

MicroLog & MicroLog Plus



User Guide



MicroLog & MicroLog Plus User Guide

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Using the Guide

MicroLog is a compact data logger used to monitor the temperature and humidity of perishable goods or controlled environments. It can also be connected to external sensors in order to monitor additional parameters, and can be mounted onto a cradle for use with the Sound Alarm feature as well as the wireless Daily Download tool.

MicroLog Plus is a sophisticated data logging system, which can remotely monitor up to 200 MicroLogs simultaneously.

Chapter 1 of this guide details the operation procedures for MicroLog as a stand-alone device, as well as how to work with its software program, MicroLab.

How to use this Guide



If you are using the wireless MicroLog Plus system read Chapter 2, which details the setup and operation of the wireless MicroLog Plus system. Chapter 3 explains how to use the MicroLog together with a cradle. Chapter 4 covers connecting your MicroLog to a receiver. Chapter 5 explains the use of external antenna, and Chapter 6 deals with connecting it to external sensors.



Compliance with FDA Title 21 CFR Part 11

To achieve compliance with FDA Title 21 CFR Part 11, use Fourier Systems' software packages: *MicroLab* or *MicroLab Plus* together with *DatPass*. The *DatPass* software is Fourier Systems' administration software. Among other features, it defines the users that can log onto the *MicroLab*/*MicroLab Plus* software, their passwords and the digital signatures the users are permitted to sign data within electronic records (files). *DatPass* also maintains an audit trail to keep track of all action performed within the system. The system is secured with a serial port dongle, without which the *MicroLab* and *DatPass* software packages will not operate.

How to use this Guide





Chapter 1 MicroLog





1.1. Overview

MicroLog can be used as a stand-alone device to monitor temperature and humidity levels. All viewing, exporting and printing of the data obtained is done with just two keys. MicroLog continuously displays the most recent recordings, along with the maximum and minimum values for a selected time interval. Users can also define minimum and maximum alarm levels for a specific shipment, and the display screen will begin to flash if either level is breached.

(Instructions for using the Sound Alarm feature can be found in section 0)

The data stored by MicroLog can be downloaded to any computer for further viewing and analysis using the MicroLab software, and can be exported to a spreadsheet.



1.2. Getting Started

In order to save battery life, MicroLog is shipped in Stop Mode. This means that before you can start recording, you must first connect MicroLog to the PC and set it up with the accompanying software. To set up MicroLog with the MicroLab software, refer to section 1.4.

Once MicroLog receives the setup command, it begins logging the data immediately.



1.3. Working with MicroLog

1.3.1. Data Displays

Current data

When MicroLog is recording, the data from the sensors is displayed alternately. The data obtained from external sensors is displayed with a small EXT symbol.

When MicroLog stores the data, the LCD display briefly changes to a “double dash” (- -) symbol.

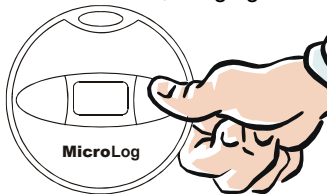
Minimum and maximum values

You can display minimum and maximum values for any hour from the last 24 hours and for any day from the last 30 days by using MicroLog’s left and right keys:



Viewing Min. and Max Values in the Last 1-24 Hours

1. Select a time period by pressing the right key on the MicroLog. The LCD will begin displaying the hour number, ranging from hours 1 to 24. Once you've reached the desired time period, release the right key.





2. Once you've released the right key, MicroLog will display the Min and Max values logged by the sensors during the selected time period.
3. (Optional) Once the left key is released, MicroLog will send an IR signal of the Min and Max values for the selected time period. To receive a printout of this data, simply point the MicroLog to the IR printer (HP portable printer – model No. 82240B).

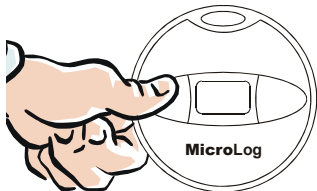
Viewing Min. and Max Values for the last 1-30 Days

1. Select a time period by pressing the left key on the MicroLog. The LCD will display the day number, ranging from days 1 to



30. Once you've reached the desired time period, release the **left** key.

2. Once the left key is released, MicroLog



will display the Min and Max values of the sensors for the selected time period.

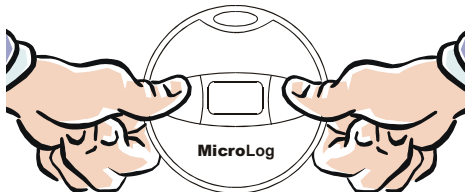
3. (Optional) Once the left key is released, the MicroLog will send an IR signal of the Min and Max values for the selected time period. To receive a printout of this data,



simply point MicroLog to the IR printer (HP portable printer – model No. 82240B).

Status messages

When both the left and right keys are pressed simultaneously, the MicroLog LCD will display MicroLog's status. This will also “wake up” the device, a step necessary for its communication with a computer. The status messages include:



– Run



– Cyclic Run



Tr

– Timer Run

St

– Stop Mode

PC

– Downloading data to a PC

1.3.2. Working Modes

MicroLog is always set in one of the 4 possible modes:

Stop – MicroLog is idle and is not recording.



Run – MicroLog is recording data. It will stop recording automatically when its memory is full (16,000 recordings).

Cyclic Run – Same as Run, but MicroLog will record over the old data when the memory is full, beginning with the earliest data recording.

Timer Run – MicroLog can be configured to start recording at a predetermined time. When MicroLog is set for such a run, its status is set to Timer Run. Once MicroLog starts recording, its status changes to either Run or Cyclic Run, depending on the desired configuration.

1.3.3. MicroLog's Connections

Note: MicroLog ships with a rubber plug that covers the rear socket. The plug protects the socket from moisture. Unless you are using the socket leave the plug in.



Connect MicroLog to a computer

For this you will need a serial communication cable (catalog number DT058).



The serial communication cable ends with a type D 9-pin female plug. Plug this in to any free COM port on your computer.



The other end of the serial communication cable ends with a small black flat plug. Plug this end into the socket at the back of the MicroLog.

Note that the socket has three pins, with one further away from the other two (Figure 1). Take care to plug the cable in correctly.

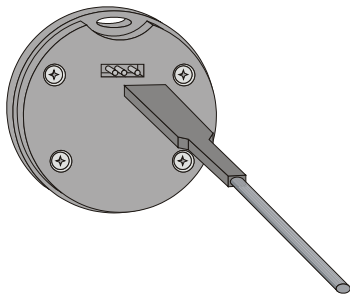


Figure 1: Connecting MicroLog



Note: You can also connect to the PC via the Cradle (see page 170).

Connect MicroLog to an external sensor

Use the same PC connection socket to connect to an external sensor (see Figure 1).

Note that the socket has three pins, with one further away from the other two (Figure 1). Take care to plug the cable in correctly.

Note: You can also connect the external sensor to the Cradle (see page 170).



1.3.4. Sleep Mode

The MicroLog battery's maximum lifespan is approximately 1.5 years. This long battery life is achieved by MicroLog putting itself "to sleep" between recordings, or after 4 minutes goes by without communication with the computer. While sleeping the data logger consumes a minimal amount of power.

MicroLog "wakes up" every second for a very short time (a few micro-seconds) to check if one of the keys has been pressed or if there is a message coming in from the computer. This is the reason you have to press and hold a key for at least two seconds before a status message appears.

If you use high sampling rates, the MicroLog battery's lifespan will be considerably shorter (see Figure 2).

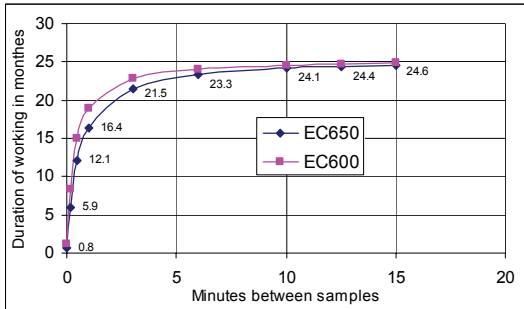


Figure 2: MicroLog battery life

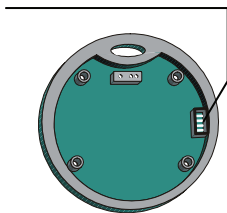
Note: The figures on the graph refer to MicroLog usage without daily download and without viewing min/max values on MicroLog's display



1.3.5. Replacing the Battery

Warning: The back cover of the MicroLog contains a special compartment for the fragile humidity sensor. When removing or replacing the cover, be careful not to harm the sensor.

Humidity
sensor



Humidity
sensor

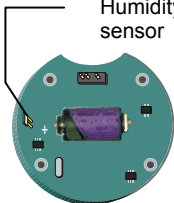


Figure 3: Replacing the battery



MicroLog's battery is a 1/2AA 3.6V lithium battery

1. Unfasten the four screws on the back of the MicroLog.
2. Carefully remove the back cover
3. Replace the battery, and be sure to insert the new battery into the correct corresponding polarities (look for the “+” symbol next to the positive terminal)
4. Carefully reposition the electronic board on MicroLog's back cover and make sure that the humidity sensor is placed in its compartment.



5. Refasten the four screws on the back of the MicroLog.

1.4. Working with the MicroLab Software

1.4.1. Installation

System requirements

To work with MicroLab, your system should be equipped with the following:

Software

Windows 95, or later (Windows 95 will not support USB)

Internet Explorer 4.0, or later (you can install Internet Explorer 5 when you install MicroLog Plus, since it ships with the product).



Hardware

Pentium 300 MHz or higher

32 MB RAM (64 MB recommended)

5 MB available disk space for the MicroLab application

Installing the software

1. Insert the CD into your CD drive.
2. The installation will start automatically. Once the process begins, follow the on-screen instructions.
3. In case auto run is not working, open the CD drive folder and double-click the setup icon, then follow the on-screen instructions.

To un-install the software: From the Start menu select Settings > Control Panel, and use the Add/Remove programs function to remove the MicroLab application.



To install the USB driver (optional for cradle communication):

1. Insert the CD into your CD drive. If Installation begins automatically (and you have already installed MicroLab), click **Cancel** to stop installation
2. Connect the Cradle to a USB port on your PC. Windows will automatically detect the new device and open the **Add New Hardware Wizard**
3. Select **Specify the location of the driver**, then click **Next**
4. Select **Search for the best driver for your device**, then check the **Removable Media** checkbox, and then click **Next**

Windows will automatically detect and install the necessary software.



1.4.2. Overview

The **MicroLab** software was designed to allow for the programming of the desired data recording specifications for MicroLog, to enable the downloading of recorded data to a PC, and to store, view and analyze the data.

