QKM Flexible Vibration Plate

User manual

Version	V2.2	Date	2023-7-5
Version	V2.3	Date	2024-5-9
Version	V2.4	Date	2024-5-27
Version	V2.5	Date	2024-7-27
Version	V2.6	Date	2024-9-29

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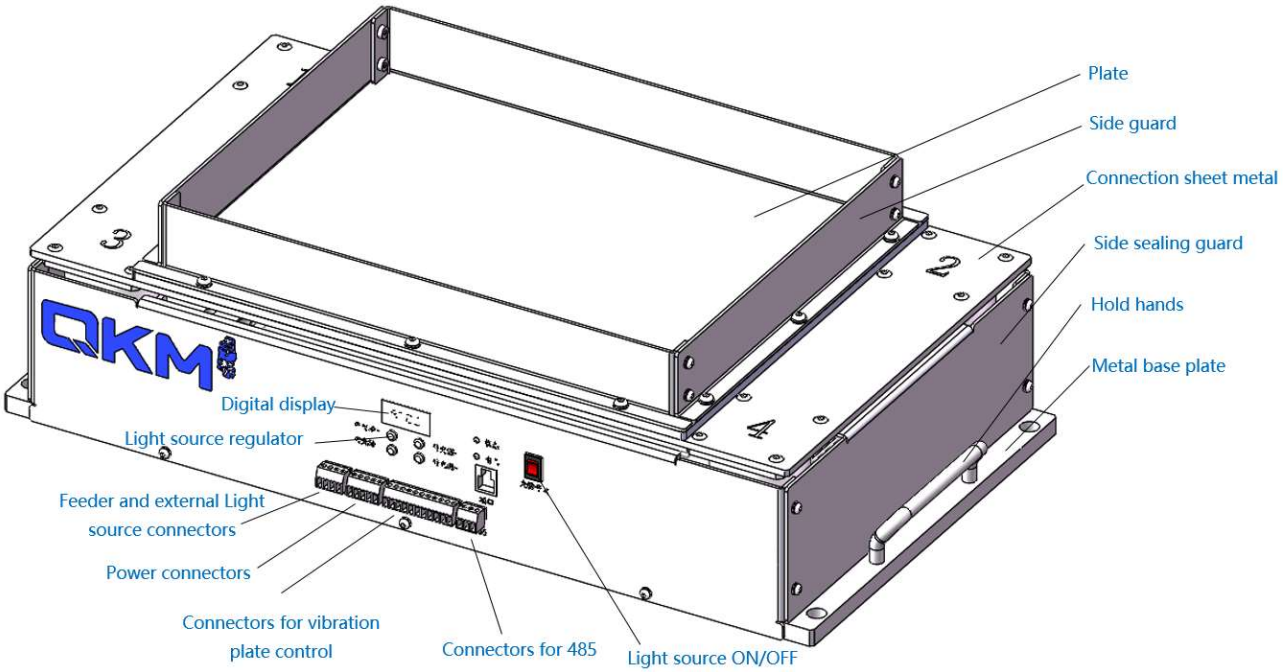


