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INFRA RED REMOTE CONTROL SYSTEMS

Infra Red Remote Control has the following characteristics which differentiate it from radio remote control:

- Only operates in line of sight
- Does not radiate radio signals or any form of electrical signal
- Is not susceptible to radio signals or any form of electrical signal
- Cannot penetrate optically opaque materials (except for certain special IR optical filters)
- Limited range, typically 20m

These characteristics give it an advantage in certain short range application areas, for example where operation should be restricted to an enclosed area or single room, or where it is essential that no radio signals should be radiated, or where susceptibility to radio signals would pose a problem.

T E Electronics produce a range of bespoke Infra Red Remote control systems that are used in situations exhibiting one or more of the above requirements, eg

- Car lift remote control systems (you want the lift to know which floor you're on…)
- Personal security systems (the location of the call must be unambiguous)
- Remote control of equipment in hospitals (medical equipment could be affected by radio signals)
- Remote control of large machinery (operation caused by radio interference would be dangerous)
- Wire-free room call systems (operation anywhere in room; no need to have a wired button)

The TE Electronics Infra Red Control System has some distinctive features. In common with many other systems it uses pulse position modulation of an infra red carrier; However, the relatively high carrier frequency of 500kHz is used. This is much less prone to interference, eg from fluorescent lights, than standard 38kHz carrier IR systems. It is also, of course, immune to spurious inputs from such domestic type controls.

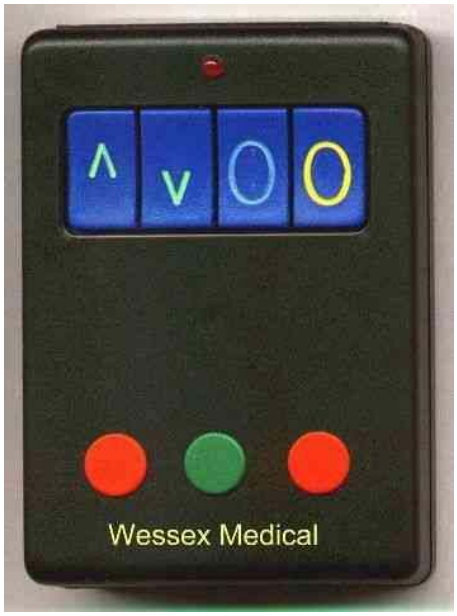
Another feature is the low current consumption of the receiver system; the 0.5mA load permits applications that require continuous battery operation.

The transmitters all have a visible red LED that indicates when the Infra Red signal is being transmitted. The LED stops indicating when the battery has dropped to a level that still gives about 50% of full power, so giving *advance* warning of battery exhaustion.

Receiver/Relay-output units are produced for battery, mobile or mains operation.

Information on **Car Lift Systems** and **Personal Security Systems** is given in the appropriate dedicated data sheets.

An example of a **REMOTE CONTROL SYSTEM** for use in hospitals is the TE2951 produced for Wessex Medical. It provides Remote Control facilities for their Travelmaster Hoist, a tracked hoist sytem which is used to move incapacitated people, typically between bed and bathroom. The remote control is particularly useful where the Hoist traverses beds that are surrounded with a curtain track; the standard wired pendant control has to be passed over each curtain track.



The system consists of a hand held four button transmitter and a receiver/relay-output PCB pair. The receiver and relay PCBs are mounted on the Travelmaster Hoist. The system can be set to any of 16 unique address codes so allowing multiple hoists to be in use in the same room.

The transmitter is a black ABS unit measuring 80 x 60mm, 25mm deep. It has four rectangular push buttons engraved with coloured symbols to signify the up, down and traverse commands and are designed to be similar to the Wessex wired hand controller symbols. The traverse commands are designated with blue and yellow ovals since "left" and "right" are user position dependent.

The Infra Red signal is transmitted from the windowed front panel. This is directed at the ceiling above the Hoist unit in direct line of sight when system operation is required (the ceiling is used as an Infra Red reflector). The requested action will continue for the duration of the button depression.

The coloured discs are a convenient way of identifying correspondence between hoist and transmitter – both will have the same colour coded triplet. The colours are left/right symmetrical so that the match is the same from both sides of the hoist; 16 combinations are achieved with four different disc colours.

Infra Red Control Systems for **LARGE PLANT OR MACHINERY** are often required to be fitted into vehicle cabs. Applications of this type that we have addressed include a coal handling depot and a cement factory.
The large coal lorries had cab control of the overhead hoppers that were used to load their tipper with coal.
At the cement factory, front-end loader tractors had cab mounted controls to direct the overhead cement conveyor operate and to traverse to the required bay.
Both of these installations used the IR system to duplicate manual buttons on a control box which had previously required the operator to leave their cab. The IR system saved time and money and provided enhanced working conditions for the operators.

The photograph facing shows the three elements of a typical mobile system (12V or 24V operation):

At the top is the IP67 Polycarbonate **Receiver/Relay Unit**. This has a green power LED, a red signal LED and knock-outs for connecting conduits. Power is 230V/115V ac or 12- 48Vdc.

Lower left is the **Control Panel**. This is mounted in painted diecast aluminium with guarded push buttons; these have sub-surface legending and are back lit with multi-LEDs. It is usually dash-board mounted and is powered from the vehicle electrical system.

A small cable runs from the Control Panel to the **TRANSMITTER** (shown lower right). This is mounted inside or outside the cab to give a clear line of sight to the receiver in the normal operating mode.

WIRE-FREE ROOM CALL SYSTEMS make use of an Infra Red "Keyfob" transmitter to alert the control centre or other area that there is a call *and* the location of the call.

Application areas include

- Interview rooms
- Consultation rooms
- Board rooms

The **RECEIVER** for the Infra Red signal can be wall or ceiling mounted. A standard form for a wired system is a standard BS double plate. This can be in white for general purpose and ceiling applications or on architectural plates, eg in brass, stainless steel or aluminium, to match other room furniture.

The double plate can be installed flush or surface mounted and make use of all the standard mains fittings and accessories.

In a wired system, the red indicator is normally arranged to show in response to an Infra-Red signal and be cleared down when acknowledged at the **CONTROL CENTRE.**

The "Control Centre" can be as simple as a single Sounder and Indicator with a "Power" and "Acknowledge" button.

WIRE-FREE SYSTEMS can be realised by using **TRANSPONDERS,** as shown facing**.** These are battery powered self contained units that transmit a coded *radio* signal to the control centre. The code defines up to 256 locations.

For further details, see a description of the ***Alarmlink*** system in the "**Personal Security Systems** data sheet.