vaddio
Camera and Electronic Products for Integrators

Installation and User Guide

WALLVIEW™ PRO HD1 WITH HSDS™

Vaddio™ PRO Series Cable System with High Speed Differential Signaling for the Sony® EVI-HD1 High Definition PTZ Camera

Figure 1:
WallVIEW PRO HD1 System with Camera, Wall Mount and EZIM

OVERVIEW

The Vaddio WallVIEW PRO HD1 (Figure 1) is built around the Sony EVI-HD1 2-megapixel CMOS high definition PTZ Camera. The WallVIEW PRO HD1 uses high speed differential signaling (HSDS), an active transmission system that delivers low-loss, high definition or standard definition video over Cat. 5 cabling distances up to 500 feet.

The WallVIEW PRO HD1 system is capable of 1080i or 720p HD resolution in a 16:9 format or standard definition (SD) resolutions – using the optional SD Break-out cable – in a variety of screen configurations to fit most monitors. The HD1 camera offers both NTSC and PAL video standards.

The WallVIEW PRO system also has many new features, including a unique IR forwarding system which allows the user to forward IR commands from third party IR remote controls, through the WallVIEW system to a third party device such as a videoconference codec (see Figure 2). Other new features include video outputs on BNC connectors (Y,Pb, Pr or Y-C and composite), a four position distance adjustment for Cat. 5 cabling, Y-Gain adjustment, and the EZ Interface Module (EZIM). Like all Vaddio WallVIEW systems, the Thin Profile Wall Mount and mounting hardware is included.

INTENDED USE

Before installing the Vaddio WallVIEW PRO HD1 Camera System, please read the entire manual thoroughly. All Vaddio camera systems are designed for use indoors. Outdoor operation is not recommended, has not been tested, and could damage the camera and/or create a potentially unsafe operating condition. Use only the Vaddio PowerRite power supply provided.

SAVE THESE INSTRUCTIONS

The information contained in this manual will help you install the Vaddio WallVIEW PRO system. For reference, Vaddio keeps copies of Specifications, Installation and User Guides and most pertinent product drawings for the Vaddio product line on the website. These documents can be downloaded from www.vaddio.com free of charge.

IMPORTANT SAFEGUARDS

Read and understand all instructions before using. Do not operate the any electrical 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 Vaddio WallVIEW products. Use of any unauthorized power supply will void any and all warranties.

INFORMATION

For RS-232 control information, please see the full-length Technical Manual for the SONY EVI-HD1 model. This manual can be found either on the Vaddio or Sony website. Vaddio has also prepared a number of TechNotes, specifications and drawings designed to inform and educate integrators' of the value and the specific uses of Vaddio products.

Document Number 341-661 Rev D.

UNPACKING:
Carefully remove all of the parts from the packaging and identify the following parts:

- One (1) - Sony EVI-HD1 High Definition PTZ Camera
- One (1) - Vaddio EZ Interface Module (EZIM)
- One (1) - Vaddio EZIM to HD Break-out Cable
- One (1) - Vaddio Quick-Connect PRO (1-RU Rack Mountable)
- One (1) - Vaddio Thin Profile PRO HD1 Wall Mount
- One (1) - Sony IR Remote Control
- One (1) - EZCamera Control Adapter 998-1001-232 (RJ-45 to DB-9F)
- One (1) - 36V PowerRite™ HD Power Supply with AC Cord Set
- One (1) - 2-position Phoenix Connector for IR
- Mounting Hardware
- Documentation
    - Vaddio Manual
    - Sony EVI-HD1 Manual

Optional Accessories: SD Break-out cable (for SD video configurations) - Part # 440-6204-000
TANDBERG Codec RJ-45 to DB-9 Adapter – Part # 998-1002-232
RS-232 and IR Adapter for Polycom 8000 & 7000 Series Codecs - Part # 998-1006-232

INSTALLATION
All WallVIEW products are specifically designed for installation on a vertical wall surface with Cat. 5 cable connectivity for Power, Video and Control signaling. Installation is simplified in that no custom 8-Pin mini-din cables or expensive S-Video plenum cables are needed and power outlets are not required near the camera bracket. All cabling is routed to the head-end using Cat.5 cables. NOTE: All RJ-45 connectors need to be terminated TIA/EIA 568B or A. The use of RJ-45 "EZ" connectors is not recommended.

Before Installing

- Locate the camera mounting position paying close attention to camera viewing angles, lighting conditions, possible line of site obstructions, and checking for in-wall obstructions. Pick a location to optimize the performance of the camera.
- Pre-wire all cabling from the camera location to the equipment head-end.
- The Thin Profile Wall Mount for the WallVIEW HD1 can be mounted directly to a 2-gang wall box or can be mounted to the drywall using four dry wall anchors.