Figure 1.1

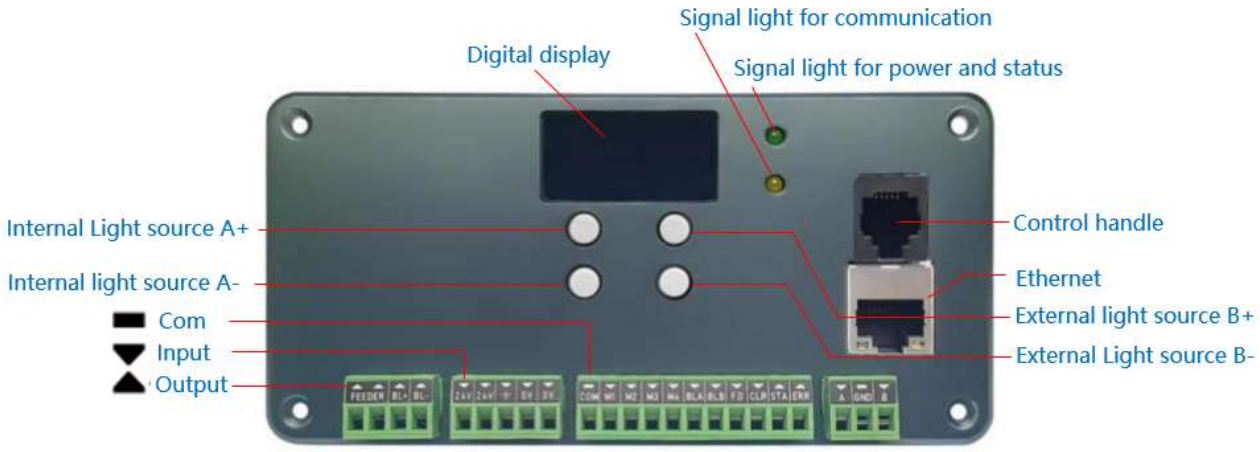
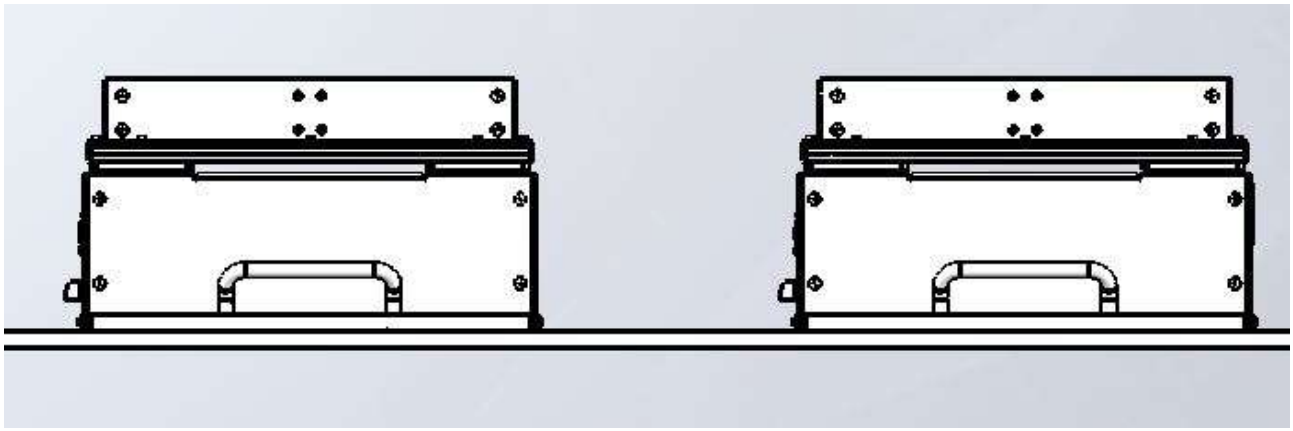


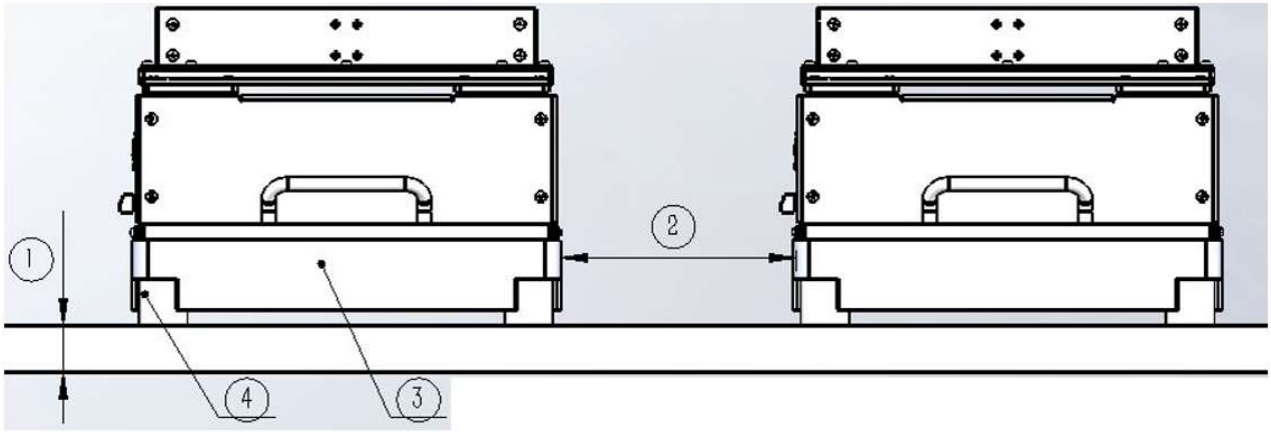
Figure 1.2

2.Installation Notes

■ Mistak installation



Correct installation



1.Mounting metal plate thickness should be more than 30mm
2.The distance between two plates should be more than 150mm
3.Extra balancing weight, it's thickness should be more than 40mm
4.shock-absorbing holder

