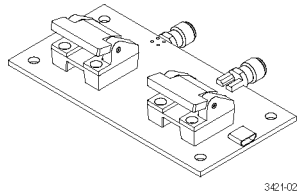


# P77DESKEW Fixture Instructions

The P77DESKEW probe deskew fixture provides an edge source to time-align (deskew) signals at the inputs of P7700 Series probes. The fixture provides a means to deskew two probes at the same time. The probe and the fixture are powered by one of the USB ports of the oscilloscope; a USB cable (Tektronix part number, 174-6919-xx) is included with the fixture.



For performing the deskew procedure, Tektronix recommends using a DPO/MSO70000C/70000DX series oscilloscope.

Connectors on the fixture accept solder tips that are available for the P7700 Series probes. The fixture can also be used to deskew probes with browser accessories.



**CAUTION.** *The probes used with the deskew fixture are ESD sensitive. To avoid damaging the probes, perform these procedures at an antistatic workstation, with an anti-static wrist strap while observing proper ESD practices. Refer to your probe user manual for the anti-static information.*

For best performance, you should check the calibration status of the oscilloscope before performing the deskew procedure. If the oscilloscope requires calibration or the probe requires compensation, perform these steps before deskewing the probes. Refer to your oscilloscope manual for instructions on performing the oscilloscope calibration procedures.

## Check the calibration status

To check the calibration status of the probe, perform the following steps:

1. Select Probe Cal... from the Vertical menu.
2. Select the channel to which the probe is attached and then check the Probe Status readout. There are three possible values for the status:
  - **Initialized.** The probe has not been calibrated on the selected channel; perform the DC probe calibration procedure.
  - **Compensated.** The probe has been calibrated on the selected channel.
  - **Fail.** The probe has not been calibrated; repeat the procedure.

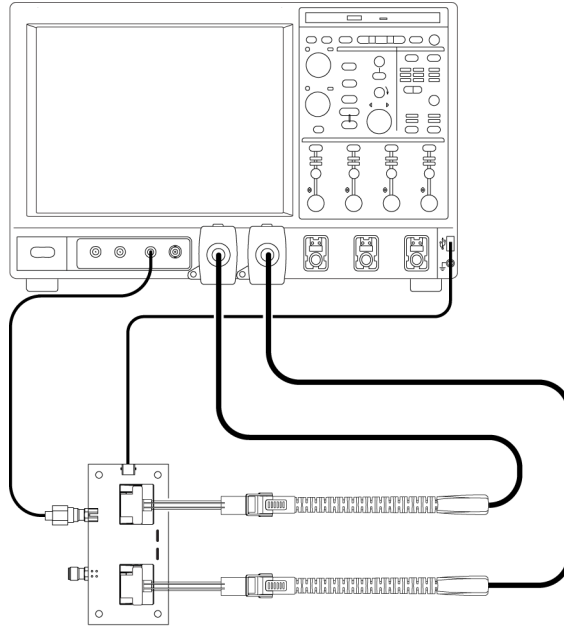
If the test continues to fail, troubleshoot the problem; do not continue with the deskew procedure.



**Deskew procedure**

The deskew function compensates for signal delays that occur between probes due to different tips or cable lengths. The oscilloscope deskew feature applies deskew values after it completes each acquisition. The deskew values do not affect logic triggering.

Refer to the following illustration while connecting the probes and cables to the deskew fixture.



