Detailed Operation – Automatic & Manual

Low pH Pump Shutdown

If the Chemigem unit detects a low pH condition acid feeding will be turned OFF. If the pH falls below 5.8 the Pump will also be turned OFF. The STATUS light will be red to warn of a problem.

Power Failure Operation

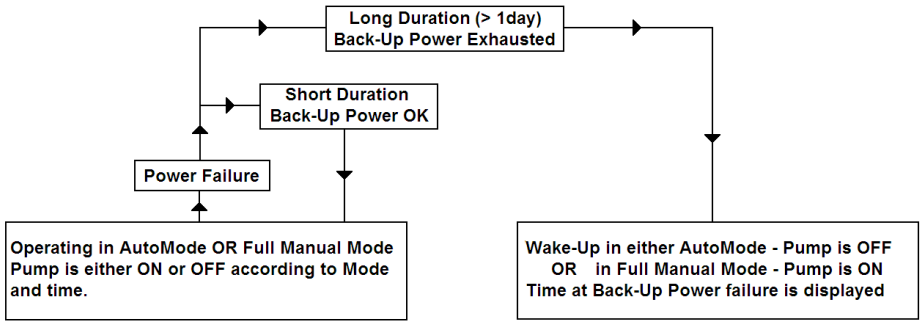
The Chemigem unit comes with a timer function built into the operating software. The timer is a 24-hour type with quartz-crystal control and has a battery back-up in case of a power failure. The battery is a rechargeable NiMH type so it will never need replacing.

If a power failure is of a short duration (a few hours) the Chemigem will keep time and maintain AutoMode functions. If a Filter Cycle is active when power is returned the pump will be turned ON.

If a power failure occurs over an extended period of time the Chemigem will save all its operating information to a special memory. When power eventually returns it will wake up remembering everything except the current time – it will show the time at which the Back-Up Power was exhausted. If the unit is in AutoMode the pump will be OFF waiting for the next Filter Cycle to become active. If the unit is in Full Manual Mode the pump will be turned ON immediately.

For future reference information that is retained in the special memory cannot be lost and is said to be *non-volatile*. Information that can be lost during an extended power failure is said to be *volatile*.

Power Fail Operation is shown in the following diagram:



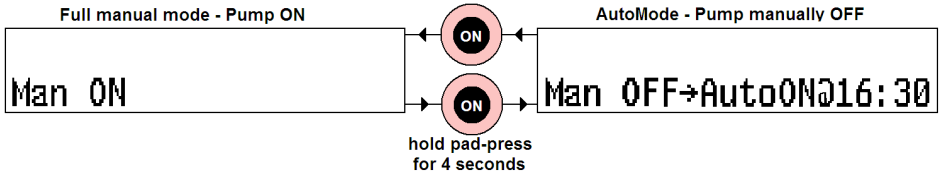
The Chemigem can operate automatically or manually in AutoMode, or it can be set to operate in Full Manual Mode (FMM). Both modes are non-volatile – a unit will always wake up in the mode to which it is set. Modes can be changed by the user however it is unlikely that this will be required – nearly all units (in Australia) will use the built-in timer.

Timer Operation Overview **Note: Chemigem uses 24-Hour time**

Selecting Full Manual Mode (FMM) or AutoMode

Most units will already be set for AutoMode operation. To change from one mode to the other:

- Press the ON-pad for 4 seconds to change to FMM
- Press the OFF-pad for 4 seconds to change to AutoMode

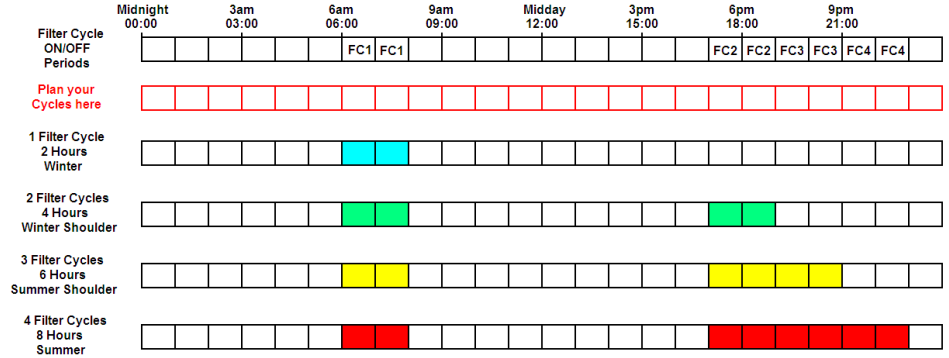


ON & OFF Times for AutoMode

The automatic operation of the Chemigem uses 4 ON/OFF times each of which make up a Filter Cycle (FC). Each FC has a start time (ON) and a stop time (OFF). Each FC has a number of 1 to 4 so that the user can select how many FCs to enable. If 3 FCs are enabled then FC1, FC2 & FC3 will determine the Chemigem automatic operation.

If an FC has an ON time the same as another FC's OFF time then they can combine to form one longer FC. For example let us assume that FC1 has an ON time of 6am and an OFF time of 8am, and FC2 has an ON time of 8am and an OFF time of 11am. If the user enables only 1 FC then the Chemigem will turn the pump ON at 6am and OFF at 8am. If the user enables 2 FCs the Chemigem will still turn the pump ON at 6am but it will now turn OFF at 11am. This method of automatic operation is useful for increasing/decreasing the filtration hours as the seasons change – with no need to change the individual ON/OFF times. It is far simpler to enable/disable Filter Cycles.

