−KEM Scientific, Inc.
Instruments for Science from Scientists

KEM Comm Communications Software for J-KEM Controllers

Using your Kemcomms software requires three steps.

1. Software installation.
2. Connecting your J-KEM controller to the serial port of the PC.
3. Opening the KemComm software.

Kemcomms software allows you to observe real-time data from one or multiple controllers on-screen, change setpoints, set over- and under-temperature alarms, and log data to the PC. With the proper communications network, a single PC can actually monitor, control, and log data from 32 controllers simultaneously.

Index

Software Installation
1. Insert the Kemcomm disk into the PC. Open the disk and double click on the "Setup.exe" icon.

2. Follow the on-screen directions for software installation.

3. When installation is complete;
    1 Open the 'Program Files' folder on the C drive.
    2 Open the 'J-KEM' folder inside the 'Program Files' folder.
    3 Open the 'Kemcomms' folder inside the 'J-KEM' folder.
    4 From the KemComm software disk, copy the folder titled "Application Files" (and all of its content) into the 'Kemcomms' folder on the C drive.
    5 Close all folders and save the floppy disk.

Setting up Serial Communications Between the PC and the Controller
J-KEM supports two communication protocols, the RS-232 protocol (most common) and the RS-485 protocol (used for controller networks).   The difference between the two protocols is how the controller connects to the system.

How do I know what system I have?   RS232 systems have a 9-pin serial connector (DB9) on the back of the controller just like the 9-pin connector on the back of a PC.   RS485 systems have a phone plug connector (RJ12) on the back of the controller.

Hardware Setup
For RS232 Systems:
Plug one end of the 9-pin serial cable into the comm port of your PC and the other end into the connector on back of the J-KEM controller.   Tighten the cable to insure a secure connection. Turn power to the J-KEM controller on.   Proceed to the section titled "Software Setup".

For RS485 Systems:
Since PC's use RS232 communications you must place a RS232 to RS485 converter between the communications outlet of the PC and the communications inlet of the first connected controller. Additional controllers can be added to the network, up to a total of 32 meters.
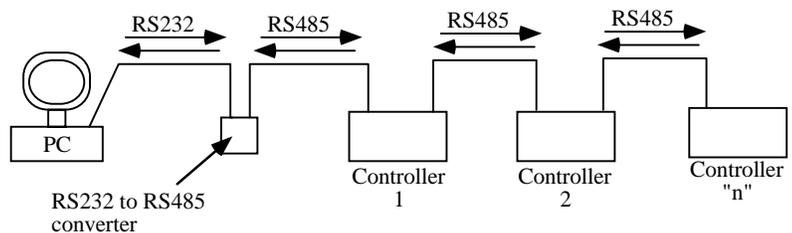
Attach the female end of the RS232 to RS485 converter (converter and 25- to 9-pin adapter) to the 9-pin comm port on the back of the PC.   Connect the female end of the DB9 to RJ12 cable (i.e., the cable with a phone connector) to the male end of the RS232 to RS485 converter.   Insert the RJ12 plug into either phone port (i.e. RJ12 receptacle) on the back of the temperature controller.   Additional controllers can be added to the network by connecting the second RJ12 port on the back of the first controller to either RJ12 ports on the second controller, this process can continue until up to 32 meters are attached.   RJ12 wire (6-wire cord) must be used to make this connection (available from J-KEM). For multi-controller systems, it's predictable that there will be controller address conflicts.   This situation is easily resolved, just call J-KEM for assistance.

NOTE: Mulit-meter controllers equipped for serial communications, such as Gemini, HCC, and Quad temperature controllers, have an internal RS232 to RS485 converter built in.   This makes it possible for controller networks to be built from these units.

Software Setup

1. Start the Kemcomms data acquisition software by selecting the Kemcomms icon from the Programs sub-menu of the Start menu of Windows 95, 98 or NT.

> NOTE: you may find it easier to move a copy of the Kemcomms icon to the desk top of your PC, which will allow you to start your software simply by double clicking of the icon you create on the desk top.
>
> Creating a shortcut icon to the Kemcomms program.
> 1. Open the 'Program Files' folder on the C drive.
> 2. Open the 'J-KEM' folder inside the 'Program Files' folder.
> 3. Open the 'Kemcomms' folder inside the 'J-KEM' folder.
> 4. Left click and drag the application 'Kemcomms' [or 'Kemcomms.exe'] inside the J-KEM folder to anywhere on the desk top. A new icon will appear on the PC desk top titled 'Shortcut to Kemcomms'.
> 5. Close all open folders.
> 6. Double click on the 'Shortcut to Kemcomms' icon you created to start the software.

