



TEMPSTIR™

CG-2032-30

CG-2032-31



OPERATIONS MANUAL

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REV: CG061018

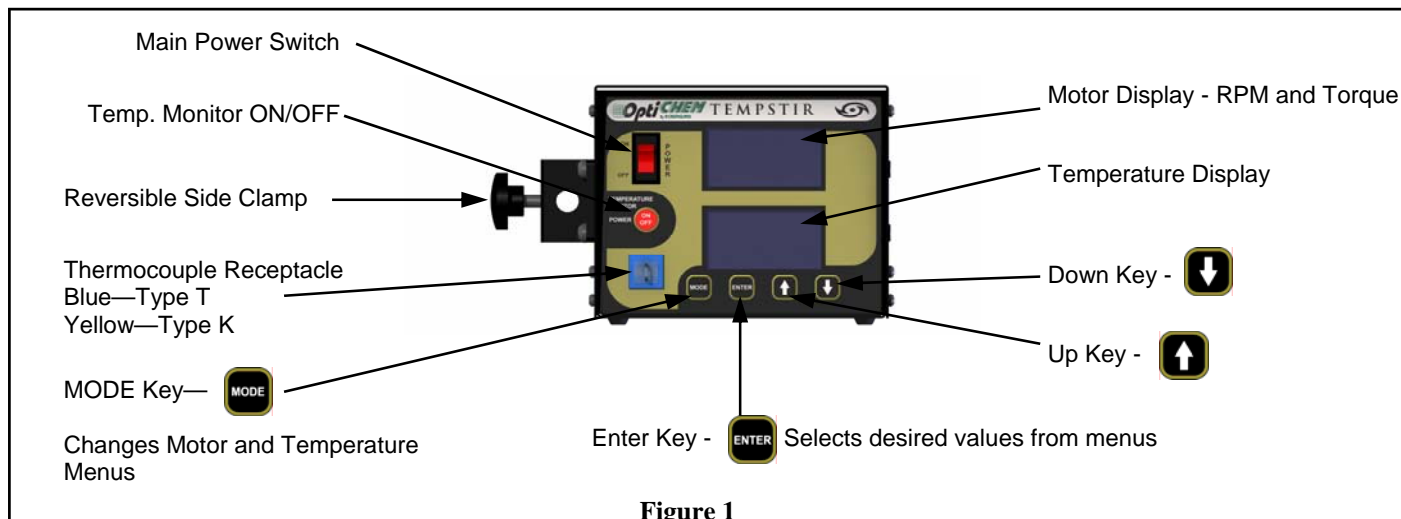
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FEATURES

1. Built in TEMPERATURE MONITOR (Type T, or Type K).
2. Separate display screen for Motor Control (RPM and Torque) and Temperature Monitor.
3. Circuit overload protection.
4. Audible alarm for over temperature set point .
5. Analog output for logging RPM, Torque, and Temperature data.
6. RS485 output to monitor, control, and log all Menu Parameters and data.
7. Reversible side clamp can be mounted on either right or left side of Controller.

GENERAL USE

The TEMPSTIR™ is designed to stir a process reaction from 50 to 500 RPM's and monitor the reaction temperature to +/- 2°C.



SET-UP

(Figure 2)

1. Connect the detachable power cord to the AC Power cord receptacle and plug into a suitable electrical outlet.
2. Connect the 14-pin motor cable (supplied with motor) to 14-pin Motor Connector—Turn to lock..
3. If purchased, connect the RS485 serial communications cord (CG-2032-51) to the RS485 connector.
4. If purchased, connect the Analog cord (CG-2032-50) to the Analog out receptacle.
5. Connect an appropriate thermocouple to the front side Thermocouple receptacle (Type T, or Type K)

