WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer’s sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell website, it is up to the customer to determine the suitability of the product in the application.

Honeywell Process Solutions
Industrial Measurement and Control
512 Virginia Drive
Fort Washington, PA 19034

UDC3500 is a U.S. registered trademark of Honeywell

Other brand or product names are trademarks of their respective owners.
Contents

1 INTRODUCTION ............................................................................................................. 5
  1.1 Overview ....................................................................................................................... 5

2 CONFIGURATION ........................................................................................................... 6
  2.1 SP Program 1 Set Up Group .......................................................................................... 6
  2.2 SP Program 2 Set Up Group .......................................................................................... 11

3 MONITORING AND OPERATING THE CONTROLLER ........................................... 13
  3.1 Setpoint Ramp/Soak Programming ............................................................................... 13

4 MODBUS READ, WRITE AND OVERRIDE PARAMETERS PLUS EXCEPTION
   CODES FOR LOCKHEED SPECIAL .................................................................................. 22
  4.1 Overview ...................................................................................................................... 22
     4.1.1 SP PROG1 ................................................................................................................. 22
     4.1.2 SP PROG2 ................................................................................................................. 29
1 Introduction

1.1 Overview

Function

This document should be looked at as being an addendum to the UDC3500 Product Manual 51-52-25-120. This document shows the unique Set Point Programming (SPP) functionality created specifically for Lockheed.
2 Configuration

2.1 SP Program 1 Set Up Group

Introduction

A Set Point Rate [SPRATE] lets you configure a specific rate of change for any local setpoint change.

A single Set Point Program [SP PROG] of 40 segments can be configured.

You can start and stop the Setpoint Program using the RUN/HOLD key.

PV Hot Start is a configurable feature and means that, at initialization, the setpoint is set to the current PV value and the Ramp or Rate or Program then starts from this value.
### Function Prompts

#### Table 2-1 SP PROG1 Group Function Prompts

<table>
<thead>
<tr>
<th>Function Prompt</th>
<th>Selections or Range of Setting</th>
<th>Parameter Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SP RATE</strong></td>
<td><strong>DISABLE</strong></td>
<td>SETPOINT RATE—Lets you configure a specific rate of change for any local setpoint change.</td>
</tr>
<tr>
<td><strong>SP Rate</strong></td>
<td><strong>ENABLE</strong></td>
<td>DISABLE SETPOINT RATE—Disables the setpoint rate option.</td>
</tr>
<tr>
<td><strong>SP Ramp</strong></td>
<td><strong>ENABLE</strong></td>
<td>ENABLE SETPOINT RATE—Allows the SP rate feature.</td>
</tr>
<tr>
<td><strong>EU/HR UP</strong></td>
<td>0 to 9999 in engineering units per hour</td>
<td>RATE UP—Rate up value. When making a setpoint change, this is the rate at which the controller will change from the original setpoint up to the new one. The ramping (current) setpoint can be viewed as SPn in the lower display. Entering a 0 will imply an immediate step change in Setpoint (i.e., no rate applies).</td>
</tr>
<tr>
<td><strong>EU/HR DN</strong></td>
<td>0 to 9999 in engineering units per hour</td>
<td>RATE DOWN—Rate down value. When making a setpoint change, this is the rate at which the controller will change from the original setpoint down to the new one. The ramping (current) setpoint can be viewed as SPn in the lower display. Entering a 0 will imply an immediate step change in Setpoint (i.e., no rate applies).</td>
</tr>
<tr>
<td><strong>SP PROG</strong></td>
<td><strong>DISABLE</strong></td>
<td>SETPOINT RAMP/SOAK PROGRAM #1—Available only with controllers that contain this option.</td>
</tr>
<tr>
<td><strong>SP Program</strong></td>
<td><strong>ENABLE</strong></td>
<td>SP RAMP must be disabled.</td>
</tr>
<tr>
<td><strong>SP Ramp</strong></td>
<td><strong>ENABLE2</strong></td>
<td>DISABLE—Disables all Setpoint Programs.</td>
</tr>
<tr>
<td><strong>SP Prog</strong></td>
<td><strong>ENABL12</strong></td>
<td>ENABLE—Setpoint Program runs on Loop 1.</td>
</tr>
<tr>
<td><strong>STRT SEG</strong></td>
<td>1 to 40</td>
<td>ENABLE2—Setpoint Program runs on Loop 2.</td>
</tr>
<tr>
<td><strong>END SEG</strong></td>
<td>2 to 40 even numbers</td>
<td>ENABL12—Setpoint Program runs on both Loop1 and Loop 2.</td>
</tr>
<tr>
<td><strong>RAMPUNIT</strong></td>
<td><strong>TIME</strong></td>
<td><strong>ATTENTION</strong> When linking programs 1 and 2, End Segment Number must be set to 20. Values less than 20 will prevent the SP Programs from linking.</td>
</tr>
<tr>
<td><strong>Recycles</strong></td>
<td>0 to 100 recycles</td>
<td>RAMPUNIT—Engineering Units for Ramp Segments</td>
</tr>
<tr>
<td><strong>TIME</strong></td>
<td><strong>EU/MIN</strong></td>
<td>TIME in hours: minutes</td>
</tr>
<tr>
<td><strong>RATE</strong></td>
<td><strong>EU/HR</strong></td>
<td>RATE in Engineering units per minute</td>
</tr>
<tr>
<td><strong>RECYCLES</strong></td>
<td>0 to 100 recycles</td>
<td>RATE in Engineering units per hour</td>
</tr>
<tr>
<td>Function Prompt</td>
<td>Selections or Range of Setting</td>
<td>Parameter Definition</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>PROG END</td>
<td>LASTSP F SAFE</td>
<td>PROGRAM TERMINATION STATE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAST SETPOINT—Hold at last setpoint in the program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FAIL SAFE—Manual mode/Failsafe output</td>
</tr>
<tr>
<td>STATE</td>
<td>DISABLE HOLD</td>
<td>PROGRAM STATE AT PROGRAM END</td>
</tr>
<tr>
<td>POWER UP</td>
<td>ABORT RESUME RESTART</td>
<td>POWER UP—This configuration determines what the Program will do in the case of a power outage during the Program. This prompt only appears on those instruments that have the Real Time Clock option.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABORT—Program terminated on power up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RESUME—Continue at the same point in program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RESTART—Restart program at beginning of the same cycle</td>
</tr>
<tr>
<td>KEYRESET</td>
<td>DISABLE ToBEGIN RERUN</td>
<td>KEY RESET—Reset/Rerun SP Program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DISABLE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RESET TO BEGINNING OF SETPOINT PROGRAM—When enabled, this selection allows you to reset via the keyboard to the beginning of the program and resets the Recycle value to 0. The program mode is placed in HOLD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the current Local Setpoint 1 value is at any value other than that Setpoint value used in the first Soak segment in the program, then the program will restart at the current Local Setpoint 1 value and at the beginning of the first Ramp segment in the program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the current Local Setpoint 1 value is at the same Setpoint value as that used for the first Soak segment in the program, then the first Ramp segment is skipped and the program will restart at the beginning of the first Soak segment in the program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RERUN CURRENT CYCLE—When enabled, this selection allows you to reset the program via the keyboard to the beginning of the current cycle. The Recycle value is not affected. The program mode (RUN or HOLD) is not affected.</td>
</tr>
<tr>
<td>HOTSTART</td>
<td>DISABLE ENABLE</td>
<td>HOT START—This feature allows the SP Program to start at the current PV value rather than the current Setpoint value.</td>
</tr>
<tr>
<td>Function Prompt Lower Display</td>
<td>Selections or Range of Setting Upper Display</td>
<td>Parameter Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>SEG1RAMP or SEG1RATE</td>
<td>0-99 hours.0-59 minutes</td>
<td>Segment #1 Ramp Time or Segment #1 Ramp Rate</td>
</tr>
<tr>
<td></td>
<td>Engineering units/minute or Engineering units/hour</td>
<td>[ATTENTION] This parameter is affected by the RAMPUNIT configuration (see above). All ramps will use the same selection.</td>
</tr>
<tr>
<td>SEG1PID</td>
<td>1-4</td>
<td>PID Set Selection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[ATTENTION] The PID Set Selection prompts will only show up when PID SETS in the Control 1 or Control 2 Setup Group is set to 4 KEYBD.</td>
</tr>
<tr>
<td>SEG2 SP</td>
<td>Within the Setpoint limits</td>
<td>Segment #2 Soak Setpoint Value</td>
</tr>
<tr>
<td>SEG2TIME</td>
<td>0-99 hours.0-59 minutes</td>
<td>Segment #2 Soak Duration</td>
</tr>
<tr>
<td>SOAK2DEV</td>
<td>0.000 to 99.99</td>
<td>Guaranteed Soak Deviation Value For Soak Segment #2—The number selected will be the PV value (in engineering units) above and below the setpoint outside of which the Soak Segment timer halts. A value of 0.000 is equivalent to no Guaranteed Soak.</td>
</tr>
<tr>
<td>SEG2 PID</td>
<td>1-4</td>
<td>PID Set Selection—This selection is Loop dependent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[ATTENTION] The PID Set Selection prompts will only show up when PID SETS in the Control 1 or Control 2 Setup Group is set to 4 KEYBD.</td>
</tr>
<tr>
<td>SEG3RATE</td>
<td>Selections are same as above.</td>
<td>Same as above</td>
</tr>
<tr>
<td>SEG3 PID</td>
<td></td>
<td>[ATTENTION] When linking programs, all 20 segments in Program 1 MUST be used.</td>
</tr>
<tr>
<td>Function Promp</td>
<td>Selections or Range of Setting</td>
<td>Parameter Definition</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>SEG9RATE</td>
<td>SG10 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG10TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK10DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG10 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG11RAMP or SG11RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG11 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG12 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG12TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK12DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG12 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG13RAMP or SG13RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG13 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG14 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG14TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK14DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG14 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG15RAMP or SG15RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG15 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG16 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG16TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK16DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG16 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG17RAMP or SG17RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG17 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG18 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG18TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK18DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG18 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG19RAMP or SG19RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG19 PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG20 SP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG20TIME</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOAK20DV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SG20 PID</td>
<td></td>
</tr>
</tbody>
</table>
### 2.2 SP Program 2 Set Up Group

