

SBC unit specifications

Operating temperature	0-50°C
Power requirements	35 watts at 15 volts
Hard drive	160 GB SSD min
RAM	2 GB
Processor	Intel Atom 1.66GHz Dual Core Hyper Threaded Processor
Operating system	Windows Embedded Standard
USB	Four USB 2.0 ports

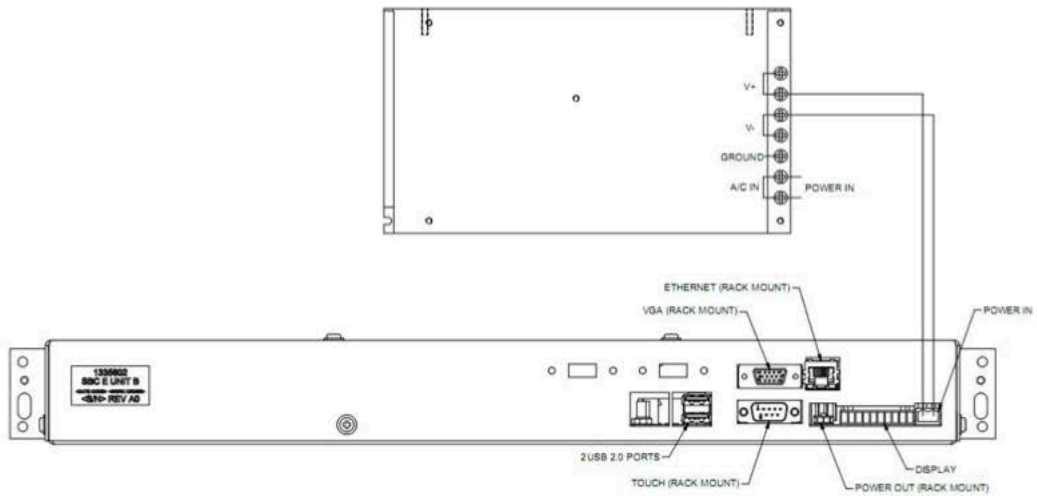


Figure 2. Rear view of the SBC unit and power supply

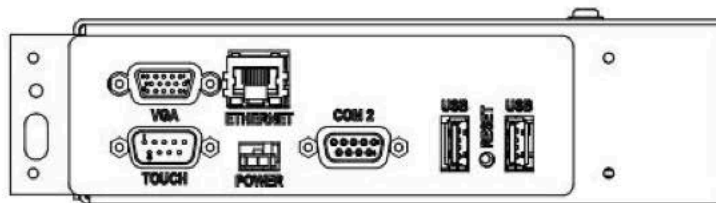


Figure 3. Detail of the front side of the SBC unit

Required components

The 8800 enhanced display module requires three separate components to be operational: the 8800 SBC (single board computer) unit, a power supply, and a touch screen monitor. The SBC unit comes in two versions, an SE version and a rack mount version. The only difference between the two is the location of the connectors for the touch screen monitor (VGA, TOUCH, ETHERNET, and POWER). The SE version has all of these connectors coming out the front of the box and the rack mount has these routed to the back. The SE version SBC unit is intended for use on SE chambers; the rack mount version of the SBC unit is intended for use in applications where a cleaner front side of the box is desired. Either option can fit into a standard 19-inch rack.

Power supply

The 8800 power supply is a 150-watt, 15-volt, off-the-shelf power supply. It is intended to be mounted in the electrical compartment and hooked up to the 8800 with general 16 AWG hook-up wire (a pluggable terminal block is provided on the 8800). All of the power required by the 8800 is supplied by this power supply, which means an 8800 can operate outside of a chamber without a control module.

