

## Arbel Delphi Software



An increasing number of our products are designed with full custom control of operating parameters. Units with this facility have an accompanying Delphi software package. Authorised users can download software from our Web site: -

[www.arbelelectronics.co.uk](http://www.arbelelectronics.co.uk)

If you are an Authorised OEM or service organisation, you must obtain the appropriate access code to download software. Please contact Arbel Electronics on: -

Tel: +(44) 1437 532266

Fax: +(44) 1437 532488

Email: [arbel@arbelelectronics.co.uk](mailto:arbel@arbelelectronics.co.uk)

We no longer supply software on CD or floppy disks, unless specifically requested.

### Delphi Software



Arbel Delphi Software is a communications and interactive utility for setting up appropriate Arbel control systems. All our software operates on Windows, 95, 98 and XP platforms. Download the appropriate Zip file from our Web site and save to Desktop. Unzip the file and save to a clean floppy disk.

Use the Run facility to load the software onto your computer or laptop. **A:Setup.exe** This will load the software and create an appropriate Desktop quick access icon.

The software will function to a limited extent only, unless connected to the correct Arbel product. Connection is achieved by using the special Serial Cable, available only from Arbel Electronics.

Do not attempt to use any other type of serial cable. The Arbel Serial Cable has a 9-Pin Serial cable connector, for connection to the PC COM Port 1 or COM Port 2. The other end of the cable terminates in an RJ44 telephone jack type connector that fits into the socket on the back of the control systems.

### How to use Arbel Operating Software

- Ensure that you have downloaded the appropriate software to your computer or laptop.
- Connect the Arbel Serial cable to your computer and to the control system.
- Ensure that the control system is switched on.
- Press OFF on the control system. This is very important. You cannot properly access the control if it is in the middle of a cooling or washing sequence.
- Click on the appropriate Delphi software icon.

The following pages will take you through the Delphi associated with the MilkMinder 2000 Core Module unit. All other software programs are very similar in operation.

**YOU CANNOT DAMAGE THE UNIT IN ANY WAY BY CHANGING SETUP PARAMETERS.**

**ALWAYS CLOSE DOWN THE SOFTWARE CORRECTLY AFTER USE**

**YOU CAN ALWAYS DEFAULT THE CONTROL TO THE FACTORY DEFAULTS**

## Using Delphi Software

Ensure that the PC is connected to the control system and the control system is switched on. Press OFF.

### Example – MM-2000- Core Module

For the purpose of this exercise, we will be using the MilkMinder 2000 Core Module DX Milk tank cooling and wash control system.

Click on the Arbel MilkMinder Core Module Icon

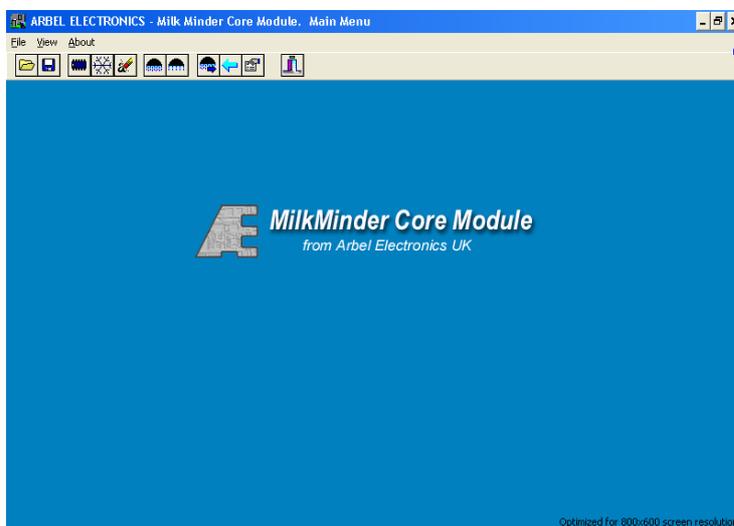


Arbel MilkMinder Core Module V1.0.Ink

You will be reminded to press OFF on the keypad before proceeding.



Click OK. This will take you to the main operating screen.