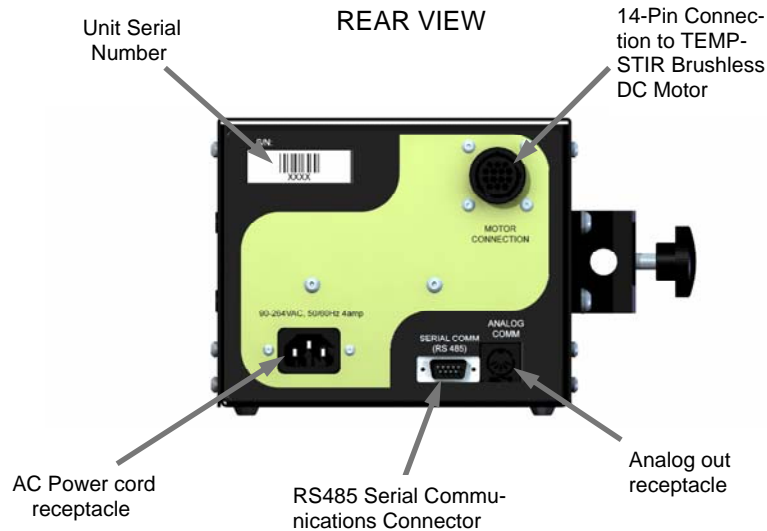



Figure 2



OPERATION - Motor




(See Figure 3)

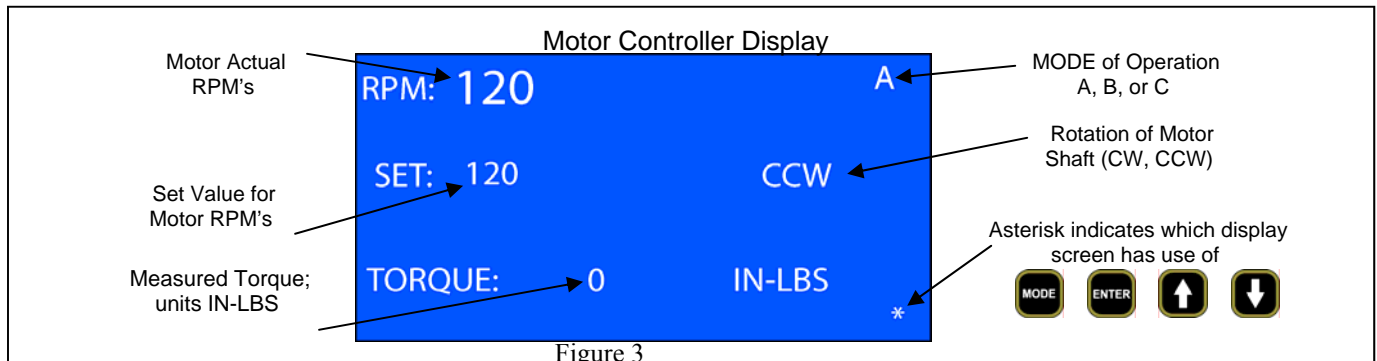
Note: Ensure all connections of Controller and Motor are secure

1. Switch TEMPSTIR™ main Power “ON”, power switch will illuminate.
2. If the Temperature Monitor Function is not going to be used, then press the TEMPERATURE  MONITOR POWER BUTTON. The lower display screen (Temp. Monitor) will go dark.
3. The default Mode of Operation is “A” as indicated in the upper right corner of the display. Modes may be changed by

MODES OF OPERATION	
A	Allows full use of TEMPSTIR functions thru front panel of unit only
B	Same as “A” mode and allows user limited interface thru serial output connections.
C	Same as “A” mode and allow user full interface thru serial output connections






pressing the mode  key (double beep) , the MAIN MENU is displayed. Then select the OPERATING MODE MENU by using the down 

arrow key. Press the Enter  key. Select the desired Mode of Operation using the Down arrow  key and then press the Enter  key. *Quick Tip:* If no key is pressed after a few seconds, then the display will go back to the previous screen. Refer to the Analog/Serial Communications Manual for use of Modes “B” and “C”.










OPERATION - Motor (cont.)

