USER MANUAL

Installation instructions

M series with receiver RELAY output model HML for

TOWER CRANES

JM200202PE-HML

Index

Warnings

Carefully read the instructions contained in this manual before proceeding with the installation and use of radio control.
Failure to follow the procedures described in this manual, it may cause damage to people and property. Do not use the transmitter as spare parts for other remote controls.
It is recommended to comply with the laws in force concerning safety and prevention of accidents at work. It 'also need to always observe all applicable regulations regarding the use of the remote control of industrial machinery.

TER is not responsible for the application and use of the remote control outside the regulations.

Risk analysis

Qualified personnel, should carry out a thorough risk assessment of the machine connected to the transmitter assuming full responsibility.
TER, disclaims any liability arising from an erroneous assessment of the risks.
Any loss of communication between the transmitter and receiver caused by noise or interference, must determine the automatic shutdown of the remote control as required by clause **9.2.7.3 EN 60204-32**. Therefore, in the case in which this condition occurs, it is necessary to perform a new start-up procedure of the remote control and the machine connected to it.

Applications

The remote control system is widely used in the lifting and transport sector at the edge of building cranes, hoists, cranes, concrete pumps, etc.
However, you can also use it for many other applications, as long as they are always observe the safety conditions described in this chapter.
The remote control can only be used in the presence of suitable electrical and climatic conditions, as specified in this manual. It's also strictly prohibited to use the remote control in explosive environments or that require explosion-proof features.

The appliance installation, must be performed by qualified personnel according to the applicable regulations.

Preventive maintenance

Before proceeding with any maintenance, power down both receiver and equipped machine and remove the batteries from the transmitter.

- Do not expose to heat sources
- Do not expose directly to the sun for long periods
- Do not soak in the water
- Do not wash with high pressure jets
- Avoid contact with oils or solvents
- In case of opening, reclose the casing paying particular attention to the gasket sealing

In order to keep the device in conditions of maximum efficiency and safety, it's necessary to periodically perform cleaning and control operations. Clean using a simple brush and a damp cloth and avoid the use of alcohol, solvents or harsh cleaners which may damage the casing itself.

Periodic maintenance by the user

Periodically clean the outside of the transmitter in order to avoid build up of debris or dirt may impede the smooth operation of buttons.

Check with particular attention to the functionality of the STOP button.

Remove any oxide from the contacts of the batteries and check that the constituent parts of the radio control (casing, buttons, etc..) for cracks or other signs of breakage and failure. Also check all the rubber parts such as buttons, gaskets and bellows for cracks or tears.

In case of damage of one or more constituent parts of the appliance, it's necessary to proceed to their replacement in a timely manner so as to prevent the penetration of liquids or substances could impair the safety and the good functioning.

Periodic maintenance by qualified personnel

After about a year of use, the unit must undergo a general inspection by technicians who will perform the following steps, **paying special attention not to come into contact with live parts of the receiving unit**:

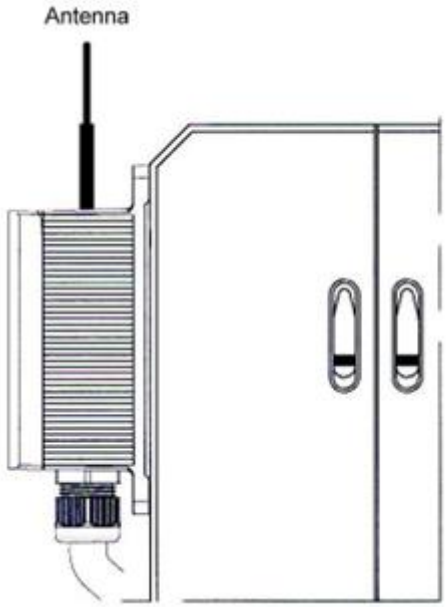
- Check the tightness of the seals of transmitter and receiver casing
- Check the tightness of cable glands
- Check fixing screws and tightness of terminals and connectors
- Check mounting of the electronic boards and various components
- Remove any traces of dirt and moisture inside the enclosures
- Check the operation of all controls
- Verify proper operation of the STOP circuit (by pressing the STOP button, the STOP relays in the receiver will be deactivated)
- Replacement of any faulty or damaged parts with original parts, so as not to affect the characteristics of safety and the proper functioning of the device

