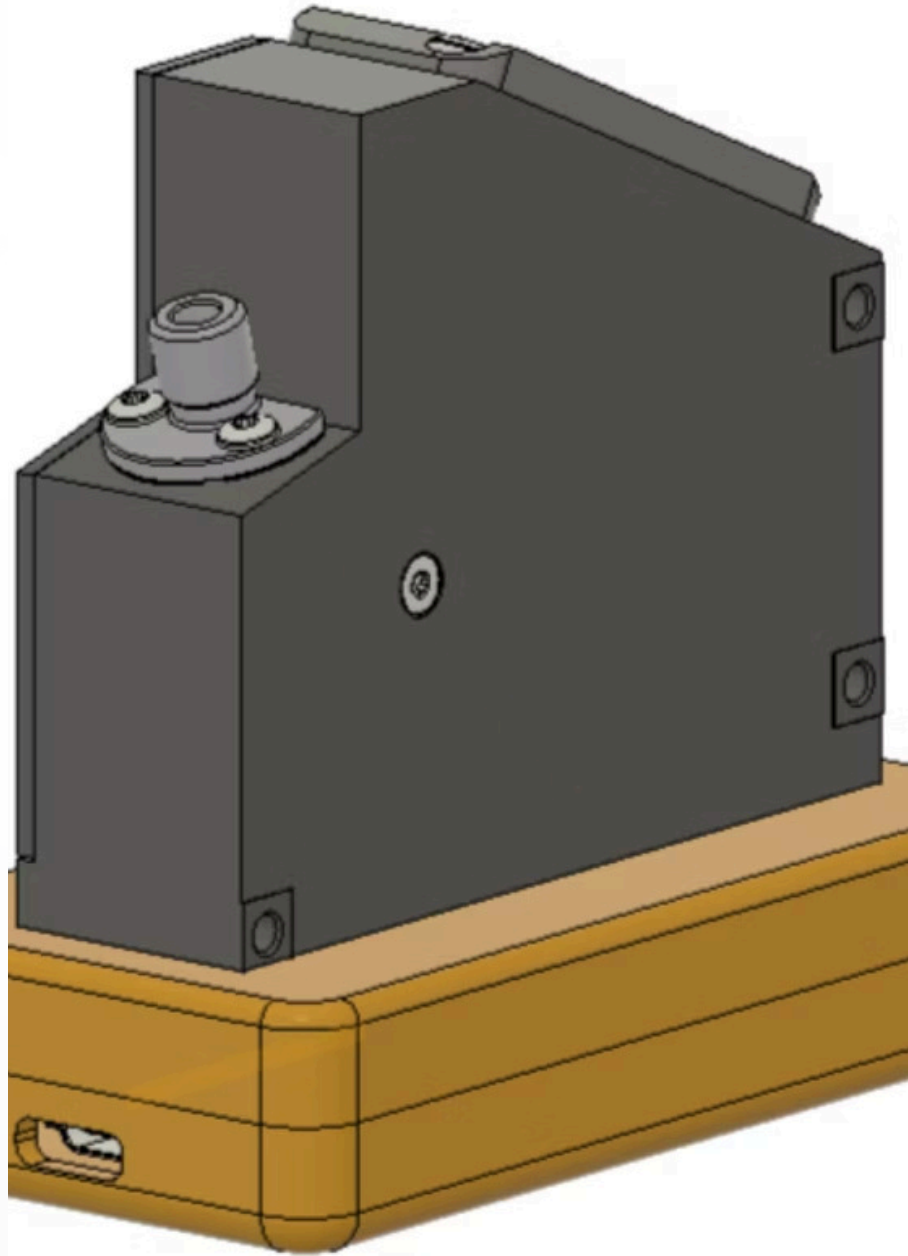
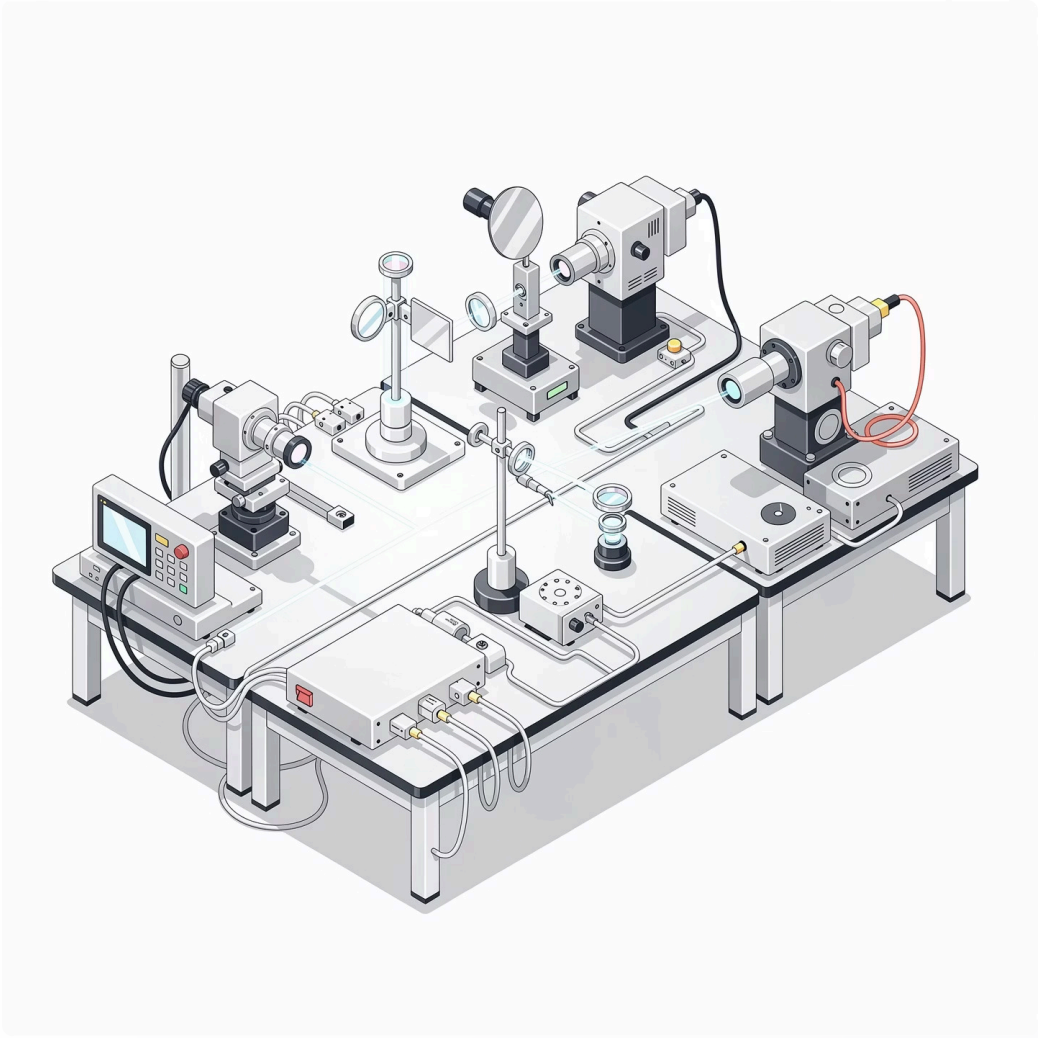
Prism Optics Advanced Spectroscopy & Imaging Systems

