

The CAM198 Traditional NiteDevil

The NiteDevil Camera is a traditional style camera for fitting in a standard housing. This camera offers the benefits of low light sensitivity and an Infra Red mechanical filter. The NiteDevil was originally developed for bars and nightclubs but is also a good choice for external dimly lit areas such as car parks and compounds. This camera has many features including a Sony Colour I.L CCD providing a resolution of 540 TVL, very low light sensitivity down to 0.0015 Lux, automatic or manual shutter and selection of camera options set by a bank of twelve dipswitches.



NOTE: Lens not supplied

Features

- | | |
|-------------------------------------|-------------------------------------|
| 1/3" SONY INTER LINE 540 TVL CCD - | Mechanical I.R Filter - |
| Low power consumption - | 12vDC 260mA or 24vAC at 160mA – |
| Mirror function – | Day/Night mode – |
| Test Monitor Function – | Digital Noise Reduction – |
| DC Drive Lens compatible – | Electronic Iris – |
| Use with CS-Mount or C-Mount lens – | Mirror functionality - |
| Electronic/Manual shutter - | Low illumination down to 0.0015 Lux |

Powering the Camera

The dome requires a 24v AC or 12v DC regulated power supply. When connecting to 12v DC power always use a regulated supply. **There is no polarity setting.** Use a 12v DC 350mA power supply unit minimum or a 24vAC 220 mA power supply minimum. (Always allow an additional 25% - 33% additional headroom to extend psu life)

12v DC power connection

The 12V DC cameras require a power supply that has a continuous rating of 350mA or higher per camera. It is recommended that you allow headroom per camera to be on the safe side especially taking into account any extra load created by adding an auto-iris lens (typically 10mA). The power supply you choose must be a well regulated one giving a smooth regulated 12V DC output.

WARNING - This power supply **must not** be a security type used in intruder alarms as the over voltage may damage the camera and void the warranty. The earthing arrangement of an intruder type alarm PSU may give rise to problematic "earth-loops" and poor voltage regulation can give poor/noisy image quality. We offer no technical support or warranty with the camera if you use a 13.8V intruder alarm PSU as it is contrary to the installation & usage instructions of the camera. The terminal strip will facilitate easier and faster power connection without the hassle of soldering. The terminal connection can be seen in the picture on the right. The 12V+ and 0v connections from the power supply can be connected either way round. If you have a 2.1mm jack plug connected to your power supply you will need to cut this off and use the bare wires to connect to the terminal strip. Although this camera is not polarity sensitive and the power connections can be connected either way round, it is worth mentioning that the 12V positive is the wire that was connected to the centre pin of the jack plug and the 0V wire was connected to the outer case.



2.1mm 12V DC Power Plug

Outer case 0V
Centre pin +12V

24v AC power connection

When connecting to 24v AC power supply there is no need to check AC's power polarity. Use a 24v AC 220mA power supply unit minimum. If you are using the cameras externally, an external housing is a great addition to the CAM198 camera as the combined load of the camera and heated housing are less than 600ma making any voltage drop on the supply cable low and negligible on quite lengthy runs. A suitable PSU is order code POW600, this will supply 3 x Camera & Housing combinations or 8 cameras without housings. Using a suitable cable between the 24V AC power supply and the camera you can connect the power to the cameras terminal strip either way around. As the power is 24v AC, (alternating current), the polarity is not important. You must use a separate cable for power and video. It is recommended you use a 2/4 core cable to carry the AC power to the camera and use an RG59 or twisted pair CAT5 cable to bring the video signal back from the camera to the monitor or control equipment. Never use CAT5 for powering this camera.

