3-5-2 Function setting by dip switch:

Transmitter's dip switch(4-bit) for function setting can be used to set the "Proportional function", "Radio remote setting", "Alarm mode" and " Software copy way" as follows:

3-5-2-1.Use of SW1 to set "Proportional function"

Dip Switch	Remark
Sw1	
ON	Enable "Proportional function"(response time:98ms)
OFF	Disable "Proportional function"(response time:65ms)

Note: The response time for *Enable "Proportional function"* would be longer(98ms) due to transmitting proportional data.

3-5-2-2. Use of SW2 to set "Radio remote setting"

Dip Switch	Remark
Sw2	
ON	Disable "Radio remote setting"
OFF	Enable "Radio remote setting"

Note: If "Enable", some applications executed by "Radio remote setting" include (1) change of operating frequency A,B,C (2)forcing receiver's frequency changed (3)renew the required channel set by software or dip switch (4)renew the required functions set by software

3-5-2-3. Use of SW3 to set "Alarm mode"

Dip Switch	Remark
Sw3	
ON	Morse alarm mode
OFF	Simple alarm mode

4.Use of SW4 to set "Software copy way"

Dip Switch	Remark

Sw4	
ON	Copy functions and/or channel from transmitter to receiver
OFF	Copy functions and/or channel from receiver to transmitter

3 – 6 Radio remote setting

The operation procedures mentioned herein refer to the process of the transmitter's remote writing of function setting software into the receiver. It means that to preserve the required setting in transmitter in advance then sends out the radio signal to receiver at workshop. This performance can eliminate the trouble of climbing to the receiver. Radio remote setting includes "Channel setting by radio" and "Function Setting by radio".

Note:

1. Before operating, one must make sure that the receiver is in "power-off" and all of the relays are at "off" status.(i.e. pressing transmitter's Emergency stop button during receiver is supplying with power.)
2. Before operating, one must make sure that the communication status between transmitter and receiver is in good condition.(i.e. the same frequency without interference, and the same model and ID code.)
3. Come as near as possible the receiver when operating, e.g. under the crane.

3-6-1 Channel setting by radio:

1. Using PC or Maintenance Kit to install channel setting into transmitter in advance, or set a new channel by dip switch on transmitter.
2. Depress EMS mushroom and turn key to "off" position.
3. Operate "Joystick 2" to the left and hold, meanwhile, turn the key(rotary key switch from "off" to "on" position simultaneously.
4. Release "Joystick 2", at this time, LED indicator will flash with yellow and green color alternately.
5. After the alarm of receiver sounds "– • – •" means that channel setting by radio is completed, then turn the key from "on" to "off" position.
6. "Power-On" according to the proper procedure and return to normal operation.

3-6-2 "Function setting" by radio:

1. Using PC or maintenance kit to install function setting into transmitter in advance.
2. Depress EMS mushroom and turn key to "off position.

3. Forward or backward "Joystick 2" and hold, meanwhile, turn the key(rotary key switch from "off" to "on" position simultaneously.
4. Release "Joystick 2", at this time, LED indicator will flash with yellow and red color alternately.
5. After the alarm of receiver sound "– •– •" means that function setting by radio is completed, then turn the key from "on" to "off" position.
6. "Power-On" according to the proper procedure and return to normal operation.

3–7 Software Setting

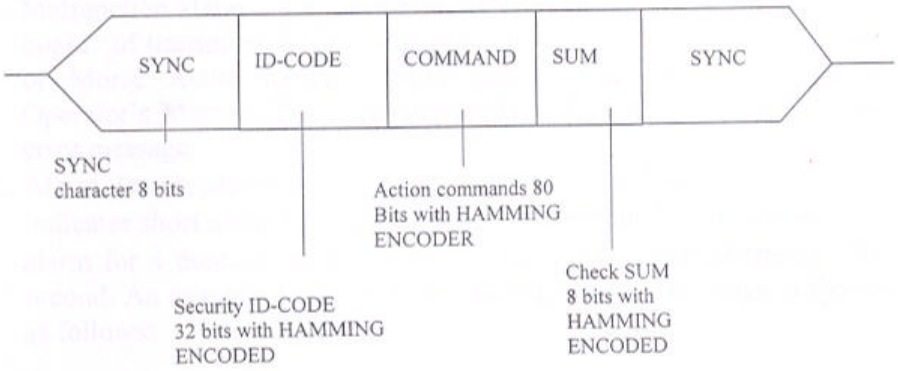
In addition to the dip switch setting mentioned in section 3-5, this remote control system can be set according to the working condition and operator's need, such as "Pushbutton function", "EMS neglected function", "search function", "interference neglected time"...etc. This enables the remote controller to perform the most effective operation and to provide the safest operation. Please refer to the manual of software setting.

3–8 Error detection/Error correction by software

SAGA1-J system employs the theory of "Error-Control Coding" used on Computer system, and incorporates the "Control Data Code" and the principle of "Error detection/Error correction" of Hamming Distance to edit and complete the "Code Word" was so-called "Hamming Code" which may ensure the control data with accuracy in process of transmission, and also equip with function of automatic "Error detection"/"Error correction" to make sure the safety in operation of SAGA1-J system remote control.