The Chemigem comes with preset FCs (4 are enabled for a total of 8 hours per day operation). These are shown in the diagram below along with possible uses. Please note that pool chlorine demand varies significantly and these settings are a guide only.



The Filter Cycle ON & OFF times are fully adjustable – please see page 40. ***The diagram above can be used to help plan alternative Filter Cycle timing to suit your pool. More on page 40.*** **See Timer Defaults page 4 & 38.**

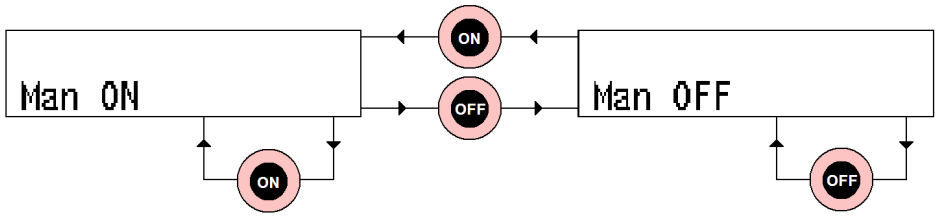
AutoMode and Full Manual Mode

Full Manual Mode (FMM)

FMM is used in situations where an external timer is required to run the Chemigem. FMM is a setting which starts the pump immediately on the application of power to the unit. A unit in FMM mode can have the pump turned OFF. This will mean that the pump will not turn back ON unless it is manually turned ON by the ON pad or a long power failure occurs.

The operation of the ON/OFF-pads in Full Manual Mode is shown below:

(Note: for clarity only Line2 of the LCD is shown)



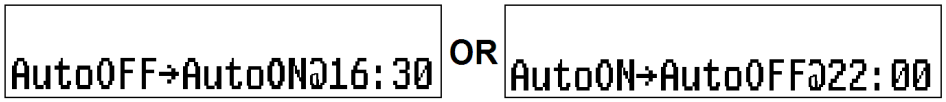
AutoMode

The Timer in the Chemigem is very versatile and easy to use. It has 4 adjustable Filter Cycles that can be accessed from the TIMER MENU. All Filter Cycles can be overridden manually. Filter Cycle 1 is always enabled. The other 3 Filter Cycles can be enabled or disabled in order (ie select 1, 2, 3 or 4 Filter Cycles to be enabled). This allows a simple increase or decrease in running times to be achieved without adjusting the Filter Cycle ON/OFF times – simply add or remove cycles ! See page 39 for details.

In AutoMode the Chemigem will START (at first power-up or after a long power failure) with the pump OFF. It will then wait for the next available ON-time to start the pump and the rest of the system. If there is a power failure the system will continue to keep time for a number of days. During this time the pump ON/OFF-times will still be checked. When power is restored the system will wake up and turn the pump ON if it is during a Filter Cycle.

Automatic Operation:

During Automatic Operation Line2 of the LCD will display whether the Pump is ON or OFF and the next OFF or ON time:

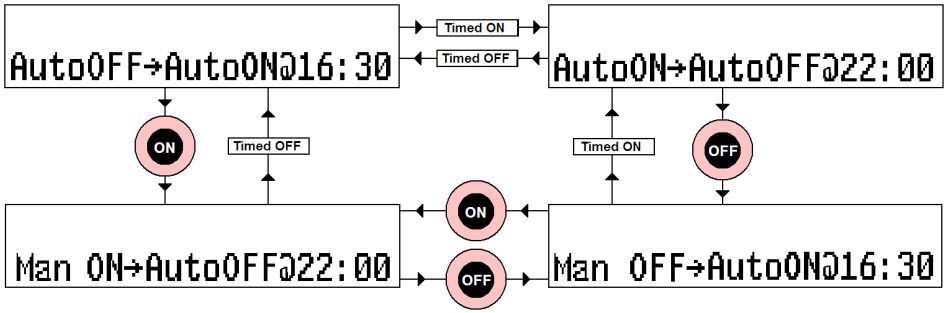


The displays read as: “Auto OFF next ON at 4:30pm” OR “Auto ON next OFF at 10pm”

Manual Operation While In AutoMode:

It is often necessary to turn the pump ON/OFF Manually when it is in AutoOFF/ON. This is a very simple operation – press the ON/OFF pad once. The pump will start or stop immediately. The unit will still be in AutoMode and will respond to the next AutoOFF/ON – it will not remain ON/OFF indefinitely (unless that is desired see page 36).

The following diagram shows what will happen to Line2 of the LCD for a Manual ON/OFF during Auto OFF/ON and Manual OFF/ON:



Operate Pump Manually For a Number of Hours:

It is sometimes desirable to run the pump for a period of time and then turn it OFF while still in AutoMode. The pump will then turn back on at the next AutoON. This feature can be used to superchlorinate over a 24, 36 or 48 hour period, or simply to run the pump for a couple of hours while the children have a swim.

