CHRISTIE

CP2000 Series

Training Notes

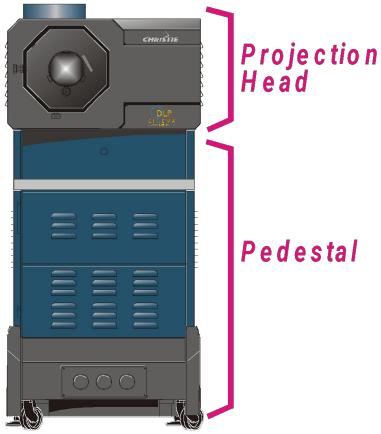
April 2009

The Family

X/S Models will be phased out in 2009

CP2000-S/SB

7KW Electronic Switching ballast
2.0 kW, 3.0 kW, 4.5kW or 6kW
(SB – High Brightness version)



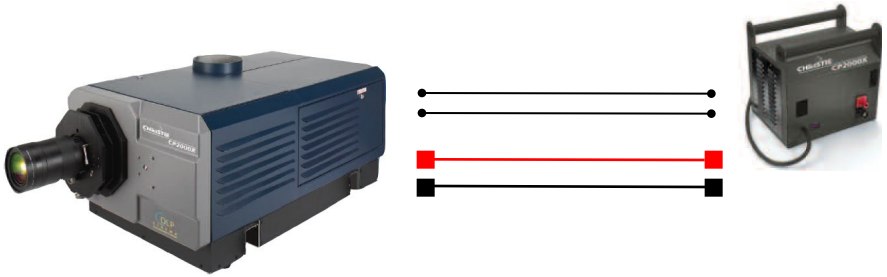
CP2000-ZX

Combined Single piece unit.
Single phase AC input
CDXL20, CDXL30 and CDXL30-SD

S, X, ZX all share the same Interface, Processor and EFIB. The light engine (DMD chip and prism) for the ZX is different to the S and X.

CP2000-X/XB

Separate Head and ballast.
Same Switching ballast as “s”
Cable length for ballast; 1.8, 7.6, 15.2 and 30.5 meters
(XB – High Brightness version)



CP2000-M

Uses 0.98” chips designed for Post Production and small screens

Two versions

-01	-02
CDXL-18SD	CDXL-18SD
	CDXL-20SD

Lens Suite

X/S/XB/SB/ZX

Throw Ratio	Equivalent local length
*1.25 – 1.45:1	35.4 – 40.7 mm
1.45 – 1.8:1	40.7 – 50.9 mm
1.8 – 2.4:1	50.7 – 67.8 mm
2.2 – 3.0:1	62.4 – 84.8 mm
3.0 – 4.3:1	85.0 – 121.6 mm
4.3 – 6.0:1	121.6 – 170 mm

Zoom lenses comes in HC or HB version.

CP2000-ZX/SB/XB can use both types

CP2000-S/X can only use HC lenses

(HC- high contrast)

(HB – high brightness)

Additional lens (late 2008)

1.25 – 1.83:1 (summer 09)

1.45 – 2.05:1

1.6 – 2.4:1

1.8 – 3.0:1

2.15 – 3.6:1
(motorized early 2009)

M

Throw Ratio	Equivalent local length
1.05:1 (fixed)	23.55 mm
1.3 – 1.75:1	28.9 – 38.9 mm
1.39 – 1.9:1	31.1 – 42.5 mm
1.5 – 2.2:1	33.5 – 49.2 mm
1.75 – 2.4:1	39.0 – 53.4 mm
1.9 – 3.0:1	41.1 – 65.0 mm
2.4 – 3.9:1	52.4 – 85.3 mm
3.9 – 6.52:1	84.9 – 142.0 mm

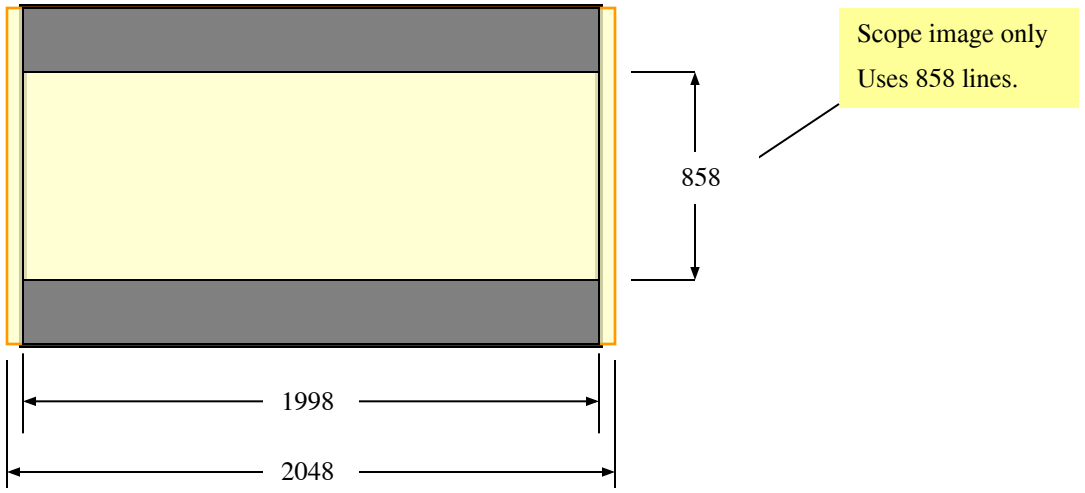
anamorphic lens (x 1.26)

Wide Converter Lens (WCL, x1.26)

* Not compatible with WCL

Installation

(Zooming and Active pixel Placement)

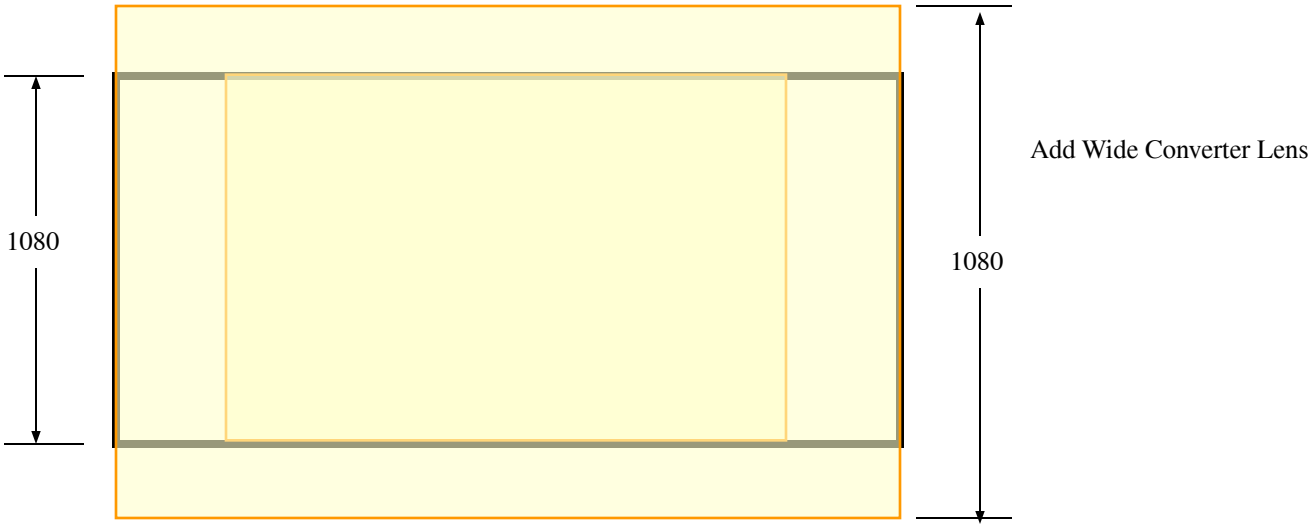


TOP/BOTTOM MASK SCREENS

For cinemas with moving top and bottom masking and fixed side masking, zoom the lens so that 1998 pixels of the DMD fills the width of the screen. Check to make sure the image also fills the height of the screen. Also check the height of the image for scope movies.

During Scope presentation, only 1998 x 857 pixels will be visible. There are 50 pixels horizontally that are given up and never used if you use this method. You can avoid this if you zoom the lens to just fill the width of the screen and accept a bit of dark screen top and bottom.

Installation
(Zooming and Active pixel Placement)



MOVING SIDE MASK SCREENS

For cinemas with moving side masking and fixed vertical masking, zoom the lens so that 1080 pixels of the DMD fills the height of the screen. Check to make sure the flat image uses only 1998 pixels. Adjust zoom to match. For scope use either an anamorph lens or the new Wide Angle Adapter.

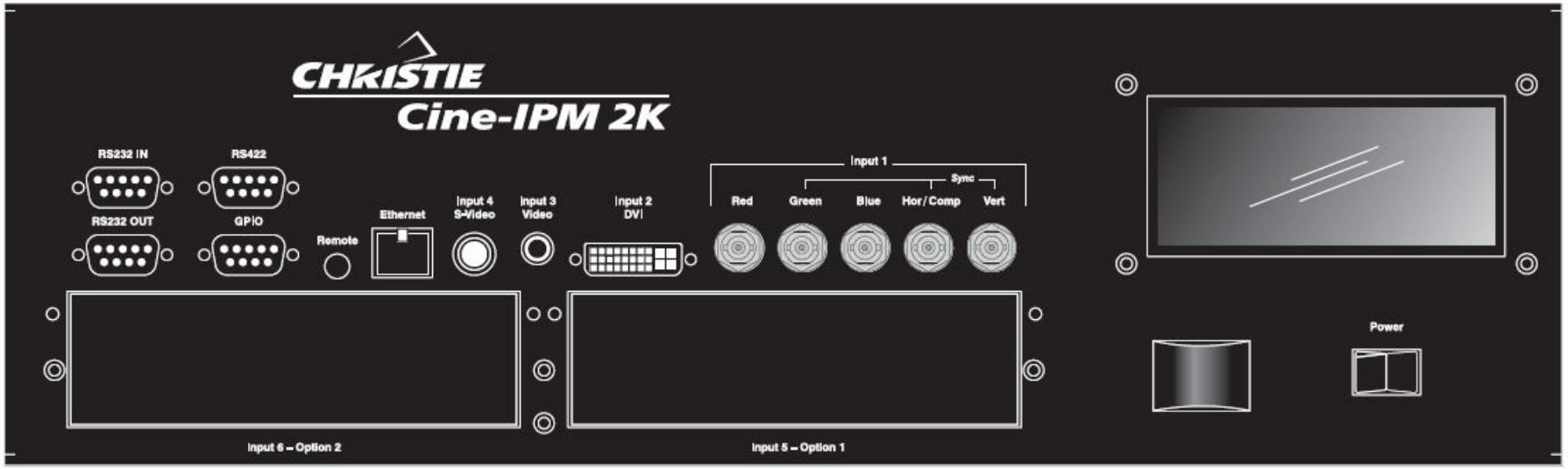
Optional Cine-IPM 2K

Control
RS232 IN/OUT
RS422
GPIO
Ethernet
Wired Remote
TPC (via rear RS232)

Inputs
1 - RGBHV
2 - DVI
3 – Composite Video
4 – S-Video
5 – Option Card
6 – Option Card

Optional Input Cards
Dual SDI/HDSDI
RGBHV
DVI

DO NOT CONNECT RS232 AT BACK OF CINE-IPM2K TO RS232B OF ZX PROJECTOR



Installation

- **General Overview**

1. Unpack and wheel pedestal to approximate location
2. Add projection head to pedestal
3. Position CP2000 at port window *(leave approx. 2 ft. from wall)*
4. Connect pre-installed internal cabling (pedestal-to-head)
5. Install sources/controllers/servers etc.
6. Connect lamp leads (pedestal-to-head).
7. Install lamp, TPC, and lens
8. Fill liquid coolant *(50/50 antifreeze, only required on "s")*
9. Connect to exhaust ducting
    a. Verify 600 CFM. Ft/min x 0.34 = CFM (1765 Ft/min)Minimum

