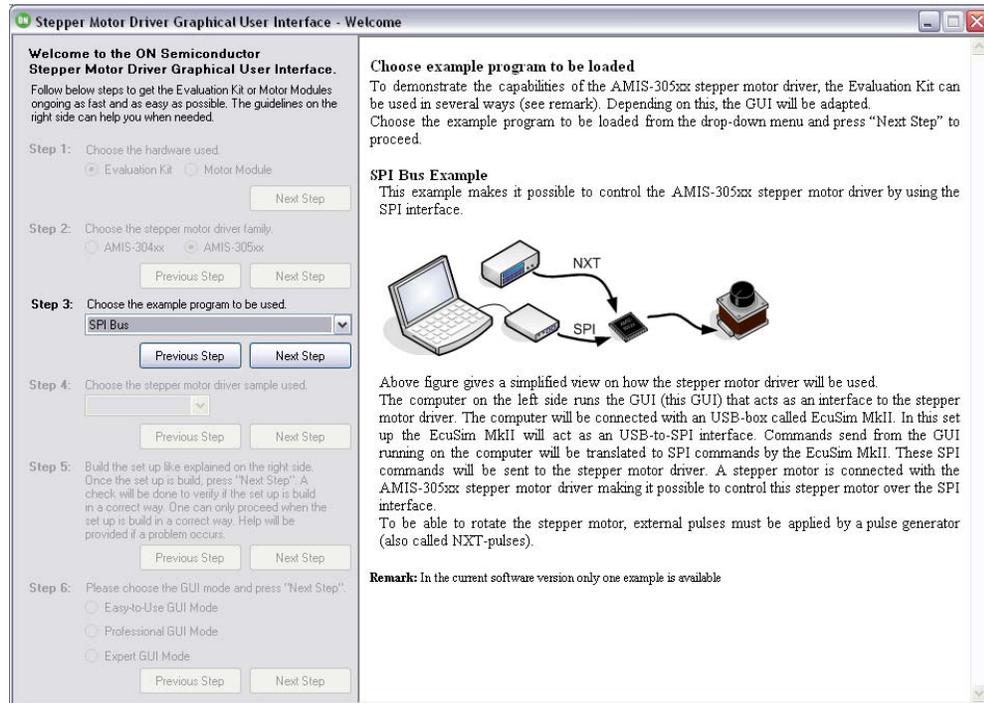


Figure 4: Select SPI Bus example

Step 6: Select the stepper motor driver used (dependent on the Daughterboard chosen) and click Next Step².

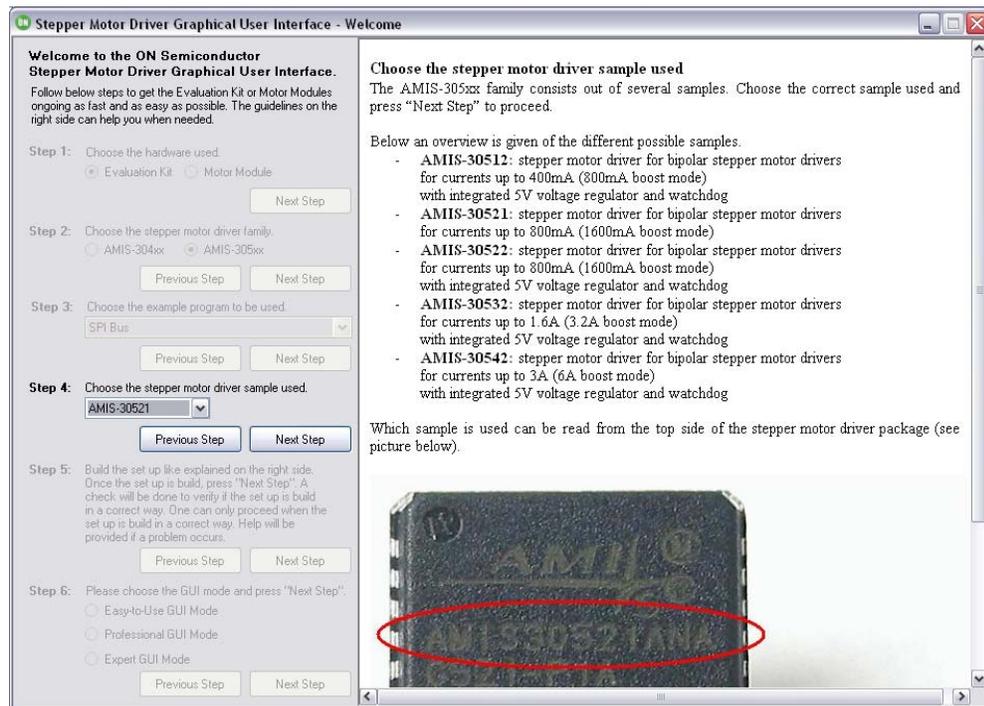


Figure 5: Select sample used

² Selecting an incorrect sample will not have an effect on the test.

