

**Operating
and
Installation Instructions**

Space Temperature Monitoring System

for

Controlled Temperature Warehouses

of

Miller Brewing Company Distributors

Balance Engineering Inc.

Operating and Installation Instructions

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Introduction

Below is a summary of the list of activities to be performed. We are providing this introduction so that you may familiarize yourself with the steps required for successful logger installation and operation.

Option 1 – Monthly Monitoring Service Customers (AM)

1. Check Packing List and Equipment Illustration sheet to ensure all materials have been received. (See Installation Diagrams for Equipment Illustration)
2. Read Operating and Installation Instructions thoroughly.
3. Install logger per instructions. (refer to Installation Details attached)
4. Splice 150' cable to each sensor and install per instructions.
5. Connect sensors to logger.
6. Install modem per instructions.
7. Connect modem to phone line, surge protector, and a 120 VAC outlet.
8. **Make sure non-dedicated phone line is spliced in upstream of phone system.**

Option 2 – Equipment Purchase Customers (ER)

1. Check Packing List and Equipment Illustration sheet to ensure all materials have been received.
2. Read Operating and Installation Instructions thoroughly.
3. Install logger software from CD Rom onto a computer at which you intend to download your temperature data.
4. Run logger software program and check to make sure the correct COM port for your computer setup is selected for data download. DO NOT attempt to change any other settings in the software. Logger does not need to be hooked up to the computer to perform this step.
5. Install logger per instructions. (refer to Installation Details attached)
6. Splice 150' cable to each sensor and install per instructions.
7. Connect sensors to logger.
8. Download data and develop monthly temperature report.
9. Check battery voltage monthly during data download. Battery needs to be replaced when voltage drops to 7.0 volts.

If after a thorough review of these Operating and Installation Instructions, you have problems or questions, you may call or email for technical assistance.

Balance Engineering, Inc.
Phone: (317) 844-2922
Email: info@balanceeng.com
www.balanceeng.com/MillerCTW

Installation Instructions

Materials

You should have received the items listed below. Certain listed items are provided only for those distributors selecting Option 1 – Monthly Monitoring Services. Refer to Equipment Illustration sheet included in shipment for a graphic depiction of items.

1. Logger(s)
2. Standard Sensors – PT 907 , Water Proof Sensors - PT940
3. Extension Cables (Max. allowed = 150' per sensor)
4. 3' Interface Cable (IC 209) 9 pin cable
5. CD Rom – Data Logger software
6. Modem(s) **
7. 3' Modem Cable (IC 211) 25 pin cable**
8. 9 VAC Adaptor **
9. 6' Phone Cord**
10. Surge Protector **

**** Option 1 – Monthly Monitoring System Customers Only**

Logger Location and Mounting

1. Mount in locations to protect from physical and moisture damage.
2. Do not mount near source of heat or cold such as lights or air blasts from heating or cooling units or an outside wall.
3. Place logger in central location so that each 150' sensor extension cable that originates from logger can be routed to reach each remote sensing location. **(See Detail A – Installation Diagrams)**
4. Mount logger approximately 5 foot above floor level in an area easily accessible to perform the monthly data download and battery replacement when required. **(See Detail B – Installation Diagrams)**
5. Option 1 – Monthly Monitoring Service customers should place loggers in a location close to 120 VAC receptacle and telephone line.
6. Logger is equipped with magnetic pad on back for convenient mounting to metal surfaces.

Sensor Location and Installation

1. The required number of sensors and the recommended placement of these sensors in the warehouse are described in the Frequently Asked Questions section of the Miller Brewing Company distributor's website. Please review this information.
2. Mount sensors in locations protected from physical or moisture damage.
3. **Standard PT 907 space sensors are not to be used in moist areas or submerged in liquid. Contact Balance Engineering Inc. for an alternate sensor if moist or submersible conditions exist.**
4. Do not mount sensors near sources of heat or cold such as lights or air blasts from heating or cooling units, or on outside walls.
5. Locate sensors in upper areas of product storage to capture the effects of temperature stratification – 5 feet below top of highest product. **(See Detail B – Installation Diagrams)**
6. Up to 150 feet, 22 gauge, 2 conductor of extension cable is provided for each sensor. Splice sensor to extension cable using wire nuts and electrical tape. **(Do not exceed 150 feet of cable per sensor.)**
7. Route sensor cables up building columns and across roof support structure to connect sensors and loggers. Secure cables using plastic cable ties as required to prevent sagging. Take care not to crimp cables or damage insulation. **(See Detail B – Installation Diagrams)**

