

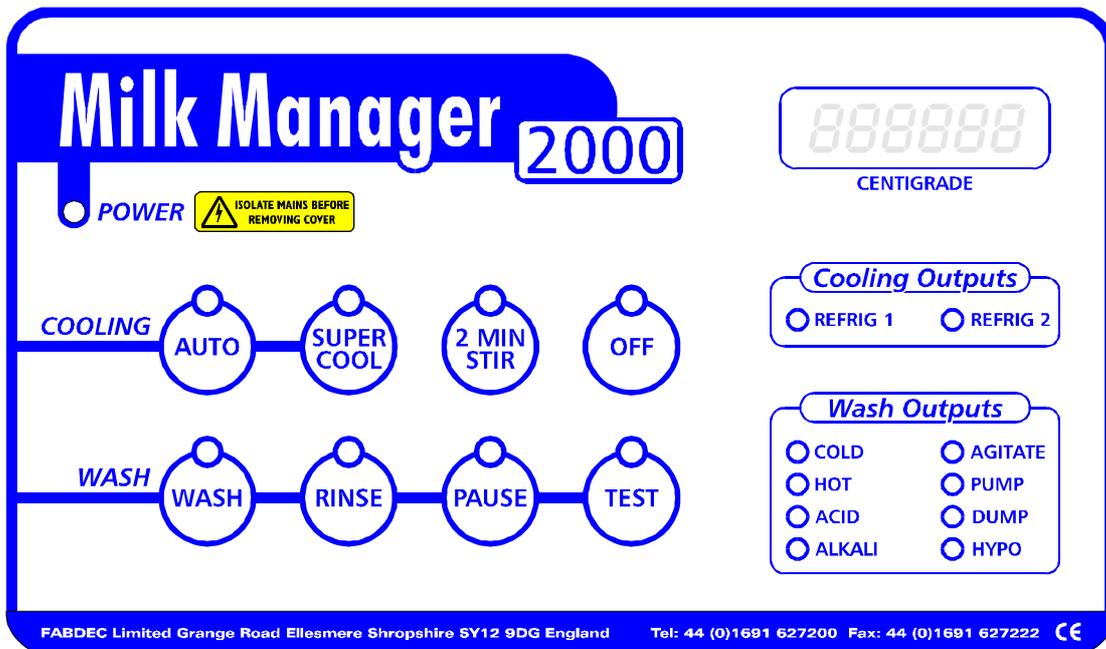
**Milk Manager 2000 Manual**  
- Installation Engineer

**Statistics show that 65% of people do not bother to read the technical manual(s) supplied with new equipment.**

**Statistics show that 86% of these people, compared with 18% of those who do read the manuals experience problems that could have been totally avoided by reference to the manual.**



## Milk Manager 2000 Operating Manual



## Milk Manager 2000 DX Milk Tank Control System

The Milk Manager 2000 system has been designed to control the cooling and washing systems of any make of DX refrigerated milk tank. Highly suitable for the milk tank OEM or as a retrofit for service organisations, the Milk Manager 2000 is a state of the art microprocessor based control system.

The cooling and washing sequences can be fully customised by the use of Windows based software supplied with the unit. As supplied from the manufacturer, the Milk Manager 2000 system is programmed with 'factory default' cooling and washing settings.

### The standard cooling default settings are as follows: -

Temperature cut-in point	4.0°C
Temperature cut-out point	3.5°C
AUTO delay time, single press of switch	15 minutes
Vat chill time during above delay period	0 minutes
Standard stir of milk when down to temperature	120 seconds
Period between stir times	30 minutes
Super-Cool cut-out temperature	2.0°C
Stir timer period for agitation	120 seconds
2 <sup>nd</sup> Compressor Delay Time	15 seconds
Double press stir timer for agitation	15 minutes
Rapid/high stir modes after Super-Cool	30 seconds
Period between stir times	120 seconds
Stir time after completion of cooling	5 minutes
Economy 7 Relay output energised from	12.00am to 07.00am
Super-Cool during E-7 period	Default is OFF

### Installation and Setting up the Milk Manager 2000 – without PC or Laptop

It is possible to install and set up the Milk Manager 2000 unit without a laptop or PC connection. It is not the purpose of this manual to instruct in the basic electrical requirements for installation, as these points have been covered elsewhere.