Figure 2.1

3.Electronic connectors

The layout of all connectors shown as figure 3.1

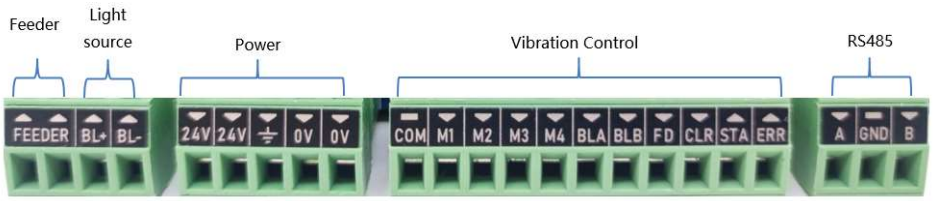


Figure 3.1

3.1 Power

There are 3 connectors：any one 24V, any one 0V, groud lead

Wires requirement:

- Use AWG17 or 1mm² type of wire and it's length should be less than 2m.
- Use AWG15 or 1.5mm² type of wire and it's length should be less than 2-3m.
- The length of wire can't be more than 3m, otherwise it will lead to voltage drop and affect the normal usage.

Attention: Please follow 24V power input and use specificed type of wire, otherwise the device may be damaged.

3.2 Vibration Control

Com	Common connector
M1/M2/M3/M4	Combined vibration control(8421), please refer to table 2 for detail.
FD	Control feeder and this connector need to be connected to **Com**.Please refer to chapter 3.3 for detail.
BLA	Control internal light source ON/OFF and this connector need to be connected to **Com**.
BLB	Control extern light source ON/OFF and this connector need to be connected to **Com.**
CLR	Clear system error and this connector need to be connected to **Com.**
STA	Status ouput(0-running 1-stopped)
ERR	System error output(0-Error,1-Ok)

Table 1

Combined vibration control shown as table 2 (● means the M1/M2/M3/M4 connects to **Com** to be pulled down)

Ports connecting configruation for vibration				
Mode	**M4（8）**	**M3（4）**	**M2（2）**	**M1（1）**
Move UP	●	●	●	●
Move Down	●	●	●	
Move Left	●	●		●
Move right	●	●		
Move upper-left	●		●	●
Move Upper-right	●		●	

Move left-lower	●			●
Gather together	●			
Move right-lower		●	●	●
Move to middle from right/left		●	●	
Move to middle from upper/lower		●		●
Vibration		●		
Group2			●	
Group1				●
Stop				

Remark: Please refer to chapter 6.10 to see the detail for Group 1 and Group2.

Table 2

3.3 Feeder

- The two connectors are used for FEEDER, the feeder has two wires which should be connected to these two connectors.
- Feeder is alternative and for supplying product to plate.
- Feeder control as follow:

➢ 1). See table 1, connect external IO to FD and controled by this IO.

➢ 2). Controled by 485 communication, please refer to chapter 6.8 for detail.

3.4 External light source

BL+/**BL-**: support external light source with power=30W. B+ for positive electrode, B- for negative electrode.

3.5 RS-485

Accessory includes a RS-485 cable, one side is USB type and can be connected to PC.

Another side T/R+ for A,T/R- for B,GND for GND.

After driver installed and RS-485 cable connected, the vibration plate can be controlled by software via 485 communication, please refer to chapter 6.3 for detail.

