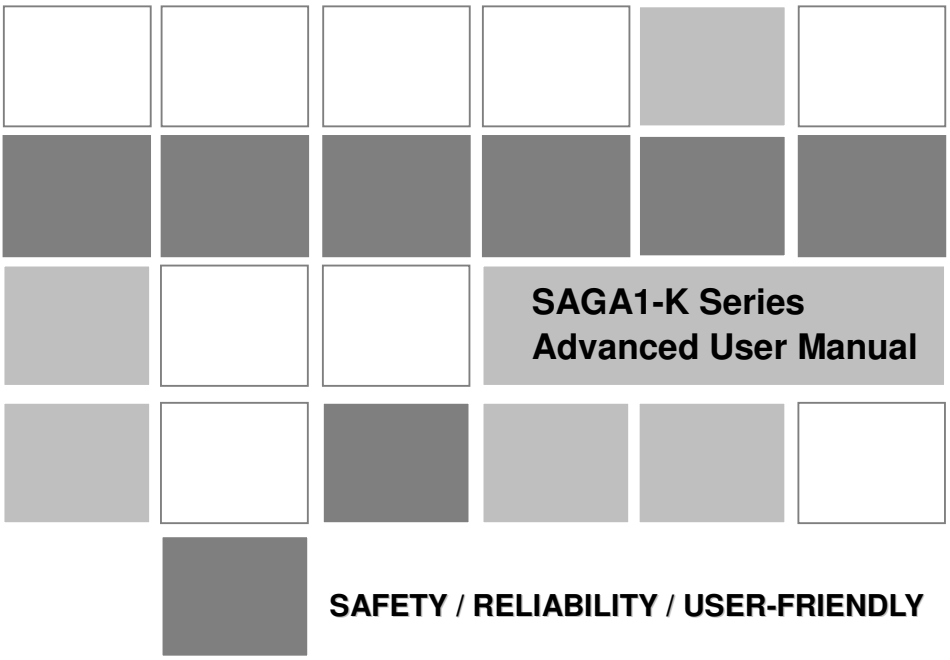
Industrial Radio Remote Controller



SAGA1-K Series
Advanced User Manual

SAFETY / RELIABILITY / USER-FRIENDLY

Contents

Warning and Caution

The following symbols may be found on the product or throughout the documentation.

Symbol	Description
	**Refer to Manual** Refer the user manual for additional information when product marked with this sign.
	**Dangerous Voltage** Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury.
	**Warning** Denotes a hazard. Included text gives proper procedures. Failure to follow instructions could result in severe personal injury and/or property damage.
	**Caution** Denotes a hazard. Included text gives proper procedures.Failure to follow instructions could result in minor personal injury and/or properly damage.

Important Information before You Start

Important

1. Read this manual carefully before operating and installation.
2. Due to the complex nature of equipment, it is necessary to read the entire manual before installation.
3. Never allow any unauthorized personnel to dismantle equipment as this may cause the equipment damage.
4. The equipment has been stringently tested for quality assurance before delivery from factory. However, it must not be used in extremely dangerous situations, or where damage may result.
5. After operation, switch off crane main power as well as receiver unit and remove rotary key from transmitter unit.
6. The transmitter should keep in a safe place when not in use to avoid any unintentionally operation.
7. The crane should be equipped with main power relay, limit switch and other safety devices required.
8. Do not use this device during electrical storm or where there are conditions of high electrical interference.
9. Always check transmitter battery and receiver input power condition before operation.
10. The installation and maintenance service is allowed only when the crane and receiver power are off to avoid electrical shock.
11. The contents of the manual may be amended by the manufacturer without notice.
12. The specification and function is subjected to change without notice by manufacturer.

Precautions

1. Press EMS button and switch off main power of crane and receiver after operation. Then remove transmitter rotary key and keep in a safe place.
2. The following situations may cause receiver response delay and stop operation immediately when situation occurs.
   (a) Beyond operating range
   (b) During severe radio interference
3. Remove transmitter batteries when not in use for long period of time.
4. To extend product life, please follow the standard operating procedure and maintain system regularly.
5. Check EMS button and other system main functions before operation.
6. Press EMS button during system failure or any abnormal conditions occur.
7. The operator must be familiar with emergency procedures before operate the system.

Emergency Procedures

In case of emergency, please follow the procedure below:

1. Press EMS button and stop operation.
2. Switch rotary key to "OFF" position and remove it from transmitter unit.
3. Switch off crane main power.
4. Contact the authorized distributor for further assistant.

