Linx 5900 & 7900

How To Diagnose Problems

LINX

THINKING ALONG YOUR LINES

Linx 5900 & 7900

Contents

LINX

Linx 5900 & 7900

1 Introduction

This document describes how you check the condition of the 5900 and 7900 printers and find the cause of any problems.

The System Events (warnings and faults) are described in the *Linx 5900 & 7900 Quick Start Guide* and are not described in this document.

You need a User Level C password to perform all the tasks that are described in this document.

1.1 Health and Safety

Make sure that you read and understand the Health and Safety information in the 'Safety' section of the *Linx 5900 & 7900 Quick Start Guide*.

2 Test message

The printer can generate a test message automatically. You can use a test message to make sure that the printer operates correctly and to check the print quality. The test message contains a number of shapes and fields. For example, the message displays the current date and time, and a counter field.

Figure 1 below shows an example test message.

Figure 1. Test message

2.1 Create a test message

To create a test message, select **Menu** > **Maintenance** > **Test Message**.

The printer displays a list of the message types that are available.
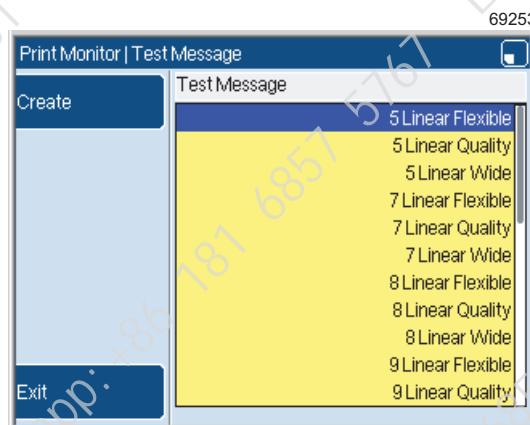
Figure 2. Test Message: message types

Normally, to test the complete raster you select the largest message type that is available for your printhead (34 Linear Quality for example). When you select the message type, the printer creates the test message and displays the following page.
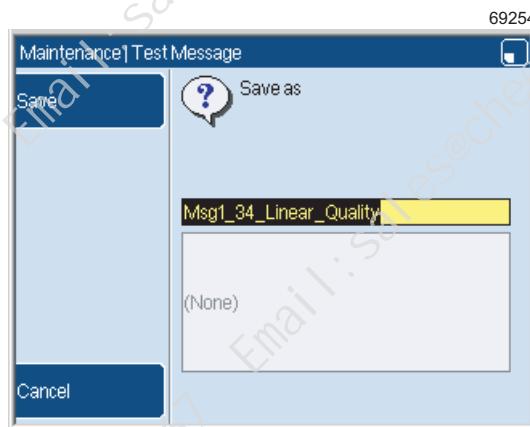
Figure 3. Test Message: save the message

The default name includes the message type. You can change this name before you save the test message.

The printer saves the test message in the message store. To print the test message you must first select it from the message store.

3 Event Log

The printer maintains a list of events that occur during the operation of the printer. The list can include all these events, or you can apply a filter, so that some events are not included in the list.

You can use the list of events to check the operation of the printer. The list tells you if one event occurs many times (for example "3.20 No Time of Flight").

3.1 Use the Event Log

At the **Print Monitor** page, press the **Menu** key to access the **Menu** page. Then select the **Event Log** option to display the **Current Events** page.
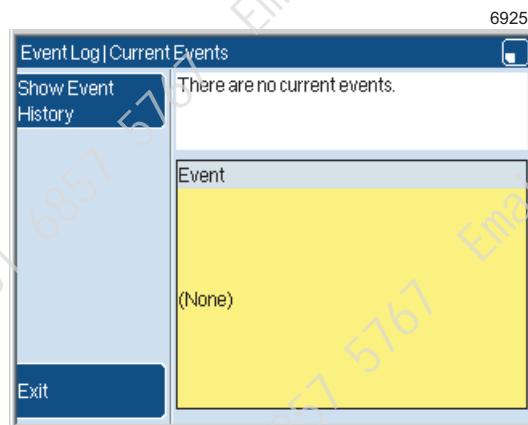

