The CCT528 is an ultra low light colour camera that can work in low light situations. It can automatically alter the exposure timing to allow more light to be processed when capturing an image. This allows images to be displayed in dimly lit areas. Other special features include digital zoom, privacy masking, anti-flare, mirror function, intelligent BLC and camera titles.



NOTE: LENS SOLD SEPARATELY

## Features

| | |
|---|---|
| Digital Zoom | You can alter the camera image magnification without changing the lens - |
| Privacy Masking | Allows areas of the camera picture to be masked observing privacy laws - |
| Anti-Flare | Reduces camera flare when looking at bright objects e.g car headlights - |
| Moonlight Mode | Using a long CCD exposure light sensitivity down to 0.008 lux * - |
| Video Motion | Basic video motion detection triggers an alarm output to VCR or DVR - |
| Mirror Function | Allows camera images to be displayed in reverse orientation - |
| Intelligent BLC | 48 individual areas can be selected for backlight compensation - |
| Camera Titles | Allows camera title or ID number to be selected & imprinted on image. |

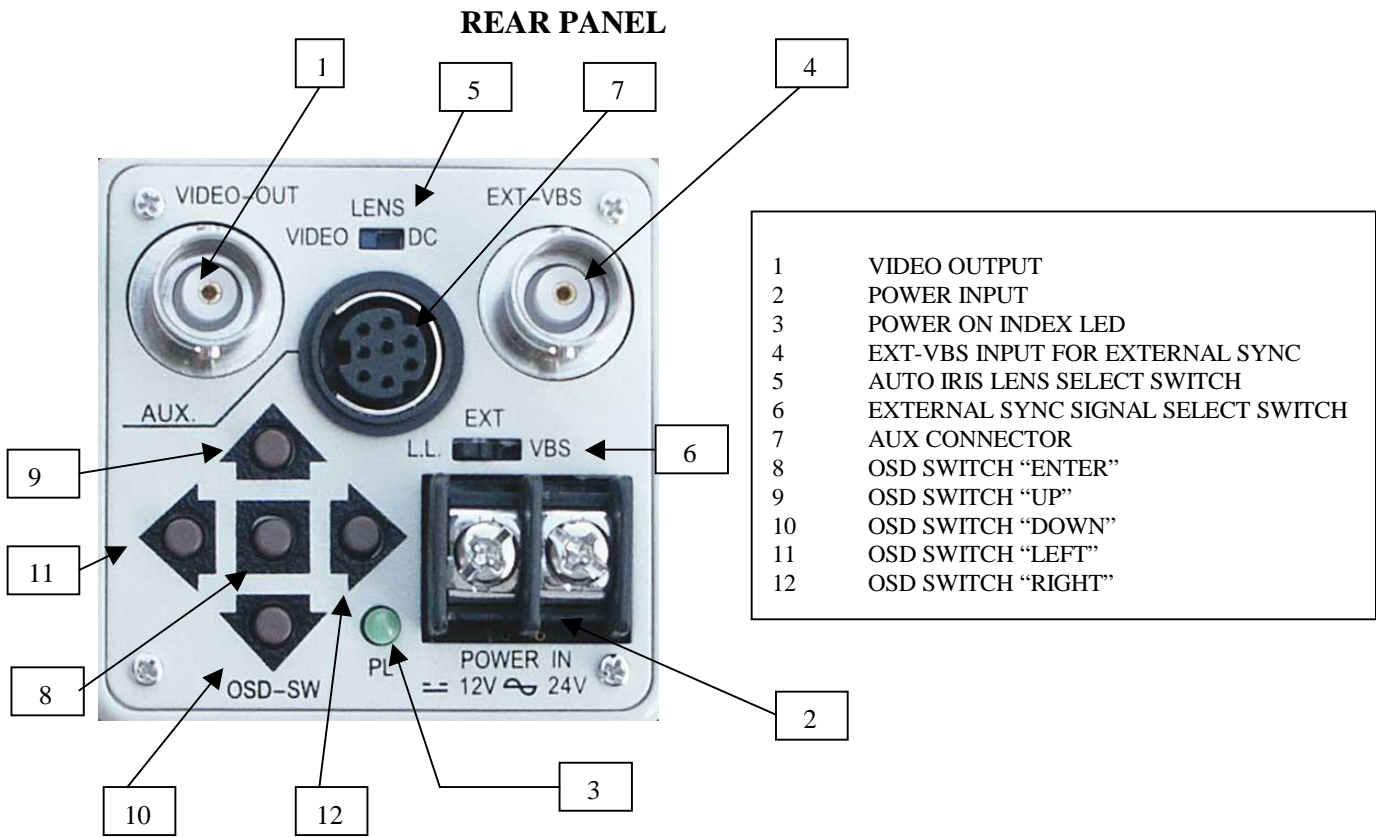 * not suitable for fast moving objects in Moonlight Mode

## What Lens do I need?

As this camera is not supplied with a lens, it is recommended to use the Auto Iris Direct Drive lens which relies on the camera having a built-in electronic amplifier to control the opening and closing of the lens iris. Whilst a Video Drive Lens could be used this lens type has an electronic amplifier controlling the lens iris, thus it duplicates the camera's functionality.