Specification

General Specification

Operating Channel. ..……...…	70 Channels
ID Code …….……	Over 1 Million Sets
Channel Space ……	25 KHz
Hamming Distance ..…….	≥4
Structure ……..……..	Enhanced Glass-Fiber
Operating Environment …….	-40℃ ~ +85℃
Operating Distance ……	Up to 100 M

Transmitter

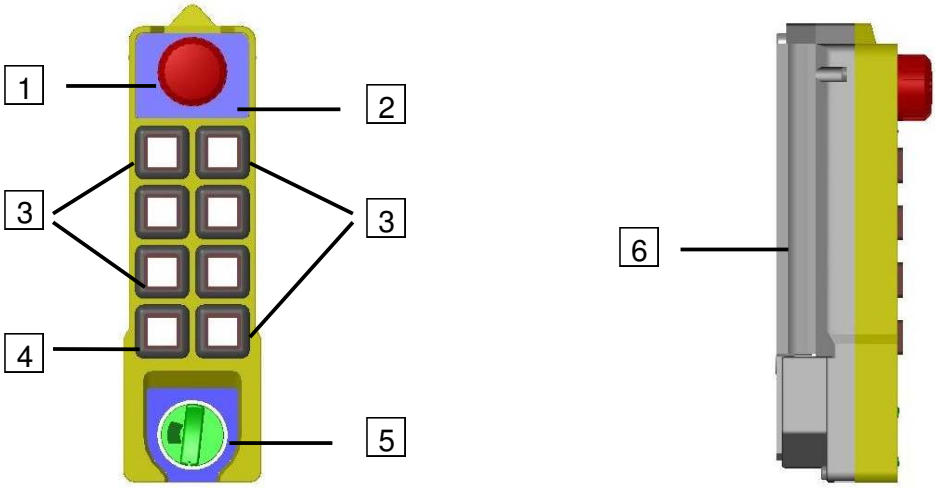
Power ……	AA Battery x 4
Emission Power ….……	< 10mW
Dimension …...…….……	163x49x45mm (SAGA1-K1/K2)
	274x77x42mm (SAGA1-K3/K4)
Weight ……..……..	210 g (SAGA1-K1/K2)
	385 g (SAGA1-K3/K4)

Receiver

Power ……	24/48/110/220/380VAC(± 20%)
Dimension ……..……..….	167x154x88mm (SAGA1-K1/K2)
	310x160x95mm (SAGA1-K3/K4)
Weight ……	2100 g (SAGA1-K1/K2) w/cable
	2900 g (SAGA1-K3/K4) w/cable

