Wiring, Configuring, and Controlling your PTZ with a DVR

PTZ = Pan-Tilt-Zoom

Connecting your PTZ camera to your DVR

This DVR has outstanding PTZ controls and in some cases it's actually easier to use than a standalone PTZ controller. This easy guide will run you step by step in connecting your PTZ camera to your DVR. Hooking up a PTZ is a lot easier than most people think. It hooks up like a regular camera, meaning that it has the basic video connection and 2 power wires. The only addition is that it has an extra wire pair known as the RS-485 communication wires which sends communication signals from your DVR to your PTZ camera.

In this guide we have used an Ultrak KD6i High Speed PTZ as our example camera. Please note that all PTZ's are different and we just used this one as a basic example. Most PTZ's do hook up similar to this one, meaning they at least have the simple Power, Video and RS-485 Communication connections. For your convenience, we not only show you how to hook up the wires to the DVR but we also show you how to hook up wires to your camera as well. But like we said, some cameras may have different wiring schematics. For exact and proper wiring of your particular PTZ camera, please refer to its manual.

*IMPORTANT: Do NOT power on your camera until you have everything properly connected!*
Basic Wiring Setup

**Step 1:** To begin connecting your camera, we need to first connect the BNC connection to the back of the DVR as seen below. Leave the other end of the BNC connection disconnected for now.

**Step 2:** From your power supply, connect the power wires to the power supply first. Note *Do not plug the power adapter in yet*. 
**Step 3:** Next, we will need to connect the other ends of the power wires to the power connections on our camera.
Step 4: Next we need to connect the other end of the BNC connection to the port on our camera. Go ahead and connect that cable now.

![BNC connection](image)

Step 5: During this step you will be using the extra pair of wires that allow communication between the DVR and the camera. These are called the RS-485 Communication wires. The RS-485 wire are very similar to a power wires as they have positive and negative connections. Now we need to connect the cable to the RS485 port on the back of your DVR: Connection "A" should be your + positive wire, which corresponds with red. Insert that into the A slot on your RS485 port on the back of your DVR. Next you will connect the black wire into the B port on the back of your DVR, this is considered your – negative connection. It should look similar to the picture below. Its very important that you do not have any of the exposed wire touching each other from pos and neg wires as this will kill the transmission signal from the DVR to the camera. A lot of folks ask what type of wire to use here. In our example, we are using basic 18 gauge stranded wire but you do not need anything real hefty for this, even the single thin wires from Cat5 cable will work. Some people even use basic speaker wires.
**Step 6:** Next we will need to connect the other end of the receiving wire to your camera. Do this by connecting the red wire to your "RX+" port (on some cameras it will just be labeled +, other times it may just be labeled A). Then connect your black wire to the "RX-" port (on some cameras this will be labeled -, other times it may be labeled B). This allows the DVR to send communications signals to the camera, enabling it to be Panned, Tilted, and Zoomed.
Step 7: Now you should have a BNC cable running from the back of your DVR to your camera, also a power wire pair running from your power supply directly to your camera. Last but not least, there should be another wire pair running from the RS485 positive "A" and Negative "B" on the back of your DVR directly to your camera (Ports usually labeled "RX+" "RX-"). Now, finally we get to plug it in, go ahead and plug in your 24VAC power supply and turn on your DVR.

Configuring your PTZ camera to be controlled by the DVR

With most all PTZ’s or Zoom cameras, there are three necessary things that need to be matched between your PTZ camera and your DVR to allow communication between the two devices:

1. Protocol
2. Baud Rate
3. Camera ID ("Address" on your DVR)

**Step 1:** Once your DVR is powered on we will need to configure a couple of settings to get your PTZ camera up and running. First we will need to access the main menu by right clicking with your mouse, this will pull up the On Screen Display menu options. Next, left click on the "Main Menu" option at the bottom of the menu.

![Main Menu](image)

**Step 2:** Once you are in the main menu you will see many options to select from. Select "settings" in the upper right corner to bring up the settings menu.
Step 3: Once inside the settings menu you will see the "Pan/Tilt/Zoom" option, click on that icon to bring you into the PTZ configuration menu.
**Step 4:** Once inside the PTZ configuration menu you will notice many fields that are able to be toggled, such as: Channel, Protocol, Address, Baud Rate, etc. First, you will need to configure the "Channel" field. Do this by selecting your corresponding channel number to the channel that your PTZ camera is currently connected to.

* In our example below you will notice our PTZ camera is connected to channel 1. *

![PTZ configuration menu](image)

**Step 5:** Once your camera channel is set we will need to set the "Protocol" option. Set this corresponding to your cameras protocol by left clicking on the down arrow, then left clicking on the protocol you are using. Make sure your camera and DVR are set at the same exact protocol (A full list of supported protocols can be viewed at the end of this guide).

*In our example here you can see our protocol for the camera is "PELCOD".*
Step 6: Next we need to set the Camera ID Address field within the DVR. Whatever your PTZ cameras Camera ID is set at, you will need to make sure that its exactly the same within the DVR. You can do this by entering the appropriate number in the address field. (Camera ID = Address)

* In our example below, you will notice that our camera ID is set at 1:
**Step 7:** Now you should have your Channel, Protocol, and Address set. Hang in there, just a couple more steps and you'll be configured for full control of your PTZ. The next field to set is the "Baud rate". This should be set corresponding to your PTZ camera, some cameras have different Baud rates therefore find this out and **make sure you have the same exact Baud Rate in the DVR**.