This is the main operating page in the software. From this page you can navigate to all the other pages to change or view operating sequences and the data logger.

In addition, it is possible to save or open wash and rinse sequence files, default sequences to factory defaults, view cooling settings and erase the data logger.

On the next page, we show the key to the entire main page features.



# ARBEL ELECTRONICS - Milk Minder Core Module. Main Menu

File View About



1 2 3 4 5 6 7 8 9 10 11

## Key

1. Open file
2. Save file
3. Read Data Logger
4. Show Cooling Parameters
5. Clear Data Logger
6. Display Wash sequence
7. Display Rinse Sequence
8. Restore Factory Default Wash Parameters
9. Restore Factory Default Cooling Parameters
10. Shoe Microprocessor Properties – Arbel Access feature
11. Exit

**Firstly, click on the snowflake icon (4).** This will take you to the cooling settings that are currently set up in the control unit. Note that the current temperature reading is shown on the software, confirming that the system is communicating correctly.

ARBEL ELECTRONICS - Cooling Parameters in Milk Minder Core Module

<p><b>Auto Cooling Parameters</b></p> <p>4.0 High Temp. On</p> <p>3.5 Low Temp. Off</p> <p>15 Initial Delay (mins)</p> <p>0 Chill Time (mins)</p> <p>30 Stir Delay (mins)</p> <p>120 Stir Time (10secs)</p> <p>15 2nd Comp delay(secs)</p> <p>15 Double Press Stir time (mins)</p> <p>5 Stir After Cooling (mins)</p> <p><input type="checkbox"/> Continuous Stir</p> <p style="text-align: right;">Send</p>	<p><b>Super Cooling Parameters</b></p> <p>3.0 Low Temp. Off</p> <p>2 Stir Delay (mins)</p> <p>30 Stir Time (10secs)</p> <p style="text-align: center;">Send</p> <hr/> <p style="text-align: center;"><b>Temperature / Offset</b></p> <p style="text-align: center;"> <input type="button" value="↑"/> <span style="font-size: 24px; font-weight: bold; color: green;">18.9</span> <input type="button" value="↓"/> </p> <p style="text-align: center;">Offset: 0.0</p> <p style="text-align: center;">Send</p>	<p><b>E7 Parameters</b></p> <p>Start E7</p> <p>Hour mins</p> <p>0 0</p> <hr/> <p>End E7</p> <p>Hour mins</p> <p>0 0</p> <p><input type="checkbox"/> Super Cool during E7</p> <p style="text-align: right;">Send</p>
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By using the mouse, the cursor can be placed in any of the setting boxes and a left click of the mouse will allow the setting to be changed. Use the delete key and type in the new setting. Do not forget the decimal point. All the settings shown are the factory defaults. Do not make any changes unless necessary.

Consider carefully the action you are taking by changing any setting.

### Auto Cooling Settings that can be changed.

<input type="text" value="4.0"/>	High Temp. On.	This setting is the thermostatic cut-in temperature.
<input type="text" value="3.5"/>	Low Temp. Off	This setting is the thermostatic cut-out temperature.
<input type="text" value="0"/>	Chill Time (mins)	This settings allows you to command evaporator plate chilling prior to milking. (Do NOT change this setting unless absolutely essential)
<input type="text" value="30"/>	Stir Delay (mins)	This setting controls the stirring time interval after the milk is cooled.
<input type="text" value="120"/>	Stir Time (10 secs)	Indicates the stirring time in seconds of the periodic stir. Only change in 10 second steps.
<input type="text" value="15"/>	2nd Comp Delay(secs)	Gives a delay start to the 2 <sup>nd</sup> condensing unit to prevent voltage drop.
<input type="text" value="15"/>	Double Press Stir Time (mins)	Gives 15 minutes stir time when 2 Min Agit key is pressed.
<input type="text" value="5"/>	Stir After Cooling (mins)	Agitates the milk for 5 minutes after cooling.
<input type="checkbox"/>	Continuous Stir	A check (click) in this box will activate a continuous stir after cooling.

After making any changes, click  to transmit the changes to the control unit.

