

DIGITAL KNIGHT

Digital Controller Upgrade



Introduction

The *Digital Knight* controller upgrade for your current Geo Knight heat press machine is a fully digital modular control system for the 674A, 674S, 674M, 674, 475S, 475, 495, 495S, 178, 178T, 374H, and 374HT clamshell heat transfer models. The *Digital Knight* controller upgrade provides the following features:

- Digital Temperature Control
- Digital Time Control
- Fully Automatic Timing Cycle
- LCD Display of parameters
- 70 Programmable User Presets
- Fahrenheit / Celsius Temperature Display
- Number of Cycles/Pressings Counter
- Temperature Drop Sense Option
- User Selectable Timer Alarms

In addition to these helpful features, the *Digital Knight* controller upgrade features a drastically improved heat control relay circuit. This computer controlled relay circuit has been field tested and shown to last over 100 times longer than the traditional heat switching method. The result is an industrial grade control system that should outlast the life of the machine itself.

Please read carefully through the installation instructions before beginning the conversion. The actual upgrade is very simple, and should take less than 30 minutes. However there are some important points that must be carefully read in order to avoid any potential problems. Here is a basic overview of the conversion & upgrade process:

1. Remove the original control console and ALL original wiring inside the heat platen (Carefully!)
2. Connect 4 wires from the *Digital Knight* controller to the heat platen.
3. Connect the timer tilt switch.
4. Turn on the machine and start pressing!

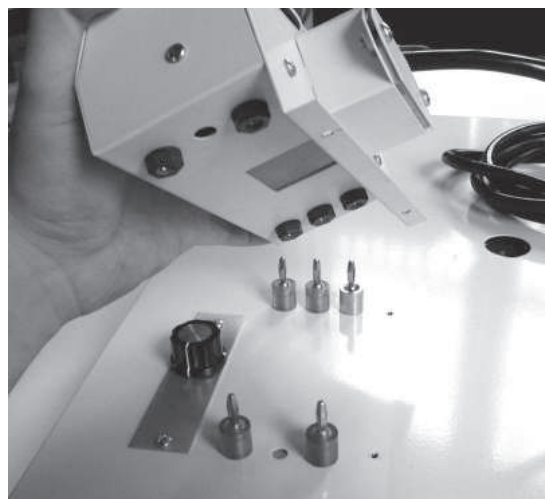
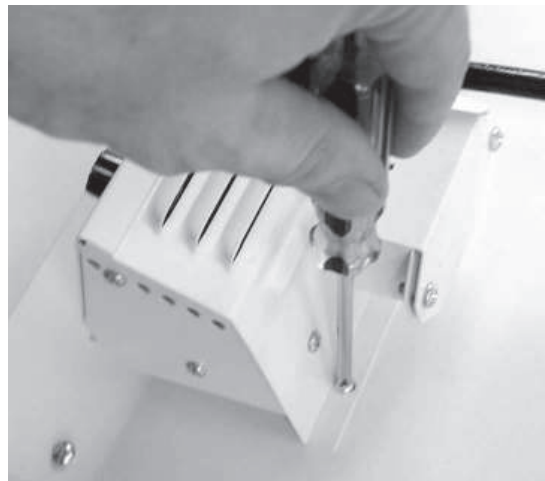
Step 1 - Detach Heat Platen

- Unplug the machine, and lower the heat platen half way.
- Turn the pressure screw towards the plus sign, in order to disconnect the heat platen from the frame of the machine.
- Be careful not to let the handle swing upward too fast when the heat platen finally drops away from the frame, as this could cause injury.



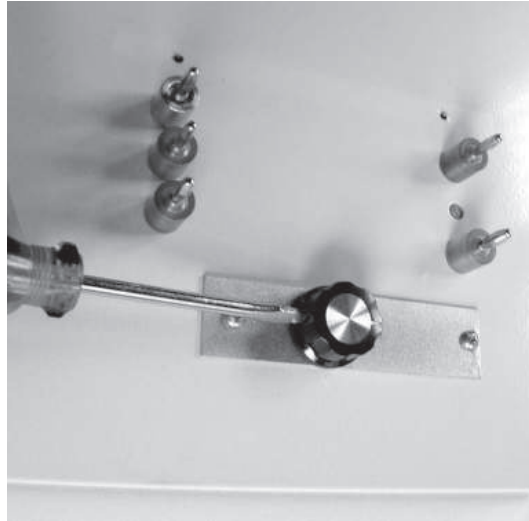
Step 2 - Remove Console

- Unscrew the two sheet metal screws behind the console. Remove only the two screws that connect into the heat platen cover.
- Unplug the console from the heat platen cover. This is done by pulling up on the console.
- Set the console & power cord assembly aside.



