

# ZH420UST



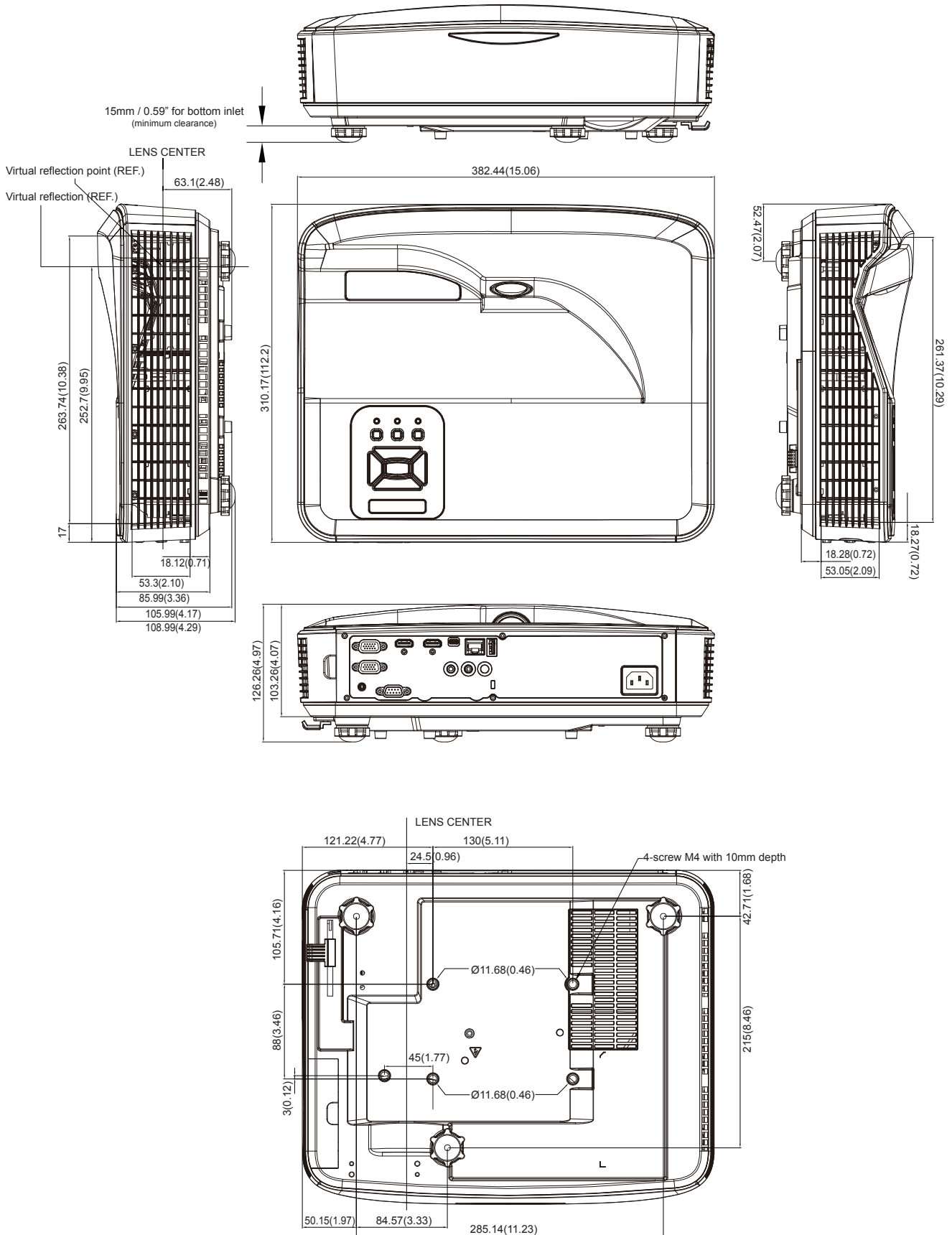
## Contents

- Product Description
- Cabinet Dimensions
- Installation Requirements
- Image Size & Projection Distance
- Back & Control Panel
- PC Control Codes
- LAN Control Ports
- IR Code

