

HERON ELECTRIC COMPANY LTD

# Advanced Options Manual

MCI-100S TWO WIRE DECODER CONTROLLER

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This manual refers to MCI Controllers using software version 75BXX.

Doc Ref MCI100 75BXX ADVANCED

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# 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 10 seconds**.

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

## Basic Options 1-15.

Option	Function - See Basic Manual for detailed description	Default Value	Allowed Values
1	Set number of valves.	48	1-99
2	Set number of Daily automatic starts.	0	30
3	Set number of Weekly automatic starts.	3	32
4	The number of irrigation programs	1	16
5	Set pump pressurisation time in minutes.	0	59
6	Set pump pressurisation time in seconds.	2	59
7	Rain sensor connected and number of historical rain days	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	0/1
13	Use 'Disable Automatic Starts' facility	0	0/1
14	Spare	0	0/1
15	DISPLAY ADVANCED OPTIONS (OPTIONS 16 TO 77)	0	0/1

**IMPORTANT: To use Advanced Options, Option 15 must be set to 1.**

**Advanced Options 16-77.**

Option	Function	Default Value	Allowed Values	Page No.
16	Allocate 'I1' input to a specific program	1	1-16	5
17	Over Load 1 threshold	8	1-20	8
18	Allocate Number of Cycling Programs	0	0/1	
19	Maximum number of automatic started programs to run together	0	0-4	5
20	Maximum number of cycling programs to run together	0	0- 4	9
21	Allow only one program to run whether 'normal' or 'cycling'	1	0/1	5
23	Run valves synchronously	0	0/1	5
24	Use wean facility	0	0/1	10
26	<i>EC controller connected – See MPD Manual</i>			
27	<i>Remote Input interface fitted – special board fitted</i>			
28	Interface fitted			
29	Cycling programs to take priority over all automatic started programs	0	0/1	9
30	Program 1 will take priority	0	0/1	5
31	Program 1 Options	0	0/255	5
32	Program 2 Options	0	0/255	5
33	Program 3 Options	0	0/255	5
34	Program 4 Options	0	0/255	5
35	Program 5 Options	0	0/255	5
36	Program 6 Options	0	0/255	5
37	Program 7 Options	0	0/255	5
38	Program 8 Options	0	0/255	5
39	Irrigate by volume	0	0/1	15
42	Valve names use a letter suffix	0	0/1	
44	Put Controller in configuration mode	0	0/1	
45	Put controller in test mode	0	0/1	
49	Display optical errors	0	0/1	
50	Engineering Only-	0	0/1	
51	Display current	0	0/1	
55	<i>Controller address – PC option</i>	1	0- 4	5
56	<i>Baud Rate- PC Option</i>	1	0- 2	5
57	Keypad security	0	0- 99	16
65	<i>Number of Log Days – PC option</i>	0	2-32	
66	<i>Number of Log Days Confirmation- PC Option</i>	0	3-32	
70	Number of Automatic Start programs to back-up	0	0-16	9
71	Number of Continual Cycling programs to back-up	0	0- 16	6
72	Volume Meter Type	0		
73	Volume Meter Units	0		
74	Volume Meter Timing window	0		
75	Volume Meter Scaler	0		
76	Volume Meter Hold Off for Flow rate Alarm	0		
77	Max Percentage error in flow rate	0		

## 2 Assigning Valves and Names and Customising Irrigation Programs

This section describes how to :-

- assign names to valves
- how to customise your irrigation programs to use named valves
- set whether valves run in parallel in a program
- change the order in which valves run in a program

### Assigning Valve Names

Valves can be named individually rather than using VALVE 1, VALVE 2 etc.

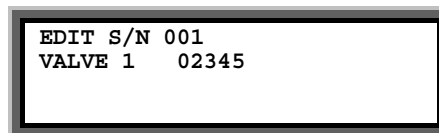
Your controller is supplied with a number of standard name prefixes to which you can add a number and a letter. The standard prefixes are :-

VALVE, GREEN, TEE, FWAY, APRCH

You can create valve names such as Green 01, Tee 01a, APRCH02a etc. Additional prefixes can be added with the aid of a PC and Ground Control Software.

The valve name is assigned on the serial number page. Therefore, to change a valve name go into the serial number pages. For example if you wish to change the name of 'VALVE 1' to 'GREEN 10' proceed as follows:-

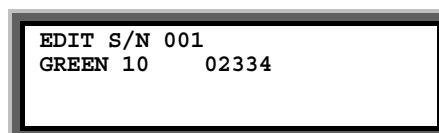
Go to the Serial Number page for Valve 1 as shown below (see User and Installation manual)



```
EDIT S/N 001
VALVE 1 02345
```

- Move the cursor over 'VALVE '
- Now press 'Select' to display GREEN.
- Press '>' to move the cursor over the valve number (1 in the above example)
- Enter '10' for GREEN 10.
- Now Press '>' to enter the serial number of the valve

In the example below a valve called 'GREEN 10' has been defined with a serial number of 2334.



```
EDIT S/N 001
GREEN 10 02334
```

**IMPORTANT** The **Name Reference Number** is shown on the top line (number 001 in the above example). You will need to use the Name Reference Number to set up your irrigation programs as described in the next section

Furthermore, any valve errors are reported using the Name Reference Number.

