Electronic Industrial Solutions Group Center of Excellence (EISG COE)

Lab - Row 1

Introducing the Truevolt Digital Multimeter

Introduction:

Keysight's Truevolt DMMs offer a full range of measurement capabilities and price points with higher levels of accuracy, speed and resolution. In this lab, you will learn how you can digitize a signal using Keysight's Truevolt DMM.

Required Equipment:

- DM34461A Truevolt DMM
- EL34243A Electronic Load
- E36154A DC Power Supply
- DC-DC Converter (30V to 12V)
- 2 banana plug to crocodile clip cable
- 3 crocodile clip cable

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Lab R.1.3
Digitizing inrush current using True*volt* DMM

The Digitizing function in the True*volt* DMM allows you to set up your DMM to achieve the speed you want in your digitizing application. It is often used for faster signal analysis. In this lab, you will use Keysight's Autoranging DC power supply and a DC-to-DC converter to capture the inrush current using the Truevolt DMM.

Prior to setting up the DC power supply, electronic load, and DMM, connect the instruments as illustrated in Figure 1 below. The DMM is connected in series with the electronic load, with the positive terminal connected to the output positive terminal of the DC-DC converter and the negative terminal connected to the load positive terminal. The load negative terminal will be connected to the output negative terminal of the DC-DC converter. Once everything is connected properly you will have something like Figure 2.

