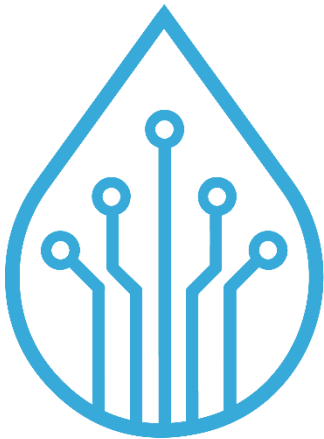


Nanomade Lab

CapaForce© Mini

Kit user manual

JUIN 2024



nanomade

Make All Materials Smart

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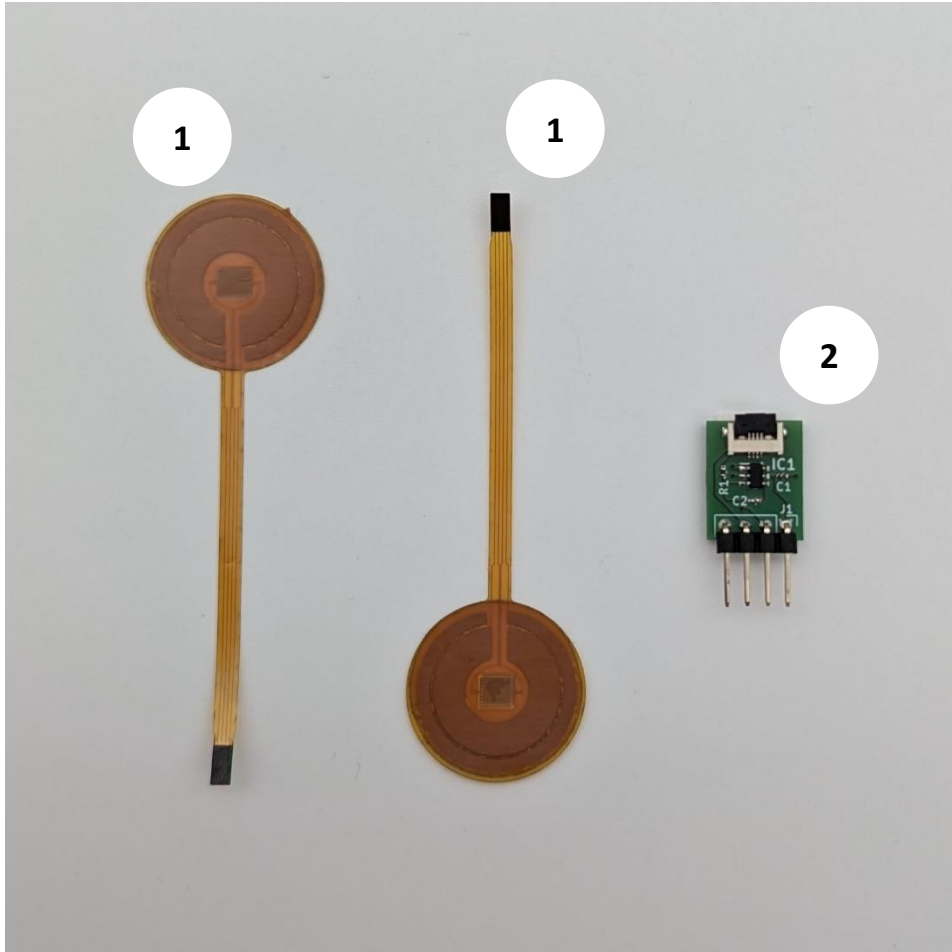
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1. Package contents

The CapaForce© mini kits contains 2 non-integrated sensors (single), and a PCB Driver.