*Once again, our camera connected to our DVR has a Baud rate of "2400" as you can see in our example.*
**Step 8:** You will notice the other three fields: Data Bits, Stop Bits, and Parity. Unless your PTZ specifically requests otherwise, those three fields should be left at their default values: 8, 1, and None. Once you have configured your Channel, Protocol, Address, and Baud Rate fields you will be set to start controlling your PTZ camera. Lastly, select "Save" in the lower right corner of the window to save your selections.

Now on to the PTZ fun!

---

**Controlling your PTZ camera**

**Step 1:** Once you have properly wires and configured your PTZ camera options you will need to navigate to the "Pan/Tilt/Zoom" On Screen Display (OSD). To do this, left click **twice** on the video feed your PTZ camera is on to maximize the view to full screen. Once you are viewing only your PTZ camera feed, **right click** to bring up the main menu. Then, **left click** "Pan/Tilt/Zoom" on the main menu.
**Step 2:** After selecting Pan/Tilt/Zoom you will see a new menu with Arrows and different options to control your camera. The Speed field sets the cameras movement and tilt speed. Set the speed to whichever number to fit your needs.

*In our example you can see we have ours set to 5 which seems to be a good speed that's not too fast or too slow.*
**Step 3:** In this step we will explain the controls you see on your PTZ menu.

1. The arrows around the circle will move your camera in the corresponding direction when you click them, giving you full 360 degree motion.
2. The Zoom option allows you to zoom your camera in and out by clicking the "-" and "+" arrows.
3. Focus allows you to focus in on certain things or areas by selecting the "-" and "+" arrows. (Not all PTZ’s have manual focus options, please ensure yours does)
4. The Iris option will allow you to control the "eye" in the camera, basically what this does is allows more or less light into the Iris allowing you to manually adjust what is best for your surroundings. Keep in mind some cameras have auto Iris control and some cameras don't allow you to control it at all.
5. The PTZ Trace option allows you to use your mouse connected to your DVR top control the camera. Basically, the PTZ camera will follow your mouse cursor wherever you point it to on the screen. This is an amazing option that this DVR has. Simply click the PTZ trace button and you will see all of the controls disappear. Now to control it, hold down the left click button on the mouse and start moving your mouse cursor to the left or right of
the screen. Also you can use the scroll wheel on your mouse to zoom in and out. Pretty cool huh?

**List of Protocols:**

<table>
<thead>
<tr>
<th></th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AD1641M</td>
</tr>
<tr>
<td>2</td>
<td>ADMATRIX</td>
</tr>
<tr>
<td>3</td>
<td>BANKNOTE</td>
</tr>
<tr>
<td>4</td>
<td>DH-CC440</td>
</tr>
<tr>
<td>5</td>
<td>DH-MATRIX</td>
</tr>
<tr>
<td>6</td>
<td>DH-SD1</td>
</tr>
<tr>
<td>7</td>
<td>DH-SD2</td>
</tr>
<tr>
<td>8</td>
<td>EPTZ</td>
</tr>
<tr>
<td>9</td>
<td>GENERAL</td>
</tr>
<tr>
<td>10</td>
<td>Haiyu</td>
</tr>
<tr>
<td>11</td>
<td>HY</td>
</tr>
<tr>
<td>12</td>
<td>LILIN</td>
</tr>
<tr>
<td>13</td>
<td>MERCER-1</td>
</tr>
<tr>
<td>14</td>
<td>PANASONIC</td>
</tr>
<tr>
<td>15</td>
<td>PE5051K</td>
</tr>
<tr>
<td>16</td>
<td>PELCO-9750</td>
</tr>
<tr>
<td>17</td>
<td>PELCOASCII</td>
</tr>
<tr>
<td>18</td>
<td>PELCOD</td>
</tr>
<tr>
<td>19</td>
<td>PELCOD-DON</td>
</tr>
<tr>
<td>20</td>
<td>PELCOD-S</td>
</tr>
<tr>
<td>21</td>
<td>PELCOD-S1</td>
</tr>
<tr>
<td>22</td>
<td>PELCOD-T</td>
</tr>
<tr>
<td>23</td>
<td>PELCOD1</td>
</tr>
<tr>
<td>24</td>
<td>PELCOD1-T</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>25.</td>
<td>PELCOP</td>
</tr>
<tr>
<td>26.</td>
<td>PELCOP-HK</td>
</tr>
<tr>
<td>27.</td>
<td>PELCOP1</td>
</tr>
<tr>
<td>28.</td>
<td>PELCOP5</td>
</tr>
<tr>
<td>29.</td>
<td>PHILIPS</td>
</tr>
<tr>
<td>30.</td>
<td>PIH-717</td>
</tr>
<tr>
<td>31.</td>
<td>QT-2XXD</td>
</tr>
<tr>
<td>32.</td>
<td>RM110A</td>
</tr>
<tr>
<td>33.</td>
<td>SAE</td>
</tr>
<tr>
<td>34.</td>
<td>SAMSUNG</td>
</tr>
<tr>
<td>35.</td>
<td>SANLI</td>
</tr>
<tr>
<td>36.</td>
<td>SANTACHI</td>
</tr>
<tr>
<td>37.</td>
<td>SHARP</td>
</tr>
<tr>
<td>38.</td>
<td>SONY</td>
</tr>
<tr>
<td>39.</td>
<td>VIDEON-D</td>
</tr>
<tr>
<td>40.</td>
<td>VIDEON-P</td>
</tr>
<tr>
<td>41.</td>
<td>VIDEON-X</td>
</tr>
<tr>
<td>42.</td>
<td>WV-CS8501</td>
</tr>
<tr>
<td>43.</td>
<td>WV-CS85011</td>
</tr>
<tr>
<td>44.</td>
<td>WV-CS950</td>
</tr>
<tr>
<td>45.</td>
<td>YAAN</td>
</tr>
</tbody>
</table>