

3. IP Cameras

Depending on the user's requirement, the systems use 720P (1280x720) high definition IP camera, this resolution can meet the requirement both image quality and bandwidth, it's a good choice to small scale IP surveillance system.

The camera support two kind of resolution encoding: main stream (1280x720) and second stream (640x480), we can record the main stream and monitor the second stream.

This factory needs to use three type cameras for different places:

- Indoor dome IR camera: installing on the ceil or room;
- Indoor bullet IR camera: installing on the wall of entrance, channel, and stair. Indoor bullet's valid IR distance is 10-15m.
- Outdoor waterproof IR camera: installing on outdoor for long distance monitoring like entrance or parking lot. Outdoor camera's valid IR distance is 15-30m.

Total cameras are below:

No.	Item	Description	Amount
1	 Indoor IR Dome	1.0 Megapixel 720P Low-light CMOS Indoor Dome IP Camera, 2 axis (vertical & horizontal) adjustable, built-in 2.8-12mm varifocal lens, 15pcs IR light, 8m. IR-Corrected Lens	2
2	 Indoor IR Bullet	1.0 Megapixel 720P WDR Low-light CMOS IR Box IP Camera, 36 pcs IR LED lights, built-in 2.8-12 mm varifocal lens	12
4	 Outdoor Waterproof IR Box	1.0 Megapixel 720P Low-light CMOS IR Box IP Camera, 4 pcs 3rd generation IR LED lights, built-in 5-15 mm varifocal lens	11
	Total		25

4. Network Devices (Switch):

According to the IP camera amount and the distance between the camera and control room, the system need 3 set of switches, 2 sets of 16 port 10/100M access switch be installed on the first floor, these switches be connected to 1000M core switch on Central Control Room, then the data be transmitted to NVR .

In the central control room, we need to use 1 set 8 port 1000M Ethernet core switch

All switch are below:

No.	Floor	Item	Description	Amount
1	1-floor		16 port 10/100M, 2 1000M Ethernet ports	2
2	Central Control Room		8 10/100/1000Base-T ports	1
3		Total		3

5. NVR (Network Video Recorder) and Monitor

NVR is the core of the system, it can store, manage, play cameras, it based on embedded Linux, so it's very stable. This system need to use two 16ch 720P standalone embedded NVR.



Storage:

- Video format: 720P, 25fps
- Bit rate: 2Mbps
- Recording hours per day: 12 hours (Continuous recording on daytime, motion detection at night)
- Recording days: 15days
- Cameras amount: 25 pieces
- Storage space (TB) : = bit rate / 8 * 3600s * hours * days * cameras / 1024

$$= \text{GB} / 1024 = \text{TB}$$

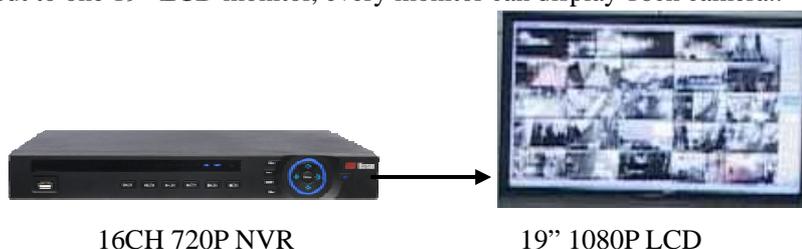
$$= 2\text{Mbps} / 8 * 3600\text{s/hour} * 12\text{hours} * 15\text{days} * 25 / 1024 / 1024 = 3.8 \text{ TB}$$

The formatting will waste 10% space, the 2TB hard disk's useful space is 1.8TB, so 2 pieces 2TB hard disk can meet the requirement.

- Total disk amount: 2 (pieces)

Monitor:

Every NVR output to one 19" LCD monitor, every monitor can display 16ch camera..



6. Total Device List

No.	Item	Description	Amount	Price	Total
1	 Indoor IR Dome	1.0 Megapixel 720P Low-light CMOS Indoor Dome IP Camera, 2 axis (vertical & horizontal) adjustable, built-in 2.8-12mm varifocal lens, 15pcs IR light, 8m. IR-Corrected Lens	2		

2	 Indoor IR Box	1.0 Megapixel 720P WDR Low-light CMOS IR Box IP Camera, 36 pcs IR LED lights, built-in 2.8-12 mm varifocal lens	12		
3	 Camera Mount	For indoor IR box camera	12		
4	 Outdoor Waterproof IR Box	1.0 Megapixel 720P Low-light CMOS IR Box IP Camera, 4 pcs 3rd generation IR LED lights, built-in 5-15 mm varifocal lens	11		
6	 Heavy Camera Mount	For outdoor IR box camera	11		
7	 16 Port Ethernet Switch	16 10/100M, 2 1000M Ethernet ports	2		
8	 8Port Ethernet Switch	8 10/100/1000Base-T ports	1		
9	 16Ch 720P NVR	<ul style="list-style-type: none"> ● 16ch 720P record, play ● 1/4/9/16 display 	2		
10	 Hard Disk: WD20EURS	Enterprise level hard disk 7200.14, Drive Only, 2TB,	2		
11	 19" LCD Monitor	19" LCD	2		
12	Accessories, cable	Integrator buy it from local market	0	0	0
13	Installation Charges		0	0	0
	Total				6,264