

## CAR LIFT INFRA RED REMOTE CONTROL SYSTEMS

TE Electronics offer a wide range of Remote Control Systems for use with Car Lifts. The remote control transmitter is used to call the lift or request transfer in the same way as the equivalent buttons on a wall but with the convenience of remote operation. Approach the lift, point the remote at the lift receiver and press the button. On receipt of the signal the receiver front panel LED will show and the lift will be called. The TE system interfaces to the main lift controller via isolated relay contacts which mimic the action of a normal wall mounted lift call buttons and control the lift via the standard control and safety equipment.

Within the lift, transfer control is usually via car window accessible buttons so requiring only a single button transmitter ("CALL") but for some systems transfer can also be by Infra Red via a two button transmitter ("CALL", "TRANSFER") or a four button IR transmitter (for systems with 3 levels; "CALL", 1,2,3). For systems with more than 3 levels a single button transmitter with manual transfer control must be used.

All of TE Electronics Car Lift Remote Controls use Infra Red as the control medium.

### **WHY USE INFRA-RED?**

Since Infra Red (IR) behaves similarly to light, it will pass through your car windscreen; however, because it's like light it won't travel through walls and floors. When you call a lift it comes to **your** floor, a pretty useful characteristic. Radio signals pass through masonry and are reflected and refracted by metals – with a radio remote it's easy to get a response from the "wrong" receiver with the result that the lift goes to the wrong floor.

The range of a standard TE IR keyfob transmitter is about 15m, which is more than sufficient for most car lift applications. For longer range requirements, up to 40m, we offer a high power pocket size transmitter suitable for in-car use. It is possible that a radio remote could offer even greater range, but would you ever want to call a lift from 200m? Or call a lift you can't see (with the attendant security implications)?

### **WHAT ABOUT INTERFERENCE IMMUNITY?**

- Infra Red (IR) Control is limited to line of sight operation. This means that the lift cannot be operated by someone who is not in sight of the lift being controlled.
- The IR receiver is unresponsive to interference from nearby radio frequency devices, eg wireless remote controls, mobile phones, personal mobile radio transmitters, etc.
- The TE Electronics Infra Red Control System encodes the IR transmission using pulse position modulation of an infra red carrier. However, whereas normal systems use a carrier frequency of around 38kHz the TE system uses a frequency more than ten times higher. 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 any domestic type Infra Red remote controller.
- IR frequencies within the system reception band must be modulated to produce a legitimate code before the receiver will respond. For all TE systems **except the BASIC system** each code word has 34 bits which gives over ten billion combinations. Included in the 34 bits are

8 Cyclic Redundancy Check (CRC) bits. The CRC is calculated within the IR transmitter as a mathematical function of the code within the word. The IR receiver carries out an identical computation on the received word and rejects the transmission if the CRCs don't match.

- While a key is depressed the IR transmitter will repeatedly radiate the corresponding code word at a rate of ten words per second. The receiver must receive two or more valid identical IR commands within a one second period otherwise the appropriate output relay remains unactivated.

**The above measures make spurious operation due to interference a vanishingly small probability**

### **WHAT CHOICES DO I HAVE?**

TE electronics offer four families of IR car lift system to cover all requirements :

- a) IRACS = Infra Red Access Control System
- b) IRACS MINI
- c) SPICS = Single Point Infra-red Control System
- d) BASIC

All have the option of standard keyfob **transmitters** or High Power long range pocket size transmitters; keyfobs have 1 or 2 buttons, Hi Pwr type has 1,2 or 4 buttons:



Standard Keyfob, 1 btn

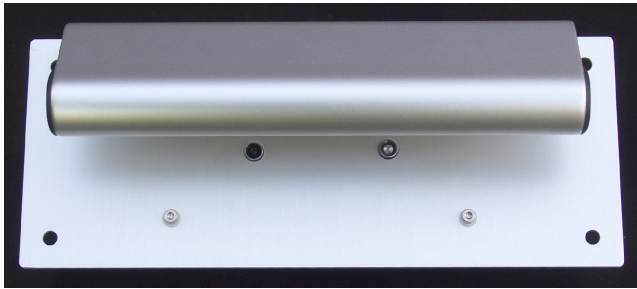


Standard Keyfob, 2 btn

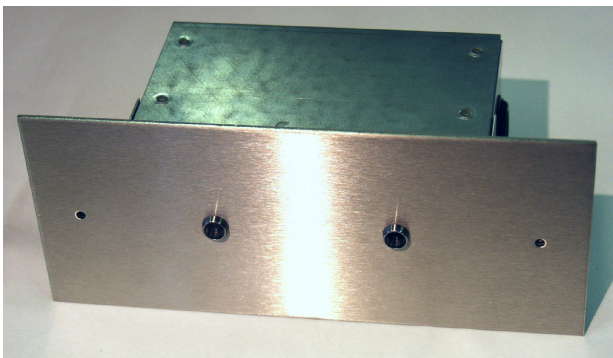


High Power Long Range Transmitter

All have various **receiver** options covering internal and external installation, surface or flush mounting, long range or wide angle or both and even types for ceiling mounting within the lift car.



