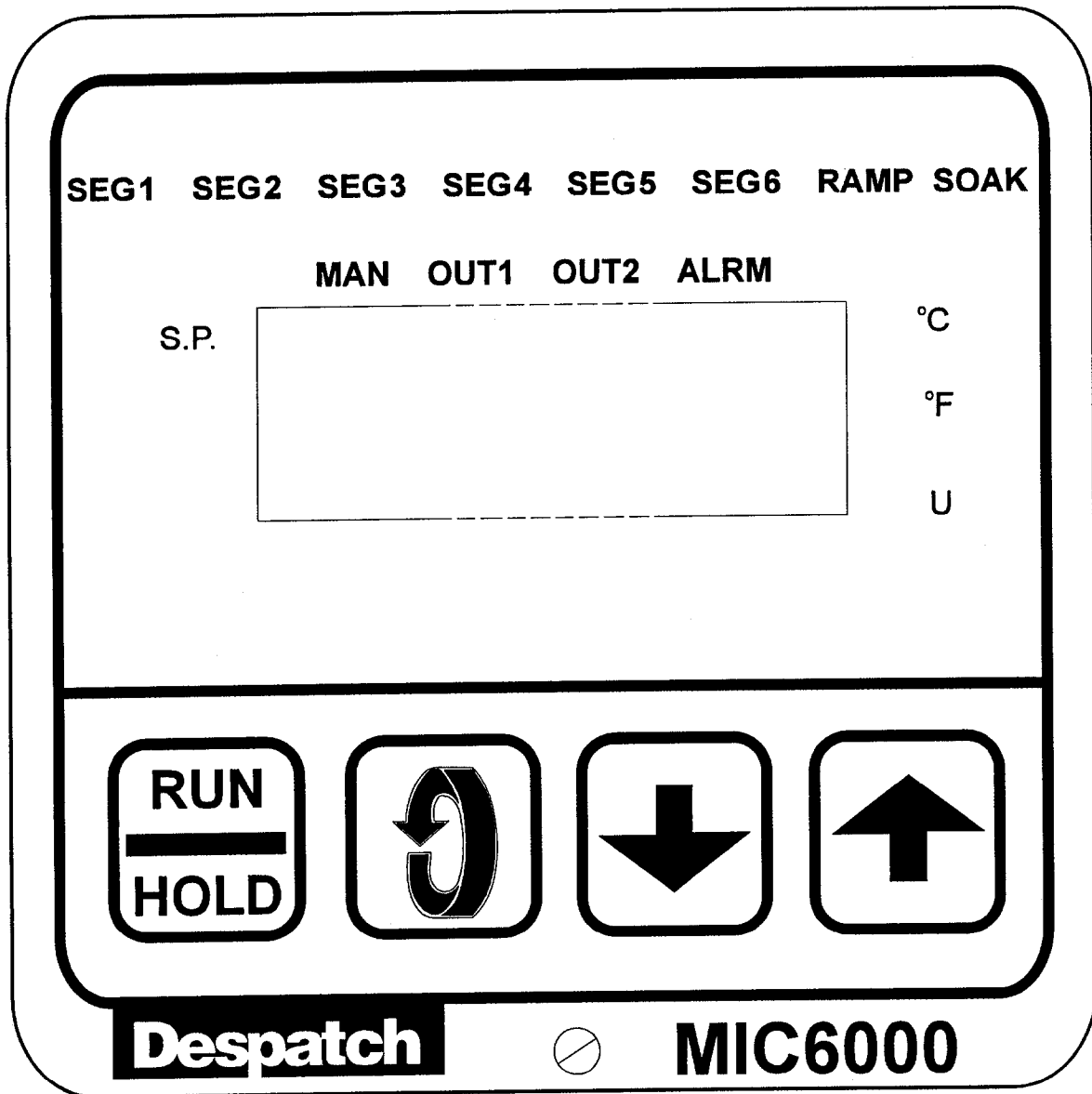


# Instruction Manual for the Despatch/Partlow MIC6000 Control



## Notice

Users of this equipment must comply with operating procedures and training of operation personnel as required by the Occupational Safety and Health Act (OSHA) of 1970, Section 6 and relevant safety standards, as well as other safety rules and regulations of state and local governments. Refer to the relevant safety standards in OSHA and National Fire Protection Association (NFPA), section 86 of 1990.