**Introduction**

Setpoint Program 2 is always linked to Program 1 in order to make a single program with a maximum length of 40 segments.

**Function Prompts**

<table>
<thead>
<tr>
<th>Function Prompt Lower Display</th>
<th>Selections or Range of Setting</th>
<th>Parameter Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG21RAMP or SG21RATE</td>
<td>0-99 hours.0-59 minutes</td>
<td>Segment 21 Ramp Time or Segment #21 Ramp Rate</td>
</tr>
<tr>
<td></td>
<td>Engineering units/minute or Engineering units/hour</td>
<td><strong>ATTENTION</strong> This parameter is affected by the RAMPUNIT configuration (see above). All ramps will use the same selection.</td>
</tr>
<tr>
<td>SG21PID</td>
<td>1-4</td>
<td>PID Set Selection</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ATTENTION</strong> The PID Set Selection prompts will only show up when PID SETS in the Control 1 or Control 2 Setup Group is set to 4 KEYBD.</td>
</tr>
<tr>
<td>SG22 SP</td>
<td>Within the Setpoint limits</td>
<td>Segment #22 Soak Setpoint Value</td>
</tr>
<tr>
<td>SG22TIME</td>
<td>0-99 hours.0-59 minutes</td>
<td>Segment #22 Soak Duration</td>
</tr>
<tr>
<td>SOAK22DV</td>
<td>0.000 to 99.99</td>
<td>Guaranteed Soak Deviation Value For Soak Segment #22—The number selected will be the PV value (in engineering units) above and below the setpoint outside of which the Soak Segment timer halts. A value of 0.000 is equivalent to no Guaranteed Soak.</td>
</tr>
<tr>
<td>SG22 PID</td>
<td>1-4</td>
<td>PID Set Selection—This selection is Loop dependent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ATTENTION</strong> The PID Set Selection prompts will only show up when PID SETS in the Control 1 or Control 2 Setup Group is set to 4 KEYBD.</td>
</tr>
<tr>
<td>SG23RAMP or SG23RATE</td>
<td>Selections are same as above.</td>
<td>Same as above</td>
</tr>
<tr>
<td>SG23 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG24 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG24TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK24DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG24 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG25RAMP or SG25RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG25 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG26 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG26TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK6DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function Prompt Lower Display</td>
<td>Selections or Range of Setting Upper Display</td>
<td>Parameter Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>SG26 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG27 RAMP or SG27 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG27 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG28 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG28 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK28 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG28 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG29 RAMP or SG29 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG29 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG30 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG30 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK30 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG30 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG31 RAMP or SG31 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG31 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG32 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG32 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK32 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG32 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG33 RAMP or SG33 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG33 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG34 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG34 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK34 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG34 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG35 RAMP or SG35 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG35 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG36 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG36 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK36 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG36 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG37 RAMP or SG37 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG37 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG38 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG38 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK38 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG38 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG39 RAMP or SG39 RATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG39 PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG40 SP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG40 TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOAK40 DV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG40 PID</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 Monitoring and Operating the Controller

3.1 Setpoint Ramp/Soak Programming

Introduction

There are special features in this group that do not appear in the Standard UDC3500 Controller:

- There is a single SP Program of up to 40 segments
- The single “SP RAMP” feature has been eliminated

The term “programming” is used here to identify the process for selecting and entering the individual ramp and soak segment data needed to generate the required setpoint versus time profile (also called a program).

