

Current Probe Active

Quick Start Guide



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The information contained in this document is subject to change without notice.

The Current Probe Active must be used according to the Current Probe Active user guide. Any operation related to maintenance, repair or calibration must be carried out by qualified personnel. Consequently, in case of failure, contact Riscure to find out about the procedure to follow.

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What is in the box

In the box you will find the Current Probe Active and all accessories to connect it to an oscilloscope.

Box content checklist

Quantity	Description		Identifier [1]
1	Probe: - Current Probe Active		
1	Probe: - High precision EM probe base		Base Unit
1	Power Supply Unit, 6 V DC input 100 V to 240 V AC, 50 – 60 Hz,		PSU
-	Power cord (included with PSU)	 Country specific	
1	Current Probe input cable: - 3 wires (white, blue, transparent) to 2-pin input plug (female)		CPINP
1	Differential converter cable: From High precision EM probe base to Current Probe Active		

Quantity	Description		Identifier [1]
1	Signal cable: BNC – BNC, 50 Ω , coax		BNC2BNC
10	Jumper wires: male – male		
-	This “Current Probe – Quick Start Guide”		

[1] Identifier is referenced by this document only.

What does it do

The Active Current Probe is an active, high frequency pick-up device for electric currents. It is used in Side Channel Analysis (SCA) to measure the power consumption of a target with great sensitivity.

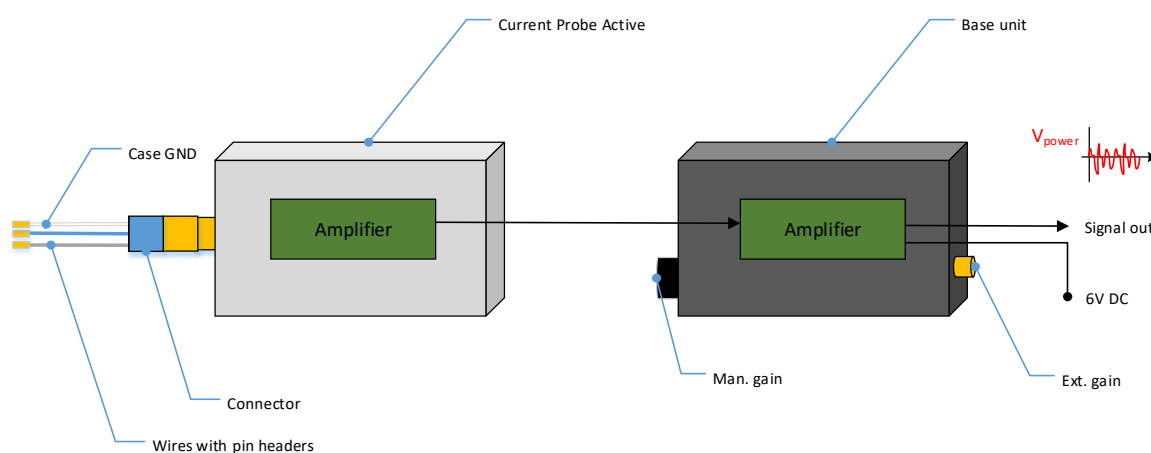


Figure 1 Current Probe Active. Power consumption signal measurement.

The Current Probe Active is inserted in the power supply line of a target and can transfer current variations up to 2 GHz.

Current Probe Active is used in combination with Base unit, which can be used to amplify the measured signal.