The **Logger** menu handles all communication between the PC and MicroLog such as programming the desired recording mode, starting or stopping data recording, as well as downloading the data.

The **View** menu controls the various data display options. Data can be viewed in graph format, in table format, or in both. The **Data Map** is a separate pane that displays a list of the open data sets. It can also be used to quickly navigate through the data sets.



The **Graph** menu contains all the commands needed to format and edit the graph.

The most common tasks and commands are available as buttons on the **main toolbar** and on the **graph toolbar**.

1.4.3. Getting Started

Downloading data

1. Connect MicroLog to the PC
2. Open the MicroLab software

3. Click **Download**  on the main toolbar.

Once the downloading has been completed, the data will be displayed both in the graph and in the table, and a new data icon will be added to the Data Map.


Chapter 1 MicroLog



You can now connect a different MicroLog to the PC and download its data. The number of downloads is limited only by the memory available on the computer.

Use the Data Map (section 0) to navigate between the different data sets.

Saving data

To save the displayed data, click **Save**  on the main toolbar. The data currently displayed by the graph will be saved in the MicroLog Data folder:

C:\Program Files\Fourier Systems\MicroLog\MicroLog Data

The data file name consists of the MicroLog name (Comment, see page 51) and of the time and date at which it was saved.



To save data in a different location or under a different name, use the **Save as...** command from the File menu:

1. Select **Save as...** from the **File** menu.
2. Enter a new name in the File name box
3. To save the data in a different folder, select a drive and/or folder from the **Save in** box
4. Click **Save**


If you've downloaded data from more than one MicroLog and you want to save all the data sets, select **Save all** from the **File** menu.

If you are using the Daily download option, data will be saved automatically.



Note: If you want to remove unwanted data before saving, apply the crop tool (see page 43).

Opening files

1. Click **Open**  on the main toolbar.
2. To open a document that was saved in a different folder, select a drive and/or folder in the **Look in** box.
3. Double-click the file you want to open.


Display properties

You can change the way numbers and dates will be displayed on screen.



1. Click **File** on the menu bar, and then click **Display properties**.
2. In the **Decimal place settings**, enter the number of decimal places you want to display (enter a number between 0 and 4) for each sensor.
3. In the **Date format settings** select the desired format option.
4. Click **OK**.

Printing a graph

1. Click **Print**  on the main toolbar to open the **Print Options** dialog box.
2. Click the graph option.




3. Click **Print** to open the **Print Dialog Box**.
4. Click **OK**.

Printing a table

The displayed data can also be printed as a table. The table will only include data from sensors that are currently represented on the graph (to learn how to add or remove data sets from the graph, see page 35) as well as the MicroLog name, serial number and the alarm level setup. Data that exceeds any of the alarm levels will be highlighted by arrows.



1. Click **Print**  on the main toolbar to open the **Print Options** dialog box.
2. Click the **Table** option.



3. If you want to print only part of the data, uncheck the check box and select the desired time and date in the **From** and **To** boxes.
4. Click the **Print** button to open the **Print dialog** box.
5. Click **OK**.

1.4.4. Viewing the Data


Display options

MicroLab's screen consists of three parts: the graph, the table and the Data Map. You can display all three parts simultaneously (the default view) or any combination of them.

If you are using the daily download option you can display a daily status window.



Graph

Click **Graph**  to display or remove the graph. The graph displays the data sets plotted vs. time. The graph usually displays all the data sets of a given MicroLog, but you can use the Data Map to remove one or more of the sets from the graph (see section 0 in this chapter).

In order to keep the graph clear and simple, only two Y-axes can be shown on the graph simultaneously. If there are three curves in the graph, one of the Y-axes will be hidden. To make this axis visible, select the corresponding plot with the cursor (see page 37).

You can identify the Y-axis by its color, which matches the plot color.



Table



Click **Table** to display or remove the table.

The data in the table always matches the data that is currently displayed on the graph.


Data Map





Click **Data Map** to display or remove the Data Map.

The Data Map is a separate window that displays the list of data sets that were downloaded or opened in the current session. Use the Data Map to navigate through the available plots and to keep track of the data that is being displayed in the graph and/or table windows.



When you double-click on a MicroLog icon  in the Document Map, MicroLab jumps to the corresponding data and displays it in the graph and table windows. It also expands the Data Map to show the individual sensors included with the selected MicroLog.

A graph icon  indicates that the data set is currently being displayed. Double click on the icon to clear the data set from the display.


An empty icon  indicates that the data set is not being displayed. Double click on the icon to add the data set to the display.

To collapse the sensor list under an individual MicroLog, click the minus sign (-) next to the MicroLog icon.




To display the complete sensor list under an individual MicroLog, click the plus sign (+) next to the MicroLog icon.

To remove an individual MicroLog from the Data Map, right-click on its icon, then click **Remove Data**.

To remove all data sets from the Data Map, right-click the Data sets icon , then click **Remove All Data**.

The Cursor

Use the cursor to view individual data recording values, or to reveal a hidden Y-axis.


To display the cursor, double click on an individual data point or click **Cursor**  on the graph toolbar. You can drag the cursor with the mouse to any other point on the plot, or to another plot altogether.



The point coordinates of the selected data recording will appear in the status bar at the bottom of the graph window.


Zooming and panning

1. Zooming

Click **Zoom in**  on the graph toolbar and drag the cursor diagonally to select the area you want to magnify. Release the mouse button to zoom in to the selected area.

Click on the **Zoom in** button a second time to turn off the Zoom tool.


2. Autoscale

Click **Autoscale** button  on the graph toolbar for the full data display.




Double-click on an individual axis to auto scale it separately.

3. Manual scaling

- Click **Graph properties**  on the graph toolbar to open the Graph Properties dialog box.
- Select the **Scale** tab, and choose the axis you want to scale in the **select axis** drop list.
- Uncheck the Autoscale check box and enter the new values in the edit box
- In the time axis, you can either enter the time and date manually, or select it with the up and down arrow buttons.



- Click **OK**.

To restore auto scaling, click **Autoscale** .

4. Default zooming

If you usually need to view a specific time frame (i.e. workday hours) use the Default zooming tool. You can set the start and end time of the time span and then use it whenever you open a file or download data from the MicroLog.


To set the default zoom:

- Click **Graph Properties**  on the graph toolbar, then click **Set Default Zoom**.
- Enter the start and end times, then click **Set**.

**To zoom to the default zoom:**

- Click **Graph Properties**  on the graph toolbar.
- Check the **Use default zoom** check box and click **OK**.

Every file and every data recording you download will automatically open in the default zoom as long as the **Use default zoom** check box remains checked.

To restore auto scaling click **Autoscale** .




5. The Stretch/Compress axis tool

Move the cursor onto one of graph axes. The cursor icon changes to double arrow symbol (\leftrightarrow), indicating that you can stretch or compress the axis scale. Drag the symbol to the desired location. Repeat the procedure for the other axis if necessary.

6. Panning

Use the pan tool after zooming view any part of the graph that is outside the zoomed area.

To do this, click **Pan**  on the graph toolbar, then click anywhere on the graph and drag the graph to view another area.

Click **Pan** a second time to turn off the Pan tool.



Cropping the data

Cropping enables you to trim the edges of a data set. Use it to remove unwanted data

- Zoom to the data range you want to keep.
- Click **Graph** on the menu bar, then click **Crop**.


All data outside the zoomed area will be **permanently** removed.

Formatting the graph

You can change a data line's color, style or width. You can also add markers that represent the data points on the graph and format their style and color.




The Y-axis color matches the corresponding plot's color and will change accordingly. The time axis color can be changed separately:

- Click **Graph properties**  on the graph toolbar to open the Graph Properties dialog box.
- Select the **Lines** tab, then select the plot or axis you want to format in the **select plot** drop list.
- From here you can format the line's color, style and width, as well as the markers' color and style. To remove the line or the marker, uncheck the corresponding **visible** check box.




- To restore the default formatting, click the **Restore default** button, and click **OK**

Displaying alarm levels

- Click **Display alarm level** .
- Select the sensor you wish to display from the **select sensor** drop list




Changing the temperature units

Click **Toggle °C/°F** button  to change the temperature scale from Fahrenheit to Celsius and vice versa.

Note: To change the units in the MicroLog display, use the Setup dialog box (see page 50).

Exporting data to Excel

Click **Export to Excel**  to export the currently displayed data to an Excel spreadsheet. MicroLab will open a new Excel workbook displaying the data along with the MicroLog info, including the MicroLog name, serial number and alarm levels setup.



Copying the graph as a picture

You can copy the graph to the clipboard as a picture and then paste it to other Windows programs such as Word and PowerPoint:

1. On the **Graph** menu, click **Copy graph**.
2. Open the destination file.
3. In the destination file, right click and select **Paste**.

Viewing more than one data set on the graph

MicroLab lets you view more than one data set in Graph and Table view at the same time, allowing you to compare the data from several data sets side by side.

Note: To use this feature the data sets must have been recorded using the same sampling rate e.g. every 1 minute

There are two modes when using the Multi-graph feature:



- Standard mode

The time scale of all data on the graph is the same. The time and date of data recorded in the first data set included on the graph is used.

For example, if you have a graph whose data was recorded starting 10:00AM on August 11, then all additional data added to the graph will be displayed with the same recording date.

The MicroLab data table below shows all data in the graph having the same time scale:



		MicroLog PRO	MicroLog PRO 3	MicroLog PRO 4
	Time (Date)	Humidity (%)	Temperature (°C)	Temperature (°C)
0	10-Aug-06 16:53:50	39.0	25.90	22.80
1	10-Aug-06 16:54:00	39.1	25.90	22.80
2	10-Aug-06 16:54:10	39.1	25.90	22.80
3	10-Aug-06 16:54:20	39.1	25.90	22.80
4	10-Aug-06 16:54:30	39.1	25.90	22.80
5	10-Aug-06 16:54:40	39.1	25.90	22.80
6	10-Aug-06 16:54:50	39.2	25.90	22.80
7	10-Aug-06 16:55:00	39.2	25.90	22.80
8	10-Aug-06 16:55:10	39.2	25.90	22.80
9	10-Aug-06 16:55:20	39.1	25.90	22.80

- Plot sync mode

To display data on the graph using the data's actual time scale i.e. the time and date when the data was actually recorded, use the **Plot sync** feature. This will also shift all data in the data table accordingly.



Once you've added the data to the graph, on the **Graph** menu, select **Plot sync** to enable the feature. To return to Standard mode, unselect **Plot sync**.

