

Multi-Channel VPD Combiner Receiver Installation Sheet

Introduction

GE Security Multi-Channel Video Power Data Combiner Receivers combine video, PTZ data, and camera power over a single 4-pair UTP cable to simplify CCTV installations in a structured wiring environment. They support up to 16 cameras and should be installed in the control room.

The GEC-4VDPBC and GEC-16VDPBC need to be used along with external class II power supplies. The GEC-8PVPDTHUB and GEC-16PVPDTHUB come with built-in 8 and 16 channel fully isolated class II 24/28 VAC power supplies. Each camera power output in addition to an auto-reset fuse is equipped with a 2 A glass fuse that is easily accessible from the front panel.

At the camera end a video balun/combiner provides video, power and data on separate outputs. The video connections are through BNC connectors to the DVR or matrix switches. The data connections to the DVR are through RJ-45 connectors. There is a separate data connection for each camera. All equipment follows industry-standard EIA/TIA 568B pin-outs.

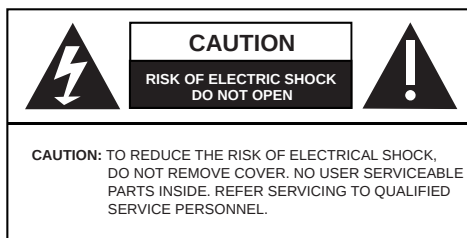
The following model numbers are covered in this document:

- **GEC-4VDPBC**
- **GEC-16VDPBC**
- **GEC-8PVPDTHUB**
- **GEC-16PVPDTHUB**



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) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing 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.



 **WARNING!** - To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. This 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!** - This apparatus is a Class I product. This product must be connected to a mains socket outlet with a protective earthing connection.

 **WARNING!** - The mains plug is used as the disconnect device and shall remain readily operable.

 The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

 The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.

Wiring Technical Notes

These technical notes should all be considered prior to installing these devices.

- Use point to point unshielded twisted pair wire 24-16 AWG (0, 5-1, 3 mm) stranded or solid, Category 2 or better.
- The video signal may coexist in the same wire bundle as other video, telephone, data, control signals, or low-voltage power. You can run GE video signals in or near electromagnetic fields (in accordance with National Electrical Code, local or other local safety requirements).
- DO NOT USE SHIELDED TWISTED PAIR WIRE. Multi-pair (8 pair or more) wires with an overall shield are fine.
- DO NOT USE UN-TWISTED WIRE.
- DO NOT place a transmit and a receive signal in the same wire bundle. It may cause interference.
- DO NOT send **Up-the-Coax** Pan/Tilt/Zoom signals through active (amplified) GE transmitters or receivers. Passive GE transceivers can transmit video and **Up-the-Coax** P/T/Z control signals up to 750 ft. (228 m).
- We recommend using short 18 AWG solid wires for ground connections.
- GE VPD products follow the EIA/TIA 568 standard. There are two wire color-code standards: EIA/TIA 568A and EIA/TIA 568B. Either standard can be used for making connections as long as the RJ-45 jacks at both ends of each cable follow the same standard.
- Measure wire distance by:
 1. Shorting the two conductors together at the far end, and measuring the loop-resistance by an Ohmmeter.
 2. Use the **Loop Resistance** table to calculate the distance.
- DO NOT connect coax cables longer than 100 ft. (30 M) to the BNC connectors of any GE UTP equipment.
- All measured distances should include any coax cables in the path.
- Verify camera current requirements and wire resistance limits for the maximum distance that power can travel. Use the **Power Distance Chart** to verify the wire distance.
- GE VPD products require Unshielded Twisted-Pair (UTP) wires Category 2 or better, 24 AWG (0,5 mm) or thicker.

