GB-60



GROUND LOOP BLOCKER AMPLIFIER

The GB-60 Ground-Loop Blocker is an active device used to eliminate Ground Loop Interference and picture quality problems in new and existing CCTV video installations. The unit is installed at the monitor site where the CCTV signals come together, or at any intermediate point where video signals are monitored. The GB-60 operates with any standard CCTV, NTSC or PAL 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" from degrading your CCTV system at time of installation and beyond.

The Level control can be adjusted to overcome losses due to long cable runs up to 3000 feet, poor cable quality, and improper video terminations. Cable runs can be extended beyond 3000 feet by placing additional GB-60s at intermediate locations.

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.

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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.

An optional secondary video distribution output can be ordered . This lets the installer add an extra monitor point or drive any other video equipment without affecting the original video signal.

By installing the GB-60 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 GB-60 on each group of four channels. It is especially useful in installations requiring lightning protection. Lightening 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.

INPUT

Level Impedance Connector

PROCESSING

Clamping Common Mode Rejection 60Hz Rejection Video Gain High Frequency Compensation 0 to +10 dB RF Bandwidth

OUTPUT

Level Impedance Connectors Channels Distribution Out(Optional) 4 Channels (E-H) Signal to Noise Ratio

MECHANICAL

Size Enclosure Power Requirement SPECIFICATION

1 Volt Peak/Peak Nominal 75 Ohms Impedance75 OnmsVideo StandardCCTV, NTSC, PALConnectorsBNC (Female)Channels4 Channels (A-D)Power Requirements24 VDC Wall Mount (Supplied)Connector5 5mm x 2 5mm 5.5mm x 2.5mm

> Tip of SYNC 40 dB Minimum 2 Vpp, Minimum Rejection -2 to +3 dB 30 MHz

> > 1 Volt Peak/Peak 75 Ohms BNC (Female) 4 Channels (A-D) 70dB

5.5" L x 4.3"W x 2"D ABS with Mounting Flange 243700, 100m 24VDC 100mA

GB-60spc

CCTV VIDEO GROUND LOOP PROBLEM SOLVING

By: Don McClatchie

This article will discuss video ground loop problems in CCTV installations, the cause and how it effects picture quality with solutions to eliminate the problem.

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 industries 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.

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 a 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. Make 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.

Sometimes a ground loop problem can be reduced by reversing the AC plug on the power transformer used to power the camera, or reverse the 24 VAC power connection to the camera. This technique will not work on DC powered cameras. If the problem still persists, video isolation transformers can be installed at one end of the coaxial cable to block the shield current flow and eliminate the 60 cycle bars.

These transformers must be installed at the coaxial cable that is originating the 60 cycle bar problem. Isolation transformers only work when they can block the current flow in the shield. Once 60 cycle bars become part of the video signal, no economical down stream solution will remove the bars. Use a portable monitor to find the origin of the ground loop problem, start at the camera and move down the coaxial cable until you see the bars appear on the portable monitor. This then is the coaxial cable with the current in the shield. Clear the ground connection or install an isolation transformer at this point.

The type of AC power transformers you use to power your cameras can contribute to Ground Loop problems. A ground can be introduced to your camera "Capacitively" through the power transformer windings depending on the type and construction technique used to build the AC transformer. Some transformers are built by winding a primary (the 110 VAC side) on a metal core, then simply winding the secondary coil (24VAC) directly over the primary coil. This puts the primary and the secondary in direct capacitive contact. This type can cause Ground Loop problems.

Other manufacturers build their AC transformers with a split bobbin. That is each winding is separately mounted on the metal core. The separation of the primary and the secondary coils are greatly increased, reducing the capacitive coupling and removing the unwanted second ground in your system. This type of transformer usually does not cost any more, and may prevent the 60 cycle ground loop from occurring. It would help if you determine which transformers are built to minimize capacitive coupling between windings and purchase that type only.

With an understanding of Ground Loop problems and the use of good single ended grounding techniques, you should be able to keep the 60 cycle bars out of your CCTV installations. If you still have problems with ground loop have a look at our GB-60 Ground Loop Blocker or Call 800-235-6960.

