CCTV

Installation

Guide

Read before you Begin

Anyone with knowledge of DIY skills can install low voltage (12V DC & 24V AC) CCTV systems. DDS can help you with product selection and prepare a quotation for the components you would need. This guide is intended to help you install a CCTV system purchased from DDS.

In this guide we will try to keep it simple and only cover common CCTV components. We assume anyone considering installation of CCTV is familiar with basic wiring techniques and safety practices. DDS cannot be held responsible or liable for damage to equipment as a result of mishandling, misuse or bad installation. Working on the ladder and using tools at heights can be dangerous so take extra care to follow all safety precautions.

Contact Details

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Unpacking Equipment and Identifying equipment

Check the items received are as per order. If any items are missing or damaged, please contact DDS sales or support team. Before you start using any components make sure you have all the accessories.

Digital Video Recorder (DVR) - DDS pre-install a Hard Disk Drive (HDD), format and configure the DVR for you. Check HDD size is as per order. All DVRs come with a power adaptor. Some larger DVR/NVR's may only have an IEC Lead (kettle lead) and no power adaptor. All DVRs include a CD with manuals and software.

A DVR

IEC Lead
(kettle lead)

Typical DVR
Power Adaptor

Cameras - Check all cameras are as per order. Check that the Glass cover is not cracked.

Power Adaptors / Supply - make sure you can differentiate between a DVR & camera power supply(s). Do not mix these as it can result in damage if incorrect voltage rating are used.

Power Supply Unit	Power Adaptor	IEC Lead (kettle lead)

Check that these are appropriate for your install. Low voltage 12V DC is good for up to 30-35m whereas you would use 24V AC with AC-DC converter for longer distances

Cables / Leads - Depending on type of installation, you may have RG59 Coaxial cable, Pre-made leads and/or CAT5 cable.

RG59 Coaxial with Power (also known as shotgun)	Pre-made Lead (10m, 20m or 30m) Length	CAT5 Cable Internal or External Grade
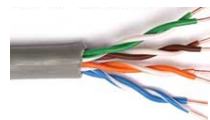
BNC connectors - A BNC is twist and lock Bayonet type of connector. You will need 2 BNC connectors for Analogue / HD cameras. These may be either TwistON BNC, Crimp BNC or Video Baluns (for CAT5 cable). On pre-made Leads and video baluns these are part of the cable.