Note: The time scale of all data is rounded to the same resolution as the time scale of the original data on the graph.


1.4.5. Programming the MicroLog

Setup

Use the Setup dialog box to view or to change the MicroLog and the Cradle settings



Note: If you intend to setup more than one MicroLog or Cradle use the Save setup tool (see page 60).

- Connect MicroLog or the Cradle to the PC
- Click **Setup**  to open the Setup dialog box.

The dialog box is made up of five sections:

- a. MicroLog info

Comment

Click the **Edit** box and type a name that will serve to identify the specific MicroLog (e.g. its location).



S/N

Displays the MicroLog's serial number

Battery Level

If the indicator is in the red zone the battery should be replaced (see page 20).

- b. Cradle info

Cradle ID

The cradle's identification number sets the cradle's transmission time in daily download mode.

Battery Level

If the indicator is in the red zone the battery should be replaced (see page 173).



c. Setup

Temperature

Click the **Temperature** check box to activate the internal temperature sensor

Humidity

Click the **Humidity** check box to activate the internal humidity sensor

External

Click on the **External** check box to activate the external sensor option, and then select a sensor in the drop list.

If you want to use a sensor that is not found in the drop list, you can define new sensor (see page 68).



The sensors' current readings will appear in the labels next to the sensor name once MicroLog begins logging for the first time.

Temperature unit

To set the temperature unit in the MicroLog display, select the option you want (Celsius or Fahrenheit).

Interval

Determines the logging interval, or the time interval between successive data recordings.

The time format is hh:mm:ss. Set the time setting to select a recording time interval from between 10 seconds and 2 hours. For example, to set a time interval of one hour, five minutes and thirty seconds, click the hours (hh) and type 1 or use the arrows to



select 01, then click the minutes (mm) and type 5 or use the arrows, and finally, click the seconds (ss) and type 30 or select 30 using the arrows.

Timer run

Click the **Timer run** check box if you want MicroLog to start recording at a predetermined time. This option is convenient if you are using several MicroLogs at once and want them to all begin logging at the same time.

Use the time and date selectors to set the start time.

Cyclic run

In **Cyclic run** mode, MicroLog overwrites the old measurements (starting with the oldest one) once the MicroLog's memory is full. Click the **Cyclic run**



check box to operate in this mode.

If the check box is clear, MicroLog will operate in **Normal run** mode and will stop recording when the memory is full.

Daily download

Check the **Daily download** checkbox to enable automatic daily download (see page 72 for details).

d. Alarm levels

Type in the desired minimum and maximum alarm levels. If MicroLog records a reading that exceeds either of these levels, the MicroLog's LCD will start



to flash and the cradle's alarm will sound.

To stop the LCD's flashing, press either of its two keys. To stop the cradle's alarm, press both the MicroLog's keys simultaneously.

The default alarm levels are the lower and upper ends of the sensors. Click **Cancel Alarm** to restore the default levels.

- e. Cradle time settings

Workday hours

Use the up and down arrow buttons to set the daily period when you want the Alarm and/or the Daily Download to be active, or type the desired period in



manually.

Alarm delay

Click the drop list to select the time delay between the time MicroLog records a reading that exceeds the alarm levels and the time the alarm will sound.

Alarm duration

Click the drop list to select the time for which the alarm will sound before it stops automatically.

Complete the setup

Click **Send setup** to send the new settings to MicroLog, which will complete the setup. Click **Cancel** if you don't want to change the setup.



Note: The **Send setup** command erases all existing data in the MicroLog.

If you set it to **Timer run** mode, MicroLog will wait in standby mode displaying `tr`, and will begin recording at the specified time.



Saving Setup

When setting up multiple MicroLogs or Cradles use the **Save Setup** option in the **Setup** dialog.

1. After you have finished the settings selection of the first MicroLog or Cradle and before sending the setup command, click **Save Setup** to save all the setup settings.
2. Connect another MicroLog or Cradle to the PC,



click **Setup** on the main toolbar, then click **Load Setup** to load your setup settings.

3. Change the Cradle ID.
4. Change the comment (optional).
5. Click **Send Setup**.



Starting recording




Click **Run** every time you want to start a new recording. The **Run** command erases all previous data in the MicroLog's memory and begins recording.

Note: If you setup the MicroLog using the Setup command, it will automatically begin recording, and you don't have to click **Run**



Stopping recording

Click **Stop**  to stop recording. In Stop mode, MicroLog keeps all recorded data but does not record new data. Use this mode to save battery power.

Sensor calibration

A new MicroLog comes fully calibrated. After a period of long use, however, you may want to recalibrate the humidity or the temperature sensors.

The humidity calibration affects both MicroLog and MicroLab and should be carried out while MicroLog is connected to the PC. The temperature calibration affects only the MicroLab software and can be carried out regardless of whether MicroLog is connected to the PC.

*Calibration password*

To prevent accidental change of the calibration, the calibration procedure is protected by a password. The default password is: 1234. To change the password:

1. Click **Logger** on the menu toolbar, then click **Calibration**.
2. Click **Change Password** to open the **Change Password** dialog box.
3. Enter the current password in the **Current Password** edit box.
4. Enter the new password in the **New Password** edit box.
5. Enter the new password a second time in the **Confirm New Password** edit box to confirm your new password.



6. Click **OK**.

Note: The password must include at least 4 characters and is **case sensitive**.

Humidity calibration

To calibrate the humidity sensor you will need a humidity chamber.

1. Connect MicroLog to the PC
2. Set up MicroLog to record every 10 seconds (see page 50).
3. Click **Logger** on the menu bar, then click **Calibration**.
4. Enter the calibration password, then click **OK**.
5. Select **Humidity** in the **Choose sensor** drop list



Calibration

Choose sensor : Humidity

Calibration Values :

	Reference value	MicroLog value
First value :	33	0
Second value :	76	0

Default Calibrate

Close

6. Click **Default** to restore the original values
7. Disconnect MicroLog from the PC and insert it into the humidity chamber.



8. Set the humidity chamber to the first reference value. Wait until the humidity level is stabilized and write down MicroLog's reading.
9. Repeat the last step with the second reference value.
10. Connect MicroLog to the PC.
11. Enter the two MicroLog values into the **MicroLog value** edit boxes.
12. Enter the two reference values into the **Reference value** edit boxes.
13. Click **Calibrate**.
14. To restore default calibration, click **Default**.

*Temperature calibration*

1. Click **Logger** on the menu bar, then click **Calibration**.
2. Enter the calibration password, then click **OK**.
3. Select **Temperature** or **Ext. Temperature** in the **Choose sensor** drop list.
4. Click the **Default** button to restore the original values.
5. Enter the two MicroLog values into the **MicroLog value** edit boxes.
6. Enter the two reference values into the **Reference value** edit boxes.
7. Click **Calibrate**.
8. To restore default calibration, click **Default**.



Defining a custom sensor

You can use MicroLog with any sensor that has a 0 – 20mA current output or a 0 – 10V voltage output.

1. Click the **Logger** menu and then select **Define new sensors** to open the **Define New Sensor** dialog box.
2. Click **Add** to add a new sensor to the list.
3. In the **Based on** drop list, select an external sensor that matches your sensor's output
4. Type the sensor's name in the **Sensor Name** edit box.
5. Type the sensor's unit in the **Sensor Unit** edit box.
6. In the **Calibration Values** section, enter two values of your sensor that correspond to the base sensor values. For example, see the definition for a 0 –



100mbar pressure sensor whose output is 0 – 20mA:

Calibration Values:		
	Base Sensor	New Sensor
Value #1:	0	0
Value #2:	20	100

Figure 4: Define New Sensor

7. Click **OK**.



The new sensor will then appear in the External Sensor list in the Setup dialog box.

Communication setup

Communication between the PC and a MicroLog takes place automatically whenever you send a command to MicroLog. However, the Communication Setup dialog box can be used for more advanced communication options.

Click on the **Logger** menu and then select **Com setup** to open the Communication Setup dialog box:

If you are not using a receiver and cradle, uncheck the **Search for Receiver and Cradle** checkbox in order to speed up the search.

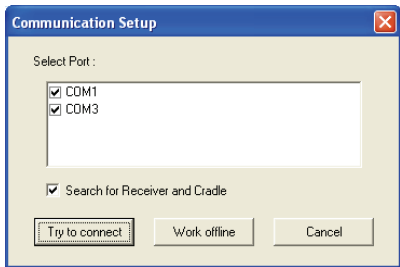


Figure 5: MicroLab's Communication Setup dialog box

The checked COM ports are available for communication. Click **Try to connect** to establish communication. Click **Work offline** to work with saved files.



1.4.6. Automatic Daily Download

You can program all the MicroLogs on your line to automatically transmit their data to a PC every day, at a preset time.

To work with this option you will need to mount the MicroLogs onto wireless Cradles (see page 168) and connect a receiver to the PC (see page 181).

Preparing the MicroLog

To prepare a Cradle with MicroLog system for daily download:

1. Connect the cradle to the PC (see page 170).
2. Setup the MicroLog and the cradle (see page 50).

**Notes:**

1. Enter an identification number for the cradle in the **Unit ID** edit box. The number should be an integer between 1 and 200 and every cradle should have a different ID number. (We recommend attaching a label with the ID number to every cradle.)
2. The recording interval **must** be equal to or greater than 1 minute for recording data from one sensor, 2 minutes for 2 sensors and 3 minutes for 3 sensors.
3. Check the **Daily download** checkbox.
4. To set the download time and file location click **Daily download** at the bottom of the setup dialog to open the **Daily download** dialog box.



5. Enter the desired download time in the **Download start time** box.
MicroLab automatically calculates and sets the cradles' transmission times according to their ID numbers, so that the cradles will transmit the data successively.
6. MicroLab stores the data files in the following folder by default: *C:\Program Files\Fourier Systems\MicroLab\MicroLog Data\Daily download*.
If you want to store your data in another location click **Browse** and navigate to the desired folder.
7. Click **OK** to return to the **Setup** dialog.
8. Click **Send setup**.
9. Repeat this procedure (except for steps d to g which should be performed only once) with every



cradle. Remember to assign a different ID number to each cradle.

10. After you have finished setting up all your cradles, connect the RF receiver to the PC (see page 181).
11. Click **Logger** on the menu bar, then click **Com setup** to open the **Communication setup** dialog.
12. Make sure that the **Search for Receiver and Cradle** checkbox is checked.
13. Click **Try to connect** to establish communication with the receiver.
14. Place the cradles at the desired data logging locations.