Step 7: Build the setup as given in the Welcome screen (see below picture).
It's important to build the setup the first time by using a so-called Golden Reference Setup. A Golden Reference Setup is a setup with all known working parts³.

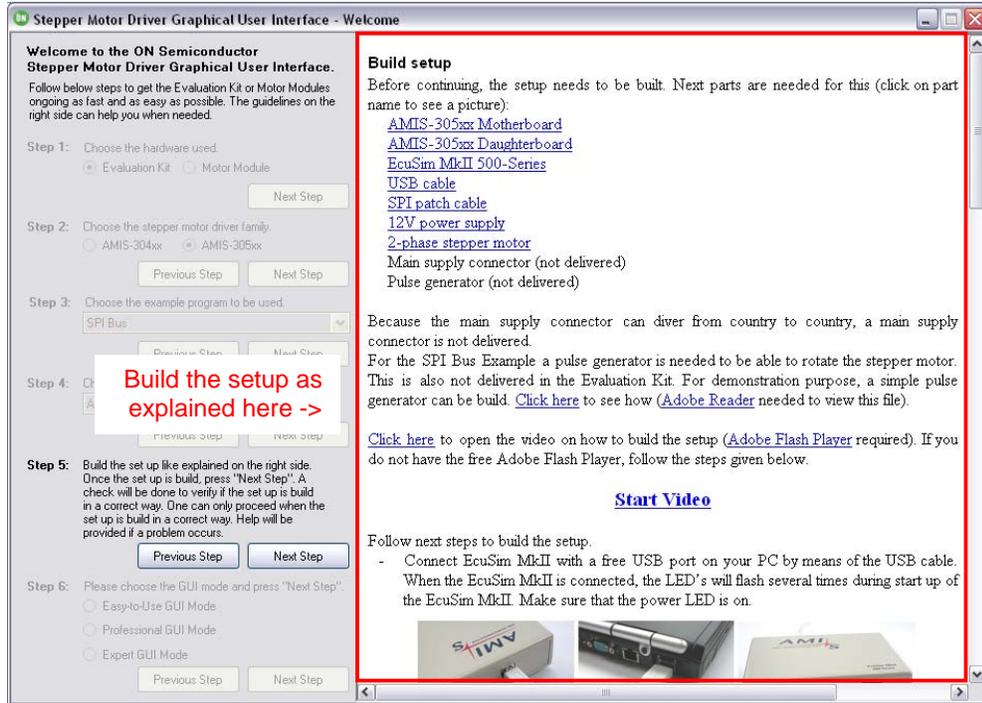


Figure 6: Build Golden Reference Setup

Once the setup is build, click Next Step. If the setup is not build correctly, help will be given to find the problem.

³ Mark all parts of the Golden Reference Setup to avoid confusion!

Step 8: If the setup is build correctly, select Professional GUI Mode and click Next Step.