*****Do not run cables adjacent to power feeds for motors or other power distribution conduits.*****

8. Connect cables to logger. Each logger is equipped with four (4) channels to accommodate four (4) sensors. The logger will not operate if Channel 1 is not utilized. For each sensor, connect (1) end of the lead to an unused input channel, and connect the other end of the lead to "C" terminal. Repeat for additional sensors. Multiple leads can be connected to the "C" terminal. The "E" terminal will not be used in this application. **(See Detail F)**

For a warehouse that requires less than four (4) sensors, the installer should make sure that Channel 1 is used, or no logging will occur. The remaining channels should be used in sequential order. (ie: Connect the 1st sensor to Channel 1 and C terminal, connect the 2nd sensor to Channel 2 and C terminal, etc.) For applications using 2 loggers and 6 sensors, utilize Channels 1 – 4 on the 1st logger and Channels 1-2 on the 2nd logger.

When connecting sensors for a warehouse that requires less than four (4) sensors, the installer must insure that Channel (1) is used for the first sensor or the logger will not operate.

9. If sensor leads at the logger terminal block are flexed repeatedly, lead breakage is possible. To prevent breakage, bundle all sensor leads together with a plastic cable tie approximately 1" – 2" from the terminal block. **(See Detail F – Installation Diagrams)**

Grounding Details – Monitoring and Equipment Purchase Customers

To prevent any stray or induced signals collected in the extension cables from affecting the logger programming or memory, it is important to properly ground the "C" terminal of the logger.

Option 1 – Monthly Monitoring Service Customers (See Detail F)

Connect a ground wire from the "C" terminal on the logger's removable terminal strip to the face plate mounting screw on the 110 VAC electrical outlet used to power the modem.

The ground wire can simply be a short length of the same cable used for the sensor extension cables.

Option 2 – Equipment Purchase Customers (See Detail F)

As with Option 1 customers, the preferred grounding method is to connect a ground wire from the "C" terminal on the logger's removable terminal strip to the face plate mounting screw on a 110 VAC electrical outlet.

If there is no electrical outlet nearby, an alternate grounding source is the building support steel. The ground wire can be attached to the building steel using the beam clamp provided. Remove a small area of paint on the building steel to ensure good electrical contact.

The ground wire can simply be a short length of the same cable used for the sensor extension cables.

Modem Installation – (Option 1 – Monthly Monitoring Service Customers Only) (See Detail H – Installation)

1. Position modem at logger location.
2. Connect 25 pin connector end of 3'- IC211 modem cable to modem.
3. Connect other end of 3' - IC211 modem cable to logger jack.
4. Modem is powered from 9 VAC / 120 VAC adapter. Plug adapter into surge protector (provided). Power the surge protector from standard 120 VAC outlet.
5. Plug other end of adapter cable into 9 VAC port on modem.
6. Modem requires a non-dedicated telephone line. Telephone line must be capable of placing and receiving unattended, long distance phone calls 24 hours per day. (Under normal circumstances, the modem will call out once per month for a duration of 1 to 5 minutes to download data.)

If the warehouse phones utilize a central system with special switching methods or complex dialing schemes, the phone line to the modem must be routed around the in-house phone system. (See Detail H)

7. Plug non-dedicated warehouse phone line into the RJ11 jack labeled "in" on the surge protector.
8. Plug one end of the phone cord (provided) into the RJ11 jack labeled "out" on the surge protector.
9. Plug the other end of the phone cord (provided) into the RJ11 jack on the modem labeled "line".
10. Turn modem power switch ON, wait 10 seconds, turn OFF, then turn modem back ON again. This will clear any interference that may have developed.

Hardware and Software Descriptions

This section provides a summary description of the logger hardware and software. Additional information is available using the help screens in the software program.

