CURLIN® SERVICE MANAGER

USER MANUAL

For use with the CURLIN 8000
Ambulatory Infusion Pump

MOOG®

Enhancing Healthcare.
Enriching Lives.™

CURLIN® Service Manager Enterprise Solution Software User Manual

Contents

List of Figures

List of Tables

Chapter 1. Introduction

Minimum Computer Requirements

- Windows 10 or 11
- 8 GB of RAM
- 2.4 GHz processor
- Display resolution XGA, 1024 x 768*

*Windows display scale set to 100%
*For XGA, leave scale at 100%

Intended Audience

Biomedical / service personnel can use this manual, along with personalized training, to manage verification and issue investigation of the CURLIN® 8000 pump, from this point forward referred to as “pump”.

CURLIN Service Manager Enterprise Solution Software

The CURLIN Service Manager Enterprise Solution (ES) Software is part of the ES software suite, which also includes the CURLIN Admin Manager and RxManager™ (Figure 1-1).

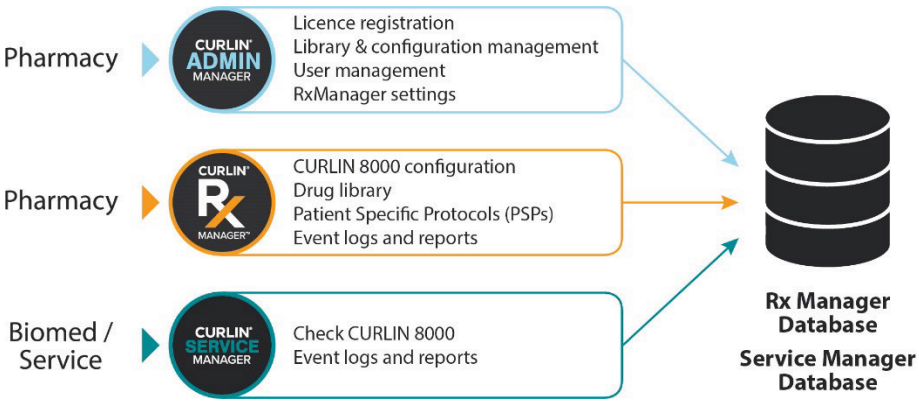


Figure 1-1: Enterprise Solution Software Suite

The Service Manager allows authorized users to:

- Review pump details
- Perform verification that pump meets specifications
- Perform annual Preventive Maintenance (PM)
- Generate reports

  - Verification reports
  - Pump event reports
- "Reset" pump prior to having pump leave current fleet; e.g., returning a leased pump
  - Set log "erased" marker
  - Reset pump to Factory Default configuration

Note: Calibration can only be performed by Moog Service. Any device that fails Verification should be serviced by Moog.

Logging In

You can log in to Service Manager from one computer at a time. If your facility has multiple computers, you must log out from Service Manager on the current computer before logging in to a different one.

Note: Service Manager should already be installed on your computer. For software installation information, see the ES Client Application Setup Guide.

1. Make sure you know your username and password. If you do not, contact your Pharmacy Administrator or IT Administrator.
2. To open Service Manager, double-click the Service Manager icon on your desktop (Figure 1-2).

Figure 1-2: Service Manager Icon

3. Type your username and password in the appropriate fields (Figure 1-3).

Note: If you attempt to log in 10 times with an incorrect password, your account will lock. Contact your IT Administrator or Root IT Administrator to unlock it.

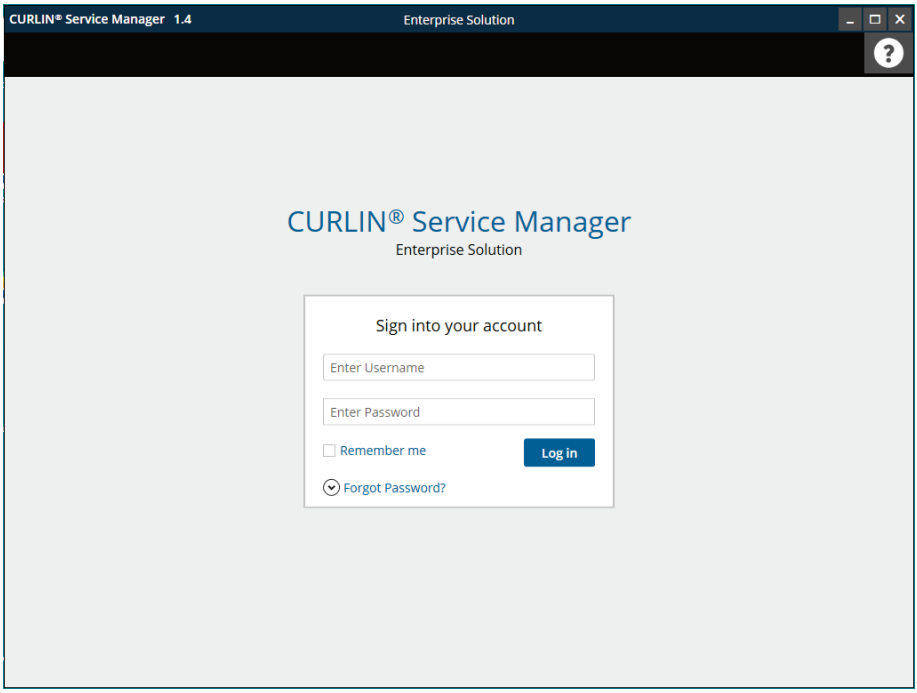


Figure 1-3: Logging In

4. Optional: If you want your username to automatically appear the next time you open Service Manager, select **Remember me**.
5. Click **Log in**. With your Enterprise Solution Software license, you purchased a number of active logins. If the number of users is at that maximum, you will be unable to log in to Service Manager and a message displays, requesting that you try to log in later.

   If there is an active login available, either the Home / Pump Details screen (Figure 2-1 or Figure 2-2), or the screen for the last Verification test for the attached pump (Chapter 4, Pump Verification) will be displayed. Your log in name and role appear at the top right corner of the screen.

Note: After 30 minutes of inactivity, the Service Manager will automatically log out the user.

Returning to the Home / Pump Details Screen

To return to the Home / Pump Details screen from any other screen, click **Home** (located in the upper left corner).

Changing Your Password

Once you have successfully logged in to Service Manager, you can change your password. Passwords must be between 8-32 characters and must contain at least one uppercase letter, one lowercase letter, and one number.

Note: If you attempt to log in 10 times with an incorrect password, your account will lock. Contact your IT Administrator or Pharmacy Administrator to request unlocking it.

1. In the upper right corner, click your name, then click **Change Password**.
2. Type your current password, then your new password (twice). The new passwords must match.
3. Click **OK**. A message appears, confirming a successful password change.

Note: If you attempt to create a new password that is found in the PwnedPasswordsTop100k list, you will get an on-screen message that states: “The password you have entered is commonly used and not secure. Please choose a different password.” If you get this message, you must create a different password.

Moog recommends that user passwords are changed at least once a year, unless there is an immediate threat or if the user suspects their password has been compromised in some way, in which case the password should be updated immediately.

Logging Out

Your log in name is displayed in the top right corner of the screen.

To sign out of Service Manager, click your name in the upper right corner and then click **Log Out** (Figure 1-4).

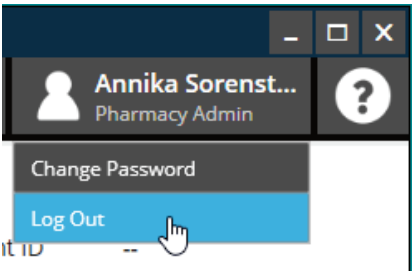
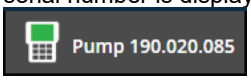


Figure 1-4: Logging Out

Chapter 2. Home / Pump Details Screen

When you first open Service Manager, either the Home / Pump Details screen is displayed (Figure 2-1 or Figure 2-2) or the last Verification test screen is displayed. The Home / Pump Details screen provides access to the different functions in Service Manager (Verification, Service Utilities, and Reports are described in Table 2-1).

The Pump Details, displayed at the top of the screen, are described in Table 2-2.

Is the pump attached to the computer running Service Manager?	**Then:**
Yes	One of the following occurs: • The Pump Details are updated/displayed (Figure 2-1). In the top status bar, the screen of the pump icon is green and its serial number is displayed:  • Service Manager will automatically transition to the last Verification test performed for this pump. See Chapter 4, Pump Verification.
No	The Home screen displays the Pump Details as “--" (Figure 2-2).

