

## SUPPLEMENTARY INFORMATION

### Novel circuit design for high-impedance and non-local electrical measurements of two-dimensional materials

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TABLE S1. Components list.

NAME	V1		V2	
	VALUE	TYPE	VALUE	TYPE
R1, R2, R5	180 k $\Omega$	1% Carbon	180 k $\Omega$	0.1% Metal film
R3, R4	680 $\Omega$	1% Carbon	680 $\Omega$	0.1% Metal film
VR1, VR2	50 k $\Omega$	1% Trimmer	50 k $\Omega$	1% Trimmer
C1, C2, C3	10 pF	Ceramic	10 pF	$\pm 0.5$ pF Mica
C4, C5, C7, C8	10 $\mu$ F	Electrolytic	10 $\mu$ F	Hi-grade Electrolytic
C6, C9	1 $\mu$ F	Electrolytic	1 $\mu$ F	Hi-grade Electrolytic
D1, D2	1N4148	Small signal silicon diode	1N4148	Small signal silicon diode
IC1, IC2, IC3	LT1097	Low-cost, Low Power Precision Op-Amp	LT1028	Ultralow Noise High Speed Precision Op-Amp
IC4, IC5	ICL7660A	CMOS Voltage Converter	ICL7660A	CMOS Voltage Converter
OC1, OC2	HCMR201	High-Linearity Analog Optocoupler	HCMR201	High-Linearity Analog Optocoupler
BAT1, BAT2	12 V	4Ah LiPo Battery	12 V	4Ah LiPo Battery

## I. COMPONENTS LIST AND PCB PROTOTYPES

In table S1 we report the list of components chosen for the realisation of the circuit shown in figure 1 main text in the two versions.

In figure S2a we show the physical realisation of the optocouplers on printed circuit boards (PCBs) in the two versions (the same PCB is used for both). The circuit is then mounted in an aluminium box and connected to the two batteries as shown in figure S2b. Figure S2c shows the PET vacuum flange (see also figure 2a main text) used to house the SMA connectors from the device under test.

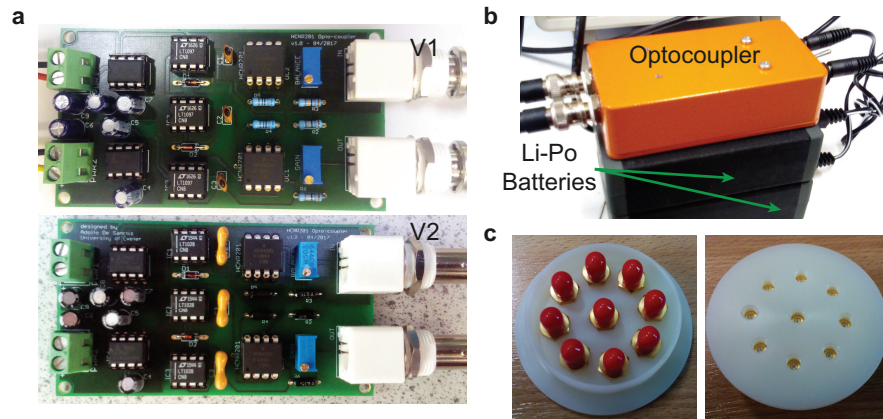


FIG. S2. **PCBs and construction of the optocouplers.** **a**, Assembled PCBs of the V1 (top) and V2 (bottom) optocouplers. **b**, Prototype enclosure and wiring. **c**, Custom-built PET vacuum flange with SMA connectors.