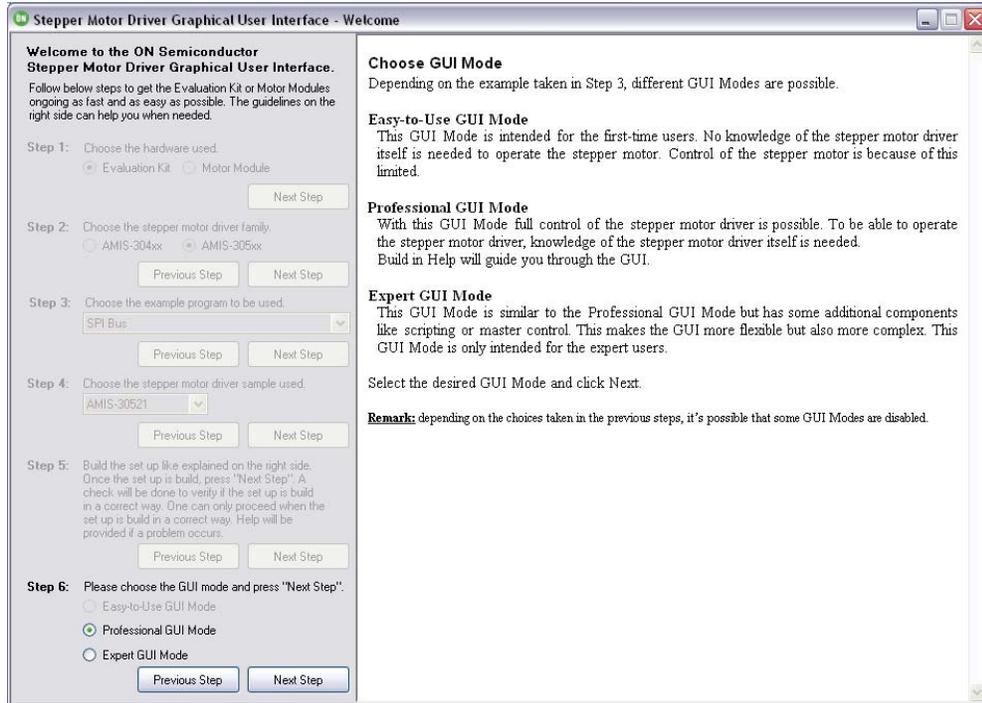


Figure 7: Select Professional GUI Mode

A new window will open (the Help window may be closed).

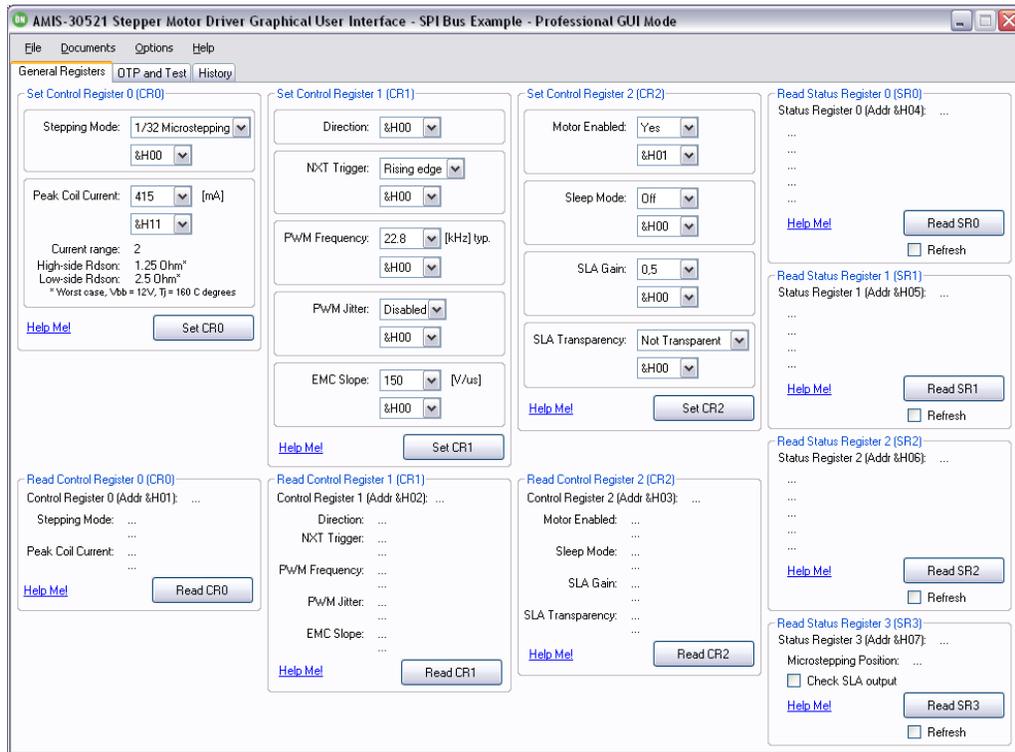


Figure 8: General Registers tab of the Stepper Motor Driver GUI

Step 9: Set Control Register 0

Set Stepping Mode to 1/32 Microstepping and Peak Coil Current to &H11 and click the Set CR0 button.

