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EXPECT MORE.

Agenda

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- **Camera Selection Parameters**
  - ✓ Focal Length
  - ✓ Field of View
  - ✓ Iris
  - ✓ Aperture
  - ✓ Automatic Shutter
  - ✓ Illumination
  - ✓ Resolution
  - ✓ S/N Ratio
  - ✓ Image Sensor
  - ✓ Lens
- **Camera Features**
  - ✓ Backlight Compensation
  - ✓ Wide Dynamic Range
  - ✓ Auto White Balance
- **Type of Cameras**
- **SATATYA Camera Range**

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Camera Selection Parameters

Focal Length

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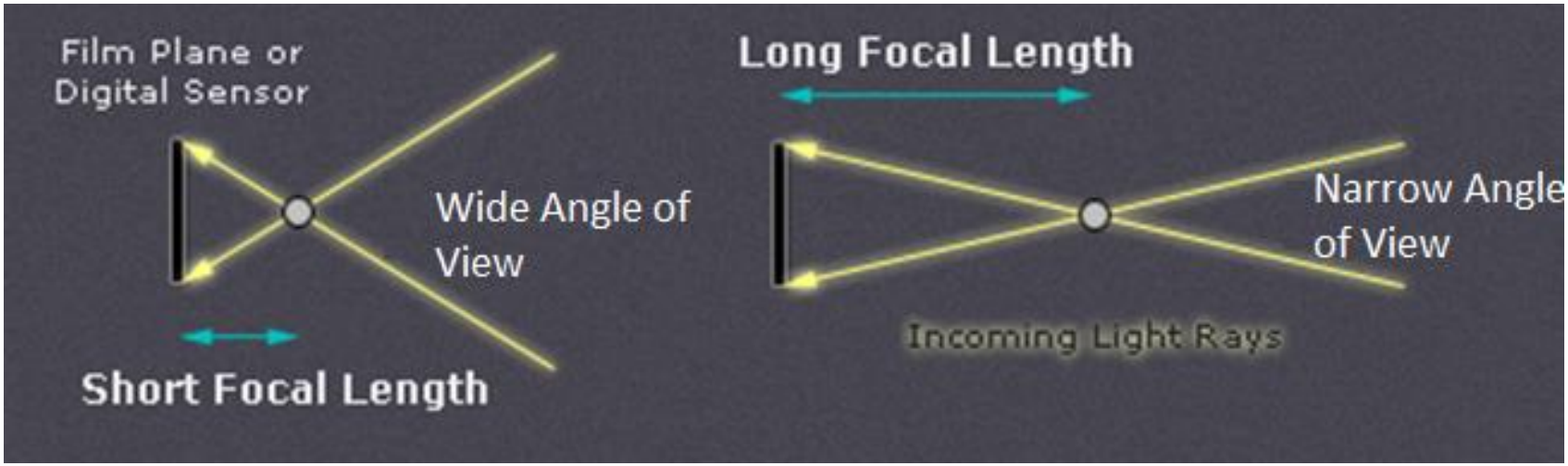
- The focal length of a lens determines its angle of view, and thus also how much the subject will be magnified for a given photographic position.

- Wide angle lenses have short focal lengths, while telephoto lenses have longer corresponding focal lengths.



Focal Length

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2.5 mm

3.6 mm

4.3 mm

6 mm

12 mm

25 mm

Field of View

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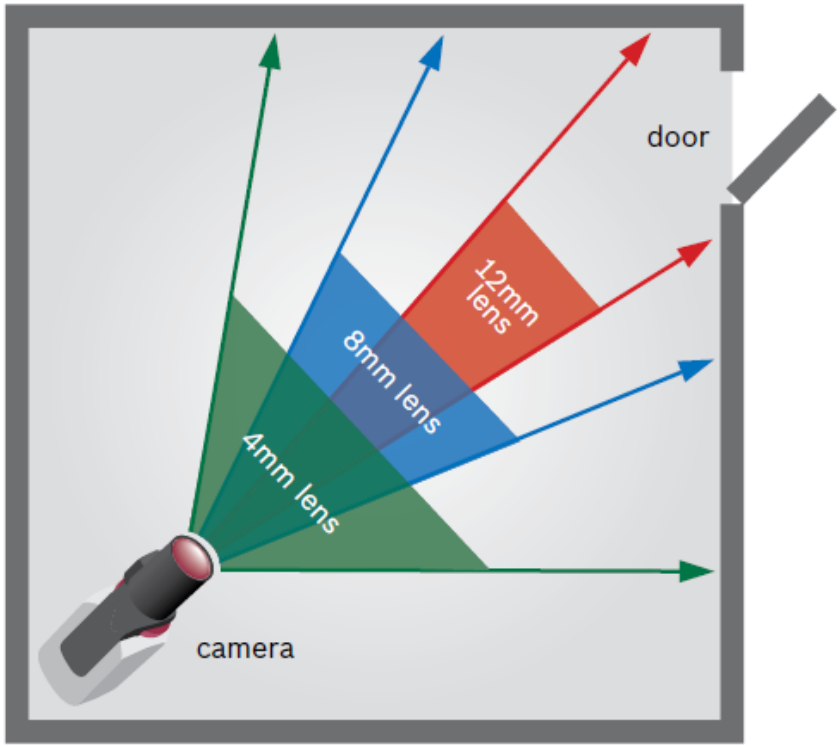
- Field of view (FOV) is a measure of how large an area a CCTV camera is capable of viewing.
- The FOV is based on the camera and lens.
- Increasing the lens' focal length decreases the perceived distance to the viewing area, but also decreases the area that the camera is able to view.



