Parts of the laser head such as nozzle, sensor, sensor interface and attached fasteners may not be fully protected by the ground wire due to function fault. These parts may have lo1mesb5(e)-2(n)-lta(n)-g(o)-( lo-4(T3

1 Safety Instructions & Precaution ..... 1
1.1 Summary ..... 1
1.2 Operation Standards ..... 1
1.3 Warning signs and instructions ..... 1
1.4 Damage Source ..... 1
1.5 User Guideline ..... 3
2 Handheld Cleaning Head ..... 5
2.1 The Connection of QBH Interface and Handheld Cleaning Head ..... 5
2.2 Removal and Installation of Cover Glass ..... 6
2.3 Inspection ..... 7
2.4 Safety Shutter ..... 7
3 Controller ..... 8
3.1 Connection of HMI Panel Communication Wire and Controller ..... 9
3.2 Connection of Laser and Controller ..... 9
3.3 Connection of Handheld Cleaning Head and Controller ..... 10
3.4 Connection of Power Supply and Controller Box ..... 10
3.5 Connection of Gas Valve, Chiller and Controller ..... 11
4 Software Introduction ..... 12
4.1 Main Interface Description ..... 12
4.2 Setting ..... 14
4.3 Process Library ..... 15
4.4 Monitoring ..... 16
Schedule 4 Wiring Diagram between Controller and Fiber Laser ..... 17
1 BWT Laser DB25 ..... 17
3 Maxphotonics Laser Aviation Plug- 12PIN Interface ..... 19
4 Raycus 380/220V DB25 PIN ..... 20
5 JPT Fiber Laser 24PIN ..... 22
6 IPG YLR-Y14 ..... 22
7 Feibo Laser ..... 24

Laser beams may hurt eyes and skin. This product is classified as the Class 4 according to different damage definition.
Therefore, please wear protective eyeglasses when cleaning and beaming out. Otherwise, D-278(o)-2(u)-4(t.ETQqg4(ie)llt.E7n)-

Laser fiber and circuit cables should be placed well, following the minimum bending radius of fiber. And the connecting wire should be away from transportation channels and machine parts with frequent and severe vibration.

Please comply with the following important rules when operating laser (for reference).
Operators should ensure to comply with these mandatory standards and regulations.
As shown in Figure 1.1, International Standard:

| | |
|---|---|
| IEC60825 | Radiation of laser product |
| EN60825 | Safety of laser product |
| EN207 | Personal eye-protection equipment Filters and eye-protectors against laser radiation. |
| EN60204 | Electrical equipment of machines |

Figure 1.1

1. Close all water/gas/ electrical circuit and safety shutter before maintaining and check in the clean environment.
2. Commission and maintain laser products regularly according to the manual. Please refer to the following chapters for maintaining detail and replace parts as required.
3. Check whether devices testing laser product are in good working regularly.

Emergency including:

1. Laser leakage.
2. Movement caused by uncontrolled system components.
3. Fire or explosion.
4. Leakage of harmful substance.

Safety measure:

1. If there are any other situations will affect human health or damage materials, please solve them timely.
2. If the danger is caused by laser products, press the emergency top button to stop radiating laser and running machine.
3. Other specific measures should be taken for different situation.
4. We recommend that users of laser products should identify potential risks through assessment and then take corresponding measures, to minimize losses or give emergency treatment to the injured.
5. Please prepare emergency signs in visible places where there is potential risk.

