

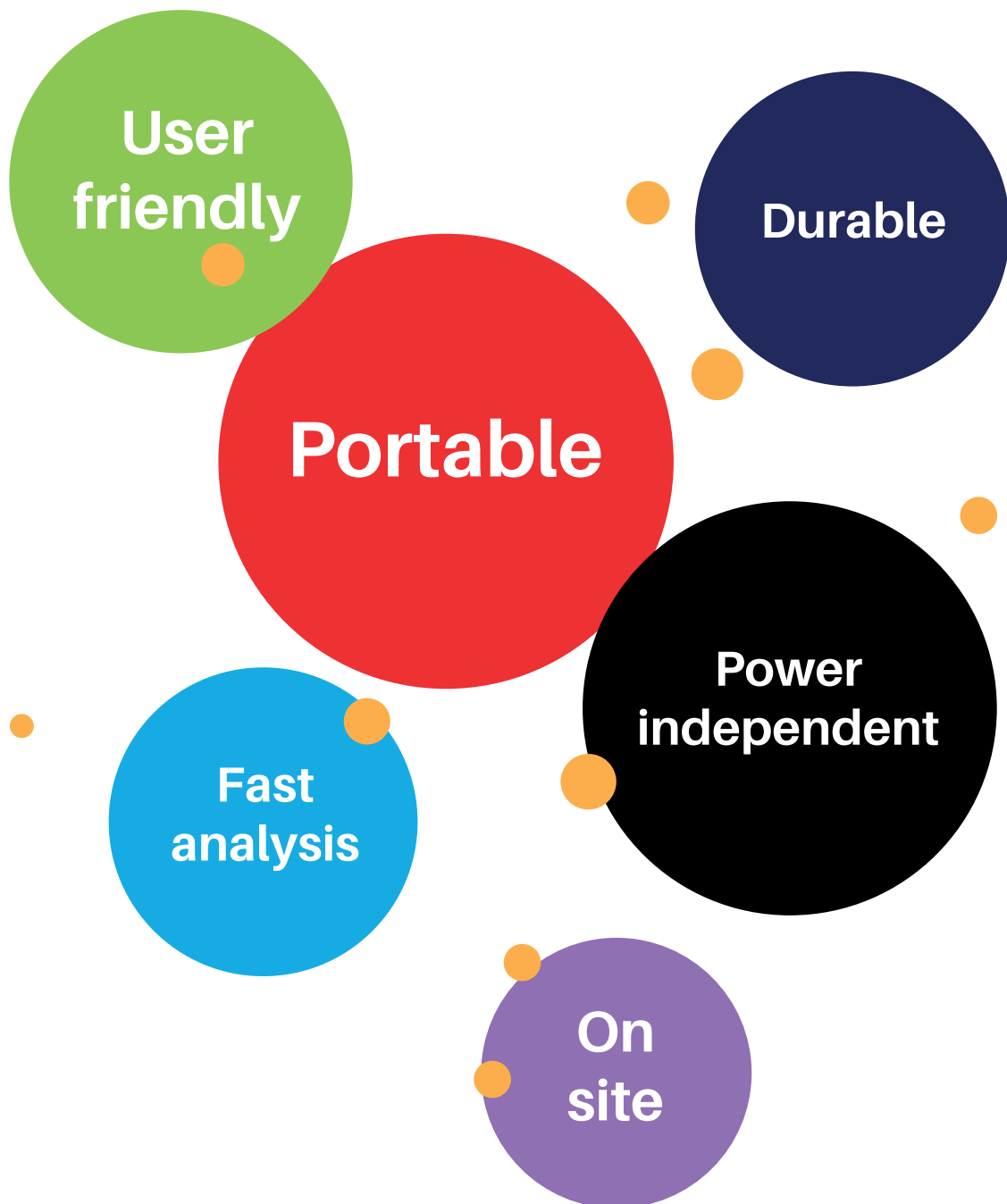


M-Trace

Fast and easy multi-elemental chemical analysis

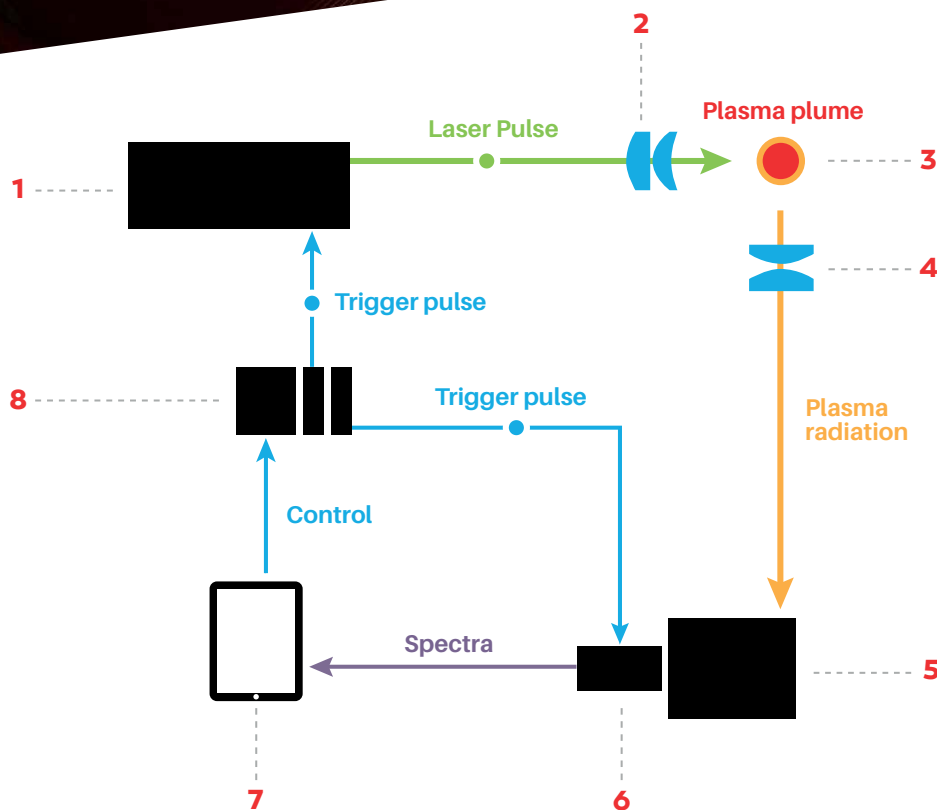
Utilizing one of today's most promising analytical technique: Laser-Induced Breakdown Spectroscopy (LIBS)

- Fast determination of elemental composition
- High resolution 2D chemical mapping
- Depth profiling of multilayer materials
- Light elements visibility
- Portable system



Laser-Induced Breakdown Spectroscopy (LIBS)

LIBS is a modern analytical technique, which utilizes a laser pulse for fast determination of chemical composition of the sample. It is an effective combination of laser ablation with an atomic emission spectroscopy.