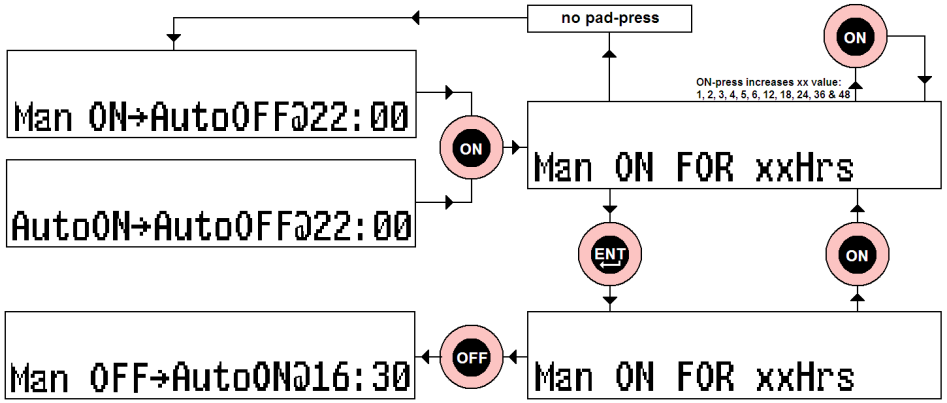
To achieve this the unit should be in AutoON or ManON – simply press the ON-pad and Line2 of the LCD will read “Man ON FOR 01Hrs”. Another press of the ON-pad (without release) increases the number of hours that the pump will operate in the following sequence: 1, 2, 3, 4, 5, 6, 12, 18, 24, 36 & 48 and then the sequence repeats from 1 again. To lock in the selected number of hours the ENTER-pad must be pressed. If this is not done the Chemigem will revert to AutoMode (ManON→AutoOFF) operation in approximately 10 seconds.

When in this mode of operation the time period can be changed by simply pressing the ON-pad and repeating the above steps.

This mode can be stopped by simply pressing the OFF-pad – this will return the unit to ManOFF→AutoON.

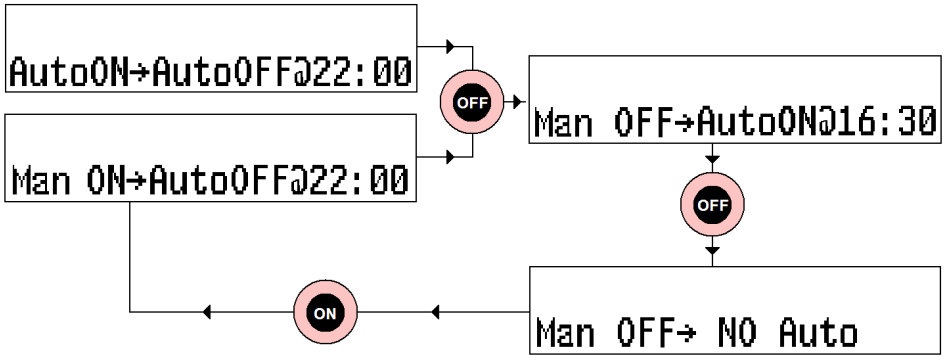
It should be noted that the LCD will count down the time left to run in this mode. When it gets to 1 hour it will then count down the remaining minutes prior to the pump being turned off and the unit reverting to AutoOFF→AutoON@hh:mm.

The following diagram shows Line2 of the LCD as the various pads are pressed:



Turn Pump OFF with No AutoON (Pump OFF indefinitely):

If the pump is required to be OFF indefinitely (perhaps while work is being carried out on pool equipment) simply press the OFF-pad 1 or 2 times until the LCD reads “Man OFF→ NO Auto”:

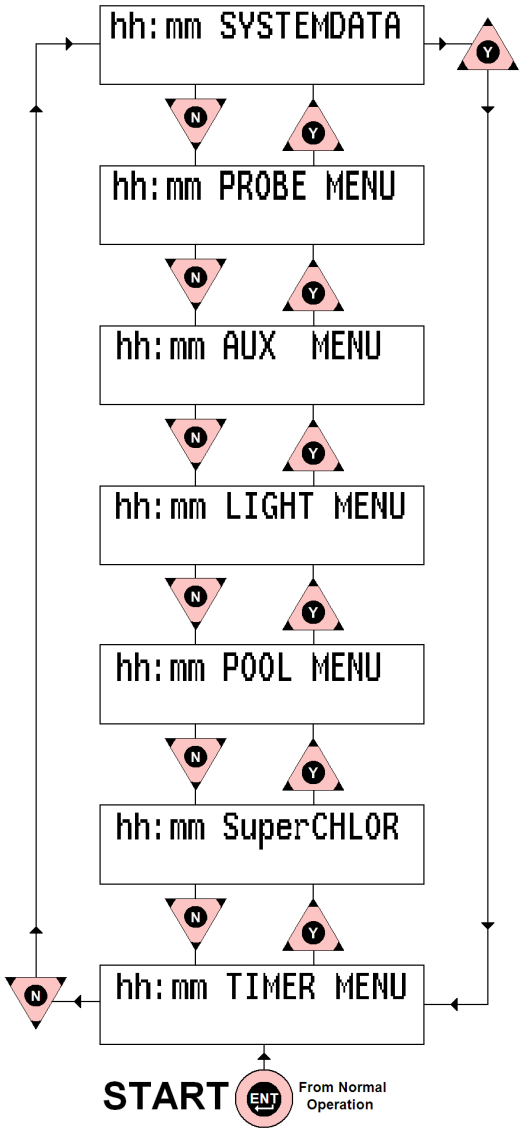


Note that if a long duration power failure occurs this setting is volatile – the Chemigem will wake in AutoOFF→AutoON.

The MENUs: Access & Operation

MENU Overview & Access

The MENU system is a logical way of allowing easy access to the settings required to run the Chemigem. The **MAIN MENUs** are accessed by pressing the ENT(ER)-pad:



The Chemigem has 6 MAIN MENUs (shown in the diagram at left) and each MAIN MENU may have SUB-MENUs (described in the following pages). The MAIN MENUs are accessed from normal operation by a single ENT-pad press. The first MENU to be displayed is the TIMER MENU. Other MENUS are available by pressing the UP/DOWN-pads.

Once the desired MENU is displayed a ENT-pad press will enter that MENU.