2

Figure 3.1

1 As shown in Figure 3.2.

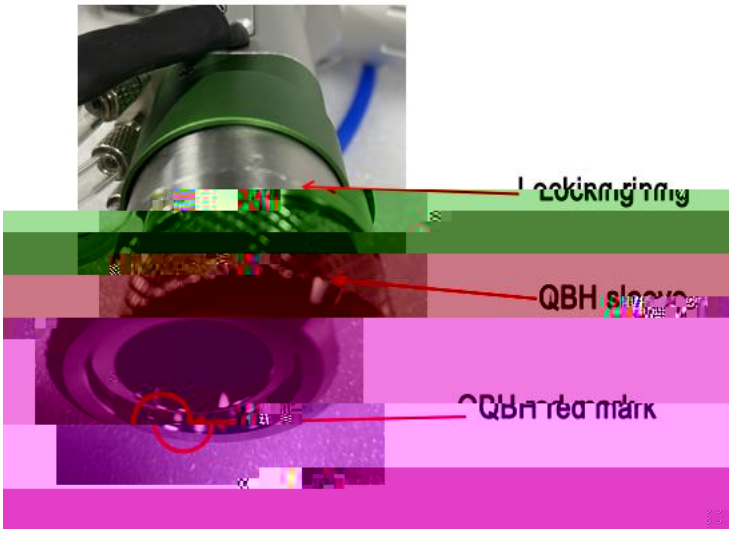
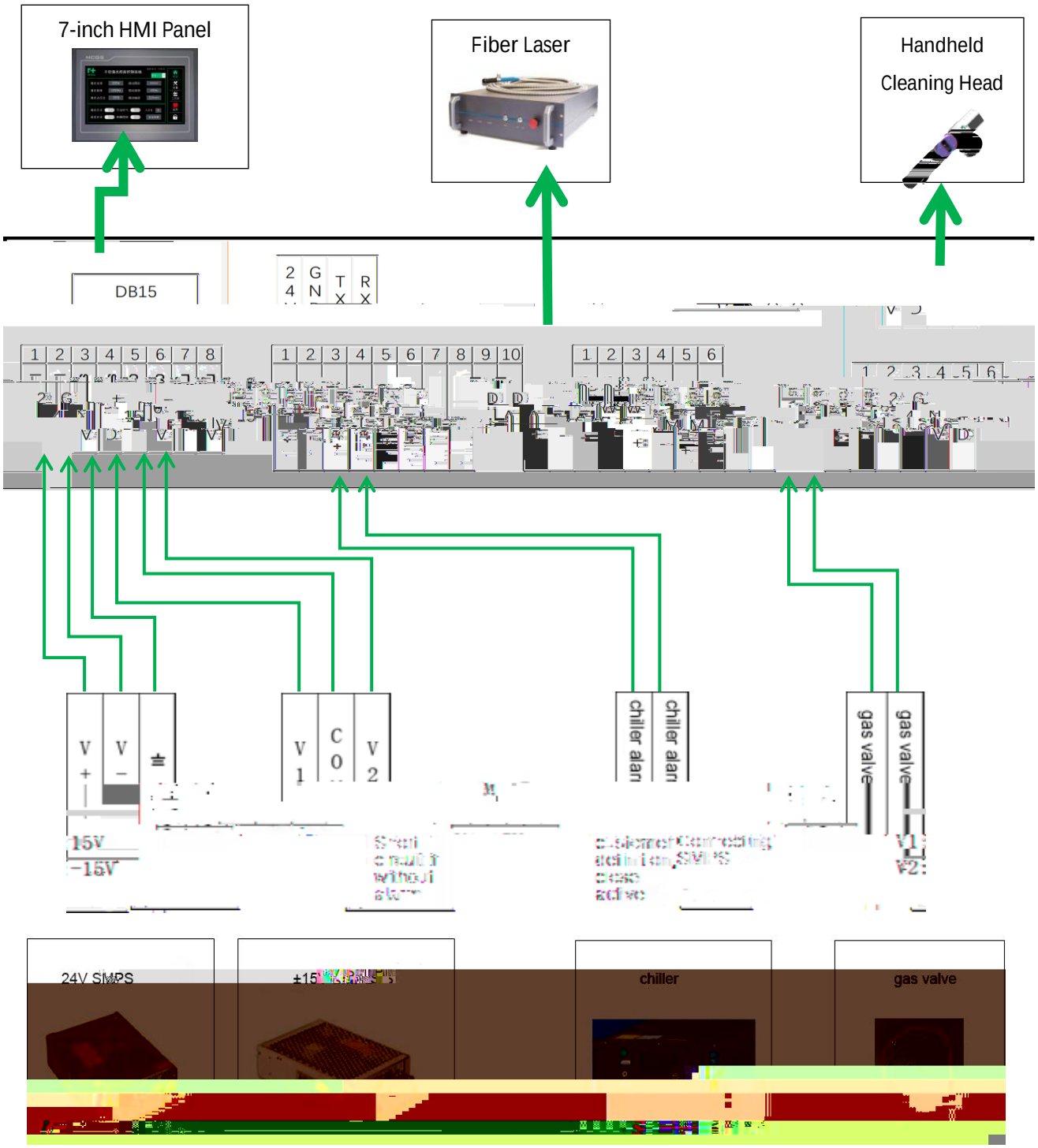


Figure 3.2

# 3

Controller overview of handheld cleaning system



As shown below.