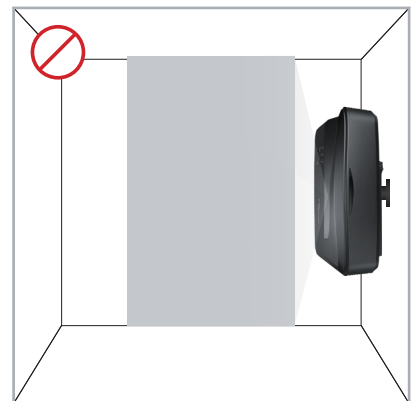
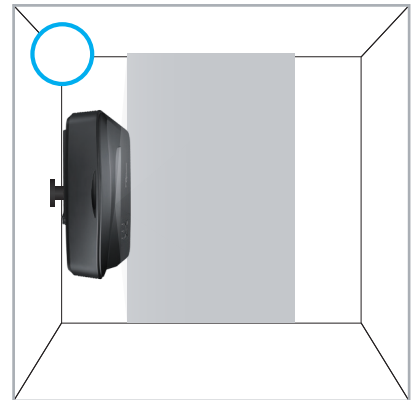
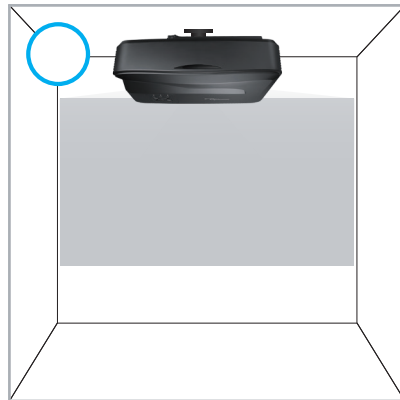
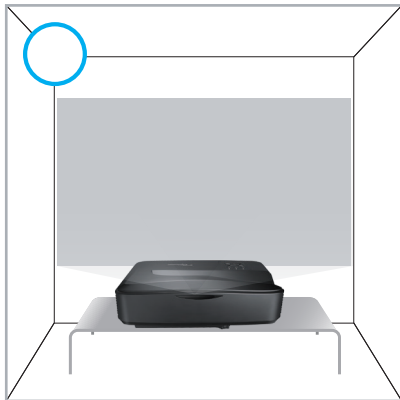
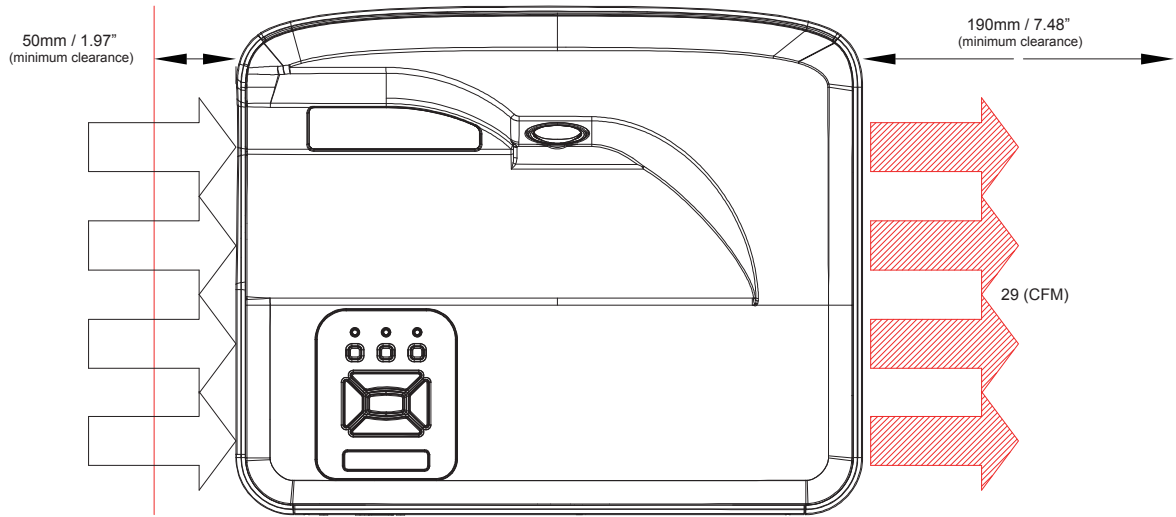
## Product Description

Resolution	1080p 1920x1080
Brightness	4,000 lumens
Dimensions	383 x 310 x 103mm (15" x 12.2" x 3.4") (without lens/elevators)
Weight	5.5 Kg (12.5lb)
Noise	32 dB (Eco Mode)
Power consumption	355W +/- 15% in Normal Mode 230W +/- 15% in Eco Mode
BTU/hr	1314.5 BTU/hr
Lens	f/2.4 , Projection Distance 87" – 102" , Throw ratio 0.25

