



**Model 900
UV Analyzer,
Absorbance Monitor and
Single/Dual Beam Photometer
Software Manual
Version 1.01**

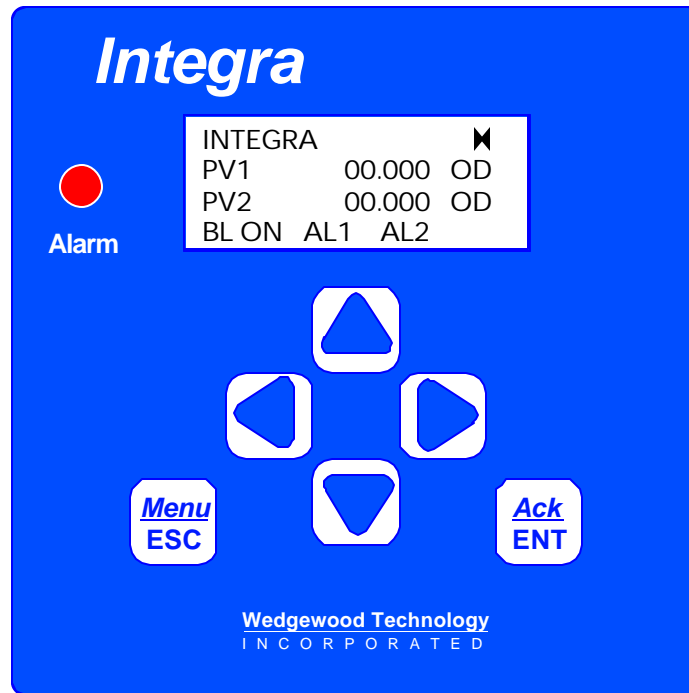


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1.0 General Overview

The Model 900 UV Analyzer, Absorbance Monitor, and the Single/Dual Beam Photometer Software, Version 1.01, has been designed for ease of operation and user application configuration. Figure 1 is a view of the Model 900 front panel. The panel design uses only six (6) buttons, a 4 line, a backlit 20 character LCD display and an Alarm indicator. The 4 arrow buttons are used to navigate between screens, and for data selection and or software options within a given screen. When in a screen, the left-right arrows control the cursor position and the up-down arrow scroll or increment standard ASCII alpha-numeric character set. Figure 2 is an overview of the software structure. The screen navigation replicates this structure and can be used to locate specific user configured procedures. The only software screen/functionality difference between the different models are: single and dual beam differ in the number of input channels (1 for single and Absorbance, 2 for dual and UV), and the proprietary Bubble Reject filtering in the Absorbance Monitor.



- ◀▶ = Panel Arrows, Scroll Left and Right Screens and Cursor Positions
- ▲▼ = Panel Arrows, Scroll Up and Down Screens and Alpha-Numeric Characters
- [TEXT] ▶◀ = Panel Arrows, Scroll Left and Right to Change Bracketed Options

Figure 1 - Model 900 Front Panel and Controls

The Model 900 software consists of three levels. The Main PV/Output (Process Variable/Current Output) Screens, The Process Control/Calibration Check Screens (Privileged), and the Configuration Sub-Menu (Password Protected).

The Figure 2 is a simplified map of the various display screens and functions. Menus are initiated by pressing the **MENU/ESC** key. Selections, Changes, and Acknowledgements are initiated by pressing the **ACK/ENT** key. Cursors and parameter changes are initiated by using the **UP/DOWN**, and **LEFT/RIGHT** keys. All user input changes are prompted with an “Are you sure?” acknowledge prompt. A press of the **MENU/ESC** key will not accept changes, and jump backwards through the menu. A press of the **ACK/ENT** key will accept changes, and continue forward through the display screen sequence.

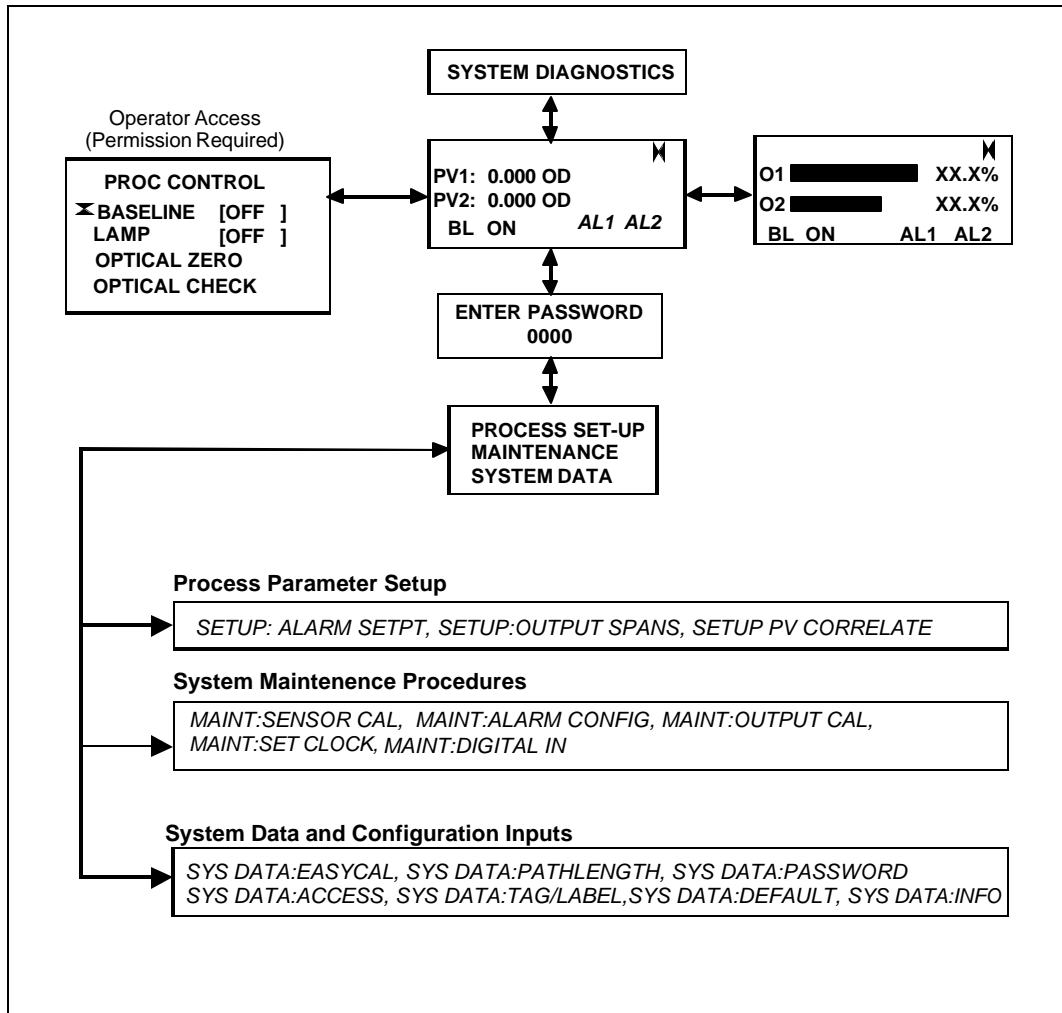


Figure 2 - Simplified Model 900 Software Flow Diagram

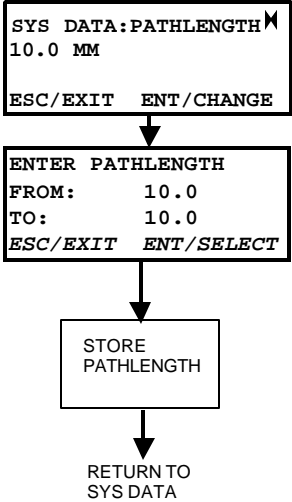
2.0 Software Description and Operation
 [1] Model 900 Start-Up and Diagnostic Functions

Model 900 Data Entry Procedures	Displayed Screens
<ol style="list-style-type: none"> 1. Apply power to the Model 900. 2. When first screen is displayed, the Up and Down Arrows can be used to adjust the screen contrast. 3. After the diagnostics, the Main Process Screen with PV1 and PV2 is displayed. The Message line will display the present instrument status. 4. If an alarm condition occurs, the panel ALARM LED and the ALARM RELAY indicator will energize. 	<p>This screen should appear immediately after power is applied.</p> <div data-bbox="1036 459 1317 573" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>DUAL BEAM PHOTOMETER TAG:UUUUUUUUUUUU VER 1.01 MM/DD/YY</pre> </div> <p>After approximately 5 Secs, the following screen is shown.</p> <div data-bbox="1036 695 1317 808" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>USER LABEL SYSTEM DIAGNOSTICS TIME LEFT 0:00 LAMP ON CONTRAST</pre> </div> <p style="text-align: center;">Error Messages</p> <div data-bbox="1044 873 1312 1020" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>OFF LAMP OFF UP CABLE FAULT LAMP FAIL LOW SIGNAL OK UNDER OVER HOLD ERROR</pre> </div> <div data-bbox="1044 1052 1325 1165" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>PV1: 0.000 OD PV2: 0.000 OD BL ON AL1 AL2</pre> </div> <div data-bbox="1036 1203 1317 1316" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre>O1 [REDACTED] XX.X% O2 [REDACTED] XX.X% BL ON AL1 AL2</pre> </div>

[2] SYSTEM DATA: Model 900 Easy-Cal Configuration Procedure.

