ON Semiconductor®

Test Procedure for the NCV7685GEVB Evaluation Board

Required Equipment:

- Bench power supply with A-meter
- Multimeter
- NCV7685GEVB board
- PC with installed SW control program
- MicroUSB cable

Initial setup:

1. Remove all jumpers
2. Connect jumpers OL1 – OL12
3. Connect jumpers JVS and JVDD
4. Remove Jumper JOEN
5. Connect strap NT3, NT4 and NT5
6. Place SWconf switch to right position to CNF1
7. Place SW1 switch to OFF position for all four pins

Test procedure (current regulation)

8. Connect setup as shown above.
9. Apply voltage and sweep V_{BAT} voltage from 0 to 14V.
10. Connect JOEN jumper.
11. The current consumption should not exceed 70 mA, the LEDs should be OFF, all four green status LEDs should indicate the voltages and DIAG red status LED should be turned OFF.
12. Switch SWconf switch to the left position to CNF2.
13. The current consumption should not exceed 140 mA, the LEDs should be ON with current ~10mA, all four green status LEDs should indicate the voltages and DIAG red status LED should be turned OFF.
14. If something is not working, check the following:
    a. Check V_{STRING} voltage sense on the J_{UV} or $J_{DCSHORT}$ jumper pin. If V_{STRING} is not 7.0V the DC/DC circuit is not mounted properly (please check Q1 transistor)
    b. Check the VDD digital supply on the VDD jumper, the 5.0V should be present, if not, please check the LDO regulator.
    c. Check the VCC output reference on the test point VCC. There should be 3.3V if not, the NCV7685 device is not mounted properly or NCV7685 is not supplied.
    d. If the LEDs are not turned ON, check the voltage on the I_{SET} pin using J_{SHRT} jumper pin. There should be 1.0V if not, the device is not powered, or I_{SET} pin is shorted to ground.
    e. If some of the LED strings are not turned on, the NCV7685 device is not mounted properly, or the LED connection is broke down.

Test procedure (High current setting)

1. Apply 14V on the supply connector.
2. Connect J_{OEN} jumper.

3. Switch SWconf switch to the left position to CNF2.
4. Connect JHiCur jumper.
5. The LED intensity should be increased from 10mA to 50mA per channel.
6. Total current consumption should be around 400 mA
7. The I_{LED} current can be checked by placing A-meter instead of OLx jumper.
8. Remove JHiCur jumper.

Test procedure (Open Load detection)

1. Apply 14V on the supply connector.
2. Connect J_{OEN} jumper.
3. Switch SWconf switch to the left position to CNF2.
4. Disconnect any of OLx jumpers.
5. The other LED strings should be turned ON, and DIAG led should flag an error.
6. Connect all OLx jumpers
7. The indication DIAG LED should stop reporting an error.

Test procedure (Short on I_{SET} detection)