A segment is a ramp or soak function which together make up a setpoint program. Setpoint Ramp/Soak Programming lets you configure 10 ramp and 10 soak segments to be stored for use as one program or several small programs. You designate the beginning and end segments to determine where the program is to start and stop.

Review program data and configuration

While the procedure for programming is straightforward, and aided by prompts, we suggest you read “Program Contents”. Table 3-1 lists the program contents and an explanation of each to aid you in configuration.

Fill out the worksheet

Refer to the example in Figure 3-1. Draw a Ramp/Soak Profile on the worksheets provided and fill in the information for each segment. This will give you a record of how the programs were developed.

Program Contents

Table 3-1 lists all the program contents and a description of each.

ATTENTION

Segments 21 through 40 are in the PROGRAM 2 Set Up Group.
<table>
<thead>
<tr>
<th>Associated Prompts</th>
<th>Contents</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRT SEG</td>
<td>Start segment number</td>
<td>The start segment number designates the number of the first segment. Range = 1 to 40</td>
</tr>
<tr>
<td>END SEG</td>
<td>End segment number</td>
<td>The end segment number designates the number of the last segment; it must be a soak segment (even number). Range = 2 to 40</td>
</tr>
<tr>
<td>RECYCLES</td>
<td>Recycle number</td>
<td>The recycle number allows the program to recycle a specified number of times from beginning to end. Range = 0 to 99</td>
</tr>
<tr>
<td>STATE</td>
<td>Program state</td>
<td>The program state selection determines the program state after completion. The selections are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• DISABLE = program is disabled (so program value changed to DISABLE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• HOLD = program on hold</td>
</tr>
<tr>
<td>PROG END</td>
<td>Program termination state</td>
<td>The program termination state function determines the status of the controller upon completion of the program. The selections are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• LAST = controls to last setpoint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FAILSAFE = manual mode and failsafe output.</td>
</tr>
<tr>
<td>POWER OUT</td>
<td>Program state after a power outage</td>
<td>This configuration determines what the Program will do in the case of a power outage during the Program. This prompt only appears on those instruments that have the Real Time Clock option. The selections are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ABORT = Program terminated on power up. Instrument controls per the PROG END configuration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• RESUME = Continue at the same point in segment and cycle where power was lost.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• RESTART = Restart program at the beginning of the first program segment in the same cycle where power was lost.</td>
</tr>
<tr>
<td>KEYRESET (ToBEGIN)</td>
<td>Reset Program to Beginning</td>
<td>When enabled, this selection allows you to reset via the keyboard to the beginning of the program and resets the Recycle value to 0. The program mode is placed in HOLD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the current Local Setpoint 1 value is at any value other than that Setpoint value used in the first Soak segment in the program, then the program will restart at the current Local Setpoint 1 value and at the beginning of the first Ramp segment in the program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the current Local Setpoint 1 value is at the same Setpoint value as that used for the first Soak segment in the program, then the first Ramp segment is skipped and the program will restart at the beginning of the first Soak segment in the program.</td>
</tr>
<tr>
<td>Associated Prompts</td>
<td>Contents</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>KEYRESET (RERUN)</td>
<td>Rerun current cycle</td>
<td><strong>RERUN CURRENT CYCLE</strong>—When enabled, this selection allows you to reset the program via the keyboard to the beginning of the current cycle. The Recycle value is not affected. The program mode (RUN or HOLD) is not affected.</td>
</tr>
<tr>
<td>HOTSTART</td>
<td>Hot Start</td>
<td>This function determines whether LSP1 or PV is used as the setpoint when the program is initially changed from HOLD to RUN. The selections are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>DISABLE</strong> = When the program is initially changed from HOLD to RUN the present LSP1 value is captured as the default setpoint. If the program is terminated or the power cycled before the program has completed, the LSP1 is used as the control setpoint. The beginning segment uses this value as the initial ramp setpoint.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ENABLE</strong> = When the program is initially changed from HOLD to RUN the present PV value is captured and used as the beginning setpoint value for the ramp segment. If the program is terminated before completion, the setpoint value will revert back to the PV value captured at the initial HOLD to RUN transition. If the power is cycled before program completion, upon power-up the setpoint is set to the PV value at power-up and when the program is restarted that setpoint value is used initially.</td>
</tr>
<tr>
<td>RAMPUNIT</td>
<td>Ramp time or rate segments</td>
<td>A ramp segment is the time it will take to change the setpoint to the next setpoint value in the program.</td>
</tr>
<tr>
<td>SEGxRAMP or SEGxRATE</td>
<td></td>
<td>Ramps are odd number segments (1, 3, . . . 39).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ramp time is determined in either:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TIME</strong> - Hours.Minutes Range = 0-99hr.59 min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>RATE</strong> - EU/MIN or EU/HR Range = 0 to 999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This selection of time or rate is made at prompt “RAMPUNIT”. Set this prompt before entering any Ramp values.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ATTENTION</strong> Entering “0” implies an immediate step change in setpoint to the next soak.</td>
</tr>
<tr>
<td>SEGx SP</td>
<td>Soak segments</td>
<td>A soak segment is a combination of soak setpoint (value) and a soak duration (time).</td>
</tr>
<tr>
<td>SEGxTIME</td>
<td></td>
<td>• Soaks are even number segments (2, 4, . . . 40).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Segment 2 will be the initial soak value and soak time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The soak setpoint range value must be within the setpoint high and low range limits in engineering units.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Soak time is the duration of the soak and is determined in:</td>
</tr>
<tr>
<td>Associated Prompts</td>
<td>Contents</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TIME – Hours:Minutes</td>
<td>Range = 0-99 hr:59 min.</td>
<td>These prompts will appear only when the number of PID sets selected in the Control or Control 2 Setup Group is set to 4KEYBD. Each Ramp and Soak segment may select a specific PID set. A Setpoint Program enabled only for Loop 1 will use Loop 1 PID Sets. A Setpoint Program enabled only for Loop 2 will use Loop 2 PID Sets. A Setpoint Program enabled for both Loop 1 and Loop 2 will use Loop 1 PID Sets. Range: PID Set 1 to 4.</td>
</tr>
<tr>
<td>SOAK2DEV through SOAK40DEV</td>
<td>Guaranteed Soak Deviation Value</td>
<td>Each individual soak segment can have a unique guaranteed deviation value of from 0.000 to ±99.99 in engineering units. Guaranteed Soak deviation values greater than zero ensure that the soak segment’s process variable is within the ± deviation value for the configured soak time. Whenever the ± deviation value is exceeded, the soak timer stops until the process variable gets within the ± deviation value. While the soak timer is halted, “R” and “H” will alternate in the upper display. When the PV gets within the ± deviation value, the timer will resume and a steady “R” will appear in the upper display. There are no guaranteed soaks whenever the deviation value is configured to 0.00 (that is, soak segments start timing soak duration as soon as the soak setpoint is first reached, regardless of where the process variable remains relative to the soak segment). The decimal location used here corresponds decimal configuration chosen in the Display Set up group.</td>
</tr>
</tbody>
</table>
Ramp/soak profile example

Before you perform the actual configuration, it is recommended that you draw a Ramp/Soak profile in the space provided for each of the “Program Record Sheets” and fill in the associated information in the associated Tables. An example of a Ramp-Soak Profile is shown in Figure 3-1 and Table 3-2. Start setpoint is at 200 degrees F.