If the ENT-pad is not pressed the Chemigem will go back to normal operation without any changes being made.

Once a MENU is entered both lines of the LCD will be used to display any SUB-MENUs or other information.

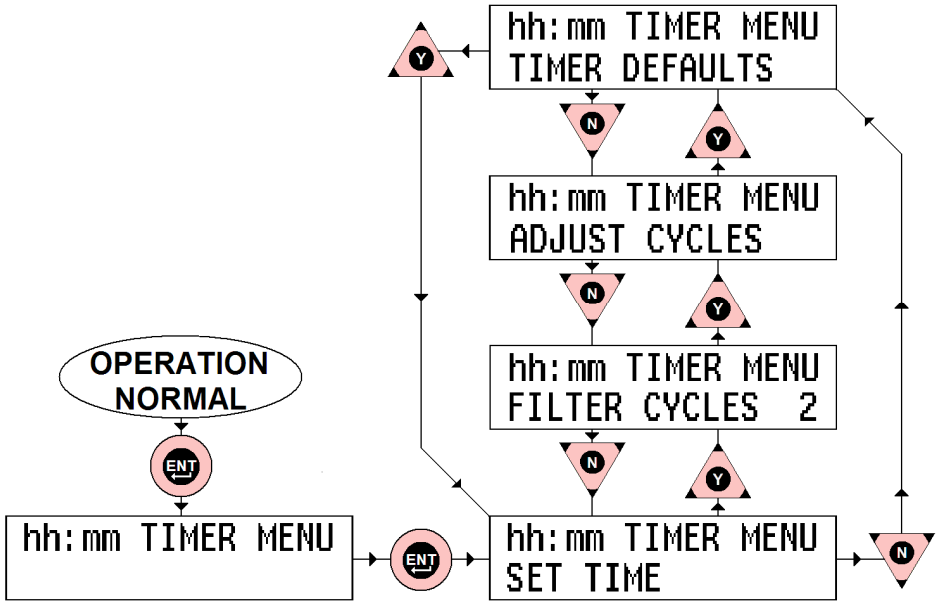
IMPORTANT: THE AUX MENU IS CURRENTLY EMPTY AND CAN NOT BE USED. IT IS FOR FUTURE USE.

Note: for clarity only the display lines involved are shown in these instructions.

The TIMER MENU

Accessing the TIMER MENU:

The TIMER MENU is accessed by a ENT(ER)-pad press from the MAIN MENU. Once the TIMER MENU is accessed the first Sub-MENU appears in Line2 – SET TIME. There are 4 Sub-MENUs: SET TIME, FILTER CYCLES, ADJUST CYCLES & TIMER DEFAULTS. These Sub-MENUs are accessed by the UP/DOWN-pads and entered by pressing the ENT-pad. The following diagram shows how to access the Sub-MENUs:



Note that the FILTER CYCLES Sub-MENU above has an associated number – 2. This is the number of Filter Cycles that are currently active. This number can have a value of 1 to 4. While the Sub-MENUs are in the display they can be entered by a single ENT-pad press.

The TIMER DEFAULTS Sub-MENU:

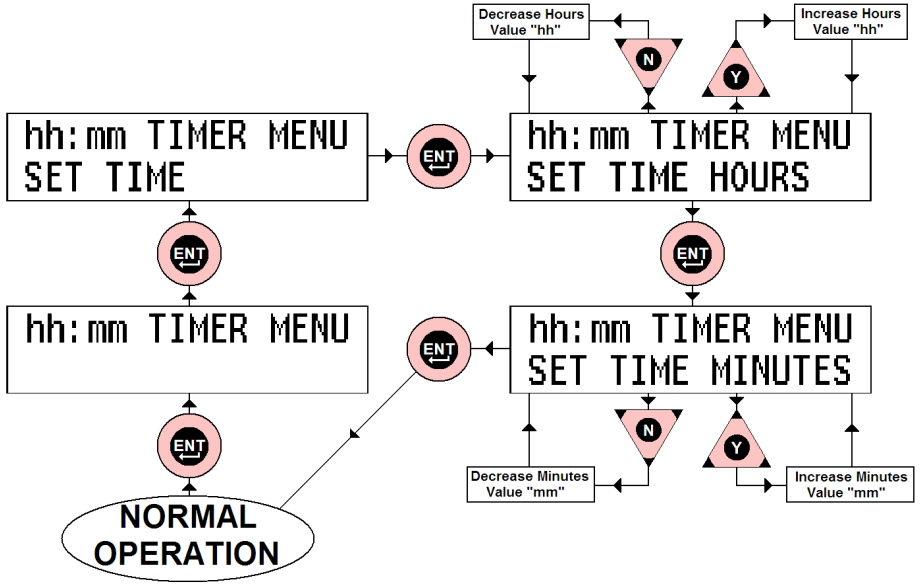
The initial TIMER DEFAULT (TD) loaded is TD1. This runs from 6-8am and 5-11pm using FC1 thru FC4 and is shown on Page 40. There are a number of other TDs (page 4) selectable using the UP/DOWN-pads from a display that looks like this:

```
DEFAULT 2    8Hrs
6 - 10am  6 - 10pm
```

Simply press the ENT-pad to select the DEFAULT that you require and the unit will configure these times using FC1 thru FC4. These times can be adjusted if desired, see page 40. Check your Chemigem for available TD times or simply make up your own !

