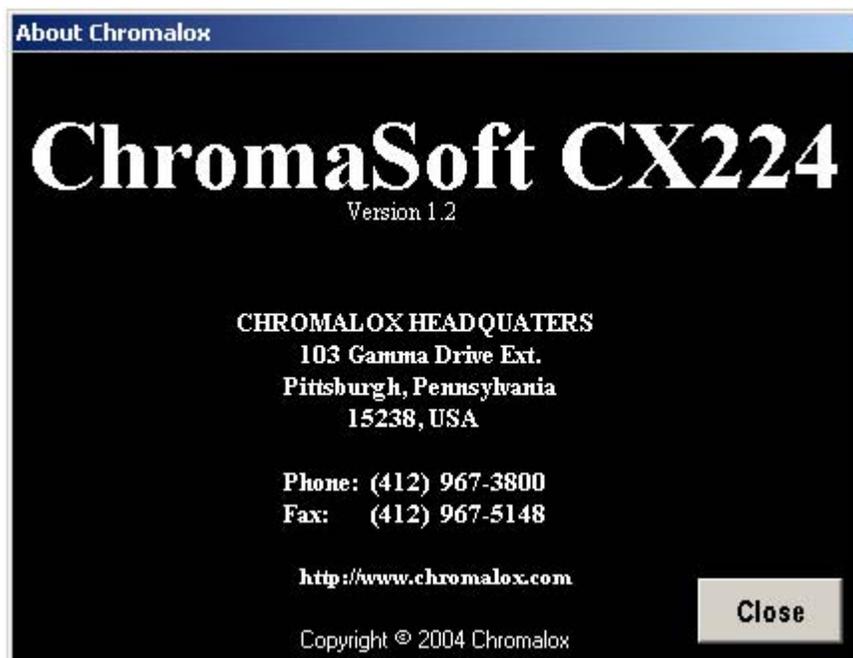




Chromalox CX224 Software



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Table Of Contents

- 1. System Requirements**
- 2. RS232 Communications**
 - A. Wiring
- 3. RS485 Communications**
 - A. Wiring
- 4. Using CX224 Software**
 - A. Overview
 - B. Getting Started (Install)
 - C. Configuring the Controller
 - D. Printing
 - E. Simulation
 - F. Real-Time Readings
 - G. Data Logging

1. System Requirements

To use Chromalox CX224 software, the following minimum requirements must be met.

1. A computer running Windows 95®, Windows98® or Windows XP®.
2. Available serial port for communications. (Maximum allowable baud rate may be determined by the speed of the computer and the operating system being used.)

2. RS232 Communications

RS232 Communications allow easy connection of the CX224 to a computer for applications that are operated in a low noise environment with a distance of less than 50ft between the CX224 and the computer. The CX224 has 6 terminal positions for connecting to the PC, only 3 will be used. This means that if a standard 9 or 25 pin D-sub connector is used to connect to the PC, the other end will need to have bare wires. If the cable has a connector on both ends, one end may need to be cut off to gain access to the wires.

RS232 allows for only one CX224 to be connected to the computer. If more than one unit must be connected to the computer, then an RS485 communications medium should be used. Due to the voltage level requirements for RS232, more than one device on the port will cause loading and disrupt the necessary voltage levels, which will ruin communications.

A. Wiring

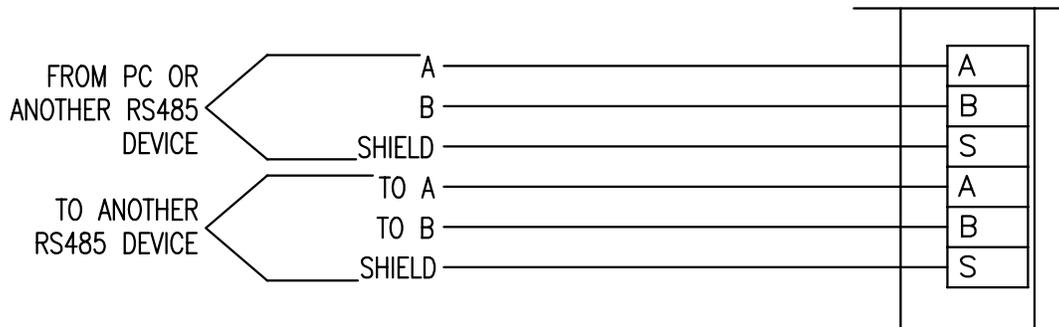
The Receive Data (RD) signal from the computer port must be connected to the A+ terminal on the CX224. The Transmit Data (TD) signal from the computer must be connected to the B- terminal on the CX224. The Signal Ground (SG) from the computer must be connected to the S terminal on the CX224. The chart below shows the pinout for 9 pin and 25 pin connectors.