Wiring Diagram with HDX 9000 Series Codec:

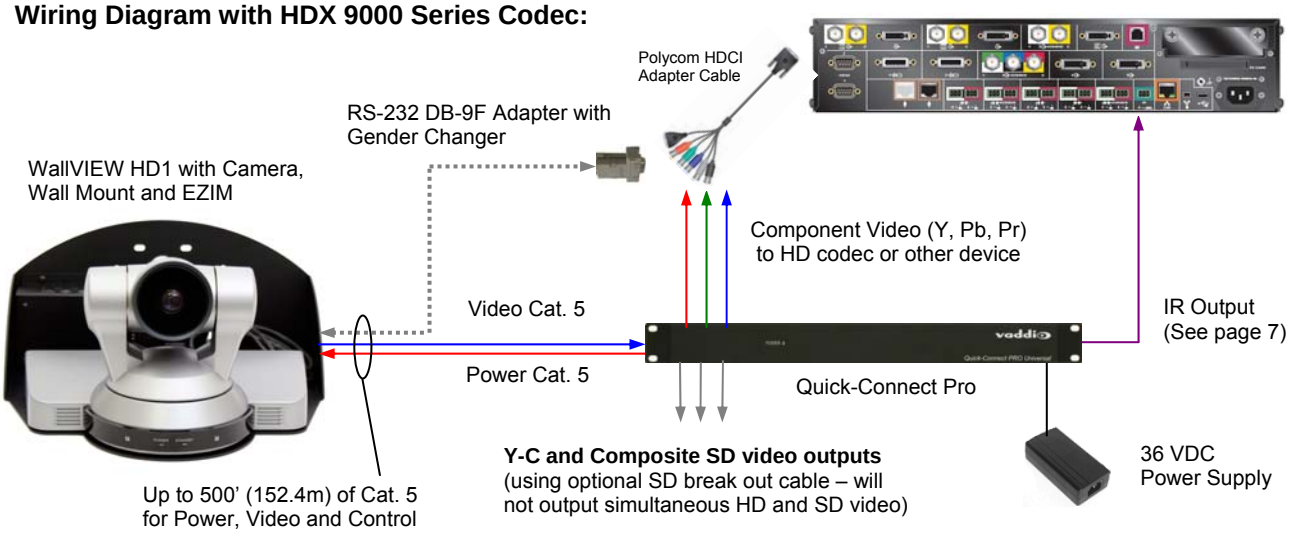


Figure 2: The WallVIEW HD1 connected to an HDX 9000 series codec uses the standard RJ-45 to DB-9 adapter supplied with the system and DB9 M-M gender changer (not supplied) for control between the camera and codec breakout cable. IR is fed out of the Quick-Connect rack mount unit to the IR port on the back of the HDX 9000 series codec for IR forwarding from the camera. The Power, Video and Control Cat. 5 cables can be run up to 500' (152.4m) from the Quick-Connect box to the EZ Interface Module, which connects to the camera. See Step 9 for additional information on HDX 9000 IR wiring.

Wiring Diagram Example for HDX 7000 and 8000 Series Codecs:

Requires optional DB-9M to RJ-45 Adapter – Part # 998-1006-232

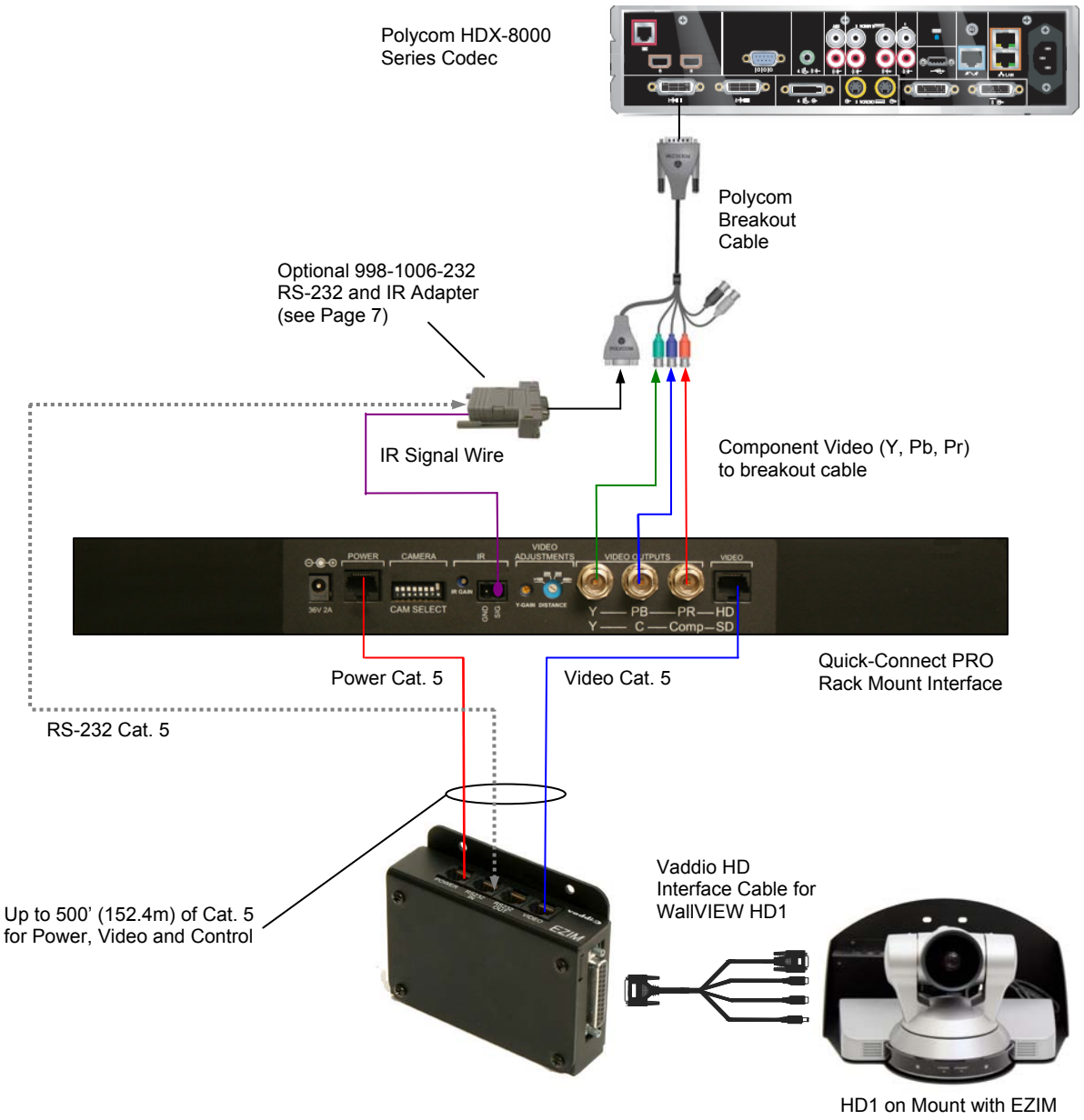


Figure 3: The WallVIEW HD1 connected to an HDX 7000 / 8000 series codec uses an Optional RJ-45 to DB-9M adapter (998-1006-232) for PTZ and IR control between the HD1 and codec. IR signals are fed from the HD1 camera, to the Quick-Connect rack mount unit – see Step 9 for additional information on wiring the HDX 7000 / 8000 codecs. The Power, Video and Control Cat. 5 cables can be run up to 500 from the Quick-Connect box to the EZ Interface Module, which connects to the camera.

Wiring Diagram Example* for Interfacing with TANDBERG Video Switch:

Requires optional TANDBERG DB-9 to RJ-45 Adapter – Part # 998-1002-232

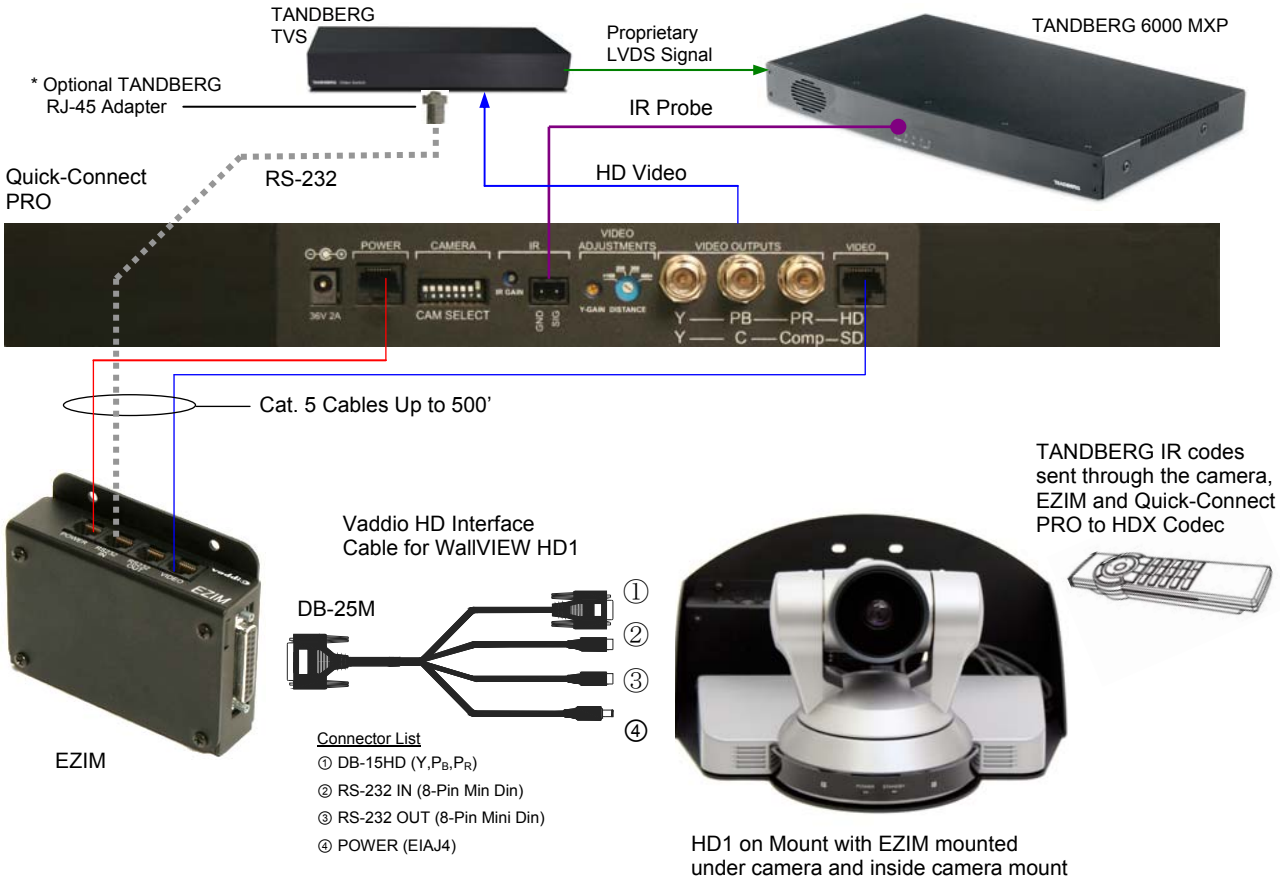


Figure 4: Basic connectivity of the WallVIEW PRO HD1 with TANDBERG Video Switch. The WallVIEW HD1 connected to a TANDBERG 6000 MXP codec and utilizes an Optional RJ-45 to DB-9 adapter for PTZ control between the HD1 and codec. IR signals are fed from the HD1 camera, to the Quick-Connect rack mount unit to the TANDBERG codec via an IR probe (not supplied) – see Step 7 for additional information. The Power, Video and Control Cat. 5 cables can be run up to 500 from the Quick-Connect box to the EZ Interface Module, which connects to the camera. NOTE: See TANDBERG Step 9 for additional information on IR Probe Wiring and compatible probes.

Daisy Chain Control Configuration:

The WallVIEW PRO HD1 has provisions for daisy chaining control signals when using an RS-232 controller with only one (1) RS-232 output. Each EZIM has a RS-232 input and a RS-232 output (Figure 3).

Figure 5:
Daisy chain control configuration using two (2) WallVIEW PRO HD1 systems and a single RS-232 output control device. See Appendix 1 for wiring and pin-out information.

MOUNTING INSTRUCTIONS

Step 1:

After determining the optimum location of the camera system, mark locations for the four screw holes and cable pass-thru (vertical oval). Install the drywall mounts and cut the hole for the cable pass-thru. At this point, do not install the Wall Mount.

Figure 6:
Thin Profile Wall Mount with oval cable feed-through hole. The wall mount may be mounted directly to a 2-gang wall box or to drywall with wall anchors.

Step 2:

Set the camera output resolution. The resolution of the camera can be set to HD (high definition) or SD (standard-definition). The EVI-HD1 cannot output both HD and SD concurrently, so a choice must be made with the rotary SYSTEM SELECT switch (Figure 5 and Table 1). Also, if an IR Remote is going to be used to control the camera, chose the IR frequency with the IR SELECT switch. NOTE: SD break-out cable sold separately.

Figure 7:
Rear panel of EVI-HD1

Note: If IR forwarding is to be used turn dip switch #1 on the bottom of the camera to the ON position

Table 1:
System Select switch settings supports both NTSC and PAL formats, LB = Letter Box, CR = Cropped, SQ = Squeezed.
Note: See Sony Manual for switch setting definitions.

