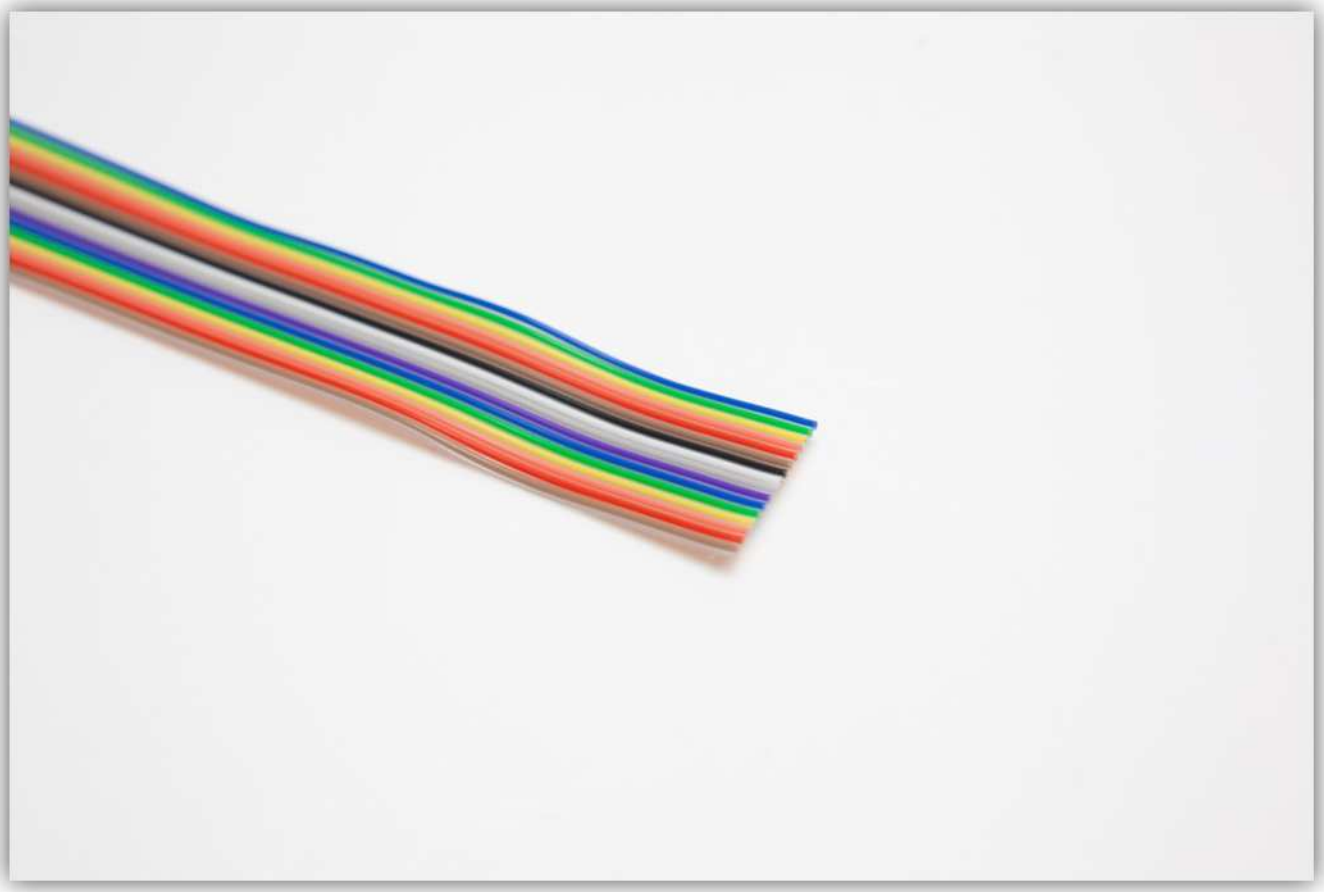
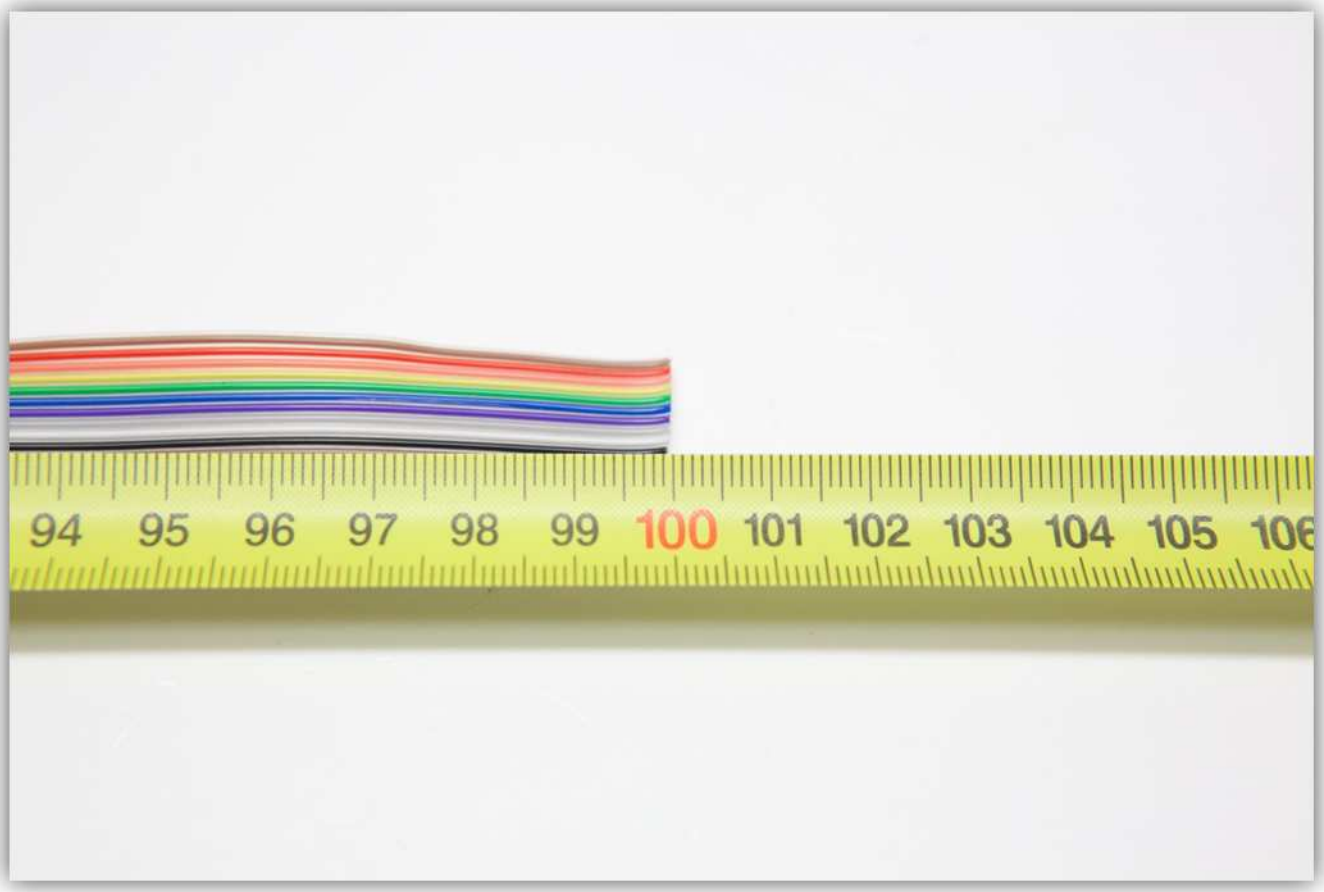
015 – WIRING THE EXTRUDER MOTOR AND FAN

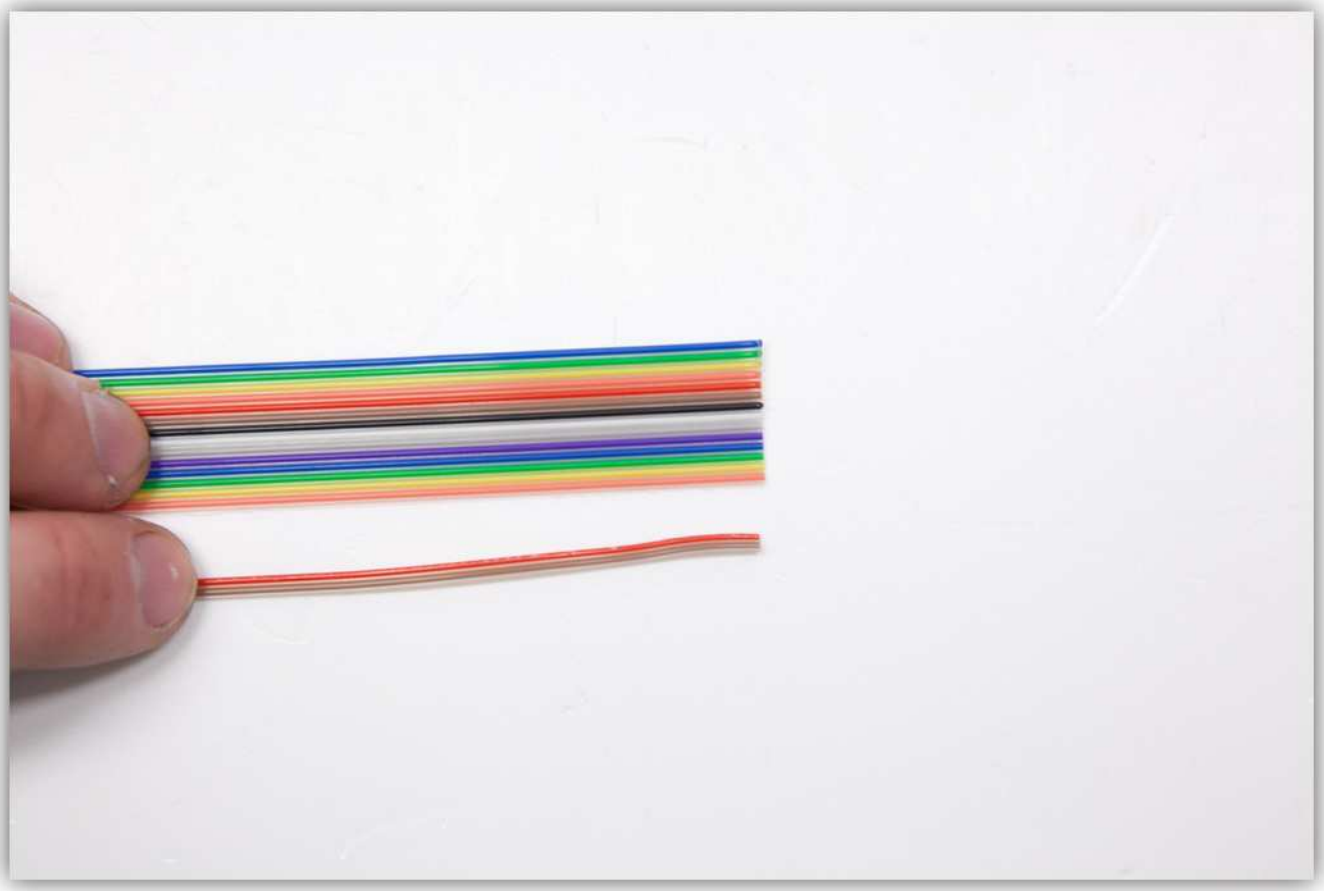
Take the MULTI-COLOURED FLATCABLE out of the bag labelled with 40.



Cut a piece of 100 cm (39.4"). **This length is critical, measure twice before cutting.**

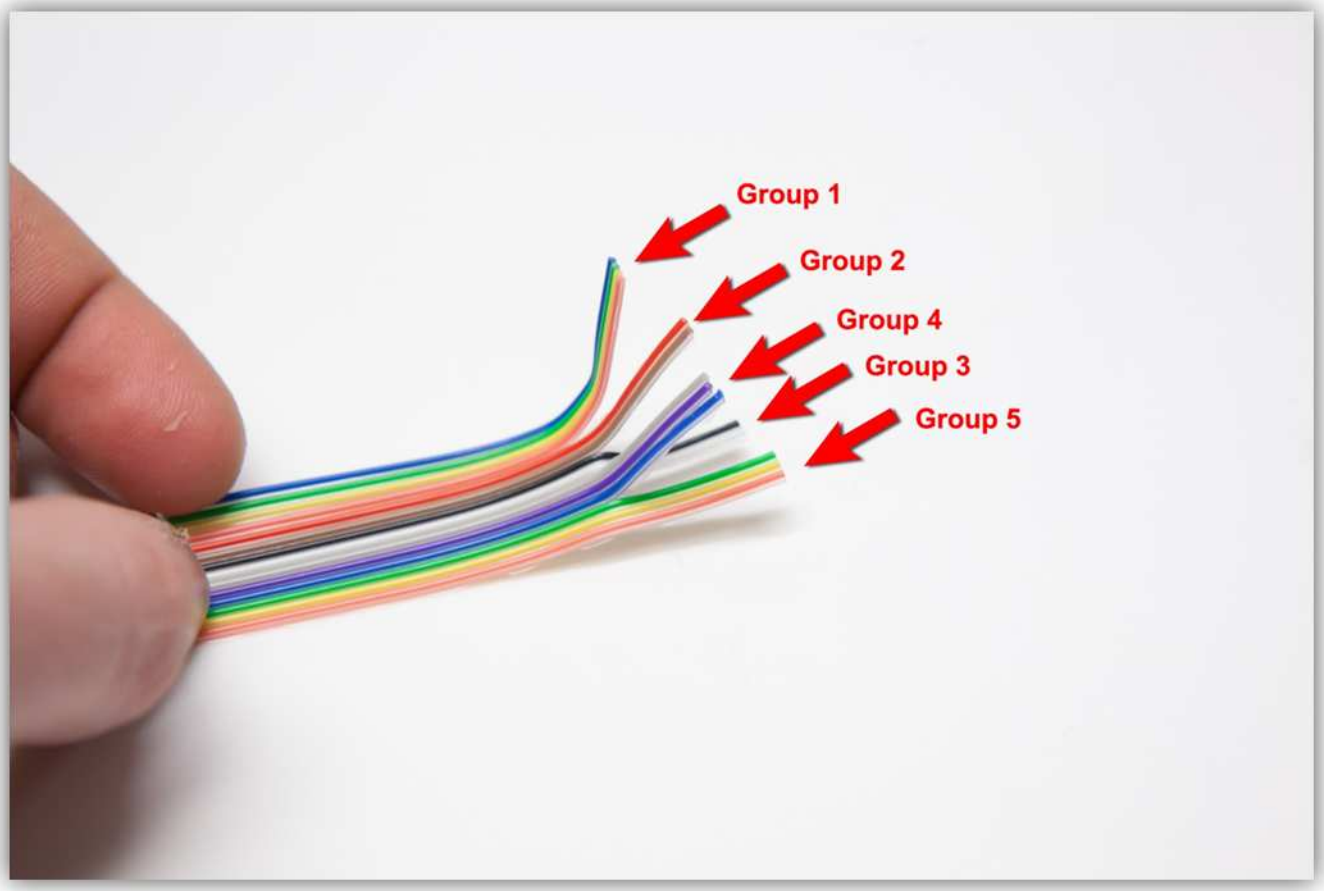


Detach (rip them of) the outer **Brown** and **Red** coloured wires from the pack over the whole length. Keep these apart, you will need these later.



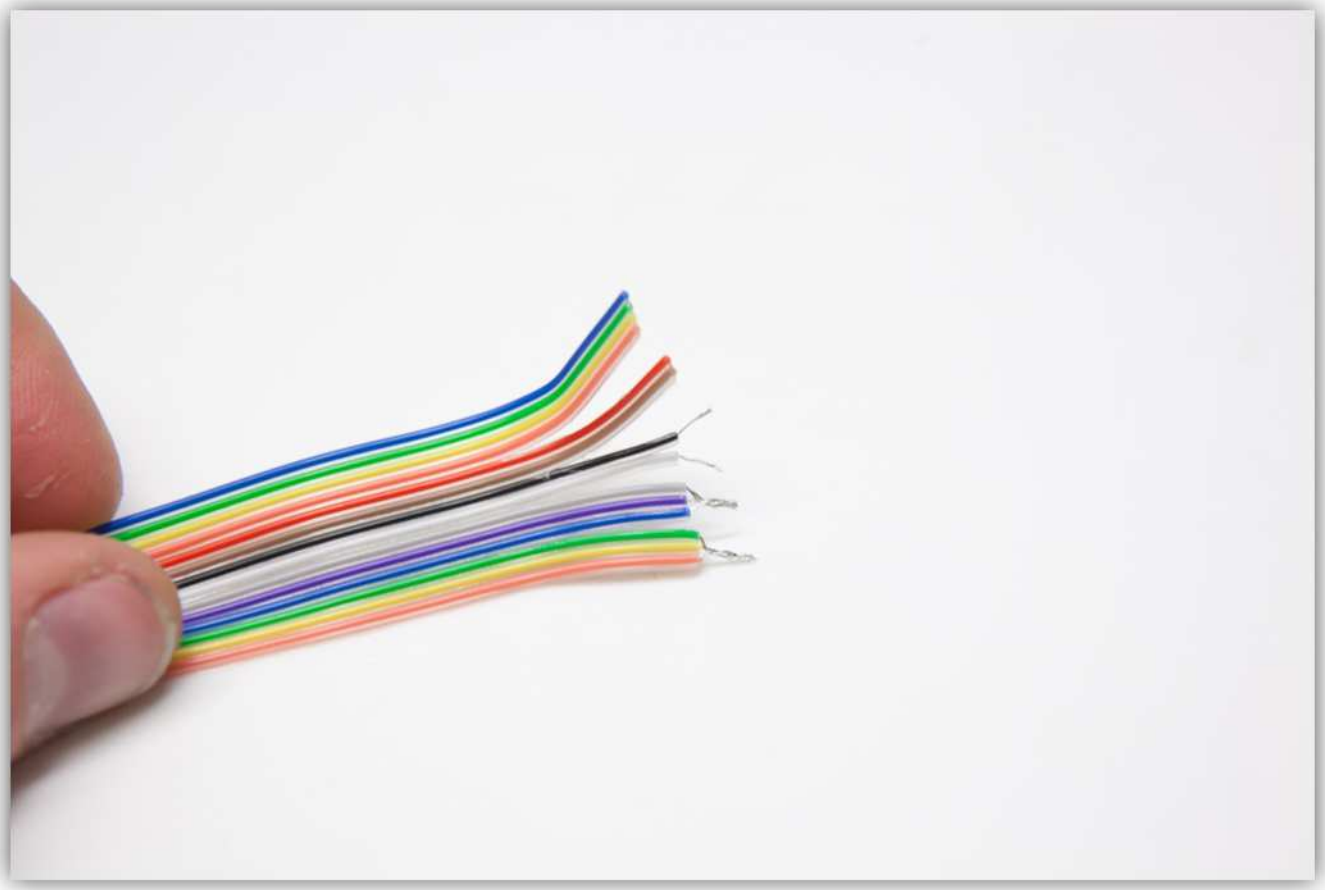
Detach the following groups for about 2 cm (0.79"):

- Group 1 : **Blue, Green, Yellow, Orange**
- Group 2: **Red, Brown**
- Group 3: **Black, White**
- Group 4: **Grey, Violet, Blue**
- Group 5: **Green, Yellow, Orange**

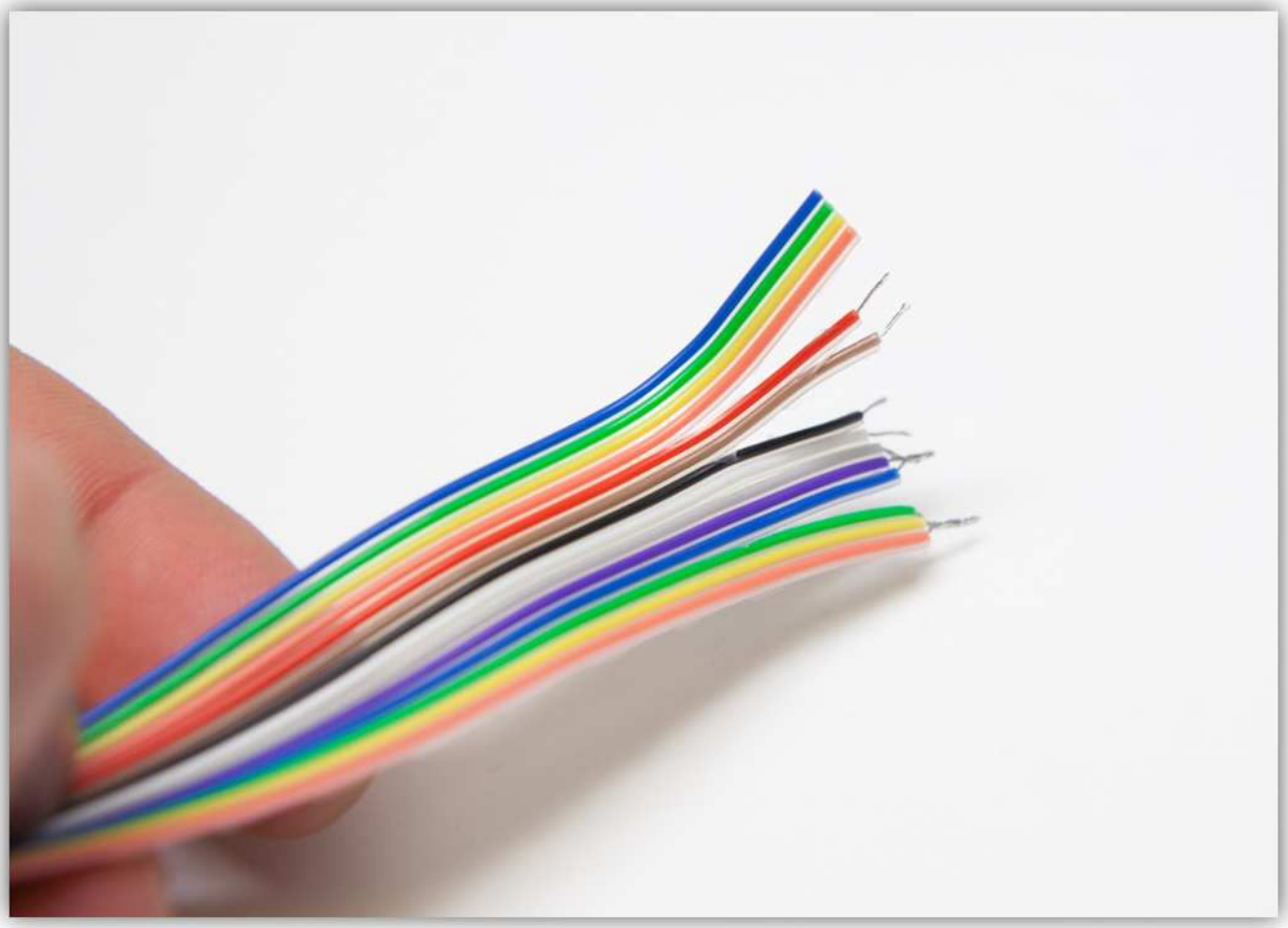


Strip the wires from group 4 and group 5 (5 mm) and twist the wires in a group together as shown in the picture.

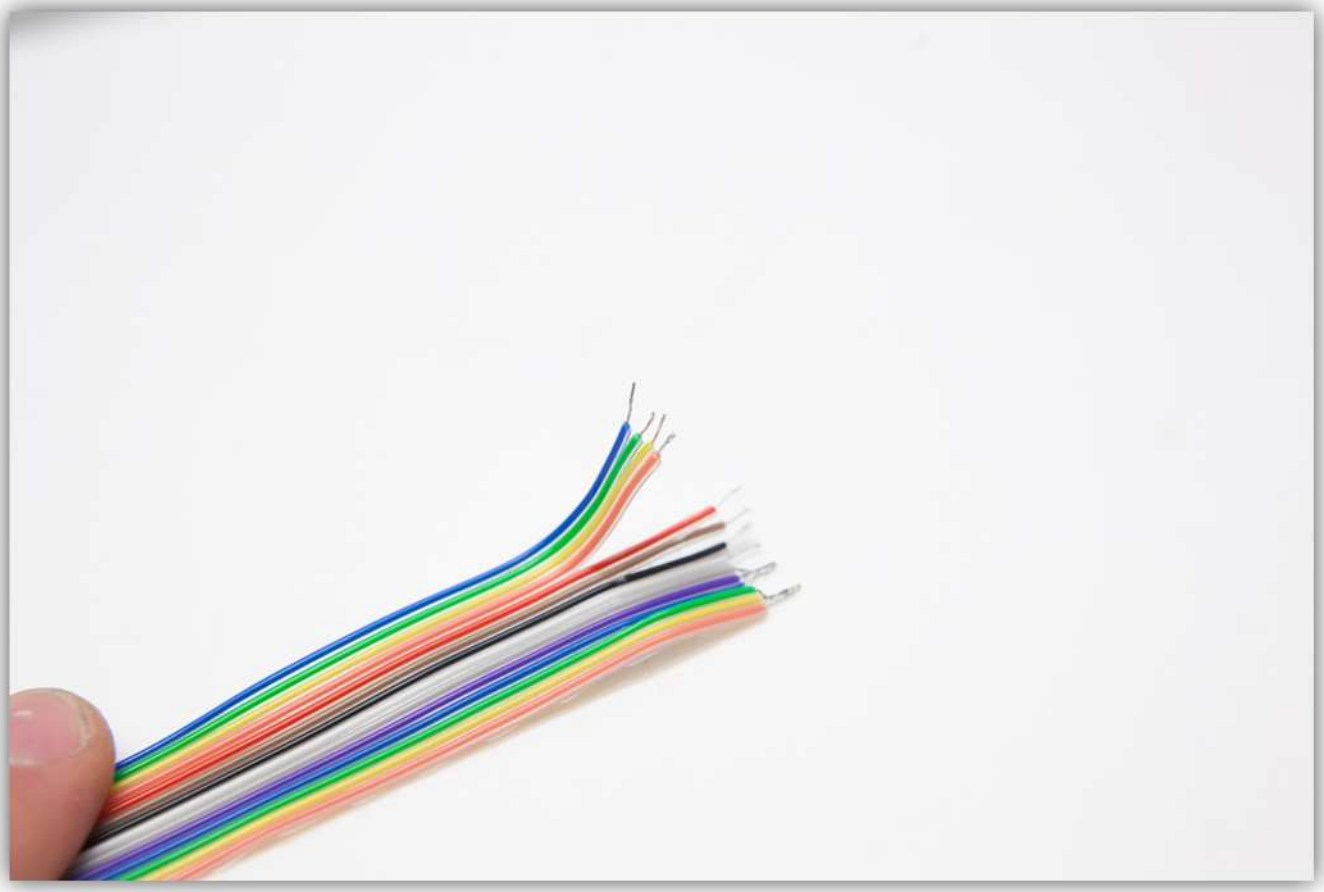
Strip the wires from group 3 (5 mm) (0.2"). **Do not twist these together.**



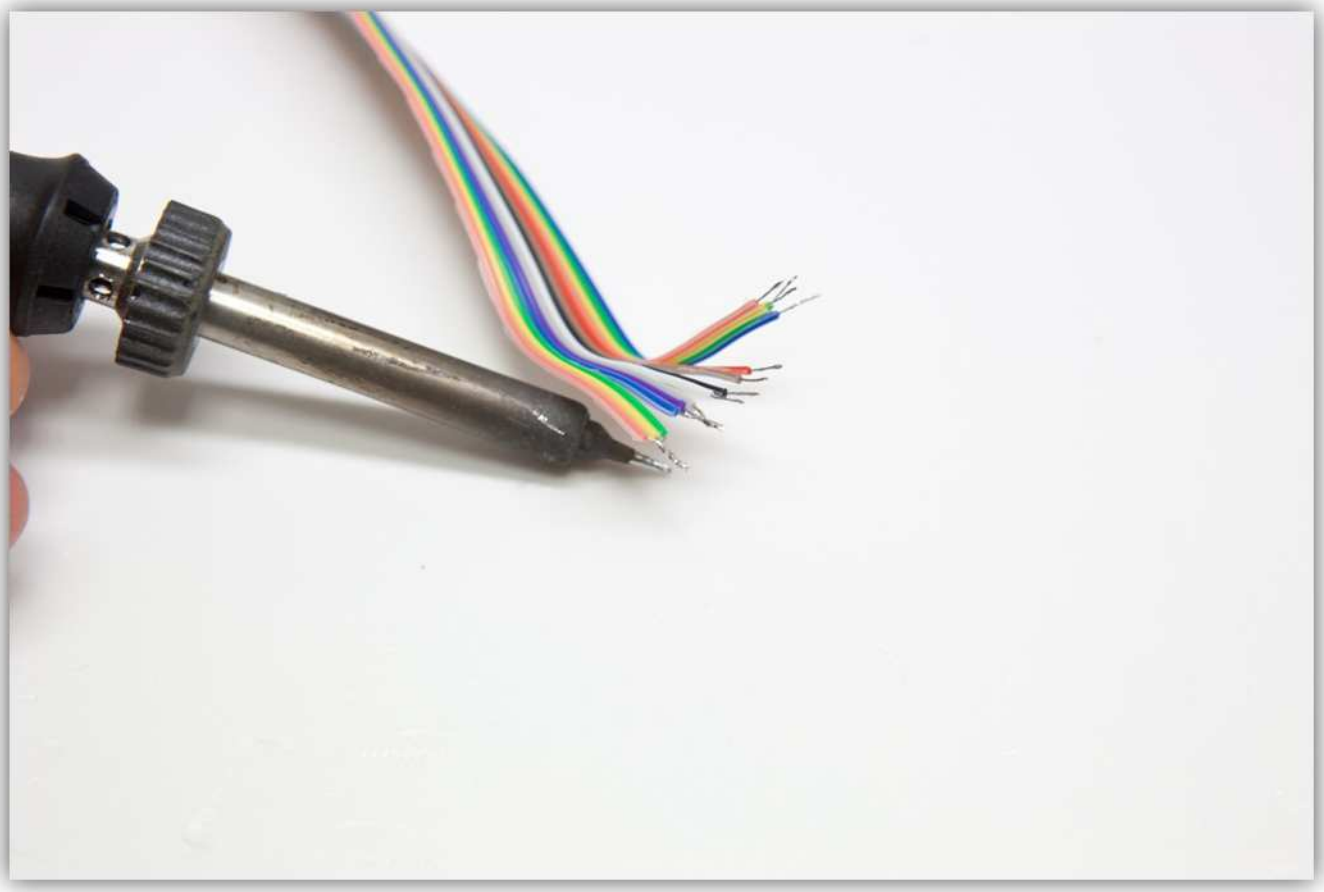
Strip the wires from group 2 (5 mm) (0.2"). **Do not twist these together.**



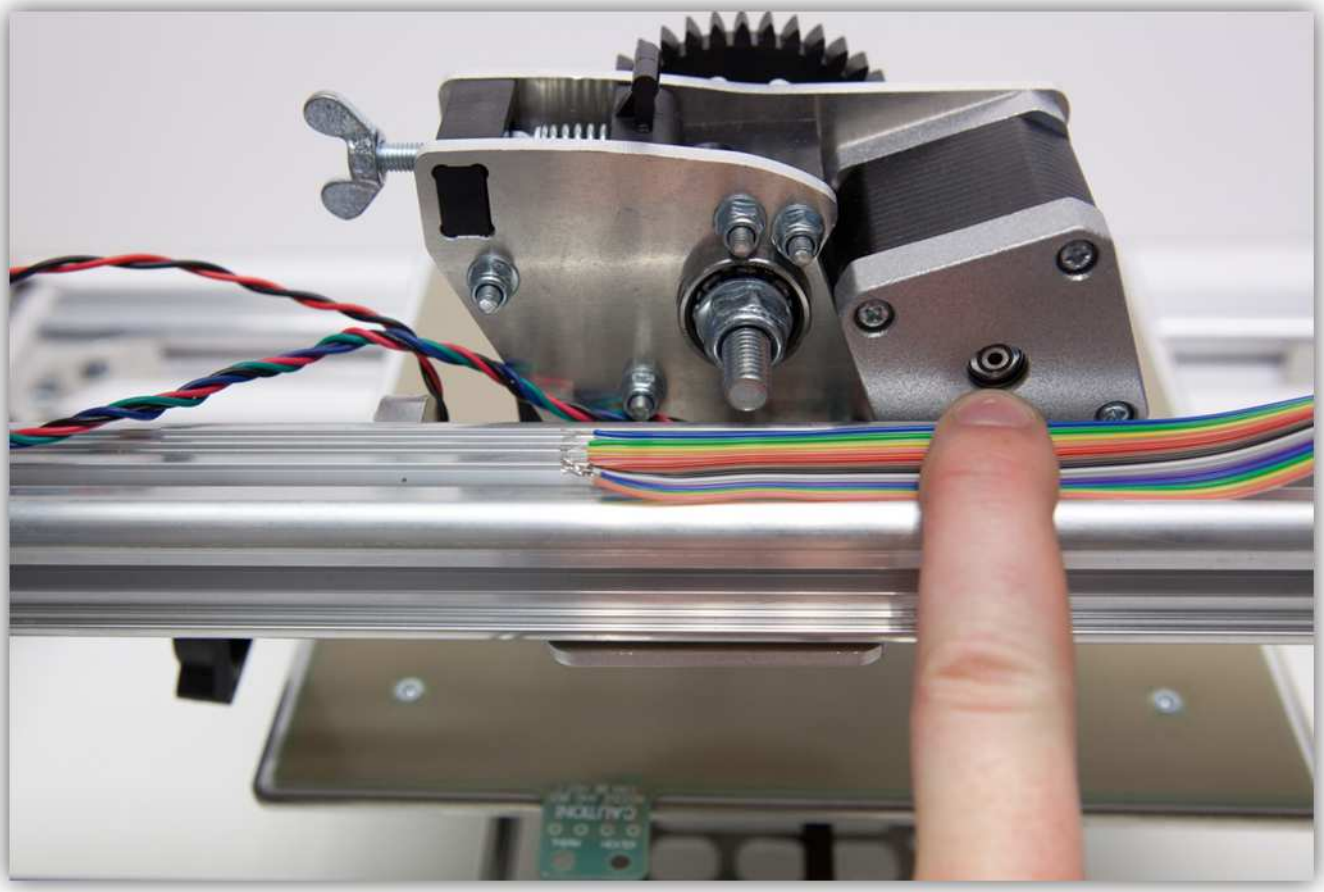
Strip the wires from group 1 (5 mm) (0.2"). **Do not twist these together.**



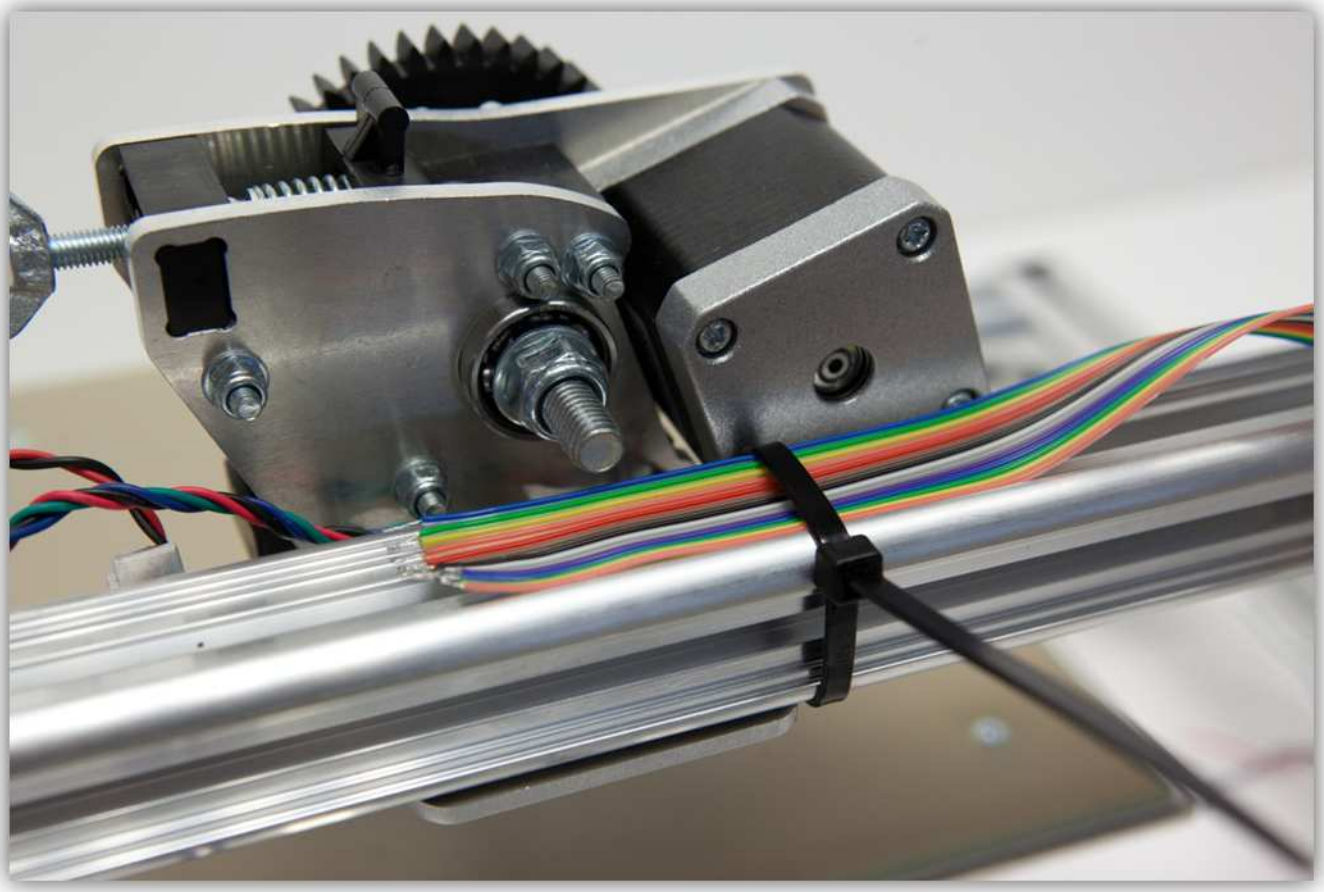
Tin all the wires. Take extra care when tinning the wires from group 4 and 5 since these are twisted together they need a bit more tin to make sure they all stay together.



