Austral Surveillance

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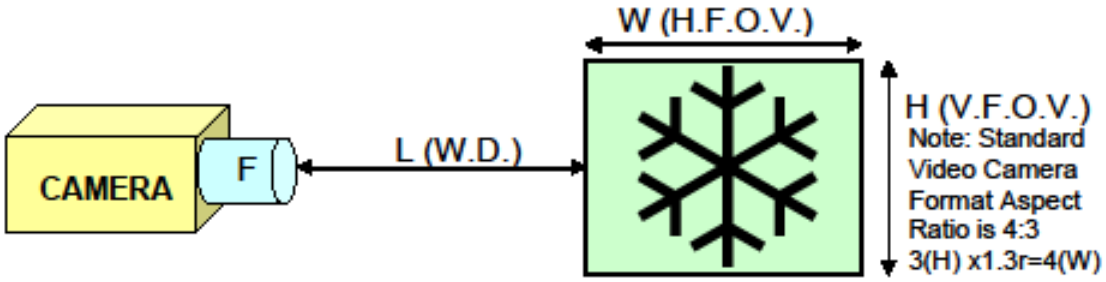
CCTV LENS SELECTION

CALCULATION OF LENS FIELD OF VIEW



CAMERA SENSOR FORMAT							
f	¼"	1/3"	½"	1/1.8"	2/3"	1"	35mm
F=	$\frac{3.6 \times L}{W}$	$\frac{4.8 \times L}{W}$	$\frac{6.4 \times L}{W}$	$\frac{8.5 \times L}{W}$	$\frac{8.8 \times L}{W}$	$\frac{12.8 \times L}{W}$	$\frac{36 \times L}{W}$
F=	$\frac{2.7 \times L}{H}$	$\frac{3.6 \times L}{H}$	$\frac{4.8 \times L}{H}$	$\frac{6.8 \times L}{H}$	$\frac{6.6 \times L}{H}$	$\frac{9.6 \times L}{H}$	$\frac{24 \times L}{H}$
W=	$\frac{3.6 \times L}{F}$	$\frac{4.8 \times L}{F}$	$\frac{6.4 \times L}{F}$	$\frac{8.5 \times L}{F}$	$\frac{8.8 \times L}{F}$	$\frac{12.8 \times L}{F}$	$\frac{36 \times L}{F}$
H=	$\frac{2.7 \times L}{F}$	$\frac{3.6 \times L}{F}$	$\frac{4.8 \times L}{F}$	$\frac{6.8 \times L}{F}$	$\frac{6.6 \times L}{F}$	$\frac{9.6 \times L}{F}$	$\frac{24 \times L}{F}$
L=	$\frac{W \times F}{3.6}$	$\frac{W \times F}{4.8}$	$\frac{W \times F}{6.4}$	$\frac{W \times F}{8.5}$	$\frac{W \times F}{8.8}$	$\frac{W \times F}{12.8}$	$\frac{W \times F}{36}$
L=	$\frac{H \times F}{2.7}$	$\frac{H \times F}{3.6}$	$\frac{H \times F}{4.8}$	$\frac{H \times F}{6.8}$	$\frac{H \times F}{6.6}$	$\frac{H \times F}{9.6}$	$\frac{H \times F}{24}$

F = Focal Length of Lens in millimetres.
W = Width of Scene to be imaged - Horizontal Field of View (H.F.O.V.)
H = Height of Scene to be imaged - Vertical Field of View (V.F.O.V.)
L = Distance between Lens & Scene to be imaged - Working Distance (W.D.)

Example: To determine what Lens is required to image an object 70mm Square at a Length or Working Distance of 500mm, use the formulae along the 2nd row. e.g.: If your Camera has a 1/3" format Sensor then multiply the W.D. by 3.6 & divide by 70 = 25.7; the nearest standard Lens in this case is 25.0mm.

Note: 1) Dimensions of W, H & L must be in the same units e.g. mm, cm or inches etc.
2) If your camera has a different Sensor Format to the ones listed in the table then you can replace the figures by using the equation: [No. of Pixels x Pixel Size]
e.g.: if the camera has 1024 x 1024 effective pixels @10µm (0.01mm) this =

$F=\frac{10.24 \times L}{W/H}$ or $W/H=\frac{10.24 \times L}{F}$ or $L=\frac{W/H \times F}{10.24}$

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What Lens Shall I Use???

Lens selection is the most critical component of any surveillance system and often overlooked in a system design. A good surveillance system will use a mix of lens types to obtain a face shot on one camera but also cover good floor area with other cameras.

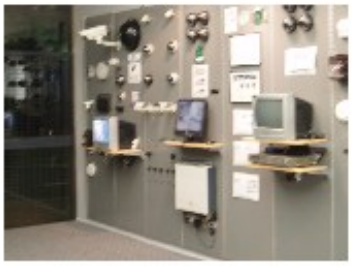
Generally optical resolution will increase as the focal length of the lens increases, as the camera is zooming in more thus capturing more detail. However as the diagrams below illustrate, greater magnification comes at the cost of lesser floor coverage by the camera.

Shots taken by a Cctv14 camera from approximately 9 metres away from the front of the showroom using various focal length lenses

3.6 -4mm Lens

6mm Lens

8mm Lens



12mm Lens

16mm Lens