RESONON

Hyperspectral Imaging Solutions

SpectralSight™
Automated Hyperspectral System with
RVS Software

See pages 18 and 29

NEW

Pika SWIR

1000-2500 nm

See page 9

Product Catalog

MAY 2024

Product Catalog

MAY 2024

Table of Contents

Hyperspectral Cameras

Pika UV

330 – 800 nm
Near Ultraviolet + Visible
(NUV + VIS)
PAGE 4.

The Pika UV is capable of sensing in the NUV and VIS spectral range, offering unique spectral information for applications in both research and industrial settings.

Pika L & Pika L-F

L: 400 – 1000 nm
L-F: 420 – 980 nm
Visible + Near Infrared (VNIR)
PAGE 5.

The Pika L is small and lightweight, ideal for drone-based remote sensing.

The Pika L-F has a fast maximum frame rate, ideal for machine vision applications.

Pika XC2

400 – 1000 nm
Visible + Near Infrared
(VNIR)
PAGE 6

The Pika XC2 is very high precision, used for cutting-edge research applications.

Pika IR & Pika IR+

900 – 1700 nm
Near Infrared
(NIR)
PAGE 7

The Pika IR and Pika IR+ are fast and affordable. They are ideal for ground-based research and for machine vision applications.

Pika IR-L & Pika IR-L+

925 – 1700 nm
Near Infrared
(NIR)
PAGE 8

The Pika IR-L and Pika IR-L+ are lightweight, compact imagers with very high spectral resolution. They are ideal for drone-based remote sensing applications.

Pika SWIR

1000 – 2500 nm
Short-Wave Infrared
(SWIR)
NEW
PAGE 9

The Pika SWIR enables a wide range of applications, including mineral exploration, pharmaceutical inspection, soil characterization, and waste recycling.

Pika UV

330 – 800 nm
Near Ultraviolet + Visible (NUV + VIS)

Pika UV

The Pika UV is a unique hyperspectral camera that measures ultraviolet light and the complete visible spectrum at the same time.

Many materials that appear similar to the human eye have distinct UV signals. Plant science, entomology and ornithology are a few of the research areas where UV light plays a significant role.
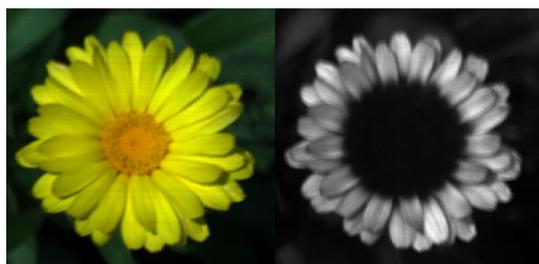
True-color image (LHS) and 360 nm image (RHS) showing "bullseye"

See page 11 for objective lens options.

	Pika UV
Spectral range	330 – 800 nm
Spectral channels	255
Spectral sampling per pixel	0.46 nm
Spectral resolution (FWHM)	2.8 nm
Spatial channels	1500
Max frame rate	142 fps
Interface	USB 3.0
Weight, no lens	2.27 kg
Dimensions	230 x 107 x 85 mm
Part Number	**01-10101**

Pika UV Benchtop System
(page 20)
NOTE: Because halogen lights do not emit below 355 nm, an additional ultraviolet light is used to augment the standard halogen line light in the benchtop system.

UV Lighting Add-On to Benchtop Kit	
Part Number	**02-20304**

Pika L and Pika L-F

Visible + Near Infrared (VNIR)

Pika L
400 – 1000 nm

The Pika L is lightweight, compact, and cost-effective. It is ideal for drone-based remote sensing applications.

Pika L-F
420 – 980 nm

The Pika L-F has a high maximum framerate (585 fps at 8-bit pixel depth) with fewer spectral and spatial channels than the Pika L.

It is designed for machine vision applications running Resonon RVS machine vision software or OEM applications. It is not an option to use with our Airborne Systems.

See page 11 for objective lens options.

	Pika L	Pika L-F
Spectral range	400 – 1000 nm	420 – 980 nm
Spectral channels	281	224
Spectral sampling per pixel	1.1 nm	1.1 nm
Spectral resolution (FWHM)	2.7 nm	3.1 nm
Spatial channels	900	720
Max frame rate	249 fps	585 fps (@ 8-bit)
Interface	USB 3.0	USB 3.0
Weight, no lens	0.64 kg	0.64 kg
Dimensions (with mount plate)	115 x 104 x 66 mm	115 x 104 x 66 mm
Part Number	**01-10201**	**01-10203**

Pika L Airborne Remote Sensing System (page 16)

Pika XC2

400 – 1000 nm
Visible + Near Infrared (VNIR)

Pika XC2

The Pika XC2 has very high spatial and spectral resolutions. It is popular for laboratory and ground-based research requiring very high precision.

See page 12 for objective lens options.

Pika XC2 Outdoor System
(page 27)

	Pika XC2
Spectral range	400 – 1000 nm
Spectral channels	447
Spectral sampling per pixel	0.67 nm
Spectral resolution (FWHM)	1.9 nm
Spatial channels	1600
Max frame rate	165 fps
Interface	USB 3.0
Weight, no lens	2.51 kg
Dimensions	265 x 106 x 75 mm
Part Number	**01-10250**

Pika XC2 Benchtop System
(page 20)

Pika IR and Pika IR+

900 – 1700 nm
Near Infrared (NIR)

Pika IR

The Pika IR is a high-speed, cost-effective infrared imager, ideal for machine vision applications.