![Figure 3-1 Ramp/Soak Profile Example](image)

Table 3-2 Ramp/Soak Profile Example (Using 12 Segments)

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Function</th>
<th>Segment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRT SEG</td>
<td>Start Seg.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>END SEG</td>
<td>End Seg.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>RAMP UNIT</td>
<td>Engr. Unit for</td>
<td>TIME</td>
<td></td>
</tr>
<tr>
<td>RECYCLES</td>
<td>Number of</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SOAK DEV</td>
<td>Deviation Value</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>PROG END</td>
<td>Controller</td>
<td>LAST SP</td>
<td></td>
</tr>
<tr>
<td>STATE</td>
<td>Controller State at end</td>
<td>HOLD</td>
<td></td>
</tr>
<tr>
<td>KEYRESET</td>
<td>Reset SP Program</td>
<td>DISABLE</td>
<td></td>
</tr>
<tr>
<td>POWER UP</td>
<td>Program Status at Power up</td>
<td>ABORT</td>
<td></td>
</tr>
<tr>
<td>HOTSTART</td>
<td>PV Hot Start</td>
<td>DISABLE</td>
<td></td>
</tr>
<tr>
<td>SEG1RAMP</td>
<td>Ramp Time</td>
<td>1</td>
<td>1 hr.</td>
</tr>
<tr>
<td>SEG2 SP</td>
<td>Soak SP</td>
<td>2</td>
<td>300</td>
</tr>
<tr>
<td>SEG2TIME</td>
<td>Soak Time</td>
<td>2</td>
<td>1 hr:30 min.</td>
</tr>
<tr>
<td>SEG3RAMP</td>
<td>Ramp Time</td>
<td>3</td>
<td>1 hr.</td>
</tr>
<tr>
<td>SEG4 SP</td>
<td>Soak SP</td>
<td>4</td>
<td>400</td>
</tr>
<tr>
<td>SEG4TIME</td>
<td>Soak Time</td>
<td>4</td>
<td>1 hr.</td>
</tr>
<tr>
<td>SEG5RAMP</td>
<td>Ramp Time</td>
<td>5</td>
<td>1 hr:30 min.</td>
</tr>
<tr>
<td>SEG6 SP</td>
<td>Soak SP</td>
<td>6</td>
<td>250</td>
</tr>
<tr>
<td>SEG6TIME</td>
<td>Soak Time</td>
<td>6</td>
<td>3 hr:0 min.</td>
</tr>
<tr>
<td>SEG7RAMP</td>
<td>Ramp Time</td>
<td>7</td>
<td>2 hr:30 min.</td>
</tr>
<tr>
<td>SEG8 SP</td>
<td>Soak SP</td>
<td>8</td>
<td>500</td>
</tr>
<tr>
<td>SEG8TIME</td>
<td>Soak Time</td>
<td>8</td>
<td>0 hr:30 min.</td>
</tr>
<tr>
<td>SEG9RAMP</td>
<td>Ramp Time</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>SG10 SP</td>
<td>Soak SP</td>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>SG10 TIME</td>
<td>Soak Time</td>
<td>10</td>
<td>0 hr:30 min.</td>
</tr>
<tr>
<td>SG11RAMP</td>
<td>Ramp Time</td>
<td>11</td>
<td>3 hr:30 min.</td>
</tr>
<tr>
<td>SG12 SP</td>
<td>Soak SP</td>
<td>12</td>
<td>200</td>
</tr>
<tr>
<td>SG12TIME</td>
<td>Soak Time</td>
<td>12</td>
<td>0 hr:30 min.</td>
</tr>
</tbody>
</table>
Figure 3-2 SP Program Segments 1 to 20 Record Sheets

Draw your ramp/soak profile for SP Program Segments 1 to 20 on the record sheet shown below and fill in the associated information in the Table provided. This will give you a permanent record of your program and will assist you when entering the Setpoint data.

Table 3-3 SP Program Segments 1 to 20 Record Sheets

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Function</th>
<th>Segment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRT SEG</td>
<td>Start Seg.</td>
<td>SEG3RAMP</td>
<td>Ramp Time 3</td>
</tr>
<tr>
<td>END SEG</td>
<td>End Seg.</td>
<td>SEG3 PID</td>
<td>PID Set 3</td>
</tr>
<tr>
<td>RAMPUNIT</td>
<td>Engr. Unit for Ramp</td>
<td>SEG4 SP</td>
<td>Soak SP 4</td>
</tr>
<tr>
<td>RECYCLES</td>
<td>Number of Recycles</td>
<td>SEG4TIME</td>
<td>Soak Time 4</td>
</tr>
<tr>
<td>PROG END</td>
<td>Controller Status</td>
<td>SOAK4DEV</td>
<td>Guar. Soak 4</td>
</tr>
<tr>
<td>STATE</td>
<td>Controller State at end</td>
<td>SEG4 PID</td>
<td>PID Set 4</td>
</tr>
<tr>
<td>POWER UP</td>
<td>Program Status at Power up</td>
<td>SEG5 RAMP</td>
<td>Ramp Time 5</td>
</tr>
<tr>
<td>KEYRESET</td>
<td>Reset SP Program</td>
<td>SEG5 PID</td>
<td>PID Set 5</td>
</tr>
<tr>
<td>HOT START</td>
<td>PV Hot Start Program</td>
<td>SEG6 SP</td>
<td>Soak SP 6</td>
</tr>
<tr>
<td>SEG1 RAMP</td>
<td>Ramp Time 1</td>
<td>SEG6TIME</td>
<td>Soak Time 6</td>
</tr>
<tr>
<td>SEG1 PID</td>
<td>PID Set 1</td>
<td>SOAK6DEV</td>
<td>Guar. Soak 6</td>
</tr>
<tr>
<td>SEG2 SP</td>
<td>Soak SP 2</td>
<td>SEG6 PID</td>
<td>PID Set 6</td>
</tr>
<tr>
<td>SEG2 TIME</td>
<td>Soak Time 2</td>
<td>SEG7 RAMP</td>
<td>Ramp Time 7</td>
</tr>
<tr>
<td>SOAK2 DEV</td>
<td>Guar. Soak 2</td>
<td>SEG7 PID</td>
<td>PID Set 7</td>
</tr>
<tr>
<td>SEG2 PID</td>
<td>PID Set 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prompt</td>
<td>Function</td>
<td>Segment</td>
<td>Value</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>SEG8 SP</td>
<td>Soak SP</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>SEG8TIME</td>
<td>Soak Time</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>SOAK8DEV</td>
<td>Guar. Soak</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>SEG8 PID</td>
<td>PID Set</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>SEG9RAMP</td>
<td>Ramp Time</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SEG9 PID</td>
<td>PID Set</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SG10 SP</td>
<td>Soak SP</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SG10 TIME</td>
<td>Soak Time</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SOAK10DV</td>
<td>Guar. Soak</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SG10 PID</td>
<td>PID Set</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SG11RAMP</td>
<td>Ramp Time</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>SG11 PID</td>
<td>PID Set</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>SG12 SP</td>
<td>Soak SP</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SG12TIME</td>
<td>Soak Time</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SOAK12DEV</td>
<td>Guar. Soak</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SG12 PID</td>
<td>PID Set</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SG13RAMP</td>
<td>Ramp Time</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>SG13 PID</td>
<td>PID Set</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>SEG14 SP</td>
<td>Soak SP</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>SEG14TIME</td>
<td>Soak Time</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>SOAK14DV</td>
<td>Guar. Soak</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>SG14 PID</td>
<td>PID Set</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3-3 SP Program Segments 1 to 20 Record Sheets

