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1. INTRODUCTION

The Alpha 3000 System is a highly reliable industrial radio remote control system. The versatile features of the Alpha 3000 system permit its use in many different remote control applications that required 3-step control. The system can be used to control factory cranes, multiple hoists, trolleys, mining equipment, building construction equipment, automatic control systems, and many others.

The Alpha 3000 Radio Remote Control System incorporates numerous redundant safety circuits that guaranty maximum security and ensure the system is resistant to outside interference. The major features of the Alpha 3000 system are as follow:

- * The system uses advanced microprocessors with highly evolved software that has redundant error checking and correcting capabilities to ensure 100% error-free transmission, decoding, and control of all output relays. This highly evolved software includes CRC (cyclical redundancy check codes) and Hamming Codes (error recovery).
- * To insure maximum operating safety, the Alpha 3000 system incorporates numerous safety features. Some of these built-in safety features include transmitter pushbutton self-diagnosing, transmitter low-voltage detection and warning, receiver self-diagnosing, and MAIN deactivation when the system is in sleep mode.
- * The transmitter encoder and receiver decoder both utilize advanced microprocessor control. The availability of 65,536 sets of unique ID codes will ensure that only commands from the matching control transmitter can be carried out without any interference from other radio systems.
- * For added safety, the system also incorporates special Safety MAIN Relay. If the Safety MAIN Relay is defective (fails to open or close during operation), it will signal the system to shut down immediately to avoid the possibility of any accidents occurring.
- * Water-resistant transmitter and receiver enclosures.

The Alpha 3000 Radio Remote Control System consists of a water-resistant handheld transmitter and receiver. The transmitter casing is molded using industrial strength composite materials which are impervious to dust, water, oil, acids, alkaline, heat and sunlight as well as being resistant to deformation due to long term use in harsh environments. The industry's best 3-step pushbuttons are also constructed from industrial strength composite materials with a minimum of up to one million press cycles. For power savings, the transmitter is designed with an ultra high efficiency power saving circuit that requires only four "AA" size alkaline batteries for more than 200 hours of continuous operation between replacements.

2. SAFETY INSTRUCTION

The Alpha 3000 system is relatively simple to use, however, it is very important to observe the proper safety procedures before, during, and after operation. When used properly our Alpha 3000 radio remote controls will enhance safety, productivity and efficiency in the workplace.

The following procedures should be strictly followed:

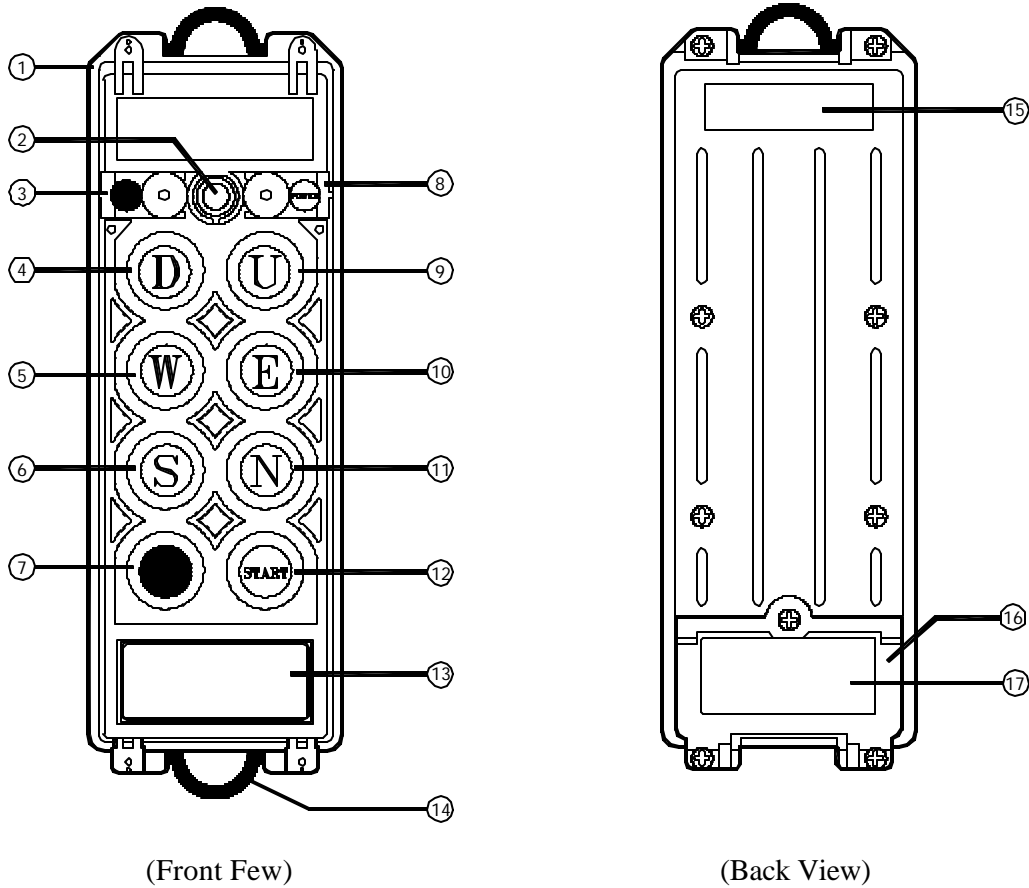
1. Check the transmitter casing and pushbuttons daily. Should any damage that could inhibit the proper operation of the transmitter be found the unit should be immediately removed from service.
2. The transmitter voltage should be checked on a daily basis. If the voltage is low (red status light blinking, refer to section 8 on page 14), the four "AA" alkaline batteries should be replaced.
3. The red mushroom type emergency stop button (EMS) should be checked at the beginning of each shift to ensure it is in proper working order and the Stop command is being received.
4. In the event of an emergency, depress the emergency stop button (EMS) immediately to disengage the receiver MAIN and the transmitter power. Then turned the power "off" from the main power source to the crane or equipment.
5. The transmitter power key switch should be pulled "off" after each use and should never leave the transmitter in the power "on" position when the unit is unattended.
6. Do not use the same channel and ID code as any other system in use at the same facility or within 600 feet.
7. Ensure the shoulder strap is worn at all time during operation to avoid accidental damage to the transmitter.
8. Never operate a crane or equipment with two transmitter units at the same time with the same channel and ID code.

