

# AlaMode

*An Arduino compatible board for the  
Raspberry-Pi®*

*brought to you by*





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## Features

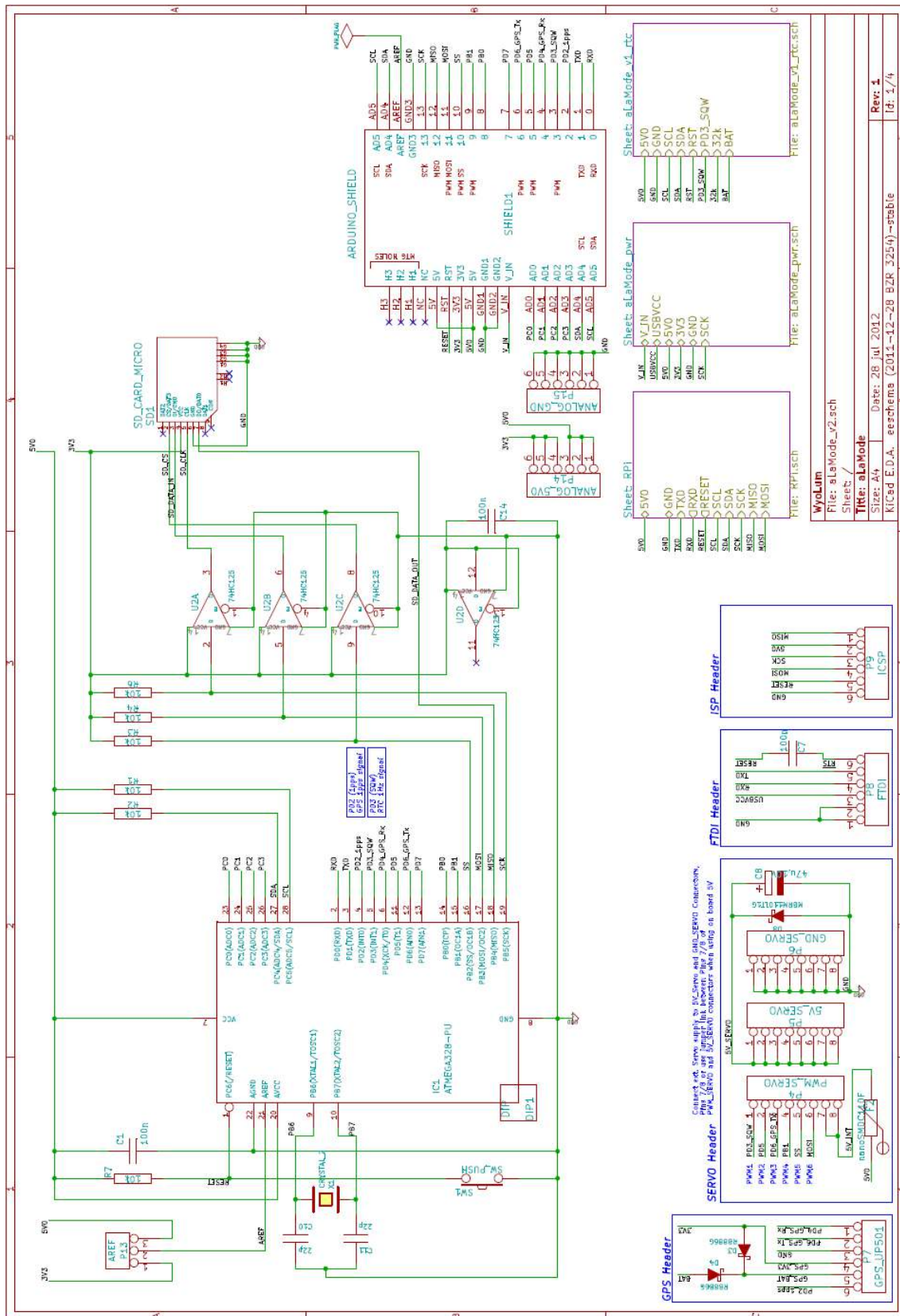
- micro SD card reader
- Temperature controlled, precision Real Time clock, with battery backup
- GPS interface for the Fastrax UP501 module
- Arduino compatible, with standard shield headers
- General purpose blink LED on port D13
- Interfaces with Raspberry-Pi® via the GPIO header
- Communicates with Raspberry-Pi via I2C, SPI or Serial UART
- Analog reference can be set to either 5V0 or 3V3
- Analog header has 5V0, 3V3 and GND headers, to allow interfacing 3 wire sensors directly.
- Servo header with 5V0 and GND connections to allow interfacing 3 wire servos directly
- Servos can be powered via on-board 5V0 or from external 5V
- FTDI and ISP headers for programming and sketch loading
- Power via external 5V to micro-USB socket, or directly from Raspberry-Pi
- 5V0 and 3V3 indicator LEDs

