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# USER GUIDE

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# DVP-2

V | 2.5

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# **Preface**

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Welcome to the future of digital package printing using the DVP-2!

The *DVP-2 User Guide* steps you through installation, calibration, and printing.

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## **Structure of the Manual**

This manual is organized by function. Operations are presented in order of probable use, but feel free to review the information in whatever manner you desire – even skip sections if the content is familiar.

**Chapter 1** introduces the DVP-2 Quality Control System. It provides an overview of the hardware and software modules that together make one of the finest image processing systems available.

**Chapter 2** provides instructions for installing and configuring the DVP-2 Printer.

**Chapter 3** provides instructions for making an Offset Calibration.

**Chapter 4** provides instructions for making a LUT Calibration.

**Chapter 5** provides instructions for Color Calibration.

**Chapter 6** provides instructions for Piezzo Calibration.

**Chapter 7** introduces the DVP-2 Printer Console. It provides a step by step walk through for printing high-quality digital images on the DVP-2 Printer.

**Chapter 8** provides maintenance and troubleshooting guidelines.

**Chapter 9** describes the DVP-2 databases

**Chapter 10** covers troubleshooting.

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## Style and Conventions

In order to make this manual as easy to use as the DVP-2, we have adopted the following conventions:

### Icons

Occasionally, an icon (small picture) will appear in the left margin. Each icon has a specific meaning. The paragraphs that follow identify the icons and their intended use.



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#### **Warning!**

Warnings contain critical information. Typical warnings include cautions about products, processes, and methods that have proven to be unreliable, unstable, or non-supported. Failure to read a warning could result in serious consequences.

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#### **Note:**

Notes alert you to information of special interest or provide clarification on a particular DVP-2 feature. Notes supplement standard content and are not required reading.

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#### **Hint:**

As you may have guessed, the helpful hints suggest ways to make your life easier. The tips are based on suggestions from other DVP-2 users.

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### Terminology and Type

- Fields and forms are referenced by their proper names.
- Literal entries (commands you type) appear in monospaced type.
- Important new terms appear in *italics*.
- Optional entries appear in italics in square brackets [*option*].
- Single keys appear capitalized in brackets, such as [A] and [ENTER].

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## **Questions and Comments**

Copies of this manual and related documents can be obtained directly from Imager Service Associates Inc.. If you can't find an answer to your question in the manuals, check the list of Frequently Asked Questions (FAQ) on our web site.

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### **Disclaimer**

This document is designed to provide information about the DVP-2 hardware, computer program and related applications. Every effort has been made to make

sure this document is as complete and accurate as possible, but no warranty or fitness is implied.

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# 1

## ***Introducing DVP-2 Q.C.***

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The DVP-2 Quality Control (Q.C.) application is required for proper operation of the DVP-2 Printer. The Q.C. application provides the ability to configure, calibrate, and maintain the operation of one or more DVP-2 Printers. The software may be configured to run on the printer PC or on a separate computer attached via Local Area Network (LAN). The software provides the following features:

1. Configuration of each DVP-2 Printer Console, including machine-specific settings such as punch options and paper advance.
2. Calibration of printer contrast settings using Lookup Tables (LUTs).
3. Calibration of printer LCD linearity using Offset Files.
4. Color Calibration.

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### **The DVP-2 Software Environment**

The DVP-2 Q.C. application is designed to run on Microsoft Windows 2000 and Windows XP Operating Systems. The software will not run on prior versions of the Microsoft Windows Operation Systems. The latest version of the DVP-2 software is designed to co-exist with prior versions such that it can be implemented during production-critical time periods. If problems arise in the new software, the previous version may be used without impacting the new version and vice-versa. All future versions will follow this same standard.

The DVP-2 Software is shipped on single CD-ROM or in a single self-extracting executable file over the Internet. It is important to understand the DVP-2 directory structure prior to installing the software.

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## DVP-2 Shared Files Installation

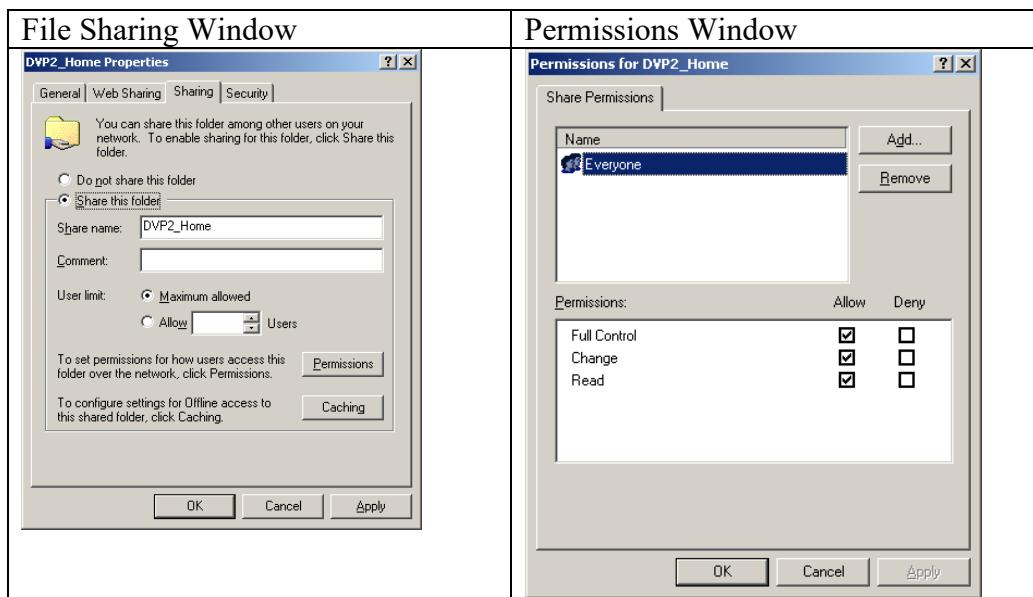
### Software Prerequisites

Ensure your PC meets the following requirements:

1. Intel Pentium III processor or higher running at 1ghz minimum.
2. 256MB RAM Minimum.
3. 2gb Free Disk Space Minimum.
4. Monitor resolution of 1024x768 running in 24bit color mode.
5. Microsoft Windows 2000 or XP Operating System.
6. 100mb or faster Ethernet Local Area Network (LAN).

### Choosing a Home Directory for DVP-2

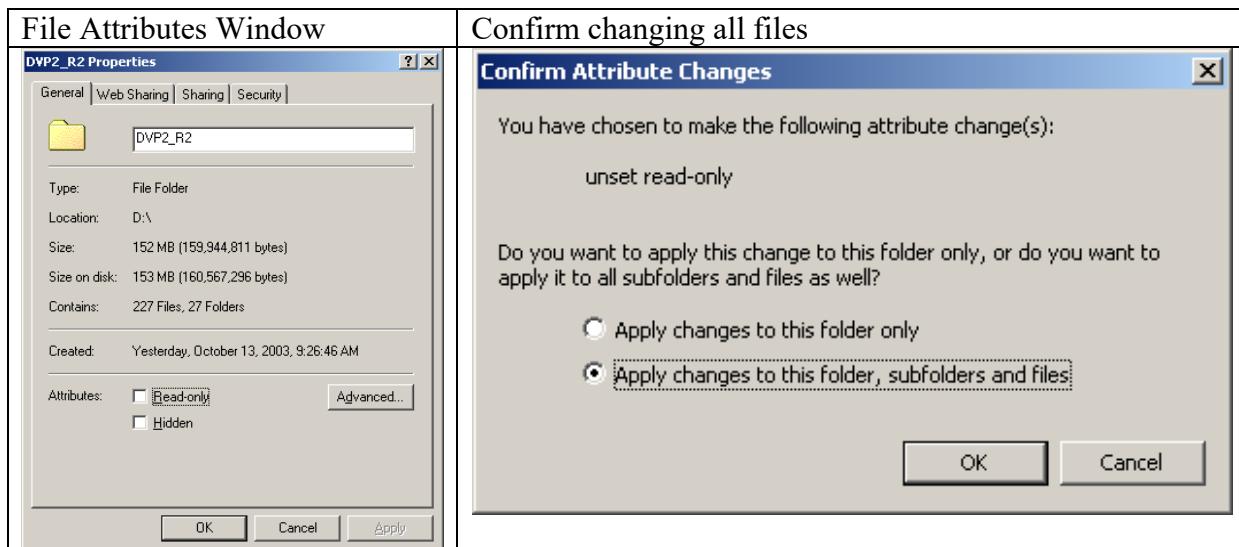
The DVP-2 software is designed to run over a Local Area Network (LAN). It is important to choose a home directory that is shared on the network. This should be a location that can be accessed by any computer that will run the Q.C. Station software and any DVP-2 Printer on the network. During the installation process, all of the DVP-2 setup files for both the Q.C. Station software and DVP-2 printers will be copied to this location. NOTE: The Q.C. Stations and DVP-2 printers need read and write access this shared location. If you are unsure what to call this directory, create a directory called “DVP\_Home” on the shared computer, then share it by right-clicking on the directory in Windows Explorer and selecting the “Sharing” option. Click on the Permissions button and verify that the “Everyone” group has all permissions enabled.



## Copying the DVP-2 Setup Files

It is necessary to copy all of the files from the DVP-2 Setup CD-ROM to the DVP-2 Home Directory (see previous section). Once the files are copied, the access permissions must be changed from Read Only to enable the software to make changes to the configuration files. To copy the DVP-2 Setup CD-ROM, perform the following steps:

1. Insert the DVP-2 Setup CD-ROM into your CD-ROM Disk Drive.
2. Copy the entire DVP2\_Rx directory to a shared location on your network.
3. Upon completion of copying the files, change the attributes of all the files copied to disable the “Read Only” attribute as shown below:



## DVP-2 Directory Structure

The DVP-2 program and all related files are shipped on a single CD-ROM, labeled “DVP-2 Setup”. The directory structure for the DVP-2 software is as follows:

D:\	Where D is the disk drive containing the software. This is the root directory of the drive where the DVP-2 Software is located.
<b>D:\</b>	
The following directories are located under the D:\ directory:	
D:\DVP2_Rx	Where x is the major revision of the DVP-2 Software. For example, the version 2 software is located in D:\DVP2_R2.
<b>D:\DVP2_Rx</b>	
The following directories are located under the D:\DVP2_Rx directory:	
Database	This directory contains the DVP-2 Settings database in Microsoft Access 2000® and Microsoft SQL Server 2000® (backup) formats.
Documentation	This directory contains manuals and technical documentation.
DVP2_Printers	This directory contains the software that controls each DVP-2 Printer connected to the network.
QC Stations	This directory contains the Q.C. software.
<b>D:\DVP2_Rx\DVP2_Printers</b>	
The following directories are located under the D:\DVP2_Rx\DVP2_Printers directory:	
Setup	This directory contains the application setup program for each DVP-2 Printer. This software installs the printer control software and can be used to recreate the program directory in the event of a PC failure on a DVP-2 Printer.
Default	This directory contains the default printer setup files, including calibration files for LUT and Offset. It also contains the calibration images used by the printer.
DVP2_xxxx	Where xxxx is the number of the DVP-2 Printer on the network. The system can support from one to many thousands of printers all under a single Q.C. methodology. Each DVP-2 Printer subdirectory contains the actual program and device-driver versions used by each printer. This provides the ability to have many printers running different versions of the software, such as mixed environments running Lucht DVP-2 Printers, converted Nord Printers, and others. These directories are created by the DVP-2 Q.C. application and may not be available on Setup CD.
<b>D:\DVP2_Rx\QC Stations</b>	
The following directories are located under the D:\DVP2_Rx\QC Stations directory:	
Setup	This directory contains the application setup program for each DVP-2 Q.C. station.
Default	This directory contains the default Q.C. Station setup files.
QC_xxxx	Where xxxx is the number of the DVP-2 Q.C. Station. The system can support from one to many thousands of Q.C. Stations. Each Q.C. Station may be used to control one or more DVP-2 Printers. These directories are created by the DVP-2 Q.C. application and may not be available on Setup CD.

## Installing the DVP-2 Q.C. Application

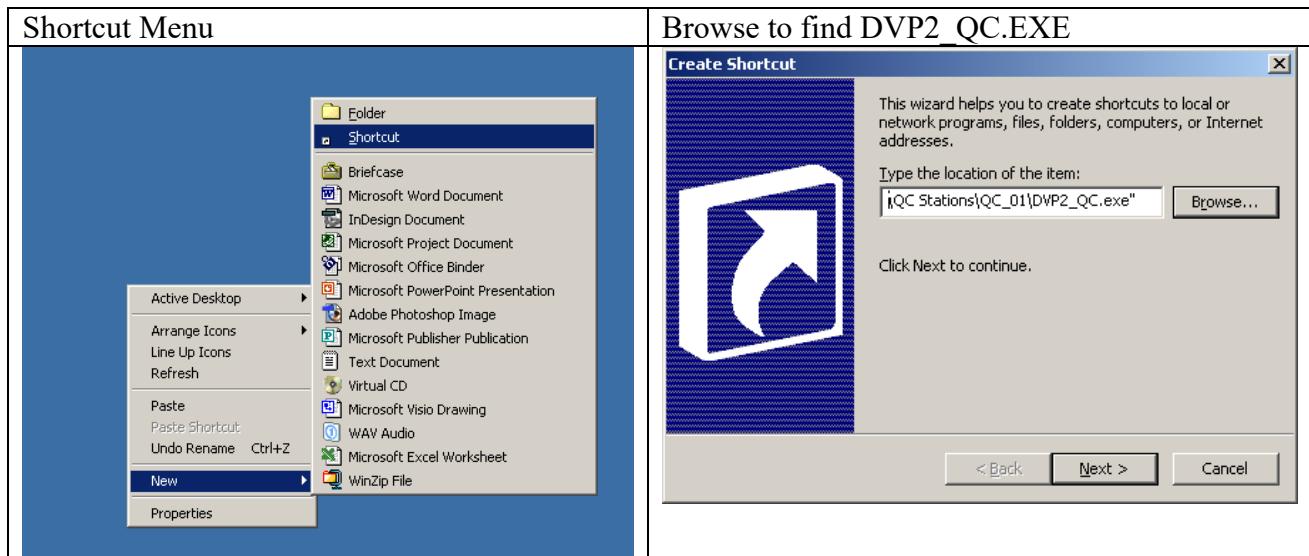
### Run the Setup Program

Using Windows Explorer, double-click on the SETUP.EXE program in the \DVP2\_Rx\QC Stations\Setup folder. When prompted, choose to install the software under the DVP-2 Home Directory using the following naming conventions:

\DVP2_Rx\QC Stations\QC_xx	Where xx is the sequential number of the Q.C. Station. For example, if this is the first Q.C. Station, install the software to \DVP2_Rx\QC Stations\QC_01.
----------------------------	--

### Create A Shortcut

It is good practice to create a Shortcut to the Q.C. application executable on the Windows Desktop. Do this by right clicking on the Desktop, then selecting the “New Shortcut” option as shown below. Click the Browse button to locate the DVP2\_QC.exe program to create a shortcut to.



## **Edit The DVP2\_QC.INI File**

Each installation of the DVP-2 Q.C. application consists of the DVP\_QC.EXE executable program and associated DVP2\_QC.INI initialization file. The executable program reads the initialization file on startup to retrieve settings pertaining to where the setup files are located. If the initialization file is not found, the Q.C. application will create a default file. This default file may not contain the correct values. Therefore it is important to edit the file to verify the settings. The format for the initialization file is as follows:

```
[Main]
DatabasePath=D:\DVP2_R2\Database\Settings.mdb
OffsetFilePath=D:\DVP2_R2\DVP2 Printers\
LutFilePath=D:\DVP2_R2\DVP2 Printers\
SettingsPath=D:\DVP2_R2\DVP2 Printers\Default\
```

The Database path must contain the complete file name of the Settings database for Microsoft Access® installations (See the DVP-2 Database chapter for more information). If you plan to use Microsoft SQL Server, the DatabasePath must point to the SQL Server using the following syntax:

DatabasePath=SQL,"server name"

The OffsetFilePath must point to the directory where printer offset files are stored. Typically, this is the root of the DVP2 Printers directory. The Q.C. software will automatically search by printer number beneath this directory for offset files.

The LutFilePath must point to the directory where printer LUT files are stored. Typically, this is the root of the DVP2 Printers directory. The Q.C. software will automatically search by printer number beneath this directory for LUT files.

The SettingsPath must point to the directory where the default printer settings are located. These settings are used to create new printer installations.