## Caution

Setup and maintenance of the equipment should be performed by qualified personnel who are experienced in handling all facets of this type of system. Improper setup and operation of this equipment could cause an explosion that may result in equipment damage, personal injury or possible death.

Dear Customer,

Thank you for choosing Despatch Industries. We appreciate the opportunity to work with you and to meet your heat processing needs. We believe that you have selected the finest equipment available in the heat processing industry.

At Despatch, our service does not end after the purchase and delivery of our equipment. For this reason we have created the Service Products Division within Despatch. The Service Products Division features our Response Center for customer service. The Response Center will direct and track your service call to ensure satisfaction.

Whenever you need service or replacement parts, contact the Response Center at 1-800-473-7373: FAX 612-781-5353.

Thank you for choosing Despatch.

Sincerely,

Despatch Industries

# PREFACE

This manual is your guide to the MIC6000 control. It is organized to give you the information you need quickly and easily.

The INTRODUCTION section provides an overview of the control.

The THEORY OF OPERATION section details the function and operation of the control.

The INSTRUCTIONS section provides details on unpacking, installing, operating and maintaining the control.

The APPENDIX section contains Special Instructions for operating the control instrument and a Troubleshooting Table.

An efficient way to learn about the control would be to read the manual while working with the control. This will give you practical hands-on experience with information in the manual and the control.

While reading this manual, if a term or section of information is not fully understood, look up that item in the appropriate section. Then go back and reread that section. Information skipped, not understood or misunderstood could create the possibility of operating the equipment in an unsafe manner. This could cause damage to the oven or personnel or reduce the efficiency of the equipment.

**NOTE:**  
Read the entire INTRODUCTION and THEORY OF OPERATION before installing the oven.

**WARNING:**  
Failure to heed warnings in this instruction manual and on the oven could result in death, personal injury or property damage.

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# INTRODUCTION

This INTRODUCTION section provides an overview of the MIC6000 controller. The microprocessor based single loop controller is capable of measuring, displaying and controlling temperature flow and level from a variety of inputs.

The controller is easy to use. Control functions, alarm settings and other parameters are easily entered through the front keypad. All user's data can be protected from unauthorized changes with its ENABLE mode security system. Battery back-up protects against data loss during AC power outages.

In this application the controller has been factory configured to control temperature and humidity conditions in your Despatch chamber. Under normal conditions, you should not have to reprogram this controller. We have, however, included reprogramming instructions in this manual to help guide you through the process if it should become necessary.

**NOTE:**  
Your control has already been configured at Despatch. Use this manual as a guide.

**CAUTION:**  
Before making changes to your control instrument, consult with the Despatch Industries Service Products Division at 1-800-473-7373



# INSTRUCTIONS

## Operating

To start the MIC6000 controller, start the oven fans. When you start the fans the following sequence will automatically take place.

1. The MIC6000 controller will power-up.
2. The controller will display its:
  - model number,
  - software revision,
  - tag number.
3. The controller will undergo a series of self tests to ensure all is well with the controller.
4. The controller will display **Ctrl** or **OFF** for a few seconds.
5. The controller will display the current temperature in the chamber. Temperature will be displayed for seven to ten seconds.
6. The green setpoint LED (S.P) will light up and the current controller setpoint will be displayed for three seconds.

The display will continue to alternate between oven temperature and setpoint as described above.

To view the setpoint at any time, momentarily press the ↑ key or ↓ key. The green S.P LED will come on and the current setpoint will be displayed.

### To operate the MIC6000 as a setpoint controller

1. Press the Ⓚ key until **Ctrl** appears in the display.
2. Press the ↓ key.

The display will blank momentarily, and then the current oven temperature will be displayed. The controller is now in the control mode and will control the oven temperature.

#### NOTE:

Your MIC6000 control has already been configured at Despatch. Use this manual as a guide only.