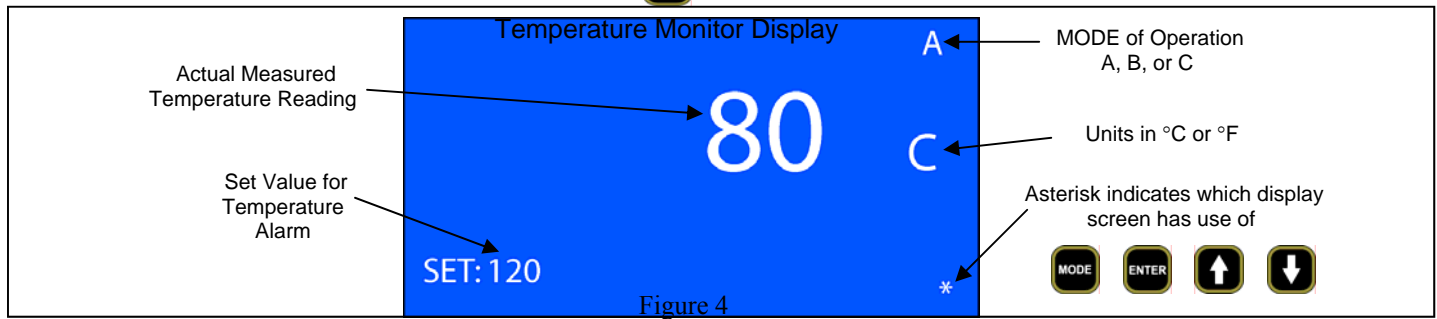
(See Figure 3)

4. Enter the desired RPM setting by pressing the Up arrow  key, release when value is reached. An audible double beep is sounded. *Quick Tip:* The RPM set value can be changed anytime by pressing the   to obtain the desired value.
5. The default rotation of the motor is in a Counter Clock Wise (CCW) direction. The direction can be changed between CCW and Clock-Wise (CW) by pressing the mode  key (single beep) and the arrow up  key (single beep). The rotation can be changed back at any time by using the same method.

OPERATION - Temperature Monitor
















(See Figure 4)

1. In order to make parameter changes to the TEMPERATURE MONITOR DISPLAY SCREEN, the Asterisk must be displayed in the lower right corner of the screen. Press and hold the Enter  key (single beep). The Asterisk will switch from the Motor Display Screen to the Temperature Display Screen each time this is done. *Quick Tip:* Menu changes can only be made to the Display Screen with the Asterisk.
2. To change the Temperature Alarm set value, press the Mode  key (single then double beep). The TEMPERATURE MAIN MENU is displayed. Select the ALARM Menu by using the down  key and Enter  key. Use the   to select the Alarm Set Point. Press the Enter  key three times to return.







OPERATION - Temperature Monitor (cont.)

(See Figure 4)

- To change the Temperature Alarm Deviation set value, press the Mode  key (single then double beep). The TEMPERATURE MAIN MENU is displayed. Select the ALARM Menu by using the down  key and Enter  key. Select the Alarm Deviation by using the down key  and Enter  key. Enter the Deviation value using   keys. Press the Enter  key three times to return. *Note:* the deviation value represents the number of degrees beyond the ALARM Set Value required to initiate the Audible ALARM. 
- To change the Temperature Units set value, press the Mode  key (single then double beep). The TEMPERATURE MAIN MENU is displayed. Select the UNITS Menu by using the down key  and Enter  key. Use the   to select the desired units (Celsius or Fahrenheit). Press the Enter  key two times to return.

MAIN MENU Parameters

The following tables list the Main Menu parameters:

To view and or change menu parameters, press the Mode  key (single then double beep). Use the   and the Enter  key to select the Menu and Parameters.





MOTOR MENU			
SELECT MOTOR	MOTOR A, 30 IN-LBS	N/A	
	MOTOR B, 11 IN-LBS	CG-2032-10	
	MOTOR C, 24 IN-LBS	N/A	
SET ACCEL RAMP	(1-10)	*10 default value	Speed at which motor accelerates
SET DECEL RAMP	(1-10)	*10 default value	Speed at which motor decelerates

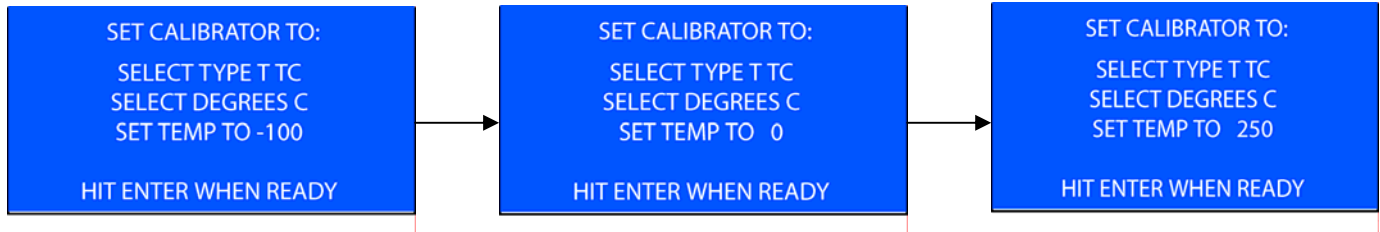
MAIN MENU Parameters (cont.)