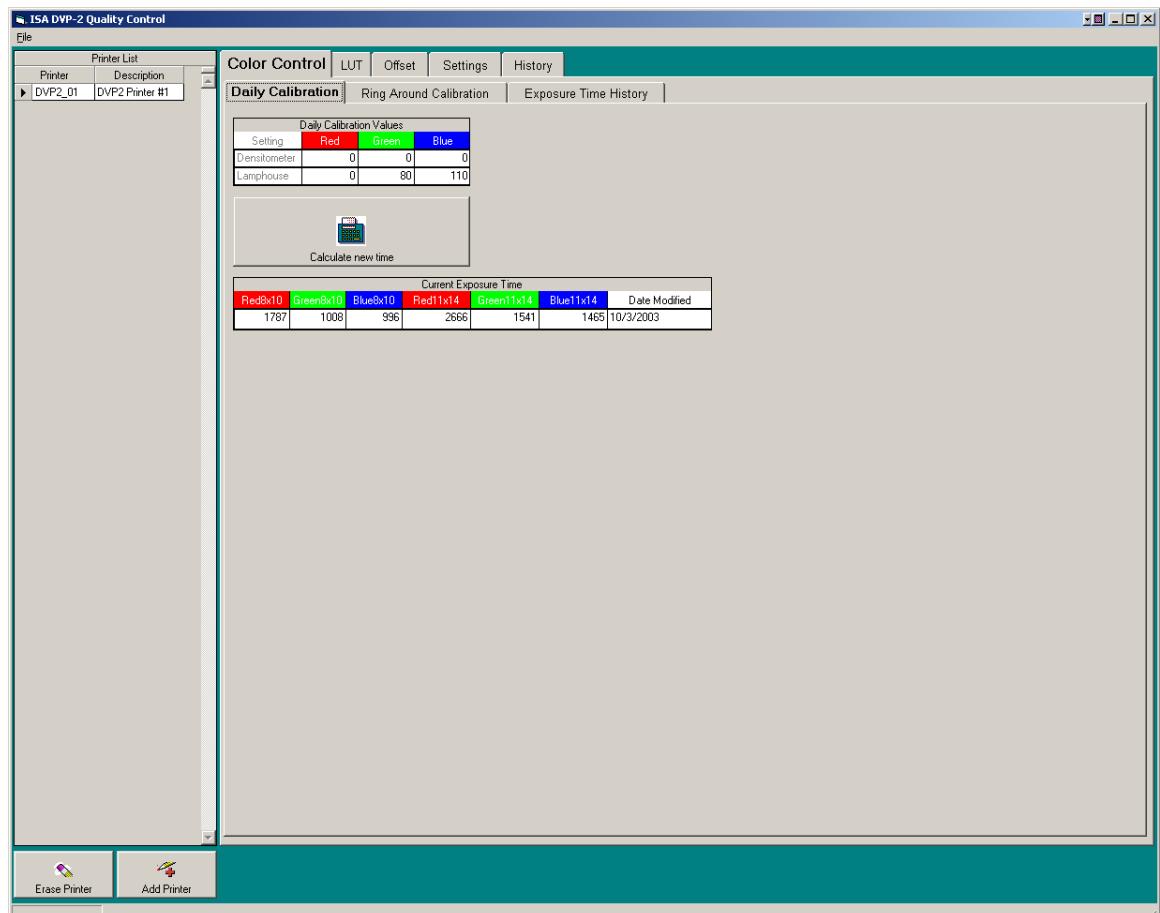
If any of these paths are incorrect, the Q.C. application will display a warning message and terminate.

## The DVP2 Q.C. Main Screen

The DVP2 Q.C. application main screen consists of the “Printer List” and the currently selected printer’s setup information that is presented in 5 tabs.

### The Printer List

The Printer List contains one entry for every DVP-2 Printer on the network. The information appearing in the folder tabs to the right of the list is specific for the currently selected printer. There is no practical limit to the number of printers that can be managed from a single Q.C. Station. To add a new printer to the list, simply click on the “Add Printer” button.

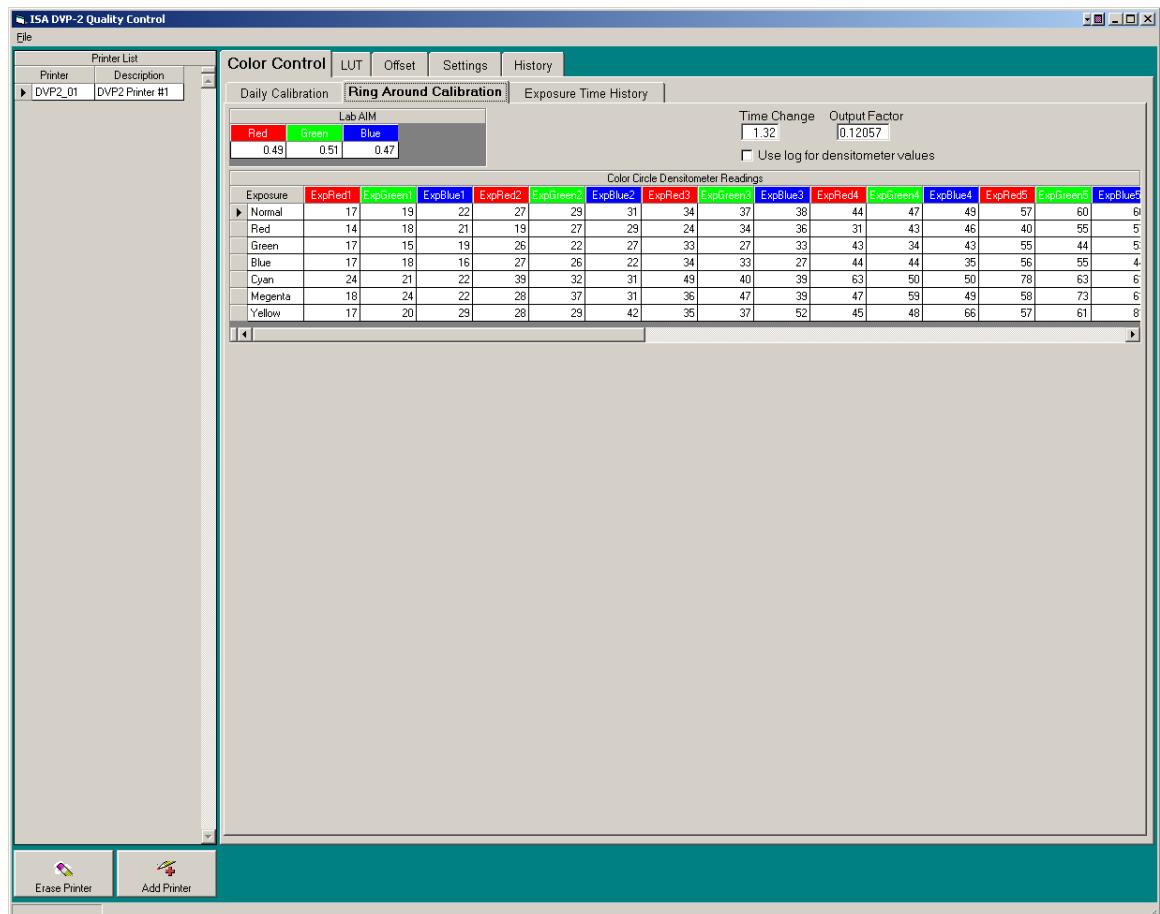


The DVP-2 Q.C. Main Screen.

## The Color Control Tab

The left-most folder tab is for printer Color Control. This tab is used to determine the printer's exposure time based upon a Daily Calibration reference image and lab aim. The Color Control tab contains 3 tabs, one for setting the exposure time daily, one for setting lab aim, and one simply to view and chart exposure time changes over time.

The Color Control tab supports reading the DVP-2 Color Calibration images automatically using an X-Rite DTP densitometer connected the PC's serial port. The Color Calibration images are simply 11-Step gray-scale images used to determine the change in exposure time required to achieve lab aim. See "DVP-2 Color Calibration" for more information.

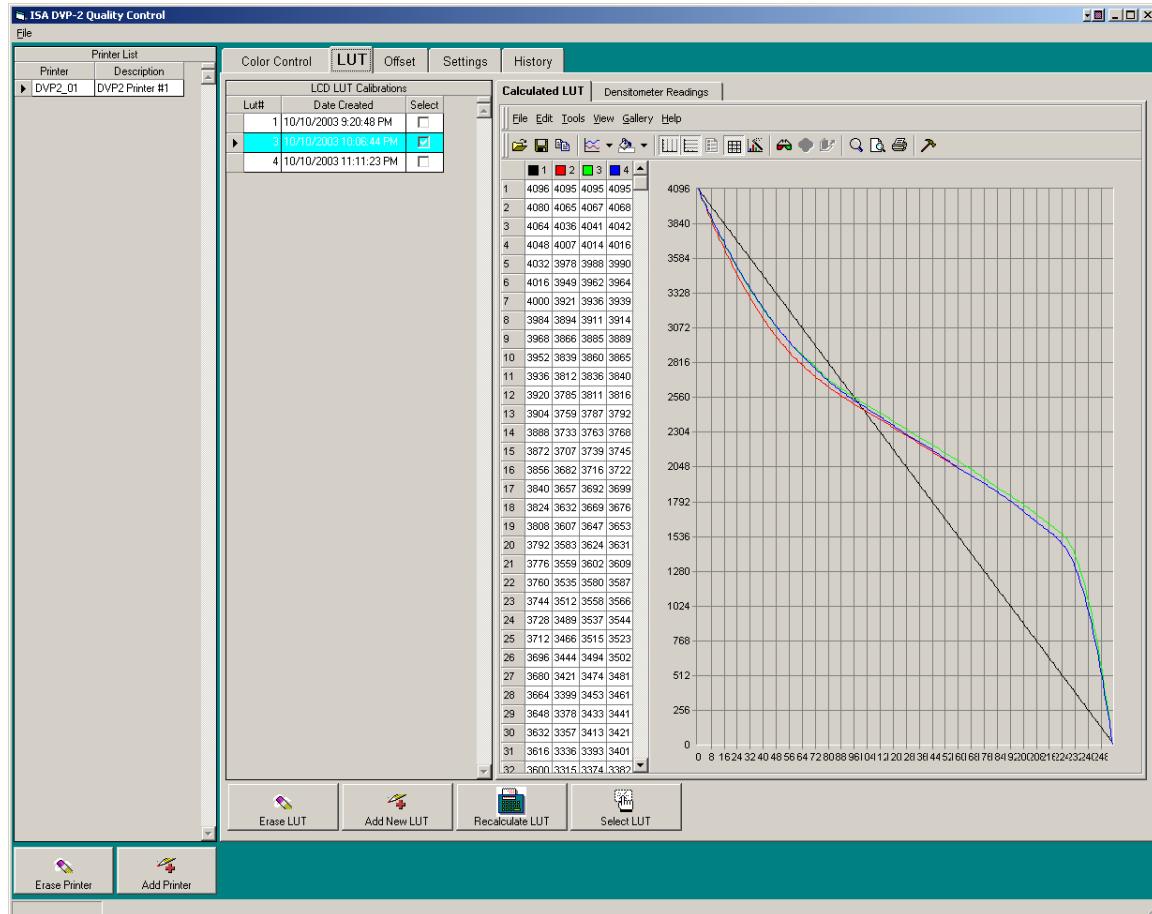


The DVP-2 Q.C. Color Color Control/Ring Around Calibration Tab.

## The LUT Tab

The second tab from the left is the LUT Tab, which is used to manage printer LCD Lookup Tables (LUT). The printer uses LUT files for contrast adjustment. These files approximate the saturation-curve of the photographic paper. The Q.C. application is designed to track printer LUT changes over time. The LCD LUT Calibration list shows the LUT files in the order they were created. The data and graph appearing to the right of the list is for the currently selected LUT. Only one LUT file can be selected for use on the printer at any given time. It is possible to have a unique LUT for every paper surface. The printer LUT is changed automatically when the user clicks the “Select LUT” option on the LUT Tab.

The LUT Tab supports using the X-Rite DTP Densitometer for reading the 48-step LUT Calibration Image.

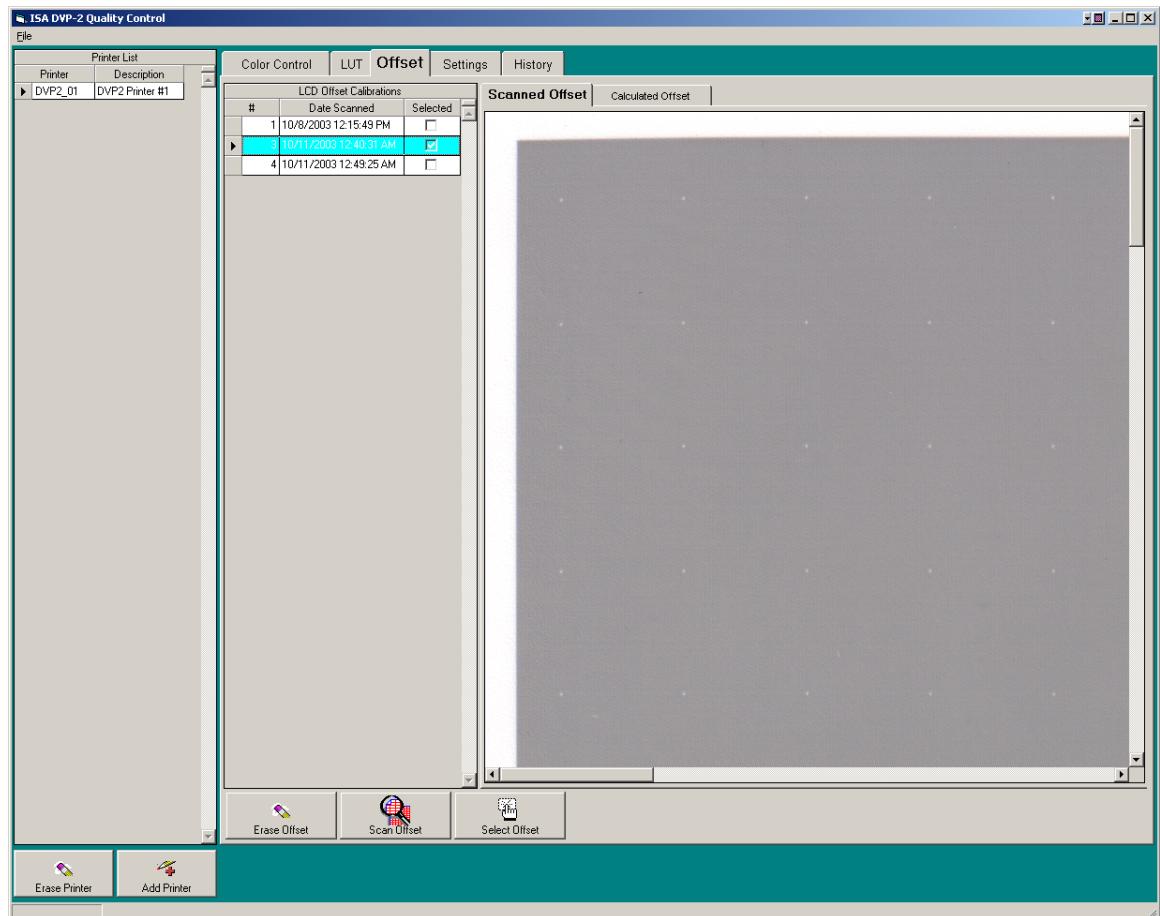


The DVP-2 Q.C. LUT Tab.

## The Offset Tab

The third tab from the left is the DVP-2 Offset tab, which is used to manage LCD Offset Calibrations. Offset calibrations compensate for uneven density across the area of the LCD. The Q.C. application provides for tracking offset calibrations over a period of time. The “LCD Offset Calibration” lists the offsets in the order they were created. Only one offset can be selected at a time for each DVP-2. The tab control to the right of the list shows the actual scan of the printed offset calibration image along with the calculated offset. The calculated offset depicts the adjustments made to LCD to produce a consistent density image.

The Offset tab provides the ability to scan new offset images using the Canon CanoScan LiDE Twain scanner drivers. It is good practice to keep offset files over time to track the compensations required for the LCD.



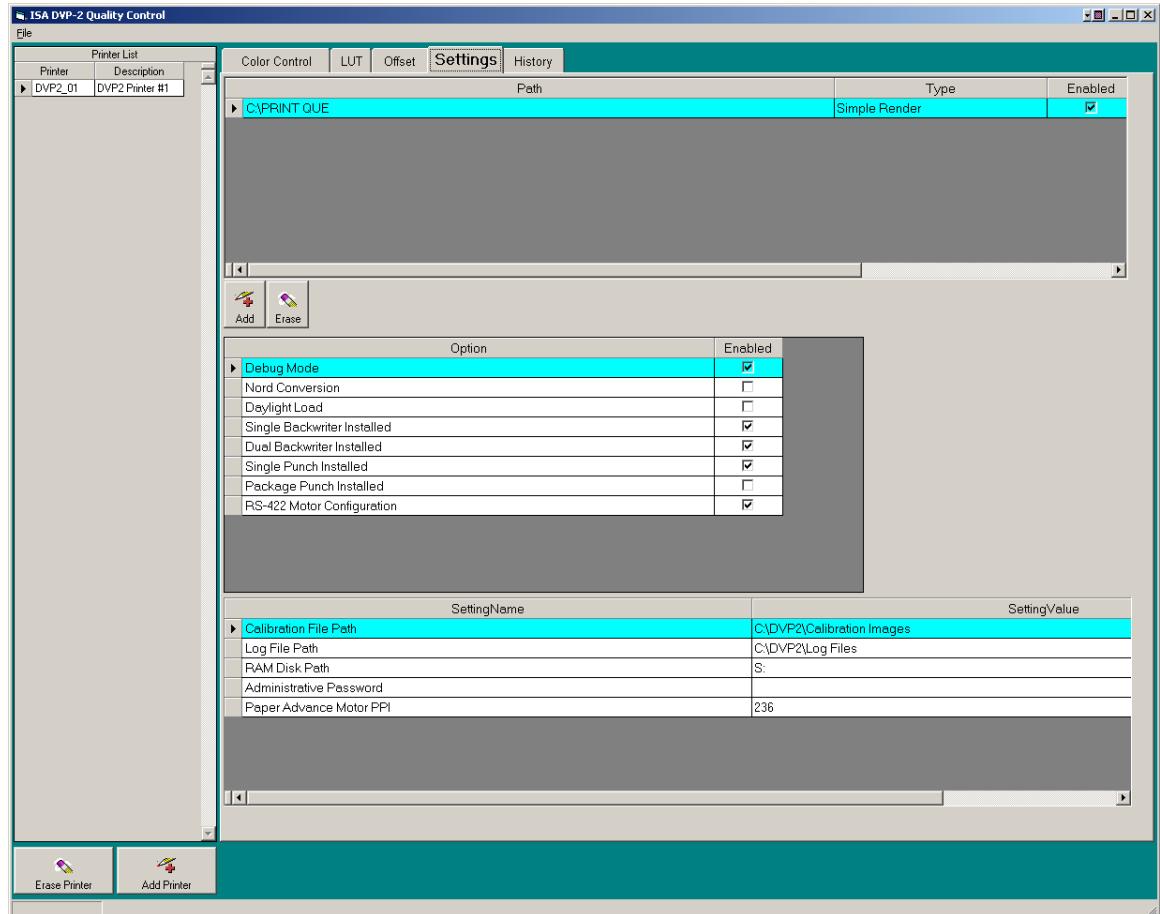
The DVP-2 Q.C. Offset Tab.

