

XH300AS Crosshair Generator with

Relay Interface

Users Guide

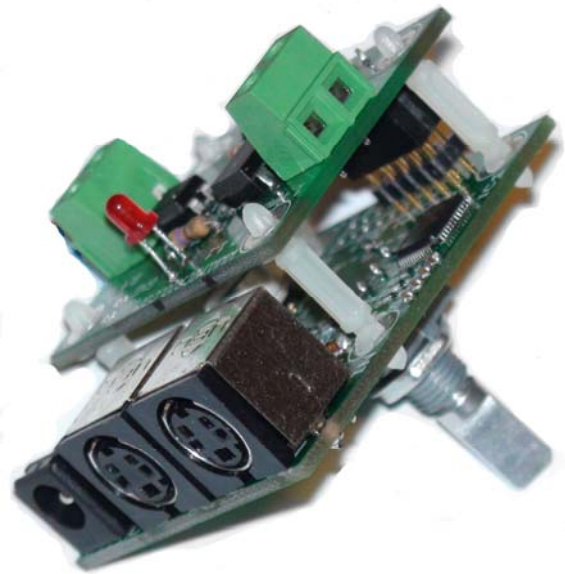
Rev 1.0

This is the user's guide for the Micrio Associates Inc. XH300AS-*-R crosshair generator with relay control. The XH300 superimposes a video crosshair on an incoming video stream. The crosshair is used to specify a position in the video image where the brightness of the image is sampled. The sampled value to control the state of a relay. The actual video level where the relay is actuated is adjustable. This is all handled through a single control knob.

This document contains the complete product description and operating instructions. The current firmware is revision 2.2. There is significant differences in the firmware between the relay version of the XH300AS-*-R and the standard version.



XH300AS-B-R



XH300AS-S-R

Table of contents

1. Introduction	3
2. Specifications.	3
3. Menu system.....	4
3.1 Select cursor style.	4
3.1.1 Single crosshair cursor.....	4
3.1.2 Double crosshair cursor.	4
3.2 Select cursor color.....	5
3.3 Select cursor size.....	5
3.4 Select font size.	5
3.5 Adjust time constant.	5
3.6 Save settings?.....	6
3.7 Exit setup?.....	6
3.8 Menu lockout.	7
4. Cursor types.....	8
4.1 Single crosshair.	8
4.2 Double Crosshair.	9
4.3 Relay trip point settings.	10
5. Connections.	12
6. Mounting.	13
5.1 Mounting holes.	13
5.2 Switch bushing.....	13
7. Mechanical drawings.....	14
6.1 Component side view.....	14
6.2 Control side view.	14
6.3 Connector Edge View.....	15
6.4 Recommended chassis holes.....	16
8. Warranty.....	16
9. Customization.....	17
10. Standards conformance.	17

1. Introduction

The XH300AS-*-R is the most versatile, easy to use, and cost effective video controlled relay driver available on the market. The XH300AS-*-R crosshair generator is capable of sampling the video level in a specified area using the cursor to select the area of interest. The user can use a single crosshair to select a single point or a box cursor to select the area of interest. It is available with BNC connectors or S-Video connectors. A version with RCA connectors will be available in the future.

The incoming video is fed into the connector labeled “Video In”. The video input can be in either NTSC or PAL format. The resulting output video is available at the connector labeled “Video Out”. The output video is in exactly the same form as the incoming video except for the superimposed video crosshair generated by the XH300AS-*-R.

The XH300AS-*-R supports two different cursor types: a crosshair or a box formed by the double crosshair. The single crosshair designates a point on the screen where the video level is sensed. The double crosshair is used to designate a square area where the video level is sensed. While adjusting the cursor position, the position is displayed as a numeric value the bottom of the screen. When the adjustment is complete the position is saved in non-volatile memory. The cursor position will be restored when power is applied.

