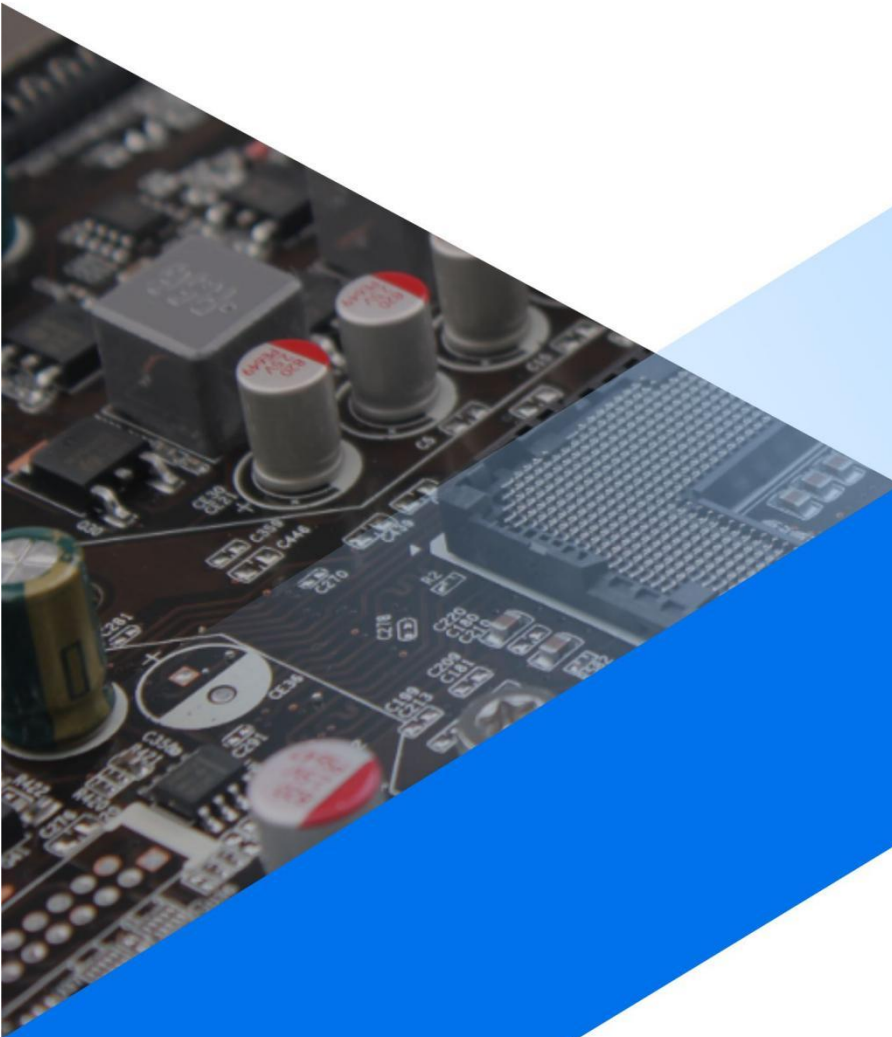


# B-Series Controller Wiring Manual

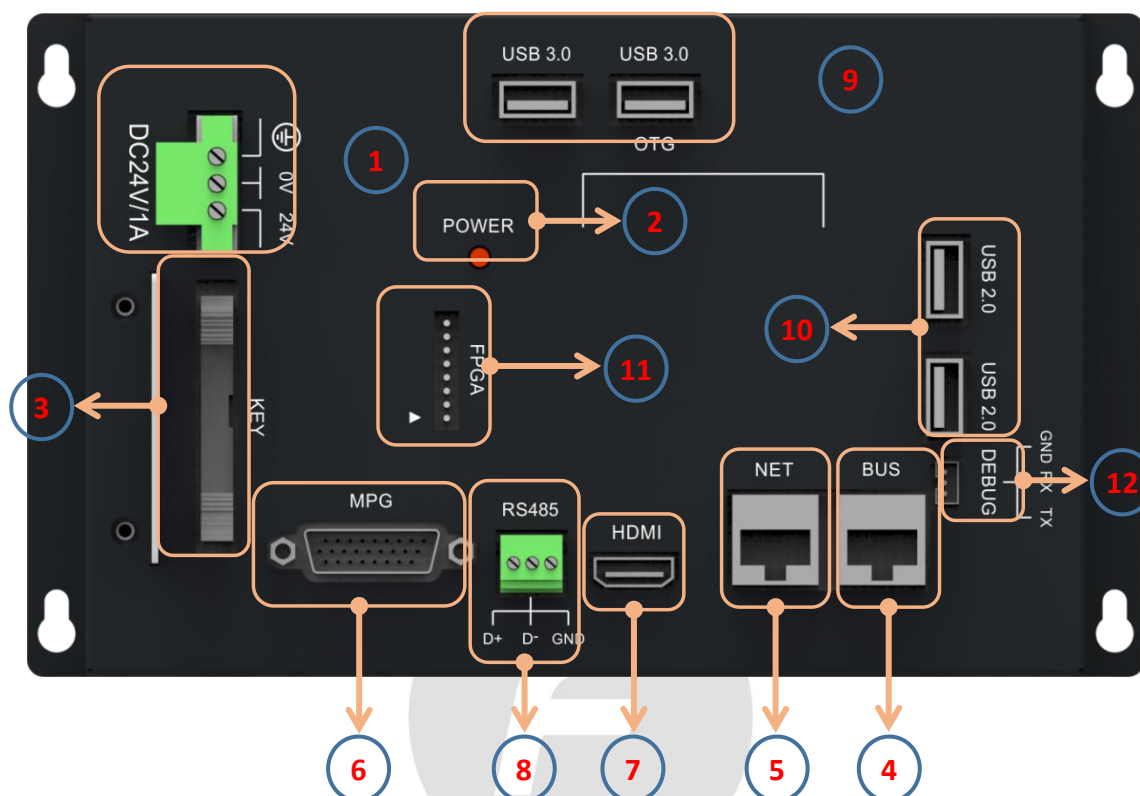
Version No: F202309WM-EN



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## Part 1.Motion Controller Interface Diagram

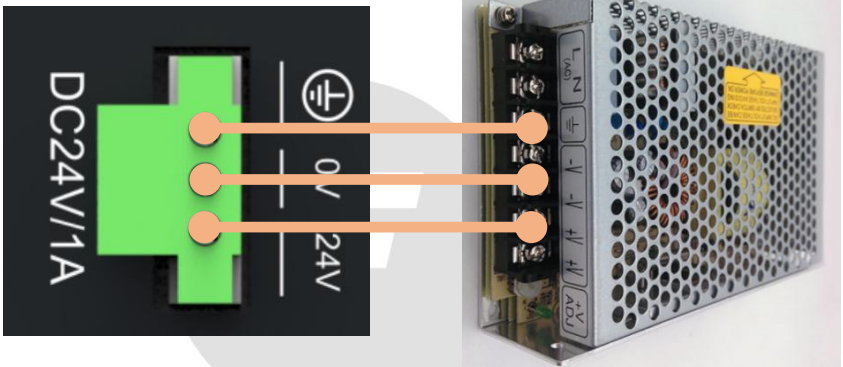


|   |                              |   |  |
|---|------------------------------|---|--|
| ① | DC 24V Power Input Interface | ⑩ |  |
| ② | Power Indicator Light        | ⑪ |  |
| ③ | Key Interface                | ⑫ |  |
| ④ | Bus Interface                | ⑬ |  |
| ⑤ | Network Interface            | ⑭ |  |
| ⑥ | MPG Expansion Interface      | ⑮ |  |
| ⑦ | HDMI Output Interface        | ⑯ |  |
| ⑧ | RS485 Interface              | ⑰ |  |
| ⑨ | USB 3.0 Input Interface2     | ⑱ |  |
| ⑩ | USB 2.0 Input Interface2     | ⑲ |  |
| ⑪ | FPGA Update Interface        | ⑳ |  |
| ⑫ | DEBUG Debugging Interface    | ㉑ |  |
| ⑬ |                              | ㉒ |  |
| ⑭ |                              | ㉓ |  |
| ⑮ |                              | ㉔ |  |

Table 1

## Part 2.Wiring Diagram

### 2.1 DC 24V Power Input Interface

| NO.                  | Description                                                                         | Connection Cables | Connected Devices |
|----------------------|-------------------------------------------------------------------------------------|-------------------|-------------------|
| ①                    | DC 24V Power Input Interface                                                        | Industrial Wiring | Power Supply Unit |
| Connection Diagram 1 |  |                   |                   |