Iris

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- 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.
- The iris can also be used to control the depth of field. Iris control can be fixed or adjustable.
- Adjustable iris lenses can be manual or automatic.

Aperture (f-stop)

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- The aperture is the size of the opening in the iris –aperture openings are expressed in f-stops.
- An f/2 aperture allows a lot of light in, f/8 is a very small aperture.
- An example of an aperture allowing in more light is our own eyes.
- Too much of sunlight entering our eyes or a dark room makes us blinded.
- Sunlight makes our pupil shut down to f/8 and dark room makes our pupil enlarge up to f/2.
- This enables us to see better in adverse conditions.

Aperture (f-stop)

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f/2 Aperture

f/8 Aperture

f/16 Aperture

Automatic Shutter

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- Automatic shutter control adds further flexibility to a camera by controlling the quality of light.
- Automatic shutters compensate for changes in light quality.
- Thus, an outdoor camera with automatic shutter control can produce accurate images of activity in a parking lot in daylight, as well as under artificial illumination.

Illumination

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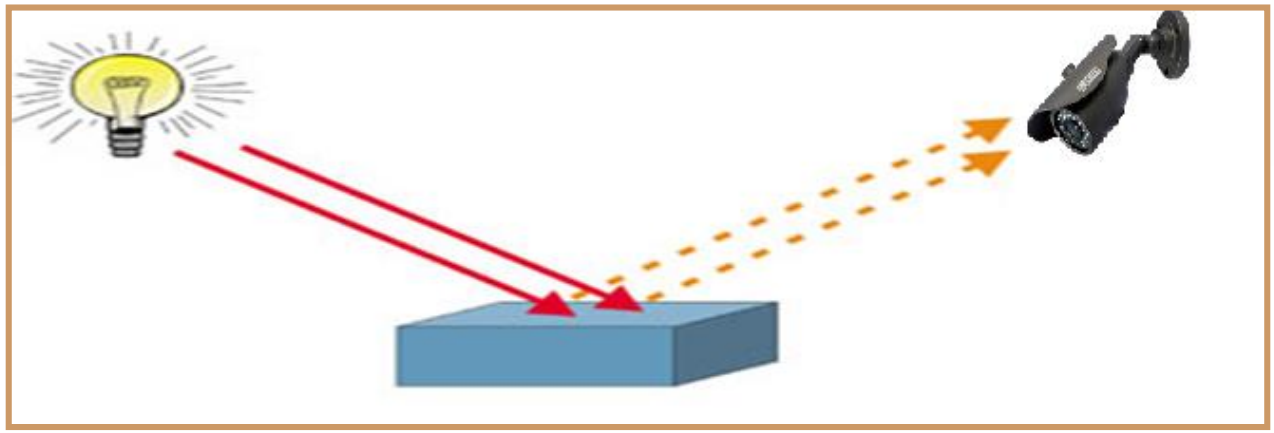
- Illumination refers to the light falling on a scene.
- Strictly speaking, illumination is not a camera function; however, it's a critical issue when considering a camera for a given area.
- Adequate illumination is essential to acquiring images that allow security personnel to monitor an area (detection), observe activity at the location (recognition), and identify specific actions, objects, or persons (identification).



Resolution

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- Resolution is the measure of fine detail that you see in an image. For analog systems, this is typically measured in Television Lines (TVL).

- The higher the resolution, the better the definition and clarity of the picture. The camera “scans” an image in a series of lines running horizontally.

- Analog cameras’ resolution is measured in TVL while Digital cameras’ resolution is measured in megapixels.