<u>Pin Description</u>	<u>D-Type 9</u>	<u>D-Type 25</u>
Transmit Data (TD)	Pin 3	Pin 2
Receive Data (RD)	Pin 2	Pin 3
Signal Ground (SG)	Pin 5	Pin 7
Request To Send (RTS)	Pin 7	Pin 4
Clear To Send (CTS)	Pin 8	Pin 5
Data Set Ready (DSR)	Pin 6	Pin 6
Carrier Detect (CD)	Pin 1	Pin 8
Data Terminal Ready (DTR)	Pin 4	Pin 20
Ring Indicator (RI)	Pin 9	Pin 22

Chart 1 – Pinout for computer serial ports

Wiring for RS232 and RS485 is shown in Figure 1. The signals for RS232 need only be connected to one of the sets of terminals (A, B, and S). The extra positions are only utilized when RS485 is used in a chain configuration as stated in section 3 of RS485 Communications.

RS485



RS232

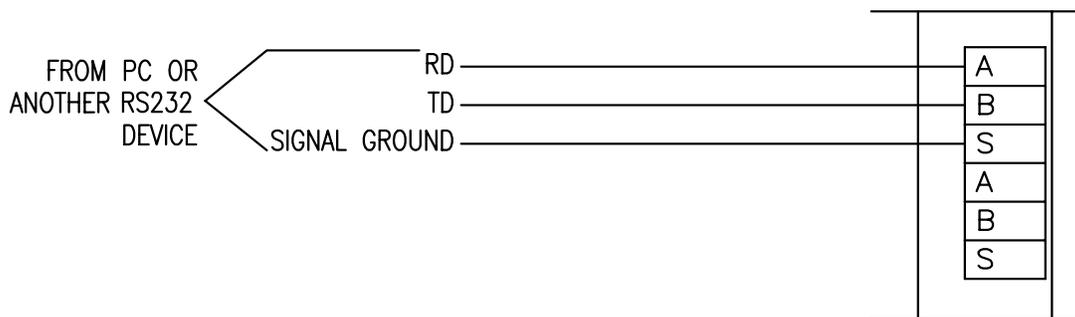


Figure 1 – Wiring for RS232 and RS485

3. RS485 Communications

RS485 Communications allow reliable communication in noisy industrial environments and allow wiring lengths up to 4000ft. The CX224 has 6 terminal positions for connecting to the PC for communications. Three of the terminals can be used for input to the CX224 and the other three can be used to connect to the next CX224 in the chain or, if the unit is at the end of the chain, the extra terminals allow for easy connection of a termination resistor

RS485 allows for multiple devices to be connected to one network. Up to 128 CX224 can be connected to a given network. The RS485 standard allows up to 32 nodes to be connected on a half-duplex network. However, each CX224 accounts for only ¼ of a node, allowing up to 128 CX224's to be connected to the network when RS485 is used as the medium.

A. Wiring

The connections on the CX224 are labeled as A, B, and S. The two signal wires are A and B. The A terminal should be connected to the A terminal on the RS232 to RS485 converter. The B terminal should be connected to the B terminal on the RS232 to RS485 converter. The S terminal should be connected to the shield. The shield wire should be connected to ground in **one location only**, to avoid ground loops, which can cause erratic communications.

A network of CX224's should be wired in a chain. A star or ring configuration is **not** appropriate for RS485. Each CX224 should only be connected to at most 2 other CX224's. Figure 2 shows the basic wiring for a chain configuration. Like terminals on the CX224's should be connected together in the chain, A to A, B to B, S to S.

