

Clarity User Guide



March 1, 2011

Part 87392-11, Rev. 1.06

Warnings, Cautions and Notes as used in this Guide

WARNING

This publication uses Warning notices to emphasize situations in which hazardous voltages, temperatures, or other conditions associated with the use of this equipment could cause personal injury or serious damage to the equipment. In situations where inattention or misuse could cause either personal injury or serious damage to the equipment, a Warning notice is used.

CAUTION

Caution notices are used where equipment might be damaged if proper operating instructions are not followed.

NOTE

Notes call attention to information that is especially significant for proper understanding and operation of this equipment.

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details of the hardware or software, or to provide for every possible contingency in connection with installation, operation or maintenance.

Safety Reminders

- DO NOT operate this equipment until you have read and understood this manual. If operating for the first time, ask your supervisor or a qualified operator for assistance.
- Plug the power supply into a grounded receptacle **ONLY**. Do not cut off the grounding prong or use any power cord or adapter without a grounding prong.
- Always assume the power is ON. Do not attempt any maintenance until you have verified that the power is OFF by unplugging the power supply from the Clarity.
- Never turn the machine on while someone is performing maintenance or repair.
- Keep your hair, hands, and clothing clear of the machine while it is in operation.
- This product is not intended to be used in an explosive environment.
- **Unit should be positioned so that it can easily be disconnected from the power source.**

THINK SAFETY FIRST – ALWAYS PRACTICE SAFE WORK HABITS.

TABLE OF CONTENTS

	<u>Page</u>
Chapter 1 - Getting Started	5
Unpacking the Clarity	5
Foam Shipping Blocks in the Blocking Chamber	6
Block #1 - #33593 - Bottom Shipping Block.....	6
Block #2 - #33592 - Rear Shipping Block	7
Shipping Bracket Used in the Blocking Chamber.....	7
Shipping Bracket Assembly, #33648	7
Installed Shipping Bracket Assembly	8
Clarity Front View - User Items.....	9
Clarity Rear Connector Bulkhead	10
Accessory Kit	10
Installing the Glass Plate	11
Installing Light Shielding.....	11
Chapter 2 - Basic Operation	13
Powering on the Clarity.....	13
Establishing Communications.....	13
The Touch Screen Display and Job Screen	14
The Processing Screen	15
The Analysis Screen.....	16
The Teach Function.....	17
The Teach Screen.....	18
Chapter 3 - Setup Screens	21
Main Menu Screen	21
Preferences Screen	22
Key Features of the Preferences Screen	22
Batch Blocking.....	22
Auto Blocking Mode.....	22
Add Verification.....	22
User Interface	22
Tolerances Screen	23
Interface Screen.....	24
Key Features of the Interface Screen	24
Display of Communication Events on the Main Menu	24
Hide Patient Name Received From Host for Privacy.....	24
Run 30-Second Loopback Test	24
Communications Log	24
Blocking Screen	25
Key Features of the Blocking Screen	25
Standard Finish Block Size, Small Finish Block Size (Half Eye), Extra Small Block Size	25
PD, Seg Height, Axis	25
Block Size Safety Margin	25
Blocker Arm Load Position.....	26
Calibration Screen.....	26
Advanced Screen.....	27

Key Features of the Advanced Screen	27
Home	27
Burn In	27
Distance, Near and Prism Power Checks	27
Technician Screen	28
Statistics Screen.....	29
Chapter 4 - Calibration.....	31
Calibration Screen	31
Step 1: Preliminary Camera Focus	31
Step 2: Camera	31
Step 3: Screen Calibration.....	31
Step 4: Block Position Offsets.....	32
Step 5: Power Calibration	32
Touch Screen Calibration.....	34
Chapter 5 - The Advanced Screen in the Setup Menu.....	37
Distance Power.....	37
Near Power.....	38
Prism Power	38
Lens Feature Detection.....	38
Auto-Run at Windows Startup	38
Warm-Up Time	38
Image	38
Display Options.....	38
Setup Password	39
Job Data Log	39
Burn In 39	
Home	39
Chapter 6 - Maintenance	41
Cleaning the Glass Plate.....	41
Cleaning the LCD.....	41
Cleaning the Touch Screen	41
Replacement of the Main Fuse Located on the Rear Bulkhead	41
Maintenance Tips	41
Intended Use & Limitations	43
Glossary of Terms	45
Appendix A	47
General Specifications.....	47
Technical Specifications	48
Appendix B - Certifications & Standards	49
FCC Class A Device Compliance	49
Appendix C - Electrical Diagram.....	51
Appendix D - Certificate of Compliance	53
Declaration of Conformity	53

Chapter 1 – Getting Started

The Clarity Automated Lens Analyzer/Blocker is designed to verify all prescription parameters including sphere power, cylinder power, axis, optical center location, prism, and all add powers as well as thickness and front curve information. It will also affix a finish block to the lens on axis at the geometric center of the frame shape. It is shipped in an almost ready-to-run condition. This guide will allow you to put the Clarity into service quickly. We will cover the following topics:

- Unpacking the Clarity
- Applying power and turning on the unit
- Connecting the unit to your lab's computer system
- Using the touch-panel display and examining some of the operator screens
- Operation including lens insertion and blocking
- Calibration
- Advanced screen functions

The Clarity has many features and settings to allow you to optimize it for your specific lab environment. It also has diagnostic capabilities and adjustments to fine tune its operation. This guide does not describe all of the features or adjustments. Once you have become familiar with operation as described in this guide and want more information, call Technical Support.

Unpacking the Clarity

The Clarity is shipped in molded foam blocks within a cardboard carton. These blocks need to be removed prior to removing the machine from the carton. An accessory kit is shipped in two small cardboard inserts. The shipping carton and shipping materials should be retained in the event that the unit must be shipped again.

Before removing the Clarity from the packing box and setting it up, please read this guide and familiarize yourself with the accessories, features and terms used throughout the guide. There is a glossary of terms in the back of this guide. Once the carton is opened, remove the two inserts containing the power supply, power cord, and accessory kit. Remove the two side panels and lift the unit out of the carton. Be careful to use the appropriate lift points. (See Fig. 1.2) Place the unit in the desired location, but out of direct sunlight.

Inspect the contents to ensure you have all the items listed below. (See Fig. 1.4). There should be 14 items in the two inserts. They are:

1. Power supply
2. Power cord
3. 70mm Plano CR39
4. 70mm -6.00 CR39
5. 65mm +6.00 CR39
6. 58mm calibration disc
7. White marking pen for progressives
8. Oval calibration template with permanent block attached

9. Main fuse (located on rear bulkhead)
10. Glass plate (See Fig. 1.5) Remove and install in the blocking chamber as described later in this chapter.
11. Light shield (blocking arm)
12. Light shield (left gripper)
13. Light shield (right gripper)
14. Bag of screws for the light shielding
15. Clarity User Guide (not shown in Fig. 1.4)

When the Clarity is prepared for shipment (by the factory or the user), its mechanism must be secured against movement caused by jarring or shocks to the shipping carton. Units may use one of two means for doing this: (1) molded foam blocks within the blocking chamber, or (2) a clamping device attached to the blocking mechanism. In either case, the shipping restraints must be removed prior to using the Clarity, and must be re-installed prior to shipping the unit, should that prove necessary.

CAUTION

Shipping the unit without properly re-installing the factory shipping restraints may cause severe damage to the equipment.

Foam Shipping Blocks in the Blocking Chamber

Remove the two foam blocks that hold the mechanism in place during shipment. Note how they are installed in the event that the Clarity needs to be shipped from your location. Call Technical Support for help in packing the machine for shipment. Figures 1.1a and 1.1b show how the foam shipping blocks are installed.

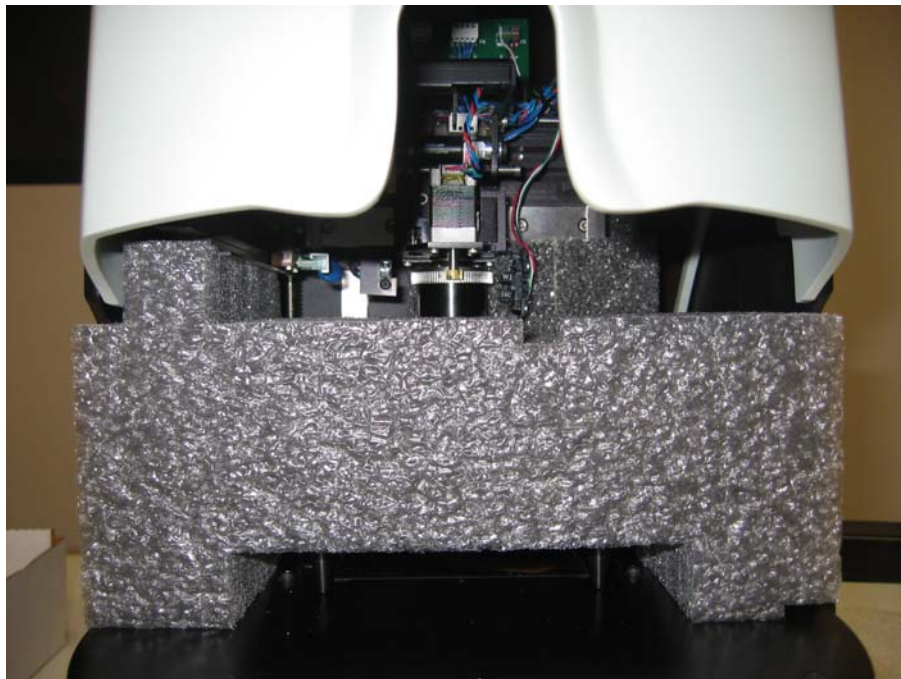


Figure 1.1a - Block #1 (P/N 33593 - Bottom Shipping Block)

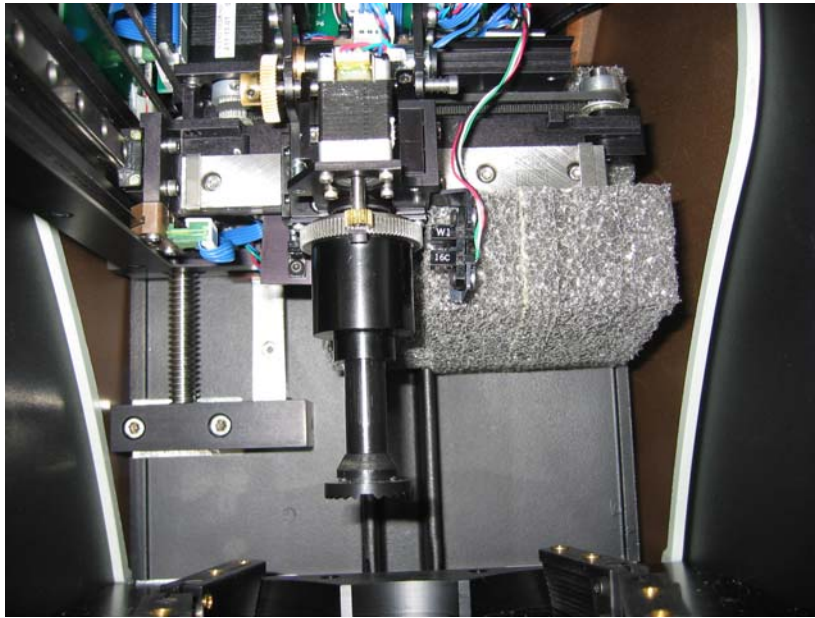


Figure 1.1b – Block #2 (P/N 33592 - Rear Shipping Block)

Shipping Bracket Used in the Blocking Chamber:

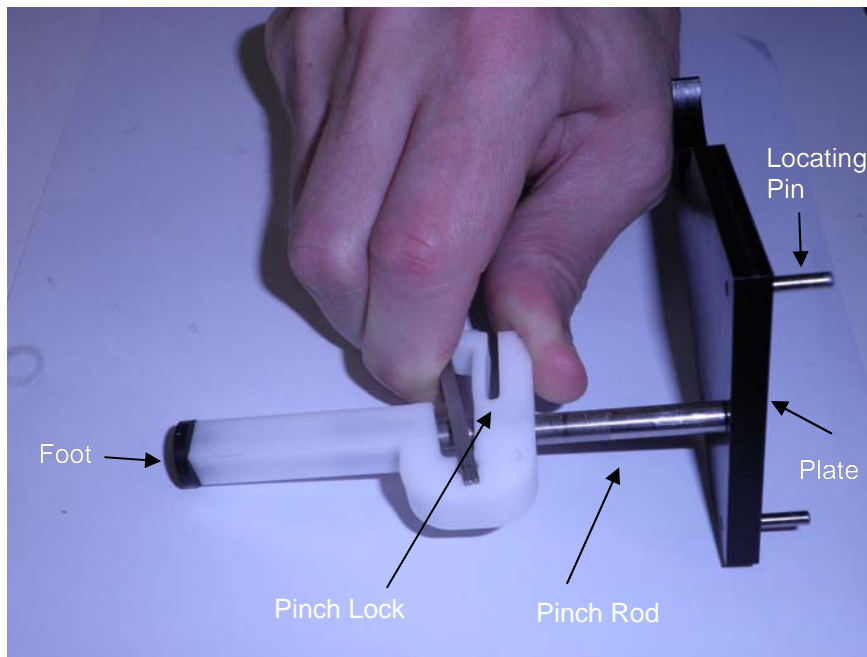


Figure 1.1c – Shipping Bracket Assembly, Clarity (P/N 33648)

The Shipping Bracket assembly is shown in Figure 1.1c. The *Foot* is placed on the base of the blocking chamber. By squeezing the *Pinch Lock*, the *Pinch Rod* may be moved up or down so that the cutout in the *Plate* engages the chuck and the *Locating Pins* engage the bottom of the blocking mechanism. When installing the assembly, the *Pinch Lock* mechanism should be moved downward so that the rubber *Foot* is slightly compressed. Figure 1.1d shows the shipping bracket in its installed aspect.

