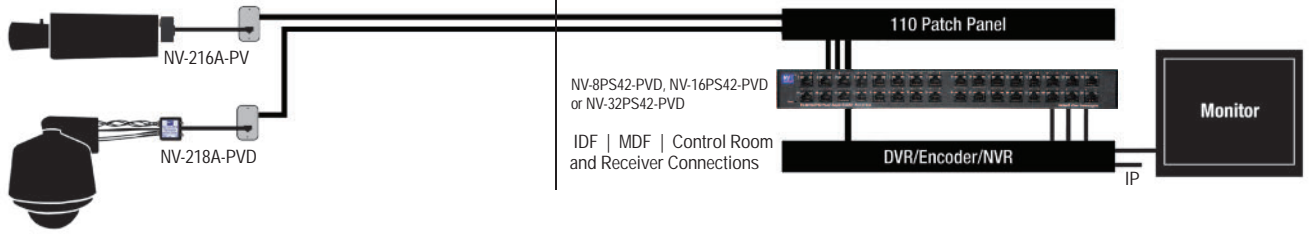




# Power Supply StubEQ™ Receiver Hub Installation Guide

## Models NV-8PS42-PVD, NV-16PS42-PVD and NV-32PS42-PVD

Camera Location and Transmitter Connections



### IMPORTANT SAFETY INSTRUCTIONS

- 1) Read these instructions.
  - 2) Keep these instructions.
  - 3) Heed all warnings.
  - 4) Follow all instructions.
  - 5) Do not use this apparatus near water.
  - 6) Clean only with a dry cloth.
  - 7) Do not block any ventilation openings.
  - 8) Install in accordance with the manufacturer's instructions.
  - 9) Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including DVRs) that produce heat.
  - 10) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
  - 11) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
  - 12) Only use attachments/accessories specified by the manufacturer.
  - 13) Use only with cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tipover.
  - 14) Unplug this apparatus during lightning storms or when unused for long periods of time.
  - 15) Refer all servicing to qualified service personnel.
- Service is required when the apparatus has been damaged in any way, such as a power supply cord or plug is damaged, liquid has been spilled, or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

**TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER OR BACK. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

**WARNING: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.**

**⚠ This installation should be made by a qualified service person and should conform to all local codes.**

**⚠ WARNING - Do not install the unit in an environment where the operating ambient temperature exceeds 122° F (50° C). The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table-cloths, curtains, etc. No naked flame sources, such as lighted candles should be placed on the apparatus.**

**⚠ ⚠ WARNING - Do not interconnect multiple outputs.**

**⚠ WARNING - The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.**

**⚠ WARNING - Use only a Certified power cord and plug (coupler / mains) assemblies for location installed.**

**⚠ WARNING - Power cord is regarded as main disconnect.**

**⚠ WARNING - Class 1 apparatus shall be connected to a mains socket outlet with a protective earthing connection.**

**⚠ WARNING - The appliance coupler (power cord/mains) shall remain readily operable.**

**⚠ WARNING - For safety, never put NVT signals in the same conduit as high-voltage wiring.**

**⚠ WARNING - Do not restrict airflow around any active powered NVT products. Model NV-32PS42-PVD requires a minimum of 2.5 in. (63.5mm) unrestricted open air space on each side of the unit.**

The NVT Power Supply StubEQ™ Receiver Hub is an active (amplified) hub that allows the transmission of real-time monochrome or color video for distances up to 1,500ft (460m) using Cat5 or better unshielded twisted-pair (UTP) wire. Its 2-band equalizer continuously and automatically compensates for cable attenuation and ground loops, independent of the video content. The 1U hub is equipped with multi-stage transient protection.

The hub combines a 28VAC power supply with video and telemetry data, for 8 to 32 cameras, all over UTP wire. Designed for installation in the Control/MDF room, the hub consolidates connectivity via standard 4-pair RJ45 EIA/TIA 568B compliant premises wiring and pinouts.

At the camera, power, video, and data connections are made using the NV-216A-PV or NV-226J-PV (power & video only) or the NV-218A-PVD (power, video, and telemetry data) transceiver via an RJ45 connector and a single 4-pair cable. Control/MDF connections are also RJ45, with BNC video outputs for the DVR, matrix switcher, etc. Telemetry connections, if required, are supported via an RJ45 connector for each group of four camera channels.