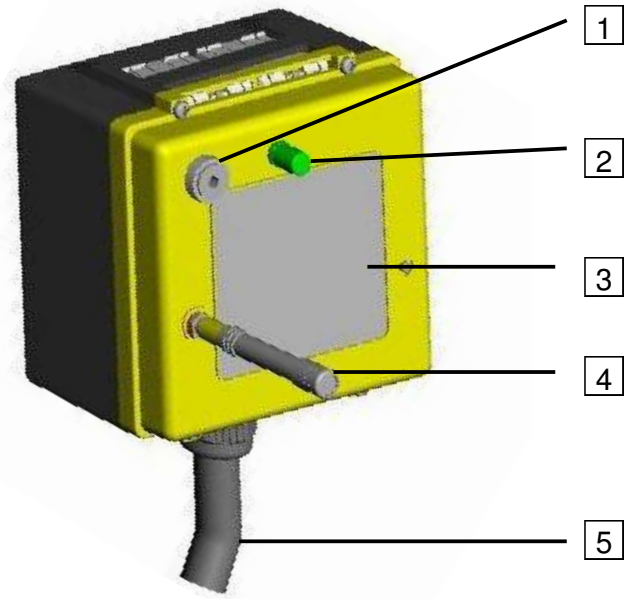
Transmitter & Receiver Overview

SAGA1-K1/2 Transmitter Overview



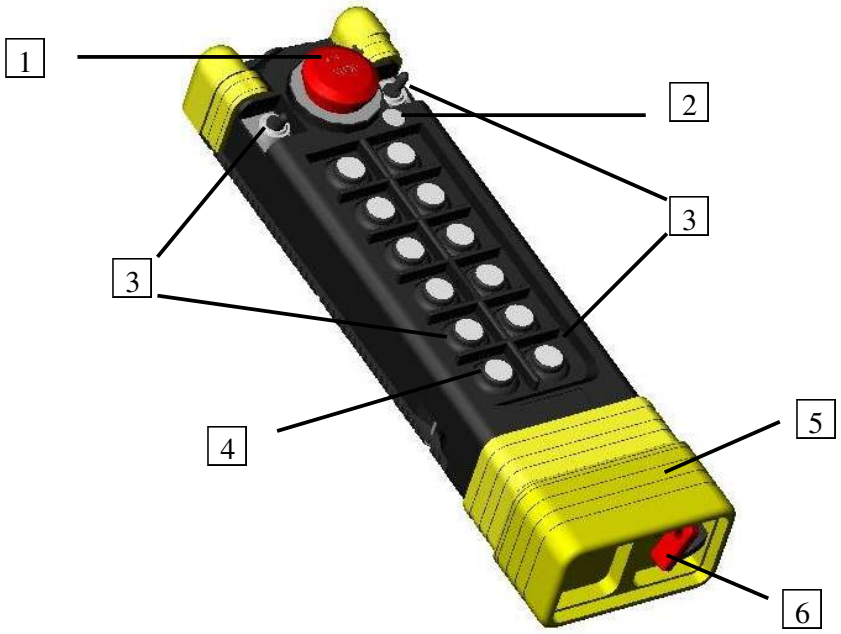
1 EMS Button
2 LED Indicator
3 Function Button
4 START /Alarm Button
5 Rotary Key
6 Battery Cover

SAGA1-K1/2 Receiver Overview



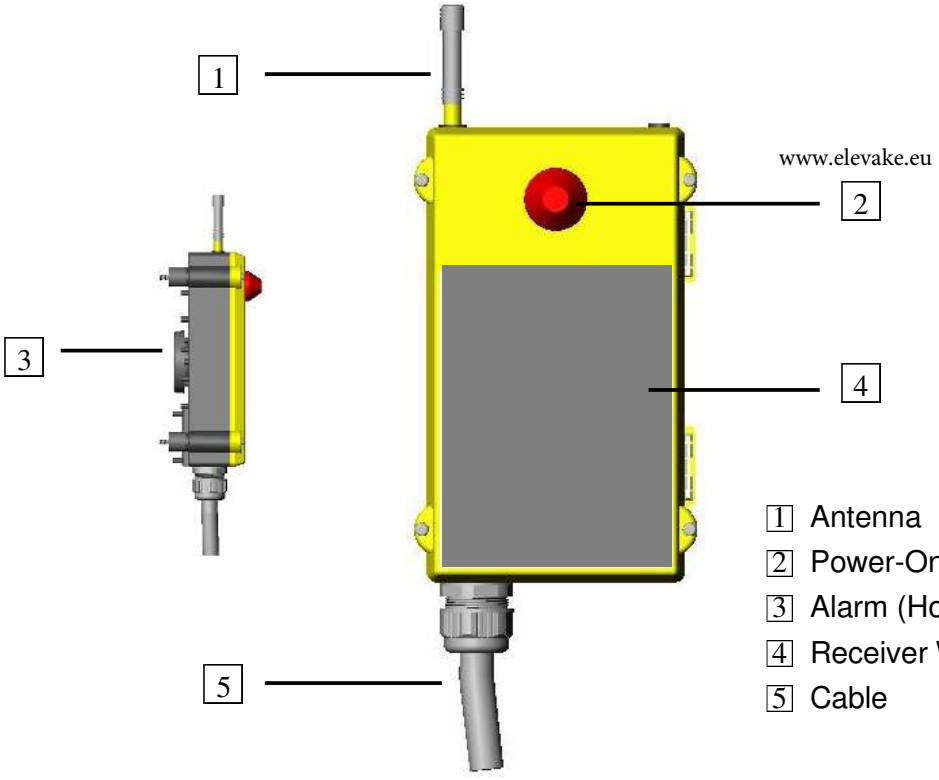
1 Alarm (Horn)
2 Power-On Indicator
3 Receiver Wiring Diagram
4 Antenna
5 Cable

SAGA1-K3/4 Transmitter Overview



1 EMS Button
2 LED Indicator
3 Function Button & A/B Switch
4 START /Alarm Button
5 Battery Cover
6 Rotary Key

SAGA1-K3/4 Receiver Overview



1 Antenna
2 Power-On Indicator
3 Alarm (Horn)
4 Receiver Wiring Diagram
5 Cable

General Operation

Getting Started

1. Install 4 new AA-size batteries in the battery compartment (make sure batteries correctly installed according to the indication of “Positive” & “Negative”) and close battery cover firmly.
2. Insert rotary key into transmitter unit and switch to “ON” position.
3. Press START button to power on the system.
   Note: Red LED indicator will flash when fail to follow procedures above accordingly.
4. Press function button for operation.

Follow the procedures below when finish operation

1. Press EMS button
2. Switch rotary key to “OFF” position
3. Remove rotary key and keep in a safe place
4. Remove batteries if not to be used for long period of time.