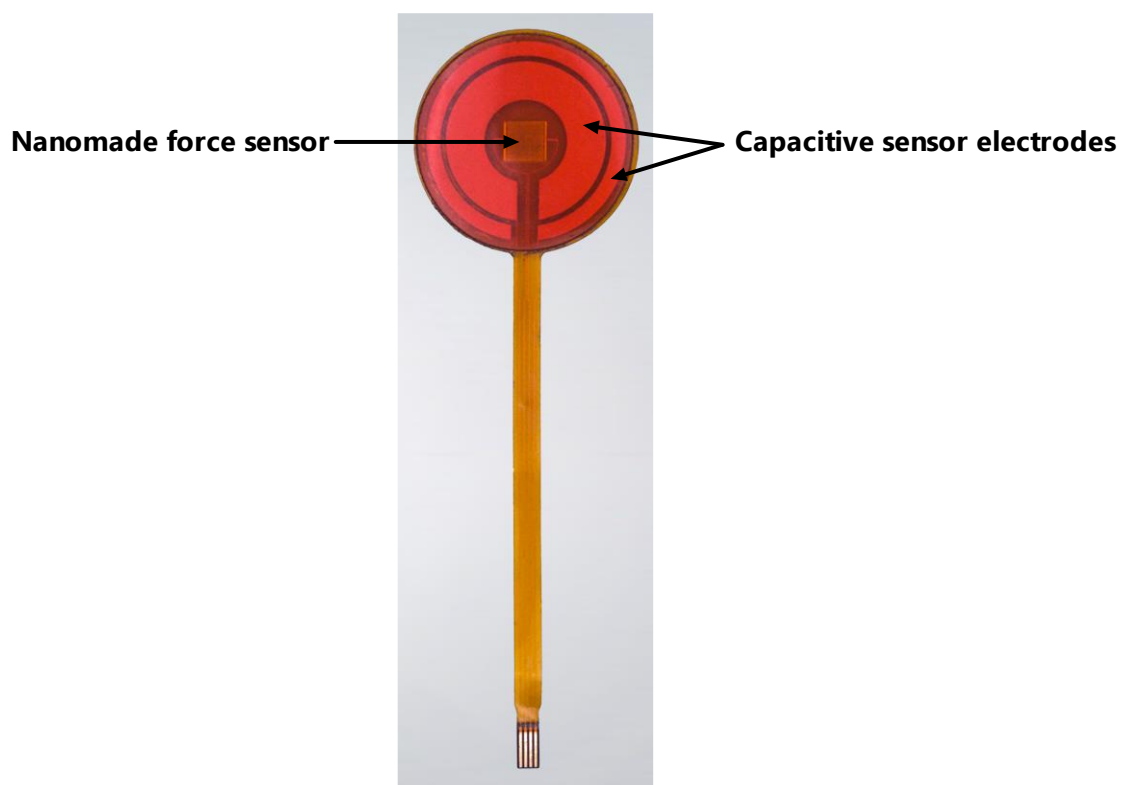
1 - Nanomade single CapaForce© sensor (x2)

2 – Nanomade CapaForce© PCB Driver

2. Sensors description

The Capaforce© sensor combines a standard capacitive sensor with a Nanomade force sensor. It allows soft touch detection and force touch with a single, thin, flexible sensor. Capaforce© is available in single or matrix version describes above.

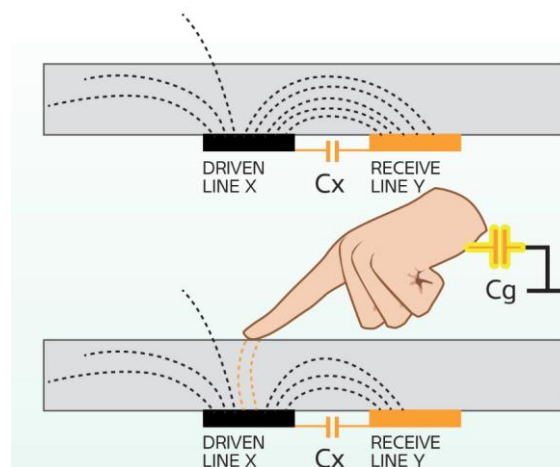
- **Capaforce© monolayer single sensor:**



This sensor is composed of only one copper layer on polyimide substrate. Both capacitive and force sensors electrodes are designed on this unique layer.