## Choice of Direct Drive Lenses

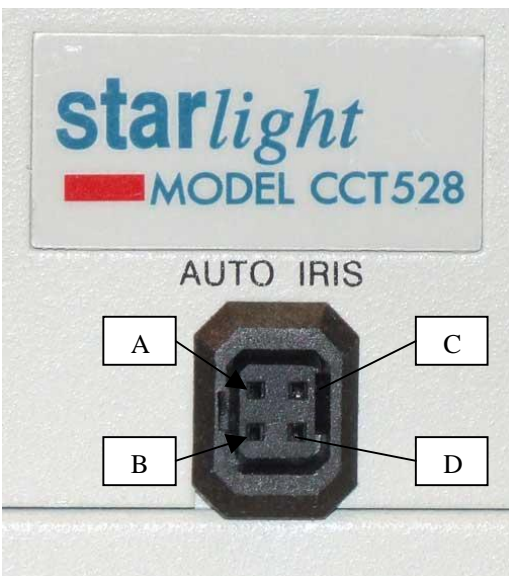| | |
|---|---|
| CCT 327 | 2.8mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 330 | 4mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 331 | 6mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 332 | 8mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 334 | 12mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 335 | 16mm Auto Iris with Focus Adjustment, Direct Drive |
| CCT 361 | 3.5-8mm Vari-focal, Auto Iris, Direct Drive |
| CCT 339 | 6-15mm Vari-focal, Auto Iris, Direct Drive |
| CCT 342 | 2.8-12mm Vari-focal, Auto Iris, Direct Drive |
| CCT344 | 12-30mm Vari-focal, Auto Iris, Direct Drive |

| CCT345 | 5-100mm Vari-focal, Auto Iris, Direct Drive |
|--------|---------------------------------------------|

**REAR PANEL**



| 1  | VIDEO OUTPUT |
|----|--------------|
| 2  | POWER INPUT |
| 3  | POWER ON INDEX LED |
| 4  | EXT-VBS INPUT FOR EXTERNAL SYNC |
| 5  | AUTO IRIS LENS SELECT SWITCH |
| 6  | EXTERNAL SYNC SIGNAL SELECT SWITCH |
| 7  | AUX CONNECTOR |
| 8  | OSD SWITCH "ENTER" |
| 9  | OSD SWITCH "UP" |
| 10 | OSD SWITCH "DOWN" |
| 11 | OSD SWITCH "LEFT" |
| 12 | OSD SWITCH "RIGHT" |

**Installation Instructions**

This camera is dual voltage and can be powered on 24 volts AC or 12 volts DC. As the camera has a rectifier, the connection of the power supply can be either way round for AC or DC connection.

Ensure that the AUTO IRIS LENS SLIDER SWITCH (5) is moved to the DC (Direct Drive) setting if you have fitted a Direct Drive Lens. Connect the Direct Drive or Video Drive lens. The Direct Drive lenses come with a standard 4 pin connector. This is plugged into the 4 pin socket on the side of the camera casing. When fitting other types of lenses e.g Video Drive lenses, they are not generally fitted with the 4 pin connector but with four leads which will need to be soldered to a connector. Note that we do not supply these connectors. If problems occur with focusing, it may be necessary to remove the black spacer ring.
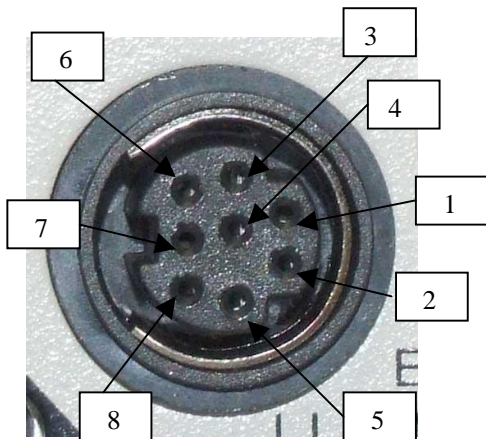


| Video Lens | |
|---|---|
| A | +9V |
| B | N.C |
| C | VIDEO |
| D | GROUND |

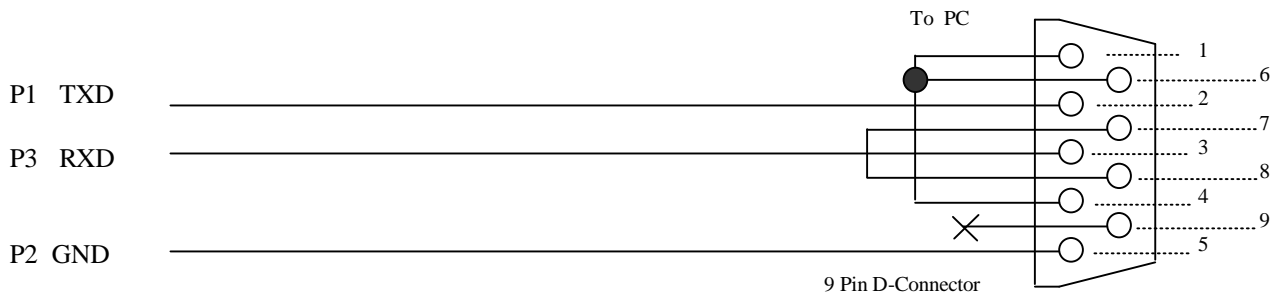| DC Lens | |
|---|---|
| A | DUMP- |
| B | DUMP+ |
| C | DRIVE |
| D | GROUND |

## Auxillary Connector

In the centre of the camera back panel there is an auxillary connector. This allows transmit and receive via RS232C connection to a PC (Pins P1, P2, P3 and P4). It also provides an alarm out ( P5 Open Collector Output and P6 Ground). A freeze trigger is also available (P7 Freeze Trigger In and P8 Ground).