Transmitter LED Indicator

Green (Full Power)	Operate as usual.
Yellow (Mid Power)	Unload the article as soon as possible and stop operation until new batteries are replaced.
Red (Low Power)	An EMS signal will be sent to receiver automatically to turn off receiver. To avoid the interruption during operation, check battery power frequently.

Note: Switch rotary key to “OFF” position to turn off transmitter completely thus extend battery life, otherwise transmitter is in standby mode when rotary key remain in “ON” position.

Changing Receiver Input Voltage

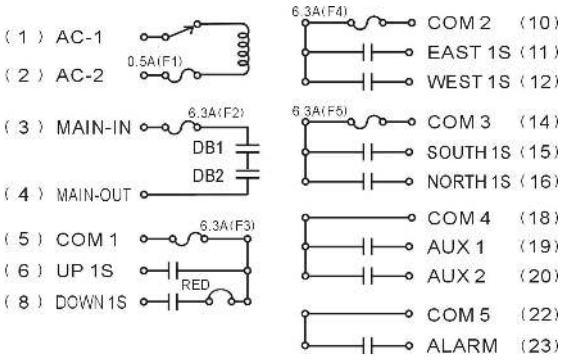
If the factory preset receiver voltage is different from application, follow the procedures below to change input voltage. (Three different voltage options for each receiver as shown in the picture with yellow label)

1. Switch off receiver main power.
2. Remove the connector from original position.
3. Insert connector to new voltage position accordingly.

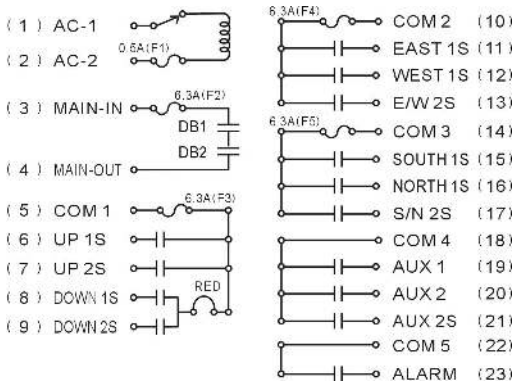
Note: Four different transformer options are available for SAGA1-K Series.
(1)24V/42V/230V (2) 48V/110V/220V (3)110V/220V/380V (4)48V/220V/380V

Receiver Wiring Diagram

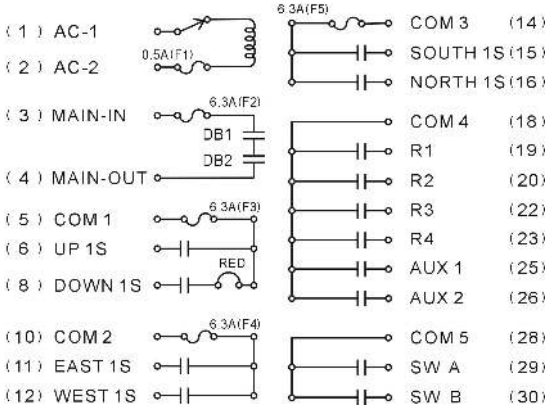
SAGA1-K1



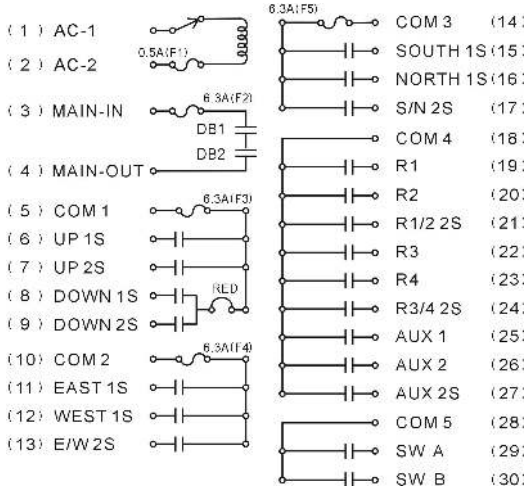
SAGA1-K2



SAGA1-K3



SAGA1-K4



Troubleshooting

A. When transmitter red LED flash fast continually, it may be

1. One of pushbutton jammed.
2. EMS button is not disengaged.
3. Fail to follow Power-on procedures accordingly.

B. When transmitter red LED flash slowly, it may be low battery power.

Appendix

A. Pushbutton Function setting

Normal
When the pushbutton is pressed and held, the relative relay is “on”. On the other hand, the relative relay is “off” when the pushbutton is being released.

Toggle
To press the pushbutton and release once for “on”, re-press and release for “off” cyclically is called “Toggle”. For instant, Toggle function is usually used as a switch to control the lighting.

