BlackJack SolderWerks
BK7050
Pre-Heating System

INSTRUCTION MANUAL

Thank you for purchasing the BlackJack BK7050 Pre-heating System.
Please read this manual before operating the equipment.
Keep manual in accessible place for future reference.

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SAFETY PRECAUTIONS

CAUTION: Improper usage can cause serious injury to personnel and/or damage to equipment. For personnel safety, please follow these precautions:

- Check each component after opening the package to make sure everything is in good condition. Do not use this item if visible damage is seen, report the issue to your vendor.
- Power off unit and unplug the device when moving the device from one location to another.
- Do not subject the main unit to physical shock
  - Never drop or sharply jolt the unit.
  - Contains delicate parts that may break if the unit is dropped.
- Always connect power to a grounded receptacle.
- Tip temperature may reach as high as 480°C when switched ON.
  - Do not use the device near flammable materials.
  - Do not touch heated parts which may include tips, nozzles, barrels.
- Disconnect from power source if the unit will not be used for a long periods. Switch off power during short breaks.
- Use only genuine replacement parts.
- Soldering process produces smoke — use on well ventilated place.
- Do not try to alter or repair unit, bring to a qualified service center for repairs.

PRODUCT DESCRIPTION

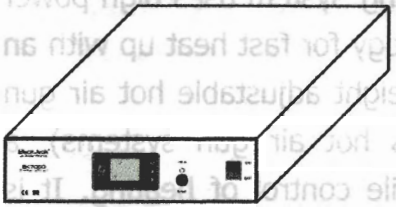
The BlackJack BK7050 Pre-heating System uses high power quartz infrared (IR) heating technology for fast heat up with an effective area of 300 x 300 mm, height adjustable hot air gun mount (compatible with BK series hot air gun systems), a multipoint board holder , and profile control of heating. It is designed for reworking double-sided, diverse technology, and oversized printed circuit boards (PCB) which utilizes traditional or lead free solder.

The system has three types of preheating operation. Type 0 for regular pre-heating or baking. Type 1 for more precise temperature control using the external probes and type 2 for fully automated time and temperature based profile mode.

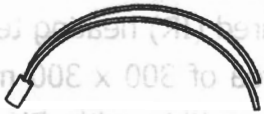
FUNCTIONS and FEATURES

- Microprocessor-controlled closed loop system and ESD safe unit.
- Multipoint board holder.
- 300 x 300 mm pre-heating area utilizing quartz infrared heating technology.
- Two flexible external temperature probes for precise control and monitoring of actual board temperature.
- Profile adjustment functionality for automated reworking tasks under user defined temperature and time settings.
- Compatible for use with either hot air or IR top heating systems.

PACKAGE INCLUSION



7050 Main Station



Temperature probe

Instruction Manual

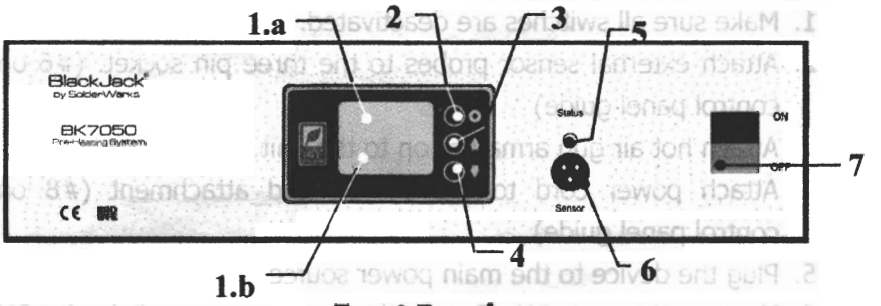
Hot air gun armature

SPECIFICATIONS

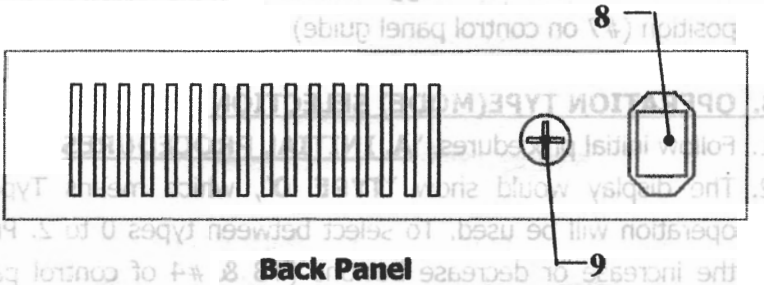
Power Input:	Available in 110V / 220V
Dimensions:	445(l) x 376(w) x114(h) mm
Power Consumption:	1500W (maximum)
Temperature Range:	50°C - 400°C(^maximum)
Heating Element:	IR Heating
Pre-Heating Area:	300mm x 300mm