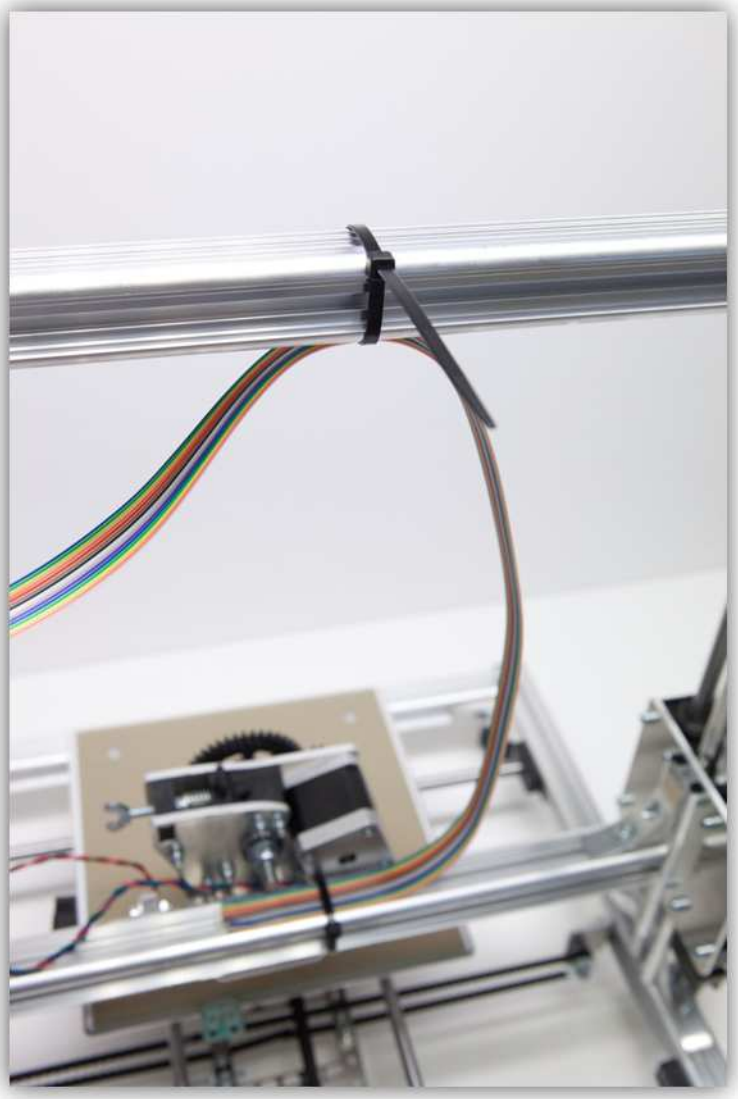
Place this end of the cable next to the extruder with group 1 closest to the extruder housing.



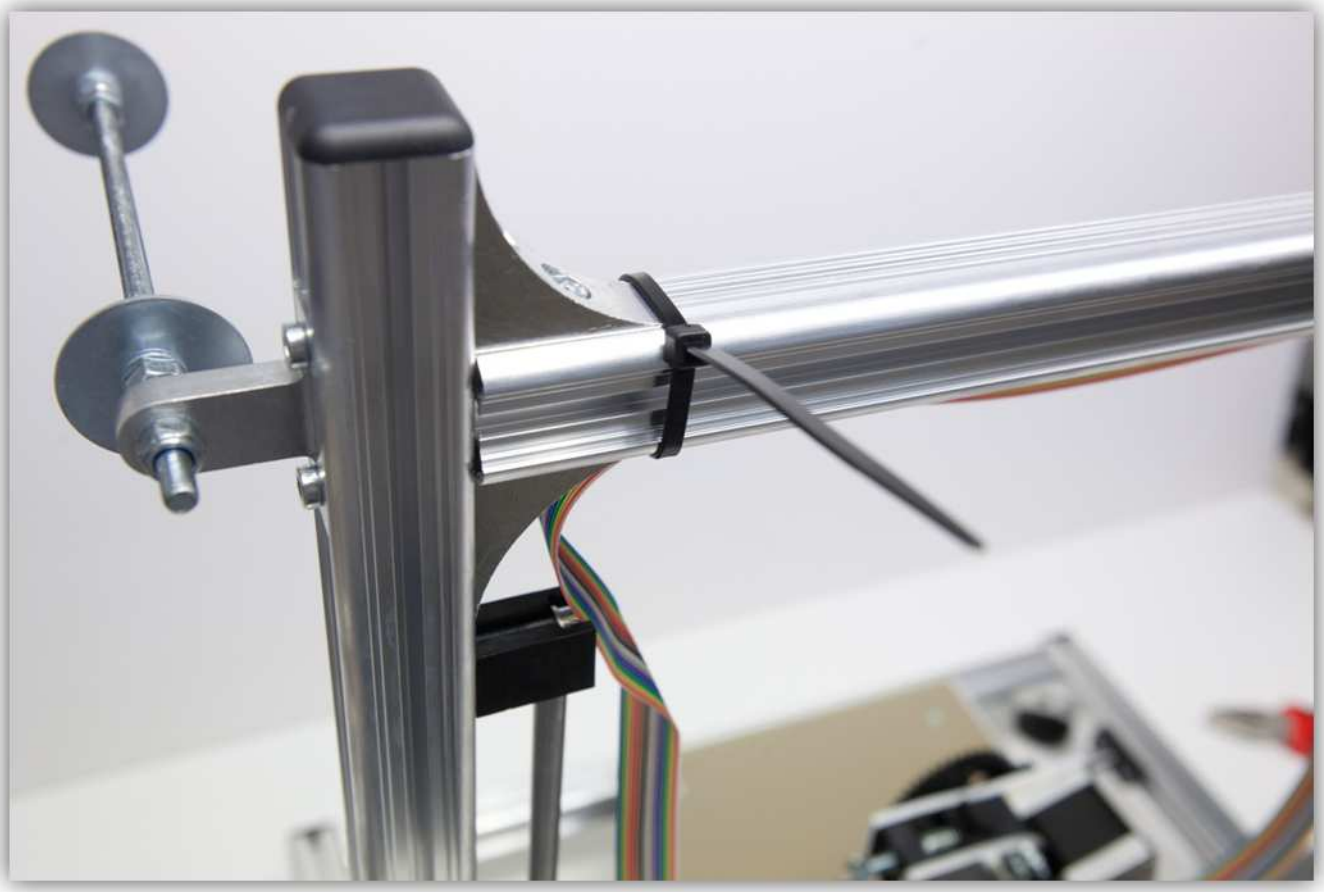
Secure the cable with a large tie strip (from the bag labelled with 40).



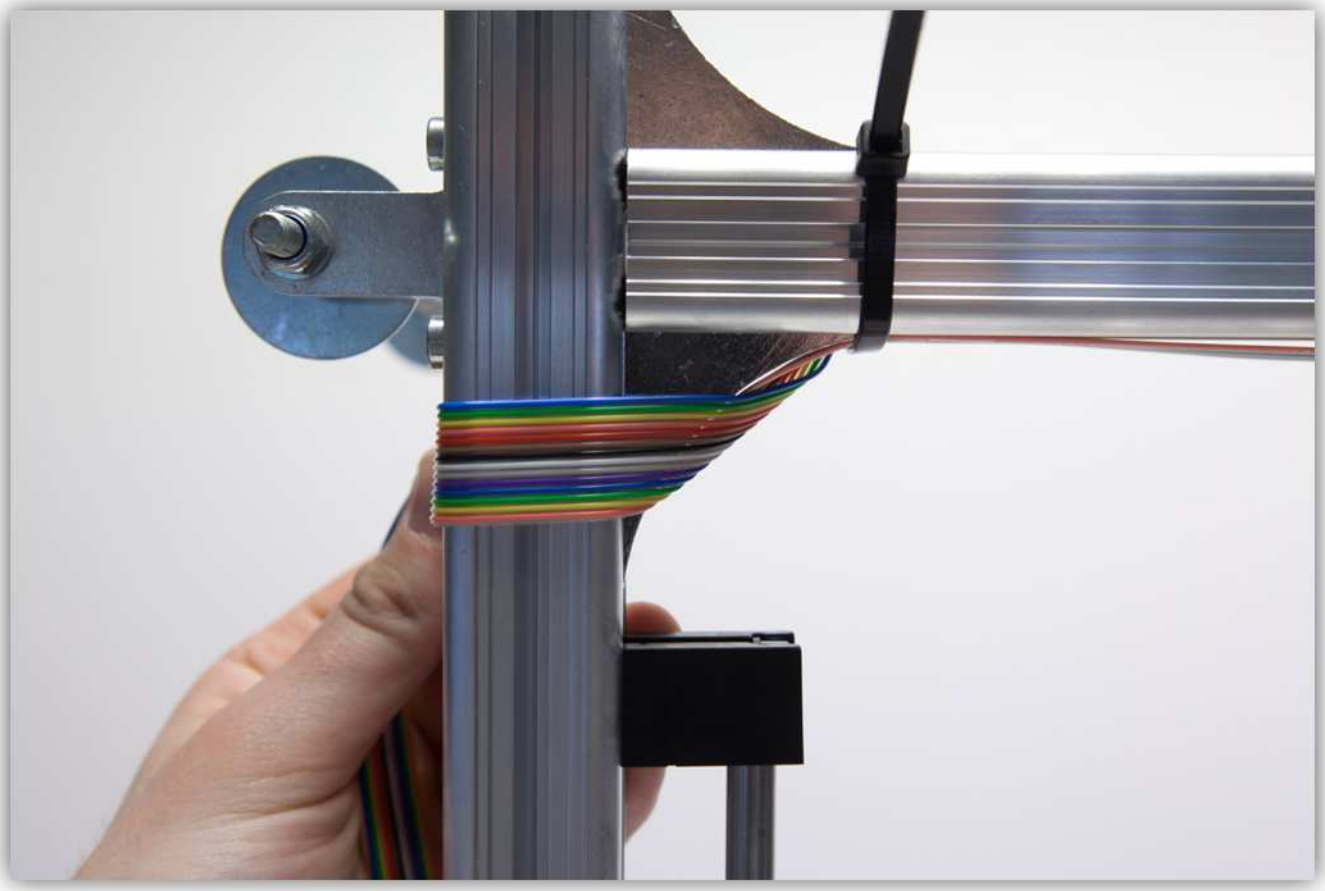
Make sure that the extruder arm is at its lowest point an then secure the cable to the horizontal profile at the top with a large tie-strip as shown in the picture. **Use only the length of cable needed, not more.**



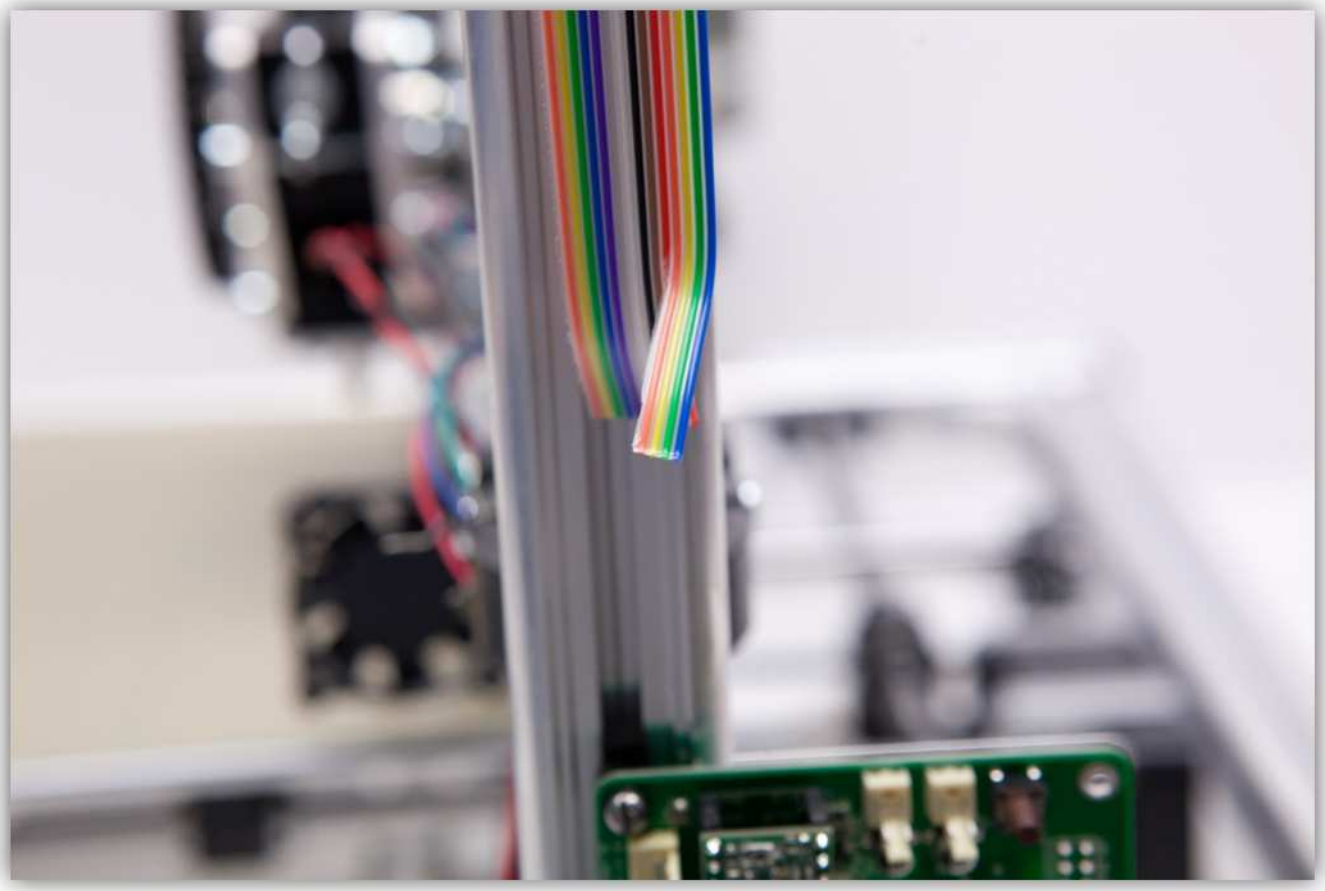
Next secure the cable with a large tie-strip next to the right upright profile.



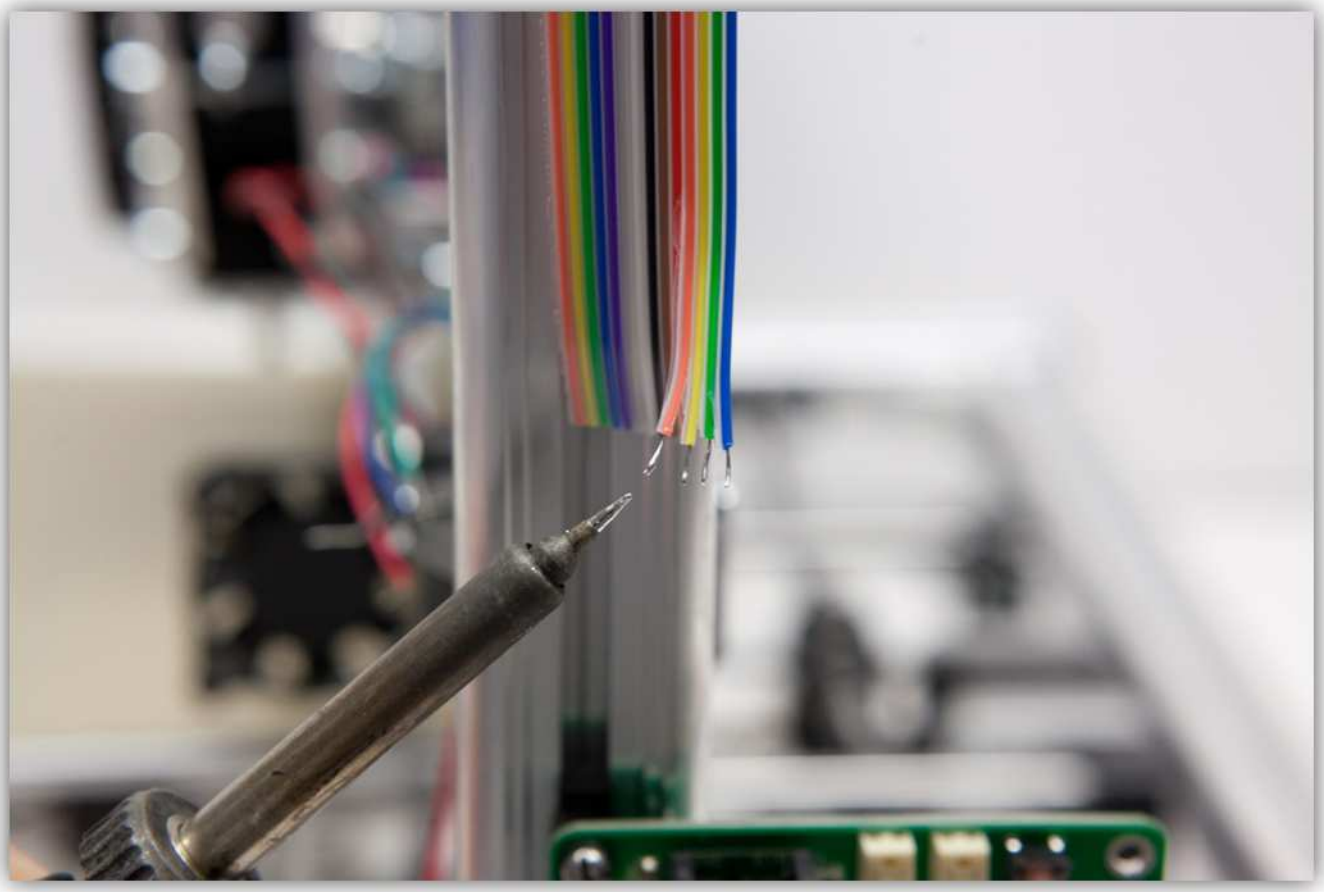
Fold the cable as shown in the pictures below and secure the cable with a large tie strip.



On this end of the cable detach (2 cm) (0.79") the **Blue, Green, Yellow, Orange** wires as a group.

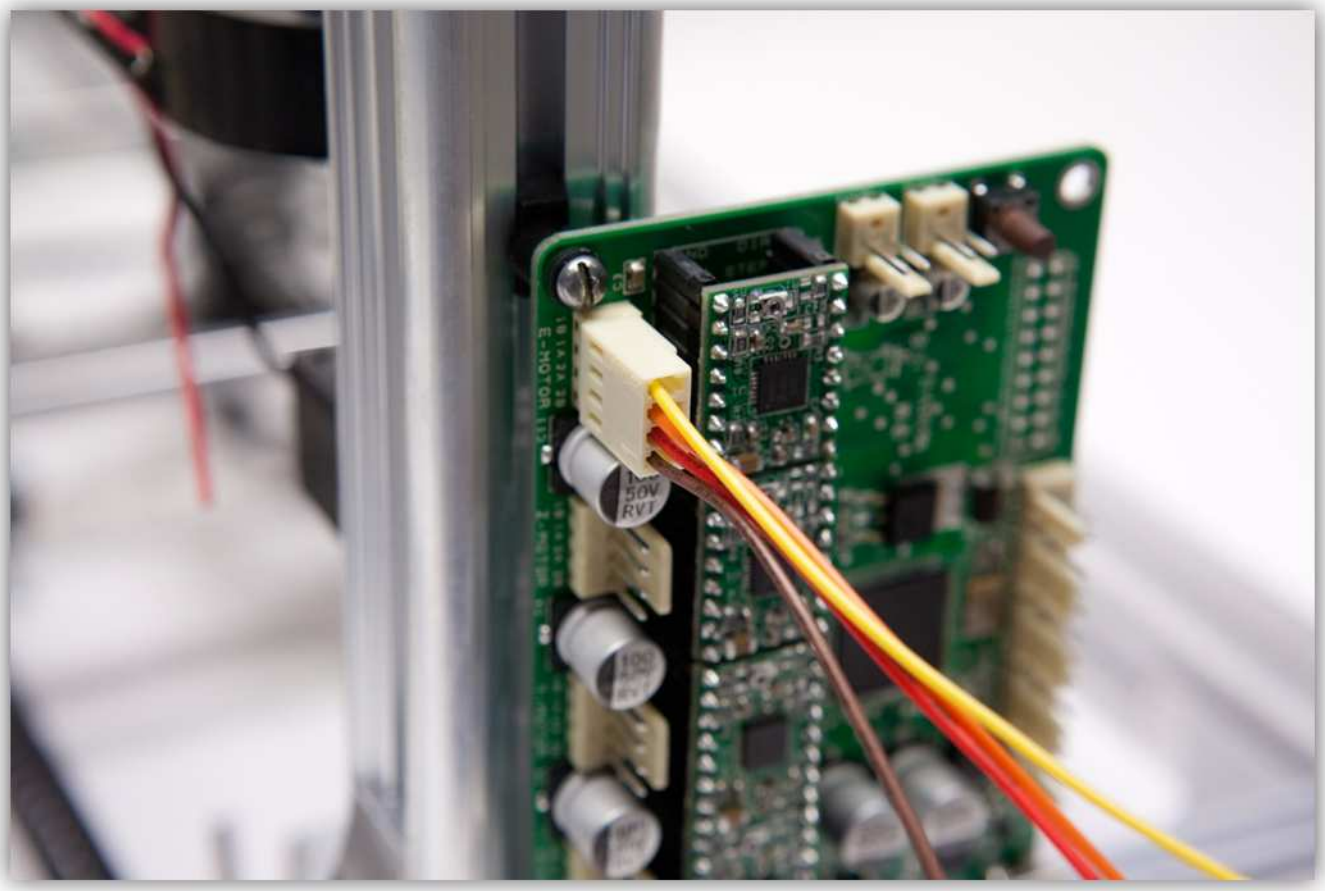


Strip the 4 wires (5 mm) (0.2") and tin them.



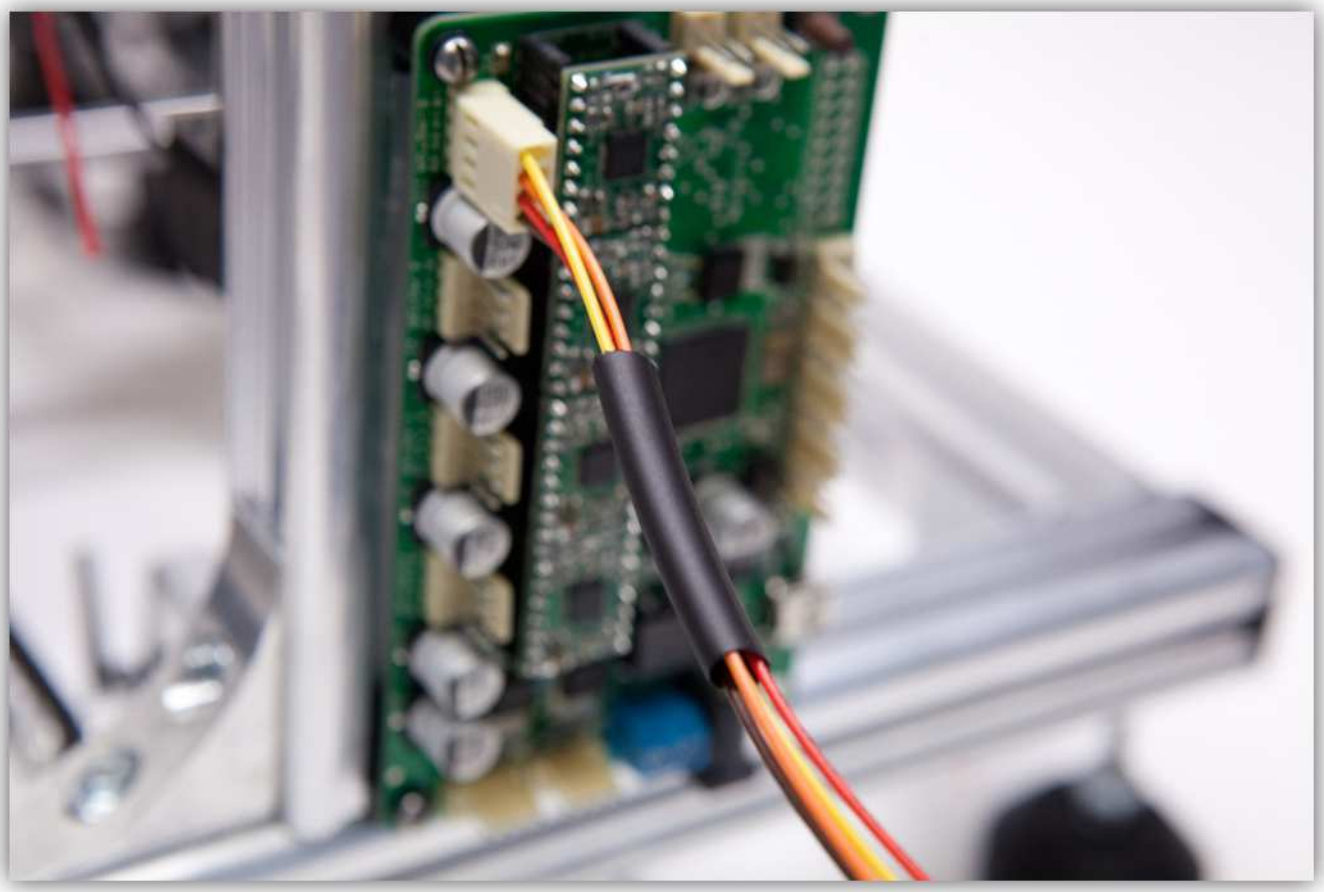
Take a board to wire connector with 4 wires out of the bag labelled with 40.

Plug the female connector in the male connector labelled with E-MOTOR on the controller board.

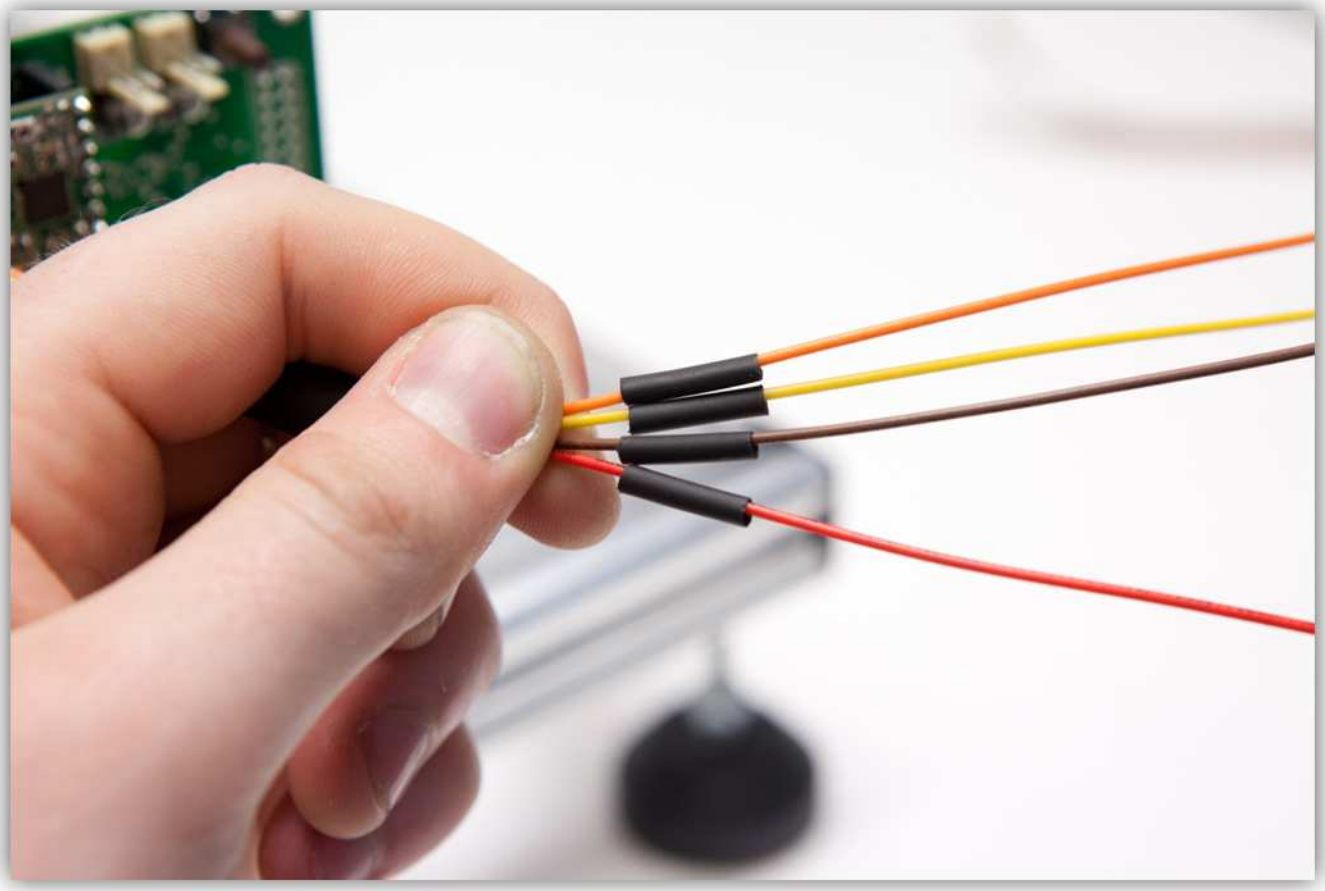


Cut 4 small pieces of the smallest heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the biggest heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

Slide the biggest piece of heat shrink tubing over the 4 wires from the connector.

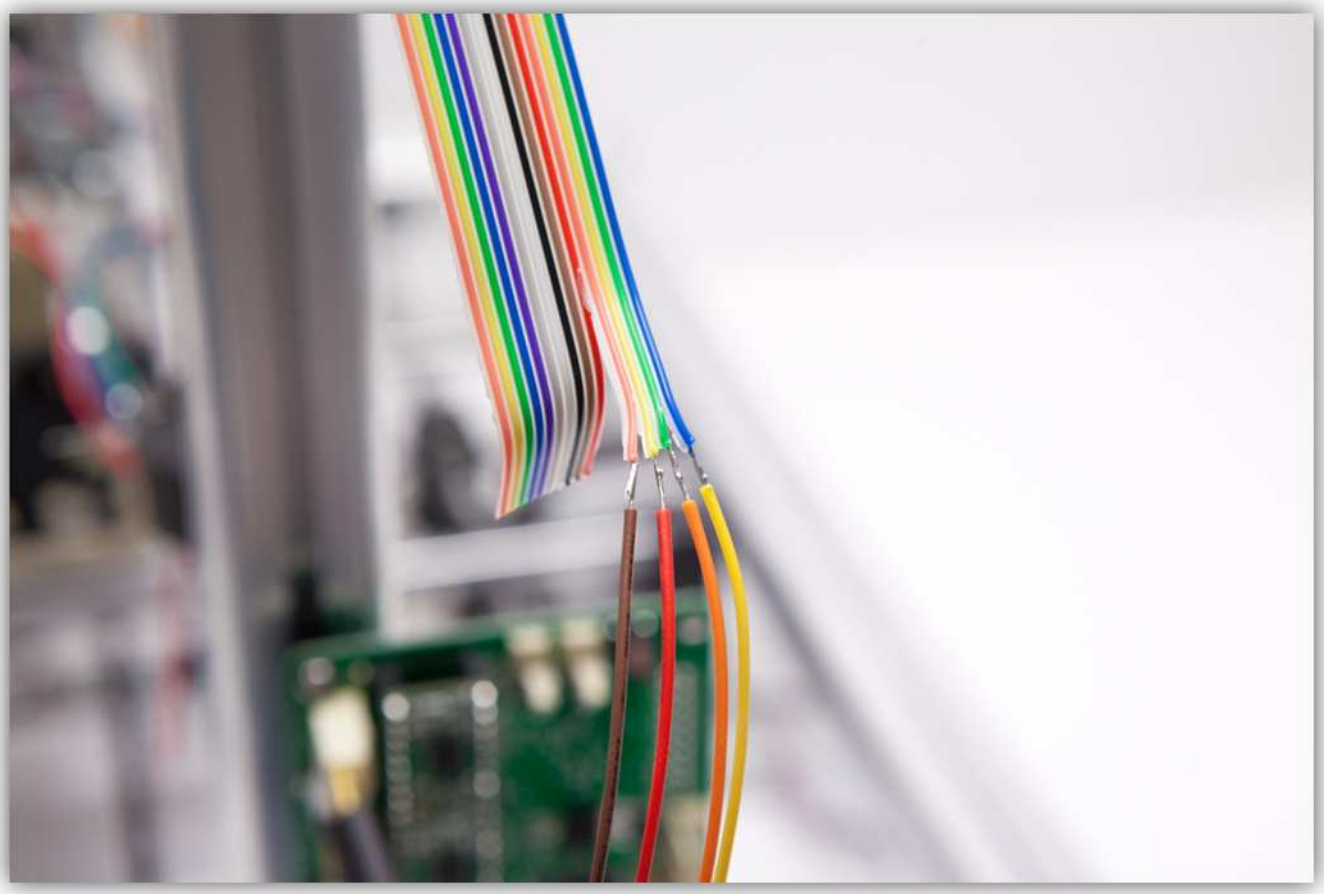


Slide the 4 small pieces of heat shrink tubing over the 4 wires of the connector.