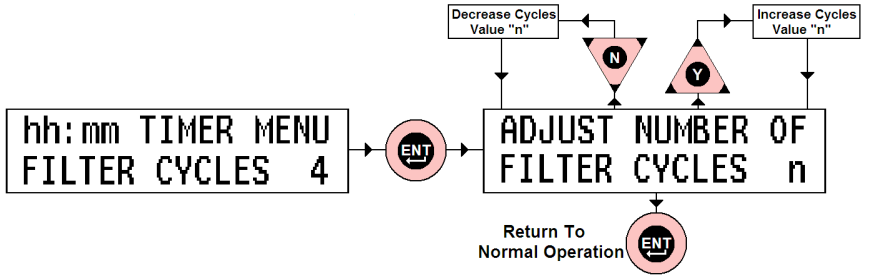
Setting the Time – the SET TIME Sub-MENU:

To set the time of day simply go to the SET TIME Sub-MENU and press the ENT(ER)-pad. Line2 of the LCD will now read “SET TIME HOURS” – simply use the UP/DOWN-pads to adjust the Hours Value on the LCD. When complete a ENT-pad press will then move to show “SET TIME MINUTES” on Line2 and the UP/DOWN-pads can be used to adjust the Minutes Value. When complete press the ENT-pad to return to normal operation.
The diagram below shows how to set the time:



Enabling Filter Cycles – the FILTER CYCLES Sub-MENU:

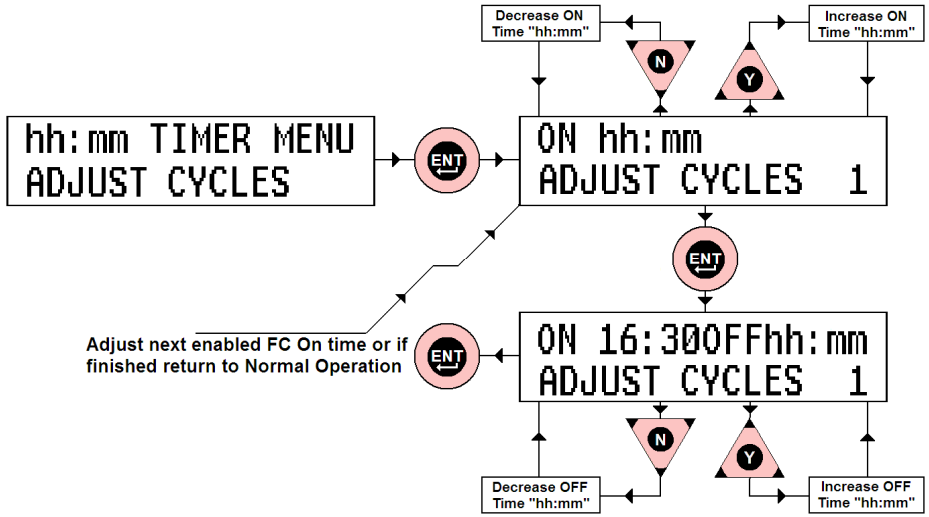
Using the ENT(ER)-pad and the UP/DOWN-pads go the FILTER CYCLES Sub-MENU (Line2 of LCD) and press ENT-pad – see “Accessing The Timer Menu” page 38. It will have an associated number – this is the number of enabled Filter Cycles (FCs). Using the UP/DOWN-pads this number can be easily changed. To make the change take effect the ENT-pad must be pressed – normal operation is then resumed. The effect of Filter Cycles is described on page 33.



Changing the Filter Cycle ON & OFF Times – the ADJUST CYCLES Sub-MENU:

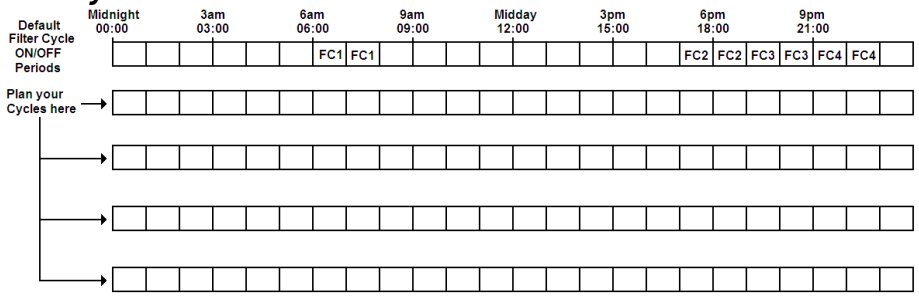
The ADJUST CYCLES Sub-MENU allows the user to change the ON & OFF times of the Filter Cycles (FCs) that are enabled. For example if there are 2 FCs enabled the user can adjust FC1 and FC2. To adjust all FC ON & OFF times all FCs must be enabled – see "Enabling Filter Cycles" page 39.

Using the ENT(ER)-pad and the UP/DOWN-pads go the ADJUST CYCLES Sub-MENU (Line2 of LCD) – see "Accessing The Timer Menu" page 38. When the ENT-pad is pressed Line1 of the LCD will now read the ON time of the Filter Cycle number shown at the end of Line2. This is adjusted with the UP/DOWN-pads. Once the desired time is reached the ENT-pad is pressed to store the ON time and the OFF time is then displayed. The OFF time is adjusted in the same way as the ON time. After ON/OFF times for the first enabled FC are adjusted the next enabled FC ON time is shown on the LCD. This process continues until all FCs are adjusted.



Note: Only enabled Filter Cycles are available for adjustment (starting with FC1).
ENT-pad must be pressed to store the changed times and move through the process.
If Times are to remain unchanged simply press ENT-pad and the original time is kept.

