SMART™ EXPLORER

SMART™ Sensor Application Guide

How to attach a single-use sensor inside a cell culture vessel, lined up with the reader and free of air bubbles, demonstrated using a petri dish.

This guide shows you how to attach a SMART™ sensor to the inner wall of a cell culture vessel so the SMART™ Explorer Reader can read it through the vessel wall. The steps use a petri dish as the example. The same technique works for any vessel whose outside can sit against the inductive coupler and whose inside wall lets the sensor attach securely without air bubbles.

What you need

ITEM	QUANTITY	WHAT IT IS FOR
SMART™ sensor	1	The single-use sensor you attach inside the vessel.
SMART™ Explorer Reader (reader unit)	1	Its inductive coupler shows where to place the sensor.
Squeegee	1	Its rounded end presses the sensor flat and pushes out bubbles.
Cell culture vessel	1	The vessel for the sensor. This guide uses a petri dish.
Flat-headed metal tweezers	1	A rounded, flat tip handles the sensor without damaging it.

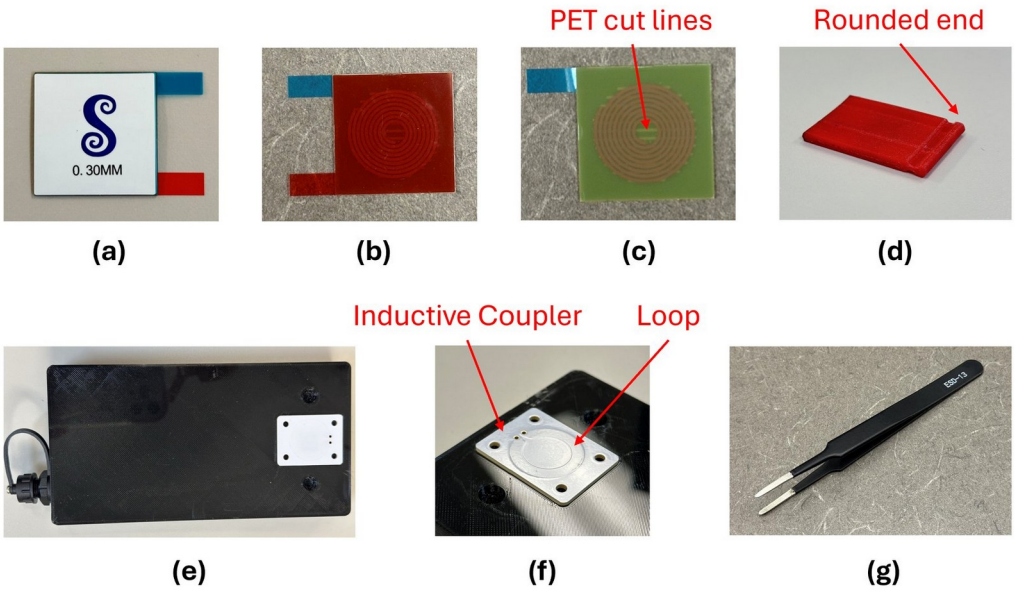


Figure 1. (a) Front of the SMART™ sensor with the Skroot logo. (b) Back of the sensor with the red backing. (c) PET cut lines after the red backing is removed. (d) Squeegee and its rounded end. (e) Reader unit. (f) Inductive coupler with its loop pattern. (g) Flat-headed metal tweezers.

Know your sensor

Each SMART™ sensor comes with two protective layers. You remove them at different points in the procedure.

- **Red backing (back of the sensor).** You peel this off first, with the red tab, to expose the adhesive side.
- **Front cover with the Skroot logo.** You peel this off last, with the blue tab, once the sensor is pressed in place.
- **Spiral.** Under the red backing you will see a spiral and rows of PET cut lines. The spiral is the sensing part of the sensor, so take care not to damage it.

Before you start

- Check the sensor for defects such as creases, a rough surface, scratches, bends or an uneven adhesive surface (Figure 2). Do not use a damaged sensor.
- Handle the sensor by its edges only, and do not touch the adhesive.

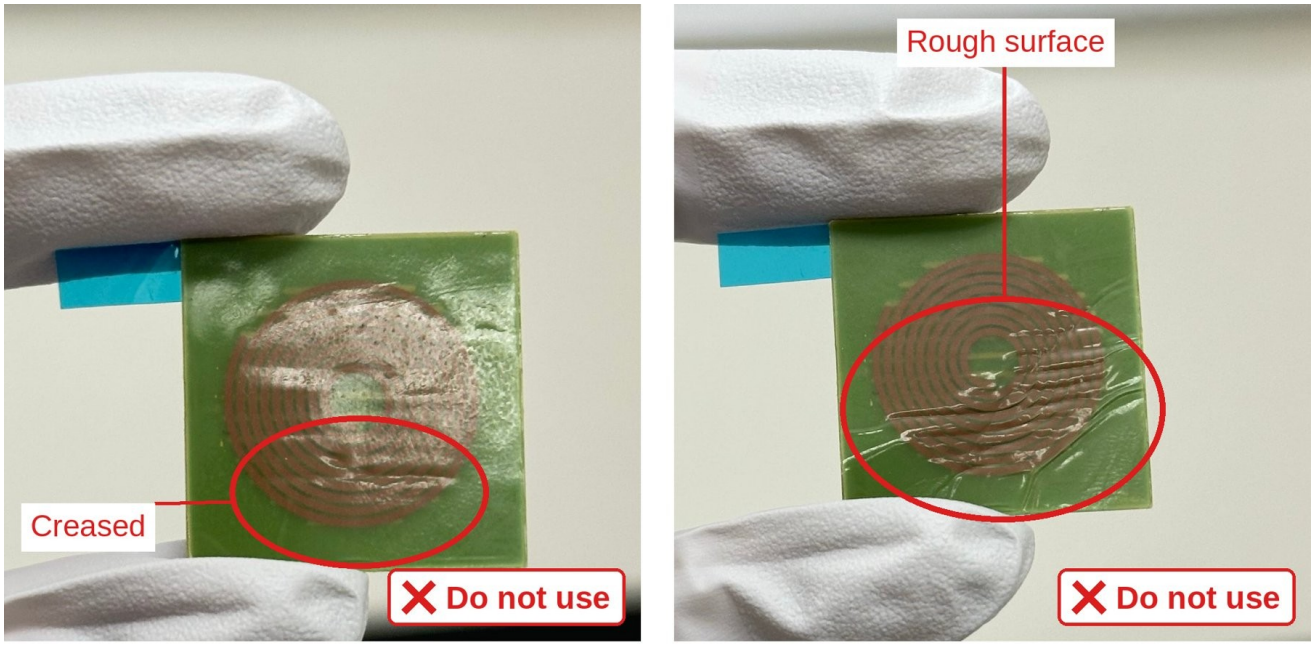


Figure 2. Damaged sensors that should not be used: (a) a creased sensor and (b) a sensor with a rough surface.

Apply the sensor

1. **Find the spot.** Place the petri dish on the reader unit, choose where the sensor will go, and line that spot up with the loop on the inductive coupler (Figure 3a).
2. **Remove the red backing.** Pull the red tab to peel off the red plastic backing and expose the back of the sensor (Figure 3b).
3. **Place the sensor.** Holding the sensor by its edges, line it up with the loop on the coupler and set it gently in the petri dish, Skroot logo facing up (Figure 3c). Do not touch the exposed adhesive.
4. **Lift the dish off the reader.** Remove the petri dish from the reader unit.
5. **Press the sensor flat.** With the rounded end of the squeegee, press the sensor fully onto the dish and push out air bubbles (Figure 3d). Start at the center of the sensor, press firmly, and move parallel to the Skroot

logo toward the edge, left to right or right to left. Holding the squeegee close to its rounded end helps you apply enough force.

6. **Check for air bubbles.** Make sure there are few or no air bubbles over the spiral (Figure 3e).
7. **Remove the front cover.** Once most of the air bubbles are gone, pull the blue tab to remove the Skroot logo layer (Figure 3f).
8. **If a tab breaks off.** If a tab breaks off before its layer comes away, use the tweezers to gently lift and remove the layer (Figure 3g).
9. **Done.** The petri dish with its SMART™ sensor is ready to use.

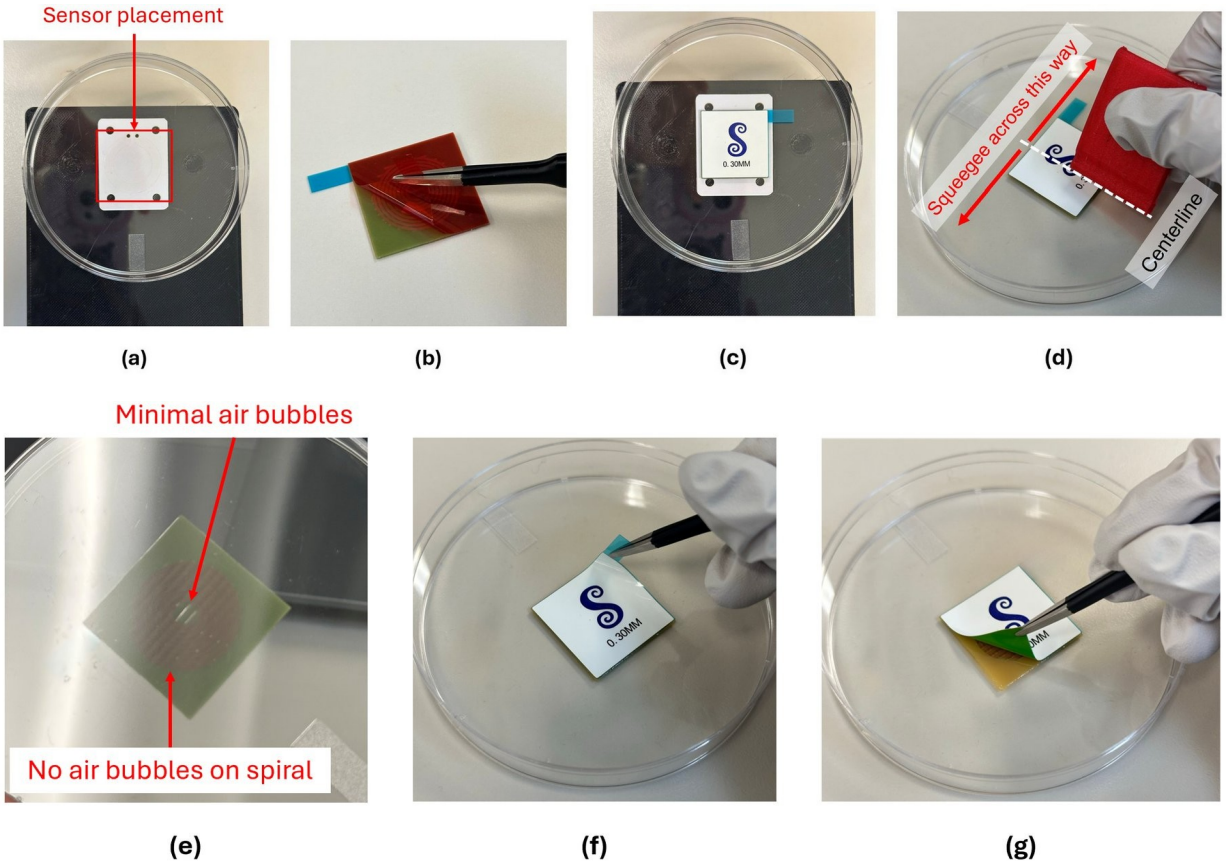


Figure 3. (a) Choosing the sensor location over the coupler. (b) Removing the red backing. (c) Sensor placed in the petri dish, lined up with the coupler. (d) Direction to move the squeegee. (e) Sensor pressed flat with minimal air bubbles. (f) Removing the Skroot logo layer with the blue tab. (g) Removing the layer with tweezers if a tab breaks off.

Check your work

Look closely at the applied sensor. There should be few or no air bubbles between the sensor and the dish wall, especially over the spiral (Figure 4).

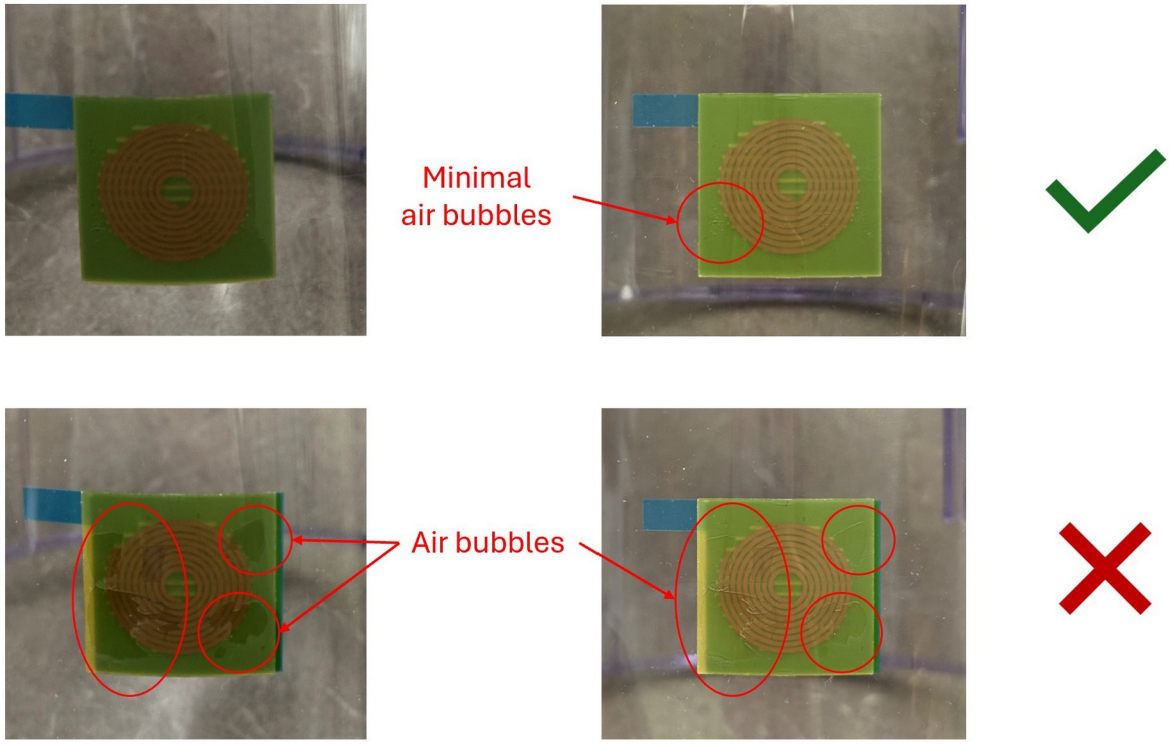


Figure 4. Checking for air bubbles between the sensor and the vessel wall: minimal air bubbles (correct, top) and visible air bubbles (incorrect, bottom).

> **NOTE**
>
> **Sterilizing the vessel**
>
> SMART™ sensors have been tested for compatibility with gamma irradiation (25–40 kGy nominal dose), steam autoclaving and UV exposure after application to a vessel wall. Before you sterilize the vessel, make sure both the red backing and the Skroot logo layer have been removed.

Next steps and help

- To start a run, place the vessel at the reader unit and center the sensor over the inductive coupler (see the SMART™ Explorer User Guide).
- Watch the video tutorials “Applying a SMART™ Sensor” and “Applying a SMART™ Sensor to Non-Scratch Surfaces” on the Support page at skrootlab.com.
- Questions about your vessel or setup: support@skrootlab.com.

The SMART™ Explorer is for research use only.