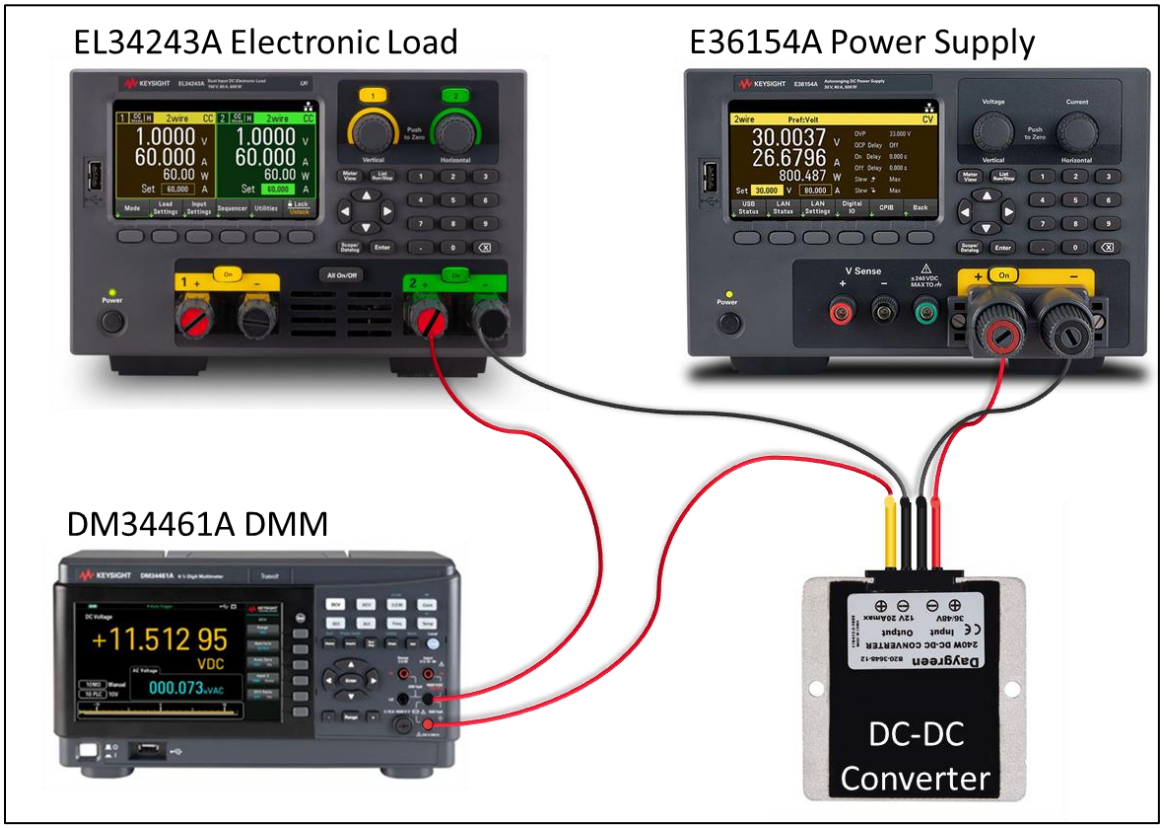

Figure 1 Connection Diagram

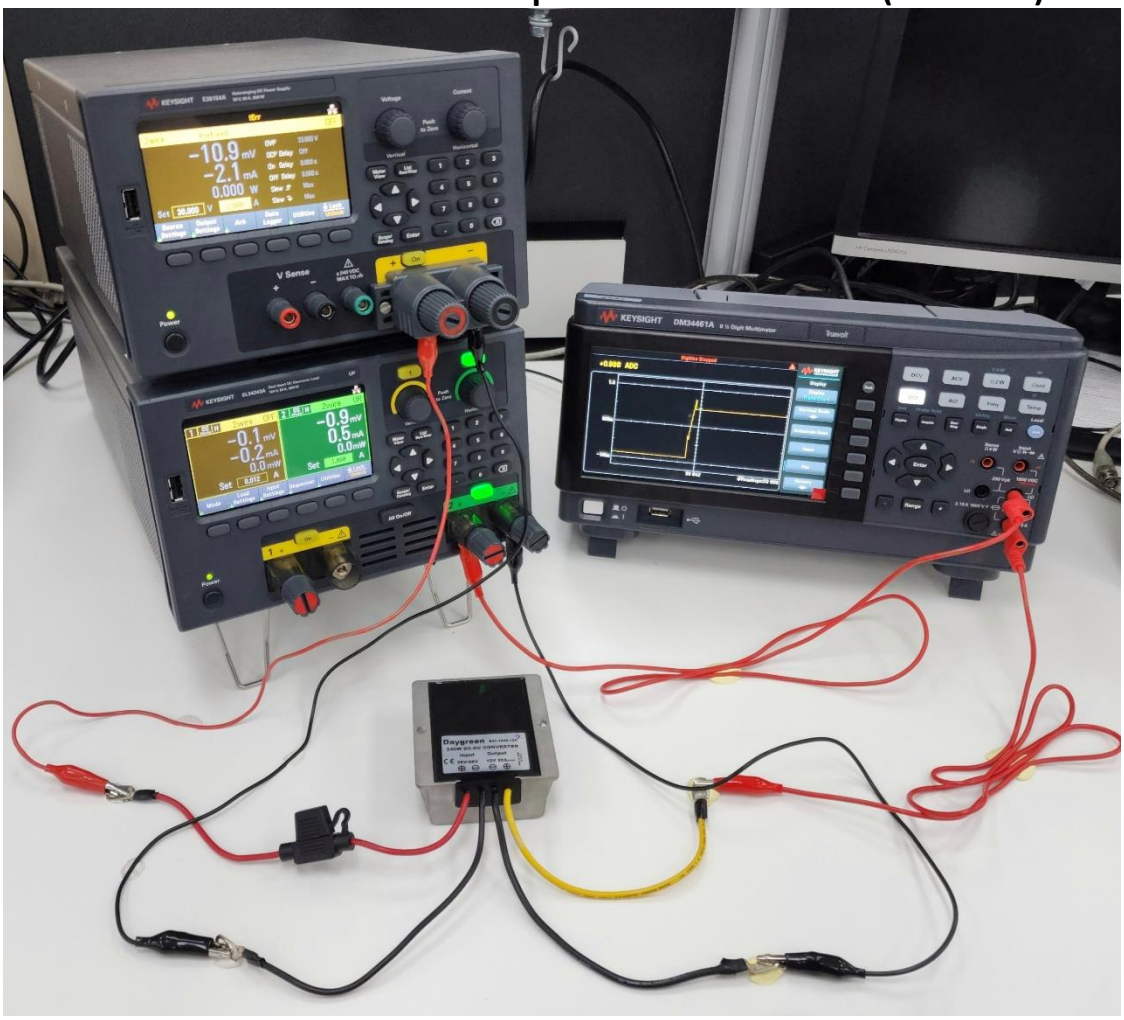

Figure 1 Hardware Connection

Setting up Channel 1 of the E36154A to supply 30 V, 2 A

1. Press the **Left Arrow** key to select the voltage, then key in 30 using the number pad and press **Enter** to program it.

2. Press the **Right Arrow** key to select the current, then key in 2 using the number pad and press **Enter** to program it.