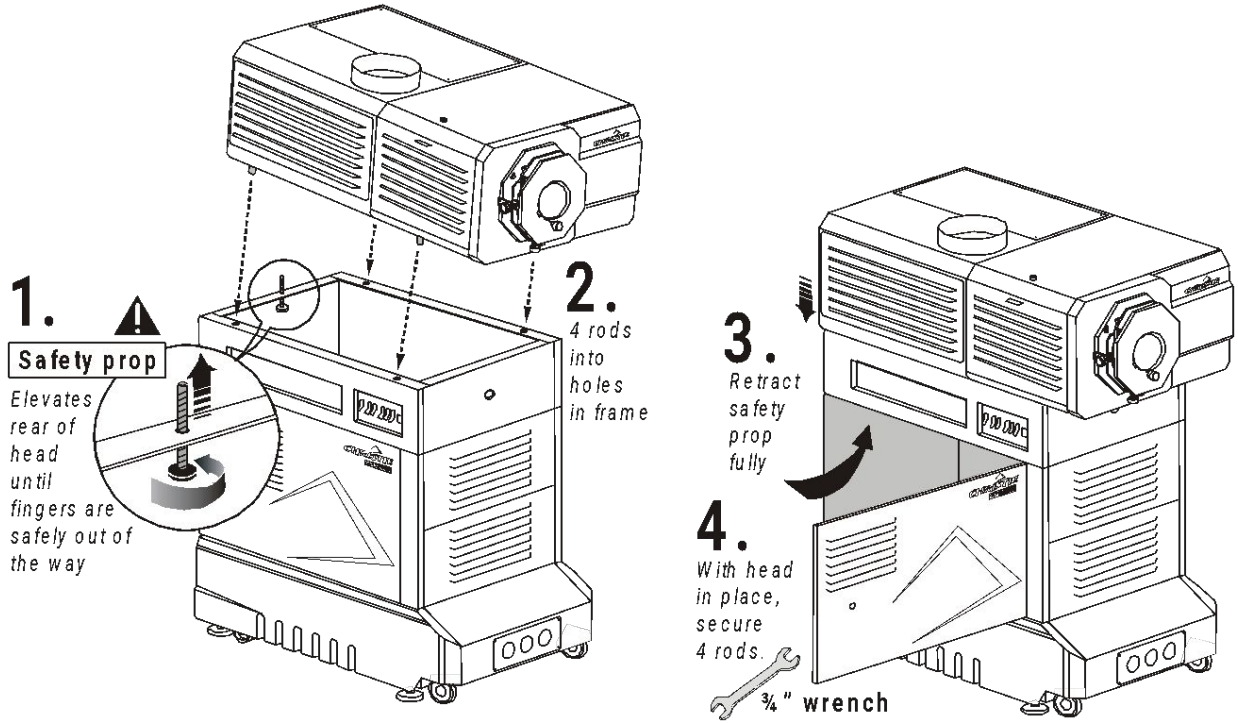
Installation

- **General Overview—Continues**

10. **Verify AC selector setting on Ballast**.
11. Initial 3-phase power-up
    a. Set local date/time
    b. Enter “New Lamp” details
    c. Ensure to select proper lamp type
12. Adjust zoom lens for proper sizing. See separate discussion on lens selection.
13. Optimize light output
    a. Auto Lamp Alignment (after 20 minutes warmup)
    b. Set (MCGD) Measured Color Gamut Data
    c. Calibrate screen for 14fL (use “DCIXYZWhite_12bit” pattern)
13. Optimize Focus and Boresight
14. Backup conf.dat files or setup “Custom” page settings
15. Test flat and scope content.

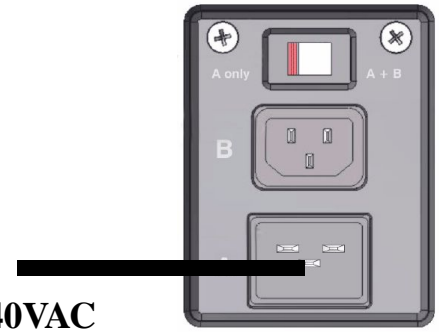
Installation
(Bolt Projection Head to Pedestal)

- Locate pedestal to approximately 2 feet from port window (or move *after* assembly)
- Extend rear safety prop
- Lift head onto pedestal — requires 4 people
- 4 rods (head) into 4 holes (pedestal)
- Retract safety prop and secure rods with 4 washers/nuts



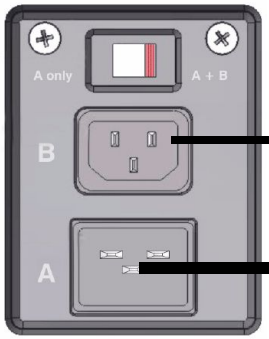
Installation
(AC Mains Input Options)

The AC Mains Input for the CP2000-M and series 2 ZX projectors provides an option to connect a separate UPS to power the electronics of the projector.



1 Single phase 240VAC

OR



UPS

240VAC single phase for other electronics.

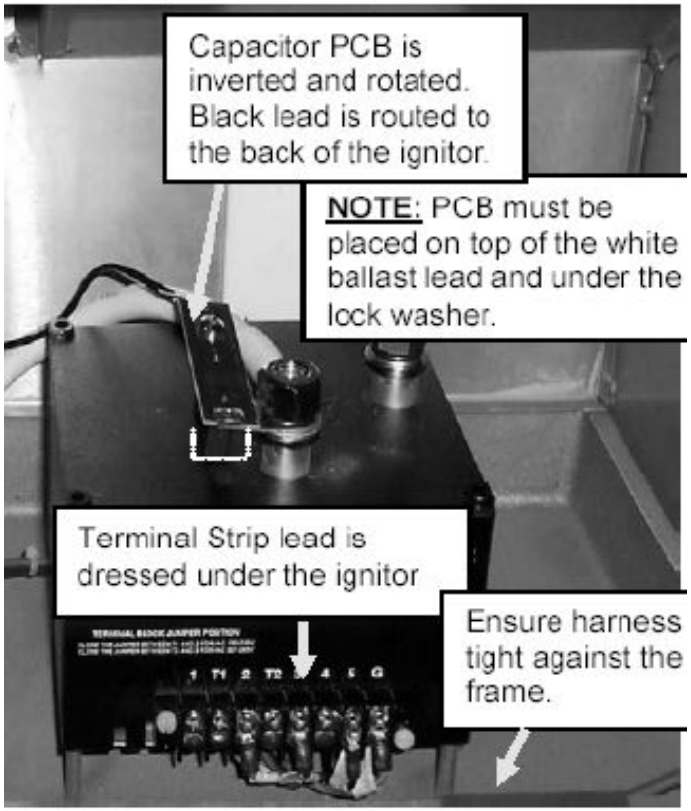
1 Single phase 240VAC

For Lamp Ballast Only

Installation

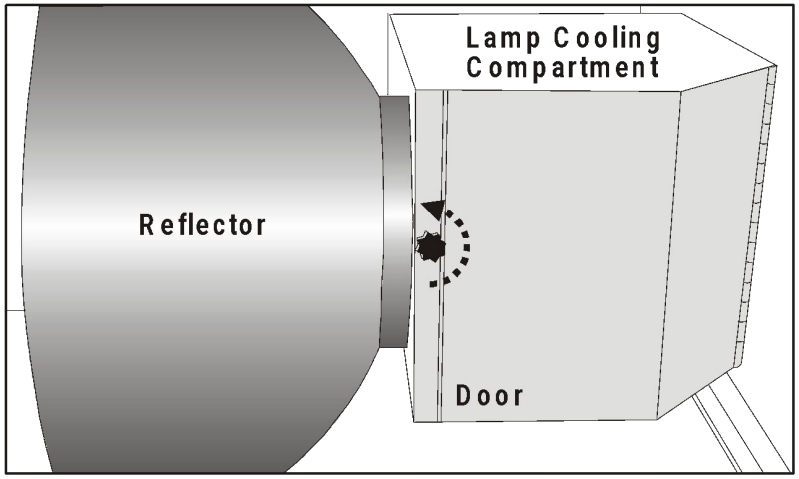
(Connect Lamp Leads “S” model only)

- Route lamp cables up from pedestal
- Connect positive (white) cable to igniter terminal and ensure PCB is on top of the cable and below the lock washer.
- White cable lead must be routed towards the back as shown in picture.
- PCB may not be up-side-down as shown.



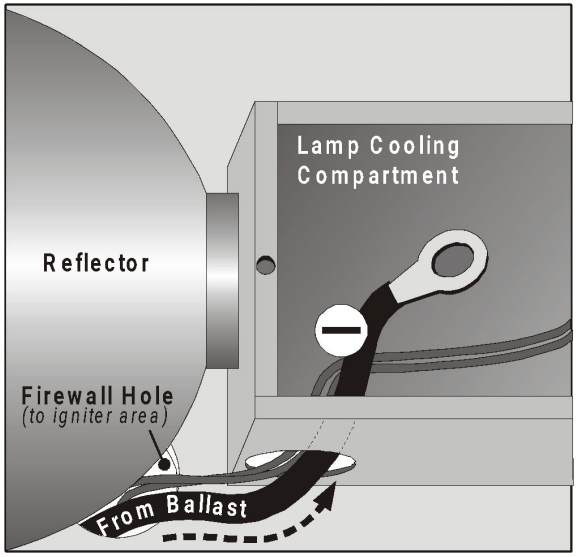
Installation

(Connect Lamp Leads “S” model only)



Open lamp cooling compartment

Route negative (black) lamp lead into lamp area

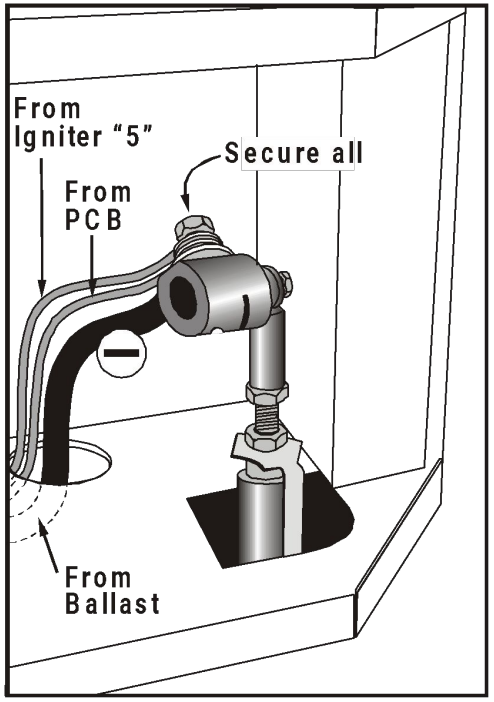


Installation

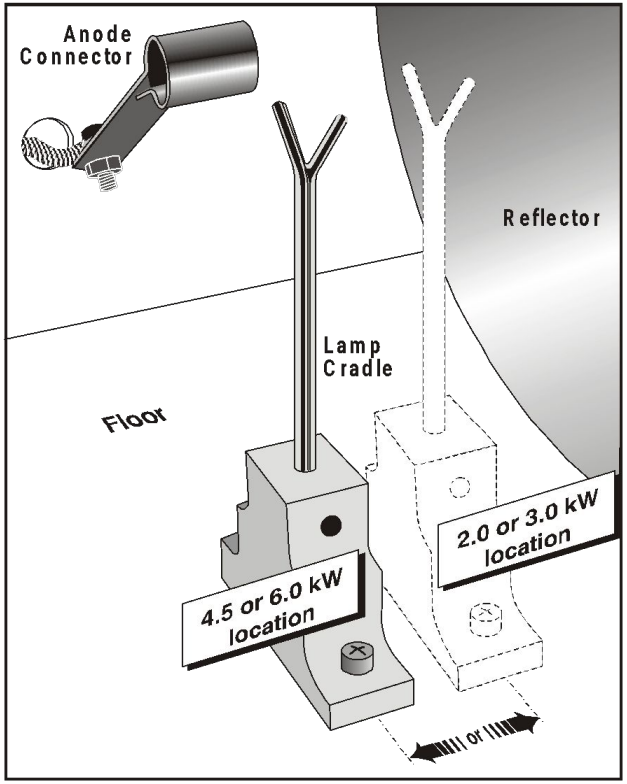
(Connect Lamp Leads “S” model only)

- Secure negative (black) lamp lead — along with the 2 other wires from the igniter area — to the lamp connector nut.

- Make sure lamp lead is on FIRST, then other 2 smaller cables last.

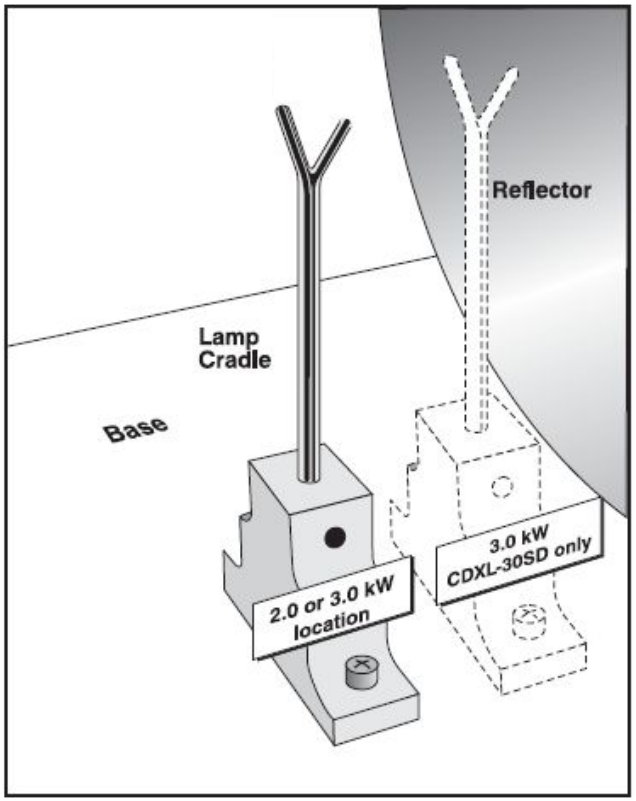


Installation
(Installing Lamp)



