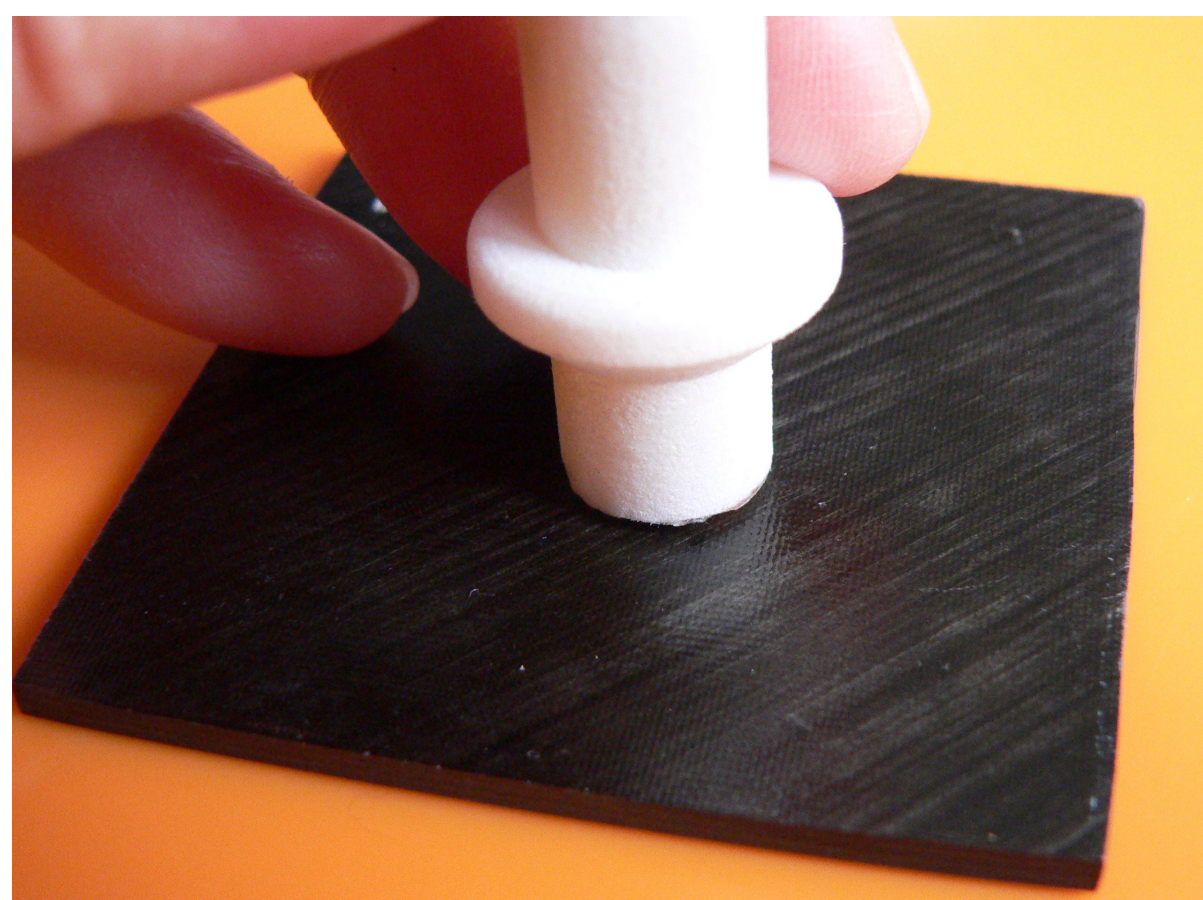




sciensoria
Electromagnetic solutions

**SPECIALIST IN EDDY CURRENT
NON DESTRUCTIVE TESTING**

Checking electrical conductivity of
carbon composite materials



Checking electrical conductivity
of *graphite*



Checking electrical conductivity or
thickness of *thin* metallic sheets or deposits



Z-SCOPE™

**A MULTI-
PURPOSE
STRUCTURE
HEALTH
MONITORING
SOLUTION**

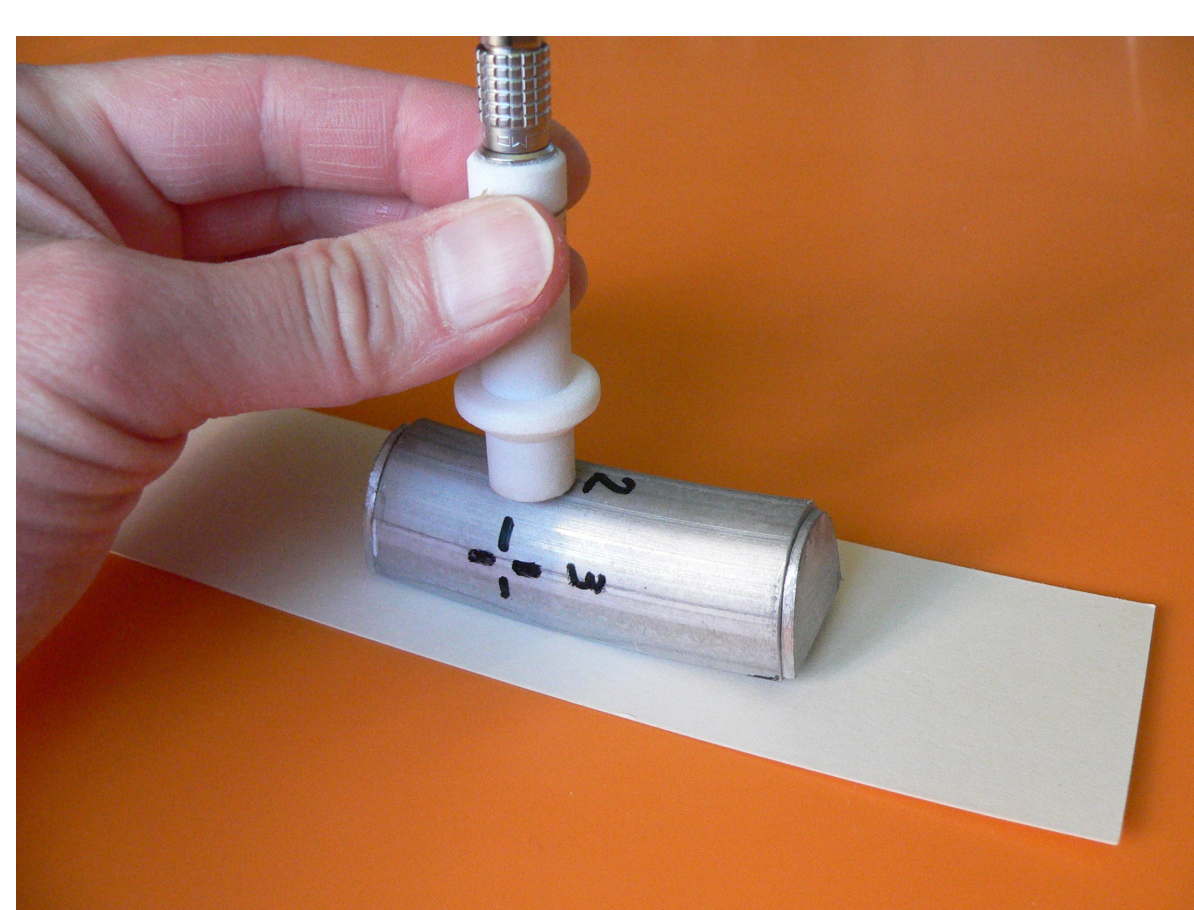


THE Z-SCOPE IS AN
EDDY-CURRENT NON
DESTRUCTIVE TESTING
INSTRUMENT THAT
ALLOWS
TO MEASURE
THICKNESS,
CONDUCTIVITY,
DISPLACEMENT AND
DETECT DEFAULTS ON
OBJECTS MADE OF
CONDUCTIVE
MATERIALS LIKE
METALS OR CARBON-
FIBER COMPOSITE

Checking wall thickness of
steam generator tube



Checking wall thickness of a closed box
(a complex geometry)



Checking electrical conductivity of
machine parts made of *steel*



Visit <http://www.sciensoria.com> or email to info@sciensoria.fr

SCIENSORIA sarl F-35170 BRUZ FRANCE VAT n°: FR04 428 837 256

ABOUT THE Z-SCOPE™

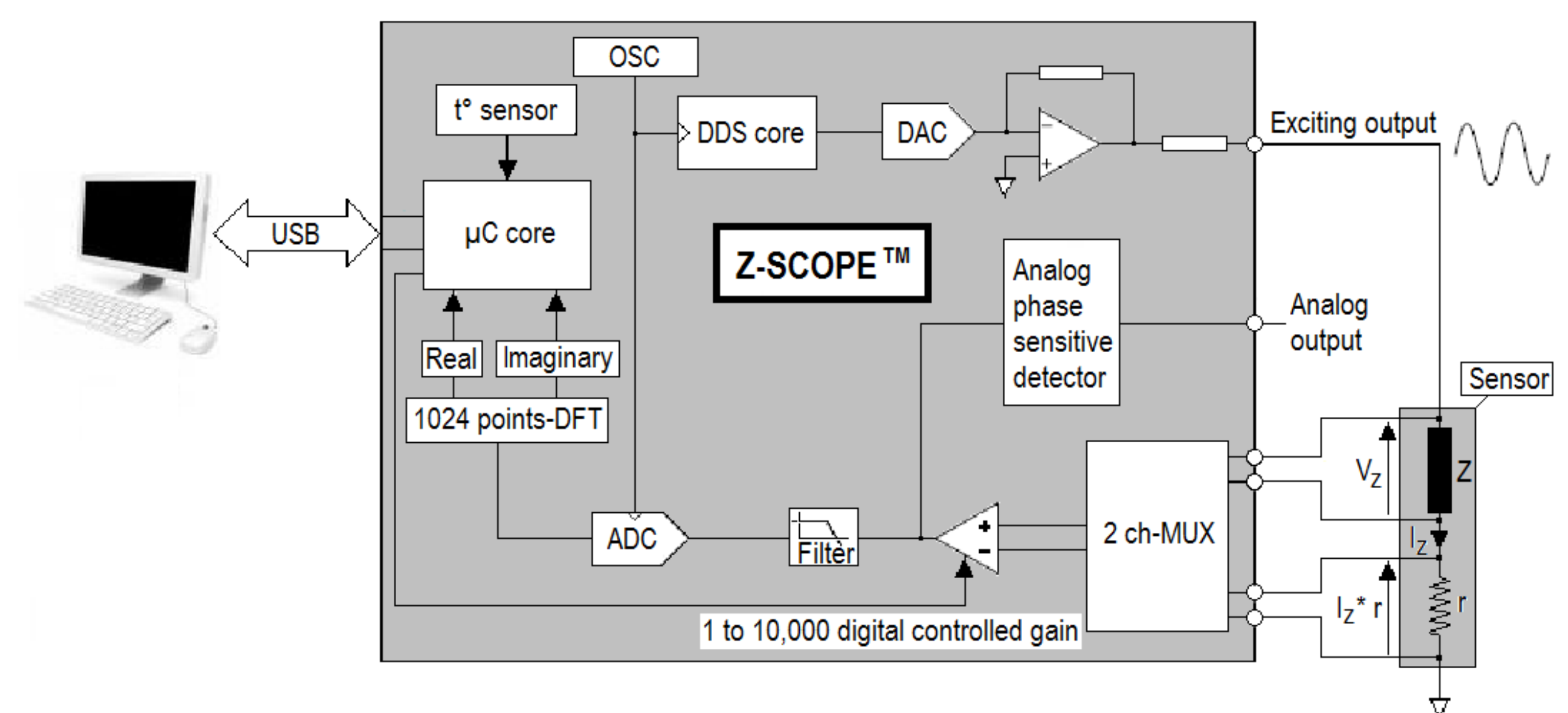
The Z-SCOPE™ is a portable USB-powered multi-frequency eddy current non-destructive testing device. It can be used for the measurement of many parameters of conductive materials like thickness, electrical conductivity, displacement, position, and detection of flaws.

The Z-SCOPE™ has an sinusoidal exciting output in the frequency range of 100 Hz—100 kHz and 2 high-sensitivity inputs with gain from 1 to 10,000. It works like a circuit-analyzer: the exciting output is used to stimulate the circuit and the 2 inputs are used to measure the circuit input and output. An internal *digital* phase-sensitive detector converts the signals to complex form $z = r + j \cdot x$. In the case of a sensor, this operating principle allows to characterize the sensor and detect any variations due to external environment changes. The measurement result is sent to an external PC through a standard USB link.

An analog phase-sensitive detector is available in order to provide analog output which can be used in an analog feedback loop, or for monitoring.

In addition to the eddy current probe, other probes can be utilized with the Z-SCOPE™ like a four-point probes for measuring electrical resistance, a LVDT sensor for measuring displacement, or GMR sensor for measuring magnetic field, etc.

The Z-SCOPE™'s power is derived primarily from the driving software WinEC™, an all-in-one software capable of data acquisition, signal analysis, sensor calibration and, finally, real-time measurement. WinEC™ uses a multivariate calibration algorithm which allows advanced measurement operations such as thickness measurement in varying lift-off.



TECHNICAL CHARACTERISTICS

- **Exciting output:** 100 Hz to 200 kHz output-frequency, with a magnitude up to 10 V_{peak-to-peak}
- **Frequency sweeping capability:** 1 to 10 points with user-specified frequency values.
- **Input gain:** 1 to 10,000 in 1, 2, 5 sequence.
- **Acquisition rate with WinEC™:** up to 150 measures per second depending on the computer speed and operating system.
- **Digital phase-sensitive detector:** 1, yielding real and imaginary parts (R, X) of the input signal
- **Analog phase-sensitive detector:** 1, optional, yielding the real part of the input signal only
- **Auxiliary input/output:** optional, designed on request

APPLICATION EXAMPLES



MEASUREMENT OF THICKNESS

- **Application examples:** measurement of thickness of copper-made flat conductor, thickness of thin aluminum sheets, wall thickness of tubes, boxes, etc.
- **Materials:** Inconel 690, 316L, TA6V, aluminum AU4G, copper, graphite
- **Remarks:**
 - for measuring low thicknesses (from 1 mm down to several micrometers), the eddy current method is better than the ultrasound method, so the two methods are complementary.
 - for curved-shaped products such as tubes or boxes, positioning the eddy current sensor is easier than the ultrasound sensor.



TESTING OF THE ELECTRICAL CONDUCTIVITY OF MAGNETIC METALS

- **Application examples:** the eddy current method is a good means to quickly check the conductivity of manufactured pieces.
- **Testable materials:** non magnetic **and** magnetic materials, composite materials (cobalt-diamond, carbon-fiber plastic, etc.)