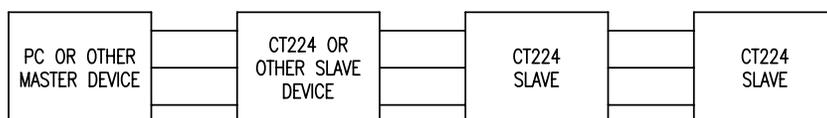


Figure 2 – Master Slave Chain

End devices (Master and last Slave) on an RS485 network should be terminated to achieve error-free communications. The termination should match the characteristic impedance of the network. Normally this value is about 120ohms. Figure 3 shows how to easily apply a termination resistor to the last CX224 in a chain. Do not use more than 2 termination resistors on the network. There are many other methods for terminating an RS485 network. If interested in trying a different termination approach, consult the Internet for various other configurations. In most applications, terminating with 120ohm resistors will provide error-free communications.

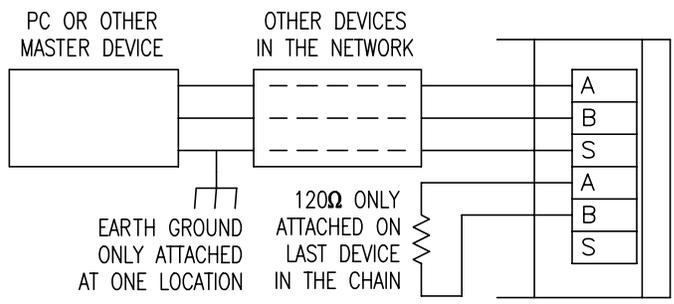


Figure 3 -Termination of RS485 Network

4. Using Chromalox CX224 Software

A. Overview

Chromalox CX224 Software allows the user to gain access to many of the CX224 features in an easy to use program. The software allows the user to configure the CX224 to the desired settings without the need to spend several minutes stepping through many menus. Chromalox CX224 software also provides an easy way to store the current program that is programmed into the CX224 by requiring the user to save a configuration before sending it to the CX224. There will always be a record to a file with the exact settings that are being used in the application.

The CX224 allows a computer to log data from the CX224. A simple window allows the user to configure the frequency of readings that will be taken and store them into the specified ASCII data file.

Using the Simulation feature allows the user to enter readings as if the CX224 had read them on the inputs. The CX224 will react according to the current settings that have been programmed into the unit. This allows the user to validate all trip and untrip conditions to be certain that the unit will react as they would like when in operation.

When the CX224 is in operation, the Real-Time window provides a means of observing the current readings and output status of the CX224.

B. Getting Started (Install)

This section provides a tutorial for using the CX224. The various features of the software are explained in a step-by-step tutorial to become familiar with the basic workings of the Chromalox CX224 Software. It is assumed that the CX224 is wired properly, according to the wiring in Section 2 or Section 3, depending on whether the unit has an RS232 or RS485 interface.

1. Install Chromalox CX224 software. Place CD into the drive. Begin installation by running Setup.exe on the CD. The installation wizard will begin and guide you through the setup process.
2. After the software has installed, run Chromalox CX224 software by clicking Start Programs → Chromalox → CX224.
3. The program will load and display the window shown in Figure 4. You will need to select the proper Baud Rate and Comm Port. The PC Communications Settings window will be displayed. Change the settings to match those on the CX224. The default baud rate is 9600, comm port is 1, and Modbus address is 1.