Figure 4. Current Events page

If there is an active event (for example "3.03 Ink Low"), the event is displayed in the **Current Events** page.
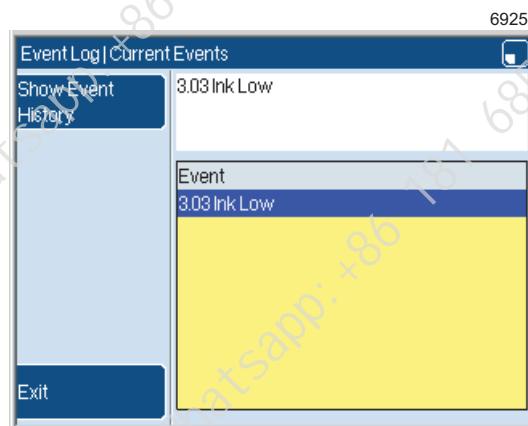
Figure 5. Current Events page: Ink Low event

Linx 5900 & 7900

3.1.1 Event History

Press the **Show Event History** key to display the **Event History** page. This page contains a list of all failures and warnings that occurred. The newest events are shown at the top of the list.
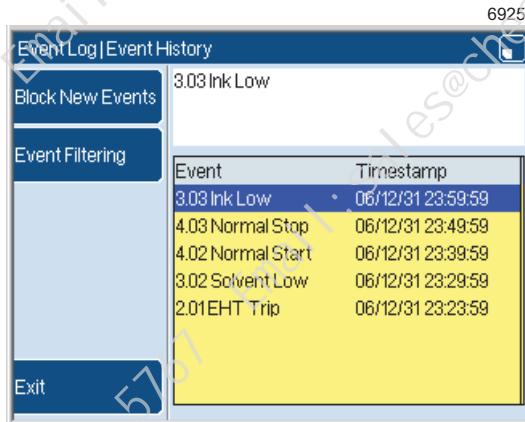
Figure 6. Event History page

You can use the **Event History** page to see any events that occur many times.

Block New Events

If you select this option, new events do not appear in the list while the **Event History** page is displayed. You can use this option to prevent any changes while you inspect the list. When you return to the **Menu** page the printer cancels this option and records new events.

If you select the **Block New Events** option, the soft key label changes to **Track New Events**.

Track New Events

This option cancels the **Block New Events** action (described above) and the soft key label changes to **Block New Events**. The list changes to include any events that occurred (but were not shown) while the **Block New Events** action was in use.

Event Filtering

If there is a large number of items in the list and the length of the list causes a problem, you can hide some items. The items remain in the list but are not shown. To hide some events, press the **Event Filtering** key. The printer displays the **Event Filtering** page.
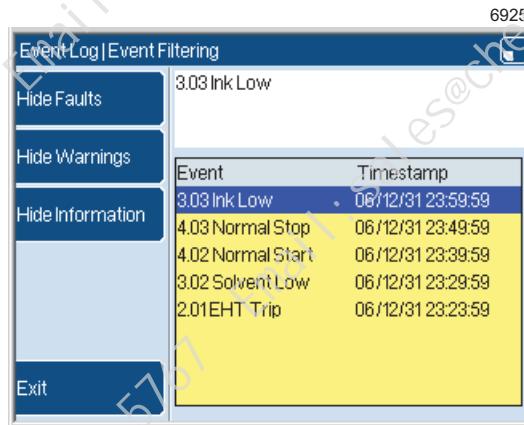
Figure 7. Event Filtering page

There are three types of event that you can hide, as shown below:

Hide Faults

Use this option to hide any Print Failure events (events that begin with the number "2"). For example, the printer removes the event "2.01 EHT Trip" from the list that is shown in Figure 7.

If you select the **Hide Faults** option, the soft key label changes to **Show Faults**.

Hide Warnings

Use this option to hide any Warning events (events that begin with the number "3"). For example, the printer removes the "3.03 Ink Low" event and the "3.02 Solvent Low" event from the list that is shown in Figure 7.

If you select the **Hide Warnings** option, the soft key label changes to **Show Warnings**.

Hide Information

Use this option to hide any Information events (events that begin with the number "4"). For example, the printer removes the "4.03 Normal Stop" event and the "4.02 Normal Start" event from the list that is shown in Figure 7.

If you select the **Hide Information** option, the soft key label changes to **Show Information**.

Linx 5900 & 7900

4 Monitor Jet

The **Monitor Jet** page gives you a summary of important technical information about the state of the printer. If you report a problem, this information can enable Linx Technical Support to find the cause. For some faults Linx Technical Support can help you to correct the cause, so that the service technician does not need to go to your site.

