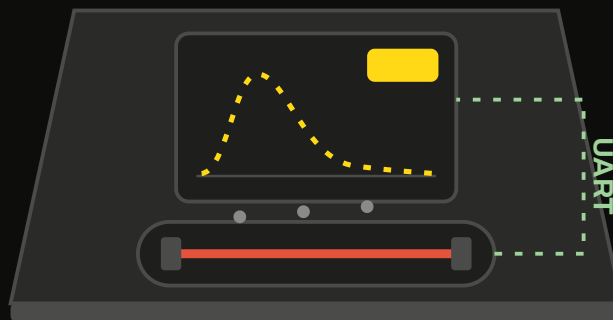


MIGAL.CO · PANEL PC

Heat the wire. Read the vapour. **Show the result.**

MIGAL.CO built its SMKY 2 wire analyser on a 10.1" Panel PC.

[Read the interactive success story online ›](#)

Schematic illustration

25 cm

of welding wire clamped for each test

10.1"

touch screen on the front of the analyser

UART

serial link from the sensor to the Panel PC

2

result formats: a graph and a number

THE CHALLENGE

The wire surface affects the weld. It is hard to assess.

In welding, you must know the surface condition of the wire electrodes you use. They can deteriorate over time, and wire feeding systems can become contaminated in storage or transport. This affects the quality of the weld. In practice, the surface condition is difficult to assess, but a reliable welding process depends on it. MIGAL.CO developed an instrument for it: the SMKY 2 residual analyser.

01

Residues you cannot see

Wire electrodes deteriorate over time. Storage and transport can contaminate the wire feeding system.

02

A repeatable test

A 25 cm piece of wire is clamped in the machine and heated almost to its melting temperature.

03

A result in minutes

A sensor collects the vapours. The screen shows the result as a graph and as a number.

04

Flexible, no licences

MIGAL.CO wanted a flexible and adaptable analyser, without licensing fees of any kind.



Ready for the production plant

The SMKY 2 can join a production plant and take more peripherals, such as barcode scanners, for the data collection, storage and processing.

HOW IT WORKS

Three stages: heat, read, keep.

Stage 1 · Clamp and heat

25 cm of wire, heated almost to melting.

The operator clamps a 25 cm piece of wire inside the machine. The analyser heats it almost to its melting temperature. The contaminants on the surface evaporate, and a sensor collects the vapours.

- 25 cm sample clamped in the machine
- Heating almost to the melting temperature
- The sensor collects the vapours of the residues

Stage 2 · Read over UART

The sensor sends. The Panel PC processes and shows.

The sensor sends its reading to the TouchBerry Pi over UART, a serial link. The Panel PC processes the data and, within minutes, shows the result on its touch screen as a graph and as a number.

- Sensor reading over UART
- Processing inside the Panel PC
- Result as a graph and as a number

Stage 3 · Presets and records

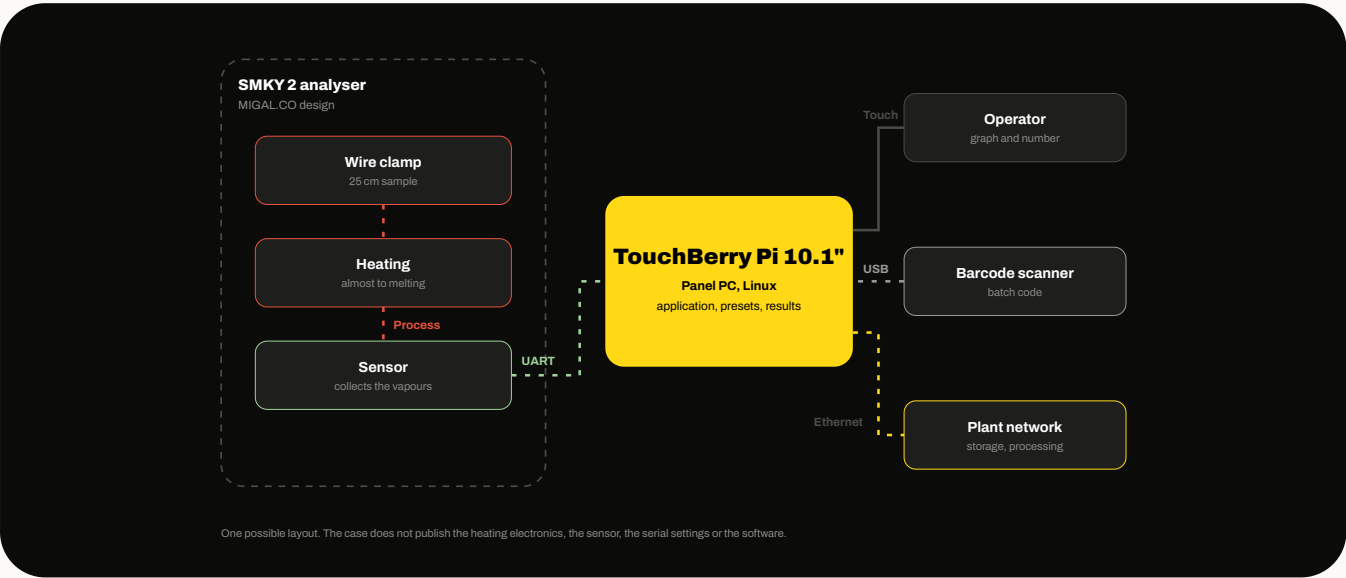
One preset per material. One record per test.

MIGAL.CO has preset parameters for most materials on the market, and the user can add new ones or change them. The analyser can also join a production plant and take peripherals such as a barcode scanner. Load a preset, scan a batch and save the result.

- Preset parameters for most materials
- New presets added or changed by the user
- Barcode scanner for the data collection

How does a Panel PC run a residual analyser?

The analyser clamps and heats the wire sample, and a sensor collects the vapours of the residues. The sensor sends its reading over UART to a TouchBerry Pi 10.1" Panel PC. The Panel PC runs the analyser application on Linux: it processes the data, keeps the material presets and shows the result on its touch screen. A barcode scanner and a link to the plant network are the typical ways to add the production data.



— Process (heat, vapour) — Serial (UART) — USB (typical) — Ethernet (typical)

Signals and data

Signal	Between	Type	Purpose
Wire sample	Operator → analyser	Mechanical	25 cm of wire clamped inside the machine
Heating	Analyser → sample	Process	Heats the wire almost to its melting temperature. Heating electronics not published
Vapours	Sample → sensor	Process	The contaminants evaporate. The sensor collects the vapours
Sensor reading	Sensor → Panel PC	UART	Readings processed inside the Panel PC. Protocol not published
Result	Panel PC → operator	Touch screen	A graph and a number, within minutes
Presets	Operator ↔ Panel PC	Touch screen	Parameters for most materials. New ones can be added or changed
Barcode	Scanner → Panel PC	USB (typical)	Peripheral named in the case. The port is an example
Plant data	Panel PC ↔ plant network	Ethernet (typical)	Data collection, storage and processing. The link is an example

A 10.1" Panel PC with a Raspberry Pi 4, built into the analyser.



TouchBerry Pi Panel PC 10.1" FLEX

An industrial Panel PC: a Raspberry Pi 4 behind a 10.1-inch capacitive touch screen, with Linux preinstalled. In the SMKY 2 it receives the sensor reading over its serial port, processes it, keeps the presets and shows the result.

Role	Screen and computer of the analyser
Screen	10.1" IPS TFT, 1280 x 800, capacitive touch, 900 nits
Computer	Raspberry Pi 4, Broadcom BCM2711 quad core, 4 or 8 GB RAM
Operating system	Linux, preinstalled
Serial port	One: RS-485, RS-232 or TTL, chosen at order
Other ports	Gigabit Ethernet, 2 x USB 2.0, 2 x USB 3.0, I2C, SPI
Own I/O	3 digital in, 2 analog in (0-10 V or 4-20 mA), 5 digital out
Reliability	UPS with supercapacitors for safe shutdown, real-time clock

The 2021 case names the Touchberry Pi 10.1" with a Raspberry Pi 4, and its link goes to this same product. Today it is the TouchBerry Pi Panel PC 10.1" FLEX, with configurable RAM, front and expansion (LoRa, 4G or CAN). The CORE version has a standard configuration. The case does not publish the RAM, the front or the serial option of the units in the SMKY 2. Choose the serial option that matches the electronics of your sensor.

[See the TouchBerry Pi 10.1" >](#)

One unit for screen and computer

A Raspberry Pi 4 sits behind the 10.1" touch screen. The analyser gets its display and its processing in one industrial device.

The code belongs to MIGAL.CO

MIGAL.CO owns the whole application, because it knows the code. It can expand the analyser when it needs to.

Presets that can grow

Preset parameters cover most materials on the market. When a new material comes, the user adds a preset or changes one.

BUILDING YOUR OWN INSTRUMENT?

Tell us your sensor and your screen. An engineer will answer.

Tell us what your machine measures, how the sensor talks (UART, RS-485, USB or Ethernet), the screen size you need and where the data must go. We will tell you which Panel PC or PLC fits.

FULL SUCCESS STORY ONLINE

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