2. Specifications.

- Video standards supported: NTSC, PAL.
- Power requirements: 8 to 15 Volts, 80 mA.
- Input/output Impedance: 75 Ohms
- Cursor types: Crosshair and box.
- Control: Rotary encoder with press switch.
- AC Relay 240 Volts at 1 Amp.
- DC Relay 48 Volts 0.4 Amps.
- Video connectors BNC or S-Video connectors.
- Power connector. 2.1 mm DIN, center pin positive.
- ROHS Lead free.
- CE CE compliant.

3. Menu system.

The XH300AS-*-R menus allow you to select all features of the crosshair generator. To enter the menu system press and hold the knob down for about 15 seconds. When the message “Select cursor style” appears you are in menu mode and you may release the knob. Rotating the knob will step through the cursor style selections. To move to the next menu press the knob again. The message “Select cursor color” will appear. Rotate to select the color. The color can be varied continuously from black to white. Advance through each menu selection in the same way; by pressing the knob momentarily. If you do not move the knob for some time, menu mode will time out and return to normal mode and discard your choices.

Each menu selection is described below.

3.1 Select cursor style.

There are a number of different cursor types that can be selected. When in the cursor style selection menu, rotating the knob will cycle through all of the possible cursor choices. Each cursor type is described below.

3.1.1 Single crosshair cursor.

The single crosshair is composed of a single vertical line and a single horizontal line. When entering menu mode, the cursor will be moved to the default position at the center of the screen. The video level is sampled at the intersection of the crosshair.

3.1.2 Double crosshair cursor.

The double crosshair is composed of two vertical lines and two horizontal lines. The position of each line can be adjusted independently. While in menu mode the cursor position is moved to the default position at the center of the screen. The video level is sampled inside the box formed by the 4 lines.

3.2 **Select cursor color.**

This menu allows the setting of the cursor color which is continuously variable between black and white. As the knob is rotated the text and the cursor will change to the selected value. The cursor color does not change how the video level is sampled. Press the knob to advance to the next menu selection.

3.3 **Select cursor size.**

This allows the thickness of the cursor lines to be adjusted. The line thickness can be adjusted from a setting of 0 to 8. The default is 1.

The width of the cursor line does affect the sampled area in single crosshair mode. The video level is sampled on every scan line of the horizontal cursor. Thus, a thick cursor will result in more samples being taken at the center of the crosshair.

A point to consider with the 0 (thinnest) selection: this causes the horizontal line to appear in only one video field. This means that the cursors' refresh rate becomes 30 Hz (25 Hz for PAL). The normal video refresh rate is 60 Hz (50 Hz for PAL). This can result in unacceptable flicker on CRT type monitors. Generally this is not a problem on flat panel displays.

Press the knob to advance to the next menu selection.

3.4 **Select font size.**

The size of the text of the menu and the position status can be test to one of two sizes. This will make the text easier to read if the display is some distance from the user. The default is 1.

3.5 **Adjust time constant.**

This changes how rapid the XH300AS-*-R will respond to changes in the light level in the sampled area. If it is set to respond instantly, there may be some false triggering. It can

also be set to respond quite slowly which will tend to ignore transient changes in the video image.

Changing the time constant has an immediate effect. If you change the value you can see how the indicator responds to changes in the video scene. Waving your hand in front of the camera can demonstrate this effect.

The range is 1 to 11. 1 will give an instant response. 11 will give quite a slow response time. The default is 6 which results in a response time of about 1 second.

