

# Remote Radio Control

## M880 Radio Control for Drilling, Mining & Quarrying Machines

### Application

Radio Remote Controls are becoming increasingly popular for controlling a wide range of complex machines in the drilling, mining and quarrying industries. The use of a remote control system allows the operator to move around the workspace and therefore find the safest and most convenient position from which to carry out the operation resulting in improved productivity in addition to greater operator safety.



### M880 Advantages

**Compact transmitters** - All M880 transmitters are compact and lightweight making life more comfortable for the operator and allowing greater freedom of movement.

**Extreme Environments** - Transmitters and Receivers are constructed from high impact resistant materials and are suitable for operating temperatures from -25 up to +70 deg C.

**Automatic Frequency change** - New 'AFA' technology effectively kills off the problem of interference as the M880 system continuously searches for, and logs on to the 'cleanest' channel within the operating frequency band.

**Contactless optical joysticks** - Designed and manufactured in house, our joysticks guarantee precise handling throughout the life of the radio system, available in both stepless and stepped format.

**Certified Safety** - The STOP circuit on all M880 units (with exception of ARES 2C) complies with the highest European and International standards (ISO13849-1 PLe / SIL3 / Cat 4).

### Joystick Style Transmitters

#### M880 KRON M2

The M880 KRON M2 is the latest addition to our range of joystick style transmitters and is the ideal solution for driving crawler machines guaranteeing maximum levels of safety when loading and unloading heavy machinery from trailers.



#### M880 ZEUS2 M2/NJ

The M880 ZEUS2 features a slightly larger panel than the KRON making it possible to accommodate additional commands in the form of joysticks, toggle switches, push buttons, key switches or potentiometers. This flexibility makes it the perfect solution for the control of small rigs (crawler movement, mast positioning, drilling etc.) and for other machines such as crushers and screeners.



#### M880 THOR2

The M880 THOR2 is a larger version of the ZEUS2 transmitter and can accommodate as many as 9 single axis joysticks together with up to 10 auxiliary commands. It is also available with a double battery compartment making it suitable for long, non-stop working. THOR2 is aimed at large, high complexity machines with multiple functions.



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### M880 G4S BJ

The M880 G4S BJ Joystick transmitter has been specifically designed for the operator who prefers to maintain the feel of the large joysticks associated with traditional machine control. Supplied with a custom designed carrying harness the control station has the familiar look and feel of a cabin mounted control station coupled with the convenience and added safety features of a wireless control.



### M880 G4 L

The M880 G4 L is a custom built range of radio transmitters for the most complex machines, with practically no limits of commands / controls possible the G4-L can be designed and produced to suit your specific requirements.



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### M880 KRON / ZEUS2 / THOR2 – Standard Features



#### Rechargeable NiMh Batteries

Extractable, rechargeable NiMh batteries for extra long operating duration up to 22 hours continuous use between charges.



#### Status LED's

Coloured LED's report the status of the radio link, battery charge level and error diagnostics



#### PIN Code

Access PIN code can be programmed in to the transmitter to restrict use to authorised personnel



#### Legends

Standard arrow legends or fully customised legends with symbols or text



#### Emergency STOP

Mushroom Head E-Stop button featuring functional safety level PLe/SIL3/Cat4



#### Carrying Strap

Waist belts or shoulder straps are available for all joystick transmitters

### M880 KRON / ZEUS2 / THOR2 – Options



#### Auxilliary commands

All KRON, ZEUS2, THOR2 & G4 joystick transmitters have space available to accommodate additional commands in the form of rotary switches, toggle switches, key switch, pushbutton or potentiometers. The number of commands which can be fitted depends on the transmitter type selected.



#### Load indication LED's

A standard requirement for many crane applications, particularly tower cranes, load indication LED's are a popular option, normally set to indicate 90% & 100% load status.



#### Add Box display

The add box display is available with all ZEUS2 & THOR2 transmitters and can be used to house additional commands or as a display screen to show load & status data received through a digital feedback link from the radio receiver.

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### M880 KRON / ZEUS2 / THOR2 - Options (continued)



#### I-READY Infra Red Start up

An infra-red directional START operation, requires line of site between transmitter and receiver to start the system increasing safety by reducing the possibility of accidental operation.



#### MTRS Multi machine control

Communication between multiple transmitters and receivers allows classic tandem operations such as catch & release and pitch & catch plus many other configurations. Can be combined with our fixed radio to provide crane to crane or machine to machine communication.



#### Tilt Sensor

The Tilt Sensor device is a micro switch within the transmitter which is able to recognise emergency situations caused by dropping or seriously tilting the transmitter, the function of the Tilt Sensor can be customised according to customer requirements and the level of safety required. It can be set to perform a number of actions from the activation of a simple buzzer up to total cut out of the radio transmission.



#### Serial Cable

All of our joystick style transmitters can be equipped with a socket for serial cable connection to the receiver. The direct cable connection from transmitter to receiver overrides the radio transmission thus overcoming any issues of signal noise and allowing use in those areas where radiofrequency transmission is not permitted.



#### Diagnostic Tool

This tool allows you to connect the transmitter or receiver to a PC to undergo status diagnostics. The data can be viewed by means of an easy and intuitive graphical interface, and can be saved to your PC in editable format.

*There are two versions of the tool :*

**Standard** - The transmitter can be connected to the tool only via cable

**Plus** - In addition to cable connection, the device can be connected in wireless mode allowing diagnostics to be carried out without removing the receiver from the crane

#### Double Battery

This feature is available only on the THOR2 transmitter and consists of a twin battery compartment. Once the first battery reaches the 'low power' state the transmitter automatically switches to the second battery. This switch over takes place without interruption to the power supply making it the ideal solution for applications where the radio system has to operate continuously for long periods.