## The Settings Tab

The fourth tab from the left is the Settings Tab, which is used to configure printer-specific program settings and option along with Hot Folders. Each DVP-2 printer can service one or more Hot Folders. To add a Hot Folder to the printer, simply click the Add button beneath the Hot Folder List.

The Printer Options grid is used to configure hardware options on the printer, such as back-writers, punches, and motor configuration. Options are either checked, meaning they are enabled or unchecked for disabled.

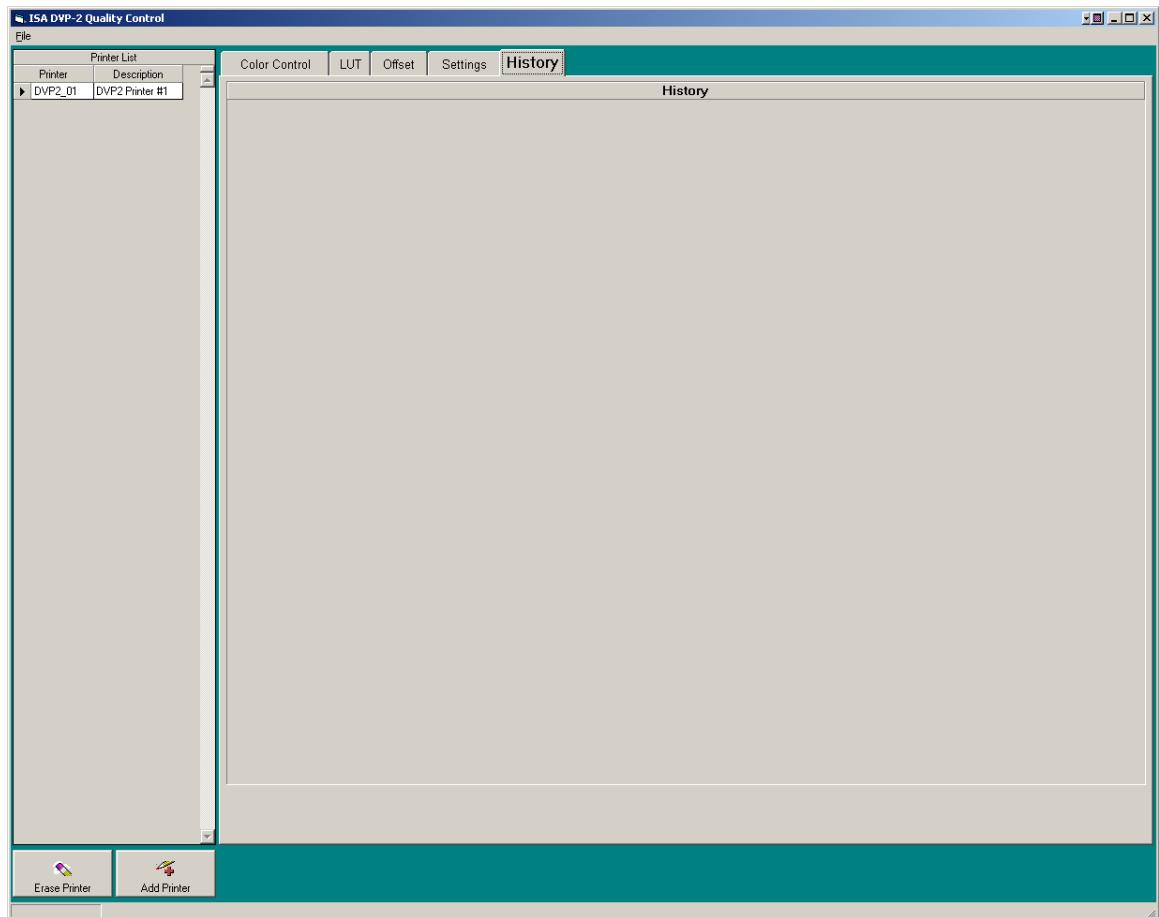
The Printer Settings grid is used to configure numeric and text settings on the printer such as password for administrative mode and storage location for calibration files.



The DVP-2 Q.C. Settings Tab.

## The History Tab

The History Tab simply provides tracking for changes to each printer's configuration.



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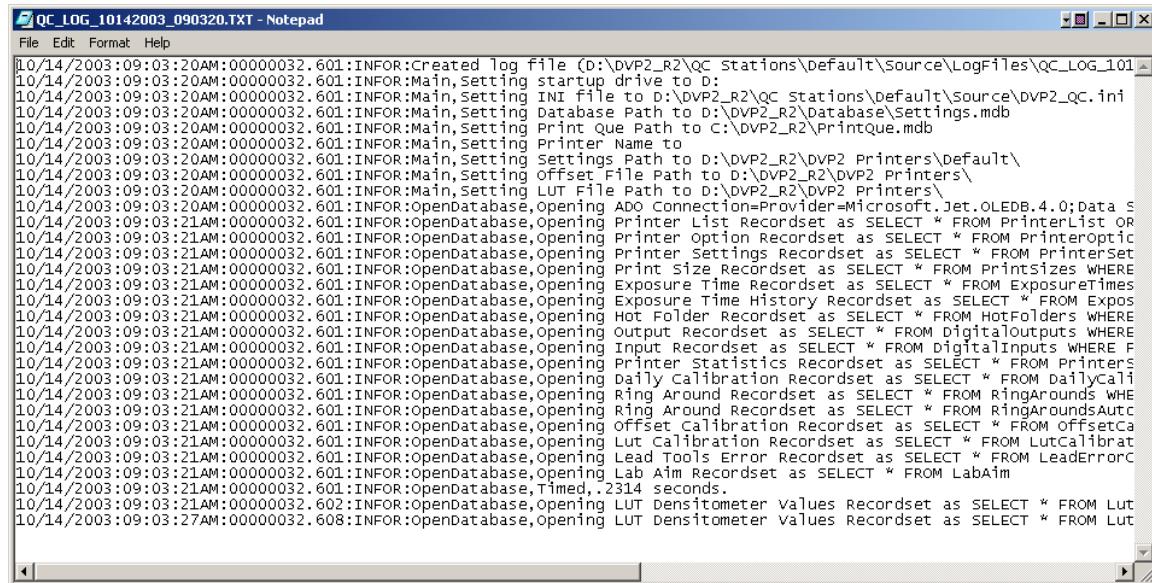
## The Application Log Files

The DVP-2 Q.C. application creates log files to aid in identifying problems that may arise from a variety of areas such as disk drive failure, densitometer communications errors, and scanner errors. The log files are stored in a directory beneath the application directory called "Logfiles." For example, the log files for the first Q.C. Station will be stored in \DVP2\_Rx\QC Stations\QC\_01\LogFiles.

The log files are identified by the station type along with date and time. New log files are created automatically when their size exceeds 1.44mb (the formatted storage of a standard 3.5" high density floppy disk). Log files older than 30 days are automatically deleted upon application startup. A typical log file name looks like:

QC\_LOG\_10112003\_181524.TXT (Created on 10/11/2003 at 18:15:24).

The log files contain information important to troubleshooting the software for both errors and performance problems. The following graphic shows a sample log file displayed in Windows Notepad. It is important that these files never contain the word "ERROR". It is good administrative practice to search these files periodically for errors.



```
QC_LOG_10112003_181524.TXT - Notepad
File Edit Format Help
10/14/2003:09:03:20AM:00000032.601:INFOR:Created Log file (D:\DVP2_R2\QC Stations\Default\Source\LogFiles\QC_LOG_101
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting startup drive to D:
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,SettingINI file to D:\DVP2_R2\QC Stations\Default\Source\dvp2_qc.ini
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting Database Path to D:\DVP2_R2\Database\Settings.mdb
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting Print Que Path to C:\DVP2_R2\PrintQue.mdb
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting Printer Name to
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting Settings Path to D:\DVP2_R2\DVP2 Printers\Default\
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting Offset File Path to D:\DVP2_R2\DVP2 Printers\
10/14/2003:09:03:20AM:00000032.601:INFOR:Main,Setting LUT File Path to D:\DVP2_R2\DVP2 Printers\
10/14/2003:09:03:20AM:00000032.601:INFOR:OpenDatabase,Opening ADO Connection=Provider=Microsoft.Jet.OLEDB.4.0;Data S
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Printer List Recordset as SELECT * FROM PrinterList OR
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Printer Option Recordset as SELECT * FROM PrinterOptic
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Printer Settings Recordset as SELECT * FROM PrinterSet
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Print Size Recordset as SELECT * FROM Printsizes WHERE
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Exposure Time Recordset as SELECT * FROM Exposures
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Exposure Time History Recordset as SELECT * FROM Expos
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Hot Folder Recordset as SELECT * FROM HotFolders WHERE
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Output Recordset as SELECT * FROM DigitalOutputs WHERE
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Input Recordset as SELECT * FROM DigitalInputs WHERE F
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Printer Statistics Recordset as SELECT * FROM Printers
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Daily Calibration Recordset as SELECT * FROM DailyCalib
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Ring Around Recordset as SELECT * FROM RingAroun
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Offset Calibration Recordset as SELECT * FROM Offse
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Lut Calibration Recordset as SELECT * FROM LutCalibrat
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Lead Tools Error Recordset as SELECT * FROM LeadErrorC
10/14/2003:09:03:21AM:00000032.601:INFOR:OpenDatabase,Opening Lab Aim Recordset as SELECT * FROM LabAim
10/14/2003:09:03:21AM:00000032.602:INFOR:OpenDatabase,Opening LUT Densitometer Values Recordset as SELECT * FROM LUT
10/14/2003:09:03:27AM:00000032.608:INFOR:OpenDatabase,Opening LUT Densitometer Values Recordset as SELECT * FROM LUT
```

## ***Installing a New DVP-2 Printer***

---

This section describes installing and configuring a new DVP-2 Printer on your network. Before installing anything on the Printer, please review and follow the directions in this section, then proceed to the chapter on the DVP-2 Console.

---

### **Adding the Printer To Q.C.**

To add a new printer to the system, click the “Add Printer” button on the DVP-2 Q.C. Main Screen. Next, enter a description for the printer. The Q.C. application automatically numbers DVP-2 Printers sequentially. These numbers are also used to maintain each DVP-2’s setup data in the database and associated files on the network. Each time a printer is added to Q.C., the directory structure for the printer is created as follows:

D:\DVP2\_R2\DVP2 Printers\DVP2\_XXX where XXX is the number of the DVP-2 Printer. The first DVP-2 Printer is created automatically when the Q.C. application first runs, so the D:\DVP2\_R2\DVP2 Printers\DVP2\_01 directory already exists. The set of files used to create this directory is available for modification as a template. These files are located in D:\DVP2\_R2\DVP2 Printers\Default.

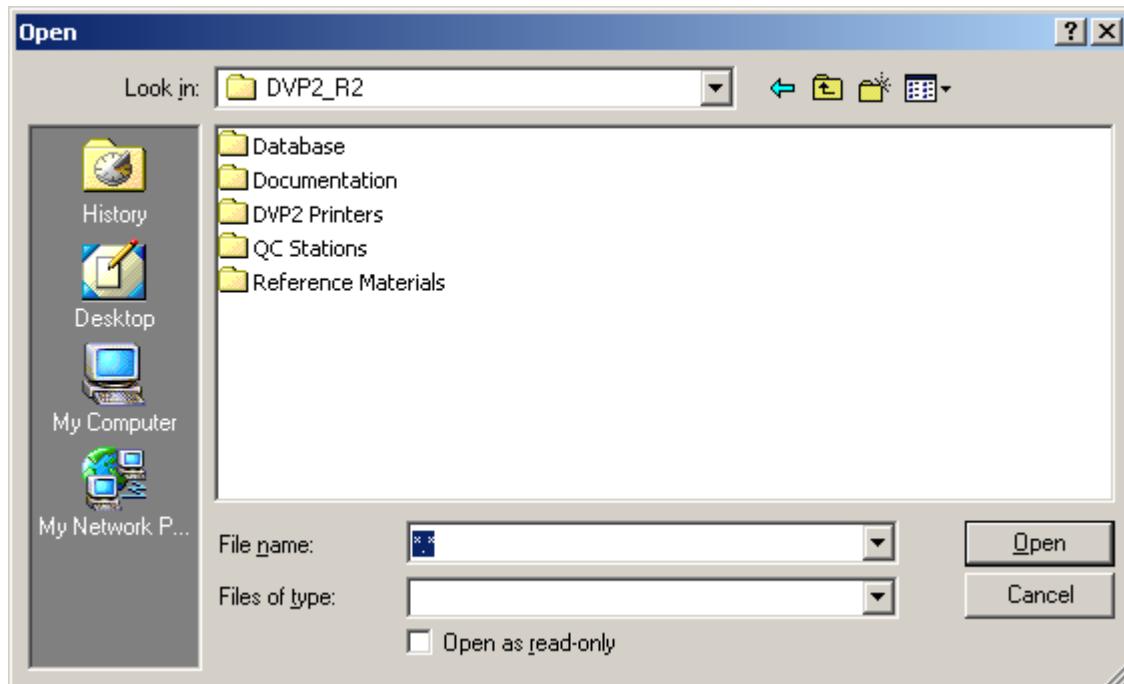
---

### **Configuring Printer Options, Hot Folders, and Settings**

The DVP-2 Q.C. application is used to configure Options, Settings, and Hot Folders for each printer. To make changes to these values, simply click on a printer in the “Printer List”, and then click the Settings tab. It is important to make sure these settings match the physical DVP-2 printer prior to running the DVP-2 Console application on the printer itself. For example, if the BackWriter option is not enabled, the printer will not attempt to use them at all. The same holds true for the Punch and other accessories.

## **Adding Hot Folders**

The DVP-2 uses Hot Folders to build its Print Queue. Hot Folders are simply shared locations on the network where the rendering software places images for printing. To add a Hot Folder, click on the “Add” button on the Settings tab. Next, select the shared folder location from the selection list shown below.



If the Hot Folder is not located on the Q.C. station, then you will need to click on “My Network Places” icon and navigate to the machine where the Hot Folder is located. It is important that the DVP-2 Printer can access the Hot Folder using the same network path as the Q.C. station. Select the Hot Folder location, and then click the Open button. The new Hot Folder will display in the Hot Folders grid.

## **Types of Hot Folders**

There are three types of Hot Folders on the DVP-2:

1. Simple Render Hot Folder
2. Control File – Single
3. Control File – Multiple

## The Simple Render Hot Folder

The Simple Render Hot Folder is supported by virtually every rendering package. It provides a flexible and easy to manage method for passing images and data to the printer. The printer is expecting only images in this type of folder. Optionally, the images may be named in a certain way to indicate print quantities, punch marking, and text for back printing. **IMPORTANT:** The print order is fixed in the order the images were rendered.

The standard naming convention for the images in the Simple Render Hot Folder is as follows:

image name \_(Text1)\_(Text2) \_PrintQuantity\_PunchCode.jpg

## The Control-File Hot Folder

The DVP-2 Printer supports two methods for passing data to the printer in Control Files, Single and Multiple. The Single method is used more commonly and provides for a single file per image. The Multiple method provides for passing a single file containing data for multiple images. The general format for both files is the same as shown below:

```
[Order_Item]  
Quantity=1  
Product_Code=8x10  
Punch_Code=15  
BackPrint_1=Backprint 1  
BackPrint_2=Backprint line 2  
FileName=Job_3995.jpg
```

NOTE: When the Multiple method is used the “[Order Item]” label is replaced with file name of the image for which the data is for. In this case the FileName field is redundant and is not used.

# 3

## ***Offset Calibration***

---

The Canon CanoScan LiDE Scanner is used to make an offset calibration for the DVP-2 Printer. The software must be installed and properly configured prior to making an offset. This section provides installation instructions for the Canon scanner along with step-by-step instructions for making a good offset calibration.

