

## Demo 6: Hipot Testing (CH2 only)

In this demo we will test a good cable then create errors that can only be detected with high voltage (hipot) testing. If you just completed Demo 5 you will be using the created test program called “My Test Program” that has a diode. If you did not complete Demo 5, use the SMART-LIGHT-CH2 test program.

**Note:** This demo requires a CH2 tester.

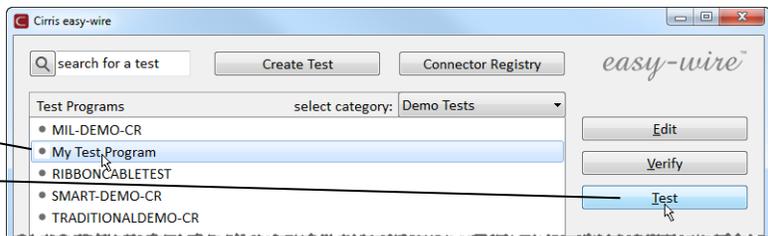
### Step 1

Make sure all connectors and all wires are connected.



### Step 2

In the Easy-Wire main menu, select “My Test Program”, and click **Test**.



### Step 3

In the test window, click **Start**.



The tester will perform a low voltage test. If it passes, the display changes to “Ready to Hipot.”



**Note:** If using “My Test Program” from Demo 5, don’t worry about damaging the diode. Cirris testers safely hipot assemblies containing components. For more on hipotting components, see [http://www.cirris.com/testing/guidelines/hv\\_components\\_testing.html](http://www.cirris.com/testing/guidelines/hv_components_testing.html)



**Warning!**  
(CH2 only)

When applying high voltage, the standard CH2 tester limits the test current so the test is considered intrinsically safe. Nevertheless, be careful to not touch the exposed leads on the harness board when high voltage is applied. If you do, you will experience a startling shock.

**Step 5**

In the test window, click **Hipot**.



The cable should pass.



In the following steps we will introduce a high voltage leakage error between two points on the harness.

## Creating an HV Leakage Error

**Step 1**

Retrieve the High Resistance clip lead from the parts container and attach it to the L1 and L2 E-Z-Hook contacts as shown.

High Resistance clip lead



**Note:** The “high resistance clip lead” has a 90 MOhm resistor that simulates an Insulation Resistance (IR) failure. The Insulation Resistance test verifies that the resistance offered by the insulating materials is sufficiently high. Failure occurs when the measured resistance value is lower than the specified value. In the demo, our IR setting is 150 MOhms; therefore, the 90 MOhm resistor is seen as an IR Leakage failure.

**Step 2**

Click **Retest**.



**Step 3**

After the low voltage test passes, click **Hipot**.



The tester first displays "IR Has Leakage" errors (error code #150) for each net that failed and also displays the measured IR value.

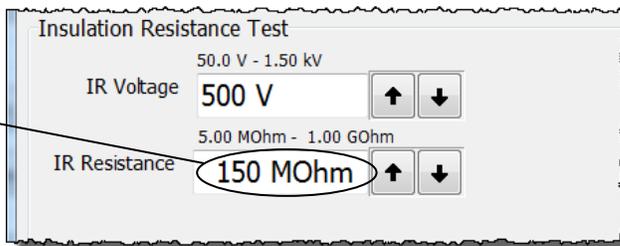
The tester then determines that these nets are failing to each other.



**Why did the 90 MOhm Resistor Fail?**

When we set up the test program, we set the IR setting at 150 MOhms meaning that we wanted at least 150 MOhms of insulation resistance between wires in the harness.

