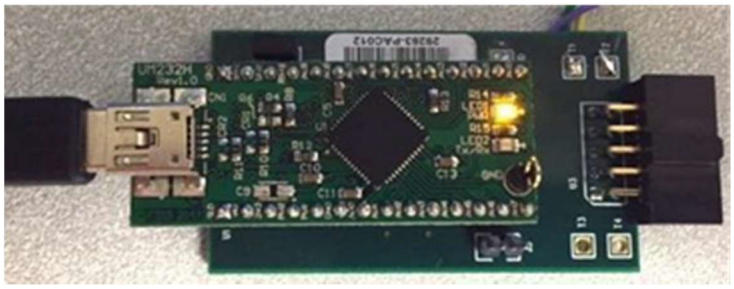
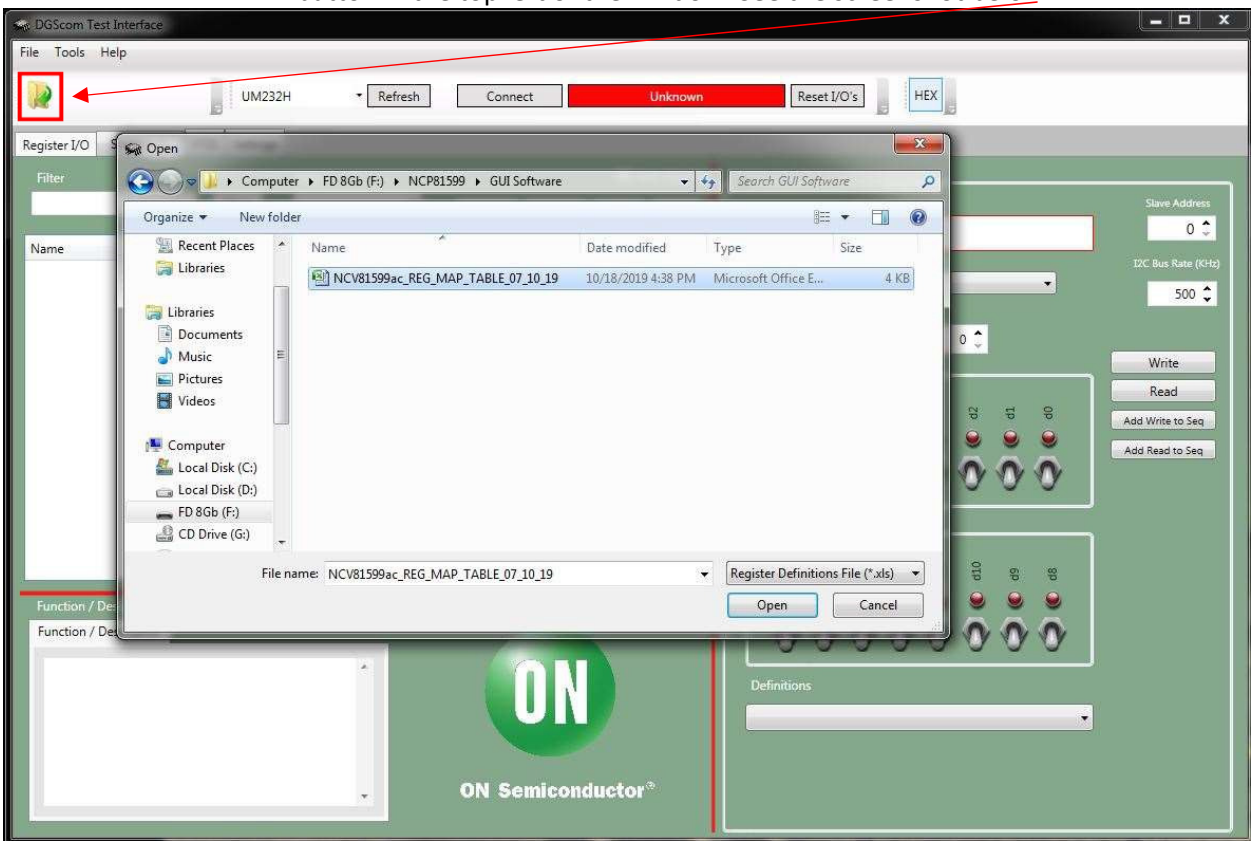
NCP81599 GUI Software & Eval Board User Guide

1. Plug I^{2}C interface board (J1 needs shorted) into your computers USB port, via a USB-A to Mini-B cable. It should install drivers automatically. Once completed, the PWR LED1 should turn on.



