

HERON ELECTRIC COMPANY LTD

# Advanced Options Manual

MCI-4, MCI-8, MCI-12, MCI-16, and MCI-96

---

This manual refers to MCI Controllers using software version 49AXX and 49BXX

Doc Ref MCI4-96 49A & 49B Advanced

01 March 2004

# Table of Contents

<b>1</b>	<b>Changing Configuration Options.....</b>	<b>2</b>
<b>2</b>	<b>Advanced Options .....</b>	<b>3</b>
<b>3</b>	<b>Pump Control .....</b>	<b>4</b>
<b>4</b>	<b>Irrigation Programs.....</b>	<b>5</b>
<b>5</b>	<b>Automatic Starts .....</b>	<b>8</b>
<b>6</b>	<b>Continual Cycling.....</b>	<b>9</b>
<b>7</b>	<b>Weaning and Chaining .....</b>	<b>11</b>
<b>8</b>	<b>Fertigation (Option 41).....</b>	<b>12</b>
<b>9</b>	<b>Installation Options.....</b>	<b>13</b>



# 1 Changing Configuration Options

This manual describes the advanced features of the controller. Advanced features are activated by changing the configuration options of your controller. To access the configuration options: press and hold down the **"Manual Advance" for 4 seconds**.

The advanced options are from Option 16 onwards. The basic Options (1-15) are listed here for completeness.

**IMPORTANT: Always fully test any new configuration after you have changed any options to check the controller functions as you require.**

## Basic Options 1-15.

Option	Function - See Basic Manual for detailed description	Default Value	Allowed Values
1	Set number of valves.	4	4-96
2	Set number of Daily automatic starts.	3	0-30
3	Set number of Weekly automatic starts.	0	0-32
4	The number of irrigation programs	1	1-15
5	Set pump pressurisation time in minutes.	0	0-59
6	Set pump pressurisation time in seconds.	2	0-59
7	Rain sensor connected and number of historical rain days	0	0-4
8	The Day of the week (1 = Monday, 2 = Tuesday)	1-7	1-7
9	Controller does a permanent Stop instead of Freeze	0	0/1
10	Display Low Tank instead of Freeze or Stop	0	0/1
11	Use Percentage Up and Down	0	0/1
12	Spare	0	0
13	Use 'Disable Automatic Starts' facility	0	0/1
14	Spare	0	0
15	DISPLAY ADVANCED OPTIONS (OPTIONS 16 TO 81)	0	0/1

## 2 Advanced Options

Option	Function	Default Value	Allowed Values	Section
16	Allocate input 1 (I1) to a specific program	1	1-15	4
17	<i>MCI100S option</i>	0	0	N/A
19	Maximum number of automatic started programs to run together	0	0-4	4
20	Maximum number of cycling programs to run together	0	0- 4	6
21	Allow only one program to run whether 'normal' or 'cycling'	1	0/1	6
22	<i>Multi-Interface Board uses Alarm op as 4<sup>th</sup> op</i>	0	0/1	*
24	Wean facility	0	0/1	7
25	Chain Programs 1,2,3 and 4	0	0/1	7
26	<i>Single Analog Interface Board Fitted</i>	0	0/1	*
27	<i>Remote Input interface Board Fitted</i>	0	0/1	*
28	<i>Multi-Interface Board Fitted</i>	0	0/1	*
29	Cycling programs take priority over automatic started programs	0	0/1	6
30	Program 1 will take priority	0	0/1	4
31	Program 1 Options	0	0/127	4
32	Program 2 Options	0	0/127	4
33	Program 3 Options	0	0/127	4
34	Program 4 Options	0	0/127	4
35	Program 5 Options	0	0/127	4
36	Program 6 Options	0	0/127	4
37	Program 7 Options	0	0/127	4
38	Program 8 Options	0	0/127	4
39	Irrigation by Volume instead of Time (available June)	0	0/1	10
40	Manually start valves in parallel	0	0/1	4
41	Fertigation	0	0/1	9
44-53	<i>MCI-100S options</i>	0	0	N/A
55	Controller address – PC option	1	0-5	*
56	Baud Rate- PC Option	2	0- 2	*
57	Keypad security	0	0- 99	11
58	Delay between valves in Seconds	0	0-59	4
59	Allocate programs to start Pump 1	15	0-15	3
60	Specify number of back flush valves	0	0– 92	8
65	Number of Log Days – PC option	0	0-32	*
66	Number of Log Days Confirmation- PC Option	0	0-32	*
68	Delay Between Valves (Option 58) in Minutes	0	0/1	4
70	Number of Automatic Start programs to back-up	0	0-16	5
71	Number of Continual Cycling programs to back-up	0	0-16	6
72	Volume Meter Type	0	0-127	*
73	Volume Meter Units	0	0-127	*
74	Volume Meter Timing window	0	0-127	*
75	Volume Meter Scaler	0	0-127	*
76	Volume Meter Hold Off for Flow rate Alarm	0	0-127	*
77	Max Percentage error in flow rate	0	0-100	*
79	<i>Number of MPD Dosing Controllers Connected</i>	0	0-1	*
80	<i>Logging rate of Flow and EC and pH values</i>	0	0-99	*
81	<i>Logging rate of Analogue Values</i>	0	0-99	*
82	GSM module connected #	0	0/1	*
83	Display GSM display GSM data #	0	0/1	*
84	Send text message on every fault #	0	0/1	*
85	Inputs 6 and 7 are monitor inputs only #	0	0/1	*
86	Site number #	0	0-99	*
87	Max number of faults before system shut down #	0	1-99	*

