

# GB474-PTZ

GROUND-LOOP BLOCKER TO PASS UP THE COAX PTZ CONTROL

INSTRUCTION BOOK

IB66424-01

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## DESCRIPTION

The GB474PTZ Ground-Loop Blocker is an active device used to eliminate Ground Loop Interference and picture quality problems in new and existing CCTV video installations. This product will allow "Up the coax Remote Control Pan, Tilt, and Zoom" operation and will extend the range of the control signal up to 3500 feet. The unit is installed at the monitor site where the CCTV signals come together, or at any intermediate point where video ground-loop problems exist. The GB474PTZ operates with any standard B/W or Color video signal.

This device controls and corrects four channels of CCTV video. Each channel is separately adjustable for Video Level and Picture Sharpness. A built-in active ground loop blocker removes the 60 Cycle Bars from the CCTV signal even after they have become part of the video signal. This ground loop isolator will prevent 60 Cycle "Hum Bars", restore the video level, picture sharpness, and allow PTZ control signals to pass up the coax cable for control of your camera.

The Level control can be adjusted to overcome losses due to long cable runs up to 3500 feet, poor cable quality, and improper video terminations.

The Picture Sharpness control can be used to restore Picture quality to its original sharpness due to long cable runs, poor quality coaxial cable, kinked or damaged coaxial cable or twisted pair "Balun" transmission installations. It will also restore the video color-burst on a color camera to improve color camera operation on long cable runs.

This device will prevent Ghosting in the picture by absorbing and eliminating the reflected video Ghost signal. It will also restore the Characteristic Impedance of the down stream video signal to prevent secondary Ghosting in the picture.

By installing the GB474PTZ in your existing CCTV system you can avoid the many hours of troubleshooting and trial/error associated with problem installations. For some installations you will find it advantageous to install a GB474PTZ on each group of four channels. It is especially useful in installations requiring lightning protection. Lightning protection devices often induce 60 cycle bars into the video signal because they use a connection to ground that does not equal the video ground at the monitor point.

This product blocks and removes the most common problems in CCTV video installations. The GB464-PTZ also restores the picture quality before it goes to the monitor or recorder.

The unit is placed at the end of the coax cable run, near the monitor site or anywhere between the PTZ control head and the control PTZ receiver. Ground-Loop Bars in CCTV pictures caused by AC power ground-loops are cancelled completely.

#### MOUNTING INSTRUCTIONS

The GB474-PTZ card slides into one of the nine positions in the RMS-400 power supply and mainframe. Select a place to mount the RMS-400 away from harsh or wet environments, indoors is mandatory. The GB474-PTZ should be located near the monitor equipment or the place you wish to bring the video signal to. Select a position that gives you the best access to cable the system and reduces the labor in installation.

Select one of the un-used nine positions in the RMS-400 to be occupied by the new GB474-PTZ circuit board module. Remove the blank label in that position by peeling it off of the front panel. Peel the label slowly to remove all of the label and adhesive. Any remaining adhesive may be removed by rubbing the surface with your thumb. **WARNING DO NOT USE SOLVENTS TO REMOVE THE LABEL ADHESIVE.** The solvent could damage the equipment cards or cause a fire.

#### HOW TO CABLE THE GB474-PTZ

Attach the coaxial cables coming from the cameras to the BNC connector Inputs A through D, one for each channel. Then attach a cable from the BNC connector marked Output to the PTZ control equipment or PTZ enabled DVR equipment. BE SURE TO TERMINATE THE END OF THE VIDEO CABLE WITH A 75 OHM TERMINATION OR PROPERLY TERMINATE INTO OTHER EQUIPMENT. Repeat this step for each channel you wish to connect.

#### POWER SUPPLY INSTALLATION

The GB474-PTZ is powered by the RMS-400 mainframe and power supply. It will power up when inserted into the RMS-400.

#### OPERATION

When video is applied to the input connectors of the GB474-PTZ an internal active Common-Mode-Rejection stage cancels the 60Hz ground-loop interfering signal. Next a video clamp removes residual 60Hz ground-loop signals that have become a part of the CCTV video picture. Next the video goes into an adjustable gain stage that lets the installer adjust for video signal loss on long cable runs. A second control allows the installer to adjust for high frequency losses that cause reduction in picture quality. This control will correct high frequency losses caused by the control equipment at the camera and the cable run. The down stream video impedance is then matched to the 75 Ohm cable to prevent Ghosting downstream.