Offset files are used to compensate for deficiencies in the LCD itself. The process of creating a usable offset begins with printing the offset calibration image with a clear offset, then scanning it into the DVP-2 software, calculating an offset, then printing it again. The image is printed, scanned, and calculated repeatedly until all defects are removed.

The offset is used to correct the following problems:

1. The light is not spread even throughout the picture, so the picture on the paper looks cloudy and colored.
2. There are stripes on the paper.

The Offset files are stored in the "\DVP2\_R2\DVPrinters\DV2\_XX\Offset" directory. The names of the files start off with "offset" followed by the sequential number of the offset and a "r" for red, "g" for green and "b" for blue. The extension of the files is ".frm".

---

### **Installing and Configuring the Canon CanoScan LiDE Scanner**

The LiDE 20 or LiDE 30 is the standard scanner for offset scanning. Please follow the steps below to ensure it is properly configured.

1. Make sure that the scanner is NOT connected to the computer.
2. Run the drivers\Canon\SetupGS.exe on the installation CD.
3. Unlock the transport bracket on the bottom of the scanner.
4. Connect the scanner to the computer. The driver will be loaded.
5. Start the DVP-2 Q.C. Application.

---

## **Printing the Offset Calibration Image**

On the DVP-2 Printer Console, click the Q.C. Mode checkbox. The Q.C. Mode command buttons will display. Click on the “Print Offset Calibration” button. The printer will automatically print two copies of the offset calibration image on the 8x10 lens in the proper orientation. NOTE: It is imperative to have perfect focus prior to printing the offset calibration image. If the printer is out of focus, the offset calibration function will fail as described in the following sections. It is also critical to have a very good offset calibration prior to performing the Lookup Table (LUT) Calibration and Color Calibration. The DVP-2 Offset Calibration Image is shown below.



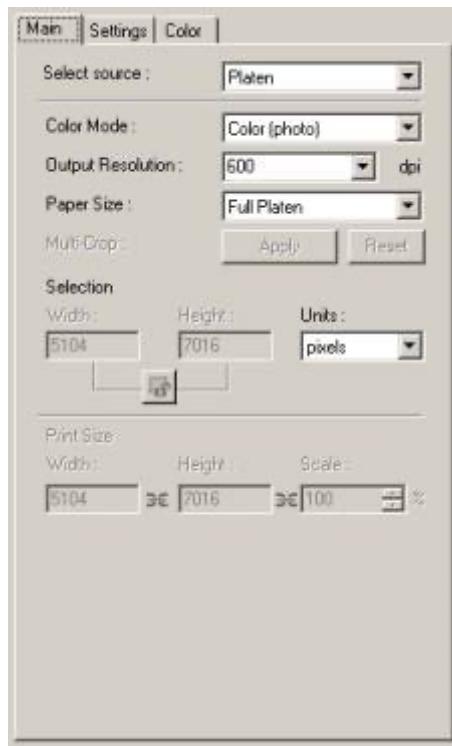
---

## Scanning the Offset Calibration Image

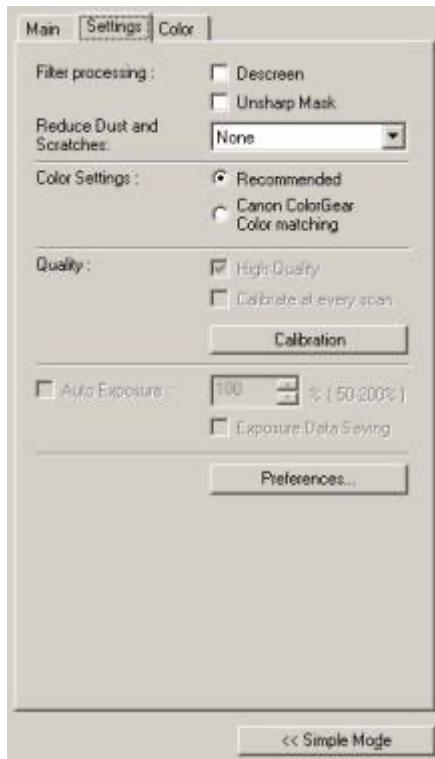
Using the DVP-2 Q.C. Application, select the printer in the Printer List to create the Offset Calibration for, and then click on the Offset tab. Click on the “Scan Offset” button to begin the scanning process.

### Configuring the Scanner Driver

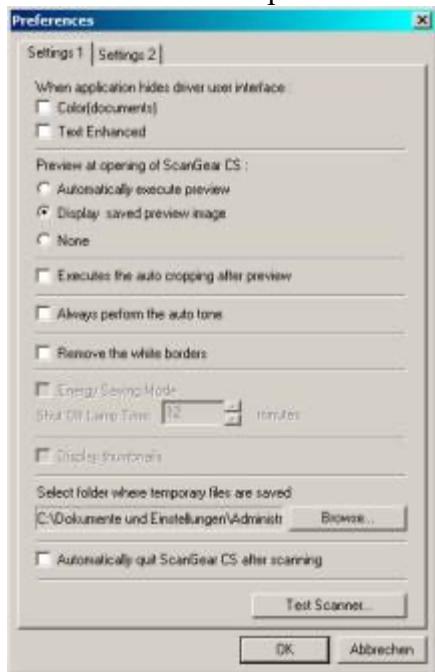
1. First select Advanced Mode in the bottom right corner of the scanner driver window.
2. On the Main tab, set the output resolution to 600 dpi and set the units to Pixels as shown below.



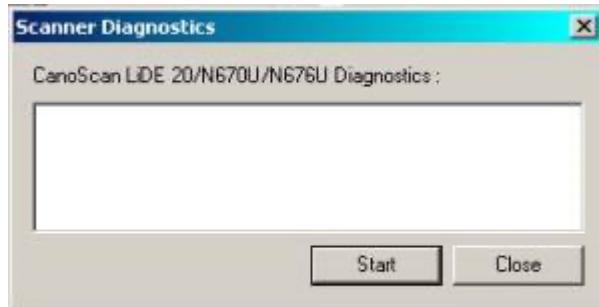
3. On the Settings tab uncheck Descreen and Unsharp Mask. Also make sure the Color Settings are set for Recommended as shown below:



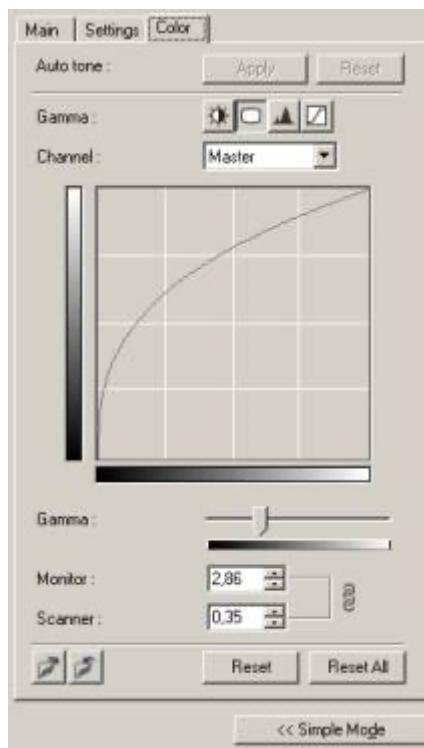
4. Click on the Preferences Button and uncheck the “Executes the automatic cropping after preview”, “Always perform the auto tone”, and “Remove the white borders” options as shown below:



5. Click the “Test Scanner” button and “Start” button. After passing the Test, click the “Close” button.



6. Click “OK“ to close the preferences window.
7. Click the “Calibration” button and wait for scanner to finish.
8. On the Color tab, click on the second button to the left with the monitor-symbol. The text left to the button changes to “Gamma”. Set the value for the Scanner to 0.35, which affects a value of 2.36 for the monitor as shown below:



9. Now the scanner driver is ready to use. Click on the Main tab to begin scanning.

## Cutting the Offset Calibration Image

It is necessary to be very careful when cutting out the offset calibration image for scanning. It is important to adhere to the following guidelines:

1. Try to leave 3/16" of white space on each side of the image.
2. Do not bend, roll, or press on the print. If there are any bends or dents in the print it will be unsuitable for creating an offset.
3. Clean the scanner prior to scanning. If there is any dust at all on the print it will cause the offset calculation to fail.

## Scanning the Calibration Image

Place the cut Calibration Image into the scanner being certain the edges of the print are against the front and left-hand side edges. Click the "Preview" button on the scanner driver window and wait the preview to display. Next, use the mouse to select the area of the image to scan. It is important to select the entire gray area of the image along with approximately 1/8" of white space on all sides. It is also important to be sure to not select the edge of the print in the scan area. Click the "Scan" button to scan the selected area into the DVP-2 Q.C. application. It will typically take the scanner at least several minutes to transfer the image into the DVP-2 Q.C. application.

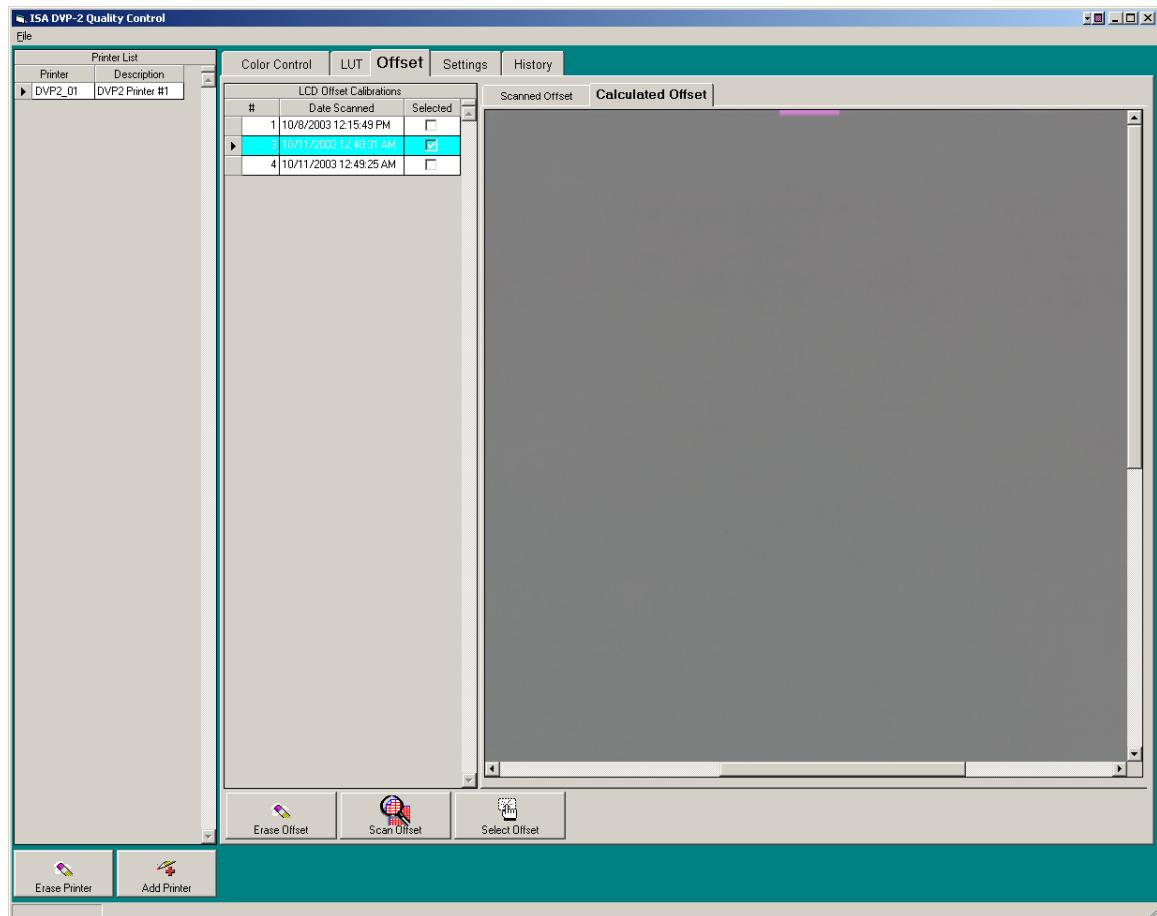
- It is important to scan a white border around the testimage.
- The entire image must appear on screen. If part of the image is missing, the calibration will fail because the LCD Exposer automatically detects the edges of the image.
- If you scan over any paper edges, it may be detected as the beginning of the picture, which causes a miscalculation.
- The software rotates the scan 90 degrees to the right, so make sure that the right hand side of picture is the upper side of the scan.
- The software looks for the white dots in the image to adjust small rotations of the paper on the scanner.
- The picture to be scanned must be very sharp so the software can detect the white dots.
- If there is dirt on the backside of the Panel glass, it results in blurry white spots on the printed picture.
- If there is dirt on the scanner, the resulting spots are sharp as shown in the image below:



## Verifying the Offset

It is important to verify the offset prior to selecting it for use on the printer. Do this by clicking on the “Calculated Offset” tab and checking the displayed image for color bars along the edges. These bars will indicate a problem with the scan such as uneven or un-sharp focus, dust on the print, or other anomaly preventing a good calculation. If the image is neutral gray, it may be selected for use as the current offset. Click on the “Select Offset” button to make this the current offset on the printer.

The screen below shows an offset image with a calculation error, identified by the purple line in the image. This line indicated a dust-spot or area of soft focus in the image. It is important to correct the error and re-scan the offset photograph to produce a workable offset calibration. Click on the “Erase Offset” button to remove offset files that are not properly calculated.



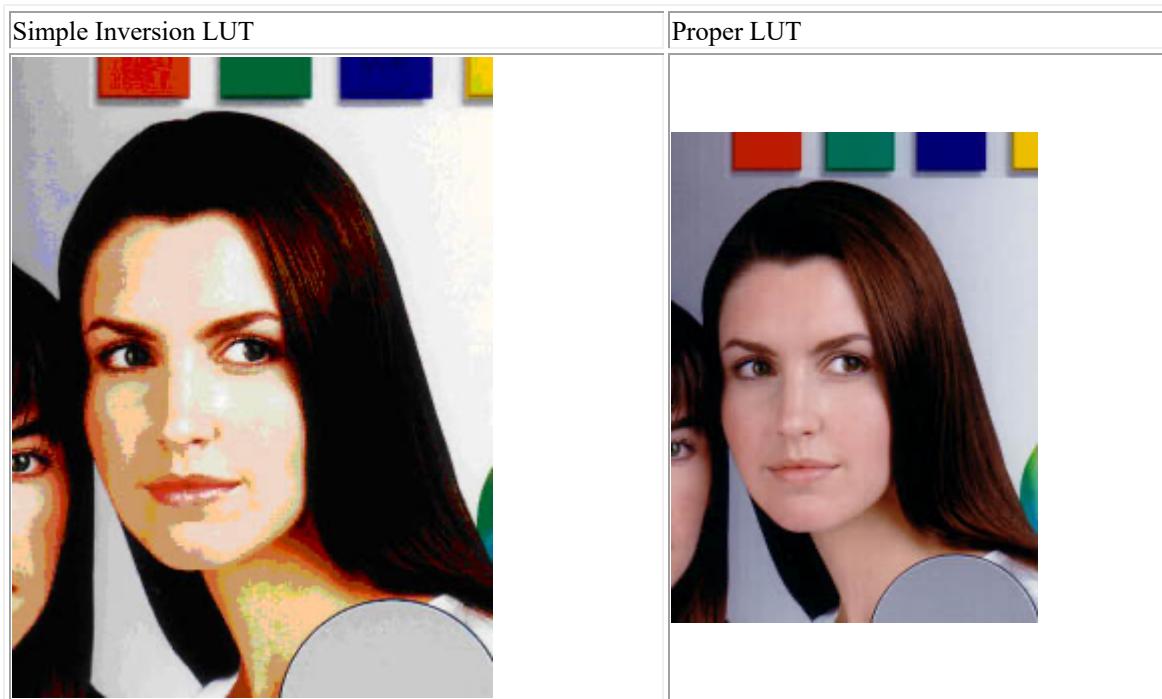
# 4

## ***LUT Calibration***

---

The LUT Calibration is used to adjust the contrast of the LCD to compensate for specific paper emulsions and processor performance. The LUT Calibration image is a 48-step gray scale that must be printed and read on a densitometer.

The LUT maps the color of an image such that it will produce a positive-image on photographic paper. In its most basic form it simply produces a negative, or inverted version of the image necessary for printing. However, when you print a picture with a simple negative LUT it will be too high in contrast. To level the contrast you need to either manually edit or create LUT files, which balance the contrast of the picture depending on the contrast behavior of the LCD and photographic paper. The pictures below show an image printed with a simple inversion LUT alongside one printed with a proper LUT. NOTE: These images will only display properly on true-color displays.