3.6 **Save settings?**

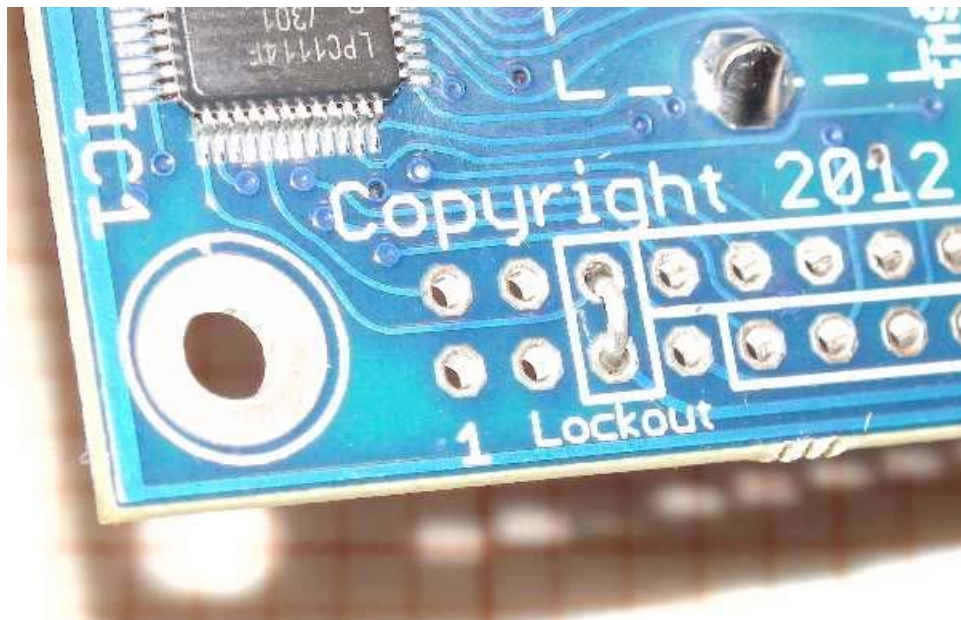
Rotating the knob allows you to choose to “Save” the current settings or “Discard” them. If you want to change some of your earlier choices you can cycle back through the menu system.

3.7 **Exit setup?**

You can choose to leave the menu system and return to normal operation. If you choose “Yes” it will exit the menus and save your selections or discard them depending on your choice in the previous menu. If you choose “No” you will cycle back through the menus from the beginning.

3.8 Menu lockout.

This is not a menu mode but rather a means of disabling the menu system. You might want to disable menus after setup to prevent users from making inadvertent changes in the settings. Disabling the menus achieved by soldering a jumper between pads 5 and 6 on DIP connector. You must connect only these two pads, 5 and 6 and no others. Other pads have the unregulated supply voltage on them that will destroy the chip if connected. This DIP connector has no other features that can be selected. There are no other features handled in this way, all other features are handled through the menus. Remove the jumper to restore the menus. The XH300AS-*-R shipped without the jumper in place. This is compatible with the relay version even though the position is populated with a connector. Simply short the same two pins.



Menu lockout jumper.

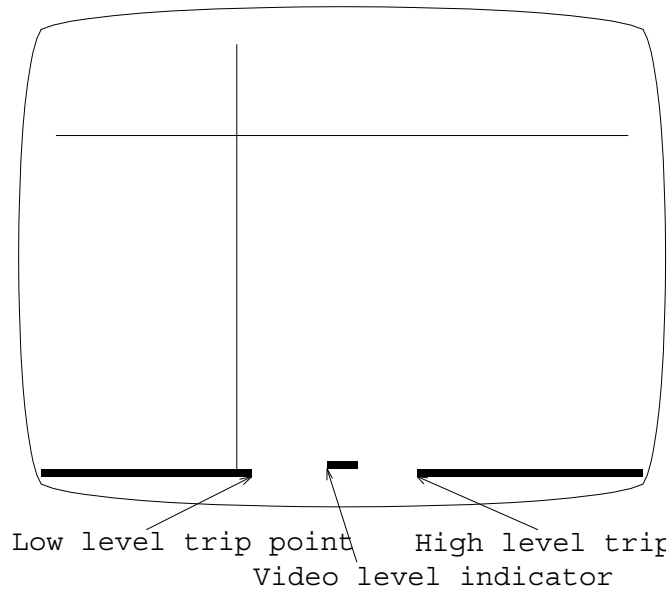
4. Cursor types.