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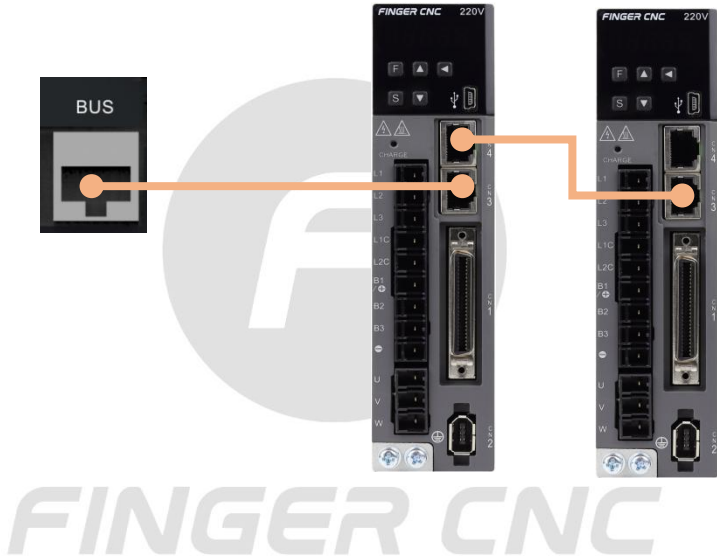
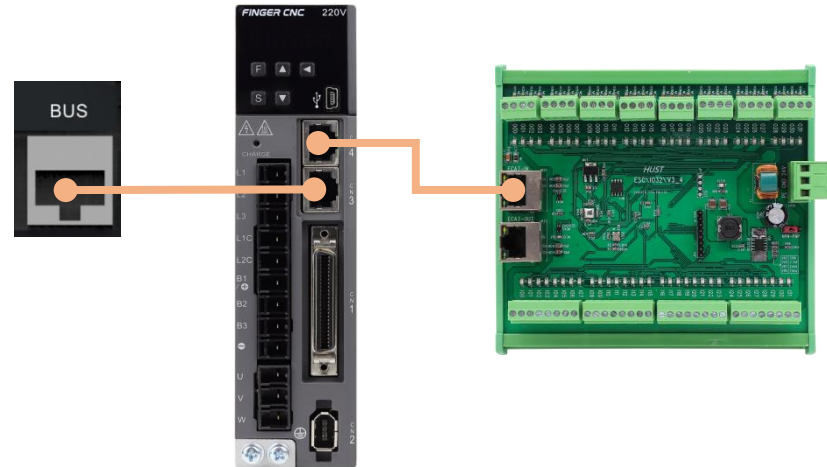
### 2.2 Power Indicator Light

| NO. | Description           | Connection Cables | Connected Devices |
|-----|-----------------------|-------------------|-------------------|
| ②   | Power Indicator Light | -                 | -                 |

2.3 Key Interface

| NO.                     | Description   | Connection Cables       | Connected Devices                             |
|-------------------------|---------------|-------------------------|-----------------------------------------------|
| ③                       | Key Interface | K3 Bullhorn Plug 26-Pin | Multiple Keyboards Can Be Connected in Series |
| Connection Diagram<br>1 |               |                         |                                               |

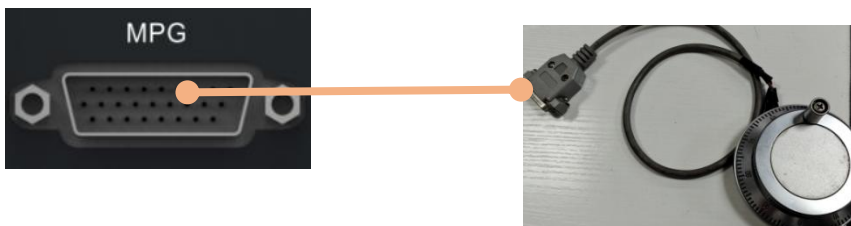
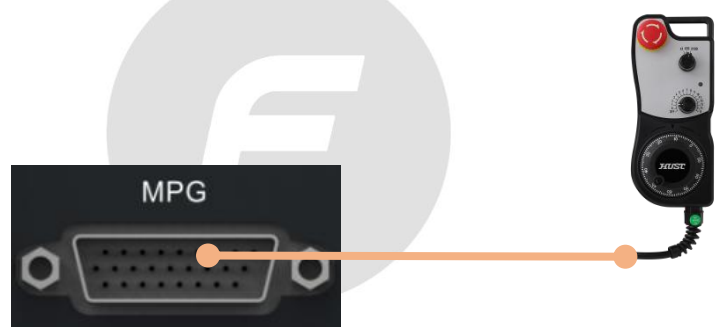
2.4 Bus Interface

| NO.                  | Description                                                                          | Connection Cables | Connected Devices                                                                                       |
|----------------------|--------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------|
| ④                    | Bus Interface                                                                        | Industrial Bus    | 1. Bus Servo Driver<br>2. Bus-Type I/O Board<br>3. Bus-Type DAC Board<br>4. Bus-Type ADC Board<br>..... |
| Connection Diagram 1 |   |                   |                                                                                                         |
| Connection Diagram 2 |  |                   |                                                                                                         |

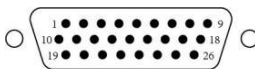
## 2.5 Network Interface

| NO.                  | Description                                                                          | Connection Cables | Connected Devices  |
|----------------------|--------------------------------------------------------------------------------------|-------------------|--------------------|
| ⑤                    | Network Interface                                                                    | Ethernet Cable    | 1. Router<br>2. PC |
| Connection Diagram 1 |   |                   |                    |
| Connection Diagram 2 |  |                   |                    |

## 2.6 MPG Expansion Interface

| NO.                  | Description                                                                         | Connection Cables | Connected Devices                                               |
|----------------------|-------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------|
| ⑥                    | MPG Interface                                                                       | Industrial Cable  | 1. Standard MPG<br>2. Multi-Function MPG<br>3. Proximity Sensor |
| Connection Diagram 1 |   |                   |                                                                 |
| Connection Diagram 2 |  |                   |                                                                 |

### ● Pinout Diagram

| B-Series MPG                                                                          |            |            |            |            |             |        |             |    |            |
|---------------------------------------------------------------------------------------|------------|------------|------------|------------|-------------|--------|-------------|----|------------|
|  |            |            |            |            |             |        |             |    |            |
| PIN                                                                                   | 1          | 2          | 3          | 4          | 5           | 6      | 7           | 8  | 9          |
| Definition                                                                            | A1         | B1         | A2         | B2         | G31-I<br>O  | GND    |             |    | 5V         |
| Hardware Definition                                                                   | MPGI<br>N0 | MPGI<br>N1 | MPGI<br>N2 | MPGI<br>N3 | G31IN/<br>O | GND-CN |             |    | VCC-C<br>N |
| PIN                                                                                   | 10         | 11         | 12         | 13         | 14          | 15     | 16          | 17 | 18         |
| Definition                                                                            |            |            |            |            |             |        | G31-I1      |    |            |
| Hardware Definition                                                                   |            |            |            |            |             |        | G31IN/<br>1 |    |            |
| PIN                                                                                   | 19         | 20         | 21         | 22         | 23          | 24     | 25          | 26 |            |

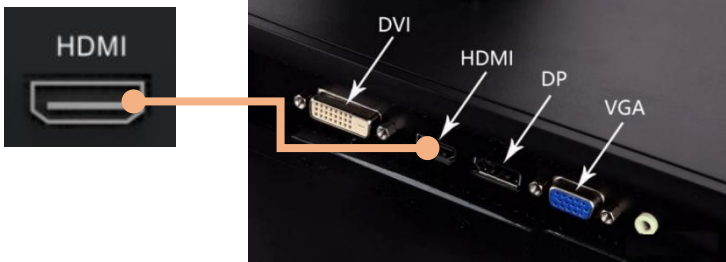


|                                                                                             |       |       |       |       |       |       |         |         |  |
|---------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|---------|---------|--|
| <b>Definition</b>                                                                           | I456  | I457  | I458  | I459  | I460  | I461  | 24V     | GND-CN  |  |
| <b>Hardware Definition</b>                                                                  | MPGI0 | MPGI1 | MPGI2 | MPGI3 | MPGI4 | MPGI5 | +24V-CN | GNDX-CN |  |
| ❖ Pins 6/7/8 GND are for 5V/ADC/DAC ground<br>❖ Pin 26 GND-CN is the ground for I-point/G31 |       |       |       |       |       |       |         |         |  |