Pika IR+

The Pika IR+ has high spatial resolution and very high spectral resolution, providing excellent data quality.

See page 12 for objective lens options.

	Pika IR	Pika IR+
Spectral range	900 – 1700 nm	900 – 1700 nm
Spectral channels	168	336
Spectral sampling per pixel	4.8 nm	2.4 nm
Spectral resolution (FWHM)	8.8 nm	5.6 nm
Spatial channels	320	640
Max frame rate	508 fps	240 fps
Interface	GigE	GigE
Weight, no lens	2.95 kg	2.95 kg
Dimensions	264 x 115 x 88 mm	264 x 115 x 88 mm
Part Number	**01-10301**	**01-10302**

Pika IR/IR+ Airborne UAV System (page 16)

Pika IR-L and Pika IR-L+

925 – 1700 nm
Near Infrared (NIR)

Pika IR-L

The Pika IR-L is a high-speed, lightweight infrared imager, ideal for drone-based remote sensing applications.

Pika IR-L+

The Pika IR-L+ has high spatial resolution and very high spectral resolution, providing outstanding data quality.

See page 13 for objective lens options.

	Pika IR-L	Pika IR-L+
Spectral range	925 – 1700 nm	925 – 1700 nm
Spectral channels	236	470
Spectral sampling per pixel	3.3 nm	1.6 nm
Spectral resolution (FWHM)	5.9 nm	3.8 nm
Spatial channels	320	640
Max frame rate	364 fps	176 fps
Interface	GigE	GigE
Weight, no lens	1.01 kg	1.01 kg
Dimensions	210 x 68 x 63 mm	210 x 68 x 63 mm
Part Number	**01-10350**	**01-10351**

Pika IR-L/IR-L+, part of the Fully-Integrated Airborne System (page 15)

Pika SWIR

NEW

1000 – 2500 nm
Short-Wave Infrared (SWIR)

Pika SWIR

The Pika SWIR is Resonon's latest hyperspectral camera.

The SWIR wavelength ranges enables a wide range of applications, including mineral exploration, pharmaceutical inspection, soil characterization, and waste recycling.

This camera utilizes a cryogenically-cooled MCT detector. The linear cryocooler has an MTTF (Mean Time To Failure) of over 20,000 hours.

The Pika SWIR can be used in our laboratory and outdoor hyperspectral systems. Integration with Resonon's airborne system will be available in the future. For those requiring for SDK-type integration, please contact Resonon.

See page 13 for objective lens options.

	Pika SWIR
Spectral range	1000 – 2500 nm
Spectral channels	245
Spectral sampling per pixel	3.1 nm
Spectral resolution (FWHM)	11.0 nm
Spatial channels	640
Max frame rate	120 fps
Interface	USB 3.0 (Frame-Grabber output)
Weight, no lens	3.98 kg
Dimensions	338.7 x 116.8 x 113.7 mm
Part Number	**01-10401**

The Pika SWIR comes bundled with the required frame grabber, power supplies, and all cables.

Objective Lenses

Objective lenses determine the field of view for each hyperspectral camera.

Field of View (FOV)

The Field of View defines the long dimension of the line imaged by the hyperspectral camera, reported in units of degrees. The user can change the FOV by changing the objective lens. See the tables below to identify the lens that provides the optimal FOV for each application.

Instantaneous Field of View (IFOV)

The Instantaneous Field of View defines the narrow dimension of the line imaged by the hyperspectral camera, reported in units of milli-radians.
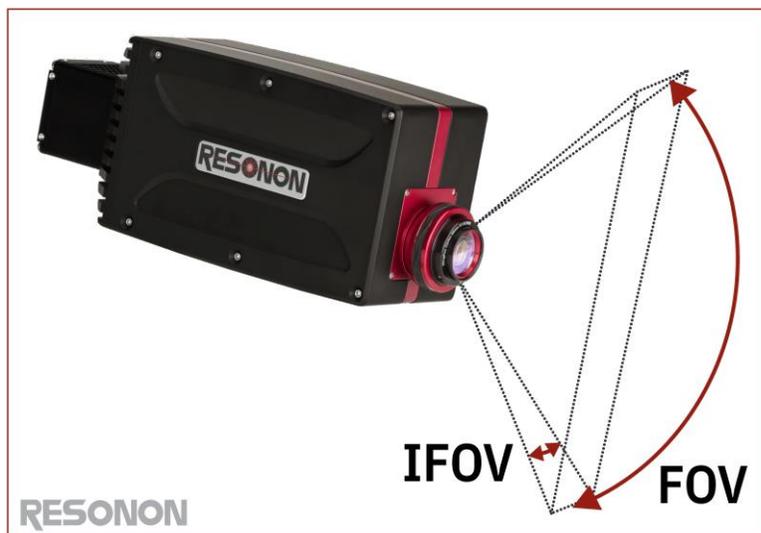
Apochromatic Objective Lenses

To help our distributors and customers better understand what an apochromatic objective lens is, and why you might need one for your imaging application, please see https://resonon.com/blog-achromatic-and-apochromatic-objective-lenses.