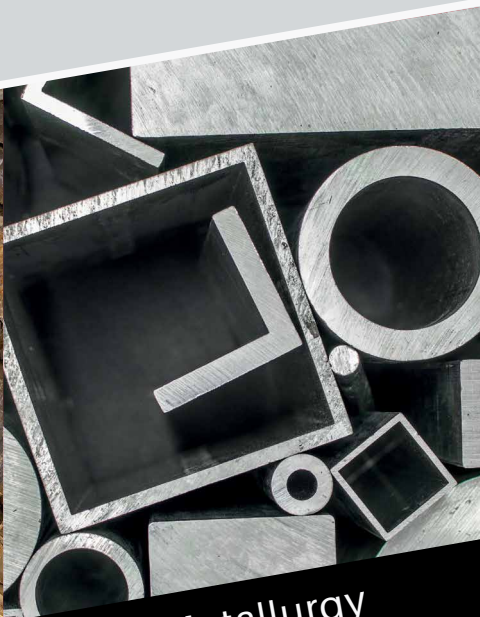
LIBS principle explained

1. Laser pulse is generated by the **Laser Head**
2. and focused on the sample by the **Laser-focusing Optics**.
3. Due to the high irradiation the **Microplasma** is induced on the sample surface.
4. Plasma radiation is collected by the **Collecting Optics**,
5. transmitted and dispersed by the **Spectrometer**.
6. Dispersed radiation is captured by the **Detector**.
7. Resulting spectrum is processed in **Tablet/PC**.
8. Whole system is precisely synchronized by the **Digital Delay Generator**.

