



Omron Multiple Set Point

User Manual & Setup Guide

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Omron Display Guide

MSP User Manual **by Thermoline**

The controller is an Omron E5CC-T microprocessor based device with digital indication of set temperature and operating temperature as well as multi step programming as standard.



Note: Limited access to the controller is available. The operator has access to alter the temperature set point, programming and parameters used for calibration purposes only.



Scroll Button: Used to view the set temperature target and start/reset the ramp/dwell function.



Page Button: Used to view calibration offset parameter and the ramp/dwell control parameters.



Increase/Decrease Button: Used to increase and decrease the parameter settings.



Side Arrow: Used to move the cursor when changing temperature

PV

Process Value: Current temperature within the cabinet

SV

Set Value: Set temperature within the cabinet.

Display Symbol

The Omron E5CC-T controller comes with an array of functions depending on the equipment it has been installed in. The table below is an overview of the LED indicators displayed throughout use. Familiarise yourself with them so you are able to recognise problems or faults easily.

LED	Name	Meaning
SUB1	Auxillary Output 1	Alarm BMS
SUB2	Auxiliary Output 2	Hi Alarm
SUB3	Auxiliary Output 3	Low Alarm
OUT1	Control Output 1	Heat output
OUT2	Control Output 2	Cooling output
CMW	Communications Write	Always on
RST	Reset	Program Off
FSP	Fixed Set Point	Program Off
MANU	Manual	N/A
TUNE	AT/ST	N/A
Key	Setting Change Protection	N/A

A	b	C	d	E	F	G	H	I	J
A	B	C	D	E	F	G	H	I	J

K	L	M	N	O	P	Q	R	S	t
K	L	M	N	O	P	Q	R	S	T

U	V	W	X	Y	Z
U	V	W	X	Y	Z

Omron MSP

The Omron MSP option is a 256-segment programmer compatible with all Thermoline products featuring an Omron controller. It can also replace older West 6100 and Eurotherm 3216 controllers in previous models.

This manual should be used in conjunction with the user manual for the Thermoline equipment that has been upgraded with the Omron MSP controller. It provides definitions for each parameter and explains how they affect the MSP's operation.

Please note that the outputs and alarms displayed on the following page will vary depending on the equipment used. For example, there may be no cooling or cooling alarms in ovens.

The 256 segments are divided into eight programs (32 Segments/Program) which can be programmed as eight individual programs and can be linked and/or set to repeat each other.

Setting Time Units

Prior to setting up any program, the time parameter needs to be considered and possibly adjusted. This governs whether the program times are in hours & minutes or minutes & seconds. The required program operation will determine this.

For Example:

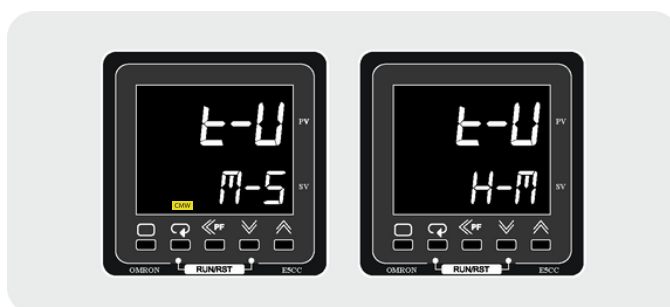
If a program requires to operate for 168 hours (1 week), then the Time Unit would be better suited to be hours & minutes rather than minutes & seconds.

The largest value that can be entered is 99:59 units. So to achieve the 168 hours, you would need to program one segment at 99:59 units, and then a second segment would need to be programmed at 68:01 units.

In the example from this manual, we have chosen hours and minutes.

How to

Hold the **PAGE BUTTON** until the display starts to flash. Keep holding until the display shows Time Unit, as shown below.



Using either **UP** or **DOWN**, select the required Time Unit (M-S being minutes & seconds/H-M being hours & minutes).

Hold the **PAGE BUTTON** to reboot the control to set the Time Unit.

Days	Hours
5	120
7	168

The following describes the individual parameters within the programmer and the process involved in editing/writing a program. It also serves as an example of how to edit/write a program.

In the instructions below, we set the controller to run from 37°C to 60°C across seven segments for a total of 23 hours (**Fig 1**).

