



XCL-C500



XCL-C500C



XCL-C280



XCL-C280C



XCL-C130



XCL-C130C



XCL-C32



XCL-C32C



XCL-C30



XCL-C30C



XCL-C Series

Digital Video Camera Module

- XCL-C500 (2/3-type CCD, 5M, 15 fps, monochrome)
- XCL-C500C (2/3-type CCD, 5M, 15 fps, color)
- XCL-C280 (1/1.8-type CCD, 2.8M, 26 fps, monochrome)
- XCL-C280C (1/1.8-type CCD, 2.8M, 26 fps, color)
- XCL-C130 (1/3-type CCD, SXGA, 31 fps, monochrome)
- XCL-C130C (1/3-type CCD, SXGA, 31 fps, color)
- XCL-C32 (1/2-type CCD, VGA, 104 fps, monochrome)
- XCL-C32C (1/2-type CCD, VGA, 104 fps, color)
- XCL-C30 (1/3-type CCD, VGA, 130 fps, monochrome)
- XCL-C30C (1/3-type CCD, VGA, 130 fps, color)



introduction

In response to customer demand, Sony is proud to introduce a broad selection of new XCL CameraLink Series cameras, ranging from VGA to 5M in monochrome and color versions. With their compact size and variety of resolution options, these new cameras make it easy and affordable for customers to migrate from analog to digital. The new XCL-C280 (monochrome) and XCL-C280C (color) cameras incorporate a 1/1.8-type EXview HAD CCD II™ sensor which provides high sensitivity with a 2.8M resolution.

In addition to inheriting Sony’s XCL Series camera features, such as Bulk Trigger and Sequential Trigger modes, these new cameras also incorporate some unique features including Shading Correction, Defect Correction, and Temperature Readout.

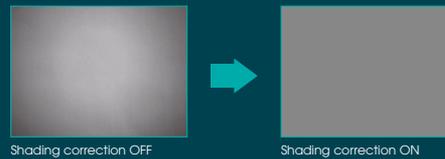
These new advanced features and benefits make XCL-C Series cameras ideal for various applications such as ITS (Intelligent Transportation Systems) and sports shooting, as well as traditional machine-vision applications.

| | XCL-C500 | | XCL-C500C | | XCL-C280 | | XCL-C280C | | XCL-C130 | | XCL-C130C | | XCL-C32 | | XCL-C32C | | XCL-C30 | | XCL-C30C | |
|--|---------------|--|-----------|--|----------------|--|-----------|--|--------------|--|-----------|--|--------------|--|----------|--|--------------|--|----------|--|
| Imager sensor | 2/3-type CCD | | | | 1/1.8-type CCD | | | | 1/3-type CCD | | | | 1/2-type CCD | | | | 1/3-type CCD | | | |
| Monochrome/Color | Monochrome | | Color | | Monochrome | | Color | | Monochrome | | Color | | Monochrome | | Color | | Monochrome | | Color | |
| Effective pixels (H x V) | 2,456 x 2,048 | | | | 1,940 x 1,460 | | | | 1,296 x 966 | | | | 659 x 494 | | | | 659 x 494 | | | |
| Cell size (µm) | 3.45 x 3.45 | | | | 3.69 x 3.69 | | | | 3.75 x 3.75 | | | | 9.9 x 9.9 | | | | 7.4 x 7.4 | | | |
| Output pixels (H x V, Full resolution) | 2,456 x 2,058 | | | | 1,940 x 1,460 | | | | 1,296 x 966 | | | | 658 x 494 | | | | | | | |
| Frame rate | 15 fps | | | | 26 fps | | | | 31 fps | | | | 104 fps | | | | 130 fps | | | |

key features

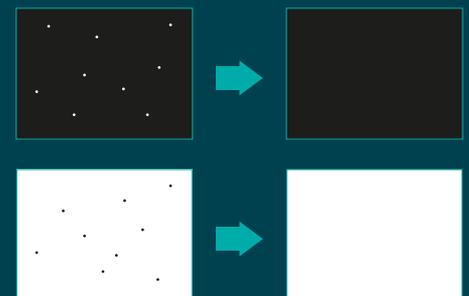
Shading Correction

With embedded shading correction, XCL-C Series cameras minimize the uneven image intensity often caused by lighting and/or the lens. Their internal hardware processing reduces the need for external image correction that is normally performed via a frame grabber board and PC. This handy function reduces the processing load of the PC, and simplifies the processing task. In addition, these cameras are equipped with three optional lighting settings to capture clear images in varying lighting conditions.



Defect Correction

XCL-C Series cameras can automatically minimize defective pixels (e.g., white and black dots) within the entire imaging area directly inside the camera. This feature helps simplify image processing.