Table 1: Loop Resistance per 1000 feet

Wire Type	Resistance
24 AWG /0,53 mm	52 ohms
23 AWG /0,57 mm	42 ohms
22 AWG /0,64 mm	33 ohms

Table 2: Power Distance Chart

Power Supply Voltage		12 VDC	24 VAC	28 VAC
Voltage at the Camera		10.8 VDC	21.6 VAC	21.6 VAC
100 mA Camera	Dual 24 AWG	448 ft. / 137 m	896 ft. / 273 m	2,388 ft. / 728 m
	Dual 23 AWG	564 ft. / 172 m	1,130 ft. / 345 m	3,012 ft. / 918 m
300 mA Camera	Dual 24 AWG	150 ft. / 46 m	300 ft. / 92 m	796 ft. / 243 m
	Dual 23 AWG	190 ft. / 58 m	378 ft. / 115 m	1,004 ft. / 306 m
1 AMP Camera	Dual 24 AWG	46 ft. / 14 m	90 ft. / 28 m	240 ft. / 73 m
	Dual 23 AWG	58 ft. / 18 m	114 ft. / 35 m	300 ft. / 92 m

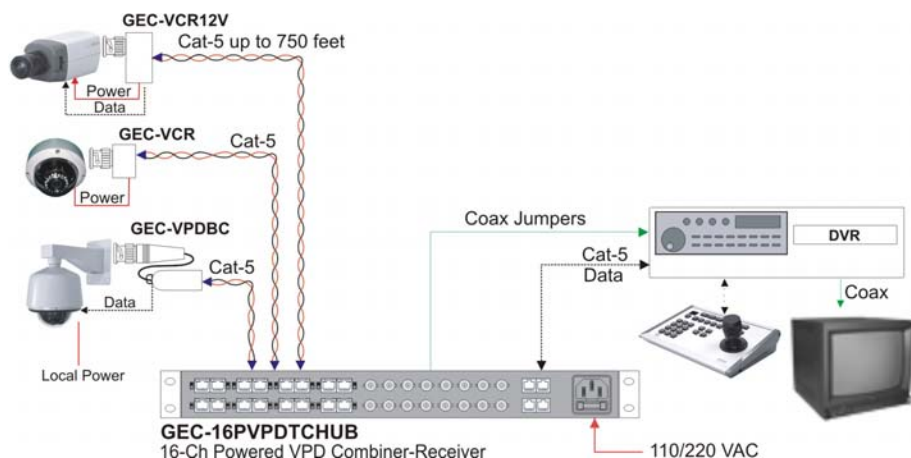
Important Safety Warnings

- Installation should be made by a qualified service person and should conform to all local codes.
- DO NOT bundle UTP signals in the same conduit as high-voltage wiring.
- To reduce the risk of fire or electrical shock, do not expose these products to rain, moisture, dripping or splashing.
- No objects filled with liquids, such as vases, shall be placed on GE equipment.
- DO NOT block ventilation openings to let sufficient airflow to the UTP devices.
- The Main fuse for models with built-in AC power supply is 5 A at 110 VAC or at 3 A 220 VAC. Each camera power fuse is 2 A and can be accessed by removing the front panel. Fuses may be replaced by a qualified service person only when the unit is off and AC power cord is unplugged.
- Use only the power cord and plug supplied with the unit for connecting to AC outlets.
- Only unplugging the power cord is considered as a main power disconnect.

- DO NOT connect multiple outputs together.
- Make sure that the mains Voltage input is set to the proper local voltage.

Application Drawing

Figure 1: VPD Combiner Receiver Application diagram



Camera End Installation

Video: Connect the baseband Video signal output of the camera to the BNC of the GE single combiner receiver.

Data: Connect the Data UTP pigtail (Black/White) of the GE single combiner receiver to the data connector of the camera. There is no data connection on GEC-VCR.

Power: Connect the power UTP pigtail (Black/Red) of the GE single combiner receiver to the power connector of the camera. Leave this power cable unconnected for PTZ dome cameras.

Cat-5 Cable: Connect the RJ-45 connector attached to the camera end of Cat-5 cable to the RJ-45 Jack of the GE single combiner receiver. Make sure that the pin-out of the RJ-45 connector matches the pin-out of the GE single combiner receiver.

