vaddio
REDEFINING CAMERA CONTROL

CEILINGVIEW™ SD CCU

Ceiling Mounted Document Camera System with CCU Image Controller

Part Numbers:
999-2009-000 (NTSC)
999-2009-001 (PAL)

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OVERVIEW:

The Vaddio™ CeilingVIEW SD CCU (Figure 1) is a Standard Definition ceiling Document Camera designed for use with videoconferencing codecs, monitors and presentation applications where image quality and resolution are critical. The CeilingVIEW SD CCU can be configured for 4:3 standard definition video with Y/C and composite video outputs. Equipped with a 36x optical motorized zoom lens and 12X digital zoom range, the camera has a 432x total zoom capability. The ¼" CCD image sensor has approximately 380,000 pixels. The heart of the CCU system is its ability to adjust red and blue gain, aperture, as well as iris and gain of the camera module.

Figure 1: CeilingVIEW CCU Image Controller (above left), CeilingVIEW HD Document Camera (above).

Vaddio's active cabling system uses high speed differential signaling (HSDS) for video signals from the camera module to the Quick-Connect™ CV HD/SD interface as opposed to baluns. HSDS gives this system superior video quality over CAT-5 cabling and the ability to adjust the video signal depending on the length of the cabling used. The EZCamera series cabling system delivers video up to 400 feet over standard CAT-5 cable. The Quick-Connect CCU connects directly to the RS-232 port on the camera module. RS-232 from an external device, such as Vaddio's ProductionVIEW FX, or an external control system can be used in-line. The CeilingVIEW SD CCU is unmatched for price and performance as compared to other ceiling mounted document cameras available today.

Intended Use:
Before operating the device, please read the entire manual thoroughly. The system was designed, built and tested for use indoors, and with the provided power supply and cabling. The use of a power supply other than the one provided or outdoor operation has not been tested and could damage the device and/or create a potentially unsafe operating condition.

Important Safeguards:
Read and understand all instructions before using. Do not operate any device if it has been dropped or damaged. In this case, a Vaddio technician must examine the product before operating. To reduce the risk of electric shock, do not immerse in water or other liquids and avoid extremely humid conditions.

Use only the power supply provided with the system. Use of any unauthorized power supply will void any and all warranties.

Please do not use "pass-thru" type RJ-45 connectors. These pass-thru type connectors do not work well for professional installations and can be the cause of intermittent connections which can result in the RS-232 control line failing and locking up, and/or compromising the HSDS™ signals. For best results please use standard RJ-45 connectors and test all cables for proper pin-outs prior to use and connection to Vaddio product.

Save These Instructions:
The information contained in this manual will help you install and operate your product. If these instructions are misplaced, Vaddio keeps copies of Specifications, Installation and User Guides and most pertinent product drawings for the Vaddio product line on the Vaddio website. These documents can be downloaded from www.vaddio.com free of charge.

UNPACKAGING - SYSTEM COMPONENT LISTS
Carefully remove all parts from the packaging and identify the following parts:

CeilingVIEW SD, Part Number 999-2009-000 (NTSC) includes:
- One (1) CeilingVIEW SD Camera Enclosure
- One (1) CeilingVIEW Camera Control Unit
- One (1) White Trim Ring with two (2) white screws
- One (1) Vaddio IR Remote Controller
- One (1) Quick-Connect CV HD/SD Interface
- One (1) PowerRite 12VDC, 1.0A Power Supply (for CCU Image Controller)
- One (1) PowerRite 24VDC, 2A Power Supply (for Quick-Connect CV HD/SD)
- One (1) 2-position Phoenix Type Connector (Tally port on CCU)
- Two (2) Adjustable ceiling tile support rails with two (2) knurled knobs
- One (1) RJ-45 to DB9 EZCamera Control Adapter (998-1001-232)
- One (1) AC Cord Set for North America
- Installation and User Guide (341-769)

CeilingVIEW SD, Part Number 999-2009-001 (PAL) includes:
- One (1) CeilingVIEW SD Camera Enclosure
- One (1) CeilingVIEW Camera Control Unit
- One (1) White Trim Ring with two (2) white screws
- One (1) Vaddio IR Remote Controller
- One (1) Quick-Connect CV HD/SD Interface
- One (1) PowerRite 12VDC, 1.0A Power Supply (for CCU Image Controller)
- One (1) PowerRite 24VDC, 2A Power Supply (for Quick-Connect CV HD/SD)
- One (1) 2-position Phoenix Type Connector (Tally port on CCU)
- Two (2) Adjustable ceiling tile support rails with two (2) knurled knobs
- One (1) RJ-45 to DB9 EZCamera Control Adapter (998-1001-232)
- One (1) Euro Power Cord
- One (1) UK Power Cord
- Installation and User Guide (341-769)

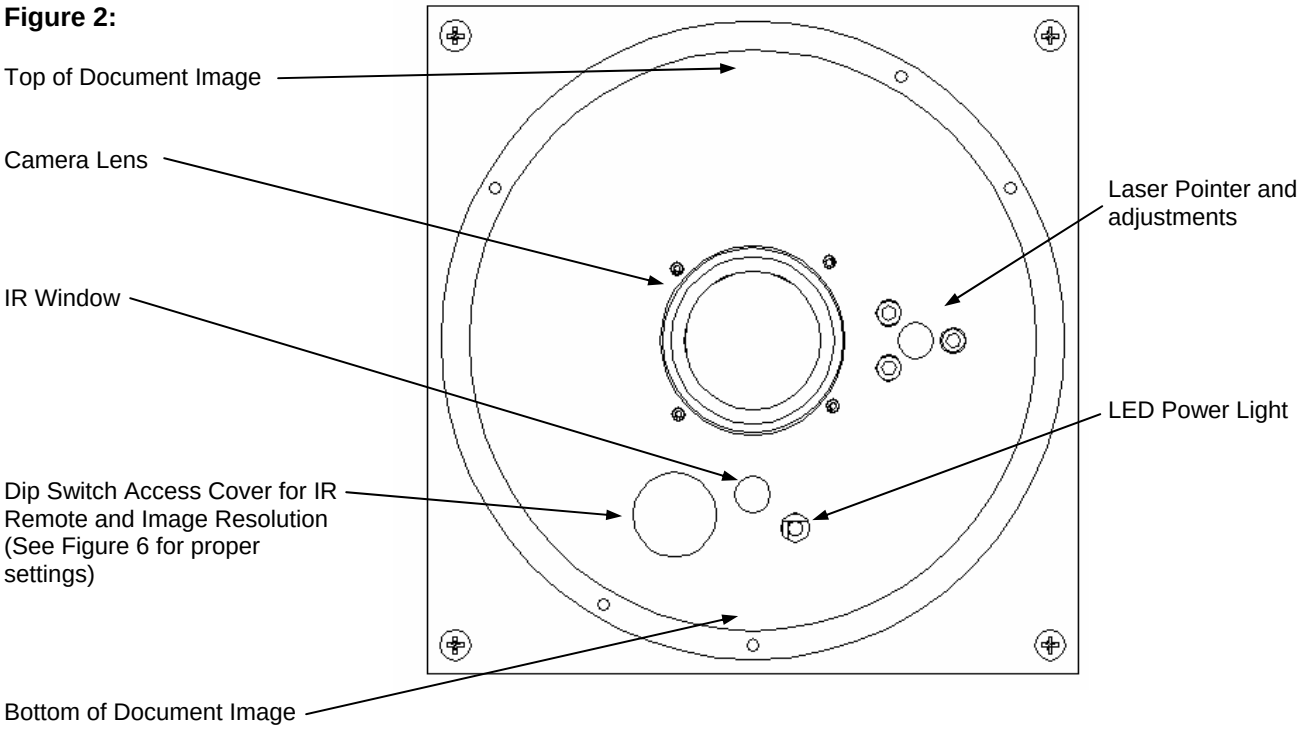
INSTALLATION INSTRUCTIONS:
The CeilingVIEW SD CCU Document Camera is an integrated document/object camera specifically designed for installation in a suspended ceiling tile above a conference table, lectern or work surface. Recommended ceiling height range is between 8’ and 12’ (2.44m to 3.66m).

