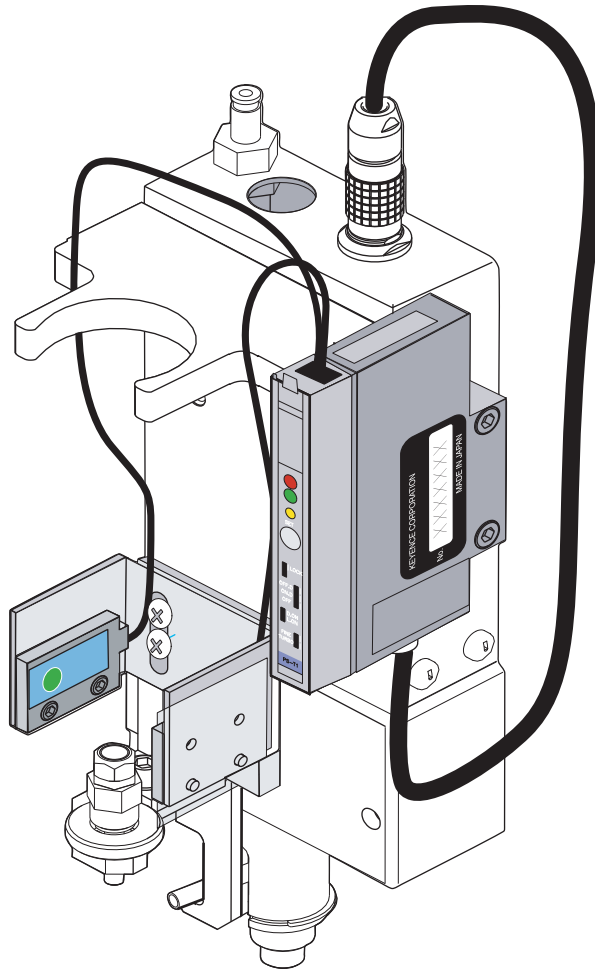# CAMALOT

811-8 (Dot Dispense Unit), 811-10 (Line Dispense Unit)
Low Level Liquid Sensor

Xyflex and XyflexPro Applications

Speedline Technologies

Speedline Technologies
A COOKSON ELECTRONICS COMPANY

811-8 And 811-10 Low Level Liquid Sensors

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Overview

Introduction

This document contains information on the installation, setup and operation of the Low Level Liquid Sensor used on the Xyflex and XyflexPro systems.

Most information is common to both systems and will be identified where they differ.

The Low Level Liquid Sensor is used to detect and alert the operator that an out of material condition exists. This system is used for 10cc and 30cc syringes.

Description

The Low Level Liquid Sensor is an optical device which is used to detect an "out of material" syringe condition. A beam of light is emitted from a sensor transmitter on one side of the material supply syringe, and aimed through the syringe at a sensor receiver on the opposite side.

The device can be used with any material, since the out of material signal can be triggered by the presence or absence of light detected by the sensor receiver.

In This Document

This document contains the following topics.

Installation

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Hardware Installation

Introduction

The following procedure is used to mount and calibrate a liquid level sensing system onto a Xyflex/XyflexPro Dispense Unit (DU). The liquid level sensing system can be used with 10cc and 30cc syringes.

Removal Of Existing Hardware

The dispense unit must be removed from the Xyflex/XyflexPro system to install the liquid level sensing. Refer to Dispense Unit (620, 621, or 622) **Dispense Unit, Option** Guide - **Removing The Dispense Unit**.

