



Ceiling DocCam™ II User Manual

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You're Virtually ThereSM

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Ceiling DocCam II™ User Manual

ClearOne Part No. 800-171-066 May 2004 (Rev. 1.0)

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Introduction

The Ceiling DocCam™ II is a ceiling-mounted document camera that displays images on monitors, plasma screens, video projectors and videoconferencing systems. It is ideal for presenting or sharing any type of object or document, from detailed images to large blueprints. The camera is installed in the ceiling above a conference table and has a low profile design that is appropriate for any room decor. Additional features include:

- **Laser pointer** providing accurate document positioning.
- **Single cable** carrying power, video and control, simplifying installation and connection.
- **IR remote** with increased functionality including zooming presets, brightness control and laser operation.
- **User accessible DIP switches** that allow the Ceiling DocCam II to respond to different video codec remotes.

Services and support

If you need additional information on how to install, set up or operate your Ceiling DocCam II, please contact us. We welcome and encourage your comments so we can continue to improve our products and better meet your needs.

Technical support

Tel: 1-800-283 5936 (USA) or
1-801-974-3760

Fax: 1-801-977-0087

E-mail: tech.support@clearone.com

Web: www.clearone.com

Sales and customer service

Tel: 1-800-945-7730 (USA) or
1-801-975-7200

Fax: 1-800-933-5107 (USA) or
1-801-977-0087

E-mail: sales@clearone.com

Product returns

All product returns require a return materials authorization (RMA) number. Please contact ClearOne Technical Support before attempting to return your product. Make sure you return all the items that shipped with your product.

Unpacking

Ensure that you received the following parts:

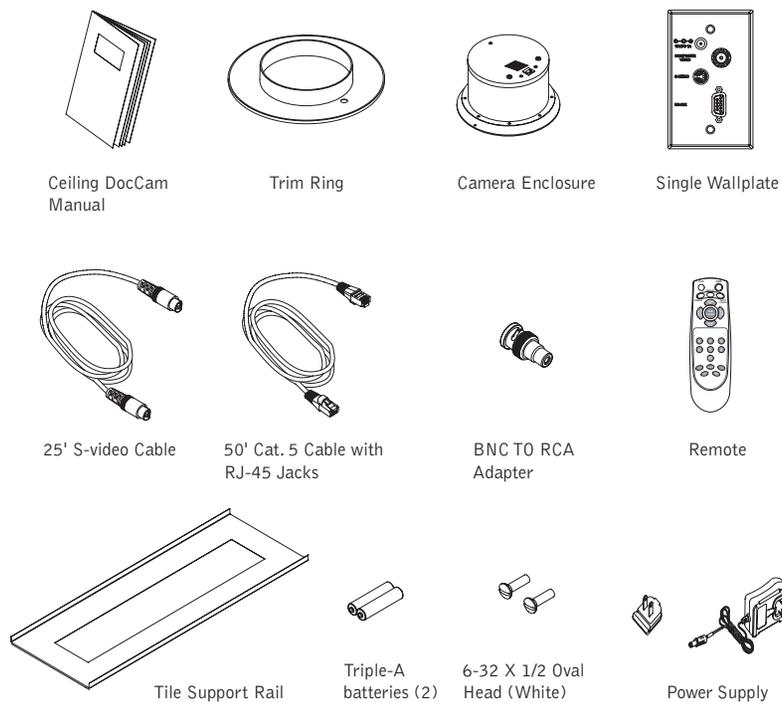


Figure 1. Unpacking items

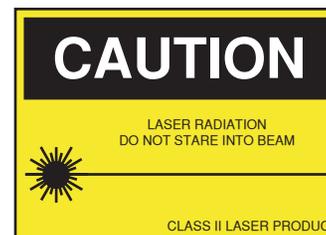
 **Note:** ClearOne is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

Important safeguards

- Read and understand all instructions before using.
- Do not operate the Ceiling DocCam II if the power cord is damaged or if the Ceiling DocCam II has been dropped or damaged. A qualified service technician must examine the Ceiling DocCam II before operating.
- Do not attempt to take the Ceiling DocCam II apart. There are no user-serviceable components inside.
- Clean exterior of Ceiling DocCam II by wiping with a clean, damp cloth; do not use abrasive chemicals.
- Do not store or operate the Ceiling DocCam II under the following conditions:
 - ~ A temperature above 104° F (40° C) or below 32° F (0° C)
 - ~ Environments with high humidity
 - ~ Dusty environments
 - ~ In inclement weather
 - ~ Under severe vibration

 **Attention:** Use only the power supply provided with the Ceiling DocCam II. Use of any unauthorized power supply will void any and all warranties.

