Tektronix

# Socket Cables and Solder Tip Kits

## Instructions

071-2538-00

## Overview

These instructions apply to the following kits:

| Kit part number | Description | Qty |
|---|---|---|
| 020-2954-00 | Socket Cable | 1 |
| 020-2960-00 | Socket Cable XL & DSP Filter Files CD | 1 |
| 020-2958-00 | TriMode High Temp Solder Tip | 10 |
| 020-2955-00 | TriMode Micro-Coax Solder Tip | 10 |
| 020-2959-00 | Damped Wire Pair | 25 |

Order the resistor kit below to replace the resistors on your solder tips.

| | |
|---|---|
| 020-2937-00 | TriMode Solder Tips Replacement Resistor Kit (Includes 50 each of the following components)<br>100 Ω leaded resistor<br>75 Ω surface-mount resistor, 0402<br>Non-conductive tube |

## Description

The Socket Cables and Solder Tips allow you to create customized, hands-free connections from your circuit to Tektronix P7500 Series TriMode probes. Integral resistors on the tips include small-diameter, pre-trimmed leads for you to solder to your circuit board vias or other fine-pitch features. Sockets at the ends of the cables allow you to quickly change between the soldered-down tips at multiple test points.

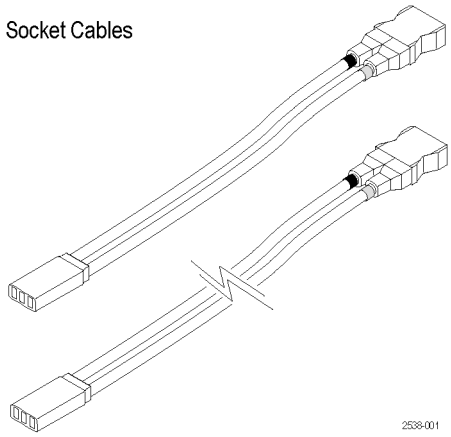
The TriMode High Temp Solder Tip and TriMode Micro-Coax Solder Tip support full TriMode capability (differential, single-ended, and common-mode configurations). The Damped Wire Pair are designed for differential measurements only.

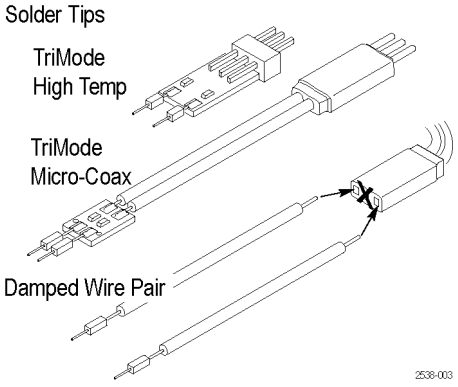
The Socket Cable XL is 5 feet long and is intended for use only with the TriMode High Temp Solder Tip. Always use the DSP filter files when using the XL cable.

### Using the Solder Tips

General recommendations:

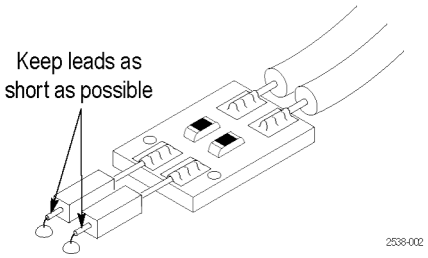
- Use the Damped Wires only in pairs, in the A-B (differential) mode.
- The solder tips cannot support the weight of the attached probe, so you must secure the probe to the circuit board to relieve strain on the tips and the solder connections.
- Use a flux pen to add flux to the solder tips and to your test points. The flux makes soldering easier.
- Use only ESD-approved soldering irons and no-clean flux solder when soldering.



