NEWTON
RESEARCH LABS

Software Component
Users Guide

S512-1200
Sheet Metal Inspection

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S512-1200 v 1.0

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INTRODUCTION

Welcome to the User's Guide for your Newton Research Labs Software Component. You will find the simplicity and ease of use of this Software Component User Interface to be unparalleled in the machine vision field.

This guide covers the installation, set-up and use of Newton Labs Software Component Number **S512-1200**. The basic S512-1200 Software Component has been optimized for Defect Detection with a Newton Labs Model 1200 series Vision System.

This Users Guide contains information on the following subjects:

Newton Labs Software Component Installation and Set-Up

- System Requirements
- User Interface Installation

Standard Newton Labs Vision Systems features for this Software Component

Operation

- Quick Start Guide
- User Interface Basics
- System Information
- Align/ Focus/ Calibrate Page
- Setup page
- Operation Page

Appendix A–Communication Troubleshooting

STANDARD NEWTON LABS VISION SYSTEMS FEATURES

Settings for the **S512-1200** Software Component

IMPLEMENTED MODEL: 1200

Feature		Setting
Ethernet		Implemented to run the user interface
DB9 Serial RS232 Configuration Connector		Used in Set-up and Configuration Mode Need not be connected during operation
DB37 Digital Inputs		Inputs 1 – 2 for imager triggers Input 8 for reflectance sensor
	Input 1	Imager 1 - Trigger
	Input 2	Imager 2 - Trigger
	Input 8	Imager 8 – Sheet presence reflectance sensor
DB37 Line Lock/Sync Input		*Not Implemented in this Software Component*
DB37 Digital Outputs		Used for reject signals
	Output 1	Reject output
DB37 Serial RS422 Data Output		*Not Implemented in this Software Component*
Newton Labs Imagers		Up to 2 Model 4520-IR Newton Labs Imagers
Video Output		*Not Implemented in this Software Component*
Front Panel LEDs	Busy	Green after power on self-test
	Pass/Fail	Green after passed inspection, red after failed
	Sync/Trigger	Green when trigger input is active

INSTALLATION AND SET-UP

SYSTEM REQUIREMENTS

Touchscreen Computer, Windows 95 or higher.

USER INTERFACE INSTALLATION

1. Start Windows.
2. Insert the Newton Labs Software Component CD-ROM into drive <drive>*.
3. Press Start on the Task bar and select Run.
4. From the Run dialog box, select (or type) <drive>:\Setup and click OK.
5. Follow the screen instructions.

*where <drive> is your CD drive letter (e.g., "d")

POWER UP DISPLAY

When the Newton Labs Vision System is first powered up, it will perform a self-test and feature detection. When the system has completed the self-test, the **BUSY** LED on the front panel will illuminate Green.

POWER FLUCTUATIONS

The Model 1200 Newton Labs Vision System requires relatively stable AC power. If the system is installed in an area where the AC power is not stable and is subject to severe fluctuations and/or discontinuity, the use of an Uninterruptable Power Supply may be required.

Should a rapid power fluctuation take place and the Newton Labs Vision System appears not to be operating correctly, turn off the main power switch on the front panel for 5 seconds and then turn the system back on.

QUICK START GUIDE

1. Connect the touchscreen computer to the Newton Labs Vision System and turn on the Vision System
2. Install Software Component on touchscreen computer
3. Start Software Component

   The Software Component User Interface will automatically connect to the Newton Labs Vision System. If it does not connect:

   Go to the *Connection Menu*

   1. Select **Configure –** Select Com Port.
   2. Select **Connect**
   3. If no connection is made after properly selecting the Com port, see Appendix A for help.

4. Go to the **Information Page**

   1. The Newton Labs Software Component will automatically confirm that the Software Component is the correct one for the connected Newton Labs Vision System
   2. If the information page does not show the correct serial number, you will not be able to continue. A display box will inform you of the conflict. Contact your Newton Labs Authorized Distributor to obtain the correct Software Component.

5. Go to the **Align/ Focus/ Calibarate Page**

   1. Attach the imagers to the Model 1200
   2. Click the *Align* radio button. Ensure that there are no obstructions in the fixture. Shift and rotate each camera until the left, middle and right brightnesses are maximized.
   3. Click the *Focus* radio button. Click the Camera 1 radio button. Place a test sheet in the fixture. Adjust the lens for the sharpest edge possible. Repeat for Camera 2.
   4. Click the *Calibrate* radio button. Ensure that there are no obstructions in the fixture. Click the Calibrate button to calibrate to current alignment and focus.

6. Go to the **Setup Page** *Sheet Template control*

   1. Click the *Add* button for each sheet you wish to add
   2. Use the *Delete*, *Move Up*, *Move Down*, or *Rename* buttons as necessary.

7. Go to the **Setup Page** *Punchouts tab*

   1. Select the *Inspect Punchouts* checkbox to include these measurements.
   2. Either type in values for each setting in the edit box, or click on image view and drag the boxes to their appropriate sizes.

8. Go to the **Setup Page** *Holes and Cutouts tab*

   1. Select the *Inspect Holes*, *Inspect Intrusions*, or *Inspect Perimeter* checkboxes to include these measurements.

2. You may either select values for each setting in the edit boxes, or click on image view and define a box to the appropriate size.

