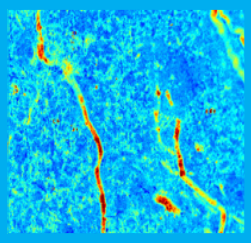
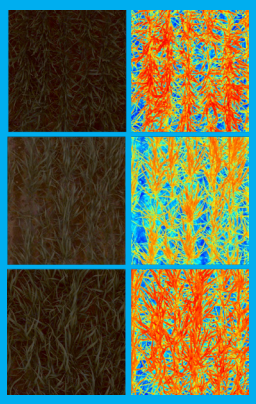
Separation of roots with the Videometer MiniRhizotron in Standard RGB.



Separation of roots with the Videometer MiniRhizotron in Jet colors.



Root imaging and changes with the Videometer MiniRhizotron. Left images in sRGB and right images in jet.

The Videometer MiniRhizotrons is a system developed specifically for root imaging across soil types.

Videometer MiniRhizotron

The compact Videometer MiniRhizotron spectral imaging system enables automated, non-destructive detection and quantification of living roots directly in field and semi-field conditions. By combining advanced spectral imaging with robust analysis algorithms, the system provides reliable, repeatable root measurements with minimal manual intervention.

The MiniRhizotron can detect roots across all soil types, including challenging or heterogeneous soils, ensuring consistent performance under real-world experimental conditions. Its spectral approach makes it possible to differentiate actively living roots from dead roots remaining from previous growing seasons, allowing researchers to focus specifically on current root activity and development.

This capability supports accurate monitoring of root growth dynamics over time and improves the quality of below-ground data for plant science, breeding, and agronomic research.

Videometer MiniRhizotron
KEY FEATURES AND ADVANTAGES

- 5 wavelengths (405, 450, 550, 660, 940 nm) with possibility of customizations.
- Spectral imaging and quantitative analysis in 5-10 seconds.
- 5 Mpixels per wavelength providing 25 million pixels/image.
- Annual subscription to VideometerLab Software.
- Standardized instrument including easy-to-use instrument calibration.
- Superior color determination compared to traditional RGB technology.
- Automatic change of dynamic range, depending on the application.
- Long lifetime of the light sources. Up to 100.000 hours.
- Increased stability due to LED source technology.
- Powerful exploratory software for R&D.
- Recipe building tool for easy-to-use routine applications.
- Optional battery for mobile in-field analysis.
- Optional water sensor for detection of water in soil.

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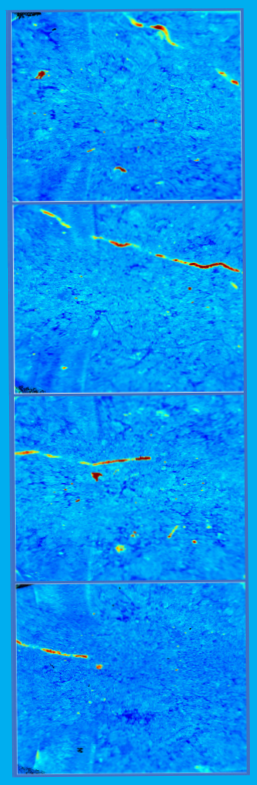
Videometer MiniRhizotron
TECHNICAL SPECIFICATIONS

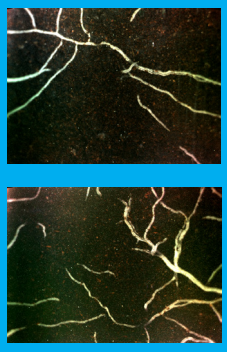
Light sources	5 high power LED sources with a range from 405 nm to 940 nm. Possibility of customization of wavelengths based on customer needs.
Image size	2448 x 2048
Resolution	20 µm / pixel.
Field of view	50 x 41 mm
Calibration	Absolute reflectance calibration using 2 reflectance calibration targets and one geometric calibration target. Simple calibration wizard procedure that takes 3 minutes.
Time of complete analysis	5-10 seconds per sample.
Dimensions instrument Dimensions flight case	350 mm (height) x 60 mm (diameter) (when folded together). 550 mm (height) x 350 mm (width) x 200 mm(depth).
Compatible tubes	Standard 70/64 mm acrylic (PMMA) tubes, 70 mm outer and 64 mm inner diameter.
Weight	1.9 kg (Net), 7 kg (Gross).
Power supply	110-240 VAC, 50/60 Hz.
Ambient temperature	Operation: 5-40 °C, Storage: –5-50 °C.
Ambient humidity	20-90 % RH non-condensing.
PC requirements	Minimum configuration: Intel i7, 12th generation or better, 32 GB RAM, USB3 SuperSpeed port.
Software requirements	Microsoft Windows 11 Professional 64 bit, full Windows update.
Hardware and hardware options	Calibration tube fixtures (3 included) Stick extentions 500 mm (2 included, up to 6 possible) Carrycase (included) Battery option possible to be ordered seperately Water sensor option to be ordered separately
Software and software options	VideometerLab Software on annual subscription basis. Spectral imaging toolbox (MSI) for image analysis, R&D and exploratory purposes. Blob toolbox to segment singular objects and create basic classification models. Classifier Design Tool (CDT) for advanced classification models.

Videometer offers a wide range of multi spectral imaging instruments measuring what you see with your eyes – and beyond. They are fast, non-destructive, versatile, and reproduceable with world-leading accuracy. The accompanying Videometer software provides a unique variety of machine learning and AI spectral imaging analysis tools. Laboratory, at-line, on-line, and in-line systems are designed for quality assurance, process control, PAT, and product development.



Root imaging with the Videometer MiniRhizotron in Jet colors.

The Videometer MiniRhizotron camera unit seen from two different angles.



White clover roots in sRGB taken with Videometer MiniRhizotron

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