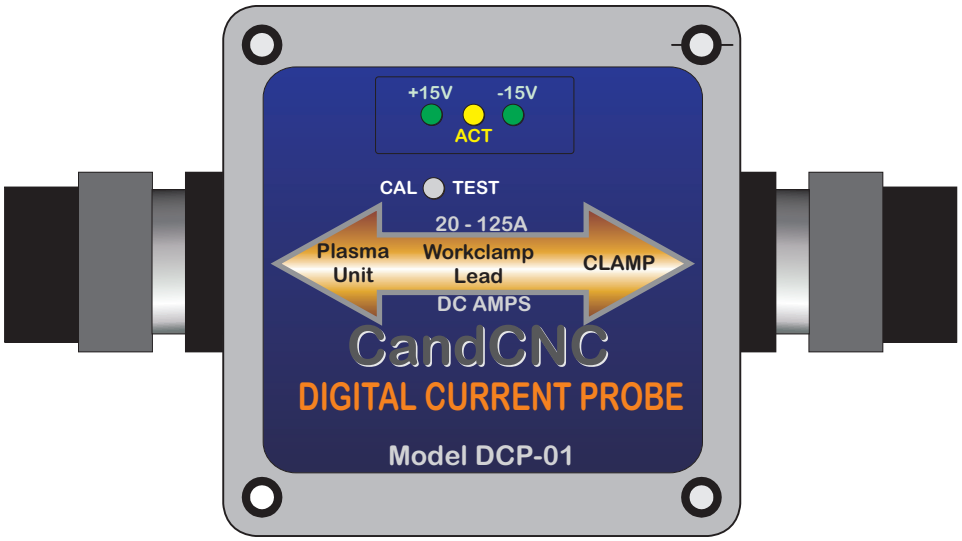
DCP-01 DIGITAL CURRENT PROBE

Setup & Calibration

REV2



CandCNC

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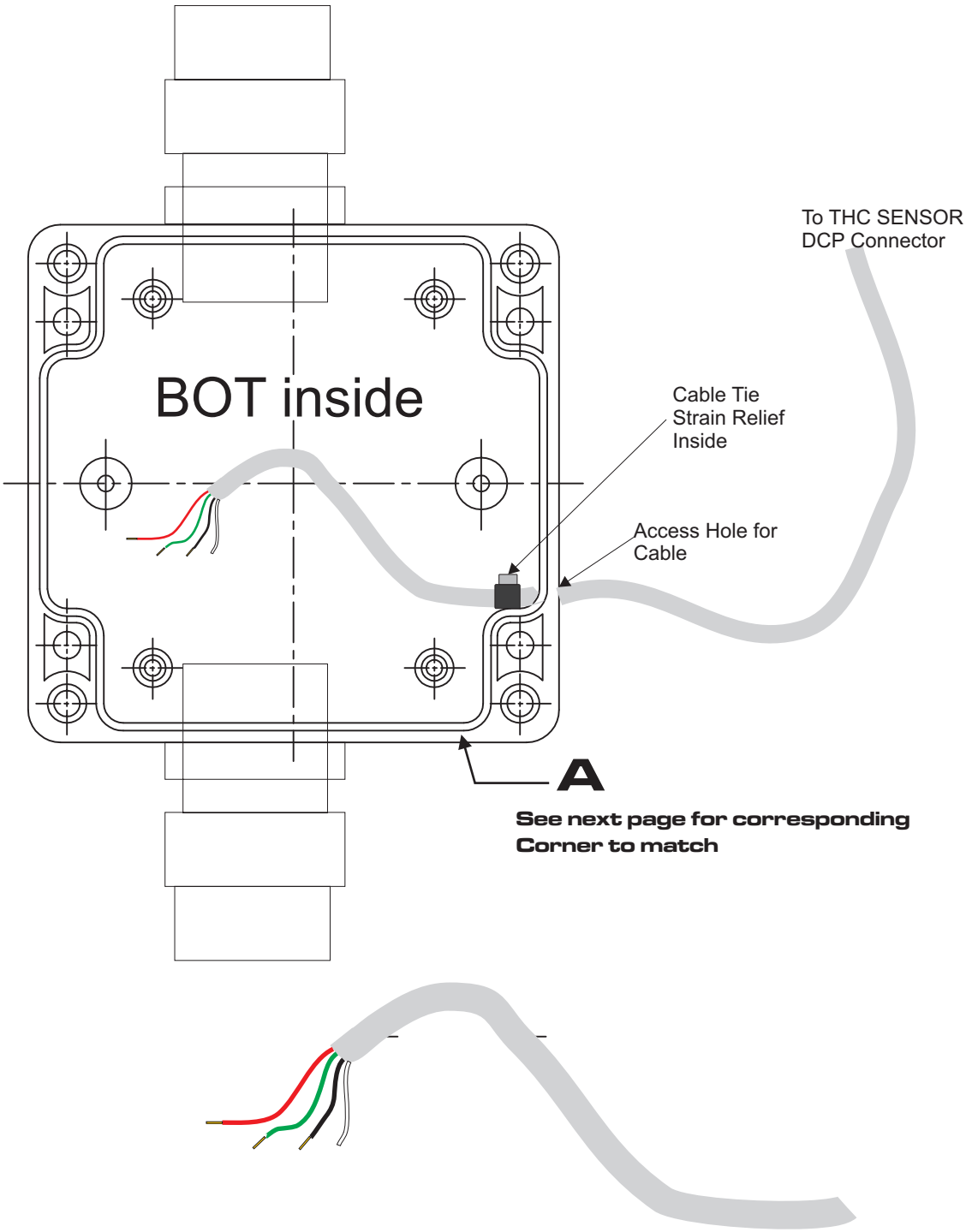
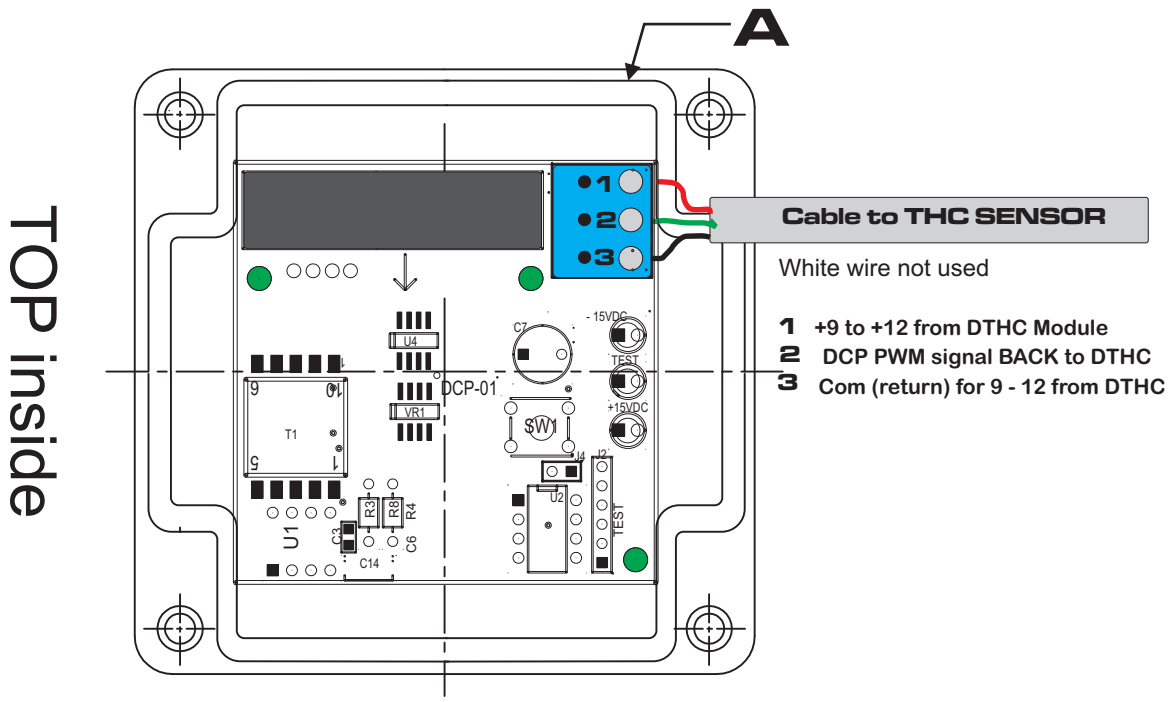