1283-001

**Figure 1: Connection diagram**

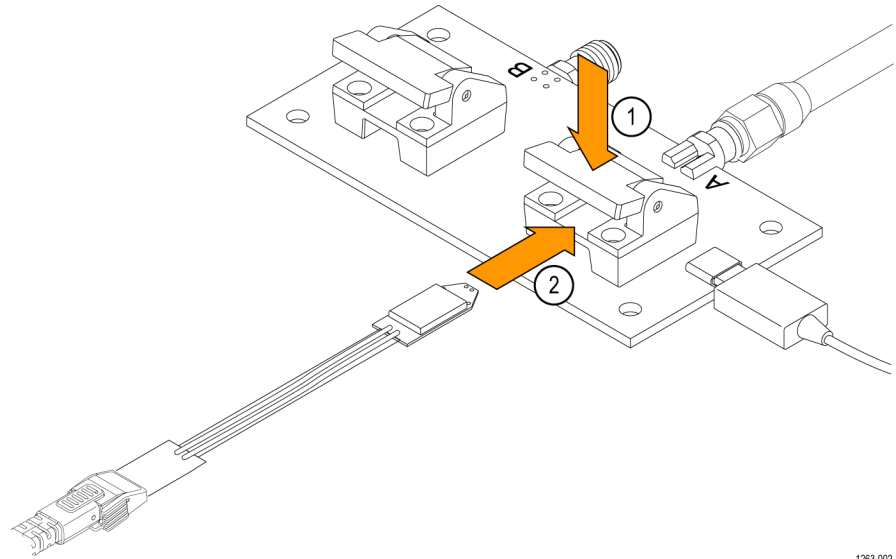
1. Connect the deskew fixture to a USB power source, such as the front panel USB connector on the oscilloscope. The LEDs on the fixture will turn on.
2. Connect the probes to oscilloscope channels where they will be used.
3. Connect the TekFlex tips to the ends of the main probe cables.
4. For single-ended inputs, connect an SMA cable from a single source, such as the FAST EDGE output connector on the oscilloscope to the A input of the fixture.
5. If using a signal generator with differential inputs, connect the + output of the signal generator to the A input of the fixture using an SMA cable. Then connect the - output of the signal generator to the B input of the fixture using an SMA-style cable with equal electrical length as the first SMA cable.

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**NOTE.** *If you are deskewing probes with solder tips, try to use the same solder tips with the deskew fixture that you will use to take measurements. If that is not possible, try to use a solder tip of similar length to the one you have soldered to your device.*

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6. For P77STFLXA or P77STCABL tips, connect the tips to the fixture as follows:
  - a. Locate the Port1 plastic clamp on the fixture and press down on the spring-loaded clamp. Insert one of the probe tips in the direction shown in the following figure, and release the clamp so that the tip locks in place.



1253-002

**Figure 2: Connecting the probe tip to the deskew fixture**

A green LED lights up under the probe tip clamp when the tip is properly inserted.

- b. Repeat the above step for inserting the second probe tip into the Port2 plastic clamp.
  - c. Verify that the green LEDs under both probe tips are on. If not, double-check your connections.
7. For P77BRWSR browser accessory, there are several pads on the deskew fixture that can be contacted by the browser tips. Using these pads, two probes with browser accessories or one probe with a solder tip and one probe with a browser can be deskewed relative to one another.

The pads on the fixture provide access to the same signals routed to the clamps used to connect the solder tips. There are also ground pads located in the same area for use when deskewing using a single-ended signal.

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**NOTE.** *The signals routed to the pads are delayed by 30 ps relative to the signal output at the solder tip clamps. There is a 5.7 ps time difference between the first row of pads and the second row.*

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Insert the TekFlex connectors into the P77BRWSR tips and then continue with the following steps:

- a. Press one of the P77BRWSR tips against one of the pairs of signal traces on the B (Port4) side of fixture board edge, located between the Port1 and Port2 clamps. Press the second tip against one of the ground pads on the right side of the row.

