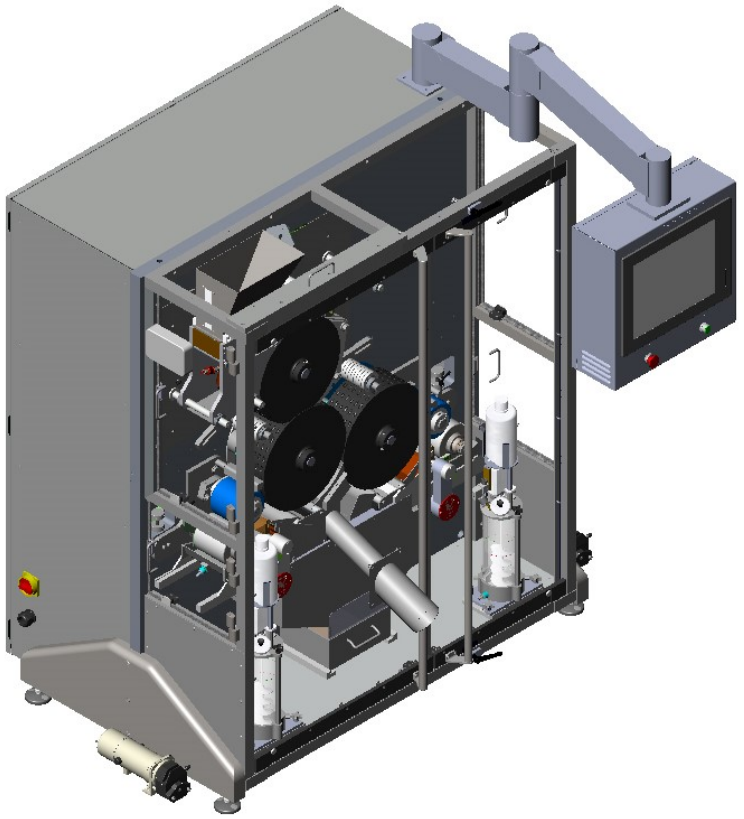
ACKLEY *machine corporation*



Three Drum Printer with Inspection System

OPERATION & MAINTENANCE MANUAL

"Our Print Gets Recognized"

Three Drum Printer

OPERATION & MAINTENANCE MANUAL

SERIAL NUMBER: 1361

MODEL NUMBER: 01291-00025

CUSTOMER: Novartis, Switzerland

Date: February 16, 2012

Prior to operation or maintenance, carefully read the manual supplied by ACKLEY *machine corporation* in order to fully understand how the system operates. Failure to do so may result in injury to the operator and / or maintenance personnel.

Revision History

Date	Revision	Author	Description
January 2012	**0**	**Don Stein**	
February 2012	**1**	**Don Stein**	**Updated recommended spares Deleted camera training. Added Batch Files Screen (page 47) & Checker screen.**

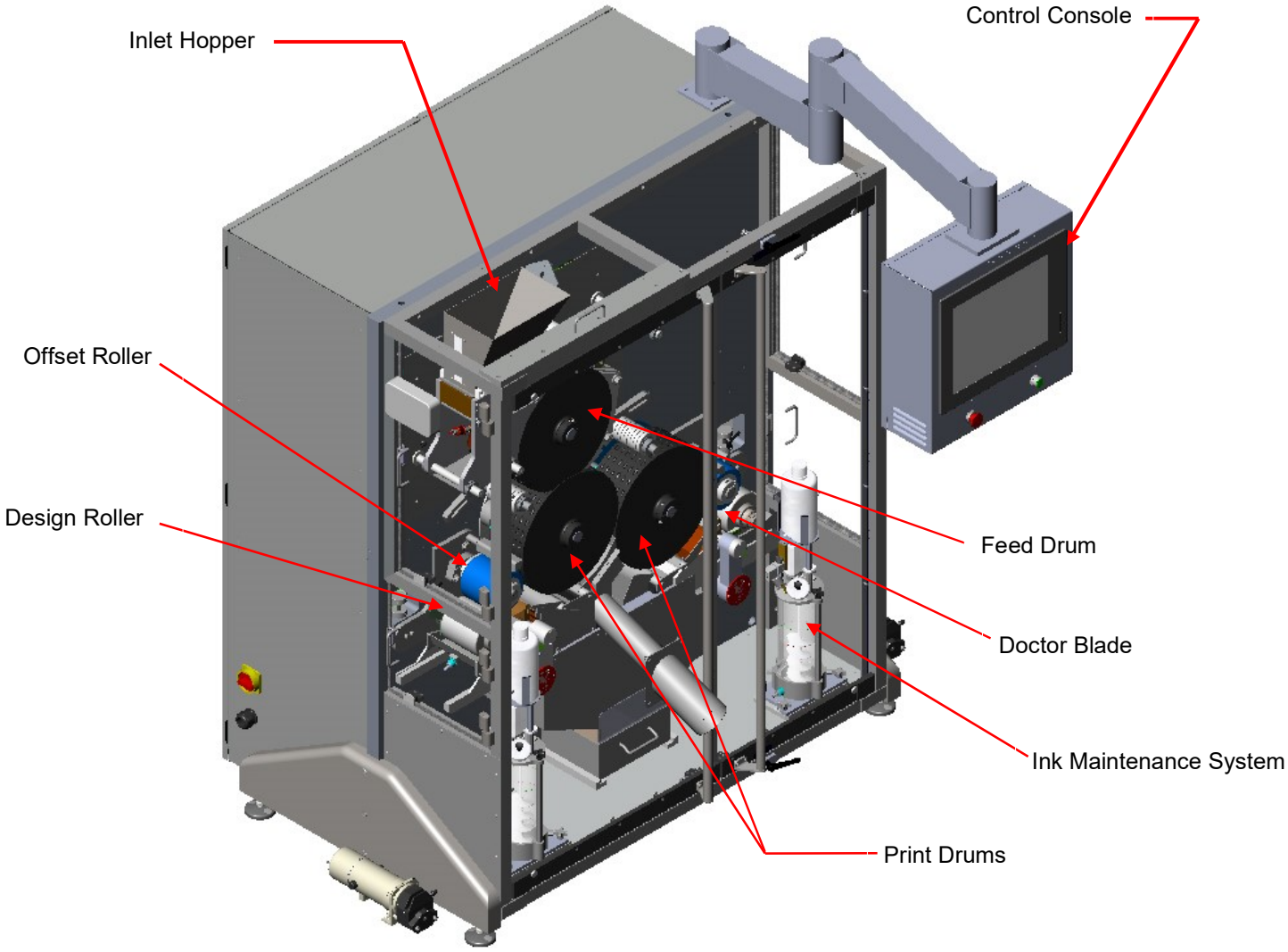
DISCLAIMER

The contents of this manual are subject to change without notice due to improvements made to the 3 Drum Printer or its related documentation. As such, the manual may contain minor visual discrepancies between the manual and the actual machine. Any changes to the manual are documented in the revision history.

Should any operational discrepancies in the manual be found, or if any part of the manual is unclear, please contact an ACKLEY *machine corporation* representative to clarify these issues prior to operation of the Variable Ramp Printer. ACKLEY *machine corporation* will not be liable for any damages occurred as a direct, or indirect consequence of operating the 3 Drum Printer without clarification of known issues.

Table of Contents

1. General Description



1. General Description (continued)

Machine General Description

The Ackley Three Drum Two Side Printing & Inspection Machine is a production offset printer custom built to your specifications and/or our recommendations. It is primarily designed for use by Pharmaceutical Industry. The Three Drum Two Side Printing & Inspection Machine is an easily learned machine, capable of producing high-quality printed product, at production rates, with a minimum amount of effort and maintenance. The printer is easily placed in any location which provides readily available 400 VAC, 50 Hz, 3 phase, 30 ampere power source, 100 psi dry compressed air and a stable level foundation. This powers the printer and the vacuum pumps.

The product to be printed is transferred form the inlet hopper to the feed drum. The feed and print drums have machined pockets, custom designed for the product to be printed. The rotating brush in the inlet hopper assists in filling the feed drum pockets with product. The product which is supported by back guides on the feed drum is transferred to print drum 1. Vacuum is used to hold the product in the pockets of the print drum 1 as it is transported through print unit 1. The design roller with the engraved logo designs, rotate through ink in the pans, and transfer the logo designs to the offset rollers. Doctor blades press against the design rollers to remove the excess ink. The offset rollers, in turn, print the logo designs on the product surfaces as the product moves through the print area and then past a camera based inspection station. After print inspection the product is transferred to print drum 2 (with the printed side down) which moves the printed product through the second print unit and inspection station where the accepted product is discharged from the machine and the rejected product goes into the reject bin. The Ackley Three Drum Two Side Printing & Inspection Machine has been thoroughly inspected, and operating test runs have been made with the customer's specified product, to assure proper product handling and quality printing and print inspection prior to shipment.

The system also contains two Ink Maintenance Systems. The Ackley Ink Maintenance Systems are self-contained units that monitor, recirculate and maintain your printing ink. The ink tray, tubing and reservoir for the ink are designed to hold two to three (2 -3) kilograms of printing ink per Ink Maintenance System.

A peristaltic unit pumps the ink to the ink pan through FDA compliant food grade tubing. The ink circulates through the ink pan and is mixed by the design roller. A weir maintains the ink level in the pan. The ink then gravity feeds back to the reservoir.

Relative viscosity is monitored by means of an auger that rotates counterclockwise in the printing ink. This auger measures shear and mixes the ink. Solvent is added as required by means of a solenoid controlled injection system.

The Ink Maintenance System is not designed to accurately display the viscosity of an ink. The system is designed to maintain the relative viscosity of the ink in the pans, which is currently providing satisfactory print quality.

1. General Description (continued)

Printing Environmental Conditions

- The relative humidity in the printing area should be controlled to within 45% to 60%.
- The temperature should be controlled to within 68° to 75°F (20° to 24°C).

Cleaning Printer Aluminum Parts

- Please observe these guidelines when cleaning the drums, and other aluminum parts on the Ackley Printer.
- The pH range that needs to be observed for the material used to clean aluminum parts is 5.5 to 9.5.
- The composition of the material should NOT contain sodium hydroxide.
- The temperature of the cleaning material should NOT exceed 140° degrees Fahrenheit.
- The immersion and/or exposure time should NOT exceed five (5) minutes.
- Ultrasonic cleaning is NOT recommended for conducting cleaning of hard coat anodized aluminum.

2. Safety Considerations

Prior to operation of any ACKLEY *machine corporation* system, operation and maintenance personnel should keep in mind the following safety related considerations:

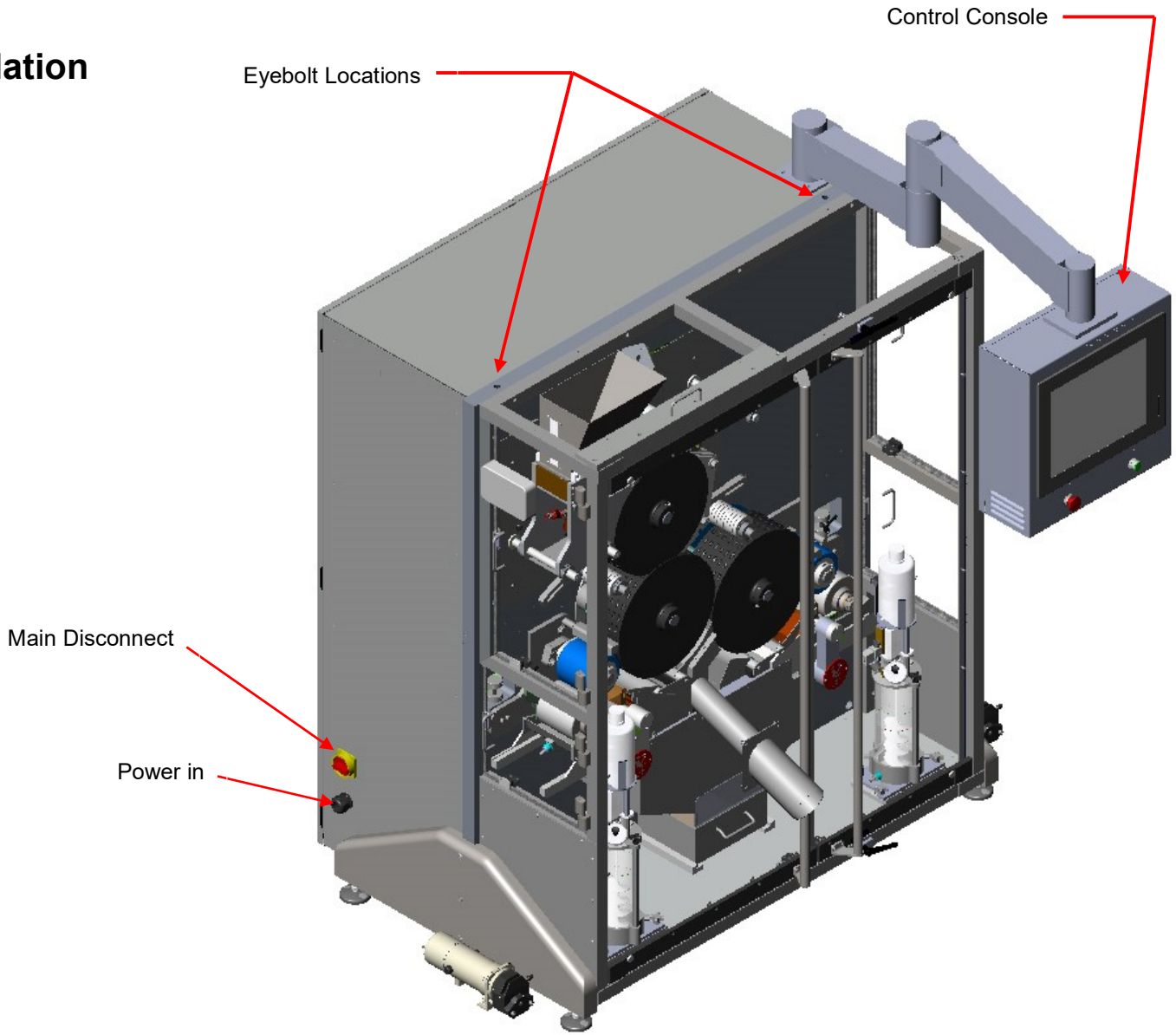
- Operation of moving equipment of any kind requires the use of common sense and forethought, before carrying out any functions or adjustments.
- All efforts have been made to properly mechanically guard, and/or electrically interlock, areas where potential bodily injury or equipment damage may occur.
- As with many types of machinery and devices, there are often areas that cannot be totally enclosed or guarded without defeating the purposes of function or design.
- Following is a list of areas where extra care should be exercised. These areas are to be carefully examined and fully understood as to their function, prior to any operation of this equipment. There should be no unauthorized use without proper training by an authorized Ackley representative or a qualified trainer from your facility.
- The area of the scraper blades (Doctor Blades). These blades are necessary to remove excess ink from the design rollers. Exercise extreme care when working in these areas, and ensure that blade guards are always in place when the blades are in the "UP" position. Place the plastic blade guard onto the blade when the printer is not operational.
- All areas of the feed and print drums, in which the drums are moving toward a restrictive area. I.E.: Under hopper brushes; into the printing areas; into the blow off and discharge areas.
- The pinch area between the design rollers and the offset rollers. There are rocker type safety bars supplied, that activate a Microswitch® that when disturbed, stops the printer. These will only be functional when properly installed!! These safety bars are detachable for the purpose of removing the design and offset rollers. It is imperative that these safety bars are replaced in their proper position before attempting to power up and operate the printer.
- Cleaning the design and offset rollers. The cloth used for cleaning the rollers should always be folded into a tight square, three (3) to four (4) inches in size, with no loose pieces, threads, dangling corners or "tails" that can be drawn between the rollers, or drag on the carrier bars. Always use a cloth that is wet with isopropyl alcohol, but not dripping. Stay "low" on the offset rollers to stay away from the safety bars.

DO NOT attempt to defeat or disable guards or Microswitches®. They are there for your protection! Respect them!!

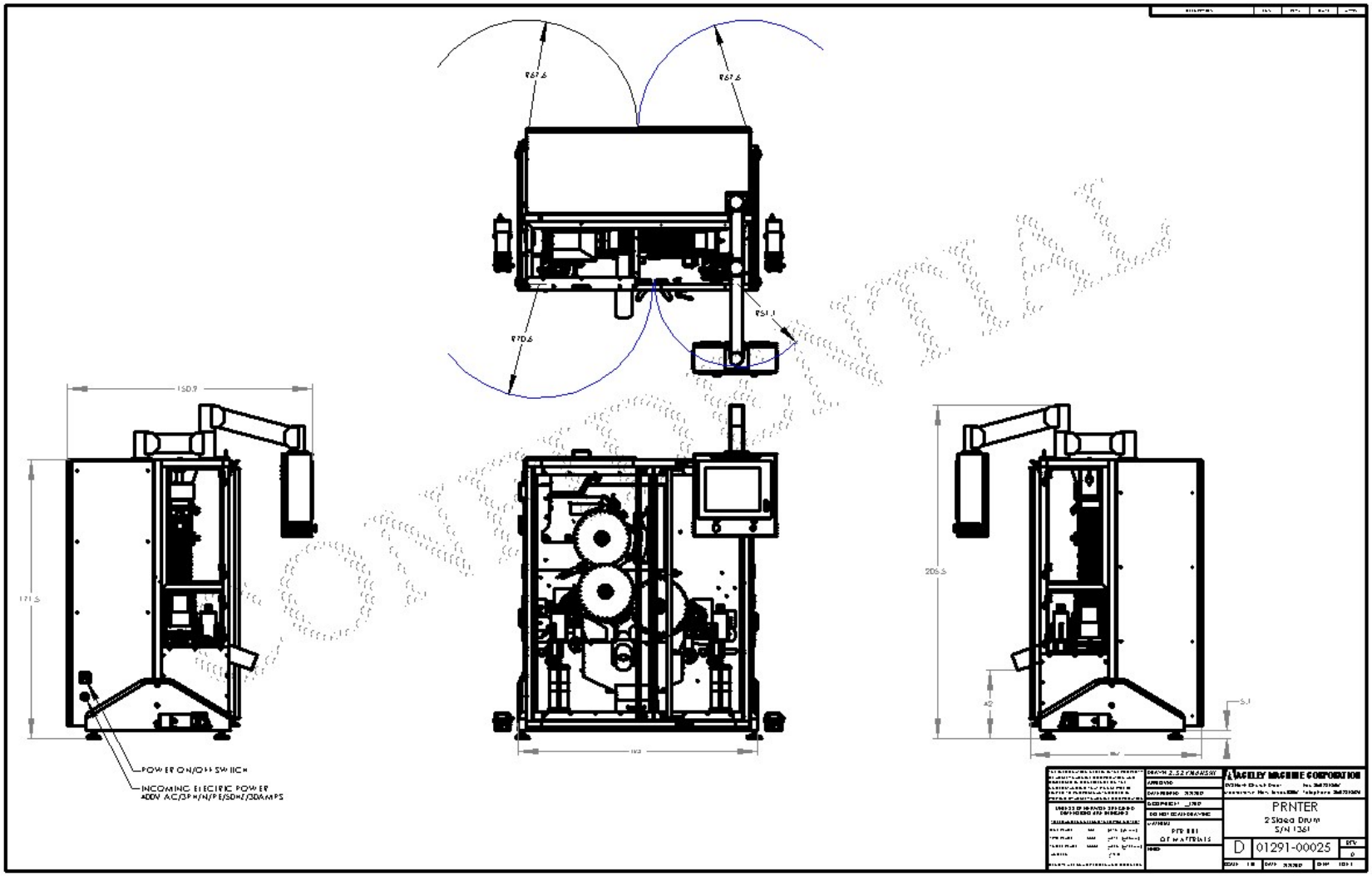
Compiled to conform to Machinery Directive 89/392/EEC, "Essential Health and Safety Requirements", Annex B, requirements 1.1.2 (c)

Failure to follow these safety considerations could result in serious injury to operation or maintenance personnel.

3. Installation



3. Installation (continued)



3. Installation (continued)

Mechanical

When the Ackley Machine is received at your plant, remove the top, sides, and end pieces of the shipping crate. Check to see that all items listed on the packing slip have been received.

With the machine still on the skid portion of the crate, move to the area where the machine is to be put into operation. Carefully remove all the other shipping straps, wood blocks, etc. Remove the bolts from the bottom of the skid, lift and set the machine in operating position, using the eye bolt provided, after installing the castor plate assemblies

The operating area should be a minimum clearance of four feet on all sides of the machine. This open area is needed to maintain the product level in the feed hopper; to manipulate collecting containers; to maintain level in ink pans; to remove covers to make adjustments; to lubricate moving parts; and, to clean and inspect machine as required.

The printer has been set up at our facility, to the correct settings for the change parts installed. When additional change parts are purchased, there will be information and instructions provided.

Electrical

The printer requires 400 VAC 50 Hz, 3 P/N/PE, 50 amps for control of the printer and the vacuum pumps. Main power should be wired into the main disconnect switch on the left side of the printer. The vacuum pump motors should be plugged into the outlets provided after they are located. This wiring is detailed in the electrical schematics. The vacuum hoses on the printer are terminated at the bottom left side of the printer. These should be connected with at least 2” ID hose with no sharp bends between the pumps and the printer.

The printer and vacuum pumps require 50 Amps continuously, but the circuit breakers are sized larger to handle in-rush current. Main power conductors should be sized for 60 Amps or more.

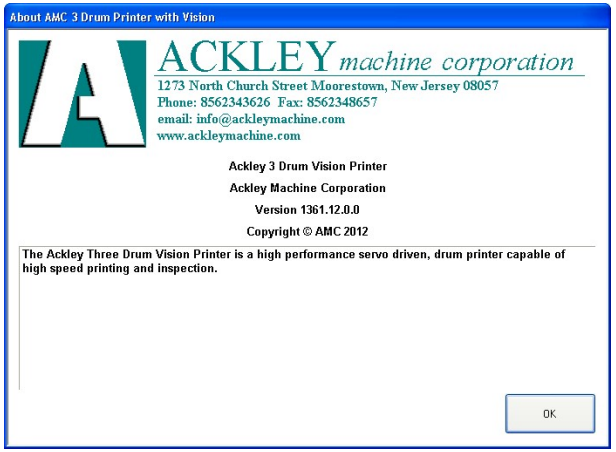
MAKE SURE THE MACHINE IS PROPERLY GROUNDED!

Air Supply

Connect air line 100 psig (6 bar) @ 70 cfm (1.9 m^3/min., continuous (filtered) dry air. Air connection is supplied with a 3/4" NPT fitting located on the left side of the printer.

4. Control Panel

This section will describe the basic functions of the ACKLEY *machine corporation* Three Drum Printer with Inspection control panel. When the **A** button on the left side is pressed the screen below displays the program version number of the system software, and a phone number to contact an ACKLEY *machine corporation* representative for service issues:



Screen Navigation Buttons

The main screen navigation buttons are located along the top of each screen. Pressing any one of these buttons will display the associated screen. There are a total of eight (8) main screens. Each screen contains various buttons and status windows used to indicate the current state of the system or the current system settings

Operation

The operation screen contains the control buttons that allow the operator to perform all the basic functions needed to run the ACKLEY *machine corporation* Three Drum Printer. Operating Buttons and real-time information about the status of the printer is also displayed on this screen.

4. Control Panel (continued)

Setup

This screen allows the user to adjust the system speed, select a product recipe or modify setup parameters for defined products to be used with the ACKLEY *machine corporation* Three Drum Printer with Inspection.

Manual Operation

The manual operation screen is divided into 2 Sections: Motors, Ejection Ports and Pneumatics

Maintenance

These screens allow the user to modify the system settings, change display settings and access system logs for the ACKLEY *machine corporation* Three Drum Printer with Inspection. The maintenance screen is divided into six (6) screen tabs: Main, Log Files, Recipe, Product, Inputs and Outputs.

Ink Maintenance

This screen allows the user to setup and control the Ink Maintenance Systems for Print Unit 1 and 2.

Fault Status

This screen will display any current faults the ACKLEY *machine corporation* Three Drum Printer with Inspection may be experiencing.

Vision

This screen will display the current images and status of the inspection cameras on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

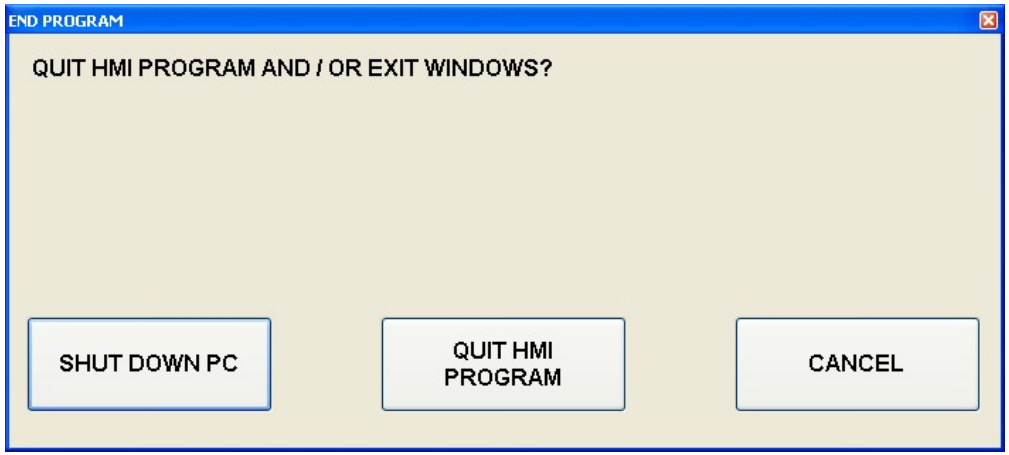
Browser

This screen allows the user to access Operation and Maintenance Manual, Drawings and PLC.

4. Control Panel (continued)

Computer Shut Down

This button is for shutting down the computer before Incoming Power is disconnected from the machine. When this button I pressed the screen below appears:



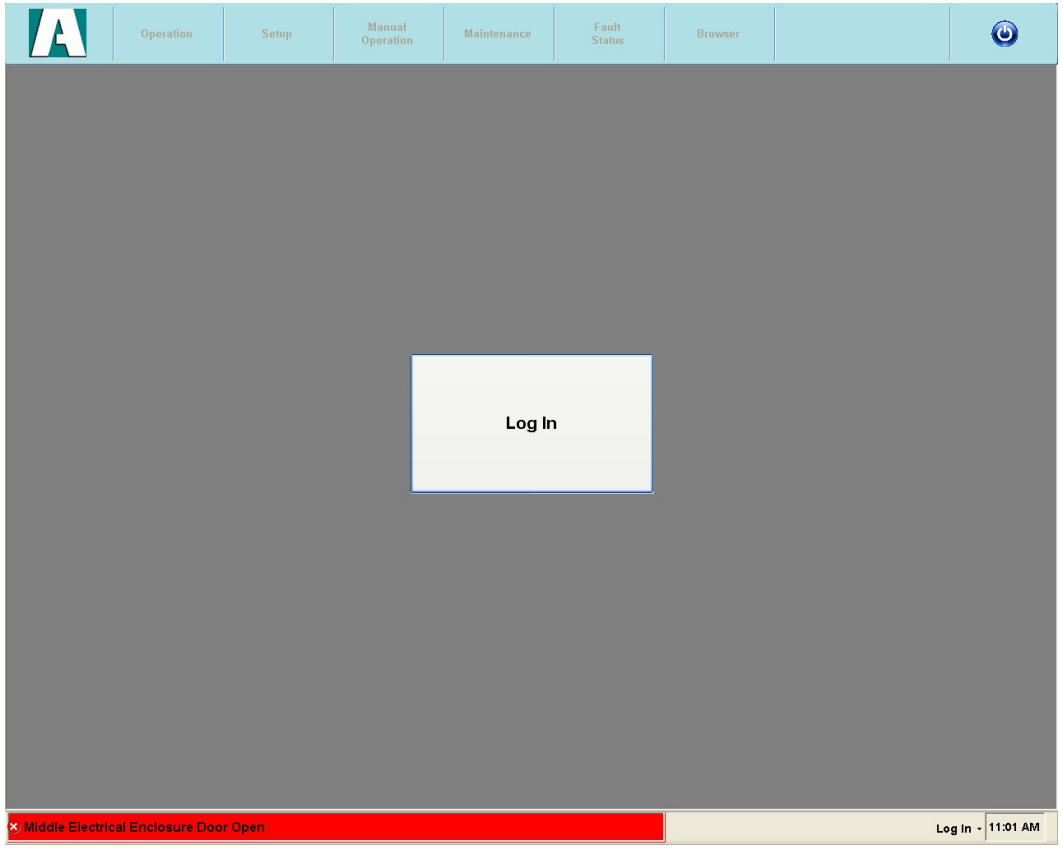
System Status Bar

The status bar is located at the bottom of the screen, and it provides informational messages about the current status of the system as well as the current user's login name. General informational messages are displayed in green and system fault messages are displayed in red.

4. Control Panel (continued)

Log In Screen

The Log In screen will appear when the system is powered on. This screen allows the operator to log in to the system and will allow access to perform all the basic functions needed to run the ACKLEY *machine corporation* Three Drum Printer with Inspection.

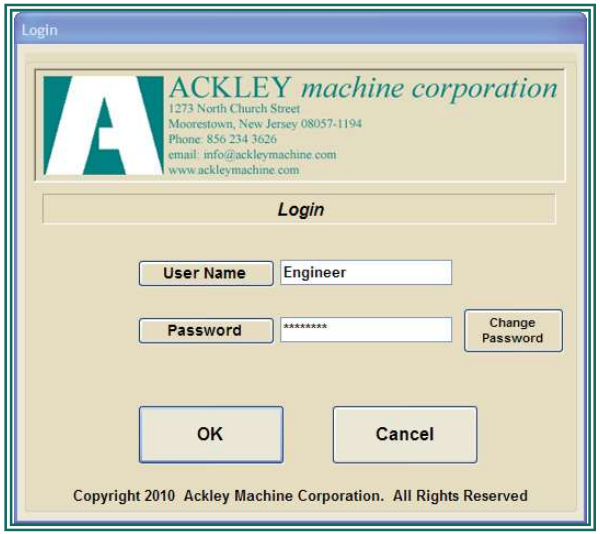


A brief description of each button on the Log In prompt screen is listed below:

4. Control Panel (continued)

Log In Prompt Screen

The Log In Prompt screen will allow the operator to input their user name and password as well as change their password for access to the ACKLEY *machine corporation* Three Drum Printer with Inspection. A brief description of each button is listed below.

