



NETWORK AND TELECOMMUNICATION





ACADEMIC BACKGROUNDS:

- 1987-1993 Georgia University of Technology (Former USSR) **Specialize: Radio Transmitting Device of Satellite Telecommunication Systems** (Master of Science).
- 1997-1998 Advanced course at the Saint-Petersburg State University of Technology in computer simulation of ground stations Modem for Sputnic communication (Russia).

PREVIOUS EMPLOYMENT:

- 2002-2018 The World Bank Cambodia (IT Analyst, Client Services).
- 1999 -2001 Worked as Systems Engineer at VIRTU International Limited.
- 1995 -1997 Worked as assistant manager in operation and technical department at CAMINTEL.
- 1993 – 1995 Worked as engineer in Operations and Technical Department in HUB-station (ex-UNTAC Networks) at Ministry of Post and Telecommunications of Cambodia.

Teaching Experiences:

- 2000 Royal Academy of Cambodia (MSc.IT).
- 2002 Build Bright University (MSc.IT).
- 2019 National Polytechnic Institute of Cambodia (BSc.Telcom).
- 2020 Norton University (BSc.IT)
- 2023 Cambodia Academy of Digital Technology (BSc.Telcom).



What is CCTV and what is CCTV used for?

- Abbreviation of CCTV is Closed Circuit Television used to monitor and record videos to have evidence.
- A self-contained surveillance system comprising camera, recorders and display.
- CCTV is system in which signals are not publicly distributed, but are monitored, primarily surveillance and security purposes.
- CCTV relies on strategic placement of cameras, and observation of the camera's input on monitors somewhere.



Why CCTV is needed for?

- Prevent and deter crime.
- The very presence of CCTV cameras on an installation is enough to deter potential criminals and prevent their action at the outset similarly, by the sight of a safety hazard, employees can take the necessary action to reduce the risk and alleviate the source in the shortest possible times.



What are the types of CCTV camera?

- 1-Dome CCTV camera.
- 2-Bullet CCTV camera.
- 3-C-Mount CCTV camera.
- 4-Day/Night CCTV camera.
- 5-Infrared/Night vision CCTV camera.
- 6-Network/IP CCTV camera.
- 7-Wireless CCTV camera.
- 8-High-Definition HD CCTV camera.
- 9-C-MOS CCTV camera.



What is CCTV camera lens and its type?

- A fixed or board CCTV camera lens has a set viewing angle.
- This means the camera lens cannot be zoomed in or adjusted in any way.
- A varifocal or manual zoom CCTV camera lens can be adjusted.
- CCTV technician can focuses on exactly the area that need to be recorded.



What is pan, Tilt and zoom?

- Panning refers to horizontal movement of the camera lens.
- Tilting describes vertical movement of the camera lens.
- The process of zooming refers to the adjustment of the focal length of the lens to make a subject appear close-up or far away depending on the setting.



What is coaxial cable?

- Coaxial cable, or coax is a type of electrical cable that has an inner conductor, surrounded by a tubular insulating layer, surrounded by a tubular conducting shield.
- Many coaxial cable also have an insulating outer sheath or jacket.



What is RG-6 and RG-11 coaxial cable?

- Both are type of coaxial cable with different characteristics.
- The biggest difference between these two cable type is carrying signal attenuation, or the degree at which signal quality is lost.
- RG-6 cables have greater attenuation compared to the RG-11.
- Another upside to the RG-11 cable is that it can transmit signals at a higher frequency range, which the RG-6 cable could no longer carry.

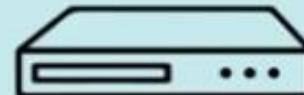


Analog CCTV purchase checklist

1. Cameras



2. Digital Video Recorder (DVR)



3. Hard Disk Drive (HDD)



4. Power supply



5. Cable



6. Connectors



7. Display



8. Accessories

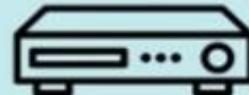


IP CCTV purchase checklist

1. Cameras



2. Network Video Recorder (NVR)



3. Hard Disk Drive (HDD)



4. Power over Ethernet (PoE)



5. Cable



6. Connectors



7. Display



8. Accessories



FEATURES

ANALOG

- Can go up to 32 Cameras

DVR



- Limited smart features

IP CCTV

- Can go up to 256 cameras

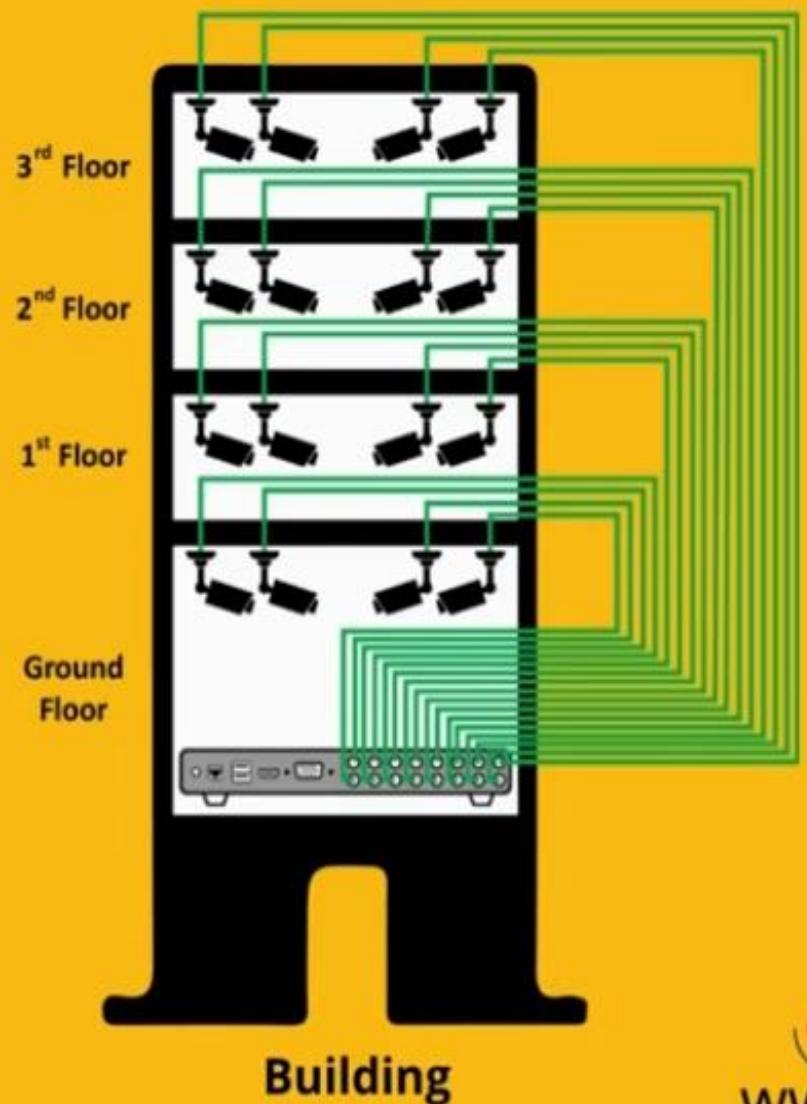
NVR



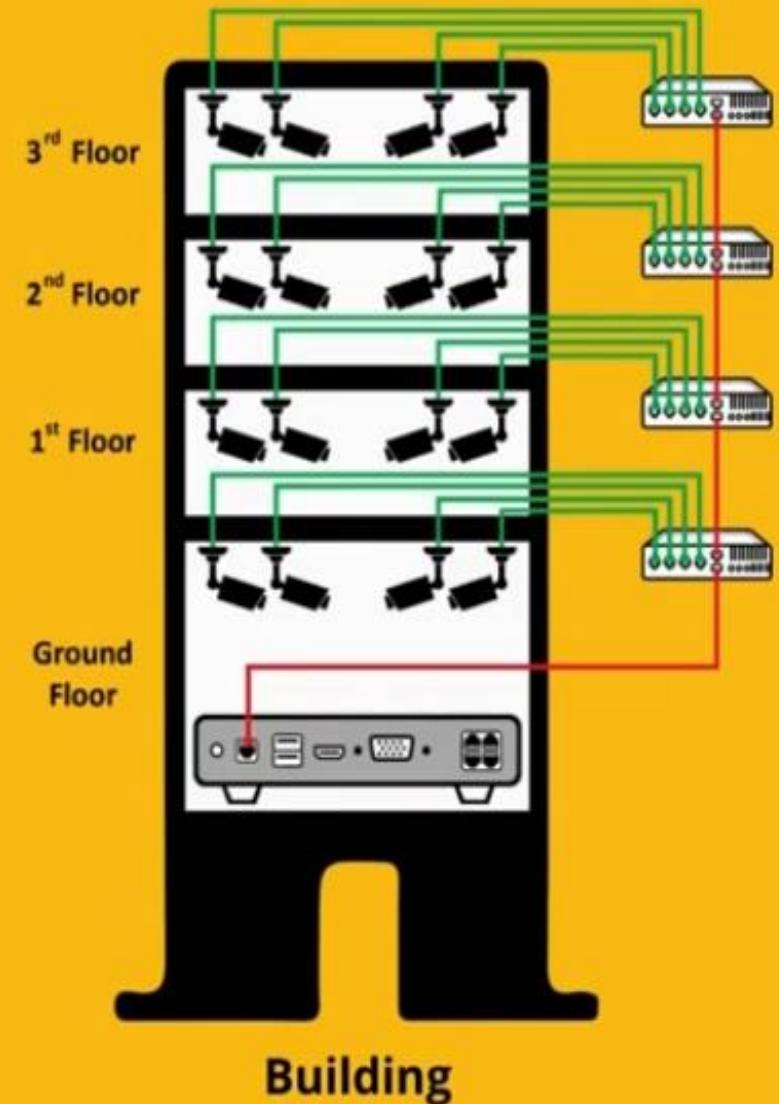
- Smart Features
Interpret & Extract data



ANALOG



IP CCTV



 AGS cctv
www.agscctv.com



Resolution

TV Lines (TVL)



