Remote Radio Control
M880 WAVE2 Push Button Radio Control

Application
Push Button Radio Remote Controls offer a competitive solution for the control of many different types of machines where a high level of safety is required, including electric hoists, overhead cranes, tower cranes, concrete pumps, sewer cleaners, vacuum pumps and many others. The lightweight and easy to use M880WAVE2 radio transmitters enable safe and secure operation of all these machines by allowing the operator to move freely around the work site and carry out his operations from the safest and most convenient location.

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

Large push buttons – extra large push buttons on all WAVE2 transmitters for ease of use even when wearing industrial gloves.

Extreme Environments – Transmitters & 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.

Certified Safety – The STOP circuit on all M880 units complies with the highest European and International standards (ISO13849–1 PLe / SIL3 / Cat 4).

M880 WAVE2 Transmitter Range

The WAVE2 Transmitter is available in two sizes, WAVE2 S with 4, 6 or 8 functions + start + E–Stop, and WAVE2 L which features 10 or 12 functions + start + E–Stop.

M880 WAVE2 S
The M880 WAVE2 S transmitter has been introduced to build on the huge success of its predecessor, the M550 WAVE S and is the ideal solution for control of a wide range of industrial equipment and machinery. The function buttons (4,6 or 8) are all double pressure as standard, in addition a green start button and red, mushroom head E–Stop button are fitted as standard.

M880 WAVE2 L
The M880 WAVE2 L transmitter increases the possibilities of the smaller WAVE2 S with additional function buttons. WAVE2 L is available with either 10 or 12 double pressure buttons in addition to the standard start and E–Stop buttons.

Other standard features on all WAVE2 transmitters include LEDs to report on status of radio link and battery condition, these LEDs are also used to transmit error codes for fault diagnosis enabling us to help get you working again quickly in the unlikely event of a system failure.

Please see the following pages for more information on standard and optional features on M880 WAVE2 radio transmitters.
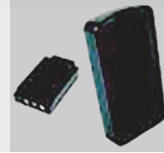
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M880 WAVE2 Standard Features

Extractable Li–ion Battery + Charger
Fast charger with extractable rechargeable Li–ion batteries for extra long operating duration with up to 22 hours continuous use between charges

Status LEDs
Coloured LEDs report the status of the radio link, battery charge level and error diagnostics.
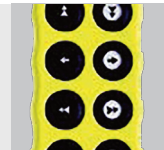
Pin Code
Access PIN code can be programmed into the transmitter to restrict the use to authorised personnel.

Legends
Large, clear push button legends with the possibility of fully customsed symbols or text.

Emergency Stop
Mushroom head E–STOP button featuring functional safety level PLe/SIL3/Cat4.
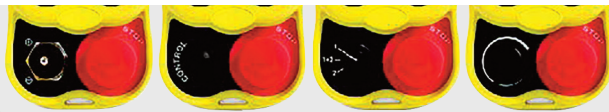
Carrying Strap
Comfortable carrying straps are fitted to all WAVE2 transmitters.

M880 WAVE2 Options

Auxiliary Command
In addition to the standard function buttons, all M880 WAVE2 transmitters have space for an additional auxiliary command (rotary switch, toggle switch, key switch, push button or potentiometer).

Keypad Illumination
Keypad illumination for use in the darkness , can be combined with a light sensor for automatic activation. Can also be used as a torch.
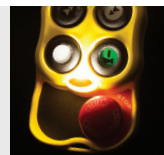
I–READY Infra Red Start up
An infra–red directional START operation, requires line of site between transmitter and receiver to start the system increasing safety by reducing the possibility of accidental operation.

iREaDy

Sleeve
Protection sleeve for extreme working conditions.

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M880 WAVE2 Options (continued)

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

Diagnostic Tool
Allows cable connection from transmitter to receiver overriding radio for situations where radio transmission is not allowed. Data can be viewed and saved ona PC in editable format. Available in 2 versions: cable connection only and wireless connection.