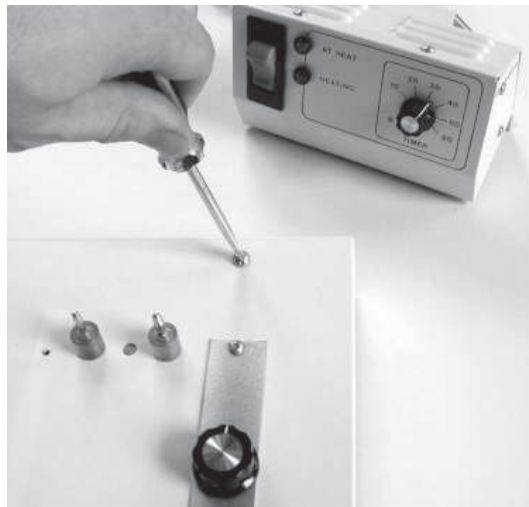
Step 3 - Remove Thermostat Knob

- Using a miniature screw driver, loosen the small set screw in the side of the black thermostat knob.
- Once the set screw is loosened, remove the thermostat knob.
- Unscrew the two screws connecting the thermostat access panel, and remove that as well.



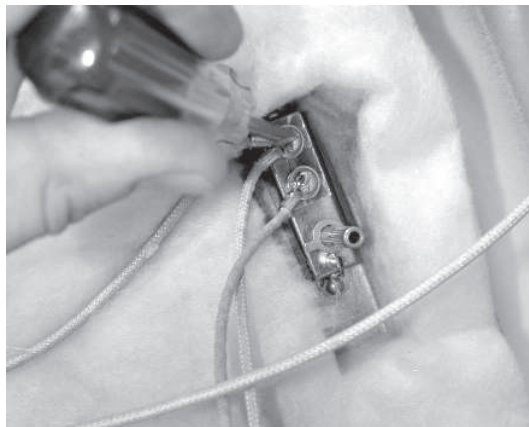
Step 4 - Open Cover

- Unscrew the four corner screws that hold the cover down onto the heat platen casting. Extra screws for these four positions have been included for replacement in case the original screws are not reusable.
- Gently lift the cover up and back to access the inside.



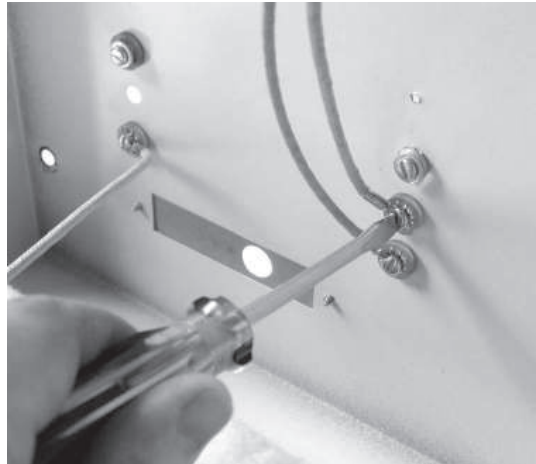
Step 5 - Remove Thermostat

- Disconnect ALL wires connected to the thermostat.
- Unscrew the two screws that hold the thermostat down against the heat platen.



Step 6 - Remove all cover connec-

- Disconnect all wires from the inside of the heater block cover.
- Loosen all five plugs and remove them completely from the cover.



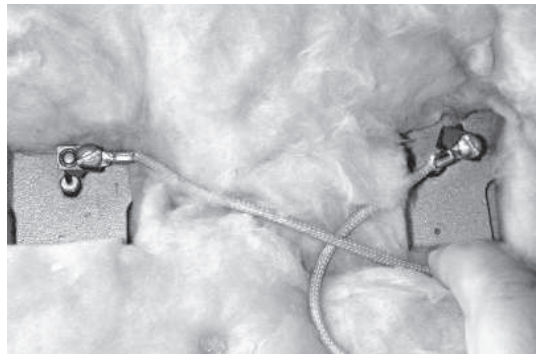
Step 7 - Remove Heater Wires

- Disconnect the two wire connections to the heating element. Read the following FIRST:

- DO NOT unscrew them only with a screwdriver. The heating element connections may twist and break off.