Video Out

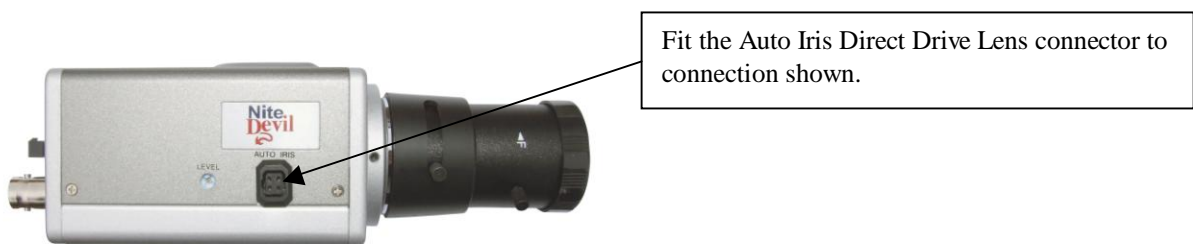
The video out from the camera is provided from the BNC connector located at the rear of the camera. The camera's video signal is carried by a suitable cable (usually RG59 or similar) to the monitor or other video input, ie, of a switcher, quad, DVR etc. Remember that the Video out from the camera is like any other electrical circuit and requires two wires to complete the circuit. When using a co-ax type cable such as RG59 or similar, the outer braid of the co-ax provides the "0V GROUND" connection and the inner core provides the "Video" connection. A typical connection is shown as follows:



It is recommended that when you are first setting up the cameras that you use a short BNC-BNC cable to link the camera directly to the monitor and to set it up at the same time. This allows you to both understand the camera and get the very best out of this great product as you will be able to adjust the camera whilst looking at the monitor screen. Obviously whilst you are setting up the camera, it does need to be powered!

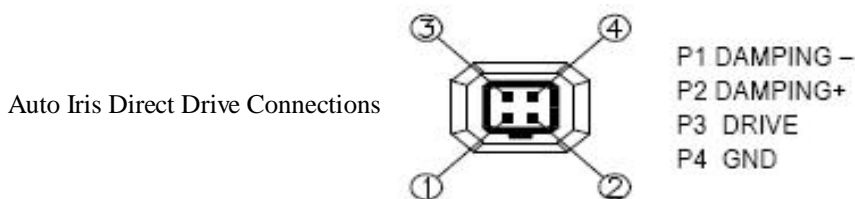
Fitting the Camera Lens

Using a lens, which is too heavy for the camera, may cause a malfunction. Ensure weight of lens is less than 450g.



Auto-Iris Direct Drive Connections

Auto Iris type lenses require the 4-pin connector to be attached to the camera. It is important that this connector is wired correctly. If you bought the lens from SystemQ and it's a direct drive lens, this will be pre-wired and you can simply plug the lens into the camera.



C or CS Mount Lenses

Most lenses are available in 2 different mounting options - C mount and CS mount. CS mount lenses are now the most popular size as they are shorter and more compact than C mount lenses. Most cameras are now manufactured to accept CS mount lenses. Before fitting the lens you need to verify that you are using a CS mount lens with the camera. You can confirm this with your lens supplier or the literature that came with your lens, check the instructions or packaging to see if your lens is a C or a CS mount version. If your lens is a C mount type you can still fit it to the camera by following the instructions under the heading **Using a C Mount lens**.

Using a CS Mount lens

If you are using a standard CS mount lens you can screw the lens straight into the camera without the need for the C-CS adapter ring (supplied).

Adjusting the inner focus ring - Once you have fitted the lens, if you have a picture on the monitor but cannot correctly focus the lens by the fine focal adjust on the lens itself, you may need to alter the inner adjusting ring that is screwed into the end of the camera. To do this you will need a small Allen key. This ring enables the lens to either "sit" a little closer or a little further away from the camera to get a sharp focused image when using lenses from different manufacturers. To adjust the inner focus ring you will need to slacken the ring by loosening the grub screw(s) with an Allen key. This is a trial and error process by moving the ring in or out say ½ turn then locking it again and trying to refocus the lens. It is possible (with common sense!) to work out whether the lens needs to be nearer or further away from the camera by watching for improvements in focus at each attempt.

NOTE – If it appears that the lens will never be in focus then it is possible that you are trying to fit a **C-mount** lens on the camera, not a **CS-mount** lens. If this is the case you will have to add the spacer ring to the lens that was provided free with the camera.



