PHILIPS

LTC0600

Digital Color Camera

Installation manual
Installationsanleitung
Manuel d'installation
Manuale d'installazione
Installatiehandleiding
Manual de instalación

PHILIPS

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FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
■ Reorient or relocate the receiving antenna.
■ Increase the separation between the equipment and receiver.
■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
■ Consult the dealer or an experienced radio/TV technician for help.

WARNING
YOU ARE CAUTIONED THAT CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PART RESPONSIBLE FOR THE COMPLIANCE COULD VOID YOUR AUTHORITY TO OPERATE THE EQUIPMENT.

This label may appear on the product.

 The lightning flash with an arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

 The exclamation point within an equilateral triangle is intended to alert the user to presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

The Camera series (LTC0500/60 and LTC0600/60) are provided with a correct polarized mains power plug for 120V supply mains. The Camera can accept 'nominal' voltage anywhere from 100-240V and can operate on either a 50 or 60Hz system.
If the Camera will be connected to an other mains voltage than 120Vac, use the **PROPER** mains power connector for that mains voltage.
In case of using a mains voltage of 240V use a correct adapter plug with the following specifications: NEMA plug type 2-15P, 2 pole 2 wire, 15 Amps-250V, or contact qualified Service personnel. See also item **Important Safeguards.**

Important Safeguards

1) Read Instructions - All the safety and operating instructions should be read before the unit is operated.
2) Retain Instructions - The safety and operating instructions should be retained for future reference.
3) Heed Warnings - All warnings on the unit and in the operating instructions should be adhered to.
4) Follow Instructions - All operating and use instructions should be followed.
5) Cleaning - Unplug the unit from the outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6) Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
7) Water and Moisture - Do not use this unit near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, near a swimming pool, in an unprotected outdoor installation, or any area which is classified as a wet location.
8) Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to a person and serious damage to the unit. Use only with a stand, tripod, bracket, or mount recommended by the manufacturer, or sold with the product. Any mounting of the unit should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9) Ventilation - Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered. This unit should not be placed in a built-in installation unless proper ventilation is provided or the manufacturer' s instructions have been adhered to.

10) Power Sources - This unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply you plan to use, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.

11) Grounding or Polarization - This unit may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. Alternately, this unit may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12) Power-Cord Protection - Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

13) Power Lines - An outdoor system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal. U.S.A. models only - refer to the National Electrical Code Article 820 regarding installation of CATV systems.

14) Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electric shock.

15) Object and Liquid Entry - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the unit.

16) Servicing - Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

17) Damage Requiring Service - Unplug the unit from the outlet and refer servicing to qualified service personnel under the following conditions
    a) When the power-supply cord or plug is damaged.
    b) If liquid has been spilled, or objects have fallen into the unit.
    c) If the unit has been exposed to rain or water.
    d) If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
    e) If the unit has been dropped or the cabinet has been damaged.
    f) When the unit exhibits a distinct change in performance this indicates a need for service.

18) Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

19) Safety Check - Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

20) Coax Grounding - If an outside cable system is connected to the unit, be sure the cable system is grounded. U.S.A. models only—Section 810 of the National Electrical Code, ANSI/NFPA No.70-1981, provides information with respect to proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

21) Lightning - For added protection of this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power-line surges.

NOTE
- For permanently connected equipment, a readily accessible disconnect device shall be incorporated in the fixed wiring;
- For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.

1 Introduction

The LTC 0600 series digital color camera offers an extremely high level of picture quality and resolution for use in surveillance and observation systems. It supports passive (DC) iris, video iris and manual iris lenses. The camera is suitable for C mount and CS mount lenses. The camera automatically detects and adapts to the type of lens fitted.