A number of benefits enables LIBS to analyze samples in various states with minimal or no preparation at all



Geology



Metallurgy



Polymer production



Food industry



Agriculture



Pharmacology



Science

LIBS is sensitive to the majority of chemical elements with limits of detections as low as 1-100 ppm

Place your sample on the high precision motorized manipulator

- 3-axis motorized movement
- Travel range: 60 × 80 × 70 mm
- < 2 μm movement resolution

A number of sample holders handle various shapes and sizes of your sample

Holders are automatically detected by the system and visualized in the Sample View window of the control software



2 × 30 mm
pellet holder



Universal
clamp holder



50 mm
pellet holder



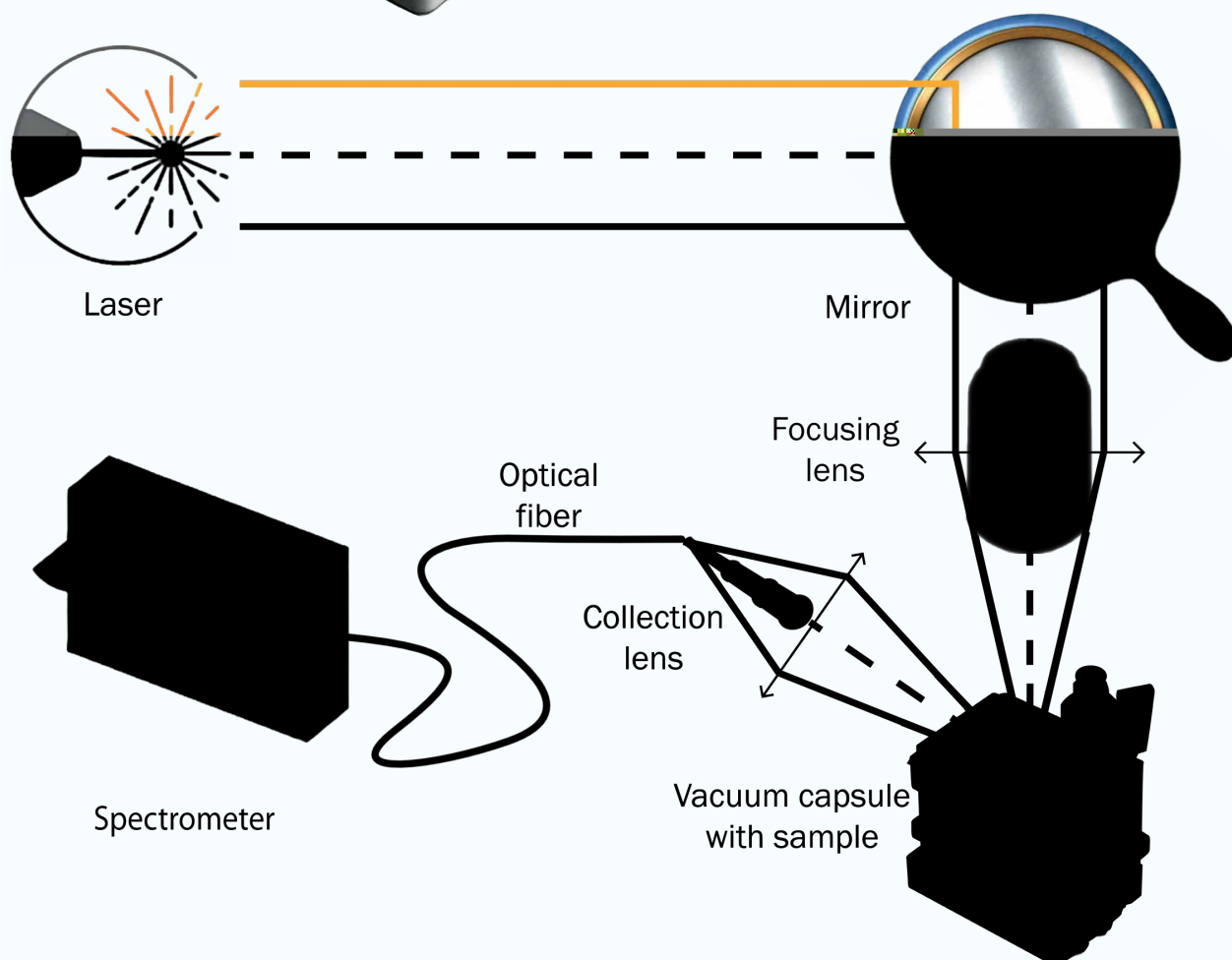
12 × 12 mm
pellet holder

Vacuum capsule

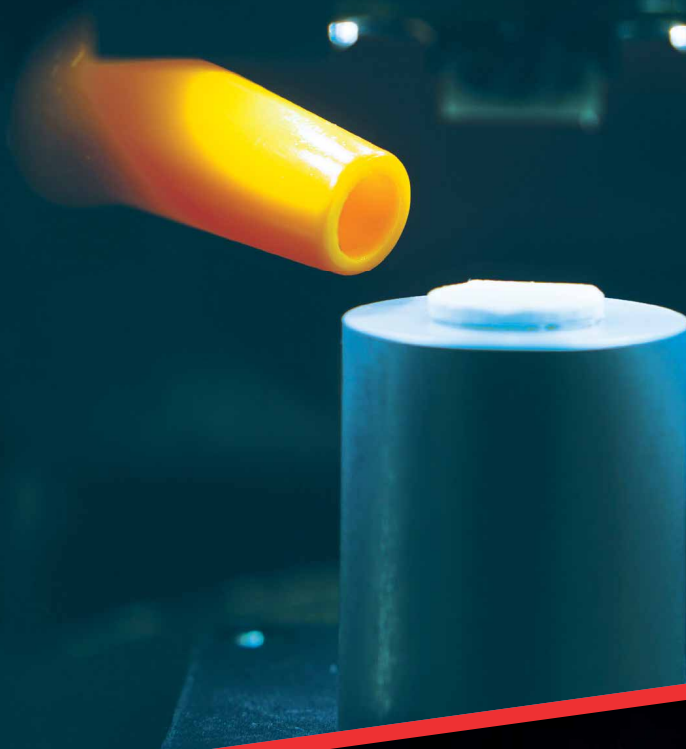
Vacuum capsule attachable atop of the manipulator will provide sufficient ambient atmosphere for your analysis



Vacuum helps to isolate signal of elements: carbon, oxygen, nitrogen, hydrogen from the sample. Since ambient air contains these elements, signal from the sample measured in ambient air could be affected.



Gas Modules



Enhance your analysis with direct purge of noble gas (Ar, He, etc.)

Interchangeable cartridges

Support the signal of your analysis with direct inlet of argon gas



Travel ready

Robust and watertight Pelicase will protect your M-Trace during the transportation.