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Function</th>
<th>Segment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG15RAMP</td>
<td>Ramp Time</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SG15 PID</td>
<td>PID Set</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SEG16 SP</td>
<td>Soak SP</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>SG16TIME</td>
<td>Soak Time</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>SOAK16DV</td>
<td>Guar. Soak</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>SG16 PID</td>
<td>PID Set</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>SG17RAMP</td>
<td>Ramp Time</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>SG17 PID</td>
<td>PID Set</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>SEG18 SP</td>
<td>Soak SP</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SG18TIME</td>
<td>Soak Time</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SOAK18DV</td>
<td>Guar. Soak</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SG18 PID</td>
<td>PID Set</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SG19RAMP</td>
<td>Ramp Time</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>SG19 PID</td>
<td>PID Set</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>SEG20 SP</td>
<td>Soak SP</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>SG20TIME</td>
<td>Soak Time</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>SOAK20DV</td>
<td>Guar. Soak</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>SG20 PID</td>
<td>PID Set</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3-3 SP Program Segments 21 to 40 Record Sheets

Draw your ramp/soak profile for SP Program Segments 21 to 40 on the record sheet shown below and fill in the associated information in the Table provided. This will give you a permanent record of your program and will assist you when entering the Setpoint data.

Table 3-4 SP Program Segments 21 to 40 Record Sheets

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Function</th>
<th>Segment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG21RAMP</td>
<td>Ramp Time</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>SG21 PID</td>
<td>PID Set</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>SEG22 SP</td>
<td>Soak SP</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>SG22TIME</td>
<td>Soak Time</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>SOAK22DV</td>
<td>Guar. Soak</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>SEG22 PID</td>
<td>PID Set</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>SG23 RAMP</td>
<td>Ramp Time</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>SG23 PID</td>
<td>PID Set</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>SEG24 SP</td>
<td>Soak SP</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>SG24TIME</td>
<td>Soak Time</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>SOAK24DV</td>
<td>Guar. Soak</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>SEG24 PID</td>
<td>PID Set</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>SG25 RAMP</td>
<td>Ramp Time</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>SG25 PID</td>
<td>PID Set</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>SEG26 SP</td>
<td>Soak SP</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>SG26TIME</td>
<td>Soak Time</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>SOAK26DV</td>
<td>Guar. Soak</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>SG26 PID</td>
<td>PID Set</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG27 RAMP</td>
<td>Ramp Time</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>SG27 PID</td>
<td>PID Set</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>SEG28 SP</td>
<td>Soak SP</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>SG28TIME</td>
<td>Soak Time</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>SOAK28DV</td>
<td>Guar. Soak</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>SEG28 PID</td>
<td>PID Set</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>SG29 RAMP</td>
<td>Ramp Time</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>SG29 PID</td>
<td>PID Set</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>SEG30 SP</td>
<td>Soak SP</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SG30 TIME</td>
<td>Soak Time</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SOAK30DV</td>
<td>Guar. Soak</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SEG30 PID</td>
<td>PID Set</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SG31 RAMP</td>
<td>Ramp Time</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>SG31 PID</td>
<td>PID Set</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>SEG32 SP</td>
<td>Soak SP</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>SG32TIME</td>
<td>Soak Time</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>SOAK32DV</td>
<td>Guar. Soak</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>SG32 PID</td>
<td>PID Set</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Prompt</td>
<td>Function</td>
<td>Segment</td>
<td>Value</td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>SG33RAMP</td>
<td>Ramp Time</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>SG33 PID</td>
<td>PID Set</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>SEG34 SP</td>
<td>Soak SP</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>SG34TIME</td>
<td>Soak Time</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>SOAK34DV</td>
<td>Guar. Soak</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>SG34 PID</td>
<td>PID Set</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>SG35RAMP</td>
<td>Ramp Time</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>SG35 PID</td>
<td>PID Set</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>SEG36 SP</td>
<td>Soak SP</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>SG36TIME</td>
<td>Soak Time</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>SOAK36DV</td>
<td>Guar. Soak</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>SG36 PID</td>
<td>PID Set</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>SG37RAMP</td>
<td>Ramp Time</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>SG37 PID</td>
<td>PID Set</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>SEG38 SP</td>
<td>Soak SP</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>SG38TIME</td>
<td>Soak Time</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>SOAK38DV</td>
<td>Guar. Soak</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>SG38 PID</td>
<td>PID Set</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>SG39RAMP</td>
<td>Ramp Time</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>SG39 PID</td>
<td>PID Set</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>SEG40 SP</td>
<td>Soak SP</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>SG40TIME</td>
<td>Soak Time</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>SOAK40DEV</td>
<td>Guar. Soak</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>SG40 PID</td>
<td>PID Set</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
4  Modbus Read, Write and Override Parameters plus Exception Codes for Lockheed Special

4.1  Overview

Introduction

This section contains information concerning Reading, Writing, and Overriding parameters in this instrument that are unique to the Lockheed Special. For all other parameters and for general information, see the UDC3500 Product Manual.