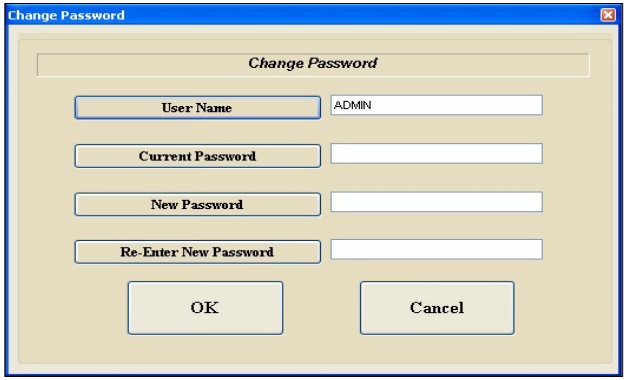


USER NAME
This button (and text box) will open the alpha-numeric keypad to allow input of the operator's user name.

PASSWORD
This button (and text box) will open the alpha-numeric keypad to allow input of the operator's password.

OK
This button will accept the current user name and password and attempt to access the system.

CANCEL
This button will return the operator to the Login screen.



CHANGE PASSWORD
This button will open the alpha-numeric keypad to allow the operator to change the password for the current user.

OK
This button will accept the new password entered.

CANCEL
This button will return the operator to the above Login screen.

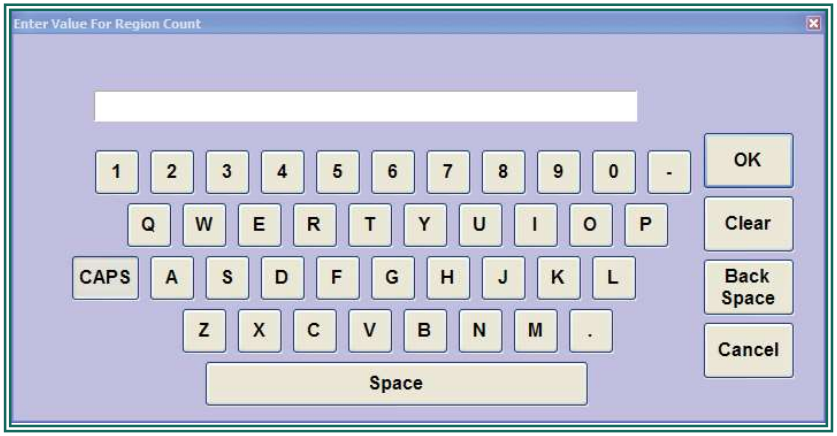
4. Control Panel (continued)

Keypad (alphanumeric)

The Keypad screen can be accessed by pressing either the **User Name** or **Password** button located on the Login screen. This screen allows the operator to input alphabetic and numeric values for various settings in the ACKLEY *machine corporation* Three Drum Printer with Inspection. A brief description of the buttons is listed below.

VALUE DISPLAY
This area will display the current input from the alphabetic and numeric keys.

KEYS
These buttons will allow the operator to input alphabetic and numeric values.



OK
This button will accept the currently shown value.

CLEAR
This button will clear the currently shown value.

BACKSPACE
This button will clear the previously entered character.

CANCEL
This button will cancel any current value input and return the operator to the previous screen.

4. Control Panel (continued)

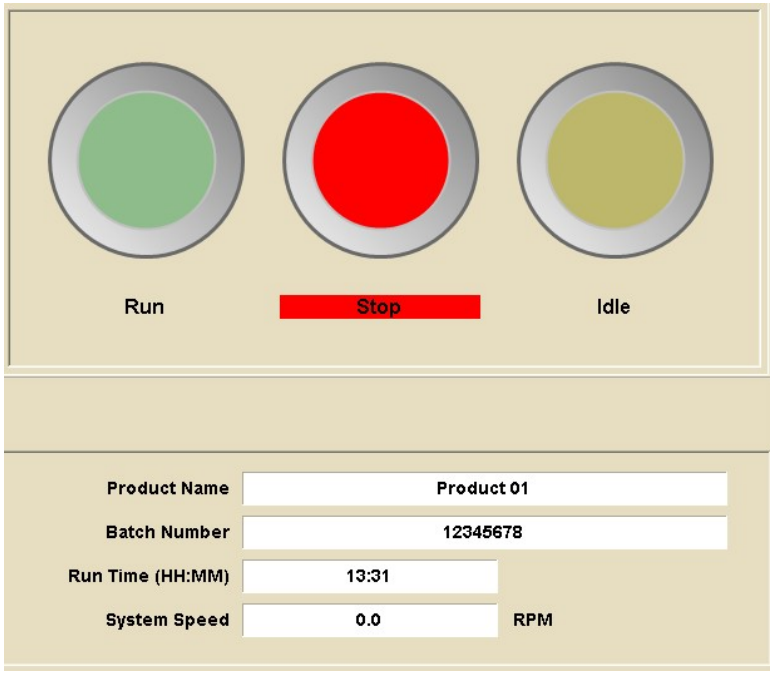
Operation Screen

The Operation screen can be accessed by pressing the Operation button located at the top of the screen. This screen allows the operator to perform all the basic functions needed to run the ACKLEY *machine corporation* Three Drum Printer with Inspection.

A brief description of the Operation screen buttons is listed below:

NAVIGATION
This area contains the buttons used

4. Control Panel (continued)



RUN
This button will begin operation of the system. If the system requires homing, it will perform a homing routine prior to operation.

IDLE
This button will clear all product from the drums, then stop the drums movement while the print unit continues to run.

STOP
This button will stop the drums & the print unit without clearing the product.

PRODUCT NAME
This window displays the current product name.

BATCH
This window displays the current batch information.

RUN TIME
This window displays the total system run time in HH:MM format.

SYSTEM SPEED
This window displays the current system speed. The default units are in bars/minute.

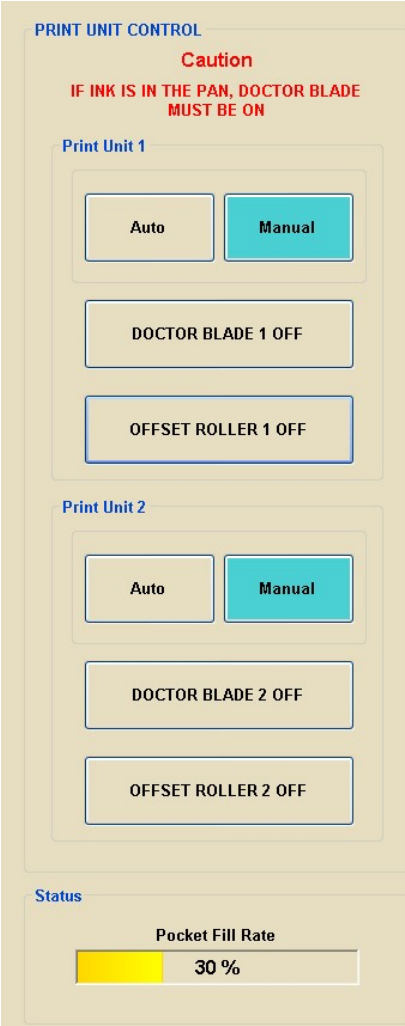
PRODUCT FEED ON/OFF
Press this button, turns blue, Product Feed ON.

HOPPER VIBRATOR ON/OFF
Press this button, turns blue, Vacuum Pumps ON.

VACUUM PUMPS ON/OFF
Press this button, turns blue, Vacuum Pumps ON.

4. Control Panel (continued)

These buttons will toggle the system to run in auto or manual mode. Toggle the doctor blade on and off and the Offset Roller ON or OFF impression with the Design Roller. The current state of the system (Auto/Manual mode) will be highlighted on the screen as shown below (Manual mode).



Auto

Auto mode is a safety feature designed to minimize the risk of an ink spill while operating the ACKLEY *machine corporation* Three Drum Printer. When Auto mode is selected, the system will not run unless the doctor blade is in the DOWN (on impression) position. For safety reasons, the system will never automatically change the position of the doctor blade. If the system is in Auto mode, the operator must press the DOCTOR BLADE OFF button to lower the blade before the system will run.

Manual

When Manual mode is selected, the system will run regardless of the doctor blade position. When there is ink in the ink pan Doctor Blade must be ON.

DOCTOR BLADE IMPRESSION ON/OFF (DB1 & DB2)

This button controls the position of the doctor blade for the print unit. The button text displays the current position of the doctor blade. If this button is pressed, then the doctor blade position will toggle. If the doctor blade is currently in the down (OFF) position (tan), then the doctor blade will go to the down (ON) position (blue). The doctor blade should never be lifted while the printer is in operation. When in Auto mode if the Doctor Blade button is pressed while the system is in Run mode or Idle mode, then the printer will enter Stop mode before lifting or lowering the doctor blade. This is to minimize the potential for ink spills.

OFFSET ROLLER IMPRESSION ON/OFF (OR1 & OR2)

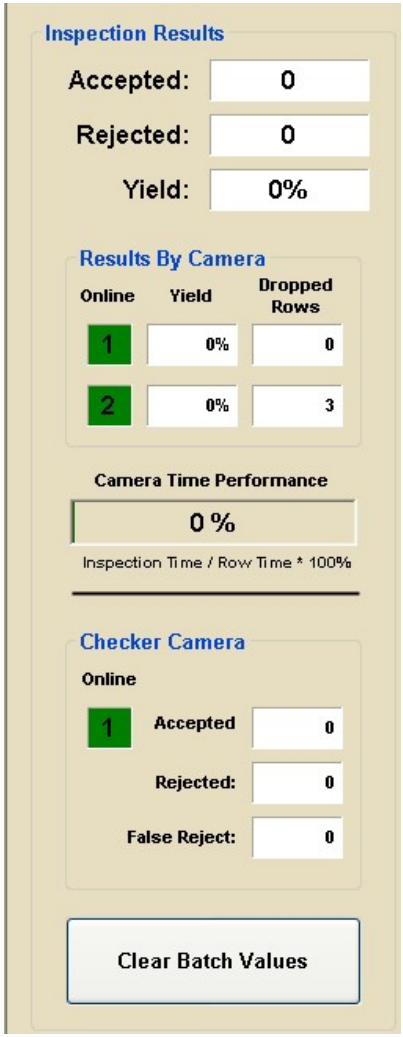
This button controls the position of the offset roller for the print unit. The button text displays the current position of the offset roller. This button is only active when the system is in the Manual mode. If this button is pressed when in Auto mode, it will not do anything.

If this button is pressed in Manual mode, then the offset roller position will toggle ON or OFF.

Status

This window displays the Pocket Fill Rate in percent.

4. Control Panel (continued)



Inspection Results
Since the last time the counters were reset

Accepted
This window displays the current inspection system result for the total quantity of accepted product.
Rejected
This window displays the current inspection system result for the total quantity of rejected product. Empty pockets in the carrier bars are not counted.
Yield
This window displays the current inspection yield percentage (accepted product / total product X 100).

Results By Camera
These windows show the camera **Yield** and **Dropped Rows** for each of the cameras.

CAMERA TIME PERFORMANCE
During operation this window displays the performance efficiency of the inspection system relative to the drum pocket row time. The calculation uses the running average of the measured processing time required to inspect a camera image over the drum row time for the camera. This number is divided by the time available between pocket row time at the set drum speed and multiplied by 100 to display an efficiency percentage.
The color of this window has three stated:

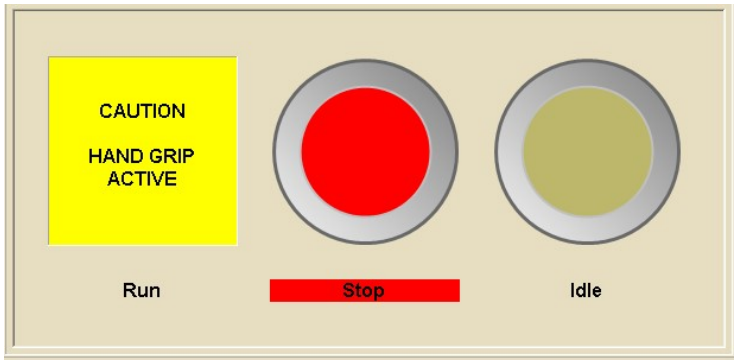
Green	Indicates an acceptable system run speed.
Yellow	Marginal system run speed and is not recommended, may “drop rows”.
Red	At this system run speed the cameras are unable to process the image data in the time available and tablets will be rejected. This is referred to as a “dropped row”.

Checker Camera
The Accepted and Rejected quantities will match the Inspection results above. If they don’t match the difference will be False rejects (accepted tablet that were rejected).

Clear Batch Values
This button clears all the counters and is only accessible at the Administrator level.

4. Control Panel (continued)

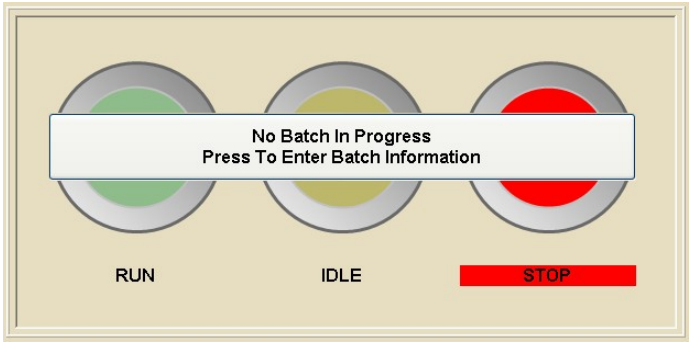
Hand Grip Control



Hand Grip Operation

When a front door is opened to clean the Offset Roller the printer should be in either Stop or Idle Mode. Hand Grip Active will be displayed in yellow. Press the Idle button and the Hand Grip button half way to run in Idle mode to clean the Offset Roller.

In Run Mode the Hand Grip is Inactive and the printer will stop if a door is opened.



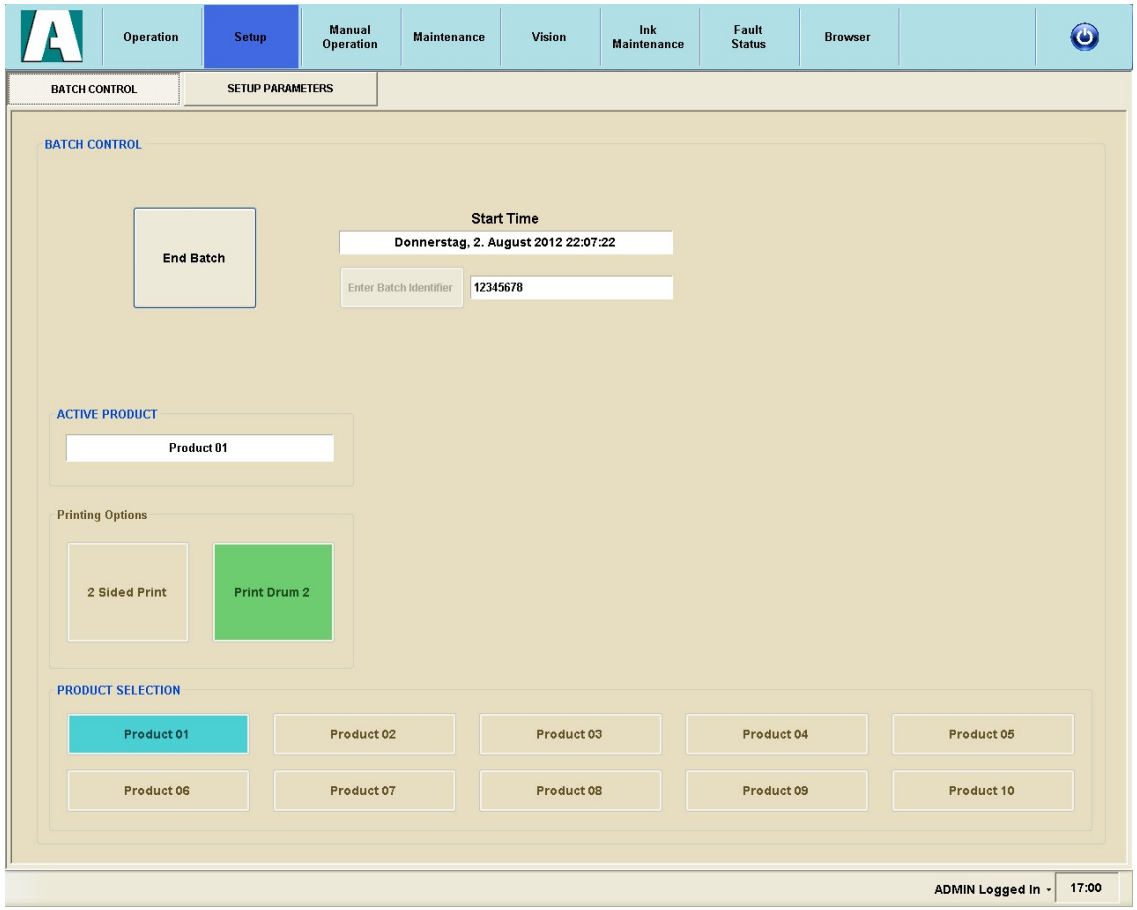
No Batch in Progress

Press this button to enter batch information. The Setup Screen for Batch Control will be displayed.

4. Control Panel (continued)

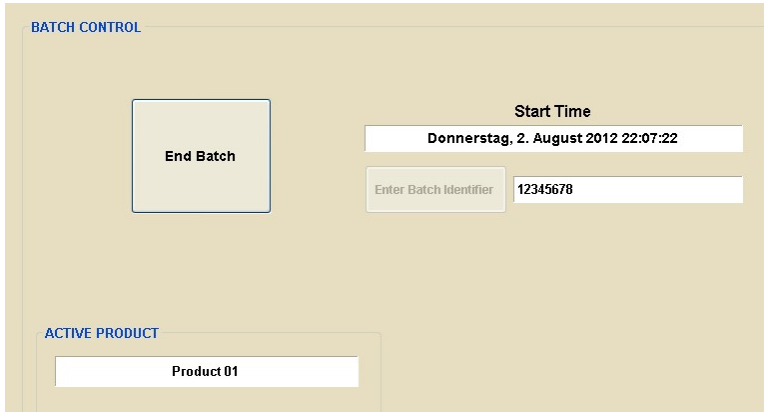
Setup Screen (Batch Control)

The Setup Batch Control screen can be accessed by pressing the Setup button located at the top of the screen and the Batch Control tab. This screen allows the operator to setup Batch Control variables for the various products to be used with the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of each button on the Setup screen Batch Control tab is listed below:

4. Control Panel (continued)



BATCH CONTROL

NOTE: The desired product must be selected before starting the batch. Go to Product Selection on the next page.

This displays the current batch start time & batch identifier. If there is no current batch, the RUN, IDLE & STOP buttons, on the Operations screen, will be disabled, as shown. The Batch Control Functions are described below.

Printing Options

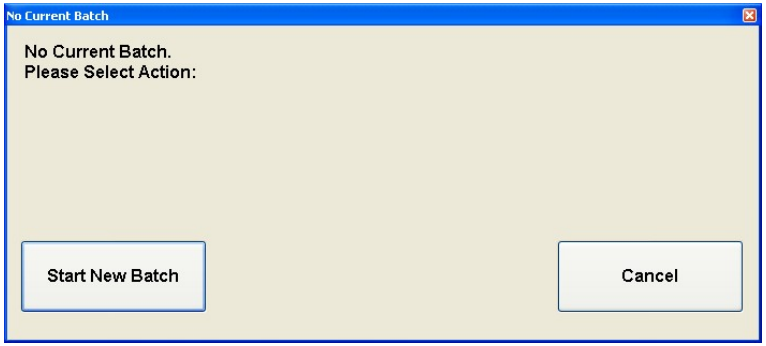
When 2 Side Print is selected Print Drum 1 and Print Drum 2 are both active.

Press 2 Sided Print to select 1 Side Print. Now either Print Drum 1 or Print Drum 2 can be selected as active for printing the tablet.

Product Selection

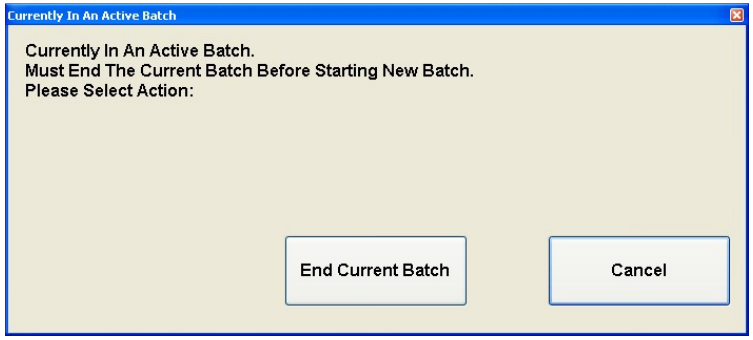
Press a product button to select that product button will turn blue.

4. Control Panel (continued)



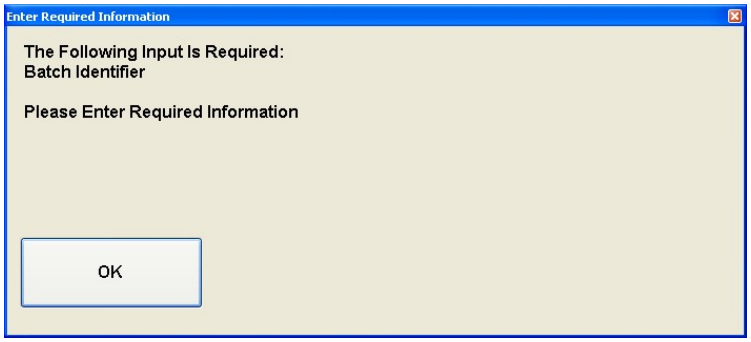
START NEW BATCH
This button will allow the user to end the current batch & start a new batch with the same product. This will prompt the user to enter the new batch identifier & prompt the user to act upon the integrity check.

CANCEL
This button allows the user to cancel the operation & close the dialog box.



End Current BATCH
This button will allow the user to end the current batch. This will prompt the user to enter the new batch identifier & prompt the user to act upon the integrity check.

CANCEL
This button allows the user to cancel the operation & close the dialog box.



Batch Identifier
If the operator tries to start a new batch without the Batch Identifier entered this prompt appears.

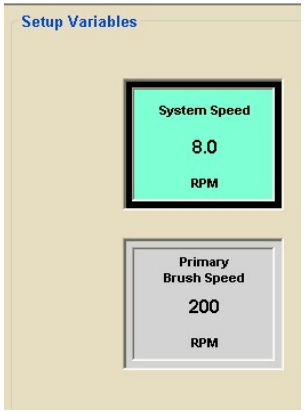
4. Control Panel (continued)

Setup Screen (Setup Parameters)

The Setup Parameters screen can be accessed by pressing the Setup button located at the top of the screen and the Setup Parameters tab. This screen allows the operator to modify the setup variables for defined products to be used with the ACKLEY *machine corporation* Three Drum Printer with Inspection.

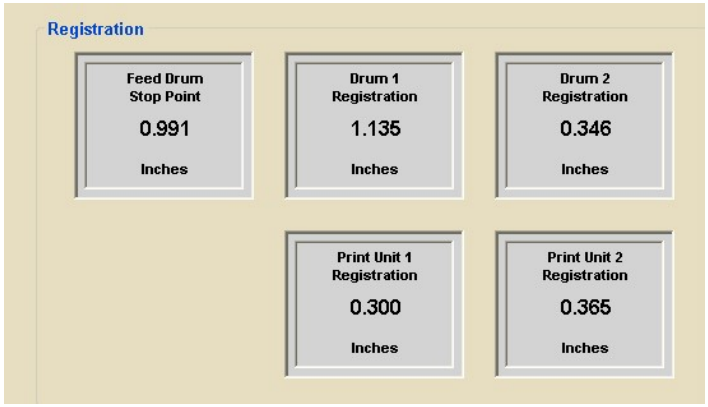
A brief description of each button on the Setup screen Setup Parameters tab is listed below:

4. Control Panel (continued)



System Speed
Selecting this button will allow the user to modify the value for the System Speed using the keypad / adjustment buttons on the right side of the screen. The units are displayed in bars per minute.

Brush Control
Selecting this button will allow the user to modify the value for the Brush Speed using the keypad / adjustment buttons on the right side of the screen. The units are displayed in RPM.



Feed Drum Stop Point
This button allows the user to adjust the Feed Drum stop point so the Feed Drum can be stopped and started without product breakage.

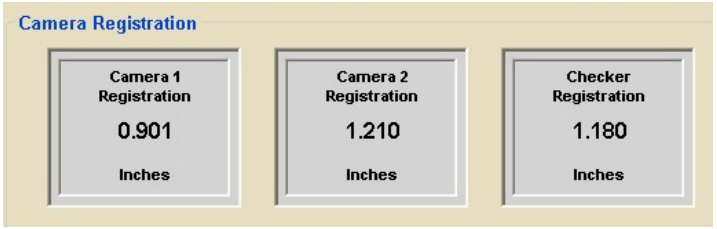
Drum 1 Registration
This button allows the user to adjust the position of Print Drum 1 pocket rows with the Feed Drum to register the product transfer from the Deed Drum.

Drum 2 Registration
This button allows the user to adjust the position of Print Drum 2 pocket rows with the Print Drum 1 to register the product transfer from the Print Drum 1.

Print Unit 1 Registration
This button allows the user to adjust Print Unit 1 registration of the printed logo on the tablet while the printer is running.

Print Unit 2 Registration
This button allows the user to adjust Print Unit 2 registration of the printed logo on the tablet while the printer is running.

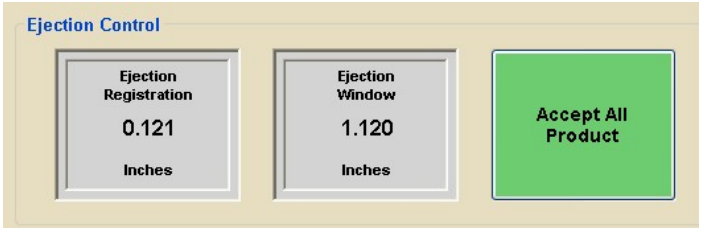
4. Control Panel (continued)



Camera1 Registration
This button allows the user to adjust Camera 1 registration .

Camera 2 Registration
This button allows the user to adjust Camera 2 registration .

Checker Registration
This button allows the user to adjust Checker registration .



Ejection Registration
This button allows the user to adjust Ejection Registration.

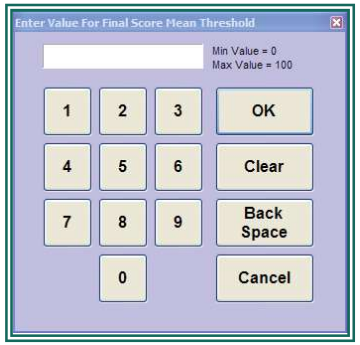
Ejection Window
This button allows the user to adjust the size of the Eject Window.

Accept All Product
This button allows the user to have Normal Product Processing, Accept All or Reject All Product.

Product Feed ON/OFF
Press this button to turn the Feed ON or OFF

SELECTION DISPLAY
This area displays the current selected system Name, Set Value, Units and Allowable Range.

VALUE ADJUSTMENT
These buttons will adjust the currently selected system setting by the value shown.

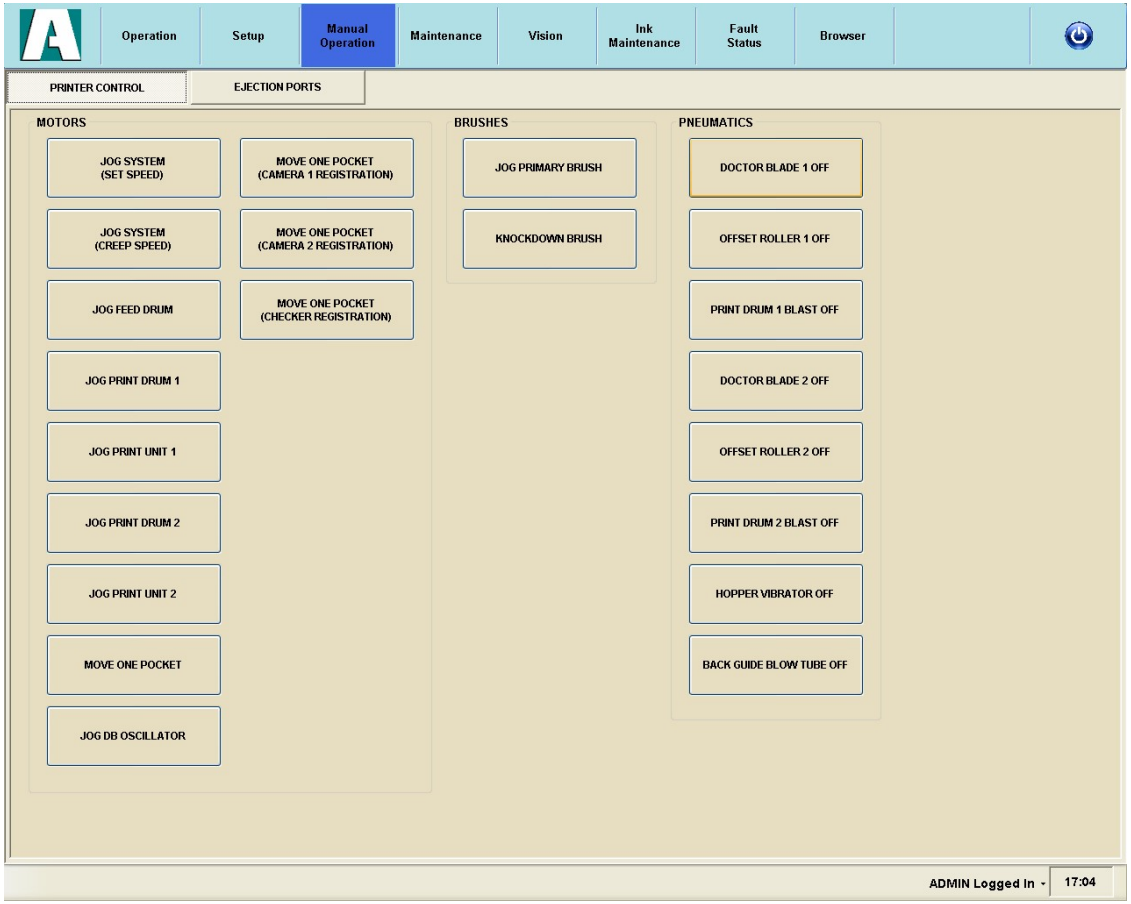


KEY PAD
This button will display a keypad that allows the operator to input specific numerical values for the currently selected setting.

4. Control Panel (continued)

Manual Operation Screen

The Manual Operation Printer Control screen can be accessed by pressing the Manual Operation button located at the top of the screen and the Printer Control tab. This screen allows the operator to move individual subsystems of the ACKLEY *machine corporation* Three Drum Printer with Inspection independent of the other subsystems.