Filter Cycle Planner:

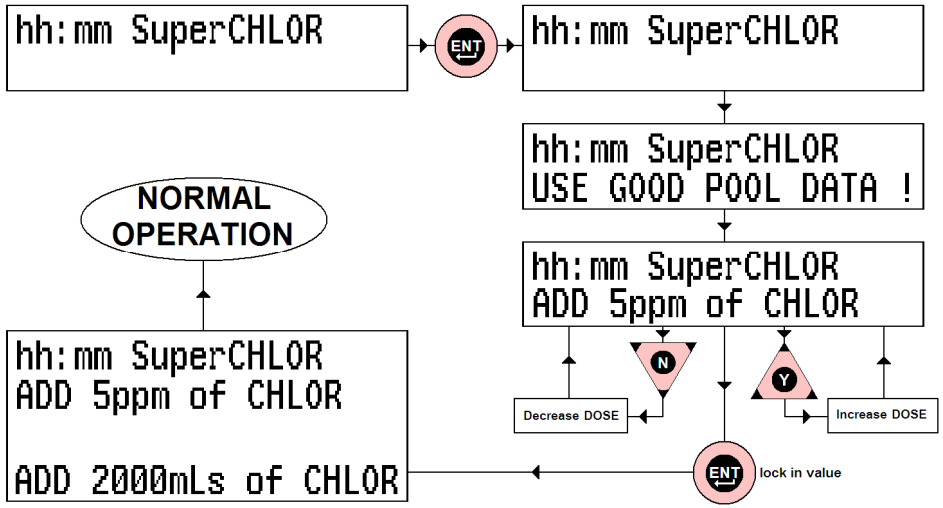


Automated Super-Chlorination - SuperCHLOR

Superchlorination is a process used to remove combined chlorine from a pool. Partially chlorinated nitrogen compounds (from reactions mainly with perspiration and urine) give rise to the "chlorine odour" from swimming pools. These compounds require higher than normal chlorine levels to be oxidised – usually greater than 5ppm. SuperCHLOR uses information about the pool (input from the POOL MENU – next page) to estimate how much chlorine to add to achieve the desired level of super-chlorination.

Accessing SuperCHLOR:

The SuperCHLOR is accessed in the same way that all other MENUs are accessed – an ENT-pad press will shift to the MENU SYSTEM (TIMER MENU), then UP/DOWN-pad presses will shift to the SuperCHLOR. Once the LCD Line1 reads "hh:mm SuperCHLOR" – press ENT-pad to enter. The LCD will display "USE GOOD POOL DATA !" – if incorrect pool information is in the unit the result will be incorrect. The LCD will then show "ADD 5ppm of CHLOR" – use UP/DOWN-presses to adjust this value up to 10ppm (or lower if desired) – then an ENT-press will lock the value. The unit will then calculate/display how much chlorine is needed and proceed to add it.



The above example assumes a 50m^3 pool.

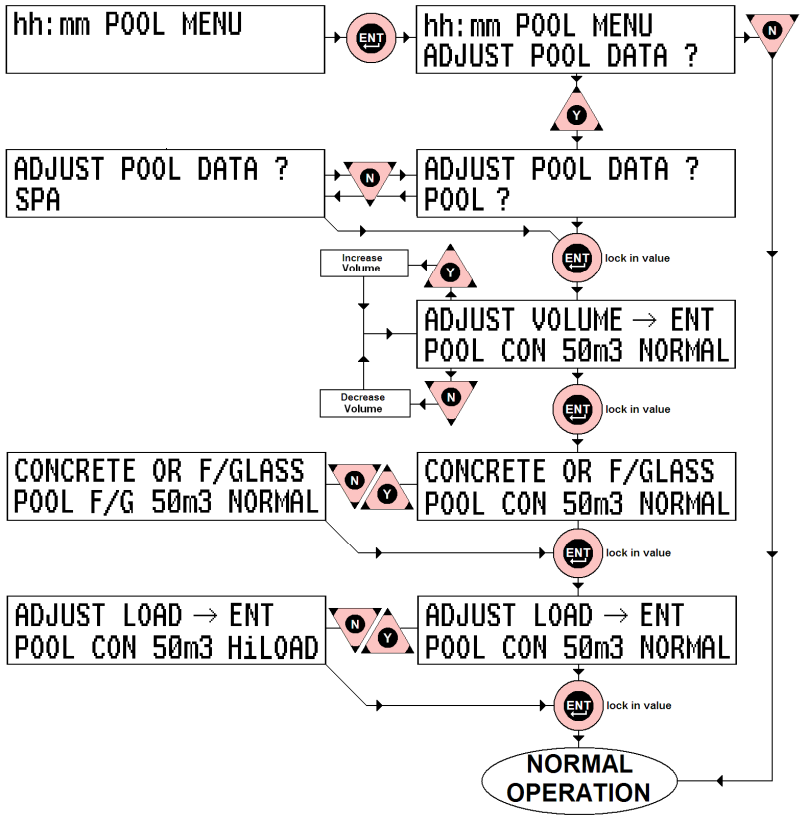
NOTE: the calculation is based on an estimated flow rate for the chlorine injecting device. It will not function correctly for erosion feeders and salt water chlorinators and should not be used if these devices are installed.

The POOL MENU

The pool MENU is used to "describe" the pool to the Chemigem Control System. The Chemigem will use this information in other Menus such as the SuperCHLOR on previous page.