4.1 Single crosshair.

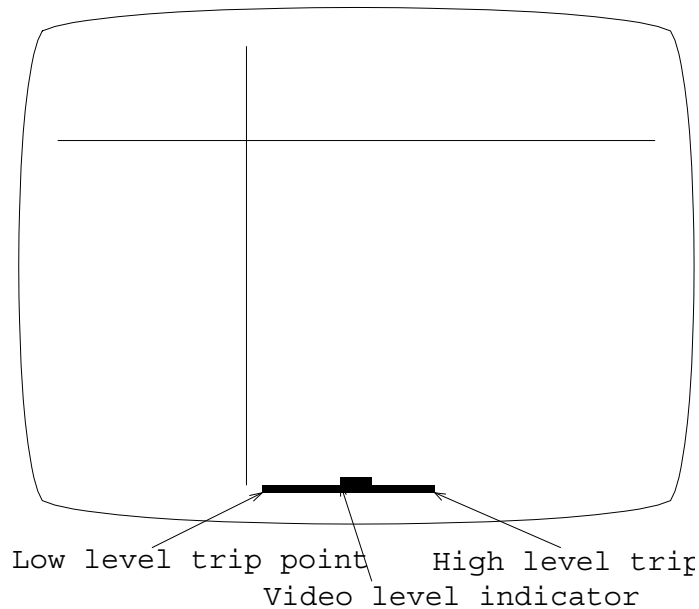
This produces a single vertical and a single horizontal line. The position of each line can be adjusted independently using the knob. The cursor adjustment mode is entered by pressing the knob momentarily. The first press will cause the horizontal cursor to flash. Rotating the knob will move the horizontal line up or down. When the horizontal cursor is at the desired position, press the switch again momentarily. The vertical cursor will begin to flash. Adjust the vertical cursor to the desired position.

The next two presses allow adjusting the relay trip points. This is further described in section 4.3. The video level is sampled at the center of the crosshair. The measured level is presented in the small slider labeled as the “video level indicator” in the picture below.

To exit the adjustment mode press the switch again, the rotary switch will become inactive and the current settings will be saved in permanent memory. When the settings are saved a message “Saved” will momentarily appear. If you do not exit the adjustment mode, the current settings will be saved after a moderate timeout.



Center open relay trip point display.



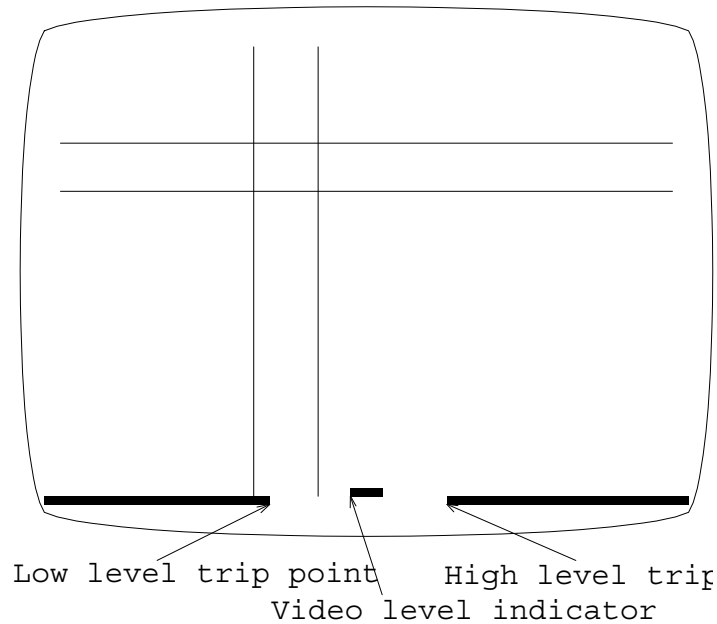
Center closed relay trip point display.

