BlueVision

June 2019

# General Catalogue

BlueVision Ltd., Japan

# *"In constant pursuit of 'Prism' spectroscopic technology"*

## Mission

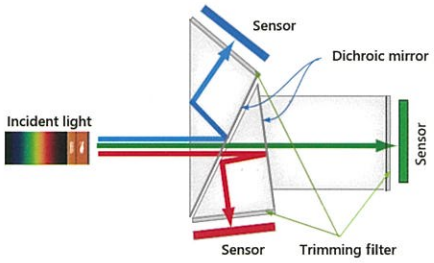
Bluevision Ltd., Japan will contribute to the increase of productivity in the industrial market by providing advanced spectroscopic imaging cameras employing prism optics of Bluevision's own design and their exclusive lenses.

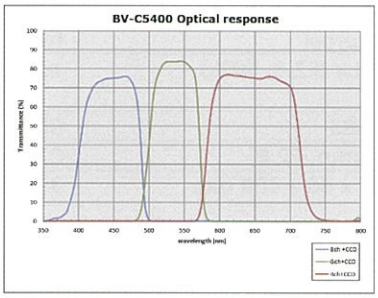
## Benefits of a Prism Spectroscopic Camera

- Images of multiple wavelengths can be obtained through one optics (lens)
- The center value and the width of its half value can be selected as required
- The characteristics of the object can be detected by the wavelength
- The image of the specified wavelength can be assigned

### ◆ 3 Wavelengths Prism Spectroscopic Imaging

The incident light is separated into three wavelengths and each light is output as the image through the sensor. It is possible to separate into the visible light and SWIR light or three wavelengths in visible bandwidth by designing the dichroic mirror and trimming filter.

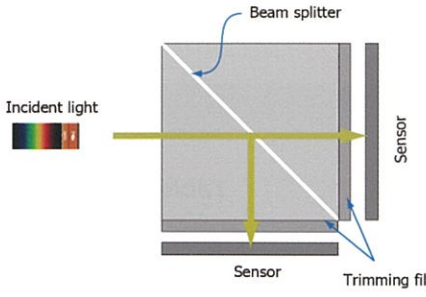


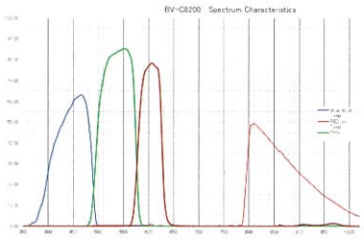




| Model name | Dichroic mirror | Trimming filter |
|---|---|---|
| BV-C5400 | R,B reflection | R,G,B bandwidth |
| BV-C5200 | R,B reflection | R,G,B bandwidth |
| BV-C8300 | R,B reflection | R,G,B bandwidth |
| BV-C8320 | R,B reflection | R,G,B bandwidth |
| Custom | R,B reflection | R,G,B specific bandwidth |

### ◆ 2 Wavelengths Prism Spectroscopic Imaging

The incident light is separated into two different bandwidths or separated according to light characteristics. The beam splitter and trimming filter can be designed based on customer's requirement.




Bayer Visible NIR


B/W Visible NIR

| Model name | Dichroic mirror | Trimming filter |
|---|---|---|
| BV-C3200 / BV-C3210 | Half mirror | Short pass, Long pass |
| BV-C3300 / BV-C3350 | P wave, S wave | — |
| BV-C3500 / BV-C3510 | Half mirror | Visible (B/W), SWIR bandwidth |
| BV-C8200 / BV-C8220 | Half mirror | Visible (Color), NIR bandwidth |
| BV-C8210 / BV-C8225 | Half mirror | Visible (B/W), NIR bandwidth |

## 3 Sensor RGB Prism Spectroscopic Line Scan Camera

- 3 CMOS sensor
- 4K/2K pixels
- High sensitivity
- Superb color reproduction
- Wavelength selectable
- Scheimpflug option

### 4K CMOS RGB Line Scan

### 2K CMOS RGB Line Scan

Photo: F mount (option)

| Specifications | BV-C5400 | BV-C5200 |
|---|---|---|
| Optics | RGB Dichroic prism | RGB Dichroic prism |
| Sensor | CMOS Line , 7μm | CMOS Line , 14μm |
| Effective image output | 4096 pixels | 2048 pixels |
| Line frequency | 18.03KHz | 32.05KHz |
| Interface | CL, CXP | CL |
| Lens mount | M52, F mount(option) | M52, F mount (option) |
| Dimensions (WxHxD) | 70 x 70 x 85 mm | 70 x 70 x 85 mm |
| Weight | 570g | 570g |