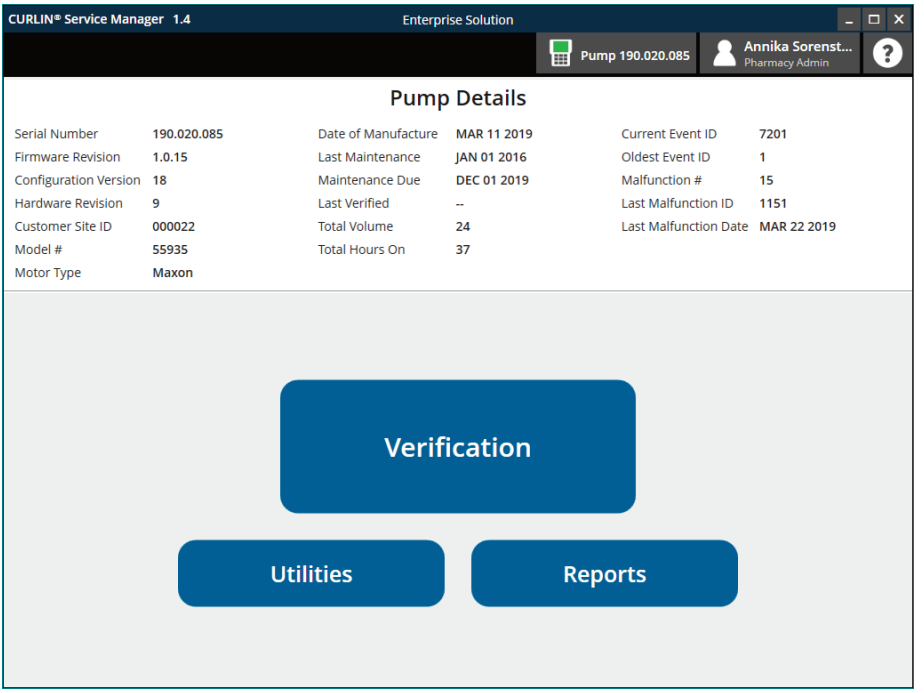


Figure 2-1: Home / Pump Details Screen (pump attached)

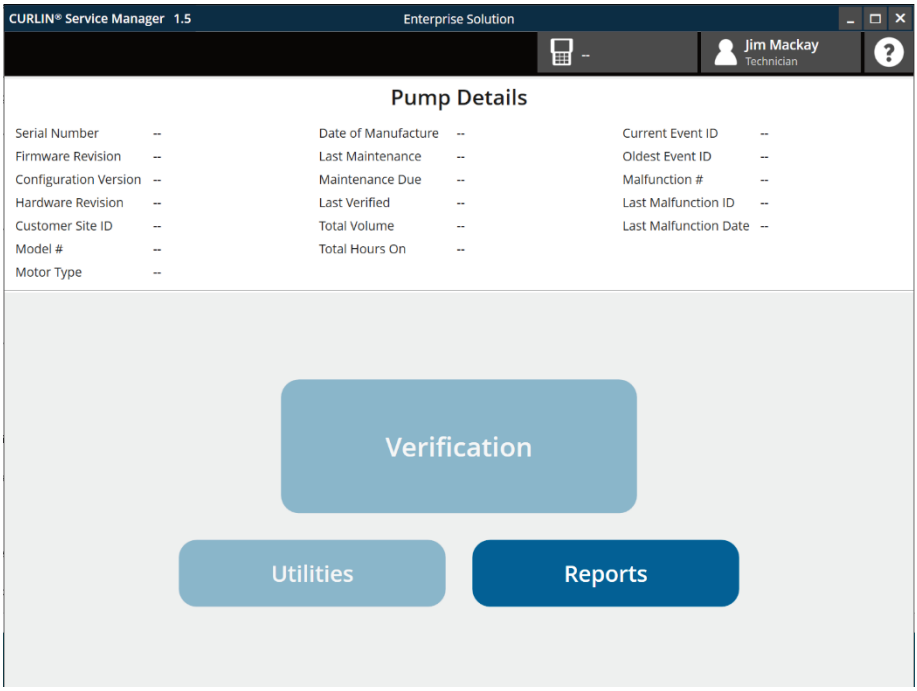


Figure 2-2: Home / Pump Details Screen (no pump attached)

Table 2-1: Home / Pump Details Screen Functions

Function	You can…	For more information, see:
Verification	Verify that the pump meets specification	Chapter 4, Pump Verification, p. 13
Service Utilities	Set Factory Default Configuration Set Log Erase Marker Upload Firmware (if enabled)	Chapter 5, Utilities, p. 31
Reports	Access reports, which you can save as a PDF and/or print	Chapter 6, Reports, p. 33

Table 2-2: Pump Details Descriptions

Item	Description
Serial Number	Pump serial number assigned in manufacturing/service. This must match the serial number on the label on the back of the pump.
Firmware Revision	Software manifest version number. This can also be viewed on the pump by selecting **Device Info** after powering on pump.
Configuration Version	Reflects the configuration refreshed when the pump was last connected to RxManager.
Hardware Revision	Circuit board revision.
Customer Site ID	Reflects the configuration refreshed when the pump was last connected to RxManager.
Model #	55935 (CURLIN 8000).
Motor Type	Motor manufacturer.
Date of Manufacture	Date that the pump was assembled.
Last Maintenance	Most recent date that pump maintenance was performed by Moog Service.
Maintenance Due	Next date that the pump should be sent to Moog for service.
Last Verified	The last time this pump was verified at this ES installation.
Total Volume	Total volume displaced since manufactured (in mL). **Note:** This is reset if the pumping mechanism is replaced by Moog Service.
Total Hours On	Total hours powered on since manufactured.
Current Event ID	Event index, which is in the pump event reports.
Oldest Event ID	The earliest event index stored on the pump. The pump will wrap-around and over-write the oldest events when the event log is full. ES maintains the list of all events “seen” by RxManager and Service Manager. **Note:** All patient identifiers are encrypted and cannot be recovered from the event log.
Malfunction #	Number of malfunctions logged on this device since manufactured.
Last Malfunction ID	Last malfunction seen on this pump. **Note:** This is cleared when Preventive Maintenance is performed. See Table 7-1 for the description of the malfunction IDs.
Last Malfunction Date	Date of the last malfunction occurrence. **Note:** Malfunctions that are detected during the power on sequence may have a date of Jan 01 2016. The actual date/time range can be determined by examining the event log for this pump and searching for the malfunction ID.

Chapter 3. Test Equipment and Setup

Test Equipment Requirements

Before performing the Verification tests, make sure you have all the following equipment:

Equipment	Details
Pressure gauge(s)	+/- 1%, -500 mmHg to 2500 mmHg (minimum) Although two pressure gauges are ideal, a single pressure gauge can be used in these tests by moving the pressure gauge to the appropriate stopcock for a given test (Figure 3-1, location A or B).
Scale	750 gram, +/- .05 gram accuracy
Administration set test loop sets	Part Number: 380-4123 **Note:** The Blue Pin Test (part of the Ancillary testing) requires using a set with a missing blue pin. You can make this set by cutting the blue pin off a new test loop, but do not damage the tubing that runs through the blue pin. This set can be used repeatedly, as this set will not have significant wear. **Important:** Replace tubing sets after 48 hours of use. Repeat any failed test with a new tubing set before considering that test as a “Fail”.
Appropriate luer / tubing connections	—
USB data cable	Use to connect pump to the computer running Service Manager ES Software
Test fluid	Normal saline or distilled water **Note:** The weight of 1 mL of normal saline is 1.0046 grams. The weight of 1 mL of distilled water is 1.0 grams. For this testing, 1.0 grams should be considered equivalent to 1 mL for either type of fluid.
Paper and pen	Use to record the values during the different tests so you can enter them into the Service Manager when the test is complete. To keep your information organized, make a copy of the Test Datasheet on p. 11 for each pump that you test.

Equipment	Details
Rechargeable battery pack	Part Number: 56012-002 This accessory's function is checked during Ancillary testing.
PCA bolus handset	This accessory's function is checked during Ancillary testing.
AC adapter cord	This accessory's function is checked during Ancillary testing.

Test Datasheet

Copy the following table and use it to record and organize the Pump Verification test results. You will add this information to Service Manager.

Pump Serial Number:	
Tests	**Data**
Volumetric Test	Volume of delivered fluid:
Pressure Test	Downstream pressure:
	Upstream pressure:
Dead Head Test	Downstream pressure:
	Upstream pressure:
Ancillary Test	**Record any failures or anomalies**
PCA Bolus Handset Test	
AC Adapter Test	
Door Open Test	
Air In Line Alarm	
Blue Pin Detection	
Safety Circuit Test	

Test Setup

All verification tests use the pump test loop tubing and the setup configuration shown in Figure 3-1.