4.1.1 SP PROG1

Table 4-1 lists all the register addresses and ranges or selections for the function parameters in Set-up Group SP PROG1.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Register Address</th>
<th>Data Type</th>
<th>Access</th>
<th>Data Range or Enumerated Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
<td></td>
</tr>
<tr>
<td>SP Rate</td>
<td>174</td>
<td>01AE</td>
<td>430</td>
<td>INT</td>
</tr>
<tr>
<td>Rate Up (EU/HR)</td>
<td>108</td>
<td>006C</td>
<td>108</td>
<td>FP</td>
</tr>
<tr>
<td>Rate Down (EU/HR)</td>
<td>109</td>
<td>006D</td>
<td>109</td>
<td>FP</td>
</tr>
<tr>
<td>Rate Up (EU/HR) Loop2</td>
<td>108</td>
<td>016C</td>
<td>364</td>
<td>FP</td>
</tr>
<tr>
<td>Rate Down (EU/HR) Loop2</td>
<td>109</td>
<td>016D</td>
<td>365</td>
<td>FP</td>
</tr>
<tr>
<td>SP PROG1</td>
<td>178</td>
<td>01B2</td>
<td>434</td>
<td>INT</td>
</tr>
<tr>
<td>Start Segment #</td>
<td>88</td>
<td>0058</td>
<td>88</td>
<td>FP</td>
</tr>
<tr>
<td>Parameter</td>
<td>ID</td>
<td>Description</td>
<td>Hex</td>
<td>Decimal</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-----</td>
<td>--------------------------------------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>End Segment # (must be a Soak Segment)</td>
<td>176</td>
<td>End Segment # (must be a Soak Segment)</td>
<td>00B0</td>
<td>176</td>
</tr>
<tr>
<td>Engineering Units or Ramp Segments</td>
<td>182</td>
<td>Engineering Units or Ramp Segments</td>
<td>00B6</td>
<td>182</td>
</tr>
<tr>
<td>Program Recycles</td>
<td>89</td>
<td>Program Recycles</td>
<td>0059</td>
<td>89</td>
</tr>
<tr>
<td>Controller Status at Program End</td>
<td>180</td>
<td>Controller Status at Program End</td>
<td>00B4</td>
<td>180</td>
</tr>
<tr>
<td>Program End State</td>
<td>181</td>
<td>Program End State</td>
<td>00B5</td>
<td>181</td>
</tr>
<tr>
<td>Power UP</td>
<td>211</td>
<td>Power UP</td>
<td>40D3</td>
<td>16595</td>
</tr>
<tr>
<td>Reset SP Program (ToBEGIN)</td>
<td>179</td>
<td>Reset SP Program (ToBEGIN)</td>
<td>00B3</td>
<td>179</td>
</tr>
<tr>
<td>PV Hotstart</td>
<td>226</td>
<td>PV Hotstart</td>
<td>00E2</td>
<td>226</td>
</tr>
<tr>
<td>Segment #1 Ramp Time</td>
<td>57</td>
<td>Segment #1 Ramp Time</td>
<td>0039</td>
<td>057</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>----</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>PID SET</td>
<td>Segment #1</td>
<td>191</td>
<td>40BF</td>
<td>16575</td>
</tr>
<tr>
<td>Soak</td>
<td>PID SET</td>
<td>193</td>
<td>40C1</td>
<td>16577</td>
</tr>
<tr>
<td>Soak</td>
<td>Segment #2</td>
<td>58</td>
<td>003A</td>
<td>058</td>
</tr>
<tr>
<td>Soak</td>
<td>Segment #3</td>
<td>60</td>
<td>003C</td>
<td>060</td>
</tr>
<tr>
<td>Soak</td>
<td>Guaranteed</td>
<td>87</td>
<td>4057</td>
<td>16471</td>
</tr>
<tr>
<td>Soak</td>
<td>Segment #4</td>
<td>61</td>
<td>003D</td>
<td>061</td>
</tr>
<tr>
<td>Soak</td>
<td>Guaranteed</td>
<td>89</td>
<td>4058</td>
<td>16472</td>
</tr>
<tr>
<td>Soak</td>
<td>Segment #5</td>
<td>63</td>
<td>003F</td>
<td>063</td>
</tr>
<tr>
<td>Soak</td>
<td>Segment #6</td>
<td>64</td>
<td>0040</td>
<td>064</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------------------------</td>
<td>-----</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>Segment #6 Soak Time</td>
<td></td>
<td>65</td>
<td>0041</td>
<td>065</td>
</tr>
<tr>
<td>Guaranteed Soak #6</td>
<td></td>
<td>89</td>
<td>4059</td>
<td>16473</td>
</tr>
<tr>
<td>Segment #6 PID SET</td>
<td></td>
<td>196</td>
<td>40C4</td>
<td>16580</td>
</tr>
<tr>
<td>Segment #7 Ramp Time</td>
<td></td>
<td>66</td>
<td>0042</td>
<td>066</td>
</tr>
<tr>
<td>Segment #7 PID SET</td>
<td></td>
<td>197</td>
<td>40C5</td>
<td>16581</td>
</tr>
<tr>
<td>Segment #8 Soak Setpoint Value</td>
<td></td>
<td>67</td>
<td>0043</td>
<td>067</td>
</tr>
<tr>
<td>Segment #8 Soak Time</td>
<td></td>
<td>68</td>
<td>0044</td>
<td>068</td>
</tr>
<tr>
<td>Guaranteed Soak #8</td>
<td></td>
<td>90</td>
<td>405A</td>
<td>16474</td>
</tr>
<tr>
<td>Segment #8 PID SET</td>
<td></td>
<td>198</td>
<td>40C6</td>
<td>16582</td>
</tr>
<tr>
<td>Segment #9 Ramp Time</td>
<td></td>
<td>0045</td>
<td>069</td>
<td>FP</td>
</tr>
<tr>
<td>Segment #9 PID SET</td>
<td></td>
<td>199</td>
<td>40C7</td>
<td>16583</td>
</tr>
<tr>
<td>Segment #10 Soak Setpoint Value</td>
<td></td>
<td>70</td>
<td>0046</td>
<td>070</td>
</tr>
<tr>
<td>Segment #10 Soak Time</td>
<td></td>
<td>71</td>
<td>0047</td>
<td>071</td>
</tr>
<tr>
<td>Guaranteed Soak #10</td>
<td></td>
<td>91</td>
<td>405B</td>
<td>16475</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------</td>
<td>-----</td>
<td>-------</td>
<td>---------</td>
</tr>
</tbody>
</table>
| Segment #10     | PID SET                          | 200 | 40C8  | 16584   | INT       | R/W    | 0 = SET1  
1 = SET2  
2 = SET3  
3 = SET4                                                  |
| Segment #11     | Ramp Time                        | 72  | 0048  | 072     | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)                                              |