## About LUT Files

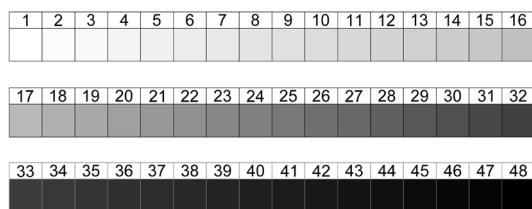
The DVP-2 uses LUT Files for contrast adjustment and automatic color leveling. The DVP-2 LUT files are binary files and should not be edited outside of the DVP-2 program. The LUT Files are stored in the "\DVP2\_R2\DV2 Printers\DV2\_XX\Offset" directory. These are files ending in ".lut". There is a LUT file for each color plane - i.e. Red, Green, and Blue. The DVP-2 ships with standard LUT files named "lutr.lut", "lutg.lut", and "lutb.lut". The DVP-2 provides a choice of editing the LUT files using tabular data entry, interactive editing of the graph, and automatic calculation using a densitometer. Each LUT consists of 256 entries ranging from 0 to 4096. The table below shows the standard LUT provided by DVP-2 along with a sample LUT produced using a densitometer.

---

## **Printing the LUT Calibration Image**

On the DVP-2 Printer Console, click the Q.C. Mode checkbox. The Q.C. Mode command buttons will display. Click on the “Print LUT Calibration” button. The printer will automatically print one copy of the LUT calibration image on the 8x10 lens in the proper orientation.

NOTE: It is imperative to have a very good Offset Calibration prior to making a LUT Calibration. This is because the Offset Calibration compensates for density shifts in the LCD that could cause erroneous readings on the densitometer. It is also important to make sure the densitometer is properly calibrated prior to taking readings. The LUT Calibration image is shown below.



---

## Reading the LUT Calibration on the X-Rite DTP Densitometer

Follow the instructions below to read the LUT Calibration image automatically on the X-Rite DTP Densitometer:

1. Cut each of the 16-Step gray patches leaving 0.25" of white space on both sides and 2" on each end.
2. Configure one of the Paper Types on the X-Rite to read 3 passes of 16 Steps. Each pass must be defined to read Density (displays "den") and output in "3col" mode. The densitometer must be configured to output 3col data without decimal points, i.e. 1.05,1.10,0.95 on the densitometer should transmit to the PC as 105,110,95.
3. Make sure the densitometer is connected to COM2 on the PC running the DVP-2 Q.C. Application
4. Start the DVP-2 Q.C. Application and select the DVP-2 Printer for which to create a new LUT.
5. Select the LUT Tab.
6. Set the X-Rite Strip Guide to position 10 and feed the first strip, with blocks 1-16 into the densitometer with the darkest block positioned to read first. The densitometer will pull the strip through automatically and after a 3 second delay the data will display on the "Densitometer Readings" tab.
7. Feed the second strip through, with blocks 17-32.
8. Feed the third strip through, with blocks 33-48.
9. After the last strip has been read the Q.C. application will automatically compute the new LUT. Click on the "Calculated LUT" tab to see the new graph.
10. Click on the "Select LUT" button to make the LUT file the active LUT on the printer.

NOTE: You can also use a manual densitometer, such as the X-Rite 810 to read each block. In this case, simply type the values for each block into the grid on the "Densitometer Readings" tab. When you have finished with all 48 blocks, click on the "Calculated LUT" tab to view the new LUT graph.

# 5

## **Color Calibration**

---

This section provides instructions for DVP-2 Color Calibration. There are three components of Color Calibration on the DVP-2 - the Color Circle Densitometer Readings (Ring Around), Lab Aim, and Daily Calibration. All of these are used to determine the current exposure time for the printer.

Please be sure to complete the Offset and LUT Calibrations prior to performing Color Calibration on the DVP-2. The DVP-2 color algorithm relies upon densitometer readings, which require an offset with absolutely no lines showing. The algorithm also relies upon the LUT to determine the amount of change required to achieve lab aim.

---

### **Printing The Color Circle**

The first step in color calibrating the DVP-2 is to print the Ring Around Calibration, which is simply a set of photographs over and under exposed a fixed percentage for each color. On the DVP-2 Printer Console, click the Q.C. Mode checkbox. The Q.C. Mode command buttons will display. Click on the “Print Ring Around” button. The printer will automatically print seven copies (Normal, Red, Green, Blue, Cyan, Magenta, & Yellow) of the Color Calibration image on the 8x10 lens in the proper orientation. The Ring Around Color Calibration image is shown below.



---

### **Reading the Color Circle on the X-Rite DTP Densitometer**

Follow the instructions below to read the Ring Around Color Calibration images automatically on the X-Rite DTP Densitometer:

1. Cut each of the 11-Step gray patches along the designated cut-lines.
2. Configure one of the Paper Types on the X-Rite to read 7 passes of 11 Steps. Each pass must be defined to read Density (displays “den”) and

output in “3col” mode.

3. Make sure the densitometer is connected to either COM1 or COM2 on the PC running the DVP-2 Q.C. Application
4. Start the DVP-2 Q.C. Application and select the DVP-2 Printer for which to create a new Color Calibration.
5. Select the Color Control Tab.
6. Set the X-Rite Strip Guide to position 10 and feed the first strip (Nomal Density) into the densitometer with the darkest block positioned to read first. The densitometer will pull the strip through automatically and after a 3 second delay the data will display on the “Ring Around Calibration” tab.
7. Feed the Red, Green, Blue, Cyan, Magenta, & Yellow strips through in sequence. Be certain not to feed the strips in any other sequence.
8. After the last strip has been read the Q.C. application will automatically compute the new color algorithm.

NOTE: You can also use a manual densitometer, such as the X-Rite 810 to read each block. In this case, simply type the values for each block into the grid on the “Ring Around Calibration” tab.

---

## **Setting The AIM**

The color algorithm is designed to compute exposure times to achieve your lab aim. It is important to enter your Lab Aim data on the Ring Around Calibration tab prior to computing new exposure times. The default AIM is Red=0.50, Green=0.50, Blue=0.50.

## Making the Daily Color Calibration

Once the Ring Around Calibration has been completed the Q.C. application can automatically compute exposure times to achieve virtually any aim. The Daily Calibration image is used for this purpose. It also provides details for checking focus, contrast, and pixel adjustment.

### Printing The Daily Color Calibration Image

On the DVP-2 Printer Console, click the Q.C. Mode checkbox. The Q.C. Mode command buttons will display. Click on the “Print Daily Calibration” button. The printer will automatically print the calibration image shown below on the 8x10 lens in the proper orientation.



### Reading The Daily Color Calibration Image

To read the Daily Color Calibration, simply take a reflective measurement of the neutral gray circle located on the chest of the woman on the right-hand side. Enter these values on the Color Control tab in the Daily Calibration Settings grid. Also enter the display readings on the LSB Lamp-house for tracking purposes. Then press the “Calculate New Time:” button. The new exposure times will display in the Current Exposure Time grid. These times will be used automatically for the next exposure on the printer.

NOTE: The Lamp-house values are not used in the exposure time computation, they are maintained for tracking purposes only.

## **Checking DMIN & DMAX**

The Daily Color Calibration image is useful for checking DMIN (White) and DMAX (Black). Check for DMIN by taking readings on the first step of the 11-step gray scale. This is the whitest white the printer can produce. Your DMIN should be less than 0.20 for each color. Typically Kodak Portra or Supra paper will yield a DMIN in the range of 0.10, 0.13, 0.9.

Check for DMAX by reading the large black rectangle next to the neutral gray circle.

NOTE: Do not read DMAX on block 11 of the 11-step gray scale, this is not the darkest black available on the printer. Your DMAX readings should be minimum 2.0 for each color.

## **Checking for Sharp Focus**

The Daily Color Calibration image provides pinwheels for checking focus. It also provides small text on each corner. Both the pinwheels and text should be in sharp focus and should not show signs of pixelation.

# 6

## ***Piezzo Calibration***

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Coming soon!

## The DVP-2 Printer Console

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The DVP-2 Printer Console is the application that controls the DVP-2 printer. This is the application that actually prints pictures! Additionally, it is used to troubleshoot the printer hardware and configure print sizes (discussed in Chapter 8). This chapter provides an overview of the Printer Console.

---

### Installing the DVP-2 Printer Console Application

Each DVP-2 Printer ships with the Printer Console application already installed and tested. In most cases, the printer is already configured with standard print sizes such as 7x10, 8x10, and 11x14. However, when installing DVP-2 on your network, configuration changes may be required to point the Printer Console application to the proper shared Settings database and shared DVP-2 Home Directory.

#### The DVP-2 Printer Console Initialization File

The DVP-2 Printer Console Initialization file is located under the DVP2\_Rx\DVPPrinters\DVPP2\_xx directory. The name of the file is DVPP2.INI. The settings in this file are as follows:

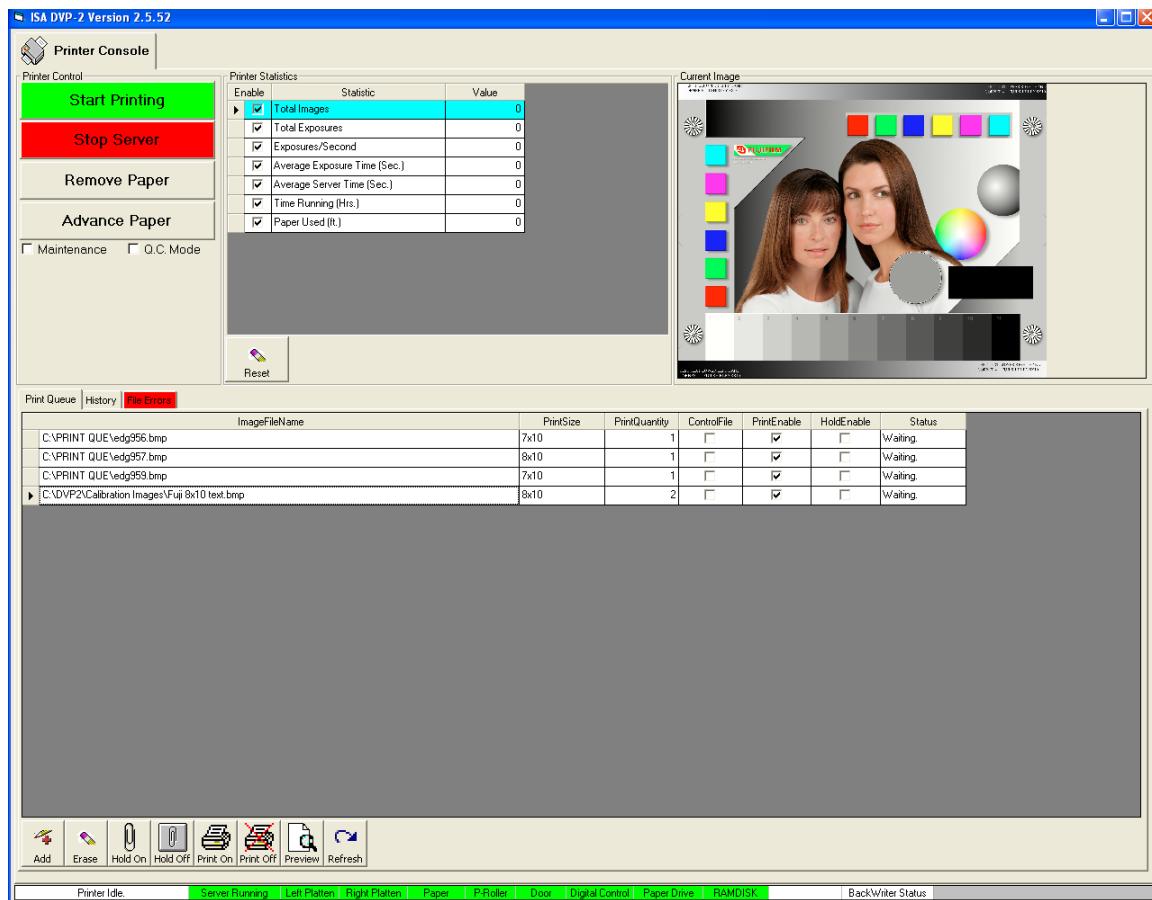
```
[Main]
DatabasePath=D:\DVPP2_R2\Database\Settings.mdb
PrintQuePath=D:\DVPP2_R2\DVPP2 Printers\DVPP2_01\Database\PrintQue.mdb
SettingsPath=D:\DVPP2_R2\DVPP2 Printers\DVPP2_01\
PrinterName=DVPP2_01
```

Change the path of the database and settings to point the location of these files under your shared DVP-2 Home directory, then restart the DVP-2 Printer Console application for these changes to take effect.

## The DVP-2 Printer Console Main Screen

The DVP-2 Printer Console Main Screen provides the ability to monitor the printer's status, manage the Print Queue, Start and Stop printing, Advance Paper, and access both Maintenance and Q.C. modes. At startup, there is one tab visible, the Printer Console tab – shown below. There are 5 areas on this tab:

1. The Printer Control area – this provides the ability to Start and Stop the printer.
2. The Printer Statistics area – this display's printer performance data.
3. The Current Image area – this shows the image currently being exposed.
4. The Print Queue area – this lists the files in the print queue.
5. The Status Bar area – this shows the status of various accessories.



## The Status Bar

The Status Bar displays at the bottom of the Printer Console Main Screen. The indicators should display with either green or white background to begin printing. If any of the indicators display with a red background then printing may not proceed (depending upon settings on the diagnostics tab).

The Status Bar shows the following:

- Printer Status – normally “idle”, or “printing exposure x of y”.
- Server Status – this is the status of the Print Server, which is the program that services Hot Folders to load images into the Print Queue. This status is normally set to “Running” although it may be stopped if in Q.C. mode or maintenance mode.
- Left Platen – indicates if the left platen is engaged.
- Right Platen – indicates if the right platen is engaged.
- Paper – indicates if the printer is out of paper.
- Pressure Roller – indicates if pressure roller is engaged.
- Door – indicates if the door is properly closed (this may be disabled for Daylight load machines by checking the “Daylight Load” option on the DVP-2 Q.C. Settings tab).
- Digital Control – indicates the operational status of the printers digital control circuitry. If this status is red, then the machine is physically broken and in need of repair.
- Paper Drive – indicates the operational status of the printer’s paper advance and stepper mask motors (if installed). If this status is red, then the machine is physically broken and in need of repair.
- RAM Disk – indicates if the printer is printing off RAM Disk Drive for increased imaging throughput. If the RAM Disk is unavailable, the printer will automatically use the hard disk drive.
- Back Writers – indicates the status of the Back Writers (if installed).

---

## The Print Queue

The Print Queue resembles a spreadsheet. It is a combination of the image files from one or more Hot Folders as defined by the Q.C. Settings for the printer. The Print Queue displays the image files in the sequence the printer will print them. The columns for each file show:

1. The Image File Name – this also shows where the image was rendered.
2. The Print Size – this is the print size selected by the printer that matches the aspect ratio of the image. If the aspect ratio of the image does not match one of the print sizes defined on the printer, the image will display on the File Errors Tab.
3. Print Quantity – this is the quantity, or number of times the printer will print this image file in sequence. The print quantity may be contained within the file name - as is the case in the Simple Render Hot Folder, or it may have come from a Control File. If no quantity is specified, the Printer will automatically add the image with a quantity of 1.
4. Control File – this indicates if a Control File was used to retrieve the Print Quantity, Punch Code, and Back Writing information (if applicable).
5. Print Enable – this indicates if the file is going to be printed on the next print cycle.
6. Hold Enable – this indicates if the file is going to be held, i.e. not deleted after the next print cycle.
7. Status – this is a simple status of the image. It will show “Waiting” if the file has not yet been printed, “Holding” if the image has been printing is being held, or “Skipped” if the Print Enable is deselected and Hold Enable is selected.

## Selecting Multiple Images In The Print Queue

It is possible to select one or more images in the Print Queue for setting options. Images are selected by clicking on the Selection column (shown below).



It is possible to select multiple image files by selecting one image, then holding down the Shift key and selecting others to select a contiguous block.

To select non-contiguous blocks of images, select one image, then select others by holding down the Control key.

## The Print Queue Command Buttons

The Print Queue Command buttons provide the ability to manually add images to the print queue, erase images from the print queue and change the status of the Hold and Print flags. NOTE: When selecting multiple image files in the print queue it is necessary to use the command buttons to make changes to the Hold and Print Enable columns. It is also possible to Erase multiple images from the print queue using the Erase button with multiple images selected.