ON/OFF
Two relative pushbuttons are set to respectively but control the same relay. If a pushbutton set as “on” is pressed then released, thus the relay remains conduction. To de-energize the relay, press the pushbutton set as “off”. Practically, like turning a switch of water pump from ON or OFF position by the respectively pushbuttons.

Interlock
If the motions cannot operate simultaneously then select “Interlock”, like UP and DOWN pushbutton are typically set as “Interlock”.

Non-Interlock
If the motions are allowed to operate simultaneously then select “Non-Interlock”.

Interlock Delay Time
The interval time before next motion is valid. For example, to prevent breaks damaged there is an interval time before next motion starting. e.g. “UP-Interval (Interlock-Delay) - Down”.

Magnetic ON/OFF
Two relative pushbuttons are set to respectively but control the same relay. If a pushbutton set as “Magnetic ON” is pressed then released, thus the relay remains conduction.
But, as operators would like to terminate this function, the pushbutton (set as “Magnetic On”) has to be pressed again and hold before pressing the pushbutton “Magnetic OFF”. This function is mainly used on electromagnetic device.

Inching
Once the pushbutton is pressed, relative relay will be activated within some certain period of time to operate a short but precise movement.

Inching 1:Press and release the “START” button firstly, then press the motion pushbutton (Inching function was active). On the contrary, to terminate Inching function please press“START” button again.
Inching 2: Press and hold “START” button then press motion pushbutton to perform the inching motion.

Acceleration Delay
This function is to set the time interval between acceleration relay (i.e. conduction-delayed time of acceleration relay). It is adding duration between two events in order to prevent the cranes directly runs to highest speed and causing some damage on motors.

Dual Motor
For 2 steps button model, only one relay active at a time i.e. press UP 1st step button, the UP1S relay turns on. And press deep to 2nd step, the UP2S relay turns on while UP1S relay turns off. There are 2 modes for Dual Motor as below

Dual Motors (1): When pushbutton is released from 2nd step to neutral position. The 1st step relay will turns on for very short time till the pushbutton is totally released.
Dual Motors (2): The 1st step relay is not active (bypass) when pushbutton is released from 2nd step to neutral position.

Synthesis
In synthesis mode, the button functions as normal button. But when two relative buttons pressed simultaneously, it works as "toggle" function.
Note: Synthesis only available on 2 steps button models.

Power On Mode
(1) Start Button: The receiver will be "Power-On" as the key is turned from "off" to "on" position then press the "START" button,
(2) Power On with Password: This function is used to set a restriction for unauthorized operators. Password will be asked before turning the transmitter on. Select 4 pushbuttons as password from UP/DOWN/EAST/WEST/NORTH/SOUTH. For example, press the pushbuttons in accordance with the sequential number (4 digits), for example: Up, Up, Down, Up.

Inching Time
Inching time is used on the situation as long as the relative relay activates to accomplish a precise movement only within a short-period time.

Transmission Mode
(1) Continuous transmitting mode: Transmitter will continuously transmit signal during "Power-On".
(2) Non-continuous transmitting mode: After "Power-On", the transmitter will transmit signal only as the pushbutton is pressed. This mode can save the power of transmitter.

TX Auto Off Time
Transmitter will turn off the power automatically over a certain time without operation.
Note: TX Auto Off Time function is only available while "continuous transmitting mode" has being selected.

TX Auto Off EMS
Whether to transmit EMS signal to switch off the receiver before transmitter turns off automatically. This function is only available when transmitter in continue transmission mode.

LED Inter. Time
LED Inter. Time means TX power indicator will lighten and vanish between an interval time. For instance, the time showing on the program indicates the duration of interval time.

Passive EMS
The function of this item is used to set the duration of “Interference Neglected Time”. It is able to set upon environment conditions, that means the duration of practical interfering time is less than the duration of “Interference Neglected Time” then the remote controller will continuous perform its function to make cranes keep moving.

Passive Act
The function of this item is used to set the reaction of receiver when the duration of interference is more than “Interference Neglected Time”.

Relay Off means the Main Relay is still on but the other Relays with the function of “Normal” are all de-energized. There is not necessary to recommence the procedure of “Power-On” again to continuously operate.

Power-Off means the Main Relay and all of the other relays with the function of “Normal” and “Control by EMS” are going to de-energize and it is essential to recommence the procedures of “Power-On” again to continuously operate.

RX Auto Off
Receiver Main Relay will power off and de-energize automatically without receiving any signal within a period of time from Transmitter.
Normally, while non-continuous transmitting mode has been selected and RX Auto Off will be active in case operators forget to press EMS after completing the task,

Start-Up/Shut-off Alarm
Alarm sounds for 2 seconds when receiver turns on and off. Select enable to active this function or disable to cancel.

