GENERAL
Accurately measure and record the temperature or temperature/humidity in environmental chambers, coolers, food or storage areas and greenhouses with the Series LCL Low Cost Data Logger. Single channel temperature logger, model LCL, includes a built-in thermistor to record up to 10,000 measurements. Model LCL20 logs temperature and humidity with a capacity of 8,000 samples and calculates dew point based on this data. For remote temperature measurements, select dual channel model LCL22 which includes 2 external temperature probes. Quickly start or stop recording via a slide switch with locking protection to avoid accidental shutoff. During recording, the built-in LED flashes every 5 seconds to indicate operation. The LCL05 WindowsTM software (sold separately) allows you to set the sampling rate, read the recorded data in text or graphical format with selectable °F/°C or to store the recorded data for future use.

SOFTWARE INSTALLATION
The Data Logger to PC program is supplied on 3 1/2" floppy disks. To install the software follow the instructions below:
1. Insert disk 1 of 2 into Drive A.
2. If you are using WindowsTM 98/95, click on START, then click on RUN.
3. Type A: SETUP and press Enter.
4. If you are using WindowsTM 3.11, click on Program Manager.
5. Select FILE, and select RUN.
6. Type A: SETUP and press Enter.

If you are not familiar with the above commands, refer to the instructions that are supplied with your version of WindowsTM.

SETTING THE DATA LOGGER
The LCL recording interval or sampling rate is the time between each temperature/humidity measurement that is saved in the logger's memory. This interval is set from the PC interface program. This sampling rate can be set from 5 seconds to 60 minutes.

PHYSICAL DATA
Temp Range: -40 to 150°F (-40 to 65°C) (LCL10 and LCL22); 32 to 140°F (0 to 60°C) (LCL20).
Relative Humidity: 0 to 95% RH, non-condensing.
Dew Point: 32 to 140°F (0 to 60°F).
Resolution: Temperature: 0.1°F (0.2°C), Humidity (LCL20): 0.1%, Dew Point (LCL20): 1%.
Accuracy: Temperature: ±2°F (±1°C), Humidity (LCL20): ±2%.
External Temperature Probe: 4’’304 stainless steel submersible tip with 6’’ long cable (two included with Model LCL22).
Memory Size: 10,000 samples (LCL10); 8,000 samples (LCL20); 8,000 samples per channel (LCL22).
Sampling Method: Stop when full.
Sampling Rate: Selectable from 5 seconds to 60 minutes.
Time Accuracy: ±100 ppm @75°F.
Storage Temperature: -40 to 170°F (-40 to 76°C).
Power: 3.6V Lithium battery (LCL10) included; 9V Alkaline battery (LCL20 and LCL22) not included.
Battery Life: 3 years (LCL10); 1 year (LCL20 and LCL22) average.
Software Requirements: IBM compatible PC with WindowsTM 98, 95 and 3.11.
Housing: ABS Plastic.
Weight: 3 oz. (85 g).
Dimensions: 2.5” × 3.6” × 1.1” (64 × 91 × 28 mm).

A user message of up to 20 characters can also be stored in the LCL. This message can be used to identify a customer's location or identify a particular logger for tracking purposes. Use the example below to set a LCL logger.
1. Plug the PC interface into the printer port of the computer being used to set the LCL. Plug the LCL being set to the cable from the PC interface.
2. Start the Data Logger program. If you are using WindowsTM 98/95, click on Start, click on Programs, click on Dywelog, click on DWYERLOG.
3. If you are using WindowsTM 3.1, double-click on the window labeled Dywelog, then double-click on the DWYERLOG icon.
4. The program will open with a blank window showing no text or graph. On the toolbar located along the top of the screen, click on the Setting Data Logger before recording button. This will open a secondary window Setting Data Logger.
5. If a user message is desired, click in the **User Information** field and add the desired message. Note that the last message will be displayed and will remain until it is erased or changed by the user.

6. To select the recording interval click on the down arrow in the **Sampling Rate** box. This will open a drop-down menu with the recording interval selections. Note that the maximum recording times are indicated in parentheses next to the recording interval.

7. Click on the desired recording interval. You may need to use the up or down arrows on the drop down menu to see more of the available recording intervals.

8. The time and date the logger is set to will be the same time as the PC clock. It is important to make sure the time set in the PC is correct. The PC time will be displayed as the **Current Date and Time** in the setting window. Refer to the owner’s manual for your computer to find instructions on setting the PC time if it is not correct.