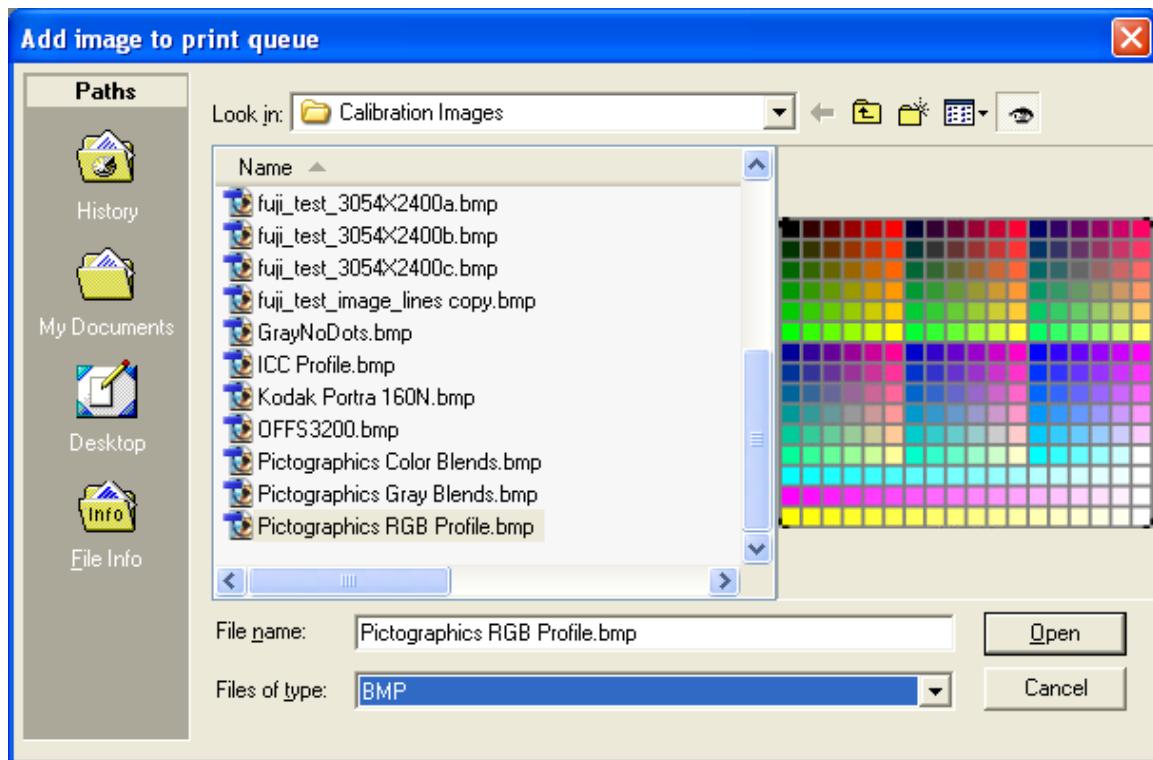


The Print Queue Command Buttons

## Adding An Image To The Print Queue

To add an image to the Print Queue, click on the “Add” button beneath the Print Queue. The Add Image To Print Queue window will display (shown below). It is possible to select any image file on the DVP-2 Printer by clicking on the Desktop icon and navigating through the computer’s disk drives. It is also possible to browse for files over the Local Area Network by clicking on the desktop, then clicking on the “My Network Places” icon.

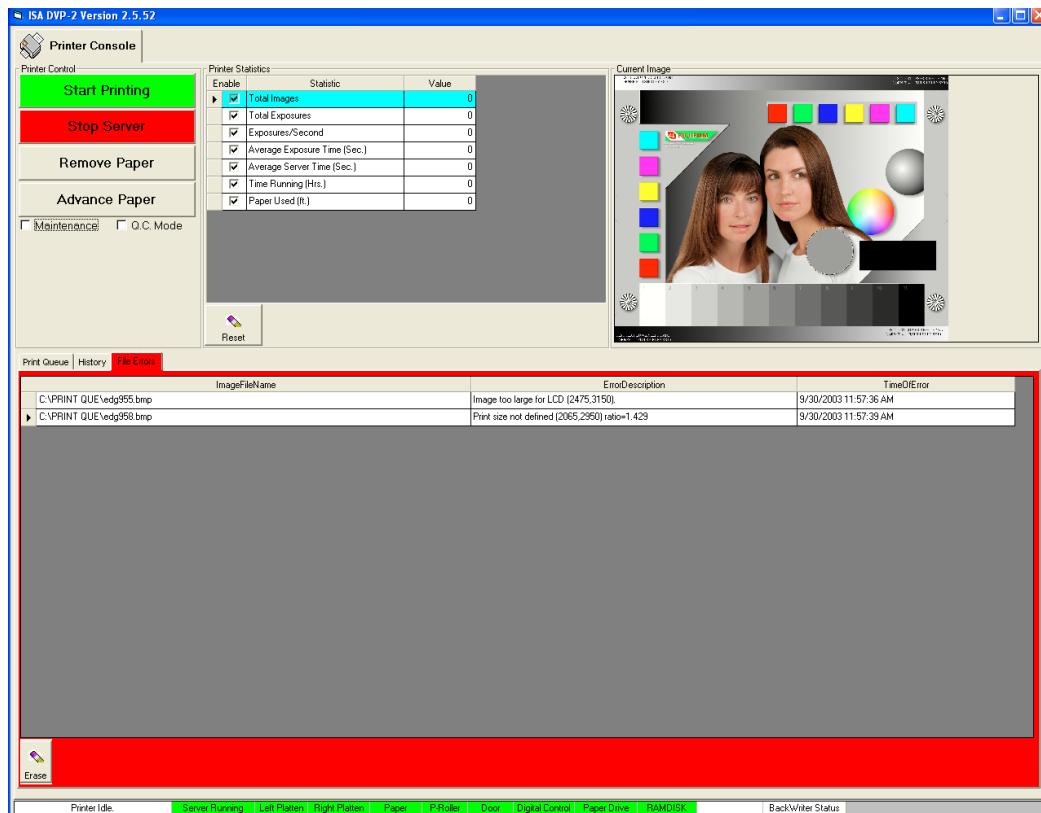
It is important to select an image that has the proper aspect ratio for a Print Size. Otherwise the image will not display in the Print Queue, it will display in the File Errors list.



## Viewing Image File Errors

The File Errors tab in the Print Queue area of the screen will turn red if files of the wrong type or resolution are sent to the DVP-2 Printer. The name of the file(s) that caused errors will display along with the time of the error and a description of the error. The most common file errors are:

1. Print Size Not Defined – this happens when images are sent to the printer rendered to a print size that the printer does not understand. In this case the printer shows the resolution and aspect ratio of the file for comparison to print sizes on the Size Settings tab. It is common to have a print size that is 0.01 off in aspect ratio. The printer uses very precise aspect ratio computations to enable a wide range of products.
2. Image too large for LCD – this happens when the rendering software is set to a DPI greater than 300 for 8x10 and 219 for 11x14. The physical dimension of the LCD is 2400x3200 pixels.
3. Invalid File Type – this happens when non-bitmap files are loaded into the hot folders or images that are compressed with proprietary algorithms (TIF for example).



---

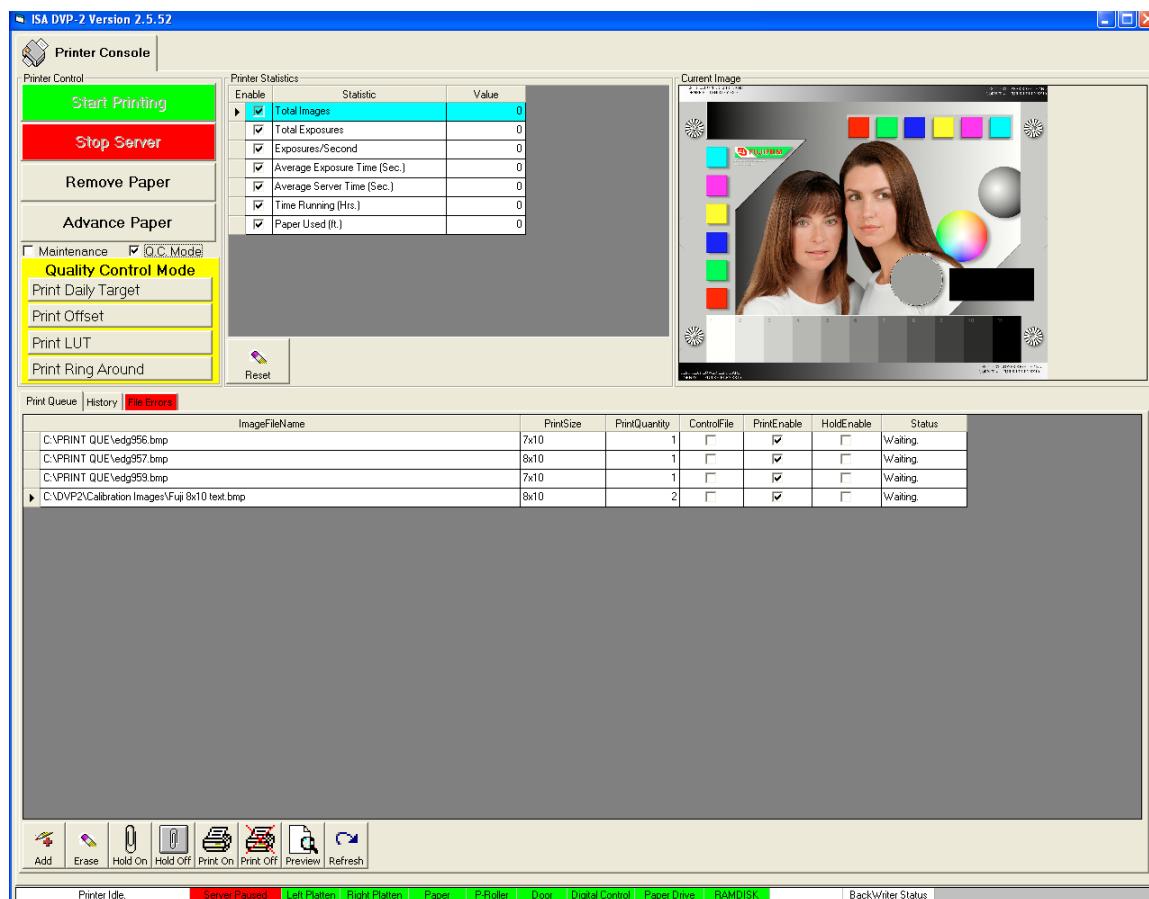
## **Printer Statistics**

## Q.C. Mode

The DVP-2 Printer provides a secured Q.C. Mode to simplify the printing of Calibration images along with preventing printing of production work while the printer is being calibrated. To access Q.C. Mode, click on the “Q.C. Mode” checkbox, and then enter the Q.C. Mode password, which can be defined on the Q.C. application Settings tab. When in Q.C. Mode, the Print Queue Server is disabled, along with the Start Printing option. The Q.C. functions available are:

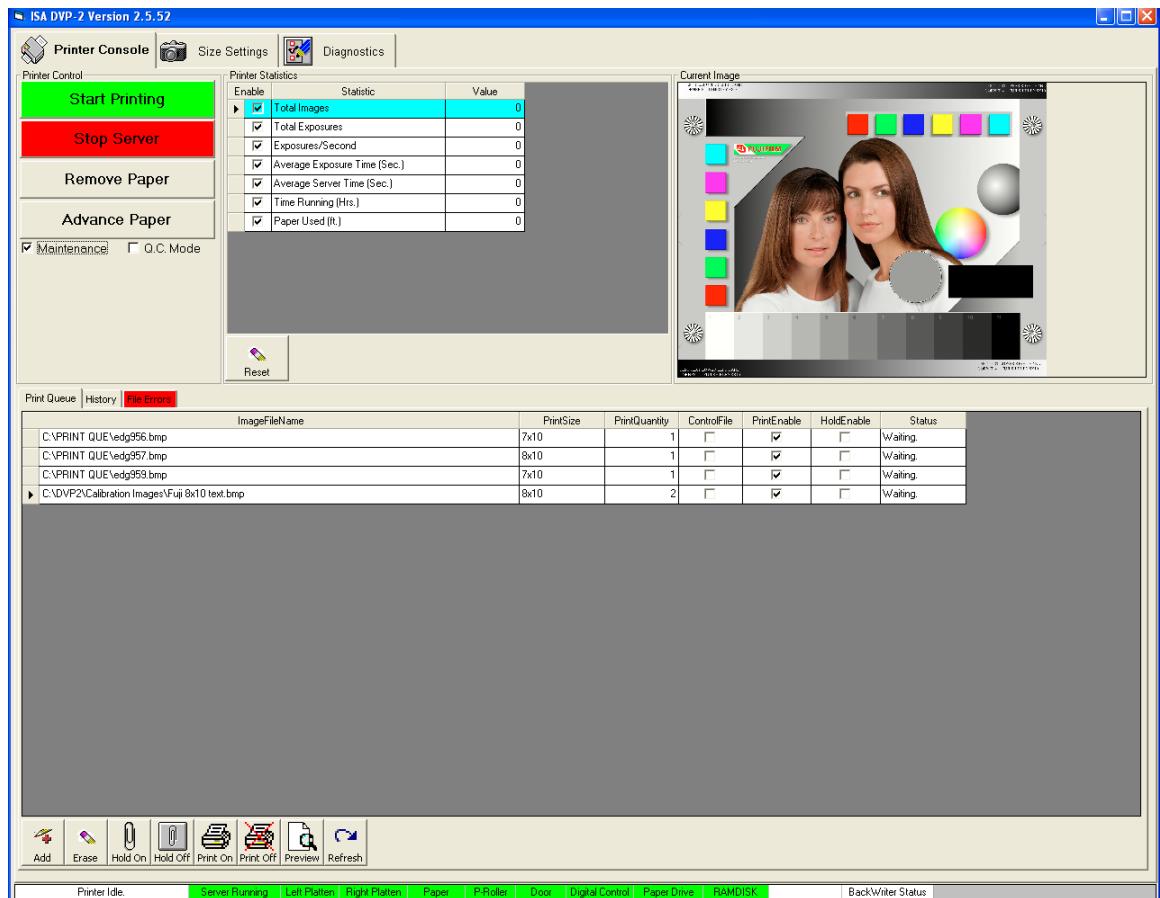
1. Print Daily Target – used to print the Daily Color Calibration image.
2. Print Offset – used to print the LCD Offset Calibration Image.
3. Print LUT – used to print the LCD LUT Calibration Image.
4. Print Ring Around – used to print the 7 Ring Around Images.

To exit Q.C. Mode, uncheck the Q.C. Mode checkbox, then re-enter the Q.C. Mode password.



## Maintenance Mode

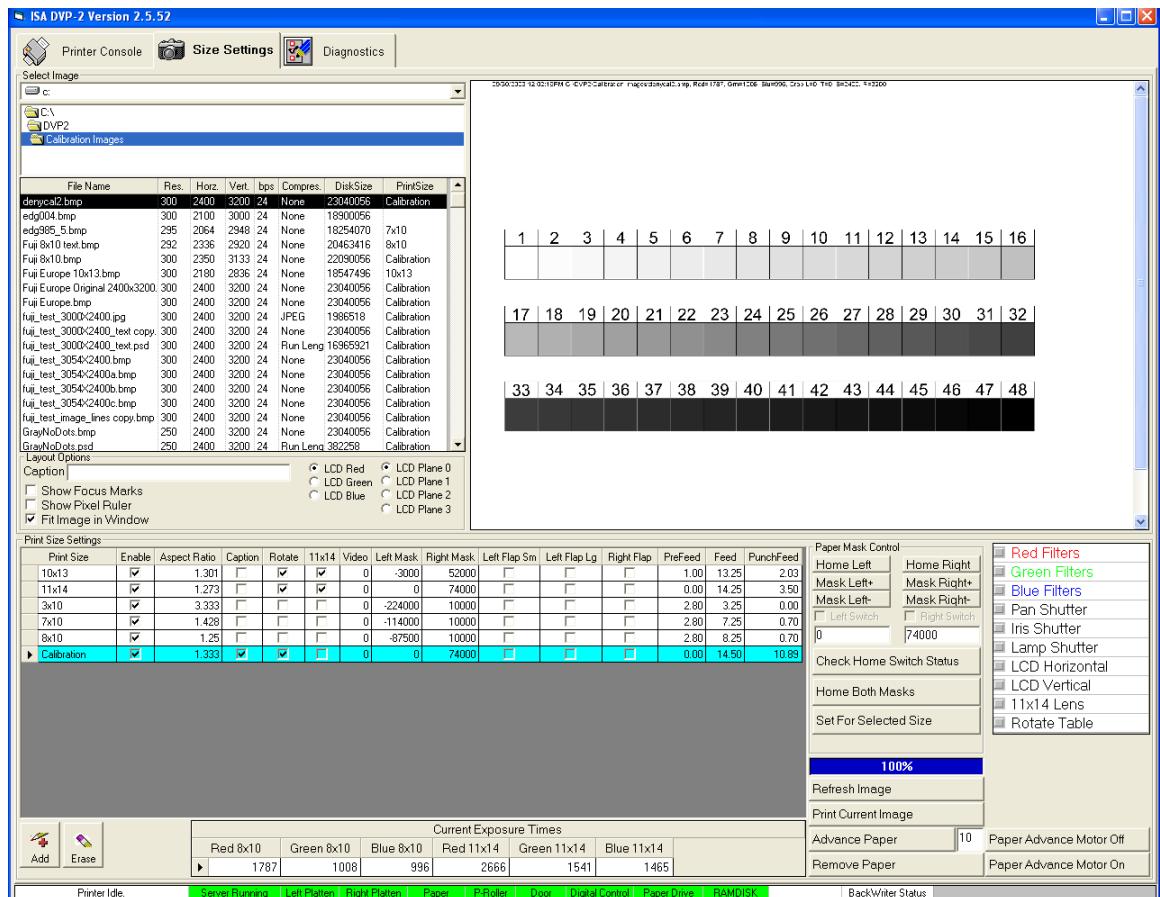
The DVP-2 Printer Maintenance Mode is used to access the printer's Size Settings and Diagnostics. These tabs may optionally be secured with a password, which can be entered on the Q.C. application Settings Tab. To enter Maintenance Mode, click on the "Maintenance" checkbox and enter the password (if enabled). The additional tabs will display to the right of the Printer Console tab as shown in the picture below.