2. When the software is started a blank gray screen appears. At this point the software needs to be configured for the proper serial port on the PC. See the next section "Configuring the Serial Port and Initiating Communications".

Configuring the Serial Port and Initiating Communications.

The following procedure performs two tasks. First, it loads the proper set of programming features for the controller model you've purchased into the memory of the controller's digital meter, and second it creates a profile of the controller on your PC which is automatically recalled every time the software is loaded.

1. From the FILE menu, select 'Open Application'.

2. Open the folder titled "Application Files".

3. Find and open the folder for the model number of the controller you have. For example, if you have a Model 210 or Model 210/Timer, open the folder titled "MODEL 210's".

4. Determine the thermocouple type of your controller, then open the file of the same thermocouple type. For example if you have a Type K thermocouple controller, open the file titled 'Type K.app'.
   The thermocouple type of a controller can be determined by the color of the thermocouple receptacle on the front face of the controller.
   Type J = BLACK,   Type K = YELLOW   Type T = BLUE

5. Click on the COMMS menu to bring up the Port Parameters Screen.

6. Click the radio button for the Comm Port the controller is attached to on the PC (this will most likely be com1 or com2).
   For Baud Rate, select   9600
   For Data Frame, select   1-8-N-1
   If you are not sure what Comm port is in use, try 'com1'.
   Click the OPEN COMMS button. If the controller face on the monitor begins to display the controller's temperature, then communications was established successfully. If an error message appears, look at the section titled "Correcting Communication Errors at the end of this manual.

Software Features

Starting a Run

The configuration procedure in the previous section created a profile of your controller.   Every time the software is started, this default profile file is read and the software is automatically configured. As long as the same controller is used with the software you can start the KemComm software and simple select 'Open Comms' from the COMMS menu to initiate communications.   In an environment where it's possible that different controller models will be used with the same computer, J-KEM **highly** recommends that the procedure below be used every time communications is established since this procedure guarantees correct parameter sets and communications for all possible lab environments.

1. From the FILE menu, select 'Open Application'.
2. Open the 'Application Files' folder.
3. Open the folder for the controller model number in use.
4. Double click on the file corresponding to the thermocouple type installed on your controller. The thermocouple type of a controller is determined by the color of the thermocouple receptacle on the front panel of the controller.
   Color: BLUE = 'Type T.app'   YELLOW = 'Type K.app'   BLACK = 'Type J.app'
5. Click on the 'Open Comms' button in the COMMS menu.

Setpoint Adjustment

During normal use, instrument setpoint can be adjusted from the Kemcomms instrument screen, by using the three button shown on the virtual instrument lower fascia.
Click the * button, and while the red circle shown around it, click either the ▼ or ▲ button to increase or decrease the setpoint value.   This setting will be implemented when the red circle disappears after a few seconds.

Instrument 1 ⊠
120.0
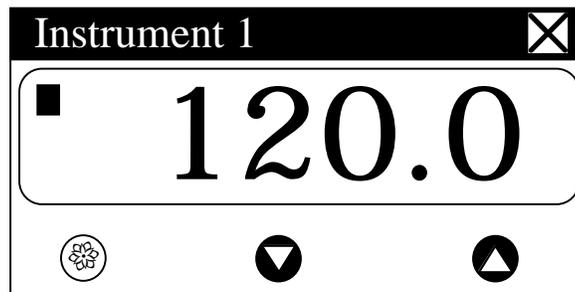
A second method to adjusting setpoint is to 'right click' on the face of the virtual meter to bring up the 'Internal Parameters' screen for the meter clicked on.   From the Internal Parameters screen click on the 'User's Level' tab.   Enter the desired setpoint in the Set Point 1 box via the up and down arrows or by typing in the value in the window provided.   When the desired value is entered click the 'Update' button and the new setpoint will take effect.

Software Alarms

This feature provides a screen alarm indicating if the measured value falls below the low alarm and/or rises above the high alarm settings.   The alarm appears as a red band across the lower fascia of the instrument.   This alarm is for display only and causes no effect on the heating or other features of the J-KEM controller.   To set software alarms, right click on the face of the meter you want to adjust to bring up that meter's 'Internal Parameters' screen.   From the Internal Parameters screen click on the 'User's Level' tab.   Enter values for high and low software alarms in the appropriate boxes at the bottom of the screen.   To activate the alarms, click on the 'Enable' check box.   When the desired value is enter click the 'Update' button and the alarm setpoints will take effect.