FCC ID: LZ6ALPHA3000MODEL

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

3. TRANSMITTER ILLUSTRATION

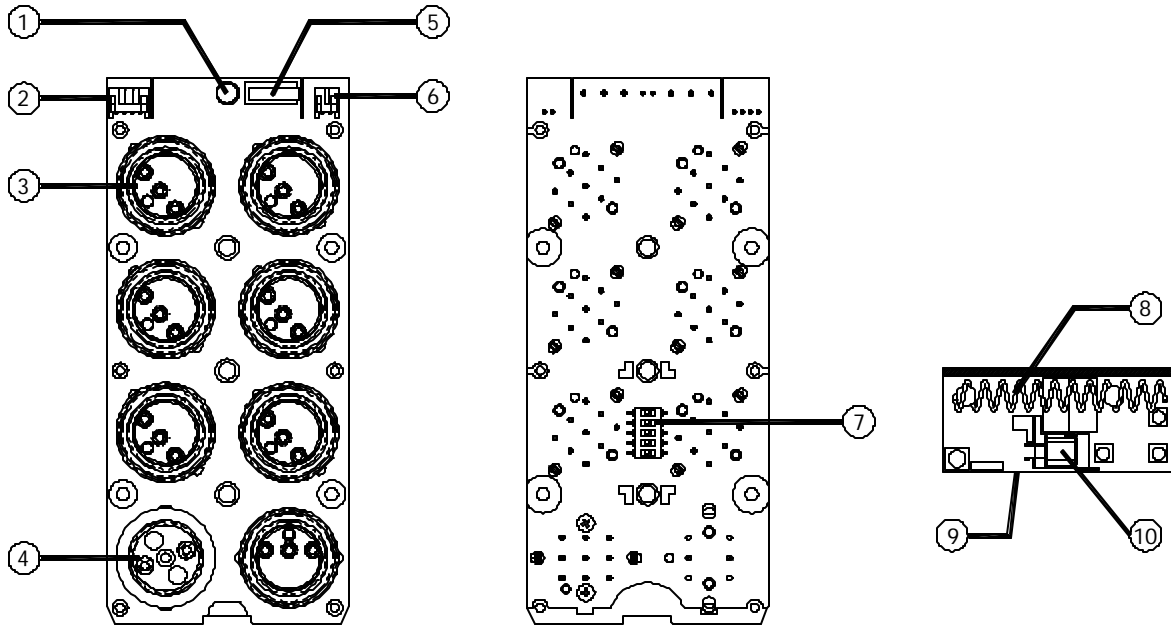
3.1 Alpha 3000 External Assembly



- | | |
|---------------------------|---------------------------|
| 1. Transmitter Unit | 9. Pushbutton #1 (Up) |
| 2. Status LED Display* | 10. Pushbutton #3 (East) |
| 3. Spare Power Key Switch | 11. Pushbutton #5 (North) |
| 4. Pushbutton #2 (Down) | 12. START/AUX Pushbutton |
| 5. Pushbutton #4 (West) | 13. System Information |
| 6. Pushbutton #6 (South) | 14. Shoulder Strap Ring |
| 7. Emergency Stop (EMS) | 15. FCC/IC Label |
| 8. Power Key Switch | 16. Battery Cover |
| | 17. Warning Label |