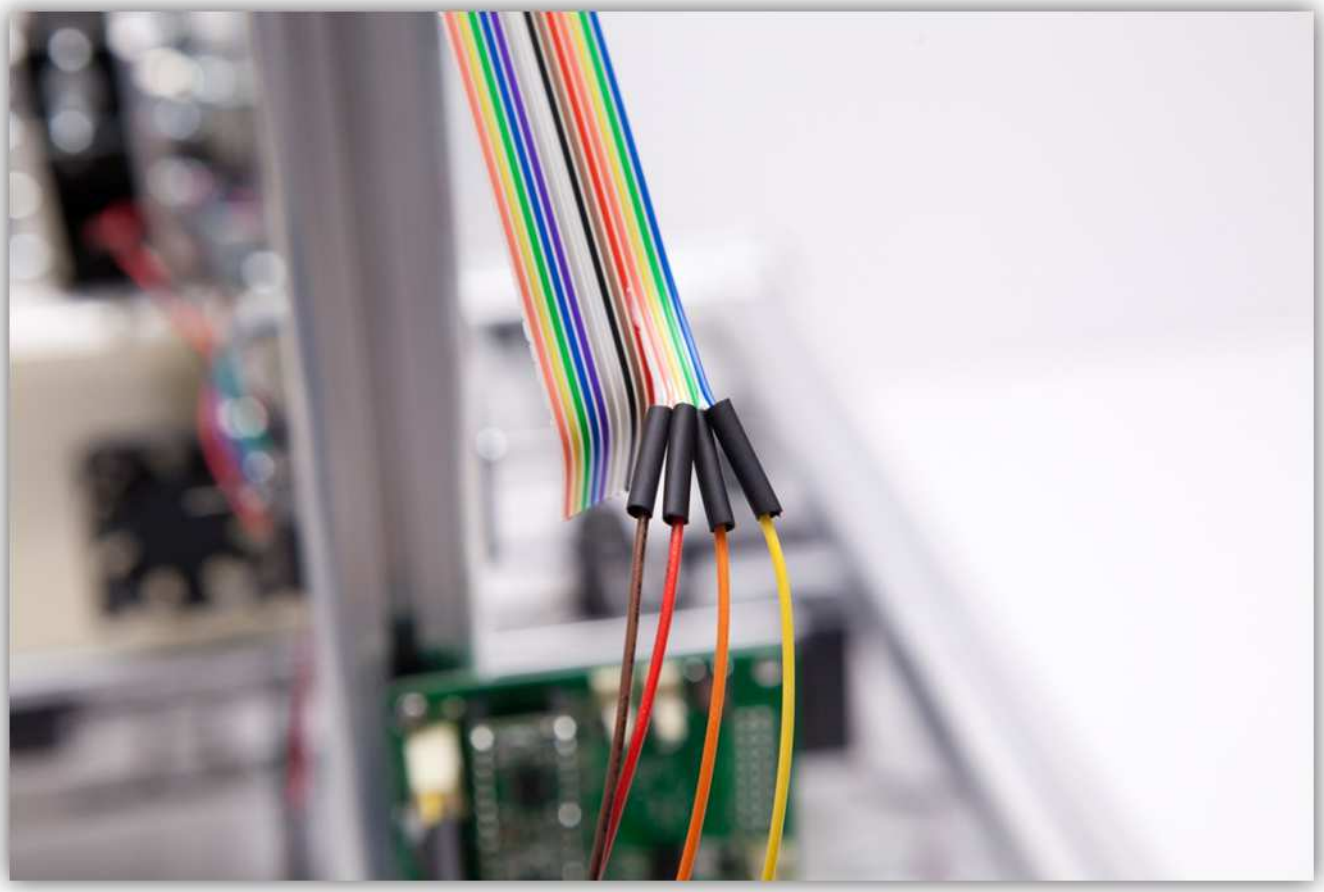


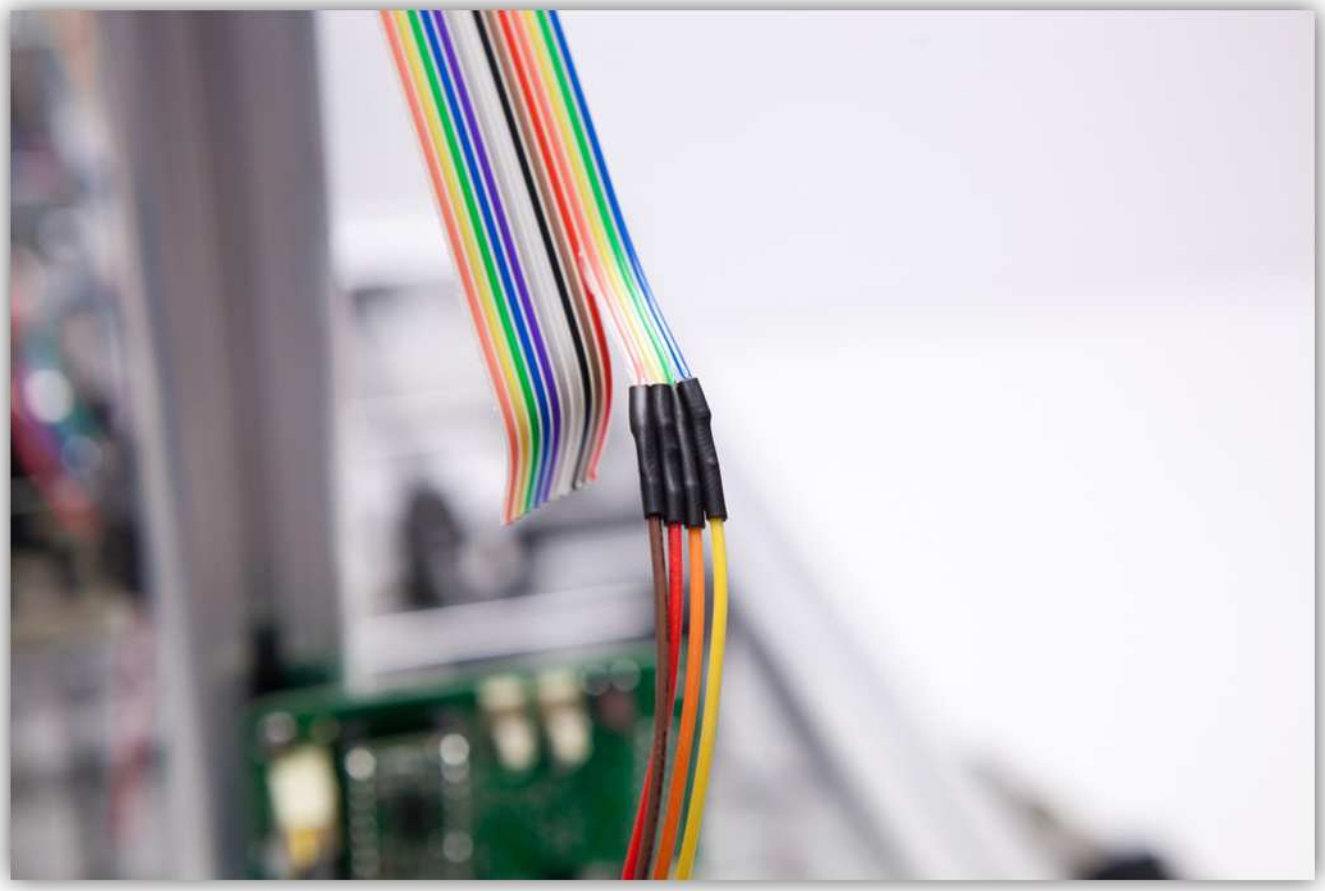
Solder the 4 wires from the connector to the 4 wires of the flat cable you tinned earlier. **Watch the colours closely.**

Flat cable	**->**	**Connector wires**
Blue	**->**	**Yellow**
Green	**->**	**Orange**
Yellow	**->**	**Red**
Orange	**->**	**Brown**

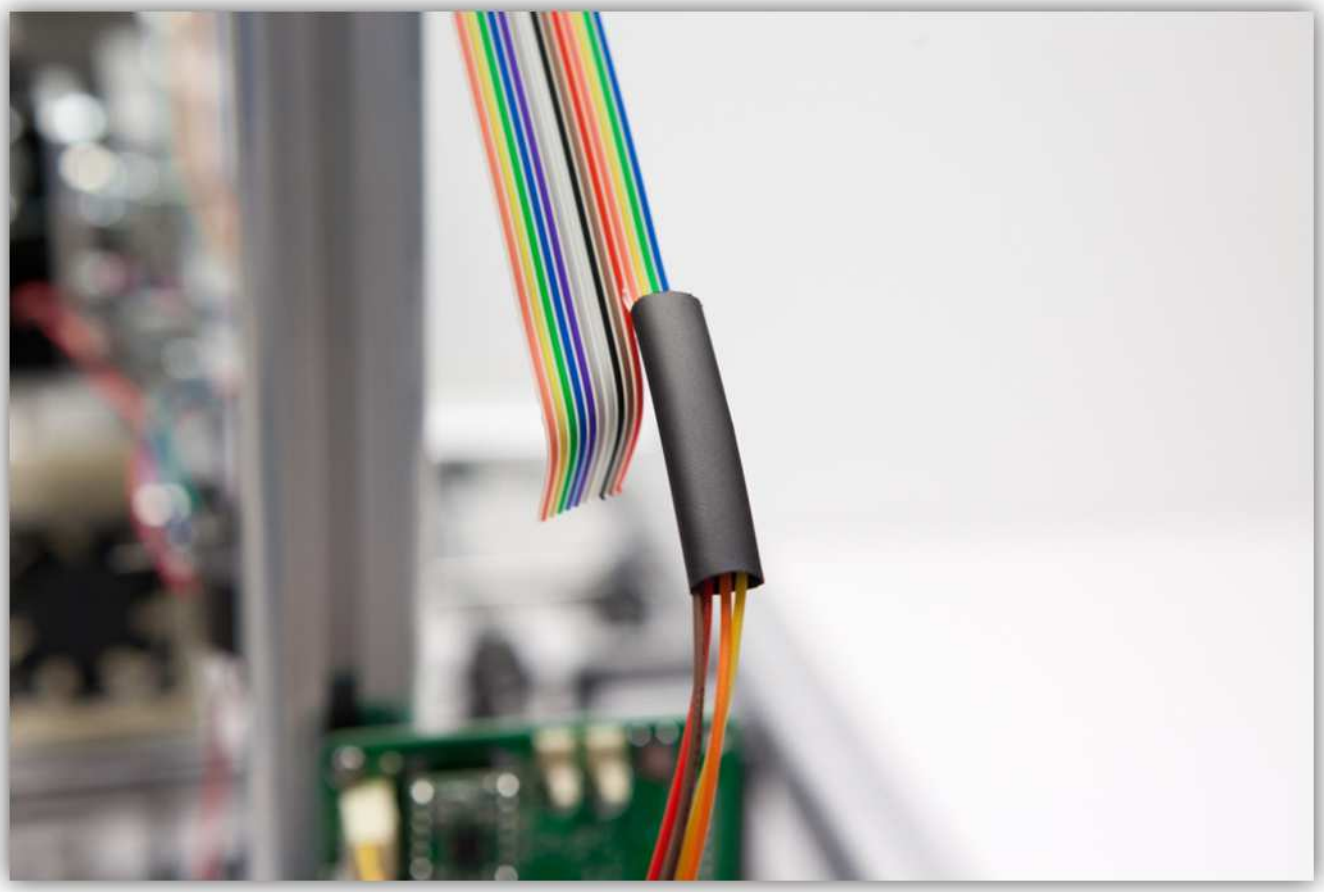


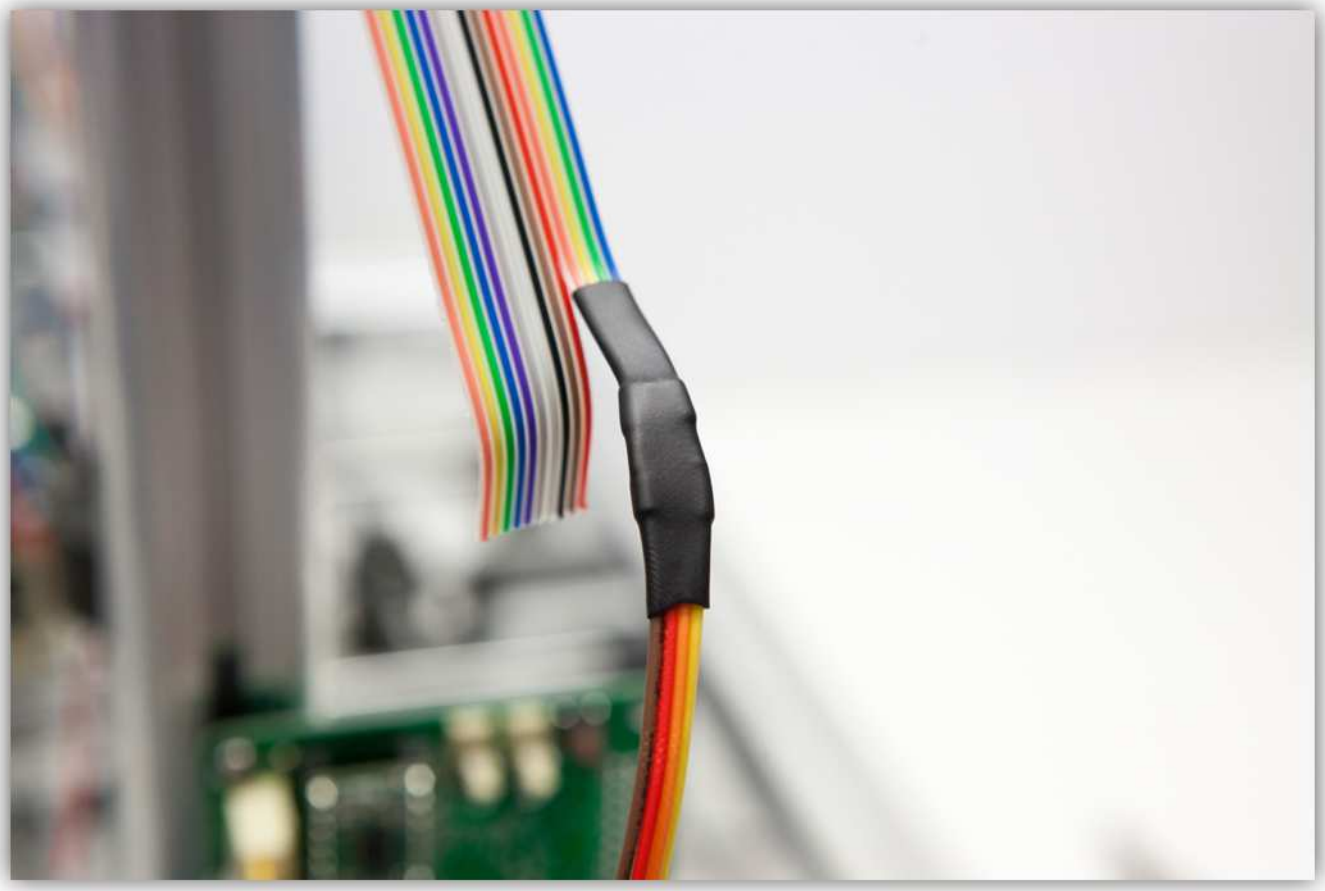
Slide the small heat shrink tubes over the solder joints and heat them up so they shrink.





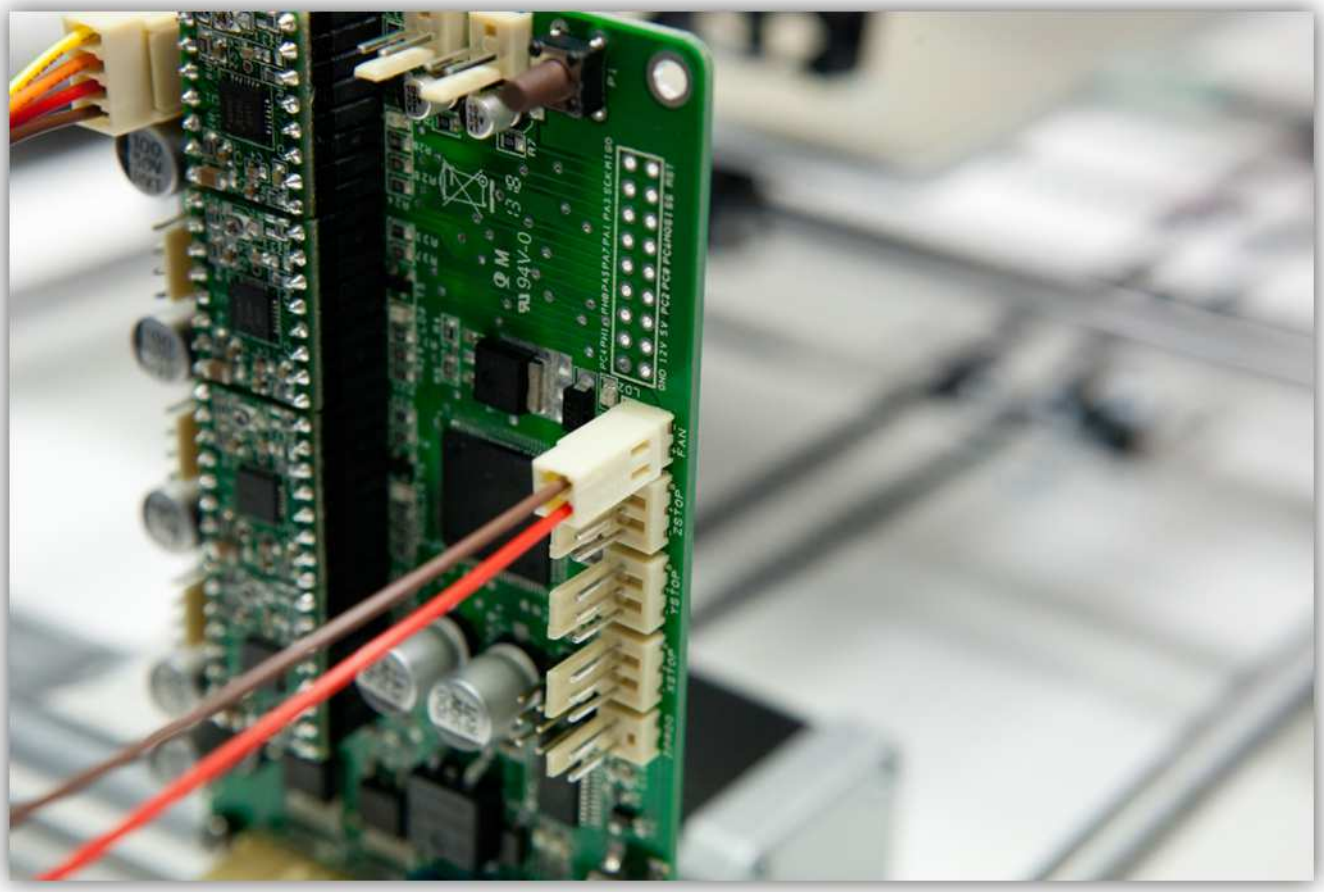
Now slide the big piece of heat shrink tubing over the 4 small pieces, heat the big piece so it covers and protects the 4 heat shrunk joints.





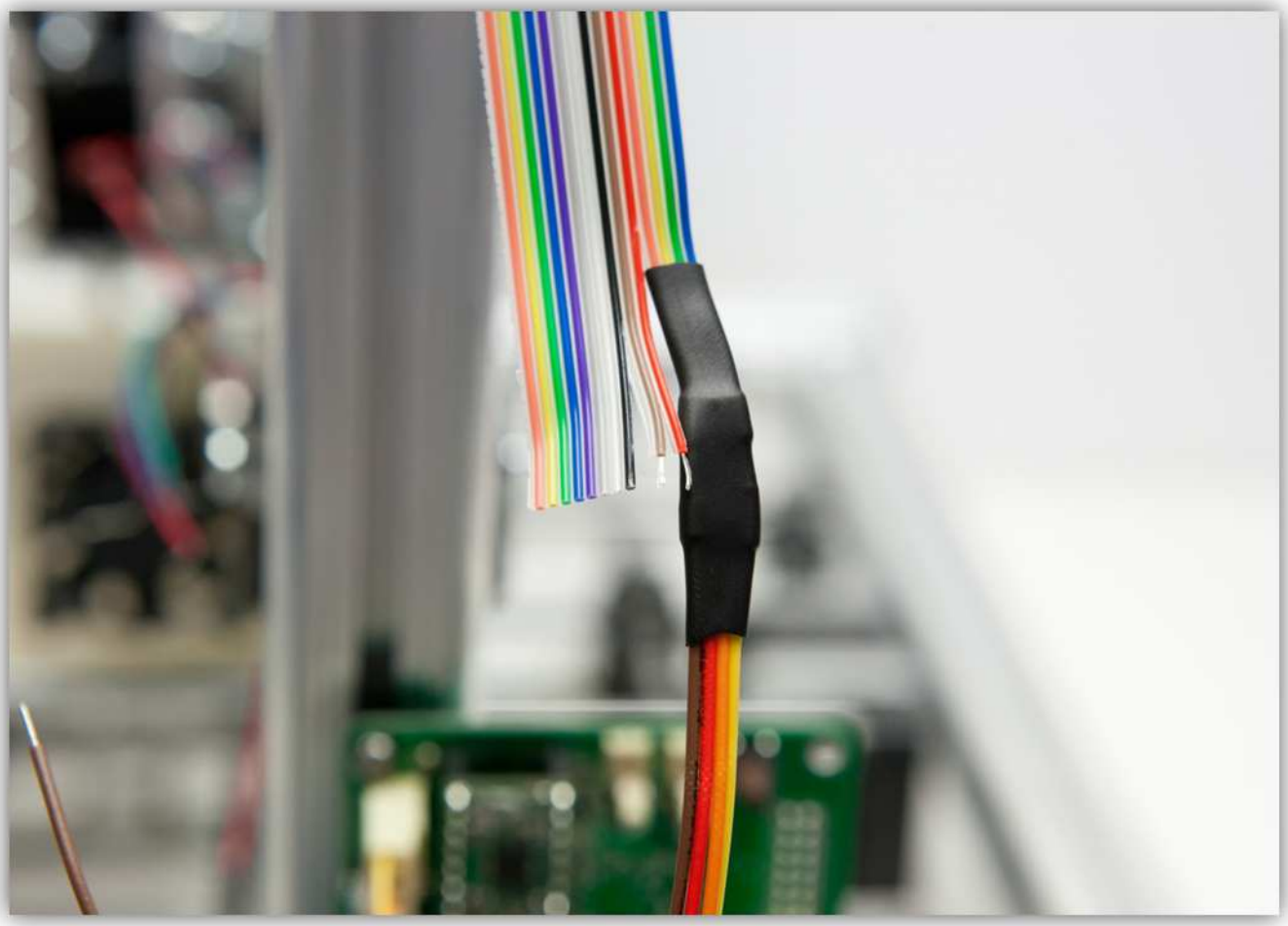
Take a board to wire connector with 2 wires out of the bag labelled with 40.

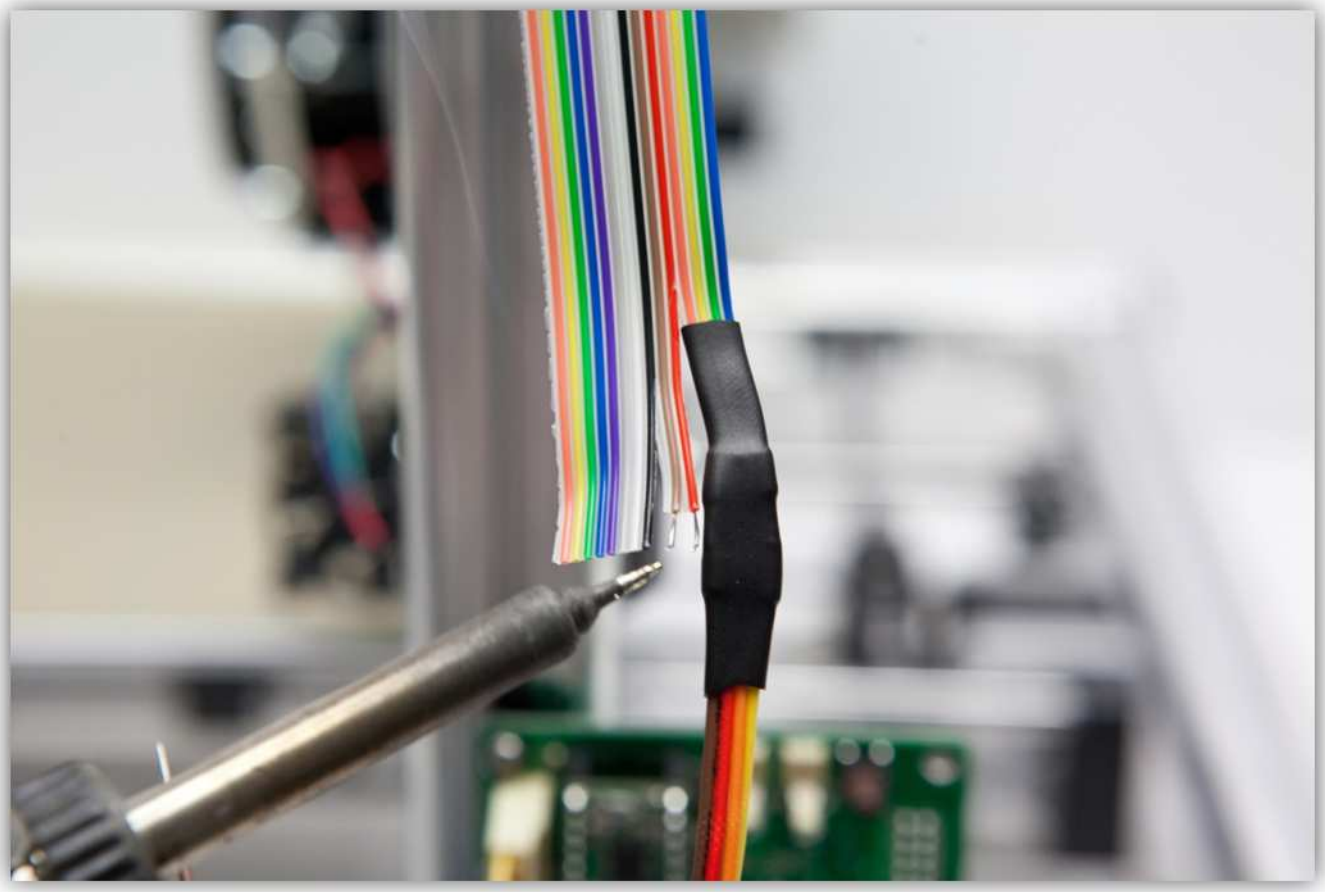
Plug the female connector in the male connector labelled with FAN on the controller board.



Detach (2 cm) the **Red** and **Brown** wires from the flat cable as a group.

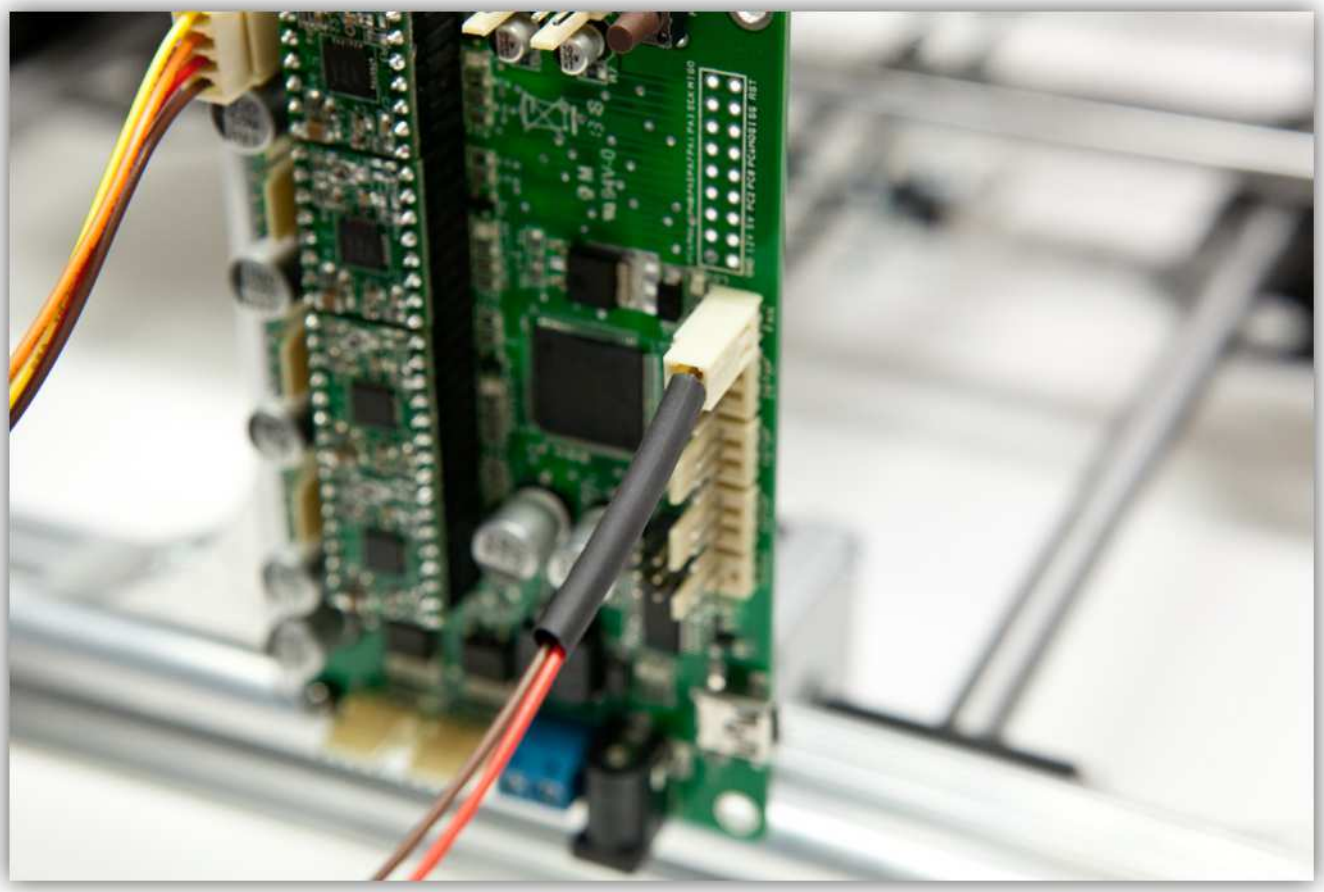
Strip and tin these two wires.



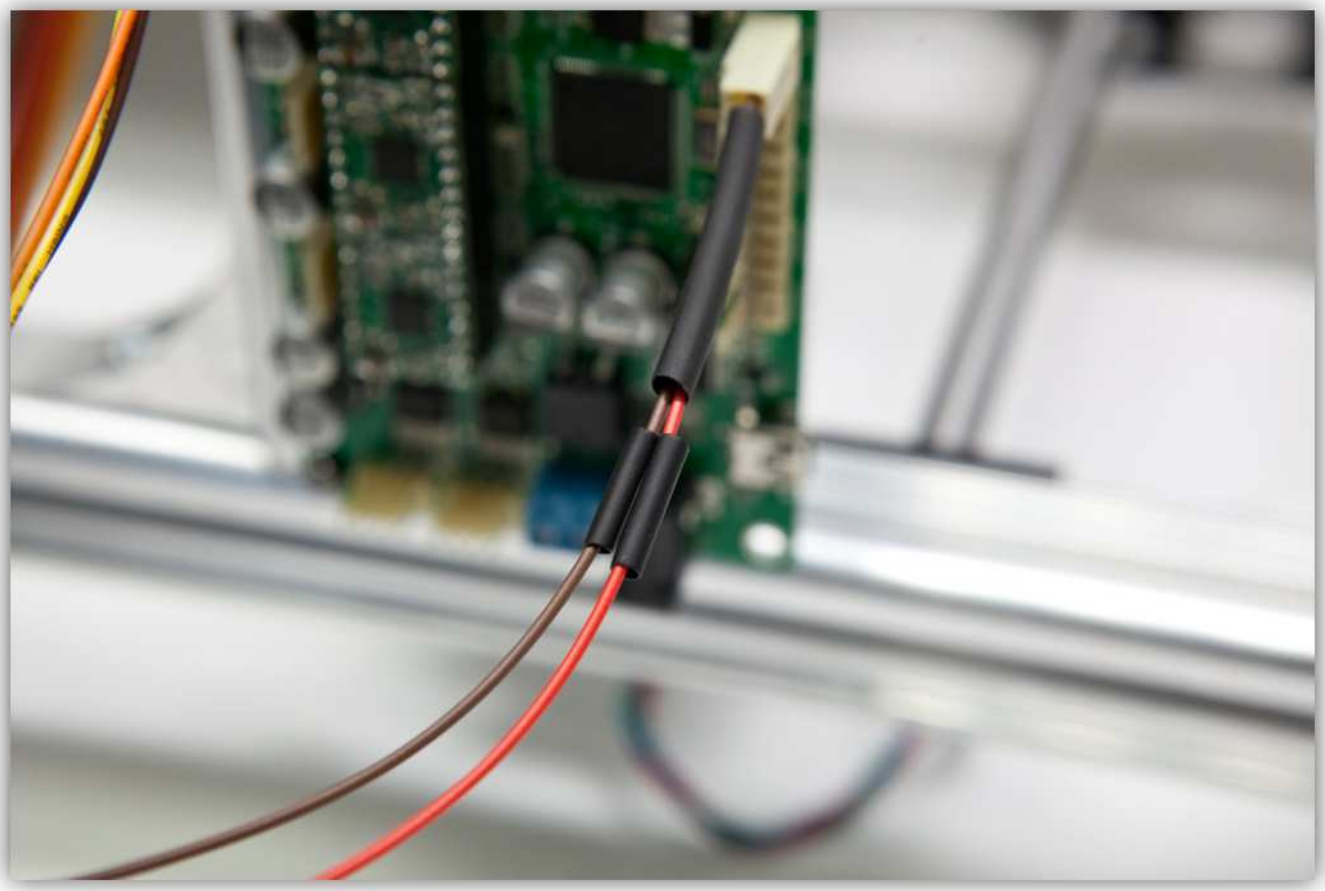


Cut 2 small pieces of the smallest heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the medium size heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

Slide the medium size heat shrink tubes over the 2 wires of the connector.



Slide the 2 small heat shrink tubes over the 2 wires of the connector.