Before Starting the Installation
- IMPORTANT NOTE: Please review Figure 5 closely. The Quick-Connect CCU for the CeilingVIEW document cameras utilizes only the ports shown in the figure. All Power for the Camera Module, as well as video returned from the Camera Module is delivered via the Quick-Connect CV HD/SD, also shown in the picture.
- Before starting the installation of the CeilingVIEW SD CCU Document Camera, check above the ceiling where you plan to install the camera and make sure the area is clear of obstructions and confirm that there is adequate room for the camera enclosure.
- When terminating your CAT-5 cabling, make sure that you test each cable for proper termination of all ends with a CAT-5 continuity tester.
- All above-ceiling work must conform to local building codes and should be performed by qualified personnel.
- The camera module enclosure and tile support rails allow for superior flexibility and positioning freedom when used with 2’x2’ and 2’x4’ ceiling tiles. The camera does not have to be mounted in the center of the tile.
- For cutting ease, remove the ceiling tile and place on a suitable and safe work surface.
- Because the Quick-Connect CCU is an in-line device, the CeilingVIEW SD CCU camera system is not compatible with daisy-chain configurations. You must have a dedicated RS-232 control port connected to the Quick-Connect CCU.

Camera Module

For video reference, LED power light, IR window and Dip Switch cover will be oriented to the bottom of the image displayed (shown in Figure 2). Take this into consideration when positioning the camera module. The supplied mounting rails may need to be used for additional support of the camera on the ceiling tile to distribute the weight of the camera into the grid and avoid tile warping.

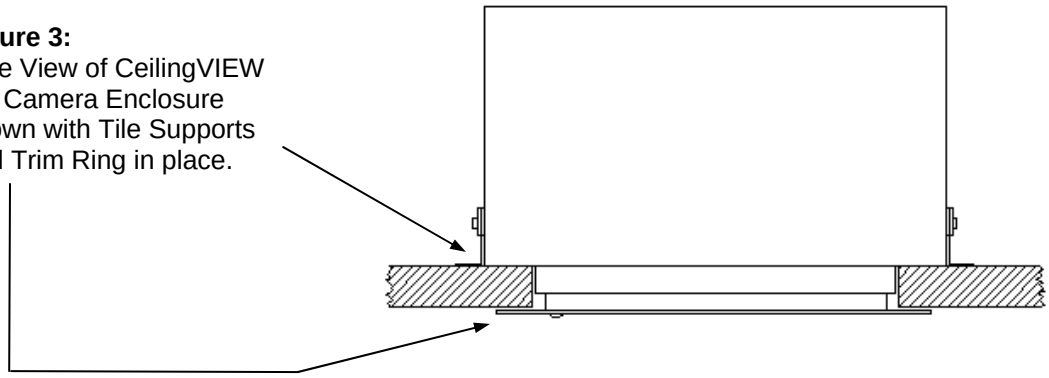
Figure 2:



Step-by-Step Assembly Instructions:

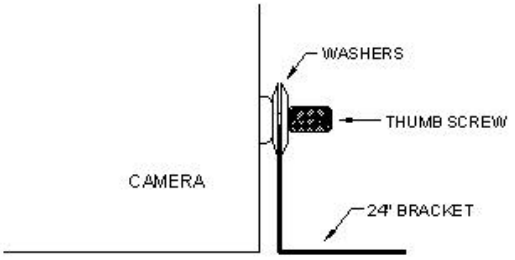
1. Attach a string or plumb bob to the ceiling tile with a thumbtack.
2. Position the string directly over the table or work surface to allow easy document and object positioning.
3. Using a sharp utility knife, score a 5-3/4" diameter circle into the front of the tile centered on the string.
4. Carefully cut out the 5-3/4" hole.
5. Place the tile support rails on the backside of the tile and center over the hole. Carefully place camera into the cutout hole from the back of tile (see Figure 3).

Figure 3:
Side View of CeilingVIEW SD Camera Enclosure shown with Tile Supports and Trim Ring in place.



6. Using the supplied thumbscrews and washers, attach the support rails to the CeilingVIEW camera (see Figure 4). Place rail edge between two washers and tighten thumbscrew securely. Repeat for the other rail. *NOTE:* The thumbscrew sits on top of the rail, not through the holes on the rail.