## 2 Sensor Prism Spectroscopic Line Scan Camera

- 2 CMOS Sensor
- 4K pixels
- Polarized
- Focal length adjustable
- Scheimpflug option

### 2 Wavelengths Polarized Bi-Focal (C3350)

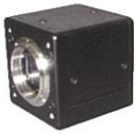
| Specifications | BV-C3300/C3350 ＊C3350 is BTO |
|---|---|
| Optics | 2ch beam splitter |
| Sensor | CMOS Line |
| Effective image output | 4096 pixels |
| Line frequency | 18.03KHz (each) |
| Interface | CL |
| Lens mount | M52 mount |
| Dimensions (WxHxD) | 95 x 95 x 95 mm |
| Weight | 820g |

## 2 Sensor (SWIR, Visible) Prism Spectroscopic Line Scan Camera

- InGaAs, CMOS
- Wavelength band/characteristic selectable
- Higher quality of contamination sorting
- Scheimpflug option

### SWIR 2 Wavelengths 900nm~1290nm/ 1290nm~1680nm

### SWIR 2 Wavelengths 900nm~1290nm/ 1290nm~1900nm



### SWIR&Visible 400nm~1680nm

### SWIR&Visible 400nm~1900nm

| Specifications | | BV-C3200 | BV-C3210CL BTO | BV-C3500 | BV-C3510CL BTO |
|---|---|---|---|---|---|
| Optics | | 2 wavelengths beam splitter | | 2 wavelengths beam splitter | |
| Sensor | | InGaAs 512 pixels (Ch1, Ch2) | | InGaAs 512pixels(Ch1),CMOS Line 4096pixels(Ch2) | |
| Band-width | Ch1 | 900nm ~ 1290nm | 900nm ~ 1290nm | 900nm ~ 1680nm | 900nm ~ 1900nm |
| | Ch2 | 1290nm ~ 1680nm | 1290nm ~ 1900nm | 400nm ~ 900nm | 400nm ~ 900nm |
| Line frequency | | 8.1KHz(each channel) | 8.1KHz(each channel) | Ch1:8.1KHz, Ch2:18.03KHz | |
| Interface | | CL | CL | CL | CL |
| Lens mount | | M52 mount | M52 mount | M52 mount | M52 mount |
| Dimensions (WxHxD) | | 95 x 95 x 95 mm | 95 x 95 x 95 mm | 95 x 95 x 95 mm | 95 x 95 x 95 mm |
| Weight | | 820g | 820g | 820g | 820g |

## Single Sensor (SWIR) Line Scan Camera

- InGaAs
- Higher quality of contaminations sorting
- Scheimpflug option

### SWIR 900nm~1700nm

### SWIR BV-C3100 : 900nm~1680nm BV-C3120CL : 1100nm~1900nm

### SWIR Air Cooling Type 1200nm~2600nm

| Specifications | BV-C3110CL NEW | BV-C3100 /C3120CL ＊C3120CL is BTO | BV-C3101R/S BTO |
|---|---|---|---|
| Sensor | InGaAs Line sensor | InGaAs Line sensor | InGaAs Line sensor |
| Bandwidth | 900nm ~ 1700nm | 900nm ~ 1680nm / 1100nm ~ 1900nm | 1200nm ~ 2600nm |
| Effective image output | 1024 pixels | 512 pixels | 512 pixels |
| Line frequency | 40KHz | 8.1KHz | 1.938KHz(R), 13.88KHz(S) |
| Interface | CL | CL | CL |
| Lens mount | C mount (1" or more) | M52, C mount (1" or more) | C mount (1" or more) |
| Dimensions (WxHxD) | 58 x 58 x 60 mm | 95 x 95 x 95 mm | 95 x 95 x 115 mm |
| Weight | 270g | 820g | 960g |

## Single Sensor (SWIR) Line Scan Camera

- InGaAs sensor
- Higher quality of contaminations sorting
- Scheimpflug option

### SWIR
950nm~1700nm

### SWIR
900nm~2550nm

| Specifications | BV-C2905CL/GE | BV-C2906GE |
|---|---|---|
| Sensor | InGaAs Line sensor | InGaAs Line sensor |
| Bandwidth | 950nm ~ 1700nm | 900nm ~ 2550nm |
| Effective image output | 512 pixels | 512 pixels |
| Line frequency | 8.1KHz | 13.88KHz |
| Interface | CL、GigE | GigE |
| Lens mount | C mount (≧1"inch) | |
| Dimensions (WxHxD) | 58 x 58 x 60 mm | 72 x 58 x 115 mm |
| Weight | 300g(CL)、290g(GE) | 725g |

