A Quick Start Guide to the Model 22C

BASIC FRONT PANEL OPERATION

Pressing the **Power** key will toggle the controller's AC power on and off. This key must be pressed and held for two seconds.

Pressing the **Stop** key will immediately disengage both control loops. Pressing the **Control** key will engage them.

Pressing the **Home** key will return the screen to the Home display from anywhere in the sub-menus. The Home display is the primary display for instrument status and can be configured by pressing the **Display** key.

CONTROL LOOP SETPOINTS

To access the setpoint for the control loops, press the **Set Pt** key and then use the navigation keys to select Loop #1, 2, 3 or 4. Use the keypad to enter the desired setpoint and press the **Enter** key to set it and return to the Home display.

CLEARING A LATCHED ALARM

During an alarm condition, the Alarm LED on the front panel will light and an audio alarm will optionally sound. To view the status of all alarms, press the **Alarm** key. To reset a latched alarm, press the **Alarm** key and then the **Home** key.

DISPLAY OPTIONS

The display time constant and display resolution fields may be accessed by pressing the **System** key.

The *Display TC* field is used to smooth temperature data with filters from 0.5 to 64 seconds. This is useful in noisy environments to provide stable readings.

```
+Display TC=0.5S
```

The display resolution field, *Display-RS* is used to set the number of significant digits shown in temperature displays. Settings 1, 2 ,3 or Full.

CONFIGURING A TEMPERATURE SENSOR

To configure an input channel for a specific temperature sensor, press the **ChA** key for input A, or the **ChB** key for input B.

The first line of this menu is used to change the sensor units. An example is shown here. Change the sensor units by using the **+** and **0** keys. When the desired units are shown, press the **Enter** key to make the selection. The current temperature is continuously displayed.

```
+ 77.123 K
```

Next, go to the sensor selection field and use the **+** and **0** keys to scroll through the available sensors. When the desired sensor is shown, press the **Enter** key to make the selection.

For advanced information on sensor configuration, see the user's manual section titled "Configuring a Sensor".

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```
+Sen:Pt100 385
```

Sensor	Description
None	Disable input channel.
Cryo-con S900	Cryo-con S900 series Silicon Diode.
LS DT-670	Lakeshore DT-670 series diode.
LS DT-470	Lakeshore DT-470 series diode.
CD-12A Diode	Cryo Industries CD-12A Silicon Diode.
SI 410 Diode	SI-410 Silicon Diode.
Pt100 385	DIN43760 standard 100Ω Platinum RTD.
Pt1K 385	1000Ω Platinum RTD.
Pt10K 385	10KΩ Platinum RTD.
RhFe 27, 1mA	Rhodium-Iron, 27Ω, 1mA excitation
CLTS-2B	Cryogenic linear temperature sensor
SI RO-105	SI RO-105 RuOx sensor.
SI RO-600	SI RO-600 RuOx sensor.
Cryo-con R500	Cryocon R500 Ruthenium Oxide sensor .
Cryo-con R400	Cryocon R400 Ruthenium Oxide sensor.
User Sensor 1-8	User supplied sensor curves 1 through 8.

CONFIGURING A USER SENSOR

User sensors may be entered from the front panel. However, it is much easier to enter them via one of the remote I/O ports. Please refer to the user's manual chapter titled "Cryo-con Utility Software". For details on front panel entry or edits, refer to "Configuring a Sensor".

ETHERNET COMMUNICATIONS

To connect the controller to an Ethernet hub or switch, use a Category 5 'patch' cable. Connecting directly to a computer is done with a Category 5 'crossover' cable.

When properly connected, the **Connected** LED on the LAN connector will light and the **Activity** LED will flicker.

The default IP and subnet masks are **192.168.1.5** and **255.255.255.0**. The user can change this from the front panel by going to the **System** menu. The controller will communicate with any computer on the same address segment.

To view the embedded web page, open an Internet browser and type 192.168.1.5 in the address bar.

The Cryo-con Utility software can be used to communicate with the controller using the Ethernet or any other remote interface. Alternatively, any communications program, such as Hyperterminal, that supports TCP and serial communication can be used.

For more information on remote configuration, refer to the chapter on Remote Interface Configuration in the User's Manual.

CONFIGURING THE LOOP #1 OUTPUT

Before using the Loop #1 (main heater) control output, it is essential that the proper load resistance and output range be selected.

❑ Press the **Loop 1** key to go to the Control Loop Setup menu for Loop #1.

❑ Use the navigation to scroll to the **Htr Resistance** field and then use the **+** and **0** keys to select between a 50Ω and a 25Ω heater and then press the **Enter** key.

❑ Use the navigation keys to scroll to the Range field and then select Hi, Mid, Low or Min.

