



# Your Vision Our Focus

Bodkin Design and Engineering  
LEADING THE WAY IN ELECTRO-OPTICS

[www.bodkindesign.com](http://www.bodkindesign.com)

# Your Vision Our Focus

## Why Choose Bodkin Design & Engineering?

Our team is experienced in highly specialized engineering and physics disciplines including: electro-optics, system modeling, precision mechanical design, digital and analog electrical systems, software and image processing.

We provide custom solutions, product development, innovation, and engineering solutions to industrial, biomedical, military, and research clients. We work as consultants and design-and-build contractors, offering our expertise to turn your vision into well-engineered solutions, on-time and on-budget.

## Areas of Specialty

- ▶ Sensor Systems
- ▶ Infrared Imaging
- ▶ Industrial Instrumentation
- ▶ Hyperspectral Imaging
- ▶ Polarimetric Imaging
- ▶ Infrared Calibration
- ▶ Optical Systems
- ▶ Biomedical Instruments

## Custom Design Solutions

Beginning with your ideas, we use our in-depth knowledge of cutting-edge technologies to turn your vision into reality, on-time and on-budget.

### Concept Development

We leverage our technical expertise to translate your ideas from a vision to a solution.

### Prototype Design and Construction

We conduct design and trade-off analysis to develop prototype devices that meet or exceed your requirements.

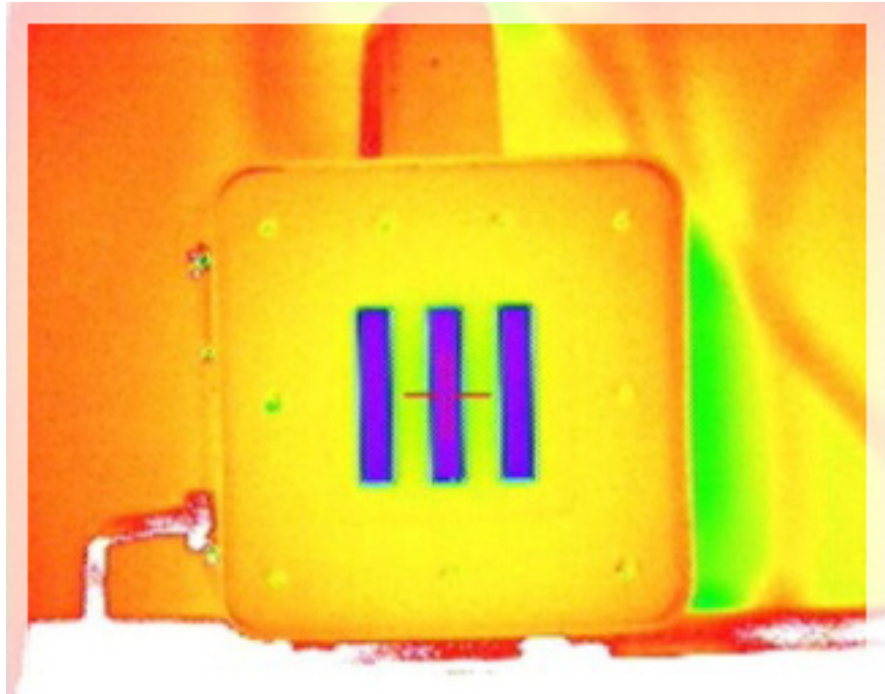
### Product Enhancement

We work to optimize the design of your existing product to enhance its capability and decrease manufacturing costs.

## Products

### Infrared Calibration Instrumentation

We offer a comprehensive line of infrared radiation products to meet any sensor calibration need. From bench-top differential blackbodies for MRDT measurements to integrated OEM sources for thermal reference, we can support your calibration needs with off-the-shelf products, custom design, and expert support.

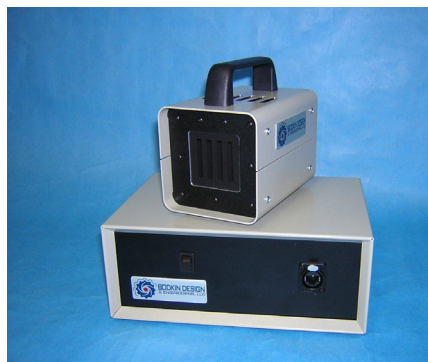


#### MRDT 50 Differential Blackbody

Designed to measure the sensitivity and resolution of infrared cameras. This thermo-electric based blackbody provides both hot and cold operation. Developed for its high slew rate and rapid settling time, it is ideal for two point calibration. It achieves set-point temperature in less than a minute.