4.1 Technical description

The following description helps you understand the parameters that are displayed in the **Monitor Jet** page.

4.1.1 Pressure

The printer has an ink pump that generates a pressure to send the ink through the printhead conduit then through a small nozzle in the printhead. The ink drops then go through a slot in the printhead cover tube. To maintain the best print quality the printer adjusts the ink pressure to maintain the correct speed for the ink drops.

4.1.2 Time of Flight (TOF)

The printer measures the time that is needed for the ink drops to pass between two sensors in the printhead. This time difference is the *Time Of Flight* (TOF). The TOF measurement allows the printer to monitor the speed of the drops. The ink drops must leave the printhead at the correct speed to maintain the best print quality.

4.1.3 Control of ink viscosity

The ink contains some solvent which evaporates during use. When the solvent evaporates, the ink viscosity increases. The increased viscosity makes the ink drops move more slowly. When the drop speed falls, the TOF value increases. The printer raises the ink pressure to maintain the correct TOF value.

When the pressure reaches a preset value, the printer adds some solvent to the ink tank. The solvent causes a decrease in the ink viscosity. The drop speed increases and the TOF value falls. The printer lowers the ink pressure to maintain the correct TOF value.

This process controls the viscosity of the ink and maintains the correct speed of the drops.

4.1.4 Modulation, Charge, and Phase

The printer generates a high-frequency signal that separates the jet into a series of drops. This signal is the *Modulation* signal (waveform D in Figure 8 on page 9).

Each drop must receive an electrical charge and the printer generates a high-frequency signal to charge the drops. This signal is the *Charge* signal (the pulse A in Figure 8 on page 9).

The Modulation signal and the Charge signal have the same frequency. The printer can apply a small time difference between the signals to provide the correct electrical charge on the ink drops. The delay between the signals is the *Phase* value. The Phase value is in the range 0 to 15.

Linx 5900 & 7900

Figure 8 shows how a phase value is defined.
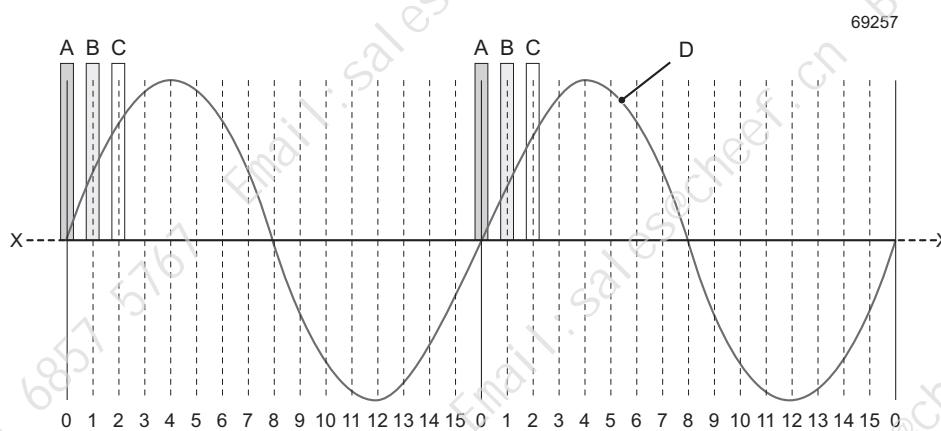
Figure 8. Phase values

The Modulation signal (D) and the Charge signal (A) are generated at the same frequency. The Charge signal appears when the Modulation signal increases through zero volts (the line "X … X").

To adjust the charge on the ink drops, the printer can delay the Charge signal (for example to B or to C). The delay (Phase value) depends on a number of factors, for example the ink type and the temperature.

There are 16 possible phase values as shown in Figure 8. The phase value for Charge signal A is 0, the value for signal B is 1, and the value for signal C is 2. The printer tries each phase value to find the setting that gives the correct charge.

NOTE: The waveform and the pulses in Figure 8 are for example and are not accurate illustrations of the signals in the printer.

The number shown for the Phase value is not important, but the value must not change quickly or by a large amount. The number changes while the ink temperature increases after you start the printer. After the printer has operated for a number of minutes, the Phase value changes by only 1 or 2 in each minute of operation.

4.2 Monitor Jet page

To understand the parameters displayed on the **Monitor Jet** page, make sure you read the previous section ('Technical description' on page 8).

