

# **The LCIC-WIM-MONITOR Utility**

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# **1. Introduction**

The powerful LCIC-WIM-MONITOR application runs on your PC and takes full advantage of the LCIC-WIM 'fast mode'. It allows reading the weight, controlling the I/O and even monitoring real time weight readings in a rate of up to more than 10000 samples per second, showing the results in a graph.

The graph can be used to:

- analyze the data,
- learn about the timing of the events,
- zoom in and zoom out,
- and much more...

The results are stored in a file that can later be further analyzed also by tools such as Microsoft Excel .®

## **1.1 Additional features**

- The '**Data Logger**' function (supported by LCIC-WIM-MONITOR V2.20 and up) logs the *weight values* and/or the *temperature values*. This function is useful when the sampling is required during a longer time interval than the 'fast mode' sampling supplies, and/or when the temperature values are required too (the 'fast mode' sampling does not supply them).

Note that the '**Data Logger**' function supports a lower rate than the 'fast mode' sampling does.

So, if Data Logger's max. rate is insufficient for your needs, use the 'fast mode' sampling.

- Controlling the analog output  
(relevant only for card types that include an analog output)
- Display the on-board temperature
- Issue a temporary 'Zero' command to the board
- Restore 'Calibration Zero'

## **1.2 Operation**

The LCIC-WIM-MONITOR utility is used to transfer messages to/from the LCIC-WIM board. These messages consist of the following:

1. Weight and/or A/D.
2. I/O.
3. Zero request.
4. Temperature.

All items are described in the following sections. However, here are some words about the first item (Weight and/or A/D):

There are **two** readings modes that the board supports, both are supplied by the monitor:

- \* Single mode
- \* Fast mode

The ***single*** mode supplies one reading at a time. The first part of the display (Current Reading, below) shows repeated readings in the single mode (both weight & A/D & I/O).

The ***fast*** mode supplies multiple weight readings. A process of 'fast mode' readings starts upon clicking 'Start' and ends either upon clicking 'Stop' or by 'Auto Stop' mechanism according to a user programmable pre-defined interval after the 'Start' – whatever comes first. The second part of the display (Fast Mode, below) shows the various elements of the fast mode.

## **1.3 The Filtering System**

In order to understand the results it is important to know first the concept of board's **filtering system**:

There are **two** filters.

The **first filter** is basically a 1st level moving average filter of size **Filter1** (2-256).

Then depending on **DECIMATOR** (2-1000), every DECIMATOR-th result from the 1st level filter is put through another moving average filter of size **Filter2** (2-256), which is the **second filter**.

The readings passed to the PC are always filtered – sometimes only by the first level filter and sometimes by both filters.

(Single mode shows weight & A/D after **both** filters.

In Fast mode the user can select either **only Filter1** (the default) or **both** filters.)

**The display consists of five main parts described in the following five sections (2-6).**

## **2. Current Reading**

This part of the display shows the current readings in **single** mode.

### **2.1 Weight**

Current readings in *physical units* (e.g., kg).

The readings are received from board's second level filter (see the "The Filtering System" paragraph in the introduction).

### **2.2 A/D**

Current readings in *A/D points*.

The readings are received from board's second level filter (see the "The Filtering System" paragraph in the introduction).

### **2.3 Reading Counter**

Current value of a counter which counts the readings.

Increment in this value signifies that everything is OK.

## **3. Fast Mode**

This part of the display manages the **fast mode**:

### **3.1 Commands**

#### **3.1.1 Start**

Click to start a 'fast mode' session.

The session will end either upon clicking 'Stop', or upon the timeout defined by the 'Auto Stop After' parameter (section 3.2.2) – whatever comes first.

#### **3.1.2 Stop**

Click to end a 'fast mode' session before its timeout (see section 3.1.1).