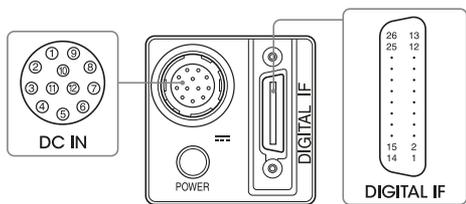
Near-infrared Sensitivity

Utilizing Sony’s EXview HAD CCD II technology enables the XCL-C280 to capture clear images in NIR (near-infrared) wavelengths. When used with an infrared strobe, the camera produces outstanding picture quality especially in low light and NIR inspection applications.

Memory Channel

In addition to factory default settings, up to 16 camera parameters – including brightness, gamma, shutter, gain, and trigger mode – can be preset to suit each particular scene.





DC IN (DC power input) connector (12-pin)

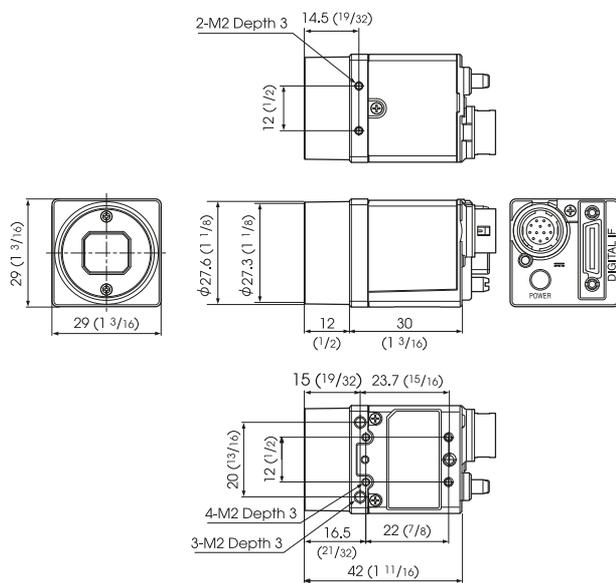
| Pin No. | Signal | Pin No. | Signal | Pin No. | Signal |
|---------|-------------------|---------|-------------------|---------|-------------------|
| 1 | Ground | 5 | Ground | 9 | GPO3 ¹ |
| 2 | DC 12 V | 6 | GPO2 ¹ | 10 | GPI2 ² |
| 3 | Ground | 7 | GPI3 ² | 11 | GPI1 ² |
| 4 | GPO1 ¹ | 8 | Ground | 12 | Ground |

¹ Signal output from pin 4, 6, 9 (GPO1/2/3) of DC IN connector. This setting allows you to select from exposure signal, strobe control signal, Hi/Low fixed value, etc. The initial values of GPO1/2/3 are all Hi fixed.
² Signal output from pin 7, 10, 11 (GPI3/2/1) of DC IN connector. Function as GPI input or trigger input. The initial setting is GPI 1 for trigger input and GPI 2/3 for GPI input.

DIGITAL IF (Interface) connector (26-pin mini connector)

| Pin No. | Signal | Pin No. | Signal |
|---------|-------------------------|---------|-------------------------|
| 1 | Power supply or Ground* | 14 | Ground |
| 2 | X0- | 15 | X0+ |
| 3 | X1- | 16 | X1+ |
| 4 | X2- | 17 | X2+ |
| 5 | XCLK- | 18 | XCLK+ |
| 6 | X3- | 19 | X3+ |
| 7 | SerTC+ | 20 | SerTC- |
| 8 | SerIFG- | 21 | SerIFG+ |
| 9 | CC1- | 22 | CC1+ |
| 10 | CC2+ | 23 | CC2- |
| 11 | CC3- | 24 | CC3+ |
| 12 | CC4+ | 25 | CC4- |
| 13 | Ground | 26 | Power supply or Ground* |

* The connection differs depending on the type of camera module interface board you use. In the case of PoCL support: Both the 1st pin and 26th pin are Power supply. In the case of non-PoCL support: Both the 1st pin and 26th pin are Ground.



Unit: mm (inches)

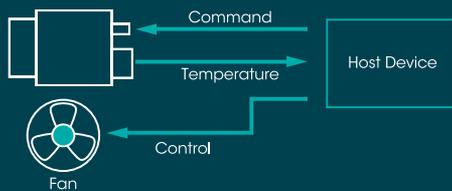
VCT-333I

Tripod Adaptor



Temperature Readout

Each camera comes with an internal temperature sensor. The host device can receive temperature information by issuing a command. This eliminates the need for a separate sensor, and simplifies system configuration.



