Bay Cat X

SN-4620-1080

User Guide

clarity visual systems

SN-4620-1080

Bay Cat X

46" Direct-view LCD Panel

User Guide

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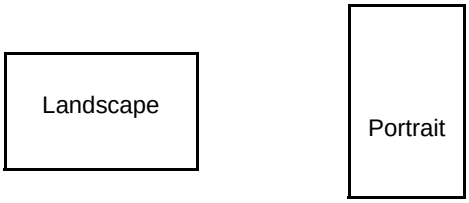
Table of Contents

1 Introduction

1.1 What are the Main Features of Bay Cat X?

Flat screen, long backlight (lamp) life (60,000 hours). Portrait or Landscape orientation

Bay Cat X is a 46" LCD display that can be wall-mounted or mounted on a stand. The display can be portrait or landscape.



Bay Cat X is only 3.96" deep. Its aspect ratio is 1.77 (16:9). Its native resolution is HD (1920 × 1080). It accepts a wide range of input pictures from VGA to UXGA in either analog or digital (DVI).

For video it accepts NTSC, PAL, and SECAM as composite, component, or S-Video.

Most important, it is easy to set up and adjust.

What features were added to Bay Cat X?

Bay Cat X (SN-4620-1080) was developed from Bay Cat (SN-4610-1080), and adds these features and enhancements.

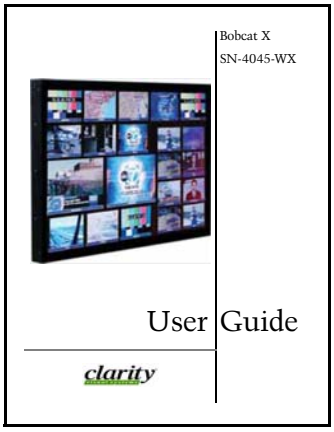
- Native WXGA resolution
- Can be ordered in three different configurations: Base Model, Video Model, and Broadcast Model
- Automatic ambient light sensing and backlight adjustment
- 40 memory slots for easy configuration switching
- Improved video performance
- Logo capture for custom splash screen
- Improved component servicability
- Integrated Big Picture Option
- Optional tabletop feet

1.2 You Should Have These Accessories

Standard accessories

- 1 Power cord
- 1 VGA cable
- 1 Remote control

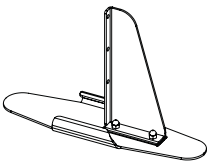
- This User Guide



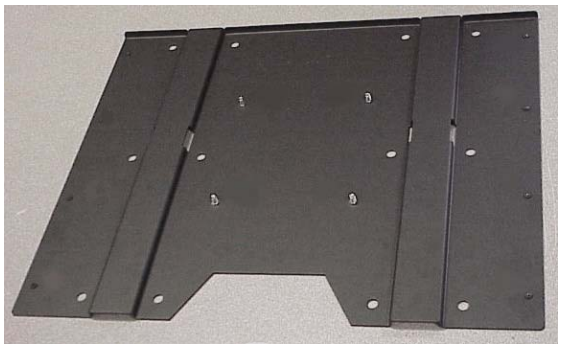
- Wall Bracket, with CATLOCK™ and locking tool

Optional accessories

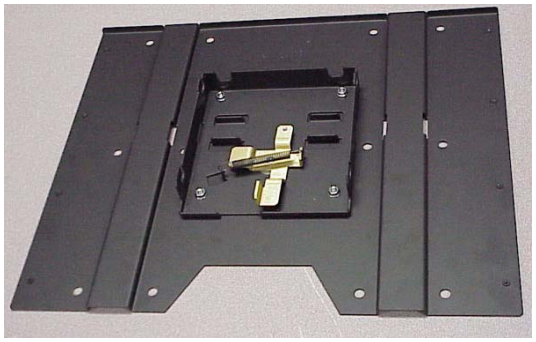
- Free-standing feet



- Adapter Plate, WAL-4025-00, with hardware



The Adapter Plate comes with 4 nuts and 8 metric screws. The 4 nuts hold the Wall Bracket to the Adapter Plate.



The Adapter Plate can be bolted to a wall. Or the Adapter Plate can be screwed onto an NEC plasma monitor display stand using the 8 metric screws.

1.3 Safety for You and Bay Cat X

This list of safety warning and caution notes isn't very long. Reading it could save you from getting an electric shock.

This display was designed with safety in mind. However, if you don't heed the safety warning and cautions, you could get hurt. The safety warning are on stickers in various places in and on the display. They are reproduced on these pages so you can see them all at once.

There are some other times you should know relating to safety:

WARNING
Wall mounts must be secure.

If the displays are hung on a wall, the wall must be strong enough to hold them. Each display unit weighs about 73 lbs. (33 kg). Simply mounting it to wallboard or wall paneling won't be adequate or safe. The mounting method must be capable of holding 5 times this weight, 275 lbs. (125 kg) for each display unit.

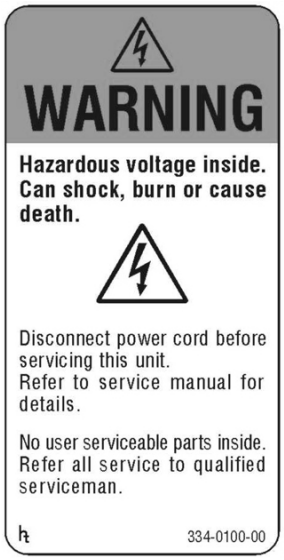
CAUTION
The screen could be damaged by heavy pressure.

Bay Cat X screens are protected with a cover glass to protect the LCD.

Some Bay Cat Xs are shipped, at customer request, without this protective glass. In these, the LCD is not protected. Slight pressure on the LCD will cause distortion of the image. Heavier pressure will cause permanent damage. Bay Cat Xs of this type should be mounted where viewers cannot touch the screen.

WARNING
The backlight contains mercury.

The backlight is 24 mercury vapor fluorescent lamps. These cold cathode fluorescent lamps behind the LCD panel contain a small amount of mercury (112 mg in each lamp). Follow local ordinances and regulations for disposal.



2 Installing

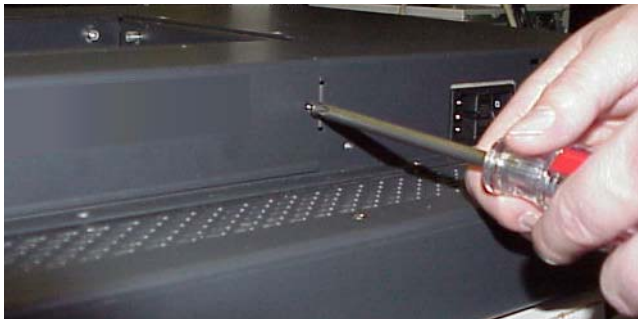
2.1 Installing the DVI Board or SDI Board

Clarity Visual Systems ships the DVI or SDI board separately from the Bay Cat X to some customers and for field upgrades.

✎ The DVI Board is the field-installed video board for the Video Model of Bay Cat X. The SDI Board is the field-installed video board for the Broadcast Model of Bay Cat X.

1. If you powered up the unit to confirm proper working order upon receipt, turn off AC power to the Bay Cat X and remove the power cord.
2. Place the unit face down on a flat surface on something soft and non-scratching. If your unit does not have a protective face glass panel, be EXTREMELY careful as the LCD material can be scratched.
3. Confirm that your DVI Board package contains four (4) mounting screws (SDI Board package contains six[6] srcews), a replacement DVI or SDI cover panel, and a disposable grounding wrist strap.
4. On the back of the Bay Cat X, remove the blank cover panel.

a) Unscrew the two screws holding the blank panel in place. Save the screws for the replacement panel you will install later.

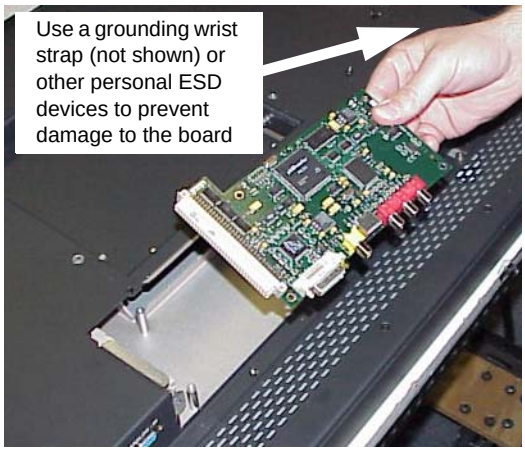


b) Remove the blank panel by pushing down slightly on the inserted end of the panel as you pull it out.

c) Recycle the blank panel with other aluminum scrap metal.

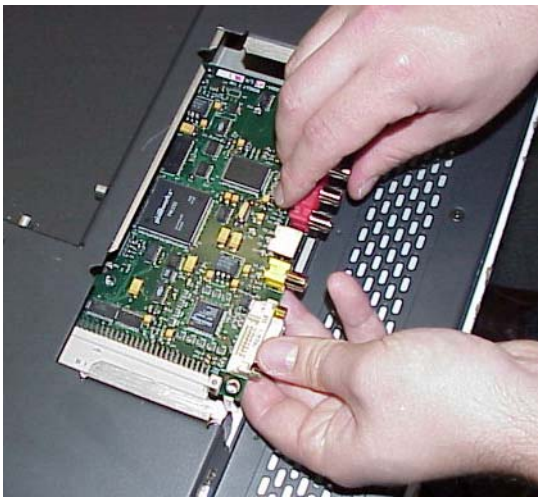
5. Attach the grounding wrist strap to bare metal on the chassis. Using standard ESD procedures, remove the

DVI or SDI board from the anti-static bag. (The DVI board is shown in the pictures below.)



6. Carefully slide the right side of the board into the slot on the right side of the opening.

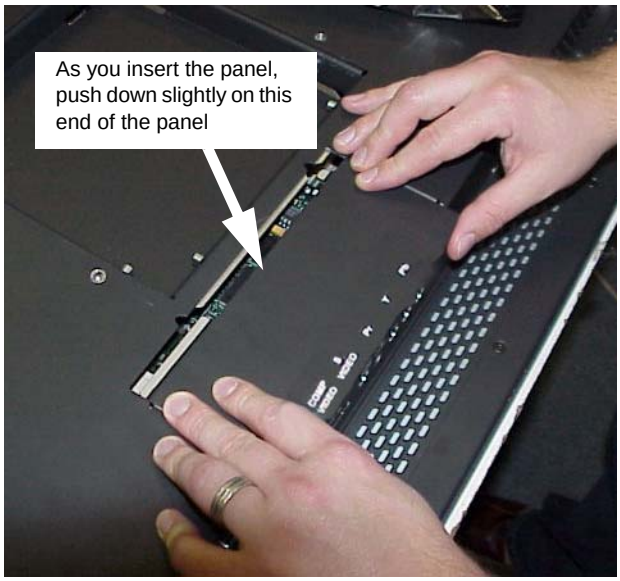
7. Align the connector on the board with the connector in the opening.



Gently push the board into the connector. The board is fully seated when the four screw holes (six for the SDI board) are aligned.

8. Screw down the four corners of the DVI board (six screws for the SDI board) with the supplied mounting screws.

9. Slide the DVI or SDI replacement cover panel into place. Press down gently on the insertion end of the panel to help the tabs insert in the slots.



10. Secure the DVI or SDI replacement cover panel using the screws you removed earlier.

2.2 Installing the Bay Cat X Wall Bracket

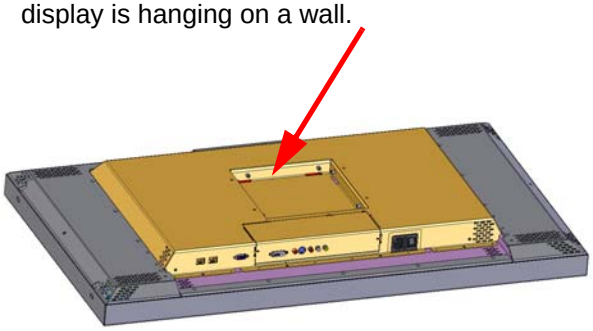
The Bay Cat X hangs on its wall bracket in either landscape or portrait orientation.

Installing the wall bracket

The wall bracket comes with each Bay Cat X. See picture in “You Should Have These Accessories” on page 3.

Using hardware you supply, bolt or screw the wall bracket to a wall. Be sure to bolt or screw to structural elements of the wall, not just the wall board or drywall. The Bay Cat X weighs 73 lbs. (33 kg). The mounting method you use must be capable of holding five times this weight (356 lbs., 160 kg). The mounting holes are on 6.26" centers. When installed, the wall bracket protrudes 0.375" from the back panel of the Bay Cat X.

✎ This space at the rear of the Bay Cat X will be occupied by the wall bracket when the display is hanging on a wall.



Ventilation

The Bay Cat X needs no space to the rear for ventilation. However, like all electronic devices, it does produce some heat. The space above the display should provide enough space so that heated air can get away. This means you should not mount it into a sealed space with nowhere for the heated air to escape.

Portrait or Landscape

The wall bracket *always* mounts the same way, whether the displays will be hung as portrait or landscape. The hooks on the wall bracket should *always* have the open part facing upward.

✎ The **Locking Wall Bracket** does *not* have the large back plate. It consists of the square, open box with the locking mechanism. This Locking Wall Bracket with CATLOCK™ is a standard accessory.

For array mounting guidelines, contact Clarity Visual Systems.

2.3 Hanging the Bay Cat X on the Wall Bracket

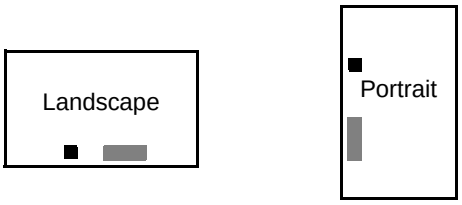
The locking system for the Bay Cat X wall bracket prevents the display from jumping off the bracket during earth tremors, and it helps deter theft.

Two-person job

The Bay Cat X weighs just over 73 lbs. (33 kg). Always have two persons hang the display on the wall bracket.

Two orientations

The Bay Cat X hangs in either landscape or portrait orientation. The small black square shows the position of the AC power receptacle. The gray rectangle shows the position of the picture connectors, when viewed from the front.



✎ The Bay Cat X will not rotate the picture. The source (computer or video source) must rotate the picture. The Bay Cat X can rotate the menus, so the internal menus will be upright with either orientation.

Hanging the display

Before you hang the first display, practice using the lock lever to open and close the locking mechanism.

✎ After the display is hung, the connectors for video and power are a little difficult to see. Some installers connect power and video cables just before hanging the display.

1. Be sure the locking lever is in the open position. The tab on the lever should *not* protrude below the bottom of the box.
2. Using two persons, lift the display so the power receptacle is at the bottom for landscape hanging.

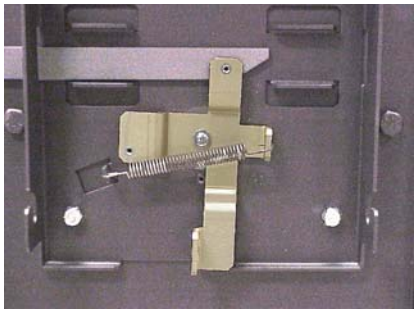
✎ For portrait orientation, the power receptacle will be on the left, looking from the front.

3. Hang the display in the hooks. Pull forward on the display to see that it is properly in the hooks.
4. Use the locking tool to lock the display onto the wall bracket. To see if it is locked in place, try to lift the display. If it won't lift, its locked.

Locking and unlocking

This end of the locking tool works from below the wall bracket.

This end of the locking tool works from the sides of the wall bracket.


Unlocking from the side: Slide the tool in from the side. It will ride up over the lock and catch it. Pull the lock back to unlock.



Unlocking from the bottom: Slide the tool in from the bottom, keeping the open side of the hook to the left, as shown. Catch the lock and pull down.

Back side of the locking lever, showing the two pins that the tool hooks onto.

2.4 Connecting Power

Bay Cat X accepts 110-120 VAC and 200-240 VAC with no manual switching.

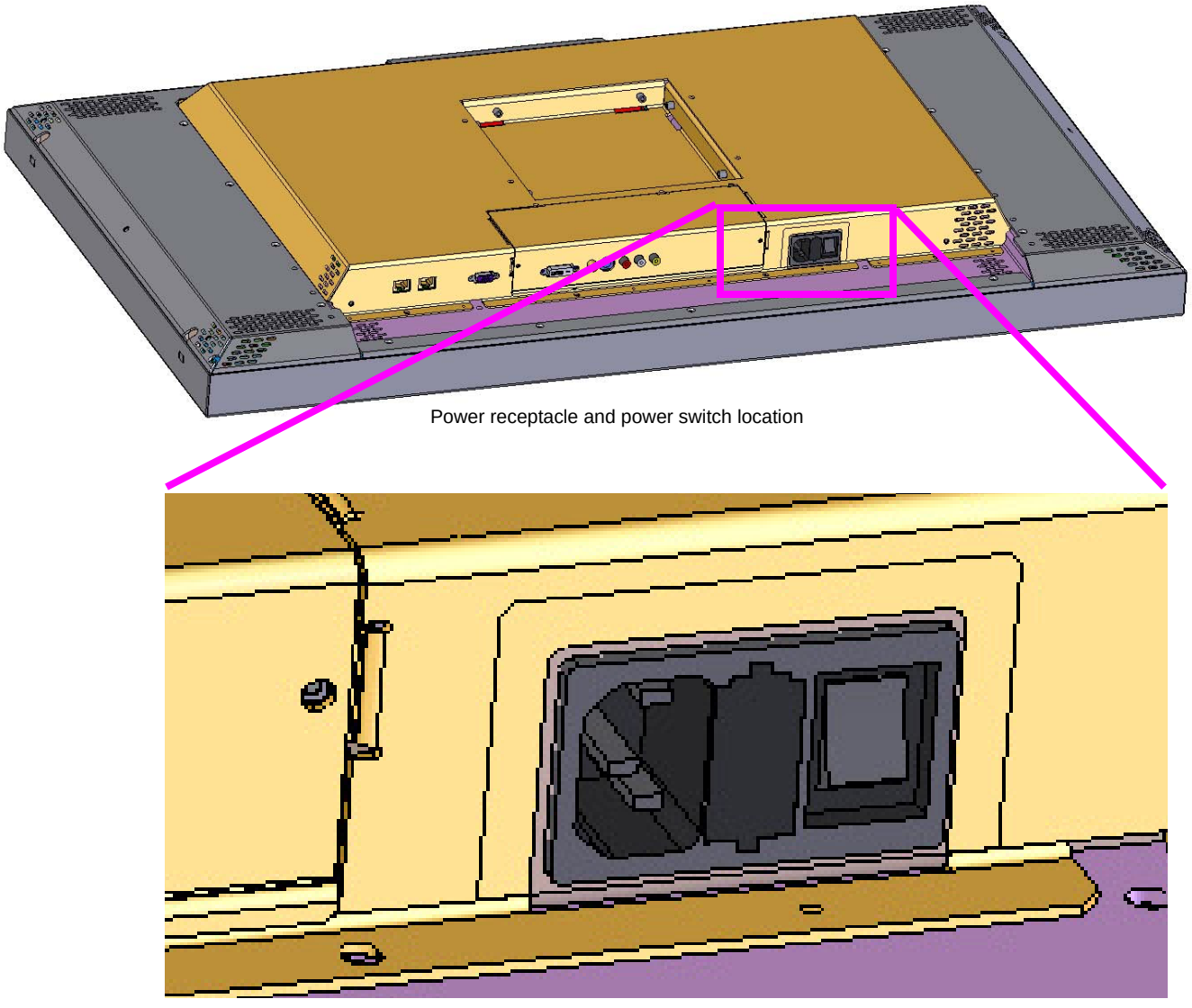
Plug the power cord into the receptacle on the rear of the Bay Cat X. Plug the other end into a good source of AC power.

When ready, turn on the power switch.

Normal operation

It is normal to leave the power connected and the power switch on all the time and turn the backlight on and off as desired.

For power receptacle dimensions, see “Connector Locations and Diagrams” on page 114.



Power receptacle and power switch location

2.5 Connecting Picture Sources

The Bay Cat X accepts inputs from many different sources, depending on configuration

Which Configuration Do You Have?

The Bay Cat X can be ordered in one of three configurations: Base Model, Video Model, or Broadcast Model. The Video Model and Broadcast Model have similar input ports, which are described below.

Base Model Inputs

The base model has one analog computer video input port and two RS-232 ports (input and output). You may connect standard sources ranging from VGA to UXGA and 480i, 480p, 720p, or 1080i to the analog video input port.

Video Model and Broadcast Model Inputs

The Video Model and Broadcast Model each have a total of five different video inputs. Of these five, four are the same for both models: Analog, Composite, S-Video, and Component (YPbPr).

The fifth connector on the Video Model is a DVI input port that accepts all video and graphics signal inputs up to 165MHz pixel clock.

The fifth connector on the Broadcast Model is an HD-SDI (Serial Digital Interface) input port, which accepts all video inputs.

Computer sources

Connect analog computer sources to the analog connector., or on Video Models, connect digital computer sources to the DVI connector.

Since computer sources are RGB, you must set the Colorspace to RGB in the Picture menu.

Video sources

Connect composite video sources to the yellow RCA connector, S-Video sources to the S-Video connector, and component video sources to the red, green, and blue RCA connectors.

Component and S-Video connectors accept NTSC and PAL video sources. The composite connector also accepts SECAM video sources.

✎ For some customers and field upgrades, video boards are shipped separately and must be installed prior to use. For more information, see “Installing the DVI Board or SDI Board” on page 6.

YPbPr sources

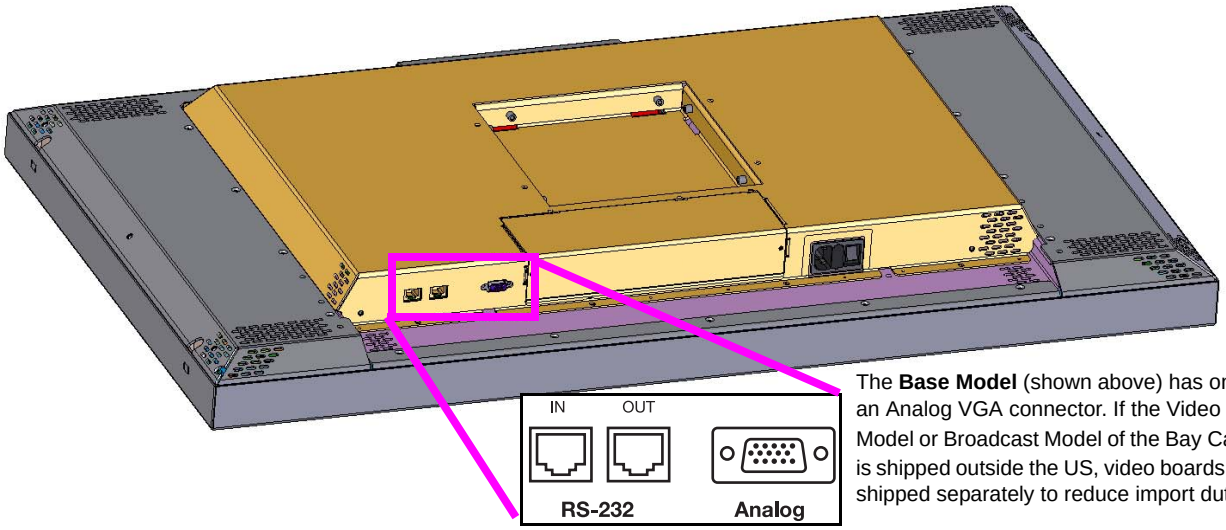
Component video sources, such as those provided by some DVD players, should be connected to the component connectors. These connectors accept 480i and 576i signals (480p and HD signals are not accepted).

Most DVD players have red, green, and blue RCA connectors for component video output.

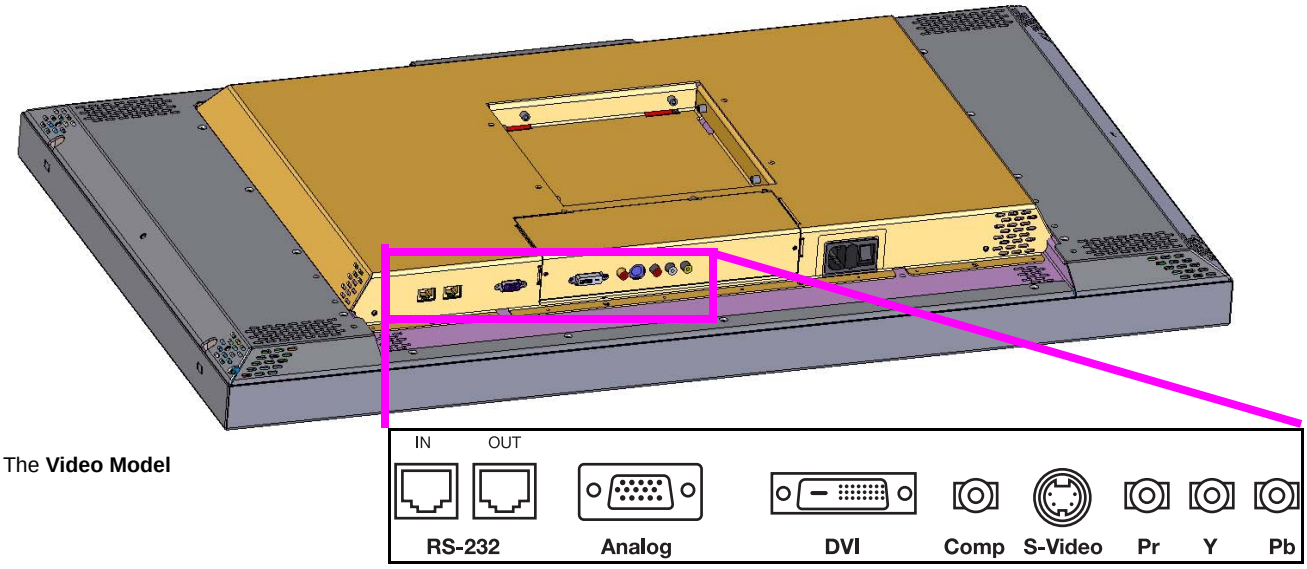
Connectors and Locations

The locations of the connectors are shown in the illustration on page 15.

✎ For exact locations and dimensions of connectors, see “Connector Locations and Diagrams” on page 114.

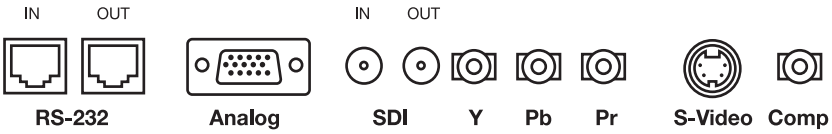


The **Base Model** (shown above) has only an Analog VGA connector. If the Video Model or Broadcast Model of the Bay Cat X is shipped outside the US, video boards are shipped separately to reduce import duties.



The **Video Model**

The **Broadcast Model** (not pictured) has SDI In/Out ports in place of the Video Model's DVI port



2.6 Connecting RS232 Communication

RS232 control is not necessary for operation, but it is a convenient way to control Bay Cat Xs from a distance.

RS232 communication allows a computer to control one or more units using the computer's serial port. Almost everything you can do with the remote, you can do with RS232 commands. Plus, you can send inquiries to the units and find out the current settings and values.

To connect a computer to the first unit, use an adapter on the computer's serial port connector to convert this to an RJ45 connector.

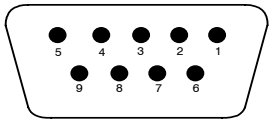
1. Obtain an adapter that has a female 9-pin connector.
2. Wire it as shown in the illustration and table below. Only three wires are required. Clip off the other wires, or tuck them into the connector body.

Wiring the adapter

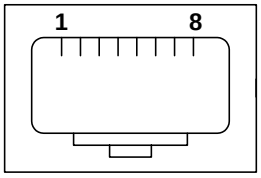
To go from 9-pin D-sub serial connector on the back of the ccomputer to an RJ45 connector, use a standard RJ45-to-9-pin adapter. Wire it internally as shown. The wiring shown for this adapter is correct for *straight-thru* cables. Straight-thru cables are wired 1-to-1, 2-to-2, etc.

Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2



female 9-pin



RJ45 looking into the socket.

Connecting for RS232 control

Use Cat-5 cable to connect from the computer (with the adapter in place) to the first unit's RS232 In connector.

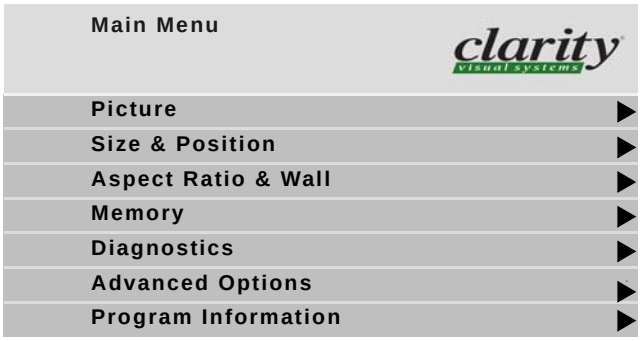
From the first unit, connect RS232 Out to the next unit's RS232 In. Continue in this way until all units are in the loop. The order of units in the loop does not matter because each unit in the array must have a unique address.

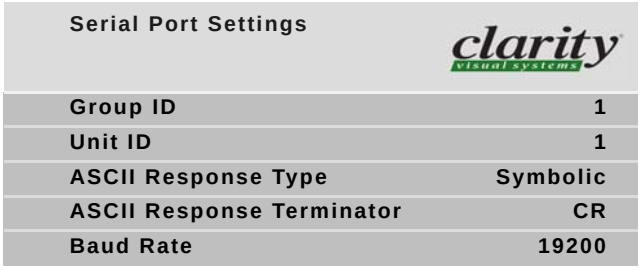
✎ The loopthrough limit is approximately 30 units in typical situations. However, if the units are spaced far apart or the total length of the loopthrough is very long, this limit may be reduced. You may need multiple RS232 sources.

RS232 IDs

Each unit in the loop must have a unique RS232 ID. Open the Serial Port Settings menu for each unit. On the

remote, press MENU. Using the up and down arrows, move to Advanced Options and select Serial Port Settings.





In the Serial Port Settings menu, set the Group ID and the Unit ID so that the combined ID is unique for each Bay Cat X in this RS232 loop.

Addressing Bay Cat X

Part of the RS232 command will be an address. This address may take several forms. For example, suppose we have 8 units in one area divided into two groups. We might set the ID s of the units like this:

Group ID	Unit ID
1	1
1	2
1	3
1	4
2	1
2	2
2	3
2	4

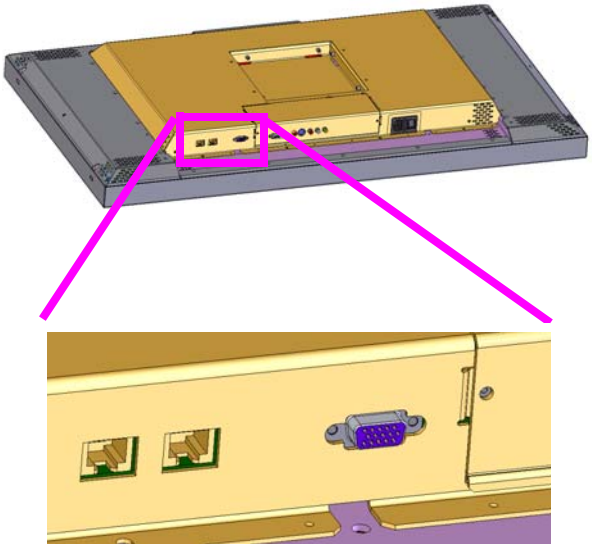
With this scheme, we have four ways to address these Bay Cat Xs:

Type of Addresses	Affect on Bay Cat X
13 24 etc.	Only the specific Bay Cat X addressed will obey the command. Also, the Bay Cat X will respond to the host computer.
**	All Bay Cat Xs in this RS232 loop will obey the command
*4	Both the Bay Cat Xs whose IDs end in “4” will obey this command
2*	All five Bay Cat Xs in Group 2 will obey the command

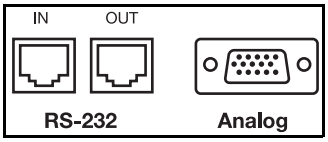
A complete list of all commands is given in “RS232 Control for Bay Cat X”, document 070-0120, available from Clarity’s website:

Go to www.ClarityVisual.com
Click on LOGIN in upper right banner
Click on lower, blue LOGIN NOW button

User name: tech
Password: help
Find Bay Cat X tech support.
Open or download “Bay Cat X RS232 Programming Guide.”



RS232 Connector Location



For exact locations and dimensions of connectors, see “Connector Locations and Diagrams” on page 114.

3 Configuring Bay Cat X

3.1 Quick Start

After you select the picture source, most of the rest of setup is automatic, although you can override the automatic settings and adjust anything manually.

Selecting the source means choosing the connector where the picture is coming in. You'll chose from the following connectors, depending on the model:

Base	Video	Broadcast
Analog	Analog	Analog
	DVI	SDI
	Composite	Composite
	S-Video	S-Video
	Component (YPbPr)	Component (YPbPr)

Quick start

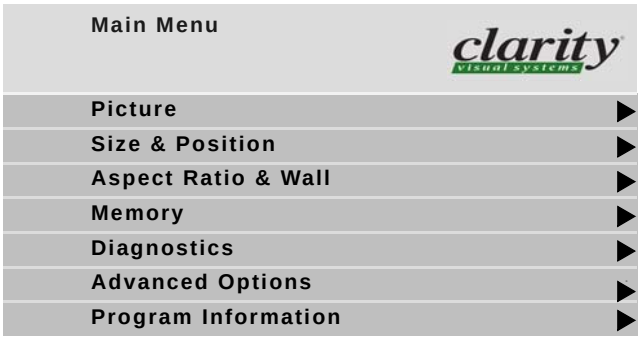
Connect power and turn on the power switch, which should light. The backlight (lamp) will come on automatically. If the power was already on, and the backlight is off, press the remote ON button.

1. Aim the remote control at the lower right corner (in landscape mode; in portrait mode, it is in the lower left corner of the Bay Cat X) and press SOURCE on the remote.

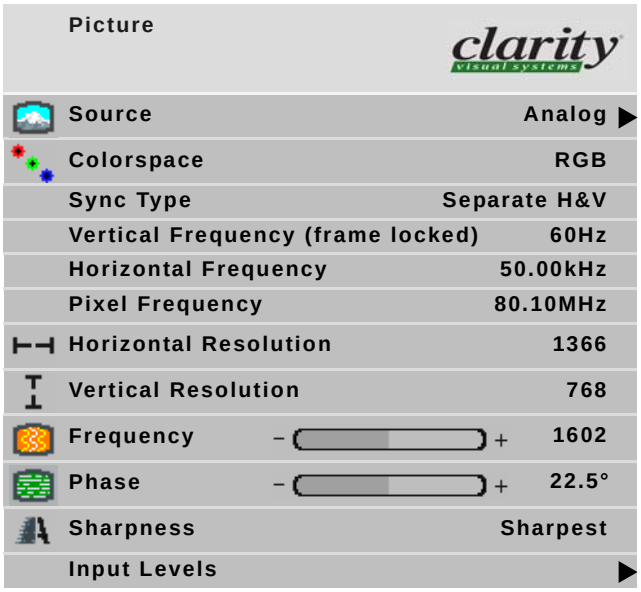
   The Bay Cat X looks at each of the connectors and stops on the first one that is receiving a valid picture. If this is successful (it may take 10 seconds) *stop here*. If you have several sources connected, press SOURCE again to go to the next one with a picture.
   If you get no picture or have other trouble, read the rest of these steps.

✎ If you use a video source (such as from a progressive DVD player) on the Analog or Digital inputs, manually change the Colorspace to YPbPr. Otherwise the colors will be wrong.

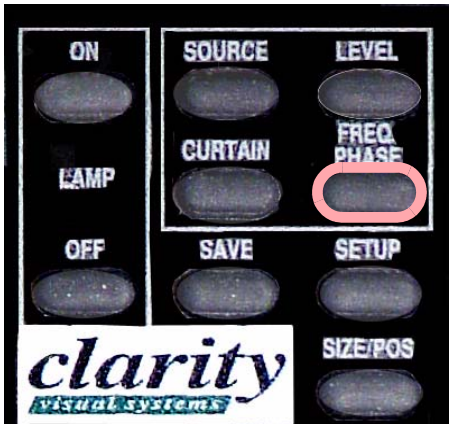
2. Press MENU. The Main Menu displays on the screen



3. Select Picture with the up-down arrow keys on the remote and press ENTER. This opens the Picture menu.



✎ TIP: The FREQ/PHASE button opens the Picture menu directly.