### SuperCool Settings that can be changed.

After transmitting any Auto Cooling Settings, the software will display the main page again. To go back to change Super Cooling Parameters click again on the snowflake icon in the toolbar.

SuperCool on this control system provides an alternative thermostatic setting to lower the milk temperature slightly below the normal setting.

<input type="text" value="3.0"/>	Low Temp. Off	This setting allows the programmer to enter a lower milk cooling temperature. The default temperature is safe to use on most milk tanks without ice formation. Do not change to a lower setting unless absolutely safe to do so.
<input type="text" value="2"/>	Stir Delay (mins)	After SuperCool, the system goes into a more frequent stirring sequence, in order to prevent fresh, hot milk from 'sitting' on top of the cold milk. It is unlikely that you will need to change this setting.
<input type="text" value="30"/>	Stir Time (10 secs)	This sets the length of agitation time of the periodic stir after rthe milk is down to SuperCool temperature.

After making any changes, click  to transmit the changes to the control unit.

## Temperature Off-Set

After transmitting any Auto Cooling Settings, the software will display the main page again.

**Click again on the snowflake icon.**

In the Temperature Off-Set box, you can calibrate the temperature reading on the display. As supplied, the MM-2000-CM system is accurate to + or – 0.3 degrees C. Most stainless steel milk tanks have a differential of about 0.5°C between the milk inside the inner vessel and the probe situated in close contact outside the vessel. Experience will dictate how to change the setting and calibrate in an Off-Set. The average is normally plus +0.5°C.

Click on the Arrow keys each side of the temperature display to raise or lower the Off-Set. The Off-set will almost invariably be a plus figure.

**After making any changes, click  to transmit the changes to the control unit.**

## E7 Parameters

The MM-2000-CM is fitted with an output relay that can be programmed to operate at selected time period. The stop and start times can be entered into the appropriate boxes.

If automatic SuperCool is selected, by checking the box, this function will start at the beginning of the selected E7 period.

**After making any changes, click  to transmit the changes to the control unit.**

Below, we show a graphic taken from a control unit where most of the cooling parameters were changed.

All parameters can be easily restored to the factory settings. This can be done from the Delphi software, or from the manual RESET button on the circuit board.

ARBEL ELECTRONICS - Cooling Parameters in Milk Minder Core Module

Parameter	Value
High Temp. On	4.5
Low Temp. Off	3.8
Initial Delay (mins)	10
Chill Time (mins)	0
Stir Delay (mins)	20
Stir Time (10secs)	90
2nd Comp delay(secs)	10
Double Press Stir time (mins)	20
Stir After Cooling (mins)	5
Continuous Stir	<input checked="" type="checkbox"/>
Low Temp. Off	3.5
Stir Delay (mins)	3
Stir Time (10secs)	40
Start E7 Hour	1
Start E7 mins	0
End E7 Hour	7
End E7 mins	0
Super Cool during E7	<input checked="" type="checkbox"/>
Temperature / Offset	18.4
Offset	0.5

This graphic shows a cooling sequence page after some changes have been made.

Note that the Chill Time remains unchanged. Do not alter this setting without good reason.

The temperature display shows that an Offset of 0.5°C has been made. In this example, the probe would be actually showing 17.9°C

You cannot damage the control unit in any way by using the software to make system changes. You can however, program in settings that would not suit your customer. The factory defaults were selected after consulting milk tank manufacturers and service engineers. These defaults will work very satisfactorily on most milk tank installations. Only make changes for a specific reason and make sure that the operator is kept fully informed.



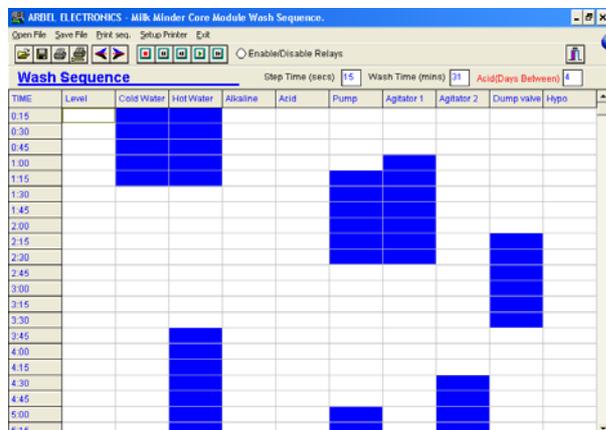
It is not possible to damage a control system in any way, even by programming in parameters that could result in poor performance. To some extent, the software will interact with the programmer to stop deliberate errors. However, in order to maintain as much flexibility as possible, it is the operator's responsibility to ensure that operating parameters are correct.

