



Power-Video-Data CCTV Product Installation Manual

Wiring Safety Notes

1. This installation should be made by a qualified service person and should conform to all local codes.
2. For safety, never put NVT signals in the same conduit as high-voltage wiring.
3. ⚠️ **WARNING** – to reduce a risk of fire or electrical shock, do not expose this product to rain or moisture.
4. ⚠️ **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.

Wiring Tech Notes

1. Use point-to-point Unshielded Twisted Pair wire, 24-16 AWG (0,5-1,3mm), stranded or solid, Category 2 or better.
2. The Video signal may co-exist in the same wire bundle as other Video, telephone, Data, control signals, or low-voltage Power. It is also OK to run NVT Video signals in or near electromagnetic fields (in accordance with National Electrical Code, local, or other local safety requirements).
3. Measure the wire distance.
4. **DON'T USE SHIELDED TWISTED PAIR WIRE.** Multi-pair (6 pair or more) wire with an overall shield is OK.
5. **DON'T USE UN-TWISTED WIRE.**
6. Due to near-end crosstalk, don't send a transmit and a receive signal in the same wire bundle. Exceptions: Less than 1,000 ft (300m), or Category 5 or better cable, up to 2,000 ft (600m) are OK.
7. Don't send "Up-the-Coax" Pan/Tilt/Zoom signals through active (amplified) NVT transceivers. Passive NVT transceivers will transmit "up the coax" P/T/Z control signals up to 750ft (225m).

Measure Your Wire Distance

All NVT quoted distance specifications include any coax in the run. It is recommended that the wire distance be measured to ensure that the capability of the NVT product is correct. Wire should be Category UTP cable. Low-voltage camera Power, Video, and RS-422 or RS-485 may be sent within the same wire bundle. Do not run 24VAC or 28VAC in the same wire bundle with other Telecom or Datacom signals.

Video Distance: 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. See Figure 1.

Camera Power Distance: Different cameras draw different amounts of current. It is important to make sure that the voltage-drop on the wire allows sufficient voltage for the camera to operate properly. A camera voltage of 21VAC or greater is usually acceptable. Figure 2 shows typical wire distances for standard camera configurations.

Agency

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



UL Listed to UL2044 or UL/IEC 60065.
cUL Listed to CAN/CSA22.2 No. 1 for Canada.
CE Mark under EMC and low voltage Directives for the European Union.

Figure 1
Resistance per 1,000 ft (300 m) out and back

24AWG (0,5mm)	= 52 Ohms	per 1000ft (300m)
22AWG (0,6mm)	= 32 Ohms	per 1000ft (300m)
20AWG (0,7mm)	= 20 Ohms	per 1000ft (300m)
19AWG (0,8mm)	= 16 Ohms	per 1000ft (300m)
18AWG (1,0mm)	= 13 Ohms	per 1000ft (300m)
16AWG (1,3mm)	= 8.2 Ohms	per 1000ft (300m)

Figure 2
Power-Distance

Power Supply Voltage	28 VAC	24 VAC	12 VDC
100 mA Camera			
2-pair 24 AWG	2,150 ft*	920 ft*	190 ft*
2-pair 23 AWG (Cat6)	2,700 ft*	1,160 ft*	240 ft*
300 mA Camera			
2-pair 24 AWG	710 ft*	300 ft*	60 ft*
2-pair 23 AWG (Cat6)	900 ft*	380 ft*	80 ft*
1 Amp Camera			
2-pair 24 AWG	210 ft*	90 ft*	15 ft*

*Actual distance will depend on the camera's inrush & operating current, minimum operating voltage, and the wire's environmental temperature. Please consult NVT Customer Support for further information.

Limited Lifetime Warranty

NVT warrants that the product conforms to NVT's applicable published specifications and is free of defects and workmanship, 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 product is damaged or 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 limitation or exclusion 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.

Customer Support

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.

NVT customer support can be reached 8:00 AM to 5:30 PM PST at (800) 959-9870, at (+1) (650) 462-8100 or our UK office at (44) (0) 20-8977-6614.