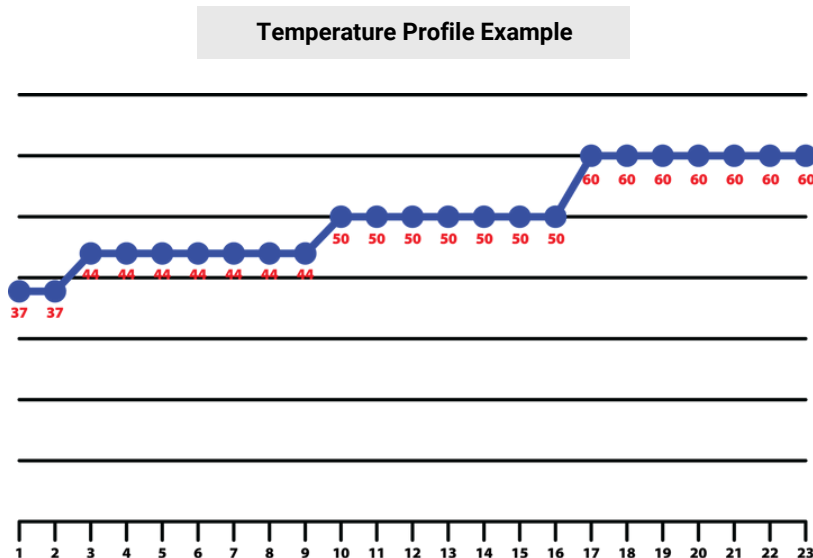


Fig 1

How to

Starting from the main display of the Omron controller. Firstly press the **PAGE BUTTON** to show the edit Program Number Display shown below. In this example, we will select the program displayed as 0 since it is the first program available.



The operator can now select the program they intend to edit. The Program Number Parameter is adjustable between 0 and 7 (8 separate programs).

The operator can select the program to edit using either the **UP** or **DOWN** button.



Setting Up a Program

2. Press the **SCROLL BUTTON** to confirm the selected segment; the Number of Segments will be shown below. This determines how many segments are to be used in the program. Each program can have up to 32 segments (in this example we select seven segments).



Press the **UP** or **DOWN** to select how many segments are required for the program.



3. Press the **SCROLL BUTTON** to confirm the number of segments and move on to the Segment Number display below. This display allows you to edit the selected segments (in this example, we will edit each of the seven segments).



Press the **UP** to change the value from "END" to the desired segment number you wish to edit. The first segment will be 0; the second segment will be 1, and so on. In our example, we previously selected seven segments, so 0 is our first and 6 is our last.



Once you have selected the first segment you can then move onto the next step. 4. Press the **SCROLL BUTTON** to confirm segment and move onto the next screen seen below.



This page is used to set the desired temperature of the first segment. In our example, we set it to 37°C. Press the **UP** or **DOWN** to change the temperature to the first segment's required temperature. In our example we change it to 37°C.



After you have set your desired temperature, you can move to the next display and set the desired Segment Time. The Segment Time determines how long the temperature will hold for. In our example, we set it to run for one hour.

5. Press the **SCROLL BUTTON** to display the Segment Time display shown below.

Press the **UP** or **DOWN** to change the desired length of time for the segment.



The length that the segment runs at will also depend on whether you selected Hours & Minutes or Minutes & Seconds from the previous 'Setting Time Units' segment of this manual.

Setting Up a Program

Programming the Segments

After you have set your desired time, you can move to the next step.

6. Press the **SCROLL BUTTON** to confirm the time and move to the next segment.



At this point, you only have to repeat steps 4, 5 and 6.

Press the **UP** or **DOWN** to select the segment you wish to edit. Press the **SCROLL BUTTON** to confirm the segment you wish to edit.

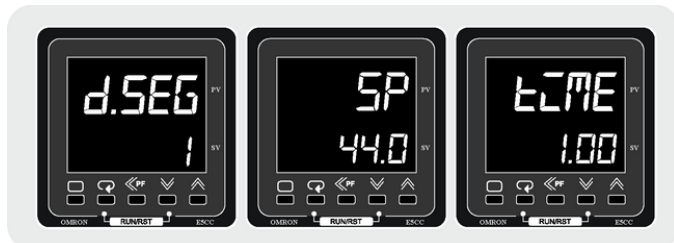
Press the **UP** or **DOWN** to select the desired temperature of the segment.

Press the **SCROLL BUTTON** to display the segment time display.