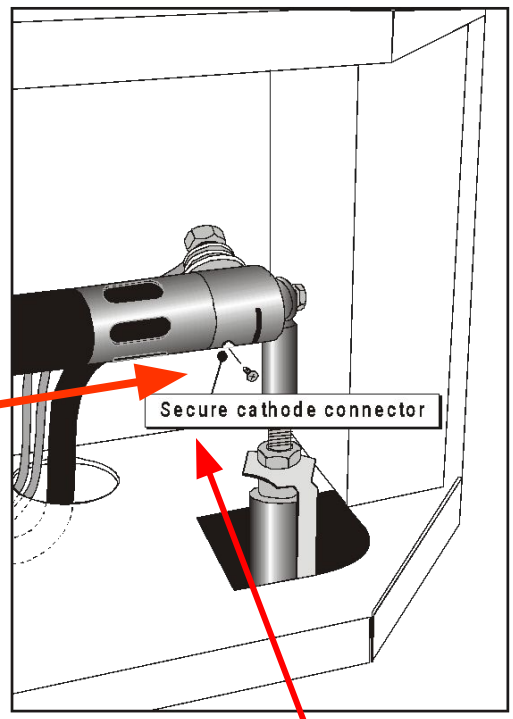
CP2000-X/S

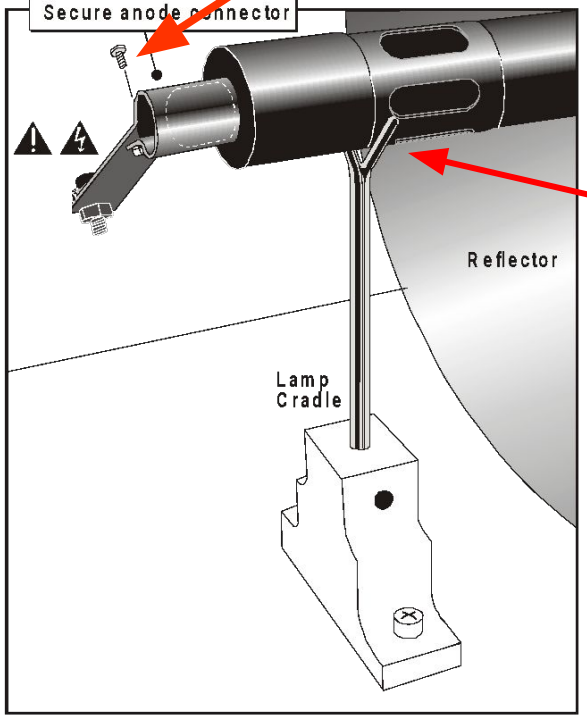
CP2000-ZX



Installation
(Install Lamp)

- Secure lamp at cathode
- Slip anode connector on and secure





Allen head 5/32

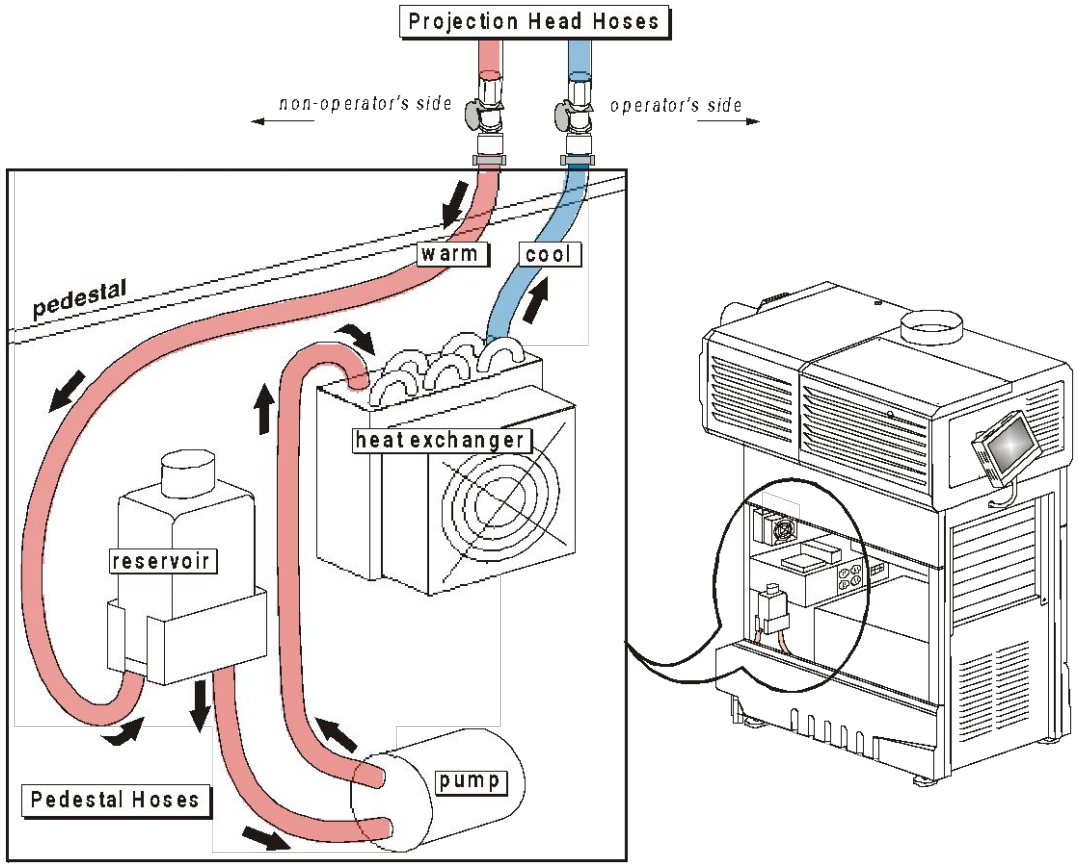
Allen head 9/64

Note:

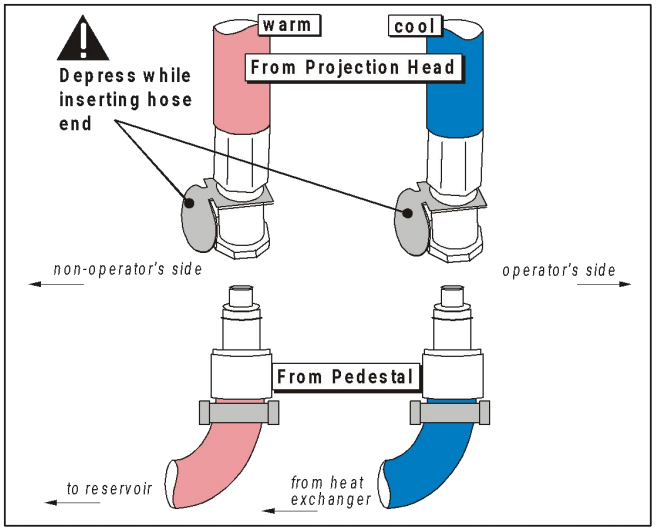
Take care when using CDXL-30SD lamp. Anode sleeve has bevelled edge that will catch at the lamp cradle. Rotate lamp until bevelled edge does not interfere with cradle.

Note: Additional adapter is required to use CDXL30-SD lamp on CP2000-ZX

Installation
(Connect Water hoses)



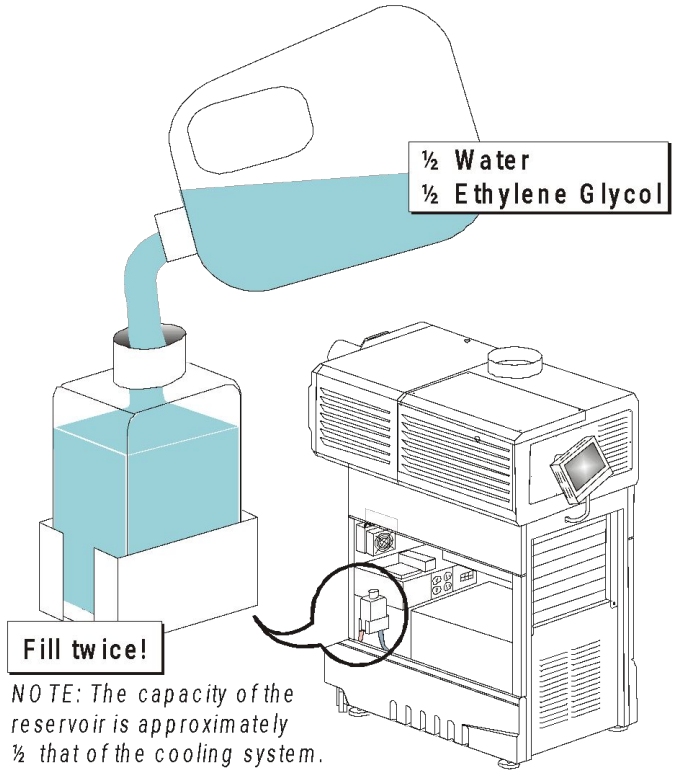
NOTE:



Installation

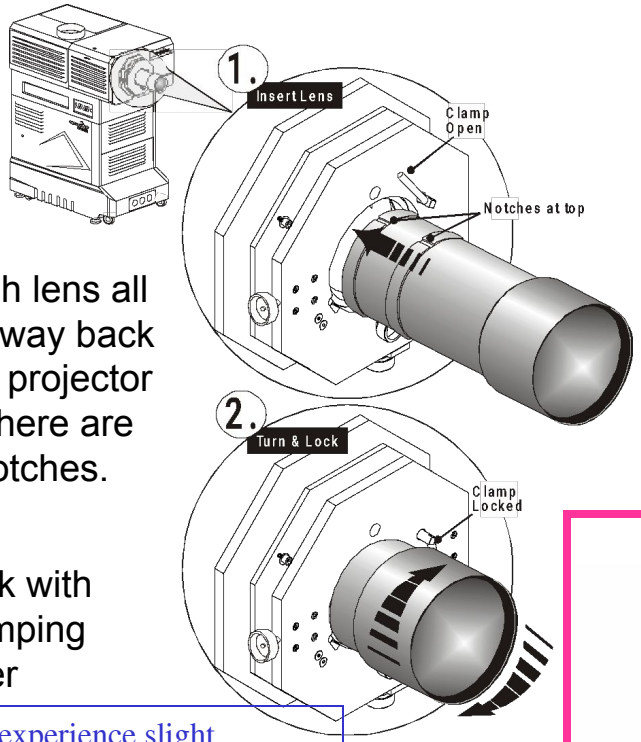
(Fill Reservoir, required for Pedestal Units only)

- Fill completely — no need to watch gauge
- Second fill will be needed after the head has been power-up for a few minutes. (check for air bubbles and squeeze tube to remove air)



Use a low Silica Ethylene Glycol mixed with distilled or de-ionized water (50/50).

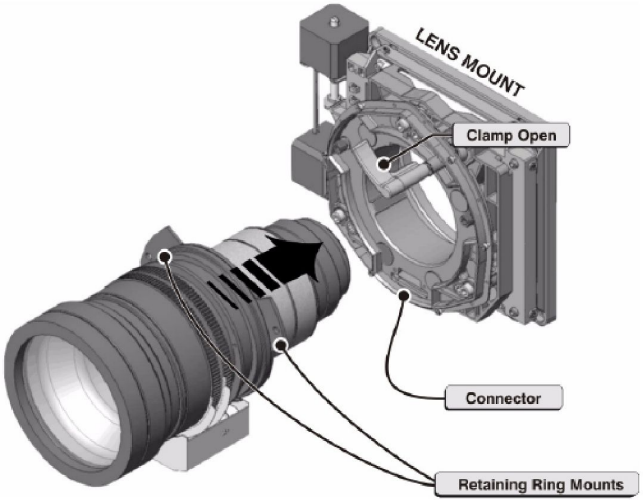
Installation
(Install Lens)



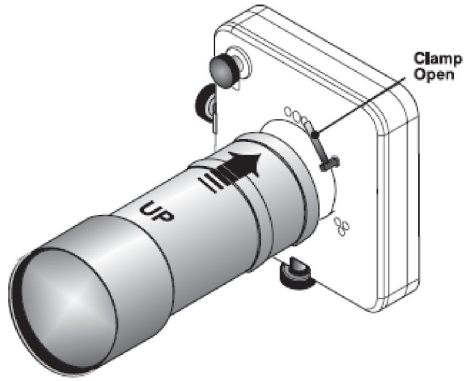
- Push lens all the way back into projector — there are 2 notches.
- Lock with clamping lever

If you experience slight vibration in image, check the exhaust fans to make sure it is not causing the problem. If vibration still occurs, there are 2 small slotted screws at the top of the lens mount that you can tighten. Remember to loosen these next time you remove the lens.