## Maintenance Mode – Size Settings Tab

The Size Settings tab is used to define print sizes on the DVP-2. It is also used to easily control the machine while focusing and performing mechanical adjustments. There are four areas on the Size Settings tab:

1. Select Image – used to select an image to configure a Print Size for, or simply to display on the LCD for diagnostics.
2. Layout Options – used to specify additional layout options for the currently selected image such as Show Focus Marks or Pixel Ruler. The LCD buttons in this area control which color plane and shift plane of the image are displayed on the LCD.
3. Print Size Settings – used to specify how the machine should configure itself for each print size. NOTE: Each Print Size is identified by a name and an Aspect Ratio. The printer is only capable of configuring itself one way for any given aspect ratio.
4. Paper Mask Control – used to set the stepping paper mask (if installed) for the currently selected Print Size.

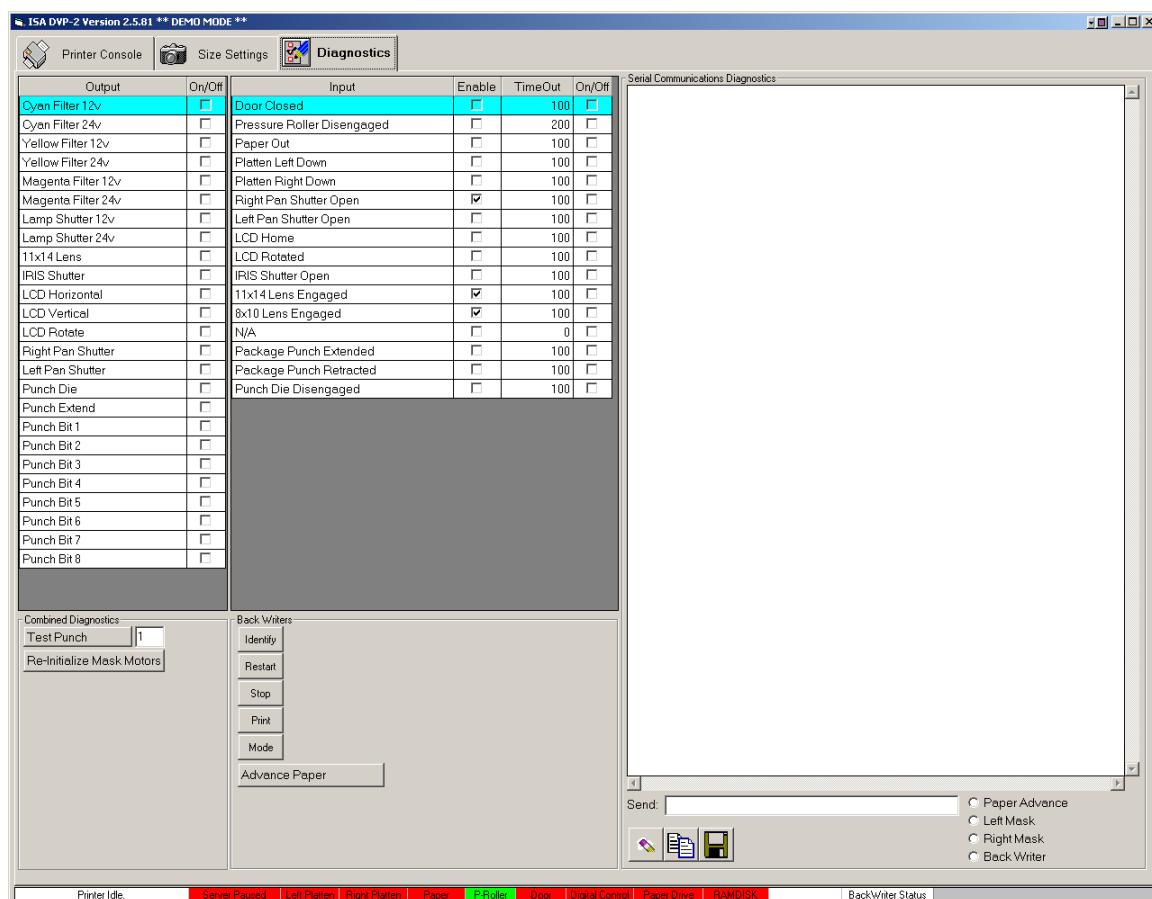


## Maintenance Mode – Diagnostics

The Diagnostics tab provides the ability to troubleshoot and exercise the machine at a low-level. There are two basic types of hardware in the Printer, Digital I/O and Serial Communications. The Digital Outputs are listed on the left-hand side of the screen. These can be enabled and disabled by checking and un-checking the On/Off checkbox.

The Digital Inputs are scanned every 100 milliseconds. If the Input is active, the On/Off status will display as checked. Each input can be verified during production printing by checking the “Enable” column. If Enabled inputs fail to validate during production within the time allotted for in TimeOut column (milliseconds), the machine will stop and display an error message. When an Input is disabled, the TimeOut value is used as a fixed delay.

The Serial Communications Diagnostics shows the list of messages sent to and from each of the Serial devices – the paper advance, mask motors (if installed), and Back Writers (if installed). This section is typically used for performing troubleshooting remotely via phone support.



# 8

## ***Configuring Print Sizes on the DVP-2***

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One of the more complicated aspects of the DVP-2 Printer is configuring Print Sizes. This chapter provides a step-by-step process for printing virtually any size image on the DVP-2, from 2.5x10 to 11x14.

---

### **Rendering the Proper Sized Images**

The first step in configuring print sizes is to render images in the proper format for printing. It is important to think about all of the sizes you intend to print on the DVP-2 prior to attempting to configure them. The most common sizes are 7x10, 8x10, 10x13, and 11x14. Most combination units are printed on the 7x10 lens, i.e. 3.5x5, 5x7, Wallets, Sub-Wallets, etc.

You must also determine if text is to be rendered into the images and the size of the text. If text is added to an 8x10 for example, the actual size of the 8x10 will typically increase from anywhere between 8.1" and 8.5" depending upon the height and placement of text. In some cases, the rendering software limits this. The DVP-2 is capable of reliably printing sizes in increments of 1/64". Prior to configuring print sizes, you must determine the image sizes that are going to be produced including text. It is good practice to write down your print sizes in the following format prior to configuring the printer:

Unit Size	Text Size	Total Size	DPI	Image Dimensions	Aspect Ratio
7x10	0.25	7.25x10	291	2109x2910	1.379
8x10	0.25	8.25x10	291	2400x2910	1.212
10x13	0.25	13.25x10	219	2190x2901	1.324

Next, configure your rendering software to produce images of the proper size and aspect ratio. Render several packages that include every print size and copy the images to a shared location on the network.

## Selecting Your Sized Images On The DVP-2

On the DVP-2 Printer Console, enter maintenance mode by checking the Maintenance mode checkbox and entering the password (if enabled). Click on the “Size Settings” tab. This is where all of the print size functions are located. It is necessary to unload the printer, remove the platen, and use a piece of ground glass with a prism to verify the print size setup.

The first step in setting up a print size is to select an existing size record or add a record in the “Print Size Settings” grid. Do this by clicking on the Add button (shown below). If there is already a size label for your intended print size, simply change the aspect ratio for the size to match the record in your table of rendered images (see previous section). For example, you can simply click on the Aspect Ratio cell of the 7x10 image and type 1.379 to make the printer coordinate a 7x10 as your 7.25x10. Or you may choose to add a new record labeled 7.25x10.

Print Size Settings														
Print Size	Enable	Aspect Ratio	Caption	Rotate	11x14	Video	Left Mask	Right Mask	Left Flap St	Left Flap Lg	Right Flap	PreFeed	Feed	PunchFeed
10x13	<input checked="" type="checkbox"/>	1.301	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	-38000	52000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.00	13.25	2.03
11x14	<input checked="" type="checkbox"/>	1.273	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	0	74000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.00	14.25	3.50
3x10	<input checked="" type="checkbox"/>	3.333	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	-224000	10000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.80	3.25	0.00
7x10	<input checked="" type="checkbox"/>	1.428	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	-114000	10000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.80	7.25	0.70
8x10	<input checked="" type="checkbox"/>	1.25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	-87500	10000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.80	8.25	0.70
Calibration	<input checked="" type="checkbox"/>	1.333	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	0	74000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.00	14.50	10.89

**Add** **Erase**

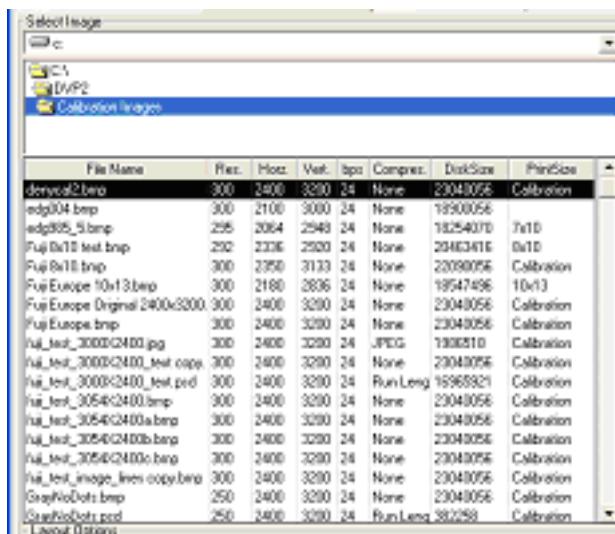
Current Exposure Times					
Red 8x10	Green 8x10	Blue 8x10	Red 11x14	Green 11x14	Blue 11x14
1787	1006	996	2666	1541	1465

The options available for each print size are as follows:

1. Enable – this is used to selectively turn print sizes ON/OFF. If a print size is disabled, the Print Queue will not load images of that size.
2. Aspect Ratio – this is simply the aspect ratio of the printed image.
3. Caption – this is used to have the printer caption every image of the selected print size with fixed text. This is primarily used for troubleshooting.
4. Rotate – this must be checked if the LCD is to be rotated to horizontal position. This is used primarily for the 11x14 lens.
5. 11x14 – this must be set to use the 11x14 Lens, if disabled the 8x10 lens will be used.

6. Video Offset – this is used to nudge the image the specified number of pixels from the front of the machine towards the back. This value changes based on the rotation of the LCD, but always is the number of pixels from the front of the machine.
7. Left Mask – this is the absolute position of the left stepper mask from the left mask home switch.
8. Right Mask – this is the absolute position of the right stepper mask from the right mask home switch.
9. Left Flap Small – this is enabled for printing 8x10 on printers with Left Flaps installed (Non-Stepper Mask).
10. Left Flap Large - this is enabled for printing 7x10 on printers with Left Flaps installed (Non-Stepper Mask).
11. Right Flap - this is enabled for printing 8x10 & 7x10 units on printers with Right Flaps installed (Non-Stepper Mask).
12. PreFeed – this is the distance between the right stepper mask (or Right Flap) position and the right-hand side of the Paper Mask. This distance is used when transitioning print sizes to determine how much additional or less paper to advance for the next print.
13. Feed – this is the amount of paper to advance for the exposed area of the print. For a 7.25x10 with 0.10” gutter, this value would be 7.26”.
14. Punch Feed – this is the distance between the punch and the right-hand side of the print. For 7x10 & 8x10 units, this number should be very small. For 10x13 and 11x14 units this number will be closer to the pre-feed number on the smaller units because it is the distance from the punch to the right-mask.

Once you have entered settings for each of the image sizes rendered, you are ready to select the actual images and configure them on the printer. To select your images, use the Drive and Directory pick lists (shown below):



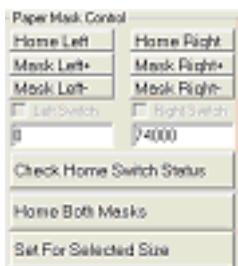
The Print Size column should display a size for each of the rendered images. If this is not the case, open the images without Print Size labels in Adobe PhotoShop® and verify that the rendering software produced the proper aspect ratio files.

As you select files in the Image Selection list, the image will display on the screen and on the LCD and the corresponding Print Size will become selected in the Print Size Settings Grid. At this point you can visually see the image on the LCD using a ground glass and prism (or mirror).

---

## Setting the Stepper Mask

While viewing the image at the paper plane using a ground glass and prism, click on the Mask Left and Mask Right buttons to adjust the stepper mask to the very edge of the projected image, and then click on the “Set For Selected Size” button (shown below).



You can test the stepper-mask by clicking on various sized images. The mask will automatically adjust for each size image in the list.

**IMPORTANT NOTE:** Do not attempt to adjust the stepper mask beyond its range of travel. You will hear the mask hit the side of the paper tower and the belt will make a clicking sound when the mask is at its full range. Setting the mask at a position beyond its full range of damage will result in inconsistent masking and may damage the machine over time. The full range of travel for the left mask is 0 to 225,000. The full range of travel for the right mask is 0 to 74,000. If you inadvertently move the mask beyond its range of travel, simply click on the Home button, wait for the mask to home itself, and then start over again with the current print size.

# 9

## ***The DVP-2 Databases***

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The DVP-2 Q.C. and DVP-2 Console applications rely upon a central database for all printer settings. The database may be stored in Microsoft Access® or Microsoft SQL Server® format. For installations of less than 5 printers, the Microsoft Access® database format can be used. This format is simple to maintain and does not require additional software or administration. For larger installations it is recommended to run the database in Microsoft SQL Server® 2000 or later. The DVP-2 Printer and Q.C. application do not include Microsoft SQL Server®. This can be purchased separately from any software vendor providing Microsoft Server® products.

There are two databases that required to operate the DVP-2 Printer. The “Settings” database and the “Print Queue” database. The Settings database is used by both the Printer Console and the Q.C. applications. This Print Queue database is used only by the Printer Console.

---

### **Configuring the Databases**

The DVP-2 software ships on a single CD. The Settings database is located in the \DVP2\_Rx\Database directory. This directory must be copied to a shared location on the network. It is recommended that the entire CD-ROM be copied to the shared directory. It is important to change the permissions after copying the directory to disable the “Read Only” attribute. This must be performed for all directories and files beneath the DVP2\_Rx directory.

The DVP-2 Q.C. and DVP-2 Console applications find the database using a value stored in the initialization file. The DVP-2 Q.C. application uses a file called “DVP2\_QC.INI”. The DVP-2 Console application uses a file called “DVP.INI”. These files are stored in the program directories and have the same format:

```
[Main]  
DatabasePath=D:\DVP2_R2\Database\Settings.mdb
```

NOTE: For Microsoft Access® format databases the DatabasePath setting must include the entire path name for the actual database file. For Microsoft SQL Server®, the DatabasePath setting must contain the ODBC Connection String to the database. Please refer to Microsoft SQL Server® documentation for more information on ODBC Connection Strings.

---

## The Settings Database

This section provides an overview of the DVP-2 Settings database tables.

### The Daily Calibration Table

The DailyCalibration table contains the neutral patch densitometer readings for each printer's daily calibration image. These values are entered on the DVP-2 Q.C. Color Control tab.

Column Name	Type	Size
PrinterName	Text	20
BlockNum	Long Integer	4
ExposureName	Text	20
ExpRed	Double	8
ExpGreen	Double	8
ExpBlue	Double	8

### The Digital Inputs Table

The DigitalInputs Table contains digital input description, Enabled Status, and TimeOut for every printer. The DVP-2 Printer retrieves input definitions from this table upon startup. There is one record in this table for every digital input on every DVP-2 Printer installed. There are four inputs per white SSR cube on the printer's digital I/O rack. The labels that appear on the diagnostics screen can be changed by making modifications to this table. The Enabled and TimeOut values are entered on the DVP-2 Diagnostic Tab.

ColumnName	Type	Size
PrinterName	Text	20
InputNumber	Long Integer	4
Description	Text	50
InputEnabled	Yes/No	1
TimeOut	Long Integer	4

## The Digital Outputs Table

The DigitalOutputs Table contains digital output descriptions for every printer. The DVP-2 Printer retrieves output definitions from this table upon startup. There is one record in this table for every digital output on every DVP-2 Printer installed. There are four outputs per red SSR cube on the printer's digital I/O rack. The labels that appear on the diagnostics screen can be changed by making modifications to this table.

Column Name	Type	Size
PrinterName	Text	20
OutputNumber	Integer	2
Description	Text	50

## The Exposure Time History Table

The ExposureTimeHistory table contains a record of exposure time changes for every DVP-2 printer. This table can be used to track performance over the life of the lamp-house bulbs. These values are entered automatically on the DVP-2 Q.C. Color Control tab when the “Calculate New Times” button is pressed.

Name	Type	Size
PrinterName	Text	20
DateModified	Date/Time	8
Red8x10	Long Integer	4
Green8x10	Long Integer	4
Blue8x10	Long Integer	4
Red11x14	Long Integer	4
Green11x14	Long Integer	4
Blue11x14	Long Integer	4
Red8x10_Density	Double	8
Green8x10_Density	Double	8
Blue8x10_Density	Double	8
Red11x14_Density	Double	8
Green11x14_Density	Double	8
Blue11x14_Density	Double	8
Lamphouse_Red	Long Integer	4
Lamphouse_Green	Long Integer	4
Lamphouse_Blue	Long Integer	4
Comments	Text	80

## **The Exposure Times Table**

The ExposureTimes table contains the current exposure time setting for every DVP-2 Printer. These values are entered on the DVP-2 Q.C. Color Control tab. They are also available on the DVP-2 Printer Console Size Settings tab.