For terminating Video connections

TwistOn BNC

3-part BNC
Crimp

Video Balun
Pair

**For terminating Power connections**

DC Plug
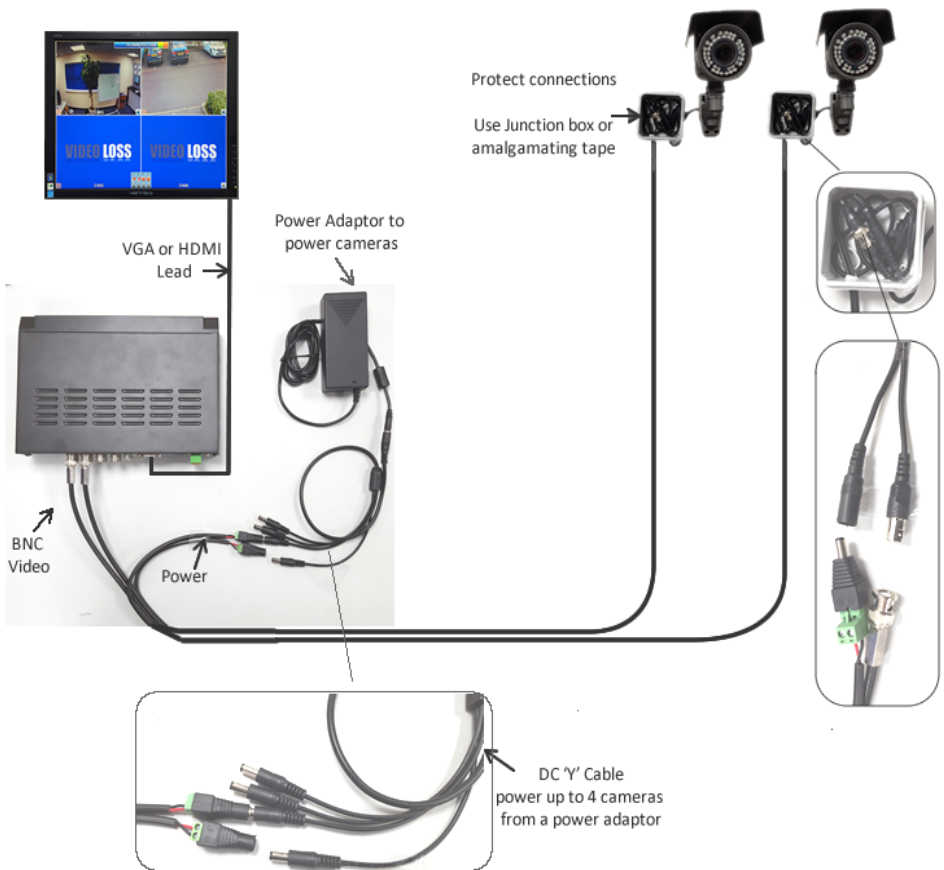for camera end

DC Socket
for power adaptor
end

Installation

Pre-made Leads

Image below is a typical illustration of 2 camera installation. The picture shows the two cameras are connected to the DVR using pre-made leads. Camera connections are protected using junction boxes. The cameras are powered from a power adaptor next to the DVR using DC 1-to-4 splitter cable. The video connections are made using a BNC connector; push and twist to lock.
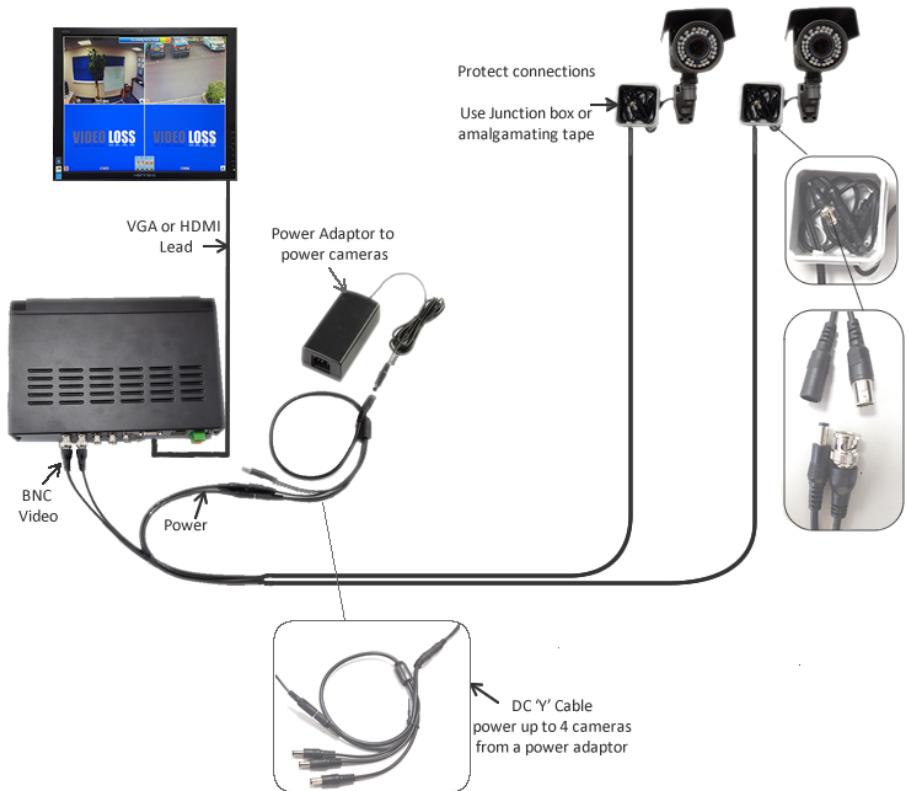
RG59 Cut-to-Length

Image below is a typical illustration of 2 camera installation. The picture shows the two cameras are connected to the DVR using RG59 coaxial cable with TwistON BNC & DC power connectors. Camera connections are protected using junction boxes. The cameras are powered from a power adaptor next to the DVR using DC 1-to-4 splitter cable. The BNC connector is pushed together and is then twist to lock.