Connecting the interface cable to DCP-01.

To make the internal connection you must first remove the top cover with the attached DCP module from the case. Feed the 4 conductor cable supplied through the hole in the bottom of the case. Strip the jacket back to expose the 4 wires (be careful not to nick any of the 4 wires inside), Cut the 4 wires so about 3/4" of each wire is exposed past the jacket. Strip the Red, Green and Black ends back about 3/16" and twist the wires in each conductor. Proceed to next page

Note top is shown flopped so edge “A” fits to edge “A” in the Bottom



Connecting interface cable to DCP (cont).

Loosen the three screws on the terminal. Insert the stripped end of the RED wire into number 1 screw terminal. **Note:** the orientation of the top is flipped. Terminal #1 is the one closest to the edge as shown.

Make sure none of the small wires in the conductor are left outside the small opening of the screw terminal. Make sure no more than 1/16th inch of exposed wires protrude from the screw terminals. Tighten the screw terminal snugly. Pull on the wire to make sure it is securely in the terminal. Repeat with the Green (2) and Black(3) connections. Trim back the White wire at the jacket, it is not used. Inspect the connections to make sure none of them have stray wires or could short against each other. Flip the top back over so it can fit back on the bottom in the correct orientation and gently pull back enough of the cable so that you can still access the inside of the bottom. Put a small cable tie tightly on the cable inside the case to act as a strain relief so if the cable is pulled on it will not break or disconnect the connections at the screw terminal

Digital Current Probe Model DCP-01

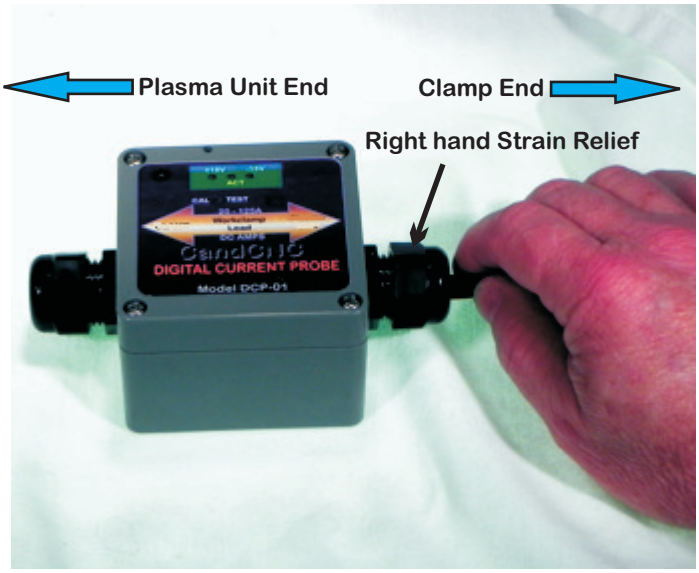
Physical install and hookup

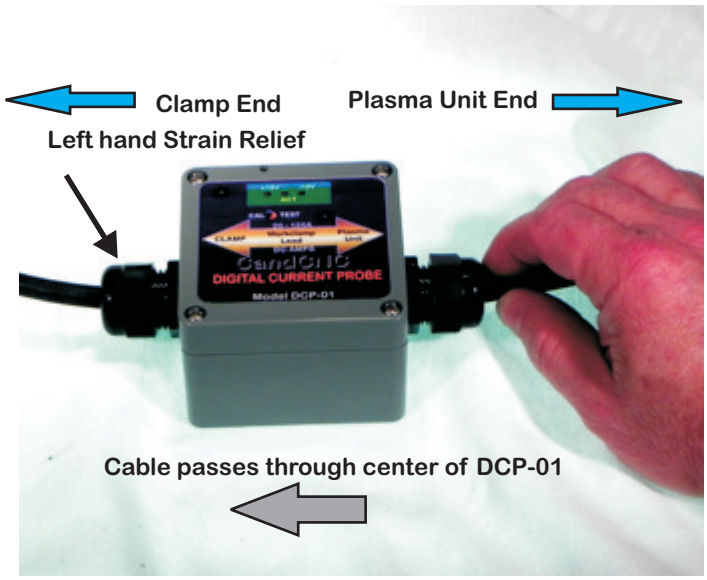
DCP-01 Digital Current Probel uses the existing THC SENSOR (rev14 or above) and slips over the Plasma System Workclamp lead wire to provide DC amp feedback to the DTHC and to the MACH screen. The following series of photos shows the DCP being hooked up to a plasma cutter.

Start by removing the ground clamp from your plasma workclamp. If it has a large ring terminal on the end where it attaches to the clamp you will need remove the ring terminal and replace it with a new one after you push it through the DCP unit.