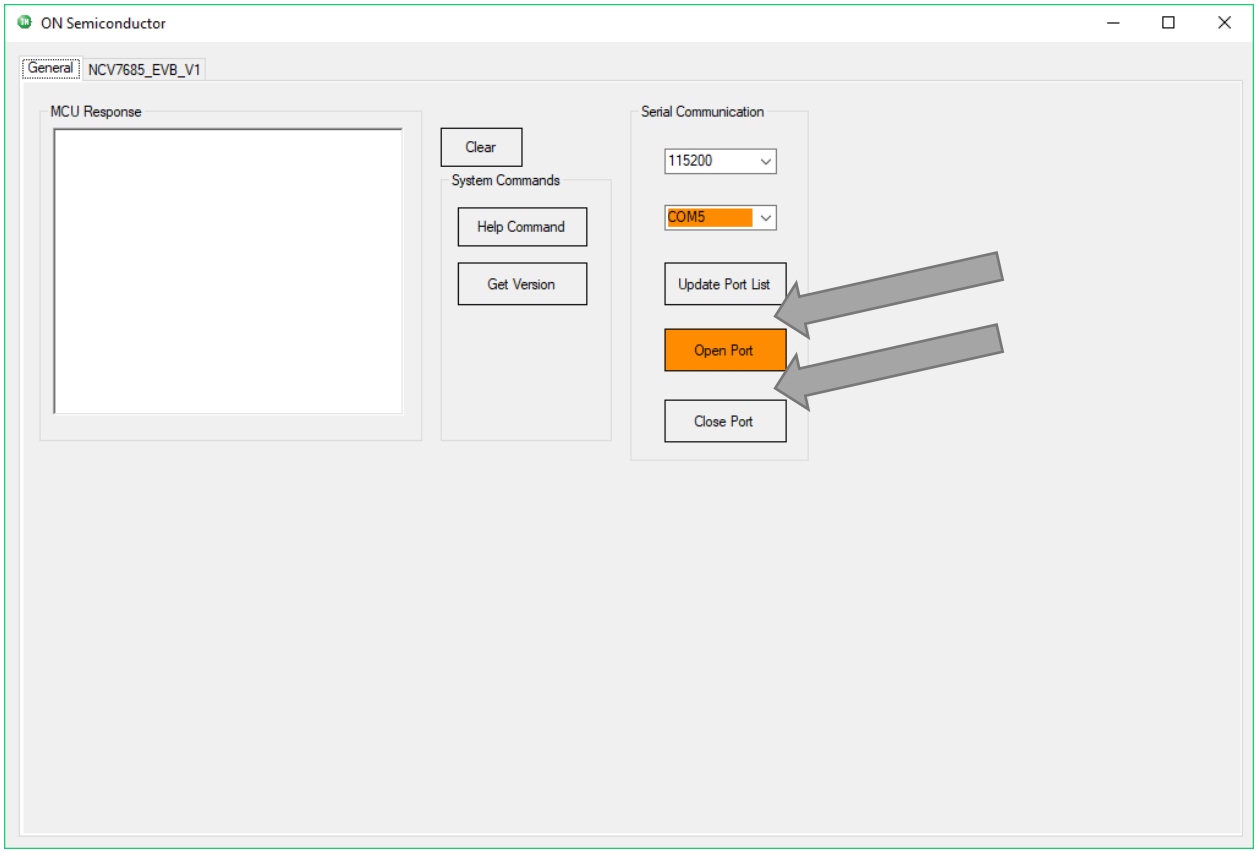
1. Apply 14V on the supply connector.
2. Connect J_{OEN} jumper.
3. Switch SWconf switch to the left position to CNF2.
4. Connect the J_{SHRT} jumper.
5. All LED strings should be turned OFF, and DIAG led should flag an error.
6. Check the voltage on the DIAG pin. Should be <0.7V.

Test procedure (Standalone Mode Animation)

