



## Manual for Installation of Additional High Voltage Boards to a C-Pace EP

This manual will show the steps necessary to a High Voltage Boards to a C-Pace EP. The example pictures show the transition from a two bank to a six bank C-Pace.

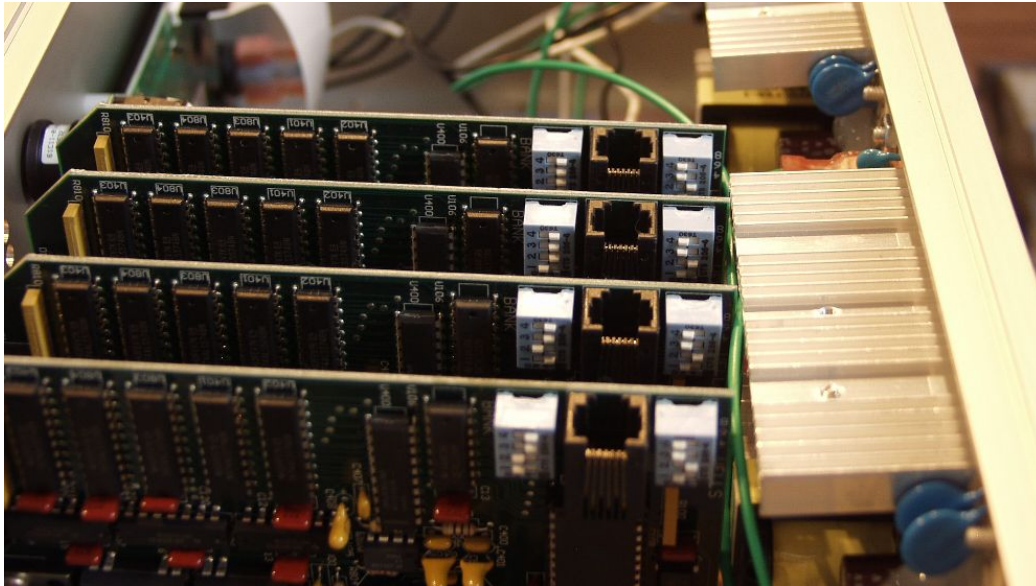


- 1) Original C-Pace EP. The user is able to select between banks 1 and 2 on the first line of the display, and LEDs and the 9 pin connector are visible in slots 1 and 2. The other slots are blocked by plastic panels.



- 2) **UNPLUG DEVICE!** All of the circuit boards must be unconnected from the front panel to allow new boards to be plugged in. Use a Philips screwdriver to remove the C-Pace EP top and bottom and the plastic panels from the slots you will need. The user can now see two brackets attaching the circuit board to the front panel on the far ends of the circuit board. Use the Phillips screwdriver to remove the two screws from the front panel that are screwed into the brackets. The High Voltage boards are attached to the front panel by jack screws on either side of the 9-pin

connector. Remove these using a 3/16" hex nut driver or wrench. Now the only thing holding the boards to the panel are the 5 BNC nuts. They can be removed with a deep 9/16" nut driver or wrench. All boards will now slide back.



- 3) Insert the new boards into the desired slots. The prototype High Voltage Boards only have one dip switch, which sets the bank number. Most have two dip switches to allow the user to set both the bank number and the number of wells in the culture dish that is being used. In those boards, the dip switch closest to the LEDs and labeled "BANK" sets the bank. The dip switches may be labeled Open and Close or On and Off. Use the table that corresponds to the dip switch label (O means the switch has been pressed down on the OPEN side, ON means the switch has been pulled in the direction of the ON arrow). Set the dip switch on each bank to correlate with the appropriate front panel number.