After electrical installation, you should be aware that, without a laptop or PC, the installer would have to accept the majority of the default settings listed above. With the exception of the items highlighted in blue, other operating parameters can only be changed by connecting a computer previously loaded with the Milk Manager 2000 software. After installation, you will be able to calibrate the unit to read the correct temperature, set the time and change the thermostatic settings. A computer is not required to make these changes.

## Setting the Milk Manager 2000 – no computer needed.

The Milk Manager 2000 requires calibration in order to compensate for the slight thermal gradient that exists between the milk inside the vat and the probe tube fixed to the outside skin of the vessel. When you have completed the installation, ensure that all electrical connections are satisfactory and that the temperature probe has been pushed completely home inside the sensing tube (always use some heat transfer compound).

**Before** switching on the power, check that the top circuit board assembly has its ribbon cable plugged into the connector on the relay board.

**NEVER PLUG OR UNPLUG A LOGIC BOARD ASSEMBLY INTO THE RELAY BOARD WITH THE POWER SWITCHED ON. THIS MAY DAMAGE THE MICROPROCESSOR AND/OR TEMPERATURE SENSOR. NO WARRANTY FOR THIS DAMAGE!**

Secure the lid temporarily by loosely screwing in the two top plastic retaining screws. This will enable the top lid to hinge against the enclosure base. Now switch on the power.

The unit will go through a self-test sequence of: -

**illuminating all segments of the display**  
**Scrolling the current date as DAY-MONTH**  
**Scrolling the current time setting**  
**Scrolling a CON or NOCON message**  
**Scrolling and holding temperature display**

The unit can be made to check the **CON** message by holding down the **TEST** switch for 5 seconds and then releasing. This is useful if the mains isolator is situated at a distance from the control system and you cannot easily see the display immediately after switching the system on.

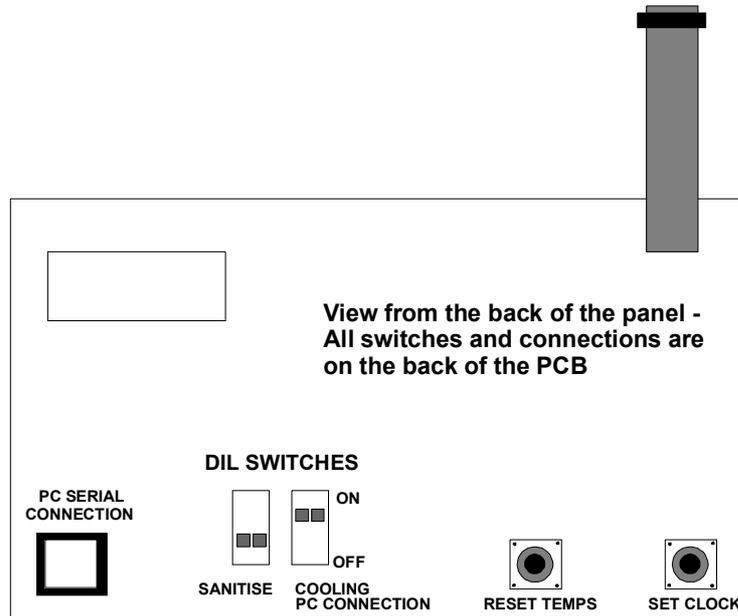
In normal operation, it is essential that the instrument should give the **CON** message to indicate that the cooling and washing functions of the system are linked for correct operation. Should the **NOCON** message scroll in the display, the probability is that the DIL switches on the back of the display board are incorrectly set. **The unit will not function correctly if the CON message is not displayed.**

If the unit is operated in the **NOCON mode**, the keypad switch functions will fail and the unit will not respond correctly. You should immediately put the DIL switches into the correct position **and** carry out a mains reset by switching the power off momentarily. The unit cannot be damaged by operating in the **NOCON mode**, but will function incorrectly.