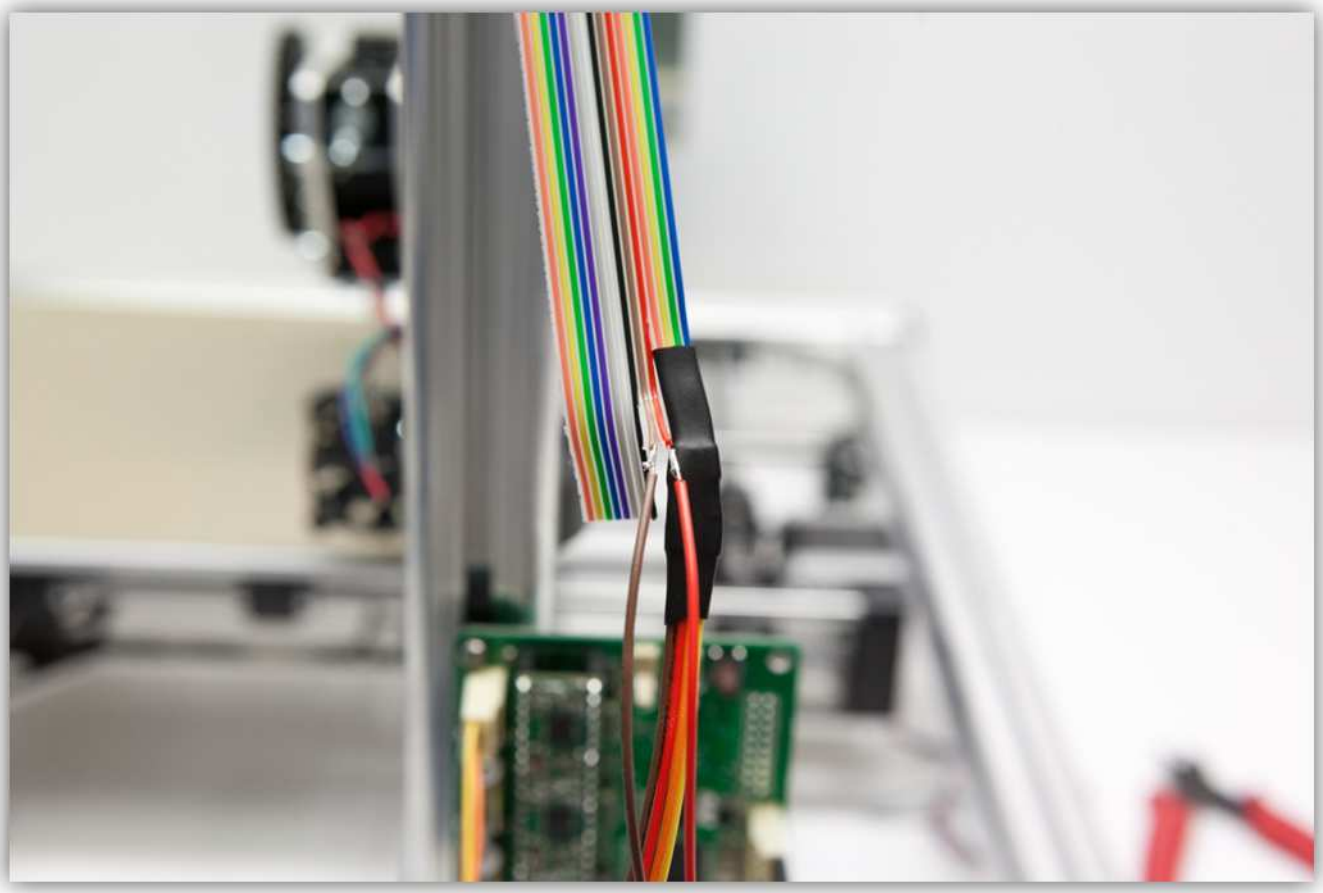


Solder the 2 wires from the connector to the 2 wires of the flat cable you tinned earlier. **Watch the colours closely.**

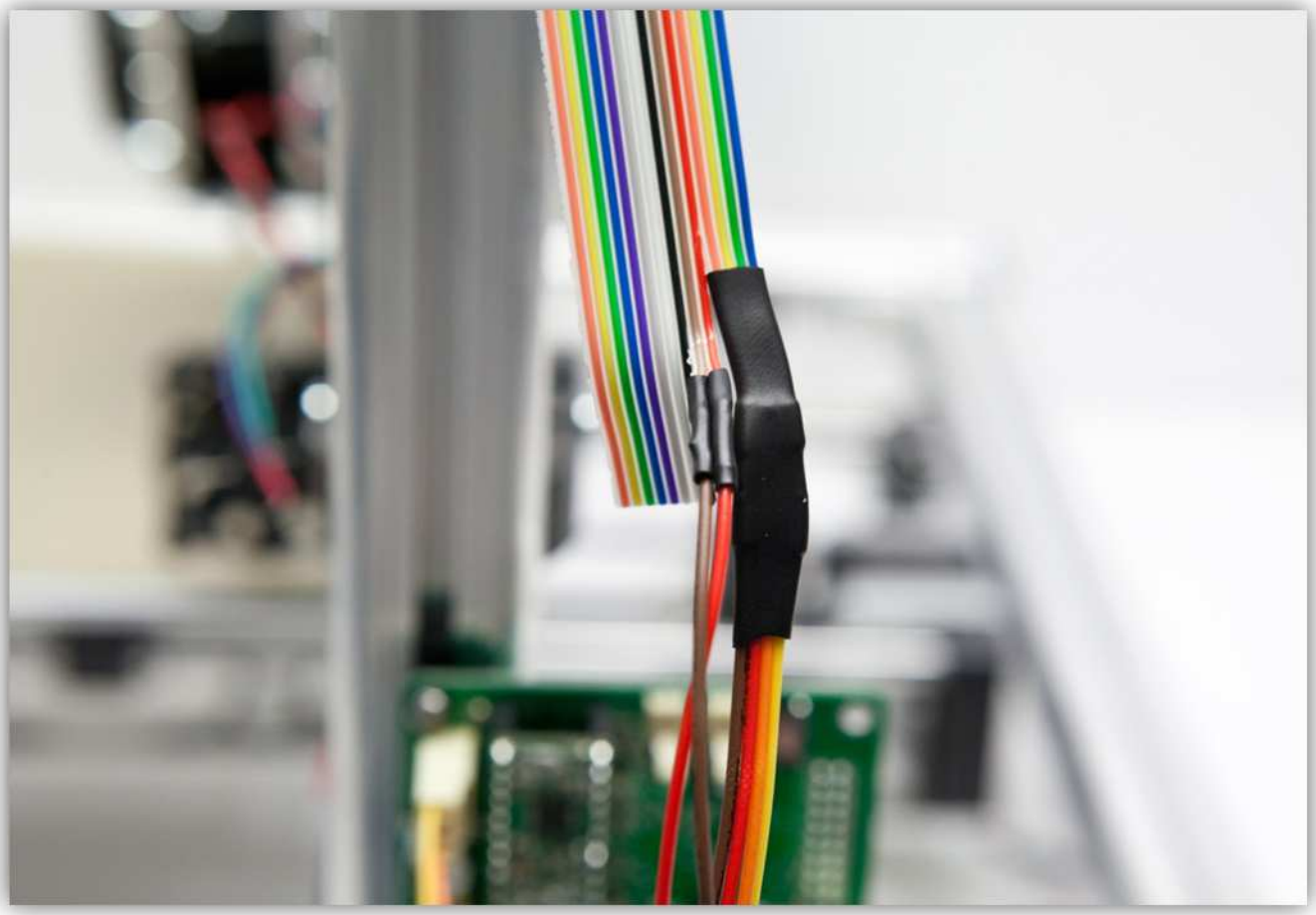
Flat cable -> Connector wires

Red -> Red

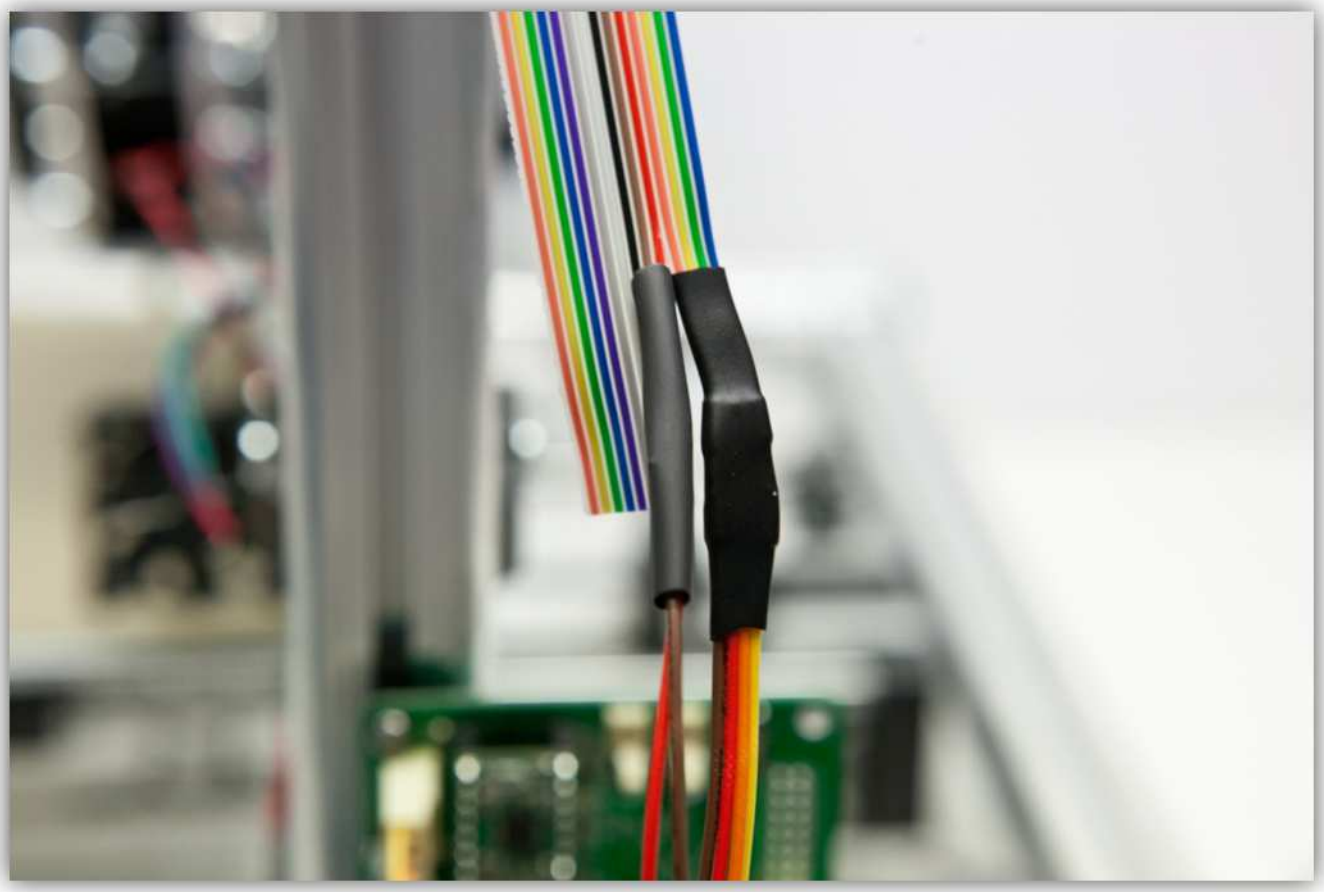
Brown -> Brown

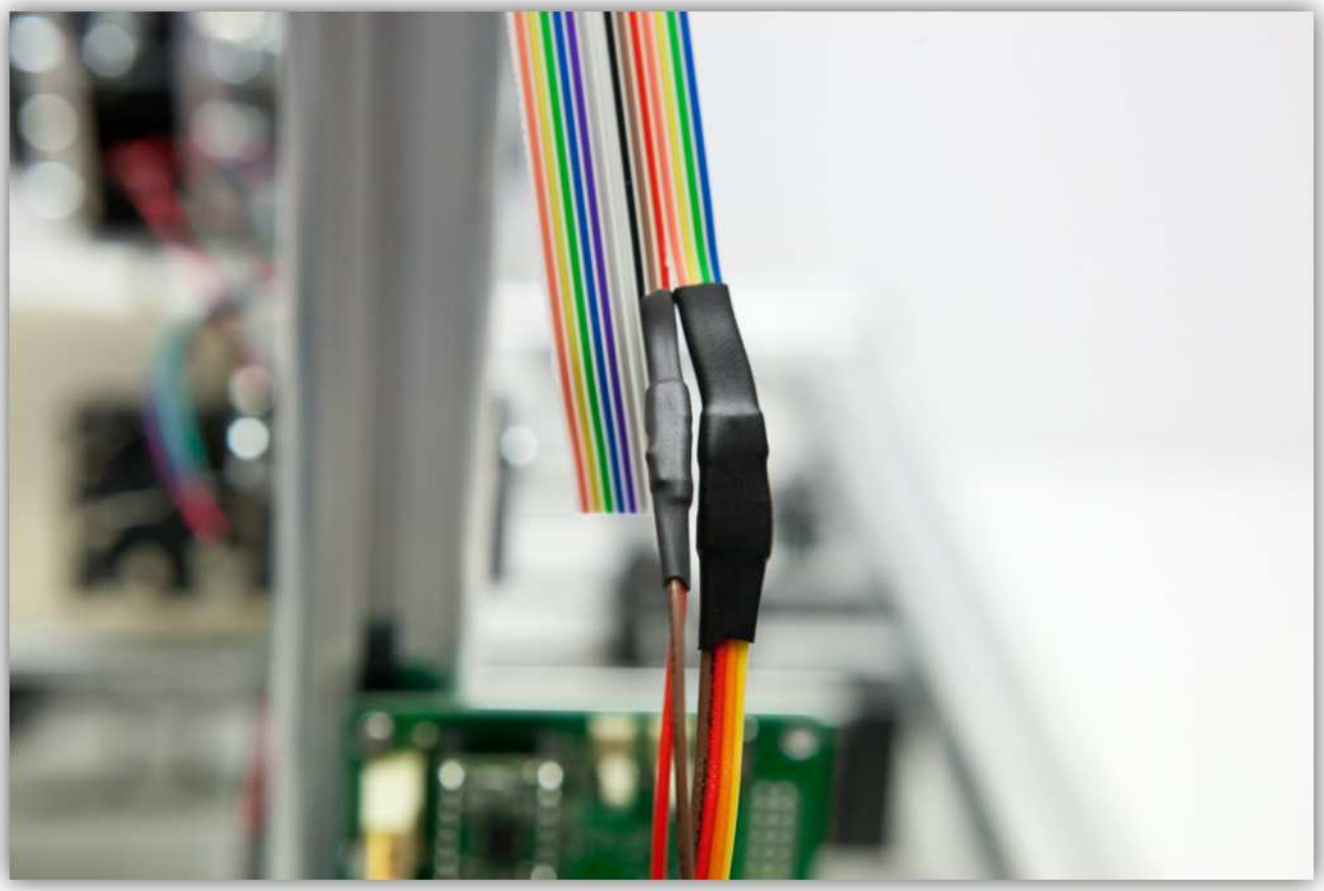


Slide the 2 small heat shrink tubes over the solder joints and heat them up.

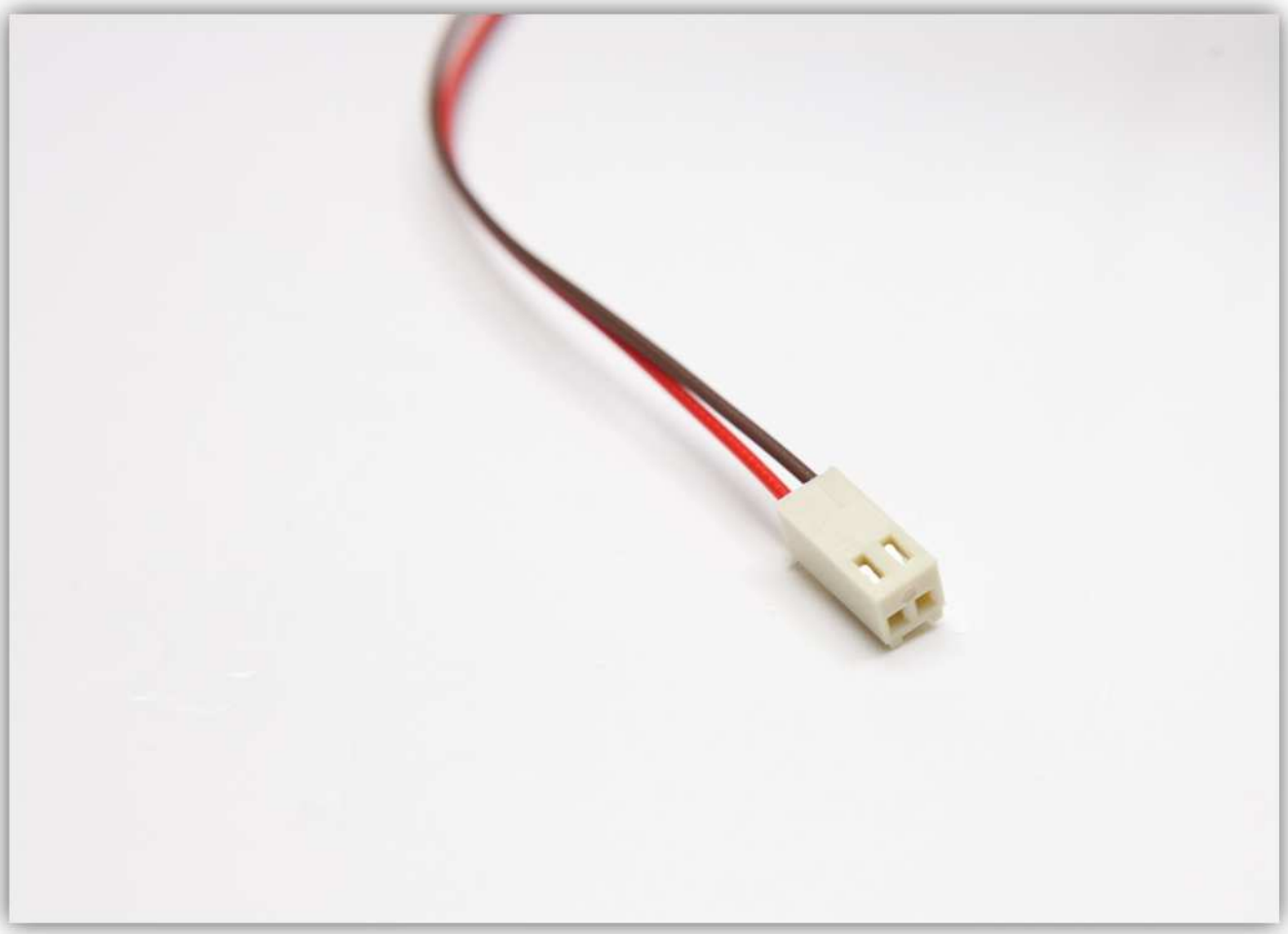


Now slide the medium size piece of heat shrink tubing over the 2 small pieces, heat the medium size piece so it covers and protects the 2 heat shrunk joints.

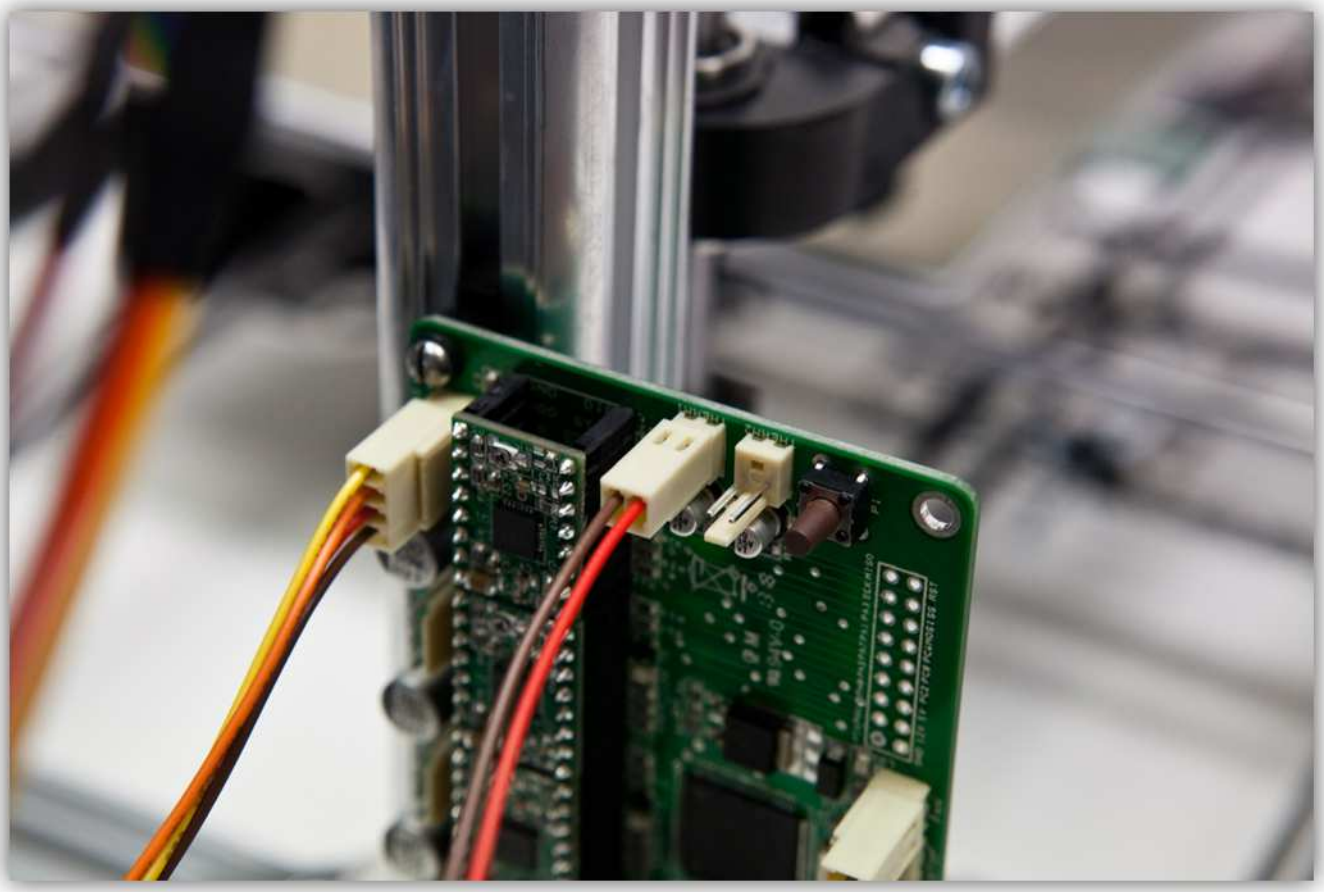




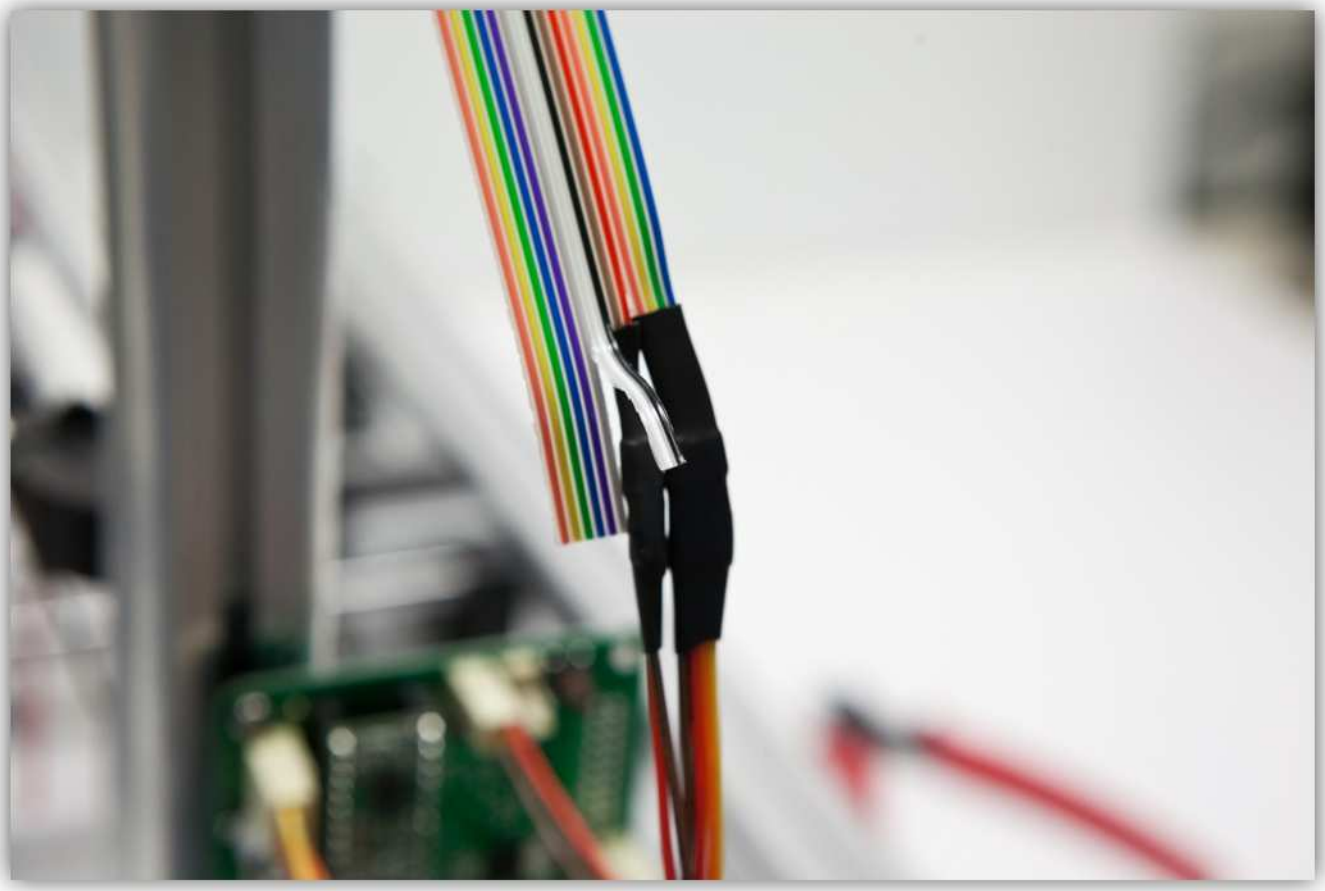
Take a board to wire connector with 2 wires out of the bag labelled with 40.



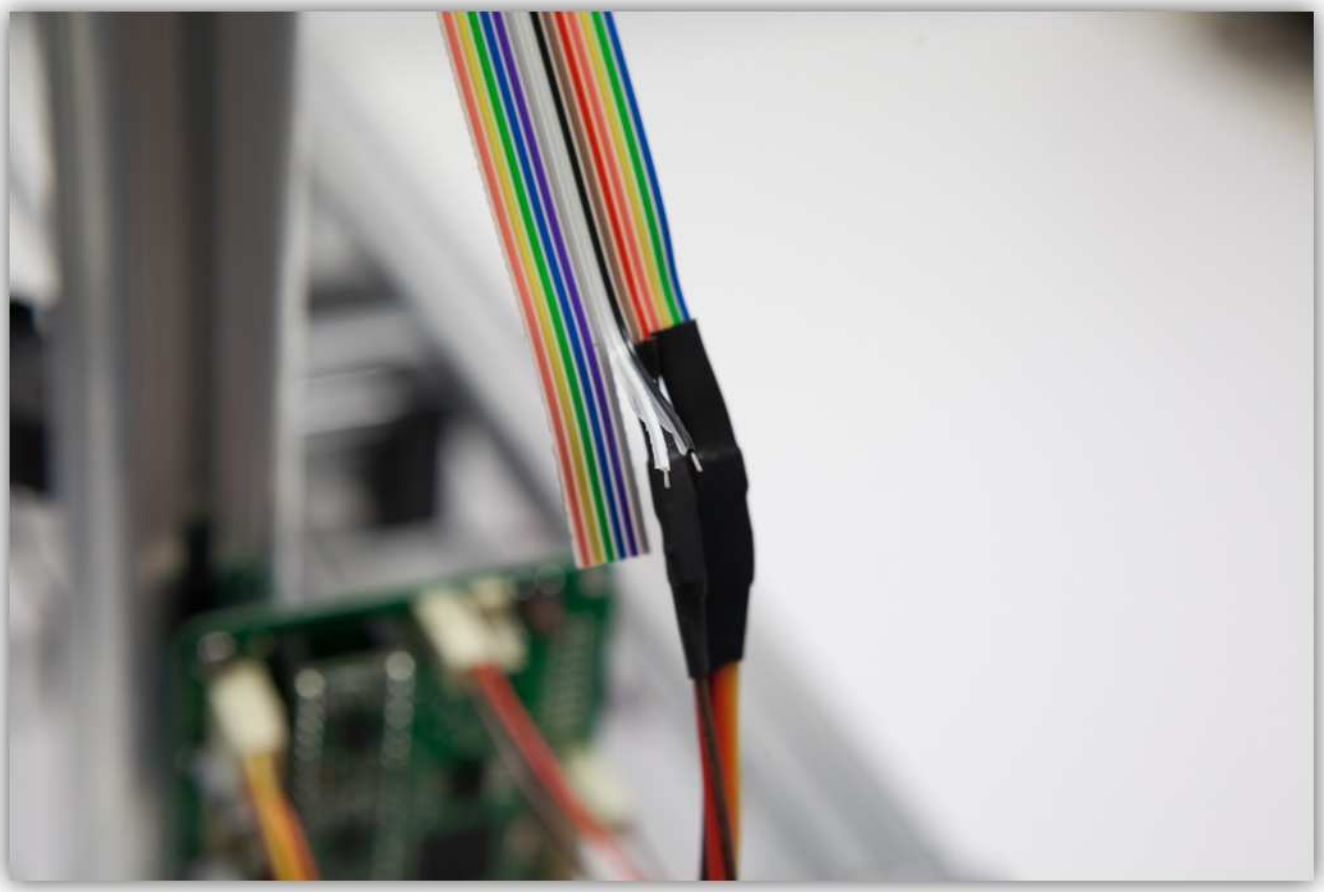
Plug the female connector in the male connector labelled with THERM1 on the controller board.

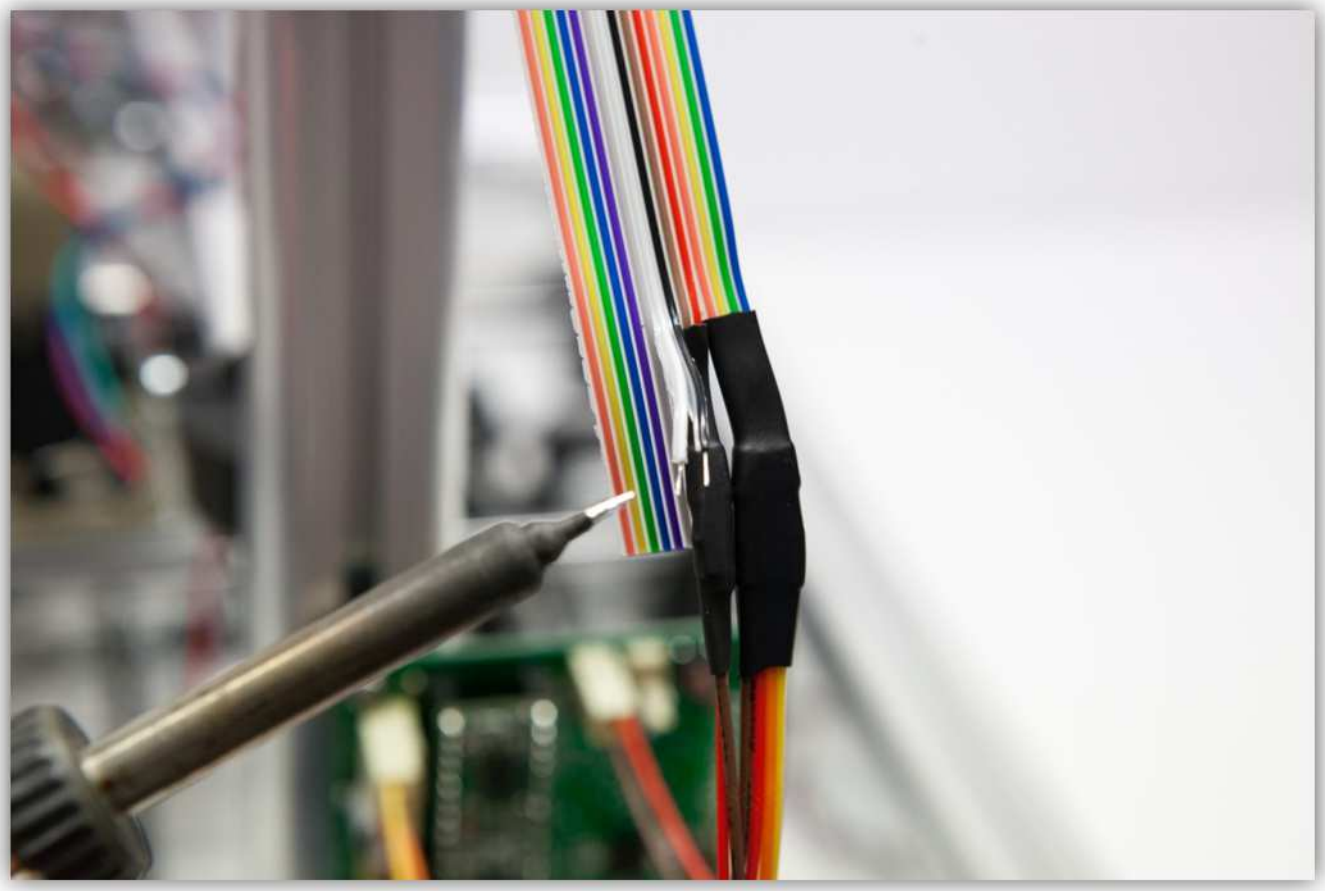


Detach (2 cm) (0.79") the **Black** and **White** wires from the flat cable as a group.



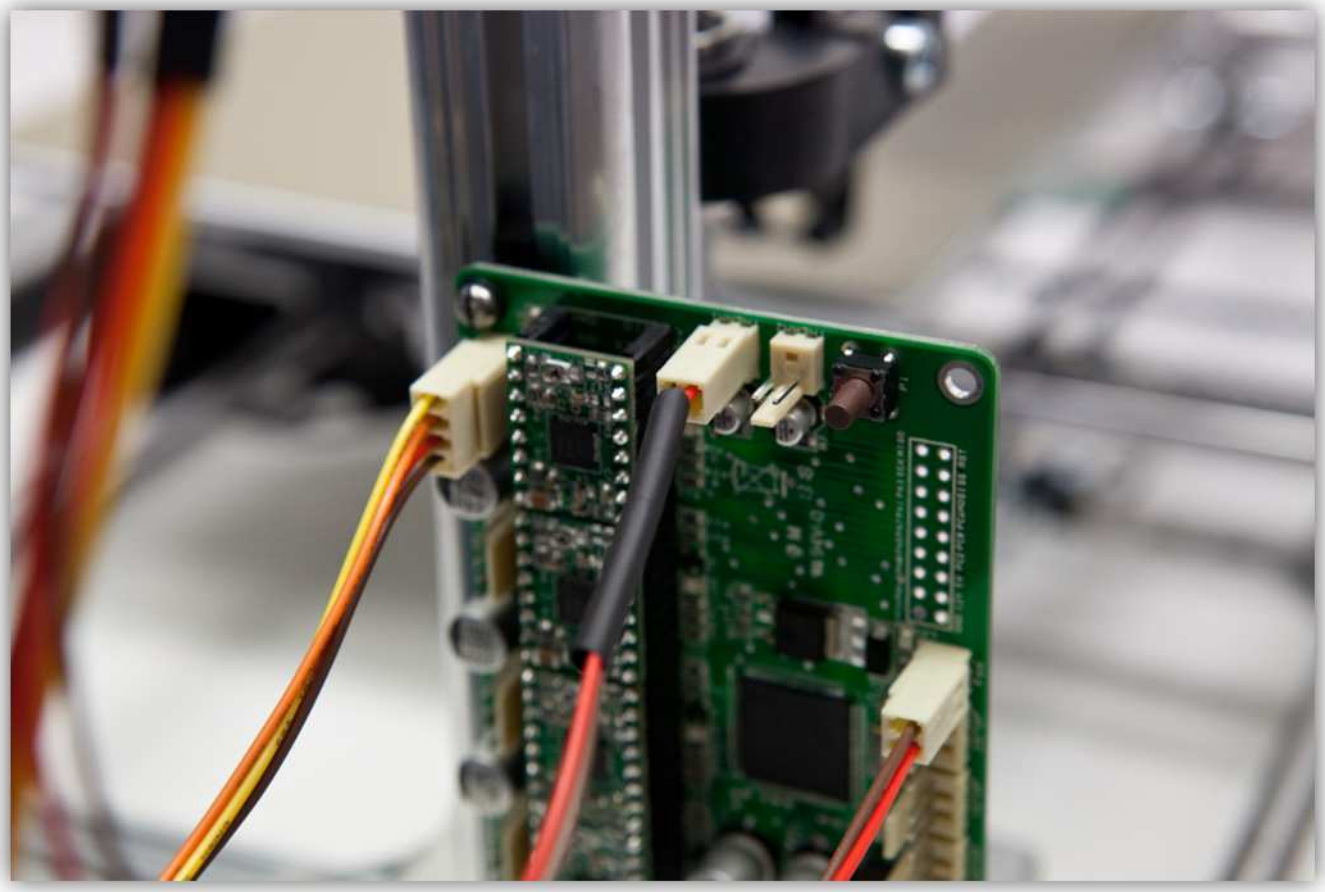
Strip the two wires (5 mm) (0.2") and tin them.



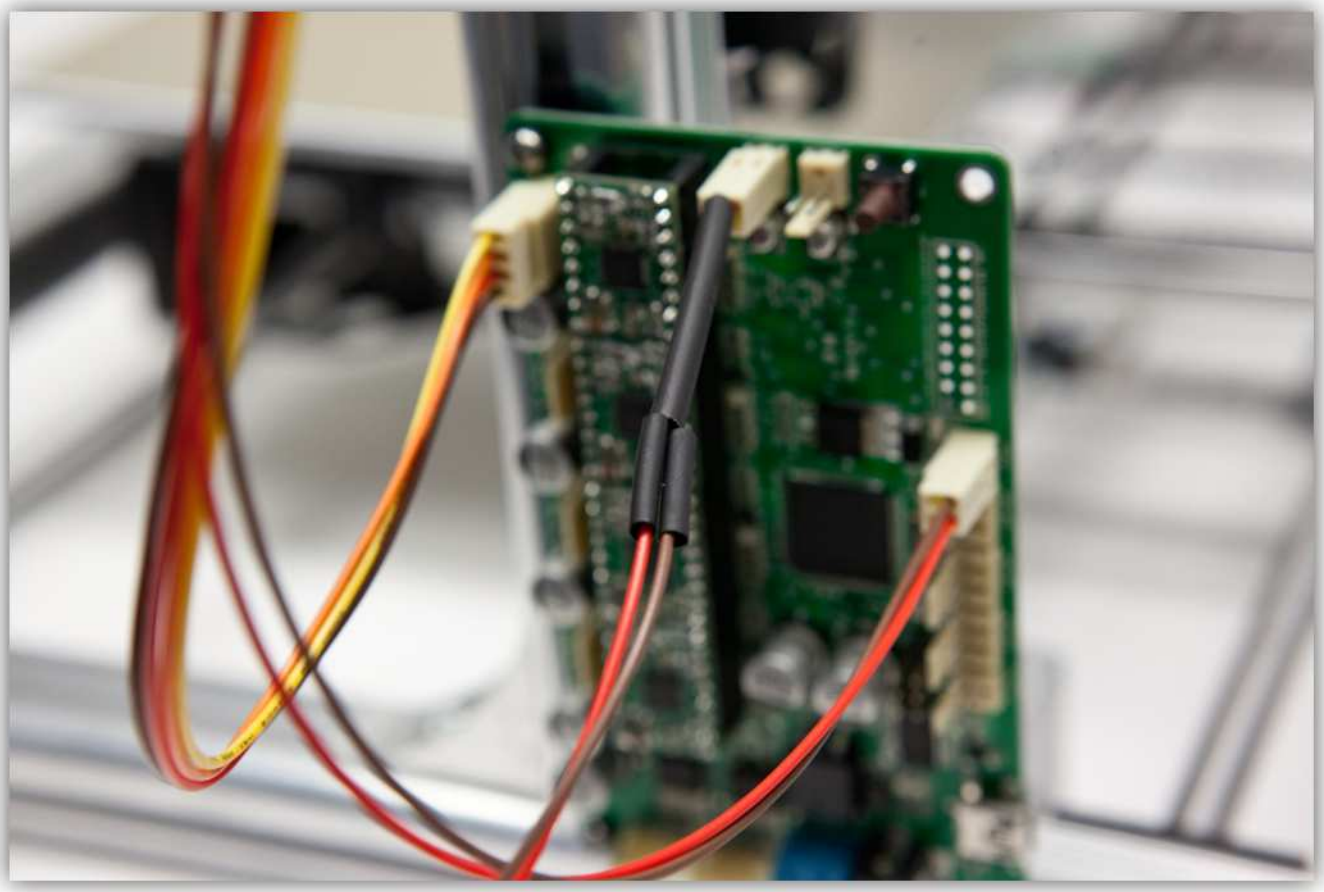


Cut 2 small pieces of the smallest heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the medium size heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

Slide the medium size heat shrink tubes over the 2 wires of the connector.