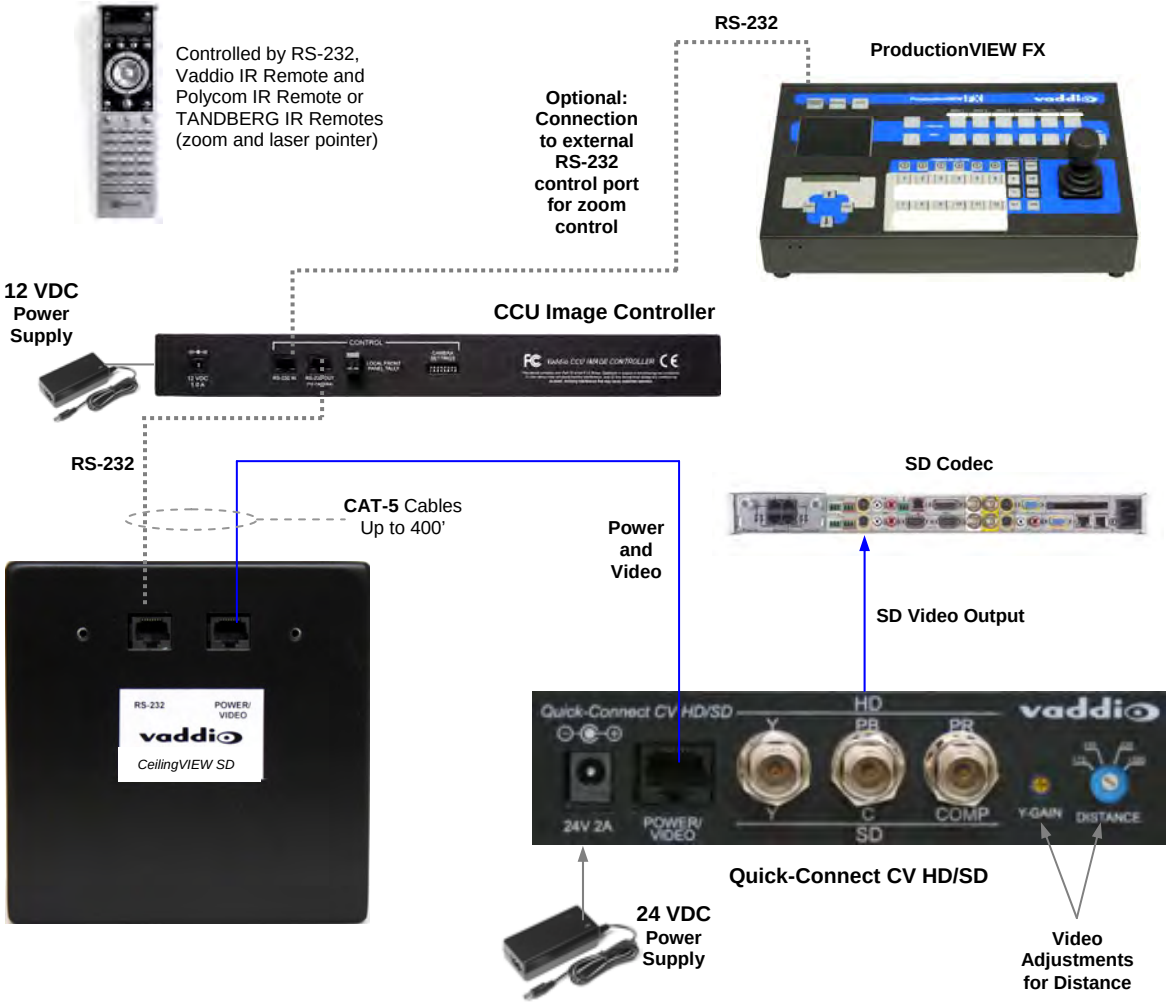
Figure 4:
Side View of CeilingVIEW SD with Tile Support Brace placement



7. Two CAT-5 cables (plenum rated as building codes dictate) are run from the ceiling location where the camera is mounted, to where the Quick-Connect Box is located near the main rack or head-end equipment. Both SD composite and Y/C are active. Connections on the CeilingVIEW SD CCU are shown in Figure 5. *NOTE:* If you are terminating your own CAT-5 cables, make sure to test all cables with a continuity tester to confirm proper pin-outs.
8. Next, connect the Power/Video CAT-5 cable from the Quick-Connect CV HD/SD box to the CAT-5 cable that is connected to the Power-Video port on the Camera Enclosure in the ceiling (see Figure 5). The Quick-Connect CV HD/SD provides power to the camera, as well as delivers video back from the camera module. Note: The Quick-Connect CV HD/SD uses a 24VDC power supply and the CCU Image Controller uses a 12 VDC power supply.
9. For RS-232 control, connect the CAT-5 cable to the Camera Enclosure, and then the other end of the CAT-5 cable to the RS-232 output on the Quick-Connect CCU (see Figure 5). If there is an external RS-232 controller (e.g. Vaddio's ProductionVIEW SD, or a control system such as Crestron or AMX, etc.) then connect a CAT-5 cable between that external controller and the RS-232 Input on the back of the Quick-Connect CCU. An RJ-45 to DB-9 connector is supplied for DB-9 RS-232 ports.
10. NOTE: The Quick-Connect CCU will only send RS-232 commands to the camera's image sensor. All zoom and zoom preset commands are handled by an external controller or IR remote controls that are compatible with CeilingVIEW SD. Pressing CCU Control on the front panel of the CCU allows the user to adjust all of the knobs and controls on the front panel. Pressing CCU control again, allows RS-232 commands from an external control system (e.g. ProductionVIEW SD, AMX, Crestron, etc.) to pass through to the Camera Module.
11. To finish the installation, the camera and ceiling tile should be carefully replaced in the suspended ceiling at this time. Carefully move the trim ring into position on the bottom of the ceiling tile and secure with the two supplied white screws.
12. With the CAT-5 cabling connected to the proper ports at both the Camera Enclosure and Quick-Connect CV HD/SD interface, review the dip switch settings (Figure 6) and set the camera to output the desired signal. Connect the Vaddio PowerRite power supply. Plug the AC cord into an outlet. The camera zoom will home into position and the video output signals will be live and viewable after the camera is fully initialized. To change the output resolution or any dip switch setting, first unplug the power supply, change the dipswitch setting and re-power the Quick-Connect CV HD/SD. If using a Polycom or TANDBERG IR Remote, set dip switches 1 & 2 accordingly to allow momentary laser pointer on the Tilt Down command. *NOTE:* Use of a power supply other than the provided Vaddio power supply for this device will void the warranty and may cause camera and equipment damage. Make sure that the proper power supply is connected to the Quick-Connect boxes – they are different voltages.

Figure 5: System Configuration

The main components of the CeilingVIEW SD CCU are the camera module and CCU Image Controller and Quick-Connect CV HD/SD interface. Basic system connectivity is outlined below. The Quick-Connect CV HD/SD interface can be installed on the optional rack mount adapter, Part # 999-6000-002.



Controlling the Camera

A unique feature of the CeilingVIEW SD CCU allows the camera's zoom functions (Zoom In and Out) and intermittent laser (Tilt Down) to be controlled by either a Polycom® or TANDBERG® remote control. In addition, the Document Camera can be used with either the Vaddio IR remote control supplied or via RS-232 using VISCA control protocol (see VISCA Command Set information at the back of the manual). The CeilingVIEW SD CCU will respond to all three IR remotes concurrently.

