LMC2015 FIBER-M Card User Manual
Pulse laser series laser

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Version Record

Version number	Update date	Updater	Update instructions
V4-M	2015-7		LMCV4-FIBER-M fiber marking control card

Safety instructions

Before installing and using the LMCFIBER-M control card, please read this section carefully. If you have any questions about this document, please contact BJJCZ.

1. Safe Operating Procedures

● Please follow all the safety instructions about laser (including but not limited to those described in laser, galvanometer and relevant chapters in this document)

● **At any time, please turn on the laser power after turning on the computer power, LMCFIBER-M power and galvanometer power. Otherwise, injuries may be caused by the uncontrollable laser beam.**

   We recommend that you use a shutter to avoid injury caused by uncontrollable lasers.

2. The safety part that the customer is responsible for

● LMCFIBER-M is designed to control a laser scanning system. Therefore, all safety instructions regarding laser systems should be understood and implemented by customers. The customer must strictly abide by the relevant safety operation instructions and be independently responsible for the safety of the laser system used.

● Safety rules may vary from country to country. The customer is responsible for complying with all local regulations.

● Please check carefully before running the software. A software error may cause the system to stop responding. In this case, neither the galvanometer nor the laser can be controlled.

● Please avoid damage to the board by moisture, dust, corrosives and foreign objects.

● When storing and using boards, please avoid electromagnetic field and static electricity damage. They may damage the electronic devices on the board. Please use an anti-static bag to store the board; please wear a good grounded anti-static protective glove to contact the board.

● Please ensure that the board is stored at -20℃ to +60℃. The allowable working environment temperature is 25℃ ± 10℃.

1 Overview

The LMCFIBER-M 2015 special marking control card is a control card specially developed for marking machines using pulsed fiber lasers. It is connected to a PC with a USB interface.

1.1 How to identify the LMCFIBER control card

The words "MODEL: LMCFIBER" and "REV: 20150723" are printed on the upper left of the board, as shown in Figure 1-1.
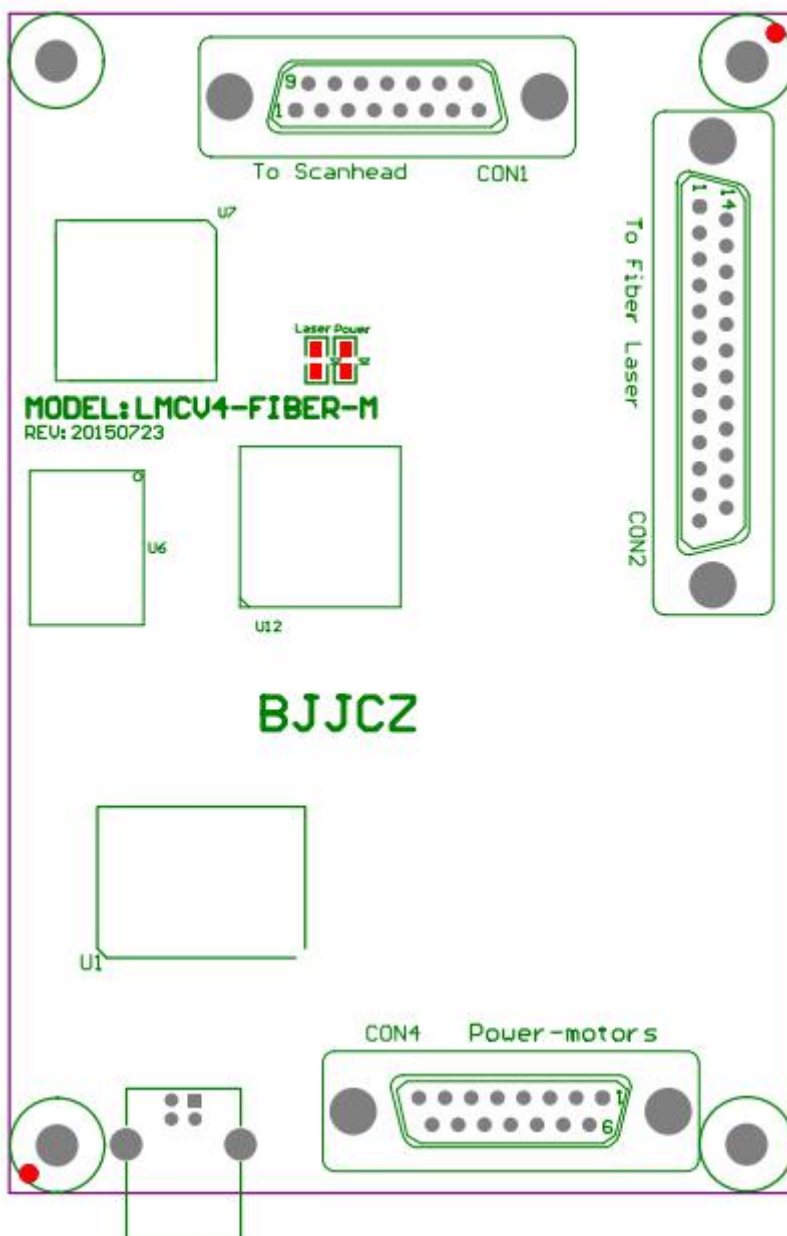
Figure 1-1 Schematic diagram of LMC2015 Fiber-M control card

