

# 4700/4750/4760 Series DC Load Calibration

## Calibration Requirements

The basic requirements are:

- Digital Multimeter.
- 25 pin DSUB connector with an adjustable 12 volt DC supply to connect to “Parallel In”. (See *Figure 1*)
- 10 pin “Molex” connector to hook up to the load remote sense pins 1 and 3. See page 46 of the 09-0281 manual for details. Pin 3 must also connect to the load negative input (If the load is LXI type, the Remote Sense is at the terminal block on the rear of the load).
- An adjustable 0 to minimum of 100 volts for the 4700 or 0 to minimum of 450 volts for the 4750/4760 load. This supply must be capable of operating in current limit.
- 5 volt power supply capable of least 60 amps for 4700 loads or 35 amps for 4750/4760 loads.
- DC Current measurement device capable of accurate current measurements in the 20 amp and 200 amp range for the 4700 or 5 amp to 50 amp for the 4750/4760.

### Parallel In Connector Details

Pin 4 Positive  
Pin 17 Negative  
10K 1% from Pin 4 to Pin 13  
10K 1% from Pin 17 to Pin 14

*Figure 1 - Parallel In*

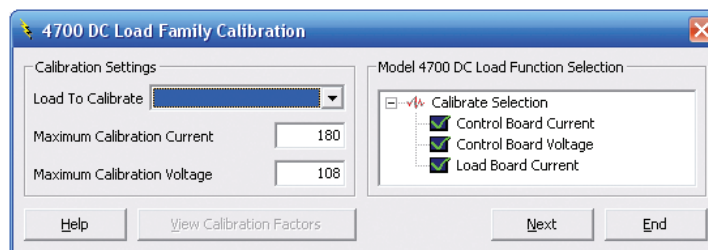
## Method

The calibration is basically a three step process. First, the control board current measurement is calibrated by injecting DC voltage into the “Parallel In” connector. Once this is done, the load voltage measurement is calibrated by injecting voltages into the “Remote Sense” input. Finally, each power boards 2 current ranges are calibrated by using a 5 volt source to supply the required currents.

Normally, all three items are performed for each load, though it is possible to do individual calibrations. The control board current measurement should always be calibrated before calibrating load boards

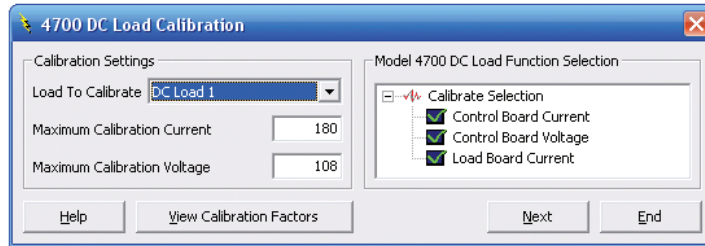
## Setup

When the program starts up, the following dialog is presented:

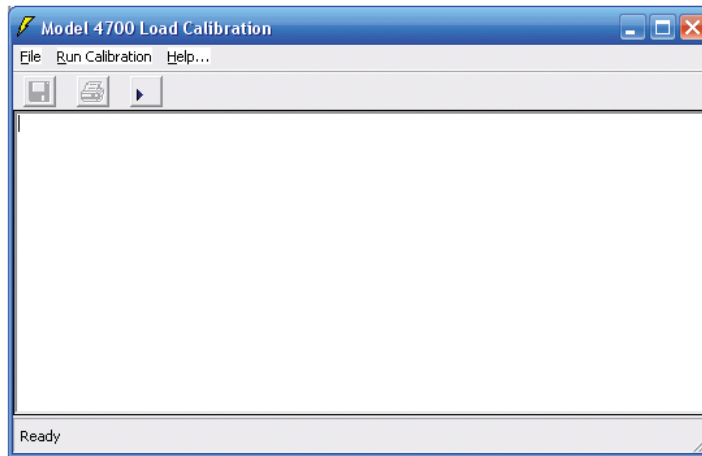


- **Load To Calibrate** – A list of configured 4700/4750/4760 loads that may be calibrated.
- **Maximum Calibration Current** – Maximum set current during constant current calibration.
- **Maximum Calibration Voltage** – Maximum set voltage during constant voltage calibration.
- **Help** – Displays this program.
- **View Calibration Factors** – Open dialog that displays all existing calibration factors.
- **Load Function Selection** – Selection list of items to calibrate (normally all are selected).
- **Next** – Opens the calibration window.
- **End** – End the program.

Once a load is selected, the “View Calibration Factors” button becomes available and depending on the load selected, the “Maximum Calibration Current” and “Maximum Calibration Voltage” fields will reset to the nominal maximums (90%) for the load that the calibration program will use.



Clicking the “Next” button will open the Calibration window.



Select the “Run Calibration”... Begin or the Start Execution toolbar button to begin calibration.

## Calibrating Voltage

Calibrating voltage is a two step process. First, the load voltage measurement is calibrated then the load constant voltage is calibrated.

During the measurement calibration (See *Figure 2 & 4*), the injected DC voltage should be as close to 10 and 90% of the range, but as it is just measurements, anything reasonably close to 90% can be used. For example the 120 volt range will calibrate fine at 90 volts or the 500 volt range will be fine with anything over 300v.

During the constant voltage calibration (See *Figure 3 & 5*) the program will try to use 90% of the range unless the Maximum Calibration Voltage setting is lower. For this calibration the connected DC source will be operating in current limit mode as the load is pulling the input voltage as hard as it can to get to the set voltage. It is recommended that the DC source have less than a 1 amp current limit set. Note that the Measurement calibration power supply may be the same supply as Constant Voltage supply since the measurement calibration draws essentially zero current.

