

Compliance with Requirements

This paper discusses some of the key requirements in all systems of this sort and shows how the equipment complies. Please note that there are many variations between different equipment and you should contact us for a specific statement of compliance against your particular requirements.

Video Quality

The requirement is to transmit real time, high resolution, video signals from 2 to 8 platform mounted cameras. The equipment is required to provide a high level of video quality to ensure that the clearest possible images are presented to the train operator for this safety related system.

This requirement is met in full by using two options. The first is FM analogue transmission that has no latency or delay in transmission. The video quality is to a good broadcast level. We guarantee the installed video quality with our customers. The video parameters are quantifiable and not subjective or open to interpretation.

The second option is a high performance digital system. It uses COFDM transmission to the Digital Video Broadcast - Terrestrial (DVB-T) standard and provides levels of video quality equal to that transmitted by the BBC and other broadcasters.

The major benefit of this technology is that it can operate under non line of sight conditions, so avoiding the need for any transmitters at the mid-points of the platforms. For this reason it could result in simpler installations on some platforms.

It should be noted that the microwave transmission equipment is analogue and digital compatible, which means that the analogue modulator and demodulator modules can be replaced at any time by compatible digital equivalents.

Interference Free Operation

Interference free operation is an essential requirement. This applies to external interference from other systems and mutual interference from the system's equipment on adjacent platforms or stations.

This requirement is met in full by using transmission frequencies in licenced or controlled bands. In the UK, the range 31.0 to 31.8 GHz is recommended. The frequency band is co-ordinated and controlled by Ofcom in the UK and other Regulators in other countries such that no new equipments can be installed without first ensuring that they will not interfere with existing systems.

Note: Ogier Electronics, as the major supplier of 31 GHz equipments, undertake the co-ordination on behalf of Ofcom.

This is in contrast to many other radio systems that operate in the licence exempt public bands, or at low frequencies where inadvertent interference is a strong possibility. Here, either the technology is freely available, or out of specification high power transmitters can cause spurious emissions that can easily generate interference.

The other feature of the system is that there is a considerable amount of spectrum available, 600 MHz, as opposed to a few tens of MHz for many other systems. This, together with the use of Beacons, allows different transmission frequencies to be used on adjacent platforms and stations. Up to 40 channels are available, thereby allowing up to 20 parallel tracks to all use different frequencies.

The other benefit of this enormous capacity, is that the system could be used for other revenue earning applications, or possibly with two-way transmissions from on-board CCTV cameras.

Continuous Coverage

Continuous and uninterrupted transmission is required over distances of up to 200 metres. There shall be no breaks in the transmission, irrespective of the curvature or complexity of the track layout.

The system employs space diversity to ensure that there are always at least two different video sources and that the effects of track curvature or other obstructions are minimised. In an absolute, worst case, if there is a break in the coverage at any platform, the solution is simply to place a supplementary Transmitter to cover the obscured area.

Easy Installation

It is important that the system is easy to install and that it cannot be accidentally damaged. It is equally important that it operates with minimal maintenance in an environment where dust, grease and other substances will contaminate all the exposed surfaces.

The system does not require any adjustment or set-up on initial installation apart from pointing the units in the correct direction, which itself is a simple task that can be accomplished with a torch and a mirror on the front surface of the unit.

All first line replacement can be achieved without any adjustment of any sort. The old unit is simply removed and the new unit inserted in its place.

All the trackside equipment can be installed well away from the track within the platform area, and existing mountings such as the camera gantries can be used where wall mounting is not possible.

The equipment has been proven to be immune from brake dust, rain and fog and the mechanical installation is not particularly critical. As a result there is no need for operators to undertake any routine or scheduled maintenance.