480 TVL
520TVL
600TVL
1000TVL

VS

Pixel



0.3 MP
1.3 MP
2.0 MP
3.0 MP
5.0 MP
8.0 MP





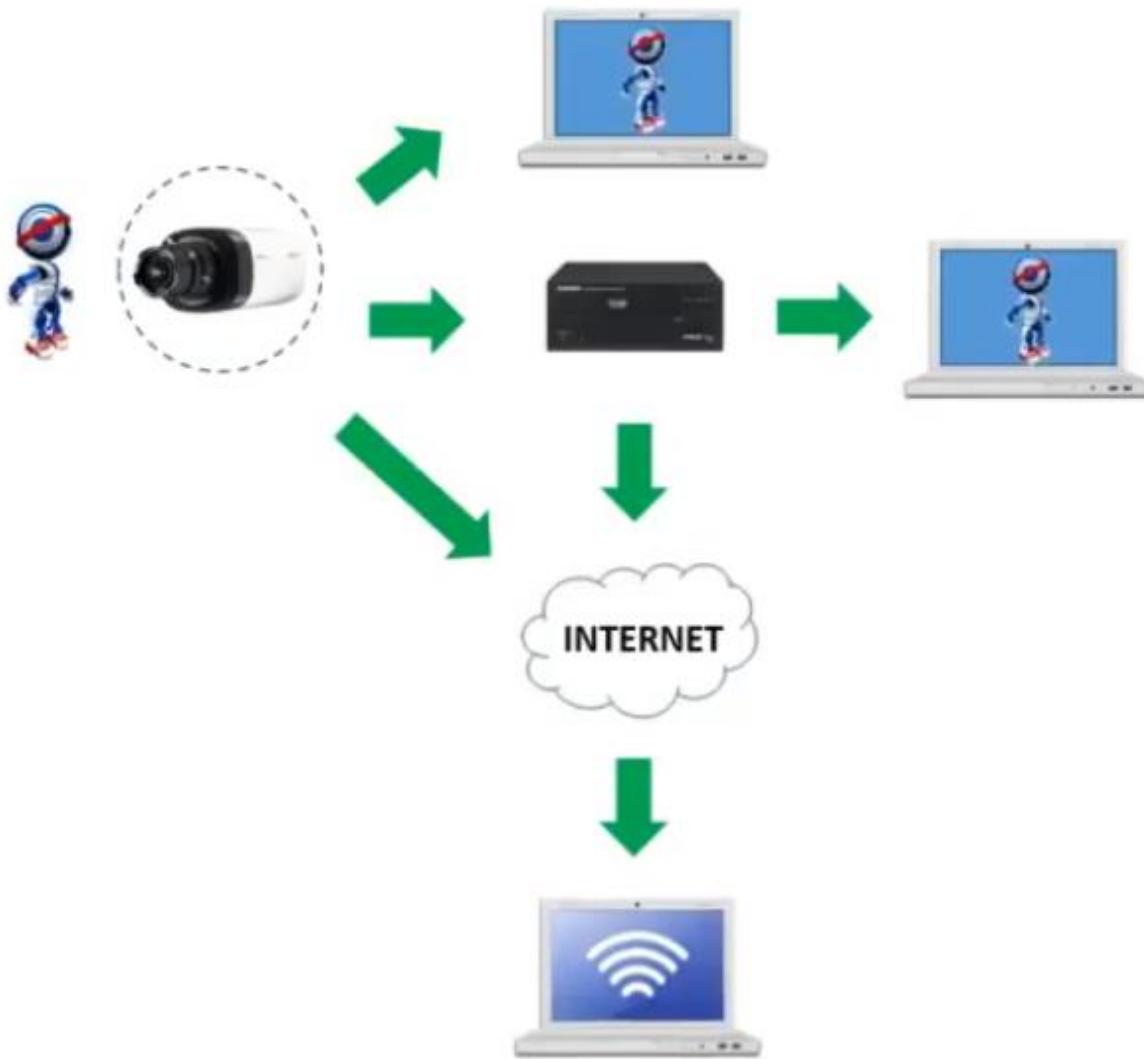
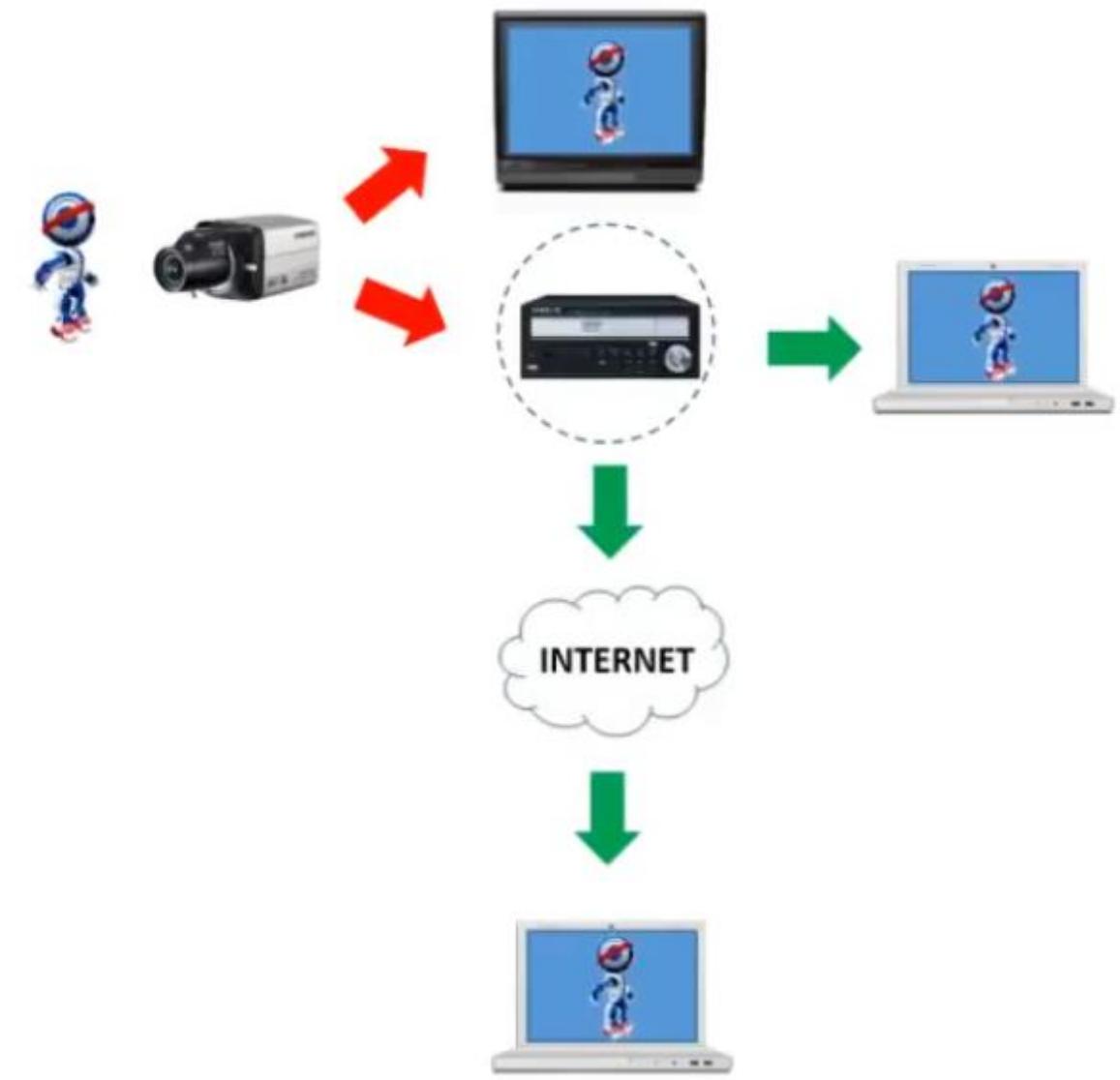
VS