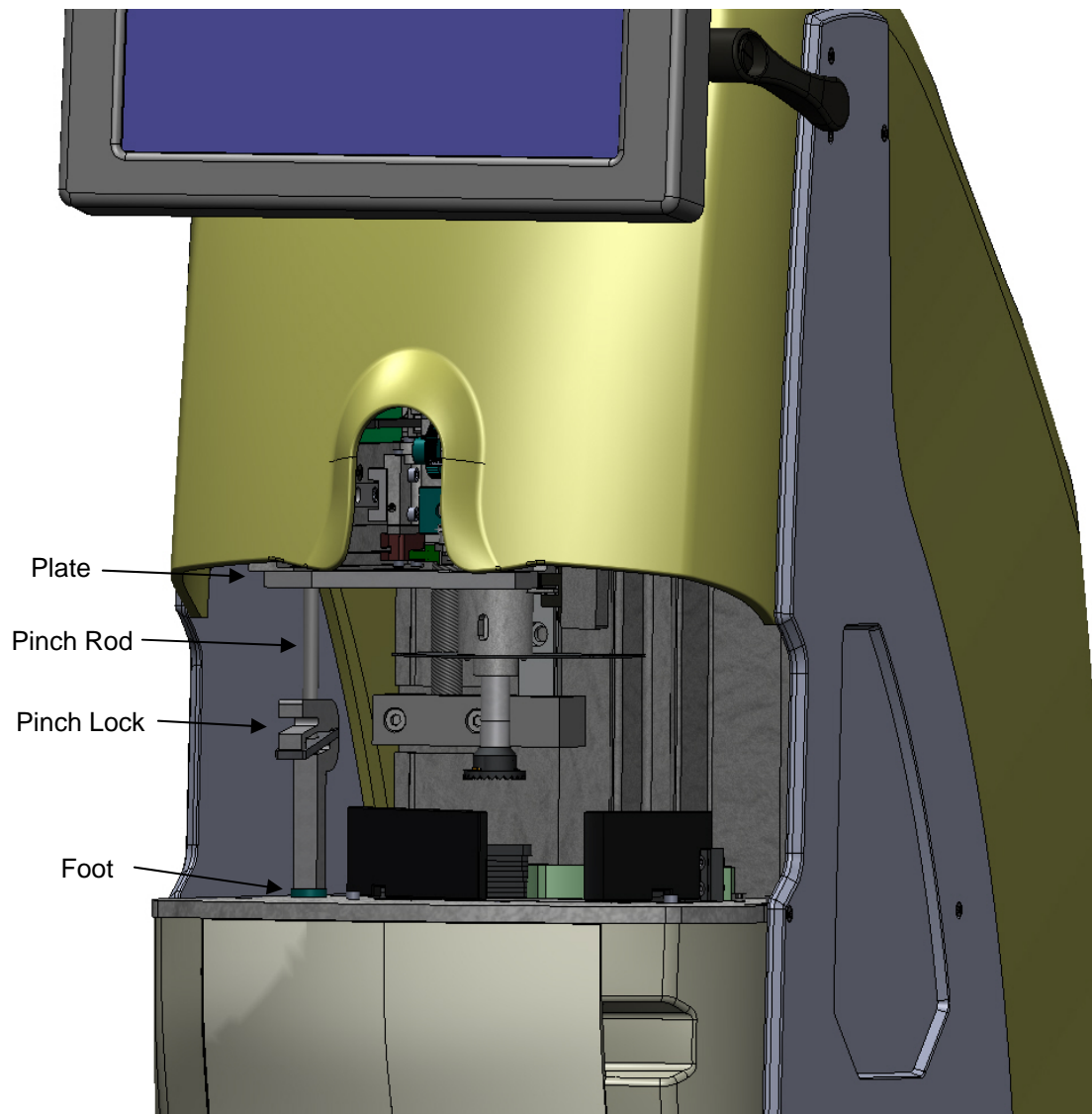


Figure 1.1d – Installed Shipping Bracket Assembly

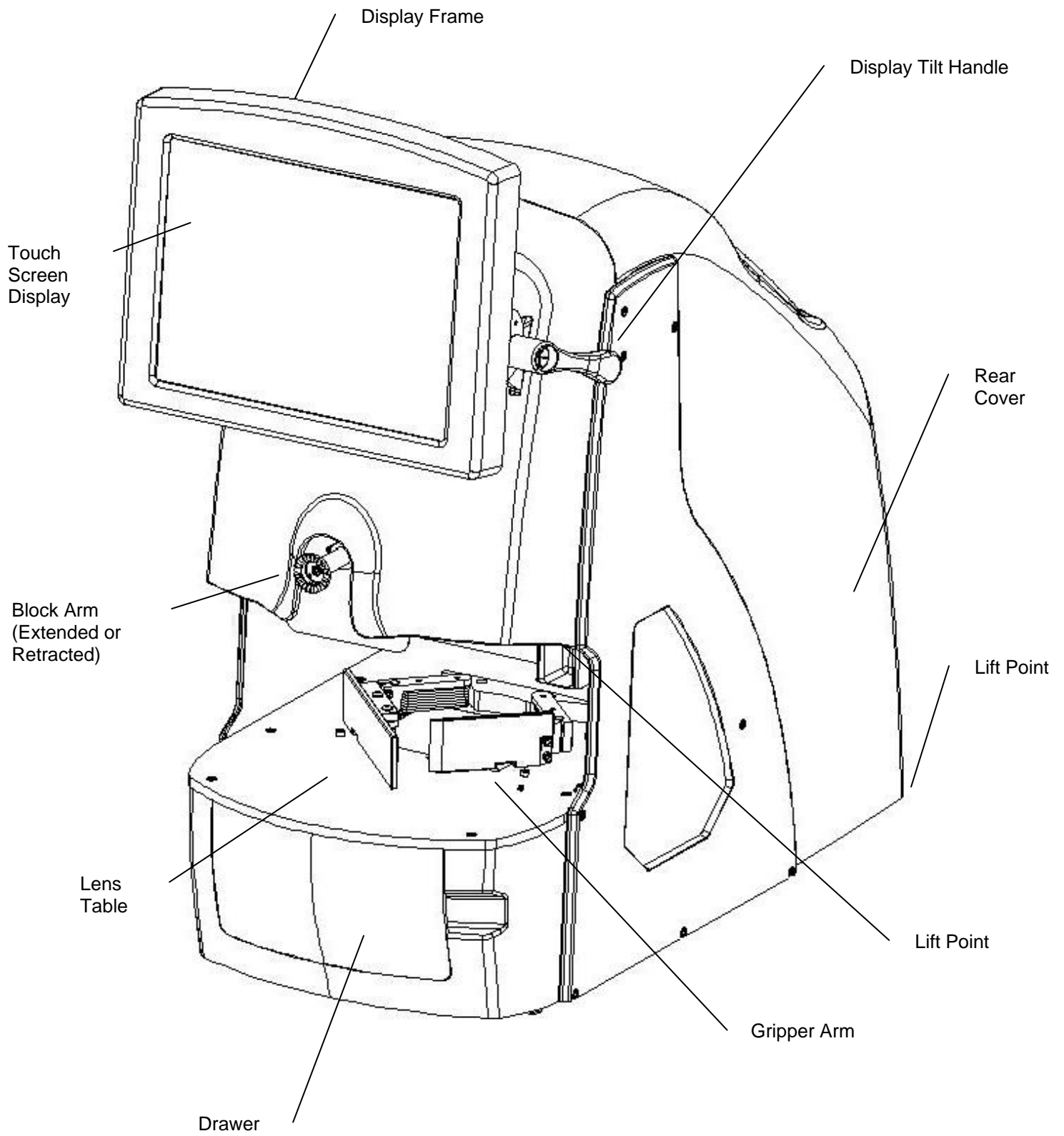


Figure 1.2 – Clarity Front View - User Items

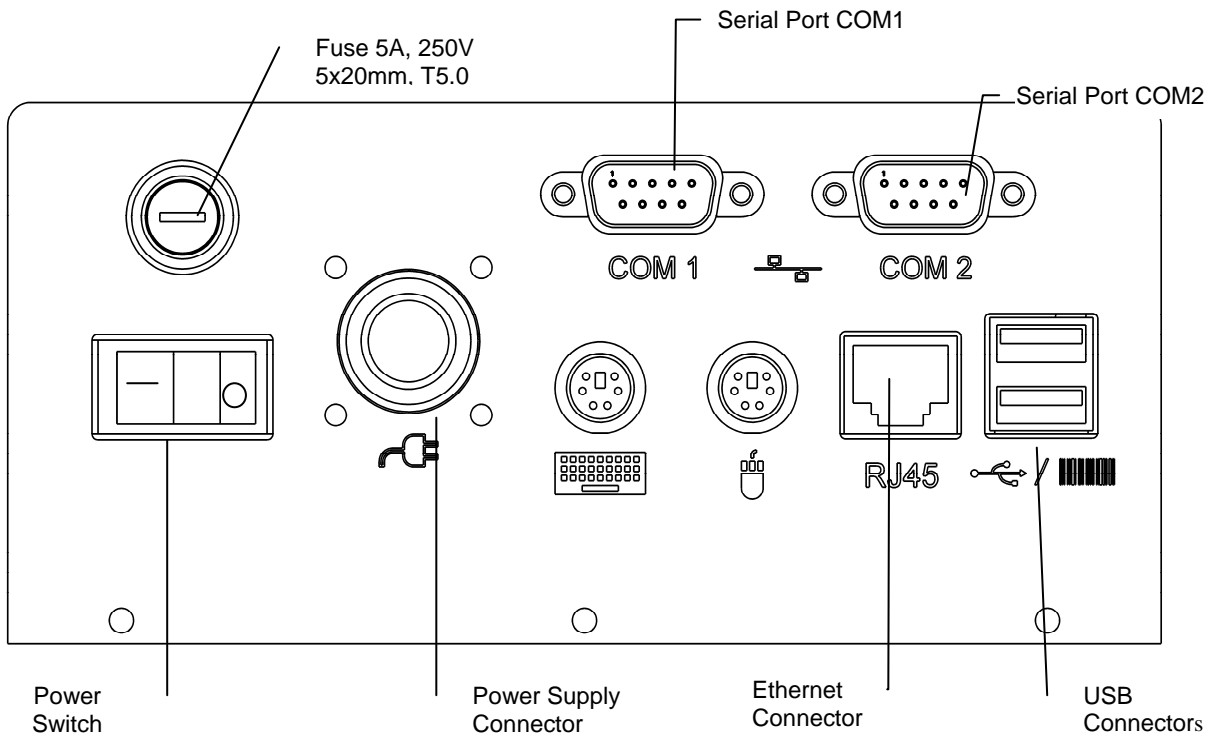


Figure 1.3 - Clarity Rear Connector Bulkhead

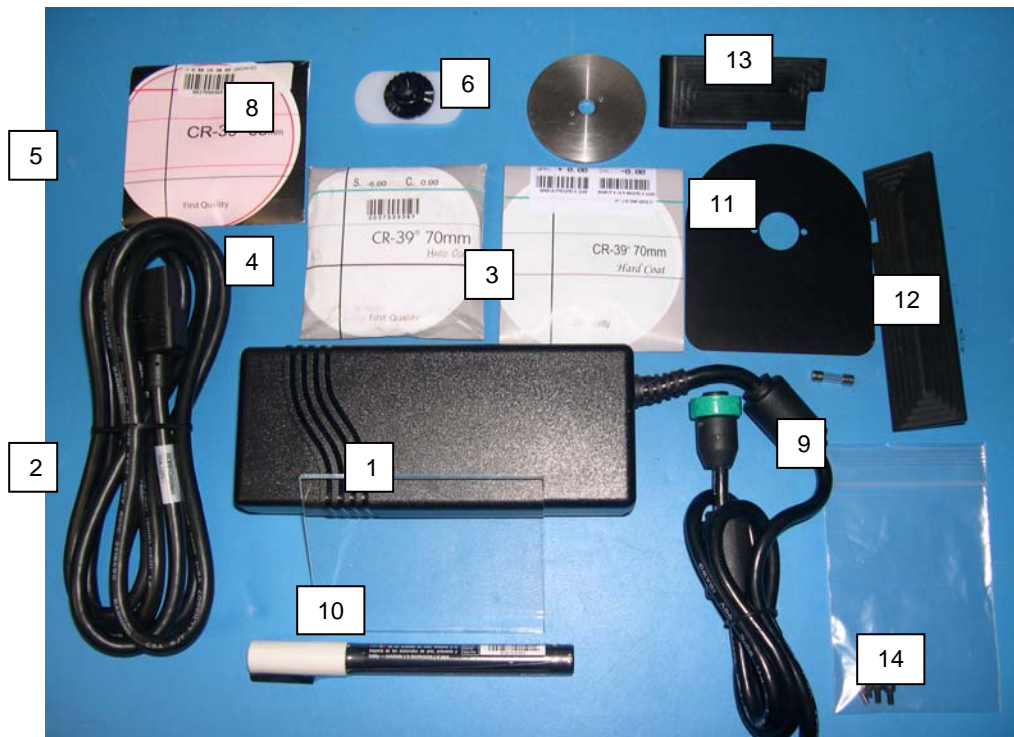


Figure 1.4 – Accessory Kit

- | | |
|--------------------------|--|
| 1. Power supply | 8. Oval calibration template with permanent block attached |
| 2. Power cord | 9. Fuse (in the bag of screws) |
| 3. 70mm Plano CR39 | 10. Glass plate |
| 4. 70mm -6.00 CR39 | 11. Light shield (Blocking Arm) |
| 5. 65mm +6.00 CR39 | 12. Light shield (Left Gripper) |
| 6. 58mm calibration disc | 13. Light shield (Right Gripper) |
| 7. White marking pen | 14. Bag of screws for the light shielding |

