Texas Instruments

HVL038 Test Procedure

Rev A

02/27/13

1 General

1.1 PURPOSE
To provide detailed instructions for testing the HVL038A modules.

1.2 SCOPE
Covers complete instructions for testing the HVL038A.

1.3 REFERENCE DOCUMENTATION
Schematic HVL038A_sch.pdf
Assembly HVL038A_pcb.pdf

1.4 MATERIALS
None

1.5 DEFINITIONS
DUT   Device Under Test

2 SAFETY

2.1 Safety Glasses are to be worn.

2.2 This test must be performed by qualified personnel trained in electronics theory and understand the risks and hazards of the assembly to be tested.

2.3 ESD precautions must be followed while handling electronic assemblies while performing this test.

2.4 Precautions should be observed to avoid touching areas of the assembly that may get hot or present a shock hazard during testing.

3 QUALITY

3.1 None

4 APPAREL

Appropriate apparel must be worn during this test to ensure the safety of the operator as well as the safety of the UUT. Example of appropriate apparel includes safety glasses, ESD smock, etc.

5 EQUIPMENT
The following equipment is needed to complete this test procedure

5.1 Power Supplies
A Single output power source capable of supplying 3.3V @ atleast 1A.

5.2 Meters
One DC Volt meter required

5.3 Wire for connecting points on board
Two single wires capable of inserting into female header and clipping to a test point.

6   EQUIPMENT SETUP

6.1 DUT
Remove the DUT from the socket before applying the power supply and place in separate ESD bag. Having the DUT in place while testing may cause damage.
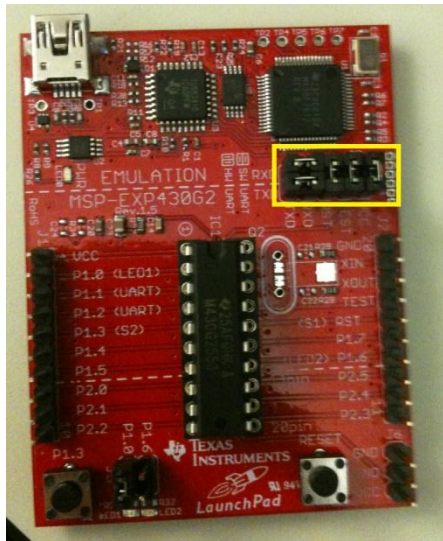
6.2 Input Supply
Set the Power Supply to 3.3 V. Set current limit to 1 Amps. Connect the input power supply negative lead to J1 pin 2 (black banana plug) and the input power supply positive lead to pin1 of J1 (red banana plug connection).
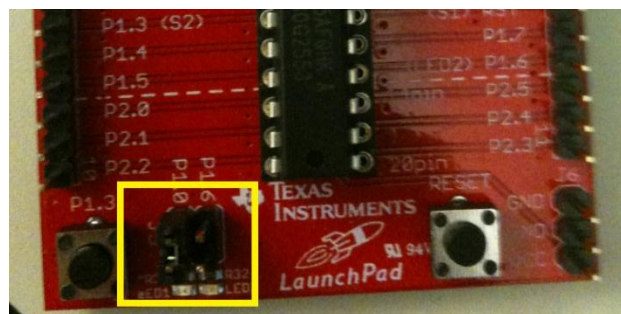
6.3 Meter
The voltmeter is used to measure the output voltage of the external circuitry to the DUT. Turn on the multimeter and set the input for DC voltage
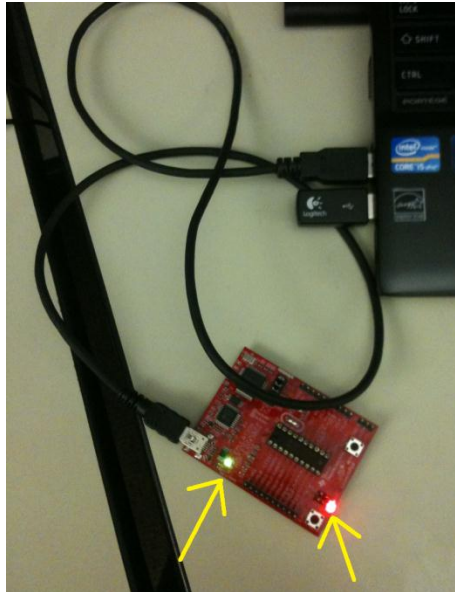
6.4 Setup the MSP430 software
1. Download Code Composer Studio from here.