● **MPG Port Pin Definition and Function Explanation**

| Pin | Pin Definition | Name               | Purpose Explanation                                                                                                                                                         |
|-----|----------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | A1             | MPG 1 Pulse Signal | Maximum Frequency 133KHz                                                                                                                                                    |
| 2   | B1             |                    |                                                                                                                                                                             |
| 3   | A2             | MPG 2 Pulse Signal |                                                                                                                                                                             |
| 4   | B2             |                    |                                                                                                                                                                             |
| 5   | G31-IO         | G31 Input Signal   | G31 Fast Input Signal 0                                                                                                                                                     |
| 6   | GND            | Digital Ground     |                                                                                                                                                                             |
| 7   |                |                    |                                                                                                                                                                             |
| 8   |                |                    |                                                                                                                                                                             |
| 9   | 5V             | Output 5V Power    |                                                                                                                                                                             |
| 10  | Reserved       |                    |                                                                                                                                                                             |
| 11  |                |                    |                                                                                                                                                                             |
| 12  |                |                    |                                                                                                                                                                             |
| 13  |                |                    |                                                                                                                                                                             |
| 14  |                |                    |                                                                                                                                                                             |
| 15  |                |                    |                                                                                                                                                                             |
| 16  | G31-I1         | G31 Input Signal   | G31 Fast Input Signal 1                                                                                                                                                     |
| 17  | Reserved       |                    |                                                                                                                                                                             |
| 18  |                |                    |                                                                                                                                                                             |
| 19  | I456           | Input              | NPN Type                                                                                                                                                                    |
| 20  | I457           |                    |                                                                                                                                                                             |
| 21  | I458           |                    |                                                                                                                                                                             |
| 22  | I459           |                    |                                                                                                                                                                             |
| 23  | I460           |                    |                                                                                                                                                                             |
| 24  | I461           |                    |                                                                                                                                                                             |
| 25  | 24V            | 4V Power Input     | External 24V power can be supplied to the system through this pin (make sure to connect the power ground as well, otherwise the system may not function with the 24V power) |
| 26  | GND-CN         | Power Ground       |                                                                                                                                                                             |

## 2.7 HDMI Output Interface

| NO.                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Connection Cables | Connected Devices   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|
| ⑦                    | HDMI Output Interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | HDMI Cable        | HDMI Display Screen |
| Connection Diagram 1 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                     |
| Notes 1              | <p>After the main board number of the controller: HD Ver:CPU-B01-G-V5_1 (inclusive), when connecting the external HDMI, pay attention to the fact that the display cannot be grounded (ground PE).</p>  <p>Do not ground (PE)</p> <p>Recommended operation: If the monitor is connected to the following socket inside the machine, the internal ground cable (PE) is not allowed to connect</p>  <p>Do not ground (PE)</p> |                   |                     |
| Notes 2              | <p>If the display housing is an iron housing, then the installation of the display must be isolated from the machine, and the display housing is not allowed to contact the machine iron housing. (The impedance between the display housing and the iron housing of the machine can be measured through the ohms of the multimeter and should be infinite)</p>                                                                                                                                                                                                                                   |                   |                     |

## 2.8 RS485 Interface

| NO.                                                  | Description     | Connection Cables                               | Connected Devices |
|------------------------------------------------------|-----------------|-------------------------------------------------|-------------------|
| ⑧                                                    | RS485 Interface | Twisted-Pair<br>Shielded<br>Industrial<br>Cable | RS485 Device      |
| <div> <div>Connection<br/>Diagram<br/>1</div> </div> |                 |                                                 |                   |

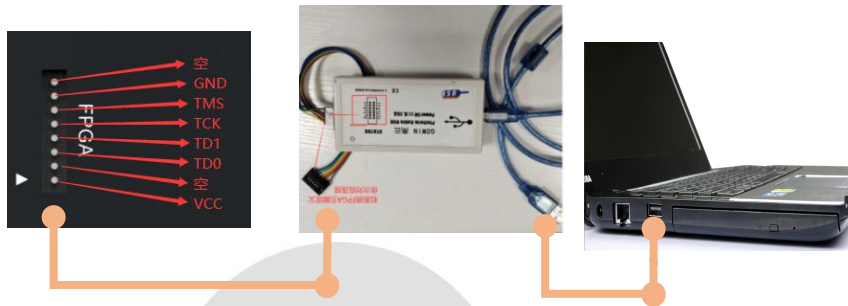
## 2.9 USB3.0 Interface\*2

| NO.                  | Description                                                                                                                                                                                                     | Connection Cables | Connected Devices                                                                                                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⑨                    | USB 3.0 interface<br>Transfer rate<br>(5Gbps)                                                                                                                                                                   |                   | <ol style="list-style-type: none"> <li>1. USB Flash Drive</li> <li>2. Keyboard and Mouse</li> <li>3. Wireless Network Card</li> <li>4. PC (for firmware or software updates)</li> </ol> |
| Connection Diagram 1 |                                                                                                                               |                   |                                                                                                                                                                                         |
| Connection Diagram 2 |                                                                                                                              |                   |                                                                                                                                                                                         |
| Connection Diagram 3 |                                                                                                                             |                   |                                                                                                                                                                                         |
| Connection Diagram 4 |  <p>To update your card, you can only use USB ports marked with an OTG label; all other functions have no restrictions.</p> |                   |                                                                                                                                                                                         |

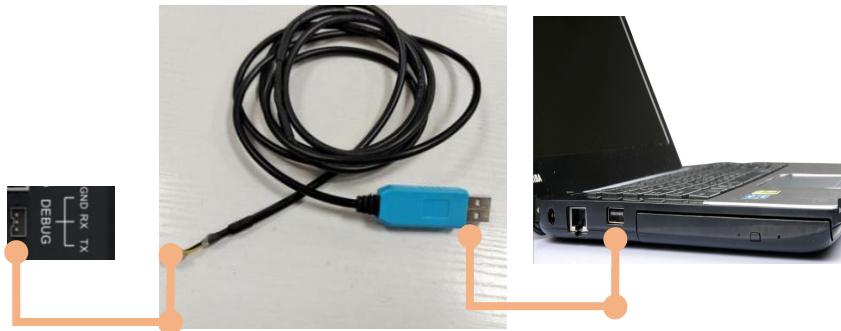
## 2.10 USB2.0 Interface\*2

| NO.                        | Description                                                                          | Connection Cables            | Connected Devices                                                       |
|----------------------------|--------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------|
| ⑩                          | USB 2.0 interface<br>Transfer rate (480 Mbps)                                        | Device<br>Standard<br>Wiring | 1. USB Flash Drive<br>2. Keyboard and Mouse<br>3. Wireless Network Card |
| Connection<br>Diagram<br>1 |    |                              |                                                                         |
| Connection<br>Diagram<br>2 |  |                              |                                                                         |
| Connection<br>Diagram<br>3 |  |                              |                                                                         |

## 2.11 FPGA Update Interface

| NO.                  | Description                                                                        | Connection Cables | Connected Devices |
|----------------------|------------------------------------------------------------------------------------|-------------------|-------------------|
| ⑪                    | FPGA Update Interface                                                              | GOWIN Downloader  | PC                |
| Connection Diagram 1 |  |                   |                   |

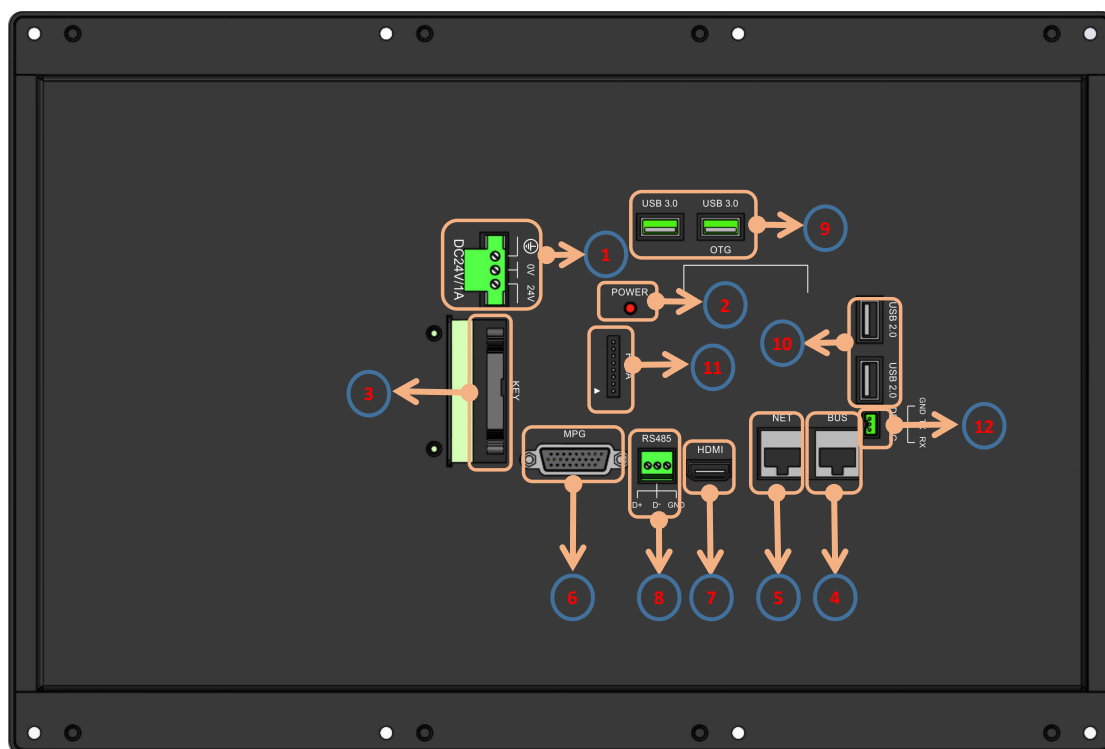
## 2.12 DEBUG Debugging Interface

| NO.                  | Description                                                                          | Connection Cables     | Connected Devices |
|----------------------|--------------------------------------------------------------------------------------|-----------------------|-------------------|
| ⑫                    | DEBUG Debugging Interface                                                            | DEBUG Debugging Cable | PC                |
| Connection Diagram 1 |  |                       |                   |

