DATASHEET

Axis Optional Lenses

Lenses for special surveillance demands

> Tested and approved for Axis cameras

> Extended surveillance possibilities

> Excellent image quality maintained

Axis network cameras are equipped with carefully selected lenses to provide the best possible performance and durability. Axis also offers various optional lenses for adverse circumstances or for meeting special surveillance requirements.

Natural obstacles, adverse conditions, or the need for semi-covert surveillance can place extraordinary demands on surveillance equipment. Axis therefore supplies a range of tested and approved optional lenses for meeting requirements on wide angle viewing, magnification, and reduction of barrel distortion.

Axis optional lenses are available for network cameras with M12 mounts or CS mounts.

Axis offers lenses for both megapixel cameras and day-and-night cameras, thus extending surveillance possibilities whilst maintaining excellent image quality.

Considerations to take into account when replacing a lens

Field of view

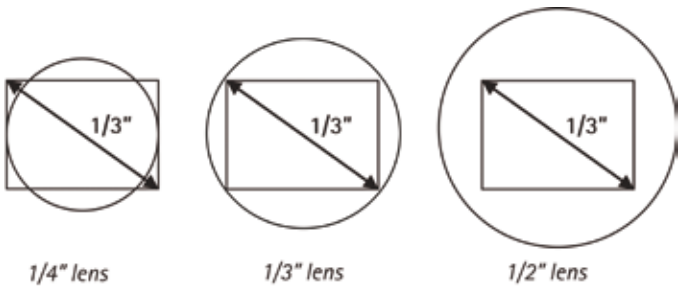
The field of view is the area of coverage and the degree of detail to be viewed. The field of view is determined by the focal length of the lens and the size of the image sensor.

The longer the focal length, the narrower the field of view. The fastest way to find out what focal length lens is required for a desired field of view is to use a rotating lens calculator or an online lens calculator, both of which are available from Axis Communications:
http://www.axis.com/techsup/cam_servers/lens_calculators/index.htm.

Matching lens and sensor

If a network camera offers an exchangeable lens, it is important to select a lens suitable for the camera. If a lens is made for a smaller image sensor than the one that is actually fitted inside the camera, the image will have black corners (see left-hand illustration below). If a lens is made for a larger image sensor than the one that is actually fitted inside the camera, the field of view will be smaller than the lens' capability since part of the information will be "lost" outside the image sensor (see right-hand illustration).

Examples of different lenses mounted onto a 1/3-inch image sensor.



When replacing a lens on a megapixel camera, a high quality lens is required since megapixel sensors have pixels that are much smaller than those on a VGA sensor (640x480 pixels). It is best to match the lens resolution to the camera resolution in order to fully use the camera's capability.

Lens mount standards

When changing a lens, it is also important to know what type of lens mount the network camera has. There are three main standards used on network cameras:

> CS-mount
> C-mount
> M12-mount

If it is impossible to focus a camera, it is likely that the wrong type of lens is used.

F-number and exposure

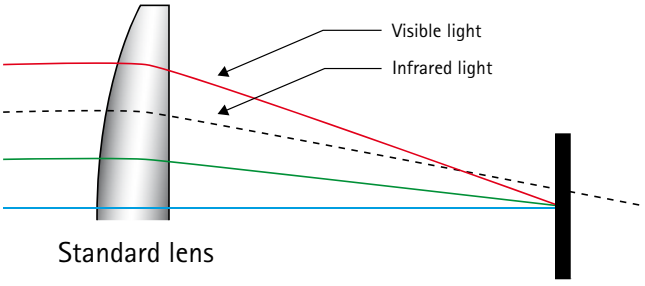
In low-light situations, particularly in indoor environments, an important factor to look for in a network camera is the lens' light-gathering ability. This can be determined by the lens' f-number, also known as f-stop. An f-number defines how much light can pass through a lens. The smaller the f-number the better the lens' light gathering ability; i.e. more light can pass through the lens to the image sensor. In low-light situations, a smaller f-number generally produces a better image quality. A higher f-number, on the other hand, increases the depth of field.