4.2 Double Crosshair.

The cursor adjustment mode is entered by pressing the switch momentarily. The first press will cause the first horizontal cursor to flash. Rotating the knob will move the cursor back and forth. When the first horizontal cursor is at the desired position, press the switch again. The second horizontal cursor will begin to flash and can be adjusted. With another press the first vertical cursor will begin to flash. Adjust the first vertical cursor to the desired position. Press again and the second vertical will flash and can be adjusted.

The next two presses allow adjusting the relay trip points. This is further described in section 4.3. The video level is sampled in the box formed by the double crosshairs. The measured level is presented in the small slider labeled as the “video level indicator” in the picture below.

To exit the adjust mode press the switch again, the rotary switch will become inactive and the current settings will be saved in permanent memory. If you do not exit the adjustment mode, the current settings will be saved after a timeout.



Center open relay trip point display.

4.3 Relay trip point settings.

The relay control settings are shown at the bottom of the display. There is a small video indicator that moves back and forth horizontally in response to the measured video level. As the image in the sampled area gets brighter the indicator moves to the right. A darker image will move the indicator to the left.

Below the indicator are one or two line segments that show the relay trip points. When the video level indicator moves past a relay trip point the relay will change state. When the video level indicator is over a solid trip point line the relay is energized. When the video level indicator is not over the open area the relay is energized. The trip point settings are adjustable as described next.

After setting the cursor positions, the next press of the knob allows adjusting the relay trip points. The first press will cause the low level trip point indicator to flash. Rotating the knob will move the trip point back and forth. Moving the low trip point all the way to the left will disable it. The message “disabled” will appear. This means that the low trip point is not active.

The next press of the switch will allow adjusting the high level trip point. The trip point indicator line on the right will begin to flash. Rotating the knob will move the trip point.

Moving the trip point all the way to the right will make it disappear and the “disabled” message will appear.

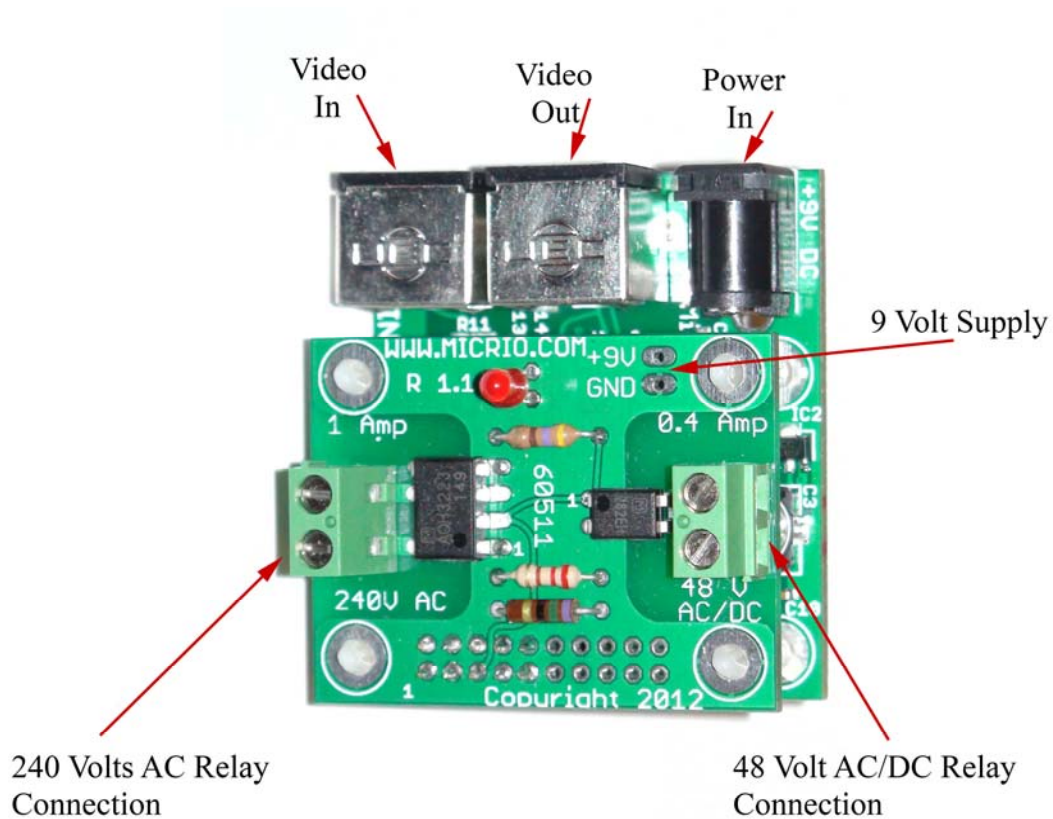
There are two trip point modes; center relay closed and center relay opened. The two modes are shown in two pictures in section 4.1. If there is only one trip point indicator line then you are in center relay closed mode. That means when the measured video level is above the low trip point but below the high trip point that the relay will be closed. If the measured video level goes higher or lower than the trip points it will open.

