DLC2-M4 board instruction manual

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Version record

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DLC2 (DSP Laser Control Electronics-2) board instruction manual

The DLC2 control board and EZCAD3 software can perform real-time synchronous control of 2D/3D scanning galvanometer and laser. The main features of the board are as follows:

(1) Support enhanced version of the XY2-100 data protocol (X, Y, Z triaxial galvanometer)

(2) Supports fiber, CO2, QCW, SPI, UV, YAG and other lasers through the laser expansion card

(3) Support 10 input and 8 output ports

(4) 12V power supply, minimum current requirement 3A

(5) Support flight marking function

(6) Support offline marking function

(7) Support 16Bit/18Bit galvanometer, which can be customized according to the actual galvanometer protocol

The board interface is as follows:
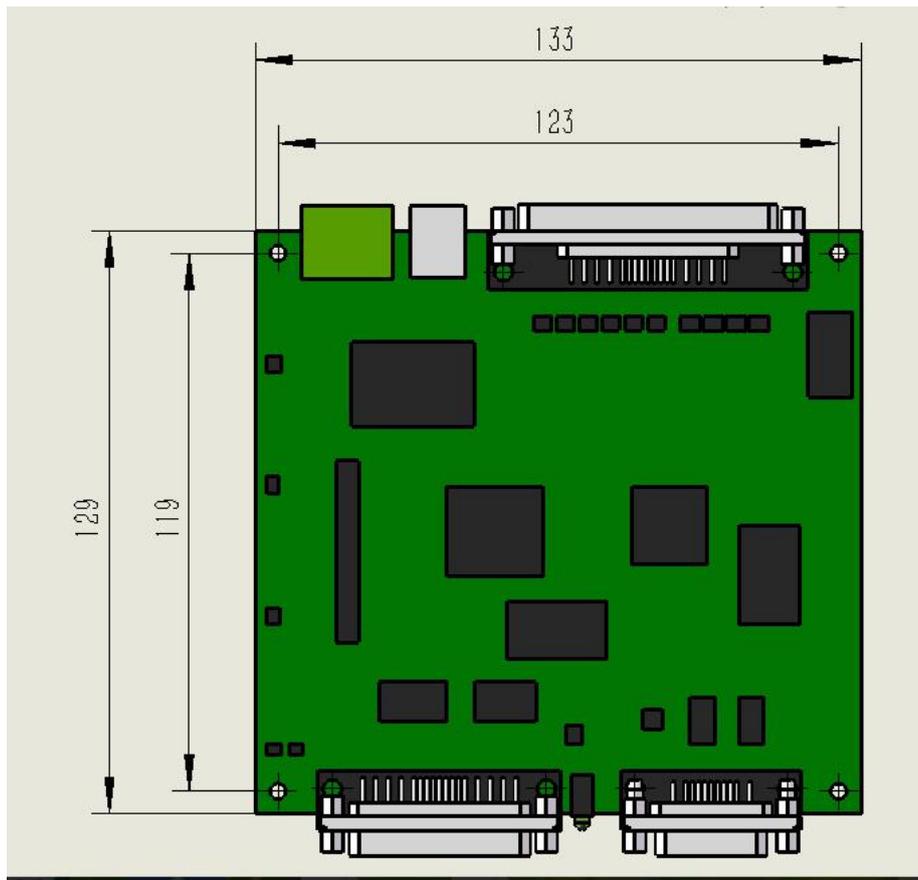
Figure 1 Board size

The board has two LED indicators. After the board is powered on, the green light is always on. The red light is on when the laser light is controlled during the marking process.

Interface function:

CON1: power interface, 2P green terminal socket;

CON2: laser interface, support all lasers, DB25 socket (female);

CON3: galvanometer interface, support enhanced XY2-100 data protocol, can drive 2D/3D galvanometer, DB15 socket;

CON5: IO interface for flight marking interface, input and output digital signals, DB37 socket.

Description of each interface:

CON1: Power supply

The DLC2 control card supports wide voltage DC power supply (12V-24V) and is recommended to be powered by a 12V DC power supply. A 12V/3A DC power supply is recommended. The power supply is connected from the CON1 2P green terminal pin. Among them, the power of the board is pin2 near the screen, and the pin1 is close to the USB interface.
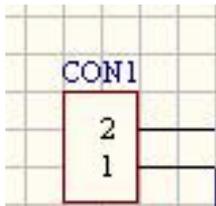
Pin	Name	Description
2	VCC	+12V. The positive terminal of the power supply.
1	GND	Ground. The negative terminal of the power supply.