To access the **Monitor Jet** page from the **Print Monitor** page, press the **Menu** key to display the **Menu** page. Then select **Maintenance** > **Monitor Jet** to display the **Monitor Jet** page.
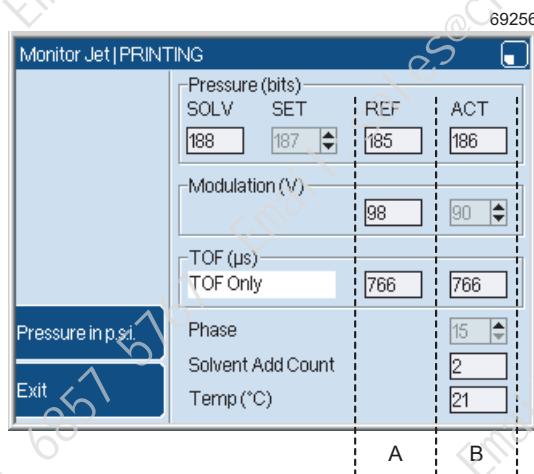
Figure 9. Monitor Jet page

The **Monitor Jet** page contains a number of boxes that display a value.

Figure 9 shows three boxes in the column (A) that has the label "REF". These boxes contain fixed "reference" values that the printer uses in its calculations. These values are set when the printer is installed.

There are six boxes in the column (B) that has the label "ACT". These boxes are updated continuously and contain the current values of the parameters.

NOTE: The values shown in the **Monitor Jet** page are for display only. You cannot change these values.

4.2.1 Pressure

There are four boxes in this group and each box contains an ink pressure value. The units of measurement are shown in the brackets that follow the label "Pressure" (for example "bits" in Figure 9).

(See also 'Pressure key' on page 12.)

SOLV

(See 'Control of ink viscosity' on page 8.)

When the ink pressure reaches the value in this box, the printer adds some solvent to the ink tank. The solvent causes a decrease in the ink viscosity and lowers the pressure. A number of minutes passes before you see a change in the displayed value.

Linx 5900 & 7900

SET

This value is the calculated ink pressure that is required to make sure that the drop speed is correct. The printer monitors the TOF value and updates the **SET** value continuously.

REF

This pressure value is a fixed number that depends on the printhead type and the ink type. The printer uses this value in the calculation for the **SOLV** Pressure.

ACT

This value is the current pressure in the ink system. There can be a small difference between the **SET** value and **ACT** value.

Fault Diagnosis

When the printer operates normally, the **SOLV**, **SET**, **REF**, and **ACT** boxes show about the same values. If the values are different, there can be a problem in the printer.

4.2.2 Modulation (V)

The modulation value is the voltage of the signal that separates the ink jet to make a continuous series of ink drops.

- The box in the **REF** column shows the reference value for the Modulation voltage. The reference value depends on the type of printhead and on the ink type. The printer uses the reference value in the calculation of the current value.

- The box in the **ACT** column shows the current value of the Modulation voltage. The printer adjusts the current value to maintain the best print quality if the operating parameters change when you print.

4.2.3 TOF (µs)

(See 'Time of Flight (TOF)' on page 8.)

TOF mode

The first box in the TOF group shows which parameters are monitored. The printer can measure both the TOF value and the Phase value, or only the TOF value (see 'Technical description' on page 8). The box displays one of the following modes:

TOF/Phase

The printer monitors the TOF value and the Phase value. This mode is used after the jet startup is complete.

TOF only

The printer monitors only the TOF value. This mode allows the printer to monitor the TOF parameter of the ink jet when the phase value is not set. The printer uses this mode for a short period when the jet starts until the pressure is adjusted to generate the correct TOF.

Off

The printer does not monitor TOF or Phase. The printer is in this mode while the jet does not run (the printer is in the "IDLE" state).

TOF (REF)

The box in the **REF** column shows the reference value for the TOF measurement. The measurement units are microseconds. The value depends on the printhead type.

TOF (ACT)

The box in the **ACT** column shows the current value of the TOF measurement. While the jet runs, the printer updates this value continuously.

4.2.4 Phase

This box shows the current value of the Phase. While the jet runs, the printer updates this value continuously. There is no value displayed when the TOF mode is set to "TOF Only".

4.2.5 Solvent Add Count

When the printer adds some solvent to the ink tank, the value in this box increases by 1. The value is reset to 0 when you start the jet.

