SIST&MATICA

FreeHand

User's Manual

REV 1.0	24/07/00

LIST OF CONTENTS

1. GENERAL DESCRIPTION OF THE PRODUCT

FreeHand is the remotely-operated radio control switch, which permits to control, with or wireless and in an ergonomic manner, the moving functions of electrically-operated machines or devices.

FreeHand is a flexible electronic system; it consists of a Radio control with handle and lever-switches, and a Receiver Unit, suitable to specific operation requirements; it substitutes or integrates the traditional control systems, electric or hydraulics.

A version with proportional control is available; by means of a trigger placed on the handle of the radio control, the control strength applied to the proportional element placed downstream the directional parts, may be adjusted, while the machine components are handled at the wanted speed.

The electronics of the proportional control permits to directly control the proportional valve, thus removing any need for further control cards.

- Microprocessor electronics both on the Radio Control and on the Receiver Unit;
- Paneuropean working frequency: 433.92 MHz;
- No control relay, rather utilization of steady-state devices capable to protect the electronics in case of breakdown of the part to be controlled;
- Direct connection to the solenoid valves;
- Built-in circulation diodes;
- Protection against polarity reversal;
- Power supply:
- Radio control: 4.8 Volt rechargeble battery;
- Receiver unit: 12/24 Volts d.c.

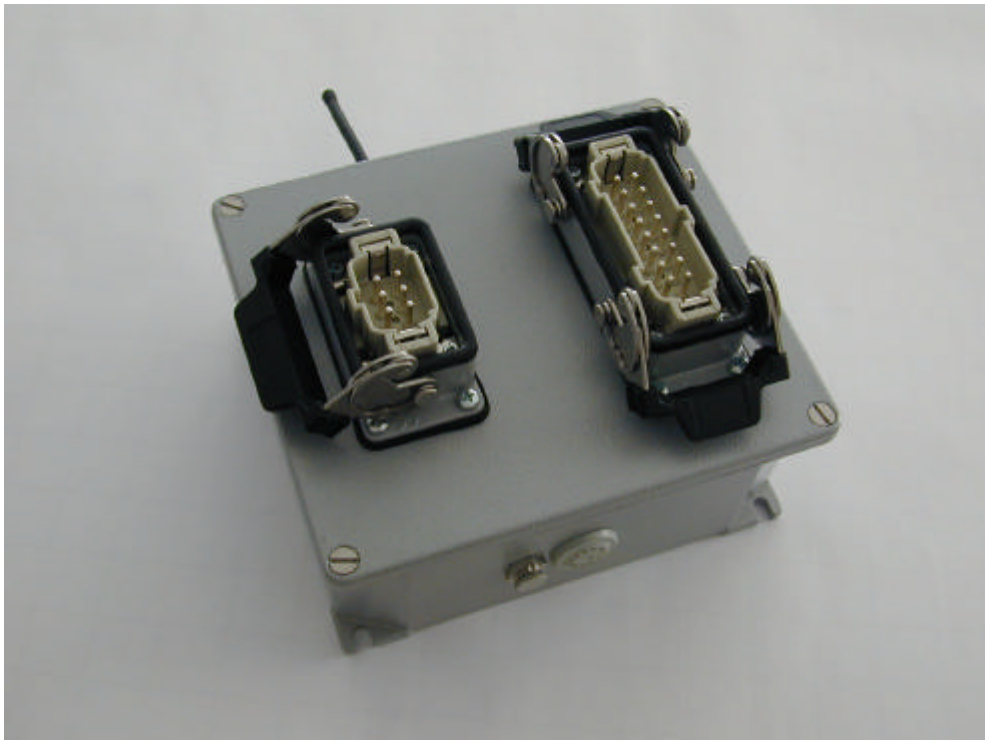
DESCRIPTION OF THE RADIO CONTROL

The radio control Series ***FreeHand*** is power supplied by a **4.8 Volt** rechargeble battery, which automatically powers up immediately when any one of the control switches is moved.
To give a command to the receiver unit, the switch corresponding to the wanted movement has to be moved.

When a switch is operated, a LED placed at the top of the radio control lights up for a split second to signal that the command transmission has started; the same LED turns on immediately when the switch is released.

To make wire comunication is necessary to connect the radio control to the receiver group with the elicoidal wire. In this way the radio trasmission is desabled and the wire comunication is enabled to allow to work in particular zone where the radio transmission isn't consented.

DESCRIPTION OF THE RECEIVER UNIT



The receiver unit Series ***FreeHand*** may be **12 VDC** or **24 VDC** (this latter on request) power supplied, through a connection to the battery of the means where it's installed.

Function of the receiver unit ***FreeHand*** is receiving the signals from the radio control and to transform them into commands given to the solenoid valves of the electro-hydraulic distributor.