## Bilinear RGB Line Scan Camera

- Bilinear (4K x2 lines)
- Compact size
- F mount

### 4K CMOS Color Bilinear Scan

| Specifications | BV-C3000CL NEW |
|---|---|
| Sensor | Color Bilinear 7μm |
| Bandwidth | Visible |
| Effective image output | 4096 pixels × 2 lines |
| Line frequency | 20KHz |
| Interface | CL |
| Lens mount | F mount |
| Dimensions (WxHxD) | 70 x 70 x 58 mm |
| Weight | 320 g |

## 3 Sensor RGB Prism Spectroscopic Area Scan Camera

- High picture quality, high sensitivity
- Superb color reproduction
- Wavelength selectable
- Scheimpflug option

### VGA CCD RGB Area Scan

### SXGA CMOS RGB Area Scan

## 2 Sensor Prism Spectroscopic Area Scan Camera

### SXGA CMOS Wide Bandwidth Area Scan
Color Visible + NIR

### SXGA CMOS Wide Bandwidth Area Scan
B/W Visible + NIR

| Specifications | BV-C8300 | BV-C8320CL | BV-C8220CL | BV-C8225CL |
|---|---|---|---|---|
| Optics, Sensor and Wavelength | RGB Dichroic prism 1/3" VGA CCD 7.4μm | RGB Dichroic prism 1/2.9" 1.6MP 3.45μm | 2 ch Beam splitter 1/2.9" Bayer CMOS, 1/2.9" B/W CMOS | |
| Effective image output | 640(H) x 480(V) | 1440(H) x 1080(V) | 1440(H) x 1080(V) | 1440(H) x 1080(V) |
| Frame rate | 200fps (max.) | 50fps (max.) | 50fps (max.) | 50fps (max.) |
| Interface | CL | CL | CL | CL |
| Lens mount | C mount | C mount | C mount | C mount |
| Dimensions (WxHxD) | 70 x 70 x 65 mm | 70 x 70 x 65 mm | 70 x 70 x 65 mm | 70 x 70 x 65 mm |
| Weight | 320g | 320g | 320g | 320g |

## 2 Sensor Prism Spectroscopic Area Scan Camera

### VGA CCD Wide Bandwidth Area Scan
Color Visible + NIR

### VGA CCD Wide Bandwidth Area Scan
B/W Visible + NIR

## Single Sensor (SWIR) Area Scan Camera

### VGA
950nm~1700nm

### QVGA
950nm~1700nm

### VGA Air Cooling Type
950nm~1700nm

| Specifications | BV-C8200CL | BV-C8210CL | BV-C2900CL/GE | BV-C2903CL/GE | BV-C2901CL/GE |
|---|---|---|---|---|---|
| Optics and Sensor | 2 ch Beam splitter 1/3" Bayer & B/W | 1/3" B/W CCD | InGaAs Area sensor | InGaAs Area sensor | InGaAs Area sensor |
| Wavelength | Visible~NIR | Visible~NIR | 950nm~1700nm | 950nm~1700nm | 950nm~1700nm |
| Resolution | 640(H) x 480(V) | 640(H) x 480(V) | 640(H) x 512(V) | 320(H) x 256(V) | 640(H) x 512(V) |
| Frame rate | 100fps (max.) | 100fps (max.) | 62fps (max.) | 226fps (max.) | 62fps (max.) |
| Interface | CL | CL | CL、GigE | CL、GigE | CL、GigE |
| Lens mount | C mount | C mount | C mount (≧1inch) | C mount (≧2/3") | C mount (≧1"inch) |
| Dimensions | 70 x 70 x 65 mm | 70 x 70 x 65 mm | 58 x 58 x 120 mm | 58 x 58 x 95 mm | 95 x 95 x 130 mm |
| Weight | 320g | 320g | 675g (CL) 665g (GE) | 570g (CL) 560g (GE) | 1100g (CL) 1090g (GE) |

## *Special* Area Scan Camera

## *Full HD* Area Scan Camera

### *ESD Visualizing Camera*

- *ESD Visualizing*
- *Cover UV Wavelength*
- *High frame rate (60fps)*
- *With gain setting*