Fixed or adjustable iris

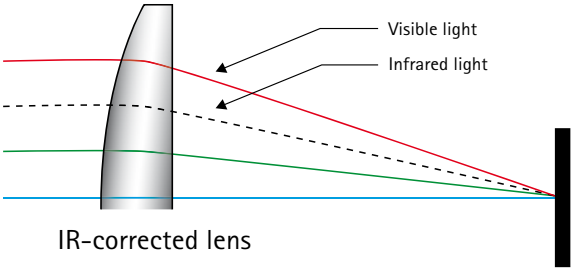
An iris is used to maintain the optimum light level to the image sensor so that images can be sharp, clear and correctly exposed with good contrast and resolution. If the network camera has been designed with an iris control, the lens needs also to match the same specification. Iris control can be fixed or adjustable. More details on the type of iris control (fixed, manual, auto iris or P-Iris) can be found here:
http://www.axis.com/products/video/camera/about_cameras/iris.htm

IR corrected lens

IR-corrected lenses are not very beneficial for cameras that do not have a removable infrared-cut filter. This is used to filter out infrared (IR) light so that it does not distort the colors of images as the human eye sees them. However, day/night cameras—used mostly for outdoor applications or in areas with poor lighting—can greatly benefit from IR-corrected lenses. Day/night cameras automatically remove an IR-cut filter in low-light conditions to take advantage of invisible, near-infrared light. Since the wavelength of IR light differs from visible light, the focus point of IR light will differ from the focus point of visible light. Consequently, when the focus is set during daytime, the picture will not be in focus at nighttime when using IR light.



The problem can be rectified by using IR-corrected lens, which focuses both the visible and the infrared light in the same vertical plane.



For more information, see
www.axis.com/products/video/camera/about_cameras/lens.htm

AXIS COMMUNICATIONS

Technical specifications – Axis Optional Lenses

Pentax Varifocal Lens 5 – 50 mm (5500-291)	
Description	Sharp, detailed images with extensive field of view
Mount	CS mount
Focal length	5 – 50 mm
Aperture	F 1.8
Sensor format & horizontal angle of view*	1/4" sensor: 38° – 4° 1/3" sensor: 50° – 6° **Angle of view may vary depending on camera model*
Supported cameras	AXIS 211, AXIS, 211W, AXIS 221, AXIS P1343
Dimensions (LxHxW)	65 x 50 x 45 mm (2.6" x 2.0" x 1.8")

Varifocal Megapixel Lens 2.4 – 6 mm (5500-871)	
Description	Megapixel lens with wide angle to see it all
Mount	CS mount
Focal length	2.4 – 6 mm
Aperture	F 1.2
Sensor format & horizontal angle of view*	1/3" sensor: 111° – 47° 1/4" sensor: 95° – 38° **Angle of view may vary depending on camera model*
Supported cameras	AXIS 211M, AXIS P1344
Dimensions (LxHxW)	62 x 55 x 44 mm (2.4" x 2.1" x 1.7")

Varifocal Lens 10 – 40 mm D/N (5502-121)	
Description	Day and night telephoto lens for high quality images
Mount	CS mount
Focal length	10 – 40 mm
Aperture	F 1.4
Sensor format & horizontal angle of view*	1/3" sensor: 32° – 13° **Angle of view may vary depending on camera model*
Supported cameras	AXIS 221
Dimensions (LxHxW)	66 x 54 x 43 mm (2.6" x 2.1" x 1.7")

Megapixel Lens 2.8 mm (5502-101)	
Description	Megapixel lens
Mount	M12 mount
Focal length	2.8 mm
Aperture	F 2.6
Sensor format & horizontal angle of view	1/4" sensor: 106° 1/3" sensor: 78°
Supported cameras	AXIS 209FD/-R, AXIS 209MFD/-R, AXISM3011, AXIS M3014
Dimensions (L x Ø)	16 x 14 mm (0.6" x 0.5")

Megapixel Lens 3.6 mm (5502-151)	
Description	Megapixel lens
Mount	M12 mount
Focal length	3.6 mm
Aperture	F 1.8
Sensor format & horizontal angle of view	1/4" sensor: 56° 1/3" sensor: 74°
Supported cameras	AXIS 209FD/-R, AXIS 209MFD/-R, AXISM3011, AXIS M3014
Dimensions (L x Ø)	17 x 14 mm (0.7" x 0.5")

