

Screened Equipment Wire

Why would you want to use Screened Wire.

All electrical wire and equipment create noise either radiated or conducted as EMI (electromagnetic Interference), this can seriously disrupt the proper operation of equipment near the wire. This is not the place to go into the science behind this, rather how we can safeguard against it.

It is important to state that the average Model Rail Layout will not suffer from the effects of EMI, but if you are using sensitive electronic modules, as used in DCC systems, there is a greater possibility.

The effects of EMI are that things happen that you don't expect, or you have not initiated, or things don't work when they should.

How do we solve this:

We must mention at this point that some people say that twisting the cable together solves the problem, there is some truth in this, but can be very difficult to achieve. In straight cable, all noise current is flowing in the same direction. When the cable is twisted, in some parts of the signal lines the direction of the noise current is the opposite from the current in other parts of the cable. Because of this, the resulting noise current is many factors lower than with an ordinary straight cable.



The alternative is to use Screened cable. The shield can act on the EMI in two ways. First it can reflect the energy. Second it can pick up the noise and conduct it to ground. (This is important 'to ground', if you use Screened cable you must Earth one end, otherwise it has nowhere to put the noise.)

Screened Cable normally has a foil sleeve and then wire braid and finally the plastic outer protective covering.

The braid is a woven mesh of bare or tinned copper wires. The braid provides a low-resistance path to Earth. The effectiveness of the braid depends on the tightness of the weave, EMI will get through the holes in the weave, so the tighter the weave the better.



A shield system is only as good as its weakest component. If you do not tie the braid to earth then it will not work. Placing shielded cable between point A and B without earthing it, is a waste of time.