HARDWARE

In the controlled temperature warehouse (CTW) application, the Data Logger is a four (4) channel logger used to collect and record space temperatures.

Battery

The logger is powered by a Lithium-grade, 9V, replaceable, internal battery. In the CTW application, **life of a lithium battery is expected to be 12 months**. Battery voltage is displayed on the **Receive/Status** screen in the logger software.

Battery should be replaced when voltage drops to 7.0 volts. We suggest replacing the battery annually. If logger goes into “Power Failure Mode” due to a dead battery, the logger will retain the data stored in its memory, but it must be reprogrammed to restores its data recording functionality. Distributor is responsible for maintaining battery in logger.

Battery Replacement:

To replace the battery, remove the battery cover on the underside of the Data Logger (opposite the terminal block) by sliding the cover back (away from the terminal block) using your thumb and index finger. Pull the bottom of the battery up first, then remove the battery.

Detach the battery from the battery clip and (see note below) connect a fresh battery to the clip. Wind the battery leads around the battery terminals (about one turn) and insert the bottom of the battery into the battery compartment. Then, pressing the bottom of the battery against the spring tab, seat the battery fully into the battery compartment. Slide the battery cover into place - if the cover will not slide into place, remove the battery and redress the leads, they were probably preventing the battery from fully seating against the bottom of the battery compartment.

Data Retention:

A new battery must be connected to the battery clip **within 10 seconds** after removing the old battery, so that the Data Logger's data is not lost and the unit will continue to record without interruption. Removing the battery from a Data Logger for a long time (more than 15 minutes) will enable an internal power fail mode, which will require the logger to be reprogrammed.

Data Storage

Stored temperature readings can be single point or average values. In the CTW application, to meet the Miller Brewing requirements, the logger has been preprogrammed to record the **average** value for each hour. Readings are accumulated every two (2) seconds to develop the hourly average.

Memory and Accuracy

The logger offers three (3) levels of data resolution. The choice affects the memory capacity and accuracy of readings. In the CTW application, the logger has been preprogrammed for **12 bit resolution**. This setting will provide approximately seven (7) months of data retention and a combined sensor, cabling, and logger accuracy of $\pm 0.32^{\circ}\text{F}$. Once the memory become full, the logger will begin to over-write the oldest data with the most recent data. At any given time, you should have approximately 7 months of data retained in the logger memory.

Start of Logging

The logger offers four (4) start modes. For **Option 1 – Monthly Monitoring Service** customers, the logger has been preprogrammed to start logging immediately with a preset dial out time. **Option 2 – Equipment Purchase** customers, the logger has been preprogrammed to start when the Channel 1 temperature sensor is attached. This will occur when the customer connects the sensor during installation at the site. When connecting sensors for a warehouse that requires less than four (4) sensors, the installer should make sure that Channel 1 is used, or no logging will occur. The remaining channels should be used in sequential order.

Communication with Laptop or Desktop Personal Computer

The logger can communicate with your laptop or desktop computer by a direct connection using the IC-209 serial interface cable provided. **See Detail G.** (For Option 1 – Monitoring customers, the logger will automatically communicate via phone modem to a remote data collection system in the Balance Engineering offices.) The requirements for your PC to communicate with the logger are:

- Running Windows 95/98/2000, NT, or XP *
- Minimum – 33 MHz CPU with 4 MB RAM
 - 90 MHz CPU to run real time graph

SOFTWARE

CD ROM

The software that operates the logger is Balance Engineering, Inc. Data Logger Software PSLOG32. This software is provided on the enclosed CD Rom. File size is approximately 1.93MB.