* Please refer to page 14 for Transmitter Status LED information

3.2 Alpha 3000 Internal Assembly



(Front View)

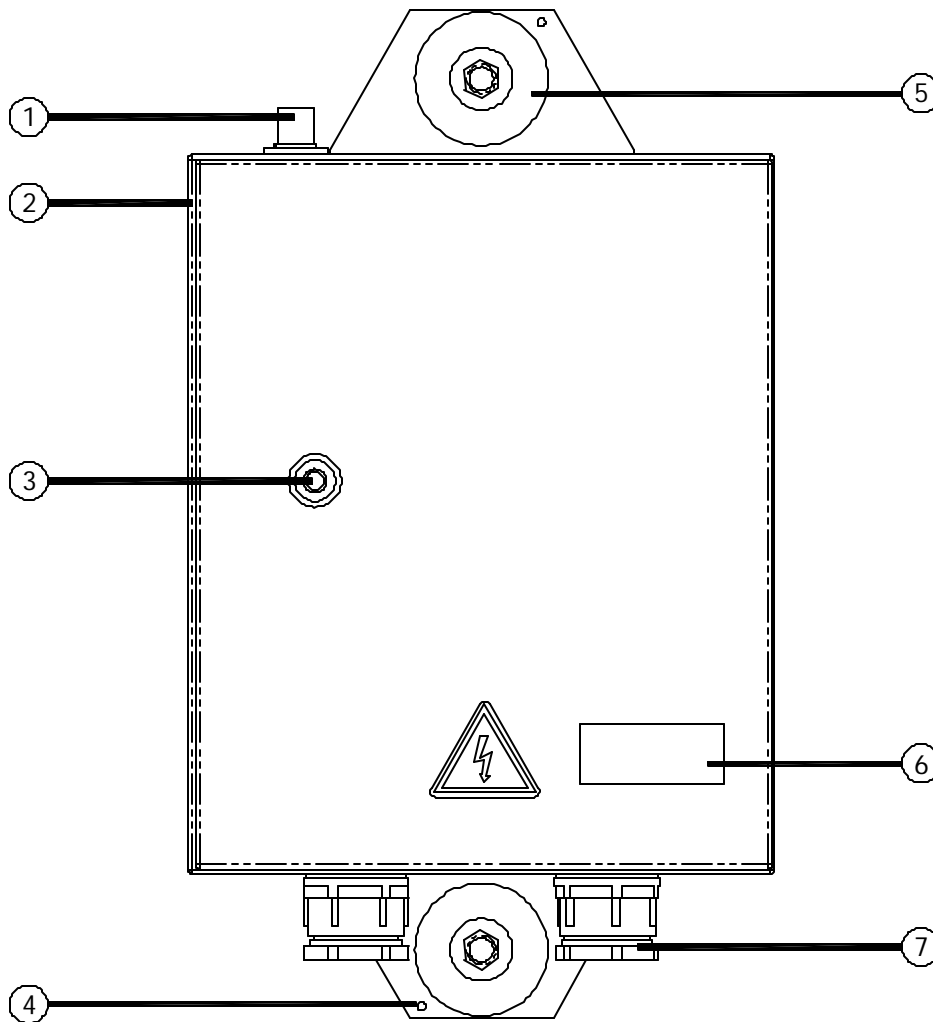
(Back View)

(RF Board)

- | | |
|----------------------------------|----------------------------|
| 1. Status LED Display | 6. Battery Power Connector |
| 2. RF-to-Encoder Board Connector | 7. ID Code Dip-switch |
| 3. 3-Speed Pushbuttons | 8. Antenna |
| 4. Emergency Stop Button (EMS) | 9. Transmitting RF Board |
| 5. Power ON/OFF Micro-Switch | 10. Quartz Crystal |