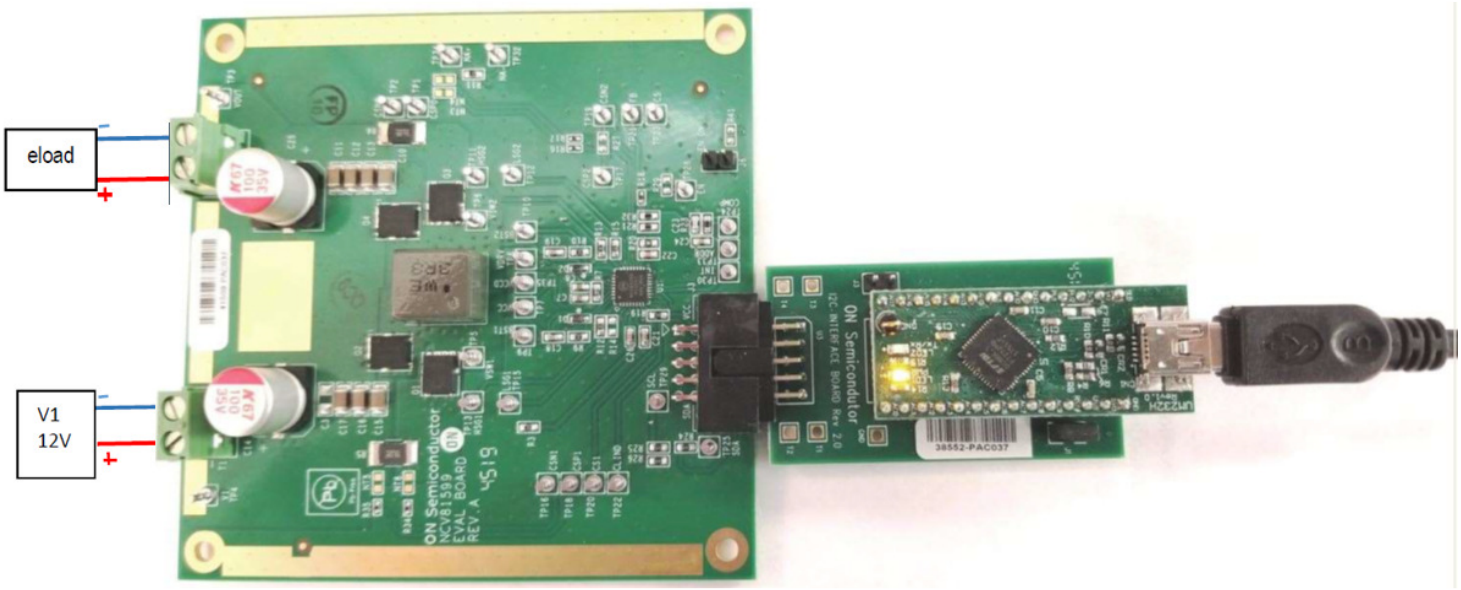
2. Run dgSCOM Setup (dgSCOM_1.5.12_setup32.msi). Follow the instructions to finish the installation.
3. When dgSCOM has been installed, run it.
4. Load the NCP81599 register map excel file “NCV81599ac_REG_MAP_TABLE_07_10_19.xlsx” from the files provided, by clicking the **File** -> **Open Register Definitions** or the quick access tool button in the top left of the window. See the screenshot below.



5. Ones the register map loaded, click “connect” to establish communication with the I^{2}C dongle. “Unknown” field will turn from red to green with “FT_OK” see below.

6. Click the "**HEX**" button if you want to convert values from Hex to Decimal format. This is important for users to set the proper readable register values (e.g. output voltage).

7. Connecting NCP81599 evaluation board.
   a. Plug I^{2}C board to I^{2}C header J3 on the evaluation board.
   b. Connect 12V (typical) input supply to T1 as shown below.
   c. Connect electronic load to T2 as shown below.