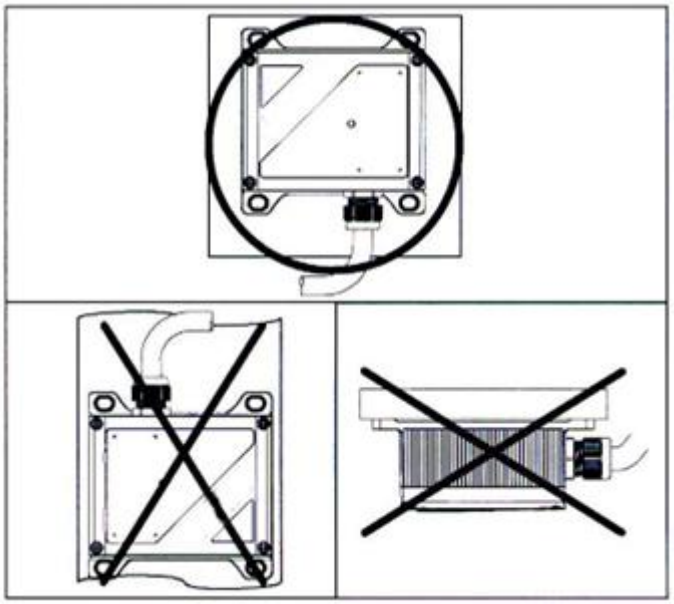
Pay particular attention to the closing of the transmitter housing, in order to avoid the risk of possible ingress of dust or moisture.

Radio control installation

The installation of the radio control, must be carried out only by qualified personnel.

The receiving unit, must be positioned so that the antenna is visible from the area where the transmitter is used and in a place free from electromagnetic shielding.
it's advisable to avoid the installation of the receiver on metallic surfaces that may reduce the operating range of the device.
Do not attempt to bypass the security systems of the machine equipped with the remote control and follow all instructions provided by the manufacturer thereof.
Do not install the receiver unit in position too high relative to the ground (10 or 20m) in order to prevent that reception of environmental radio signals, could compromise the correct operation of the appliance.
Install the receiver in vertical position and with the cable facing downwards so as to prevent any water infiltration.
In the presence of strong vibrations, install the receiver using the appropriate anti-vibration mounts.





Electrical connection of the receiver

Make sure that during installation, the receiver and the machine connected to it, remain unpowered.
The power supply of the receiver, must be taken downstream of the main switch of the machine.

It's forbidden to connect the power supply of the receiver, directly to the distribution network and the main disconnect switch, must be provided with a suitable device (padlock) to prevent unauthorized power-on.

The electrical connection between receiver and machine, must be removable and in case of direct connection to the terminal block on the remote control, it must be employed a connector that allows if necessary, to quickly disconnect the remote control and use a corded pendant station. The wiring of the receiver, shall comply with the EN60204 standard and wires used must be self-extinguishing with a minimum section of 0,50/0,75 sq. mm. Pay attention to the supply voltage of the receiver and verify the correspondence between the controls on the transmitter and the outputs on the receiver.
Once the wiring of the receiver has been completed, check the real correspondence between the pushbuttons on the transmitter and the various functions of the machine.

Also check the operation of the circuit STOP: Pressing the button on the transmitter, verify that the opening of the contacts of the 2 STOP relay in the receiver.

Proceed with the compilation of the wiring board, indicating the correspondence between the outputs of the receiver and the related machine controls.