Cabinet Dimensions



Installation Notice

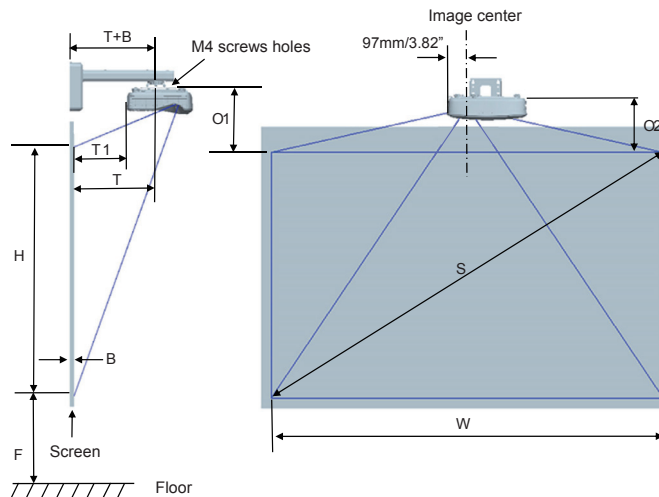


## Image Size & Projection Distance & Diagrams

### Adjusting Projection Image Size (Diagonal)

- ▶ 1080p series: Projection Image Size from 87" to 102" (2.21 to 2.59 meters).

### Projector installation measurement chart (Wall mount)

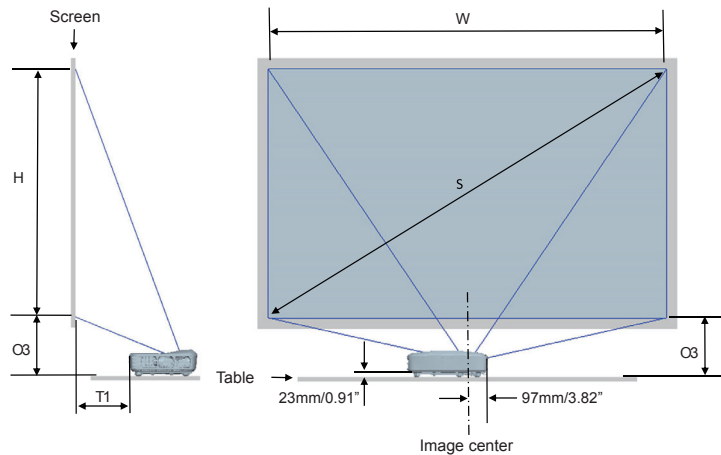


This table is for user's reference only.

1080P (16:9) Wall mount installation measurement chart							
Diagonal image size (S) in inch	Diagonal image size (S) in mm	Image width (W) in mm	Image height (H) in mm	Distance from surface of whiteboard to center of projector mount (T) in mm	Distance from surface of whiteboard to back of projector (T1) in mm	Distance from top of image to top of interface boss (O1) in mm	Distance from top of image to top of projector (O2) in mm
87	2210	1926	1083	370	233	288	268
88	2235	1948	1096	376	239	291	271
89	2261	1970	1108	382	245	294	274
90	2286	1992	1121	387	250	296	276
91	2311	2015	1133	393	256	299	279
92	2337	2037	1146	398	261	301	281
93	2362	2059	1158	404	267	304	284
94	2388	2081	1171	409	272	307	287
95	2413	2103	1183	415	278	309	289
96	2438	2125	1196	421	284	312	292
97	2464	2147	1208	426	289	314	294
98	2489	2170	1220	432	295	317	297
99	2515	2192	1233	437	300	320	300
100	2540	2214	1245	443	306	322	302
101	2565	2236	1258	448	311	325	305
102	2591	2258	1270	454	317	327	307