Objective Lenses: Specifications

Part Number		Notes	FOV (degrees)	IFOV (milliradians)
Pika UV (page 4)				
60 mm	04-40102		8.4	0.4
24 mm	04-40101	Standard on all systems	20.5	1.0
Pika L (page 5)				
70 mm	04-40207		4.3	0.17
50 mm	04-40206		6.0	0.24
25 mm	04-40503	Apochromatic (high-performance option)	12.0	0.47
23 mm	04-40205	Standard on benchtop and outdoor systems	13.1	0.52
17 mm	04-40204	Standard on airborne systems	17.6	0.71
16 mm	04-40502	Apochromatic (high-performance option)	18.2	0.75
12 mm	04-40203		24.8	1.0
8 mm	04-40501	Apochromatic (high-performance option)	36.5	1.5
8 mm	04-40202	Achromatic	36.5	1.5
6 mm	04-40201		47.4	2.0
Pika L-F (page 5)				
70 mm	04-40207		4.0	0.22
50 mm	04-40206		5.7	0.30
25 mm	04-40503	Apochromatic (high-performance option)	11.3	0.60
23 mm	04-40205		12.3	0.66
17 mm	04-40204		16.6	0.88
16 mm	04-40502	Apochromatic (high-performance option)	17.4	0.94
12 mm	04-40203		23.4	1.3
8 mm	04-40501	Apochromatic (high-performance option)	34.4	1.9
8 mm	04-40202	Achromatic	34.4	1.9
6 mm	04-40201		44.9	2.5

Objective Lenses: Specifications

Part Number		Notes	FOV (degrees)	IFOV (milliradians)
Pika XC2 (page 6)				
70 mm	04-40207		7.7	0.17
50 mm	04-40206		10.7	0.24
25 mm	04-40503	Apochromatic (high-performance option)	21.2	0.47
23 mm	04-40205	Standard on benchtop and outdoor systems	23.1	0.52
17 mm	04-40204	Standard on airborne systems	30.8	0.71
16 mm	04-40502	Apochromatic (high-performance option)	30.4	0.75
12 mm	04-40203		42.7	1.0
8 mm	04-40501	Apochromatic (high-performance option)	60.8	1.5
8 mm	04-40202	Achromatic	60.8	1.5
Pika IR (page 7)				
100 mm	04-40305		5.5	0.3
75 mm	04-40304		7.3	0.4
50 mm	04-40303		11.0	0.6
25 mm	04-40503	Apochromatic (high-performance option)	21.7	1.2
25 mm	04-40302	Standard on all systems	21.7	1.2
16 mm	04-40502	Apochromatic (high-performance option)	33.4	1.9
8 mm	04-40501	Apochromatic (high-performance option)	61.9	3.8
6 mm	04-40301		77.3	5.0
Pika IR+ (page 7)				
100 mm	04-40305		5.5	0.15
75 mm	04-40304		7.3	0.2
50 mm	04-40303		11	0.3
25 mm	04-40503	Apochromatic (high-performance option)	21.7	0.6
25 mm	04-40302	Standard on all systems	21.7	0.6
16 mm	04-40502	Apochromatic (high-performance option)	33.4	0.9
8 mm	04-40501	Apochromatic (high-performance option)	61.9	1.9
6 mm	04-40301		77.3	2.5

Objective Lenses: Specifications

| Part Number		Notes	FOV (degrees)	IFOV (milliradians)
Pika IR-L (page 8)				
100 mm	04-40305		5.5	0.3
75 mm	04-40304		7.3	0.4
50 mm	04-40303		11.0	0.6
25 mm	04-40503	Apochromatic (high-performance option)	21.7	1.2
25 mm	04-40302	Standard on all systems	21.7	1.2
16 mm	04-40502	Apochromatic (high-performance option)	33.4	1.9
8 mm	04-40501	Apochromatic (high-performance option)	61.9	3.8
6 mm	04-40301		77.3	5.0
Pika IR-L+ (page 8)				
100 mm	04-40305		5.5	0.15
75 mm	04-40304		7.3	0.2
50 mm	04-40303		11.0	0.3
25 mm	04-40503	Apochromatic (high-performance option)	21.7	0.6
25 mm	04-40302	Standard on all systems	21.7	0.6
16 mm	04-40502	Apochromatic (high-performance option)	33.4	1.9
8 mm	04-40501	Apochromatic (high-performance option)	61.9	3.8
6 mm	04-40301		77.3	2.5
Pika SWIR (page 9)				
25 mm	04-40503	Standard on benchtop systems Apochromatic (high-performance option)	21.7	0.6
25 mm	04-40402	Throughput-optimized	21.7	0.6
16 mm	04-40502	Apochromatic (high-performance option)	33.4	0.9
8 mm	04-40501	Apochromatic (high-performance option)	62	2.0
6 mm	04-40401	Standard on outdoor systems	82	2.5

Bio-LIF™ System

Hyperspectral Imaging of Laser-Induced Fluorescence

The Bio-LIF system combines Laser-Induced Fluorescence and Hyperspectral Imaging to yield unparalleled spectral resolution of emission data and insight into biological samples.