Using CAT5 with Video Baluns

Image below is a typical illustration of 2 camera installation. The picture shows the two cameras are connected to the DVR using CAT5 cable terminated using Video baluns & DC power connectors. Camera connections need to be protected using junction boxes. The cameras are powered from a power adaptor next to the DVR using DC 1-to-4 splitter cable. The BNC connector is pushed together and is then twist to lock.

The Picture also illustrate how a CAT5 cable can be used for 2 cameras.
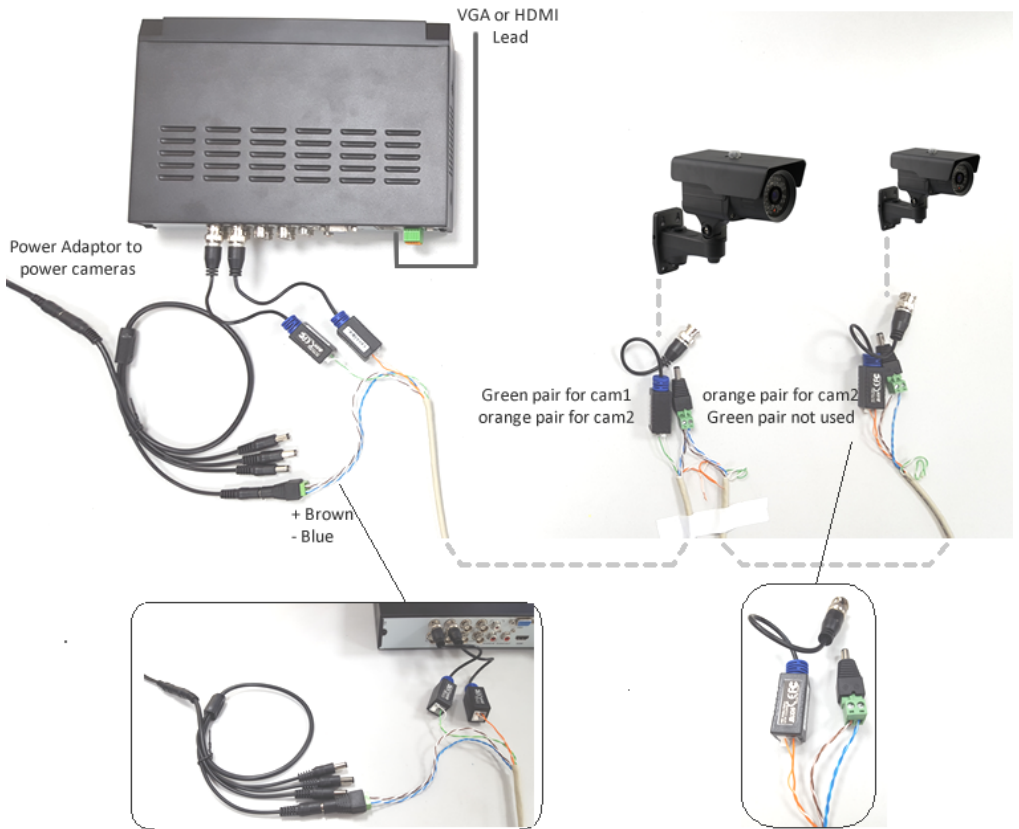
Using Central Power unit

Image below is a typical illustration of how to wire central power supply unit. RG59 Coaxial cable with power (also known as shotgun) is split apart for connection into power supply unit. The coax part would connect to the DVR as illustrated above in section RG59 Cut-to-length.

