

## Remote Radio Control

### 'WAVE' Push button radio control systems

#### Application

Radio Remote Controls have become a key element within a wide range of modern working environments where safety, productivity and freedom of movement are of continuously increasing importance. As a result industrial radio controllers are becoming a common sight in areas where time saving and risk reduction are crucial to a particular process with the use of radio control allowing the operator to stand in the position with optimum visibility and lowest operation risk.



**SIMBAL INDUSTRIAL RADIO CONTROL SHOULD NOT BE CONFUSED WITH OTHER POPULAR, LOW COST TYPES OF RADIO CONTROL, THERE ARE A NUMBER OF IMPORTANT DIFFERENCES AS FOLLOWS :**

#### ● EXCLUSIVE CONTROL

You can be certain that no other radio device will take over the control of your application thanks to an exclusive communication channel protected by a unique ID code that is assigned to each SIMBAL radio remote control unit.

#### ● CONTINUOUS AND SAFE TRANSMISSION

This device operates with a continuous signal transmission between the transmitting and receiving units. The radio link is a combination of digital communication frames that are monitored by algorithms at the receiver. This guarantees a secure correspondence between the commands sent by the operator and the received commands. When the radio link is disturbed or interrupted the receiver unit will immediately default to Stop mode bringing the machine to a safe status.

#### ● INTRINSIC SELF CONTROL

Our Radio controllers are based on designing and manufacturing concepts aiming to guarantee complete safety and reliability. For example, all received signals are cross checked using dual microprocessors, the STOP circuit features monitored double safety relays, a SAFETY-STOP relay is available and can be connected in line with each command relay to reduce the possibility of motion command failure and risk, error and failure tests are performed each time the transmitter or receiver are powered up.

#### Transmitters & Receivers

The portfolio of radio control units offered by SIMBAL involves a range of different transmitter types including push button units, joysticks and also fixed position, DIN rail mounted systems, these can be married to different receiver units which are available for a wide range of AC and DC power supplies. Details of the various transmitters & receivers are shown on the following pages.

## ZEUS / THOR Joystick transmitter

The ZEUS type 'B' transmitter combines the advanced ergonomic design and functional features required for standard applications such as tower cranes, factory cranes, small concrete pumps, high pressure and vacuum pump vehicles and any other kind of machine for which double-axis joysticks represent the ideal type of movement command. The ZEUS console has a compact size with space for two joysticks and ample additional space for on/off and proportional commands making it an easily customisable transmitter for special applications. The larger THOR 'B' transmitter maintains all the design details of the ZEUS in a slightly larger frame providing space for up to 4 joysticks plus numerous buttons, switches etc.



Both ZEUS & THOR transmitters are also available with single axis proportional joystick for applications such as hydraulic proportional cranes, telescopic handlers, crawler vehicles and any other kind of machine for which single-axis joysticks represent the ideal type of movement command. The ZEUS type 'M' console has a compact size and can accommodate up to 6 single axis joysticks plus a number of buttons & switches, the larger THOR 'M' console can be fitted with as many as 8 joysticks plus a large number of additional commands.

ZEUS 'NJ' & THOR 'NJ' is an infinite range of radio transmitters which can be produced with literally any combination of momentary or stay put buttons, switches and / or potentiometers producing the possibility for remote radio control of just about any piece of machinery imaginable



ZEUS & THOR type 'X' transmitters can be supplied with any required combination of joysticks and other commands such as buttons, switches and potentiometers.

### START button:

This is the Standard command on all ZEUS & THOR transmitters for turning the radio system into working mode. Horn command is activated simultaneously to signal the machine is ready to operate.



### Emergency STOP button:

Stop circuits on all SIMBAL Industrial radio remote controls feature the maximum level of safety ie, ISO 13849 PLe & EN62061 PLe SIL3, thanks to a product design based on the concepts of redundancy, monitoring and self-checking. The mushroom head mechanically latching button is protected by the casing against damage without restricting easy access to the button.

### "Contactless" extractable key:

Every SIMBAL transmitter features a security key which must be inserted to allow operation of the system, this is a simple method of restricting access to the transmitter to authorised personnel only.