1. Place Dispense Unit on a clean work bench.
2. If not already done, remove syringe and cartridge assembly from the dispense unit.
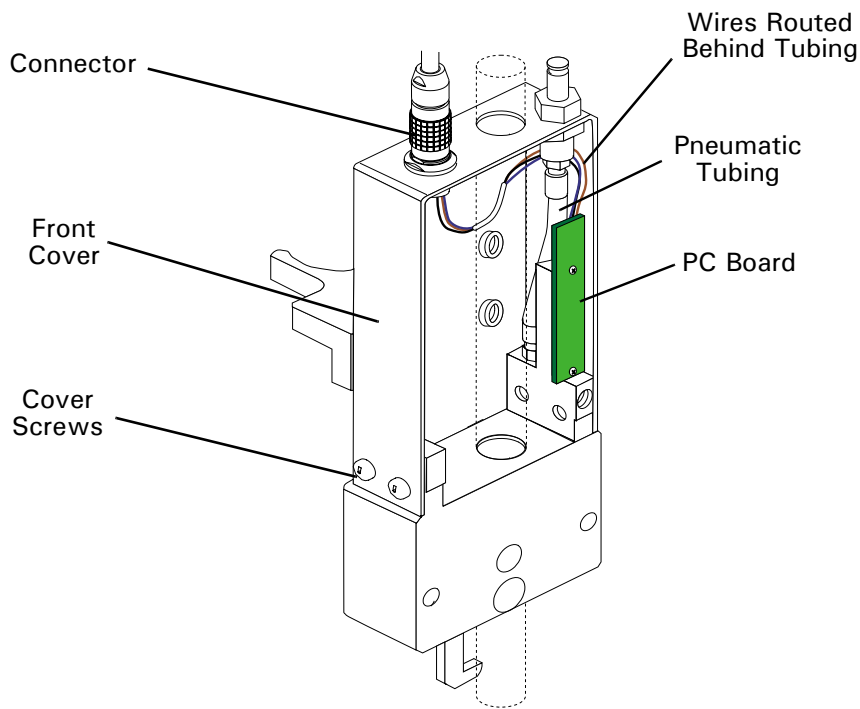3. Cut and remove pneumatic tubing from back of dispense unit. See Figure 1.

Figure 1

4. Remove four screws securing front cover to dispense unit and remove front cover.
5. Remove two phillips pan headscrews securing PC board to dispense unit. Remove old PC board.

New Hardware Installation

1. Insert and assemble connector into new front cover. Secure connector with jam nut. See Figure 1.

2. Assemble new front cover and connector onto dispense unit. Secure cover with four phillips pan head machine screws.

3. Assemble new PC board and secure with two phillips pan head machine screws.

4. Install a new piece of precut tubing onto nipples in the back of the dispense unit. Be sure wires from PC board go behind tubing. See Figure 1.

5. Assemble sensor bracket support as follows:

   a. For Dot Dispense Unit assemble sensor bracket support onto syringe support plate and secure with socket button head cap screw. See Figure 2.
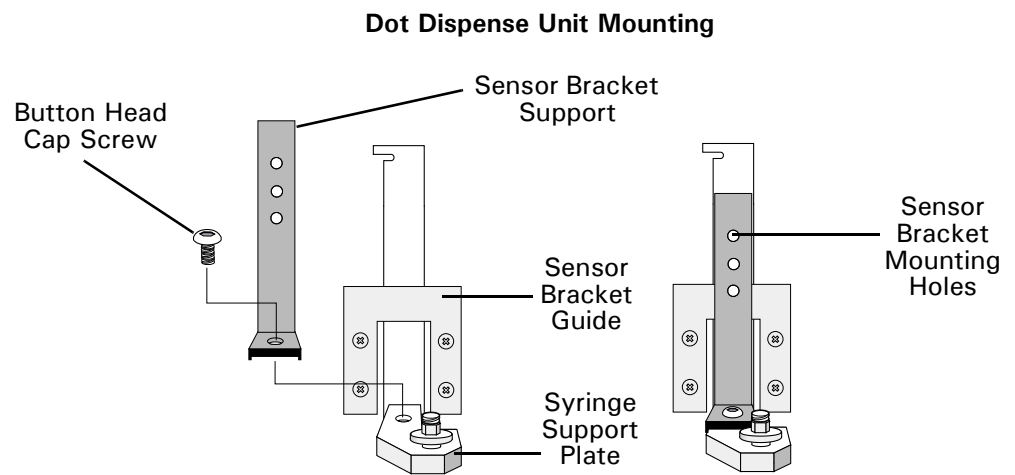
Dot Dispense Unit Mounting

Button Head Cap Screw — Sensor Bracket Support — Sensor Bracket Guide — Syringe Support Plate — Sensor Bracket Mounting Holes

Figure 2

   b. For Line Dispense Unit assemble sensor bracket support onto dispense unit bracket and secure with socket button head cap screw. See Figure 3.