Spectrometers, Raman platforms, and computational imaging systems—engineered end-to-end for research and deployment.



OVERVIEW

Integrated Optical Instruments for Advanced Sensing



Prism Optics designs complete optical instruments, imaging systems, and embedded compute platforms that transform raw spectral data into actionable intelligence. Our expertise spans the full electromagnetic spectrum from UV through SWIR wavelengths.

We deliver production-ready systems combining precision optics, advanced sensors, and edge computing capabilities for spectroscopy and multidimensional imaging applications.

UV–VIS–NIR–SWIR

Complete spectral coverage

Raman Systems

Molecular identification

Hyperspectral

Multidimensional imaging

EMBEDDED COMPUTE

GPU-Accelerated Spectroscopy & Imaging at the Edge

Modern spectroscopy and imaging systems generate massive data streams that demand real-time processing at the point of acquisition. Prism Optics designs instruments around embedded GPU platforms, particularly **NVIDIA Jetson** modules, enabling sophisticated processing, visualization, and AI inference directly at the instrument—eliminating bottlenecks and enabling immediate decision-making.

Jetson Platform Integration

Support for Nano, Xavier, and Orin-class platforms with optimized thermal and power management for continuous operation

High-Bandwidth Ingest

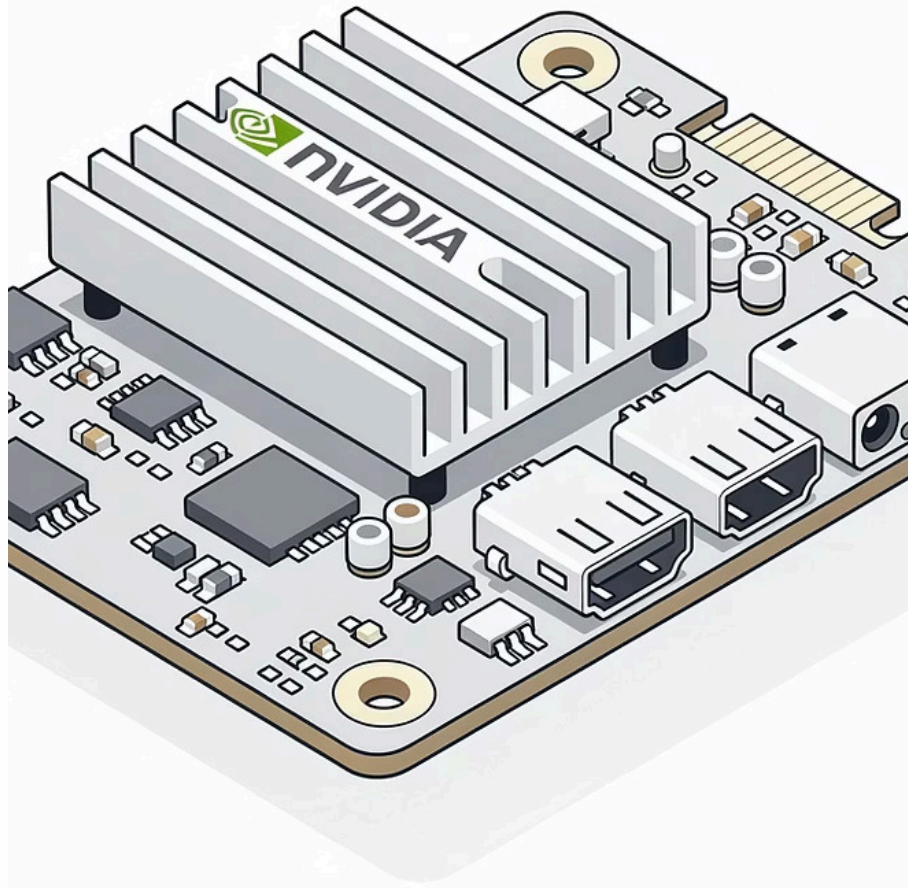
Multi-camera synchronization and high-speed sensor data acquisition with minimal latency

Real-Time Processing

CUDA-accelerated spectral processing, image fusion, and custom Python-based control pipelines

Edge AI Inference

On-device classification, segmentation, and detection models for immediate actionable results



IMAGING SYSTEMS

Multispectral & Hyperspectral Imaging

Prism Optics develops advanced multispectral and hyperspectral imaging systems that capture spectral information across hundreds of wavelength bands, transforming spatial data into rich spectral cubes. Our systems bridge the gap between laboratory research instruments and rugged field-deployable platforms.

System Architectures

- Snapshot hyperspectral systems for dynamic scenes
- Scanning pushbroom and whiskbroom configurations
- Multispectral camera arrays with synchronized capture
- Tunable filter-based architectures for flexible spectral sampling

Complete Pipeline Support

From initial optical design and sensor selection through data acquisition, spectral calibration, and analysis software—we deliver turn-key solutions optimized for your application.