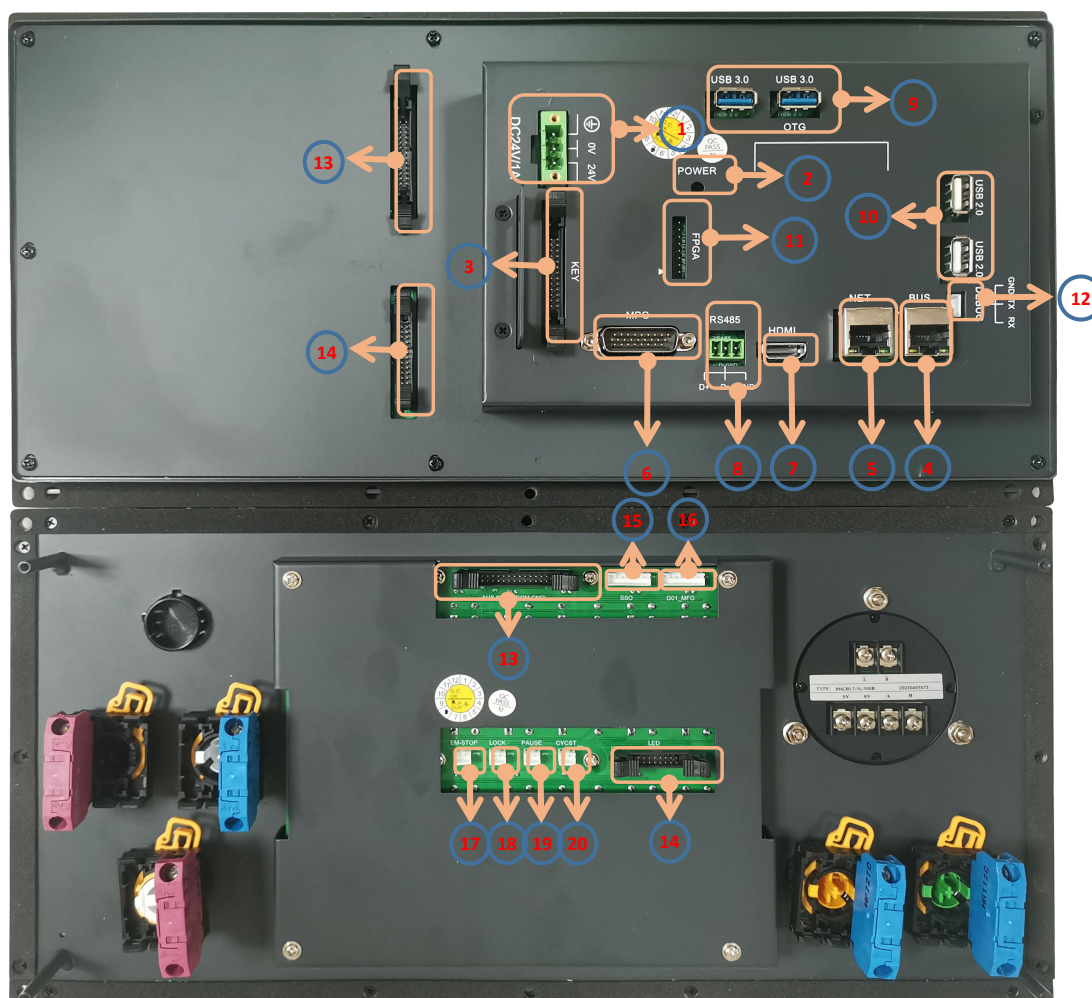
## Part 3.Other Controller Interface Diagram

### 3.1 Lathe Controller Interface Diagram

#### 3.1.1 7-Inch Horizontal Lathe Controller Interface Diagram



### 3.1.2 8-Inch Horizontal Lathe Controller Interface Diagram



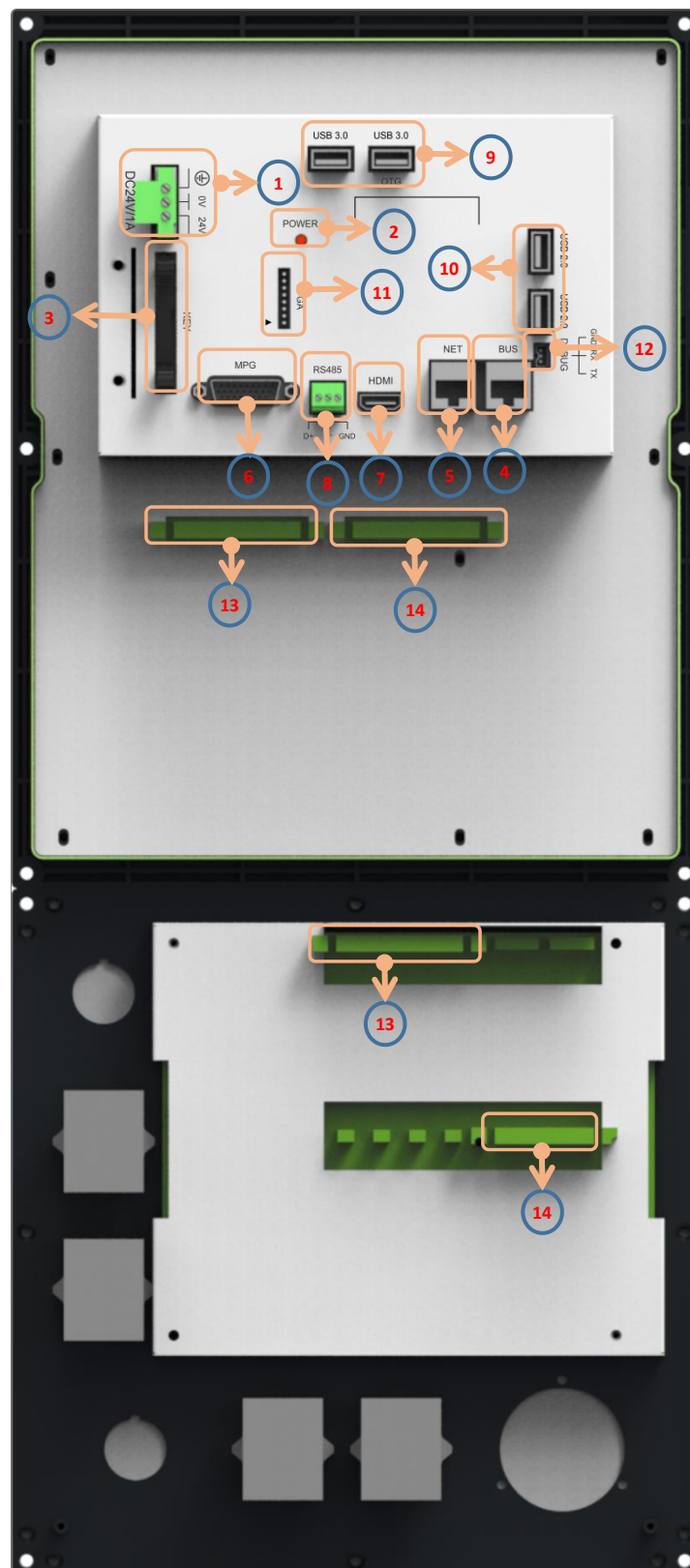
|   |                              |    |                                 |
|---|------------------------------|----|---------------------------------|
| ① | DC 24V Power Input Interface | ①⑥ | G01_MFO Rotary Knob Interface   |
| ② | Power Indicator Light        | ①⑦ | Emergency Stop Button Interface |
| ③ | Key Interface                | ①⑧ | Lock Button Interface           |
| ④ | Bus Interface                | ①⑨ | Pause Button Interface          |
| ⑤ | Network Interface            | ②① | Cycle Start Button Interface    |
| ⑥ | MPG Expansion Interface      | ②② |                                 |
| ⑦ | HDMI Output Interface        | ②③ |                                 |
| ⑧ | RS485 Interface              | ②④ |                                 |
| ⑨ | USB 3.0 Input Interface2     | ②⑤ |                                 |
| ⑩ | USB 2.0 Input Interface2     | ②⑥ |                                 |
| ⑪ | FPGA Update Interface        | ②⑦ |                                 |
| ⑫ | DEBUG Debugging Interface    | ②⑧ |                                 |
| ⑬ | DC 24V Power Input Interface | ②⑨ |                                 |
| ⑭ | Power Indicator Light        | ③① |                                 |
| ⑮ | SSO Rotary Knob Interface    | ③② |                                 |



