

Positioning Multiple Traces in PicoScope 6



When you're using a four-channel scope like the PicoScope 3423, 3424 or 3425, you often need to rearrange the four traces to prevent them from overlapping on the display. To make them fit, you need to scale them down and then shift them.

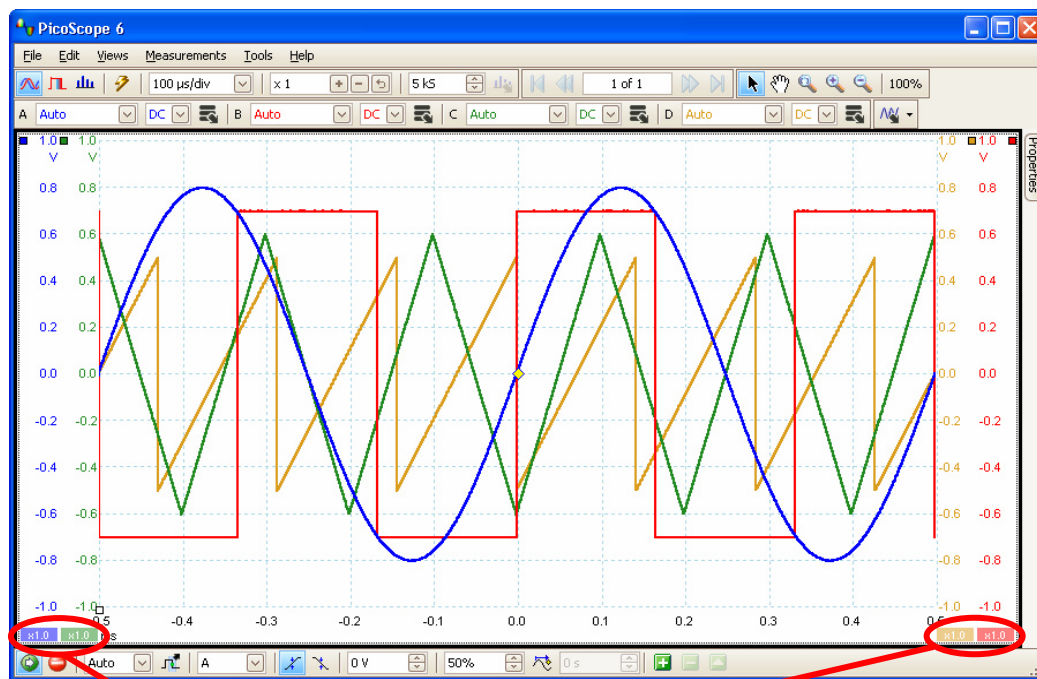
It's easy to rearrange the traces on a scope display. What could possibly go wrong?

In most scopes, ranging from the old analogue types to some of the latest digital models, the only way to scale down a trace is to reduce the vertical sensitivity. That's a bad thing to do on a digital scope. Reducing the vertical sensitivity means that your signal occupies only a small fraction of the input range of the analogue-to-digital converter, so part of the converter's range is wasted. This reduces the measurement resolution and increases errors. Reducing the sensitivity by a factor of four, for example, effectively throws away two bits of resolution.

Luckily, the PicoScope software has a way to scale your traces without compromising measurement accuracy

PicoScope to the rescue

Imagine that you have a different signal connected to each of the four channels of your four-channel scope. Since each trace is initially drawn with zero volts halfway up the Y axis, all the traces are superimposed, as in Figure 1.



Channel scaling buttons

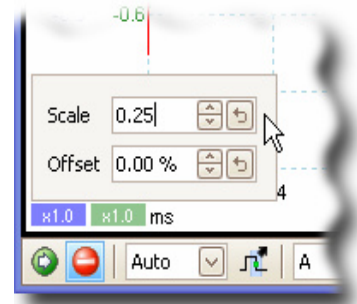
Figure 1. The initial display. The four channels are superimposed on a single scope view. We shall return to the channel scaling buttons later.

PicoScope 6 provides two features to help you arrange these traces into a neat layout:

1. "channel scaling", which shrinks or expands a trace vertically
2. "channel offset", which shifts it up or down

Notice the channel scaling buttons at the bottom left and bottom right of the scope view in Figure 1. Each button is colour-coded to match one of the scope channels. Click one of these buttons and you will get a channel scale and offset dialog, as in Figure 2.

Figure 2 – Scale and Offset dialog. This appears when you click the colour-coded channel scaling button (initially marked "x1.0").



As you have four traces on the screen, you need to scale each one to about a quarter of its original height. To do this, type "0.25" in the "Scale" box, as we have done in Figure 2. Repeat this with the other three channel scaling buttons to scale the remaining traces.



The key advantage of scaling the trace using the scaling button is that, unlike changing the vertical sensitivity, this method does not affect the original data. The PC Oscilloscope is still sampling your signal with full resolution, and it is only the size of the trace on the screen that has changed.

