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HemaTrax® Unity Print Server

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Release Notes

Build No. 13311.1338



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Overview

With this release of the new HemaTrax Unity Client and Print Server update there are some changes and new features to consider. This document also touches on each of the changes and enhancements incorporated into this new build.

Note: The information in this document is subject to change without notice.

Prerequisites

The HemaTrax software services and applications rely on a system with the following resources:

Hardware:

Computer System:

- Standard Wintel system with common resources (monitor, keyboard, mouse, etc.)
- Network capable (required even for Standalone operation)
- Serial Port (if label printer requires it)
- 40 Megabytes Disk storage (Minimum)
- 2 Gigabytes RAM (Minimum)
- CD-ROM or DVD Drive (If software is to be installed via this mechanism)

Label Printer: (SATO America CL412e* or Zebra Technologies Z4M* printer)

Network BLOOD LABELING printers must have statically assigned IPv4 addresses in order to work properly with the HemaTrax Print Server application.

Operating System:

- Microsoft Windows OS (Windows 7, Windows 2003 Server or Windows 2008 Server)

Software Configuration:

The system may be configured to use DHCP to obtain an IP address dynamically (in the case of Slave or Standalone operation) or must have a statically assigned IP address (when operating as a Master server installation).

* SATO and Zebra printers must be equivalent to the model numbers provided above and must be installed with the blood bank ready firmware supplied by Digi-Trax Corporation. A standard "off-the-shelf" printer model will not have the features

required by HemaTrax software in order to print all of the various ISBT 128 labels in FDA compliance.

Components

The new HemaTrax software is composed of some familiar components and a couple of new ones as well. The following sections address each of the major components and how they fit into the scheme of things.

HemaTrax Print Service Components

There is still a service application that is familiar to all implementers of the HemaTrax Print Server. The service application has been expanded considerably to add a great deal of functionality needed by the new client application discussed a little later. The print service components are as follows:

Component File Name	Description of Component Function
DTiSAMlib.dll (Deprecated)	The Digi-Trax Indexed Sequential Access Method database engine library has been integrated with the HemaTraxLIB.dll
HemaTraxLIB.dll (Updated)	The Digi-Trax developed HemaTrax label formatting language and print engine library has been refactored and the DTiSAM functions integrated.
HTPrtsrvr.exe (Updated)	The Print Server service application and listening socket interface.
HTFileMigrate.exe	The file migration utility to convert and transfer files and tables from the previous print server or standalone installation to the new one.
HTPrtsrvrSettings.exe	An application that provides convenient access to and allows maintenance of the print server settings.
IAIP.exe	The Initialize Administrator ID and Password application, which gets executed conditionally and only during installation.
HTServer.pdf (Updated)	The HemaTrax print server API guide shipped only with the Software Development Kit (SDK) version of the HemaTrax software for interface developers.

Table 1: Print Service components

These components are now stored in the directory path "`"\Program Files\HemaTrax_Unity\Print_Server"`.

Server Data File Directories

In releases prior to the Unity releases the data files tended to be scattered and could be found either in the primary installation folder with the executable files or could be located in the "Data" folder found in the

application's folder located with in the "Program Files" folder. The program's data files are now organized and all kept in a sub-directory of the "ProgramData" folder. The tree structure for the new print server is shown in the table below:

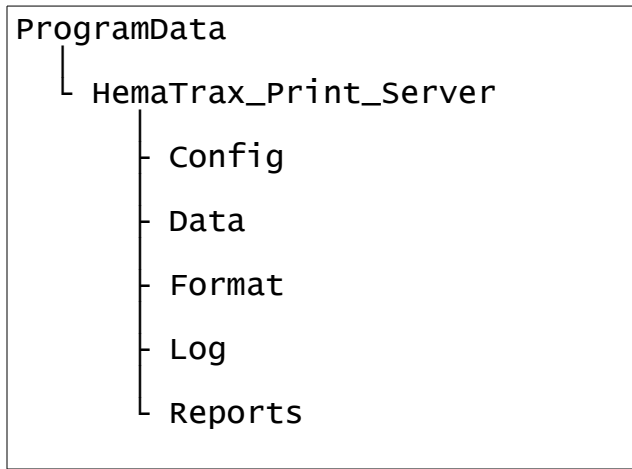


Table 2: Print Service data directory tree

The new data file organization makes more sense and will aid in making back-ups of these important files.