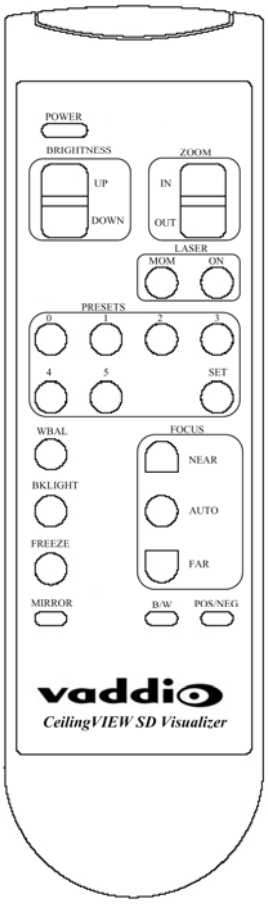
Control Systems

If you are using a control system (i.e. Crestron®, AMX®, etc.) plug the Cat. 5 cable from the RS-232 IN jack on the camera to your control system using the Cat. 5 to DB-9 serial adapter supplied with the CeilingVIEW SD. Daisy Chain Note: Use the CeilingVIEW SD as the last camera in the control chain when daisy chaining cameras together, as there is no RS-232 output on the Camera Module.

Dip Switch Settings
Set the dipswitches to the desired signal/function and then apply power to the system. To make any changes, remove power from the system, make the change and re-apply power to the system.

Description / Dip Switch	1	2	3	4	5	6
CeilingVIEW SD Laser Pointer "MOMENTARY ON" will be activated by the Polycom or TANDBERG IR Remote Controller "TILT DOWN" command	DN	UP	DN	DN	DN	DN
CeilingVIEW SD Laser Pointer "MOMENTARY ON" will not be activated by the Polycom or TANDBERG IR Remote Controller "TILT DOWN" command	DN	DN	DN	DN	DN	DN
Disable All Polycom and TANDBERG IR Remote Commands	UP	*	*	*	*	*

Figure 6: Vaddio IR Remote



Programming the Remote:
1. Install 3 "AAA" batteries into the remote
2. Press and hold POWER & MIRROR for 5 seconds

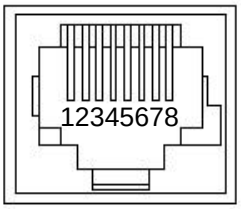
Function	Description
POWER	Camera on/off
ZOOM	IN (tele) OUT (wide)
FOCUS	AUTO: Auto Focus Mode ON NEAR: Manual Focus Near FAR: Manual Focus Far
LASER	ON: On/Off toggle MOM: Turns on Laser for five seconds
BRIGHT	UP: Brightness up DOWN: Brightness down
PRESET	Six (6) presets - 0 though 5
SET	Sets Zoom Presets
W/BAL	One Touch White Balance
BKLIGHT	Back Light Compensation
B/W	Black and White Mode (color off)
POS/NEG	Positive/Negative - Art Mode
FREEZE	Freeze Frame/Image Effect

Setting Zoom Presets (Vaddio Remote):
1. Zoom the camera lens to the desired position.
2. Press and hold the SET button for one second. The blue LED will blink for approximately 5 seconds.
3. Press button labeled 0 through 5 within the 5 seconds. The Blue LED on camera will stop blinking.
4. To Recall Presets, press on the PRESET buttons labeled 0 thru 5.

COMMAND LIST

Communication Specification

Communication Speed: 9600 bps (default)
Start bit: 1
Stop bit: 1
Data bits: 8
Parity: None
No Flow Control



Pin #	RJ-45 RS-232 and IR Out Pins
1)	Unused
2)	Unused
3)	Unused
4)	Unused
5)	Unused
6)	GND (GND of IR Short Range - Pin 3)
7)	RXD (from TXD of control source)
8)	TXD (to RXD of control source)

Communication Example: For the VISCA Packet "8x 01 04 07 03 FF" (CAM_Zoom_Wide), "x" corresponds with the number of the camera in the control chain. NOTE: This will always be 1 when using a CCU.

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	
IF_Clear	Broadcast	88 01 00 01 FF	
CommandCancel		8x 2p FF	P: Socket No. (=1or2)
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	P=0 (Low) to 7 (High)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	Pqrs: Zoom Position
CAM_Dzoom	On	8x 01 04 06 02 FF	Digital Zoom ON/OFF
	Off	8x 01 04 06 03 FF	
	Combine Mode	8x 01 04 36 00 FF	Opt/Dig Zoom Combined
	Separate Mode	8x 01 04 36 01 FF	Opt/Dig Zoom Separate
	Stop	8x 01 04 06 00 FF	
	Tele(Variable)	8x 01 04 06 2p FF	P=0(Low) to 7 (High)
	Wide(Variable)	8x 01 04 06 3p FF	
	X1/Max	8x 01 04 06 10 FF	X1/MAX Maginification Switch
	Direct	8x 01 04 46 00 00 0p 0q FF	Pq: D-Zoom Position
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	P=0 (Low) to 7 (High)
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	Pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
	Infinity	8x 01 04 18 02 FF	Forced Infinity
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	Pqrs: Focus Near Limit Position
AF Sensitivity	Normal	8x 01 04 58 02 FF	AF Sensitivity High/Low
	Low	8x 01 04 58 03 FF	
CAM_AFMode	Normal AF	8x 01 04 57 00 FF	AF Movement Mode
	Interval AF	8x 01 04 57 01 FF	
	Zoom Trigger AF	8x 01 04 57 02 FF	
	Active/Interval Time	8x 01 04 27 0p 0q 0r 0s FF	Pq: Active Time, rs: Interval
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	Pqrs: Zoom Position Tuvw: Focus Position
CAM_Initialize	Lens	8x 01 04 19 01 FF	Lens Initialization Start
	Comp Scan	8x 01 04 19 02 FF	Correction of Pixel Blemishes
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	Auto Tracing White Balance
	Manual	8x 01 04 35 05 FF	Manual Control mode
	One Push Trigger	8x 01 04 10 05 FF	One Push WB Trigger
CAM_Rgain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	Pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	Pq: B Gain