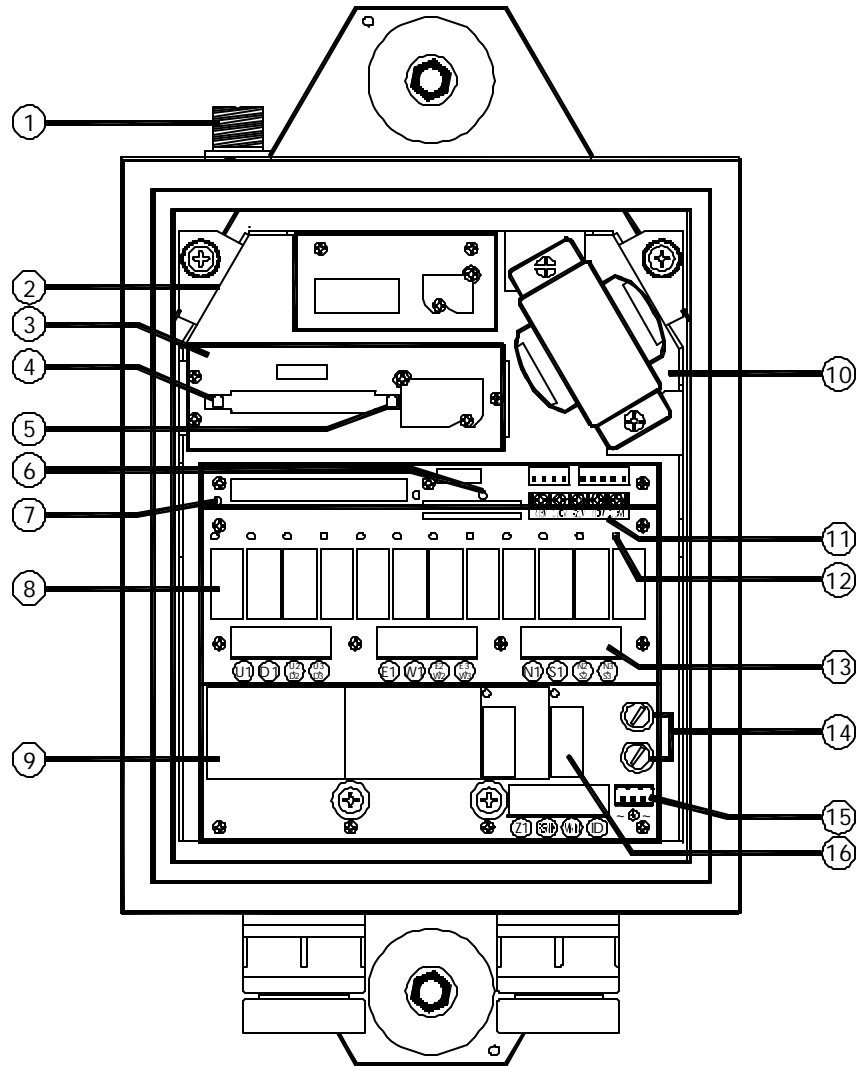
4. RECEIVER ILLUSTRATION

4.1 External Assembly



- | | |
|-----------------------|----------------------------|
| 1. Antenna mount | 4. External Grounding Hole |
| 2. Receiver Enclosure | 5. Shock Absorber |
| 3. Key Lock | 6. System Information |
| | 7. Cable Gland / Cord Grip |