How to build a setup

Overview of the typical setup

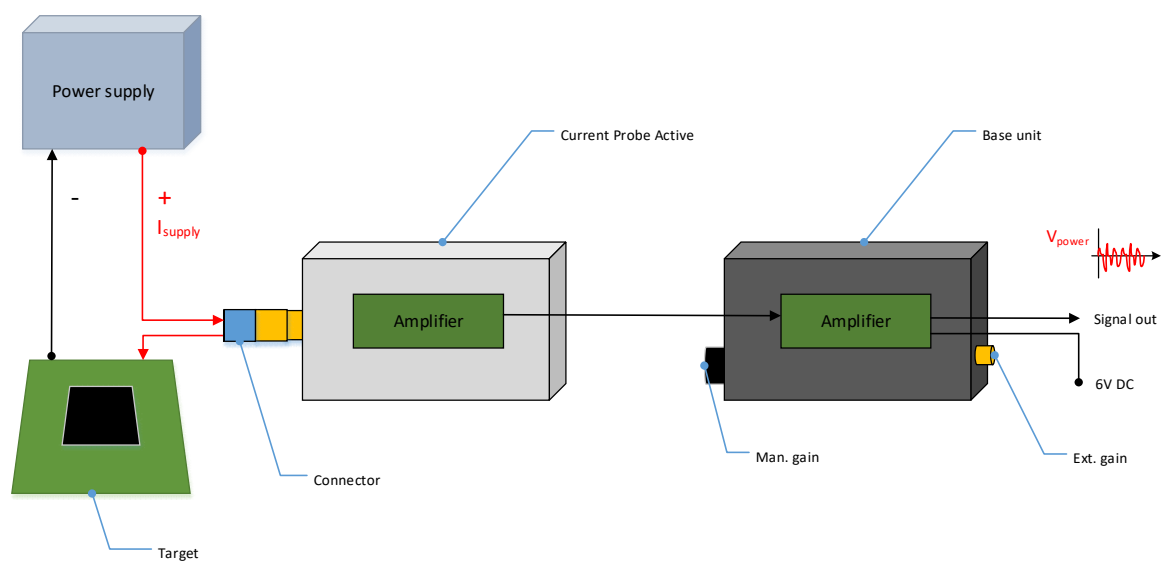


Figure 2 Inserting the Current Probe Active into the supply line of a target of evaluation.

Connecting the setup.

Preparation:

Create a tap point in the VCC supply line to the target chip.



The printed circuit board of the target may have a dedicated jumper block labelled VCC. Remove the jumper and apply jumper headers to the wires of the input cable of the Current Probe Active.

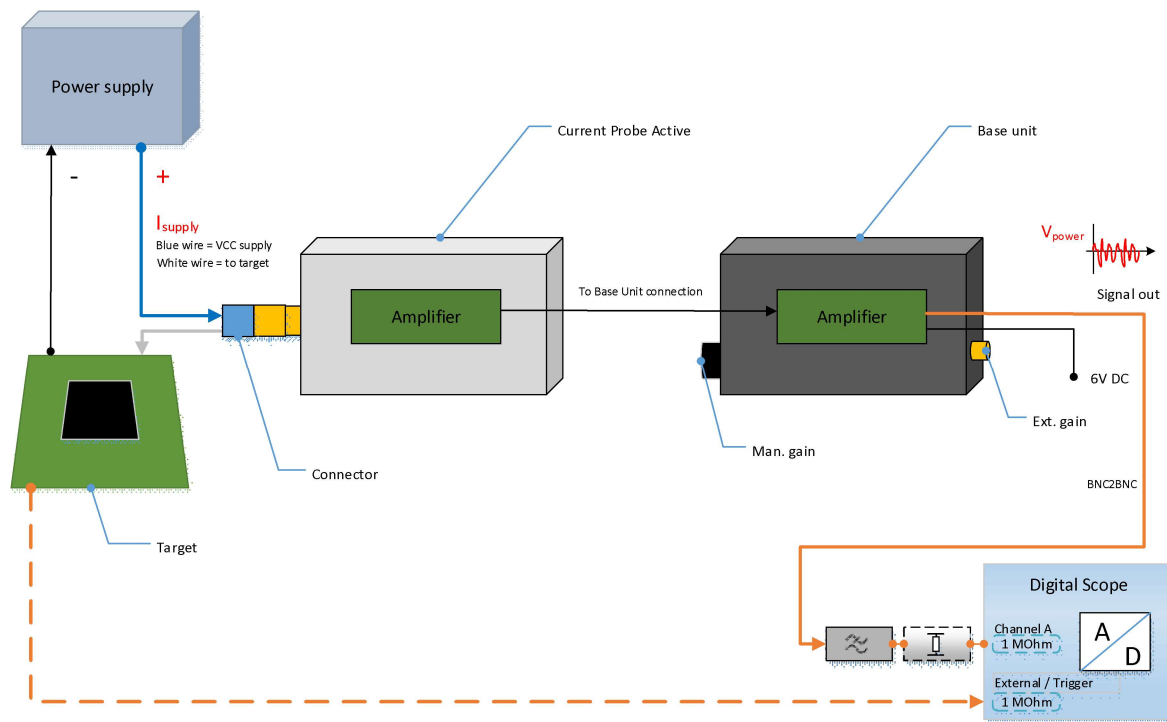


Figure 3 Order of connecting a typical setup using the Current Probe Active.