**Extractable rechargeable NiMH Batteries:**

The new NiMH generation of rechargeable batteries provides extended battery life. The transmitter is equipped with an easily accessible battery slot that enables quick replacement, yet still maintaining a perfect sealing against liquids and dust. Gold plated contacts guarantee a long and stable electrical connection over many years.

**Status LED:**

All SIMBAL transmitters are equipped with a LED providing information about the working status, the battery level and coded error messages enabling quick & efficient fault finding



**Motion buttons:**

All motion commands feature double pressure push buttons with large print for comfortable use when wearing gloves and for long working periods. The legends are easily interchangeable and can be chosen from a vast range of standard symbols

**Ergonomics:**

ZEUS & THOR transmitters are ergonomically designed to ensure a combination of functionality and comfort in use



**Specifications**

**ZEUS & THOR Transmitter - Technical Specification**

**Dimensions:**

ZEUS	210 x 130 x 150mm	1200g
THOR	295 x 150 x 150mm	1650g
Frequency Range	434.050—434.775Mhz	
Seperation	25Khz steps	
No of channels	30	
Range	~100mts in clear conditions	
Modulation	GMSK	
Output power	10mW ERP	
Pairing addresses	65,536	
Housing material	Fibre re-enforced nylon	
Protection	IP65	
Temp range	200°C to 700°C	

**Standards :**

ISO 13849-1	Stop	PLe
	Buttons & Selectors	PLc
EN 62061	Stop	PLe / SIL3
	Buttons & Selectors	PLc / SIL1

**ZEUS & THOR Battery Charger - Technical Specification**

**Dimensions:**

Power supply	AC version 230V
	DC version 11–32V
Absorption	3.3W during charging
Recharging time	~ 3hours
Charging temp.	0°C to 35°C
Dimensions	137 x 75 x30mm
Weight	AC Version 825g
	DC version 535g

## RADIO RECEIVERS

Each of the transmitters shown on the previous pages can be used with any one from a range of radio receivers to suit a wide range of both AC & DC applications. Details of the range of receivers is shown below.



### M550 L Receiver

The M550 L is the most common receiver for standard applications, its compact size and high versatility make it ideal for situations where space constraints are an issue. It is the natural receiver type for on/off application in VAC and VDC and for standard application requiring proportional outputs in VDC such as hydraulic cranes. The LAC receiver accepts a wide range of supply voltages (24–230VAC) and it is equipped with 20 relays for the movement commands in addition to the Start, Stop (ISO 13849-1 PLe / EN 62061 PLe / SIL3) and Safety Stop outputs.

The LDC receiver can be powered indifferently with the full range 12–28VDC. It is available in two versions: with 16 relays for the movement commands or with 20 solid state on/off + 8 proportional outputs in addition to the Start, Stop, Safety Stop and Timed Stop (delayed stop for "automatic motor to idle" or similar function) outputs.

**Dimensions:** 145 x 225 x 65 mm, Weight: 1700 g

### M550 H Receiver

The M550 H receiver is ready for the most complex configurations. Its modular structure allows it to be equipped with up to 48 relays or 38 relays + 8 proportional outputs in addition to the Start, Stop (ISO 13849-1 PLe / EN 62061 PLe / SIL3), Safety Stop and Timed Stop outputs.

The data feedback option is guaranteed by mean of half-duplex radio modules. This receiver is the common partner for transmitting units having a large number and variety of commands. The HAC receiver can be powered with 24 to 230VAC while the HDC accepts the full range 12–28 VDC.

**Dimensions:** 205 x 280 x 130 mm, Weight: 3500 g



### M550 M Receiver

The M550 M receiver has been developed for Din rail mounting inside electrical control panels. The outputs are available on practical extractable terminal blocks.

This kind of receiver has 21 relays + 4 proportional outputs in addition to the Start, Stop (ISO 13849-1 PLe / EN 62061 PLe / SIL3), Safety Stop. It can be equipped with half-duplex radio modules for the data feedback option.

M550 M is supplied with an external antenna plugged on SMA connector. The power supply can range between 12 and 28 Volts in either AC or DC.

**Dimensions:** 180 x 120 x 73 mm, Weight: 910 g





### M550 K Receiver

The M550 K receiver is equipped with a field bus output, CAN type, for the movement commands. The CAN bus output is directly coupled to the machine bus network and the communication is established through a specific protocol. Traditional relay outputs are present for Start, Stop (ISO 13849-1 PLe / EN 62061 PLe / SIL3), Safety-Stop and Timed-Stop functions.