#### CAUTION:

Before making changes to your MIC6000, consult with Despatch Industries Service Products Division at 1-800-473-7373.

## Operate (Cont.)

To change the setpoint press and hold the ↑ key (to increase setpoint) or the ↓ key (to lower setpoint). The green S.P. light will come on and the display will begin to change. The longer the key is held the faster the display changes. When desired setpoint is in the display leave all keys alone. The display will continue to show the new setpoint for three seconds before changing to the oven temperature.

### To run a profile

1. Press the 0 key until the desired profile is number is in the display. (P1, P2, . . . ,P8)
2. Press the ↓ key or the RUN key.

Run will display for a few seconds, followed by the current oven temperature. The **SEG 1** and **RAMP** LEDs indicate that the control is ramping in segment 1. As the profile continues the segment LEDs, **RAMP** LED and the **SOAK** LED indicate the status of the control.

### To abort a profile

1. Press the **RUN/HOLD** key to stop the profile at the preset position.
2. Press the 0 key until **OFF** appears in the display.
3. Press the ↓ key.

The profile is now aborted and the controller is in the off mode.



# Enable Mode

The enable mode is used to turn on or off access to the various modes of the controller: such as the program mode and the tune mode.

1. Press and hold the ↑ key and the ↓ key for approximately 10 seconds. The following sequence will take place.
  - All LEDs will light up on the front of the instrument.
  - After about 10 seconds **EnAb** will be displayed.
2. Release the ↑ key and the ↓ key. **EtSt** will be displayed.
3. Press the Ⓚ key. Either **oFF** or **oN** will be displayed, indicating whether access to the **tEst** mode is on or off.
  - If access is off, pressing the ↑ key will turn access on.
  - If access is on, pressing the ↓ key will turn access off.
4. Press the Ⓚ key to bring up the next mode.
5. Continue on through all the modes, turning access off or on as required.
6. After scrolling through all selections, **EtSt** will be displayed again. Press the ↑ key to exit the enable mode.

**NOTE:**  
If you cannot enter the enable mode, consult Despatch Industries Service Products at 1-800-473-7373 for instructions.

**NOTE:**  
If no entry is made for 10 seconds, the control will leave the enable mode.

Once set up and operating correctly all modes should be turned off except for the **EPC, EPE, ESPC** modes.

Table 1 Enable Mode

Display Code	Setting	Description
Etst	Off	Test mode
ECAL	Off	Calibration mode
EPro	Off	Program mode
Etun	Off	Tune mode
ESby	Off	Standby mode
ESPS	Off	Setpoint select mode
EPC	On	Profile continue mode
EPE	On	Profile entry mode
ESPC	On	Setpoint change mode

# Program Mode

The program mode is used to re-configure the controller. We have included complete instructions in this manual for re-configuring the controller installed on your chamber. If you want more details on display codes and settings, refer to the Program Mode Configuration Procedure in the Partlow manual. Refer to Table 2 when re-configuring the controller. The following questions will help determine which settings apply to your application.

Is your chamber gas heated or electrically heated? If your chamber is gas heated, use the settings listed in the Gas column. If your chamber is electrically heated, use the settings listed in the Electric column.

Is the controller installed on a 16000 series chamber or LEY chamber? If so, use the settings listed in the Temperature and Humidity columns.

Table 2 Typical Program Display/Code Setting Guide

Display Codes	Heat Settings for Ovens		Display Codes	16000/LEY Chambers Control Settings	
	Electric	Gas		Temperature	Humidity
inPS iCor	1 0	1 0	inPS iCor	4 0	30 0
out1 o1PL	4 100	6 100	out1 o1PL	4 100	4 100
out2 o2PL	0 --	0 100	out2 o2PL	3 100	3 100
out3 rlyA	0 1	0 0	out3 rlyA	0 1	0 1
rlyB rlyC	0 0	0 0	rlyB rlyC	2 0	2 0
diSP dPoS	2 0	2 0	diSP dPoS	2 0	2 0
EuU EuL	-- --	-- --	EuU EuL	-- --	1000 0
HySt SPL	0 *	0 *	HySt SPL	0 *	0 100
AtFr Ptb	0 2	0 2	AtFr Ptb	0 2	0 2
PIA PFF	1 1	1 1	PIA PFF	1 1	1 1
dFF	1	1	dFF		1