## Valves Names Use a Letter (Option 42)

If you need more than one valve with the name GREEN10, you can add a letter so you can have names such as:-

GREEN10a  
GREEN10b  
GREEN10c

To enable this you must set Option 42 to 1

## Manual Valve Start With Named Valves

The operation of a manual valve start will change with named valves as you will need to select the correct name. For example if you wish to manually start 'GREEN10a' proceed as follows:-

To start a valve:-

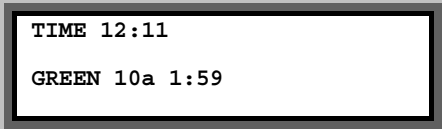
- Press **'Start'**
- Press ">" to move the flashing arrow to point at "VALVE"
- Press **"Select"** and the page below is shown.
- Now press **"Select"** to display the correct valve name, ie **GREEN**
- Now enter the valve number.
- Press ">" to move the flashing arrow to the right
- Now enter the optional letter ie 'a' by repeatedly pressing **'Select'**.
- Press ">" and enter the run time for the valve.

In the example below GREEN10a as been set to run for 2 minutes.



START GREEN 10a 2

Now press **"Select"** to start this valve and the following page is displayed.



TIME 12:11  
GREEN 10a 1:59

## Customising Programs

You only need to do this if:-

- you wish to vary the number of valves that run in parallel.
- you wish to vary the order in which valves run in the program
- you wish to change valve names

First you need to select the configuration mode by setting **Option 44 to 1**. **When you have finished you should now set Option 44 back to 0**. This prevents the sequence number and the valve names being changed.

Now you need to enter the program, you wish to customise. Press ">" to display the 'Enter Program Page' as shown below.

```
ENTER PROG 1
```

Now press **Select** to edit program 1 and the first page of Program 1 will be displayed. If the controller is new it will be the default configuration as shown below.

```
1 VALVE 01 00:00
1 VALVE 02 00:00
1 VALVE 03 00:00
1 VALVE 04 00:00
```

## Changing the Zone Number

In the example above, there are four valves displayed called VALVE 01 , VALVE 02 VALVE 03 and VALVE 04.

The number on the left is the irrigation zone number for the valve. They are all set to 1 so all valves are in the same zone (zone1). As they are in the same zone NO valves will run together.

If, for example, you wanted VALVE 01 and VALVE 02 to run together you would need to assign them to different irrigation zones, as follows:-

```
1 VALVE 01 00:00
2 VALVE 02 00:00
1 VALVE 03 00:00
1 VALVE 04 00:00
```

To do this move the cursor over the zone number for VALVE 02 and change it to 2.

## Changing the Valve Order

If, for example, you wanted VALVE 04 to run before VALVE 03 then you would need to change the page to the following:-

```
1 VALVE 01 00:00
1 VALVE 02 00:00
1 VALVE 04 00:00
1 VALVE 03 00:00
```

Now VALVE 04 appears before VALVE 03 in the list so VALVE 04 will run first.

To do this move the cursor so it is over VALVE 03 and the page will automatically ask you to enter the Name Reference Number. In the example below it is currently at 003 which is the reference for VALVE 03.

```
1 VALVE 01 00:00
1 VALVE 02 00:00
1 NAME 003
1 VALVE 03 00:00
```

Now change **Name Reference Number** to 004 which will be the **Name Reference Number** for VALVE 04.as shown below.

```
1 VALVE 01 00:00
1 VALVE 02 00:00
1 NAME 004
1 VALVE 03 00:00
```

Now press '>' and VALVE 04 will be the third valve in the program.

## Changing the Valve Name (if you are using named valves)

If you are using named valves you can change the valve name in the same way as changing the valve order. For example, if we want to add the name GREEN 10 to the first position in the program above proceed as follows:-

Enter Program 1 and move the cursor over VALVE 01 and the page will automatically display NAME 001 as shown below :-

```
1 NAME 001 00:00
1 VALVE 02 00:00
1 VALVE 03 00:00
1 VALVE 04 00:00
```

Now enter the new **Name Reference Number** . The **Name Reference Number** is shown on the Serial Number Page for this valve. For example, if the **Name Reference Number** is '007' for GREEN10 type in 7 as shown below.

```
1 NAME 007 00:00
1 VALVE 02 00:00
1 VALVE 03 00:00
1 VALVE 04 00:00
```

Now press '>' and the page will show GREEN10 in the first position.

```
1 GREEN 10 00:00
1 VALVE 02 00:00
1 VALVE 03 00:00
1 VALVE 04 00:00
```

**IMPORTANT** When you have finished you should now set the Configuration Option 44 back to 0.



### 3 Irrigation Program Options

#### 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:** If option 29 has been set then any the continually cycling program will have priority running over irrigation program 1.