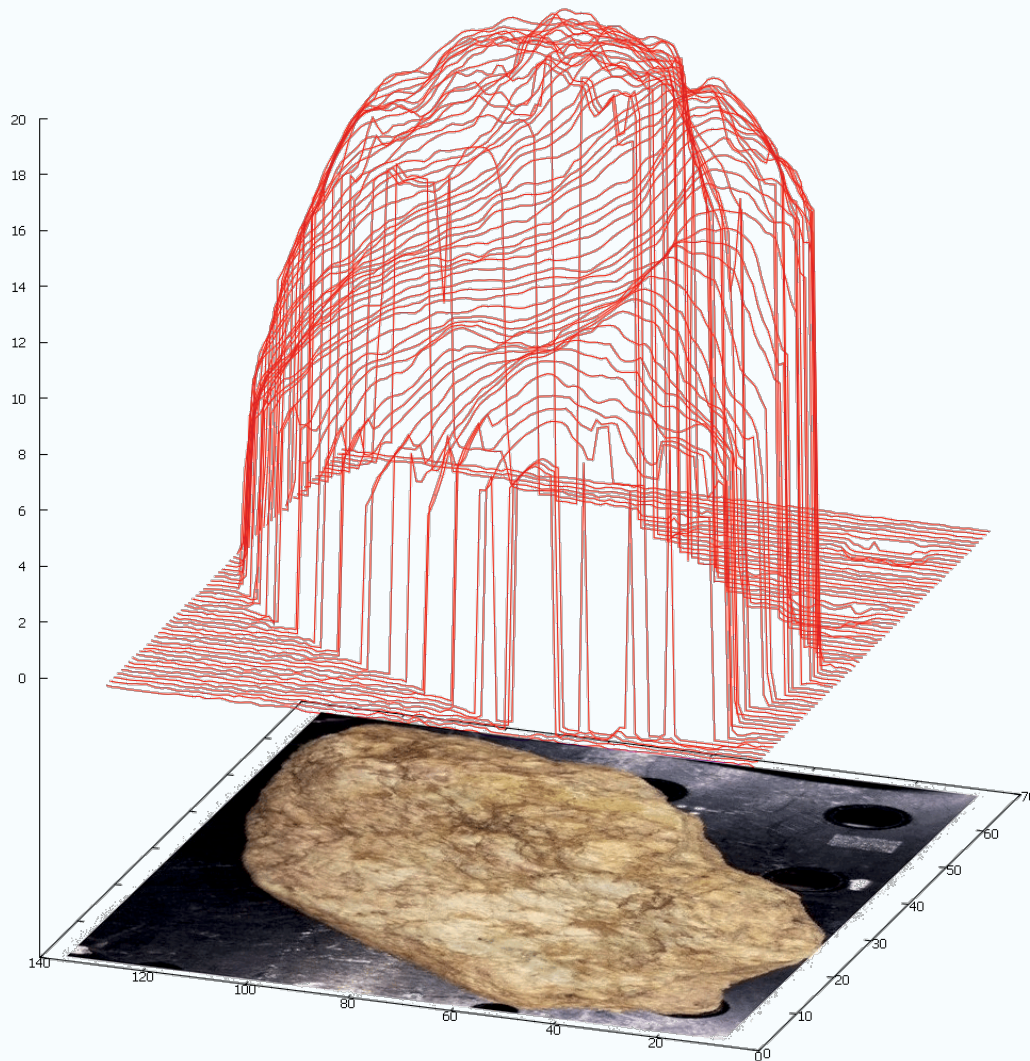
Simple manipulation

Easily portable by a single person.



3D sample measurement

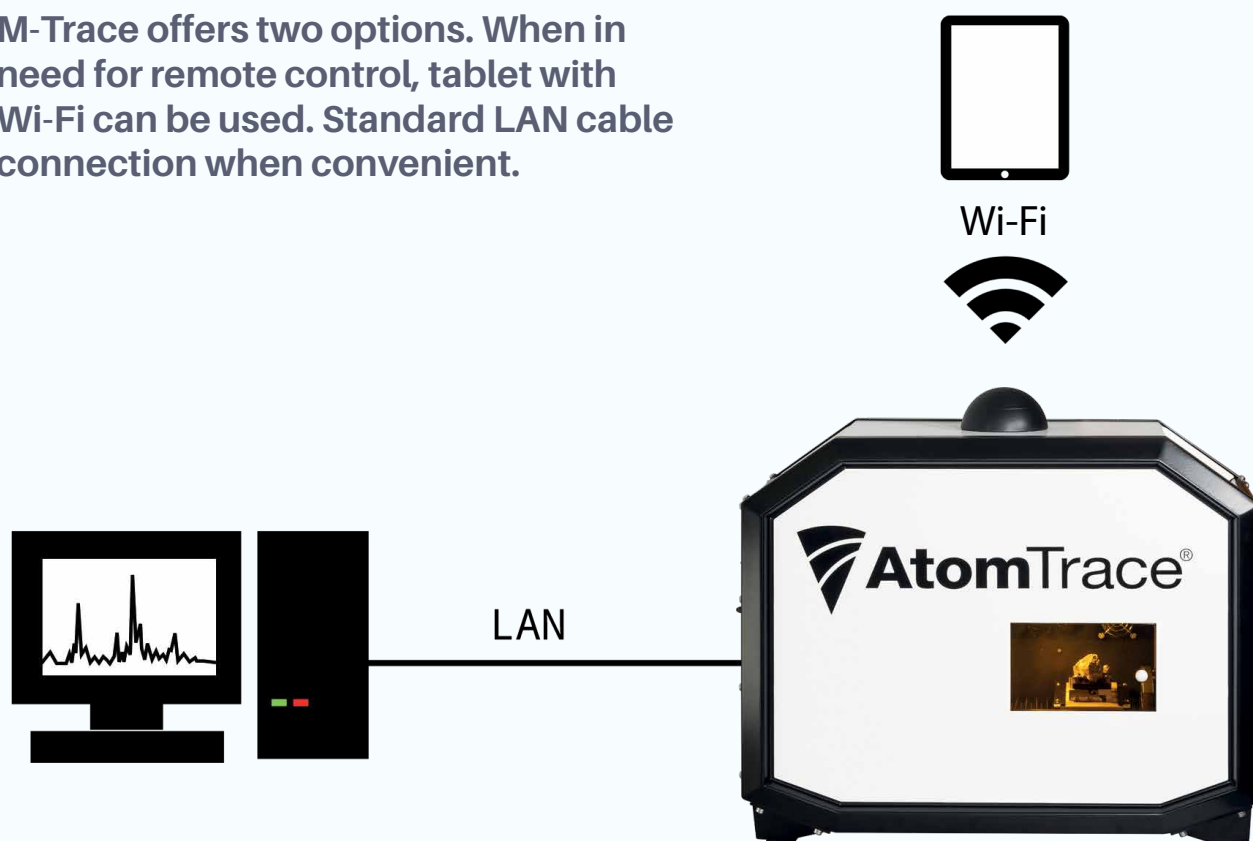
One of the key features of the M-Trace is 3D scanning. Collect spatial information about your sample in real time with fast and precise technology. **Save your time spent on sample preparation!**