2. INSTALLATION

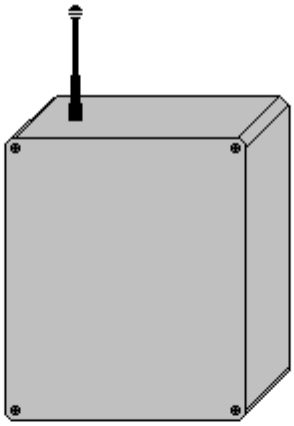
- Location of the receiver unit

- Drilling template

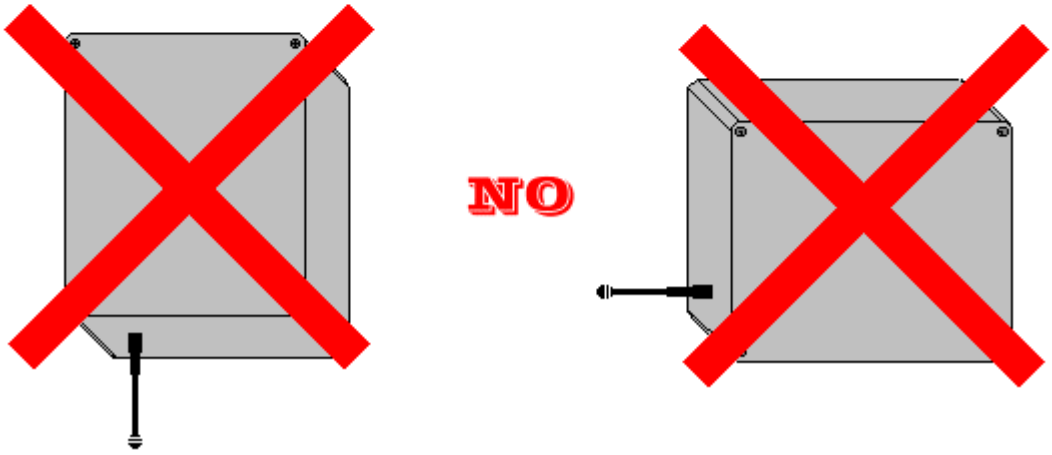
- Connecting instructions

LOCATION OF THE RECEIVER UNIT

To insure a good reception, the receiver unit ***FreeHand*** has to be positioned as shown on the figure below (CORRECT POSITION), with aerial on sight.

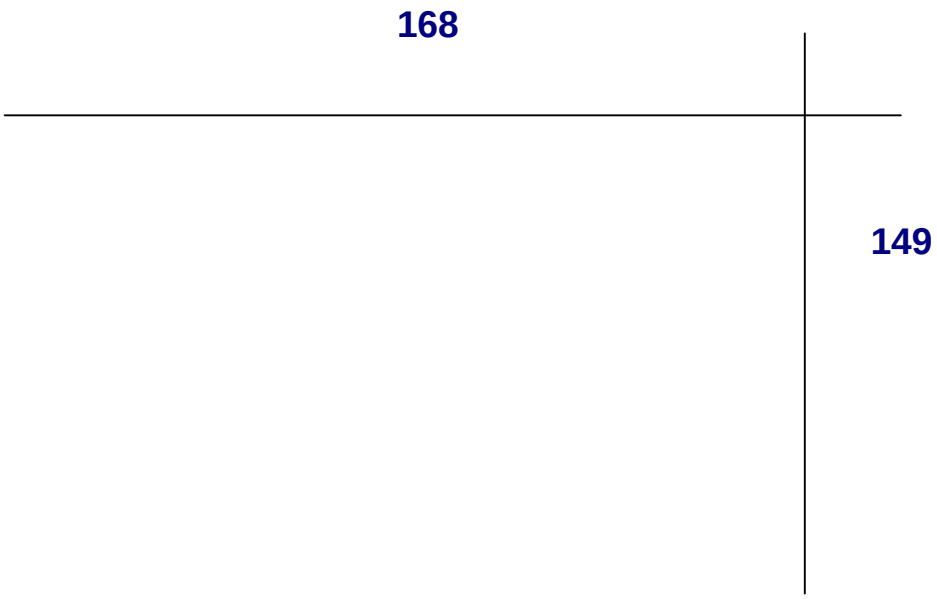


CORRECT POSITION



DRILLING TEMPLATE

The drilling template (in mm) shown on the figure below has to be used for fixing the receiver unit ***FreeHand*** to the equipment.