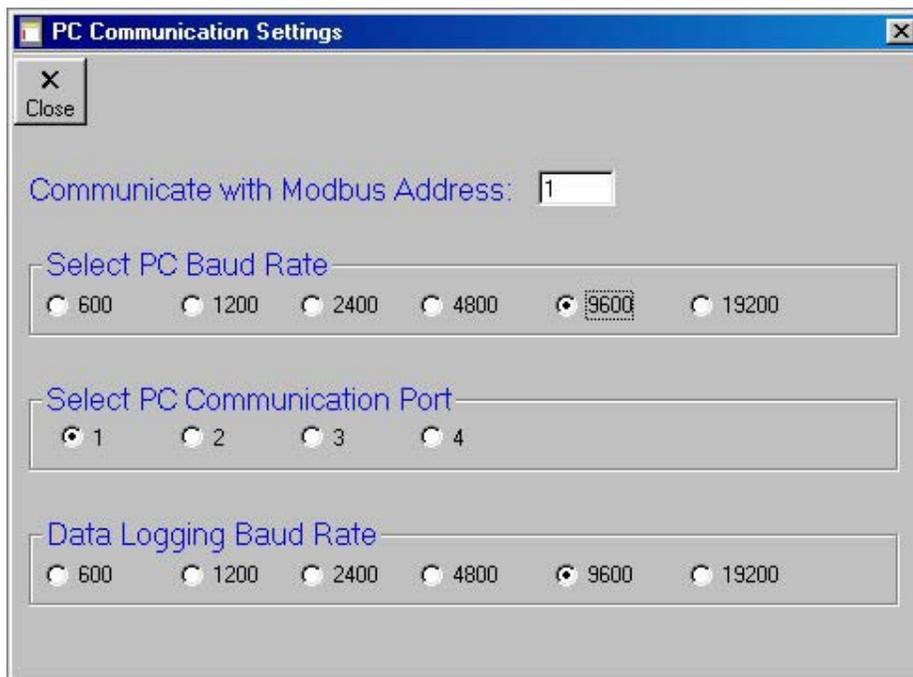


Figure 4 (Default settings shown)

4. Connect the monitor to the PC using the proper connections as outlined in section **2. RS232 Communications** or **3. RS485 Communications**, based on the type of unit that is being used.

5. Apply power to the CX224.
6. Click the "Close" button of the Communication Settings window. The current settings in the window will be saved and recalled the next time the program is started.

C. Configuring the Controller

This section will step through configuring the CX224 using the software. A simple configuration will be done to allow input on one channel and show how to save the file. The settings in the file are then reloaded into the settings screens for viewing.

Tutorial:

1. Select Functions → Configure Monitor. The window shown in Figure 5 will appear.

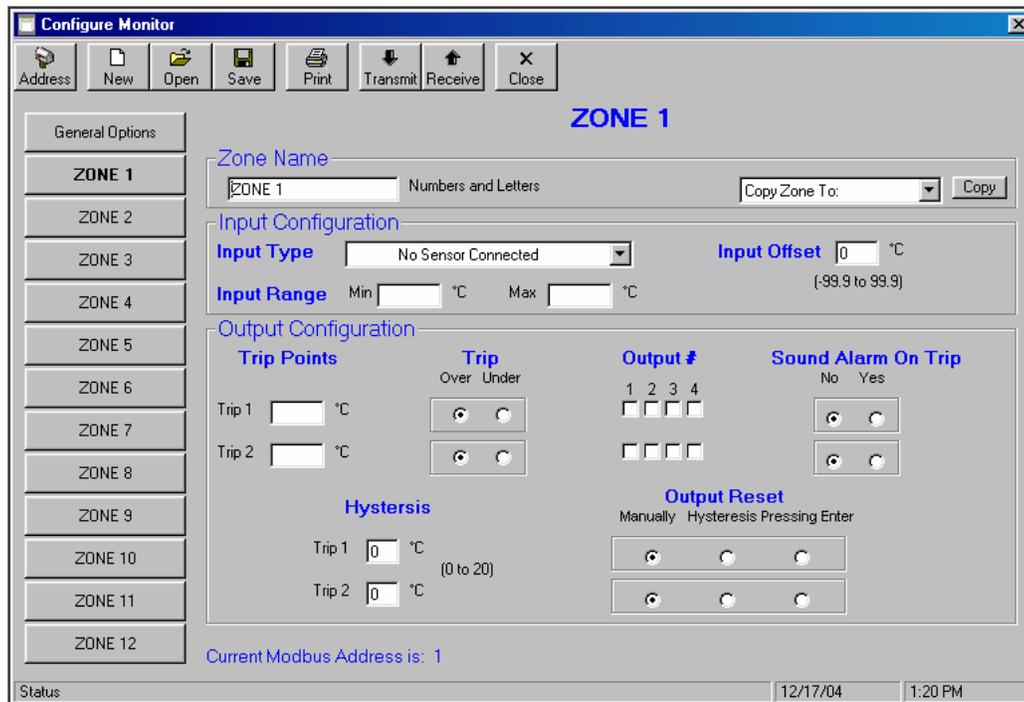


Figure 5

2. Load the current settings from the CX224 by clicking "Receive" in the toolbar on the top of the Configure Monitor window. A box will appear to show progress. Once the box disappears the form will be loaded with the current configuration settings on the unit.
3. Click on General Options to display the general settings that cover several common aspects of the CX224. In the Temperature Scale section, select Fahrenheit. This will configure the CX224 to display all readings in Fahrenheit. Now click ZONE 1 to return to the configuration for Zone 1. Enable an input on Zone 1, use a PF 1000ohm sensor input (or the appropriate sensor that you have connected to Zone 1). Enter 100 for Trip Point 1 and 120 for Trip Point 2, this will set two trip points for Zone 1. Mark the check box for tripping Output

1 with Trip Point 1 over temp and Output 2 to trip on Trip Point 2 over temp. Click No for Sound Alarm on Trip 1 and Trip 2. Type "PF 1000 OHM" into the Zone Name box (or a different name to indicate the sensor type). Click "Save" to save the new settings.