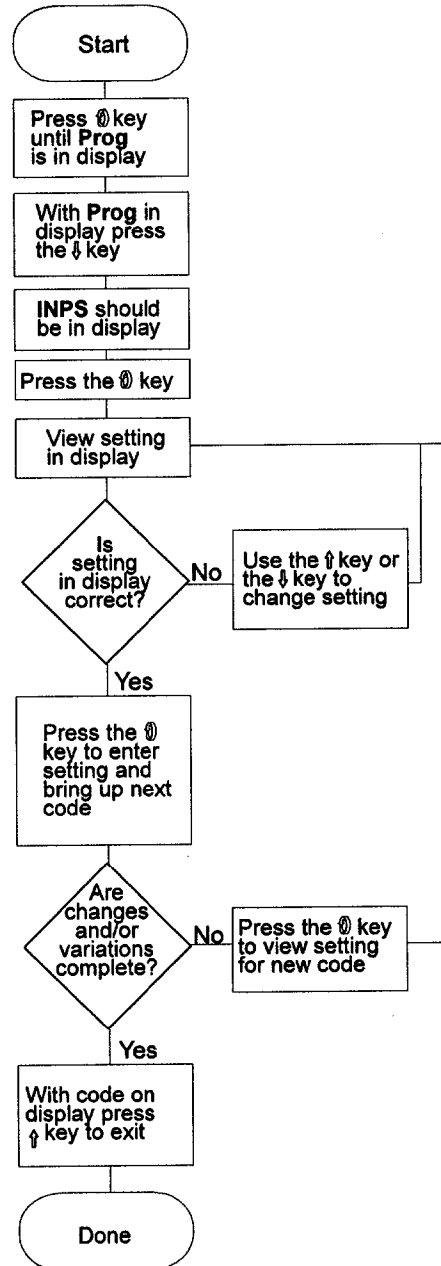
\* Set to maximum temperature of oven

# Program Mode (Cont.)

Record your settings for future reference. Use the worksheet on page 24 of this manual for this purpose.

**NOTE:**  
If no entry is made for 30 seconds, the control will exit the program mode.

1. Press **⓪** key until **Prog** appears in display. If **Prog** is not displayed, refer to the Enable mode section of this manual.
2. Press **↓** key. You are now in the program mode. **InPS** should be in the display.
3. Press the **⓪** key to view the setting for the display code **InPS**.
  - If the setting does not have to be changed, move on to step 6 in these instructions.
  - If the setting needs to be changed, continue on to step 4 in these instructions.
4. Press the **↑** key or **↓** key to change the setting. Refer to Table 2 for the correct setting.
5. When the correct setting is displayed press the **⓪** key to enter the new setting into memory and bring up the next code.
6. Press the **⓪** key to view the next setting.
7. Repeat steps 3 through 6 until you are satisfied all settings have been correctly entered.



# Tune Mode

Refer to this table when changing settings in the Tune mode.

Table 3 Typical Tune Display/Code Setting Guide

Display Code	Heat Settings for Ovens	
	Electric	Gas
SPRD Pb1	— 10	— 35
Pb2 rSet	— 0	— 0
ArSt rAtE	0.5 0	0.5 0
Ct1 Ct2	20* —	— —
FOP	0	0
Display Code	16000/LEY Chambers Control Settings	
	Temperature	Humidity
SPRD Pb1	0 10	0 60
Pb2 rSet	10 0	60 0
ArSt rAtE	0.5 0	0.5 0
Ct1 Ct2	1 7	1 5
FOP	0	0

\* If the oven is equipped with solid state relays (SSR), CT1=1.