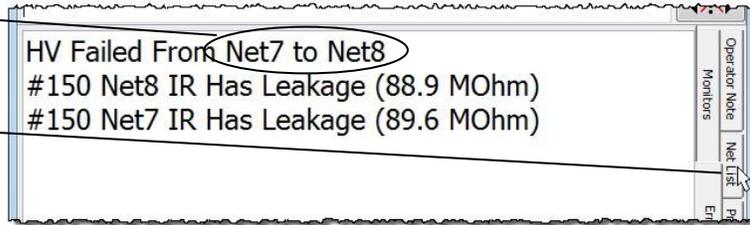
Since 90 MOhms is less than 150 MOhms, the test failed.



### Step 4

In this example nets 8 and 7 are leaking to each other.

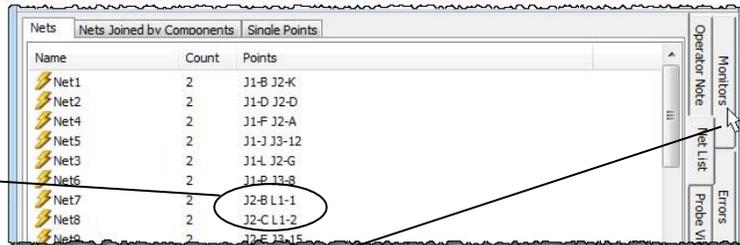
Observe which net numbers are leaking in your test program, then click the Net List tab to see which points (connector pins) make up these nets.



### Step 5

Since you put 90 MOhm resistor across L1-1 and L1-2, you will see these points in the leaking nets.

Click the Monitors tab to return to return the test window to its previous state.



## Creating a Dielectric Error

Dielectric failures happen when the tester applies high voltage and there is a sudden electrical breakdown such as an arc. We will now create a dielectric error.

### Step 1

Retrieve the lamp clip lead from the parts container, and replace the high resistance clip lead with the lamp clip lead.



Notice that the two electrodes are close but not touching.

This causes an arc, similar to when two exposed wires are close to each other.



**Note:** If the lamp electrodes were surrounded by air, a hipot voltage over 5000 volts would be required to cause an arc. However, the neon gas inside the lamp breaks down at a much lower voltage than air; therefore, a 500 volt test creates arcing.

**Step 2**

Click **Retest**.



**Step 3**

After the low voltage test passes, click **Hipot**.



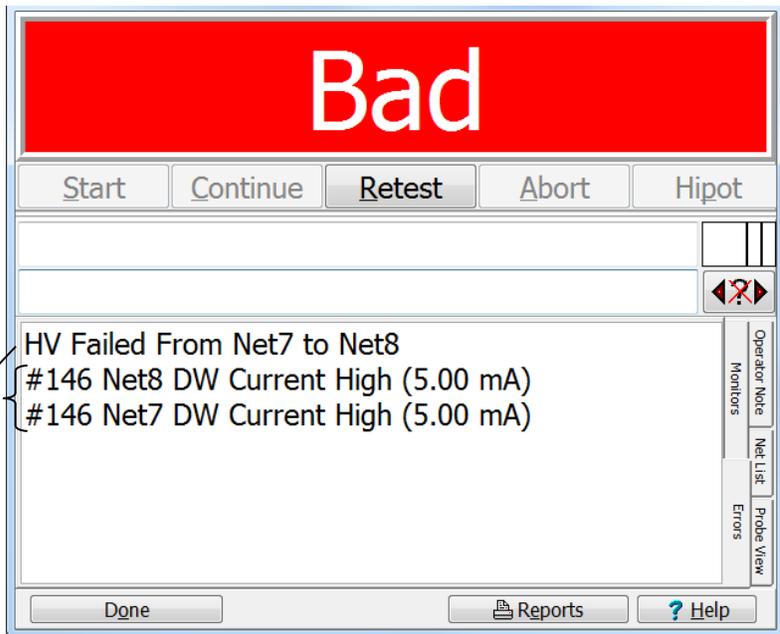
If you watch the lamp closely, you will see it flicker when an arc occurs.



The tester first displays hipot failures on each net as they occur:

- “DW Current High” errors (error code 146) for each net that failed and the measured current value.
- “Arc” errors for each net that failed and the measured current value.

