Cell MicroControls, P.O. Box 11387, Norfolk, VA 23517
Tel: (800) 398-4262; (757) 622-0261
Fax: (800) 398-9262; (757) 622-0262
WWW: **http://www.cellmc.com**; Email: **NickBD@cellmc.com**

Equipment for cellular & electrophysiology research

ITO heater application notes

Busses

All the ITO heaters have Ag based busses running along the long edge of the heater. This allows the heater leads to come from the left or right edges which is usually more convenient than having a lead on each side. The buss material is very hard and heatproof (up to 200C though you would be unlikely to use the heaters at this temperature. Having the lead attached to the heater provides a more reliable contact compared to screen printed contact areas and contact mechanisms. The buss thickness depends on the heater type. At the point where the lead attaches the heater is about 0.8mm above the glass surface. The photograph of th edge of a **HI-25p** heater illustrates this. This means that you can't just place the heater on a surface or sandwich the heater between two surfaces.

Flat platforms

Typically the heater is attached to the bottom of a tissue chamber or in one of the polycarbonate holders that we make (eg. for the **HI-55Dp** and **HI-711Dp**). Although we have made frames to go beneath the thinner heaters so that you can have a flat plane to place small chambers etc. on top the thinner heaters are generally not suited for this. You should use the **D** series heaters since these are 0.6mm or greater in thickness. For example the **BT-I55D** can be used on any microscope we make a stage adapter for. It provides a 45x45mm working area with uniform temperature. For a larger working are you can use the **HWPT-96OL** or **HWPT-96NK** for the Olympus and Nikon microscopes. This provides a 65x105mm uniformly heated area.

Taking care of the heaters

If you are careful handling and using the ITO heaters they will last for many years. The ITO coating is very rugged and chemically inert. The busses need more care. You can't get salt solutions on the busses, especially where the leads attach. The salt will corrode the buss and undermine the lead attachment area which in time will degrade the contact resistance which has to be extremely low. Make sure that the leads can't get pulled away from the busses. If you are using the heater on a chamber, tape the leads to the chamber or if you are using one of our microscope stage adapters have the leads come through the holes to the top surface of the adapter. This way they can't tangle with the microscope objective. You can clean the heater with ethanol and similar solvents. The epoxy coating over the lead attachment point may be affected slightly by some solvents but this will not affect the heater performance. Don't use acids or alkaline solutions on the ITO side of the heater.