LIMITS MENU		
MAX RPM LIMIT	(50-500)	Set RPM value cannot exceed this value
MAX TORQUE LIMIT	(1-20) *11 default value	IN-LBS at which motor responds to Torque Alarm Setting
TORQUE ALARM SETTING	HOLD STOP	Motor will maintain rpm's if value is exceeded Motor will stop if value is exceeded

COMMUNICATIONS MENU		
NETWORK ADDRESS	53 default value	Used to set communications between pcb's









THERMOCOUPLE CALIBRATION

- To recalibrate the thermocouple value, press the Mode  key (single then double beep). The TEMPERATURE MAIN MENU is displayed. Select the TC CALIBRATION Menu by using the down key  and Enter  key. Use the  to select CALIBRATE TC and press Enter key. Follow window prompts to calibrate using a certified calibrator. See Example.



THERMOCOUPLE CALIBRATION (cont.)

NOTE: If the CALIBRATE TC function is inadvertently selected, the Controller must be turned OFF then ON by the Main power switch to clear.

The TC CALIBRATION MENU also includes a TEMP OFFSET feature. A number entered here will offset the thermocouple calibration by that value in degrees (°C or °F) whichever units has been selected previously. This can be used to fine tune or zero out the thermocouple function. To use this feature, press the Mode  key (single then double beep). The TEMPERATURE MAIN MENU is displayed. Select the TC CALIBRATION Menu by using the down  key and Enter  key. Use the  to select TEMP OFFSET and press Enter  key. Select a value using the   then press Enter  three time to return.

MOTOR TEMP OVERLOAD

Under continuous high torque loads the TEMPSTIR Motor can become hot to the touch. An indicator located on the Motor will display a warning should the external motor temperature reach about 50°C. **NOTE:** Use CAUTION regardless when handling the motor after it has been running for an extended period of time. An internal device located inside the motor itself will cause the motor to shut down, to protect the motor should the internal temperature exceed 120°C.

ANALOG COMMUNICATIONS

The Tempstir is equipped with three analog outputs. These outputs provide a 0-4vdc signal for speed, temperature, and torque. See the attached chart for scaling parameters. †

Parameter	Range	Voltage per unit	Output Voltage
Speed:	0 to 500RPM	.008vdc/RPM	0-4vdc
Temperature Type T:	-100°C to 250°C -148°F to 482°F	.011vdc/°C .006vdc/°F	0-4vdc 0-4vdc
Temperature Type K:	-100°C to 400°C -148°F to 752°F	.008vdc/°C .004vdc/°F	0-4vdc 0-4vdc
Torque:	0 to 30 in-lbs	.133vdc/in-lb	0-4vdc

ANALOG COMMUNICATIONS CABLE PART NUMBER: CG-2032-050

PIN & COLOR CODE	OUTPUT
PIN1 (BLACK):	GND
PIN2 (GREY):	RPM
PIN3 (WHITE):	GND
PIN4 (BROWN):	TORQUE
PIN5 (BLUE):	TEMPERATURE

† SCALED PER STANDARD MOTOR (B). SCALING FOR OTHER MOTOR SUPPLIED WITH MOTOR DOCUMENTATION.

RS485 COMMUNICATIONS

The Tempstir is equipped with a RS485 communications port. The unit may be remotely monitored and controlled using the RS485 communications parameters. The easiest method to communicate is via windows HyperTerminal but other software available on the market that can be easily configured to communicate with the Tempstir.

Communications Setup:

Baud rate: 9600 †
Data Bits: 8 †
Parity: None †
Stop Bits: 1 †
Flow Control: None †
† (*preset non-programmable*)
Address: selectable 1 to 255

Communications Mode:

Mode A: No RS485 communications allowed all control done from Tempstir front panel.
Mode B: Limited RS485 communications allowed values may only be monitored, no changes allowed. All changes made from Tempstir front panel.
Mode C: Full RS485 communications allowed. Changes can be made via RS485 or the Tempstir from panel.