Line Dispense Unit Mounting

Button Head Cap Screw — Sensor Bracket Support — Dispense Unit Bracket — Sensor Bracket Guide — Sensor Bracket Mounting Holes
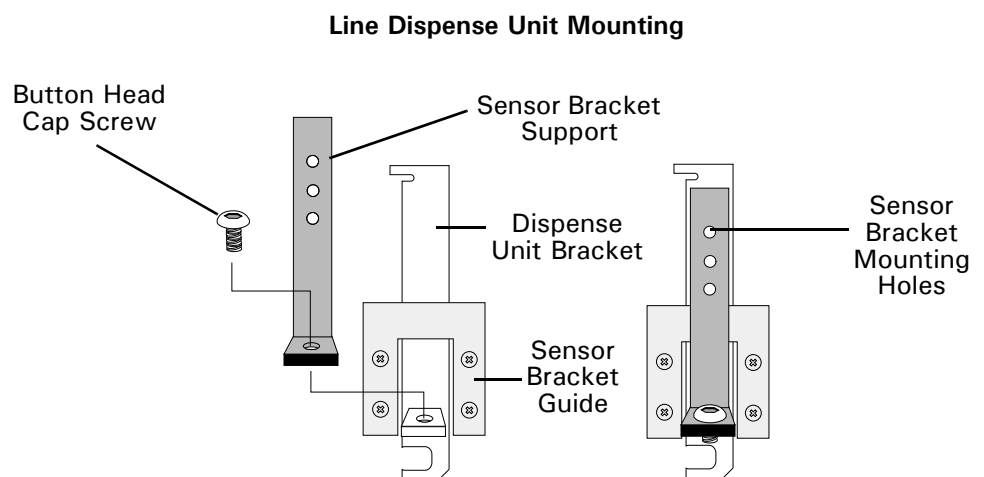
Figure 3

6. Assemble sensor head bracket onto sensor bracket support using two phillips pan head machine screws. Leave screws loose enough to allow movement of sensor head bracket for sensor height adjustment. See Figure 4.
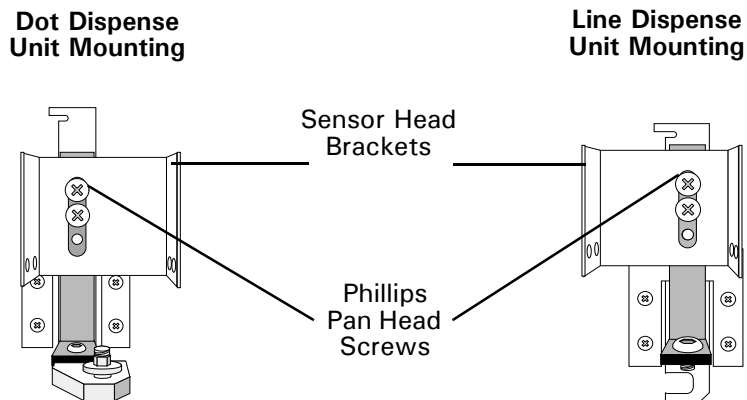
Dot Dispense Unit Mounting **Line Dispense Unit Mounting**

Sensor Head Brackets

Phillips Pan Head Screws

Figure 4

7. Assemble sensor amplifier onto the right side of the front cover and secure with two socket head cap screws. See Figure 5.