As given in Figure 9, a Peak Coil Current of &H11 will be equal to 415mA. Depending on the sample taken (see Figure 5), this value can be different.

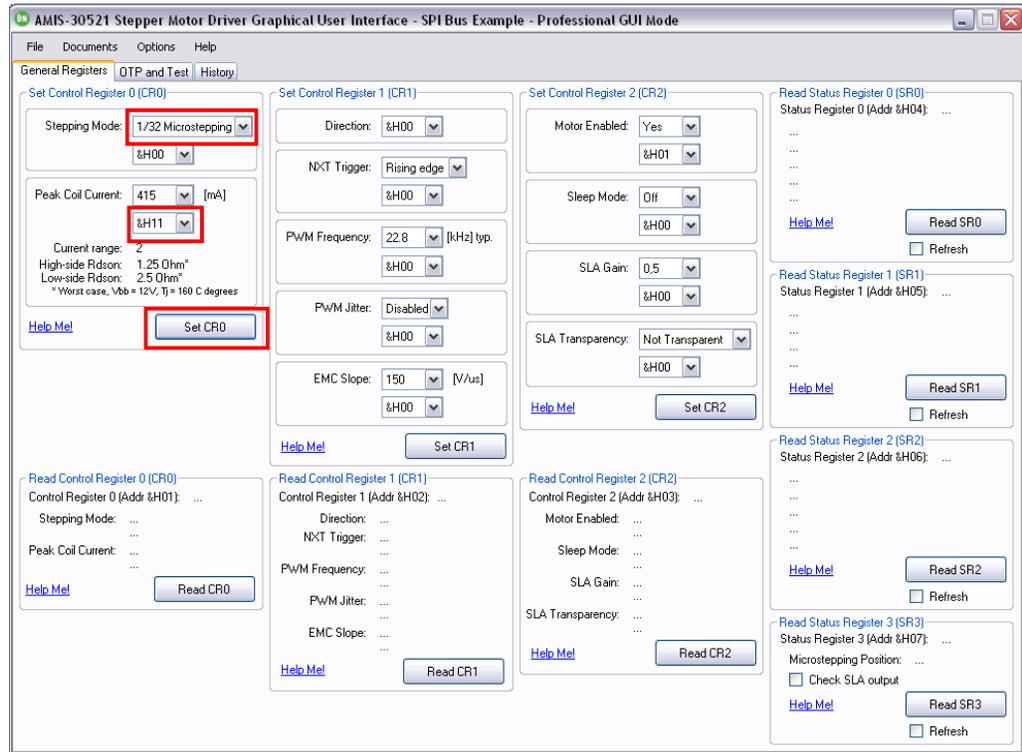


Figure 9: Set Control Register 0

Step 10: Enable Motor Driver
Set Motor Enabled to Yes and click Set CR2.