A power supply of this type also offer extra protection from accidental or intentional cable being cut or *short* applied(plus & minus are joined) on the cable. The PTC would cut-out whilst the *short* is present without blowing a fuse or causing a damage.
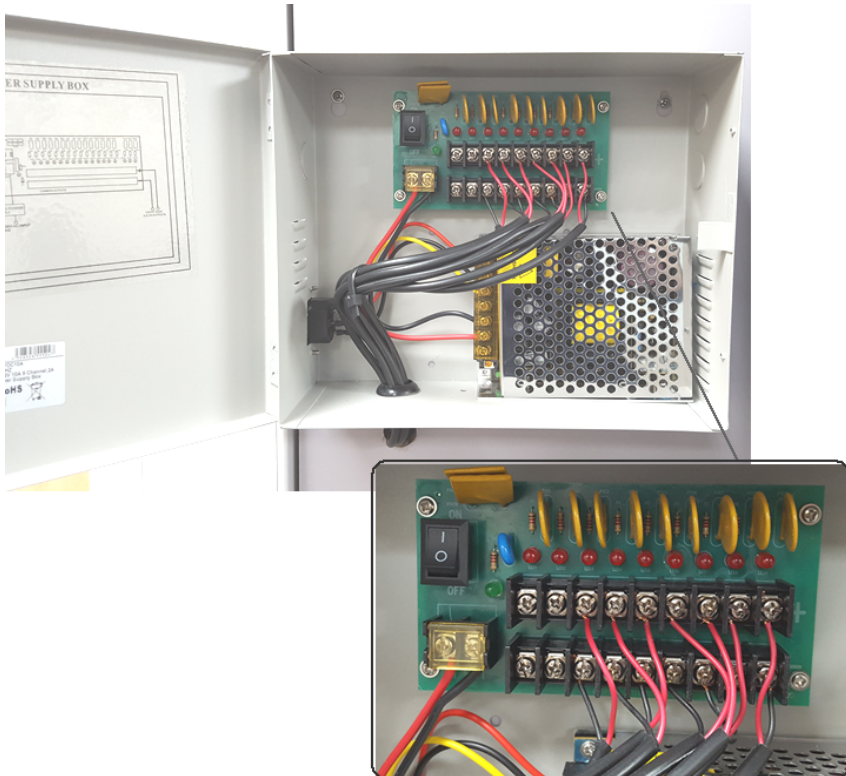
Camera Locations - Position cameras for clear view of the area. Try to mount cameras at height which gives you a view across the area and not look straight down. ie, on a normal house, try to mount cameras below first floor window. See illustration below. A good height to mount would be around 4m (12-13ft).

Front View   Side View
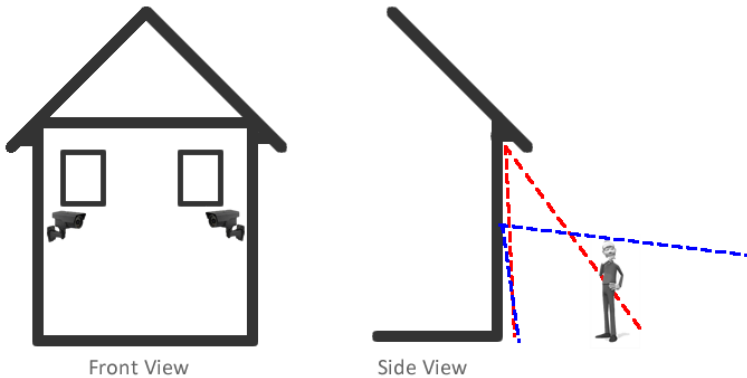
Try not to mount cameras under gutters that overflow or other weather related hazards. For external cameras, try to avoid locations where the camera view is obstructed or where you are likely to get IR reflection issues from adjacent objects like down pipes, window sill, conservatory, roof etc.

Cabling - This is the most difficult part of the install from our point of view. Plan your cabling route and camera locations. Before installing "Pre-made leads" make sure you understand and can identify each end of cable, See illustration.

With pre-made leads, the BNC connectors on both ends are the same but the DC connectors are different.

Note, the **DC plug** goes at the camera end.

RG59 coaxial cable and CAT5 cabling is little easier because you can cut cable-to-length and then fix connector. See details above for cable and connectors.