4.Panel function

See figure 4.1

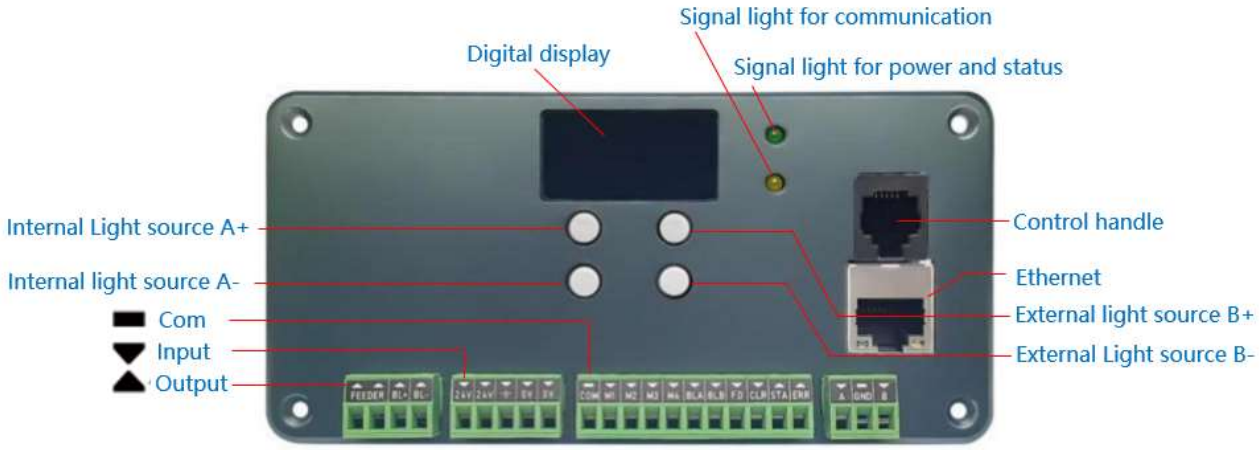


Figure 4.1

Part	Function
Digital display	● When press A+/A-/B+/B-, the first letter means the number of light source A or B and the left 3 letters means the value of light source. ● When vibration plate works, displays it's control mode.
Light source A+/A-	Press A+/A- to adjust the internal light intensity.
Light source B+/B-	Press B+/B- to adjust the external light intensity.
Control handle	Connect a external handle to setup vibration plate.
Signal light for power and status	Normally the light is green, it will turn to red if there is any abnormal case which can be reset by CLR(see table 1) or 485 command.
Signal light for communication	The light sparkles if RS-485 connected.
Ethernet	It's IP is 192.168.10.10 in default.

Table 3

5.Light source control

- System supports two light sources: internal light source inside vibration plate, another light source for external one which need to be connected to BL+/BL-.

- Both internal and external light source can be controlled:

➢ Light intensity:

✧ Use software adjust when RS-485 communication.

✧ Manual adjust shown as above figure 4.1 vis A+/A-/B+/B-.

➢ Light source ON/OFF:

✧ Use software to ON/OFF light source when RS-485 communication.

✧ Use IO(BLA/BLB) to ON/OFF light, refer to table 1 for detail.