CAM_AE	Full Auto Manual Shutter Priority Iris Priority Bright	8x 01 04 39 00 FF 8x 01 04 39 03 FF 8x 01 04 39 0A FF 8x 01 04 39 0B FF 8x 01 04 39 0D FF	Auto Exposure Mode Manual Control mode Shutter Priority Auto Exp Iris Priority Auto Exp Bright Mode (Manual)
CAM_SlowShutter	Auto Manual	8x 01 04 5A 02 FF 8x 01 04 5A 03 FF	Auto Slow Shutter ON/OFF
CAM_Shutter	Reset Up Down Direct	8x 01 04 0A 00 FF 8x 01 04 0A 02 FF 8x 01 04 0A 03 FF 8x 01 04 4A 00 00 0p 0q FF	Shutter Setting Pq: Shutter Position
CAM_Iris	Reset Up Down Direct	8x 01 04 0B 00 FF 8x 01 04 0B 02 FF 8x 01 04 0B 03 FF 8x 01 04 4B 00 00 0p 0q FF	Iris Setting Pq: Iris Position
CAM_Gain	Reset Up Down Direct	8x 01 04 0C 00 FF 8x 01 04 0C 02 FF 8x 01 04 0C 03 FF 8x 01 04 4C 00 00 0p 0q FF	Gain Setting Pq: Gain Position
CAM_Bright	Reset Up Down Direct	8x 01 04 0D 00 FF 8x 01 04 0D 02 FF 8x 01 04 0D 03 FF 8x 01 04 4D 00 00 0p 0q FF	Bright Setting Pq: Bright Position
CAM_ExpComp	On Off Reset Up Down Direct	8x 01 04 3E 02 FF 8x 01 04 3E 03 FF 8x 01 04 0E 00 FF 8x 01 04 0E 02 FF 8x 01 04 0E 03 FF 8x 01 04 4E 00 00 0p 0q FF	Exp. Compensation on/off Exp. Comp. Amt Setting Pq: ExpComp Position
CAM_Backlight	On Off	8x 01 04 33 02 FF 8x 01 04 33 03 FF	Backlight Comp. ON/OFF
CAM_AE_Response	DIRECT	8x 01 04 SD pp FF	Pp: 01 to 20 (hex) Default: 01
CAM_SpotAE	On Off Position	8x 01 04 59 02 FF 8x 01 04 59 03 FF 8x 01 04 29 0p 0q 0r 0s FF	Spot Auto Exp. Setting Pq: X(0 to F), rs: Y(0 to F)
CAM_Aperture	Reset Up Down Direct	8x 01 04 02 00 FF 8x 01 04 02 02 FF 8x 01 04 02 03 FF 8x 01 04 42 00 00 0p 0q FF	Aperture Control Pq: Aperture Gain
CAM_Freeze	On Off	8x 01 04 62 02 FF 8x 01 04 62 03 FF	Freeze ON/OFF
CAM_PictureEffect	Off Neg.Art B&W	8x 01 04 63 00 FF 8x 01 04 63 02 FF 8x 01 04 63 04 FF	Picture Effect Setting
CAM_PictureFlip	On Off	8x 01 04 66 02 FF 8x 01 04 66 03 FF	Picture flip ON/OFF
CAM_ICR	On Off	8x 01 04 01 02 FF 8x 01 04 01 03 FF	Infrared Mode ON/OFF
CAM_AutoICR	On Off	8x 01 04 51 02 FF 8x 01 04 51 03 FF	Auto Infrared Mode ON/OFF
CAM_Memory	Reset Set Recall	8x 01 04 3F 00 0p FF 8x 01 04 3F 01 0p FF 8x 01 04 3F 02 0p FF	P: Memory # (=0 to 5)
CAM_CUSTOM	Reset Set Recall	8x 01 04 3F 00 7F FF 8x 01 04 3F 01 7F FF 8x 01 04 3F 02 7F FF	
CAM_MemSave	Write	8x 01 04 23 0X 0p 0q 0q FF	X:00 to 07 (Address) Total 16 Byte Ppqq: 0x0000 to 0xFFFF (Data)
CAM_Display	On Off On/Off	8x 01 04 15 02 FF (8x 01 06 06 02 FF) 8x 01 04 15 10 FF (8x 01 06 06 03 FF) 8x 01 04 15 10 FF (8x 01 06 06 10 FF)	Display ON/OFF
CAM_Title	Title Set 1 Title Set 2 Title Set 3 Title Clear On Off	8x 01 04 73 00 mm nn pp qq 00 00 00 00 00 FF 8x 01 04 73 01 mm nn pp qq rr ss tt uu vv ww FF 8x 01 04 73 02 mm nn pp qq rr ss tt uu vv ww FF 8x 01 04 74 00 FF 8x 01 04 74 02 FF 8x 01 04 74 03 FF	mm: Vposition, nn Hposition pp: Color, qq: Blink mnpqrstuvw: Setting Characters (1st to 10th Characters) mnpqrstuvw: Setting Characters (11th to 20 Characters) Title Setting Clear Title Display ON/OFF

CAM_Mute	On Off On/Off	8x 01 04 75 02 FF 8x 01 04 75 03 FF 8x 01 04 75 10 FF	Mute ON/OFF
CAM_PrivacyZone	SetMask Display SetMask Color SetPan TiltAngle SetPTZMask Non_InterlockMask GridOn GridOff CenterLineOn	8x 01 04 76 mm nn 0r 0r 0s 0s FF 8x 01 04 77 pp pp pp pp FF 8x 01 04 78 pp pp pp pp qq rr FF 8x 01 04 79 0p 0p 0p 0q 0q 0q FF 8x 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF 8x 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF 8x 01 04 7C 02 FF 8x 01 04 7C 03 FF 8x 01 04 17 00 FF	Mm: Mask Settings Nn 00: Modify, 01: New Rr: W, ss: H Mask Display ON/OFF Pp pp pp pp: (0:OFF, 1:ON) Pp pp pp pp: Mask Color Setting Qq: Color Set when 0 is select Rr: Color Set when 1 is select Pan/Tilt Angle Settings Ppp: Pan Qqq: Tilt Pan/Tilt/Zoom Settings for Mask Ppp: Pan, qqq: Tilt, rrrr: Zoom Mm: Non_Interlock Mask Set Pp: X, q: Y, rr: W, ss: H Grid Display ON/OFF Grid/Center Line Display Off Center Line Display On
CAM_KEY Lock	Off On	8x 01 04 17 00 FF 8x 01 04 17 02 FF	Camera control on/off
CAM_ID Write		8x 01 04 22 0p 0q 0r 0s FF	Pqrs: Camera ID (0000-FFFF)
CAM_ExternalLock	INT Line Lock	8x 01 04 55 00 FF 8x 01 04 55 01 FF	Internal Mode Line Lock Mode
CAM_VPhase	Stop Up Down Up (Step) Down (Step) Reset Direct 0 Degree 180 Degree	8x 01 04 05 00 FF 8x 01 04 05 02 FF 8x 01 04 05 03 FF 8x 01 04 05 2p FF 8x 01 04 05 3p FF 8x 01 04 05 40 FF 8x 01 04 05 00 00 0p 0q FF 8x 01 04 25 00 FF 8x 01 04 25 01 FF	 p=step (1-7) Restore Factory Settings Pq: V-Phase (00-FF) No Phase Turnover Phase Turnover
CAM_Alarm	On Off Set Mode SetDayNight Level Alarm (Reply)	8x 01 04 6B 02 FF 8x 01 04 6B 03 FF 8x 01 04 6C pp FF 8x 01 04 6D 0p 0p 0p 0q 0q 0q FF y0 07 04 6B 01 FF y0 07 04 6B 00 FF	Alarm ON/OFF PP: Mode Settings 00 Focus Move Detect (fixed) 01 Focus Move Detect (reset) 02 AE Move Detect (fixed) 01 AE Move Detect (reset) ppp: Day Detect Level setting qqq: Night Detect Level setting Detect Level “Low” → “High” Detect Level “High” → “Low”
Vaddio Commands	**Command**	**Command Packet**	**Comments**
CAM_LaserPointer	ON OFF Toggle	8x 01 04 2F 02 FF 8x 01 04 2F 03 FF 8x 01 04 2F 01 FF	