The center relay opened mode is just the opposite. In the center, between the trip points, the relay will be open.

To change from one mode to the other simply move the high trip point all the way to the left. At the left extreme the mode will flip and the trip points will be moved to their default positions near the center. After they flip the trip points can be adjusted normally.

5. Connections.

The XH300AS-*-R relays are on a daughter board with screw connections for external devices.



XH300AS-S-R shown

On the left is the high voltage connection for AC devices. The relay is optically isolated and supports voltages up to 240 volts and current up to 1 Amp. The relay is rated for 5,000 Volts AC isolation.

On the right is the low voltage connection for AC or DC devices. The relay is rated for voltages up to 48 volts and currents up to 0.4 Amps. The relay is rated for 1,500 volts AC isolation. The purpose of this second relay is to provide control for external DC devices. However, the relay is non-polarized and will work equally well for AC devices as long as the voltage is within the lower voltage specification of 48 volts.

Power is available to supply DC loads. This can be used along with the DC relay to power off board devices. The power is available at the 2 pin DIP header location labeled +9 volts. For example this can be used to drive an external solid state relay (SSR). The XH300AS-*-R will provide the power to drive the SSR relay's control. The pin labeled +9V is wired directly to the incoming power connected to the DIN connector labeled "Power In". The current is limited by the power available from the external supply but in no case should exceed 0.4 amps.

There is a LED to indicate when the relays are in the energized state. Both the high voltage relay and the low voltage relay operate at the same time.

The relay daughter board may be detached from the XH300 and driven through a ribbon cable. Please contact Micrio Associates Inc. to discuss this option.

6. Mounting.

There are two ways to mount the XS300AS-*-R; by the 4 mounting holes or by the threaded bushing. You should not use both at the same time because it will likely put stress on the switch and other components unless carefully aligned. The relay board is spaced 0.5 inches away and should be secured to the main board with spacers. Alternatively the relay board can be mounted separately and connected with a 20 conductor ribbon cable.

5.1 Mounting holes.

There are 4 mounting holes that can take either 3 mm metric screws or 4/40 American standard screws. This is the preferred mounting method. It results in the greatest strength for the video and power connectors. This also results in better cooling for the components.