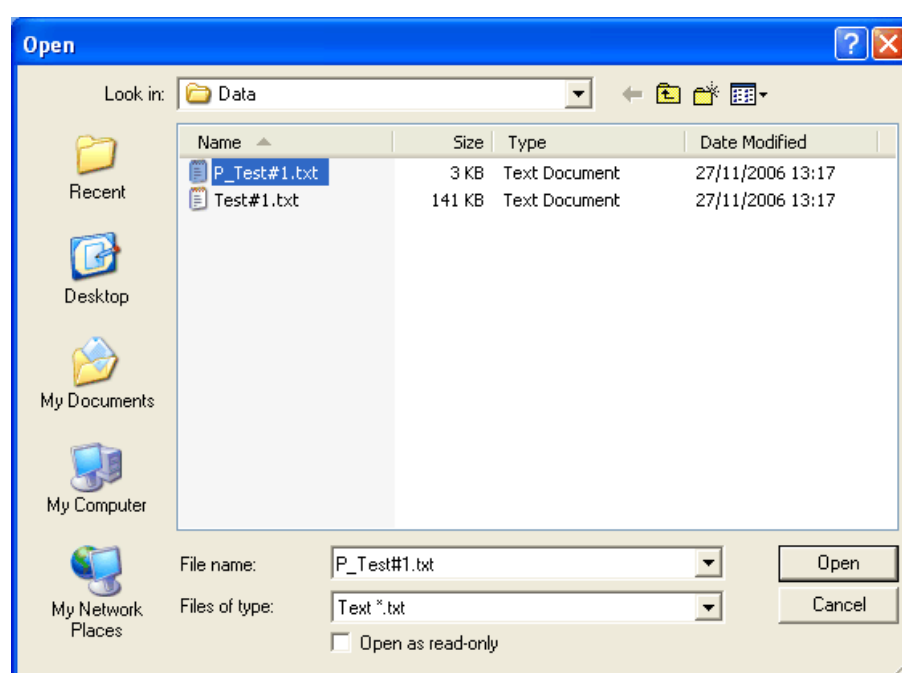
After a 'fast mode' session the monitor automatically displays a graph. This graph is based on the 'preview' file (see section 3.1.4). Refer to section 3.1.3 about how to save the data in a file.

### **3.1.3 Save to File** (visible only after a 'fast mode' session)

After a 'fast mode' session, you may save the results for further reference, such as the 'Show History Graph' (section 3.1.4). The system suggests a filename based on the date & time. Either accept it, or select another filename. Note that the default file type upon Show History Graph is \*.txt; therefore, the most simple way is to use a filename with a 'txt' extension. However, if you use another extension, make sure that when you apply 'Show History Graph' you change the 'Files of type' (in the popping dialog) accordingly, otherwise you won't see the file.

### **3.1.4 Show History Graph (Full/Preview)**

Once you saved the results (see section 3.1.3), you may see them graphically. Select the filename as used while saving the results (see section 3.1.3). Note that for faster display you may use a 'preview' instead of the full file. The graph produced is almost the same as if the full file was used, but it's much faster. The filename of the 'preview' file is the same as the full one, except that it's preceded by 'P\_'. For example, suppose the user selected the name Test#1.txt upon saving the file. The monitor produced **two** files: Test#1.txt with the full data, and P\_Test#1.txt for fast load upon using 'Show History Graph'. See the screenshot below, and notice the difference in the sizes of the files.



### **3.1.5 Multi Graph Mode**

(This mode **does not** support the zoom in & zoom out operations)

Upon entering the HistoryGraph (either directly or by Monitor's 'Show History Graph' button) you will see in the right-upper corner the 'Multi Graph Mode' check box. Checking this box turns the display to the Multi Graph Mode, in which you may select up to 5 graphs that will be displayed simultaneously (in various colors). The following operations (in the 'Multi Graph Control' frame) become visible in the Multi Graph Mode.

#### **3.1.5.1 In the Add / Remove box**

Click '+' in order to **add** (include) a new graph.

You'll be prompted to select the desired file.

Note that you may not include the same graph twice, nor to exceed the maximal graphs allowed simultaneously (5).

The new graph becomes automatically marked by dots indicating that it is 'selected'. The meaning of 'selection' is that some operations refer to the selected graph. Only one graph is selected at the same time.

Note: A graph is produced according to the 'Effective Rate' parameter that was defined in the Monitor application at graph's production time (see section 3.2.3). The scale in which ALL graphs are displayed is according to the 'Effective Rate' of the first graph (graph #1). So, in case of adding a new graph with 'Effective Rate' different from the 'Effective Rate' of graph #1, its representation will be distorted – the more difference between the effective rates, the more distortion will be in the representation. Therefore, in case you try to add such graph (with different 'Effective Rate'), you'll get a proper warning explaining the situation, and you'll have to answer whether you wish to add the new graph anyway.

Click '-' in order to **remove** (erase) the selected graph.

### 3.1.5.2 In the **selection** box

Use the **up** & **down** buttons in order to make another graph selected. Note that also clicking the desired graph makes it selected. The text 'i/n' means: Out of the n displayed graphs, currently the selected one is graph #i.