## Potential Uses

- Stand-alone data logger
- Simple-to-use, persistent storage
- Program loader for separate Arduino compatible

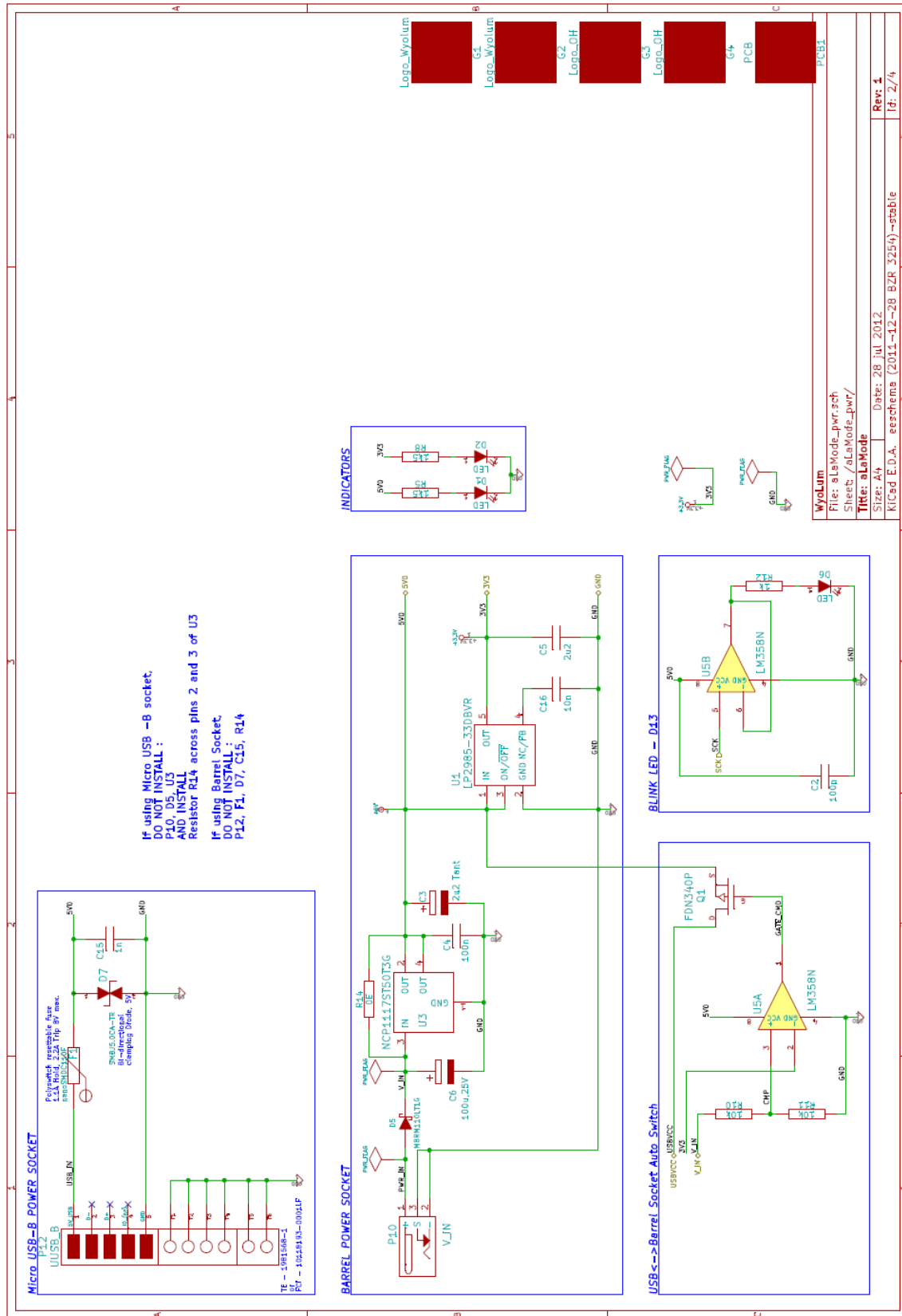


# Schematic, #1



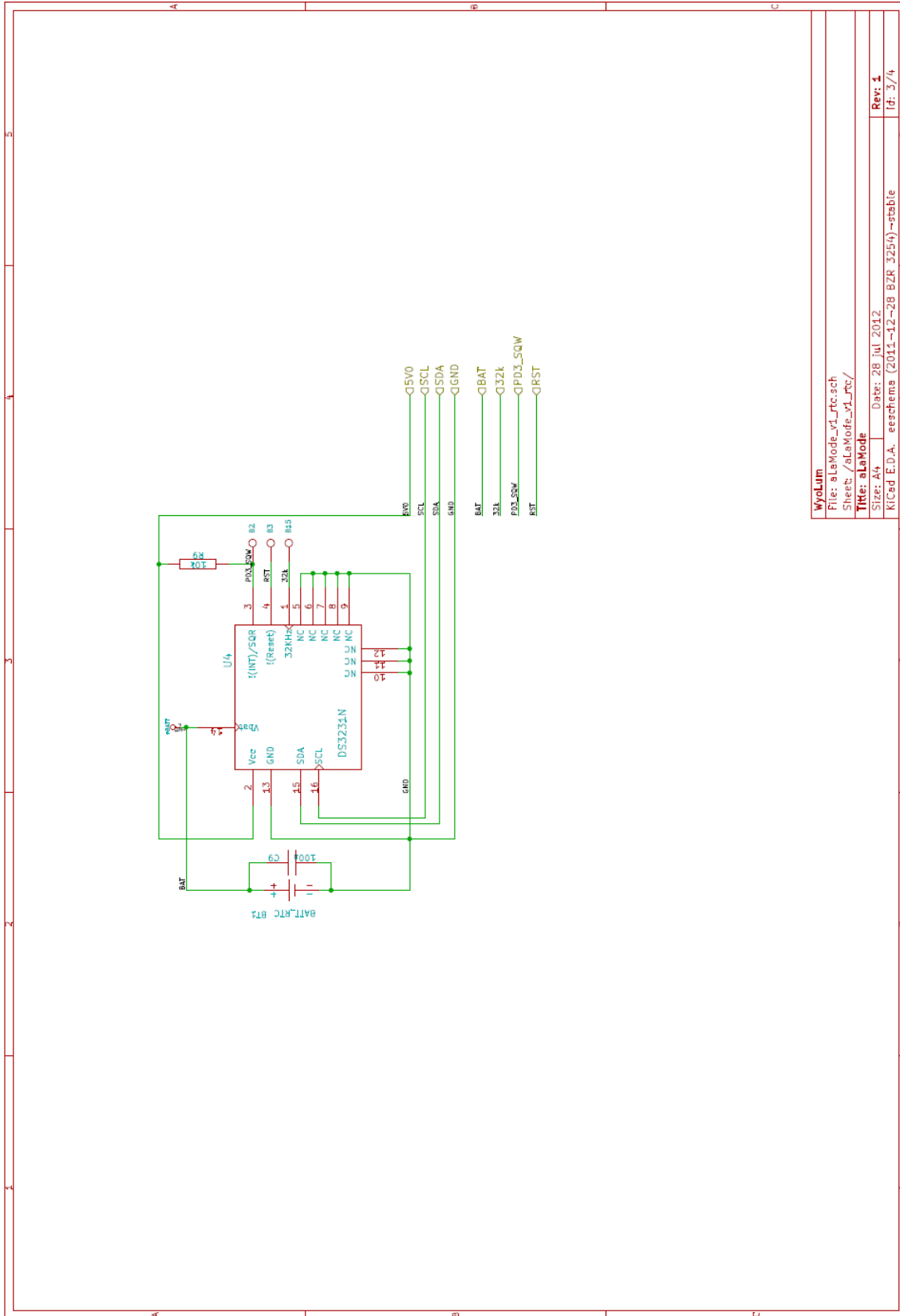


# Schematic, #2





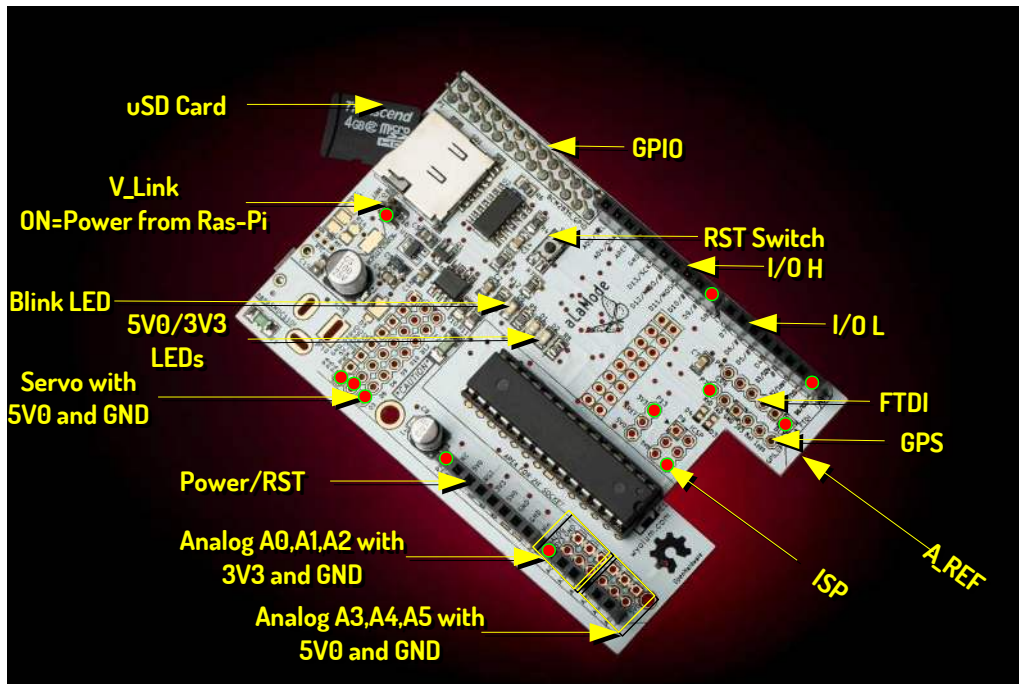
# Schematic, #3



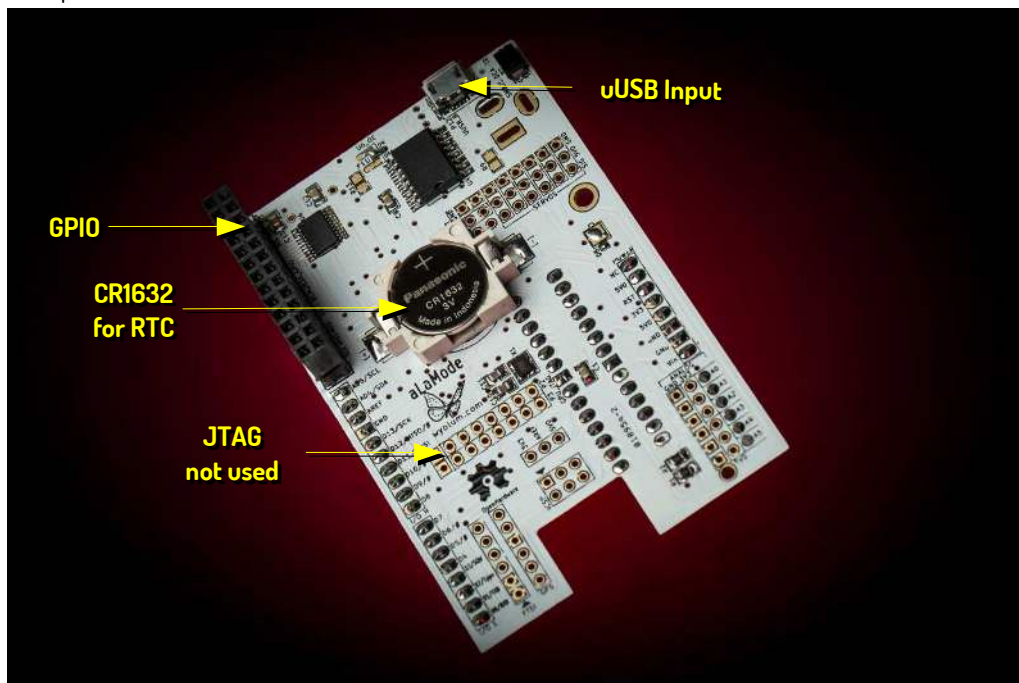