CP2000-M/MR



CP2000-ZX

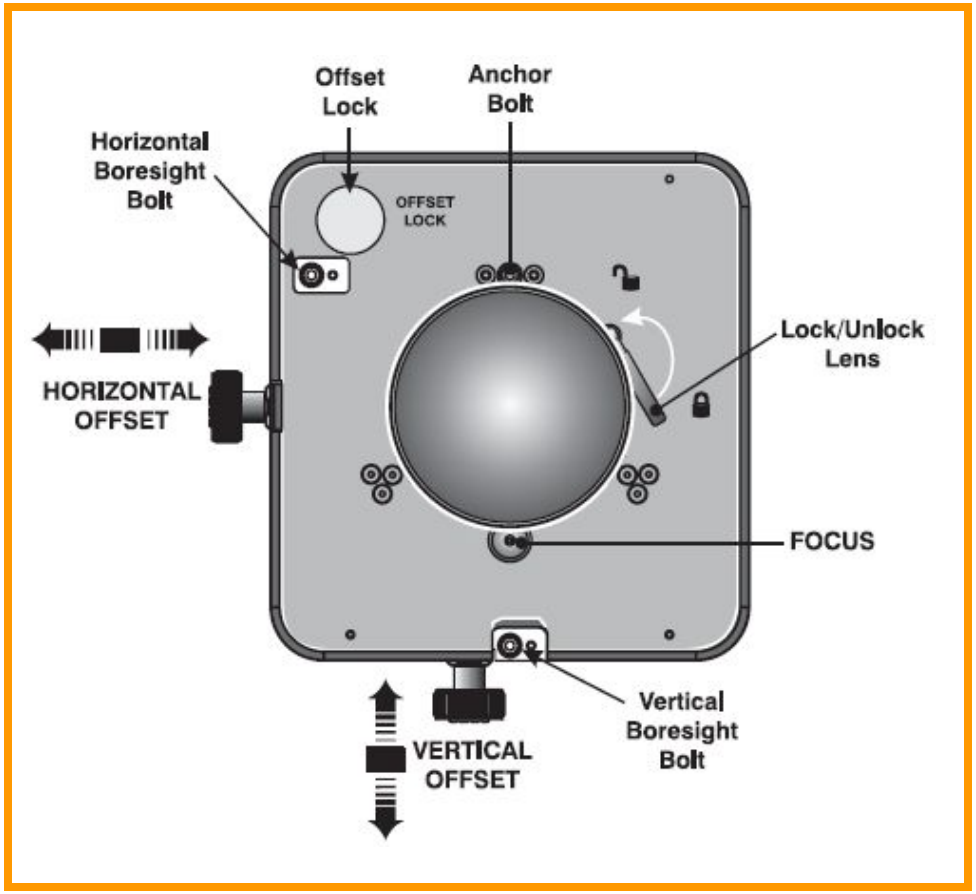


When installing HC lens in ZX, you need to take note of the up position of the lens and rotate the lens after in has been fully seated so that “up” is pointing upwards.

Installation

(Boresight or top/bottom, side/side focus)

CP2000-ZX/XB/SB



Tools: 3/16 + (3mm or 7/64) Allen key

Ensure image is centered and focused before proceeding.

Vertical Boresight: Using a 3mm or 7/64 Allen key, loosen the Set screw to allow the Adjust screw to travel. Turn the Adjust screw until the top and bottom focus is equal. You may need to play with the center focus settings.

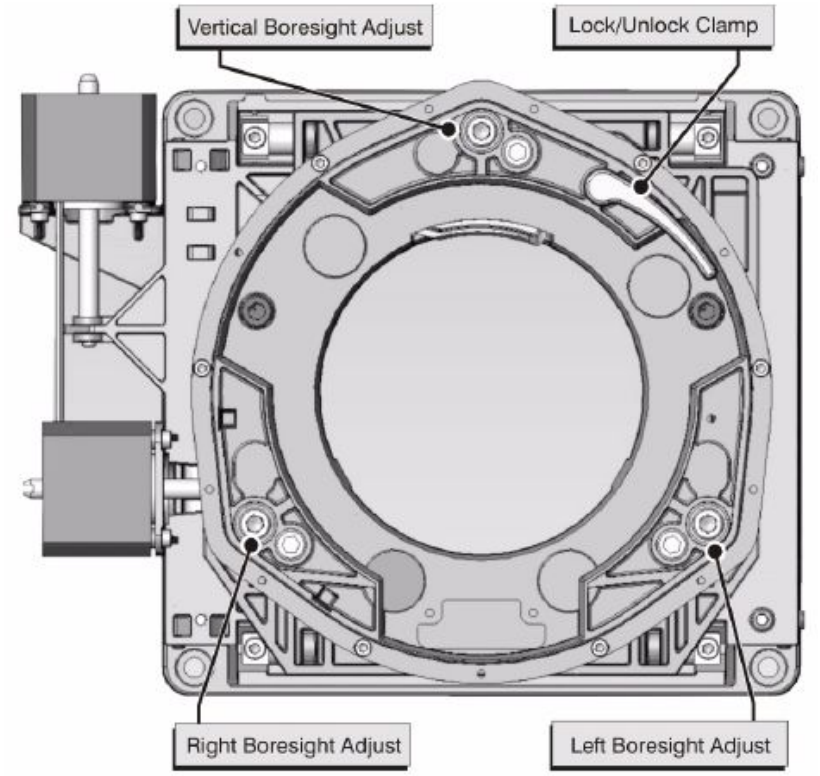
Horizontal Boresight: Use the same procedure as for Vertical Boresight. You may need to go back to the Vertical adjustment as there are some interaction between the two.

After all adjustments are complete, remember to tighten the Set screw for both Vertical and Horizontal.

Installation

(Boresight or top/bottom, side/side focus)

CP2000-M



Tools: 5mm Allen key

Vertical Boresight: To adjust Top/Bottom focus, start by loosening the Set screw beside the Adjust screw. Turn the Adjust screw 1/8 of a turn in one direction. Now turn both Right and Left Adjust screw, 1/16 of a turn in the opposite direction. Continue this procedure until you are satisfy with the focus.

Horizontal Boresight: To adjust the Left/Right focus, start by loosening both Set screws beside the Adjust screw. Start with the right side of the picture and turn the Right Adjust screw 1/16 of a turn. Now turn the Left Adjust screw in the opposite direction the same amount. Continue this procedure until the right side is in focus compare to the middle. Repeat the

Once both Vertical and Horizontal Boresight has been completed, remember to tighten the Set screw beside the Adjust screw for all 3 group of screws.

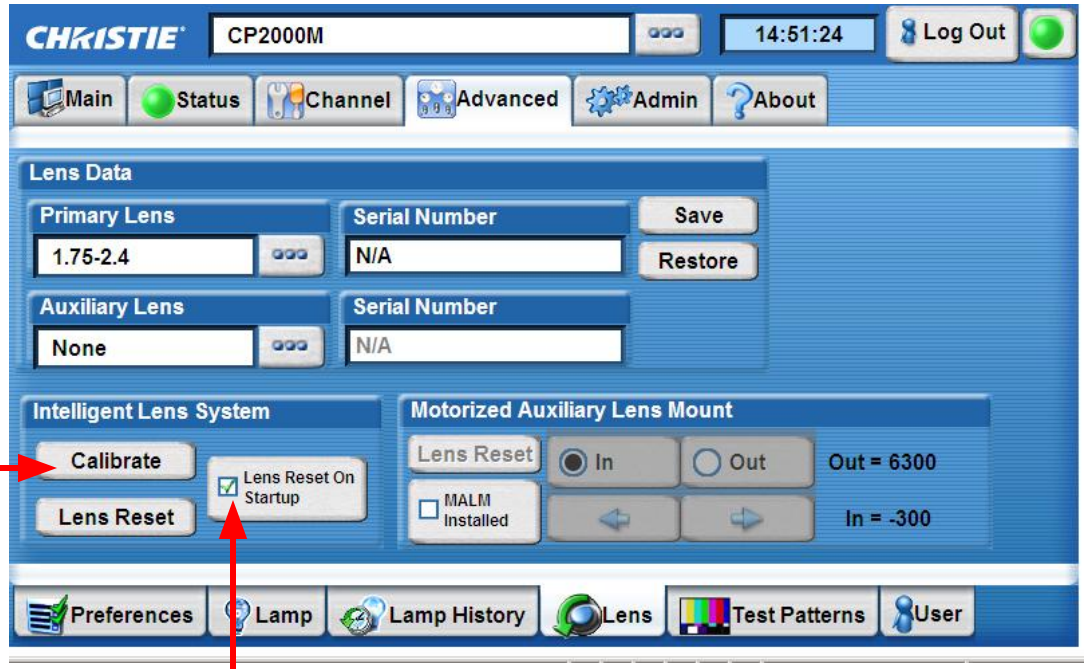
Installation
(Install Lens)

CP2000-M Lens Calibration

Any time a new lens is installed on a CP2000-M, you must "Calibrate" the lens motors for proper ILS operation.

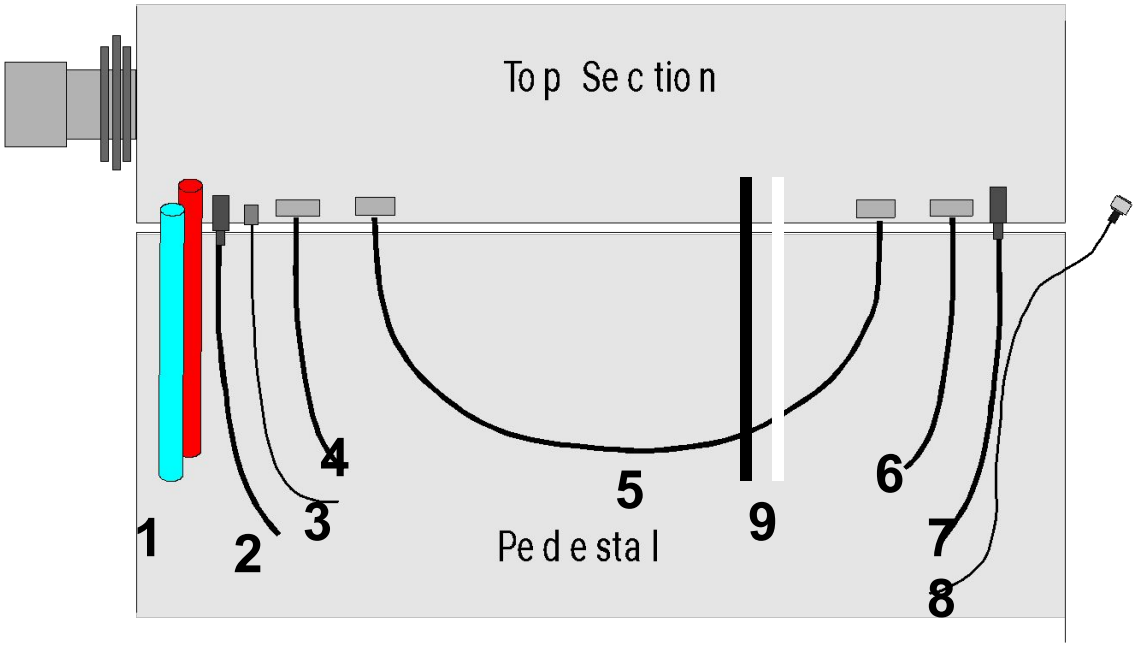
Press the "Calibrate" button. This procedure takes approximtely 2 minutes.

It is also a good idea to enable the "Lens Reset On Startup" function. This will ensure the lens returns to the same point as it was programed to even if someone has accidentally bumped into it.



Installation

(Head and Pedestal Interconnections “SB” model only)

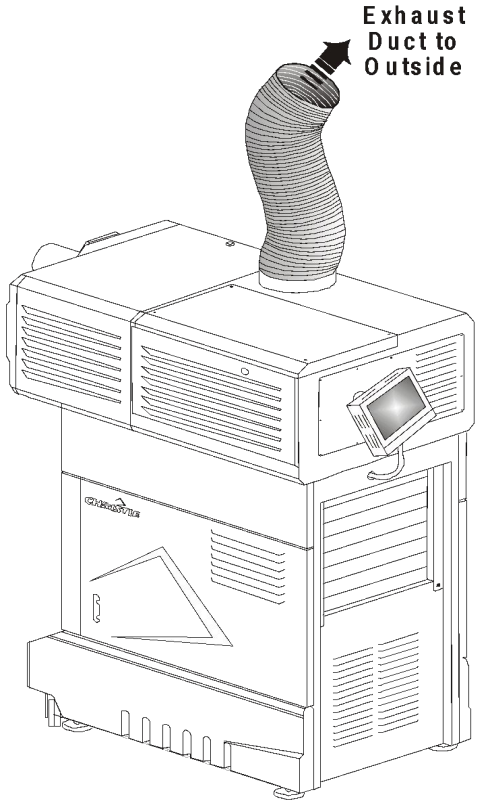


1. Water hoses
2. AC (front)
3. Ethernet (from Hub)
4. 9-pin Control (front)
5. 15-pin Interconnect
6. 9-pin Control (back)
7. AC (Back)
8. Touch Panel Controller
9. Lamp DC Power

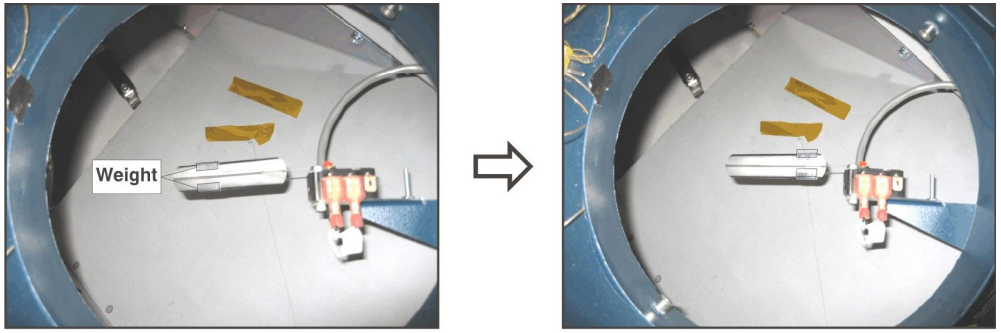
Installation
(Exhaust)

Lamp Power	Minimum Extraction
2 - 3KW	450 CFM or 212 l/s
4 – 6KW	600CFM or 283 l/s

Use the higher 600 CFM rating for systems installed in small, poorly ventilated rooms. Remember if you have 3D, use this lamp rating for calculations.