Visible Spectrum

High-resolution color and spectral imaging for materials analysis

NIR Range

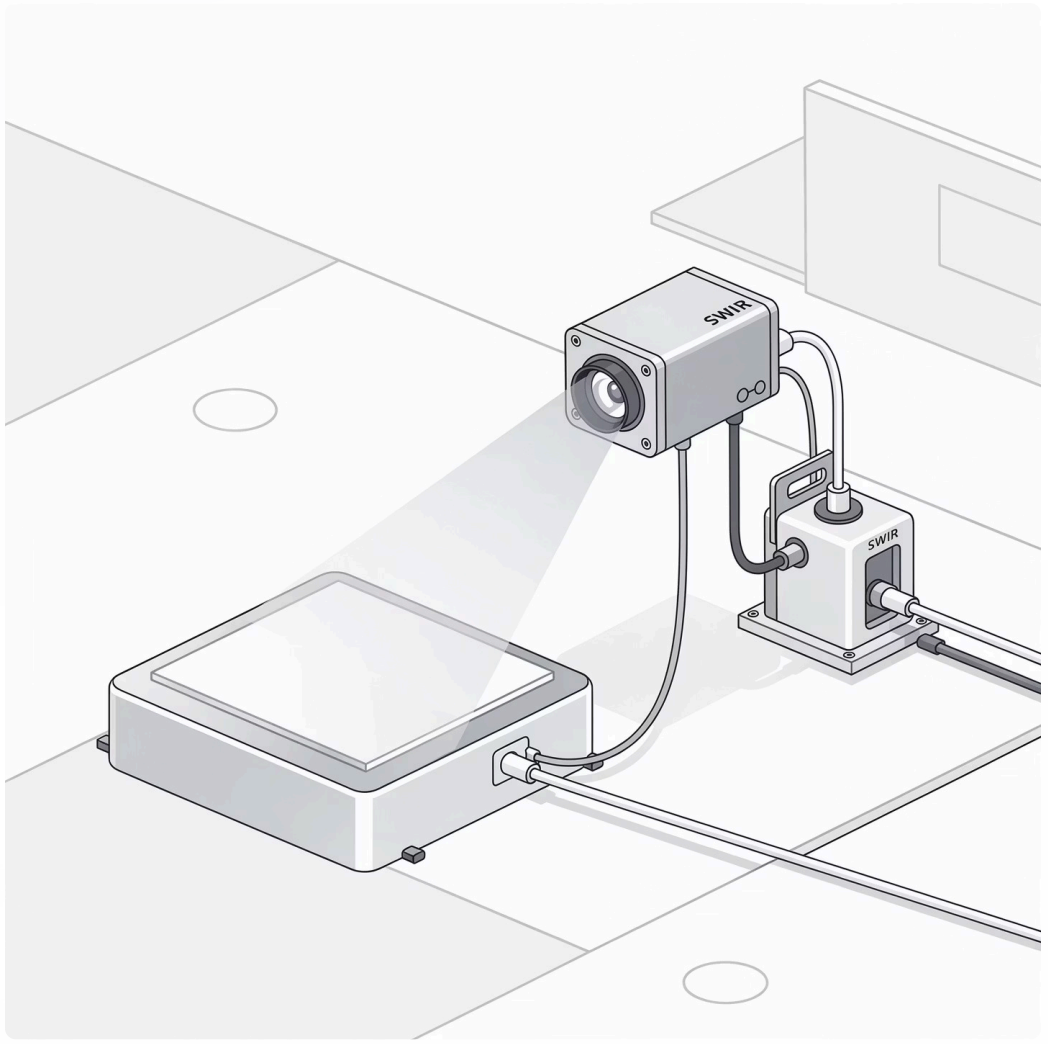
Near-infrared systems for agricultural, pharmaceutical applications

SWIR Capability

Short-wave infrared for enhanced material discrimination

SWIR TECHNOLOGY

Short-Wave Infrared Imaging for Material & Tissue Contrast



Short-wave infrared imaging (900–2500 nm) reveals material properties and compositional details invisible to visible and standard NIR cameras. Prism Optics delivers complete SWIR imaging solutions—from standalone camera modules to fully integrated computational platforms.