4. Save the new settings to a file. Enter "Tutorial Configuration" for the file name and click "Save".
5. Send the new settings to the CX224 by pressing the "Transmit" button.
6. The Transmission in Progress window will be displayed and show the transmission progress. Once complete, the CX224 is programmed with the new settings. The new settings can be verified by entering the Configuration menu on the CX224 unit and reviewing the settings.
7. Clear the settings that are shown in the Configuration window by clicking "New" in the toolbar. All of the settings in the forms will be cleared.
8. Load the file that was previously saved by clicking "Open". Select "Tutorial Configuration" and click open.
9. The settings will be loaded into the window.
10. These settings can now be sent to another unit by selecting "Address". When a new address number is chosen by entering the address into the box and OK is clicked, the new address will be used for all future communications until the address is changed. Since there is only one CX224 being used in this tutorial, enter 1 into the box and click OK.

D. Printing

This section will show how to print the settings that are shown in the Configuration window. Printing settings from a file is also covered.

Tutorial:

1. Select Functions → Configure Monitor.
2. Click Receive from the toolbar to load the current settings from the CX224.
3. Click the “Print” button on the Configure Monitor window. The window shown in Figure 7 will appear.



Figure 7

4. Select “Print Current Settings in Window” and click “OK”. The current settings in the Configure Zones window will be printed to the default printer.
5. To print a file, click “Print” and then select “Print a File”. Click OK and the window in Figure 8 will appear.

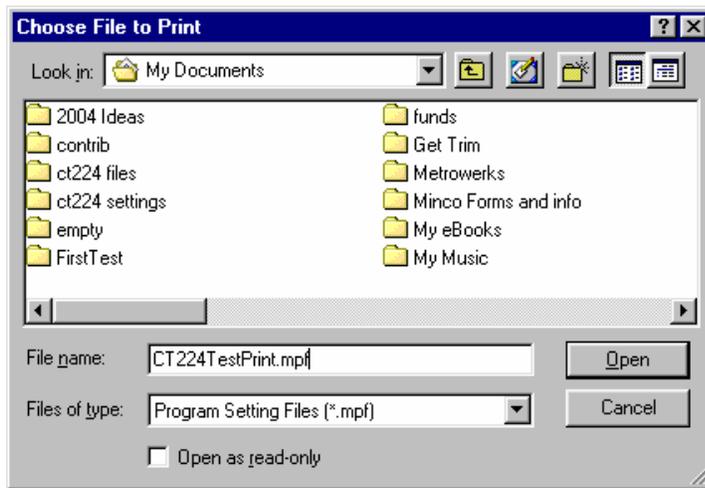


Figure 8

6. Select the file you would like to print and click "Open" and the file will print to your default printer.

E. Simulation

This section will step through how to simulate different inputs being read by the CX224. The CX224 enters a special mode of operation which allows the user to send readings to the CX224 as if the CX224 had actually read them on the input. This can be very useful for determining how the CX224 will react to certain input readings.

Tutorial:

1. Select Functions → Simulation to simulate the operation of the CX224.
2. A new window will open and begin transmitting data from the CX224 to the computer (Figure 9).