Data Feedback
Data feedback with 64 x 102 pixel graphic display and 4 LED's.

Enabling Switch
An additional safety feature for hazardous environments which must be activated by the operator before the transmitter becomes active.

Batteries & Battery Chargers

Rechargeable Li–ion Batteries
The M880 WAVE2 Transmitters benefit from the latest battery technology with 3.7V Li–ion batteries providing up to 22 hours continuous use from a single charge. All new systems are supplied c/w 2 batteries and battery charger.
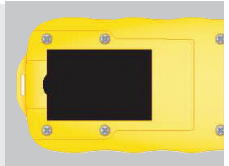
Battery Chargers
Battery chargers are available for 110V or 240V AC and 11–30V DC and can deliver a full charge to the batttery in 2 hours 45 minutes. DC chargers are also available with a 'cigarette lighter' style plug for in–vehicle charging.

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Remote Radio Control
M880 WAVE2 Push Button Radio Control

Technical Data

M880 Transmitting Units

Power supply	3,7VDC with Li–ion battery
Frequency band	433.05 – 434.79 MHz (69 channels)
	2,4GHz (16 channels)
Range	100 meters
Autonomy with fully charged battery (20°C ie 68°F)	≈ 25 hours with Li–ion battery
Safety performance STOP function (EN ISO 13849–1)[a]	PL e
Protection degree	IP65 (NEMA 4)
Operating and storage temperature	Operating –25°C ÷ +55°C
	Storage –40°C ÷ +85°C
Dimensions	S 72 x 42 x 190mm, L 72 x 42 x 255mm
Weight	≈ 0.235 Kg, ≈ 0,315Kg

[a] depends on the configuration

M880 Battery Chargers

	CB3722
Supply Voltage (AC)	110 / 240v AC
Supply Voltage (DC)	11–30Vdc
Absorption	300mA max
Battery Type	Li–ion 3.7V
Charging Current	640mA
Max Charging Time	2 hrs 45 mins
Recommended Charging Temp	0– +35 deg C
Dimesions	130x70x25mm
Weight	110g
Degree of Protection	IP20

Compliance to Standard

IEC/EN 60950–1	EN 301 489–1	EN 301 489–1
EN 50371	EN 301 489–3	EN 301 489–3
EN 60204–32	EN 300 220–1	EN 300 220–1
EN 60529 1991+A1	EN 300 220–2	EN 300 220–2
ISO 13849–1	1999/5/CE (Directive R&TTE)	1999/5/CE (Directive R&TTE)
EN 13557/A2	2006/42/CE (Directive R&TTE)	2006/42/CE (Directive R&TTE)
EN 61000–6–2	RED Directive (2014/53/EU)	RED Directive (2014/53/EU)

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Remote Radio Control
M880 Radio Receivers

Receiver M880 S

The **Receiver S**, thanks to its minimum size
(127 x 70 147mm), can be installed in small spaces.

Technical Data

	M880 S AC	M880 S DC Harting Conector PCB415	M880 S DC DEUSCH connector PCB410
Supply voltage	24Vac (50–60HZ) 11÷30 Vdc (24 – 240V optional)	11÷30 Vdc	11÷30 Vdc
Safety control	1 safety–enable relay, 2 Stop relays	1 safety–enable relay, 2 Stop relays	1 safety–enable relay, 2 Stop relays
Max. no. of ON/OFF controls	14 relays ISO 13849–1:2006 6.2.7 architecture (PLe Cat 4)	Up to 14 MOSFET ISO 13849–1:2006 6.2.7 architecture (PLe Cat 4)	8 MOSFET ISO 13849–1:2006 6.2.7 architecture (PLe Cat 4)
	or	or	or
2 STOP relays	ISO 13849–1:2006 6.2.6 architecture (PLC Cat 1) (excluding ARES2 C) (excluding WAVE2 C)	ISO 13849–1:2006 6.2.6 architecture (PLC Cat 1) (excluding ARES2 C) (excluding WAVE2 C)	ISO 13849–1:2006 6.2.6 architecture (PLC Cat 1) (excluding ARES2 C) (excluding WAVE2 C)
Max. no. of analog controls	N.D.	4	N.D.
Service commands	Start, Horn	Start, Horn	Start, Horn,
Serial ports	N.D.	CAN, RS232, RS485	CAN, RS232, RS485
Analog commands	N.D.	0÷20mA, 4÷20mA, 0Vdc – (Vdc–3) with N.D. Vccmax=28Vdc, 0 ÷ ±10Vdc PWM 0÷1,4A (F=40÷150Hz F=200÷600Hz; F=600÷1000Hz), 25%–50%–75% Vcc	