#### BB-100 Single Point Blackbody

The BB-100 Single Point Blackbody has a 4" diameter aperture for large sensors and long stand-off operation.



MRDT 50 Differential Blackbody



BB-100 Single Point Blackbody

## Hyperspectral Imagers

Bodkin Design & Engineering offers unique designs for high speed hyperspectral imagers that create spectrographic images at rates exceeding 1000 data-cubes/second. Select from our standard products or we can design the hyperspectral camera that suits your needs - from visible through long wave infrared and any spectral resolution necessary, with an appropriate trade-out for spatial resolution. This technology, based on the patented HyperPixel Array™, has the unique capability to eliminate motion artifacts. We can spectrally analyze bullets in-flight, or take hyperspectral data-cubes from a moving vehicle. Our suite of task specific software allows for chemical mapping, camouflage penetration, and target tracking with unprecedented accuracy. All of our hyperspectral imaging systems share the following features:

- ▶ Identify Spatial and Spectral Features in a Single Video Frame
- ▶ Ideal for Moving Platforms and Transient Events
- ▶ No Moving Parts
- ▶ Unique Patent Pending Technology

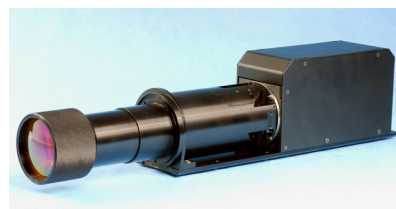
Recent ground-breaking work includes hyperspectral video systems, high sensitivity polarimetric imaging, standoff chemical detectors, and high resolution broadband spectroscopy



**VNIR-20B - 20 Waveband Visible Spectrometer**  
Captures hyperspectral datacubes at a resolution of 90x75 spatial by 20 spectral at video rates.



**VNIR-90 - 90 Waveband Visible Spectrometer**  
Captures hyperspectral datacubes at a resolution of 55x44 spatial by 90 spectral at video rates.



**MWIR-60 - 60 Waveband Mid-IR Spectrometer**  
Captures hyperspectral datacubes at a resolution of 17x13 spatial by 60 spectral at video rates.

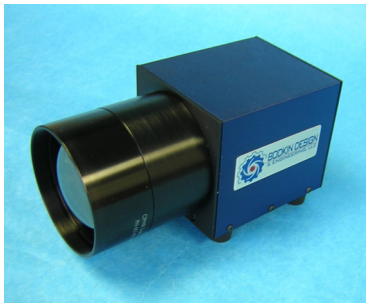
## Polarimetric Imagers

BD&E's patent pending polarimetric imager uses a single, standard focal plane to capture the full Stokes vector, thus eliminating motion artifacts and maximizing the signal-to-noise ratio.



## Infrared Cameras

From miniature UAV surveillance cameras to dual-band munitions targeting, Bodkin Design & Engineering has been at the forefront of technical innovation for infrared imaging. We have extensive experience designing infrared cameras using the latest in cooled and uncooled detector technology. Examples of our infrared imaging products include:



Uncooled IR camera



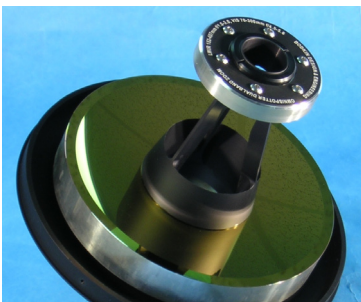
**Dual Field of View Camera**  
8 degree and 4 degree field-of-view



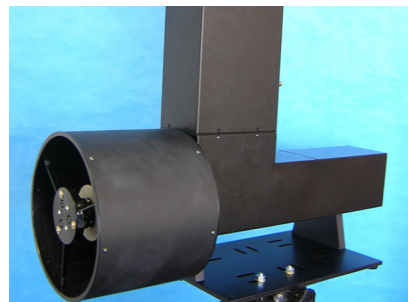
**Continuous Zoom Imager**  
25 mm to 75 mm fl. F/1 Ethernet interface

## Multispectral Imagers

A multi-band camera provides high-resolution, co-registered visible and infrared imagery, unlike conventional visible or infrared cameras that provide image data in limited wavelength bands. Bodkin Design has created multi spectral cameras to enable the user to better discriminate targets from both background and decoys by blending color images with information from the IR band. The images obtained from these systems penetrate darkness, camouflage, smoke and clutter better than either visible or IR images could alone.