Among them,

CON1: Galvanometer (SCANHEAD) control interface, DB15 socket

CON2: DB25 control interface of IPG YLP series lasers;

CON4: IO interface used to connect power supply and extended axis control signal, DB15 socket.

1.2 Main features

● Adopt DB25 socket to output laser control signal, and directly connect with pulsed fiber

laser through 25-pin cable.

- The galvanometer control signal is a digital signal, which can be directly connected to the internationally used digital galvanometer.

- Extended axis (stepper motor / servo motor) output: It can output the direction / pulse signal of one channel to control the stepper motor (or servo motor), which can be used for rotating shaft or splicing.

- 6-channel universal input digital signal (TTL compatible). XORG0 (IN14), (IN15). Among them IN0 ~ IN3 is designated as the laser state input signal introduced by CON2 (LaserST0 ~ LaserST3).

- 2 general-purpose output digital signals (TTL compatible). OUT4, OUT5 are TTL output;

- ReMark (Repetitive Marking of Cached Content) signal: used when the marking content is the same and high-speed marking is required. (If the marking content contains variable text, or the marking content is too large to be saved in the board, it must be connected to the general input signal.)

- Compatible with USB2.0.

2. Electrical connection

2.1 Interface description

2.1.1 Power Supply

The control card needs 5V DC power supply. It is recommended to use 5V/3A DC power supply.

The power supply is connected to the 4/5/12/13 pin of the CON4 socket.

CON4 Pins	Name	Description
4，5	VCC	+ 5V. The positive terminal of the power supply
11，12，13	GND	Ground. The negative terminal of the power supply

2.1.2 CON1: DB15 galvanometer control

The galvanometer control signal is a digital signal and can be directly connected to the digital galvanometer. Because the digital signal transmission protocol used by the digital galvanometer is not exactly the same, it is necessary to confirm which transmission protocol the digital galvanometer uses. Our company also provides a digital to analog adapter board, which can also be

converted into an analog signal output and connected to an analog galvanometer.
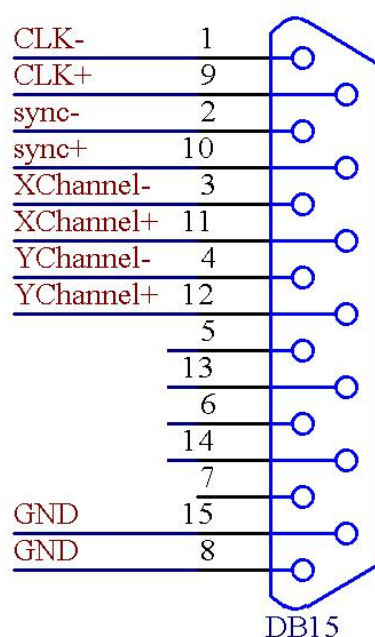

Figure 2 1 Schematic diagram of pin definition of CON1 socket

Pins	Name	Description
1，9	CLK－ / CLK＋	Clock signal-/ Clock signal +
2，10	SYNC－ / SYNC＋	Synchronization signal-/ synchronization signal +
3，11	X Channel－ / X Channel＋	Galvanometer X signal－ / Galvanometer X signal＋
4，12	Y Channel－ / Y Channel＋	Galvanometer Y signal-/ galvanometer Y signal +
5，13	NULL	Reserve
6，14，	NULL	Reserve
7	NULL	Reserve
8，15	GND	Ground

The digital signal is recommended to use shielded twisted pair connection.