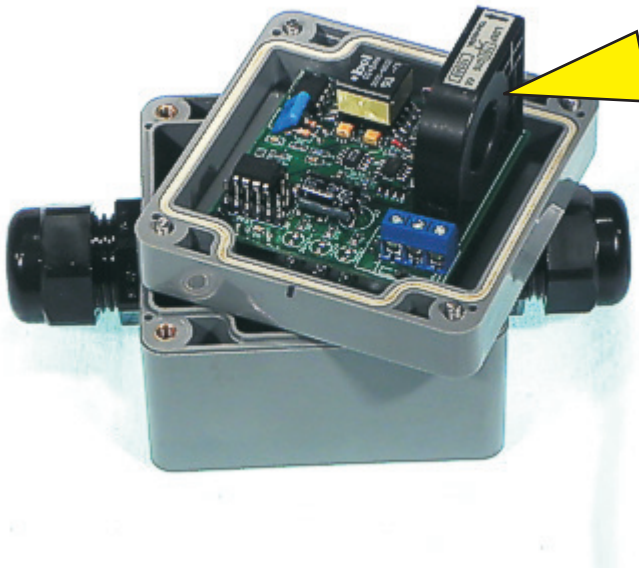
Loosen the cable strain relief/clamps on each end of the box by twisting the retainer nut counterclockwise viewed from the end. The strain relief has an internal collar that clamps down on the wire the more it is tightened.

Straighten the wire as much as possible and start feeding it from the right hand side.



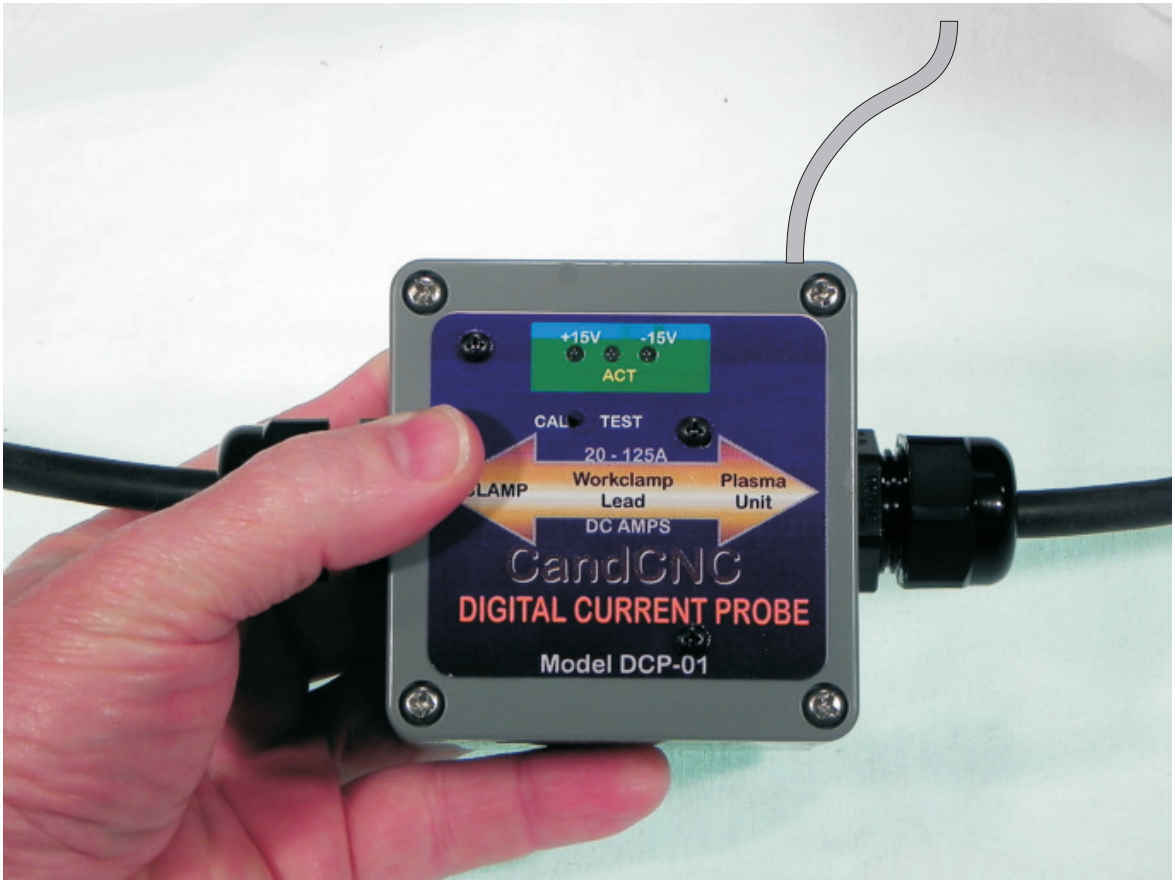


Push the wire through gently. If it hangs try rotating the wire and pushing but do not force it. There is a round hole in the Hall probe inside the box that the wire has to pass through. It is located close to the right side of the unit. If you have problems getting the wire to go though, pull the wire out and remove the 4 screws holding the top and remove the top and the PCB with the Hall Probe (see next page). Thead the wire though the right side strain relief and pull enough through so you can thread the Hall Probe on the card and then over and out of the left side strain relief.