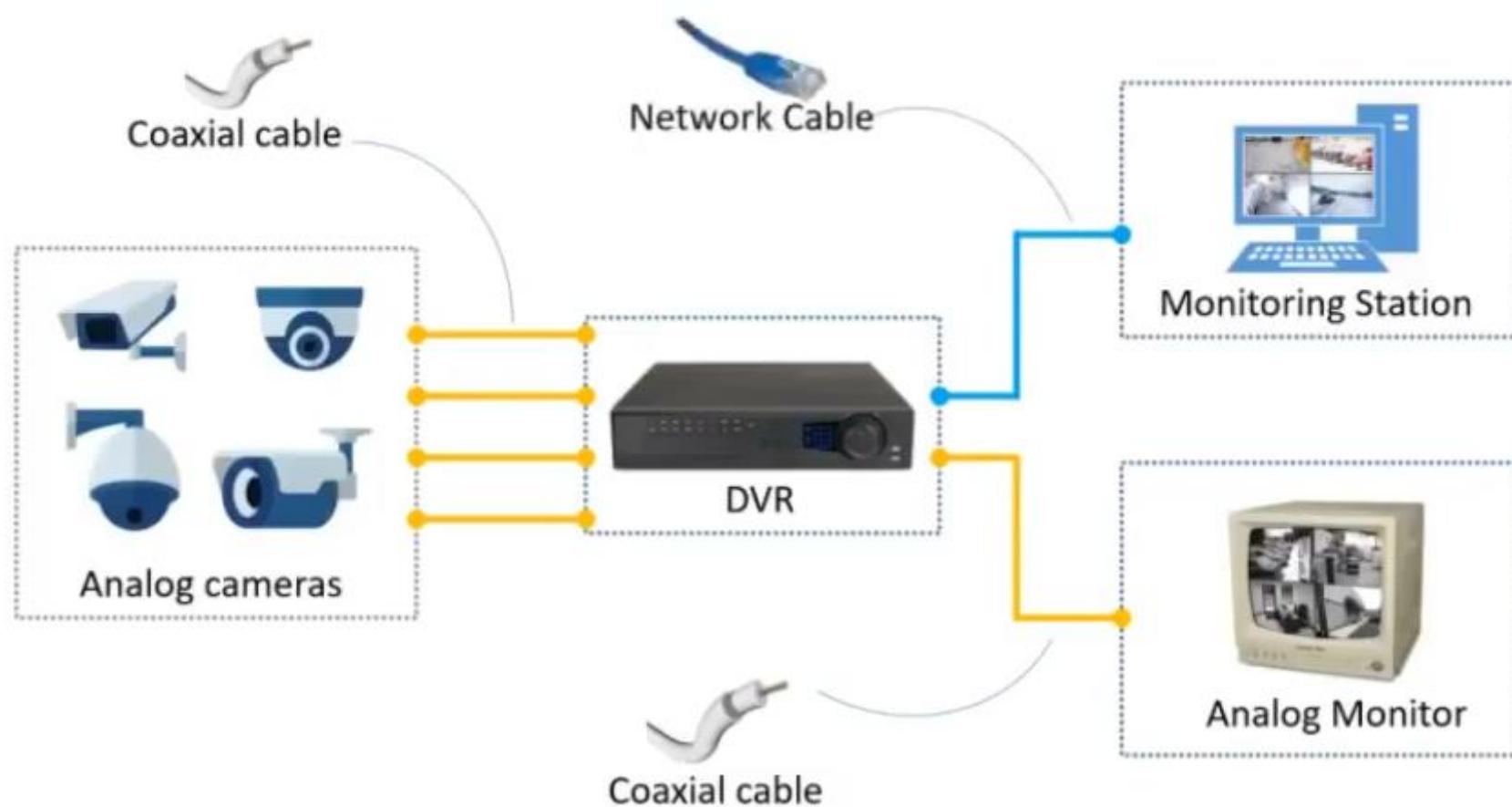
Analog & Digital recording



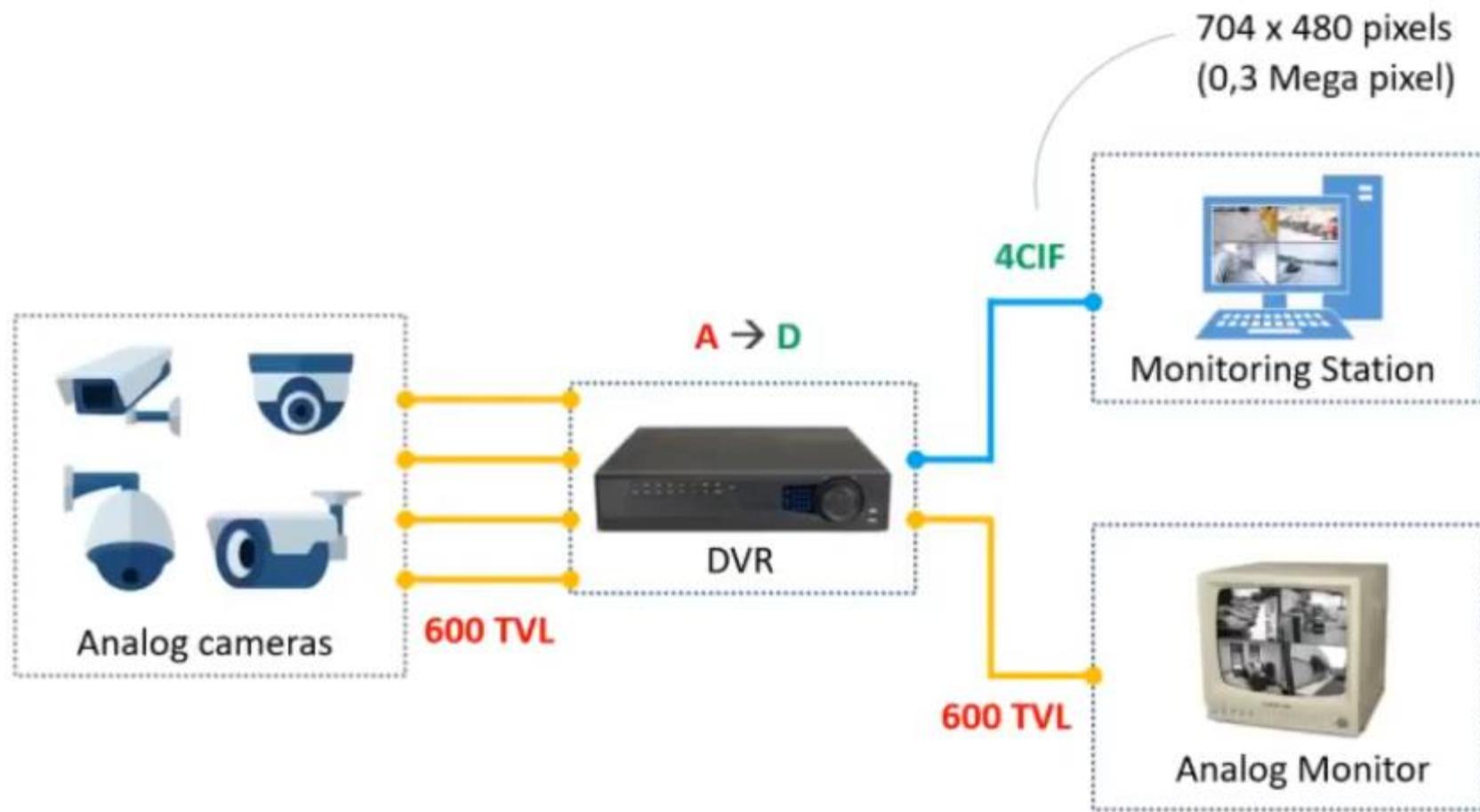
Analog and digital transmission



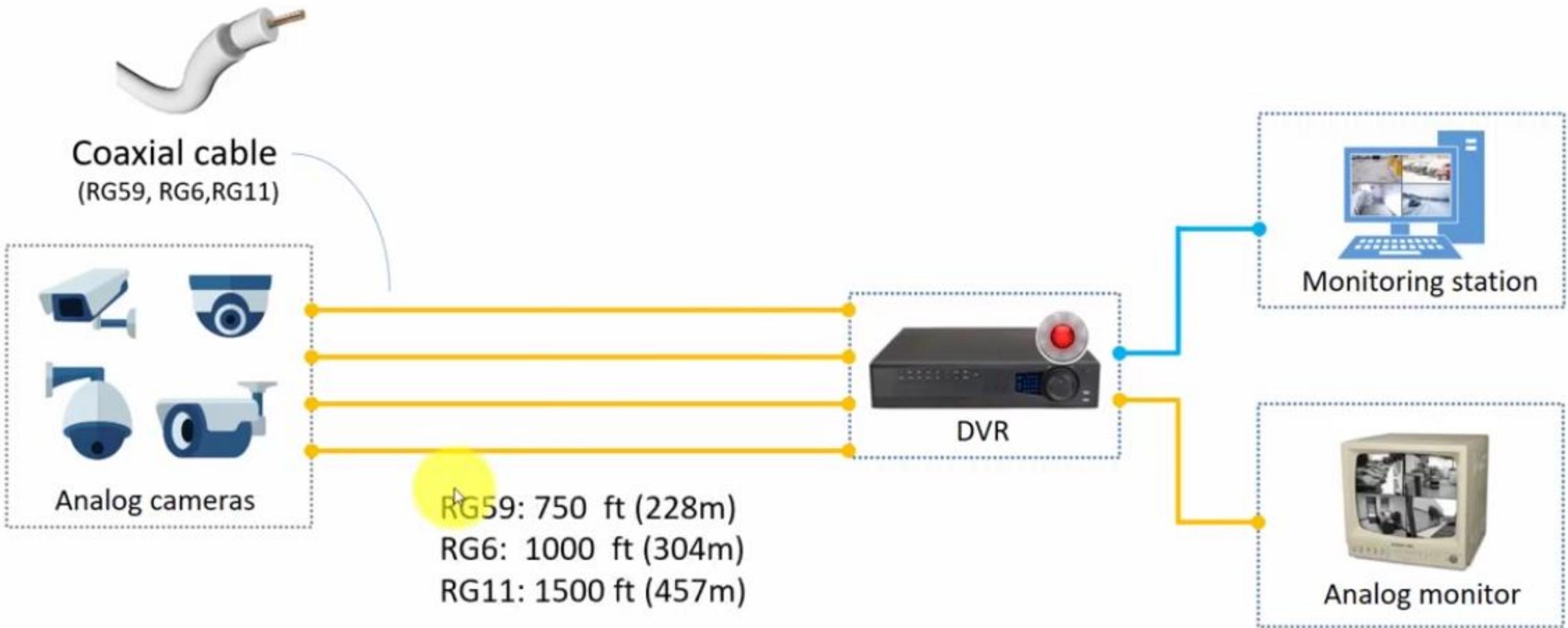
Traditional analog system

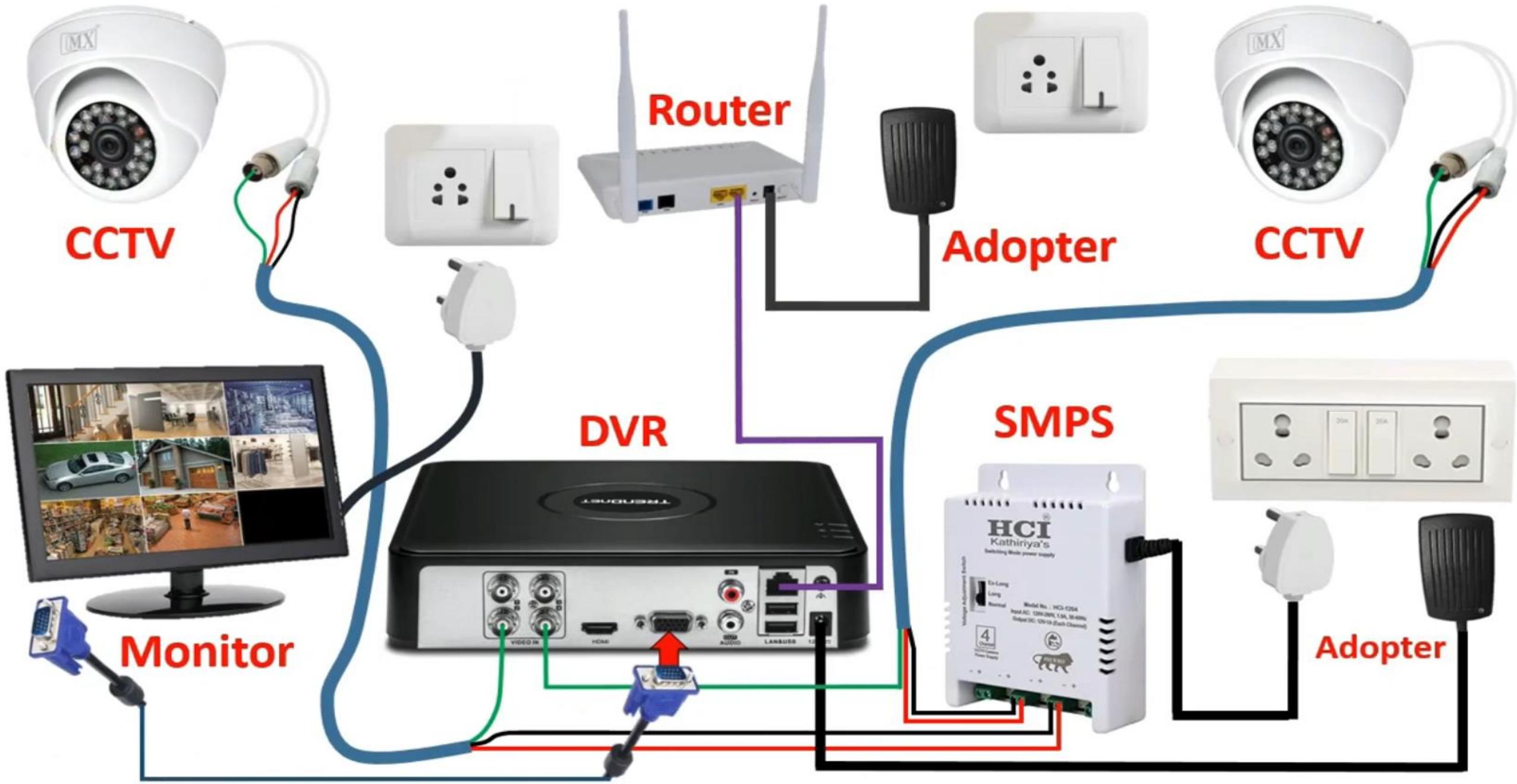


Traditional analog system



Traditional analog system





WHAT IS A BALUN?