Standard Kit Components:

- 335 spectral channels for each pixel
- Automated scan routine with built-in spectral calibration and auto-exposure
- Tray carrier accepts 90mmØ dishes or standard 96-well microplates (127 x 86mm)
- 25-second scan time for an entire microplate
- Bio-LIF software (an application-specific version of Resonon's Spectronon)
    - Laptop is an optional add-on.
- High-resolution, publication-ready data
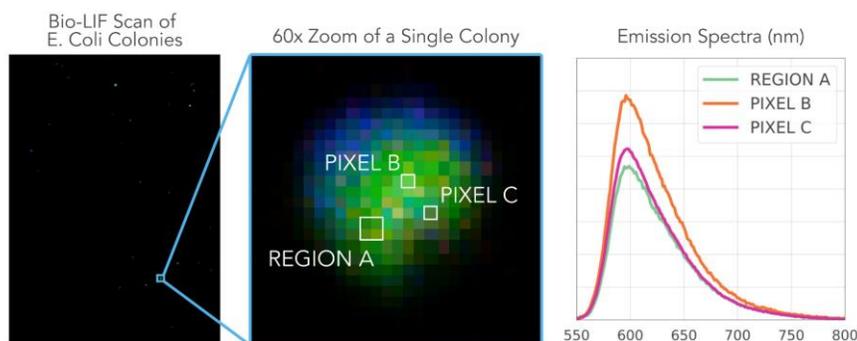
	Bio-LIF
Laser Excitation Wavelength	532 nm (others possible)
Spectral range	550 – 1000 nm
Spectral channels	335
Spectral resolution (FWHM)	1.9 nm
Image Resolution (pixels)	1600 x 2065
Spatial Resolution	60 μm
Signal-to-Noise Ratio (peak)	255
Weight	28.0 kg
Dimensions	692 x 470 x 279 mm
Part Number	**02-20111**
Laptop Computer with Bio-LIF software (optional add-on)	**02-20501**

Bio-LIF system kit components

Fully-Integrated Airborne System

Resonon is excited to announce our partnership with Vision Aerial, manufacturer of USA-made industrial drones.

Fully-Integrated System Components:

NEW

Vector Hexacopter System

- Pika L, Pika IR-L, Pika IR-L+, or **Pika UV** Airborne System
  - Details and system components next page
- Standard Objective Lens
- [Vision Aerial Vector Hexacopter kit](#):
  - Vector Hexacopter
  - Pelican transport case with custom foam insert
  - 2x Flight batteries (two used per flight)
  - High-capacity AC dual charger (1-hour charge)
  - Ground control station with internal battery
  - Mission planning software (no subscription fee)
  - 1-year manufacturer warranty

Vector Hexacopter with Pika IR-L

Vector Add-on Options:

- Indefinite Flight Package: 4x batteries & charger
- HereLink Blue: NDAA & TAA compliant (USA-made)
- First Person View (FPV) Pilot Camera
- Other payloads (LiDAR, Inspection, Thermal)
- Drone training (option to include along with HSI training in Bozeman or at customer site)
- Additional year of warranty

Vector Hexacopter with a Pika L

Vision Aerial Vector Hexacopter System integrated with:	Part Number	
	US	International
Pika L Airborne Kit, 17mm Objective Lens, Single-Antenna GPS/IMU	03-30601	03-30611
Pika IR-L Airborne Kit, 25mm Objective Lens, Single-Antenna GPS/IMU	03-30602	03-30612
Pika IR-L+ Airborne Kit, 25mm Objective Lens, Single-Antenna GPS/IMU	03-30603	03-30613
Pika UV Airborne Kit, 24mm Objective Lens, Single-Antenna GPS/IMU	03-30604	03-30614
Pika L Airborne Kit, 17mm Objective Lens, Dual-Antennas GPS/IMU	03-30605	03-30615
Pika IR-L Airborne Kit, 25mm Objective Lens, Dual-Antennas GPS/IMU	03-30606	03-30616
Pika IR-L+ Airborne Kit, 25mm Objective Lens, Dual-Antennas GPS/IMU	03-30607	03-30617
Pika UV Airborne Kit, 24mm Objective Lens, Dual-Antennas GPS/IMU	03-30608	03-30618

* Kit includes full airborne system (details next page) integrated to Vector drone, drone system components listed above, and standard objective lens.

Airborne Systems

Complete hyperspectral imaging systems for remote sensing.
Includes all hardware and software necessary for georegistered hyperspectral data.

NOTE: the Airborne Systems operate independently from, and are compatible with, any aircraft that can carry the payload.

Standard Kit Components:

- Data Acquisition Unit
- Ellipse D Dual-Antennas GPS/IMU with Antennas and All Required Mounting Hardware
- Georectification Software
- Post-Processing & Analytical Software
- System Mount (UAV Standard)
- Radiometric Calibration & Calibration Target
- Protective Travel Case

Options (details on next page):

- M300/350 or Piloted Aircraft Mount Kit
- Ellipse N Single-Antenna GPS/IMU
- Emlid RTK Base Station and Compatible Radio (for centimetric positioning and increased orientation accuracy)
- Downwelling Irradiance Sensors
- Training Services

Complete System Weight (kg/lb)	
Pika L *****	1.83 / 4.03
Pika XC2	3.84 / 8.47
Pika IR/IR+	4.33 / 9.55
Pika IR-L/IR-L+	2.23 / 4.91
Pika UV	3.60 / 7.93

* The Pika L used in the airborne system has a GigE output for reliable operation in the electronically-noisy environment found on many small UAV systems.

Airborne kit, no imager or lens, with:	Part Number
Ellipse D Dual-Antennas GPS/IMU	03-30102
Ellipse N Single-Antenna GPS/IMU	03-30101

Pika L Airborne
UAV System

Pika IR-L/IR-L+ Airborne
UAV System

Pika IR-L Piloted
Aircraft System

Airborne Systems: Options

Various options are available to tailor the airborne system for your customers needs.