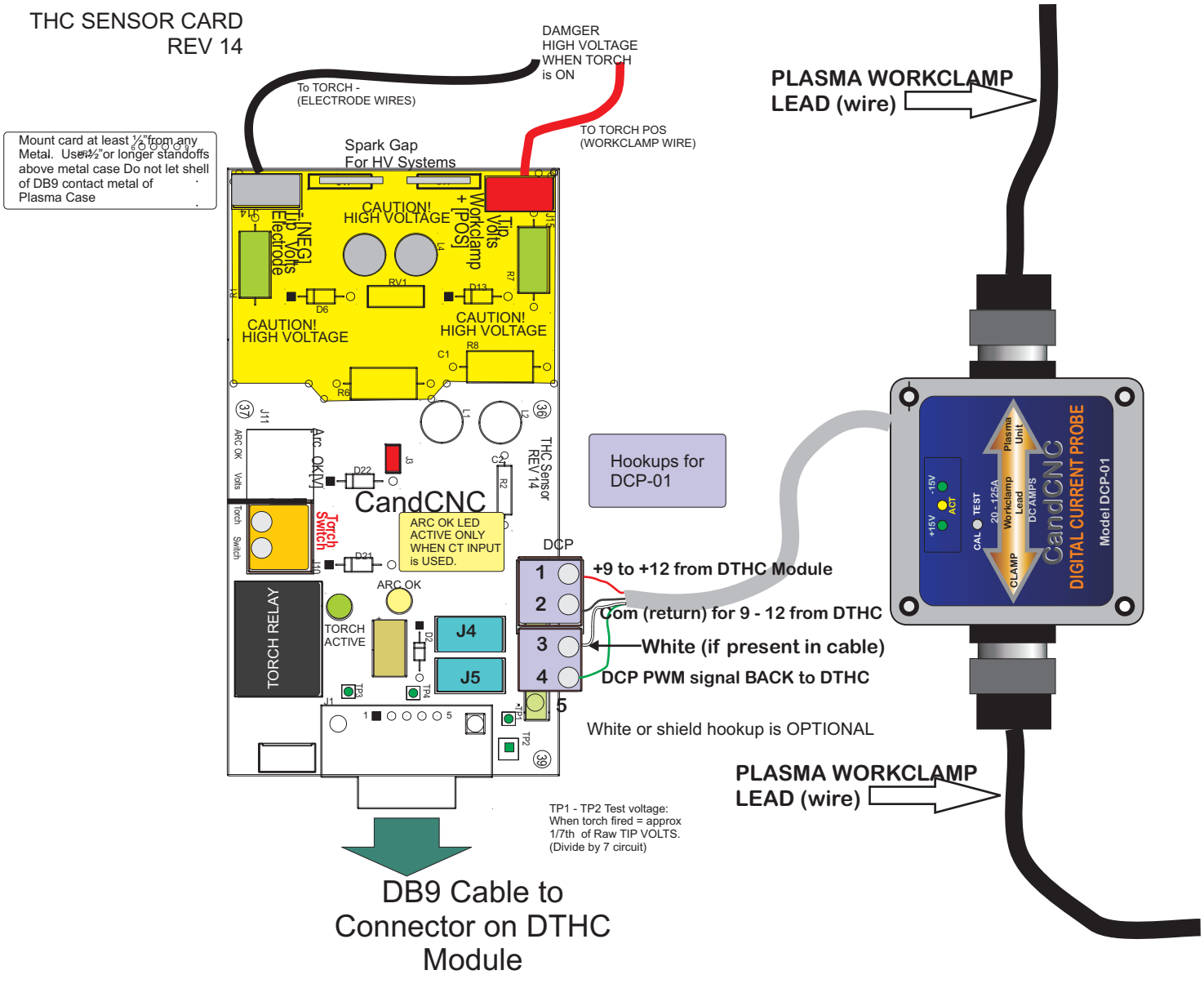
Workclamp Lead Wire goes through Hall Probe center as shown. Top shown flipped 180 degs

NOTE: Your DCP-01 unit will ship with a 8 ft interconnect cable to connect it to the THC SENSOR card. That connection is covered in the Setup and Test section for the DCP and comes in the side of the unit. If you remove the top cover pull carefully to prevent breaking or disconnecting the interconnect cable. If it comes loose the DCP setup section has the wire colors and hookup for the cable



When you have the Workclamp lead wire threaded through the box, hand tighten the outside nuts on each strain relief until it is tight around the cable. It is important that each end is sealed to keep out plasma dust and smoke. Position the DCP-01 along the cable close to the plasma unit and in a place it will not get stepped on, crushed or can will dragged across the floor if you decide ot move your plasma unit or use it manually in the shop. The enclosure is sealed and rugged but it can be damaged by excessive abuse.

CONNECTIONS FOR SYSTEMS USING DIGITAL CURRENT PROBE



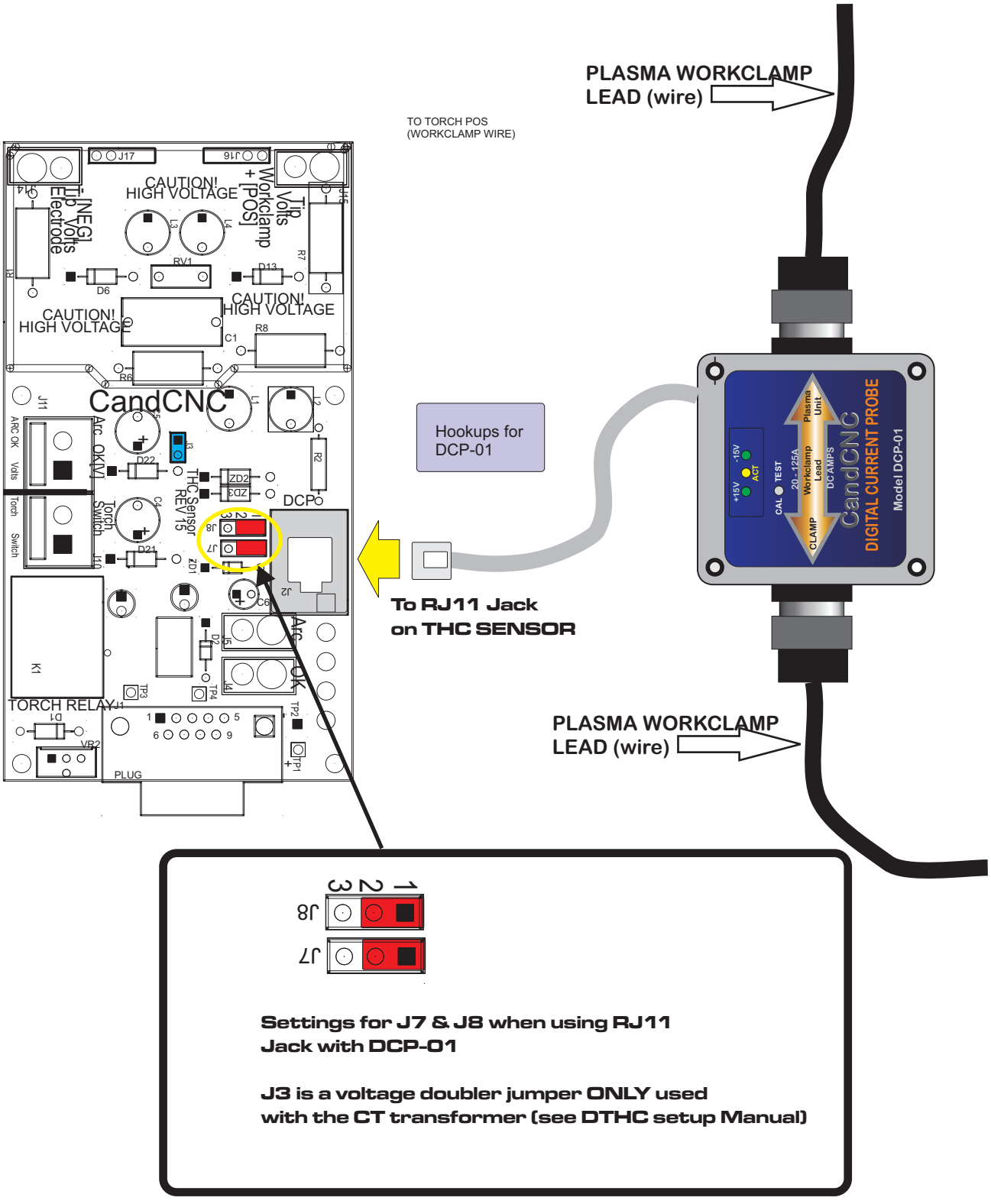
Digital Current Probe is an OPTION and must be ordered separately. It is used primarily to read and display the actual cut current (TORCH AMPS) on the screen and to set fault trip points and actions. The DCP can also be used as the ARC OK signal instead of either the internal ARC OK (some plasma units) or the CT (current transformer covered on the previous page. **IF YOU HAVE THE DCP hooked up as shown YOU DO NOT NEED ANY OTHER SOURCE OF ARC OK.** You can continue to use the ARC OK (arc xfr/OK to Move) plasma internal signals connected to J4 and J5 and either one will trigger ARC OK but the signals are redundant. The ARC OK from the DCP can be adjusted by material (by Cut Profile) and is more accurate than either the internal or CT method. See the DTHC settings section on how to set the ARC OK trip points in the DTHC Cut Profile.