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Press the MENU/ESC to enter the Process Set-Up, Maintenance and System Data selection screen.</p> <p>2. Select the SYSTEM DATA MENU and press ENT/SEL. Use the LEFT/RIGHT arrow to select the SYS DATA:EASYCAL Screen.</p> <p>3. If EASYCAL is installed, the screen reads, INSTALLED' YES ><'. Press ENT/CHANGE to enter the EASYCAL filter data screens. If the screen reads, INSTALLED' NO ><', proceed to the next SYSTEM DATA Screen.</p> <p>4. This screen displays the present NIST Filter A values and the Date re-certification is required. Press ENT to change the Date and filter values starting with the next screen.</p> <p>5. To change date TO: use the L-R PB to locate the cursor under the MM, DD, YY digit. Use the UP-DOWN PB to select 0-9 for each cursor position. When date is correct, press ENT. 'ARE YOU SURE?' will next appear. Press ENT to accept and ESC for NO. When accepted, the next screen will appear.</p> <p>6. To change the Filter A TO: use the LEFT-RIGHT PB to locate the cursor under the X.XXXX digit. Use the UP-DOWN PB to select 0-9 for each cursor position. When A is correct, press ENT, 'ARE YOU SURE?' will next appear. Press ENT to accept and ESC for NO. When accepted, the next screen will appear.</p> <p>NOTE: Once Easy-Cal Config is initiated, when a value entered is not accepted, the values are re-entered starting with top screen of EasyCal. The default value for the NIST filters is 1.0000 A. MM will not accept >12 and DD will not accept >31.</p>	<pre> graph TD S1["PV1: 0.000 OD PV2: 0.000 OD BL ON AL1 AL2"] --> S2["XPROCESS SET-UP MAINTENANCE SYSTEM DATA ESC/EXIT ENT/SELECT"] S2 --> S3["SYS DATA:EASYCAL INSTALLED YES"] S3 --> S4["SYS DATA:EASYCAL INSTALLED [YES]"] S4 --> S5["RECERT DUE MM/DD/YY FILTER 1.000 A"] S5 --> S6["CHANGE DUE DATE FROM: 01/01/02 TO: 01/01/02 ESC/EXIT ENT/CHANGE"] S6 --> S7["CHANGE FILTER A FROM: 1.000 A TO: 1.000 A ESC/EXIT ENT/CHANGE"] S7 --> S8["STORE NIST FILTER DATA"] </pre> <p>The flowchart illustrates the sequence of screens during the Easy-Cal configuration process. It starts with a screen showing process parameters (PV1, PV2, BL ON, AL1, AL2). The user navigates to the 'PROCESS SET-UP' menu, then to 'SYSTEM DATA', and finally to 'SYS DATA:EASYCAL'. The 'INSTALLED' status is confirmed as 'YES'. The user then enters the 'SYS DATA:EASYCAL' screen where the date and filter values are displayed. The user can change the 'RECERT DUE' date and the 'FILTER' value. The 'CHANGE DUE DATE' screen shows the current date (01/01/02) and the 'TO' date (01/01/02). The 'CHANGE FILTER A' screen shows the current filter value (1.000 A) and the 'TO' filter value (1.000 A). Finally, the user stores the NIST filter data.</p>

[3] SYSTEM DATA: Pathlength Configuration

Model 900 Data Entry Procedures	Displayed Screens
<p>1. From this screen, press either L/R PB until Pathlength screen is displayed. This screen will display the current Pathlength in MM.</p> <p>2. Press the ENT/CHANGE PB to enter the next screen.</p> <p>3. The FROM value is the present Pathlength Value. Use the L/R PB to position the cursor and the U/D PB to select wanted digit. Repeat for each digit position. When new Pathlength has been selected, press ENT twice.</p> <p>4. The SYS DATA: PATHLENGTH is displayed together with the new value for Pathlength. This screen is for information only. No measurement calculations are affected.</p> <p>5. NOTE: THE DEFAULT PATHLENGTH IS 10.0 MM Minimum Pathlength is 0.5mm Maximum Pathlength is 50.0 mm</p>	 <pre> graph TD A["SYS DATA: PATHLENGTH 10.0 MM ESC/EXIT ENT/CHANGE"] --> B["ENTER PATHLENGTH FROM: 10.0 TO: 10.0 ESC/EXIT ENT/SELECT"] B --> C["STORE PATHLENGTH"] C --> D["RETURN TO SYS DATA"] </pre> <p>The flowchart illustrates the sequence of screens during pathlength configuration. It starts with the 'SYS DATA: PATHLENGTH' screen showing '10.0 MM' and navigation options. An arrow points to the 'ENTER PATHLENGTH' screen, which shows 'FROM: 10.0' and 'TO: 10.0' with navigation options. A second arrow points to the 'STORE PATHLENGTH' screen. A final arrow points to the text 'RETURN TO SYS DATA'.</p>

[4] SYSTEM DATA: Model 900 Password Procedure

Model 900 Data Entry Procedures	Displayed Screens
<p>1. With L-R PB scroll to the SYS DATA: PASSWORD Screen. Press the ENT/CHANGE PB to change or enter a new PASSWORD.</p> <p>2. When in the ENTER OLD PASSWORD screen, the CURSOR highlights the left digit position. Use the L/R PB to wanted digit position. The U/D PB scrolls thru 0-9 for each digit position. Move the cursor to the desired digit and enter a number. The default password is "0000". When the old password number has been entered, press ENT twice to accept.</p> <p>3. When in the ENTER NEW PASSWORD screen, the CURSOR highlights the left digit position. Use the L/R PB to wanted digit position. The U/D PB scrolls thru 0-9 for each digit position. Move the cursor to the desired digit and enter a number. Repeat as wanted for each cursor position. Any password number up to 4 digits can be entered. When the password number has been selected, press ENT twice to accept. The Password for MENU access is now the number entered. Write it down and REMEMBER it! This number will be required for system access.</p> <p>NOTE: When the MENU/ESC is pressed from the Main Process Screen, the ENTER PASSWORD screen is displayed. Enter the password as selected above. If the password entered is correct, system access is allowed. If the password entered is incorrect, a RE-ENTER PASSWORD prompt is displayed.</p>	<pre> graph TD A["SYS DATA:PASSWORD ESC/EXIT ENT/CHANGE"] --> B["ENTER OLD PASSWORD 0000 ESC/EXIT ENT/CHANGE"] B --> C["ENTER NEW PASSWORD 0000 ESC/EXIT ENT/CHANGE"] C --> D["STORE PASSWORD"] D --> E["RETURN TO SYS DATA:PASSWORD"] E --> F["PV1: 0.000 OD PV2: 0.000 OD BL ON AL1 AL2"] F --> G["ENTER PASSWORD 0000 PRESS ENT WHEN DONE"] G --> H["ENTER PASSWORD 0000 RE-ENTER PASSWORD PRESS ENT WHEN DONE"] H --> I["PROCESS SET-UP MAINTENANCE SYSTEM DATA ESC/EXIT ENT/SELECT"] </pre>

[5] SYSTEM DATA: Operator Process Screen Access

Model 900 Data Entry Procedures	Displayed Screens
<p>1. With the L-R PB, scroll right to SYS DATA: ACCESS screen. The current privileges are displayed. Press the ENT to enter the change access.</p> <p>2. Select the option to configure. Note: The Response is in brackets, []. With bracketed responses use the L/R PB for changes. Select YES for each option. There are 4 options to configure. When all changes are made, press ENT PB twice to accept the entries and return to top screen. From this screen, press the MENU/ESC twice to return to the Main Process Screen.</p>	<pre> graph TD S1["SYS DATA: ACCESS BASELINE Y LAMP Y OPT ZERO Y OPT CHK Y ESC/EXIT ENT/CHANGE"] --> S2["OPERATOR SCRIN ACCESS X BASELINE [YES] NO LAMP ON/OFF [YES] ESC/EXIT ENT/CHANGE"] S2 --> S3["OPERATOR SCRIN ACCESS BASELINE [YES] NO X LAMP ON/OFF [YES] NO ESC/EXIT ENT/CHANGE"] S3 --> S4["OPERATOR SCRIN ACCESS X OPTICAL ZERO [YES] NO OPTICAL CHK [YES] ESC/EXIT ENT/CHANGE"] S4 --> S5["OPERATOR SCRIN ACCESS OPTICAL ZERO [YES] NO X OPTICAL CHK [YES] NO ESC/EXIT ENT/CHANGE"] S5 --> S6["STORE ACCESS LEVEL"] S6 --> S7["RETURN TO SYS DATA"] </pre>

[5] SYSTEM DATA: The Model 900 Operator Process Screen Access (Con't)