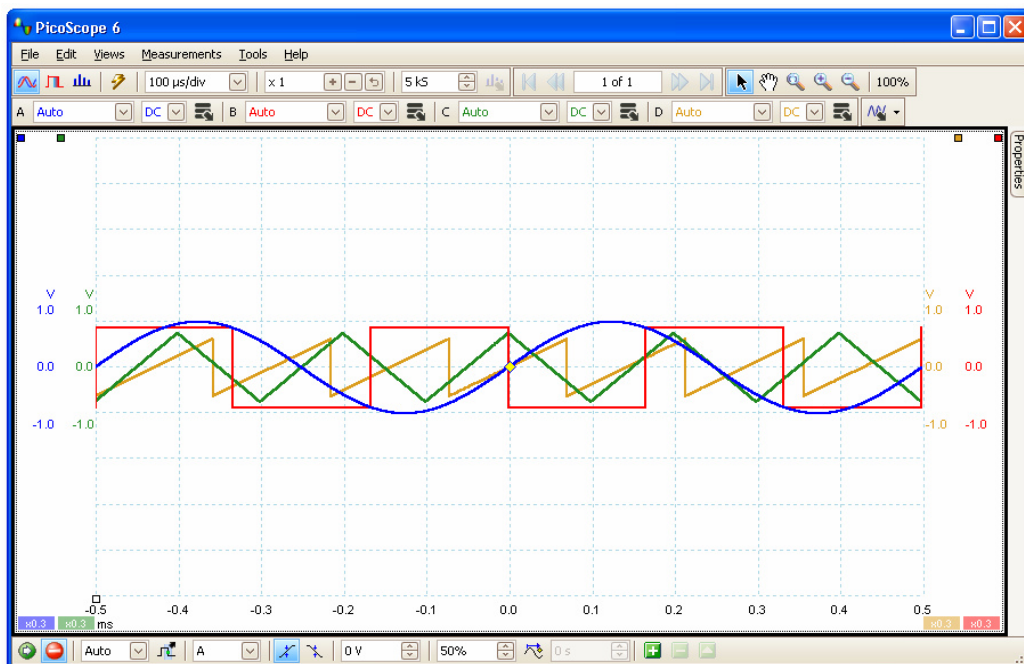
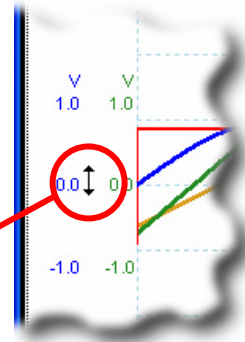


Figure 3 – All traces are now scaled to one quarter of their original height.

The final step is to shift or "offset" each trace so that it occupies a separate area of the scope view. This is easy to do in PicoScope. Just click and drag each vertical axis (where the voltage scale is displayed on the left or right edge of the view) up or down. The pointer changes to a double-headed arrow to show you that you are in axis-dragging mode, as shown in Figure 4.

Figure 4 – Changing the channel offset. This is as easy as dragging the voltage axis up or down. The picture shows the Channel A axis before we moved it.

The pointer changes to a double-headed arrow to indicate axis-dragging mode.



Drag each axis up or down to give each trace its own space on the scope view. The voltage scale changes as you drag it to keep the measurements correct at all times. It's best to choose a location for the trace so that "0.0" volts is aligned with a graticule line. Finally, you will have a much cleaner scope view with each channel in its own space, as in Figure 5.

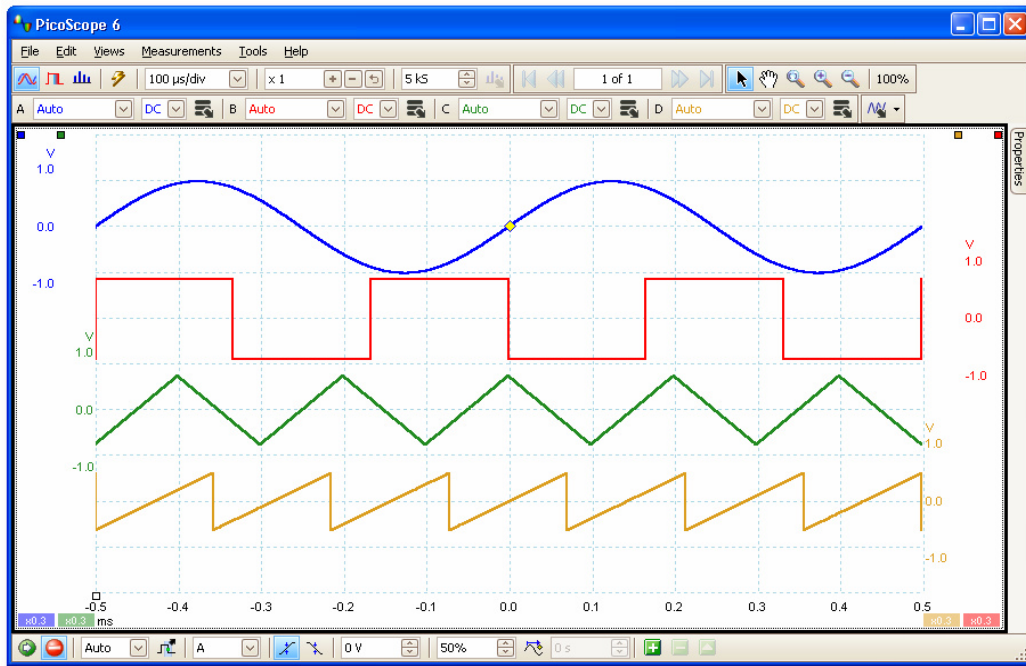


Figure 5 – Each trace now has its own space on the scope view, with Channel A at the top.

With its simple scaling and offset controls, PicoScope 6 lets you arrange the traces on the display without losing detail. This is just one of the features that keeps PicoScope 6 at the forefront of PC Oscilloscope technology.