4. Select Source and press ENTER. This opens the Source menu (the menu shown below is from the Video Model; the Broadcast Model and Base Model have different options):

☐	**Analog**
☐	**Digital**
☐	**Component (YPbPr)**
☐	**S-Video**
☐	**Composite**

5. With the arrow keys, select the input connector you want:

All Models	Analog, usually computer sources, VGA through UXGA
Video and Broadcast models have the following additional choices:	
Video Model	Digital (DVI connector)
Broadcast Model	SDI (SDI In/Out ports)
Video and Broadcast models	Component
	Composite Video
	S-Video

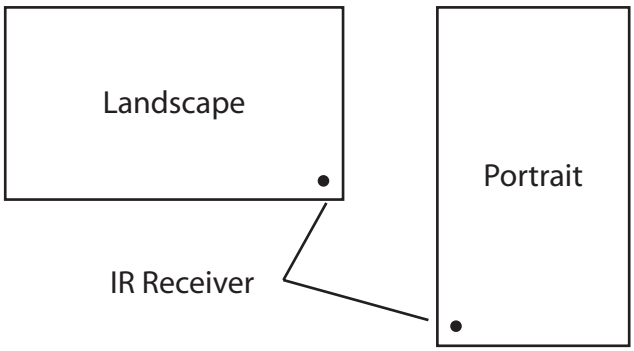
6. Press ENTER. The Bay Cat X will immediately display the picture. Within a second or two the Bay Cat X will analyze the picture and adjust to it.

If you see no picture …

- Check the source by connecting it to another type of display. If the source is a laptop, maybe it has timed out and the screen is blank. Did you enable the VGA output on the rear of the laptop?
- Check the power switch near the AC power cord. It should be lit.
- The IR receiver for the remote is a small hole in the lower left corner of the display. Be sure the remote is aimed toward it. (In Portrait orientation the IR receiver is in the lower left corner.

About the remote

The remote control operates with IR (infra-red) signals going to the IR receiver. The receiver is in the lower right corner (in landscape mode; in portrait mode, it is in the lower left corner) of the screen bezel behind a small hole.



(Later, to prevent accidental adjustment of the display, disable the remote control function using an RS232 command.)

A quick reference for all the remote buttons is found in “Remote Control Buttons” on page 106.

If the remote doesn’t work

- The batteries in the remote are dead or installed wrong.
- The remote was not aimed at the screen.
- Something is blocking the IR receiver in the Bay Cat X.
- IR remote action was disabled by an RS232 command.

✎ The remote control has a large spread of its IR radiation. It is difficult from a distance to control only one Bay Cat X in an array. Step closer.

3.2 Setting up a Bay Cat X

The source picture—from computer, video, DVD—is not always perfect in its size or resolution; it does not always conform exactly to a standard. Bay Cat X can compensate for this.

You'll find it easier to configure your Bay Cat Xs when you perform the steps in the following order:

- Select the Source (Picture)
- Adjust the Input Levels
- Select the Scale Mode
- Adjust the Sharpness
- Check the Image Position

Then if you are using multiple units, whether in a banner or an array, perform the remaining steps:

- Set up Tiling the image on multiple units
- Adjust Scaling and Cropping
- Color Balance the units

Computer sources vary quite a bit from computer to computer. They even vary between video outputs on the same video card. Video sources vary more.

To make the Bay Cat X respond correctly to these non-standard sources we adjust Input Levels.

- To adjust Input Levels for digital computer sources, see page 26
- To adjust Input Levels for analog computer sources, see page 28
- To adjust Input Levels for video sources, see page 30

How does Input Level relate to Color Balance?

To make all the displays show the same color and brightness across the whole array, you need to adjust input levels *and* do color balancing.

You can do Input Levels first, or you can do Color Balance first. It doesn't matter. But they must both be done.

✎ Input Levels and Color Balance do not affect each other, but they both affect the final picture.

- To color balance the displays, see page 46

✎ If you have a stand-alone application, you don't need to do color balancing, but you can use the Color Balancing menu to adjust the color to your preferences. Nonetheless, you should still set Input Levels.

What does Input Level do?

For analog computer sources adjusting to the computer's picture output means finding what that computer means by black and white.

Black is supposed to be a voltage of zero coming from the computer's video card, but it almost never is. White is supposed to be a voltage of 0.7 volts, but it usually isn't either.

The Input Level adjustment process asks you to provide a picture from the computer that is black, then one that is pure white. With these, you can quickly and automatically make the display "learn" what *this* computer means by black and white.

The result? Good pictures, using all the dynamic range of color coming from the computer.

✎ For Input Levels, you must use black and white coming from the computer you will use for the program. Don't make this adjustment with your work laptop and then switch to another computer for the display's program of pictures.

What does Color Balance do?

Color balancing adjusts all the displays in an array so they produce the same colors across the entire array.

Displays differ from one another because of very small differences in the color of the light produced by the backlight and by differences in the liquid crystal panels themselves.

In color balancing you use the display's internal test patterns of white, first, then gray. The internal pattern assures that a pure white is used.

3.2.1 Selecting the Picture

Selecting the source (picture) manually is usually quicker than using the SETUP *button.*

Selecting the picture is really selecting the input connector. If you have the Base Model, you have only one connector, which is a HD-15 for analog computer sources. If you have either the Video Model or the Broadcast Model, you have the following additional connectors:

Video Model (DVI Board)	Broadcast Model (SDI Board)
Digital	SDI
Component (YPbPr)	Component (YPbPr)
Composite	Composite
S-Video	S-Video

Computer sources

Use the HD-15 connector for standard analog inputs, the type we've used for years with computers. For digital inputs, use the DVI connector. Either of these accepts pictures of the following common standards as well as many, many others:

Type	Resolution
VGA	640 x 480
SVGA	800 x 600
XGA	1024 x 768
SXGA	1280 x 1024
	1360 x 768 1366 x 768
UXGA	1600 x 1200
HD1920	1920 x 1080
VESA	640 x 400

Component video sources

Component video sources are assumed to be YPbPr.

DVD and component video sources

DVD players have composite video and S-Video outputs, and sometimes have component video outputs from three RCA connectors. Component video sources are assumed to be YPbPr, so you do not need to specify the colorspace.

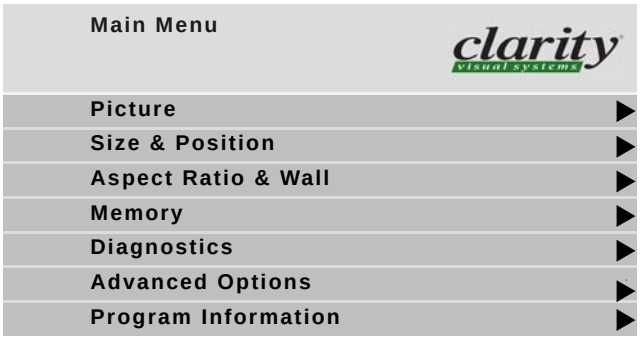
✎ HDCP (High Definition Copy Protection) is not supported.

Composite Video and S-Video

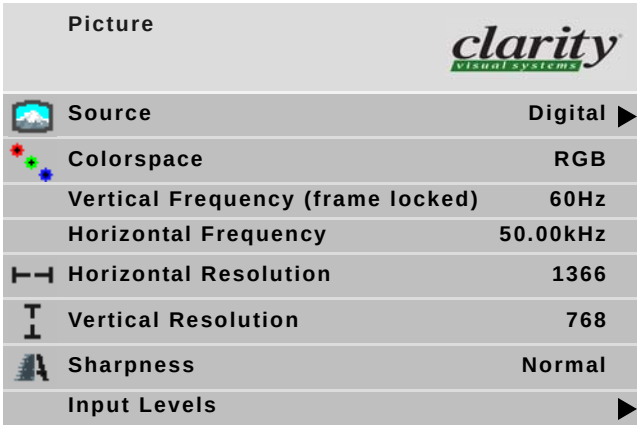
These two inputs accept NTSC and PAL. The Composite connector also accepts SECAM video.

To manually select the source

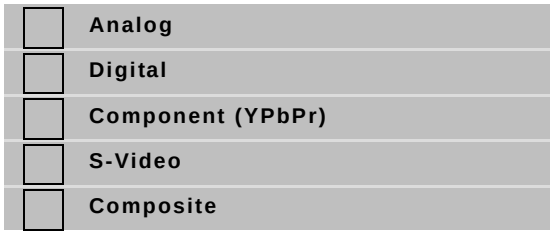
1. After the display is on, press MENU on the remote. This opens the Main Menu.



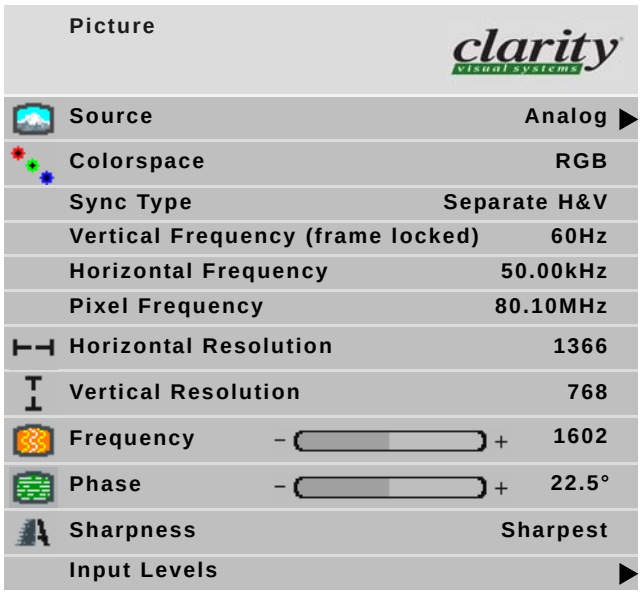
2. With Picture highlighted, press ENTER This opens the Picture menu.



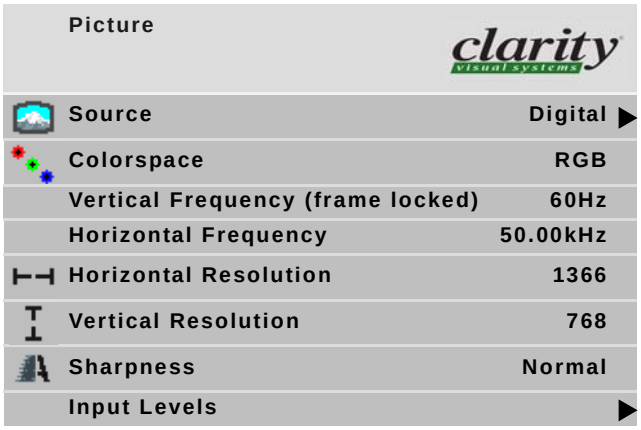
3. Select Source and press ENTER.
   The Source popup menu displays to the right of the Picture menu. (For space saving reasons, only the Source popup menu is shown below.)



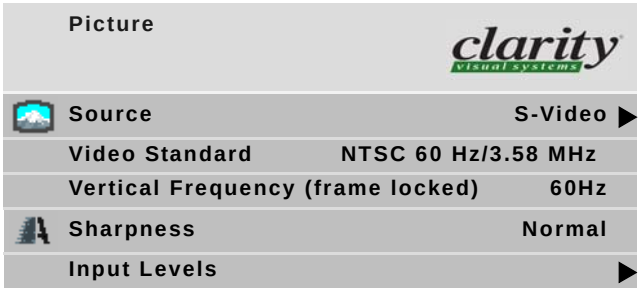
4. Use the up and down arrow keys on the remote to select the type of source, and press ENTER.
   Analog



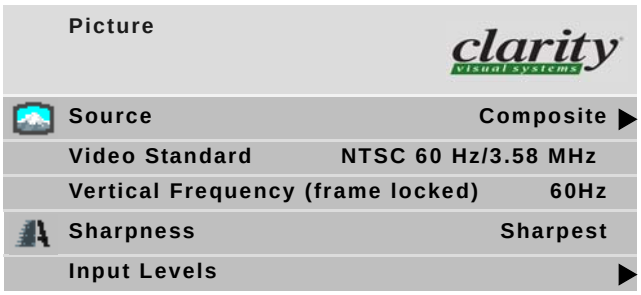
Digital



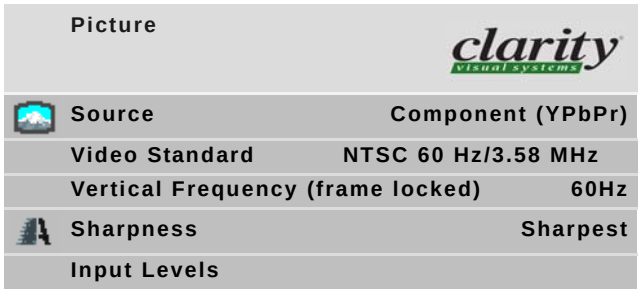
S-Video



Composite



Component (YPbPr)



5. Close the menu by pressing ENTER, or let it time out.

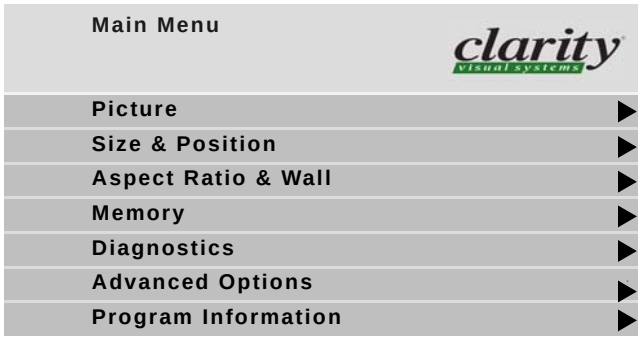
The resolution or type of source picture currently coming in is displayed on the line just below Source. This is grayed out because you can't adjust it.

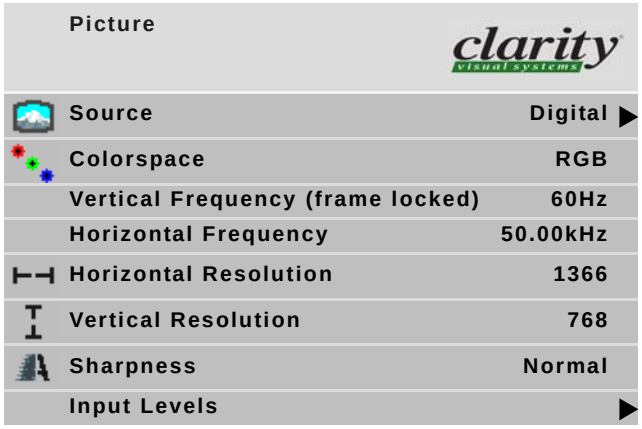
3.2.2 Adjusting Levels for Digital Computer Sources

Digital sources do not normally need adjustment, but the controls are there if you need them.

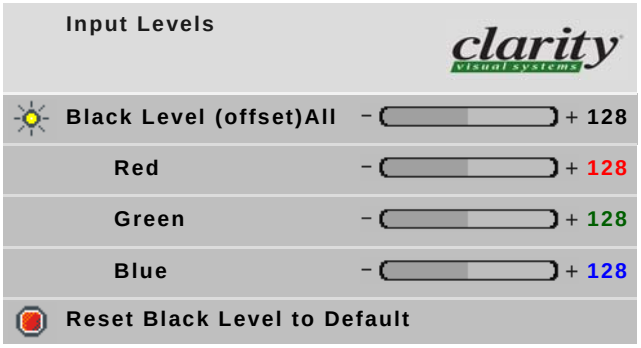
These controls are advanced level controls and should not be adjusted unless you have been briefed by the factory or are familiar with black level adjustments. They are used to correct the digital blacks that come from video cards that have incorrect levels.

✎ Don't use these controls unless you have been briefed by Clarity or you are familiar with black level adjustments. These controls are usually not necessary.

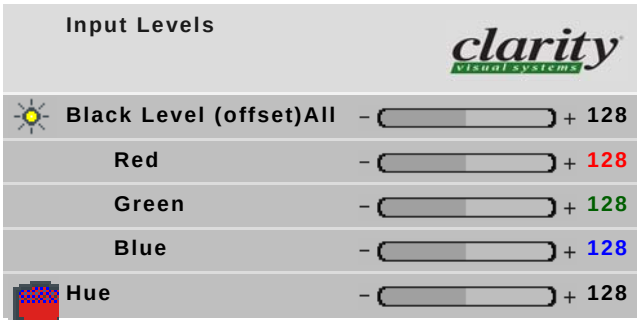




The Input Levels menu looks different for different colorspaces. The Input Levels for Digital RGB sources is shown below:



The Input Levels menu for Digital YPbPr sources is shown below:



3.2.3 Adjusting Levels for Analog Computer Sources

This section applies to Analog RGB (computer) pictures only. The Levels are best adjusted semi-automatically.

Why adjust levels?

For analog RGB pictures the levels for black and white vary from one computer to another, or from one video processor to another. They even vary between video outputs from a multiple-output video card in a computer.

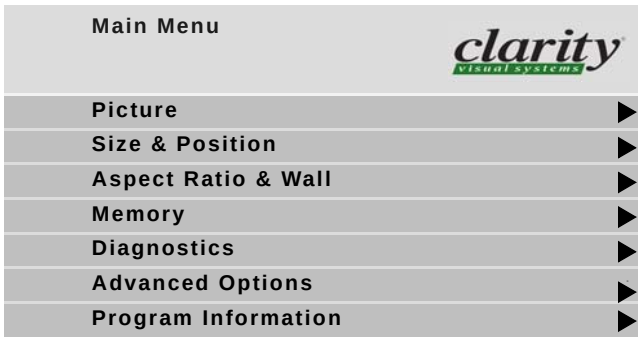
Your pictures will not look their best on Bay Cat X until you adjust for these differences. This is *not* about adjusting color or contrast. It's about telling the Bay Cat X what the computer or processor means by black and by white.

Semi-automatic adjustment

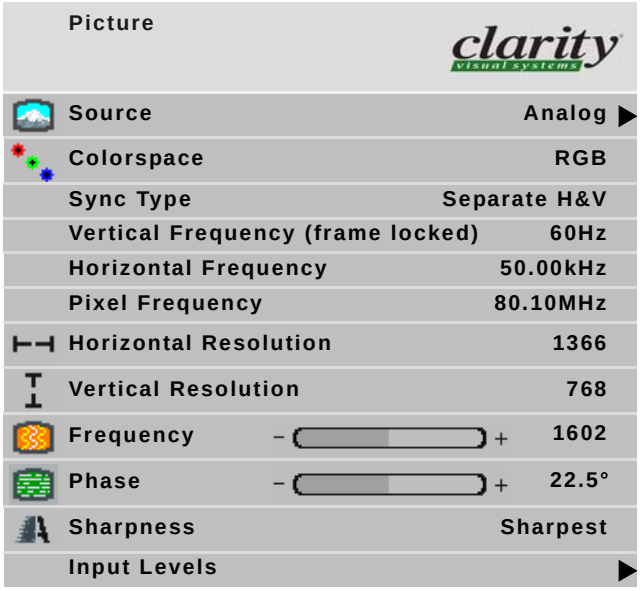
1. From the computer source, display an all-black picture. *This must come from the computer source that will be used for the program.* It does no good to use your laptop for this adjustment, then connect to a different computer for the program. Nor can you use the Bay Cat X's black test pattern. (Hint: Display a black screen using Windows Paint program.)

✎ To adjust levels for UXGA sources that will be displayed in One to One scale mode, perform your adjustments using Fill All scale mode and then switch back to One to One.

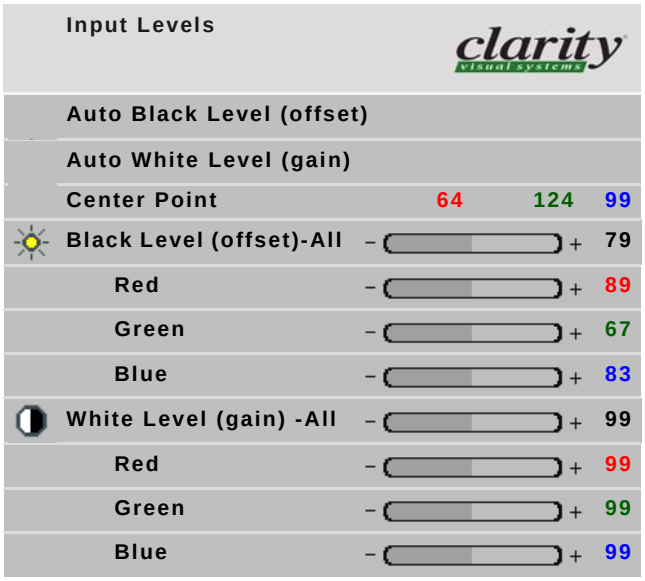
2. Press MENU.



3. Select Picture, and press ENTER.



4. Select Input Levels and press ENTER.



5. In the Input Levels menu, select Auto Black Level and press ENTER. This menu line says "Working…" until the process is complete.
6. From the computer source, display an all-white picture.
7. In the Input Levels menu select Auto White Level and press ENTER. Wait for "Working…" to disappear. The Bay Cat X is now adjusted to the black and white levels of *this* computer using *this* video card. If you change computers or video output cards in the computer, you must do this again.

✎ Black Level *must* be done before White Level. The black and white pictures *must* come from the real source. It doesn't help to do this with a laptop, then plug in the "real" computer for the program.

That completes the levels adjustments. If you have more than one computer or other analog RGB source, as might come from a switcher, you should do this for each source and save the configuration to a memory slot.

Adjusting levels for computer sources manually

1. Display an all-black picture from the source computer.

✎ You cannot make these adjustments using the internal Test Patterns. The black/white picture must come from the computer that will be used for the program material. Adjusting levels with your laptop, then connecting to the "real" computer will not do a proper job.

2. On the remote press LEVEL.
3. In the Advanced Levels menu, select MANUAL BLACK LEVEL and adjust it up and down with the + \ – keys to make the three CENTER POINT values go to zero. If they do not all touch zero at the same time, use the individual colors under MANUAL BLACK LEVEL to adjust them.

✎ Do not go beyond the point where the Minimum just goes to zero. The idea is to just touch the zero level.

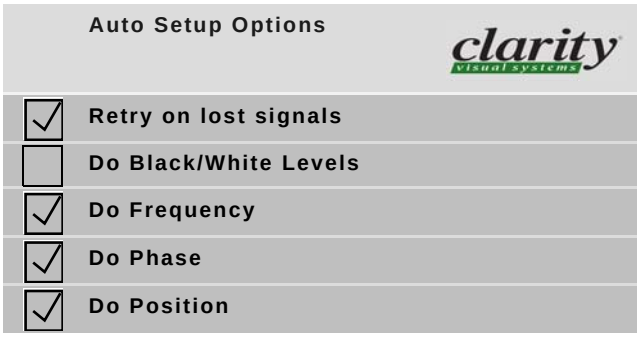
Next, adjust Contrast (gain) until the Image Maximums just go to 255. Again, do not push it up after the maximum is 255. Just touch the 255 point. You must adjust Brightness first, Contrast second.

If the three colors are not all at 255 (or 254), adjust them separately.

Full automatic adjustment of levels

Automatic adjustment of black and white levels does not do as good a job as manual adjustment of levels. By selecting Do Black/White Levels box is in the Auto Setup Options menu (Main Menu > Advanced Options > Auto Setup Options), the Bay Cat X adjusts White levels and Black levels to the brightest and darkest pixel, respectively, in the picture. This does not work well because:

- some pictures do not contain a pure white pixel;
- some white pixels contain "spikes," which makes them seem brighter than they really are, resulting in incorrect settings.



3.2.4 Adjusting Levels for Video Sources

Video sources are adjusted best if a color bar test pattern is available from the video source: the DVD or VCR player. If not, you will have to adjust by eye and the "feel" of the picture.

Adjusting the picture

1. Select a video source in the Picture menu.
2. Press LEVEL on the remote.

✎ These controls are also used for analog sources when you chose YPbPr Colorspace.

Now you have two choices.

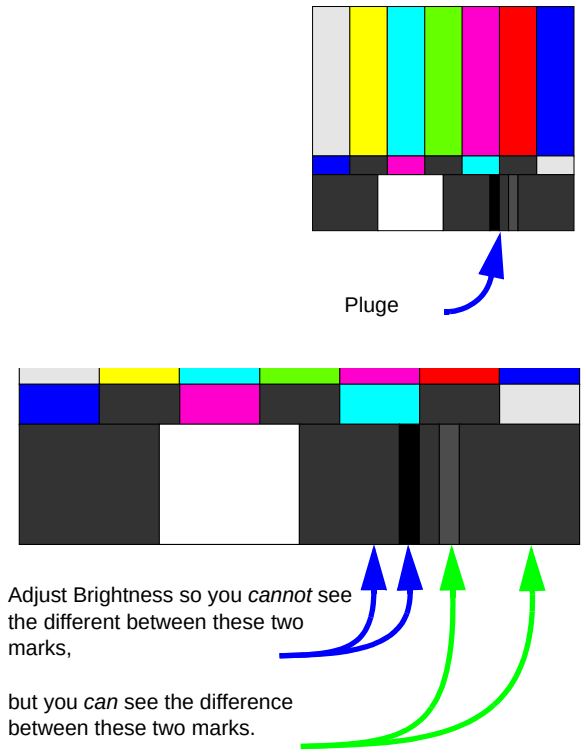
- Adjust using any picture from the video source.
- Adjust using a standard color bar pattern from the source.

Adjusting with color bars

1. If possible, use a color bar pattern from the video source you will use for the program material. You cannot use the color bar from the Test Patterns menu.
2. In the Main Menu > Picture > Input Levels menu, check Blue Only. You should see only the alternate color bars, all of them blue.
3. Adjust Saturation to make the outer two color bars match. Match them in brightness; they will already match in color.
4. Adjust Hue to make the inner two color bars match.
5. Uncheck Blue Only

✎ When a video source is selected, Auto Setup Options is not available. Adjustments must be made manually.

6. If the color bar pattern has a pluge, you can use it to adjust Brightness.

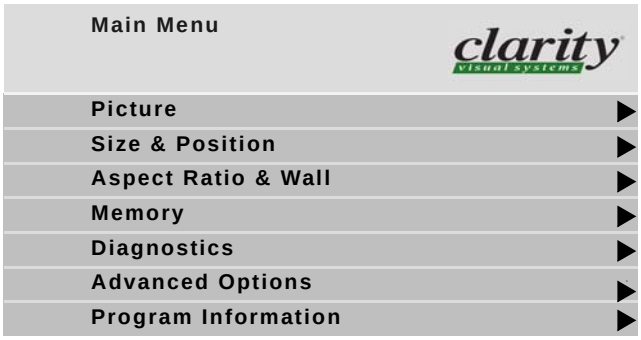


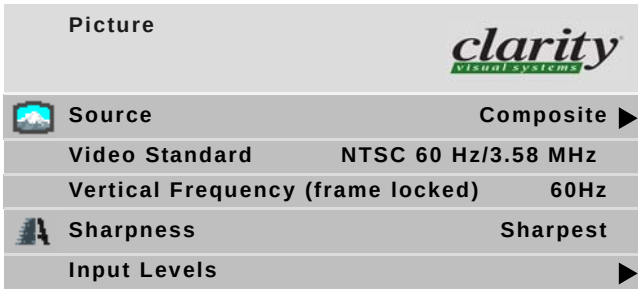
Adjusting with any picture

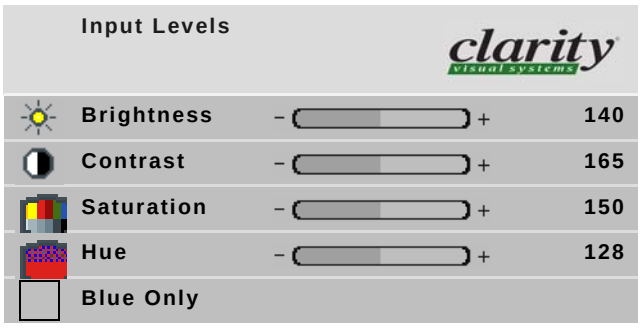
This procedure must be done *after* you adjust color balance (page 46).

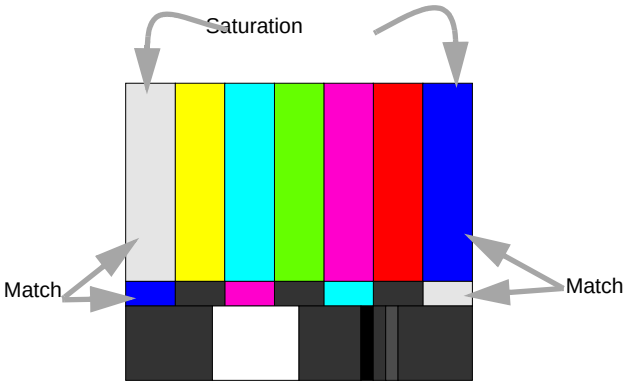
1. Choose pictures that have blacks and whites represented as well as a variety of colors.
2. Adjust Contrast, Brightness, Saturation and Hue on *one* Bay Cat X until it looks satisfactory.

3. Adjust all the other Bay Cat Xs in the array so they have the same values for Contrast, Brightness, Saturation and Hue as the first Bay Cat X.

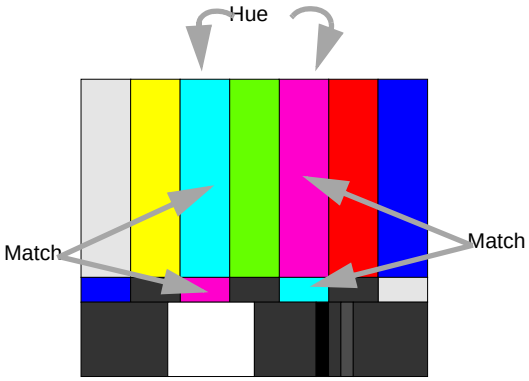








Adjust Saturation so the outside bars match when Blue Only is checked.



Adjust Hue so inside bars match when Blue Only is checked.

3.2.5 Aspect Ratio and Scale Mode

The aspect ratio of any picture is its height divided by its width. H / W = Aspect Ratio

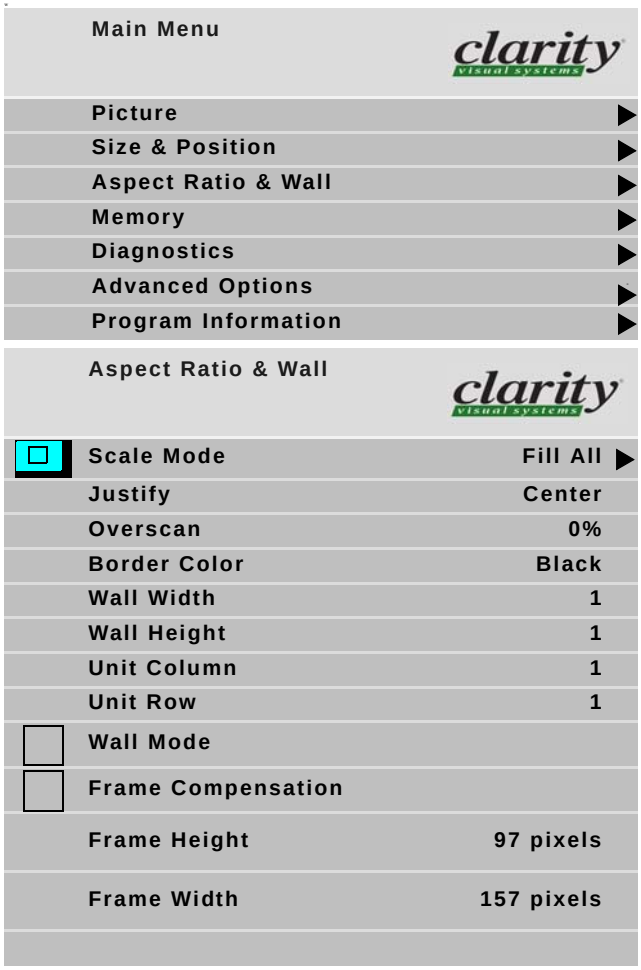
The native aspect ratio of the Bay Cat X screen is 1.77, which is sometimes referred to as 16:9. This is the WXGA and HDTV picture format.

1366 horizontal pixels, 768 vertical pixels

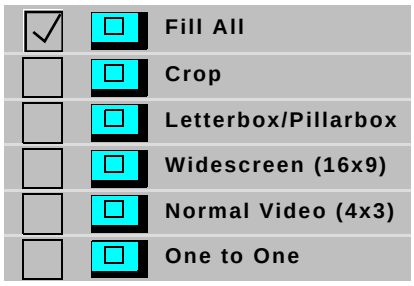
1366 / 768 = 1.77

Many pictures do not have this aspect ratio. Standard television, VGA, SVGA, and XGA signals are 1.33. Movies from DVDs vary depending on the original film format, often 1.85. The larger the number, the "wider" the picture seems.

When the incoming picture is a different aspect ratio from the screen, Bay Cat X gives you six choices to make it fit. To select the scaling mode, go to Main Menu > Aspect Ratio & Wall > Scale Mode.



The six Scale Modes are "radio" buttons; you can only choose one.)



✎ The Scale Mode menu icons change to indicate the effect each mode will have on the picture based on the Justify and Scale Mode settings, and the source resolution.

Fill All makes the picture fit top-to-bottom and left-to-right regardless of how this stretches or compresses the picture. Fill All distorts the picture, when the aspect ratio of the incoming picture is not the same as the Bay Cat X screen.

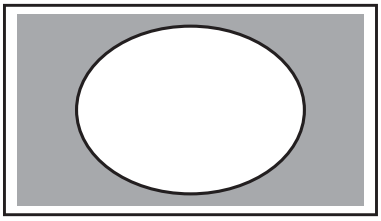
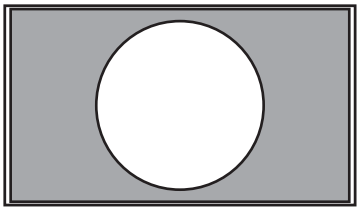
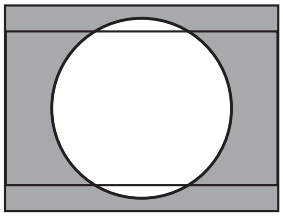
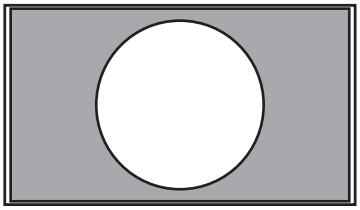
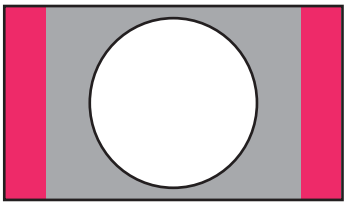
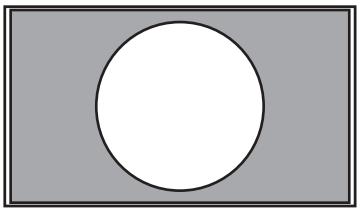
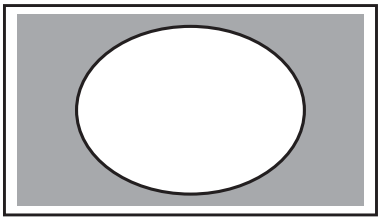
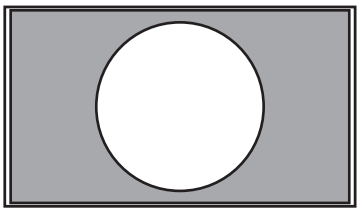
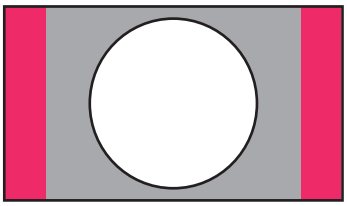
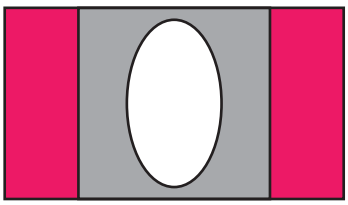
Letterbox/Pillarbox expands the picture until the first edges (top-bottom or left-right) touch the border of the display, and then fills in the other sides with a solid color.

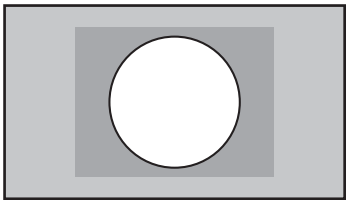
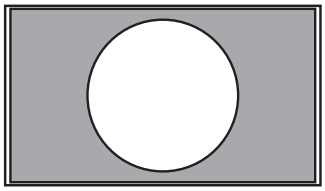
Crop expands the picture until the *second* edges touch the border and let the other edges of the picture fall outside the display and get cropped.

Widescreen (16x9) forces the aspect ratio to 16 x 9 (1.77), the standard for many DVD movies. This will distort any picture other than 16X9 aspect ratio pictures. Widescreen can be used to display anamorphic DVDs on an array.