For detailed instructions on how to install, setup and calibrate the DCP with any DTHC based CandCNC product see the DCP Setup section at page_____

SPECIAL NOTE:

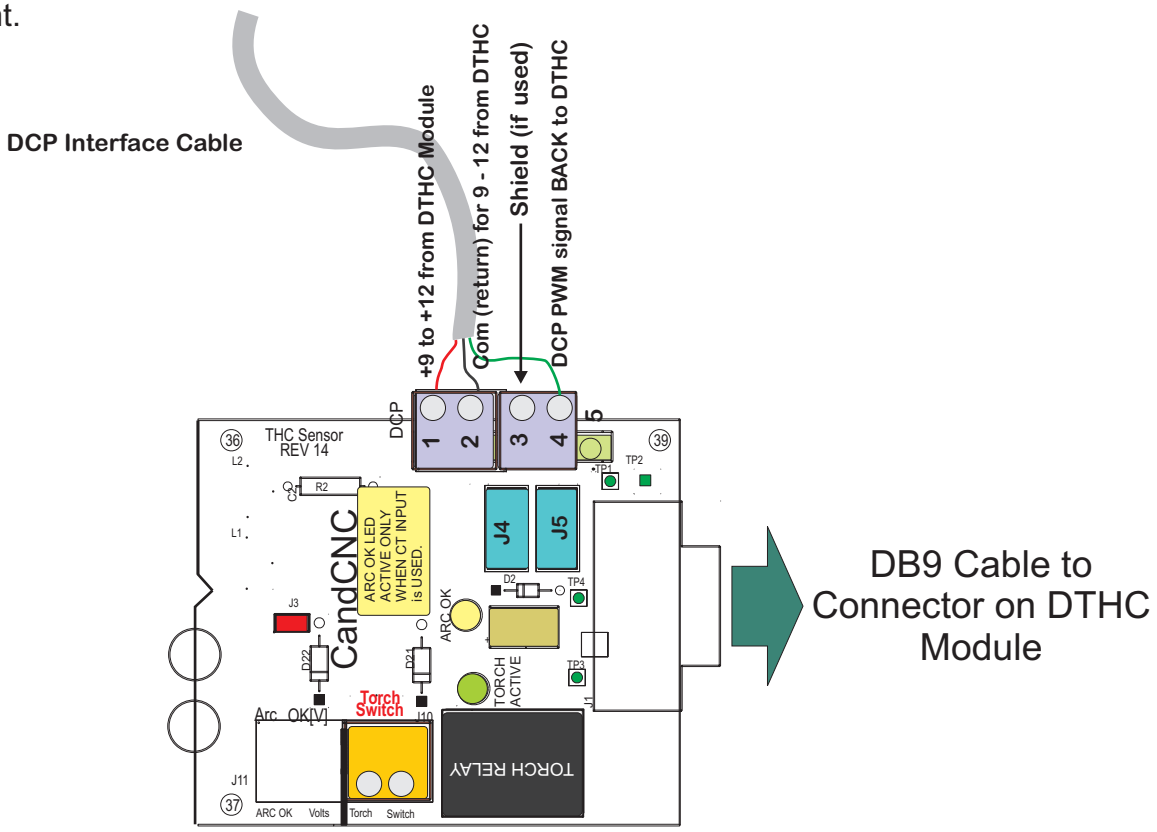
The DCP Digital Current PRobe can be added to any CandCNC product that has a DTHC expansion module and was shipped AFTER Jan 15th 2010. The DCP will not work with REV 12 THC Sensor cards or with DTHC modules before REV9. If you have questions about it's use with your unit see the DCP Setup section to help identify if your DTHC can accept the new DCP.

CONNECTIONS FOR SYSTEMS USING DIGITAL CURRENT PROBE
THC SENSOR REV15 card WITH RJ11 connector on DCP-01

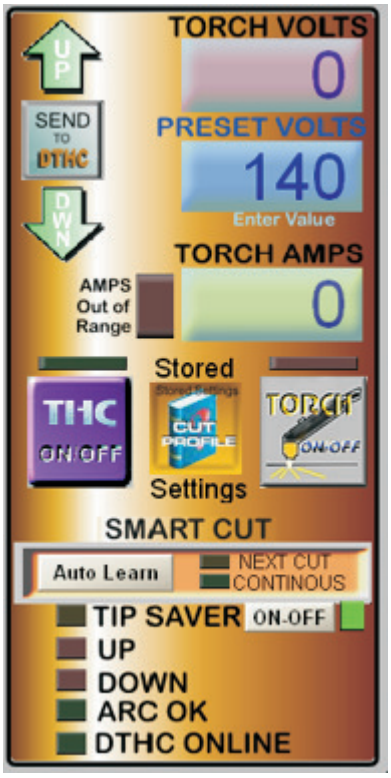


Do the following steps in order:

1. Connect the DCP-01 interface cable to the THC SENSOR using the wire colors and screw terminals on the THC SENSOR as shown. Most THC SENSOR cards were shipped without the plug screw terminals on the 5 exposed posts. You DCP-01 ships with 2 dual plug-on screw terminals. Place them on the posts and carefully strip back about 1/4" of each conductor, insert and tighten the top screw down until a tug on the wire will not pull it out of the terminal. If your THC SENSOR is mounted in a box or inside the plasma unit then you will need to make provisions to route the wire to the THC SENSOR. Keep the DCP interface cable away from the high voltage TIP Volts end of the THC SENSOR card. If your THC Sensor card is inside the plasma unit keep the DCP interface cable at least 1" away from an high voltage cables in the unit. Do not cable tie the Interface cable to other cables in the box unless you know they are low voltage cables. If you are connecting up your DTHC and THC SENSOR for the first time make the connections to the THC SENSOR card and the DB9 cable back to the DTHC module (front Panel connector on the MP3000-DTHC or the BladeRunner Dragon Cut. Do this BEFORE you make the Tip Volts (Arc volts) connection or the TORCH SWITCH. You can run some tests on the THC SENSOR Card and the DCP without having the plasma unit turned on or the Tip Volts present.