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### M880 Receiving Units



The new range of M880 Radio systems includes a total of four new receiver units, the M880 Lac and Ldc are the most popular and cost effective units, housing a maximum of 20 relays or MOSFETS they are suitable for use with the full range of transmitters and flexible enough to cover the majority of applications.

Where the 20 relays of the type L receiver are not sufficient then the Hac and Hdc receivers come in to their own, configurable with a maximum of 73 relays or MOSFETS there are very few applications that can not be accommodated by a combination of the H receiver and one of our range of radio transmitters.

All receiving units in the M880 range are encased in solid and robust enclosures with a protection rating of IP66 making them suitable for indoor and outdoor use

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## M880 HAC / M880 HDC / M880 LAC / M880 LDC Receivers

### Technical Data

#### M880 HAC / M880 HDC Receivers

Dimensions & weight	M880 HAC / HDC 205 x 130 x 280 (3500g)
Power supply (M880 AC type)	45 - 240 Vac (50-60 Hz)
Absorbed power	45 VA max
Power supply (M880 DC/AC type)	11 - 30 Vdc 24 Vac
Absorbed power	44 W max. 68 VA max
Operating temperature range	-25 to +70°C (-13 to 158° F)
Casing protection	IP66
Safety enable (N/O) relay(s)	8 (ISO 13849-1:2006 6.2.6 architecture)
STOP relays (N/C & N/O)	8 (ISO 13849-1:2006 6.2.7 architecture)
Timed relay	1
Horn output	1
Feedback	
Serial LCD data	> 100 Bytes/sec
Digital ON/OFF commands	128 max.
Diagnostics	By means of status LED/display or through interface to PC using specific IMET equipment
Analogue inputs	12 Voltage (0 - 10VDC) Current (4/20mA, 0/20 mA)
Digital inputs	8 0/24 VDC optoisolated
Outputs	
Max number of control relays	
Max number of control relays (N-O/N-C)	ON/OFF - 128 max relay (AC or DC) or MOSFET (DC) ANALOGUE 32 max
Serial communication interfaces	(Proportional PWM/Analogue current/Analogue voltage) RS232 or RS485 (max 115200 Baud) CAN_Bus (ID 11-29 Bit) {1 Mbit/s max} CANOpen (ID 11-29 Bit) {1 Mbit/s max} Other types on request

#### M880 LAC / M880 LDC Receivers

Dimensions & weight	M880 LAC / LDC 140 x 65 x 230mm (1700g)
Power supply (M880 LAC type)	24-55 Vac / 100-240 Vac (50-60 Hz)
Absorbed power	30 VA max
Power supply (M880 LDC type)	11 - 30 Vdc
Absorbed power	22 W max
Operating temperature range	-25 to +60°C (-13 to 140° F)
Casing protection	IP66
Safety enable (N/O) relay(s)	1 (ISO 13849-1:2006 6.2.6 architecture)
STOP relays (N/C & N/O)	2 (ISO 13849-1:2006 6.2.7 architecture)
Timed relay	1
Horn output	1
Feedback	
Serial LCD data	> 100 Bytes/sec
Digital ON/OFF commands	128 max.
Diagnostics	By means of status LED/display or through interface to PC using specific IMET equipment
Analogue inputs	4 Voltage (0 - 10VDC) Current (4/20mA, 0/20 mA)
Digital inputs	8 0/24 VDC optoisolated
Outputs	
Max number of control relays	20
Max number of control relays (N-O/N-C)	4 (with relay board mods RLC) 14 (with relay board mods RDC)
Max number of service relays	3 (start, klaxon and t-relay)
Max number of DC command drivers	20 (MOSFET)
Number of analogue outputs	8 proportional (PWM) analogue current and/or voltage
Serial communication interfaces	RS232 (max 115200 Baud) CAN_Bus (ID 11-29 Bit) {1 Mbit/s max} CANOpen (ID11-29 Bit) {1 Mbit/s max}

#### KRON, ZEUS2, THOR2, AREAS2, G4L & G4S Joystick Transmitters

	KRON	ZEUS2	THOR2	ARES2	G4L	G4S
Dimensions	180x107x160mm	205x150x150mm	295x180x160mm	143x80x143mm	430x225x180mm	265x185x165mm
Dimensions with LCD display		205x205x150mm	295x250x165mm			
Weight (inc. battery)	880g max	1450g max	2300g max	667g max	4000g max	1950g max
Power supply				3.6 VDC		
Battery				Ni - MH 3.6V		
Low battery notification time				15 minutes		
Operating temperature range				-25 to 55°C (-13 to +131° F)		
Casing protection				IP65		
Safety categories ISO 13849-1				STOP circuit PLc Cat4 ISO 13849-1:2006 6.2.7 architecture with 5A fuse Joysticks PLd Cat3 ISO 13849-1:2006 6.2.7 architecture with 5A fuse Push button and toggle switch commands PLc Cat2 ISO 13849-1:2006 6.2.7 architecture		
Status indicator/diagnostic LEDs				Green - power ON Yellow - diagnostic Blue - LINK status		
Commands/outputs				56 maximum		
Number of panel indicators				16 maximum		
Number of ON/OFF commands				56 maximum		
Number of analogue commands				16 (19) maximum		
Max UMFS commands up to PLd Cat3				16 (ISO 13849-1:2006 6.2.6 architecture)		
Display (optional extra)				Graphic backlight LCD 102x64 / 128x64 / 160x64 pixels monochrome QVGA 3.5" colour TFT		
Beeper in transmitter				Internal buzzer		
Backlit panel				Optional		
Serial lines				RS232 or RS485 CAN		
Optional extras				Wired control cable Dead man function IREADY infra red start up		