RS485 COMMUNICATIONS

Changing and Monitoring Values

Parameter Input: <command><address><,><value><return>

Example: RT53,1 will read back the current temperature from the Tempstir with the address 53

Note: to change the RPM value the appropriate input is SP<address>,+0_ _ _ <return>. The +0 must be used in front of the desired RPM value each time. Example: SP53,+0100

RS485 COMMUNICATIONS

COMMAND	VALUE	DESCRIPTION
RT	7	READ OVERTEMP ALARM (Y=YES, N=NO)
RV	1	READ CURRENT RPM
RV	2	READ CURRENT DIRECTION (R =CW, L=CCW)
RV	3	READ ACCELERATION RAMP (0-10)
RV	4	READ DECELERATION RAMP (0-10)
RV	5	READ RPM MAX SETPOINT
RV	6	READ TORQUE ALARM SETPOINT
RV	7	READ CURRENT TORQUE VALUE (IN-LBS)
RV	8	READ SELECTED MOTOR (1 = A, 2 = B, 3 = C)
RV	9	READ TORQUE ALARM (Y=TORQUE ALARM, N=NO ALARM)

RS485 COMMUNICATIONS

COMMAND	VALUE	DESCRIPTION
RV	0	READ TORQUE ALARM SETTING (H=HOLD, S=STOP)
TA	-0100 TO +0400	SET TEMPERATURE ALARM DEVIATION SETPOINT
TB	-0100 TO +0400	SET TEMPERATURE SETPOINT
TU	C OR F	SET TEMPERATURE UNITS
SA	0 TO 10	SET ACCELERATION RAMP
SD	R OR L	SET STIRRING DIRECTION (R=CW, L=CCW)
SE	0 TO 10	SET DECELERATION RAMP
SF	H OR S	SET TORQUE ALARM SETTING (H=HOLD, S=STOP)
SM	1 OR 2 OR 3	SET SELECTED MOTOR (1 = A, 2 = B, 3 = C)
SP	+0000 TO +0500	SET RPM

RS485 COMMUNICATIONS

COMMAND	VALUE	DESCRIPTION
SR	+0000 TO +0500	SET MAXIMUM RPM LIMIT
ST	0 TO 30	SET TORQUE ALARM SETPOINT

STEP 1: Open HyperTerminal and Name your project. Then Click the OK button.

STEP 2: Select the port the Serial Communications cable is attached to. Then Click the OK button.

SETTING UP HYPERTERMINAL FOR COMMUNICATIONS:



RS485 COMMUNICATIONS

STEP 3: Set the Port Settings.