9. Go to the **Setup page** *Train button*

    1. Click the Train button to train the sheet once it's been set up.

10. Go to the **Operation Page**

    1. Select the desired Sheet Data Template by clicking on its name in the list.
    2. Read the defect description
    3. To reset the defect, click the Reset button

11. *File Menu* **Save Settings**

    Save to File

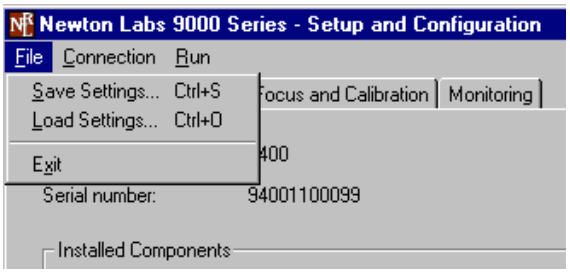
12. *Run Menu* **Start Running**

13. *Connection Menu* **Disconnect**

14. *File Menu* **Exit**

USER INTERFACE BASICS

FILE MENU



Save Settings–Saves currently selected settings to a file on the laptop or PC you are using. A dialog box will ask for a file name and location. It is highly recommended that you save the settings after a successful setup.

Load Settings–Opens previously stored settings file and loads those settings into the User Interface.

Exit–Closes the Software Component User Interface

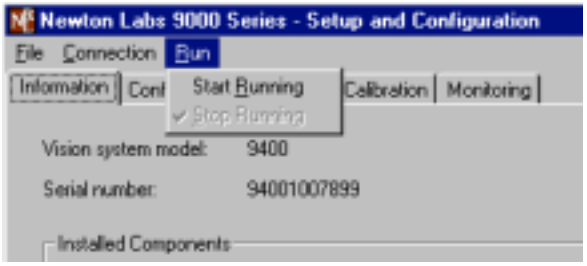
CONNECTION MENU

Connect–Connects the Newton Labs Software Component User Interface to a Newton Labs Vision System. *This option must be selected first in any setup session.*

Disconnect–Disconnects the Newton Labs Software Component User Interface from a Newton Labs Vision System.

Configure Serial Port–Select the communications port the Vision System is connected to.

RUN MENU



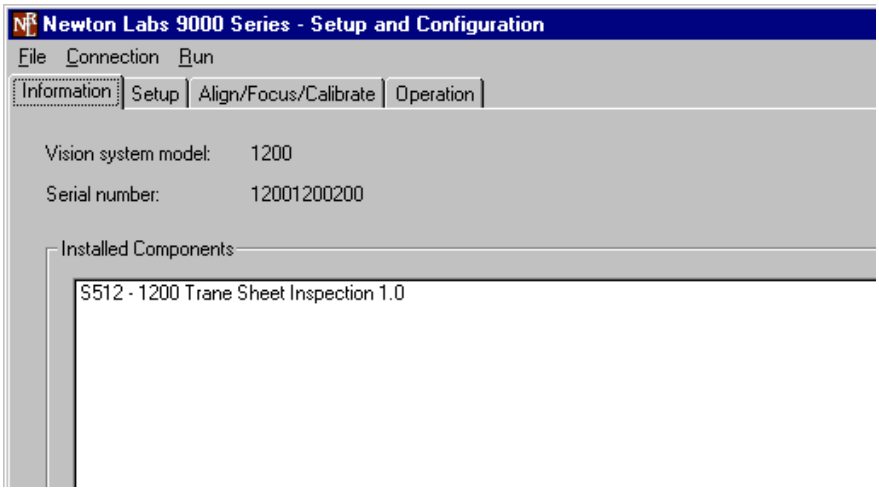
Start Running– Put the system in the running state. While running, the system will react to triggers by inspecting bottles.

Stop Running– Put the system in the not running state. While running, the system will not react to triggers. However, it will display real-time views from the three cameras on the video out monitor.

SYSTEM INFORMATION PAGE

- Vision System Model
- Serial Number
- Installed Components

S512 – 1200 Sheet Inspection



Vision System Model

The Newton Labs Software Component User Interface reads and automatically identifies the Model number of Newton Labs Vision System to which it is connected.

Serial Number

The Newton Labs Software Component User Interface reads and auto identifies the Serial number of the Newton Labs Vision System to which it is connected. If the Software Component is not correct for that serial number, a display box will appear. Contact your Authorized Newton Labs Distributor for the correct Software Component.

Installed Components

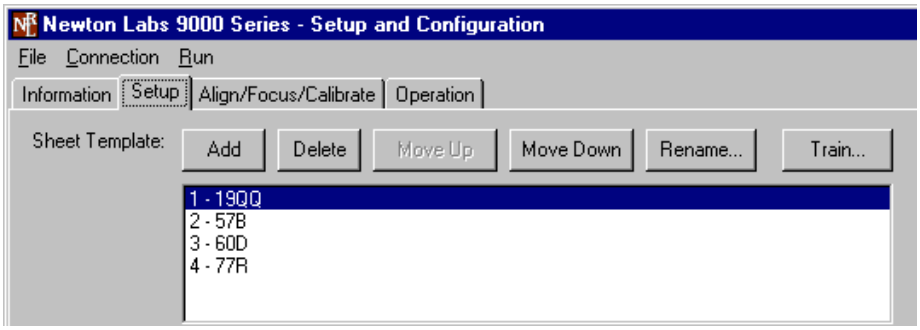
Since many final applications require several Newton Labs Software Components, this table identifies which of the Newton Labs Software Components have been included in this application.