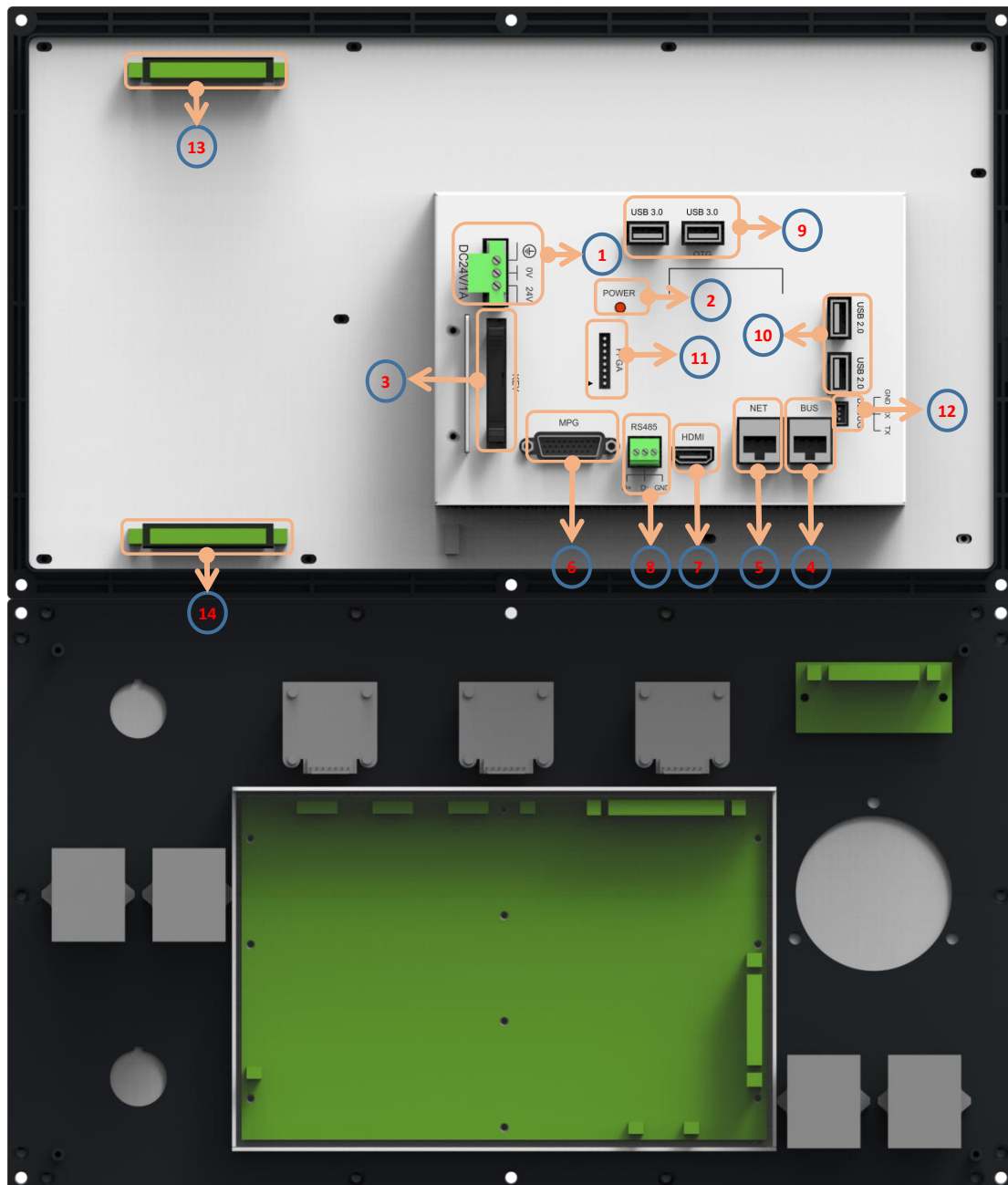
3.1.1.1 8-Inch Horizontal Lathe Controller: Keypad, Rotary Knob, Buttons, and Wiring

| NO.                  | Description                                                | Connection Cables                                                    | Connected Devices             |
|----------------------|------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------|
|                      | 8-inch horizontal lathe controller: buttons, button wiring | Wire 1:26pin<br>Ox horn plug-in cable<br>Wire 2:2pin<br>Button cable | 1. Button board<br>2. Buttons |
| Connection Diagram 1 |                                                            |                                                                      |                               |

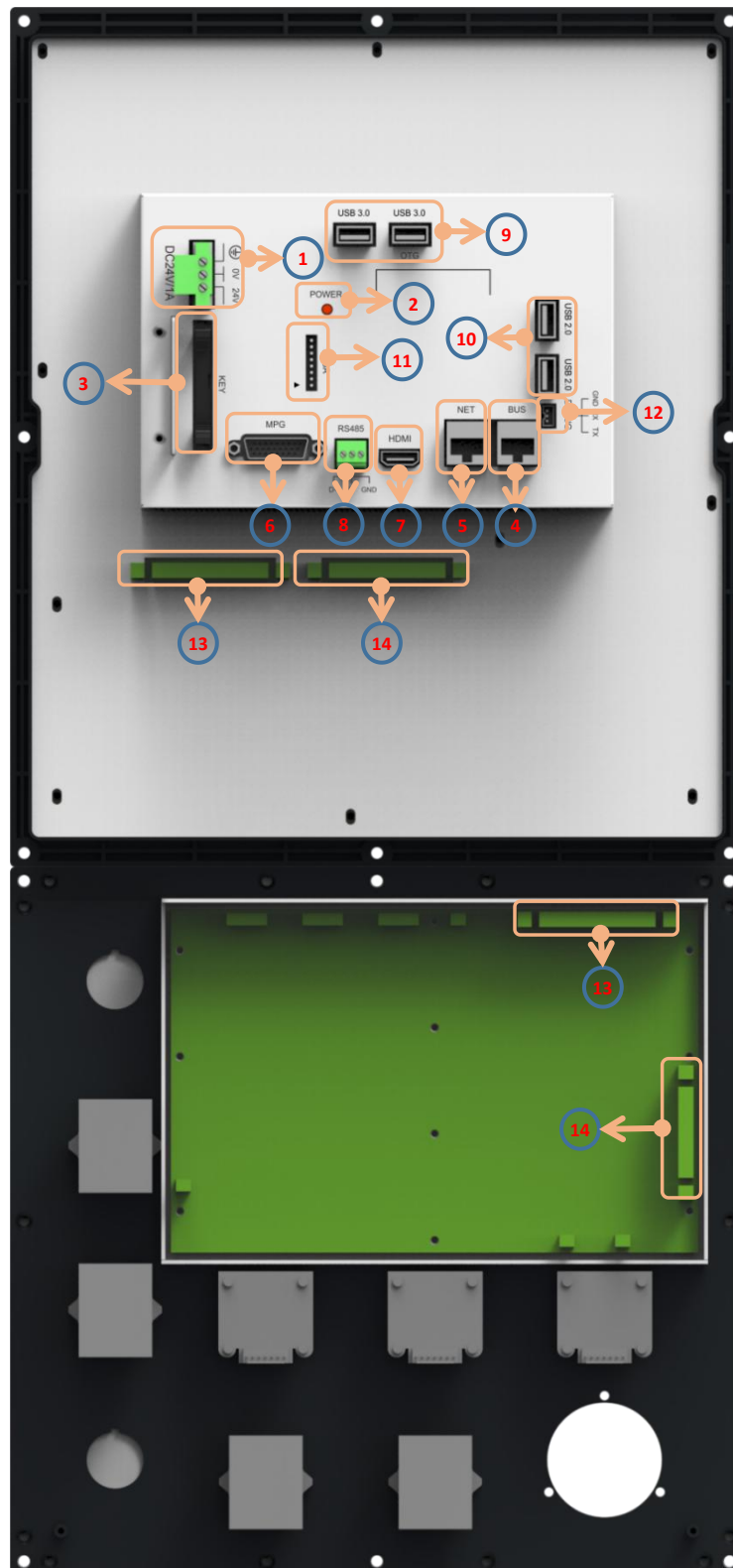
### 3.1.3 8-Inch Vertical Lathe Controller Interface Diagram