### Auxillary Connector

| P1 | TXD | RS-232C connector To PC |
|----|-----|-------------------------|
| P2 | GND | |
| P3 | RXD | |
| P4 | GND | |
| P5 | ALARM-OUT | Open collector output Max sync DC50v/30mA |
| P6 | GND | |
| P7 | FREEZE Trigger-IN | Current Loop DC12v/10mA |
| P8 | GND | |

### P.C connections

To  PC

P1   TXD

P3   RXD

P2  GND

9 Pin D-Connector

1
6
2
7
3
8
4
9
5

**ON SCREEN DISPLAY**

There are 5 rubber push buttons on the rear of the camera that are used to access the camera menu.
If you press the centre button in for about 2 seconds, a menu will be displayed on the monitor.
The menu can be browsed by pressing the up or down buttons.

**MAIN MENU**

This page describes the menu options available for this camera.
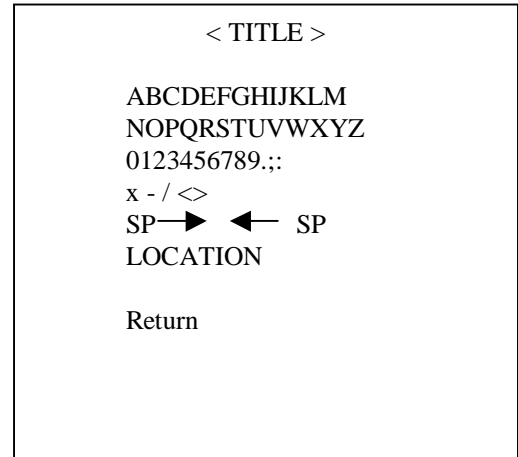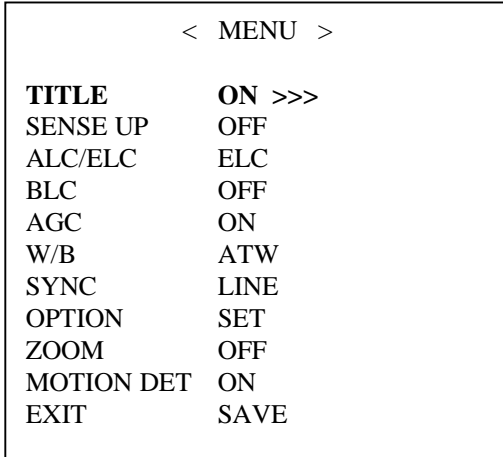
A full description of each option is detailed on the following pages.

```
<   MENU   >

TITLE          ON
SENSE UP       OFF
ALC/ELC        ELC
BLC            OFF
AGC            ON
W/B            ATW
SYNC           LINE
OPTION         SET
ZOOM           OFF
MOTION DET     ON
EXIT           SAVE
```

1. TITLE       -       Name the camera and display it on the monitor

2. SENSE UP    -       Increase the camera sensitivity by setting frame integration mode

3. ALC/ELC     -       Automatic Light Control/Electronic Light Control

4. BLC         -       Backlight Compensation

5. AGC         -       Automatic Gain Control

6. W/B         -       White Balance

7. SYNC        -       Synchronisation method – INT mode/VBS mode/Line mode

8. OPTION      -       Various functions – Mask/Negative/Height Reverse/Vertical Reverse
                       Freeze Function/Priority Function/Gamma function

9. ZOOM        -       Set zoom  up to 2x

10. MOTION DET -       Motion Detection settings

**TITLE**

You can choose a name for this camera and display it on the monitor.

```
        <  MENU  >

TITLE        ON  >>>
SENSE UP     OFF
ALC/ELC      ELC
BLC          OFF
AGC          ON
W/B          ATW
SYNC         LINE
OPTION       SET
ZOOM         OFF
MOTION DET   ON
EXIT         SAVE
```

```
        < TITLE >

ABCDEFGHIJKLM
NOPQRSTUVWXYZ
0123456789.;:
x - / <>
SP ➤    ◄ SP
LOCATION

Return
```

**TITLE    -            Name the camera and display it on the monitor**

Move cursor to TITLE and press bottom right button to change mode from OFF to ON.

Press centre bottom button to display TITLE menu.

Decide name of this camera.

Move cursor to letters required from the Alphabet set and press bottom centre button to select the correct character.

When you have finished editing name, move cursor to LOCATION row and press bottom centre button once.

The chosen name is now displayed on the screen.

You may now press the up, down, left and right buttons to move the title name to one of the four corners of the display screen. Press the bottom centre button to go back to the TITLE menu.

Move cursor to Return and press bottom centre button once more to return to main MENU.