Our SWIR systems leverage advanced InGaAs sensor technology combined with optimized optical designs for maximum sensitivity and contrast. Each system can be configured as a standalone unit or integrated with Jetson compute for real-time image processing and AI-driven analysis.

Material Sorting

Discrimination of plastics, polymers, and composite materials for recycling and quality control applications

Biomedical Imaging

Enhanced tissue contrast and subsurface feature visualization for surgical guidance and diagnostics

Moisture & Composition

Non-contact measurement of water content, lipid distribution, and chemical composition analysis

Process Monitoring

Real-time industrial inspection and quality assurance for manufacturing environments

INTEGRATED SYSTEMS

Hybrid Spectroscopy & Imaging Platforms

Prism Optics breaks down traditional silos between spectroscopy and imaging, delivering **hybrid systems** where complementary modalities work in concert. Spectrometers feed imaging pipelines with spectral ground truth, Raman systems integrate with machine vision for spatially-resolved molecular analysis, and all spectral data flows directly into edge AI models for real-time classification.

Co-Designed Hardware

Optics and compute architectures developed together from the ground up

Unified Data Streams

Spectroscopy and imaging data synchronized and calibrated at acquisition

Real-Time Intelligence

Integrated AI models process multimodal data for immediate actionable output

> *This integrated approach accelerates development cycles, produces cleaner datasets, and creates scalable system architectures that grow with your research or product needs.*

COMPONENTS

Optical Components & Sensor Integration

Beyond complete instruments, Prism Optics supplies production-ready optical components and sensing elements for integration into your existing platforms or new system designs. We provide component-level support with system-level expertise.

Diffraction Gratings

Transmission and reflection gratings optimized for spectroscopic applications across UV to SWIR

Optical Filters

Bandpass, notch, edge, and laser-line filters with custom specifications and coatings

Raman Filtering

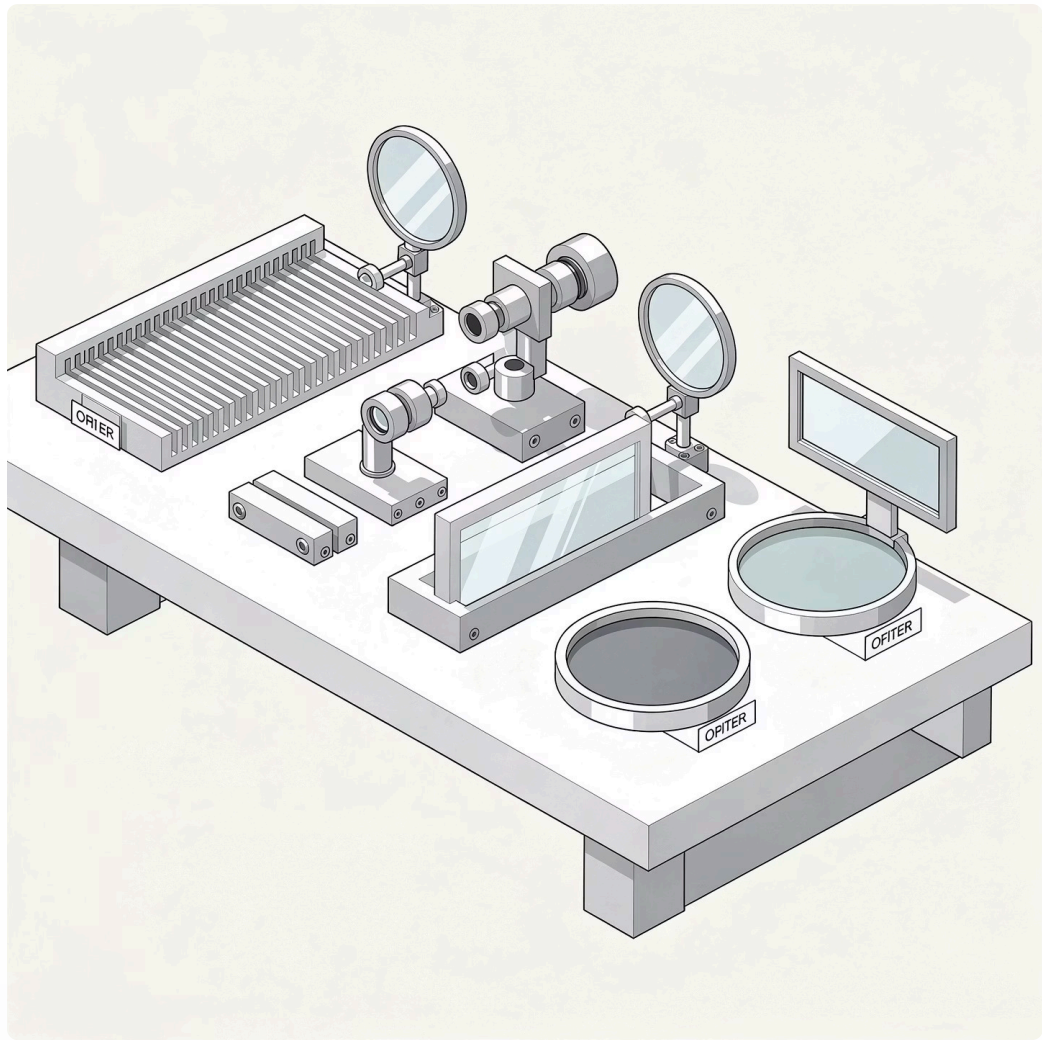
Ultra-narrow edge and laser-line filters engineered for high-performance Raman spectroscopy