A brief description of each button on the Manual Operation screen Printer Controls tab is listed below:

4. Control Panel (continued)

JOG SYSTEM (Set Speed)
Press and hold this button to manually jog the Printing System. The jog speed will match the System Speed value on the setup screen. The Printing System will move continuously until the button is released.

JOG MAIN BELT (Creep Speed)
Press and hold this button to manually jog the Printing System. The system will move continuously at a slow (creep) speed until the button is released.

JOG FEED DRUM
Press and hold this button to manually jog the Feed Drum.

JOG PRINT DRUM 1
Press and hold this button to manually jog the Print Drum 1.

JOG PRINT UNIT 1
Press and hold this button to manually jog the Print Unit 1.

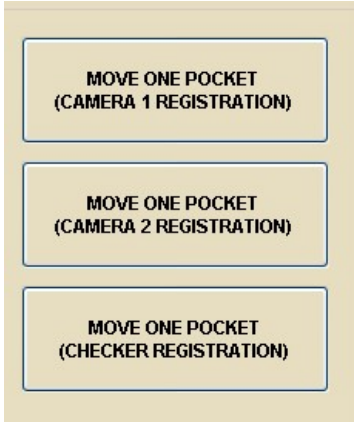
JOG PRINT DRUM 2
Press and hold this button to manually jog the Print Drum 2.

JOG PRINT UNIT 2
Press and hold this button to manually jog the Print Unit 2.

MOVE ONE POCKET
Press this button to move one row of pocket.

JOG DB OSCILLATOR
Press and hold this button to jog the Doctor Blade Oscillator. The Doctor Blade will oscillate until the button is released.

4. Control Panel (continued)



MOVE ONE POCKET
Press this button to move Print Drum 1 one pocket for Camera 1 Registration.

MOVE ONE POCKET

Press this button to move Print Drum 2 one pocket for Camera 2 Registration.

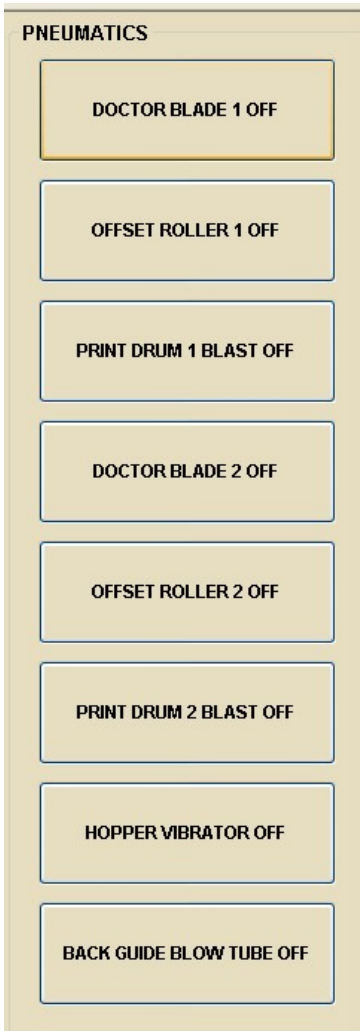
MOVE ONE POCKET

Press this button to move Print Drum 2 one pocket for Checker Registration.

JOG PRIMARY BRUSH
Press and hold this button to manually jog the Primary Brush. The Primary Brush will move continuously until the button is released.

KNOCKDOWN BRUSH
Press and hold this button to manually jog the Knockdown Brush. The Knockdown Brush will move continuously until the button is released.

4. Control Panel (continued)



DOCTOR BLADE 1 ON/OFF
Press and release this button to manually toggle Doctor Blade 1 ON or OFF.

OFFSET ROLLER 1 ON/OFF
Press and release this button to manually toggle Offset Roller 1 ON or OFF impression.

PRINT DRUM1 BLAST ON/OFF
Press and release this button to manually toggle the Print Drum 1 Blast ON or OFF.

DOCTOR BLADE 2 ON/OFF
Press and release this button to manually toggle Doctor Blade 2 ON or OFF.

OFFSET ROLLER 2 ON/OFF
Press and release this button to manually toggle Offset Roller 2 ON or OFF impression.

PRINT DRUM 2 BLAST ON / OFF
Press and release this button to manually toggle the Print Drum 2 Blast ON or OFF.

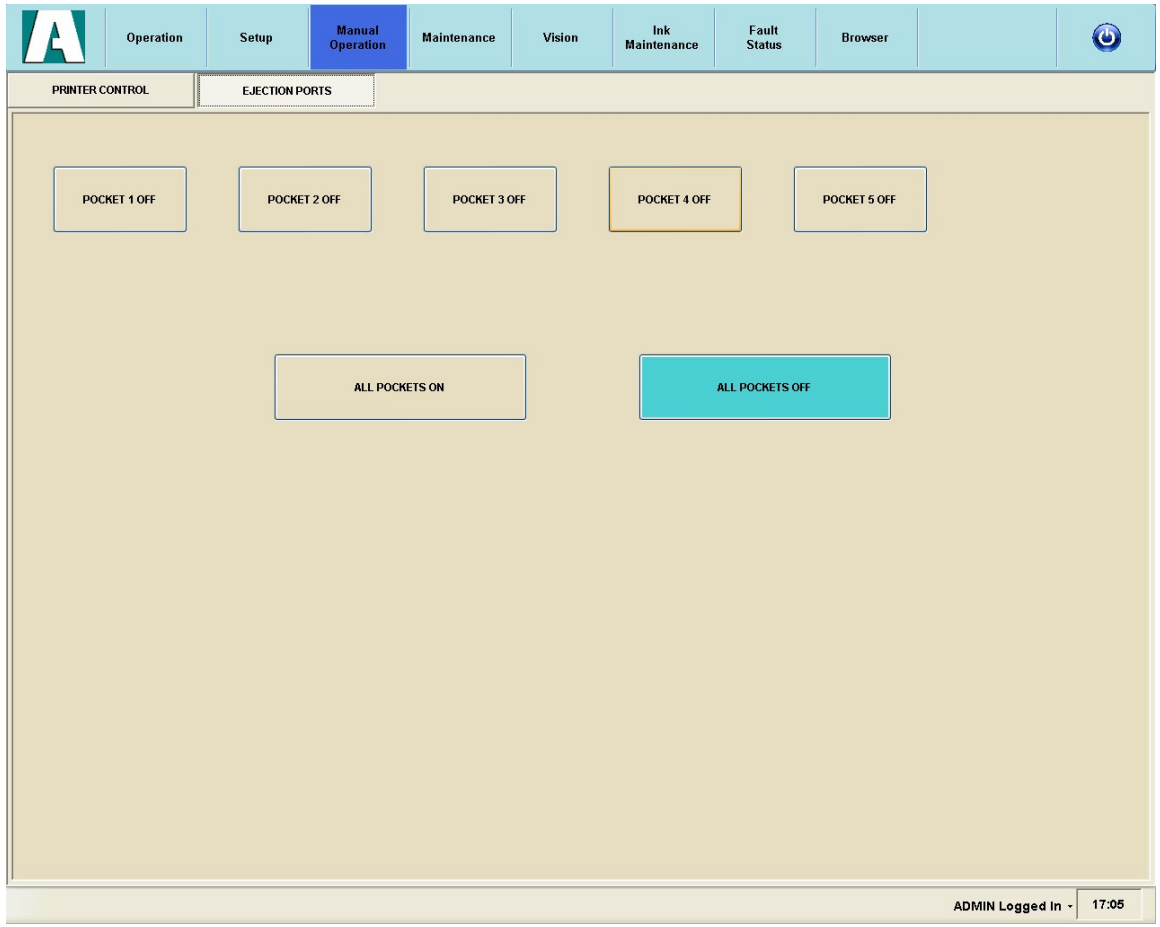
HOPPER VIBRATOR ON / OFF
Press and release this button to manually toggle the Hopper Vibrator ON or OFF.

BACK GUIDE BLOW TUBE ON / OFF
Press and release this button to manually toggle the Back Guide Blow Tube ON or OFF.

4. Control Panel (continued)

Manual Operation Screen - Ejection Ports

The Manual Operation Ejection Ports screen can be accessed by pressing the Manual Operation button located at the top of the screen, then the Ejection Ports tab. This screen allows the operator to manually control the ejection valves for Print Drum 2 pockets on the ACKLEY *machine corporation* Three Drum Printer with Inspection. A brief description of each button on the Manual Operation screen Ejection Ports tab is listed below.



POCKETS 1 - 5 ON / OFF
These buttons will allow the operator to toggle the individual vacuum ejection valve ports ON or OFF for each pocket (row) on Print Drum 2.

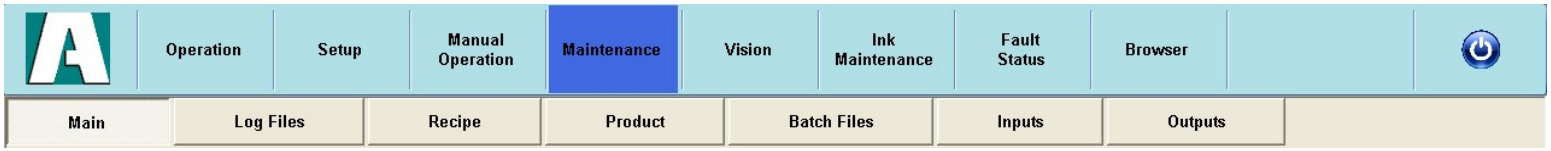
ALL POCKETS ON
This button will toggle all the vacuum ejection valves ON when pressed.

ALL POCKETS OFF
This button will toggle all the vacuum ejection valves OFF when pressed.

4. Control Panel (continued)

Maintenance

The Maintenance screen can be accessed by pressing the Maintenance button located at the top of the screen on the ACKLEY *machine corporation* Three Drum Printer with Inspection. The Maintenance screen is divided into six tabs: Main, Log Files, Recipe, Product, Inputs and Outputs.



Main: This tab allows the user to access the User Maintenance screen, the Level Security screen and the Strobe Controller Program. Database management utilities are also included on the Maintenance screen – Main tab.

Log Files: This tab allows the user to view the system Program and Alarm log files, and includes log file management utilities.

Recipe: This tab allows the user to copy product recipes and view the setup parameters for all product recipes.

Product: This tab allows the user to enable or disable individual product recipes or change the product recipe names.

Batch Files: *This tab allows the user to access and copy the batch files.*

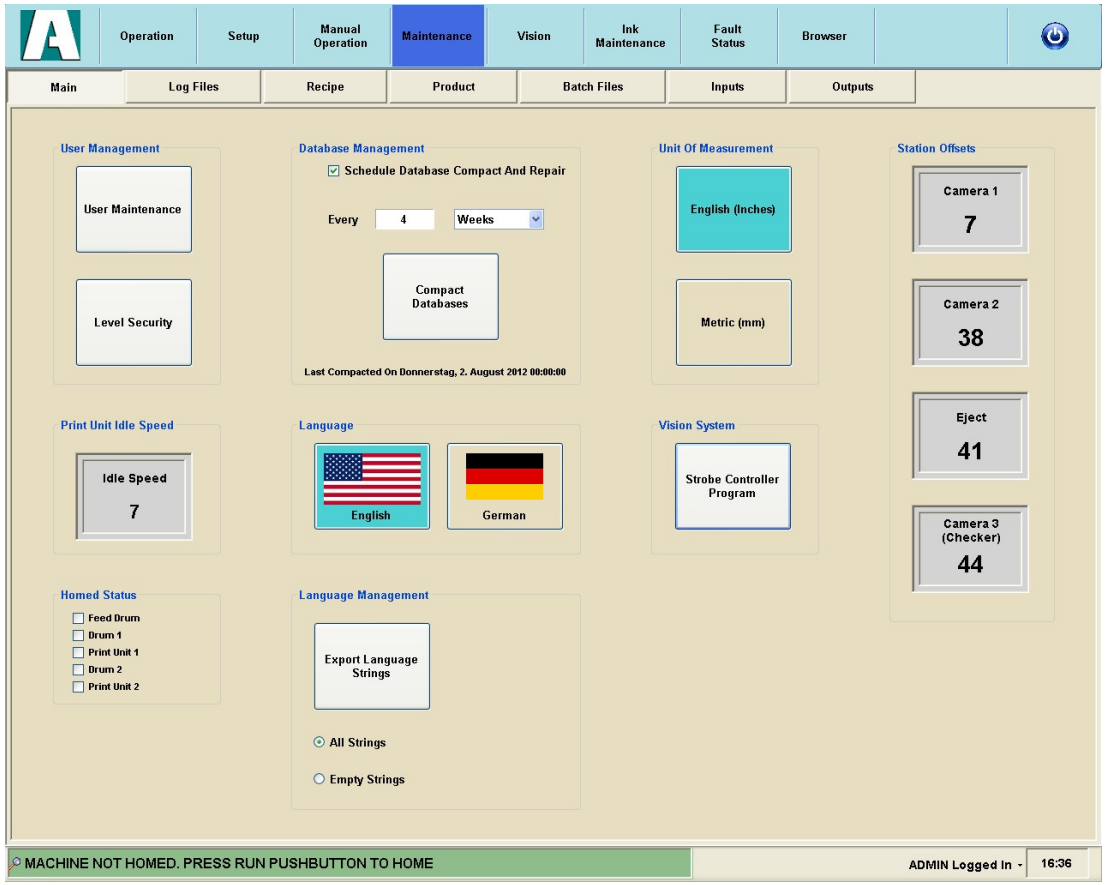
Inputs: This tab allows the user to monitor the current status of all PLC inputs.

Outputs: This tab allows the user to monitor the current status of all PLC outputs.

4 Control Panel (CONTINUED)

Maintenance Screen -Main

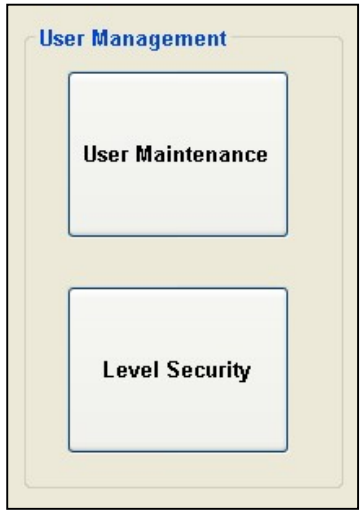
The Maintenance (Main) screen can be accessed by pressing the Maintenance button located at the top of the screen then the Main tab. This tab allows the user to access the User Maintenance screen, the Level Security screen and the Strobe Controller Program. Database management utilities and screens Language are also included on this tab.



A brief description of the buttons on the Maintenance screen Main tab is listed below:

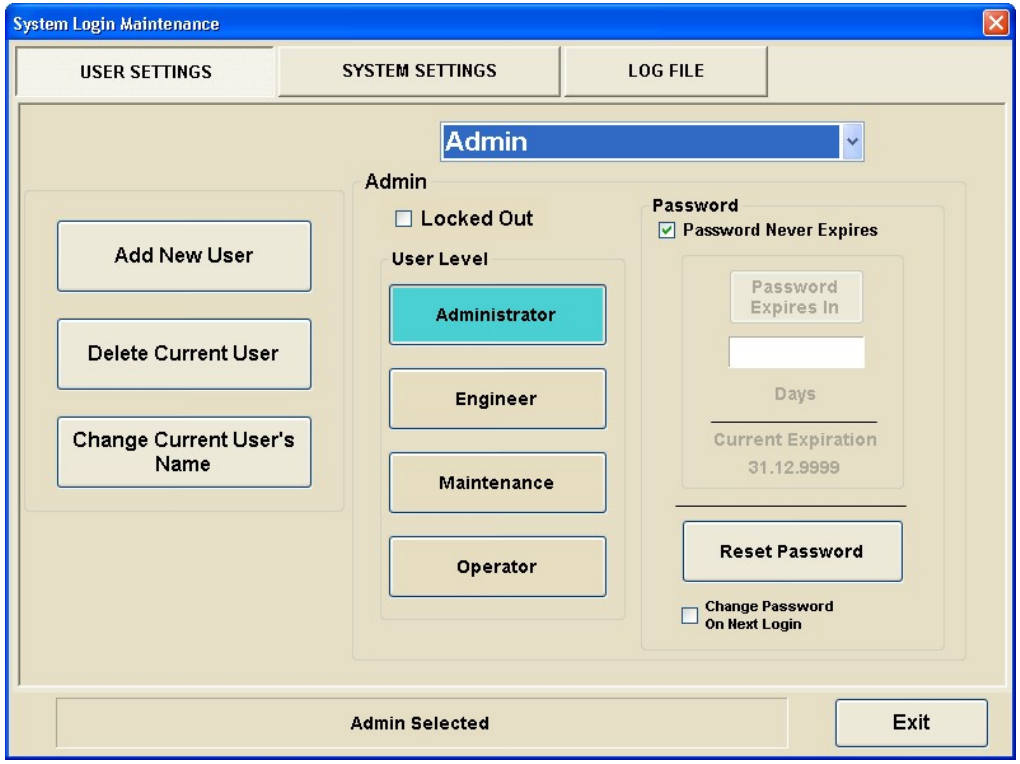
4 Control Panel (CONTINUED)

The User Management utilities are divided into two buttons: User Maintenance and Level Security. The User Maintenance button is used to view or modify the user log-in profiles for those who have access to the system. The Level Security button is used to define the level of system access for each user type – Administrator, Engineer, Maintenance and Operator.



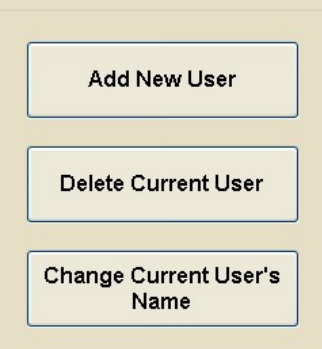
System Login Maintenance

The screen is accessed by pressing the **User Maintenance** button. This screen is used to add a new user, delete an existing user, change log-in security settings or view the system access log file.



A brief description of the buttons on the system Login Maintenance screen User Settings tab is listed below:

4 Control Panel (CONTINUED)



Add New User

When this button is pressed, the on-screen keypad will open to allow a new user name to be entered. When a new user is added to the system, the name will appear in the user drop-down list at the top of the screen.

Delete Current User

This button will delete the log-in profile for the user name currently selected from the drop-down list at the top of the screen.

Change Current User's Name

This button will open the on-screen keypad to allow the log-in name to be changed for the user currently selected from the drop-down list at the top of the screen.

User Drop-Down List

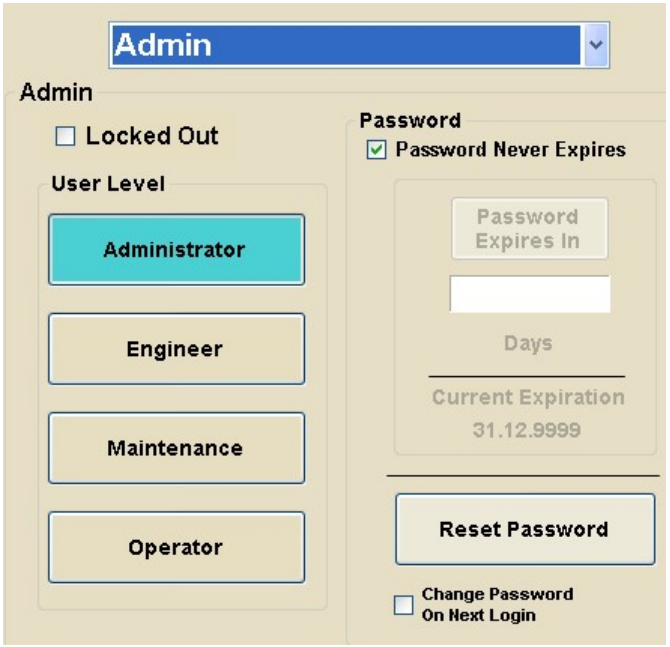
Press the downward arrow on the right side of this window to open the drop-down list of all users. Select a user name from the list to view or modify the log-in settings for that user.

Locked Out

If a user attempts to repeatedly log-in with an incorrect password, and the number of log-in attempts exceeds the "Login Attempt" setting on the "System Settings" tab, the user will be locked out and this box will be checked. Only a user with Administrator level security can un-check a "locked out" box.

User Level

Every user is assigned to one of four user types: Administrator, Engineer, Maintenance or Operator. The level of access for each user type is defined through the Level Security settings described in the next section.



Password Expiration

This button will allow the system administrator to define the password expiration requirements for each user.

Reset Password

This button will change the password for the currently selected user to the default password defined on the System Settings tab.

Change Password On Next Login

When this button is checked, the currently selected user will be prompted to change their password during their next log-in attempt. This is usually done whenever the user's password has been reset to the default password by the system administrator.

4 Control Panel (CONTINUED)

. **SYSTEM SETTINGS TAB**
This tab is used to change the global default password and log-in rules for all users.

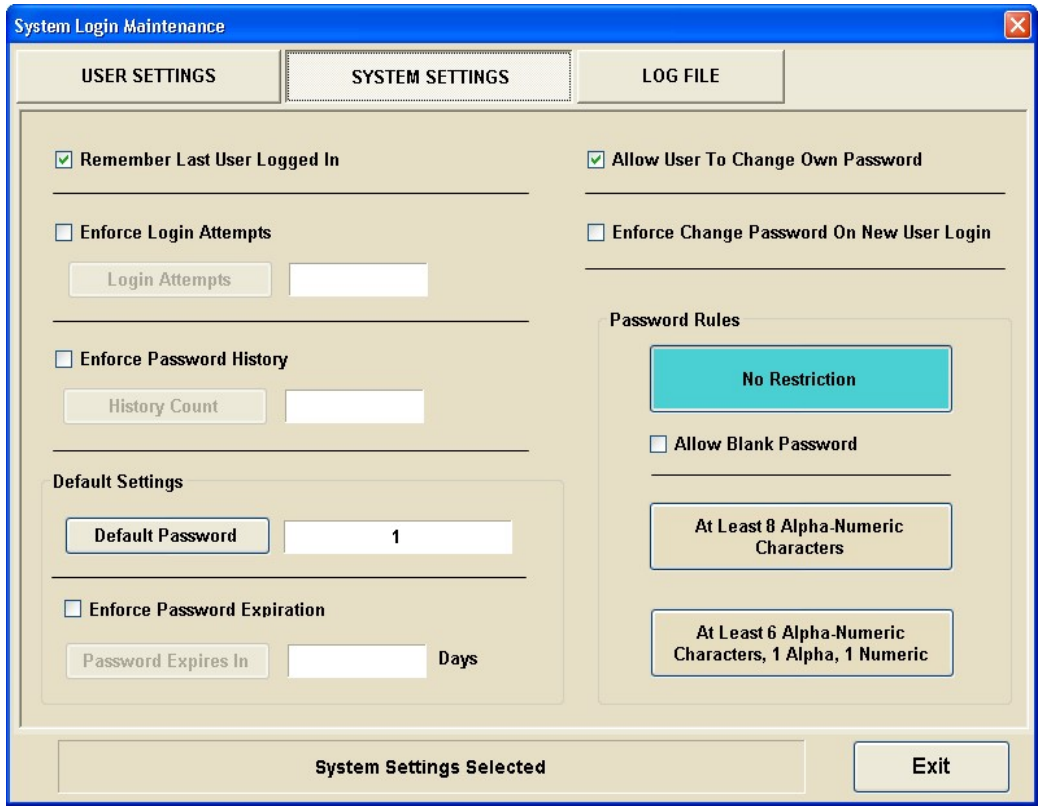
REMEMBER LAST USER LOGGED IN
This checkbox will select the last user logged in by default whenever the User Maintenance screen is opened.

ENFORCE LOGIN ATTEMPTS
This checkbox and data entry box allow the system administrator to limit the number of login attempts for all users. A user will be locked out after failing this number of consecutive login attempts.

ENFORCE PASSWORD HISTORY
This checkbox and data entry box allow the system administrator to require all users to create different passwords when their current password expires.

DEFAULT PASSWORD
When this button is pressed, the on-screen Keypad will open to allow a default password to be entered. This password is used when a new user is added to the system, or when a user's password is reset.

ENFORCE PASSWORD EXPIRATION
This checkbox and data entry box allow the system administrator to enforce password expiration requirements for all users.

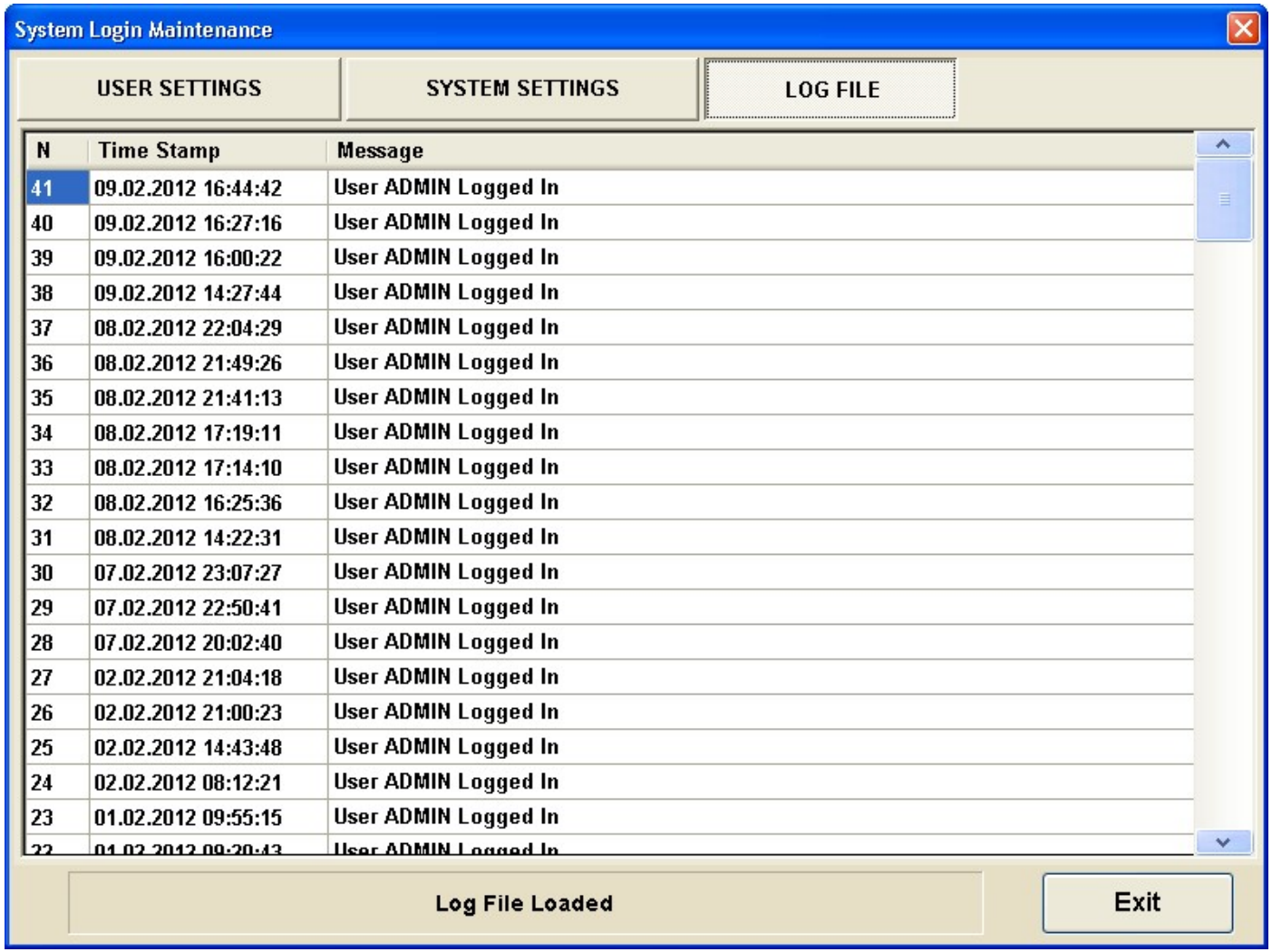


ALLOW USER TO CHANGE OWN PASSWORD
Select this checkbox to change your password.

ENFORCE CHANGE PASSWORD ON NEW USER LOGIN
This checkbox requires a new user to change his default password.

PASSWORD RULES
As stated on the buttons and check box

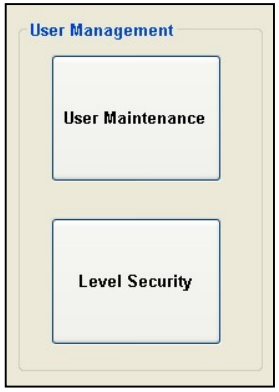
4 Control Panel (CONTINUED)

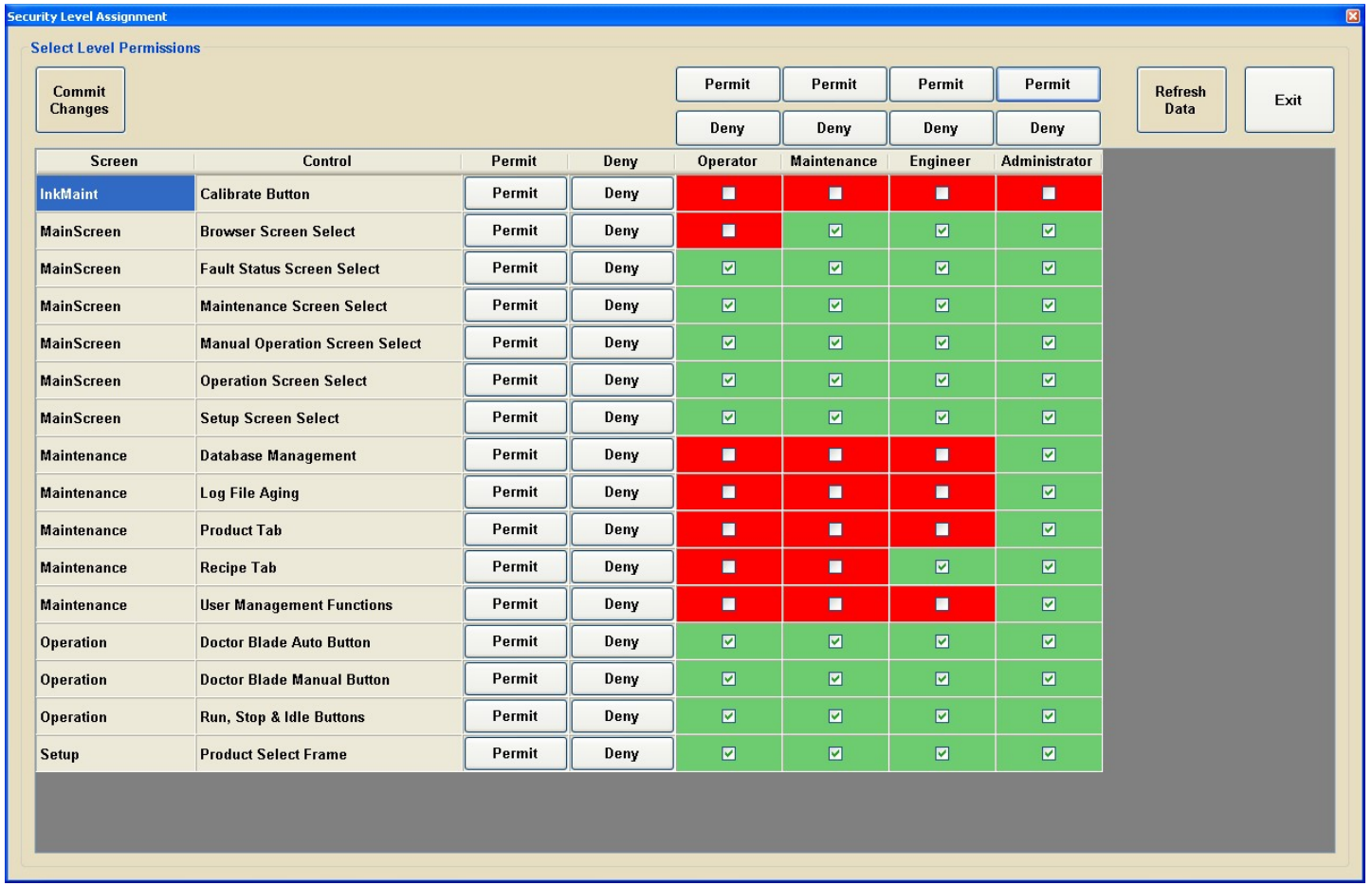


4 Control Panel (CONTINUED)

Level Securty

The Level Security Assignment screen is accessed by pressing the Level Security button on the Maintenance screen Main Tab. This is used to assign access rights to the various screens & buttons, based on user groups.