Downloading Logger Software from the CD Rom:

1. Insert Software CD Rom into CD Rom drive on the computer you intend to use for the data download. Insert CD label side up.
2. Use Windows Explorer to navigate to the CD ROM drive.
3. Double-click the log32 icon (the only program listed on the CD-ROM). (You should see a picture of a diskette with an arrow pointing towards a CPU.)
4. The **Welcome screen** will appear, prompting you to start the software installation. Click "OK".
5. The **Select Destination Directory screen** shows the directory where the data software will be installed. (A directory location has been pre-selected for you, but you may override and select your own directory location if you chose.) **The default download location is C:\Program Files\PSLOG**. Write down your download location for future reference. Click "OK"
6. The **Installation screen** will appear. When installation is complete, the **Install screen** will appear telling you the data logger software has been installed. Click "OK"
7. The software installation file has now been downloaded to your computer.
8. To create a short cut to access the software from the Desktop:

Go to C:\Program Files\PSLOG
Right Click on the Pslog Icon
Highlight "Sent To: with your curser
Select: Desktop
9. Double Click on the Shortcut to Pslog32 icon to open the software (the icon looks like a gray box with black border with a black wishbone shape inside)

For ER Distributors - See Download Loading on Page 12 for instructions on downloading your data from the logger.

Communicating with the Logger – Option 2 – Equipment Purchase Customers Only

Option 2 – Equipment Purchase customers must utilize their own laptop or desktop computer to communicate with the logger and download data. **(See Detail G)**

Your logger has already been pre-programmed with the information specific to your warehouse as provided on the Order Form you submitted.

In order for the logger to communicate with the Data Logger software, you must perform the following:

1. Select the COM Port, (COM 1 is the default setting)

This establishes the communication protocol between the computer and the logger, but does not affect the programming of the logger. The logger does not need to be connected to the computer to make these selections.

Selecting COM Port

1. If you have not yet installed the Data Logger software, you must do so now. Please refer to your Installation and Operating Instructions for software installation procedures.
2. Open the Data Logger software program. (In Windows Explorer, you can start the Data Logger software by double clicking on the PSLOG Application file in the PSLOG directory under Program Files)
3. At the Data Logger menu screen, Click on “Setting” on the menu bar.
4. **Select the Port Setting for your computer - COM 1 through COM 8 - that is used to connect your PC to the logger via the IC 209 cable.** (COM 1 is the default setting and typically the COM Port selected for use.)
5. Click “OK”
6. Click on File on the Menu Bar at the top of the screen
7. Click on Exit

Equipment purchase customers can connect the logger to their computer to accomplish the following tasks:

1. Review logger programming
2. Download (receive) stored data
3. Display real-time graphs of data as it is collected.

The steps to accomplish these tasks are as follows:

1. Review Your Logger's Programming and Battery Strength (Not a Required Step – Informational Only)

To view how your logger is programmed, please perform the following:

- a. Connect the logger to your computer using the IC 209 cable provided (9 pin cable) **(See Detail G)**
 - b. Click on "Receive" on the top menu bar
 - c. Click on "Status"
 - d. The "Status" window shows how your logger has been programmed.
 - e. Click the "X" to Close and Return to the main menu
- 2. Downloading (Receiving Data from Logger)**

The following steps are required to download stored data from the logger to your laptop or desktop computer in spreadsheet format.

- a. Plug prong-end of the IC209 cable into the logger and connect the 9 pin end of the cable to the selected COM port on your computer. (This must be the COM port that was selected in the original setup file – typically COM 1.) **(See Detail G)**
- b. Start the Data Logger software program.

- c. At the Data Logger menu screen, Click on “Settings” on the menu bar and make sure the following setting are selected:

Port: Com 1 (Com 1 is the default but it may be change if you utilize a different Com Port)

Baud Rate: 9600

Connect to: Single Logger

The follow options should be checked

- ✓ **XR4xx Protocol**
- ✓ **Auto Export Data**

Export Data Format: mm/dd/yyyy (USA)

Time: 24 Hour

Click ✓OK to accept these settings

- d. At the Data Logger menu screen, Click on “Receive” on the menu bar
- e. Under “Receive”, Select “Data”
- f. Enter file name under which you would like to store your downloaded data. (ie. June08Data) This new file will be saved under the default directory C:\Program Files\PSLOG unless you select another location. (ie. C:\ Program Files\PSLOG\June08Data) Take note of the directory location where your file will be downloaded.
- g. Click on “Save”
- h. A serial link will be established, and data transfer will continue until the “transfer complete” message appears. In the serial link data transfer box, the location of the data file transfer will appear.
- i. If you would like to see a graph of the data on screen, click on “Yes”, otherwise click on “No”
- j. Click on “File” in the top menu bar.
- k. Click on “Exit” to exit the Data Logger software program. Your data has been downloaded.