2.1.3 CON2: DB25 laser control

The CON2 socket is directly connected to the 25-pin socket of the fiber laser through a 25-pin cable.
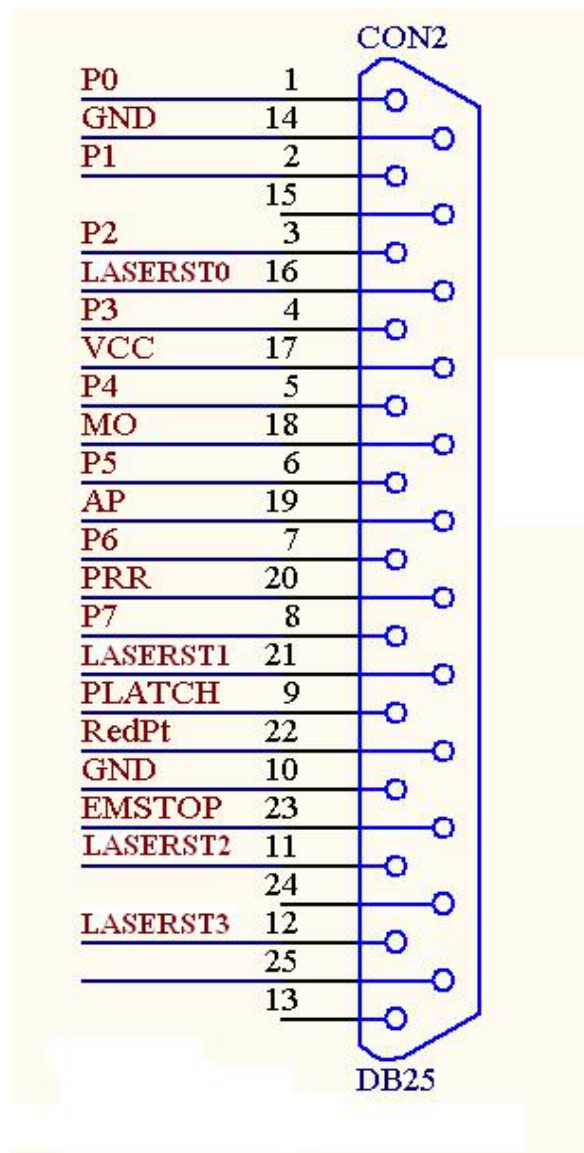
Figure 2-2 CON2 socket pin definition diagram

Pins	Name	Description
1—8	P0—P7	Laser power. TTL output.
9	PLATCH	Power latch signal. TTL output.
10，14，	GND	Reference ground for the control card.
11，12，16，21	LASERST0~3	Laser status input.
17	VCC	5V power output of the control card.
18	MO	Main oscillator switching signal. TTL output.
19	AP	Power amplifier switching signal. TTL output.
20	PRR	Repeat pulse frequency signal. TTL output.
22	RedPt	The red light of the laser indicates the signal. TTL output.
23	EMSTOP	Emergency stop switch signal. TTL output.
13,24,25		These Pins are floating, not connected.

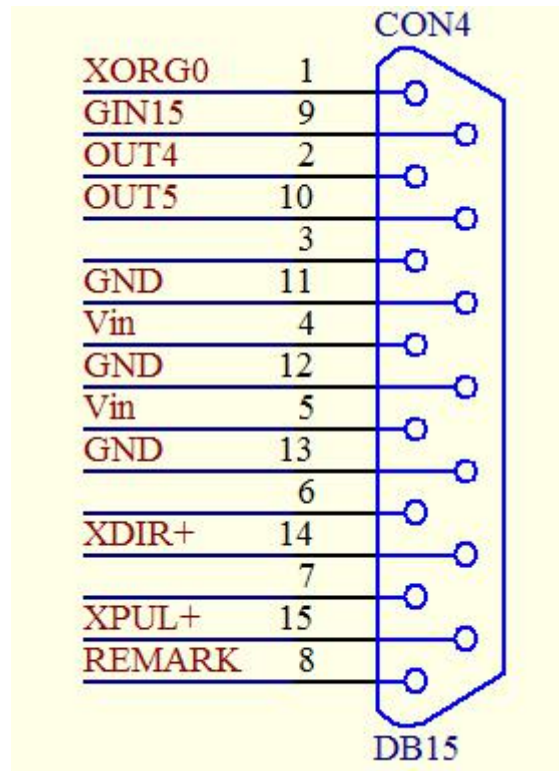## 2.1.5 CON4: DB15 power supply / extension axis / IO socket