4.2.6 Temp (^{o}C)

This box shows the internal temperature of the printhead.

4.2.7 Pressure key

Use this key to change the units of measurement for the four boxes in the Pressure group. When you change the units, the key label changes to show the next available units of measurement (for example "Pressure in bar").

The following measurement units are available:

- p.s.i.
- bar
- Bits

If the units of measurement are "Bits", each value is displayed as a number in the range 0 to 255.

5 Maintenance Times

The printer maintains a record of the times during which the printer is used or turned on. This record allows the printer to calculate the date of the next Scheduled Maintenance, for example. The **Maintenance Times** page shows you the information in the record.
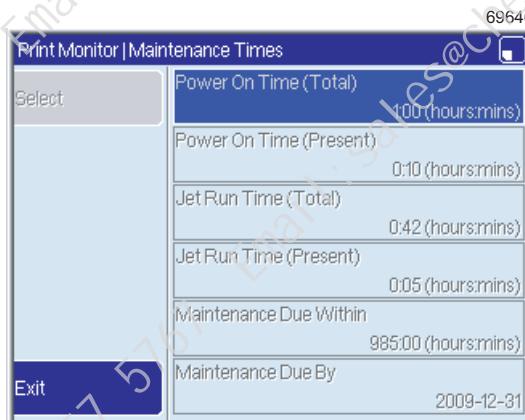
Figure 10. Maintenance Times page

5.1 Maintenance Times page

The menu options on this page are for display only. You cannot select the options or change the values.

5.1.1 Power On Time (Total)

This item shows you the total number of hours and minutes that the printer power was turned on (from the date of the printer installation).

5.1.2 Power On Time (Present)

This item shows you the number of hours and minutes that have passed after the last time that the printer power was turned on.

5.1.3 Jet Run Time (Total)

This item shows you the total number of hours and minutes during which the jet was active (from the date of the printer installation).

5.1.4 Jet Run Time (Present)

This item shows you the total number of hours and minutes during which the jet was active (from the last time that the printer power was turned on).

5.1.5 Maintenance Due Within

This item shows you the number of hours and minutes that remain before the next Scheduled Maintenance.

5.1.6 Maintenance Due By

This item shows you the date of the next Scheduled Maintenance.

Linx 5900 & 7900

6 System Information page

The **System Information** page gives you access to four pages of information about the configuration of your printer. To access this page from the **Print Monitor** page, press the **Menu** key then the [end] key to highlight the **System Information** option. Press the **Select** key to display the **System Information** page.
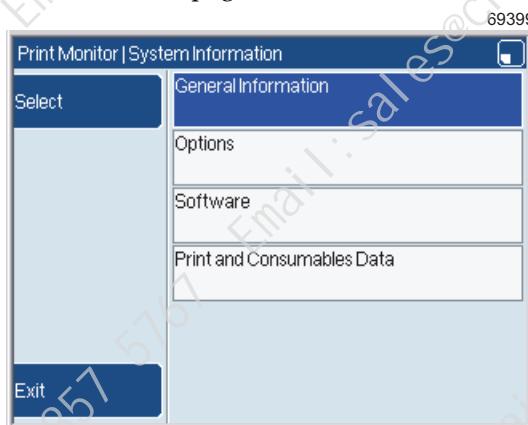
Figure 11. System Information page

At the **System Information** page, select the **General Information** option to display the following page.
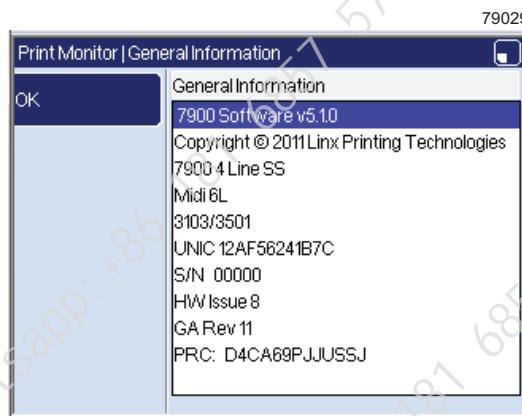

Figure 12. General Information page

The **General Information** page shows you the following information:

Line 1:   Software version information.

Line 2:   Copyright information.

Line 3:   Printer configuration.

Line 4:   Printhead.

Line 5:   Ink type.

Line 6:   UNIC code (a unique serial number that identifies the printer).