- Use pliers and a screwdriver to remove the connections. Hold the connection tightly with the pliers so it does not twist, and unscrew the wire with the other hand.

- Set all the wires, ultem connectors, and thermostat aside. **You should now have a bare heater block cover and bare heating element with insulation.**



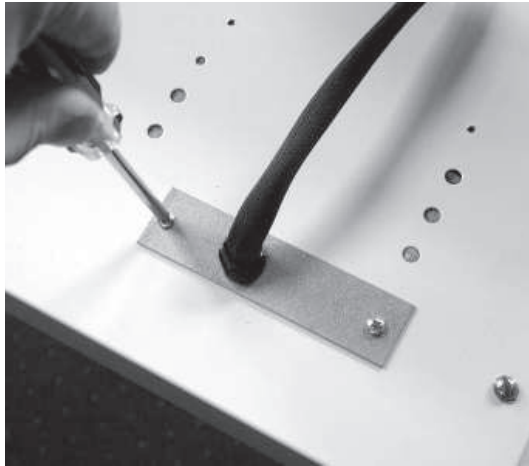
Step 8 - Remove Thermometer

- Unscrew the set screw holding the thermometer in place.
- Remove the thermometer out of the heating element and set it aside.



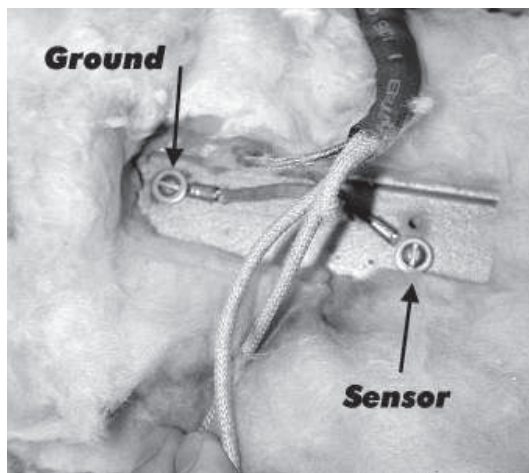
Step 9 - Attach wire harness panel

- Connect the new Digital Knight controller wire harness to the heat platen cover.
- Make sure all the wires pass in through the top down into the underside of the cover.



Step 10 - Attach sensor & ground

- Screw the temperature sensor wire and ground wire into the holes formerly used for the thermostat. Which hole is used for which wire does not matter.
- The ground wire is the shortest light colored wire, and the sensor wire is the dark brown wire.



Step II - Attach heater wires

- **CAREFULLY** connect the two heater wires (**Read step 7**) to the heating element connections. Either heater wire can be connected to either connector.



- Be sure that no metal part of the ring connectors on the heater wires will contact the heating element or the cover.

Step I2 - Reattach cover and platen

- Gently mount the heater block cover back onto the heating element. Screw the four screws (included with upgrade) back into the posts of the heating element.

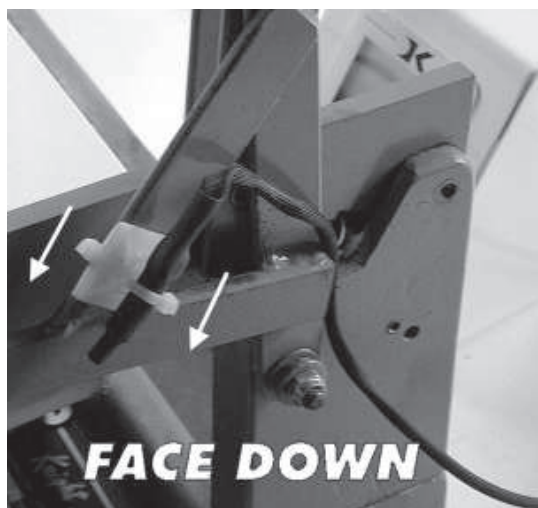
- Reconnect the heat platen to the frame of the machine. Tilt the front of the heat platen upward in order to screw the pressure screw back into the heat platen.