- A **balun** is an electrical device that converts between a balanced signal (two signals working against each other where ground is irrelevant) and an unbalanced signal (a single signal working against ground or grounding issues). A balun can take many forms and may include devices that also transform impedances but need not do so. Baluns can take many forms and their presence is not always obvious. Sometimes, in the case of transformer baluns, they use magnetic coupling but need not do so. Common-mode chokes are also used as baluns and work by eliminating, rather than ignoring, common mode signals



Connection Details





6



Transceiver devices

NVT tranceivers



SDI Transceiver





CCTV Camera



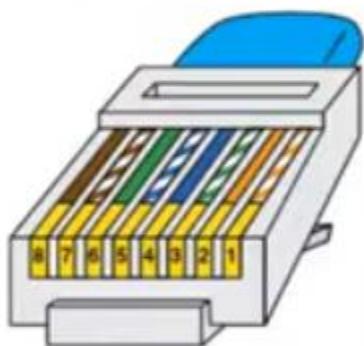
Notes: 1. Make sure that both transmitter and receiver ends use the same wiring.

2. The maximum cable length is 328ft(100m). For voltage drops over long distances, refer to the table further in this manual.

1 2 3 4 5 6 7 8



- ① Video +
- ② Video -
- ③ ④ ⑤ Power -
- ⑥ ⑦ ⑧ Power +



RJ45 PINOUT T-568B

- 1 : White/Orange
- 2 : Orange
- 3 : White/Green
- 4 : Blue
- 5 : White/Blue
- 6 : Green
- 7 : White/Brown
- 8 : Brown



	Video+	Video-						
	1	2	3	5	7	8	6	4
T568B:	White Orange	Orange	White Green	Blu	White 'US	Clear	White Brown	Blue

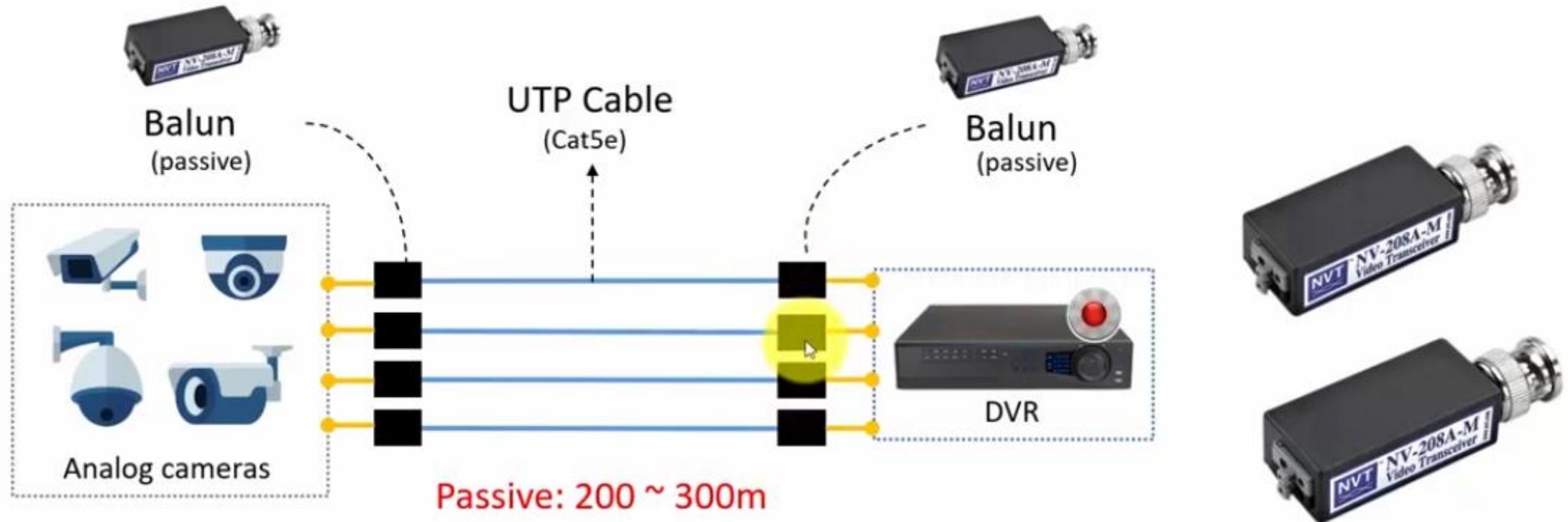
CCTV Camera World



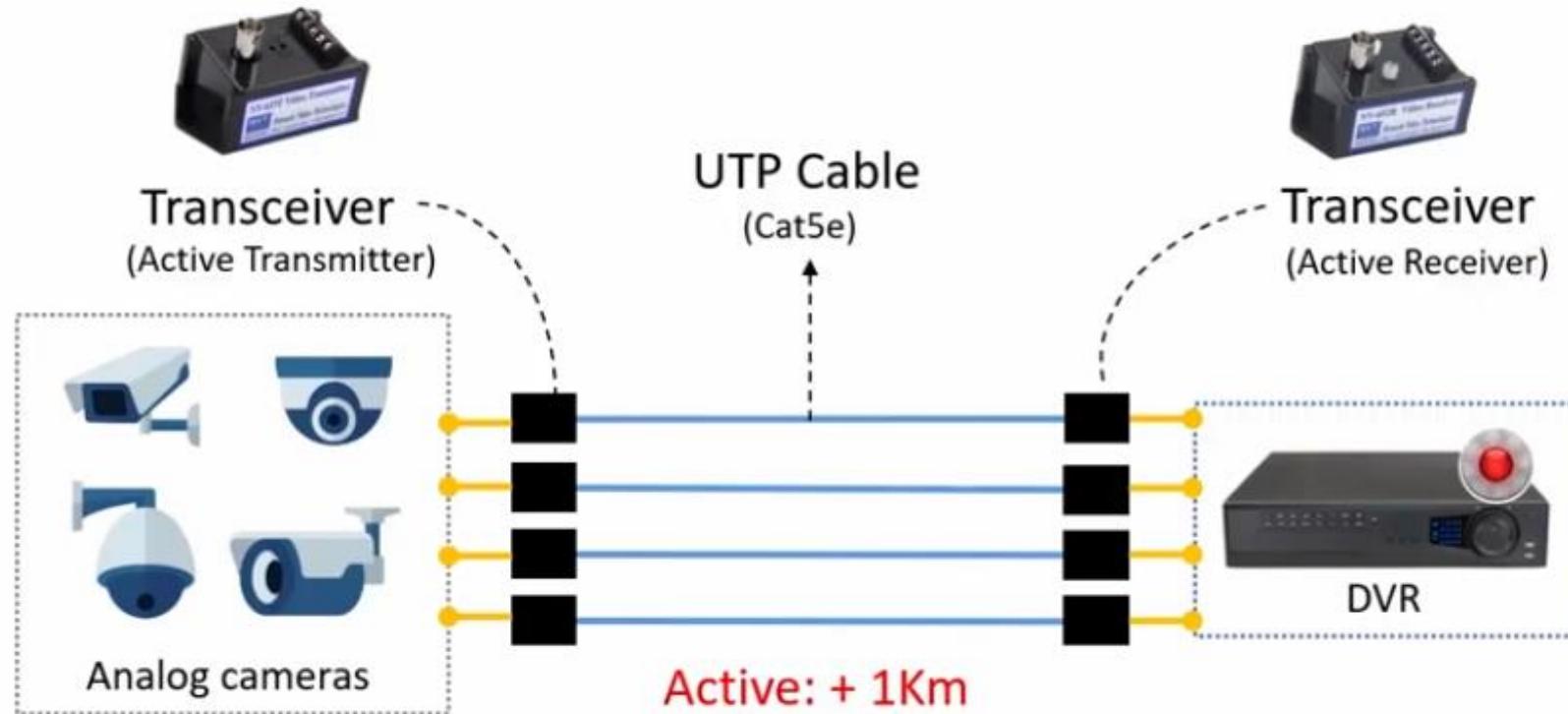




Analog System with passive balun (Transceiver)

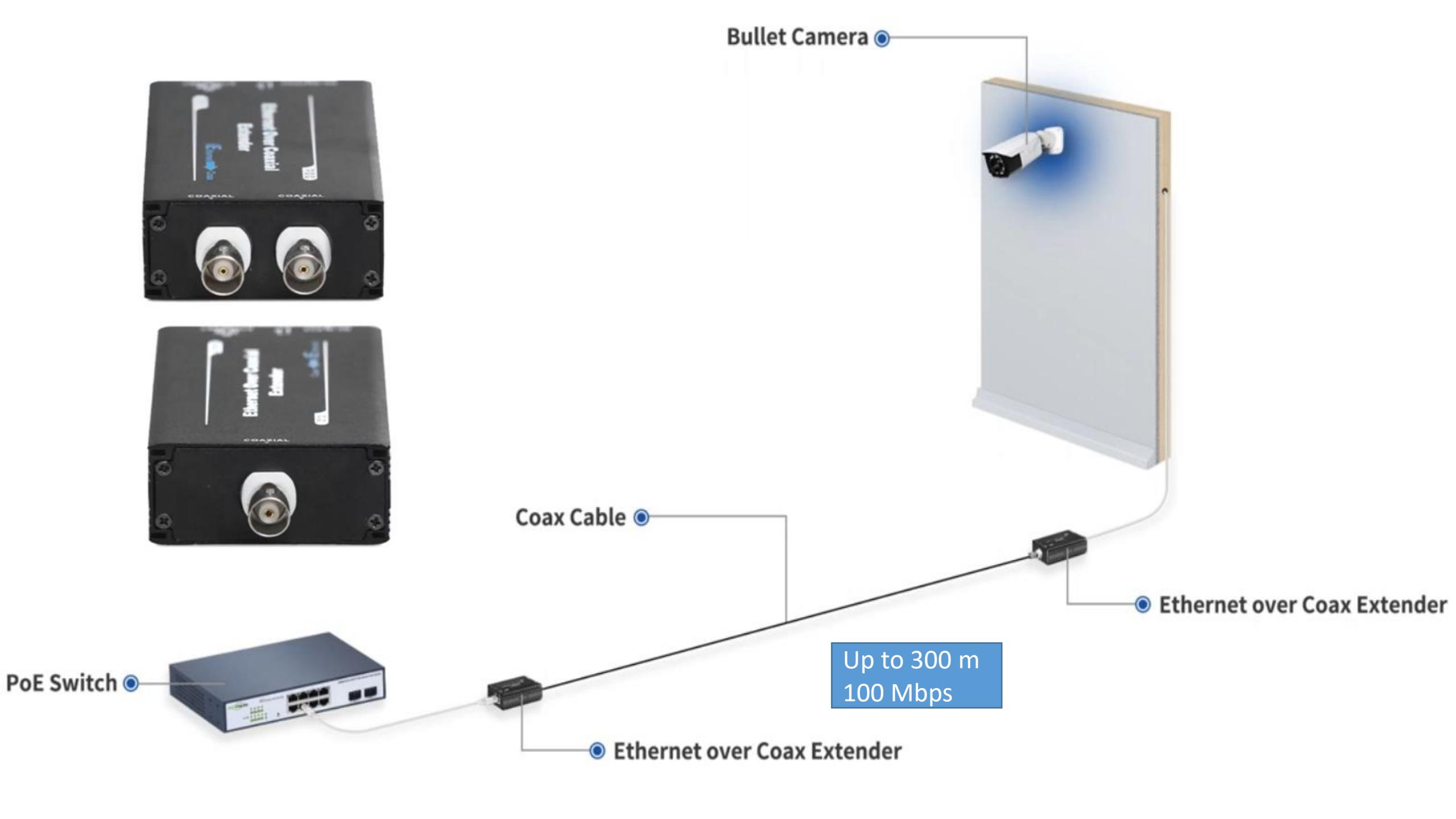


Analog system with active balun (transceiver)