9. When all of the settings for the LCL are to your satisfaction, click on **OK** to store the setting in the LCL and to close the window.

10. The LCL is now set and ready to begin a new recording. Disconnect the LCL from the PC interface.

11. You can now connect a different LCL or exit the program. To exit the program, click on the **Exit** button on the tool bar.

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**TO START A RECORDING**

To begin a new recording slide the access door closed. The LED indicator will begin to flash for 10 seconds. During this period the recording can be canceled without losing the data previously recorded. When the LED indication stops flashing, a new recording has begun and any previous data has been erased. The LCL recording function can be “locked” on by passing a Ty-Wrap™ or similar restriction through the logger-mounting opening. This can be used to prevent accidental or intentional disruptions of a recording.

The LED will flash every 5 seconds to indicate operation. A bright flash of the LED is used to indicate that the temperature has been sampled and recorded. A dim flash is used to indicate that the LCL is operating properly and the temperature has not been sampled or recorded. The LED indicator will continue to flash, until the user stops the recording or the memory has reached its maximum capacity.

**NOTE:** If the battery is exhausted during a recording, the LCL will automatically terminate the recording and save any temperature data recorded up to that point. The LED will stop flashing and the LCL will not allow a new recording to be started until the battery has been replaced. Recorded data can be retrieved regardless of the condition of the battery.

**TO STOP A RECORDING**

Slide the access door open. If locked, remove the restriction device first. The LED indicator will stop flashing. The recorded data can now be retrieved using the supplied Windows™ compatible software and PC interface.

**NOTE:** Do not close the door until a new recording is desired! It is important to leave the door open until you want to start a new recording. Starting a new recording now will erase the previous recording. To prevent accidental erasing of recordings, the access door of the LCL can be “locked” open by passing a Ty-Wrap™ or similar restriction through the lock opening. The temperature recording will remain in the LCL until a new recording is started. The recordings may be retrieved as many times as required or the battery can be removed with no effect on the stored data.

**RETRIEVING TEMPERATURE RECORDINGS**

1. Plug the PC interface into the printer port of the computer being used to set the LCL. Plug the LCL being read to the cable from the PC interface.

2. Start the Data Logger program. If you are using Windows™ 98/95 click on **Start**, click on **Programs**, click on **Dwyerlog**, click on **Dwyerlog**.

3. If you are using Windows™ 3.1 double-click on the window labeled **Dwyerlog**, double-click on the **Dwyerlog** icon.

4. The program will open with a blank window showing no text or graph. On the toolbar located along the top of the screen click on the **Download data from Data Logger** button. A **Data Transfer** window will open. A message will be displayed to connect the LCL to the printer port. Connect the LCL now if it is not already connected.
5. To the right of the “Connect” message is a selection box, which will allow you to select the temperature information in Celsius or Fahrenheit. Click on the desired scale, °F or °C.

6. Click on OK. The program will begin to retrieve the recording. A status bar along the top of the window will show the progress of information being retrieved.

7. When the information has been retrieved, the program will automatically display the recording in the current mode that has been selected (graph or text).

**VIEWING A RECORDING AS A GRAPH**

1. To view a graph of the recording click on the Full Graph button. The program will display the entire recording as a plotted graph with the temperature on the vertical scale and the time on the horizontal scale.

2. To zoom to a particular part of the graph, place the mouse cursor in a corner of an imaginary box that will enclose the area of interest.

3. Press and hold the left mouse button and move the cursor in a diagonal direction from the original position of the cursor. A dashed line forming a box will be displayed.

4. Move the cursor until the box encloses the area of interest and release the left mouse button.

5. The box will now be stationary on the screen. Move the mouse cursor so that it is inside the box and click the left mouse button.

6. The enclosed area of the box will now be zoomed so that it fills the entire window. This may be repeated if additional magnification of an area of the graph is desired.

7. To return to the original graph click on the Full Graph button.

8. The graph on the screen may be printed at any time by clicking on the Print button. Note that the print out will be what is displayed on the screen when the button is clicked.

9. A prompt window will open in the middle of the screen. Click OK to print, or Cancel if you change your mind.

**VIEW A RECORDING AS TEXT**

1. When a recording is first retrieved or when a saved recording is opened, the most recently used mode will be displayed.