Accessing the POOL MENU:

The POOL MENU is accessed in the same way that all other MENUs are accessed – an ENT-pad press will shift to the MENU SYSTEM (TIMER MENU), then UP/DOWN-pad presses will shift to the POOL MENU. Once the LCD Line1 reads "hh:mm POOL MENU" – press ENT-pad to enter. Once into this Menu it must be completed to return to normal operation. The LCD will show "ADJUST POOL DATA ?" – currently an UP/Y-press is required. The LCD will now show "POOL ? Y/N" – an UP/Y-press will select POOL and a DOWN/N-press will select SPA. Further DOW/N-presses will alternate between POOL & SPA. When the selection has been made an ENT-press will lock it in. The LCD will then show "ADJUST VOLUME → ENT" – an UP/DOWN-press will alter the volume number and an ENT-press will lock it in. The LCD will then show "CONCRETE OR F/GLASS" – an UP/DOWN-press will alternate between "CON" and "F/G" and an ENT-press will lock it in. The LCD will then show "ADJUST LOAD → ENT" – an UP/DOWN-press will then alternate the bather load between "NORMAL" and "HiLOAD" and an ENT-press will lock it in.



The LIGHT MENU *240Vac Light Outlet in the bottom right of the unit.*

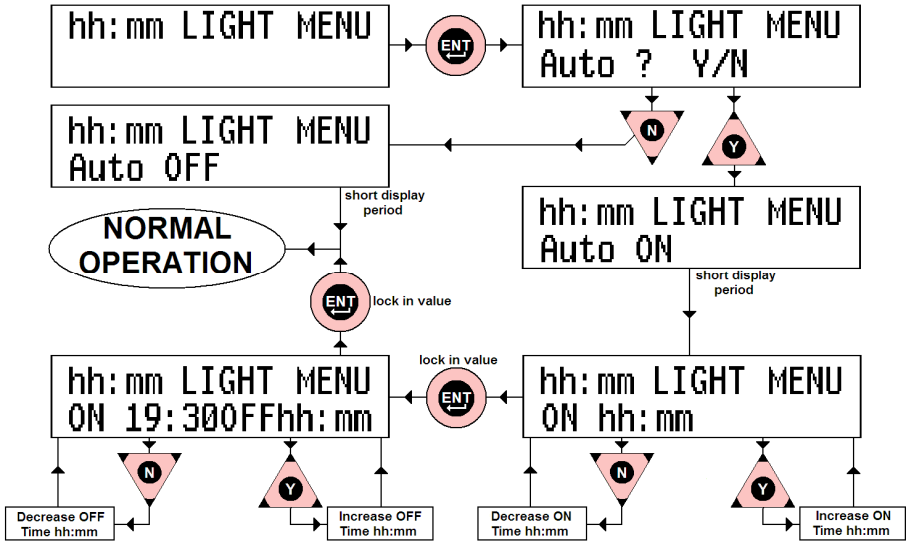
The LIGHT MENU is used to select and adjust the automatic light control. The light power supply can be turned ON/OFF like a Filter Cycle, as well as being manually controlled. If the light automation is selected the light power supply will be controlled by the ON and OFF times. If the light is turned ON manually it will still be turned off at the OFF time. If the light automation is not selected the light can only be controlled manually.

Manual Light Operation

During normal operation the light can be turned ON manually by pressing the UP-pad for approximately 4 seconds. It can be turned OFF by again pressing the UP-pad for 4 seconds. Note that for LED Lights requiring a power pulse to change effects you will be prompted after turning the Light ON manually. An UP-press will pulse the light.

Accessing the LIGHT MENU:

The LIGHT MENU is accessed in the same way that all other MENUs are accessed – an ENT-pad press will shift to the MENU SYSTEM (TIMER MENU), then UP/DOWN-pad presses will shift to the LIGHT MENU. Once the LCD Line1 reads "hh:mm LIGHT MENU" – press ENT-pad to enter.
Line2 will now read "AUTO ? Y/N". To disable automatic light operation press the DOWN-pad. Line2 will read "Auto OFF" for short period then the system will return to normal operation and the light will only respond to Manual ON/OFF.
To enable automatic light operation press the UP-pad. Line2 will read "Auto ON" for short period before displaying "ON hh:mm". The ON-time is adjusted using the UP/DOWN-pads. A ENT-pad press will lock in the new ON-time and the LCD will read "ON 19:30OFFhh:mm". The OFF-time is adjusted by using the UP/DOWN-pads. A ENT-pad press will lock in the new OFF-time and the system will revert to normal operation.



The PROBE MENU (use only when replacing a PROBE)

The PROBE MENU is used when a new PROPBE is attached to the Chemigem. The Chemigem keeps statistics on the amount of time it has operated. This data is non-volatile. ***It is vital that the PROBE MENU only be used when adding a new probe. Information stored can be used to help validate a warranty claim. ONLY USE THIS MENU WHEN ADDING A NEW PROBE!*** Average probe life is around 5 years.

Accessing the PROBE MENU:

The PROBE MENU is accessed in the same way that all other MENUs are accessed – a ENT-pad press will shift to the MENU SYSTEM (TIMER MENU), then 4 UP-pad presses will shift to the PROBE MENU. It is also possible to access this MENU with 2 DOWN-pad presses. Once the LCD Line1 reads "hh:mm PROBE MENU" – press ENT-pad to enter.