The NV-8PS42 supports up to 8 cameras at up to 1 amp per camera, and delivers two BNC outputs per channel. The NV-16PS42 supports up to 16 cameras at up to 1 amp per camera, and delivers two BNC outputs per channel. The NV-32PS42 supports up to 32 cameras at up to 500mA per camera, and delivers one BNC output per channel.

### Wire Type

The Power Supply StubEQ™ Receiver operates well with Category 5 or better Unshielded Twisted-Pair (UTP) wire, 24-22 AWG (0.5-0.64mm).

The video signal may co-exist in the same cable tray as other video, telephone, data, control signals, or low-voltage power. It is also OK to run NVT signals near electromagnetic fields (in accordance with National Electrical Code, and other local safety requirements).

DO NOT USE individually shielded twisted pair. Overall shielded, multi-pair (6pr +) Cat5 is OK.

Do NOT use un-twisted wire.

Wire in underground conduit or wet locations must be polyethylene-jacketed, gel-filled.

Wire in plenum environments must be plenum-rated, per local codes.

RS-422 and RS-485 Pan/Tilt/Zoom telemetry signals are supported.

### Wire Distance

All measured distances include any coax in the path.

Wire resistance may be measured with an ohm-meter by shorting the two conductors together at the far end, and measuring the loop-resistance out and back. 1000 feet (300m) of 24 AWG (0.53mm) wire is 52 ohms; 23 AWG (0.57mm) is 42 ohms.

Wire distances are limited to the minimum of:

**POWER DISTANCE** - the power loss along the wire from the Power Supply Passive Receiver Hub out to the camera,

- or the -

**VIDEO DISTANCE** - the video signal distance limit from camera to the Power Supply StubEQ™ Receiver, not to exceed 1500ft (460m).

### Connecting PVD at the Camera End

Use the NV-216A-PV for fixed cameras, or the NV-218A-PVD for fixed or P/T/Z cameras. Install per the instructions that come with the transmitting device using 4-pair wire and RJ45 connectors. NVT recommends the use of factory-cripped RJ45 patch cables rather than unreliable field-cripped RJ45s to connect between the NVT device and an adjacent female RJ45 jack. Wiring pinouts are:

1	Wht/org	Video +
2	Org/wht	Video -
3	Wht/grn	Data +
4	Blu/wht	Power -
5	Wht/blu	Power +
6	Grn/wht	Data -
7	Wht/brn	Power +
8	Brn/wht	Power -

### Connecting PVD at the Power Supply StubEQ™ Receiver Hub

**⚠ CAUTION:** Before applying power set voltage selection switch to proper input line voltage.

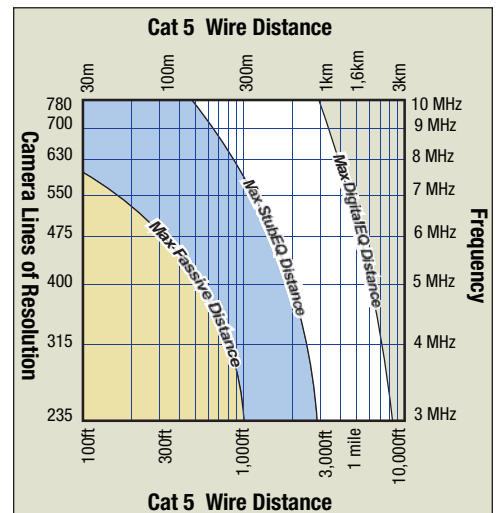
Bring the 4-pair PVD cable from each camera back to the location of the Power Supply StubEQ™ Receiver. NVT recommends that an RJ45 Patch Panel be used here in conjunction with RJ45 patch-cords. Use of these EIA/TIA 568B compliant practices allows for easy testing with an RJ45 (LAN) tester, as well as moves and changes.

Connect the PVD signals into ports on the front of the Power Supply StubEQ™ Receiver Hub.

Connect the IEC cable between the power inlet and a grounded electrical outlet. Switch on the power switch and observe the blue power LED.

### Video Distance

Recommended wire distances for best resolution is shown in chart below. Wire distance between the camera and the Power Supply StubEQ™ Receiver Hub should not exceed these recommendations:



### Power Distance

Wire distance between the Power Supply StubEQ™ Receiver Hub and the camera is dependent on the camera's current draw. Please refer to the Power Distance Charts below.