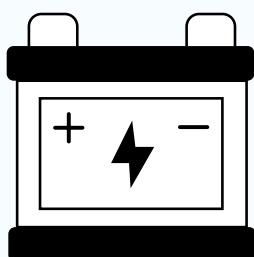
Find the most about the topology of your sample. Use contemporary advanced technology to measure height and dimensions.

Control unit and power supply

M-Trace offers two options. When in need for remote control, tablet with Wi-Fi can be used. Standard LAN cable connection when convenient.



The client-server architecture detaches control and allows remote manipulation with the device via network communication channels Wi-Fi 2.4 GHz, 5.0 GHz, GSM, 3G and LTE. Measured LIBS data are along with initial outputs from analysis saved in real time to local data storage in the device. In the sense of Industry 4.0, the measured LIBS data along with the outputs of the analysis could be exported to remote data storage units on the servers or cloud.

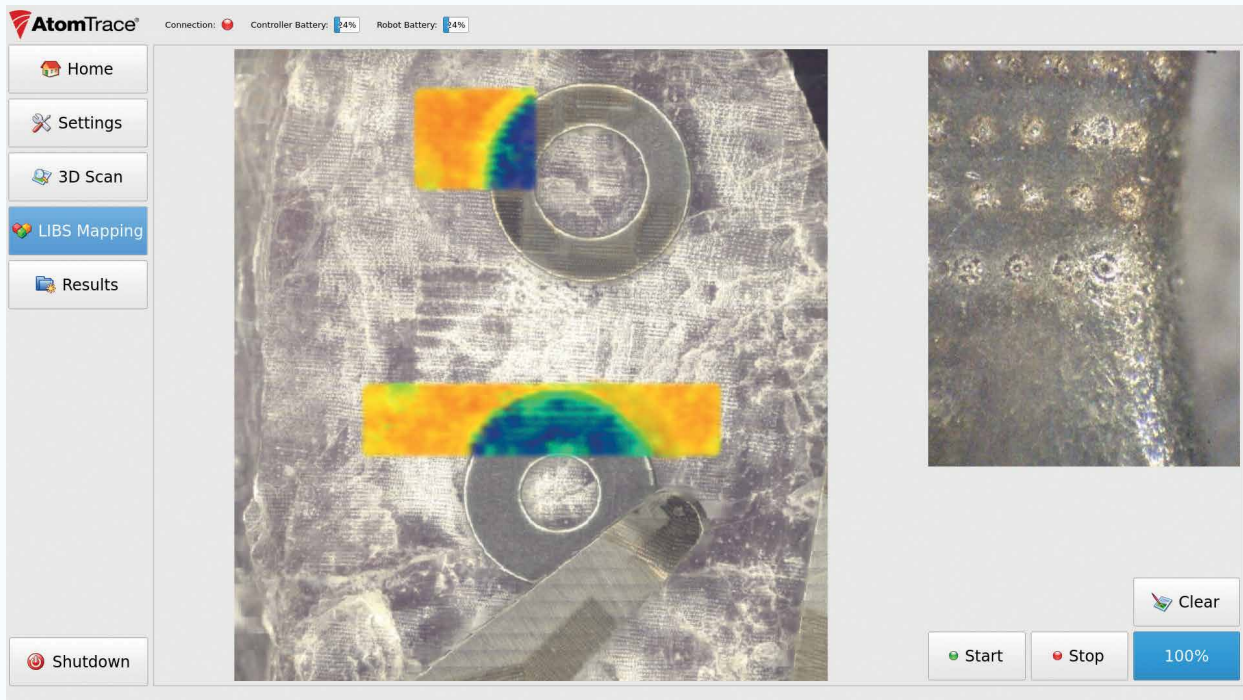


M-Trace can be powered directly from power grid 230V/60Hz or from built-in batteries. Batteries can be changed if more battery time operation is required.