You should note that the instrument receives date information from the settings on the PC or laptop connected at initial or subsequent interrogation. An incorrect date will not affect the day to day operation of the unit, but will be recorded in the data logger. The Milk Manager 2000 is completely millennium compliant.

## Settings that can be changed without a PC or Laptop

To affect changes to the basic settings, two small push button switches, situated on the back of the display circuit board are provided. The following schematic indicates the position of these buttons and other important components.



### THE DIL SWITCHES ARE SHOWN IN THE NORMAL OPERATING POSITION

We have shown the view looking at the back of the display circuit board. To gain access and manipulate these switches, remove the lower two lid retaining screws completely and loosen the two top ones so that the lid may be hinged upwards. Access to the switches can now be easily made, leaving the lid assembly connected to the power supply board.

### THERE ARE NO DANGEROUS VOLTAGES ON THE TOP BOARD

All instructions assume that you are facing the opened lid.

The unit must be powered up to make any changes.

### To Set the Clock

**Briefly** press the **SET CLOCK** switch on the bottom left hand side of the panel. The **temperature display** will change to a **flashing time display**. Adjust for the correct time by using the **AUTO** and **SUPER COOL** switches. **AUTO** increases the time and **SUPER COOL** decreases the time. When you have the correct time, simply press the **SET CLOCK** switch at the back of the panel to enter the setting. The display will now revert to temperature.

### To Calibrate the Temperature Display

**Briefly** press the **RESET** switch to the right of the **SET CLOCK** switch. Wait for about 3 seconds and the temperature display will flash, indicating that you can now change this setting. Use the **AUTO** and **SUPER COOL** switches to adjust the temperature UP or DOWN respectively. When you are satisfied with the reading, you can now go on to view the thermostat settings and check the channel outputs for the cooling functions.

## To Check or Alter the Thermostat Settings

After setting the display temperature, press the **RESET** button again. You will now see the display change to the thermostatic cut-in temperature: -

# H 4.0

Use the **AUTO** or **SUPER COOL** button to increase or decrease this value respectively. Press the **RESET** button again to set the lower cut-out temperature in the same way.

# L 3.5

You cannot set the cut-in/cut-out differential closer than **0.4 degrees**. If you try to set a smaller value, you will be reminded when you press the **RESET button**, as you will return again to the **H** or cut-in setting. This is to prompt you to set a new setting that has a differential of **0.4 degrees or higher**.

Pressing the **RESET** button again will check the four output relays on the cooling system. These are: -

**Channel 1 Compressor No.1**

**Channel 2 Compressor No.2**

**Channel 3 Agitator**

**Channel 4 Economy 7 Device**

After the CH.4 display, pressing the **RESET** switch will return the instrument to the temperature display and normal operation.

## VERY IMPORTANT

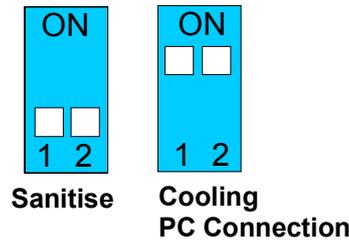
The two push button switches have dual functions. Holding down the **SET CLOCK** switch for over 7 seconds will restore the **Default Wash Sequence**. You will know that you have defaulted the Wash Sequence, as the unit will go through a reset sequence.

Holding down the **RESET** switch for longer than 7 seconds will restore the entire factory set **Default Cooling Settings**.