4.2 Alpha 3000 Internal Assembly

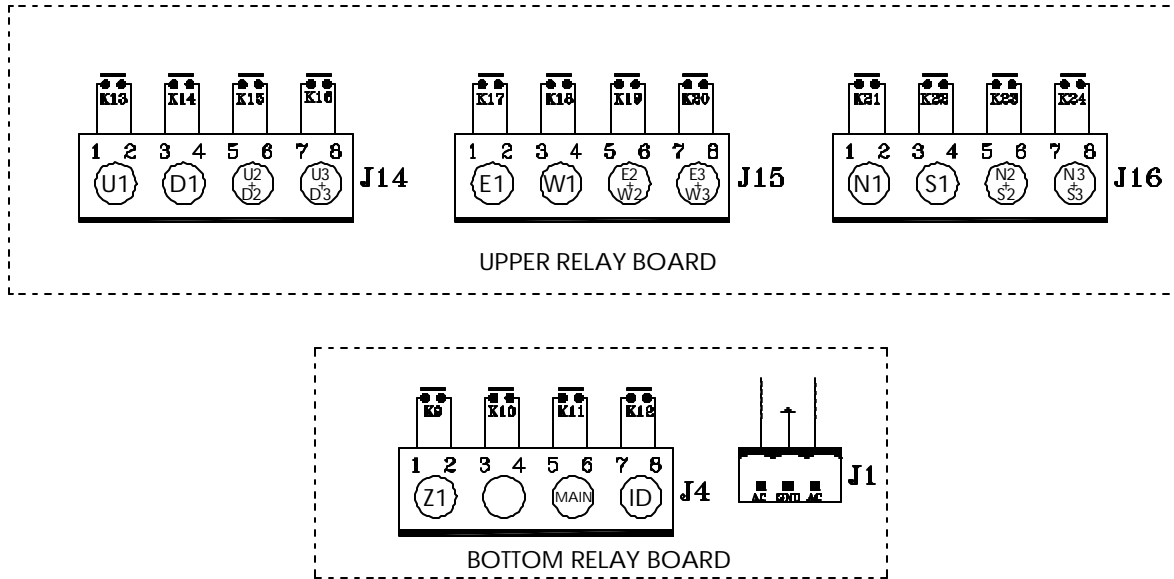


- | | |
|---------------------------------|---------------------------------|
| 1. Antenna Seat | 9. Bottom Relay Board |
| 2. Receiving RF Module | 10. Power Transformer |
| 3. Decoder Module | 11. Input Voltage Selector Seat |
| 4. Decoder Module Power Display | 12. Contact Relay LED Display |
| 5. Receiver Status LED Display* | 13. Terminal Block |
| 6. SQ Status LED Display* | 14. Power Fuses (1.0A) |
| 7. Power (AC) LED Display | 15. AC Power Input |
| 8. Upper Relay Board | 16. MAIN Safety Contact Relay |

* Please refer to page 15 for Receiver and SQ display information

5. OUTPUT CONTACT DIAGRAM

Alpha 3000 Output Contact



Note: Z1 represents START/AUX output contact.



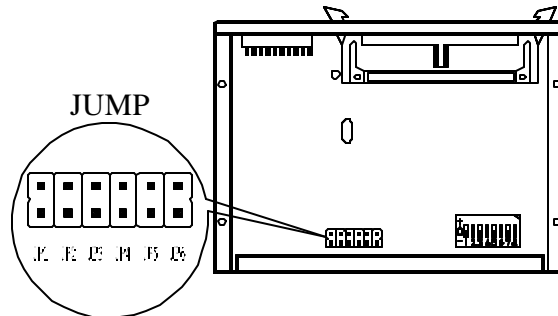
Terminal Block and Common Shorting Pin Assembly

Common shorting pin illustrated above can be used rather than “daisy chaining” wiring for the common.

6. SYSTEM CONFIGURATIONS

6.1 Jumper Settings

There are numerous functions that can be set via jumpers located inside the decoder module. Please see the diagram and chart below on how to set these functions.



<div style="background-color: #cccccc; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> Manufacture Setting		
JP1	Open	After inserting the transmitter power key switch, or after EMS reset, press START/AUX pushbutton to activate the receiver MAIN.
	Short	Insert the transmitter power key switch will immediately activates the receiver MAIN. After EMS reset, re-insert the power key switch to reactivate the receiver MAIN.
JP2	Open	After 5 minutes of transmitter non-usage the receiver MAIN will be deactivated (sleep mode).
	Short	Sleep mode deactivated with receiver MAIN stays on constantly.
JP3	Open	Pushbutton 1 ~ 6 interlocked.
	Short	Pushbutton 1 ~ 6 non-interlocked with single speed contact.
JP4	Open	No acceleration delay from 1 st through 3 rd speed.
	Short	Acceleration delay for up to 1 second from 1 st through 3 rd speed.

Note: Every time when you change jumper settings you must first turn the receiver power "off" and then turn it back "on" after setting so that they can be stored in memory.

JP1

JP1 Open	Insert the transmitter power key switch	Press START/AUX	Receiver MAIN activated	or	After EMS reset	Press START/AUX	Receiver MAIN activated
JP1 Short	Insert the transmitter power key switch	Receiver MAIN activated	or	After EMS reset	Re-insert the transmitter power key switch	Receiver MAIN activated	

JP2

JP2 Open	After 5 minutes of transmitter non -usage	Receiver MAIN deactivated
JP2 Short	Receiver MAIN stays "on" constantly until the main power source of the system is turn "off"	

JP3

JP3 Open	Pushbutton 1 ~ 6 interlocked
JP3 Short	Pushbutton 1 ~ 6 non-interlocked with single speed contact

JP4

JP4 Open	No acceleration delay from 1 st through 3 rd speed								
JP4 Short	1 st speed depressed	After 1 second	1 st speed contact relay engaged	2 nd speed depressed	After 1 second	2 nd speed contact relay engaged	3 rd speed depressed	After 1 second	3 rd speed contact relay engaged

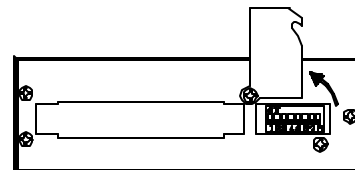
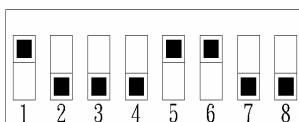
6.2 Security ID Code Settings

The ID code dip-switch is located on the backside of the encoder board (refer to item #7 on page 5) and on the top of the decoder module (see below).