Normal Video (4x3) forces a 4 x 3 (1.33) aspect ratio, the ratio of standard television. Normal Video is used to display YPbPr video on the analog input port. Its resolution is 720x640 which is not 4x3 but it should be displayed as 4x3 (the pixels aren't square).

One to One maintains the original size and aspect ratio of the picture. This may leave blank areas on all four sides. For instance, a VGA picture (640 × 480) will occupy only a small area in the center of the screen. For UXGA sources, this will crop the picture top and bottom.

Scale Mode	Affect on Input Type	
	Standard Video or VGA/SVGA/XGA Source	1080i Computer Source
Fill All	Distorts (expands) width of image 	Displays at native resolution without distortion 
Crop	Crops top and bottom of image; fits width of image without distortion 	Displays at native resolution without distortion 
Letterbox/ Pillarbox	Fits height of image without distortion; fills width with border 	Displays at native resolution without distortion 
Widescreen	Stretches image to fill width without affecting height 	Displays at native resolution without distortion 
Normal Video	Fits height and width of image without distortion; fills width with border 	Fits height of image, compresses width and fills with border 

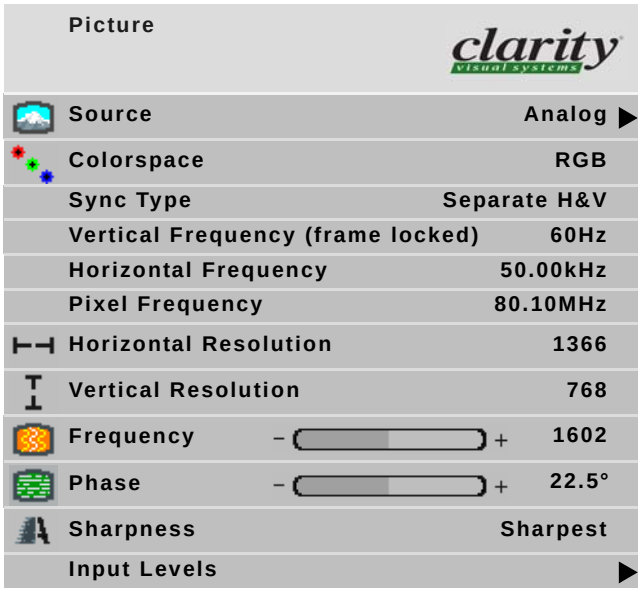
Scale Mode	Affect on Input Type	
	Standard Video or VGA/SVGA/XGA Source	1080i Computer Source
One to One	Displays image without distortion at actual size with border on all sides 	Displays at native resolution without distortion 

3.2.6 Adjusting Sharpness

After you set the Scale Mode to the one you will use for the program, select the Sharpness level in the Picture menu to reduce scaling artifacts. If you are not scaling your image, you may skip this section.

Sharpness Settings

The Sharpness setting is in the Picture menu.



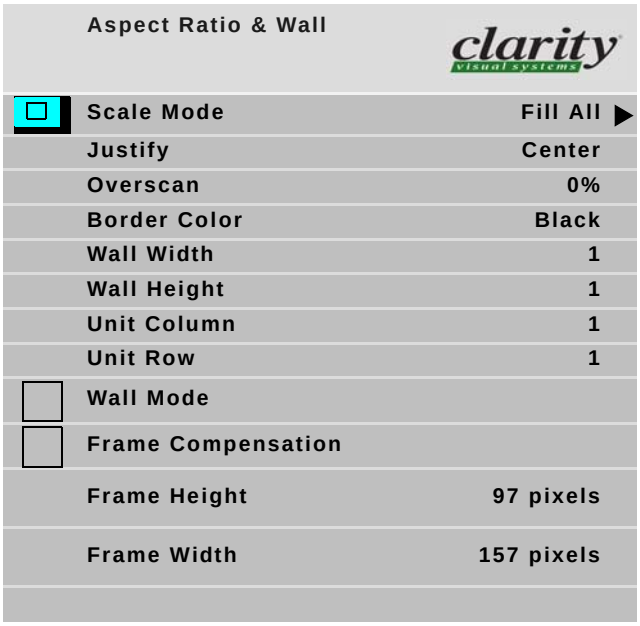
There are five levels of sharpness:

- Sharpest
- Sharp
- Normal
- Soft
- Softest

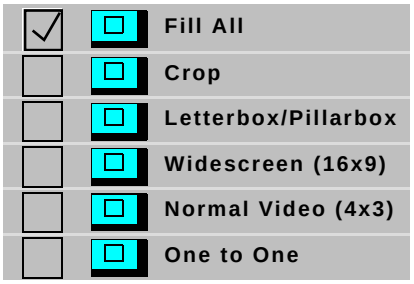
Normal is the default. It is essentially a “pass through” with no effect on the picture. Make any adjustments to sharpness with the picture scaled, that is, with the Scale Mode set the way you will use it. Use Sharpness to reduce artifacts of scaling.

✎ The Sharpness adjustments are in effect only when the image is scaled.

From the Aspect Ratio menu (Main > Aspect Ratio & Wall), select Scale Mode.



Press ENTER to move to the Scale Mode sub-menu. Use the up and down arrow keys to highlight the mode you need. Press ENTER to select the mode...



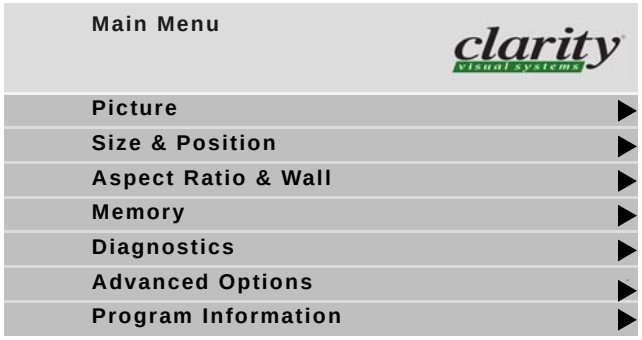
✎ The Scale Mode menu icons change to indicate the effect each mode will have on the picture based on the Justify and Scale Mode settings, and the source resolution.

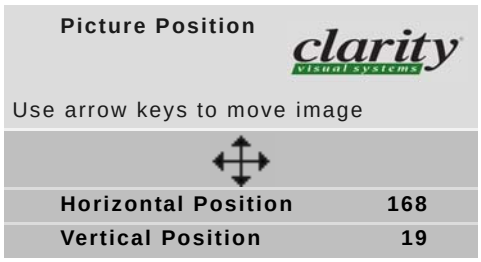
3.2.7 Position

This moves the picture image on the screen, but does not move the menus.

Image Position

In the Picture Position menu, the four arrow keys move the picture.





The Horizontal Position number shows the number of pixels from the beginning of H sync to the first active pixel. Because there are many black pixels after H sync, this number will not be zero when the picture is at the left border of the screen.

The Vertical Position number is the number of lines from V sync to the first active line, so it will not be zero when the picture is at the top of the screen.

3.3 Tiling a Display

Whether you use Clarity's Big Picture™ or an external video processor, your goal is to make the picture fit together properly at the edges.

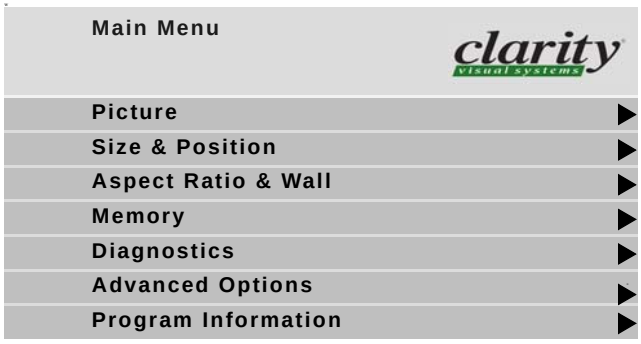
Using an external processor

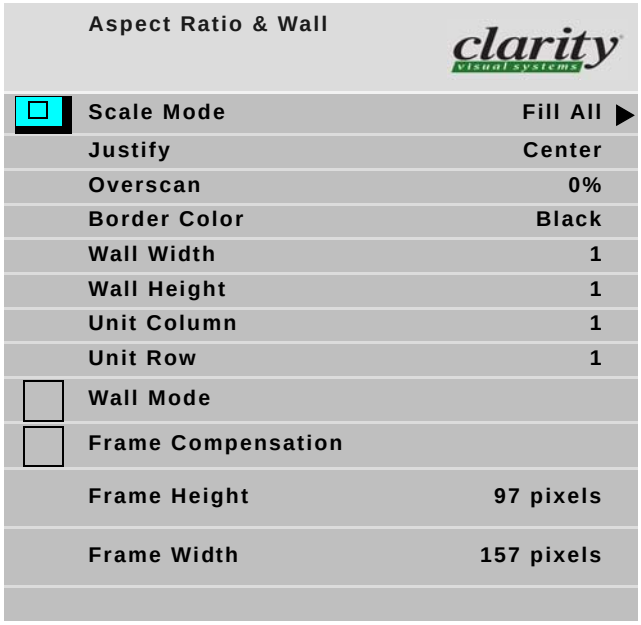
The processor divides a single picture into several sections and sends each part on a separate cable. Connect these cables to the proper Bay Cat X.

You can still position the picture with the Bay Cat X controls, or, with most processors, position and zoom the picture with the processor controls.

Using Clarity's Big Picture™

To show the same source on all the Bay Cat Xs in an array you'll need to use an external distribution amplifier. For each unit, set the Aspect Ratio & Wall menu for the same array size.





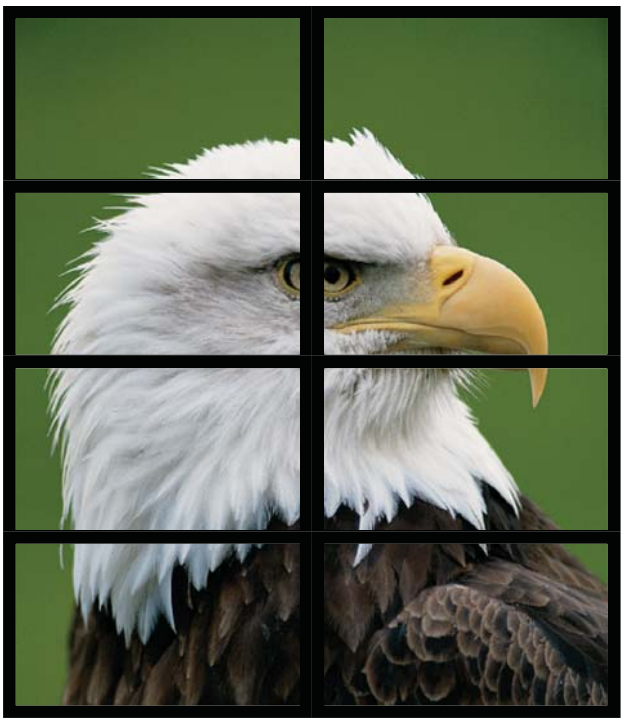
Wall Width and Wall Height are the number of units wide and high for the *picture*. This may be different from the physical array size. You could build a 4x4 array of Bay Cat Xs and use Wall Mode to put a single picture on the four cubes in the upper left corner, for instance.

- Unit Column and Unit Row represent the position of the Bay Cat X in this "array." For example, in a 2 x 3 array of Bay Cat Xs, the unit at the top left corner of the array would have a Unit Column value of 1 and a Unit Row value of 3
- Wall Mode, when checked, turns on the Clarity Big Picture™ feature. When not checked, the unit shows the whole picture.

✎ Each unit in a "array" gets the whole picture by feeding them all with a distribution amplifier. The Aspect Ratio & Wall menu tells the unit what portion of the entire picture to display.

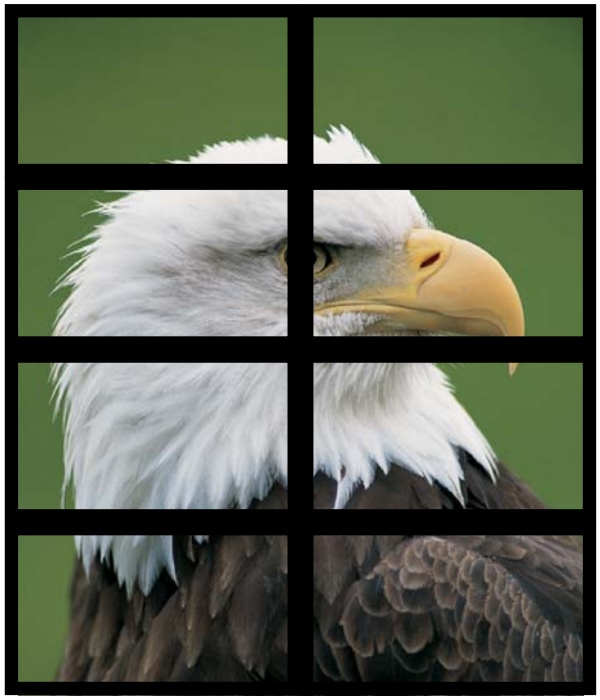
Frame Compensation

When video units are used in an array, the intent is to display a large version of an image. However, even the thinnest of mullions break up the image oddly.



One way around this is to adjust the image. Imagine looking out a window made up of many panes of glass. The image you see is partially obscured by the frames, but your mind assembles the image and ignores the frames.

Frame compensation allows you to mimic the mind's function by "hiding" portions of the picture (as if the mullions were actually hiding the image) and allow the distributed image to appear as one very large image.



To ensure that images containing diagonal lines remain correctly diagonal, turn on Frame Compensation.

Depending on how closely you space the units, you must determine how much of the picture to "hide" behind Bay Cat X's mullions and the space between units.

WARNING

The Bay Cat X generates heat. Plan your array installation to provide adequate ventilation or cooling to ensure that your Bay Cat Xs operate within normal usage guidelines. For more information, see "Optimizing Your Clarity Display" on page 116.

If you have any questions about your installation, consult Clarity Visual Systems for proper Bay Cat X array configuration guidelines.

To hide pixels at the top and bottom of images, set Frame Height.

To hide pixels to the left and right of images, set Frame Width.

3.4 Saving Your Work & Recalling a Memory

Some saving is done automatically, but there are big advantages to saving your work manually.

How automatic save works

Whatever changes you make with the remote control or RS232 commands, these changes are saved automatically. If you change sources (switch to another input connector) and come back to this source, everything you did before will be "recalled." Things will look like they did before.

Suppose you make adjustments to an SVGA source on Analog 1, then you feed a UXGA source to Analog 1 and make new adjustments. Then you switch to the S-Video 1 connector and do some more setup for it.

Later you switch to the Analog 1 input again, and this time it has the SVGA source from before. The Bay Cat X will recognize that it has seen this source before, or at least a source with these characteristics, and will recall the SVGA settings you established before.

This kind of recall includes Input Levels, Position, and Frequency, but it does not include Wall Mode and any Big Picture adjustments you made. Those need to be recalled from memory slots.

Manually saving to memory slots

Bay Cat X has 40 numbered memory slots, and this is the best way to save. Recall is fastest from memory slots.

First, set up the Bay Cat X the way you want it, including all the adjustments listed in this section. Then press the SAVE button twice. This opens the Save grid.

Navigate to an unchecked slot number, or to a checked slot if you want to overwrite what's already saved. Press ENTER.

This menu shows all the data that will be saved. You can't change anything but the name in this menu. To save immediately, press ENTER. The appearance of this menu is somewhat different for digital and video sources, reflecting what is saved for them.

To change the name of the memory slot

The default name is an abbreviated description of the contents. In this case, the name tells you that the source is connected to Analog 1, which is an XGA picture. This unit is part of a 2x2 array, and it's the unit lower left corner (column 1, row 2).

If your customer wants or needs a more descriptive name, select the Name line and press ENTER.

Use the left-right arrow keys to navigate along the line. Use the up-down keys to change the character at that point. Press PREV when finished. Then select Save Now and press ENTER again.

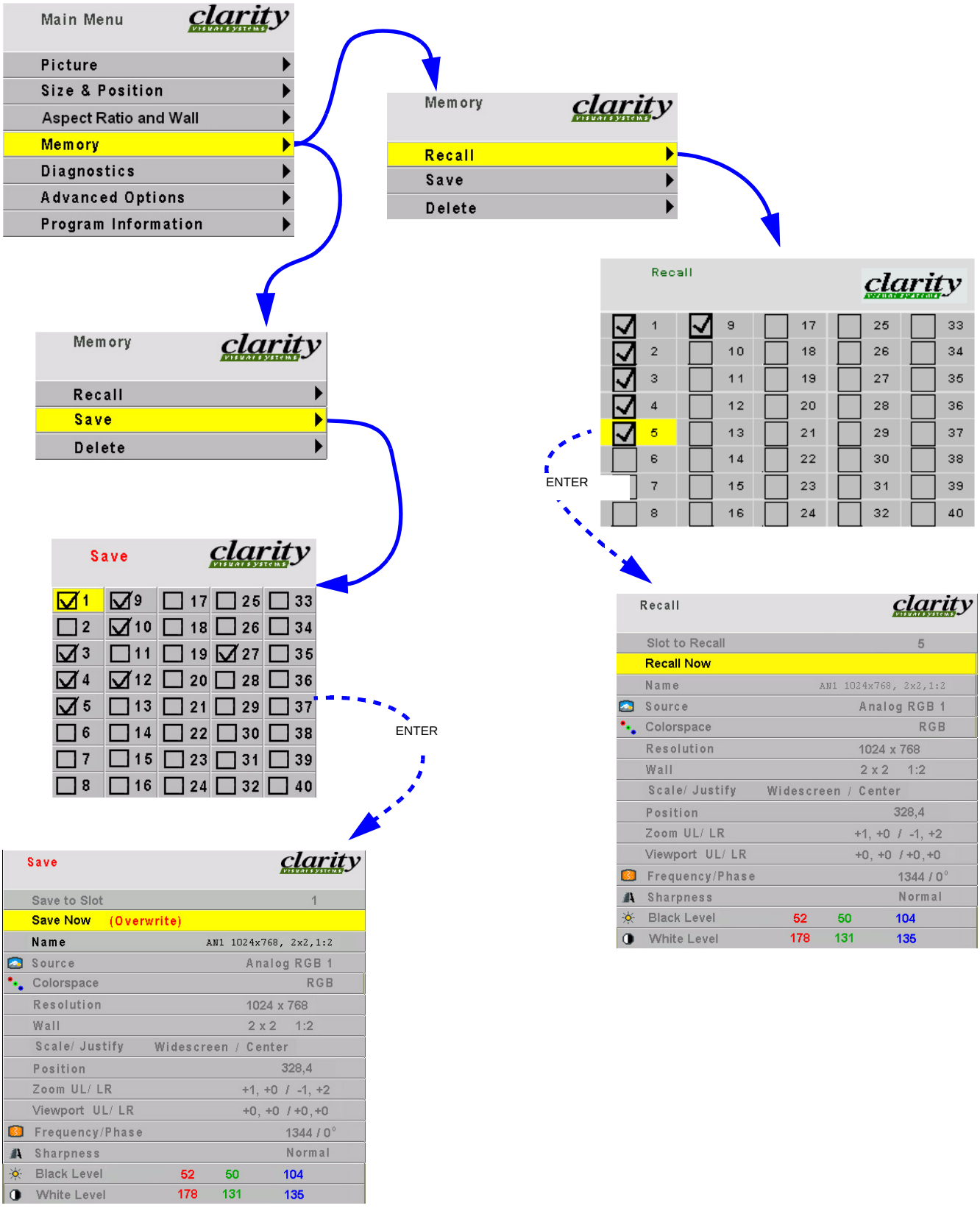
If you have RS232 control, there are commands to send a string name to a memory slot, saving time.

How to recall a memory slot

1. Press SAVE once to open the Recall grid.
2. Navigate to the slot you want to recall. You can only land on slot numbers that are not empty (have checks). Press ENTER to open the Recall detail menu. If this slot number has exactly the same settings are currently being used, a (Current) message appears on the top line.
3. The only line you can select is Recall Now. Press ENTER.

Advantages of saving configurations to memory slots

- You can compare multiple settings quickly
- You don't have to repeat settings when comparing entire configurations
- You can revert to a known good setting when testing new configurations


Main Menu
Picture
Size & Position
Aspect Ratio and Wall
Memory
Diagnostics
Advanced Options
Program Information
Memory
Recall
Save
Delete
Memory
Recall
Save
Delete
Recall
1 9 17 25 33
2 10 18 26 34
3 11 19 27 35
4 12 20 28 36
5 13 21 29 37
6 14 22 30 38
7 15 23 31 39
8 16 24 32 40
ENTER
Save
1 9 17 25 33
2 10 18 26 34
3 11 19 27 35
4 12 20 28 36
5 13 21 29 37
6 14 22 30 38
7 15 23 31 39
8 16 24 32 40
ENTER
Recall
Slot to Recall 5
Recall Now
Name AN1 1024x768, 2x2,1:2
Source Analog RGB 1
Colorspace RGB
Resolution 1024 x 768
Wall 2 x 2 1:2
Scale/ Justify Widescreen / Center
Position 328,4
Zoom UL/ LR +1, +0 / -1, +2
Viewport UL/ LR +0, +0 / +0,+0
Frequency/Phase 1344 / 0°
Sharpness Normal
Black Level 52 50 104
White Level 178 131 135
Save
Save to Slot 1
Save Now (Overwrite)
Name AN1 1024x768, 2x2,1:2
Source Analog RGB 1
Colorspace RGB
Resolution 1024 x 768
Wall 2 x 2 1:2
Scale/ Justify Widescreen / Center
Position 328,4
Zoom UL/ LR +1, +0 / -1, +2
Viewport UL/ LR +0, +0 / +0,+0
Frequency/Phase 1344 / 0°
Sharpness Normal
Black Level 52 50 104
White Level 178 131 135

3.4.1 Memory: What Is Saved? And Where?

Bay Cat X's automatic memories work well, but the best way to save and recall is with the numbered memory slots, because they recall everything.

In the Bay Cat X some parameters (values) are associated with the **mode**. The mode is primarily the horizontal and vertical resolution and the vertical frequency of the incoming source picture. It is more than this, but if you think of it this way, you will be close enough.

Some parameters are associated with the **input**. The input in this instance means the input connector: Analog 1, Digital, Composite Video, etc.

✎ The parameters specific to Mode and Input are saved in memory slots.

Some parameters are global, that is, they are not associated with either the mode or the input connector, and are not saved to memory slots. They are universal.

Parameter	Specific to the		Global
	Mode	Input	
ASCII Response Term.			x
ASCII Response Type			x
Auto Codes			x
Auto Backlight On			x
Baud Rate			x
Black Level: R, G, & B	x		
Brightness (video)	x		
Color Balance (all values)			x
Colorspace		x	
Contrast (video)	x		
Curtain Pattern			x
Do Black/White Levels			x
Do Frequency			x
Do Phase			x
Do Position			x
Frequency	x		
Group ID			x
Hue	x		
Justify		x	
Menu H Position			x
Menu Timeout			x
Menu V Position			x
Phase	x		
Plug and Play (EDID)			x
Position, Horizontal	x		
Position, Vertical	x		
Resolution, Horizontal	x		
Resolution, Vertical	x		
Retry On Lost Signal			x
Saturation	x		
Sharpness		x	
Unit ID			x
White Level: R, G, & B	x		

Memory

The Bay Cat X remembers the last 10 modes it received and all the **mode** parameters associated with them.

Switching modes

For instance, suppose you set up the Black and White Levels for a 1024x768 @ 65Hz vertical from a computer connected to Analog. Then later, using the same input connector but a different computer you set up the Bay Cat X for a 1600x1200 @ 60Hz. You re-adjust the Black and White Levels, because they are different.

Still later you plug in the first computer with its 1024x768 @ 65Hz picture. Immediately, the Bay Cat X recognizes that it has seen this signal type before, and it recalls the Black and White Levels from its internal memory.

It does not Do Frequency or Phase or anything else, because it recognizes that this input was used before, and the previous settings are probably correct.

Possible issue with Mode specific memory

Suppose that after setting up the 1024x768 and 1600x1200 pictures, you connect a third computer that is 1024x768, but it has a different requirement for Black and White Level. In this case, the Bay Cat X would use the *default* values for these levels.

To prevent this from happening, use the memory slots as described in “Saving Your Work & Recalling a Memory” on page 40.

Switching input connectors

Now suppose you use Digital to bring in a picture that uses the component YPbPr video. You change the Colorspace setting to YPbPr. If you switch back to Analog in the Picture menu, the Bay Cat X switches back to the RGB Colorspace, because Colorspace is specific to the input connector.

Possible issue with Input specific memory

What happens if you switch back to Analog and the picture there is YPbPr? The Bay Cat X has no way to know this, no way to detect the difference between RGB and YPbPr, so it will use the wrong Colorspace.

To prevent this from happening, use the memory slots as described in “Saving Your Work & Recalling a Memory” on page 40.

Global parameters

In none of the examples above does the Bay Cat X try to change the Baud Rate or the Color Balance values, because these items are saved globally.

3.4.2 Scaling and Cropping

Sometimes the picture does not fit the array. If the source picture is video from a DVD, the aspect ratio is probably 1.77 (16x9), the same as HDTV.

✎ The aspect ratio of a picture is its width divided by its height. 1024 ÷ 768 = 1.33

The aspect ratio of a Bay Cat X is 1.77 (16x9), the same as HDTV. When the source picture's aspect ratio is *not* the same as the Bay Cat X array, you have to do something to make the picture fit. You have some basic choices:

- Fill the area both ways. This will produce some distortion in the picture. Circles will not be round.
- Put the picture in without distortion and crop off the sides (or top and bottom).
- Put the picture in without distortion and fill the extra space with black or some other solid color.
- Force an aspect ratio, such as 16 x 9 or 4 x 3.

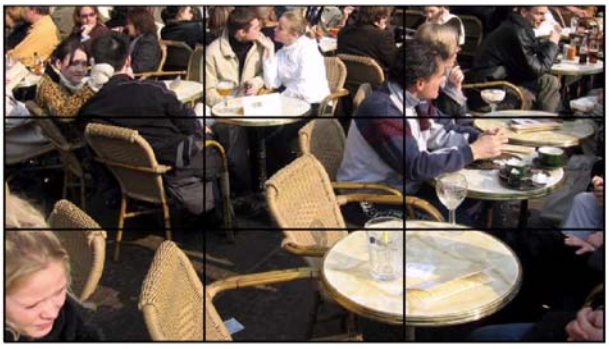
Below is a 1.77 picture shown on a 3x3 array of Bay Cat Xs. The picture fills the array nicely, and there is no distortion or cropping.

Let's start with a 1.33 (4x3) picture, the aspect ratio of normal TV, and put it on this same array of Bay Cat Xs. Here is the original picture.

Scale Mode determines how the picture will be made to fit the array.

- **Fill All** means that the picture will touch the borders of the array all around, even if this means stretching (and distorting) the picture in one direction. The picture had to be stretched sideways to fill the screens.

- **Letterbox** means expand the picture until the first edges (top-bottom or left-right) touch the border of the array, then fill in the other sides with a solid color.
- **Crop** means expand the picture until the *second* edges touch the border and let the other edges of the picture fall outside the array and get cropped. Here the width is filled, there is no distortion, but the top is cropped off. This would happen when the Justify is BOTTOM.



- **Widescreen** means force the aspect ratio to 16 x 9 (1.77), the standard for many DVD movies.
- **Normal** forces a 4 x 3 (1.33) aspect ratio, the ratio of standard television.

Justify determines how the picture will be placed in the array.

- If the picture is too wide for the array and is cropped on the sides, you can choose **Left**, **Center**, or **Right**.

- If the picture is too tall for the array and is cropped top and bottom, you can choose **Top**, **Middle**, or **Bottom**.
- Similar choices are made if the picture is letterboxed.

Border Color determines the color of the “extra” space around the picture if it doesn’t fill the screen. The choices are:

- Black
- White
- Red
- Green
- Blue
- Dark Red
- Dark Green
- Dark Blue

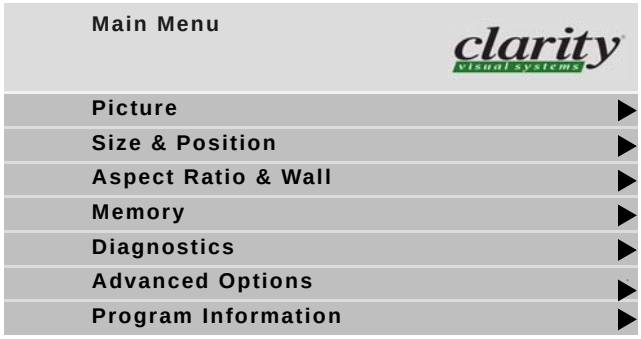
When the Scale Mode is Fill All, the Border Color line will be grayed out, because there will be no border.

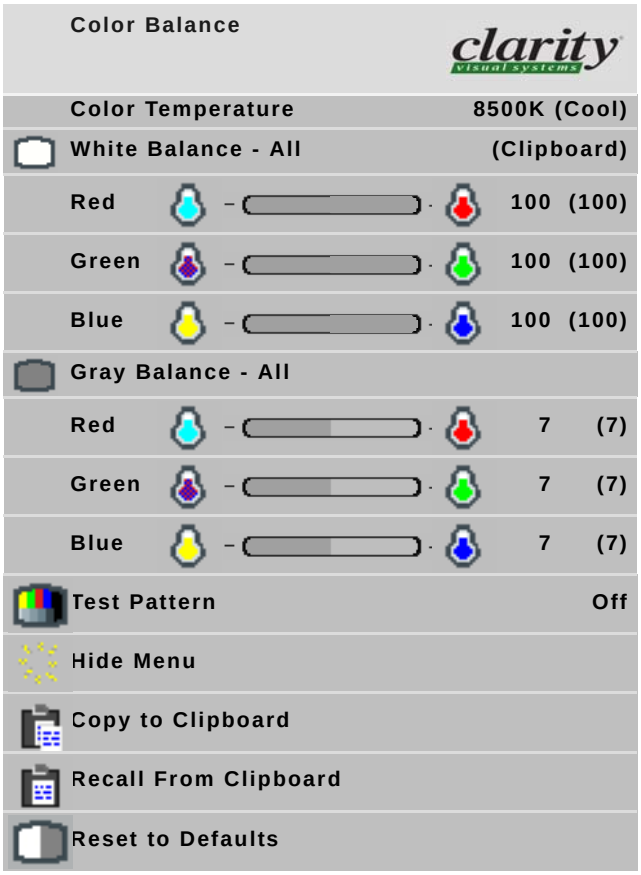
3.4.3 Adjusting Color Balance

Color Balance is used to match the colors of adjacent displays when several Bay Cat Xs are arranged in an array. You may also use it to adjust the color of a single display.

For one Bay Cat X only

If you have only one display, the Color Balance controls can be used to set the color temperature of the single display.





Understanding Color Temperature

Different "Pure white" light sources do not always have the same color. For instance, light from an incandescent bulb is much more yellowish than light from direct sunlight. "Color Temperature" is a way of measuring these color differences. In general higher color temperature numbers are more bluish or "cooler". You may have a reason for wanting your unit to be a specific color temperature. For instance, if you are using your Bobcat X in a television studio where you will be videotaping the content, you will want a low color temperature. The default color temperature for the Bobcat X is 8500k. This is the native color temperature of the LCD panel. You may choose a different color temperature by setting it in the Color Balance menu.

Adjusting Color Temperature

Select Color Temperature in the Color Balance menu and select from 3200°K (Warm), 5500°K, 6500ºK, and 8500°K (Cool).

Each of these selects a set of White Balance values to give the picture a warm (3200K) to cool (9500K) appearance.

To adjust an array of Bay Cat Xs for Color Balance

The object of color balancing is to make the individual units in an array show the same colors. When we see a yellow car move across a video array from one display to another, we want it to have the same color for the whole trip, not change from yellow to maroon to orange.

The displays naturally have slightly different colors from one display to the next, because of slight variations in the backlights and LCDs. This cannot be avoided, but we can compensate for it with color balancing.

Color balancing is subjective. It may seem strange at first, but it gets easier with practice. Fortunately, you don't have to match all the colors; you only have to match whites and grays.

When you make all the displays look the same with White and Gray, all the other colors will look the same. It is not necessary to achieve a perfect white or a perfectly colorless gray. It is only necessary that all the displays look alike when they display white and gray.

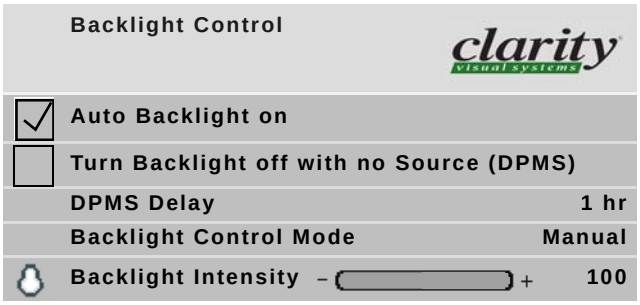
CAUTION

Never try to match the colors of the display units with the Black and White Level controls or with the Video Controls. You will not like the results if you do.

Color Balancing

1. Turn on all the units in the array and let them warm up for at least five minutes. The lamps must be thoroughly warm before you color balance.

2. Open the Backlight Control and Status menu (MENU > ADVANCED OPTIONS > BACKLIGHT CONTROL).



   a) Set Backlight Mode Control to Manual.

   b) Set (or confirm) Backlight Intensity to 100%.

3. For each Bay Cat X in the array, do the following:
   a) Open the Color Balance menu on all displays in the array. (MENU > ADVANCED OPTIONS > COLOR BALANCE).

✎ If the array has never been color balanced, make sure you start with the same color temperature setting on each unit. If you are not interested in achieving a specific color temperature, use the default of 8500K, which is the brightest. If the unit has been color balanced before, it will display CUSTOM in its color temperature setting, because the balance values don't match any of the pre-set color temperatures.

   b) Highlight Test Pattern and use the left-right arrow keys until it says White.

✎ Always use the internal Test Patterns for color balancing, not an external pattern.

4. When all displays are white, find the *least bright* display in the array. This will be the "baseline" display, and you will *not* adjust it. All other displays will be adjusted to this baseline display.

✎ Why pick the "least bright" display? Why not pick the brightest and adjust to it? When the White value is 100, the display is a bright as it can get. You are adjusting for slight variations in backlight brightness.

5. Choose a display next to the baseline display and adjust its White values (red, green, and blue) to make it match the baseline display. Concentrate on the center of the

displays, not the adjacent edges. (If you can't bring theses settings down to match the baseline, maybe you didn't choose the darkest display.) Do *not* adjust the Gray values at this time.

6. Continue with other adjacent displays until all the displays have the same appearance when white. Be careful not to change the values of displays once you are satisfied with them. Use Hide Menu to keep from setting other displays and allow you to see more of the white field. To unhide the menu, press ENTER

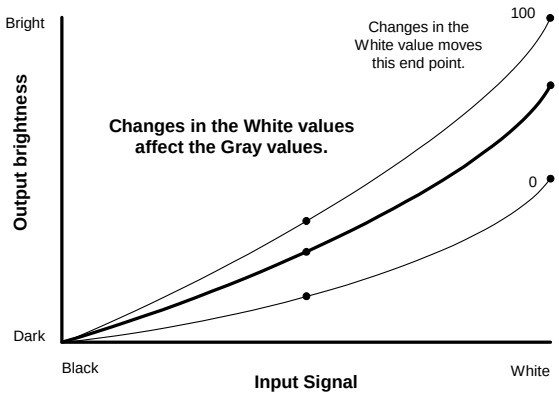
✎ The menus will automatically turn off after a time determined in Menu Options (MENU > Advanced Options > Menu Options > Menu Timeout). If Menu Timeout is 0 (zero), the menus stay up indefinitely.

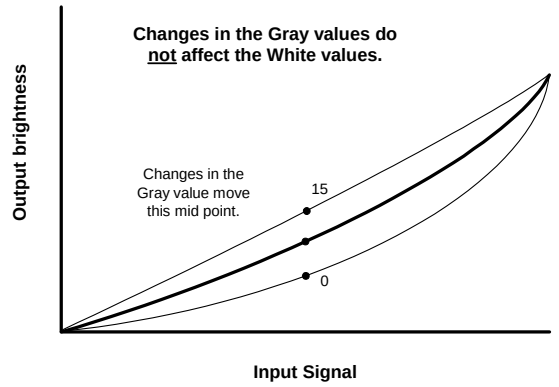
7. When all displays look the same for White, choose the Gray test pattern in all displays.
8. Choose any display as the new baseline display. It does not need to be the baseline display you used for White.
9. Adjust all the displays in the Gray part of the Test Patterns menu until they match the baseline display. Do one display at a time. Again, match the center part of the picture, not the edges.
10. When all displays match in Gray, close all the menus. The test pattern automatically turns off.