Bits per second = 9600

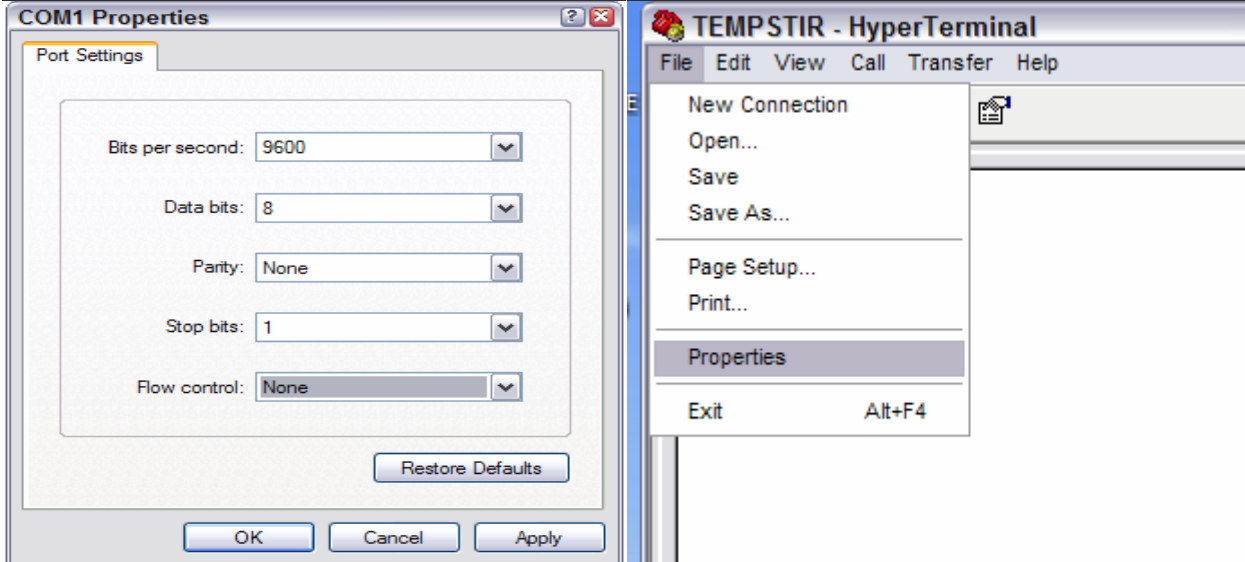
Data Bits = 8

Parity = None

Stop Bits = 1

Flow Control = None

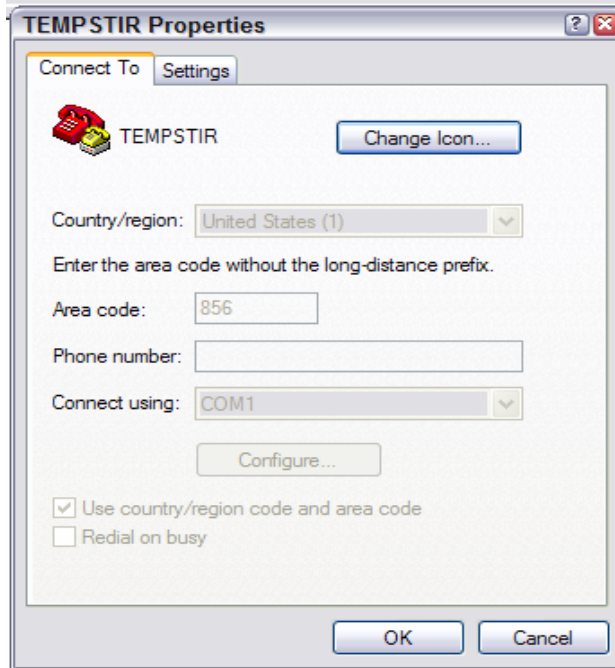
STEP 4: Select Properties under the File menu on the taskbar.



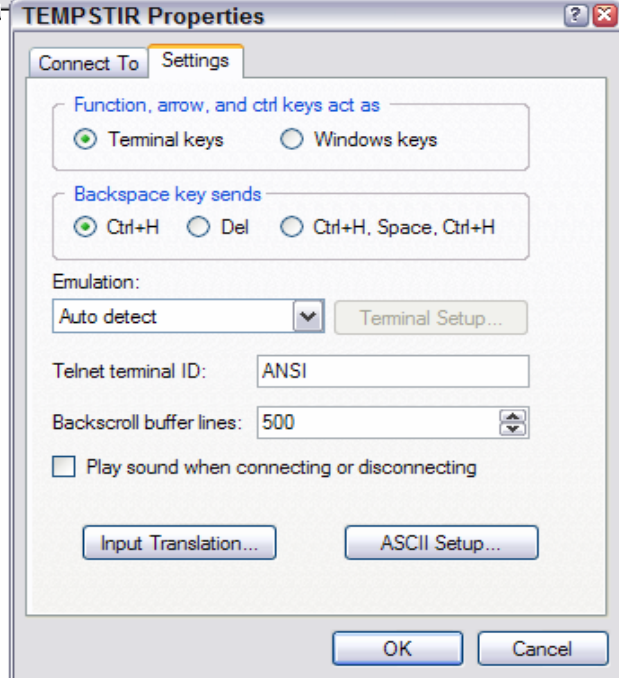
RS485 COMMUNICATIONS

STEP 5: Select the Settings Tab under the Properties Manager.

STEP 6: Select the Settings Tab under the Properties Manager. Then press the ASCII Setup button.



The dialog box is titled "TEMPSTIR Properties" and has two tabs: "Connect To" and "Settings". The "Connect To" tab is selected. It features a red telephone icon and the text "TEMPSTIR" with a "Change Icon..." button. Below this, there is a "Country/region:" dropdown menu set to "United States (1)". A note says "Enter the area code without the long-distance prefix." The "Area code:" field contains "856". The "Phone number:" field is empty. The "Connect using:" dropdown menu is set to "COM1". There is a "Configure..." button. At the bottom, there are two checkboxes: "Use country/region code and area code" (checked) and "Redial on busy" (unchecked). "OK" and "Cancel" buttons are at the bottom right.