NOTE: All commands should end with a <cr> (Carriage Return)

INQUIRY LIST

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_ZoomPosInq	8x 09 04 47 FF	Y0 50 0p 0q 0r 0s FF	Pqrs: Zoom Position
CAM_DZoomModeInq	8x 09 04 06 FF	Y0 50 02 FF Y0 50 02 FF	D-Zoom On D-Zoom Off
CAM_DZoomC/SModeInq	8x 09 04 36 FF	Y0 50 00 FF Y0 50 01 FF	Combine Mode Separate Mode
CAM_DZoomPosInq	8x 09 04 46 FF	Y0 50 00 00 0p 0q FF	Pq: D-Zoom Position
CAM_FocusModeInq	8x 09 04 38 FF	Y0 50 02 FF Y0 50 03 FF	Auto Focus Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	Y0 50 0p 0q 0r 0s FF	Pqrs: Focus Position
CAM_FocusNearLimitInq	8x 09 04 28 FF	Y0 50 0p 0q 0r 0s FF	Pqrs: Focus Near Limit Position
CAM_AFSensitivityInq	8x 09 04 58 FF	Y0 50 02 FF Y0 50 03 FF	AF Sensitivity Normal AF Sensitivity Normal
CAM_AFModeInq	8x 09 04 57 FF	Y0 50 00 FF Y0 50 01 FF Y0 50 02 FF	Normal AF Interval AF Zoom Trigger AF
CAM_AFTimeSettingInq	8x 09 04 27 FF	Y0 50 0p 0q 0r 0s FF	Pq: Active Time, rs: Interval
CAM_WBModeInq	8x 09 04 35 FF	Y0 50 00 FF Y0 50 01 FF Y0 50 02 FF Y0 50 03 FF Y0 50 05 FF	Auto In Door Out Door One Push WB Manual
CAM_RgainInq	8x 09 04 43 FF	Y0 50 00 00 0p 0q FF	Pq: R Gain
CAM_BgainInq	8x 09 04 44 FF	Y0 50 00 00 0p 0q FF	Pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF y0 50 03 FF y0 50 0A FF y0 50 0B FF y0 50 0D FF y0 50 10 FF	Full Auto Manual Shutter Priority Iris Priority Bright Spot Light
CAM_SlowShutterModeInq	8x 09 04 5A FF	Y0 50 02 FF Y0 50 03 FF	Auto Manual
CAM_ShutterPosInq	8x 09 04 4A FF	Y0 50 00 00 0p 0q FF	Pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	Y0 50 00 00 0p 0q FF	Pq: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	Y0 50 00 00 0p 0q FF	Pq: Gain Position
CAM_BrightPosInq	8x 09 04 4D FF	Y0 50 00 00 0p 0q FF	Pq: Bright Position
CAM_ExpCompModeInq	8x 09 04 3E FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_ExpCompPosInq	8x 09 04 4E FF	Y0 50 00 00 0p 0q FF	Pq: ExpComp Position
CAM BacklightModeInq	8x 09 04 33 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_AE_ResponseInq	8x 09 04 5D FF	Y0 50 pp FF	Pp: 01 to 20 (hex)
CAM_SpotAEModeInq	8x 09 04 59 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_SpotAEPosInq	8x 09 04 29 FF	Y050 0p 0q 0r 0s FF	Pq: X position, rs: Y position
CAM_ApertureInq	8x 09 04 42 FF	Y0 50 00 00 0p 0q FF	Pq: Aperture Gain
CAM_LR_ReverseModeInq	8x 09 04 61 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_FreezeModeInq	8x 09 04 62 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_PictureEffectModeInq	8x 09 04 63 FF	Y0 50 00 FF Y0 50 02 FF Y0 50 04 FF	Off Neg.Art B&W
CAM_PictureFlipModeInq	8x 09 04 66 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_ICRModeInq	8x 09 04 01 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_AutoICRModeInq	8x 09 04 51 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_MemoryInq	8x 09 04 3F FF	Y0 50 pp FF	Pp: Last Recall Memory No.
CAM_MemSaveInq	8x 09 04 23 0X FF	Y0 50 0p 0p 0q 0q FF	X: 00 to 07 (Address) Ppqq: 0x0000 to 0xFFFF (Data)
CAM_DisplayModeInq	8x 09 04 15 FF (8x 09 06 06 FF)	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_TitleDisplayModeInq	8x 09 04 74 FF	Y0 50 02 FF Y0 50 03 FF	On Off
CAM_MuteModeInq	8x 09 04 75 FF	Y0 50 02 FF y0 50 03 FF	On Off
CAM_PrivacyDisplayInq	8x 09 04 77 FF	Y0 50 pp pp pp pp FF	Pp pp pp pp: Mask Display (0:Off, 1: On)
CAM_PrivacyMonitorInq	8x 09 04 6F FF	Y0 50 pp pp pp pp FF	Pp pp pp pp: Mas is displayed now.
CAM_KeyLockInq	8x 09 04 17 FF	Y0 50 00 FF y0 50 02 FF	Off On
CAM_IDInq	8x 09 04 22 FF	Y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
Vaddio Commands	**Command Packet**	**Inquiry Packet**	**Comments**
CAM_LaserPointerInq	8x 09 04 2F FF	y0 50 02 FF y0 50 03 FF y0 50 01 FF	ON OFF Toggle

General Specifications:

CeilingVIEW SD CCU	
Part Numbers	999-2009-000 (NTSC), 999-2009-001 (PAL)
Image Sensor	Sony ¼" EXview HAD CCD
Effective Pixels (NTSC)	380K Pixels
Effective Pixels (PAL)	440K Pixels
Horizontal Resolution	470 TVL (NTSC), 460 TVL (PAL)
Min. Illumination	1/60 s mode: 1.4 Lux typical (F1.6, 50 IRE) / 1/4 s mode: 0.1 Lux typical (F1.6, 50 IRE)
Lens	36X optical zoom, f=3.4 mm (wide) to 122.4 mm (tele), F1.6 to F4.5
Digital Zoom	12X (432X Total Zoom)
Angle of View (H)	57.8 degree (wide end) to 1.7 degree (tele end)
CeilingVIEW SD Image Sizes - • 36X Optical Zoom • Std. Resolution - Aspect Ratio 4:3 • Ceiling Height of 9' • Distance to table top 6.5'	• Wide End (zoomed out) measurement = 86" x 64.5" • Tele End (zoomed in) measurement = 2.3" x 1.7"
Video Outputs	VBS:1.0 Vp-p (Sync Negative) & Y/C Output
S/N Ratio	More than 50 dB
Focusing System	Full Auto, Manual
Min. Working Distance	320mm (wide end), 1500mm (tele end)
Sync System	Internal
Picture Effects	E-Flip, Negative Art, Black & White, Mirror Image
Camera Control	• RS-232 (VISCA™, baud rate: 9.6 Kb/s, 1-stop bit) • IR - Responds to Vaddio IR Remote (full functionality), Polycom and TANDBERG IR ZOOM IN and ZOOM OUT commands automatically. • With dip switch control (#2 UP), Polycom and TANDBERG "PAN RIGHT" command can activate the Laser Pointer "MOMENTARY ON" command for document positioning
• **Camera Enclosure**	
Components	Camera Enclosure, White Trim Ring, Mounting Rails and Mounting Hardware
Connectors	One (1) RJ-45 for Video and Power One (1) RJ-45 for RS-232
Camera Enclosure Dimensions	4.85" x 5.75" x 5.75" (H x W x D),
Camera Enclosure Weight	2.4lbs
• **Quick-Connect CV HD/SD**	
Connectors	One (1) RJ-45 for Video and Power 3-BNC: Analog SD (Y/C and composite) Outputs Note: The CeilingVIEW SD has only Y/C and Composite Video Outputs 5.5mm OD x 2.5 ID Power Connector
Controls	Y-Gain Adjustment Distance Adjustment (for longer Cat. 5 cable runs)
Max Cat. 5 Cable Distance	400'/121.92m between Quick-Connect CV HD/SD and Camera Enclosure
Quick-Connect CV HD/SD Dimensions	1.75" x 5.5" x 3.0" (3.75" with BNC connectors) (H x W x D) 1/3-Rack Width
Quick-Connect CV HD/SD Weight	1.0lbs
Power Supply	24VDC, 2A
Accessories	999-6000-002 Rack Mount Adapter Panel for 1/3-Rack Quick-Connect Interface

• **CCU Image Controller**	
Connectors	Power Connector: 12 VDC 5.5mm OD x 2.5mm ID Power RJ-45: Not applicable with CeilingVIEW CCU Control In RJ-45: Accepts RS-232 from ProductionVIEW or other non-daisy-chain control systems Control Out RJ-45: Passes RS-232 and Sync video feed to camera EZIM Tally: 2-Pin Phoenix type spring cage connector Video Inputs: Not applicable with CeilingVIEW CCU Video Outputs: Not applicable with CeilingVIEW CCU Video RJ-45: Not applicable with CeilingVIEW CCU
Camera Feature Dip Switch	For Future Functionality – Leave all switches in the down position
Video Adjustments	Unused on the Quick-Connect CCU – Make adjustments on the Quick-Connect CV HD/SD
Power Supply	12VDC, 1.0 Amp
Dimensions	1-RU Rack Mount - 1.75" H x 19" W x 6" D (4.45 cm x 4.26 cm x 15.24 cm)

FCC, ICES-003 Compliance and CE Declaration of Conformity

FCC Part 15 Compliance

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

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference including interference that may cause undesired operation of the device.

Changes or modifications not expressly approved by Vaddio can affect emission compliance and could void the user's authority to operate this equipment.

ICES-003 Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le présent appareil numérique n'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicte par le ministère des Communications du Canada.

European Compliance

This product has been evaluated for Electromagnetic Compatibility under the standards for Emissions and Immunity and meets the requirements for E4 environment. This product complies with Class A (E4 environment). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Standard(s) To Which Conformity Is Declared:
EMC Directive 89/336/EEC

EN 55022A	Conducted and Radiated Emissions
EN 55024	Electromagnetic Compatibility - Immunity
EN 61000-4-2	Electrostatic Discharge Requirements
EN 61000-4-3	Radiated Electromagnetic Field Requirement
EN 61000-4-4	Electrical Fast Transients / Burst Requirements
EN 61000-4-5	Surge Requirements
EN 61000-4-6	Conducted Immunity Requirements
EN 61000-4-8	Power Frequency Magnetic Field Requirements
EN 61000-4-11	Voltage Dips, Interrupts and Fluctuations Requirement

WARRANTY INFORMATION (See Vaddio Warranty Policies posted on vaddio.com for complete details):

Hardware* Warranty: One year limited warranty on all parts. Vaddio warrants this product against defects in materials and workmanship for a period of one year from the day of purchase from Vaddio. If Vaddio receives notice of such defects during the warranty period, they will, at their option, repair or replace products that prove to be defective.

Exclusions: The above warranty shall not apply to defects resulting from: improper or inadequate maintenance by the customer, customer applied software or interfacing, unauthorized modifications or misuse, operation outside the normal environmental specifications for the product, use of the incorrect power supply, improper extension of the power supply cable or improper site operation and maintenance.

Vaddio Customer Service: Vaddio will test, repair, or replace the product or products without charge if the unit is under warranty and is found to be defective. If the product is out of warranty, Vaddio will test then repair the product or products. The cost of parts and labor charge will be estimated by a technician and confirmed by the customer prior to repair. All components must be returned for testing as a complete unit. Vaddio will not accept responsibility for shipment after it has left the premises.

Vaddio Technical Support: Vaddio technicians will determine and discuss with the customer the criteria for repair costs and/or replacement. Vaddio Technical Support can be contacted through one of the following resources: e-mail support at support@vaddio.com or online at www.vaddio.com.

Return Material Authorization (RMA) Number: Before returning a product for repair or replacement, request an RMA from Vaddio's technical support. Provide a technician with a return phone number, e-mail address, shipping address, and product serial numbers and describe the reason for repairs or returns as well as the date of purchase and proof of purchase. Include your assigned RMA number in all correspondence with Vaddio. Write your assigned RMA number on the shipping label of the box when returning the product. All returns are subject to a restocking fee without exception (see warranty policies at vaddio.com).

Voided Warranty: The warranty does not apply if the original serial number has been removed or if the product has been disassembled or damaged through misuse, accident, modifications, or unauthorized repair. Cutting the power supply cable on the secondary side (low voltage side) to extend the power to the device (camera or controller) voids the warranty for that device.