For external cameras, (1) it is important to protect cable connections and (2) allow a loop of cable between junction box and cable entry into a building so that water can drip-off the cable.
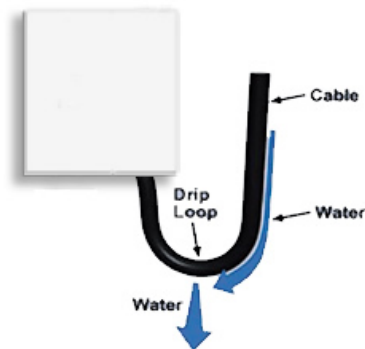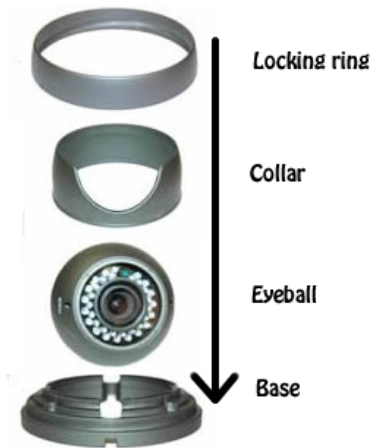
Camera Installation - Position cameras for a clear view of the area without obstructions. Protect cable connections from weather (rain, snow, fog) using a junction box, push into roof space or using amalgamating tape. Pictures below illustrate how to open & adjust cameras.

Eyeball Dome Cameras

Eyeball Dome cameras

Locking ring

Collar

Eyeball

Base

The Locking holds the eyeball in position. Locking ring is screwed onto base.

Use small flat head screw driver to adjust

Be careful not to over-turn the controls.

Zoom control   Focus control

Bullet Cameras

Camera can be adjusted
up & down, Left & right

*Be careful not to over-turn as
this will damage the cable that
is fed through the bracket.*

Zoom & Focus
controls

Camera can be adjusted
up & down, left & right and
twist

*Be careful not to over-turn as
this will damage the cable that
is fed through the bracket.*

Zoom & Focus
controls

When adjusting lens on a vari-focal camera, adjust the Zoom and then
adjust focus. The picture will be out of focus but you should be able to tell
if you are getting closer or further away. Be careful not to over-turn the
controls. If you over-turn the controls you will damage the camera and it
will have to be returned for us to repair for you (Contact support for an
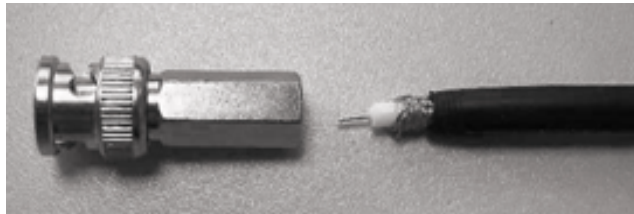RMA).

Connection Termination and Junction Boxes

The BNC connectors will mate with twist and lock. The power connector are normally screw terminals. See illustration below.
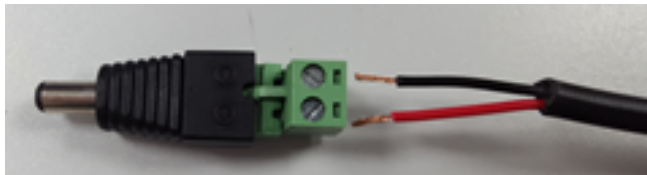
TwistON BNC connectors
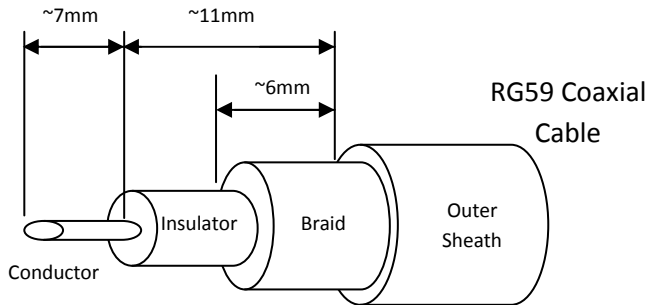
Push & twist BNC on to coaxial cable.
Make sure centre conductor is pushed into centre pin.