HemaTrax Client Components

In **releases prior the Unity** releases the client program (HTClient.exe) was intended to provide some utility functions that were not typically developed by Laboratory Information Systems (LIS) companies. These functions included the ability to maintain printer port definitions, maintain the product label database and to print relatively complex test labels of various formats. The HTClient.exe program has been replaced by an entirely new application. The HemaTrax Client is now a fully functional, production quality application that also serves as a replacement for the HemaTrax Standalone program. The component that is included with the HemaTrax Client application is listed below:

Component File Name	Description of Component Function
HTUnityClient.exe	The new HemaTrax Client application replacing the Standalone application and the previous HTClient.exe program.

This file is stored in the path "\\Program Files\HemaTrax_Unity\Unity_Client".

Beneath the path referenced above there is a tree of directories, each containing files that are static in nature and required by the client application.

Client Data Files

All of the dynamic data files are maintained by the print service application in its data directories. The static files used by the client program are installed in sub-directories beneath the client application's home directory as shown in the table below:

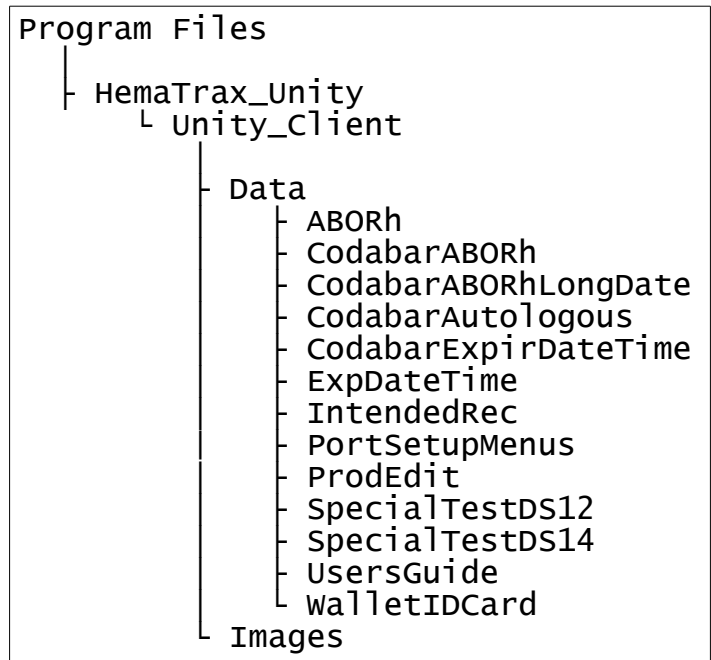


Table 3: HemaTrax Client data directory tree

HemaTrax Print Server

This section deals with feature changes and additions.

Server Mode

With the introduction of the Unity releases the HemaTrax Print Server service application now operates in one of three modes. The mode of operation is established at installation time. The mode is one of the following given in the table below:

Server Mode	Description of Server Functionality
Master	This server accepts requests from other systems on the network to perform maintenance on files and tables or to print labels at attached serial and networked printers. Other systems include LIS and HemaTrax Client applications.
Slave (Local)	This server is installed at a workstation with the HemaTrax Client application and is intended to provide emergency support of labeling activity to the HemaTrax Client application running at the workstation when a master server is unavailable. It synchronizes its data files with the master server's files via the HemaTrax Client application. A Slave (or Local) server, will NOT accept messages from other systems. Local files and tables can be added to and changed when the client is running with the local server, however, when the local file and tables are later synchronized with the master server any additions or changes may be lost.
Standalone	A "Standalone" mode server is installed on a workstation that is intended to be used with the HemaTrax Client exclusively as a Standalone application. The Client application uses this server to maintain files and print labels. The server files and functions are only available to the HemaTrax Client application running on the same machine. The standalone mode server will NOT accept messages from other systems.

Table 4: Print Server modes

Service Connection Response

As explained above the print service now operates in one of three possible modes. Depending on the service mode and where a socket connection request is originating from the print service may respond differently. The following paragraphs explain these differences.