Automatic download

At the download start time the cradles should be within 300m of the receiver and in its line of sight. The cradles will automatically transmit the data one after the other according to their ID number. The time interval between successive transmissions is two minutes.

MicroLab automatically saves the data after every transmission under the name: daily download [&date]. After the daily download has been completed, the file will automatically be closed. Every 24 hours MicroLab creates a new data file.



Manual transmission

If one of the cradles fail to transmit data automatically, or if you need to download all data from a specific cradle (not just data that was recorded during working hours) press the **Trs** (Transmit) button on the right side of the Cradle (see page 170). The cradle will then transmit all stored data to the PC.

Viewing Daily Download data and status

To open a daily download data file:



1. Click **Open** on the main toolbar
2. Navigate to the folder in which the daily download data files are stored
3. Double click the file name to open the file



MicroLab prompts to a daily summary of the automatic download. The summary includes a list of the MicroLogs that have completed their data download, along with their respective cradle's battery level, transmission status and indication as to whether alarm levels were exceeded.

4. Click **OK** to close the summary window and to display the data.



1.4.7. Toolbar Buttons

Main (upper) toolbar



Open

Opens saved files



Save

Saves the data that is currently displayed



Print...

Opens the Print Option dialog box



Export

Exports the displayed data to an Excel spreadsheet.

Chapter 1 MicroLog



Run Begins data recording.



Stop Stops data recording.



Setup Opens the Setup dialog box.



Download Downloads data from the MicroLog onto the PC.



Graph Displays or removes the graph



Table Displays or removes the table



Data Map Displays or removes the Data Map



°C/°F Displays the desired unit of temperature



Alarm Displays or removes alarm levels from the graph



Graph (lower) toolbar



Zoom in Activates the zoom tool



Pan Activates the pan tool



Auto scale Returns the graph to full view



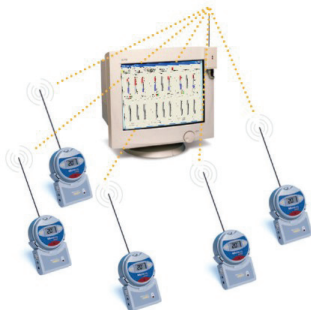
Graph properties Opens the Graph Properties dialog box



Cursor Displays or hides the cursor



Chapter 2 MicroLog Plus





2.1. Overview

The MicroLog Plus software enables wireless communication between a PC and up to 200 MicroLog devices simultaneously. Furthermore, real-time temperature and humidity readings from the MicroLog are automatically delivered directly to the PC. Data from external sensors can also be transmitted in the same manner. The complete MicroLog Plus system includes the MicroLog data logging device, the cradle that the data logger is mounted on, a small receiver that is placed on the PC, and the user-friendly software that allows for convenient central management.

MicroLog Plus uses MicroLog data loggers to record temperature and humidity readings. The cradle that the data logger is mounted on is a wireless transmitter that can



transmit measurements to a PC from up to 300 meters. Since each cradle is tagged with an ID number, the cradles can be programmed to transmit data at various time intervals based on the criteria defined in their IDs. This advanced feature prevents data collision between two or more loggers.

The **MicroLab Plus** software reports on the status of up to 200 MicroLogs on a single color-coded interface. Other features that help automate all aspects of the industrial data logging procedure include the ability to store the data of each MicroLog, to set MicroLog alarm levels and to define sampling intervals, as well as any other necessary parameters.

The **Logger** menu handles all communication between the PC and MicroLog such as programming the desired

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MicroLog and Cradle, calibrating sensors, as well as defining new sensors.

The **View** menu controls the various data display options. Online data can be viewed in multiple meters format (the default view), in multiple graph format, or Cradle map format. The stored data can be viewed on an off-line graph and table.

The **Offline Graph** menu contains all the commands needed to format and edit the graph.

The **Cradle Map** menu contains all the commands needed to setup and edit the map.

The **Multiple Graphs** menu contains all the commands needed to view and edit the graphs.

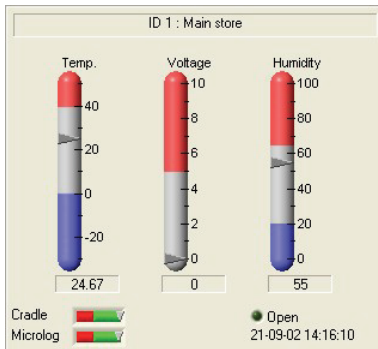


The most common tasks and commands are available as buttons on the **Main toolbar** (upper toolbar), the **Graph toolbar** (lower toolbar) and on the **Cradle map toolbar** (lower toolbar).

2.1.1. MicroLab Plus Default Window Layout

In Meters view (the default view), the data for each MicroLog is displayed in a separate window in a meter. There are six MicroLog windows in each display. The picture below represents an individual MicroLog display.

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The blue and red zones on the meters represent the low and high alarm levels



2.2. Getting Started

2.2.1. Installation

System requirements

To work with MicroLab Plus, your system should be equipped with the following:

Software

Windows 95, or later (Windows 95 will not support USB).
Internet Explorer 4.0, or later (you can install Internet Explorer 5 when you install MicroLab Plus, since it ships with the product).



Hardware

Pentium 300 MHz or higher

32 MB RAM (64 MB recommended)

5 MB available disk space for the MicroLab Plus application

Installing the software

1. Insert the CD into your CD drive.
2. The installation will start automatically. Once the process begins, follow the on-screen instructions.
3. In case auto run is not working, open the CD drive folder and double-click the setup icon, then follow the on-screen instructions.

To un-install the software: From the Start menu select Settings / Control Panel, and use the Add/Remove programs function to remove the MicroLab Plus application.

**To install the USB driver (optional):**

1. Insert the CD into your CD drive. If Installation begins automatically (and you have already installed MicroLab Plus), click **Cancel** to stop installation
2. Connect the Cradle to a USB port on your. Windows will automatically detect the new device and open the **Add New Hardware Wizard**
3. Select **Specify the location of the driver**, then click **Next**
4. Select **Search for the best driver for your device**, then check the **Removable Media** checkbox, and then click **Next**

Windows will automatically detect and install the necessary software.



2.2.2. Setting up the MicroLog Plus System

Before you start using the MicroLog Plus System you must connect each Cradle to the PC using the serial communication cable and set it up. Follow the steps below to setup your system:

1. Mount the MicroLogs onto the cradles
2. Open the MicroLab Plus software
3. Connect the first cradle to the PC (see page 170)
4. Set up the first MicroLog data logger (see page 137)
5. Disconnect the first cradle from the PC
6. Repeat steps 3 – 5 with each cradle



Note: When setting up multiple Cradles we recommend to use the Auto Setup tool (see page 147).

7. Connect the RF receiver to the PC
8. Click **Logger** on the menu bar, then click **Com setup** to open the **Communication setup** dialog.
9. Click **Try to connect** to establish communication with the receiver.
10. Place the cradles at the desired data logging locations.

2.2.3. Saving Data

There is no need to save data manually as the data is saved automatically every half an hour in the MicroLog Data folder:

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C:\Program Files\Fourier Systems\MicroLab Plus\MicroLog Data.

You can always change the file location.

MicroLab Plus creates a folder for each MicroLog naming it with the cradles ID number and stores the MicroLog's data in this folder.

MicroLab Plus creates a new data file for each MicroLog every 24 hours at midnight.

By default the data is saved in MicroLab Plus file format (.MPD – MicroLog Plus data). If you want to use the data in another program you can save it in text files (.CSV – comma separated values). The data can be saved in either one of or both file formats.



To select file format and location:

1. Click **File** on the menu bar, then click **Stored data folder...**
2. To save data in MicroLab plus file format check the **Save MicroLab Plus files** check box
3. To change the file location, click **Browse** and navigate to the desired folder
4. To save the data in text file format Check the **Save text files** check box
5. To change the file location, click **Browse** and navigate to the desired folder
6. Click **OK**

Note: If you want to remove unwanted data, apply the crop tool (see page 133).



2.2.4. Activating the Sound Alarm



Click **Enable Alarm** on the main toolbar to activate sound alarm.

If any MicroLog records a reading that exceeds its alarm levels, the MicroLab Plus's alarm will sound.

The alarm will sound as long as the MicroLog readings exceeds the alarm levels.

Click **Enable Alarm** a second time to disable the Alarm.

Note: To activate the Cradle alarm, use the Setup dialog box



2.2.5. E-mail Alarm Notification

MicroLab Plus can be programmed to send e-mail notifications to one or more e-mail addresses in any of the following cases:

- **Sensor alarm**
Notification that the cradle sensors have breached their high or low alarm level.
- **Lost cradle connection**
Notification that the cradle has either stopping sending data to the MicroLab Plus, or that it has come back online.
- **Low battery indicator**

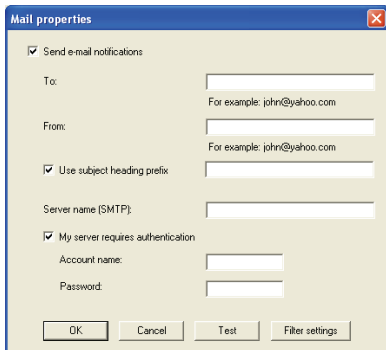
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The notifications include the MicroLog name, the sensor whose alarm level was exceeded and the sensor's measured value.

To setup MicroLab Plus in order to send e-mail notifications:

1. Click **File** on the menu bar, then click **Mail properties** to open the **Mail properties** dialog box.



The image shows a 'Mail properties' dialog box with the following fields and options:

- Send e-mail notifications
- To:
For example: john@yahoo.com
- From:
For example: john@yahoo.com
- Use subject heading prefix
- Server name (SMTP):
- My server requires authentication
 - Account name:
 - Password:

Buttons at the bottom: OK, Cancel, Test, Filter settings

2. Check the **Send e-mail notification** check box.
3. In the **Server name** box, type the outgoing mail server name (mandatory).



4. In the **To** box, type the e-mail address of each recipient, separating names with a semicolon (;) (mandatory).
5. In the **From** box, type your e-mail address (mandatory).
6. If your server requires authentication, enter the account name and password as relevant.
7. If you require a specific subject heading in your emails, enter the prefix in the **Subject heading prefix** text box.
8. Click **Test** to verify that the email properties were entered correctly. Your default email client should receive an email from the MicroLab Plus within seconds.
9. If the email was received, click **OK** to exit the **Mail properties** dialog.

