AUR⊙RA™ 2000

AurorA2000 Digital Multiplexers

- **Simplex units can be upgraded to duplex**
- **30, 60 and 90 images/sec live refresh versions (90 on simplex only)**
- **Sharp, crystal-clear pictures with accurate color**
- **Programming from user-friendly on-screen menus**
- **Records up to sixteen cameras on one VCR**
- **High-resolution video output for VGA monitor**
- **No camera sync required**
- **Front panel telemetry control**
- **Intelligent updating of live video and recording**
- **Many multiscreen displays**
- **Linear electronic zoom from 1× to 16×**
- **Full-featured analog sequential switching**
- **Y/C input/output to VCR for highest resolution**
- **Alarm inputs**
- **Digital video motion detection**
- **Automatic reboot after power outage**
- **Requires only 1 field in encoding mode**
- **Context-sensitive help system**
- **Macros available (to include touring)**
- **High-resolution video output for VGA monitor**

Vicon's AurorA2000 video multiplexers offer all the features expected in an advanced multiplexer plus a level of image quality never seen before. Multiplexing allows multiple cameras to be recorded on one VCR with little loss of information from each camera. Sharp, crystal-clear pictures are assured in all modes. Intelligent updating (30, 60 or 90 images/sec) refreshes the live screen display and the output to the VCR more often for cameras watching motion than for cameras without motion. Multiscreen displays include picture-in-picture (PIP), quad split, 3 × 3, 4 × 4 and various other split screens. Refer to Figure 1. Video may be sequenced in individual video sectors in multiscreen modes. Electronic pan-tilt-zoom offers a 16× zoom ratio with low image blocking. The AurorA2000 accepts alarm inputs from a variety of sources, including digital motion detection and hardwired inputs (one per camera channel). Video loss and communication failure alarms are available on each camera in your system. Serial ports for interfacing with a host computer, up to 16 receivers, or with Vicon NOVA systems are provided.

The AurorA2000 features telemetry control (mechanical PTZ). Using front panel keys, the AurorA2000 can remotely control up to 16 camera stations. Refer to Figure 2.

A broad range of models is available. Prepacs are available that include looping cables for installation with a Matrix 66 switcher card cage. Refer to Table 1 for a description of each model.

Refresh Rates: The AurorA2000 product line includes versions that provide refresh rates of 30, 60 or 90 images/second. Simplex units are available in all three refresh rates; however, duplex units are available with refresh rates of 30 or 60 images/second only. Units may be purchased for any of the available refresh rates or units may be upgraded with the purchase of an option board, Model A2K-VID-PCB. Using AurorA2000 programming screens, a user can define that the increased refresh rate be applied to one or more video channels in a multiscreen display format.

Simplex and Duplex: The AurorA2000 multiplexers are capable of performing four general functions: (1) multiplexing (encoding) multiple cameras onto one VCR tape; (2) playing back (decoding) camera videos from a VCR tape; (3) displaying digitally processed live video; (4) displaying unprocessed, analog video. Functions 1, 2, and 3 all require processing by the AurorA2000's digitizing circuits.

A simplex model (all models with SC in the model number) has one digitizing board and may perform either encoding, decoding, or live multiscreen display, along with the display of unprocessed analog video. In other words, a simplex unit may perform one of the three digitizing functions, plus analog display. A duplex model (all models with DC in the model number) has two complete digitizing circuits and can perform two of the digitizing functions at a time in addition to analog display. A simplex unit may be upgraded to a duplex unit with the installation of an option board, Model A2K-DUP-PCB. Note that, in order to encode multiplexed video to a VCR and decode multiplexed video from a VCR at the same time, two VCRs are required. One will be operating in the RECORD mode for encoding, and one will be operating in the PLAYBACK mode for decoding. The availability of the undigitized video output is unaffected by the operation of the digital circuits.

VCR Multiplexing: AurorA2000 multiplexers allow video from multiple cameras to be recorded on a single VCR tape with little elapsed time between recorded images from a given camera. It works by recording intermittent fields of video from each camera. A camera generates 60 fields/second in the NTSC system or 50 fields/second in the PAL system. The multiplexer switches from one camera to the next every 2 or 3 fields of video, or approximately 30 times per second in the NTSC television systems (about 25 times per second in PAL). For instance, if an NTSC-based system has 10 cameras, then each camera will be visited and recorded 3 times in one second (approximately 30 switches/second divided by 10 cameras). Since very little can happen in front of a camera in 1/3 second, the security coverage is very thorough. If the system is based on PAL standards, 2.5 images would be recorded from each camera in the sample system (about 25 switches/second divided by 10 cameras).

Note, however, that it is not possible to record all the video from each camera; while the VCR is recording cameras 2 - 10, no video is recorded from camera 1. This is an important fact, and it is true of all multiplexers. If absolutely continuous recording (that is, 25 or 30 frames/second from every camera in the system) is required, then every camera must have its own VCR, and the VCRs

Vicon Product Facts	ⓊL FC	Model No: AurorA2000 Series	Product Code: Refer to Table 1	SEC: 5	SPEC: V040	REV: 901

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Product specifications subject to change without notice.

must all be set to the 2-hour mode. The great benefit of using a multiplexer is that numerous cameras can be recorded on a single VCR with very little loss of information from each camera.

AurorA2000 multiplexers provide time-base correction for input video so that no camera synchronization is required. The AurorA2000 receives analog video from a camera, converts it to digital form, stores the digital image in memory until just the right instant, then converts it back to analog and sends it to the VCR. This permits the video from each camera to be perfectly synchronized with all other cameras on the VCR tape.

Moreover, AurorA2000 features "intelligent updating," thanks to its digital video motion detection feature. If the unit identifies activity in front of any camera, it sends video images from that camera to the monitor and to the VCR more frequently than video from cameras viewing inactive scenes.

AurorA2000 units can be set to coordinate with the time-lapse modes of any time-lapse recorder. Programming the AurorA2000 for various recorders is simple and is performed with user-friendly on-screen menus.

Playback from a VCR: The decoding function allows a viewer to watch video played back from the VCR comfortably. The user specifies the camera or cameras to be viewed and puts the VCR in the PLAY mode. For example, the user wishes to view the recorded video from camera 2. Select the decode mode on the AurorA2000, select channel 2, and put the VCR on PLAY. The AurorA2000 looks for the first image from camera 2 from the VCR. When it is found, the AurorA2000 converts it to digital form and puts it in memory. It is then reconverted to analog video and is output to the monitor. The image held in memory is used to continuously update the picture on the monitor until the next image from camera 2 is retrieved from the tape. (Remember that, between each image from any single camera on the VCR tape, there will be one image from every other camera in the system. Thus if there are 10 cameras in the system, there will be images from 9 other cameras between each image from camera 2.) Although this example refers to viewing only one camera, multiple cameras may be viewed in playback using the multiscreen display feature of the AurorA2000.

High-Resolution Output: AurorA2000 provides a high-resolution video output of 720 pixels (540 lines) for use with a VGA monitor (NTSC only). A BNC standard output is also available with 640 pixels (480 lines) resolution.

Multiformat Decoding: The AurorA2000 can play back tapes that have been encoded by AurorA2000 and AurorA99.

Multiscreen Displays: The AurorA2000 has the widest selection of multiscreen displays of any multiplexer in the industry. These include picture-in-picture (PIP), quad split, 3×3 (9 screen segments), 4×4 (16 screen segments), and various combinations of quad- and sixteenth-sized segments. Figure 1 shows various screen displays.

In all of the multiscreen displays, any camera may be assigned to any of the screen segments. There is no fixed partitioning of camera input to screen segment. Also, any screen segment may be made to sequence multiple cameras. If sequencing is selected, the cameras assigned to the sequence may be put in any order, and selected cameras may be sequenced with greater or lesser frequency than other cameras in the sequence.

Digital Special Effects: AurorA2000's electronic zoom feature has continuously variable magnification up to 16 times the original size. This means that an object that is 0.6 inch wide on a 12-inch monitor screen can be enlarged to fill the full screen. The magnification takes place with low blocking or pixellating because the AurorA2000 interpolates data to provide smooth line edges in the image. The expanded picture remains bright and sharp. The electronic pan-and-tilt function allows the enlarged window to be moved around to any part of the original monitor image.

NOTE: Electronic zooming is not the same as lens zooming. In photographic zooming, the telephoto setting looks at a smaller part of the original scene and thus can capture more detail than would be seen in a wide angle view of the scene. In electronic zooming, a segment of a picture of the original object is enlarged. Consequently, only the detail that was in the original picture is enlarged; no additional detail is seen. This is true of all electronic zoom devices.

Analog Sequential Switching (Spot Monitor): One monitor output is dedicated to video that has not been digitized. This output may be used to display one camera continuously or to sequence multiple cameras. If sequencing is selected, the cameras may be sequenced in any order, allowing more important cameras to be displayed more frequently. Individual cameras may be called up during sequencing and will remain displayed for the dwell period. The dwell period may be adjusted from 1 to 60 seconds.

Alarm Functions: The AurorA2000 offers versatile, multi-faceted alarm functions. There is one hardwired alarm contact for each camera channel, and each may be used as an alarm input or output. Inputs may be set for normally open (NO) or normally closed (NC) operation, and outputs may be set to active high or low. Alarm inputs may be defined as latching or momentary. Alarms may be acknowledged automatically or manually. Digital video motion detection is provided on each camera channel, and all channels are protected by a video loss alarm feature. Sixteen receiver alarms are available (these alarms are always latching).

Alarm outputs include a tone, a special display of the alarmed video, the word ALARM displayed on screen, a front-panel LED for each alarmed channel, dry contact relay outputs (NO and NC), and an output to the VCR to initiate alarm recording.

Digital Video Motion Detection: AurorA2000 features video motion detection in all display formats. Motion detection may be used to generate alarms or to provide more frequent updating of cameras with motion in their fields-of-view, or to do both. The auto bypass feature allows cameras which do not have motion in their field-of-view to be bypassed in the encoding.

The video picture area is divided into 192 motion detection blocks. Detection may be enabled or disabled for each block, and each camera channel may be programmed for the minimum number of blocks that must detect motion before the motion detection outputs go active. Also, the detection sensitivity level may be set individually for each camera channel over a relative range of 1 to 9.

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Refer to Table 1 | SEC: 5 | SPEC: V040 | REV: 901 |

Mechanical PTZ (Telemetry) Mode: The AurorA2000 multiplexer features RS-422 receiver control of up to 16 receivers (one for each camera) using the front panel keys. Each pan-and-tilt drive connected to the receivers may be controlled from the multiplexer, as well as lens functions of the cameras and any auxiliary equipment connected to the receiver. This provides the ability to pan, tilt, zoom, autopan, enable/disable autoiris, acknowledge alarms and perform other receiver functions from the AurorA2000. The AurorA2000 electronic pan, tilt, and zoom feature is also available in telemetry mode. Any monitor can be used.

Titling Features: Each camera channel can be given its own title of up to twelve characters, and a time and date display may also be provided. Additional display information includes an alarm status display that indicates whether the alarm source is a hardwired input, motion detection, receiver alarm, receiver comm fail or video loss. Titling is available on any monitor.

Date information may be displayed in the American, European, or Asian formats. AurorA2000 includes an automatic daylight saving feature.

Easy Programming: AurorA2000 is programmed with user-friendly on-screen menus. AurorA2000's on-screen menus lead the programmer step-by-step through the various programming functions.

A very important feature of the AurorA2000 design is that all program information is retained during power outages, and when the power outage ends, AurorA2000 resets itself and reloads all the user settings. Thus an AurorA2000-based system is up and running as soon as power is restored and does not require an operator to restart it.

Passcoding: Access to the programming screens may be restricted, if the system owner wishes. AurorA2000 may be programmed so that a passcode is required to permit modifying the program parameters. The passcode can also be set to limit the ability to change from one display format to another.

Furthermore, using the password activation, any video can be locked out from the live display while still being encoded and recorded on the VCR. This feature gives an Administrator the ability to collect video onto tape while maintaining the privacy of areas monitored by locked cameras.

The AurorA2000 multiplexers meet FCC requirements for Class A computing devices and European Community (CE) standard EN 50081-1 (generic emissions) and EN 50082-1 (generic immunity).

Host Protocol: The Host Protocol allows a PC or other host computer to communicate with, and operate, the AurorA2000 using RS-232 protocol. This protocol is available in software version V1.0.4 of the AurorA2000. This protocol is modeled on the Vicon VCR RS-232 protocol. With this protocol, 16 Vicon VCRs (RS-232 capable) followed by up to 999 AurorA2000s can be linked on an RS-485 bus (simplex or duplex) or using a distribution line with RS-232 or RS-422. The use of protocol other than RS-232 would require a protocol converter.

The protocol allows remote front panel key presses to exactly emulate operation locally. In addition, other available commands are time/date broadcast, Spot Monitor control and receiver control. The time/date broadcast feature allows the host computer, or another dedicated AurorA2000 unit, to broadcast the time to any number of other units to synchronize time across all AurorA2000s.

Model Number	Product Code	Video Inputs	Operating System	Live View Refresh Rate	Video System	Input Voltage (VAC)
AurorA2000 Multiplexers						
AUR2K-SC3	6904	16	Simplex	Color; 30 images/second	NTSC/PAL	120, 230
AUR2K-SC6	6905	16	Simplex	Color; 60 images/second	NTSC/PAL	120, 230
AUR2K-SC9	6906	16	Simplex	Color; 90 images/second	NTSC/PAL	120, 230
AUR2K-DC3	6907	16	Duplex	Color; 30 images/second	NTSC/PAL	120, 230
AUR2K-DC6	6908	16	Duplex	Color; 60 images/second	NTSC/PAL	120, 230
AurorA2000 Multiplexers with Looping Cables						
AUR2K-SC3C	7430	16*	Simplex	Color; 30 images/second	NTSC/PAL	120, 230
AUR2K-SC6C	7431	16*	Simplex	Color; 60 images/second	NTSC/PAL	120, 230
AUR2K-SC9C	7432	16*	Simplex	Color; 90 images/second	NTSC/PAL	120, 230
AUR2K-DC3C	7433	16*	Duplex	Color; 30 images/second	NTSC/PAL	120, 230
AUR2K-DC6C	7434	16*	Duplex	Color; 60 images/second	NTSC/PAL	120, 230
AurorA2000 Options				Description		
A2K-DUP-PCB	7420	—	—	Duplex Option Board		
A2K-VID-PCB	7421	—	—	Video Processing Board		

* Includes looping cable.

Table 1: Model Descriptions

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Digital Video Multiplexers

The multiplexer shall provide multiplexed encoding of up to sixteen video cameras onto a single video recorder, decoding of encoded tapes for monitor display, digital multiscreen monitor displays, alarm operation, digital motion detection, and time/date/titling. The front panel keys of the multiplexer shall be dual purpose; they may be used for normal mode, which includes alarm, non-alarm and programming modes, and mechanical PTZ mode (telemetry), which controls up to 16 receivers from a single RS-422 port. Mechanical PTZ mode functions shall include panning, tilting, freezing and restoring video displays, electronic pan/tilt/zoom, storing and setting presets, acknowledging alarms, enabling/disabling autoiris, autopan, and auxiliary devices, and lens control. A context-sensitive help screen shall be available.

Encoding functions shall include: time-base correction; customized timing for all recorder models and all time-lapse modes; ability to be controlled by recorder clock pulse output; and proportional updating to cause cameras with motion in the field-of-view to be updated to the recorder more frequently than cameras without motion.

Decoding functions shall include: multiformat decoding to allow tapes recorded from other multiplexers to be played back through the multiplexer; playback of encoded or unencoded video; and multiscreen display of recovered video.

Live digital video display functions shall include: picture-in-picture; quad screen display; nine-window screen display; sixteen-window screen display; mixed border screen display; mixed half screen display; mixed split screen display; any window may display any camera; any window or windows may display sequencing video; sequence may be ascending or random order, with variable dwell; screen update rate may be controlled by activity in camera field-of-view; screen update rate may be prioritized by user; continuously variable electronic zoom up to 16 times the original size, with interpolation to minimize pixellating or blocking; electronic pan and tilt; and analog sequential switching shall be provided, with ascending or random order display and individual camera dwell. Automatic operation of motion and alarm scheduling shall be available.

The multiplexer shall be available in versions that provide refresh rates of 30, 60 or 90 images/second; option boards shall be available to upgrade to a faster refresh rate or from simplex to duplex. Using programming screens, the increased refresh rate shall be able to be applied to one or more video channels.

The multiplexer shall offer versatile, multi-faceted alarm functions. There shall be one hardwired alarm contact for each camera channel, and each may be used as an alarm input or output. Inputs may be set for normally open (NO) or normally closed (NC) operation, and outputs may be set to active high or low. Alarm inputs may be defined as latching or momentary. Alarms may be acknowledged automatically or manually. Digital video motion detection shall be provided on each camera channel, and all channels shall be protected by a video loss alarm feature. Sixteen receiver alarms shall be available (these alarms shall always be latching).

Titling functions shall include individual camera titles of up to twelve characters, time, date, and alarm status. Size, outline, and background of the display information shall be user-programmable, and the date format shall include American, European, and Asian options. An automatic daylight saving time feature shall be provided.

Programming shall be by on-screen menus, and all program information shall be retained during power outages and shall automatically reload itself upon termination of the outage. Passcode protection of the programming screens shall be provided. The passcode may also be used to limit the ability to change from one display format to another.

Models shall be available capable of supporting the NTSC and PAL television systems. Horizontal resolution shall be 640 pixels (480 TV lines). Video crosstalk shall be less than 50 dB at 4.2 MHz.

The multiplexer shall be Vicon Model (See Table 1) .

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Vicon Product Facts	ⓊL FC	Model No: AurorA2000 Series	Product Code: Refer to Table 1	SEC: 5	SPEC: V040	REV: 901

ELECTRICAL

Input Voltage: Refer to Table 1.

Line Cord: Detachable 3-conductor cable with grounding plug.

Power Consumption: Less than 50 W.

Heat Equivalent: 2.8 btu/min (0.72 kg-cal/min). Note: These figures represent the conversion of 100% of the electrical energy to heat. Actual percentage of the heat generated will be less and will vary from product to product. These figures are provided as an aid in determining the extent of cooling required for an installation.

Fuse: 1.5 A, 250 V, 3AG.
5A, 32 V, 3AG, inline.

Radio Frequency Emission Standards: FCC Class A.

European Community (CE): EN 50081-1 generic emissions.
EN 50082-1 generic immunity.

VIDEO

Video System: NTSC: RS-170, 525 lines, 30 frames/sec.
PAL: 625 lines, 25 frames/sec.

Video Input Signal: Composite video: 1.0 V p-p (140 IRE), consisting of 714 mV (100 IRE) of luminance and 286 mV (40 IRE) of negative-going sync.
Y/C input: 1.0 V p-p Y signal (Y = luminance) plus 400 mV C signal (C = chominance or color) over separate conductors.

Video Output Signal: 1.0 V p-p (140 IRE) composite video, consisting of 714 mV (100 IRE) of luminance and 286 mV (40 IRE) of negative-going sync.
Y/C output: 1.0 V p-p Y signal (Y = luminance) plus 400 mV C signal (C = chominance or color) over separate conductors.

Horizontal Resolution: NTSC
VGA: 720 pixels, 540 lines.
BNC: 640 pixels, 480 TV lines.
PAL: 640 pixels, 480 TV lines.

Video Crosstalk: Less than 50 dB at 4.2 MHz.

Video Inputs: 16; terminated with 75 ohms.

Looping Video Outputs: 1 looping output for each camera input.

Monitor Outputs: 2 monitor outputs for digitally processed video, 1 BNC, 1 VGA (for multiscreen displays, video special effects, etc.).
1 monitor output for unprocessed analog video. Provides sequential switching, hold viewing of selected cameras and time, date, titling.

VCR Inputs/Outputs: 1 output to VCR for composite video; 1 output to VCR for Y/C-type signal for Super-VHS VCRs.
1 input from VCR for composite video; 1 input from VCR for Y/C video.

Synchronization: All video inputs are synchronized internally by the AurorA2000; it is not necessary to synchronize the cameras.

VIDEO FUNCTIONS

Multiscreen Displays: Refer to Figure 1.

Input Channel Distribution: Any video input channel may be assigned to any segment of a multi-screen display.

Multiscreen Sequencing: Any segment or segments of a multi-screen display may be assigned to sequence a series of different input videos. Dwell is user-selectable.

Electronic Zoom: Linear 16× zoom range with interpolation to minimize blocking.

Electronic Pan and Tilt: The zoomed area can be moved around to any part of the original full-screen image.

Decoding Compatibility: The AurorA2000 can decode (play back) video tapes which were originally encoded with AurorA2000 and AurorA99 models.

Refresh Rates: AUR2K-SC3/SC3C: 30 images/sec.
AUR2K-SC6/SC6C: 60 images/sec.
AUR2K-SC9/SC9C: 90 images/sec.
AUR2K-DC3/DC3C: 30 images/sec.
AUR2K-DC6/DC6C: 60 images/sec.

DIGITAL VIDEO MOTION DETECTION

Number of Channels: 16.

Sensing Area: Programmable 16 × 12 block array. Variable sensing area can be as small as 1 block.
Programmable sensitivity level.

Active Video Recording: Channels detecting activity may be programmed to record more frequently than channels without activity.

Live Video Display Update: Frequency of update of live video display depends on level of activity in front of camera.

MECHANICAL PTZ (TELEMETRY) MODE

Functions: Pan Left/Right.
Tilt Up/Down.
Pan/Tilt Speed.
Autopan.
Zoom In/Out.
Iris Close/Open.
Autoiris.
Lens Speed.
Focus Far/Near.
Digital Zoom.
Acknowledge Alarm.
Auxiliary Devices On/Off.
Preset Store/Recall.
Freeze/Restore Video.
Help Screen.

Connection: RS-422 (serial 1 and/or 2 port).

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Maximum Number
of Receivers: 16.

ALARM OPERATION

Number of Hardwired
Alarm Inputs: 16. Each of these can be set as an output.

Hardwired Alarm
Input Type: Alarm equipment connected to AurorA2000 should provide voltage-free contact pairs or the equivalent as the output.

Alarm Outputs: 2 dry-contact relay outputs, one normally closed (NC) and one normally open (NO). Relay is rated at 0.5 A at 42 V with a resistive (noninductive) load.

Aux Alarm Output: TTL active high or low.

Alarm
Recording Modes:
1. Normal recording continues unchanged.
2. Alternate recording provides increased frequency of alarmed cameras. Nonalarmed cameras continue to be recorded.

Video Loss: Alarm is generated when loss of video is detected.

TITLING

Camera ID: A default camera title with number is displayed unless replaced by a customer-selected title.

Alphanumeric Titling: Each title may have up to 12 alphanumeric characters. Size, color, shadow, and background are selectable.

Screen Display: The screen may display various combinations of title, time/date, mode, status, and various messages.

Recorded Information: Camera title, time, date, plus alarm information are recorded with each image.

MECHANICAL

Dimensions: In rack-mount configuration:
Height: 1.75 in. (44 mm).
Width: 19.0 in. (483 mm).
Depth: 11.5 in. (292 mm).
In desk-top configuration:
Height: 2.0 in. (51 mm).
Width: 17.5 in. (445 mm).
Depth: 11.5 in. (292 mm).

Weight: Approximately 9.75 lb (4.4 kg).

Shipping Dimensions: Height: 4.9 in. (124 mm).
Width: 21.6 in. (549 mm).
Depth: 14.5 in. (368 mm).

Shipping Weight: Approximately 13.5 lb (6.1 kg).

Shipping Volume: 0.9 ft^3 (0.025 m^3).

ENVIRONMENTAL

Operating
Temperature Range: 32 to 122° F (0 to 50° C)

Operating
Humidity Range: 0 to 90% relative, noncondensing.

Storage
Temperature Range: -20 to 140° F (-29 to 60° C).

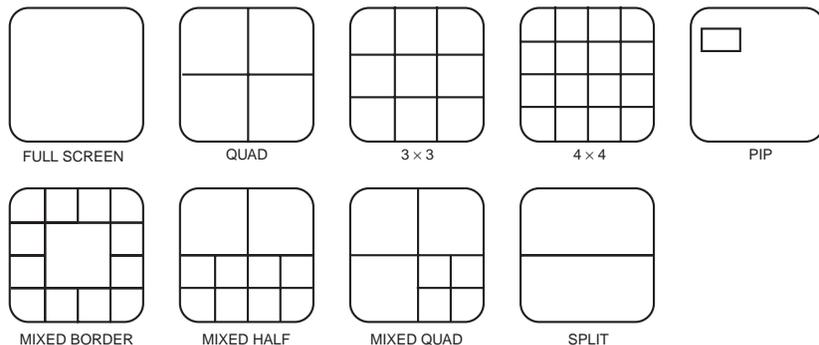Storage Humidity: Up to 85% relative, noncondensing.

FULL SCREEN   QUAD   3 × 3   4 × 4   PIP

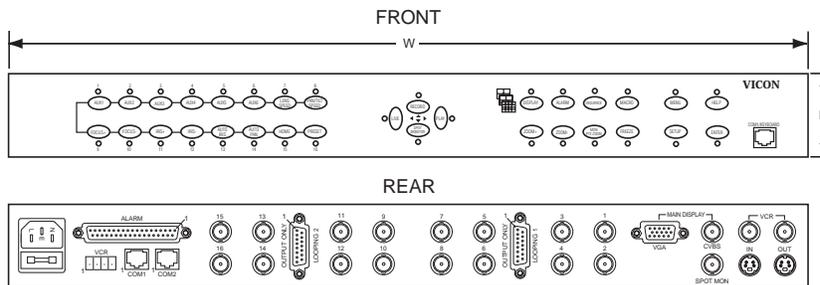MIXED BORDER   MIXED HALF   MIXED QUAD   SPLIT

Figure 1: AurorA2000 Displays

FRONT

REAR

Figure 2: Front and Rear Panels

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