**Multi-Band Imaging System**  
Coaxial visible and LWIR optics



**Omni-Spotter**  
Dual-band visible and LWIR Zoom Imager



**Javelin CLU**  
Visible and LWIR Imager with Laser Ranger

## Sample Projects

### Biomedical Instrumentation

Utilizing our expertise in opto-electronics and mechanics, Bodkin Design & Engineering, LLC develops biomedical devices, such as imaging systems, laser delivery systems, and fluid handling systems.



### Immunoassay Identification Platform

Multiplexed immunoassay platform that identifies the presence of specific protein biomarkers in biological samples and enables many immunoassays to be analyzed on one disposable chip.



### Bacterial Detection System

Provides a rapid and sensitive method for detecting bacterial contamination in blood products.

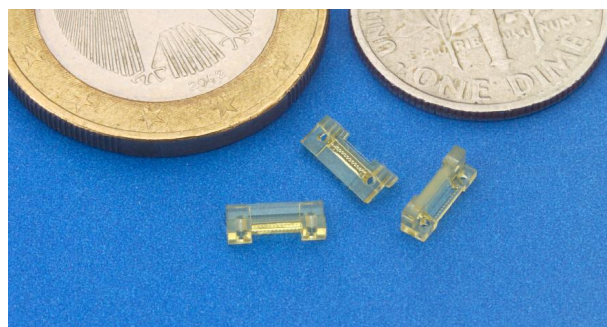
### Industrial Products

Drawing on our expertise in mechanical and optical engineering, Bodkin Design & Engineering provides product development to industrial clients.