For example, if one tries to set the thermostatic cut-in and cut-out temperatures too close, (the minimum is 0.4°C) a warning will appear if these are 'sent' to the unit. In such a case, the changes are not saved in the control system.

\* \* \* \* \*



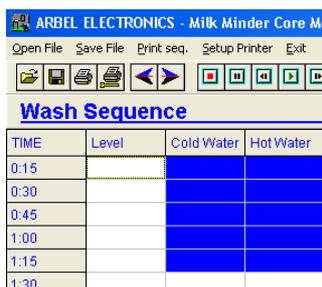
Wash and rinse sequences are composed of 'time blocks'. If a block is highlighted in blue or red, that block will become part of the sequence. By using the computer mouse, it is possible to add or remove these time blocks for the various wash and rinse valves and pumps. The block time can also be adjusted, as well as the ratio of alkaline to acid chemical dosing days. **The maximum block time is 65 seconds.** To open the sequence in the control unit, click on the left pointing arrow.



The software will now display the wash sequence set inside the control system, starting at the beginning. The display shows the sequence in a vertical format and by using the mouse on the scroll buttons on the right hand side, all the sequence can be displayed.

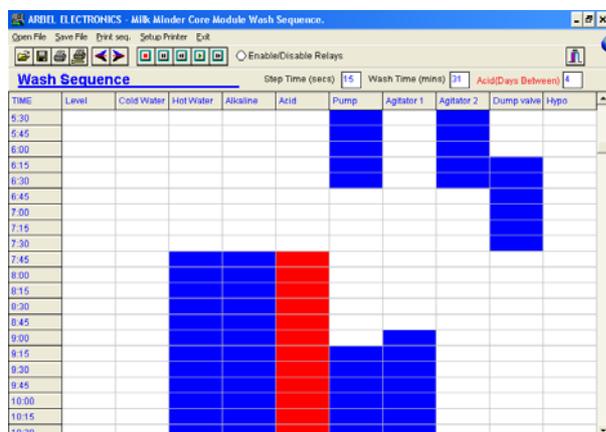
On the graphic shown, the first warm rinse sequence can be seen, where the system commands the opening of the hot and cold water valves. This is followed by the circulating pump and agitator starting, finalising with the opening of the dump valve. The sequence then goes on to start the hot water rinse.

## VERY IMPORTANT



Do not program in the Level blocks, unless using a level-sensing device wired into the MilkMinder 2000 system. If you program a Level command, the appropriate water valve will stay open and the program will not advance, until the control system receives a signal from the level sensor.

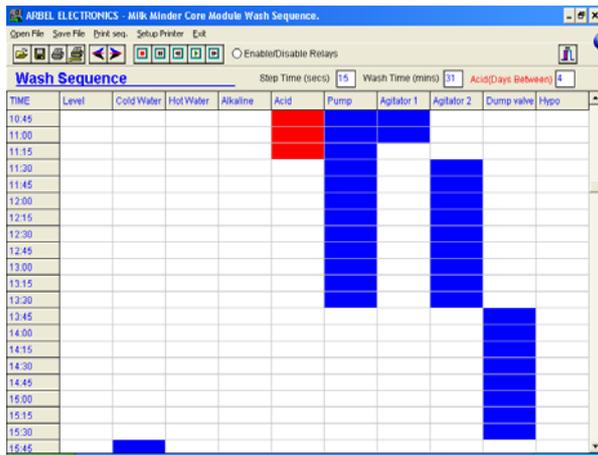
**If no level sensor is fitted you will flood the milk tank and the sequence will stop. Never program in a Level block in this situation.**



Scrolling down the wash sequence shows the end of the hot water rinse and the beginning of the main hot water chemical wash.