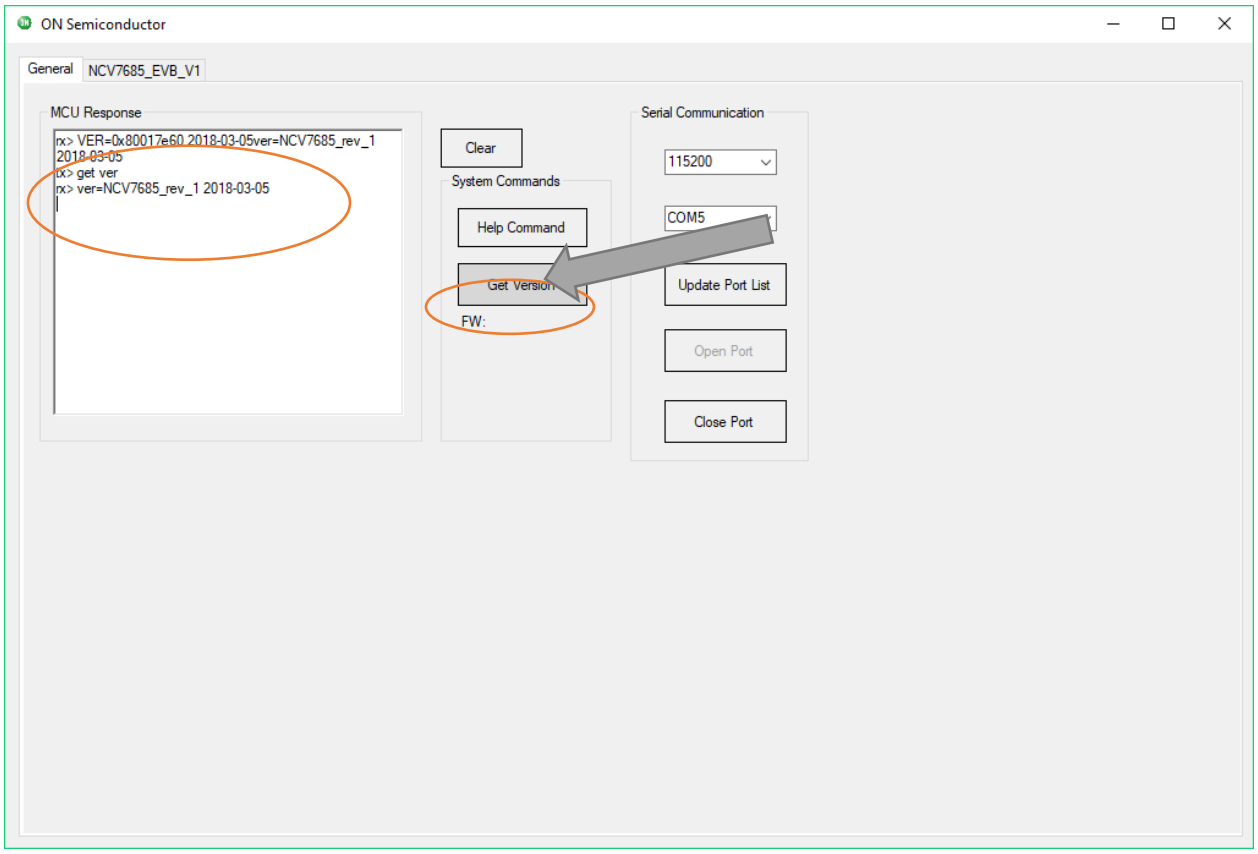
1. Apply 14V on the supply connector.
2. Connect J_{OEN} jumper.
3. Switch first pin of the SW1 switch to ON position.
4. All LED strings perform an animation in the loop. Indication LED D7 should be turned ON.
5. The animations can be changed by SW1[2:4] pin combination
6. The animation can be stopped by SW1[1] to OFF position

Control Program description:

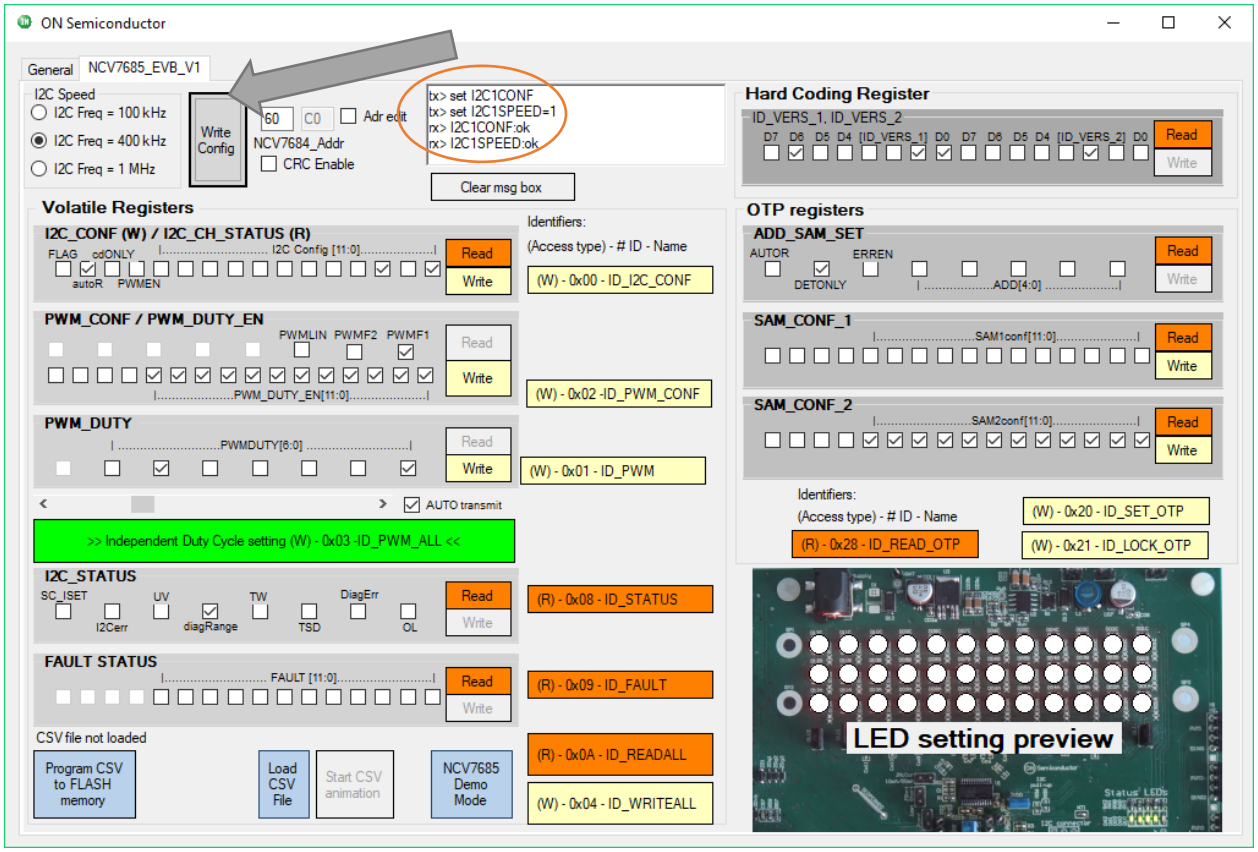
1. Apply 14V on the supply connector.
2. Connect J_{OEN} jumper.
3. Connect micro USB cable between PC and Jusb connector
4. Press J_RST button to reset the MCU
5. Open the Control Software
6. Press the Update Port Number button, select the COM Port and press Open port.