2. To view a recording as text when a graph is on the screen click the Text button located in the display box.

3. Use the Windows scroll bar on the right hand side of the screen to scroll through the text information.

4. To print the text information as text data click on the Print button. A window will open in the middle of the screen.

5. In the lower left of the window will be a drop-down menu which will allow you to select the number of degrees the temperature has to change before the new value is printed. This feature will prevent needless printing of temperature when no change has occurred. If you wish to print all the recorded information, leave this value at zero.
6. When you have selected the amount of temperature change to print (if any), click on the OK button to start printing.

DATA LOGGER CALIBRATION

You can calibrate the LCL Data Logger to make its reading match an external reference or standard. Set the LCL sampling rate long enough to allow the logger to stabilize at the reference temperature and humidity and make a recording along with an external reference in a controlled environment such as a temperature/humidity chamber.

The calibration routine will use the second recording sample to make the logger reading match with the external reference. Click Tools on the menu and click Calibrate Logger. A calibration password window will open. Type your password in the Current Password section. If you want to have a new password next time, you can type a new password in the New Password section. Click the OK when finished. If this is the first time you are calibrating the LCL, no password is needed. You can click the OK button or press the Enter key to continue. If you have typed a password before and you don't want password protection for the calibration function, you can input None as the new password and this will clear the password protection.

After you type the correct current password and click OK, a calibration window will open. You can click the plus or minus button to make the Data logger reading match with the reference reading that you recorded at the same time and same place with the LCL. Click the OK button and the software will make a new data retrieval based on your new calibration setting. The new calibration setting will be saved in the LCL and apply to all future recordings.

BATTERY REPLACEMENT

The LCL 10 Temperature Data Logger is supplied with a Lithium battery, which will have an average life of 3 years. The LCL 20 Temperature/Humidity Data Logger and LCL 22 Dual Channel Temperature Data Logger use a 9-volt Alkaline battery (not supplied) which will have an average life of 1 year. The actual life of the battery will depend on a variety of factors such as the temperature the battery is used in, the sampling rate of the logger, and how often the LCL is used. Extreme temperatures will result in reduced battery life. If the battery is exhausted during the recording, the LCL will automatically terminate the recording and save any data recorded up to that point. The LED will stop flashing and the LCL will not allow a new recording to be started until the battery has been replaced. Recorded data can be retrieved regardless of the condition of the battery.

The LCL 10 Temperature Data Logger uses a TADIRAN Model # TL-5276/W Lithium battery or equivalent. Models LCL 20 and LCL 22 use only Alkaline batteries. Substitution of a different battery can result in reduced performance or permanent damage to this instrument.

To replace the LCL 10 Lithium battery follow the steps below:

1. Be sure the logger is not set in the recording position, by sliding the door open. Any information recorded up to this point will not be lost and is automatically saved.
2. Remove the rear battery cover.
3. The battery is connected with a keyed connector, remove the connector from the PC board.
4. Remove the battery from the logger and dispose of properly.
5. Line up the connector of the new battery and push onto the pins of the PC board with a firm motion. Note that the connector will only fit when it is correctly oriented.
6. Place the battery in the battery compartment of the LCL.
7. Replace the battery cover. To replace the LCL 20 or LCL 22's batteries follow the steps below:

1. Make sure the logger is not set in the recording position. If so, slide the door open. Any information recorded up to this point will not be lost and is automatically saved.
2. Remove the rear battery cover.
3. The battery and battery clip may be extended from the battery compartment to facilitate replacement.
4. Remove the battery from the battery clip and dispose of properly.
5. Line up the connector of the new battery and push onto the pins of the battery clip with a firm motion. Do NOT reverse the battery connection, even momentarily, as this can result in loss of data or permanent damage to the logger.
6. Place the battery in the battery compartment of the LCL.
7. Replace the battery cover.

Once the battery has been replaced it will be necessary to reset the logger's internal clock. Refer to the section Setting the Data Logger for instructions on how to do this.

MAINTENANCE

No routine maintenance is required on the Series LCL data loggers. Periodic checks of connections and mounting is recommended. Please contact Dwyer Instruments, Inc. before returning unit for repair to review information relative to your application and obtain a return authorization number. When returning a product to the factory, carefully package and ship freight prepaid. Be sure to include a complete description of the application and problem and identify any hazardous material used with the product.

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