The spacer ring looks something like this:

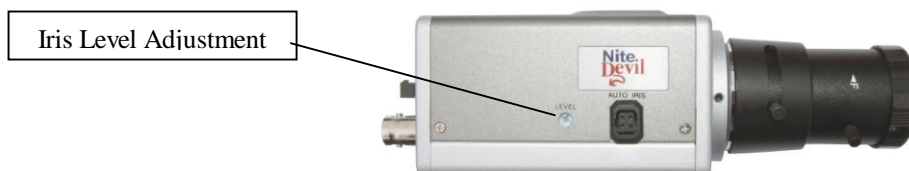
Using a C Mount Lens

If you are using a C mount lens you will need to add the C-CS mount adapter ring. This ring effectively moves the C mount lens an extra 5mm away from the camera body to achieve the correct focusing of the lens. Once you have fitted the adapter ring you can carefully screw the lens to the camera. If the picture is out of focus, try focusing it in using the focus adjust on the lens itself. If you can nearly get the focus right but not quite (because the lens runs out of adjustment) then you probably need to adjust the inner focus ring with the Allen key. See **Adjusting the inner focus ring** above.

It is important that you never force a lens when it becomes tight on the camera or you may damage one or the other device. A **C-mount** lens fitted on a **CS-mount** camera may protrude too far into the camera and cause irreparable damage.

Setting Up an Auto Iris Direct Drive Lens for different Light Levels.

If you have set up the dipswitches on the camera, ensuring that ALC is switched on, fitted and focused the lens, you may wish to set up your auto iris lens to adjust the light level at which the lens iris will open and close, therefore getting the best possible picture out of the camera in various light conditions. This is done by adjusting the Iris Level Adjustment on the side of the camera.



The Iris Level Adjustment setting determines when the IRIS of the lens opens and closes. Turn the control to LOW (anticlockwise) and the IRIS opens allowing more light into the camera producing a brighter picture. Turn the control to HIGH (clockwise) and the IRIS starts to close producing a darker picture. The trick to setting up the iris level is to set it up in the brightest possible conditions, i.e. sunlight and keep the IRIS open to its maximum without a too bright picture. This means at night in low light, the IRIS will be open as much as possible and give the best results.

To do this, follow these steps:

With the camera in the brightest light conditions that it will be expected to work,

1- Turn the Iris Level Adjustment fully anti-clock wise. The picture on the monitor is probably very bright / white.

2- Slowly turn the Iris Level Adjustment clockwise until the picture is okay, but as soon as it is okay do not turn it past this position. Once you have done the above the lens will restrict the light sufficiently in bright sunlight but open up to its maximum in low light giving good night time performance.

Fitting into camera housing

This camera has two fixing screw holes, one on the top of the camera case and one on the bottom. A standard size camera screw connector found on the bottom of the camera can be used for fitting camera tripods etc. Ensure that the clamp screw is not over-tightened as this can damage the camera case.

Setting the Function dipswitches

This camera has a bank of dipswitches for controlling camera functionality. These can be set to select the following options:

AGC – Automatic Gain Control - should always be switched to ON allowing the camera to automatically adjust the video output to maintain the best possible picture quality in a wide range of conditions.

ATW - Auto Tracking White Balance - suitable for viewing objects with changing colour temperature.

AWC – Automatic White Balance Control – uses fixed settings for white balance.

H Mirror – this switches video to mirror display horizontally.

V Mirror - this switches video to mirror display vertically.

BLC – Back light Compensation is recommended as always set to ON and it helps the camera when it is looking at a bright object such as an external window. The BLC tries to compensate for the bright part of the image so that some of the surrounding area is not too dark.

Image Zoom x 2 – provides digital enhancement.

Enhance - quality high or middle.

Colour Bar – used for camera setup only.

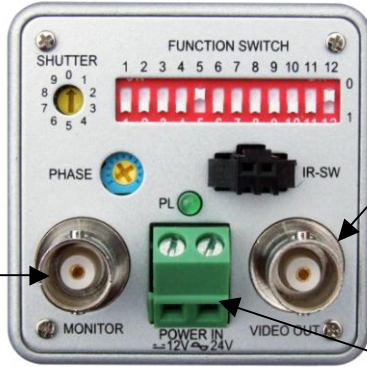
AES – Automatic Electronic Shutter is sometimes referred to as the Electronic Iris. This should only be switched ON when you are **using a manual iris lens** as the lens itself can't adjust for varying light levels so the camera has to do this electronically. If you leave this switched ON with an auto-iris lens, the camera will still function but the picture quality will be erratic being too bright or dark with poor colour reproduction as both the lens and camera will be fighting (unsuccessfully) to compensate for varying light levels. Only used for fixed iris lens.