SETUP PAGE

The Sheet Inspection user interface is optimized for a touchscreen display. You may enter alphanumeric information via a touchscreen keypad dialog box.

The Setup Page allows you to create a list of sheet templates. For each sheet, you can set the inspection values for punchout location, hole variation, intrusion depth and variation, and perimeter variation. After a sheet is setup, the sheet may be trained.

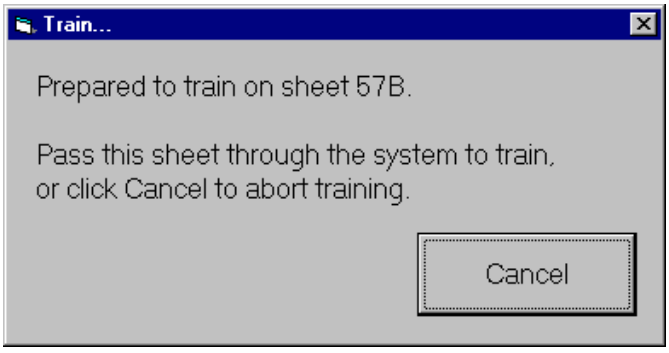
Setup Page, Sheet Template



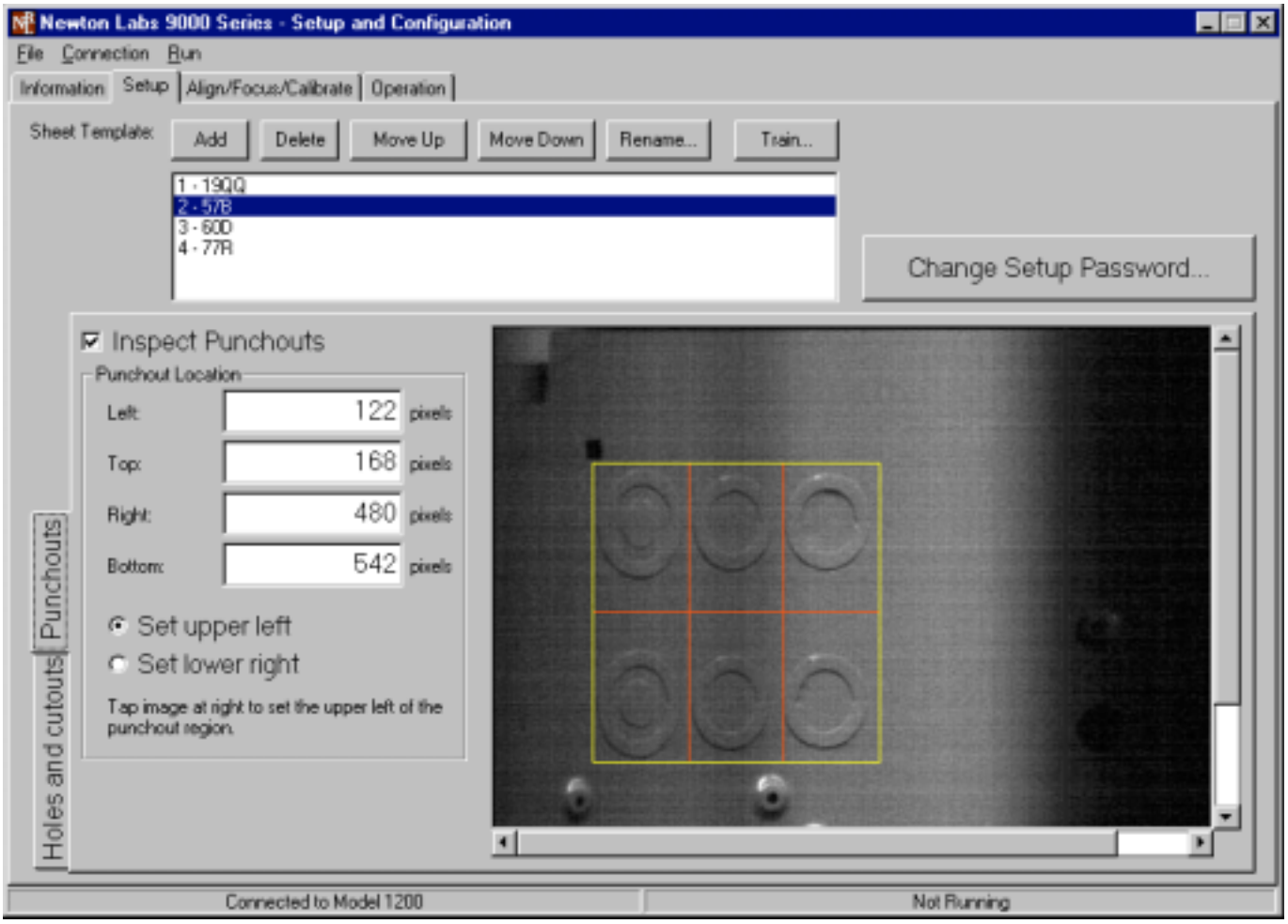
Sheet Template The Sheet Template control lets you add, delete, reorder, rename, and train your sheet template.