2. Unzip the TCA8424_API folder into your workspace folder and open this project in Code composer.

3. With the Launchpad unplugged, Configure the headers on the Launchpand to match the yellow box in the below image:
    i. The right 3 headers are vertical and the left 2 are horizontal

4. With the launchpad still unplugged remove the rightmost jumper on the J5 header to match the yellow box below:

5. Connect the Launchpad to your computer with a USB to mini cable. A green LED and a red LED should be on as shown below:
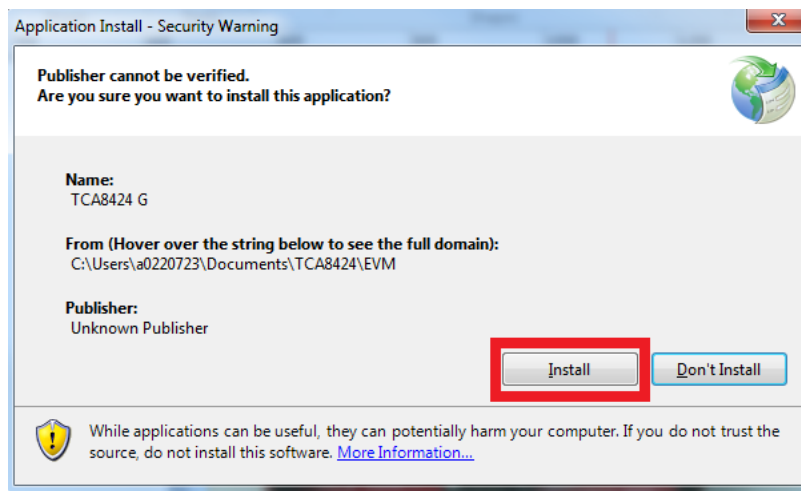

6. With the TCA8424_API project active, open the debugger and then press run
   a. The launchpad is now running the firmware necessary to interact with the GUI.
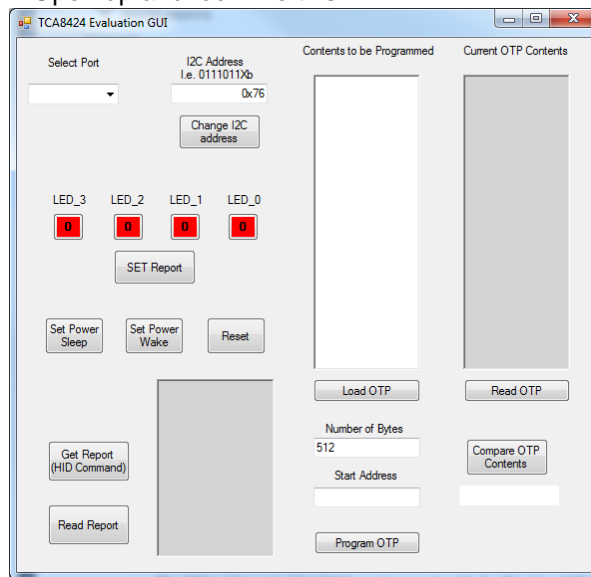
If the launchpad is running and VCC is not connected the I2C communication will fail. You must pause the debugger, reset the cpu and then press "play" again.
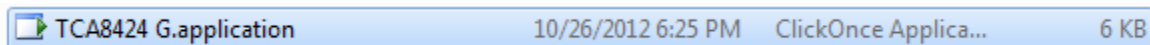
6.5 Setup the GUI

1. Extract the "TCA8424 GUI.zip" contents to the destination folder of your choice.

2. Double click the setup.exe folder that was extracted in the previous step.
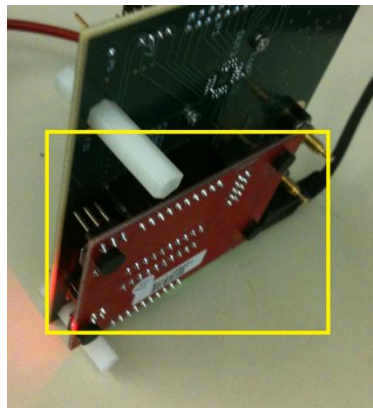
3. The following window will pop up. Click "Install"

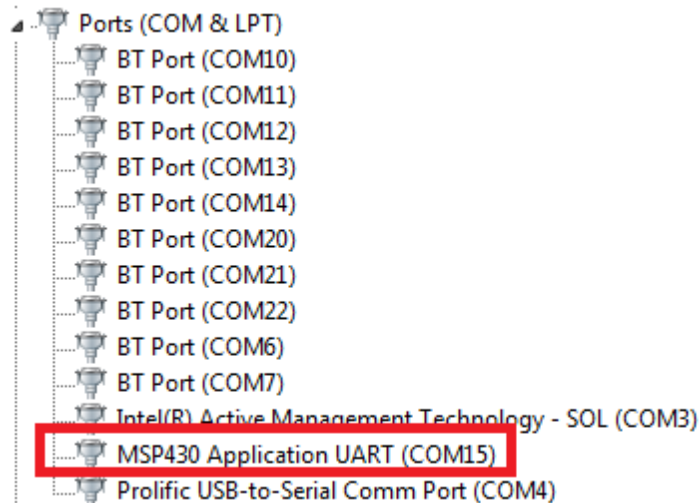4. After finishing the GUI will Open up and look like this:

5. To open the GUI in the future simply double click on the "TCA8424 G.application" file that was unzipped in step 1.

6. Selecting the correct COM port (for section 7.8)
   a. Connect the MSP430 launchpad to the EVM as shown below
      i. Connection point is under the board

   b. Connect the launchpad to your PC.
   c. Open up the device manager on your PC and find which of the COM ports is associated with the launchpad
      a. In my case the com port is COM15 as shown in the below image:

7 PROCEDURE

7.1.0 Check Continuity
Ensure there is nothing connected to the EVM.

Remove the jumper from P16. Check continuity between pin 1 of header P9 and Pin1 of J1 (Red VCC connection) with the multimeter. Test passes if there is no continuity.

Keep Jumper removed for the rest of testing.

7.2.0 Test Voltage
Connect the negative lead of the multimeter to J2 or one of the four GND headers (P3, P4, P5, P6). Connect the positive lead to test point P11. Test passes if Voltage measured is between 0 V and 0.2 V.

7.3.0 Test Voltage 2
Apply 3.3 V from the same power supply powering the board to Pin 8 of header P9(indicated below).

Connect the negative lead of the multimeter to J2 or one of the four GND headers (P3, P4, P5, P6). Connect the positive lead to pin 4 of U3. Test passes if Voltage measured is between 6.7V and 7.3 V.

Keep the 3.3 V applied to Pin8 of header P9.

7.4.0 Test Voltage 3
Without removing the 3.3 applied to Pin8, connect the negative lead of the multimeter to J2 or one of the four GND headers (P3, P4, P5, P6). Connect the positive lead to test point P11. Test passes if Voltage measured is between 0 V and 0.2 V.

Keep the 3.3 V applied to Pin8 of header P9.

7.5.0 Test Voltage 4
Without removing the 3.3 applied to Pin8, apply 3.3 V from the same power supply powering the board to pin7 of P9(indicated below).

Connect the negative lead of the multimeter to J2 or one of the four GND headers (P3, P4, P5, P6). Connect the positive lead to test point P11. Test passes if Voltage measured is between 6.7 V and 7.3 V.

Remove the 3.3 V applied to pin8 and pin9.

7.6.0   Test Voltage 5
Connect Pin6 of header P9 to Ground. Connect the negative lead of the multimeter to J2 or one of the four GND headers (P3, P4, P5, P6). Connect the positive lead to test point P11. Test passes if Voltage measured is between 1.8 V and 2.4V.

Remove the connection from Pin6 of P9 to Ground.

7.7.0   Check Resistance
Remove all connections to the EVM. Set the multimeter to measure resistance. Place the negative probe of the multimeter on one pin of R17. Place the positive probe on the other pin of R17. Test passes if Resistance is between 1.0 kohm and 1.5 kohm.

Repeat Test for R18and R19.

7.8.0   Setup for functionality
Install jumpers on the following headers: P12, P13, P14, P15. Ensure no jumper is installed on P16.

Connect the MSP430 launchpad to the board by inserting J1 of the launchpad into P9 of the EVM and J2 of the launchpad into P8 ensuring that pin 1 of J1 matches pin 1 of P9 and pin 1 of J2 is inserted into pin 1 of P8.
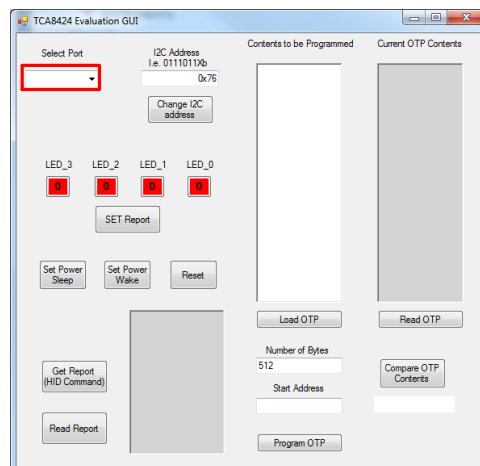
Attached the Ground of the power supply to Pin2 of J1 and 3.3 V from the power supply to Pin1 of J1.

Connect the Launchpad to your PC using a USB to USB-A cable. Launch Code composer. Launch the TCA8424 API project debugger. Press the "play" button.
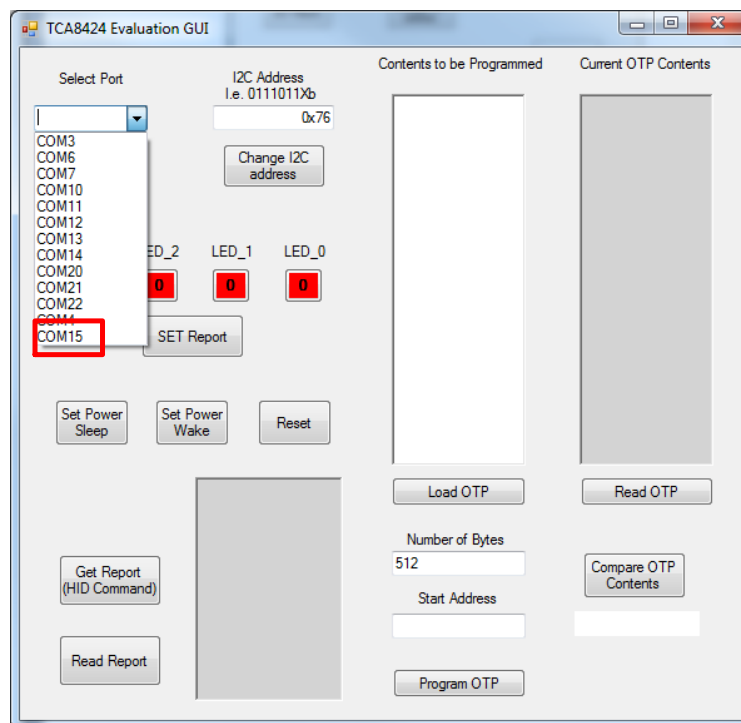
Open the Application GUI.
DO NOT CLICK ANY BUTTON UNLESS SPECIFICALLY INSTRUCTED.
Under the Select Port there is a drop down menu box which will be blank on startup by default as shown below:
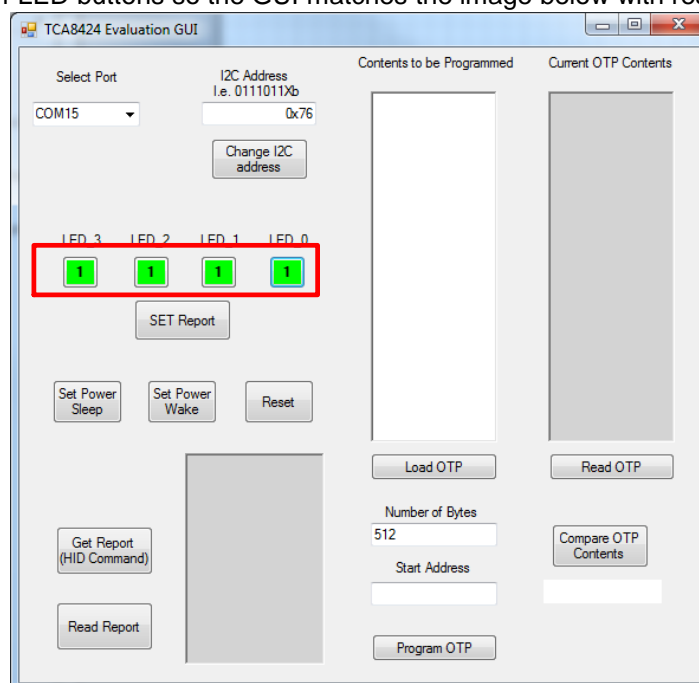
Click on this box and a list of COM ports will pop up. Select the COM port that is associated with the launchpad which was identified in step section 6.5 Step 6-c.

    a.   In my case this will again be COM 15 again

No Pass or fail for this section.

7.9.0   <u>Functionality Testing</u>

Click on the 4 LED buttons so the GUI matches the image below with respect to the red box.

After inputting the LED values to be set click on the "SET Report" button and the LEDs on board will turn on.

Test Passes if LED's turn on.

If LED's do not turn on follow the following steps:
Step1: In the code composer studio ensure the program is running. If it was not running Proceed to Step 3 else proceed to step 2.
Step 2. Press the pause button.
Step 3. Press the reset CPU button
Step 4. Press the Play button

After completing these four steps return to the beginning of section 7.9.0

8   EQUIPMENT SHUTDOWN
Disconnect the Launchpad from the PC before disconnecting the Power supply from the EVM.

9   Final Jumper locations after Test
Jumpers should be installed according to the following table.

Reference Designator	Installed (Y/N)
P12	Yes
P13	Yes
P14	Yes
P15	Yes
P16	

10   MATERIAL DISPOSITION & TRANSFER

10.1.0   Conforming Material
Units that have passed this test procedure shall be packaged into anti-static ESD approved bags, labeled with the labels according to the table below, and shipped per the P.O.

Label 1 Assembly Number+Dash Number if Applicable	Label 2 IC Number
HVL038A	TCA8424RHAR

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