Example : ID code ? 10001100

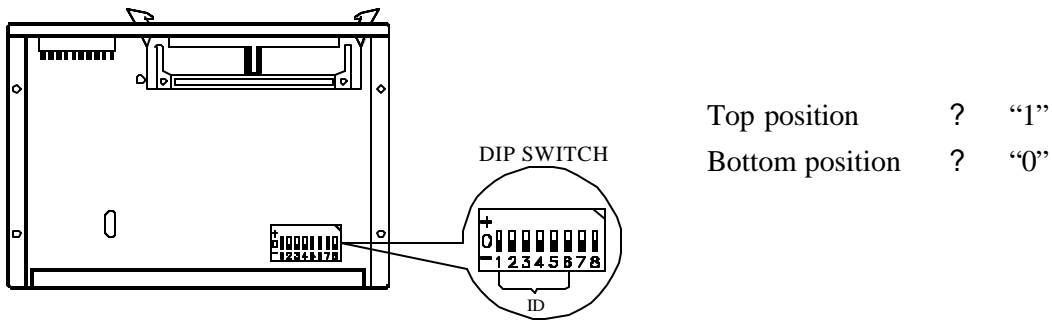
Top Location ? "1"

Bottom Location ? "0"



6.3 Pushbutton Contact Settings

The START/AUX pushbutton can be set either to normal or latching contact. This function that can be set via an 8-position dip-switch located inside the decoder module (please refer to the diagram below). By adjusting the dip setting either to the top or bottom slot will change the contact form of the pushbutton (please refer to the chart below). Pushbuttons are numbered from right-to-left and from top-to-bottom.



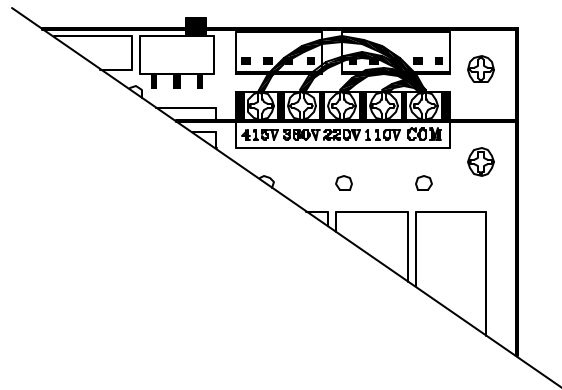
Alpha 3000	DIP1 ? "0" ? Pushbutton 7 (START/AUX) with normal momentary contact "1" ? Pushbutton 7 (START/AUX) with toggle / latching contact
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6.4 Voltage Settings

There are four different voltage settings available inside the Alpha 3000 receiver enclosure (bottom relay board), please select one that corresponds to the main power source of the crane or equipment.

Input Voltage Range Accepted:

- 1) AC 110V? From AC 100V ~ AC 120V
- 2) AC 220V? From AC 220V ~ AC 240V
- 3) AC 380V? From AC 380V ~ AC 400V
- 4) AC 415V? From AC 415V ~ AC 440V



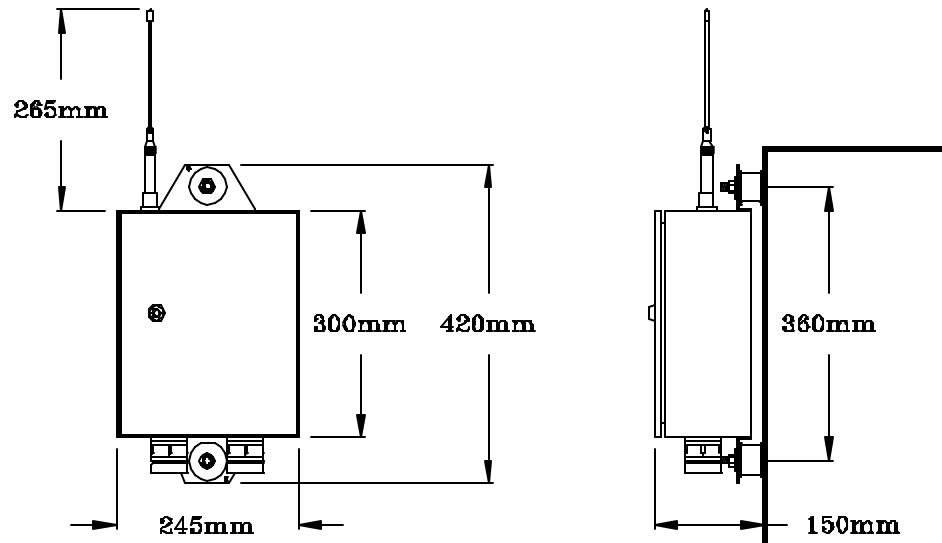
7. RECEIVER INSTALLATION

7.1 Preparation For Installation

1. Required Tools:
 - (1) Flat Head Screwdriver (-)
 - (2) Phillips Head Screwdriver (+)
 - (3) Multi-Meter
 - (4) Open End Wrench
 - (5) Power Drill with 10.5mm ~ 11mm Drill-Bit
2. Check to ensure that your receiver is not set to the same channel and ID code as any other systems in operation at the same facility within 600 feet.
3. Prior to installation, make sure that the crane or equipment itself is working properly.
4. Use a multi-meter to check the voltage source available and ensure that the receiver voltage setting matches your power source.
5. Prior to installation, switch “off” the main power source to the crane or equipment.