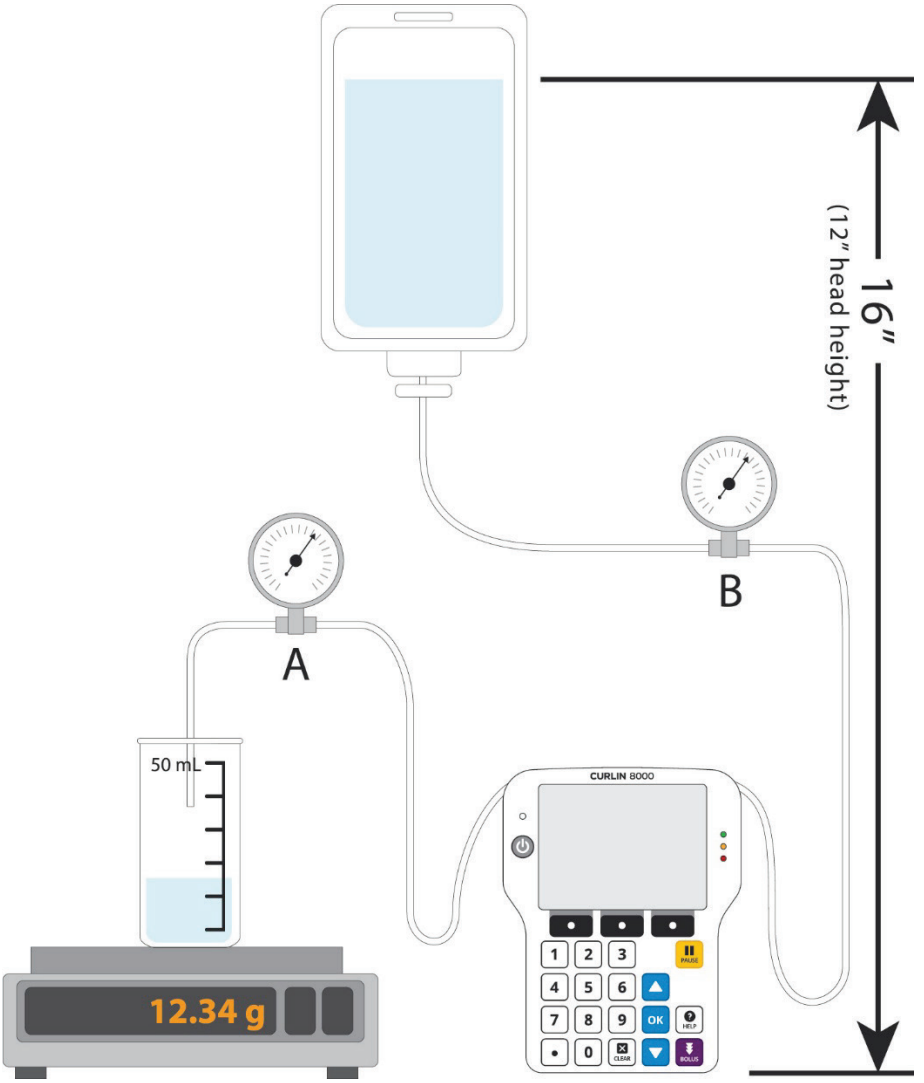


Figure 3-1: Test Setup

Chapter 4. Pump Verification

The tests for verification follow a sequential workflow. The Service Manager ES Software remembers the pump and where it is in the workflow, allowing you to use multiple workstations and potentially multiple biomed / service technicians to perform verification and manage interruptions without forcing “re-execution” or introducing error.

The following pump verification tests are listed along the left side of the Pump Verification screen:

- Display and LED
- Audio
- Visual
- Volumetric
- Pressure
- Dead Head
- Keypad
- Ancillary

To perform these tests you must have the equipment listed in “Test Equipment Requirements”, p. 9 and configure the test setup as depicted in Figure 3-1. After performing these tests a few times, it should take about 7 minutes to complete all verification tests.

Each test is presented in the linear order listed above. However, you can click **Skip** in any Pump Verification screen for any of the tests you do not wish to perform. For example, if you wanted to perform a quick Volumetric Accuracy Test, you would skip the tests before and after Volumetric Accuracy. However, in order to generate a verification report certificate (called “PM Certificate” in Service Manager), for the pump verification, you must perform all tests and they must all be “Pass”.

Clicking **Back** in any Pump Verification screen will go back up the list of the tests. Your results are not modified, e.g., a “Pass” remains passed, but the test data that you entered is not displayed. However, the test data is maintained and will appear on the final verification review summary and PM Certificate.

Note: During Verification, if any portion of a test results in a Fail, you must add a brief description in the Comment field in that test screen. This description is included in the Service History Report. For more information, see Chapter 6, “Reports”, p. 33.

Verification Start

To begin Verification:

1. Make a copy of the Test Datasheet on p. 11.
2. Using the USB data cable, connect the pump to the computer running the Service Manager ES software.

3. Power on the pump.
4. Open the Service Manager ES software. The Pump Verification screen appears (Figure 4-2).

Important: At any point while using Service Manager, if the software does not recognize that the pump is connected, first make sure the pump is powered on and connected. You may need to disconnect the pump and reconnect it. Then Service Manager should recognize the connected pump.

A message is displayed (Figure 4-1):

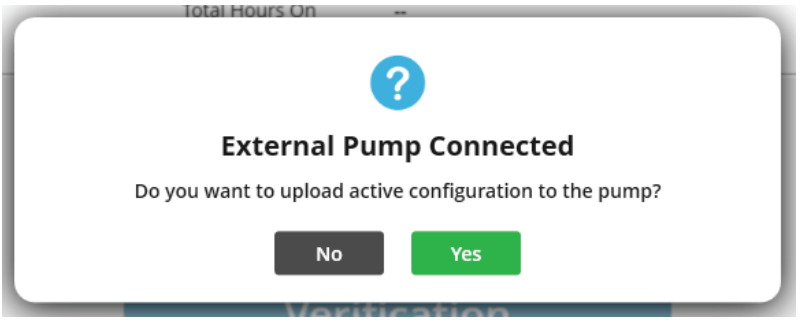


Figure 4-1: Upload Active Configuration

Click **No** if you do not want to overwrite the pump's current configuration.

Click **Yes** if you want to overwrite the pump's configuration with the latest one in the ES software. Once the configuration is uploaded to the pump, a "Success" message appears in Service Manager.

5. If you already started the Verification tests, the screen displays the last test where you left off. You can continue the testing sequence.

   Otherwise, from the Home / Pump Details screen, click **Verification**.

Important: You can click **Skip** and not perform any of the pump verification tests. The following sections describe each of the tests in the order you perform them.

Display and LED Test

This test verifies the functionality of the LCD display and the three infusion status indicator lights: green, yellow and red (Figure 4-2).

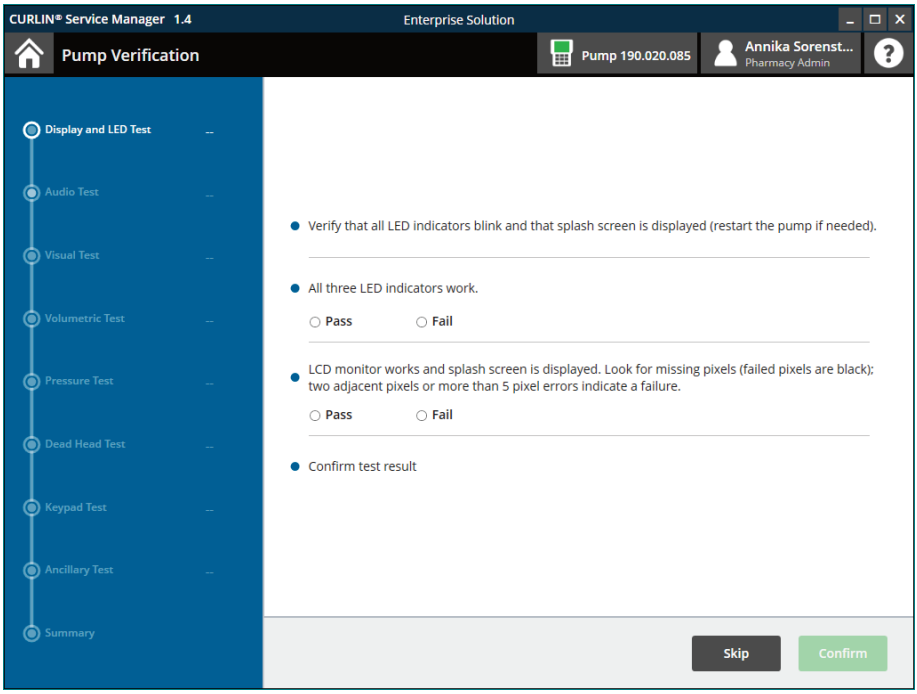


Figure 4-2: Display and LED Test Screen

1. Power off, then power on the pump.
2. Observe the display. Look for any adjacent pixel failures when the splash screen is displayed. While you will need to look closely, halfway through the splash screen the pixels are inverted, which will make any bad pixels stand out.
3. Observe the three LEDs. They are turned on in sequence after the inverted splash screen is displayed. Make sure that all light up.
4. Select **Pass** or **Fail** for all test options.

   If any fail, the Confirm test result is Fail. If any options are failed, you must type a comment to describe the failure(s), then click **Confirm** to continue with the next test.

Audio Test

This test verifies the functionality of the main speaker and the piezo backup speaker (Figure 4-3).

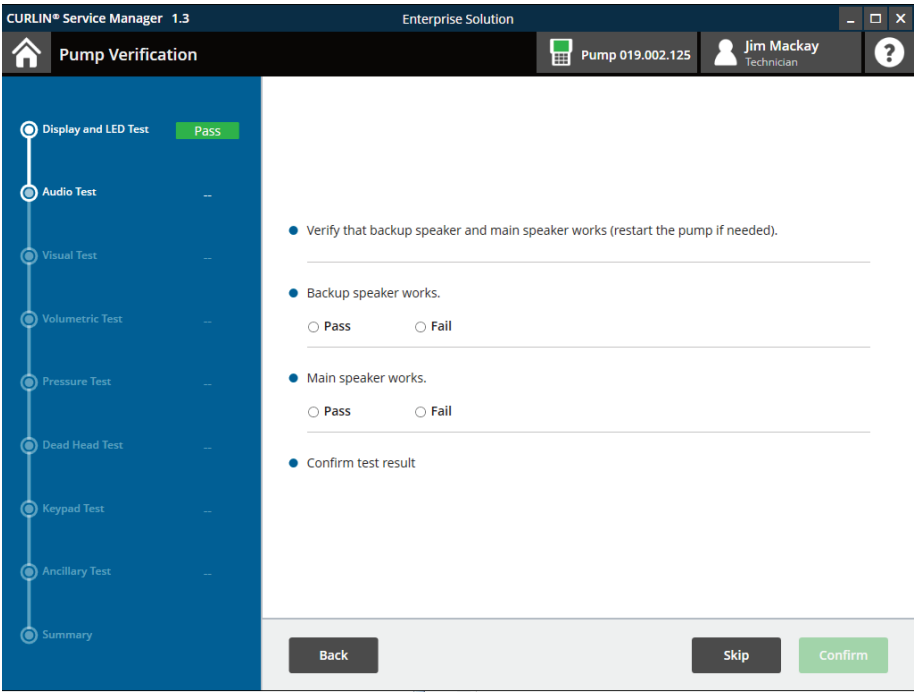


Figure 4-3: Audio Test Screen

The piezo is played first as a single note, which occurs when the green LED is on, and is followed by the multiple note power on “fanfare”, which the main speaker plays.

