Connecting Signature® Slide / Cassette Printer to your Laboratory Information System (LIS)

Version 2.6

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Primera's Signature Slide and Signature Cassette printers are the world's first and only color-capable direct-to-slide/direct-to-cassette printer. They are also smaller and more competitively priced than other slide/cassette printers. This not only makes direct printing more affordable to a wider range of customers, but also makes it economically viable for a lab to install multiple units. For example, a printer can now be placed at every microtome instead of having to continuously walk back and forth to a larger, more expensive centralized printer.

Signature Printers increases efficiency and reduce errors by eliminating handwriting or using expensive and difficult to apply xylene-resistant labels. With 300 dpi print resolution and color capability, you can print text, graphics and logos along or 2D bar codes on every slide or cassette.

Primera has developed several methods of utilizing Signature Printers in your laboratory's IT environment. There are four main choices:

1. **Stand Alone System using PTLab Standard Edition (SE)**

   - PTLab SE is a flexible, template-driven stand-alone solution that allows each lab to completely customize the printed layout. PTLab SE is provided at no extra charge with each Signature Printer.

   - Content is provided manually by the technician through a simple, clean User Interface (UI) or pulled from a barcode scan using the integrated 2D bar code scanner.

2. **LIS Integration using Signature Printer Windows Printer Driver**

   - LIS software can use the printer as a standard Windows raster-based printer by utilizing the included Windows XP/Vista/7/8 printer driver. This printer driver is included at no extra charge with every Signature Printer.

- Slide/cassette images generated by the LIS are sent via standard Windows APIs to the printer.

- If a software provider wishes to do a more robust integration with Signature, a series of low-level commands are available to query status and report error conditions. A document that describes the available commands is available in the LIS integration section of our website.

  http://primera-healthcare.eu/en/LISIntegration.html

3: LIS Integration using PTLab Professional Edition (PE)

- PTLab PE is sold as an optional, extra cost upgrade to PTLab SE.

- Uses the PTLab SE UI while allowing LIS companies to integrate by using a hot folder that reads a flat file that contains the desired print data.

- LIS companies or IT personnel can write their own plug-ins to support virtually any additional LIS interfaces.

- Job and System Status information is passed to the plug-in and displayed to the user via the PTLab UI.

- Can also accept manual print jobs from the user (similar to the Stand Alone method above).

Each of these methods of using the printer will be explained in the following pages. See Appendix A on page 12 to decide which method may apply best to your requirements. Appendix B on page 13 shows a feature comparison of the different versions of PTLab software.

Description:

PTLab in conjunction with PTTemplate can provide a lab with a complete customized stand alone system. Templates are created by lab management with PTTemplate when the printer is installed. The technician interfaces to the printer via the PTLab SE software UI. All the choices that are presented to the technician can be customized when creating the template.

LIS Interface:

In this configuration there is no LIS interface. The technician will either input all data via a customized interface (i.e. lists, text entry, automated fields, etc.) or data can be pulled from an existing barcode via the optional 2D bar code scanner. A customizable log file will also be generated.

Example Use of PTLab SE:

Acme Labs is currently handwriting slides. Management is concerned about the accuracy and the liability of not being able to trust the handwritten information. The only barcode they use consists of an accession number on a lab order.

They want the slide to contain three fields:

- Accession number from the barcode on the lab order

- Patient name (limited to 10 letters only; no numbers)

- Color-coded specimen type where Liver is Red, Kidney is Yellow, Skin is Blue, etc.

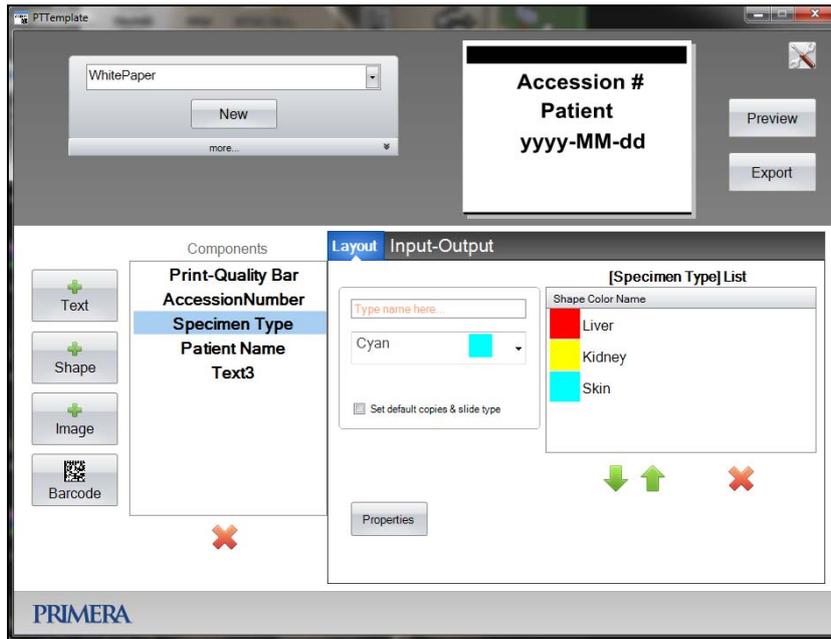The lab manager uses PTTemplate (see Figure 1) to create his template.