Three fully programmable operating modes are available to match the camera to a variety of scene conditions. These can be selected either by using the camera push buttons or by the RS-232 port.
An optional software configuration tool LTC0650/00 can be ordered for setting up the operating mode functions.
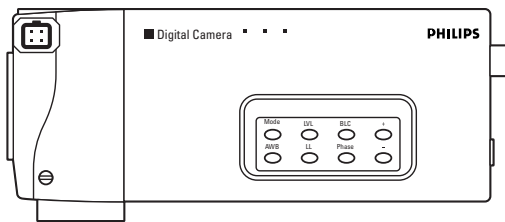
2 Features

Hardware:
- $1/_2$-inch interline transfer CCD image sensor, providing 480 TVL resolution (PAL 752 x 582; NTSC 768 x 494).
- Advanced real time camera sensitivity down to 0.3 lux, (0.03 foot-candle) illumination with f1.2 lenses.
- Various Sync. Functions, internal X-Tal, Line-lock, External V-lock, H/V-lock.

Software:
- OSD, On Screen Display text is available for camera ID and set-up feedback.
- RS 232 communication.

Automatic image quality enhancement:
- Auto Light Control (ALC) / Electronic Light Control (ELC) allows the use of manual lenses for indoor use.
- Non Linear Processing (NLP), Auto Black and Back Light Compensation (BLC) provide superb dynamic contrast handling for the best picture result.
- 2 H type Auto Contour Enhancement (ACE) for image details without aliasing on fine objects.

3 Preparation

This manual describes how to install the hardware and how to use your video camera.

Check that the following items are present in the box:
- Philips LTC 0600 Color Camera;
- This manual;
- Dust cap (placed onto the lens mount on delivery);
- Lens connector (for connecting lenses with automatic iris control to the camera);
- Low voltage connector (only for the models LTC 0600/10 and LTC 0600/20).

4 Precautions

Before using the camera, please take note of the following guidelines concerning the handling of the camera.

- **Handle the camera with care.**
  Do not abuse the camera. Avoid striking, shaking, etc. The camera can be damaged by improper handling or storage.

- **Do not expose the camera to rain or moisture, or try to operate it in wet area locations.**
  If accidentally exposed to above mentioned conditions turn the power off immediately, and seek servicing from a qualified service technician. Moisture can damage the camera and also create the risk of electric shock.

- **Do not use strong or abrasive detergents when cleaning the camera body.**
  Use a dry cloth to clean the camera when dirty. Persistent dirt should be removed by wiping gently with a mild detergent.

- **Clean the CCD faceplate with care.**
  Do not clean the CCD with strong or abrasive detergents. Use lens tissue or a cotton -tipped applicator and ethanol.

- **Never point the camera towards the sun.**
  Do not point the camera at bright objects. Never point it at the sun or other extremely bright objects, even when the camera is switched off. This may damage the sensor.

5   Mounting the lens

The camera supports Manual Iris, Video Iris and DC Iris lenses. The use of Video or DC Iris lenses is recommended for outdoor use to prevent bleaching of the CCD.
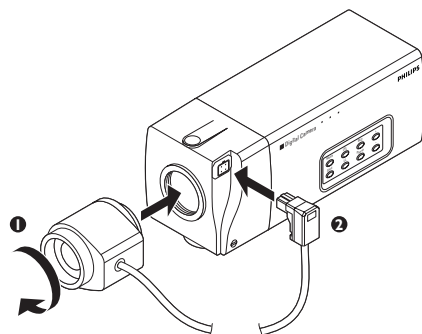
Lens mount, lens thread
The lens mount should be C mount or CS mount (1"-32UN). No CS/C adapter is required when using C mount lenses.

Auto Lens Detection
At power-up the camera automatically detects the lens type in use and configures itself.
Note: If auto detection fails while hot plugging the connector to the camera, then disconnect the camera power and re-power again.

Heavy lenses
Heavy lenses need additional support from a housing or base plate in order to withstand vibration or shocks. Use the correct spacer height to align supported lenses in order to prevent torque damage of internal camera components.