Steps to follow:

1. Connect the **blue and white wires** of the CPINP cable to the tap point.
2. In some situations, it may be beneficial to connect the **GND wire** of the CPINP cable to the GND of the target.
3. Connect the **CPINP** cable plug to the **In** port of the Current Probe Active.
4. Connect Current Probe Active port **to Base Unit** with cable to **Base Unit** port **In**.
5. Connect the **Out** port of the **Base Unit** with cable **BNC2BNC** to input **Channel A** of the oscilloscope.

If your scope channel has a 1 M Ω impedance, you need to insert a 50 Ω impedance adapter (not supplied).

Depending on your application you may need to insert a certain low-pass filter (not supplied).

6. Plug the **6V PSU** into the power mains.
7. Connect the **6V plug** from the PSU with the **power supply jack** in the **Base Unit**.

Your setup is ready to start measuring!



Figure 4 Current Probe Active. Connected to Base Unit.

Using the Base unit

Connecting the Base Unit

Connect the Base Unit with cable BNC2BNC to a measurement channel with 50 Ω impedance (or through a 50 Ω impedance adapter [not supplied]).

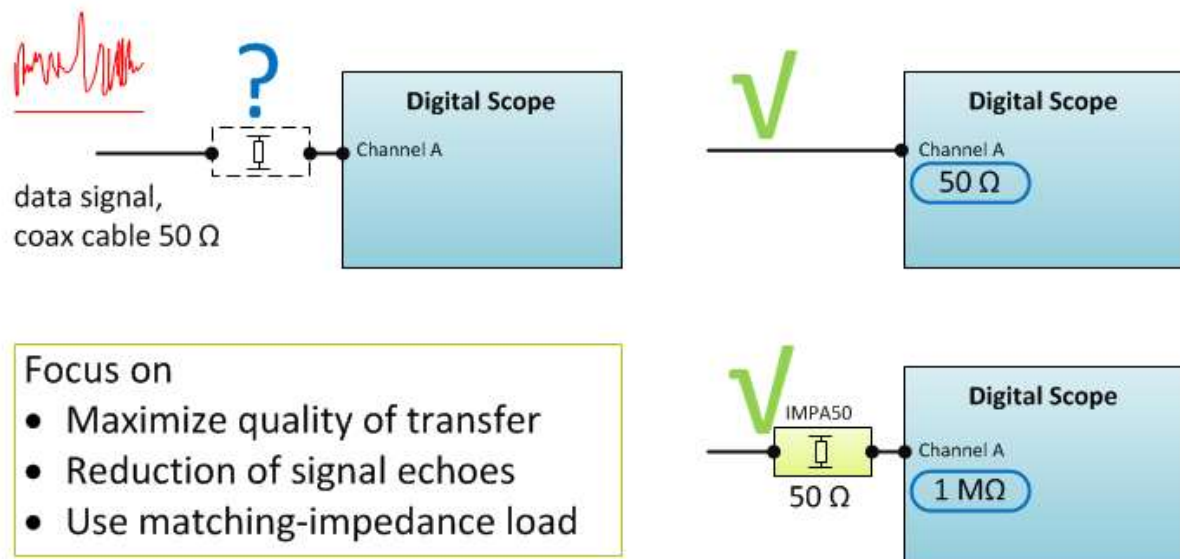


Figure 5 Reading the Base Unit signal with a matching impedance.

Adjusting the gain

There are two methods of adjusting the probe sensitivity.

The first method is using the manual gain knob.

- Make sure the “man. gain on” LED indicator is lit up. If not, push the gain knob to switch to manual gain.
- Rotate the “man. gain” knob clockwise until the desired gain setting has been met.