Master Mode

When the print server is operating in "Master" mode, it behaves exactly as the print server has in its previous releases. A print server in master mode will accept connections and request messages from other systems on the network. When a socket connection is made to the print service the unsolicited message, "**HemaTrax Print Server Connected**" is sent to the client application. The remote application must read

this message before attempting a dialog with the print server.

Slave Mode

A print server operating in "Slave" mode, will not accept socket connections from any system other than the one that the service is actually running on. If a client running on another system attempts to connect to a "slave" server the unsolicited message, "**Slave/Standalone Connection Refused**" is sent to the client application and the socket connection is immediately closed. When a connection is made from the same system that the service is running on the standard unsolicited message, "**HemaTrax Print Server Connected**" is sent to the local client application.

Standalone Mode

A print server operating in "Standalone" mode, will not accept socket connections from any system other than the one that the service is actually running on. If a client running on another system attempts to connect to a "Standalone" server the unsolicited message, "**Slave/Standalone Connection Refused**" is sent to the client application and the socket connection is immediately closed. When a connection is made from the same system that the service is running on the standard unsolicited message, "**HemaTrax Print Server Connected**" is sent to the local client application.

Changed Print Service Messages/Responses

The following paragraphs describe print service messages whose message structure have been changed from the most current Version 3.x production releases of the print service.

Get Printer Port (GPT)

The GPT message response structure that is returned in the version 3.x releases of the print service, as it is defined in the API Guide, is shown below:

```
"<Port Number>","<Port Description>","<Printer Model Code>","<Baud Rate>","<CRC Flag>","<Form Code>"<cr>
```

Table 5: Version 3.x Print Service GPT message response

The new HemaTrax print service responds to the GPT message from the client with an altered response format. The new response format is shown with the highlighted changes below:

```
"<Port Number>","<Port Interface>","<Port Description>","<Printer Model Code>","<Baud Rate>","<CRC Flag>","<Form Code>"<cr>
```

Table 6: New Print Service GPT message response

<Port Interface>

The <Port Interface> portion of the response is the same data content as was found in <Port Description> portion of the response from the previous 3.x releases. This field contains the interface description used to target the printer. For example, if the printer is attached to the "COM1" serial communications port on the system hosting the print service then this field will be "COM1". As another example, if the printer targeted to print a label is at **the IPv4 dotted IP** network address "192.168.1.212", then that is what will be in the response for the Port Interface field.

<Port Description>

The <Port Description> field of the previous 3.x releases of the print server is redefined to have a new meaning in the new HemaTrax print service release. Now, Port Description is exactly that; it's a generic description field up to forty characters in length that may be used for any purpose by the end user.

*Note: The file migration utility used to convert and transfer files and tables from previously installed Version 3.x releases **prior to the first Unity release** will handle transferring the appropriate information to these fields and will create an initial Port Description consisting of the printer manufacturer name and the interface description.*

Set Port (SPT)

The SPT message structure that was transmitted to the print server in version 3.x releases is shown below:

```
SPT,"<Port Number>","<Port Description>","<Printer Model Code>","<Baud Rate>","<CRC Flag>","<Form Code>"<cr>
```

Table 7: Version 3.x Print Service SPT message

The new HemaTrax SPT message transmitted to add or change printer port settings is shown with the highlighted changes below:

```
SPT,"<Port Number>","<Port Interface>","<Port Description>","<Printer Model Code>","<Baud Rate>","<CRC Flag>","<Form Code>"<cr>
```

Table 8: New Print Service SPT message

<Port Number>

The <Port Number> allowed range has been expanded from 1 to 32 port definitions to the range 1 to 64.

<Port Interface>

The <Port Interface> portion of the response is the same data content as was found in <Port Description> portion of the response from the previous 3.x releases. This field defines the interface used to target the printer. For example, if the printer is attached to the "COM1" serial communications port on the system hosting the print service then this field will be "COM1". As another example, if the printer targeted to print a label is at **the IPv4 dotted IP** network address "192.168.1.212", then that is what will be in the entry for the Port Interface field.