Follow these steps to mount a lens on the camera:
1) Remove the dust cap, and screw the lens into the lens mount.
2) Where applicable, connect the iris control cable for automatic iris control to the lens connector.
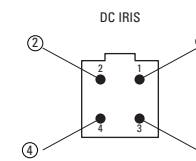3) You will need to adjust the back focus setting after fitting a new lens or replacing a lens.

NOTES:
• Lenses without plug or with a non-compatible plug should be wired in accordance with the drawings.
• Lens outputs are short-circuit proof.
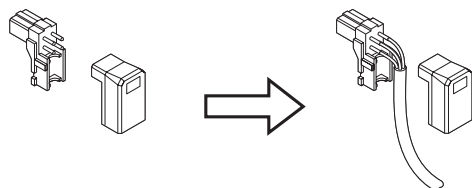
Lens connector specifications (rear view):

VIDEO IRIS   DC IRIS
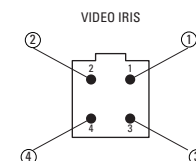
1 = 9VDC 40 mA max.
2 = N.C.
3 = Iris video 1Vp, 1kΩ
4 = Ground

1 = Damping coil -
2 = Damping coil +
3 = Drive coil + 40 mA max.
4 = Drive coil - Ground

5.1   LENS ADJUSTMENTS

Manual Iris Lenses
Set Lens iris to the required F. number when applicable.
Point camera at the scene. Adjust LVL (chap. 9.2.2) to desired video level.

DC Iris Lenses
Initial lens setting
Point the camera at a test chart or scene; avoid highlights for optimum results.
Ensure sufficient scene illumination (>200 lux); the camera does not allow lens adjustment under low light conditions.
Push LVL button once, use +/- buttons until the OSD indication on the left [DC lens level] reaches "0".
Note: the OSD counter on the right indicates the reference value for DC lenses only.

Camera/Lens Level Adjustment
Adjust the Video output level by pushing the LVL button again or twice if the OSD menu has disappeared.
Use +/- buttons for adjusting desired video level (OSD indication on the right displays video level).

Video Iris Lenses
Initial lens setting
Point the camera at a test chart or scene; avoid highlights for optimum results.
Ensure sufficient scene illumination (>200 lux); the camera does not allow lens adjustment under low light conditions.
Set the Lens ALC potmeter to the central position.
Push LVL button once, adjust the ALC potmeter until the OSD indication on the left [VI lens Level] reaches "0".

Camera/Lens Level Adjustment
Adjust the Video output level by pushing the LVL button again or twice if the OSD menu has disappeared.
Use +/- buttons for adjusting desired video level (OSD indication on the right displays video level).

6 Back focus adjustment

The back focus screw is an 'endless' screw that turns the back focus ring. Turning the screw in either direction will move the sensor chip back and forth from C mount position to CS mount position.
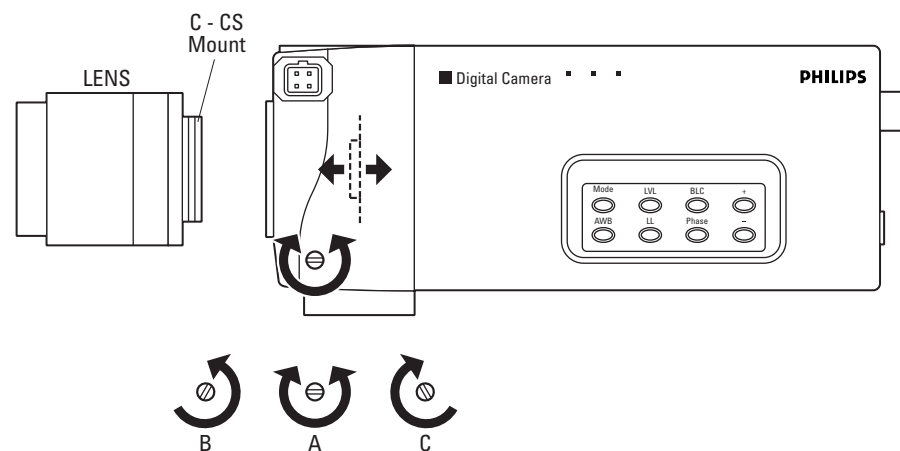
A: Back Focus (Fine adjustment)
B: CS Mount, (Turn till focus)
C: C Mount, (Turn till focus)