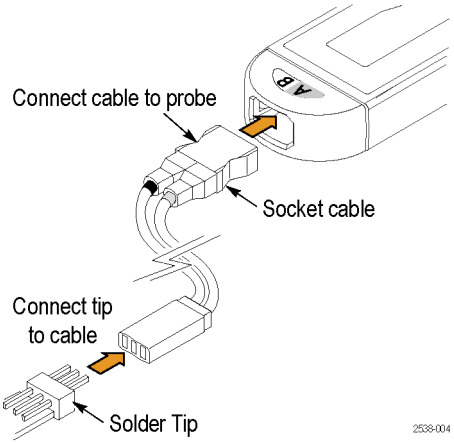




## Procedure

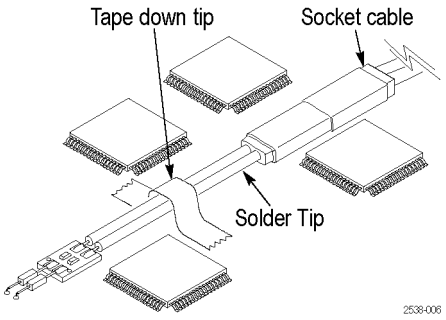
1. Choose a location where the solder tip leads can reach your test points, while keeping the tip leads as short as possible for the best signal quality. Note signal polarities and grounds where applicable.




2. Apply solder to the test points on your circuit.
3. Solder the tip leads to the test points on your circuit and clip off any excess.
4. Connect the pins of the tip to the sockets in the cable. Note signal polarities and grounds where applicable.




5. Align the cable with the red band to the A input of the probe. Push the cable end into the probe head until it seats in the head.
6. For a secure mechanical connection, use double-sided tape or hot glue to secure the tip to your circuit.




### Signal Quality with the Socket Cable XL

Due to the length of the Socket Cable XL, the input signal to the oscilloscope requires some DSP filtering. You must load filter files onto your oscilloscope from the CD that is included in your XL cable kit. Always use the filter files when you use the Socket Cable XL.

### Load the Filter Software

1. Insert the CD in the oscilloscope drive.
2. Navigate to the CD folder and make a copy of the Socket Cable XL Filter Files.
3. Paste the files in C:/TekScope/ Math_Arbitrary_Filters/Probe-Filters.
4. From the Vertical menu, click Probe Cal. Under Probe Tip, select Other Tip.
5. From the Math menu, select Math Setup.
6. Click Editor and select Filter.
7. In the user-defined Arbitrary Filter area, click the Load button.
8. Navigate to the directory that you stored the filter in (from step 2) and select the filter.

### Using the Filter Software

Two filters are available:

- XL_HTT_DIFF_Multirate.flt (for differential mode)
- XL_HTT_A_B_COMM_Multirate.flt (for A-Gnd, B-Gnd, and CM modes)

Both filters are multi-rate filters that can operate at sampling rates from 50 GS/s down to 1.25 GS/s. Since these are multi-rate filters, the filter bandwidth and rise time vary with the sample rate.

The filters are 4000 points long, so your oscilloscope record length must be at least 2X or greater to display a usable waveform. The first and last 2000 points of record length are truncated from the filtered waveform.

More information about using filters is located in the Tektronix Digital Oscilloscopes Online Help in the "Math Equation Editor (Filter Tab)" topic. For specific information on arbitrary filters, refer to "Arbitrary filters, math".