System Select			
0	1080i/59.94	8	1080i/50
1	1080p/29.97	9	1080p/25
2	720p/59.94	A	720p/50
3	720p/29.97	B	720p/25
4	480i/59.94 (LB)	C	576i/50 (LB)
5	480i/59.94 (CR)	D	576i/50 (CR)
6	480i/59.94 (SQ)	E	576i/50 (SQ)
7		F	

Step 3:

Connect the 25-pin cable to the EZIM. Next, mount the EZIM and break out cable to the back of the wall mount, using the two tapped screw holes (see Figure 6).

Figure 8:
25-pin connector mounted to EZIM (left) and EZIM mounted to the back of the Wall Mount (right)

Step 4:
Place the wall mount, without the EZIM installed, against the drywall anchors or 2-gang wall box, making sure to pull the Cat. 5 cables through the oval hole at the back of the mount. Finger-tighten the screws to the mount and confirm that the base is level. Tighten the screws firmly. If the bracket is to be mounted on a 2-gang wall box, use screws supplied with the electrical box.

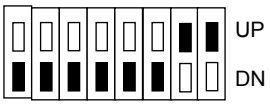
Step 5:
Place the EZIM onto the wall mount and with the supplied screws, mount the EZIM to the Wall Mount (see Figure 6, right photo). Connect the cables to the back of the HD1 PTZ camera, and then secure the camera to the mount and using the ¼"-20 screw.

Step 6:
Connecting the Quick Connect PRO. The Quick Connect PRO is a 1-RU rack mount interface that breaks out the signals from the Cat. 5 cables back to the standard connectors. The basic system connectivity is illustrated in Figures 2 & 3.

Step 7:
Check all Cat. 5 cables for proper continuity in advance of final connection. Attach the Cat. 5 cables for Power, Video and Control to the Quick-Connect PRO rack mount interface. Connect the BNC video output connectors – either HD or SD – depending on where the SYSTEM SELECT rotary switch was set in Step 2. Connect the PowerRite 36 VDC power supply to the Quick-Connect PRO power input.
Note: Plugging the POWER Cat. 5 Cable into the wrong RJ-45 may cause damage to the camera system and void the warranty.

Step 8:
The Quick-Connect PRO interface has an 8-position dip switch on the rear panel to allow the selection of IR Forwarding Mode for Polycom® and TANDBERG® codecs. The following table defines the dip switch settings:

DIP Switch Example
WallVIEW Universal PRO back panel



Description — Dip Switch (Up = ON) →	1	2	3	4	5	6	7	8
IR Forwarding through main camera for use with Polycom HDX-9000 Series Codecs • 2-wire signal & GND connection only to IR spring cage connector on the back panel of the codec	*	*	*	*	*	*	UP	UP
IR Forwarding through main camera for use with Polycom HDX-8000/7000 Series Codecs • Single wire from RJ-45 to DB-9 adapter to "SIG" pin on IR Port of the back of the Quick-Connect PRO	*	*	*	*	*	*	DN	UP
IR Forwarding through main camera for use with TANDBERG MXP (using the TANDBERG TVS) Codecs • Modulated IR signal from Quick-Connect PRO to IR probe attached to the front panel IR window of the codec o Compatible IR Emitters ▪ Xantech 282MRP ▪ Xantech 283M	*	*	*	*	*	*	UP	DN

Step 9: For HDX 9000 Series Installs Requiring IR Pass-Thru
Connect a two-conductor wire to the connectors of both the Polycom HDX codec and Quick-Connect Universal PRO rack mount box. Ground from the Universal PRO should be terminated to the "-" port on the HDX 9000 Series codec's IR input. The SIG port on the Universal PRO should be terminated to the square wave symbol. See adjacent drawing for additional detail

Connect the IR output from the Quick-Connect Universal PRO to either the IR spring cage IR input on an HDX series codec (where available) or a Xantech™ IR probe (compatible models: 282MRP or 283M). The white striped wire on the IR Probe is the Signal and the black wire is Ground.

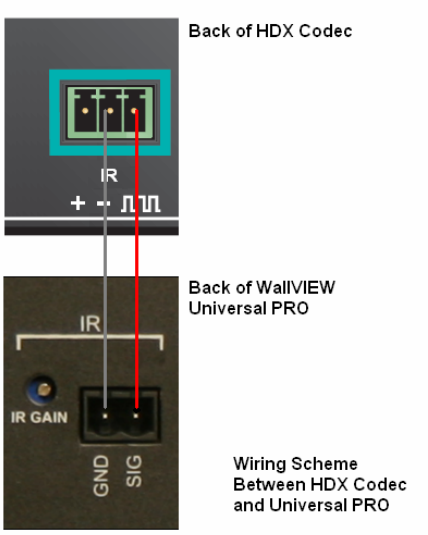


Figure 9: Wiring Configuration for IR Forwarding feature (optional)

Step 9: For HD1 IR Pass-Thru on HDX 7000 and 8000 Series Codecs
Using the Optional RJ-45 to DB-9 adapter (998-1006-232) with the system, strip and terminate the single wire coming out of the back of the adapter, and connect it to the Phoenix-type connector supplied with the Quick-Connect PRO. The wire needs to be terminated to the Signal "SIG" pin on the back of the Quick-Connect PRO.