- I. **To locate and review your temperature data file:** - In Windows Explorer, locate the directory where you have downloaded your data. (ie: C:\Program Files\PSLOG\June08Data)

Two data files will be downloaded:

- i. **PL 1 file**

- ii. CSV File (Microsoft Excel Comma Separated Values)
(ie: June08Data.csv)

To review your data - Double click on the CSV file to open. Your data file will appear in an Excel compatible format.

Downloading a Specified Range of Data

1. Download the data from the logger as described in the Installation Instructions.
2. At the **Information** screen, when prompted to Graph Data? Click “Yes”
3. A graph of all the data downloaded will appear.

To Graph a specified range of data points:

- a. Position your cursor on a data point in the middle of the graph. The date, time, and temperature for this data point is displayed in the upper left hand corner of the screen, below the main menu.
- b. Move the cursor to the left until you reach the 1st data point you would like to graph/download. (ie 1/01/2008 0:16, 55.55 = a temperature reading of 55.55°F at 12:16 am on January 1, 2008). Click on the 1st data point to begin your selection and drag the cursor to the right until you reach the last data point in the range you would like to graph/download. (ie 1/31/2008, 23:16). Release the mouse. The graph will change to show the new range of data points selected. Click “File”, “Print” to print the new graph.

If you make a mistake or did not get the right range of data points, Click “Change”, “Undo Zoom” and the original graph of all the data will appear. Start your selection again.

Downloading the specified range of data from the graph

- c. While in the **Pocket Logger Graph** screen which shows a graph of the specific range of data selected, Click “File”, “Export”. An **Export** Screen will appear. Make sure **ASCII is selected**, and Click “OK”. A **Create ASCII File** screen will appear.

Make sure the following options are selected:

Type: Comma Separated Values
Data: All Points

Click once in the Save As field to enter a file name, a **Save As** screen will appear.

Save in: The **Save In** prompt will indicate that the default download directory location is **PSLOG (C:\Program Files\PSLOG)**. Most people do not change the default download location, if you choose to make a change, make of note of where you downloaded the data.

File name: Enter a file name to identify the specific range of data selected (ie. Jan2003 Data)

Save as Type: Choose “CSV File”

Click “Save”

The **Create ASCII File** screen will appear again, with the selected file name and download path in the **Save As** field. Click “OK”. A prompt will show you the directory, path, and file name where your data has been downloaded. Click “OK”

Click “File”, “Exit Graph” to return to the Pocket Logger software

Click “File”, “Exit” to exit Pocket Logger software

- d. **Locate and review your temperature data file:** In Windows Explorer, locate the directory where you have downloaded your data. (ie: C:\Program Files\PSLOG32\Jan2003 Data)

Double click on this new CSV file to open. Your data file will appear in an Excel compatible format.

- e. Your data is ready for analysis and reporting as required by Miller Brewing Company.

3. Displaying Real Time Data Graphs - (Option 2 - Equipment Purchase customers)

The following steps are required to see a Real Time display of the data as it is collected.

- a. While the logger is collecting data, connect the IC 209 cable from the logger to a COM port on your computer. (This must be the COM port that was selected in the original setup file.) **(See Detail G)**
- b. In Windows Explorer, start the Data Logger software by double clicking on the PSLOG Application file in the PSLOG directory.
- c. Click on "Receive" in the top menu bar
- d. Click on "Real Time Graph"
- e. The Real Time graph will be updated approximately every (2) seconds. After approximately (45) minutes of data history is displayed, the oldest (10) minutes of history will be deleted.
- f. For additional features of Real Time Graph refer to the On Screen Help menu.
- g. To exit Real Time Graph, click on "File" in the top menu bar.
- h. Click on "Exit Graph"
- i. Click on "Yes – Terminate Real Time Graph"
- j. To exit the Data Logger Software, click on "File" in the top menu bar
- k. Click on "Exit"
- l. Disconnect the IC 209 cable from the logger and the Com Port on your computer.

