Conveyor Belt Building Guide

The build completed in Lesson 3 of the TETRIX® Getting Started Guide will be used in Step 35 of this guide.

Step 1

**Parts Needed**

- 1x Flat Bracket
- 2x 96 mm Channel
- 4x 1/2” SHCS
- 4x Kep Nut

**Tips**

- Make sure the screws are snug.
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Parts Needed

- 1x 160 mm Channel
- 2x 1/2” SHCS
- 2x Kep Nut

Step 2

Tips

- Ensure that the teeth of the nut face the head of the screw
Parts Needed

- 1x 160 mm Channel
- 2x ½" SHCS
- 2x Kep Nut

Step 3

Tips

- Place this channel in line with the channel from Step 2.
Parts Needed

- 2x 32 mm Channel
- 4x 1/2" SHCS
- 4x Kep Nut

Tips

- Place the channels at the very end of each beam.
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**Parts Needed**

- 1x 288 mm Angle
- 4x 5/16” SHCS
- 2x 1-inch Stand-Off Post

**Step 5**

**Tips**

- Make sure to put the stand-off posts on the correct holes in the 288 mm Angle element.
TETRIX® Add-On Extensions

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Step 6

Parts Needed

- 1x 288 mm Angle
- 4x 5/16" SHCS
- 2x 1-inch Stand-Off Post

Tips

- Place this angle beam in line with the right one.
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Step 7

**Parts Needed**

- 4x 5/16" SHCS
- 4x 1-inch Stand-Off Post

**Tips**

- Make sure to put the stand-off posts on the correct holes in the 288 mm Angle element.
TETRIX® Add-On Extensions

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Step 8

Parts Needed

- 4x 5/16" SHCS
- 4x 1-inch Stand-Off Post

Tips

- Place these stand-off posts in line with the right ones.
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Step 9

Parts Needed

- 8x 5/16” SHCS
- 4x 32 mm Channel

Tips

- Make sure all four channels are added before moving on.
**Parts Needed**

- 4x 5/16" SHCS
- 2x Axle Hub

**Tips**

- It is important to note the position of the set screw within the axle hub. If the set screw is facing upward, it cannot be tightened.
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Step 11

Parts Needed

- 4x Bronze Bushing
- 2x Idler Wheel

Tips

- Make sure the bushings do not fall out before or during the next step.
Step 12

Parts Needed

- 2x Bronze Bushing

Tips

- Make sure the bushings do not fall out before or during the next step.
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**Step 13**

**Parts Needed**

- 2x Bronze Bushing

**Tips**

- Make sure the bushings do not fall out before or during the next step.
Parts Needed

- 2x 100 mm Axle
- 2x Idler Wheel Assembly

Tips

- Space the axle evenly between the axle hub and the far bronze bushing. Tighten the set screw to prevent the axle from slipping.
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Step 15

Parts Needed

- 1x Flat Bracket
- 2x 1/2" SHCS
- 2x Kep Nut

Tips

- Ensure that the teeth of the nut face the head of the screw.
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Step 16

Parts Needed

1x L Bracket  2x 1/2" SHCS  2x Kep Nut

Tips

- Make sure the bracket is screwed to the correct side of the flat bracket from the previous step. If it is on the wrong side, the motor will not line up with the axle that drives the conveyor belt.
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Step 17

Parts Needed

- 1x TETRIX® Hard Point Connector
- 2x 1/2" SHCS
- 2x Kep Nut

Tips

⚠️ Turn the screws only until the hard point connector is securely attached to the bracket.
**Parts Needed**

- 1x TETRIX® Hard Point Connector
- 2x 5/16” SHCS
- 1x L Bracket
- 1x Axle Hub

**Tips**

*Turn the screws only until the hard point connector is securely attached to the bracket.*
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Step 19

Parts Needed

1x 9-Module Beam

Tips

• Insert the beam with the holes placed horizontal.
Parts Needed

2x 3-Module Connector Peg with Friction

Tips

• Make sure the beam is placed in the center of the hard point connector.
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Step 21

Parts Needed

- 2x 3-Module Connector Peg with Friction
- 4x 2-Module Cross Block

Tips

- Face the cross blocks upward, as shown above.
Step 22

Parts Needed

- 2x 10-Module Axle
- 2x Double Cross Block

Tips

- Insert each axle into one 2-module cross block, then add both double cross blocks to the axles, and finally, push the axles the rest of the way through the last 2-module cross blocks. Center the axles within the assembly.
Parts Needed

- 2x 2-Module Connector Peg With Friction
- 1x 7-Module Beam

Tips

- The double cross blocks must be pushed against the 2-module cross blocks in order for the 7-module beam to properly fit.
**Parts Needed**

- 2x 3-Module Connector Peg with Friction
- 1x 36-Tooth Gear

**Tips**

- The 3-module connectors must have one module sticking out of the gear.
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Step 25

Parts Needed

1x Interactive Servo Motor

Tips

- Connect the gear on the correct side of the motor. If it is on the wrong side, the motor will not line up with the axle that drives the conveyor belt.
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**Step 26**

**Parts Needed**

- 2x 3-Module Connector Peg with Friction
- 1x 9-Module Beam

**Tips**

- Line up the end of the beam with the holes on the underside of the motor.
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Step 27

Parts Needed

- 1x Motor Assembly

Tips

- The hard point connector that the motor assembly slides into goes all the way to the motor. Lift up the motor from the 9-module beam connected to it in order to slide the hard point connector under it.
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Step 28

Parts Needed

2x 3-Module Connector Peg with Friction

Tips

• The hard point connector must be slightly under the motor for the connectors to properly be inserted.
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Step 29

Parts Needed

- 1x Drive Sprocket
- 4x 1/2" SHCS
- 1x Axle Hub

Tips

- Do not overtighten the screws.
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Step 30

Parts Needed

- 2x Bronze Bushing

Tips

- Make sure the bushings do not fall out before or during the next step.
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**Parts Needed**

- 1x 100 mm Axle
- 1x Axle Set Collar
- 1x Sprocket Assembly

**Step 31**

**Tips**

- Insert the axle properly through all the pieces that go around it and then slide it all the way into the axle hub on the motor assembly. Tighten the set screw on this axle hub first, then space the other components on the axle, and tighten the remaining set screws.
Step 32

Parts Needed

71x Track Link

Tips

- Assemble all but one of the links in the conveyor belt. This one link is left out so that the belt can be placed on the wheels and drive sprocket on the main assembly.
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Step 33

Parts Needed

12x Track Paddle

Tips

- Make sure there are five empty links between every link with a paddle.
Parts Needed

1x Track Link

Tips

• Wrap the conveyor belt with the paddles around the wheels and drive sprocket of the main assembly and then insert the last track link to make the belt into a loop. It can be difficult to connect the final links together.
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Step 35

Parts Needed

- 1x Conveyor Belt Assembly
- 4x 1/2" SHCS
- 4x Kep Nut

Tips

- Make sure the conveyor belt assembly is centered on the front 288 mm channel on the Ranger Bot base.
- Make sure the screws holding the conveyor assembly on the Ranger Bot are tight. If they are loose, the whole top portion of the robot will not be stable.
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Wiring Diagram

Tips

• Tighten the screws on the HiTechnic controller after the wires have been inserted.

⚠️ Complete all wiring before attaching the battery.