2. Start MACH3 on the controller PC and load the profile and screen set for the DTHC. If this is the first time you have used the DTHC and MACH you should have had MACH loaded and setup. If you do not, STOP! Go back to the MP3000-DTHC or the BladeRunner AIO manual and the DTHC Setup-Config Manual and first setup MACH and get your table moving and the proper MACH profile loaded for your system.



This dialog box or one similar to it should appear in the center part of your MACH main screen if you are running the right profile. The important readouts (DRO's) are the TORCH AMPS. We will be using the TORCH AMPS readout to calibrate the DCP and then use the Stored Settings Button to preset some values for the DCP. It's important that you have gone through the DTHC setup in this manual FIRST and that you have confirmed (using the DTCH self-test button that it is working properly. The DTHC ONLINE Led at the bottom should be ON (Green). If it is NOT you cannot go further in the DCP setup until the issue is resolved!

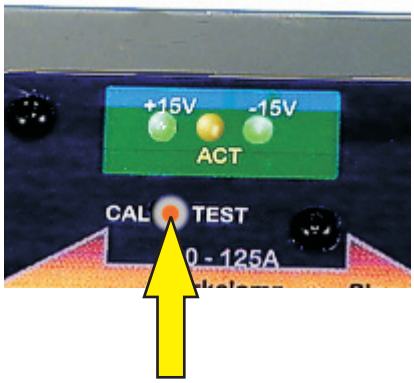
3. Power up the MP3000-DTHC or the BladeRunner (or your UBOB Builders Kit + DTHC) so the DTHC module has power. The first thing you should see is that the +15 LED and - 15 LED on the font of the DCP light up. The ACT (activity) LED will NOT be on.

4. Bring MACH out of reset. On any unit with our ESP smart power controller (including Bladerunners) you MUST have the DC power to the motors on to come out of reset. At this stage you should have MACH setup, running and know how to come out of reset.

5. Make sure that the DTHC module is communicating with MACH. The DTHC ONLINE Led should be ON (green) When you activate the DTHC Self-test the TORCH VOLTS should change from 100 to 150 and the THC UP and THC DOWN leds (and ARC OK) will alternate off and on. The TORCH VOLTS comes from the DTHC across the PC serial port connection to MACH. Without the serial communications you will not get Torch Volts and you will not be able to see TORCH AMPS

6. Once you have determined the DTHC passes self-test then locate the small hole in the front of the DCP unit (marked CAL and TEST). You will need a small screwdriver or probe tip (paperclip?). You will feel the button click. Push it once to turn on the TEST/CAL function. When it is active the ACT LED (yellow) will flash.

TO TURN OFF TEST/CAL MODE on the DCP-01 push the recessed CAL/Test button once and the ACT LED should stop flashing and the TORCH AMPS readout should return to 0



Calibration/Test Button (recessed)

7. While you are in TEST/CALmode (LED blinking) the TORCH AMPS should display a value. If you are installing a DCP on an existing product with a DTHC the calibration will be off so the number you see could be anything from ___ to ____. I your unit displays 100 volts as shown then you continue on to final testing and CUT PROFILE Setup. IF YOUR VOLTAGE IS NOT 100 You will need to proceed to the CALIBRATION SECTION

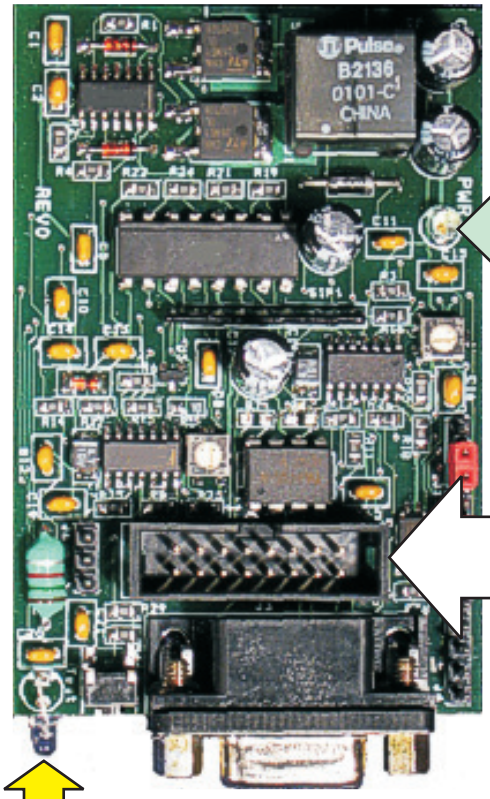
CALIBRATION of the DCP-01

Use this section any time you put the unit into TEST/CAL and the displayed value in the TORCH APMS readout is NOT 100 as shown.

1. To calibrate the DTHC module to the DCP-01 you must have access to the top of the DTHC Expansion Module. Refer to your product manual to identify and access the DTHC module. It is the small PCB card behind the panel on all CandCNC units where the DB9 cable from the THC Sensor plugs in. In most cases all you have to do to gain access is remove the top cover (MP3000-DTHC) or the Front panel (BladeRunner AIO). Use the photos below to find and identify the DTHC card and the correct adjustment point for the DCP. CAUTION there are two identical pots (variable resistors) in the card. One is the DCP calibration pot. ***The other is the TORCH VOLTS calibration pot and is set at the factory; DO NOT ADJUST THE WRONG POT. IF YOU ACCIDENTLY CHANGE THE TORCH VOLTS (wrong pot) you will throw your DTHC unit out of calibration, and without a know accurate source of volts on the TIP Volts input of the THC SENSOR card you will not be able to get it back in calibration***!
Check the photos. Study the board orientation and MAKE SURE you are adjusting the pot. This calibration should only have to be done once so take the time to do it right.