7.2 Step By Step Installation

1. The location selected should have the antenna visible from all areas where the transmitter is to be used.
2. The location selected should not be exposed to high levels of electrical noise.
3. Ensure the selected location has adequate space to accommodate the receiver enclosure.
4. Make sure the receiver unit is in upright position (vertical).
5. The distance between the antenna and the control panel should be as far apart as possible.
6. Drill two holes on the control panel (10.5mm). Refer to diagrams next page.
7. Tightened the bolt nuts provided.
8. Ensure AC ground is connected to the power input terminal block, otherwise chassis ground should be connect to the chassis ground connection hole on the receiver enclosure (refer to item #4 on page 6).
9. For system wiring, please refer to the output contact diagram on page 8.
10. Ensure all wiring is correct and safely secured and all screws are fastened.



7.3 System Testing

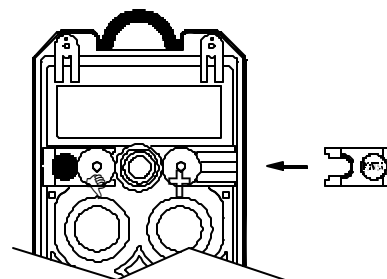
1. Connect the power source to the receiver and test the MAIN relay output (EMS button) and observe that it properly opens and closes the main line.
2. Test the operation of each function to ensure it corresponds to the transmitter direction labels and/or the pendant it is replacing.
3. Test the limit switches on the crane and verify that they are working properly.
4. If your new remote control is replacing an existing pendant make sure it is completely disconnected to prevent unwanted control commands.
5. If your new remote control is replacing an existing pendant make sure the pushbutton is stored in a safe location where it will not interfere with remote operation.

8. TRANSMITTER OPERATION

1. **Batteries** _ Make sure the four “AA” alkaline batteries are installed correctly, the labels on the battery holder will tell you which side is “up” and which side is “down”. Use 2000mA alkaline type batteries for optimum operating time between replacements.
2. **Start Up** _ Insert the power key switch located on the top right hand side of the transmitter unit (refer to diagram below). The Status LED on the face of the transmitter will display a green light (type -1 below) for up to 2 seconds when the power key switch is inserted. Do make sure the red EMS pushbutton is in elevated position when the transmitter power key is inserted, by pulling it upward. Then depress the START/AUX pushbutton to activate the receiver MAIN (depending on JP1 setting on page 9). When the pushbuttons are depressed, the transmitter status LED will display a blinking green light (type-2 below) telling you that the command signals are being transmitted to the receiver. After 5 minutes of transmitter non-usage (pushbuttons not depressed), the receiver MAIN will be automatically deactivated (depending on JP2 setting on page 9). To resume work, just depress the START/AUX pushbuttons.
3. **Status Light Display** (refer to item #2 on page 4).

TYPE	LED DISPLAY	INDICATION
1	Green “on” ? 2.0 seconds	System power “on”
2	Green “on” ? 0.1 second “off” ? 2.0 seconds	Pushbutton depressed with signal transmitted
3	Red “on” ? 0.1 second “off” ? 2.0 seconds	Transmitter low -voltage warning
4	2 fast red blinks followed by 2 seconds “off”	Pushbutton contact jammed or locked
5	Red “on” ? 0.5 second “off” ? 0.5 second	Emergency Stop Button activated (depressed)

4. **EMS & Restarting** _ In case of an emergency, depressing the Red EMS pushbutton will immediately deactivates the receiver MAIN contact relay. When EMS is activated, the Status LED will display a red blinking lights that is “on” ? 0.5 second and “off” ? 0.5 second (refer to the chart above). To reactivate the system, just pull up the EMS pushbutton and depress START/AUX (depending on JP1 setting on page 9).
5. **Interlocking Pushbuttons** _ The top three sets of motions (the first 6 pushbuttons) are interlocked to its self so no conflicting commands can take place for safety purpose. For example, depressing the hoist “UP” and “DOWN” pushbutton simultaneously will result in no command being sent.



9. TROUBLE SHOOTING

Should the operator find the equipment not operating normally, please check the chart below for simple trouble shooting tips.

