



Embedded Flying Marking Control System

Hardware User Manual

Shenzhen RuiDa Technology CO., LTD

Tel: 86- 0755-26066687

Fax: 86-0755-26982287

Web: www.rd-ac.com

E-Mail: support@rd-ac.com

Add: 1B-1, Building 5, Tian'an Nanyou Industry Area,
Dengliang Road, Nanshan District, Shenzhen, P.R.C.



CONTENTS

CONTENTS	2
Copyright Declaration.....	3
Chapter 1 Overview	4
1.1 Brief Introduction	4
Chapter 2 Installation & Operation.....	6
2.1 List of products	6
2.2 RDM602XG embedded flying marking controller.....	6
2.3 System Application Steps	8

Copyright Declaration

Shenzhen Ruida Technology Co., Ltd. (hereinafter referred to as “Ruida Technology”)

All rights reserved.

1. Ruida Technology holds the patent rights, copyrights and other intellectual property rights for this product and its related software. Without authorization, none company or organization or individual is allowed to copy, manufacture, process and use this product and its relative parts directly or indirectly, otherwise shall be investigated for legal responsibility according to the law.
2. Ruida Technology is entitled to increase or reduce and modify the products and functions of this product stated herein as well as amend any documents attached to this product, without prior notification.
3. The users should peruse this manual prior to using the product stated herein, Ruida Technology shall not be responsible for the direct, indirect, special, incidental or corresponding losses or damages arising out of improper use hereof or of this product as below:
 - Users using this manual or product improperly
 - Users not follow the related safety operation rules
 - The loss caused by the forces of nature
4. The machine in operation is dangerous, so the users are obliged to design and institute the effective mechanism for error handling and safety protection. Ruida Technology shall not undertake any duties or responsibilities for the incidental or corresponding losses arising therefrom.

Chapter 1 Overview

1.1 Brief Introduction

Embedded flying marking control system adopts RUIDA technology RDM602XG embedded hardware platform based on the mature and stable ARM + DSP + FPGA platform. Using the stable WINCE embedded operating system, which is specifically developed for miniaturization of embedded flying marking equipment. It has excellent vibrating mirror motion control function and laser control function.

Plenty peripheral interfaces, this system has serial port, internet access, USB and SD card interface, etc. So this system can meet the user's demand. The whole system adopts touch screen, friendly interface design, easy to operate.

The system has the simulated vibrating mirror interface and digital vibrating mirror interface, and simulated vibrating mirror interface output + / - 5V voltage, resolution up to 16. Digital interface is compatible with XY2-100 protocol format.

