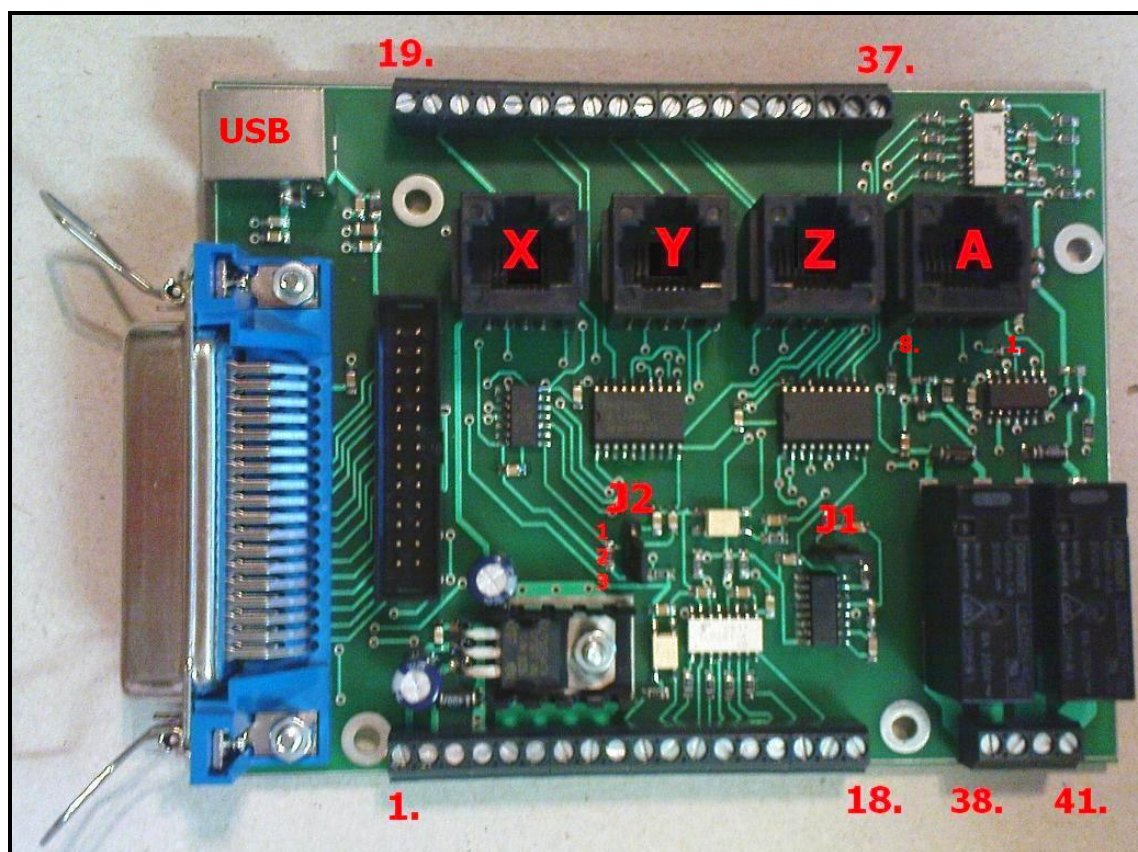


HDBB Breakout board user's manual



The HDBB breakout board was designed to use with our **Whale2(-T)***, **Whale3**, **Mammut*** and **Dugong** servo drives or with any other third party stepper or servo drives which using step and direction control signals.

This datasheet describes the features and pinouts of the breakout board.

Features

- Buffer for all outputs.
- Buffer and optical isolation for all inputs.
- 2 onboard relays.
- Onboard chargepump safety circuit.
- Reliable Centronix connector for LPT port connection.
- IDC connector for Smoothstepper motion controller connection.
- Common servo error line feedback to the PC through optical isolation.

* The Whale2, Whale2-T and Mammut servo drives are no more manufactured.

Pinouts

DC input terminals:

- 1.) DC in-
- 2.) DC in+

DC output terminals:

- 3,4,5.) DC OUT+

These terminals also wired to the DC in terminal, after the reverse polarity protection diode.

- 6,7,8.) DC OUT-

These terminals simply wired to the DC in- terminal.

Comments:

-These terminals acts only as power distribution terminals.

-The „DC OUT+” outputs are connected to the „DC in+” input through the reverse polarity protection diode onboard, therefor external devices connected to these pins will be protected against reverse polarity connection made on the „DC in” power input terminals.

Opto isolated filtered and buffered inputs:

- 9.) Input 5 +
- 10.) Input 5-
- 11.) Input 1+
- 12.) Input 1-
- 13.) Input 2+
- 14.) Input 2-
- 15.) Input 3+
- 16.) Input 3-
- 17.) Input 4+
- 18.) Input 4-

Comments:

- All inputs + terminals has a 470R series current limiting resistors and wired to opto Anode.