M300/350 Integration Kit

The Pika L and Pika IR-L airborne systems are compact and lightweight, making them ideal to use with the DJI Matrice 300 and 350. The M300/350 Integration kit includes:
- A mount to attach to the DJI Dual Gimbal Mount
- A GNSS antenna mount and battery holder

Piloted Aircraft Integration Kit

Any of Resonon's imagers can be mounted to a piloted aircraft using our VIP (Vibration Isolation Pod), shown with a Pika IR-L on the previous page.

GPS/IMU

The Single-Antenna Ellipse 3N GPS/IMU is sold as an option to the baseline Ellipse 3D Dual-Antenna GPS/IMU. For details about choosing, please see this guide.

RTK (Real-Time Kinematic positioning)

The Emlid RTK base station and radio are used to generate centimetric positioning and increased orientation accuracy, providing the highest quality airborne data.

Downwelling Irradiance Sensors

Several downwelling irradiance sensors are available to fit the needs of any airborne imaging system.

Training

Training can be in-person or virtual. Please contact us for details.

RTK and Mount Options:	Part Number
Airborne RTK System	03-30401
Pika L UAV Standard Mount Kit	03-30201
Pika L UAV M300 Mount Kit	03-30202
Pika L Piloted Mount Kit	03-30203
IR-L UAV Standard Mount Kit	03-30204
IR-L UAV M300 Mount Kit	03-30205
IR-L Piloted Mount Kit	03-30206
IR/XC2/UV UAV Mount Kit	03-30207
IR/XC2/UV Piloted Mount Kit	03-30208

Downwelling Sensor Options:	Part Number
UV with 6-inch Fiber	03-30301
UV with 2-meter Fiber	03-30302
UV with Direct Mount	03-30303
VNIR with 6-inch Fiber	03-30304
VNIR with 2-meter Fiber	03-30305
VNIR with Direct Mount	03-30306
IR with 6-inch Fiber	03-30307
IR with 2-meter Fiber	03-30308
IR with Direct Mount	03-30309

SpectralSight™ System

Automated hyperspectral system with Resonon's Real-time Vision System (RVS) software
For details about RVS and RVS Support Packages, see page 29

NEW

Standard Kit Components:

- RVS-Acquire License
    - RVS-Analyze and RVS-Automate Licenses available as options
- 8" x 22" Conveyor Belt System
- 115 VAC or 230 VAC Motor and Controller
- Quadrature Encoder and Cabling
- Gray, Medium-Friction Belt
    - Food-Processing Blue Belt available as an option
    - Other options possible
- Six-Fixture Halogen Flood Light
    - Halogen Line Light or Hyperspectral LED Line Light available as an option (see page 23 for details)
- Mounting Tower and Baseplate
- High-Performance Desktop Computer (Fast i9 CPU, 64GB ram, 1TB SSD HD)
- Calibration Tile and Sample Catch Container

NOTE: Computer monitor, monitor cable, keyboard and mouse are NOT included

No imager or lens is included, order separately	Part Number	
SpectralSight with Desktop Computer and Six-Fixture Halogen Flood Light	02-20108	Choose lighting option
SpectralSight with Desktop Computer and Halogen Line Light	02-20109	
SpectralSight with Desktop Computer and Hyperspectral LED Line Light	02-20110	
SpectralSight 115 VAC Motor and Controller	02-20206	Choose either 115 or 230 VAC
SpectralSight 230 VAC Motor and Controller	02-20207	
SpectralSight Gray Belt	02-20204	Choose either Gray or Blue Belt
SpectralSight Food-Processing Blue Belt	02-20205	
RVS – Acquire (perpetual license)	05-50101	Choose one RVS Package
RVS – Analyze (perpetual license)	05-50102	
RVS – Automate (perpetual license)	05-50103	

SpectralSight™ System
Benchtop Conversion Kit

Kit includes all hardware and instructions required to convert an existing Reflectance Configuration System into a SpectralSight System.

NOTE: This kit is only compatible with new-style benchtop systems, identified by the smooth aluminum column. Old-style benchtop systems had an 80/20 column.

NEW

Standard Kit Components:

- RVS-Acquire License
  - RVS-Analyze and RVS-Automate Licenses available as options
- 8" x 22" Conveyor Belt System
- 115 VAC or 230 VAC Motor and Controller
- Quadrature Encoder and Cabling
- Gray, Medium-Friction Belt
  - Food-Processing Blue Belt available as an option
  - Other options possible
- High-Performance Desktop Computer (Fast i9 CPU, 64GB ram, 1TB SSD HD)
- Calibration Tile and Sample Catch Container

NOTE: Photo represents what benchtop system might look like after conversion kit. The Conversion kit reuses your existing light, baseplate, and column. Computer monitor, monitor cable, keyboard and mouse are also NOT included.

No imager or lens is included, order separately	Part Number	
SpectralSight Conversion Base Kit with Desktop Computer	02-20202	Base Kit
SpectralSight 115 VAC Motor and Controller	02-20206	Choose either 115 or 230 VAC
SpectralSight 230 VAC Motor and Controller	02-20207	
SpectralSight Gray Belt	02-20204	Choose either Gray or Blue Belt
SpectralSight Food-Processing Blue Belt	02-20205	
RVS – Acquire (perpetual license)	05-50101	Choose one RVS Package
RVS – Analyze (perpetual license)	05-50102	
RVS – Automate (perpetual license)	05-50103	

Benchtop System:
Reflectance Configuration

Complete hyperspectral system designed for laboratory measurements.
Includes all hardware and software to acquire and analyze hyperspectral data.