6. Software

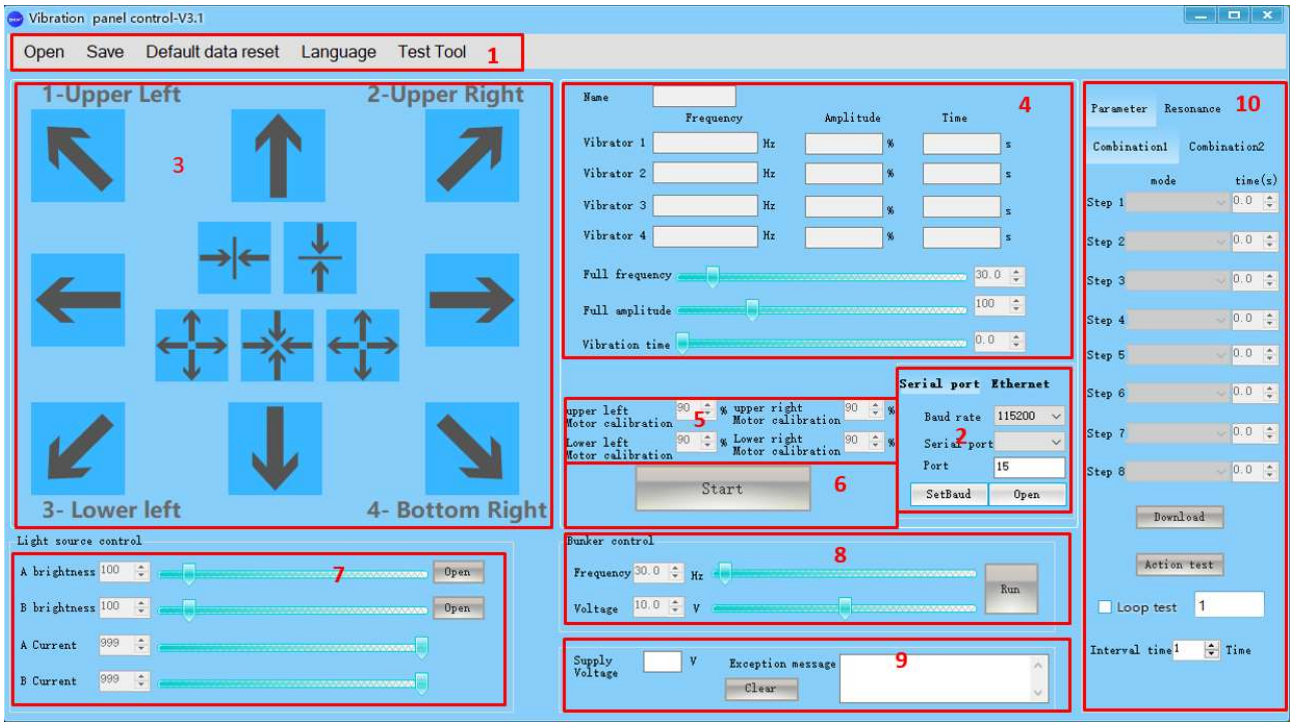


Figure 6

6.1 Menu

- Open: open and load parameter file to software memory.
- Save: Save current vibration plate memory parameter to PC file.
- Default data reset: restore vibration plate default parameter in MCU unit to software memory.

- Language: Chinese/English is alternative.

6.2 RS-485 communication

- Communication mode：Serial Port/Ethernet
- Serial Port：Set serial port: Band rate/Port/Station.
- Ethernet：Set ethernet IP/Port.
- Open：connect vibration plate vis selected serial or enternet port.

6.3 Vibration Mode

See below figure 6.1, there are 13 types of vibration mode: Move UP,Move Down,Move Left,Move right,Move upper-left,Move Upper-right,Move left-lower,Gather together,Move right-lower,Move to middle from right/left,Move to middle from upper/lower, Vibration1, Vibration2.