Fixed Camera 24VAC only, used with NV-216A-PV		
Power Supply Voltage	24 VAC	28 VAC
Minimum Voltage at Camera	21 VAC	21 VAC
B&W Camera, 2.4 W		
2-pair 24 AWG	789ft (240m)	1,840ft (561m)
2-pair 23 AWG	994ft (303m)	2,320ft (707m)
Color Camera, 4.8 W		
2-pair 24 AWG	393ft (120m)	916ft (279m)
2-pair 23 AWG	495ft (151m)	1,155ft (352m)
Color Camera, 7.2 W		
2-pair 24 AWG	262ft (80m)	612ft (186m)
2-pair 23 AWG	331ft (101m)	771ft (235m)

Fixed Dual Voltage 24VAC/12VDC Camera with NV-216A-PV		
Power Supply Voltage	24 VAC	28 VAC
Minimum Voltage at Camera	14 VAC	14 VAC
B&W Camera, 2.4 W		
2-pair 24 AWG	1,753ft (534m)	2,454ft (748m)
2-pair 23 AWG	2,210ft (674m)	3,094ft (943m)
Color Camera, 4.8 W		
2-pair 24 AWG	874ft (266m)	1,223ft (373m)
2-pair 23 AWG	1,102ft (336m)	1,542ft (470m)
Color Camera, 7.2 W		
2-pair 24 AWG	583ft (178m)	816ft (249m)
2-pair 23 AWG	735ft (224m)	1,029ft (314m)

P/T/Z 24VAC Camera used with NV-218A-PVD		
Power Supply Voltage	24 VAC	28 VAC
Minimum Voltage at Camera	21 VAC	21 VAC
P/T/Z Camera, 21 W		
2-pair 24 AWG	90ft (27m)	210ft (64m)
2-pair 23 AWG	113ft (35m)	265ft (81m)

Fixed 12VDC Camera used with NV-226J-PV		
Power Supply Voltage	24 VAC	28 VAC
B&W Camera, 2.4 W		
2-pair 24 AWG	1,586ft (748m)	2,220ft (677m)
2-pair 23 AWG	1,999ft (609m)	2,799ft (853m)
Color Camera 4.8 W		
2-pair 24 AWG	795ft (242m)	1,113ft (339m)
2-pair 23 AWG	1,002ft (306m)	1,403ft (428m)

## Channel LED Indicators

Each RJ45 connector has two LEDs. The LEFT LED indicates video status:

OFF:	No video received
SOLID GREEN:	Video received and equalized
WINKING GREEN:	Video present, but cannot equalize typically due to wire that is too long
RED:	Time varying signal detected, but it's not video

The RIGHT LED indicates 28VAC Power status:

OFF:	No camera current (<50 mA)
SOLID GREEN:	Camera current detected
WINKING GREEN:	Current in the four power conductors don't match one of the four power conductors is open

Detects that current in each of the four power conductors is the same, allowing for the detection of open conductors. Above 100 feet, or with high current P/T/Z cameras, the winking green LED is an indication that the wire continuity should be checked with a ohm meter or LAN tester for miswires.

ALTERNATING

RED/GREEN:	Current exceeds Hub's spec
RED:	Thermistor protector has opened due to over-current fault check for shorts in the wiring

FAST FLASHING RED: CAUTION: HAZARDOUS VOLTAGE DETECTED

## Connecting the Video Outputs

Using the BNC jumper cables (included) connect the video outputs on the rear of the Power Supply StubEQ™ Receiver Hub to the DVR, encoder, or multiplexer.

The NV-8PS42-PVD supports 8 channels, two BNC outputs each. The NV-16PS42-PVD supports 16 channels, two BNC outputs each. The NV-32PS42-PVD supports 32 channels, single BNC output.

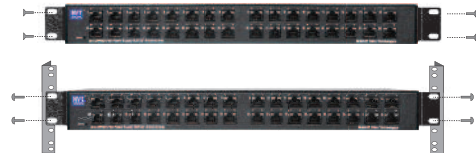
## Data Connections

The data path for each camera arrives on the front RJ45 jack of the Power Supply StubEQ™ Receiver Hub. Each Data jack supports the pass-through of four camera data signals. Use a 4-pair Cat5 cable to bring these data signals back to the P/T/Z Controller. For small installations, these wire pairs may be connected directly to the RS-422/485 telemetry control output on your controller. In most cases a "Code Distribution Unit" (available from the camera manufacturer) is inserted between the telemetry output and the wire-pairs. This allows one telemetry output to drive many cameras without having to drive too many loads. It also prevents a fault at one camera from taking down the entire system.