A brief description of the buttons on the Security Level Assignment screen is listed below:

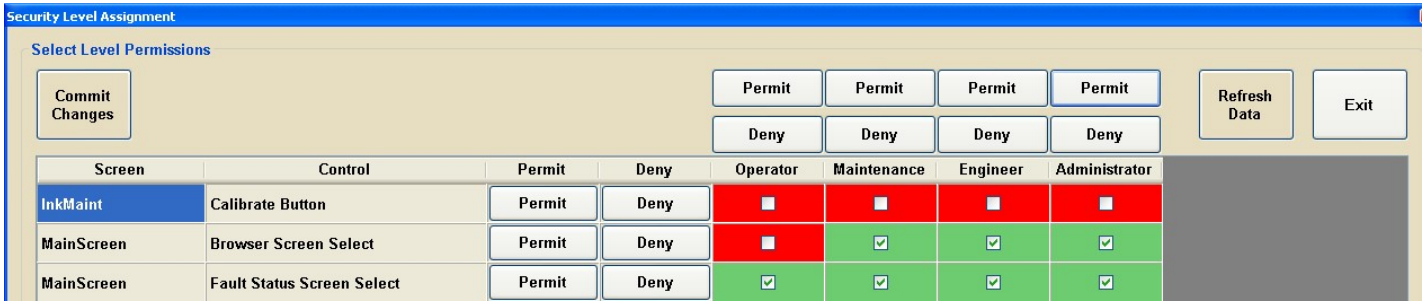
4 Control Panel (CONTINUED)

Commit Changes

This button saves any changes made to the permissions (YELLOW boxes). ***WARNING***: *Ensure that the "Administrator" (highest user level) has permission to all items before pressing this button.*

Refresh Data

Pressing this button will update the screen, displaying the current values. *NOTE*: *If the operator has made changes, HAS NOT hit the "Commit Changes' button, & wishes to discard ALL changes; pressing the "Refresh Data" button will read the database & update the window, based on those values.*



Exit

Press & release this button to close this window

Screen & Control Columins

These columns define the location & description of the item which has the access defined. Select the item in the Screen column to define the permissions for that item.

.Permit or Deny Rows

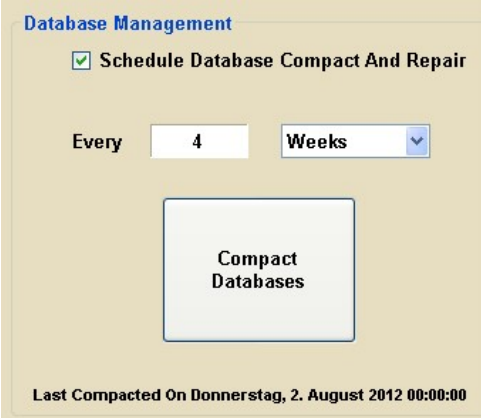
With the item in the Screen Column selected, pressing corresponding the Permit or Deny button will add or remove permission to all users for that item.

User Group Permit or Deny Columns

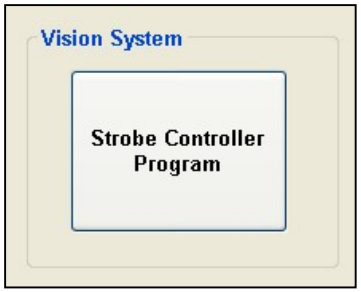
These columns represent the available user groups for selection to define permissions. They are arranged in order, from left to right, lowest to highest permission level. The columns have two (2) features to indicate permission: a "check" & highlighted GREEN = PERMIT, "NO CHECK & highlighted RED = DENY, YELLOW = CHANGED. The PERMIT & DENY buttons, above these columns will add or remove all permissions for the user

4 Control Panel (CONTINUED)

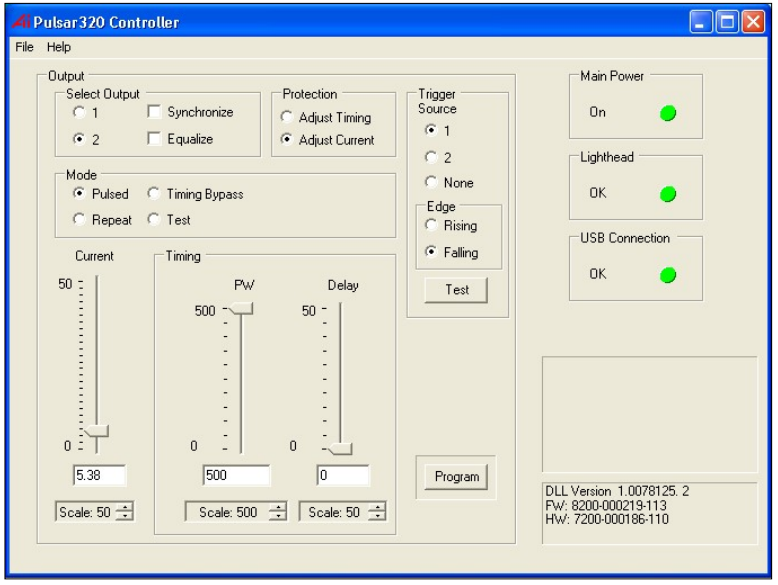
Maintenance Screen –Main (continued)



Data Base Management enables the ability to maintain the database, schedule the frequency of the maintenance and display the time & date of the last maintenance performed.



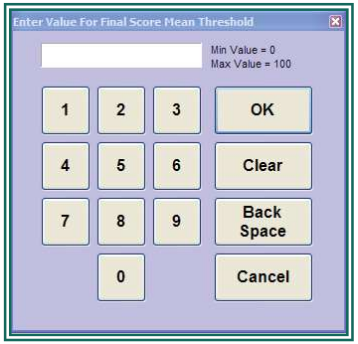
Strobe Controller Program
This button shows the strobe program and enables program adjustments.



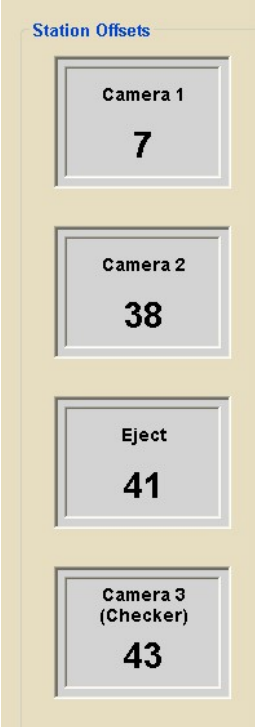
Strobe Controller
Pulsar 320 Controller program. This is used to modify the strobe controller variables.

4 Control Panel (CONTINUED)

Idle Speed
This button is used to set the design roll speed while the machine is in Idle Mode. Press the button to change this value.



KEY PAD
These buttons when pressed will display a keypad that allows the operator to input specific numerical values for the currently selected setting.



Camera 1
This button is used to change Camera 1 Offset.

Camera 2
This button is used to change Camera 2 Offset.

Eject
This button is used to change Eject Offset.

Camera 3 (Checker)
This button is used to change Camera 3 Offset.

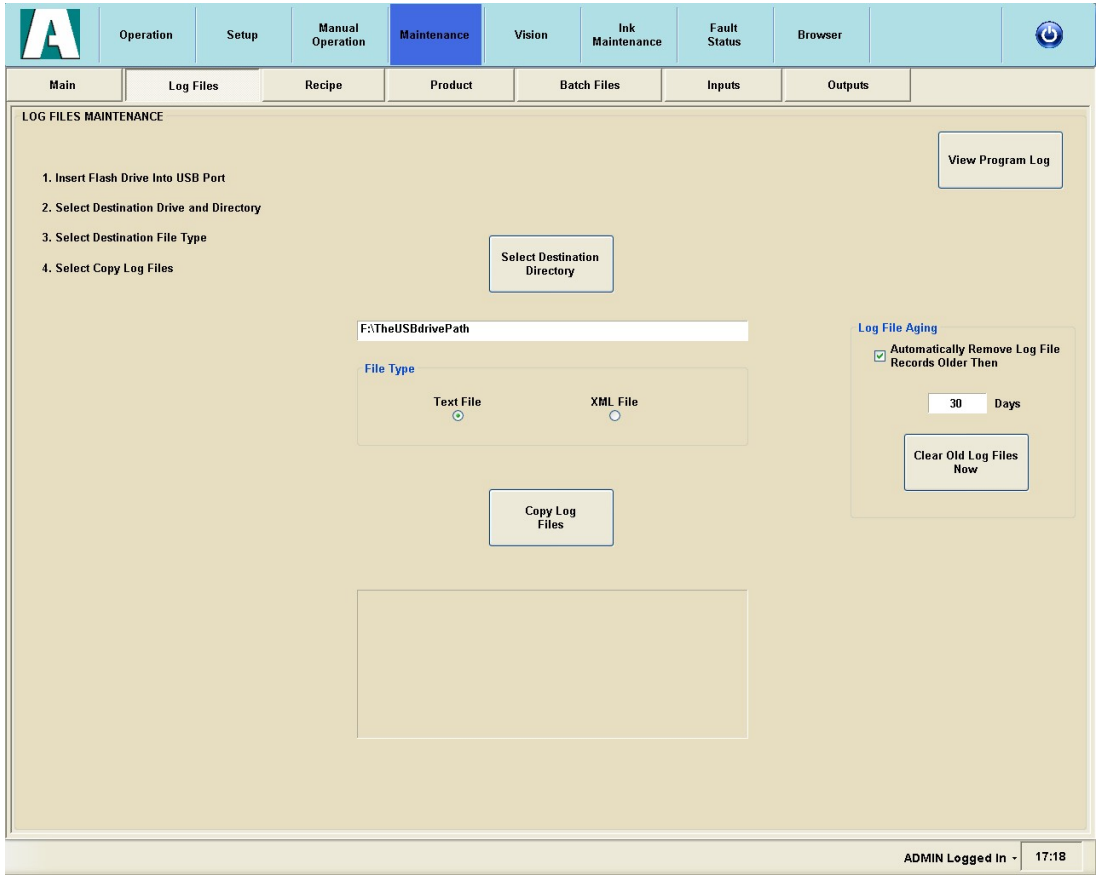
English (Inches)
This button when pressed turns blue and changes the units on the various to Inches.

Metric (mm)
This button when pressed turns blue and changes the units on the various screens to Metric.

4 Control Panel (continued)

Maintenance Screen -Log File Maintenance

The Log File Maintenance screen can be accessed by pressing the Log File Maintenance button located at the upper right hand side of the Maintenance (Program Log File View) screen. This screen allows the operator to change the log file maintenance of the alarm log files generated by the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of the buttons shown on the Log Files tab is listed below:

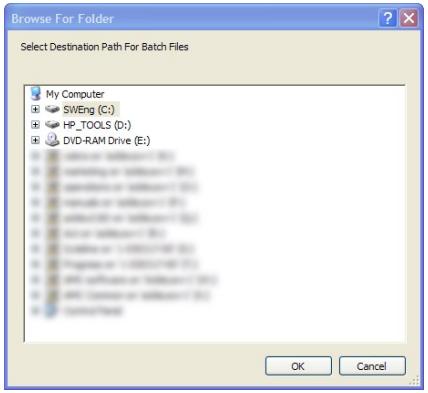
4 Control Panel (CONTINUED)

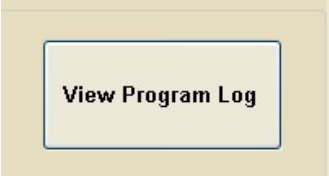
LOG FILE MAINTENANCE
This allows the user to export the log files to a location of their choice and the choice of 2 file formats.

SELECT DESTINATION DIRECTORY
Press this button to change the log file destination directory for the log file export.

FILE TYPE
The highlighted radio button indicates the file format that will be used to export the log file.

COPY LOG FILES
Press this button to copy the log files to the selected destination





VIEW ALARM/PROGRAM LOG
Press this button to return to Program log screen, Alarm and Program Log screen are shown on the next page.

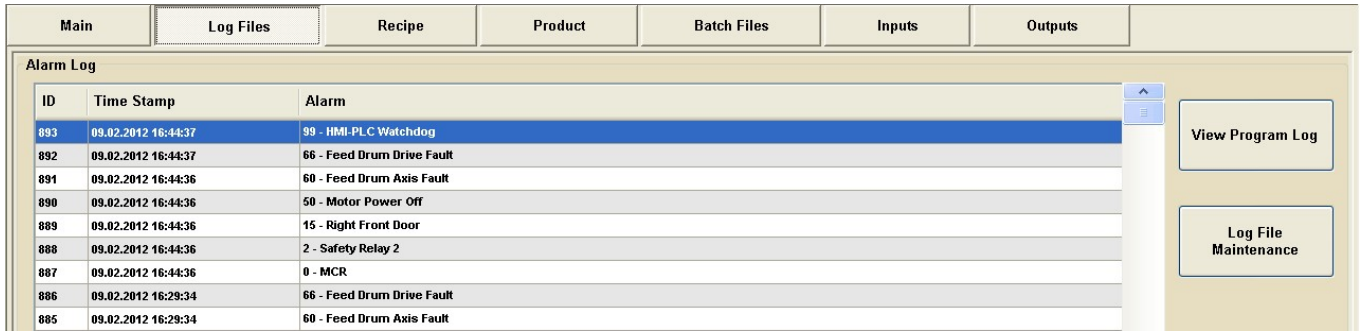
LOG FILE AGING
Selecting the "check box" will enable the automatic maintenance of the log file. This will delete the log files automatically at the set interval. The window below allows the user to set the maintenance interval.

CLEAR LOG FILES
Pressing this button will instantly reset the log files.

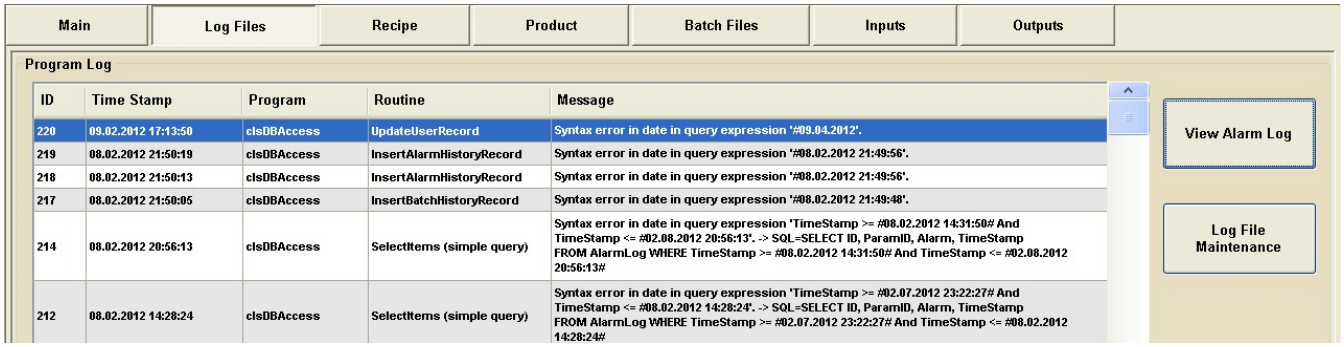
4 Control Panel (CONTINUED)

Maintenance Screen - Log Files

The Maintenance (Log Files) screen can be accessed by pressing the Maintenance button located at the top of the screen then the Log Files tab. This screen allows the operator to view, copy or reset the log files for the ACKLEY *machine corporation* Three Drum Printer with Inspection. A brief description of the buttons shown on the Log Files tab is listed below:



VIEW ALARM LOG
Press this button to display the Alarm Log Files



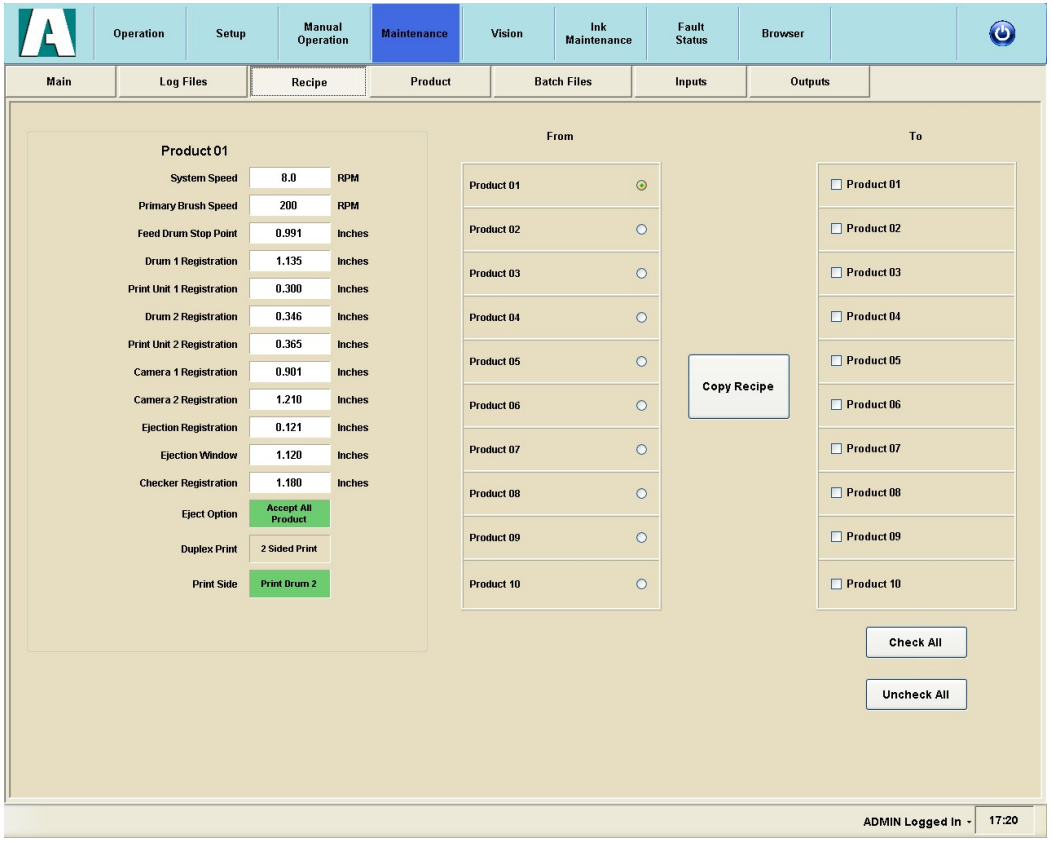
VIEW PROGRAM LOG
Press this button to display the Program Log Files

LOG FILE MAINTENANCE
Press this button to display the Log File Maintenance screen:

4 Control Panel (CONTINUED)

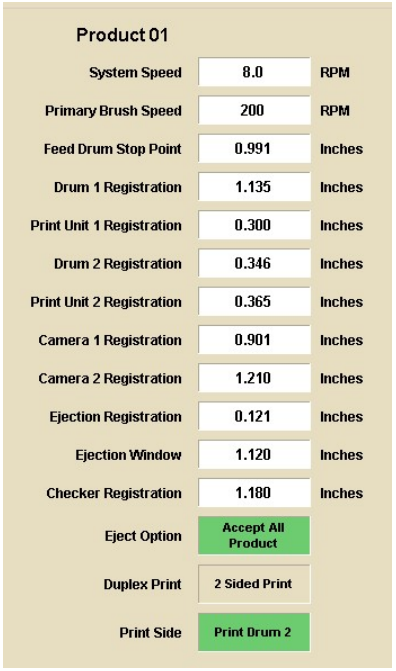
Maintenance Screen (Recipe)

The Maintenance (Recipe) screen can be accessed by pressing the Maintenance button located at the top of the screen then the Recipe tab. This screen allows the operator to set values, subsystem behavior and to copy recipes for product to be run on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

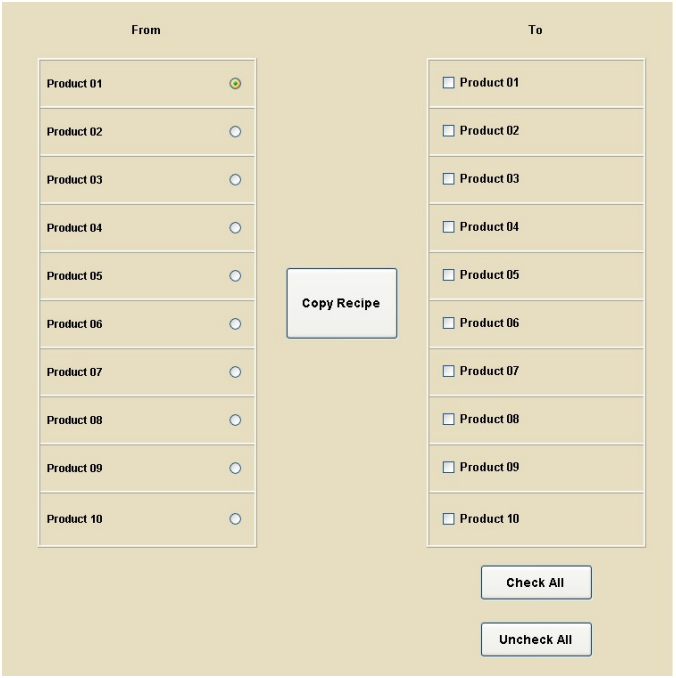


A brief description of the buttons on the Recipe tab is listed below:

4 Control Panel (CONTINUED)



Product Recipe
This column displays the current values of the selected Product recipe, in the FROM column. These values can be changed on the Setup screen, Setup Parameters tab.



From Column
This column is a list of all available recipes. Select the recipe you wish to copy to another recipe. Verify the values on the left.

Copy Receipe
Press this button to copy the selected recipe, in the FROM column to the selected recipes in the TO column.

To Column
This column allows the user to select the copied recipe's destination. Any number of recipes can be chosen.

Check All
Pressing this button will select all of the available recipes in the TO column

Uncheck All
Pressing this button will clear all recipe selection in the TO column.

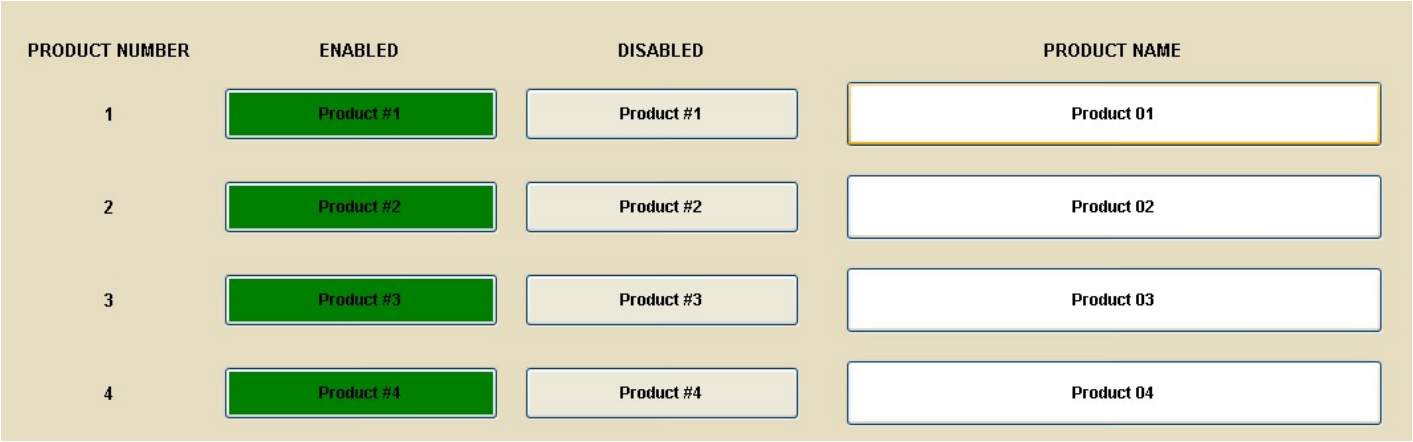
4 Control Panel (CONTINUED)

Maintenance Screen - Product

The Maintenance Product screen is accessed by pressing the Maintenance button located at the top of the screen then the Product tab. This screen allows the user to enable or disable product recipes or change the Product names for Products to be run on the ACKLEY*machine corporation* Three Drum Printer with Inspection.

A brief description of the buttons shown on the Product tab is listed below:

4 Control Panel (CONTINUED)



PRODUCT NUMBER
This is the default numerical value for the recipe. This cannot be changed.

ENABLED
Selecting the button, next to the product, will enable that product for selection on the Setup, Batch Control screen

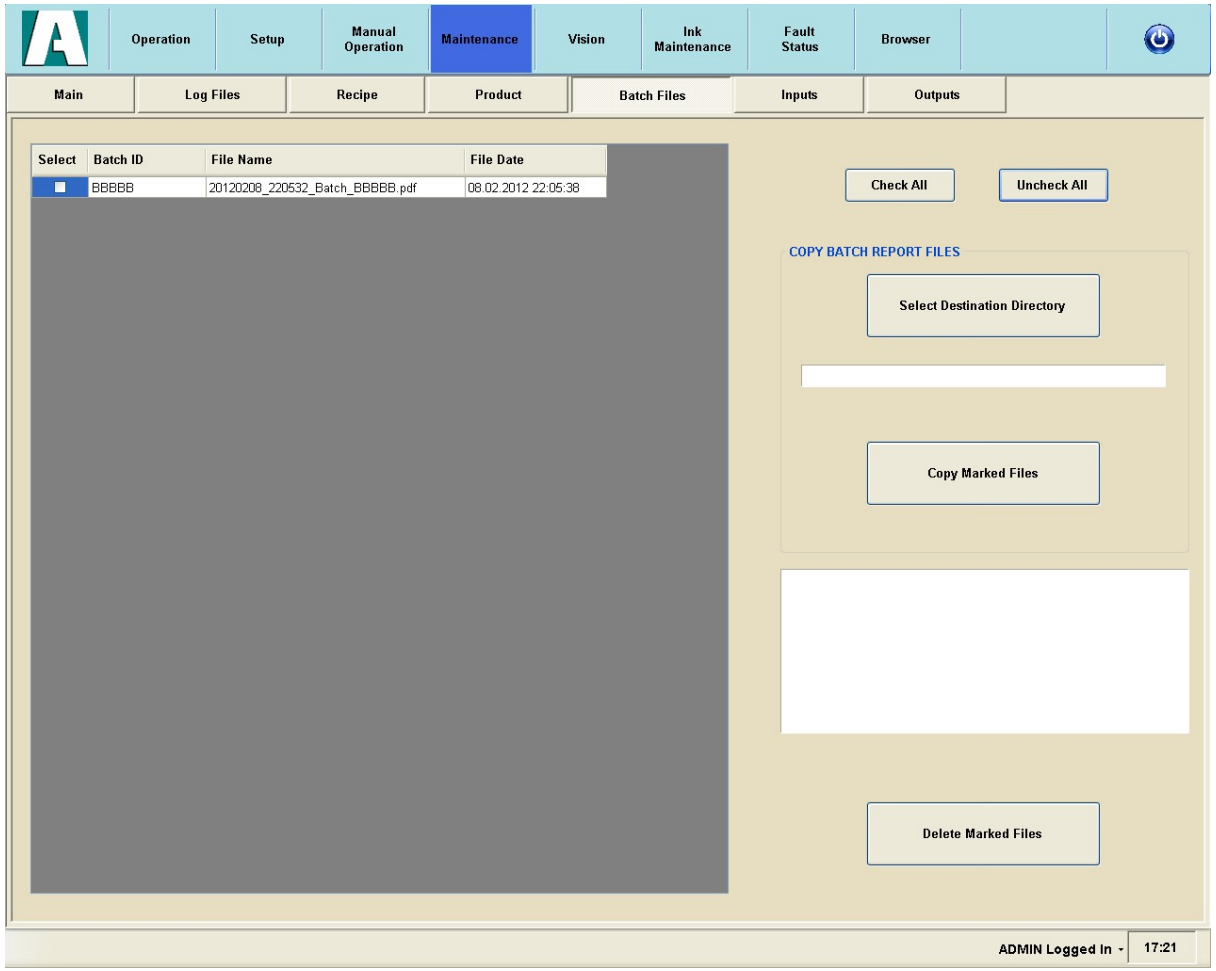
DISABLED
Selecting the button, next to the product, will disable that product for selection on the Setup, Batch Control screen

PRODUCT NAME
This is a text box for entering the name to describe the product. When you press one of these buttons the Keypad appears.

4 Control Panel (CONTINUED)

Maintenance Screen – Batch Files

The Maintenance Batch Files screen is accessed by pressing the Maintenance button located at the top of the screen then the Batch Files tab.