8. Assemble two sensor heads onto sensor head bracket (one on each side of bracket) and secure with two socket head cap screws.
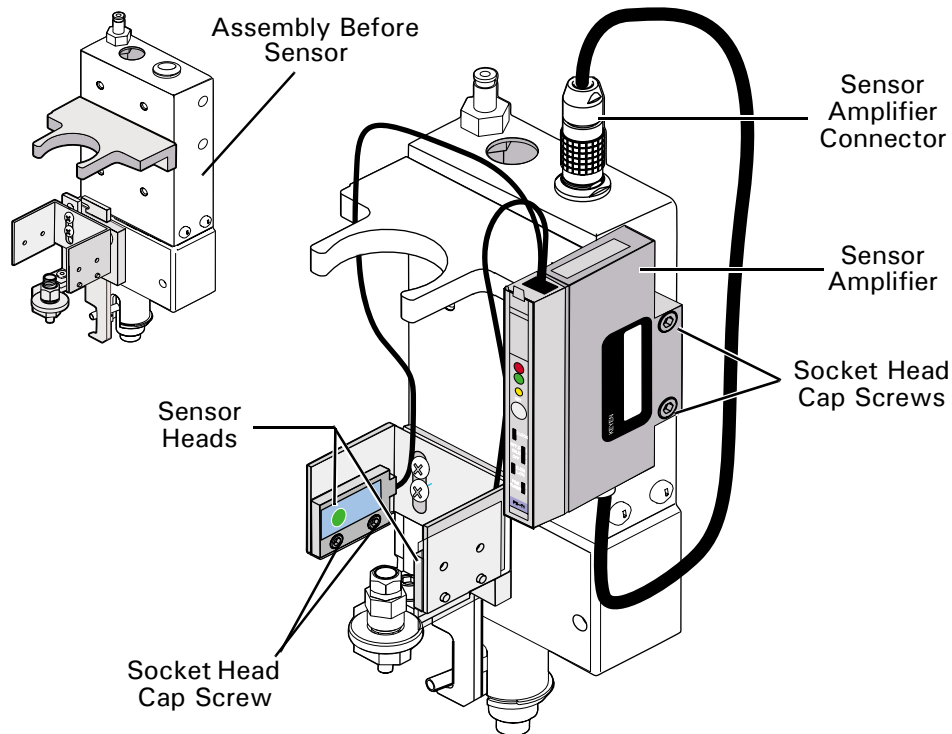

Assembly Before Sensor

Sensor Amplifier Connector

Sensor Amplifier

Socket Head Cap Screws

Sensor Heads

Socket Head Cap Screw

Figure 5

9. Install wire and connector from sensor amplifier into the top of the dispense unit.

10. Tie-wrap wires as required.

**Sensor Height
Adjustment**

Attention

The Sensor Head adjustment is performed with an empty syringe and piston. The height is set by moving the sensor bracket up and down. See Figure 4.

1. Push syringe piston into an empty syringe until piston is at desired empty position.
2. Thread empty syringe onto syringe holder subassembly.
3. Move sensor bracket support up or down until sensor level is about 0.1 to 0.2 inch [2.5mm to 5.0mm] above top of piston or above desired liquid level if piston is not going to be used. See Figure 4.
4. Remove empty syringe.
5. Tighten phillips pan head machine screws to secure sensor bracket support at desired location.
   a. Re-install syringe to check for bracket support drift during handling.
   b. Re-adjust if necessary.
6. Install the dispense unit onto the Z-Axis. Refer to **Dispense Unit** Option Guide, **Installing The Dispense Unit**.

Calibration

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Calibration Procedure

Mounting the Dispense Unit

Attention

The calibration procedure must be performed whenever the type of material color, syringe color or piston is changed.

The following procedure is used to calibrate the liquid level sensor to the type of material that is going to be dispensed.

1. Turn machine **ON**. Refer to System Manual, Chapter titled- **Startup And Shutdown** in the **Operation And Programming** Guide.

Install the dispense unit onto the dispense head as follows:

Attention

The safety door(s) must be closed and locked prior to installation or removal of the dispense head. This allows the axes to move to their proper position for mounting or removing the dispense unit.