Select EXIT to save.

**SENSE UP**

Increases the camera sensitivity which extends minimum illumination

```
        <  MENU  >

TITLE          ON
SENSE UP       OFF >>>
ALC/ELC        ELC
BLC            OFF
AGC            ON
W/B            ATW
SYNC           LINE
OPTION         SET
ZOOM           OFF
MOTION DET     ON
EXIT           SAVE
```

```
              <  MENU  >

TITLE          ON
SENSE UP       X2
ALC/ELC        ELC
BLC            OFF
AGC            ON
W/B            ATW
SYNC           LINE
OPTION         SET
ZOOM           OFF
MOTION DET     ON
EXIT           SAVE
```

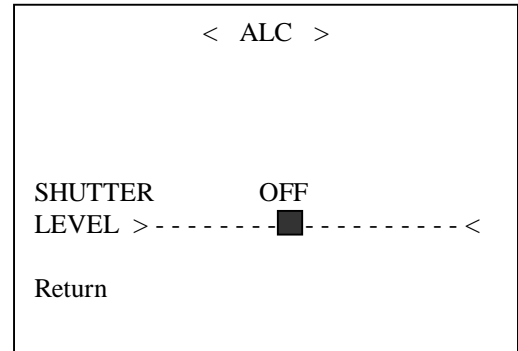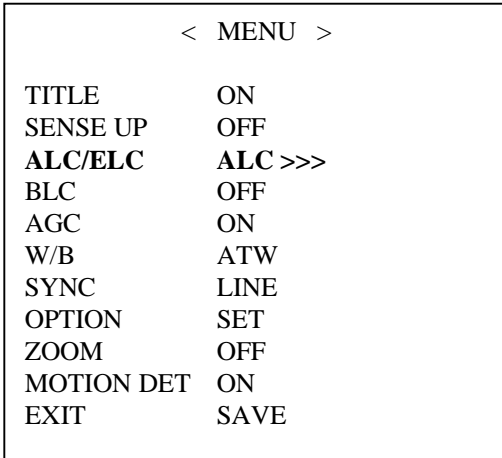**SENSE UP   -            Increases the minimum illumination of the camera**

Move cursor to SENSE UP and press bottome left or right buttons to set frame integration time.
The minimum illumination will be increased to 2x, 4x, 6x, 8x, 12x, 16x, 24x, 32x, 48x, 96x & 128x

Press EXIT to save.


Note that as sensitivity is increased the frame refresh rate will be decreased respectively.

**ALC/ELC**

Choose exposure mode  - ALC (Automatic Light Control) or ELC (Electronic Light Control)

```
        < MENU >

TITLE         ON
SENSE UP      OFF
ALC/ELC       ALC >>>
BLC           OFF
AGC           ON
W/B           ATW
SYNC          LINE
OPTION        SET
ZOOM          OFF
MOTION DET    ON
EXIT          SAVE
```

```
        < ALC >



SHUTTER        OFF
LEVEL >--------■----------<

Return
```
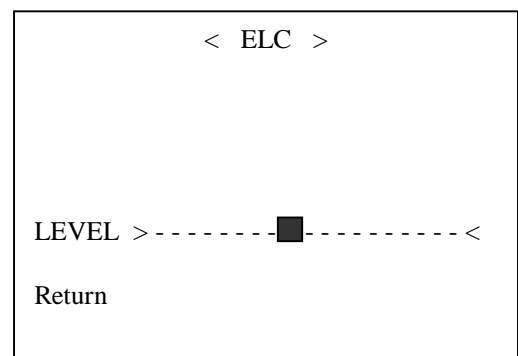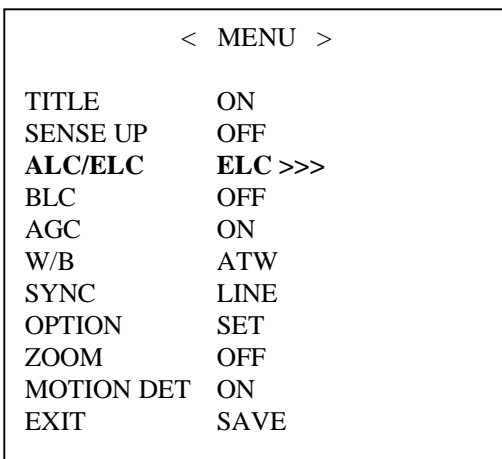
Move cursor to ALC/ELC and push bottom right button to select ALC mode.
Press bottom centre button to enter ALC menu.
Select shutter speed  - options available  OFF, 1/100, 1/120, 1/180, 1/250, 1/350, 1/500, 1/750, 1/1000,  1/1500, 1/2000, 1/3000, 1/4000, 1/6000, 1/8000 and 1/12000 sec.
The DC-IRIS lens LEVEL can be adjusted by moving the level indicator.
Press Return and EXIT to save.

```
        < MENU >

TITLE         ON
SENSE UP      OFF
ALC/ELC       ELC >>>
BLC           OFF
AGC           ON
W/B           ATW
SYNC          LINE
OPTION        SET
ZOOM          OFF
MOTION DET    ON
EXIT          SAVE
```

```
        < ELC >




LEVEL >-------■----------<

Return
```