TX Emission PWR
TX Emission PWR offers 8 different stages being selected, which will be providing maximum operating range of 500 Meters and minimum of 20 meters.
Note: The operating range will depend on actual circumstance.

Relay Jammed Detect
If the relay was detected as jammed, the main relay will de-energize for safety.
Note: Relay Jammed Detect is only available for UP/DOWN, EAST/WEST SOUTH/ NORTH relays in “Normal” function.

Remote Pairing
Remote setting being selected as enable, remote pairing function is effectively. For standard operating procedures please refer “Special Function setting” . To cancel remote pairing function, select “disable”

Manual Channel Scan
Manual CH Scan being selected as enable, manual channel scan is effectively. For standard operating procedures please refer “Special Function setting”
To cancel Manual CH Scan function, select “disable”.

Channel
Operators can set frequency among CH1-CH70, 70 Channels available.

B. Special Function setting

Manual Channel Scan
Precaution: In order to maximize signal strength without having any disturbance pleases make sure transmitter and receiver close to each other as possible when operating this function

Working principles of Manual CH Scan: Firstly, the transmitter will send a command signal, requesting the receiver to automatically search the best operating frequency for the moment. Then, as this command has been received and confirm, receiver will start searching a new suitable frequency and it will be updated and restored as the new operating frequency into Transmitter and Receiver both.

Standard procedure of operating Manual CH Scan
1. Press “EMS” mushroom then turn rotary key to “OFF” position.
2. Press and hold “START” pushbutton,
3. Turn rotary key from “OFF” to “ON” position.
4. Then release “START” pushbutton and LED indicator flashes Green Yellow and Red sequentially.
5. Press “ UP “ Pushbutton, LED indicator will be flashing Yellow..
6. As LED indicator from Yellow Turns to Green and vanishes, the new frequency has been updated successfully
7. As the new frequency has been updated successfully, then turn rotary key from “ON” to “OFF” position. “Manual CH Scan” is completed.

Note: But if LED indicator from Yellow turns to Red and vanishes, the processes are incomplete and fail, please repeat the processes starting step 1.

Remote Pairing
Working principles of Remote Pairing is just working like follows - initially, transmitter will search the receiver(s) which are requesting to be matched. Next, as the reciver has been found and confrimed by operator, the receiver will upload its function settigs e.g. ID-code, frequency into transmitter in order to pair a matched transmitter and receiver. This performance can eliminate the trouble of climbing to the receiver.

Standard procedure of operating remote pairing

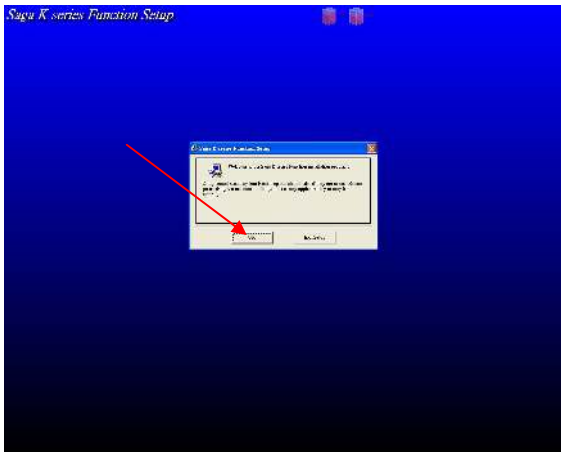
1. Press EMS" mushroom and turn rotary key to "OFF" position.
2. Press and hold "START" pushbutton,
3. Turn rotary key from "OFF" to "ON" position.
4. Then release "START" pushbutton, and LED indicator flashes Green Yellow and Red sequentially.
5. Press "DOWN" pushbutton, LED indicator will be flashing Green and Red that means Transmitter is doing the task of searching the matched Receiver.
   *If the transmitter searches a receiver which is not correct one, please press "DOWN" pushbutton until the matched receiver is found,
6. As the matched receiver has been found, the LED indicator will turn to Green.
7. To double-check the receiver has been found is right one or not, operator can press "START" pushbutton to verify it by receiver power indicator and beeping from the receiver.
8. While the transmitter found a confirmed and matched receiver, please press "UP" pushbutton, the LED indictor of transmitter will flash yellow which means data is going to be downloaded into the transmitter.
9. After the LED indictor of transmitter from yellow turns to green, press "UP" pushbutton to confirm it. Then the LED indictor of transmitter will be flashing green light 4 times and showing all the data is transferred completely.
10. Then, turn rotary key from "ON" to "OFF" position. .
11. "Remote Pairing" is completed.