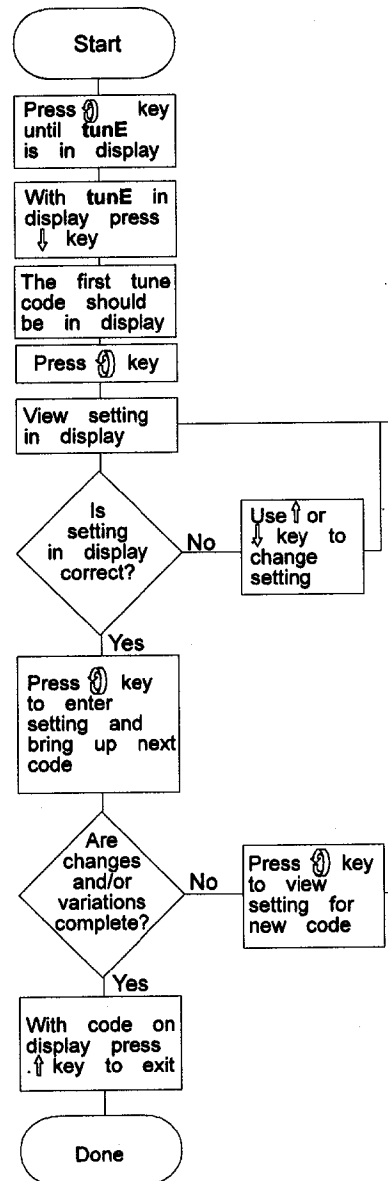
## Tune Mode (Cont.)

The controller tune settings have been factory set for an empty oven. Load mass, fresh air and exhaust damper settings will affect tuning parameters. Some experimentation is required to determine the optimum settings. Record your settings for future reference. Use the worksheet on page 21 of this manual for this purpose.

These instructions should be adequate for adjusting tune parameters. If you want more details on the display codes and settings, refer to Tune Mode Configuration Procedure in the Partlow manual.

1. Press **⓪** key until **tunE** appears in display. If **tunE** is not displayed, refer to the Enable mode section of this manual.
2. Press **↓** key. You are now in the tune mode. **Pb1** should be in the display. If **FOP** is displayed, review the program mode parameters.
3. Press the **⓪** key to view the setting for the display code **Pb1**.
  - If the setting does not have to be changed, move on to step 6.
  - If the setting needs to be changed, continue on to step 4.
4. Press the **↓** key or **↑** key to change the setting. Refer to Table 3 for the typical Despatch settings.
5. When the correct setting is displayed press the **⓪** key to enter the new setting into memory and bring up the next code.
6. Press the **⓪** key to view the next setting.
7. Repeat steps 3 through 6 until you are satisfied all settings have been correctly entered.

**NOTE:**  
If no entry is made for 30 seconds, the control will exit the tune mode.



**NOTE:**  
These are typical settings only. Each oven/process has its own settings.

## Profile Mode

The Partlow control is capable of storing eight profiles with up to six (6) segments in each profile. Each segment consists of a timed ramp to temperature and soak period at that temperature. If longer profiles (more segments) are required, profiles can be linked together to form one long profile. Before trying to enter a profile, draw a diagram like that shown in figure 1 to determine the number of segments required for the profile.

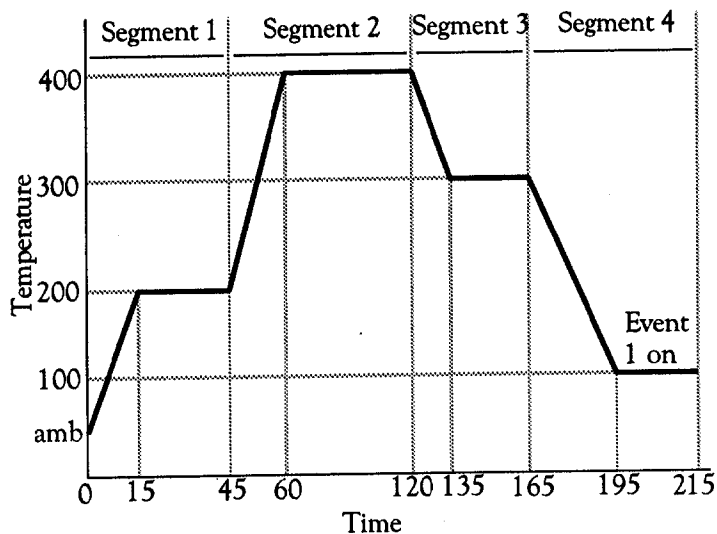


Figure 1 illustrates a sample profile with 4 segments.