Instructions for back focus adjustment:
1. Set the lens distance to infinity.
2. Switch on the power supply to the camera, and switch on your monitor.
3. Aim the camera at an object which is over 15 meters away.
4. Adjust the back focus by turning the screw until the picture on the monitor is sharp.

Note: This adjustment is most accurate with the iris fully open.

7 Electrical Connections

7.1 AC MAINS POWER SUPPLY

Mains voltage models:
LTC0600/50 PAL
LTC0600/60 NTSC

Power cable & inner conductors
Camera models /50 are fitted with 2 wire power cable with Euro plug.
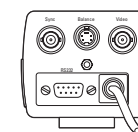- Brown: Live, Reference line lock
- Blue: Neutral

Camera models /60 are provided with 2 wire power cable with polarized US plug.
- Black: Live, Reference line lock
- White: Neutral.
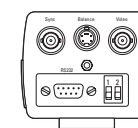Voltage Range: rated 100-240 V AC.
Power dissipation: <8 W.

Mains voltage models:
LTC0600/50 PAL
LTC0600/60 NTSC

7.2 LOW VOLTAGE AC/DC INPUT TERMINAL

Low voltage models:
LTC0600/10 PAL
LTC0600/20 NTSC

Low voltage models:
LTC0600/10 PAL
LTC0600/20 NTSC

Camera models -/10 & -/20 are equipped with screw terminals
Note: Power supply input terminals are isolated from video output terminals.

24 V AC Power Supply
Connect the 24 V AC wires to the camera- input terminal.
- Pin 1: Live, Reference line lock
- Pin 2: Neutral
Voltage Range: rated 12-28 V AC
Power dissipation: <8 W.
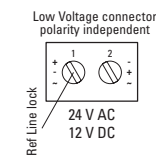Start-up current: <1 A.

12 V DC Power Supply
Connect the 12 V DC wires to the camera- input terminal.
The supply connection is polarity independent.
Voltage range rated: 11 – 36 V DC
Power dissipation: <8 W.
Start-up current: <1 A.

Low Voltage connector
polarity independent

Ref Line lock

24 V AC
12 V DC

7.3 VIDEO CONNECTIONS
① BNC composite video
② Y/C 4 pin connector or
② Balanced 4 pin connector
   (selectable via PC software)

③ Sync. Input   ② Video output   ① Video output

H-V LOCK   Y/C OUT/ Balanced   CVBS OUT

7.4 SYNCHRONIZATION CONNECTION (SYNC)
The vertical and horizontal camera synchronization signals can be generated:
* internal x-tal;
* by the mains supply or the AC low voltage supply (50/60 Hz);
* by a video signal from an external source (PAL/NTSC), sync input BNC ③;
* by a synchronization signal from an external source, sync input BNC ③.
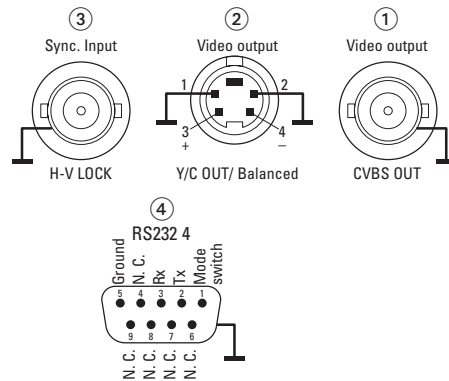
The camera automatically configures for the applied external synchronisation.
For adjustment see chapter 9.

④ RS232 4

Ground N. C. Rx Tx Mode switch
5   4   3   2   1
9   8   7   6
N. C. N. C. N. C. N. C.