\* see separate manual

#49B software only

### 3 Pump Control

#### Allocate Programs to Start Pump 1 (Option 59)

This option controls which irrigation programs start Pump 1.

If option 59 is set to '1' **only program 1** will start Pump 1.

If it is set to '2', **programs 1 and 2** will start Pump 1 etc.

Values between '0' to '15' can be used. If option 59 is set to '15', all programs will start Pump 1. Default is '15'.

## 4 Irrigation Programs

### Maximum Number of Automatically Started Programs to Run Together (Option 19)

This specifies the maximum number of automatically started irrigation programs that can run at the same time. If this option is set to '0', only one irrigation program can run at any time. Setting this option to 2 will allow 2 irrigation programs to run at the same time.

Note: A maximum of 4 irrigation programs can run at any time. This includes automatically started AND continually cycling programs. See option 20 below.

### Allocate Remote Start input to a Program (Option 16)

The Remote Start Input can be assigned to initiate any irrigation program. Enter the number of the irrigation program you want it to initiate. If this option is not set, the Remote Start Input will trigger irrigation program 1 by default.

### Program 1 will Take Priority (Option 30)

This allows program 1 to take priority over any other automatically started irrigation programs. If you need his facility set Option 30 to '1'. Default is '0'.

With Option 30 set, if a program is running, and program 1 wishes to start, it will cut-in and run. The halted irrigation program will continue from where it was stopped, once program 1 has completed.

**Note: You must set option 19 and 20 to 1 and set option 21 to 0.**

### Delay Between Valves (Option 58)

A delay between the operation of the valves within an irrigation program can be introduced using this option. The delay can be set from 1 to 255 seconds. Enter the number of seconds delay required. The delay will apply to all irrigation programs. If you require the delay in minutes use Option 68.

### Delay Between Valves In Minutes (Option 68)

Option 68 sets the delay between valves in minutes rather than seconds. With this option set the pump will switch off during the delay period.

### Allow Programs to be manually Started in Parallel (Option 40)

With Option 40 set programs can be manually started in parallel. Operation of the controller is exactly the same except that pressing **Start/Stop** will **always** show the following page.

START	>PUMP	VALVE
	PROG	STOPALL

To manually stop the controller you must press **Start/Stop** to display the page above and then press '>' to move the cursor to 'STOPALL' and then press **Select**.

To allow programs to run in parallel you must also set one or both of the parallel program Options (Option 19 or 20).

## Program Configuration Options: Option 31 to 38

Program configuration options allow individual programs to be customised. Option 31 relates to program 1, Option 32 to program 2 etc. Programs 1 to 8 can be individually customised.

The following 6 features can be set for each program.