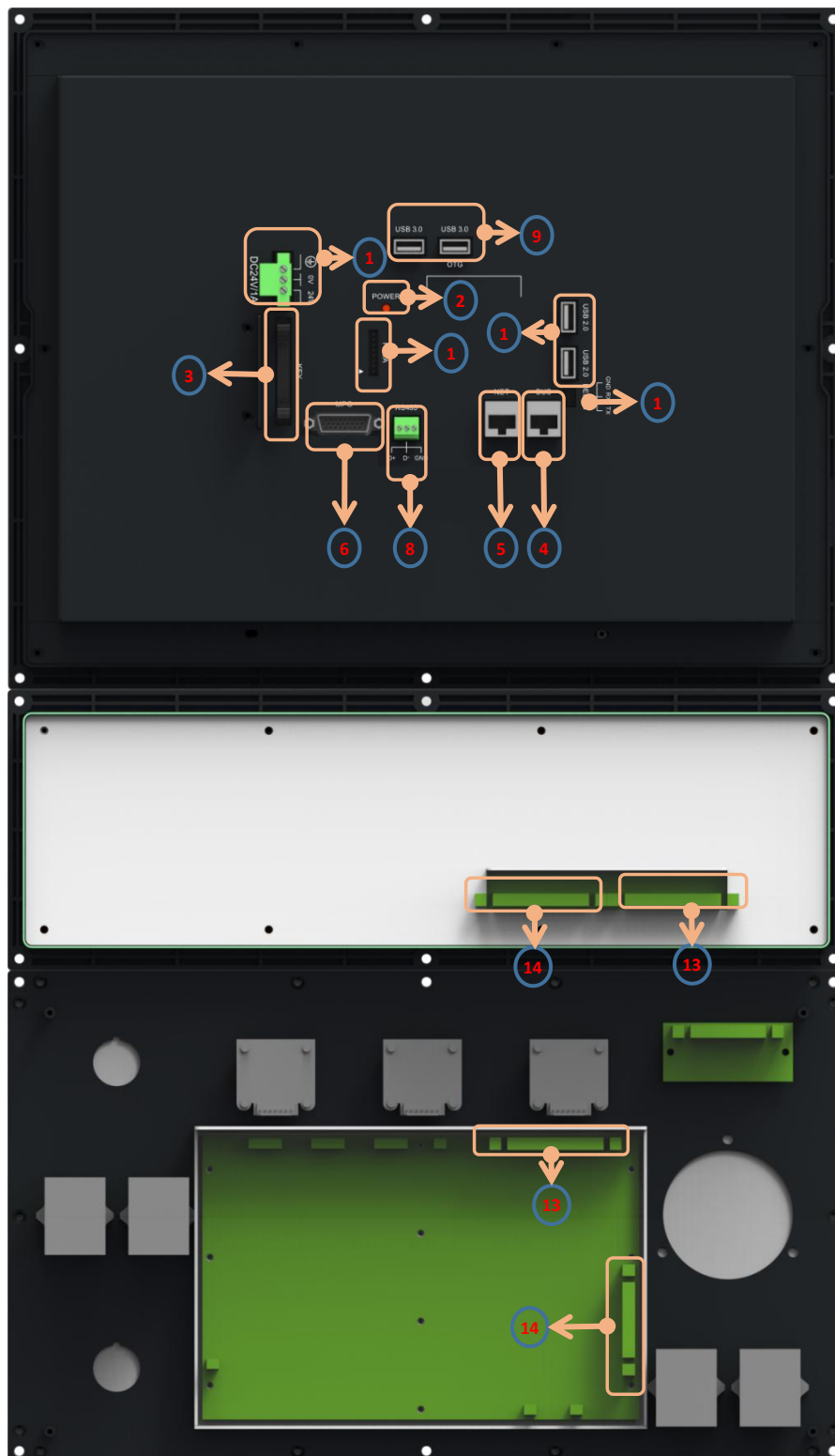
### 3.1.4 10-Inch Horizontal Lathe Controller Interface Diagram



### 3.1.5 10-Inch Vertical Lathe Controller Interface Diagram

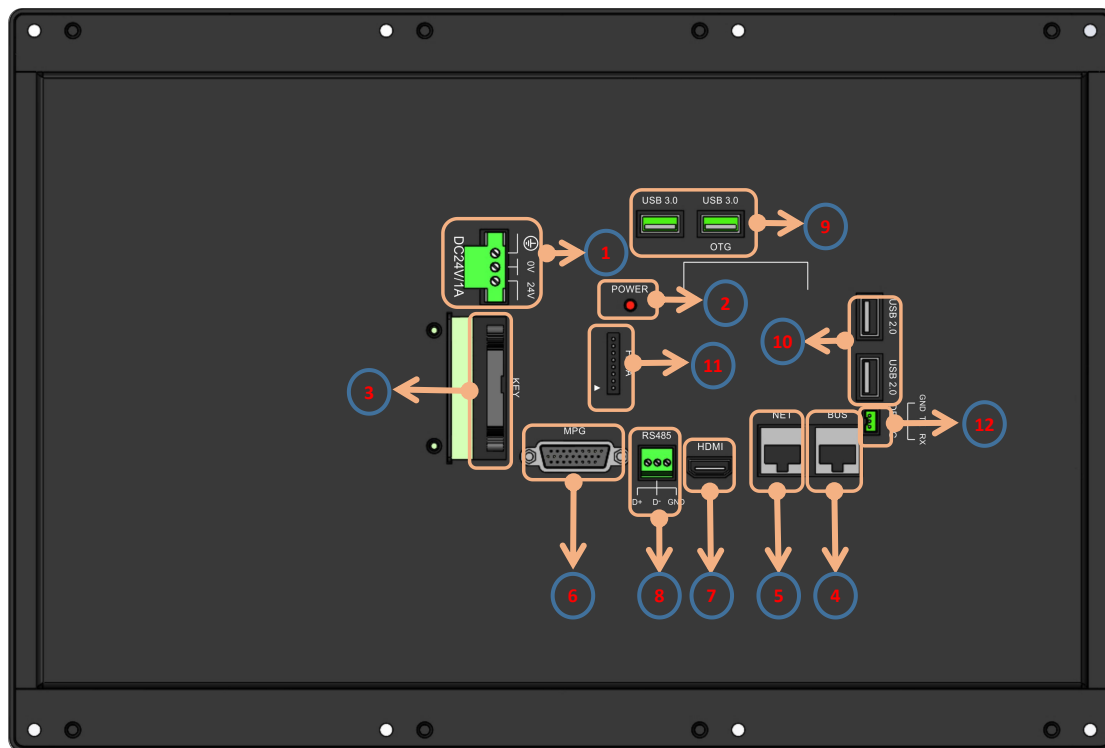


### 3.1.6 15-Inch Vertical Lathe Controller Interface Diagram



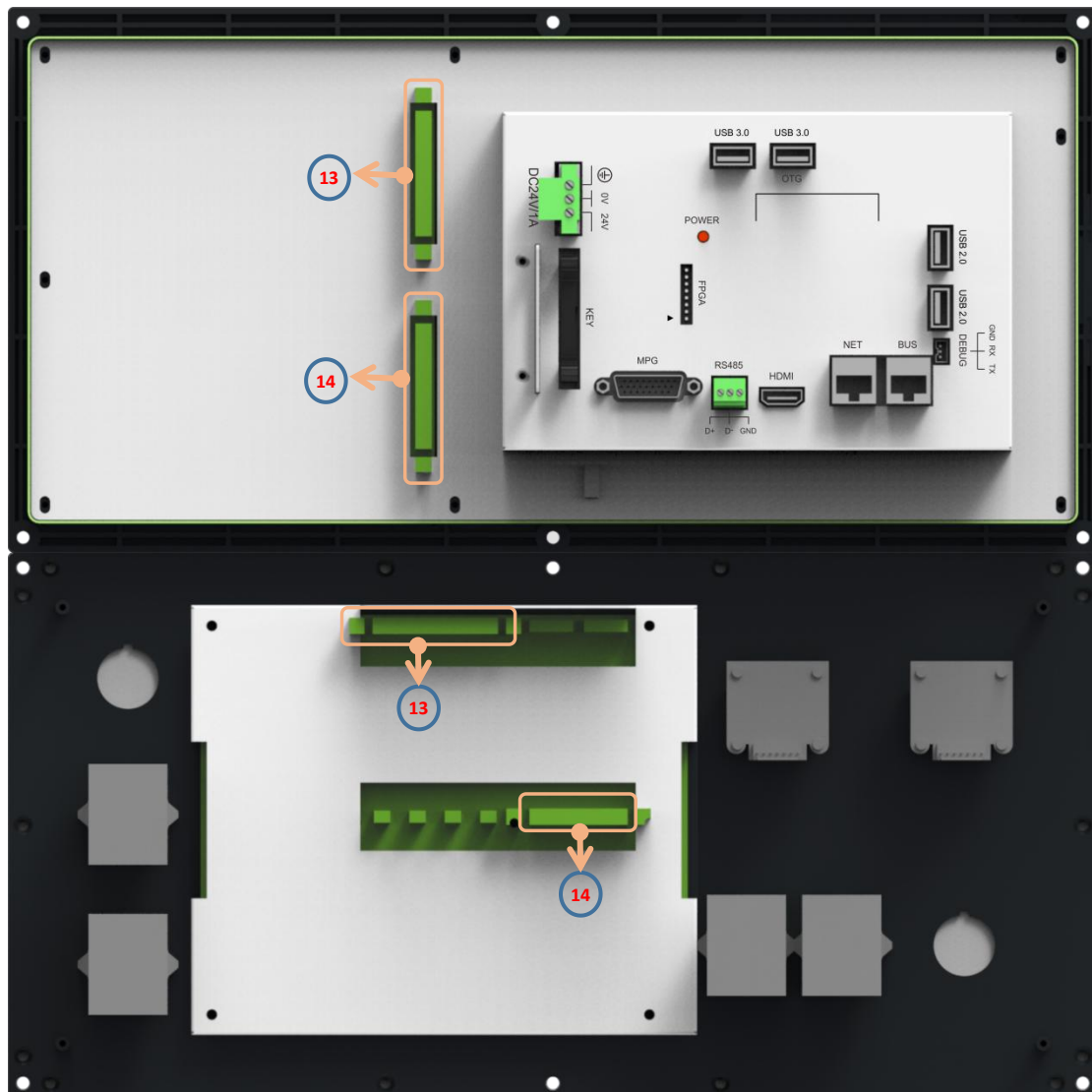
## 3.2 Milling Machine Controller Interface Diagram