The **CALCOMMS** software is capable of logging readings from up to 32 instruments which it stores in data files. The data can be exported into text files which will enable the data to be displayed in c.s.v. format, as columns of readings against dates and times, for each of the 32 instruments. In addition, the readings of up to 12 of the instruments can be presented graphically and in colour, by the chart recorder facility.

As in other sections of the manual, it is assumed that a mouse or pointing device is being used. Where only a keyboard is available, the standard **Windows** *key conventions can be used to operate the program.*

## GETTING STARTED
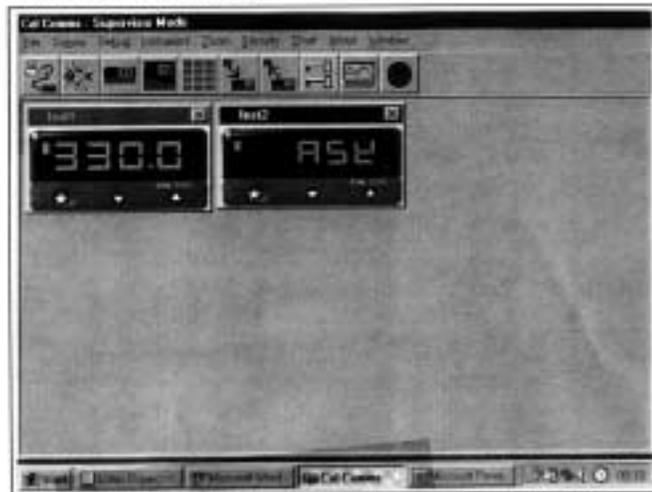
From the **CALCOMMS** instrument screen.

Click		the **add new chart recorder** icon in the menu bar, and in the **Chart recorder** screen;
Click		the **create new file** icon, and in the **File name** box of the **Select File to Create** panel;
Type		your chosen file name, then **Click** the **Save** button.
		In the **Select Units to Chart** screen;
Click		to highlight all of the units that are to be logged from, in the **Available instruments** list.

Logging and Charting (continued)

Click	the transfer button to list them in the **Instruments to record** table. For each instrument to be charted from, **double click** in the **Plot?** column to change the **No** to **Yes**.
Double click	in each instrument colour panel, and from the standard **Windows**™ colour chart, select contrasting colours that will effectively display all of the instruments listed. Additional shades can be added