1. If you did not initially listen for the tones, power off, then power on the pump. Disconnect, then reconnect the USB data cable.
2. Select **Pass** or **Fail** for all test options.

   If any fail, the Confirm test result is Fail. If any options are failed, you must type a comment to describe the failure(s), then click **Confirm** to continue with the next test.

Visual Test

This test captures your visual inspection of the pump (Figure 4-4).

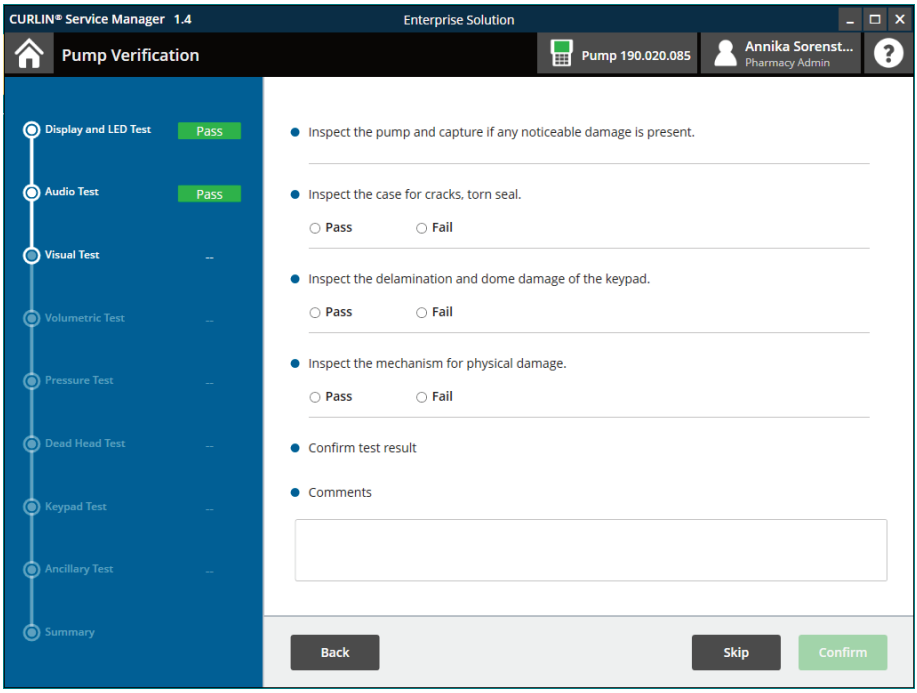


Figure 4-4: Visual Test Screen

1. Look for any damage, e.g., cracks, keypad delamination, or scratches on the display cover that would affect the readability of the display. Any non-cosmetic marring or cracks in the pump case is considered a Fail.
2. Open and close the pump door. The door should move freely and not bind; the latch should operate firmly and snap into place.
3. Select **Pass** or **Fail** for all test options.

   If any fail, the Confirm test result is Fail. If any options are failed, you must type a comment to describe the failure(s).

   You can also add comments to capture any cosmetic issues in the pump history for “Pass” visual inspections. All comments are recorded in the Pump Service History report (see Chapter 6, “Reports”, p. 33).
4. Click **Confirm** to continue with the next test.

Volumetric Test

This tests the volume delivery accuracy of the pump (Figure 4-5).

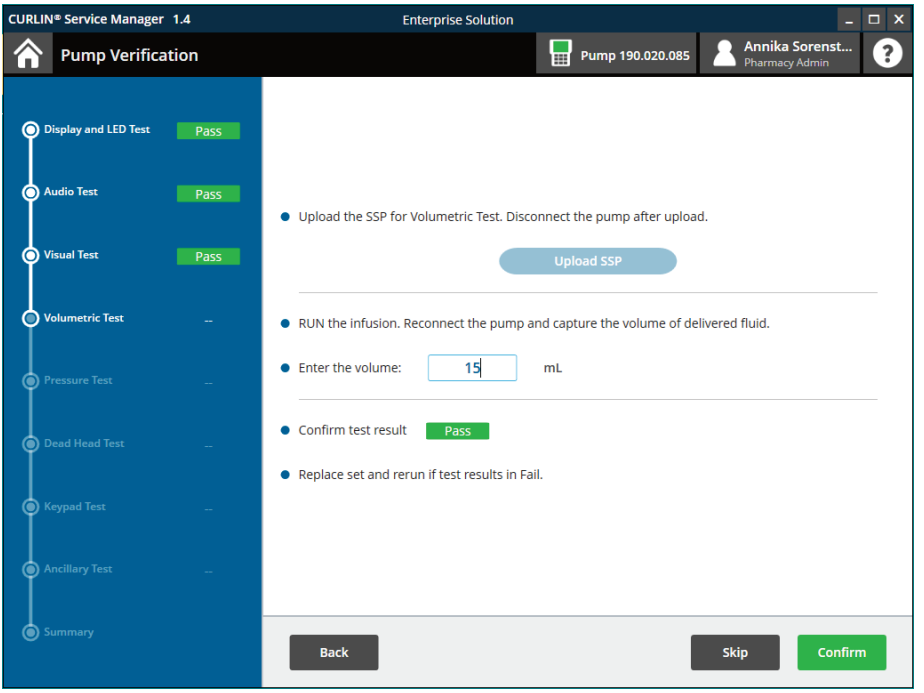


Figure 4-5: Volumetric Test Screen

1. Using Figure 3-1, set up your bag and the tubing. Prime out any air.
2. If the pump is off, power it on, then connect the USB data cable from the pump to the computer running Service Manager. Wait for the pump connection to complete: In the top status bar of Service Manager, the pump icon screen turns green and the serial number displays. If the connection is unsuccessful, disconnect the USB data cable, then reconnect it.
3. In the Service Manager Volumetric Test screen, click **Upload SSP** and observe the message on the pump: “PSP Transferred | NOT FOR HUMAN USE | NOT FOR CLINICAL USE”.
4. On the pump, press the **SHUTDOWN** soft key, then disconnect the USB data cable from the computer.
5. Power on the pump, press **CONFIRM** for the Patient Information, and select the “NOT FOR HUMAN USE” program. Use the PRIME feature if you have not yet primed the administration set.
6. Tare the scale.
7. On the pump, press **RUN**. It will take just under two minutes for the test to complete.

8. When the INFUSION COMPLETE message appears on the pump, press **CONFIRM**.
9. Power off the pump and then power it on. Connect the USB data cable. Wait for the pump connection to complete: In the top status bar of Service Manager, the pump icon screen turns green and the serial number displays. If the connection is unsuccessful, disconnect the USB data cable, then reconnect it.
10. In Service Manager, enter the weight / volume of the infusion and confirm that the test is a “Pass”.

    If the test result is “Fail”, replace the test loop administration set and repeat the test.

    If the pump continues to fail the test, send the pump to Moog for servicing. At this point, you can either stop testing or continue and finish the verification testing.

Pressure Test

This tests the pressure / occlusion detection accuracy of the pump (Figure 4-6).

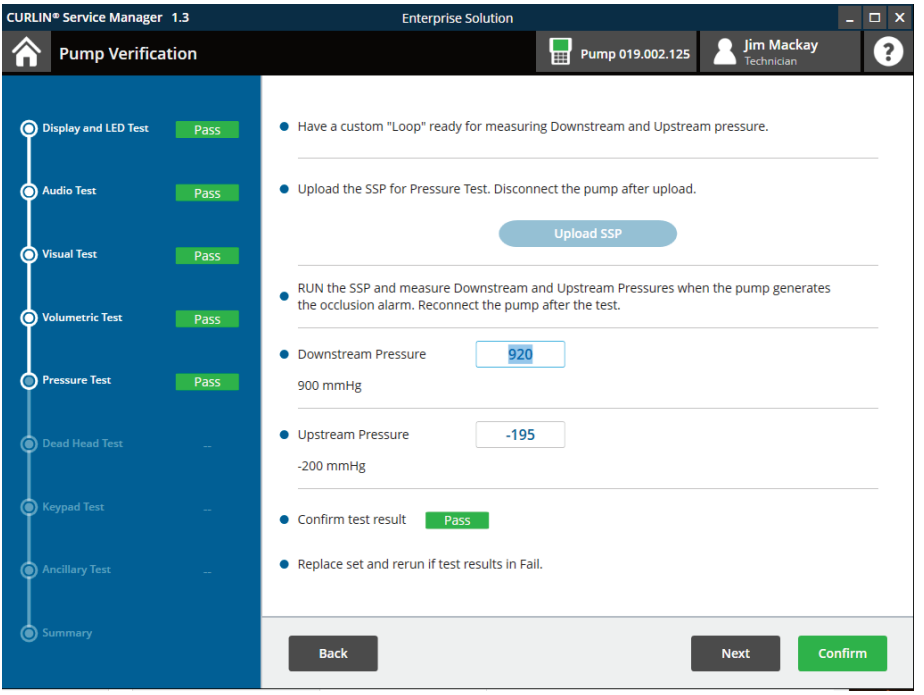


Figure 4-6: Pressure Test Screen

1. Using Figure 3-1, set up your bag and the tubing. Prime out any air.
2. Turn pressure gauge(s) on.
3. In Service Manager, click **Upload SSP** and observe the message on the pump: “PSP Transferred | NOT FOR HUMAN USE | NOT FOR CLINICAL USE”.
4. On the pump, press the **SHUTDOWN** soft key, then disconnect the USB data cable from the computer.
5. Power on the pump, press **CONFIRM** for the Patient Information, and select the “NOT FOR HUMAN USE” program. Use the PRIME feature if you have not yet primed the administration set.
6. Set up to test the downstream pressure system:

   Adjust stopcock **A** so that the flow is only directed to the downstream pressure gauge.
7. On the pump, press **RUN**.
8. When the AIR DETECTOR IS OFF notification appears, press **CONFIRM**.