### 3.1.5.3 In the **shift** box

Use the **up**, **down**, **right** & **left** buttons in order to **shift** (move vertically or horizontally) the selected graph in the specified direction.

#### Notes

1. You may shift the graph (to any direction) also by dragging it using the mouse:
  - \* Select the graph to be shifted.
  - \* Move the cursor to the selected graph until you see a cross with 4 arrows.
  - \* While clicking and holding the left mouse button, move the cross to its desired location.
  - \* Release the left mouse button, then the graph shifts.
2. The (x=..., y=...) text in the title of the box shows graph's shift from its original location.
3. Click the '**x**' button in order to return the selected graph to its original location.

### 3.1.6 Independent Activation of the 'History Graph' Viewer

'History Graph' files may be shown independently of the Monitor program.

Run the HisGraph viewer by clicking  on your desktop, then go on according to the instructions in sections 3.1.4 & 3.1.5.

## **3.2 Parameters**

### **3.2.1 Threshold**

Specify in the 'Threshold' parameter the minimum weight value indicating that an object is on scale.

### **3.2.2 Auto Stop After ...**

Defines the maximal time that one 'fast mode' session will take. The session will stop either upon clicking 'Stop' by the user, or after the time specified in this parameter – whatever comes first.

→ Please refer also to section 3.2.4.

### **3.2.3 Effective Rate**

Defines the effective sampling rate in 'fast mode', in samplings per second.

→ Please refer also to section 3.2.4.

### **3.2.4 Interrelation between 'Effective Rate' & 'Auto Stop After'**

There are two important parameters that should be defined properly:

**\* Effective Rate**

For example, if Effective Rate = 3000, then the sampling rate will be 3000 readings per second.

**\* Auto Stop After**

For example, if Auto Stop After = 600, then the sampling will stop automatically after 10 minutes (=600 sec.). Additionally, you may stop the sampling earlier by clicking the Stop button.

The available values of 'Auto Stop After' depend of the value of 'Effective Rate'. Therefore, first, select 'Effective Rate' and only then select 'Auto Stop After'.

In order to decide which 'Effective Rate' to select, watch the following table:

#### **For RS232**

<b><u>Effective Rate</u></b>	<b><u>Maximal 'Auto Stop After' (seconds)</u></b>
------------------------------	---

1900	900
920	1900
600	2900
450	3900
360	4900
250	7000
100	17600

Example:

You know that the time it takes the train to pass is 20 minutes (1200 seconds). Then you cannot select 'Effective Rate' = 1900, because it will limit the 'Auto Stop After' to 900. So, select 'Effective Rate' = 920 and then set 'Auto Stop After' to 1200.

### **For USB**

<b><u>Effective Rate</u></b>	<b><u>Maximal 'Auto Stop After' (seconds)</u></b>
------------------------------	---

17500	100
8500	200
5800	300
4300	400
3000	600
2000	900
1500	1200
1000	1800
800	2200
500	3500
300	5900
200	8800
100	17600

Example:

You know that the time it takes the train to pass is 25 minutes (1500 seconds). Then you cannot select 'Effective Rate' = 1500, because it will limit the 'Auto Stop After' to 1200. So, select 'Effective Rate' = 1000 and then set 'Auto Stop After' to 1500.

## **3.3 User's Notes**

Here you may type some notes that will be recorded in the file that you save, and displayed on the top of the graph if you use the 'Show History Graph' option.

## **3.4 Filters**

### **3.4.1 Filter1 (view only)**

### **3.4.2 Filter2 (view only)**

### **3.4.3 Decimator (view only)**

**About the meaning of these three parameters please refer to section 1.3 ("The Filtering System").**

### **3.4.4 Filter2 On/Off (selection)**

You may select whether the data supplied by a fast mode process will be '**one** filter readings' or '**two** filter readings':

- \* When Filter 2 is **off**, a fast mode process will supply '**one** filter readings'; that is, the values of the Filter2 & the Decimator are irrelevant for this fast mode process, hence displayed dimmed.
- \* When Filter2 is **on**, a fast mode process will supply '**two** filter readings'; that is, the values of the Filter2 & the Decimator take effect.

(However, please note that the effect of the 'Filter2 On/Off Selection' is restricted to the **fast mode** process. The **single mode** readings – both A/D and weight – are always '**two** filter readings', regardless of the 'Filter2 On/Off Selection'.)