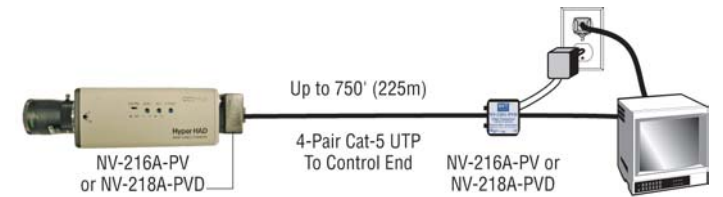
NVT customer support is available for consultation from 8:00 AM to 5:30 PM PST Monday through Friday. In addition, emergency after-hours callback support is available.

US Office: (800) 959-9870 or (+1) (650) 462-8100
 US Fax: (+1) (650) 326-1940
 UK Office: (+44) (0)20 8977 6614
 UK Fax: (+44) (0)20 8973 1855
 Email USA: info@nvt.com
 Email UK: uksales@nvt.com
 Web home page: 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.

Power-Video Fixed camera single channel application



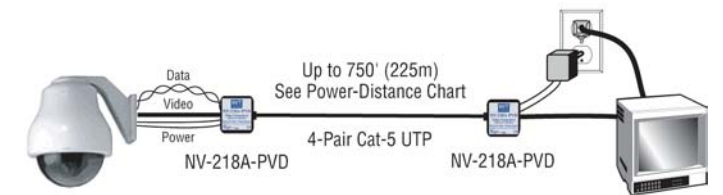
Power and Video at the Camera End

1. Connect the baseband Video signal output from the camera to the male BNC on the NV-216A-PV or NV-218A-PVD.
2. Connect the camera's Power input to the 18AWG Power wires on the NV-216A-PV or NV-218A-PVD. Verify wire distance, camera load and wire resistance limit for the maximum distance that Power can travel using Figure #2.
3. Connect the 4-pair Cat-5 using the NV-216A-PV's or NV-218A-PVD's 8-pin RJ45 connector on the UTP run to the Equipment Room as shown in Figure #3 below.

Connecting the Power-Video at the Equipment Room End

1. Connect the baseband Video input twisted pair to the screwless terminals adjacent to the RJ45 connector of the NV-218A-PVD, or using the 8-pin RJ45 connector on the NV-216A-PV or NV-218A-PVD as shown in Figure #3 below.
2. Connect the baseband Video signal output from the BNC pigtail on the NV-218A-PVD or the BNC of the NV-216A-PV directly to the Video monitor, multiplexer, or DVR.
3. Connect Power via a Class II (SELV) low-voltage Power supply. NVT recommends the use of 18AWG solid wire. NVT also recommends Power supplies with individually floating outputs.

Power-Video-Data P/T/Z camera single channel application



Connecting Power-Video-Data at the Camera End

1. Connect the baseband Video signal output from the camera to the Male BNC pigtail connector on the NV-218A-PVD.
2. Connect the camera's Power input to the screwless terminals marked Power on the NV-218A-PVD. Verify wire distance, camera load and wire resistance limit for the maximum distance that Power can travel using Figure #2.
3. If the camera supports P/T/Z telemetry over RS-422 or RS-485, connect the camera's Data terminals to the Data screwless terminals on the NV-218A-PVD.
4. Connect the 4-pair Cat-5 using the 8-pin RJ45 connector on the UTP run to the Control end as shown in Figure #3 below.

Connecting the Power-Video-Data at the Equipment Room

1. Connect the 4-pair Cat-5 from the camera end to the RJ45 connector on the NV-218A-PVD.
2. Connect the baseband Video signal output from the BNC pigtail on the NV-218A-PVD directly to the Video monitor, multiplexer or DVR.
3. Connect the control equipment data port to the screwless terminals marked data on the NV-218A-PVD.
4. Connect the Power screwless terminals to a Class II (SELV) low-voltage Power supply. NVT recommends the use of 18AWG solid wire. NVT also recommends Power supplies with individually floating outputs.