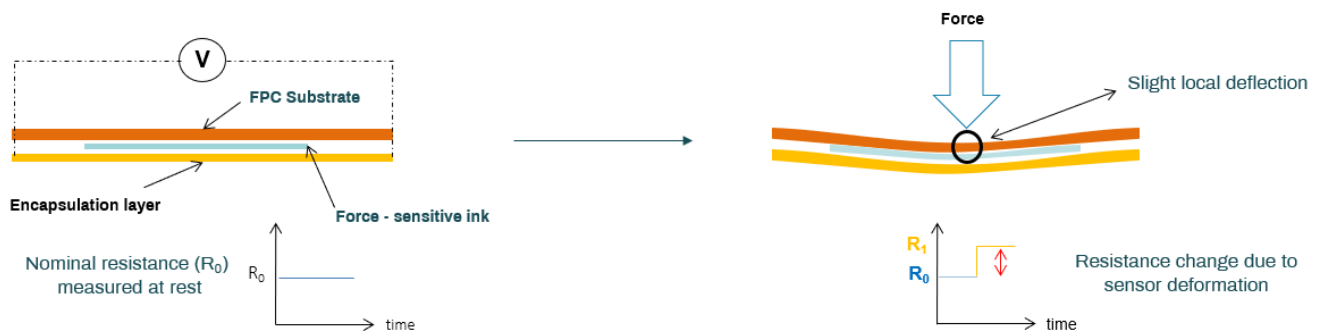
2.1 The capacitive sensor:

It is a proximity sensor that detects nearby objects by their effect on the electrical field created by the sensor. The sensor electrode is connected to a measurement circuit and the capacitance is measured periodically. The output capacitance will increase if a conductive object touches or approaches the sensor electrode. The measurement circuit will detect the change in the capacitance and converts it into a trigger signal.

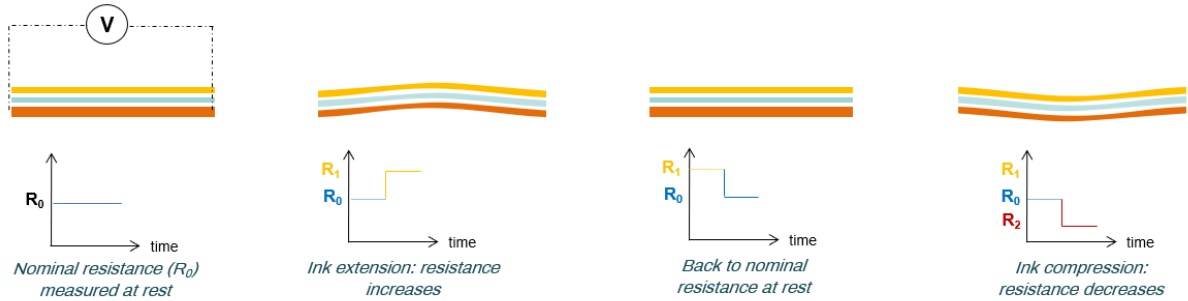


2.2 Nanomade force sensor

Nanomade force sensor works as a very highly sensitive strain gauge, i.e. the sensor nominal resistance varies with the applied force. Its properties rely on a proprietary force-sensitive ink printed on a Flexible Printed Circuit (FPC) substrate.



When a strain is applied, a measurable change in the electrical resistance of the sensor is detected. The higher the pressure applied, the higher the resistance change.



Nanomade Capaforce© sensors can be used as-is or integrated with other materials. The integration step is critical to get the best of Nanomade's Capaforce© sensors.

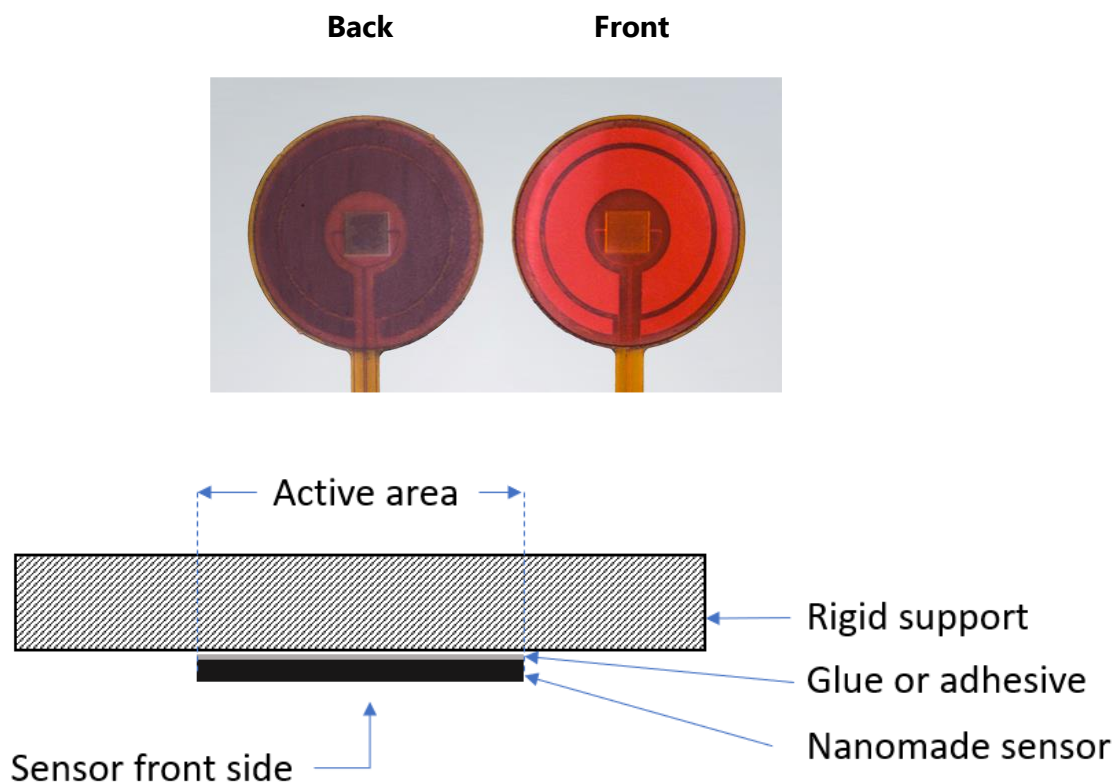
Detailed guidelines can be found in the **Sensor integration** section.

3. Sensor integration

Nanomade sensor is a very highly sensitive strain gauge, which means that, sensor nominal resistance will vary with deformation.

The sensor must be glued under the piece of material the user wants to make touch and force sensitive. Any small and high deformations induced by the pression of a finger, for example, on the active area, will be translated into a change in the sensor resistance.

The sensor is placed directly behind the piece of material and glued to it by its back side as shown in the picture below:



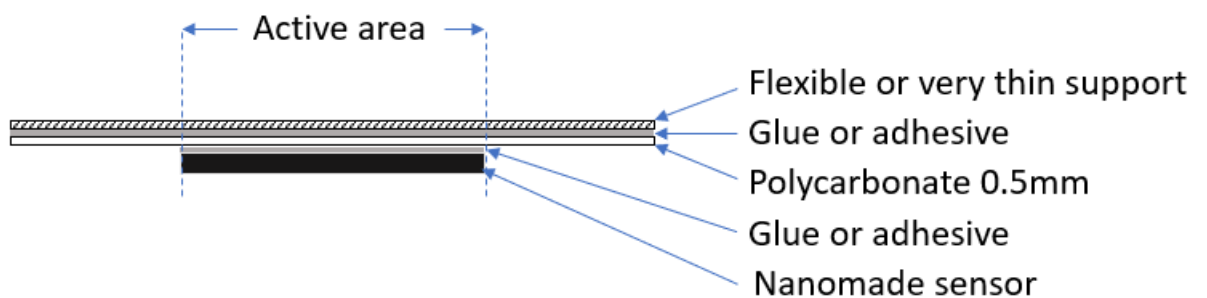
The higher the deformation transmitted to the sensor, the higher the variations of the sensor signal output. To glue the sensors to the surface adapted to your needs it is strongly recommended to use a rigid glue. The following three glues have been tested and are valid for your tests, the references are given in the table below.

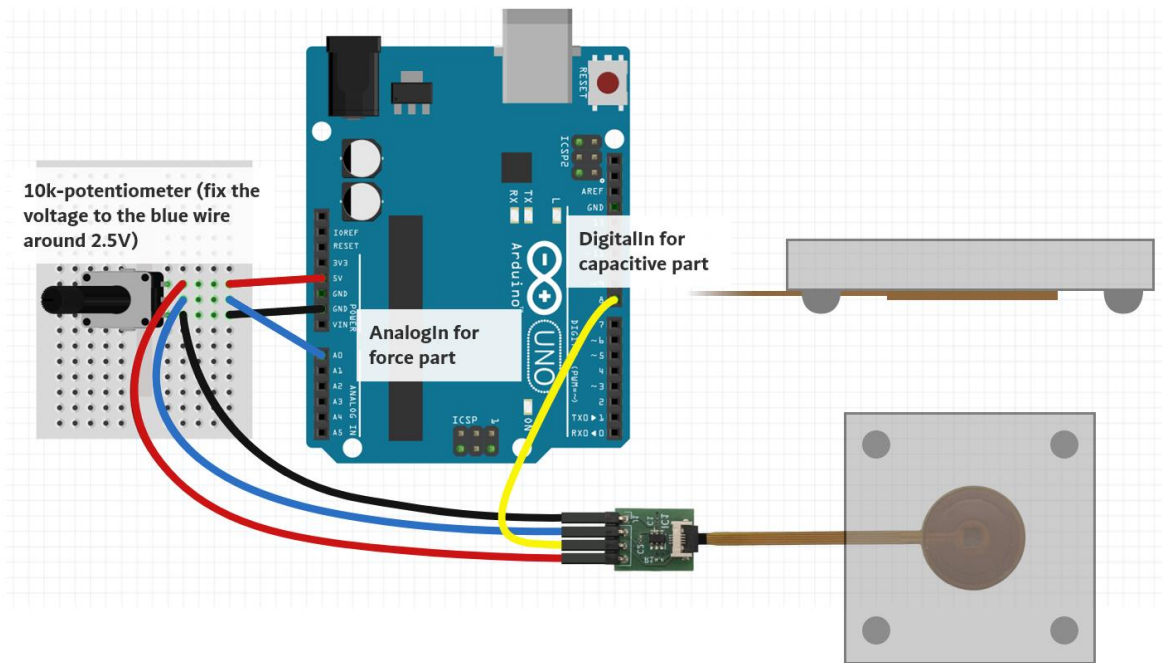
Glue Technology	Reference
Cyanoacrylate	LOCTITE 401
Acrylic UV	LOCTITE AA 3921
Two-component epoxy	3M Scotch-Weld DP 460

Sensors can also be fixed with transfer tape adhesive. As flexible adhesive will absorb strain transmission, it will slightly reduce sensor response compared to a rigid adhesive. However, as Nanomade sensors are highly sensitive, it can be enough function of the final use case. In the table below some already tested references.

Adhesive Transfert Tape
3M™ VHB™ F9460PC
DuploCOLL® 101 HCR

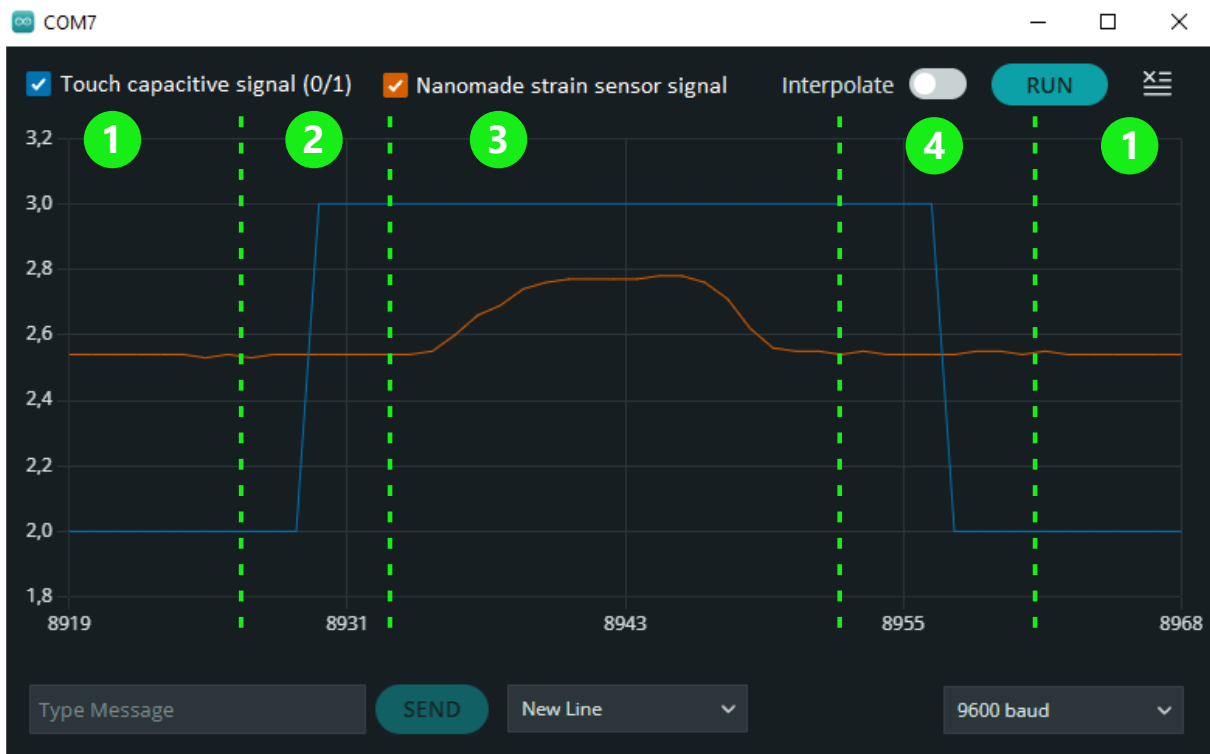
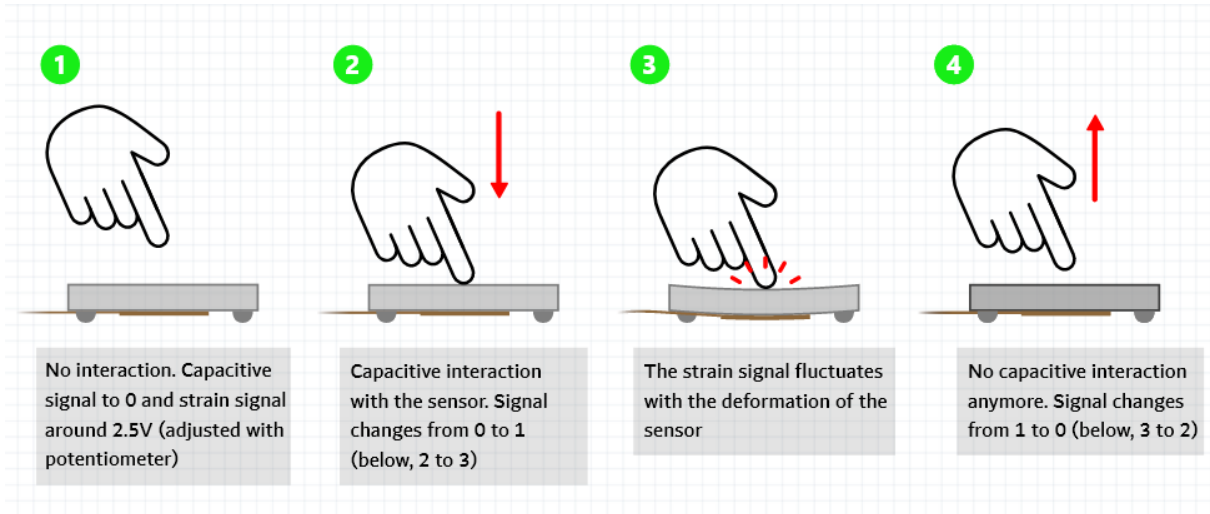
In the case of very thin or semi rigid material like leather or wood, sensor can be glued on a thin intermediate substrate as polycarbonate 0.5mm or more:





4. Sensor signal

The sensor provides two signals: capacitive touch signal, 0 or 1 and Nanomade strain sensor signal between 0 and 5V.



5. Contact

Thank you for purchasing our products and trusting our company.

Don't hesitate to contact us for any questions on this product and other solutions via the options below:

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