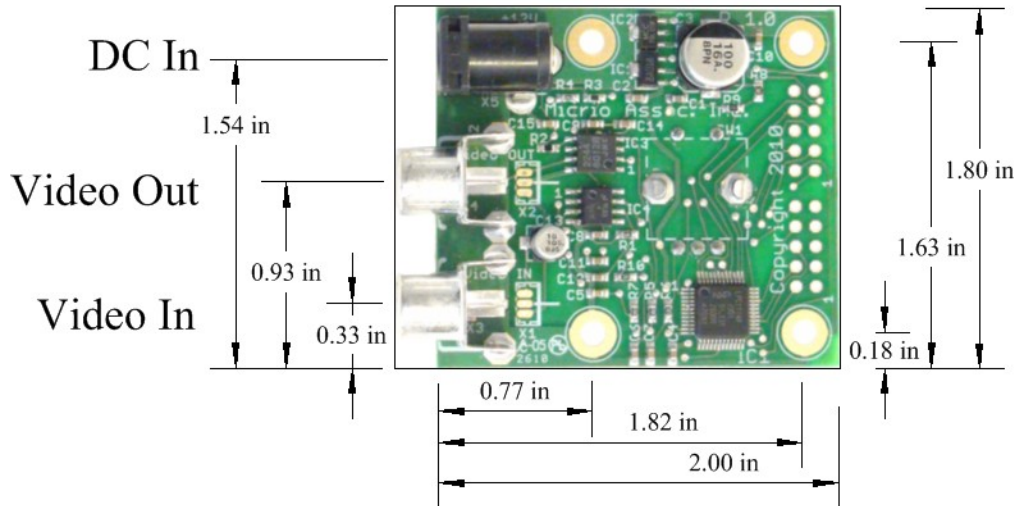
The BNC units may be mounted using the BNC connectors. Each BNC connector has a threaded section and a nut that can be used for mounting.

5.2 Switch bushing.

The switch has a 7 X .75 mm metric threaded bushing. Hardware is included that can be used to mount the XH300AS-*-R using the bushing. This should only be used if the video and power connectors are not normally changed. This is a less secure mounting method.

7. Mechanical drawings.

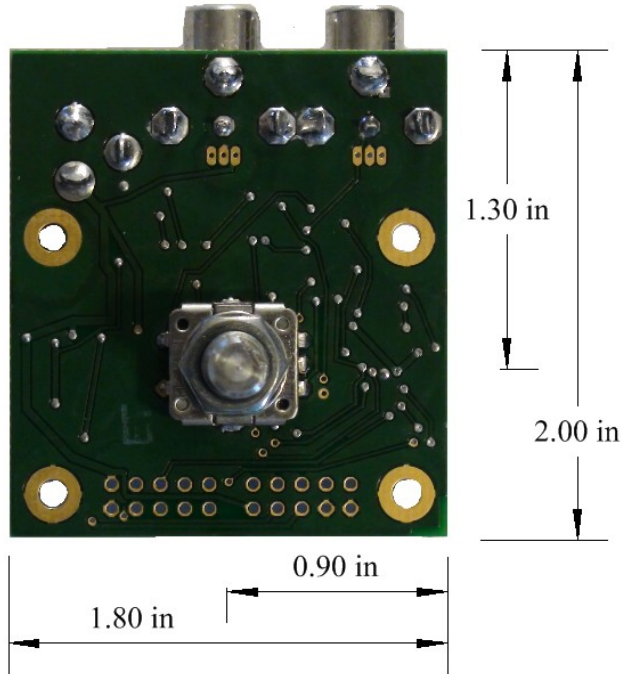
6.1 Component side view.



Board view, component side.

All measurements are from the corner of the board. All components except for the encoder switch are on the top of the board. All mounting holes are connected to the ground plane and to the ground terminal of all connectors. The DIP connector pattern is not used and should be left not connected except for disabling the menus as described earlier. The connector positions are the same for the BNC and S-Video connectors.