Connect the control box with Enable , PWM and DA of the laser (Laser Fault is not required). However, different lasers require different wiring methods, and some lasers need to be interlocked before beaming out.
As shown in Figure 4.4.

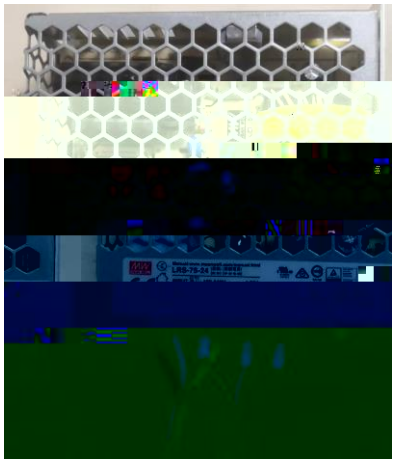
Figure 4.4

Enable Enable + laser enable output signal + Enable - laser enable output signal ground. Enable input generally NPN active

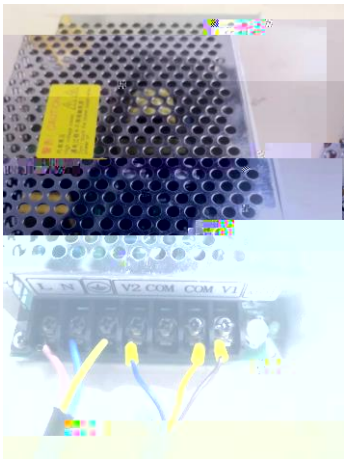
PWM PWM+ modulation output signal + PWM- modulation output signal ground. control laser modulation beaming

Figure 4.5

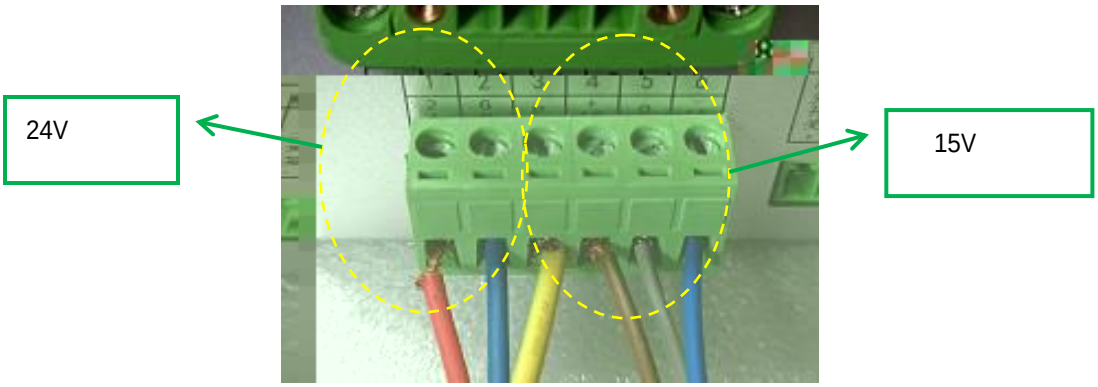
DB15 interface on the cleaning head wire connecting DB15 interface of control box, as shown in Figure 4.5.



24V



15V




4.6

As shown in Figure 4.6:

15V Power: V1 to 15V+, V2 to 15-, and com to GND.

24V Power: V+ to 24V+, and V- to GND.