### 3.2.1 7-Inch Horizontal Milling Machine Controller Interface Diagram



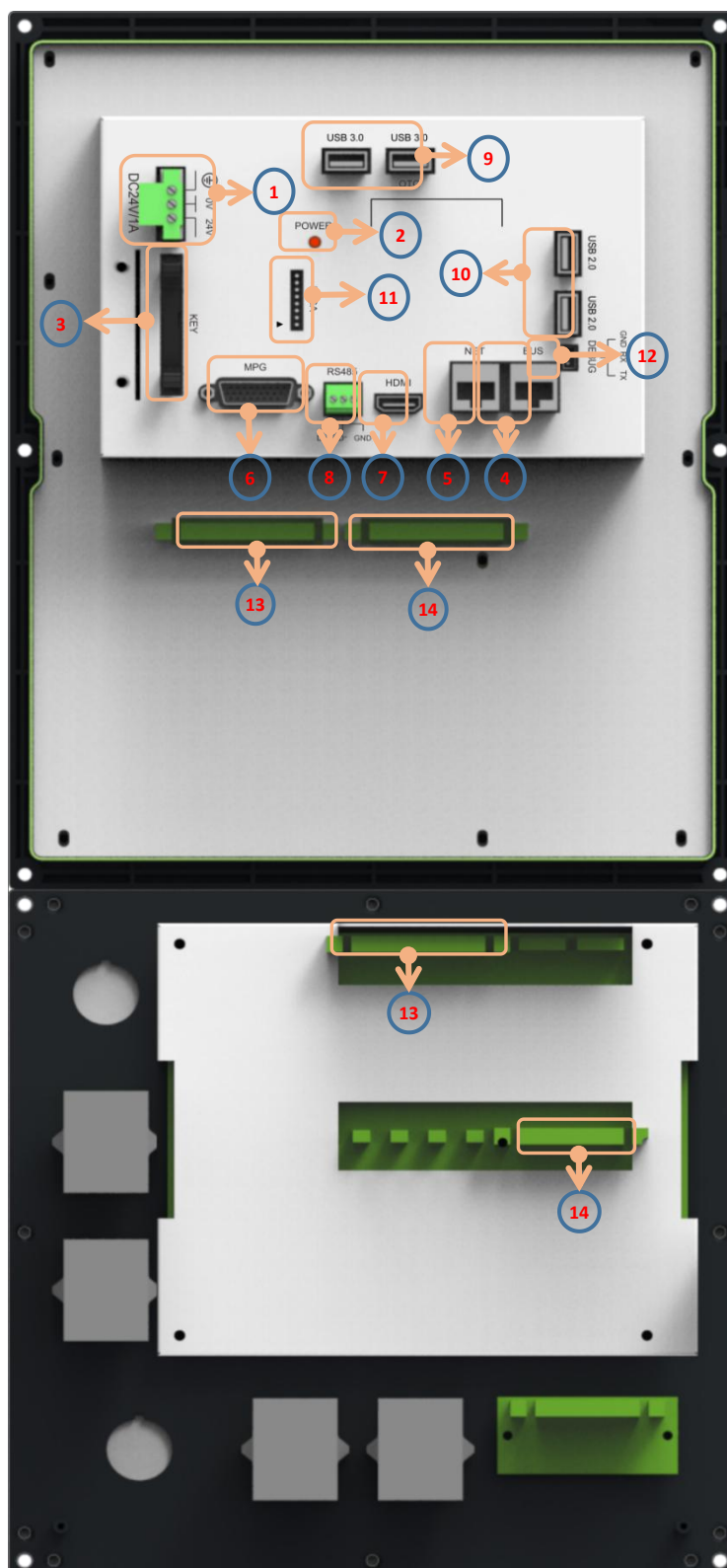
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### 3.2.2 8-Inch Horizontal Milling Machine Controller Interface Diagram