Resolution

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Signal-to-Noise Ratio

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- The signal-to-noise ratio (s/n ratio) is the ratio of the video signal level to the amount of noise present in the image.

- Noise in a video image is seen as snow or graininess, resulting in a poorly defined image on the monitor or video recording. The unit for expressing s/n ratio is decibels (dB), but it can also be expressed as a ratio.

S/N Ratio dB	Ratio	Picture Quality
60	1,000:1	Excellent, no noise apparent
50	316:1	Good, a small amount of noise but the picture quality is good
40	100:1	Reasonable, fine grain or snow in picture and loss of fine detail
30	32:1	Poor picture quality with a great deal of noise
20	10:1	Unusable picture

Image Sensors

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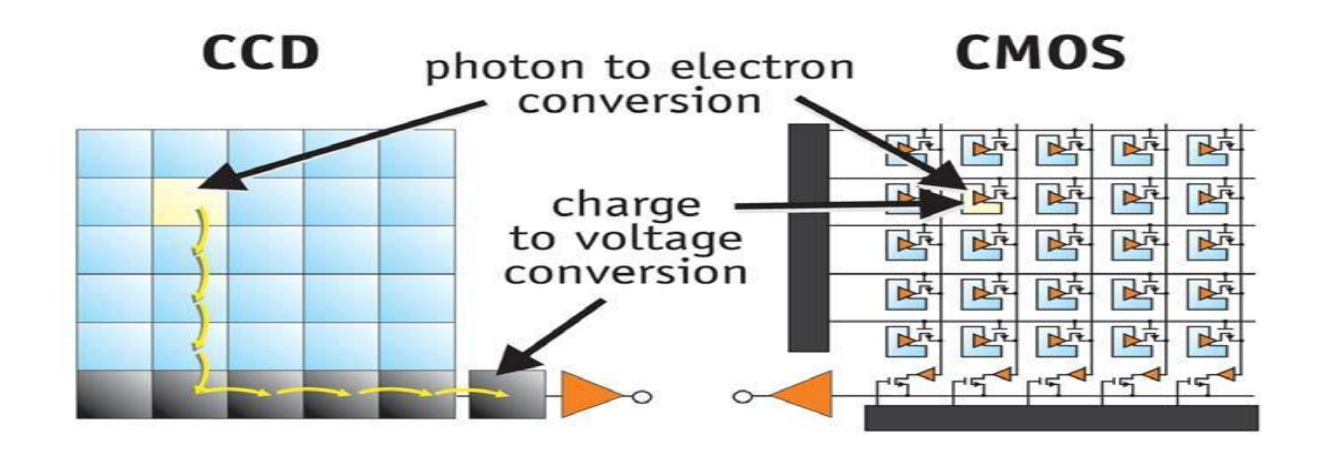
- There are two types of image sensors available in the market :
  - ✓ CCD (Charge-Coupled Device)
  - ✓ CMOS (Complementary Metal Oxide Semiconductor)

- Both types of sensor accomplish the same task of capturing light and converting it into electrical signals.



CCD vs. CMOS Sensors

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CCD Image Sensor	CMOS Image Sensor
High-quality, Low-noise Image	Images are more susceptible to noise
Better low light performance	Lesser power consumption
Mature technology	Cheaper

CCD

CMOS

Lenses

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- Lenses perform two main functions:
  - ✓ It determines the scene that will be shown on the monitor.
  - ✓ It controls the amount of light reaching the sensor.
- Focal length can be fixed or variable (e.g., zoom lens).
- The iris may be manually adjusted or automatically controlled by the camera.

Lens Types

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- **Fixed focal length lenses:**
  - ✓ Fixed focus lenses are the simplest type of lens, and therefore the least expensive.
  - ✓ If a predefined area needs to be covered, fixed lenses can be used.

- **Varifocal lenses:**
  - ✓ Varifocal lenses offer more flexibility, allowing you to adjust the field of view manually.
  - ✓ Although slightly more expensive, these lenses are popular because you can get a more precise adjustment of the scene.
  - ✓ In a store, the varifocal camera can be used at the lower setting to cover a large wall of merchandise, or you could use it at the higher setting to watch a cash register.

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Camera Features

Backlight Compensation (BLC)

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• Due to brighter light in the background, objects of interest in the foreground are often overshadowed.

• BLC allows the camera to adjust the exposure of the entire image to properly expose the subject in the foreground.

• ATMs are areas where a person enters the scene often and usually cameras are connected opposite the entrance.

• During day time a lot of sunlight enters the scene along with the person in the foreground.

• BLC is beneficial in conditions like ATMs, cameras connected indoors, Porch Doors, Mall Entrances, etc.