	Value	Description of facility
<b>Program has Continual cycling facility</b> <b>(For version 49A controllers you must use lowest number programs ie you cannot cycle Program 2 without assigning cycling to Program 1.)</b>	+1	See section 5
<b>Program Valve time in Hours and Minutes</b>	+2	Sets time in hours and minutes instead of minutes and seconds
<b>Program ignores Percentage reduction</b>	+4	Ignores percentage reduction whether set manually or by rain sensor (always runs at 100%)
<b>Program ignores the Freeze input</b>	+8	Program ignores the freeze or Stop inputs.
<b>Program can be started via Analogue input on MF interface</b>	+16	See MF interface manual
<b>Program can be started via light</b>	+32	See Light sensor manual (only applies to programs 1,2,3 and 4)
<b>Parallel Valves</b>	+64	

To include a feature add the value of the facility to the Option .

For example suppose you require continual Cycling on Program 1 and Program 1 to Ignore Freeze input. For program 1 we must change Option 31. Now Continual Cycling has a value 1 and 'Ignore Freeze Input' has a value 8. The required value for Option 31 is **1+8=9**.

## Program Ignores Percentage Reduction (+4)

This facility allows a program to ignore any percentage reduction that is set. For example you may not want indoor irrigation to be affected by the rain sensor percentage reduction. As described above add 4 to the appropriate Program Option number.

## Program Ignores Freeze Input (+8)

This facility allows a program to ignore the Freeze Input. For example you may have two different irrigation systems one which uses a water storage tank and one that uses mains water. This facility can prevent the mains water irrigation from being suspended when the water storage tank runs low. As described above add 8 to the appropriate Program Option number.

## Program Runs Valves in Parallel (+64)

This facility allows the program to run valves in parallel.

For programs 1 to 6, **two** valves within the program will run in parallel.

For programs 7 and 8, **four** valves within the program will run in parallel.

## 5 Automatic Starts

The controller allows daily and weekly automatic starts to be set. You can specify the number of each type of automatic starts you wish to use. You can specify up to 30 **daily** automatic starts and up to 32 **weekly** automatic starts, see 'Basic Manual'.

### Number Automatically Started Programs to Back-Up (Option 70)

If an 'Automatically Started' program cannot run because another program is running the controller can remember that a program tried to start. The controller will run the program when the other program(s) have finished. Option 70 controls the number of automatic starts that the controller will remember. Values between 0 and 16 are allowed.

Set Option 70 to 0 if you do not want any Automatic Starts remembered. Set Option 70 to '1' for one start to be remembered, set to 2 for 2 starts etc. Default is 0.

## 6 Continual Cycling

The continual cycling facility allows irrigation programs to continuously cycle. Programs continually cycle between a specified start and stop time, with a programmable delay between cycles. This is normally used for misting or propagation applications.

To set a program to continually cycle add **+1** to the appropriate Program Option. Option 31 is for Program 1 and Option 32 is program 2 etc. See Section 4 for more details.

### Setting Up Continual Cycling

An extra page will be displayed after the Automatic Start Pages, as shown below, for each continually cycling program. This page allows you to:

- Specify the start and stop times for the continual cycling period
- Set the delay period (in hours and minutes) between each cycle
- Disable / Enable the continual cycling program.

When a program has continual cycling specified the following page is displayed. Press **“Select”** to enter the start and stop times for continual cycling and the delay period between cycles.

P1 CYCLE NEVER WAIT 0:00
-----------------------------

In the example below, program 1 has been set to continually cycle from 6:00 hours to 21:30 hours, with a 20 minute delay between each cycle.

P1 CYCLE	6:00>21:30
WAIT 00:20	NEXT 13:30

The time that the next cycle will begin is automatically calculated and displayed. In the example above, the next continual cycle of program 1 will begin at 13:30 hours.

### Disabling Continual Cycling

You can disable the continual cycling program by pressing the **“Select”** button when the continual cycling page is displayed.

P1 CYCLE NEVER WAIT 0:00
-----------------------------

To re-enable continual cycling press the **“Select”** button again. The start times will be redisplayed.

P1 CYCLE	6:00>21:30
WAIT 00:20	NEXT 13:30

## Other Options You May Want to Set

### Max Number of Continual Cycling Programs to Back-Up (Option 71)

If a 'Continual Cycling' program cannot run because another program is running the controller can remember that a program tried to start. The controller will run the program when the other program(s) have finished. Option 71 controls the number of cycling starts that the controller will remember. Values between 0 and 16 are allowed.