4

Home

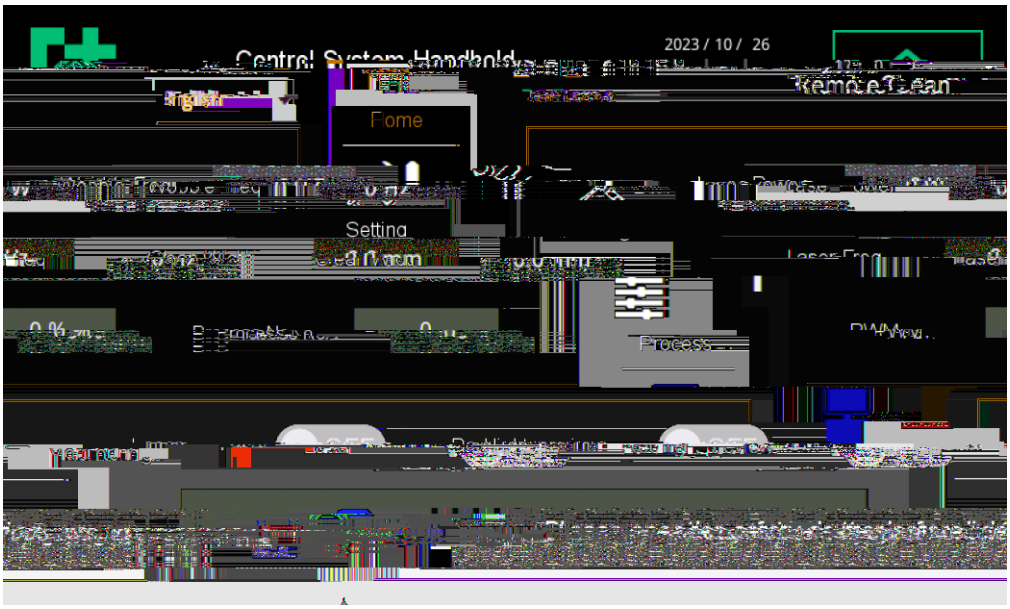



Figure 7.1

1. Laser Power Laser Power laser output power: 0-2000W
2. Laser Freq

O If without opening shutter or opening incompletely, the sign is the safety shutter before lighting ;

10.

Setting: Modify parameters in this interface

11. Process: Include various process reference parameters and could be modified and selected

12. Monitoring Red for alarm, please check IO status and fault signal

13. Screen locking: Locking the screen to stop operation. It mainly used for preventing accidental touch by other people when operating, resulting in light off in welding or beaming when the operator debugs, to ensure the safety of the operator. When operating, click on the screen locking to unlock it, and click again to lock the screen again;

14.

Multi-language switching button: Click the language dropdown box and select the required language.

Gas in Advance

Gas in Adance: The time for laser lighting and gas valve blowing in advance after opening switch;

Gas Delay

Gas Delay: The time for gas valve stopping blowing after closing switch;

Max Power

Max. Power: Setting based on Max. power of laser in actual usage. (range: 0-2000W);

Alarm Signal

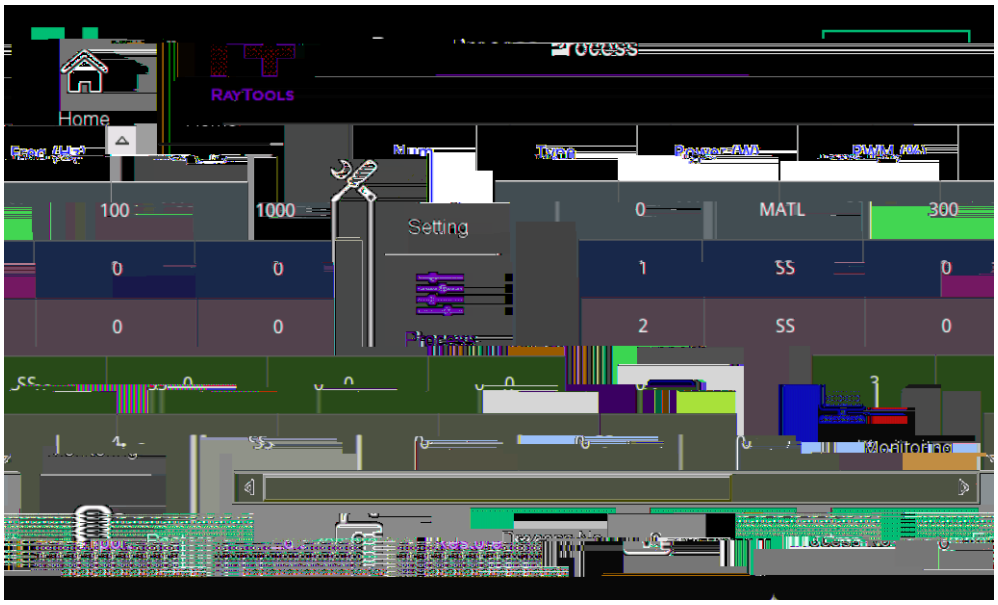
Alarm Signal: Selecting based on laser and wiring confn actual usage. NPN for short circuit