	using the **Add to Custom Colour** feature.
Click	the **OK** box in the colour screen.
	In the **Sample Frequency** panel,
Click	the **spin buttons** to set the log reading frequency.
Click	the **OK** button to open the **Chart Recorder** screen.
	In the **Chart Recorder** screen, check that the **Active File** panel shows the correct file name, then make the following chart recorder settings to suit your application, starting with the **Scaling** panel;
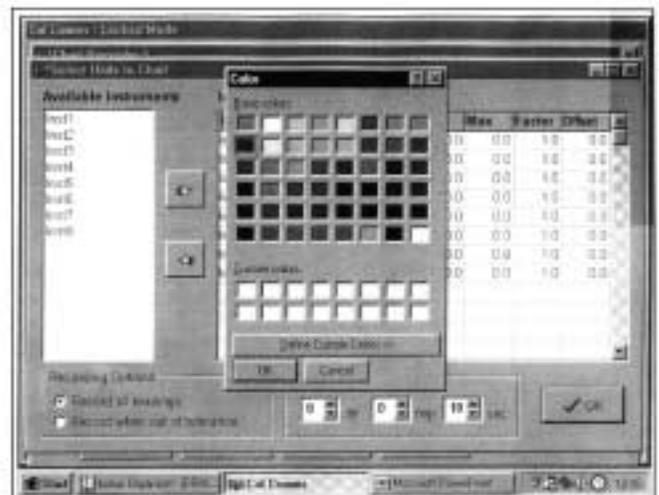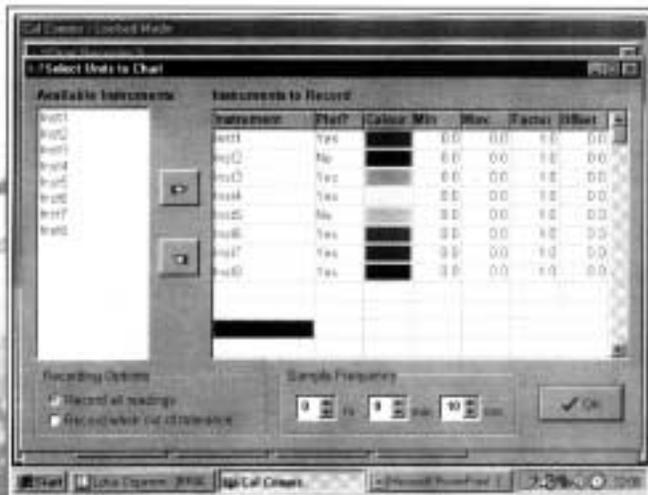
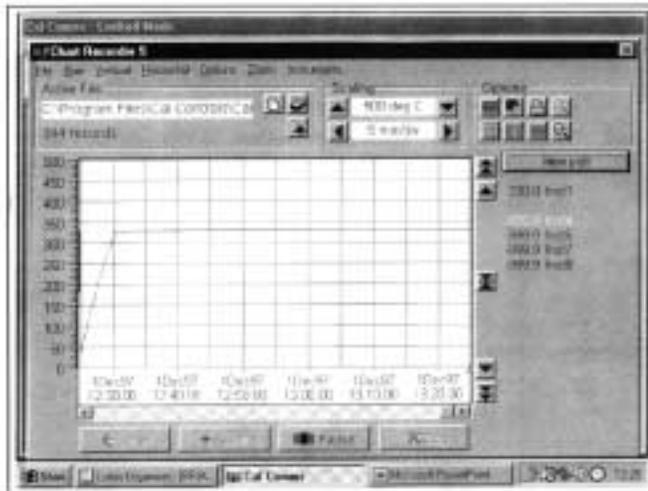| Click	the **buttons** in the **deg C/F** box to set up a suitable temperature scale in the chart Y axis.
Click	the buttons in the **time/div** box to set

chart speed in the time interval per minor division of the X axis.

Click	the **Start** button to commence logging and run the chart recorder with default chart settings.

⚠ **Note:** Chart scale settings are determined by the settings chosen for the first instrument (or instrument 1)

Traces can be vertically positioned on the chart by using the chart scroll buttons.

Click	the buttons to move the chart **up** or **down** by **10%**
Click	the buttons to move the chart **up** or **down** by **100%**
Click	the button to **zero** the chart

The appearance and colours of the chart can be changed as follows;

Click	**select background colour** icon, and chose another colour from the colour chart.
Click	the **toggle grid intensity** icon to add minor divisions to the Y axis.
Click	the **select primary grid colour** icon to change the colour of the grid major divisions.
Click	the **select grid colour** icon to change the colour of the grid minor divisions.

Note: Because the chart is re-drawn after each plot, a setting of **less than** 5 minutes/div is recommended, to avoid extravagant use of system resources while logging. Longer settings can be used to review the full chart history in **view plot** mode.

Click	the **make chart bigger** or **make chart smaller** icons to adjust the size of the chart on your screen.
Click	in the **chart recorder** blue title band, and **drag** to adjust the position of the chart recorder on your screen. Repeat this for the **CALCOMMS instrument** screen, and trim both adjustments so that both are visible. If you prefer using full screens for both chart and instruments, toggle between screens using the **instruments** menu bar

option in the **chart** screen and the **chart** option in the instruments screen.

| Click	the **pause** button to stop logging and stop the chart recorder.
Click	the **Resume** button to re-start logging and charting. Note that a grey vertical band appears on the right of the chart to signify the break in readings.
Click	the **auto plot** button to pause the chart and allow the chart history to be viewed using the horizontal scroll bar controls. *(normal logging continues meanwhile)*
Click	the **view plot** button to return to **automatic chart update state** and normal charting is resumed. During charting, the current value is displayed to the right of the chart, in the trace colour. When in **view plot** mode
Point	and **Click** to any point on the trace. A dashed vertical line will appear and cut the trace at this point, and the value will appear to the right of the chart in place of the current value. If used in auto plot mode the reading will be set to current value at the next plot.