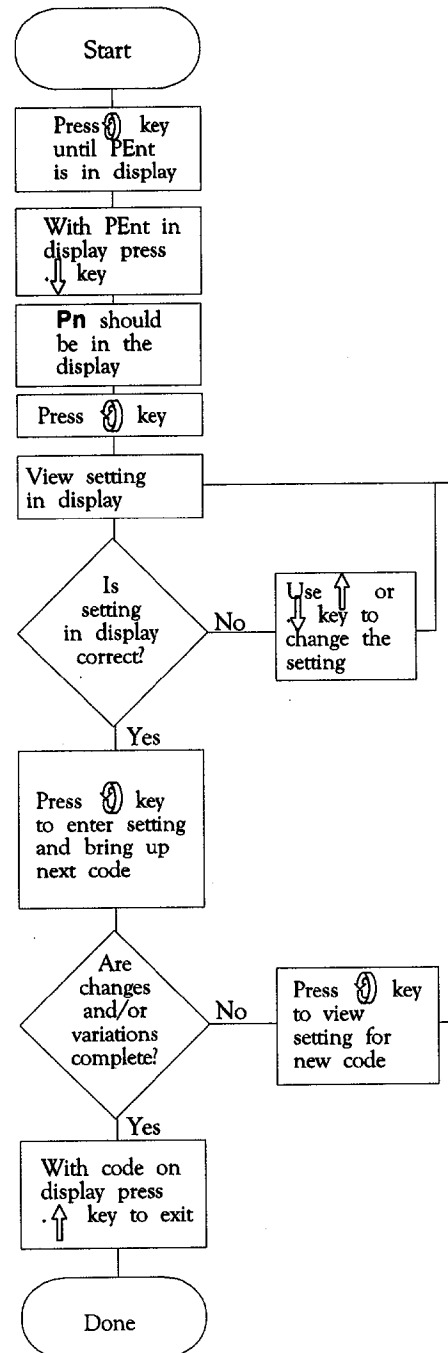
Next fill in the blanks on the profile data worksheet. This worksheet will now be used to enter the profile into the instrument.

	Pn	<u>1</u>	Profile number				
	ns	<u>4</u>	Number of segments				
	SEG1	SEG2	SEG3	SEG4			
rt	<u>0.15</u>	rt	<u>0.15</u>	rt	<u>0.15</u>	rt	<u>0.30</u>
SP	<u>200</u>	SP	<u>400</u>	SP	<u>300</u>	SP	<u>100</u>
E1	<u>OFF</u>	E1	<u>OFF</u>	E1	<u>OFF</u>	E1	<u>OFF</u>
St	<u>0.30</u>	St	<u>1.00</u>	St	<u>0.30</u>	St	<u>0.20</u>
E1	<u>OFF</u>	E1	<u>OFF</u>	E1	<u>OFF</u>	E1	<u>ON</u>
	PLCt	<u>1</u>	Loops				
	dhru	<u>0</u>	Degrees				
	dhrd	<u>0</u>	Degrees				
	PEnd	<u>0</u>	All outputs off				

# Profile Mode (Cont.)

## To enter a profile

1. Enter the profile by pressing the **⓪** key until **PEnt** appears in the display.
2. Press the **↓** key. Now **Pn** will be displayed.
3. Press the **⓪** key. A profile number (tag number) will be displayed.
4. Use the **↑** key or the **↓** key to change the profile number.
5. Press the **⓪** key to enter the new number. **nS** will be displayed.
6. Press the **⓪** key.
7. Enter the number of segments in the profile.
8. Press the **⓪** key. The **SEG 1** LED will light and **rt** (ramp time) will be displayed.
9. Use the **↑** key or the **↓** key to change the ramp time setting.
10. Press the **⓪** key. **SP** will be displayed.
11. Use the **↑** key or the **↓** key to change the setpoint.
12. Press the **⓪** key. **E1** will be displayed if events are programmed.
13. Use the **↑** key or the **↓** key to turn events on or off during ramp time.
14. Press the **⓪** key. **St** (Soak time) will be displayed.
15. Use the **↑** key or the **↓** key to change the soak time.
16. Press the **⓪** key. **E1** will be displayed if events are programmed.
17. Use the **↑** key or the **↓** key to change the soak time.