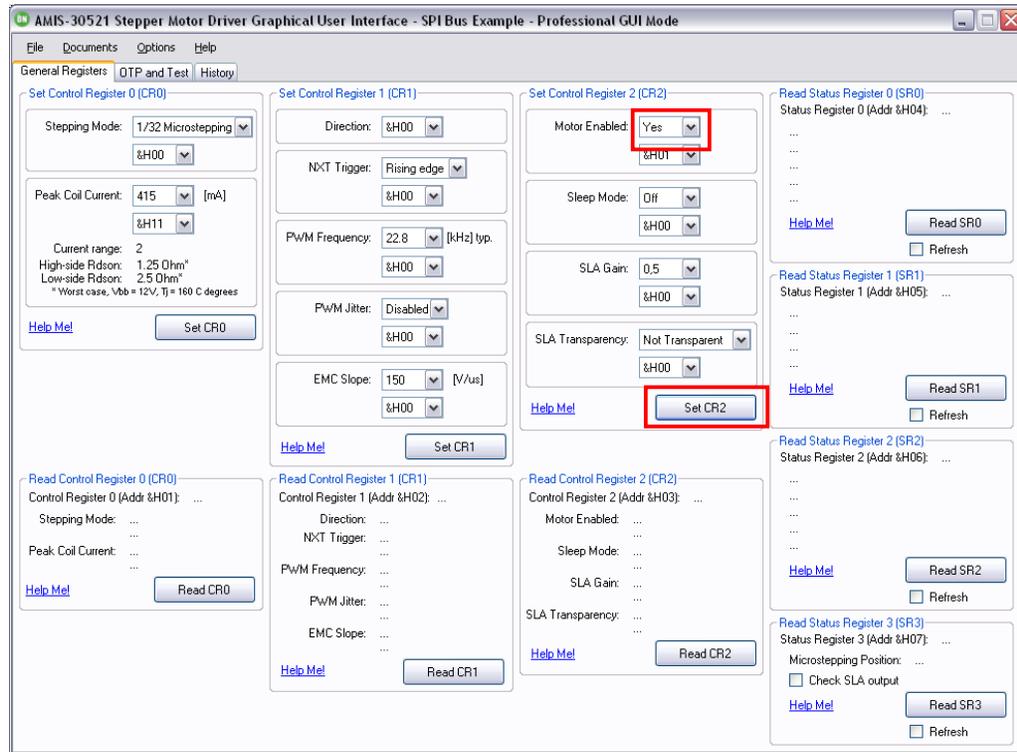


Figure 10: Enable motor driver

The stepper motor should be rotating at this moment. If not, check if the EcuSim MkII is connected properly with the PC running the Stepper Motor Driver GUI. Check if the Motherboard is powered and the SPI cable between EcuSim MkII and Motherboard is connected correctly. Check also if the Daughterboard is mounted correctly and the stepper motor is connected properly. Also make sure a pulse generator is connected (see Figure 6). If the problem can not be solved, restart the software and try again. Because the Golden Reference Setup is used for the first test, the stepper motor should be rotating before one can continue with the test!

Step 11: Test the different parts

Once the Golden Reference Setup is up and running, the SPI cable (if needed)⁴, Motherboard and/or Daughterboard(s) can be tested.

It's very important that only one part of the Golden Reference Setup is replaced by a to-be-tested part. In this way, if the test would fail, the defect part can be located easily.

Test SPI Cable:

Starting from the Golden Reference Setup, replace the Golden Reference SPI cable by the to-be-tested SPI cable and repeat step 9 and 10.

Replacing of the SPI cable can be done while the Motherboard is powered and the EcuSim MkII is connected with the PC.

If the test fails (= stepper motor is not rotating), the SPI cable is broken and needs to be repaired.

Test Daughterboard:

Starting from the Golden Reference Setup, replace the Golden Reference Daughterboard by the to-be-tested Daughterboard and repeat step 9 and 10.

Un-power the Motherboard before replacing the Daughterboard. EcuSim MkII as also the SPI cable do not need to be disconnected.

⁴ At this moment the CAN cable can not be tested and should be tested by using a Cable Tester.

If the test fails (= stepper motor is not rotating), the Daughterboard is broken and needs to be repaired. Check if all components are stuffed correctly (all caps stuffed, all resistors stuffed, connectors stuffed in the proper way, pin 1 of U1 is at the correct location). If all this is correct, one could replace U1 and redo the test.

Test Motherboard:

Starting from the Golden Reference Setup, replace the Golden Reference Motherboard by the to-be-tested Motherboard and repeat step 9 and 10.

Always test the Motherboard with the stepper motor cable that is connected to the board. Do not use the stepper motor cable of the Golden Reference Setup! This to make sure that the stepper motor cable is connected correctly.

EcuSim MkII does not need to be disconnected when replacing the Motherboard.

Make sure the Golden Reference Daughterboard is mounted properly before powering the Motherboard.

If the test fails, check carefully if the Motherboard is connected properly. Also, check if the stepper motor cable is connected properly with the Motherboard. If needed, redo the test with the Golden Reference Motherboard to verify.

If all is connected correctly and the test still fails, the Motherboard is broken and needs to be repaired. Check if all components are stuffed correctly.

If the test passes, the Motherboard is working and can be placed inside an Evaluation Kit case (see NCV7052x EvalKit Assembly document). Do not disconnect the stepper motor cable from the Motherboard! The Motherboard together with the connected stepper motor cable need to be placed inside the Evaluation Kit case.

Step 12: End of test

When all parts are tested (SPI and CAN cables, Daughterboards, Motherboards and EcuSim MkII), the NCV7052x Evaluation Kits can be build completely (see the NCV7052x EvalKit Assembly document) and shipped to customers.

Remark: before placing the Motherboard inside the grey kit case, make sure jumper J51 is placed.

Close the software and store the Golden Reference Setup at a safe place for future tests.