



Antelope
Owner's Manual

OCX-V

Video Enabled High Resolution Audio Clock Generator



www.antelopeaudio.com

Isochrone OCX-V achieves the breakthrough clock stability by placing the quartz crystal in an isolated, temperature controlled oven. Constant temperature control of the crystal oscillator and a proprietary Jitter Management Module provide unprecedented sonic benefits. Isochrone OCX-V takes the digital sound out of digital audio, giving you the audio in its purest form whether connected to digital mixer, Pro-Tools system, DAW or digital effects unit.

The amazingly stable Isochrone OCX-V can be taken to the ultimate level by locking it to the most stable clock on Earth: the Atomic clock.

Designed for the modern studio and beyond, the Antelope's master clock provides the most comprehensive video support in the industry. The OCX-V locks to PAL, NTSC, and a staggering array of 20 HDTV standards. International pull ups and pull downs are also supported.

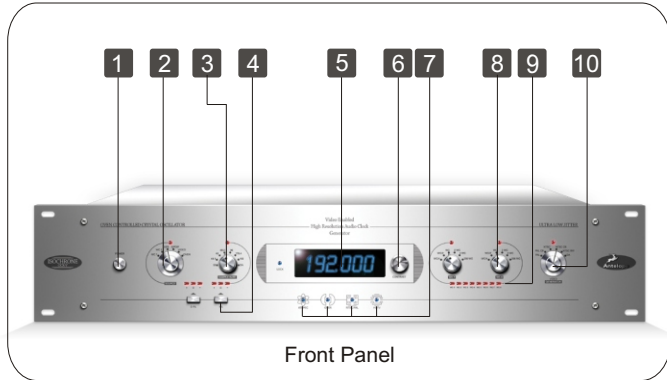
With added flexibility of being able to output multiple sample rates and the built in support for Pro Tools, Isochrone OCX-V easily surpasses the industry standard AardSync II, and is destined to become the new Gold Standard.

Getting Started:

It takes only seconds to harness the benefits of the Isochrone OCX-V.

- ❶ Connect the AC input to a power outlet.
- ❷ If you plan on slaving to an external source, connect the master sync device to a corresponding sync input on the on OCX-V rear panel. Set the SOURCE knob on front to the input receiving incoming clock. If you are using OCX-V's internal clock, set SOURCE to OVEN.
- ❸ Connect any devices you want synced to the appropriate outputs on the OCX-V back panel.
- ❹ Power the OCX-V on via the power button on the front panel. Verify that both the LOCK LED is lit, and that none of the red warning LEDs are flashing.
- ❺ The OCX-V is now providing clock to connected devices. Some devices will automatically sync to clock coming from the OCX-V. Other devices may require additional configuration in order to utilize this incoming clock.

Note: When making initial connections, do so with the studio volume turned down. Some devices may emit unpleasant sound until properly configured to accept incoming clock.



Front Panel

1 Power Switch

2 SOURCE Knob Designates which input the OCX-V receives its timing reference from. The first five options correspond to physical inputs on the back of the unit. The final setting, OVEN, configures the OCX-V to use its internal, oven controlled crystal oscillator as timing reference, with one exception. The OVEN setting is also used to slave the OCX-V to incoming atomic clock; the device will do so automatically, if an incoming atomic clock signal is present.

Directly above the SOURCE knob is a red LED. When lit, it verifies a valid source signal is present at the selected input. When flashing, it means the selected input is not receiving a signal, or the incoming signal is not at a valid frequency.

More discussion about what constitutes a valid frequency is found in SAMPLE RATE Knob section.

3 SAMPLE RATE Knob

Determines the frequency of the Word Clock, AES/EBU and S/PDIF outputs on the back of the unit. The first seven choices are specific sample rates, which will be generated regardless of the incoming reference frequency. When the sample rate does not match the incoming reference frequency, the OCX-V operates in gearboxing mode, which is explained in greater detail later in the manual.

The final setting of the SAMPLE RATE knob is DA (Distribution Amplifier). In the DA there is no gearboxing functionality. The OCX-V simply takes the incoming audio clock selected by the SOURCE knob, puts it through the Jitter Management Module to regenerate a clean, de-jittered signal that is distributed to all audio outputs. In DA mode, the outgoing sample rate will always match the incoming reference.

The DA mode will not work if the SOURCE knob is set to VIDEO or OVEN, as there is no audio reference to distribute. In this case the red LED above SAMPLE RATE knob will flash. Note that in the DA mode, the OCX-V can work with non-standard sample rates as may occur in vari-speed mode; any sample rate from 30 to 202 kHz is acceptable.

4 Pull up / Pull down Buttons

These buttons are used to modify the outgoing sample rate chosen with the SAMPLE RATE knob. The first button accommodates the United States pull up / pull down standard, increasing or decreasing the selected sample rate by 0.1 %. The second button accommodates the European pull up/ pull down standard, increasing or decreasing the selected sample rate by 4 %.

The rectangular LEDs above each button indicate whether the frequency is pulled up (+), pulled down (-) , or not modified (0) by its corresponding button. You can always use the Frequency Display window to see the actual frequency the unit outputs, with the pull ups / pull downs selected at the moment.

Note that pull up / pull down feature is disabled when the SAMPLE RATE switch is set to DA.

5 Frequency Display

Displays the sample rate outputted by the Word Clock, AES / EBU and S/PDIF outputs.

Word Clock outputs 7 and 8 are capable of providing fractional frequencies different from the one displayed here. When the output frequency can not be generated during some error conditions, the display will show "-----".

6 Contrast Knob

Adjusts the contrast of the frequency display.

7 Status LEDs

LOCK , when lit indicates that the OCX-V is locked to a valid incoming reference.

ATOMIC, when lit, indicates that the OCX-V is slaving to external atomic clock.

OVEN, will flash when the OCX-V is first turned on, until the oven reaches its temperature of operation. Once this temperature is achieved, the light will remain lit.

NTSC / PAL, will be lit if SOURCE is set to VIDEO, and the incoming video signal is either NTSC or PAL format.

HDTV, will be lit if SOURCE is set to VIDEO, and the incoming video signal is a valid HDTV format. See Appendix B for a list of the supported HDTV formats.

8 Alternate Sample Rate Selector for Word Clock outputs 7 and 8.

Word clock outputs 7 and 8 are capable of outputting frequencies different from the signal on WC 1-6. The first five settings of the switch choose frequencies that are multiples of the output frequency of the audio generator. The final setting, 256 WC, configures the output to generate the 256 FS Clock, a protocol used by some Digidesign components. These settings are summarized below:

WC/4	The output frequency is ¼ of WC 1-6
WC/2	The output frequency is ½ of WC 1-6
WC	The output frequency is the same as on WC 1-6
2 WC	The output frequency is 2x of WC 1-6
4 WC	The output frequency is 4x of WC 1-6
256 WC	The output is in Digidesign format, rate shown on the Frequency Display

A red LED is present above each knob. When lit, it indicates that a valid sample rate is selected. When flashing, the output has been configured to output at a frequency outside the supported range (30kHz- 202 kHz).

For easy reference, the following chart indicates what frequencies outputs 7 and/or 8 transmit depending on what sample rates and knob settings are chosen. Although the OCX-V can generate any frequency between 30kHz and 202 kHz, this chart is limited to those most commonly used. Note a setting that would produce invalid output is marked With an 'x'.

		ALTERNATE SAMPLE RATE					
		WC / 4	WC / 2	WC	2 WC	4 WC	256 WC
SAMPLE RATE	32 kHz	X	X	32 kHz	64 kHz	128 kHz	256 fs
	44.1 kHz	X	X	44.1 kHz	88.2 kHz	176.4 kHz	256 fs
	48 kHz	X	X	48 kHz	96 kHz	192 kHz	256 fs
	88.2 kHz	X	44.1 kHz	88.2 kHz	176.4 kHz	X	X
	96 kHz	X	48 kHz	96 kHz	192 kHz	X	X
	176.4 kHz	44.1 kHz	88.2 kHz	176.4 kHz	X	X	X
	192 kHz	48 kHz	96 kHz	192 kHz	X	X	X

9 Word Clock Termination Status LEDs

When lit, the corresponding Word Clock output is in use, and is properly Terminated at 75 ohms. Blinking means the corresponding output is over-terminated. Dark means the corresponding output is unused or is not terminated.

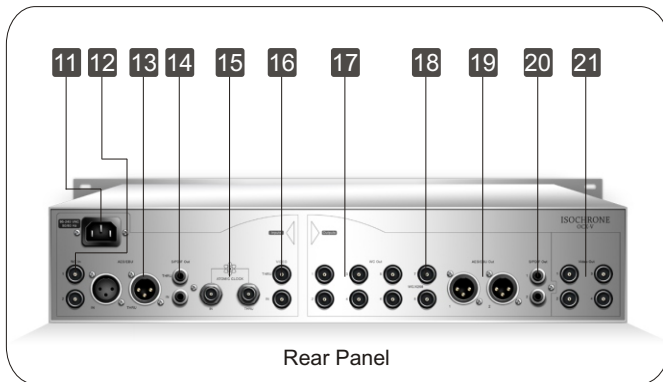
10 Video Generator knob

This knob selects the video signal provided by the four video outputs on the back of the OCX-V. The first five choices provide different video standards.

PAL	PAL Black Burst
PAL CB	PAL Color Bars
NTSC	NTSC Black Burst
NTSC CB	NTSC Color Bars
NTSC BW	NTSC Black and White mode (30 fps, color burst off)

The final option, DA (distribution amplifier), distributes an incoming video signal to the four video outputs. The DA setting will only work if the SOURCE knob is set to VIDEO.

Like the output audio clock generator, the video generator is always phased-locked with the input reference. For this locking to work the input reference has to be one of at a valid rate. The red LED above the knob indicated the status of the video generator. If the LED is flashing, the video generator is not able to lock to the incoming reference. This situation can occur if the unit is locking to one of the audio references while in the DA mode (SAMPLE RATE knob is set to DA) and the audio reference is not at a valid rate. (Valid rates are listed in Appendix A).



Rear Panel

11 Power Connection

This IES AC connection accepts an input of 95-245 VAC 50/60 Hz. As a result, the OCX-V automatically accommodates to the range of voltages found internationally, permitting use in any country.

12 Word Clock input 1 and 2

BNC connections used to accept Word Clock reference.

13 AES/EBU Input and AES/EBU THRU

The AES/EBU Input is an XLR connection that accepts AES/EBU clock or audio. This signal is buffered and made available at the AES/EBU THRU for chaining purposes.

Note that the signal at the THRU is not de-jittered by the Jitter Management Module; it is simply a replica of the AES/EBU input.

14 S/PDIF Input and S/PDIF THRU

The S/PDIF Input is an RCA connection that accepts S/PDIF clock or audio. This signal is buffered and made available at the S/PDIF THRU for chaining purposes. Note that the signal at the THRU is not de-jittered by the Jitter Management Module; it is simply a replica of the S/PDIF input.

15 Atomic Clock In and THRU

The Atomic Clock Input allows the OCX-V to operate with unprecedented accuracy.

This BNC input accepts the 10 MHz clock signal found on an atomic clock device. This signal is buffered and made available at the Atomic THRU for chaining purposes.

16 Video input and THRU

The video input is a BNC connection that accepts video reference, see appendix B for supported formats. This signal is buffered and made available at the Video THRU for chaining purposes.

17 Word Clock Outputs 1-6

The sample rate provided by these outputs always matches the sample rate indicated by the Frequency Display on the front panel.

18 Word Clock Outputs 7-8

The sample rate provided by these two outputs can either match the sample rate of outputs 1-6, or can be changed to alternate sample rates by using their corresponding knobs on the front panel.

19 AES/EBU Outputs 1-2

Provide AES/EBU clock at the sample rate shown in the Frequency Display on the front panel.

20 S/PDIF Outputs 1-2

Provide S/PDIF clock at the sample rate shown in the Frequency Display on the front panel.

21 Video Outputs 1-4

Provide video signal in the format selected by the VIDEO GENERATOR Knob.

OCX-V GEARBOXING MODE

In Gearboxing Mode, the OCX-V always generates an output clock at the sample rate set by the SAMPLE RATE knob, regardless of the incoming reference frequency. This output clock is still phase-locked to the reference input, but the sample rates need not match.

For example, you may set the SAMPLE RATE knob at 48 kHz and apply a 44.1 kHz reference. The device then "gearboxes" 44.1 kHz into 48 kHz output, as selected by the SAMPLE RATE knob. This ability to lock to one sample rate and generate another is very useful for sample rate conversions. Gearboxing Mode dramatically improves the sound quality of sample rate conversions.

For Gearboxing to work, the incoming reference must be one of 63 recognized valid frequencies. A valid frequency is i) one of the standard frequencies: 32, 44.1, 48, 88.2, 96, 176.4, 196 kHz; ii) a standard frequency subjected to every possible combination of US and Euro pull up/downs (9 combinations are possible). See Appendix A for a complete table of all valid frequencies.

Appendix A
Table of valid input frequencies in Gearboxing Mode

	32	44.1	48	88.2	96	176.4	192
USPD+EUPD	30.689	42.294	46.034	84.587	92.068	169.175	184.136
EUPD	30.720	42.336	46.080	84.672	92.160	169.344	184.320
USPU+EUPD	30.751	42.378	46.126	84.757	92.252	169.513	184.504
USPD	31.968	44.056	47.952	88.112	95.904	176.224	191.808
None	32.000	44.100	48.000	88.200	96.000	176.400	192.000
USPU	32.032	44.144	48.048	88.288	96.096	176.576	192.192
USPD+EUPU	33.300	45.892	49.950	91.783	99.900	183.566	199.800
EUPU	33.333	45.938	50.000	91.875	100.000	183.750	200.000
USPU+EUPU	33.367	45.983	50.050	91.967	100.100	183.934	200.200

Appendix B
Table of valid input video formats

PAL	Europe	Standard Definition
NTSC 59.94	N. America	Standard Definition
NTSC 60	N. America	Standard Definition. Avoids drop frame time code.
1080i-60	Japan	Supercedes analog 1035 line system. Interlaced.
1080i-59.94	N. America: CBC, CBC, NBC, PBS	Contribution format. Interlaced.
1080i-50	Europe	SMPTE-274M Interlaced.
1080i-49.95	Europe	Studio format. Interlaced.
1080i-48	N. America, Japan	Studio format. Interlaced.
1080i-47.952	N. America	Studio format. Interlaced.
1080p-30	Japan	Studio format. Progressive scan.
1080p-29.97	N. America	Studio format. Progressive scan.
1080p-25	Europe	Studio format. Progressive scan.
1080p-24.975	Europe	Studio format. Progressive scan.
1080p-24	N. America, Japan	Studio format. Progressive scan.
1080p-23.976	N. America	Studio format. Progressive scan.
1080psf-60	Japan	Studio format. Progressive, segmented frame.
1080psf-59.94	N. America	Studio format. Progressive, segmented frame.
1080psf-50	Europe	Studio format. Progressive, segmented frame.
1080psf-49.95	Europe	Studio format. Progressive, segmented frame.
1080psf-48	N. America, Japan	Studio format. Progressive, segmented frame.
1080psf-47.952	N. America	Studio format. Progressive, segmented frame.
720p-60	N. America	Studio format. Progressive scan.
720p-59.94	N. America: ABC, FOX	Contribution format. Progressive scan.

TECHNICAL SPECIFICATIONS

Internal Reference:	Oven Controlled Crystal Oscillator
Frequency Accuracy:	Better than 1PPM
Atomic Clock Input:	10 MHz, BNC 75 Ohm
Reference Inputs:	2 WC, 1 AES/EBU, 1 S/PDIF, 1 VIDEO, 10 MHz Atomic
Video Reference:	PAL, NTSC, NTSC 60, and common HDTV standards
Audio Clock Outputs:	8 WC (6 Standard and 2 User Defined), 2 AES/EBU, 2 S/PDIF
Sampling Rates:	32, 44.1, 48, 88.2, 96, 176.4, 192 kHz
Pull up/down:	0.1% NTSC and/or 4% PAL, simultaneously
Video Generator:	PAL, PAL CB, NTSC, NTSC CB, NTSC 60
Video Outputs:	4 BNC 75 Ohm
AC Power:	95-245 VAC, 50-60 Hz, 15 W max
Operating Temperature:	0-50 C, 32-122 F
Weight:	3 kg, 6.6 lb
Dimensions:	482mm (W) x 89mm (H) x 203mm (D) 19" (W) x 3.5" (H) x 8" (D)