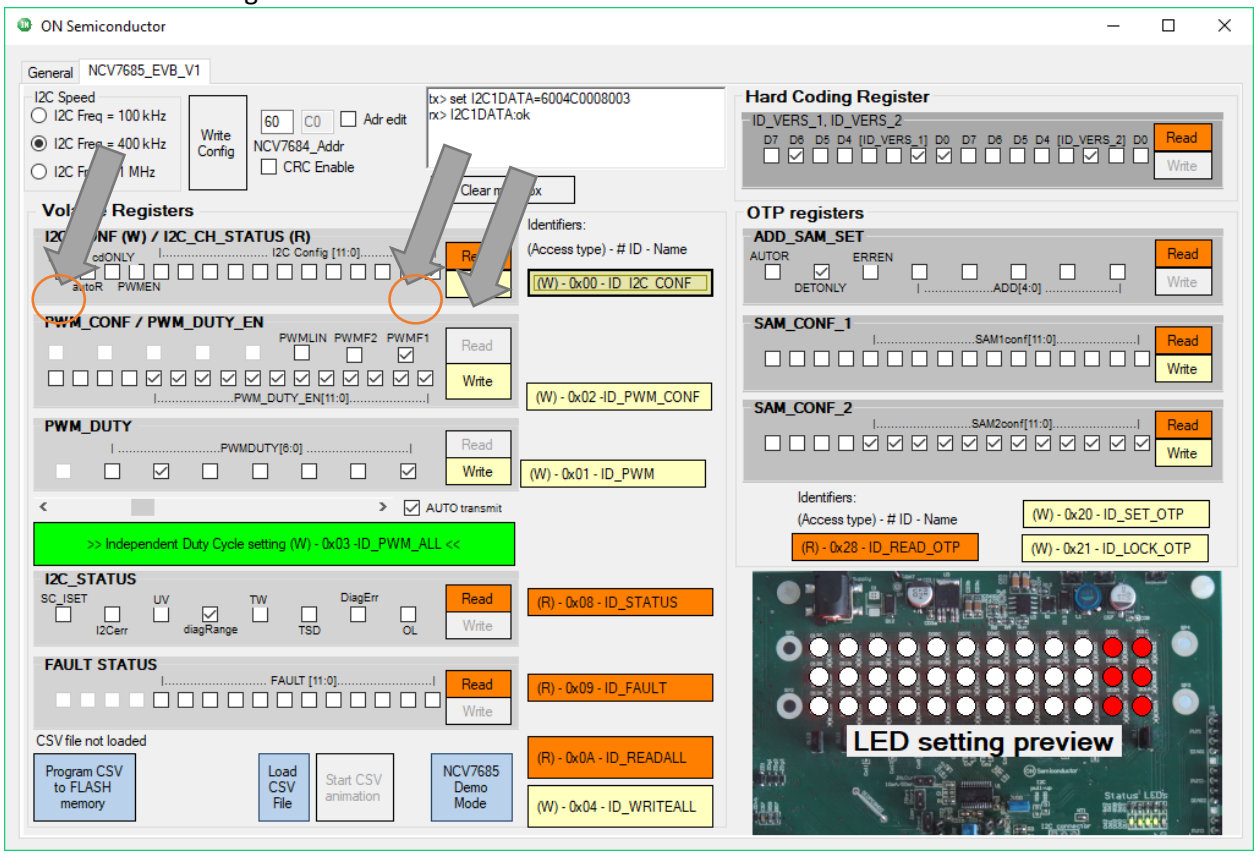
7. The NCV7685GEVB board is properly connected if MCU receive the information using Get Version button