3-8-1 Data Stream

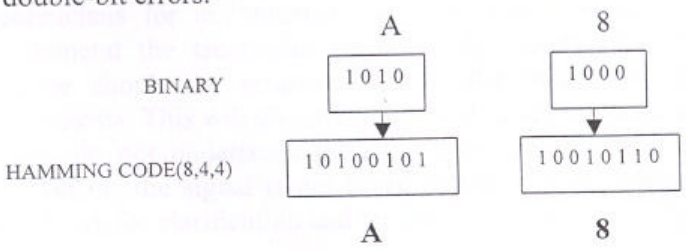
As shown as below, before the receiver's relays output to control the equipment's movement, the data including SYNC, ID-CODE, COMMAND and SUM must be checked twice to further make sure, so the data transmission becomes more safe and reliable.



TOTAL DATA LENGTH=128 bits

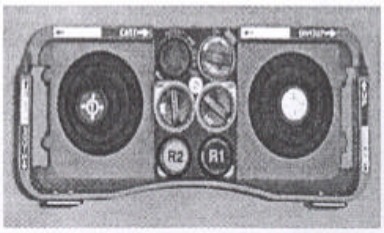
3-8-2 Hamming Code

As shown as below, the Code Word length is equal to 8, the Data Bit is equal to 4, the Hamming Distance is equal to 4, it means that HAMMING CODE (8,4,4) can correct single-bit errors and also detect double-bit errors.

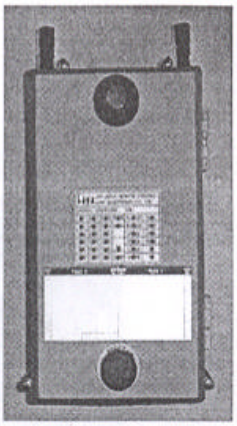


Chapter 3. SAGA1-J Standard Accessories

When you get a standard and full set of SAGA1-J system, it includes the following item.:



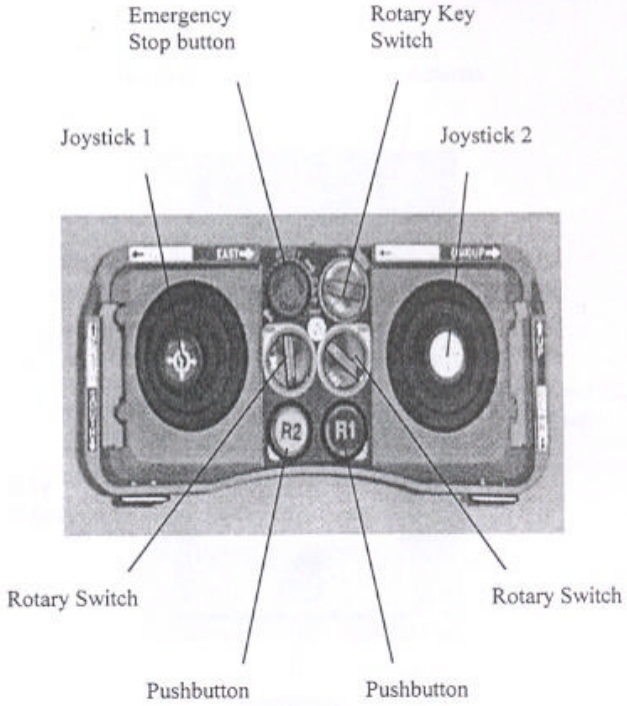
(1)Transmitter, one unit.



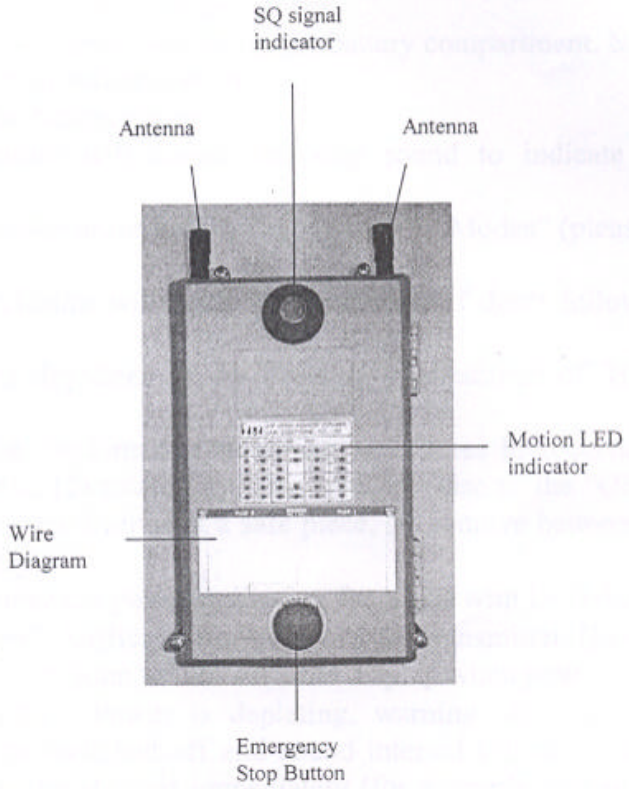
(2)Receiver, one unit.