<Port Description>

The <Port Description> field of the previous 3.x releases, **prior to the first release of Unity**, of the print server is redefined to have a new meaning in the new HemaTrax print service release. Now, Port Description is exactly that; it's a generic description field up to forty characters in length that may be used for any purpose by the end user.

Version (VER)

The server response to the VER message has been altered. The response to the VER message in the previous Version 3.x releases is shown below:


```
HemaTraxSrvr: Ver 08343.0941
HTLibDLL: Ver 08343.0911
IsamDLL: Ver 08343.0911
PCode.tbl Released: 05/20/2008
Cur Dir: C:\Program Files\HemaTrax Print Server\
```

Table 9: Print Service response to VER message in previous Version 3.x releases

The new VER message response is shown below with the additional or altered information highlighted:

```
HemaTraxSrvr: Build 13311.1338 [Master]
HTLibDLL: Build 12157.1000
IsamDLL: Build 10062.1122
PCode.tbl Released: 8/10/2011 10:26:16 AM
Home Dir: C:\ProgramData\HemaTrax_Print_Server\
```

Table 10: Response to VER message in the new print service release

Server Mode

At the end of the first VER response line, with all releases beginning with the first Unity release, the word enclosed in square brackets " [] " indicates the server mode. For any client sending the VER message from a system other than the one hosting the print service, the only server mode reported will be "[Master]". The other possible server modes reported to the local machine's Client application are "[Slave]" and "[Standalone]".

PCode.tbl Release Time

The time of table creation is now reported at the end of the fourth line of the VER response from the print server. This time is Central Time for the mid-west United States on the date provided.

Current/Home Directory

In the previous Version 3.x releases of the print server the current directory reported by the print server application indicated the directory path where the print server application and its data files were located. With the new print server the home data directory path is now reported. This provides an easy way to determine the directory that should be saved (backed up) on a periodic basis.

New Print Service Messages

The following table lists print service messages that have been added beginning with the first Unity release. These are messages that do not exist in the most current Version 3.x production releases of the print service.

Note: For details regarding these new messages it is important to use the new API Guide that is supplied in the Software Development Kit (SDK) version of the HemaTrax Print Service product. The "End Use" version is intended strictly for installation on a production site. The SDK version is intended for use by developers to create and test their interface to HemaTrax.

It must also be noted here that all of the new messages that print labels will eventually replace their older counter parts of the Version 3.x releases. No specific date has been selected yet for the removal of support for the older messages.

It is recommended that developers of the interfaces to HemaTrax Print Server consider transitioning to the new message formats at the earliest date practical.

New Message	Message Eventually to be Replaced
DPR	DAP
FPM	GPM
GPD	GPI
PAT	PAD
PDL	PDT
PFF	OFF
PFP	OFF
PPD	OPD
PPR	OPR
SPD	SPI

Table 11: New messages to eventually replace Ver. 3.x messages

For details regarding the new messages please consult the API guide that is included as part of the installation.

Note: The API guide is distributed as a PDF document with the Software Developers Kit distributions only. You can only access the guide, after completing the installation of the new software. From the Windows "Start Menu" and with "All Programs" displayed, click on the "HemaTrax_Unity" item. From the short list of selections then shown, choose the "HemaTrax Print Server API Guide" by clicking on it. Provided that you have the Adobe Acrobat Reader installed on your system, the guide will display in a moment.

HemaTrax Print Server Settings

The HemaTrax Print Server Settings application establishes various parameters used by the print server. For details relating to the operation of this updated application please refer to the separate document that addresses these new features and changes. What follows is a nutshell description of the enhancements.

Enhanced Security

Beginning with the first Unity release the "HemaTrax Print Server Settings" application can only be executed by an "Administrator" on the Windows system. The application enforces Windows User Account Control (UAC). When the Windows Administrator starts the application that person will be required to next enter the ID and Password of the HemaTrax Print Server Administrator which was established as part of the HemaTrax Unity installation procedure. The print server settings file, maintained by this application, is now stored in an encrypted format to discourage tampering.