DC Connector(S)

Note Polarity
+ Red and - Black

Be careful of polarity on DC connector. Incorrect wiring will damage camera. Damage caused by Incorrect power is not covered by warranty

Video Baluns

Video baluns come in various shapes and sizes. Some carry video & power and others just video. Picture below illustrates a push terminal video balun pair with DC power connector.

CAT5 cable has 4 pairs. In this case, orange is being used for video whereas the brown and blue pair are being used for power

Be careful of polarity on DC connector. Incorrect wiring will damage camera.

Example below attempts to demonstrate how to use single CAT5 to connect up to 2 cameras. *Note, camera leads are not shown on the picture.*

In this case, orange pair is being used for camera 1 & green pair for camera 2.

whereas the brown and blue pair are being used to power both cameras.

Be careful of polarity on DC connector. Incorrect wiring will damage camera.

We recommend you use Junction boxes to protect connections (video baluns and power connectors

Junction Boxes

Junction boxes help to protect connections from the elements. Junction boxes help to keeps cable tidy and allow you to make adjustment easily.

Electrical tape is not ideal protection for external connections. It will deteriorate over time especially in extreme weather conditions.

Amalgamating tape is best alternative to junction boxes.

Menu control on the cable must be protected from the elements

Power Connections

Cameras can be powered using a number of different methods; And these are:

Using local power adaptor - Plug 12V DC power adaptor into the camera. For IR camera (camera with night vision), we recommend a minimum rating should be at least 1Amp. Higher ampere is better than a lower ampere. *Connections must be protected from the elements.*

Using a power adaptor with Y Cable - This method can be used with pre-made, RG59 Shotgun cable and CAT5. See illustration below.

Connect Mains to 12V DC Power Adaptor

Power up to 4 cameras

Using DC 1 to 4 Y cable to power up to 4 cameras from 1 power adaptor

Using RG59 Shotgun

Using Pre-made leads

Using Cat5 Cabling

Using a central power supply unit

A central power supply can be used to power multiple cameras from a power supply unit. Power supply units also have added benefit of PTC protection on each output. This means if the cable is **cut** or there is a **short** on the cable (water across terminal) it will not blow fuse(s); when the fault is removed the cameras will return.


Example shows 7 cameras powered from a power supply unit. The power supply unit itself is powered using mains a IEC lead (kettle lead).

Be careful of polarity on DC connections. Incorrect wiring will damage camera.

Central power supplies are available in the following capacity (12V DC 4 Way 5A, 9 Way 10A and 18Way 20A).

Using 24V AC with DC converter - This option is for long cable runs (up to 70m) where there is no local power.
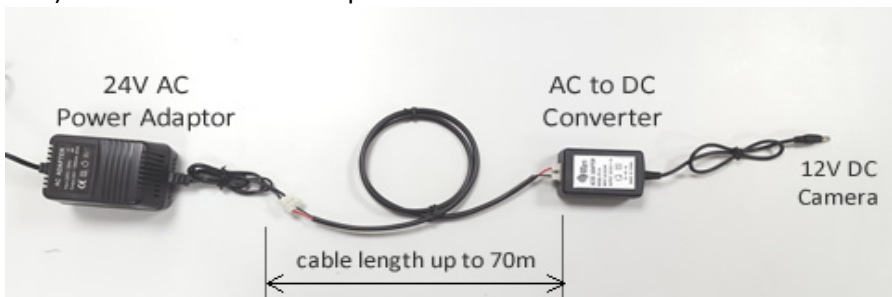
Central 24V AC power supply units are also available in the following capacity (24V AC 9 Way 5A, 18 Way 10A).

Digital Video Recorders (DVR)

The main purpose of a digital video recorder (DVR) is to store multiple video streams to Hard disk drive (HDD) and then to allow interrogation of stored video. In addition to this, all our DVRs support Live viewing, playback, motion detection, motion mask, remote network access and mobile phone access. All DVRs support network multiple clients simultaneously; remote pc and mobile phones.