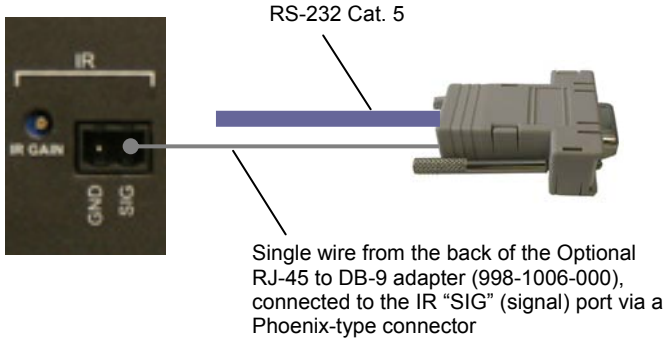


Figure 10: Required wiring configuration for IR Forwarding from the camera IR port to codec. Note: There is no IR port on the front of the HDX 7000 and 8000 series codecs. The IR receiver on these codecs is imbedded in the camera.

Step 9: For TANDBERG Video Switch IR Pass-Thru
If connecting a Xantech IR Probe to the IR output of the Quick-Connect Pro, the white striped wire on the probe should be connected to the signal "SIG" terminal and the ground, or black wire to "GND". Attach the probe over the IR window of the codec. Make sure the dipswitch is in the correct position

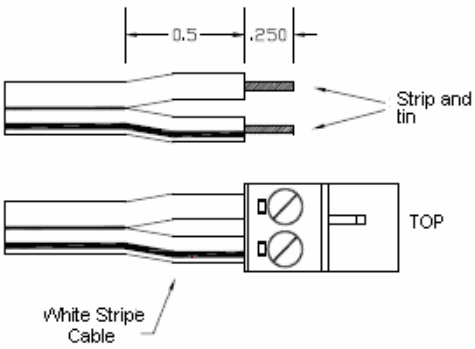


Figure 11: Terminating Xantech Probe cable to 2-position Phoenix type connector

COMPLETING THE INSTALLATION:
Connect the Vaddio 36 VDC power supply to an AC outlet. Power will travel down the Power Cat. 5 cable to the EZIM, powering the camera. The camera will "Home" to a centered position ready for control information from the provided IR Remote Control or RS-232 Camera controller of the integrators' choice. To insure proper continuity of control and operation of the cameras, the RS-232 controller (control system or joystick) should be powered on after the camera.

Step 10: Setting the IR Pass-Through Adjustment (optional)
The PRO system is capable of transmitting IR signal frequencies between 25 to 45 kHz. Connect the IR output from the Quick-Connect PRO to either the IR input on a third party device or a Xantech™ IR probe (compatible models: 282MRP or 283M). See Figure 8 for terminating the Xantech probe. NOTE: Vaddio has tested compatibility of the IR forwarding with Sony, Vaddio, Polycom and TANDBERG remote controls.

IMPORTANT NOTE: The IR Gain adjustment is factory set for distances below 300 feet (91.4 meters), and should not have to be adjusted unless the Cat. 5 cabling distance is over this length. For cable runs above 300 feet, slowly adjust the gain level up while pressing functions on the remote control, pointed at the HD1 camera using the WallVIEW PRO system. Once all remote control functions are operating from the remote, through the camera's IR sensor, the IR gain is adjusted properly.

CARE AND CLEANING
- Do not attempt to take the products in the system apart. There are no user-serviceable components.
- Keep the devices away from food and liquid, and do not spill liquids on the products
- For smears or smudges on the lens, wipe with a clean, soft cloth. Do not use any abrasive chemicals on the camera body at any time.