Tips for color balancing

- Copy to Clipboard will save all the current settings to a temporary memory. You can then make more adjustments to see if it gets better or worse. Recall from Clipboard will restore these saved settings. The clipboard is only for testing. These values are not saved when AC power is off.

Color Balance values are saved for all input sources in the same memory location. Color Balance is the same for all sources.





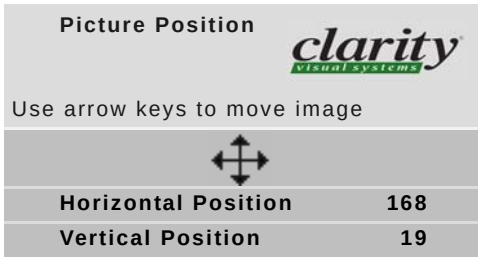
- Removing red has the same effect on hue as increasing blue and green together. The Color Balance menu slider bars have colored bulbs at each end to tell you what the effect will be of moving a color toward that end.
- Stand back from the display array and directly in front of it to get the overall view.
- Small changes are difficult to see at first, particularly with White. Change the value by 4 or 5 steps to see the difference. If you are going the wrong way, go back and move it 4 or 5 steps in the other direction. If neither of these bring you closer to a match, try another color.
- When you don't know which color to change, pick one at random and change it 3 or 4 steps. The result will be either better or worse. If worse, go the other way with that color. If that is also worse, put this color back where you started and to the same with another color. If everything you do makes the match worse, you must be close to the ideal point.

3.4.4 Zoom and Position

Position moves the picture on the screen. Zoom adjusts the edges of the picture to make it fit with the other pictures in an array.

Position

Press the MISC button once to open the Picture Position menu. The four arrow keys move the picture on the screen.



The numbers for Horizontal and Vertical Position refer to the number of pixels from sync to the first displayed pixel. These numbers get smaller as the picture moves up and to the left.

Zoom

Zooming (Main > Size & Position > Zoom Window) is used mainly to make the edges of a large picture—one that covers many Bay Cat X screens—fit each other side-to-side and top to bottom.

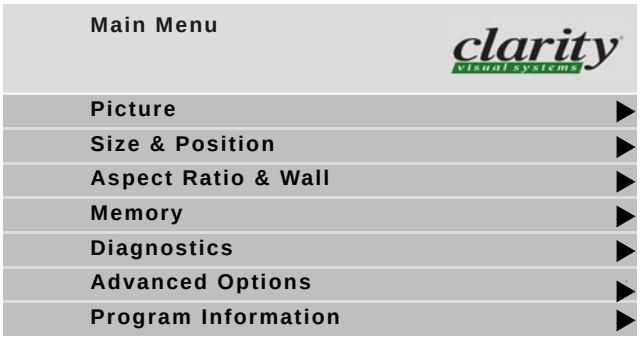
Zoom menu entries

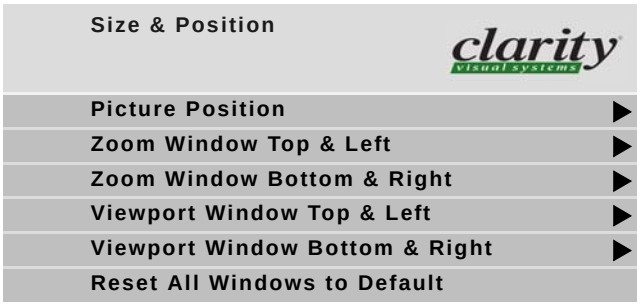
- **Image Resolution** is the resolution of the source picture.
- **This Unit** is the number of pixels this unit is using of all the incoming pixels, followed by the size of the array (from the Wall & Aspect Ratio menu) and the Column and Row of this unit.

Using Zoom and Position

Picture Position is usually used to center the picture on the screen.

Zoom is primarily used to adjust the edges of the picture when one picture is spread over several units. Whether you use Clarity's Big Picture™ or an external video processor to make one picture cover several units, the Zoom controls can make the edges fit together.





Zoom Top & Left

Arrows move top and left

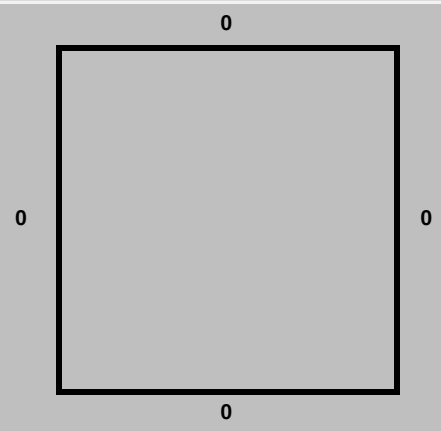


Image Resolution	**1920 x 1080**
This unit	**1920 x 1080**

Zoom Bottom & Right

Arrows move bottom and right

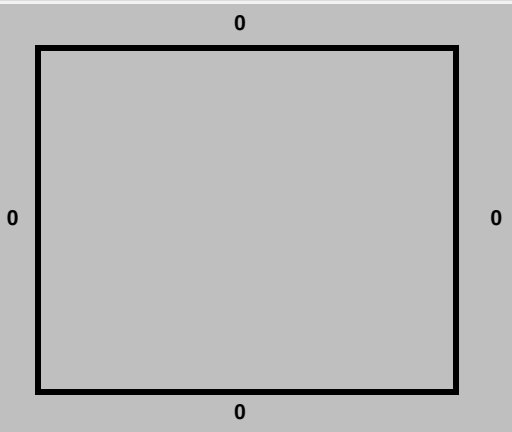


Image Resolution	**1920 x 1080**
This unit	**1920 x 1080**

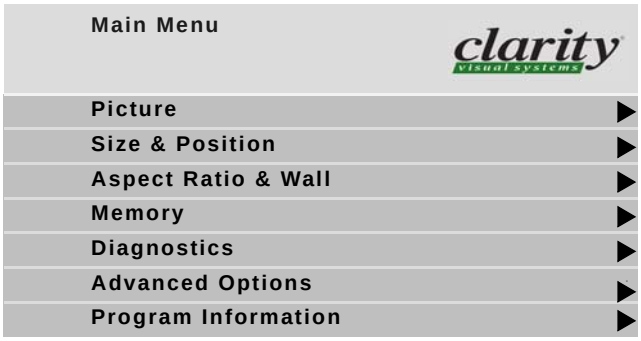
3.4.5 Viewport Adjustment

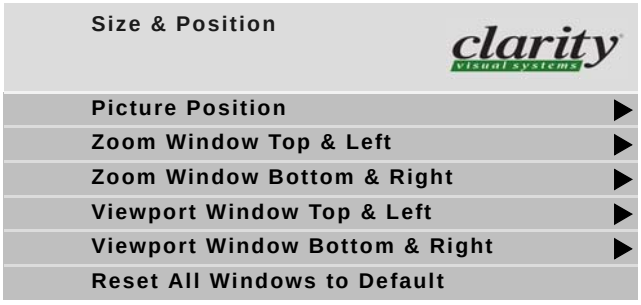
The Viewport menus adjust the image on the LCD.

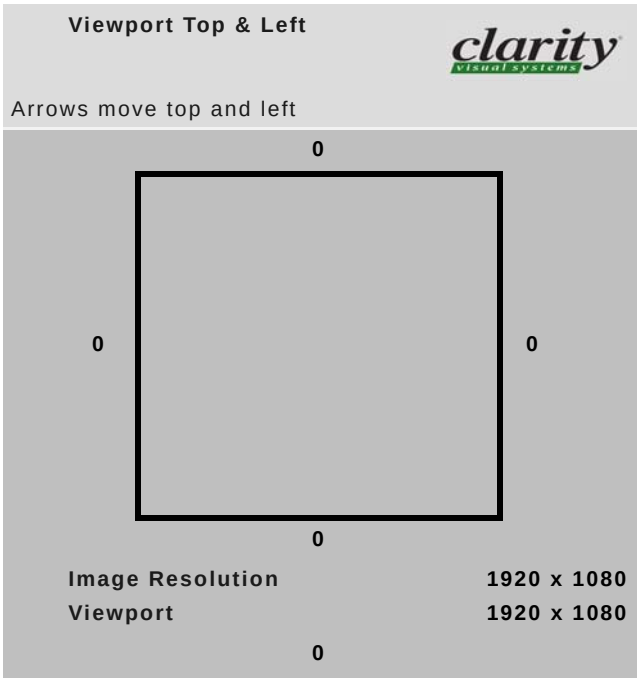
What is Viewport?

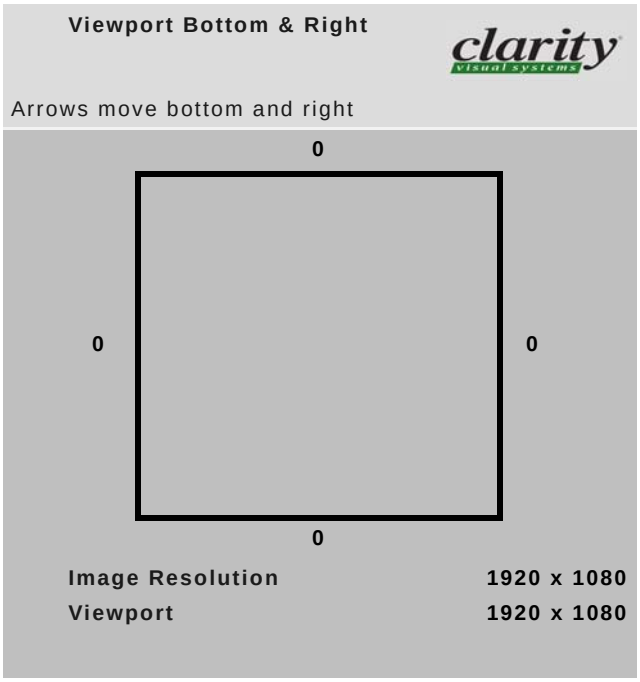
The Viewport menu (Main > Size & Position > Viewport) adjust the number of pixels actually used on the LCD. You can't increase this number, naturally, but you can reduce it.

- **Image Resolution** shows the resolution of the image. This has nothing to do with the resolution of the source picture.
- **Viewport** shows the number of LCD pixels being used.







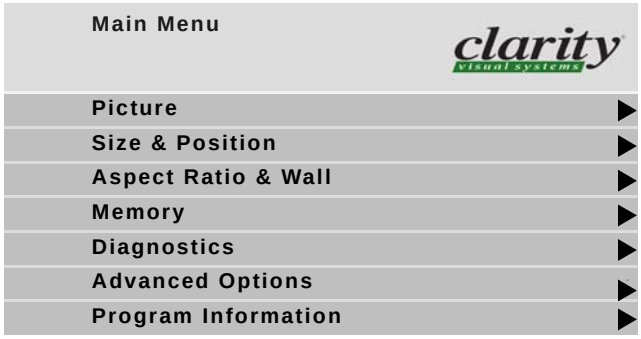


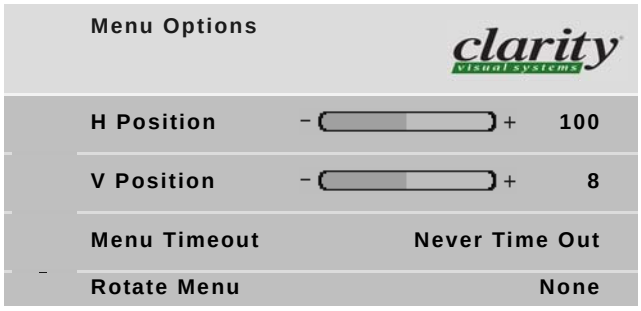
3.5 Advanced Options

Menu Options moves the menus to other places on the screen. Auto Adjustment Options sets what will happen automatically and what will not.

Menu Options

These controls move the menu to a different position on the screen or rotate it for Portrait orientation. Menu Timeout is set here.





H Position moves the menus (all of them) left and right on the screen. Use the left and right arrow keys to increase or decrease the distance from the left side of the screen to the left side of the menu. The number indicates the how far across the screen, in percent, the menu starts.

V Position moves the menus up and down. Use the left and right arrow keys (on the up-down keys) to move the menu. The number indicates how far down the screen the menu is in percent. It is not possible to move the menu to the bottom of the screen.

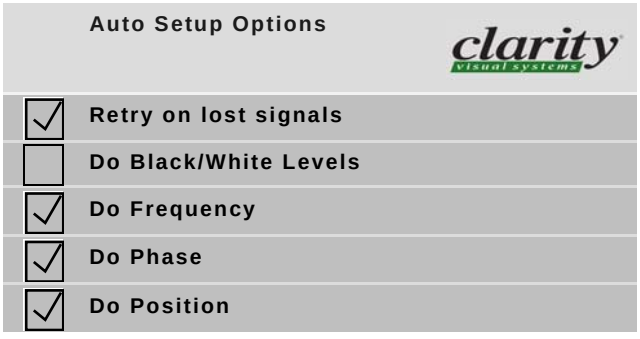
Menu Timeout determines how many seconds the menu will stay on the screen without any activity. Never Timeout means the menus will not automatically disappear. The maximum time is 60 seconds. The shortest possible time is 2 seconds. The default value, if you have never changed Menu Timeout, is Never Timeout.

Rotate Menu makes the menus readable when the Bay Cat X is arranged in portrait or landscape orientation.

✎ Rotate Menu does not rotate the picture. It only arranges the menus so they read the same way the picture does. To use the Bay Cat X in portrait mode, your source image must be rotated.

Auto Adjustment Options

Each of the "switches" in Auto Options can be turned on or off by selecting it (up-down arrows) and pressing ENTER.



When the box is checked, the action will occur under these circumstances:

- When a new source is detected that has not been detected before. (See 'About the input memories' on this page and "Input system caches" on page 63.)

- When you press the SETUP button.

Retry on lost signal occurs only when the present signal (picture) disappears or changes in some way. If this item is not checked, the Bay Cat X will not try to sync to a new signal. Keep this menu item checked.

Note that searching will *not* happen just because the picture goes black. Black, from video or from a computer, is a valid picture. The signal itself (the sync pulses) must be lost to trigger a search.

The several **Do** items in this menu will, if checked, happen in these situations:

- If a new signal is acquired, either through a search to a different connector or because source picture changed modes, such as from WXGA to UXGA, each of the checked items occurs in the order listed in the menu.
- When you press the SETUP button on the remote, each of the checked actions occurs in the order given in the menu.

Do Quick Black/White Levels searches for the brightest and darkest pixels in the picture and adjusts to these. Black and White Levels are best done semi-automatically (see "Adjusting Levels for Analog Computer Sources" on page 28) so leave this unchecked.

Do Frequency and **Do Phase** find the frequency and phase (separately) of the computer picture and adjust to them. This works best on a picture that has lots of sharp changes in brightness, such as text (adjacent white and black pixels).

Do Position centers the picture on the screen.

About the input memories

The Bay Cat X has a ten input memories for storing the most recent attributes of the pictures it displays. When a new picture arrives that is near enough to a previous type, it uses the stored attributes rather than automatically adjusting brightness, contrast, frequency, etc.

For example, suppose the Bay Cat X sees an analog WXGA picture and auto-adjusts everything in the Auto Options Menu. Then you change the Brightness and Contrast. Then you change computers and feed in a UXGA picture.

If you now switch back to the computer with the WXGA picture, Bay Cat X will use the Brightness, Contrast, as well as other settings, from the last time it saw a WXGA picture.

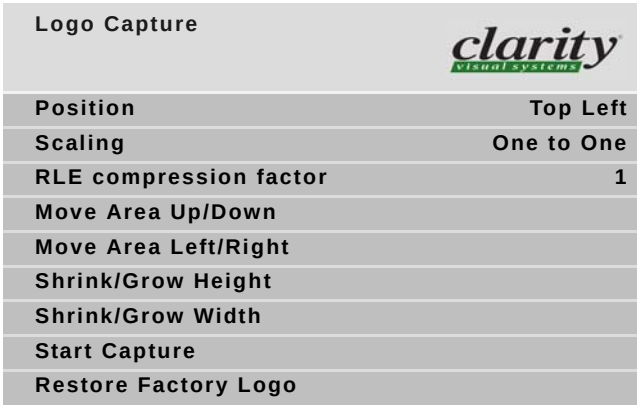
✎ Aspect Ratio is specific to the source, which means it applies to all modes. It does not change when the system recalls a memory from cache.

Setup button

The SETUP button on the remote starts the "Do" processes. Each Do that is checked ☑ will begin, one at a time, until all are adjustments completed.

Logo Capture

The capture menu is used to create a custom splash screen that appears when the unit is turned on or the CURTAIN button is pressed and in the Miscellaneous menu (see "Advanced Options > Miscellaneous Settings" on page 94), Curtain Pattern is set to Logo.



To capture a screen image, do the following:

1. Display the image you want to capture.

✎ You may capture a portion of the image or the entire screen; the larger the area captured the longer the process.

2. On the Logo Capture menu (Main > Advanced > Capture Custom Logo) select Position to specify the on-screen position for the custom splash screen. Choices are:

Middle Left	Centered top/bottom at the left side of the screen
Middle Center	Centered on the screen, both top/bottom and left/right
Middle Right	Centered for top/bottom, at the right side of the screen
Bottom Left	At the bottom left corner of the screen

Bottom Center	Centered left/right, at the bottom of the screen
Bottom Right	At the bottom right corner of the screen
Tile	Repeat the image across and down to fill the screen with the captured image
Top Left	At the top left corner of the screen
Top Center	Centered left/right at the top of screen
Top Right	At the top right corner of the screen

✎ It may help to set the Scale Mode to one to one in the Aspect Ratio menu before starting the logo capture. (although it will work from any scale mode). This will allow you to visualize the true size of the captured image relative to the screen.

3. Select Scaling to specify the aspect ratio of the captured image. Choices are:

one to one	Each captured pixel of the logo will appear as one pixel of the display *regardless of how the image was scaled when you captured it.* For example, if you capture a logo from a VGA input, it will take up at most 640x480 pixels of the 1920x1080 pixel logo screen.
full screen	The captured image will be stretched until it fits the output screen in one direction, without changing the aspect ratio. This is analogous to the “letterbox/pillarbox” choice in the aspect ratio menu
n percent	The image will be scaled somewhere in between the two choices above. 10 percent is a little bigger than one to one, 20 is bigger than that etc.

4. Select RLE Compression Factor to reduce the bitsize of the image.
   RLE (Run Length Encoding) is a very simple method of compressing an image where multiple pixels that are the same will be stored as a count and a value rather than as individual pixels, thus saving space. The RLE Factor is the number used to determine when a pixel is “the same”. As long as each color of the new pixel is within the RLE factor of the old pixel it will be considered the same. For analog images, it is best to put the RLE factor at 1 so that the analog noise will be eliminated and a flat image can be compressed. There are only 576 kilobytes available for the captured logo which is not large enough for a full screen image without compression. If you get the error message that the logo is too large, you can try increasing the RLE factor. However, the results will probably be more blurry than you may like.

✎ The larger the capture image (in number of pixels, not scale mode) the slower it will be to draw. Repeated pixels draw faster than non repeated so a higher RLE factor can also increase draw speed somewhat.

5. Move the capture area (indicated on screen by the red rectangle) to the portion of the screen you want to capture.
   a) Select Move Area Up/Down or Move Area Right/Left and then use the + and - keys to position the upper right corner of the red rectangle to the upper right corner of the image.
6. Resize the red rectangle by selecting Shrink/Grow Width and Shrink/Grow Height and using the + and - keys to increase or decrease the size of the red rectangle.

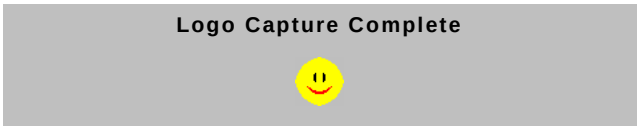
✎ The background color for the logo will be the color of the pixel in the upper left corner of the capture area. This background color will be used even if the scaling is set to full screen, since the aspect ratio of what they captured will probably not be the same as the screen. The captured image will reach to the outside of the red line. There's a “bite” taken out of each corner to allow you to better see what's under the line.

7. After you have sized and positioned the selection rectangle, select Start Capture.
   The screen displays the following note:

Capturing Logo...
Capture can take several minutes
Unit will not respond to commands during capture

✎ The larger the image, the more time it will take to capture. Capture can take up to 5 minutes, during which time there is no response from the unit. The reason for this is that the logo gets captured to the same FLASH part that the embedded firmware resides in. You can't write to the FLASH and read from it at the same time.

8. When capture is complete, the following note displays:



9. On the remote, press MENU to dismiss the note and the Logo Capture menu from the screen.
10. To see the custom splash screen, on the remote, press CURTAIN. Depending on the size of the captured image and the positioning choices, the logo may take up to a minute to display.
11. To return to the input source, press CURTAIN again.

✎ The custom logo is also available from the Test Patterns menu (Menu > Diagnostics > Test Patterns > Logo).

Logo capture guidelines

It is difficult to say what is the largest size logo you can capture. There are 576 kilobytes of memory set aside for the logo (at 16 bits per pixel), which can hold an image of about 576x512 pixels, but this varies depending on how much it can be compressed. However, large or high resolution images draw quite slowly, so you may be happier with a lower resolution image scaled up to the size you want.

As an example, the Clarity logo you see on the splash screen is 666 pixels wide and 213 pixels high scaled one to one. If you have an image you would like to use for a logo, you can open it in a graphics application (such as Paint or Adobe Illustrator) on a computer connected to the Bobcat X.

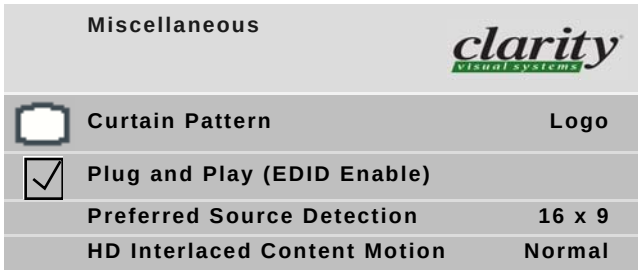
On the Bobcat X, from the Scale Mode submenu (Main > Aspect Ratio & Wall), set the Scale Mode to One to One and you will see your logo at the size it will be if you set the logo capture Scaling to One to One. If it appears too small, set the logo capture scaling to a higher value. If you wish to stretch your logo as big as it can be on the screen set the scaling to Full Screen. You may need to capture a few times at different settings to find what looks best.

If the logo draws too slowly or is too large, try reducing the size of your image using your graphics application program, capturing the smaller image, and using the Bobcat X's scaling mode to scale it to the desired size.

✎ Use a static image; moving images are too difficult to capture

3.5.1 Miscellaneous Options

This menu holds several unrelated settings.



Curtain Pattern determines what the screen will show when there is no source picture. You have a choice of several solid colors or the logo.

Plug and Play (EDID Enable)

For Plug and Play and **EDID**, see the full discussion in “EDID: What It Is and How It Works” on page 118.

Preferred Source Detection

Analog computer video cards provide only vertical and horizontal frequencies. Sometimes, this is not enough information. Bay Cat X receiving such “ambiguous” signal modes, in certain cases, could misinterpret the resolution to be any of three different modes. For example, 1024 x 768, 1280 x 768, and 1360 x 768 all have the same respective horizontal and vertical frequencies but represent different aspect ratios, 4 x 3, 15 x 9, and 16 x 9. By specifying the correct source detection mode, Bay Cat X can correctly interpret the signal and display the incoming image in the proper aspect ratio. The native aspect ratio of Bay Cat X is 16 x 9, and the default resolution is 1366 x 768.

HD Interlaced Content Motion

HD Interlaced Content Motion is a control you probably won't need to touch. Here is an explanation of it.

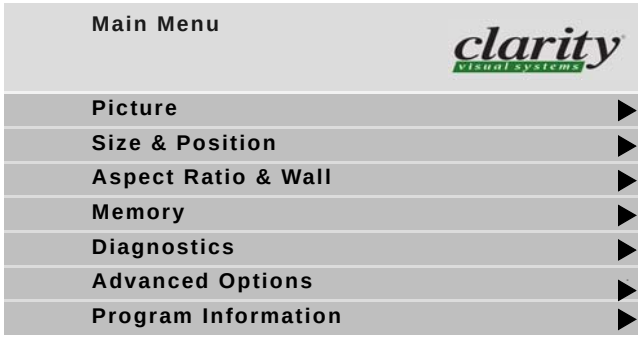
Some video signals, most notably those made for television, are what is known as “interlaced”. At one moment in time, only the even number lines of image are transmitted to the display. At the next moment (usually 1/30 or 1/25 of a second later) the odd numbered lines are transmitted. These two moments in time are known as fields. On CRT television sets, the even field persisted on the phosphor long enough so that by the time the odd field got there, our eyes put it all together into one picture. On digital displays such as Bobcat X, the electronics reassembles the odd and even fields together into one image to display every sixtieth (or fiftieth) of a second. If the image is static, such as with computer graphics, it is quite simple to put the fields back together. However, if the image is moving, it can cause problems because an image will have moved from the time the even lines arrive to when the odd lines arrive. A special piece of electronics known as a deinterlacer can analyze whether an image is moving or stationery and use mathematical algorithms to put the two image fields together in the best way. The Bobcat X has deinterlacer electronics to take care of standard definition television signals. However, it does not have deinterlacer circuitry for high definition television (1080i). The “HD Interlaced Content Motion” control gives the regular electronics some help in determining how to put together the two fields if you are viewing 1080i. Keeping this setting at “Normal” works best for most images. This will assume the image has no fast motion. The only time you will see a problem with this setting is if you are at native resolution (i.e. you are using a Baycat X or your scale mode is set to one to one on a Bobcat X). In that case, you may see something of a "zipper" effect on the edge of moving objects. To get rid of this, change the setting to "Rapid". However, if you do, you will probably see static images flickering slightly (known as “twittering”).

Another alternative to minimize both effects is to keep the setting at Normal and set overscan (in the Aspect Ratio menu) to 1%. This will turn on the scaler and minimize the zipper effect.For more information about the Miscellaneous options, see “Miscellaneous Settings” on page 97.

3.5.2 Backlight Control

Backlight control can automatically adjust the screen brightness as ambient light conditions change.

To get to the Backlight Control menu, go to Main Menu > Advanced Options > Backlight Settings.



Backlight control has two options: automatic and manual. In the manual mode, you adjust the backlight brightness to suit ambient conditions that are not likely to change.

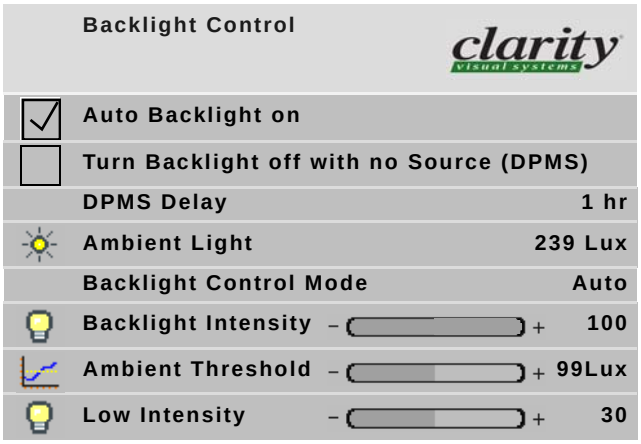
In the automatic mode, you let the ambient light determine the image brightness. This is useful when the Bay Cat X is in a location that sometimes has daylight which, of course, varies.

When there is more light in the area of the Bay Cat X, the screen will have to be brighter to see it clearly, and the backlight intensity will be 100%. When there is less ambient light, the screen can be darker and still be read easily. This is the low intensity setting which is a percentage (30% to 100%) of the maximum backlight brightness.

The look of the Backlight Control menu depends on whether it is in manual or auto mode.

Auto backlight control

Set the Backlight Control Mode to Auto.



1. Set the Ambient Threshold to a ambient light level at which the backlight switches to low intensity. Thus, if the ambient light drops, the backlight dims.
2. Set the Low Intensity at the level (in percent of maximum) you want the backlight to have when the ambient light falls below the threshold.

The Ambient Light at the top of the menu measures the ambient light in Lux. As long as this number is above the Ambient Threshold number, the backlight will be 100%.

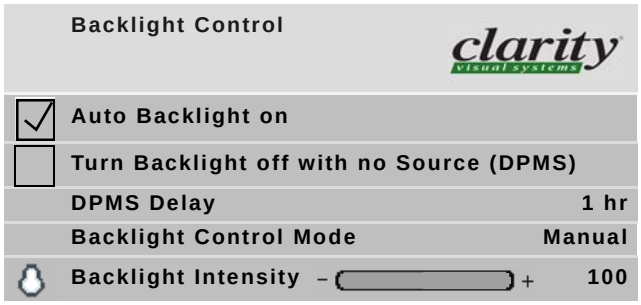
✎ Ambient Light is a relative value, and is pertinent only to the Bay Cat X. It is not an absolute value. You may get different ambient light values with a handheld light meter.

When the Ambient Light is below the Ambient Threshold, the backlight dims to the Low Intensity setting. Bay Cat X has a nominal time delay of three minutes before changing light levels. This time delay prevent flickering if the ambient light level is near the Ambient Threshold.

Manual backlight control

This mode is useful when the Bay Cat X is in a room with no outside windows and unchanging ambient light levels.

Set the Backlight Control Mode to Manual.



Adjust the Backlight Intensity to comfortable brightness. A lower brightness will increase lamp life.

CAUTION

Changing a failed backlight is a job for a qualified service technician. It is done at the factory, not in the field. Contact your Clarity dealer.

For more information about these settings, see “Backlight Control Menu Options” on page 99.

3.5.3 Serial Port Settings

This applies only if you use RS232 *commands to control the Bay Cat X.*

If you wish to control Bay Cat Xs remotely with RS232 commands from a computer, read this section. Otherwise, skip it.

Bay Cat Xs can be linked together for RS232 using straight-through 8-conductor cable with RJ-45 connectors. This is the common type of LAN connection cable, *not* null-modem, sometimes call Cat-5 cable.

RS232 is also used to upgrade the firmware of the unit.

Adapter from computer to RJ45

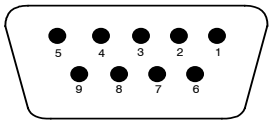
At the computer end, you will need an adapter to go from the computer's 9-pin serial output connector to a female RJ45 connector. Electronics stores have these ready-to-wire types. Buy one with a female 9-pin sub and connect the wires as shown.

Wiring the adapter

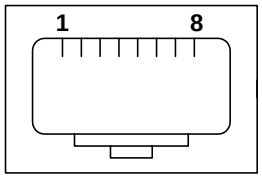
To go from 9-pin D-sub serial connector on the back of the ccomputer to an RJ45 connector, use a standard RJ45-to-9-pin adapter. Wire it internally as shown. The wiring shown for this adapter is correct for *straight-thru* cables. Straight-thru cables are wired 1-to-1, 2-to-2, etc.

Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2



female 9-pin

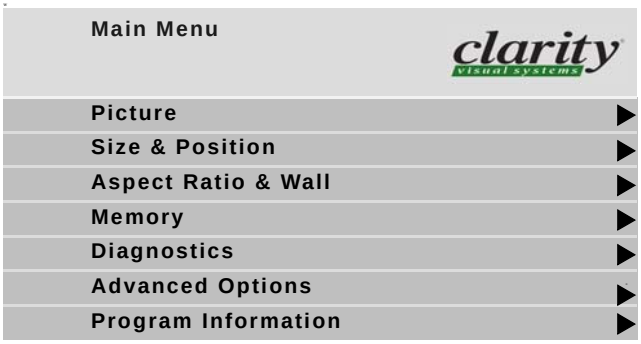


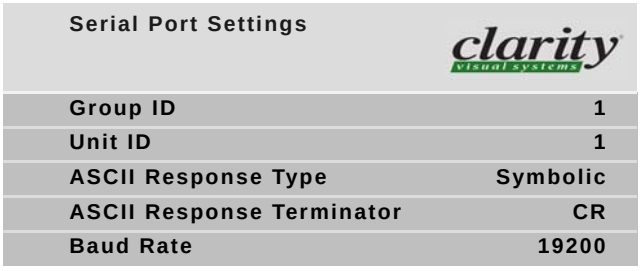
RJ45 looking into the socket.

Connect all the Bay Cat Xs together through their RS232 ports: from the computer to the first Bay Cat X RS232 IN; from the first Bay Cat X RS232 OUT to the next Bay Cat X RS232 IN, etc. It doesn't matter what order you string them together. Most RS232 signals easily travel up to 150 ft. (50 m) between Bay Cat Xs.

Setting Unit IDs

Each Bay Cat X in the RS232 series needs a unique ID so it can be individually addressed. To set unit IDs, go to Main Menu > Advanced Options > Serial Port Settings.





The ID is in two parts, Group ID and Unit ID. Each of these has a range of 0–9, A–Z. This range results in 1296 possible addresses.

You can group the Bay Cat Xs by using the same letter or number of the Group ID, such as 8. In this way you can address the group as 8*, and all the Bay Cat Xs in the string that have Group ID 8 and any Unit ID will execute the command. See the RS232 programming guide for Bay Cat X (part number 070-0108-02 or later) on www.ClarityVisual.com/login/.

1. Click the lower, **blue** button.
2. Use the name “tech” and password “help”.

Response type and terminator

The ASCII Response Type determines what type of data will be returned to the computer. For human readable text in a serial program choose Symbolic. For computer-read data you can use Numeric or Data Only.

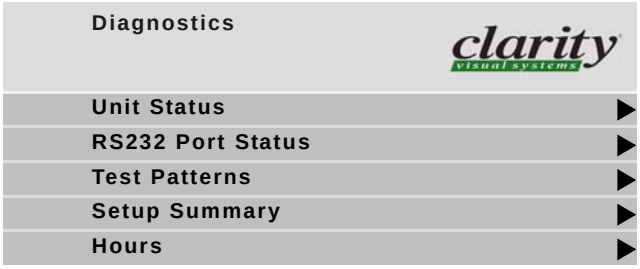
The ASCII Response Terminator will be determined by what your serial program wants to see at the end of every transmission from the Bay Cat X.

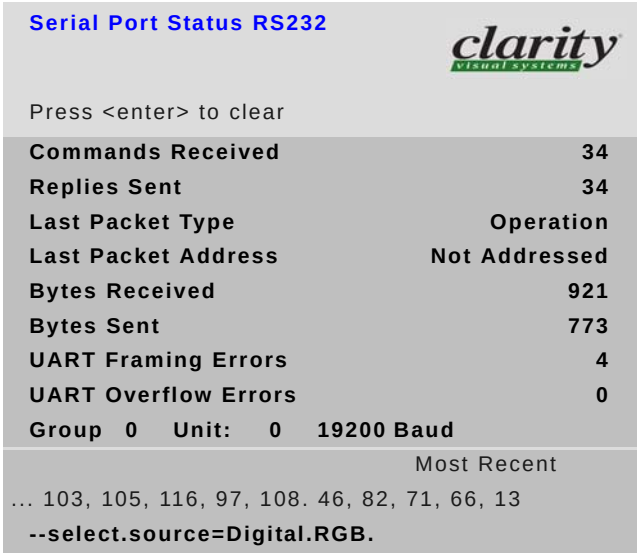
Baud Rate *must* be the same as that used by the controlling computer. The baud rate is *not* automatically set, as it is with modem communications. It must be manually set here and at the computer to match each other.

✎ For firmware upgrades, you don’t need to adjust the baud rate.

Diagnostics for RS232

To view RS232 port status, go to Main Menu > Diagnostics > RS232 Port Status.



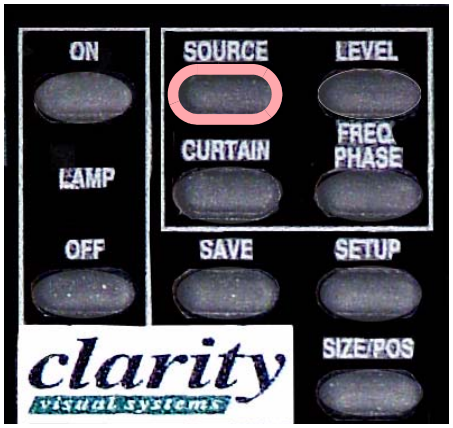


The Serial Port Status RS232 menu lists items that concern RS232. For more information, see “Serial Port Status Settings” on page 91.

3.6 Other Operations

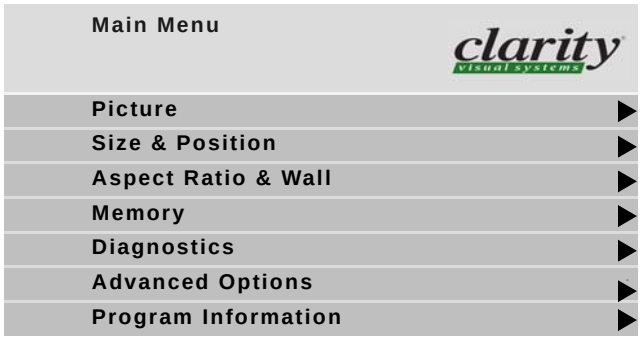
To change sources (input connectors)

Press the SOURCE button on the remote. Bay Cat X will look for the next connector that has a picture coming in, select that one, and auto adjust to it.