## **4. Inputs/Outputs**

### **4.1 Show *or* Hide I/O**

Click this button in order to show or to hide the I/O fields, that is, the fields described in the following three sections (4.2, 4.3 & 4.4).

### **4.2 Inputs**

This field shows the current status of board's inputs.

### **4.3 Outputs**

This field shows the current status of board's outputs. In addition, you may change an output status by clicking on the switch, provided that this output is defined as 'manual' and not as 'setpoint'.

### **4.4 Analog Output**

This field shows the actual value of the analog output; additionally, if the analog output is in manual mode (that is, not in 'auto' mode), you may set it to some desired voltage by specifying its value in the 'Change' square and clicking 'OK'.

**In order to define the 'auto' mode refer to the Settings program (section 3.3.1.1 in LCIC-WIM.PDF).**

#### **4.4.1 Actual**

Shows board's actual voltage of the analog output.

#### **4.4.2 Change**

Specify here a new desired voltage you like to change to.

#### **4.4.3 OK**

Click to validate the value specified in the Change' square.

## **5. Zero Request**

You may re-define board's 'zero level', i.e., the point where weight=0. However, this re-definition is temporary – it's valid only until board reset, after which the original zero level will be restored. In order to apply that temporary re-definition of the zero level click the 'Zero' button.

## **6. Board Temperature**

The 'thermometer' on the right side of the display shows the temperature on the board. In order to have the exact temperature, move the cursor on the 'thermometer'.

## **7. The 'Data Logger'**

(Supported by LCIC-WIM-MONITOR V2.20 and up.)

### **Introduction**

The '**Data Logger**' function logs *weight samples* and/or *temperature samples* in the general mode. On account of the sampling rate – which is lower than in the 'fast mode' sampling – this function supplies the following features which the 'fast mode' sampling does not:

- Longer sampling time (actually limited only by the free space on the disk).
- Temperature samples may be logged too.

In case Data Logger's max. rate is insufficient for your needs, use the 'fast mode' sampling.

The characteristics of the '**Data Logger**' function are pre-defined by the '**Data Logger Parameters**'; the function itself is activated by the '**Data Logger**' button.

### **The 'Data Logger' Parameters**

Click the '**Data Logger Parameters**' tab (in the menu bar) in order to enter the logging parameters:

- **Graph Weight Limits (Min. & Max.).**
- **Mark data in log file by '<<<'**

You have an option to selectively mark (by '<<<' in line's end) log file's weight samples according to your pre-defined setting, for easy later localization of the relevant weight samples in the file:

- \* Select '**No**' to disable this option.
- \* Select '**When Weight Inside Range**' to mark the samples which are within the range defined in the rightward 'Range' frame.
- \* Select '**When Weight Outside Range**' to mark the samples which are beyond the range defined in the rightward 'Range' frame.

- **Sampling Rate**

Here you define the sampling rate of the weight samples and (optionally) the temperature samples.

For example, if you define

**Weight: Each 2 sec.**

**'Log also Temperature' option = checked**

**Temperature: Each 10 weight samples**

– then the produced file will contain a weight sample each 2 second, and a temperature sample each 20 sec.

In case you like to have only the weight samples in the log file, uncheck the **'Log also Temperature'** option – that way no temperature sample will be logged.

### **Notes**

\* The minimal temperature sampling rate is one second. Therefore, if you selected, say,

**Weight: Each 0.2 sec.**

– then the minimal valid next parameter will be 5:

**Temperature: Each 5 weight samples**

\* The actual sampling rate depends (in addition to the Sampling Rate parameter) also on the power of the PC (hardware & software). Recall that the multitasking of the Windows ® and the current load of the various tasks might affect the actual sampling rate. This is significant especially when using a fast rate (that is, a low value in the "**Weight: Each ... sec.**" parameter).

\* Your Sampling Rate selection affects the **size** of the log files that will be produced. Obviously, a faster rate will yield larger files.

### **Activation**

Click the **'Data Logger'** button.

## **The Log Files**

### **Location**

The log files are produced automatically in the "DATA-LOGGER" subfolder under the **LCIC-WIM-MONITOR** application folder.