| Segment #11     | PID SET                          | 201 | 40C9  | 16585   | INT       | R/W    | 0 = SET1  
1 = SET2  
2 = SET3  
3 = SET4                                                  |
| Segment #12     | Soak Setpoint Value              | 73  | 0049  | 073     | FP        | R/W    | Within Setpoint Limits                                                                                |
| Segment #12     | Soak Time                        | 74  | 004A  | 074     | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min)                                                                          |
| Guaranteed      | Soak #12                         | 92  | 405C  | 16476   | FP        | R/W    | 0 to 99.9 (0 = no soak)                                                                              |
| Segment #12     | PID SET                          | 202 | 40CA  | 16586   | FP        | R/W    | 0 = SET1  
1 = SET2  
2 = SET3  
3 = SET4                                                  |
| Segment #13     | Ramp Time                        | 72  | 4048  | 16456   | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)                                              |
| Segment #13     | PID SET                          | 203 | 40CB  | 16587   | INT       | R/W    | 0 = SET1  
1 = SET2  
2 = SET3  
3 = SET4                                                  |
| Segment #14     | Soak Setpoint Value              | 73  | 4049  | 16457   | FP        | R/W    | Within Setpoint Limits                                                                                |
| Segment #14     | Soak Time                        | 74  | 404A  | 16458   | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min)                                                                          |
| Guaranteed      | Soak #14                         | 93  | 405D  | 16477   | FP        | R/W    | 0 to 99.9 (0 = no soak)                                                                              |
| Segment #14     | PID SET                          | 204 | 40CC  | 16588   | INT       | R/W    | 0 = SET1  
1 = SET2  
2 = SET3  
3 = SET4                                                  |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>ID</th>
<th>Hex</th>
<th>Decimal</th>
<th>Data Type</th>
<th>Access</th>
<th>Data Range or Enumerated Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment #15 Ramp Time</td>
<td>75</td>
<td>404B</td>
<td>16459</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #15 PID SET</td>
<td>205</td>
<td>40CD</td>
<td>16589</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #16 Soak Setpoint Value</td>
<td>76</td>
<td>404C</td>
<td>16460</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #16 Soak Time</td>
<td>77</td>
<td>404D</td>
<td>16461</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #16</td>
<td>94</td>
<td>405E</td>
<td>16478</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #16 PID SET</td>
<td>206</td>
<td>40CE</td>
<td>16590</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #17 Ramp Time</td>
<td>78</td>
<td>404E</td>
<td>16462</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #17 PID SET</td>
<td>207</td>
<td>40CF</td>
<td>16591</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #18 Soak Setpoint Value</td>
<td>79</td>
<td>404F</td>
<td>16463</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #18 Soak Time</td>
<td>80</td>
<td>4050</td>
<td>16464</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #18</td>
<td>95</td>
<td>505F</td>
<td>16479</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #18 PID SET</td>
<td>208</td>
<td>40D0</td>
<td>16592</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #19 Ramp Time</td>
<td>81</td>
<td>4051</td>
<td>16465</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
<td>Data Type</td>
<td>Access</td>
<td>Data Range or Enumerated Selection</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>----</td>
<td>------</td>
<td>---------</td>
<td>-----------</td>
<td>--------</td>
<td>------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Segment #19 PID SET</td>
<td>209</td>
<td>40D1</td>
<td>16593</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 = SET2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 = SET3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #20 Soak Setpoint Value</td>
<td>82</td>
<td>4052</td>
<td>16466</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #20 Soak Time</td>
<td>83</td>
<td>4053</td>
<td>16467</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #20</td>
<td>96</td>
<td>4060</td>
<td>16480</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #20 PID SET</td>
<td>210</td>
<td>40D2</td>
<td>16594</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 = SET2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 = SET3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 = SET4</td>
<td></td>
</tr>
</tbody>
</table>
4.1.2 SP PROG2