Name	Type	Size
PrinterName	Text	20
Enabled	Yes/No	1
Red8x10	Long Integer	4
Green8x10	Long Integer	4
Blue8x10	Long Integer	4
Red11x14	Long Integer	4
Green11x14	Long Integer	4
Blue11x14	Long Integer	4
DateModified	Date/Time	8

## **The Hot Folders Table**

The HotFolders table contains the hot folder locations for every DVP-2 Printer. These values are entered on the DVP-2 Q.C. Settings tab.

Name	Type	Size
PrinterName	Text	20
HotFolderPath	Text	255
FolderType	Long Integer	4
FolderEnabled	Yes/No	1
Status	Text	50
NumberOfFiles	Long Integer	4

## **The Lab Aim Table**

The LabAim table contains one record for the Lab Aim data. These values are entered on the DVP-2 Q.C. Color Control tab.

Name	Type	Size
AimRed	Double	8
AimGreen	Double	8
AimBlue	Double	8

## The Lead Error Code Table

The LeadErrorCode table contains error definitions for the LeadTools Imaging Library used by the DVP-2 Printer Console.

Name	Type	Size
ErrorNumber	Long Integer	4
ErrorDescription	Text	255

## The LUT Calibrations Table

The LutCalibrations table contains one record for every LUT Calibration on every DVP-2 Printer. The LUT number assigned from this table matches the LUT number on the LUT files, i.e. lut5r.lut would indicate the 5<sup>th</sup> LUT Calibration.

Name	Type	Size
PrinterName	Text	20
LutNum	Long Integer	4
LutDate	Date/Time	8
Selected	Yes/No	1

## The LUT Densitometer Values Tables

The LutDensitometerValues table contains the actual densitometer readings used to create each LUT.

Name	Type	Size
PrinterName	Text	20
LutNum	Long Integer	4
BlockNum	Integer	2
DensRed	Double	8
DensGreen	Double	8
DensBlue	Double	8

## The Offset Calibrations Table

The OffsetCalibrations table contains one record for every offset Calibration on every DVP-2 Printer. The Offset number assigned from this table matches the Offset number on the Offset files, i.e. offset3r.lut would indicate the 3<sup>rd</sup> Offset Calibration.

Name	Type	Size
PrinterName	Text	20
OffsetNum	Long Integer	4
OffsetDate	Date/Time	8
Selected	Yes/No	1

## The Printer List Table

The PrinterList table contains one record for every printer installed.

Name	Type	Size
PrinterName	Text	20
Description	Text	50

## The Printer Options Table

The PrinterOptions table is used to specify which printer options are enabled, i.e. Back Writers, Punches, etc. These values are entered on the Q.C. Settings Tab.

Name	Type	Size
PrinterName	Text	20
OptionNumber	Long Integer	4
OptionName	Text	50
OptionValue	Yes/No	1

## The Printer Settings Table

The PrinterSettings table is used to specify printer settings such as Motor PPI. These values are entered on the Q.C. Settings Tab.

Name	Type	Size
PrinterName	Text	20
SettingNumber	Long Integer	4
SettingName	Text	50
SettingValue	Text	50

## The Printer Statistics and Printer Statistics History Tables

The PrinterStatistics tables contain production statistics for every DVP-2 installed. The history table is used to store time-based snapshots of statistical information for reporting purposes.

Name	Type	Size
PrinterName	Text	20
StatisticNumber	Long Integer	4
StatisticEnable	Yes/No	1
StatisticName	Text	50
StatisticValue	Double	8
DateModified	Date/Time	8

Name	Type	Size
PrinterName	Text	20
StatisticNumber	Long Integer	4
DateModified	Date/Time	8
StatisticEnable	Yes/No	1
StatisticName	Text	50
StatisticValue	Double	8

## The Print Size Table

The print size table contains print size definitions for every DVP-2 installed. These values are entered on the DVP-2 Printer Console Size Settings tab.

Name	Type	Size
PrinterName	Text	20
PrintSize	Text	20
Enable	Yes/No	1
AspectRatio	Double	8
Caption	Yes/No	1
RotateTable	Yes/No	1
Lens11x14	Yes/No	1
VideoPosition	Long Integer	4
LeftMaskPosition	Long Integer	4
RightMaskPosition	Long Integer	4
LeftFlapSmall	Yes/No	1
LeftFlapLarge	Yes/No	1
RightFlap	Yes/No	1
PaperPreFeed	Double	8
PaperFeed	Double	8
PaperPunchFeed	Double	8

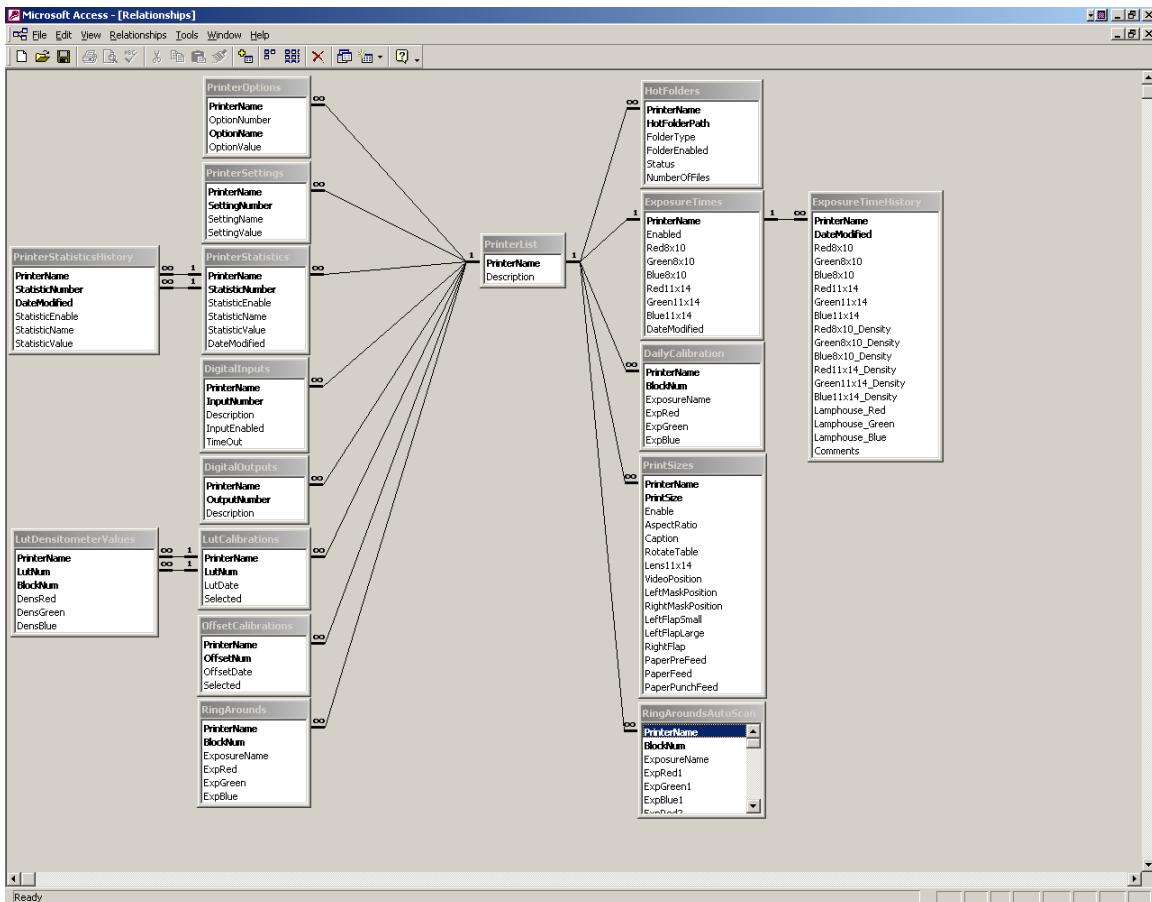
## The Ring Arounds Table

The RingArounds Table contains the actual densitometer values read from each of the 7 Ring Around Color Calibration Images. These values are used within the color algorithm to determine the amount of change required to adjust the Daily Color Calibration image to achieve Lab Aim.

Name	Type	Size
PrinterName	Text	20
BlockNum	Long Integer	4
ExposureName	Text	20
ExpRed1	Double	8
ExpGreen1	Double	8
ExpBlue1	Double	8
ExpRed2	Double	8
ExpGreen2	Double	8
ExpBlue2	Double	8
ExpRed3	Double	8
ExpGreen3	Double	8
ExpBlue3	Double	8
ExpRed4	Double	8
ExpGreen4	Double	8
ExpBlue4	Double	8
ExpRed5	Double	8
ExpGreen5	Double	8
ExpBlue5	Double	8
ExpRed6	Double	8
ExpGreen6	Double	8
ExpBlue6	Double	8
ExpRed7	Double	8
ExpGreen7	Double	8
ExpBlue7	Double	8
ExpRed8	Double	8
ExpGreen8	Double	8
ExpBlue8	Double	8
ExpRed9	Double	8
ExpGreen9	Double	8
ExpBlue9	Double	8
ExpRed10	Double	8
ExpGreen10	Double	8
ExpBlue10	Double	8
ExpRed11	Double	8
ExpGreen11	Double	8
ExpBlue11	Double	8

## Table Relationships

The following picture shows the relationship between all of the DVP-2 Tables in the Settings Database. Please refer to Microsoft Access® or Microsoft SQL Server 2000® documentation for more information on database Relationship Diagrams. The Settings database is maintained by the Q.C. application or by Microsoft SQL Server, depending upon the installation.



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## The DVP-2 Print Queue Database

The DVP-2 Printer Console relies upon a Microsoft Access® database to store it's current position and status. The printer automatically maintains and optimizes the Print Queue database each time the program is started.

The Print Queue database is called "PrintQue.mdb" and is stored under each printer's Database directory. The Print Queue database contains three tables:

There are 3 tables in the Print Queue database.

### The Active Print Queue Table

The ActivePrintQue Table this is the active print queue used for batch printing. If the printer loses power or is stopped by the operator during batch printing, it uses this table to recover from where it left off. This table is also displayed on the DVP-2 Console main screen to maintain the current Print Queue image list.

Column Name	Type	Size
PrinterName	Text	10
ImageFileName	Text	255
PrintSize	Text	10
PrintQuantity	Integer	2
PixelsX	Integer	2
PixelsY	Integer	2
ControlFile	Yes/No	1
PrintEnable	Yes/No	1
HoldEnable	Yes/No	1
Status	Text	20
PrintQue	Text	80
PrintQueType	Long Integer	4
PunchCode	Integer	2
BackWriterText1	Text	80
BackWriterText2	Text	80
BackWriterText3	Text	80
BackWriterText4	Text	80
ImageResolution	Integer	2
ColorDepth	Integer	2
Compression	Text	20
DiskSize	Long Integer	4
FileDate	Date/Time	8

## The File Errors Table

The FileErrors table holds information pertinent to any errors that occurred while processing the image files.

Column Name	Type	Size
PrinterName	Text	20
PrintQue	Text	80
ImageFileName	Text	255
ErrorDescription	Text	50
TimeOfError	Date/Time	8

## The Print History Table

The PrintHistoryTable holds tracking and statistical information for analyzing printer performance. If enabled, there is one record for every image printed.

Column Name	Type	Size
PrinterName	Text	10
PrintTime	Date/Time	8
ImageFileName	Text	255
PrintSize	Text	10
PrintQuantity	Integer	2
PixelsX	Integer	2
PixelsY	Integer	2
ControlFile	Yes/No	1
PrintEnable	Yes/No	1
HoldEnable	Yes/No	1
Status	Text	20
PrintQue	Text	80
PrintQueType	Long Integer	4
PunchCode	Integer	2
BackWriterText1	Text	80
BackWriterText2	Text	80
BackWriterText3	Text	80
BackWriterText4	Text	80
ImageResolution	Integer	2
ColorDepth	Integer	2
Compression	Text	20
DiskSize	Long Integer	4
FileDate	Date/Time	8
RedTime	Integer	2
GreenTime	Integer	2
BlueTime	Integer	2
ActualImagePrepTime	Long Integer	4
ActualExposureTime	Long Integer	4
TotalTimeRequired	Long Integer	4
TotalPaperUsed	Long Integer	4

# 10

## ***Hardware Overview***

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### **The DVP-2 Hardware Platform**



#### **The VP-2 Printer.**

The main benefit of the VP-2 is its flexible design. With its interchangeable lens drawers, you can switch over to a different film format in a matter of minutes. The VP-2 is ideal for school and store promotion work, or any application where the film format is unlikely to change within any given order, but where different orders are in different formats.

The VP-2 printer's flexibility and high performance have made it an industry standard. In fact, it's used in more school labs than any other printer on the market. It's also compatible with most automation systems.

#### **Specifications**

Electrical: 117 VAC, 60/50 Hz, 20 amp  
Air supply: 80 psi at .25 cfm  
Weight: 650 lbs (29.2 kg)  
Height x Width x Depth: 71" x 50" x 26" (180.34 x 127 x 66 cm)

#### **Features Standard & Optional**

Negative table 90° automatic rotation  
Paper sizes 5", 10" or 11" x 575'max  
\* All sizes from 35mm to 70mm  
Print format Borderless/bordered  
Lamphouse Subtractive filter flags  
Stepper paper advance  
Lens drive assemblies:  
Daylight load  
Stepper paper mask  
Mark paper with a single punch, package punch or digital cut code

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## The DVP-2 Controller

The DVP-2 Controller PC provides the following features:

1. Control of Mullersohn LCD Array for “digital negative” rendering using Sony 8 Megapixel Array. The LCD subsystem will control calibration, color profile, rendering to LCD, the physical exposure and image shifting, LSB 3 Lamp house control and diagnostics.
2. Control of paper drive
3. Control of Lucht/Bremon Dual Back Writing Print Heads
4. Control of Lucht Stepping Paper Mask (includes Motors & Senses)
5. Control of Lucht PPM (Includes Solenoids & Senses)
6. Control of Lucht SSPM (includes Solenoid & Senses)
7. Control of Lenses and related Lens Senses
8. Control of Rotary Table and related Senses
9. Control of Pan Shutter & related Senses
10. Control of IRIS Shutter & related Senses
11. Control of Paper-Out Sense
12. Control of Platen Sense
13. Control of Door-Open Sense
14. Rendering of all standard image formats (see Appendix)
15. Support for input from Adobe Photoshop 7.0, Digiprint, Kodak DP-2, Express Digital, TimeStone, Axiohm, OZE, and other front-end applications using networked hot-folders similar to Fuji Frontier and Kodak LED printers
16. Support for stand-alone manual and network printing

The Controller PC is a standard “off-the-shelf” computer meeting the following requirements:

Brand	Dell Precision or Optiplex ( <a href="http://www.dell.com">http://www.dell.com</a> or <a href="http://www.ibm.com">http://www.ibm.com</a> ) (Latest model or IBM brand equivalent to latest Dell model).
Processor	Intel Pentium 4 running at 2.5ghz (minimum)
Memory	512mb (minimum)
Storage	120gb IDE hard drive (minimum) 48x CD-Writer DVD Reader
Display	1024x768 resolution at 24-bit color depth (minimum)
LAN	100baseT or optionally 10/1000baseT Ethernet
O/S	Microsoft Windows 2000 Professional or XP Professional
Cost	\$2500 US as of January 1, 2003.

## **System Evaluation**

The exposure and advance timing from traditional VP2 Equipment vs. DVP2 Equipment have improved with the updated technology.

### **Original VP-2 Package Printer Specifications**

#### **One Negative / One Exposure**

Exposure time	1 second
Paper Advance	1 second
Negative Positioning	6 seconds
<b>Total</b>	<b>8 seconds per negative</b>

7.5 negatives per minute

450 negatives/prints per hour

#### **One Negative / Two Exposures**

Exposure time	1 second
Paper Advance	1 second
Negative Positioning	6 seconds
Change Lenses	1 second
<b>Total</b>	<b>9 seconds per negative</b>

6.6 negatives per minute

396 negatives per hour - 2 exposures per negative  
= 792 prints/units per hour

### **DVP-2 Package Printer Specifications**

#### **One Image / One Exposure**

Exposure time	2.7 second
Paper Advance	1.3 second
<b>Total</b>	<b>4 seconds per image</b>

? images per minute

? prints per hour

#### **One Image / Two Exposures**

Exposure time	2.7 second
Paper Advance	1.3 second
<b>Total</b>	<b>4 seconds per image</b>

15 images per minute

= 900 Prints/hour

These figures are for normal production using manual roll film carrier. They do not include paper or film loading. The VP-2 uses paper rolls up to 575 ft long. Paper and film changes take only a

**FEW MINUTES.**

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## ***Troubleshooting The DVP-2***

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## **Standard Software Error Handling & Reporting System**

### Error Handling

The printer error handler is designed to provide a consistent reporting of all critical errors encountered while in production. The error handler provides three functions for retaining and communicating errors as they occur:

1. Copy. This simply copies the error message to the Microsoft Windows Clipboard. Once the message is in the clipboard it can be pasted into documents or electronic mail for reporting.
2. E-Mail. If an electronic mail (e-mail) account is configured on the printer this function may be used to automatically e-mail the error text.
3. Save. This simply saves the file to disk in ASCII Text format.

A sample of the error window is shown below:

