

# CON700 the Humbloc – Groundloop Isolator

Remove earth loop interference problems from CCTV installations quickly with the Humbloc Groundloop Isolator!

A common problem many installers face with CCTV installations is earth or ground loop problems. Many CCTV installers have seen the classic symptoms of the rolling humbar or the tearing picture but don't understand the cause of the problem and the solutions to cure it. They may have even seen a small spark or felt a slight tingle when they disconnect interlinking cables from video recorders and other equipment; these are all signs of ground loop problems. (Please note - a tearing picture can also be caused by a weak signal and a humbar by over-voltage or an unregulated power supply used with a 12V camera such as a 13.8V alarm PSU.)



## So, what is a ground loop?

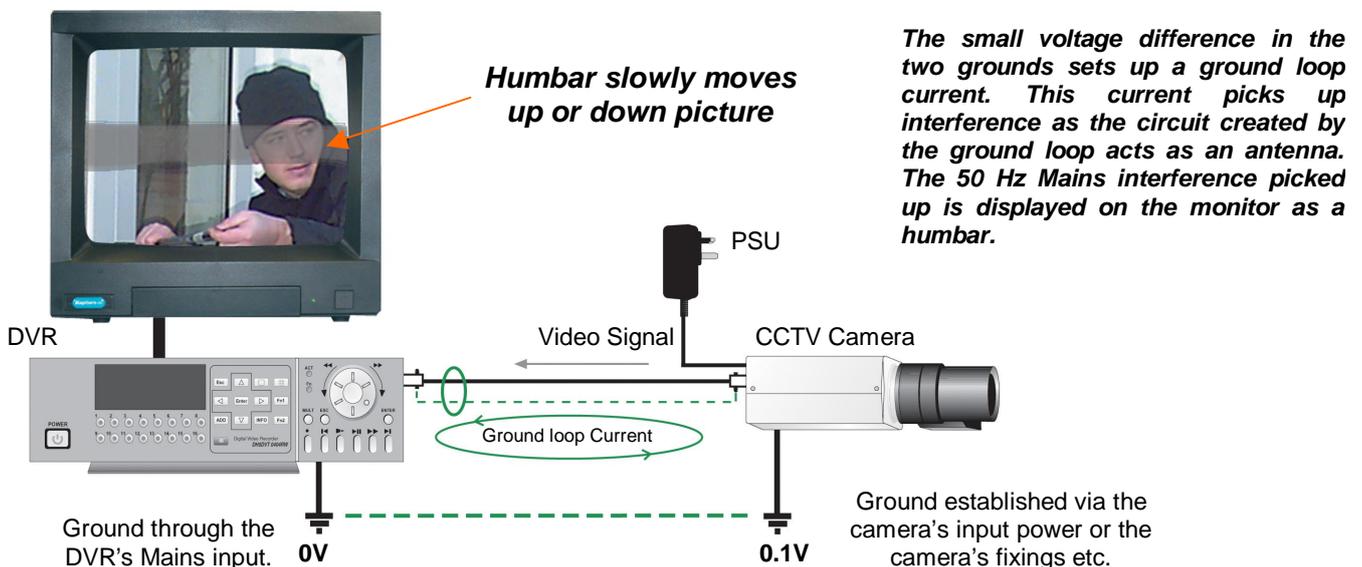
A ground loop occurs when there is more than one “ground” or “earth” between two pieces of equipment. Because the two pieces of equipment have multiple ground paths, loops (circuits) are formed in which current can flow.

The current flowing through this unwanted circuit in the CCTV system can have a devastating effect on the system's performance. The current flows through the shield of co-ax types of cable and instead of “dragging” any interference (usually 50Hz mains hum) down to a “true” ground at the receiving end of the cable, it actually picks this interference up (in its ground loop antenna!) and carries it to the sensitive inputs of CCTV equipment such as DVRs, Quads and Switchers.

The DVR, quad or switcher simply interprets this “interference hum” as part of the intended video signal entering the equipment and displays it on the monitor as a rolling “hum” bar.



## Diagram illustrating a system with a ground loop problem...



# CON700 the Humbloc – Groundloop Isolator

## So how can you prevent ground loops?

In practice this is hard to do as each CCTV system is pretty much bespoke so you can't apply general rules. Some equipment tends to be inherently free from ground loop problems; this is usually the more DIY equipment such as cameras with mini Din plug connections. This is because the monitor usually powers all the cameras and the cameras don't have different ground potentials so there are no ground loops.

In systems that have different types of CCTV cameras installed with different types of power supplies, there is a greatly increased chance that some of the cameras and other pieces of equipment may have different ground potentials. Two pieces of equipment only need a "ground voltage" difference of 0.1V (which is tiny) and to be interconnected with an earth cable of 0.1 ohms resistance to form a ground loop current of 1A!! Well designed 12V CCTV power supplies are often "double-insulated" and the 0V output is in effect floating. This has the benefit that it can "float up or float down" to the ground potential of other equipment minimising ground loop problems. Some other power supplies such as "alarm-power supplies" may clamp the 0V output to an electrical earth causing ground loop problems with CCTV equipment. **You should never** remove the electrical safety earth of mains equipment in an attempt to remove a ground loop as it can endanger lives.

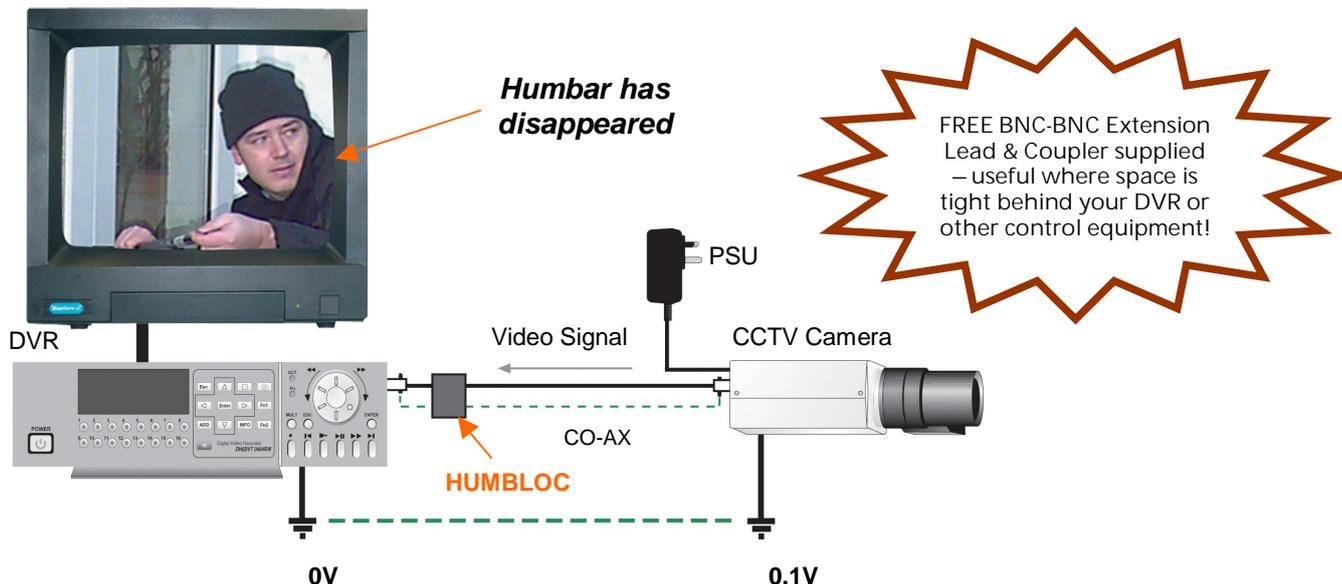
By carefully using good CCTV power supplies you will minimise ground loops but if they still exist then a device that blocks the current flowing down the earth connection is an option.

The HumBloc simply terminates ground loop currents in a cable and blocks the hum and interference carried in the ground loop.

## How many Humblocs do I need to cure a problem?

The Humbloc should be fitted between the camera and the input of CCTV equipment such as a DVR that it is connected to; generally speaking the Humbloc would be fitted at the rear of the DVR to its "video input(s)". For example in a 4 camera system it is possible that only one camera has an earth loop problem and that one Humbloc may cure it. In reality though if you experience ground-loop problems in a CCTV system it is often best to fit one Humbloc to every input as earth loops may sometimes not be sufficiently strong to show up as humbars but they may still cause erratic operation of equipment due to the unwanted currents flowing through the earths. The motto here being better to be safe than sorry.

**The HUMBLOC helps prevents the "ground loop" in the cable - blocking the "humbar" interference on the monitor.**



### Specifications

|                               |                       |
|-------------------------------|-----------------------|
| Insertion Loss                | 0.4db                 |
| Frequency Response            | Approx 0-3 db @ 10MHz |
| Input Resistance              | 75 ohm                |
| Output Resistance             | 75 ohm                |
| Isolation Voltage             | 750 V DC              |
| Insulation Resistance         | 100 Mega-ohm          |
| Transient Voltage Suppressors | 12V RMS               |
| Max. Body Size                | L79 x W30 x H25mm     |
| Lead Length                   | 200mm                 |
| Construction                  | Black ABS Casing      |

All specifications are approximate. Anti-hum.com reserves the right to change any product specification or features without notice. Whilst every effort is made to ensure that these instructions are complete and accurate, Anti-hum.com cannot be held responsible in any way for any losses, no matter how they arise, from errors or omissions in these instructions, or the performance or non-performance of the camera or other equipment that these instructions refer to.

© All contents are subject to copyright, [www.anti-hum.com](http://www.anti-hum.com), 2005.