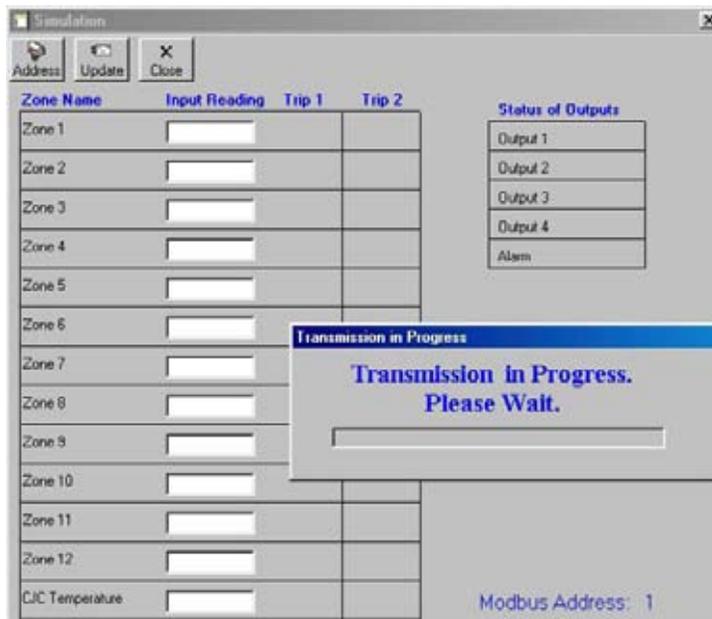


Figure 9

3. The values for the zones will be read from the CX224 and enter them into the boxes after the readings have been transferred.
4. Enter 70 into the Zone 1 reading box. Click "Update". The CX224 will display "SM" in the upper right hand corner of the CX224 display, signifying the monitor is in Simulation Mode. Zone 1 (PF 1000 OHM) will read 70 C, with no tripped outputs according to the settings applied in the Configuration window.
5. Enter 101 into the Zone 1 Input Reading box and click "Update". Output 1 will trip and the CX224 display will show 101 C for Zone 1 (PF 1000 OHM). Output

1 will also display tripped on the computer screen. "SM" will remain in the upper right hand corner of the display on the CX224.

6. Enter 121 into the Zone 1 reading box and click "Update". Zone 1 (PF 1000 OHM) will read 121 C on the CX224 display and Output 1 & 2 will be tripped.
7. Exit Simulation mode by clicking "Close". The CX224 will begin to read temperatures from the actual input and display the temperature that it is reading. The CX224 will no longer display "SM", since the monitor is no longer in Simulation mode. **Note:** If "Close" is not clicked to end Simulation Mode, the CX224 will timeout and leave Simulation Mode after 2 minutes. Exiting Simulation Mode may also take place during a session, if too much time is taken between sending readings to the CX224.

F. Real-Time Readings

This section will step through the use of the Real-Time Readings window. The Real-Time Readings window allows the user to see the current readings that the CX224 is gathering as well as the current status of the outputs. The readings in the window are updated every 10 seconds.

Tutorial:

1. Click Functions → Real Time Readings. A new window will appear that will show the current readings that the CX224 is monitoring (Figure 10).

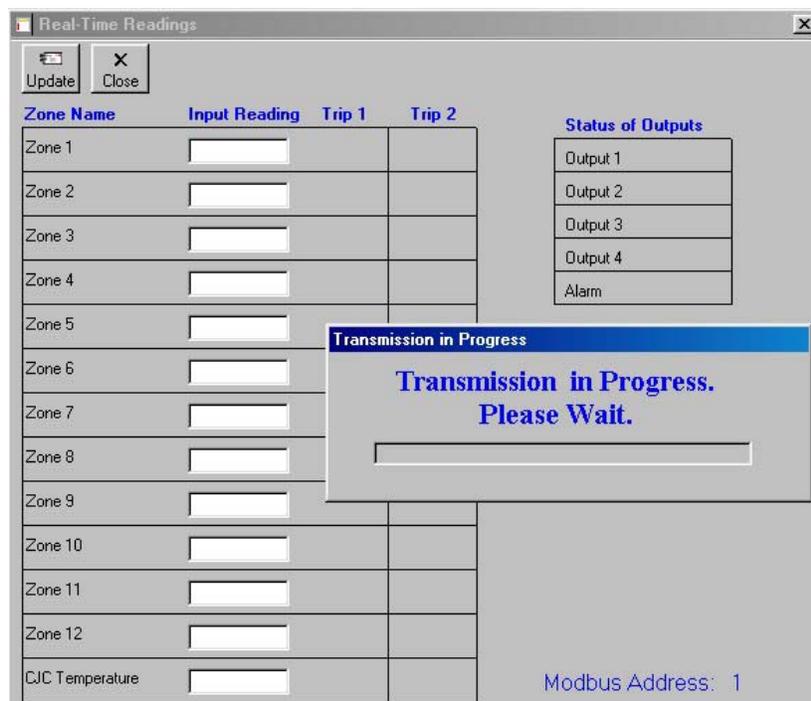


Figure 10

G. Data Logging Setup

This section will step through configuring and using the Data logging feature of the CX224 software.