**THIS IS A POWERFUL COMMAND. DO NOT DEFAULT THE  
SETTINGS UNLESS YOU WISH TO RESTORE THE  
FACTORY DEFAULTS**

## DIL Switch Setting Positions

### DIL Switches - Normal Operation



The above position is the normal operating position of the DIL switches. The Milk Manager 2000 will NOT function correctly on the milk tank unless the switches are in this position. If you have connected a PC or laptop to the unit, always return the DIL switches to the above positions before refitting the lid.

With the DIL switches in this position, the unit will: -

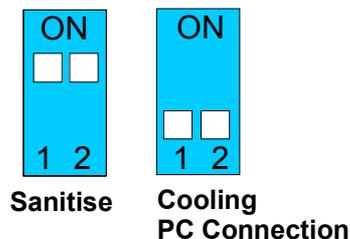
Control the cooling and washing functions correctly.

Allow the connection of a remote data reading PC

Allow the connection of a laptop for advanced alterations to the COOLING Settings only.

Block connection to the Wash Sequence Settings.

### DIL Switches - Position for accessing Wash Sequence Program



Move the DIL switches to the above position if you are connecting a laptop in order to view or change the Wash Sequence settings. Afterwards, you **MUST** change the DIL switches back to their normal operating position.

**Attempting to use the control system with the DIL switches in the incorrect position may cause a temporary malfunction. To restore all the switch and display functions, simply reset the DIL switches to the normal operating position and carry out a mains reset. Full functionality will be immediately restored. You will NOT lose any setting changes that you have previously entered.**

## **Milk Manager 2000 Software**

Using the Milk Manager 2000 software will enable you to carry out advanced system changes to both the COOLING and WASHING sequence settings.

You will require the three software disks and the correct serial cable in order to connect your PC or laptop to the system.

Before attempting to use the Milk Manager 2000 software, it is essential that you fully understand the basic use of the control system and you are advised to read the first portion of the manual again, preferably gaining some hands-on experience with the system.

Try to become familiar and at ease with setting the time, temperature display and thermostatic settings by using the SET CLOCK and RESET TEMPS switch buttons on the rear of the display board.

Do **NOT** change any system settings unless absolutely necessary. The Milk Manager 2000 system is despatched from the factory with all settings at the default value. These settings have been found to suit most operating conditions. Most installation engineers will find that the only changes that will usually be required are: -

**Setting the time display**  
**Adjusting the temperature display**  
**Changing the thermostat settings**

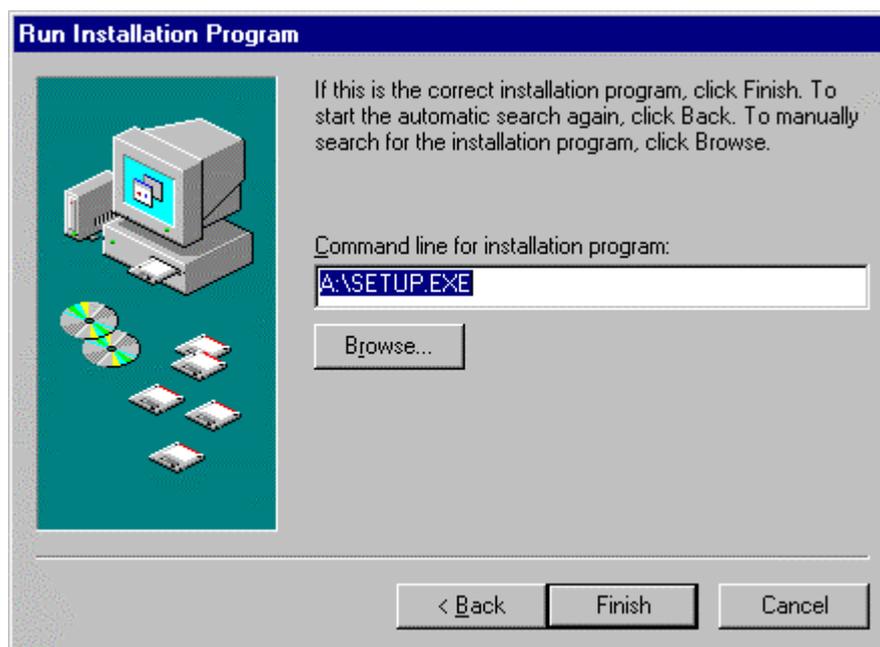
The factory default settings are retained permanently in the microprocessor system and can always be recalled by following the instructions on Page 6.