The M550 K receiver can be DC powered (12-28VDC).

**Dimensions:** 145 x 225 x 65 mm

**Weight:** 1700 g



## Specifications

### Data common to both types 'L' and 'H'

Power supply – AC	24, 48, 110 & 230VAC	Weight – Type 'L'	1.7Kg
– DC	12 to 28VDC	Type 'H'	3.5Kg
Absorbed power	20W max	Housing material	Fibre re-enforced nylon
Max. analogue outputs	8-Voltage or Current driven	Protection	IP65
Stop relay volt free	Category 4 6A	Temp range	-20°C to +70°C
Start relay volt free	Yes	Frequency range	434.050–434.775Mhz
Security relay volt free	Operated by each motion button	Seperation	25Khz steps
Dimensions – Type 'L'	145 x 65 x 225		
– Type 'H'	205 x 280 x 130		

## Batteries & Battery Chargers



### Chargers

Battery chargers for the SIMBAL range of radio transmitters are available for a power supply of 11-32 Vdc (with car cigarette lighter plug) or 230 Vac (with schuko plug). We can also supply chargers for other supply voltages on request. The charger case has a protection level of IP30 and an operating temperature range from 0°C. to +35°C. Thanks to the "intelligent" design of this apparently simple device, recharging cycles are minimal with a maximum of 3 hours for full recharge.

### Batteries

Two NiMH removable and rechargeable batteries are included with every new radio control unit, the use of NiMH provides a longer battery life and reduced 'memory deterioration effect' than the older NiCAD style battery technology.



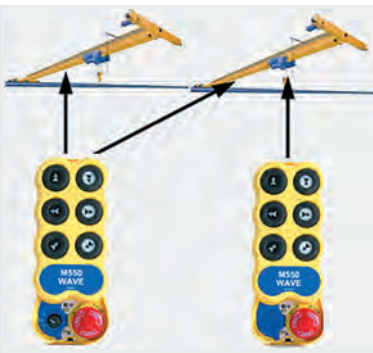
## SPECIAL APPLICATIONS & SOLUTIONS

### Wireless Data Transmission

The M8 transmitter is designed for mounting on a DIN rail, and is the ideal solution for creating high-safety wireless link enabling the transmission of commands and status signals. Sensors, RS232 and RS485 ports can be inputs for a M8 transmitter becoming outputs at a MAC receiver thus providing a status or alarm signals reporting. In the same way, control panel commands can be radio transmitted to the receiver for the remote control of a machine.



This device should be mounted inside a control box for clean and trouble free installation, and is supplied complete with an external antenna for the radio communication. In addition to the 21 on/off + 4 proportional inputs, Start, Stop and Frequency Change features are available as for traditional radio control commands. The double transmission version can manage the feedback information displaying it on a LCD screen or activating some transmitter built in relays.



### MULTIPLE MACHINE CONTROL Master / Slave (MTRS) System

The MTRS system allows one transmitter to work with up to 10 receivers, and up to 8 transmitters with one receiver. This enables a multitude of options such as Master / Slave and Pitch & Catch with multiple cranes. MTRS can be supplied using either WAVE push button transmitters or ZEUS / THOR joystick units depending on the complexity of the application.

### Infra-Red Start Up

Available with all WAVE systems, the iREaDy Infra - Red system requires the transmitter to be pointed towards the receiver to start the system hence reducing the possibility of accidental operation.



### Conversion Kit for Manual Hydraulic Systems

The conversion kit consists of power pack, cable kit, actuator kit and cross rod clamps suitable for converting existing, lever operated hydraulic cranes and machines to radio control. The power pack and cable kit can be supplied c/w Herschmann style plugs for existing electronic valves, or with the addition of actuator kit and clamps to adapt to existing cross rod systems

### ATEX Radio Control

Simbal can also supply Radio systems with ATEX certification (only with joystick style transmitters)- certification levels are shown below - please contact Simbal sales for more information.

**Transmitter:** Ex II 3GD Ex nA IIB T6 X Ex tD A22 IP65 T85 X  
**Receiver:** Ex II 2GD EX d IIB+H2 T6 EX tD A21 IP66 T85°