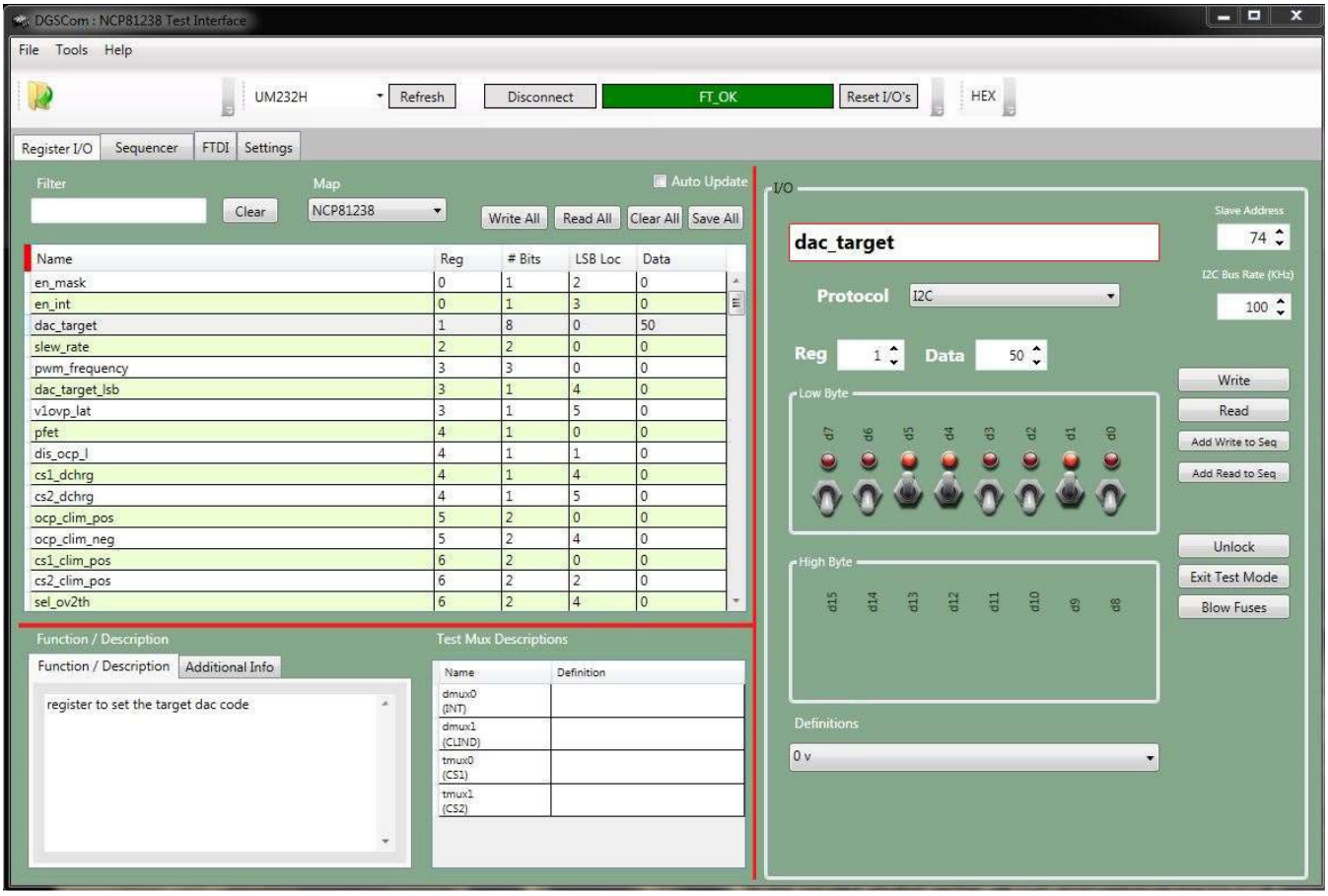


Note: The reason for the two pin header connected to the bottom of the board, rather than on the C7 pads is due to the fact that the C7 pad is before the output pi filter, which is used to suppress high frequency noise on the output, the two pin header can be used with a differential prob. You can also use a passive probe to observe the output by probing the test point on the Q6 drain pad.