Figure 1

When the technician uses PTLab they are presented with the UI in Figure 2. All they need to do is scan the barcode from the lab order, enter the patient name, select the specimen type and click "Print."

Figure 2

Benefits:

- Consistent layouts and required information from technician to technician

- Legible text and graphics to prevent mistakes

- Color coding

- Can contain a 2D barcode for further tracking and processing

- Contains basic error checking such as Patient Name limits and automatic date/time

Description:

The Signature Printer can be integrated into a LIS system through the use of the Windows printer driver. This allows LIS software that currently prints to either a slide or label printer to easily interface with the Signature Printer.

LIS Interface:

The LIS supplier will need to create an image representation of the slide/cassette and send it to the printer through standard Windows printer APIs. The Signature printer driver interface has the following requirements:

- Colors supported: red, green, blue, cyan, magenta, yellow, black, white (orange, violet and grey will also be supported soon)

- Slide Printer: Printable area: .87" x .67" (22mm x 17mm)

- Cassette Printer: Four sizes are available:

  - Size 1 for standard 45° angle cassette - .236" x 1.01"(default)

  - Size 2 for rounded edge 45° angle cassettes - .236" x .880"

  - Size 3 for 35° angle cassettes - .293" x 1.01"

  - Size 4 for rounded edge 35° angle cassettes - .293" x .880"

- DPI: the rasterized DPI of the image should be 300 dpi; any higher resolution is not required and will only result in longer raster times

Example Using Signature Printer Driver:

Bonner Labs was using the NetLIMS LIS system for printing slides on their existing centralized slide printer. They wanted a more reliable and efficient solution where every station has its own printer. This would prevent slides being generated by one technician from being mistaken for slides generated by another technician. They also wanted to print color bars on the slides to

show which type of tissue should be placed on the slide. Finally, they wanted to eliminate color-frosted slides because all slides would now be printed with a 2D bar code. A white slide frosting is always recommended for obtaining the best possible scan rates.

NetLIMS was able to use the same interface developed for the old slide printer and only had to make minor changes to the label which they were able to do through a remote TeamViewer session. In one morning they were able to swap the large centralized printer for two much smaller, more reliable printers that now reside at each technician's station.

Benefits:

- Color bars can be printed on the slides for different types of studies, eliminating the need to stock colored slides

- One printer at each station to prevent mix-ups of slides printed at a centralized printer.

- Small footprint

Description:

Primera has also developed an optional PTLab Professional Edition (PE) to handle more complex interfaces to new or existing LIS software. It is a flexible, powerful way to integrate the printer into the widest range of LIS environments.

LIS Interface:

PTLab PE supports a plug-in architecture to handle virtually any LIS integration. Plug-ins are .NET Class Libraries that adhere to the IPTPlugin interface. Primera includes with PTLab PE a flat file plug-in using this interface. Source code is open and is included with this Primera provided plug-in. Third-party developers can use the source code to create custom plug-ins to support existing and new interfaces.

Current Plug-ins:

Primera's Flat File Plug-in:

Primera has developed a plug-in that will look for a Flat File (text file) to be placed in a configurable directory. This file will be read by the plug-in and a job will be passed into PTLab. This data will be applied to a pre-designed template and printed. The lab or LIS can define how the fields from the flat file are mapped into the template.
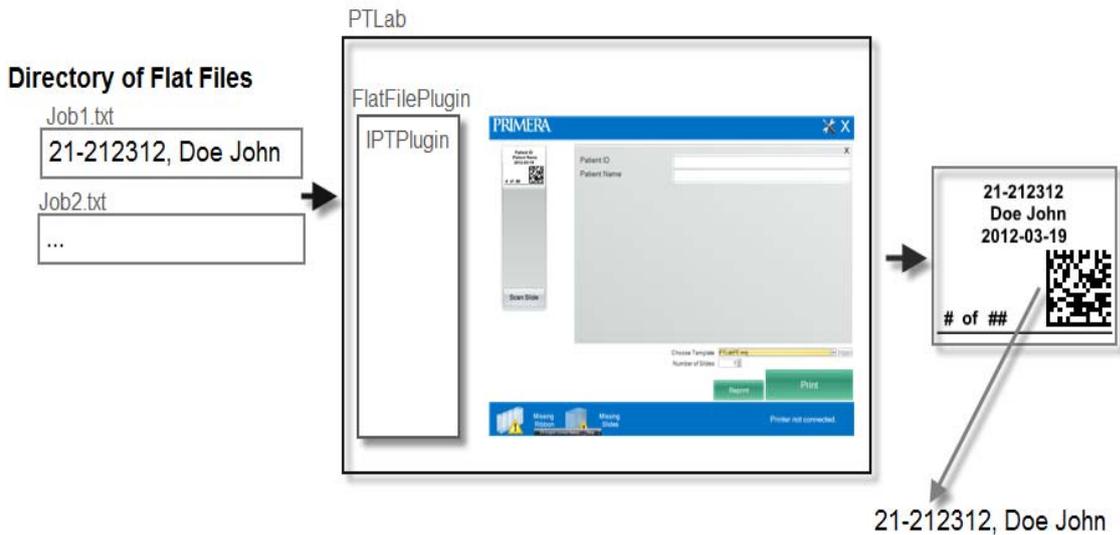
Example Using Primera's Flat File Plug-in:

Conway Labs uses an LIS system that already interfaces with an existing slide printer by copying a flat file to a specific location. They want to replace this printer with a Primera Signature Slide Printer to increase reliability and integrate printed 2D barcodes.

Usage:

In this case, no custom development is needed. Primera's Flat File Plug-in can be configured to look into the same location for the slide print job. The lab manager can create a template for

this data and map all the input fields to printed fields. The lab manager can then add a barcode to the template and pick the fields that need to go into the barcode.

Example Using Custom Plug-in:

Danbury Pathology uses an LIS system that already interfaces with an existing cassette printer by copying an XML file to a specific location. They want to replace this printer with a Primera Signature Cassette Printer to increase reliability and integrate printed barcodes.
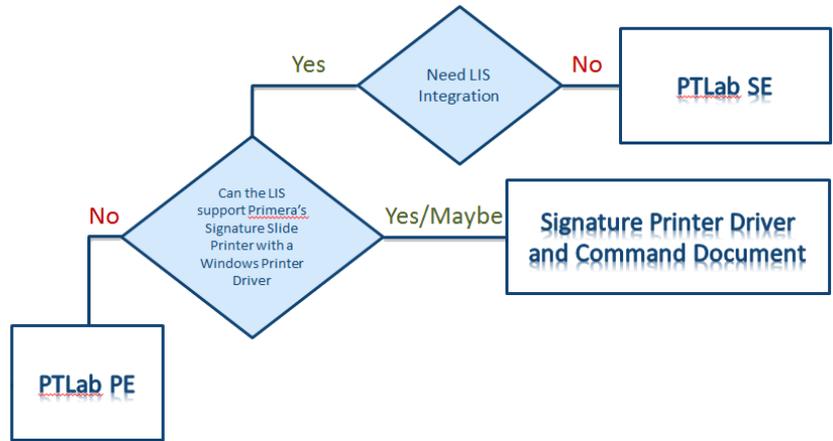
Usage:

Primera currently doesn't offer an XML plug-in interface. In this case, the LIS software provider would need to create a plug-in to parse the XML and pass it to PTLab via the IPTPlugin interface. The LIS provider could create its own plug-in from scratch or simply modify the provided source code from Primera's Flat File Plug-In to support XML. Third-party plug-ins for Primera are currently available from companies such as Niceware.

Benefits:

- Support for a large number of currently installed LIS systems

- Flexible plug-in architecture allows the LIS, Primera or a third party to develop compliant plug-ins using existing source code

- Future proof and interface agnostic

APPENDIX A: LIS INTEGRATION DECISION TREE

Yes

Need LIS
Integration

No

PTLab SE

Can the LIS
support Primera's
Signature Slide
Printer with a
Windows Printer
Driver

No

Yes/Maybe

Signature Printer Driver
and Command Document

PTLab PE

APPENDIX B: PTLAB FEATURE MATRIX

PTLab Feature Matrix		
Feature	**Standard Edition (SE)**	**Professional Edition (PE)**
Customize Templates		
Text Fields	Yes	Yes
2D Barcode Fields	Yes	Yes
1D Barcode Fields (Code 39 and Code 128)	Yes	Yes
Date Fields	Yes	Yes
Sequential Input Fields	Yes	Yes
Technician ID	Yes	Yes
Color Blocks	Yes	Yes
Images	Yes	Yes
Job Source		
From Scanner	Yes	Yes
From User Interface	Yes	Yes
From LIS via Customized Plugins	No	Yes
From LIS via eTransX HEMI and STREAM	No	No
Intelligent routing to multiple printers	No	No
Route based on day/time/department	No	No
Route based on any print data (Test Type, Technician, Sample, etc)	No	No
Job Queuing		
Allow multiple jobs to be submitted	Yes	Yes
Visual Queue of Submitted Jobs * (See Screenshot)	Yes	Yes
Visual Queue of Completed Jobs * (See Screenshot)	Yes	Yes
Ability to Reprint Completed Jobs * (See Screenshot)	Yes	Yes
Ability to Add More Slides to a Reprint * (See Screenshot)	Yes	Yes
Support		
Support technician login via scan or manual login	Yes	Yes
Support printing technician initial on each slide	Yes	Yes
Cost	**Free with Printer**	**Additional Cost /Printer**
Maintenance Cost	**N/A**	**N/A**

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