Transmitter description

Front view

Symbol legend

1 – J1 Joystick 5x5 steps TROLLEY / SLEWING
2 – J2 Joystick 5 steps HOIST
3 – START pushbutton
4 – Stop EMERGENCY Pushbutton
5 – Selection LIFTING ROPE 2 or 4
6 – Selection work with second TROLLEY joynted
7 – control Slewing Brake manual

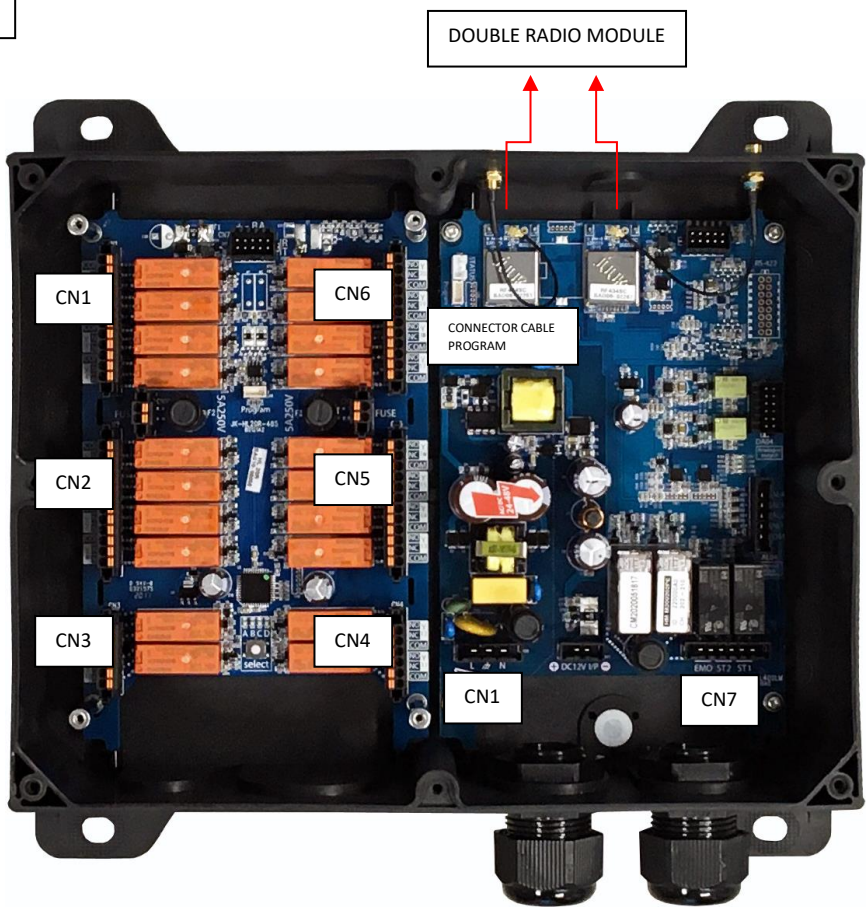
8 – Auxiliary pushbutton (free)
9 – Feed Back LED
10 – Feed Back LED
11 – Battery STATUS
12 – Remote Control STATUS LED
13 – Anomaly LED
14 – Symbol TROLLEY / SLEWING control
15 – Symbol HOIST Control

Receiver description

Before removing the cover of the receiver to do any work, first make sure you have unplugged the power cord.

WARNING ! Relay on receiver board are named with K (coil relai). For every K relay there is an Y number contact as wiring diagram of this manual.