Model 900 Data Entry Procedures	Displayed Screens
<p>3. From the Main Process Screen scroll thru the process screens using the L/R PB to display the PROC CONTROL screen. If the Access Screen Privileges were set to YES, and full access was allowed, the following procedure will confirm operator access to these process control selections.</p> <p>4. Scroll through the listing and verify that the assigned privileges are displayed. Privileges not assigned are not displayed.</p> <p>Note: If EasyCal is not installed on Dual Beam Photometer, Optical Check screen will not be displayed.</p>	<p>Main Process Screens</p> <pre> PV1: 0.000 OD PV2: 0.000 OD BL ON AL1 AL2 </pre> <pre> O1 [REDACTED] XX.X% O2 [REDACTED] XX.X% BL ON AL1 AL2 </pre> <p>Operator Process Access Screens</p> <pre> X PROC CONTROL BASELINE OFF LAMP OFF ESC/EXIT ENT/SELECT </pre> <pre> PROC CONTROL X BASELINE [OFF] LAMP OFF ESC/EXIT ENT/SELECT </pre> <pre> PROC CONTROL BASELINE OFF X LAMP [OFF] ESC/EXIT ENT/SELECT </pre> <pre> PROC CONTROL X OPTICAL ZERO OPTICAL CHECK ESC/EXIT ENT/SELECT </pre> <pre> PROC CONTROL OPTICAL ZERO X OPTICAL CHECK ESC/EXIT ENT/SELECT </pre>

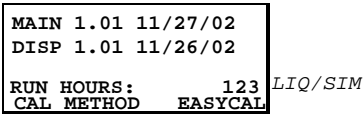
[6] SYSTEM DATA: Verification of: The Model 900 System Data Tag and Label Entry Procedure.

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll in the SYSTEM DATA MENU until SYS DATA: TAG/LABEL is displayed. Use the U-D PB to select TAG:XXXXXXXXXX and press ENT.</p> <p>2. In the SYS DATA: TAG/LABEL screen, use the L/R PB to position cursor at wanted character position. Use the U/D PB to scroll thru the numbers, characters and symbols available at each character position. Repeat as needed for the Tag but not more than 12 characters. When completed, press ENT twice to accept.</p> <p>3. Repeat the above procedure for the LABEL. When finished the display will return to the top screen and the LABEL entered will be displayed.</p> <p>4. Press the ESC twice to return to the Main Process Screen and the entered label will appear on that screen. Repeat the above Tag and Label entry procedure as necessary to validate the entry procedure.</p>	<pre> graph TD S1["SYS DATA:TAG/LABEL TAG: NO TAG LABEL:NO LABEL ESC/EXIT ENT/SELECT"] S2["ENTER TAG (12 MAX) FROM: NO TAG TO: NO TAG ESC/EXIT ENT/CHANGE"] S3["STORE TAG"] S4["RETURN TO SYS DATA"] S5["SYS DATA:TAG/LABEL TAG: NO TAG LABEL:NO LABEL ESC/EXIT ENT/SELECT"] S6["ENTER LABEL (12 MAX) FROM: NO LABEL TO: NO LABEL ESC/EXIT ENT/CHANGE"] S7["STORE LABEL"] S8["RETURN TO SYS DATA"] S1 --> S2 S2 --> S3 S3 --> S4 S4 --> S5 S5 --> S6 S6 --> S7 S7 --> S8 </pre>

[7] SYSTEM DATA: Factory Default

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll in the SYSTEM DATA MENU until SYS DATA: FACT DFLT is displayed. Press ENT to proceed.</p> <p>2. This screen allows the user to return the Model 900 to the factory default parameters. All configured screens (except sample correlation) will be reset. Press the ESC to exit without changing or ENT to reset to default settings.</p> <p>3. The final screen prompts the user to cycle the input power (OFF then ON) to reset.</p>	<div data-bbox="1049 352 1334 468" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>SYS DATA:FACT DFLT ▶</p> <p>ESC/EXIT ENT/CHANGE</p> </div> <div data-bbox="1049 499 1334 615" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PRESS ENTER TO SET FACTORY DEFAULT CONFIGURATION</p> <p>ESC/EXIT ENT/CHANGE</p> </div> <div data-bbox="1049 640 1334 751" style="border: 1px solid black; padding: 5px;"> <p>FACTORY DEFAULTS HAVE BEEN SET POWER MUST BE CYCLED</p> <p>ESC/EXIT ENT/CHANGE</p> </div>

[8] SYSTEM DATA: Verification of: The Model 900 System Information Screen, Run Time, CAL Method and Software versions.

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll with the L-R until the SYS DATA: INFO screen is displayed. This is a status/information screen and no entries are made. As changes are made in the CAL METHOD, the current method will be displayed in this screen. The hours displayed are the total hours of Model 900 operation. The MAIN and DISP indicate the current software versions of the Main and Display processors.</p>	 <pre>MAIN 1.01 11/27/02 DISP 1.01 11/26/02 RUN HOURS: 123 LIQ/SIM CAL METHOD EASYCAL</pre>

[9] Process Setup: Bubble Reject (Absorbance Monitor Only)

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Press the ESC/MENU until the PROCESS SET-UP screen is displayed. With the U-D PB, select MAINTENANCE and press ENT.</p> <p>2. Scroll with L-R PB until the SET-UP: BUBBLE REJECT is displayed. The current Bubble Reject "Count" value will be displayed. To change value, press ENT twice.</p> <p>3. Use the L-R PB to scroll through the possible selections. Count Values of 0, 1, 5, 10, 30, and 60 are possible. These correspond nominally to filtering time in seconds. Select the value that works best for the desired application. When the Count Value is selected, press ENT twice to change and accept.</p>	<div data-bbox="1052 321 1328 432" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PROCESS SET-UP X MAINTENANCE SYSTEM DATA ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1052 453 1328 564" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>SETUP: BUBBLE REJECT X COUNT 0 ESC/EXIT ENT/CHANGE</p> </div> <div data-bbox="1052 573 1328 684" style="border: 1px solid black; padding: 5px;"> <p>CHANGE BUBBLE REJECT FROM: 0 TO: [0] X ESC/EXIT ENT/SELECT</p> </div>

[10] Process Setup: Baseline Shift

Model 900 Data Entry Procedures	Displayed Screens
<ol style="list-style-type: none"> 1. Press the ESC/MENU until the PROCESS SET-UP screen is displayed. With the U-D PB, select PROCESS SET-UP and press ENT. 2. Scroll with L-R PB until the SET-UP: BASELINE SHIFT is displayed. The current Baseline Shift “%” Percentage value will be displayed. To change value, press ENT twice. 3. Use the L-R PB to position the cursor and the U-D PB to select wanted number. When the new percentage value has been entered, press ENT twice to change and accept. 4. The PV2 Analog Output will “Shift” to the % of full scale selected when the baseline is activated. Hence, a 0% baseline shift value will output a 4ma (zero) signal, and a 50% baseline shift value will output a 12ma (midscale) signal. 	<div data-bbox="1052 327 1330 441" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PROCESS SET-UP * MAINTENANCE SYSTEM DATA ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1052 462 1330 562" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>SETUP:BASELINE SHIFT SHIFT 0% ESC/EXIT ENT/CHANGE</p> </div> <div data-bbox="1052 583 1330 684" style="border: 1px solid black; padding: 5px;"> <p>CHANGE BASELINE SHIFT FROM: 0% TO: 0% ESC/EXIT ENT/SELECT</p> </div>

[11] Process Setup: Alarm 1 and 2 Set Points

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Press the ESC/MENU until the PROCESS SET-UP screen is displayed. With the U-D PB, select PROCESS SET-UP and press ENT.</p> <p>4. Scroll with L-R PB until the SET-UP: ALARM SETPT is displayed. Select AL1 with the U-D PB and press ENT to change set point value. Use the L-R PB to position the cursor and the U-D PB to select wanted number. When the new set point value has been entered, press ENT twice to change and accept.</p> <p>5. From the top screen select AL2 with the U-D PB. Follow the procedure used for AL1.</p> <p>NOTE: The Alarm Setpoint is based on system range/user units. Values entered that exceed maximum range will be rounded down to the maximum Setpoint value for that pathlength.</p>	<p style="text-align: center;">Alarm 1 Screens</p> <pre> XPROCESS SET-UP MAINTENANCE SYSTEM DATA ESC/EXIT ENT/SELECT </pre> <pre> SETUP: ALARM SETPT XAL1: 1.100 OD AL2: 2.000 OD ESC/EXIT ENT/SELECT </pre> <pre> CHANGE AL1 SETPT FROM: 1.100 OD TO: 1.100 OD ESC/EXIT ENT/CHANGE </pre> <pre> STORE AL1 </pre> <pre> RETURN TO SETUP:ALARM SETPT </pre> <p style="text-align: center;">Alarm 2 Screens</p> <pre> SETUP: ALARM SETPT AL1: 1.100 OD XAL2: 2.000 OD ESC/EXIT ENT/SELECT </pre> <pre> CHANGE AL2 SETPT FROM: 2.000 OD TO: 2.000 OD ESC/EXIT ENT/CHANGE </pre> <pre> STORE AL2 </pre> <pre> RETURN TO SETUP:ALARM SETPT </pre>

