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How to Replace the End Connector of a Networked Robotics TPL3-series Digital Temperature Probe

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Introduction

There are several reasons why you may wish to disconnect and reattach the end connector on your Networked Robotics TPL3-series digital temperature probes.

These include:

(1) The connector may have been pulled off accidentally.
(2) You might want a shorter wire.
(3) There may be a tight space or seal and thus the probe is too big to insert in the monitored device; you need to temporarily remove the end connector so that it fits through the small space and then reattach it.

Preparation

The probe is comprised of standard telecom components. The process of attaching an end-connector is similar to that of attaching an end connector on a standard business network or phone cord. Your telecom or IT group is likely to have the materials and expertise necessary to do the job. An IT professional is not needed however. Many will be able to accomplish this with some simple commonly-available materials and the instructions below.

Lengthening Probes

TPL3-series probes can be lengthened at any time by simply attaching another cable with the RJ45 coupler that is included in every shipment and either Catx (network) or business phone cable. These extensions can be very long – as much as 300 ft.

Cat 5 and 6 wires are round rather than the flat wire of the probe. Try to run only the flat wire of the probe itself through doors and seals in order to minimize any air gap and thus air infiltration. Any extension with round wire should be completely external to the freezer or other monitored device.

If you shorten a probe, you can usually lengthen it again as above.

Differences in the End Connector Attachment Process between TPL3 and TPL3U

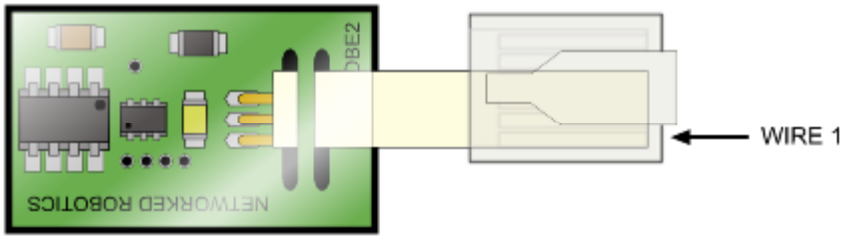
There are differences in how easily the TPL3 model version end connector can be attached vs the TPL3U model version. The TPL3U version is used to monitor ultracold minus 80°C freezers. The TPL3U model utilizes a kind of wire that is a little more difficult for customers to successfully crimp – but the instructions are very similar.

Removing the Existing RJ12 End Connector

You can cut TPL3-series flat cable with common scissors. Cut the old clear end connector off, cutting perpendicular to the wire. You may wish to save the old connector to look at and use for reference when you crimp on the new connector. Don't try to reuse or repair an RJ12 connector plug that was ever attached to a probe. Always use a new connector.

Crimping the RJ12 Connector onto the TPL3 Version Wire

Crimp a new 6-pin, 6 connection (6P6C), RJ12 connector onto the probe wire using a 6-pin telecom RJ11 crimper. Example sources for these are listed below. The TPL3 wire has 4 conductors and the RJ connector has 6 so there's not an even pairing. Note that the top 2 pins of the connector are unused. The wire must be inserted asymmetrically all the way to one side before crimping. See the figure below.



Align the probe and wire as indicated. In the figure the tab or clip on the RJ12 connector is on the top, the pins are on the bottom and are only somewhat visible in the figure. In the figure above the wire is shown as just a few inches long which is easy to orient, but standard TPL3-series are 10 feet long. You can trace the wire back from the probe head or you can look carefully at the wire which has two distinguishable sides on the TPL3-version. One side has four sections, on the other there is a broader strip down the middle. In the figure above the top of the wire is the side with the 4 sections. The 4-section side of the wire is visible when the tab is up. Slide the connector/cable end into the 6-pin section of the telecom crimper (not the 8 pin section) and squeeze hard. You may need to squeeze several times to ensure a reliable connection. To test, plug into an NTMS4 port and verify that the probe lights green as expected.

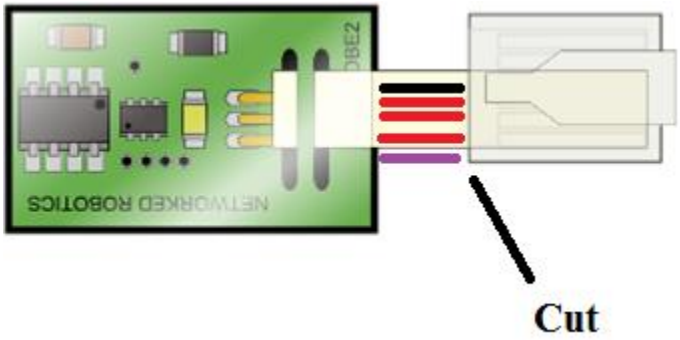
TPL3U Version

In 2019 Networked Robotics switched to a 5-wire version of the TPL3U digital temperature probe from a 4-wire version. The 5-wire version is easier to recrimp than the 4-wire version but the TPL3U probe is still much harder to work with than Networked Robotics' TPL3 probe when it comes to attaching an end connector.

To attach the end connector requires one simple modification from the above. In the figure below the bottom-most wire (purple) is unused and must be cut back so that the other 4 wires can fit into the connector properly. The bottom red wire must match the

bottommost pin of the connector as described above. The purple wire is left disconnected.

Why did Networked Robotics do it this way? The 2 unused wires (black and purple) serve as guard wires that protect against damage to the active signals in the cable in the 3 red wires. Only the red wires carry active signal. If the black and purple wires are damaged or do not exist the probe will function normally.



Testing
Pull lightly on the connector to make sure it is firmly attached.

Plug the probe into a free NTMS port and make sure that the green LED on the TPL3 is lit. If not use the NTMS Configuration Wizard to make sure that the NTMS port that you are plugged into is set to “TPL3”. You may wish to acquire data manually with the “Telnet” command as described in the TPL3 manual to confirm that temperature is acquired properly.

If the probe doesn’t light, or if temperature is not acquired, cut the end connector off again, select a new RJ12 end, and try again. It may take several tries to get it right the first time that you try it. This is especially true with the TPL3U versions. You may wish to look carefully with magnifiers on the TPL3U versions to make sure that the three active wires line up with the first three pins of the connector. The TPL3U versions may take several tries to crimp successfully. The TPL3 versions are usually straightforward.

Home Depot® is a Source for a Crimper Tool and RJ End Connectors

End Connectors

Ideal® 6P6C part 85-345
http://www.homedepot.com/p/Ideal-RJ11-Modular-Plugs-25-Pack-85-345/202276268?keyword=ideal+85-345

Or

Klein Tools®

http://www.homedepot.com/p/Klein-Tools-Telephone-Plug-RJ11-6P6C-25-Pack-VDV826-600/203579136?MERCH=REC-_-nosearch2_rr-_-NA-_-203579136-_-N

Crimping Tool

http://www.homedepot.com/p/Commercial-Electric-Ratchet-Modular-Plug-Crimper-CE70806/202039352

Contact Networked Robotics at support@networkedrobotics.com for any additional questions.