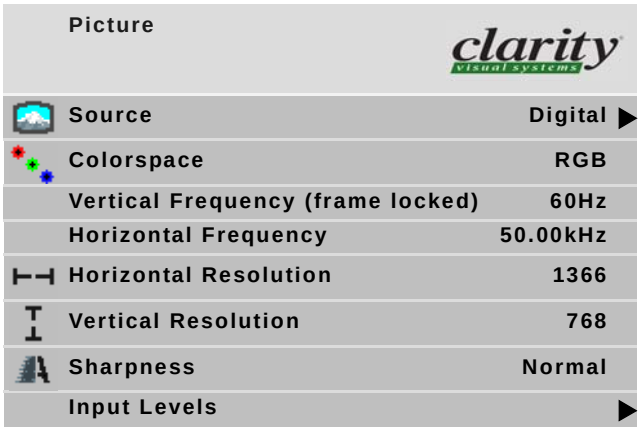


Or use the Source menu.

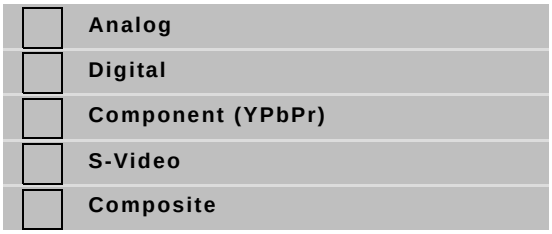
1. Press MENU on the remote.
   This opens the Main Menu.



2. With Picture highlighted, press ENTER
   This opens the Picture menu.

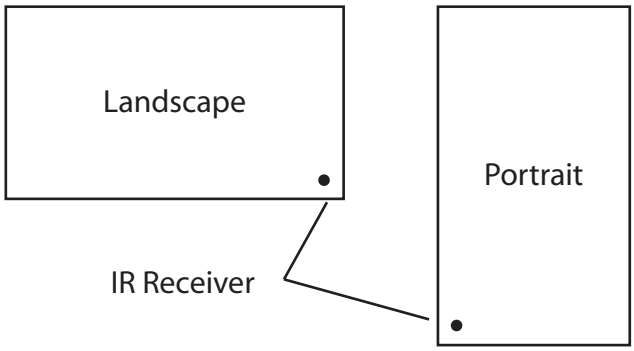


3. Select Source and press ENTER.
   The Source popup menu displays to the right of the Picture menu. (For space saving reasons, only the Source popup menu is shown below.)



To "disable" the remote control

To prevent unauthorized use and adjustment of the Bay Cat X either hide the remote or disable the remote control function with an RS232 command.



Input system caches

Settings (position, aspect ratio, brightness/contrast, color balance) are saved automatically 5 seconds after you make a change. The system caches the last ten settings. Whenever a picture is shown from a new source with the same resolution as a previous picture, the system recalls the previous settings rather than readjust everything. This happens regardless of the check marks in Auto Adjust Options. (See also “Auto Adjustment Options” on page 52.)

For example, suppose you display an NTSC picture in the composite input and set the Aspect Ratio and Position to your liking. Then you feed in a composite PAL picture and set a different Aspect Ratio and a different Position. If you then feed in a new NTSC picture, the previous NTSC picture’s settings for Aspect Ratio and Position will be used.

4 Maintenance

4.1 Cleaning the Screen

Clean the screen with a soft cloth or lint-free paper towel and a mild cleaning solution.

Cleaning products and how to use them

For protective glass and the LCD screen itself, a foam spray cleaner seems to work well. It's is sold under different names in different parts of the world. It is available from many janitor supply companies or building maintenance supply companies. Ask for

- **Claire** #50 glass cleaner, or
- **Sprayway** #50 glass cleaner

It is probably sold under a local name, but it all comes from one company. If you ask for either of the two names above (it is sold under both), you will get this cleaner under the local name.

This cleaner is good on glass (screens, lenses, mirrors) and acrylic (screens).

Spray it on the protective outer glass, but *not on the LCD itself*. For LCDs, spray it on the cloth, not the screen.

> ⚠ ***CAUTION***
> Prevent liquid from running down the screen and leaking into the interior of the Bay Cat X. Spray liquids on the cloth or towel, not directly on the LCD.

Wipe the mirror or screen gently with a lint-free cloth or lint-free paper (see Cloth below). Turn the cloth over to the dry side and continue wiping to take up the haze.

- **Glass Wax**™ is another good cleaner for mirrors and glass screens, but it does not work well on acrylic screens. It is a liquid in a can. You spread it on, let it dry, then wipe it off.
- **Windex**™ works well, too. Just don't spray it on the screen. (See Warning above.)

Cloth to use

White cotton cloth is better for cleaning than colored cloth. The dyes in some colored cloth tend to make it less absorbent.

> ⚠ ***CAUTION***
> If you use a cloth towel, be sure it is clean. If the towel was used to clean counter tops or anything else, it may contain grit which could scratch the protective glass.

Paper towels tend to leave lint. A better paper towel for cleaning is Scott® **Shop Towels**. These blue, lint free, paper towels are generally available at auto parts stores, home fix-it stores, and hardware stores.

5 Troubleshooting

5.1 Basic Bay Cat X Troubleshooting Steps

The Bay Cat X is very simple to troubleshoot because there is very little that can malfunction

Troubleshooting Checklist

Problem	Possible Cause	Possible Resolution	Result/Further Action
Screen is black	No power	Check power cord. Check power switch	
	Backlights not lit.	On the remote, press ON	
	Image being displayed is black.	On the remote, press SOURCE.	
Screen is a solid color, not black	Unit is displaying a test pattern	Turn off the test pattern. See “To turn off a Test Pattern” on page 70.	
	Unit is displaying a custom splash screen.	On the remote, press CURTAIN	
Picture is visible, but something is wrong with it	Image is rotated	Check your source. The Bay Cat X has no way of rotating images.	
	Picture has a black edge	Picture is not positioned correctly.	Use the Picture Position menu to adjust it (see “Position” on page 36)
	Picture has a black or colored edge	The source has a black edge	
		Wall Mode turned on and the picture is not the same aspect ratio as the wall. The edge color is determined by the Border Color in this menu	Check the Aspect Ratio and Wall menu (see “Aspect Ratio and Scale Mode” on page 32)
	Picture is too large or too small	This could be a zoom adjustment, particularly if you are using Clarity’s Big Picture™	Check the two Zoom menus and set them both so you see a zero on all four sides. Then check the two Viewport menus and see that they read zero on all four sides (see “Zoom and Position” on page 49)
	Picture is noisy Picture has horizontal or vertical streaks	Cable from source is poor quality or too long	Use a different cable
		Poorly adjusted Phase and/or Frequency	Only analog computer signals may need this adjusted. This can be done automatically by pressing SETUP on the remote.
	Colors are wrong	Input Levels must be adjusted	For analog computer sources, see “Adjusting Levels for Analog Computer Sources” on page 28. For digital computer sources, see “Adjusting Levels for Digital Computer Sources” on page 26

Troubleshooting Checklist (Continued)

Problem	Possible Cause	Possible Resolution	Result/Further Action
RS232 communication does not work	Wrong baud rate	Baud rates of the unit and the source computer must be the same.	Check the current baud rate of the Bay Cat X: MENU > ADVANCED OPTIONS > SERIAL PORT SETTINGS > BAUD RATE. It must be the same as the baud rate of the computer's serial port.The Bay Cat X's default value is 19200, but it might have been changed.
	Wrong com port	Check the Com Port setting of the computer. Usually #1 is correct	
	Incorrectly wired adapter	Check the adapter is wired according to instructions in "Connecting RS232 Communication" on page 16	
	Command is not properly formed	Use Serial Talk as the communications program. Download this from Clarity's website: Go to www.ClarityVisual.com Click on LOGIN in upper right banner Click on lower, blue LOGIN NOW button User name: tech Password: help Find Bay Cat X tech support. Open or download "Bay Cat X RS232 Programming Guide." Under Utility Software download Serial Talk, Using Serial Talk and Clarity Commands Set.	
	Commands are not getting to the electronics module	Contact Clarity Customer Service.	
Bay Cat X doesn't respond to remote control	IR response disabled via RS232	Re-enable IR response using RS232 commands	
	Remote batteries are dead or improperly installed	Replace batteries	
	Remote was not aimed at the IR receiver	The IR receiver is in the lower right corner (in landscape mode; in portrait mode, it is in the lower left corner) of the screen bezel behind a small hole	
	Something is blocking the IR receiver		

5.2 Diagnostics, Test Patterns

These are used for testing and troubleshooting

Possibly the most important test pattern is None. This is the one that allows the source picture to show on the screen. All other patterns block the program picture.

All test patterns are full screen. Aspect Ratio has no effect.

To turn on a Test Pattern

1. Press MONITOR then press ENTER.

2. Select the pattern with the arrow keys. Move between columns using left-right arrow keys; up-down arrows will eventually get you to the next column.
3. Press ENTER to display the highlighted test pattern.

✎ When a Test Pattern is shown, the program picture is blocked. To see the source picture, set Test Pattern to None.

To turn off a Test Pattern

1. Press MONITOR then press ENTER.
2. Select None with the up-down arrows.
3. Press ENTER.

White, **Red**, **Green**, **Blue**, **Black**, and **Gray** all show full screens of the color. Gray is 50%.

4 x 4 Checkerboard is a pattern of 16 rectangles alternating black and white. This pattern is used in the factory.

The **Gray**, **Red**, **Green**, and **Blue Scales** show 32- or 64-step scales. You should be able to see all the steps clearly.

Grid shows a white background with a 4 x 4 grid of magenta lines surrounded by a 3-pixel-wide magenta border. This is useful for aligning an image, especially in rear projection applications.

Color Bars displays a pattern of the three primary colors and the primary combinations along with black and white. This is similar to, but not the same as, color bars in the television and video field. These bars are 100% saturated.

Uniformity shows some marks on the screen where factory measurements are made for color and brightness uniformity testing.

Colors shows a rainbow of colors and a gray scale at several levels of saturation for testing uniformity.

Unit Status

The Unit Status menu displays information about the unit.

The first two lines display the product name and screen resolution of the unit, along with the firmware revision level. Other information is described below.

Asset Tag is an optional user settable field which is set via the RS-232 port. This could be a serial number, name or any other piece of information desired

Backlight Status shows OK if the electronics module detects that both banks of backlights are functioning normally. Shows Failed if one or both of the backlight banks is not drawing the correct amount of current

Internal Temperature is the current internal temperature at one point on the backplane of the LCD panel. For more information, see “Internal Temperature” on page 85.

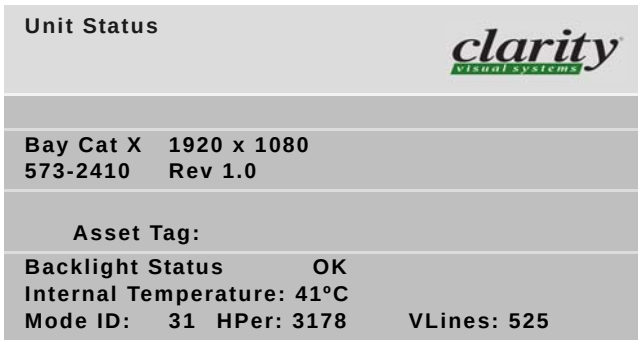
Mode ID is the index into the internal mode table found for the incoming signal. This is used in diagnosis of mode detection problems

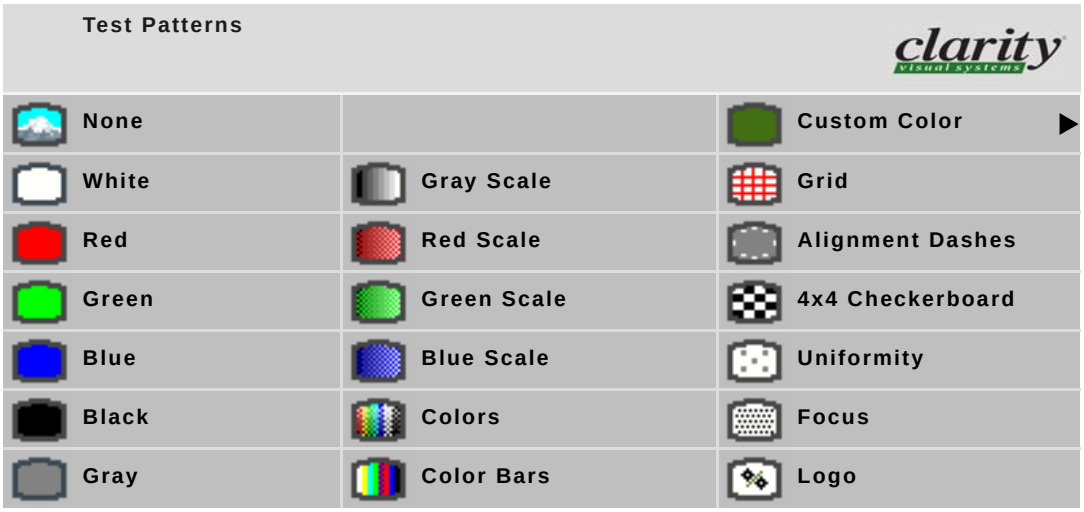
HPer is the measured horizontal period of the incoming signal. This is used in diagnosis of mode detection problems

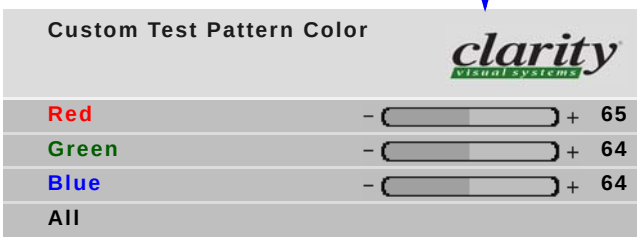
VLines is the number of horizontal lines detected per vertical period. This is used in diagnosis of mode detection problems

Custom Test Patterns

Using the Custom Test Pattern Color menu (Test Patterns > Custom Color), you can create custom solid color test patterns.


Unit Status
clarity
visual systems
Bay Cat X 1920 x 1080
573-2410 Rev 1.0
Asset Tag:
Backlight Status OK
Internal Temperature: 41°C
Mode ID: 31 HPer: 3178 VLines: 525


Test Patterns
clarity
visual systems
None
White
Red
Green
Blue
Black
Gray
Gray Scale
Red Scale
Green Scale
Blue Scale
Colors
Color Bars
Custom Color
Grid
Alignment Dashes
4x4 Checkerboard
Uniformity
Focus
Logo

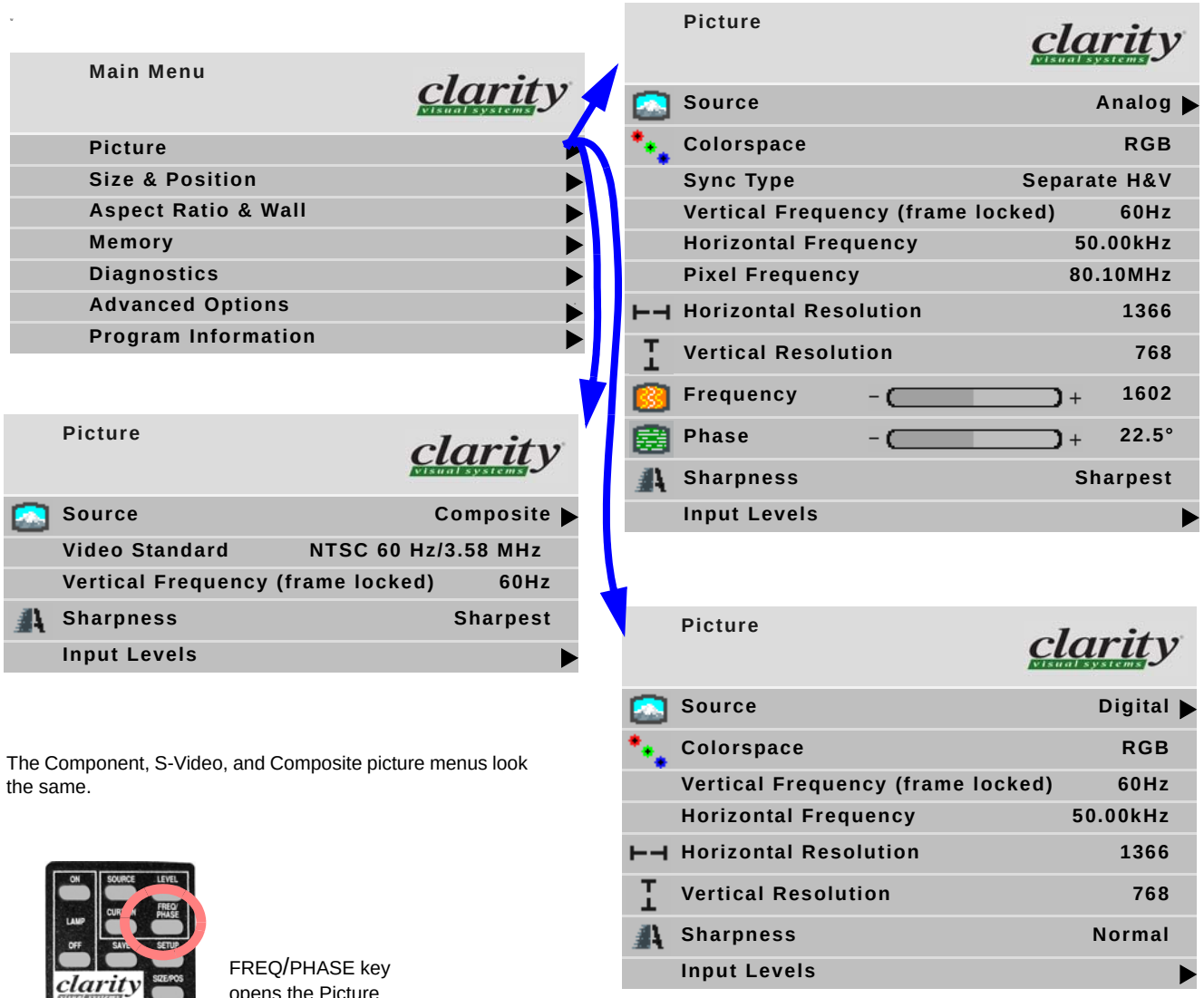

Custom Test Pattern Color
clarity
visual systems
Red – + 65
Green – + 64
Blue – + 64
All

6 Reference

6.1 Menu Structures

The gray text in menus is for information only. You cannot move the yellow selector to these lines. Some menus change their appearance depending on the source selected or other factors.

Picture



The Component, S-Video, and Composite picture menus look the same.

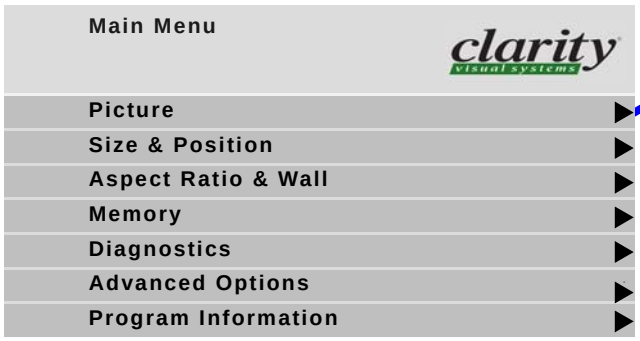
FREQ/PHASE key opens the Picture menu directly.

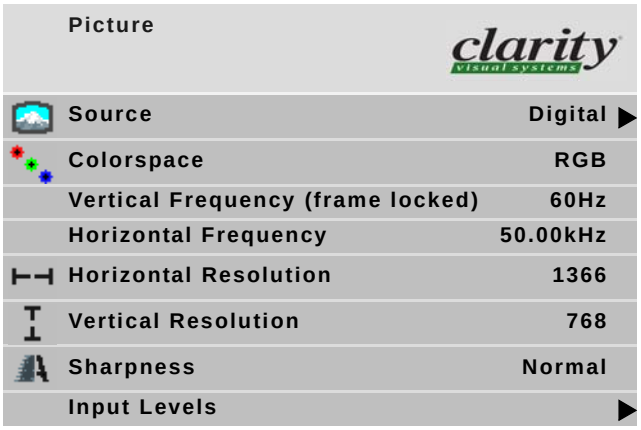
Source chooses the source (the input connector you want to use) and adjusts the picture. Use the + \ – keys to select the source. Digital pictures rarely need adjusting.
Colorspace is either RGB or YPbPr
Horizontal Resolution and **Vertical Resolution** can be set to match the source computer video settings, see “Computer sources” on page 23.
Frequency and **Phase**, see “Selecting the Picture” on page 23.
Sharpness, see “Adjusting Sharpness” on page 35

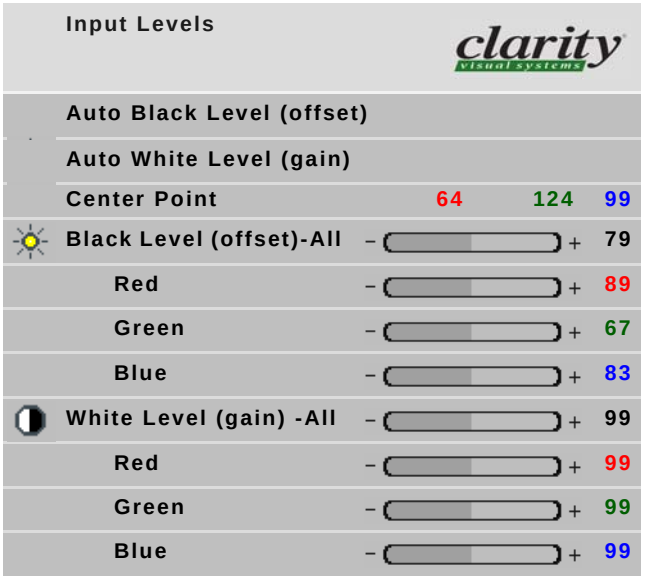
Picture Menu Options

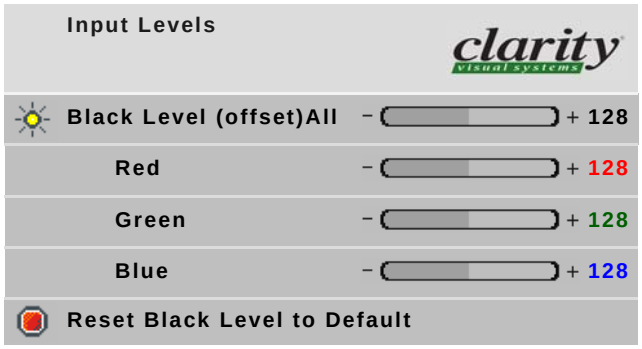
Menu Item	Description	Setting(s)
Source	The source of the video signal.	Analog, DVI, SDI, Component, Composite, S-Video
Colorspace	The range of colors for the type of input. Generally computer inputs use RGB and video sources use YPbPr.	RGB, YPbPr
Video Standard	The three major signal standards have different timing, horizontal and vertical frequency requirements. This is shown only on video sources (Composite, S-Video, Component)	NTSC, PAL, SECAM
Sync Type	Determines which portion of the signal that carries the synchronization timing	Separate H&V, composite, sync on green
Vertical Frequency	The number of vertical fields per second (in Hz)	
Horizontal Frequency	The number of horizontal lines per second (in kilohertz)	
Pixel Frequency	The number of pixels per second (in megahertz)	
Horizontal Resolution	The number of vertical lines or pixels from one side of an image to the other. The pixel width of an image.	The resolution of an analog signal is determined from an internal mode table and the measured horizontal and vertical frequency of the signal. If the incoming signal does not conform to the one found in this mode table, the resolution can be adjusted. This should not normally be necessary.
Vertical Resolution	The number of vertical lines or pixels from the top to the bottom of an image. The pixel height of an image. NTSC and PAL (SDTV) is 480 lines, HDTV is 720 or 1080.	
Frequency	The total number of pixels in a horizontal line, including those not show on the screen.	The Range depends on the input signal. A default frequency is obtained from an internal mode table depending on the horizontal and vertical frequency of the signal. The frequency can then be adjusted if the signal does not match the one in the internal table. Automatic frequency adjustment will also change this setting.
Phase	The position of the pixel clock relative to the start of the line.	0 – 360 degrees in 32 steps.
Sharpness	A setting for how sharp image edges are on an image that is scaled to fit the screen. Primarily used for low-quality video images. High-quality video and digital image will not benefit from this setting.	softest, soft, normal, sharp, sharpest

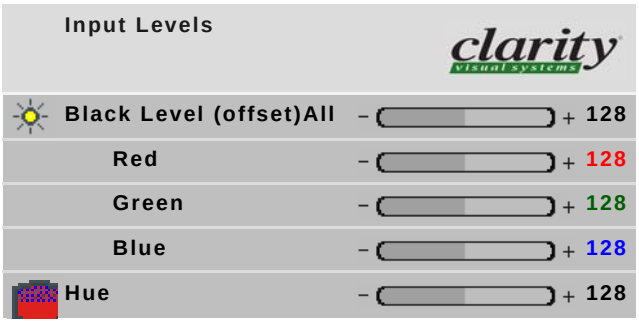
Picture > Input Levels









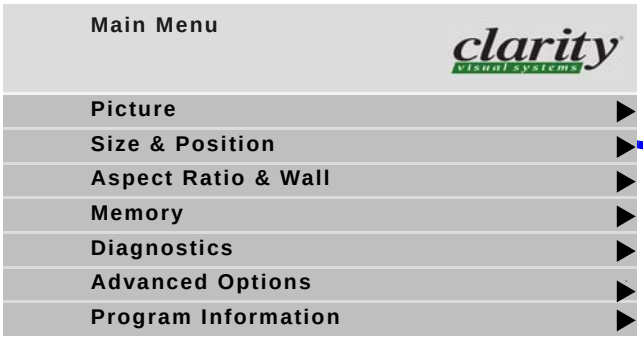


LEVEL key opens the Input Levels menu directly

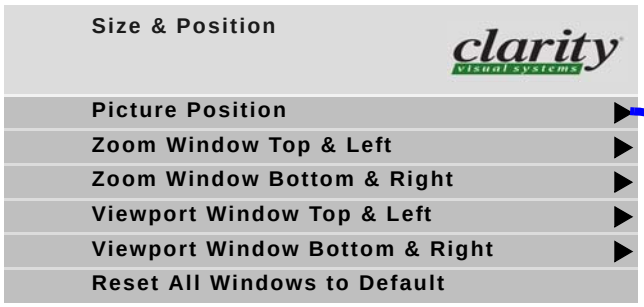
Input Levels Menu Options

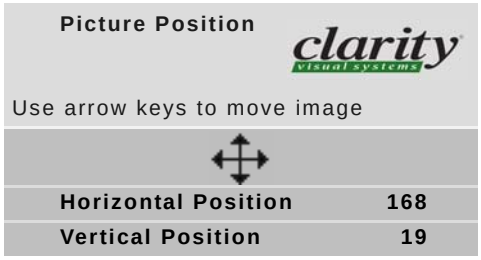
Menu Item	Description
Center Point	The intensity value for each of the red, green, and blue color components for the point at the center of the screen. Used while adjusting black level and white level
Black Level (offset)	An adjustment which allows you to compensate for differences in the voltage levels of signals by adding an offset to the signal. This adjustment is sometimes known as brightness or offset. The black level adjustment adjusts all three color channels at the same time. Black level is only for analog RGB and digital signals
Red, Green, Blue	Individual adjustments for setting the black level for each of the three colors
White Level (gain)	An adjustment which allows you compensate for different amplitudes of signals by applying a gain to the signal. This adjustment is sometimes known as contrast or gain. The white level adjustment adjusts all three color channels at the same time. White level is only for analog RGB signals
Red, Green, Blue	Individual adjustments for setting the white level for each of the three colors
Brightness	Similar to black level, but used for composite, S-Video, Component and YPbPr signals. There is only a single brightness adjustment for these types of signals
Contrast	Similar to white level, but used for composite, S-Video, Component and YPbPr signals. There is only a single contrast adjustment for these types of signals
Saturation	An adjustment to the intensity of the colors of the signal. Used for Composite, S-Video, Component and YPbPr signals
Hue	An adjustment to the red/green balance of color in the signal. Used for Composite, S-Video, Component and YPbPr signals

Size and Position



SIZE/POS key opens the Picture Position menu directly.

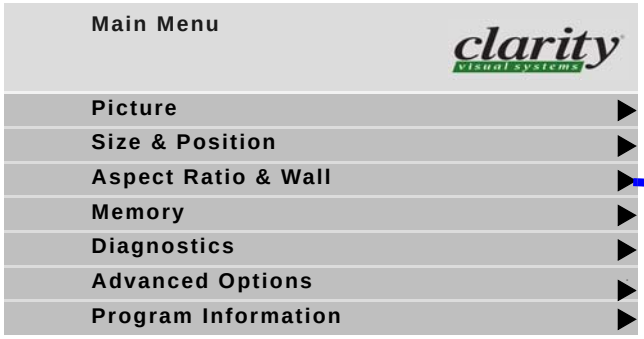




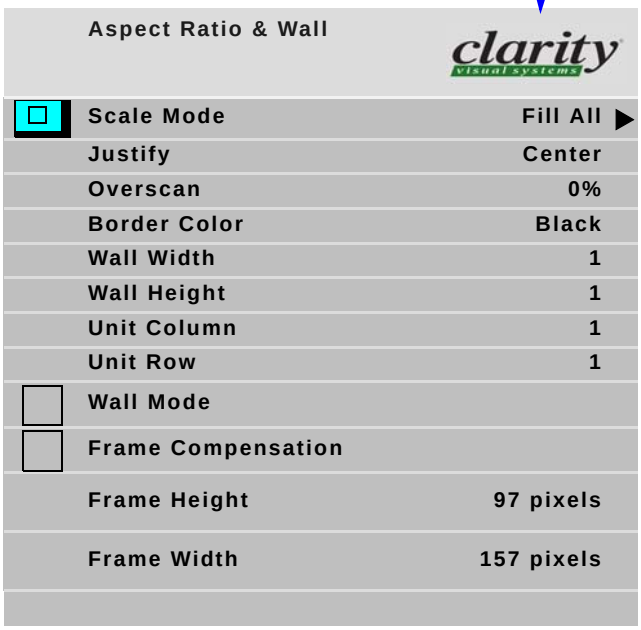
Size & Position Menu Options

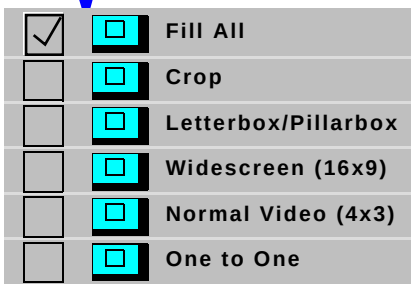
Menu Item	Description	Setting(s)
Picture Position	The position of the image relative to the sync signal	Default value and range depends on the incoming signal Picture position is automatically adjusted during setup based on where the edge of the image is found (see auto setup options)
Zoom Window Top & Left	For information on using Zoom and Viewport go to Clarity's website and download the separate document on Viewport	
Zoom Window Bottom & Right		
Viewport Window Top & Left		
Viewport Window Bottom & Right		
Reset All Windows to Default		

Aspect Ratio and Wall



WALL key opens the Aspect Ratio & Wall menu directly.

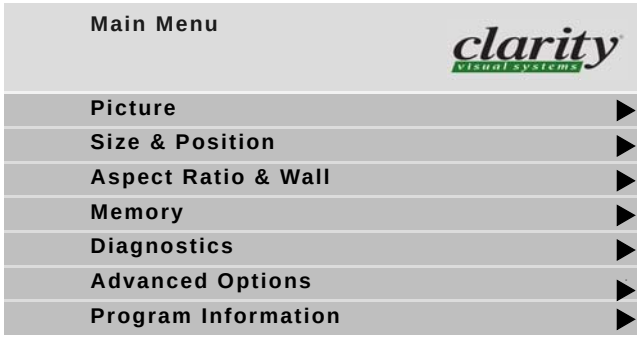




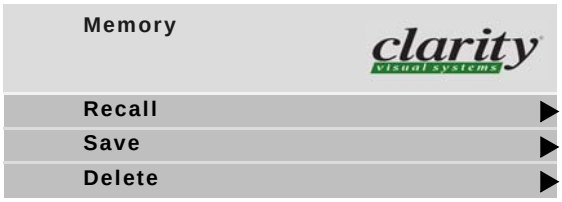
Aspect Ratio and Wall Menu Options

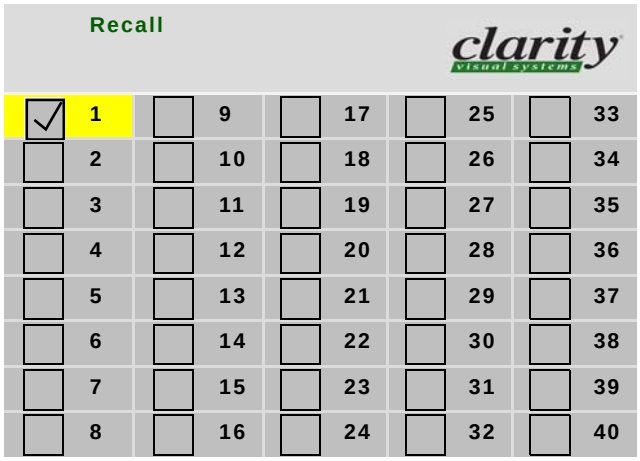
Menu Item	Description	Setting(s)
Scale Mode	Fill All makes the picture fit top-to-bottom and left-to-right regardless of how this stretches or compresses the picture. Letterbox/Pillarbox expands the picture until the first edges (top-bottom or left-right) touch the border of the display, and then fills in the other sides with a solid color. Crop expands the picture until the second edges touch the border and let the other edges of the picture fall outside the display and get cropped. Widescreen (16x9) forces the aspect ratio to 16 x 9 (1.77), the standard for many DVD movies. This will distort any picture other than 16X9 aspect ratio pictures. Normal Video (4x3) forces a 4 x 3 (1.33) aspect ratio, the ratio of standard television. Normal Video is used to display YPbPr video on the analog input port. One to One maintains the original size and aspect ratio of the picture. This may leave blank areas on all four sides. For more information, see “Aspect Ratio and Scale Mode” on page 32.	
Justify	Justify determines which portion of a cropped picture to be cropped. Center crops equal portions from the top and bottom (or sides). Bottom/Right crops off just the top (or left). Top/Left crops off just the bottom (or right). For letterboxed pictures, Justify determines the position of the image on the screen. Center centers the image, Bottom/Right puts it at the right of the screen (or bottom). Top/Left puts it at the top of the screen.	Top/Left, Center, Bottom/Right
Overscan	Zooms the image a small amount so that the outer edge is chopped off all around. Conventional television sets overscan anywhere from 5 to 20%. A television picture shown with no overscan may have objectionable lines or other extraneous noise on the outer edges of the picture. By agreement among the broadcast industry, for standard definition television, no titles or text will be chopped off with as much as 20% overscan. No important action will be chopped off with as much as 10% overscan.	0% to +20% Default 3% when image is Composite, S-Video, Component or YPbPr 0% for all others
Border Color	The color of the border when one of the scale mode settings fills the sides or top and bottom with a color.	Black, White, Red, Green, Blue, Dark Blue, Dark Green, Dark Red
Wall Width	When Wall Mode is checked, Wall Width is the number of units across the array. For example, for a 4 x 3 array of units, Wall Width would be set to 4.	1-32
Wall Height	When Wall Mode is checked, Wall Height is the number of units top to bottom in the array. For example, for a 4 x 3 array of units, Wall Height would be set to 3.	1-32
Unit Column	When Wall Mode is checked, Unit Column is the column in which the unit is located. For example, for a 4 x 3 array of units, and this unit is the top right corner,.Unit Column would be set to 4.	1-32
Unit Row	When Wall Mode is checked, Unit Row is the row in which the unit is located. For example, for a 4 x 3 array of units, and this unit is the top right corner, Unit Row would be set to 1.	1-32
Wall Mode	Enables/disables Wall Mode	Enable, Disable
Frame Compensation	When Bay Cat Xs are used in an array, to ensure that images containing diagonal lines remain correctly diagonal, turn on Frame Compensation.	
Frame Height	The number of pixels to be hidden at the top and bottom of the image. Default value of 97 is the width of the Bay Cat X top and bottom mullions	0-100
Frame Width	The number of pixels to be hidden at the left and right of the image. Default value of 157 is the width of the Bay Cat X left and right mullions	0-500

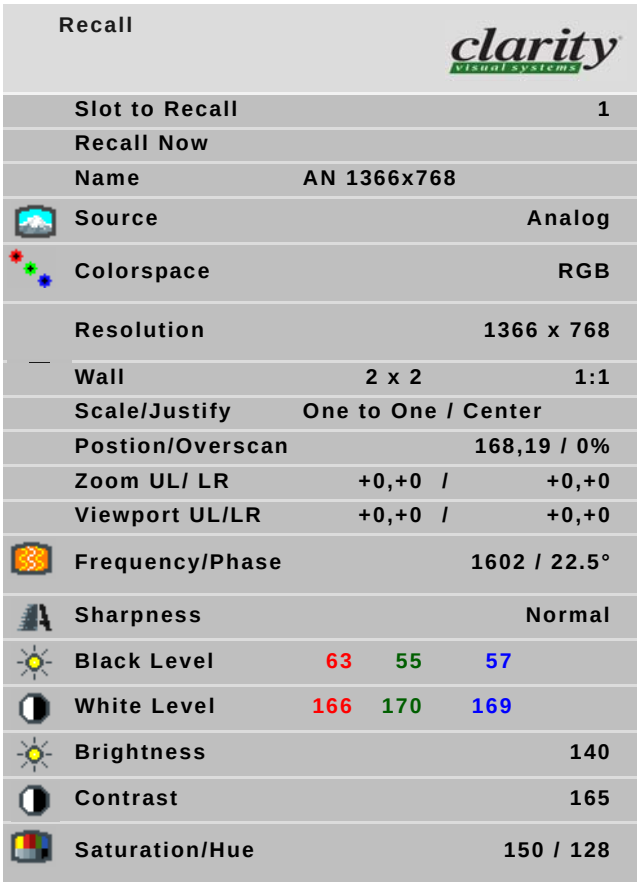
Memory



The submenus for Recall, Save, and Delete are very similar.