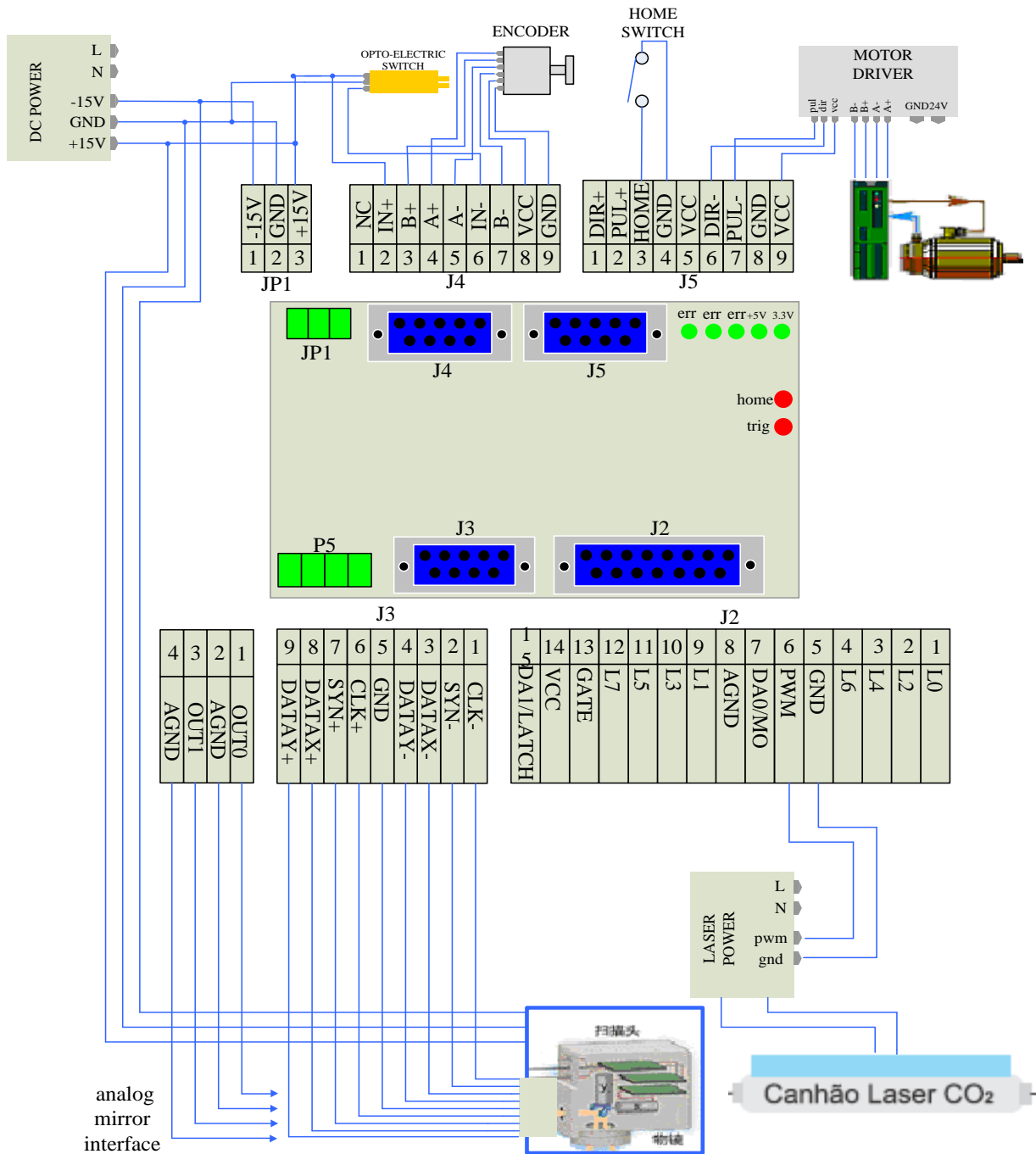
The laser control interfaces are compatible with CO2 glass tube, the CO2radio-frequency tube and YAG and fiber lasers. Users only need to set the software or hardware jump line interface to meet the requirements of the interface.

In addition, system also provides flying marking special encoder input interface and IO trigger input interface, one way rotary motor pulse control interface, the origin signal input interface and limit switch input interface.



Picture 1 System software

The detailed electrical connection diagram as Picture1-2 showed:



Picture1-2

Chapter 2 Installation & Operation

2.1 List of products

When you received our product, please check the type and accessories and make sure these are what you ordered. If wrong, please contact RuiDa technology. If the model is consistent, the user can open the packing, after opening the package, because of the controller circuit board has a lot of electrostatic sensitive devices, in order to prevent the damage of electrostatic, please wear good anti-static gloves, and then carefully check whether there is any damage on the board, if there is damage, please contact the RuiDa technology.

Please take good care of packaging of general motion controller, so that at the time of repairing using its original packaging to avoid damage when return to RuiDa technology.