When you click the Add or Rename button, the touchscreen keypad will be invoked. This will let you change the sheet data template name via the touchscreen. When you click the Add button, the properties of the sheet currently in focus in the list are used for the added sheet.

After you have entered the punchouts location, holes, and cutouts values for the selected sheet (see below) you may then train your sheet. Click the Train button to train the sheet. This dialog box will appear to ask you to pass the sheet through the system.



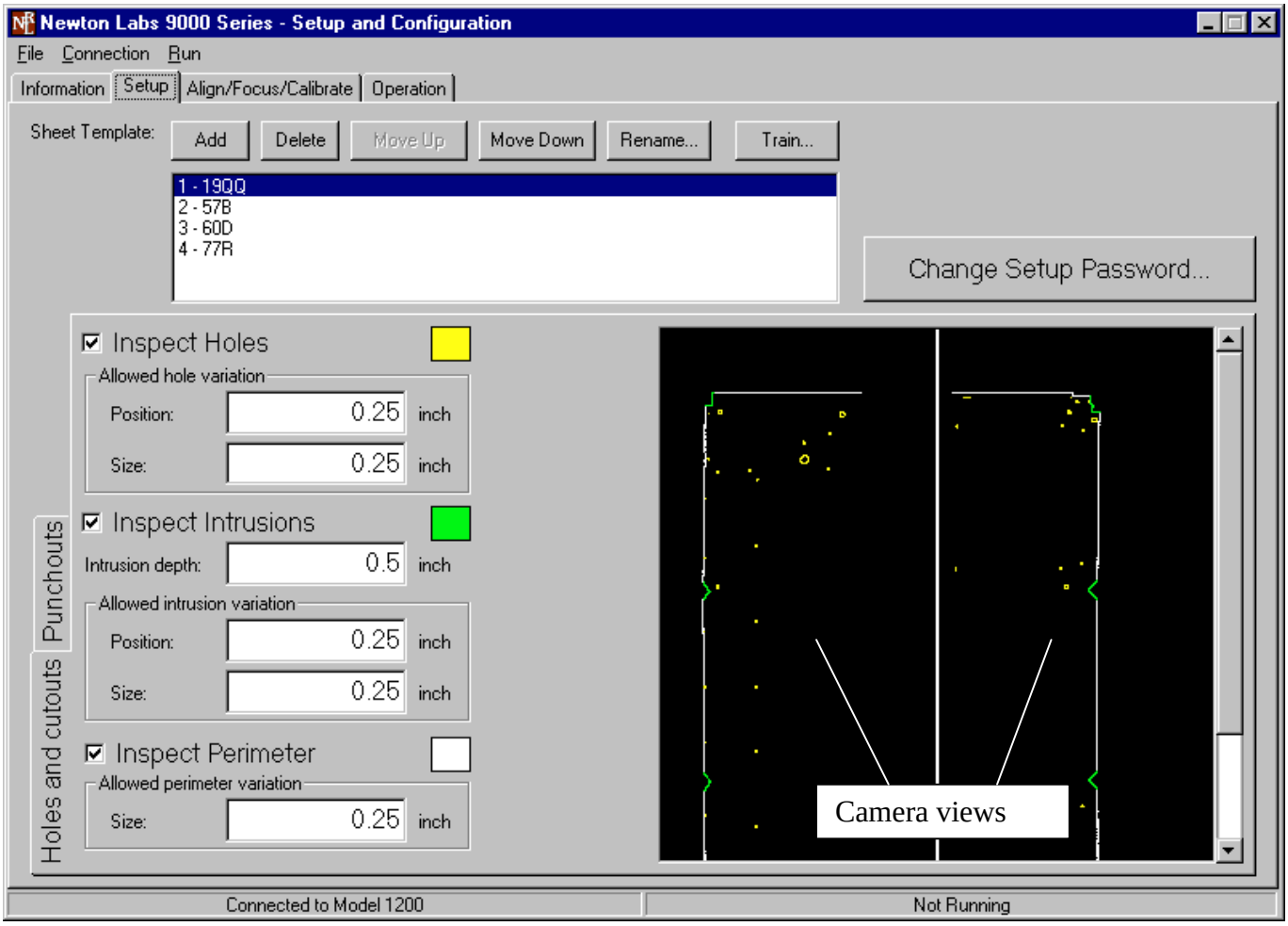
Setup Page, Punchouts Tab



Inspect Punchouts The Inspect Punchouts control lets you change the values for punchout location either via the left, top, right, and bottom edit boxes or via the picture box. To use the edit boxes click in an edit box to change it via the keypad.

You may use the image view to change the values. Select the *Set upper left* radio button, then tap the image view picture where you want to set the upper left of the punchout region. Select the *Set lower right* radio button, then tap the image view picture where you want to set the lower right of the punchout region.

Setup Page, Holes and Cutouts Tab



Sheet Template The Sheet Template control lets you add, delete, reorder, rename, and train your sheet template. When you click the Add or Rename button, the touchscreen keypad will be invoked. This will let you change the sheet data template name via the touchscreen. When you click the Train button you have trained the sheet.