The tester then determines which nets are failing to each other.

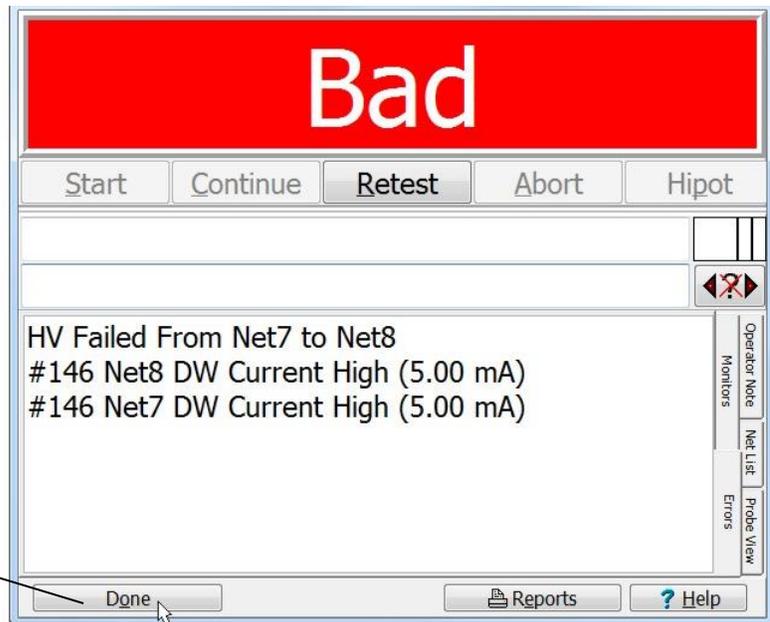
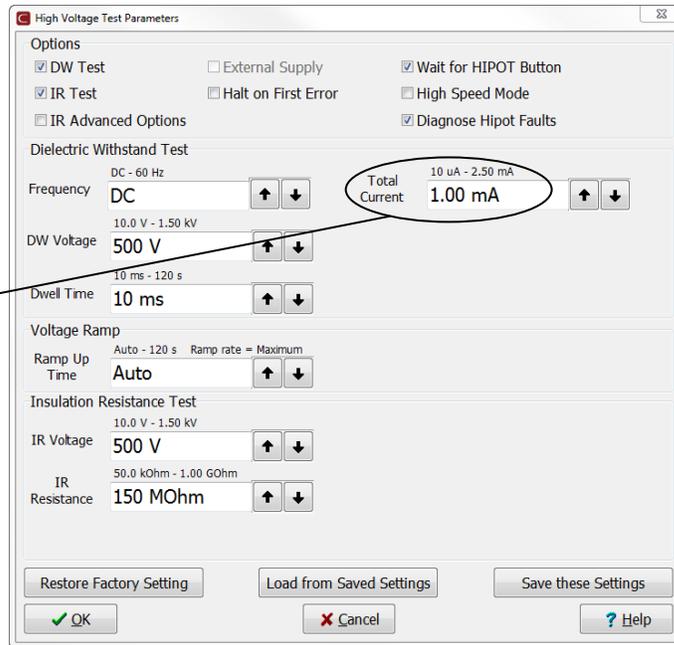


Why did the CH2 hipot tester see a Current High or Arc error?

The window at right shows the High Voltage Test Parameters for the test.

When high voltage was applied there was a sudden spike in current that exceeded the 1.00 mA setting, which was set for the test program when the high voltage test parameters were set.

A DW Current High Error indicates the applied current to the nets exceeded the current limit.



#### Step 4

In the test window, click **Done** to return to the main menu.

**Congratulations!** You successfully created and observed common types of hipot errors.

**Returning the Demo** Before shipping the demo board back to Cirris, please make sure all high voltage clip leads and components are back in their case on the harness board.