Specifications are subject to change without prior notice

CONTROL PANEL GUIDE



Front Panel



Back Panel

LEGEND:

1 — Digital Display
  1.a Top Display
  1.b Bottom Display
2 — Selection button.
3 — Increase Button/ Enter button.
4 — Decrease Button.
5 — Status LED.
6 — External Sensor connector
7 — Main Power switch.
8 — Power cord attachment.
9 — Fuse holder.

Suffix guide:

A - Set temperature for type 0 and 1 operation.

b - Actual Temperature of Sensor 1 (Marked B)

c - Actual Temperature of Sensor 2 C

d - Actual Temperature of Internal Sensor

C - Set Temperature for profile.

t - Set duration/time (seconds) for profile.

OPERATING PROCEDURES

A. INITIAL PROCEDURES

1. Make sure all switches are deactivated.
2. Attach external sensor probes to the three pin socket. (#6 on control panel guide)
3. Attach hot air gun armature on to the unit.
4. Attach power cord to the power cord attachment (#8 on control panel guide)
5. Plug the device to the main power source.
6. To turn the unit ON. Toggle the main power switch to ON position (#7 on control panel guide)

B. OPERATION TYPE(MODE) SELECTION

1. Follow initial procedures, "**A. INITIAL PROCEDURES**".
2. The display would show "**TYPE 0**", which means Type 0 operation will be used. To select between types 0 to 2. Press the increase or decrease buttons (#3 & #4 of control panel guide).
3. To confirm selection and enter into operation mode using the selected type. Press the selection button.(#2 of control panel guide)

C. TYPE "0" OPERATION

This type of operation utilizes the internal temperature sensor to control the heat. Using this type frees up the two extra external temperature probes for additional monitoring. Attach the two extra temperature probes to areas of interest such as the bottom of the board and top of the board near the components to be worked on for monitoring.

1. To set the desired temperature press the selection button repeatedly until the top display shows "**Set**". The bottom display would show the current set temperature followed by a suffix "**A**".

OPERATING PROCEDURES

2. Press the increase or decrease button to adjust the set temperature level. The set temperature is adjustable from 50 to 400 C in this type of operation.
3. To view the actual temperature read by the internal temperature probe, repeatedly press the selection button until the top display shows the word **"Act3"**, and the bottom display shows the actual temperature of internal temperature probe followed by a suffix **"d"**.
4. To view the actual temperature read by the external temperature probe "b", repeatedly press the selection button until the top display shows the word **"Act1"**, and the bottom display shows the actual temperature of first external temperature probe followed by a suffix **"b"**.
5. To view the actual temperature read by the external temperature probe "c", repeatedly press the selection button until the top display shows the word **"Act2"**, and the bottom display shows the actual temperature of second external temperature probe followed by a suffix **"c"**.
6. To simultaneously view the actual temperature read by the first and Second external temperature probe, repeatedly press the selection button until the top display shows a suffix **"b"**. and the bottom display shows a number with suffix "**c**".

Note: External temperature probes have stickers attached to differentiate each other. The first probe is marked with "B" while the second is marked with "C"

OPERATING PROCEDURES

D. TYPE "1" OPERATION

Before proceeding with this type of operation, attach the first external temperature probe to the underside of the PCB to be worked on. The second probe can be placed near areas of interest.

This type of operation utilizes the first external temperature sensor (Marked "B") to control the heat. Using this type of operation allows us to closely control the temperature at board level. While freeing up the second external temperature probe for additional monitoring.

1. To set the desired temperature press the selection button repeatedly until the top display shows "**Set**". The bottom display would show the current set temperature followed by a suffix "**A**".
2. Press the increase or decrease button to adjust the set temperature level. The set temperature is adjustable from 50 to 280 C in this type of operation.
3. For this type of operation we must closely monitor the actual temperature of the first external temperature probe. To view the actual temperature readout of this probe repeatedly press the selection button until the top display shows the word "**Act1**", and the bottom display shows the actual temperature of first external temperature probe followed by a suffix "**b**".
4. To view the temperature of the second external temperature probe or simultaneously view both external temperature probe's temperature:

- Repeatedly press the selection button until the top display shows "**Act 2**" and bottom's suffix shows "**c**" this displays the second temperature probe.
- Repeatedly press the selection button until the top shows the first temperature probe with suffix "**b**" and the bottom shows the second temperature probe with suffix "**c**".