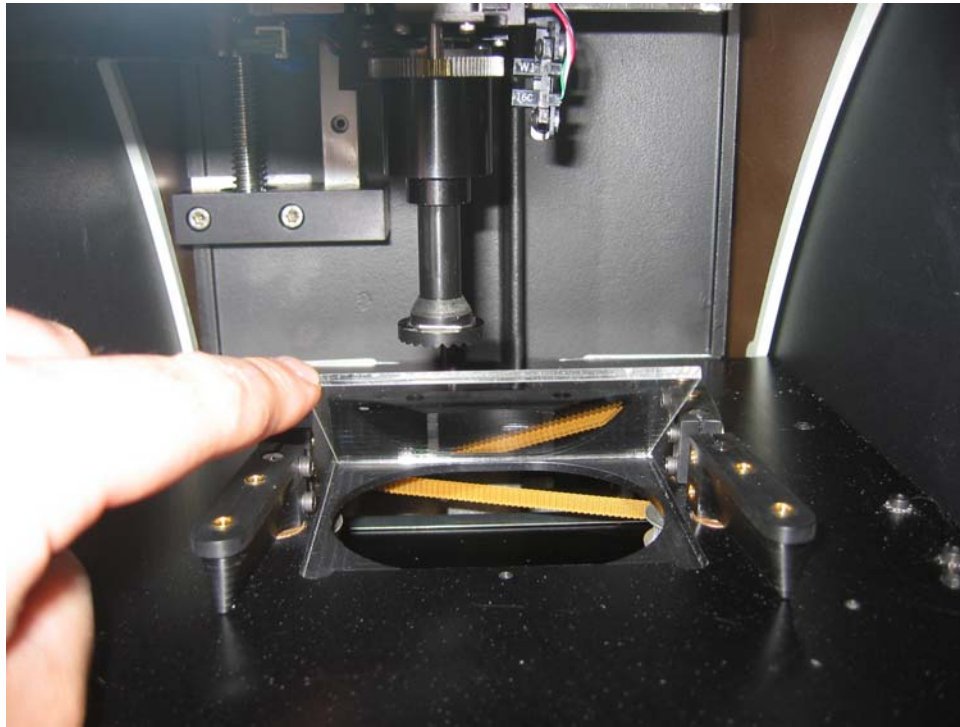


Figure 1.5 – Installing the Glass Plate

Installing the Glass Plate – The glass plate is placed over the opening in the base plate of the blocking chamber. Clean the glass plate and then slide it into the pocket. It should fit and seat down in the pocket fully. (The glass plate is shipped in the accessory box.)

Installing Light Shielding – This shielding is designed to reduce or eliminate light coming in to the blocking chamber causing inconsistent lens analysis. The shields are not necessary in all lab environments. Only if you see white or clear areas on the lens image (on screen) during processing should the shields be needed. They are in the accessory box in the event that there is too much light entering the chamber. There are three separate parts to the light shielding including the left gripper shield, the right gripper shield and the blocking arm shield.

The left and right gripper shields can be installed using the screws in the accessory box to secure them to the tops of the front gripper arms. There are two threaded holes for the screws to attach the shields to the tops of each gripper arm.

The blocking arm shield requires that you remove the center screw of the blocking arm, thereby removing the chuck. Place the shield over the arm with the flat side facing down. Replace the chuck (align small hole on the back of the chuck with the locator pin) and insert and tighten the center screw.

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Chapter 2 – Basic Operation

WARNING

Use only a grounded outlet. Do not defeat the grounding by cutting off the grounding prong on the power cord, or by using a non-grounding adapter.

NOTE

The power supply module is designed to work with both 115 VAC (60 Hz) and with 230 VAC (50 Hz). A separate power cord is available for each application. In the U.S., units will be shipped with 115 VAC power cord unless otherwise specified.

WARNING

The back case top should not be removed while the machine is powered ON. Power the machine OFF and unplug from the wall.

Powering on the Clarity

- Make sure that the Clarity main power switch is in the **OFF** position. The side of the switch with the symbol **0** should be depressed.
- Plug one end of the AC power cord into the power supply module. (Fig. 1.3)
- Plug the other end of the AC power supply cord into a grounded outlet.
- Plug the power supply module into the power socket on the rear connector bulkhead shown in Fig. 1.3.
- At this time you can connect a serial cable for communications from the host computer to COM 1 or COM 2, 9-pin serial port on the rear bulkhead. This method will require the use of a null modem at either end of the serial cable.
- Once the unit is properly plugged in, both at the machine and the wall, press the left side of the power switch (with the symbol **I**) to apply power to the Clarity. Within 6 to 10 seconds, the display should become active and the mechanism should move to locate its home position.
- Either of the two 9-pin serial ports on the rear bulkhead labeled **COM 1** and **COM 2** (may show up in the Interface tab as COM 5 and COM 6 respectively) can be used to set up serial communications.

Establishing Communications

At this time, you will want to set the communications to your lab software. From the Job Screen, press EXIT, then select **Setup**, and then select the **Interface** tab. Choose the **VC Connection Method**, and then set the **Baud Rate** and **COM Port** if you are using a serial

connection. If you are using an Ethernet connection, then you must set the two ports in the **TCP/IP Network Auto-Connect Settings** box.

CAUTION

Keep hands away from unit during the blocking function.

The Touch Screen Display and Job Screen

CAUTION

Do not use a sharp object (pencil or pen point, paper clip, etc.) on the touch screen as it may scratch or tear the screen. Clean the screen with a microfiber cloth such as is used to clean eyeglasses. A soft cloth slightly dampened with clear water may be used for hard-to-remove spots. Turn the Clarity off before cleaning the screen.

The Clarity is equipped with a touch screen display. A mouse and keyboard can be installed on the rear bulkhead if desired. A mouse is recommended to have at all times for manual alignment of progressives, bifocals and trifocals. There are two USB ports that can be used as well as two PS-2 connectors at the rear of the machine. (See Fig. 1.3) If you install a PS-2 mouse or keyboard while the machine is ON, you will have to reboot the machine (cycle the power OFF and then ON) for the machine to recognize there is a device connected.

Once the unit is powered **ON**, it will boot to the main **Job** screen. (See Fig. 2.1.) The program will open, initialize communications, and the camera will go through several checks.

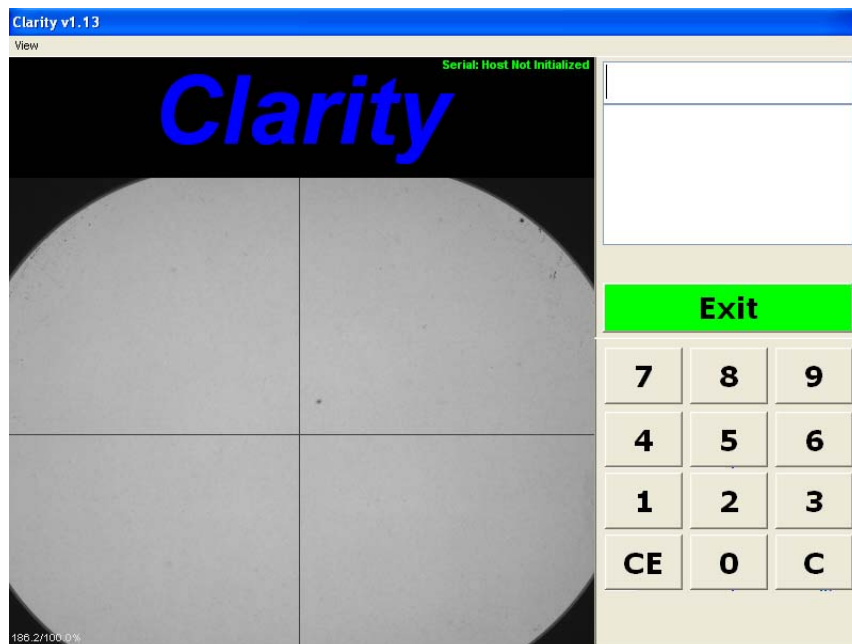


Fig. 2.1 - Job Screen

When a Job Number has been entered, the **EXIT** label on the control button changes to **PROCESS**. Jobs are processed in one of the following three ways:

1. You may enter the job number manually with the touch screen keypad or keyboard and then select **PROCESS**.
2. You may use USB barcode reader and scan a job number into the machine and then select **PROCESS**.
3. You may enter multiple job numbers either manually or with the barcode reader by going to the **Preferences** tab in the **Setup** menu and checking the box labeled **Enable Batch Blocking** and activating **Last in First Out**, or **First in First Out**.

NOTE

Selection 3 above allows the operator to enter a large group of jobs (like a stack of trays) for efficiency. The Clarity will then bring up each job in the order that was specified in the setup. (See batch blocking in the glossary.)

The Processing Screen

From the **Job Screen**, press the **PROCESS** control button to gain access to the **Processing Screen** (Figure 2.2).

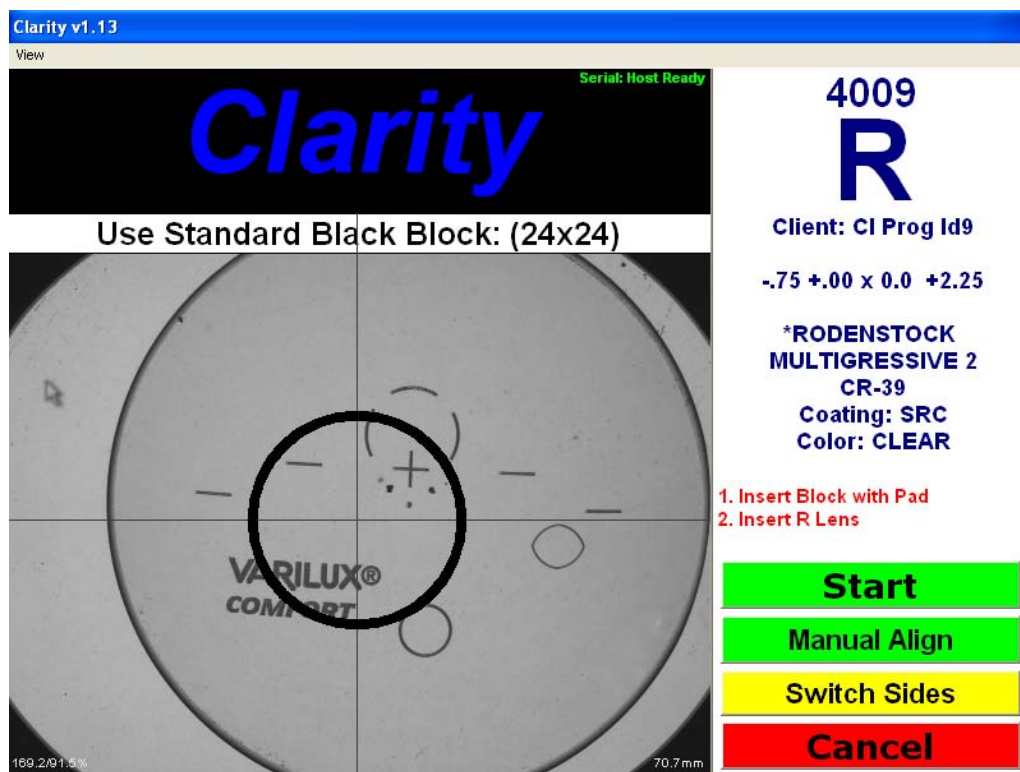


Figure 2.2 - Processing Screen

When the screen is first displayed, only two control buttons are shown in the lower right:
Switch Sides – Change displayed eye to the opposite side. OD is displayed initially.
Cancel – Return to Job Screen.

As instructed by the screen prompts, load a block and pad onto the blocking arm chuck and place the lens to be blocked on the glass plate in the blocking chamber. The Clarity automatically detects that a lens has been loaded and displays two additional control buttons at the lower right:

START – Initiate the lens analysis/verification and blocking process.

Manual Alignment – Perform the lens alignment manually prior to blocking.

Select **START** to identify features of the lens and perform lens analysis.

The **Manual Alignment** button can be used instead of the **Start** button when a progressive is known not to align properly. You can choose **Manual Alignment** and not have to wait for analysis to proceed.

The Analysis Screen

The **Analysis** screen will appear and show the prescribed Rx information on the left side of the screen and the measured information on the right side of the screen. Once the analysis is complete, the measured information will be checked against the prescription to determine if the lens meets ANSI standards. If the lens does not meet the tolerances, the individual parameter(s) that are out of tolerance will be displayed in red. Those that fall within the standards will display in black. (See Fig. 2.3.)