Note: If there is no any receiver found, the LED indicator of transmitter will flash red 4 times which means ""Remote Pairing" processes are being aborted.

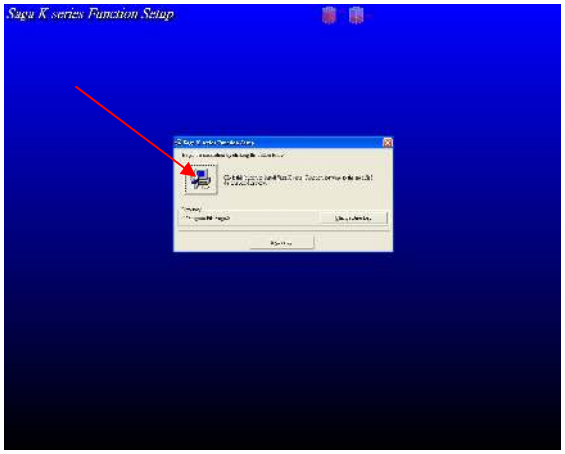
(A) Software Installation

Insert SAGA1-K CD into CD-Rom drive for auto installation.

1. Press “OK” to continue installation

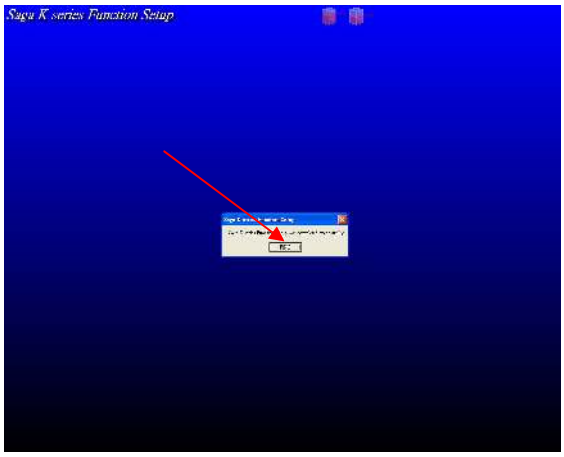


2. Press “PC Button” to continue installation



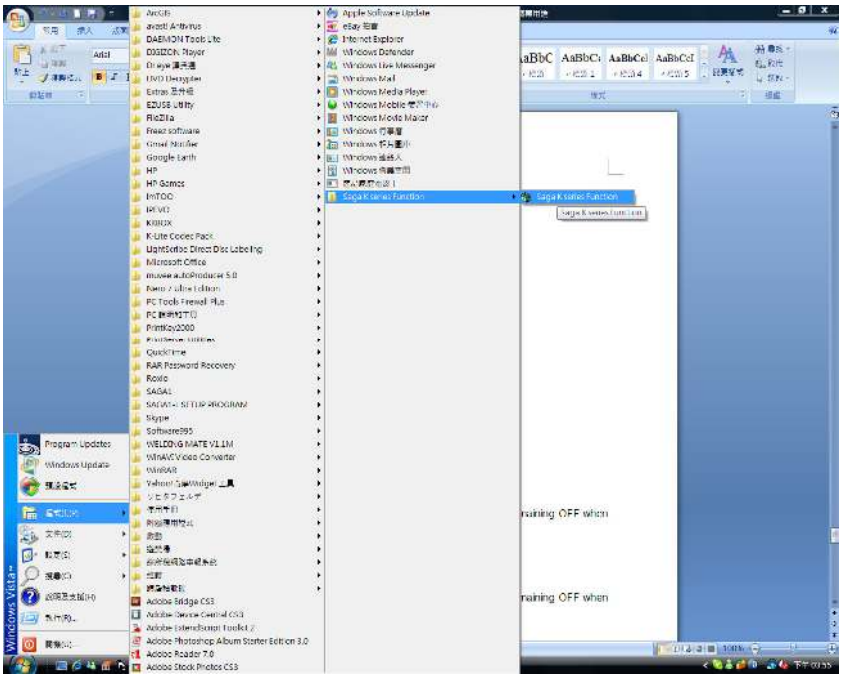
3. Press “continue” to continue installation

4. Press “**FINISH**” to complete installation



(B) Starting SAGA1-K Software

1. Press **“Start”** button
2. Select “**Program**”
3. Select “**SAGA1-K Function**”
4. Then select “**SAGA1-K Function**”



(C) Using SAGA1-K Software

Read Data

1. Connect program USB cable into transmitter or receiver.
2. Press “Read Data”.
3. Press “OK” when finish

Note: Make sure both power of transmitter and receiver is remaining OFF when reading or writing the data.