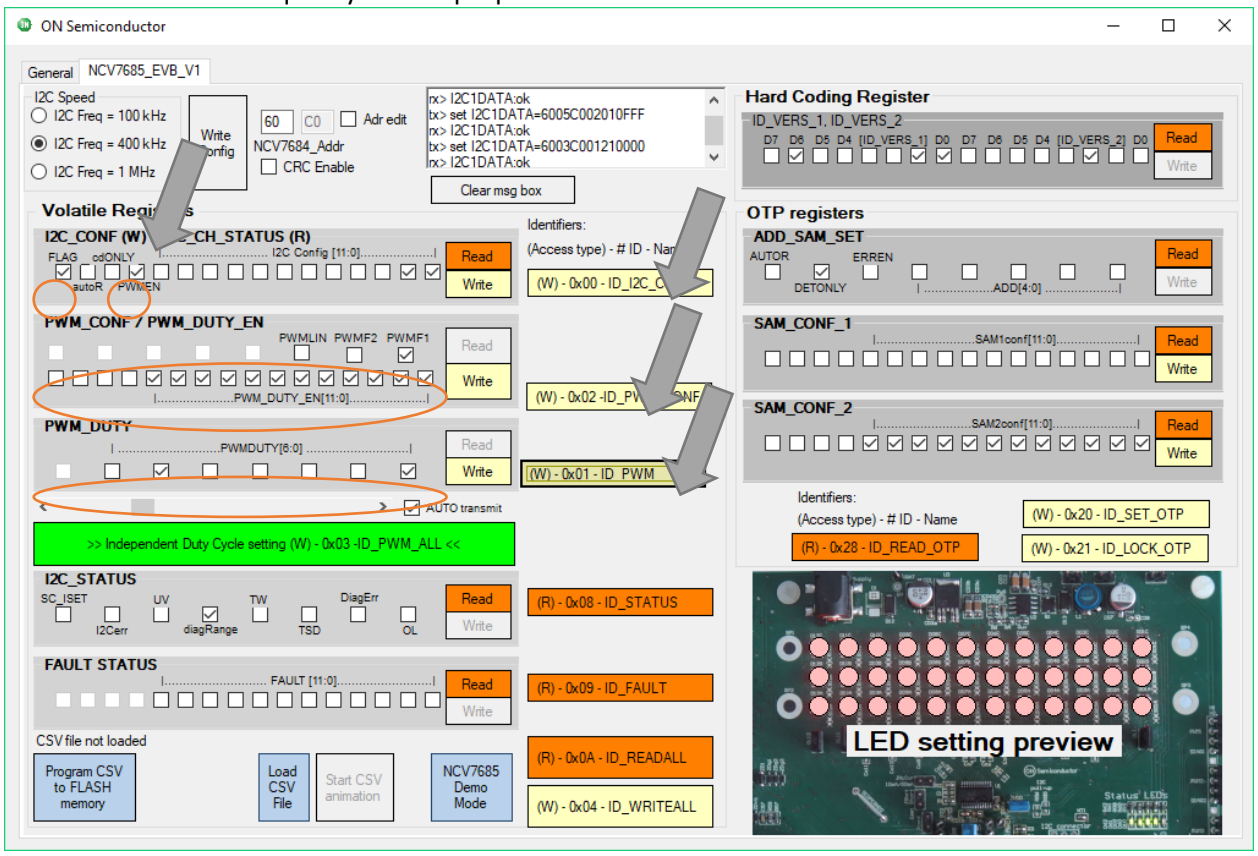
8. On the NCV7685_EVB_V1 tab click on the Write Config button to initialize the I2C communication at the 400 kHz, the Tx and Rx response from MCU should be visible in the msg box.