LOG-ON-CHANGE (ONLY LOG/CHART OUT OF LIMITS READINGS)

This feature reduces the size of log and chart files by ignoring readings that are within adjustable specified limits. To specify the limits;
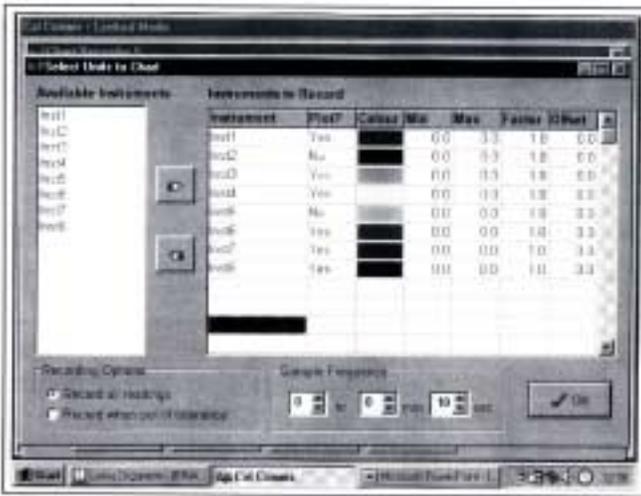
Double click in the **inst.1 Min** column and enter the value **below** which readings are to be logged. Repeat in the **Max** column, and enter the value **above** which readings are to be logged.

Check the radio button **record when out of tolerance**, and **Click** the **OK** button.

The chart will now only register **out of limits** readings which will be separated by grey vertical bands signifying periods of **in limit** readings. It will still be necessary to set the **Sample Frequency** buttons.

Check the radio button **record all readings** to return to normal logging/charting.

Factor and Offset adjustments

A factor adjustment can be made to enable readings of differing orders of magnitude to be charted on the same scale. For example, a X10 factor applied to ambient temperature readings would enable them to be charted alongside process temperatures of 200°/400°C - 400°/1470°F. Factor adjustments can be greater or less than one.

Offset adjustments can be applied to any trace to adjust its position with respect to the scale. For example, the readings from a particular instrument may be known to be 4° low due to poor siting of the sensor. An adjustment of +4 in the Offset column will remove this error.

Sizing and positioning your chart

Click to make the chart smaller or larger. If required, it is possible to super-impose a small chart screen on top of or beside the **CALCOMMS** screen so that both are visible.
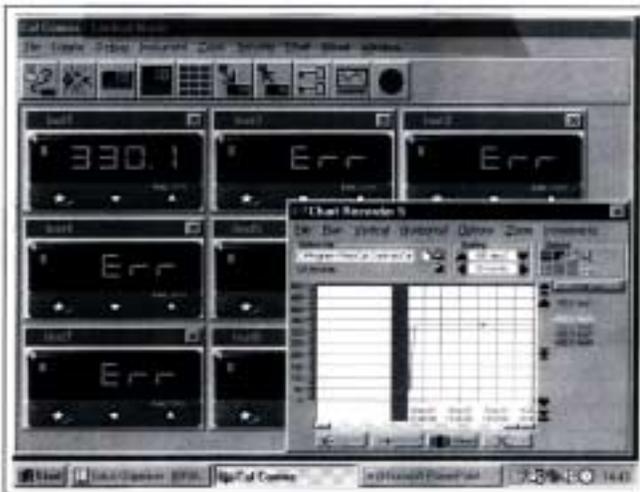

Saving Charts

To stop recording

Click Either the **close** button or from the menubar chose **File** then **Exit**. The file will automatically be saved with the name given earlier as **Givenname.cht**

Files can be recalled to view, or to add additional data using the **Append** feature.

Click the **Open existing file** icon, and select the name of the file to be opened from the list in the file box.

Click **Open** button.
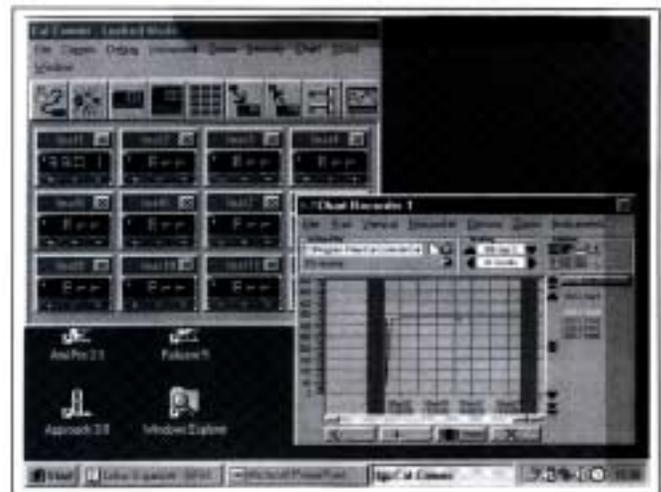
The chart recorder screen will open with the chart settings returned to default. If preferred, reset the chart to your original settings, then;

Click **Append** button to add the new readings to the chart. The new readings will be separated by a vertical grey bar.