HML - type Receiver LAY-OUT and size



LEFT BOARD

CN1 = CONNECTOR PUSH-IN RELAY CONTACT Y1 – Y2 – Y3 – Y4
CN2 = CONNECTOR PUSH-IN RELAY CONTACT Y5 – Y6 – Y7 – Y8
CN3 = CONNECTOR PUSH-IN RELAY CONTACT Y9 – Y10
CN4 = CONNECTOR PUSH-IN RELAY CONTACT Y11 – Y12
CN5 = CONNECTOR PUSH-IN RELAY CONTACT Y13 – Y14 – Y15 – Y16
CN6 = CONNECTOR PUSH-IN RELAY CONTACT Y17 – Y18 – Y19 – Y20

RIGHT BOARD

CN1 = CONNECTOR PUSH-IN POWER SUPPLY 24/48 Vac/dc
CN7 = CONNECTOR PUSH-IN RELAY CONTACT EMO – ST2 – ST1
Emergency – Start 1 – Start 2

Overall size:

Width	273 mm
Height	259 mm
Depth	90 mm

Distance between mounting brackets:

Width	230 mm
Height	240 mm

HML type receiver connection output relay contact & function

FUNCTIONS REFER TO PAGE 8 LAY-OUT TRANSMITTER CONSOLE

LEFT BOARD			
CN	Relay Contact	Function	No. Part Transmitter Lay-Out Reference
CN1	Y1	UP 1ST SPEED	2 – HOIST
CN1	Y2	DOWN 1ST SPEED	2 – HOIST
CN1	Y3	UP/DOWN 2ND SPEED	2 – HOIST
CN1	Y4	UP/DOWN 3RD SPEED	2 – HOIST
CN2	Y5	UP/DOWN 4TH SPEED	2 – HOIST
CN2	Y6	UP/DOWN 5TH SPEED	2 – HOIST
CN2	Y7	LEFT 1ST SPEED	1 – SLEWING
CN2	Y8	RIGHT 1ST SPEED	1 – SLEWING
CN3	Y9	LEFT/RIGHT 2ND SPEED	1 – SLEWING
CN3	Y10	LEFT/RIGHT 3RD SPEED	1 – SLEWING
CN4	Y11	LEFT/RIGHT 4TH SPEED	1 – SLEWING
CN4	Y12	FORWARD 1ST SPEED	1 – TROLLEY
CN5	Y13	BACKWARD 1ST SPEED	1 – TROLLEY
CN5	Y14	FORW./BACK. 2ND SPEED	1 – TROLLEY
CN5	Y15	FORW./BACK. 3RD SPEED	1 – TROLLEY
CN5	Y16	FORW./BACK. 4TH SPEED	1 – TROLLEY
CN6	Y17	ROPE II/IV	5 – HOIST
CN6	Y18	second TROLLEY joynted	6 – TROLLEY
CN6	Y19	BRAKE	7 – SLEWING
CN6	Y20	AUXILIARY	8

RIGHT BOARD			
CN	Relay Contact	Function	No. Part Transmitter Lay-Out Reference
CN7	EMO	STOP EMERGENCY	4
CN7	ST2	START 1	3
CN7	ST2	START 2	3
CN	NAME	FUNCTION	VOLTAGE
CN1	L	POWER SUPPLY	24/48 Vac/dc
CN1	⏚	GND	
CN1	N	POWER SUPPLY	24/48 Vac/dc

FEED-BACK LED REFERENCE			
LED No.	Relay Contact	Function	No. Part Transmitter Lay-Out Reference
1	Y17	ROPE II/IV	9
2	Y18	second TROLLEY joynted	9
3	Y19	SLEWING BRAKE	9
4	Y20	AUXILIARY	9
5	FREE	FREE	9
6	FREE	FREE	9
Symbol Battery	NONE	Battery STATUS	11
Green / Red colour	NONE	Remote Control STATUS LED	12
Symbol Warning	NONE	Anomaly LED	13
7	FREE	FREE	10
8	FREE	FREE	10
9	FREE	FREE	10
10	FREE	FREE	10
11	FREE	FREE	10
12	FREE	FREE	10

RELAY CONTACT

Every relay from Y1 to Y20 has *"dry contact"* NO/NC with common.

User information

For a correct use of the radio remote control, you must observe the following basic rules for safety at work.