8. Once the NCP81599 evaluation board is connected, turn on the Vin power supply. Now you should see 5V at the output.

9. To change the output voltage:

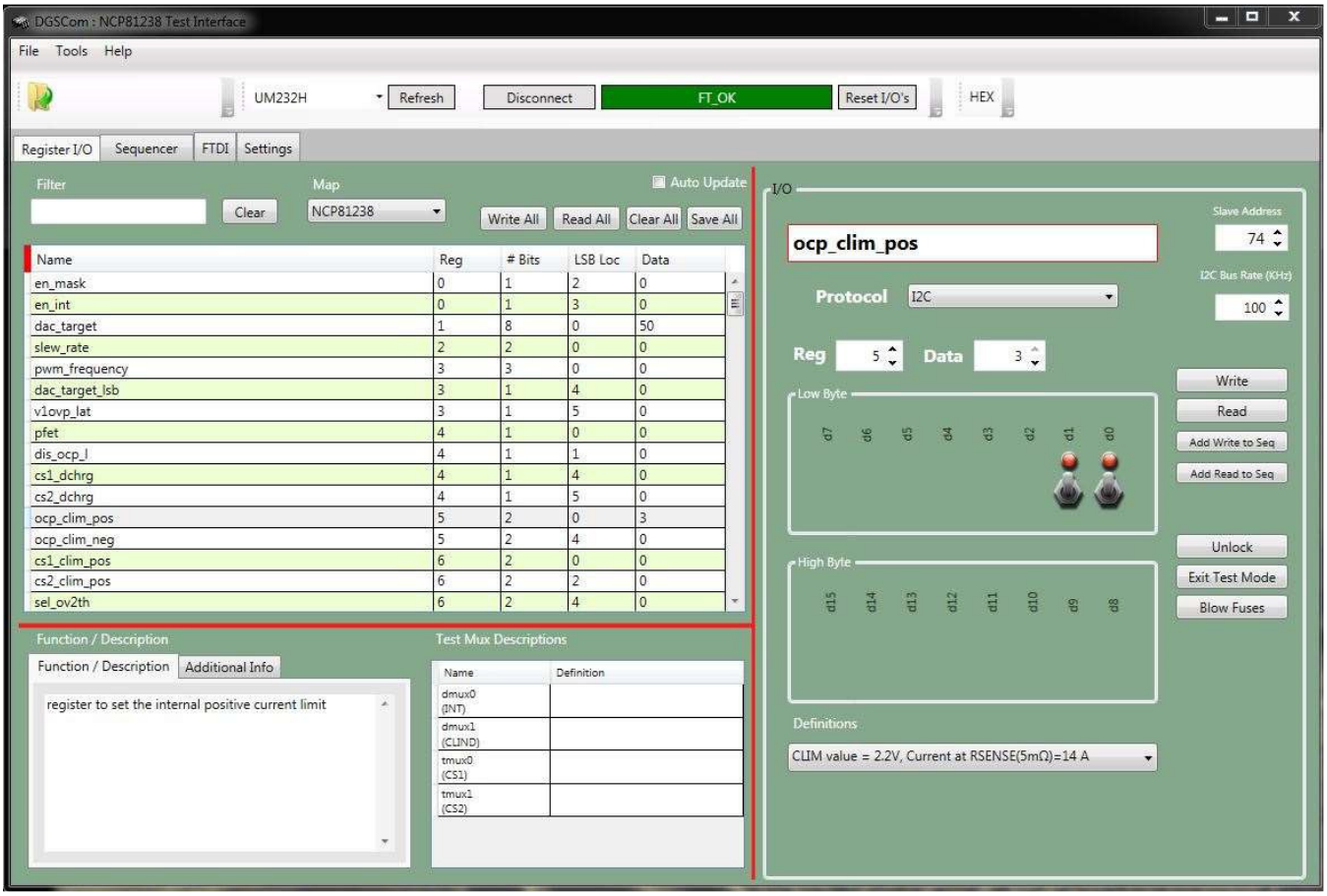
Under the “Register I/O” tab find the “dac_target” register. Click to select that row and press the **Read** button. If you have properly converted to decimal format and are properly connected, you should see a 50 in the “Data” box.



Note: The “dac_target” register (01H) is to set the internal reference voltage, which is 0.5 V with a resolution of 10 mV by default. The reference voltage can be adjusted with 10 mV steps from 0.1 V to 2.55 V through this dac_target register, which makes the continuous output voltage profile possible. For example, by default, if there’s a 10:1 ratio resistor divider from the converter output to the FB, the output voltage profile will be set to 5V by default and be able to vary from 1 V to 25.5 V with 100 mV steps.

Moreover, the LSB of the 9-bit DAC is not actually the LSB of the 8-bit “dac_target” register. There’s a 1-bit “dac_target_lsb” register (03h) by using which one can set a finer resolution of DAC output to 5 mV.

WARNING: YOU MUST INCREASE CURRENT LIMIT TO PULL A 5A LOAD. THE DEFAULT CURRENT LIMIT IS SET TO 7.6A (peak detect), YOU WILL NEED TO INCREASE THIS TO 14A VIA THE DEFINITIONS DROP DOWN MENU IN REGISTER “ocp_clim_pos”, THEN PRESS WRITE. SEE THE SCREEN SHOT BELLOW.



10. As you can see, there are many read/writeable registers. They can all be changed to accomplish different things. In the data package is a complete register map (NCP81599_register_map_rev3.pdf) with register definitions. Use that as a guide to change any register values.

NOTE: This part does not have memory and will revert to all default register values when power (or enable) is cycled.

<u>Operating Conditions:</u>

V_{in}: 4.5V – 28V

V_{out}: 1V – 20V

I_{max}: 5A (Limitation of passive components, not NCP81239)

F_{sw}: 600 kHz (Default, can be changed in GUI via **pwn_frequency** register)