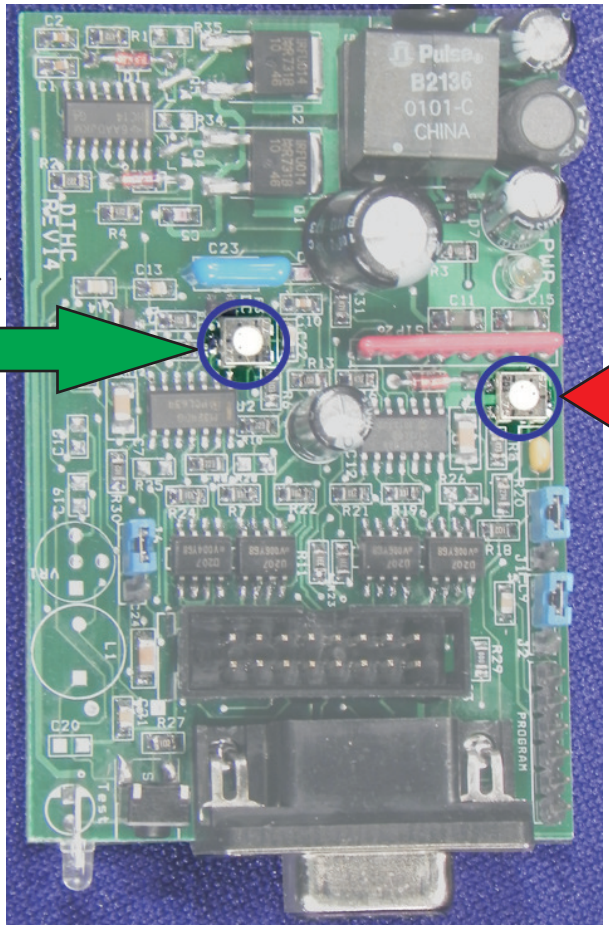
DCP Calibration (Cont)

DTHC EXPANION MODULE. Located above the UBOB III card in most CandCNC products.. Ribbon cable connecting DTHC down to UBOB card may cover adjustment pots. If so, gently move it out out the way. Do not unplug the ribbon cable or the card will be disabled.



2. Using the diagram below and with the DCP in the TEST/CAL mode (LED flashing) adjust the DCP calibration pot while watching the TORCH AMPS DRO in the MACH screen. Adjust the pot until the value displayed is 100 AMPs.

Your calibration procedure is complete!

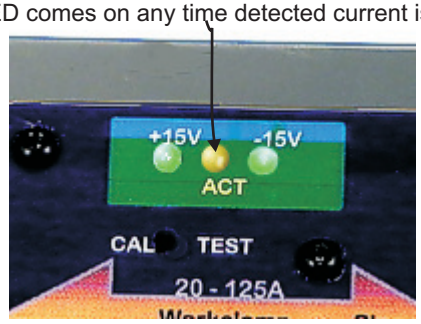


OPERATION of the DTHC with the DCP-01.

The primary purpose of the DCP-01 is to give the operator real time feedback of the actual Cut Current (Torch AMPS). Using the settings in the Cut Profile you can set fault points (based on a percentage of the varience from the current preset value to warn the operator if cut current is too high or too low. The ACT LED on the front of the DCP-01 (when not in Text/Cal mode) will light up anytime the detected current is above 20A It's just a visual indicator that the DCP-01 is reading current. If the LED lights when you fire the torch and have a valid arc and you do not see the Current displayed on the TORCH AMPS DRO on the MACH screen then go back through the test and calibration section. If you see cut current out of range or get a Current Fault then check the workclamp connection, the current setting on the plasma unit, the consumables, the Cut Current setting in the Cut Profile (stored settings) and determine why the current is not what it should be.

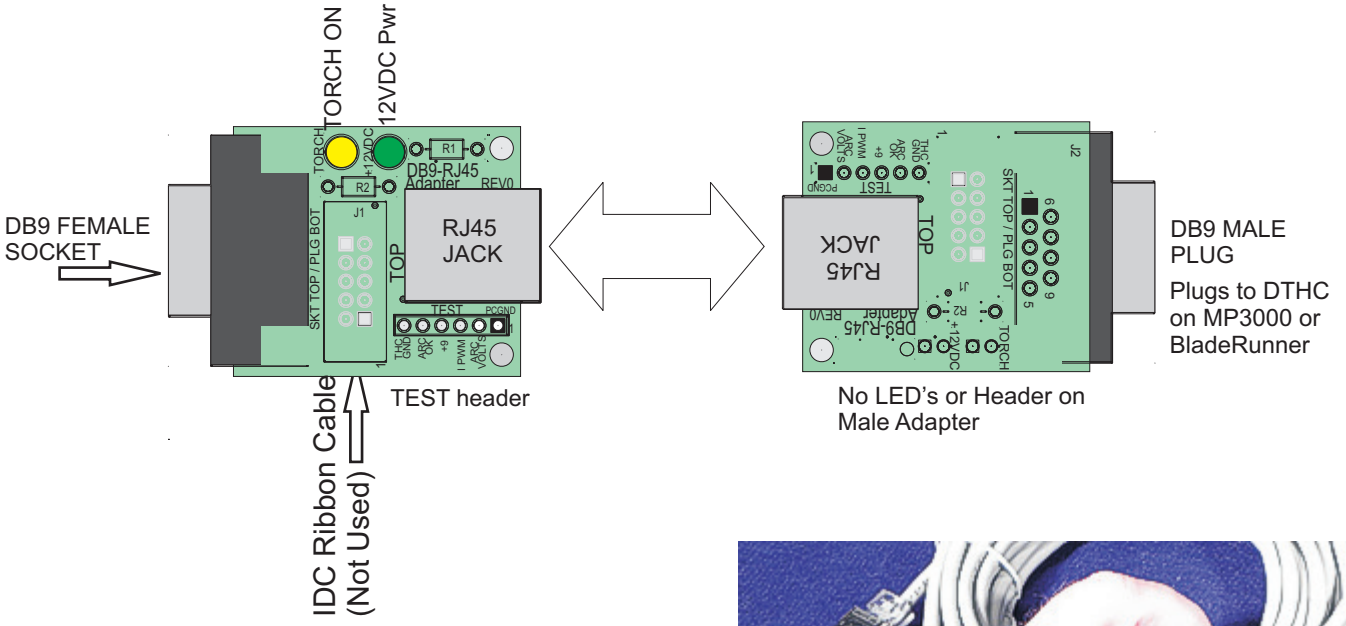
It's important to understand that the CUT PROFILE does NOT *set* the cutting current. Only the manual adjustment on the plasma unit sets that value. The DCP-01 just tells you what the cut current REALLY is at the cut and tells you if the value is not what you have set in the specific Cut Profile you are running.