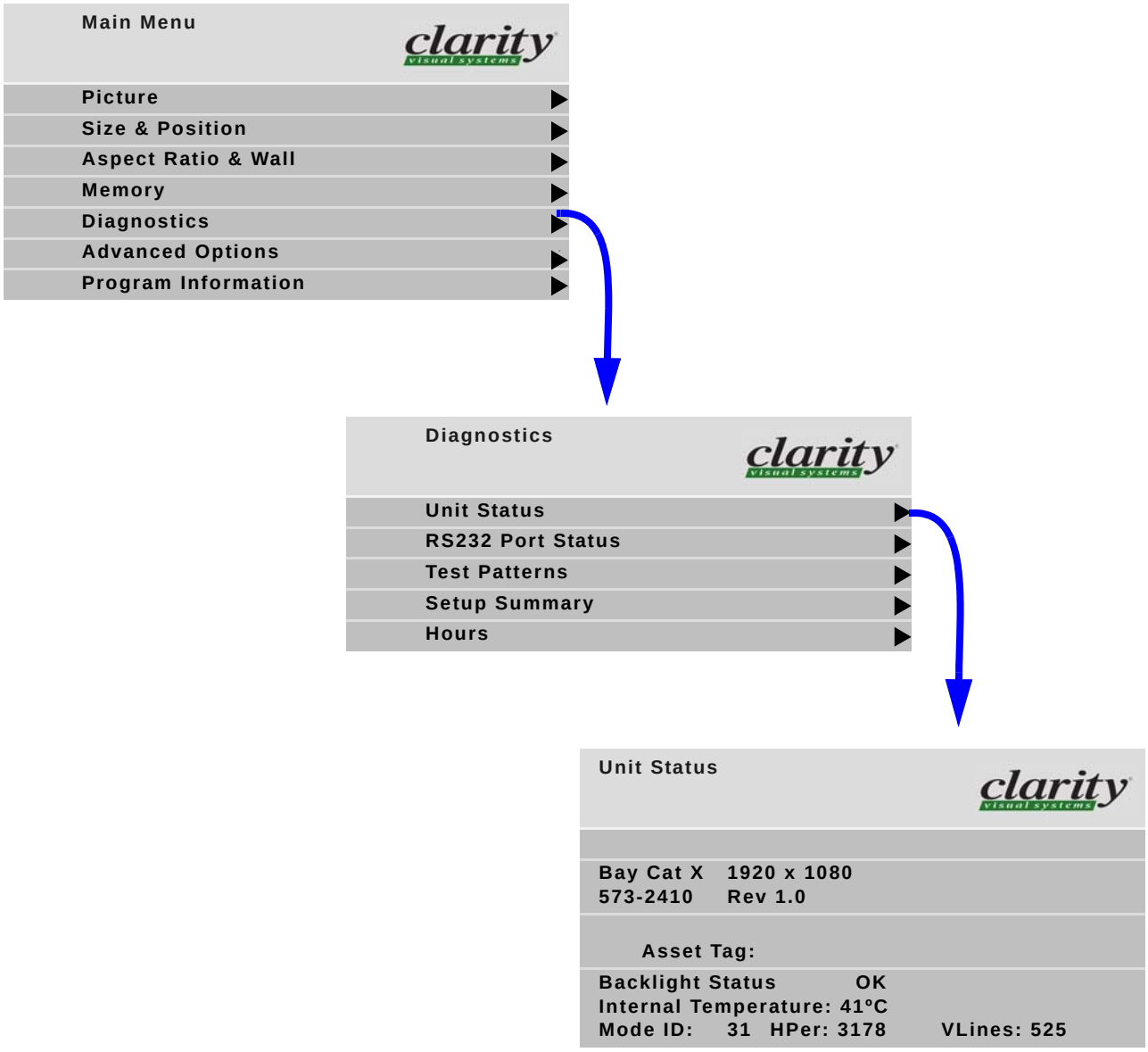


Pressing the SAVE key opens the Recall menu. A second press opens the Save menu.

Memory Options and Settings

Menu Option/Setting	Description	Settings/Values
Name	The name of the saved setting	A default name is created by the unit, which may be changed by the user
Source	The type of input	Analog, Digital, Component (YPbPr), S-Video, or Composite
Colorspace	The colorspace of the input.	RGB, YPbPr
Resolution	The image resolution	800 x 600 1024 x 768 1280 x 1024 1280 x 768 1600 x 1200 1920 x 1080 …and others
Wall	When Wall is enabled, the first set of numbers are the size of the array and the second set are the unit's position in the array, column first, then row.	
Scale/Justify	The value for Scale Mode value (from Main > Aspect Ratio & Wall > Scale Mode) and the value for Justify (from Main > Aspect Ratio & Wall > Justify) for this memory slot	
Position/Overscan	The position and amount of overscan of the image on the screen	
Zoom UL/LR	The zoom adjustment settings (see "Size and Position" on page 78)	-100 to +100
Viewport UL/LR	The viewport adjustment settings (see "Size and Position" on page 78)	-100 to +100
Frequency/Phase	The frequency and phase settings (see "Picture" on page 74)	
Sharpness	The sharpness setting (see "Picture" on page 74)	
Black Level White Level	The values for red, green, and blue that define the Black and White levels for this setting. (For Analog RGB signals only)	0-255
Brightness	The brightness of the image (for Composite, S-Video, Component or YPbPr signals only)	0-255
Contrast	The contrast (ratio between white and black areas) of the image (for Composite, S-Video, Component or YPbPr signals only)	0-255
Saturation/Hue	The saturation and hue settings (for Composite, S-Video, Component or YPbPr signals only)	

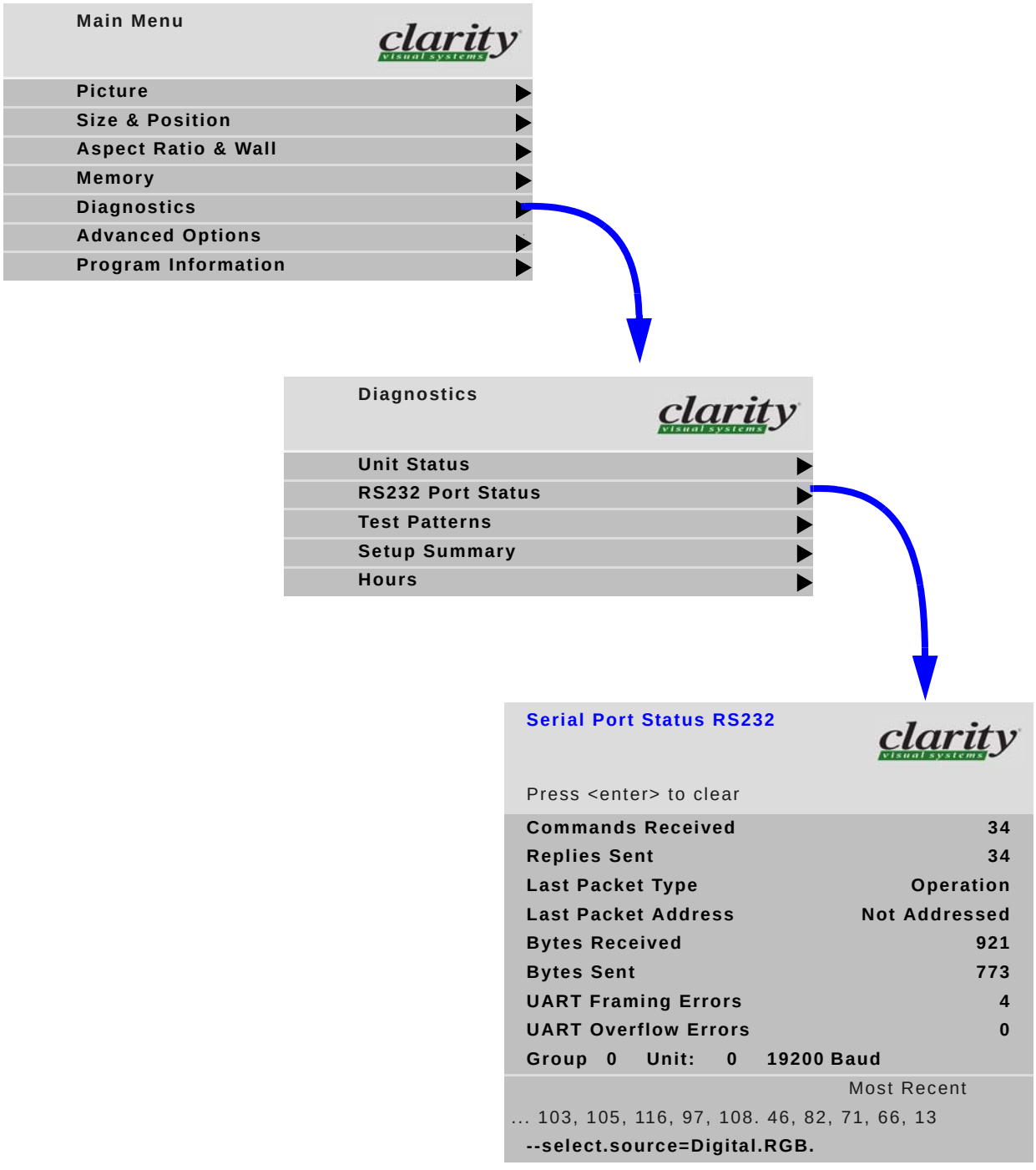
Diagnostics > Unit Status



Unit Status Settings

Setting	Description
Asset Tag	An optional user settable field which is set via the RS-232 port. This could be a serial number, name or any other piece of information desired
Backlight Status	Shows OK if the electronics module detects that both banks of backlights are functioning normally. Shows Failed if one or both of the backlight banks is not drawing the correct amount of current
Internal Temperature	The current internal temperature at one point on the electronic module. This is not necessarily the highest nor the lowest temperature point of the unit, nor is it an indicator of ambient temperatures. If thermal guidelines (see “Normal Use Thermal Guidelines” on page 116) are exceeded and additional ventilation or cooling has been implemented, this temperature may be used as a datapoint to determine if the temperature of the unit is being affected.
Mode ID	The index into the internal mode table found for the incoming signal. This is used in diagnosis of mode detection problems
HPer	The measured horizontal period of the incoming signal. This is used in diagnosis of mode detection problems
VLines	The number of horizontal lines detected per vertical period. This is used in diagnosis of mode detection problems

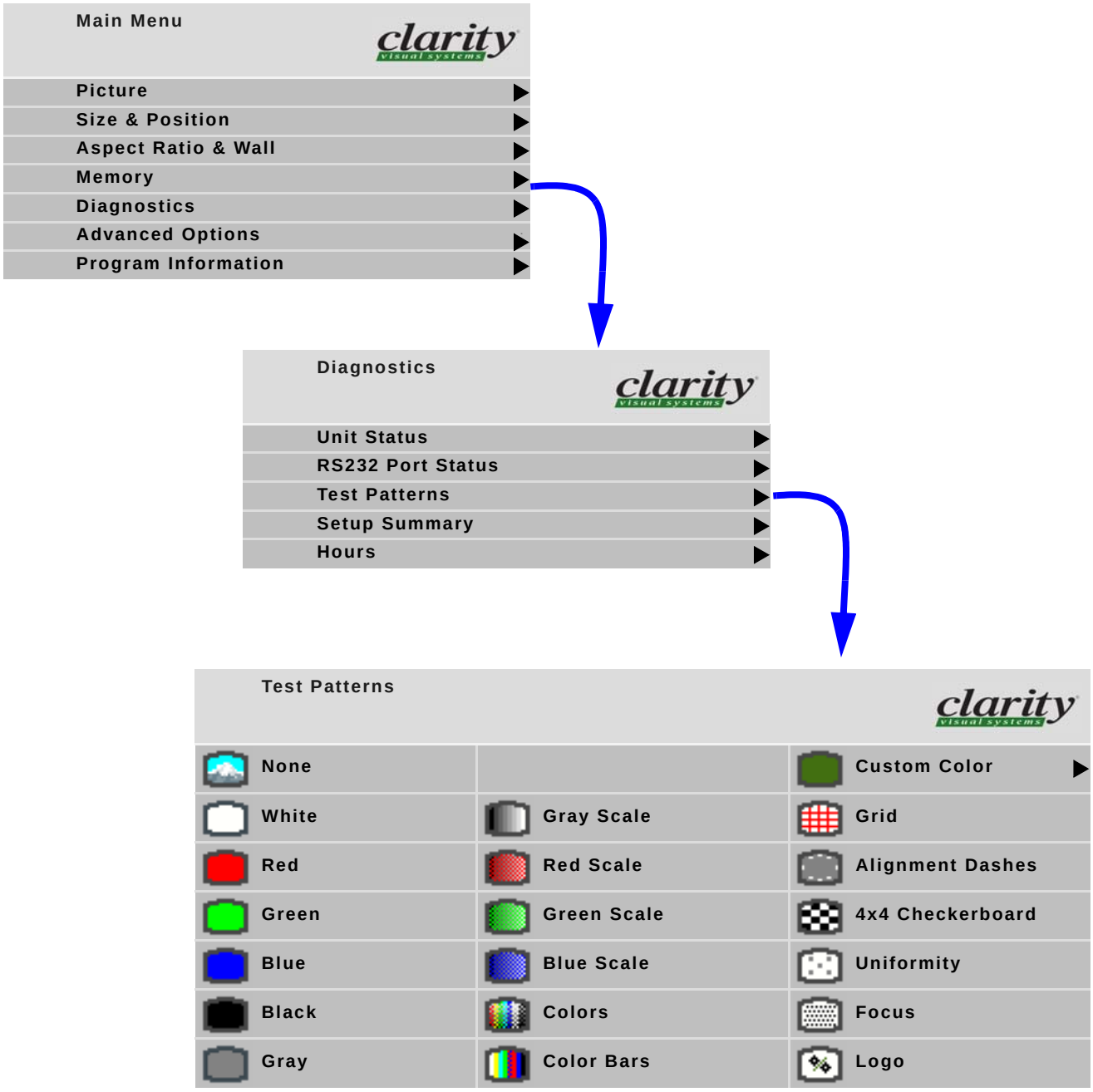
Diagnostics > RS232 Port Status



Serial Port Status Settings

Setting	Description
Commands Received	The total number of properly formed messages received by this Bobcat X, whether they were addressed to it or not
Replies Sent	Counts the number of replies sent. It counts up to 32767 and then resets to 0
Last Packet Type	The kind of packet that was last received. When using the ASCII RS-232 protocol, the possible types are operation, event (for KY packets) and OEM (for ST packets) but other types are possible when using the binary protocol (for internal and diagnostic use only)
Last Packet Address	This Unit Alone – The last packet was addressed to this unit and no others. It will be acted on and answered Global -- The last packet was addressed to this unit and also to others. It will be acted on but not answered. Not This Unit – The last packet was addressed to a unit or units other than this one. It will not be acted on or answered Not Addressed – The last packet was received with address -- or via the binary non addressed protocol. It will be acted on and answered. If multiple units are connected on the RS-232 chain, the answer may not be properly received, since all units on the line will be “talking” at once.
Bytes Received Bytes Sent	Counts the number of bytes received and sent by the unit, even bytes that are not part of properly formed messages will be shown here.
UART Framing Error	The number of bytes that were received by the unit which were not properly formed according to RS-232 protocol. A high number of framing errors often indicates an error in the baud rate.
UART Overflow Error	The number of characters that were lost due to the units inability to keep up with the incoming data stream. This should not happen if the protocol is followed.
Group, Unit	Group is the Group ID for the unit. Unit is the Unit ID for the unit.
Baud	The Baud rate for the unit.
For more information about RS232 settings, Go to www.ClarityVisual.com. In the upper line of the home page, click on LOGIN. Click on the *lower* blue LOGIN NOW button for specifiers and end-users. Your login name is “tech”. Your login password is “help”. Click on the Bay Cat X section. Click on the RS232 instructions. Be sure you get the instructions for Bay Cat X RS232, document number 070-0146-xx.	

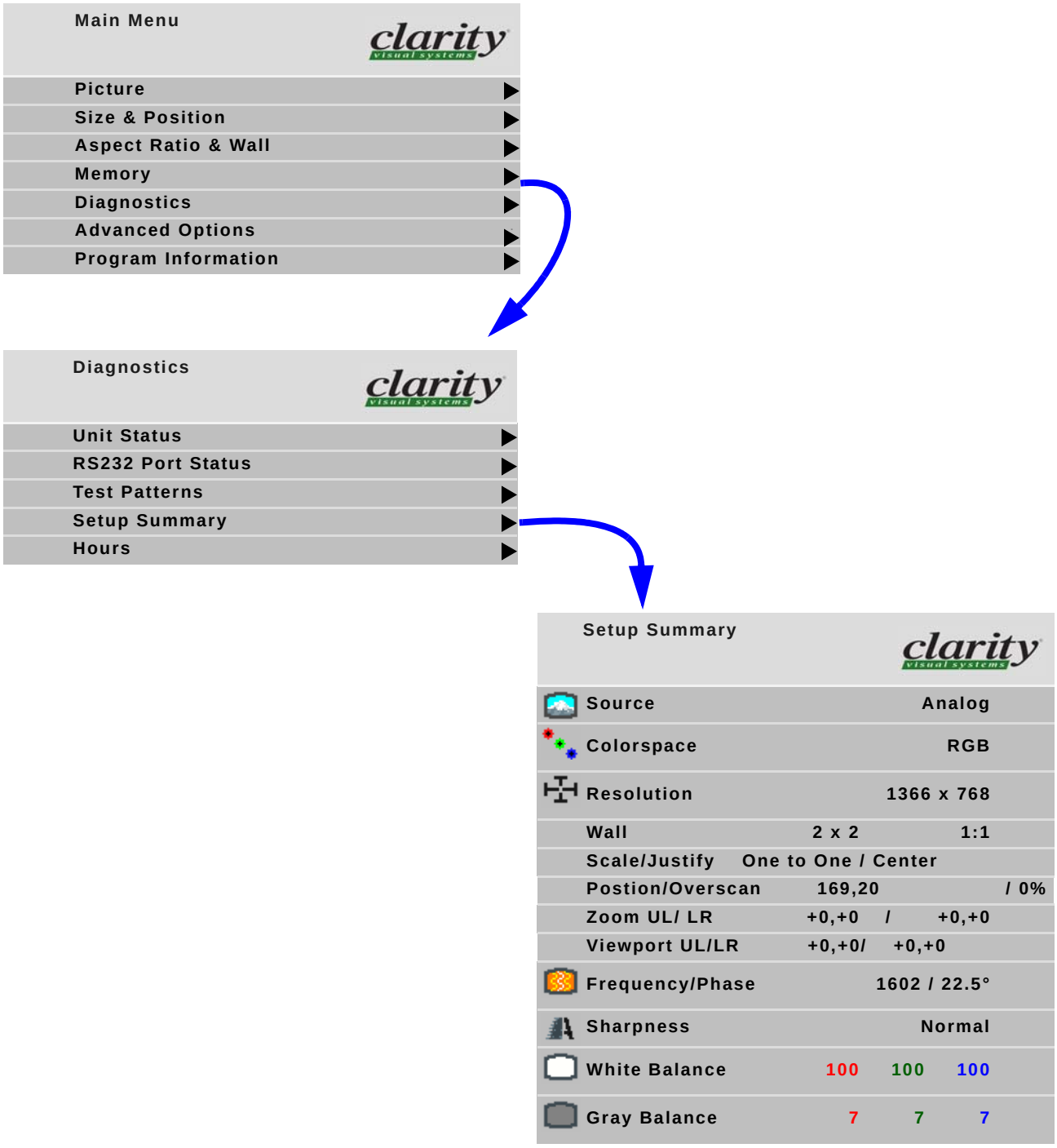
Diagnostics > Test Patterns



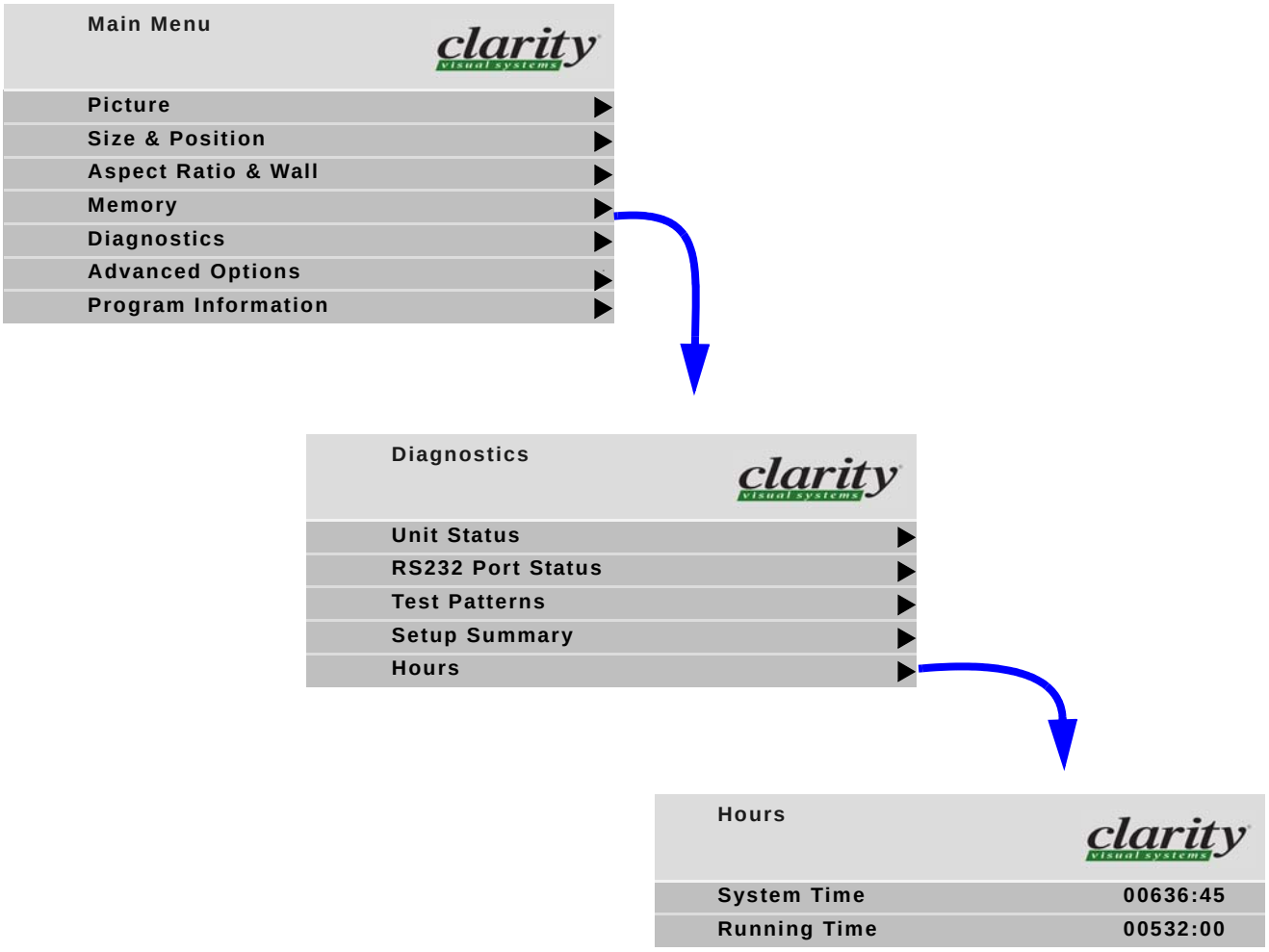
Test Patterns

Test Pattern	Notes
None	Displays the source
Red Green Blue Black Grey	Displays a full screen of the selected color. Gray displays a 50% gray pattern, which is useful for detecting if TIR has occurred. For more information, see “Optimizing Your Clarity Display” on page 116.
Gray Scale Red Scale Green Scale Blue Scale	These show 32- or 64-step scales. You should be able to see all the steps clearly.
Colors	Displays a rainbow of colors and a gray scale at several levels of saturation for testing uniformity.
Color Bars	Displays a pattern of the three primary colors and the primary combinations along with black and white. This is similar to, but not the same as, color bars in the television and video field. These bars are 100% saturated.
Grid	Displays a large grid pattern with illuminated outer edge, and is useful for aligning an image, especially in rear projection applications
Alignment Dashes	Displays a set of six-pixel staggered alignment bars. Used to ensure the same number of pixels are hidden on all sides in rear projection systems. Not useful in direct view applications
4x4 Checkerboard	Used in the factory to measure the contrast of a system
Uniformity	Used in the factory to measure brightness of the rear projection lamps in 13 different locations on the screen
Focus	Used in the factory to adjust the focus of rear projection systems
Logo	Displays the default factory logo or a custom captured logo.

Diagnostics > Setup Summary

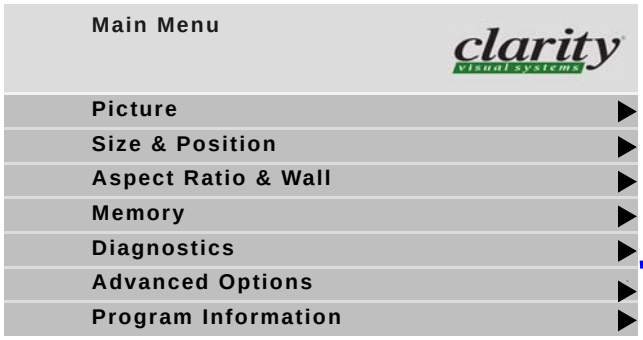


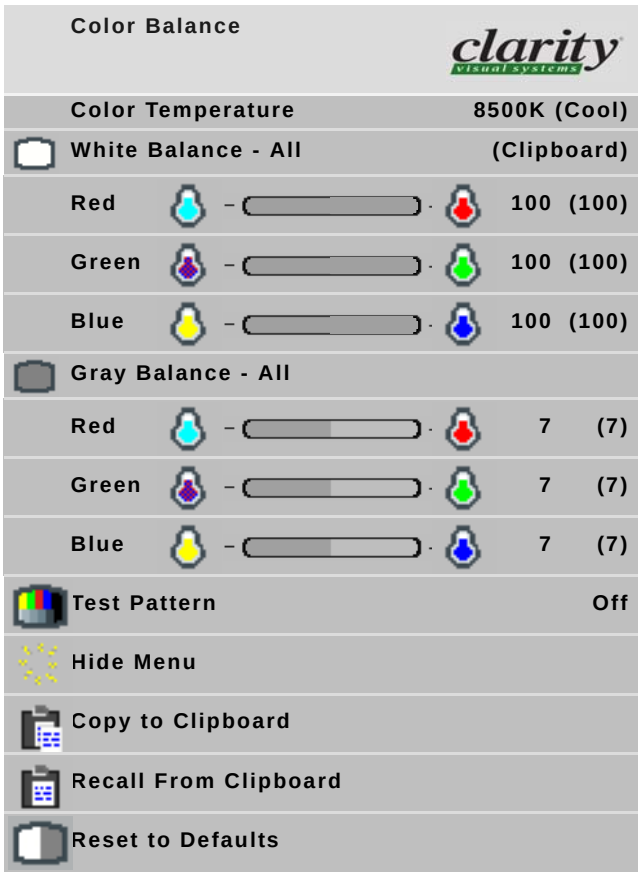
Diagnostics > Setup Summary

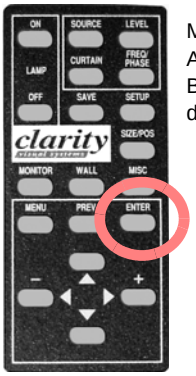


System Time is the number of hours the electronics module has received power.
Running Time is the total number of hours the backlights have been on.

Advanced Options > Color Balance







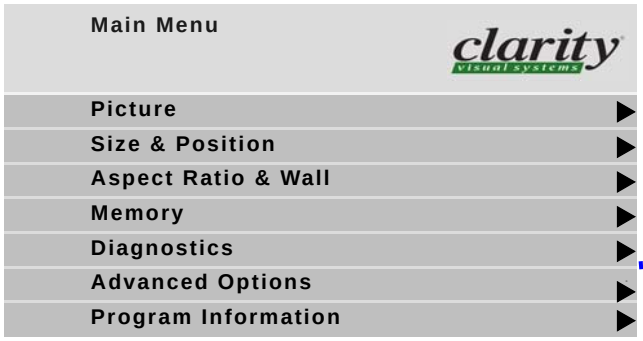
MISC opens the Advanced Color Balance menu directly.

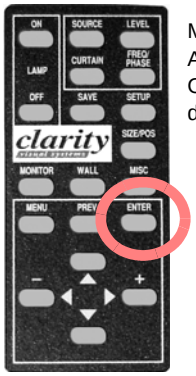
You can display the White, Gray, Grayscale, and Colors test patterns from the Test Pattern option.

Color Balance Settings

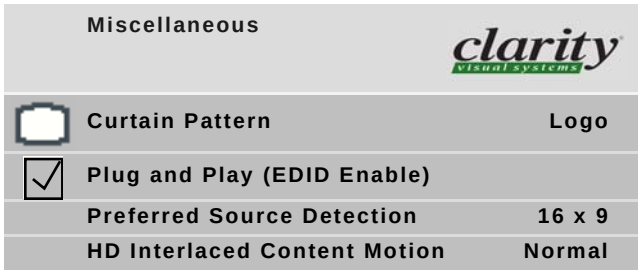
Menu Item	Description	Setting(s)
Color Temperature	Adjust the “pure white” of the system to different color shades	3200°K (Warm), 5500°K, 6500ºK, 8500°K (Cool)
White Balance - All	Adjusts the white balance setting of all three colors simultaneously, keeping them in proportion to each other, thus keeping the color the same, and adjusting the brightness of white to match other units in an array.	Clipboard
Red	Adjusts each of the colors separately, allowing the user to change the color of white to match other units in an array.	0-100
Green		
Blue		
Gray Balance - All	Adjusts the gamma setting of all three colors simultaneously, allowing the user to change the brightness of gray to match other units in an array	
Red	Adjusts the gamma of each of the colors separately, allowing the user to change the color of gray to match other units in an array	0-15
Green		
Blue		
Test Pattern	The four test patterns are the same patterns available from Main > Diagnostics > Test Patterns but are more conveniently accessed from this menu when you are using the remote to color balance units.	Off, White, Gray, Grayscale, Colors
Hide Menu	Use Hide Menu to quickly hide the on-screen menu while you are doing color balancing using a remote	
Copy to Clipboard	To compare settings, you can save to the clipboard or recall from the clipboard a range of settings. This can dramatically speed up the process of performing color balancing. For more information on color balancing an array of units, see “Adjusting Color Balance” on page 46.	
Recall From Clipboard		
Reset to Defaults	Reset all the settings to the factory defaults.	

Advanced Options > Miscellaneous Settings





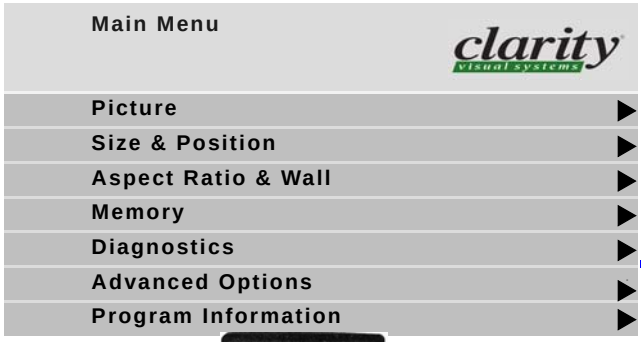
MISC opens the Advanced Options menu directly.



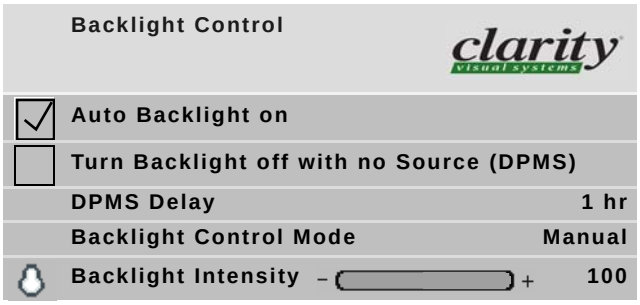
Miscellaneous Settings

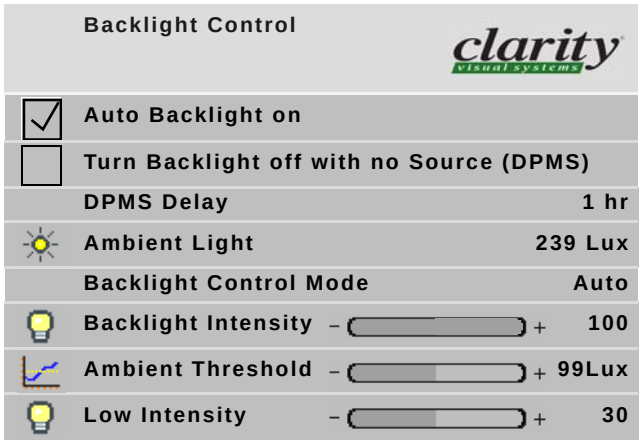
Menu Item	Description	Setting(s)
Curtain Pattern	When the curtain is put up (via the curtain button on the remote, or via RS-232), this is the pattern that is displayed.	White, Red, Green, Blue, Black, logo
Plug and Play	This enables the display to give information to a computer graphics card to allow it to automatically configure itself.	
Preferred Source Detection	This tells the Bay Cat X which aspect ratio to use when the incoming signal may have several choices. For instance, 1024x768 and 1366x768 have similar signal timings, and the Bay Cat X might choose the wrong one. If your application sometimes has 1024x768 but never 1366x768, set this control for 4x3.	16x9, 15x9, 5x4, 4x3
HD Interlaced Content Motion	For static and normal motion images, the Normal setting eliminates twitter. This is the best setting for most images. For quickly moving images, select Rapid to reduce deinterlacing artifacts and provide a sharper, cleaner image. Note: this setting only applies to 1080i signals.	Normal, Rapid

Advanced Options> Backlight Settings



MISC opens the Advanced Options menu directly.