- The remote control should be used only by operators who are perfectly familiar with the operation of the equipment and machinery attached to it.
- Never operate the transmitter without having the visual of the machine controlled by the remote control.
- Once you have finished using the device even for short periods, it's necessary to turn off the transmitter and keep it in a place inaccessible to unauthorized personnel.

Start-up procedure

- With the STOP button pressed, remove the back cover of the transmitter and insert 4 RECHARGEABLE AA batteries in the battery compartment according to the polarity indicated.
- As soon as the batteries are inserted, all LEDs present on the front of the transmitter, will turn on a few second which indicate proper operation.
- Power up the receiver and the machine connected to it.
- As soon as the receiver is powered, its LED indicator will turn on RED fix and then will flash GREEN once the transmitter will not START.
- Now releasing the STOP button (a buzzer will emit sound) and then pressing the START button, the remote control turns on and while the LED on the receiver remains on, the status LED on the transmitter will blink slowly.
- In case of malfunction due to electromagnetic interference, the LED on the receiver will blink red in rapid succession.

Switch-off procedure

- Pressing the red mushroom button, you will get an immediate opening of the STOP circuit on the receiver and at the same time, all active commands will be disabled. Transmitter will emit Sound buzzer.
- When not in use, the remote control will remain active (without sleep), or there is the option to set a delay time to sleep, selectable in 1, 2, 3, 5, 10, 30, 45 minutes, never stop.

HML - RECEIVER

Frequency	433.0525 > 434.7775 MHz
Modulation method	4GFSK
Sensitivity	-112dBm at 1,2Kbps
Control system	PLL
Antenna impedance	50 ohm
Commands response time	50 > 100mS
Power supply	90-460Vac
Antenna	External
Standby current consumption	16mA at 220Vac
Emission power	+ 10dBm
Operating temperature	-10°C > +75°C
Relays	2 stop + 13 function (1 N.O. 5A 250Vac)
Dimensions	H190xW184xD64 (mm)
Weight	1795g
Housing	Nylon and glass fiber IP65

Warranty and service

The radio remote control is guaranteed 12 months (twelve) with extension to an additional 24 months for electronic parts that may be defective in manufacture from the date of purchase shown on the invoice on which must be clearly marked model and serial number of the system. Juuko Italy guarantees the product against manufacturing defects, therefore, all the components which in our sole discretion present anomalies of construction, will be replaced at no charge to the customer. However, it's absolutely ruled out the complete replacement of the device. The repair will be performed at our service center where the equipment must be received without any charge to us regarding transport costs or other incidental expenses. Should it be necessary the intervention of one of our technicians at the place of installation of the system, the replacement of defective parts and related labor will be done under warranty and all expenses incurred, will be borne by the customer. The warranty does not apply to loss or damage during transport and it also does not cover damage caused by misuse, improper installation, improper power supply or static electricity discharges.
The warranty expires when the unit is tampered or repaired by unauthorized personnel, and also does not include consumable parts and accessory such as batteries, signaling devices, antennas and external connectors. Juuko Italy assumes no responsibility for damage caused by the equipment to persons or property, therefore, is not subject to possible claims for damages. However in case of any disputes, the court of jurisdiction is the **Foro di Novara** (Novara, Italy).

The warranty does not cover
- Faults resulting from normal wear
- Consumable Parts
- Products that have been subject to unauthorized changes
- Faults resulting from improper installation or use
- Damage due to moisture, water, or external events

Repair and maintenance
- Repairs and maintenance must be performed by qualified personnel
- Use only original Juuko spare parts
- Contact your dealer for service or maintenance needs
- Store in a clean, dry place
- Keep the battery contacts clean
- Remove dust and dirt with a clean, damp cloth

Keep this manual and certificate of conformity issued which shall contain the number and serial number of the product.