"Do not print" check boxes

Beginning with the first Unity release, three new check boxes have been added to the "Print Server Controls" panel of the "HemaTrax Print Server Settings" application. These check boxes allow the print server administrator to turn off the printing of: (1) Registration Number lines, (2) License Number lines and (3) the "Rx only" line.

Alternative Properly Identify Intended Recipient and See Circular Text

Beginning with the first Unity release, the new "Alternative Properly Identify Intended Recipient and See Circular Text" panel has been added to allow easier maintenance of the "PIIRSeeCircular.txt" text file. This text file was formerly created manually by a text editor, such as Notepad. A check box now controls whether or not the alternative text maintained inside the memo box is printed on FDA compliant quadrant one labels.

Maximum Time Periods

Beginning with the first Unity release, two edit boxes on the new "Maximum Time Periods" panel allow the operator to establish: (1) an idle time after which a client user will have to log on again and (2) establish the number of days after which a user must define a new password. This only effects HemaTrax Client users and does not have any impact on LIS connections.

Added ABO-Rh Codes

Beginning with the first Unity release, eight new ABO-Rh message codes have been added to the print server's label request messages which include the ABO-Rh (quadrant two) label. The eight new codes may be used with any print request message that includes the printing of the quadrant two (ABO-Rh) label. The new codes are listed in the table below:

ABO-Rh Code	ABO-Rh Description
"17"	O para-Bombay Rh Negative
"18"	O para-Bombay Rh Positive
"19"	A para-Bombay Rh Negative
"20"	A para-Bombay Rh Positive
"21"	B para-Bombay Rh Negative
"22"	B para-Bombay Rh Positive
"23"	AB para-Bombay Rh Negative
"24"	AB para-Bombay Rh Positive

Table 12: Added para-Bombay ABO-Rh Codes

These new ABO-Rh message codes have not only been incorporated into the new message request codes, but are also now available in the original label request messages as well.

Donation ID Number Flag Digit Rotation Changed

In releases prior to the first Unity release of the HemaTrax Print Server the flag digits, that are printed below the DIN bar code, were rotated 90 degrees counter-clockwise. This new release corrects the rotation so that the flag digits are now printed with a 90 degree clockwise rotation.

New Product Label Database

In the first Unity release several columns in the previous product label database have been changed to support changes in the printing logic for the product label (quadrant three). Due to the paradigm changes in the product label format logic in the new release, the Ver. 3.x release label message formats are not able to be used with the new database. The original product label database is still shipped with the new HemaTrax software. The original database and the alternate produce codes created by the user continue to be used in the original label request messages that print any label that includes the product label (quadrant three). The table below compares the column changes between the original database and the new database.

Original Product Label Table Column Names	New Product Label Table Column Names	Description of the column change and how product label print logic changed.
(none)	VolCode 5,6 VolPrompt 5,6 VolRngLow 5,6 VolRngHigh 5,6	Eight columns have been added to the product label database to support the inclusion of two additional unknown component volumes or measures.
NotUSA	(none)	The ICCBBA no longer defines a table column that indicates whether or not a product is manufactured in the United States. This boolean column has been eliminated in the new product label table.
MfrCaution	MfrCaution	Formerly this 65 character column held static text that was printed on the product label. Text such as "CAUTION: FOR MANUFACTURING USE ONLY". Now this is a 2 character column holding the intended use attribute code defined in the ICCBBBA product database. This code is now used in conjunction with the "affirmed question code" to indicate what, if any, dynamic manufacturing use text is to be printed on the product label.
CollDateFlag	RequiredDateCode	The CollDateFlag was a boolean flag that indicated whether the product required a collection date (True or False). The column has been renamed to "RequiredDateCode" and is a single digit ASCII numeric character that represents one of four collection/expiration date requirement possibilities.

Table 13: Product Label Table Changes

This second release of Unity includes an expanded ICCBBA PCode table that includes blood product codes current to November 1, 2013.