Backlight Compensation (BLC)

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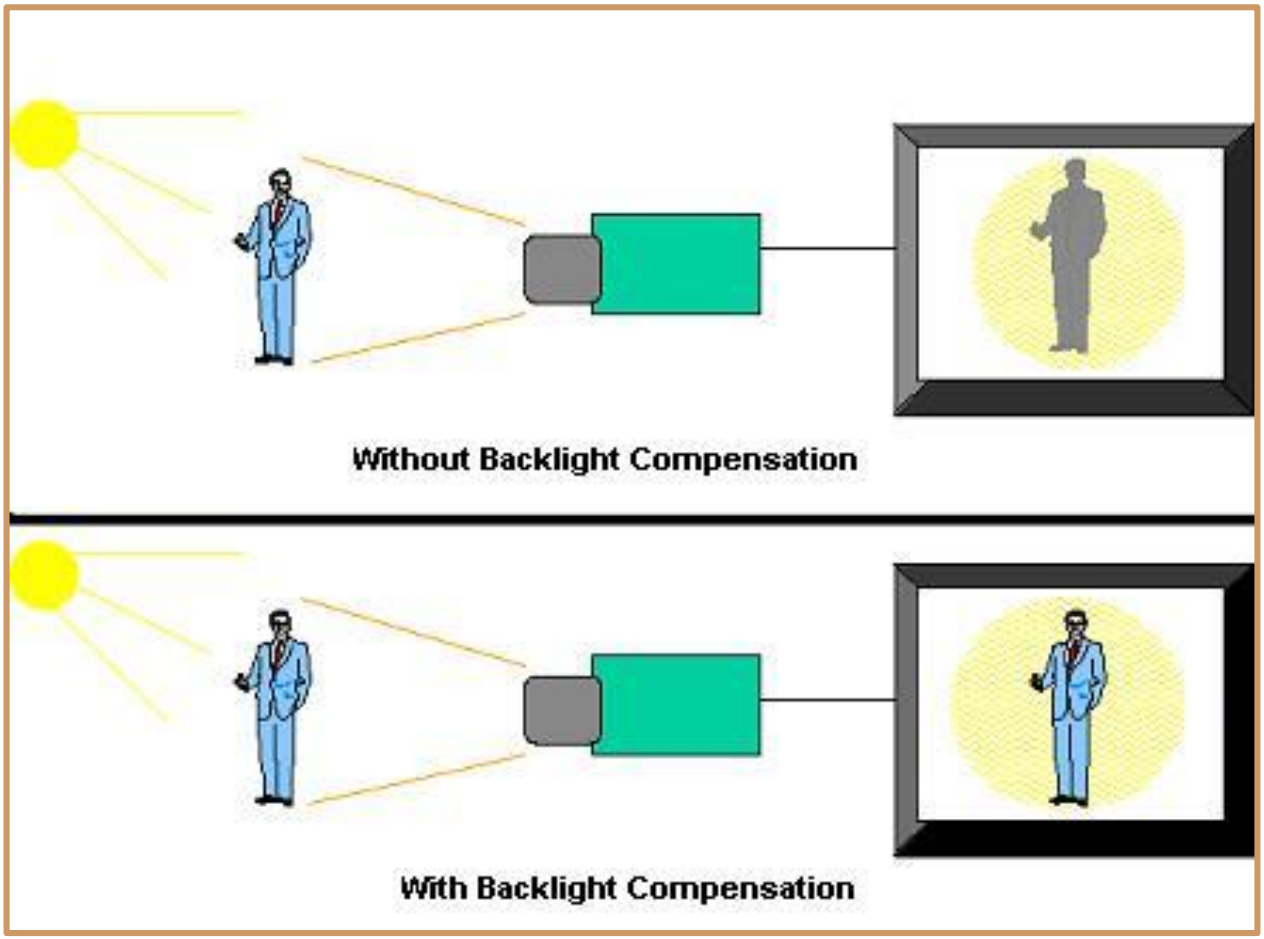

Wide Dynamic Range (WDR)

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- In a scene with extremely bright and dark areas or in backlight situations where a person is in front of a bright window.
- Wide dynamic range takes two samples of the image, one at slow shutter speed for the bright area, and one at fast shutter speed for the dark area, and combines them into one image.
- Areas like parking areas of hotels and mall are dark inside but the entrance to the parking area has bright light coming.
- Both the extreme lighting conditions can be captured well by this feature.