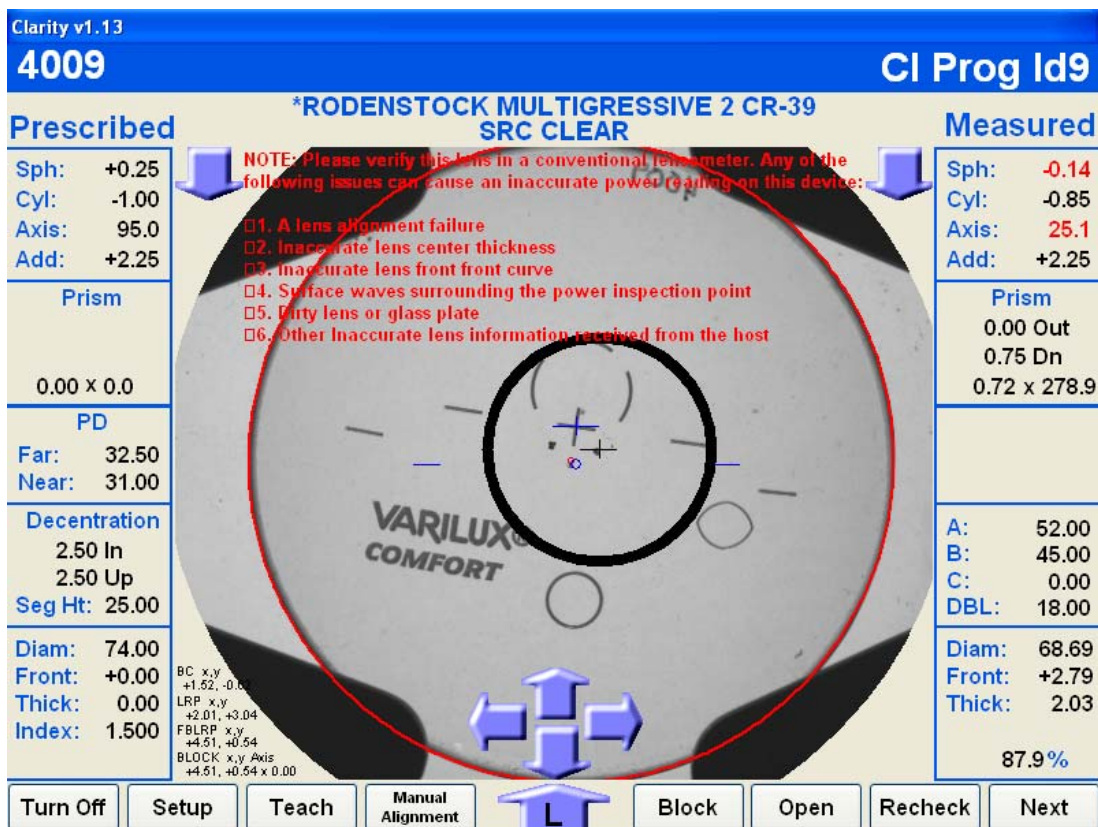


Figure 2.3 – Analysis Screen

After the lens has been analyzed, the bottom of the screen will display eight buttons and five arrows. (See Fig. 2.3.) The eight buttons are:

1. **Turn Off** – Exit the program and shut the power off.
2. **Setup** – Access the main Setup screen with tabs at the top of the screen for other setup options.
3. **Teach** – “Teach” the Clarity how to analyze a problem lens. Described later in this chapter.
4. **Manual Alignment** - Use this button whenever the camera misaligns a lens after analysis. Proper alignment may be drawn on the screen using a mouse.
5. **Block** – Activate the blocking sequence. Typically this is the most used button after the lens is analyzed. (See Figure 3.2 for automatic blocking.)
6. **Open** – Open the lens clamps to remove the lens from the chamber.
7. **Recheck** – Recheck the lens that is in the chamber.
8. **Next** – Exit the **Analysis** screen and return to the **Process** screen to enter a new job number.

The arrows have two functions:

1. The lowest arrow that has either an R or an L in it allows you to switch to the other eye for the job you are blocking on screen.
2. The four arrows (up, down, in, and out) allow you to change the block position in case of cutout issues for the frame.

Once you have blocked the lens, the screen will prompt you to remove lens. The display will then change to the left lens, or if this was the left lens, then it will return to the **Process** screen to start the next job.

NOTE

If the information about the lens coming from the host program is inaccurate on any of the following items, then the power measured could be inaccurate and out of tolerance.

1. **Front Curve**
2. **Back Curve**
3. **Lens center thickness**
4. **Lens diameter**

If you see power problems, check data coming from the host for that particular lens.

The Teach Function -- In some cases, the Clarity is unable to recognize the fitting cross on progressive lenses. When this occurs, the user may use the teach function to “draw” the fitting cross on the screen to “teach” the Clarity what it looks like. The teach function is accessed from the Analysis screen via a button at the bottom of the screen. A mouse and keyboard should be attached to the Clarity to effectively use the teach function. Upon pressing the **Teach** button, a screen similar to that shown in Figure 2.4 will appear.

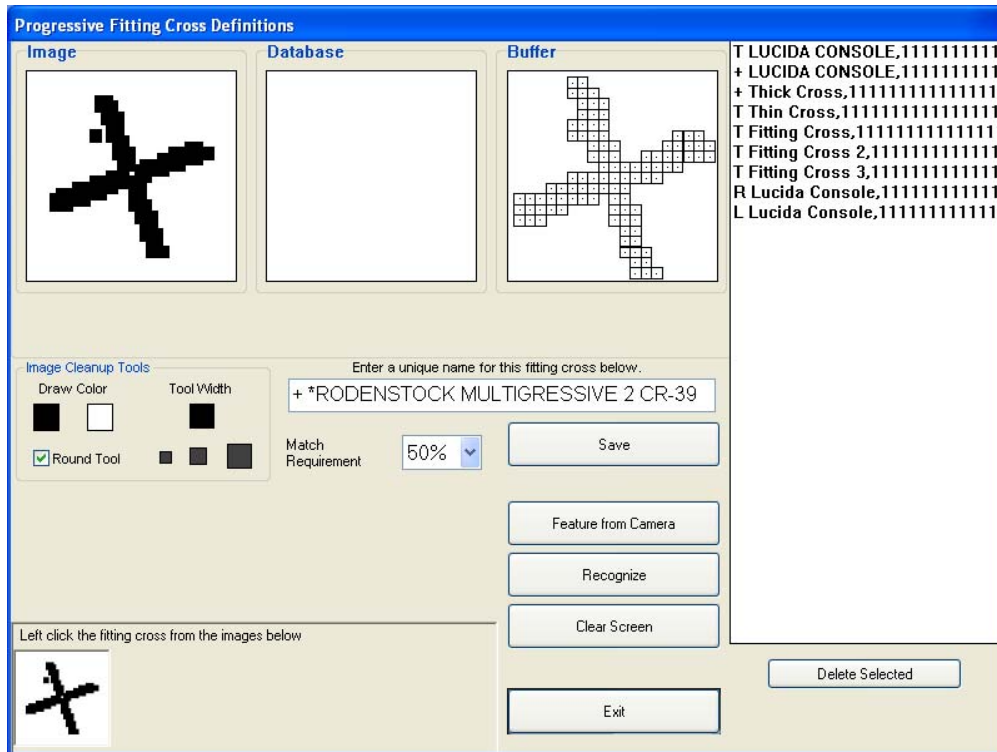


Figure 2.4 – The Teach Screen

At the lower left of the screen, there may appear one or more images that the Clarity has identified as candidates for the fitting cross. If one of these matches the actual fitting cross *and is on axis*, left-click the image; it will move to the Image Box at the left top of the screen.

NOTE

Do not select a candidate image from the lower-left unless it is aligned. In Figure 2.4, the image is not aligned so should not have been copied to the Image Box at upper left.

If there is no suitable candidate image at the lower-left, two alternatives remain for creating an image:

1. Use the image cleanup tools and the mouse to draw an image in the image box. The width of drawn pixels may be selected by clicking on one of the tool-width squares. Select the black draw color to actually draw, and the white draw color to clear or erase.
2. Click the **Feature From Camera** control. A screen shot of the lens will appear. Rotate the lens if necessary to align it. Then use the mouse to draw a rectangle around the fitting cross. The pixels enclosed in the rectangle will be copied to the Image Box. The rectangle should be as small as possible but still include the complete image of the fitting cross.

Once an image has been acquired (from among the candidates, or drawn, or copied from the camera image) it may need to be “cleaned up” by removing stray pixels or adding pixels to fill gaps. Use the Image Cleanup tools for this purpose. (Cleanup is especially important for camera captures.) The result should be a clean image that nearly spans the width and height of the Image Box.

The image should be saved in the Clarity database. Images in the database are listed in the upper-right of the Teach screen. Each image has a unique name that may be derived from the lens type name, or entered via a keyboard. The first character of each name in the database must be either a “+” or “ T ” to indicate whether the image is a cross or T-shape. T-shapes may be upright or inverted. Once the name has been assigned, use the SAVE control to make the database entry.

NOTE

The teach function cannot be used with fitting crosses that include gaps (white space).

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Chapter 3 – Setup Screens

Clarity v1.08

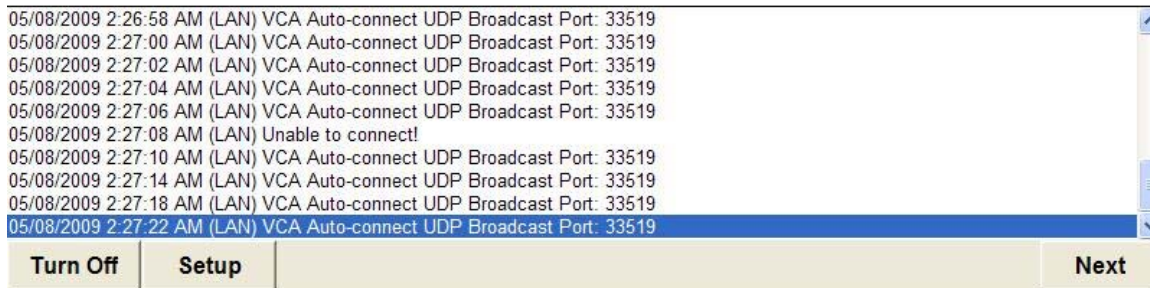


Figure 3.1 – Main Menu Screen

The **Setup screens** are accessed by pressing the **Setup** button at the lower left of the **Main Menu screen**. (See figure 3.1.) Specific setup functions are selected by using the tabs across the top of the Setup screen. The tabs are:

- Preferences**
- Tolerances**
- Interface**
- Blocking**
- Calibration**
- Advanced**
- Technician**
- Statistics**

The screens associated with each tab are shown below. The meanings of most of the setup options should be apparent to the operator. The descriptions provided in this chapter only include highlights of features that may not be obvious. Complete guidance on using all of the Setup screens may be obtained by phoning the Technical Support group.

The Preferences Screen

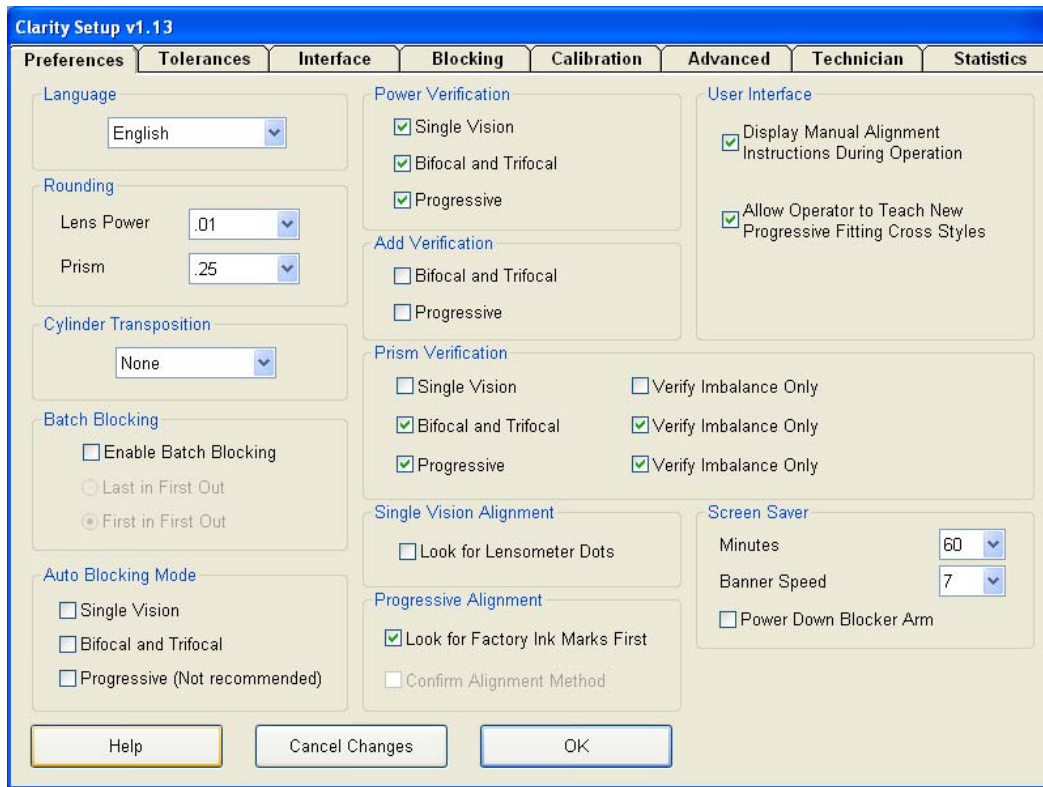


Figure 3.2 - Preferences Screen

Key Features of the Preferences Screen

Batch Blocking: If enabled, the user may enter a series of job numbers. As each job completes, the next job is automatically started. Use the check boxes to specify the order in which the jobs are processed.

Auto Blocking Mode: In auto-blocking mode, the Clarity will block a lens that has been successfully analyzed without operator intervention. Use the check boxes to select which types of lenses may be auto blocked.

