



Multifunctional PE Toolbox

Developed and manufactured by Metafas in cooperation with Elantas



Purpose of the Toolbox

The demonstrator box aims to show in a practical and interactive way how printed electronic sensors work. It is designed to engage with, allowing users to feel, see, and press different sensors.

Key Features:

- Heating Element: Demonstrates the application of printed heating technology
- Pressure Sensor: Allows users to experience pressure sensitivity
- Humidity Sensor: Measures and displays humidity levels
- Temperature Sensor: Monitors and shows temperature readings
- Display Interface: All functions can be observed and adjusted via a display
- Durable Design: Encased in a high-quality, sturdy aluminum housing
- Replaceable Sensors: Sensors can be easily swapped out if needed

Impact:

This demonstrator visually and pragmatically illustrates the broad application field of printed electronics. It serves as an educational tool and a practical example of how printed electronics can be integrated into various devices, enhancing user interaction and understanding of this technology.

Project Description

We have build a solid casing with a interactive display and 8 slots in which printed sensors can be assembled. Each sensor has its own functionality of which the output or the measurement will be presented in the display. For example, a heater sensor can be

switched on and off via the touch screen display. Or the temperature sensor show the measured temperature in the display. Or the pressure sensor show the relative force (from 0% to 100%) which the user applies on the sensor. With this box we create a very hands-on and accessible tool to "play with" printed electronic sensors.

For many potential integrators of PE sensors, end-users, students or other stakeholders, it is not always very clear how PE sensors do work. With this tool it becomes very accessible for much more people.

- Screen: All these features are shown on a screen where you can also adjust them
- Strong Case: Everything is packed in a tough aluminum case
- Easy to Fix: If any sensor breaks, you can easily replace it

Impact

This device helps people understand how printed electronics can be used in real life. It's a great tool for learning and seeing how these technologies work together.

Functionality

- 1) Printed Components: The demonstrator uses special inks to print electronic components like heaters, pressure sensors, humidity sensors, and temperature sensors onto a flexible plastic sheet (PET film).
- 2) Sensors in Action:
 - a. Heater: When activated, the printed heater warms up, demonstrating how printed heating elements can be used.
 - b. Pressure Sensor: When you press on the pressure sensor, it detects the force and shows the pressure level on the display.
 - c. Humidity Sensor: This sensor measures the moisture in the air and displays the humidity level.
 - d. Temperature Sensor: It monitors the temperature and shows the current reading on the screen.
- 3) Display Interface: All the data from these sensors is shown on a display. You can see the readings and adjust settings directly from this interface.
- 4) Durable Housing: The entire setup is enclosed in a sturdy aluminum case, making it durable and easy to handle.
- 5) Replaceable Sensors: If any sensor stops working or needs an upgrade, you can easily replace it without much hassle. In essence, this demonstrator lets you interact with and understand the practical applications of printed electronics in a hands-on way