OPERATING AND STORAGE CONDITIONS
Do not store or operate the WallVIEW PRO System under the following conditions:
- Temperatures above 40°C (104°F) or below 0°C (32°F), for Indoor Use Only
- High humidity, condensing or wet environments
- Dusty environments
- In inclement weather
- Under severe vibration

GENERAL SPECIFICATIONS

WallVIEW HD1 System	
System Part Numbers	999-6305-000 NTSC 999-6305-001 PAL
Quick-Connect Interface	
Connectors	Power Connector: 5.5mm OD x 2.5mm ID Power RJ-45: Supplies 36V to EZCamera Interface Module Regulator IR: 2-Pin Phoenix type spring cage connector Video Outputs: BNC Connectors for HD Analog Component (Y,PB,PR) or SD Video RJ-45: Transports HD or SD video from camera depending on camera selection switch position
Camera Select Switch	8-Position DIP switch loads camera profiles and IR Forwarding for Polycom and TANDBERG Codecs
Video Adjustments	Y-Gain (luminance gain) for fine tuning over longer cable distances Distance Compensation: 100', 200', 300', 400'+
Compatible Cameras	Sony BRC-H700, BRC-Z700, EVI-HD1, BRC-300, (EVI-D70, EVI-D100 also in SD Mode) Polycom EagleEye
Max. Cat. 5 Cable Distance	Up to 500' (152.4m) for Video Power and Control
Power Supply	36 VDC, 2.78 Amp
Dimensions	1-RU Rack Mount (1.75" H x 19" W x 6" D)
Connectors	Four (4) RJ-45 Connectors One DB-25 for Power, Video, Control & IR
Cable Assemblies	For Sony HD Cameras: DB-25M to DB-15HD/8-Pin Mini Din x 2/EIAJ4 Power Connector For Sony SD Cameras: DB-25M to RCA-M/4-Pin Mini Din/8-Pin Mini Din x 2/EIAJ4 Power Connector * * SD Break-out cable
Power Regulator	Supplies 12VDC to Cameras
Dimensions	Approx. (3.035" H x 4.46" W x 1.242" D)

CAMERA SPECIFICATIONS

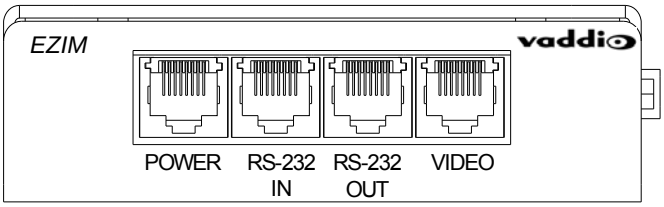
Sony EVI-HD1 Camera Basic Specifications	
Camera Part Number	EVI-HD1
Image Sensor	1/3-type CMOS
Effective Pixels	Approx 2-Mill Pixels (16:9)
Signal Systems	NTSC and PAL
Video Resolutions	HD: 1080i (59.94/50), 720p (59.94/50), SD: 480i, 576i
Lens	10X Optical, 4X Digital, 40X total
Horiz. Viewing Angle	8° tele to 70° wide (16:9)
Weight	Approx. 4 lbs 7 oz (2kg)
Dimensions	Approx 10.25" W x 6" H x 6.75" D (259mm x 150mm 169mm)

Appendix 1: Cable Pin-outs for the WallVIEW PRO System

EZCamera Interface Module Pin-outs:

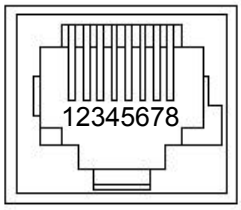
Power Connector

Pin	Signal
1	Power +
2	Power -
3	Power +
4	Power -
5	Power +
6	Power -
7	Power +
8	Power -



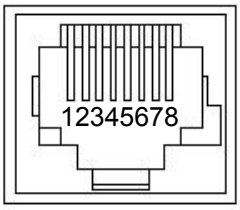
RS-232 IN Connector

Pin	Signal
1)	DTR (Sony® Daisy chain to DSR)
2)	DSR (Sony Daisy chain from DTR)
3)	Unused
4)	Unused
5)	Unused
6)	Digital GND
7)	RXD (from TXD of control source)
8)	TXD (to RXD of control source)



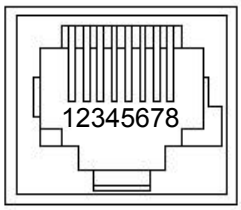
RS-232 OUT Connector

Pin	Signal
1)	DSR (Sony Daisy chain from DTR)
2)	DTR (Sony Daisy chain to DSR)
3)	Unused
4)	Unused
5)	Unused
6)	Digital GND
7)	TXD (to RXD of control source)
8)	RXD (from TXD of control source)