Change weight on flow switch if necessary (i/h/x/s/xb/sb)

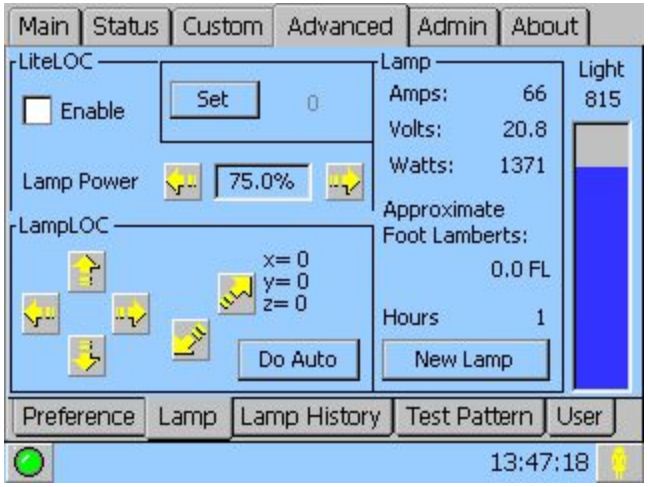


Default Weight Position
600 CFM

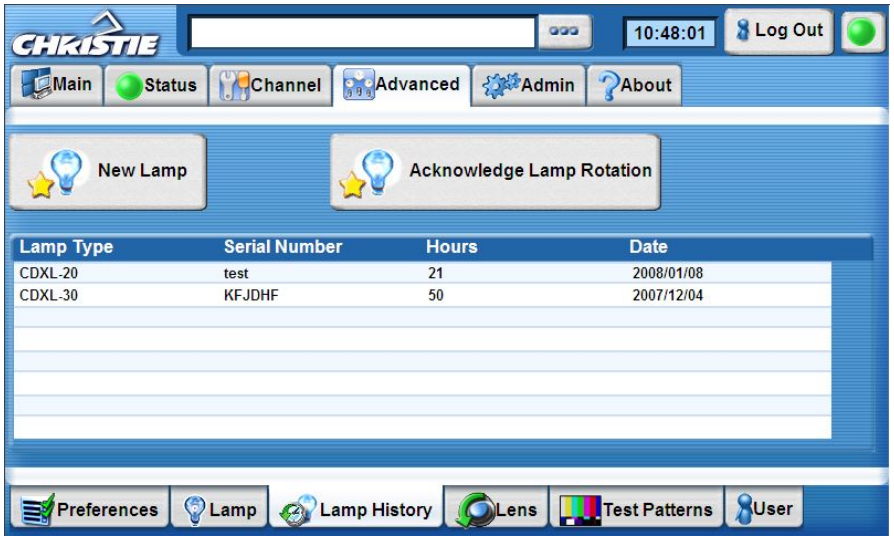
New Weight Position
450 CFM

Installation
(Enter Lamp Data)

- Enter New Lamp Type and Serial number. The “Type” will tell the projector what power settings to use. After installing new lamp, projector will keep track of usage hours.

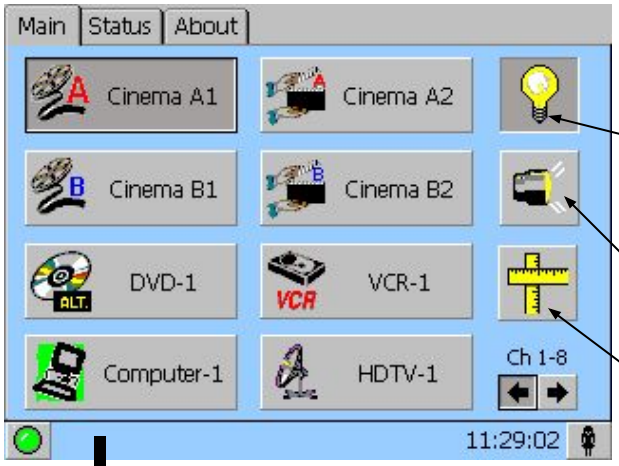


CP2000-ZX



Installation

(Main Menu)



Lamp On/Off

Press and hold for 1 second

Mechanical Shutter On/Off

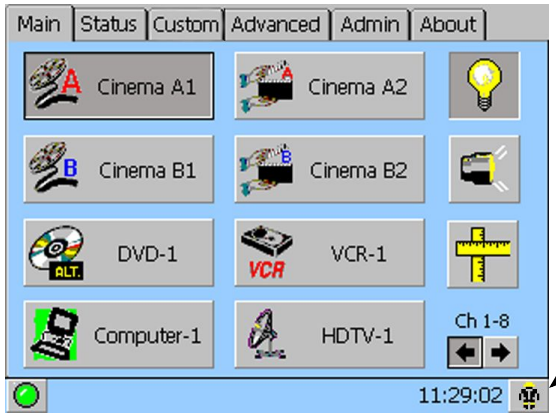
Listen for "clunk" noise if in doubt

Test Patterns List

Patterns added in Advanced Menu

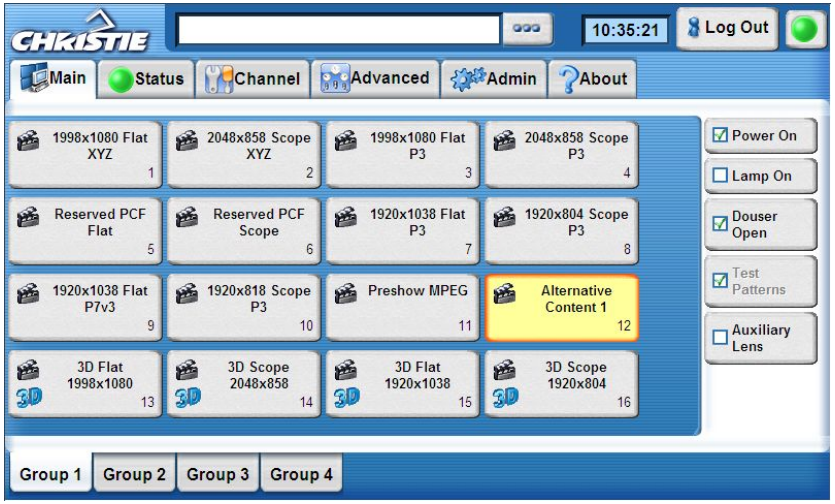
Login: (CP2000-X/S)

User = service
Password = tpccds



Click again to remove advanced features

CP2000-ZX/M



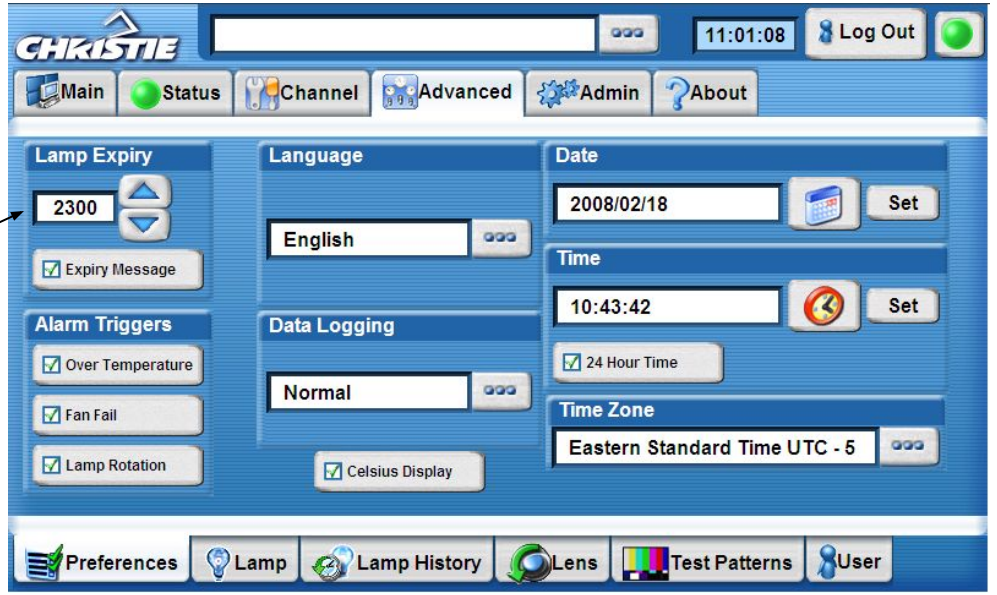
Login: (CP2000-ZX/M)

User = service
Password = service

Installation
(Enter Lamp Hour Limit)

- Enter lamp hour limit to receive a lamp replacement warning message.

Lamp	Hour Limit
CDXL-20	2400
CDXL-30	1440
CDXL-30SD	1100
CDXL-45	900
CDXL-60	500



Touch Panel Controller (TPC)

(Custom setup files)

Inputs:
292-A or B (Typical Mpeg servers)
292-Dual (used in JPEG2K 4:4:4)
DVI - A, B, Twin (3rd party processors)
Cine-IPM - A, B, Twin (Inputs 1, 2, ..6)
Cine-IPM - A, B, Twin (Channels 1, 2, …)

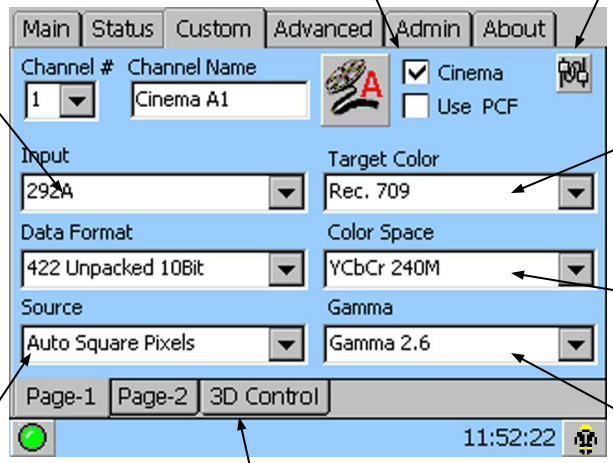
Data Format:
422 Unpacked 10Bit, O/E Pixels
422 Unpacked 10Bit, O/E Lines
422 Packed 12 Bit, O/E Pixels
422 Packed 12 Bit, O/E Lines
444 Unpacked 10 Bits
444 Packed 10 Bits, Mixed
444 Packed 10 Bits, O/E Pixels
444 Packed 12 Bits
422 Unpacked 10 Bit, O/E Frames

Unpacked 8 Bit (for DVI inputs)
Twin packed 10 Bit (for Twin-DVI)

Source:
Auto Square Pixels (assume no squeeze)
H x V Aspect ratio (e.g. 1920 x 1080 1.77)
Aspect ratio 0 = square pixels

Use Cinema Path for all D-Cinema sources.

Synchronizes head activity with TPC
Click after you load/delete files from head



Target Color: (TCGD)
P7v2 – Telecine, Theatre (Old standard)
DCI_XENON (New standard for Mpeg servers)
DCI_XYZE_314_351 (Standard for JPEG servers)
Rec. 709 (Standard HDTV)
SMPTE C (Standard Broadcast)

Color Space: (CSC)
YCbCr240M (Standard 292 inputs)
RGB (Standard DVI inputs or Dual 292 4:4:4)

Gamma: (LUT-DG)
Gamma 2.6 (Standard D-Cinema)
Pal (Standard Video format)

This Tab will only appear if projector is 3D capable.

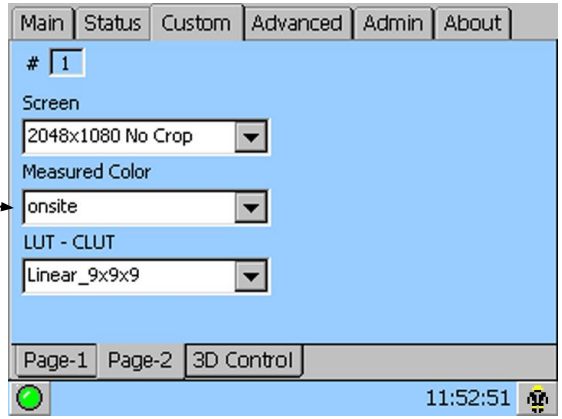
Touch Panel Controller (TPC)

(Custom setup files)

Screen:
Sets Masking and Anamorph Type

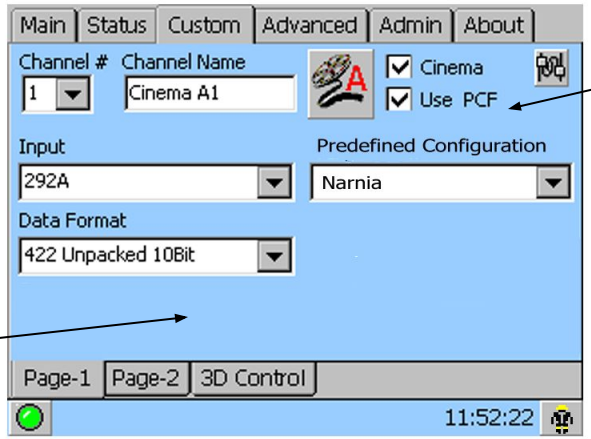
Measured Color: (MCGD)
Typically use “OnSite” as label

LUT – CLUT:
Also known as 3D color lookup table
Linear_9x9x9 (Standard D-Cinema)
Others created by Post Production Houses



Touch Panel Controller (TPC)

(Projector Configuration Files; pcf)



PCF defines the following:

"Source", "TCGD", "CSC", gamma and "LUT-CLUT"

All remaining setup parameters contained and defined inside pcf file.