Tutorial:

1. Select Functions → Data Logging Setup to configure the data logging settings. The screen in Figure 11 will appear.

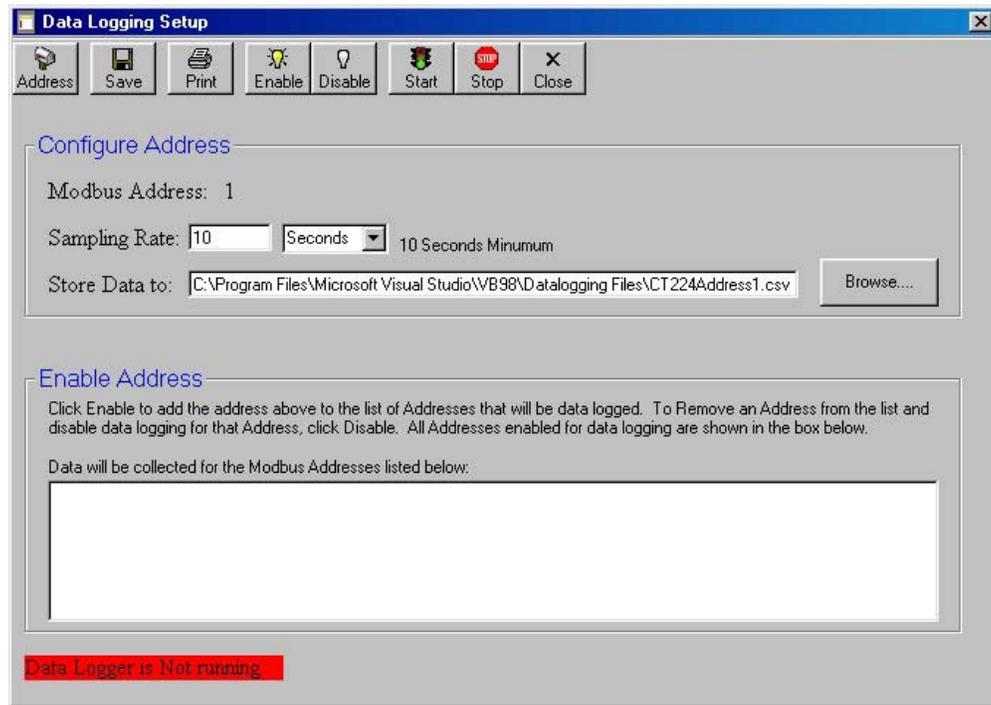


Figure 11

2. Set the data logging Sampling Rate for Address 1, by entering 10 seconds for the Sampling Rate. 10 seconds is the fastest sampling rate available.
3. Click the “Enable” button and notice that 1 will appear in the Enable Address box. The addresses shown in the box are the addresses from which data will be collected.
4. If you would like to change the file that will be used to store the data, click “Browse” and choose the location and enter the file name. The default file name is in the form: CX224Address#.csv. # represents the Modbus Address from which data will be collected. Click “Save” and the file will be stored to the location listed in the “Store Data to” box.
5. Click “Start Data Logging”. This will run dlCX224.exe, which is the program that actually requests data from the CX224, and begin to log data from Address 1.

You will see a new icon appear in the tray and a new window will appear, see Figure 1212.

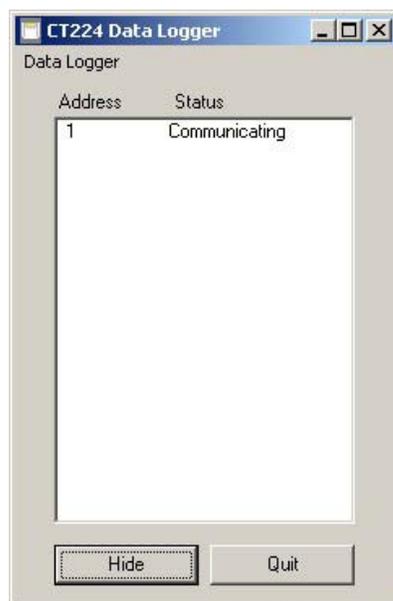


Figure 12

6. Wait for about one minute to allow data to be logged. You may vary the input on Zone 1 to obtain more interesting data. Remember that the sampling rate is once every 10 seconds, so after one minute you should have 6 data points.
7. Right click on the icon in the tray, select Quit. This will close the Data Logging program.
8. Click "Close" in the Data Logging Setup window.



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