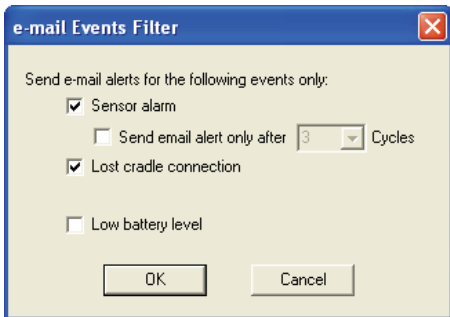


2.2.6. E-mail Events Filter

You have the ability to filter the type of email notifications you receive.

This will give you greater control over the frequency of email alarms generated by the software, and will in turn reduce the traffic to your email inbox.

1. Go to **File > Mail Properties** and click **Filter settings** in the Mail properties dialog box.
2. The e-mail Events Filter window will open up:



3. Select the checkboxes according to which alarm event you want to receive. If no checkbox is selected, you have effectively disabled the email alarm notification feature.



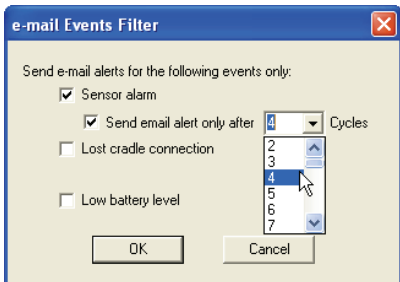
4. Click **OK** to apply the changes.

2.2.7. Delaying Email Notifications

In the **email Events Filter** dialog, you have the option to delay the sending of the email notification when your system goes into alarm. You can determine that if the system returns to normal conditions from anywhere between 2 to 100 cycles after the initial alarm, then an email is not sent.

This feature is useful when wishing to minimize the number of alarm notifications as a result of a legitimate change in the environment.

1. Go to **File > Mail Properties**. Click on **Filter settings** to open the **email Events Filter** dialog.



2. Select the **Sensor alarm** checkbox and then select the **Send email alert only after X cycles** checkbox. You may select between 2 and 100 cycles.



If the MicroLog returns to the pre-alarm level before the selected number of cycles is reached then no email is sent. If the MicroLog is still in alarm when the number of cycles is reached then an email is sent. Another email will be sent once the logger is out of alarm.

2.2.8. Alarm Trigger Settings

Using this feature will enable you to trigger a cradle alarm only after a combination of alarm parameters has been met. Once these alarm levels are breached, MicroLab Plus will indicate that cradle is in alarm (this includes e-mail notification).

You can define a combination of at least two of the following sensor types:

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- Internal temperature sensor
- Internal humidity sensor
- External sensor
- Cradle contact

For example, you can determine that for those cradles running the internal temperature sensor and an external sensor, only when MicroLab Plus records alarms from both of these sensors will the alarm sound.

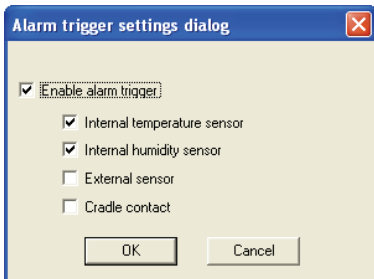
However, MicroLab Plus will indicate an alarm for cradles recording data using sensors other than what is defined in the Alarm trigger settings setup.

For example, if you selected an alarm trigger for a combination of the temperature, humidity and external sensors, but a cradle running just the temperature and



humidity sensors go into alarm, MicroLab Plus will indicate an alarm for that cradle.

1. Go to **File > Alarm trigger setting** to launch the dialog box:
2. You must select a combination of at least two triggers.



Enabling the alarm trigger applies to alarm emails, sounding of the alarm in the software, alarm indication in the Cradle map, and alarm indication in the mail MicroLab Plus window.



2.2.9. Changing the Temperature Units



Click **Toggle °C/°F** button to change the temperature scale from Fahrenheit to Celsius and vice versa.

Note: To change the units in the MicroLog display, use the Setup dialog box or the **Logger** menu

2.2.10. Display Properties

You can change the way numbers and dates will be displayed on screen.



1. Click **File** on the menu bar, then click **Display properties**.
2. In the **Decimal place settings**, enter the number of decimal places you want to display (Enter a number between 0 and 4) for each sensor.
3. In the **Date format settings** select the desired format option.
4. Click **OK**.



2.3. Online Mode

2.3.1. Display Options

Online data can be displayed in:

- Meters View (the default view), in which the current data is displayed in meters
- Multiple Graph View, in which the data from the last 24 hours is displayed in graphs
- Cradle Map format, where the MicroLogs are represented by color coded icons



2.3.2. Meters View






Click **Meters** on the main toolbar to switch to Meters view.

In Meters view (the default view), the data for each MicroLog is displayed in a separate window in meters. The number of active meters in the window corresponds to the number of active sensors in each MicroLog. The meters are updated every time MicroLab Plus receives new data.

If a MicroLog is inactive the corresponding window becomes gray and disabled.

There are six MicroLog windows in each display. If you are using more than six MicroLogs, you can manually scroll to the other displays, or let MicroLab Plus do this automatically.



- Click **Auto scroll**  on the main toolbar to allow automatic scrolling.
- Click **Auto scroll** a second time to return to manual scrolling.
- Click **Scroll forward**  on the main toolbar to scroll to the next MicroLogs display.
- Click **Scroll back**  on the main toolbar to scroll to the previous MicroLogs display.



2.3.3. Multiple Graphs View



Click **Multiple graphs** on the main toolbar to switch to Multiple graphs view.



In Multiple graphs view, the data for each MicroLog is displayed in a separate window in graphs. The graphs display the data sets plotted versus time. In order to keep the graph clear and simple, only two Y-axes can be shown on the graph simultaneously. If there are three curves in the graph, one of the Y-axes will be hidden. To make this axis visible, select the corresponding plot with the cursor.

You can identify the Y-axis by its color, which matches the plot color.



The graphs are updated every time MicroLab Plus receives new data. If a MicroLog is inactive the corresponding window becomes gray and disabled.

There are six MicroLog windows in each display. If you are using more than six MicroLogs, you can manually scroll to the other displays or let MicroLab Plus do it automatically.


- Click **Auto scroll**  on the main toolbar to allow automatic scrolling.
- Click **Auto scroll** a second time to return to manual scrolling.
- Click **Scroll forward**  on the main toolbar to scroll to the next MicroLogs display.



- Click **Scroll back**  on the main toolbar to scroll to the previous MicroLogs display

The Cursor


Use the cursor to view individual data recording values, or to reveal a hidden Y-axis.


To display the cursor, click **Cursor**  on the graph toolbar. You can drag the cursor with the mouse to any other point on the plot, or to another plot altogether.

The point coordinates of the selected data recording will appear in the information bar at the bottom of the graph window.



Zooming

1. Click **Zoom in**  on the graph toolbar and drag the cursor diagonally to select the area you want to magnify. Release the mouse button to zoom in to the selected area.
2. Click on the **Zoom in** button a second time to turn off the Zoom tool.

To restore auto scaling, click **Autoscale**  .



Autoscale



Click **Autoscale** button on the graph toolbar for the full data display.

The Stretch/Compress axis tool

Move the cursor onto one of graph axes. The cursor icon changes to double arrow symbol (\leftrightarrow), indicating that you can stretch or compress the axis scale. Drag the symbol to the desired location. Repeat the procedure for the other axis if necessary.



To restore auto scaling, click **Autoscale** .



Panning

Use the pan tool after zooming view any part of the graph that is outside the zoomed area.



To do this, click **Pan** on the graph toolbar, then click anywhere on the graph and drag the graph to view another area.

Click **Pan** a second time to turn off the Pan tool.

Displaying alarm levels

1. Click **Display alarm level** .
2. Select the sensor you wish to display from the

select sensor drop list



2.3.4. Cradle Map



Click **Cradle Map** on the main toolbar to display the Cradle Map.

In Cradle Map, each MicroLog is represented by an icon. Each icon carries the MicroLog's individual ID number. When the MicroLog is active, the icon's color is green. If the recorded data exceeds either of the alarm levels, the icon's color turns to red. Move the cursor over an icon to display the MicroLog's name.

Double click on any MicroLog icon to display its meters window, which is identical to its window in the Meters view




format. To close the meters window, click Close at the upper right-hand corner of the window.

Before using the Cradle Map, you must set it up and then lock it.

Setting up the Cradle Map





- Click **Cradle Map** on the main toolbar to display the Cradle Map.
- Click **Cradle Map** on the menu bar, then click **Display toolbar** to display the Cradle Map toolbar.
- Click **Lock View**  on the Cradle Map toolbar to unlock the Cradle Map.



Add icons

Add icons to match the number of MicroLogs you are using.

- Click **Add cradle**  on the Cradle Map toolbar to add a new icon or click the down arrow button next to it to add a group of 5, 10 or 15 icons.
- Use the **Remove cradle** button  or the down arrow next to it to remove icons.

Load a picture

You can arrange the icons on a picture or plan of your working space, so that each icon represents the corresponding MicroLog's actual location in the working space. First, load the picture into the program:



1. Click **Load picture** on the Cradle Map toolbar
2. Locate the picture file you want to load
3. Double-click on the file

Now you can click and drag the MicroLog icons to their desired locations on the picture.

Lock Cradle Map

After you have finished arranging the icons, click **Lock View**



on the Cradle Map toolbar to prevent any accidental change in the icon arrangement.



2.4. Offline Mode

2.4.1. Offline Screen



Click **Offline** on the main toolbar to switch to Offline mode.


MicroLab plus's Offline screen consists of two parts: the graph and the table. The data in the table always matches the data that is currently displayed on the graph.




2.4.2. Opening Files

In Online mode the received data is displayed on-line both in graphs and in meters.

To display previously saved data, switch to off-line mode:

1. Click **Offline**  on the main toolbar.

2. Click **Open**  on the main toolbar.
3. Enter the desired cradle ID number.
4. Select a date in the **From** box.
5. Select a date in the **To** box.
6. Click **OK**.

That will load all the data between the dates you selected and display it in graph and table display.




2.4.3. Printing

Printing a graph

You can print saved data in Offline mode



1. Click **Print**  on the main toolbar to open the Print Options dialog box.
2. Click the **graph** option.
3. Click **Print** to open the Print Dialog Box.
4. Click **OK**.

Printing a table

You can also print saved data as a table in Offline mode.



The table will include data as well as the MicroLog name, serial number and the alarm level setup. Data that exceeds any of the alarm levels will be highlighted by arrows.



1. Click **Print** on the main toolbar to open the Print Options dialog box.
2. Click the **Table** option.
3. If you want to print only part of the data, uncheck the check box and select the desired time and date in the **from** and **to** boxes.
4. Click the **Print** button to open the Print dialog box.
5. Click **OK**.