CON3: galvanometer interface

The galvanometer interface (CON3) supports the enhanced XY2-100 data protocol, which can drive 2D/3D galvanometers. The interface type is: 15-pin double-row pin (female head, 2.54mm pitch). The pin definition is as follows:
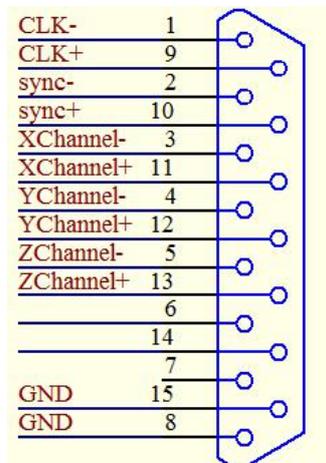
Pin	Name	Description
1, 9	Clock	The galvanometer data is output according to the

| 2，10	Synchronization signal	standard XY2-100 protocol
3，11	X-axis data	
4，12	Y-axis data	
5，13	Z-axis data	
8，15	Digital GND	Digital GND
Others	Reserved	Reserved

Figure / Table 3 galvanometer interface definition

For the commonly used two-dimensional galvanometer, only need to connect CLK clock, SYNC synchronization, XChannel, Ychannel four groups of signals, and GND a total of nine signal lines. Digital signals are recommended for twisted pair connections with shields.

CON2: laser interface

The laser interface (CON2) supports all lasers and controls different lasers to change via Ezcad3 Software > Parameter (F3) laser control settings. Note: When change the laser type, be sure to turn off the laser power, set the correct laser parameters, and then turn on the laser power. Interface type: 25-pin double-row pin (female, 2.54mm pitch)

(1) Fiber mode pin definition
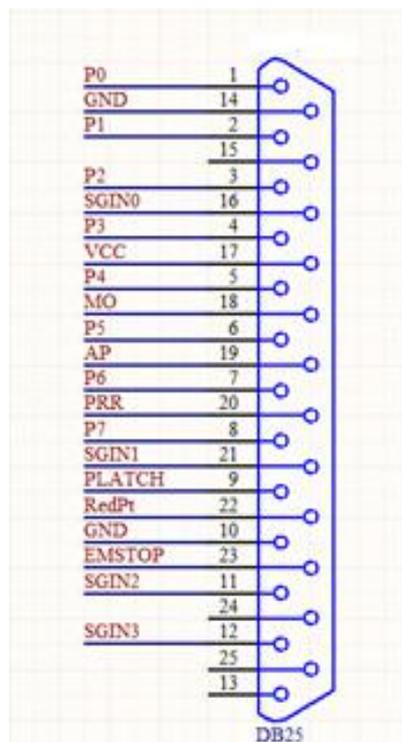
Pin	Name	Description

1，2，3，4，5，6，7，8	P0---P7	Laser power control interface. TTL output
9	Platch	Laser power latch signal. TTL output
11，12，16，21	SGIN0---SGIN3	Laser state input signal
18	MO	Main oscillator switching signal. TTL output
19	AP	Power amplifier switching signal. TTL output
20	PRR	Repeative pulse frequency signal. TTL output
22	Red light indication	Laser red light indication signal
23	EMStop	Laser emergency stop output signal
Others	Reserved	Reserved

Figure / Table 4 CON2-Fiber mode pin definition

(2) CO2/YAG mode pin definition
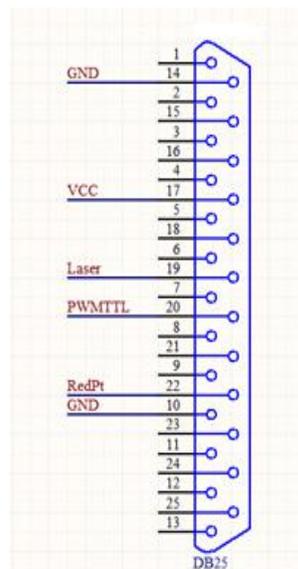
Pin	Name	Description
10，14	GND	Control card reference ground
19	Laser	Laser switching signal (shutter signal), TTL output. Form a loop with the GND signal.
22	REDPT	Red light indicates the output. TTL output. The ground reference signal is GND.
20	PWMTTL	PWM signal. TTL output. The ground reference signal is GND. For CO2 lasers, this signal is used to set the power of the laser and also as a Tickle signal output; for Yag lasers, this signal is used as a repetitive frequency signal for the Q driver.