Megapixel Lens 6 mm (5502-111)	
Description	Megapixel lens
Mount	M12 mount
Focal length	6 mm
Aperture	F 1.8
Sensor format & horizontal angle of view	1/4" sensor: 34° 1/3" sensor: 44°
Supported cameras	AXIS 209FD/-R, AXIS 209MFD/-R, AXISM3011, AXIS M3014
Dimensions (L x Ø)	17 x 14 mm (0.7" x 0.5")

Megapixel Lens 8 mm (5502-411)	
Description	Megapixel lens for optional angle view
Mount	M12 mount
Focal length	8 mm
Aperture	F 1.8
Sensor format & horizontal angle of view	1/4" sensor: 26° (28° for AXIS M3014 only) 1/3" sensor: 28°
Supported cameras	AXIS 209FD/-R, AXIS 209MFD/-R, AXIS M3011, AXIS M3014
Dimensions (L x Ø)	17.4 x 14 mm (0.7" x 0.5")

Megapixel Lens 16 mm (5502-161)	
Description	Megapixel lens
Mount	M12 mount
Focal length	16 mm
Aperture	F 2.0
Sensor format & horizontal angle of view	1/4" sensor: 12° 1/3" sensor: 16°
Supported cameras	AXIS 209FD/-R, AXIS 209MFD/-R, AXISM3011, AXIS M3014
Dimensions (L x Ø)	16 x 14 mm (0.6" x 0.5")

Theia Fixedfocal Megapixel Lens 1.7 mm (5502-451)	
Description	Wide angle lens without barrel distortion
Mount	CS mount
Focal length	1.7 mm
Aperture	F 1.8
Sensor format & horizontal angle of view	1/3" sensor: 111° 1/4" sensor: 99°
Supported cameras	AXIS 211M, AXIS P1344
Dimensions (L x Ø)	56 x 33 mm (2.2" x 1.3")

Raynox Conversion Lens 0.5x zoom (5500-501)	
Description	Wide angle conversion lens
Mount	M37 mount
Zoom	0.5x
Supported cameras	AXIS Q1755
Dimensions (L x Ø)	40 x 62 mm (1.6" x 2.4")

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Raynox Conversion Lens 2.2x zoom (5500-511)	
Description	High-Definition telephoto conversion lens
Mount	M37 mount
Zoom	2.2x
Supported cameras	AXIS Q1755
Dimensions (L x Ø)	73 x 55 mm (2.9" x 2.2")

Tamron Varifocal Megapixel Lens 5 - 50 mm (5502-221)	
Description	Extensive field of view
Mount	CS mount
Focal length	5 - 50 mm
Aperture	F 1.4
Sensor format &horizontal angle of view	1/3" sensor: 54° - 6° 1/4" sensor: 44° - 5°
Supported cameras	AXIS 211M, AXIS P1344
Dimensions (L x Ø)	60 x 40 mm (2.3" x 1.6")

Evatar Fixed iris Megapixel Lens 16 mm (5502-741)	
Description	High-definition megapixel lens
Mount	CS mount
Focal length	16 mm
Aperture	F 1.8
Sensor format &horizontal angle of view	1/4" sensor: 12° (AXIS M1103) 1/4" sensor: 15° (AXIS M1104)
Supported cameras	AXIS M1103, AXIS M1104
Dimensions (L x Ø)	15 x 30 mm (0.6" x 1.2")

Fujinon Varifocal Megapixel Lens 2.2-6 mm (5502-751)	
Description	DC iris lens with wider viewing angle
Mount	CS mount
Focal length	2.2 - 6 mm
Aperture	F 1.3
Sensor format &horizontal angle of view	1/4" sensor: 84° - 32° (AXIS M1113) 1/4" sensor: 100° - 40° (AXIS M1114)
Supported cameras	AXIS M1113, AXIS M1114
Dimensions (L x Ø)	54 x 38 mm (2.1" x 1.5")

Fujinon Varifocal Megapixel Lens 15-50 mm (5502-761)	
Description	For accurate and detailed information acquisition
Mount	CS mount
Focal length	15 - 50 mm
Aperture	F 1.5
Sensor format &horizontal angle of view	1/4" sensor: 15° - 4° (AXIS M1113) 1/4" sensor: 21° - 5° (AXIS M1114)
Supported cameras	AXIS M1113, AXIS M1114
Dimensions (L x Ø)	59 x 38 mm (2.3" x 1.5")

More information is available at www.axis.com/accessories

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