Up to 1500m (5000 ft) with active
DC12V/AC24V power supply,







Coax extender

Automatically detect

12V PD(IEEE802.3af)

UP TO 300 METERS



8- Channel Active Video Hub Model

Number: SVU-AR8

Product Feature

- Transmission distance of color signal via CAT5 or CAT6
- Up to 800m (2667ft) with passive transmitter
- Up to 1500m (5000ft) with active transmitter
- 6 level independent gain, sharpness, brightness control
- Suitable for direct installation in surveillance cabinets
- Excellent anti-interference ability
- Built-in transient protection

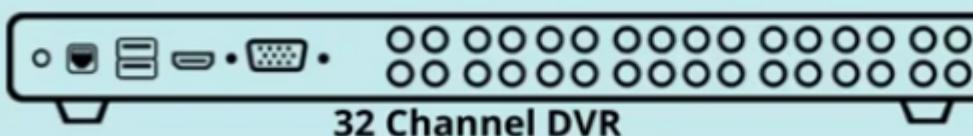
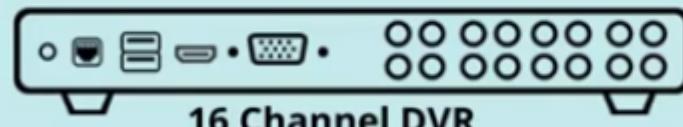
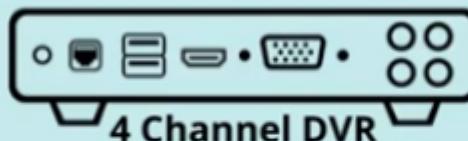


2. Digital Video Recorder (DVR)

DVR front view



DVR rear view



Channel = maximum number of cameras

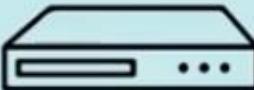


Analog CCTV purchase checklist

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3. Hard Disk Drive (HDD)



4. Power supply



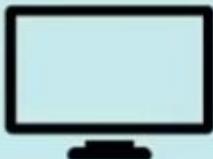
5. Cable



6. Connectors



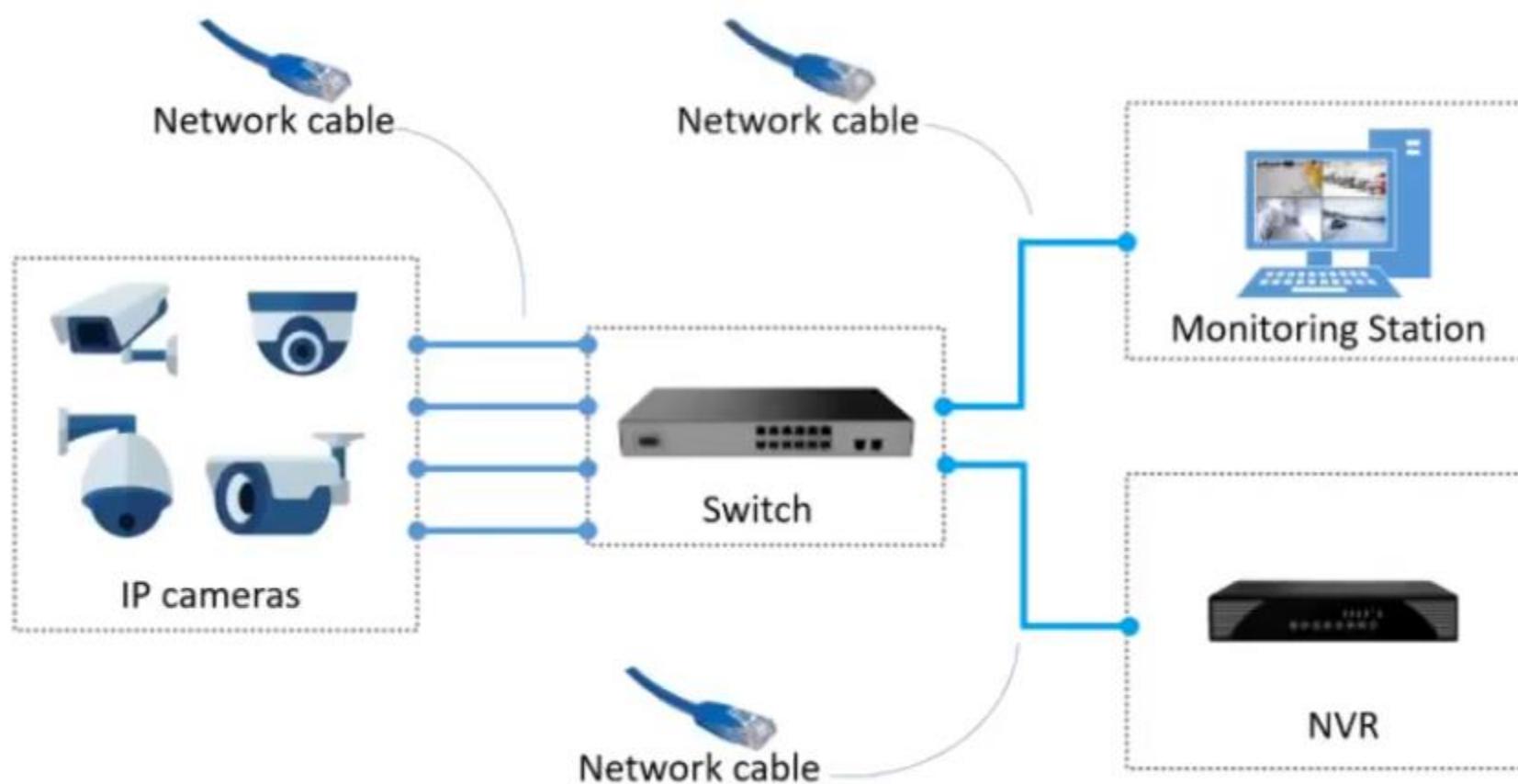
7. Display



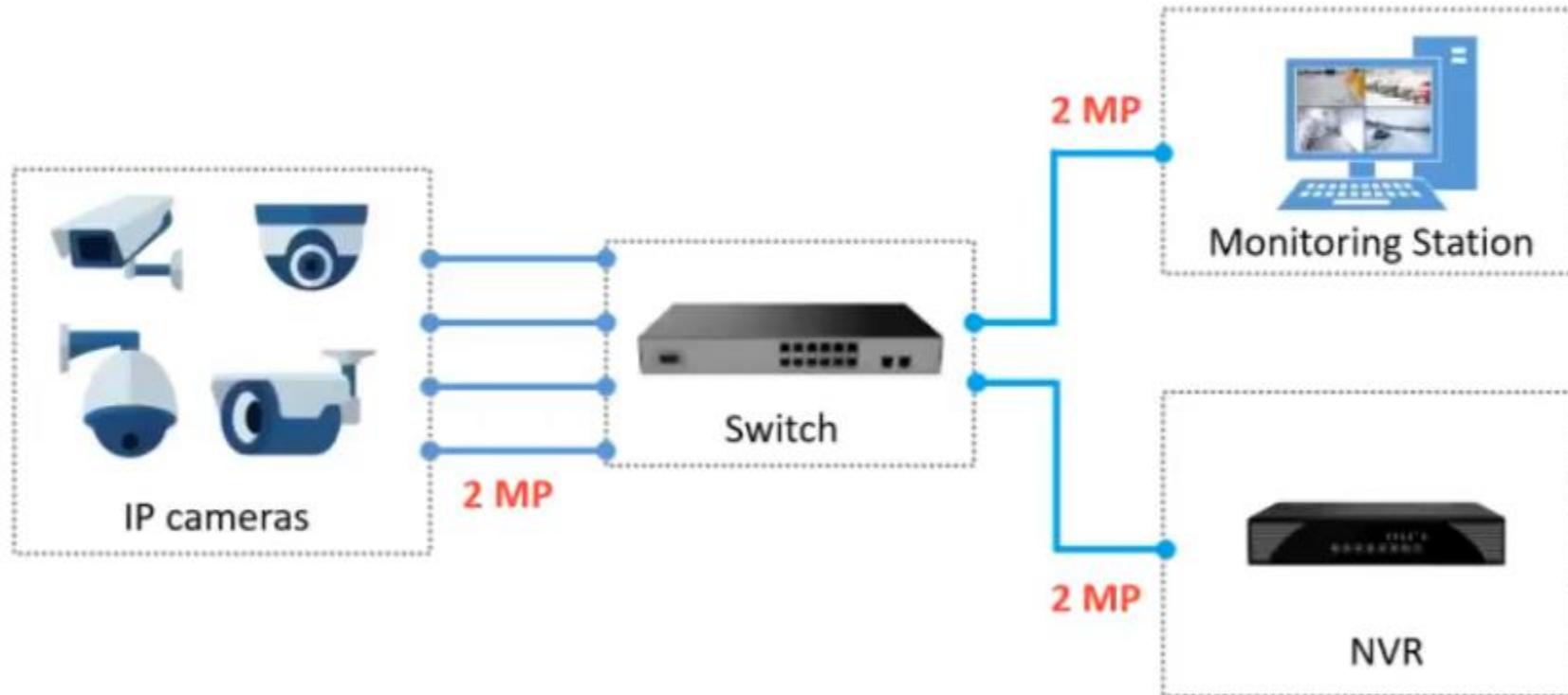
8. Accessories



Traditional IP System



Traditional IP System



3 STYLES

1



TURRET
DOME

2



VANDAL
DOME

3



BULLET



TURRET DOME CAMERA

IR= INFRARED



FIXED LENS
15Metre IR



FIXED LENS
30Metre IR



VARI-FOCAL LENS
30Metre IR

LENS+ IR VARIATIONS



VANDAL DOME CAMERA

IR= INFRARED



FIXED LENS
15Metre IR



FIXED LENS
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LENS+ IR VARIATIONS