Safety Lock Interval

Safety Lock Intreval: Valid interval during clicking lighting button tw;

X Magn

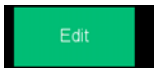
Magn: Has been corrected before selling, supporting adjustment if necessrary.



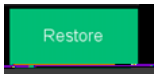

Process Parameters Displaying each parameter clearly including Type, Power(W), PWM (%) and Freq (Hz);

Process No: Valid process No. to use after saving modified parameters and back Home by clicking Import;

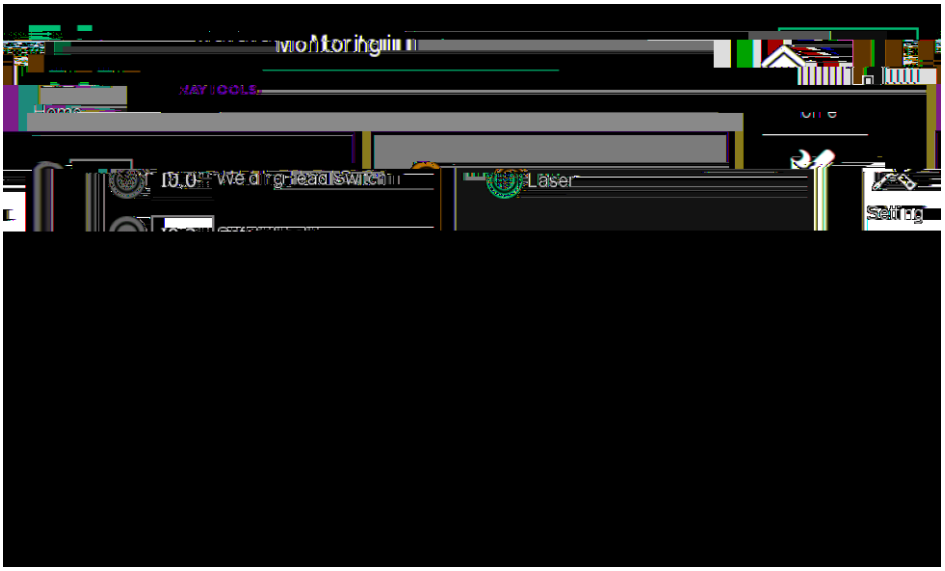
Import: Click to apply selected Process No;




Edit Click Save to save modified parameters;




Restore: Click to restore factory reset.




Input / Output Status

I0.0 WeldingHead switch: ON/OFF of cleaning head;

I0.3 Safety Lock  Whether safety lock is in-pos;

Q0.2 LaserEnable  Laser Enable signal output status;

Q0.4 Gas Valve  Gas valve output status;

DA: DA signal output status.