2.4.4. Graph Display

Graph

The graph displays the data sets plotted vs. time.

In order to keep the graph clear and simple, only two Y-axes can be shown on the graph simultaneously. If there are three curves in the graph, one of the Y-axes will be hidden. To make this axis visible, select the corresponding plot with the cursor.

You can identify the Y-axis by its color, which matches the plot color.



The Cursor

Use the cursor to view individual data recording values, or to reveal a hidden Y-axis.

To display the cursor, double click on an individual data point



or click **Cursor** on the graph toolbar. You can drag the cursor with the mouse to any other point on the plot, or to another plot altogether.

The point coordinates of the selected data recording will appear in the information bar at the bottom of the graph window.



Zooming and panning

Manual Scaling




1. Click **Graph Properties** on the graph toolbar to open the Graph Properties dialog box.
2. Select the **Scale** tab, and choose the axis you want to scale in the **select axis** drop list.
3. Un-check the Autoscale check box and enter the new values in the edit box
4. In the time axis, you can either enter the time and date manually, or select it with the up and down arrow buttons.
5. Click **OK**.



To restore auto scaling, click **Autoscale**



Autoscale

1. Click **Autoscale** button  on the graph toolbar for the full data display.
2. Double-click on an individual axis to autoscale it separately.


Default Zooming

If you usually need to view a specific time frame (i.e. work-day hours) use the Default zooming tool. You can set the




start and end time of the time span and then use it whenever you open a file or download data from the MicroLog.

To set the default zoom:

1. Click **Graph Properties**  on the graph toolbar, then click **Set Default Zoom**.
2. Enter the start and end times, then click **Set**.

To zoom to the default zoom:

1. Click **Graph Properties**  on the graph toolbar.
2. Check the **Use default zoom** check box and click **OK**.



Every file and every data recording you download will automatically open in the default zoom as long as the **Use default zoom** check box remains checked.

To restore auto scaling click **Autoscale**



Cropping the data

Cropping enables you to trim the edges of a data set. Use it to remove unwanted data:

1. Zoom to the data range you want to keep.
2. Click **Offline Graph** on the menu bar, then click **Crop**.

All data outside the zoomed area will be **permanently** removed.



Formatting the graph

You can change a data line's color, style or width. You can also add markers that represent the data points on the graph and format their style and color.

The Y-axis color matches the corresponding plot's color and will change accordingly. The time axis color can be changed separately:



1. Click **Graph Properties** on the graph toolbar to open the Graph Properties dialog box.
2. Select the **Lines** tab, then select the plot or axis you want to format in the **select plot** drop list.
3. From here you can format the line's color, style and width, as well as the markers' color and style. To



remove the line or the marker, un-check the corresponding **visible** check box.

To restore the default formatting, click the **Restore default** button, and click **OK**

Copying the graph as a picture

You can copy the graph to the clipboard as a picture and then paste it to other Windows' programs, such as Word and PowerPoint:

1. On the **Offline Graph** menu, click **Copy graph**.
2. Open the destination file.
3. In the destination file, right click and select **paste**.



2.4.5. Exporting Data to Excel



Click **Export to Excel** to export the currently displayed data to an Excel spreadsheet.

MicroLog Plus will open a new Excel workbook displaying the data along with the MicroLog info, including the MicroLog name, serial number and alarm levels setup.



2.5. Programming MicroLog

2.5.1. Setup

Use the Setup dialog box to view or to change the MicroLog and the Cradle settings

When setting up multiple Cradles use the **Auto Setup** tool (see page 147).

To save the settings for future use, activate the **Save setup** tool (see page 149).



1. Connect the Cradle to the PC



2. Click **Setup** on the main toolbar to open the Setup dialog box.

The dialog box is made up of five sections:

MicroLog info

Comment

Click the **edit** box and type a name that will serve to identify the specific MicroLog (e.g. its location).

S/N

Displays the MicroLog's serial number

Battery Level

If the indicator is in the red zone the battery



should be replaced.

Cradle info

Cradle ID

The cradle's identification number sets the cradle's transmission time in daily download mode.

Battery Level

If the indicator is in the red zone the battery should be replaced.

Setup

Temperature

Click the **Temperature** check box to activate the internal temperature sensor



Humidity

Click the **Humidity** check box to activate the internal humidity sensor

External

Click on the **External** check box to activate the external sensor option, and then select a sensor in the drop list.

Cradle contact

Click the **Cradle contact** check box to activate the cradle contact

The sensors' current readings will appear in the labels next to the sensor name, once the MicroLog begins logging for the first time.



Temperature unit

To set the temperature unit in the MicroLog display, select the option you want (Celsius or Fahrenheit).

Interval

Determines the logging interval, or the time interval between successive data recordings.

The time format is hh:mm:ss. Set the time setting to select a recording time interval from between 10 seconds and 2 hours. For example, to set a time interval of one hour, five minutes and thirty seconds, click the hours (hh) and type 1 or use the arrows to



select 01, then click the minutes (mm) and type 5 or use the arrows, and finally, click the seconds (ss) and type 30 or select 30 using the arrows.

Timer run

Click the **Timer run** check box if you want MicroLog to start recording at a predetermined time. This option is convenient if you are using several MicroLogs at once and want them to all begin logging at the same time.

Use the time and date selectors to set the start time.

Cyclic run

In **Cyclic run** mode, MicroLog overwrites the old measurements (starting with the



oldest one) once the MicroLog's memory is full. Click the **Cyclic run** check box to operate in this mode.

Use this mode if you intend to operate the system continuously.

If the check box is clear, MicroLog will operate in **Normal run** mode and will stop recording when the memory is full.

Alarm levels

Type in the desired minimum and maximum alarm levels. If MicroLog records a reading that exceeds either of these levels, the software's alarm will sound, the MicroLog's



LCD will start to flash and the cradle's alarm will sound.

To stop the LCD's flashing, press either of its two keys. To stop the cradle's alarm, press both the MicroLog's keys simultaneously.

The default alarm levels are the lower and upper ends of the sensors. Click **Cancel Alarm** to restore the default levels.



Cradle time settings

Workday hours

Use the up and down arrow buttons to set the daily period when you want the Alarm and/or the Daily Download to be active, or type the desired period in manually.

Alarm delay

Click the drop list to select the time delay between the time MicroLog records a reading that exceeds the alarm levels and the time the alarm will sound.

Alarm duration


Click the drop list to select the time for which the alarm will operate before it stops automatically.



Complete the setup

Click **Send setup** to send the new settings to MicroLog, which will complete the setup. Click **Cancel** if you don't want to change the setup.

Note: The **Send setup** command erases all existing data in the MicroLog, and it will automatically begin recording.

If you set it to **Timer run** mode, MicroLog will wait in standby mode displaying , and will begin recording at the specified time.



2.5.2. Auto Setup

When setting-up multiple Cradles use the Auto Setup tool. This tool will automatically set the minimum logging interval, depending on the number of units you are using, and set the start time for each unit.

To perform auto Setup:

1. Connect the first Cradle to the PC
2. Click **Logger** on the menu bar, then click **Auto Setup**
3. In the **Number of units** drop list select the number of Cradles you are setting up, then click **Start**
4. Set up the first unit as you would normally

Note: the minimum logging interval is already set in the Interval box and you cannot select a shorter time interval



5. Click **OK**
6. Click **Send**

After setup is completed the Auto Setup tool is ready to setup the second unit (notice that the title bar on the Auto Setup dialog has changed to 'Unit 2')

7. Connect another Cradle to the PC
8. Change the comment (optional).
9. Click **Send**
10. Repeat this procedure with every cradle

To change the settings of a specific unit click **Edit** on the Auto Setup dialog and select the new settings before executing the Send command. These settings will be saved until the next time you change them.



Use the **forward arrow** and **backward arrow** buttons on the Auto Setup dialog to navigate to a specific unit. Notice that this will change the automatic sequence

2.5.3. Saving Setup

When setting up multiple Cradles use the **Save Setup** option in the **Setup** dialog.

1. After you have finished the settings selection of the first Cradle and before sending the setup command, click **Save setup**. This will save all the setup settings.



2. Connect another Cradle to the PC, click **Setup**



- on the main toolbar, then click **Load Setup** to load your setup settings.
3. Change the Cradle ID
 4. Change the comment (optional).
 5. Click **Send Setup**.

2.5.4. Defining a Custom Sensor

You can use MicroLog with any sensor that has a 0 – 20mA current output or a 0 – 10V voltage output.

1. Click the **Logger** menu and then select **Define New Sensors** to open the Define New Sensor dialog box.



2. Click **Add** to add a new sensor to the list.
3. In the **Based On** drop list, select an external sensor that matches your sensor's output
4. Type the sensor's name in the **Sensor Name** edit box.
5. Type the sensor's unit in the **Sensor Unit** edit box.
6. In the Calibration Values section, enter two values of your sensor that correspond to the base sensor values. For example, see the definition for a 0 – 100mbar pressure sensor whose output is 0 – 20mA:



Define New Sensor

Based on :
Ext. Current

Sensor Name : Pressure
Sensor Unit : mb

Pressure

Calibration Values :		
	Base Sensor	New Sensor
Value #1 :	0	0
Value #2 :	20	100

Add Remove

OK Cancel

7. Click **OK**.



The new sensor will then appear in the **External Sensor** list in the **Setup** dialog box.

2.5.5. Sensor Calibration

A new MicroLog comes fully calibrated. After a period of long use, however, you may want to re-calibrate the humidity or the temperature sensors.

The humidity calibration affects both MicroLog and MicroLog plus and should be carried out while MicroLog is connected to the PC. The temperature calibration affects only the MicroLog Plus software and can be carried out regardless of whether MicroLog is connected to the PC.



Calibration password

To prevent accidental change of the calibration, the calibration procedure is protected by a password. The default password is: 1234. To change the password:

1. Click **Logger** on the menu toolbar, then click **Calibration**.
2. Click **Change Password** to open the Change Password dialog box.
3. Enter the current password in the **Current Password** edit box.
4. Enter the new password in the **New Password** edit box.
5. Enter the new password a second time in the **Confirm New Password** edit box to confirm your new password.



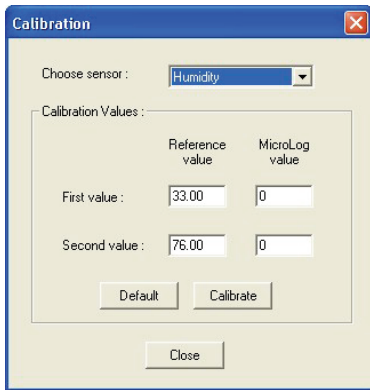
6. Click **OK**.