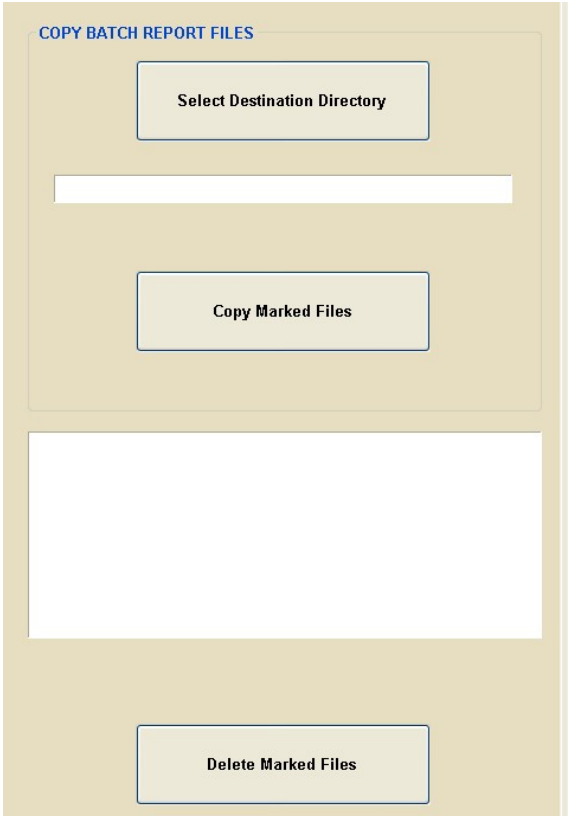


A brief description of the buttons shown on the Batch Files tab is listed below:

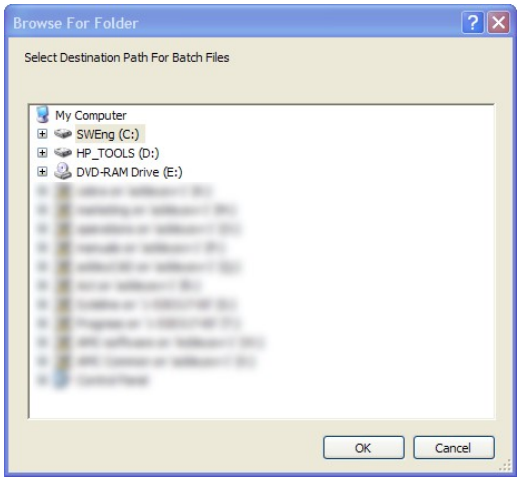
4 Control Panel (CONTINUED)

Check All
Press this button to check all of the batch files.

Uncheck All
Press this button to uncheck all of the batch files.



Select Destination Directory
Press this button to show a dialog box (right) with a list of the destination.



Copy Marked Files
Press this button to copy the files that are checked.

Status Window

Delete Marked Files
Press this button to delete the files that are checked.

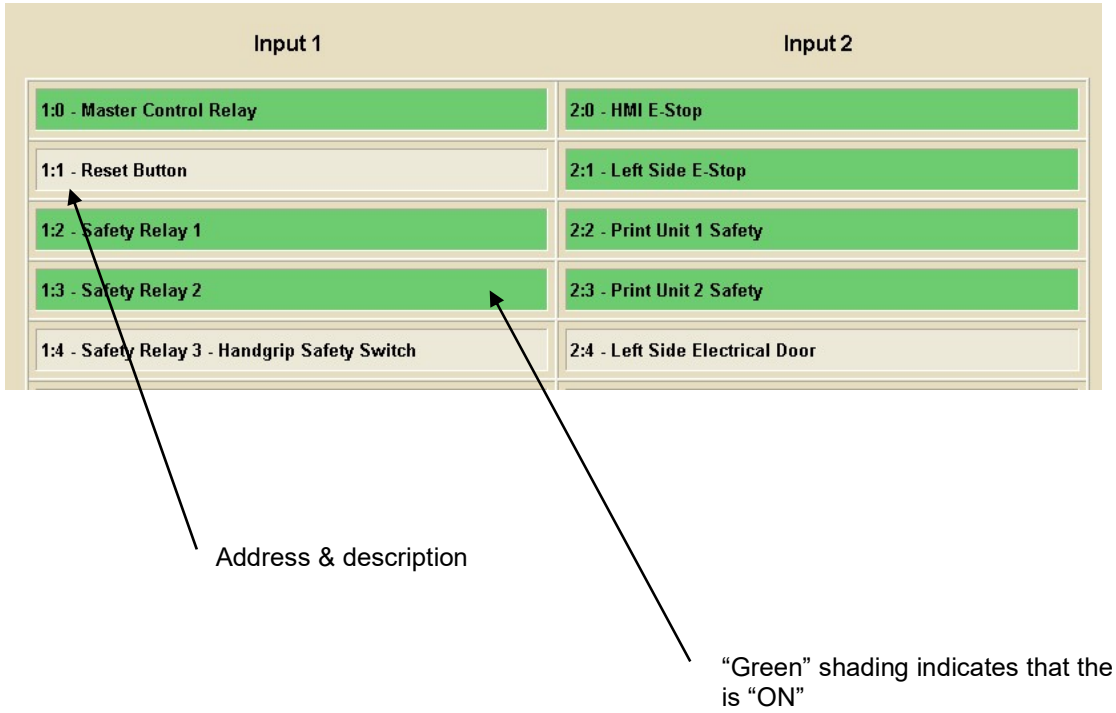
Maintenance Screen - Inputs

The Maintenance (Inputs) screen can be accessed by pressing the Maintenance button located at the top of the screen then the Inputs tab. This screen will display all the current inputs on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

A brief description of the buttons on the Inputs tab is listed below:

4 Control Panel (continued)

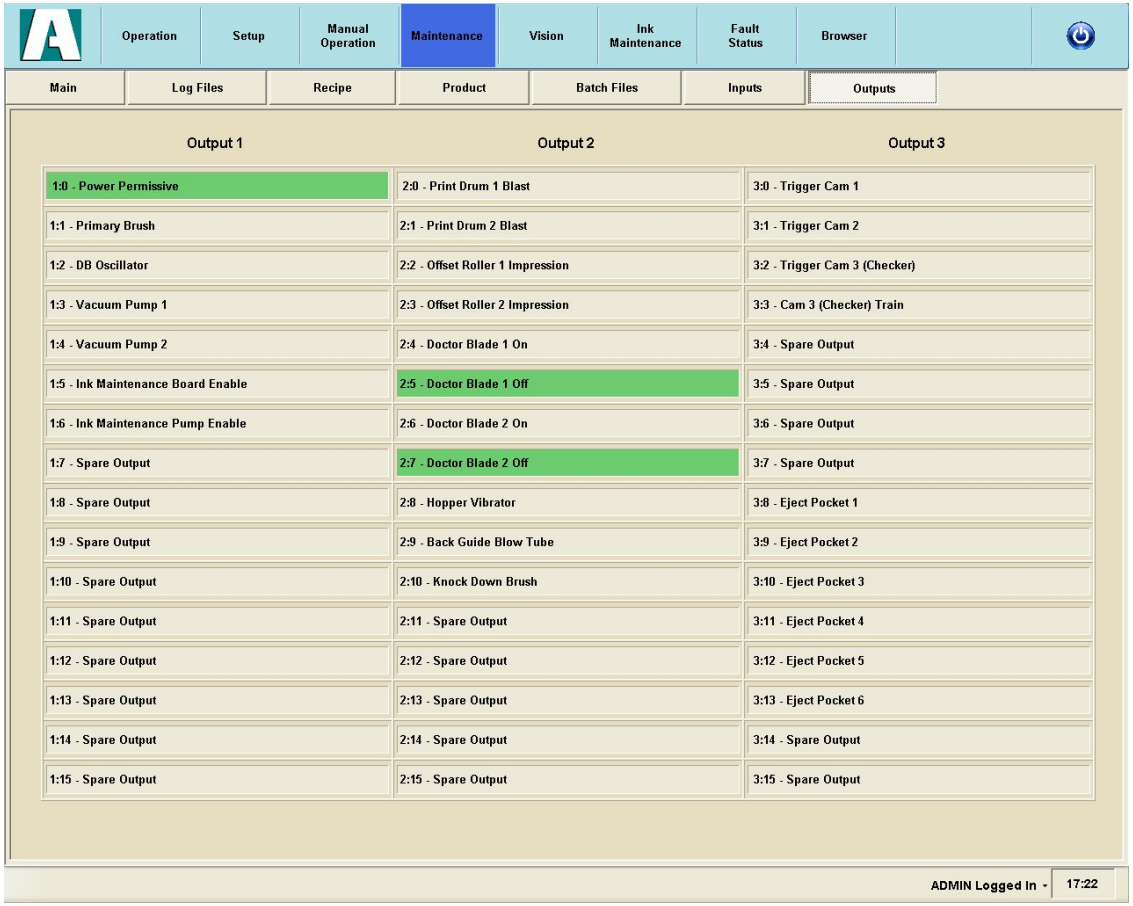
INPUT
Indicates the location of the PLC card, in the PLC I/O rack.



4 Control Panel (CONTINUED)

Maintenance Screen - Outputs

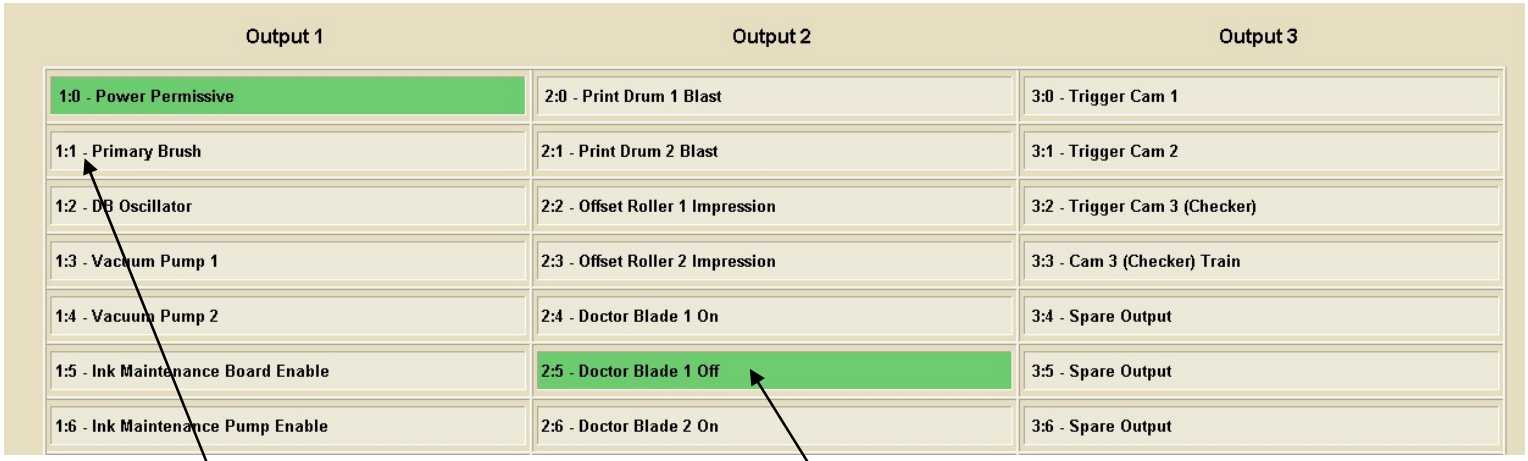
The Maintenance Outputs screen can be accessed by pressing the Maintenance button located at the top of the screen then the Output tab. This screen the current Outputs on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of the buttons on the Outputs tab is listed below:

4 Control Panel (CONTINUED)

OUTPUT
Indicates the location of the PLC card on the PLC I/O rack.



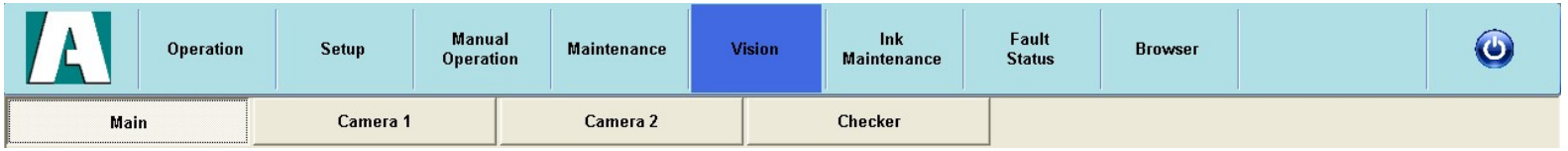
Address & description

"Green" shading indicates that the output is "ON"

4 Control Panel (CONTINUED)

Vision Screens

This screen is accessed by pressing the Print Inspection Cameras button located at the top of the screen on the ACKLEY *machine corporation* Three Drum Printer with Inspection. The Print Inspection Cameras Screen is divided into seven tabs: Main, Camera 1, Camera 2 and Checker

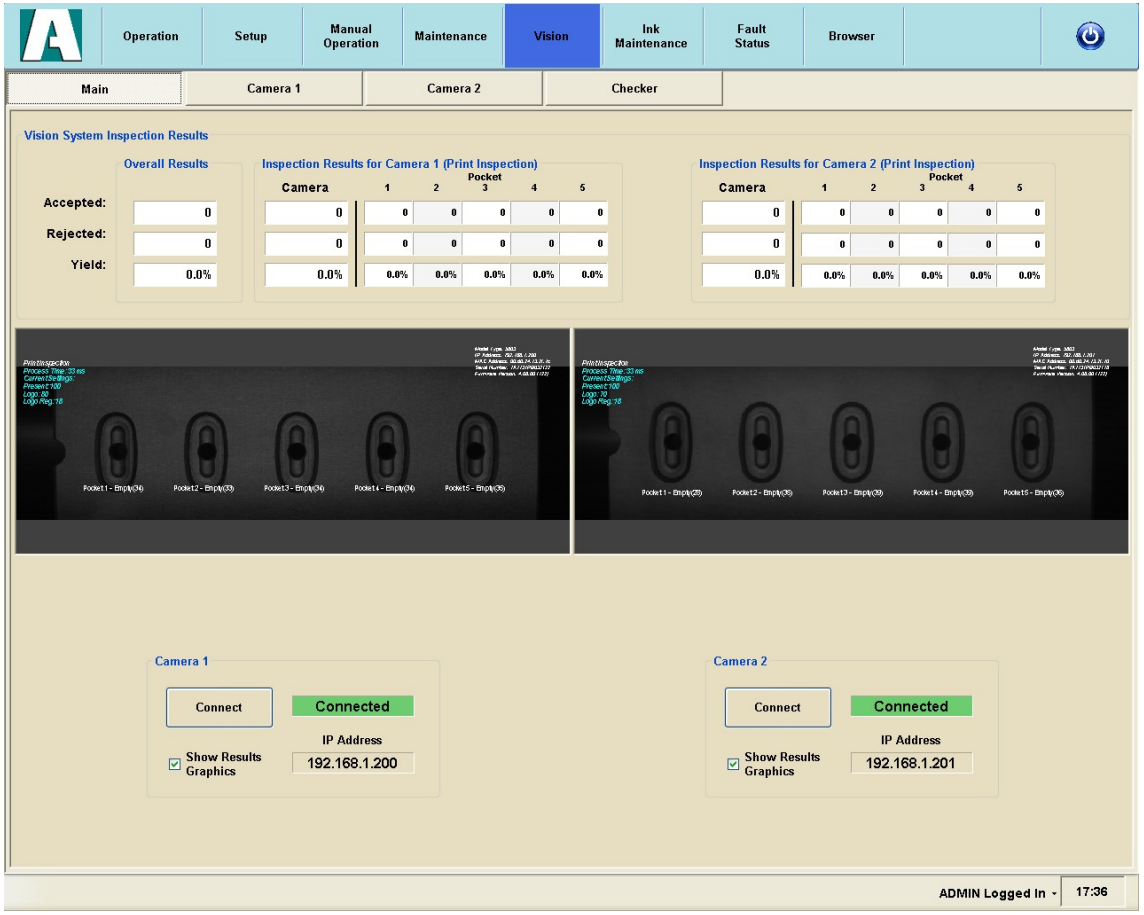


Main	This tab is for the user to access the Print Inspection Results, Overall Inspection Results, Graphics, Camera Connection status and toggle Graphics options.
Camera 1 - 2	These tabs is for configuration of the individual cameras.
Checker	This tab is for the configuration of the rejects checker camera.

4. Control Panel (continued)

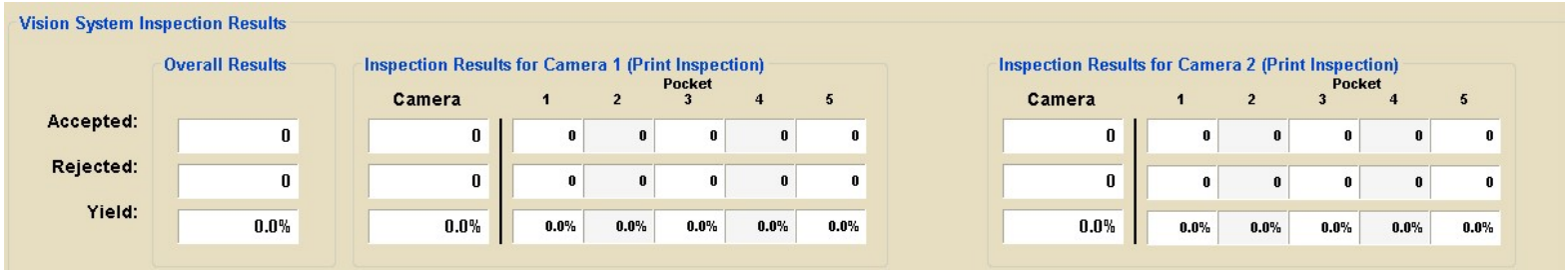
Vision Screen - Main

The Print Inspection - Main screen can be accessed by pressing the Vision button located at the top of the screen then the Main tab. This screen will display the current images and results of the inspection cameras on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of the buttons on the Vision (Main) screen is listed below:

4 Control Panel (CONTINUED)



Overall Inspection Results

This portion of the screen displays the total number of accepted and rejected product. These values are then analyzed to display the percentage yield.

Camera Results

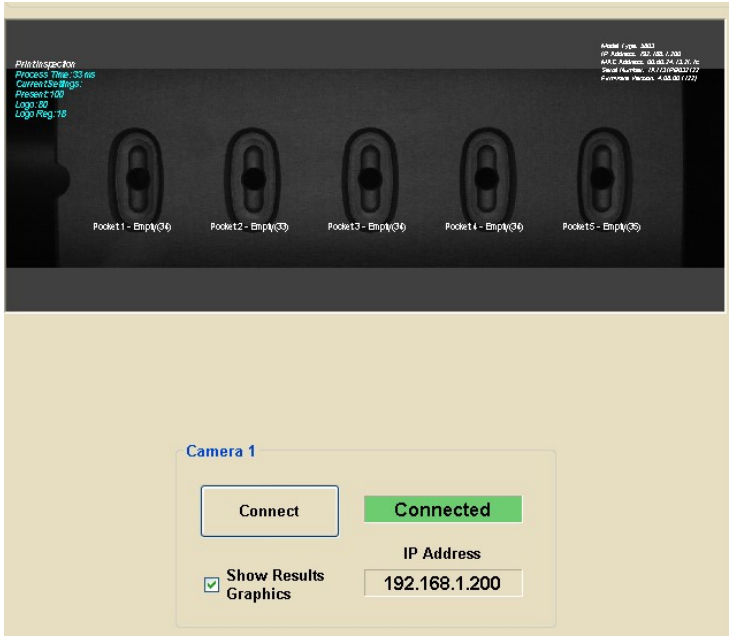
This portion of the sreeen displays the inspection results grouping by Camera or by Pocket. The accepted, rejected and yield values are for each Camera. This can be useful in determining a problem. If there was an issue, one Camera would have a disproportionate amount of rejects and a low percentage yield. This information would assist the user in diagnosing the problem.

Pocket Results

These values are broken down by pocket. The accepted, rejected and yield values are for that specific pocket. If there was an issue, one pocket would have a disproportionate amount of rejects and a low percentage yield. This can be useful in diagnosing a problem.

4 Control Panel (CONTINUED)

The image shown is the results graphics (last image inspected) for Camera 1. The information displayed is described below:



Vision Settings
The Vision Acceptance Settings for this camera are displayed on the upper left side of the screen.

Camera Information
Job product number and other camera information is displayed in the upper right side of this screen.

DISCONNECT / CONNECT
These buttons are used to change the connection state of the camera. They change color to indicate the state of the camera.

SHOW RESULTS GRAPHICS
This check box toggles ON / OFF the display of the result graphics for the camera.

IP ADDRESS
This shows the IP Address of the camera

4 Control Panel (CONTINUED)

Vision Camera Setup

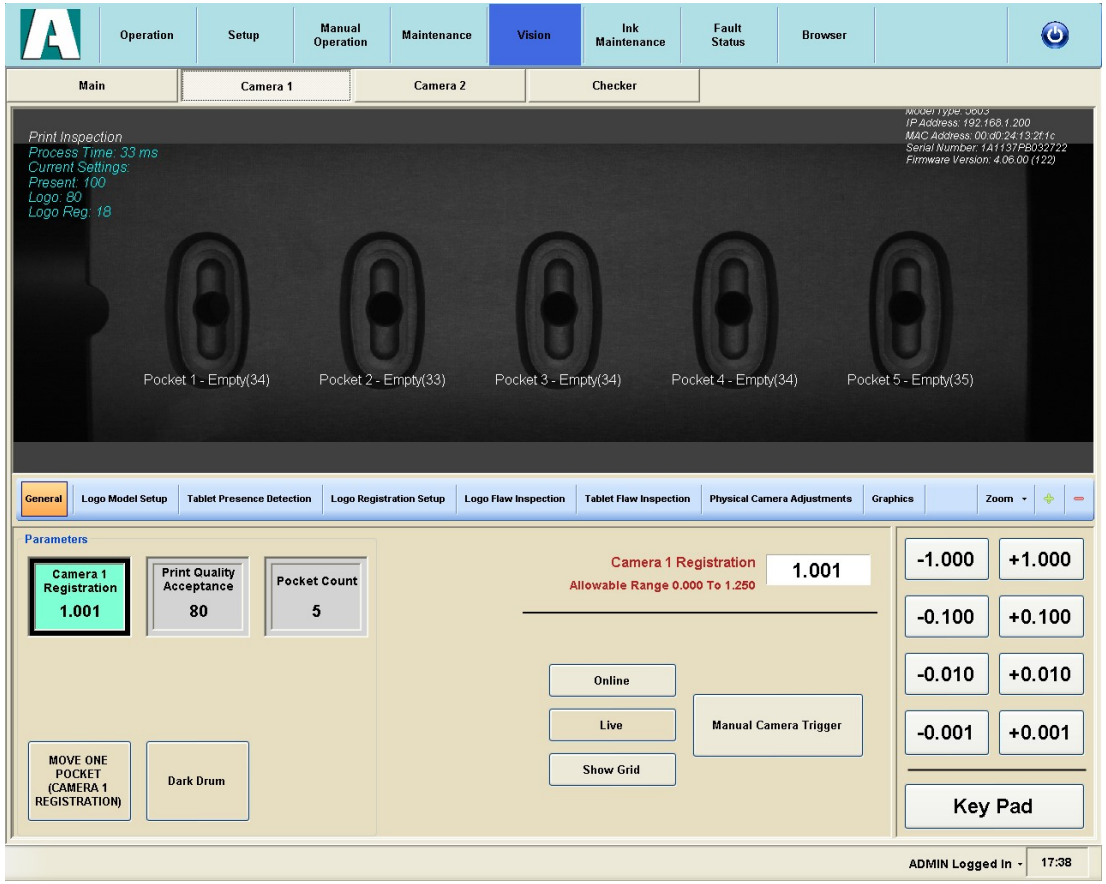
The Camera Tabs can be accessed by pressing the Vision button located at the top of the screen then one of the Camera Setup tabs. These Tabs contains settings applicable to all the inspection regions specified on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

General	This tab allows the operator the ability to change the “online” status, view live images, manually trigger, move a bar to camera registration, define the camera offset and define the number of pockets the camera will be inspecting.
Logo Model Setup	This tab allows the operator to define the region of the logo and train the camera to a quality image.
Tablet Presence Detection	This tab allows the operator to define the region that the camera will search for tablets, for the selected pocket.
Pocket Position Detection	This tab allow the operator to define the region that the camera will search for empty pockets, for the selected pocket.
Logo Registration Setup	This tab allows the operator to define the region that the camera will search for the logo image, for the selected row of pockets.
Physical Camera Adjustments	This tab allows the the operator to physically position the camera, while viewing the result graphic.
Graphics	This screen allows the Operator set the camera position graphics.
Zoom	This button allows the operator to zoom in or (+) or zoom out on the tablet area.

4 Control Panel (CONTINUED)

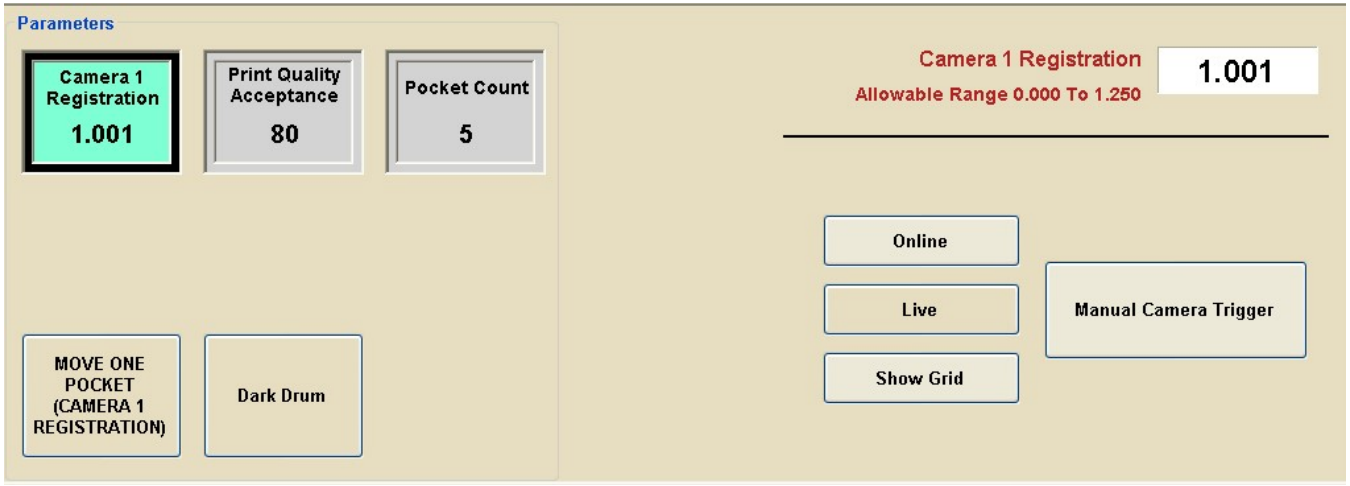
Vision Camera 1 - General

General screen can be accessed by pressing the Vision button located at the top of the screen and camera 1 tab, and the General tab. This tab allows the operator the ability view live images, manually trigger, move a bar to camera registration, define the camera registration and define the number of pockets the camera will be inspecting on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



.A brief description of the Camera 1 – General screen buttons is listed below:

4 Control Panel (CONTINUED)



.**Move One Pocket One**
Press this button to advance the Drum one pocket position, relative to the camera

Camera Registration
This button is used with the number pad on the right side to register a row of pockets on the Drum in the center of the Camera.

Print Quality Acceptance
This button is to set the inspection quality level for acceptance of the tablet.

Pocket Count
The Pocket Count is set at the number of pockets for each camera.

Dark/Light Drum
This button changes to dark or light depending on tablet color..

Online
This button toggles the selected camera Online and Offline.

Live
When this button is pressed the Camera will continuously trigger at a high rate.

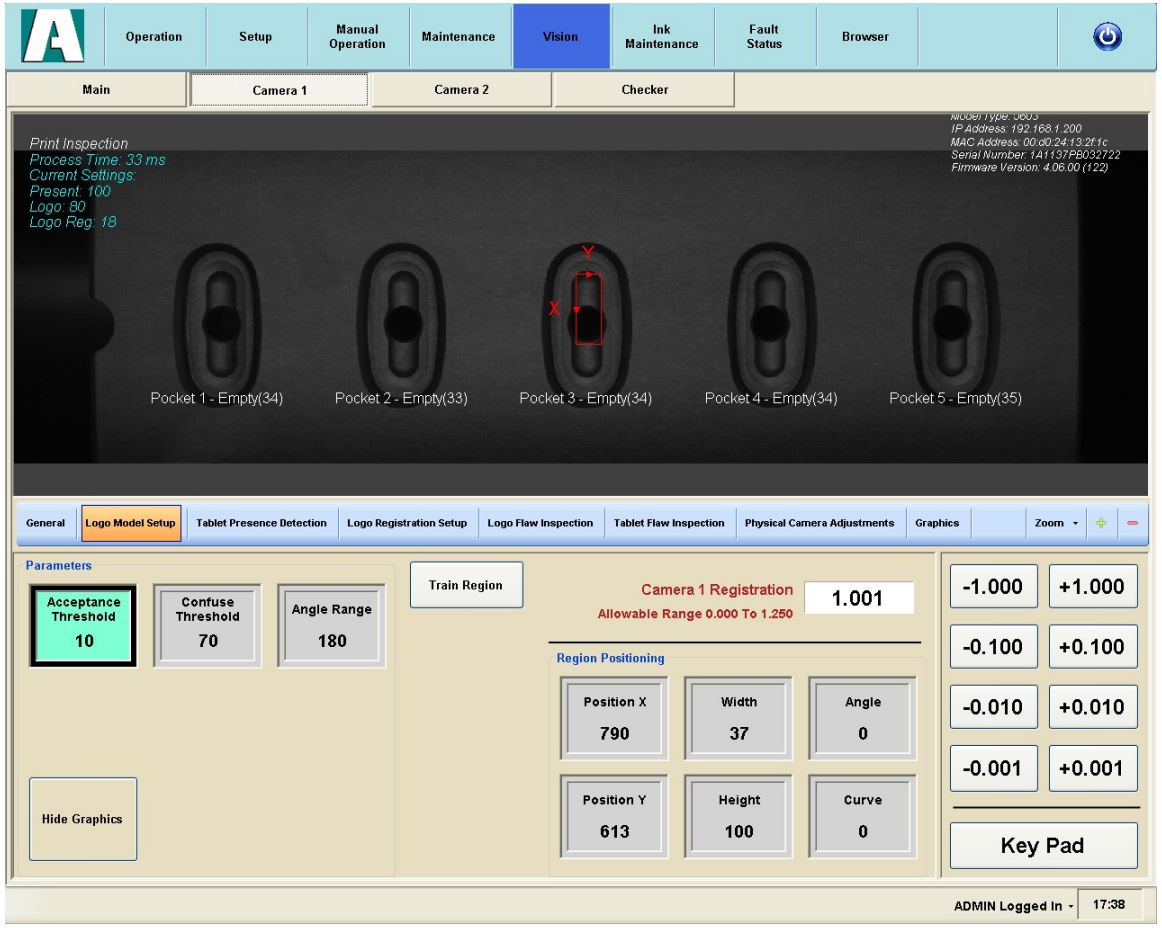
Show Grid
You Press this button to show the program grid. This grid is Factory set.