5. Under type "**1**" mode of operation it is not necessary to monitor the internal temperature sensor's read out.

OPERATING PROCEDURES

D. TYPE "2" OPERATION

Before proceeding with this type of operation, attach the first external temperature probe (Marked "B") to the underside of the PCB to be worked on. The second probe can be placed near areas of interest. Such as near the component to be worked on.

This type of operation utilizes the first external temperature sensor to control the heat. Type **"2"** operation uses the profile to slowly control the rise and fall of the temperature at board level. While the second external temperature probe can be attached for additional monitoring.

1. To enter type "**2**" mode. Select 2 at the initial screen then press the select button. The display would change to **"run Prof"**. This signifies we are now in the type "**2**" mode.
2. To adjust the time and temperature profile of each segment press the selection button. The top display will show which segment "**SEG1**" we are currently adjusting while the bottom display shows whether we are adjusting the time (suffix **"t"**) or temperature (suffix **"C"**).
3. Press the increase or decrease button to adjust the desired time and temperature. The set temperature is adjustable from 50 to 250 C and time 5 to 200 seconds.
4. To start preheating with the profile, repeatedly press the selection button until the display shows the word **"Run Prof"** then press the increase button. A 3 second countdown will commence before automated reworking starts.
5. To see the running time, or current segment the system is processing or the temperature of the external temperature probes. repeatedly press the selection button to switch between different views. Follow the suffix guide to determine displayed temperature.

OPERATING PROCEDURES

6. After the process is finish the display will show **"End"**, press the increase button to save the profile and exit to profile adjustment mode.
7. To exit before the process is finished press the increase button while the profile is running. The system would exit and return to profile adjustment mode.

Note: There is a built in protection feature to automatically limit the temperature rising slope to no more than 3 degrees per second. Therefore based on your set time, the maximum temperature may not reach 250C.

Sample Profile analysis:

SEG1	SEG2	SEG3	SEG4	SEG5	SEG6
050t	060t	080t	050t	040t	60t
100C	150C	180C	190C	195C	100C

Segment one is set to 50 seconds to reach 100C. Which means after 50seconds at the end of segment one the temperature should reach 100C. Then Segment two is set to 60 seconds to reach 150C, which means by the end of 60 seconds the set temperature should reach 150C, so on and so forth.

To check the slope from segment Two :

- 150C - 100C =30C
- Time to reach 150C is set to 60seconds.
- Therefore the slope is 50/60= 0.833 degrees per second increase.

To determine the slope if it is declining as seen in segment six:

- 195C - 100C =95C
- Time to reach 100C is set to 60seconds.
- Therefore the slope is 95/60= 1.58 degrees per second decline.

Recommended Working Profile :

SEG1	SEG2	SEG3	SEG4	SEG5	SEG6
060t	060t	060t	050t	040t	30t
100C	130C	150C	172C	180C	180C

BASIC TROUBLESHOOTING GUIDE

PROBLEM 1: THE UNIT HAS NO POWER

1. Check if the unit is switched ON.
2. Check the fuse. Replace with the same type if fuse is blown.
3. Check the power cord and ensure there are no disconnections.
4. Verify that the unit is properly connected to the power source.

PROBLEM 2: PANEL DISPLAYS "Err" MESSAGES

DESCRIPTION: Display show **"SEnS" "Err"** messages. \

SOLUTION: Turn off power and back on.

If err messages shows err0 or err1 check the connection of sensor to its receptacle. Check if the temperature probe tip is still intact.

If err messages shows err2 internal temperature connector might have come loose or needs to be replaced.

If err messages shows err3, the external temperature probe "b" was not detected, secure the external temperature on the underside of the board to be worked on.

PROBLEM 3: DISPLAY AND OTHER DEVICE OPERATION ISSUES

SOLUTION: Turn off power and back on.

OTHER PROBLEMS NOT MENTIONED:

Contact the vendor.

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If err messages shows err3, the external temperature probe "o" was not detected, secure the external temperature on the underside of the board to be worked on.

PROBLEM 3: DISPLAY AND OTHER DEVICE OPERATION ISSUES

SOLUTION: Turn off power and back on.

OTHER PROBLEMS NOT MENTIONED:

Contact the vendor