 **Attention:** Laser radiation is present. To avoid eye damage, do not stare directly into laser beam.



Product overview

Camera enclosure

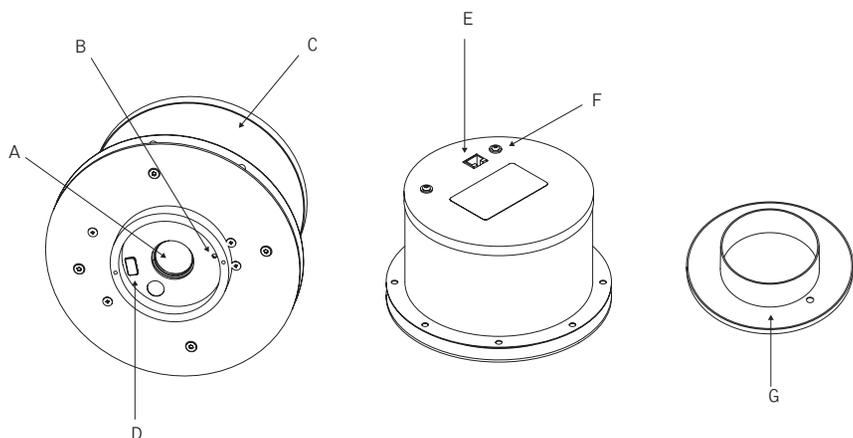


Figure 2. Front and back of camera enclosure and trim ring

- A. **Lens.** The lens has motorized zoom capabilities up to 25X optical and 12X digital for a total of 300X.
- B. **Positioning indicator/laser.** The laser ensures proper document orientation by indicating where a document should be placed for best viewing. Laser displays for five seconds when camera is first powered on.
- ⚠ Attention:** Laser radiation is present. To avoid eye damage, do not stare directly into laser beam.
- C. **Camera enclosure.** This metal enclosure houses the camera electronics.
- D. **DIP switches.** These are user configurable switches for specific third party remotes.
- E. **RJ-45 connector.** This connector provides S-video, composite video, RS-232 and power to the rear of the wall plate using the provided 50' Cat. 5 plenum-rated cable.
- F. **Threaded inserts.** These inserts enable attachment to a standard electrical box (not provided) using standard conduit connectors.
- G. **Trim ring.** The trim creates a finished look when the camera is installed and holds the camera and tile together.

Front and back wall plate connections

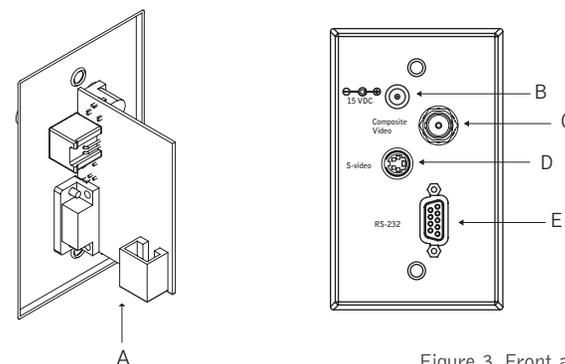


Figure 3. Front and back wall plate

- A. **RJ-45 Connector.** The RJ-45 jack connects to the RJ-45 connector on the camera enclosure using a Cat. 5 cable.
- B. **15 VDC.** The 15 VDC power supply jack.
- C. **Composite.** This output jack allows the Ceiling DocCam II to be connected to video display devices that require a composite signal such as codecs, TV monitors, VCRs and LCD and DLP projectors.
- D. **S-video.** This output jack allows the Ceiling DocCam II to be connected to video display devices that require an S-video signal such as video conferencing systems, video capture cards, TVs and video to USB adapters. If your video display device has both S-video and composite, use S-video for the highest quality image.