Chapter 4. Operation

4-1 SAGA1-J Transmitter



4-2 SAGA1-J Receiver



4 – 3 General Operation

1. Remove the Transmitter's battery cover.
2. Install 4 Fresh AA-size batteries in the battery compartment. Make sure the "+" and "-" directions are correct.
3. Attach back the battery cover.
   Note: Transmitter will sound two-long sound to indicate the correct installation.
4. Turn on the power according to the "Power-On Modes" (please refer to 4-4-1).
   Note: LED indicator will flash with red color if don't follow the proper procedures.
5. Properly using Joysticks or by pressing pushbuttons of Transmitter to operate.
6. After operation, perform the following procedures in sequence: (1) Press EMS mushroom, (2) rotate key counter-clock-wise to the "OFF" position, (3) remove key and keep it in a safe place, (4) remove batteries if not used for a long period.
   Note: Transmitter has power indicating functions with LED display.
   ← "Green color": Sufficient power to operate transmitter. (In order to save power, one can program to turn off LED display when power is sufficient.)
   ↑ "Yellow color": Power is depleting, warning sound occurs every 4 seconds (can be switched off and sound interval can be set by software). Operation must be stopped immediately (for example: down the goods to ground) to replace batteries.
   → "Red color": Insufficient power. In addition to red LED, warning sound will continue and transmitter is no longer functional. Transmitter will send out an emergency stop signal to the receiver due to insufficient power. Operator should avoid this situation in order to maintain the safety of operation.

4 – 4 Special Functions Operation

4-4-1 Power-On operation

Power-on means that the Main-Relay on receiver will energize as soon as receiving the control data from transmitter and then receiver keep in condition of standby for continuous control. There are 7 different ways of "Power-On mode" could be setting.

A. Mushroom or Key Power-On Mode
   1. Mushroom power-on: turn the key(Rotary key switch) clockwise to "ON" position first, then it will power on once rotate "EMS" mushroom clockwise 45° and pull out.
   2. Key power-on: rotate "EMS" mushroom clockwise 45° and pull out first, then it will power on once turn the key(Rotary key switch) clockwise to "ON" position.

B. Mushroom Power-On Mode
   1. Turn the key(Rotary key switch) clockwise to "ON" position.
   2. It will power on, once rotate "EMS" mushroom clockwise 45° and pull out.

C. Key Power-On Mode
   1. Rotate "EMS" mushroom clockwise 45° and pull out.
   2. It will power on, once turn the key(Rotary key switch) clockwise to "ON" position.

D. Any pushbutton(Joysticks) Power-On Mode
   1. Rotate "EMS" mushroom clockwise 45° and pull out.
   2. Turn security key clockwise to "ON" position.
   3. Press any pushbutton(or operate Joysticks) on the transmitter. This will turn on the power as well as execute the function of pushbutton(Joysticks) .

E. "Start" rotary key switch Power-On Mode
   1. Rotate "EMS" mushroom clockwise 45° and pull out.
   2. Turn the key(Rotary key switch) clockwise to "ON" position.
   3. Continue to turn the key(Rotary key switch) clockwise to "START" position to power on. After power on, when release the key(Rotary key switch), it will return to the "ON" position.

Note: If the mode is set as "Any pushbutton(joysticks) power-on" or "Start pushbutton power-on", the transmitter is in the "non-continuous" mode, i.e.

when transmitting, pushbutton(joysticks) must be pressed(operated), it can save power.

F. E.U. standard Power-On Mode

1. Rotate "EMS" mushroom clockwise 45° and pull out.
2. Turn key(Rotary key switch) clockwise to "ON" position.
3. Continue to turn the key(Rotary key switch) clockwise to "START" position to power on. After power on, when release the key(Rotary key switch), it will return to the "ON" position.
4. After 3 minutes of non-operation, transmitter will send out an emergency stop signal to the receiver. When this occurs, one must turn the magnetic key counter-clockwise to the "OFF" position, then turn the key clockwise to the "ON" position, and Continue to turn the key clockwise to "START" position to power on again. After power on, when release the key, it will return to the "ON" position.

Note: When the mode is set as "E.U. standard" Power-on Mode, the transmitter is in the continuous mode.

G. E.U. simple Power-On Mode

1. Rotate "EMS" mushroom clockwise 45° and pull out.
2. Turn key(Rotary key switch) clockwise to "ON" position.
3. Continue to turn the key(Rotary key switch) clockwise to "START" position to power on. After power on, when release the key(Rotary key switch), it will return to the "ON" position.
4. After 3 minutes of non-operation, transmitter will send out an emergency stop signal to the receiver. When this occurs, one just only turn the key clockwise to the "START" position, it will power on again. After power on, when release the key, it will return to the "ON" position.