Figure 3
Camera Pinouts & UTP Wire Colors

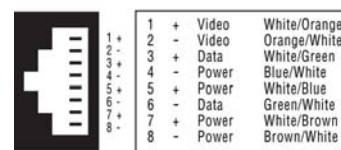
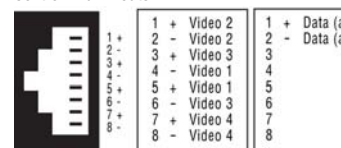
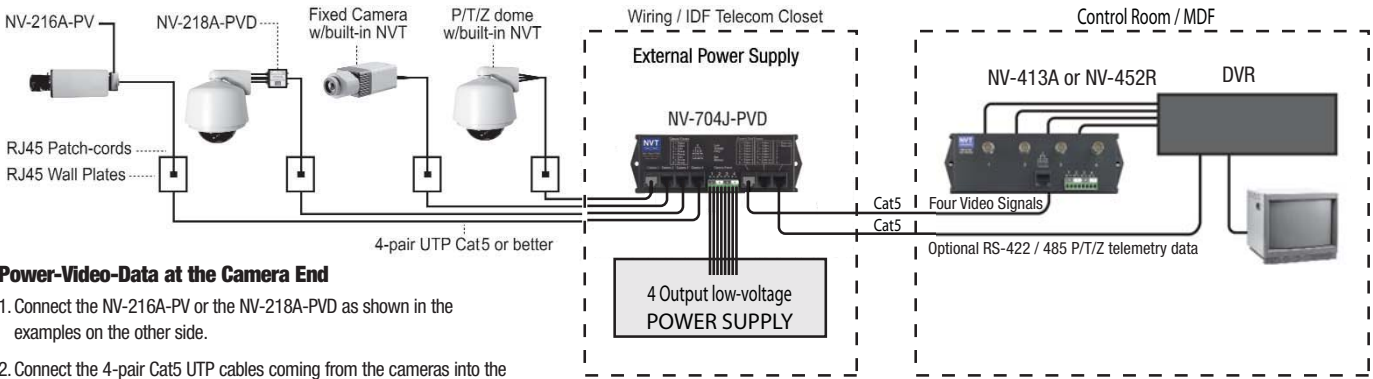


Figure 4
Control End Pinouts



Power-Video-Data 4-Channel Application using the NV-704J-PVD at the Telecommunications Closet or IDF