Both the S-video and composite outputs are always live making it possible to connect the camera to two separate display devices at the same time.
- E. **RS-232.** This output allows you to connect the camera to control systems such as Crestron or AMX.

Remote

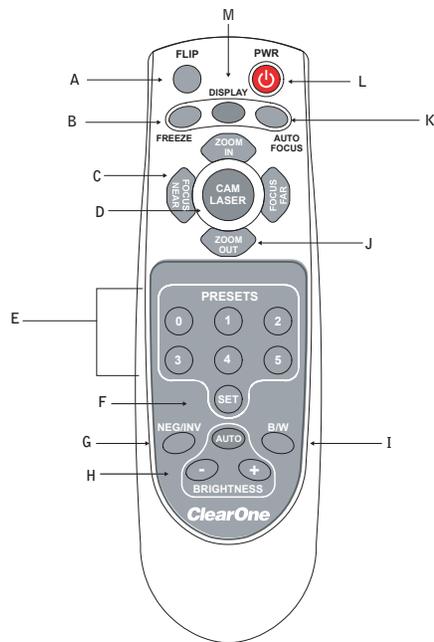


Figure 4. ClearOne remote

- A. **Flip.** Rotates image 180° on video display device.
- B. **Freeze.** Freezes current image until you press again to release and return to live view.
- C. **Focus.** Focus Near for close up views. Focus Far for distance views.
- D. **Cam Laser.** Displays a laser pointer with momentary on (5 seconds) and auto off. Use the laser pointer to position documents directly under the camera.
- E. **Presets.** Stores up to six programmed camera setting presets (0-5).
- F. **Set.** Press to program presets.
- G. **Neg/Inv.** Makes image a negative. This is useful in hiding highlighted portions of documents, by making them appear not highlighted.
- H. **Brightness.** Auto automatically adjusts brightness, (+) manually brightens image and (-) manually dims image.
- I. **B/W.** Black/White displays image in black and white.
- J. **Zoom.** Zoom In zooms for small images such as a stamp. Zoom Out zooms out for large images or documents such as a blueprint.
- K. **Auto Focus.** Automatically focuses an image.
- L. **Power.** Turns the camera on or off.
- M. **Display.** Shows icons for all camera controls and any messages associated with the presets.

Installation

Before you install

The following equipment is needed for proper installation:

- String or plumb bob
- Utility knife
- Flathead screwdriver

Be sure to check above the ceiling tile where you plan to install the camera to make sure the area is clear and that there is enough room for the Ceiling DocCam II and all of its components. Use the string or plumb bob to align and center the camera directly above the viewing area. Use the utility knife to cut a hole in the tile and the screwdriver to attach the white trim ring to the camera enclosure.

Mounting the camera

The Ceiling DocCam II is an integrated document/object camera designed to be installed in a suspended ceiling above a table. Recommended ceiling heights are between 8 and 12 feet. The camera module enclosure and the tile support rail allow for exceptional positioning freedom when used with 2'x2' and 2'x4' ceiling tiles. The camera may be used with any tile 2' wide. The tile support rail distributes the weight of the camera into the grid and prevents tile warping. The diagram in Figure 5 shows the completed installation.