Add Verification: Many labs find it unnecessary to verify the add power once the distance Rx has been verified. Leaving the boxes unchecked will reduce analysis time and improve system throughput.

User Interface: Select either or both of these somewhat advanced features if desired. They are most useful in processing “difficult” lenses in which the Clarity may not be able to find alignment marks or the fitting cross.

Tolerances Screen

Clarity Setup v1.11.01.01

Preferences | **Tolerances** | Interface | Blocking | Calibration | Advanced | Technician | Statistics

Single Vision and Multifocal Power

Sphere	0.00 to ±6.50	± .13	D
	> ±6.50	± 2.00	%
Cylinder	0.00 to 2.00	± .13	D
	> 2.00 to 4.50	± .15	D
	> 4.50	± 4.00	%

Single Vision Prism Imbalance

Vertical	0.00 to 3.375	± .33	D
	> 3.375	± .36	D
Horizontal	0.00 to 3.375	± .67	D
	> 3.375	± .67	D

ANSI Custom

Note: The highest meridian power will be used for all sphere tolerance checks.

Progressive Power

Sphere	0.00 to ±6.50	± .16	D
	> ±6.50	± 2.00	%
Cylinder	0.00 to 2.00	± .16	D
	> 2.00 to 3.50	± .18	D
	> 3.50	± 5.00	%

Multifocal Prism Imbalance

Vertical	0.00 to 3.375	± .33	D
	> 3.375	± .36	D
Horizontal	0.00 to 3.375	± .67	D
	> 3.375	± .67	D

Progressive Prism Imbalance

Vertical	0.00 to 3.375	± .33	D
	> 3.375	± .36	D
Horizontal	0.00 to 3.375	± .67	D
	> 3.375	± .67	D

Axis

Cylinder	0.00 to 0.25	± 14	°
	> 0.25 to 0.50	± 7	°
	> 0.50 to 0.75	± 5	°
	> 0.75 to 1.50	± 3	°
	> 1.50	± 2	°

Other Tolerances

Center Thickness	± .30	MM
Front Curve	± .75	

Relax center and front tolerances on stock finished lenses

Add Power

	0.00 to 4.00	± .12	D
	> 4.00	± .18	D

Keypad: 7, 8, 9, 4, 5, 6, 1, 2, 3, + -, 0, <-, ., Enter

Buttons: Help, Cancel Changes, OK

Figure 3.3 – Tolerances Screen

The values on this screen indicate how closely a measured lens characteristic must match the Rx in order for the verification to pass. The values are preset prior to shipment to ANSI standards. You can customize the tolerances by selecting **Custom** and then changing any or all of the parameters using the touch screen keypad. (If you switch to **Custom** and make any changes to any or all of the tolerances, you can easily return to the ANSI standards by selecting **ANSI**.)

The Interface Screen

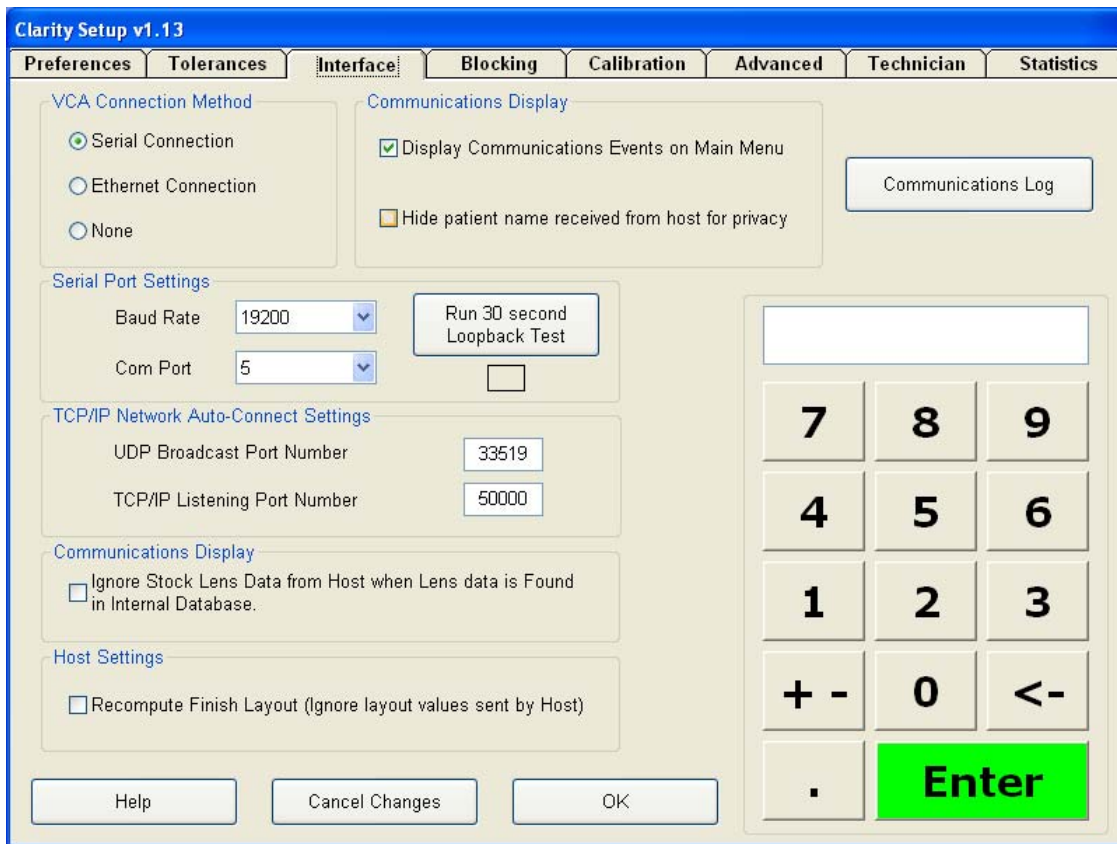


Figure 3.4 – Interface Screen

Key Features of the Interface Screen - This screen allows you to set the serial communication baud rate for the port used. It also allows for the use of Ethernet, which includes UDP and TCP/IP port setup.

Display of Communication Events on the Main Menu – Check this box to view communication events on the Main Menu screen.

Hide Patient Name Received From Host for Privacy – If this box is checked, the patient’s name will not be shown during processing.

Run 30 Second Loopback Test – Check this box to run a loopback test on the serial port. This test verifies that the port can send and receive data. You must insert a loopback plug in the port to perform this test. Press the test button. In the box below the button, you will see a string of letters and numbers if the port is working. You will not see any characters in the box if the port is not functioning.

Communications Log – This button is a diagnostic tool that may be used by Technical Support.

NOTE

Communication Events include packet requests, download a job, received packet, timeouts, etc. If you place a checkmark in the box under Communications Display, you will see communication errors on the screen. This can be a useful diagnostic tool.

The Blocking Screen

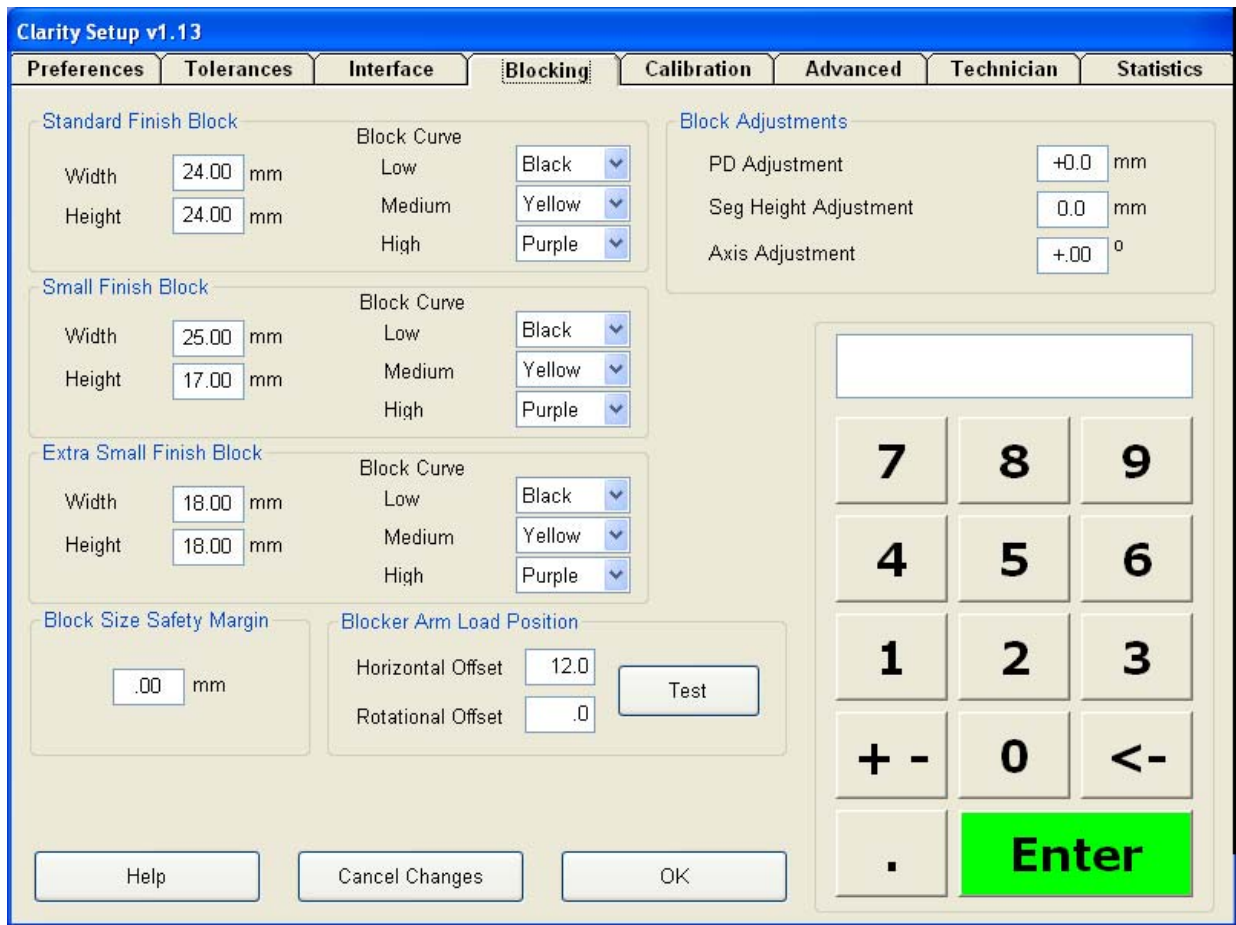


Figure 3.5 – Blocking Screen

Key Features of the Blocking Screen

Standard Finish Block Size, Small Finish Block Size (Half Eye), Extra Small Block Size – Enter the dimensions for the finishing blocks used in your lab. Use the dropdown menu to enter the color of each block.

PD, Seg Height, Axis – Enter values to correct any observed offset in these parameters across all jobs.

Block Size Safety Margin – Specifies tolerance to ensure that the correct block size is used under close tolerances between block B-size and frame B-size.

Blocker Arm Load Position - Values are used to position the blocker arm so that it does not collide with the slot in the case top.

The Calibration Screen

Clarity Setup v1.11.01.01

Preferences Tolerances Interface Blocking Calibration Advanced Technician Statistics

Step 1: Camera

Brightness: 715
Shutter: 513
Gain: 40

Calibrate

Step 2: Screen Calibration

Horizontal: 6.850060928069
Vertical: 6.850060928069

Calibrate

Touch Screen Calibration

Step 3: Block Position Offsets

Horizontal: .64
Vertical: -.70
Axis: -1.11

Calibrate

Use rotational block calibration

Step 4: Power and Prism Calibration

Calibration Lens Specifications

	Minus	Plus
Diameter	69.4	65.3
Index	1.498	1.498
Power	-6.00	+6.00
Front Curve	+2.00	+8.25
Back Curve	-8.00	-2.25
Center Thick	1.80	7.10

Minus Power Bias: 0.865666666667
Plus Power Bias: 0.852333333333
Power Offset: 0
Minus Prism Bias: 0.795
Plus Prism Bias: 0.99

Calibrate Power

Help Cancel Changes OK

7 8 9
4 5 6
1 2 3
+ - 0 <-
. Enter

Figure 3.6 – Calibration Screen

This screen contains the calibration values obtained in performing the five calibrations necessary for best performance of the Clarity:

- Preliminary Camera Focus (described in the Technician Screen)
- Camera Calibration
- Screen Calibration
- Block Position Offsets Calibration
- Power and Prism Calibration

The preliminary camera focus calibration is performed via the Technician screen. The other calibrations are described in Chapter 4: Calibration.