3. Press the yellow **On** button to turn on the power supply, only do so after the digitizer is turned on.

Setting up the EL34243A to draw 1 A

1. Since I am using channel 2, I will press the green **2** button above the rotary knob to select channel 2.

2. Key in 1 using the number pad and press **Enter** to program it.

3. Press **Mode** to ensure the mode is set to constant current (CC).

4. Press the green **On** button to turn on the channel 2.

Setting up the DM34461A to digitize the inrush current

1. Press **DCI** to enter DC current mode.

2. Press **Acquire** (hard key), then press **Acquire** (soft key) and select **Digitize**.

3. Set the sampling rate to 50 kHz.

4. Press **Display**, then press **Vertical Scale** and set to **Manual**.

5. Set the **Low** to -100 mA, and set the **High** to 1.4 A, to visualize the waveform.

6. Press **RUN/STOP** to begin digitizing.

View the digitized data on the 34461A

1. Press **Display** (hard key), then press **Display** (soft key) and select **Trend Chart**.

2. Press **Range**, then press **More** and select **3A**.

3. Increase the zoom percentage by selecting **Zoom** and pressing the **Up Arrow** key, set the zoom range to around 200% to 1000% to view the inrush current phenomenon.

4. Adjust the centering of the signal by selecting **Pan** and pressing the **Left-Right Arrow** key.

5. To screen capture the display press **Shift**, then **Utility** and press **Manage Files**. In here the default **Action** is **Capture Display**, to save it to an external drive press **Browse**, then press the **Down Arrow** key

and press **Select**. Finally, press **Save Screen** to save the screen capture.