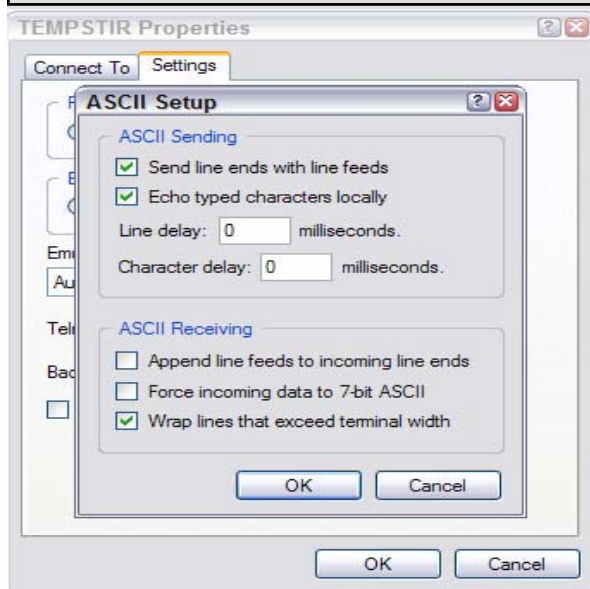
The dialog box is titled "TEMPSTIR Properties" and has two tabs: "Connect To" and "Settings". The "Settings" tab is selected. It features a section for "Function, arrow, and ctrl keys act as" with radio buttons for "Terminal keys" (selected) and "Windows keys". Below this is a section for "Backspace key sends" with radio buttons for "Ctrl+H" (selected), "Del", and "Ctrl+H, Space, Ctrl+H". The "Emulation:" section has a dropdown menu set to "Auto detect" and a "Terminal Setup..." button. The "Telnet terminal ID:" field contains "ANSI". The "Backscroll buffer lines:" field contains "500". There is an unchecked checkbox for "Play sound when connecting or disconnecting". At the bottom, there are "Input Translation..." and "ASCII Setup..." buttons. "OK" and "Cancel" buttons are at the bottom right.

RS485 COMMUNICATIONS

STEP 7: Select The following options.

- Send Line ends with line feeds
- Echo typed characters locally

Then press OK at each screen and exit the properties window. At this point you are ready to type the commands into HyperTerminal to communicate with your Tempstir unit.



TO COMMUNICATE USING THE RS485 PORT A COMMUNICATIONS CABLE WITH RS232 TO RS485 CONVERTER IS REQUIRED. THIS CABLE MAY BE PURCHASED FROM CHEMGLASS:



- RS485 COMMUNICATIONS CABLE WITH RS232 TO RS485 CONVERTER: CG-2032-51

SPECIFICATIONS

Supply Voltage - 120VAC or 240VAC +/-10%, 50-60 Hz
 Ambient Temperature - 0 to 40°C, 32 to 104°F

Dimensions h x w x d (in) - 5 7/8 x 6 7/8 x 5 7/8
 Current draw - 4 AMPS

TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
No display when unit is switched ON	Blown fuse, no power from source	Replace fuse. Check source circuit
OPEN TC 	Thermocouple is not connected or there is a break in thermocouple	Connect or replace defective thermocouple
Under Range !	Measured temperature is below TC range	A different TC type may be required
OVER TEMP 	Measured temperature exceeds ALARM and Deviation Set Values	Lower reaction temperature. Reset ALARM and/or Deviation values. See pages 6-7
Motor Shutdown	Excessive internal heat. Torque limit reached	Allow motor to cool. If torque limit is at peak, then motor may be insufficient



Warranty

Chemglass, Inc. warranties this unit against defects in material and workmanship for a period of one year from the date of sale. If the unit should malfunction, it must be returned for evaluation. If the unit is determined to have a defect in materials or workmanship, then it will be repaired or replaced at no charge. Tampering with the unit or damage resulting from excessive current, heat, moisture, vibration, corrosive materials, or misuse will void this warranty. Programming changes or reconfigurations are not covered under warranty.

To return this item under warranty, advise the Chemglass Electronic department of the issue and they will provide you with a return authorization number. The unit will be evaluated and repaired as required in accordance to the warranty.

Please contact the Chemglass Electronics department with warranty repair information.

Chemglass Electronics department:

Tel: 1-800-843-1794 ext. 2124

Fax: 1-800-922-4361

Email: electronics@chemglass.com