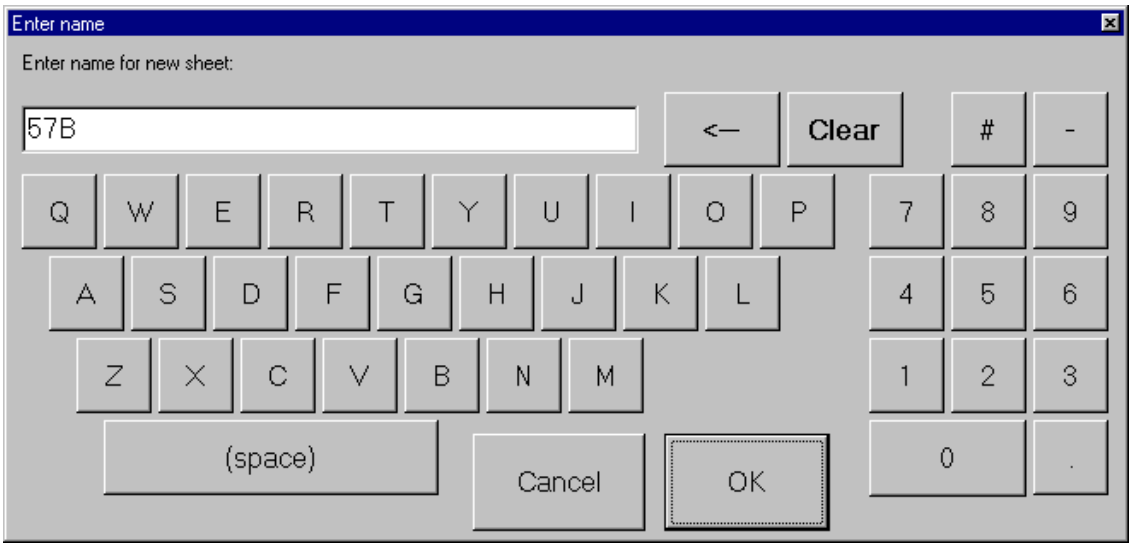
Inspect Holes Select the Inspect Holes checkbox to include this measurement. When you click on an edit box, the touchscreen keypad will be invoked. Enter the allowable hole position and size variation values here.

Inspect Intrusions Select the Inspect Intrusions checkbox to include this measurement. When you click on an edit box, the touchscreen keypad will be invoked. Enter the allowable intrusion depth, position, and size variation values here. The intrusion depth is defined as the depth allowed before it is considered an intrusion.

Inspect Perimeter Select the Inspect Perimeter checkbox to include this measurement. When you click on an edit box, the touchscreen keypad will be invoked. Enter the allowed perimeter variation size value here.

Camera View The camera view displays a split-screen image (left and right sides) of the last-trained sheet with regions colored yellow for holes, green for intrusions, and white for edges.

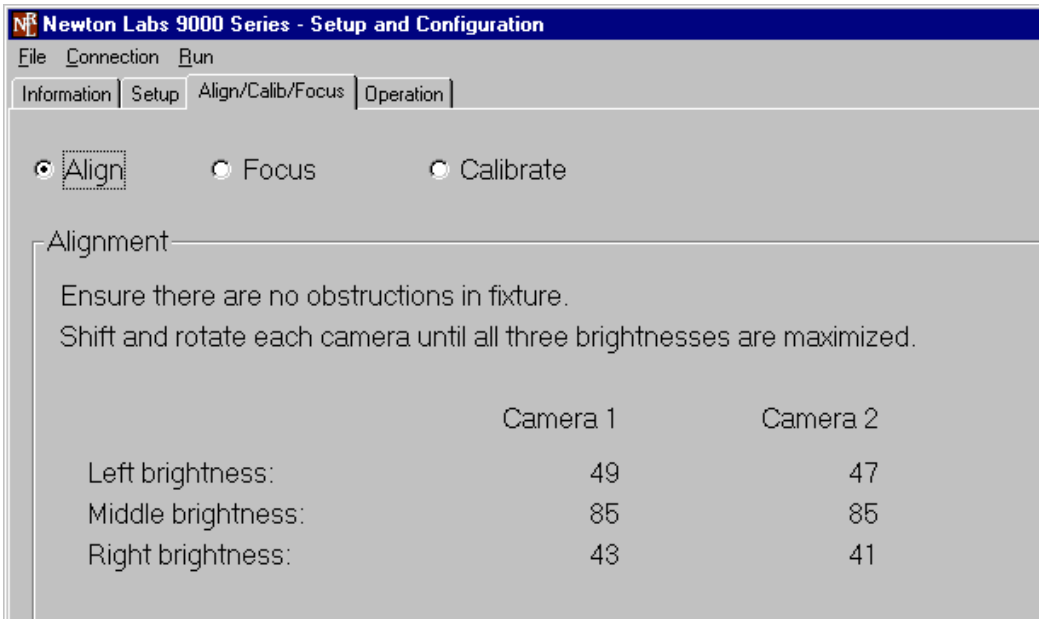
Touchscreen pad The touchscreen pad is invoked when you want to change the text of a sheet name or the value of an edit box. It displays the current field's value in the upper-left. You may use the key buttons to change the current value. Click OK to accept your changes, or Cancel not to accept the changes.