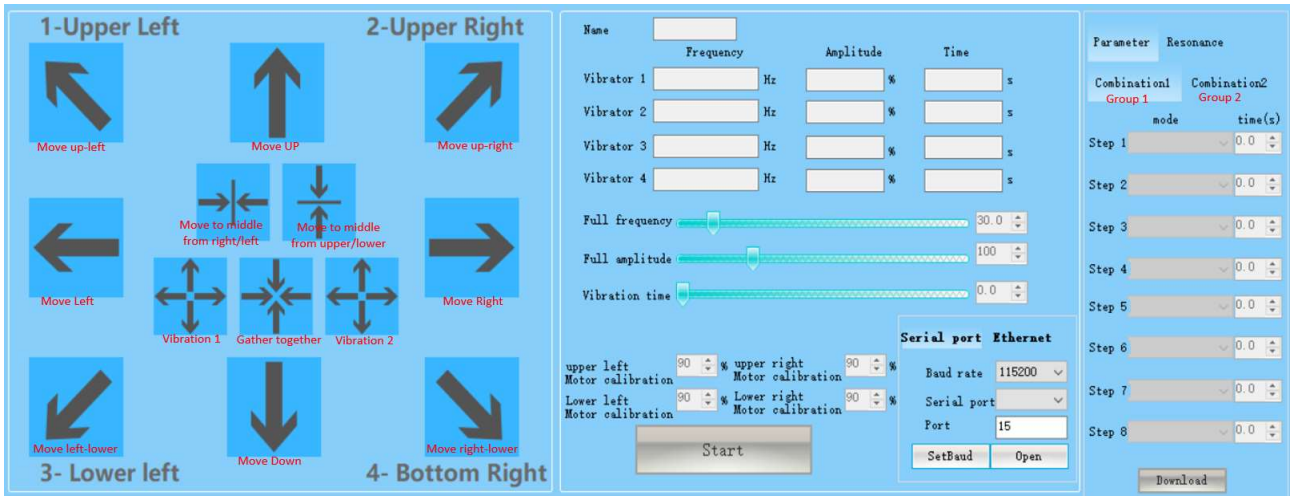


Figure 6.1

- The software interface can save above all 13 types of vibration mode parameter in memory.
- The all 13 types of vibration mode parameter will be saved into file after you click menu **Save**.
- The all 13 types of vibration mode parameter will be loaded into software memory after you click menu **Open**.
- The parameter will be shown on the middle area if you click any mode of above 13 types on the left.

- The all 13 types of vibration mode parameter will be sent into vibration plate MCU unit after you click button **Download**, then you can use IO to control the vibration mode(see table 2 for detail).
- Group1/Group2 consists of mode 1-13 step by step, please refer to chapter 6.10 for detail.

6.4 Vibration Parameter adustment

- System has done optimized for most parameter automatically, you need to adjust Frequency、Amplitude、Time only by dragging the prograss bar or inputting value manually.
- Mode Gather together consists of mode Move to middle from right/left and Move to middle from upper/lower in tun with interval 0.5s, So mode Gather together locks the frequence/amplitude and user can't change them.

6.5 Motor adjust

This function aims to balance motor physical difference, it has been done before shipment generally.

6.6 Vibration testing

Start: Click this button, vibration plate will work according to configured parameter.

6.7 Light source control

- **A** is the internal light sorce and **B** is the external light source.
- Drag the prograss bar to adjust the light intensity, click button **Open** to ON/OFF light source.
- Besides software interface, physical panel A+/A-/B+/B- can be used to adjust light intensity too.

6.8 Feeder control

The available parameters for feeder is Frequence and Voltage, Drag the prograss bar to adjust them, click button **Run** to run feeder.

6.9 Other information

- Supply Voltate: Current voltage, read only.
- Exception message: shows current exception message if there is any abnormal case, read only.

6.10 Combination vibration action

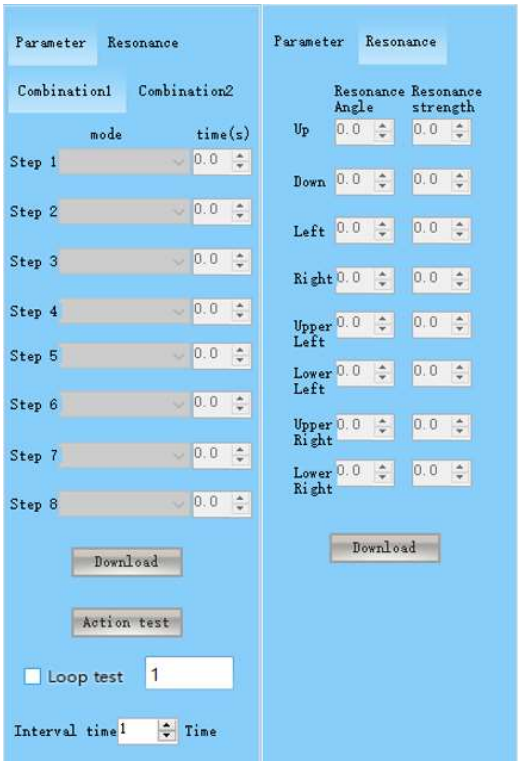


Figure 6.2

- Support 2 groups of combinated action, each group supports maximum 8 vibration mode steps.
- Each step needs a vibration mode and time, if the time is 0, system will regard current step as the last step then stop ignoring of other remaind steps.
- After finishing setup the combinated action, click button **Download** to sent the combinated steps into vibration plate MCU unit to make combinated action work in the following control.
- **Resonance**
  - ➢ It's parameter includes angle and strong for vibration mode: Up,Down,Left,Right,Upper left,Lower left,Upper right,Lower right. It will help these vibraiton mode work more flexibly.
  - ➢ After the setup, click button **Download** to send it's parameter into vibration plate MCU unit to make resonance work in the following control.

- Click button **Action test** to test the combinated action.
- Use IO to enable combination action, please refer to table 2 for detail.