Tutorial\_Building

Body assembly

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| **Author** | **Version** |
| Geert Huisman | Setup |

**TABLE OF CONTENTS**

[1. LEGS 4x 4](#_Toc46662133)

[2. BODY 13](#_Toc46662134)

|  |  |  |
| --- | --- | --- |
| **Requirements Legs** | | |
| **Hardware M3** |  | **Amount** |
|  | hex flat nut | 9x |
| 12mm | hex inbus | 5x |
| 10mm | hex inbus | 2x |
| 8mm | hex inbus | 2x |
| 5mm | round phillips screw | 4x |
|  | ~~Spring washers~~ | ~~2x~~ |
| 5mm | HTSB (spacers) | 3x |
| 3x8x4mm | F693ZZ (bearing) | 2x |
| 6mm | Hex Self Tapping screws | 5x |
| 8mm | bolt | 1x |
|  | Embedded Nuts | 8x |
|  | old bike inner tire (Rubber is used for grip pads on the legs with some glue) | 1x |
| **3D parts** |  | **Amount** |
|  | TIBIA | 4x |
|  | TIBIA\_bracket | 4x |
|  | TIBIA\_batteryHolder | 2x |
|  | FEMUR | 4x |
|  | FEMUR\_bracket | 4x |
|  | COXA\_bracket | 4x |
|  | Single\_cable\_bracket (Optional ) | 8x |
|  | Duo\_cable\_bracket |  |
| **Electronics** |  | **Amount** |
|  | MG996R 55g Gear Servo Motor | 2x |
| 50cm | 1.27mm Pitch 16 Pin Flat IDC Ribbon (flatcable for extention) | 3x |
| 50cm | Cable sleeve M3 | 1x |
|  | High Accuracy 10g-1kg Pressure Sensor Smart Flexible Thin Film Force Sensor | 1x |
|  | Custom pcb (Leg Distr sensor) | 1x |
| 100cm | L125BL25 0.25mm2 wire | 6x |
| 15cm | L125BL25 0.25mm2 wire | 2x |

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| LEGS 4x | |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_1.PNG | 8mm hex inbus  hex flat nut  ~~Spring washers~~ | 2x  2x  ~~2x~~ |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_2.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_3.PNG | Embedded Nuts | 8x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_4.PNG | 10mm hex inbus | 2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_5.PNG | MG996R 55g Gear Servo Motor  hex flat nut  12mm hex inbus | 2x  2x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_6.PNG | 3x8x4mm F693ZZ (bearing) | 2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_7.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_8.PNG | (90o in the up position, see picture. Make sure the servo axle is turned 180o)  Servo horn  Servo lock screw  6mm Hex Self Tapping screws | 1x  1x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_9.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_10.PNG | hex flat nut  5mm HTSB (spacers) | 2x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_11.PNG | hex flat nut  12mm hex inbus | 3x  3x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_12.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_13.PNG | round phillips screw | 2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_14.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_15.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_LEGS\Capture_16.PNG | (Make sure the servo axle is turned 180o)  Servo horn  Servo lock screw  6mm Hex Self Tapping screws | 1x  1x  2x |

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| **Requirements body** | | |
| **Hardware** |  | **Amount** |
| M2 5mm | round phillips Tapping screw | 4x |
| M3 12mm | hex inbus | 12x |
| 10mm | hex inbus | 4x |
| 8mm | hex inbus | 1x |
| 7mm | bolt cheese head | 4x |
| 5mm | round phillips screw | 4x |
|  | hex flat nut | 16x |
| 15+6mm | Nylon Hex Spacers Male to Female | 10x |
| 10mm | Embedded Nuts | 11x |
| 3x8x4mm | F693ZZ (bearing) | 5x |
|  | Tapping screws | 2x |
|  |  |  |
| **3D parts** |  | **Amount** |
|  | BODY\_capBot | 1x |
|  | BODY\_frame1 | 1x |
|  | BODY\_frame2 | 1x |
|  | BODY\_frame3 | 1x |
|  | BODY\_PS2Bracket | 1x |
|  | BODY\_servoBracket1 (embedded nuts[ optional]) | 1x |
|  | BODY\_servoBracket2 |  |
|  | Legs | 4x |
| **Electronics** |  | **Amount** |
|  | MG996R 55g Gear Servo Motor | 1x |
|  | MG90S Micro Metal Gear 9g Servo (screws for mounting is included) | 4x |
|  | HC-SR04 Ultrasone sensor | 1x |
|  | MPU-6050 | 1x |
|  | GP2Y0A41SK0F | 1x |
|  | PS2 Controller kit | 1x |
|  | PCA9685 16 Channel 12bit PWM Servo motor Driver | 1x |

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| BODY | | |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_2.PNG  12mm  Embedded nuts | 12mm hex inbus  10mm hex inbus  Embedded Nuts | 4x  2x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_3.PNG | Nylon Hex Spacers | 4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_4.PNG | Embedded Nuts | 3x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_5.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_6.PNG | 10mm hex inbus  MG996R 55g Gear Servo Motor | 1x  1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_7.PNG | 12mm hex inbus  hex flat nut | 2x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_8.PNG  Embedded nuts | 7mm bolt cheese head  Embedded Nuts | 2x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_9.PNG  Embedded nuts | round phillips screw  Embedded Nuts  PS2 Controller kit | 2x  2x  1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_10.PNG | round phillips screw  PCA9685 16 Channel 12bit PWM Servo motor Driver | 2x  1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_11.PNG | hex flat nut  Nylon Hex Spacers | 6x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_12.PNG | 12mm hex inbus | 4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_13.PNG | Nylon Hex Spacers | 4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_14.PNG | MG90S Micro Metal Gear 9g Servo  +lock screw   * Note: Customize the length of the servo wires. | 4x  4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_15.PNG | Embedded Nuts  HC-SR04 Ultrasone sensor | 2x  1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_16.PNG | MPU-6050 | 1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_17.PNG | GP2Y0A41SK0F  10mm hex inbus | 1x  2x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_18.PNG | 8mm hex inbus | 1x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY_bottom\Capture_19.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY-LEGS\Capture_2.PNG | Legs  F693ZZ (bearing) | 4x  4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY-LEGS\Capture_3.PNG | Servo horn  Servo lock screw  M2 5mm  round phillips Tapping screw | 4x  4x  4x |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY-LEGS\Capture_4.PNG | Assembly view |  |
| F:\01_Projecten\02_Shadow-Bot\04.Spider-bot\MARK_II\1.CAD_dataSpider\version 2.2\4_SPIDER_assemblys\TUTORIAL\Assem_BODY-LEGS\Capture_5.PNG | F693ZZ (bearing)  Servo horn  Servo lock screw  Tapping screws | 1x  1x  1x  2x |