## Milk Manager 2000 Operating Software

**IMPORTANT** - It is in your own interests to read these instructions.

Milk Manager 2000 software is a dedicated Windows 95/98 and NT package. It is the responsibility of the user to ensure that all computers, laptops or PC's are Millennium Compliant. This software will not operate on any other platform. The software is supplied on two floppy disks.

To load into Windows 95/98 machines, switch on the computer and enter the Windows 95/98-command screen. Click on the Start 'button' in the lower left-hand corner, put your cursor on Settings and then into Control Panel. Double click in Control Panel and open the Control Panel Window. Double click on the Add/Remove Programs icon. When in this window, put the software disk No. 1 into the floppy drive and click on Install. **When asked for the command line for installing the program, please type in A: setup.exe.** Follow all screen instructions.



Follow all the computer commands and the software will automatically be loaded onto the hard disk and create the Milk Manager 2000 program under Program Files, sub directories Arbel Electronics / Milk Manager 2000. Remove the floppy disks from your drive and store in a safe place. You can create a quick start icon on the main screen at this time if required. To do so, go into Start - Programs and click on Milk Manager 2000. When the window appears on the screen, drag the icon onto the main windows by positioning the cursor on the icon and holding down the left-hand mouse button.

Supplied with the software is a special Serial Cable to link the Milk Manager 2000 control to the PC. Do not attempt to use any other type of cable and ensure that the cable is not damaged in any way.

### **Connecting a Milk Manager 2000 to a PC**

Turn the Milk Manager 2000 unit mains power supply off. Attach one end of the PC-Link cable to a 9 pin serial port on the back of your PC. This cable is included with the authorised version of the software. Then unscrew the Milk Manager 2000 unit front panel and insert the PC-link telephone jack (RJ45) into the socket in the back of the display board that is attached to the front panel. Now restore the power supply to the Milk Manager 2000 unit.

### **PRESS THE OFF SWITCH BEFORE CONNECTING TO THE MILK MANGER 2000**

Double click on the Milk Manager 2000 short cut icon, or open the software through the Programs window.

The Milk Manager 2000 program screen will appear. If the cable is not connected correctly an error message will appear suggesting that you check the connection. Now study the Milk Manager 2000 Manual.

You will initially see the following Windows screen: -

**DO NOT USE THE KEYPAD WHEN COMMUNICATING TO THE SYSTEM WITH A PC OR LAPTOP**

If you do, you may cause a temporary malfunction, which can be corrected by carrying out a mains reset.