Shipping and Handling: Vaddio will not pay for inbound shipping transportation or insurance charges or accept any responsibility for laws and ordinances from inbound transit. Vaddio will pay for outbound shipping, transportation, and insurance charges for all items under warranty but will not assume responsibility for loss and/or damage by the outbound freight carrier. If the return shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

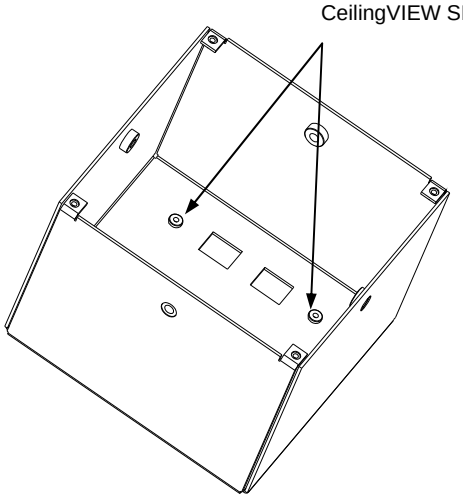
Products Not Under Warranty: Payment arrangements are required before outbound shipment for all out of warranty products.

**Vaddio manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry standard practices.*

Appendix 1:
Building Code Compliance

Camera Enclosure:
The Camera Enclosure for the new CeilingVIEW SD features threaded inserts to attach a 1-gang conduit box over the 2-Cat.5 connectors. This is for use in areas of the country with strict building codes pertaining to plenum air space (i.e. Chicago, NYC, etc.) and use of conduit. The RJ-45 connectors for Power/Video and Control are located to fit within the foot print of a 1-gang junction box.

Figure 7:
CV Enclosure with threaded inserts to attach a conduit box to the outside of the CeilingVIEW SD Enclosure



Appendix 2:
Video, Power and Control Pin-outs for the Camera Enclosure

Power/Video on RJ-45 Jack (Figure 8)

#	Pins SD VIDEO
1)	Power (+)
2)	Power GND
3)	Y+
4)	C+
5)	C-
6)	Y-
7)	Comp. Video +
8)	Comp. Video -

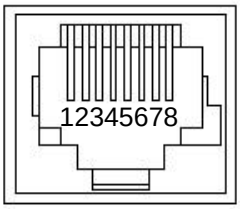


Figure 8:
Power/Video on RJ-45

RS-232 on RJ-45 Jack (Figure 9)

#	Pins	
1)	DSR	For Last in line Daisy Chain
2)	DTR	
3)	Unused	
4)	Unused	
5)	Unused	
6)	Digital GND	
7)	RXD (from TXD of control source)	
8)	TXD (to RXD of control source)	

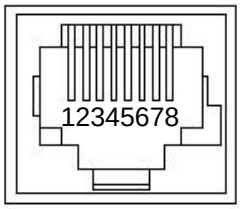


Figure 9:
RS-232C Control on RJ-45

Appendix 3: Quick-Connect CCU Front Panel and Back Panel Controls and Connectors

Tally Light:
The blue LED tally light on the front panel is tied to the tally contacts on the rear panel allowing the user to easily track which camera interface is being used in a multi-camera system by supplying a simple contact closure (i.e. from ProductionVIEW Super Joystick or ProductionVIEW SD).

LCD Display:
Backlit (blue) display indicates which mode is active (CCU CONTROL or PTZ CONTROL) and the value of the parameter being adjusted. In CCU CONTROL mode, when a rotary encoder is touched, the name of the control being actuated and the value of that assigned parameter will be displayed.

CCU Control Switch:
Backlit (blue) SPDT switch, lit when activated, blocks the incoming PTZ controls on the RS-232 input and allows the end user to make adjustments to the camera image characteristics. When off or deactivated, PTZ information is throughput to the camera and the front panel controls of the QCCU are deactivated to avoid a control issue or latency created by a master control string filtering program.

Scene A and B:
Two camera adjustment scenes (A & B) can be stored into microprocessor memory. When lit (backlit blue SPDT switch), the scene is activated. To store a scene, the user adjusts the camera to taste and touches and holds the scene button down until the button blinks.

Red Gain Control:
The Red Gain encoder adjusts the red gain of the signal when AWB is disengaged.

Blue Gain Control:
The Blue Gain encoder adjusts the blue gain of the signal when AWB is disengaged.

AWB:
The Automatic White Balance controls/adjusts the color levels automatically when engaged. Turn off AWB to manually adjust the Red and Blue levels.

OPWB:
One-Push White Balance control allows the user to set the white balance with one push (the camera must see 60% of the image as white in order to operate). OPWB overrides AWB and Red/Blue controls when activated.

Aperture:
The Aperture control sharpens the image and adds detail to the edges of objects in the frame. When text is the subject matter, the Aperture control can help sharpen the image.

Auto Iris:
The Auto Iris mode automatically adjusts the iris and gain of the camera. To manually adjust the iris or gain, turn off this control.

Manual Iris:
The manual iris control allows the user to set the iris manual to one of the 18 settings available.

Gain:
The Gain control adjusts the overall gain of the camera. To manually adjust the gain Auto Iris must be off.

Unused Rotary Encoders:
There are three (3) unused encoders on the front panel for the CeilingVIEW Document Cameras.

Appendix 3 (continued) Rear Panel Connections:

Power Supply Input:
12VDC 1.0 Amp power supply on a 5.5mm OD x 2.5mm ID connector.

RS-232 IN on RJ-45:
RS-232 Input from ProductionVIEW or other external RS-232 controller. NOTE: Daisy-chain control is not supported with any of the CCU products.

RS-232 OUT / G/L Out on RJ-45:
RS-232 on Cat-5e provides control to the CeilingVIEW Camera Module. NOTE: Genlock (G/L) is not supported with CeilingVIEW CCU systems.

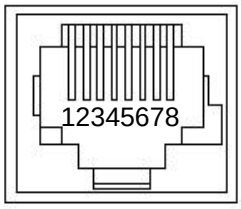
Tally on 2-pin Phoenix type connector:
Contact Closure lights LED on front panel allowing indication of which QCCU/camera combination is active in a multi-camera/QCCU installation.

Appendix 4:

Control Pin-outs for the Quick-Connect CCU

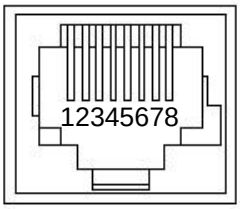
RS-232 IN Connector RJ-45

Pin	Signal - RS-232
1)	Not Used
2)	Not Used
3)	Not Used
4)	Not Used
5)	Not Used
6)	GND
7)	RXD (from TXD)
8)	TXD (to RXD)



RS-232 / G/L OUT Connector RJ-45

Pin	Signal - RS-232
1)	Not Used
2)	Not Used
3)	Not Used
4)	Not Used
5)	Not Used
6)	GND
7)	TXD (to RXD)
8)	RXD (from TXD)



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