Wide Dynamic Range (WDR)

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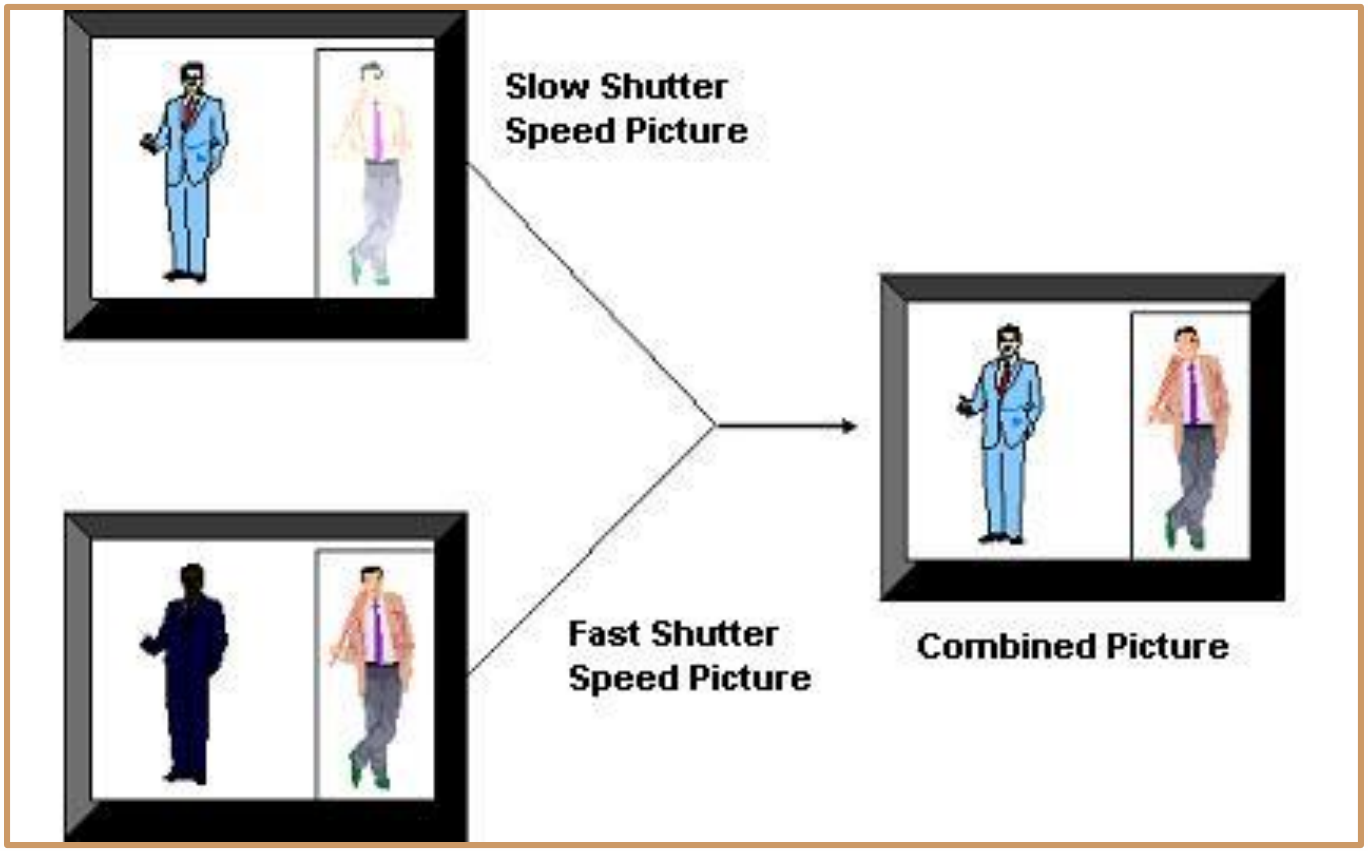

Auto White Balance (AWB)

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- White balance (WB) is the process of removing unrealistic color casts, so that objects which appear white in person are rendered white in your photo.

- This feature automatically adjusts the color temperature of the camera image to match the type of light available, so that white and other colors appear as natural as possible.

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Type of Cameras

Dome Cameras

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- The dome camera is obviously named for its dome shape.
- Because of its shape, its difficult to tell exactly where the camera is aiming unless you see it up close.
- Dome cameras are generally used inside buildings, although the armor domes can be used outside as well.
- You can mount them on the ceiling or on a wall. They are available in black and white (b/w) and color, and the basic unit has good video resolution.

Bullet Cameras

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- The term Bullet Camera comes from its resemblance to a rifle bullet. Generally long and tapered like a cylinder, it looks like an oversized ammo cartridge.
- Most bullet cameras come with a fixed 3.6mm lens that allows a 80 degree angle of view.
- This is the widest angle you can have without distorting the picture.