PROCEDURES TO CLEAR LOGGER'S MEMORY OF OLD DATA

Reprogramming the Logger – Sending a New Setup File to the Logger

WARNING: Your logger has been custom programmed for your distributorship prior to shipment per your specifications indicated on the order form you submitted. Reprogramming the logger is NOT required for logger functionality.

Please contact the Balance Engineering Technical Support line 317-844-2922 for assistance in reprogramming your logger to ensure all custom programmed information pertinent to your distributorship is maintained.

If you elect to reprogram your logger yourself, you accept full responsibility for any lost data or errors that may occur in the course of reprogramming the logger.

(NOTE: Sending a new setup file to the logger reprograms the logger and erases all data stored in the logger's memory. Be sure to download any data stored in the logger before sending a new set up file to the logger.)

The logger is designed to retain all the data it has collected in its memory until its memory is full. Once its memory is full, the logger will over-write the oldest data with the newest data, as it continues to collect data.

Each time you download your data, all the data stored in the logger will be downloaded. Each month as more data is collected, it will take a little longer to download the data from the logger and the data download file will become larger.

One way to control the amount of data stored in the logger is to clear the memory by sending a new setup file to the logger monthly after each data download.

Steps to Creating a New Setup File:

1. Follow the Downloading (Receiving Data from Logger) instructions to retrieve the data currently stored in the logger.
2. Check / Adjust the time and date settings on the computer. During re-programming, the logger's internal clock will be set to match the time and date settings of your computer.
3. With the logger still connected to the computer Com port via the IC209 cable: **Go to the Pocket Logger main menu screen, Select "File", then "Setup"**
4. The **Pocket Logger Setup screen** will appear (See Figure No. 1). To create a new setup file, Click "Save As. A **Save Setup As screen** will appear. At the **Save Setup As screen**, you will be prompted to Enter a File name for the new setup file. (Your file name is limited to (8) characters – we suggest simply using "Miller" as your file name). Enter a File name. Your new setup file will be saved in your PSLOG subdirectory. C:\Program Files\PSLOG3\FileName.set (ie: C:\Program Files\PSLOG\Miller.set) After you have entered a file name, Click "Save"
5. At the upper left hand portion of the **Pocket Logger Setup screen**, in the box under "Setup from", your new file name should appear followed by **.set.** (ie: Miller.set)

6. You will now need to Establish a new Session Description. In the box below Session Description, Type in the following:

Type your file name, followed by a semi-colon (;), then type your file name again

File Name;File Name (ie: **Miller;Miller**)

Make sure you type a semi-colon (;) to separate the file names

7. You will now need to Select your logger programming information.

The **▼ button** indicates a drop down menu that allows you to make selections.

You may customize the sensor description field to more accurately describe your sensor placement location, if you choose.