Move cursor to ALC/ELC and push bottom right button to select ELC mode.
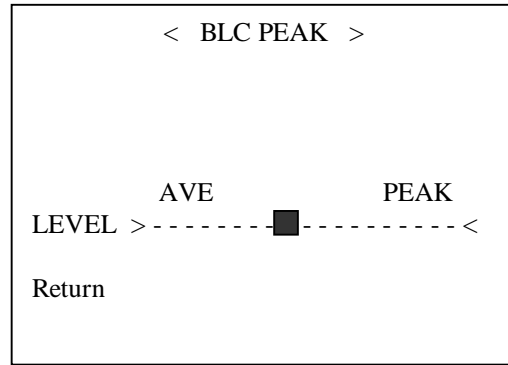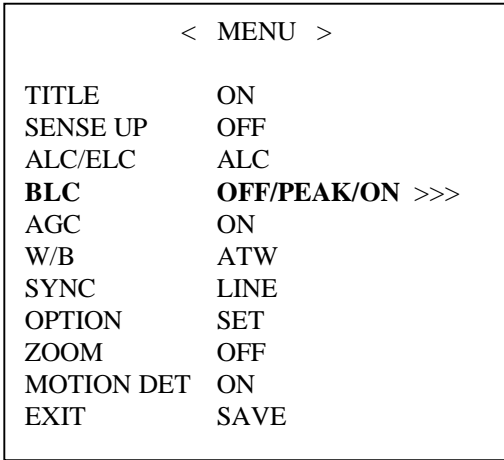Press bottom centre button to enter ELC menu.
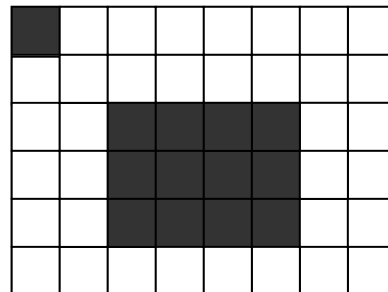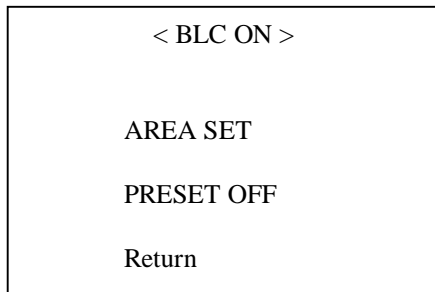The Exposure LEVEL can be adjusted by moving the level indicator.

Press Return and EXIT to save.

**BLC**

Backlight Compensation -

```
        < MENU >

TITLE        ON
SENSE UP     OFF
ALC/ELC      ALC
BLC          OFF/PEAK/ON >>>
AGC          ON
W/B          ATW
SYNC         LINE
OPTION       SET
ZOOM         OFF
MOTION DET   ON
EXIT         SAVE
```

```
        < BLC PEAK >



            AVE          PEAK
LEVEL >-------■----------<

Return
```

Move cursor to BLC and press bottom right button to select PEAK mode.
Press bottom centre button to enter PEAK menu.
Move the LEVEL bar to to select the BLC level required.

```
        < BLC ON >


    AREA SET

    PRESET OFF

    Return
```
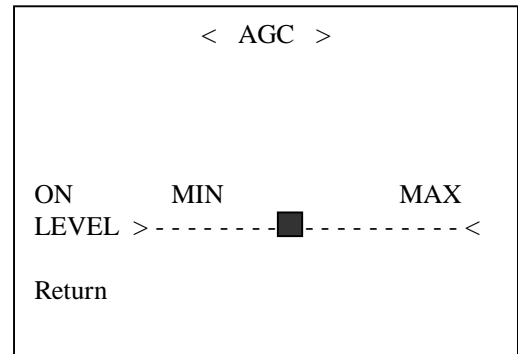
Move cursor to BLC and press bottom right button to select ON mode.
Press bottom centre button to enter BLC ON menu.
In the BLC ON menu move cursor to PRESET row and press bottom right button to select OFF
mode. Now move cursor to the AREA SET row and press bottom centre button once to enter the 48
zone programming screen.
Move cursor to any block and press bottom centre button once to turn the block grey. Move to
another location and repeat step until all blocks are programmed properly.
Now press the bottom centre button once for 2 seconds to exit from the 48 zone screen and move
cursor to Return. Now press bottom centre button to return to main menu.

**AGC**

AGC  -  Automatic Gain Control

```
       <  MENU  >

TITLE        ON
SENSE UP     OFF
ALC/ELC      ALC
BLC          OFF
AGC          OFF/ON
W/B          ATW
SYNC         LINE
OPTION       SET
ZOOM         OFF
MOTION DET   ON
EXIT         SAVE
```

```
          <  AGC  >



ON      MIN              MAX
LEVEL >--------■----------<

Return
```

Move cursor to AGC and push bottom right button to select AGC ON mode.
Press bottom centre button to enter AGC menu.


Press Return and EXIT to save.

