

# Grounding the SI-9002 Differential Probe

## Scopes with differential inputs

The following TiePie engineering scopes have differential inputs:

- Handyscope HS4 DIFF
- Handyscope HS6 DIFF
- WiFiScope WS4 DIFF
- WiFiScope WS6 DIFF
- Automotive Test Scope ATS610004D-XMSG
- Automotive Test Scope ATS605004D-XMS
- Automotive Test Scope ATS5004D
- Automotive Test Scope ATS610004DW-XMSG
- Automotive Test Scope ATS605004DW-XMS
- Automotive Test Scope ATS5004DW

Unlike conventional oscilloscopes, these oscilloscopes have inputs that are not referenced to ground. This makes it possible to measure signals that are not referenced to ground, directly without the requirement of extra accessories. But, when the signals that need to be measured exceed the input range of the oscilloscope, it can be necessary to use an external device to convert the signals to an appropriate range. This device can be the SI-9002 Differential Probe differential probe.

## SI-9002 Differential Probe

The SI-9002 Differential Probe differential probe is designed to provide an oscilloscope (with a standard single ended input) with a differential input. It also gives the oscilloscope a large input range, up to 1400 Volt DC + AC peak.

## Ground requirement

For proper functioning, the SI-9002 Differential Probe requires a ground reference. When used on an oscilloscope with a single ended input, this ground reference is automatically achieved through the input it is connected to.

When using the SI-9002 Differential Probe on a Handyscope HS6 DIFF or WiFiScope WS6 DIFF with option **SafeGround** or an Automotive Test Scope ATS610004D-XMSG or Automotive Test Scope ATS610004DW-XMSG, switch the input of the used channel to single ended by enabling **SafeGround**. That will create a ground reference for the SI-9002 Differential Probe.

However, when using the SI-9002 Differential Probe on an instrument **with** differential inputs and **without** **SafeGround**, there is no ground reference through the oscilloscope input. To overcome that, the SI-9002 Differential Probe is equipped with an extra ground lead that can be connected to a ground terminal on the oscilloscope it is connected to.

The Handyscopes with differential inputs however do not have a ground connection that can be used directly by the SI-9002 Differential Probe.

## Ground cable

Therefore, an extra cable is supplied to connect to the extension connector on the rear of the instrument, providing a ground terminal that can be used for the SI-9002 Differential Probe. The ground cable has a 9 pin or 25 pin Sub-D connector at one end, which must be connected to the extension connector at the rear of the instrument. At the other end of the cable there is a 4 mm banana plug, which is connected to the ground of the instrument. Connect the ground lead of the SI-9002 Differential Probe to the banana plug of the ground cable of the instrument as shown in the image.



The SI-9002 Differential Probe now has a ground reference through the ground of the differential Handyscope, WiFiScope or Automotive Test Scope.



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