DECLARATION OF CONFORMITY

CERTIFICATE OF COMPLIANCE WITH TECHNICAL, FUNCTIONAL AND SAFETY STANDARDS

The producer: JUUKO INDUSTRIAL RADIO REMOTE CONTROL SHUN HU TECNOLOGY CO. LTD	No.21, Zhonggoong Rd., Xihu Township, Changhua County 514, Taiwan	CE 0560
The distributor: JUUKO ITALY INDUSTRIAL RADIO REMOTE CONTROL	Via don Signini 43 28010 – Briga Novarese (NO) ITALY	Tax code/VAT No. IT01179050032 Comm. register 01179050032 C.O.C. of NOVARA 154120

JM SERIES RADIO REMOTE CONTROL Which consider in the set Transmitter Unit and Receiver Unit that work together in dual transmission.

Transmitter unit: **M200202PE**

Receiver unit list: **HML**

It's suitable to be installed on machines or other equipment conforming to the **"Directive 2006/42/EC"** and complies with the technical requirements of the standards and specifications listed below:

Essential requirement	**Regulation / Standard applied**	**Result**
Machinery Directive	2006/42/EC (revisione della 98/37/EC)	compliant
Low Voltage Equipment Directive	2014/35/UE	compliant
Electromagnetic Compatibility Directive	ETSI - EN 301 489-1: V.1.9.2, EN 301 489-3: V.1.4.1 and 2014/30/UE	compliant
Radio Equipment Directive	ETSI - EN 300 220-1: V.2.4.1 - EN 300 220-2: V.2.4.1 e 1999/5/EC	compliant
Electromagnetic Compatibility Directives	EN55022/2010 – EN61000-3-2:2006+A1:2009+A2:2009 EN61000-3-3:2006 / EN61000-4-2:2009 EN61000-4-3:2006+A1:2008+A2:2010 EN61000-4-4:2004+A1:2010 EN61000-4-5:2006 / EN61000-4-6:2009 EN61000-4-11:2004	compliant

This declaration of conformity is also compliant with the under-reported harmonized directives:

Essential requirement	**Regulation / Standard applied**	**Result**
Cranes – Control	EN 13557/2003 (31/12/2005)	Compliant
Safety of Machinery	IEC 60950-1/2006 + A11:2009 + A1:2010 + A12:2011 EN ISO 13849-1/2006 Category 4 for STOP circuit – Category 3 for control circuit	Compliant
Safety of Machinery Electrical equipment	EN60204-1/2006	Compliant
Safety of Machinery Electrical equip. for Cranes	EN60204-32/1998	Compliant

SAFETY FUNCTION PERFORMANCE LEVEL ACCORDING TO EN 13849-1:2008	**PL** **d**	EMERGENCY STOP FUNCTION: EMERGENCY STOP CONTROL FOR SAFE STOP OF ALL MOTOR

DECLARATION OF CONFORMITY

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Transmitter unit list: **JM200202PE**

Receiver unit list: **HML**

Produced in the year:	*Model:*	*Serial Number:*

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Low Voltage Equipment Directive	2014/35/UE	compliant
Electromagnetic Compatibility Directive	ETSI - EN 301 489-1: V.1.9.2, EN 301 489-3: V.1.4.1 e 2014/30/UE	compliant
Radio Equipment Directive	ETSI - EN 300 220-1: V.2.3.1 - EN 300 220-2: V.2.3.1 e 1999/5/EC	compliant
Electromagnetic Compatibility Directives	EN55022/2010 – EN61000-3-2:2006+A1:2009+A2:2009 EN61000-3-3:2006 EN61000-4-2:2009 EN61000-4-3:2006+A1:2008+A2:2010 EN61000-4-4:2004+A1:2010 EN61000-4-5:2006 EN61000-4-6:2009 EN61000-4-11:2004	compliant

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Safety of Machinery	IEC 60950-1/2001 and EN ISO 13849-1/2006 Category 4 for STOP circuit – Category 3 for control circuit	Compliant
Safety of Machinery Electrical equipment	EN60204-1/2006	Compliant
Safety of Machinery Electrical equip. for Cranes	EN60204-32/1998	Compliant

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