Sensitivity Control

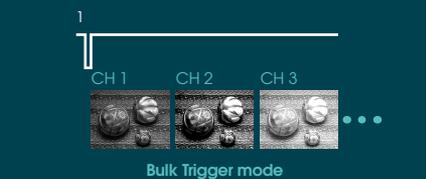
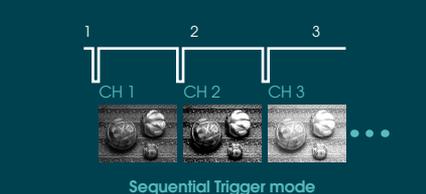
The XCL-C Series¹ is equipped with a saturation signal control function to allow the amount of saturation signal charge on the CCD to be increased or decreased via software commands. For example when capturing dark objects, the user can increase the amount of saturation signal charge elevating the camera's sensitivity to improve the picture quality instead of using a long exposure time.² On the other hand, by decreasing the amount of saturation signal charge, the amount of smear can be reduced or improved.

¹ Excludes XCL-C130 and XCL-C130C.
² If the saturation signal charge amount exceeds the maximum that can be transferred into the vertical and horizontal registers, a transfer error will occur (e.g. smear).

Bulk Trigger Mode & Sequential Trigger Mode

These new XCL-C Series cameras feature advanced Bulk Trigger and Sequential Trigger modes in addition to a conventional trigger mode. Each camera supports 16 memory channels that can store up to 16 different camera setups (e.g., exposure, and gain).

Bulk Trigger mode allows these cameras to capture up to 16 images in rapid succession using a single software or hardware trigger.



Pulse Train Generator

XCL-C Series cameras are capable of outputting any rectangular wave from one of the general-purpose outputs. This pulse train can be programmed for frequencies from 0.5 Hz up to 100 KHz in 1 μs steps to control external devices such as LED lights, simplifying overall system configuration.

Look-up Table (LUT)

Each XCL-C Series camera supports a look-up table which transforms the input luminance signal into the required digital output. It supports factory presets - Linear, Negative, Binarization, and Linear Interpolation - as well as a User-defined LUT (input: 12 bits, output: 12 bits).

Trigger Noise Filtering

With a trigger line filter, these cameras can specify a valid pulse width for the trigger. This helps avoid unexpected image capture caused, for example, by triggers from insignificant noise.

XCL-C Series Specifications

www.pro.sony.eu/vision
www.image-sensing-solutions.eu

camera

| | XCL-C500 | XCL-C500C | XCL-C280 | XCL-C280C | XCL-C130 | XCL-C130C | XCL-C32 | XCL-C32C | XCL-C30 | XCL-C30C |
|--|--|--|--|---|--|---|--|---|--|---|
| Image sensor | 2/3-type progressive scan IT CCD | | 1/1.8-type progressive scan IT CCD | | 1/3-type progressive scan IT CCD | | 1/2-type progressive scan IT CCD | | 1/3-type progressive scan IT CCD | |
| Image sensor (Number of effective pixels, H & V) | 2,456 x 2,058 | | 1,940 x 1,460 | | 1,296 x 966 | | 659 x 494 | | | |
| Cell size (H&V) | 3.45 µm x 3.45 µm | | 3.69 µm x 3.69 µm | | 3.75 µm x 3.75 µm | | 9.9 µm x 9.9 µm | | 7.4 µm x 7.4 µm | |
| Output pixels (H&V) | 2,448 x 2,048 | | 1,920 x 1,440 | | 1,280 x 960 | | 640 x 480 | | | |
| Output pixels (H x V, Full resolution) | 2,456 x 2,058 | | 1,940 x 1,460 | | 1,296 x 966 | | 658 x 494 | | | |
| Color filter | - | RGB color mosaic filter | - | RGB color mosaic filter | - | RGB color mosaic filter | - | RGB color mosaic filter | - | RGB color mosaic filter |
| Frame rate | 15 fps | | 26 fps | | 31 fps | | 104 fps | | 130 fps | |
| Minimum illumination (50%) | 0.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/15 s) | 8 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/15 s) | 0.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/25 s) | 10 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/25 s) | 0.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/30 s) | 12 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/30 s) | 1.0 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/60 s) | 12 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/60 s) | 1.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/90 s) | 15 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/90 s) |
| Sensitivity | F8 (400 lx, Gain: 0 dB) | F8 (2000 lx, Gain: 0 dB) | F5.6 (400 lx, Gain: 0 dB) | F5.6 (2000 lx, Gain: 0 dB) | F5.6 (400 lx, Gain: 0 dB) | F5.6 (2000 lx, Gain: 0 dB) | F5.6 (400 lx, Gain: 0 dB) | F5.6 (2000 lx, Gain: 0 dB) | F5.6 (400 lx, Gain: 0 dB) | F5.6 (2000 lx, Gain: 0 dB) |
| S/N ratio | More than 50 dB | | | | | | | | | |
| Gain | Auto, Manual: 0 dB to +18 dB | | | | | | | | | |
| Shutter speed | 2 s to 1/100,000 s | | | | | | | | | |
| White balance | - | One push WB, Manual | - | One push WB, Manual | - | One push WB, Manual | - | One push WB, Manual | - | One push WB, Manual |