# Physical Interfaces



NOTE : Picture shows the prototype Beta boards. Final production boards do not have the cutout, and GPS header is re-positioned.





## Physical Interfaces, Description

[ RED Markers point to Pin # 1 of each header ]

HEADER POWER							
	<ol style="list-style-type: none"> <li>1. NC</li> <li>2. 5V0</li> <li>3. RST</li> <li>4. 3V3</li> <li>5. 5V0</li> <li>6. GND</li> <li>7. GND</li> <li>8. Vin (Note : 5V only)</li> </ol>						
HEADER ANALOG							
	<ol style="list-style-type: none"> <li>1. A0 : 3V3 : GND</li> <li>2. A1 : 3V3 : GND</li> <li>3. A2 : 3V3 : GND</li> <li>4. A3 : 5V0 : GND</li> <li>5. A4 : 5V0 : GND , SDA</li> <li>6. A5 : 5V0 : GND , SCL</li> </ol>						
HEADER's ISP and AREF							
	<table border="0"> <tr> <td>1. MISO</td> <td>2. 5V0</td> </tr> <tr> <td>3. SCK</td> <td>4. MOSI</td> </tr> <tr> <td>5. RST</td> <td>6. GND</td> </tr> </table> <ol style="list-style-type: none"> <li>1. 3V3</li> <li>2. AREF</li> <li>3. 5V0</li> </ol>	1. MISO	2. 5V0	3. SCK	4. MOSI	5. RST	6. GND
1. MISO	2. 5V0						
3. SCK	4. MOSI						
5. RST	6. GND						