Manual Camera Trigger
When the Camera is Offline the user presses this button to manually trigger the Camera selected.

4 Control Panel (CONTINUED)

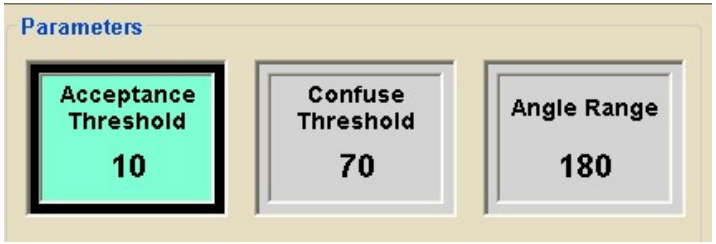
Vision Camera 1 - Logo Model Setup

Vision Camera 1 Logo Model Setup screen can be accessed by pressing the Vision button located at the top of the screen the camera 1 tab and then the Logo Model Setup tab. This tab allows the operator to define the region of the logo and train the camera to a quality image on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of the buttons on the Camera 1 Logo Model Setup screen is listed below.

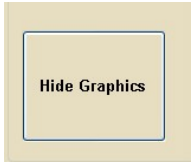
4 Control Panel (CONTINUED)



Acceptance Threshold
Press this button to set or change the minimum acceptable threshold.

Confuse Threshold
Press this button to set or change the maximum expected threshold.

Angle Range
Press this button to set the tablet angle variation toleration. The larger the angle the longer it will take to inspect except, for a round tablet.



Hide/Show Graphics
Press this button to switch from Hide to Show Graphics (blue).

REGION POSITIONING (Logo Model Setup)
The user places a quality printed tablet **(Gold standard)** in one of the five pockets for Camera 1.When one of these buttons is pressed a box outline appears on the screen. With the Positioning Buttons and the number pad the user centers and sizes the box over the logo. When the logo box region is defined he presses the Train Region button to train Camera 1. Repeat this procedure for Camera 2.

TRAIN LOGO/LOGO TRAINED
This box will turn blue and state **Logo Trained**.

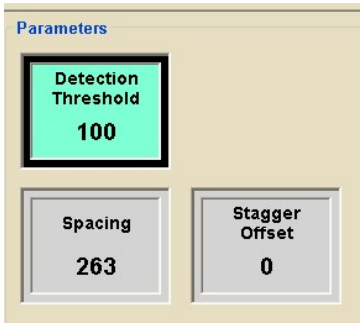
4 Control Panel (CONTINUED)

Vision Camera 1 – Tablet Presence Detection

Vision Camera 1 Tablet Presence Detection screen can be accessed by pressing the Vision button located at the top of the screen, the camera 1 tab, and the Tablet Presence Detection tab. This tab allows the operator to define the region that the camera will search for tablets on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

A brief description of the buttons on the Camera 1 Tablet Presence Detection screen is listed below:

4 Control Panel (CONTINUED)



Detection Threshold
This is the value for determining if there is a product in the pocket.

Spacing
Press this button to set the pocket centerline spacing in inches.

Stagger Offset
Press this button to set for a staggered row (high density) on the Drum.

Hide/Shown Region Graphics
Press the Hide region Graphics button to Show Region Graphics(turns blue). This will show the box region over the 5 pockets.

Region Positioning
The user places a tablet in first one of five pockets for Camera 1. With the Region Positioning Buttons and the Key Pad the user centers and sizes the box over the tablet. When the tablet box region is defined press the Region Hidden button to change to Regions Shown to show the sized box over the 5 tablets then press the Spacing button and enters the pocket centerline spacing with the Key Pad. Repeat this procedure for Camera 2.

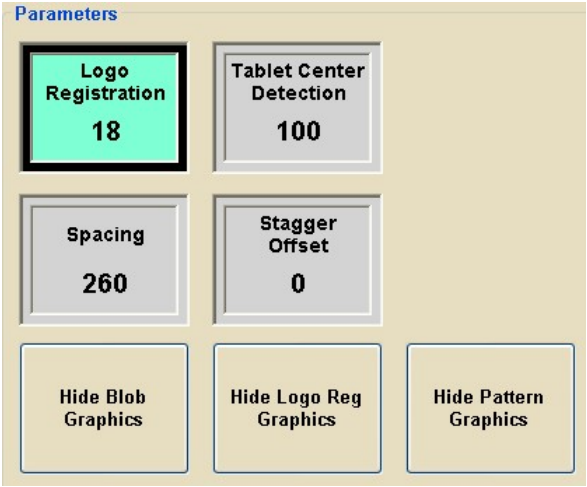
4. Control Panel (continued)

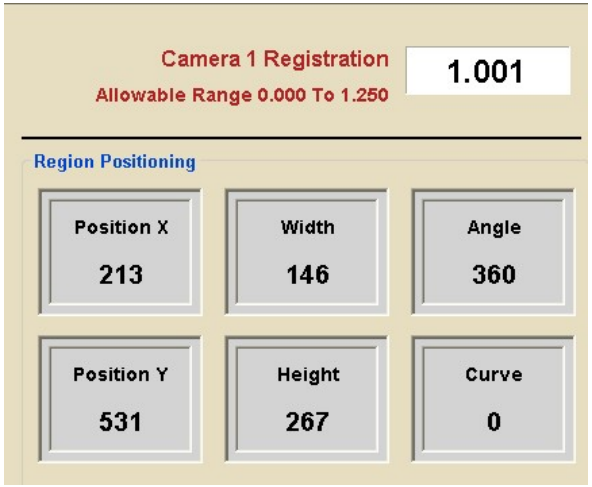
Vision Camera 1 – Logo Registration Setup

Vision Camera1 logo Registration Setup can be accessed by pressing the Vision button located at the top of the screen, Camera 1 tab, and the Logo Registration Setup tab. This tab allows the operator to setup the camera logo registration on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

A brief description of the buttons on the Camera 1 Logo Registration Setup screen is listed below:

4 Control Panel (CONTINUED)





Logo Registration
Press this button to setup the logo registration.

Tablet Center Detection
Press this button to setup the tablet center detection.

Spacing
Press this button to set the pocket centerline spacing in inches.

Stagger Offset
Press this button to set for a staggered row (high density) on the Drum.

Hide/Show Blob Graphics
Press this button to Show the pattern graphics.

Hide/Show Logo Reg. Graphics
Press this button to Show the logo region graphics.

Hide/Show Pattern Graphics
Press this button to Show the Blob graphics.

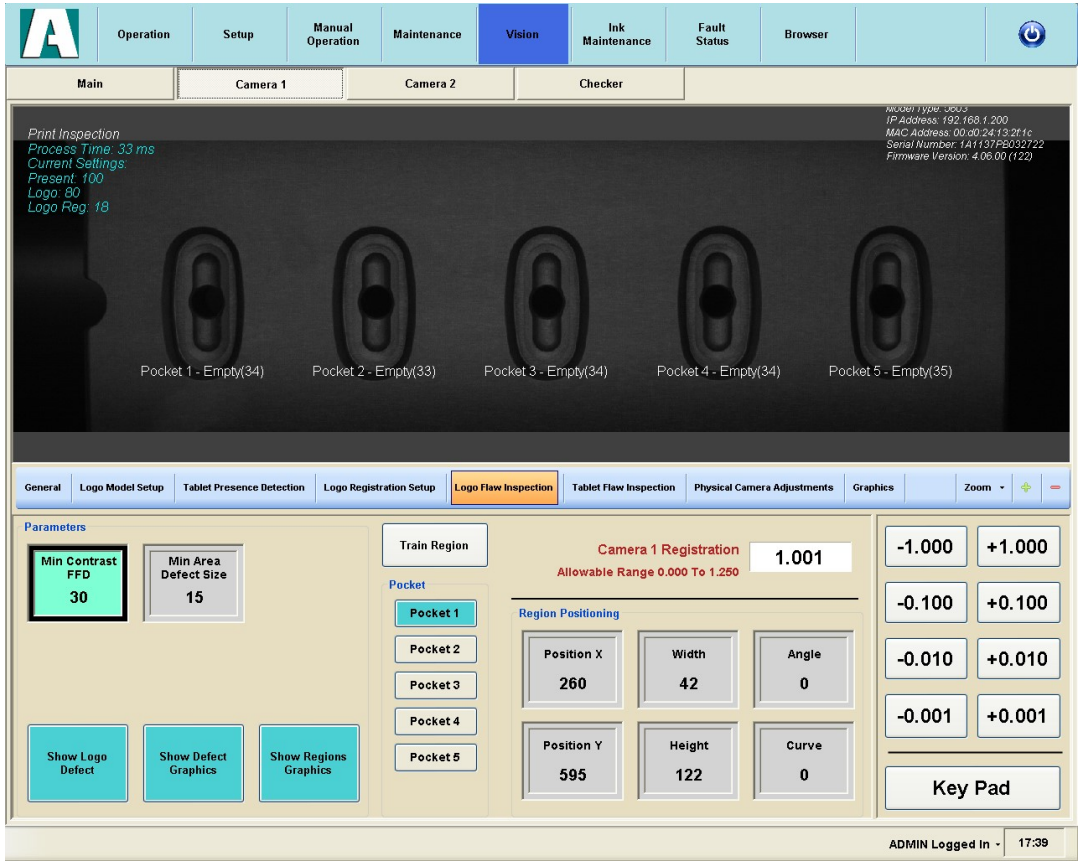
REGION POSITIONING
The user places a tablet in first one of five pockets for Camera 1. Press the Logo Registration button then with the Region Positioning Buttons and the Key Pad the user centers and sizes the box over the pocket for the Logo Registration. When the tablet box region is defined press the Hide Logo Region button to change to Regions Shown to show the sized box over all the tablets then press the Spacing button and enters the pocket centerline spacing with the Key Pad. Then press the Tablet Center Detection button and repeate the above procedure for the tablet center detection.

Repeat this procedure for Camera 2..

4. Control Panel (continued)

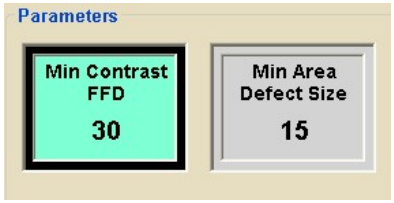
Vision Camera 1 – Logo Flaw Inspection

Vision Camera 1 Logo Flow Inspection screen can be accessed by pressing the Vision button located at the top of the screen, Camera 1 tab, and the Logo Flow Inspection tab. This tab allows the operator to setup the Logo Flow Inspection on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



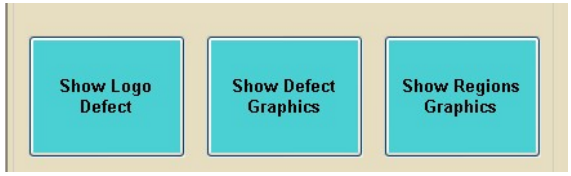
A brief description of the buttons on the Camera 1 Logo Flow Inspection screen is listed below:

4 Control Panel (CONTINUED)



Min Contrast FFD
Press this button to set the minimum contrast transition value to be considered as an edge or an area effect FFD.

Min Area Detect Size
Press this button to set the minimum area detect size in pixels. An area below this value is not considered a defect.



Show/Hide Logo Defect
Press this button to hide the logo defect.

Show/Hide Defect Graphics
Press this button to hide the defect graphics.

Show/Hide Regions Graphics
Press this button to hide the regions graphics.

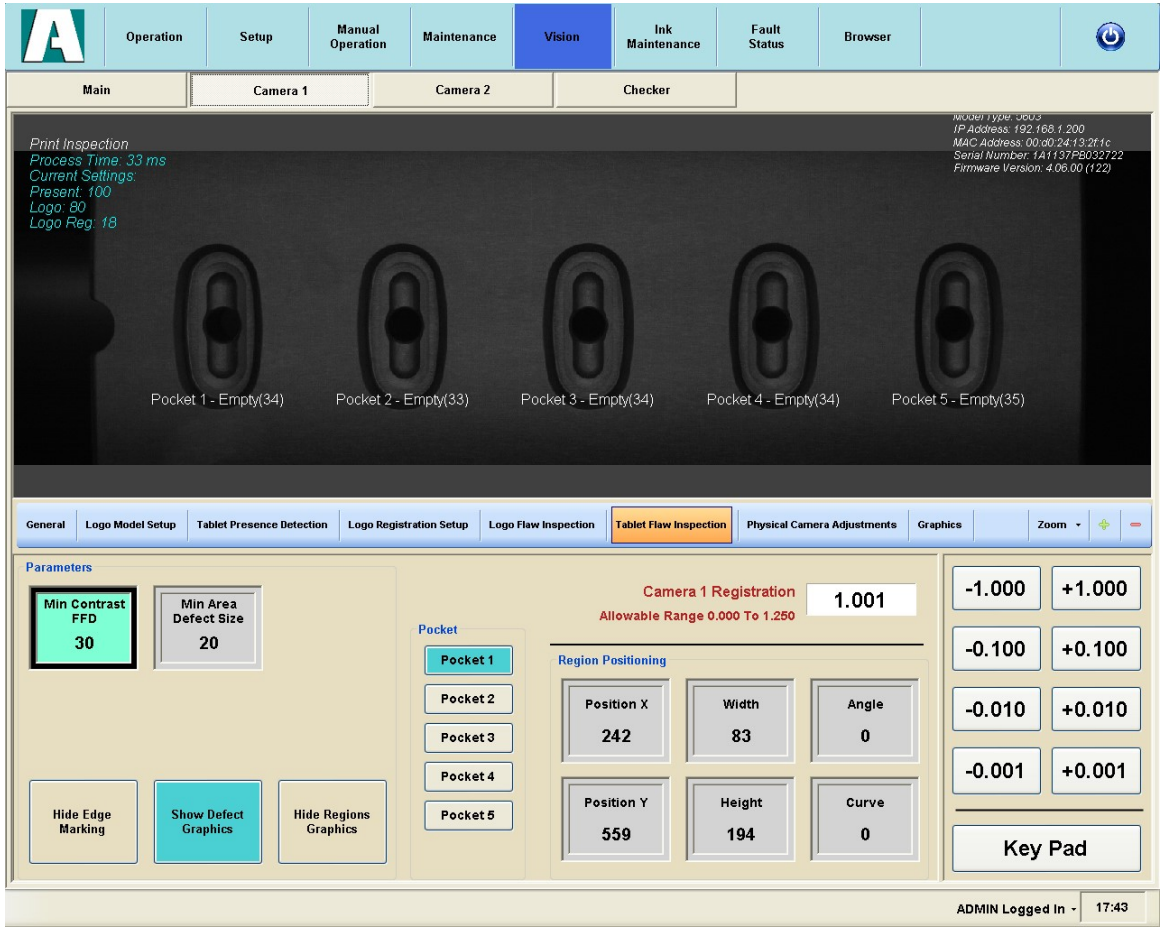
Region of Positioning
With these buttons the user sets up the Region of Inspection (ROI) of the image that undergoes image analysis for each of the 5 pockets. When a pocket button is pressed to select that pocket it turns blue.

Train Region
Press this button (after each one of the 5 pocket region is set.

4 Control Panel (CONTINUED)

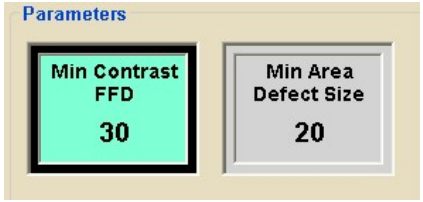
Vision Camera 1 – Tablet Flaw Inspection

Vision Camera 1 Tablet Flow Inspection screen can be accessed by pressing the Vision button located at the top of the screen, Camera 1 tab, and the Tablet Flow Inspection tab. This tab allows the operator to setup the Tablet Flow Inspection on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



A brief description of the buttons on the Camera 1 Tablet Flow Inspection screen is listed below:

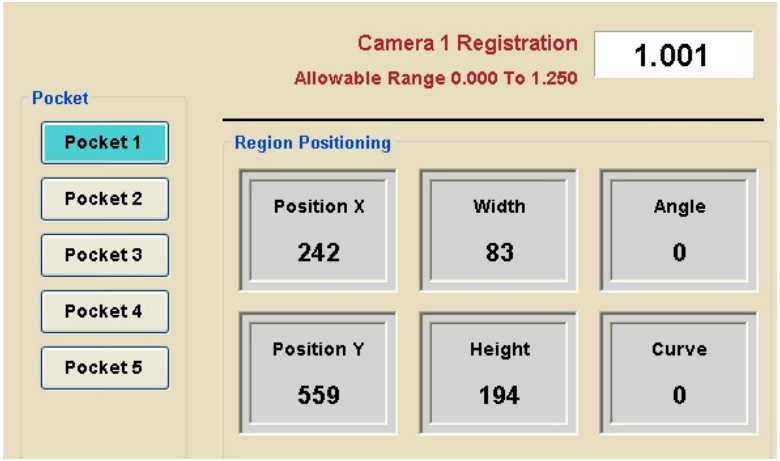
4 Control Panel (CONTINUED)



Min Contrast FFD
Press this button to set the minimum contrast transition value to be considered as an edge or an area effect FFD.

Min Area Detect Size
Press this button to set the minimum area detect size in pixels. An area below this value is not considered a defect.

Show/Hide Edge Marking
Press this button to hide the edge marking.
Show/Hide Defect Graphics
Press this button to hide the defect graphics.
Show/Hide Regions Graphics
Press this button to hide the regions graphics.



Region of Positioning
With these buttons the user sets up the Region of Inspection (ROI) of the image that undergoes image analysis for each of the 5 pockets. When a pocket button is pressed to select that pocket it turns blue.

Train Region
Press this button (after each one of the 5 pocket region is set.

4 Control Panel (CONTINUED)

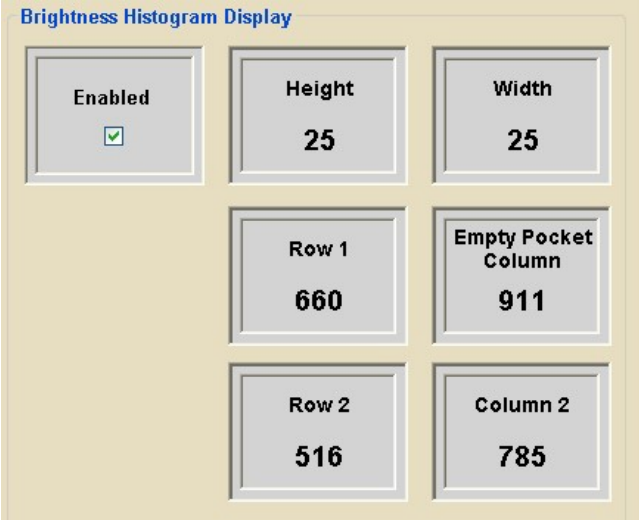
Vision Camera 1 – Physical Camera Adjustments

Vision Camera 1 Physical Camera Adjustments screen can be accessed by pressing the Vision button located at the top of the screen, Camera 1 tab, and the Physical Camera Adjustments tab. This tab allows the operator to setup the Physical Camera Adjustments on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

A brief description of the buttons on the Camera 1 Physical Camera Adjustments screen is listed below:

4 Control Panel (CONTINUED)

Physical Camera Adjustments are factory set and should not have to be adjusted in the field.



BRIGHTNESS HISTOGRAM DISPLAY
Once the ENABLED button is active, the user is able to place the regions to define the positions that the cameras will use to determine the contrast between the tablet & the carrier bar.

CAMERA CENTER LINE INDICATOR
Once the ENABLED button is active, a cross-hair will be displayed on the screen. This allows the user to align the camera's physical position to the carrier bars

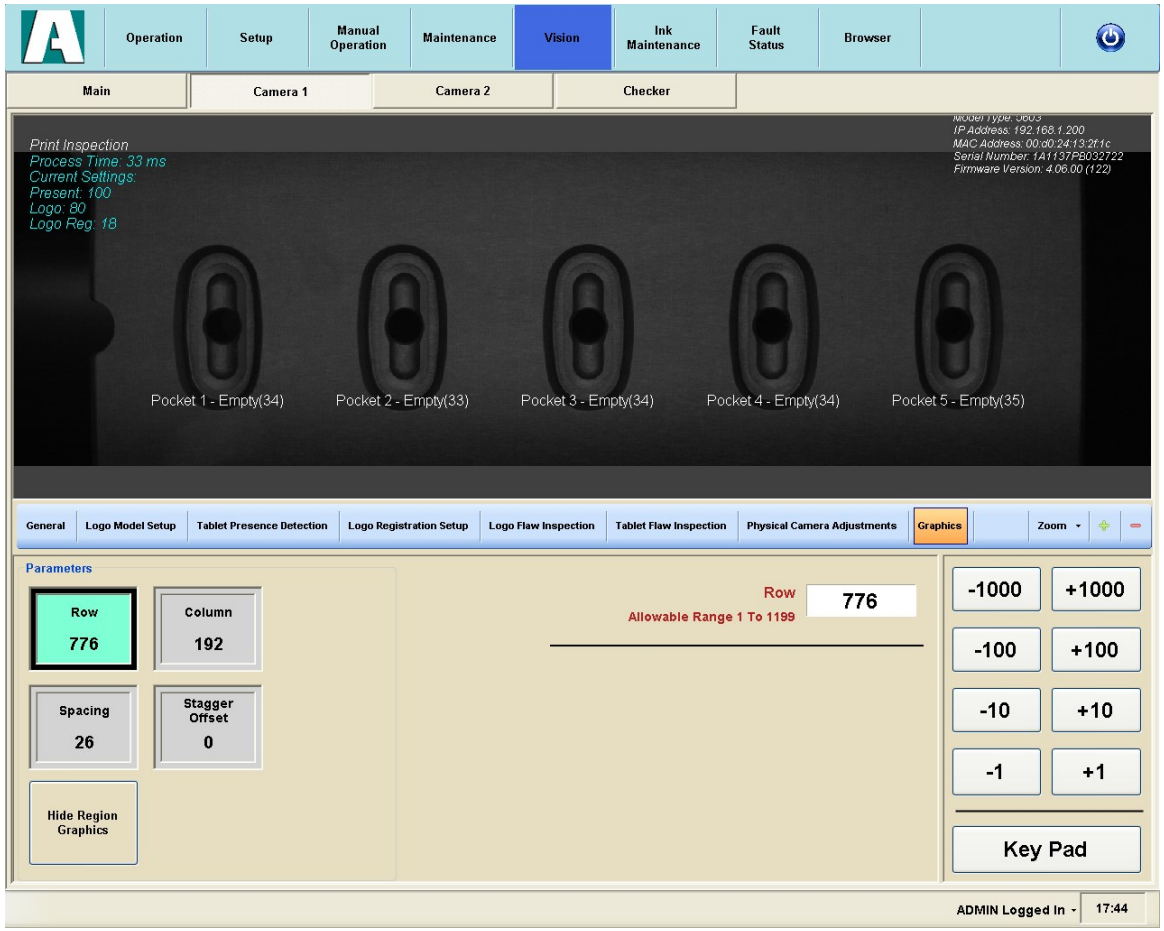
START ROW
This is the position (pixels) that the camera begins its vertical field of view.

NUMBER OF ROWS
This is the number of rows (pixels) that defines the camera's vertical field of view.

4 Control Panel (CONTINUED)

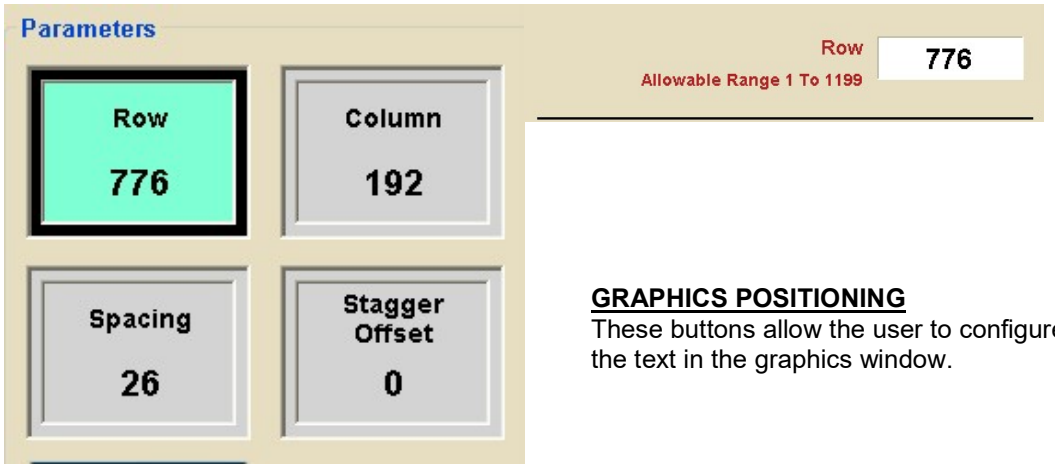
Vision Camera 1 - Graphics

Vision Camera 1 Graphics screen can be accessed by pressing the Vision button located at the top of the screen, Camera 1 tab, and the Graphics tab. This tab allows the operator to setup the Graphics on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

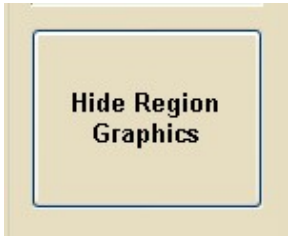


A brief description of the buttons on the Camera 1 Graphics screen is listed below:

4 Control Panel (CONTINUED)



GRAPHICS POSITIONING
These buttons allow the user to configure the position and spacing of the text in the graphics window.

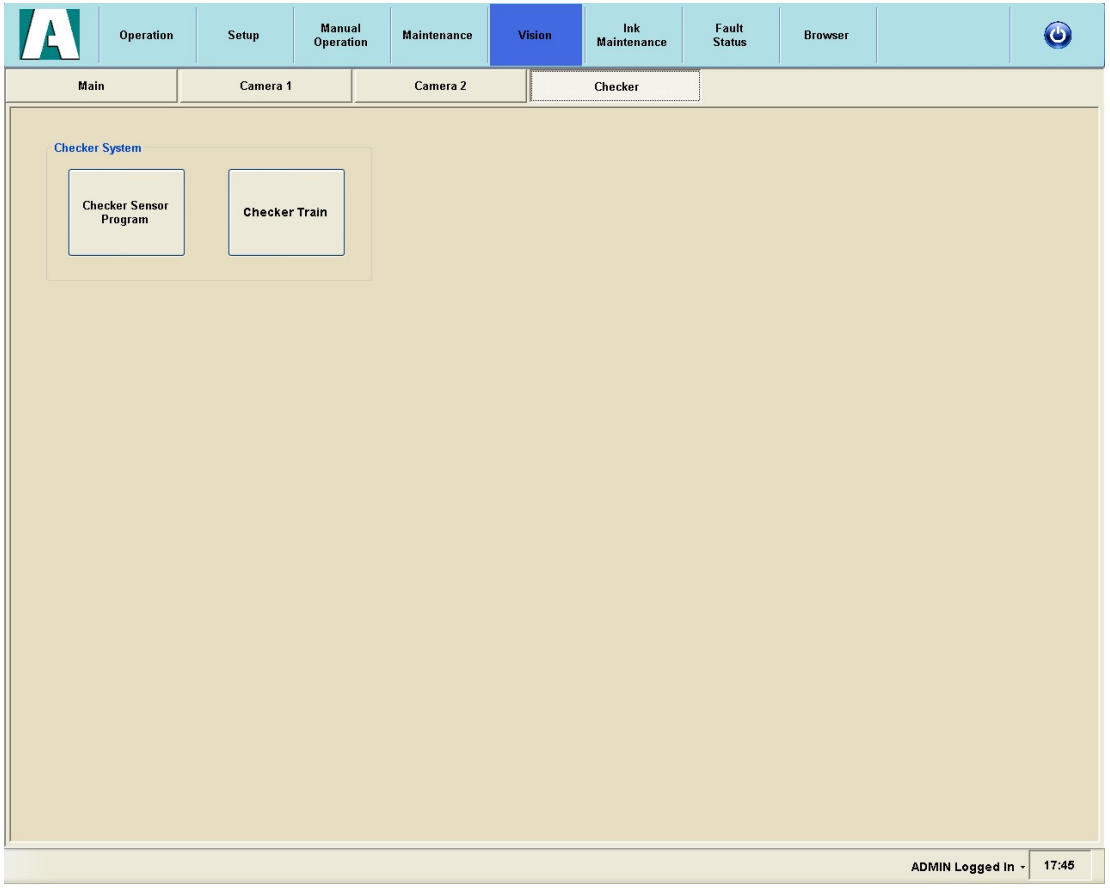


Show/Hide Regions Graphics
Press this button to show the region graphics.

4 Control Panel (CONTINUED)

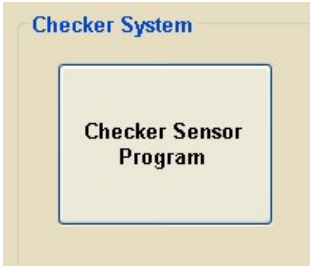
Vision - Checker

Vision Checker screen can be accessed by pressing the Vision button located at the top of the screen, Checker tab. This tab allows the operator to setup Checker Camera on the ACKLEY *machine corporation* Three Drum Printer with Inspection.



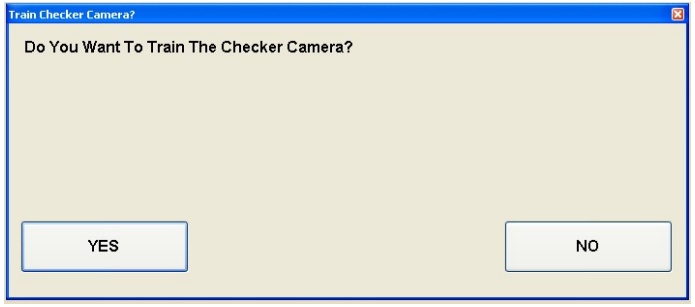
A brief description of the buttons on the Checker screen is listed below:

4 Control Panel (CONTINUED)



Checker Sensor Program
This button opens the Checker program.