Added Unknown Volume Codes

Beginning with the first Unity release, two new unknown volume codes have been added. These two codes provide for the inclusion of Plasma ABO-Rh and Hematocrit Percentage information on the product label. The table below shows the new codes and their meaning:

Unknown Volume Code	Meaning of Unknown Volume Code
"9"	Plasma ABO-Rh Text
"A"	Hematocrit percent

Table 14: Added Unknown Volume Codes

Unknown Volume Value Substitution Error

In mid-October 2013 a regression error not caught during validation was detected. This impacts the first release of the Unity print server (server Build Number: 13063.1145 Library Build Number: 13058.1036). If the unknown volume codes and values are not provided, in the product portion of any label print message that includes the product label quadrant, in the order that they are specified in the PCode or AltPCode tables, then they will not be filled in the correct areas of the product label. This second release of the Unity print server corrects that problem (Server Build Number: Library Build Number:).

HemaTrax Client

Beginning with the first Unity release, the HemaTrax Client application is an entirely new program that not only replaces the original HTClient.exe utility program, but now represents a production quality label manufacturing application. The following paragraphs serve to briefly describe this new application. For a more complete and detailed treatment of the HemaTrax Client please refer to the separate documentation supplied for that application.

HemaTrax Client Functionality

Beginning with the first Unity release, the functionality available from the HemaTrax Client application depends on the operating mode of the print server that is connected to. The following paragraphs generally describe the server modes and how they impact the HemaTrax Client's functionality.

Master Server Connection

Beginning with the first Unity release, when a HemaTrax Client application connects with a print server operating in "Master" server mode, the client application will have access to the files and operational capabilities of the remote or local master server. The client application will be sharing the resources of that master server with any other clients distributed on the network. This is a multiple user operating environment. Any restrictions on what a user may do are the result of any security limitations that might be placed on the user.

Slave Server Connection

Beginning with the first Unity release, when the HemaTrax Client program connects with the local slave print server, the client application will be able to generally operate as when it connects with a master server. The exception is that any local file or table modifications made while connected to the slave server, may be lost once a connection is re-established with the remote master server and the databases are then resynchronized. Slave server mode operation is intended for use during emergencies when the master server may not be available. Client or LIS applications cannot connect with a slave server running on another machine.

Standalone Server Connection

Beginning with the first Unity release, when a HemaTrax Client program connects with a local print server operating in "Standalone" server mode, the client application will have maintenance access to the files on the local standalone server. The client application will be able to perform maintenance on all file and tables and have full label printing capabilities at the local machine's serial ports or at any network printers. This is a full single user operating environment. Restrictions on what a user may do are the result of application or network security limitations placed on the user. Client or LIS applications running on other machines cannot connect with a standalone server.

File Migration Utility

The file migration utility is a program that is called from the installation wizard near the end of the installation process. The file migration program searches all of the Windows directories for matches on files known to exist in either a current or previous HemaTrax Standalone installation or a previous **pre-Unity** Print Server installation. The file migration utility builds a list of all directories that have these files contained in them. After the migration utility completes its scan the utility may ask the operator for a confirmation that a file migration from a previous or current Standalone or a previous **pre-Unity** Print Server installation is to be performed. If the operator acknowledges that a standalone or print server migration is to be performed and if there is more than one possible directory with remaining files, the operator will be prompted to select which directory is to be used as the source for the migration.

Important Note: If you are installing from a previous release of Unity then DO NOT perform any file migration as this would possibly regress data file changes that you have made since the first copy of the Unity release was installed.

New Directory Tree Structure

Beginning with the first Unity release, the new HemaTrax software makes use of a directory tree structure that differs **from the previous pre-Unity** releases of the software installation. The migration utility in cooperation with the installation wizard makes certain that the directories and sub-directories are properly created in advance of the file conversions and copy operations.

Conversions of Files

Some files and tables have altered record structures in the new software. These files and tables from a previous installation undergo a conversion process in order to make their content compatible with the new software. The file migration utility handles all of these conversions.

File Copies

Some files and tables do not require any conversions, but do need to be copied to the various directories or sub-directories used by the new software application. All necessary file copy operations are handled by the migration utility.

Migration Utility Restriction

The migration utility has been written to only execute from within the installation process. While the migration utility program can be found in the Program Files directory after installation, it isn't possible to run it either accidentally or intentionally outside of the installation process.

Note: For detailed information about the file migration utility it is recommended that users consult the PDF file, "UnityFileMigration.pdf", located in the root directory of the installation CD-ROM.