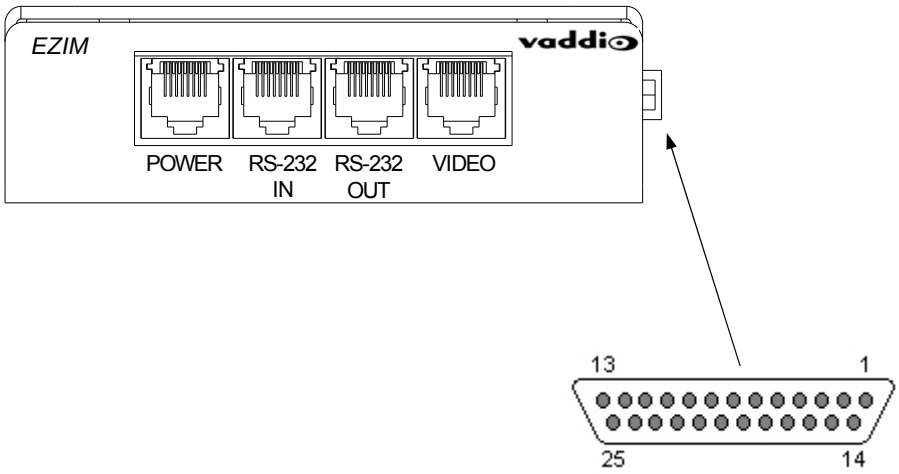
Video Connector

Pin	Signal SD	HD
1)	IR+	IR+
2)	IR GND	IR GND
3)	Y+	Y+
4)	C+	PB+
5)	C-	PB-
6)	Y-	Y-
7)	Comp. Video +	PR+
8)	Comp. Video -	PR-

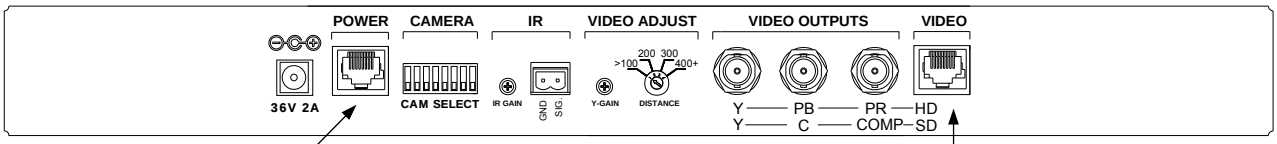


DB-25 Connector

Pins	Signal
1	GND Out
14	RXD Out
2	TXD Out
15	DTR Out
3	DSR Out
16	GND IN
4	TXD IN
17	RXD IN
5	DTR IN
18	DSR IN
6	IR
19	GND
7	GND
20	CVBS/PR
8	GND
21	C/PB
9	GND
22	Y/Y
10	GND
23	GND
11	GND
24	12V
12	12V
25	12V
13	12V



Quick-Connect Pin-outs:



Power Connector

Pin	Signal
1	Power +
2	Power -
3	Power +
4	Power -
5	Power +
6	Power -
7	Power +
8	Power -

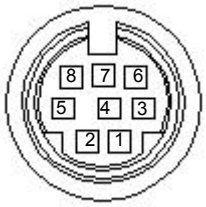
Video Connector

Pin	Signal	
	SD	HD
1)	IR+	IR+
2)	IR GND	IR GND
3)	Y+	Y+
4)	C+	PB+
5)	C-	PB-
6)	Y-	Y-
7)	Comp. Video +	PR+
8)	Comp. Video -	PR-

Sony HD & SD Camera Control Pin-outs:

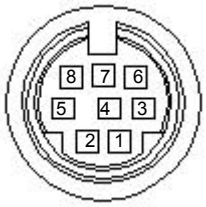
RS-232 IN Connector (8-Pin Mini Din)

Pin	Signal
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	GND
7	IR OUT
8	Unused



RS-232 IN Connector (8-Pin Mini Din)

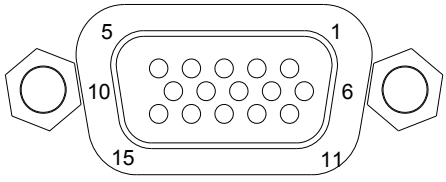
Pin	Signal
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	GND
7	Unused
8	Unused



Sony HD Video (analog component) Pin-outs:

Video Output Connector (DB-15HD)

Pin	Signal
1	PR
2	Y
3	PB
4	GND
5	GND
6	GND
7	GND
8	GND
9	NC
10	Unused
11	Unused
12	Unused
13	Unused
14	Unused
15	Unused



FCC, ICES-003 Compliance and CE Declaration of Conformity

For Vaddio Quick-Connect and EZIM products

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.

Industry Canada Industrie Canada

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 Requirements

WARRANTY INFORMATION

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. Please see Vaddio's website for current RMA policies and procedures.

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.*

9433 Science Center Drive, Minneapolis, MN 55428
Toll Free: 800-572-2011 ▪ Phone: 763-971-4400 ▪ FAX: 763-971-4464
www.vaddio.com