The linear translation stage holds the sample and translates across the field of view.

Standard Kit Components:

- Linear Translation Stage
- Six-Fixture Halogen Flood Light Assembly
- Mounting Tower and Baseplate
- Spectronon Software
  - Data acquisition laptop is an optional add-on
- Calibration Tile

Features:

- High-capacity, sealed, linear scanning stage
- Easily adjustable imager height, light height, and light angle

Options:

- Halogen Line Light or Hyperspectral LED Line Light available as an option (see page 23 for assistance choosing)
- For a UV imager, an Ultraviolet light is needed to augment the halogen line light, which has no output < 355 nm.

Benchtop Reflectance
System with Ultraviolet Light

No imager or lens is included, order separately	Part Number
Benchtop Reflectance System Kit with Six-Fixture Halogen Flood Light	02-20102
Benchtop Reflectance System Kit with Halogen Line Light	02-20103
Benchtop Reflectance System Kit with Hyperspectral LED Line Light	02-20104
Benchtop Reflectance System Kit with Halogen Line light and Ultraviolet Light	02-20105
Laptop Computer with Spectronon (optional add-on)	02-20501

Benchtop System:
Reflectance-Transmission Configuration

Complete hyperspectral system designed for laboratory measurements.
Includes all hardware and software to acquire and analyze hyperspectral data.

Clear stage with option for reflectance (from above) and transmission (from below) lighting.

System Components:

- Linear Translation Stage with Clear Tray
- High-Intensity, Halogen Line Light Assembly
- Backlight Housing
- Mounting Tower and Baseplate
- Spectronon Software
    - Data acquisition laptop is an optional add-on
- Calibration Tile

Reflectance
Configuration

Features:

- High-capacity, sealed, linear scanning stage
- Line light quickly moves between transmission and reflectance configurations
- Easily adjustable angle / height for the light (reflectance)
- Easily adjustable imager height (both configurations)

No imager or lens is included, order separately	Part Number
Benchtop Reflectance-Transmission System Kit with Halogen Line Light	02-20101
Laptop Computer with Spectronon (optional add-on)	02-20501

Transmission
Configuration
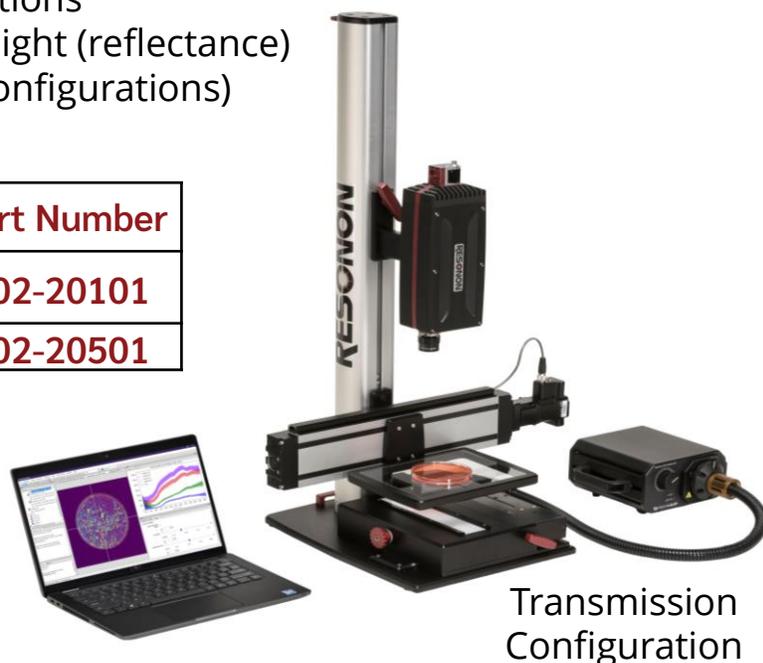
Benchtop System:
Large Sample Reflectance Configuration

Complete hyperspectral system designed for large stationary samples.
Includes all hardware and software to acquire and analyze hyperspectral data.

The imager and lighting are mounted to a long-travel stage that is mounted to a tower(s). Both vertical and horizontal orientations are available.

Standard Kit Components:

- 890 mm Long-Travel Linear Translation Stage
- Six-Fixture Halogen Flood Light Assembly
- Mounting Towers and Baseplates
- Spectronon Software
  - Data acquisition laptop is an optional add-on
- Radiometric Calibration
- Calibration Standard

Horizontal Orientation:
Pointing Down

Horizontal Orientation:
Pointing Forward

Vertical
Orientation

No imager or lens is included, order separately	Part Number
Reflectance Large Sample System Vertical Configuration with Six-Fixture Halogen Flood Light	02-20106
Reflectance Large Sample Horizontal Configuration with Six-Fixture Halogen Flood Light	02-20107
Laptop Computer with Spectronon (optional add-on)	02-20501

Benchtop System:
Lighting Options

Benchtop and SpectralSight Systems are offered with three lighting options.

All three lighting options are stabilized to provide a consistent output.