**W/B**

W/B   -   White Balance

```
        <  MENU  >

TITLE        ON
SENSE UP     OFF
ALC/ELC      ALC
BLC          OFF
AGC          ON
W/B          ATW/AWC/MANU >>
SYNC         LINE
OPTION       SET
ZOOM         OFF
MOTION DET   ON
EXIT         SAVE
```

```
        <  MANU  >



PRESET         OFF  <USER>
RED   > - - - - - - -■ - - - - - - - - - <
BLUE  > - - - -■ - - - - - - - - - - - <

Return
```

Move cursor to W/B and push bottom right button to select ATW, AWC and MANU mode.

ATW mode:  (Auto Trace White Balance)
The White Balance is adjusted automatically according to the general image colour

AWC mode:  (One Push Auto White Balance)
This option fixes the standard White Balance by pressing the bottom centre button on a one push basis selecting different colour settings.

MANU mode: (Manual White Balance)
Press bottom centre button to enter MANU menu.
Press bottom left or right buttons to select:
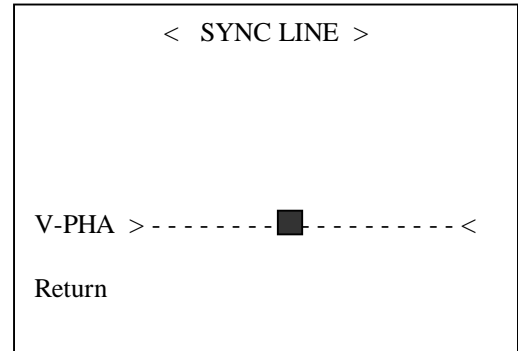          PRESET 5600°K / PRESET 3200°K / PRESET OFF<USER>
In the PRESET OFF<USER> setting, the RED and BLUE colour can be adjusted manually.

Move cursor to Return and press bottom centre button to return to main menu.

**SYNC**

Camera is synchronised by (LINE) AC Line sync signal, (INT) internal sync signal or by (VBS) external input video signal.

```
         <  MENU  >

TITLE        ON
SENSE UP     OFF
ALC/ELC      ALC
BLC          OFF
AGC          ON
W/B          ATW
SYNC         LINE / INT / VBS >>>
OPTION       SET
ZOOM         OFF
MOTION DET   ON
EXIT         SAVE
```

```
        <  SYNC LINE  >




V-PHA  > - - - - - - - ■ - - - - - - - - <

Return
```

**Line Mode**
Move cursor to SYNC and push bottom right button to select LINE mode.
Camera is synchronised by AC-LINE sync signal.
Press bottom centre button to adjust vertical phase.
Move cursor to Return and press bottom centre button to return to main menu.

**Int Mode**
Move cursor to SYNC and push bottom right button to select INT mode.
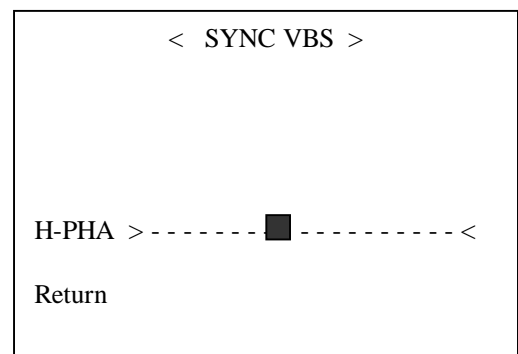Camera is synchronised by internal sync signal.
Press EXIT to save

**VBS Mode**
Move cursor to SYNC and push bottom right button to select VBS mode.
Camera is synchronised by external input video sync signal.
Press bottom centre button to adjust horizontal phase.

```
        <  SYNC VBS  >




H-PHA  > - - - - - - - ■ - - - - - - - - - <

Return
```

Move cursor to Return and press bottom centre button to return to main menu.

### OPTION

The OPTION menu provides access to an OPTION page and an OPTION2 page.

OPTION
This menu provides 4 masked areas, displays in either positive or negative mode, displays picture in horizontal reverse or vertical reverse mode, provides a freeze function, a priority on AGC or SENSE options and a gamma setting.

OPTION2
This menu provides the APC setting, high light setting and colour bar function.

```
           <  MENU  >

TITLE         ON
SENSE UP      OFF
ALC/ELC       ELC
BLC           OFF
AGC           ON
W/B           ATW
SYNC          LINE
OPTION        SET >>>
ZOOM          OFF
MOTION DET    ON
EXIT          SAVE
```

```
           <  OPTION  >

MASK A        OFF
MASK B        OFF
MASK C        OFF
MASK D        OFF
POSI/NEGA     POSI
H-REV         OFF
V-REV         OFF
FREEZE        FIELD
PRIORITY      AGC
GAMMA         0.45

Return
```

Move cursor to OPTION and push bottom centre button to select OPTION mode.

### MASK function     MASK A ~ MASK D
This allows the setting of a privacy mask, in order to mask out an area that is not to be viewed. The function provides four masking areas – MASK A, MASK B, MASK C and MASK D. The function is set at OFF for the default setting.

Move cursor to MASK area selected then press bottom left or right button to set MASK n area ON.
(n = MASK A, B, C or D)

Press bottom centre button to enter the AREA MASK page. Use up/down buttons to select location and size of the Masking zone. Press bottom centre button to return to Previous page.

```
           < AREA MASK>




           ▭▭▭

       LOCATION
       SIZE

       Return
```

### POSI / NEGA  function
This function reverses a positive video image to a negative video image.
The default setting is positive (POSI).
Move cursor to select POSI/NEGA then press bottom left or right button to select positive or negative setting.