7.5 REMOTE CONTROL CONNECTION (RS-232)
The camera can be set up using an optional Windows based PC software tool.
This product can be ordered separately.

Functions available with this software tool are: AGC manual, Automatic. Electronic Light Control (ELC). Dynamic Contrast. Gamma/Compression/Contour, OSD remainder text, Camera set-up logbook etc.

RS-232 communication: Pin 3 = Rx, Pin 2 = Tx, Pin 5 = GND
pin 4,6,8,9 are not connected ④.

Hard wire mode switch between current mode and mode 3
Connect Pin 1 to pin 5 (GND) by a switch. (refer to chapter 9.2.1)
Input pin 1: 10kΩ to +5V. Default active Low. Selection Active High or Disable via PC configuration tool.

RS-232 Connector functions
• Camera system remote control.
• Mode selection
• Advanced Camera set-up via PC based Configuration tool LTC 0650/00.
The windows based configuration is a separate Philips product which is not included with the camera itself. Functions available with this software tool are: Mode set-up and PC logging. AGC manual, Boost, Automatic. Electronic Light control (ELC). Dynamic Contrast. Gamma/Compression/Contour/Black level. Input/output functions and impedance selections.

8 Mounting the camera
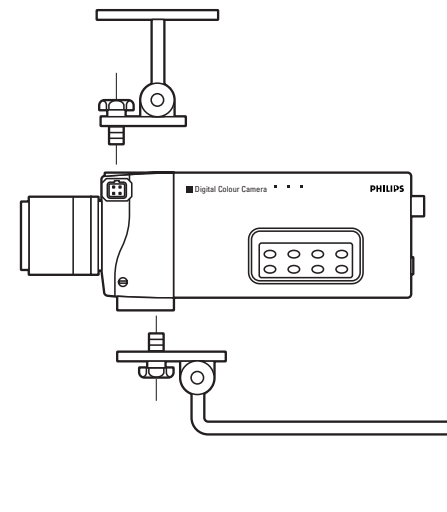
Top mounting: 1/4'' 20 UNC
Max lens weight: 0.5 kg

Bottom mounting: 1/4'' 20 UNC
Max. lens weight: 1.5 kg

9 Operating controls and features

9.1 HOW TO SET UP YOUR CAMERA
The camera has 8 buttons which can be operated from the side of the camera. Feedback is provided by means of On Screen Display. Extended setup functions are possible via the software configuration tool.
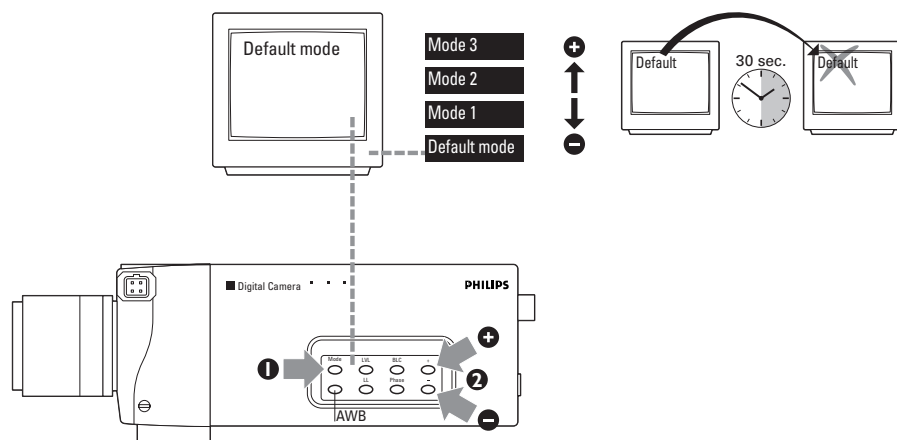
Mode   = Mode selection
LVL   = Video Level
BLC   = Back Light Compensation
AWB   = Auto White Balance
LL   = Linelock
Phase = Linelock-phase, H-phase or Vext phase
+   = Increase or On
-      = Decrease or Off