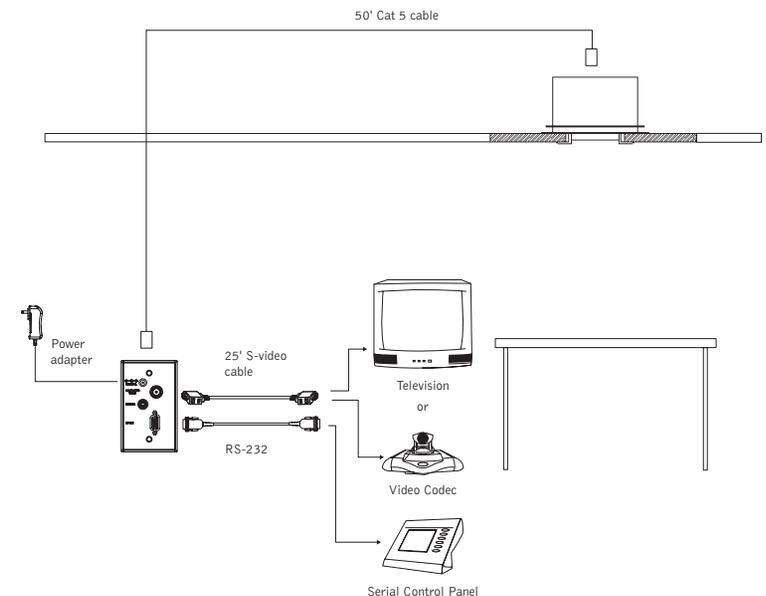


Figure 5. Complete installation

To mount the camera

1. Attach a string or plumb bob to the ceiling tile with a thumb tack.
2. Position the string directly over ample table space or work surface to allow easy document and object positioning.
3. Using a sharp utility knife, score a $3\frac{1}{2}$ " diameter hole into the front of the tile centered on the string.

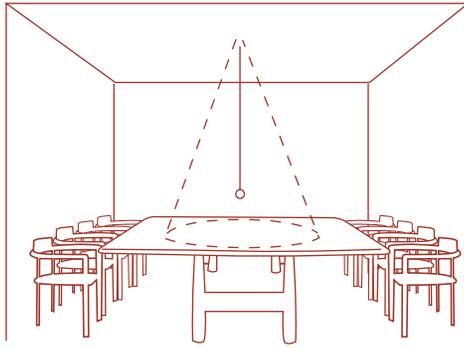


Figure 6. Positioning the camera

4. Cut out the $3\frac{1}{2}$ " hole.
5. Place the tile support rail on the back side of the tile and center over the hole.
6. Rotate the camera enclosure module so that the positioning indicator is oriented toward the monitor or display device. This position is standard document camera orientation.

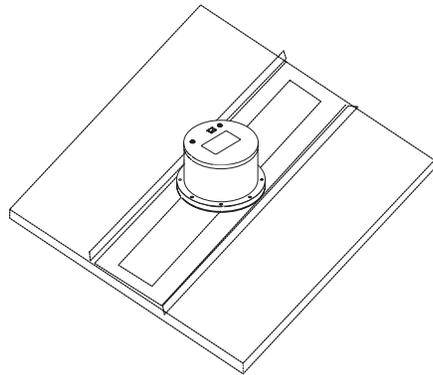


Figure 7. Support braces on 2'x2' ceiling tile

-  **Note:** If the positioning indicator is not oriented toward the monitor or display device, your image will not be oriented properly.
7. Fit the tile ring through the hole in the tile, sandwiching the tile support between the camera enclosure and the tile. The camera tile ring will fit into the $3\frac{1}{2}$ " opening from the rear of the tile.
 8. Position the tile above the ceiling.
 9. Attach the white trim ring to the camera enclosure from the front of the tile and tighten gently. This will pull the trim ring, camera module and tile support rail together and firmly hold the camera in position against the ceiling tile.

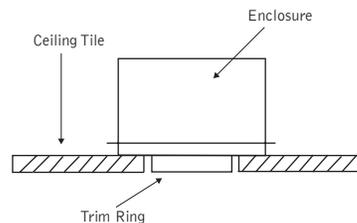


Figure 8. Enclosure and trim ring side view

Connecting cables

A single RJ-45 cable connects to the back of the wall plate providing S-video, composite video, power and RS-232 control. The front of the wall plate provides the break-out connections for S-video, composite video, power and RS-232 control. The wall plate may be attached to a standard single gang wall box or placed in an equipment rack in a surface mount wall box. A 50' Cat. 5 cable is included to connect the camera enclosure to the back of the wall plate. It is best to use the included Cat. 5 cable. In situations where a third party cable is necessary, the cable must be between 10' and 200' long. Using a longer cable may cause the camera to lose power.

