AirCleaner

Abekas AirCleaner
User Manual

v3.5

ROSS

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You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:

1. Provide a Superior Customer Experience
   - offer the best product quality and support

2. Make Cool Practical Technology
   - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at *solutions@rossvideo.com*.

David Ross

David Ross

CEO, Ross Video

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Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

Document Information

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FCC Compliance and User Information

The following information has been provided to clarify FCC requirements for operation of this device. These requirements are found in the FCC rules for radio frequency devices, Part 15.

Compliance

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

Important - Modifications & Shielded Cables

Changes or modifications to this product not authorized by Ross® Video Limited could void the FCC Compliance and negate authority to operate the product.

This product was tested for FCC compliance under conditions that included the use of Ross® Abekas® peripheral devices and Ross® Abekas® shielded cables and connectors between system components. It is important that Ross® Abekas® peripheral devices are used, and shielded cables and connectors are used between system components to reduce the possibility of causing interference to radios, television sets, and other electronic devices. Ross® Abekas® peripheral devices and the properly shielded cables and connectors can be obtained directly from Ross® Abekas®, or through a Ross® Abekas®-authorized dealer.

Safety and First Aid

Ross® Abekas® equipment is designed to the highest standards of quality and reliability. However, no matter how these systems are designed, operators and maintenance personnel can be exposed to electrical shock hazard when protective covers are removed for maintenance or the installation of options. With this caution in mind, each operator and engineer must observe all safety regulations, and have a clear understanding of first aid procedures related to electrical hazards.

Safety and Compliance Certifications

- Certified to IEC/EN-60950, EN-55103-1 and EN-55103-2

Power Information

To ensure safe operation and to guard against potential shock or risk of fire, ensure your AC power source for the system is within the required voltage range and frequency.

- Input AC Power Requirement: 100 to 240VAC / 3 to 1.5A / 60 to 50Hz

⚠️ **Warning:** *This device uses open-module power supplies with: **UNUSUALLY HIGH CURRENT and VOLTAGES!** The power supplies should NEVER*

*have external AC power connected when the chassis top cover is removed. Risk of **DEADLY electrical shock is EXTREMELY HIGH!** Always remove all AC power from main chassis BEFORE removing the chassis top cover. For units fitted with the redundant power supply option, be sure to remove BOTH AC power cords*

Operating Environment

The optimum operating environment is within the following ranges:

• Recommended Operating Temperature: 20°C to 35°C (68°F to 95°F)

• Recommended Operating Humidity: 20% to 80% non-condensing

Note: High temperature/humidity should be avoided at all times.

Safety Information

Important Safety Notices

This system complies with safety standard IEC/EN60950. To ensure safe option and to guard against potential shock hazard or risk of fire, the following must be fulfilled:

• This system features auto-ranging power supplies. Ensure that your power source is within the correct range of voltage and frequency, as required by the system.

• Each chassis in this system must be electrically grounded by connecting the input power cord(s) to a correctly wired and grounded power outlet.

Warning: Completely disconnect all input AC power cords from the chassis before removing the top cover from the chassis. Failure to do so will expose dangerous electric currents and voltages. Physical contact with these electric currents and voltages is extremely dangerous and may result in severe physical injury or death! Only qualified service personnel should remove the top cover from the chassis.

Warning Hazardous Voltages: Modules marked with this symbol may be removed while the system is operating (powered). After removing a module, beware of dangerous electric currents and voltages that are exposed on the module receptacle connector inside the chassis. Please keep fingers, tools, and foreign metal objects away from the exposed receptacle connector while the chassis has input AC power applied. Physical contact with these electric currents and voltages is extremely dangerous and may result in severe physical injury or death! Only qualified service personnel should remove these modules.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

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Technical Support

At Ross Video, we take pride in the quality of our products, but if a problem does occur, help is as close as the nearest telephone.

Our 24-Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support are provided directly by Ross Video personnel. During business hours (eastern standard time), technical support personnel are available by telephone. Outside of normal business hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. Our Technical support staff are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

Contents

Overview

AirCleaner® is a solid-state, all-digital video and audio delay machine for use in live-to-air television broadcasts. AirCleaner® is designed as a protection against "wardrobe malfunctions", spoken profanities, or any type of unwanted broadcast content. AirCleaner® offers multiple operating modes with the ability to mask video offenses with an auxiliary safe video source or a defocused live image. AirCleaner® will mask audio offenses with an auxiliary safe audio source or a mute.

AirCleaner® can be operated with either one or two screeners (operators that censor the live audio/video feed). In the case of two-screener operation, the total program delay internal to AirCleaner® can be divided between the two users (in any proportion desired).

AirCleaner® operates in either High-Definition (HD) or Standard-Definition (SD) digital video, with all of the popular video formats supported. AirCleaner® is equipped with 2 SD/HD SDI video inputs, 2 SD/HD SDI video outputs and has 1 analog reference input. AirCleaner® handles 8 channels (4 stereo pairs) of AES/EBU audio for each of the 2 video I/O streams. AirCleaner® can also utilized embedded audio in the SDI I/O streams.

Note: In SD 525 and 625 operation, AirCleaner® supports only 4-track (2 stereo pairs) of embedded digital audio, as defined by SMPTE specification.

AirCleaner® also features a single stereo analog audio monitoring output on a 3.5mm jack.