2. If necessary, close the safety door(s).
3. Select **Maintenance > Change Syringe** or select the **Change Syringe** tool bar

   icon from the **Machine** screen.

   A head selection box appears. See Figure 6.

Figure 6

4. Select the head to which you will mount the dispense unit.

5. Select the **Next >** button.
   A series of screen notes and a purge checkbox appears.
   See Figure 7.

6. Open the safety door.

7. Pull the sleeve on the dispense unit all the way down.
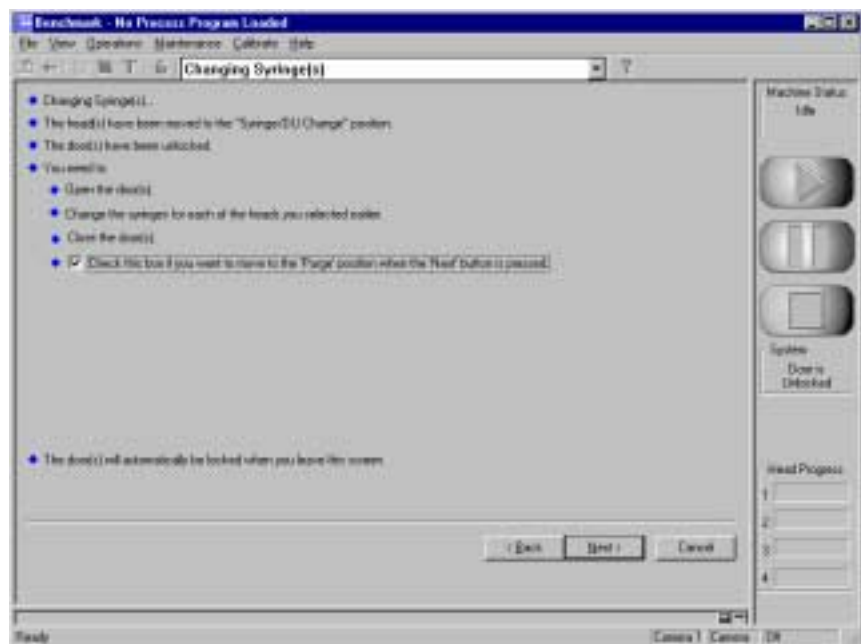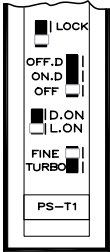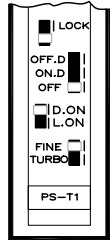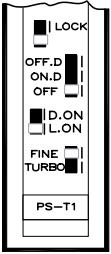   This allows for proper installation of the dispense unit.
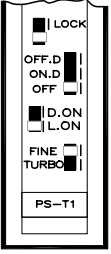

Figure 7

8. The open side of the circlip at the top of the sleeve should face the dispense unit housing.

9. Carefully position the dispense unit so that two locating pins align with the holes in the dispense head.
The U-shaped yoke on head and the matching groove on sleeve of dispense unit should be properly aligned with each other.

10. Press the dispense unit straight back against the head.
The U-shaped yoke on head will automatically engage with matching groove on the sleeve of the dispense unit.

11. Push down the lever on the left side of the head until a distinct click is heard. The click indicates that the dispense unit is securely engaged.

12. Click on the **Purge** checkbox if you want to purge the DU.
If the box is checked the head is moved to the purge position when the <u>**Next**</u> button is selected in step 13.

13. Select the <u>**Next**</u> button.

Calibrating The Low Level Liquid Sensor

1. Unlock and open the safety door(s).

2. Install syringe that has been filled with material to be dispensed onto the Luer Lock fitting.

3. If not already done, open sensor amplifier cover.

4. Set amplifier settings according to material and follower being used, refer to the following table and Figure 8.

Sensor Amplifier Settings			
Process Material (Color	**Follower (Plunger) Color**	**Sensing Location**	**Sensor Amplifier Settings**
Dark Material (Opaque)	Dark Follower (Plunger) (Opaque)	Sense Above Follower (Plunger)	(No Lock) Off L.On Fine
Light Material (Translucent)	Dark Follower (Opaque)	At Follower	(No Lock) Off L.On Fine
*Note- The sensor is not designed to perform with any accuracy with two translucent materials.			