List of products:

RDM602XG Motion controller (1set);

Green 3-pin terminal (1pcs), 4-pin terminal (1pcs), DB9 male (bonding wire) (3pcs), DB15male (bonding wire) (1pcs);

Instruction and CD (1pcs)

Antistatic glove (1pcs)

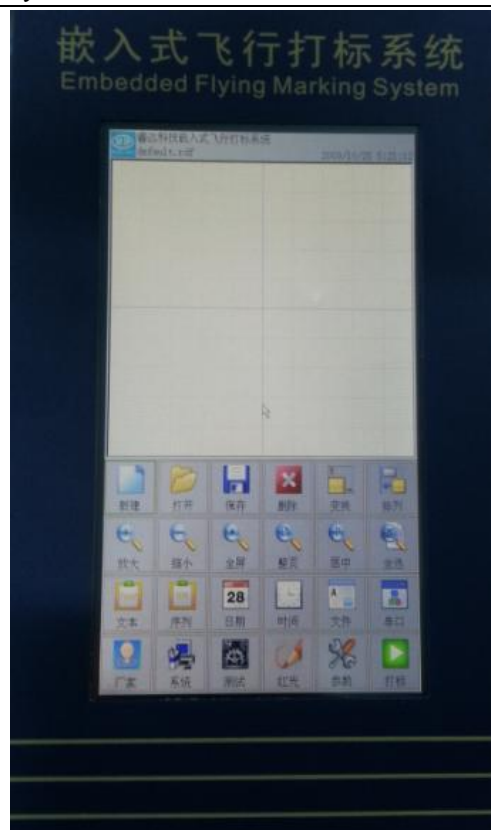


Dangerous !

Avoid the controller form ESD, please release the static charge before touching the motion controller.

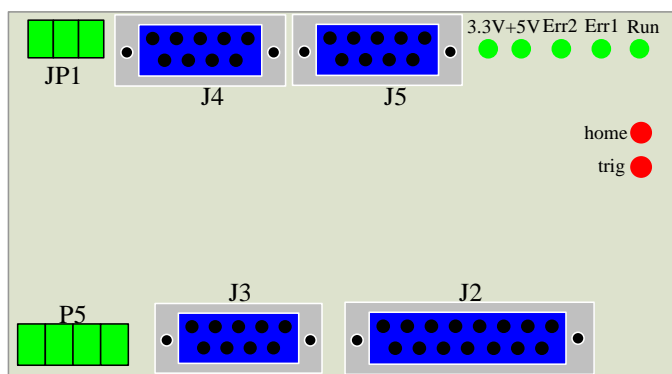
2.2 RDM602XG embedded flying marking controller

RDM602XG controller configuration as showed in Picture 2-1



Picture 2-1 front view

The descriptions of external device connection terminals as below picture 2-2 showed:



Picture 2-2 RDM602XG ports diagram

The function definition of terminals as below showed:

Sheet 2-1 Terminals Definition

PIN	Signal Definition
JP1	power supply input
P2	reserved
P5	analog vibrating mirror output interface
J2	laser control interface
J3	analog vibrating mirror control interface
J4	encoder and external trigger signal interface
J5	single-axis motor pulse control interface

The function definition of indicators as below showed:

Sheet 2-2 Indicator Definition

Indicator	Signal Definition
Run	controller data memory self-check errors
Err1	controller data memory self-check errors
Err2	controller internal work errors
+5V	external power supply indication
3.3V	internal working power supply indication
HOME	HOME switch trigger indication
TRIG	external IO switch trigger indication

2.3 System Application Steps

Please follow the steps to establish control system as follows:

Step1: Connect power supply



Dangerous !

Avoid the controller form ESD, please release the static charge before touching the motion controller.

The control system needs +15V/-15V power supply. The marking controller and vibrating mirror head can share the same power supply due to the vibrating mirror requiring the +/-15V supply voltage.

The input interface of power supply is JP1, the definition of J1 as below sheet 2-4.

Sheet 2-3 Signal definition of power supply input

PIN	Signal Definition
1	-15V
2	GND
3	+15V

Step 2: Connect laser marking head

If the marking head is analog, you can connect P5 port of controller. If the marking head is digital, you can connect P3 port of controller.

The signal definition of P5 as sheet 2-4 showed:

Sheet 2-4 Signal definition of analog vibrating mirror interface

PIN	Signal	Description
1	OUT0	the first way vibrating mirror signal interface, voltage range: -5V~+5V
2	AGND	analog quantity reference ground
3	OUT1	the second way vibrating mirror signal interface, voltage range: -5V~+5V
4	AGND	analog quantity reference ground

Notice: Must keep the input voltage range of vibrating mirror is the same as the controller, otherwise the vibrating mirror will be damaged.