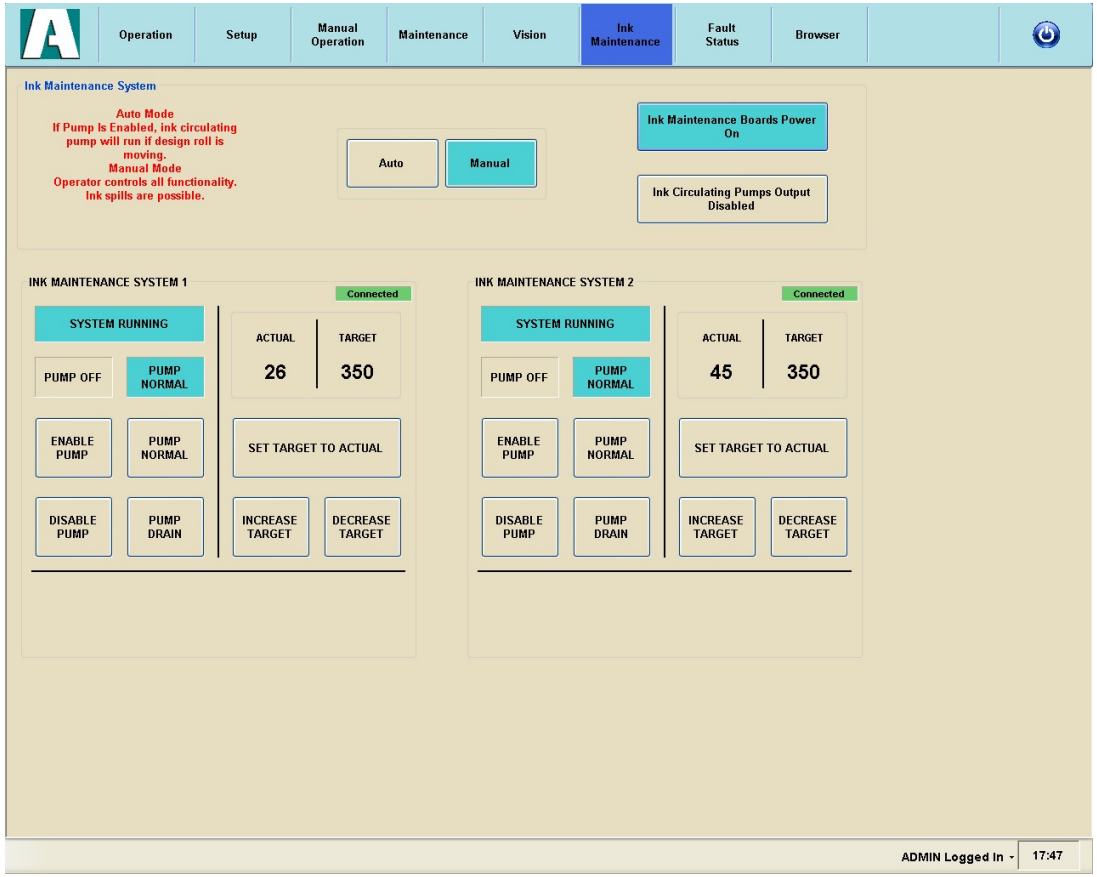
Checker Train
This button is used to train the Checker camera. When the button is pressed the Message Window below appears.
The Checker Training Procedure must be used.



4 Control Panel (CONTINUED)

Ink Maintenance

Ink Maintenance screen can be accessed by pressing the Ink Maintenance button located at the top of the screen. This tab allows the operator to setup the Ink Maintenance System on the ACKLEY *machine corporation* Three Drum Printer with Inspection.

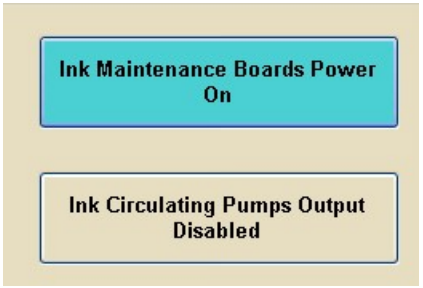


A brief description of the buttons shown on the Ink Maintenance screen is listed below:

4 Control Panel (CONTINUED)

Auto
Press this button to put the Ink Maintenance System in Auto Mode, button turns blue.
In Auto mode the ink pump is on when the Print Unit is running or in Idle mode. If the Print Unit is stopped the ink pump is turned OFF to avoid overfilling the Ink Pan.

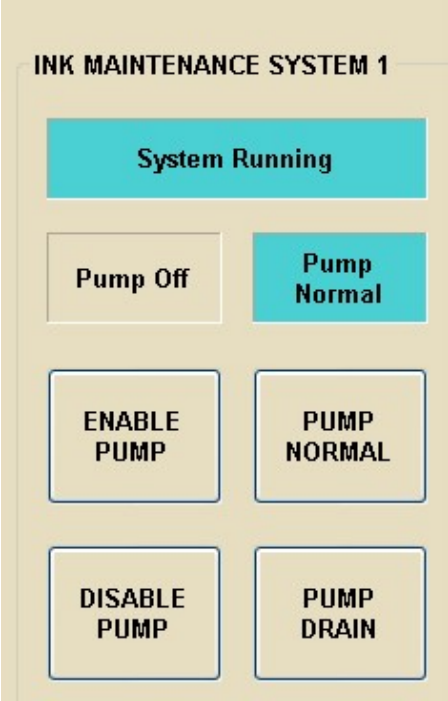
Manual
Press this button to put the Maintenance System in Manual Mode, button turns blue ((Auto turns tan). In Manual mode the ink pump is turned ON and OFF manually.



Ink Maintenance Board Power
This button turns the power ON / OFF to Ink Maintenance Board. When the ink reservoir unit Is removed for cleaning and is reinstalled the power to the board must be cycled ON with this button.

Ink Circulating Pumps Output
This button enables (blue) and disables the Ink Circulating Pumps PLC to the pump control buttons below.

4 Control Panel (CONTINUED)



System Runing
These are status indicators, blue when operating and tan when off.

Pump Normal
These are status indicator for the circulating pump to the Ink Pan.

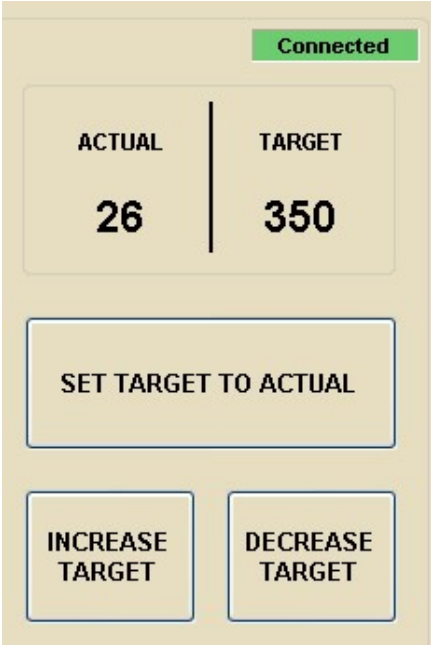
ENABLE PUMP
Pressing this button turns the Ink Maintenance System ink circulation pump on.

DISABLE PUMP
Pressing this button turns the Ink Maintenance System ink circulation pump off.

PUMP NORMAL
When the pump is Enabled and this button is pressed (turns blue) the Ink Maintenance System ink pump circulates ink from the reservoir into the Print Unit ink pan. The weir in the ink pan controls the ink level in the pan, ink flows over the weir into the drain tube and back into the ink reservoir.

PUMP DRAIN
When the pump is Enabled and this button is pressed (turns blue) the Ink Maintenance System ink pump reverses the ink circulation so the ink is pumped from the Print Unit ink pan back into the reservoir.
When the ink pan is empty the Disable Pump button is pressed and the ink pan can be removed for cleaning.

4 Control Panel (CONTINUED)



Connected
Indicates the status of being connected or disconnected to the HMI.

ACTUAL
The Value shown in this window is the empirical viscosity value for the ink in the reservoir.

TARGET
The value shown in this window is the set value for the Ink Maintenance System to maintain the ink.

SET TARGET VISCOSITY TO ACTUAL VISCOSITY
After the operator has adjusted the ink to get the best quality printed logo on the product and the value in the Actual window has stabilized this button is pressed to make Actual value the set value In the Target window.

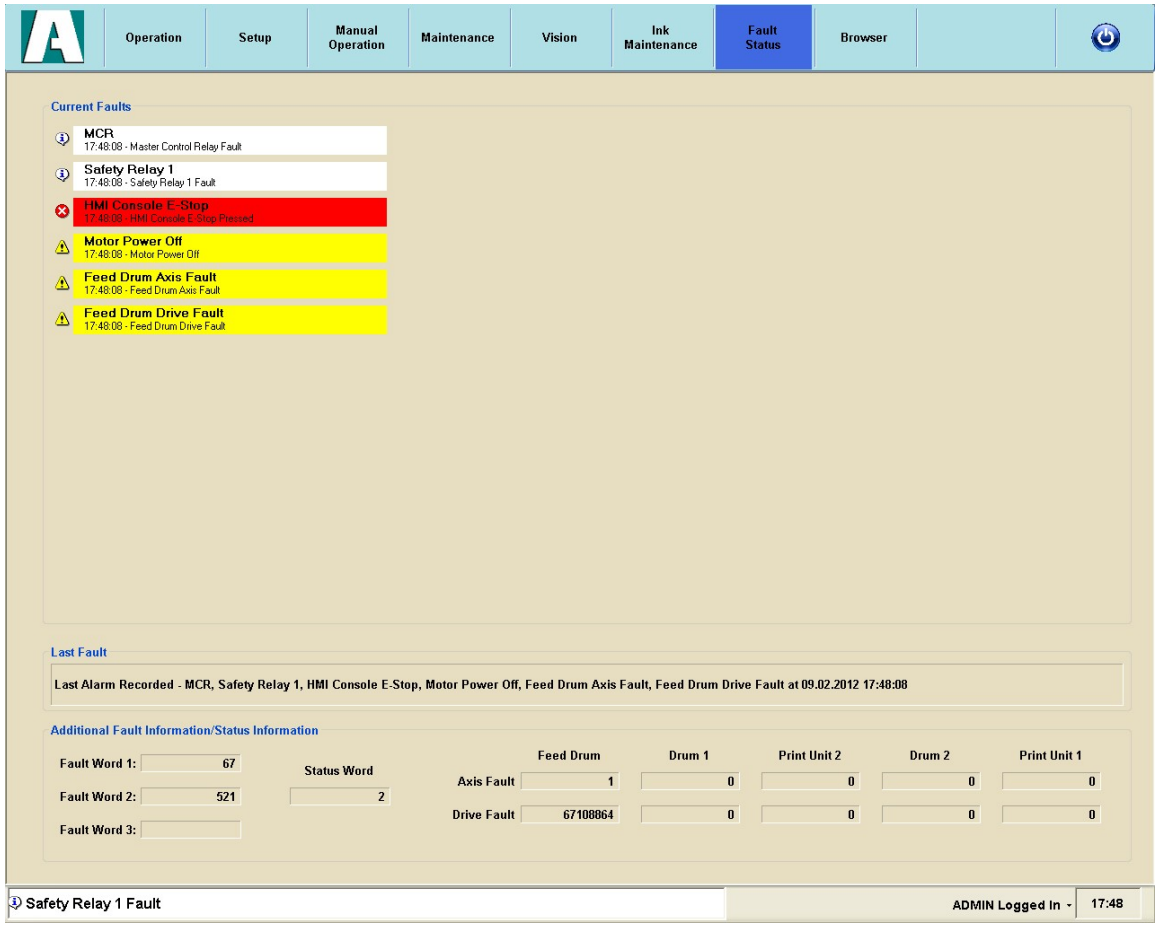
INCREASE VISCOSITY
Each time this button is pressed and released the Target value is increased one (1) digit.

DECREASE VISCOSITY
Each time this button is pressed and released the Target value is decreased one (1) digit.

4 Control Panel (CONTINUED)

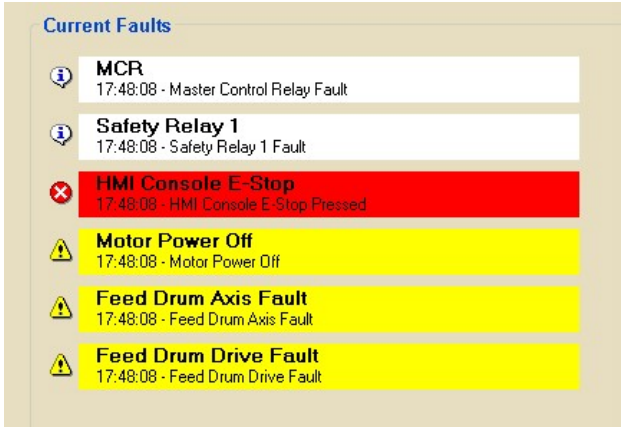
Fault Status Screen

The Fault Status screen can be accessed by pressing the Fault Status button located at the top of the screen. This screen will display any current faults the ACKLEY *machine corporation* Three Drum Printer with Inspection may be experiencing.



A brief description of the Faults status windows is listed below:

4 Control Panel (CONTINUED)



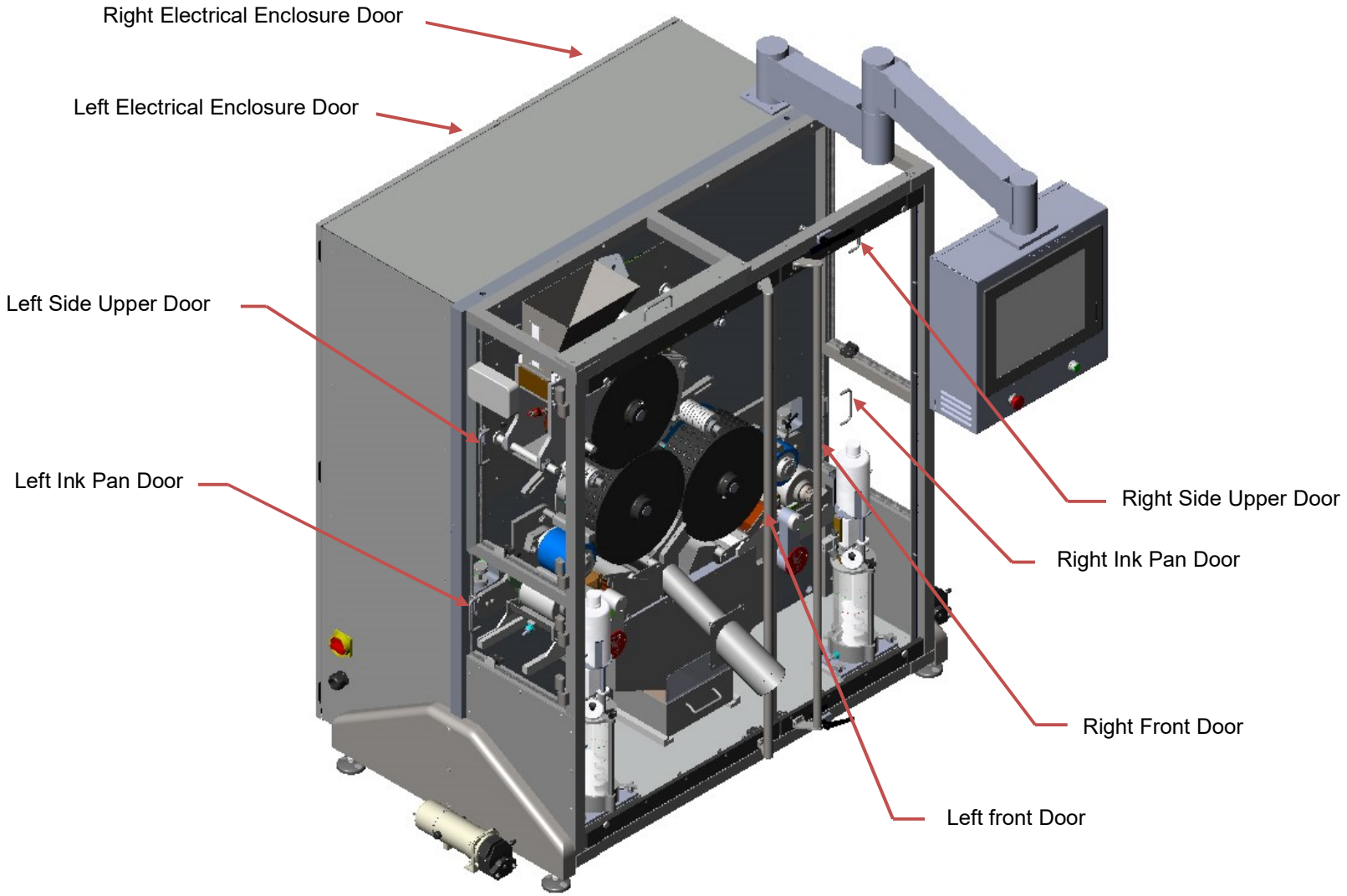
CURRENT FAULTS
This area displays all of the faults that are occurring at the time the screen is displayed. Red indicates primary faults such as E-Stops, Guards, Console Doors, etc. The yellow and white are secondary type faults.

LAST FAULT
This displays the last fault/faults experienced by the system.

ADDITIONAL FAULT/STATUS INFORMATION
This displays advanced fault information for troubleshooting purposes

4 Control Panel (continued)

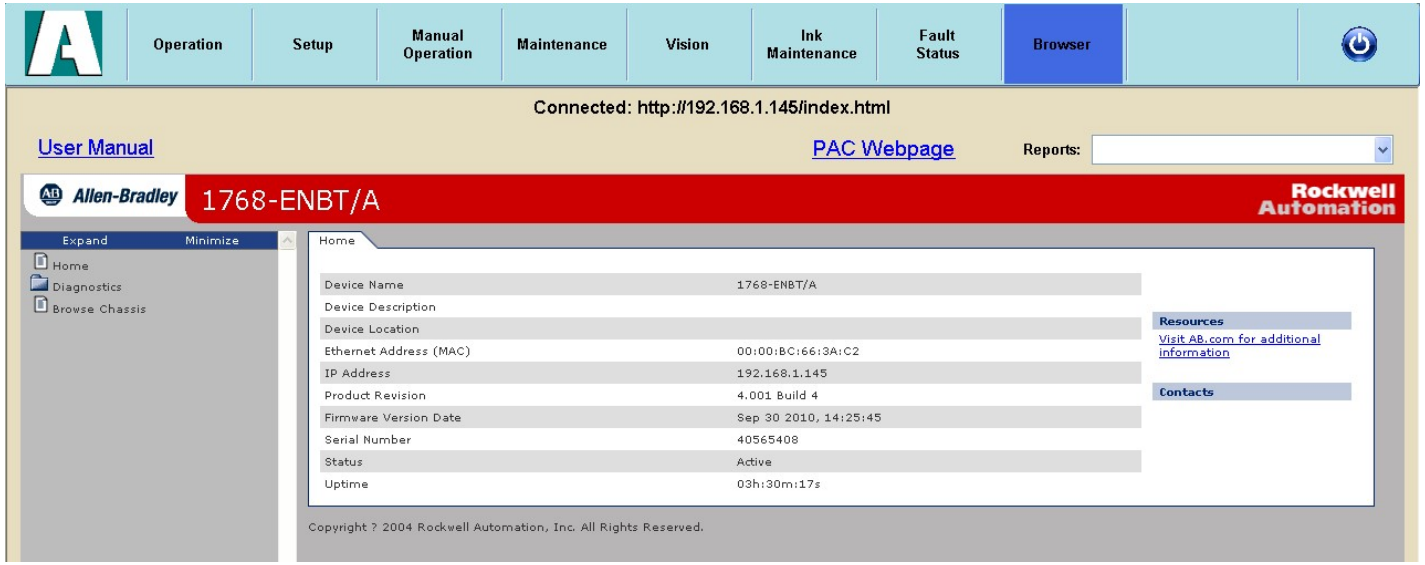
Fault Door Names



4 Control Panel (continued)

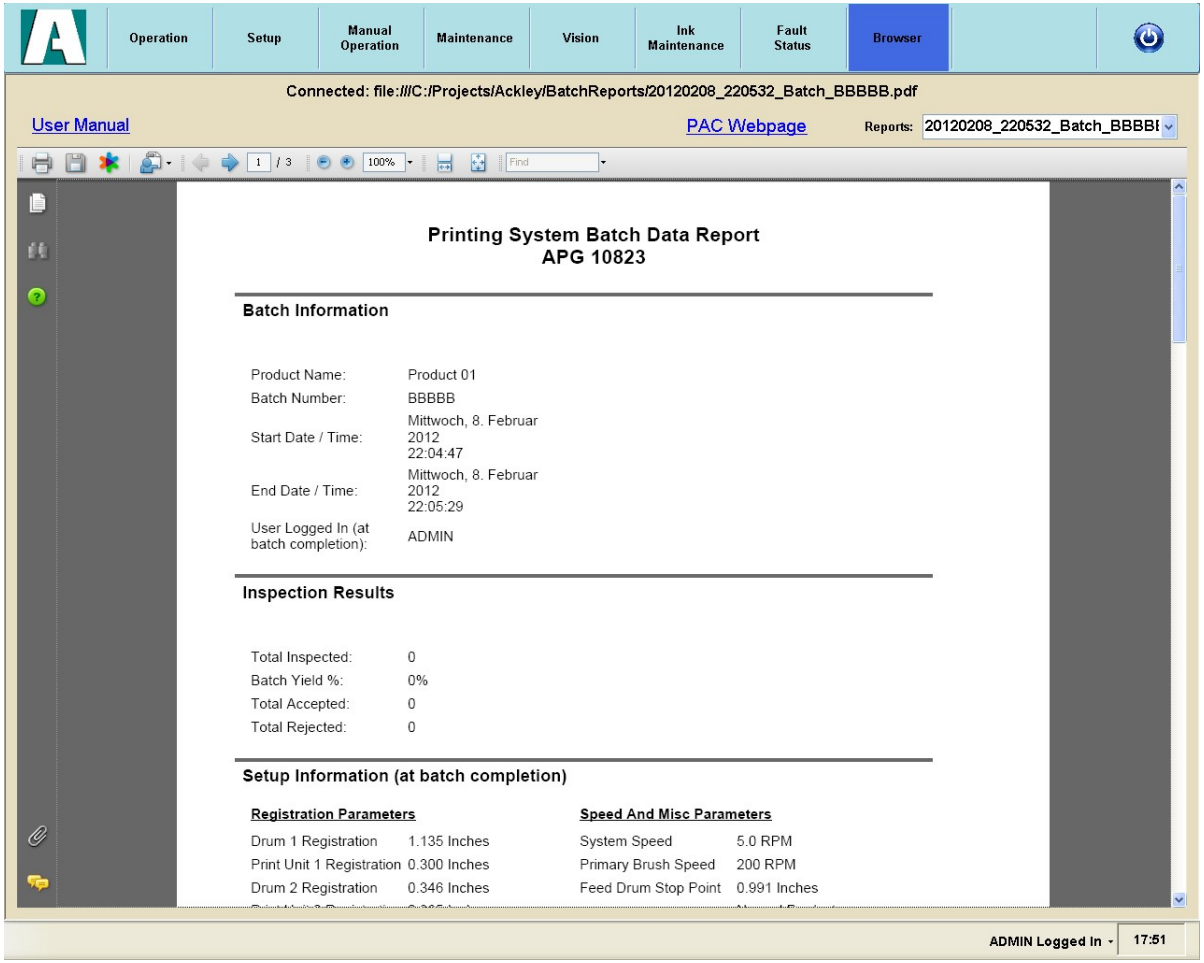
Browser Screen

The Browser screen can be accessed by pressing the Browser button located at the top of the top of the screen. This screen displays the PCL information, batch Report and the Operation and Maintenance Manual for the Novartis, Stein ACKLEY *machine corporation* Three Drum Printer with Inspection.



4 Control Panel (continued)

Browser Screen – Batch Report



5. System Startup

Machine Setup – Before Operation

Adjust Feed Drum Stop Point

1. The Feed Drum Stop Point should be set before any ink is poured into the ink pans.
2. Make sure that the system has been homed by pressing Home System on the Setup screen.
3. Stop the Feed Drum by either pressing Stop or Product Stop on the Operations Screen
4. Go to the Product Select screen and select the appropriate Product # for the product to be setup.
5. Press Setup to go to the Setup screen.
6. Select the Feed Drum Stop Point by clicking it if it is not already highlighted.
7. Adjust the Back Guide position for the current product by loosening the mounting screws and moving the back guide to the appropriate adjustment mark. The optimum back guide position has been tested for each product and is included in the Printer Specification Sheet for each product located at the end of this manual.
8. Observe the position of the pocket or product in relation to the back guides where the product transfers to the Print Drum. The front edge of the product should be about 1/16" from the edge of the back guide. This allows the last product to transfer cleanly, while keeping the next product completely supported on the back guide.
9. If the position of the pocket or product is not where it should be then adjust this by pressing the +0.100, -0.100, +0.030, -0.030, +0.003, -0.003 until it is where it should be. If the Stop Point is adjusted backwards by pressing any of the "-" buttons along the bottom of the Adjust Registration box, then the Feed Drum will actually move forward to make the proper adjustment. This is to prevent product breakage in the event the feed drum moved backwards and there was product in the hopper.
10. Once the Feed Drum Stop Point is set, then you can move on to adjust the print drum registration.

Adjust Print Drum Registration

1. Make sure that the system has been homed by either pressing Run on the Operations screen or the Home System on the Setup screen.
2. Stop the system by pressing Stop on the Operations Screen
3. Go to the Product Select screen and select the appropriate Product # for the product to be setup.
4. Press Setup to go to the Setup screen.
5. Select the Print Drum by clicking it if it is not already highlighted.
6. Observe the position of the Print Drum in relation to the Feed Drum. Notice that there are timing marks on the side of the drum for each pocket to assist in machine setup. The timing between the Feed Drum and Print Drum is variable. This setting will vary depending on the size, shape and lubricity of the product.
7. If the position of the drum is not where it should be then adjust this by pressing the +0.100, -0.100, +0.030, -0.030, +0.003, -0.003 until it is where it should be. You will probably need to tweak this setting while running to ensure optimal transfer from the Feed Drum to the Print

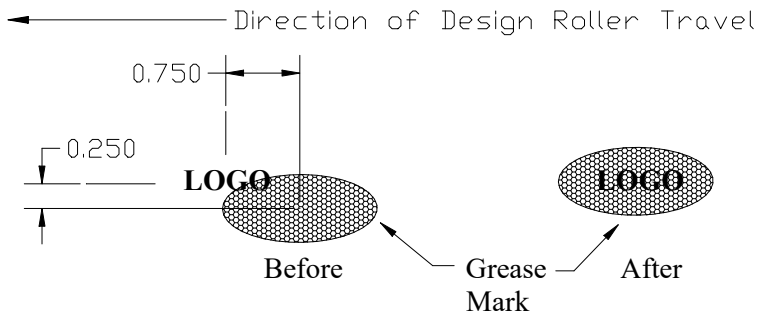
5. System Startup (continued)

8. Drum. It is best to get it close before running any product to prevent significant product breakage.
9. Turn on the Vacuum Pump and feed a small amount of product to test the transfer between the drums. Repeat steps 5-8 as necessary to ensure proper product transfer.

Adjust Print Unit Registration

1. Print unit registration is best performed using the grease transfer method. Make sure to note the direction of travel for the print unit when measuring how far to increase or decrease the registration. All registration numbers are in the direction of travel. A positive number is further forward than a negative number in relation to the print drum.
2. Power up the system and press Reset. Make sure that the system is homed by either pressing the Home System on the Setup screen or by pressing Run on the Operation screen.
3. Go to the Product Select screen and select the appropriate Product # for the product to be setup.
4. Turn on the vacuum pump by pressing the Vacuum On/Off on the Operation screen.
5. Press the Run button on the Operation screen and make sure that the design roller and offset roller are clean of ink, grease and debris.
6. Press Stop on the Operation Screen.
7. Manually feed one product into the Print Drum before the print unit. Place a small amount of grease on the product and spread it around evenly over the product surface.
8. Press Run on the Operation screen and then wait for the product to transfer grease to the offset roller and then for the offset roller to transfer the grease to the design roller.
9. When the grease mark is visible on top of the design roller, press Stop on the Operation screen.
10. Observe how far off the grease mark is from the closest logo. Measure how far the logo has to move laterally (side to side) and how far is has to move circumferentially (in the direction of motion).
11. Adjust the lateral registration by loosening the locking collar on the design roller adjustment collar. Turn the collar clockwise to move the logo towards the printer frame and counterclockwise to move the logo away from the printer frame. One full turn of the design roller adjustment collar will move the logo ~0.083” or 1/12” (one-twelfth of an inch).
12. Adjust the circumferential registration by going to the Setup screen. Select the Print Unit by clicking it if it is not already highlighted. Increase or Decrease the Print Unit Registration by the amount observed using the “+” and “-“ buttons.
13. Repeat Steps 5 thru 12 until the logo is in the center of the grease transfer mark.
14. Below is an example of a grease transfer mark before adjustment and after adjustment. In this example, you would need to make the following adjustments: Adjust the lateral adjustment 0.250” towards you by turning the lateral adjust collar three (3) full turns counterclockwise (3 * 0.083 = 0.250). Adjust the circumferential registration by changing the registration by -0.750 by pressing the –0.100 button seven times, the –0.030 button once, and the –0.003 button seven times (-0.100*7 –0.030 - 0.003*7 = -0.751).

5. System Startup (continued)



Operation (Single Side Printing)

1. This procedure assumes that the machine has been setup for the current product prior to operation.
2. Power up the system, wait for HMI program to load.
3. Make sure that there are no faults displayed.
4. Press the Reset pushbutton, make sure that green light comes on and stays on.
5. Press Auto/Manual button to change to Manual Mode for both Print Unit 1 and 2.
6. Press Product Select Screen button.
7. Press the Product button for the current product to be run.
8. Press the Operations Screen button.
9. Press Run to home the system and start operation.
10. After system starts running, press Stop.
11. Press Auto/Manual to change to Auto Mode for the Print Unit being used. Make sure that system is in Auto mode for the Print Unit being used BEFORE you pour ink to minimize the potential for an ink spill.
12. Prepare ink for use on the printer. Shake well and add appropriate amounts of solvents.
13. Pour ink into ink pan for the Print Unit being used.
14. Press Doctor Blade Impression to lower the doctor blade for the Print Unit being used.
15. Press Run to start the system running and make sure that the ink is doctoring properly.
16. Press Product Feed Stop to stop the Feed Drum.
17. Press Vacuum Pump button to turn on the vacuum pump. Check to make sure that the vacuum pump is on before feeding product.
18. Load product into the hopper and adjust the flow control gates per printer specification sheets.
19. Press Product Feed to start the product feeding.