PCF	Source	TCGD	CSC	Gamma	LUT-CLUT
DCDM_RGB_185	1998 x 1080	_DCI_XENON	Unity RGB	2.6	Linear 9x9x9
DCDM_RGB_239	2048 x 858	_DCI_XENON	Unity RGB	2.6	Linear 9x9x9
DCDM_XYZ_185	1998 x 1080	_DCI_XYZE_	Unity RGB	2.6	Linear 9x9x9
DCDM_XYZ_239	2048 x 858	_DCI_XYZE_	Unity RGB	2.6	Linear 9x9x9
MXFI_185	1920 x 1038	_DCI_XENON	YCbCr 240M	2.6	Linear 9x9x9
MXFI_239	1920 x 804	_DCI_XENON	YCbCr 240M	2.6	Linear 9x9x9

The above pcf's were issued by DCI and represents their view as the most common formats that will be used.

Touch Panel Controller (TPC)

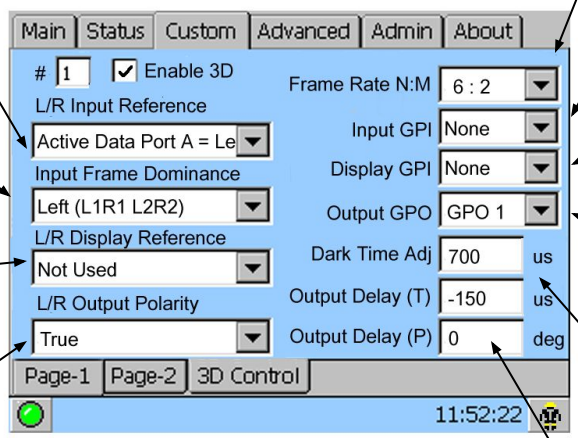
(3D)

Sets whether port A is left eye or right eye.

Determines if the left or right eye is the dominant or frame leading trigger for motion. If set wrong, static images may appear okay but motion will appear jerky.

L/R Display Reference not used. This information is either in the source or the Input GPI signal.

Output polarity of sync signal should be matched to L/R dominance frame. If set wrong, left eye sees right eye image.



frames Display : # frames Input
(Typical input = 24fps; 6:2)
Max frame rate ~ 144Hz.

Input sync signal used by GPIO connector. Most dual signal system do not require separate sync input.

(i. e. set to "None")

Related to Display Reference which is not used by dual signal systems

Sync pulse used to trigger IR transmitters or "Z" screens. Check GPIO connector to match.

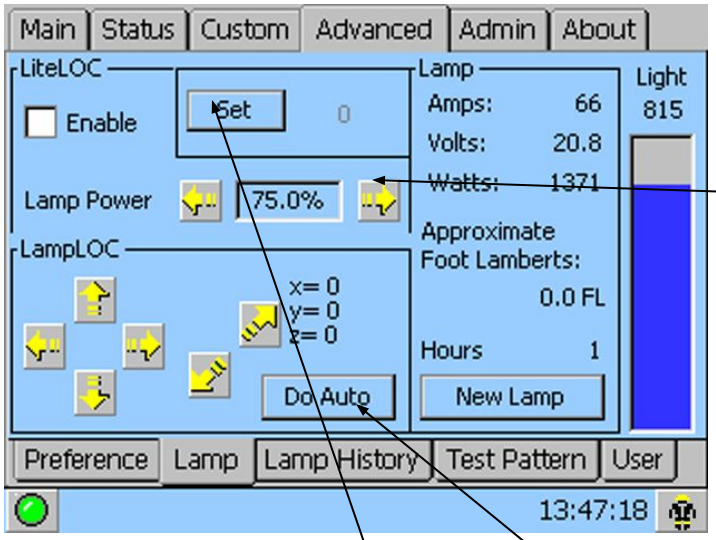
Dark Time and Output Delay together varies the sync pulse to reduce image ghosting or crosstalk.
Dark Time Range: 388 – 4500 for 4:2
Dark Time Range: 388 – 2500 for 5:2
Output Delay Range: +/- 2000us for 4:2
Output Delay Range: +/- 200us for 5:2

Output Delay (P): not supported

If this menu is missing on your TPC, then the projector may not have an EFIB installed. Check the "About" tab to see if FIB or EFIB is installed.

Touch Panel Controller (TPC)

(Lamp Control)



2D = 12 - 14 fL (41 – 48 cd/m^2).

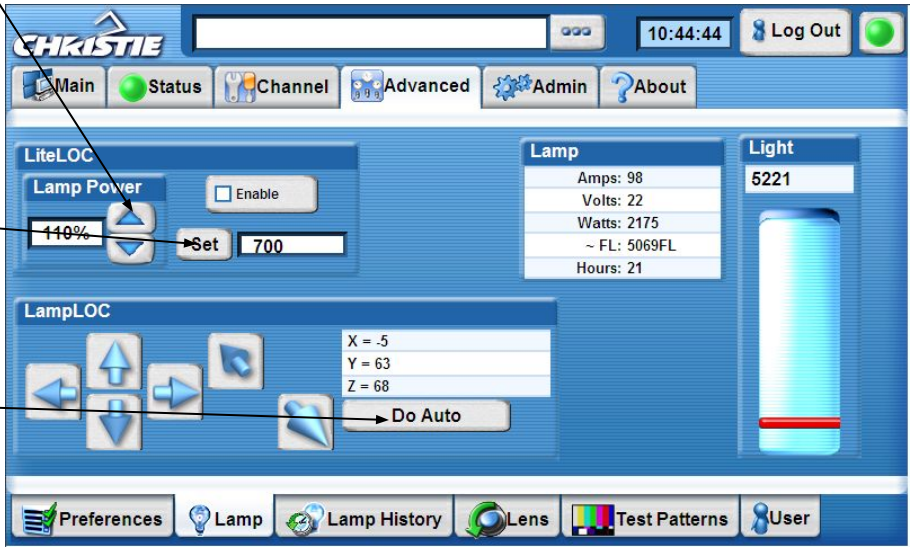
3D = (~30 fL before filters)

Lamp Current Range:

(requires TPC 2.4d firmware or higher)

Lamp	75%	110%
2KW	66	98
3KW	82	128
4.5KW	112	160
6KW	126	180

CP2000-ZX

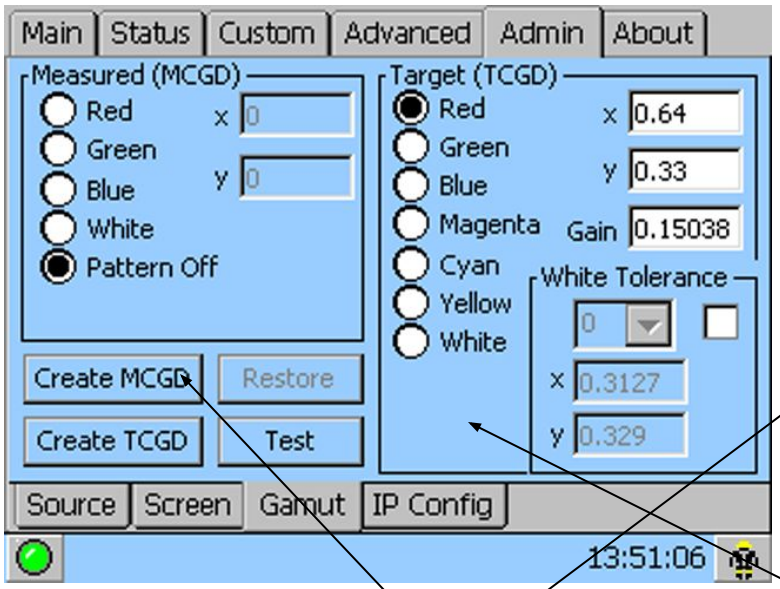


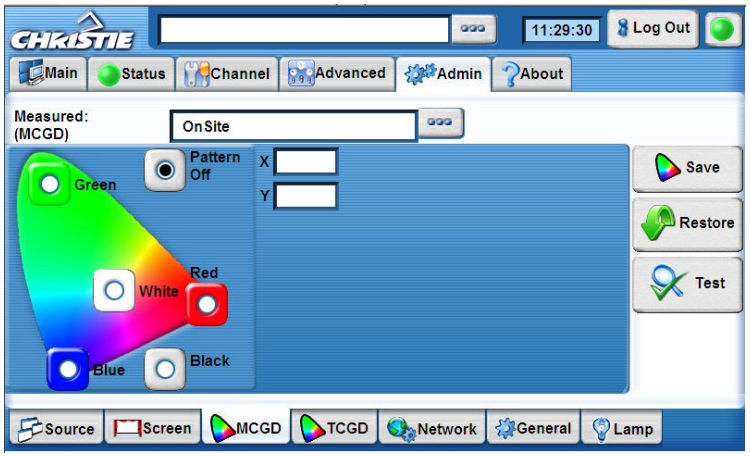
LiteLOC: Select “Enable” to use. Projector will automatically adjust Lamp Power to track light output as lamp ages. Click “Set” periodically to reset the target point.

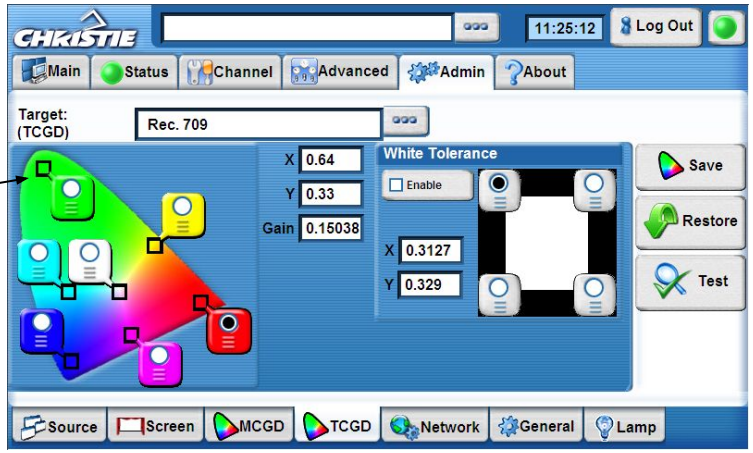
LampLOC optimises alignment between lamp and reflector. Use when installing a new lamp and periodically as lamp ages. Allow lamp to warm up before using.

Touch Panel Controller (TPC)

(Colour or Gamut settings)







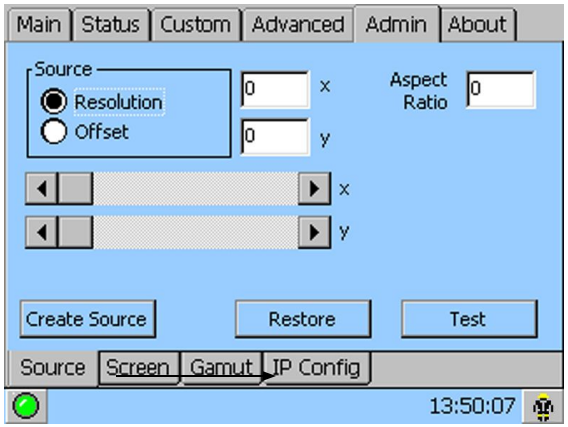
MCGD System must be calibrated on site. Usually performed during installation and checked anually. You may need to create 2 MCGD file: 2D and 3D

If desired, TCGD's can be manually created here. More likely, use this menu to identify the exact x,y values of the target color used.

Touch Panel Controller (TPC)

(Masking and Presentation)

Use this menu to either create a new "Source" file or check the active one. Remember to define the aspect ratio. An "Aspect Ratio" of "0" equals square pixels or non squeezed content.



Presentation defines the active area of the DMD. Default (full) area is:

(0,0), (2047, 1079).