## Profile Mode (Cont.)

Continue on in this fashion with the rest of the segments. As you step through each segment, the **SEG 2** through **SEG 6** indicators, as well as the **RAMP** and **SOAK** LEDs, will light up along the top of the instrument. They indicate which segment of the profile you are currently in. When **Pn** appears in the display again the profile is complete. Press the up key to exit the profile entry mode.

To view the time remaining while the profile is running, press the  $\odot$  key and the ↓ key. The display will cycle through several parameters, including **tr** for the time remaining in that segment. Press the  $\odot$  key to stop the cycling.

To view the percentage output while the profile is running, press the  $\odot$  key and the ↑ key. The display will alternate between the process variable and the percentage output. Press the  $\odot$  key to stop cycling.



# Profile Data Worksheet

Pn \_\_\_\_\_ Profile number, 1 - 8

ns \_\_\_\_\_ Number of segments, 1 - 6

	SEG1	SEG2	SEG3	SEG4	SEG5	SEG
rt	_____	_____	_____	_____	_____	_____
SP	_____	_____	_____	_____	_____	_____
E1	_____	_____	_____	_____	_____	_____
E2	_____	_____	_____	_____	_____	_____
E3	_____	_____	_____	_____	_____	_____
St	_____	_____	_____	_____	_____	_____
E1	_____	_____	_____	_____	_____	_____
E2	_____	_____	_____	_____	_____	_____
E3	_____	_____	_____	_____	_____	_____

PLCt \_\_\_\_\_ 0 - Continuous, 1 - 9,999 Loops

dhru \_\_\_\_\_ 0 - Disabled, 1 - 3,000 Degrees

dhrd \_\_\_\_\_ 0 - Disabled, 1 - 3,000 Degrees

PEnd \_\_\_\_\_ -1 Hold at last setpoint

- 0 All outputs off
- 1 Run profile #1
- 2 Run profile #2
- 3 Run profile #3
- 4 Run profile #4
- 5 Run profile #5
- 6 Run profile #6
- 7 Run profile #7
- 8 Run profile #8



# TROUBLESHOOTING

For your convenience, we have included a troubleshooting section in this manual. This section covers problems which may occur in the Despatch application of the controller. The Partlow manual has a more detailed troubleshooting section. We recommend that you refer to both manuals.

Clean up most errors by performing (CAL 1, Master Clear, Re-configure Hardware):

Common Errors are:

- Error #16 - Perform a CAL 1.
- Error #17 - Master clear, reconfigure the Hardware, perform CAL 1.
- Error "LO" - Perform a CAL2, then a CAL3.
- Error #18 - Perform CAL 8

# CAL 1

1. Enable the CAL mode by pressing ↑ key and the ↓ key simultaneously for approximately 15 seconds (EnAb will appear on the display).
2. Release keys (**EtSt** will appear on the display). Enable mode is ON.
3. Press the ↓ key until **ECAL** appears on the display.
4. Press the Ⓚ key. Display will say **OFF**. Press the ↑ key (display will change to **on**).
5. Press the Ⓚ key. Display will say **EPro**. Press the ↑ key (display will return to **OFF** or **Ctrl** modes).
6. Repeat pressing the Ⓚ key until the display says **CAL**. Then press the ↓ key (display will change to **CAL 1**).
7. Press and hold the ↓ key, then press the Ⓚ key. The display will blank momentarily. Release the keys. **CAL 1** is complete.
8. Re-install the program and tuning software parameters. Refer to the program mode and the tune mode sections of this manual.
9. Turn off the program mode by following steps 1 through 5. In step 4, use the ↓ key to turn the mode off.

## NOTE:

Record/save the program and tuning parameters prior to performing a **CAL 1**. All of the software values will be reset to the default values during a **CAL 1!!!!**

# Reconfigure Hardware

You should reconfigure the controller only if the incorrect model number is displayed when the controller is powered up.