To connect to the wall plate

1. Plug the Cat. 5 cable into the RJ-45 connector on the rear of the camera enclosure.
2. Feed the wire through the ceiling to where the wall plate will be connected.
3. Connect the other end of the Cat. 5 cable to the RJ-45 connector on the back of the wall plate.
4. Install the wall plate into an electrical box.

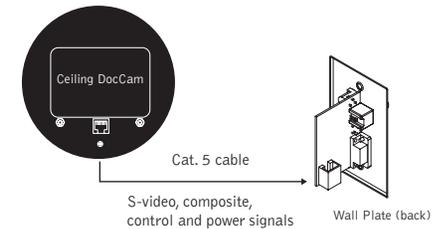


Figure 9. Enclosure with back of wall plate

To connect to the display device and control system

1. Connect the 15 VDC power supply plug into the 15 VDC jack.
2. Plug the power supply into a standard wall outlet (100V-240V).
3. Using the 25' S-video cable, connect the S-video jack to the display device at the S-video connector.

 **Note:** For display devices that do not have an S-video connector, use a composite cable (not included) to connect the composite jack to the composite connector on your display device.

4. Connect a serial cable to the control system, if needed.

 **Attention:** Use only the power supply provided with the Ceiling DocCam II. Use of any unauthorized power supply will void warranty.

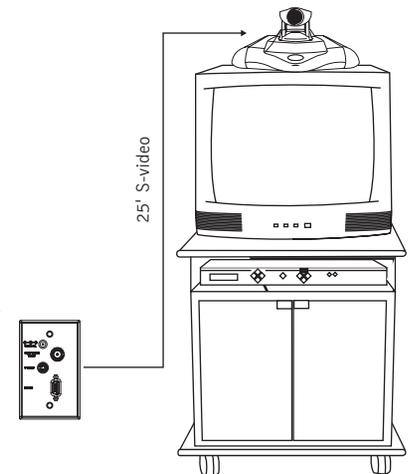


Figure 10. Connection to a video codec

Configuring for remote controls

The Ceiling DocCam II can be programmed to work with the remotes listed below. DIP switches on the camera enclosure must be configured in order to work with these remotes. See Figure 2 on page 4 for exact location of DIP switches. Use the following diagram to program your Ceiling DocCam II correctly.

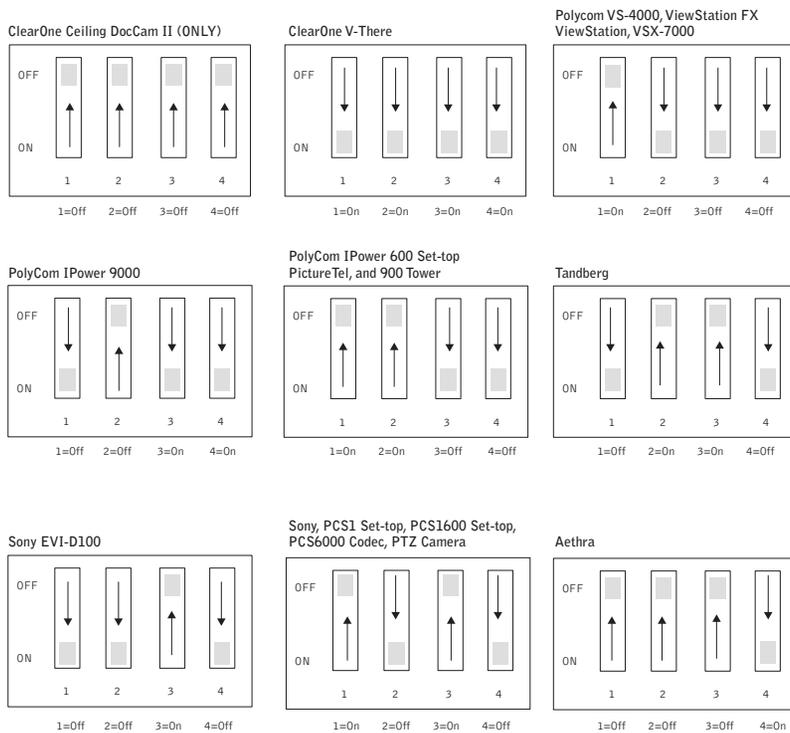


Figure 11. DIP switch configurations

Note: For best performance of the VISCA™ (a trademark of Sony Corporation) commands, set DIP switches to the ClearOne configuration when the camera is connected to the control port of a codec.