Line 7:   An optional label that identifies the printer. (This line can contain any text.)

Lines 8 and 9:   Version information for the electronics inside the printer.

The **Options** page shows you which optional features are installed in the printer.
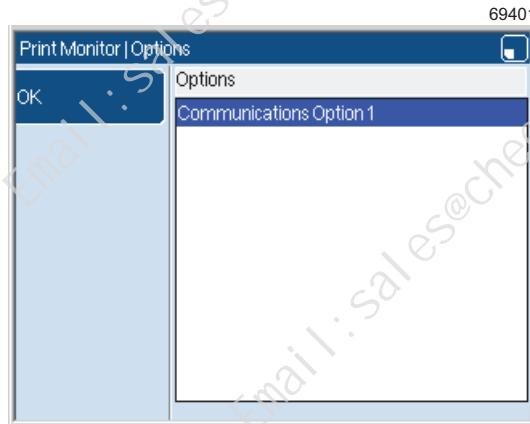
Figure 13. Options page

The **Software Information** page shows additional information about the printer software and the storage capacity for messages and other data. The service technician can use this page to check the status of the data storage capacity of the printer.
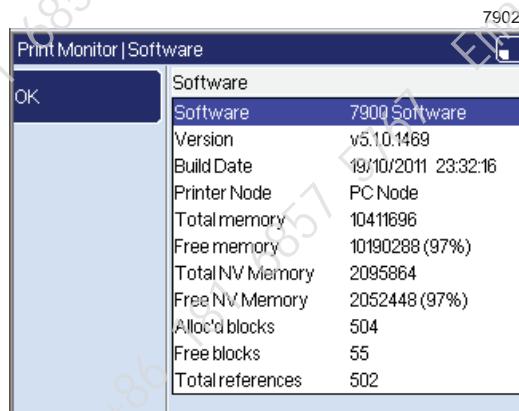
Figure 14. Software information page

The **Print and Consumables Data** page is described on page 19.

7 Print and Consumables pages

There are two pages of information that help you manage the ink and solvent use.

7.1 Print and Consumables History

To access this page from the Print Monitor page, press the **Menu** key. Then select **Maintenance** > **Print and Consumables History**.

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Figure 15. Print and Consumables History Page

The **Print and Consumables History** page gives you some information about the rate at which the printer has used ink and solvent.

The counter which is next to each item shows the number of the items that the printer has used. The counters calculate from the date when the printer was installed and from the time that the counters were reset to zero. (You cannot reset the counters if you have a User Level C password—the service technician performs this task.)

The information helps you monitor ink and solvent use, and gives the service technician information about the past performance of the printer.

The information in the **Print and Consumables History** page is approximate because many variables control the rate at which the consumables are used. The calculations for the next time that the ink or solvent are refilled are also approximate. (See also 'Print and Consumables Data' on page 19.)

7.1.1 Messages

This item shows the total number of messages printed from the time that the printer was installed.

7.1.2 Drops

This item shows the total number of drops printed from the time that the printer was installed.

7.1.3 Ink Bottles

This item shows the total number of ink bottles that the printer has used from the time that the printer was installed.

7.1.4 Solvent Bottles

This item shows the total number of solvent bottles that the printer has used from the time that the printer was installed.

7.1.5 Recent Messages

This item shows the number of messages printed from the time that the counter was last reset to zero.

7.1.6 Recent Drops

This item shows the number of drops printed from the time that the counter was last reset to zero.

7.1.7 Recent Ink Bottles

This item shows the number of ink bottles that the printer has used from the time that the counter was last reset to zero.

7.1.8 Recent Solvent Bottles

This item shows the number of solvent bottles that the printer has used from the time that the counter was last reset to zero.

Linx 5900 & 7900

7.2 Print and Consumables Data

To access this page from the Print Monitor page, press the **Menu** key. Then select **System Information** > **Print and Consumables Data**.

Figure 16. Print and Consumables Data page

The **Print and Consumables Data** page tells you the average number of hours of use for each bottle of ink or solvent. This page also tells you the approximate number of hours that remain before you must refill the ink tank or the solvent tank.

The information in the **Print and Consumables Data** page is approximate because many variables control the rate at which the consumables are used.

7.2.1 Ink Bottle Life Expectancy

This item shows the number of hours of use for each ink bottle.

7.2.2 Solvent Bottle Life Expectancy

This item shows the number of hours of use for each solvent bottle.