## Image Size & Projection Distance & Diagrams

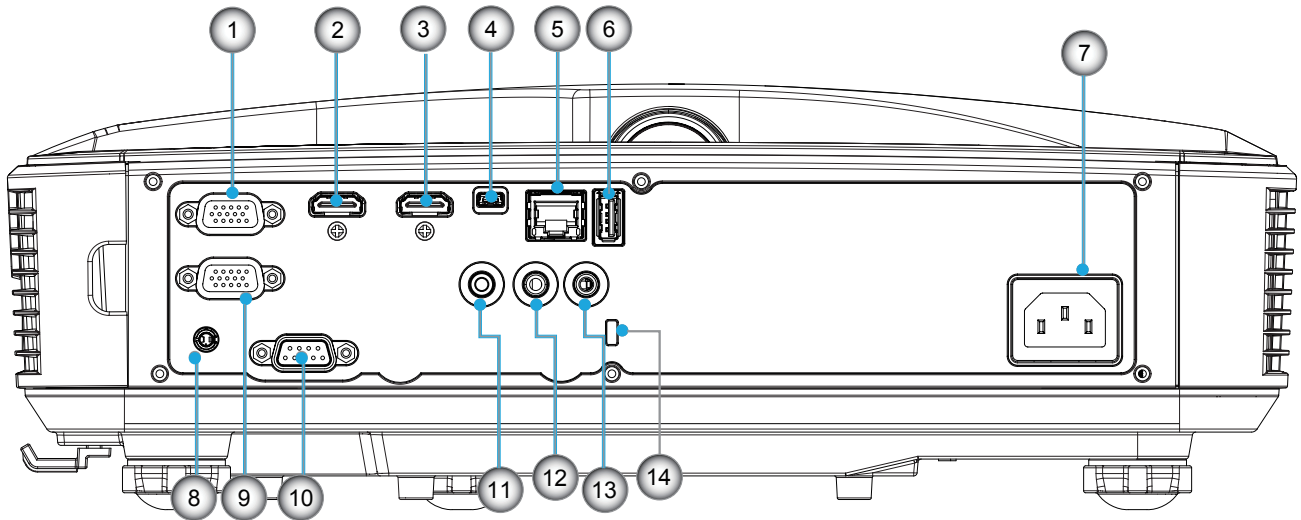
Projector installation measurement chart (Table top)



*This table is for user's reference only.*

1080P (16:9) Table top installation measurement chart					
Diagonal image size (S) in inch	Diagonal image size (S) in mm	Image width (W) in mm	Image height (H) in mm	Distance from surface of whiteboard to back of projector (T1) in mm	Distance from bottom of image to top of table (O3) in mm
87	2210	1926	1083	233	291
88	2235	1948	1096	239	294
89	2261	1970	1108	245	297
90	2286	1992	1121	250	299
91	2311	2015	1133	256	302
92	2337	2037	1146	261	304
93	2362	2059	1158	267	307
94	2388	2081	1171	272	310
95	2413	2103	1183	278	312
96	2438	2125	1196	284	315
97	2464	2147	1208	289	317
98	2489	2170	1220	295	320
99	2515	2192	1233	300	323
100	2540	2214	1245	306	325
101	2565	2236	1258	311	328
102	2591	2258	1270	317	330

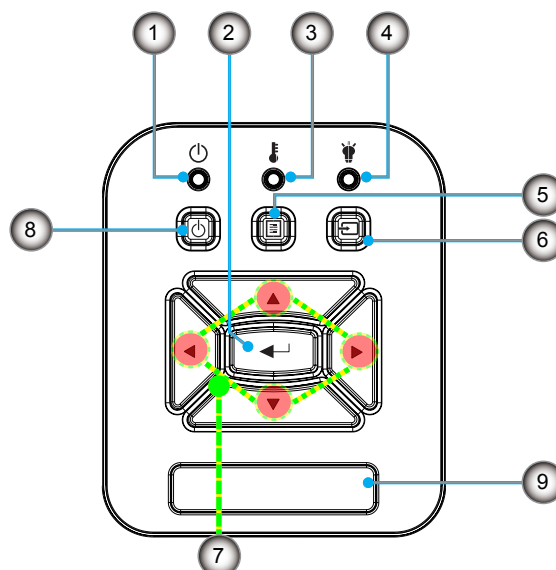
## Back Panel



- |                                            |                           |
|--------------------------------------------|---------------------------|
| 1. VGA-IN / YPbPr connector                | 8. Interactive connector  |
| 2. HDMI2 Input connector                   | 9. VGA-OUT connector      |
| 3. HDMI1 Input connector                   | 10. RS-232C connector     |
| 4. USB-B mini connector (Firmware upgrade) | 11. AUDIO OUT connector   |
| 5. RJ-45 / HDBaseT Input connector         | 12. AUDIO IN connector    |
| 6. USB Power Out (1.5A) connector          | 13. Microphone connector  |
| 7. Power socket                            | 14. Kensington™ Lock Port |