Sensor Amplifier Settings				
Dark Material (Opaque)	Light Follower (Translucent)	Sense Above Follower	(No Lock) Off L.On Fine	
*Light Material (translucent)	*Light Follower (translucent)	Sense Above Follower	(No Lock) Off L.On Fine	
*Note- The sensor is not designed to perform with any accuracy with two translucent materials.				

5. Push **SET** button on sensor to set sensor for full indication. Yellow calibration indicator LED will light. See Figure 8.

Sensor Amplifier

Green LED Indicator

SET Button

Output Selector Switch

Red LED Indicator

Yellow LED Indicator

Key Protection Switch

Output Timer Selector
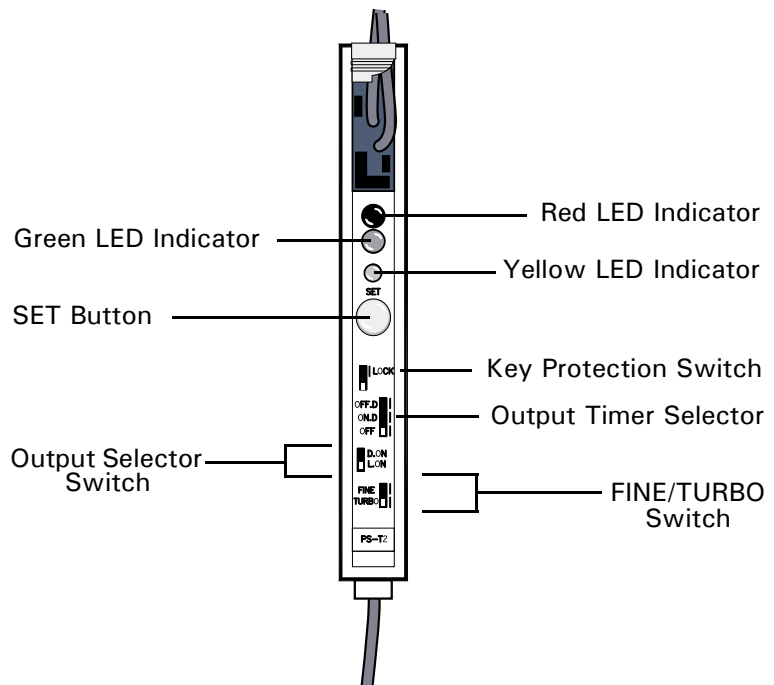
FINE/TURBO Switch

Figure 8

6. Remove full syringe.

7. Install empty reservoir that has been used for dispense operation.

8. Push **SET** button.

   Yellow LED will go off. Sensor is set for operation.

Calibration If Empty Syringe Is Streaked

If walls of empty syringe are streaked with residual material, it may be necessary to calibrate empty syringe as follows:

1. Install empty syringe.

2. Place one or two sheets of blank copy paper between sensors and syringe.

3. After pushing calibration **SET** button, remove paper and check calibration by slowly rotating empty syringe.

   Indicator LED should not change states while rotating syringe.

Sensor Amplifier Indicators During Calibration

The following indicators and controls are used during the sensor calibration:

Controls And Indicators	Description
Operation Indicator	Red LED lights when control output is activated.
Stable Operation Indicator	Green LED lights when a sufficient light quantity is received or the light beam is interrupted.
Calibration Indicator	Yellow LED lights during sensitivity adjustment.
Set Button	Sensitivity setting button.
Key-Protection Switch	Locked position disables key operation. Must be set to OFF position.
Output Timer Selector Switch	Not Used. Must be set to OFF position.
Output Selector Switch	Used to select output active state. Preset at Speedline Technologies, Inc. Should be set to L.ON. If dispense material is clear, it may be necessary to change the output selector switch setting from L.ON to D.ON.
Fine/Turbo Switch	Used to increase light output when stable operation indicator light is flickering. Normally set to FINE position. If stable operation indicator light is flickering, change to TURBO setting.