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Remote Radio Control
M880 Radio Receivers

RECEIVING UNIT MODEL	M880 **S** AC	M880 **S** DC Harting Conector PCB415	M880 **S** DC DEUSCH connector PCB410
Operating temperature	–25°C ÷ +70°C	–25°C ÷ +70°C	–25°C ÷ +70°C
Storage temperature	–40°C ÷ +85°C	–40°C ÷ +85°C	–40°C ÷ +85°C
Size (L x P x A)	127 x 70 x 147 mm	127 x 70 x 147 mm	127 x 70 x 147 mm
Weight	630 g	630 g	630 g
Serial cable between TX and RX	YES *	YES	YES *
Integrated blinklight	YES	NO	NO
External antenna	YES **	YES **	NO
Protection class	IP 66	IP 66	IP 66

*   If DEUSCH no serial cable
** If Harting or DEUSCH no external antenna

Receiver M880 L

Thanks to its compact size and extreme versatility, the
M880 L receiver is perfect for a wide range of on/off applications in AC and DC, as well as for standard proportional applications in DC, such as hydraulic cranes. It may be installed on the machine in an easy and non–invasive way.

Technical Data

RECEIVING UNIT MODEL	M880 L AC	M880 L DC
Supply voltage	24÷240Vac (50–60Hz), 30VA, max 1.2A @24Vac	11÷30Vdc, max 2A @11Vdc
Safety controls	Safety–enable relay, 2 Stop relays	Safety–enable relay, 2 Stop relays
Max. no. of ON/OFF controls	20 relays or MOSFET	20 relays or MOSFET
Mx. no. of analog controls	8	8
Service commands	Start, Horn, Timed–relay	Start, Horn, Timed–relay
2 STOP relays	ISO 13849–1:2006 6.2.7 architecture (excluding ARES2 C) (excluding WAVE2 C)	ISO 13849–1:2006 6.2.7 architecture C) (excluding WAVE2 C)
Input port	CAN, Serial	CAN, Serial
Proportional commands	N.A.	0÷20mA, 4÷20mA, 0Vdc – (Vdc–3) with Vccmax=28Vdc, 0 ÷ 310Vdc PWM 0÷1,4A (F=40÷150Hz; F=200÷600Hz; F=600÷1000Hz), 25%–50%–75% Vcc
Proportional commands	CAN (ID 11–29 bit) CANOpen (ID 11–29 bit) RS232/RS485	CAN (ID 11–29 bit) CANOpen (ID 11–29 bit) RS232/RS485
Operating temperature	–25°C ÷ +70°C	–25°C ÷ +70°C
Storage temperature	–40°C ÷ +85°C	–40°C ÷ +85°C
Size (L x P x A)	145 x 65 x 230 mm	145 x 65 x 230 mm
Protection class	IP66	IP66

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Remote Radio Control
M880 Radio Receivers

Receiver M880 H

The **M880 H receiver** can be paired with transmitting units that require executing a significant number and variety of commands.
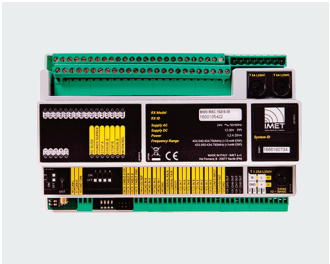
Technical Data