AirCleaner® comes in four configurations:

- **ACL-A** — Max Delay 5sec(HD), 34sec(SD)
- **ACL-B** — Max Delay 10sec(HD), 68sec(SD)
- **ACL-C** — Max Delay 35sec(HD), 68sec(SD)
- **ACL-D** — Max Delay 70sec(HD), 68sec(SD)

Options

All AirCleaner® models support the Redundant Power, Panic Button Control Panel, and Panel Button Y Cable options.

Redundant Power Supply

This option provides an additional power supply to guard against complete system failure in the event of a single power supply failure. Both power supplies operation in a load sharing configuration but AirCleaner® will run on a single power supply. In the event that one of the power supplies fails, the remaining operational power supply will automatically take over the complete power load.

Panic Button Control Panel

The Panic Button Control Panel provides a simple two-button interface (one button for Video, the other for Audio) that sits on a desktop and is connected to the AirCleaner® chassis via a DB9 cable.

The Panic Button Control Panel is used to trigger the video and/or audio mask in the event of a visual or aural offense. Pressing the specific button (**AUDIO** or **VIDEO**) will tell AirCleaner® to mask the content according to how the AirCleaner® is programmed. The masking will continue for the duration the button is held down.

The Panic Button Control Panel communicates to the AirCleaner® chassis over a standard GPI connection. The Panic Button Control Panel ships with a 33-foot shielded cable for connection to the GPI connector on the AirCleaner® chassis.

Panic Button Control Panel Y-Cable

AirCleaner® can be operated in a two screener mode that requires a second Panic Button Control Panel. This customized Y-cable is required to connect two Panic Button Control Panels to the AirCleaner® chassis. The Y-cable is connected to the rear of the AirCleaner® chassis and then the control cables for each of the two Panic Button Control Panels are connected to the Y-cable.

Operation

The unique architecture of AirCleaner® allows for multiple user modes consisting of one or two screeners, multiple trigger options and the ability to have two completely independent delay paths through the system with independent control of audio and video delay.

Although AirCleaner® was designed primarily as a device to screen out visual and aural obscenities and profanities, it also features an adjustable delay to offset audio relative to video and therefore may also find uses as an audio-to-video synchronization device.

Realizing that every broadcast facility is designed for a unique work-flow, AirCleaner® in turn is designed with maximum flexibility in mind. AirCleaner® provides the flexibility required to meet a multitude of needs.

AirCleaner® can be quickly and easily configured by the user to provide either one-screener or two-screener operation. With two-screener operation, the internal delay can be split between the two screeners in any proportion desired; each of these screeners also has their own parameters for reaction time, individually adjustable for both audio and video. AirCleaner® also offers a simple way to offset the audio and video delay to compensate for timing or synchronization errors in the incoming audio/video feed.

Theory of Operation

The basic operation of AirCleaner® is described below. Only the video pathway is described, and the basic increment of time is one second (with up to 30 frames included in each second, depending on the video format).

In this example, AirCleaner® is programmed with the following parameters:

- Screeners = One
- Total PGM Delay = 40:00
- Video Reaction 1 = 2:00
- On Video Trigger = Defocus
- Defocus Ramp = 0:00

This example begins at an arbitrary time zero (00:00) as shown by the stop watch timer. As this example progresses, the stop watch timer advances as the violation segment of video shifts rightward through the video pipeline.

The real-time defocus engine is positioned at the end of the video pipeline in AirCleaner®, and is normally switched out of the video pathway. As you will see, when the first video frame that is marked as the start of violation reaches the end of the delay pipeline, AirCleaner® then automatically switches the video output to the processed output of the real-time defocus engine

Time 00:00

The current video that the screener is looking at is safe, with no violations. There are violations coming (marker with an **X**) in the next 5 seconds. Each box in the figures below represent 1 second. The **0** frame will also advance through the delay.
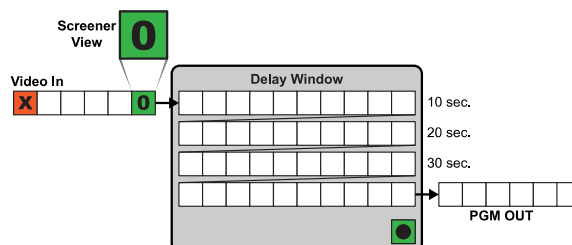

Time 05:00

Five seconds have elapsed and the first frame of the violation appears on the screener's video monitor as it enters the AirCleaner®. The screener must now react and press the panic button.
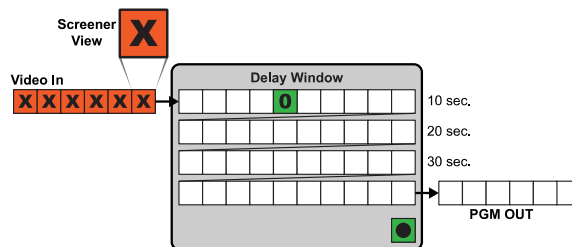
Time 06:00