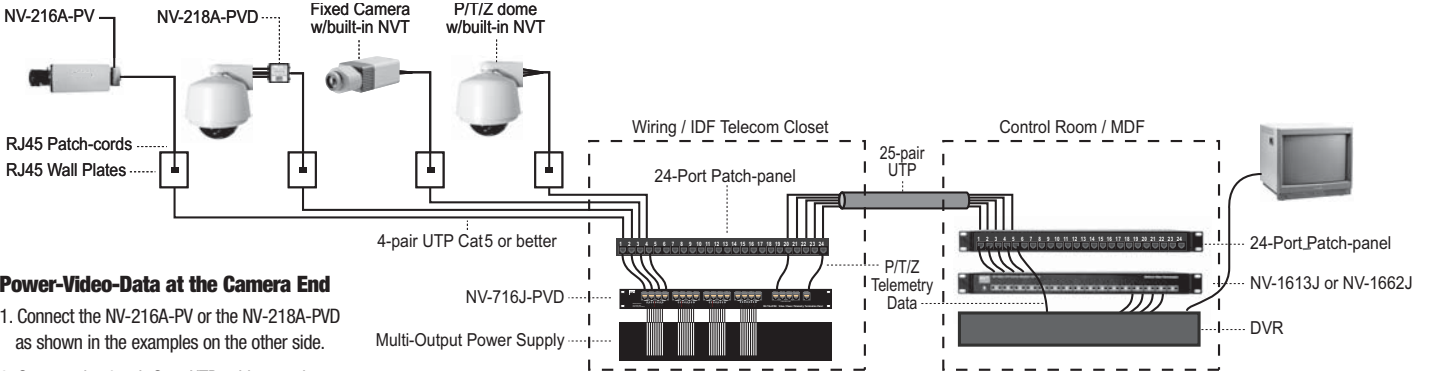
Power-Video-Data at the Camera End

1. Connect the NV-216A-PV or the NV-218A-PVD as shown in the examples on the other side.
2. Connect the 4-pair Cat5 UTP cables coming from the cameras into the appropriate camera port on the NV-704J-PVD using the RJ45 connector as shown in Figure 3.
3. Connect the outputs of your independent power supply into the appropriate Camera Power terminals on the NV-704J-PVD. Torque to 2 in-lbs (0.22 Nm). NVT recommends the use of 18AWG (1,0 mm) solid conductor wire. NVT also recommends that the external power supply have individually floating outputs.

Power-Video-Data at the Equipment Room End

4. Connect the NV-704J-PVD's Control Room outputs to the NV-413A or NV-452R via UTP using RJ45 connectors and Cat5 cable. The control end pinouts are listed in Figure 4. If P/T/Z telemetry is required, connect a second RJ45 Cat5 cable from the data port to the DVR's RS-422 or RS-485 control output.

Power-Video-Data 16-Channel Application using the NV-716J-PVD at the Telecommunications Closet or IDF



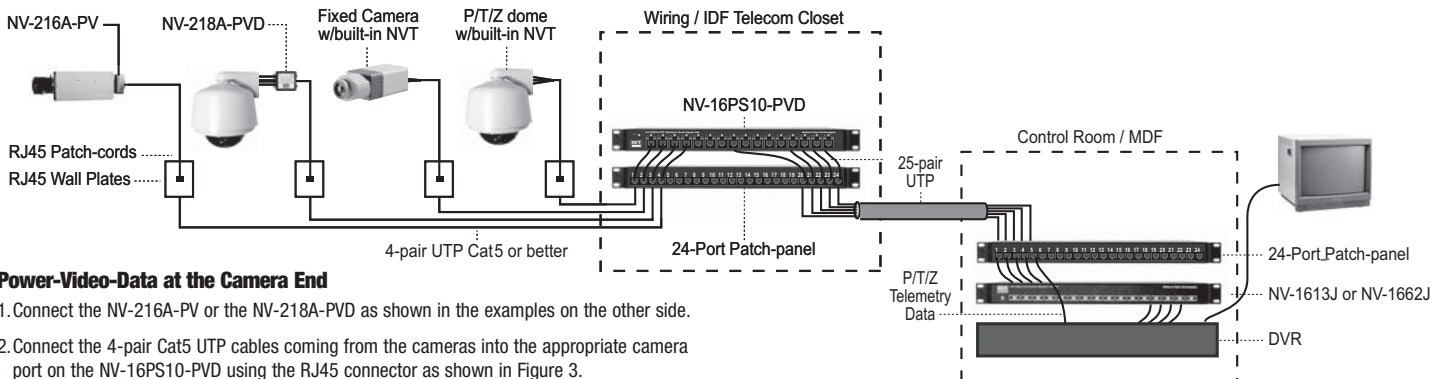
Power-Video-Data at the Camera End

1. Connect the NV-216A-PV or the NV-218A-PVD as shown in the examples on the other side.
2. Connect the 4-pair Cat5 UTP cables coming from the cameras into the appropriate camera port on the NV-716J-PVD using the RJ45 connector as shown in Figure 3.
3. Connect the outputs of your independent power supply into the appropriate Camera Power terminals on the NV-716J-PVD. Torque to 2 in-lbs (0.22 Nm) Figure 4. NVT recommends the use of 18AWG (1,0 mm) solid conductor wire. NVT also recommends that the external power supply have individually floating outputs.

