

# ANYCUBIC I3 MEGA

## X-CARRIAGE MK4



This is the new generation (MK4) of the previous MK3 design of my famous free-to-use X-Carriage for the Anycubic I3 Mega (S)

The MK4-Design was completely re-designed from scratch for most parts to gain more flexibility and a better user experience. Thanks to all supporters of this project & their suggestions/ideas for new stuff which I took for improvements of this new generation of the Carriage!

The whole MK3 project is included in the MK4 project folder which can be downloaded here.

If you enjoyed this project please share your Make, leave a Like and Collect for the community. **To show your acknowledgment and support for my large Effort on this I appreciate your donation via my [PayPal-Link](#)**

### The main design features:

- e3d v5 & v6 hotends + Volcano are supported
- Fully new X-Carriage with better & more flexible bearing holding system
- Faster Hotend change due to improved Carriage system
- Less weight compared to MK2 & MK3 (mainly due to weight reduction of the mandatory fasteners)
- Increased build volume in z direction (205-210mm)
- Extremely effective belt tensioners included in the Carriage
- PCB on the backside of the carriage
- New fan duct design which combines the powerful cooling from the MK3 with an easier assembling process and a more effective blower position & inflow
- BLTouch usage possible (probe offset: X=+29, Y=-15)
- Improvement for easier printing experience - no more support
- Usage of Linear Ball Bearings (LM8LUU) or slide bearings (IGUS) in the same Carriage
- Either hex nuts or threaded brass inserts can be used
- Cable Harness guiding with spiral tube or drag chain (10x20) possible

Instructions on the stl-files, print settings & assembling process can be found in the project folders as a pdf file which is name '00\_Instructions(...).pdf'. The assembly instructions are summarized in an instructional video which can be found here: <https://www.youtube.com/watch?v=LadxXGYkU20>

The project also contains the newest Marlin 2.0.6 Firmware on the one hand for manual mesh bed leveling (MBL) and on the other for automatic bed leveling (ABL) with BLTouch. Special Thanks go to Christian H. for adapting and managing the Firmware part for the MK4 project. <https://www.thingiverse.com/thing:4358979/>  
You **DO NOT** have to change the firmware if you do not want to, its optional.

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**Print/Slicing settings are given in the PDF-instruction files!**

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The project folder "MK4\_Project\_Repo.zip" contains the following sub-folders for the project organization:

<ul style="list-style-type: none"> <li>📁 01_MK4_Hex_Nuts.zip</li> <li style="padding-left: 20px;">📁 01_Standard }</li> <li style="padding-left: 20px;">📁 02_BLTouch }</li> </ul>	<p>In this variant all bolts are fixed with <b>hex nuts</b></p> <p>These contain both <b>v5 &amp; v6 hotend</b> version parts &amp; instructions</p>
<ul style="list-style-type: none"> <li>📁 02_MK4_Threaded_Brass_Inserts.zip</li> <li style="padding-left: 20px;">📁 01_Standard }</li> <li style="padding-left: 20px;">📁 02_BLTouch }</li> </ul>	<p>In this variant most bolts are fixed with M3x5x5 <b>brass inserts</b></p> <p>These contain <b>v5 &amp; v6 hotend</b> version parts &amp; instructions</p>
<ul style="list-style-type: none"> <li>📁 03_Various_Parts.zip</li> <li>📁 04_Firmware_Marlin_v2.0.6</li> <li>📁 xx_MK3_Carriage_repository.zip</li> </ul>	<p>Here you will find firmware versions for MBL and ABL (BLTouch)</p> <p>Old MK3-repo with all stl &amp; instruction files</p>

*Note:* 03\_Various\_Parts.zip contains additional parts which are optional to be used:

<ul style="list-style-type: none"> <li>📄 vp01_Dragchain_Rear_Bracket.stl</li> <li>📄 vp02_Dragchain_Extruder_Mount.stl</li> <li>📄 vp03_Axialfan_Adapter_F(A)</li> <li>📄 vp04_Axialfan_Adapter_F(B)</li> <li>📄 vp05_Fanduct_(B)</li> <li>📄 vp06_Fanduct_(B)_Mount</li> <li>📄 vp07_Carrier_Plate_e3d_v6_Volcano</li> </ul>	<p>Drag chain mount for the Carriage (10x20 Chain)</p> <p>Drag chain mount for the extruder holder</p> <p>Adapter for Axialfan-Partcooling with Fanduct (A)</p> <p>Adapter for Axialfan-Partcooling with Fanduct (B)</p> <p>Alternative Fanduct with different fan orientation</p> <p>Mount for the alternative Fanduct (B)</p> <p>Carrier plate for the e3d v6 volcano hotend</p>
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If you want to use a drag chain (10x20) you must print the "vp01\_Dragchain\_Rear\_Bracket.stl" instead of the regular one, additionally you have to print "vp02\_Dragchain\_Extruder\_Mount.stl" which is mounted at the extruder. To mount the drag chain you will need 4x M3x10 bolts + nuts."

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**If you mounted all parts on the printer take care before first homing! You may have to adjust the two z-screws on the linear carriage of z-axis so the nozzle doesn't crash on the heated bed, because it comes slightly lower with this carriage**

The layout of the small hotend PCB is:

- HOTEND = Heating Cartridge
- FAN2 = Coldend/Heatbreak Axialfan
- FAN0 = Partcooling (Radial-)Fan
- T0 = T0-Sensor (Thermistor)

**Do not unplug a fan when the printer is turned on or do not turn the printer on when a fan is not plugged in you may risk damage to a transistor on the mother PCB!**



## Changelog:

- **04.05.2020:** Publication of threaded brass insert parts & parts for drag chain usage, update of instructions
- **07.05.2020:**
  - Reduction of the tolerance oversize of the hexagonal recesses & hotend groove mount
  - Addition of the bore hole for fixing the hotend like with the MK3 Carriage in the Carrier Plate (Only if necessary to prevent rotation with an M3x10 screw)
  - Adaptation of the fanduct support for better removability of the supports
- **10.05.2020:** Addition of the Firmware Repo: Marlin 2.0.5.3 MBL and ABL versions by Christian H.
- **11.05.2020:** BLTouch firmware bugfix (T0 issue -14°C)
- **14.05.2020:** Adjustment of fanduct outlet position & inner guide plates for improving the outlet stream & cooling efficiency
- **18.05.2020:** Change of the X-Carriage threaded brass insert version (TBI) in terms of the bore hole for the belt tensioner which now was switched back to hex nut fixing since some soldering irons were not able to reach into the pocket, Adaption of the BOM and the Text on the Carriage to prevent a predetermined breaking point
- **13.06.2020:**
  - Axialfan adapter for print part cooling with an axialfan (user wish)
  - Alternative Fanduct (B) with different fan orientation in case the radialfan tends to vibrate in the way its mounted with Fanduct (A) - To use it an additional mount is necessary
  - Optimization of the fanduct design / inner flow channels for better outlet stream conditions
  - Adaption of the fanduct support in terms of thinner walls for less waste material
  - Revised e3d v6 cover plate with slightly bigger air in- and outlet for better heatsink cooling
  - Adaption of the BOM & addition of part lists for v6 hotend configurations
  - Adaption / optimization of the necessary bolt lengths for threaded insert parts (less weight)
  - Slight change of the PCB mount at the Carriage to reduce the fracture susceptibility
  - Addition of a e3d v6 VOLCANO carrier plate
  - Firmware update
- **20.06.2020:**
  - Increase of tolerance oversize of the hex nut recesses to +0.1mm
  - Bugfix: Missing Part vp 02\_Extruder\_Dragchain\_Mount.stl added to 03\_Various\_Parts
- **06.07.2020:**
  - Firmware update (pause function, M600, BLTouch settings improvement, ...)
  - Minor tolerance change for cover-plates and carrier-plates heatsink groove mount
- **16.08.2020:**
  - Firmware update to Marlin 2.0.6