Slide the 2 small heat shrink tubes over the 2 wires of the connector.

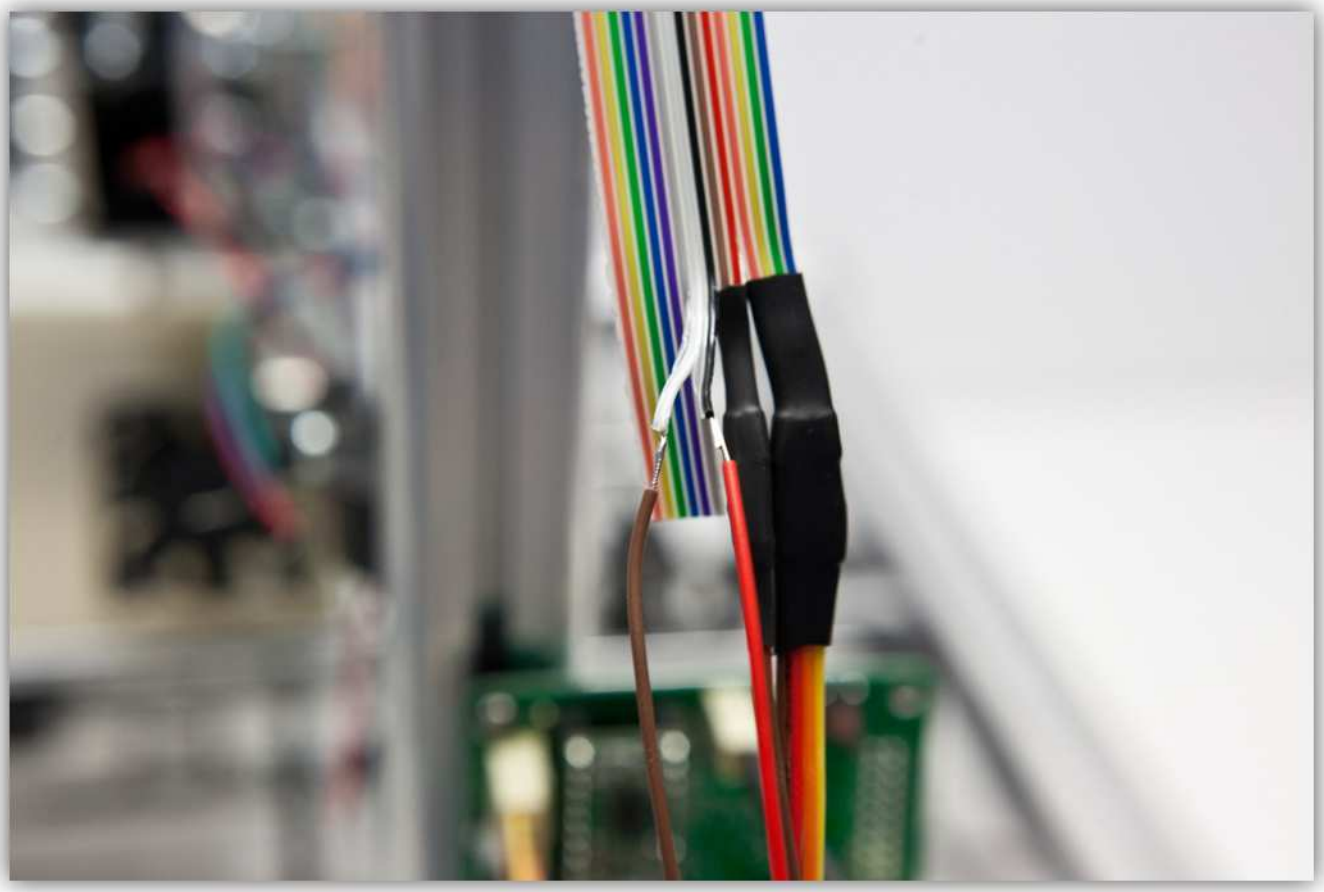


Solder the 2 wires from the connector to the 2 wires of the flat cable you tinned earlier. **Watch the colours closely.**

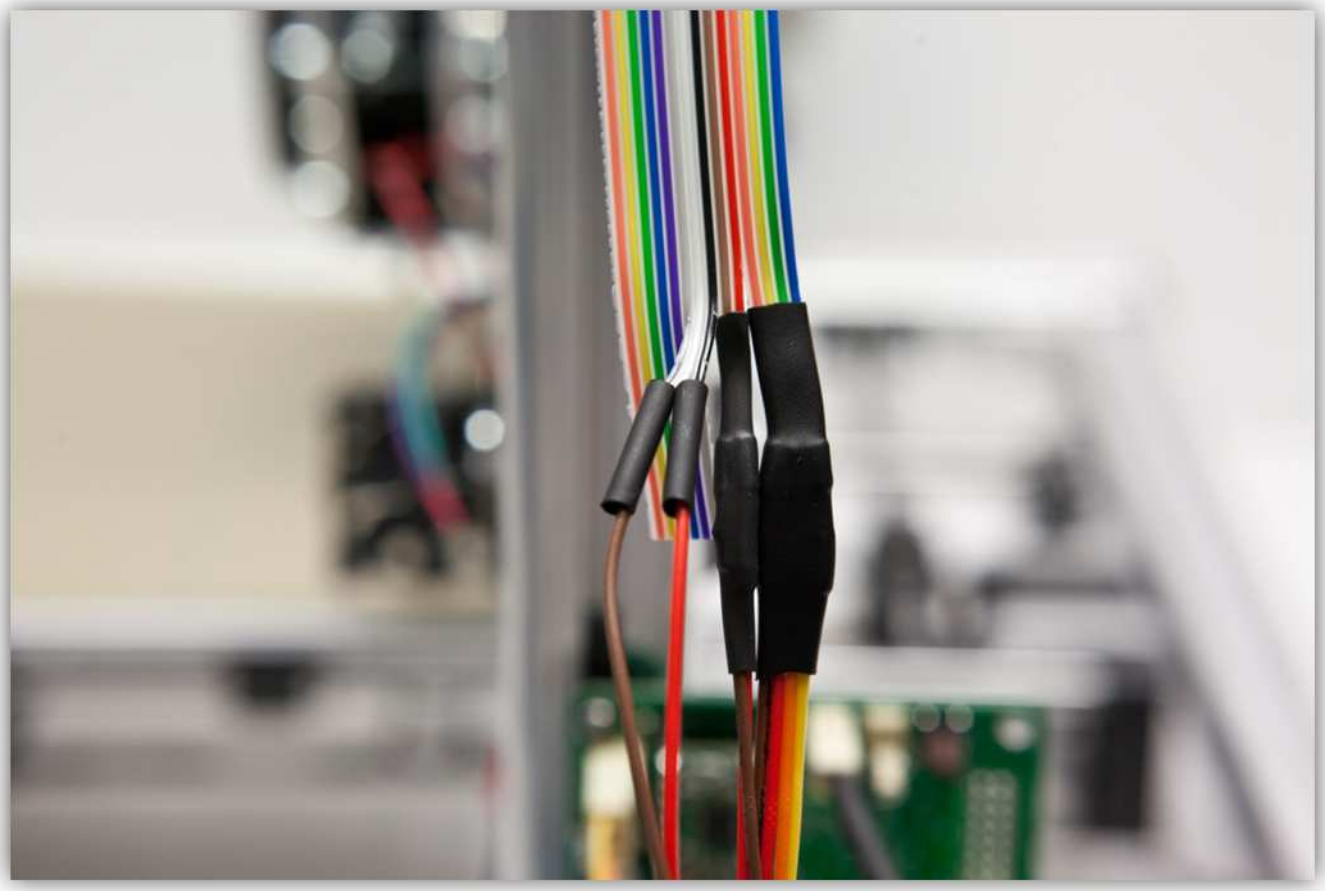
Flat cable -> Connector wires

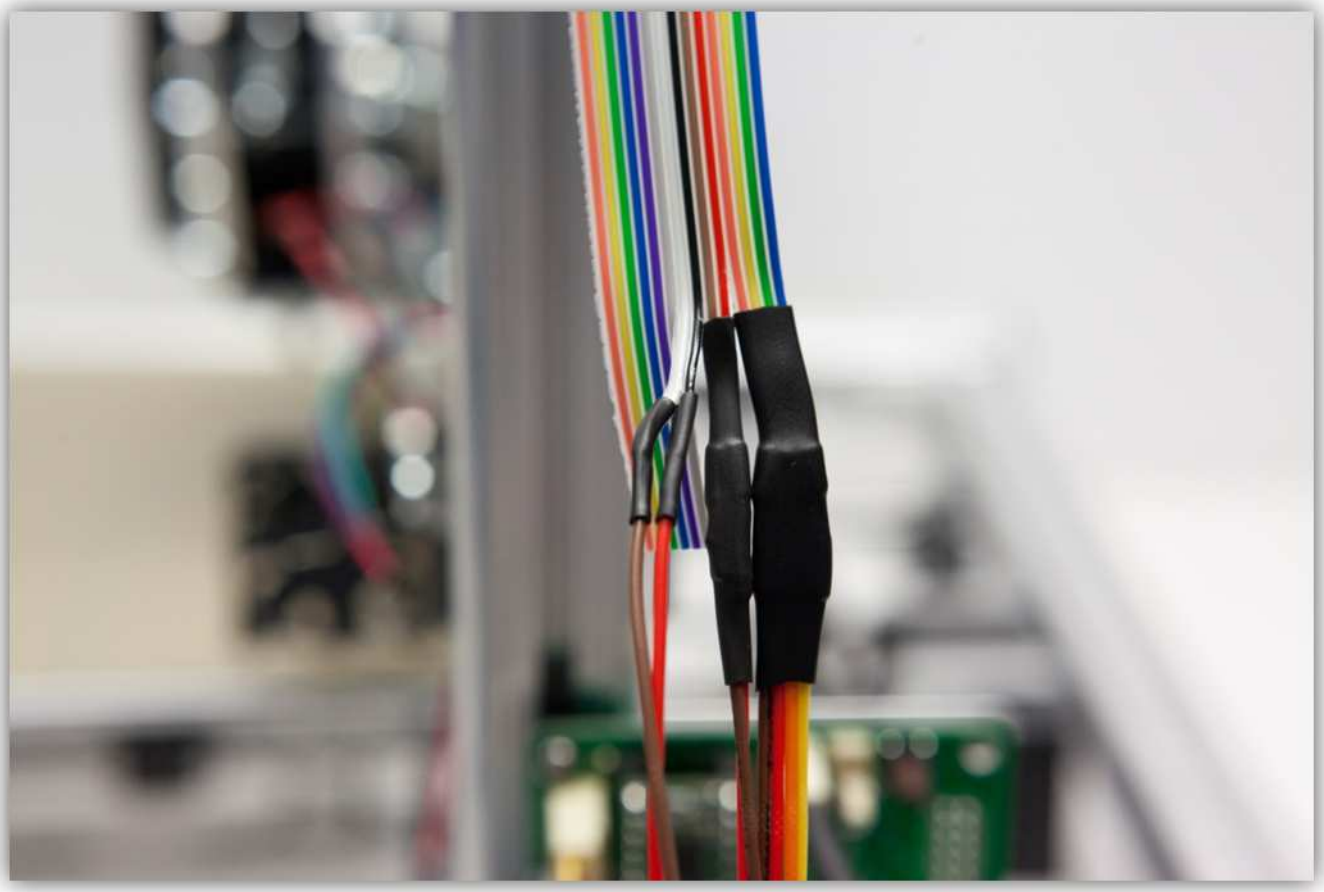
Black -> Red

White -> Brown

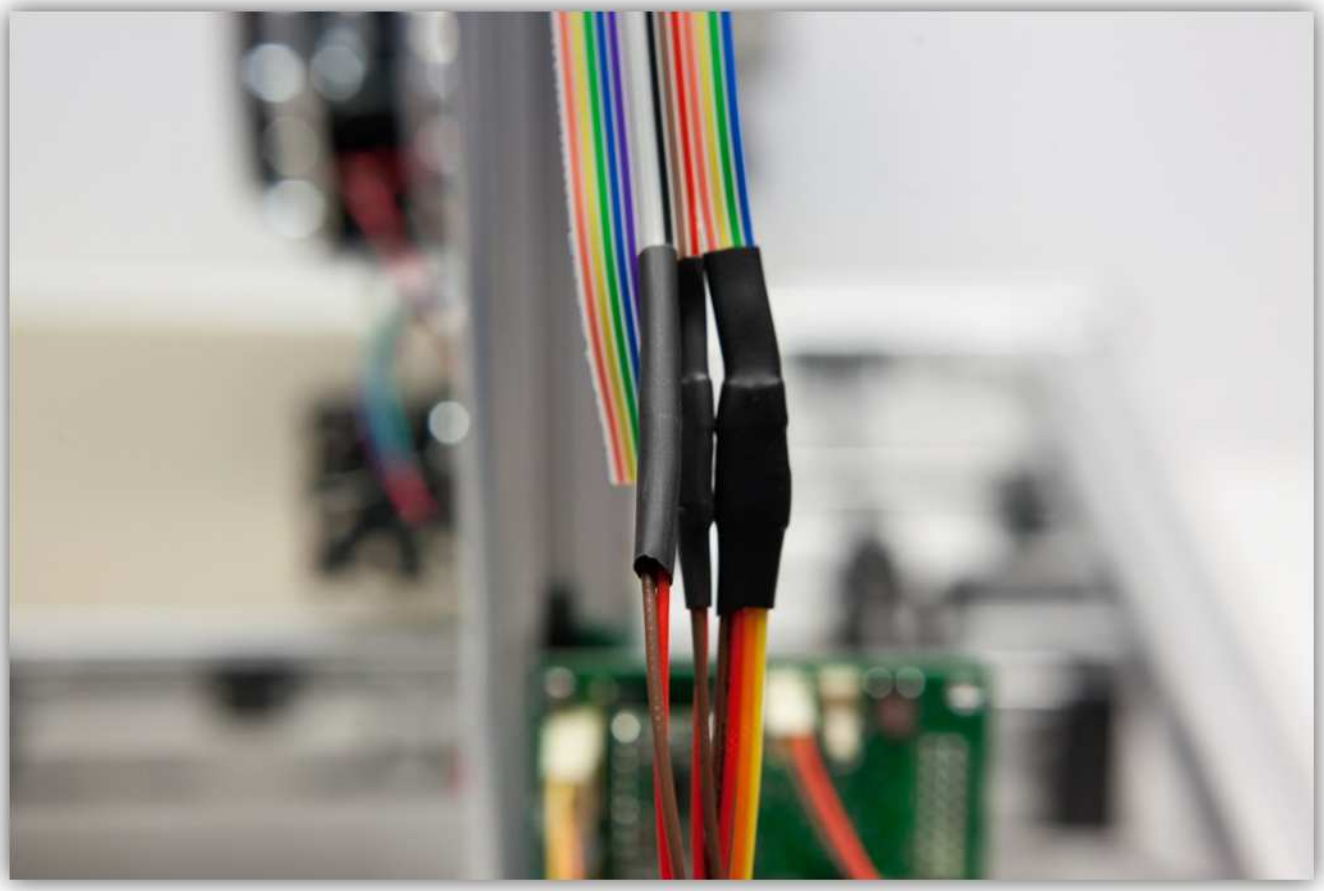


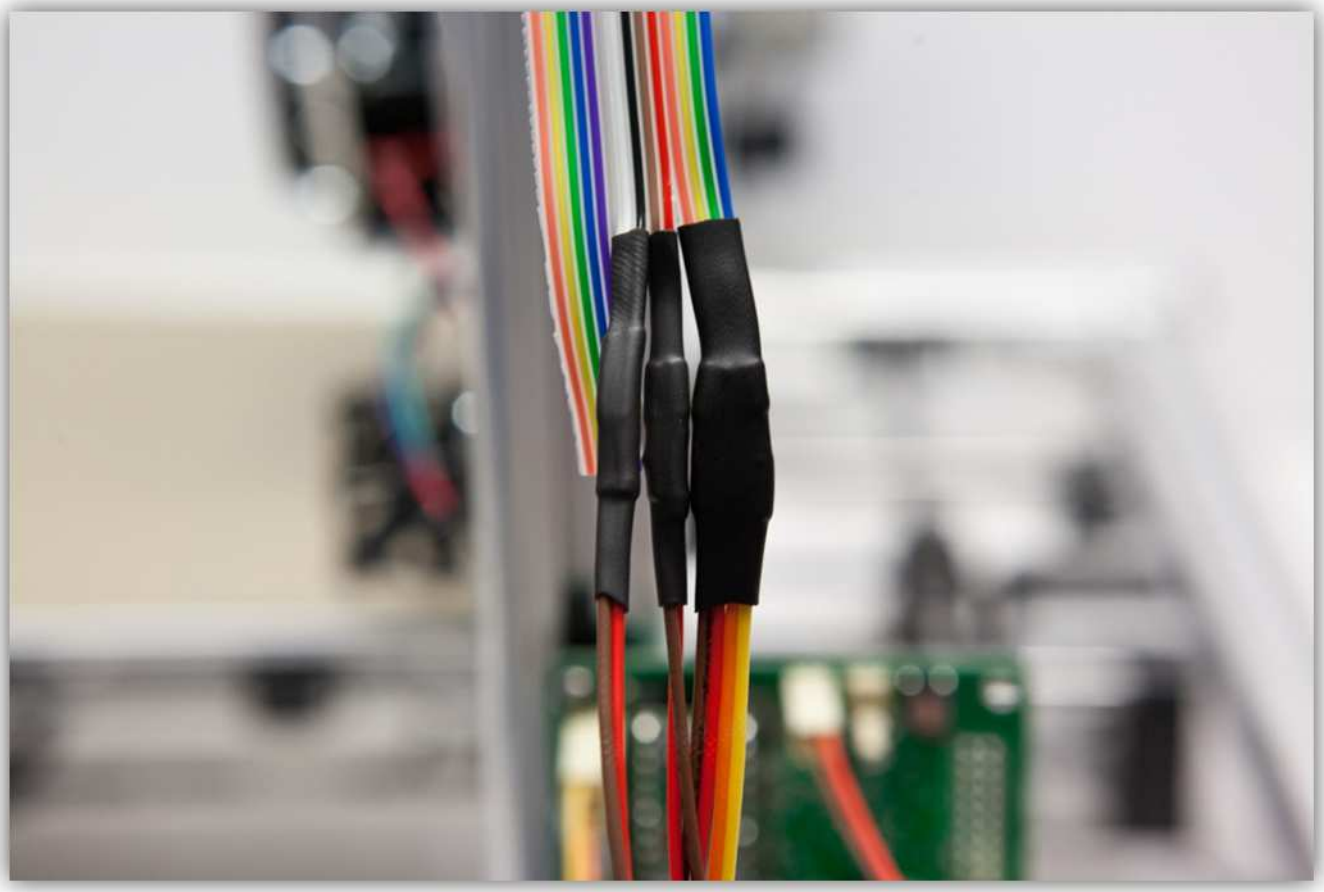
Slide the 2 small heat shrink tubes over the solder joints and heat them up.



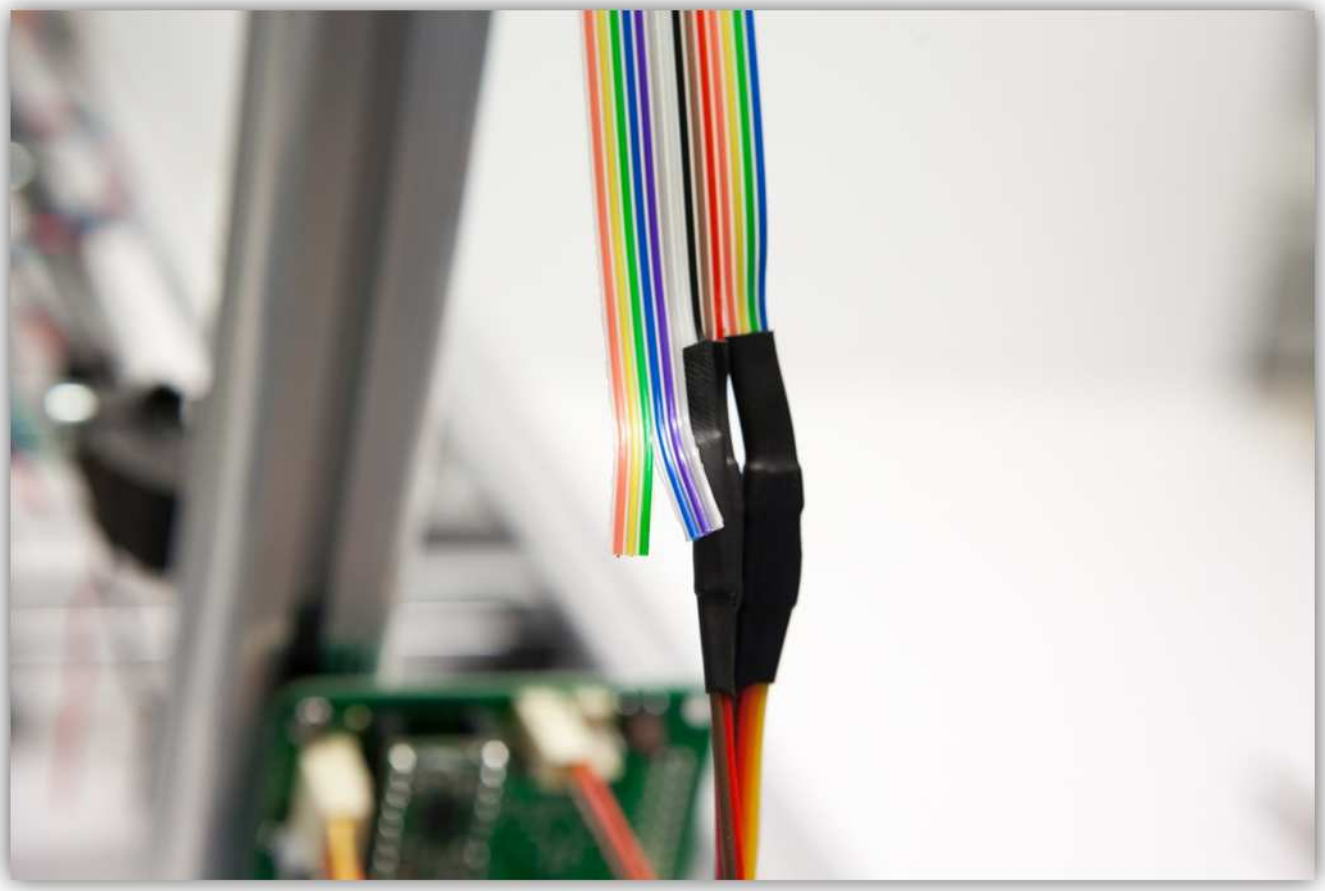


Now slide the medium size piece of heat shrink tubing over the 2 small pieces, heat the medium size piece so it covers and protects the 2 heat shrunk joints.

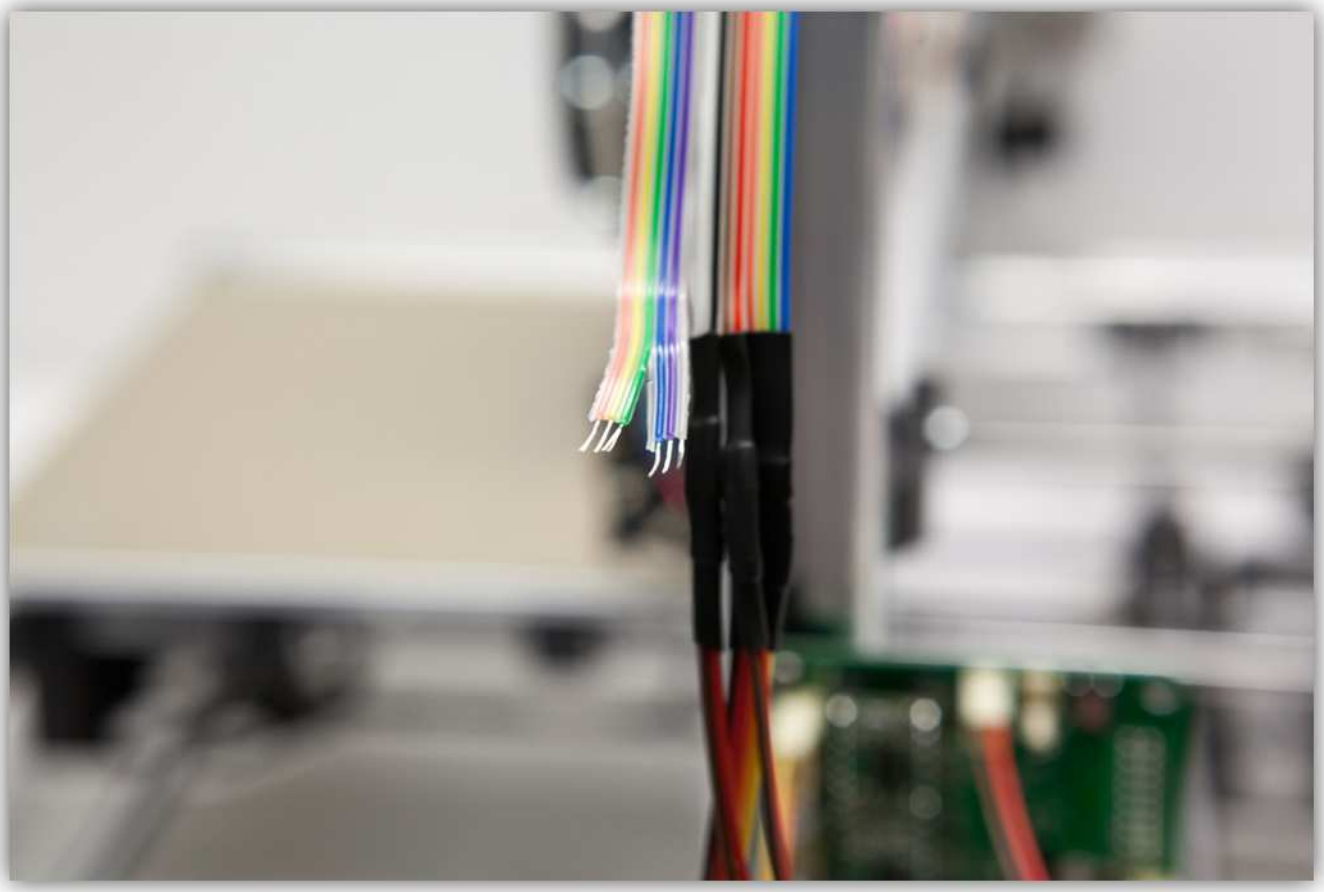


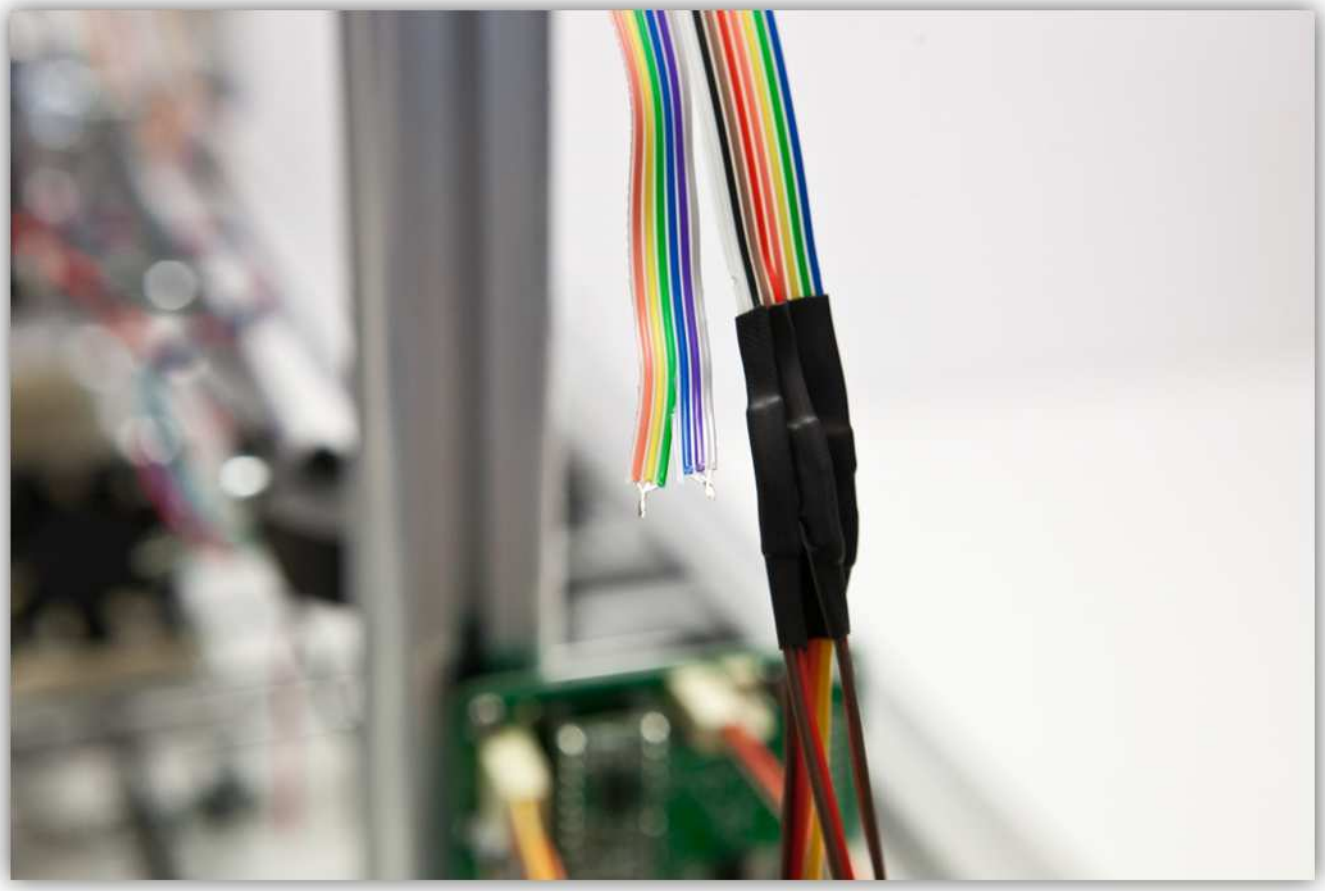


Next detach 2 cm (0.79") the **Orange, Yellow, Green,** and **Blue, Violet, Grey** as groups.

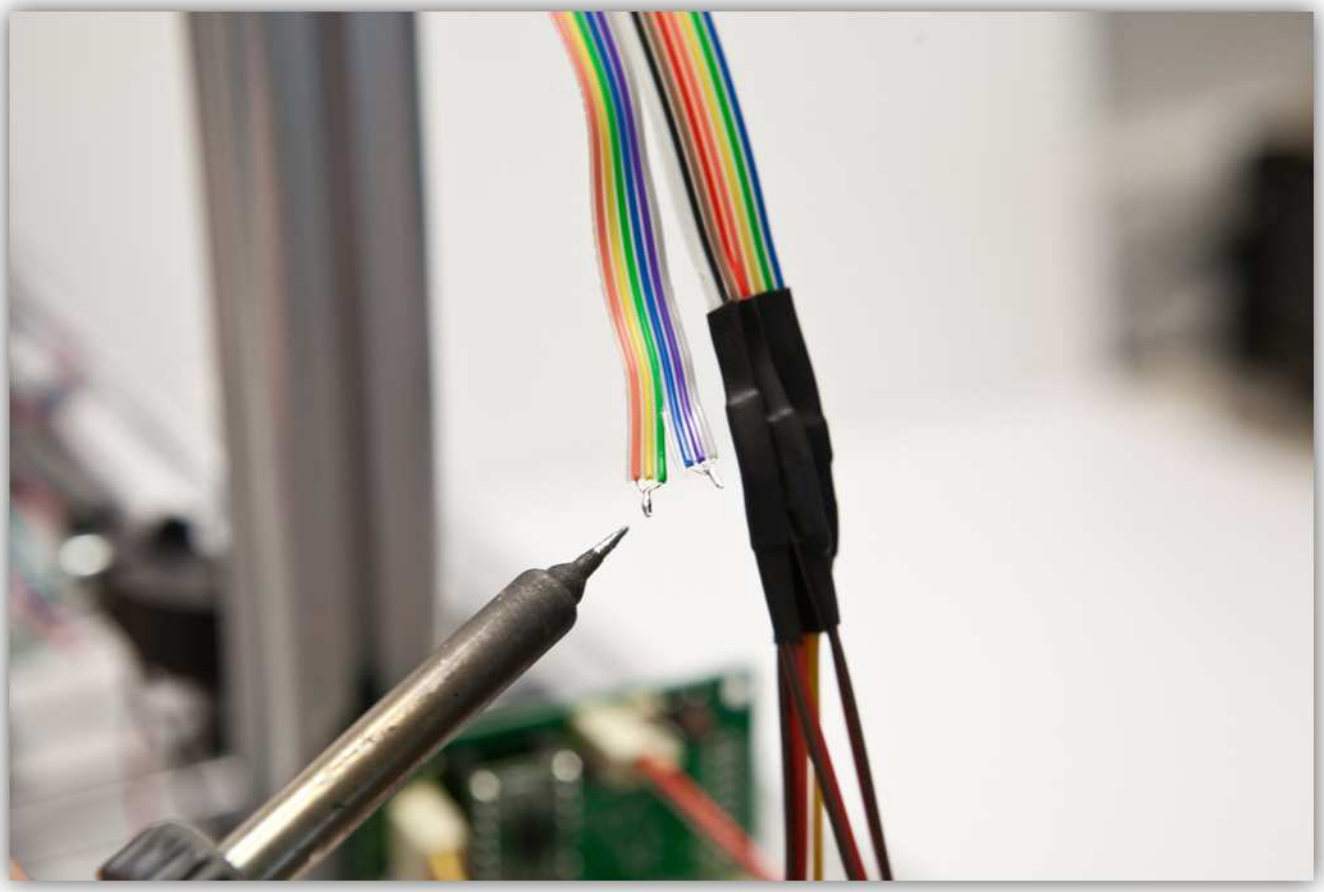


Strip the wires (5 mm) (0.2") and twist them together per group.