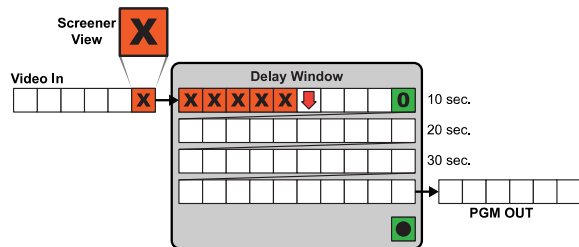After another second the screener recognizes the violation and pushes the panic button and holds it. Since the Reaction Time for this screener is set for 2:00 seconds, the button trigger is advanced forward in time, and is marked in the video one second before the violation.
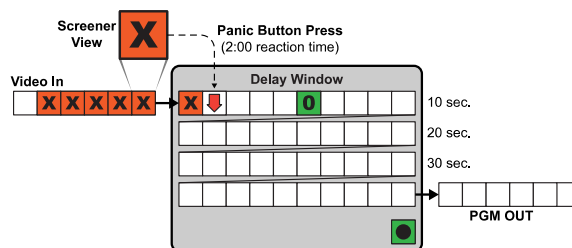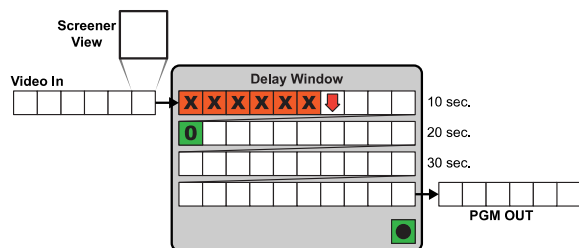

Time 10:00

After four more seconds the screener is still seeing a violation on their monitor and is still pressing the panic button.
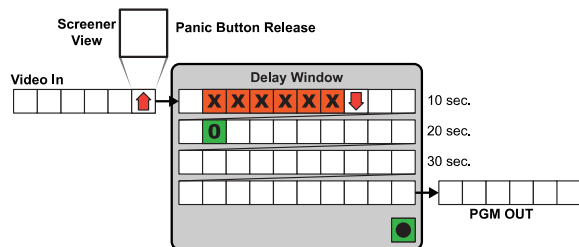
Time 11:00

After another second the violation is over. The screener must now react and release the panic button.


Time 12:00

Another second later and the screener has released the panic button. AirCleaner® marks that frame of video as the end of the violation (as shown by the upward arrow).

Note: *The button release is not advanced by the Reaction Time parameter.*


Time 20:00

Eight seconds later the violation is progressing through the video pipeline delay. The start and end of the violation (as depicted by the two arrows) are marked to tell the system when to switch to the real-time defocus engine or aux in video feed.
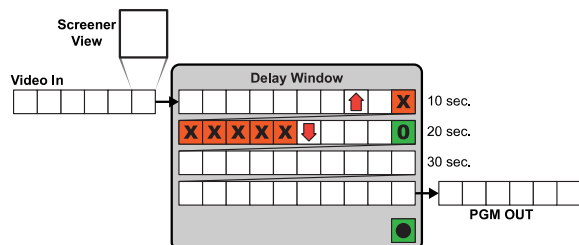
Time 43:00

After twenty-three more seconds the violation is near the end of the video pipeline delay. The first frame that was marked as the start of the violation is just one second away from triggering the system.
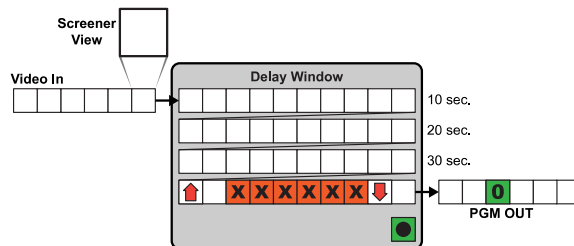
Time 44:00

One second later the first frame of the violation has arrived at the trigger point. If the defocus is being used the video is routed to the real-time defocus engine.

Tip: *If the Defocus Ramp is set, AirCleaner® starts the fade (ramp) to the defocus level before the frame marked as the start of the violation so that the defocus is fully applied for that frame.*
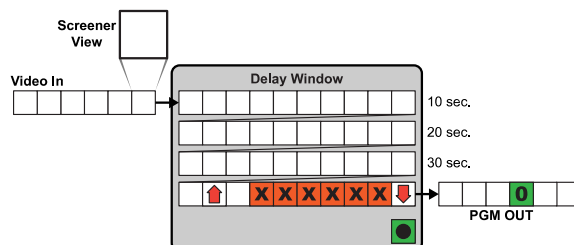
Time 45:00

After another second the aux in video feed is cut in or the video is exiting the defocus engine. The first second of the video before to the violation is now defocussed or replaced and is fed out the PGM OUT.
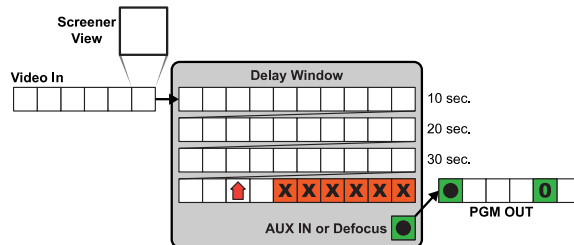
Time 50:00

After five more seconds the end of the violation is nearing the trigger point. The previous six seconds of video have been defocussed or replaced and fed out the PGM OUT.
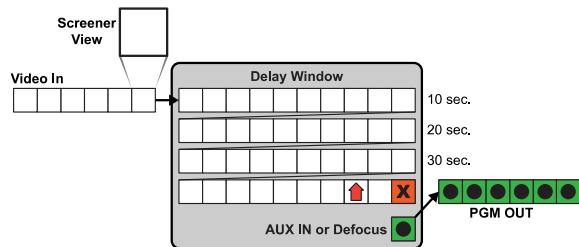
Time 51:00

One second later the first non-violation frame arrives at the trigger point. However, the panic button release marker (as depicted by the upward arrow) has not reached the trigger point yet. The video is still masked or replaced.
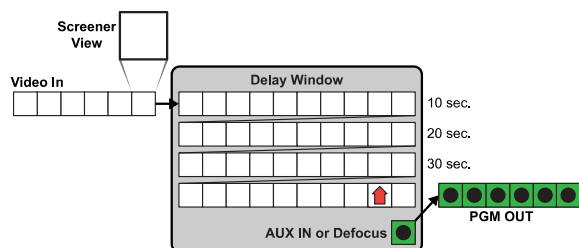
Time 52:00

