

Microservo breakout board short description

The uservo breakout board is designed to offer a complete solution to control small CNC mills, routers and lathes in closed loop with DC servo motors.

The cost effectiveness of the uservo drives and this board makes it possible to use servo motor control in low cost systems and to replace old steppermotor controllers with higher speed and more reliable closed loop servo drives.

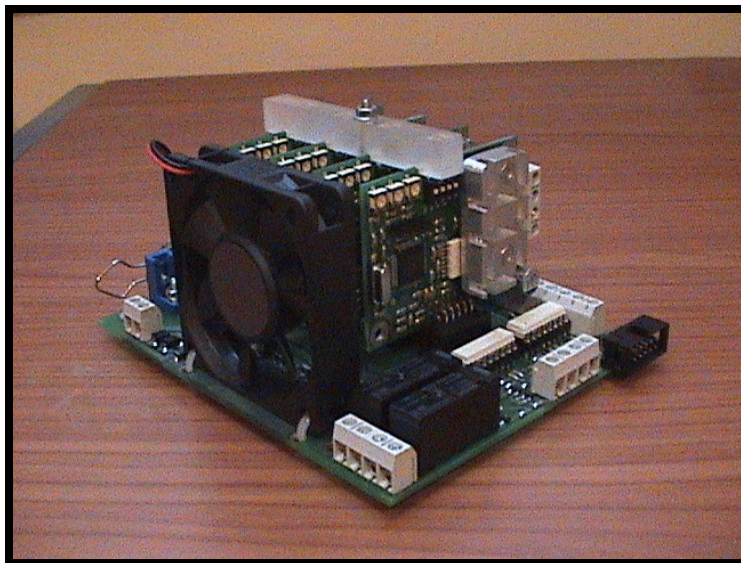
Maximum 4pcs of uservo drives can be connected to one breakout board moreover 2 relay outputs with onboard relays, 1 open collector output and 1 analog output is available for the user. 4 onboard inputs gives the ability to connect limit, reference switches and/or E-stop buttons to the host PC.

All connections are optically isolated from the host computer.

The board includes an integrated FAN to keep the uservo drives cool.

The breakout board can be connected to the host PC with standard Dsub25 – Centronix36 printer cable. (cable is not supplied with the board!)

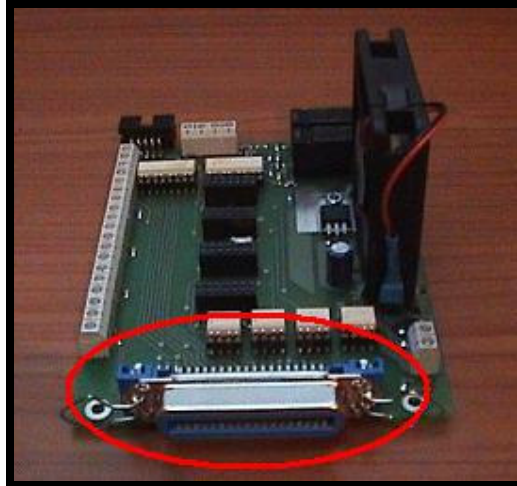
The system is compatible with Mach2,3, KCAM4 and with any other CNC controller softwares which using step/direction signals to drive the controllers.



Picture shows uservo breakout board with 4 uservo drives connected

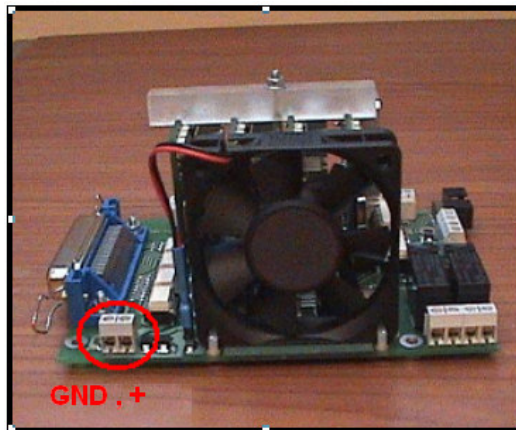
In the following document connections and pinouts of the device is described.

1.) LPT – Centronix36 connector



Use a standard Dsub25-Centronix36 cable to connect the PC' parallel port.