VARI-FOCAL LENS
30Metre IR



BULLET CAMERA

IR= INFRARED



FIXED LENS
15Metre IR



FIXED LENS
30Metre IR

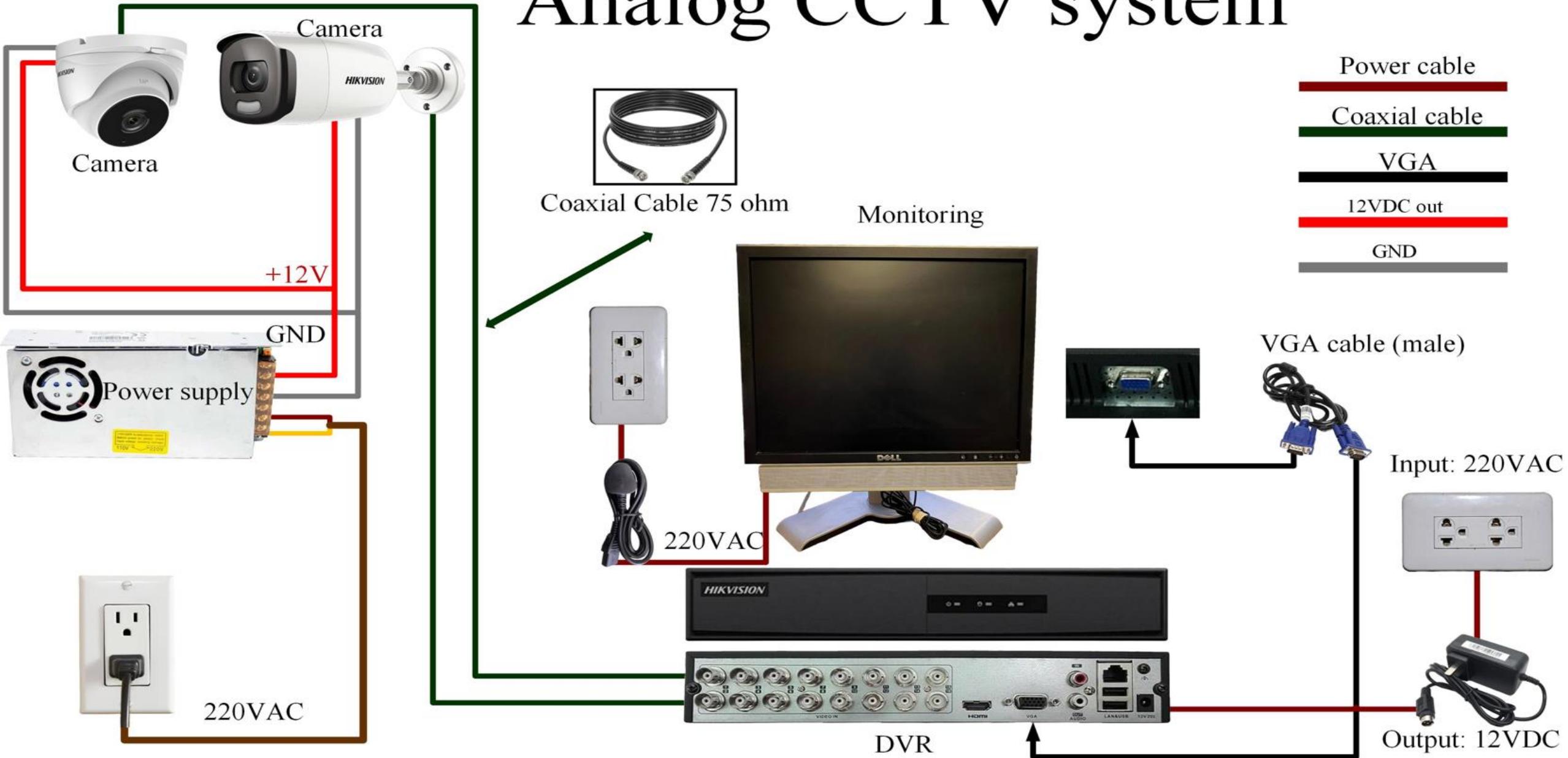


VARI-FOCAL LENS
30Metre IR

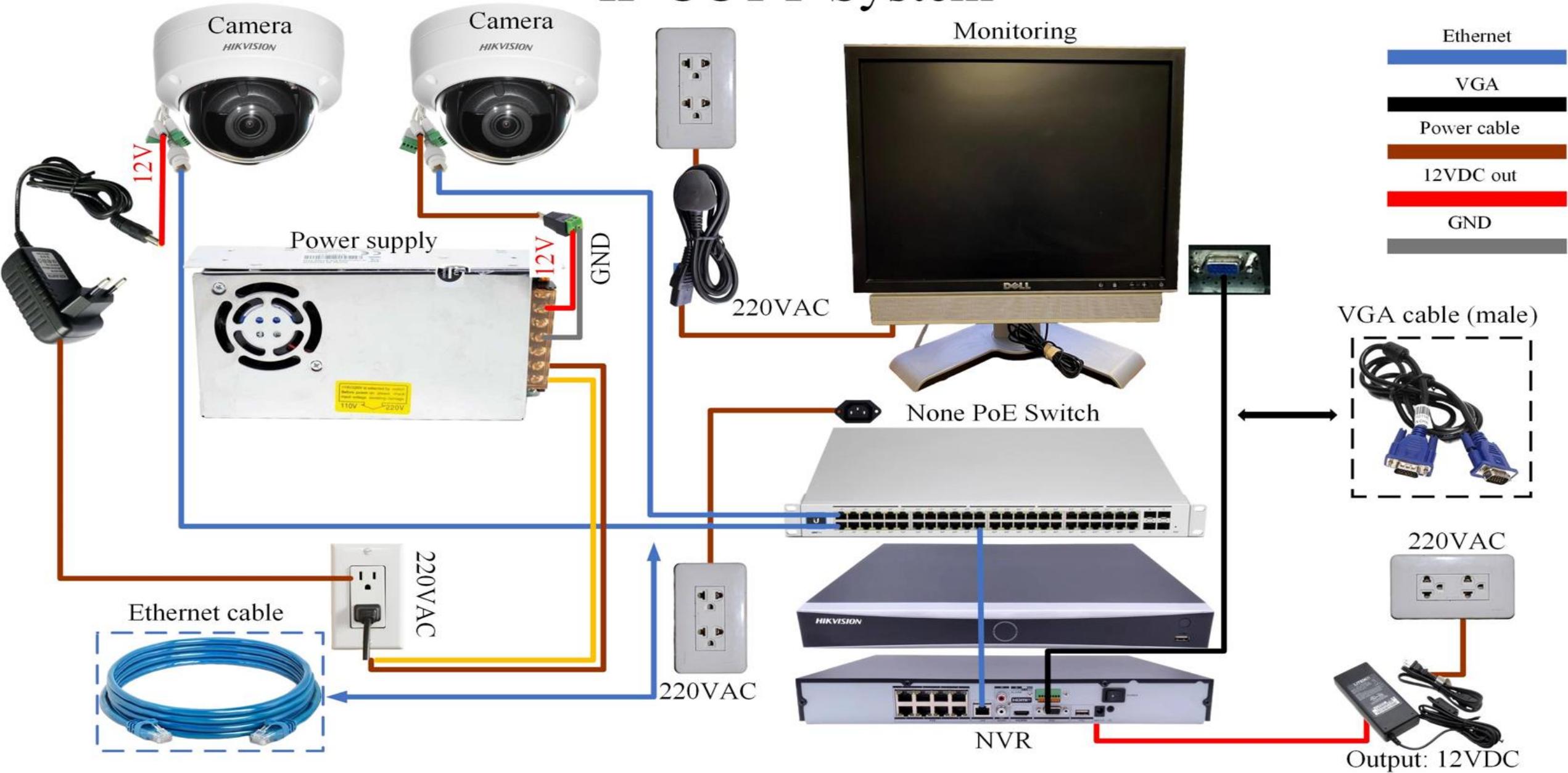
LENS+ IR VARIATIONS



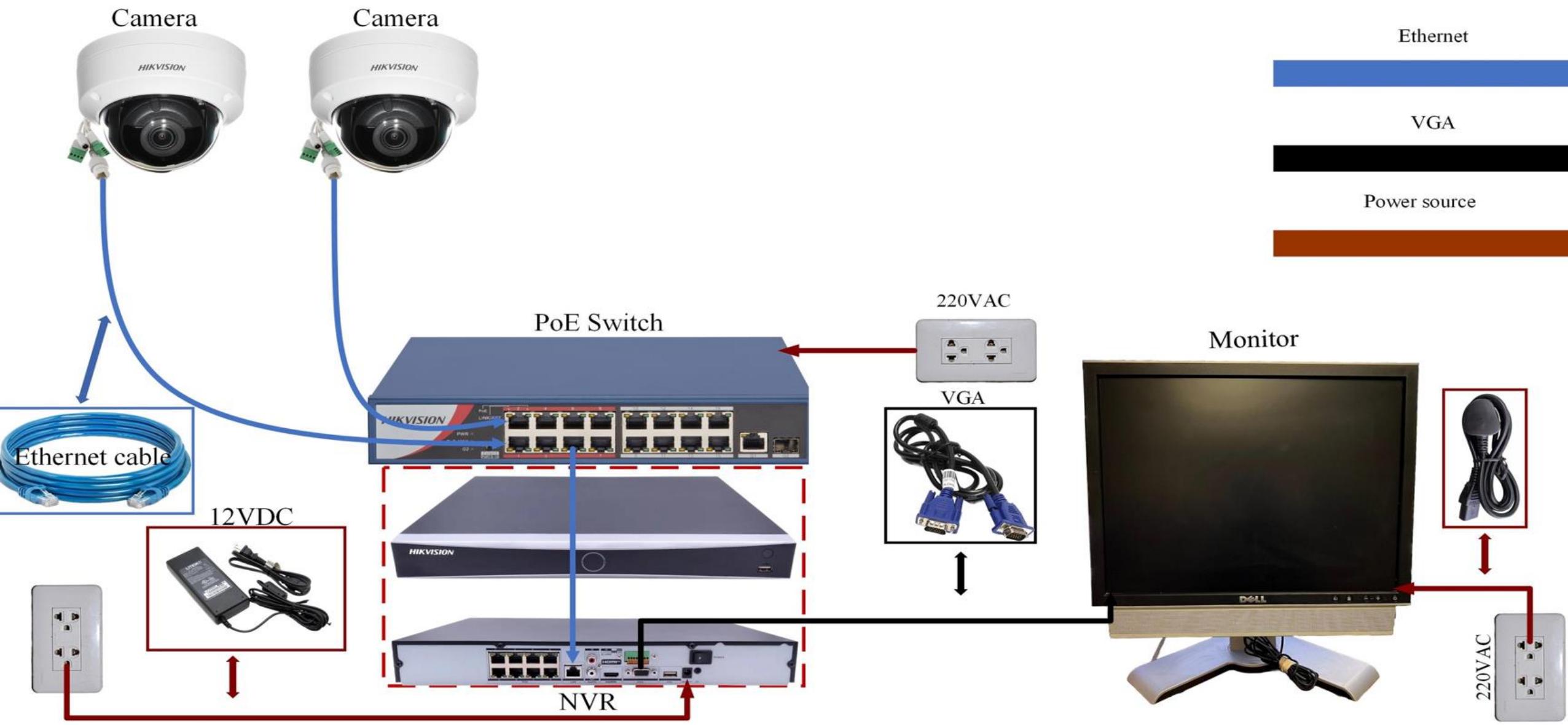
Analog CCTV system



IP CCTY System

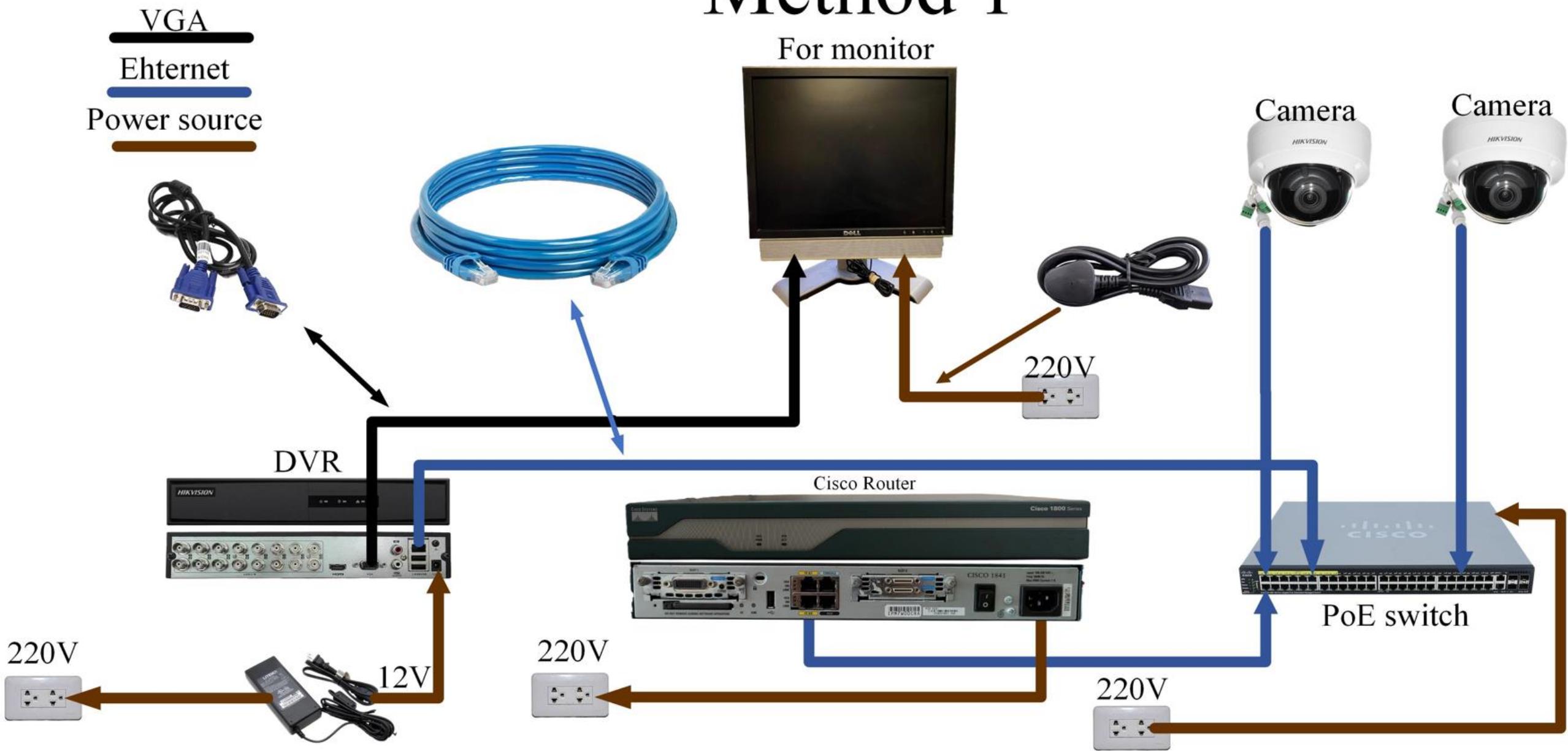


IP CCTV System



Method 1

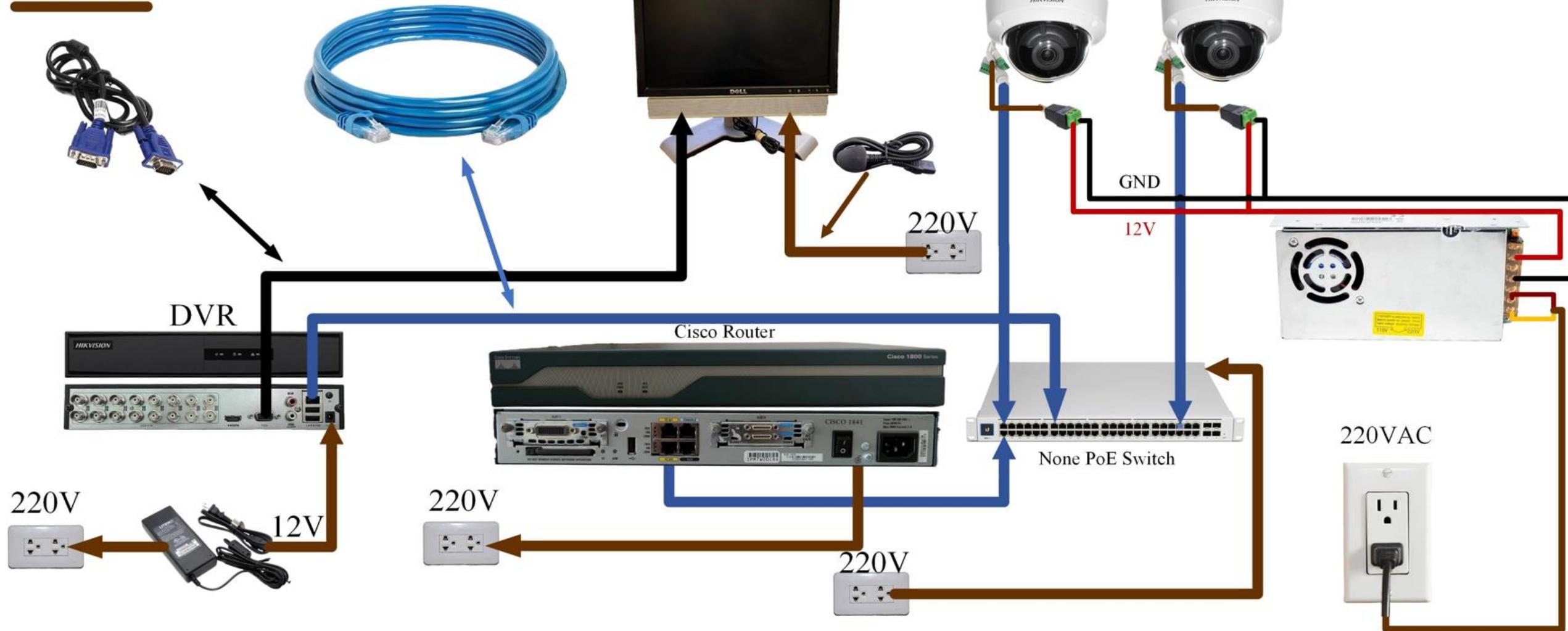
For monitor



Method 2

For monitor

VGA
Ethernet
Power source



Day time: Powered by solar panels

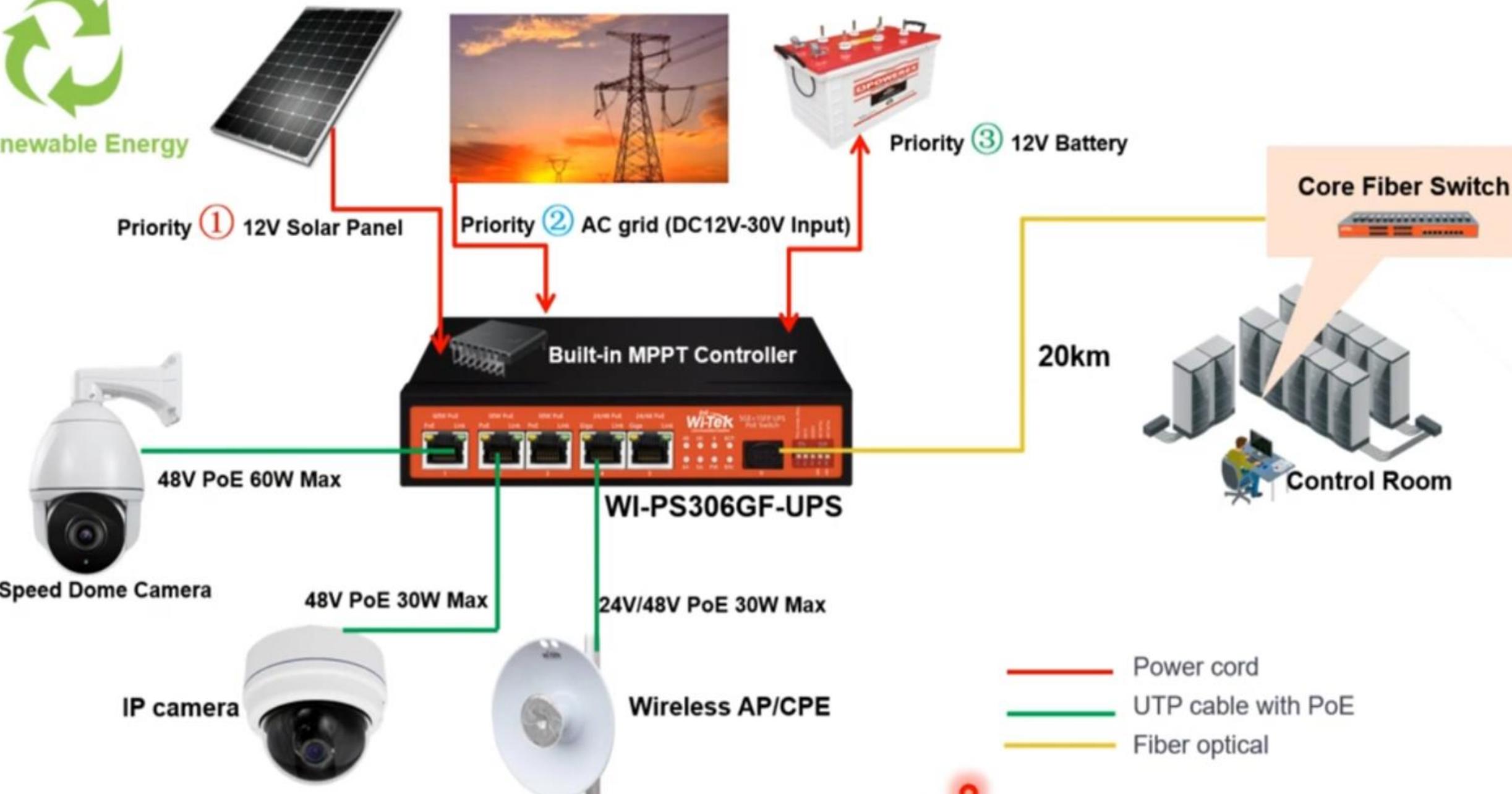


◆ Night time: Powered by battery





Renewable Energy



Long Range (500meter) PoE



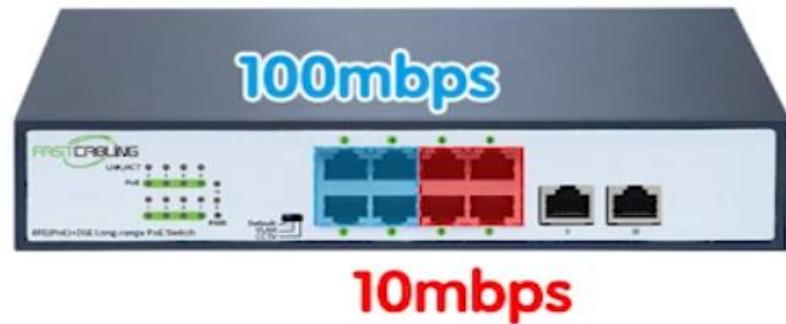
100mbps

Max Distance 500m



10mbps

Max Distance 250m



10mbps

Max Distance 250m



LAN Connectivity - PoE Budget Calculation

PoE Switches Power Budget

- PoE Switches have limitation on the amount of power they can supply to all PoE devices – the **PoE Power Budget**.
- The PoE Power Budget is specified in the switch specifications.
- Best practice when calculating PoE budget requirements – add 15% for power loss over distance.

Example: How many Cameras can be powered by this PoE switch?

PoE	PoE Standard	IEEE 802.3af and IEEE 802.3at
PoE Power Budget		Max. 185 W



$$\frac{185 \text{ Watts}}{(10.5 \text{ Watts} + 15\%)} = 15 \text{ cameras}$$

Power Consumption	• 10.5 watts ± 5%
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Per Camera PoE Required = 10.5W, for 15 Camera = $10.5 \times 15 = 157.5W$. Considering 15% buffer, we need total 185-Watt PoE switch.