PTZ Camera:

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- Pan/tilt/zoom cameras give the surveillance operator the ability to move the camera left or right (pan); up and down (tilt); and zoom the lens closer or farther.

- There are cameras that have automated pan/tilt/zoom functionality where the camera is moving on a timed basis.

Infra Red Cameras

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- An infrared security camera has infrared LED lighting installed around the outside of the lens of the camera.
- This lighting allows the camera to capture a good image in no light at all.
- With a little bit of light (called low light) the infrared camera can capture a picture that looks just like daytime.
- Infrared cameras are often called “Night Vision” cameras because they can ‘see’ in the dark.

IP Cameras

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- An Internet protocol camera, or IP camera, is a type of digital video camera commonly employed for surveillance.
- Unlike analog closed circuit television(CCTV), IP cameras can send and receive data via a computer network and the Internet.

SATATYA Camera Nomenclature

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CA	DR	700	FL	36	C	B
CA - Camera Analog **CI** - Camera IP	**Camera Type** D- Dome DR- IR Dome BR- IR Bullet BX- Box DRP- IR Dome PTZ	**Camera Resolution** XYZ - in TVL XY - in MP	**Lens Type** FL- Fixed VL- Vari Focal RL- Replaceable	**Lens Size** in 0.1mm	**Image Sensor** C-CMOS S-Super HAD CCD II	**Color** B-Black W-White G-Grey S-Silver

SATATYA Camera Range

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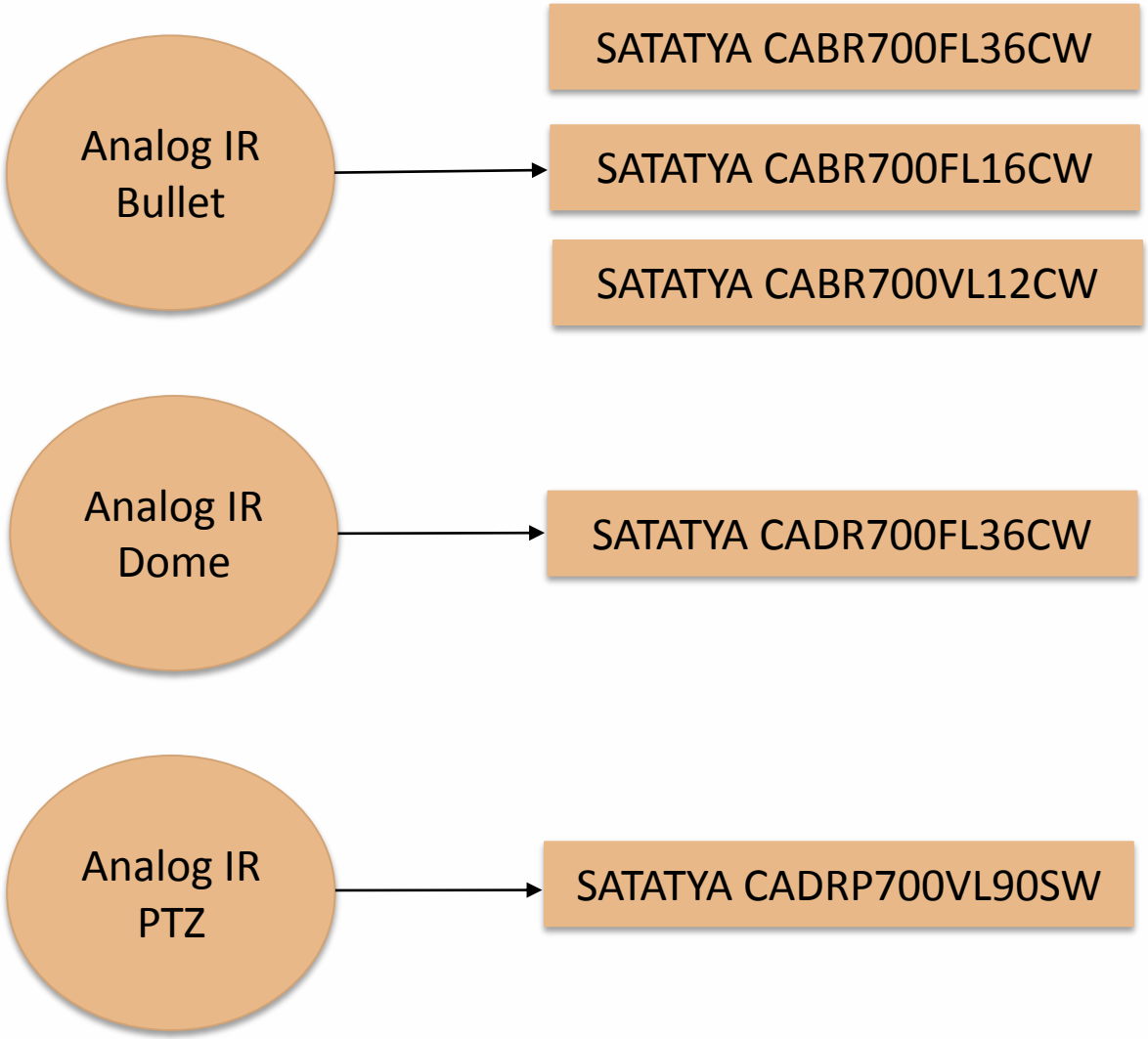