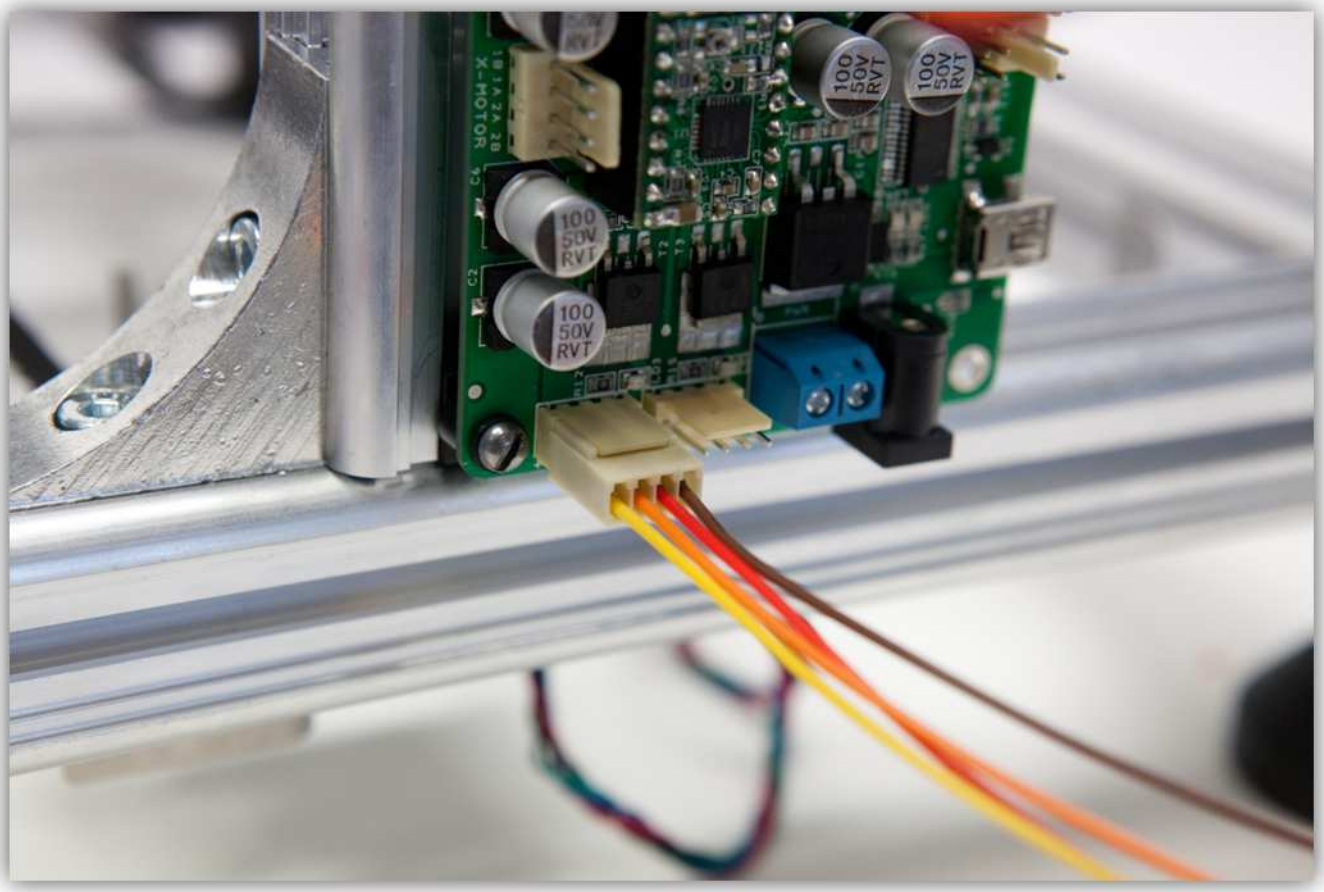


Tin the wires together per group.



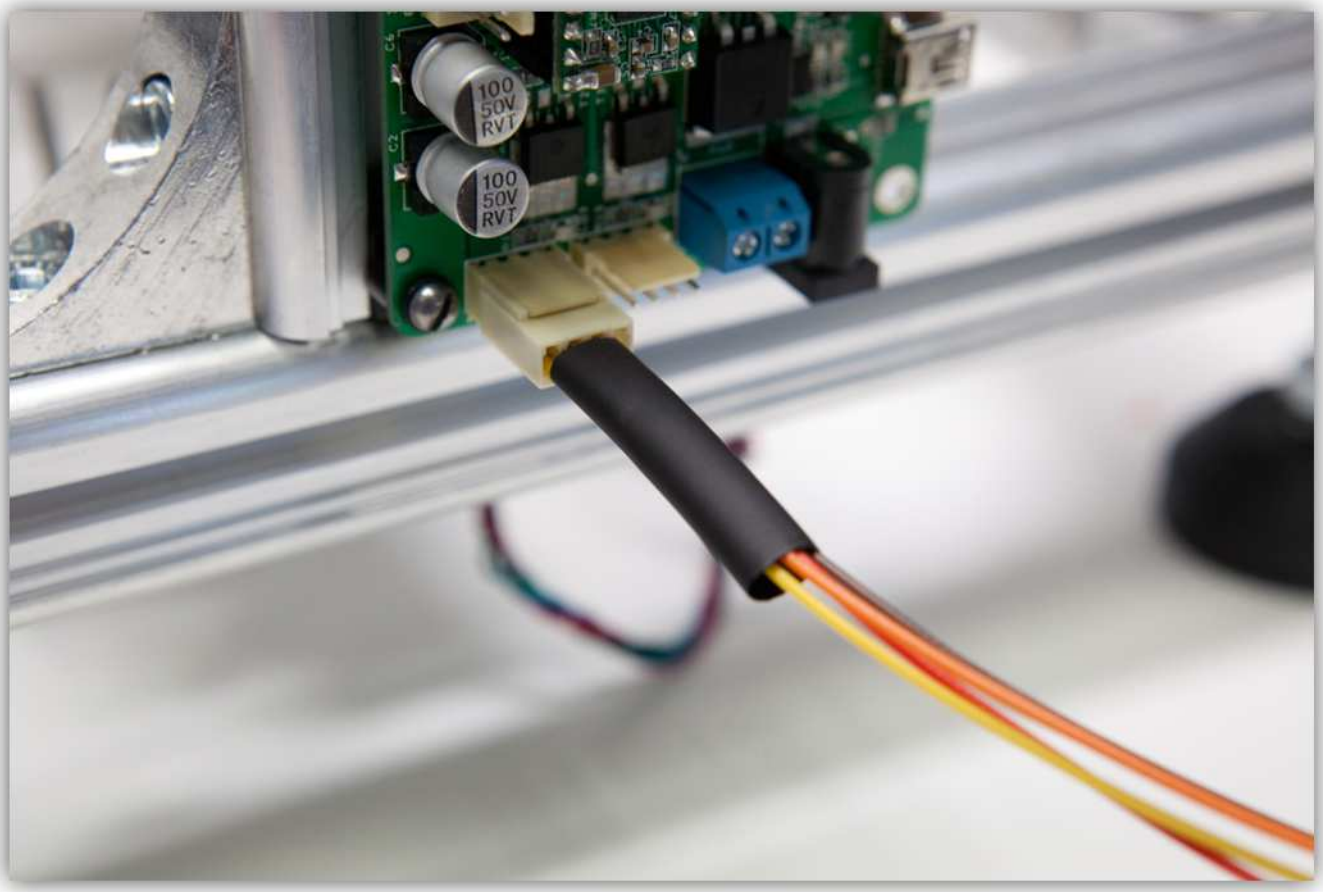
Take a board to wire connector with 4 wires out of the bag labelled with 40.

Plug the female connector in the male connector labelled with HEATER1 on the controller board.

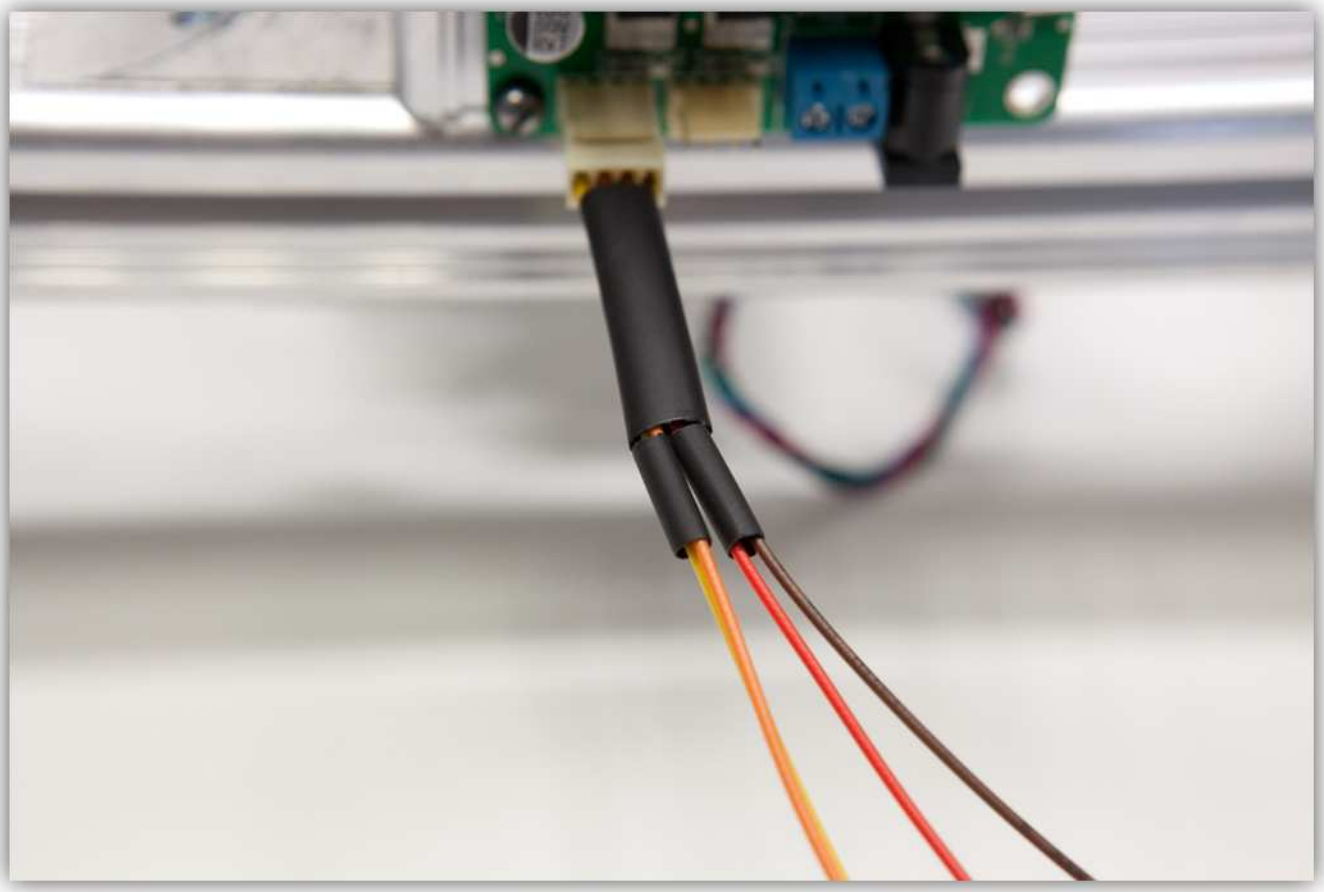


Cut 2 small pieces of the medium size heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the biggest heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

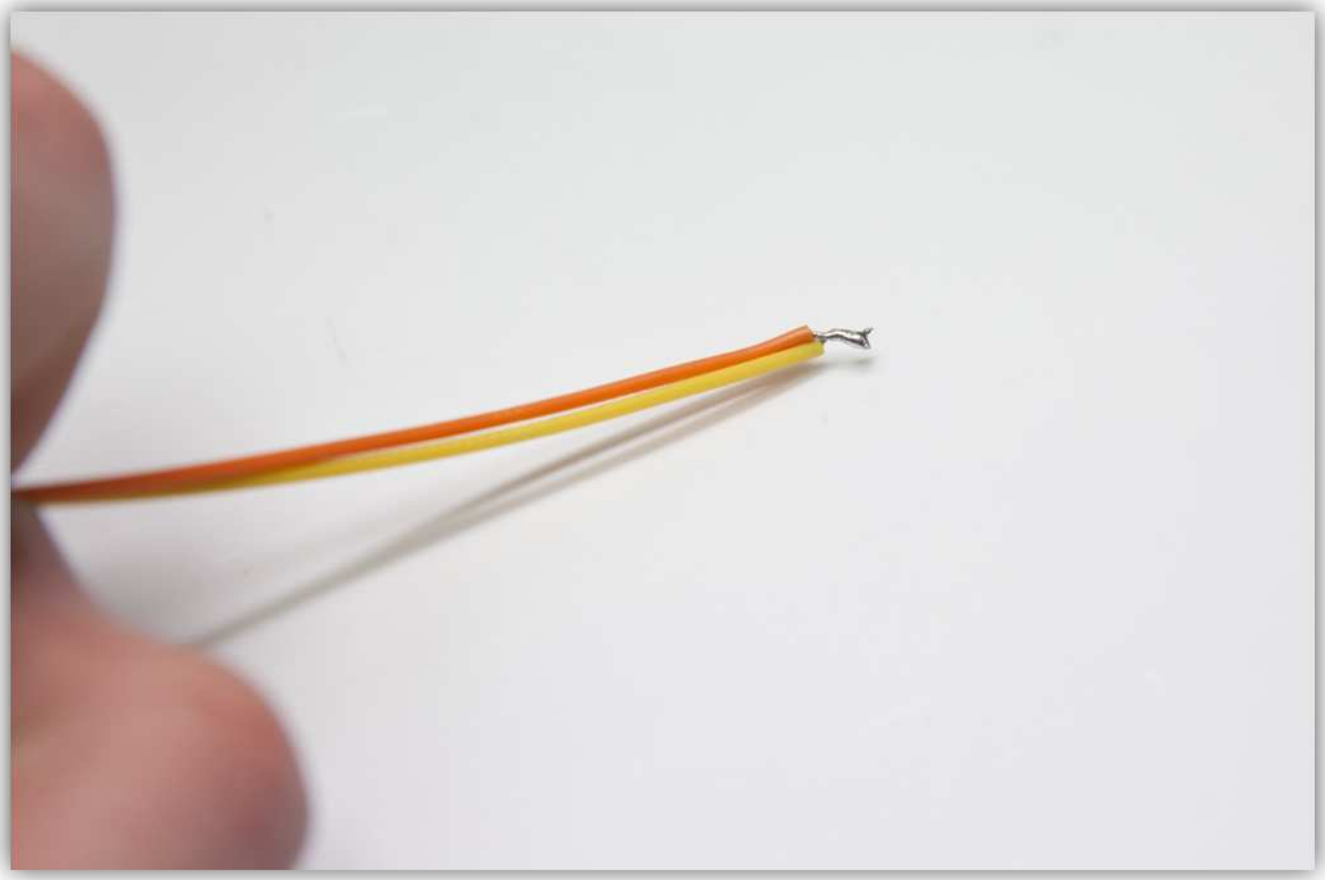
Slide the big heat shrink tubes over the 4 wires of the connector.



Slide 1 medium size heat shrink tubes over the **Yellow** and **Orange** wire and 1 medium size heat shrink tube over the **Red** and **Brown** wire.



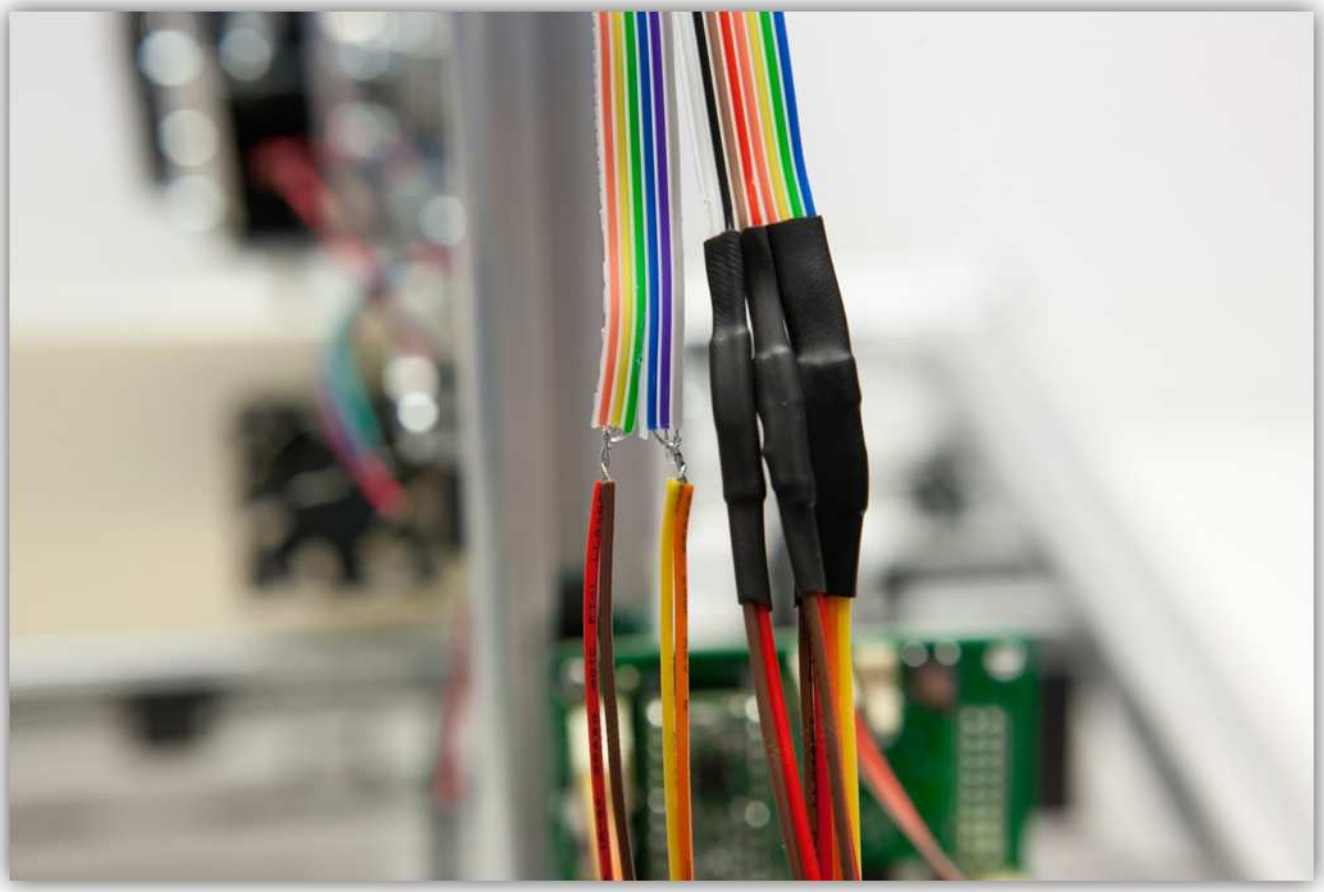
Next twist and tin the ends of the **Yellow** and **Orange** wires together.



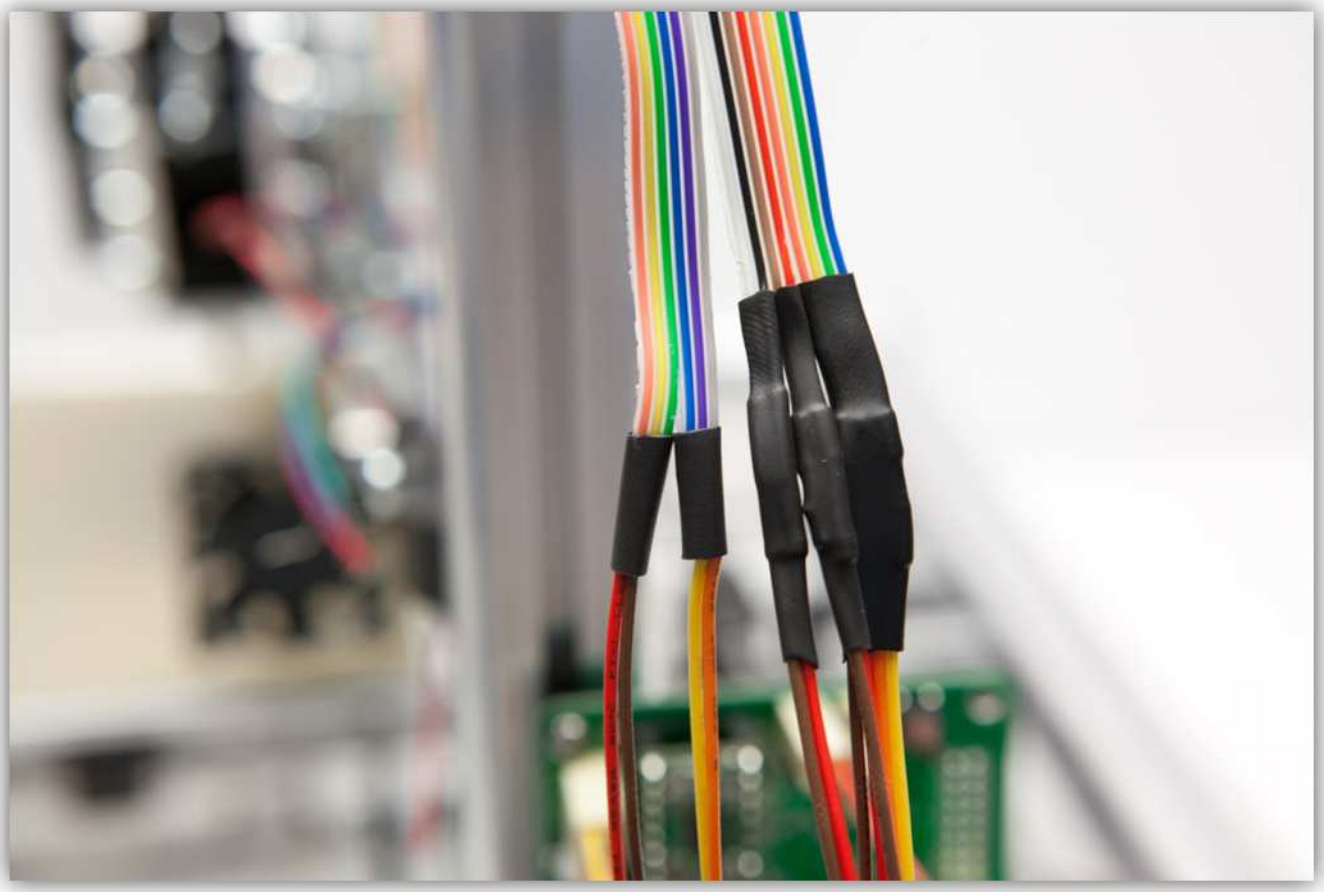
Also twist and tin the ends of the **Red** and **Brown** wires together.

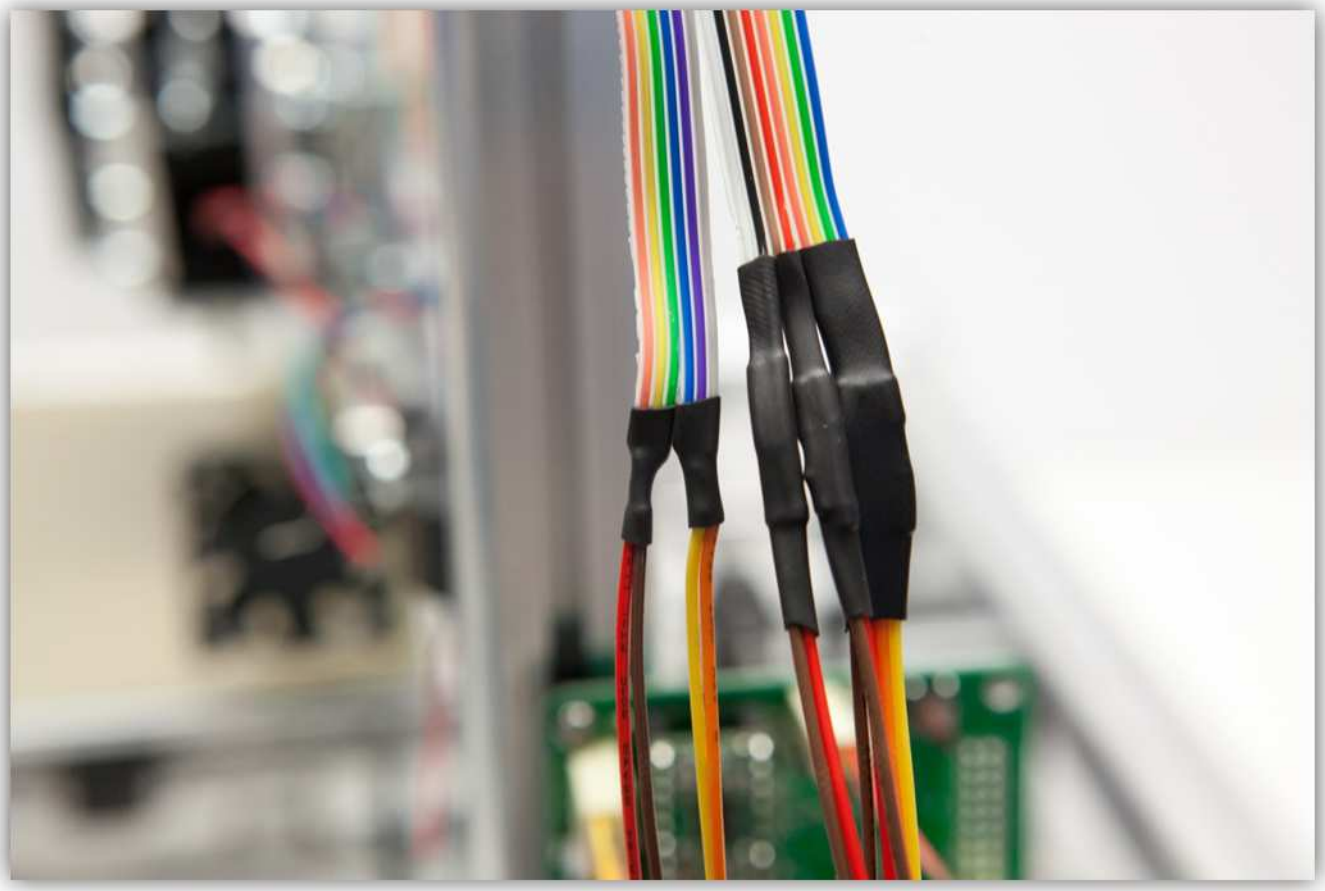
Solder the 6 wires from the connector to the 4 wires of the flat cable you tinned earlier. **Watch the colours closely and respect the groups.**

Flat cable	**->**	**Connector wires**
Orange, Yellow, Green	**->**	**Red** and **Brown**
Blue, Violet, Grey	**->**	**Yellow** and **Orange**

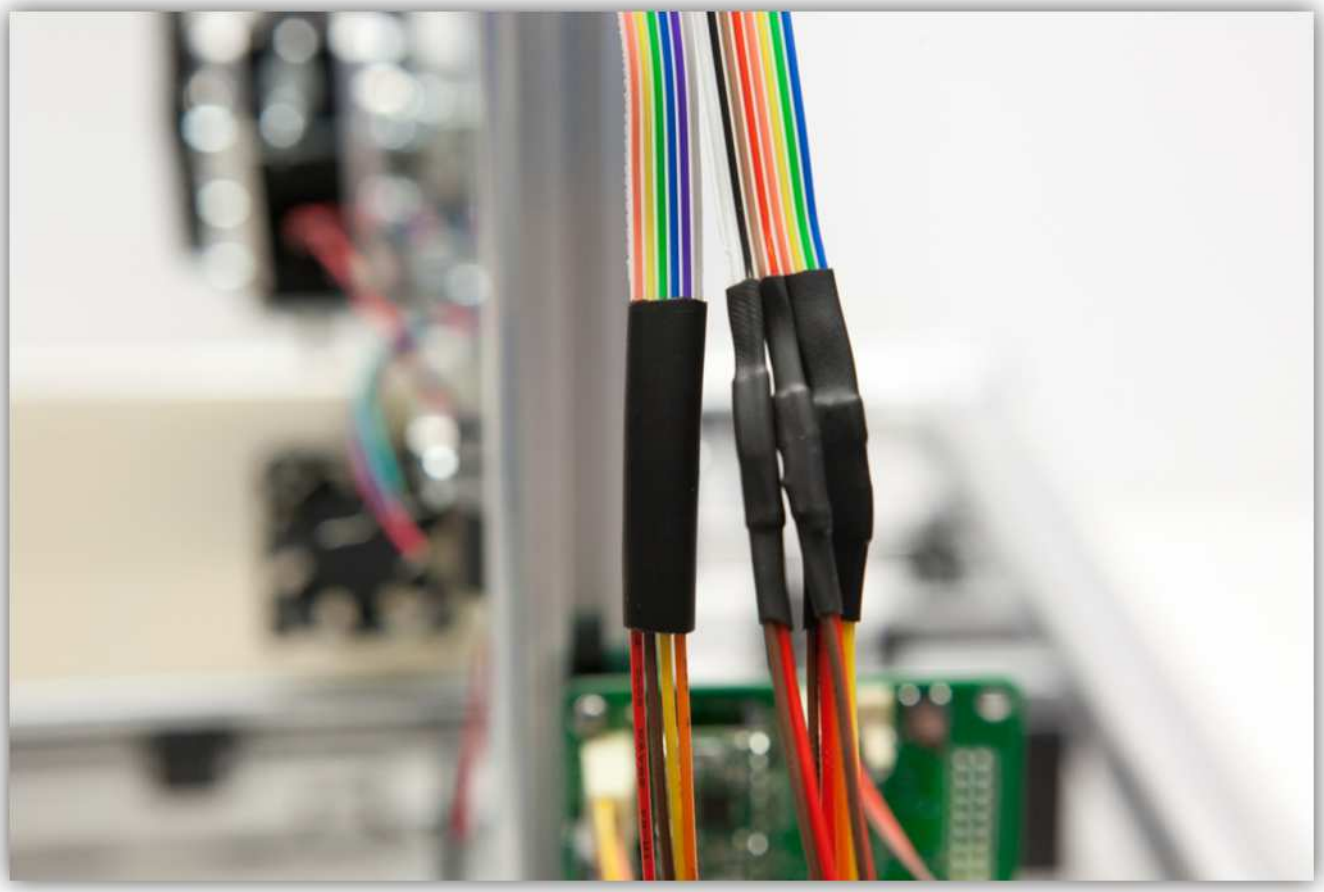


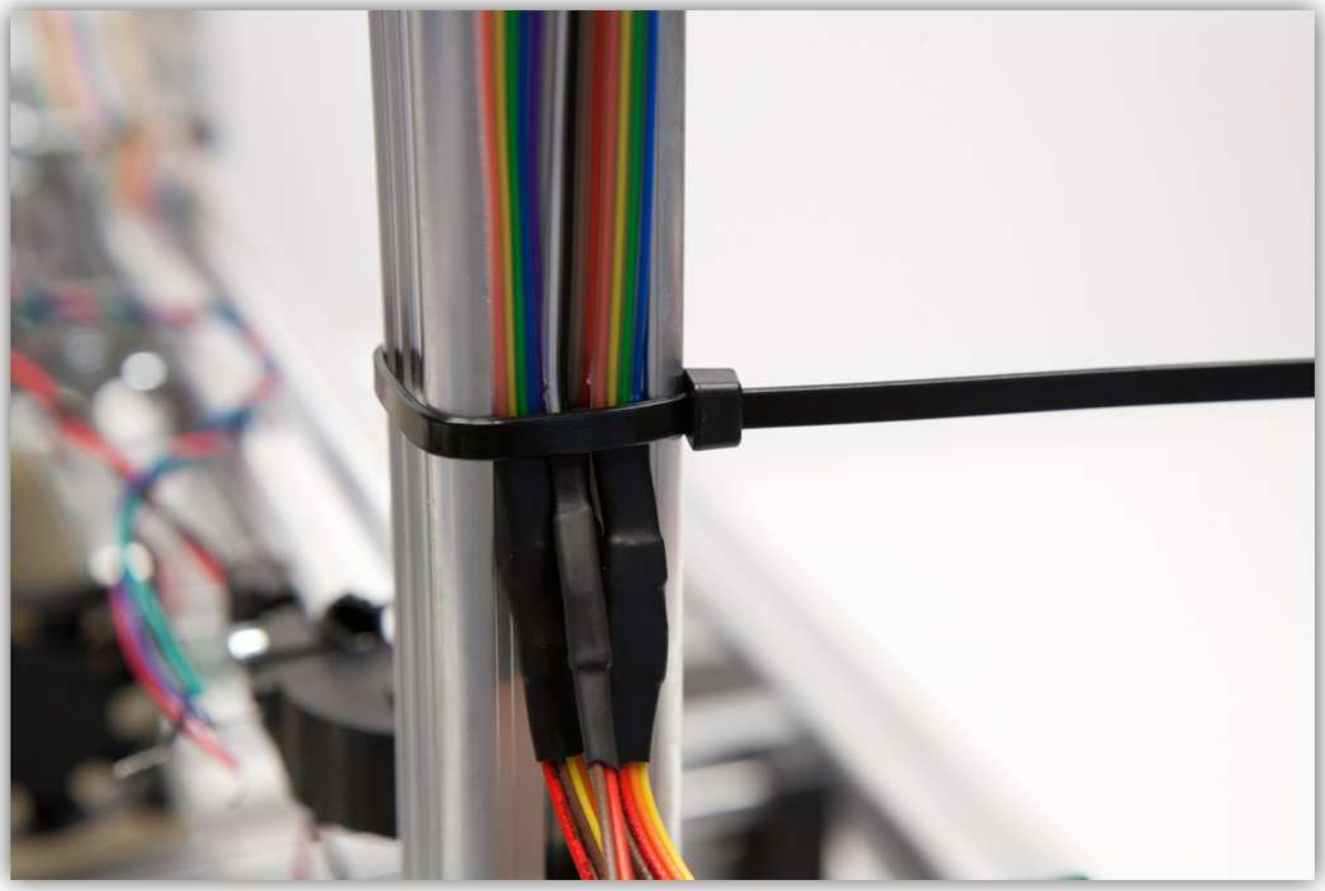
Slide the medium size heat shrink tubes over the solder joints and heat them up so they shrink.