Live viewing and playback - on local monitor, mobile phone and remote PC. Each device can have independent view.

Motion detection & motion mask - this is where the DVR compares current picture with previous picture, if a difference is detected it regards this as motion and starts to record. You can configure motion mask & adjust sensitivity to reduce false triggers. It is impossible to eliminate false triggers.

Remote Access - All our DVRs include support for remote network access via a PC and Mobile phones. For this you will need to connect your DVR to your router. This could be hard wired using a LAN (Ethernet) cable or power-line adaptors. For remote access you will most likely need to configure port forwarding on the router. DDS offer a remote set-up service where we connect to your PC and help you configure your router.

Mobile phone app (for both iPhone & Android) and PC software is supplied with the DVR free of charge. If you need assistance with DVR configuration or mobile Apps, please contact our support team. We have guides on how to use certain features of DVR and mobile phones (ask our support team).

DVR Connections

All our DVRs use BNC connectors for Video inputs and RCA (phono) connectors for Audio. They have multiple Video output connectors like VGA, HDMI and some have BNC connector for composite video out. See picture illustration below.
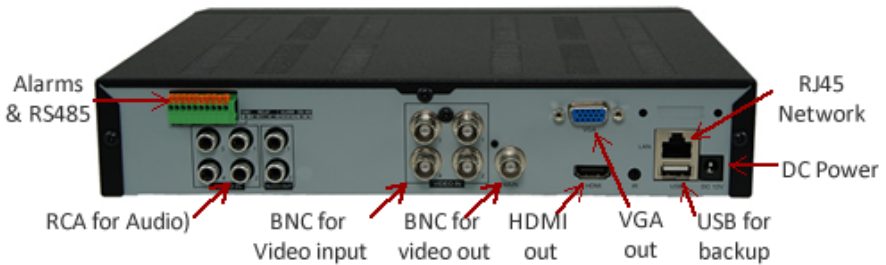
Camera Connections - Cameras are connected using a BNC connector which is pushed on and twist collar to lock.

Monitor Connections - by default VGA connections are set to 800x600 or 1024x768 resolution, HDMI is 1920x1080P and BNC video out is composite. Composite video is an analogue signal, which is low quality and only works with AV or scart input on TVs.

Power Connection - use power adaptor supplied with the DVR. Using incorrect adaptor otherwise it may cause damage to the DVR.

USB Connections - Most DVRs have 2 USB ports, 1 for mouse (optional) and the other is used for taking backup of video footage.

Turning Power-ON for the first time

Once you have mounted the cameras and plugged them in, it is a good idea to confirm that your power connections are correct polarity before you turn ON power. When you completed your final check turn the Cameras ON and then turn DVR ON. Hopefully everything will power up first time and you can proceed with DVR setup.

You can now also fine tune the Camera views. Try to avoid covering the horizon or big wide area as this will not give you much detail.

Shutdown - DVRs must be shutdown like a PC otherwise it can cause damage to HDD.

Default passwords - All DVRs have username and password to stop unauthorised access.

Guardian DVR   Username: admin
Password: 123456 or 888888

Phoenix DVR   Username: admin
Password: 123456

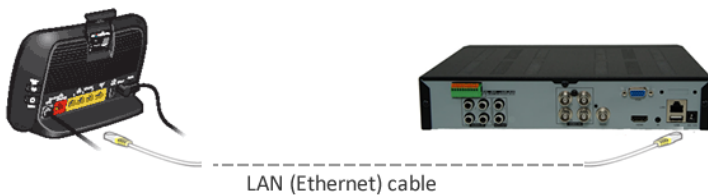Vistron DVR   Username: admin
Password: 12345