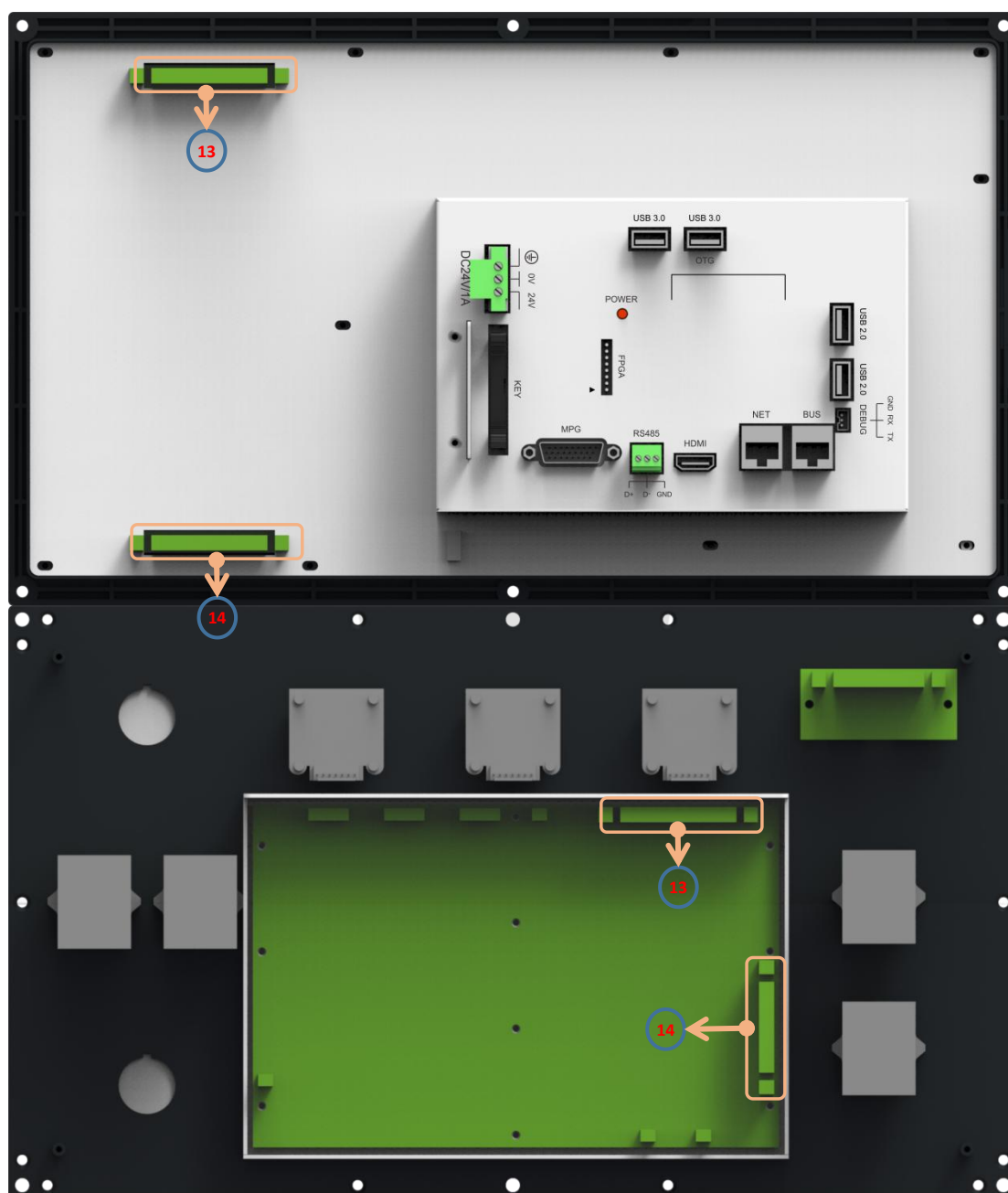


### 3.2.3 8-Inch Vertical Milling Machine Controller Interface Diagram

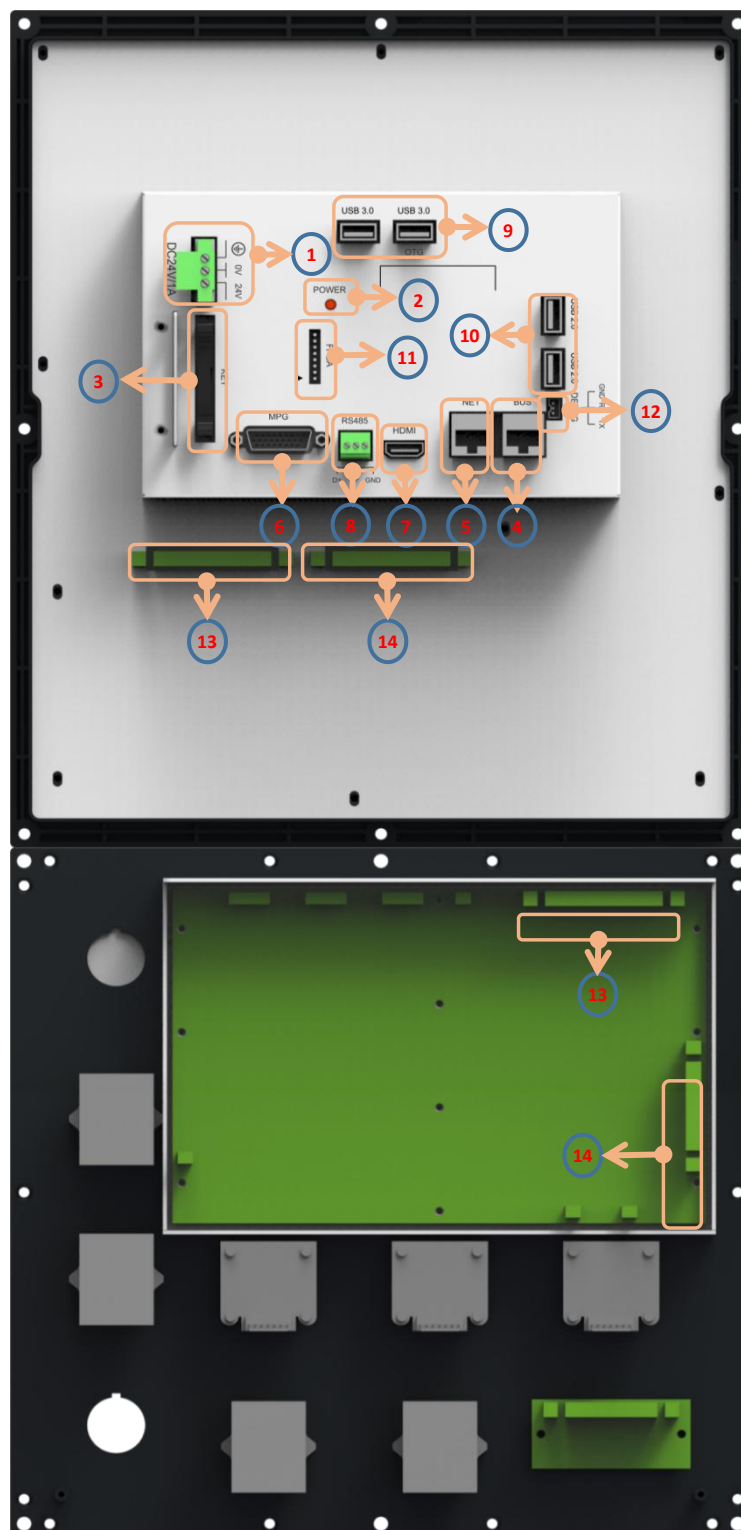




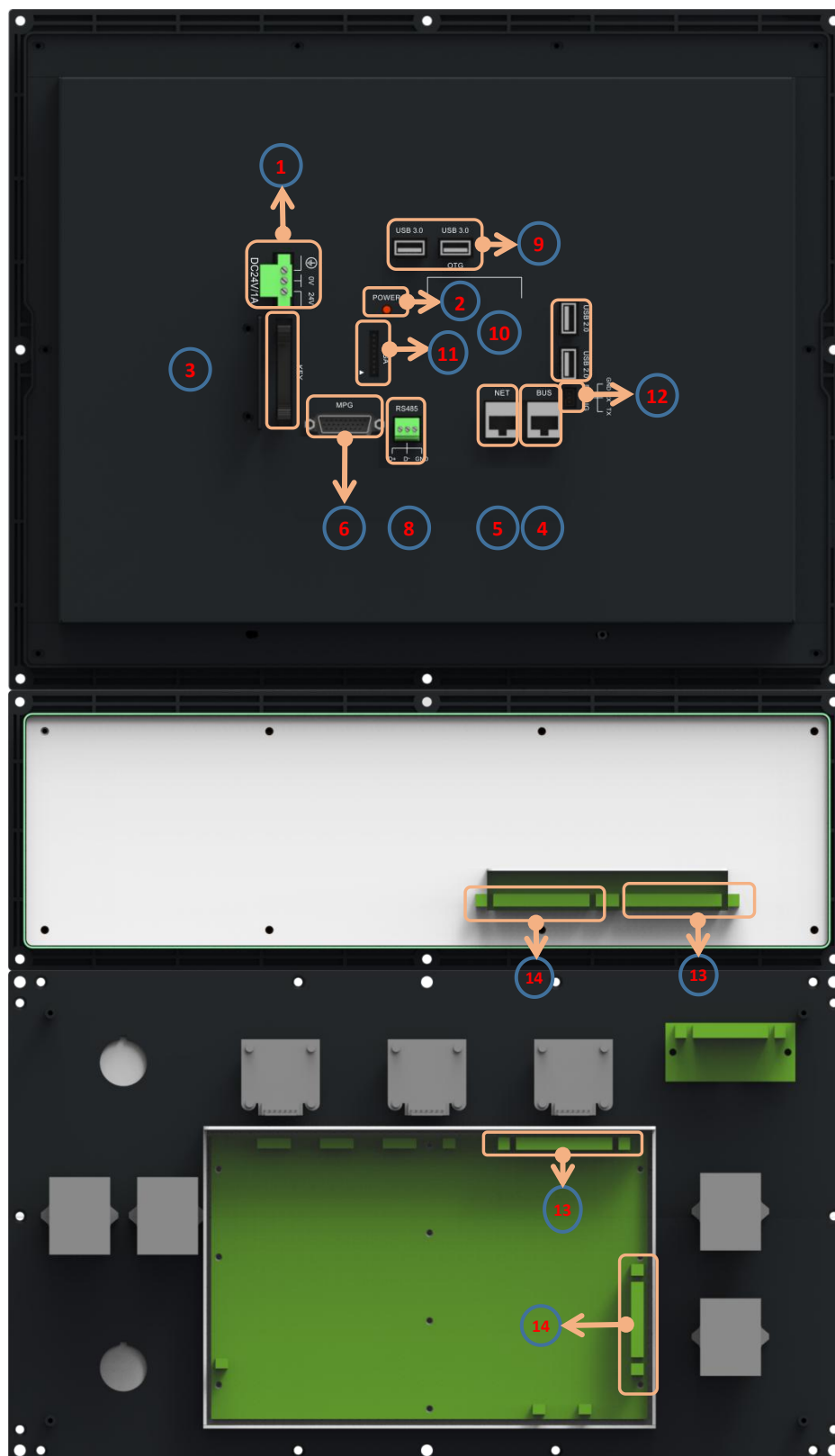
### 3.2.4 10-Inch Horizontal Milling Machine Controller Interface Diagram

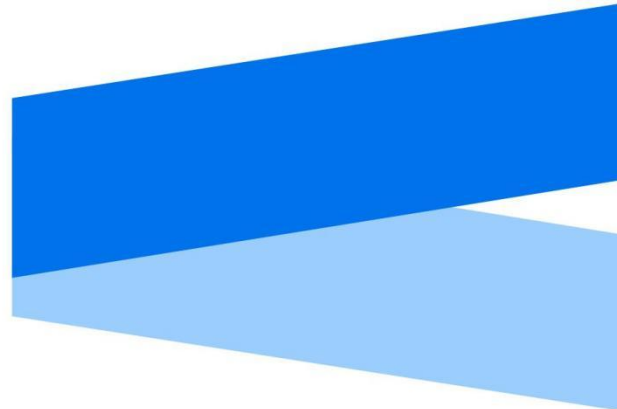


### 3.2.5 10-Inch Horizontal Milling Machine Controller Interface Diagram



### 3.2.6 15-Inch Vertical Milling Machine Controller Interface Diagram





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