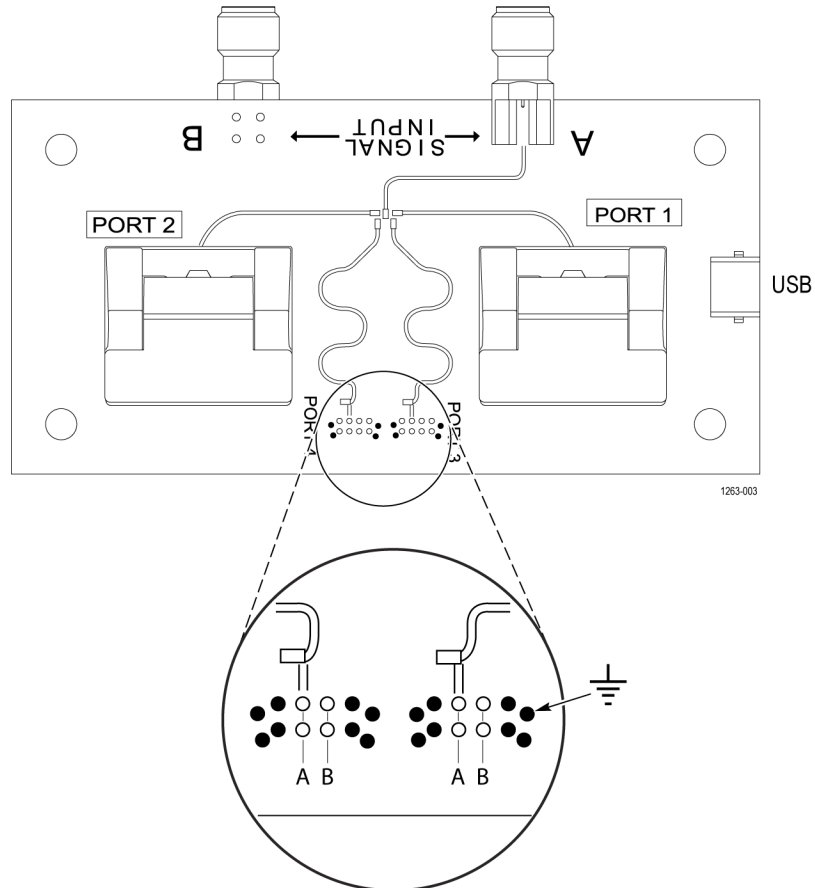
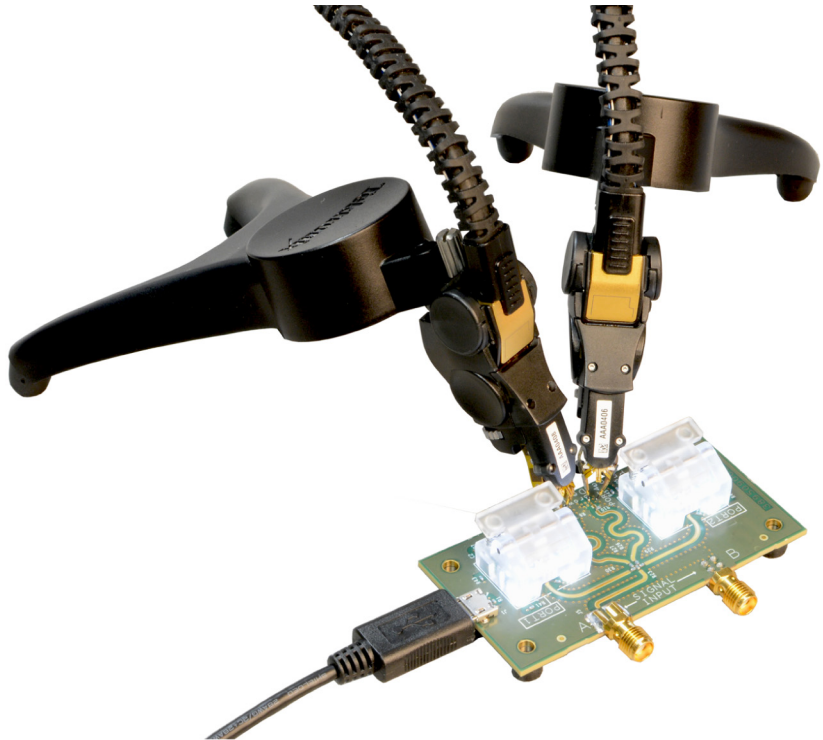


Figure 3: Connection points for the P77BRWSR tips on the deskew fixture

- b. Press the second P77BRWSR tip against a second pair of signal traces on the A (Port3) side of the fixture and one of the ground pads.

The following figure shows an example of using the hands-free accessories with two browsers connected to the deskew fixture.



1263-004

**Figure 4: Connecting the hands-free accessories and P77BRWSR to the deskew fixture**

8. Adjust the oscilloscope to display a stable waveform or push the Autoset button. Choose a channel to use as the reference channel. Channel 1 works well for this purpose.
9. Select Deskew from the Vertical menu.
10. Select the reference channel button and set the Deskew to 0.0 s.
11. Set the acquisition mode on the oscilloscope to average.
12. Adjust the trigger level to get a stable trigger.
13. Turn on the display of the second oscilloscope channel.
14. Adjust the vertical SCALE, POSITION, and OFFSET for each channel so that signals from the reference and second channel overlap and are centered on screen.