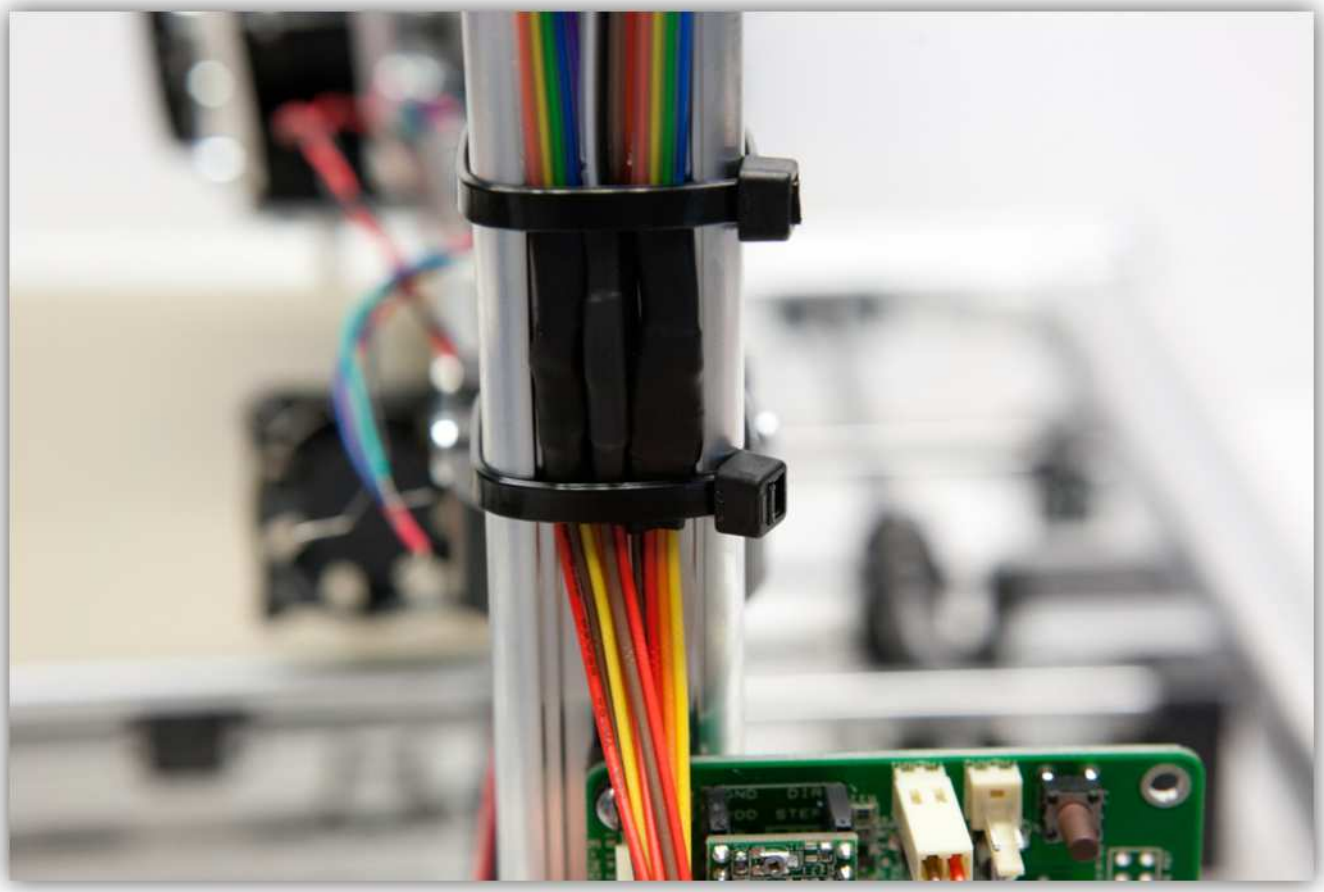




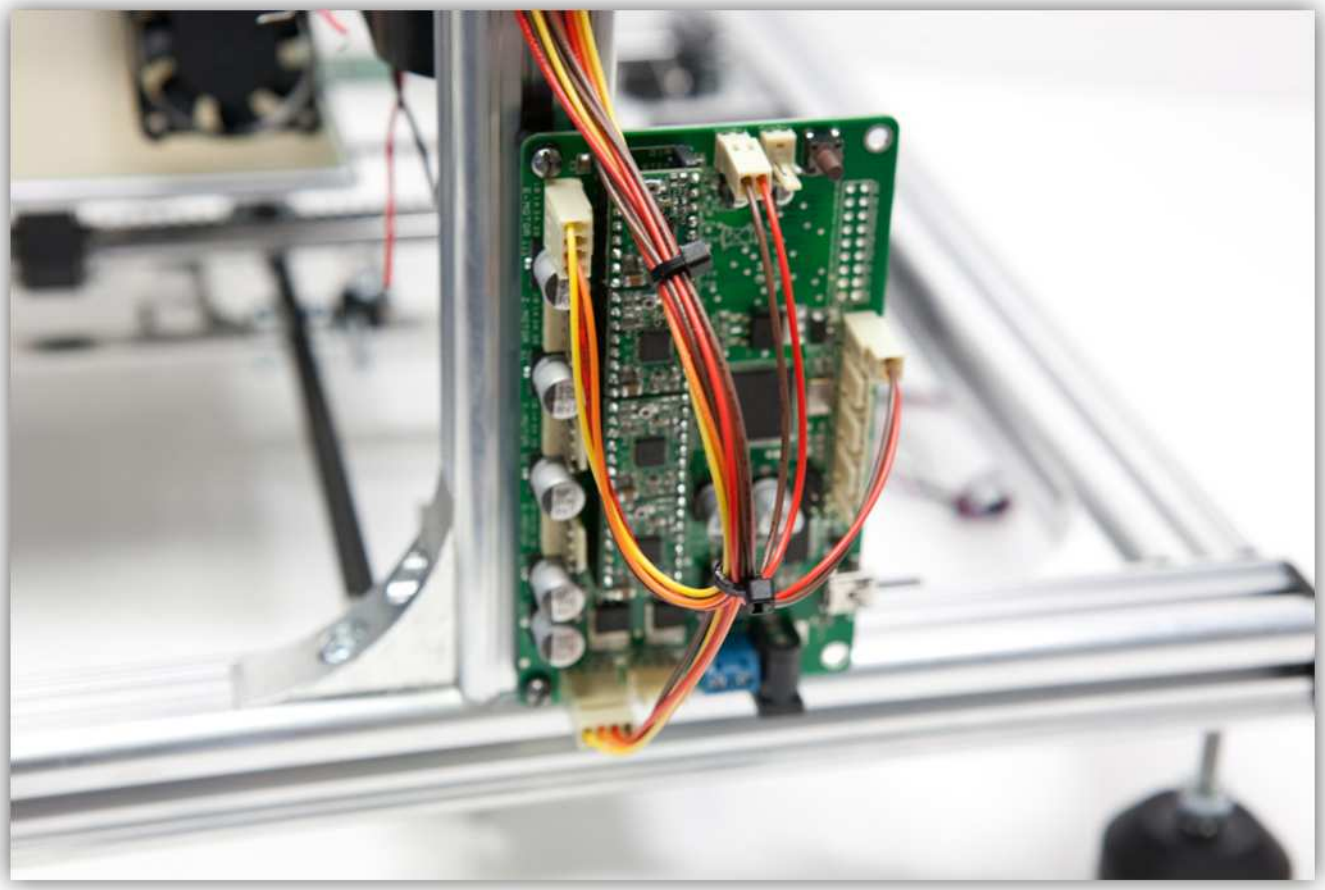
Now slide the big piece of heat shrink tubing over the 2 medium size pieces, heat the big piece so it covers and protects the 2 heat shrunk joints. Secure all the joints with 2 large tie-strips to the profile.



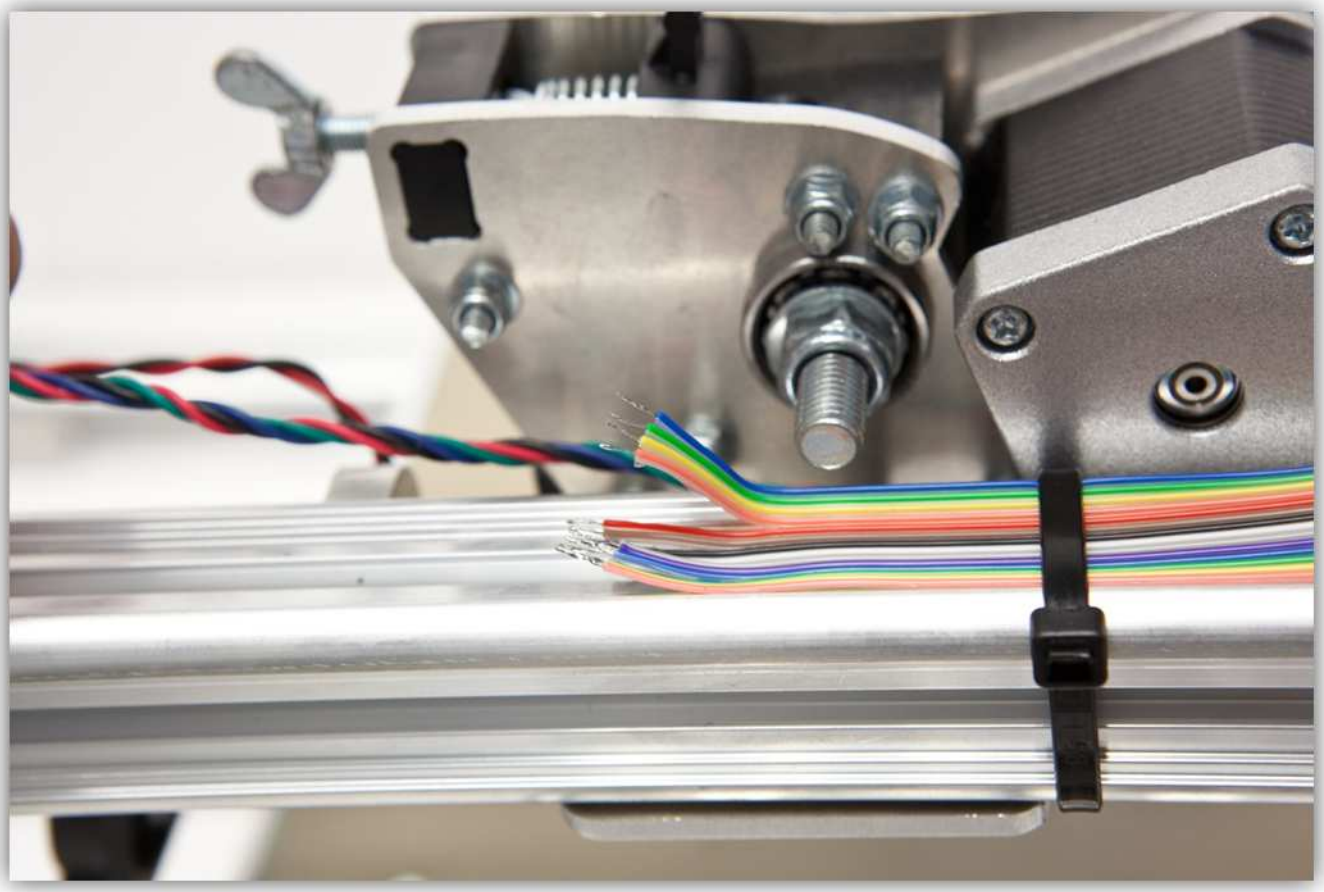




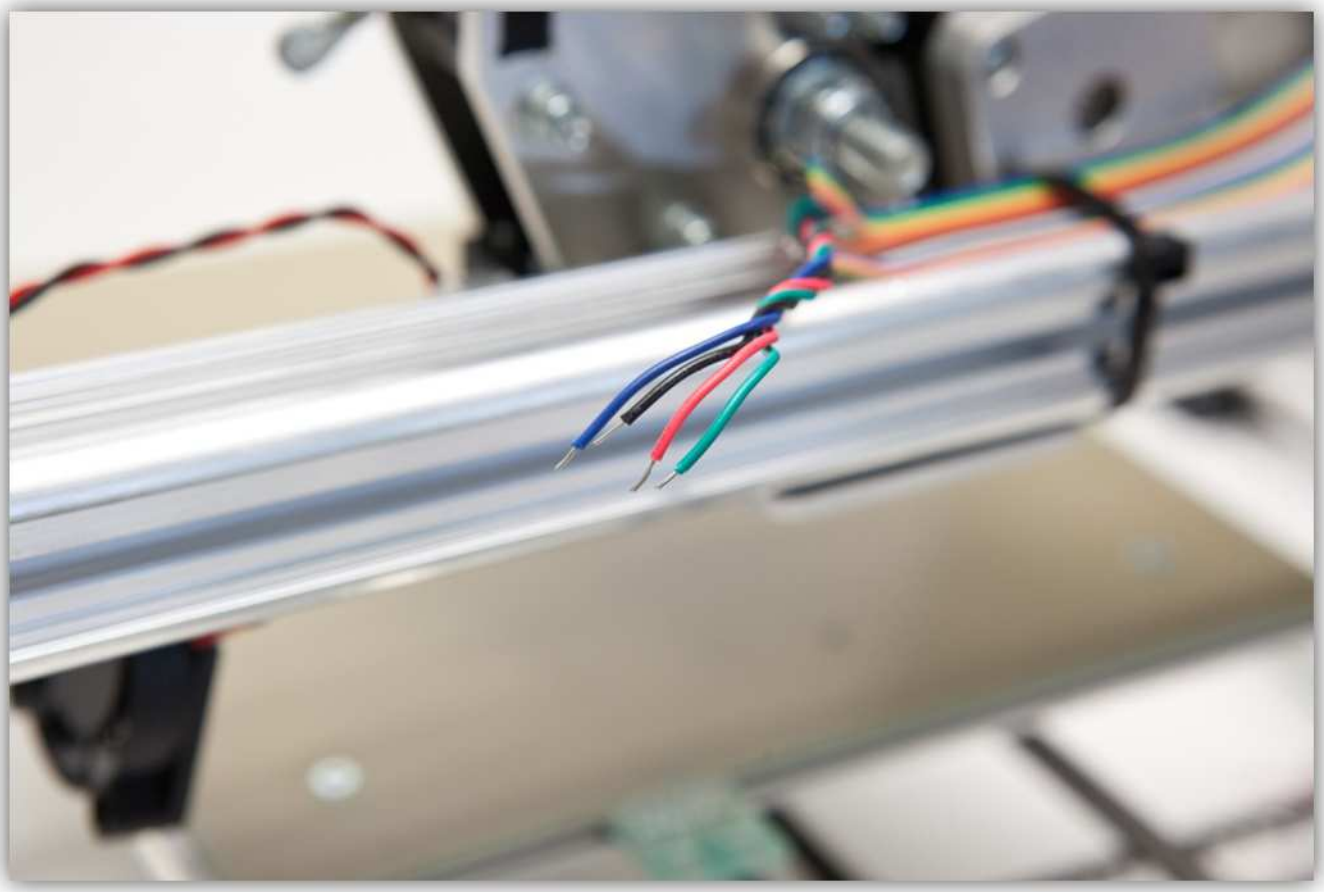
Use some small tie-strips (bag 40) to group the wires together.



Turn you attention to the other end of the flat cable again.

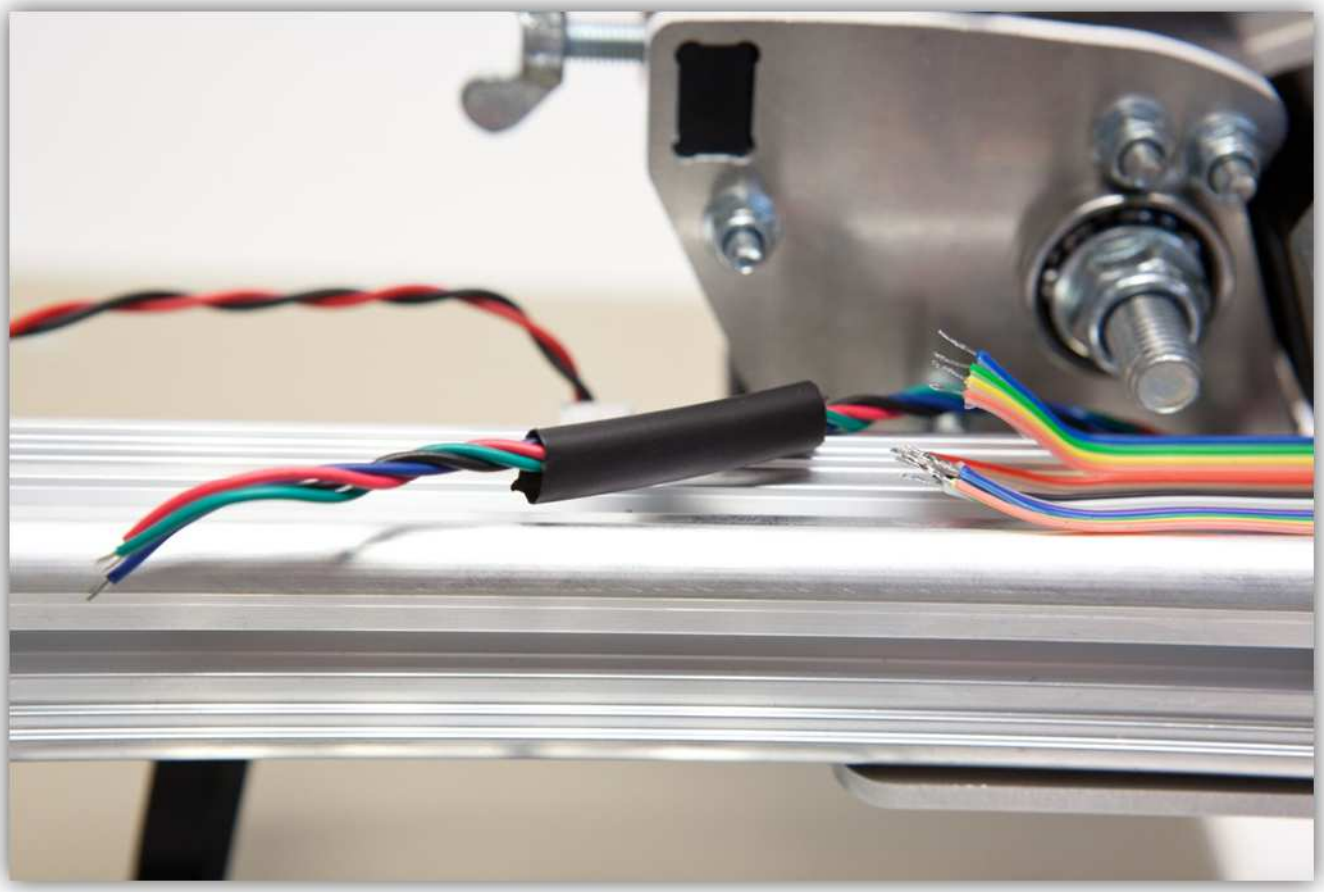


Take the wires of the extruder motor and tin them.

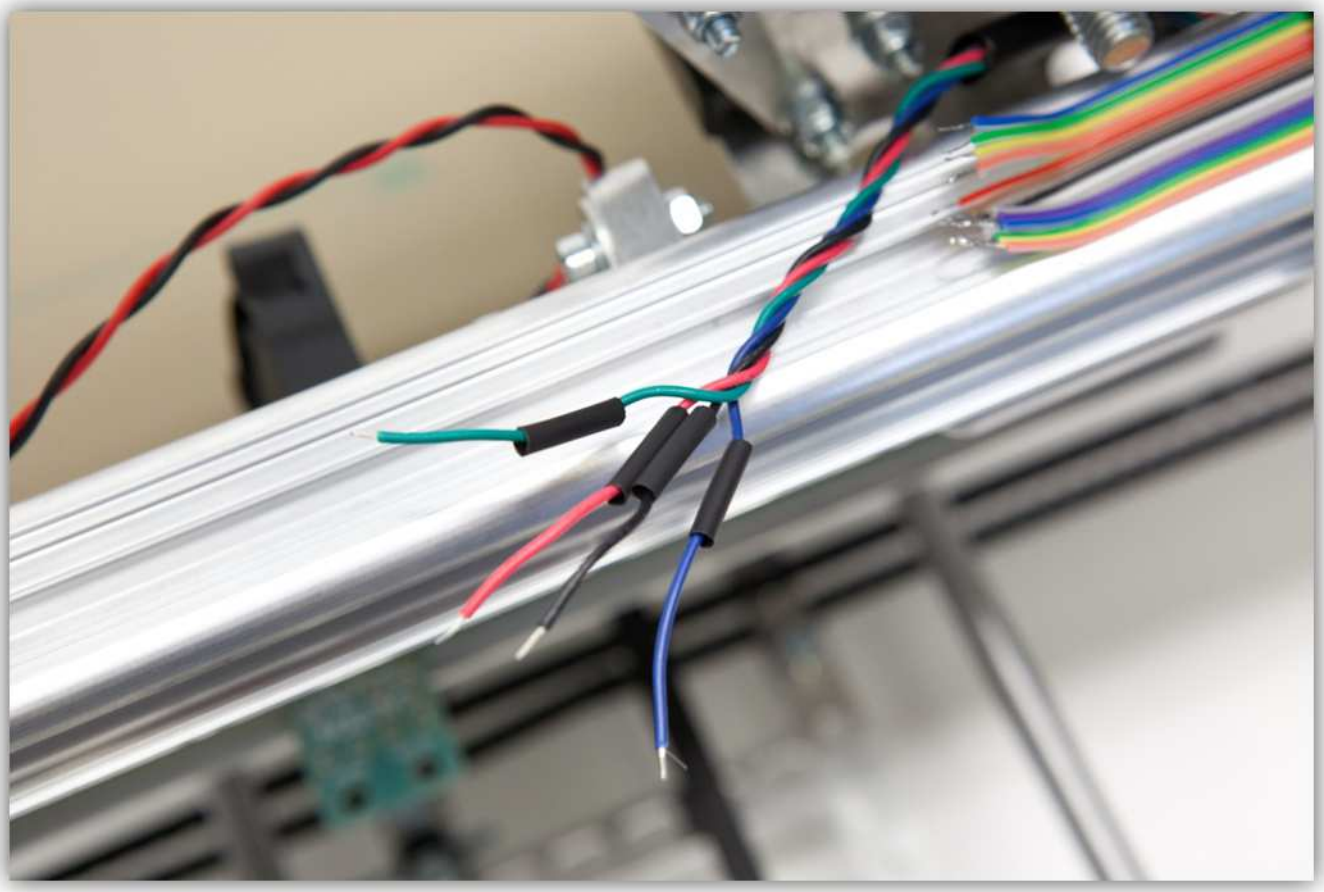


Cut 4 small pieces of the small heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the biggest heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

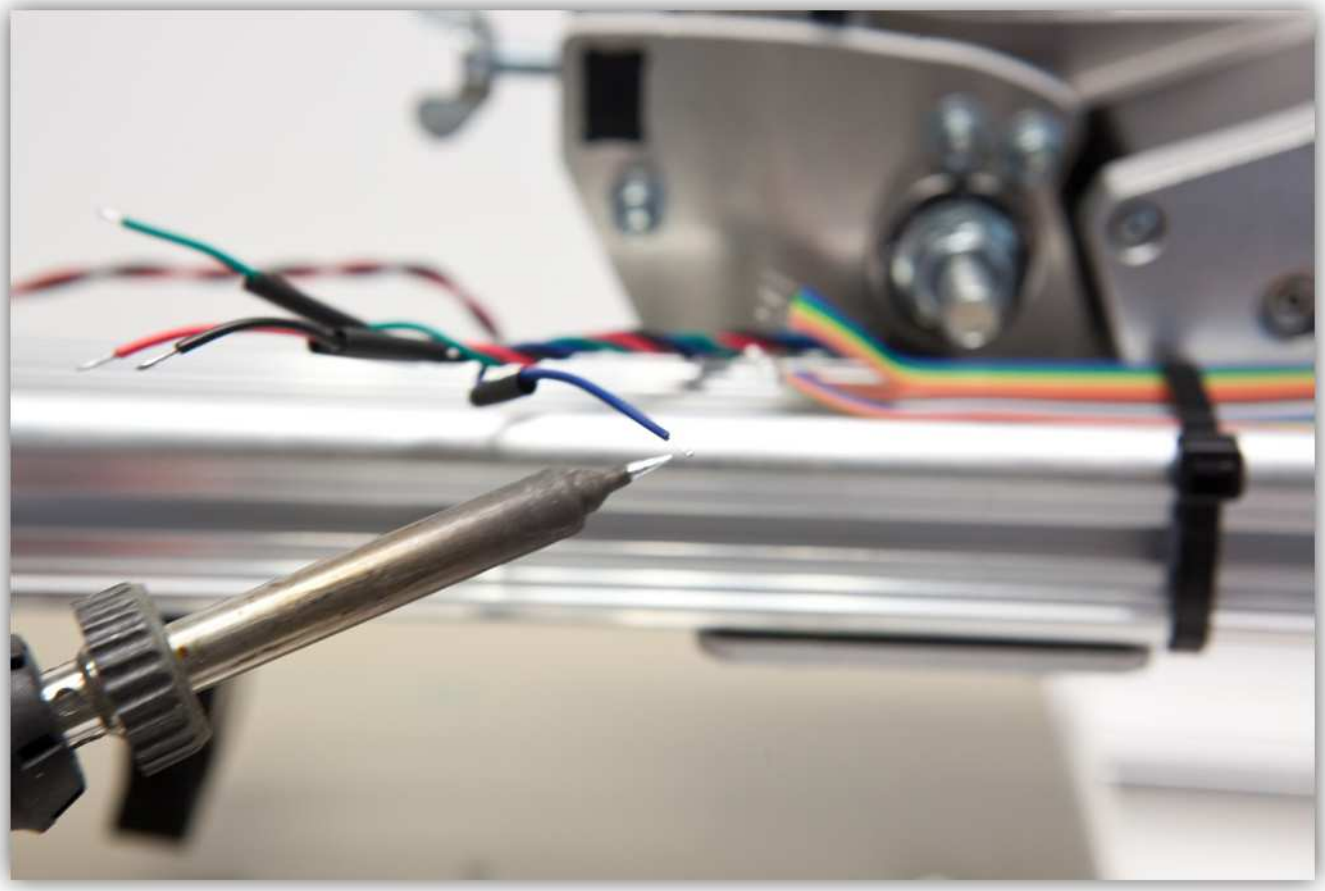
Slide the big heat shrink tube over the 4 wires of the motor.



Slide the 4 small heat shrink tubes over the 4 wires of the motor.

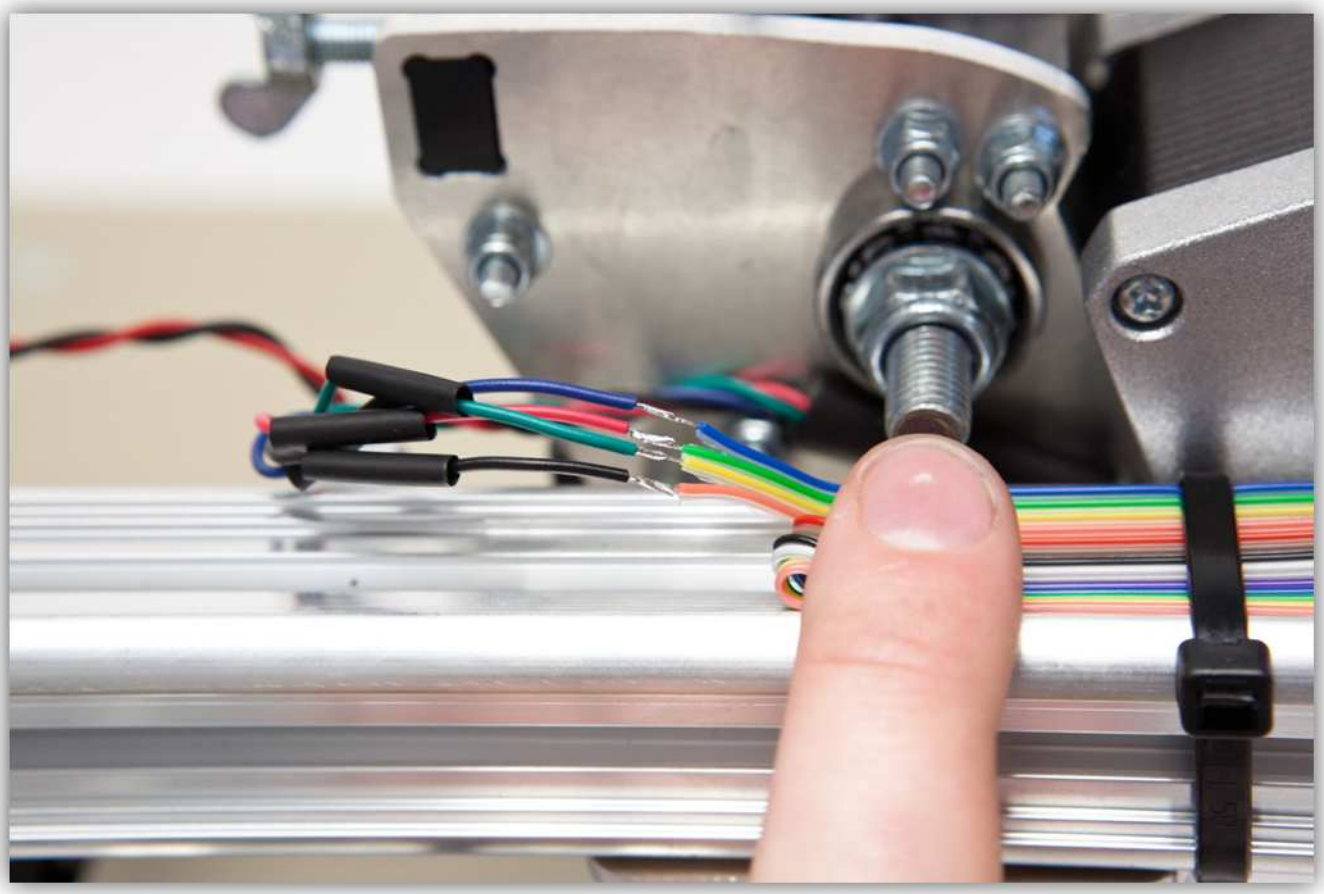


Tin all the wires.

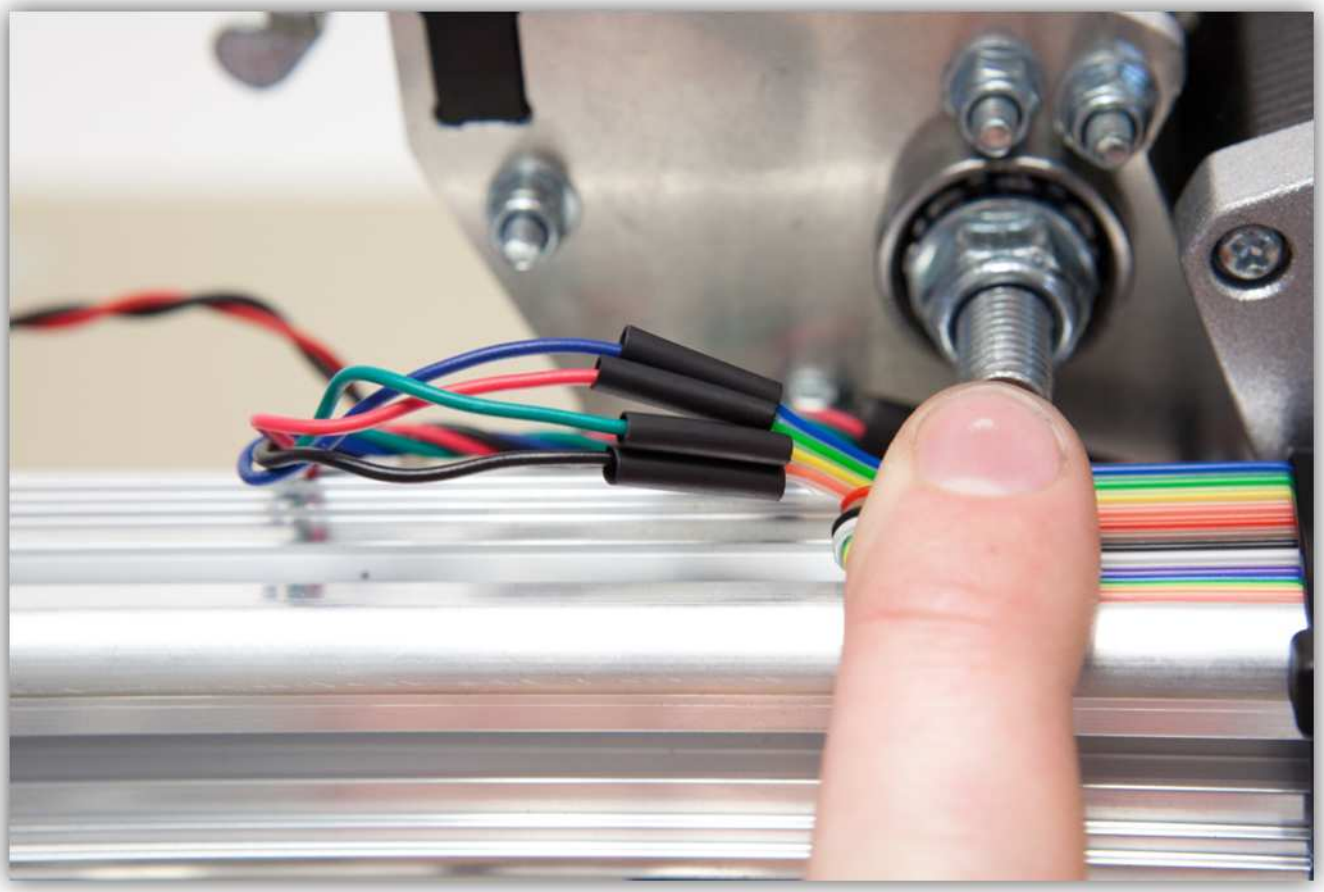


Solder the 4 wires from the motor to the 4 wires of the flat cable you tinned earlier. **Watch the colours closely.**

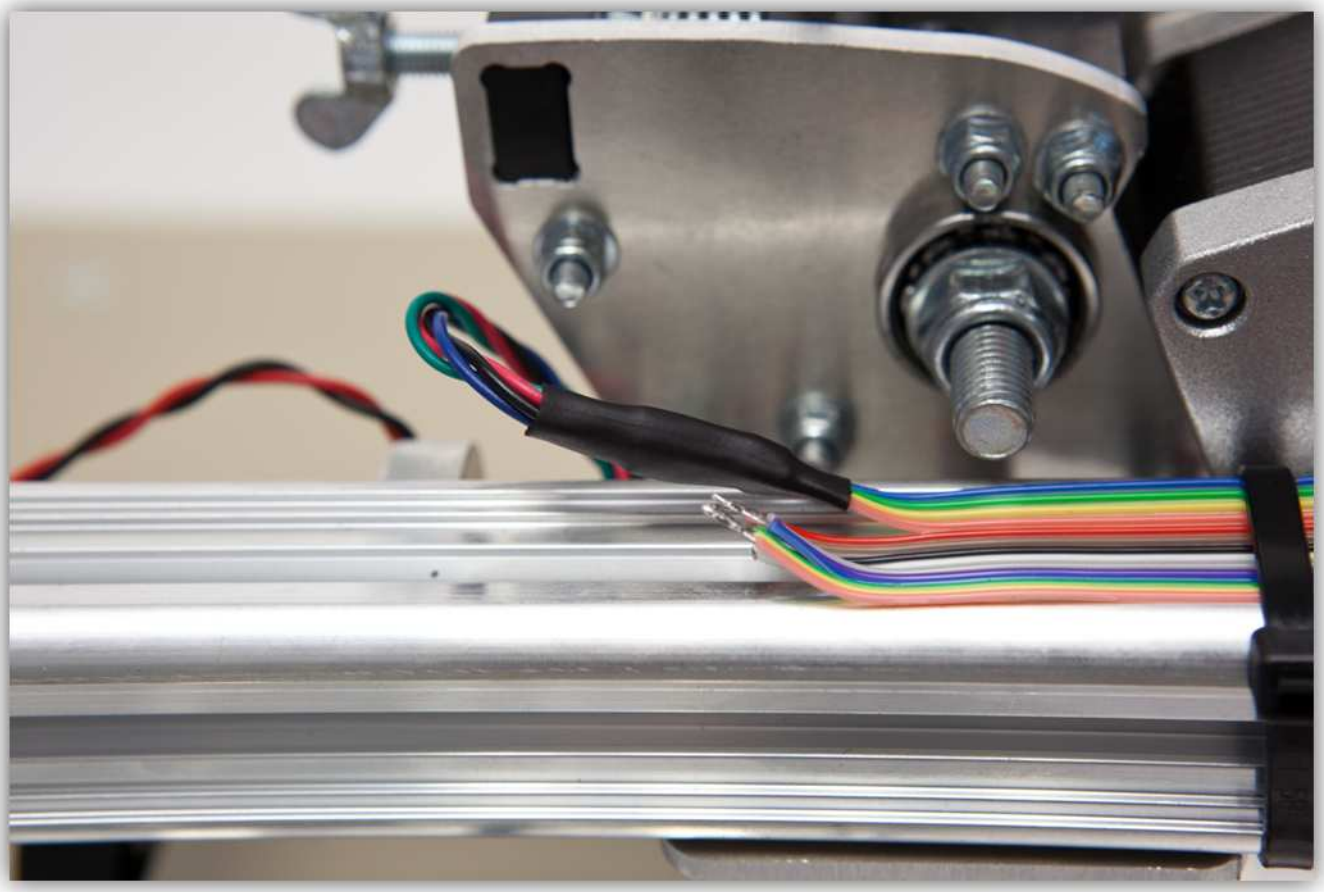
Flat cable	**->**	**Motor wires**
Blue	**->**	**Blue**
Green	**->**	**Red**
Yellow	**->**	**Green**
Orange	**->**	**Black**



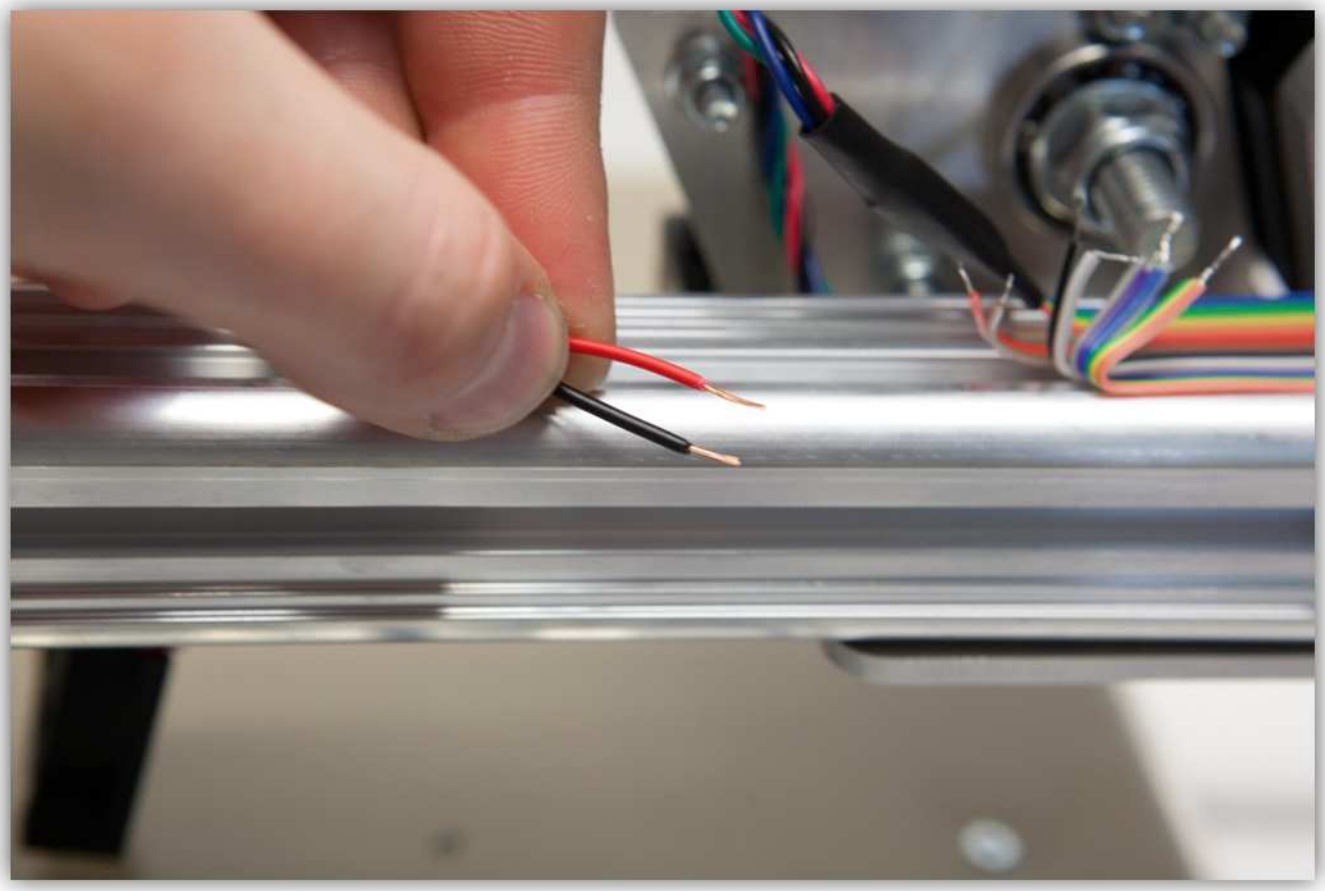
Slide the small heat shrink tubes over the solder joints and heat them up so they shrink.