Table 4-2 lists all the register addresses and ranges or selections for the function parameters in Set-up Group SP PROG2.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>ID</th>
<th>Hex</th>
<th>Decimal</th>
<th>Data Type</th>
<th>Access</th>
<th>Data Range or Enumerated Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment #21 Ramp Time</td>
<td>1 Ramp Time</td>
<td>6001</td>
<td>6001</td>
<td>24577</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
</tr>
<tr>
<td>Segment #21 PID SET</td>
<td>141 PID SET</td>
<td>608D</td>
<td>608D</td>
<td>24717</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #22 Soak Setpoint Value</td>
<td>2 Soak Setpoint Value</td>
<td>6002</td>
<td>6002</td>
<td>24578</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
</tr>
<tr>
<td>Segment #22 Soak Time</td>
<td>3 Soak Time</td>
<td>6003</td>
<td>6003</td>
<td>24579</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
</tr>
<tr>
<td>Guaranteed Soak #22</td>
<td>31 Guaranteed Soak</td>
<td>601F</td>
<td>601F</td>
<td>24607</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
</tr>
<tr>
<td>Segment #22 PID SET</td>
<td>142 PID SET</td>
<td>608E</td>
<td>608E</td>
<td>24718</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #23 Ramp Time</td>
<td>4 Ramp Time</td>
<td>6004</td>
<td>6004</td>
<td>24580</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
</tr>
<tr>
<td>Segment #23 PID SET</td>
<td>143 PID SET</td>
<td>608F</td>
<td>608F</td>
<td>24719</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #24 Soak Setpoint Value</td>
<td>5 Soak Setpoint Value</td>
<td>6005</td>
<td>6005</td>
<td>24581</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
</tr>
<tr>
<td>Segment #24 Soak Time</td>
<td>6 Soak Time</td>
<td>6006</td>
<td>6006</td>
<td>24582</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
</tr>
<tr>
<td>Guaranteed Soak #24</td>
<td>32 Guaranteed Soak</td>
<td>6020</td>
<td>6020</td>
<td>24608</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
</tr>
<tr>
<td>Segment #24 PID SET</td>
<td>144 PID SET</td>
<td>6090</td>
<td>6090</td>
<td>24720</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Register Address</td>
<td>Data Type</td>
<td>Access</td>
<td>Data Range or Enumerated Selection</td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------</td>
<td>----</td>
<td>-----------------</td>
<td>-----------</td>
<td>--------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Segment #25</td>
<td>Ramp Time</td>
<td>7</td>
<td>6007</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #25</td>
<td>PID SET</td>
<td>145</td>
<td>6091</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1, 1 = SET2, 2 = SET3, 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #26</td>
<td>Soak Setpoint Value</td>
<td>8</td>
<td>6008</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #26</td>
<td>Soak Time</td>
<td>9</td>
<td>6009</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #26</td>
<td></td>
<td>33</td>
<td>6021</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #26</td>
<td>PID SET</td>
<td>146</td>
<td>6092</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1, 1 = SET2, 2 = SET3, 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #27</td>
<td>Ramp Time</td>
<td>10</td>
<td>600A</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #27</td>
<td>PID SET</td>
<td>147</td>
<td>6093</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1, 1 = SET2, 2 = SET3, 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #28</td>
<td>Soak Setpoint Value</td>
<td>11</td>
<td>600B</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #28</td>
<td>Soak Time</td>
<td>12</td>
<td>600C</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #28</td>
<td></td>
<td>34</td>
<td>6022</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #28</td>
<td>PID SET</td>
<td>148</td>
<td>6094</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1, 1 = SET2, 2 = SET3, 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #29</td>
<td>Ramp Time</td>
<td>13</td>
<td>600D</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Parameter Address</td>
<td>Data Type</td>
<td>Access</td>
<td>Data Range or Enumerated Selection</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>-----</td>
<td>-------------------</td>
<td>-----------</td>
<td>--------</td>
<td>-------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Segment #29 PID SET</td>
<td></td>
<td>149</td>
<td>6095</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #30 Soak Setpoint Value</td>
<td></td>
<td>14</td>
<td>600E</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #30 Soak Setpoint Value</td>
<td></td>
<td>15</td>
<td>600F</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Segment #30 Soak Setpoint Value</td>
<td></td>
<td>35</td>
<td>6023</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #30 PID SET</td>
<td></td>
<td>150</td>
<td>6096</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #31 Ramp Time</td>
<td></td>
<td>16</td>
<td>6010</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #31 PID SET</td>
<td></td>
<td>151</td>
<td>6097</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #32 Soak Setpoint Value</td>
<td></td>
<td>17</td>
<td>6011</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
<td></td>
</tr>
<tr>
<td>Segment #32 Soak Setpoint Value</td>
<td></td>
<td>18</td>
<td>6012</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
<td></td>
</tr>
<tr>
<td>Segment #32 Soak Setpoint Value</td>
<td></td>
<td>36</td>
<td>6024</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
</tr>
<tr>
<td>Segment #32 PID SET</td>
<td></td>
<td>152</td>
<td>6098</td>
<td>FP</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Segment #33 Ramp Time</td>
<td></td>
<td>19</td>
<td>6013</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
<td></td>
</tr>
<tr>
<td>Segment #33 PID SET</td>
<td></td>
<td>153</td>
<td>6099</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>ID</td>
<td>Hex</td>
<td>Decimal</td>
<td>Data Type</td>
<td>Access</td>
<td>Data Range or Enumerated Selection</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------------</td>
<td>-----</td>
<td>------</td>
<td>----------</td>
<td>-----------</td>
<td>--------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Segment #34 Soak Setpoint Value</td>
<td>Soak Setpoint Value</td>
<td>20</td>
<td>6014</td>
<td>24596</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
</tr>
<tr>
<td>Segment #34 Soak Time</td>
<td>Soak Time</td>
<td>21</td>
<td>6015</td>
<td>24597</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
</tr>
<tr>
<td>Guaranteed Soak #34</td>
<td>Soak Time</td>
<td>37</td>
<td>6025</td>
<td>24613</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
</tr>
<tr>
<td>Segment #34 PID SET</td>
<td>PID SET</td>
<td>154</td>
<td>609A</td>
<td>24730</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #35 Ramp Time</td>
<td>Ramp Time</td>
<td>22</td>
<td>6016</td>
<td>24598</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
</tr>
<tr>
<td>Segment #35 PID SET</td>
<td>PID SET</td>
<td>155</td>
<td>609B</td>
<td>24731</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #36 Soak Setpoint Value</td>
<td>Soak Setpoint Value</td>
<td>23</td>
<td>6017</td>
<td>24599</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
</tr>
<tr>
<td>Segment #36 Soak Time</td>
<td>Soak Time</td>
<td>24</td>
<td>6018</td>
<td>24600</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
</tr>
<tr>
<td>Guaranteed Soak #36</td>
<td>Soak Time</td>
<td>38</td>
<td>6026</td>
<td>24614</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
</tr>
<tr>
<td>Segment #36 PID SET</td>
<td>PID SET</td>
<td>156</td>
<td>609C</td>
<td>24732</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #37 Ramp Time</td>
<td>Ramp Time</td>
<td>25</td>
<td>6019</td>
<td>24601</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute)</td>
</tr>
<tr>
<td>Segment #37 PID SET</td>
<td>PID SET</td>
<td>157</td>
<td>609D</td>
<td>24733</td>
<td>INT</td>
<td>R/W</td>
<td>0 = SET1 1 = SET2 2 = SET3 3 = SET4</td>
</tr>
<tr>
<td>Segment #38 Soak Setpoint Value</td>
<td>Soak Setpoint Value</td>
<td>26</td>
<td>601A</td>
<td>24602</td>
<td>FP</td>
<td>R/W</td>
<td>Within Setpoint Limits</td>
</tr>
<tr>
<td>Segment #38 Soak Time</td>
<td>Soak Time</td>
<td>27</td>
<td>601B</td>
<td>24603</td>
<td>FP</td>
<td>R/W</td>
<td>99.59 (0-99 Hrs:0-59 Min)</td>
</tr>
<tr>
<td>Description</td>
<td>ID</td>
<td>Register Address</td>
<td>Data Type</td>
<td>Access</td>
<td>Data Range or Enumerated Selection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>----</td>
<td>------------------</td>
<td>-----------</td>
<td>--------</td>
<td>-----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guaranteed Soak #38</td>
<td>39</td>
<td>6027</td>
<td>FP</td>
<td>R/W</td>
<td>0 to 99.9 (0 = no soak)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Segment #38 PID SET       | 158| 609E             | INT       | R/W    | 0 = SET1  \\
|                           |    |                  |           |        | 1 = SET2  \\
|                           |    |                  |           |        | 2 = SET3  \\
|                           |    |                  |           |        | 3 = SET4  |
| Segment #39 Ramp Time     | 28 | 601C             | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min) or 0 to 999 (Degrees/Minute) |
| Segment #39 PID SET       | 159| 609F             | INT       | R/W    | 0 = SET1  \\
|                           |    |                  |           |        | 1 = SET2  \\
|                           |    |                  |           |        | 2 = SET3  \\
|                           |    |                  |           |        | 3 = SET4  |
| Segment #40 Soak Setpoint Value | 29 | 601D             | FP        | R/W    | Within Setpoint Limits            |
| Segment #40 Soak Time     | 30 | 601E             | FP        | R/W    | 99.59 (0-99 Hrs:0-59 Min)         |
| Guaranteed Soak #40       | 40 | 6028             | FP        | R/W    | 0 to 99.9 (0 = no soak)           |
| Segment #40 PID SET       | 160| 60A0             | INT       | R/W    | 0 = SET1  \\
|                           |    |                  |           |        | 1 = SET2  \\
|                           |    |                  |           |        | 2 = SET3  \\
|                           |    |                  |           |        | 3 = SET4  |