Photodetectors

Photodiodes and photodiode arrays including devices from Hamamatsu Photonics for precision detection

Imaging Sensors

CMOS and InGaAs sensors for visible, NIR, and SWIR applications with optimized readout electronics



All components are available as standalone items or pre-integrated into Prism Optics instrument platforms, complete with mechanical housings, electronics, and control interfaces.

APPLICATIONS

Who This Is For

Prism Optics serves organizations developing and deploying advanced optical systems—teams that need more than benchtop demos and require production-ready instruments that perform in real-world conditions.

Research Institutions

Universities and national labs conducting cutting-edge spectroscopy and imaging research requiring custom instrument capabilities

Medical Device Developers

Teams building diagnostic instruments, surgical guidance systems, and tissue imaging platforms for clinical applications

Industrial Instrumentation

Companies developing analytical instruments for process monitoring, quality assurance, and materials characterization

OEM Integration Partners

Original equipment manufacturers embedding spectral or imaging subsystems into commercial products and platforms

Why Prism Optics

Systems Thinking for Modern Instruments

Contemporary spectroscopy and imaging demand more than optical expertise alone. Success requires deep integration across optics, sensors, embedded compute, and intelligent algorithms.

At Prism Optics, we design systems where hardware, sensors, and compute platforms evolve together from initial concept through production. This holistic approach produces instruments that are faster to develop, easier to deploy, and more capable in the field.

End-to-End Design

From optical simulation to embedded firmware

Real-World Ready

Built for deployment, not just demonstration

Modular Architecture

Scalable platforms that grow with your needs

Whether you need a single optical subsystem or a complete compute-enabled imaging platform, Prism Optics delivers production-grade systems designed for real scientific and industrial deployment.

Design Your Next Spectroscopy or Imaging System

Ready to develop a custom spectroscopic instrument, multispectral imaging platform, or SWIR sensing system? Prism Optics brings decades of optical engineering expertise combined with cutting-edge embedded compute capabilities.

From initial feasibility studies through production integration, we partner with research teams, device developers, and OEM manufacturers to transform spectral sensing concepts into deployed reality.

Custom Instruments

Embedded Compute

Multispectral & SWIR Platforms

Start Your Project | Technical Consultation