#### 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 99 seconds. Enter the number of seconds delay required. The delay will apply to all irrigation programs.

## 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>	+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
<b>Future Use</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**.

## 4 Automatic Start Options

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 71)

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 71 controls the number of automatic starts that the controller will remember. Values between 0 and 16 are allowed.

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

## 5 Continual Cycling Option

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 3 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.

```
CYCLE PROG 1  
  
CYCLE NEVER  
WAIT 0:00
```

Now Press **"Select"** to enter the start and stop times for continual cycling and the delay period between cycles.

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.

```
CYCLE PROG 1  
  
CYCLE 06:00 > 21:30  
WAIT 0:20      NEXT 13:30
```

The time that the next cycle will begin is automatically calculated and displayed if the real time is within the cycling range. 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.

```
CYCLE PROG 1  
  
CYCLE NEVER  
WAIT 0:00
```

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

```
CYCLE PROG 1  
  
CYCLE 06:00 > 21:30  
WAIT 0:20      NEXT 13:30
```

## Other Options You May Want to Set

### 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.

### 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 continually 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 continually cycling programs to take priority over any automatically started irrigation program.

With this option set, if an automatically started irrigation program is running, the continually 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'.

## 6 Wean Facility (Option 24)

The wean facility allows Program 2 to be operated half as many times as Program 1, see table below. Programs 2 is automatically triggered after Program 1 finishes.

Irrigation Initiated	Program 1	Program 2
First Time	X	
Second Time	X	X
Third Time	X	
Fourth Time	X	X
Fifth Time	X	
Sixth Time	X	X
Seventh Time	X	
Eighth Time	X	X
Ninth Time	X	

:

## 7 Volume Meter Options

This section explains how to set the controller to operate with a volume meter. You can use a volume meter to do any of the following:-

- ensure irrigation flow rate is within range
- Log flow and volume to a PC
- Irrigate on volume instead of time.

If you are using a Volume meter you must set the following options to configure the volume meter. You must also set **Option 28 to 1** for the MF interface board. The flow meter connects to the MF interface board.

Select from the table below the volume meter you are using and the flow range that best suits you. Then you can set Options 72, 73, 74 and 75 as indicated by the table.

### Pulse Type Volume Meter - Metric

<i>Volume Meter</i>	<i>Flow Range</i>	<i>Units Displayed</i>	<i>Option 72</i>	<i>Option 73</i>	<i>Option 74</i>	<i>Option 75</i>
1 Pulse/Litre	3 to 30 LPM	L/min	1	1	12	100
1 Pulse/Litre	6 to 83 LPM	L/min	1	1	2	17
1Pulse/10 Litres	13 to 166 LPM	L/min	2	1	16	8
1Pulse/10 Litres	30 to 400 LPM	LX10/min	2	2	5	42

## Flow Meter Connection

### Pulse Type

Connect the pulse type volume meter between **FLW** and **+V** on the MF Interface card.

### Paddle Wheel Type

Connect the paddle wheel type volume meter between **FLW** and **G** on the MF Interface card.

## Setting Expected Valve Flow Rates

The flow rate is displayed after the Time Page. Run a valve and inspect its flow rate. When you are happy it is running at a steady state you can then enter the expected flow rate

The expected flow rates are set on the Serial Number page. When the Option 73 is set.

```

EDIT S/N 001
VALVE 1 02345
EXPEC FLOW 1 LPM
    
```

Simply enter the expected flow rate. To enter flow rates of other valves press '>'.

## Flow Rate Alarm Hold Off (Option 76)

The Flow Rate Alarm Hold Off allows the irrigation system to settle down after a valve opens and prevents flow rate alarms during this period. The option is in seconds. Typically you may set this to 20 seconds. For large irrigation systems you may need to set this much longer.

## Flow Rate Percentage Error (Option 77)

This option allows you to set the maximum allowed percentage error in the irrigation flow rate. Typically you may set this to 25. If the flow rate goes out of range the irrigation controller will activate the alarm output. If this is set to 0 then no alarms will be raised.

## Irrigation by Volume (Option 39)

You can also irrigate by volume rather than time. The volume facility allows you to set programs to be set by volume rather than time. The volume meter is connected and set up as described above.

In the example below, valve 1 is set for 1100 litres and valve two for 5,000 litres with a flow meter giving one pulse per 1 litre.

1	VALVE 01	0000
1	VALVE 02	0000
1	VALVE 03	0000
1	VALVE 04	0000



## 8 Installation Options

### 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