The sequence designer can stipulate the number of days between acid and alkaline washes. This is done in the check box - Acid (days between)

Notice also that each box in the sequence has a time defined by the entry in the Step Time (secs) box. This can be changed to a maximum value of 65 seconds. Do not attempt a higher value than 65. It is important to hit the Return key on the PC after changing any check box value.

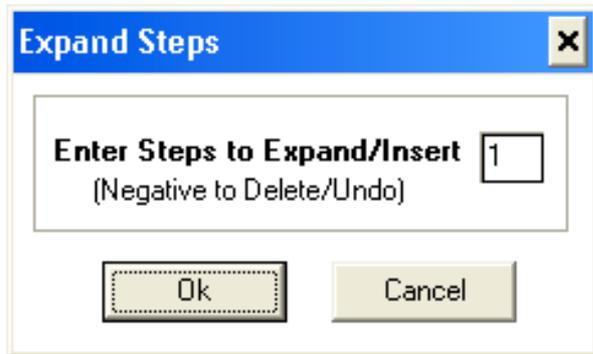


Scrolling down again shows the end of the hot chemical wash. This is usually the longest sequence in the wash program. Notice that the chemical column is shown in red.

Any block in the sequence can be removed, replaced or added to by putting the cursor into the block and clicking with the PC mouse.

### Expand/Insert Command

Right-click the mouse at a point in the sequence where you wish to insert additional blocks. This will open the software expansion/insert command.

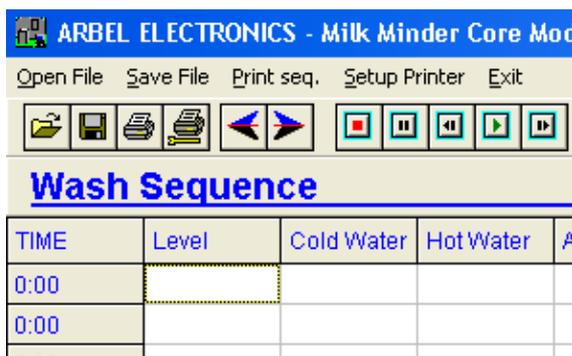


This is an extremely useful function, especially when working in a farm situation where water flow rates are lower than average.

This feature enables the programmer to make a major alteration to a sequence without having to start from the beginning. It is a powerful and very useful feature.

### Designing and Programming a new Wash Sequence.

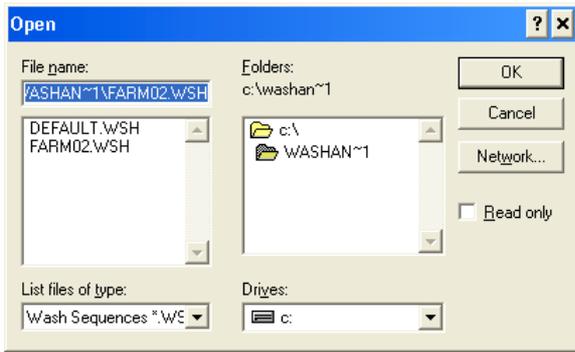
Newcomers to Arbel Delphi software are advised to use and modify an existing Wash or Rinse program. It is useful to build up a portfolio of wash and rinse sequences, saved to disk and/or the PC hard drive.



To open an existing wash or rinse sequence, click on the Open File graphic on the toolbar. Select the source of the file and open it in the normal way.

The sequence will be imported into the Wash or Rinse sequence page.

The file can now be modified if required.



This graphic shows that the programmer has saved his Wash and Rinse sequences on the PC hard disk in a Folder Named WASHAN~1

Please note that the software is designed to run in all Windows platforms and the full name of the folder will not be displayed.

You can see that the programmer has saved two wash sequences: **DEFAULT.WSH** and **FARM02.WSH**

Double-clicking on the appropriate wash file will automatically open the file in the sequence page. The programmer can now make any alterations if required.