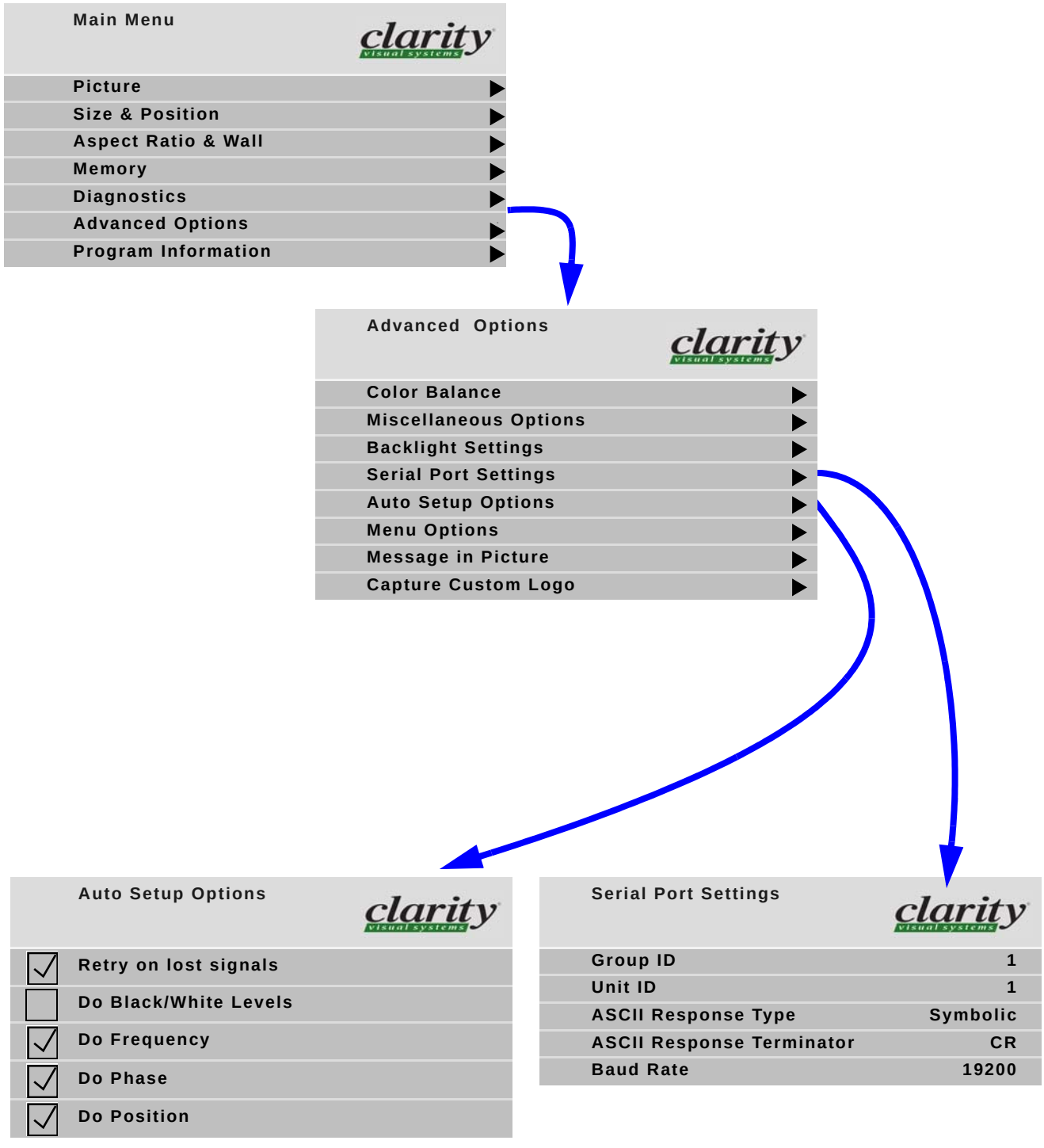




Backlight Control Menu Options

Menu Item	Description	Setting(s)
Auto Backlight on	Auto Backlight turns on the backlight soon after AC power is restored.	
Turn Backlight off with no Source (DPMS)	Saves lamp life and energy by turning off backlights	
DPMS Delay	The amount of time the unit will wait after a source is removed, before it turns off the backlights.	0 mins - 1 hr
Backlight Control Mode	The method by which the backlight intensity is adjusted. Auto mode adjusts the light levels using a threshold and a light intensity sensor. Manual mode allows the user to set the backlight intensity manually.	Auto, Manual
When Backlight Control Mode is set to Manual:		
Backlight Intensity	Backlight Intensity can be controlled when Backlight Control Mode is Manual. In Auto mode, Backlight Intensity is read only.	30-100%
When Backlight Control Mode is set to Auto		
Ambient Light	Ambient Light is the light currently in the immediate area of the Bay Cat X	
Ambient Threshold	Ambient Threshold is the light intensity below which the backlights go to the Low Intensity setting.	
Low Intensity	Low Intensity is the backlight level (as a percent of maximum) the light will go to when the ambient light falls below the Ambient Threshold. There is a built-in 3 minute delay before the low intensity takes effect. This keeps the backlight from flashing between low and high intensity if the ambient light is hovering near the threshold value.	30-100%

Advanced Options> Serial Port Settings & Auto Setup Options



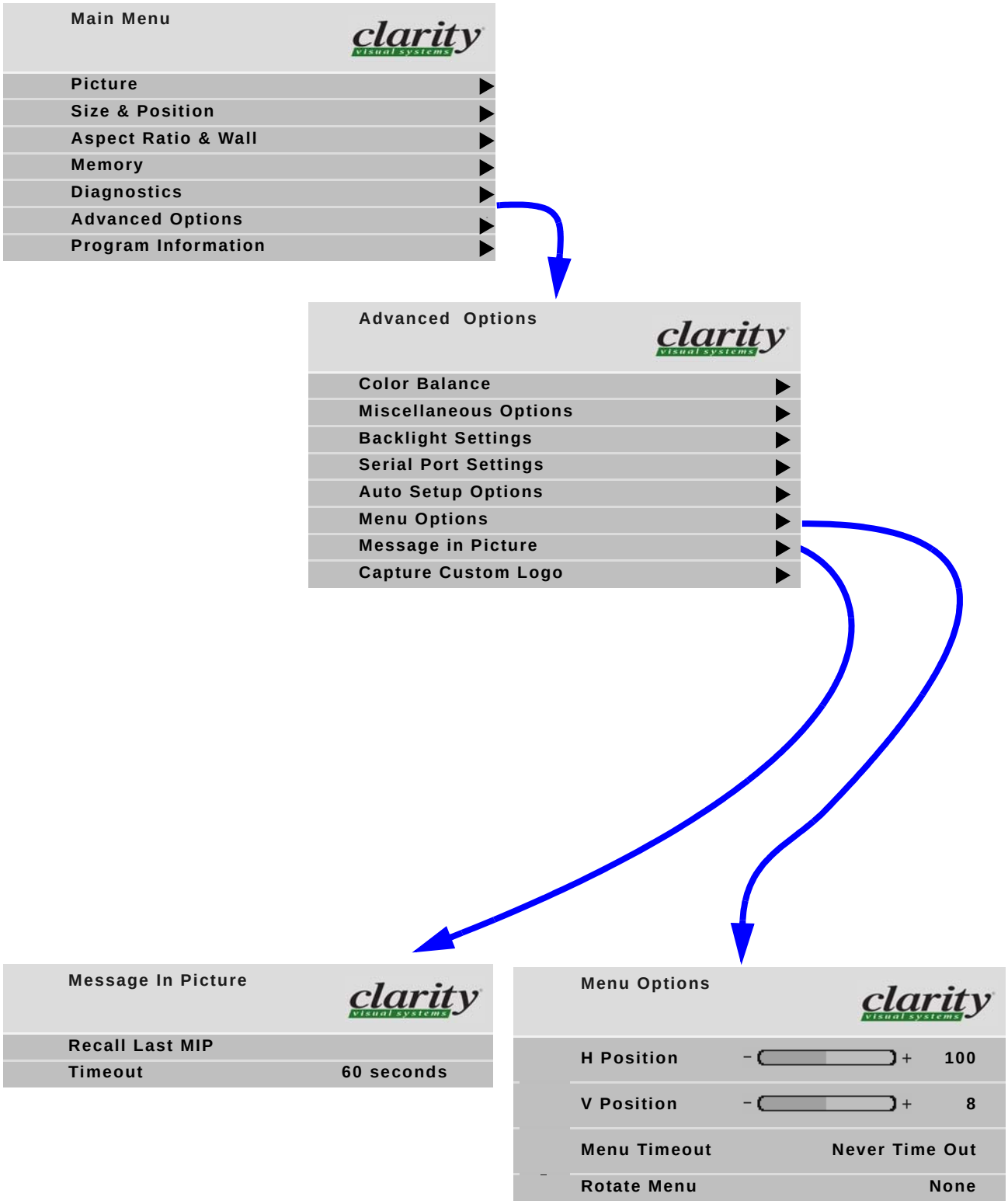
Serial Port Settings Options

Menu Item	Description	Setting(s)
Group ID Unit ID	Group ID and Unit ID together make up at two-character ID for this Bay Cat X. In a group of Bay Cat Xs connected in a series for RS232 commands, each Bay Cat X should have a unique ID.	0-9 and A-Z
ASCII Response Type	ASCII Response Type is Symbolic (ascii words are returned), Numeric (numbers are returned), or Data Only (only the data value is returned.	
ASCII Response Terminator	ASCII Response Terminator is the non-printing character or two-character combination that will end each response sent. This is useful for getting your particular host program to display returned commands on separate lines. Windows type systems normally work best with CR + LF. UNIX and LINUX type systems often want only LF. Any combination of terminations can be sent to the unit regardless of this setting.	CR – ASCII code 13 (carriage return) only CR +LF – ASCII code 13 followed by ASCII code 10 (line feed) LF + CR ASCII code 10 followed by ASCII code 13 LF ASCII code 10 only
Baud Rate	Baud Rate must match the baud rate of the host computer.	1200 - 19200
For complete information, see the RS232 Control manual for Bay Cat X available on www.ClarityVisual.com/login/. Click lower, blue button. Use name “tech” and password “help”.		

Auto Setup Options

Menu Item	Description
The checked events in Auto Setup Options occur when • the input changes, such as from XGA to UXGA • a new source is selected • you press the SETUP button.	
Retry on Lost Signal	Retry on lost signal, when checked, means the unit will attempt to find a different signal when it detects a change in syncs. This should normally be checked. If a signal is very noisy, you may want to uncheck this box to avoid the image flashing when it receives bad syncs. However, when unchecked, the unit will never detect when a signal goes away or changes to a different resolution. (sync).
Do Black/White Levels	Do Quick Black/White Levels automatically adjusts the lightest and darkest pixels to be white and black. This fully automatic method is prone to small errors in the white level. Semi-automatic level adjustment is better. For more information, see “Adjusting Levels for Analog Computer Sources” on page 28.
Do Frequency	Automatically adjust the frequency, phase, and position, respectively, of the image to optimal values based on the image it detects. If the incoming image is all black at the time it is first received, the unit will not be able to make these settings effectively. It must have some content to work with to adjust frequency and phase and it must have an edge to edge non black image to adjust position.
Do Phase	
Do Position	

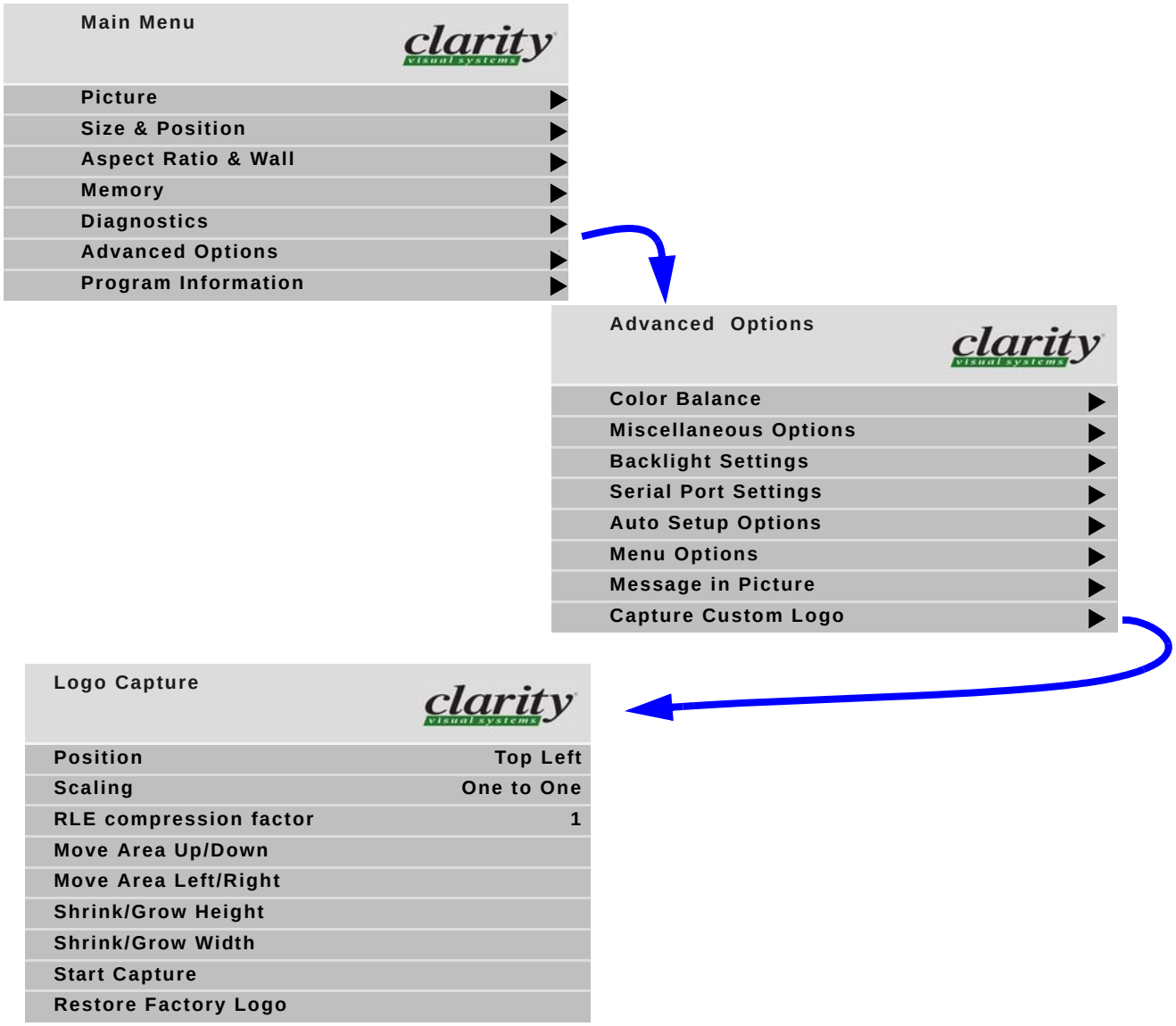
Advanced Options> Menu Options and Message In Picture



Menu Options and Message in Picture Options

Menu Item	Description	Setting(s)
H and V Position	The position of the on-screen menus.	H: 0-150 V: 0-100
Rotate Menu	Rotates the menu for Portrait orientation. It does *not* rotate the picture. See “Advanced Options” on page 52.	None, clockwise, counter-clockwise
Menu Timeout	Menus disappear after this time when there is no remote control activity.	5 seconds to Never Time Out, which means menus do not disappear.
Recall Last MIP	Displays the last Message In Picture that was displayed.	
Timeout	Determines how long this message will be displayed.	0-120 seconds 0 seconds means it will not time out.
To learn the complete MIP system and how to control it: Go to www.ClarityVisual.com Click on LOGIN in upper right banner Click on lower, blue LOGIN NOW button User name: tech Password: help Look in the Technical Support section under Bobcat X		

Advanced Options> Capture Custom Logo



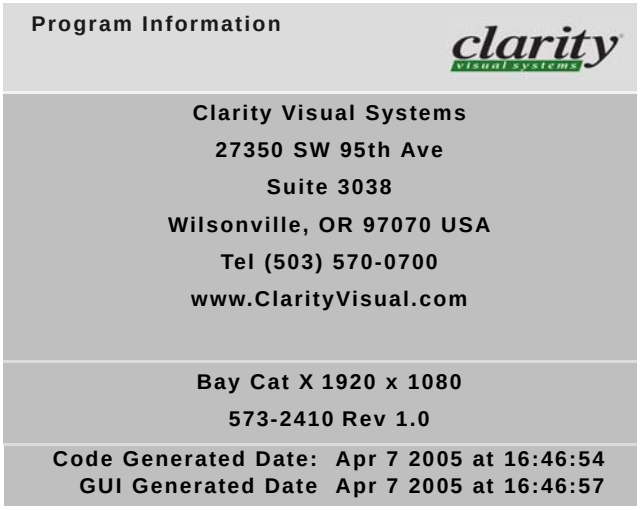
Logo Capture Menu Options

Menu Item	Description	Setting(s)
Position	The position for the finished captured image.	Middle Left Middle Center Middle Right Bottom Left Bottom Center Bottom Right Tile Top Left Top Center Top Right

Logo Capture Menu Options

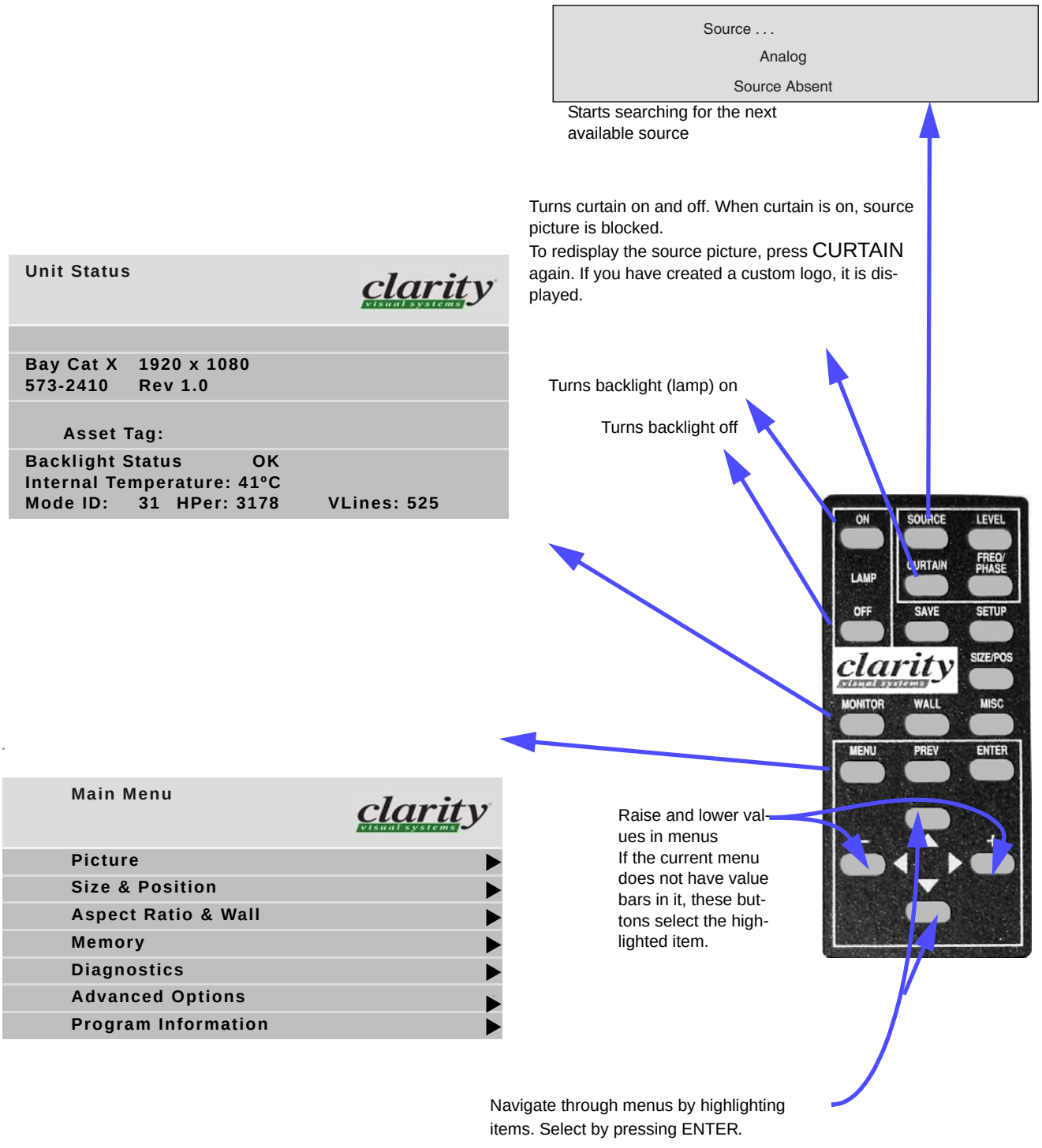
Menu Item	Description	Setting(s)
Scaling	The amount of zoom of the captured image. One to one will display the captured image as one captured pixel to one output pixel. Full screen will stretch the captured image until one dimension fills the output screen. N percent is a fraction of zoom between one to one and full screen.	one-to-one full screen n percent
RLE compression factor	RLE (Run Length Encoding) compresses the file size by treating adjacent pixels that are almost the same as the same The RLE factor sets the minimum difference between the RGB pixel values of adjacent pixels for them to bet treated and stored as separate pixels. For the most accurate reproduction of the captured image, set this to 0 for digital sources or 1 for analog sources. Higher values will allow a larger image to be captured or for faster drawing, but will blur fine detail.	0-100
Move Area Up/Down	Position of the area to be captured. When this menu option is highlighted, the area can be moved up or down using the + or - keys on the remote.	
Move Area Left/Right	Position of the area to be captured. When this menu option is highlighted, the area can be moved left or right using the + or - keys on the remote.	
Shrink/Grow Height	Size of the area to be captured. When this menu option is highlighted, the height can be increased or reduced using the + or - keys on the remote.	
Shrink/Grow Width	Size of the area to be captured. When this menu option is highlighted, the width can be increased or reduced using the + or - keys on the remote.	
Start Capture	When you start the process, the unit displays the following note: **Capturing Logo...** **Capture can take several minutes** **Unit will not respond to commands during capture** The unit will not respond during the logo capture process. When the process has completed, the unit displays the following note: **Logo Capture Complete**  To dismiss the note, press MENU.	
Restore Factory Logo	Deletes the custom captured logo and restores the original factory logo	
For more information on the Capture Custom Logo process, see “Logo Capture” on page 53.		

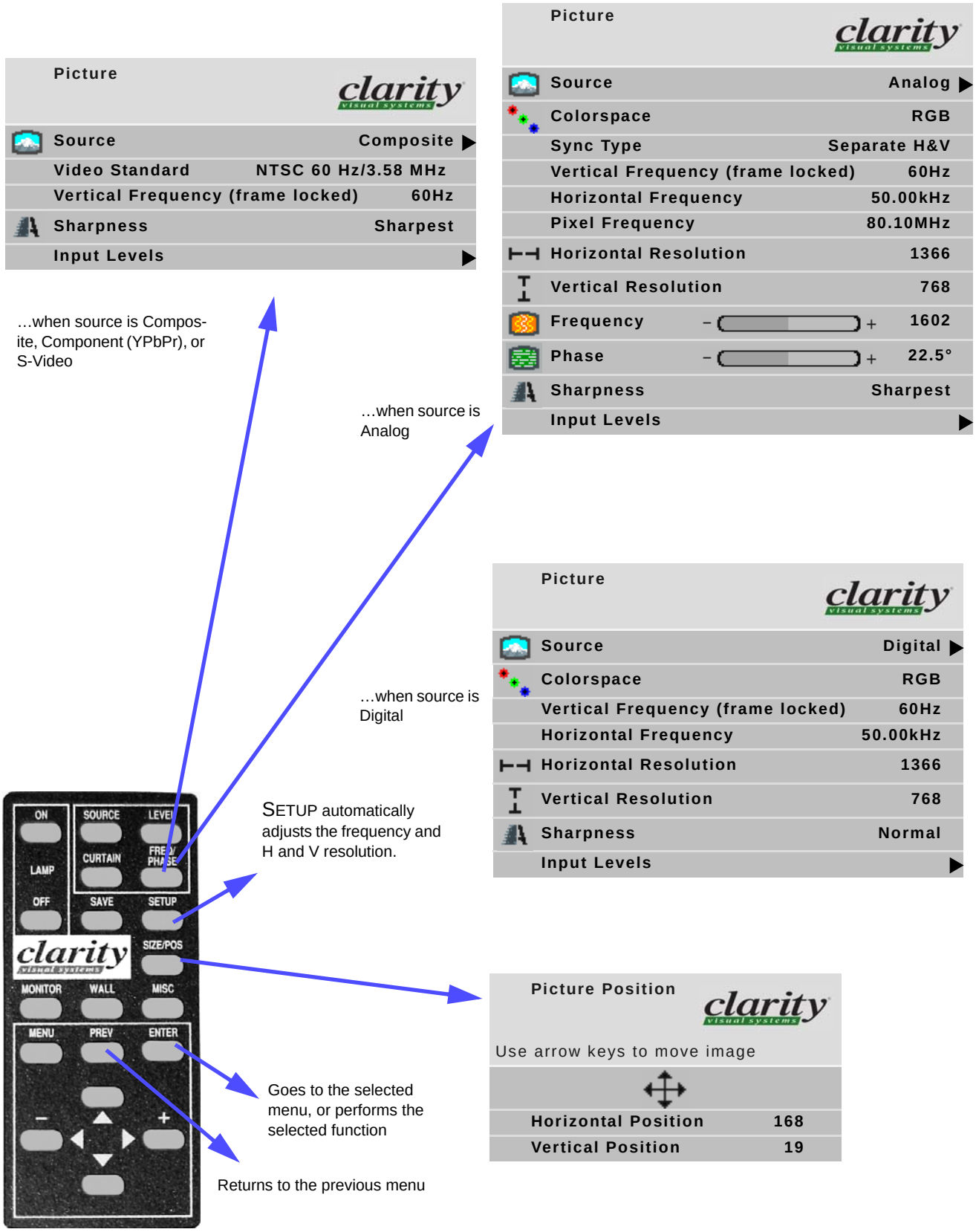
Advanced > Program Information

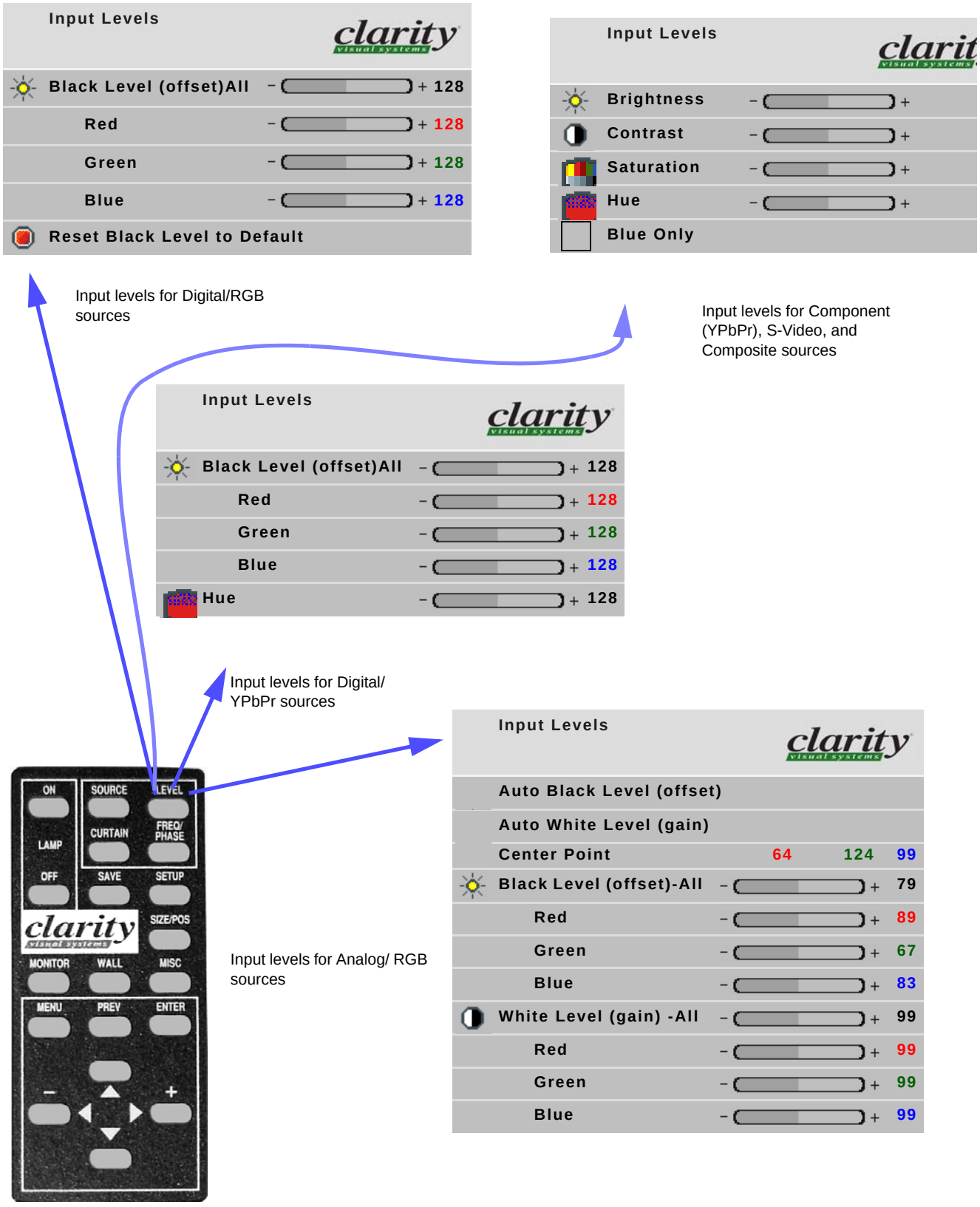


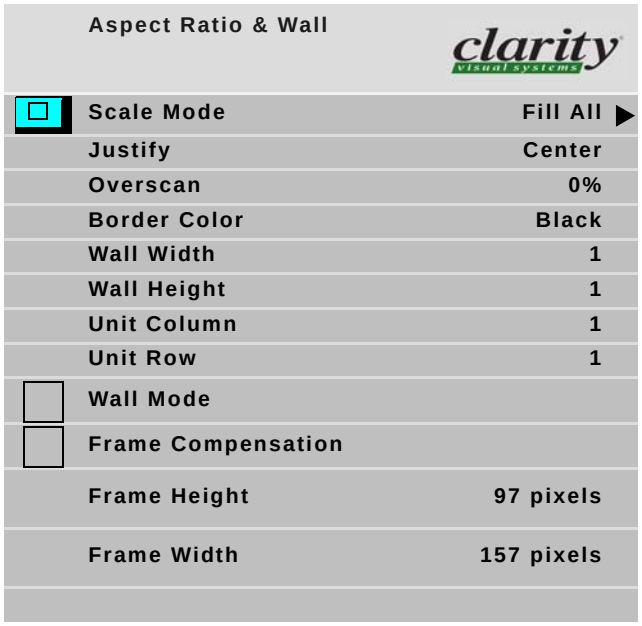
When Clarity upgrades firmware (software used in the Bay Cat X), it will be available on www.ClarityVisual.com.

6.2 Remote Control Buttons

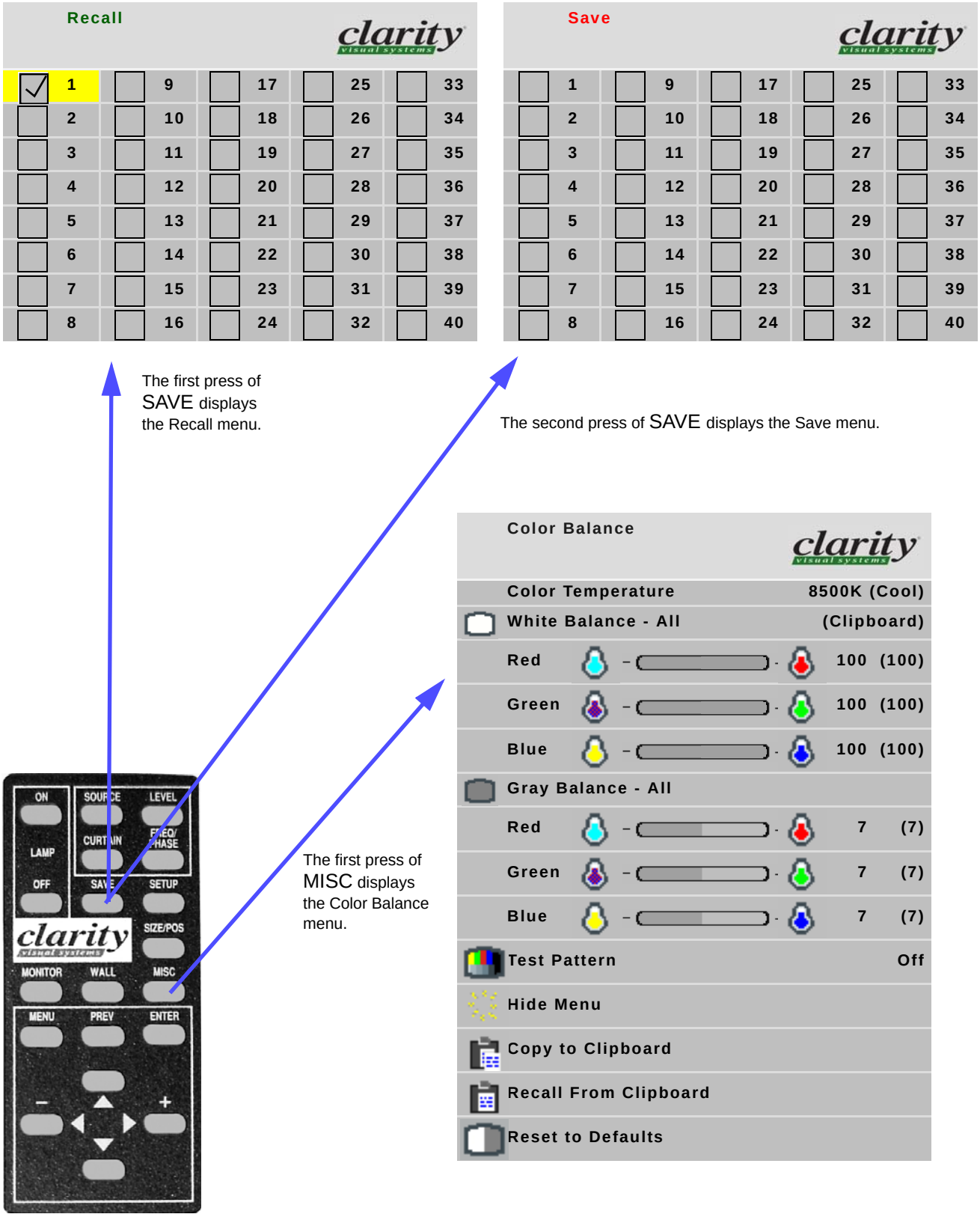



Picture
clarity visual systems
Source Composite
Video Standard NTSC 60 Hz/3.58 MHz
Vertical Frequency (frame locked) 60Hz
Sharpness Sharpest
Input Levels
…when source is Compos-ite, Component (YPbPr), or S-Video
Picture
clarity visual systems
Source Analog
Colorspace RGB
Sync Type Separate H&V
Vertical Frequency (frame locked) 60Hz
Horizontal Frequency 50.00kHz
Pixel Frequency 80.10MHz
Horizontal Resolution 1366
Vertical Resolution 768
Frequency 1602
Phase 22.5°
Sharpness Sharpest
Input Levels
…when source is Analog
Picture
clarity visual systems
Source Digital
Colorspace RGB
Vertical Frequency (frame locked) 60Hz
Horizontal Frequency 50.00kHz
Horizontal Resolution 1366
Vertical Resolution 768
Sharpness Normal
Input Levels
…when source is Digital
ON
SOURCE
LEVEL
LAMP
CURTAIN
FREQ/ PHASE
OFF
SAVE
SETUP
clarity visual systems
SIZE/POS
MONITOR
WALL
MISC
MENU
PREV
ENTER
SETUP automatically adjusts the frequency and H and V resolution.
Picture Position
clarity visual systems
Use arrow keys to move image
Horizontal Position 168
Vertical Position 19
Goes to the selected menu, or performs the selected function
Returns to the previous menu


Input Levels
clarity visual systems
Black Level (offset)All – + 128
Red – + 128
Green – + 128
Blue – + 128
Reset Black Level to Default
Input Levels
clarity visual systems
Brightness – +
Contrast – +
Saturation – +
Hue – +
Blue Only
Input levels for Digital/RGB sources
Input levels for Component (YPbPr), S-Video, and Composite sources
Input Levels
clarity visual systems
Black Level (offset)All – + 128
Red – + 128
Green – + 128
Blue – + 128
Hue – + 128
Input levels for Digital/ YPbPr sources
Input Levels
clarity visual systems
Auto Black Level (offset)
Auto White Level (gain)
Center Point 64 124 99
Black Level (offset)-All – + 79
Red – + 89
Green – + 67
Blue – + 83
White Level (gain) -All – + 99
Red – + 99
Green – + 99
Blue – + 99
Input levels for Analog/ RGB sources
ON
SOURCE
LEVEL
LAMP
CURTAIN
FREQ/ PHASE
OFF
SAVE
SETUP
clarity visual systems
SIZE/POS
MONITOR
WALL
MISC
MENU
PREV
ENTER
–
+



Aspect Ratio and Wall


Recall
clarity
visual systems
1 9 17 25 33
2 10 18 26 34
3 11 19 27 35
4 12 20 28 36
5 13 21 29 37
6 14 22 30 38
7 15 23 31 39
8 16 24 32 40
Save
clarity
visual systems
1 9 17 25 33
2 10 18 26 34
3 11 19 27 35
4 12 20 28 36
5 13 21 29 37
6 14 22 30 38
7 15 23 31 39
8 16 24 32 40
The first press of SAVE displays the Recall menu.
The second press of SAVE displays the Save menu.
Color Balance
clarity
visual systems
Color Temperature 8500K (Cool)
White Balance - All (Clipboard)
Red 100 (100)
Green 100 (100)
Blue 100 (100)
Gray Balance - All
Red 7 (7)
Green 7 (7)
Blue 7 (7)
Test Pattern Off
Hide Menu
Copy to Clipboard
Recall From Clipboard
Reset to Defaults
The first press of MISC displays the Color Balance menu.
ON
SOURCE
LEVEL
LAMP
CURTAIN
FREQ/ PHASE
OFF
SAVE
SETUP
clarity
SIZE/POS
MONITOR
WALL
MISC
MENU
PREV
ENTER
–
+

Miscellaneous

Curtain Pattern	Logo
☑ Plug and Play (EDID Enable)	
Preferred Source Detection	16 x 9
HD Interlaced Content Motion	Normal

The second press of MISC displays the Miscellaneous menu.