Figure 3 Hardware Connection And Inrush Current

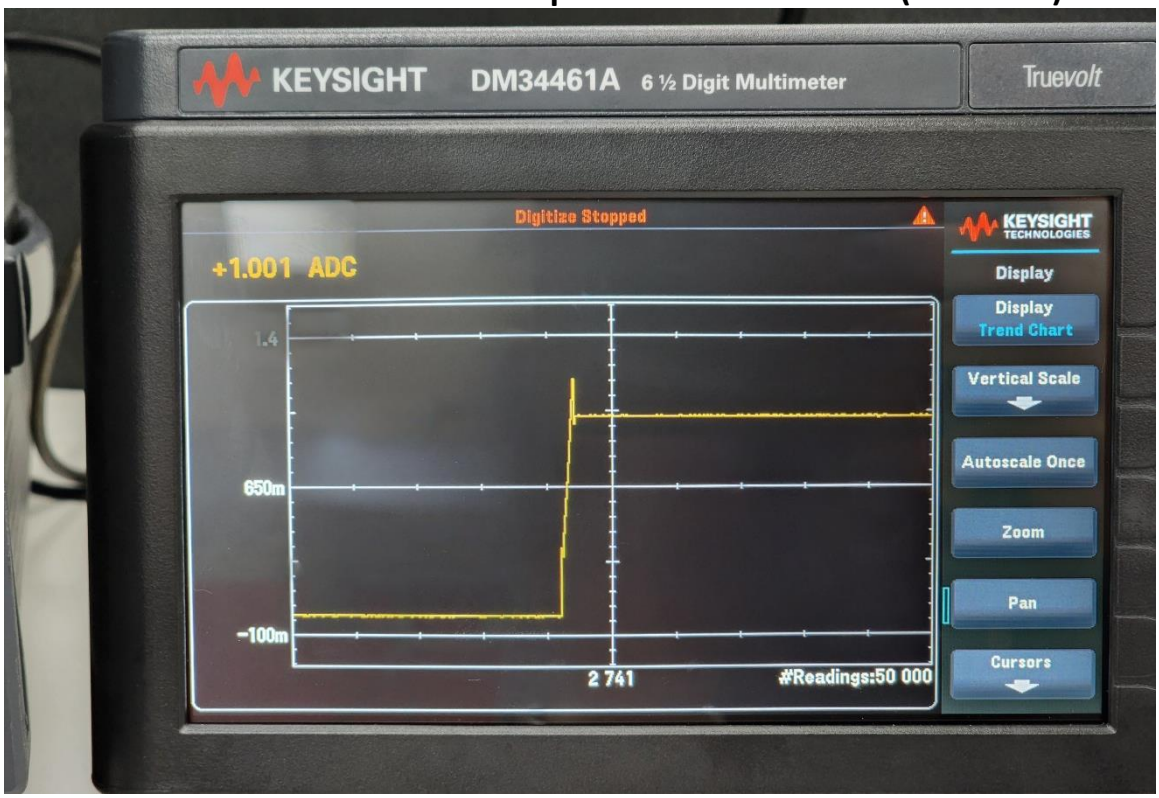

Figure 4 Inrush Current Front LCD Display

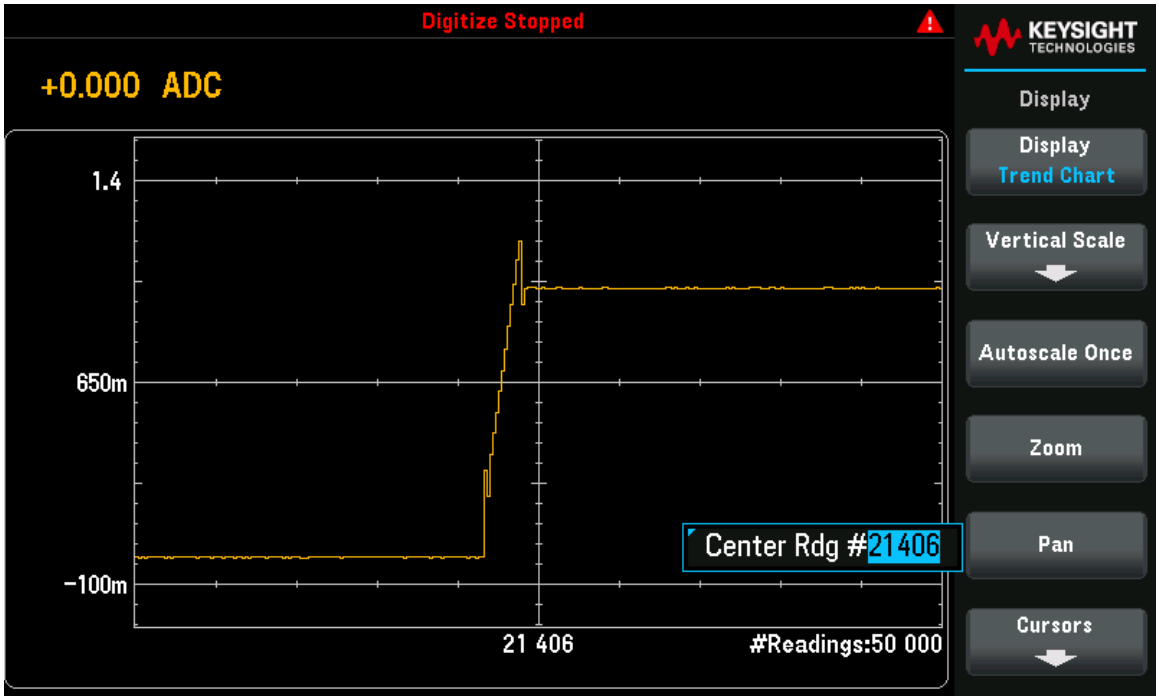

Figure 5 Inrush Current Screen Capture 200% Zoom