ALC - Automatic Light Control option is for **auto-iris lens** to balance light levels.

FLC – Flicker related to vertical syncs and video fields display.

LL - Line Lock synchronises the field sync pulses.

Connecting the camera to control equipment.



The camera BNC video connection is to be found on the rear of the camera. Connect to your DVR or direct to your monitor using a BNC-BNC lead.

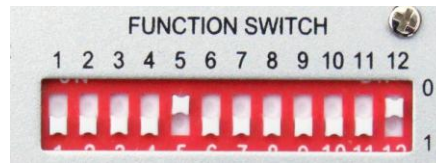
Use the test monitor connect for video setup.

Connect a 12vDC 650mA regulated power supply or a 24vAC 325mA power supply. Connections are not polarity sensitive.

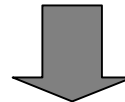
Shutter



Function Switch



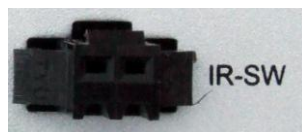
SHUTTER	SPEED
0	1/60 (50) sec.
1	1/100 sec.
2	1/250 sec.
3	1/500 sec.
4	1/1000 sec.
5	1/2000 sec.
6	1/4000 sec.
7	1/10000 sec.
8	1/60 (50) sec.
9	1/100 sec.



SW	1	0
1	AGC - ON	AGC - OFF
2	ATW	AWC
3	NORMAL IMAGE	H - MIRROR
4	NORMAL IMAGE	V - MIRROR
5	BLC - ON	BLC - OFF
6	NORMAL IMAGE	IMAGE ZOOM - X2
7	ENHANCE - HIGH	ENHANCE - MID
8	GAMMA = 0.45	GAMMA = 1
9	NORMAL IMAGE	COLOUR BAR ON
10	AES	ALC
11	FLC - OFF	FLC - ON
12	LL - OFF	LL - ON

IR - SW Extension control Connector

Line Lock Phase Adjustment



Auto & Day Mode	P1 & P2 are open
Night Mode	P1 & P2 connected
IR-SW	P1 Input / P2 Ground

Mechanical IR Filter Option

Extra mechanical IR filtering allows the camera to be setup to automatically filter out IR light to achieve optimum night time performance when used with standalone infra-red lighting. In addition to the automatic switching, the camera also has an input to allow an external device such as a photocell and relay to trigger this mode.

Precautions

Do not install the camera in extreme temperature conditions. Only use the camera where temperatures are between -20 degrees centigrade and +50 degrees centigrade.

Never install the camera in damp or humid conditions. This can affect image quality.

This camera requires stable lighting conditions to operate effectively.

Do not touch the front lens of the camera. Fingerprints can stain the lens glass.

The camera must not be placed directly facing the sun or strong light. This may damage the camera CCD.

Never expose the camera to rain or liquids. These will corrode the camera electronics.

Do not subject the camera to vibration as it may cause camera malfunctions.

Troubleshooting

The camera is built to the highest standards and every unit is fully tested prior to packing so if you experience an installation problem you need to investigate your cabling, connections, power supply and monitor. If you do fail to get a picture on a monitor you need to check the following things.

NO PICTURE OR A POOR PICTURE.

The camera cannot function without the correct working power supply. The power supply **MUST** be regulated if using a 12v DC power supply.