SATATYA Camera Range

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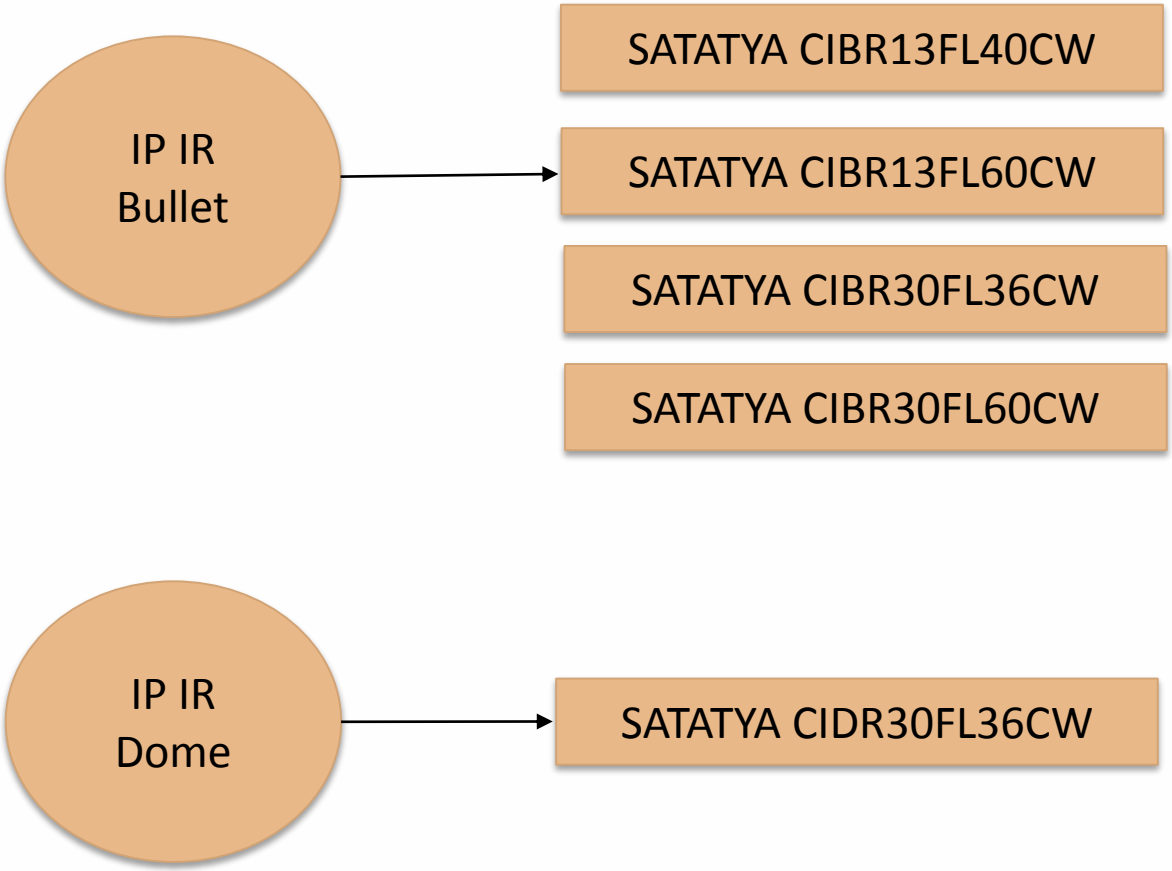

SATATYA Camera Range

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1) 3MP IP CAMERAS

- SATATYA CIBR30FL36CG- 3MP, 3.6mm, IP IR Bullet Camera
- SATATYA CIBR30FL60CG- 3MP, 6mm, IP IR Bullet Camera
- SATATYA CIDR30FL36CW- 3MP, 3.6mm, IP IR Dome Camera

Key Features:

- Edge Recording
- Smart and Adaptive Streaming
- 4 Stream Support
- e-PTZ
- 128GB SD Card Support
- 2 IR Array LEDs, IR Distance Coverage of up to 30m
- 10/ 100 Mbps Ethernet Interface

SATATYA Camera Range

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2) 2MP IP PTZ CAMERAS
SATATYA CIDRP20VL130CW

Matrix SATATYA IP PTZ cameras come with a varifocal lens of 4.3-129mm which can cover an IR range of 100m. Also, this camera has 30x optical zooming capabilities which allows closer inspection.