Six-Fixture Halogen Flood Light

- Most versatile, recommended for most applications
- Default lighting option
- Provides diffuse illumination over a large area
- Best option for different surface-finishes or heights
- Only option for Large Format Systems
- Compatible with VNIR, IR, and SWIR cameras

Halogen Line Light

- Narrow line of light
- For applications where heat may impact objects being scanned or for objects with limited height range
- Used for Reflectance/Transmission Systems
- Compatible with VNIR, IR, and SWIR cameras

Hyperspectral LED Line Light

- Very bright, diffuse, stable, and low heat output
- Long lifetime
- Compatible with VNIR cameras only, LEDs have reduced spectral range of 405 – 970 nm.

For data showing the different lighting systems outputs, see here.

Benchtop System:
Lighting Add-On Kits

Each kit includes everything required to add a new lighting system to any new-style Benchtop Reflectance System. New-style benchtop systems have a smooth aluminum column while old-style benchtop systems have an 80/20 column.

Kit Components:

- One of the following:
  - **Six-Fixture Halogen Flood Light** or
  - **Halogen Line Light** or
  - **Hyperspectral LED Line Light** or
  - **Ultraviolet Line Light**
    - Note: a UV light is required in addition to one of the halogen light sources for a UV imager benchtop system
- Appropriate Power Supply and Cables
- Mounting Bracket, Hardware and Instructions

	Part Number
Six-Fixture Halogen Flood Light Add-On Kit	02-20301
Halogen Line Light Add-On Kit	02-20302
Hyperspectral LED Light Add-On Kit	02-20303
Ultraviolet Line Light Add-On Kit	02-20304

Six-Fixture Halogen Flood Light
Add-On Kit

Halogen Line Light
Add-On Kit

Hyperspectral LED Line Light
Add-On Kit

Ultraviolet Line Light
Add-On Kit

Benchtop System:
Transmission Benchtop Add-On Kit

Kit includes all hardware and instructions required to convert an existing Reflectance Configuration System **with the Halogen Line Light option** into a Reflectance-Transmission Configuration System.

Kit Components:

- Clear Tray
- Line Light Housing Assembly for Transmission Configuration
- Mounting Brackets, Hardware and Instructions

NOTE: This kit is only compatible with new-style benchtop systems, identified by the smooth aluminum column. Old-style benchtop systems had an 80/20 column.

	Part Number
Transmission Benchtop Add-On Kit	02-20201

Benchtop System:
Benchtop Enclosure (The "Black Box")

The "Black Box", created to easily eliminate unwanted ambient light without turning off the room lights, is an add-on accessory.

The "Black Box" benchtop enclosure

Features:

- The simplest means to control light incident on your sample
- Fits any standard Resonon Benchtop System
- Comes fully assembled; just pull from the box, place overtop your benchtop system, and begin acquiring data.

	Part Number
Benchtop Enclosure	02-20203

Outdoor System

Complete hyperspectral system designed for outdoor measurements.
Includes all hardware and software to acquire and analyze hyperspectral data.

The imager is attached to a tripod-mounted rotational scanning stage.

Standard Kit Components:

- Rotational Scanning Stage & Tripod
- Spectronon Software
  - Ruggedized laptop is available as an optional add-on)
- Radiometric Calibration
- Calibration Target
- Power Supply
- Protective Travel Case

No imager or lens is included, order separately	Part Number
Outdoor System Kit	02-20401
Rugged Laptop with Spectronon (optional add-on)	02-20502

Spectronon™ Software
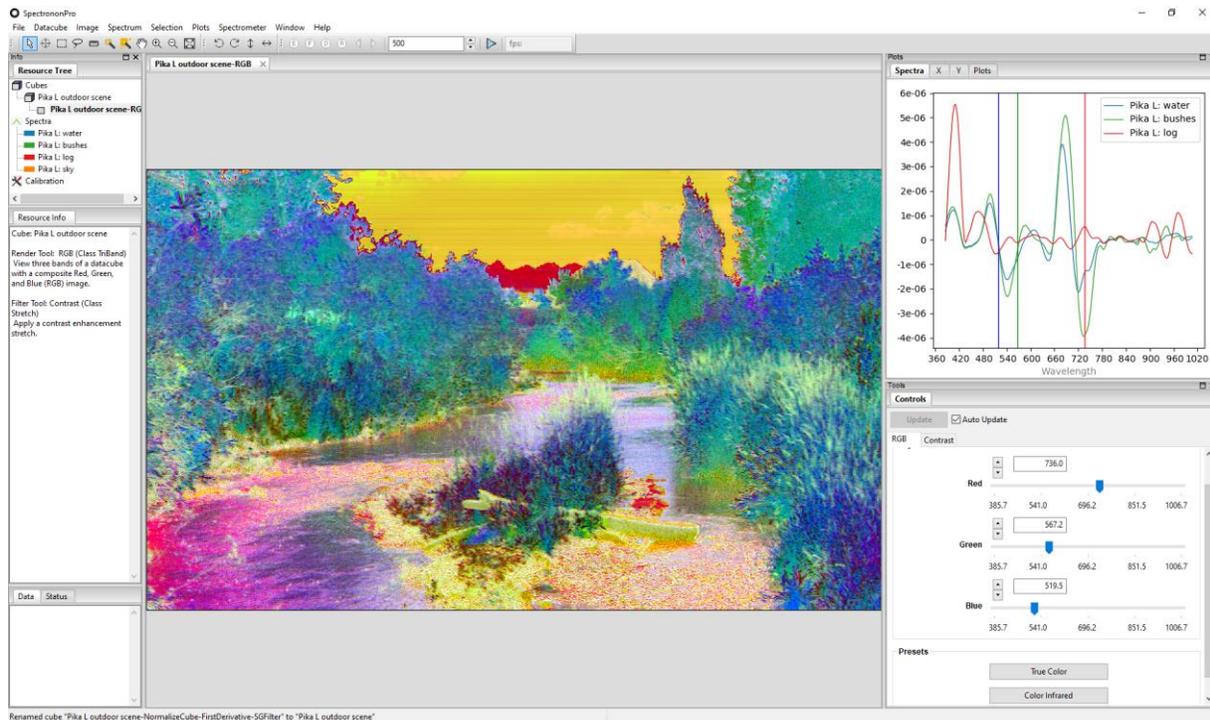
Spectronon™ Hyperspectral Analysis Software