Examples of External Receivers



Examples of Internal Receivers (RH one is omnidirectional lift car ceiling mount)

*NB: External mounting receivers may also be mounted internally but not vice-versa.*

Receivers are located at each lift station and, depending on the requirement, within each lift car. They must be within line of sight of the car approaches to the gates/doors. Within a lift car a single ceiling mounted omni-directional receiver can pick-up signals reflected off the inside of either lift car door, should IR transfer control be required. Receivers can have varying ranges and acceptance angles, generally an increase in one implying a decrease in the other. Composite receivers can combine wide angle and long range performance which may be required, for example, for car and pedestrian access.

All receivers except those of the BASIC system incorporate a low noise pre-amplifier followed by a microprocessor decoder using a proprietary high performance algorithm. This gives twice the sensitivity of the BASIC system and so greater Infra Red reception range.

**IRACS** This is our top of the line Hi spec Control System. For an example installation at a major recent new build in London see the [IRACS](#) website.

- All keyfobs/transmitters have a unique code
- Over 1 000 000 possible code combinations
- Maximum of 999 keyfobs/transmitters per system, generally single button types
- Maximum of 6 receivers per system
- Range with standard keyfob and receiver approx 15m
- Range with Hi Pwr Transmitter approx 30m
- Each receiver is linked to a central CONTROLLER via standard CAT5 network cables
- The controller can accept or reject any individual keyfob according to an editable list
- Lifts can be manually controlled from the central controller
- All actions are reported and can be logged on a PC connected to the controller.



IRACS CONTROLLER

**IRACS MINI** Lower cost than IRACS but with an upgrade path to full IRACS  
For more details see the [IRACSmini](#) website

- All keyfobs/transmitters have a unique code
- Over 1 000 000 possible code combinations
- Maximum of 999 keyfobs/transmitters per system, generally single button types
- Maximum of 6 receivers per system
- Range with standard keyfob and receiver approx 15m
- Range with high power Transmitter approx 30m
- Choice of autonomous mains powered receivers **or** central Lo V power unit/JB with CAT5 network cabling carrying lift control signals plus power for the receivers.
- No user control to reject individual keyfobs but **UPGRADEABLE TO FULL IRACS** which has this feature (see above)

### **SPICS – Single Point Infra-red Control System**

This is a Single Receiver system for use with a car 'storage' type doorless lift, where all control is from ground level and the car, having been driven into the lift, is taken below ground for secure, unobtrusive garaging within the lift itself. The user is not expected to be inside the car during lift operation. See also the [SPICS](#) website.

- Up to 16 keyfobs per system
- Range with standard keyfob and receiver approx 15m
- Range with high power Transmitter approx 30m
- Single lift system: 2 button control – “UP”, “DOWN” (retrieve, store)
- Double lift system: 4 button control - UP, DOWN for each of the lifts
- “Duration” Control for safety, ie the Lift mimics the fob button, so that releasing the button causes the lift motion to cease almost immediately.

- Fault-detection circuitry is incorporated in this version, since safety is paramount and it is highly undesirable for the lift to operate spuriously.
- For most possible failures an indication is provided to the user (but clearly there is the possibility of total failure resulting in lack of operation (e.g. if power fails)).
- Design aim: no single component failure within SPICS can result in the lift being energised spuriously

## BASIC SYSTEM

This is the current version of the original TE Electronics Car Lift remote Control, introduced in 1996 and installed successfully at numerous locations. It has a lower level of security, interference immunity and reception range to the other later TE systems described above but still finds application where these requirements are not paramount and the lower price is attractive. Information is available at the [T.E. Electronics](http://www.te-electronics.com) website.

- All keyfobs/transmitters in a given installation have the same code – keyfobs cannot be differentiated from one another.
- 16 bit code with hardware based encoding and decoding
- 256 possible code combinations of which 16 are available for a given system
- Single button, two button or four button control
- Any number of keyfobs can be used in a system.
- Any number of receivers can be used in a system.
- Each receiver is autonomous.
- Range with standard keyfob and receiver approx 12m
- Range with high power Transmitter approx 24m
- Long range receiver gives 50% increase in range over a narrower angle
- NOT upgradeable to IRACS

*T.E. Electronics Ltd can and do tailor any of the above system architectures to suit different circumstances; every system is a bespoke system. Please contact us to discuss **your** requirement.*

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