For 12VDC camera To check that your power supply is functioning correctly use a multimeter set on DC volts (above 12V) and connect the probes to the power supply's output plug or terminal strip (the plug polarity is previously shown). The meter should read between 12-13V. If the meter shows a negative voltage the power supply could be wired incorrectly or you may have the leads of the multimeter reversed. To make sure the multimeter is working correctly, connect it to a known voltage and polarity such as a battery. If you find that the power supply is giving out more than 13V you may be using a non-regulated power supply and must stop using it with the camera immediately or you may cause permanent damage. This rule applies to most 12V CCTV cameras. If you get a black or very dark picture and you are using an auto-iris lens it could well be that the lens iris is not opening properly. To check this, simply remove the lens from the camera. Whilst it is still connected to the monitor via a BNC to BNC lead and still powered up, on the monitor you should see a "whitish" misty screen. By placing your hand in front of the camera (where the lens would normally sit) you will stop light getting to the camera and the screen should darken. If this is the case you have proven the camera is working but the lens iris is not opening correctly. This could be because the lens connecting plug is not correctly wired for the camera or that the dipswitches on the rear of the camera are not set correctly. Ensure the dipswitch setting is set to ALC and not AES for an auto-iris lens and AES for a manual iris lens. Make sure the BNC-BNC lead you connect between the camera and the monitor has no shorts or open circuits. If you are making up your own BNC-BNC lead, don't forget the lead must have two wires connected to complete the circuit, Video AND GROUND (without both of them it will not function correctly). If in doubt swap your lead with a pre-wired commercial one, as faulty leads are the main cause of problems.

INTERFERENCE ON THE CAMERA PICTURE.

This is usually caused by poor or inadequate cabling, not observing the correct wiring techniques and for 12V DC cameras the use of an unregulated or poorly regulated power supply. If you want a good picture quality and require the camera to work to its full potential, do not use an intruder alarm PSU with 12V DC cameras. If you suspect you have a PSU problem with a 12v DC camera, the best way to check this is to power your system using a fully charged 12V lead acid battery to give a 12V totally regulated supply. If this stops the problem then, you will need to change your PSU for a better quality unit.

UNABLE TO FOCUS THE CAMERA OR A WHITE/MISTY SCREEN.

This means that the lens is not correctly fitted on the camera. To remedy this you need to refer back to the section on fitting the lens.

POOR PERFORMANCE IN LOW LIGHT.

This could mean that you need to adjust the IRIS on the lens. On a manual IRIS lens this is done by turning an IRIS ring located on the lens itself. On an auto-iris lens you need to set up the lens using the correct switch combinations and repeat the section covering setting up a Direct Drive lens for different light levels.

TOO BRIGHT PICTURE.

See above Poor performance in low light. Also check dipswitch setting and Iris Level Adjustment.

Technical Specifications

Model Number	CAM198
TV System	PAL
Image Sensor	1/3 inch I.L CCD Image Sensor
CCD Total Pixels	470K
Sync System	Internal / Line Lock
Minimum Illumination	0.012 Lux F1.2 / 40 IRE AGC On 0.0014 Lux 0 Lux with Infra Red light in Night Mode
Lens Mount	C / CS
Resolution	540 TVL
White Balance	Mode: ATW / AWC Range: 3200 ~ 10000 °K
Signal to Noise Ratio	50dB (min) / 58dB (Typical) (Gamma = 1, Aperture, AGC, Off)
SDNR	Built in SDNR (Super Digital Noise Reduction) S/N UP 4.5dB
Sense Up	ON (Preset x 4, Option x 32)
H – Mirror Function	OFF / ON
V – Mirror Function	OFF / ON
BLC Function	ON / OFF
Enhance	High / Middle
Flickerless	OFF / ON
Colour Bar	OFF / ON
ICR(IR-Cut Removable)	Mechanical Switch
ICR Control	Auto and External
Auto Iris	A.E.S / DC-Iris
Electronic Shutter	A.E.S 1/50 ~ 1/120,000 sec. Fixed 1/60(50),1/100(120),1/250,1/500,1/1000,1/2000,1/4000,1/10000sec.
Video Output	1.0v p~p composite video at 75ohm with monitor output
Gamma Correction	0.45 / 1.0
Gain Control	AGC ON / OFF
Operation Temperature	-20°C ~ +50°C
Operational Humidity	Within 85% relative humidity
Power Supply	12vDC / 24vAC Dual Power 6 watts

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