It should take less than a minute (more if there is air in the tubing) for the pump to go into a BLOCKAGE IN TUBING alarm (the pump status bar will be red and will display “Downstream Occlusion”).

9. On a copy of the Test Datasheet (p. 11), record the maximum pressure value on the gauge.
10. On the pump, to silence the alarm, press **CONFIRM**.
11. Set up to test the upstream pressure system:
    a. Adjust stopcock **A** so that it flows to your capture vessel.
    b. Adjust stopcock **B** so that the pump is only drawing from the pressure gauge tubing and not from the bag.
12. On the pump, to restart the infusion, press **RESUME**.

    It should take less than a minute for the pump to go into a BLOCKAGE IN TUBING alarm (the pump status bar will be red and will display “Upstream Occlusion”).
13. On a copy of the Test Datasheet (p. 11), record the minimum pressure value from the gauge.
14. To acknowledge the alarm condition, open the pump door.
15. Turn off the pump, then turn it on, and connect the USB data cable. Wait for the pump connection to complete: In the top status bar of Service Manager, the pump icon screen turns green and the serial number displays. If connection is unsuccessful, disconnect the USB data cable and then reconnect it.
16. In Service Manager, enter the two pressure measurements and confirm that the test is a “Pass”.

    If the test result is “Fail”, replace the test loop administration set and repeat the test.

    If the pump continues to fail the test, send the pump to Moog for servicing. At this point, you can either stop testing or continue and finish the verification testing.

Dead Head Test

This tests the pressure capability of the pump. You will let the pump run and observe the greatest / least amount of pressure generated during the test.

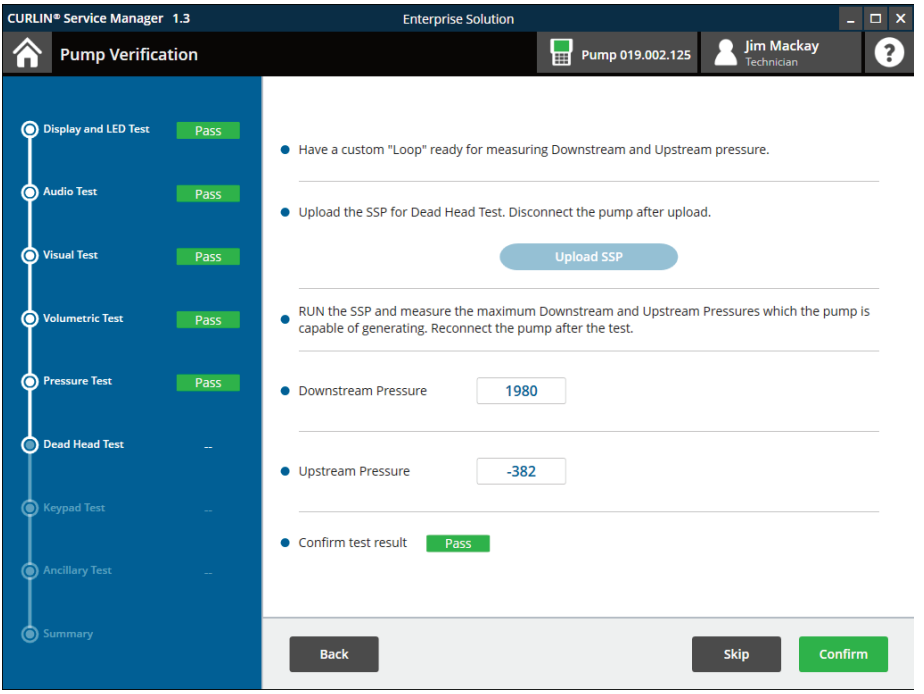


Figure 4-7: Dead Head Test Screen

1. Using Figure 3-1, set up your bag and the tubing. Prime out any air.
2. Make sure pressure gauge(s) are on.
3. Make sure the pump is on, then connect the USB data cable from the pump to the computer running Service Manager.
4. In the Service Manager Dead Head Test screen, click **Upload SSP** and observe the message on the pump: “PSP Transferred | NOT FOR HUMAN USE | NOT FOR CLINICAL USE”.
5. On the pump, press the **SHUTDOWN** soft key, then disconnect the USB data cable from the computer.
6. Power on the pump, press **CONFIRM** for the Patient Information, and select the “NOT FOR HUMAN USE” program. Use the PRIME feature if you have not yet primed the administration set.
7. Set up to test the downstream pressure system:

   Adjust stopcock **A** so that the flow is only directed to the downstream pressure gauge.
8. On the pump, press **RUN**. When the AIR DETECTOR IS OFF notification appears, press **CONFIRM**.

9. Observe the downstream pressure. It is normal for the pressure to “pulse” during this test. It should take less than one minute for the pump to reach its maximum pressure level. On a copy of the Test Datasheet (p. 11), record the maximum pressure value from the gauge.
10. On the pump, when it has reached its maximum capability, press **PAUSE**.
11. Set up to test the upstream pressure system:
    a. Adjust stopcock **A** so that it flows to your capture vessel.
    b. Adjust stopcock **B** so that the pump is only drawing from the pressure gauge tubing and not from the bag.
12. On the pump, to restart the infusion, press **RESUME**.

    It should take less than two minutes for the pump to reach its minimum pressure.
13. On a copy of the Test Datasheet (p. 11), record the minimum pressure value from the gauge.
14. Power off the pump and then power it on. Connect the USB data cable. Wait for the pump connection to complete: In the top status bar of Service Manager, the pump icon screen turns green and the serial number displays. If connection is unsuccessful, disconnect the USB data cable and then reconnect it.
15. In Service Manager, enter the two pressure measurements and confirm that the test is a “Pass”.

    If the test result is “Fail”, replace the test loop administration set and repeat the test.

    If the pump continues to fail the test, send the pump to Moog for servicing. At this point, you can either stop testing or continue and finish the verification testing.

Keypad Test

This test verifies that the keypad is functioning correctly.

1. Make sure the pump is powered on and is connected to the computer running Service Manager.
2. In Service Manager, click Start Keypad Test (Figure 4-8).
3. On the pump, press every button (including the power button). The corresponding buttons on the Service Manager graphic should turn green.

   If a button on the pump fails to operate, send the pump to Moog for service.

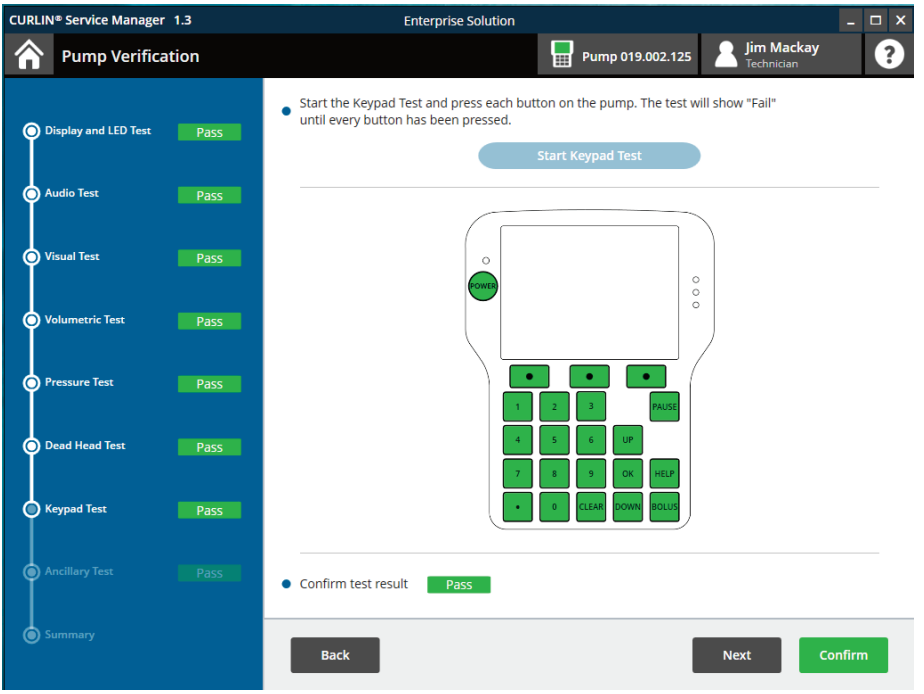


Figure 4-8: Keypad Test Screen

Ancillary Test

Ancillary tests check sensors and the safety system to ensure the pump performs correctly, and will detect failures in the system (Figure 4-9).

On a copy of the Test Datasheet (p. 11), record any failures or anomalies as you perform these steps. You can enter the results into Service Manager only after you complete the sixth, final Ancillary test.