LAN Connectivity - D-Link PoE Series

Examples of PoE switches			PoE ports	PoE power budget
	DGS-1210-10P	Smart Managed 10 port Gigabit switch with 2 Combo SFP ports	8	78 Watts
	DGS-1210-28P	Smart Managed 24 port Gigabit switch with 4 Combo SFP ports	24	193 Watts
	DGS-1210-28MP	Smart Managed 24 port Gigabit switch with 4 Combo SFP ports	24	370 Watts
	DGS-3130-30PS DGS-3130-54PS	Managed 24/48 ports Gigabit switch with 6 10Gbports (RJ45 and SFP+)	24 48	370-740* Watts
	DPE-301GI	PoE+ injector. Suitable for PoE/PoE+ devices.	1	30 Watts

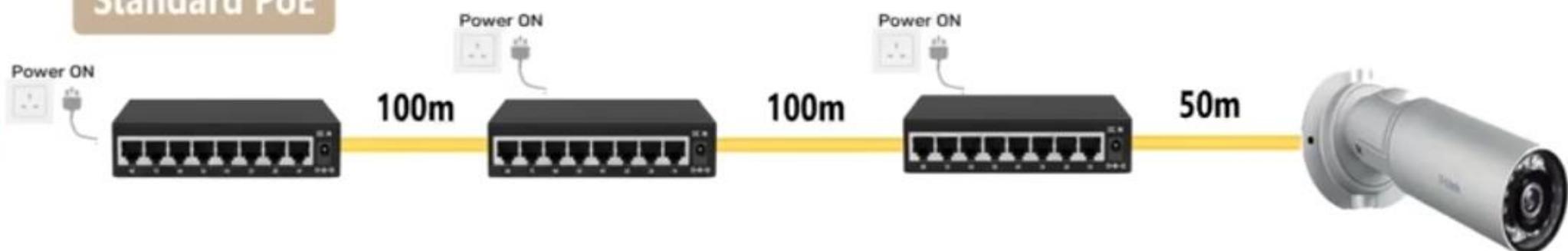


Long Range (250meter) PoE applications

Long Range PoE – 250m



Standard PoE



250m PoE



Long Range (500meter) PoE applications

Long Range PoE – 500m



Long Reach
PoE Solution -
Up to 250m



6kV
Surge
Protection

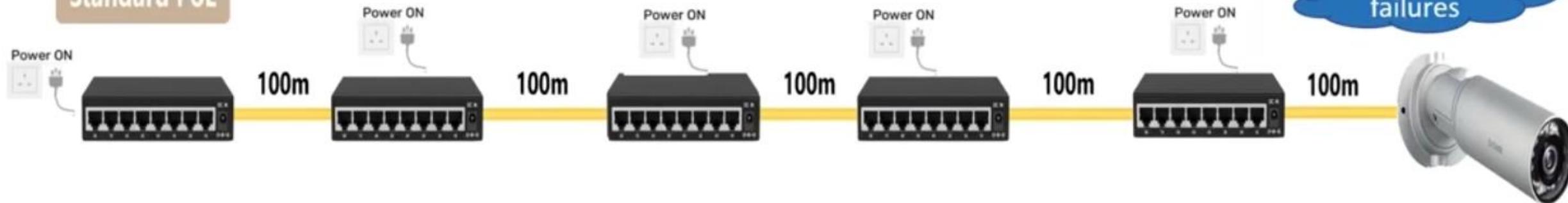


Gigabit
Uplink Ports
(On Selected Models)



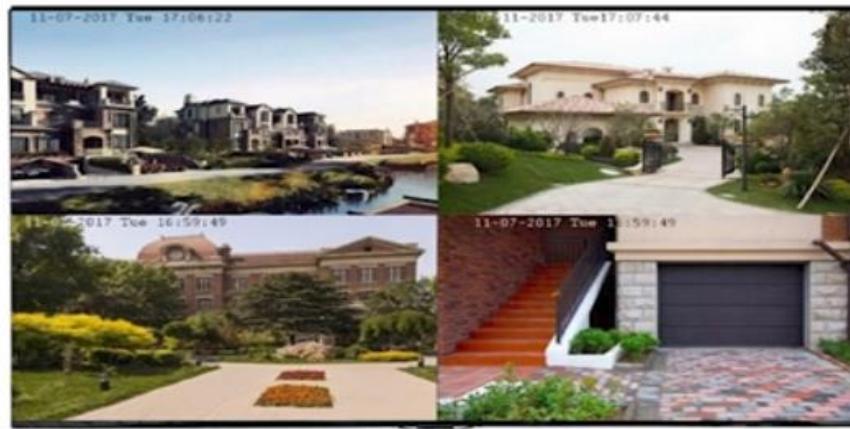
Built-in Smart Features
(VLAN Support, QoS,
PoE Device Monitoring)

Standard PoE



500m PoE





TU/MONITOR

DVR/NVR

ACCESS POINT



Connect wirelessly up to 10 Km

CLIENT



TECHLOGICS

MODEM/ROUTER



LAN/POE SWITCH



Product Portfolio – Long Distance PoE F-Series

DES-F1006P-E



PoE Budget 60 Watts

DES-F1010P-E



PoE Budget 120 Watts

DGS-F1010P-E



PoE Budget 120 Watts

DGS-F1018P-E

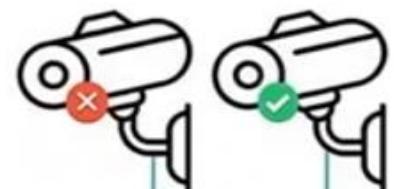


PoE Budget 150 Watts

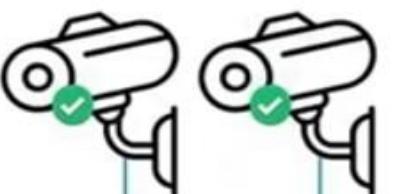