1. Insert the controller into case while pressing the Ⓚ key and the ↓ key simultaneously until the display blinks. Release the Ⓚ key first, then release the ↓ key.
2. The first four digits of the hardware configuration will be displayed (example 6100). Press the ↑ key and change hardware configuration back to basic controller (example 6110).
3. Next press the Ⓚ key and the second four digits of the hardware configuration will be displayed (example 000-).
4. Press the ↑ key and change hardware configuration back to basic controller (example 001-).
5. Press the Ⓚ key. Controller will self test.

The program mode parameters and the tune mode parameters will need to be re-entered. Refer to the program mode and the tune mode sections of this manual.

# Master Clear

These instructions are for the controller hardware and software matrix.

1. Insert the controller into case while pressing the ↑ key and the ↓ key simultaneously until the display blinks.
2. Re-install the hardware configuration. Refer to the Reconfigure Hardware section.
3. Re-install the program and tuning software parameters.

Before you call Despatch for help, obtain the following information from the controller:

- Controller part number (displayed on power up).
- Controller software revision level (displayed on power up).
- Controller serial number (listed on sticker on the front of the controller).

## NOTE:

Record/save the program, tuning and profile parameters prior to performing a **MASTER CLEAR**. The hardware configuration and all of the software values will be reset to the default values during a **MASTER CLEAR!!!!**

## CAL 8

1. Press the ↑ key and the ↓ key simultaneously for approximately 15 seconds. **EnAb** will appear in the display.
2. Release the arrow keys. **EtSt** will appear on the display. The enable mode is on.
3. Press the ↓ key until **ECAL** appears on the display.
4. Press the ⓪ key. **oFF** will appear in the display.
5. Press the ↑ key. **on** will appear in the display.
6. Press the ⓪ key. **EPro** will appear in the display.
7. Press the ↑ key. **oFF** or **Ctrl** will appear in the display.
8. Repeat pressing the ⓪ key until **CAL** appears in the display.
9. Press the ↓ key. **CAL 1** will appear in the display.
10. Repeatedly press the ⓪ key until **CAL 8** appears on the display.
11. Press the ⓪ key and the ↓ key simultaneously. The display will blank momentarily. **CAL 8** is complete.
12. Reinstall the profile parameters.

### NOTE:

Record and save the profile parameters prior to performing a **CAL 8**. All of the profile parameters will be erased during a **CAL 8!!!**





# WORK SHEETS

We have provided a tuning worksheet and a programming worksheet for your convenience.

## Tuning

Refer to the tuning instructions in this manual when filling out the tuning worksheet. If you require more information on tuning display codes, refer to the Partlow manual.

Table 4 Tuning Display/Code Setting Work Sheet

Display Code	Heat Settings for Ovens		Display Code	16000/LEY Chambers Control Settings	
	Electric	Gas		Temperature	Humidity
SPRD			SPRD		
Pb1			Pb1		
Pb2			Pb2		
rSet			rSet		
ArSt			ArSt		
rAtE			rAtE		
Ct1			Ct1		
Ct2			Ct2		
FOP			FOP		

# Programming

Refer to the programming instructions in this manual when filling out the programming worksheet. If you require more information on programming display codes, refer to the Partlow manual.

Table 5 Program Display/Code Setting Work Sheet

Display Codes	Heat Settings for Ovens		Display Codes	16000/LEY Chambers Control Settings	
	Electric	Gas		Temperature	Humidity
inPS			inPS		
iCor			iCor		
out1			out1		
o1PL			o1PL		
out2			out2		
o2PL			o2PL		
out3			out3		
rlyA			rlyA		
rlyB			rlyB		
rlyC			rlyC		
diSP			diSP		
dPoS			dPoS		
Euu			Euu		
EuL			EuL		
HySt			HySt		
SPL	*	*	SPL	*	100
AtFr			AtFr		
PTB			PTB		
PIA			PIA		
PFF			PFF		
dFF			dFF		

\* Set to maximum temperature of oven.