Software

User-friendly interface. Whole analysis in three steps:

- 1) Surface scan
- 2) LIBS mapping
- 3) Result display



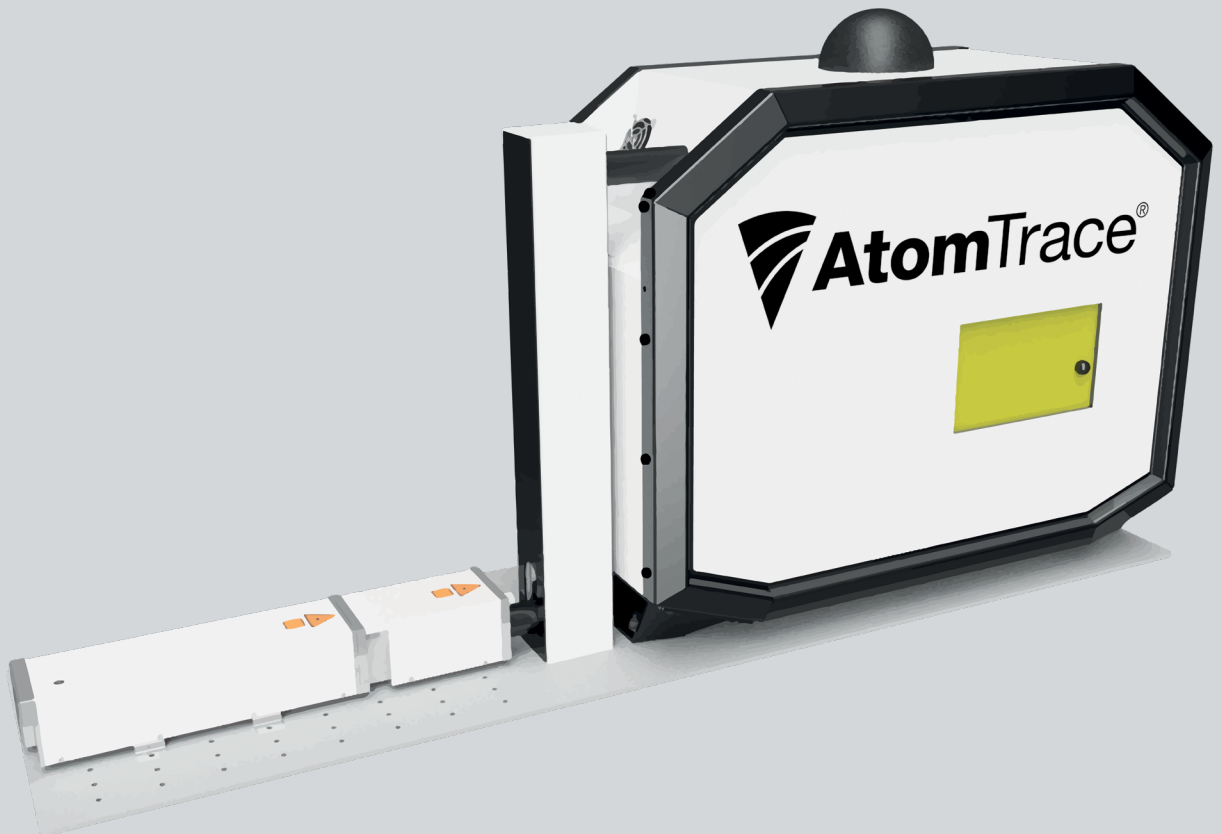
Tablet parameters:

Display:	11.6" FHD LCD multi-touch panel
Weight:	1,39 kg
Dimensions:	317 × 215 × 24 mm
I/O ports:	USB 3.0, socket for Headphone/Microphone, DP port, Fullsize RJ45 connector, USB 2.0, DC Power-in, Docking connector