## Control Panel

1. Power LED
2. Enter
3. Temp LED
4. Light source LED
5. Menu
6. Input
7. Four Directional Select Keys
8. Power/Standby button
9. IR Receiver



## PC Control Codes

### RS232 protocol function list

Baud Rate : 9600  
 Data Bits: 8  
 Parity: None  
 Stop Bits: 1  
 Flow Control : None  
 UART16550 FIFO: Disable

#### Write Command

~	X	X	X	X	X		n	CR
Lead Code	Projector ID		Command			space	variable	carriage return
Prefix	00~99 (00: All projectors)		000~999				0~9999	suffix

#### Response Format

Pass:  Fail:

#### Read Command

~	X	X	X	X	X		n	CR
Lead Code	Projector ID		Command			space	variable	carriage return
Prefix	00~99 (00: All projectors)		000~999				0~9999	suffix

#### Response Format

Pass:     Fail:

#### System Automatically Send

I	N	F	O	n
				Variable

**Note:** There is a <CR> after all ASCII commands. 0D is the HEX code for <CR> in ASCII code.

#### Character to HEX table

Character	HEX
~	7E
0	30
1	31
2	32
3	33
4	34
5	35
6	36
7	37
8	38
9	39
Space	20
CR (Enter)	0D

e.g.

ASCII to HEX

RS232 Command	~	0	0	1	9	5		1	CR
HEX	7E	30	30	31	39	35	20	31	0D

## PC Control Codes

Level 1	Level 2	Level 3	Level 4	Write CMD	Write Parameter	Read CMD	Read Parameter	Response	
Picture	Color Mode	Bright			2			O K 2	
		Presentation			1			O K 1	
		Movie		~ X X 2 0	3	~ X X 1 2 3	1	O K 3	
		Game			4			O K 4	
		Blending			19			O K 19	
		User			5			O K 5	
Screen	PIP - PBP Settings	Function	Off		0				
			PIP	~ X X 3 0 2	1				
			PBP		2				
		Main Source	VGA			5			O K 2
			HDMI1	~ X X 1 2	1	~ X X 1 2 1	1	O K 7	
			HDMI2		15			O K 8	
			HDBaseT		21			O K 16	
		Sub Source	VGA			2			O K 2
			HDMI1	~ X X 3 0 5	1	~ X X 1 3 1	1	O K 7	
			HDMI2		4			O K 8	
			HDBaseT		10			O K 16	
		Location	Top Left			1			
			Top Right	~ X X 3 0 3	2				
			Bottom Left		3				
			Bottom Right		4				
		Size	Large			1			
			Medium	~ X X 3 0 4	2				
			Small		3				
		Swap		~ X X 3 0 6	1				
		Options	Information	[Open Info Menu]		~ X X 3 1 3	1		
[Close Info Menu]					0				
Model Name						~ X X 1 5 1	1	O K n	
SNID						~ X X 3 5 3	1	O K nnnnnnnnn	
Source (Main/Sub)						~ X X 1 2 1	1	O K "" Check ""Input Source"" read above"	
Main Source Resolution						~ X X 1 5 0	4	O K nnnnnnnnn	
Sub Source Resolution						~ X X 1 5 0	10	O K nnnnnnnnn	
SW Version (DDP/MCU/LAN)						~ X X 1 2 2	1	O K nnn/nnn/nnn	
Aspect Ratio						~ X X 1 2 7	1	O K nnn/nnn/nnn	
SSI Hours (Normal/Eco)						~ X X 1 0 8	1	O K nnnnnn/nnnnnn	
IP Address						~ X X 8 7	3	O K nnn.nnn.nnn.nnn	
Network Status	Disconnected						~ X X 8 7	1	O K 0
	Connected								O K 1