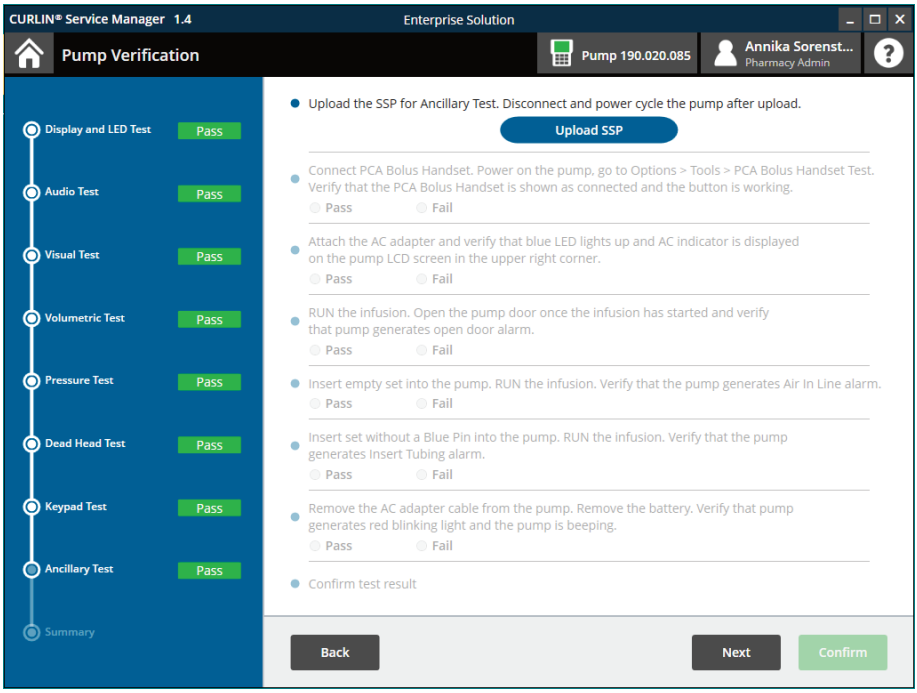


Figure 4-9: Ancillary Test Screen

Prepare for the Ancillary Test

1. Make sure the pump is powered on and is connected to the computer running Service Manager.
2. Install a rechargeable battery pack in the pump (part number 56012-002).
3. Using Figure 3-1, set up your bag and the tubing. Prime out any air.
4. In Service Manager, click **Upload SSP** and observe the message on the pump: “PSP Transferred | NOT FOR HUMAN USE | NOT FOR CLINICAL USE”.
5. On the pump, press **SHUTDOWN**. Disconnect the USB data cable.
6. Power on the pump. Do not press **CONFIRM** for the Patient Information; if you did, power off the pump and then power it back on.

PCA Bolus Handset Test

a. On the pump, select **OPTIONS** / **TOOLS** / **PCA BOLUS HANDSET TEST**.

b. Plug the PCA bolus handset to the pump. In Service Manager, the Bolus Cable should display “CONNECTED”.

c. Press the PCA bolus handset button. The pump should beep. In Service Manager, the Button Press Count should increment.

d. On a copy of the Test Datasheet (p. 11), record any abnormal test results. Disconnect the PCA bolus handset from the pump.

AC Adapter Test

a. Connect the AC adapter from a working electrical outlet to the pump. On the lower left corner of the pump, the blue LED indicator should be lit. The pump’s status bar should display the battery “charging” icon:  or  .

b. Disconnect the AC adapter. An audio alert should sound, and both of the indicators should go out.

c. On a copy of the Test Datasheet (p. 11), record any abnormal test results.

Door Open Test

a. On the pump, confirm the patient information by pressing **CONFIRM**.

b. Select the NOT FOR HUMAN USE infusion.

c. Make sure the administration set is installed and primed; use the pump’s PRIME feature if needed.

d. On the pump, press **RUN**.

e. When the pump starts, open the door.

On the pump, observe the CLOSE THE DOOR alarm on the screen and listen for an audio alarm. This test is considered a Fail if the pump does not alarm.

f. On the pump, silence the alarm by pressing **CONFIRM**. Leave the door open.

g. On a copy of the Test Datasheet (p. 11), record any abnormal test results.

Air In Line Alarm Test

a. On the pump, install a dry, unconnected administration test loop and close the door.

b. To restart the infusion, press **RESUME**.

c. On the pump, observe the AIR IN LINE DETECTED alarm on the screen and listen for an audio alarm. This should start within 10

seconds of resuming the infusion. This test is considered a Fail if the pump does not alarm.

d. On the pump, press **CONFIRM**. Leave the pump in the “Paused” state.

e. On a copy of the Test Datasheet (p. 11), record any abnormal test results.

Blue Pin Detection Test

a. On the pump, remove the unconnected administration test loop used in the Air In Line Alarm test.

b. Insert the administration set with the blue pin removed, running the upstream tubing in towards the front of the pump, and close the door.

c. On the pump, select **OPTIONS** / **Rx TASKS** / **PRIME**. To acknowledge the “DISCONNECT FROM PATIENT” notification, press **CONFIRM**.

d. Press and hold the **PRIME** soft key.

The “INSERT TUBING” alarm should display.

If the “ADMINISTRATION SET ISSUE” alarm displays, open and reclose the door, ensuring that bag side tubing lies over the pressure sensor (small bump just above the hole for inserting the blue pin) and repeat priming.

If the pump “primes” (volume counts up) the test has failed. Send the pump to Moog for service.

e. On the pump, if an alarm is present, press **CONFIRM**.

f. On a copy of the Test Datasheet (p. 11), record any abnormal test results.

Safety Circuit Test

a. If the AC adapter is still attached to the pump, remove it.

b. Remove the battery cover and then remove the rechargeable battery pack.

c. The pump screen should go black. The pump should beep and the red LED should blink. If this occurs, this Safety Circuit test is considered a Pass.

d. On the pump, press the power button once to turn off the “safe state” alarm.

e. Reinstall the rechargeable battery pack.

f. Power on the pump and reconnect the pump to the computer running Service Manager. Wait for the pump connection to complete: In the top status bar of Service Manager, the pump icon screen turns green and the serial number displays. If connection is unsuccessful, disconnect the USB data cable and then reconnect it.

g. On a copy of the Test Datasheet (p. 11), record any abnormal test results.

Complete the Ancillary Test

In Service Manager, click **Confirm**. The Pump Verification Summary screen appears (Figure 4-10).

Verification Summary

After you complete all the Verification tests you want to perform, you can view all of the Pass/Fail results on one screen (Figure 4-10).

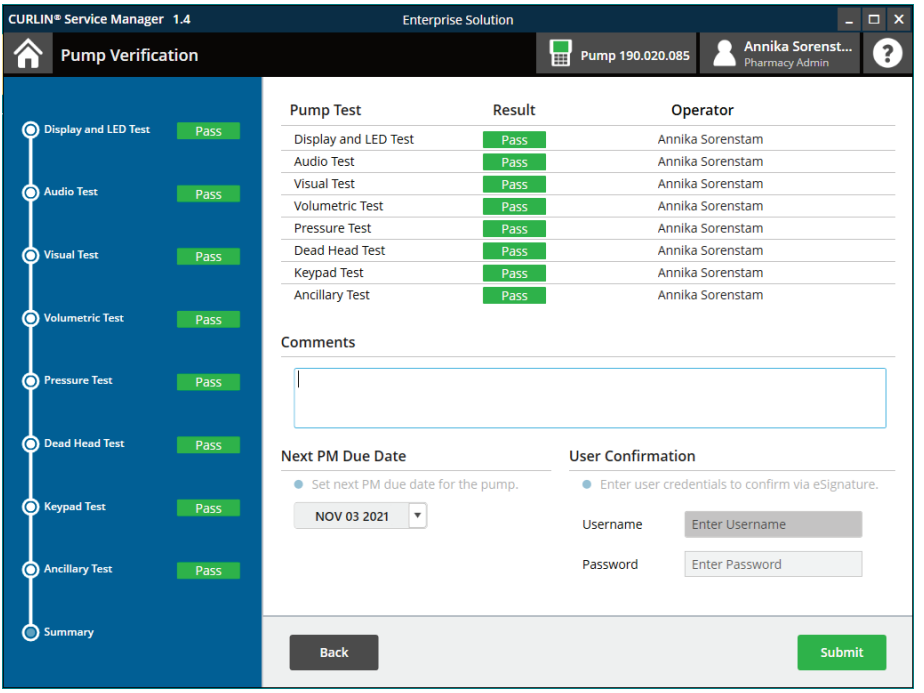


Figure 4-10: Pump Verification Summary

1. In the Comments field, enter any information you recorded during the Ancillary test. Because these comments appear in the PM Certificate, also include any appropriate information that supports the procedures at your facility.
2. If available:
   - **Next PM Due Date:** It automatically selects the date exactly one year in the future from today, but you can adjust it forward or backwards 90 days from that date. Click the arrow to display a calendar to select a different date.
   - **User Confirmation:** To add a digital signature for the pump verification, type your Username and Password.
3. When you are finished, click **Submit**. The Verification Review Summary screen appears (Figure 4-11).

Verification Review and Finish

The Verification Review Summary screen (Figure 4-11) displays the pump's information, test results, verification test date, the person(s) who conducted the tests, and any comments. At this point, verification testing is complete.