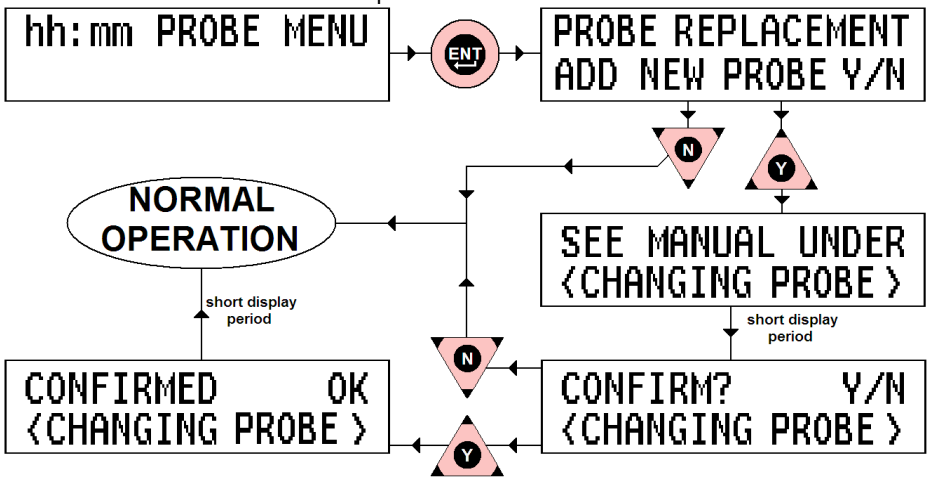
The LCD will read on Line1: "PROBE REPLACEMENT" and
on Line2: "ADD NEW PROBE Y/N"

A DOWN-press will make the Chemigem ignore the Menu and go to normal operation.
An UP-press will enter the Menu and the LCD will read a warning for a few seconds –
Line1: "SEE MANUAL UNDER" and
Line2: "<CHANGING PROBE >"

This is followed by Line1: "CONFIRM? Y/N" and
Line2: "<CHANGING PROBE >"

A DOWN-press will make the Chemigem ignore the Menu and go to normal operation.
An UP-press will store the old Probe data and reset for new Probe. The LCD will read –
Line1: "CONFIRMED OK" and
Line2: "<CHANGING PROBE >"

The unit will then revert to normal operation.



SYSTEMDATA

SYSTEM DATA is used to display system information on the LCD. It is included as a tool for the user and service technician to determine various system settings with ease.

Accessing SYSTEMDATA:

SYSTEMDATA is accessed in the same way that all other MENUs are accessed – a ENT-pad press will shift to the MENU SYSTEM (TIMER MENU), then 5 UP-pad presses will shift to the PROBE MENU. It is also possible to access this MENU with 1 DOWN-pad press. Once the LCD Line1 reads "hh:mm SYSTEMDATA" – press ENT-pad to enter.

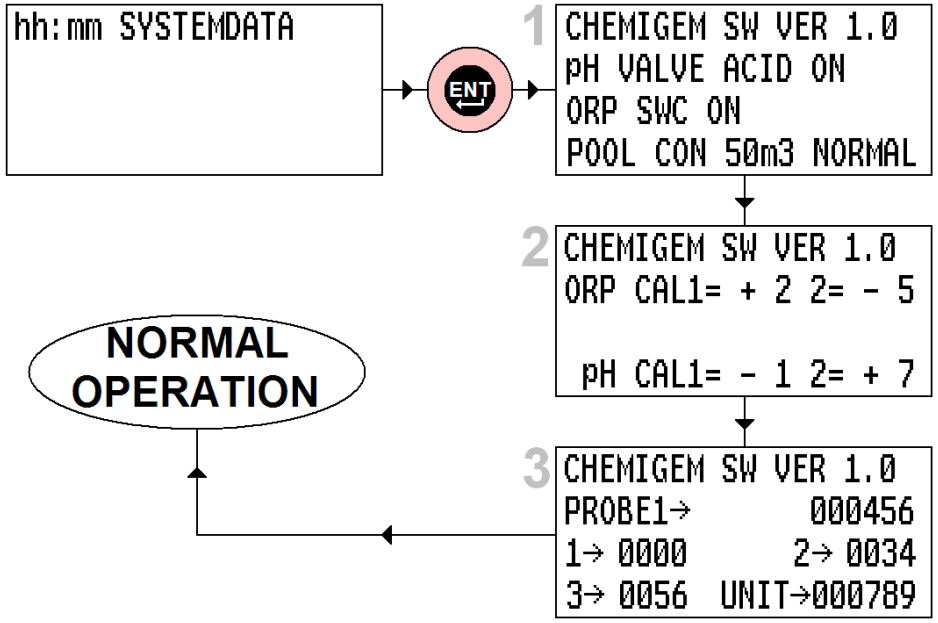
When selected SYSTEMDATA will show a number of displays on the LCD, WITH Line1 always showing CHEMIGEM SoftWare VERsion #.#. The examples following read as:

Display 1, Line2: pH dosing VALVE feeding ACID – system is ON
Line3: ORP controlling Salt Water Chlorinator – system is ON
Line4: set for POOL, CONcrete with volume of 50m3 and NORMAL load

Display 2, Line2: ORP CALibration1= +2 and calibration2= -5
Line4: pH CALibration1= -1 and calibration2= +7

Display 3, Line2: PROBE1 has operated for 456 hours
Line3: historical data probe1 has 0 hours and probe 2 has 34 hours
Line4: and probe3 has 56 hours with the UNIT having run for 789 hours

An example set of displays will look like this:



pH and ORP Menus

The pH & ORP Menus ares used to make changes to the way the Chemigem operates. The changes that can be made are: Turning the each system ON/OFF, Manual Dosing, changing the Set Point and Calibration (note ORP cannot be calibrated).

Accessing pH and ORP Menus:

The pH MENU is accessed by an UP/Y-press from normal operation. Similarly the ORP MENU is access by a DOWN/N-press from normal operation. See pages 23-24 for other information. Following is a flowchart depicting the operation of these Menus: