PRODUCT DATASHEET

QUANTUM OPTICS AND INTERFEROMETRY KIT

QBox

Quantum photonics on the classroom desk

QBox democratizes quantum photonics. Students assemble UC2 cubes with a laser, mirrors, a lens and beam splitters and build real interferometers, then go all the way to quantum sensors using a diamond.



openUC2 developed together with TH Münster / OQ3

Why high schools choose QBox

A real quantum lab, not a simulation

Students work with a real laser, real interference fringes and real quantum effects: a lab that only one high school in Romania can offer today.

Fits the physics curriculum

Builds on the wave optics (interference, polarization) from Grade 11 and the quantum physics elements from Grade 12.

Built by students, not just watched

Modular UC2 cubes on a baseplate: each group builds, aligns and measures its own setup, guided by a browser-based wizard.

Ready for clubs and projects

Ideal for STEM clubs, science fairs and student projects in quantum technologies, a field in which Europe is investing heavily. The advantage of an open-source kit is that students can also produce a similar kit for themselves or for their school.

4	3	520 nm	DE
experiments, from polarization to ODMR	themes: polarization, interference, quantum	green laser-diode cube, included	made in Germany, open-source platform

From classical light to quantum sensors

STEP 1

Polarization

Crossed polarizers, stress birefringence, Malus's law, the three-polarizer paradox.

STEP 2

Interference

Michelson and Mach-Zehnder interferometers, quantitative phase imaging.

STEP 3

Quantum sensing

ODMR with NV centers in diamond: detect magnetic fields with a quantum sensor.

Vegacomp Consulting
Your partner for quantum education in Romania

cornel@vegacomp.ro +40 720 587 837 vegacomp.ro

Experiments students can do

Theme	Experiment	What students learn
Polarization	**Polarization experiments**	Crossed polarizers, stress birefringence, the three-polarizer paradox and Malus's law: polarization states, birefringence, polarimetry
Interference	**Michelson interferometer**	Wave optics, coherence, optical path differences and precision alignment; resolve sub-nanometre displacements
	Mach-Zehnder interferometer	Split-beam interferometry with separate reference and sample beams; quantitative phase imaging, holography
Quantum	**ODMR with NV diamond**	Quantum sensing: electron spin resonance and magnetic field detection with NV centers in diamond

What's in the box

- UC2 base plate & cubes
- 520 nm laser-diode cube
- 2 × 90/45° mirrors (kinematic)
- 1 × 90/45° mirror (stiff)
- 2 × beam-splitter cube with long-pass filter
- Plano-convex lens (f = 75 mm)
- XY stage with NV-diamond mount
- Microwave driver and loop antenna (incl. Seeed Studio XIAO ESP32C3)
- Magnet cube
- Light-sensor module
- USB-C control board with Wi-Fi GUI
- Quick-start booklet and full open-source docs

Technical specifications

Laser	520 nm green laser-diode cube
System	Modular openUC2 cubes (injection-molded, v4) on a UC2 base plate; 3D-printable, replaceable parts
Detection	Light-sensor module; fluorescence intensity and ODMR spectra streamed to Python notebooks or CSV
Control	USB-C control board with Wi-Fi GUI and open-source ESP32C3 firmware; browser-based guidance wizard
Setup	A stable table or vibration isolation is recommended
Dimensions	39 × 24 × 9 cm
Weight	1 kg
Origin	An openUC2 product, developed together with TH Münster / OQ3, made in Germany

Delivered and supported by Vegacomp

Vegacomp delivered the first Quantum Lab in a school in Romania (Sector 6, Bucharest), co-organized the Quantum Summer Camp Timișoara 2026 and is the only Romanian member of the European Quantum Industry Consortium (QuIC).

Delivery in 3 weeks **Teacher training [optional]**
Local support in Romanian