- Make sure the wire harness traveling to the controller passes underneath the crossbar of the frame.

Step I2 - Attach timer tilt switch

- Attach the timer tilt switch to the side handle of the clamp assembly on the frame. This will signal to the digital controller when the press is closed.

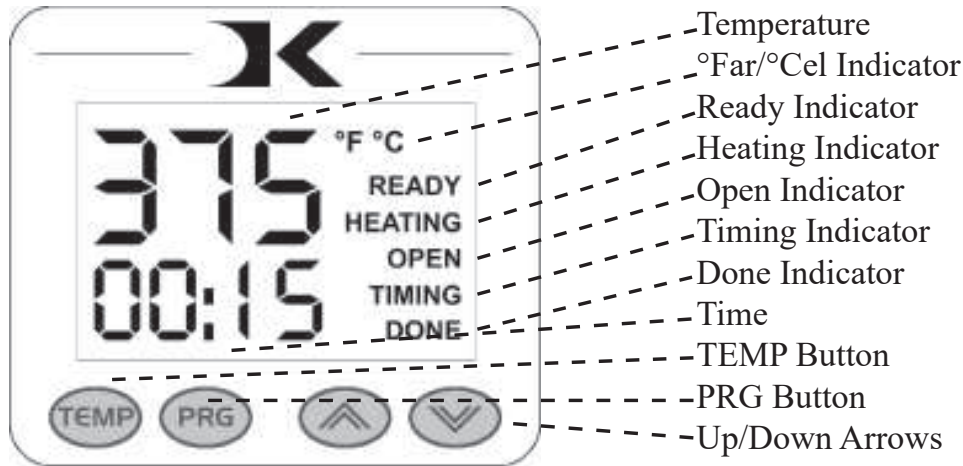
- Peel off the backing and stick it to the side handle as shown, then wire tie it around the handle brace as well.



Start Up

The press is now ready to operate. Plug the modular power cable into the back of the *Digital Knight* controller, and turn the on/off switch on. Please refer to the following illustration of the various terms on the controller.

Default Operating Mode of Controller



Setting Time

The time setting is always editable in the default operating mode of the controller. The left two digits of the time display are minutes. The right two digits are seconds. This can be changed to Hours/Minutes in the User Options Menu.

- Use the Up & Down arrow keys to change the time.
- Hold the Up or Down arrow key down to increment the values quickly. After a brief pause, the values will accelerate.
- Press the Up & Down arrow keys together to clear the setting to 00:00
- When the press is closed, the timing cycle starts. The “TIMING” indicator will appear.
- When the timing cycle is finished, the “DONE” indicator will appear.
- Depending on the timer alarm chosen, the alarm may continue to sound at the end of the timing cycle until the press is opened.
- When the press is opened up, the “OPEN” indicator will appear.



Setting Temperature

In the default operating mode of the controller, the displayed temperature is the **Current** temperature. This is the actual temperature of the heat platen surface. Please note that the operating range of the controller is from 150°F to 550°F (65°C to 288°C). During the first heat up cycle of the press, the controller will display 150°F (65°C) until the heat platen temperature rises above that temperature.

The **Set Point** temperature is the temperature the operator sets the press for. This is the value the press will regulate the **Current** temperature based on. The set point temperature may be changed whenever necessary:

- When in the default operating mode, press the TEMP button.
- The Current temperature will be replaced by the *blinking* Set Point temperature.
- Use the Up & Down arrow keys to change the Set Point temperature.
- Hold the Up or Down arrow key down to increment the values quickly. After a brief pause, the values will accelerate.
- Press the Up & Down arrow keys together to set the temperature to 350.
- When finished setting the temperature, press the TEMP button to return to the default operating mode.



- The control will regulate the heat platen temperature based on the set point temperature. When the temperature falls below the Set Point, the “HEATING” indicator will appear.
- When the temperature reaches the Set Point, the “HEATING” indicator will disappear and the “READY” indicator will appear.
- If the Set Point temperature is set to a temperature below the Current temperature, the press will wait to cool down to that Set Point. At that time, neither the “READY” or “HEATING” indicators will appear.