The signal definition of P3 as sheet 2-5 showed. Communication protocol follows XY2-100 data transmission format, and is compatible with all marking heads which conforming to the agreement.

Sheet 2-5 Signal definition of analog vibrating mirror interface

PIN	Signal	Description
1	CLK-	clock signal differential output negative terminal
2	SYN-	synchronizing signal differential output negative terminal
3	DATAX-	X-axis data signal differential output negative terminal
4	DATAY-	Y-axis data signal differential output negative terminal
5	GND	GND
6	CLK+	clock signal differential output positive terminal
7	SYN+	synchronizing signal differential output positive terminal
8	DATAX+	X-axis data signal differential output positive terminal
9	DATAY+	Y-axis data signal differential output positive terminal

Step 3: Connect rotating axis motor

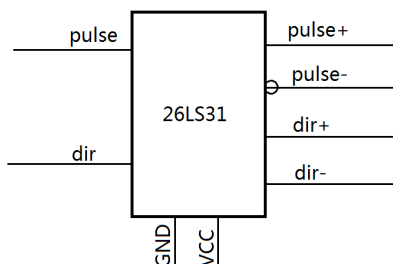
This interface is only applied to rotary marking function. If not rotating marking, do not need to connect the interface. The motor interface of rotating marking is J5. Rotating marking function provides the origin switch and motor control pulse signal. The signal definition of this interface as sheet 2-6 showed:

Sheet 2-6 rotary marking motor interface

PIN	Signal	Description
1	DIR+	motor control direction signal differential output positive terminal
2	PUL+	motor control pulse signal differential output positive terminal
3	HOME	HOME switch input
4	GND	GND
5	VCC	+5V output power supply
6	DIR-	Motor control direction signal differential output negative terminal
7	PUL-	motor control pulse signal differential output negative terminal
8	GND	GND
9	VCC	+5V output power supply

The motor output direction and pulse signal output principle as Picture 2-3 showed:

- motor control output signal

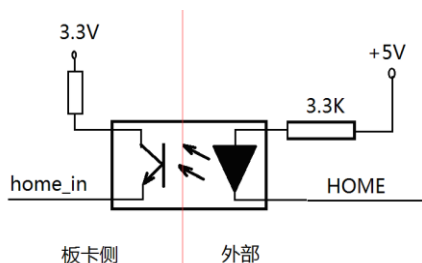


Picture 2-3 pulse differential output signal schematic diagram

- HOME switch input signal

The input circuit of rotating motor HOME switch as Picture 2-4 showed.

HOME switch low level effective.



Picture 2-4 HOME switch input circuit principle

When connected to the mechanical contact switch, only connecting the one end of the mechanical

switch to the PIN 4 of system GND J5, the other end is connected to the PIN3 of J5.

If the connection is close or photoelectric switch, it is recommended that the user selects the + 5V standard close or photoelectric switch, when connecting, the close or photoelectric switch power supply is supplied by VCC and GND, that is, namely connected to PIN9 and PIN 8 of J5, output PIN directly connected to PIN 3 of J5.

This system is compatible with + 24V or + 12V which close or photoelectric switch. But + 5V standard switch is recommended.

Step 4: Connect laser device

The laser device interface of marking controller is J2, the signal definition sheet as below sheet 2-7:

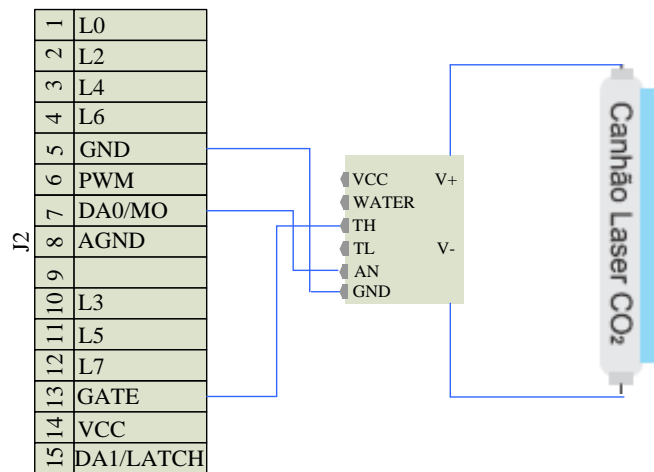
Sheet 2-7 Signal Definition of laser device control interface J2

PIN	Signal	Description
1	L0	fiber laser power digital control 0 BIT
2	L2	fiber laser power digital control 2 BITS
3	L4	fiber laser power digital control 4 BITS
4	L6	fiber laser power digital control 6 BITS
5	GND	GND
6	PWM	PWM output
7	DA0/MO	the first way analog or MO signal output
8	AGND	AGND
9	L1	fiber laser power digital control 1 BIT
10	L3	fiber laser power digital control 3 BITS
11	L5	fiber laser power digital control 5 BITS
12	L7	fiber laser power digital control 7 BITS
13	GATE	laser switch signal
14	VCC	+5V power supply
15	DA1/ALTCH	the second way analog or power latch

(1) Connect CO2 glass tube laser

In general, CO2 glass tube laser needs 2-way signals, one way is analog power control signal, voltage range is 0~5V; the other is laser switch signal.

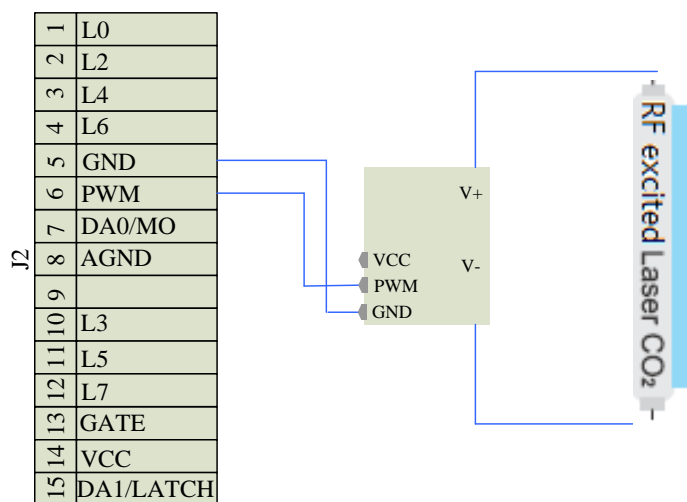
When CO2 laser connects to J2, the PIN13 of J2 should connect to laser switch control terminal of CO2 laser, and the CO2 laser power control interface connects to PIN7 of J2. Please refer to Picture2-5.



Picture 2-5 glass tube laser connection diagram

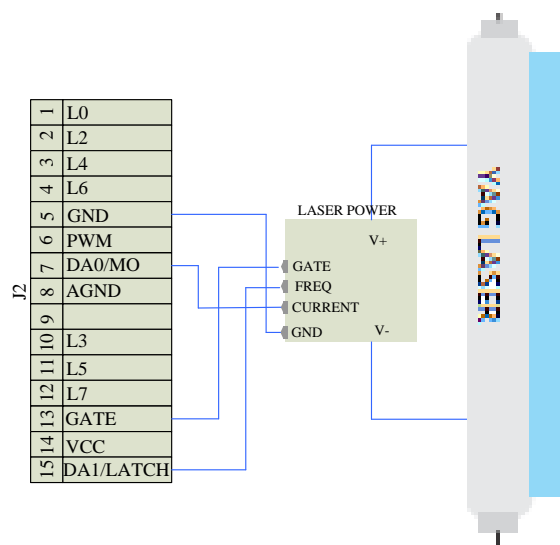
(2) Connect CO2 RF laser

The control signal of CO2 RF laser only needs one way PWM, as Picture 2-6 shown:



Picture 2-6 RF CO2 laser connection diagram

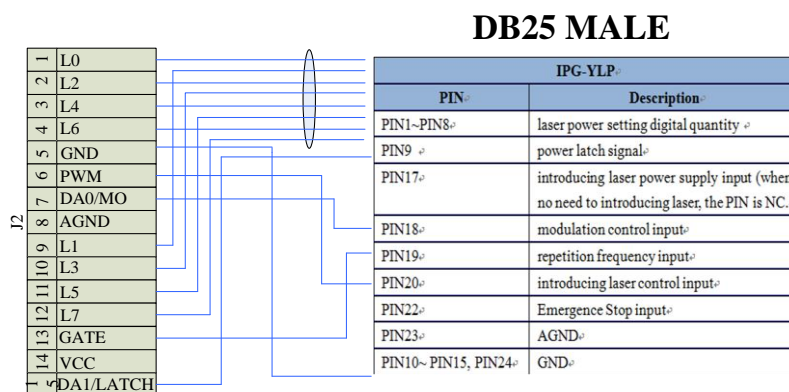
(3) Connect YAG laser
As Picture 2-7 showed:



Picture 2-7 YAG laser connection diagram

(4) Connect fiber laser

When connected to fiber laser, such as YLP serials of IPG and Mingschin fiber laser. Please refer to Picture 2-8.



Picture 2-8 fiber laser connection diagram

PIN23 of fiber laser---emergence stop control terminal, external controlled by user manually.

If the user needs to use fiber laser introducing laser, the fiber laser guided laser switch also need user manual control outside, guide the laser power input PIN17, the user needs to provide independent + 5 V power supply to meet the requirements of laser protection level.

Step 5: Connect flying marking special signal

The flying marking special signal connects to the J4 of controller. The signal definition of J4 as sheet2-6 showed:

Sheet 2-6 Signal Definition of flying marking special interface J4

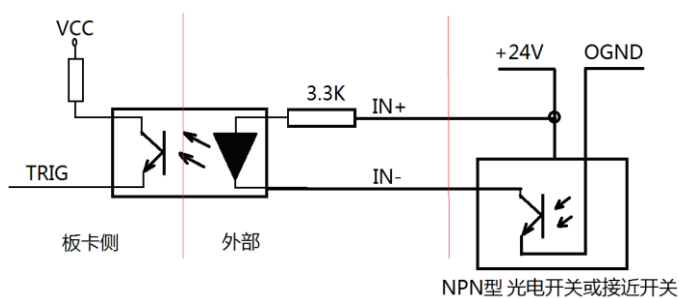
PIN	Signal	Definition
1	NC	NC
2	IN+	IO trigger signal positive terminal
3	B+	encoder signal B phase positive terminal
4	A+	encoder signal A phase positive terminal
5	A-	encoder signal A phase negative terminal
6	IN-	IO trigger signal negative terminal
7	B-	encoder signal B phase negative terminal
8	VCC	+5V power output
9	GND	GND

(1) Encoder input interface

Encoder input interface connects to J4 interface directly. Encoder can use PIN8, PIN9 of J4 to provide power supply. Encoder outputs A+, A-, B+, B- to connect the related pins of J4 directly.

(2) IO trigger input interface

IO trigger signal adopts opto-couplers isolation and differential input due to different input switch. If the user switch is optoelectronic switch of NPN type, 24V standard, please refer to the below connection:



Picture 2-9 trigger switch connection



Thank you very much for using the product from Shenzhen RuiDa Technology!

All parts of this manual description, all rights reserved by Shenzhen RuiDa Technology Co., Ltd. Without our permission, any company or individual shall not reprint, copy or distribute the content related to this product manual. We keep the rights to revise or update the contents without notice.

If any comments and suggestions please feel free to contact us.

Phone: 0755-26066687 Fax: 0755-26982287

Website: www.rd-ac.com

Address: 1B-1, Building 5, Tian'an Nanyou Industry Area,
Dengliang Road, Nanshan District, Shenzhen, P.R.C.