Note: The password must include at least 4 characters and is **case sensitive**.

Humidity calibration

To calibrate the humidity sensor you will need a humidity chamber.

1. Connect the MicroLog to the PC
2. Set up the MicroLog to record every 10 seconds (see page 137).
3. Click **Logger** on the menu bar, then click **Calibration**.
4. Enter the calibration password, then click **OK**.
5. Select **Humidity** in the **Choose sensor** drop list



The image shows a 'Calibration' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog is set to 'Humidity' in a dropdown menu. Below the dropdown is a section titled 'Calibration Values' which contains a table with two columns: 'Reference value' and 'MicroLog value'. The 'First value' row has '33.00' in the reference column and '0' in the MicroLog column. The 'Second value' row has '76.00' in the reference column and '0' in the MicroLog column. At the bottom of the dialog are three buttons: 'Default', 'Calibrate', and 'Close'.

	Reference value	MicroLog value
First value :	33.00	0
Second value :	76.00	0

6. Click **Default** to restore the original values.



7. Disconnect MicroLog from the PC and insert it into the humidity chamber.
8. Set the humidity chamber to the first reference value. Wait until the humidity level is stabilized and write down the MicroLog's reading.
9. Repeat the last step with the second reference value.
10. Connect the MicroLog to the PC.
11. Enter the two MicroLog values into the **MicroLog Value** edit boxes.
12. Enter the two reference values into the **Reference Value** edit boxes.
13. Click **Calibrate**.

To restore default calibration, click **Default**.



Temperature calibration

1. Click **Logger** on the menu bar, then click **Calibration**.
2. Enter the calibration password, then click **OK**.
3. Select **Temperature** or **Ext. Temperature** in the **Choose sensor** drop list.
4. Click the **Default** button to restore the original values.
5. Enter the two MicroLog values into the **MicroLog Value** edit boxes.
6. Enter the two reference values into the **Reference Value** edit boxes.
7. Click **Calibrate**.

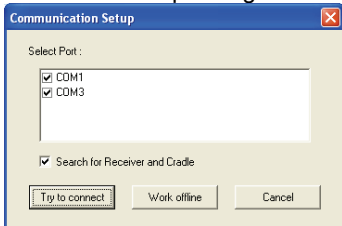
To restore default calibration, click **Default**.



2.5.6. Communication Setup

Communication between a PC and a MicroLog take place automatically whenever you send a command to MicroLog. However, the Communication Setup dialog box can be used for more advanced communication options.

Click on the **Logger** menu and then select **Com setup** to open the Communication Setup dialog box:



Chapter 2 MicroLog Plus



The checked COM ports are available for communication.

Click **Try to connect** to establish communication.

Click **Work offline** to work with saved files.



2.6. Toolbar Buttons

2.6.1. Main (Upper) Toolbar



Open

Opens saved files (enabled only in Offline View)



Print...

Opens the Print Option dialog box (enabled only in Offline View)



Export

Exports the displayed data to an Excel spreadsheet. (enabled only in



Offline View)



Setup

Opens the Setup dialog box.



°C/°F

Displays the desired unit of temperature



Meters View

Displays Meters View



Multiple graphs View

Displays Multiple graphs View



Offline View Displays Offline View



Cradle Map Displays Cradle Map



Scroll back Scroll to the previous MicroLogs display (enabled only in Online View)



Auto-scroll Automatic scrolling between MicroLogs displays (enabled only in Online View)



Scroll forward Scroll to the next MicroLogs display (enabled only in Online View)



Alarm Enables or disables sound alarm

2.6.2. Graph (Lower) Toolbar



Zoom in Activates the zoom tool



Pan

Activates the pan tool



Auto scale

Returns the graph to full view



Cursor

Displays or hides the cursor



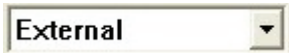
Graph properties

Opens the Graph Properties dialog box (only in Offline view)



Alarm levels

Displays or removes alarm levels from the graph



Alarm level selection box

2.6.3. Cradle Map (Lower) Toolbar

In Cradle Map view, click **Cradle Map** on the menu bar, then click **Display toolbar** to display the Cradle Map toolbar.



Lock

Locks or unlocks Cradle Map



Add Cradle

Adds Cradle icon to Cradle Map



Remove Cradle

Removes Cradle icon from Cradle Map



Load picture

Inserts a picture to Cradle Map



Chapter 3 The Cradle





3.1. MicroLog Cradle Line

Alarm Cradle

Accommodates an additional external sensor and RS 232/USB Computer Serial Interface, as well as a hardware alarm that operates sound alarm

Catalog number

DT174

Wireless Cradle with Alarm

A wireless cradle that can accommodate additional external sensor and RS 232/USB Computer Serial Interface, as well as a hardware alarm that operates sound alarm.

Catalog number

DT175



3.2. Operating the Cradle

1. Place the MicroLog in the cradle so that its rear connection socket fits into the plug on the cradle.

2b. USB socket

4. DC power input

2a. RS232 serial communication socket

3. External sensor input

Trs button

LED indicator



Figure 6: MicroLog and Cradle



To set up MicroLog (see Figure 6 above):

1. Mount MicroLog onto the cradle (1).
2. Connect the cradle to the PC using either serial or USB communication cable (2).
3. Run your MicroLog's software and use the setup command.

To prepare the wireless cradle to transmit data:

1. Set up MicroLog (see above).
2. Connect an external sensor if needed (see 3 in Figure 6 above).

The cradle will automatically transmit data online or once a day depending on how it was set up.

See page 84 for more on online transmission or page 72 for more on Daily Download.



When the cradle transmits data the LED indicator lights up in a green light.

To manually transmit data to the PC:

Press the **Trs** (Transmit) button on the right side of the Cradle. The Cradle will then transmit all stored data to the PC.

To activate the Sound Alarm feature:

You **must** connect the AC power adaptor (see 4 in Figure 6 above).

When the alarm operates the LED indicator lights in red light.



3.3. Replace the Battery

The cradle is powered by its internal battery or by external AC adaptor. The cradle battery's maximum lifespan is approximately 100,000 transmissions (for example, if the recording rate is once every 15 minutes the battery's lifespan is approximately 3 years).

The Cradle's battery is a 1/2AA 3.6V
lithium battery

1. Unfasten the four screws at the back of the cradle.
2. Carefully rotate the cradle
3. Remove the front cover and replace the battery. Be sure to insert the new battery in the correct corresponding polarities (look



- for the “+” symbol next to the positive terminal)
4. Replace the front cover, turn the cradle over and refasten the four screws at the back of the cradle.

3.4. Screw Terminals

The cradle is equipped with eight screw terminals for permanent connections to the cradle. These terminals include:

Connection to external sensor: Identical to the cradle’s external sensor socket.

Contact sensor (DT175 only): This cradle sensor (in addition to the usual external contact sensor) monitors Reed



Relay contacts and switch status (open/closed) to identify the correlation between phenomena such as temperature change and door status. This sensor's data is stored in the cradle's memory and is available only through wireless transmission.

External control switch: Closes an external control circuit when sensor readings exceed alarm levels. Maximum load: 30VDC, 1A.

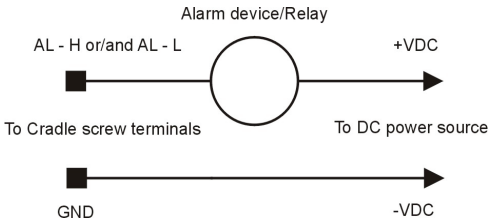


Figure 7: External control switch wiring diagram

You can wire one alarm device for High alarm level (AL – H terminal) and another alarm device for the low alarm level (AL – L terminal), or you can connect the same device to both terminals so it will operate whenever any of the alarm level is exceeded.



If you want to operate an alarm device that consumes more than 30VDC, 1A or an AC alarm device. You will have to use a relay.

External power: Connection to an external 12VDC power supply (i.e. vehicle battery).

To connect to the screw terminals:

1. Unfasten the antenna screw at the top back of the cradle.
2. Remove the antenna.
3. Unfasten the four screws at the back of the cradle.



4. Remove the back cover and break the oval seal at the bottom of the back cover by pressing it with a screwdriver.
5. Replace the back cover.
6. Carefully rotate the cradle.
7. Remove the front cover.
8. Insert the external wires through the oval opening you have broken at the back cover and fasten them to the appropriate screw terminals (see picture and table below)
9. Replace the front cover, turn the cradle over and refasten the four screws at the back of the cradle.
10. Replace the antenna and fasten the antenna screw.



Figure 8: Cradle's screw terminals

The table below lists the various screw terminals according to their labels (from left to right) that are printed above the terminals:



Label (Left to right)		Function
1	AN	External sensor (+Ground)
2	PWR	
3	DOOR	Contact sensor (online only)
4	GND	
5	AL-H	External control switch (30VDC, 1A)
6	AL-L	
7	GND	External power
8	+12V	



Chapter 4 The Receiver





4.1. Overview

The Receiver is designed to receive wireless data from remote MicroLog cradles or Repeaters and send it to your computer.

The Receiver is equipped with two LED indicators to show Receiver status and is powered by an AC/DC mains adaptor.

4.2. Getting Started

4.2.1. Locating the Receiver

Locate the Receiver near the computer. You can either place it on a tabletop or hang it on the wall.



4.2.2. Receiver Layout

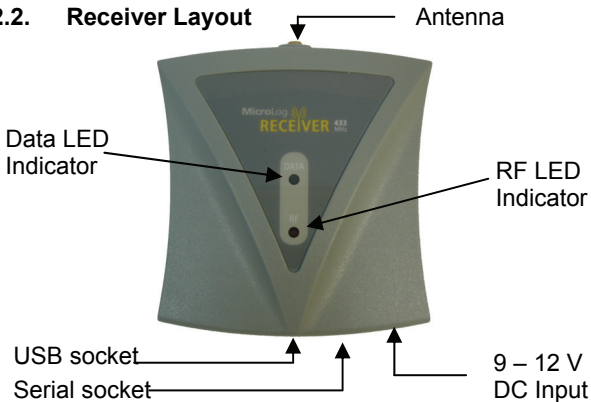


Figure 9: Receiver layout



4.2.3. Powering the Receiver

The receiver must be connected to the mains when in use. The rechargeable battery functions only as a backup in the event of electricity failure.

Connect the supplied AC/DC adaptor to the mains, and then connect it to the 9-12V DC input at the bottom of the Receiver (refer to Figure 9 above).

The Receiver is now ready to receive data and transfer it to the computer.