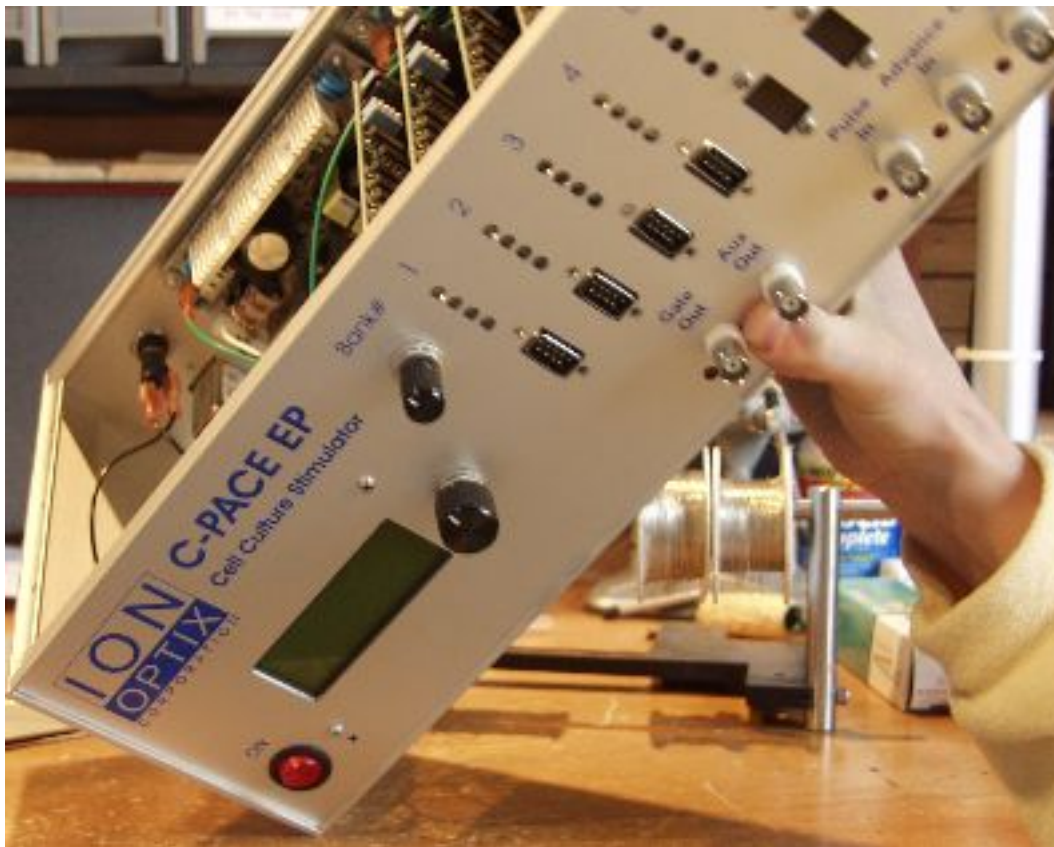
Number of the Slot on the Front Panel	Number on Dip Switch			
	1	2	3	4
1	O	O	O	O
2	C	O	O	O
3	O	C	O	O
4	C	C	O	O
5	O	O	C	O
6	C	O	C	O
7	O	C	C	O
8	C	C	C	O

Number of the Slot on	Number on Dip Switch			
	1	2	3	4
1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF

	5	OFF	OFF	ON	OFF
	6	ON	OFF	ON	OFF
	7	OFF	ON	ON	OFF
	8	ON	ON	ON	OFF

The dip switch closest to the edge of the board and labeled “WELLS” sets the dish type the bank is configured to drive. You will see that the settings on the switch correlate to the number labeled on the circuit board.

Number of Wells	Number on Dip Switch			
	1	2	3	4
4	OFF	ON	ON	ON
6	ON	OFF	ON	ON
8	ON	ON	OFF	ON



- 4) Now for the tricky part. It can be difficult to line everything up to fit back into the front panel. The LEDs all have a little give, so make sure they have not twisted or tilted up before you begin. I find it is easiest to hold the main board up and against the panel from underneath with one hand and manipulate the High Voltage Boards and connectors with the other. It also sometimes helps to rest an edge on a table and turn the C-Pace on its side so that gravity is helping. ) While

continuing to hold the boards against the front panel, finger tighten a couple of the connector screws. Once it is secure, finish tightening and insert rest of screws.



- 5) To screw the top of the box back on, line up the little clips with the holes on the side panel and place the top panel down with the “V” of the holes facing out. Make sure to apply very little force when screwing the top down as the clips are kind of flimsy. Plug the device in and turn it on. Watch the LEDs as they initially cycle through. They should turn on in order by bank (ie, bank 1 first, bank 2 second...). The knob underneath the label “Bank #” is used to lock the outputs to the desired bank and well. The selection is indicated by a green light (or combination of lights). By turning that knob and counting the number of wells the bank cycles through before the green light moves to the next bank, you can make sure that the bank is set to the appropriate number of wells (ie, if the knob turns for 6 clicks while on bank 1, bank 1 is set to work with a 6 well dish. Scroll through the available banks on line one, and make sure that all installed banks are displayed. Enable them one at a time to make sure that each turns on when it's supposed to. If there is a problem, UNPLUG THE DEVICE, take the top off and recheck the dip switch settings. Also check to make sure the High Voltage Boards are securely inserted into the main board and that socketed chips are firmly in their sockets.

## Trouble-Shooting

- 1) Make sure the power cord is plugged in firmly.
- 2) It is possible that one or more High Voltage Boards have come loose in their sockets. Take the bottom of the C-Pace off and push up on the main board to push the High Voltage Boards more firmly into their sockets.
- 3) Recheck the dip switch settings that were discussed in section 3
- 4) One of the Microcontroller chips may not be in its socket firmly. Press down on the socketed chips to make sure they are making good connection. There is one chip on each High Voltage Board and one on the main board.

**Contact Us if You Have Any Difficulty**

Contact Kate Barber at 617-696-7335 or [kate@ionoptix.com](mailto:kate@ionoptix.com)