Backlight Control

☑ Auto Backlight on	
☐ Turn Backlight off with no Source (DPMS)	
DPMS Delay	1 hr
Backlight Control Mode	Manual
Backlight Intensity – +	100

The third press of MISC displays the Backlight Control menu.

Backlight Control

☑ Auto Backlight on	
☐ Turn Backlight off with no Source (DPMS)	
DPMS Delay	1 hr
Ambient Light	239 Lux
Backlight Control Mode	Auto
Backlight Intensity – +	100
Ambient Threshold – +	99Lux
Low Intensity – +	30

Serial Port Settings

Group ID	1
Unit ID	1
ASCII Response Type	Symbolic
ASCII Response Terminator	CR
Baud Rate	19200

The fourth press of MISC displays the Serial Port Settings menu.

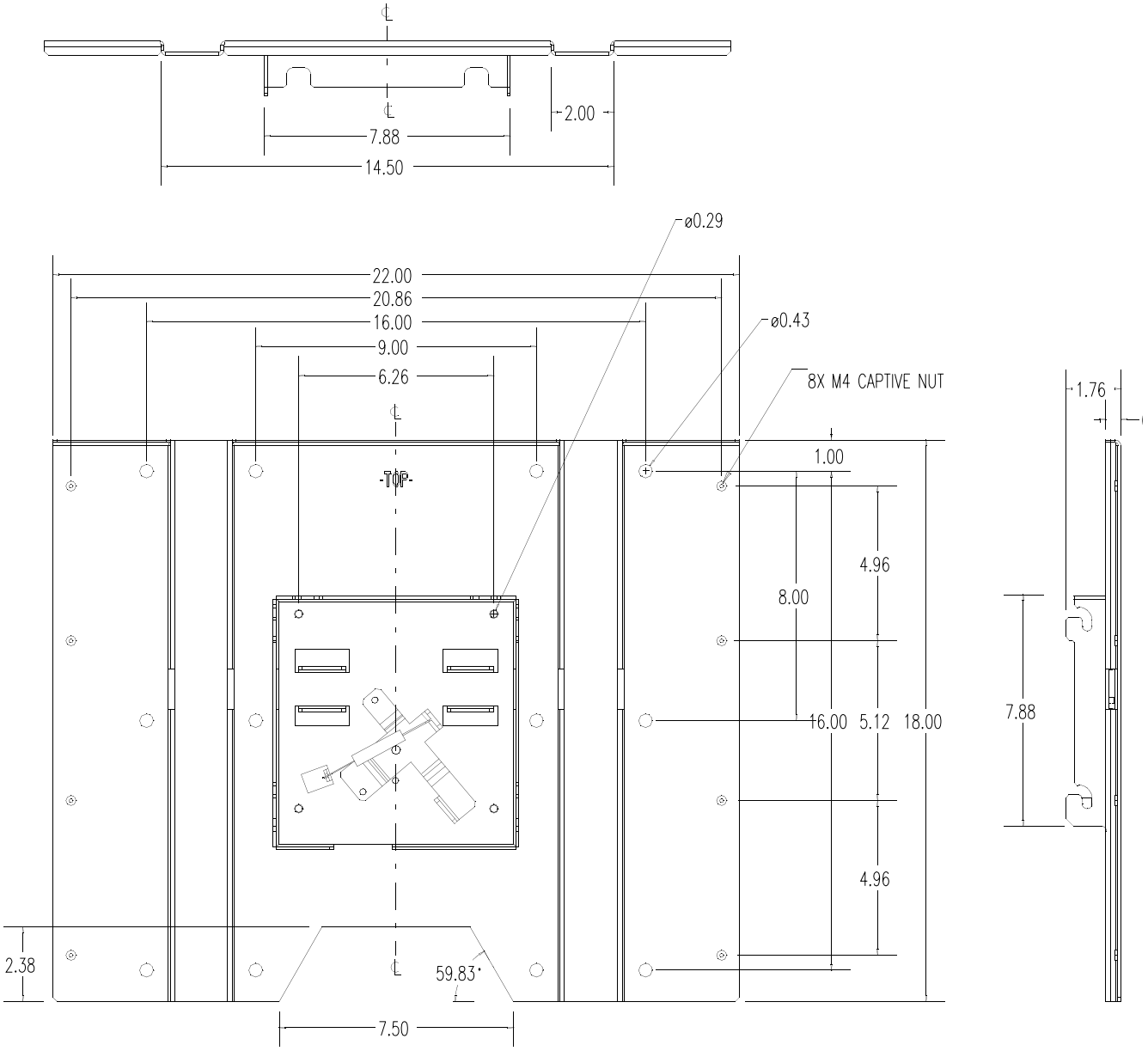
Auto Setup Options

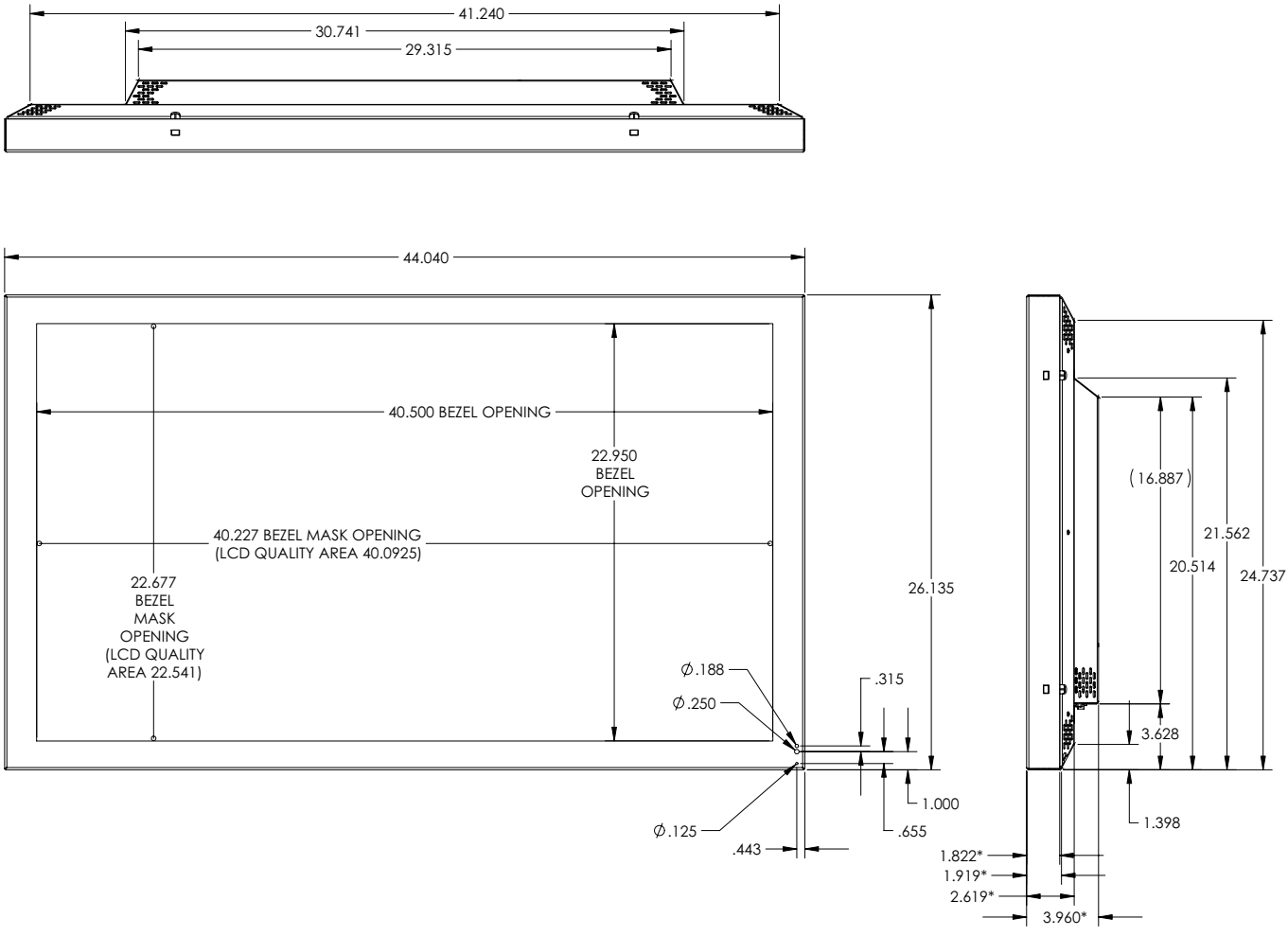
☑ Retry on lost signals	
☐ Do Black/White Levels	
☑ Do Frequency	
☑ Do Phase	
☑ Do Position	

The fifth press of MISC displays the Auto Setup menu.

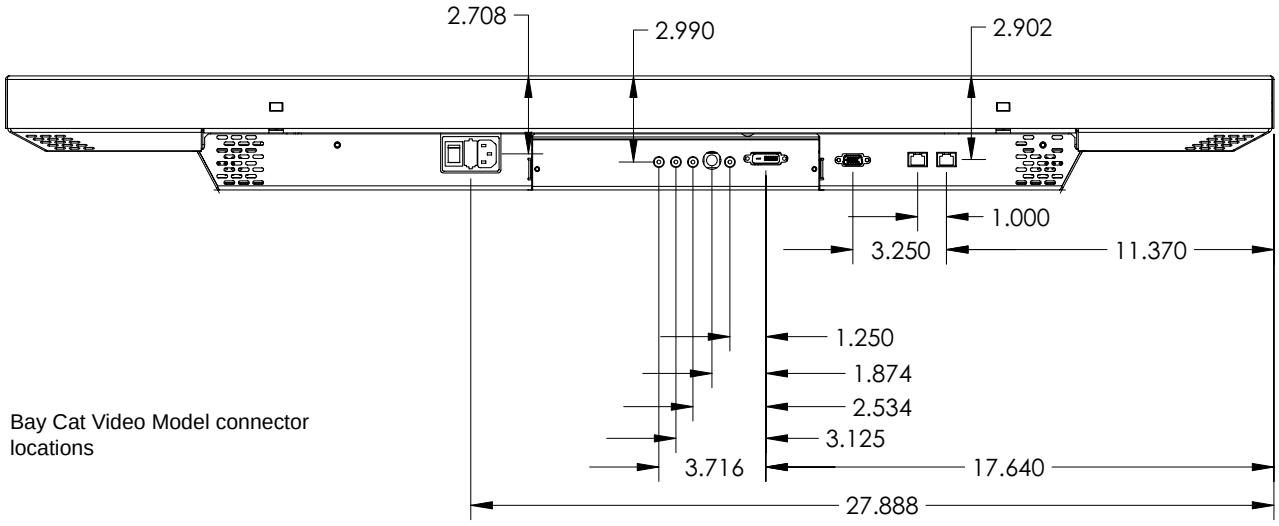
6.3 Drawings

Dimensions in inches.

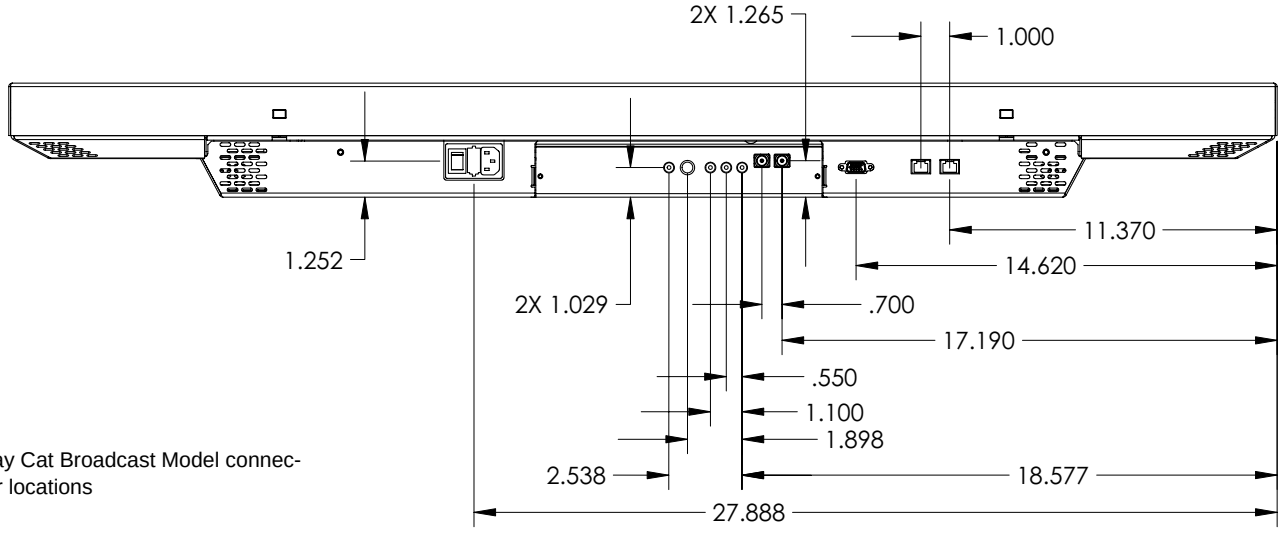



41.240
30.741
29.315
44.040
40.500 BEZEL OPENING
22.950
BEZEL
OPENING
40.227 BEZEL MASK OPENING
(LCD QUALITY AREA 40.0925)
22.677
BEZEL
MASK
OPENING
(LCD QUALITY
AREA 22.541)
26.135
Ø.188
Ø.250
.315
1.000
.655
Ø.125
.443
(16.887)
21.562
20.514
24.737
3.628
1.398
1.822*
1.919*
2.619*
3.960*

Connector Locations and Diagrams



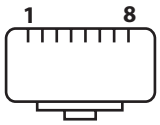
Bay Cat Video Model connector locations



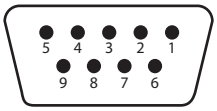
Bay Cat Broadcast Model connector locations

Wiring for RS232 9-pin to RJ45 adapter

The wiring shown for this adapter is correct for *straight-through* network cables.



RJ45 looking into the socket.



Yellow wire	pin 3
Black wire	pin 2
Green wire	pin 5

RJ45	9-pin
6	3
5	5
3	2

6.5 Optimizing Your Clarity Display

Here are some guidelines for using your Clarity display.

Burn In versus Temporary Image Retention

Burn-in causes the screen to retain an image essentially forever, with little or no way to correct the problem. Under normal use, a Bay Cat X will *not* experience burn-in, as plasma displays do, nor will it retain images in any way.

✎ Normal use of a Bay Cat X is defined as displaying continuously changing video patterns or images.

However, Bay Cat X's can experience *temporary* image retention.

What is Temporary Image Retention?

Temporary image retention (TIR) can occur when a static image is displayed continuously for extended periods of time (12 hours or longer). An electrical charge differential may build up between the electrodes of the liquid crystal, which causes a negative-color video image (color- and brightness-inverted version of the previous image) to be retained when a new image is displayed.

✎ Normal use of *any* LCD device does not cause TIR.

Static image applications

Typical static image applications include airports, transit stations, stock markets, banks, and command/control installations, or anywhere a fixed image is displayed continuously for 12 or more hours.

How to detect temporary image retention

If you suspect image retention has occurred, display the Gray Test Pattern (Main Menu > Diagnostics > Test Patterns).

If anything other than a uniform gray image displays, you may have TIR.

Static image display guidelines

Here are some guidelines to help you avoid TIR:

- Use Bay Cat X to show moving images or still pictures that change regularly
- Turn the display off when it is not in use

  After 24 hours continuous use, turn off the power for 2 hours. After 12 hours continuous use, turn off the power for 1 hour. For computer sources, use the PC Power Management Properties to power off the monitor when it is not in use.
- Display a black screen. Research at Clarity has shown that displaying a black image, or turning off the AC power, is the quickest way to dissipate the temporarily retained image (a black image is available from the Test Patterns menu: Main Menu > Diagnostics > Test Patterns)
- Use a screen saver in one color (other than grey), a moving image, or random images
- Alternate display images by displaying primary information for 1 hour followed by a display logo or moving image for 1 minute
- Change colors: alternate the color information with 2 colors every 30 minutes.
- When using high-contrast images, reposition the images frequently (every 30 minutes).

Normal Use Thermal Guidelines

Normal use of a Bay Cat X is defined as operating in the open air to prevent heat buildup, and without direct or indirect heat sources such as adjacent displays, lighting fixtures, heating ducts, or direct sunlight that can cause the display to experience temperatures higher than the maximum ambient operating specification of 35ºC, nor below the minimum ambient operating specification of 0ºC. If one of these conditions exist, it is up to the installer to ensure that display placement is changed, thermal shielding is provided and/or additional ventilation is provided to keep the display within its nominal operating parameters.

Some examples of common problems include the following:

- A display is placed near an outside window. Sunlight shining directly on the front of the display causes the unit to overheat from solar radiation even though the display is mounted in ambient air conditions that would otherwise be acceptable.
- A display is mounted inside an enclosure without adequate ventilation. Heat buildup within the enclosure eventually causes the display to overheat
- Multiple displays are mounted close together in an array. Heat from the lower displays rises and creates a thermal ambient air gradient on the back of the displays that goes from cool to hot (bottom to top). Displays at

the top of the array experience a higher ambient temperature and overheat.

Should the thermal ratings be exceeded, the most likely visible affect will be that the display may start to ‘clear’ which means the LC material within the display starts to lose its light altering properties and off-color or black voids will start to be visible in the display. This is not destructive to the display and will correct itself once the thermal issue is adequately addressed.

WARNING

Chronic overheating may shorten the unit lifespan and void your warranty.

In each case, either moving the display away from a heat or light source, providing shielding from that source, or providing additional ventilation to ensure against heat buildup should be sufficient to address the thermal issue.

A built-in thermal sensor on the display electronics (see “Internal Temperature” on page 85) which can be monitored in the UI and through RS232. While not directly correlating to the ambient temperature, it can be used to determine if changes to the displays environment have had a positive or negative effect. It can also be used to thermally map a large group of displays to determine if some are running significantly warmer or cooler than the others.

6.6 EDID: What It Is and How It Works

EDID is the name of a method computers use to determine the characteristics of the computer monitor.

EDID stands for Extended Display Identification Data. It is the system behind Plug and Play. But just knowing its name doesn't tell you how it works.

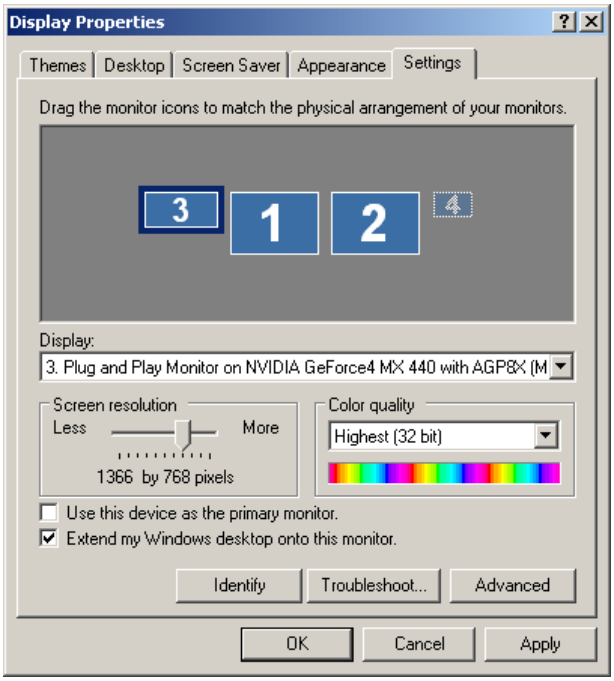
EDID is a block of 128 bytes of data residing in a monitor that contains information about the following:

- the manufacturer,
- the product ID,
- whether the monitor is analog or digital,
- video timings [resolutions],
- and color capability.

How EDID works

When a computer with EDID capability boots up, it reads the EDID data in the monitor it is connected to. It stores this data in the Registry (in Windows™) where it is available to the video card.

Different video cards use this information in different ways. Many video cards will not send video with resolutions that are not listed in the monitor's EDID.



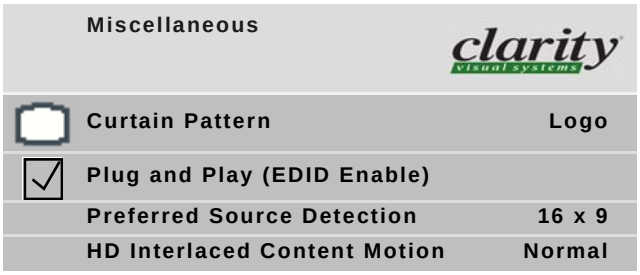
This dialog box shows a setting of 1366 x 768 for the 3rd monitor. If the #3 monitor were not capable of this resolution, some video cards would not show 1366 x 768 in the dialog box.

EDID too small for Clarity displays

One problem with this system is that Clarity displays are capable of many more resolutions (video timings) than can be stored in a data block of only 128 bytes. Clarity displays are capable of hundreds of resolutions, but the EDID block has room to store only dozens.

This means that some video cards will not put out certain resolutions, even though the connected Clarity display is capable of handling them. If the resolution you want to use is not listed in the Clarity EDID, and the video card won't list that resolution unless it *is* seen in the EDID, what can you do?

A possible solution is to **un**check the Plug and Play box in the Miscellaneous menu (Main Menu > Advanced Options > Miscellaneous Options).



This causes the EDID to use an incorrect CRC checksum.

Some video cards will see the incorrect checksum, assume the data is corrupted, and fall back on a default set of timings, which may include the one you want.

Other cards may not bother to look at the checksum and limit the resolutions to those in the display's EDID.

When EDID doesn't work

- There is no point in changing the refresh rate in the Display > Settings tab > Advanced menu. The Bay Cat X has a fixed refresh rate of 60 Hz. It will handle other refresh rates, but the native refresh rate is fixed. The electronics system changes the incoming video to the display's fixed refresh rate.

- Uncheck the Plug and Play box and reboot the computer.

✎ Use of long line distribution systems may cause EDID to not function correctly or at all.

✎ Bay Cat X adheres to EDID standard 1.3.

A Glossary of Terms

Terms used in this manual, and general terms.

<table>
<tr><th>Term</th><th>Meaning</th></tr>
<tr><td>array</td><td>A group of displays physically bolted together. (Not possible with Panthers or Bengals.)</td></tr>
<tr><td>aspect ratio</td><td>The ratio of the width to the height of a picture, often expressed as 4-by-3, 4:3, 4×3, or 1.33:1 (the aspect ratio of standard television pictures). 16-by-9 (1.77:1) is the aspect ratio for high-definition TV.
<table>
<tr><th>Clarity Display</th><th>Aspect Ratio</th></tr>
<tr><td>Lion X, UX, XP, UXP, XL, UXL
Puma X, XP, UXP</td><td>1.33</td></tr>
<tr><td>Lion SX, SXP</td><td>1.25</td></tr>
<tr><td>Bobcat 1, 2</td><td>1.66</td></tr>
<tr><td>Bay Cat, Margay, Bengal, Bay Cat X</td><td>1.77</td></tr>
</table></td></tr>
<tr><td>Backlight</td><td>The fluorescent lamp or lamps behind a direct-view LCD panel that make its pictures visible.</td></tr>
<tr><td>ballast</td><td>The electronics part (module) that powers the lamp, providing high voltage to start the lamp and a lower voltage for operation.</td></tr>
<tr><td>Bay Cat</td><td>The name for a Clarity direct-view LCD display, similar to a Clarity Bobcat, but with a larger screen (46”) and higher resolution (1920x1080). Model number SN-4610-1080</td></tr>
<tr><td>Bobcat</td><td>The name for any Clarity model beginning SN-4025 or SN-4035. A 40" direct view LCD display of 1366 × 768 pixels.</td></tr>
<tr><td>composite sync</td><td>Sync signals that combine the horizontal and vertical syncs onto one signal line, separate from the video. RGBS uses this type.</td></tr>
</table>

Term	Meaning
composite video	A video distribution system in which all the video information, is sent on one wire. Sometimes called C-Video.
cube	One display without regard to others that may be in an array with it. *See also* unit; display.
C-Video	Composite video; a video distribution system in which all the video information, is sent on one wire.
DA	Distribution amplifier; a device that takes in one input and gives out many of the same type. DAs are available for video, computer and digital signals.
display	One display unit without regard to others that may be in an array with it.
DVI	Digital Video Interface, a standard for distributing computer pictures in digital form.
electronics module	The electronic part that controls almost everything about the display. It converts incoming pictures to a form the LCD can use to display pictures and provides control through the remote control and RS232 connections to other functions, such as turning lamps on and monitoring fans.
Fast key	One of the buttons on the remote control that takes you directly to a menu or chain of menus.
H & V sync	Horizontal and vertical sync on two separate lines. The VGA family uses this type.
key	a push button on the remote control
LCD	Liquid Crystal Display: the imaging device used in the Lion, Puma, Wildcat, and Panther displays. It works something like a digital watch, but in three colors and with greater detail.

Term	Meaning
LED	Light Emitting Diode: a small, low power lamp used as an indicator, often red or green, but can be other colors.
Lion	The name for any Clarity model beginning WN-6720.
Margay	Model WN-5040-720, a DLP™ optical engine with one lamp and a resolution of 1280 × 720
module	A stand-alone electronic assembly. Clarity displays are designed to be serviced at the module level, not the component level. That is, the technician changes the whole electronics module rather than changing a small part in it.
mullion	The metal edge surrounding the screen material that holds the screen in place.
native resolution	The resolution of the LCD or DMD itself. This is the highest resolution the display can show, but in some products the display will accept higher resolutions
NTSC	The television system used in North America, Japan and parts of South America. It stands for National Television Systems Committee, the group that originally approved it. See also PAL and SECAM.
PAL	The television system used in most of the world. It stands for Phase Alternation Line. See also NTSC and SECAM.
power supply	The device that converts the mains AC voltage to other voltages that the rest of the display can use.
Puma	The name for any Clarity model beginning with WN-5020 or WN-5010.
remote	The remote control.
RGB	Red, green, blue; three parts of a video signal sent on separate wires. *See also* YPbPr.
RGBHV	RGB plus sync, where H and V sync are on separate wires.
RGBS	RGB plus sync, where composite sync is on a separate wire.

Term	Meaning
SECAM	The television system used primarily in France, Russia and the former Soviet Bloc countries. Sequential Color and Memory. See also NTSC and PAL.
SOG	Sync on green, usually for RGB sources
source	A source of pictures, such as a computer, a VCR, or a DVD player .
SVGA	Super VGA, a standard for distributing analog computer pictures with a resolution of 800 pixels by 600 pixels.
S-Video	A video distribution system in which the luminance (brightness) and chrominance (color) are sent on separate wires. Short for Super Video.
SXGA	Super extended VGA, a standard for distributing analog computer pictures with a resolution of 1280 pixels by 1024 pixels.
sync on green	The sync part of the signal is combined with the green channel in RGB video. Also called SOG.
unit	One complete display. *See also* cube; display.
UXGA	Ultra-extended VGA, a standard for distributing analog computer pictures with a resolution of 1600 pixels by 1200 pixels.
VGA	Video Graphics Adapter, a standard for distributing analog computer pictures with a resolution of 640 pixels by 480 pixels.
video	In this manual, video means NTSC, PAL or SECAM pictures.
video input module	See VIM
VIM	Video Input Module: an optional board which plugs into the electronics module that allows S-Video and composite video inputs.
wall	See array
Wildcat	The name for any Clarity model beginning WN-4030.

Term	Meaning
WXGA	Wide XGA, a standard for distributing analog computer pictures with a resolution of 1280 pixels by 768 pixels.
XGA	eXtended VGA, a standard for distributing analog computer pictures with a resolution of 1024 pixels by 768 pixels.
Y	One of the components of “component” video. *See also* component video *and* colorspace.
YPbPr	Designators for the three conductors in component video. Y = luminance signal Pb = B-Y (blue – luminance) signal Pr = R-Y (red – luminance) signal

B Specifications for Bay Cat X

Mechanical

Specification	Maximum	Minimum	Typical	Notes
Outside dimensions				
Width	44.0"			111.8 cm
Height	26.1"			66.3 cm
Depth	3.96"			9.9cm
Weight	73 lbs.			33 kg
Shipping weight	105 lbs			47.7 kg
Orientation				Landscape or portrait
Chassis color				Standard: dark gray Optional: red, blue, silver, white, beige or custom color
Ventilation requirement (rear)	0"			Wall mountable
Screen dimensions				Aspect ratio 1.77 (16:9)
Diagonal	46.0"			116.8 cm
Width	40.1"			101.9 cm
Height	22.6"			57.4 cm
Pixel pitch				0.648 × 0.648 mm

Electrical and Heat

Specification	Maximum	Minimum	Typical	Notes
Video input amplitude				
Separate RGB analog	1.0 V p-p	0.5 V p-p	0.7 V p-p	75 ohm termination
Composite analog	5.0 V p-p		0.3 V p-p	75 ohm termination
TTL H and V sync	5.0 V	2.5 V	3.5 V	TTL at 330 ohm termination
Input connectors				
DVI-D				Digital
15-pin HD D-sub				
RCA				Composite video: NTSC, PAL, SECAM
Mini nDIN 4-pin				S-Video: NTSC, PAL
RJ45				RS232 In, RS 232 Out
AC requirements				
Line voltage115 V range 230 V range	120 V 240 V	100 V 200 V		50-60 Hz auto-ranging, power factor corrected
Power			240 W	
Current115 V			3.0 A	
230 V			1.5 A	
Heat, BTUs per hour			820	

Optical

Specification	Maximum	Minimum	Typical	Notes
Screen Brightness			450 nits	without front protective glass
Contrast ratio			900:1	
Viewing Angle, horizontal & vertical			±85° 170° total	at 10:1 contrast ratio
Color Gamut			72% NTSC	
Color CIE				
Red x			0.638	±0.03
Red y			0.331	
Green x			0.282	
Green y			0.595	
Blue x			0.144	
Blue y			0.060	
White x			0.280	
White y			0.290	
Response time	20msec		16msec	@ 25°C, 10 ms t_{rise} + 6 ms t_{fall}
Number of colors			16 M	
Resolution				1920 × 1080 pixels
Lamp life, hours			60,000	to ½ brightness

Environmental

Specification	Maximum	Minimum	Typical	Notes
Temperature, operating	30° C 86° F	0° C 32° F	25ºC	All performance specifications are maintained within this temperature range See “Optimizing Your Clarity Display” on page 116.
non-operating	60° C 140° F	–20° C –4° F		
Altitude (barometric pressure)	15,000 ft			Above sea level, or equivalent barometric pressure
Humidity	80% R.H.	20% R.H.		non condensing

C Regulatory Information

Declaration of Conformity

Manufacturer's Name: **Clarity Visual Systems**
Manufacturer's Address:
27350 SW 95th Avenue, Suite 3038
Wilsonville, OR 97070

declares that the products

Model Numbers: **SN-4620-1080** (LCD display)
Product Options: **All**

conforms to the following EU Directives and the standards stated:

Safety: **UL60950 - Safety of IT Equipment**

Electromagnetic Compatibility Directive**89/366/EEC and amendments**

EN 55022/CISPR 22, Class A – Radiated and Conducted Emissions from IT Equipment

EN 50082-1/EN61000-4 – Generic Immunity Standard

Including:	EN61000-3-2	Harmonic Emissions
	EN61000-3-3	Voltage Fluctuations and Flicker Emissions
	EN61000-4-2	Electrostatic Discharge
	EN61000-4-3	Radiated Susceptibility
	EN61000-4-4	Electrical Fast Transient Burst
	EN61000-4-5	Surge
	EN61000-4-6	Conducted Susceptibility
	EN61000-4-11	Voltage Dips and Interrupts

FCC Regulations

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 in an installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate receiving antenna.
- Increase separation between equipment and receiver.
- Connect equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician.

Note: Any changes or modifications to the display not expressly approved by Clarity Visual could void the user's authority to operate this equipment. Use of a shielded interface cable is required to comply with the Class A limits of Part 15 of FCC rules.

Other Certifications

UL, CUL, FCC/CISPR 22, CE

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Feedback About Manuals

Clarity Visual Systems, Inc., is constantly striving to provide the best product available at a reasonable cost. Part of *this* Clarity product is the manual. If you have found an error in this manual, or if you would like to make any comments about it, you may use this form.
This form is used with the **SN-4620-1080 USER GUIDE**, PART NUMBER **070-0150-00** DATED **31 May 2005**

You may fax this form to Clarity Visual Systems, **Attention: Manuals** at +1 503 570 4657.
Or you may email comments and corrections to Manuals@ClarityVisual.com. If you use email, please mention the 070- part number listed above.

What I like about this manual: (We love to read this part.)

What I don't like about this manual: (We read this part, too.)

Error(s) I found in the manual: (Yipes! We thought we were perfect.)

In future manuals of this type, I wish you would …

Thank you for taking the time to help us improve.

Having trouble?

Most questions are probably answered somewhere in this manual. Check the Index.

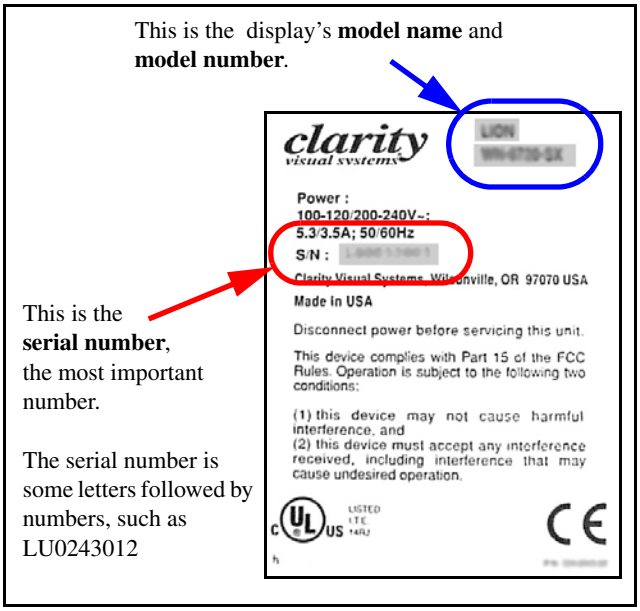
If the problem you have is completely baffling, call your Clarity reseller—the company that sold the Clarity display to you.

My Clarity Reseller is:

If you can't contact your reseller for some reason, Clarity's contact information is on the back cover of this manual.

But first!
Get the **serial number** of the unit you have. The serial number is found on a label in these places:

Clarity Display	Serial Number Label Location	
	from rear	from front
Bobcat	on the back panel and from edge of the connectors panel next to the power connector	not available
Lion	on the back panel of the lower section	on the left wall of the Center Bay
Puma	on the back panel	on the left wall
Margay	on back of electronics door	behind electronics door
Bay Cat	on the back panel	not available
Bengal	on right above electronics	on left behind screen, above electronics



Describe the problem
Try to describe the problem in the most precise language you can. Remember, the person you are talking to or writing to can't see what you see. Try to use helpful language.

Un-helpful language:

- It looks funny.
- The picture doesn't look right.
- The image is bad.
- It isn't working.

Helpful language:

- I see horizontal streaks coming from the right side of high contrast edges.
- I see a solid green background has vertical bands in it.
- Whenever I try to "_____", I get a message on the screen that says "_____".
- The lamp will not turn on. When I changed it with another lamp, it still did not turn on.
- There is a black line on the left side, and I can't move the picture over there with the Position control.
- I see flashing red and amber lights on the screen. (Note the sequence of the colored lights. It's important.)

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