## Rack / Table / Wall Mounting

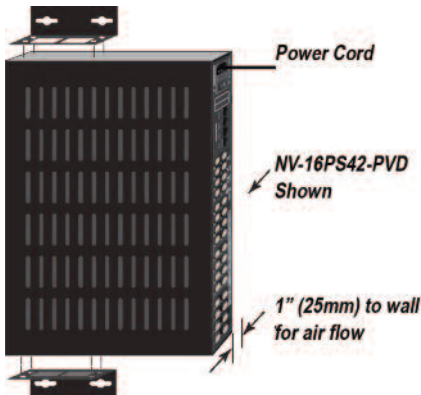
Ambient temperature must be below 122°F (50°C). Airflow must be at least 4ft<sup>3</sup>/min (0,1<sup>3</sup>/min) of un-restricted airflow. Many DVRs produce enough heat to exceed this temperature without external airflow.

For 19" rack mounting, use enclosed "L" brackets and screws. Because the NV-16PS42-PVD and the NV-32PS42-PVD Hubs weigh approximately 25 lbs. (11,3kg), some thinner-gauge rack systems may require additional rear support. NVT provides a rear-rail mounting accessory kit for this purpose.

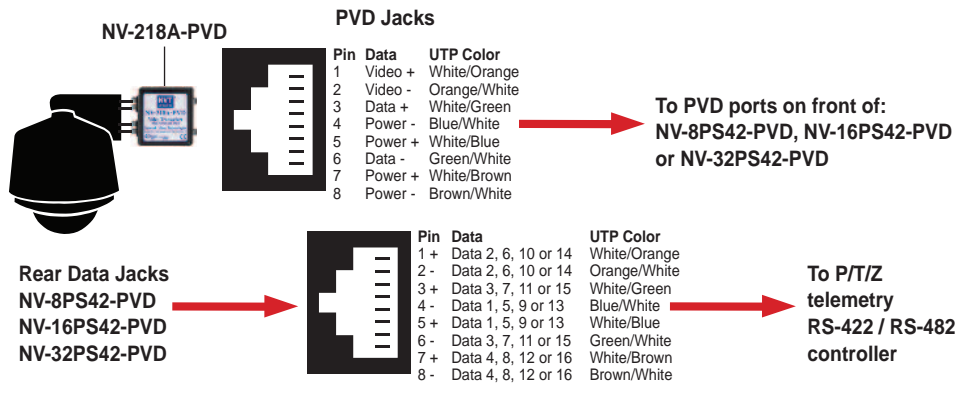


For table mounting, use enclosed self adhesive rubber feet and attach to the bottom corners of the hub.

For wall mounting, attach the optional mounting "L" brackets to two sides of the unit, using the enclosed screws. The brackets may be installed facing outward or inward. Inward facing brackets allow the unit to be mounted on 16" centres, useful in US wall stud applications. For easy connector and LED access, it is recommended that the front of the unit faces left.



## PVD Connector Pinouts



## Technical Specifications

### Video

Frequency	DC to 10 MHz
Attenuation	0.5 dB typ
Common Mode/Differential Mode Rejection	15 KHz to 10 MHz 60dB typ

### Power Output

Output Voltage	28VAC
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### Maximum output current

NV-8PS42-PVD:	1 Amp per channel, 8 aggregate
NV-16PS42-PVD:	1 Amp per channel, 16 aggregate
NV-32PS42-PVD:	0.5 Amp per channel, 16 aggregate

### Connectors and Impedance

UTP input	100 ± 20 ohms
BNC output	75 ohms

### LEDs

Power	Blue
Channel Status	see column 1

### Environmental

Temperature	32 to 122°F (0 to 50°C)
Humidity	0 to 95% non-condensing
Transient immunity	per ANSI / IEEE687 C62.41

### Power Input

IEC380 Inlet

### Power Cord

IEC380 AC line power receptacle for use with removable cords. Use only the power cord provided with the unit or equivalent UL approved type SJT or SVT, 18AWG, 125/250V, 5A 60 deg.C, Max. 4,5m long; One end with NEMA 5-15P. Other end with appliance coupler.