Spectronon software is used to control Resonon's benchtop and outdoor hyperspectral imaging systems. Spectronon features many data processing, analysis, and visualization tools for hyperspectral datacubes and enables user-written plugins.

Spectronon comes standard with the Benchtop, Outdoor, and Airborne Systems.

The full version of Spectronon (including controls for hyperspectral cameras and systems) is available on the **downloads page** of our website, along with sample data.

Spectronon runs on Windows 10 or 11 operating systems.

Software Development Kit (SDK)

Resonon provides for free a programming guidance document for integrating Resonon hyperspectral cameras using readily available SDKs in a number of different software languages and operating systems.

Real-time Vision System (RVS) Software

RVS is available in three packages. See [this video](#) for more details.
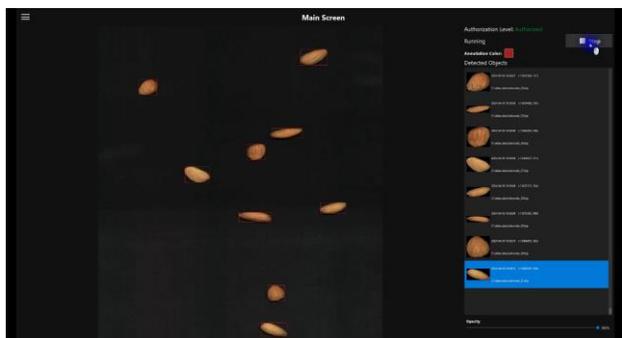
RVS-Acquire

- Rapid, automatic object detection and datacube collection for each object
- Datacubes are able to be imported into Spectronon for further analysis
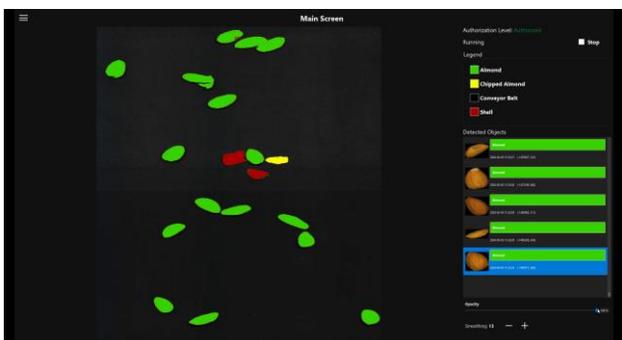
RVS-Analyze

All the features of RVS-Acquire plus:
- Model creation, training, and classification/regression
- Intuitive UI enables fast testing of different models and parameters for development and proof-of-concept experiments

RVS-Automate

All the features of RVS-Analyze plus:
- User-configurable socket output to provide real-time results to downstream systems
- Control sorting robots, output data to a database or create a signal based on results

RVS-Automate Support Package

- Priority support: Resonon works to ensure minimum downtime for your system
- Access to all software updates / bug fixes (made solely at Resonon's discretion)
- Remote training provided (on-site training available for additional fee)

	Part Number
RVS – Acquire (perpetual license)	05-50101
RVS – Analyze (perpetual license)	05-50102
RVS – Automate (perpetual license)	05-50103
RVS – Automate Annual Support Package (per year)	05-50104

Support

Resonon strives to make products that are easy-to-use and very reliable. If an issue arises with one of our products, Resonon Customer Support will work with you to solve any issues.

Please email **support@resonon.com** with a description of the issue and Resonon Customer Support will quickly reach out to assist you.

Recalibration

As with most precision instruments, Resonon recommends a wavelength and radiometric recalibration yearly, or after any rough handling or exposure to extreme temperatures. This ensures the best performance from your hyperspectral imaging system.

Warranty

All equipment comes with a 2-year warranty. An additional year of warranty can be purchased for 5% of the total price.

Official Terms and Conditions for Sale can be found here: **US** and **International**. Details of our Warranty and Repairs policies can be found **here**.

Repairs

If repairs are required, please contact us. We will issue an RMA number and provide shipping guidance. If the system is under warranty, we will repair and return it.

If the system is out of warranty and the customer is located outside of the United States, there is a $500 evaluation fee charged in addition to the customer paying for shipping costs. The fee is due to the import/export paperwork that must be generated for the return.

If the repair costs fall within $500, then no additional charges will apply. If the repair costs more than $500, the overage will be invoiced to the customer when the product is returned.