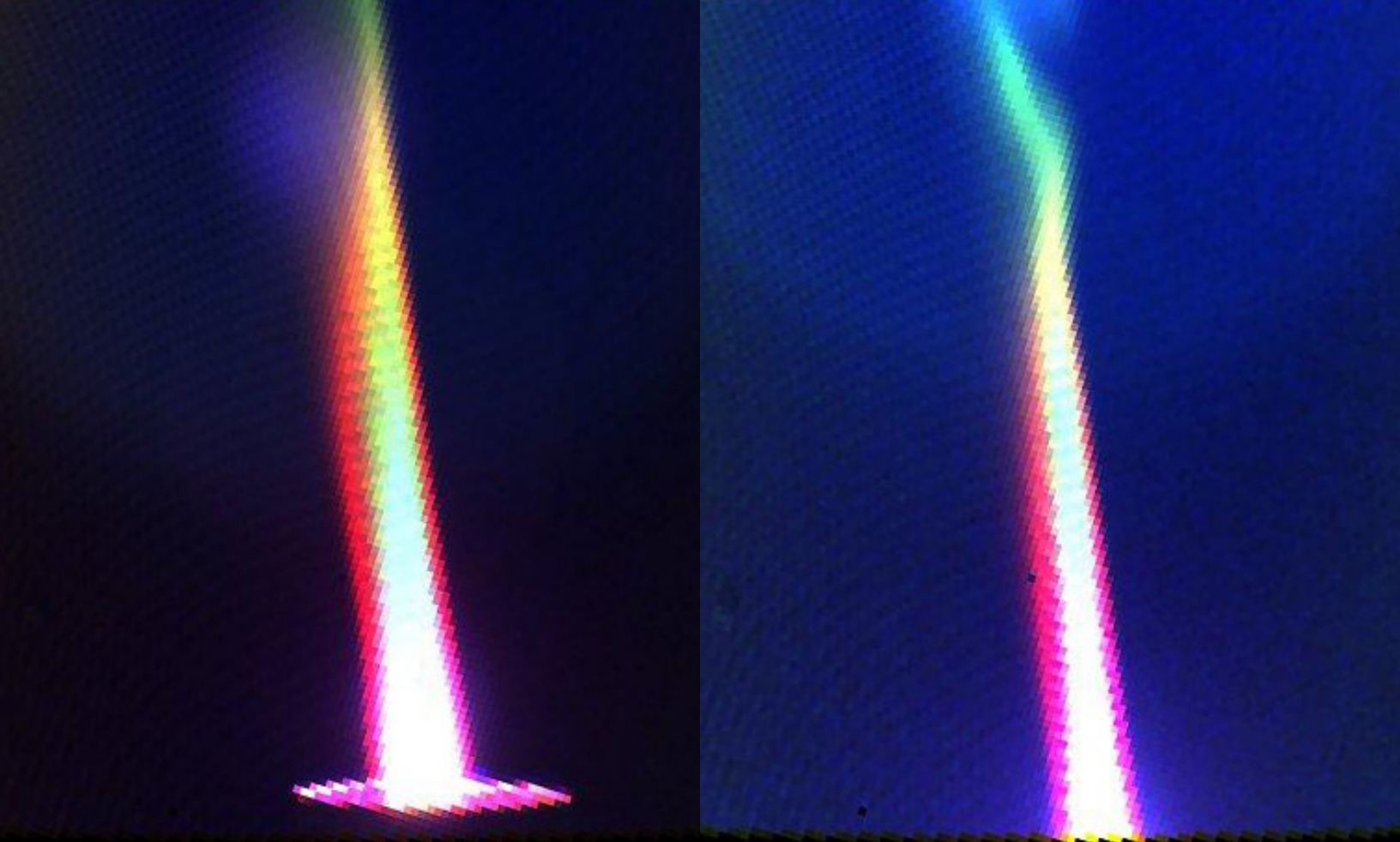
### Portable Repair System

Portable laser trimmer used for repairs of installed smart window circuit elements. The system consists of a ruggedized control case featuring a tablet PC running proprietary software, and a mobile working head that allows for the identification, targeting and removal of microscopic defects.