For example,

**C:\Program Files\IMS\LCIC-WIM-MONITOR-V2.20\DATA-LOGGER**

### **Files & Naming**

The logging produces a **set** of 3 or 4 log files:

- |                                    |  |
|------------------------------------|--|
| #1. DL- <i>date_time</i> .txt:     | All weight & temperature samples. <ul style="list-style-type: none"><li>* Each sample is preceded by a serial number, date &amp; time, and followed by 'w' or 'T', indicating whether the value is weight ('w') or temperature ('T').</li><li>* Optionally, a weight reading may be followed also by a '&lt;&lt;&lt;' mark. Refer to "The 'Data Logger' Parameters" section.</li><li>* The usage of this file is for manual view (e.g. by Notepad) or for a user's application.</li><li>* Example for the name of a #1 file:<br/>DL-15_Jan_2012_16_16_28.txt<br/>(DL stands for 'Data Logging').</li></ul> |
| #2. HG_DL- <i>date_time</i> .txt   | <b>Weights</b> extracted from file #1, converted to a format readable by the HisGraph viewer (see section 3.1.6). (That is, you may run the HisGraph viewer and select this file.)   |
| #3. HG_P_DL- <i>date_time</i> .txt | The same as file #2, in a 'preview' format for faster viewing (see section 3.1.4 about 'preview'). This is significant only when file #2 is very large.  |
| #4. HG_T_DL- <i>date_time</i> .txt | <b>Temperatures</b> extracted from file #1, converted to a format readable by the HisGraph viewer (see section 3.1.6).   |

### Notes

1. Optional. See the above 'Log also Temperature' option in *"The 'Data Logger' Parameters" / Sampling Rate* section.
2. You may run the HisGraph viewer twice (simultaneously): Once viewing file #2 (or file #3) and another time viewing file #4. Now, if you locate the two graphs one below the other, you may find out whether there is effect of the temperature on the weight. For example, the same weight (or none) is applied on the load cell, and only the temperature varies.

### **Accessibility & Snapshot Files**

Note that you may **not** access the current log files as long as the current logging runs; they do become accessible only upon closing the Data Logger window. However, you may click the 'Copy' button (near the up-right corner of the graph): Each 'Copy' click will produce a **copy** (a 'snapshot') of the current log files. The 'copy' files **are** accessible, although the logging goes on. The names of the snapshot files are 'Copy\_(...)\_Of\_' followed by their final name as specified above. For example, the name of the first copy of the above file #1 would be:

Copy\_(1)\_Of\_DL-15\_Jan\_2012\_16\_16\_28.txt

(The name of the latest snapshot of file #1 – if there is such – is displayed to the left of the 'Copy' button.)

Note that during one logging session each copy of a log file contains also the samples of the preceding log file. For example,

Copy\_(2)\_Of\_DL-15\_Jan\_2012\_16\_16\_28.txt

includes all the samples of

Copy\_(1)\_Of\_DL-15\_Jan\_2012\_16\_16\_28.txt

**plus** the new samples gathered between the first 'Copy' click and the second one. Nevertheless, a 'Copy' operation does not erase any previous copy file – it is **user's responsibility** to erase unnecessary files.

## **"Catch & Watch"**

One way to watch a graph of the results was already described above: Produce a set of 'copy' (snapshot) files and use the HisGraph ("Show History Graph") viewer. Below is an alternative way, different in four points:

- \* Its activation is faster.
- \* Unlike the first way, it shows only the **current** displayed data, **not** all the data since logging start.
- \* The data file is **not** saved automatically – if you like to save it, you have to do it manually using the 'Save Graph Data' button.
- \* Only the weights are taken, **not** the temperatures.

You may take a snapshot of the displayed graph and watch it by the **"Show History Graph"** viewer (as described in section 3.1.4). Viewer's features – such as zoom & ShowData' – are available. To take and display this snapshot, just make sure that the displayed graph includes at least 10 samples, and click anywhere inside the graph. While you watch the snapshot graph, the data logging keeps going on.

## **8. Concerning IMS Support**

In case of weighing difficulties, it might be that IMS may help. Usually IMS will ask you to send Monitor results files; in that case, follow these instructions:

- Make sure that you use the latest version of the Monitor. The latest software for LCIC-WIM is available at <http://www.ims.co.il/download/Lcic%20-%20wim/LCIC-WIM-Software.zip>
- Usually IMS needs the results with Filter2 active. Please note that this is not the default – you have to check the 'Filter2 is on' option as in the screenshot below.
- Use the 'Save to File' button in the **main** screen, not the 'Save Graph Data' button in the graph (close or minimize the graph). The 'Save to File' button will be available only after you click 'Start' and the graph appears, as shown in the screenshot below.
- This 'Save to File' saves two files; please send them zipped.