After pressing a function button, the – or + buttons operate on the selected function:
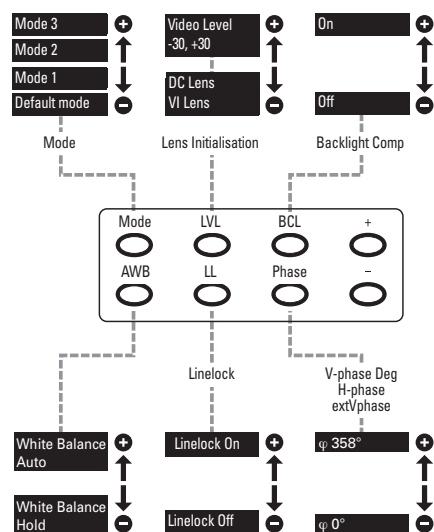   – : Decrease or Off
   + : Increase or On
These functions automatically increase when the button is depressed for a longer period.
For all functions the - and + actions are positive choices. There are no toggle functions and no cycles.

9.2 FUNCTION SET-UP

Use the buttons to change the following settings:

9.2.1 Mode setting

The camera is delivered operating in Mode 1.
In total three modes are available.
Mode 1 = Backlight compensation
Mode 2 = Traffic
Mode 3 = Night (low light mode)

Mode 0 is a non-programmable mode (Default mode) in which factory settings are stored.

9.2.2 Video level setting

The nominal video level setting is 700 mV contrast. Adjustments are possible in +30/-30 steps.

9.2.3 Backlight compensation

Turn on the backlight compensation to improve the image quality when you have a scene where the background features a high level of illumination.
To adjust the amount of back light compensation the use of the software configuration tool is needed.

9.2.4 Automatic White Balance

The white balance setting automatically controls the different color components in the picture to obtain the most natural color reproduction.
Automatic white balance control is provided between 2700 K to 10,000 K.

9.2.5 White Balance Autostore

The white balance autostore automatically adjusts the cameras; white balance & stores this setting for further use.

9.2.6 Linelock setting

Use this button to select between internal synchronisation and linelock. The camera will switch to external lock when an external lock source is connected (see 9.2.7-9.2.9)
When DC is supplied, the camera selects internal synchronisation.

9.2.7 Linelock Phase
This function is active when the camera operates in linelock mode.

9.2.8 H Phase
This function is active when the camera operates with external synchronisation (H+V). Use the H-phase setting to adjust Horizontal timing differences when cameras are H-V synchronised. Input standard CVBS synchronisation signals.

9.2.9 ext V Phase
This function is active when the camera operates with external synchronisation. (External V)
Use the extV phase setting to adjust V phase differences when cameras are used in a system. Input; Positive V-pulse, 8-50% duty cycle, 5 V CMOS level.

10   Specifications

LTC 0600/10 models, PAL

Pick-up Device:	752 (H) x 582 (V) active pixels, Interline Transfer CCD.
Scanning Area:	7.95 (H) x 6.45 (V) mm. Equivalent to 1/2" diagonal scanning area.
Scanning PAL:	625 lines / 50 fields / 25 frames, interlaced
Horizontal:	15.625 kHz
Vertical:	50 Hz

LTC 0600/20 models, NTSC

Pick-up Device:	768 (H) x 494 (V) active pixels, Interline Transfer CCD.
Scanning Area:	7.95 (H) x 6.45 (V) mm. Equivalent to 1/2" diagonal scanning area.
Scanning PAL:	525 lines / 60 fields / 30 frames, interlaced
Horizontal:	15.734 kHz
Vertical:	60 Hz

Horizontal Resolution: 480 TVL
MTF: $\geq$ 45 % at 4 MHz

Sensitivity:

		Usable Picture	Full Video
Scene illumination:[1]	fc	0.03	0.17
	lx	0.3	1.7
Imager illumination:	fc	0.003	0.02
	lx	0.03	0.2

[1] for f/1.2 lens, 89% scene reflectance and 18 dB AGC

Signal-to-Noise:	50 dB at 1.7 lux (0.17 fc) sensor illumination (Unified weighting filter in accordance with CCIR Rec. 567)

AGC:	18 dB
Selectable[2]:	24 dB
Automatic shutter:	up to 1/100,000 sec.
Selectable[2]:	ON, OFF, Flickerless
Manual shutter:	1/60 up to 1/10,000
Selectable[2]:	
Auto Black:	ON, OFF
Selectable[2]:	
Black level:	15 fixed levels
Contouring:	H and V symmetrical,
Selectable[2]:	15 fixed levels, Automatic and OFF
Compression:	White Compression
Selectable[2]:	15 fixed levels and OFF
Gamma:	Contrast Enhancement
Selectable[2]:	15 fixed level, 0.25 up to 1
White Balance:	Auto sensing (TTL)
Auto AWB:	2700 K to 10,000 K
Auto store:	2700 K to 10,000 K

Video Output

Video output 1:	BNC isolated from mechanical earth, 75 Ω, AC coupled, nominal 1 V$_{[p-p]}$ Pal or NTSC composite,
Video output 2:	4 pin S-VHS connector 75 Ω, AC coupled S-VHS. Level: Y 1 V$_{[p-p]}$, C, 300 m V$_{[p-p]}$. or
Selectable[2]:	Balanced output. 2 V$_{[p-p]}$ into 150 Ω. *Unbalance -20 dB at 5 MHz*

Synchronization: Internal crystal reference, Line-locked, H/V-lock, ext V-lock

Sync. Input	BNC isolated from mechanical earth
Input impedance:	Selectable[2]: 75 Ω or >10 kΩ AC coupled
External H/V lock:	Nominal CVBS 1 V$_{[p-p]}$ (min. 150 mV, max. 600 mV)
External V-lock:	Positive V-pulse, 8%-50% duty cycle, Standard 5 V, Cmos level
Capture time:	$\leq$2 s.

Serial Input/Output:	Sub D, 9-pole connector, RS 232 Selectable[2]): 1200, 2400, 4800 baud. Connector pinnings: TX=2, Rx=3, Ground=5
User input:	Switch to Mode 3, Mode select input=1, Ground=5. Pull-up 10 kΩ to +5V
Selectable[2]:	Active low or active high or disable.

[2] Selection by PC software LTC0650/00

Lens:
    DC-iris   Control & Drive 40 mA max
    Video-iris   9-10 Vdc 40 mA max. Video drive level 1 V$_{[p-p]}$

MECHANICAL

Dimensions:	65 x 70 x 149 mm (HxWxD*) * including connectors
Weight:	0.6 kg
Camera mounting:	Top and Bottom $^1/_4$" 20 UNC
Lens mounting:	C & CS
Lens weight:	0.5 kg top mounting, 1.5 kg bottom mounting

Power:
    LTC 0600/10 & -/20: Screw terminals
    LTC 0600/50:   2-strand power cable with Euro plug
    LTC 0600/60:   2-strand power cable with polarized US plug
Power supply input terminals are isolated from video output terminals

ENVIRONMENTAL

Temperature range:
    Operating: -10 to 55 °C, (14 to 131 °F)
    Storage: -40 to 70 °C, (-40 to 158 °F)

Operating Humidity: 5% to 93% non condensing

Electro-Magnetic Compatibility:
    Emission: EN 50081-1, FCC Part 15 Class B
    Immunity: EN 50130-4

Safety:
    LTC 0600/10 and /50: EN 60950
    LTC 0600/20 and /60: UL 6500 and CSA -E65 - 94.

Accessories: Configuration Software LTC 0650/00, supporting Windows 3.x,
                          Windows 95/98/NT

Deutsch

Inhalt