Multiple Charts

It is possible to open a number of charts simultaneously. The menu will register the number of charts open under the chart heading. These can be arranged on the screen, in or out of view, and moved or sized as required.

Log files can be exported as "Comma Separated Variable" (csv) text files, which appears as column of logged instrument readings, set against its time, date and line number.

In this form the data can be exported into other applications such as spreadsheets or data bases for use in the preparation of reports or other management documents.

To export data to a text file, in the **Chart Recorder** screen,

Click the **export file in text format** icon, and in the **Export Text File** screen, type your file name in the **File name** box.

Click the **Save** button to save your file as a **Filename.txt** file
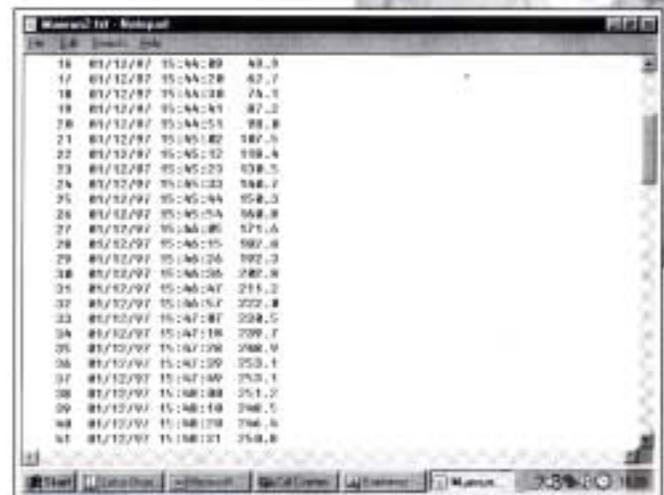
To check that your file has been correctly saved, open **Windows Explorer**

And from the **C:** directory click **Program Files** then **CAL Controls** then **CAL Comms**

From the list contained under the filepath

C:\Program Files\CALControls\CAL Comms

Double click   Select **Filename.txt**

Exporting Log Files as Text Files

Depending on the size of the file, it will be opened in either **Notepad** or **WordPad**

Printing Charts

Charts can be printed in full colour, depending on the specification of the printer.

From the **Chart recorder** screen use either the **print** icon or the **print** chart command from **Options** in the menu bar. This will open the Windows™ **print** screen. Click the **properties** button to select landscape setting. If changes in appearance are required, review the logging and charting section.

Correcting Communication Errors

The most frequently encountered problem when setting up communications with a controller is an improper serial connection. A serial connection has three requirements, 1) the serial port on the PC be configured with the correct parameters within Windows95® itself, 2) the J-KEM controller be configured with the correct parameters and 3) a sound electrical connection between the PC and the controller. Most communication problems are on the PC side of the setup and is rarely due to the J-KEM controller being configured wrong.

Companies frequently change comm port settings for internal use or when adding peripherals such as modems. If may be necessary to contact your information services group to verify the PC's comm port settings before calling J-KEM for assistance. Several of the more frequent 'fixes' are listed below.

1. If communication is not established when the procedure titled "Configuring the Serial Port and Initiating Communications" is followed, try all possible comm ports by performing the following steps.

    I.   Quit the Kemcomms program.
    II. Restart Kemcomms and follow the procedure detailed in "Configuring the Serial Port and Initiating Communications", EXCEPT in Step 6, select a different comm port until all comm ports have been tried. After each failure quit Kemcomms and start again.

2. Check the serial cable for a secure connection between the controller and the PC.

3. Most problems are due to incorrect serial port setting on the PC. Call your computer group to verify serial port identification and settings. [Set to: 9600 baud, 8 data bits, NO parity, 1 stop bit].

4. Call J-KEM for assistance.

    J-KEM® Scientific, Inc.
    6970 Olive Blvd.
    St. Louis, MO
    (314) 863-5536