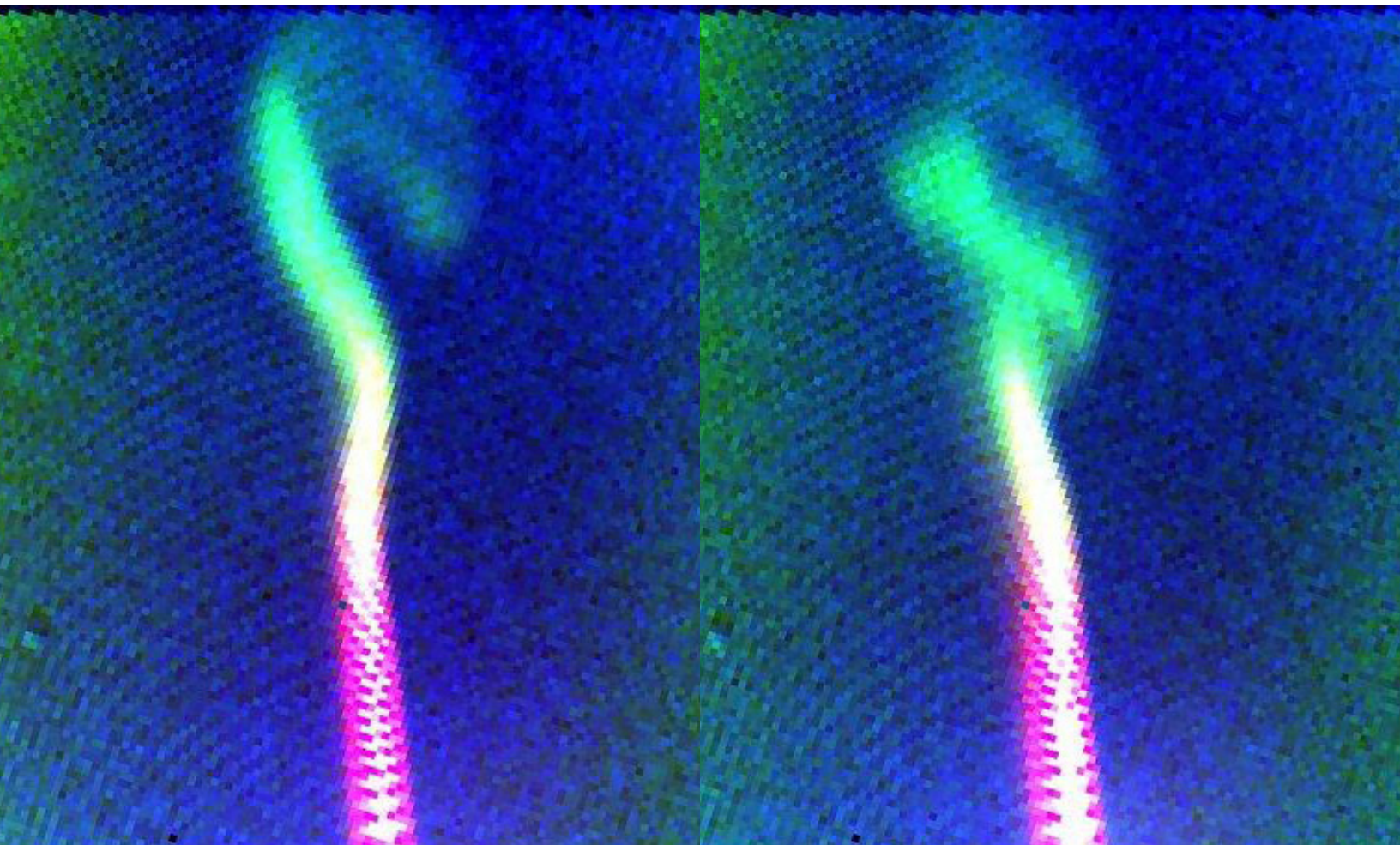


### 12 Channel VCSEL to Fiber Coupler

The injection molded low profile fiber array coupler is designed to mate 12 fibers to a linear array of Vertical Cavity Surface Emitting Lasers (VCSEL). The right angle feature reduces board clearance requirements by eliminating the fiber optic bend radius.



**False-color mid-wave infrared hyperspectral images of candle flame**



## Customers / Awards

BD&E is proud to provide commercial, biomedical, industrial and government customers with solutions and designs for electro-optic and infrared systems.

BD&E pioneered infrared reconnaissance in a miniature Unmanned Aerial Vehicle (UAV). Working under Navy contract, we developed the world's first miniature infrared camera for the Pointer Unmanned Aerial Vehicle. We demonstrated the utility of miniature UAVs by enabling covert, nighttime, aerial reconnaissance at the field command level. This ground-breaking work has led to the rapid adoption of small UAVs across the military. BD&E was awarded the 1998 Laser and Optronics Technology Award for this innovation, and was granted U.S. Patent No. 6023061.

## Partial Customer List

- ▶ Advanced instruments
- ▶ Applied Bio-Systems
- ▶ APTI
- ▶ BAE
- ▶ Biotell
- ▶ Boston University
- ▶ Diffraction LTD
- ▶ General Dynamics
- ▶ Georgia Tech University
- ▶ Gillette
- ▶ Immunetics
- ▶ Infrared Industries
- ▶ Insitu
- ▶ Lockheed Martin
- ▶ Loral IR Imaging Systems
- ▶ Nanosphere
- ▶ New England Photoconductor
- ▶ Process Sensors Inc.
- ▶ Raytheon
- ▶ Sage Electro-Chromics
- ▶ Sen Tech
- ▶ Space Computer Corporation
- ▶ Talking Lights
- ▶ Terra Op
- ▶ University of Wisconsin
- ▶ US Air Force
- ▶ US Navy
- ▶ US Missile Defense Agency
- ▶ US Army
- ▶ Zoiray Technology

Our commercial line of off-the-shelf infrared calibration instruments and spectral imaging equipment are available through our websites:

[www.irblackbody.com](http://www.irblackbody.com)  
[www.hyperspectralimagers.com](http://www.hyperspectralimagers.com).

For further information, please contact:

**Bodkin Design and Engineering, LLC**

PO BOX 81368

Wellesley, MA 02481

P 617-795-1968

F 617-795-1969

[info@bodkindesign.com](mailto:info@bodkindesign.com)

[www.bodkindesign.com](http://www.bodkindesign.com)