Scorpion DVR   Username: admin
Password: 0000

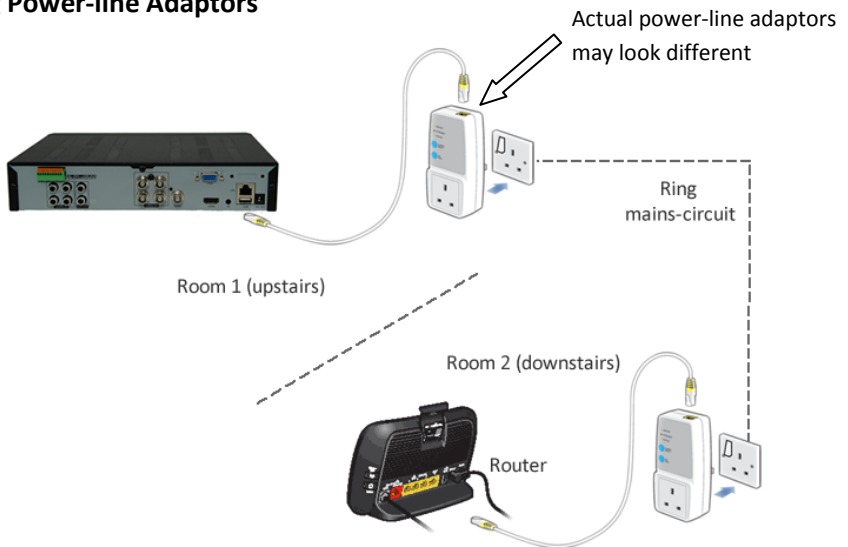Vortec NVR   Username: admin
Password: admin

Network Connection

All our DVRs include support for remote network access via a PC and Mobile phones. For this you will need to connect your DVR to your router. This could be hard wired using a LAN (Ethernet) cable or powerline adaptors. See Illustrations below.

Hardwired using LAN cable

LAN (Ethernet) cable

Using Power-line Adaptors

Actual power-line adaptors
may look different

Ring
mains-circuit

Room 1 (upstairs)

Room 2 (downstairs)

Router

For remote access you will most likely need to configure port forwarding on the router. DDS offer a remote set-up service where we connect to your PC and help you configure your router.

Mobile phone app (for both iPhone & Android) and PC software is supplied with the DVR free of charge. If you need assistance with DVR configuration or mobile Apps, please contact our support team. We have guides on how to use certain features of DVR and mobile phones (ask our support team).

Port Forwarding

Port forwarding is a term used to describe the redirecting of external traffic to specific device on the network. It tells the router how and where to forward any incoming traffic. Unknown traffic where ports are not open or forwarded will be blocked.

>   Port Forwarding is also known as:
>
>>   Gaming application
>>
>>   Virtual Server
>>
>>   NAT (Network Address Translation)
>
>   Inbound / Outbound - For CCTV (DVRs & NVRs) only configure inbound traffic.

Security

To access a DVR remotely, you need to know the IP address (or Dynamic DNS or no-ip URL), port number(s) and DVR user name and password. These be changed be if you feel security has been compromised.

Common Faults

No video on the monitor - check lead, select appropriate monitor input on the monitor and check resolution compatibility. By Default, VGA connections are set to 800x600 or 1024x768 resolution, HDMI is 1920x1080 (1080P) and BNC video out is composite. Composite video is an analogue signal, which is low quality and only works with AV or scart input on TVs.

Monitor is showing Video Loss - Assuming you can see DVR display but video loss on some or all channels. Check power connections & then check BNC connections. On central power supply units, the RED LED's should be ON solid. If they are flickering you have a short between + & - lines. check strands aren't causing short on connectors, check cable damage or cable clips isn't nailed into wire.

It could be BNC cable fault; It is possible conductor is not making proper connection.

Check camera is receiving power - On an IR camera, place your finger on day/night sensor (greenish) and then wrap your hands around the LEDs; after a few seconds you should see a small red glow on LEDs.

Camera is powered but no video - with TwistON BNC check the centre conductor is pushed in to centre pin.

Video Loss when another camera is plugged in - on most Hybrid DVRs, channel 1 & 2, 3&4, 5&6 as pairs have to be same the technology. Check DVR Specification or Contact DDS Support if you are unsure.

HDD Error - Contact DDS Support