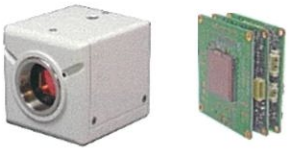
### *Sensor without Glass VGA Camera*

- *Compact size*
- *UV ~ NIR*

### *HDTV Color / B/W Camera*

***BV-C340H/MH***

***BV-C340/M Module***



- *CMOS Global Shutter*
- *High sensitivity (Full HD)*
- *HD-SDI output*
- *Small, compact*

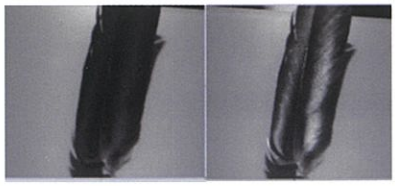
| *Specifications* | *BV-C2950* NEW | *BV-C2953* NEW BTO | *BV-C340H/MH、 BV-C340/M* |
|---|---|---|---|
| Optics and Sensor | 2 ch Beam splitter, CMOS High sensitivity UV sensor | CMOS | 1/1.8 Bayer CMOS and B/W CMOS CMOS (Global shutter) |
| Resolution | 640(H) x 480(V) | 640(H) x 480(V) | 1920(H) x 1080(V) |
| Synchronization | Internal | Internal | Internal / External (HD/VD) |
| Minimum illumination | 10Lx (F2.8, 50%) | 1Lx (F1.4, 50%) | 0.015Lx (Color)、 0.008Lx (B/W) |
| Output | USB3 | USB3 | 1080/60P,1080/60i |
| Lens spec(mount) | 35mm, F2.8 | C mount | CS mount |
| Dimensions (WxHxD) | 57 x 90 x 108 mm | 35 x 35 x 48 mm | 55 x 55 x 61 mm (BV-C340H/MH type) |
| Weight | TBD | 96g | 235g (BV-C340H/MH type) |

## *Tripod Base*

| *Model* | *Applicable Cameras* |
|---|---|
| BVA-TB01 | BV-C3XXX series (except 3000, 3101, 3110) |
| BVA-TB02 | BV-C2903 |
| BVA-TB03 | BV-C2900, 2906 |
| BVA-TB04 | BV-C2905, 3110 |
| BVA-TB05 | BV-C2950 |
| BVA-TB06 | BV-C82XX series, BV-C83XX series |
| BVA-TB07 | BV-C5200, 5400 (except CXP) |
| BVA-TB08 | BV-C2901, 3101 |
| BVA-TB09 | BV-C3000 |
| BVA-TB10 | BV-C5400CXP |

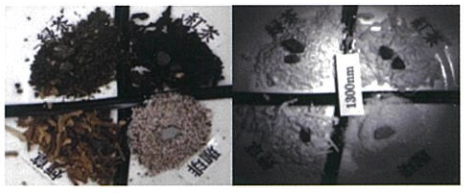
## *Image Examples*

***Feather of wild bird***



P wave S wave

***Contamination into tea, green tea, coffee and tobacco***



Visible 1300 nm

***Tablets***

1300 nm 1450 nm

- ***The cameras using InGaAs sensor are in the scope of Export Trade Control Order and requires the Export license.***
- ***Specifications are subject to change without prior notice.***

## Lens for Prism Spectroscopic Line Scan Cameras (BV-LXXXX series)


- *Designed to be suitable for prism based multi sensor line scan cameras*
- *Optical design to minimize the longitudinal and lateral chromatic aberration*
- *Extend the spectral response to NIR area*
- *High resolution for 7μm pixel size*
- *The applicable sensor length is up to 30mm*
- *The maximum aperture ration is F2.8 for all types*