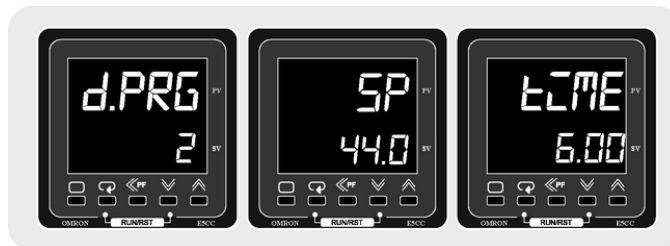
Press the **UP** or **DOWN** to select the desired length of time for the segment.

Press the **SCROLL BUTTON** to move on to the next segment.

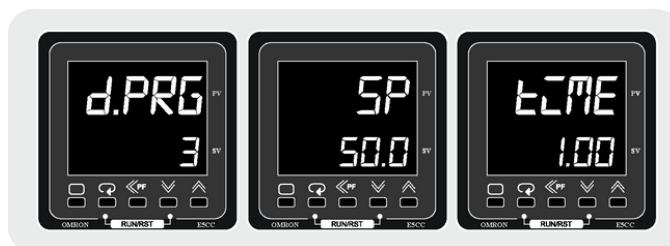
The example is continued below, following the steps above.



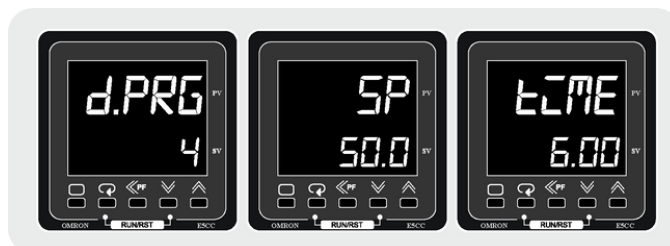
1. Selected Segment 1
2. Set Temperature at 44°C
3. Set time at 1 hour
4. This will ramp the temperature from 37°C to 44°C in 1 hour



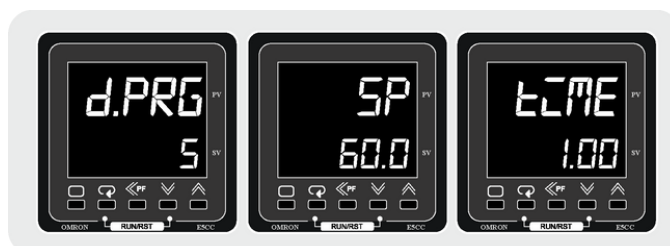
1. Selected Segment 2
2. Set Temperature at 44°C
3. Set time at 6 hours
4. This will hold the temperature at 44°C in 6 hours



1. Selected Segment 3
2. Set Temperature at 50°C
3. Set time at 1 hour
4. This will ramp the temperature from 44°C to 50°C in 1 hour



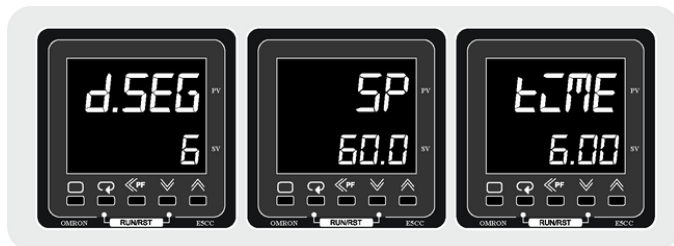
1. Selected Segment 4
2. Set Temperature at 50°C
3. Set time at 6 hours
4. This will hold the temperature at 50°C for 6 hours



1. Selected Segment 5
2. Set Temperature at 60°C
3. Set time at 1 hour
4. This will ramp the temperature from 50°C to 60°C in 1 hour

Setting Up a Program

Programming the Segments



1. Selected Segment 6
2. Set Temperature at 60°C
3. Set time at 6 hours
4. This will hold the temperature at 60°C for 6 hours



Once all the segments have been adjusted, the Segment Number display reverts to “END”. Press the **SCROLL BUTTON** to con rm all entries and move on to the Program Repeat Value.

Program Repeat

After setting up the program, you must determine how many times the program will repeat. This number can be set at 0 to perform no repeats, or it can be set as high as 9999.

In the example below, we will leave it at 0, but by following along, you will learn how to set it to whatever you wish.

How To

The Repeat display shown below is the screen that will show after setting the program.