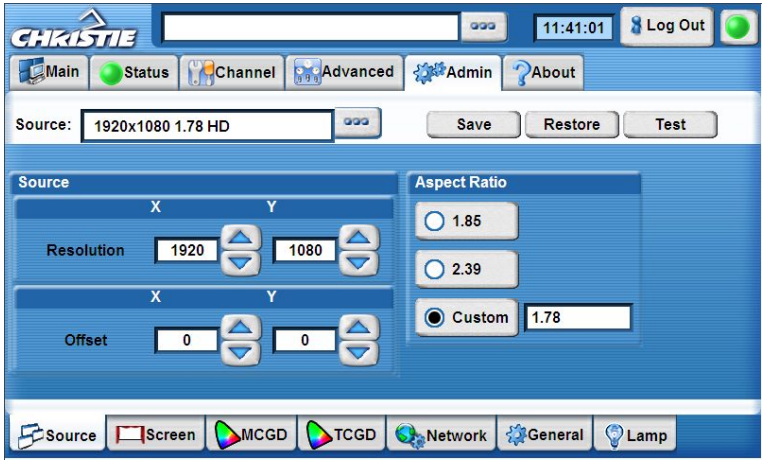
Other typical settings:

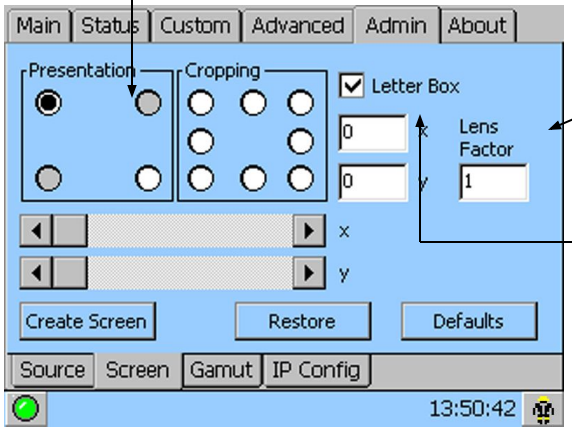
2D flat: (24, 0) (2022, 1079)

2D scope: (0, 111) (2047, 968)

3D flat (209, 99) (1837, 979)

3D scope: (63, 137) (1983, 941)

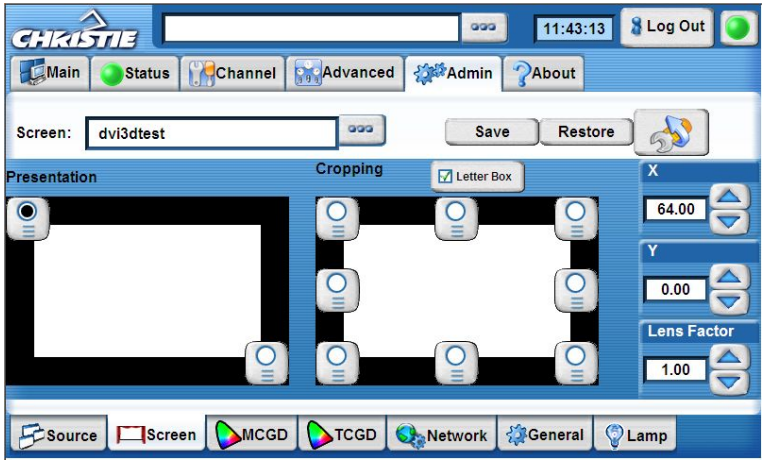




Lens Factor 1 equals no anamorph adapter. If anamorph lens is used, enter 1.26.

Letter Box setting tells the projector to always show the full image and use black bars if necessary where no image appears.

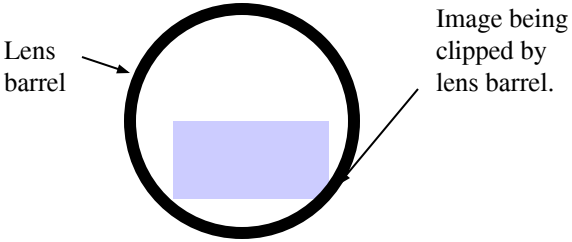
With Letter Box unchecked, projector will scale to fill panel and may clip image.

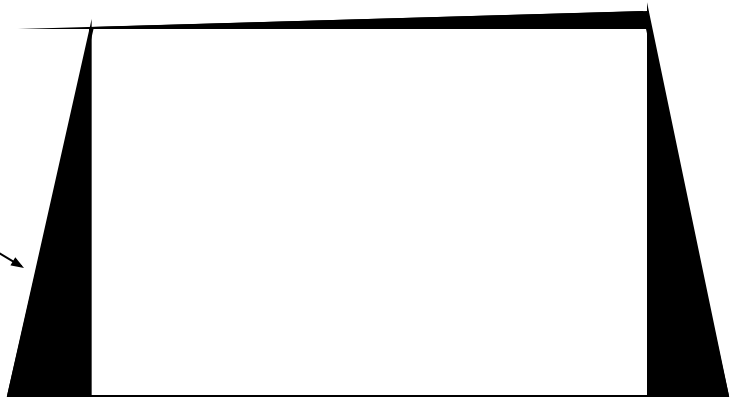


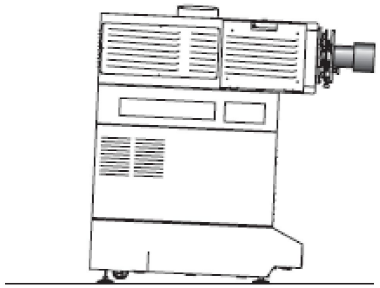
Cropping or masking only hides image. Use slide bar or enter pixel values in box. Lowest resolution of 0.125 of a pixel possible.

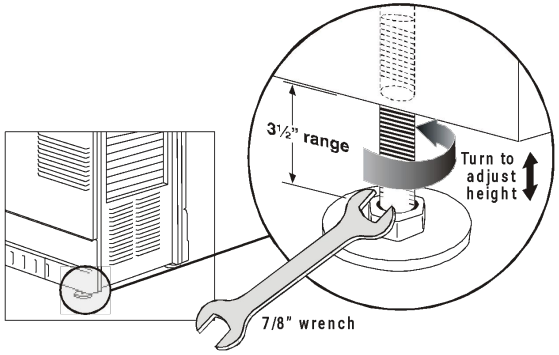
Installation
(Leveling and Tilting)

- Adjust lens shift and look into the front of the lens to ensure image is not being cut by lens barrel. Reduce lens shift if image is blocked by the lens. You will then have to tilt and pivot the projector to align the image back onto the screen.

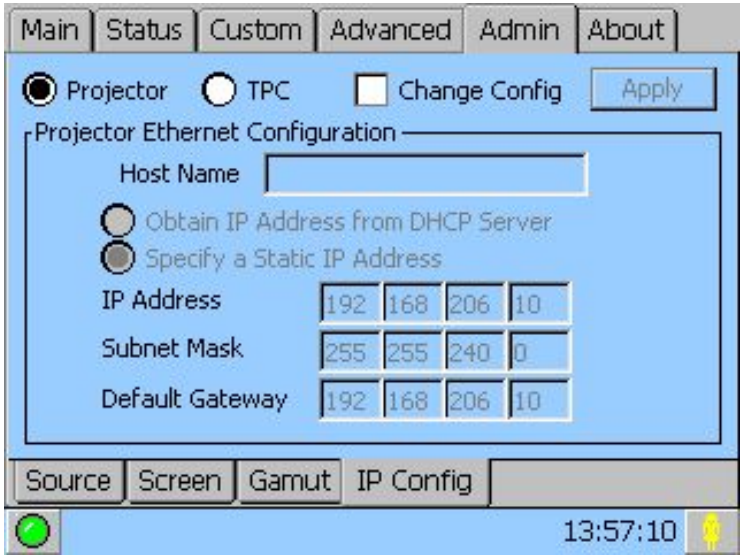





Tilted Projector

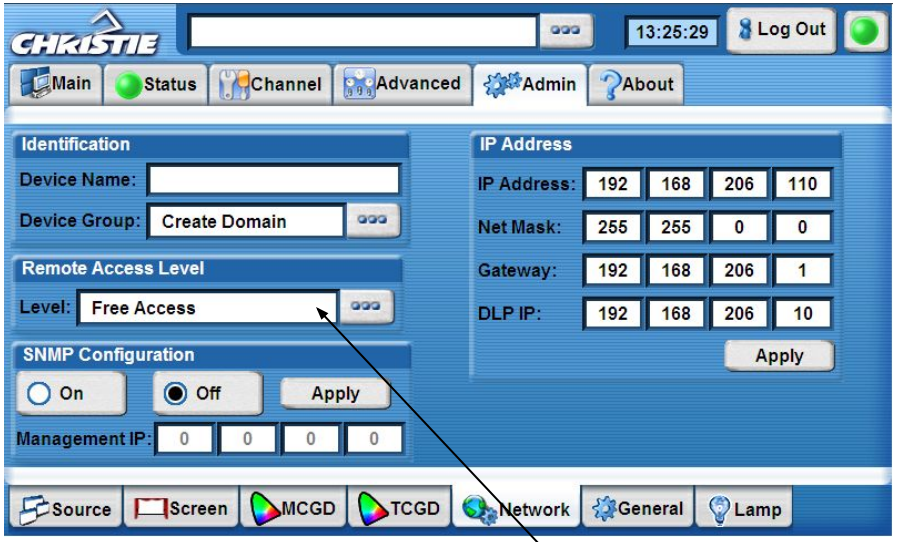


Installation
(Setting IP Address)



- You may need to change the default IP Address of the projector head and controller (e.g. TPC or PCM). Use the menus shown above to do this.
- Both projector head and Touch Panel needs to be power cycled for changes to take place.

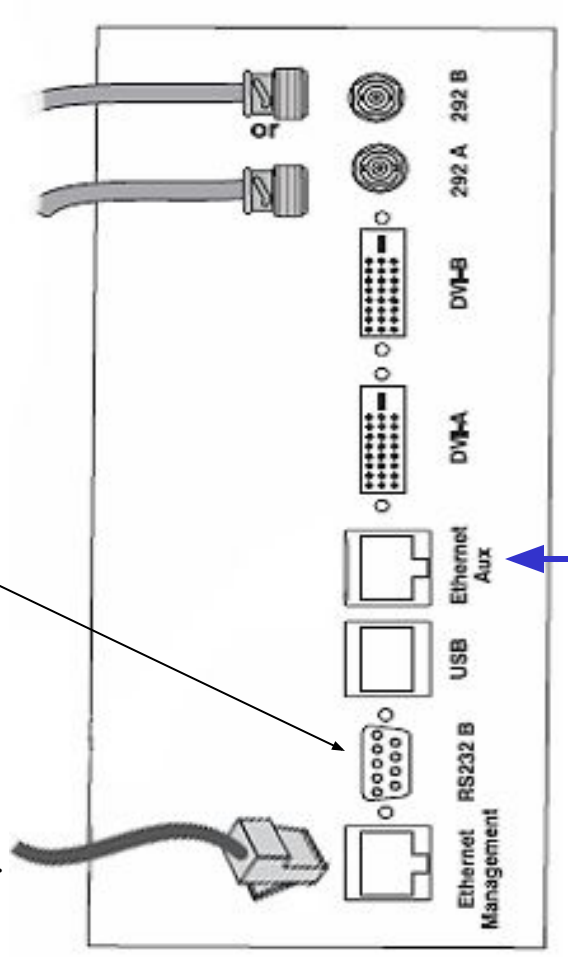
CP2000-ZX



Remote Controlling: You may need to set the Remote Access Level to "Free Access" if you wish to control the projector via a Server or Third party controller which does not have password authenticated commands.

Default IP address: DLP IP – 192.168.206.10 TPC or PCM – 192.168.206.110

Installation
(CP2000-ZX/M I/O Connections)

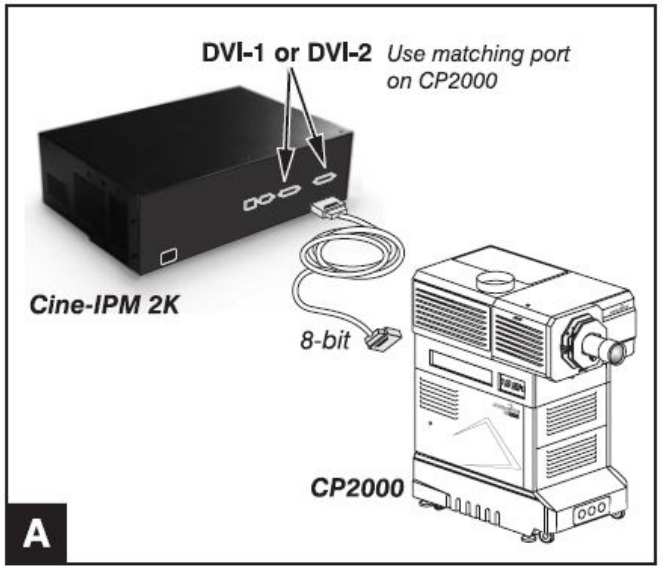


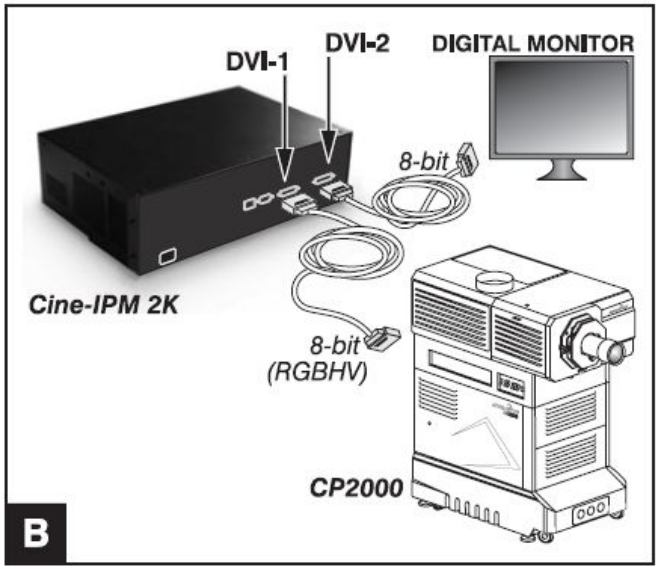
Used for general serial communication to Projector. Not to be used for Cine-IPM2K or connections directly to the "head". RS232 A is located to the left of this panel and is dedicated to serial connection to T.I. electronics.