Figure / Table 5 CON2-CO2/YAG mode pin definition

DB37: Flight marking interface / digital input and output

Flight marking interface / digital input and output port (CON5, DB37 pin female) are described as follows:
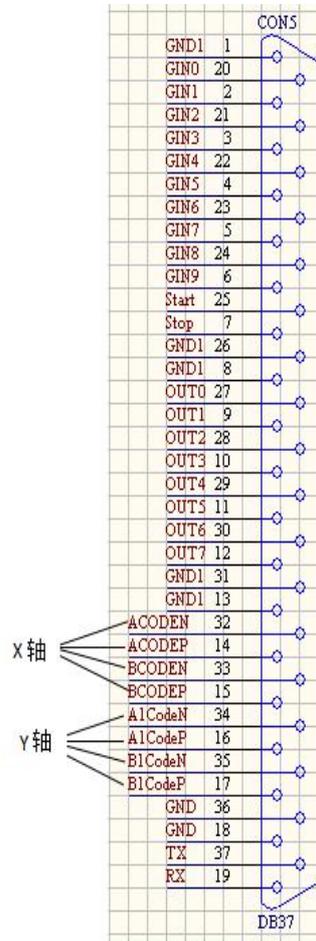
Pin	Name	Description
20，2， 21，3， 22，4， 23，5， 24，6	GIN0~GIN9	Universal input signal 0~9, Positive terminal and GND form a loop
27，9， 28，10， 29，11， 30，12	OUT0~OUT7	Universal output signal, TTL mode output, output current is 15mA, Form a loop with GND
25，7	Start / Stop	Reserved
32，14	ACODEN / ACODEP	Encoder input A- / A+, connected to the X-axis encoder
33，15	BCODEN / BCODEP	Encoder input B- / B+, connected to the X-axis encoder

| 34，16	AICodeN /AICodeP	Encoder input A- / A+, connected to the Y-axis encoder
35，17	BICodeN / BICodeP	Encoder input B- / B+, connected to the Y-axis encoder
37	TX	RS232 data transmission interface, form a loop with GND
19	RX	RS232 data receiving interface, form a loop with GND
36，18	GND	GND, Loop with encoder signal and RX/TX
1,26,8, 31，13	GND1	Form a loop with the input and output port signals

Figure / Table 6 CON5 socket pin definition

Remarks:

(1) The input and output signals of DLC2 are outputted by the isolation chip, and they must be combined with GND1 (PIN1, 8, 13, 26, 31) to form a loop;

(2) The board ground GND (PIN18, 36) is connected to the power ground (CON1, PIN1). When using the encoder interface, it must form a loop with GND.

(3) The universal output port supports the contact normally open relay.

M4 board instruction manual

The M4 motion control board is used with the DLC2 marking control card and EZCAD3 software to provide four-way direction, pulse signal output and support 4-way motion extension axis.

The board interface dimensions are shown below:
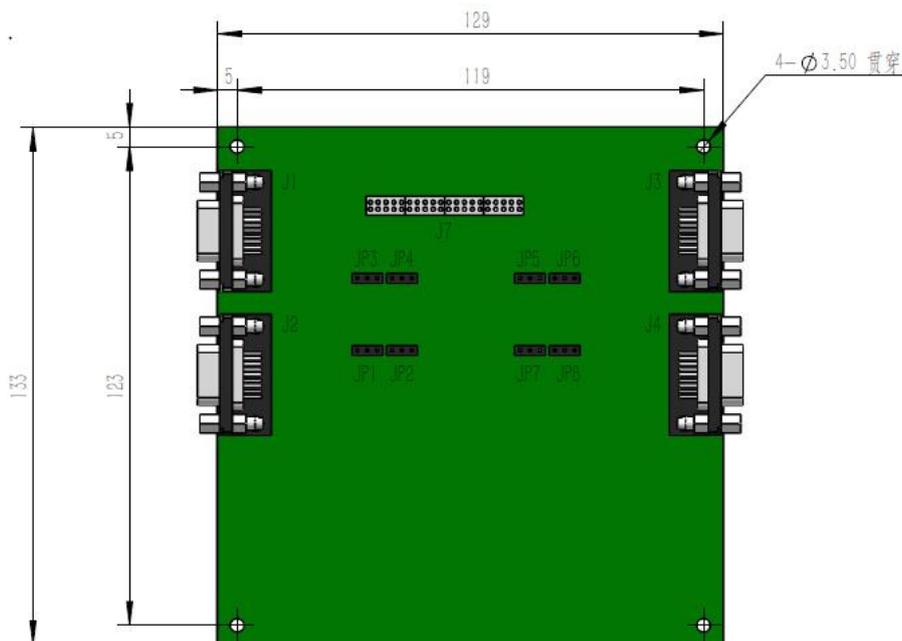
Figure 1 Board size