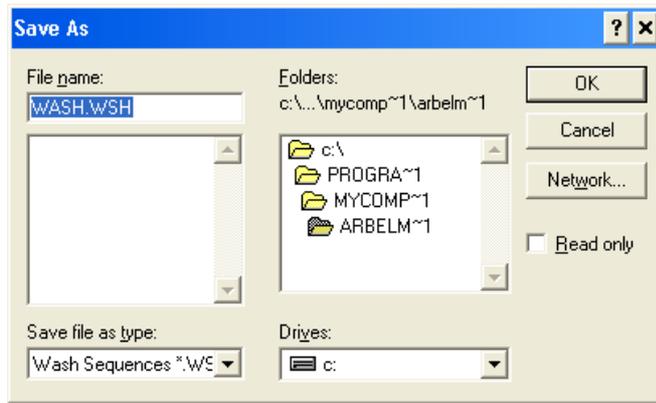


Once the wash sequence has been selected and modified in any way, it can be saved into the control system by clicking on the right facing arrow.



Wait until the information box appears, to say that the sequence has been saved into the control unit. This may take a few seconds, so be patient.

**Click OK.**



If the programmer has made any changes to the sequence, the software will prompt to offer the option of saving the new sequence to disk. The wash sequence can either be saved with the existing .WSH file name or given another.

Note that all wash sequences have the file extension **.WSH** and all rinse sequences **.RSE**

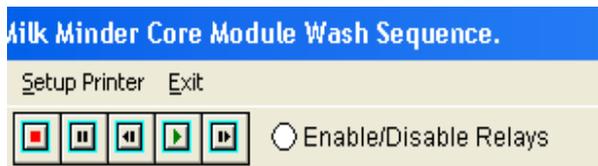


### Important

If you wish to change the block time or set the Acid (Days Between), click in the box and change the value. It is essential to hit the **Return** key to accept the change(s).

After hitting the **Return** key, the Wash Time (mins) window will automatically calculate the total wash sequence time.

### The Design and Play Feature



1 2 3 4 5

#### Key

1. Stop.
2. Pause.
3. Step back.
4. Play program.
5. Step forward.

This function is provided for experienced wash and rinse sequence designers. Using this facility, a designer can actually formulate a wash or rinse program in real time.

The starting point would be a 'clean' sequence page. By adding blocks and putting in an appropriate step (block) time, the Design and Play controls can be used to run the sequence. Click on the text Enable/Disable Relays. This will allow the sequence to open valves etc. The window will change to red.



This graphic shows that the relays are activated.

Clicking on Play will start the sequence. The designer can then observe the results – such as the quantity of water entering the milk tank. The sequence will stop running and allow the programmer to further develop the program. Using the Play command and re-activating the relays will allow a full sequence to be developed. This sequence can be saved to the control and/or disk as required.

You are advised to experiment and practise with the Design and Play facility before you attempt to use this feature for the first time in a farm situation. We recommend setting up a control system and connecting to a PC in your workplace. Design and Play is very easy to use, but like most new techniques, a little practice makes perfect.

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## Data Logger

Most Arbel control systems have a data-logging facility. This utility operates automatically and cannot be turned off.

The data logger holds critical information for a period of time. The time depends on the frequency of keypad inputs, temperature sampling intervals (adjustable) and the particular control system. When the data logger is full, it will automatically start over-writing the oldest data.



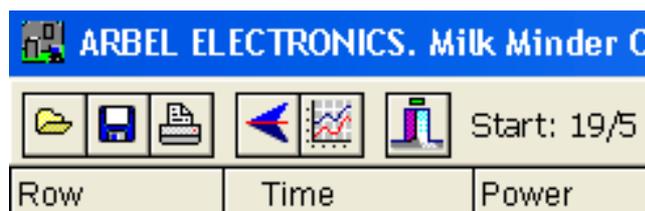
Access the data logger by **clicking on the microchip icon.**

The data logger will automatically be displayed on the software.