camera features

| | | | | | | | | | | |
|----------------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Readout modes | Normal, Binning (2 x 1, 1 x 2, 2 x 2), Partial scan | Normal, Partial scan | Normal, Binning (2 x 1, 1 x 2, 2 x 2), Partial scan | Normal, Partial scan | Normal, Binning (2 x 1, 1 x 2, 2 x 2), Partial scan | Normal, Partial scan | Normal, Binning (2 x 1, 1 x 2, 2 x 2), Partial scan | Normal, Partial scan | Normal, Binning (2 x 1, 1 x 2, 2 x 2), Partial scan | Normal, Partial scan |
| Readout features | Binnarization, Gamma (variable), Built-in test pattern, LUT | | | | | | | | | |
| Synchronization | Hardware trigger, Software trigger | | | | | | | | | |
| Trigger modes | Edge detection, Pulse width detection, Bulk Trigger, Sequential Trigger | | | | | | | | | |
| Memory channel (User sets) | 16 channels | | | | | | | | | |
| User memory | 32 kbytes + 64 bytes x 16ch | | | | | | | | | |
| Other features | Shading correction, Defect correction, Temperature readout | | | | | | | | | |

interface

| | | | | | | | | | | |
|----------------------|--------------------------------|--|----------------------------------|--|--------------------------------|--|--------------------------------|--|--------------------------------|--|
| Video data output | 8, 10, 12-bit, digital | 8, 10, 12-bit, Raw, digital, RGB Color | 8, 10, 12-bit, digital | 8, 10, 12-bit, Raw, digital, RGB Color | 8, 10, 12-bit, digital | 8, 10, 12-bit, Raw, digital, RGB Color | 8, 10, 12-bit, digital | 8, 10, 12-bit, Raw, digital, RGB Color | 8, 10, 12-bit, digital | 8, 10, 12-bit, Raw, digital, RGB Color |
| Digital interface | LVDS | | | | | | | | | |
| Camera specification | PoCL, CameraLink® Version 1.2 | | | | | | | | | |
| Output data clock | 80 MHz (1 tap), 40 MHz (2 tap) | | 81 MHz (1 tap), 40.5 MHz (2 tap) | | 50 MHz (1 tap), 25 MHz (2 tap) | | 40 MHz (1 tap), 20 MHz (2 tap) | | 50 MHz (1 tap), 25 MHz (2 tap) | |
| Digital input/output | TTL IN (x3), TTL OUT (x3) | | | | | | | | | |

general

| | | | | | | | | | | |
|-----------------------------------|---|--|-----------------|--|-----------------|--|-----------------|--|--|--|
| Lens mount | C mount | | | | | | | | | |
| Power requirements | DC +12 V (+10.5 V to +15.0 V) | | | | | | | | | |
| Power consumption | 3.2 W (typical) | | 3.0 W (typical) | | 2.4 W (typical) | | 2.8 W (typical) | | | |
| Operating temperature | -5°C to +45°C (23°F to +113°F) | | | | | | | | | |
| Performance guarantee temperature | 0°C to 40°C (32°F to +104°F) | | | | | | | | | |
| Storage temperature | -30°C to +60°C (-22°F to +140°F) | | | | | | | | | |
| Operating humidity | 20% to 80% (no condensation) | | | | | | | | | |
| Storage humidity | 20% to 95% (no condensation) | | | | | | | | | |
| Vibration resistance | 10 G (20 Hz to 200 Hz) | | | | | | | | | |
| Shock resistance | 70 G | | | | | | | | | |
| Dimensions (W x H x D) | 29 x 29 x 30 mm (1 3/16 x 1 3/16 x 1 3/16 inches) (excluding protrusions) | | | | | | | | | |
| Mass | 56 g (2.0 oz) | | | | | | | | | |
| Regulations | UL60950-1*, FCC Class A, CSA C22.2-No.1, IC Class A Digital Device, CE: EN61326 (Class A), AS EMC: EN61326, VCCI Class A, KCC | | | | | | | | | |
| Supplied accessories | Lens mount cap (1), Operating instructions (1) | | | | | | | | | |

* Compliance pending (expected in/around April 2013).

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