[12] Process Setup: SETUP: OUTPUT SPANS, Outputs 1 and 2 span adjust

Model 900 Data Entry Procedures	Displayed Screens
<p style="text-align: center;">Output 1 Span Adjust</p> <p>1. Scroll with L-R PB until the SETUP:OUTPUT SPANS screen is displayed and scroll U-D to O1 (Output 1). Press ENT to select. The next screen displays the current span and the Max and Min values that can be entered. The Maximum and Minimum span limit is determined by the system range/user units. Press ENT to enter the CHANGE O1 SPAN screen.</p> <p>2. In this screen the current value for span is the FROM value. Position the cursor as done previously and select the number for that position. Repeat as needed for each digit position. When the new span has been entered press ENT twice to change and accept.</p> <p style="text-align: center;">Output 2 Span Adjust</p> <p>1. Scroll with L-R PB until the SETUP:OUTPUT SPANS screen is displayed and scroll U-D to O2 (Output 2). Press ENT to select. The next screen displays the current span and the Max and Min values that can be entered. The Maximum and Minimum span limit is determined by the system range/user units. Press ENT to enter the CHANGE O2 SPAN screen.</p> <p>2. In this screen the current value for span is the FROM value. Position the cursor as done previously and select the number for that position. Repeat as needed for each digit position. When the new span has been entered press ENT twice to change and accept.</p> <p>NOTE: The output spans are based on the system range/user units. If span values entered exceed the minimum or maximum acceptable values, the entered values will either be rounded up to the minimum value or down to the maximum value.</p>	<p style="text-align: center;">Output 1 Screens</p> <pre> SETUP:OUTPUT SPANS M O1 [] 19.9% O2 [] 30.0% ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre> O1 SPAN 2.00 UNITS MAX: 2.00 OD MIN: 0.10 OD ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <pre> CHANGE O1 SPAN FROM: 2.00 OD TO: XX.XX OD ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <pre> SANITY CHK MIN/MAX </pre> <p style="text-align: center;">↓</p> <pre> RETURN TO PROCESS SETUP </pre> <p style="text-align: center;">Output 2 Screens</p> <pre> SETUP:OUTPUT SPANS M O1 [] 19.9% O2 [] 30.0% ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre> O2 SPAN XXXXX UNITS MAX: 2.00 OD MIN: 0.10 OD ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <pre> CHANGE O2 SPAN FROM: 2.00 OD TO: XX.XX OD ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <pre> SANITY CHK MIN/MAX </pre> <p style="text-align: center;">↓</p> <pre> RETURN TO PROCESS SETUP </pre>

[13] Process Setup: SETUP: PV CORRELATE, Sample in Cell

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll with the L-R PB to the SETUP: PV CORRELATE screen, press ENT to select.</p> <p>2. The next screen asks which curve (1-3) do you want to store the sample information. Scroll with the L-R PB to select curve number. Press ENT to continue</p> <p>3. Select 'SAMPLE IN CELL?' by scrolling with the U-D PB to select. Press ENT to continue.</p> <p>4. The next screen asks if sample is in the cell and displays the PV (process value). If this value is within the Min/Max acceptable press the ENT to read and store.</p> <p>5. The next screen asks if another sample is to be measured. Press the ENT to read another sample, ESC to finish.</p> <p>6. Continue with as many samples (12 max) as required. The last screen asks to store the data. Press the ENT to save data or, ESC to abort.</p>	<pre> SETUP PV CORRELATE M PV1: 1.000 UNITS PV2: 1.000 UNITS ESC/EXIT ENT/CHANGE </pre> <pre> SETUP PV CORRELATE CURVE [#1] # POINTS ESC/EXIT ENT/CHANGE </pre> <pre> PROCESS CORRELATE X SAMPLE IN CELL? SAMPLE EDIT? MANUAL ENTRY? ESC/EXIT ENT/SELECT </pre> <pre> PV:1.000 OD CURVE #1 SAMPLE #1 IN CELL? ESC/EXIT ENT/READ </pre> <pre> SANITY CHECK. OD RANGE MIN>OD<MAX. IF NOT OK UNDER/OVER ESC TO ABORT </pre> <pre> CURVE #1 ANOTHER SAMPLE? ESC/NO ENT/YES </pre> <pre> PV:2.000 OD CURVE #1 SAMPLE #2 IN CELL? ESC/EXIT ENT/READ </pre> <pre> CURVE #1 ANOTHER SAMPLE? ESC/NO ENT/YES </pre> <pre> CURVE #1 (# POINTS) SAVE DATA ? ESC/EXIT ENT/ACCEPT </pre>

[14] Process Setup: SETUP: PV CORRELATE, Sample Edit

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll with the L-R PB to the SETUP: PV CORRELATE screen, press ENT to select.</p> <p>2. The next screen asks which curve (1-3) do you want to store/edit the sample information. Scroll with the L-R PB to select curve number. Press ENT to continue</p> <p>3. Select 'SAMPLE EDIT?' by scrolling with the U-D PB to select. Press ENT to continue.</p> <p>4. The next screen asks if the user would like to change the sample point OD value. If this value needs to be changed, use the U-D and L-R PB to change value. Press the ENT PB to continue.</p> <p>5. The next screen is for entry of user values that can be assigned to the measured value. i.e. 1.32 measured units to 99.999 units. The FROM value is the last entered value (1.000 OD Default) on the 'ENTER USER VALUE' screen. Enter the new value using the U-D and L-R PB to position the cursor and select the number for each required position. If a different position is required for the decimal point, do this first. Press ENT twice to change and accept.</p> <p>6. The Change OD and Change User Value screens will continue for as many points as have been entered in the "Sample in Cell" section.</p> <p>7. When all the sample points have been edited, the Change Units screen is next. The engineering unit can be entered is limited to 6 alpha-numeric characters.(i.e. gr/l, %, mg/l, cel/cc, etc.). Press ENT twice to change and accept entry.</p> <p>8. The Max/Min values are calculated in the entered values and units. These values are the new limits for output span and the displayed Process Display PV value and units.</p>	<pre> SETUP PV CORRELATE M PV1: 1.000 UNITS PV2: 1.000 UNITS ESC/EXIT ENT/CHANGE </pre> <pre> SETUP PV CORRELATE CURVE [#1] # POINTS: UNITS ESC/EXIT ENT/CHANGE </pre> <pre> PROCESS CORRELATE SAMPLE IN CELL? X SAMPLE EDIT? MANUAL ENTRY? ESC/EXIT ENT/SELECT </pre> <pre> CHANGE OD #1 FROM: 1.000 TO: 1.000 ESC/EXIT ENT/CHANGE </pre> <pre> ENTER USER VALUE #1 FROM: 1.000 TO: 100.0 ESC/EXIT ENT/CHANGE </pre> <pre> CHANGE OD #2 FROM: 2.000 TO: 2.000 ESC/EXIT ENT/CHANGE </pre> <pre> ENTER USER VALUE #2 FROM: 1.000 TO: 200.0 ESC/EXIT ENT/CHANGE </pre> <pre> CHANGE UNITS FROM: OD TO: CU ESC/EXIT ENT/CHANGE </pre> <pre> CURVE #1 (2 POINTS) MAX: 500.0 CU MIN: 10.0 CU ESC/EXIT ENT/ACCEPT </pre>

[15] Process Setup: SETUP: PV CORRELATE, Manual Entry

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll with the L-R PB to the SETUP: PV CORRELATE screen, press ENT to select.</p> <p>2. The next screen asks which curve (1-3) do you want to store/edit the sample information. Scroll with the L-R PB to select curve number. Press ENT to continue</p> <p>3. Select 'MANUAL ENTRY' scrolling with the U-D PB to select. Press ENT to continue.</p> <p>4. The next screen asks if the user to enter the first point OD value. Use the U-D and L-R PB to change value. Press the ENT PB to continue.</p> <p>5. The next screen is for entry of user values that can be assigned to the measured value. i.e. 1.32 measured units to 99.999 units. The FROM value is the last entered value (1.000 OD Default) on the 'ENTER USER VALUE' screen. Enter the new value using the U-D and L-R PB to position the cursor and select the number for each required position. If a different position is required for the decimal point, do this first. Press ENT twice to change and accept.</p> <p>6. The "ANOTHER DATA POINT" screen will be next. Press ENT to add another point, ESC to continue. A maximum of 12 points may be entered per curve.</p> <p>7. When all the sample points have been entered, the "ENTER UNITS" screen is next. The engineering unit can be entered is limited to 6 alpha-numeric characters.(i.e. gr/l, %, mg/l, cell/cc, etc.). Press ENT twice to change and accept entry.</p> <p>8. The Max/Min values are calculated in the entered values and units. These values are the new limits for output span and the displayed Process Display PV value and units.</p>	<pre> SETUP PV CORRELATE M PV1: 1.000 UNITS PV2: 1.000 UNITS ESC/EXIT ENT/CHANGE SETUP PV CORRELATE CURVE [#2] # POINTS: UNITS ESC/EXIT ENT/CHANGE PROCESS CORRELATE SAMPLE IN CELL? SAMPLE EDIT? X MANUAL ENTRY? ESC/EXIT ENT/SELECT CHANGE OD #1 FROM: 0.000 TO: 1.000 ESC/EXIT ENT/CHANGE SANITY CHECK. OD RANGE MIN>OD<MAX. IF NOT OK UNDER/OVER ESC TO ABORT ENTER USER VALUE #1 FROM: 0.000 TO: 5.000 ESC/EXIT ENT/CHANGE CURVE #2 ANOTHER DATA POINT? ESC/NO ENT/YES CHANGE OD #2 FROM: 0.000 TO: 2.000 ESC/EXIT ENT/CHANGE ENTER USER VALUE #2 FROM: 0.000 TO: 10.00 ESC/EXIT ENT/CHANGE CURVE #2 ANOTHER DATA POINT? ESC/NO ENT/YES CHANGE UNITS FROM: OD TO: CU ESC/EXIT ENT/CHANGE CURVE #2 (2 POINTS) MAX: 25.00 CU MIN: 0.50 CU ESC/EXIT ENT/ACCEPT </pre>