Power-Video-Data at the Equipment Room End

4. Connect the NV-716J-PVD's Control Room outputs to the NV-1613J or NV-1662J via UTP using RJ45 connectors and Cat5 cable. The pinouts are listed in Figure 4. If P/T/Z telemetry is required, connect additional RJ45 Cat5 cable(s) from the data port(s) to the DVR's RS-422 or RS-485 control output. Additional details can be found in the NV-716J-PVD installation manual, or at www.nvt.com.

Power-Video-Data 16-Channel Application using the NV-16PS10-PVD Power Supply Cable Integrator



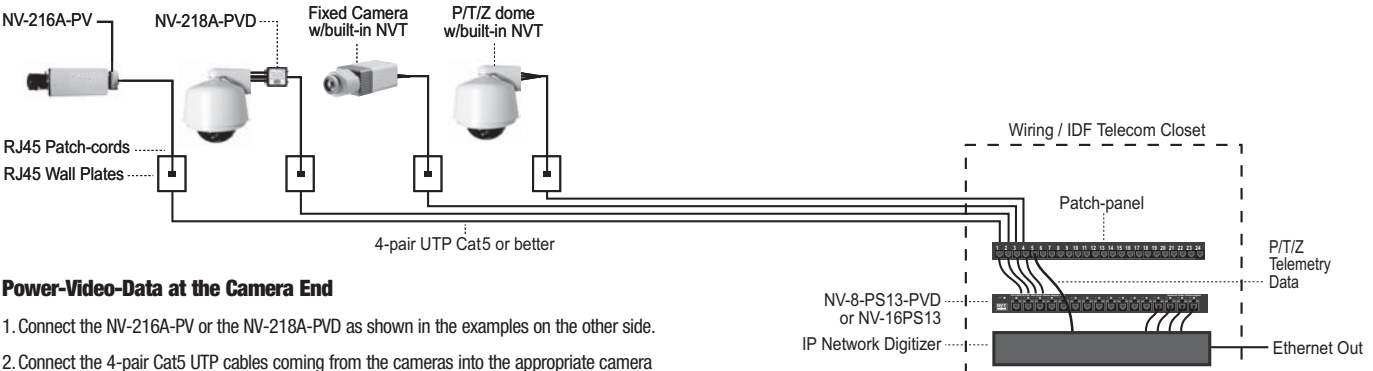
Power-Video-Data at the Camera End

1. Connect the NV-216A-PV or the NV-218A-PVD as shown in the examples on the other side.
2. Connect the 4-pair Cat5 UTP cables coming from the cameras into the appropriate camera port on the NV-16PS10-PVD using the RJ45 connector as shown in Figure 3.

Power-Video-Data at the Equipment Room End

3. Connect the NV-16PS10-PVD's Control Room outputs to the NV-1613J or NV-1662J via UTP using RJ45 connectors and Cat5 cable. The pinouts are listed in Figure 4. If P/T/Z telemetry is required, connect additional RJ45 Cat5 cable(s) from the data port(s) to the DVR's RS-422 or RS-485 control output. Additional details can be found in the NV-16PS10-PVD installation manual, or at www.nvt.com.

Power-Video-Data 8 or 16-Channel Application using the NV-8PS13-PVD or NV-16PS13-PVD



Power-Video-Data at the Camera End

1. Connect the NV-216A-PV or the NV-218A-PVD as shown in the examples on the other side.
2. Connect the 4-pair Cat5 UTP cables coming from the cameras into the appropriate camera port on the NV-PS13 (8-port) or the NV-16PS13-PVD (16 port) using the RJ45 connector as shown in Figure 3.
3. Connect the NV-8PS13-PVD's or NV-16PS13-PVD's BNC outputs to your DVR/MVR or IP digitizer. If P/T/Z telemetry is required, connect additional RJ45 Cat5 cable(s) from the NV-8PS13-PVD's or NV-16PS13-PVD's data port(s) to the DVR/MVR or IP digitizer's RS-422 or RS-485 control output. Additional details can be found in the NV-8PS13-PVD or NV-16PS13-PVD installation manual, or at www.nvt.com.