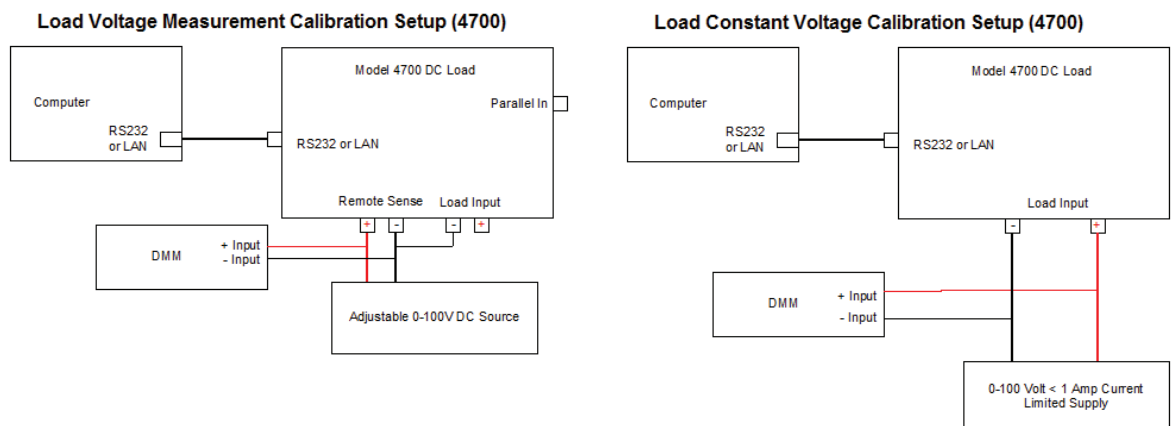


Figure 2 - 4700 Calibration Setup

Figure 3 - 4700 Calibration Setup

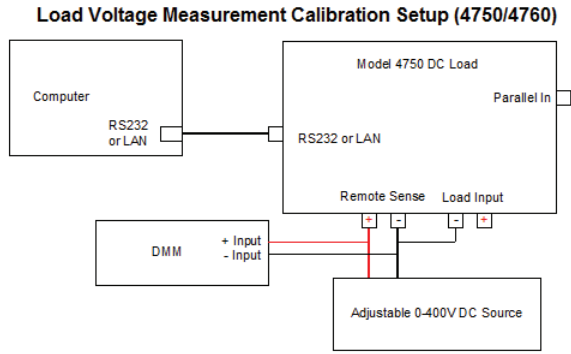


Figure 4 - 4750-60 Calibration Setup

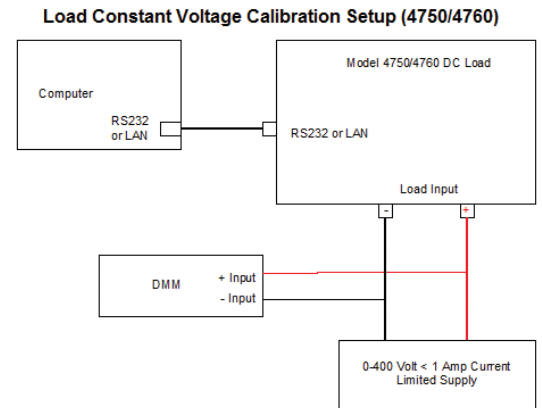
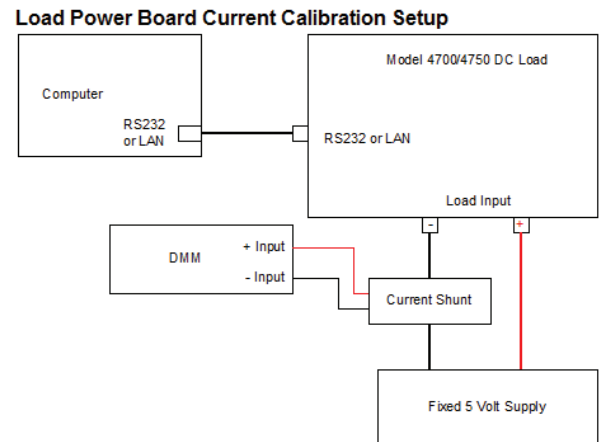
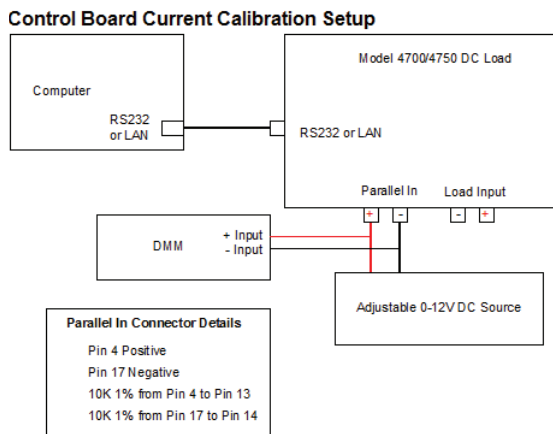


Figure 5 - 4750-60 Calibration Setup

## Calibrating Current

Current calibration consists of 2 steps. First, the control board current measurement must be calibrated followed by each individual power board. While it is possible to calibrate only the control board current measurement, the power board calibration requires that the control board be accurate.

The current calibration will set 10% and 90% of each range for each board. If the power supply cannot supply the 90% maximum, the Maximum Calibration Current can be used to lower the 90% setting. For example the 4700 load 200 amp range can still calibrate with accurate results as low as 100 amps.



**Contact NH Research for more information or to discuss your testing needs**



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