4.2.4. Connecting the Antenna

Screw the supplied whip antenna to the SMA antenna socket at the top of the Receiver (refer to Figure 9 above). If the Receiver is lying on a tabletop, use the hinge to bend the antenna to an upright position.



Note: You can also use Fourier Systems' magnet antenna (refer to Chapter 5).

4.3. LED Indicators

Two LED indicators are used to indicate the Receiver's status by flashing. The indicators are located on the Receiver's front panel. The upper LED is marked **DATA** and the lower LED is marked **RF**.

The **RF** indicator lights up red whenever the Receiver receives RF carrier of the operating frequency (433 MHz in Europe or 915 MHz in the US).

The **DATA** indicator lights up green whenever the Receiver receives MicroLog data.

Chapter 4 The Receiver



The upper LED also represents the power supply and lights up yellow whenever the Receiver is connected.

If the Receiver is disconnected from the mains power supply, the DATA indicator lights up yellow and keeps blinking every two seconds as long as the external power is down. The backup battery will allow for five hours of operating.



4.4. Beeper

The Receiver is equipped with a built-in beeper that beeps whenever the Receiver receives a single data point. If the Receiver receives daily download data, it beeps when transmitting it to the next leg.

To turn the beeper on and off:

1. Connect the Receiver to the computer.
2. Run MicroLab or MicroLab Plus software.
3. Click **Logger** on the main menu, then click **Receiver beeper on**.

To change the beeper's status, repeat step 3 above.



Chapter 5 External Magnet Antenna

For use with the Cradle and/or receiver





5.1. Overview

The external antenna is equipped with a magnet clamp for easy mounting on metallic surfaces. Just plug the antenna to the Cradle or Receiver, place the magnet antennae in a location where transmission is most accessible (for example, on the roof of a truck) and you are ready to go.

Use the external antenna in cases where the:

- Cradle or Receiver is located in metal chambers (for example, in refrigerators).
- Cradle or Receiver is located indoors for protection from harsh environmental conditions and rain.

Chapter 5 External Magnet Antenna



The external antenna is designed for 914MHz and 433MHz carriers. The antenna adds a 1-3dB gain to the Transmitter-Receiver path. With the use of an external antenna on both Cradle and Receiver we manage to maintain a constant data reception from the Cradle at distances of *360m with no line of sight*.



5.2. Connecting the Antenna to the Receiver

To use the external antenna, simply screw the antenna to the SMA connector at the top of the receiver (refer to Figure 9 on page 183).

5.3. Connecting the Antenna to the Cradle

All cradles produced after March 2003 have an SMA connector on their right side of the cradle.

To use the external antenna, simply screw the antenna to the SMA connector.



SMA external
antenna

Figure 10: MicroLog with Cradle



5.4. Preparing the Cradle to work with the External Antenna

The cradle is equipped with an internal jumper that connects the transmitter either to the built-in wiper antenna or to the external magnet antenna.

To change the jumper position:

1. Unfasten the four screws at the back of the cradle.
2. Carefully rotate the cradle.
3. Remove the front cover.
4. Place the jumper in the desired position.

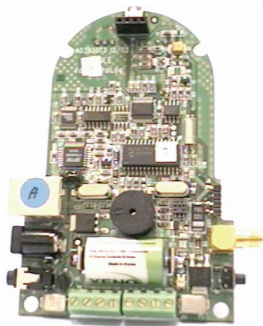


Figure 11: Changing the jumper position



External Magnet Antenna Chapter 5

The jumper connects the middle pin either to the right-hand pin marked INT (internal antenna) or to the left-hand pin marked EXT (external antenna).

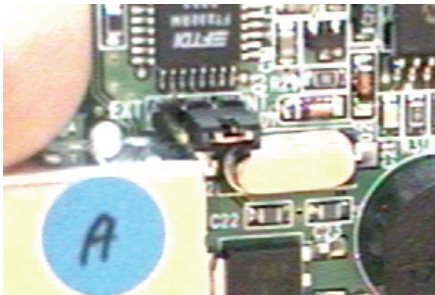


Figure 12: INT and EXT Antenna pins

Chapter 5 External Magnet Antenna



5. Replace the front cover, turn the cradle over and refasten the four screws at the back of the cradle.



Chapter 6 External Sensors

MicroLog works with the following external sensors:

6.1. Temperature -50°C to 100°C

This MicroLog sensor takes external temperature measurements over a wider range than the internal temperature sensor with a faster response time than the internal sensor.

Specifications:

Range: -50°C to 100°C

Resolution: Better than 1°C between -20°C to 75°C

Accuracy: $\pm 2\%$ of reading



Probe Length: 150 mm

Probe OD: 3.2 mm

Probe Max. Temperature: 150°C

Cable Max. Temperature: 80°C

6.2. Temperature -10°C to 10°C

This is a high-precision temperature sensor designed for refrigeration monitoring

Specifications:

Range: -10°C to 10°C

Resolution: 0.2°C

Accuracy: $\pm 0.2^\circ\text{C}$



Probe Length:	50 mm
Probe OD:	4 mm
Operating Temperature:	-10°C to 50°C

6.3. Temperature -100°C to 120°C PT100 adapter

This is a wide range temperature adapter designed to process PT100 output

Specifications:

Range:	-100°C to 120°C
Resolution:	1°C
Accuracy:	±1°C



Adapter operating Temperature:

-10°C to 50°C

Screw terminals for PT100 connection

6.4. Voltage Sensor

This is a general sensor that will measure any device or transmitter that produces a linear analog output of 0-10V. The voltage can easily be converted to the correct measured units with the help of the MicroLab software.

Specifications:

Range: 0-10V

Resolution: 0.05V

Accuracy: $\pm 3\%$ before calibration



Input Impedance: $3M\Omega$

Calibration: Two point calibration

OV protection: +30V

6.5. Current Sensor

This MicroLog external sensor can sample any device or transmitter producing a linear current of 0-20mA. The 0-20mA can be converted to the correct measured units using the MicroLab software's Calibration option.

Specifications:

Range: 0-20mA

Resolution: $\pm 0.1\text{mA}$

Accuracy: ± 3 before calibration



Calibration: Two point calibration

OC protection: 55mA

6.6. pH Sensor

This external sensor monitors the pH level of liquids.

Specifications:

Range: 1-14pH

Resolution: 0.116pH

Accuracy: 5% of reading

Calibration: Single point, done with a small trimmer on the sensor.



6.7. Contact Adapter

This MicroLog sensor monitors Reed Relay contacts and switch status (open/closed) to identify the correlation between phenomena such as temperature change and door status.

Specifications:

Range: open/close

Connector: Screw Terminal

Cable Length: 2.5m

Internal Pull-Up Resistor: No need for external power source



Specifications

MicroLog

Models:

EC600 temperature and external sensor data logger

EC650 temperature, relative humidity and external sensor data logger

Inputs:

Two built-in sensors:

Temperature: -30°C - 50°C (resolution 0.5°C , accuracy $\pm 0.6^{\circ}\text{C}$)



Specifications

Relative Humidity: 0-100% (resolution 0.5%, accuracy $\pm 3\%$)

External sensor:

Voltage	0 to 10V
Current	4 to 20mA
Temperature	-50°C to 100°C
pH	0 to 14pH
Contact	Open / Closed

Outputs:

Two digit 7-segment LCD

IRDA interface to HP-printer and host computer

RS232 serial communication at 19,200 bps

Specifications



Memory Capacity:

16,000 recording samples

Power Supply:

Internal Lithium Battery: 3.6V 1.2AH 1/2AA

Battery Life - approximately two years, replaceable
(Lifespan may vary with use of external sensors)

Sampling Rate:

User defined: from once every 10 seconds to every 2 hours

Dimensions:

Diameter: 72mm



Specifications

Thickness: 22.9mm

Weight: 55gr

Standards

Water and dust proof IP65 standard, compliance for EC600 model

CE and FCC standard compliance

MicroLog Cradle

Audible alarm.

Serial communication channels:

RS232 at 19.2Kbps

USB at 1.5Mbps

Specifications



Memory Capacity (DT175 only):

2,000 recording samples

Connectors:

4-pin flat connection to the MicroLog

4-pin flat connection to any MicroLog external sensor

Screw terminal for External DC supply, Connection to external sensor, External control switch and additional Contact sensor (the additional contact sensor is available in DT175 only)

Power supply:

Internal lithium battery: 3.6V



Specifications

Battery Life - approximately 100,000 transmissions,
replaceable

External: 6-30V, minimum 300mA

RF transmission (DT175 only):

EMC conformant to ETS 300-683

Type approved to ETS 300-220. Usable range to 300m
(75m indoors) 418 (UK) & 433.92MHz (Euro) versions

1mW on 418 MHz, 10mW on 433.92MHz

2nd harmonic <-60dBc

16cm whip antenna

CE and FCC standard compliance



MicroLog Plus Receiver

Usable range to 300m (75m indoors)

One RS232 communication port to the computer's

Power supply:

- External AC/DC 6V adapter

- Red LED indicating RF signal

- Green LED indicating valid data being received

- Type approved to ETS 300-220

- CE and FCC standard compliance



Software

MicroLab software

- Downloads data from MicroLogs

- Graph and table displays

- Displays alarm levels on graph

- Setting up MicroLog:

 - Define sensors

 - The ID number of each of the cradles

 - The alarm levels of each data logger

 - Comment (name) for each data logger

Specifications



Sampling rate: From once every 10 seconds to every 2 hours

Automatic daily download:

Wireless daily download from up to 200 MicroLogs

Automatic data saving

Daily status report

System requirements

Software

Windows 95 or later

Internet Explorer 4.0 or later



Hardware

- Pentium 300 MHz or higher
- 32 MB RAM (64 MB recommended)
- 5 MB available disk space for the MicroLab application

MicroLab Plus software

Wireless communication with up to 200 MicroLogs:

- Real-time temperature and humidity and external sensor readings

- Displays data in meters or on graphs

- Visual and sound alarm when the data reading exceeds a minimum or maximum alarm threshold for temperature or humidity

Specifications



E-mail alarm notification

Displays battery level

Automatic data saving to an Excel file



Setting up MicroLog:

- Define sensors

- Sensor calibration

- The ID number of each of the cradles

- The alarm levels and properties of each data logger

- Comment (name) for each data logger

- Sampling rate: From once every 10 seconds to every 2 hours.

System requirements

Software

- Windows 95 or later

- Internet Explorer 4.0 or later

Specifications



Hardware

- Pentium 300 MHz or higher

- 32 MB RAM (64 MB recommended)

- 5 MB available disk space for the MicroLog Plus application



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