All-in-one



Modular knit



Datasheet

Interaction area

Manipulator	Movement range: 60 × 80 × 70 mm Recommended maximal sample size: 50 × 70 × 45 mm Holders: 2 × 30 mm / 1 × 50 mm / 12 × 12 mm pellet holder, universal clamp holder 2 µm movement resolution
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Accessory	[opt] Gas purge, Vacuum capsule
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LIBS instruments

Pulsed laser	DPSS pulsed laser, energy 30 mJ @532 nm, 20 Hz (standard)
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[opt] DPSS pulsed laser, 80 mJ @1064 nm, 20 Hz

Spectrometer	Czerny-Turner, 75 mm focal length; resolution 0,05–20 nm spectrometer range is modular in range 200–1100 nm (standard)
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[opt] Echelle

Detector	CMOS, 4096 px, Integration time 9 µ–40 s
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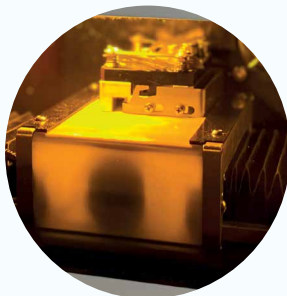
[opt] CCD, iCCD

DDG	4 output, pulse 10 ns–1000 s, resolution 5 ns, delay 0–1000 s
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Accessory	[opt] Calibration lamp, safety glasses, energy meter, gas cartridge, battery
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Protected by the interlock system



Covered by laser filters

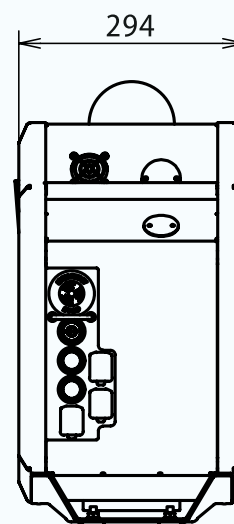
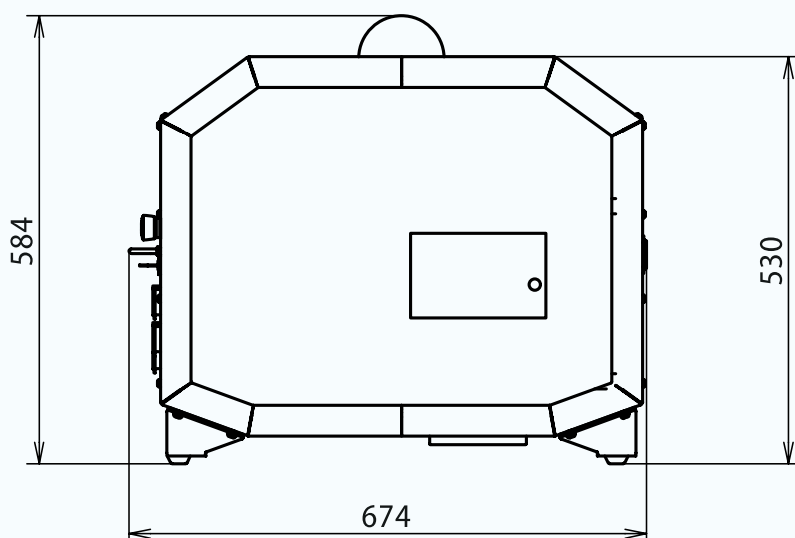


Automated temperature regulation

Datasheet

Case

Housing & construction	Aluminium body and covers
Control panel	Emergency STOP, safety key, electronics START/STOP, 2 × LAN, USB-C
Safety elements	Interlock safety system Laser safety glass door Covered optical periscope for modular version
Dimensions & weight	674 × 584 × 294 mm device alone; 32 kg 463 × 762 × 847 mm device in transportation case; 52 kg
Power requirements	Interchangeable Li-Ion battery or 230 V, 50 Hz, 16 A





From Science to Industry

Instrumentation for the Laser-Induced Breakdown Spectroscopy

AtomTrace is focused on the development and commercialization of promising technologies in the field of fast material analysis by the Laser-Induced Breakdown Spectroscopy (LIBS). Motivation and know-how is given by the years of research experiences of the Laboratory of Laser Spectroscopy (Brno University of Technology, Czech Republic).

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