### NV-8PS42-PVD

Voltage	115/230 VAC
Frequency	50/60 Hz
Current Wattage	2.5 A @ 115 VAC, 2.5A @ 230 VAC, 250 W
Heat	250 BTU/Hr (power supply only) 1,000 BTU/Hr (power supply with camera)

### NV-16PS42-PVD

Voltage	115/230 VAC
Frequency	50/60 Hz
Current Wattage	5 A @ 115 VAC, 2.5 A @ 230 VAC, 500 W
Heat	275 BTU/Hr (power supply only) 2,000 BTU/Hr (power supply with camera)

### NV-32PS42-PVD

Voltage	115/230 VAC
Frequency	50/60 Hz
Current Wattage	5 A @ 115 VAC, 2.5A @ 230 VAC, 500 W
Heat	325 BTU/Hr (power supply only) 2,000 BTU/Hr (power supply with camera)

### Fuse 5 x 20mm Type T

NV-8PS42-PVD	5 Amps
NV-16PS42-PVD	5 Amps
NV-32PS42-PVD	5 Amps

A spare fuse is located inside the fuse holder.

### Weight (Excluding brackets and connectors)

NV-8PS42-PVD	Product Weight 13lb (5,90kg) Packaged Weight 17lb. (7,7kg)
NV-16PS42-PVD	Product Weight 23.5lb (10,66kg) Packaged Weight 32lb (14,5kg)
NV-32PS42-PVD	Product Weight 24.1lb (10,93kg) Packaged Weight 40lb (18,14kg)

### Dimensions

NV-8PS42-PVD W 17" (43,2cm) H 1.7" (4,5cm) D 8in (20cm)

NV-16PS42-PVD W 17" (43,2cm) H 1.7" (4,5cm) D 12in (30cm)

NV-32PS42-PVD W 17" (43,2cm) H 1.7" (4,5cm) D 12in (30cm)

### Accessories

- Mounting: Rackmount "L" brackets for front or rear installations; rubber feet for desk applications
- Rack screws: 4 12-24 x 3/4" Phillips Pan Head
- BNC patch cables: 2ft long 1 per channel
- Power cable IEC power cord 7ft (2,13m)
- Optional Mounting Support Bracket Kits
  - Model NV-RMBK (rear mount kit) purchased separately
  - Model NV-WMBK (wallmount kit) purchased separately

## Agency

These NVT products are listed and/or conform to the following certifications and directives:



UL Listed to UL2044 or UL/IEC60065 cUL

Listed to CAN/CSA22.2 No.1 for Canada CE Mark under EMC and low voltage directives for the European Union. Complies with FCC part 15B limits

## Troubleshooting

If you are experiencing problems, attempt to simplify your setup. Test each cable segment separately. For example, test the camera and monitor together without the other equipment. Then add in the NVT transceivers, back-to-back. Test each segment of a long cable-run independently. Attempt to isolate the problem.

## Customer Support

NVT customer support is available for consultation from 8:00 AM to 5:30 PM PST Monday through Friday. In addition, emergency after-hours callback support is available.

USA Office:	(+1) (650) 462-8100
USA Fax:	(+1) (650) 326-1940
UK Office:	(+44) (0)20 8977 6614
UK Fax:	(+44) (0)20 8973 1855
Email USA:	www.nvt.com/email
Email UK:	www.nvt.com/email
Web home page:	www.nvt.com

## Returns

Please call before returning units to NVT. Returned materials must have a "Returned Materials Authorization" (RMA) number from NVT marked on the outside of the shipping carton.

## Limited Lifetime Warranty

NVT warrants that the product conforms to NVT's applicable published specifications and is free of defects for the life of the product. There shall be no other warranties, express, statutory, or otherwise, including any implied warranty of merchantability, of fitness, or any other obligation on the part of NVT with respect to any of the products.

In the event that any of the products is damaged, altered, or modified without the express written consent of NVT, any warranty for those products will cease and NVT will have no further liability as it pertains to those products.

NVT assumes no responsibility for damages or penalties incurred resulting from the use of this product in a manner or location other than for which it is intended.

NVT's liability under any warranties shall be discharged by replacing or repairing any part or parts which do not conform to the applicable warranty under normal and proper use. NVT's liability with respect to any product shall not exceed a refund of the price received by NVT for that product, and in no event shall NVT have any liability for any incidental, consequential, special, or indirect damages.

Some states do not allow the exclusion or limitation of special, incidental, or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Specifications subject to change without notice.