PROBLEM	POSSIBLE REASON	SOLUTION
Transmitter does not communicate to receiver.	Transmitter and the receiver are not on the same RF channel (SQ not lit) or ID code.	Ensure the correct transmitter is in use. The labels on the receiver and the transmitter will identify the RF channel and ID code in use.
Transmitter does not communicate to receiver.	Low or no transmitting power from the transmitter unit.	Turn on the transmitter and with EMS elevated. If the status LED shows blinking red lights or no lights, then turn the power off and replace the four batteries.
No power to the receiver.	Blown fuse or no input power connection.	Ensure power input to the receiver unit is correct. If power indicator (AC) is not lit, please check the receiver for any open fuse.
Outputs do not operate correctly.	Receiver configuration and output wiring is not set properly.	Please refer to section 5 and 6 to ensure receiver is correctly wired and configured for your application.

Receiver Status LED Display (refer to item #5 on page 7)

TYPE	LED INDICATION	PROBLEM AND SOLUTION
1	3 fast blinks followed by OFF ? 2.0 seconds	Defective MAIN contact relay.
2	2 fast blinks followed by OFF ? 2.0 seconds	Incorrect ID code setting.
3	ON ? 0.1 second OFF ? 2.0 seconds	Decoder on standby.
4	ON ? 0.1 second OFF ? 0.1 second	Transmitted signal decoded.

SQ Status LED Display (refer to item #6 on page 7)

TYPE	LED INDICATION	PROBLEM AND SOLUTION
1	ON ? 0.1 second OFF ? 0.1 second	Transmitted signal received by the receiver.
2	Blinking when pushbuttons are not depressed.	Other radio interference.

10. SYSTEM SPECIFICATION

Transmitter Unit

Frequency Range	:	301MHz
Transmitting Range	:	150 feet
Hamming Distance	:	? 6
Channel Spacing	:	25KHz
Frequency Control	:	Quartz Crystals
Frequency Drift	:	< 5ppm @ -4? ~ 158?
Frequency Deviation	:	< 1ppm @ 77?
Spurious Emission	:	-50dB
Transmitting Power	:	0.1mW
Emission	:	F1D
Antenna Impedance	:	50 ohms
Enclosure	:	IP-66
Source Voltage	:	DC 6.0V
Current Drain	:	8mA @ 6V
Operating Temp.	:	-4? ~ 158?
Dimension	:	23cm x 7.8cm x 4.7cm
Weight (include batteries)	:	21oz

Receiver Unit

Frequency Range	:	301MHz
Modulation	:	Narrow Band FM
Frequency Control	:	Quartz Crystals
Frequency Drift	:	< 5ppm @ -4? ~ 158?
Frequency Deviation	:	< 1ppm @ 77?
Sensitivity	:	-118dBm
Antenna Impedance	:	50ohms
Data Decoder Reference	:	Quartz Crystals
Responding Time	:	64~100mS
Enclosure	:	IP-66
Standard Source Voltage	:	AC 120V/220V/380V/415V @ 50/60 Hz.
Power Consumption	:	11VA
Operating Temp.	:	-4? ~ 158?
Output Contact Rating	:	250V @ 10A
Dimension	:	42.5cm x 24.5cm x 13cm
Weight (include antenna)	:	17.68lb

11. PARTS LIST

1.	Transmitting RF Board	TX-2005
2.	Encoder Board	EN-3000
3.	Receiving RF Module	RX-3000
4.	Decoder Module	DE-3000
5.	Upper Relay Board	RY-3000
6.	Bottom Relay Board	RY-3001
7.	Transmitter Casing	TC-3000
8.	Receiver Enclosure	RC-3000
9.	Receiver Antenna (30MHz)	ANT-301
10.	Transformer (AC-110V/220V/380V/415V)	SSB-1726
	(AC-115V/208V/230V/460V)	SSB-2213
11.	1-Step Pushbutton (Optional)	PB-3001
	2-Step Pushbutton (Optional)	PB-3002
	3-Step Pushbutton (Standard)	PB-3003
12.	Emergency Stop Button	EMS-3000
13.	Emergency Stop Red Cap	RD-3000
14.	Pushbutton Rubber Boot	RB-3000
15.	Pushbutton Compass Label	DL-3000
16.	Transmitter Power Key + Strap	TK-3000
17.	Receiver Panel Key	RK-3000
18.	Transmitter Battery Holder	BH-3000
19.	Transmitter Battery Cover	BC-3000
20.	Terminal Block	TB-3000
21.	Common Shorting Pin	SP-3000
22.	Cable Gland / Cord Grip	CG-3000
23.	Shock Absorber	SA-3000
24.	Transmitter Shoulder Strap	SS-3000
25.	Protective Vinyl Covering	PC-3000