- All inputs - terminals wired directly to the optocoupler's Cathode.

- When using not TTL (5V) voltage input levels, use external current limiting resistor and connect the external resistors between the input signal and „input ..+” terminal.

Servo external stop and reset signals:

19,20.) Servo reset, connect a pushbutton (with closing contact) to reset servos.

21,22.) Servo stop, connect pushbutton (with closing contact) to stop servos.

Comments:

These functions will work with our servo drives and may not work with third party drives due to different circuit structures and interfaces.

Control signals on screw terminals (step/direction):

23.) X Step signal
24.) X. Direction signal
25.) LPT GND

26.) Y Step signal
27.) Y Direction signal
28.) LPT GND

29.) Z Step signal
30.) Z Direction signal
31.) LPT GND

32.) A Step signal
33.) A Direction signal
34.) LPT GND

RJ45 axis connectors for servo drives:

Comment:

Connectors marked with 'X', 'Y', 'Z' and 'A' has identical pinout except the step and direction pins.

Pinout of RJ45 connectors:

- 1.) Step signal
- 2.) Direction signal
- 3.) LPT port ground
- 4.) N/C (No internal connection)
- 5.) Reset signal (Output from breakout board)
- 6.) Common ERROR line (Birirectional line)
- 7.) DC power output+
- 8.) DC power output-

Auxiliary and relay outputs:

35.) Output4.

Comment:

Output4 is common with charge pump, it is only useful if charge pump is not used, if charge pump is enabled, it is useless.

- 36.) Output3 (filtered to analog)
- 37.) Output3 (not filtered, digital)

Comment:

Signals on terminals 36. and 37. are connected to the same source, the difference between the two connections is that the signal on pin36. is passed through a lowpass filter. The cutoff frequency of this filter is around 1kHz.

PWM signals from Mach can be used to drive an analog input of for example a frequency controller and HF spindle motor for speed control.

38, 39.) Output1.

40, 41.) Output2.

Comment:

These outputs are connected to the onboard relays.

Each relay has one potential independent closing contact.

LPT port signals to functions assignments:

Comment: Port numbers listed here are in the Centronix-36 connector on the Breakout board. Controller software may need an LPT port pin number for setup, check LPT port cable pinout to get DSUB-25 LPT port pin numbers. (Appendix A. in this document.)

Inputs assignments:

Input1: pin 10. (Can be jumpered to servo error input, then this input is useless.)

Input2: pin 12.

Input3: pin 11.

Input4: pin 13.

Input5: pin 32.

Outputs assignments:

Output1: pin 31.

Output2: pin 14.

Output3: pin 1.

Output4: pin 36. (common with chargepump)

Step/dir assignments:

X-axis step: pin 4.

X-axis direction: pin 5.

Y-axis step: pin 6.

Y-axis direction: pin 7.

Z-axis step: pin 8.

Z-axis direction: pin 9.

A-axis step: pin 2.

A-axis direction: pin 3.

Jumpers:

J1: Charge pump select (if on charge pump is active)

If charge pump is active set charge pump output in MACH to OUT4 (Centronix pin 36.)

J2:

pin 1-2 jumpered: selects servo common error line for input1. (In this case Input1 is useless)

pin 2-3 jumpered: selects input1 as standard input.

Comment:

In jumper „J2” do not jumper both possibility and also do not leave it totally unjumped.

USB connection

The breakout board has an USB-B connector onboard, a connection must be made from this connector to the computer's USB port with a standard USB-A < - > USB-B cable to make the device work.

There is no communication through the USB port, this connection only powers the buffer chips on the board, therefor there is no need to install and Windows will not ask for drivers when plugging the USB in.

Caution:

This documentation is under development and may be uncompleted and may contain minor bugs, if you explore any bug in this document please tell it to us to help our work.

Before installing this device please go to our website and download and use the latest version of this manual.

For more informations visit or e-mail us at:

<http://www.cncdrive.com>

e-mail: info@cncdrive.com

Appendix A,
Printer cable pinout.

Parallel printer cable

Line	DB 25 male (computer)		Centronics (printer)
Strobe	1	→	1
Data bit 0	2	→	2
Data bit 1	3	→	3
Data bit 2	4	→	4
Data bit 3	5	→	5
Data bit 4	6	→	6
Data bit 5	7	→	7
Data bit 6	8	→	8
Data bit 7	9	→	9
Acknowledge	10	←	10
Busy	11	←	11
Paper out	12	←	12
Select	13	←	13
Autofeed	14	→	14
Error	15	←	32
Reset	16	→	31
Select	17	→	36
Signal ground	18	↔	33
Signal ground	19	↔	19 + 20
Signal ground	20	↔	21 + 22
Signal ground	21	↔	23 + 24
Signal ground	22	↔	25 + 26
Signal ground	23	↔	27
Signal ground	24	↔	28 + 29
Signal ground	25	↔	16 + 30
Shield	Cover	↔	Cover + 17