CONNECTING INSTRUCTIONS

Sample connection of a 16-pin connector:

Pin 1	**EV 1**
Pin 2	**EV 2**
Pin 3	**EV 3**
Pin 4	**EV 4**
Pin 5	**EV 5**
Pin 6	**EV 6**
Pin 7	**EV 7**
Pin 8	**EV 8**
Pin 9	**EV 9**
Pin 10	**EV 10**
Pin 11	**Lamp**
Pin 12	**Proportional EV**
Pin 13	**Proportional EV**
Pin 14	**Emergency Stop**
Pin 15	**Emergency Stop**
Pin 16	**Battery +**
GND	**Battery - / EV Common**

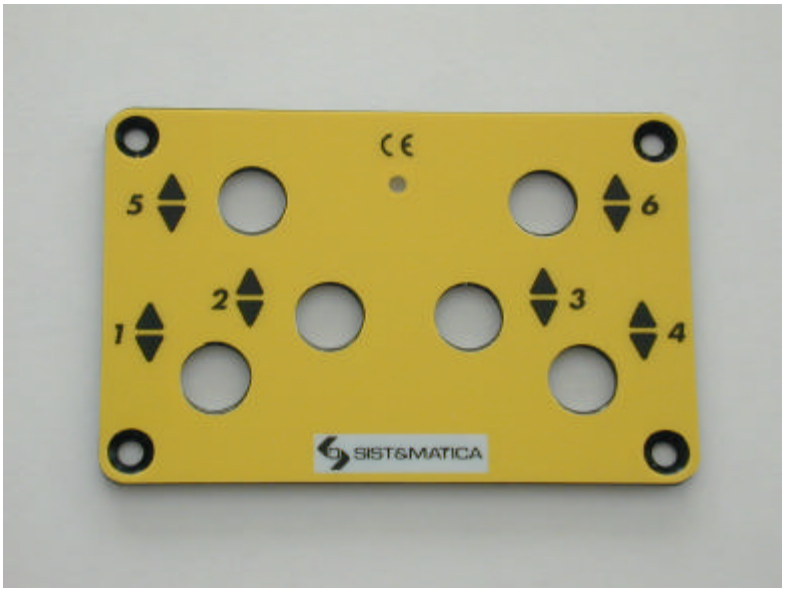
Sample connection of a 6-pin connector:

Pin 1	**Bozzello**
Pin 2	**Pressostato**
Pin 3	**Common Inputs**
Pin 4	**EM 1**
Pin 5	**EM 2**
Pin 6	**Battery +**
GND	**Battery -**

3. USE AND MAINTENANCE

- Description of the control keypad
- Preliminary operations
- Safety rules
- Recharge of the battery

DESCRIPTION OF THE CONTROL KEYPAD



1. Control Lever 1 (Up/Down)

2. Control Lever 2 (Up/Down)

3. Control Lever 3 (Up/Down)

4. Control Lever 4 (Up/Down)

5. Control Lever 5 (Up/Down)

6. Control Lever 6 (Up/Down)

PRELIMINARY OPERATIONS

This section describes the checking to be performed before starting to use the ***FreeHand*** system.

- Check the emergency stop mushroom head push button is released;
- Check the proportional solenoid valve is working correctly;
- Check the consistency of the radio control switches (see under DESCRIPTION OF THE CONTROL KEYPAD) with the commands executed by the utilities.

In case of consistency failure between switch and command or of reversed action, check the connections towards the utilities.

SAFETY RULES

In case of anomalies (es. encontrollable movements or not desired commands) press the emergency's fungus placed in the side of the radio control and to apply to the qualified personal.

REPLACEMENT OF THE BATTERY

The radio control Series ***FreeHand*** is power supplied by a **4.8 Volt** rechargeble battery.
When the battery is down (LED placed at the top of the radio control lights up by intermittence), it must to be recharged.
This operation is make by connecting the radio control to the receiver group (wire comunication).
When the radio control is connected, the led placed at the top of the radio control fixed lights up as long as the battery is completely recharged. When the battery is completely recharged the led lights up by intermittence.

4. TROUBLESHOOTING AND RESOLUTION OF PROBLEMS

TROUBLE	POSSIBLE CAUSE	SOLUTION
The Led on the radio control does not light up when any switch is shifted	Battery down	Recharge the radio control
The Led on the radio control lights up by intermittence	Battery down	Recharge the radio control
The system does not react the commands	Battery down	Recharge the radio control
The system does not react the commands	The receiver unit is not powered up	• Check the emergency stop mushroom head pushbutton is released. • Check the battery of the concerned means is connected correctly to the receiver unit. • Check that the fuses (car type) inside the receiver unit are sound; otherwise, replace them.
The system does not react the commands	Wrong connections of the cable towards the utilities	Check the aerial installation
The system does not react the commands	Wrong installation of the receiving antenna	Check the aerial installation
The system does not react the commands	System coding loss	Recode the system according to the instructions concerning the coding of the receiver unit
Non-consistency of switch and control	Wrong connection of the cable to the utilities	Check the cable towards the utilities (motors, solenoid valves etc.)
The system reacts the commands in a non-continuous way	Battery down	Recharge the radio control
The system reacts the commands in a non-continuous way	The connections to the battery and utilities are carried out with cables having inadequate gauge and lenght	Check the connections to the battery and the utilities are carried out with cables having adequate gauge and lenght