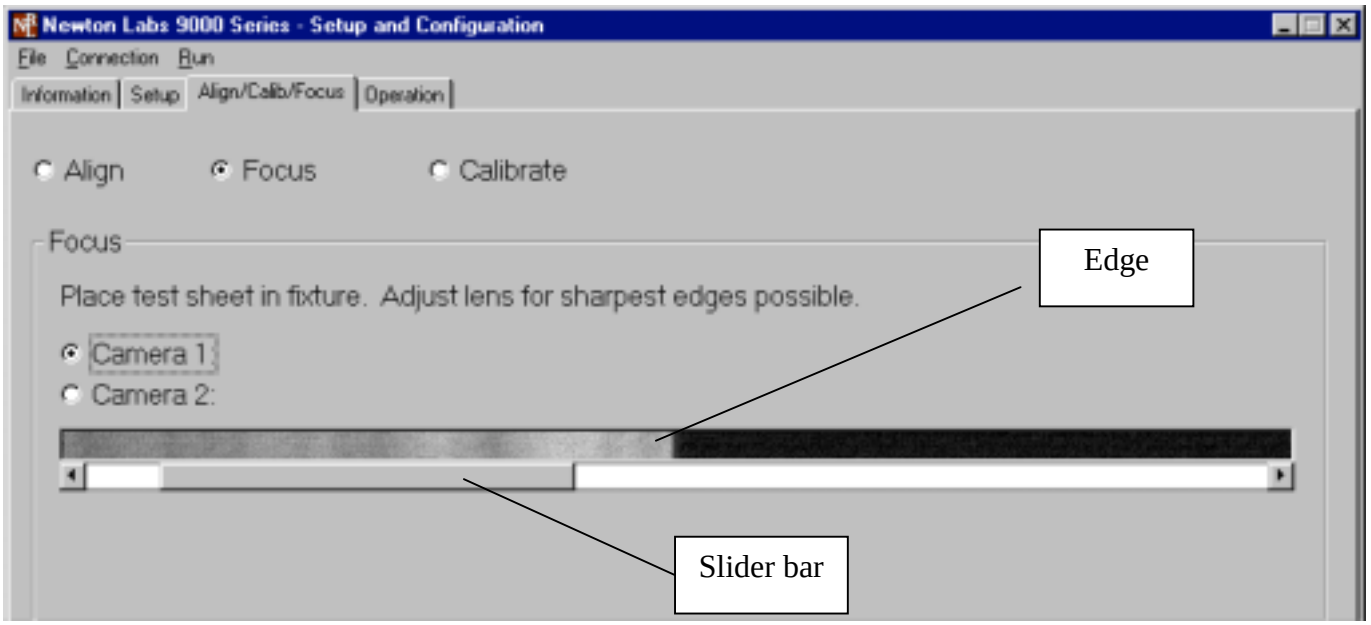
ALIGN/ FOCUS/ CALIBRATE PAGE

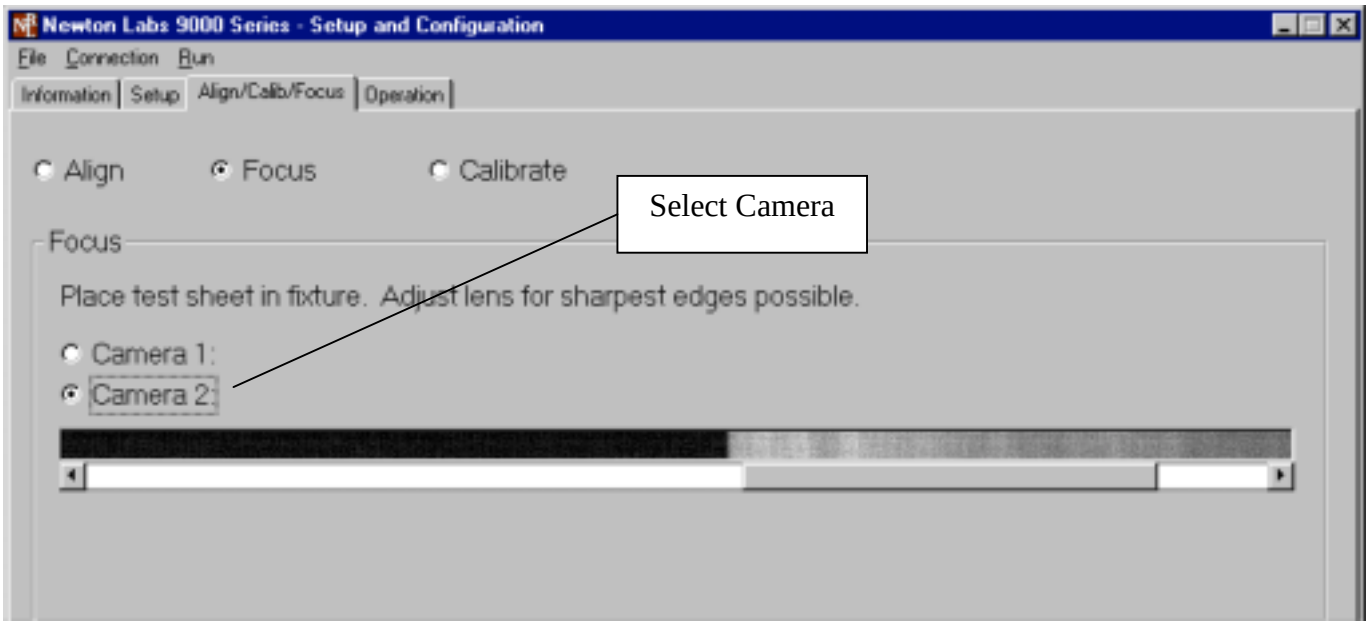
The Align/ Focus/ Calibrate Page allows you to view alignment strengths for each of the two cameras, calibrate the light source, and focus both cameras for maximum focus strength.