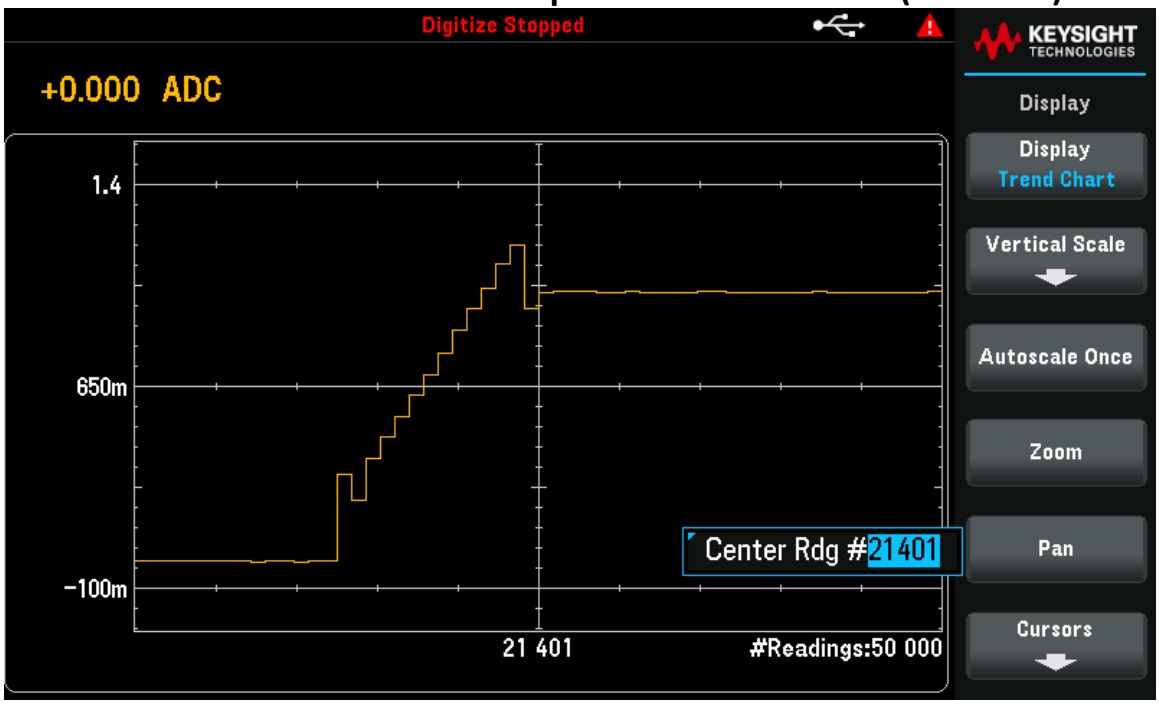

Figure 6 Inrush Current Screen Capture 1000% Zoom

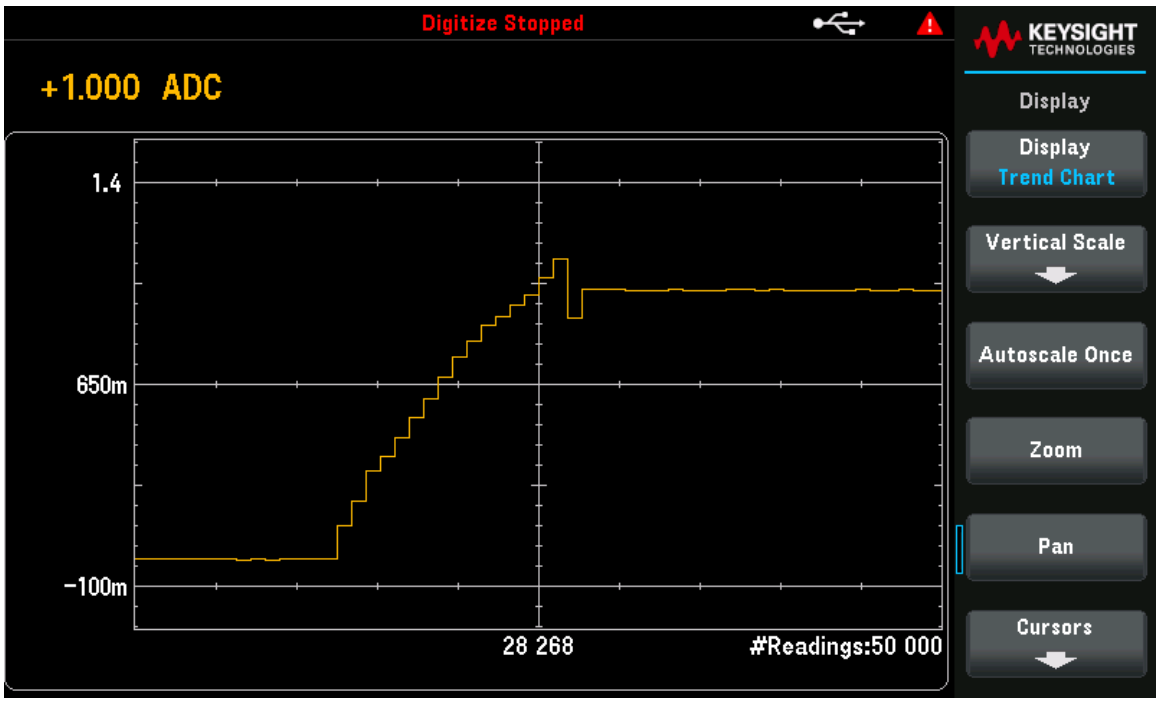

Figure 7 Alternate Inrush Current Screen Capture Max Zoom

Notes:

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