#### GB474PTZ-DA (DUAL OUTPUT OPTION)

The GB474PTZ can be ordered with a dual video output option. This option has two video channels per PC Card and two video outputs per channel. Channels A and C are used and channels B and D are left blank. One video output per channel is used for the reverse path PTZ control and is connected to the PTZ control device.

The other video output per channel is not used for PTZ control. The second video output is video output only for use with a DVR or other display devices. See the GB474PTZ-DA diagram for input and output connector placement.

## CARE AND MAINTENANCE

There is no routine maintenance or calibration required with this equipment. All controls are accessible from the front panel.

## APPLICATIONS (WHERE TO USE THE SYSTEM)

This system can be used anywhere that a video signal on coaxial cable exists. It will improve coaxial cable video transmission system response. Video pictures on long wire runs will benefit from the installation of the GB474-PTZ. In a long cable run the GB474-PTZ can be placed at the mid point between the camera and the monitor to improve the transmission level of the signal.

## CCTV INSTALLATION TIPS

This section will discuss video ground loop problems in CCTV installations. The cause and how it effects picture quality with solutions to eliminate the problem. Remember that ground-loop problems are the same with twisted pair wire runs as they are with coaxial cable.

When Video Ground Loop problems or 60 cycle Bars occur, they are easy to see on a video monitor. They look like a horizontal band or bar across the video monitor, that slowly moves up the video screen. These bars can be barely noticeable, or can be so bad that the video monitor loses lock and breaks up the picture. If the video camera is Line-Locked to the 60 cycle main power, the bars may stand still in the picture, but they still obscure picture definition and create customer complaints.

The source of the 60 cycle bar originates from the power Industry's use of local grounds to balance their power grid.

Everywhere 60 cycle power is used, a local ground is attached to the power grid to return all unbalanced current flow to ground. As an example, you will notice that every main power breaker box will have a ground wire or conduit going to a ground rod or similar device connected to an earth ground. Every correctly installed power outlet will have a connection to this ground.

Not all grounds are created equal. In fact the earth ground in one building is most likely to have a different voltage potential relative to any other building, even grounds inside the same building will have different voltages between them, based on the uneven current flow of the power load.

## CCTV INSTALLATION TIPS (cont.)

Here is how the 60 cycle bar gets into your video picture. If you connect a coaxial cable to a monitor or other equipment that plugs into the 60 cycle main power and the other end of the coaxial cable becomes grounded locally for any reason a Ground Loop is created. Any difference in the 60 cycle voltage between these two ground points will create a current flow in the shield of the coax that induces the 60 cycle AC voltage into your video signal.

It is easy to measure these differential voltages, simply disconnect the video cables at the monitor point and using your voltmeter on AC volts, measure between any two shields of the incoming video cables, you will be amazed at the difference.

The solution is to never connect both ends of a video cable to local grounds. Any cable can be grounded at one end without inducing the ground loop current. When you run coax cable from one building to another, it is acceptable to install through connection points, but do not allow the shields to come into contact with one another or the local ground.

A coaxial connector laying in the cable tray or conduit box can accidentally contact ground, don't let this happen. Use tape on the connector to prevent accidental grounding. Also try not to attach the camera to any structure that is likely to be grounded. Remember that the camera is already grounded at the opposite end of the coaxial cable by the monitor equipment.

At the monitor station you may have many pieces of equipment connected together, like a (Quad, Tape Recorder, Monitor) all of which plug into the main 60 cycle power. This will not present a problem if you plug all of the equipment into the same power line at the monitor point. Making sure that all the equipment share the same ground point at the monitor station. Also try to keep the video cables between equipment, (the service loops) as short as possible. If you already have an installation that has 60 cycle bars, there are some steps you can take to solve the problem. If coaxial cable shields are connected together anywhere in the system, separate them if possible. Similarly remove all but one ground connection on each coaxial cable if possible, the ground is usually at the monitor end of the coaxial cable because the monitor equipment plugs into the 60 cycle main power supply which is grounded.

If the problem still persists, a GB474-UTP can be installed at the end of the coaxial cable to eliminate the 60 cycle bars. This is much easier and cost effective when you consider the labor cost to find and solve the ground-loop problem.

## TROUBLESHOOTING

PROBLEM: Video Scrambled, Wide White Jagged Area.

SOLUTION: Reduce the Definition and level controls and re-adjust them.

PROBLEM: No Video at receiver.

SOLUTION: Check Camera Video and Coax Connections. Check the coaxial cable for Shorts and Opens.

PROBLEM: Ghosts Image to the Right, Horizontal Smearing.

SOLUTION: Check for Bridge Taps or "T" Taps on the coaxial cable and Remove Them.