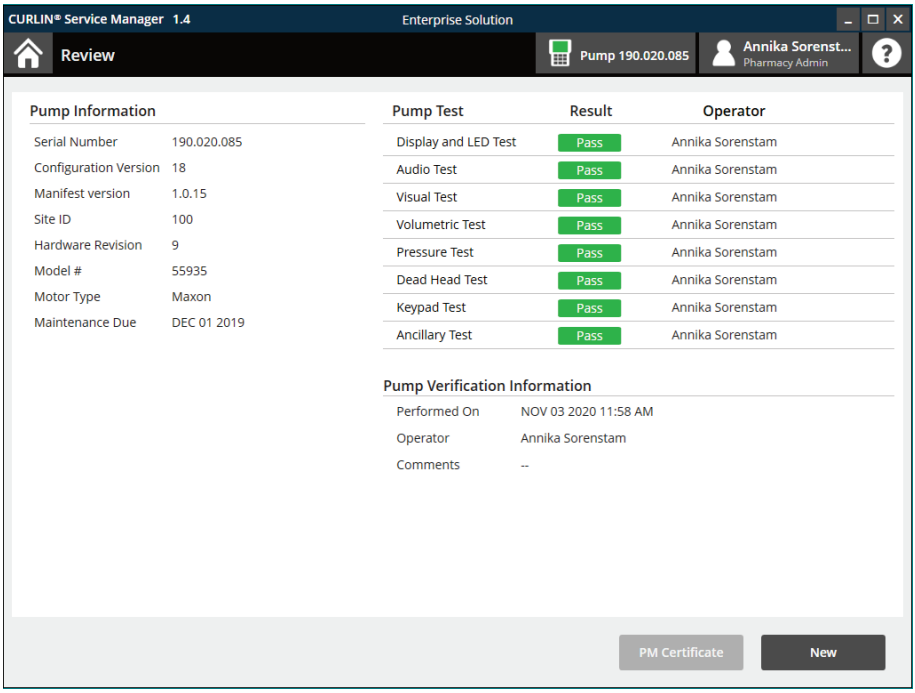


Figure 4-11: Verification Review Summary

1. If all test results were Pass, you can view the PM Certificate as a PDF and save or print it for this pump's verification testing. Click **PM Certificate**.
2. To start a new test verification, click **New**.

   An "Are You Sure" confirmation message appears.

   - To continue, click **Yes**.
   - To return to the Review screen, click **No**.

Notes

Chapter 5. Utilities

When the CURLIN 8000 pump is connected to the computer running Service Manager, different utility options are available, depending on how Service Manager is configured (see Figure 5-1).

To view the Utilities screen:

- From the Home / Pump Details screen (Figure 2-1), click **Utilities**.

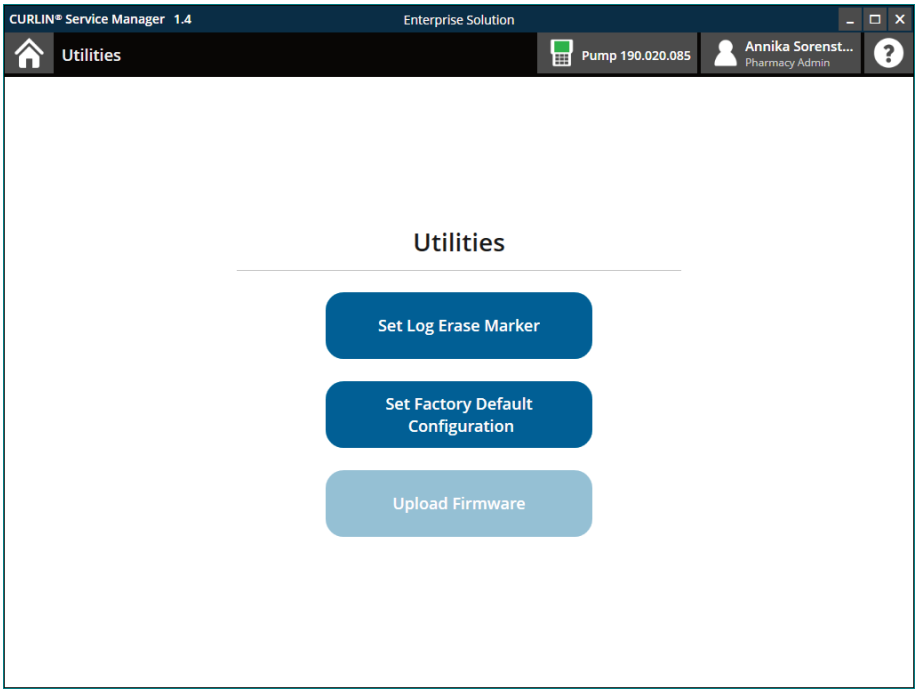


Figure 5-1: Utilities Screen

Set Log Erase Marker

Setting the log erase marker ensures another service provider cannot view any of the previous pump events. Use this feature before returning your leased pump.

Important: Patient identifiers are never viewable in the pump log.

---

1. Make sure the pump that you want to work with is connected to the computer running Service Manager and in the top status bar, the screen of the pump icon is green and its serial number is displayed.

2. From the Utilities screen, click **Set Log Erase Marker**.

   A success message briefly appears on the screen.

Set Factory Default Configuration

Setting the factory default configuration prevents another service provider from seeing your pump configuration. Use this feature before returning your leased pump.

For a list of factory settings, see the CURLIN 8000 Ambulatory Infusion System User Manual, Chapter 16, Default Configuration.

1. Make sure the pump that you want to work with is connected to the computer running Service Manager and in the top status bar, the screen of the pump icon is green and its serial number is displayed.
2. From the Utilities screen, click **Set Factory Default Configuration**.

   A confirmation message briefly appears on the screen.

Upload Firmware

This utility is available only for Moog Medical Service Technicians.

Pressure Calibration

This utility is available only for Moog Medical Service Technicians.

Volumetric Calibration

This utility is available only for Moog Medical Service Technicians.

New Pump Permanent Record

This utility is available only for Moog Medical Service Technicians.

Chapter 6. Reports

The following reports are available for export in CSV format:

Report Name	Description
Service History	List of all of the verifications performed on the pump. Includes pass/fail and associated values with the operator name and the date/time and any comments entered for failed tests.
Pump Malfunctions	List of all malfunctions that have occurred on the pump since it was manufactured.
Pump Events	List of all events downloaded from the pump at this facility. **Note:** There may be gaps in the pump event history if the pump is not occasionally connected to either the Service Manager or the RxManager ES software applications. The event log typically “wraps over” old events in 6 to 12 months, but may occur as early as 3 months with extreme use.
PM Certificates	This report is for the Moog Service Center. This report option will be unavailable.

Generating Reports

1. From the Home / Pump Details screen (Figure 2-1), click **Reports**.

   The pumps are organized by serial number (S/N). You can search for a pump by S/N or by column (Figure 6-1).

   Select the pump for which you want to view reports.

2. At the bottom of the Reports screen, click the report you want to view.

   A Save As window appears.

3. Navigate to the location where you want to save the report. Rename the file as necessary and then click **Save**.

4. Open the report file to view it.

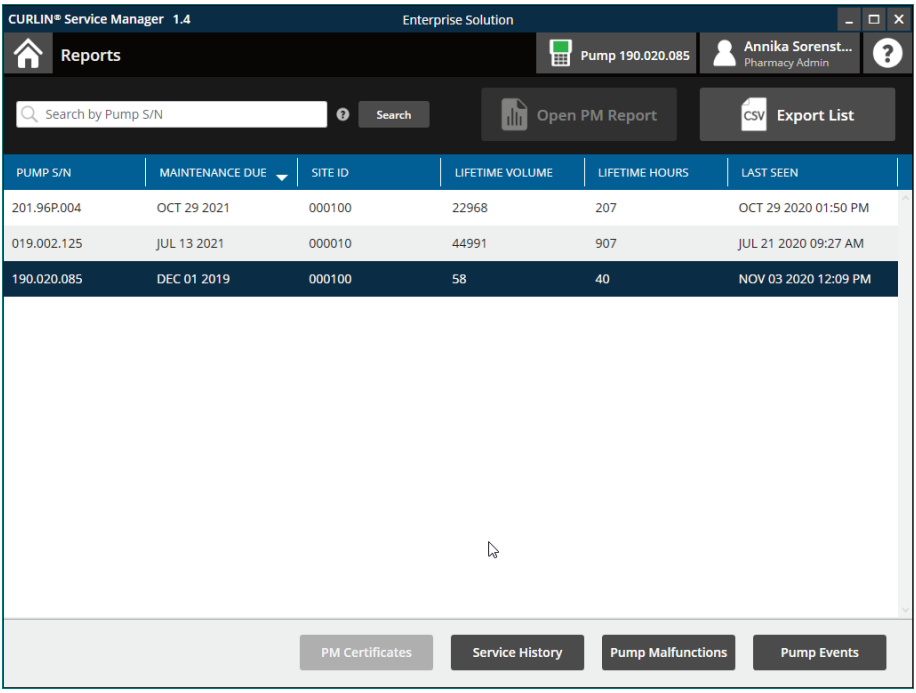


Figure 6-1: Reports Screen

Service Utility / Service Reports

This utility is available only for Moog Medical Service Technicians.

Chapter 7. User Assistance and References

Online Help

User Manual

You can display and save an online version of this user manual. You must have Adobe Acrobat installed on your computer. If you do not, contact your IT Admin for assistance.

1. At top right corner, click the Help icon  .
2. The Service Manager downloads a PDF version of this user manual. You can save this file to your desktop for reference. If you are unable to find the information you need to solve your problem, contact Customer Support.

Context-Sensitive Help

On some Service Manager screens,  next to a field indicates that context-sensitive help is available. Move your mouse cursor over the  to view the information.

Customer Support Help

If you need to speak directly with a CURLIN Service Manager Enterprise Solution Software support person, call 800.970.2337.

Acronyms and Glossary

csv	Comma Separated Value. The file type that an exported Events Report is saved as. Most spreadsheet software programs support .csv files.
ES	Enterprise Solution
PM	Preventative Maintenance

Pump Malfunction Code Descriptions

If malfunctions reoccur, contact Moog Service.