SBC unit

The SBC unit contains the single board computer (SBC), hard drive, and a circuit board assembly that distributes power to the components of the 8800 and provides the interface between the SBC and the control module. The SBC unit has connectors coming out of two sides. The front side is shown above in Figure 3. The back side is shown in Figure 2. Refer to these two figures for the connector descriptions shown below:

- Power in** The 15-volt power supply is connected to this connector located on the back of the SBC unit. Positive voltage is connected to pin 1, which is on the left when facing the connector as shown in the diagrams. The 8800 unit consumes a worst case 35 watts of power. The power supply has been sized to work over a 0-70°C operating range.
- Display** The display connector located in the back of the SBC unit is the connection point to a control module. The pins of this connector are numbered left to right when facing the back of the SBC unit as shown in Figure 2. The 8800 does not need the power pins in the display cable, but they can be connected and energized without harming the SBC unit.
- COM 2** An extra serial port is provided on the front of the SBC unit to enable the 8800 to communicate with a personal computer using Thermotron's serial communications protocol. This port will only handle RS-232 communications, but it has a standard 9-pin, female, D-subminiature connector with a pin-out compatible with the standard 9-pin RS-232 pin-out. Any off-the-shelf RS-232 cable will work with this port. Any other communications protocol (RS-422, RS-485, TCIP, or GPIB) will have to be done through the control module.
- USB** Four standard USB 2.0 ports have been provided: two on the front side and two on the back side of the SBC unit. These ports will work with any standard USB cable or device. The 8800 can handle four high-power USB devices (500 mA per port) at the same time.
- Reset** A recessed hardware reset button has been provided in case problems ever arise with the system. This button may be pressed by pushing a small, pointed object into the hole between the USB connectors on the front of the SBC unit.

CAUTION: Because any unsaved setup or programming data will be lost after a reset, performing a reset while editing setup data or entering programs is not recommended.

The following four connectors are part of the monitor connector cluster. They are located either on the front of the SBC unit for an SE version (as shown in Figure 3), or in the back of the SBC unit for a rack version (as shown in Figure 2). A special cable harness that contains all of the cabling necessary to run the monitor in one sheath has been designed and built.

VGA	The VGA connector is a standard high-density, 15-pin, female D-subminiature connector intended to connect the LCD monitor to the SBC on the 8800. Any standard VGA cable will work in this situation, but a special cable harness that contains all of the cabling necessary to run the monitor in one sheath has been designed and built.
Touch	The communication between the SBC and the touch screen controller is done on a standard RS-232 serial port. This connector has been dedicated for that purpose and is a standard 9-pin, male, D-subminiature connector. The pin-out of this connector abides by the 9-pin serial standard, so that any standard female-to-male RS-232 cable will work.
Power out	This connector provides power for the LCD monitor. The power supply behind this connector has been sized to power a 12-volt, 15-watt, 12.1-inch monitor.
Ethernet	The Ethernet connector is part of the monitor connector cluster due to space reasons only. This connector is a standard 8-pin, RJ45 connector, but only makes use of four pins (two twisted pair). It is intended to enable a personal computer to communicate with an 8800 over a standard Ethernet network.

Troubleshooting procedures

NOTE: If you need to reinstall any of the hardware or software, please call the Thermotron Product Support group at (616) 392-6550.

Symptom 1: The touch screen display appears blank

1. Make sure the LCD monitor is turned on.
2. Touch the screen to see if the display comes on.
3. Make sure power is applied to the chamber and SBC unit.
4. Check the cable harness for proper connections and conductivity. Replace any bad cables.
5. Replace the LCD monitor.

Symptom 2: The touch screen does not work, works randomly, or produces incorrect results

1. Calibrate the 8800 touch screen monitor:
 - a. From any screen, hold the stylus against the touch screen for 10 seconds.
 - b. Follow the instructions on the screen.
2. Check the cable connections at connectors P9 or labeled "Touch" on the LCD monitor.
3. Replace the LCD monitor.

Replacing the touch screen monitor

1. Remove power from the chamber.
2. Disconnect the LCD cable harness from the back of the LCD monitor. **NOTE:** The LCD cable harness consists of a VGA cable, RS-232 serial cable, and a DC power cable bundled in one sheath.
3. Remove the four screws connecting the LCD monitor to the mounting bracket. Be careful not to drop the monitor during this process.
4. Attach the new LCD monitor to the bracket with the screws removed in the previous step. **NOTE:** The LCD mounting screws are metric screws and new screws are not provided with new monitors.
5. Reconnect the LCD cable harness to the back of the LCD monitor.