The Advanced Screen

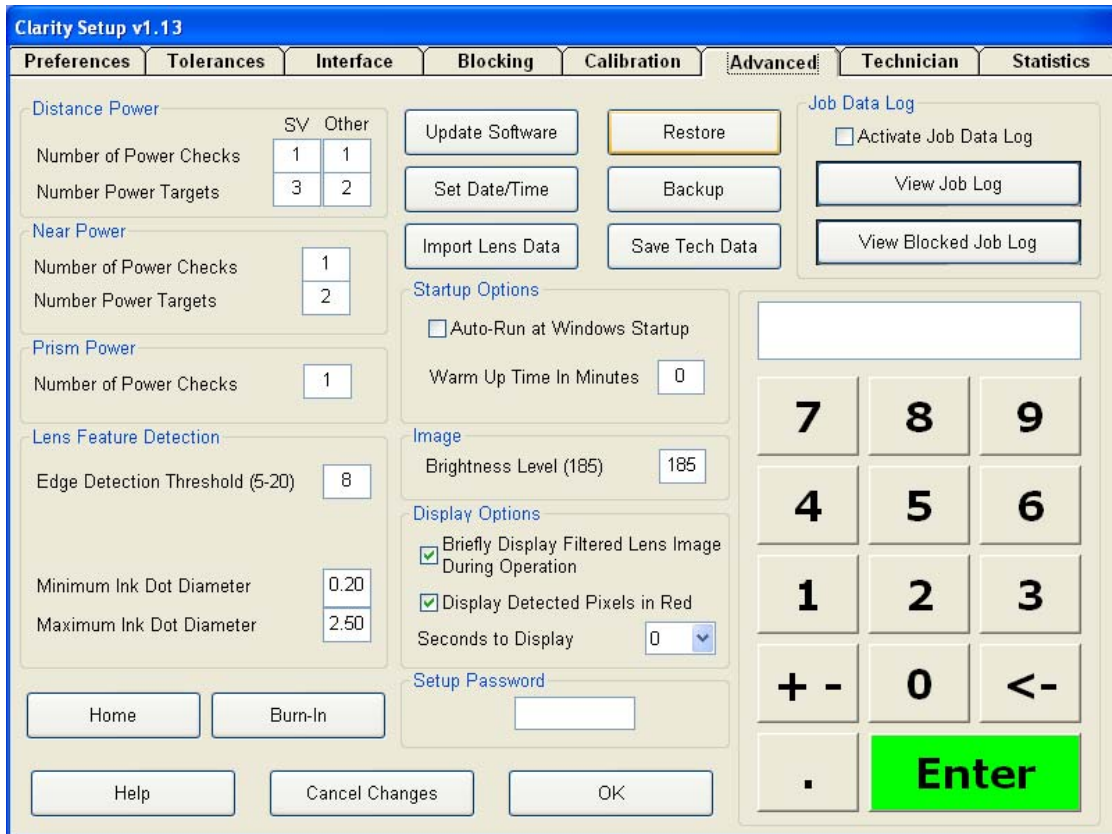


Figure 3.7 – Advanced Screen

This screen is discussed in detail in the last chapter of this guide. Please call Technical Support before making any changes to this screen.

Key Features of the Advanced Screen

Home - To return all of the axes to their home position, press this button.

Burn In - Is used to exercise the axes, especially when the machine is cold.

Distance, Near and Prism Power Checks – Specifies both the number of power checks and the number of power targets. Higher values improve accuracy but take longer. The Clarity is set at the factory for the combination that provides optimum function balancing speed and accuracy.

Other features:

- **Update Software** (Install new versions of software.)
- **Set Date and Time**
- **Restore Data** (If a backup was made, which is recommended.)
- **Backup Data** (Copy setup data to a USB thumb drive.)
- **Import Lens Data** (Used to import finished lens data for accurate power reading of stock finished lenses.)
- **Save Tech Data** Save screen images of all the Setup screen tabs.

There are two other buttons that will allow you to check and save job log data for analysis of VC labels:

- **View Log**
- **Copy Logs to Flash Drive**

To copy or look at the log, you must have the **Activate Job Log Data** box checked. This screen also includes a box to allow the machine to boot up completely past Windows and open into the Clarity software. There is a **Brightness Image Level** that is set at the factory to 185. There is also a box called **Display Options**. These parameters should only be changed with input from Technical Support. Advanced screen functions are discussed in detail in Chapter 5.

The Technician Screen

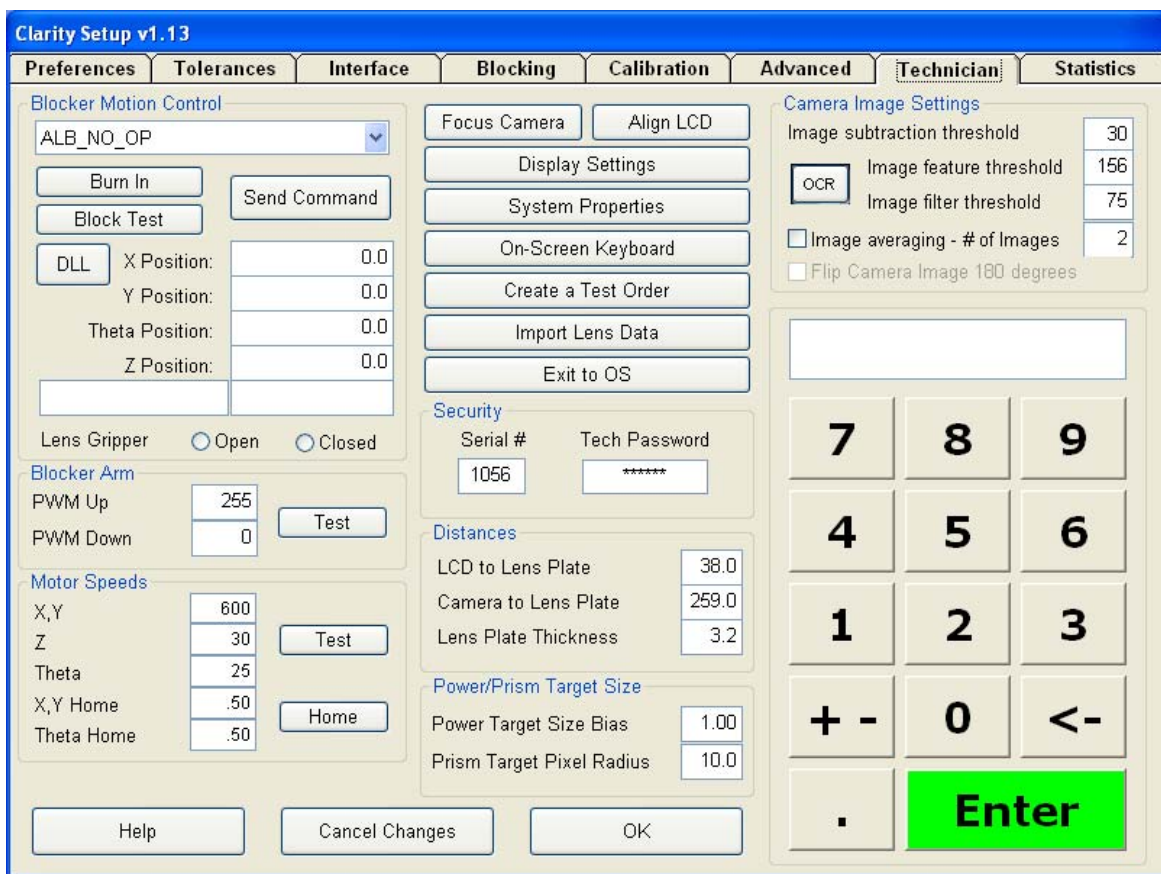


Figure 3.8 – Technician Screen

When you select the **Technician** tab, a number keypad appears. Enter the password (**082379**) to allow entry into the screen. This screen contains a wide variety of features that will be useful in diagnostics. Contact Technical Support before making any changes to this screen.

This screen also contains a **Focus Camera** button that is used as a preliminary calibration of the camera focus to optimize the camera's ability to recognize clearly the edge of the lens. This, in turn, optimizes diameter checks and affects power readings.

The Statistics Screen

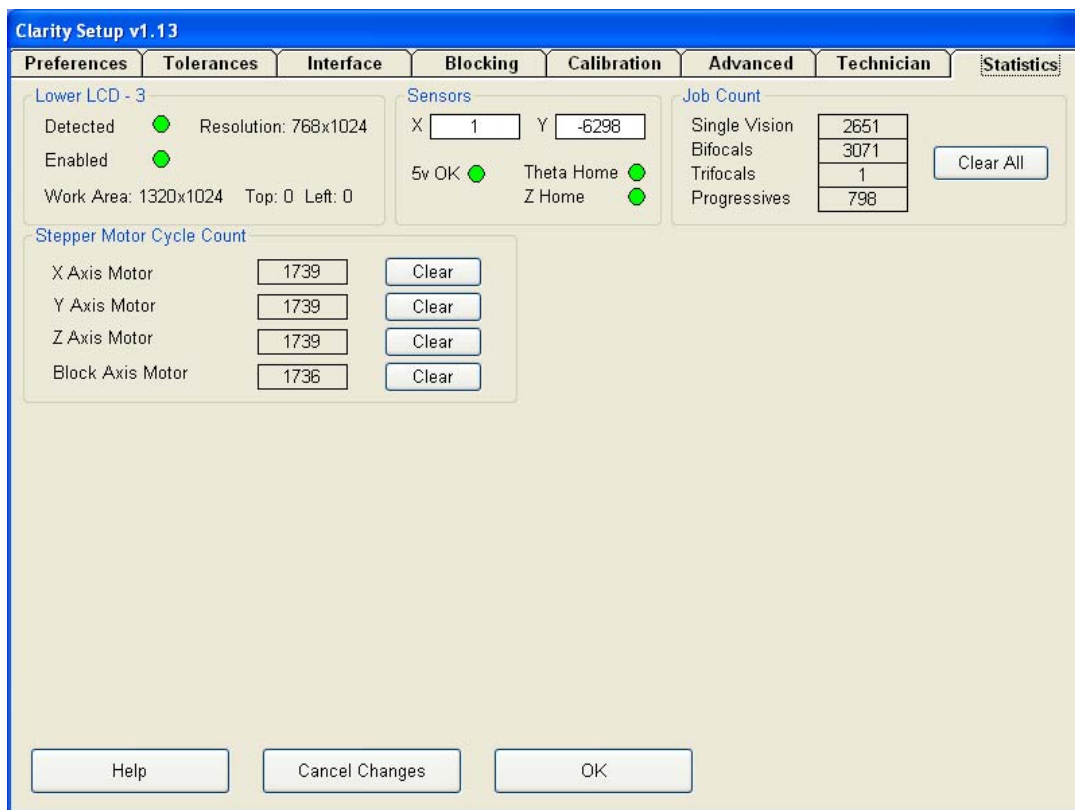


Figure 3.9 - Statistics Screen

The box labeled **Job Count** shows the number of Single Vision, Bifocals, Trifocals and Progressives that have been processed. There is a **CLEAR** button that will reset the counter for all of the lens types.

The area labeled **Stepper Motor Cycle Count** has four boxes for the four motors the Clarity uses. The X, Y and Z Axis Motors and the Block Axis Motor each have their own **CLEAR** button so that you can keep track of the individual motor counts and clear the data when a motor is replaced.

In the upper-left and center of the screen are a number of indicators related to LCD operation and showing axis home switch status.

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Chapter 4 – Calibration

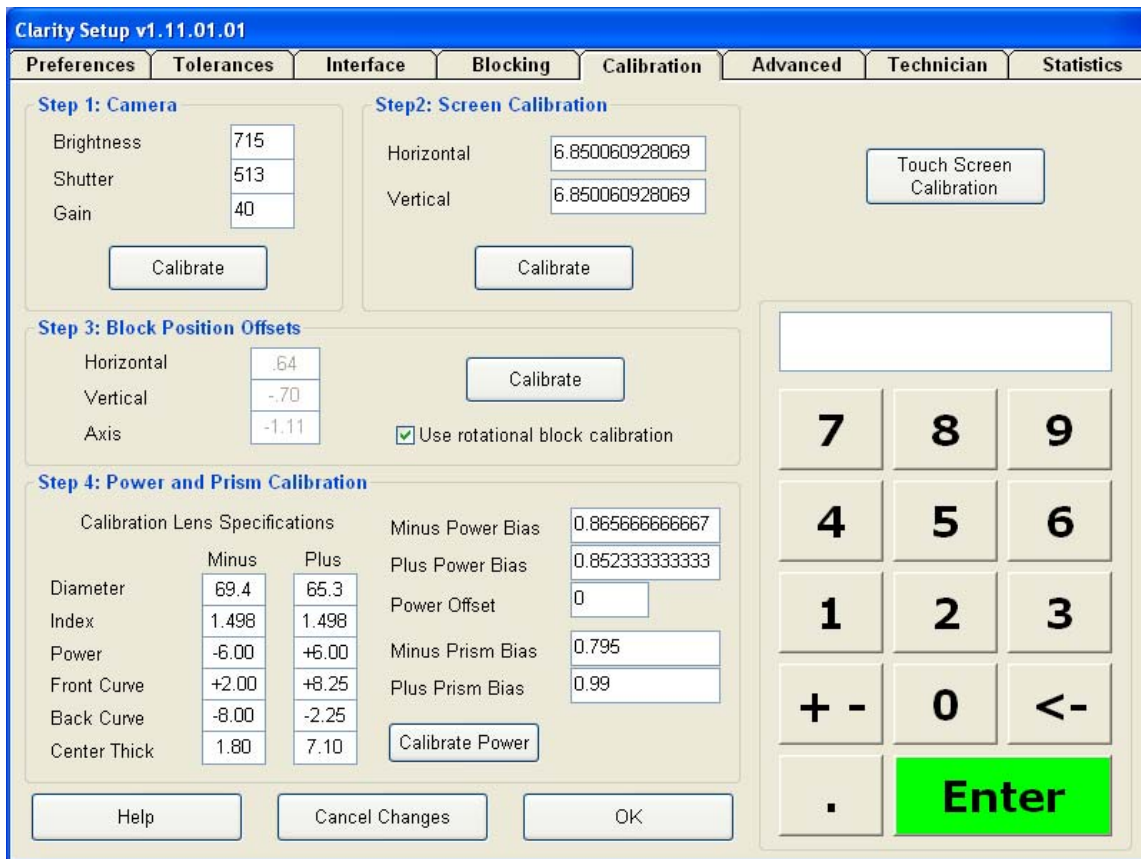


Figure 4.1 – Calibration Screen

A full calibration of the Clarity involves the following five steps:

Step 1: Preliminary Camera Focus: This step is performed from the **Technician** screen. There you will find a button labeled **Camera Focus**. Select this button and follow the instructions on the right side of the screen. This calibration will require the use of the 58mm round pattern found in the accessory kit.