DIP switch settings

1. VLAN
2. Extended (250m)
3. PoE
4. QoS (Priority)



Switch Detect IP Camera "Unresponsive



Power the PoE automatically to recover the device



6Kv Surge Protection



D-Link Smart Series

DGS-1510-28X
DGS-1510-28XMP (**370W**)
DGS-1510-52XMP (**740W**)



D-Link Smart Series



DGS-1210 Series

Gigabit Smart Managed Switches

DGS-1210-10

DGS-1210-10P(**65W**)

DGS-1210-10MP(**130W**)

DGS-1210-12TS/ME

DGS-1210-28

DGS-1210-28P(**193W**)

DGS-1210-28MP(**370W**)



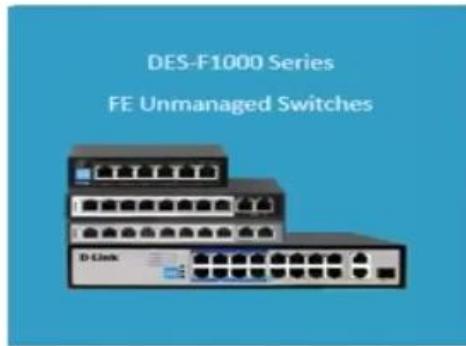
D-Link Smart Series



DGS-1250-28X
DGS-1250-28XMP(**370W**)



D-Link Smart Positioning



Smart Managed

- ✓ PoE Budget - 65,130,193, 370W
- ✓ Easy Mngt- GUI
- ✓ IPv6 Ready
- ✓ Support SNMPv1,v3,v3
- ✓ Support Green Ethernet
- ✓ Auto Voice VLAN
- ✓ Support LACP
- ✓ Support STP, RSTP, MSTP
- ✓ Basic L3 – 4 IP Interface

Smart 10G uplink

- ✓ 4X10G SFP+ Uplink ports
- ✓ 6Kv Surge Protection
- ✓ Support Safeguard Engine
- ✓ Easy Mngt – GUI, CLI
- ✓ Support QoS
- ✓ Security - IMPB Support
- ✓ PoE Budget -193, 370W
- ✓ Basic L3 – 4 IP Interface

Smart Managed PRO

- ✓ Support Physical Stacking
- ✓ Support sFlow
- ✓ Support ERPS
- ✓ Support GVRP
- ✓ Support DHCP Server
- ✓ Support Advance QoS
- ✓ PoE Budget -193, 370W
- ✓ Basic L3 – 16 IP Interface



How to read D-Link Switch Models

D-Link switch:

DGS-1100-16

16-port switch



RJ45 ports

DGS-1210-28P

28-port switch

PoE ports

DGS-3130-54S

54-port switch

SFP ports



SFP or SFP+ ports for Fibre Optic Transceivers