Control Room Installation

GEC-4VDPBC and GEC-16VDPBC

Turn off external power supply.

Video: Use short coax patch cords to connect the BNC video inputs of video receiving devices such as DVRs or matrix switches.

Data*: Connect each RJ-45 data connector to a Cat-5 cable carrying 4 data signals to the PTZ controller.

Camera Cable: Connect each camera RJ-45 connector to the appropriate camera Cat-5 cable.

Power: Connect the camera power input connectors to the external class II power supply. Make sure that the power requirement is within the recommended range. Turn on the external power supply.

Important Note: Do not overload the power supply.

GEC-8PVPDTCHUB and GEC-16PVPDTCHUB

Turn off main power switch on the combiner receiver unit.

Video: Use provided 2 ft. (60 cm) coax patch cords to connect the BNC video inputs of video receiving devices such as DVRs or matrix switches.

Data*: Connect each RJ-45 data connector to a Cat-5 cable carrying 4 data signals to the PTZ controller.

* In starting a configuration use a data distribution unit to populate the single data line from DVR. Then run the outputs of the data distributor to RJ-45 data connectors of the combiner. You may need to use a 110 junction block to connect the output of the GE data distributor to the RJ-45 data connectors.

Camera Cable: Connect each camera RJ-45 connector to the appropriate camera Cat-5 cable.

Power: Make sure that the power requirement is in the recommended range. Connect the AC power cord to the AC power outlet and turn on the power switch on the unit.

Important Note: Do not overload the power supply.

Make sure that the pin-out of the RJ-45 connectors matches the illustrated color code of the Cat-5 wires.

VPD Design Considerations

Step 1: Measure or calculate the distance from each camera to the DVR (DVideo).

Step 2: Calculate Maximum possible distance from each camera to power supply (DPower) using the Power/Distance Chart:

- If (DVideo) < 750 feet AND (DVideo) < (DPower)
Use a combiner transceiver at Control Room.
- If (DVideo) > 750 feet
Use a combiner at Mid-span location closer to the cameras.
Use an active receiver hub at control room.

Step 3: Use a single channel GE combiner transceiver on the camera side considering the camera voltage.

Diagnostic LEDs

GEC-4VDPBC, GEC-16VDPBC:

There is one green LED per channel:

OFF: Camera power is disconnected

ON: Camera is connected and current flows

GEC-8PVPDTCHUB, GEC-16PVPDTCHUB:

There are two diagnostic LEDs per channel:

Green LED:

OFF: Camera power is disconnected

ON: Camera is connected and current flows

Red LED:

OFF: The fuse is blown

ON: Power is available at RJ-45 connector to the Camera

Technical Specifications*

Electrical

Video Format	Pass-through
Power Protection	One self-resetting fuse at 1.5 A per channel
Input Voltage	Pass through (GEC-4VDPBC, GEC-16VDPBC) 115/230 VAC, 50/60 Hz, externally switch selectable
Input Current	2.4 A at 115 VAC / 1.2 A at 230 VAC (GEC-8PVPDCHUB) 4.8 A at 110 VAC / 2.4 A at 220 VAC (GEC-16PVPDCHUB)
Camera Power	Voltage: Isolated class II, individually switch selectable to 24 VAC, off or 28 VAC Camera Current: 1 A max per camera, 6 A aggregated, 170 VAC total power (GEC-8PVPDCHUB) 12 A aggregated, 340 VAC total power (GEC-16PVPDCHUB)
Camera Fault Protection	2 A, 5x20 mm type T fuse (front access) plus a 2.5 A self-resetting fuse at per channel
Main fuse	4 A at 115 VAC/3 A at 220 VAC, 5x20 mm, (GEC-8PVPDCHUB) 7 A at 115 VAC/5 A at 220 VAC, 5x20 mm (GEC-16PVPDCHUB)
Twisted Pair	100 Ohms +/- 20%, 24 AWG minimum, Category 2-7
Connectors	Camera connection: RJ-45 connector Data: RJ-45 connector Video: BNC connector Power: Screw-less connector (GEC-4VDPBC, GEC-16VDPBC)