Align Click the Align button to view the Focus control. You will see brightness values for both Camera 1 and Camera 2. The numbers are a measure of the brightness in the camera's field of view. Ensure that there are no obstructions in the fixture. Shift and rotate each camera until all three brightnesses are maximized.

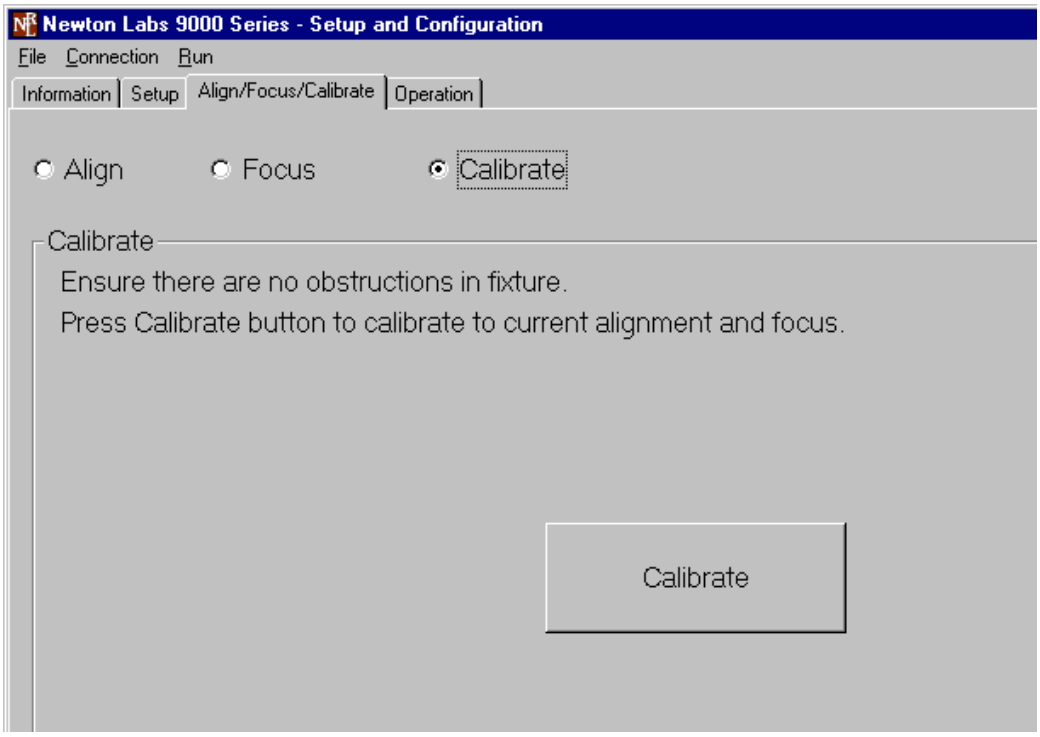


Focus Click the Focus button to select the Focus control. Click on either Camera 1 or Camera 2 to select which camera you wish to focus. Place a test sheet in front of the fixture. Use the slider bar to place the edge at the center. Adjust the lens focus to find the sharpest edges possible.