Note: After changing the DIP switches, camera must be power cycled.

Programming presets

Presets are used to program defined positions of the camera into a simple, one button preset. You can switch easily from a zoomed in position on a small document to a zoomed out position for documents such as blueprints. This saves the hassle of zooming in and out when presenting documents of a variety of sizes. You can program your ClearOne IR remote with six different presets labeled 0-5.

Note: These presets will only work with the ClearOne IR remote.

To program a preset

1. Zoom in or out to desired view.
2. Press the Set button once. The on-screen notification will indicate "Set number."
3. Press the selected preset button (0-5).

Note: If you want to reset a preset, just program a new preset using that same number. The new preset will override the old one.

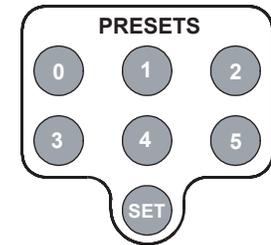


Figure 12. Presets

Operation

Using your codec remote

The only function you can control on the Ceiling DocCam II from your codec remote is the zoom in or zoom out. All other functions must be performed using the ClearOne remote.

Using your ClearOne remote

The ClearOne remote will function in all DIP switch configurations. Please refer to Figure 4 on page 6 for a complete list of remote buttons.

To zoom

1. Press the **Zoom Out** button to view large documents.
2. Press the **Zoom In** button to view documents up close.

 **Note:** When the zoom indicator passes the divider on the display bar, the camera moves from optical zoom to digital zoom. Optical zoom uses the optical lens to enlarge the image. Digital zoom crops a small section of the picture and then enlarges it to screen size. This can leave the zoomed in image looking pixelated.

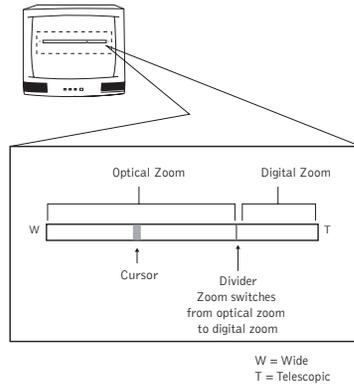


Figure 13. Zoom display

To focus an image

1. Press the **Auto Focus** button to automatically focus the camera.
2. Press the **Focus Far** button to manually focus a zoomed out view.
3. Press the **Focus Near** button to manually focus a zoomed in view.

To use the camera laser

1. Press the **Cam Laser** button.
2. Center document under laser.

The camera laser will turn off automatically after 5 seconds.

To adjust the brightness

1. Press the **Auto** button to have the camera automatically adjust the brightness of the on-screen image.
2. Press the **-** button to manually dim the on-screen image.
3. Press the **+** button to manually brighten the on-screen image.

Viewing areas

Viewing area depends on the distance between the ceiling and the table. Use the following tables to determine the maximum and minimum viewing areas of the Ceiling DocCam II for distances of 5.5', 6.5' and 7.5'. (Most tables are about 2.5' and ceiling heights vary between 8', 9' and 10'). If the distance differs from the examples given, use the table to estimate the viewing area. There is also a distance calculator available online at www.clearone.com.

Distance between the ceiling and table : 5.5'

| | Height | Width | Diagonal |
|-----------------------------------|--------|-------|----------|
| Zoomed out max | 2.90' | 3.87' | 4.84' |
| Zoomed in optical 25x | .13' | .17' | .21' |
| Zoomed in optical 25x digital 12x | .06' | .09' | .11' |

Distance between the ceiling and table : 6.5'

| | Height | Width | Diagonal |
|-----------------------------------|--------|-------|----------|
| Zoomed out max | 3.43' | 4.58' | 5.72' |
| Zoomed in optical 25x | .15' | .20' | .25' |
| Zoomed in optical 25x digital 12x | .08' | .10' | .13' |

Distance between the ceiling and table : 7.5'

| | Height | Width | Diagonal |
|-----------------------------------|--------|-------|----------|
| Zoomed out max | 3.96' | 5.28' | 6.60' |
| Zoomed in optical 25x | .17' | .23' | .29' |
| Zoomed in optical 25x digital 12x | .09' | .12' | .15' |

Custom cable information

If you need a longer cable, for best performance use a Cat. 5E or Cat. 6 cable with a 200' maximum and 24 AWG. Use the following pinouts for the Cat. 5 or Cat. 6 cable.