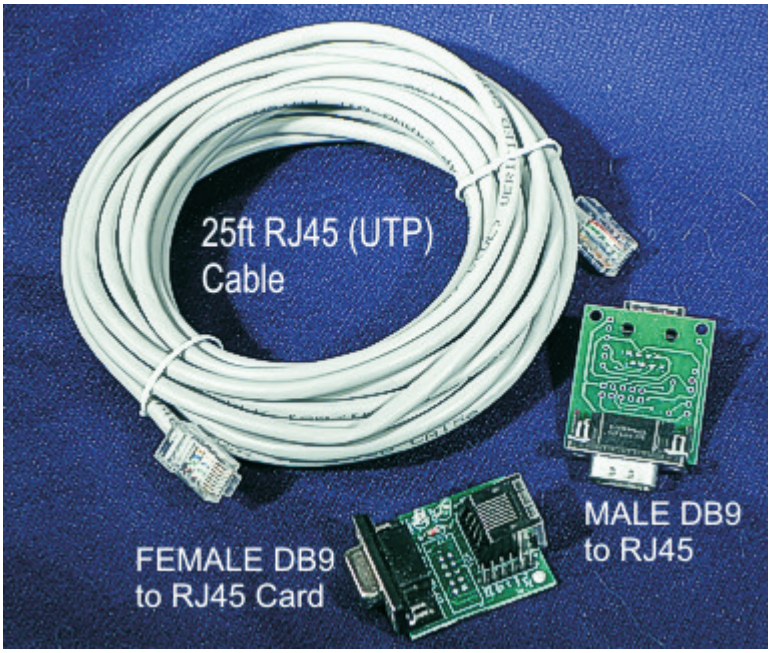
This LED comes on any time detected current is 20A or greater

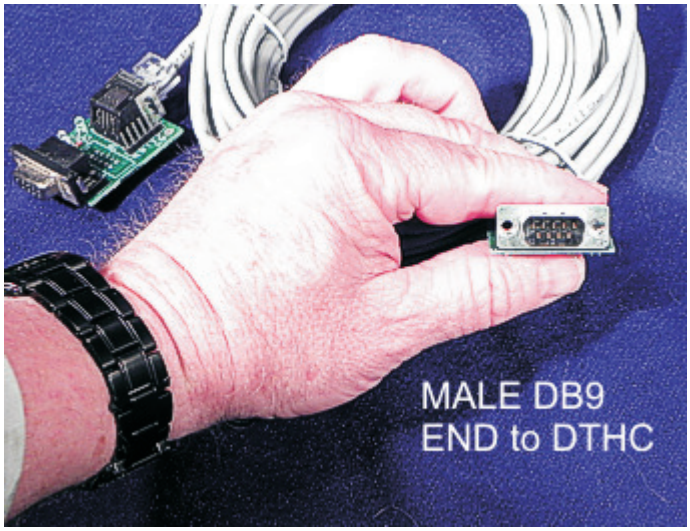


ADDENDUM: LOW LOSS CABLE KIT

Low Loss Cable Kit for DCP-01. This cable kit **replaces the 25 ft DB9 cable supplied with base DTHC units** (MP3000-DTHC, BladeRunner Dragon-Cut). If you do not have this kit you may experience problems calibrating the DCP-01. You can contact us for a kit at no charge







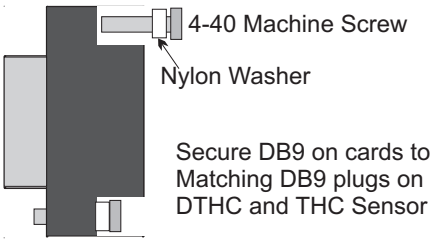
ADDENDUM: LOW LOSS CABLE KIT

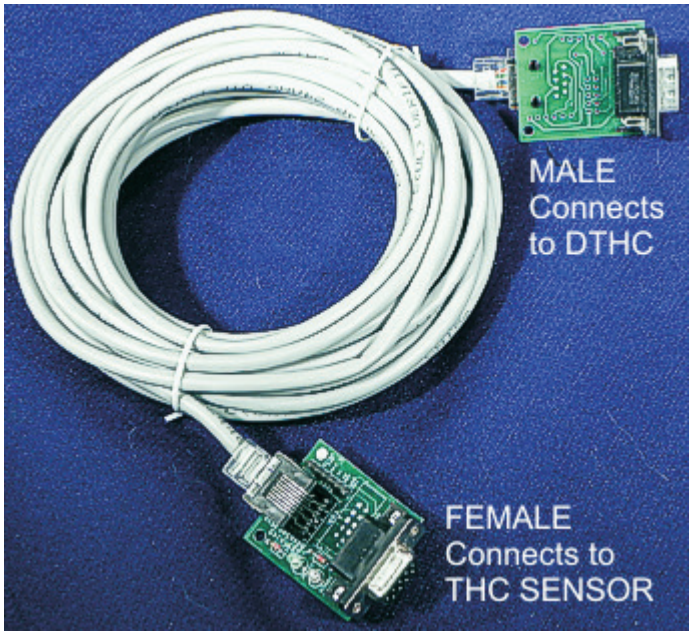
Hookup is as follows:

1. Disconnect the DB9 25 ft cable between the THC Sensor Card and the plug on the DTHC (either the front of the MP3000 or the side of the BladeRunner located above the PORT 1 and Serial connectors. Throw it way or use it to tie up some garbage (then throw it all away)

2. Open the Low Loss Cable Kit. You will have two adapter cards, a 25 ft RJ45 to RJ45 UTP network cable,and four 4-40 screws with washers. Find the adapter card with the FEMALE DB9 oonnector. Plug it into the MALE DB9 on the THC SENSOR CARD. Note that adapter has added components to show the status of some signals. Secure the card to the jack screws on the THC SENSOR CARD with two of the 4-40 machine screws and washers as shown below. Make sure the connection is tight.

3. Find the other adapter card with the MALE DB9 and plug it into the DB9 female plug on the front of the DTHC module (at the MP3000 or the BladeRunner side panel). Secure it with the remaining two 4-40 machine screws and washers.





4. Uncoil the 25 ft RJ45 cable and plug one end (does not matter which end) into the RJ45 plug on on the adpater card at the THC SENSOR. Plug it in until it clicks and you cannot pull it back out unless you press on the release tab.

5. Plug the other end into the RJ45 jack on the adapter card at the MP3000 (or BladeRunner) end at the DTHC. Make sure it is plugged in and will not pull out without releasing the release tab.

6. Fire up your system. The Green power LED on the adapter at the THC SENSOR end should light.

7. The yellow LED at the THC SENSOR END will light when you activate the torch on from MACH or G-code.

8. Run the calibration on the DCP-01 as per the manual even if you did it before and got the correct readings.\\