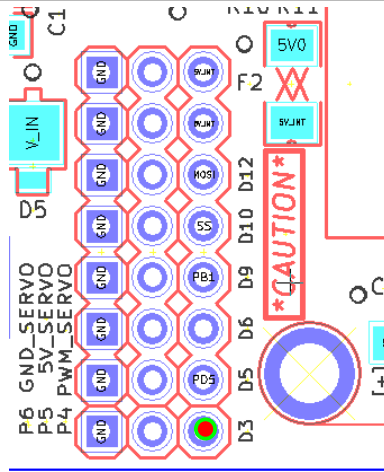
HEADER's GPS and FTDI	
	<ol style="list-style-type: none"> <li>1. GPS_Rx , PD4 (Arduino digital pin 4)</li> <li>2. GPS_Tx , PD6 (Arduino digital pin 6)</li> <li>3. GND</li> <li>4. 3V3</li> <li>5. GPS_BATT (backup for GPS, from RTC 3V batt.)</li> <li>6. 1pps , PD2 (Arduino digital pin 2)</li> </ol> <ol style="list-style-type: none"> <li>1. GND (BLACK)</li> <li>2. GND</li> <li>3. 5V0</li> <li>4. RXD , PD0 (Arduino digital pin 0)</li> <li>5. TXD , PD1 (Arduino digital pin 1)</li> <li>6. RESET (GREEN)</li> </ol>
HEADER's I/O L and I/O H	
	<ol style="list-style-type: none"> <li>1. PD0 , RXD</li> <li>2. PD1 , TXD</li> <li>3. PD2 , 1pps (GPS)</li> <li>4. PD3 , SQW (RTC) , # (PWM1)</li> <li>5. PD4 , GPS Rx</li> <li>6. PD5 , # (PWM2)</li> <li>7. PD6 , GPS Tx , # (PWM3)</li> <li>8. PD7 ,</li> <li>9. PD8 ,</li> <li>10. PD9 , # (PWM4)</li> <li>11. PD10 , SS # (PWM5)</li> <li>12. PD11 , MOSI , # (PWM6)</li> <li>13. PD12 , MISO</li> <li>14. PD13 , SCK</li> <li>15. GND ,</li> <li>16. AREF ,</li> <li>17. AD4 , SDA</li> <li>18. AD5 , SCL</li> </ol>



HEADER GPIO																											
	<table border="0"> <tr> <td>1. Rpi_3V3</td> <td>2. Rpi_5V0</td> </tr> <tr> <td>3. Rpi_SDA , SDA0</td> <td>4. NC</td> </tr> <tr> <td>5. Rpi_SCL , SCL0</td> <td>6. GND</td> </tr> <tr> <td>7. NC , GPIO4</td> <td>8. Rpi_Tx</td> </tr> <tr> <td>9. NC</td> <td>10. Rpi_Rx</td> </tr> <tr> <td>11. NC , GPIO 0</td> <td>12. Rpi_RST , GPIO 1</td> </tr> <tr> <td>13. NC , GPIO 2</td> <td>14. NC</td> </tr> <tr> <td>15. NC , GPIO 3</td> <td>16. NC , GPIO 4</td> </tr> <tr> <td>17. NC</td> <td>18. NC , GPIO 5</td> </tr> <tr> <td>19. Rpi_MOSI</td> <td>20. NC</td> </tr> <tr> <td>21. Rpi_MISO</td> <td>22. NC , GPIO 6</td> </tr> <tr> <td>23. Rpi_SCK</td> <td>24. NC , SPL_CE0</td> </tr> <tr> <td>25. NC</td> <td>26. NC , SPL_CE1</td> </tr> </table>	1. Rpi_3V3	2. Rpi_5V0	3. Rpi_SDA , SDA0	4. NC	5. Rpi_SCL , SCL0	6. GND	7. NC , GPIO4	8. Rpi_Tx	9. NC	10. Rpi_Rx	11. NC , GPIO 0	12. Rpi_RST , GPIO 1	13. NC , GPIO 2	14. NC	15. NC , GPIO 3	16. NC , GPIO 4	17. NC	18. NC , GPIO 5	19. Rpi_MOSI	20. NC	21. Rpi_MISO	22. NC , GPIO 6	23. Rpi_SCK	24. NC , SPL_CE0	25. NC	26. NC , SPL_CE1
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MICRO HEADER 5V-LINK																											
	<table border="0"> <tr> <td>1. 5V0</td> </tr> <tr> <td>2. Rpi_5V0</td> </tr> <tr> <td>3. NC</td> </tr> </table> <p>If ON, AlaMode is powered via Rpi 5V0          If OFF, AlaMode needs to be powered via P12, u-USB socket</p>	1. 5V0	2. Rpi_5V0	3. NC																							
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2. Rpi_5V0																											
3. NC																											

