

## How to connect PTZ Camera (Speed Dome) to your DVR system

DVR systems, controller keyboard (joystick) and PTZ cameras have to run on the same protocol and interface before they can “talk to each other”. When you select any of the above mentioned equipment, please make sure they are compatible; else there is no simple way to get them operate together. **Pelco D** protocol with **RS485** interface on a **single twisted pair** cable is the most common way to interface and control a PTZ camera. Following is a description on how to select and set up these products.

**Protocol:** DVRs have to send out command signals to PTZ cameras to pan, tilt or zoom. The PTZ camera has to understand this command to do what they are asked to. These command sets are called protocols. For example, Panasonic protocol uses “Hex 2021224” as a command for zoom and focus, and if your camera uses only Pelco protocol, it would not understand what this Hex code means. If you are planning to purchase DVR cards or cameras, please make sure the protocol is matched. The most common protocol is Pelco “D”. ILDVR PTZ cameras have dip switches that you can select 10 different protocols. HiKvision, Dahua, DG, GeoVision and AVerMedia DVR cards have software option for your protocol selection.

**Interface:** Command protocol has to be transmitted from the DVR or controller keyboard via an interface cable to the PTZ camera. RS485 is a one way (DVR to camera) interface on a single twisted pair, and is dissimilar from RS422, which is a two way interface on a double twisted pair. Another possibility is to use RS232 which is for very short distance. RS485 interface works over a few thousand Km, and is used by most PTZ cameras. Stand-alone DVR usually has RS485 interface. PC based DVR would have to use the “comm port”, or serial port of the PC with an interface converter that converts the serial RS232 port to RS485. For short distance, the converter can be a passive converter that does not require power. The RS-1 is a passive “plug” that costs only US\$20. For long distance, up to a few thousand km, the converter should be powered with optical isolation from lightning. GeoVision’s GV net can convert a USB to a RS485 output.

When connecting the RS485 cable pairs, always remember that the computer sends command to the PTZ camera. Therefore, on the computer side, use Tx+ and Tx- (Transmit + and -) and on the PTZ side, connect the twisted pair to Rx+ and Rx- (Receive + and -)

**Connecting a PTZ camera to a DVR:** To connect a PTZ camera to a DVR, you need three cable pairs: coax for video, twisted pair for the RS485 command interface, and the power supply. The twisted pair should be at least 22 Gauge, and if these cables are to be installed outdoor or there are electrical appliances nearby, please make sure they are shielded in conduits.

Before you start the installation, please set the PTZ camera to the appropriate protocol, baud rate, and camera ID, e.g. Pelco “D”, 2400bps, camera ID 1,2,3,,,etc. Of course, all PTZ camera IDs on the same system has to be distinct. Then set up the DVR software to match your camera settings, and to map the camera inputs with the corresponding IDs.

If you are installing multiple PTZ cameras on one DVR system, please be careful of the wiring scheme for RS485 interface. There are two ways:

1. Star network: all twisted pairs would run from one interface converter (RS-1, RS2, GV net) direct to the PTZ cameras. Please sure that the polarity for the twisted pair is right. The longest run cable would have to be terminated with a resistor, which is a simple setting in the ILDVR Speed dome. Try NOT to splice the cable that runs from the DVR to the camera..
2. Daisy chain: Run the twisted pair from the RS485 interface on the DVR to the closest camera, then, from this camera to the next, and to another till you get to the furthest camera.

At the furthest camera, terminate the cable with a resistor, which, in the case of ILDVR speed dome, is a simple setting.

Try not to mix up the wiring scheme, and not to splice the cable runs. In this way, you can daisy chain as many speed domes as you want for one DVR. Contact BernClare Multimedia Inc. (905)-513-2722 should you need more information on the above. We have years of experience in PTZ camera selection and installation.

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