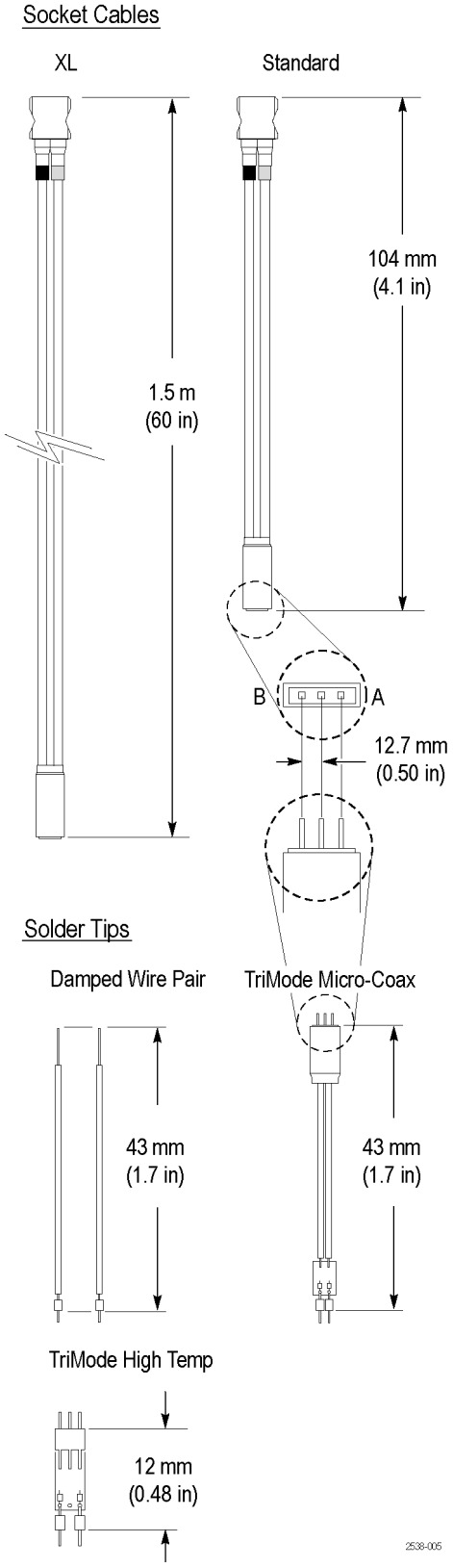
### Replacing the Resistors

The resistors that are presoldered to the solder tips need to be replaced periodically, due to normal wear. A kit of replacement resistors is available (order part number 020-2937-00).

1. Apply a soldering iron to the via on the tip board and remove the existing wire. Work quickly with a low-heat soldering iron.

   If a small piece of wire is in the via, heat the solder and use another piece of wire to push the wire fragment from the via.
2. Add fresh solder to the via, if necessary.
3. Cut one lead of the resistor to 0.2" (5mm).
4. Heat the solder in the via and thread the cut resistor lead into the via, leaving enough lead length to bend the resistor flat with the tip board.
5. Cut excess lead on the bottom of the board.
6. Cut the remaining resistor lead as necessary to reach your test point.

## Dimensions




## Electrical Characteristics (Typical)

**Table 1: Socket Cable [1]**

| Tip/measurement mode | Rise time, ps 10–90% | Rise time, ps 20–80% | BW, GHz |
|---|---|---|---|
| **TriMode High Temp Solder Tip** | | | |
| Differential (A-B) | 60 | 40 | 6 |
| Single-ended (A, B) | 120 | 80 | 3 |
| Common-mode | 150 | 100 | 2.5 |
| **TriMode Micro-Coax Solder Tip** | | | |
| Differential (A-B) | 100 | 60 | 4 |
| Single-ended (A, B) | 150 | 100 | 2.5 |
| Common-mode | 200 | 135 | 1.5 |
| **Damped Wire Pair** | | | |
| Differential (A-B) | 50 | 35 | 8 |

[1] Temperature range 0 °C to +40 °C (32 °F to 104 °F)

**Table 2: Socket Cable XL with TriMode High Temp Solder Tip and DSP filter files [1] [2]**

| | Measurement mode | | | |
|---|---|---|---|---|
| | Differential | | A, B, Com | |
| Acquisition rate, Gs/s | Rise time, ps, 10–90% | BW, GHz | Rise time, ps, 10–90% | BW, GHz |
| 50 | 55 | 10 | 150 | 3 |
| 25 | 60 | 8 | 150 | 3 |
| 12.5 | 120 | 4 | 150 | 3 |
| 6.25 | 230 | 2 | 230 | 2 |
| 3.125 | 450 | 1 | 450 | 1 |
| 1.5625 | 900 | 0.5 | 900 | 0.5 |
| 1.25 | 1150 | 0.4 | 1150 | 0.4 |

[1] The DSP filter files must be used with the Socket Cable XL.

[2] Temperature range –55 °C to +150 °C (-67 °F to 302 °F)

## Warranty Information

For warranty information, go to www.tektronix.com\warranty.

## Contacting Tektronix

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For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.