**OPTION (cont.)**

| < OPTION > | |
|---|---|
| MASK A | OFF |
| MASK B | OFF |
| MASK C | OFF |
| MASK D | OFF |
| POSI/NEGA | POSI |
| H-REV | OFF |
| V-REV | OFF |
| FREEZE | FIELD |
| PRIORITY | AGC |
| GAMMA | 0.45 |
| | |
| Return | |

**H-REV function**
This function switches the video display to a mirror effect.
The default setting is OFF.
Move cursor to select H-REV then press bottom left or right button to set the function ON for mirror effect or OFF for normal.

**V-REV function**
This function reverses the vertical video display.
The default setting is OFF.
Move cursor to select V-REV then press bottom left or right button to set the function ON for vertical reverse effect or OFF for normal.

**FREEZE function**
This function captures the image in field mode or frame mode. There are two fields to one frame.
The default setting is field mode.
Move cursor to select FREEZE then press bottom left or right button to select FIELD or FRAME.

**PRIORITY function**
This function sets priority for either AGC or SENSE UP (camera sensitivity).
The default setting is AGC.
Move cursor to select PRIORITY then press bottom left or right button to select AGC or SENSE UP.

**GAMMA function**
This function sets the GAMMA level to 0.45 or 1.
The default setting is 0.45.
Move cursor to select  GAMMA then press bottom left or right button to select gamma level.

**OPTION2**
This menu provides the APC setting, High Light setting and Colour Bar function.
Move cursor to Return then press bottom left or right button to select NEXT.
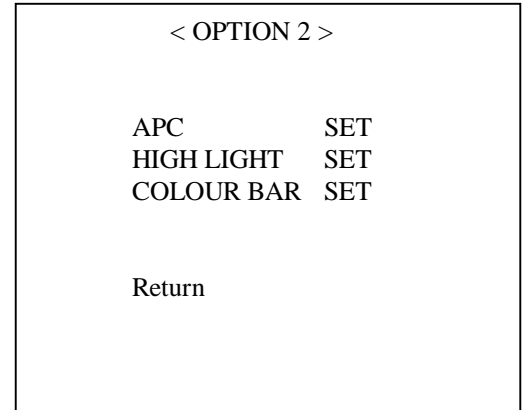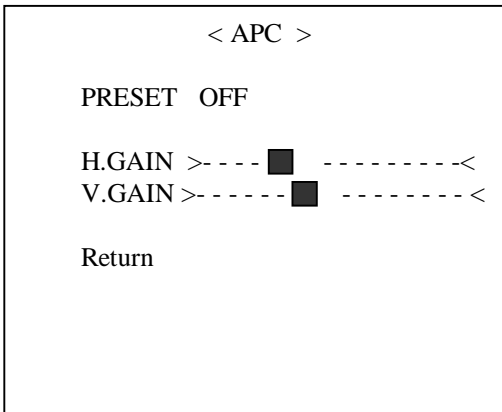Now press bottom centre button to enter the OPTION 2 menu page.

**OPTION2**
This menu provides the APC setting, High Light setting and Colour Bar function.

**APC SET function**
The APC function allows picture quality enhancement.
Move cursor to APC SET and press bottom centre button
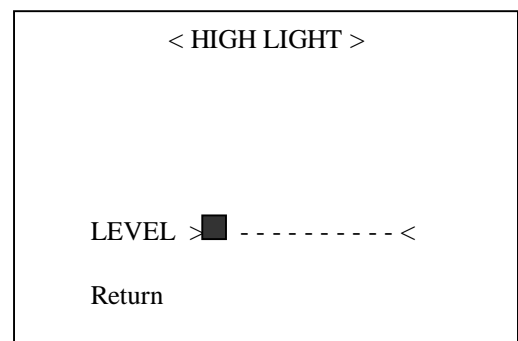to select  APC Menu page.

```
+------------------------------------+
|          < OPTION 2 >              |
|                                    |
|                                    |
|   APC            SET               |
|   HIGH LIGHT     SET               |
|   COLOUR BAR   SET                 |
|                                    |
|                                    |
|   Return                           |
|                                    |
+------------------------------------+
```

```
+------------------------------------+
|           < APC  >                 |
|                                    |
|   PRESET   OFF                     |
|                                    |
|   H.GAIN  >- - - - ■ - - - - - - - -<|
|   V.GAIN >- - - - - - ■ - - - - - - <|
|                                    |
|   Return                           |
|                                    |
|                                    |
|                                    |
+------------------------------------+
```

Adjust horizontal and vertical gain by moving levels to
provide the best picture enhancement setting.

**HIGH LIGHT SET function**
The High Light function reduces anti-flare particularly when looking at bright objects such as car
headlights.
Move cursor to HIGH LIGHT SET and press bottom centre button to enter the HIGH LIGHT
menu.