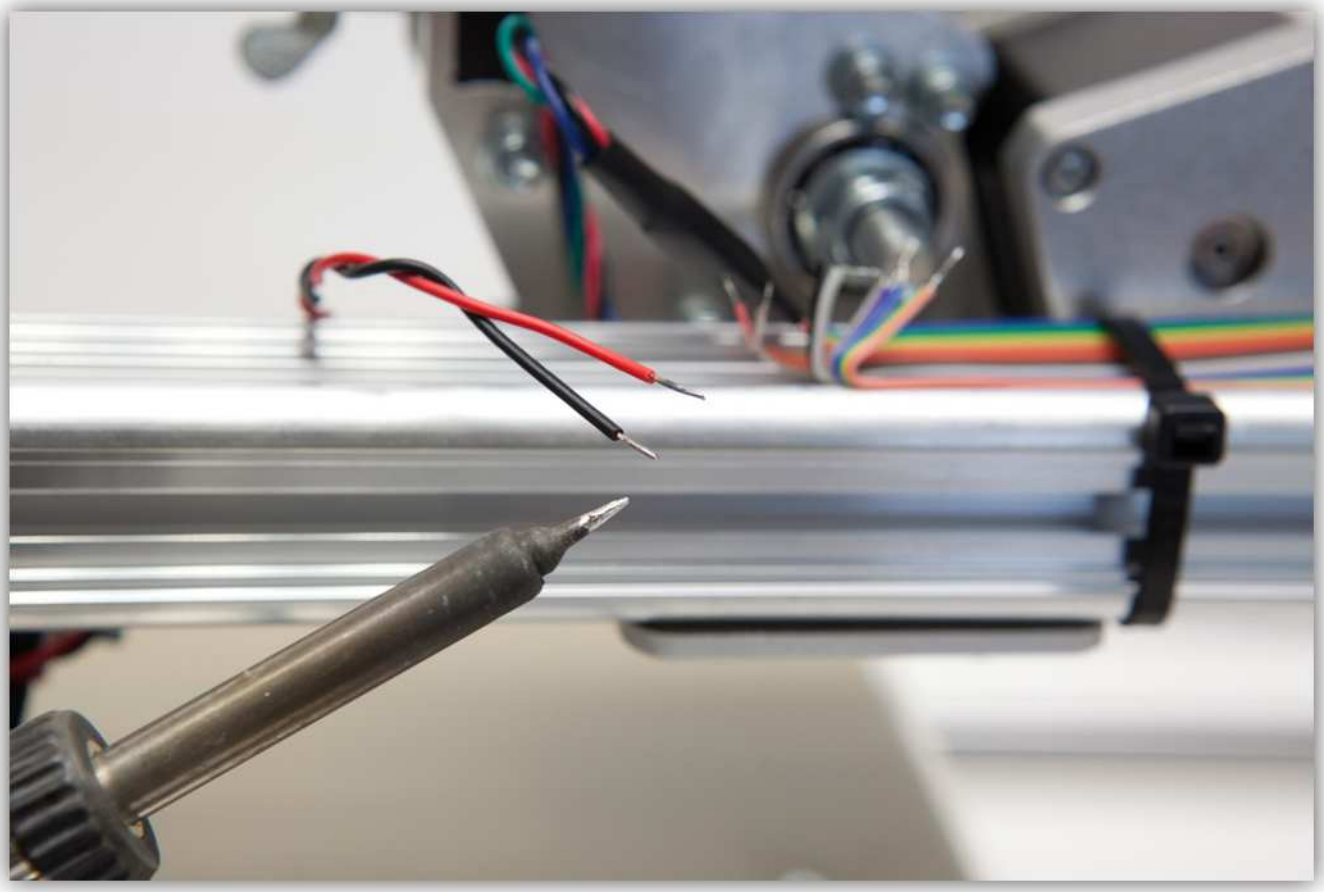


Now slide the big piece of heat shrink tubing over the 4 small pieces, heat the big piece so it covers and protects the 4 heat shrunk joints.



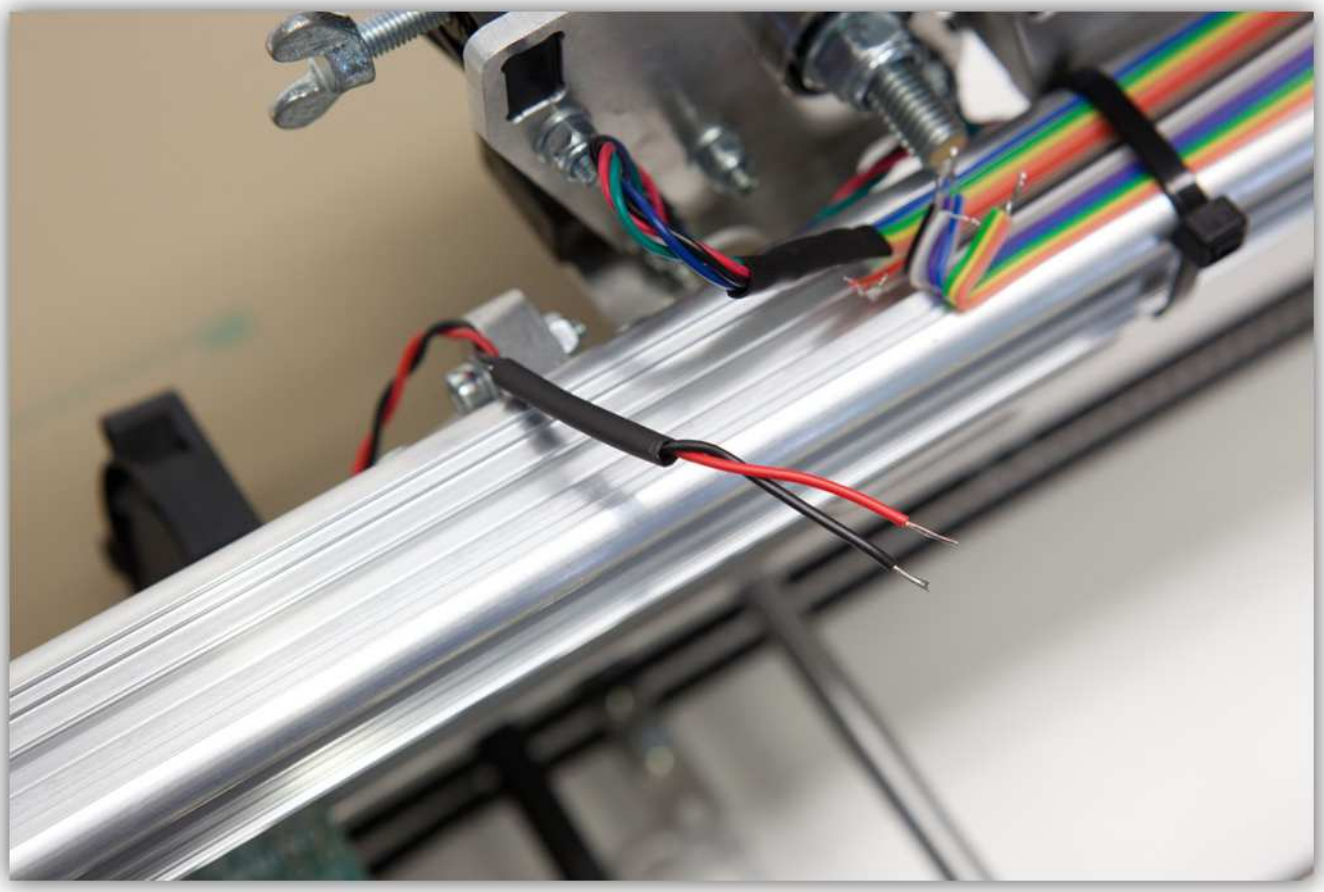
Now take the 2 wires of the fan and tin them.



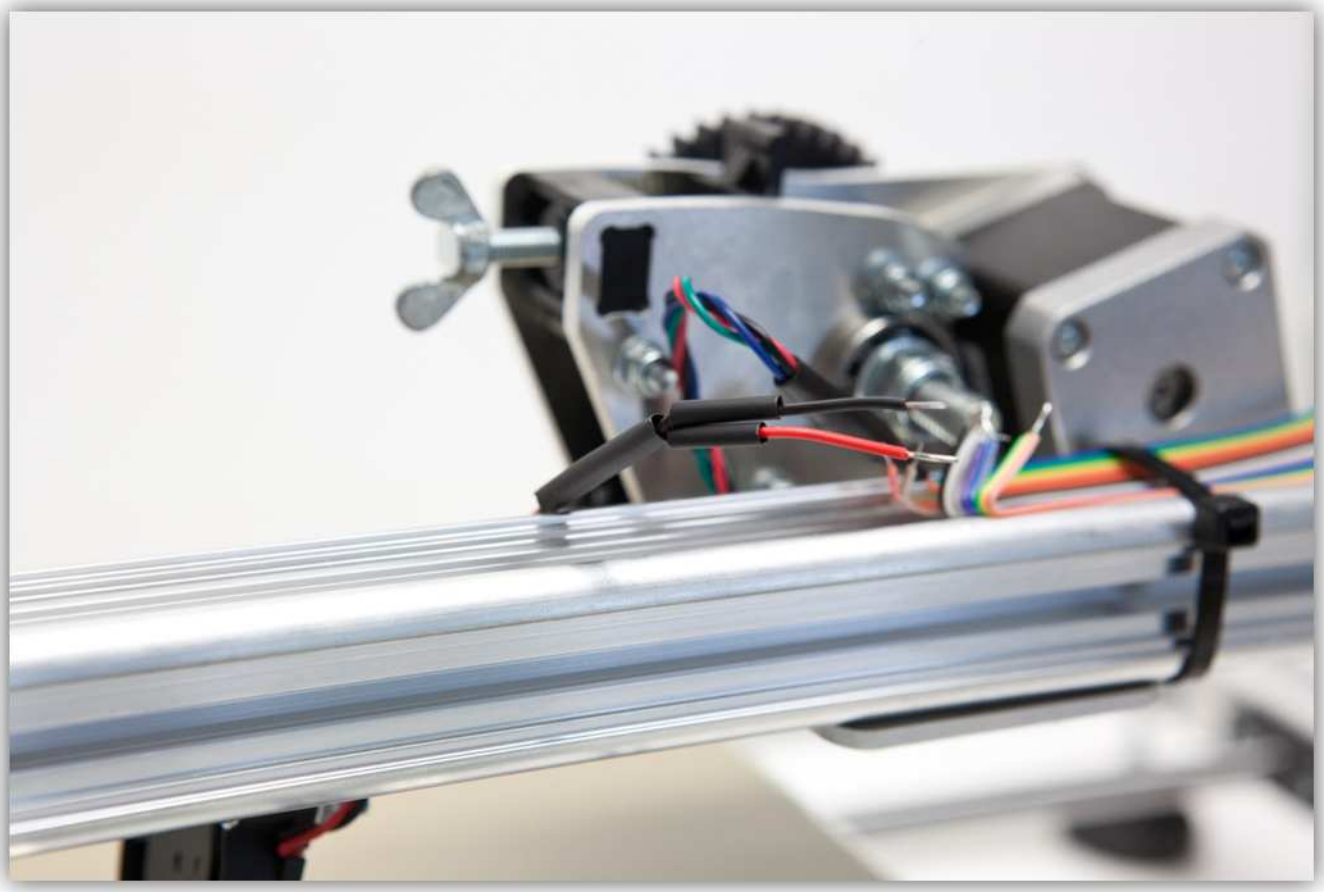


Cut 2 small pieces of the smallest heat shrink tubing of 1.5 cm (0.59") long and 1 large piece of the medium size heat shrink tubing of 4 cm (1.57"). You can find the heat shrink tubing in the bag labelled with 40.

Slide the medium size heat shrink tube over the 2 wires of the fan.

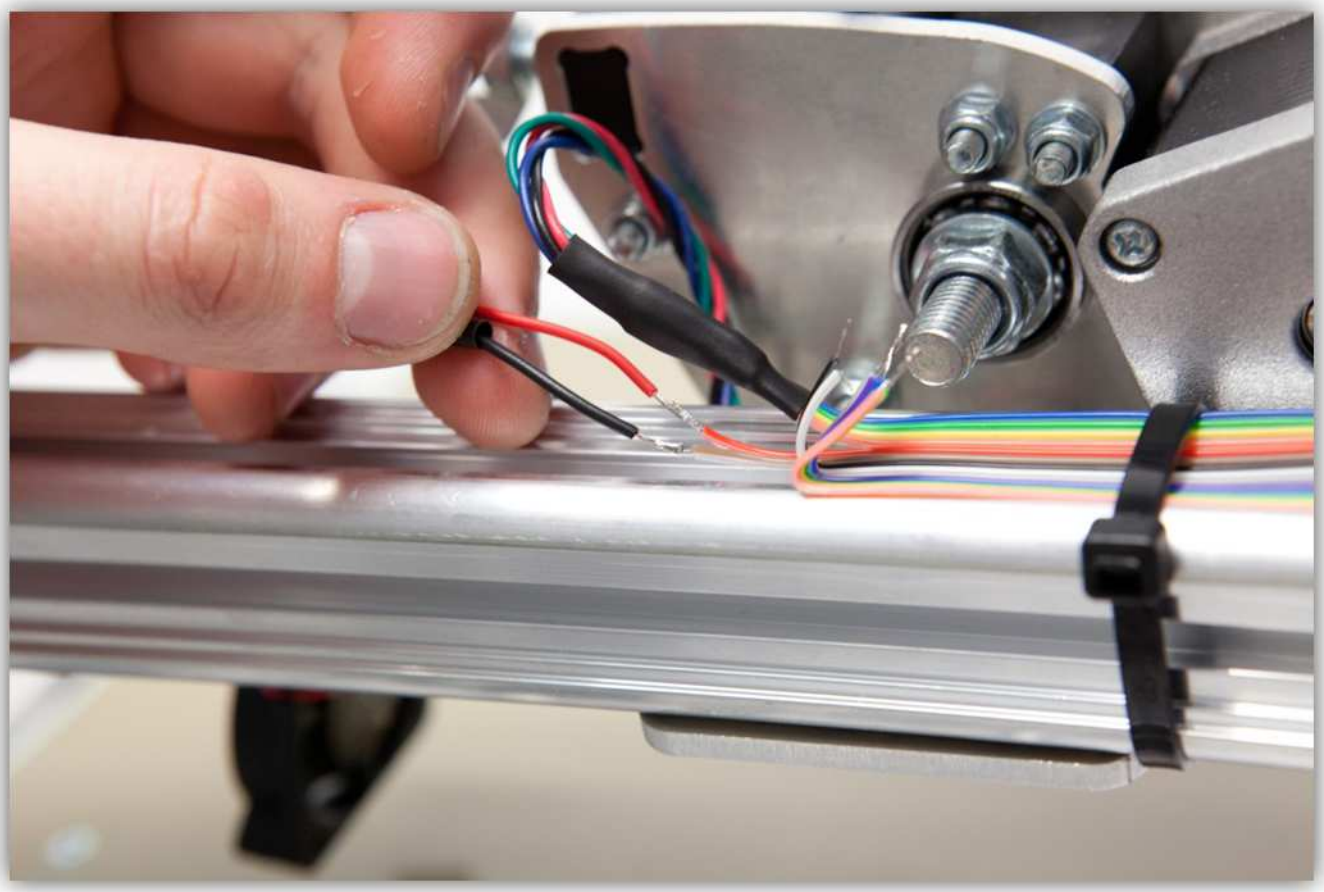


Slide the 2 small heat shrink tubes over the 2 wires of the connector.

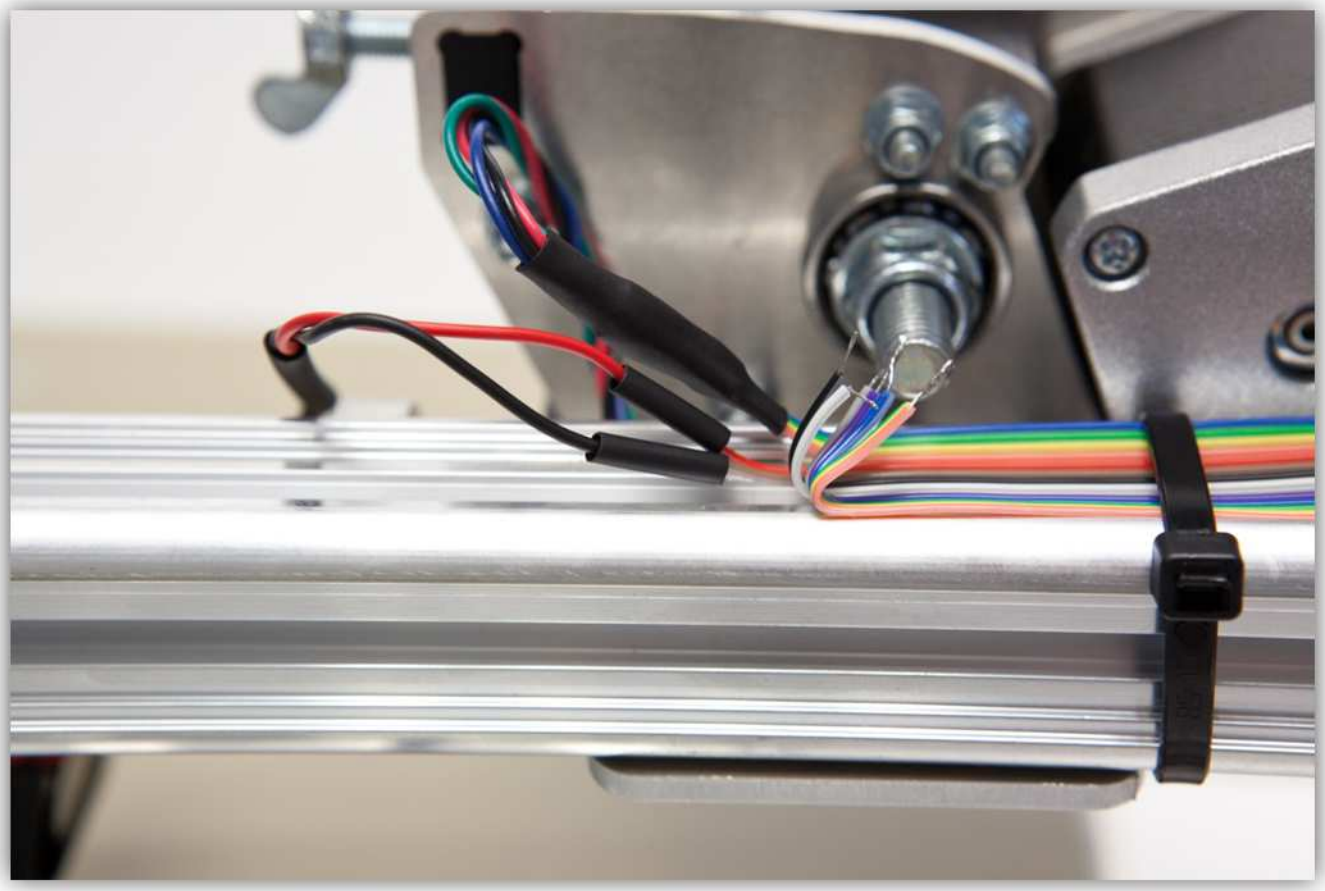


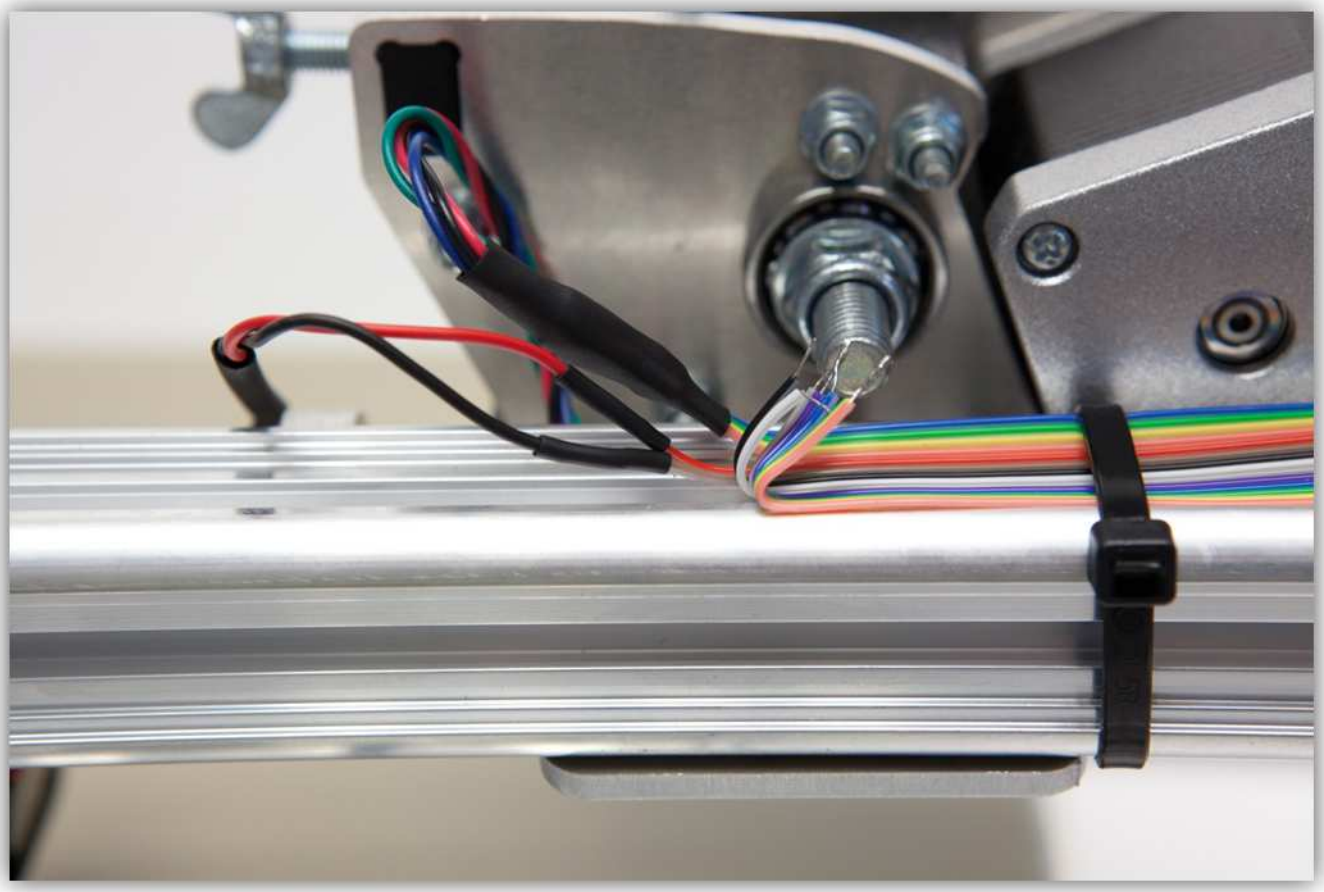
Solder the 2 wires from the fan to the 2 wires of the flat cable you tinned earlier. **Watch the colours closely.**

Flat cable	**->**	**Fan wires**
Red	**->**	**Red**
Brown	**->**	**Black**

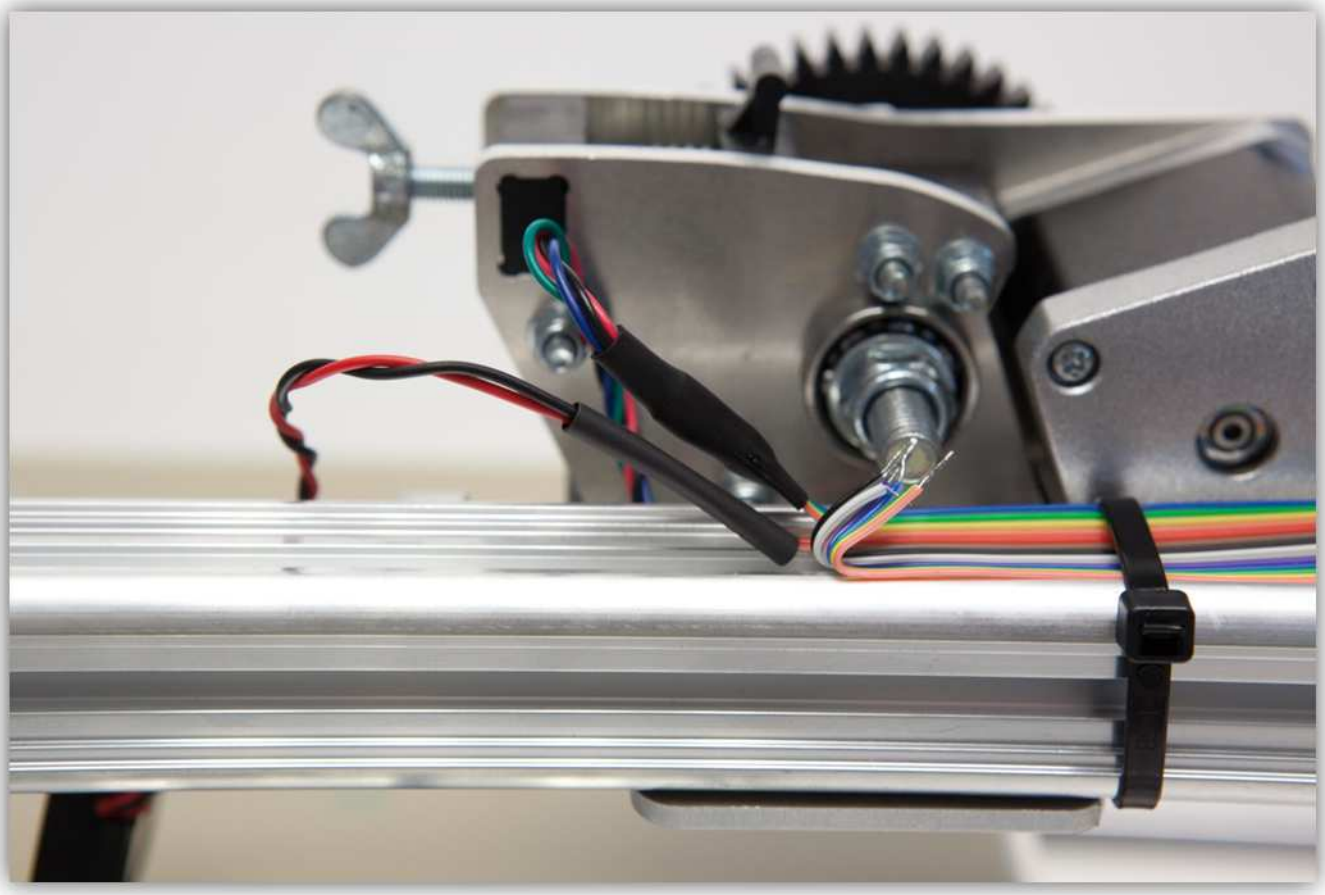


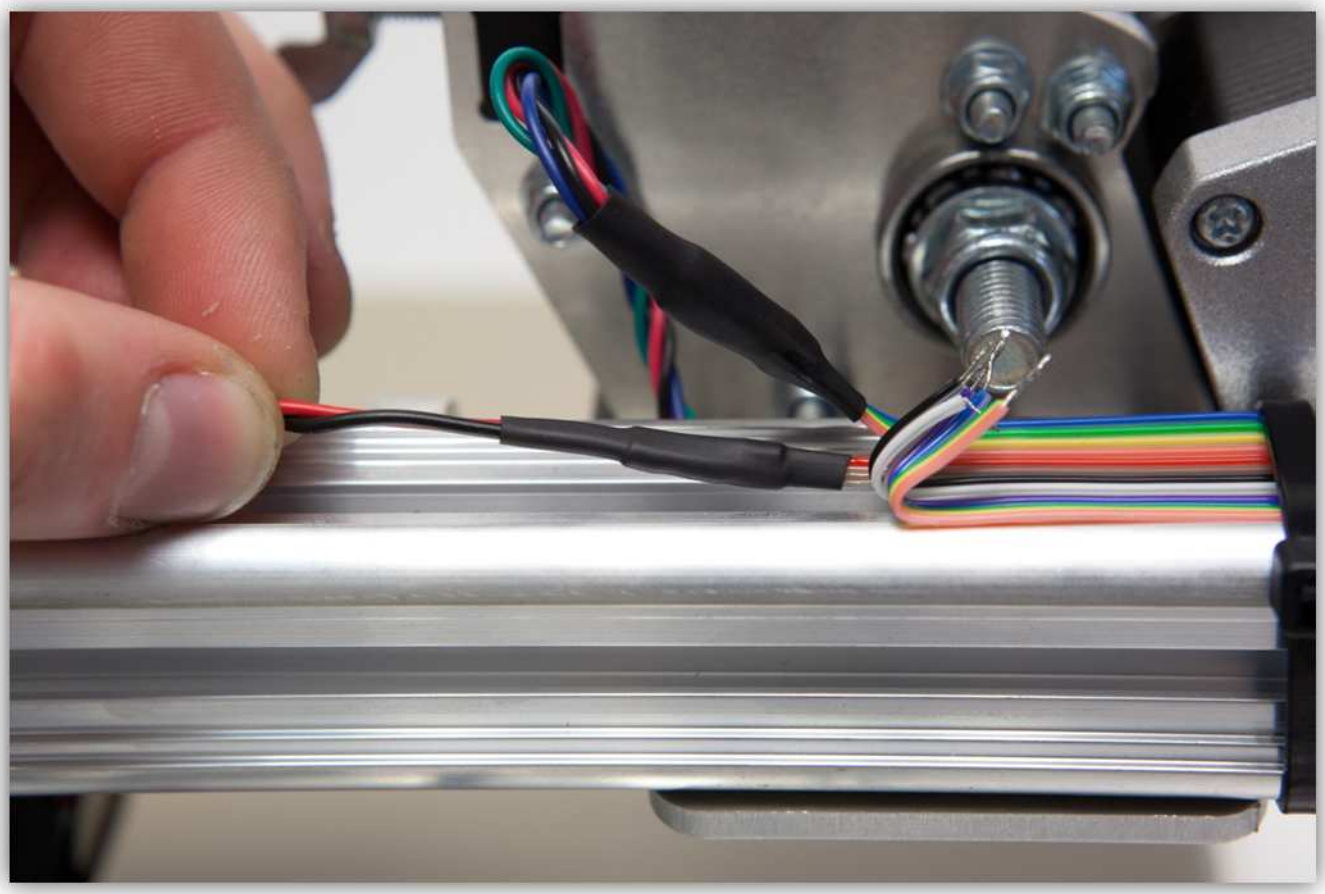
Slide the small heat shrink tubes over the solder joints and heat them up so they shrink.



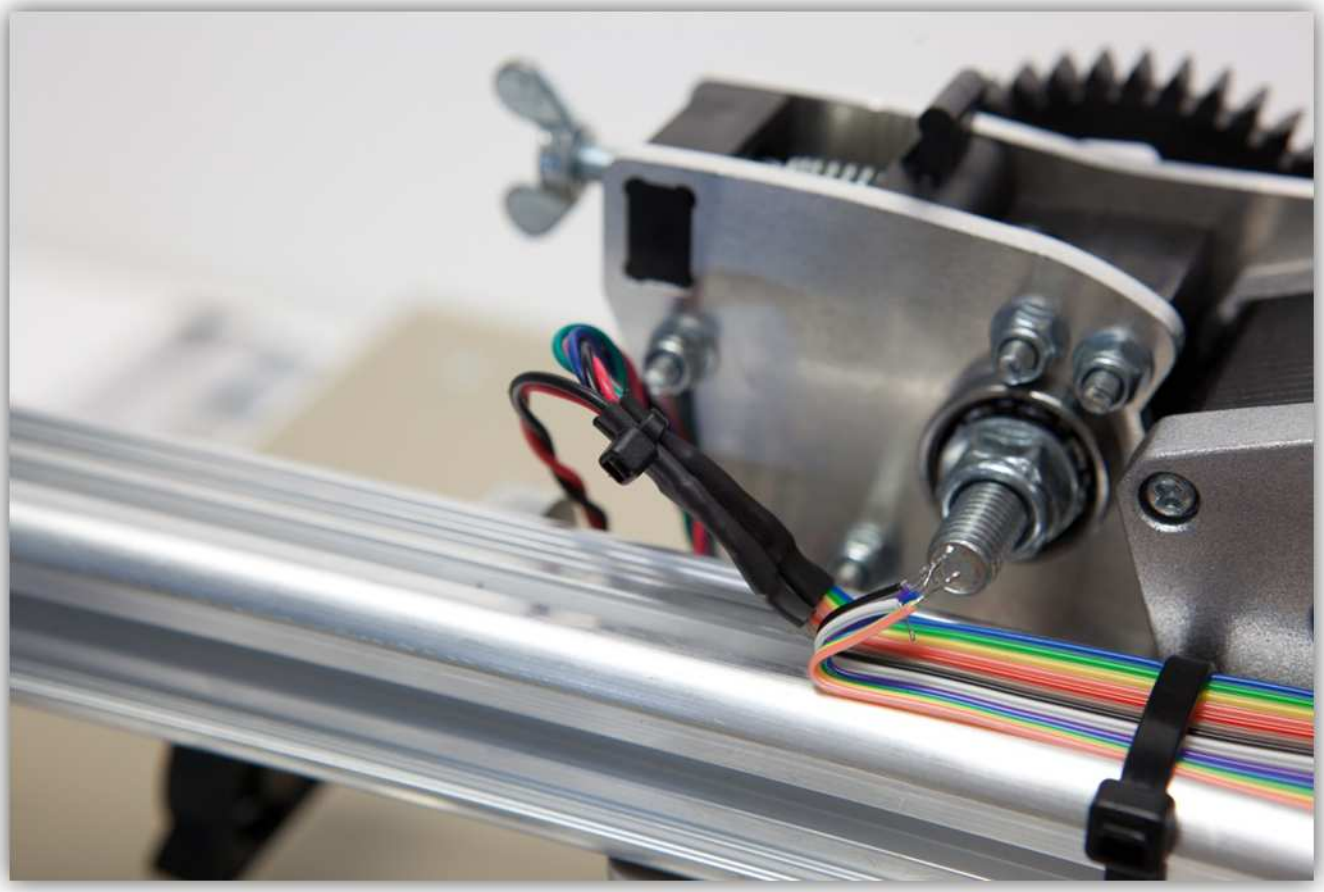


Now slide the big piece of heat shrink tubing over the 2 small pieces, heat the big piece so it covers and protects the 2 heat shrunk joints.





Use a small tie-strip to keep the cables together.



Use a small tie-strip to guide the cable of the fan.

We will return to this flat cable again in a later chapter to hook up the extruder itself.