Set Option 71 to 0 if you do not want any cycling starts remembered. Set Option 71 to '1' for one start to be remembered, set to 2 for 2 starts etc. Default is 0.

## Maximum Number of Cycling Programs to Run Together (Option 20)

A maximum of 4 continual cycling programs can run together. Set this option to the number of continual cycling programs you want to run together ('1' to '4'). Default is '0'.

## Allow Only One Program to Run whether 'Normal' or 'Cycling' (Option 21)

If option 21 is set to '1', only one irrigation program will ever run at any time. Option 21 overrides options 19 and 20 i.e. specifying how many automatically started and continual cycling programs can run at the same time. Default is '1'.

**Note:** If you want either automatically started or continually cycling irrigation programs to run at the same time, then you **must** set option 21 to '0'.

## Cycling Programs to take Priority Over Auto Start Programs (Option 29)

This option allows any of the continual cycling programs to take priority over any automatically started irrigation program.

With this option set, if an automatically started irrigation program is running, the continual cycling program will cut-in and run. The halted automatically started irrigation program will then continue from where it was stopped, once the cycling program has completed.

If you want this facility set option 29 to '1'. Default is '0'.

**Note:** You must set option 19 and 20 to 1 and set option 21 to 0.

## 7 Weaning and Chaining

### Setting Weaning Programs (Option 24)

The wean facility allows Programs 2,3 and 4 to be operated at less frequent intervals than Program 1. For example Program 2, will start half as many times as Program 1, see table below.

Programs 2,3 and 4 are automatically triggered after Program 1 finishes.

Irrigation Initiated	Irrigation Programs Run			
	Prog 1	Prog 2	Prog 3	Prog 4
First Time	X			
Second Time	X	X		
Third Time	X		X	
Fourth Time	X	X		X
Fifth Time	X			
Sixth Time	X	X	X	
Seventh Time	X			
Eighth Time	X	X		X
Ninth Time	X		X	

That is:

Program 2 will start every **second time** program 1 starts

Program 3 will start every **third time** program 1 starts

Program 4 will start every **fourth time** program 1 starts.

To activate the wean facility the following options must be set:

### Chaining Programs (Option 25)

The chain facility allows Programs 1,2,3 and 4 to be chained together. With the option set when ever Program 1 finishes, Programs 2 will start and so on.

## 8 Fertigation (Option 41)

Option 41 should be set to '1' if a fertigation operation is required. Default is '0'. Fertigation allows fresh water to be irrigated before and after the application of fertiliser.

Fertigation will control up to 32 irrigation valves and one fertiliser valve. The 2nd pump start output is automatically assigned by the controller to operate the fertiliser valve. The 2nd pump start output is across C1 and 03.

When the fertigation option is activated, each valve time on the Irrigation Program Set Up page is divided up into three time periods, period 'a', 'b' and 'c', as illustrated below.

VALVE 1a	1b	1c
05:00	10:00	05:00

The fertiliser valve will be opened when ever the 'b' time period is run. The fertiliser valve will be closed when ever the 'a' and 'c' time periods are run, and fresh water only will be irrigated, see below.

Step 1	Switch valve 1 on for 5 minutes and irrigate fresh water only.
Step 2	Leave valve 1 on and open the fertiliser valve for 10 minutes to introduce fertiliser into the irrigation line.
Step 3	Close the fertiliser valve and leave valve 1 on for another 5 minutes to irrigate fresh water only.
Step 4	Switch valve 1 off.  Valve 1 has remained open for a total of 20 minutes.

**Note:** If you are using delay between valves (option 11) with fertigation you must set a time under 'a' for each valve you are using. It only needs to be a short time e.g. 5 seconds.

**Limitations To use** The fertigation option disables the manual starting of a valve and disables the use of Set All.

## 9 Installation Options

### Max Faults (Option 87)

Option 87 is the maximum number of faults that are allowed before the controller will switch off all irrigation programs.

### Keypad Security (Option 57)

If you require a security code to be entered before the controller can be used , then set option 57.

Set option 57 to any number from '01' to '99'. This number will become the third and fourth digits of the security code. The first and second digits of the security code will be '57'.

For example, if option 57 has been set to '15', then the security code "5715" must be entered when ever the controller is operated.

The user must enter the security code if the keypad is not used for three minutes