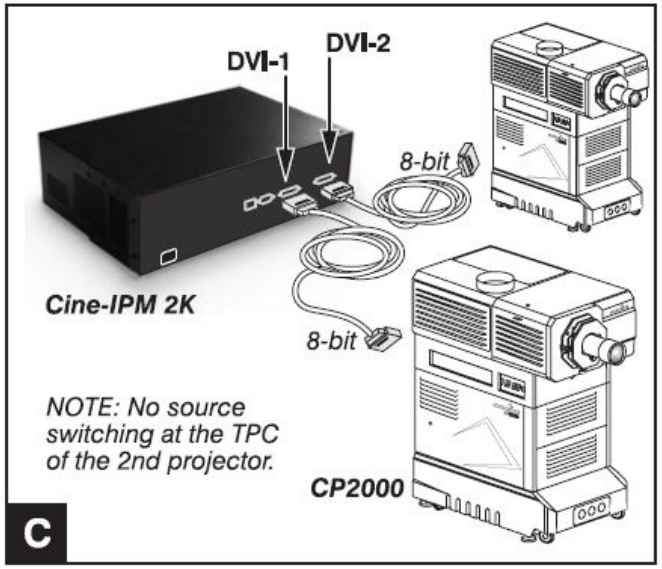
Not used at the moment.

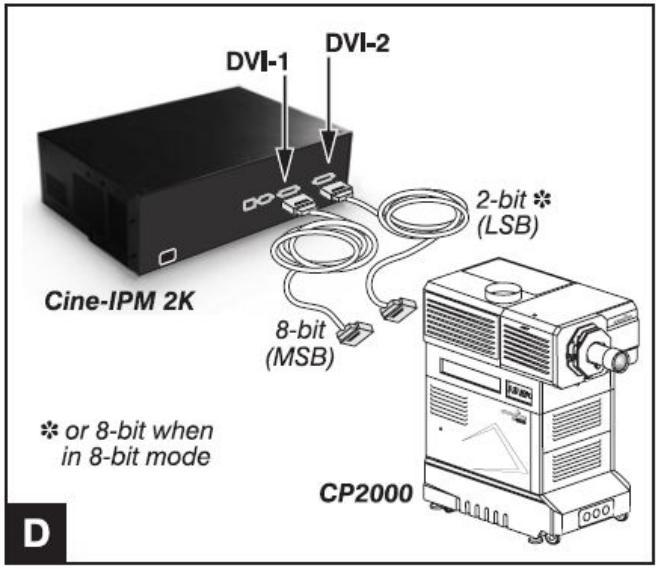
Connect to System Ethernet Switch or Hub.

Installation
(Cine-IPM 2K)









Projectors with FIB will loose 15 lines top and 15 lines bottom.

Projectors with EFIB will loose no lines but must be set to non-Cinema path.

Output of Cine-IPM 2K is selectable:

1280 x 720
1280 x 1024
1400 x 1050
1920 x 1080
2048 x 1080

Make sure you set the Projectors Source and Data Format to match.

Maintenance

Maintenance
(Proper Cooling)

- Standard precautions
  - Avoid crowding with other equipment
  - Keep louvers & vents clear and away from other heat sources
- Air filter
  - Some environments are not “sealed” and the main filter becomes clogged regularly.
  - Replaced air filters every lamp change or more as required. Check monthly.
- Liquid Cooler
  - Check coolant level every month.
  - Coolant is 50/50 distilled water and ethylene glycol (antifreeze)
  - CP2000-M also has a washable filter for the radiator.
- Exhaust Duct
  - No kinks or obstructions

Maintenance
(Cleaning; dust, dirt, oil)

- Electrical: AC connections
  - Check every 60 days or 500 hours:
    - Contact surfaces of anode and cathode connections
    - Look for heat fatigue on metal surfaces (discolouration)
    - All other connections tight?
- Optical See *CP User's Manual*
  - Avoid unnecessary cleaning! Damage possible!
  - Check LENS and LAMP REFLECTOR only
  - **IF DUSTY LENS**
    1. Camel-hair brush
    2. Compressed air (filtered nitrogen through anti-static nozzle)
    3. Microfibre cloth if dust is bound to surface. No pressure.
    4. Lens cleaning solution only if necessary
  - **IF FINGERPRINTS, SMUDGES, OIL ON LENS**
    1. Camel-hair brush or compressed air first
    2. Damp lens tissue with lens cleaning solution, wrap around cotton swab

Maintenance
(Cleaning; dust, dirt, oil)

- Optical *Continued*
  - Other Cleaning
  - Lamp fan
  - Igniter
  - Air flow interlocks (lamp fan and exhaust opening)

Lamp Replacement Schedule

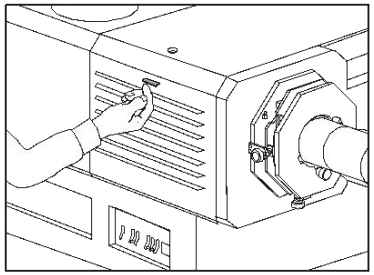
- Warranties for CDXL lamps
  - 2.0 Kw [60 hours full warranty, 61 - 1200 pro-rated]
  - 3.0 kW [720 hours full warranty, 721 - 1440 pro-rated]
  - 4.5 kW [60 hours full warranty, 61 - 900 pro-rated]
  - 6.0 kW [50 hours full warranty, 51 - 500 pro-rated]

- Never exceed warranted life by more than 20% (safety)

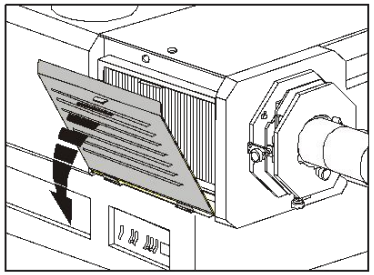
- Lamp age is tracked in proj. Can also record on card provided.

Main Filter Replacement

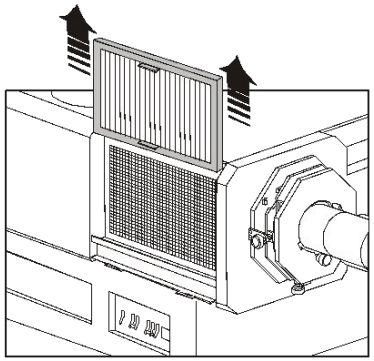
Replace Main Filter with each lamp change!



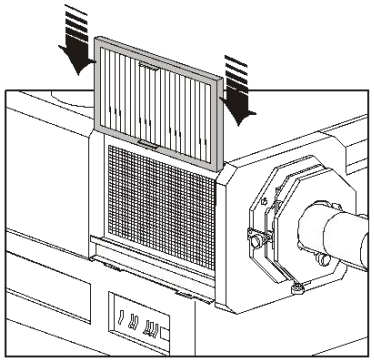
1. Open filter door



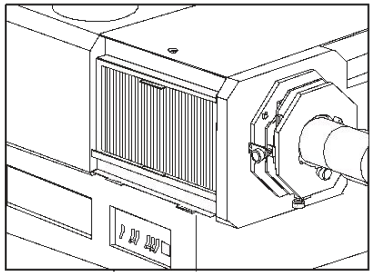
2. Open or remove door



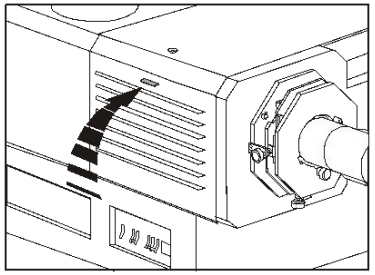
3. Remove old filter



4. Install new filter, tabs out

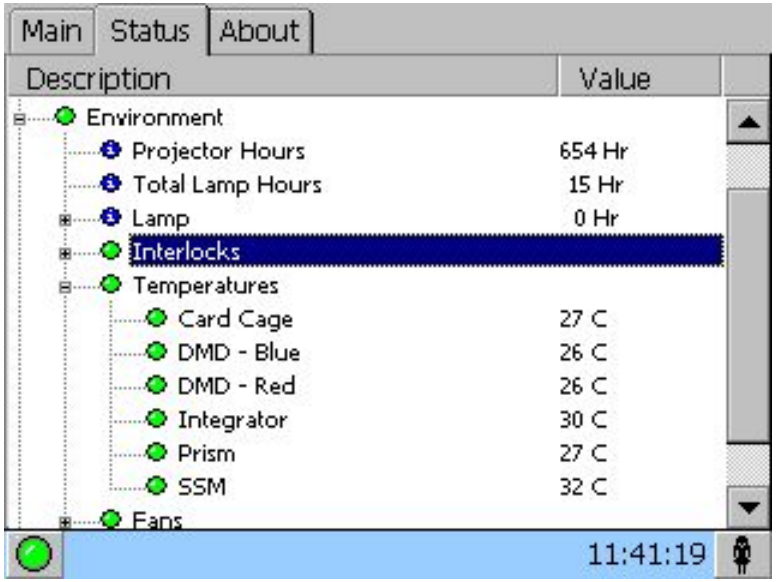


5. Filter installed



6. Shut filter door (magnetic closure)

Temperature Limits



Device	Warning	Critical
Card Cage	55-69	70
DMD – Blue	50-54	55
DMD – Red	50-54	55
Integrator	95-104	105
Prism	70-74	75
SSM	55-59	60

Interface Board Hardware LEDs

LED Identifier	Short Description	Full Description
D3	DOC Active	Indicates Disk-On-Chip read or write activity
D4	Ethernet TX	Indicates Ethernet transmit activity from the board
D5	Ethernet RX	Indicates all Ethernet activity on the connected LAN, including,but not limited to, data intended for the board
D6	Ethernet SPD	Indicates the speed of the Ethernet link (if present)OFF = 10Mbit ; ON = 100Mbit
D7	Ethernet LNK	Indicates the presence of a link to an external deviceOFF = Link Not Present ; ON = Link Present
D8	Ethernet COL	Indicates recent Ethernet collisions. While this is an error, itcan occur during normal operation of a LAN when there are multiple devices attempting to transmit at the same time. This is usually corrected at the hardware layer by the normal Ethernet protocol.Occasional and brief collision indications are not usually a problem.OFF = No Collision ; ON = Collision
D9	Ethernet FDX	Indicates full duplex Ethernet (not important)OFF = Not Full Duplex ; ON = Full Duplex
D12	Fuse Fail	Indicates that fuse F1 is blown. Fuse F1 protects the input to the 1.5V switching regulator.OFF = Fuse OK ; ON = Fuse Blown
D13	Software Fail	Indicates that the FPGA has not loaded, or that the CPU watchdoghas timed out.OFF = OK ; ON = Fail

Interface Board Hardware LEDs (continues)

LED Identifier	Short Description	Full Description
D14	5VDC OK	Indicates that the 5VDC supply is nominally greater than 4.65VDCOFF = Fail ; ON = OK
D15	3.3VDC OK	Indicates that the 3.3VDC supply is nominally between 3.06VDC and 3.52VDCOFF = Fail ; ON = OK
D16	1.5VDC OK	Indicates that the 1.5VDC switching regulator is operating properlyOFF = Fail ; ON = OK
D17	Supply Fail	Indicates that one or more of the power inputs has failedOFF = OK ; ON = FAIL
D18	Hardware Fail	Indicates that the ARM software has declared an error.OFF = OK ; ON = FAILConditions that will be indicated by this LED:•This LED will be illuminated during system initialization. If any part of the initialization fails, LED will remain illuminated.•This LED will illuminate during system operation if an error occurs that puts the system in a state that is less than fully functional. An example would be the loss of communication with the cinema processor board.This LED will illuminate during system operation if an error occurs where the setup of the electronics does not match the last user request. An example of the would be if active data could not be made active in the electronics. If this occurs, the user should examine the System Status and Error Logs.

Processor Board Hardware LEDs		
LED Identifier	**Short Description**	**Full Description**
D3	Local Power Good	Indicates the on-board 1.8VDC and 1.5VDC regulators are operating properlyOFF = FAIL ; ON = OK
D4	3.3VDC Supply	Indicates presence of external 3.3VDC supplyOFF = FAIL ; ON = OK
D5	5VDC Supply	Indicates presence of external 5VDC supplyOFF = FAIL ; ON = OK
D6	12VDC Supply	Indicates presence of external 12VDC supplyOFF = FAIL ; ON = OK
D7	Flash V_ID Mode	Indicates that FLASH memory is in an unprotected stateOFF = Protected ; ON = Unprotected•FLASH memory protection is not being used, therefore, this LED has no meaning.•In certain Series-0 Pre-Production Processor boards (with MSN numbers starting with “0123”), FLASH protection of some sectors was used. Updating the FLASH onthese boards required using the “TEMP UNPROTECT”button which would unprotect the FLASH and illuminate this LED.
D8	Diagnostic Fail	Indicates that built-in diagnostic test failed. See System Status for details on which test failedOFF = OK ; ON = FAIL