2.) Digital power screw terminal



Connect digital power supply to these terminals.

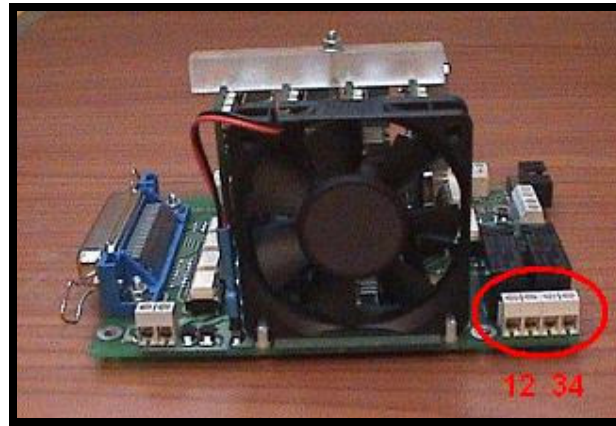
The digital supply Voltage range is 9 to 13VDC.

Current requirement of this power supply depends on the numbers of uservo drives connected. Please see the uservo drive's datasheet for current requirements.

The current requirement is 400mA + the uservo drives' current requirement.

When all 4 uservos are connected an 1Amper 12VDC power supply is enough for correct operation.

3.) Relay outputs



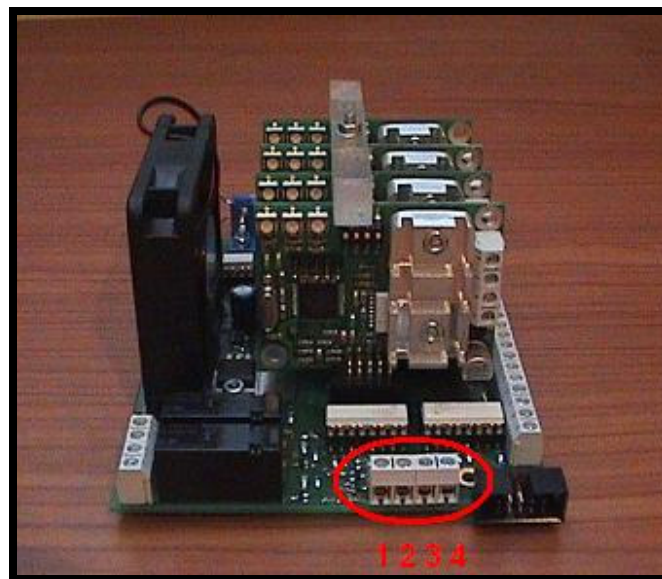
There are 2 potential independent relays on the breakout board.

Connect and switch on/off the main spindle, coolant etc.

1&2 terminals are relayA and 2&3 terminals relayB outputs.

Maximum switching Voltage is 250VAC, maximum switching current is 8Amps.

4.) Open collector and analog output

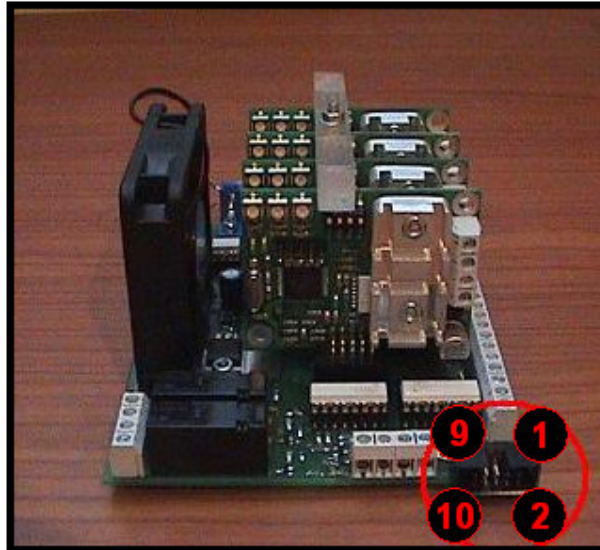


- 1. terminal is a TTL level (5V) open collector output.**
- 2. terminal is GND.**
- 3. terminal is GND.**
- 4. terminal is an analog output.**

The analog output provides a 0 to 5V Voltage level. The controller software, e.g. Mach3 can be set to control spindle speed with PWM signal. Set the software to PWM output and the analog output will give a proportional analog Voltage to the PWM duty cycle. Set PWM frequency to 5kHz or above to get smooth analog signal.