## PC Control Codes

### Other Uart Command

Level 1	Level 2	Level 3	Level 4	Write CMD	Write Parameter	Read CMD	Read Parameter	Response
Power				~ X X 1 4 0	1			
Up				~ X X 1 4 0	10			
Left				~ X X 1 4 0	11			
Enter (for projection MENU)				~ X X 1 4 0	12			
Right				~ X X 1 4 0	13			
Down				~ X X 1 4 0	14			
V Keystone +				~ X X 1 4 0	15			
V Keystone -				~ X X 1 4 0	16			
Volume -				~ X X 1 4 0	17			
Volume +				~ X X 1 4 0	18			
Menu				~ X X 1 4 0	20			
VGA				~ X X 1 4 0	23			
AV Mute				~ X X 1 4 0	24			
Freeze				~ X X 1 4 0	30			
Zoom +				~ X X 1 4 0	32			
Zoom -				~ X X 1 4 0	33			
Mode				~ X X 1 4 0	36			
Format				~ X X 1 4 0	37			
info				~ X X 1 4 0	40			
Re-sync				~ X X 1 4 0	41			
HDMI 1				~ X X 1 4 0	42			
HDMI 2				~ X X 1 4 0	43			
Source				~ X X 1 4 0	47			
1				~ X X 1 4 0	51			
2				~ X X 1 4 0	52			
3				~ X X 1 4 0	53			
4				~ X X 1 4 0	54			
5				~ X X 1 4 0	55			
6				~ X X 1 4 0	56			
7				~ X X 1 4 0	57			
8				~ X X 1 4 0	58			
9				~ X X 1 4 0	59			
0				~ X X 1 4 0	60			
PIP				~ X X 1 4 0	63			
H Keystone				~ X X 1 4 0	68			
V Keystone				~ X X 1 4 0	69			
Exit				~ X X 1 4 0	74			
power Off				~ X X 0 0	0			
power On				~ X X 0 0	1			
Re-Sync				~ X X 0 1	1			
AV Mute	Off			~ X X 0 2	0			
	On				1			
Mute	Off			~ X X 0 3	0			
	On				1			
Freeze	UnFreeze			~ X X 0 4	0			
	Freeze				1			

## LAN Control Ports

Protocols	Port #
Crestron	41794
PJ-Link	4352
AMX Device Discovery	9131
Telnet	23
Http	80
Extron	2023

## IR Code

No.,	Key Function	custom code		data code		Repeat
		Byte0	Byte1	Byte2	Byte3	
1	ON	32	CD	2	#BYTE3	F1
2	OFF	32	CD	2E	#BYTE3	F1
3	Geometric Correction	32	CD	96	#BYTE3	F1
4	PIP/PBP	32	CD	78	#BYTE3	F1
5	F1	32	CD	26	#BYTE3	F1
6	F2	32	CD	27	#BYTE3	F1
7	Mode	32	CD	95	#BYTE3	F1
8	Up arrow	32	CD	C6	#BYTE3	F1
9	AV Mute	32	CD	3	#BYTE3	F1
10	Left arrow	32	CD	C8	#BYTE3	F1
11	Enter	32	CD	C5	#BYTE3	F1
12	Right arrow	32	CD	C9	#BYTE3	F1
13	Info.	32	CD	25	#BYTE3	F1
14	Down arrow	32	CD	C7	#BYTE3	F1
15	Laser	N/A	N/A	N/A	N/A	N/A
16	Source	32	CD	18	#BYTE3	F1
17	F3	32	CD	66	#BYTE3	F1
18	Re-Sync	32	CD	4	#BYTE3	F1
19	Volume +	32	CD	9	#BYTE3	F1
20	D Zoom +	32	CD	8	#BYTE3	F1
21	Menu	32	CD	88	#BYTE3	F1
22	Volume -	32	CD	0C	#BYTE3	F1
23	D Zoom -	32	CD	0B	#BYTE3	F1
24	Format	32	CD	15	#BYTE3	F1
25	Freeze	32	CD	6	#BYTE3	F1
26	ID	3201 ~ 3299		N/A		
27	ALL	32	CD	N/A		
28	1/VGA1	32	CD	8E	#BYTE3	F1
29	2/S-Video	32	CD	1D	#BYTE3	F1
30	3/HDMI1	32	CD	16	#BYTE3	F1
31	HDMI2	32	CD	9B	#BYTE3	F1
32	4/HDBaseT	32	CD	70	#BYTE3	F1
33	5/Video	32	CD	1C	#BYTE3	F1
34	6/DVI	32	CD	19	#BYTE3	F1
35	HDMI3	32	CD	98	#BYTE3	F1
36	7/BNC	32	CD	1A	#BYTE3	F1
37	8/YPbPr	32	CD	17	#BYTE3	F1
38	9/DisplayPort	32	CD	9F	#BYTE3	F1
39	0/3D	32	CD	89	#BYTE3	F1