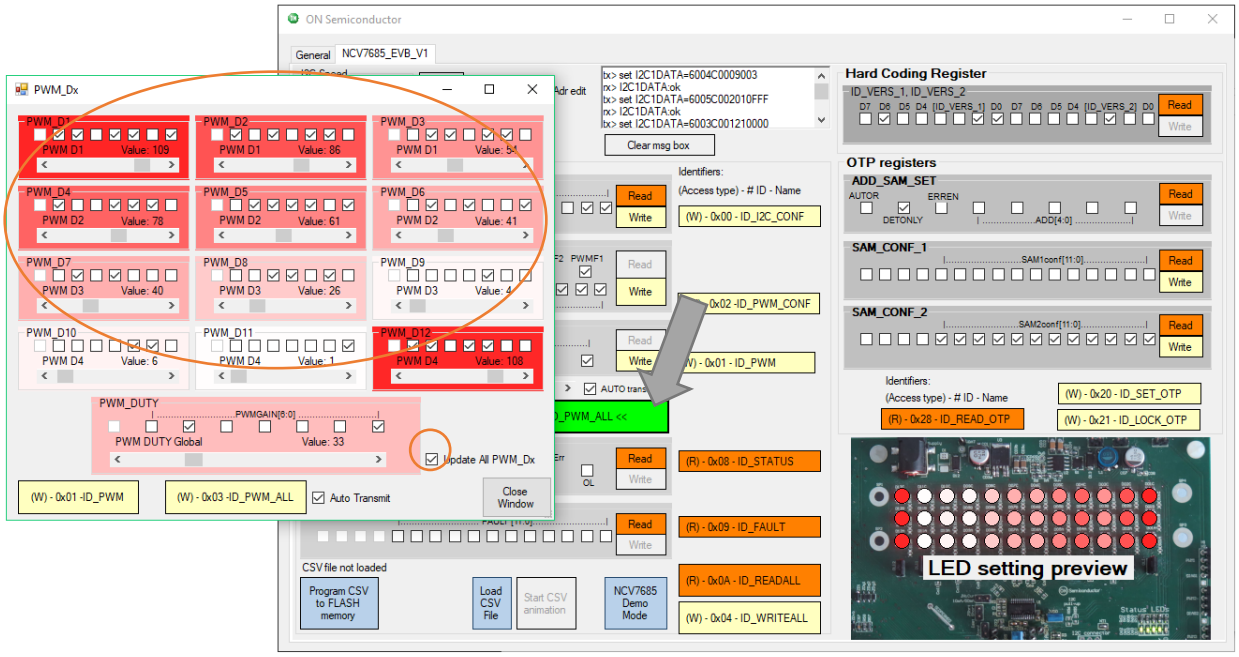
9. To set NCV7685 device into I2C mode, set the FLAG bit and set some I2C_CONF bits to turn on the channels. And then click to write button.
10. Only activated outputs should be active. The communication between MCU and Software can be check in the message window.



11. PWM can be enabled by PWMEN bit and controlled by PWM_CONF and PWM_DUTY_EN register. The PWM dutycycle intensity is controlled by PWM_DUTY register. For PWM duty cycle setting, the slider can be used to quickly set the proposed value.



12. Individual PWM Duty Cycle setting can be changed using another window accessible from green button in the main form. If the Update All PWM_Dx checkbox is checked, then every change is automatically transmitted to the output.



13. The registers can be read using Read Buttons. Only for reading OTP registers, the Jprog jumper has to be connected to bring 2.9V to the ISET pin to have access to the Hard coding and OTP registers