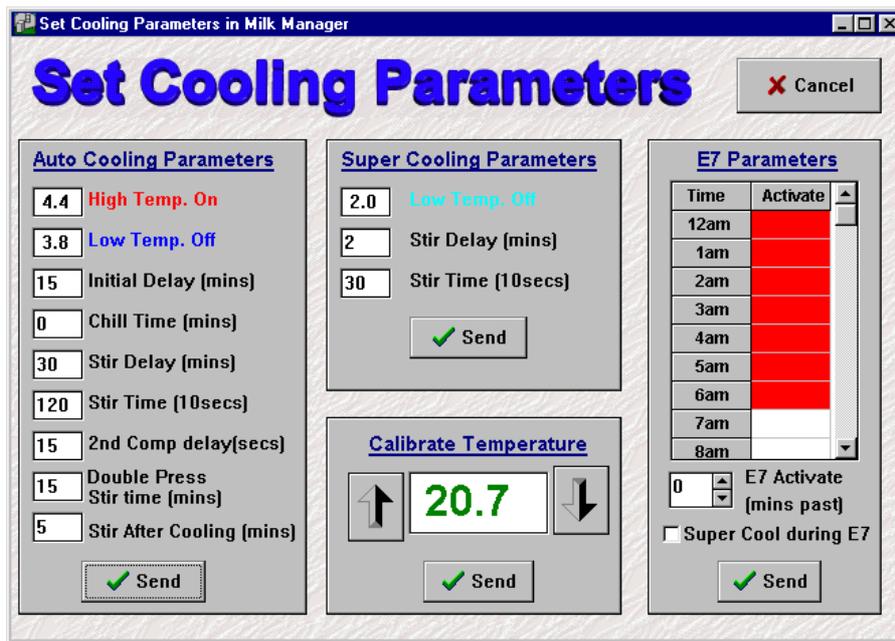


This screen is to remind you to set the DIL switches into the correct positions, depending on whether you want to view the cooling settings and data logger or the wash and rinse sequences.

The Cooling and Data Logger functions can be accessed with the DIL switches in the normal operating position. Use the mouse to click on OK. You will now go into the main MilkMinder 200 screen, which will look like this: -



From this screen, you are now able to access the cooling, data logging and wash sequence windows.



Let us assume that firstly you wish to check the cooling parameters. Make sure the DIL switches are correctly set. Click on the button called **Set Cooling**. The software will display a small window to say that the connection has been successful. Click on the OK button. The PC or laptop will now display the current settings. If these are still in the factory default settings, you will see a window similar to the one shown here: -

From this window you will be able to change any of the settings. The software has built in limits to prevent very undesirable changes from being made. To change any setting, place the cursor alongside the setting and click the left-hand mouse button. Use the delete key to erase the setting and then type in a new value.

After you have made any changes, carefully evaluate the effects of what you have done. Check everything again carefully before clicking on the OK 'switch', which will cause the computer to transmit the new settings into the Milk Manager 2000. There may be a slight delay as this takes effect. On completion, the main Milk Manager 2000 screen will appear again.

If you are only experimenting with the system and wish to return to the default cooling settings, simply click on the **Restore Def** switch.

You cannot do anything on the computer or laptop that will damage the Milk Manager 2000. If you enter incorrect settings, these will be transmitted to the unit and may cause incorrect cooling or washing functions. You can always restore the default settings with the computer, or manually after disconnection.

**AFTER COMPUTER DISCONNECTION, ALWAYS CHECK THE DIL SWITCH POSITIONS**

## The Data Logger

This is probably the most powerful function of the Milk Manager 2000 system. The data logger will record all keypad inputs and temperatures during the cooling and washing operations. The data logger will only record the correct time and date, if the time is correctly set on the Milk Manager and the time and date settings on the computer are accurate.

Access the data logger by clicking on the **Data Logger** 'switch' in the main window. The computer will read the log, and give an OK window to click before going into the log. You should see a window similar to the one shown below: -

Time	Power On	Comp 1	Comp 2	Str-Agit	Temperature	Messages
1/9						DATE
3:36pm	On				19.9	
3:36pm					19.9	KEY AUTO
3:36pm					19.9	KEY AUTO
3:36pm	On	On	On	On	19.8	
3:46pm					19.2	

From the Data Logger window, you can access additional functions, including opening a data log file, saving the data log to the computer hard drive or floppy disk, printing the log and clearing the log.

The log will automatically recover and display the offset (calibration) temperature programmed into the unit. The Max and Min temperatures occurring during the cooling periods will also be recorded and the maximum temperature during each wash cycle will be displayed in the sequence window.

You are advised not to use the Print Log command unless absolutely necessary, as the complete contents of the log will be printed out, which could use a great deal of paper. You should always remember that most logged data would be of a routine nature and of no great interest. Only abnormal situations will be of interest and worth detailed examination. If you have saved the log to file under a suitable title, you can always bring the log back onto the screen at any time.