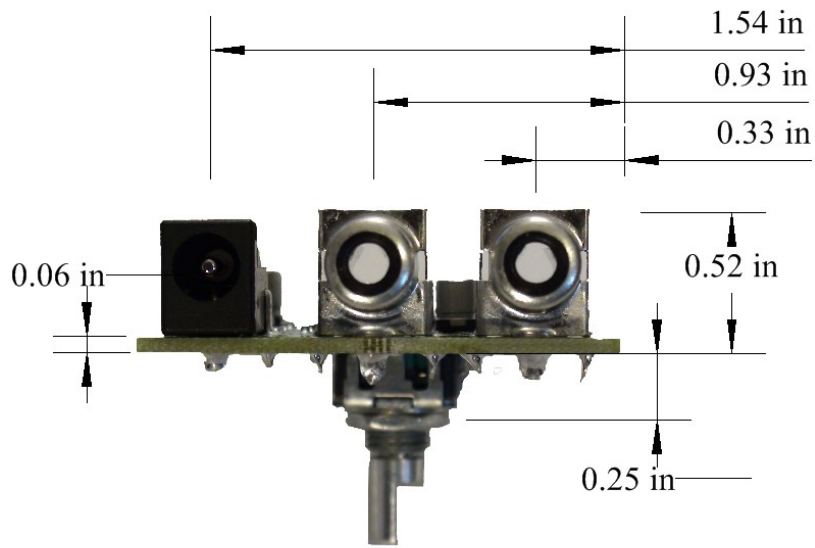
6.2 Control side view.



Board view, control side.

This shows the position of the cursor control from the reference corner of the board. The board dimensions for the BNC and S-Video units are the same.

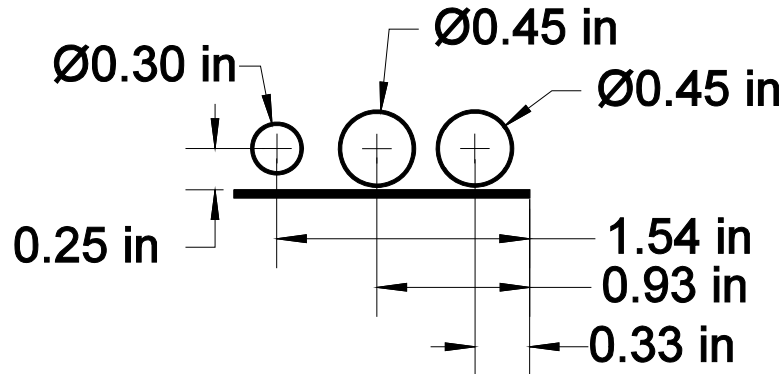
6.3 Connector Edge View.



Board view, connector edge.

This shows the position of the connectors from the reference edge of the board. The next section has the recommended cutout sizes for the connectors.

6.4 Recommended chassis holes.



Board view, from video connector edge.

This shows the recommended chassis punch out holes necessary to expose the RCA connectors. The encoder switch (not shown) is facing downward in this view. With the BNC and S-Video connectors the connector hole is increased to .5 inches in diameter but is otherwise the same.

8. Warranty.

This is Micrio's "we understand" warranty. We understand that our products sometimes fail before they should. We also understand that sometimes customers make mistakes and kill our products. We always want our customers to be happy with anything they purchase from Micrio.

If one of our products fails we want to make it right. You don't have to tell us what happened but we would like have an idea what caused our products to fail so that we can improve them. In this spirit Micrio will repair or replace any of our products for a period of one year after the date of purchase. We will do our best to make it right!

9. Customization.

The XH300AS has been designed with versatility in mind. The crosshairs and text are all generated in firmware. This allows a wide range of customizations for specialized needs. This product is able support a serial ASYNC interface with special firmware. There is a full ASCII text generator available for use in optional features. Special firmware could support a button interface rather than the knob. Contact www.micrio.com for any special needs.

There are two video connectors that are not populated. They are next to the existing video connectors and perform the same function, one for video in and the other for video out. They are Molex 1.25mm connectors, part number 53047-0310. They are compatible with the micro video cameras and board cameras that are commonly available. The incoming power is available on these connectors. Contact Micrio for more information.

10. Standards conformance.

The XH300AS-S-R and the XH300AS-B-R are designed using good engineering practices with regard to handling high voltages. However, these devices are sold as components to be integrated in other equipment. As such the customer is responsible for obtaining any necessary standards certifications.