The graphic below shows the data logger taken from a MilkMinder 2000 –Core Module control unit. The log shows for example: -

- The log started on the 19<sup>th</sup> of May at 4.08pm
- The AUTO key was pressed at 9.19pm
- That the temperature at this time was 19.9°C
- That the agitator switched on, followed by Compressor 1 and then Compressor 2
- 

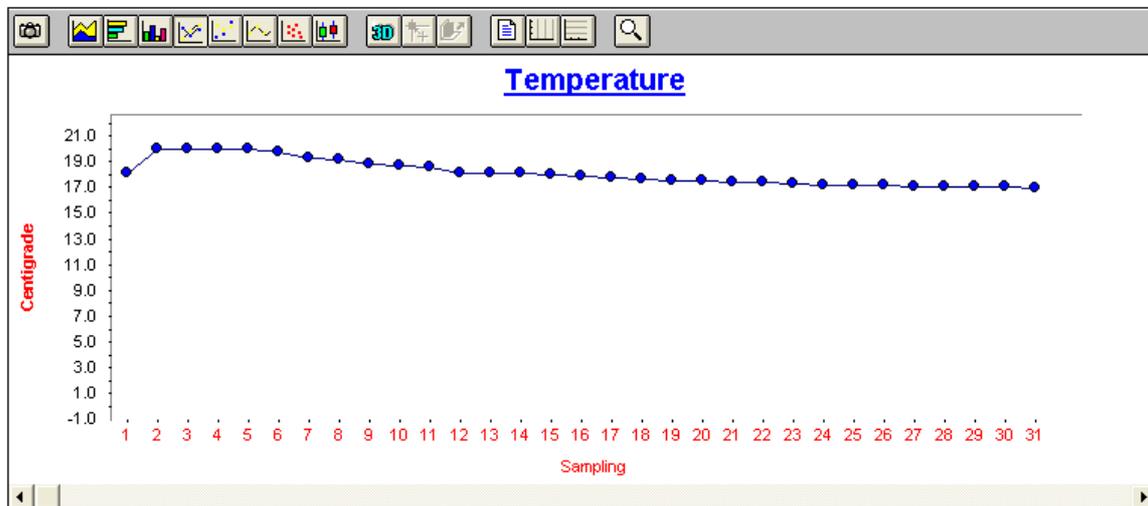
Row	Time	Power	Comp 1	Comp 2	Agitator	Temperature	Messages
1	19/5						Day
2	4:08pm	On				18.1	
3	9:19pm					19.9	AUTO Key Pressed
4	9:34pm				On	20.0	
5	9:34pm		On			20.0	
6	9:34pm			On		20.0	
7	9:44pm					19.7	
8	9:54pm					19.3	
9	10:04pm					19.1	
10	10:14pm					18.8	



To show a graphical representation of temperature changes, **click on the graph icon.**

The **Graphical Display** can be useful to the service engineer to quickly identify areas of concern and changing trends that could be caused by a system malfunction.

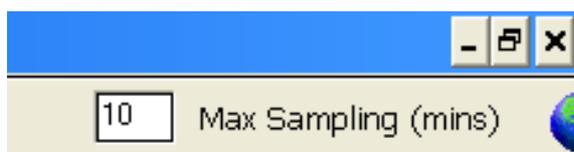
In the case of the MilkMinder-2000-Core Module unit, it is especially useful for identifying the peak wash temperatures.



The graph axis will automatically change to accommodate higher (or lower) temperatures.

The default temperature-sampling rate is set at 10 minutes. This can be changed in the window labelled **Max Sampling (mins)**. If the sampling rate is increased, the data logger will start to overwrite in a shorter period of time. For example if set to 1 minute, the data logging period will be only 10% of the normal default period.

Changing the default-sampling rate will always reset and erase the log. Save the log before changing this setting if you want to keep a record of the previous log.



After changing the Max Sampling (mins) rate, it is essential to **hit the Return key to store the change**.



The data log can be saved to file or erased. Once erased, it cannot be recovered unless it was previously saved. Erase by clicking on the Rubber icon in the main program page.

Data logs can be saved to disk for future reference. Select an identifying name, so that you can easily identify the source of the log file. Data log files are saved under the file extension **.LOG**

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