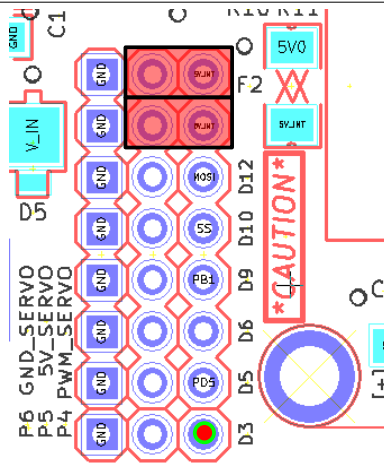


## HEADER SERVO



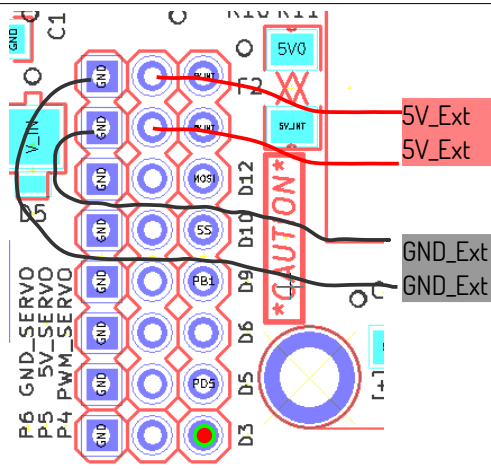
- |    |             |          |           |
|----|-------------|----------|-----------|
| 1. | PWM1 , PD3  | 5V_SERVO | GND_SERVO |
| 2. | PWM2 , PD5  | 5V_SERVO | GND_SERVO |
| 3. | PWM3 , PD6  | 5V_SERVO | GND_SERVO |
| 4. | PWM4 , PD9  | 5V_SERVO | GND_SERVO |
| 5. | PWM5 , PD10 | 5V_SERVO | GND_SERVO |
| 6. | PWM6 , PD11 | 5V_SERVO | GND_SERVO |
| 7. | 5V_INT      | 5V_SERVO | GND_SERVO |
| 8. | 5V_INT      | 5V_SERVO | GND_SERVO |

**ERRATA : PWM6 = PD11 , MOSI (NOT PD12)**



To power Servos via AlaMode 5V0 supply (internal mode), fix shorting links/jumpers between  
Pin 7 (5V\_INT) and 5V\_SERVO and  
Pin 8 (5V\_INT) and 5V\_SERVO  
as marked here (red rectangles)

(Note : Single jumper will work too. Dual jumpers allow higher current capacity)



To power Servos via External 5V supply (external mode), connect  
5V\_SERVO to 5V\_Ext  
5V\_SERVO to 5V\_Ext  
and  
GND to GND\_Ext  
GND to GND\_Ext  
as marked here (red / gray rectangles)

(Note : Single connections will work too. Dual connections allow higher current capacity)



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## LINKS

- website : [www.wyolum.com](http://www.wyolum.com)
- e-mail : [info@wyolum.com](mailto:info@wyolum.com)
- forum : <http://wyolum.com/forum/forumdisplay.php?fid=14>
- Git Repo : <https://github.com/wyolum/alamode>
- Arduino : <http://www.arduino.cc/>