Figure 6 Manual gain.



Use the engraved markers around the “man. gain” knob for easy reproducibility of the gain setting.

The second method is control gain through an external device that can put an accurate voltage for amplification of the signal by the internal amplifiers of the base unit.

- Make sure to pull the “man. gain” knob. The “ext. gain on” LED indicator will light up.
- Use a device (for example Riscure Spider) to provide an accurate voltage from 0V (low gain) to 3.3V (high gain) to the “ext. gain” SMB input to set the desired gain.



Figure 7 The “man. gain” knob is pulled out to enable external gain.



Do not use a control voltage greater than 3.3V

This results in damaging the Base Unit.

Connecting the Converter cable

The differential converter cable connects Current Probe Active to Base unit.

Connect the differential converter cable to the Base unit by placing the notch against the pin of connector.

If connector does not slide in fully, rotate the end of the connector until it does.



Figure 8 Differential converter cable



Do not use force.

The connector might damage.

Help and troubleshooting

Still having questions?

1. The Inspector Help menu, has detailed information on the Current Probe.
2. Visit the Riscure internet support portal: <http://support.riscure.com>.

The support portal allows you to submit questions.

Technical specifications

Operational conditions

- Room temperature 20 - 30 °C, (68 – 86 F).



Maintain stable environmental conditions (temperature, humidity, airflow etc.) to reliably repeat tests and compare test results.



The housing of Current Probe Active will get hot when in use ~40 °C (104 F) .



The housing of Current Probe Active is electrically conductive.
And is ground (GND) of Current Probe Active.

Power supply input

- Current Probe Active.
- Base Unit (Amplifier), 6 V DC, load typical 820 mA Max.
- Center-positive plug, inner-Ø 2.5 mm, outer-Ø 5.5 mm.



Use of a PSU other than supplied by Riscure is not supported. Power spikes may cause internal damage and loss of accuracy.

Current Probe Active

- Bandwidth 1 MHz - 2000 MHz
- Max. continuous current 100 mA (RMS) AC.
- Max. pulse current 5 A, max.
- Current measurement circuit $\leq 0.082 \Omega$, $\leq 0.042 \mu\text{H}$
- 40dB of gain with Base Unit Max.

Product case Current Probe

- Dimensions L x W x H: 59.90 x 35.30 x 29.30 [mm], 2.35 x 1.38 x 1.15 [inch].



Port	Label	Description
A1	in	Current measurement circuit, $\leq 0.082 \Omega$
A2	To Base Unit	Differential signal to Base Unit



Element	Label	Description
1	out	BNC, Analog output -2.5 V ~ +2.5V (50 ohm)
2	ext. gain	Control voltage input 0V ~ +3.3V (2.3k ohm)
3	ext gain LED	When ON amplification is controlled with external voltage (2)
4	Power in	Connector for the 6 V DC 2 A PSU
5	Power on	When lit power is OK
6	man gain	Knob to control the gain
7	Man. gain LED	When ON amplification is controlled with potentiometer.
8	in	Connection to the “to Base Unit” connector on Current Probe Active

EC-DECLARATION OF CONFORMITY

Suppliers Details

Name

Riscure B.V.

Address

Frontier Building, Delftechpark 49, 2628 XJ Delft, The Netherlands

Product Details

Product Name

Inspector

Model Name(s)

Current Probe Activ

Trade Name

Riscure

Applicable Standards Details

Directives:

- LVD (2006/95/EC) - EMC directive (2004/108/EC)

Standards:

- IEC 60825-1; IEC 320 C8; IEC 60950-1; 21 CFR 1040; ANSI/ESD S20.20:2007; BS EN 61340-5-1:2007; EN55022-B; EN61000-4-2, 4-5; CISPR 11; CISPR22-B; UL 1950

Supplementary Information

The appliance fulfils the relevant requirements of the EMC-directive and the LVD-directive according to our technical documentation TCD-Power Tracer.

Declaration

I hereby declare under our sole responsibility that the product(s) mentioned above to which this declaration relates complies with the above mentioned standards and Directives


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Issued Date

19 / 12 / 2023



Signature of representative