Programmable Presets

This feature is ideal for recalling previously saved settings from various different applications. The presets are extremely easy to use, and bring a powerful level of accuracy to heat transfer pressing.

For example, the user may have Setting 00 for Hot-Split T-Shirts. When the user needs to perform that particular application, they simply select Setting 00, and the Current temperature & time parameters are updated. A pressure reference is also displayed, telling the user what pressure to set the press to. The user can then rotate the pressure knob until the gauge displays the same value that was stored and displayed by the preset.

This allows the user to quickly change from one application to another with extreme accuracy. Over time, the user will save many different settings in the presets based on the best results for every application. When those presets are selected, the user is immediately returned to the proper settings, without time consuming experimentation and risk of unsuccessful applications.

- From the default operating mode, to select a preset, press PRG.
- Use the Up & Down arrow keys to select a preset (00 - 70).
- Press PRG to update the current settings and return to the default operating mode.
- To edit or add a new preset, select the preset to be added/updated.
- Press TEMP to cycle through Temperature, Time & Pressure values.
- The editable value will flash indicating it may be changed.
- Use the Up & Down arrow keys to change values. Pressing Up & Down together when editing the temperature value resets it to 350, and 00 for time.
- After setting the pressure value, pressing PRG again will bring the user back to the preset selection screen.
- The user may press PRG to update the current settings and return to the default operating mode, or select another preset for editing/adding.



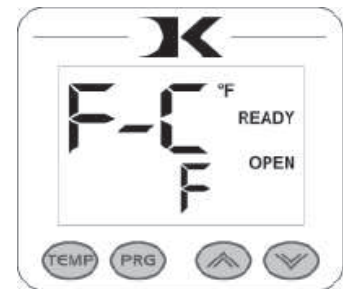
User Options Menu

The user options menu is a set of features and calibration options that are programmable and adjustable by the user. It consists of a set of menu items that can be scrolled through. Each menu item is a feature whose values can be viewed and /or changed. To enter the user options menu:

- From the default operating mode, press the TEMP & PRG keys simultaneously.
- If the keys are not pressed exactly at the same time, you may enter the temperature edit mode, or the presets mode. Exit either of those modes and try again.
- To cycle from one menu item to the next, press PRG.

Fahrenheit / Celsius

The Current, Set Point, and Preset temperature values can be displayed in Fahrenheit or Celsius. To change the value to F or C, use the arrow keys. Press PRG to move to the next menu item.



Timer Counter

The timer displays as factory default Minutes:Seconds. This can be changed to Hours:Minutes. To change to value to HR (hours:mins) or MIN (mins:secs), use the arrow keys. Press PRG to move to the next menu item.



Recorded Pressings

The digital control records the number of pressing cycles completed. This can be very helpful when counting the number of full pressings that have been performed. The value will scroll from left to right. A “-” sign will separate the beginning and end of the number. To reset the count to Zero, press an arrow key. Press PRG to move to the next menu item.



Pressure/Height Gauge Settings

The PrH, PrL, and Prr settings are not applicable to this particular use of the *Digital Knight* controller.

Drop Sense

A temperature alarm is available for warning the user of out-of-range temperature conditions. The user can set this menu item to sound an alarm if the heat platen drops below the Set Point temperature by the amount indicated. This can be helpful when pressing substrates that absorb an unusually large amount of heat, causing the platen to fall in temperature quickly. If the results of the transfer begin to deteriorate, the Drop Sense feature can help the user avoid this.

Use the arrow keys to set the degrees or to turn this feature off. If the Current temperature drops below the Set Point by this amount or more, an alarm will sound. The default value is OFF.



Beep

Normally, all buttons on the keypad beep when pressed. This can be turned off, so all button key-presses are silent. Use the arrow keys to turn this feature On or Off.



Alarms

There are 10 different alarms available to choose from. These alarms are sounded at the end of the timing cycle, as well as if the Drop Sense feature is enabled.

Use the arrow keys to change the values or to turn the alarm off. Please note the different alarms below.



- denotes a short beep.
- _ denotes a longer beep.
- ~ denotes infinite loop.

<u>Alarm #</u>	<u>Alarm Pattern</u>
Off	No alarm
01	•••_
02	•••_~
03	••_
04	••_~
05	•••
06	•••~
07	_~
08	_
09	•
10	• (shorter)



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