```
+Htr Resistance:50Ω
```

❑ Next, the control type (usually PID) should be set. This is done by scrolling to the **Type** field and selecting the desired loop control mode.

Range	Max. Output Power	
	25Ω	**50Ω**
Hi	25 W	50 W
Mid	2.5W	5.0 W
Low	0.25 W	0.50 W

Loop #1 Output Ranges

For information on how to determine PID values for the control loop, please refer to the user's manual section titled "Autotuning" for automatic generation, or to "Appendix D: Tuning Control Loops".

| Type	Description
Off	Control loop is OFF.
Man	Manual control mode. A constant heater output power is applied. The **Pman** field selects the output power as a percentage of full-scale.
PID	Standard PID control. The **Pgain**, **Igain** and **Dgain** fields hold the PID values. **Igain** is in seconds and **Dgain** is in inverse seconds.
Table	PID control mode where the PID coefficients are generated from a stored, user supplied PID table.
RampP	Temperature ramp control.
RampT	Ramp using a PID table.

CONFIGURING THE LOOP #2 OUTPUT

The second control loop is a 25-Watt output that is matched to a 50Ω resistive load. Therefore, there are no load resistance to configure.

Range	Max. Output Power
Hi	25 W
Low	0.25 W

Loop #2 Output Ranges

Rear Panel Connections
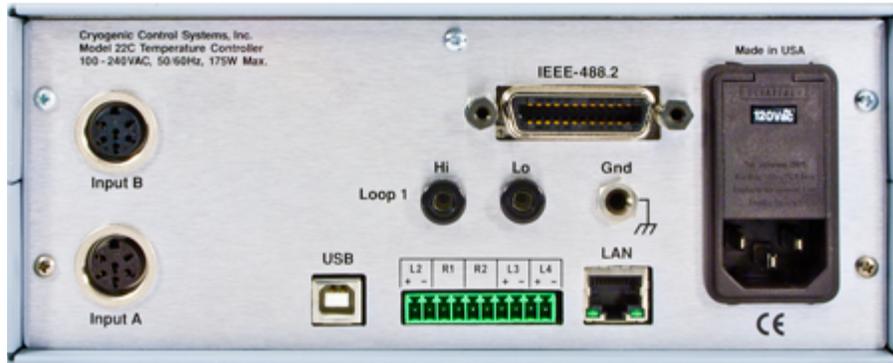
AC POWER CONNECTION

Before connecting AC power, check the input voltage setting through the window on the power entry module to ensure that it is set properly. If not, please refer to the User's Manual section titled Fuse Replacement and Voltage Selection.

SENSOR CONNECTIONS

Silicon Diode and all resistor type sensors should be connected using the four-wire method. It is strongly recommended that sensors be connected using shielded, twisted pair wire. Wires are connected as shown below and the shield should be connected to the metal back-shell of the connector.

Pin	Function
1	Excitation (-), I-
2	Sense (-), V-
3	Aux. Power: 5V
4	Sense (+), V+
5	Excitation (+), I+
6	Not Connected

Rear View

LOOP #1 CONNECTION

Primary Heater Output (Loop #1) connection is made using a dual banana plug. Loop #2, #3 and #4 as well as the relay output connections are made using a 10-pin detachable terminal block.

Ensure that the heater is floating, as grounded heaters are not supported.

For more information, refer to the user's manual section titled "Rear Panel Connections".

Pin	Function	Pin	Function
1	Loop #2 +	6	Relay 2 common
2	Loop #2 -	7	Loop #3 +
3	Relay 1 N.O.	8	Loop #3 -
4	Relay 1 common	9	Loop #4 +
5	Relay 2 N.O.	10	Loop #4 -