Sensor Operation
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Running The Low Liquid Level Sensor

Introduction

When the Low Level Liquid Sensor detects an empty syringe, it sends the system a message not allowing any upstream boards to enter the machine. All internal work in progress will finish dispensing and be sent downstream. The blue light will continue to flash (on the Light Tower) until all boards are completed within the machine. When the system is finished dispensing the last board, the blue light will turn amber (on the light tower). The **Syringe Empty** (Alarm Condition), will appear in the **Alarm Status** screen.

Attention

A software liquid level counter is provided when a hardware Low Level Liquid Sensor option (optical or proximity sensor) is not present.

On the Configuration screen's **Head/Syringe** tab the **Syringe** group **ON**/Off check box is titled **"Counter"**. This label is replaced with **"Sensor"** when the sensor software is introduced. This permanently overrides the counter control and grays out the fields (not enabled).

Enabling The Low Level Liquid Sensor

The liquid level sensor is enabled as follows:

1. Select **View > Configuration >** from the Machine Screen and select the **Head/Syringe** tab. The **Head/Syringe** tab appears. See Figure 9.

Figure 9

2. Select the desired **Z-head** from the Head drop down list. If you have a Xyflex-Pro with a dual head, select the right or left head by selecting either **1** or **2**.

3. Left click the **Sensor "On"** checkbox. A checkmark enables the sensor.

4. Select the **OK** button to close the **Head/Syringe** tab. If Cancel is selected no updates will occur.

The low liquid level sensor will monitor the level of the dispensing material at each head selected on the **Head/Syringe** tab.

Operation and Programming of the system is not changed when using the liquid level sensor.

Changing An Empty Syringe And Clearing The Alarm Condition

When the syringe empty indication is sent, the head will move to the syringe position. The **Syringe Empty** (Alarm Condition), will appear in the **Alarm Status** screen.

Install a full syringe as follows:

1. Select **View** > **Maintenance** > **Change Syringe** from the main screen or left click on the **Change Syringe** icon button. The Changing Syringe(s) screen appears. See Figure 10.
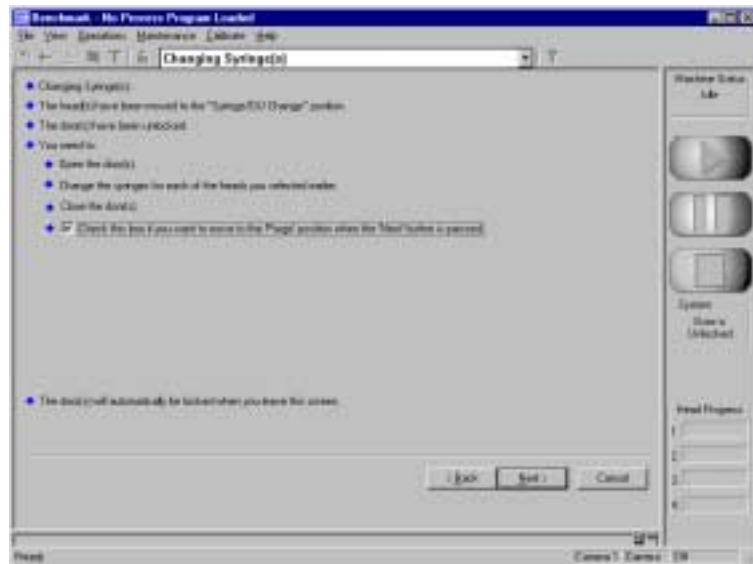

Figure 10

2. Unlock and open the safety door(s).

3. Remove empty syringe from dispense unit.

4. Install full syringe onto Luer lock fitting of dispense unit.

5. Close and lock the safety door(s).

To clear the Alarm Condition, refer to the System Manual - **Alarms And Troubleshooting**.