Alarm signal

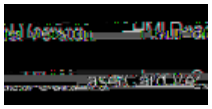
Laser: Green for normal and red for abnormal alarm;

Chiller: Green for normal and red for abnormal alarm;

HMI Panel-LaserCard Communication: Green for normal and red for abnormal alarm;

HMI Panel-GalvoCard communication: Green for normal and red for abnormal alarm;

Gas: Gas pressure alarm, green for normal and red for abnormal alarm;


HMI Panel Version & LaserCard Version: Each generation of products matches a corresponding software version. Details here will correspond to the HMI panel, laser card and galvo card version, and the

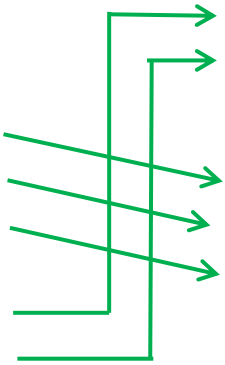
| No. | Definition | Function | Description |
|---|---|---|---|
| 1 | Enable+ | Enable input signal + | 5V-24V, PNP active. |
| 2 | Enable- | Enable input signal ground | |
| 3 | AD+ | Analog input + | 0V-10V, control laser output power (10V to 100% output power). |
| 4 | AD- | Analog input ground | |
| 5 | Bias+ | Bias Current + | Max. value: 1V. |

| Pin | Definition | Remark |
|---|---|---|
| 1 | RS485-A | 485 Interface for parameter setting, fault checking and program upgrading. |
| 2 | RS485-B | |
| 3 | REM_START- | 24V active, for starting device remotely (with same functions as Power button). |
| 4 | REM_START+ | |
| 5 | LASER_EN+ | 24V active, for beaming enable in AD mode. |
| 6 | LASER_EN- | |
| 7 | KEY_LOCK | Short circuit for normal status and displaying KEY_LOCK alarm for disconnecting |
| 8 | KEY_LOCK | |
| 9 | EX_ALARM_OUT+ | Fault signal output + |

| CTRL interface No. | Wiring color | Function | Description |
|---|---|---|---|
| 1 | Red | Enable input + | 24V VDC active. |
| 2 | Red & white | Enable input - | |
| 3 | | | |

| PIN | Item | Input/ Output | Function | | Typical value | Min. | Max. | Current |
|---|---|---|---|---|---|---|---|---|
| 6 | LASER EN | Input | Laser beaming EN signal | EN | 24V | 15V | 28V | 8mA |
| | | | | No | 0V | 0V | 3V | |
| 7 | ADEN | | | | | | | |

| NO. | Handheld Controller |
|---|---|
| 1 | DA+ |
| 2 | DA- |
| 3 | EN+ |
| 4 | EN- |
| 5 | PWM+ |
| 6 | PWM- |
| 7 | Fault input+ |
| 8 | Fault input- |



| Raycus 380/220V Laser modulation signal | |
|---|---|
| | MOD + |
| | MOD - |

| Raycus 380/220V Laser DB25 | |
|---|---|
| 22 | Analog |
| 25 | AGND |
| 6 | LASER EN |
| | |
| | |
| | |
| 24 | Alarm |
| | |
| | |
| | |
| 7 20 | 7-ADEN; 20-EXVCC |
| 9 | EXGND |

| NO. | Handheld Controller |
|---|---|
| 1 | 24V |
| 2 | GND |
| 3 | Fault light |
| 4 | Preparation light |
| 5 | Running light |

| PIN | Item | Type | Level | Description |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | Interlock channel + | C | | |

| PIN | Signal | Description |
|---|---|---|
| 1 | INTLK1A | Interlocking switch 1A, 1A1B close active |
| 2 | INTLK2A | Interlocking switch 2A, 2A2B close active |
| 3 | INTLK2B | Interlocking switch 2B, 2A2B close active |
| 4 | INTLK1B | Interlocking switch 1B, 1A1B close active |
| 5 | RS232 RX | RS232 receiving, no use with DB9-RS232 |
| 6 | RS232 TX | RS232 sending, no use with DB9-RS232 |
| 7 | CASE | RS232 RS485 signal ground |
| 8 | RS485 D+ | Spare communication interface (RS485) |
| | | unication interface (RS485) |
| | | or internal testing signal |
| | | or internal testing signal |
| | | g input (0-10V)<br>g voltage = 10-100% output power<br>10V: 10V |
| | | |
| | | ge (Pin 12) signal ground |
| | | tact signal input, 16-24V active |
| | | rface signal ground (Pin15-Pin24) |
| | | EN input<br>V: OFF |
| | | input<br>EN / 0V: control stop |
| | | output signal<br>V: NO |
| | | rface signal ground (Pin15-Pin24) |