

HOW TO: Test **DC CURRENT (DCI)**

Table of Contents:

1. Required Equipment.....	1-2
2. Safety Requirements.....	2-3
3. Testing.....	3-4
4. Report.....	4

1. Required Equipment:

A. **Fluke AMP clamp 376FC or Extech 380942** or equiv. (must have current calibration)

B. **Amprobe HD110C**



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1. “A” Purchase at: <https://www.grainger.com/product/FLUKE-Digital-Clamp-Meter-Clamp-45MU54>
or https://www.testequipmentdepot.com/extech-380941-true-rms-acdc-mini-clamp-meter-400vacdc-200aacdc-high-resolution.html?ref=gbase&qclid=EAlaIqObChMImd3p5eXb_gIVRCmzAB0ZYQ8QEAQYByABEqJzs_D_BwE
2. “B” Purchase at: https://www.testequipmentdepot.com/extech-380941-true-rms-acdc-mini-clamp-meter-400vacdc-200aacdc-high-resolution.html?ref=gbase&qclid=EAlaIqObChMImd3p5eXb_gIVRCmzAB0ZYQ8QEAQYByABEqJzs_D_BwE

2. Safety Requirements for testing:

A. Before beginning, review the following items:

1. Drawing
 - a. Become familiar with area to be tested. Review rows, panel configuration and strings feeding into CBX.
 - b. At this point, inverters are “hot” and site is producing.
2. Equipment
 - a. Ensure test equipment is in good working order and has current calibration.
 - b. Test will require “clamping” around leads (home runs) as they enter into CBX.
 - c. Testing will be performed by authorized employees only.
3. Job Hazard Analysis (J.H.A.)
 - a. Ensure voltage and current exposures are listed on JHA.
 - b. Have all required PPE.
 - c. Get JHA reviewed by E Light’s Director of Safety and Loss Prevention.
4. Site specific method of procedure
 - a. Create a detailed step by step procedure on how task will be performed.
 - b. The DCI document (this document) is not site specific and is only written as a general procedure on how to perform DC Current testing.
 - c. Get procedure reviewed by E Light’s Director of Safety and Loss Prevention

NOTE:

AT THIS POINT the entire solar system installation is complete, all collection cables have been terminated and landed, met stations are logging data, inverter is in production and trackers are operational.

This is the final test to assure entire site is functioning correctly and all panels are operating 100%. This test will ensure all strings for each combiner box are performing as they should with no blown fuses, damaged or open circuits.

IF COMBINER BOX ACCESS IS REQUIRED, wear appropriate PPE for ARC FLASH rating of CBX. DO NOT allow contact between adjacent bus bars. Follow all LOCK OUT –TAG OUT procedures.

Verify irradiance is above required minimum value (typical 400 watts/m²) and panels are in proper tilt position before continuing with current checks.

3: Testing:

A. Locate / isolate leads feeding CBX

1. Ensure Inverter and CBX is "ON"/switch closed and system is producing.
2. Find a location where string wiring is accessible and slack is present for applying ampclamp. (typically this is done at end of row or entering CBX where all strings come together)

B. Attach amp clamp around positive conductor of first string and record current reading.

C. Continue with all PV wires until all strings/circuits have been checked.

(DO NOT OPEN CBX to VERIFY # OF STRINGS/CIRCUITS UNLESS WEARING APPROPRIATE PPE. EVERYTHING IS "HOT")

D. Record readings and calculate average current for entire CBX.

1. Ensure all strings are within 5% of combiner box average current.
2. Investigate and repair any discrepancies.

E. Repeat above procedure for all CBXs/DSCs associated with this inverter/block.

F. Complete for remaining blocks on site.

NOTE: All current reading should be within 5% of CBX average (ex. 20 amps +/- 4 amps). If reading seems off, look for incorrect tilt of panels, shading, short rows or missed connections. If wiring needs attention, DO NOT attempt without 1st eliminating the source of power. "Turn OFF CBX" and proceed with caution. Refer to troubleshooting guide.

(Possible link to troubleshooting "how to")

4. Testing Report:

1. Type Test Report and submit entire block in pdf format to E Lights Commissioning Manager.



DCI Form.xlsx



Best Practice
-troubleshooting.doc

- a. form
- b. Edit form to site specific requirements.
- c. Only submit pdf format to customer/client.