[16] Process Setup: SETUP: RUN CAL CURVE

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll with the L-R PB to the SETUP: RUN CAL CURVE screen, press ENT to select.</p> <p>2. The next screen asks which curve (0-3) do you want to execute. Curve #0 is the default OD measurement. Curves 1-3 are user defined. Scroll with the U-D PB to select curve number. Press ENT twice to select and confirm.</p> <p>NOTE: Entering a curve with Process Correlate will automatically set it as the active curve.</p>	<div data-bbox="1057 388 1325 489" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">SETUP RUN CAL CURVE CAL CURVE #0 ESC/EXIT ENT/CHANGE</div> <div data-bbox="1057 506 1325 609" style="border: 1px solid black; padding: 5px;">CHANGE CAL CURVE FROM: CURVE [#0] TO: CURVE [#0] ESC/EXIT ENT/CHANGE</div>

[17] MAINTENANCE: SENSOR CAL, SIMULATOR

Model 900 Data Entry Procedures	Displayed Screens
<p>1. The Calibration Type, Simulator/Default or EasyCAL is set in the SYS DATA: EASYCAL screen. When NO is selected, the calibration is Simulator or Default. From the screen Process Screen press the ESC twice to return to the Process Setup, Maintenance and System Data Screen.</p> <p>2. If the absorbance seen by the Model 900 unit is out of range for calibration, the High Absorbance warning message will appear.</p> <p>3. The CAL screen will now appear. The user may choose Simulator (current source) or Default calibration. The Simulator function may be used if two (2) current sources (Dual Beam) or one (1) current source (Single Beam) are available. These would replace the detector assembly, and provide the input to the Model 900. The Default method, uses a straight mathematical equation to calculate the OD from the log amp output with “nominal” values. The nominal values may differ unit to unit, but are very repeatable for a given unit. Select either method with the U-D PB’s and Press ENT to select.</p> <p>4. The current source should provide an output similar to the sensor being simulated. A maximum of 166µA input current should be used for a “zero” reading on both measurement and reference channels.</p> <p>5. The SIMULATOR screen will now appear and the PV value will be near ‘0’ and display ZERO SOL IN CELL. When the ENT is pressed, this PV value is stored and establishes zero point for the calibration procedure.</p> <p>6. The next screen shows/changes the calibration value. Enter a value of 1.000 OD (typically). Press ENT twice to accept.</p> <p>7. The next screen will show current PV value, and will read the simulated (current source) value. The measurement current source should be changed to reflect the calibration value entered previously. If 166µA input current was used as a “zero”, then a value of 16.6µA input current should be used on the measurement source for a 1 OD value. Press ENT to proceed.</p> <p>8. The next screen will show the calibrated value, press ENT to confirm.</p>	<div data-bbox="1057 289 1325 401" style="border: 1px solid black; padding: 2px;"> <p>MAINT:SENSOR CAL M ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1057 428 1325 539" style="border: 1px solid black; padding: 2px;"> <p>HIGH ABSORBANCE IN CELL. CAN NOT PROCEED. ESC/ABORT</p> </div> <div data-bbox="1057 567 1325 678" style="border: 1px solid black; padding: 2px;"> <p>CAL X SIMULATOR DEFAULT OD ESC/EXIT ENT/ACCEPT</p> </div> <div data-bbox="1057 705 1325 816" style="border: 1px solid black; padding: 2px;"> <p>SIMULATOR 0.000 OD SIMULATOR AT ZERO ESC/EXIT ENT/READY</p> </div> <div data-bbox="1057 844 1325 955" style="border: 1px solid black; padding: 2px;"> <p>SIMULATOR STD VALUE FROM: 0.000 OD TO: 1.000 OD ESC/EXIT ENT/CHANGE</p> </div> <div data-bbox="1057 982 1325 1094" style="border: 1px solid black; padding: 2px;"> <p>SIMULATOR CAL 1.000 OD SIM AT STD VALUE ESC/EXIT ENT/READY</p> </div> <div data-bbox="1057 1121 1325 1232" style="border: 1px solid black; padding: 2px;"> <p>SIM CAL CONFIRM SIM 1.000 OD ESC/EXIT ENT/ACCEPT</p> </div>

[18] MAINTENANCE: SENSOR CAL, Default

Model 900 Data Entry Procedures	Displayed Screens
<p>1. The Calibration Type, Simulator/Default or Easycal is set in the SYS DATA: EASYCAL screen. When NO is selected, the calibration is Simulator or Default. From the screen Process Screen press the ESC twice to return to the Process Setup, Maintenance and System Data Screen.</p> <p>2. If the absorbance seen by the Model 900 unit is out of range for calibration, the High Absorbance warning message will appear.</p> <p>3. The CAL screen will now appear. The user may choose Simulator (current source) or Default calibration. The Simulator function may be used if two (2) current sources (Dual Beam) or one (1) current source (Single Beam) are available. These would replace the detector assembly, and provide the input to the Model 900. The Default method, uses a straight mathematical equation to calculate the OD from the log amp output with "nominal" values. The nominal values may differ unit to unit, but are very repeatable for a given unit. Select either method with the U-D PB's and Press ENT to select.</p> <p>4. The sensor should be connected to the Model 900, and have a non-absorbing solution water or air, in the flowcell. The DEFAULT screen will now appear and the PV value will be near '0' and display ZERO SOL IN CELL. When the ENT is pressed, this PV value is stored and establishes zero point for the calibration procedure and calculates the nominal OD calibration.</p>	<div data-bbox="1057 321 1326 432" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>MAINT:SENSOR CAL M</p> <p>ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1057 464 1326 575" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>HIGH ABSORBANCE IN CELL. CAN NOT PROCEED. ESC/ABORT</p> </div> <div data-bbox="1057 606 1326 718" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>CAL SIMULATOR X DEFAULT OD ESC/EXIT ENT/ACCEPT</p> </div> <div data-bbox="1057 749 1326 861" style="border: 1px solid black; padding: 5px;"> <p>DEFAULT OD 0.000 OD ZERO SOL IN CELL? ESC/EXIT ENT/READY</p> </div>

[19] MAINTENANCE: SENSOR CAL, EASYCAL

Model 900 Data Entry Procedures	Displayed Screens
<p>1. If EASYCAL INSTALLED is YES, and the MAINTENANCE: SENSOR CAL is selected the Pre Cal check will be performed. The EASYCAL FILTER DATA screen will then be displayed. This screen has the current filter value and the certification due date. Press ENT to continue.</p> <p>2. The EASYCAL CALIBRATE screen displays the current Zero solution in the cell. Press ENT to accept and confirm and store this value.</p> <p>3. The value displayed in the next screen is '0.000 A' and changes when the FILTER is set to the IN position (Approx 1.000). Press ENT to accept and confirm this value.</p> <p>4. The screen that follows displays the calibrated value. Press ENT to accept, confirm and store this value.</p> <p>NOTE: When the calibration procedure is completed, set the NIST Filter in the OUT position and set the thumbscrews to hold the filter in position.</p>	<div data-bbox="1052 415 1321 531" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>MAINT:SENSOR CAL M</p> <p>ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1052 556 1321 672" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>HIGH ABSORBANCE IN CELL. CAN NOT PROCEED. ESC/ABORT</p> </div> <div data-bbox="1052 697 1321 812" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>EASYCAL FILTER DATA FIL 1.000A CERT DUE 11/01/01 ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 846 1321 961" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>EASYCAL CALIBRATE 0.000 A ZERO CALIBRATE ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 999 1321 1115" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>EASYCAL CALIBRATE 1.000 A PLACE FIL IN ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 1152 1321 1268" style="border: 1px solid black; padding: 5px;"> <p>FILTER 1.000 A ESC/EXIT ENT/ACCEPT</p> </div>

Notes for MAINTENANCE: SENSOR CAL, Autocal Calibrate

To verify the AUTOCAL Calibrate software performance, the AUTOCAL Controller and actuator must be installed. In selecting this mode of calibration the alarm output relays, Relay 1 and Relay 2 are re-defined and control the Filter Valve. The following chart defines the action of the Digital In options for Disable, Std Config and Auto-Cal selections.

Disabled: All digital Inputs are disabled, Alarm Relay Outputs are as configured in Alarm 1-2 setup.