| Specifications | BV-L1020-M/F | BV-L1024-M/F | BV-L1028-M/F | BV-L1035-M/F | BV-L1050-M/F | BV-L1105-M/F |
|---|---|---|---|---|---|---|
| Sensor length | 30mm | 30mm | 30mm | 30mm | 30mm | 30mm |
| Focal length | 20mm | 24mm | 28mm | 35mm | 50mm | 105mm |
| Maximum F No. | F2.8 | F2.8 | F2.8 | F2.8 | F2.8 | F2.8 |
| M.O.D | 0.3m | 0.3m | 0.3m | 0.3m | 0.3m | 0.3m |
| View angle (H) | 71.59° | 63.89° | 55.23° | 46.22° | 32.09° | 15.84° |
| Applicable Pix. size | 7μm | 7μm | 7μm | 7μm | 7μm | 7μm |
| Filter diameter | 82mm (P 0.75) | 67mm (P 0.75) | 72mm (P 0.75) | 62mm (P 0.75) | 52mm (P 0.75) | 72mm (P 0.75) |
| Mount type | M52, F mount | M52, F mount | M52, F mount | M52, F mount | M52, F mount | M52, F mount |
| Dimensions(maxΦ) | Φ84 x 111mm | Φ69 x 98mm | Φ74 x 108mm | Φ64 x 109mm | Φ60 x 62mm | Φ84 x 162mm |
| Weight | 660g | 530g | 550g | 530g | 340g | 1010g |

## Lens for SWIR Prism Spectroscopic Line Scan Cameras (BV-LXXXX-SWIR-M series)


- *Spectral response to comply with prism based SWIR line scan cameras*
- *The applicable sensor length is up to 15mm*
- *The applicable sensor size is 25μm*
- *The maximum aperture ratio of F2.8 for all types*
- *The minimum object distance of 300 mm*
- *M52 mount*

| Specifications | BV-L1020-SWIR-M | BV-L1024-SWIR-M | BV-L1028-SWIR-M | BV-L1035-SWIR-M | BV-L1050-SWIR-M | BV-L1105-SWIR-M |
|---|---|---|---|---|---|---|
| Sensor length | 15 mm | 15 mm | 15 mm | 15 mm | 15 mm | 15 mm |
| Focal length | 20 mm | 24mm | 28mm | 35mm | 50mm | 105mm |
| Maximum F No. | F2.8 | F2.8 | F2.8 | F2.8 | F2.8 | F2.8 |
| M.O.D | 0.3m | 0.3m | 0.3m | 0.3m | 0.3m | 0.3m |
| View angle (H) | 35.79° | 31.94° | 27.61° | 23.11° | 16.04° | 7.92° |
| Applicable Pix. size | 25μm | 25μm | 25μm | 25μm | 25μm | 25μm |
| Filter diameter | 82mm (P0.75) | 67mm (P0.75) | 72mm (P0.75) | 62mm (P0.75) | 52mm (P0.75) | 72mm (P0.75) |
| Mount type | M52 | M52 | M52 | M52 | M52 | M52 |
| Dimensions(maxΦ) | Φ84 x 111mm | Φ69 x 98mm | Φ74 x 108mm | Φ64 x 109mm | Φ60 x 62mm | Φ84 x 162mm |
| Weight | 660g | 530g | 550g | 530g | 340g | 1010g |

## C Mount Lens

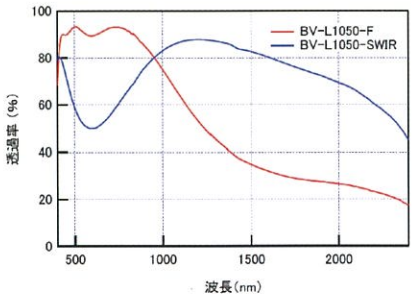
*Lens for 1/3" / 1/2" 2CCD and 3CCD cameras.*
*Applicable camera:*
*BV-C8300 series,*
*BV-C8200 series*

| | |
|---|---|
| BV-L1020-C | 20mm |
| BV-L1024-C | 24mm |
| BV-L1028-C | 28mm |
| BV-L1035-C | 35mm |
| BV-L1050-C | 50mm |
| BV-L1105-C | 105mm |

*Lens for SWIR cameras using C mount*
*Applicable camera:*
*BV-C2900 series,*
*BV-C3100C series*

| | |
|---|---|
| BV-L1020-SWIR-C | 20mm |
| BV-L1024-SWIR-C | 24mm |
| BV-L1028-SWIR-C | 28mm |
| BV-L1035-SWIR-C | 35mm |
| BV-L1050-SWIR-C | 50mm |
| BV-L1105-SWIR-C | 105mm |

## Spectral Response




**Bluevision Ltd., Japan**
1-13-12 Shin-Yokohama, Kohoku-ku
Yokohama-shi, Kanagawa 222-0033 Japan
TEL: 045-471-4595 / FAX: 045-471-4598
URL: http://www.bluevision.jp

**KYUSHU office**
3602-1 Anraku, Shibushi-cho
Shibushi-shi, Kagoshima 899-7104 Japan
TEL: 099-478-1004 / FAX: 099-478-1005

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