Step 2: Camera - This calibration sets the **Brightness, Shutter** and **Gain** of the camera. Select the **Calibrate** button and a box will appear that is titled **Remove Lens**. Select **OK** and in a couple of seconds another box will appear that will say **The camera calibration is completed**. Select **OK** to complete this step.

Step 3: Screen Calibration – This calibration requires the use of the 58mm round pattern found in the accessory kit. (See Fig. 1.4) Select the **Calibrate** button and a box will appear titled **Graphics Scale Calibration**. It prompts you to put the 58mm round pattern in the chamber and select **OK**. Within a couple of seconds another box will appear with the same title saying that the screen graphics have been calibrated. Select **OK** to complete this step.

Step 4: Block Position Offsets – The oval calibration template with a Vario block permanently mounted and the 70mm plano CR39 lens are required for this calibration. This process places the oval calibration template on the plano lens and takes a snapshot of the position eight separate times to complete this operation. This will set the horizontal, vertical and axis position. Select the **Calibrate** button and, after a few seconds, you will be prompted to clean the glass plate and make sure no lens is in the chamber. (See Fig. 1.5.)

NOTE

Clean the glass plate using an A/R microfiber cleaning cloth. The glass plate is removable and it may be necessary to clean the lower LCD under the glass plate. Refer to the Maintenance chapter for details.

Select **OK** and the screen will change to the **Block Position and Axis Calibration** screen. Select the **Calibrate** button and the first of eight boxes will appear. The box will direct you through the operation.

1. Place the plano 70 mm lens (found in the accessory kit) in the blocking chamber.
2. Place a blocking pad on the alignment block. (See Fig. 4.2) The pad must have a hole in the center to allow the camera to see through the hole on the center of the finishing block.
3. Mount the alignment block on the blocking arm.
4. Select **OK**.

At this time, the machine will place the block on the lens and analyze the data to set the 0, 0 Coordinate Origin position (See Glossary) for X and Y and also set the axis. This calibration will ask you to perform 1-4 above eight separate times. The software rotates the block 45 degrees each cycle.

Follow the on-screen direction until the calibration is complete. At the end of this calibration three numbers will appear in the box for:

1. Horizontal offset (X)
2. Vertical offset (Y)
3. Axis (A)

NOTE

Look closely as the block is being placed on the lens. If you believe each of the eight steps were completed with no block slippage or any irregular motion, then select OK to accept the new offsets and continue to the power calibration. If you feel that any of the eight steps were compromised, select Cancel and start the process over.

Step 5: Power Calibration – This calibration requires the use of the 70mm CR39 -6.00 and the 65mm CR39 +6.00 lenses found in the accessory kit. This process will set the power throughout the range of powers this device is able to verify.

On the **Calibration** screen under Step 4 (See Fig. 4.1), there are six parameters that describe the lens that will be analyzed:

1. Diameter
2. Index of Refraction
3. Power
4. Front Curve
5. Back Curve
6. Center Thickness

These parameters are for both the plus and the minus lenses.

NOTE

If these lenses are misplaced or compromised in any way, please call the factory and order a new calibration lens. Once the new lens arrives, check these parameters and make any necessary changes.

To perform this calibration, select the **Calibrate** button. You will be prompted to remove the lens. Make sure there is no lens in the chamber and select **OK**. After 25 seconds, you will be prompted to insert the calibration lens. Put the -6.00 lens in the chamber and select **OK**. The Clarity will analyze the lens and will instruct you to place the +6.00 lens in the chamber. Select **OK**.

After both lenses are analyzed, the plus and minus slope adjustments will be displayed. Select **YES** to accept these changes. The calibration wizard will appear telling you that the power calibration is complete. Select **OK**. To exit back to the **Job** screen, select **OK** at the bottom of the screen and then on the next screen select **Next**.

NOTE

On this screen, there is also a Power Offset box. This can be used if you see a consistent power error. For example, powers are showing 0.25 weak across the board. Enter a +.25 and all analyzed powers will have 0.25 added to the final reading. This functions like the manual eyepiece adjustment for power on a conventional lensometer.

This screen includes two parameters labeled Minus Prism Bias and Plus Prism Bias. They are constants and should not be changed unless directed by the factory.

To verify power calibration, there is an internal job (Job Number 999999999) which will allow you to use the two calibration lenses (+6 and -6). From the main **Job** screen enter the Job Number 999999999 and follow the directions. Each lens will show the measured power in the upper right hand corner of the screen. If they are within acceptable limits, you can move on. If they are out of tolerance, recalibrate.

Touch Screen Calibration

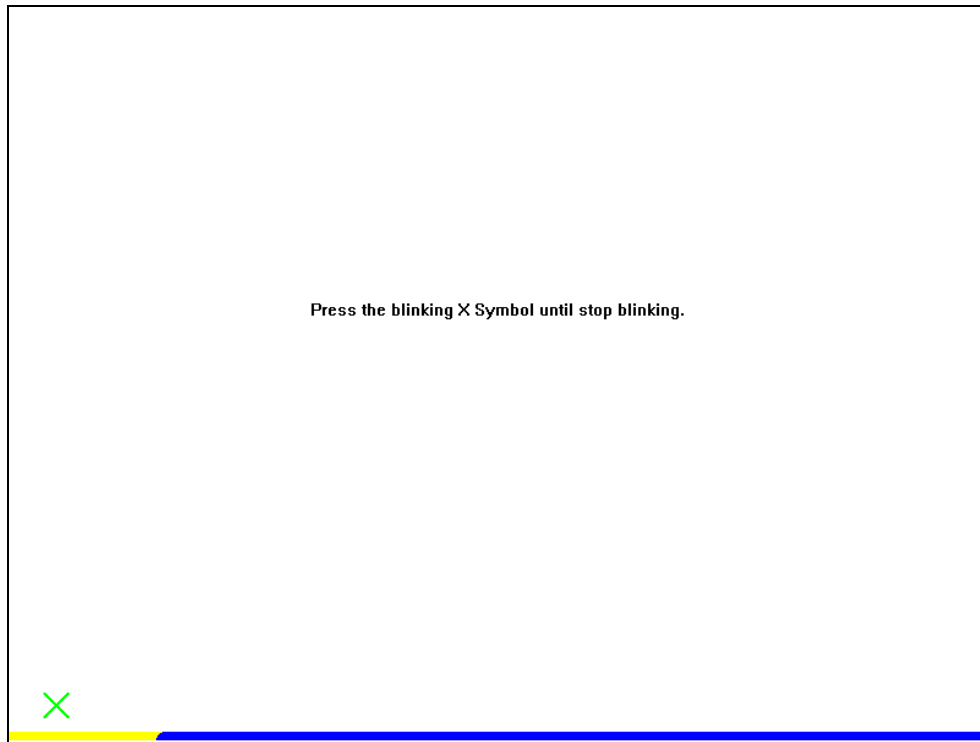


Fig 4.2 Touch Screen Calibration Screen

Touch Screen Calibration – In the upper right corner of the calibration screen there is a box titled **Touch Screen Calibration**.

NOTE

This calibration is done at the factory and does not need to be done on a regular basis, only if the touch screen fails.

Select the box labeled **Touch Screen Calibration**. After a second, the touch target will move and a new screen will appear. In the center of the screen it will read **Press the blinking X symbol until stop blinking**.

- In the lower left corner of the screen a blinking X will appear and there will be a yellow to blue progress bar at the bottom of the screen.
- Hold your finger over the blinking X.
- When the X stops blinking, remove your finger and the X will move to the lower right hand corner.

- Hold your finger over the blinking X and when it stops blinking, remove your finger and the X will move to the upper right hand corner.
- Hold your finger over the blinking X and when it stops blinking, remove your finger and the X will move to the upper left hand corner.
- Hold your finger over the blinking X and when it stops blinking, remove your finger.
- The screen will then change to a blank screen with a progress bar box in the center.
- When the progress bar fills completely, the screen will return to the **Calibration** tab in the setup.

To exit back to the **Job** screen, select **OK** at the bottom of the screen and then on the next screen select **Next**.

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Chapter 5

– The Advanced Screen in the Setup Menu

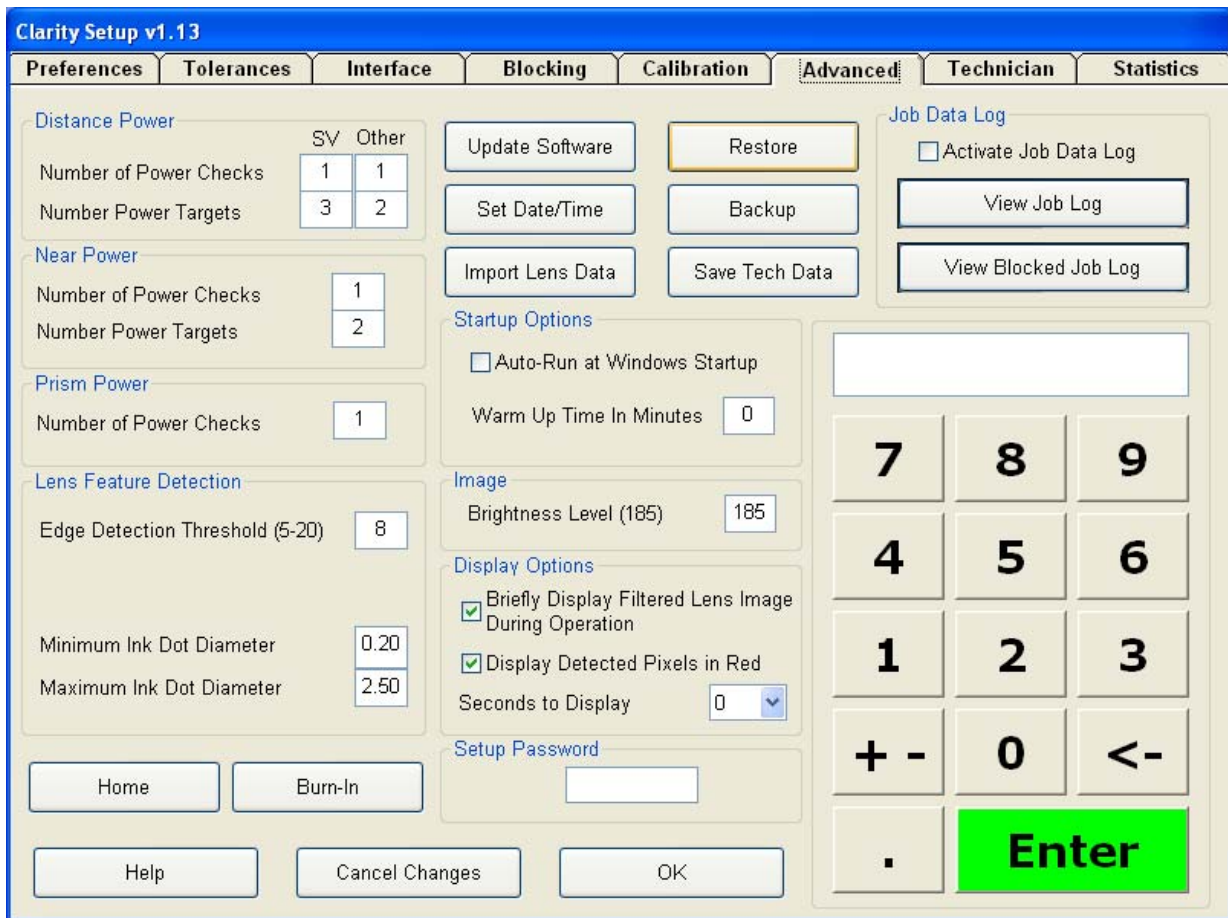


Figure 5.1 - Advanced Screen

The Advanced screen has software adjustments for power, lens edge detection, lens diameter, prism, brightness of the camera image, as well as updating software and data import, restore and backup.

To enter the **Advanced** screen from the **Job** screen select **Exit**. When the next screen appears, select **Setup**. In the **Setup** screen select the **Advanced** tab.

These parameters are set at the factory to achieve a balance between speed and accuracy. Note that different values may be set for single vision and other lenses.

Distance Power:

1. **Number of Power Checks** – How many times the Clarity will analyze the power.
2. **Number of Power Targets** – There are several different sized power targets that the Clarity uses to determine the power in different areas of the lens.

Near Power:

1. **Number of Power Checks** – How many times the Clarity will analyze the power.
2. **Number of Power Targets** – There are several different sized power targets that the Clarity uses to determine the power in different areas of the lens.

Prism Power:

Number of Power Checks – The number of times the software analyzes prism.

Lens Feature Detection:

This box contains thresholds for accurate diameter measurement and identifying ink dots for progressives.

1. **Edge Detection Threshold (10-40)** -- Generally this number will be between 15 and 25. This parameter allows maximum sensitivity in detecting and measuring the diameter of a lens. It is a critical component of calculating power.
2. **Minimum and Maximum Ink Dot Diameters** -- These two parameters relate to the minimum and maximum size of progressive ink dots put on after A/R coating prior to edging. The camera identifies features like these dots for proper lens alignment prior to blocking.