Std Config: Digital Input 1 = LAMP ON/OFF
Digital Input 2 = BASELINE ON/OFF
Digital Input 3 = BASELINE UPDATE
Digital Input 4 = HOLD

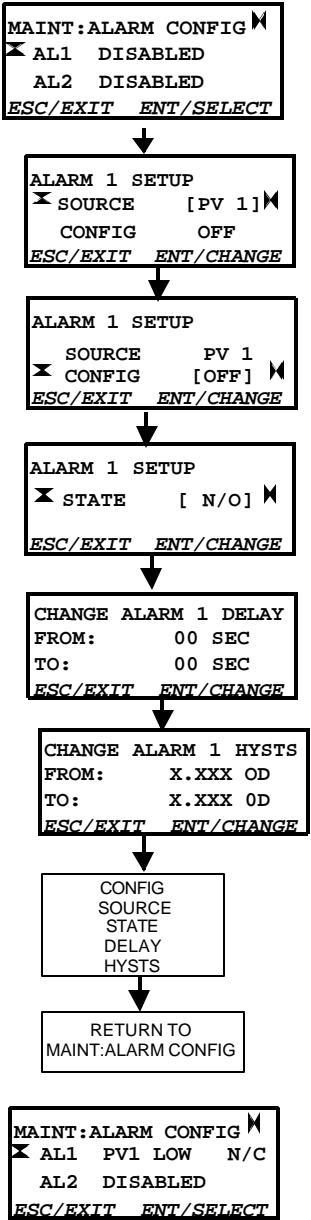
Auto-Cal Config: Digital Input 1 = FILTER IN
Digital Input 2 = N.C.
Digital Input 3 = FILTER OUT
Digital Input 4 = SELECTABLE (LAMP ON/OFF, BASELINE ON/OFF, BASELINE UPDATE,HOLD)
Relay 1 = Filter Valve Enable
Relay 2 = N.C.

Since the AUTOCAL option is only used when the AUTOCAL controller and actuator are installed. The EasyCal filter data entered under in the SYS DATA is used for with the AutoCal calibration sequence. The AUTOCAL procedure is similar to the EasyCal except the filter position is initiated from the Model 900 front panel and controlled by the AutoCal controller and actuator. For the Validation Procedure, it is recommended that the AUTOCAL procedure be performed after all other tests have been completed. That will save time and avoid confusion.

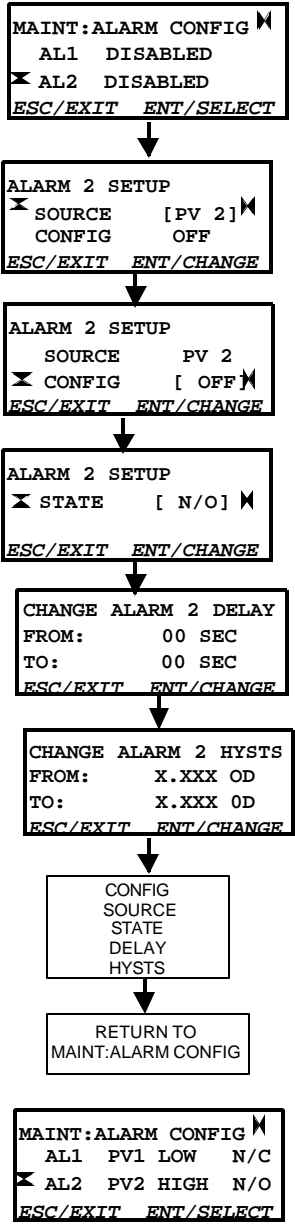
[20] MAINTENANCE: SENSOR CAL, Autocal Calibrate

Model 900 Data Entry Procedures	Displayed Screens
<p>1. The AUTOCAL sensor calibration follows the ENT to select from the MAINT: SENSOR CAL when the EasyCal Installed is 'YES' and the MAINT:DIGITAL IN screen has AUTOCAL CONFIG selected. The first screen displays the filter data after the sensor Pre-Cal Check has been passed.</p> <p>2. Press ENT to start the procedure. With an acceptable ZERO solution in the sensor, a ZERO Calibrate is performed and the 'TEMP ZERO' is stored when the ENT is pressed.</p> <p>3. The AUTOCAL CALIBRATE is displayed with the current PV and the filter state displayed. The FILTER CHANGING will quickly change to FILTER IN the PV value will go to 1.000 OD. When the PV value is stable, press ENT to accept and confirm.</p> <p>4. The Filter will then be moved to the OUT position, and the calibrated value will be displayed. Press ENT to accept and confirm.</p> <p>NOTE: With AUTOCAL system, the filter position and valve action is monitored by the Model 900 digital inputs. If a failure occurs, the FIL CHANGING screen will not change. To check this, remove in succession each digital input. Also, the air supply may have been removed. These failure tests will result in FILTER CHANGING screen latch-ups. If this occurs, check all wiring and the controller air supply and power.</p>	<div data-bbox="1052 352 1318 466" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>MAINT:SENSOR CAL M</p> <p>ESC/EXIT ENT/SELECT</p> </div> <div data-bbox="1052 493 1318 606" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>HIGH ABSORBANCE IN CELL. CAN NOT PROCEED. ESC/ABORT</p> </div> <div data-bbox="1052 634 1318 747" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>EASYCAL FILTER DATA FILTER 1.000A CERT DUE 11/01/01 ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 774 1318 888" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>AUTOCAL CALIBRATE 0.000 A ZERO CALIBRATE ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 930 1318 1043" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>AUTOCAL CALIBRATE 0.000 A FILTER CHANGING ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 1085 1318 1199" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>AUTOCAL CALIBRATE 1.000 A FILTER IN ESC/EXIT ENT/READY</p> </div> <div data-bbox="1052 1226 1318 1339" style="border: 1px solid black; padding: 5px;"> <p>FILTER 1.000 A ESC/EXIT ENT/ACCEPT</p> </div>

[21] MAINTENANCE: ALARM CONFIG, Alarm 1

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll to the MAINT: ALARM CONFIG screen. Use the U-D PB to select the AL1 line. Press ENT to select and confirm.</p> <p>2. The 'ALARM 1 SETUP' screen will appear with the SOURCE line selected. Select either PV1 or PV2.</p> <p>3. Press the U-D PB to scroll down to the 'ALARM 1 SETUP CONFIG' line. Use the L-R PB to select OFF, HIGH, LOW. High = Alarm above Setpoint. Low = Alarm below Setpoint.</p> <p>4. Press the U-D PB to scroll down to the ALARM 1 SETUP STATE screen. The L-R PB selects either normally open (N/O) or normally closed (N/C) alarm state of the relay contacts. Select the N/O option and press ENT to accept and confirm.</p> <p>5. The CHANGE ALARM 1 DELAY is next displayed. Set the delay to value between 00 to 99 SEC. Press ENT to accept and confirm.</p> <p>The CHANGE ALARM 1 HYSTS option controls the alarm hysteresis. If the alarm Setpoint is set 1.00 OD and the hysteresis is 0.100 OD, an alarm condition exists at 1.00 OD and will stay in alarm until the PV is 0.90 OD or less. Hysteresis can be called the deadband between an alarm on and off condition. Set the hysteresis to 0.100 OD and press ENT to accept and confirm. The top screen is next displayed and selected Alarm 1 options are shown.</p>	 <pre> graph TD S1["MAINT:ALARM CONFIG X AL1 DISABLED AL2 DISABLED ESC/EXIT ENT/SELECT"] --> S2["ALARM 1 SETUP X SOURCE [PV 1] CONFIG OFF ESC/EXIT ENT/CHANGE"] S2 --> S3["ALARM 1 SETUP SOURCE PV 1 X CONFIG [OFF] ESC/EXIT ENT/CHANGE"] S3 --> S4["ALARM 1 SETUP X STATE [N/O] ESC/EXIT ENT/CHANGE"] S4 --> S5["CHANGE ALARM 1 DELAY FROM: 00 SEC TO: 00 SEC ESC/EXIT ENT/CHANGE"] S5 --> S6["CHANGE ALARM 1 HYSTS FROM: X.XXX OD TO: X.XXX OD ESC/EXIT ENT/CHANGE"] S6 --> S7["CONFIG SOURCE STATE DELAY HYSTS"] S7 --> S8["RETURN TO MAINT:ALARM CONFIG"] S8 --> S9["MAINT:ALARM CONFIG X AL1 PV1 LOW N/C AL2 DISABLED ESC/EXIT ENT/SELECT"] </pre>