RECEIVING UNIT MODEL	M880 H AC	M880 H DC
Supply voltage	24Vac (50–60Hz), 68VA, max 2.8A	11÷30Vdc, max 4A @11Vdc, 44W
	45÷240Vac (50–60Hz), 45VA, max 1,1A @45Vac	
Safety control	Up to 6 safety–enable relays, 2 Stop relays	Up to 6 safety–enable relays, 2 Stop relays
Max. no. of ON/OFF controls	73 relays or MOSFET	73 relays or MOSFET
Max. no. of analog controls	32	32
Service commands	Start, Horn, Timed–relay	Start, Horn, Timed–relay
2 STOP relays	ISO 13849–1:2006 6.2.7 architecture	ISO 13849–1:2006 6.2.7 architecture
	(excluding ARES2 C) (excluding WAVE 2C)	(excluding ARES2 C) (excluding WAVE 2C)
Input port	CAN, Serial	CAN, Serial
Proportional commands	N.A.	0÷20mA, 4÷20mA, 0Vdc – (Vdc–3)
		with Vccmax=28Vdc, 0 ÷ 310Vdc
		PWM 0÷1,4A (F=40÷150Hz; F=200÷600Hz;
		F=600÷1000Hz), 25%–50%–75% Vcc
Communication protocols	CAN (ID 11–29 bit)	CAN (ID 11–29 bit)
	CANOpen (ID 11–29 bit)	CANOpen (ID 11–29 bit)
	RS232/RS485	RS232/RS485
Operating temperature	–25°C ÷ +70°C	–25°C ÷ +70°C
Storage temperature	–40°C ÷ +85°C	–40°C ÷ +85°C
Size (L x P x A)	205 x 130 x 280 mm	205 x 130 x 280 mm
Protection class	IP66	IP66

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Remote Radio Control
M880 Radio Receivers

Receiver M880 **M** AC

Thanks to its compact size and extreme versatility, the **M880 L receiver** is perfect for a wide range of on/off applications in AC and DC, as well as for standard proportional applications in DC, such as hydraulic cranes.
It may be installed on the machine in an easy and non–invasive way.

Technical Data

RECEIVING UNIT MODEL	M880 M AC
Supply voltage	MAC:12–30 Vdc / 24 Vac (50–60 Hz)
Safety controls	2 STOP, 1 Safety–Enable
Max. no. of ON/OFF controls	24 relays (20 N.O: and 4 N.C. /N.O.)
Max. no. of analog controls	4
Service commands	Start, Lamp, (Between 24 relays)
2 STOP relays	ISO 13849–1:2006 6.2.7 architecture
	n(excluding ARES2 C) (excluding WAVE2 C)
Input port	CAN, Serial 232, 485
Proportional commands	0÷20mA, 4÷20mA, 0Vdc – (Vdc–3) with Vccmax=28Vdc,
	0 ÷ 310Vdc
	25%–50%–75% Vcc
Communication protocols	CAN (ID 11–29 bit)
	CANOpen (ID 11–29 bit)
	RS232/RS485
Operating temperature	–25°C ÷ +70°C
Storage temperature	–40°C ÷ +85°C
Size (L x P x A)	180 x 73 x 120 mm
Protection class	IP20

ATEX Certified Receiving Unit

Device of group II. Device designed for environments in which explosive atmospheres may occur;
High protection level: category 2. Intended for use in enviroments in which explosive atmospheres may occur due to gases, vapours, mists or ir and dust mixtures;
Protection system for potentially explosive gases and dusts. The device remains powered and keeps operating in zones 1, 2 (G) e 21, 22 (D);
Explosion–proof housing;
Temperature class 85°C;
Fully protected against dust and powerful water jets (IP66);
Case equipped with a 1" IOS7/1RC and ¾" IOS7/1RC barrier for reinforced cables with specifications: ATEX Ex ll2GD Exd ll C IP 66;
Operating radious 70 m without obstacles.

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