Table 7-1: Malfunction Error Code Definitions

Malfunction Error Code	Cause
1	Software failure
2	Software update required
3	Software update required

Malfunction Error Code	Cause
15	Update pump configuration by connecting pump to the RxManager Enterprise Solution Software
16	Error was detected in any of the files associated with the current patient
52	Red indicator light failure
101	Green indicator light failure
151	Yellow indicator light failure
201	Screen failure
251	Piezo failure
252	Main audio failure
301	Keypad failure
452	SPI failure
501	Software update required
505	Flash failure
601	Health check failure
602	System cross check failure
702	Software failure
706	System cross check failure
707	Watchdog failure
1000	Software failure
1051-1201	Hardware failure
1202	Software update required
1251-1302	Software failure
1303-1354	Hardware failure
1401	Software update required
1402	Error was detected in any of the files associated with the current patient
1450-1454	Hardware failure
1501	Backup battery failure
1551	Hardware failure
1601	Hardware failure
1602	Software failure
1603	Error was detected in any of the files associated with the current patient
1701	Hardware failure

Chapter 8. Troubleshooting

While using Service Manager, you may encounter messages that require a response. Figure 8-1 shows an example of a message, and Table 8-1 defines the most common messages. If the information in the User Response column does not help you solve the problem, or if you have any questions, call 800.970.2337.

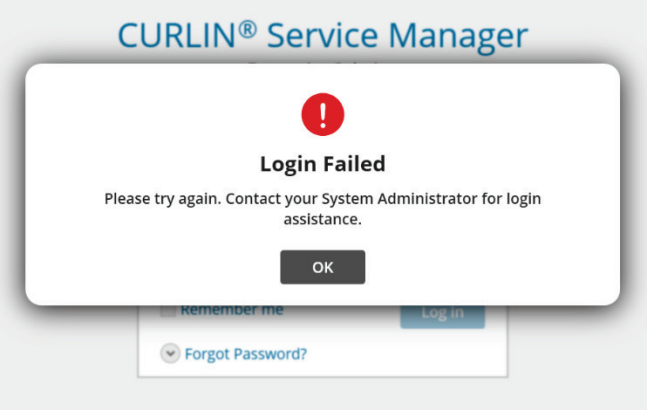


Figure 8-1: Example Message

Table 8-1: Message Definitions and Resolutions

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
Application Malfunction CURLIN Service Manager encountered an error and will shut down.	A Windows failure occurred.	You may be required to log out and back in to Windows. Then restart the application. Contact your IT Admin or Moog if problem persists.
Application Timeout You have been logged out due to inactivity.	Automatic logout due to user inactivity.	Log in to Service Manager again.
Application Timeout All work in progress has been lost. User has been logged out.	Automatic logout due to user inactivity.	Log in to Service Manager. Entries that were in progress have been discarded. Review and re-enter work in progress.

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
Connection Error – Database Connection Lost All work in progress has been lost. User has been logged out.	A network error caused a disconnection between the Service Manager and the database.	Attempt to log in to Service Manager. It may take up to one minute before you can log in again. Contact your IT Admin or Moog if problem persists.
Connection Error – Incompatible Database Database is not compatible with the current CURLIN Service Manager™ version. Contact Administrator.	A database error has occurred.	Contact your IT Admin or Moog if problem persists.
Connection Error – Incompatible Pump Pump is not compatible with the current CURLIN Service Manager™ version. Return the pump to Biomed.	The version of pump connected cannot communicate with the version of Service Manager in use.	Replace pump with compatible pump. Contact Moog about ES / Pump software updates if problem persists.
Connection Failed Failed to connect to the pump. Please try re-connecting.	Cable or connection error.	Inspect cable connection, restart pump and Service Manager application. In some cases, you may need to restart your PC in order for the PC to connect to the pump. Also, check the battery charge level. Low battery pumps will not connect to the PC. Connect the pump to AC power. Contact your IT Admin or Moog if problem persists.
Database Error Database server does not have SSL enabled. Please contact System Administrator.	Network compatibility / Installation error.	Contact your IT Admin or Moog if problem persists.

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
Critical Error An error occurred while logging previous error. Please contact IT Administrator.	An error occurred with the application.	Restart the application and review/re-enter work in progress. Work in progress may have been lost. Contact your IT Admin or Moog if problem persists.
Document Error User Manual was not found. Please contact IT Administrator.	Installation error. The application's user manual was not installed as part of the setup.	Reinstall the application. Contact your IT Admin or Moog.
Document Error – Unable to Open Adobe Acrobat Reader was not found. Please contact IT Administrator.	Adobe Acrobat is not installed on this computer.	Contact your IT Admin.
Export Failed Export failed. Click OK to continue.	Potential data error, or write privilege error.	Retry, ensure that a duplicate named file is not open. Contact your IT Admin or Moog if problem persists.
External Pump Connected Do you want to upload active configuration to the pump?	The connected pump has a different Site ID from the Site ID of the ES installation to which it is currently connected.	Select **Yes** if you are adding this pump to your inventory for this site. Select **No** to continue with connection without uploading the current site configuration. The previous site's configuration will be maintained in the pump.
Incorrect Pump Please return the pump to Moog Customer Service	The serial number stored in the pump is 000.000.000. This is not a valid serial number.	Contact Moog for servicing of the pump.
License Expired Current license has expired. Contact Administrator for renewed license. Press OK to continue using the application.	Your software license has expired. You are currently using this application outside of your license agreement.	Contact Moog for new license code.

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
License Unavailable All available licenses are currently in use. Please try again later.	The user attempted to log in to Service Manager, but all available seats are in use.	Contact your IT Admin, Pharmacy Admin or Moog to obtain additional seats.
Login Failed Please Try again. Contact your System Administrator for login assistance.	User tries to log in with incorrect username or password.	Contact your Administrator or Root IT Administrator. Contact Moog if the Administrator cannot login.
Low Battery: Pump Insufficient power to connect. Replace pump batteries or connect AC power.	The application will not allow a connection to a pump with low batteries. This prevents data errors that could occur if the pump power fails during data transfer.	Replace the batteries in the pump or connect the AC adaptor and then reconnect the pump.
Multiple Pumps Connected Disconnect all pumps and re-connect the pump you want to work with.	The Service Manager supports connection to only one pump at a time.	Disconnect all pumps, and then reconnect the pump you wish to work with.
Network Error Undefined network error occurred.	Due to network error, the Service Manager application cannot be opened.	Retry opening the application and logging in. Contact your IT Admin or Moog if problem persists.
Pump Error An error occurred while communicating with the pump.	Error during update to pump permanent record.	Repeat steps. Contact Moog if problem persists.
Registration Required Please contact System Administrator to register software.	The user is attempting to log in to the Service Manager application without a license.	Contact your IT Admin or Moog if problem persists.
Report Unavailable No report data available for reporting.	User is attempting to export Pump Events, Malfunction Log or Service History data when data is not available.	Select pumps with available report data. Contact Moog if problem persists.

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
Unable To Initiate Only one instance of Enterprise Solution application can run at a time.	Currently there is another CURLIN Enterprise Solution application open on the computer. Only one can be open at a time.	Ensure that none of the following CURLIN applications are open on the computer before proceeding: – RxManager – Admin Manager – Service Manager (2nd instance)
Update Available New Version of CURLIN Service Manager is available. Please contact Moog representative for the latest update.	Software update is available.	This does not impact on-going work with Service Manager. Contact your Pharmacy Admin or Moog for update.
Another Session is active in the network	The same user is logged into a CURLIN Enterprise Solution application on another computer.	Log out on other computer. **Note:** In some circumstances, it may take up to a minute for log in to be available to the user. Contact Moog if problem persists.
Warning Calculated pressure slope exceeded limits Pump must be returned for service.	Pressure system gain is outside of range.	Replace the tubing set and repeat the test. If error persists, contact Moog for servicing of the pump.
Warning Calculated VPPC out of range during Volume calibration	The volume calibration is outside of range.	Replace the tubing set and repeat the test. Ensure that the set is fully primed. Ensure that the scale is correctly tared. If error persists, contact Moog for servicing of the pump.
Entered credentials are incorrect	When signing for completion (record) username / password were incorrect.	Enter correct username and password. They are the same as those used to start Service Manager. Contact your IT Admin if problem persists.

Title and Message on Screen	Cause	User Response (Click OK to Clear the Message)
Warning Pressure mV value exceeded limits. Pump must be returned for service.	Pressure system gain is outside of range.	Replace the tubing set and repeat the test. If error persists, contact Moog for servicing of the pump.
The operation may take a long time. Do you want to continue?	Some reports can take a while to process.	Respond accordingly.
The pump has been disconnected	User disconnects the pump during use with Service Manager; e.g., during keypad test.	Reconnect the pump and continue operations. If problem persists, examine cable connection. Contact Moog if unable to resolve.
The pump has no complete verifications	No reports are available. There has not been a verification completed on this pump.	Use software to perform verifications. After completing verifications, contact Moog if problem persists.
Warning Calculated volume exceeded limits. Pump must be returned for service.	Pump is no longer within its volumetric delivery specification and requires calibration.	Contact Moog for RMA # and send to Moog Service Center for service.

Index

Notes

For over 20 years, Moog Medical has been designing industry-leading curvilinear peristaltic infusion pumps. Our infusion expertise and collaboration with customers and patients continues to benefit healthcare delivery and enhance caregiver and patient outcomes.

Speak live with a Moog Clinical Representative for pump questions and troubleshooting guidance 24 hours per day, 7 days per week.

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carbon neutral
All Moog Administration and Delivery Sets are manufactured at a carbon neutral facility.

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