[22] MAINTENANCE: ALARM CONFIG, Alarm 2

Model 900 Data Entry Procedures	Displayed Screens
<p>1. Scroll to the MAINT: ALARM CONFIG screen. Use the U-D PB to select the AL2 line. Press ENT to select and confirm.</p> <p>2. The 'ALARM 1 SETUP' screen will appear with the SOURCE line selected. Select either PV1 or PV2.</p> <p>3. The procedures for configuring Alarm 2 are the same as Alarm 1. When the alarm have been configured, the top screen , MAINT: ALARM CONFIG is displayed and both Alarm 1 and 2 configurations are shown.</p>	 <pre> graph TD S1["MAINT:ALARM CONFIG AL1 DISABLED AL2 DISABLED ESC/EXIT ENT/SELECT"] --> S2["ALARM 2 SETUP SOURCE [PV 2] CONFIG OFF ESC/EXIT ENT/CHANGE"] S2 --> S3["ALARM 2 SETUP SOURCE PV 2 CONFIG [OFF] ESC/EXIT ENT/CHANGE"] S3 --> S4["ALARM 2 SETUP STATE [N/O] ESC/EXIT ENT/CHANGE"] S4 --> S5["CHANGE ALARM 2 DELAY FROM: 00 SEC TO: 00 SEC ESC/EXIT ENT/CHANGE"] S5 --> S6["CHANGE ALARM 2 HYSTS FROM: X.XXX OD TO: X.XXX OD ESC/EXIT ENT/CHANGE"] S6 --> S7["CONFIG SOURCE STATE DELAY HYSTS"] S7 --> S8["RETURN TO MAINT:ALARM CONFIG"] S8 --> S9["MAINT:ALARM CONFIG AL1 PV1 LOW N/C AL2 PV2 HIGH N/O ESC/EXIT ENT/SELECT"] </pre>

[23] MAINTENANCE: Output Cal, Outputs 1 and 2

Model 900 Data Entry Procedures	Displayed Screens
<p style="text-align: center;">Output 1 Cal Adjust</p> <ol style="list-style-type: none"> 1. Scroll to the MAINT: OUTPUT CAL screen. Use the U-D PB to select the OUTPUT 1 line. Press ENT to select. 2. The next screen allows trimming of the 4.00 mA output up or down using the L-R PB. After the 4MA TRIM has been adjusted to wanted value, press ENT to accept and confirm. 3. Scroll down to the 20MA TRIM and adjust the 20 mA output up or down using the L-R PB. After the 20 mA TRIM has been adjusted to wanted value, press ENT to accept and confirm. <p style="text-align: center;">Output 2 Cal Adjust</p> <ol style="list-style-type: none"> 4. Scroll to the MAINT: OUTPUT CAL screen. Use the U-D PB to select the OUTPUT 2 line. Press ENT to select. 5. The next screen allows trimming of the 4.00 mA output up or down using the L-R PB. After the 4MA TRIM has been adjusted to wanted value, press ENT to accept and confirm. 6. Scroll down to the 20MA TRIM and adjust the 20 mA output up or down using the L-R PB. After the 20 mA TRIM has been adjusted to wanted value, press ENT to accept and confirm. <p>NOTE: The OUTPUT CAL procedure is performed to adjust for any errors between the Model 900 and the connected analog input. Usually these errors are due to terminating impedances.</p> <p>NOTE: The Output Cal adjustments for the Full and Minimum Scale values is done with a suitable measuring device connected to each output, i.e. a recorder, PLC Analog input properly terminated or other suitable device.</p>	<p style="text-align: center;">Output 1 Cal Screens</p> <pre> MAINT:OUTPUT CAL M X OUTPUT 1 OUTPUT 2 ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre> OUTPUT 1 CAL +/-2% X 4MA TRIM 20MA TRIM ESC/EXIT ENT/ACCEPT </pre> <p style="text-align: center;">↓</p> <pre> OUTPUT 1 CAL +/-2% 4MA TRIM X 20MA TRIM ESC/EXIT ENT/ACCEPT </pre> <p style="text-align: center;">↓</p> <pre> ESC RETURN TO MAINT:OUTPUT CAL </pre> <p style="text-align: center;">Output 2 Cal Screens</p> <pre> MAINT:OUTPUT CAL M OUTPUT 1 X OUTPUT 2 ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre> OUTPUT 2 CAL +/-2% X 4MA TRIM 20MA TRIM ESC/EXIT ENT/ACCEPT </pre> <p style="text-align: center;">↓</p> <pre> OUTPUT 2 CAL +/-2% 4MA TRIM X 20MA TRIM ESC/EXIT ENT/ACCEPT </pre> <p style="text-align: center;">↓</p> <pre> ESC RETURN TO MAINT:OUTPUT CAL </pre>

[24] MAINTENANCE: SET DATE and TIME

Model 900 Data Entry Procedures	Displayed Screens
<p style="text-align: center;">Set Date Procedure</p> <p>1. Use the L-R PB to scroll the Maintenance screens until the MAINT: SET CLOCK is displayed. Use the U-D PB to select the CUR DATE line.</p> <p>2. Press ENT to select the DATE option and then the CHANGE DATE Screen is displayed with the previously set date. Use the L-R PB to position the cursor and the U-D PB to change the mm/dd/yy numbers. When the wanted date is entered, press ENT to accept and confirm.</p> <p style="text-align: center;">Set Time Procedure</p> <p>1. Use the L-R PB to scroll the Maintenance screens until the MAINT: SET CLOCK is displayed. Use the U-D PB to select the CUR TIME line.</p> <p>2. Press ENT to select the TIME option and then the CHANGE TIME Screen is displayed with the previously set time. Use the L-R PB to position the cursor and the U-D PB to change the hh/mm/ss numbers. When the wanted time is entered, press ENT to accept and confirm. A 24 hour format is used.</p>	<p style="text-align: center;">Set Date Screens</p> <pre style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> MAINT:SET CLOCK M X CUR DATE 03/22/02 CUR TIME 11:15:13 ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> CHANGE DATE FROM: 03/22/02 TO: 03/22/02 ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"> SET DATE USING L-R FOR CURSOR POSITION AND U-D PB FOR DATE CHANGE </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"> ESC RETURN TO MAINT:SET CLOCK </div> <p style="text-align: center;">Set Time Screens</p> <pre style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> MAINT:SET CLOCK M CUR DATE 03/22/02 X CUR TIME 11:15:13 ESC/EXIT ENT/SELECT </pre> <p style="text-align: center;">↓</p> <pre style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> CHANGE TIME FROM: 11:22/09 TO: 11:21:18 ESC/EXIT ENT/CHANGE </pre> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"> SET DATE USING L-R FOR CURSOR POSITION AND U-D PB FOR TIME CHANGE </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"> ESC RETURN TO MAINT:SET CLOCK </div>

[25] MAINTENANCE: DIGITAL IN

Model 900 Data Entry Procedures	Displayed Screens
<p>1. The MAINT: DIGITAL IN screen selects the External Digital configuration. Press ENT to initiate the DIGITAL IN configuration procedure.</p> <p>2. The following screen displays the current configuration of the external digital inputs. Use the L-R PB to scroll through the DISABLE, STANDARD CONFIG and AUTOCAL CONFIG. When disabled the external digital inputs are inoperative.</p> <p>3. When in the STANDARD CONFIG, the digital inputs are configured as;</p> <ol style="list-style-type: none"> 1. Lamp On-Off 2. Baseline On-Off 3. Baseline Update 4. Hold. <p>4. When the AUTOCAL CONFIG is selected, use the U-D PB to position the cursor #4 Lamp On-Off line. Use the L-R PB to scroll thru the options listed for #4 digital input. When the wanted option is selected, press ENT to accept and confirm. The default is LAMP ON/OFF.</p>	<pre> graph TD S1["MAINT: DIGITAL IN DISABLED ESC/EXIT ENT/SELECT"] --> S2["CHG DIGITAL IN CNFG DISABLED ESC/EXIT ENT/SELECT"] S2 --> S3["CHG DIGITAL IN CNFG STANDARD CONFIG ESC/EXIT ENT/SELECT"] S3 --> S4["CHG DIGITAL IN CNFG AUTO-CAL CONFIG #4 LAMP ON/OFF ESC/EXIT ENT/SELECT"] S4 --> S5["CHG DIGITAL IN CNFG AUTO-CAL CONFIG #4 LAMP ON/OFF ESC/EXIT ENT/SELECT"] </pre> <p>STANDARD CONFIG AUTO-CAL CONFIG</p> <p>LAMP ON/OFF BASELINE ON/OFF BASELINE UPDATE HOLD</p>

[27] PROC CONTROL: BASELINE (Model 900 Digital Input 2 and 3 Controlled)

Model 900 Data Entry Procedures	Displayed Screens
<p>1. When in the Process Screen, the PV1 and PV2 will read the same value > 0.000 OD.</p> <p>2. To activate the BASELINE, Digital 2 Input is switched to logic low. The PV2 value will immediately go to '0.000' and the BL ON will be displayed. As long as the Digital Input is low the BASELINE is ON.</p> <p>3. To update the BASELINE to a new level, Digital 3 Input is momentarily switched to LO. The BL ON is displayed and the PV2 value goes to 0.000.</p> <p>4. With Digital 2 Input to HI, the BASELINE is OFF. The PV1 and PV2 values are equal and the BL OFF is displayed.</p>	<p style="text-align: center;">Process Screen</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PV1: 0.500 OD</p> <p>PV2: 0.500 OD</p> <p>BL OFF AL1 AL2</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PV1: 0.500 OD</p> <p>PV2: 0.000 OD</p> <p>BL ON AL1 AL2</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PV1: 1.000 OD</p> <p>PV2: 0.500 OD</p> <p>BL ON AL1 AL2</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>PV1: 1.000 OD</p> <p>PV2: 0.000 OD</p> <p>BL ON AL1 AL2</p> </div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px;"> <p>PV1: 0.000 OD</p> <p>PV2: 0.000 OD</p> <p>BL OFF AL1 AL2</p> </div>