15. Adjust the horizontal SCALE and horizontal POSITION so the differences in the channel delays are clearly visible. The waveforms on the screen should look similar to the following figure (note the delay between the two edges):



Figure 5: Signal delay between two channels

16. Select Deskw from the Vertical menu.
17. Select the button for the second channel that will be matched in time to the reference channel.

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**NOTE.** Do the next step at a signal amplitude within the same attenuator range (vertical scale) as your planned signal measurements. On the MSO/DPO70000C series oscilloscope, a change to the vertical scale (Attenuator Setting) can cause up to 100 ps variation in timing skew between channels. If you are using an MSO/DPO70000D/DX series oscilloscope, the channel-to-channel skew will not change with a vertical scale change.

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- Adjust the deskew time for that channel so that its signal aligns with that of the reference channel. When the signals are aligned they should look similar to the following figure:

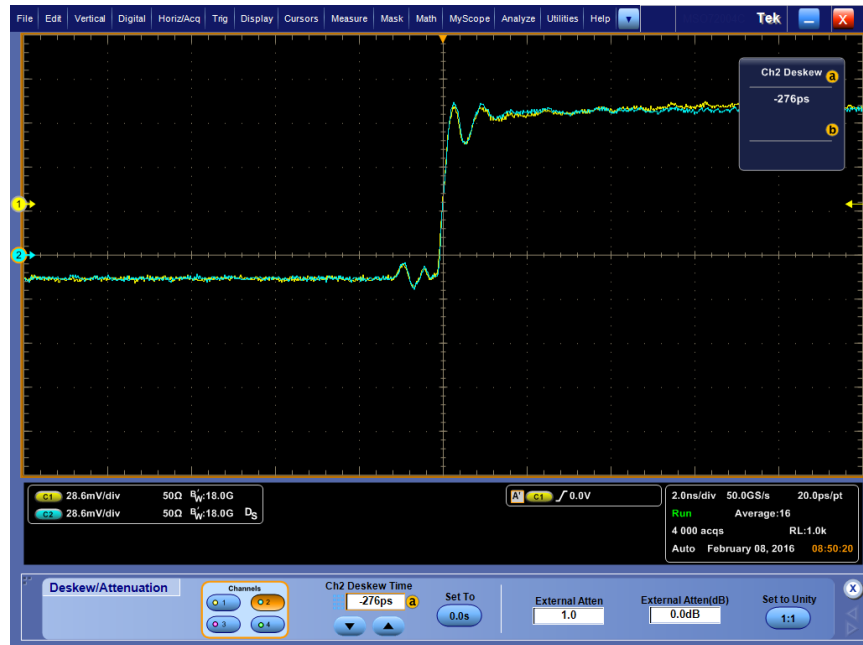


Figure 6: Aligned signals, no delay

- Repeat the preceding steps for each additional channel that you want to deskew.

**P77DESKEW specifications**

<b>Description</b>	<b>Specification</b>
Input impedance	50 Ω ±2%
Fast Edge signal A & B input connectors	SMA
Maximum input signal	4.6 V <sub>RMS</sub>
Time delay (Typical)	
A to B (differential signal path)	≤5 ps
Port1 to Port2, or Port3 to Port4	≤10 ps
Port1 to Port3 or to Port4	30 ps
Port2 to Port3 or to Port4	30 ps
Difference between two rows of pads	5.7 ps
Temperature	
Operating	0 °C to +45 °C (32 °F to +113 °F)
Non-operating	-20°C to +60 °C (-4 °F to +140 °F)

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**NOTE.** *The signals routed to the pads are delayed by 30 ps relative to the signal output at the solder tip clamps. There is a 5.7 ps time difference between the first row of pads and the second row.*

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**Environmental information**



**Equipment Recycling.** This product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For more information about recycling options, check the Support/Service section of the Tektronix Web site ([www.tektronix.com](http://www.tektronix.com)).

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**Warranty information**

For warranty information, go to [www.tek.com/warranty](http://www.tek.com/warranty).