After another second the panic button release marker has reached the trigger point and if a defocus is being applied the real-time defocus engine starts to fade out.
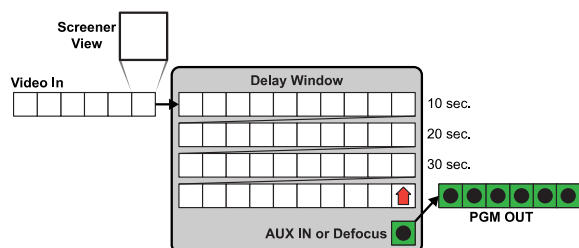
Time 53:00

One second later the aux in video feed has been cut out or the real-time defocus engine has been removed from the video pathway. The video output now shows the normal unprocessed video. The 40 seconds video delay is still applied.
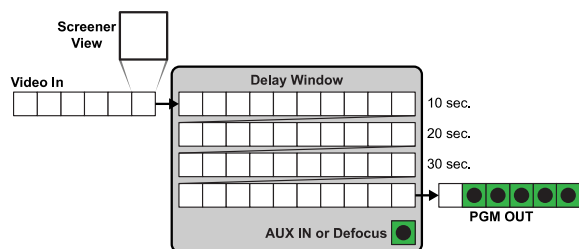
Menu System

The menu system is accessed using the two-line display, and **SELECT** and **SET** knobs on the front of the chassis.

Menu Navigation

The menu system allows you to access all of the setup and configuration information on the AirCleaner®. When navigating the menus, the **SELECT** knob is used to select the menu item you want to adjust. This is typically on the top line of the display. The **SET** knob is used to adjust the value of the menu item and it typically on the bottom line of the display.

*Note: Changes made on the **Main Menu** are applied immediately but changes made on the **Options Menu** are only applied after they are saved. Keep this in mind when using AirCleaner® during a live production.*

*Tip: For long lists you can press and hold the **SELECT** knob and use the **SET** knob to jump through the list quickly. Release the **SELECT** knob and use the **SET** knob for normal operation again.*

Menu Trees

The menu system consists of three main branches (**Main Menu**, **Options Menu**, **User Memory Menu**), each allowing quick access to specific areas of system configuration or control. When you exit the **Options Menu** or **User Memory Menu** you are taken back to the first item on the **Main Menu**.

Menu Lock

You can lock the menu system to prevent the accidental selection or change of parameters using the knobs. The menu lock only turns off the functionality of the knobs and does not prevent changes from other menu interfaces.

To Lock/Unlock the Menu System

The procedure to lock or unlock the menu system is the same.

Use the **SELECT** knob to select **Menu Lock Now** and press the **SET** knob.

*Tip: You can also press the **SELECT** and **SET** knobs at the same time.*

To Turn the Menu Auto-lock On

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.
2. Use the **SELECT** knob to select **Menu Lockout**.
3. Use the **SET** knob to turn the auto-lock on and set the sleep time.
   - **OFF** — the menu will not lock automatically.
   - *XX* **Seconds** — the menu will lock automatically after the set amount of time. (10 to 60 Seconds)
4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

Video Reference

AirCleaner® accepts either Bi-Level or Tri-Level analog reference. SD video signals can only be locked to a Bi-Level external reference signal (or to the video input or free run). HD video signals can be locked to either Tri-Level or Bi-Level reference, as long as the frame rate of the video and the reference signal are matched.

The reference signal will lock both the PGM OUT and TAP OUT together in time with the reference signal. The reference input is internally terminated (no loop-thru).

Reference can also be set to lock to the PGM IN or AUX IN video signal or set to free run.

The input video format must be at the same frame-rate as the input reference signal.

To Set the Video Reference Type

All audio/video outputs from the system will be locked to the reference source.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.

2. Use the **SELECT** knob to select **Genlock**.

3. Use the **SET** knob to select the reference type you want to use.

    *   **Free Run** — audio/video outputs are not locked to any reference signal.
    *   **PGM Video IN** — audio/video outputs are locked to the SDI video signal present on the PGM IN BNC.
    *   **AUX Video IN** — audio/video outputs are locked to the SDI video signal present on the AUX IN BNC.
    *   **Bi-Lvl REF IN** — audio/video outputs are locked to the Bi-Level sync analog video signal present on the REF IN BNC.
    *   **Tri-Lvl REF IN** — audio/video outputs are locked to the Tri-Level sync analog video signal present on the REF IN BNC.

4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

To Adjust Video Timing

You can adjust the timing of the output video for both the PGM OUT and TAP OUT.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.

2. Use the **SELECT** knob to select **H OUT Timing**.

3. Use the **SET** knob to adjusts the horizontal position of the PGM OUT and TAP OUT SDI video signals, in pixels, relative to the reference source. (0 to max)

4. Use the **SELECT** knob to select **V OUT Timing**.

5. Use the **SET** knob to adjusts the vertical position of the PGM OUT and TAP OUT SDI video signals, in lines, relative to the reference source. (-10 to 10)

6. Use the **SELECT** knob to select **Pix Vert. Shift**.

7. Use the **SET** knob to adjusts the vertical picture position of the PGM OUT and TAP OUT SDI video signals relative to the reference source. (0 to 50)

8. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

Screeners

AirCleaner® can be operated with either one or two screeners (operators that censor the live audio/video feed). In the case of two-screener operation, the total program delay internal to AirCleaner® can be divided between the two users (in any proportion desired).

Related information

Delays and Offsets on page 14

To Set the Number of Screeners

Either one or two screeners are supported. All screeners share the total delay time provided by the system.

1. Use the **SELECT** knob to select **Screeners**.

2. Use the **SET** to select the number of screeners.

   - **One** — the total program delay is applied to this single user. Screener 1 monitors the incoming audio/video.

   - **Two** — the total program delay is split between the two screeners. Screener 1 monitors the incoming audio/video and screener 2 monitors the audio/video output from the TAP OUT BNC.

When you select two screeners, separate delay and reaction times are available for each screener.

Delays and Offsets

Delays are used to set the amount of time each screener has to catch a violation. The system has a total amount of delay (Total PGM Delay) that can be divided up between the two screeners. Each screener can also be assigned a video and audio reaction time offset to compensate for that particular user.

An audio offset is also available to compensate for any audio/video synchronization issues.

Total PGM Delay

The Total PGM Delay is the total delay, in seconds, applied to the audio/video stream by the system between the PGM IN and the PGM OUT. If you have a single screener, they get the entire delay interval. If you have two screeners, the delay interval is divided between the two screeners with the Screener 2 Delay parameter determining how much of the total delay is allocated to screener 2.

To Set the Total PGM Delay

This parameter has a variable range that depends on the video format of the system is operating in, as well as the amount of delay memory installed.

1. Use the **SELECT** knob to select **Total PGM Delay**.
2. Use the **SET** knob to select the amount of delay you want to use. (0 to max)

   The maximum amount of time available depends on the model of AirCleaner® you have and the video format you are working in. The higher the format, the less time is available.

Audio PGM Offset

The PGM Audio Offset is used to correct any audio-to-video synchronization errors on the incoming audio/video. If an upstream device causes the audio to be 'slipped' in time with respect to the video, this parameter can correct the audio/video synchronization.

The maximum possible audio offset that can be programmed is +/–10 seconds, depending on the current Total PGM Delay value. The range of the audio offset will decrease if the total program delay is set below 10 seconds.

To Set the PGM Audio Offset

This adjusts the offset applied to the audio relative to video in tenths of a second to correct synchronization errors.

1. Use the **SELECT** knob to select **PGM Audio Offset**.
2. Use the **SET** knob to select the amount of offset you want to apply to the audio.

   - **-X** — to advance the audio relative to video (which decreases the audio delay) a value up to the value of the current Total PGM Delay can be selected, or to a maximum of –10 seconds (whichever is smaller).

   - **+X** — to delay the audio relative to video (which increases the audio delay) a value up to the value of the current Total PGM Delay parameter can be selected, or to a maximum of +10 seconds (whichever is smaller).

Screener 2 Delay

The Screener 2 Delay is the amount of the total delay that is assigned to screener 2. This delay is applied for screener 2 on the TAP OUT feed.

If Total PGM Delay is set to 8:00 seconds, and the Screener 2 Delay is set to 3:00 seconds, then the PGM IN feed is delayed by 3:00 seconds before arriving at the TAP OUT for screener 2. It then takes an additional 5:00 seconds for the audio/video to arrive at the PGM OUT.

To Set the Screener 2 Delay

This adjusts the delay between the audio/video on the PGM IN feed versus the TAP OUT by selecting how much of the total delay is allocated to screener 2.

1. Use the **SELECT** knob to select **Screener 2 Delay**.
2. Use the **SET** knob to select the amount of delay you want to assign to screener 2. (0:01 to Total PGM Delay)

   The maximum amount of time available depends on the model of AirCleaner® you have and the video format you are working in. The higher the format, the less time is available.

Video Reaction Times

The Video Reaction selects the reaction time delay for a screener when the Video Panic Button for that screener is pressed. In a two-screener system there are separate reaction times for both screeners. This will back-time the button press to compensate for the time it takes the screener to see a violation and then press the VIDEO panic button.

To Set the Video Reaction Time

This allows the system to compensate for the amount of time it takes for a screener to see a violation and press the panic button. The inpoint for the violation is set back this amount to compensate for the reaction time.

1. Use the **SELECT** button to select the video reaction you want to set.

   - **Video Reaction 1** — the video reaction offset for screener 1.
   - **Video Reaction 2** — the video reaction offset for screener 2. (Screeners must be set to TWO)

2. Use the **SET** knob to select the amount of reaction time in seconds. (0 to max)

   The maximum amount of time available depends on the model of AirCleaner® you have and the video format you are working in. The higher the format, the less time is available.

> **Tip:** Although it may be tempting to program an extremely large reaction time, there are pitfalls of doing so. A very large reaction time can cause the violation trigger to be advance so far ahead of the actual violation that a large amount of non-violation content will be lost.

Audio Reaction Times

The Audio Reaction selects the reaction time delay for a screener when the Audio Panic Button for that screener is pressed. In a two-screener system there are separate reaction times for both screeners. This will back-time the button press to compensate for the time it takes the screener to hear a violation and then press the Audio panic button.

To Set the Audio Reaction Time

This allows the system to compensate for the amount of time it takes for a screener to hear a violation and press the panic button. The inpoint for the violation is set back this amount to compensate for the reaction time.

1. Use the **SELECT** button to select the audio reaction you want to set.

   - **Audio Reaction 1** — the audio reaction offset for screener 1.
   - **Audio Reaction 2** — the audio reaction offset for screener 2. (Screeners must be set to TWO)

2. Use the **SET** knob to select the amount of reaction time in seconds. (0 to max)

   The maximum amount of time available depends on the model of AirCleaner® you have and the video format you are working in. The higher the format, the less time is available.

> **Tip:** Although it may be tempting to program an extremely large reaction time, there are pitfalls of doing so. A very large reaction time can cause the violation trigger to be advance so far ahead of the actual violation that a large amount of non-violation content will be lost.

Trigger Stretch

The Trigger Stretch setting works with the Video and Audio Reaction Time settings to extend the masking of the violation after a panic button is released. This works in the same way as the Video and Audio Reaction Time to back-time the button release to compensate for the time it takes the screener to see or hear the end of a violation and then release either the Video or Audio Panic Button.

> **Note:** Ross Video recommends leaving this setting on (**YES**).

Video Setup

AirCleaner® provides 2 SDI BNC video inputs with embedded audio (**PGM IN** and **AUX IN**) and 2 SDI BNC video outputs with embedded audio (**PGM OUT** and **TAP OUT**). A single **REF IN** BNC provides external reference to the system.

Video Connections

All SDI inputs operate in the same video format that the associated output is set to.

> *Tip:* The LED next to the PGM IN, AUX IN, and REF IN is on if an input signal is detected and locked on that input. If the LED is flashing or off there is a problem with the video signal. The LEDs next to the PGM OUT and TAP OUT are always on.

- **PGM IN** — the main video feed coming into the system that audio and video delays can be applied to. Audio delays are applied to the 8 channels of associated audio.
- **PGM OUT** — the main "Live to Air" video feed coming out of the system that the audio and video delays are applied to.
- **AUX IN** — the safe video feed that the system switches to when the video panic button is pressed. The system can be set to use a defocus instead of the aux video. The embedded audio from this video source can also be used.
- **TAP OUT** — the monitor out used in a two-screener work-flow. This video feed is downstream of the delay window used by the first screener and allows the second screener to monitor video coming into their own delay window.

Supported Video Formats

The system supports a number of video format.

- SD 525i (480i) 59.94Hz
- SD 625i (576i) 50Hz
- 720p 50Hz
- 720p 59.94Hz
- 1080p 25Hz
- 1080p 29.97Hz
- 1080p 30Hz
- 1080i 50Hz
- 1080i 59.94Hz

To Set the Video Reference Type

The Video Format parameter determines the video format of all the video inputs and outputs of the system.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.

2. Use the **SELECT** knob to select **Video Format**.

3. Use the **SET** knob to select the video format you want the system to operate in.

4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

Audio Setup

AirCleaner® provides 8 channels of AES/EBU digital audio on 4 dedicated BNC inputs per video input (PGM IN, AUX IN) and output (PGM OUT, TAP OUT). Embedded audio on the video inputs/output is also supported.

Audio Connections

All AES/EBU digital audio inputs and outputs operate at the same 48kHz @ 24bit rate. Each BNC supports 2 channels, or a stereo pair.

- **PGM IN** — the digital audio inputs that are associated with the PGM IN SDI video input.
- **PGM OUT** — the delayed "Live to Air" digital audio output that is associated with the PGM OUT SDI video output.
- **AUX IN** — the safe audio feed that the system switches to when the audio panic button is pressed. The system can be set to use a mute instead of the aux audio.
- **TAP OUT** — the audio out used in a two-screener work-flow. This audio stream is downstream of the delay window used by the first screener and allows the second screener to monitor audio coming into their own delay window.

A 3.5mm female stereo jack (**STEREO ANALOG AUDIO OUTPUT**) provides monitoring of analog audio output. You can monitor any stereo pair from the PGM OUT audio output. The output level is 0dBmV. The Analog Audio OUT parameter in the Main Menu controls the audio source selection for this output jack and the Analog Audio Vol parameter controls the volume.

To Select the Audio Source for PGM IN

Select the source of the audio that is used for the PGM In.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.
2. Use the **SELECT** knob to select **PGM IN Audio**.
3. Use the **SET** knob to select the audio source for the PGM In.
   - **AES** — the 4 PGM IN AES audio BNCs.
   - **SDI Embedded** — the embedded audio in the PGM IN SDI video signal on the PGM IN BNC.
4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

To Select the Audio Source for AUX IN

Select the source of the audio that is used for the AUX In.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.
2. Use the **SELECT** knob to select **AUX IN Audio**.
3. Use the **SET** knob to select the audio source for the AUX In.
   - **AES** — the 4 AUX IN AES audio BNCs.
   - **SDI Embedded** — the embedded audio in the AUX IN SDI video signal on the AUX IN BNC.
4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

To Configure the Analog Audio Out Jack

You can select the source and audio level that is fed out of the analog audio headphone jack.

1. Use the **SELECT** knob to select **Analog Audio OUT**.
2. Use the **SET** knob to select the audio source for the headphones.
   - **PGM OUT 1/2** — monitor program audio channels 1 and 2.
   - **PGM OUT 3/4** — monitor program audio channels 3 and 4.
   - **PGM OUT 5/6** — monitor program audio channels 5 and 6.
   - **PGM OUT 7/8** — monitor program audio channels 7 and 8.
3. Use the **SELECT** knob to select **Analog Audio Vol**.
4. Use the **SET** knob to select the volume for the headphones. (0 to 255)

To Embed Audio in the SDI Outputs

You can embed the audio out into the SDI video output on the PGM OUT and TAP OUT output BNCs.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.
2. Use the **SELECT** knob to select **Embed. Audio OUT**.
3. Use the **SET** knob to select whether the audio is embedded in the PGM and TAP SDI outputs (**ON**), or not (**OFF**).
4. Use the **SELECT** knob to select **Save Changes** and press the **SET** knob to select **OK**.

Panic Setup

AirCleaner® canViolations be set up to either defocus any violation content or replace it will the aux in feed. This applied to both audio and video violations.

To Configure Video Panic Setting

The video panic settings tell the system how to react when the video panic button is pressed.

1. Use the **SELECT** knob to select **On Video Trigger**.

2. Use the **SET** knob to select how the system reacts to a video panic button trigger.

   - **Defocus** — visual violation is covered by defocusing the live image. The amount of defocus is determined by the Defocus Level parameter.

   - **Luma Matte** — visual violation is covered by switching to a flat-screen luminance matte image. The luminance value of matte image is determined by the Luma Matte Level parameter.

   - **AUX IN** — visual violation is covered by switching to the AUX IN video.

3. (Defocus Only) Use the **SELECT** knob to select **Defocus Level**.

   a) Use the **SET** knob to select the amount of defocus you want to apply to cover a video violation. (0 to 100)

   > *Tip:* To help determine the amount of defocus you need, feed sample video through the system and press the video panic button. While holding the video panic button you can adjust the amount of defocus.

4. (Defocus Only) Use the **SELECT** knob to select **Defocus Ramp**.

   a) Use the **SET** knob to select the amount of time to fade the defocus effect in. (0 to max)

   > *Note:* The defocus ramp is applied along with the reaction time. This means, for example, that the defocus fade could start the value of the ramp time (1:00) before the value of the reaction time offset (2:00) is applied, resulting in the defocus fade starting the cumulative time (3:00) before the trigger point.

5. (Luma Matte Only) Use the **SELECT** knob to select **Luma Matte Level**.

   a) Use the **SET** knob to select the amount of luma matte to apply. (0 to 100)

   > *Tip:* To help determine the amount of luma matte you need, feed sample video through the system and press

> the video panic button. While holding the video panic button you can adjust the amount of luma matte.

To Configure Audio Panic Setting

The audio panic settings tell the system how to react when the audio panic button is pressed.

1. Use the **SELECT** knob to select **On Audio Trigger**.

2. Use the **SET** knob to select how the system reacts to an audio panic button trigger.

   - **Mute** — aural violation is masked by muting the audio.

   - **Audio AUX IN** — aural violation is masked by switching to the Audio AUX IN audio signal.

Memories/Setups

The system can store up to three (3) complete snapshots of the current configuration. These setups can be recalled to easily reconfigure the system for different events, screener with custom reaction times, or work-flows.

⚠️ **Important:** *Do not save or recall a setup while live on-air.*

To Save a Setup

Save the current configuration of the system to a user memory register.

1. From the **Main Menu**, use the **SELECT** knob to select **User Memory Menu** and press the **SET** knob.

2. Use the **SELECT** knob to select the memory register you want to save the setup to.

3. Press **SAVE** and **OK** to save the setup to the selected memory register.

4. Use the **SELECT** knob to select **Finished** and press the **SELECT** knob to select **YES**.

To Load a Setup

Load a setup from a user memory register. The current configuration is lost.

1. From the **Main Menu**, use the **SELECT** knob to select **User Memory Menu** and press the **SET** knob.

2. Use the **SELECT** knob to select the memory register you want to load the setup from.

3. Press **LOAD** and **OK** to load the setup from the selected memory register.

4. Use the **SELECT** knob to select **Finished** and press the **SELECT** knob to select **YES**.

Network Setup

AirCleaner® is equipped with a single ethernet port to allow remote access for upgrades over FTP.

The system does not require an IP address to operate.

To Set the IP Address

The factory default IP address is 192.20.200.240. You can change this to another address to better integrate into your facility.

Note: *The AirCleaner® does not support DHCP.*

1. Open a web browser and navigate to the IP address of the AirCleaner®.

2. Enter the new network settings in the **IP Address**, **Subnet Mask**, and **Gateway** fields.

3. Click **Update IP Settings**.

   The ethernet subsystem of the AirCleaner® restarts with the new network settings.

4. Wait 45 seconds for the ethernet subsystem to reboot. The amber LED will be on and the green LED blinking when the reboot is complete.

Maintenance

Refer to the following information for performing maintenance on your AirCleaner®, restoring factory defaults, or upgrading the software.

To Bypass AirCleaner®

The system can be set into bypass mode for maintenance or troubleshooting. This turns off all delays and routes the inputs directly to the outputs.

⚠️ *Important:* *Bypass rewrites the audio/video delay buffers causing a momentary glitch on the audio/video outputs. Depending on whether you are going into or out of bypass, the video may freeze and the audio mute.*

Swing the clear plastic cover over the **MANUAL BYPASS** button up and press the red button.

The **MANUAL BYPASS** button will light up, indicating that bypass is active.

When the bypass relays are active, the PGM IN audio/video is routed directly to PGM OUT with no delay in the pathway. The menu parameters will not be active at this time and the STEREO ANALOG AUDIO OUTPUT jack will not be active.

To Check the Model and Software Version

Press both the **SELECT** and **SET** buttons at the same time and release them.

The top line of the display shows the model and delay cache of the system and the second line of the display show the current version of software.

To Factory Default the System

All menus and settings can be returned to the settings when the system left the factory.

1. From the **Main Menu**, use the **SELECT** knob to select **Options Menu** and press the **SET** knob.
2. Use the **SELECT** knob to select **Factory Defaults** and press the **SET** knob.
3. Press the **SELECT** knob to recall the factory default settings.

To Upgrade the Software and Firmware

To perform the upgrade you must FTP the files onto the system and then run the upgrade using those files.

1. Download the AirCleaner® `fpga.bin` file from the Ross Video website.
2. Create an FTP connection to the AirCleaner®. The user name is `root` and the password is `Netsilicon`.
3. Copy the `fpga.bin` file to the root directory on the AirCleaner®.
4. Close the FTP connection.

Note: *The QUIT command resets the ethernet module. Wait for 60 seconds and look for the green LED on the ethernet port to start blinking.*

5. Open a web browser and navigate to the IP address of the AirCleaner®.
6. Click **Go to FPGA update Page**.
7. Click **Program Xilinx Flash Utility** to start the upgrade.

⚠️ *Important:* *Do not remove power from the system during the FPGA upgrade. The Xilinx Flash programming takes about 35 minutes to complete. Removing power from the system during the upgrade will damage the hardware.*

8. When `Program Complete - Repower Unit` is shown on the webpage, it is safe to disconnect power from the system.
9. Wait for 15 seconds and reconnect power to the system.

AirCleaner® will power on with the new software installed.

Specifications

Resources, video specifications, power rating, and port pinouts.

The information is this section is subject to change without notice.

AirCleaner® Resources

The number of resources specific to your AirCleaner® depends on the model.

Resource	ACL-A	ACL-B	ACL-C	ACL-D
Video Inputs	2			
Video Outputs	2			
Audio Inputs per SDI I/O	8 channels (4 stereo pairs)			
Audio Outputs	8 channels (4 stereo pairs)			
Delay (HD)	5 sec	10 sec	35 sec	70 sec
Delay (SD)	34 sec	68 sec	68 sec	68 sec
Default IP	192.20.200.240			
Default Subnet Mask	255.255.255.0			
Default Gateway	0.0.0.0			

Operating Temperature

The system has been qualified at an operational temperature range of **20-35°C** (**68-95°F**) and a non-condensing humidity range of **20-80%**.

Note: *Operator is responsible for providing sufficient ventilation to maintain surface temperature below 40°C (104°F) at the center of the top cover of the media drive.*

Note: *Non-condensing conditions should be maintained at all times.*

Note: *Maximum storage period inside shipping package is one year.*

Video/Audio Input Specifications

Specification	Value
Video Inputs, SDI	HD: SMPTE 292M 10-bit at 1.5Gb/s serial digital
	SD: SMPTE 259M 10-bit at 270Mb/s serial digital

Specification	Value
Embedded Audio	HD: 16 Tracks, AES/EBU 48kHz at 24-bit, 8 Tracks (4 stereo pairs) per PGM IN/AUX IN.
	SD: 4 Tracks, AES/EBU 48kHz at 20-bit, 4 Tracks (4 stereo pairs) per PGM IN/AUX IN.

Video/Audio Output Specifications

| Specification	Value
Video Outputs, SDI	HD: SMPTE 292M 10-bit at 1.5Gb/s serial digital
	SD: SMPTE 259M 10-bit at 270Mb/s serial digital
Embedded Audio	HD: 16 Tracks, AES/EBU 48kHz at 24-bit, 8 Tracks (4 stereo pairs) per PGM OUT/TAP OUT.
	SD: 4 Tracks, AES/EBU 48kHz at 20-bit, 4 Tracks (4 stereo pairs) per PGM OUT/TAP OUT.
Analog Audio Monitoring Output	3.5mm headphone connector, unbalanced, line-level at -10dBv, 2 Tracks (1 stereo pair), user selectable to monitor any stereo pair (input or output)

Power Rating

Input AC Power Requirement:

- 100 to 240VAC
- 3 to 1.5A
- 60 to 50Hz

GPI Port

The GPI port on the back of the chassis is used to connect the external panic button panel. The four GPI inputs are fixed to a video and audio panic trigger for screeners one and two. All GPIs are level triggered and remain triggered for as long as the button is pressed (the circuit is closed).
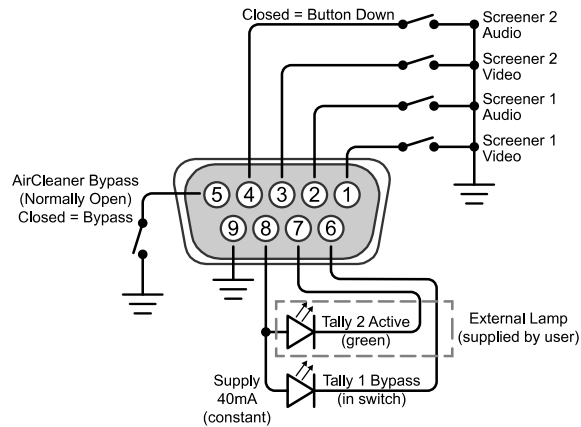
Pin	Signal
1	Video Panic for Screener 1
2	Audio Panic for Screener 1
3	Video Panic for Screener 2
4	Audio Panic for Screener 2
5	Manual Bypass Switch
6	Tally 1 (Manual Bypass)
7	Tally 2 (External Lamp)
8	Tally Common
9	Ground

Pins 5 (Bypass Button) and 1 (Tally 1) are tied to the **Manual Bypass** button on the front of the AirCleaner® chassis and can be used to locate the functionality of this button remotely.

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