Press the **UP** or **DOWN** to change the required value of repeats.



Press the **SCROLL BUTTON** to confirm the Repeat value and change the display to the Program Link value shown below.



The Program Link display allows the current program being edited to link to another of the 8 Programs. As this example is editing program 0, if we made this value of the Link 0, it would effectively repeat the program endlessly. This is handy for creating a Diurnal Cycle.

Setting Up a Program

Program Repeat

Press the **UP** or **DOWN** to change the required value of the Link.



Press the **SCROLL BUTTON** to confirm the Link Program value and move onto the Program Number display.



Press the **UP** or **DOWN** to change the value to the program that needs to be edited and repeat the previous instructions.

or

Press the **PAGE BUTTON** to move on to the input shift display shown below.



If you want to move on and adjust the Wait Band, simply:

Press the **SCROLL BUTTON** to display Wait Band.

Or to display the PID settings, simply:

Press the **PAGE BUTTON** to display the PID Settings.

Wait Band

The Wait Band parameter guarantees that a programmed target temperature is held within the specified temperature range for its programmed time. The Wait Band value works on a deviation between the programmed temperature and the actual temperature. It will automatically hold the program until the actual temperature is within the Wait Band value.

Example:

With a set point value of 37°C and a Wait Band of 2°C, if the actual temperature falls below 35°C or rises above 39°C, the program will go into hold mode. This means the controller will pause the program until the temperature is back within the +/- 2°C range. When the actual temperature it is back within the range, the program will resume as normal.

How To

The value **OFF** corresponds to the Wait Band being disabled.

NOTE: It is advisable to turn this function off if the operator is using the programmer to perform a Diurnal Cycle. The Wait Band will increase the 24 hour time cycle if it activates during a running program.

The single Wait Band parameter covers all eight programs.

To change the value of the Wait Band simply:

Press the **UP** or **DOWN** to change the Wait Band value.



Note: In the example above, 2°C is both above and below the setpoint.

To move onto the next step, simply:

Press the **PAGE BUTTON** to confirm the Wait Band value and move onto PID Settings.

Setting Up a Program

PID Settings

This is a protected setting within the controller and access is locked. Press the **PAGE BUTTON** to move on from this page and return to the main display.



If you require information on PID settings, please contact Thermoline.

Starting a Program

Once you have set up the programs in this manual, you must enable the program. The below guide will show you how to do that.

The controller has two indicators showing if a program is operational or not. These are the two yellow indicators, RST and FSP. RST indicates that the program is in reset mode and not operational. FSP indicates that the controller is in Fixed Set Point mode.

RST	Indication that the program is in Reset mode and non-operational.
FSP	Indicates that the program is in Fixed Set Point Mode.

FSP is the mode the controller defaults to when the program is either reset, finished or power to the controller is interrupted when the controller is running. FSP mode allows the operator to set a temperature, and the controller control that temperature indefinitely. FSP mode can also be used as a safe operating value if the power is interrupted to help save the product being tested.

Start at the Main Display shown below.



Press the **SCROLL BUTTON** until the Program Select display is shown below.



Press the **UP** or **DOWN** to select the program you wish to run. These are the programs between 0 and 7 that were set up in the Setting Up a Program guide.



Press the **SCROLL BUTTON** to confirm which program to run and display the Run Reset shown below.



The Run/Reset allows the operator to start and/or stop the selected program.

Press the **UP** or **DOWN** to change between Run and Reset values.

Selecting Run will start the program. Selecting Reset will reset and stop the program.



Setting Up a Program

Starting a Program

When a program is in Run mode, the operator can Hold the program. Turning the Hold function on means the program will pause until Hold is turned off again:

Press the **SCROLL BUTTON** to display the Hold display shown below.

Press the **UP** or **DOWN** to change the value between ON and OFF.



Example:

This setting can be useful for numerous reasons. Extra items may need to be added to the current test, an error has occurred with the the item under test or the item under test may need to be observed.

The next display is the Current Segment parameter. This parameter serves two functions. It indicates the segment in the program that is currently active and the operator can also use this program as a way to skip ahead to other programs.

Press the **SCROLL BUTTON** to confirm Hold setting and display the Current Segment parameter shown below.

Press the **UP** or **DOWN** to advance between segments.



Setting Up a Program

Program Template

You may wish to visually represent your program as a aid while entering the parameters into the controller using something similar to the below blank profile.