Mechanical

Material	GEC-4VDPBC: Extruded Aluminum GEC-16VDPBC: Extruded Aluminum GEC-8PVPDCHUB: Extruded Aluminum and sheet metal GEC-16PVPDCHUB: Extruded Aluminum and sheet metal
Dimensions (W x H x D)	GEC-4VDPBC: 4.97 x 1.74 x 1.77 in. (12.6 x 4.2 x 4.5 cm) GEC-16VDPBC: 18 x 1.74 x 1.77 in. (45.7 x 4.2 x 4.5 cm) GEC-8PVPDCHUB: 17 x 1.74 x 10.5 in. (43 x 4.2 x 26.6 cm) GEC-16PVPDCHUB: 17 x 1.74 x 10.5 in. (43 x 4.2 x 26.6 cm)

Weight	GEC-4VDPBC: 0.44 lb. (198 g)
	GEC-16VDPBC: 1.37 lb. (620 g)
	GEC-8PVPDTCHUB: 14.7 lb. (6.6 kg)
	GEC-16PVPDTCHUB: 22 lb. (10 kg)

Environmental

Humidity	0 to 95%, noncondensing
Temperature	Operating: -10° to +50° C
	Storage: -30° to +70° C

*Specifications are subject to change without notice.

Included Accessories

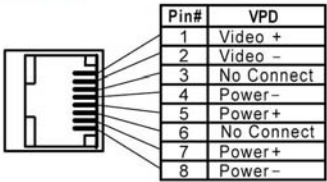
- Mounting brackets for front, rear or wall installations
- Rubber feet for desk applications
- 8 or 16 2 ft. (60 cm) coax jumper cables (excluding GEC-4VDPBC)
- RJ-45 Adapters (excluding GEC-4VDPBC)
- Molded IEC power inlet cord 7 ft. (200 cm)

EIA/TIA 568A, B Color Codes

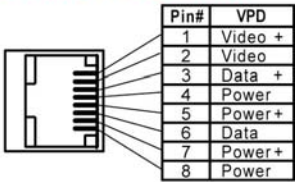


Camera side RJ-45 Connections

GEC-VCR



GEC-VPDBC, GEC-VCR12V



Control Room Data Connections

Figure 2: GEC-4VDPBC (Cameras 1-4 only) 16VDPBC 8PVPDTHUB 16PVPDTHUB (Cameras 1-8)

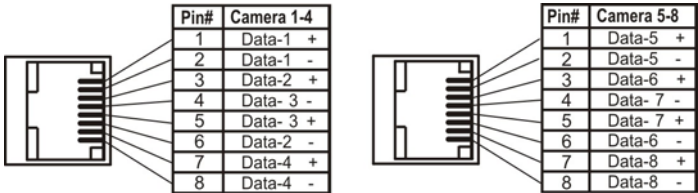
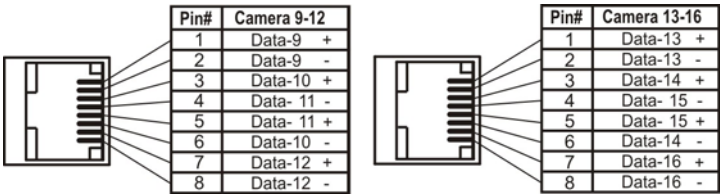


Figure 3: GEC-16VDPBC 16PVPDTHUB (Cameras 9-16)



Regulatory information

Manufacturer	GE Security, Inc. HQ and regulatory responsibility: GE Security, Inc., 8985 Town Center Parkway, Bradenton, FL 34202, USA EU authorized manufacturing representative: GE Security B.V., Kelvinstraat 7, 6003 DH Weert, The Netherlands
Regulatory information	 N4131 Note: C-Tick mark applies to models GEC-4VDPBC and GEC-16VDPBC only.
North American standards	UL 60065
FCC Compliance	This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: • Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help.
 	2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

Contact information

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