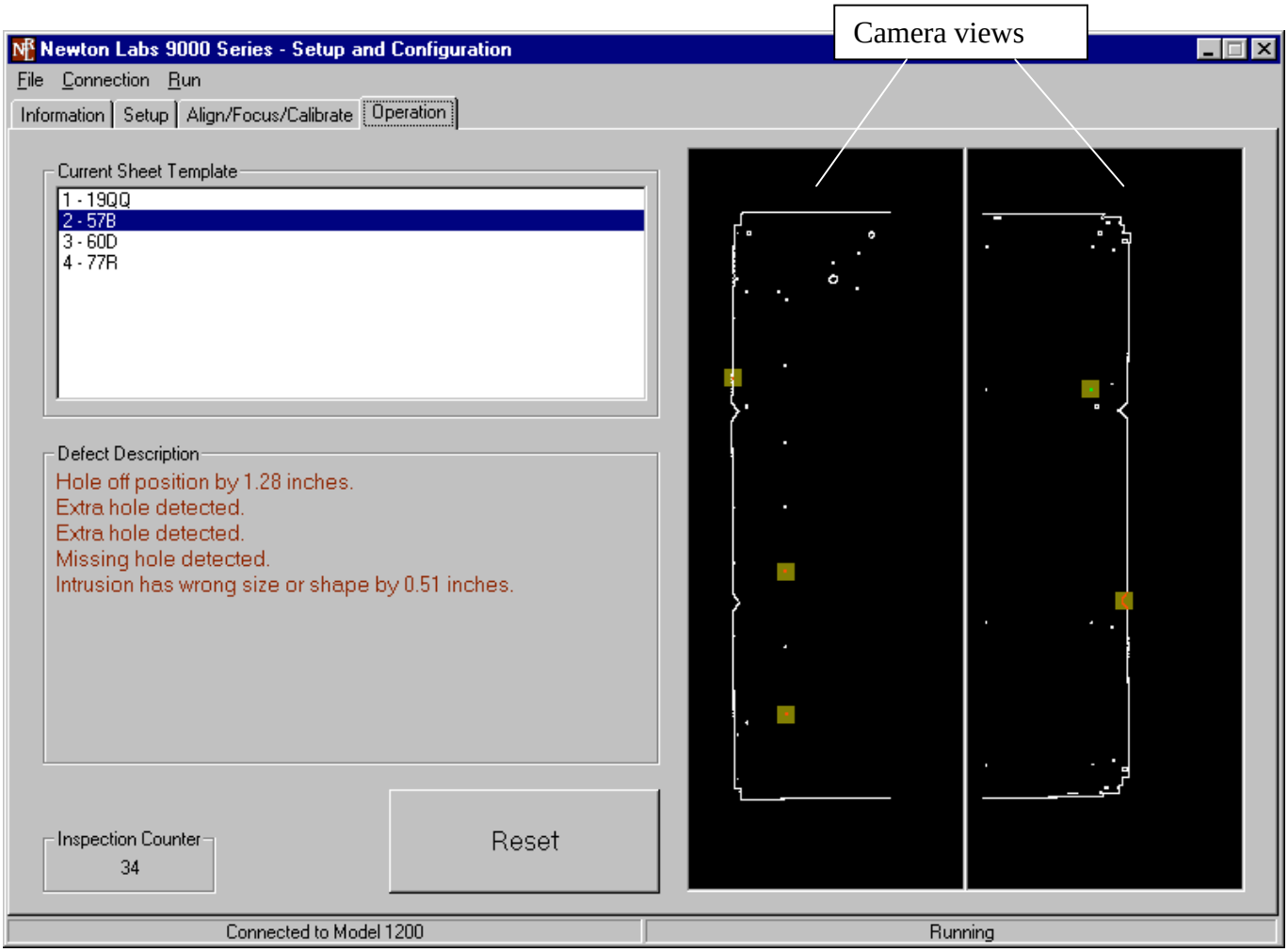


Calibrate Click the Calibrate button to choose the Calibrate control. Ensure that there are no obstructions in the fixture. Click the Calibrate button to calibrate on the previously-set alignment and focus.



OPERATION PAGE

The Operation Page allows you to view the current list of sheet data template names, to select a sheet from the list to see if a defect has been detected for that sheet, and to reset the defect. A camera view shows the sheet template for that sheet. The reset button allows you to reset the defect condition.



Sheet Data Templates List This contains the list of stored sheet data templates. Select an existing sheet from this list.

Defect Description If there is a defect for the selected sheet a description of the defect will appear here.

Camera View The camera view for the selected sheet will appear here.

Reset Button Click the Reset button to reset the defect condition.

APPENDIX A - COMMUNICATION TROUBLESHOOTING

Problems Communicating with the 1200 Series	
♦ The user interface will not connect with the 1200 Series	Try the following first: ♦ Wait 30 seconds and try reconnecting. ♦ Check all connections. ♦ Make sure only one copy of the software component is running on the laptop or PC. ♦ Make sure that no other software (e.g. Palm Desktop) is using the serial port. ♦ Try to connect using another COM port. ♦ Turn off the computer, restart, and try again. If the above suggestions do not provide results, follow the procedures below to further troubleshoot communications: STEP 1: Establish communications via a communications terminal program. HyperTerminal can be used to debug system communications. You can use the HyperTerminal program as follows: Start HyperTerminal: Click the Start button, choose Run, type in Hypertrm.exe and click OK. A dialog box will appear with the words "Connection Description" in the title bar. Type NRL1200 in the name field. Under "Connect Using", click "Direct to Com ..." and choose the COM port you are using to connect to the 1200 Series. Try using COM 1, if you are using a PS-2 mouse. If you have a serial mouse, try COM 2. If you are not sure which COM port to use, repeat until you determine the right one. Select the appropriate communications port.

PROBLEMS COMMUNICATING WITH THE 1200 SERIES (CONTINUED)	
♦ The user interface will not connect with the 1200 Series (continued)	A dialog box will appear listing the properties for the com port selected. Set the com port properties to 115,200, 1 stop bit, Flow Control-Hardware The HyperTerminal program will display a white box. Press the space key (several times). An "OK" will appear each time you press space as long as the PC is communicating with the 1200 Series through HyperTerminal. If successful communications with the 1200 Series have been established, skip to Step 4. STEP 2: Check the wiring There may be a problem with the RS-232 cable or the laptop/PC. Make sure the wiring is correct. STEP 3: Make sure the computer is working properly If you are not able to obtain control over a COM port on the PC, check with your system administrator for help. If you are able to get control over a COM port, and you have checked all wiring and connections, go to Step 4. STEP 4: Power down the 1200 Series and power up again normally. STEP 5: Establish communications with the 1200 Series using the software component. Disconnect from the terminal mode in the program you are using. Use the software component to try to connect to the 1200 Series. If you still cannot establish communications using the terminal mode and/or the software component after reloading the software and establishing that there are no problems with the wiring or PC, go to Step 6. STEP 6: Call your Newton Labs Authorized Distributor Arrange with your local distributor to substitute a working 1200 Series and laptop to determine where the problem exists.

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