The analog output feature is useful to control high speed spindles with frequency controller.

5.) Input signals



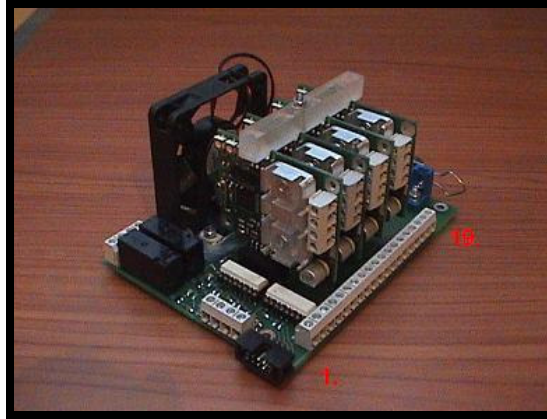
A 10pin IDC connector is on the board to interface input signals, like E-stop, limit switches etc.

Pinout of the IDC connector:

1. Input 1.
2. Vcc (5V output)
3. Input 2.
4. Vcc (5V output)
5. Input 3.
6. Vcc (5V output)
7. Input 4.
8. Vcc (5V output)
9. GND
10. GND

To trigger any of the inputs , simply short it to any of the Vcc terminals in this connector e.g. with a mechanic switch or button.

6.) Main screw terminal



1. GND
2. Servo common error in/out
3. Vcc (5V output)

To stop all servos, connect a button/switch between terminal 1. and 2. , when button is pushed/closed, all servos will stop and motors will be freewheeled.

To restart all servos, connect a button/switch between terminal 2. and 3. , when button is pushed/closed, all servos will be re-enabled.

(Please note that there is an approximately 1sec safety startup time when re-enabling the drives.)

Axis 4.

4. Encoder channel A
5. GND (output for encoder)
6. Encoder channel B
7. Vcc (5V output for encoder)

Axis 3.

8. Encoder channel A
9. GND (output for encoder)
10. Encoder channel B
11. Vcc (5V output for encoder)

Axis 2.

12. Encoder channel A
13. GND (output for encoder)
14. Encoder channel B
15. Vcc (5V output for encoder)

Axis 1.

16. Encoder channel A
17. GND (output for encoder)
18. Encoder channel B
19. Vcc (5V output for encoder)

Encoders connections are wired out from the connected userservo drives to the main terminal encoders of the motors should be connected to the main connector of the breakout board as listed above.

7.) Connection of the uservo controllers to the breakout-board.



There are 4 IDC-10pin connectors on the breakout board, uservo drives can be plugged here.



To connect the uservo drives, simply plug them into the IDC connectors and screw down the holder screw rod and plexi holder with the nut as shown on the picture.

8.) Pinout and setup on the PC side

The servo axis has the following pinout at the PC side on the parallel port.
This is how Mach or other controller software has to be set up.

Pin number	Description
1	Relay output 1
2	X-axis direction signal
3	X-axis step signal
4	Y-axis direction signal
5	Y-axis step signal
6	Z-axis direction signal
7	Z-axis step signal
8	A-axis direction signal
9	A-axis step signal
10	Input 4
11	Input 3
12	Input 2
13	Input 1
14	Open collector output
15	NC
16	NC
17	NC
18	NC
19	LPT port GND
20	LPT port GND
21	LPT port GND
22	LPT port GND
23	LPT port GND
24	LPT port GND
25	LPT port GND
26	LPT port GND
27	LPT port GND
28	LPT port GND
29	LPT port GND
30	LPT port GND
31	Analog output
32	NC
33	NC
34	NC
35	NC
36	Relay output 2

*NC = No connection

Note: Pin numbers listed here are on the Centronix-36 connector side, to see pin numbers on the computer's DSUB-25 connector follow the diagram on the next page.

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

More informations at: <http://www.cncdrive.com>

E-mail: <mailto:info@cncdrive.com>