[28] PROC CONTROL: LAMP (Model 900 Panel and Digital Controlled)

Model 900 Data Entry Procedures	Displayed Screens
<p>Model 900 Panel Controlled</p> <ol style="list-style-type: none"> 1. Again from the Process Screen scroll to the PROCESS CONTROL screen and scroll down to the LAMP [OFF] option. With the L-R PB select OFF and press ENT to accept and confirm. 2. When the lamp is turned OFF, the front panel ALARM LED and the Alarm Relay will be energized. The Process Screen will display 'LAMP OFF'. <p>Model 900 Digital Input 1 Controlled</p> <ol style="list-style-type: none"> 1. From the Process Screen set the Digital Input 1 toggle switch to OFF, (LAMP ON/OFF). 2. When the lamp is turned OFF, the front panel ALARM LED and the Alarm Relay will be energized. The Process Screen will display 'LAMP OFF'. 3. When this test is confirmed, set the Digital Input 1 toggle switch to ON, (LAMP ON/OFF) to turn the lamp 'ON'. When the lamp is ON, the alarms will reset and the display LAMP OFF will not be displayed. <p>Note: During the time when the lamp is returned to the ON position, and the alarms are reset, a CABLE FAULT message may be displayed on the screen.</p>	<p>Model 900 Panel Screens</p> <pre> graph TD S1["PV1: 0.000 OD PV2: 0.000 OD BL OFF AL1 AL2"] --> S2["X PROC CONTROL BASELINE [OFF] LAMP [ON] ESC/EXIT ENT/SELECT"] S2 --> S3["X PROC CONTROL BASELINE [OFF] LAMP [OFF]M ESC/EXIT ENT/SELECT"] S3 --> S4["OFF,ON"] S4 --> S5["PV1: 0.000 OD PV2: 0.000 OD BL OFF LAMP OFF"] </pre> <p>Model 900 Digital Input 1 Screens</p> <pre> graph TD S1["PV1: 0.000 OD PV2: 0.000 OD BL OFF AL1 AL2"] --> S2["PV1: 0.000 OD PV2: 0.000 OD BL OFF LAMP OFF"] S2 --> S3["PV1: 0.000 OD PV2: 0.000 OD BL OFF AL1 AL2"] </pre>

[29] PROC CONTROL: HOLD FUNCTION (Model 900 Digital Input 4 Controlled)

Model 900 Data Entry Procedures	Displayed Screens
<p>1. When in the process screen, set the Digital Input 4 toggle switch to ON, (HOLD ON).</p> <p>2. The HOLD function sets the Model 900 in standby and all outputs will remain at the value until the HOLD is released.</p>	<pre> graph TD A["PV1: 0.500 OD PV2: 0.500 OD BL OFF AL1 AL2"] -- "HOLD ON" --> B["HOLD PV1: 0.500 OD PV2: 0.500 OD BL OFF AL1 AL2"] B -- "HOLD OFF" --> C["PV1: 0.000 OD PV2: 0.000 OD BL OFF AL1 AL2"] </pre> <p>The flowchart illustrates the state of the Model 900 process screen during a HOLD operation. It starts with a normal process screen showing PV1 and PV2 at 0.500 OD, BL OFF, and AL1 and AL2. Pressing the HOLD ON button transitions the screen to a standby state where the word 'HOLD' is displayed above the PV1 and PV2 values, which remain at 0.500 OD. Pressing the HOLD OFF button then transitions the screen back to the normal process screen, but with the PV1 and PV2 values reset to 0.000 OD.</p>

[30] PROC CONTROL: OPTICAL ZERO

Model 900 Data Entry Procedures	Displayed Screens
<p>1. The OPTICAL ZERO is the basic instrument zero. This procedure is performed during periods when a low optical absorbent liquid is in the sensor sample cell.</p> <p>2. With the L-R PB scroll to the PROCESS CONTROL screen. Scroll down this screen with the U-D PB thru the Baseline and Lamp options to the OPTICAL ZERO option. Press ENT to accept and confirm.</p> <p>3. Upon return to the Process Screen, PV values will now read 0.000 OD, confirming the OPTICAL ZERO function.</p>	<pre> graph TD S1["PV1: 0.500 OD PV2: 0.500 OD BL OFF AL1 AL2"] --> S2["PROC CONTROL BASELINE OFF LAMP OFF ESC/EXIT ENT/SELECT"] S2 --> S3["PROC CONTROL BASELINE OFF LAMP [OFF] ESC/EXIT ENT/SELECT"] S3 --> S4["PROC CONTROL OPTICAL ZERO OPTICAL CHECK ESC/EXIT ENT/SELECT"] S4 --> S5["PV1: 0.000 OD PV2: 0.000 OD BL OFF AL1 AL2"] </pre>

[31] PROC CONTROL: OPTICAL CHK, Easycal Check

Model 900 Data Entry Procedures	Displayed Screens
<p>1. If the EASYCAL INSTALLED option was selected in the SYS DATA: EASYCAL screen, then the EASYCAL CHK will be displayed when performing the OPTICAL CHK.</p> <p>2. The first screen of the procedure is 'ZERO SOL IN CELL?'. Insure the Easycal filter is in the OUT position. Press ENT to accept and confirm.</p> <p>3. If the solution is within limits, the EASYCAL CHK screen is displayed. If not, the FAIL ZERO screen is displayed.</p> <p>4. When the EASYCAL CHK screen is displayed, set the EASYCAL filter to the 'IN' position. The PV will read 1.000 A Press ENT to accept and confirm.</p> <p>5. The FILTER OUT? Screen is next displayed. Set the Easycal filter to the 'OUT' position. When ready, press the ENT to accept and confirm.</p> <p>6. The next screen displays the PV of the filter and if it is within tolerance, PASS EASYCAL CHK is displayed.</p> <p>7. If the filter value is not within tolerance, then the FAIL CHK >+/- 1% is displayed together with the measured value, PV.</p>	<pre> graph TD S1["EASYCAL CHK PV:0.000 A ZERO SOL IN CELL? ESC/EXIT ENT/READY"] --> S2["EASYCAL CHK PV:0.000 A FAIL ZERO > +/- 1% ESC/EXIT ENT/READY"] S2 -- OPT ZERO OK --> S3["EASYCAL CHK PV:1.000 A FILTER IN? ESC/EXIT ENT/READY"] S3 --> S4["EASYCAL CHK PV:0.000 A FILTER OUT? ESC/EXIT ENT/READY"] S4 --> S5["EASYCAL CHK PV:0.000 A PASS EASYCAL CHK ESC/EXIT ENT/READY"] S5 --> S6["EASYCAL CHK PV:0.000 A FAIL CHK > +/- 1% ESC/EXIT ENT/READY"] S6 --> S7["ESC TO RETURN MAIN PROCESS"] S5 --> S6 </pre>

[32] PROC CONTROL: OPTICAL CHK, Autocal Check

Model 900 Data Entry Procedures	Displayed Screens
<p>1. If the EASYCAL INSTALLED option was selected in the SYS DATA: EASYCAL , and the AUTOCAL CONFIG selected in the DIGITAL INPUT screen then the EASYCAL/AUTOCAL CHK will be displayed when performing the OPTICAL CHK.</p> <p>2. The first screen of the procedure is FILTER IS OUT. If the empty cell absorbance is within limits, the AUTOCAL CHK screen is displayed. If not, the FAIL ZERO screen is displayed.</p> <p>3. When the AUTOCAL CHK screen is displayed the filter is changed and the display will read FILTER IS IN and the display will read 1.000 A</p> <p>4. Press ENT to accept and confirm and to move down to the next AUTOCAL CHK Screen. The filter is changed and the display will read FILTER IS OUT and the display will read 0.000 A</p> <p>5. Press ENT to accept and confirm and to move down to the next AUTOCAL CHK Screen. The AUTOCAL CHK will either PASS or FAIL. The measured Absorbance of the filter will be displayed, and if it is within tolerance, PASS EASYCAL CHK is displayed. If the filter value is not within tolerance, then the FAIL CHK > +/- 1% is displayed together with the measured value, A.</p>	<pre> graph TD S1["EASYCAL CHK 0.000 A FILTER IS OUT ESC/EXIT ENT/READY"] --> S2["AUTOCAL CHK 0.000 A FAIL ZERO > +/- 1% ESC/EXIT ENT/READY"] S2 -- OPT ZERO OK --> S3["AUTOCAL CHK 1.000 A FILTER IS IN ESC/EXIT ENT/READY"] S3 --> S4["AUTOCAL CHK 0.000 A FILTER IS OUT ESC/EXIT ENT/READY"] S4 --> S5["AUTOCAL CHK 0.000 A PASS EASYCAL CHK ESC/EXIT ENT/READY"] S5 --> S6["AUTOCAL CHK 0.000 A FAIL CHK > +/- 1% ESC/EXIT ENT/READY"] S6 --> S7["ESC TO RETURN MAIN PROCESS"] </pre>



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