A neater solution is to scroll to the relevant part of the log and press the Ctrl + Print Screen keys on the computer. If you now open a conventional word processing page such as Microsoft Word, use the Paste command to place the page in the program. Now use the Print command to print out a single page. The above graphic was obtained from an actual log by using this method.

## Temp Graph

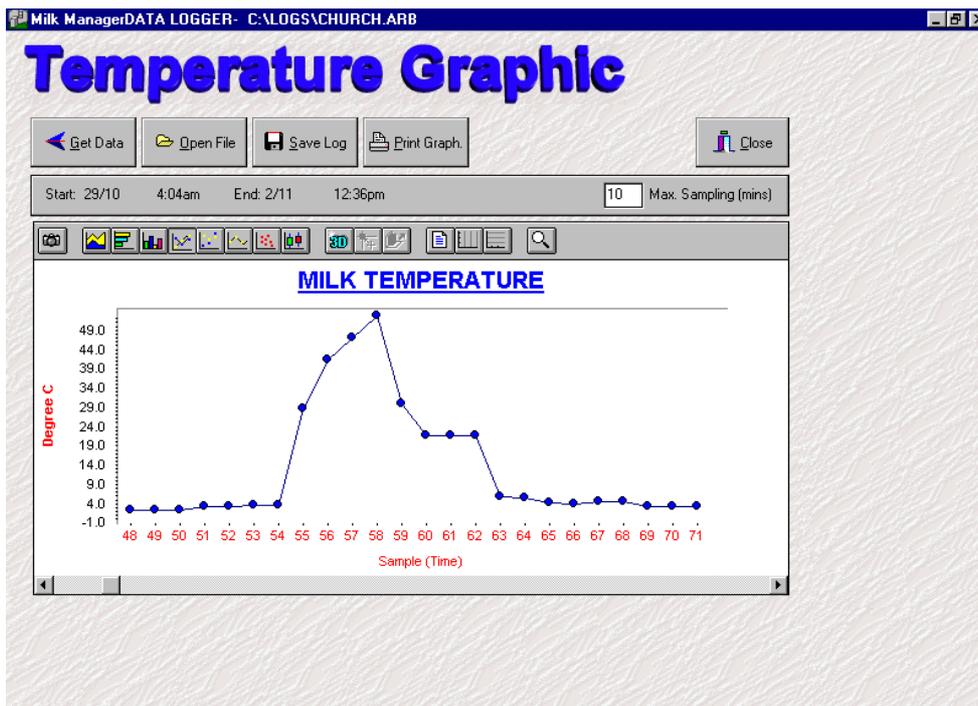
Clicking on the Temp Graph button on the main software window will enable the temperature data to be viewed in graphical form. From this window, the frequency of recordings can be entered in the Rate of Sampling window. Altering this figure will erase the data and effectively reset the log to the beginning. The unit can store approximately 800 readings and the engineer setting up the system should set this figure to suit the requirements of the customer. For guidance, the following settings show the approximate log duration: -

10 minutes

42 days

These figures are only approximate, as all keypad inputs and critical wash temperatures are recorded.

Using the graphical representation of data samples will enable the service engineer to rapidly evaluate milk cooling and wash water temperatures. The graphic below shows a typical graph display of a milk tank from which milk has been collected and immediately washed after the collection.



Log taken from 8,000 litre DX Milk Tank

## **Sanitise Program**

The Milk Manager 2000 is supplied with a default wash program that has been found to be highly suitable for most milk tank washing operations. If a different wash sequence is required, this may be programmed into the instrument through a laptop computer.

It is essential that the DIL switches are set into the correct position for accessing the sanitising functions. Refer back to page 11.

### **REFER TO WASH MANUAL**

The latest version of the Milk Manager 2000 operating software and relevant manuals may be downloaded from our Web site at: -

[www.arbelelectronics.com](http://www.arbelelectronics.com)

Technical help is available from: -

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