5. System Startup (continued)

Operation (Two Side Printing)

20. This procedure assumes that the machine has been setup for the current product prior to operation.
21. Power up the system, wait for HMI program to load.
22. Make sure that there are no faults displayed.
23. Press the Reset pushbutton, make sure that green light comes on and stays on.
24. Press Auto/Manual button to change to Manual Mode for both Print Unit 1 and 2.
25. Press Product Select Screen button.
26. Press the Product button for the current product to be run.
27. Press the Operations Screen button.
28. Press Run to home the system and start operation.
29. After system starts running, press Stop.
30. Press Auto/Manual to change to Auto Mode for both Print Units. Make sure that system is in Auto mode for both print Units BEFORE you pour ink to minimize the potential for an ink spill.
31. Prepare ink for use on the printer. Shake well and add appropriate amounts of solvents.
32. Pour ink into ink pan for both Print Units.
33. Press Doctor Blade Impression to lower the doctor blade for both Print Units.
34. Press Run to start the system running and make sure that the ink is doctoring properly.
35. Press Product Feed Stop to stop the Feed Drum.
36. Press Vacuum Pump button to turn on the vacuum pump. Check to make sure that the vacuum pump is on before feeding product.
37. Load product into the hopper and adjust the flow control gates per printer specification sheets.

Ink Characteristics

The following list gives the relative rate, fastest to slowest of some commonly used solvents.

SDA-3A Alcohol
Ethyl Alcohol
Isopropyl Alcohol
Normal Butyl Alcohol
Propylene Glycol (Used Sparingly)

An equal mixture by volume of Isopropyl and Butyl alcohol is a good average dry-time solvent. However, each ink and its use on various machines and types of product can be different. Install ink pans. Raise pans to full "UP" position and tighten black lever handles.

Doctor Blade Adjustment

When the machine is running in Idle mode press the Stop button on the Operation screen. In Print Unit Manual mode raise the Doctor Blade. Loosen the three (3) hex head screws on bottom of blade holder and finger tighten. Put doctor blade in "down/on" position.

Inspect doctor blade action. If doctor blade is wiping the ink clean from the design roller, apply slight hand pressure to top side of blade holder to maintain blade position. While holding, tighten the three (3) hex head screws on the bottom of the holder.

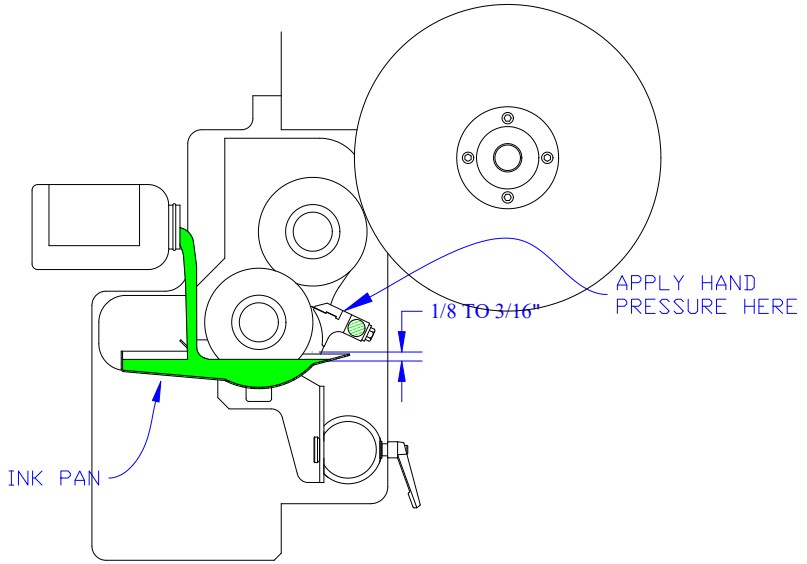
If there are no ink leaks or trace lines, adjust the doctor blade pressure regulator, located inside the control console, to the lowest pressure that provides a clean wipe of ink from the design roller. Lower pressures greatly reduce design roller and doctor blade wear.

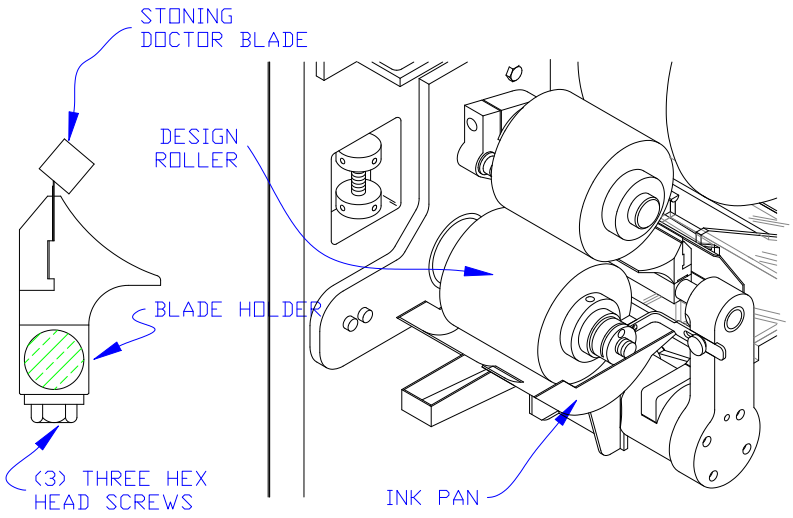
When ink leaks or traces cannot be stopped, press the Stop button on the Operation screen. Put doctor blade(s) in "up/off" position by pressing the Doctor Blade 1(2) Impression on the Operation screen to lift the doctor blade, and inspect blade(s) for debris, or nicks. If there are nicks, rub the nicks out on the bottom side of the blade with a fine India stone, and then finish with a fine Arkansas stone.

Wipe blade with an alcohol-dampened cloth to remove finishing debris; also, check the design roller for debris, and clean if necessary. Put doctor blade(s) in "down/on" position. Re-check wiping action on design rollers.

If there are still leaks or trace marks, the doctor blade has to be replaced with a new blade. Check a new pre-honed blade, or hone a new blade so it is ready to install. It is important that the blade be replaced as quickly as possible; and, that the machine is stopped for only a short period, so that the ink does not dry in the etches.

Doctor Blade Adjustment(continued)





Doctor Blade Replacement

Stop the machine, remove the doctor blade assembly, wipe design roller etches with an alcohol-dampened cloth, then wipe the ink off the doctor blade and holder.

BE CAREFUL - BLADE IS SHARP!

Replace damaged blades and put the new doctor blade in the "on" position, re-start machine, and re-check wiping action. Blade must never be out of contact with the design roller when the machine is running with ink in the pan. If not contacting, ink is carried around the design roller and transferred to adjacent machine parts, requiring immediate and extensive cleanup.

Make necessary doctor blade adjustments as described above.

Product Change-Over

1. Run system until all product is removed.
2. Remove Back Guide Assembly, Primary Brush and drive belt for Hopper Brush (if supplied).
3. Remove both the Design Roller and Offset Roller.
4. Remove Feed Drum and Print Drum.
5. Remove Hopper Assembly.
6. Install Hopper Assembly for product to be run.
7. Install Feed Drum and Print Drum for product to be run.
8. Install both the Design Roller and Offset Roller for product to be run.
9. Install Primary Brush, drive belt for Hopper Brush (if supplied) and Back Guide Assembly.
10. Adjust the Back Guide position for the current product by loosening the mounting screws and moving the back guide to the appropriate adjustment mark. The optimum back guide position has been tested for each product and is included in the Printer Specification Sheet for each product located at the end of this manual.
11. Power up system and go to Product Select screen.
12. Select Product Number to be run. If the product has been setup before, then all of the system parameters should be already be set. If the product has not been setup before or the parameters have been overwritten, then proceed to Machine Setup above. If the product has been setup before, but you are using a new design roller, then proceed to Adjust Print Unit Registration above.

5. System Startup (continued)

After the offset roller impression and stripper plate adjustment is complete on the ACKLEY *machine corporation* Three Drum Printer with Inspection, the system is ready for the addition of the printing ink.

Ink Maintenance System

General Description

The Ink Maintenance System will monitor, recirculate and maintain the printing ink. The ink tray, tubing and reservoir for the ink are designed to hold two to three (2 - 3) kilograms of printing ink.

A peristaltic pump circulates the ink to the ink pan through FDA compliant food grade tubing. The ink flows through the ink pan and is mixed by the design roller. A weir maintains the ink level in the pan. The ink flows over the weir and gravity feeds back to the reservoir.

Relative viscosity is monitored by means of an auger that rotates in the printing ink. This auger measures shear and periodically speeds up for a short period to mix the ink in the reservoir. Solvent is added as required by means of a solenoid controlled injection system.

The Ink maintenance System DOES NOT REQUIRE CALIBRATION

This system has NOT been designed to indicate the viscosity of an ink; it has been designed to **MAINTAIN** the relative viscosity of the ink presently in the system, which is currently providing good print quality.

Ink Maintenance System Startup and Operation

Clean and install the ink pan on Print Unit 1 and install the ink supply and ink drain tubes on Ink Maintenance system 1. Insure that the reservoir mounting clamps are in the locked position. Install the quick release end of the ink supply tube into the opening on the bottom of the ink supply reservoir, making sure that the connector clicks in and locks. Install the return line at the top of the unit.

Thoroughly mix printing ink and add to the fill level indicated by the green line on the reservoir. The ink level in the reservoir should always be above the red line to insure that the auger blade is always fully submerged. **Do not allow level to drop below red line. The auger blade MUST be completely covered or the ink viscosity will not be properly maintained!**

Open the pumping assembly by moving the locking lever away from the printer. Place the ink supply tube ***fully*** into the pumping assembly and move locking lever to the full locked position (toward the printer), making sure it locks. Check the tubing to insure that it is not crimped by the pump. On the Ink Maintenance screen press the Manual button, Ink Maintenance Board Power On button, Pump Normal button and the Enable Pump button (buttons turn blue). Pump Normal and the System Running indicators turns blue. Ink will now pump from the reservoir up to the ink pan. Ink will circulate and drain over a weir back to the reservoir. On the Operation screen press the Idle button so the Print Unit 1 is operating in Idle mode. Then press the Auto button (Auto button turns blue and the Manual button turns tan). Add additional ink to the reservoir if necessary so the ink level is above the red line and below the green line, DO NOT OVER FILL. The weir in the Print Unit ink pan will maintain the ink level in

Ink Maintenance System Startup and Operation (continued)

the ink pan. If the doctor blade is leaving ink streaks or smear on the design roller follow the procedure in the Doctor Blade Adjustment section above.

If the level of ink in the pan is changing the circulating pump speed can be adjusted with the viscosity speed dial SC-1 located in rear enclosure on Panel 3 for Print Unit 1 (pump speed is factory set for the ink supplied for the FAT).

Fill the Ink Maintenance System solvent bottle with mixture of solvents recommended by the ink manufacture.

Print tablets to check the printed logo quality add diluents to the ink pan until the printed logo is optimized. Press the Idle button on the Operation screen and wait until the ink relative viscosity Actual reading stabilizes. The higher the reading, the more viscous the ink. When the Actual reading is stable press the Set Target Value to Actual button. As the viscosity increases due to solvent evaporation, the solenoid valve will automatically open, and solvent will be added at a predetermined amount and rate, to compensate for the thickening of the ink.

The Ink Maintenance System should maintain the Target value to within +/- 10 % of the Actual value. Let the system run in Idle mode for several hours to check that the Ink Maintenance System maintains the Actual value to the target value to within this tolerance.

Repeat the above Startup and Operation procedure for Print Unit 2, Ink Maintenance System 2.

Cleanup

We do not recommend the use of caustic cleaners. They can be dangerous and will pit and erode aluminum. We do recommend plenty of HOT water and a detergent cleaner. As a rule, use only a cleaner that you would use on your own skin!

Clean the Offset Roller and Press the Stop button on the Operation screen to stop the printer. Press the Ink Maintenance button to change to the Ink Maintenance screen. Press the Manual button (turns blue) and then press the Pump Drain button. Allow the ink in the pan to be pumped back into the reservoir. Scrape excess ink in the pan into the drain port. Remove the ink pan fill tube and install the plug, and pump the ink into a suitable container until the reservoir is empty. Wipe ink out of the drain port. Carefully remove the drain hose. Lower ink pan to the "down" position. **DO NOT REMOVE THE INK PAN!** Wipe ink off the surface of the design roller. Raise the Doctor Blade, wipe excess ink from the holder, the sides of the design roller, and remove side scrapers. Before removing the ink pan, clean off all ink traces that may drip. Open the pumping assembly by moving the locking handle fully away from the printer. Remove the return tube from the fitting at the ink pan end, raise and drain into reservoir. Remove the ink supply tube from the peristaltic pump housing. Remove the reservoir from its base.

Take the ink pan, return tube, reservoir, and side scrapers to the cleaning area. Thoroughly clean the reservoir, tubing, and quick release valves. Tubing, valves, reservoir and ink pan must be cleaned thoroughly or ink will harden and be difficult to remove.

Insure that NO ink contaminates affect the rotation of the spindle in the reservoir cap!

6. Machine Maintenance

Inlet Hopper

Maintain product level as recommended, to assure a consistent drum pocket fill rate.

Product Transfer

Operator should monitor product transfer from inlet hopper to the feed drum. Broken or "twin" tablets should be removed before they enter the hopper section.

Offset Roller

Keep free of dust and other debris. Use a soft bristle sash brush with bristles cut short for stiffness. Offset rollers may be wiped periodically with magnesium stearate talc, or French chalk, to prevent debris from sticking, and to reduce static build-up. It also forms a barrier between ink and roller. Apply lightly, and wipe all excess material from roller to avoid clogging etches.

Design Roller

Monitor for ink streaking. Debris may occasionally collect under the doctor blade, causing ink streaking and possible design roller damage. If build-up occurs, machine must be stopped, doctor blade placed in "Up/Off" position, and debris cleaned from the doctor blade with an alcohol-dampened cloth. Printing process should be re-started as soon as possible.

Cleaning of Ackley Machine Printer Aluminum Parts

Please observe the following guidelines when cleaning the aluminum parts:

The pH range that needs to be observed for the material used to clean aluminum parts is 5.5 to 9.5.

The composition of the material should NOT contain sodium hydroxide.

The temperature of the cleaning material should NOT exceed 140° degrees Fahrenheit.

The immersion and/or exposure time should NOT exceed five (5) minutes.

Ultrasonic cleaning is NOT recommended for conducting cleaning of hard coat anodized aluminum.

7. System Shutdown

Short Term Shutdown

Press the Product Stop button on the Operation screen, and then press Idle. Allow all product to pass the print station, and discharge. The print drum will stop and the offset roller will automatically come off impression. The print unit will continue to run at an Idle speed to keep the ink from drying in the design roller etches.

Offset Roller Cleaning

Wipe offset roller clean with an isopropyl alcohol-moistened cloth. Isopropyl alcohol is the recommended cleaner for maintaining offset rollers. Butyl alcohol will tend to soften the rubber, and also takes longer to dry. Other solvents may damage the rollers' surface. It is important that offset rollers are cleaned immediately so ink does not dry on the rollers. Dried ink on offset rollers is difficult to remove. Allow offset rollers to dry, wipe with magnesium stearate, remove excess, and then stop machine.

Design Roller Cleaning

Press the Idle button on the Operation screen. Wet an etch brush with isopropyl alcohol, then scrub design rollers until etches are clean. For stubborn clogs, put print unit impression in the "Down/On" position. Do this by pressing the Auto/Manual button on the Operation screen to enter the Manual mode. Then press the Offset Roller Impression button to put the offset roller On Impression with the design roller. Wipe offset roller with cloth wet with isopropyl alcohol. The wet rubber surface will conform to etch, soften ink to help "suck" dried clogs out of etches. Avoid using excessive amounts of alcohol to prevent dripping onto the machine. Place the print unit impressions in the "Off" position. Wipe offset roller clean and re-check design roller etches. Repeat this process as necessary to obtain clean etches.

Doctor Blade Cleaning

Make sure that the Auto/Manual mode is set to Auto. If not, then press the Auto/Manual button to enter the Auto mode. Press the Stop button on the Operation screen to stop machine for cleaning. Place doctor blades in the "Up/Off" position. Check blade edges for damage or debris. ***Blades become very sharp after they have been run. It is important to exercise extreme caution.*** Wipe ink and debris off doctor blades and holders with isopropyl alcohol on a cloth. Inspect doctor blades and restone or replace as necessary. Put the doctor blades in the "Down/On" position. Press the Start button on the Operation screen and check wiping action of doctor blades.

7. System Shutdown (continued)

Machine Shutdown - Extended Periods

Close shut-off gate, stopping the flow of product, allow all remaining product to pass printing stages, and discharge from the machine. Clean the Offset & Design Rollers as described in MACHINE SHUTDOWN – SHORT PERIODS.

Doctor Blade Cleaning

Remove doctor blade holder by unscrewing the three (3) hex head bolts holding the body to the shaft.

Disassemble, and thoroughly clean all parts. Check parts for nicks, burrs, and refinish if found. Carefully clean and inspect doctor blade, replace if worn or damaged. Re-assemble doctor blade unit.

Ink Pan Cleaning

Wash ink pans and side ink scrapers in hot water and a borax detergent such as Boraxo®. Make sure water is very hot.

Preparing Machine For Down Period

Clean the entire machine of pieces of product, grease or oil residue and ink spatters.

Cover design rollers with a soft, protective, material. Protect entire machine with a clean cover.

For shutdown periods of more than one day, remove the design rollers, and store in shipping containers in which they were received. Also remove offset rollers and store in shipping containers.

8. Troubleshooting

Machine Won't Operate

Electrical

- Check power source to the machine, and check that the rotary disconnect is ON.
- The "Reset" button located under the touch-panel is in the correct position, and illuminated.
- Check the Fault Status screen on the touch-panel display for further information.
- If any of the E-Stops, Print Unit Safety Switches or Machine Guard Switches are tripped, then reset them and press Reset to restore power. If the Reset button remains illuminated, then there are no safety device faults.
- If any of the low pressure switches are tripped, check the incoming air supply to make sure that it is on. If the doctor blade low pressure switch is tripped, then check the gauge for the doctor blade
- If either vacuum pump starter is tripped, then turn off the vacuum pump and wait for 5 minutes before turning them back on. The vacuum pump starter overload relay is thermal and will automatically reset itself after it cools down.

Product Feed Problems

Product Will Not Feed Well

- Check for any obstruction in the inlet hopper.
- Check for changes in product size or surface finish.

Print Problems

Ink Transfer To Offset Roller

- Ink level too low in pan - Fill to correct operating level, 1/8"-3/16" (3.18mm - 4.76mm) below top edge of ink pan.
- Ink - too thick or pigment separation - Contact ink manufacturer for proper solvent(s) used in your ink.
- Clogged etches - Clean design roller. Dampen a clean cloth with isopropyl alcohol. With machine rotating, move print unit impression to "on" position. Wipe offset roller side-to-side with cloth. The wet rubber will conform to the etch; to help soften, and remove dried ink clogs. Move print unit impression to "OFF" position, and clean offset rollers. Use the etch brush for stubborn clogs.
- Damaged offset roller, flat spot - Replace offset roller.
- Offset roller contact with design roller - Design roller shaft and offset roller shaft center-to-center must measure 4.775" inches (121.28mm), with print unit impression in "ON" position. DO NOT ALTER THIS SETTING! If roller shaft centerline is incorrect, arrange for factory service representative to correct.

8. Troubleshooting (continued)

Ink Transfer To Product

- Check offset roller to product impression.
- Ink too thick - Add small amounts of recommended solvent.
- Ink too thin - Replace ink with new ink.
- Ink drying on offset roller - Add slow drying solvent.

Ink Print Quality on Product

Print Location On Product
If not centered refer to 14.1.3 ADJUST PRINT UNIT REGISTRATION

Print Weak, Thin Line
Ink is probably too thick, or drying too quickly. Add appropriate solvents to the ink pan.

Print Broad, Fuzzy, Washed-Out
Ink is probably too thin or too wet: reduce the amount of solvents entering into the ink pan, or replace with new undiluted ink.

Print Missing, Or Incomplete
Possibly debris on offset roller, clogged etches, insufficient print impression, or damaged offset roller.

Smudge Or Spotty Marked Printed Product
Offset roller print impression too high, "squash effect" - loose print rollers or debris in roller gears.
Spotting
Ink has not dried sufficiently before discharge.

Ink Is Drying Too Quickly
If ink is too thin to add solvents add Propylene Glycol. **NOTE:** Add in small amounts. Too much and ink may become too wet and cause ink spotting.

Product Damage

- Check for obstruction in inlet hopper.
- Offset roller over impression - Adjust to a lower pressure.
- Check transfer between drums.
- Excessive blow off air - Adjust to a lower pressure.

9. Maintenance

Recommended Spare parts

The following parts should be readily available at the location of the ACKLEY *machine corporation* 3 Drum Printer with Inspection for immediate replacement or for replacement during normal maintenance schedules when required.

Recommended quantities are listed for each part is based on two years, 2 Shifts per day, 5 days per week or 8000 hours of operation.

Qty	Description	Part No
8	Bearing – Design and Offset roller	99128-00009
6	Bearing – Drum	99128-00148
16	Bushing – Doctor Blade	99163-00016
500	Doctor Blades Pre-Honed	99135-00006
50	Back-Up Blades	99135-00009
3	Brush – Primary Hopper	See Spec. Sheet
1	Driver – DC Quadrant	99241-00360
1	Driver – Analog Ref. Signal	99241-00361
1	Master Driver AC Servo 900W/200V	99241-00589
1	Driver – AC Servo 900W/200V	99241-00590
1	Motor – AC Servo 620W/200V	99500-00102
1	Reducer – Hollow Shaft, 30:1	99619-00033
1	Reducer – Hollow Shaft, 70:1	99619-00035
1	Home Sensor	99638-00020
1	Power Supply – 24VDC, 5A	99241-00572
1	Power Supply – 24VDC, 10A	99241-00573
2	Relay – DPDT 24VDC Control	99241-00440
1	PAC – 8 Axis Motion Controller	99498-00071
1	HMI – Touch Panel Computer, 17″	99499-00058
16	Gear – Design and Offset Rollers	99430-00264
1	Motor, Hopper Brush	99500-00049
1	Motor, Oscillator, Print Unit	99500-00101
1	Relay, Contactor 35A	99241-00442
1	Relay, SPDT 24VDC	99241-00535
2	Over Load 7-10 Amp 2NO 2NC	99241-00451
2	Auxiliary Contact 2NO 2NC	99241-00443
8	Seal Vacuum 1.890 -2.090 D/P	99413-00021

Qty	Description	Part No
1	Relay, Safety	99241-00384
32	ink Scrapper	99635-00001
3	Shaft – Drum	99640-00324
2	Shaft – Offset Roller	99640-00174
2	Shaft – design Roller	01283-00019
2	Spring, Lateral Adjust	99659-00004
2	Spring, Offset Roller Imp	99659-00006
2	Valve, Solenoid 24VDC S.	99244-00127
2	Valve, Solenoid 24VDC D.	99244-00134
2	Valve, Solenoid 24VDC	99244-00168
2	Regulator – Valve Interface	99244-00099
1	Air Input Low P. Switch	99241-00481
1	Low Pressure Sensor Head	99241-00482
1	Pressure Switch Control Module	99241-00598
1	Safety Switch	99735-00054
2	Safety Switch	99735-00050
1	Safety Switch Magnetic Coded	99735-00051
1	Safety Switch Magnetic Coded	99735-00065
1	Motor, Viscosity Auger	99500-00038
1	Motor, DC 180VDC	99500-00076
1	Camera, Vision	99202-00067
1	Camera, Checker	99202-00105
1	Strobe Controller, Dual	99202-00089
1	Strobe Light	99202-00090
1	Fluid Control, V/C Precision	99548-00015
1	Vacuum Shoe Assembly P. Drum 2	01293-00167

9. Maintenance

Scheduled Maintenance

The following section contains recommendations for maintaining the ACKLEY *machine corporation* 3 Drum Printer with Inspection. These recommendations should be followed to ensure proper operation of the ACKLEY *machine corporation* 3 Drum Printer with Inspection. Maintenance records should be maintained and kept in an area available to all maintenance personnel.

After **1000** operation hours, inspect or replace the following:

Ink Scraper	99635-00001

After **2000** operation hours, inspect or replace the following:

Bushing – Doctor Blade	99163-00016
Spring – Lateral Adjust	99659-00004
Spring – Offset Roller Impression	99659-00006
Gear – Design and Offset Roller	99430-00264

NOTE: **A.** We recommend stocking a minimum of three (3) design rollers for each logo to be printed.

B. We recommend stocking a minimum of four (4) offset rollers.

After **4000** operation hours, inspect or replace the following:

Bearing – Design and Offset Roller	99128-00009
Bearing – Drum	99128-00148

After **8000** operation hours, inspect or replace the following:

Shaft – Drums	99640-00324
Shaft – Offset Roller	99640-00174
Shaft – Design Roller	99640-00325

9. Maintenance (continued)

Preventive Maintenance

Lubrication
On a weekly basis, before startup, lubrication should be checked, and grease should be added as required.

Remove guards and grease all bearing housings that are equipped with grease fittings. Use good quality grease, such as Bel-Ray No-Tox®, clear grease #2 Food Grade USDA H-1. Be sure to clean any excess grease from machine parts and floor.

Gear tooth faces, should also be checked and maintained. Apply with a small brush, lubricate weekly.

Machine operating experience, and regular inspection, will determine the frequency and amount of lubrication required to properly maintain the machine.

Mechanical
On a monthly basis, tighten all bolts; screws, gears and all locking set screws.

Parts' Replacement
After six month's operation or 2000 operating hours, inspect/replace the following:

- Hopper brushes
- Design and Offset roller bearings, replace if there is any play in shaft.
- Feed and Print Drum bearings, replace if there is any play in shaft.
- Design and Offset roller gears

Removing Machine Parts
Machine parts should only be removed and replaced after "Machine Shutdown - Extended Periods" procedure has been completed. Electrical power and pneumatic supply to the machine must be disconnected.

Offset Rollers
Ensure that the print unit impression is in the "Off" position. Loosen the socket head screw in the pinch collars and remove offset roller. Reverse this procedure to install new offset rollers. Be sure keys are in place.

9. Maintenance (continued)

Design Rollers

Remove the ink pan and side ink scrapers. Loosen socket head set screw in the hubs on outside end of design roller. Slide design roller off drive shafts.

Reverse procedure to re-install design rollers. Be sure keys are in place.

Feed Drum

Loosen socket head pinch screw in the hub on the outside end of feed drum. Slide feed drum off drive shaft. It is not necessary to removed key or drum spacer from the shaft.

Reverse procedure to re-install feed drum. Be sure spacer and key is in place.

Print Drum

Loosen socket head pinch screw in the hubs on the outside end of print drum. Slide print drum off the drive shafts. It is not necessary to removed keys or drum spacers from the shafts.

Reverse procedure to re-install drum. Be sure spacer and key is in place.

NOTE:

A. We recommend stocking a minimum of three (3) design rollers for each product to be printed.
B. We recommend stocking a minimum of four (4) offset rollers per machine.

10. Glossary

Back Up Blade	A blade that is placed on top of the doctor blade, to add stiffness at the clamping point. This blade is twice as thick, and 1/16" shorter in height than the doctor blade.
Blow Off Tube	An air tube mounted at the discharge end of the printer, which assists gravity, to separate the product from the carrier link pockets, and into the discharge chute. This air tube also helps to dry the ink on the product.
Bulk Feed Hopper	The stainless steel receptacle into which the product is introduced.
Design Roller	The metal roller, engraved with the logo designs, which rotates within the ink pan. (Ink in the pan fills the engravings, and the doctor blade removes the excess ink.). The design roller is also referred to as a rotogravure cylinder.
Doctor Blade	The blade that is placed under the backup blade and contacts the design roller. This blade is 1/2 the thickness of the backup blade, and 1/16" longer in height than the backup blade. This blade scrapes the excess ink from the design roller, back into the ink pan.
Etch Brush	The brush used to scrub any etches which may be contaminated with dried ink. The Etch Brush is composed of a center area of brass bristle tufts, and an outer perimeter of hair bristle tufts.
Etch	The logo pattern that is engraved to a specific width and depth into the design roller surface, either chemically with acids, or mechanically with tools. This is the well which holds the ink to be transferred to the product surface
Impression	The amount of offset roller to product surface contact required to transfer the complete inking to the product surface. Impression also refers to the contact of the design roller to the offset roller when in the printing mode
Lateral Adjust	The mechanism used to register the logo on the product from side-to-side.
Logo	The symbols, signs and/or alphanumeric configurations that have been selected to be printed on the product surface.
Offset roller	The roller that contacts the design roller, picks up the ink from the design roller etches, and transfers the ink to the product surface. These rollers are also available made of PVC (FDA approved) plastic.

11. Standard Accessories and Replacement Parts

Each printer is shipped with the following accessories;

This Instruction manual containing;

- Parts list with part number and description
- Recommended spare parts list, based on normal, 2000 hour/year usage
- 1 - Tool Box Containing;
  50 - Scraper Blades .005" x 3/4" x 6-1/4" (.127mm x 19.05mm x 15.87cm)
  20 - Back-up Blades .010" x 11/16" x 6-1/4" (.254mm x 17.46mm x 15.87cm)
  1 - Plate Brush
  1 - 1/2" x 1/2" x 4" Medium India Stone (12.7mm x 12.7mm x 10.16cm)
  1 - 1/2" x 1/2" x 4" Hard Arkansas Stone (12.7mm x 12.7mm x 10.16cm)
  1 - Set Hex Keys, .050"-3/8", (1.27-9.53mm)

When ordering replacement parts, please supply the following information:

- Part number, Description and Quantity
- Serial number of printer
- Name of product

We thank you for choosing Ackley Machine Corporation products and services.

It is our intent to provide you with continuing support and services for your printing and mechanical requirements.

We look forward to supplying you with your future needs.

Sincerely,

ACKLEY MACHINE CORPORATION

11. Standard Accessories and Replacement Parts (continued)

Consumable Parts

Based on two years, at two shifts per day, 5 days per week, or 8000 hours of operation.

QTY	PART No.	DESCRIPTION
500	99135-00008	Doctor Blades
50	99135-00009	Back - Up Blades
3	SEE SPEC SHEET	Brush - Primary Hopper
24	99630-00TBD	Offset Roll - 5"
12	99305-MTBD	Design Roller – 5”
12	99305-MTBD	Design Roller – 5”

NOTE:
A. We recommend stocking a minimum of three (3) design rollers for each logo to be printed.
B. We recommend stocking a minimum of four (4) offset rollers per machine.

12. Drawings