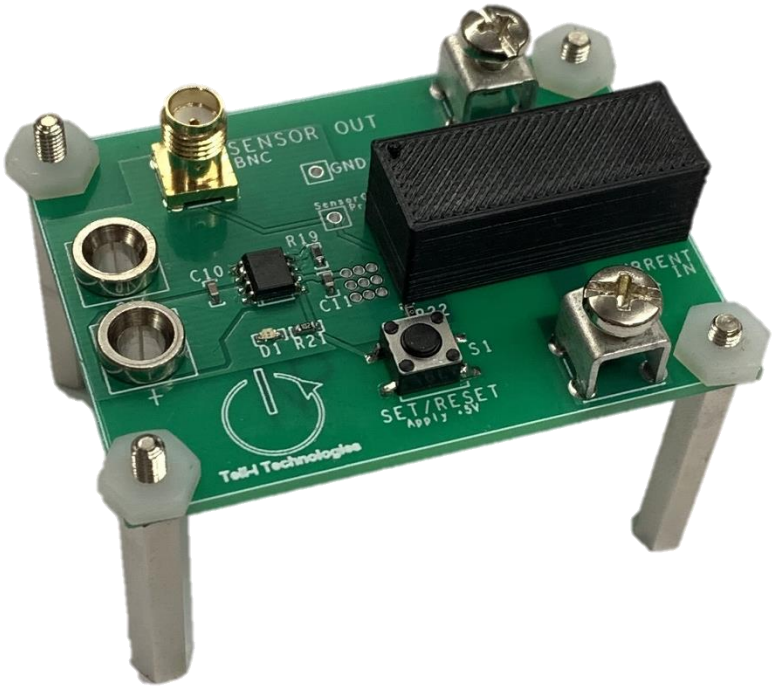
Tell-i Technologies

Tell-i DS10.2s Current Sensor Evaluation Board Manual



Introduction

This manual is presented by *Tell-i Technologies* to instruct the user of the procedure to test the Tell-i DS10.2s current sensor using the provided evaluation board. The board is designed to quickly test the sensor using the current trace provided. The evaluation board consists of multiple functions and serves as an example of how the sensor should be applied to design.

The evaluation board comes ready to use from the manufacture. The user needs to provide the following:

- +9V Control Supply
- Connection for Current Trace
- BNC Connection (If needed)

To view where to provide the recommended the connections, please refer to Figure 1 below.

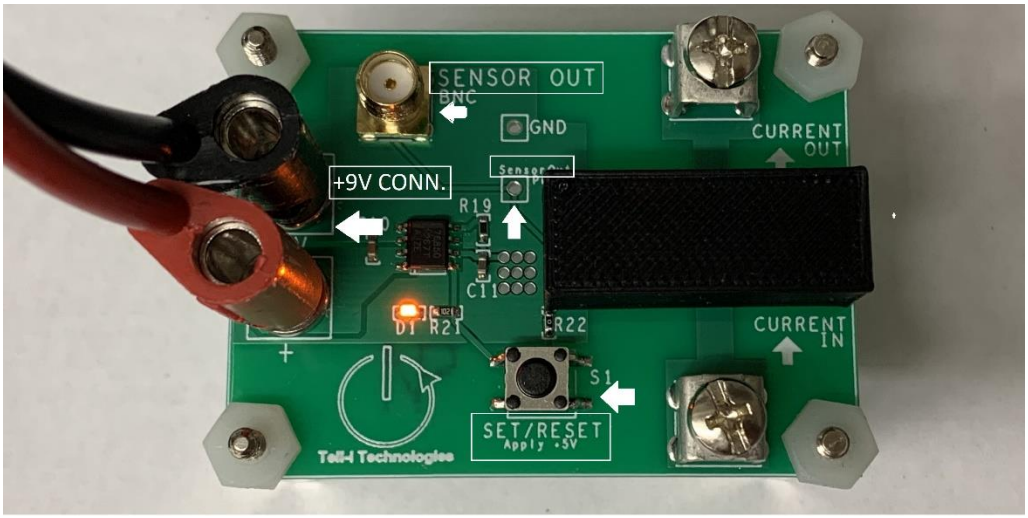


Figure 1: Connections and Reference of Evaluation Board w/ DS10.2S Current Sensor

+9V Control Supply

The sensor needs to be powered by a +9V supply. The polarity of voltage is noted in Figure 1 (red is positive and black is negative) and on the Printed Circuit Board (PCB). A recommendation to twist the +9V supply leads is suggested to further reduce noise if it exists. Figure 2 also shows a representation of the twisted leads.

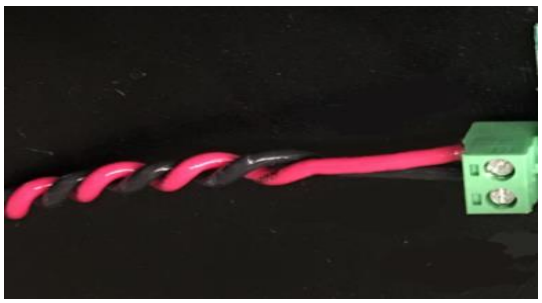


Figure 2: Example of Twisted Leads for Voltage Supply

Measurements

On the evaluation board, a SMA connector is placed for a cleaner measurement of high frequency waveforms. The SMA can be used to connect to a SMA-to-BNC connector which is the best way to measure the signal. For BNC connections, it must be noted that the BNC is to be terminated to 50Ω. It is also recommended to use the shortest possible BNC connector to reduce any noise that may affect the signal. Figure 3 shows the SMA-to-BNC connector with a short BNC connector.

If the user does not have a BNC connection, the evaluation board also provides testpoints for regular probing. Figure 4 shows an example of regular probing. Note: when regular probing, it is recommended to use a small ground lead to reduce as much inductance as possible.

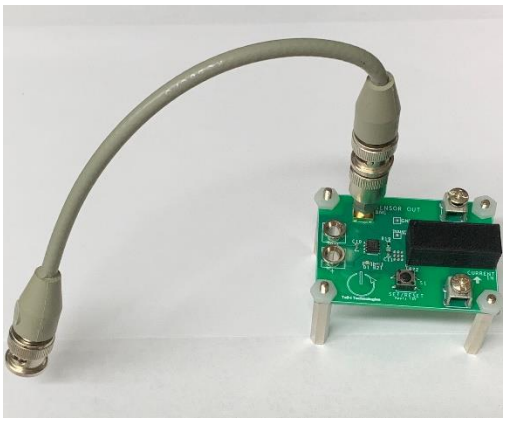


Figure 3: SMA-to-BNC with Short BNC Cable

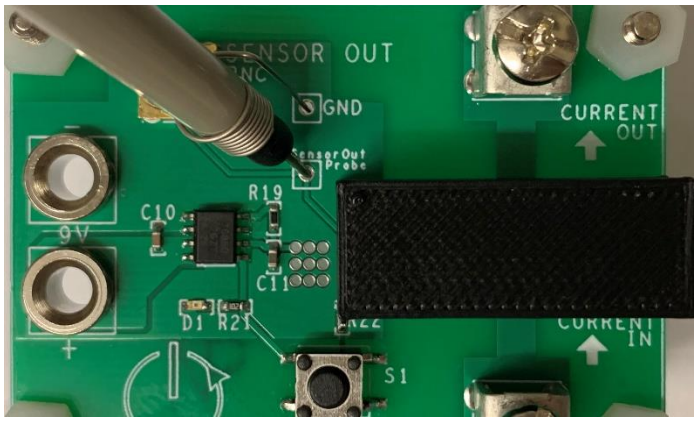


Figure 4: Example of Regular Probing Location

Once the +9V supply has been connected and turned ON, the output on these sensors should show approximately 2.5V. This is the default offset of the current sensor. To confirm the sensor is working correctly, please refer to Figure 1 for sensor output and use a multimeter to check for correct voltage. If the sensor's offset is not approximately 2.5V, refer to "Reset of Current Sensor" to reset the sensor.

Reset of Current Sensor

If for any reason the sensor output is not approximately 2.5V, the evaluation board has a manual reset for the current sensor. The sensor reset is a Single-Pole Single-Throw switch that when clicked, should apply +5V to the Set/Reset pin on the DS10.2s sensor. Refer to figure 1 for the location of the SPST switch to manually reset the sensor.

Note: When the SPST switch is clicked, the power supply may short and have a current spike. Do not be alarmed, this is normal and will not cause a problem to the sensor.

Note: The SPST switch should not be held. The sensor only needs about a 2 second or less press to fully reset the sensor. Holding it for longer may cause future problems.

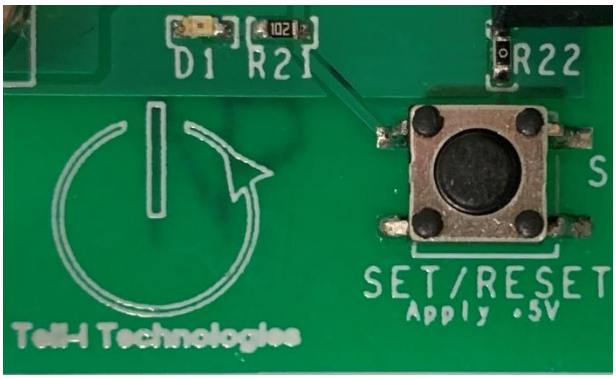


Figure 4: Set/Reset Switch on Evaluation Board

Once the sensor is reset, the sensor output should return to approximately 2.5V. If problem persists, contact *Tell-i Technologies* for more information.

Input/Output Power Connections

To connect your current for sensing with the evaluation board, two connections are provided on the evaluation board to connect. For reference of where the power connectors are located, refer to figure 1. The evaluation board notes the polarity the current must flow for the sensor to work regularly. If the current is flowing in the reverse direction, the sensor will output an inverted signal. Most oscilloscopes contain the "invert" function to invert the signal if needed.

Set-up Examples for Reference

Below are two examples of how the evaluation board and the current sensor should be properly connected to a power connection. Figure 5 shows this example by connecting the DS10.2S with a Pulse Generator board.

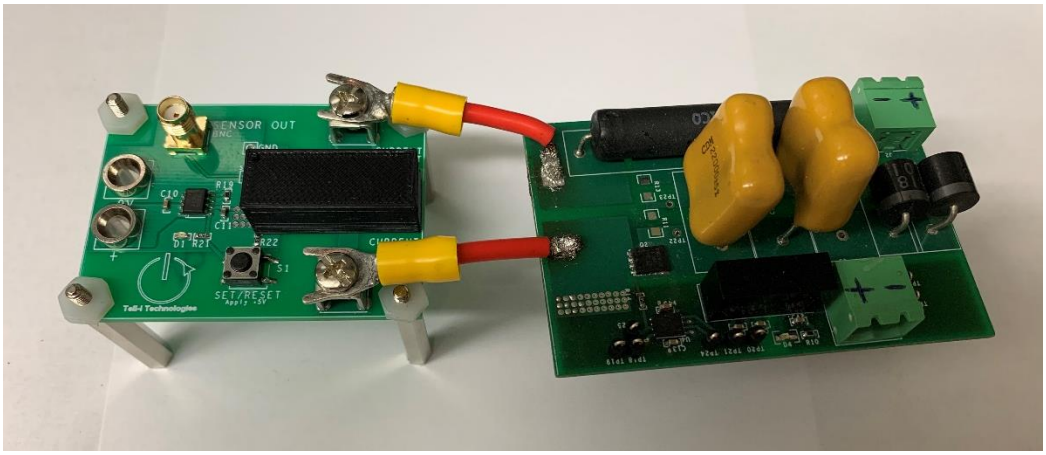


Figure 5: Example of DS10.2S and Evaluation Board (Left) connected to Pulse Generator (Right)

Please note the length of the power connection leads. They are intended on being very small to reduce as much inductance as possible.

The second example is using a simple DC/DC buck converter setup. Once again, note that small leads are used to reduce the inductance and noise seen by the sensor. Figure 6 is the Buck Converter setup.

Note: When connecting the sensor to a converter, place the sensor after the inductor or sensing element. This is to prevent any common-mode noise or oscillations that may appear in the signal.

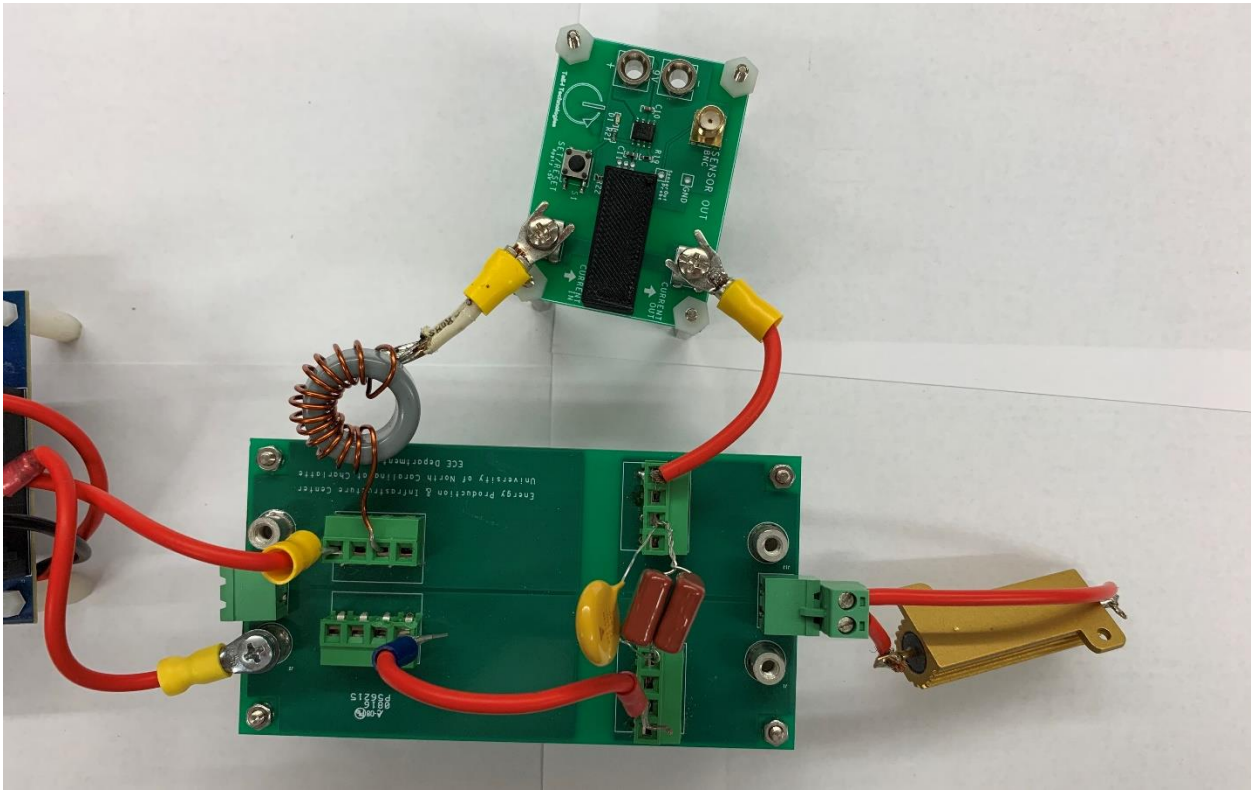


Figure 6: Buck Converter Example of DS10.2S and Evaluation Board