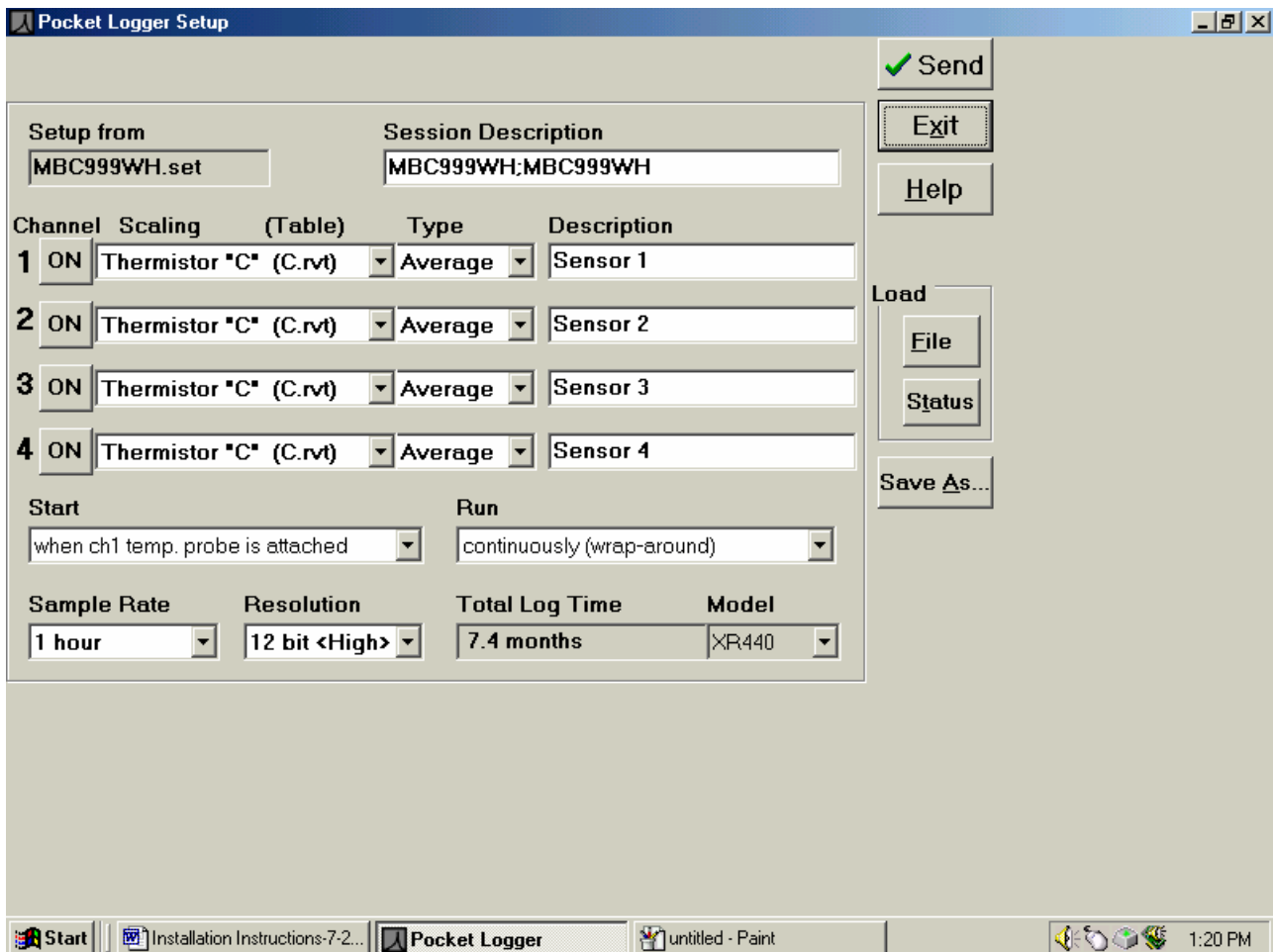


Figure No. 1

8. To send this newly created setup file to the logger and erase all data currently stored the logger, Click “✓Send”
9. A Warning Screen will appear with the following statement: **Pocket Logger’s data is about to be erased, and its clock set to the date / time of this computer.** Click “OK”
(Please confirm that you have downloaded the data in the logger and verified the computer time and date are correct.)

ELECTRONIC REPORTING PROCEDURES

(For additional information regarding Electronic Reporting - please refer to the FAQ- Electronic Reporting Procedures document available for download on our website www.balanceeng.com/MillerCTW)

AM Distributors

Data files submitted automatically to Balance Engineering via modem and phone line.

To view, print or download Monthly CTW Report:

1. Go to www.balanceeng.com/MillerCTW
2. Enter User ID & Password
3. Click "Reports" to view the Miller Brewing Company Reports on file for your distributorship.
4. Select Summary Only or Summary with Charts to view report for specified month.

ER Distributors

Distributor's who have purchased the Balance Engineering monitoring equipment, must upload the PL1 file to Balance Engineering by the 3rd business day of the month:

To upload PL1 data file:

1. Go to www.balanceeng.com/MillerCTW
2. Enter User ID & Password
3. Click "Upload File"
4. Click "Browse"
5. Double Click on the PL1 data file to be uploaded
6. Click "Upload File"

To view, print or download Monthly CTW Report:

You must subscribe to Report Services to gain access to your Monthly CTW Report.

If you are a Report Service Subscriber:

1. Go to www.balanceeng.com/MillerCTW
2. Enter User ID & Password
3. Click “Reports” to view the Monthly CTW Reports on file for your distributorship.
4. Select Summary Only or Summary with Charts to view specified report.