Auto-Run at Windows Startup:

This box will be checked as a default at the factory. The machine will boot up to the main job screen of the Clarity software. If the box is unchecked, the Clarity will boot up to the Windows Desktop screen.

Warm-Up Time:

A non-zero value causes a burn-in cycle upon power-up. This may improve accuracy in situations where overnight lab temperature is low.

Image:

Brightness Level – This is the brightness level of the camera image. 185 is the factory setting. Call Technical Support before changing this parameter.

Display Options:

1. **Briefly Display Filtered Lens Image During Operation** – Check this box if you want to see a quick image of the lens during processing. This can be used as a diagnostic tool to see what the camera is picking up.
2. **Display Detected Pixels in Red** – Check this box if you want to see the pixel that the camera is going to use displayed in red.
3. **Seconds to Display** – This feature should be set to **0** during normal operation, just to get a glimpse of the image. A service technician may change this to two seconds for diagnostic purposes.

Setup Password:

The **Setup Password** is set at the factory to **082379**. This feature allows you to change the password if you choose. If you forget the password, call Technical Support.

Job Data Log:

Activate Job Data Log – Place a check in this box if you would like to begin maintaining a job log.

View Log – Select this button if you would like to view the log. (The log must have been previously activated.) This can be useful in diagnosing issues.

View Blocked Job Log – Select this button if you want to view only those jobs that were successfully blocked.

There are six buttons in the upper center of this screen (See Fig. 5.1):

1. **Update Software** - Select this button to download new software versions. Follow the on-screen instructions to complete the update.
2. **Set Date/Time** – Use this function to set the time if you are not in the eastern U.S.A. time zone. The date and U.S. Eastern Time are entered at the factory.
3. **Restore** – If you have made a backup of the system data, you can restore the data if need be.
4. **Backup** – Follow the on-screen instruction to back up the system data onto a USB thumb drive.
5. **Import Lens Data** – This function can be used when periodic updates are available to update and import new lens data. This is finished lens data that the Clarity uses to verify power.
6. **Save Tech Data** – This function causes all of the Setup screens to be saved. Saved screen images may be useful for error recovery.

NOTE

We recommend backing up your system prior to and immediately after making any significant changes in the Setup Menu. The USB thumb drive needs to be 256 megabyte or higher.

Burn In:

In the lower left corner of the screen there is a **Burn In** button. This button is used to exercise a cold machine or to diagnose axis movement issues. A box will appear with a default number of cycles set for operation. You can change this number or accept it and select OK. Select the **Stop** button to abort the burn in cycles.

Home:

This button causes the axes to move to their home positions. The Home function is also available from the Technician screen.

(This screen intentionally left blank for duplexing purposes.)

Chapter 6 – Maintenance

NOTE

Always unplug unit before performing any maintenance.

Cleaning the Glass Plate:

Lift the glass plate out (See Fig. 1.5) and clean it using a microfiber cloth as used in cleaning A/R coated lenses. You can also clean the glass plate with glass cleaner or warm soapy water and a clean water rinse. Make sure that the plate is completely dry before replacing into the chamber. Replace the glass plate and resume using the Clarity.

Cleaning the LCD:

Remove the glass plate (See Fig. 1.5) and reach down into the opening that the glass plate covered. Using a microfiber cloth, clean the LCD gently and thoroughly.

Cleaning the Touch Screen:

The touch screen can be cleaned using a microfiber cloth. Wipe the screen gently until fingerprints and smudges are eliminated.

Replacement of the Main Fuse Located on the Rear Bulkhead (Fig. 1.3):

Using a flat head screw driver, insert it into the slot on the cover and push in while rotating to remove the cover/holder. Remove the bad fuse and replace it with the proper 250v 5amp 5x20 mm slow blow fuse. Re-install the fuse holder using the flat head screwdriver to push in and rotate to lock in place.

Maintenance Tips

- Do not attempt to lubricate any part of the mechanism except under supervision of factory service personnel.
- Do not interfere with the motion of the lens grippers or the blocking mechanism.
- Operate the equipment in an environment free from dust or debris.
- Use the burn-in function to warm the machine if its temperature is estimated to be 5° C or 9° F below the final stable operating temperature.
- Do not ship the equipment unless you have re-installed the factory shipping restraints and foam packing-box inserts.

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INTENDED USE & LIMITATIONS

- This machine is designed to measure power, axis and prism of ophthalmic lenses of all materials, and to place a block on axis at the geometric center of the frame shape in a commercial laboratory environment. For operational and safety reasons, this machine should only be used with parts supplied by the manufacturer listed in the Technical Specifications section of this manual. Any use of this machine in a manner not specified in this manual may unintentionally bypass machine safeguards.
- This unit is capable of inspection and blocking of all materials in single vision, bifocals, trifocals, progressives and polarized lenses. It cannot process round segs, ultex or curve tops.
- It cannot do automatic alignment of single vision lenses with prescribed prism; although, it can process them manually if the lensometer dots are present and the Setup menu on the Preferences tab has **Look For Lensometer Dots** checked.
- For best analysis results, insert the lens into the inspection chamber at a 45-degree angle.
- If alignment or power checks fail, rotate the lens 5 degrees and recheck.
- Single vision polarized lenses must be placed in the chamber with the polarization within +/- 10 degrees to eliminate the image being blacked out due to the polarization being off axis too far.
- When straight top or progressive polarized lenses are inserted into the chamber close to the 180 +/- 10 degrees and the image is blacked out, then the polarization is off axis from the lens manufacturer. (This is a rare occurrence.)
- On progressive lenses with factory ink marks, if the markings are worn or broken, the chance of misalignment increases. Remove all factory markings and dot the two watermarks on the lens with the white marking pen provided in the accessory box. This will also decrease the cycle time.
- Progressives with no markings visible cannot be processed. There must be either factory markings or white dots on the watermarks. If the factory markings are used, there must be a clearly marked fitting cross.
- Progressive add power accuracy is inconsistent. **They will still be aligned and blocked accurately.**
- Progressive cylinder axis on powers < 1.00 diopter can be inconsistent depending on the design of the lens. **They will still be aligned and blocked accurately.**
- Cylinder axis accuracy on 0.25 cylinder and below for single vision lenses is not guaranteed to block within ANSI.

- Manual alignment of lenticular and occupational lenses is recommended. Occupational lenses could be aligned upside down in automatic mode.
- In the case of extreme prism >6 diopters, the prism accuracy is good, but the lens may be tilted to such a degree that cylinder accuracy decreases and spheres may show some cylinder. This can be eliminated by holding the lens so that the front curve is parallel to the glass plate when you insert it into the chamber and then select **START** and let the clamps close on the lens in that position. It will then process normally.

GLOSSARY OF TERMS

Batch Blocking: Method of entering jobs. For example, with a stack of ten or more trays, you can enter or scan all jobs in succession and then start to process them either by **first in/ first out** or **last in/ first out**.

Blocking Chamber: Where the lens is placed for analysis and blocking. Four grippers will center and hold the lens in place until the blocking is complete.

Coordinate Origin: Position 0,0 for X and Y; it is the starting point for the placement of the finished block on the lens.

Edge Detection Threshold: Refers to the sensitivity of the camera image to detect the edge of a lens for diameter measurement. This is found on the **Technician** screen and is generally numbered between 15 and 20.

Grippers: Four paddles that clamp and center the lens in the blocking chamber once **Start** is selected.

Gain: Intensity of the brightness of the camera.

Glass Plate: Found in the accessory kit during shipping; it covers the opening in the blocking chamber.

LCD: Stands for Liquid Crystal Display. It is found under the glass plate in the blocking chamber.

Measured: On the **Analysis** screen (on the right side of the screen), the measured results of the lens being analyzed and compared to the **Tolerances** screen for accuracy (generally ANSI).

Oval Calibration Template: This is a pattern attached to a Vario block found in the accessory kit. It is used to calibrate the block position and axis of the chuck.

Power Checks: The number of times the camera will take a shot and be analyzed.

Power Offset: In the **Calibration** screen; used if a consistent power error occurs. For example, all minus lenses are coming out .25 diopters weak so you would put a +.25 adjustment in this field.

Power Targets: The number of different sized targets that will be used in the analysis.

Prescribed: The prescription as written by the optician – sent from the retail location to the lab.

Red Circle Superimposed on the Lens on the Analysis Screen: This is the position of the block on the lens and is the geometric center of the frame shape.

Shutter: Length of time of the exposure of the camera.

Slope: For both plus and minus powered lenses. These fields in the **Calibration** screen are a linear correction for the range of powers the Clarity can check.

NOTE

Call Technical Support before making any changes to the Technician screen.

Appendix A - General Specifications

Machine Identification

Clarity
Ophthalmic Lens Analyzer and Finish Blocker

Name and Address of Manufacturer

National Optronics
100 Avon Street
Charlottesville, VA 22902 USA

Name and Address of Manufacturer's Representative for Service

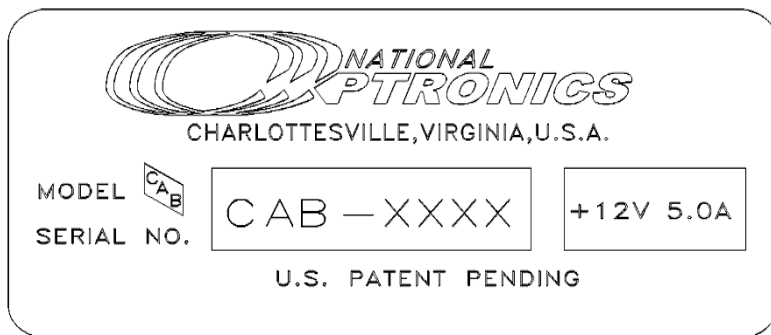
National Optronics
100 Avon Street
Charlottesville, VA 22902 USA
434-295-9126

External Connections

Electric Power Supply
USB Data Connectors (2: Data Backup/Restore and USB Barcode Reader)
9-Pin Subminiature D-Connectors (2: DCS Serial Communications)
RJ-45 Ethernet Connector (DCS Ethernet Communications)
PS-2 Connectors (2: Keyboard and Mouse)

Manufacturer's Serial Number Plate Information

A facsimile of the Manufacturer's Serial Number Plate appears below. The characters "XXXX" will be replaced by four digits on an actual plate.



Technical Specifications

External Power Supply:	Input:	100-240 V ~ 50 – 60 Hz 2A
	Output:	+12 V DC 12.5 A 150 watts maximum
Clarity Power Requirements:	Input	+12 V DC 5A
Temperature:	Operating	60°F to 90°F (10°C – 32.2°C)
	Storage	20°F to 110°F (-6.7°C – 43.3°C)
Fuse Specifications:		5 x 20mm, 5.0 Amp, Slow Blow
Relative Humidity:		50% - 90% (non-condensing)
Altitude:		0 ft to 6000 ft (0m to 1829m)
Pollution Degree:		2
Weight:		45.35 lbs. (20.57 kg)
Height:		23.5" (596.90mm)
Width:		10.4" (264.16mm)
Manufacturer:		National Optronics Charlottesville, Virginia USA

Appendix B

- Certifications & Standards

FCC Class A Device Compliance **[Testing in Progress]**

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Appendix C - Electrical Diagram


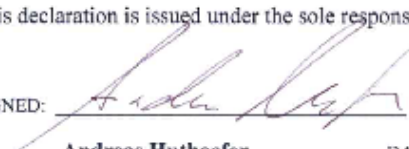
[To be supplied.]

(This screen intentionally left blank for duplexing purposes.)

Appendix D - Certificate of Compliance

Note

The following Declaration of Conformity shall not be regarded as operative unless it is included in a released (non-draft) version of this manual. In draft versions, it is included for planning purposes only.

	
National Optronics 100 Avon Street P.O. Box 1547 Charlottesville, VA 22902 Tel: 800-247-9796 Fax: 434-295-7799	
DECLARATION OF CONFORMITY	
National Optronics, a manufacturer of precision lens processing equipment used in the ophthalmic industry, declares that the product(s) described hereafter:	
Clarity	: Analyzer/Blocker
is in conformity with the following requirements and provisions of Directives:	
2004/108/EC:	relating EMC Directive
2006/95/EC:	relating to Low Voltage Directive
2006/42/EC:	relating to Machinery Safety
The standards listed have been used as reference in order to gain the CE marking.	
EN 61326-1: 2006 (EN 55011:2007) Radiated emissions	
EN 61326-1: 2006 (EN 55011: 2007) Conducted Emissions	
EN 61326-1: 2006 (EN 61000-3-2: 2006) Harmonic Current Emissions	
EN 61326-1: 2006 (EN 61000-3-3: 1995 +A1: 2001, +A2: 2005) Voltage Fluctuations and Flicker	
EN 61326-1: 2006 (EN 61000-4-2: 1995,+A1:1998,+A2:2001) Electrostatic Discharge	
EN 61326-1: 2006 (EN 61000-4-3: 2006 +A1: 2008) Radiated Immunity	
EN 61326-1: 2006 (EN 61000-4-4: 2004) Electrical Fast Transients	
EN 61326-1: 2006 (EN 61000-4-5: 2006) Surge	
EN 61326-1:2006 (EN 61000-4-6:2007) Conducted Immunity	
EN 61326: 2006 (EN 61000-4-11:2004) Voltage Dips and Short Interruptions	
EN 61010-1 :2001 Safety requirements for electrical equipment for measurement, control and laboratory use Part 1: General Requirements	
This declaration is issued under the sole responsibility of National Optronics.	
SIGNED: 	
Andreas Huthoefner <i>CEO, National Optronics</i>	DATE: <u>26-Feb-10</u>

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