The board is directly connected to the interface corresponding to the DLC-2 control card through J7 (40-pin). The power supply is provided by the DLC-2 board, and no external power supply is required.

J1, J2, J3 and J4 are motion extension axis signal interfaces (DB9, female), which are defined as X-axis, Z-axis, Y-axis and R-rotation axis respectively. The specific correspondence is as follows:

J1 ------ X axis

J2 ------ Z axis

J3 ------ Y axis

J4 ------ R axis

The J1, J2, J3 and J4 interfaces are defined as follows:
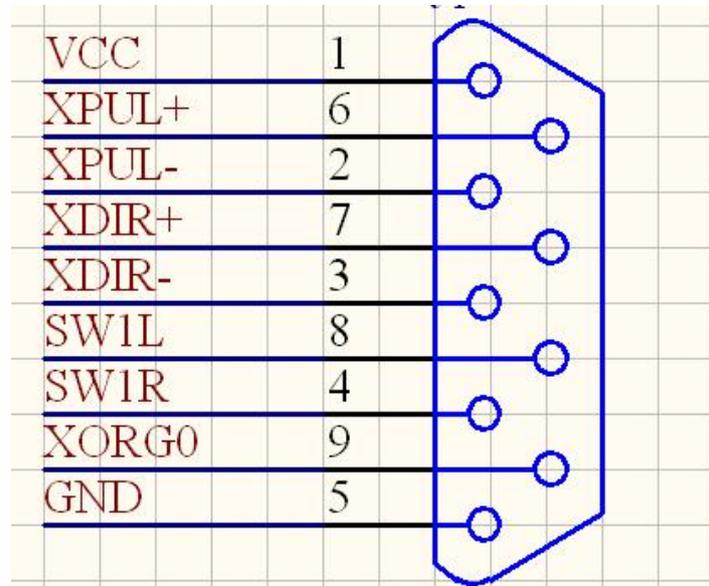
Pin	Name	Description
1	VCC OUTPUT	5V OUTPUT
2，6	Pulse signal output	Extended axis pulse signal, output mode can be set to differential output or common anode output (TTL output, typical value 30mA)
3，7	Direction signal output	Extended axis direction signal, output mode can be set to differential output or common anode output (TTL output, typical value 30mA)
4	Right limit input	Right limit input
8	Left limit input	Left limit input
9	Zero signal input	Extend axis zero input signal. When using this signal, connect the modified signal and the GND signal to the two terminals of the switch.

5	GND	

<p align="center">Figure / Table 2 Extended Axis Signal Interface Definition</p>

Description:

There are two output modes for the pulse and direction signals output by the board: differential output and common anode (TTL) output, which are selected by jumpers JP1-JP8, defined as below:

(1) When the 2-3 pins of the jumper are shorted, the pulse and direction signals are differential outputs, and the PIN2 is pulse-, PIN6 is pulse+, PIN3 is direction-, PIN7 is direction+, which signals are respectively connected to The PUL-, PUL+, DIR- and DIR+ signals of the driver.

(2) When the 1-2 pins of the jumper are shorted, the pulse and direction signals are common anode output, the PIN1 is VCC, and is connected to the VCC of the driver, the pulse of the PIN6 is + and the PIN7 is connected to the PUL and DIR of the driver respectively.

Note: When using EZCAD3 software with DLC2-M4, open Motors.ini in the EZCAD3 software folder "PARAM" to find m_bUse9030=1 to enable the 9030 motion control card, m_bUse9030=0 means that the M4 motion control card is enabled.