Figure 2-3 CON4 socket pin definition diagram

Pins	Name	Description
1	XORG0	X axis origin signal of extension axis. It forms a loop with the ground (12, 13 feet) of the control card. When using this signal, connect this signal and ground to the two ends of the switch. This signal is an input signal.
9	GIN15	General input GIN15 signal. It forms a loop with the ground (11, 12, 13) of the control card. When using this signal, connect this signal and ground to the two ends of the switch. This signal is an input signal.
2，10	OUT4，OUT5	General output signal OUT4, OUT5. Use the GND signal as a reference ground.
4，5	Vin	The positive terminal of the 5V input power supply. This signal is an input signal.
11，12, 13	GND	The negative terminal (ground signal) of the 5V input power supply is the ground signal of the control card. This signal is an input signal.
14	XDIR +	Extension axis X direction signal. This signal is a TTL output signal. Common anode output, use VCC and XDIR + signal, VCC is anode signal.
15	XPUL+	The pulse signal of the extension axis X, this signal is a TTL output signal. Common anode output, using VCC and XPUL + signals, VCC is the anode signal.
8	ReMark	Repeat the marking signal. Form a loop with the Gnd signal,

		and connect this signal and ground to the two ends of the switch. When this signal is used, the control card will mark the content that was kept in the cache when it was last marked. This signal is an input signal.

2.3 Connection of digital input and output signals

2.3.1 Input signal, XORG0, GIN15, and Remark

The schematic diagram of the interface circuit of the input signal (XORG0 / GIN15 / Reamrk) and the recommended connection scheme are shown in Figures 2-4 and 2-5:
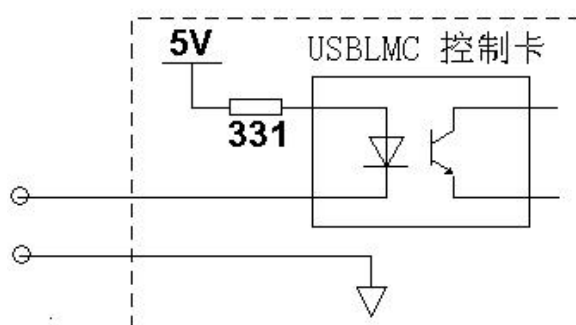
Figure 2-4 Interface circuit diagram of general input signal (XORG0 / GIN15 / Remark)
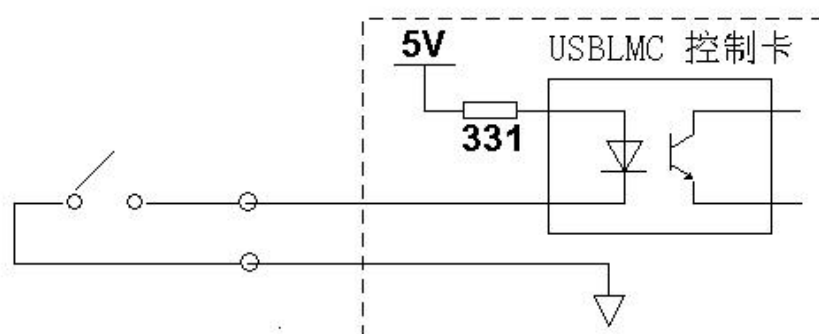
Figure 2-5 Recommended connection scheme for general input signals

(XORG0 / GIN15 / Remark)

For these input signals, only need to provide a normally open switch. The contact resistance of the switch should be less than 100ohms.

2.3.3 Output signals Out4, Out5

The output signals OUT4 and OUT5 are TTL outputs.

TTL output must avoid short circuit or grounded, otherwise it will damage the board.

2.4 Board dimensions