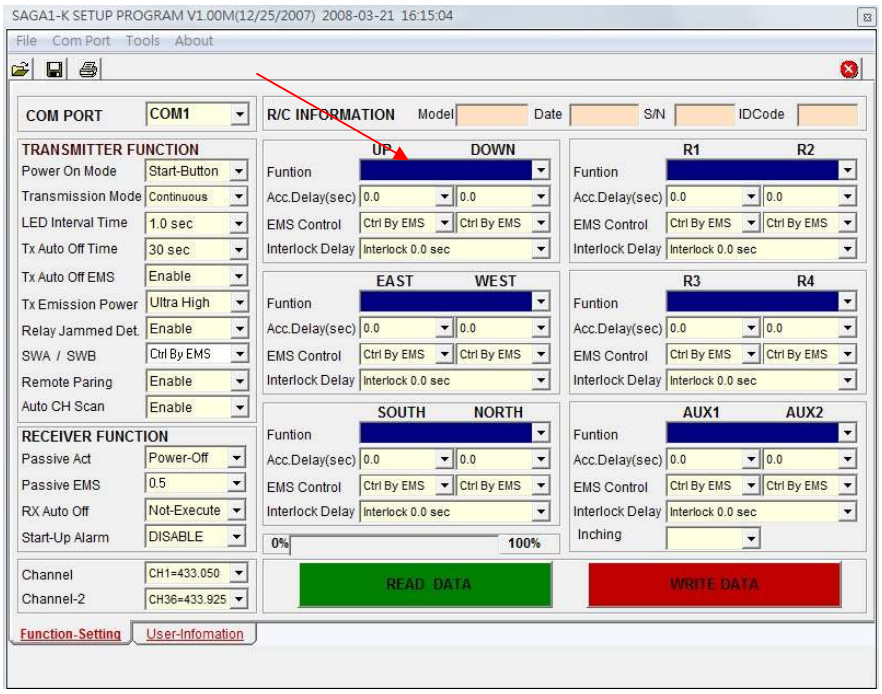
Write Data

1. Connect USB cable into transmitter or receiver.
2. Press “Write Data”. ◦
3. Press “OK” when finish.

Note: Make sure both power of transmitter and receiver is remaining OFF when reading or writing the data.

To Change Pushbutton Function

1. Read data from Transmitter. (Receiver)
2. Click the pushbutton function menu and select the new function setting.



Saving Data

To save function and customer data

1. Press Save button 
2. Select the saving folder and file name then press “SAVE”

Open File

To open file (data)

1. Press open file button  or select LOAD
2. Select the file name then press OPEN

Customer Data

It allows you to save customer information such as company name, date of purchase, address, and phone etc.

1. Click “User-Information”
2. Fill the information.
3. Press Save button

Print

To print the screen, press printing button 

Note: Only the current viewing page will be printed when press printing button.

Exit Program

Press  to exit program

SAGA1-K Series Copier User's Guide

Introduction:

The copier with 6-pin connector cable for SAGA1–K1/K2/K3/K4 is combined with two colors. Its upper casing is in yellow color and lower casing in black. Using the copier you can pair transmitter and receiver with same data. You can transfer data from TX to TX, TX to RX, RX to TX or RX to RX. There are 3 buttons on the copier; each of these three buttons only can allow you to store latest data that you read from transmitter or receiver. Before you use copier, please make sure you remove transmitter's batteries and turn off receiver.

Instruction:

1. Batteries Installing
   Remove 4 screws from back side of lower casing with a Philips screw driver, then open the lower casing and install 2 AA size 1.5V Alkaline batteries. Paying attention to batteries' polarity. Now you can screw the lower casing on.

2. Data Reading
   - Put the green magnetic key into key holder and do not remove it until entire process completed.
   - Connect copier's 6-pin cable to the Transmitter or Receiver.
   - Press any button you want to store data and release it after green LED stops flash. Now you can disconnect 6-pin cable.

3. Data Writing
   - Remove green magnetic key from key holder before you start to write data into transmitter or receiver.
   - Connect copier's 6-pin cable to transmitter or receiver.
   - Press the button you stored data and release it after green LED stops to flash. Now you can disconnect 6-pin cable.

Precaution

1. Always use copier to read and write data with same model.
2. Before using the copier, make sure that you remove transmitter's batteries and turn off receiver. Otherwise, the system data will be damaged.
3. Remember the button you pressed to store data and press same the button when writing data out. Every button when being pressed only store latest data and older one will be overwritten automatically.
4. If copier's battery power is insufficient, the LED will be in orange flash. Please install new batteries.
5. It is abnormal if copier's LED flashes red when reading or writing; please check if the cable is not well connected.