Key Features:

- Inbuilt Analytics: Intrusion Detection and Trip Wire
- 30x Optical Zoom, 4.3-129mm Varifocal Lens
- 6 Piece IR Array LEDs with IR Distance of 100m
- 1 Audio Input & 1 Audio Output
- H.264/M-JPEG, Quad Streams
- 64GB SD Card
- IP66. TVS 4.000V Lightning Protection

SATATYA Camera Range

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3) 1.3MP IP CAMERAS

Matrix SATATYA 1.3MP IP cameras come in 4mm and 6mm IR Bullet and 4mm IR Dome variants and are designed to cover a IR distance of 20-30 meters.

Key Features:

- Inbuilt Analytics: Intrusion Detection and Trip Wire
- H.264/M-JPEG Video Compression
- Dual Stream Support
- 30 IR LEDs, IR Distance Coverage of up to 30m
- IR Cut Filter with Auto Switch
- Network Drive Storage
- 10/100 Mbps Ethernet Interface
- CE, FCC, RoHS, IP66 and IK10 Certification

SATATYA Camera Range

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IP CAMERAS

	SATATYA CIDR13FL40CW	SATATYA CIBR13FL40CW	SATATYA CIBR13FL60CW	SATATYA CIBR30FL36CG	SATATYA CIBR30FL36CW	SATATYA CIDR30FL60CG	SATATYA CIDRP20VL130CW
Type of Camera	IR Dome	IR Bullet				IR Dome	PTZ
Resolution	1.3MP			3MP			2MP
Image Sensor	1/3" DIS						1/2.8" DIS
Lens Size	4mm		6mm	3.6mm		6mm	4.3 - 129mm
No. of LEDs in IR Camera	30 LEDs			2 Pieces IR Array LEDs			6 Pieces IR Array LEDs
IR Camera Range	20-30m						100m
Certifications	CE, FCC, RoHS, IP66 and Ik10	CE, FCC, RoHS and IP66		–			IP 66, TVS 4,000V Lightning Protection, Surge Protection and Voltage Transient Protection

SATATYA Camera Range

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SATATYA ANALOG CAMERAS

Matrix SATATYA analog cameras are available in various form factors like IR dome, IR bullet and PTZ to suite diverse surveillance needs of organizations. These are available with Sony 1/3" Super HAD CCD II or DIS image sensor and with fixed and vari focal lenses.

IR HIGH SPEED DOME (PTZ) CAMERAS

SATATYA CADRP700VL90SW

Sony Super HAD CCD II, 700TVL, 3-90mm Lens, 30x Optical Zoom, 12 IR Array LEDs to cover up to 150m IR Distance

SATATYA Camera Range

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SATATYA CMOS CAMERAS

SATATYA CABR700FL36CW

IR Bullet, 700TVL, 3.6mm Lens, 12 LEDs to cover up to 20m IR Distance

SATATYA CABR700FL16CW

IR Bullet, 700TVL, 16mm Lens, Smart IR, cover up to 80m IR Distance

SATATYA CABR700VL12CW

IR Bullet, 700TVL, 2.8-12mm Lens, Smart IR, cover up to 40m IR Distance

SATATYA CADR700FL36CW

IR Dome, 700TVL, 3.6mm Lens, 12 LEDs to cover up to 20m IR Distance

SATATYA Camera Range

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ANALOG CAMERAS

	SATATYA CADR700FL36CW	SATATYA CABR700FL16CW	SATATYA CABR700FL36CW	SATATYA CABR700VL12CW	SATATYA CADRP700VL90SW
Type of Camera	IR Dome	IR Bullet			PTZ
TVL	700				
Image Sensor	DIS				Sony Super HAD CCD II
Lens Size	3.6mm	16mm	3.6mm	2.8-12mm	3-90mm
No. of LEDs in IR Camera	12	2 Piece IR Array LED	12	42	12
IR Camera Range	20m	80m	20m	30-40m	120-150m
Certifications	CE, FCC and RoHS	IP66, CE, FCC and RoHS			CE, RoHS and IP66

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We put
more
in the box

so your
business
can think
more
out of
the box.

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Thank You.