Move the High Light Level indicator to set
the High Light depress level adjustment.

```
+------------------------------------+
|         < HIGH LIGHT >             |
|                                    |
|                                    |
|                                    |
|                                    |
|   LEVEL  >■ - - - - - - - - - <     |
|                                    |
|   Return                           |
|                                    |
+------------------------------------+
```

**Colour Bar function**
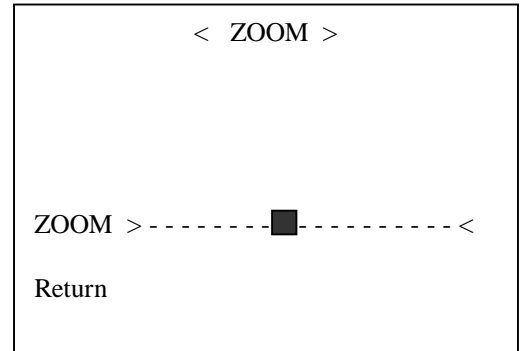The colour bar function displays the camera colour bar.
The default setting is OFF.
Move cursor to COLOUR BAR and press bottom left or right buttons to select ON (Display Colour
Bar) or OFF (Display Normal Image).

## ZOOM

The ZOOM facility allows you to zoom in up to 2 x.

```
          <  MENU  >

TITLE        ON
SENSE UP     OFF
ALC/ELC      ALC
BLC          OFF
AGC          ON
W/B          ATW
SYNC         LINE / INT / VBS
OPTION       SET
ZOOM         OFF / ON >>>
MOTION DET   ON
EXIT         SAVE
```

```
          <  ZOOM  >




ZOOM  > - - - - - - - ■ - - - - - - - - <

Return
```
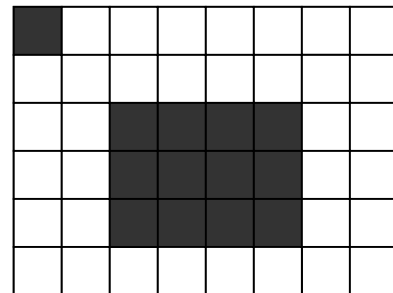
## ZOOM

Move cursor to ZOOM and push bottom right button to select ON and OFF mode.

The default option is OFF.

Press bottom centre button to enter zoom menu.

Move the zoom level to increase or decrease zoom range.

Move cursor to Return and press bottom centre button to return to main menu.

## MOTION DET

The MOTION DET motion detection function allows an alarm trigger to be made at the AUX connector at the back of the camera across pins 5 and 6.

```
         < MENU >

TITLE         ON
SENSE UP      OFF
ALC/ELC       ALC
BLC           OFF
AGC           ON
W/B           ATW
SYNC          LINE / INT / VBS
OPTION        SET
ZOOM          OFF
MOTION DET  ON / OFF >>>
EXIT          SAVE
```

```
       < MOTION DETECT >

 AREA SET

 PRESET OFF

 LEVEL > - - - - - - -■- - - - - - - - -
<

   TIMER   30SEC
        Return
```

## MOTION DETECTION
Move cursor to MOTION DET and push bottom right button to select ON and OFF mode.
The default option is OFF.
Press bottom centre button to enter motion detection menu.
In the MOTION DETECT page move cursor to PRESET  and press bottom right button to select OFF mode.

Move cursor to AREA SET and press bottom centre button once to enter the 48 zone programming screen.

Now move cursor to any block and press bottom centre button once to turn the block grey. The grey blocks are the chosen blocks. Move to another location and repeat the above step until all blocks required are selected. If the bottom centre button is now pressed for 2 seconds you will exit from the 28 zone screen.

Move cursor to LEVEL and press bottom left or right buttons to select motion detect sensitivity.

Move cursor to TIMER and press bottom left or right buttons to select alarm output time, 10 secs, 30 secs, 60 secs.

Move cursor to Return and press bottom centre button to return to main menu.

| CCT528 | Technical Specifications |
|---|---|
| Image Sensor | 1/3" High Resolution DSP Colour CCD |
| Horizontal Resolution | 470 TV Lines / 580 TV Lines Enhanced |
| Effective Pixels | PAL  795 x 596 |
| Scanning system | PAL 625 lines – 2:1 interlaced |
| Video Output | 1.0V p-p Composite. 75 ohms |
| S/N Ratio | More than 52dB |
| Lens (Direct Drive) | **Lens Sold Separately – Use Direct Drive** |
| Lens Mount | CS Mount Lens  (C adaptor supplied) |
| Minimum Illumination | 0.8 Lux at F1.2   Moonlight Mode 0.008 Lux at F1.2 |
| Backlight Compensation | Selected by OSD (On Screen Display)  48 zones for BLC |
| Shutter Speed | PAL:  1/50 ~ 1/100,000 sec |
| Alarm Out | Motion Detection |
| Gamma Correction | r = 0.45 or more |
| Gain Control | AGC On/Off  (0 ~ 18dB) |
| High Light Suppress | On / Off |
| Power Source | 12 volt DC / 24 volt AC |
| Operating Current | 12 volt DC 250 mA  / 24 volt AC 125mA |
| Weight | 410g |
| Housing | Vandalproof , weatherproof (IP67) and tamperproof with inner bracket built-in |
| Operating Temperature | -20ºC ~ 50ºC |
| Dimensions | 50.5mm(W)  x  50.5mm(H)  x  115mm(L) |