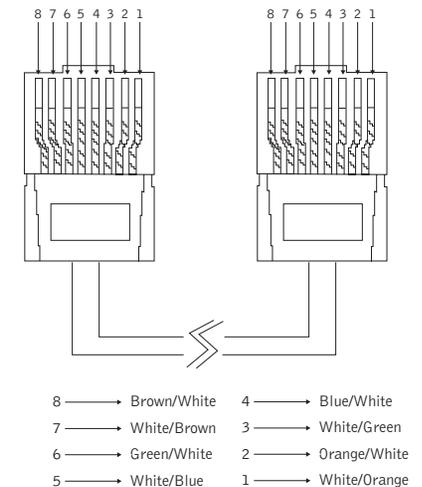


Figure 14. Cable pinouts

Troubleshooting

| Problem | Try this |
|--|---|
| No video image | <p>Verify that the Cat. 5 is connected between the RJ-45 jack on the back of the camera module enclosure and the RJ-45 jack on the back of the wall plate.</p> <p>Make sure the provided 15 VDC power supply is plugged into a wall outlet and the 15 VDC jack on the wall plate.</p> <p>Check the S-video or composite cables to verify they are properly connected, ensure video display device is powered and make sure the display device is set to the correct video source.</p> |
| The IR remote control does not work | <p>Verify fresh batteries are installed and positioned correctly.</p> <p>Remove power supply plug from the 15 VDC jack on the wall plate. Wait a few seconds and reinsert the power supply plug.</p> |
| Can't see an entire drawing/page clearly on the video screen | <p>When large documents, such as blueprints, are being viewed, the smallest details may not appear perfectly. The resolution only allows zoomed in images to be clear. However, in viewing normal size documents, details should be clear.</p> |

Appendix

Specifications

Dimensions (Height x Diameter)

Enclosure: 4.5" x 6.5" (11.43 x 16.51 cm)
 Ceiling cutout: 3½" (8.9 cm) diameter
 Trim ring: 5.5" (14 cm) diameter white

Weight

4 lb (1.81 kg)

Video Format

NTSC or PAL

Image Sensor

1/6 Type Super

Pixels

Effective: Approx. 688,000

Horizontal Resolution

480+ TV lines

Sensitivity

2.5 Lux

SNR (Min)

49 dB

Camera Features

White balance: Auto
 Brightness: Auto/Manual
 Backlight compensation: Auto
 Iris: Auto
 Shutter: Auto exposure
 Focus: Auto/Manual
 6 Presets
 Laser (momentary-on for document positioning)
 Image Freeze
 Image Flip
 Black and White (color off)
 Pos/Neg - Negative Art

Focal Range

Infinity to 800mm (Telescopic) -35mm (Wide)

Lens (Horizontal Angle)

45 degrees (wide end) to
 2.0 degrees (telescopic end)

Zoom

Optical 25X zoom, f=2.4 mm (wide) to 60 mm (tele), F1.6 to F2.7
 Digital 12X (300X total with optical zoom)

Video Output

S-video and composite video (concurrent)

Control

IR remote (Either ClearOne or Selectable),
 VISCA and IP control with optional Rack
 Mount Interface Kit

Control Interface

VISCA (TTL Signal Level; Baud Rate: 9.6Kbps,
 19.2Kbps; Stop Bit: 1 Selectable)

Wall Plate

S-video, composite video, power, RS-232

Enclosure

Plenum-rated

Power

Power Supply: 15 VDC,
 100-240 VAC, 50/60 HZ
 Consumption: 1.0 mA

Operating Temperature

32° F to 122° F (0° C to 50° C)

Cables

50' (15.24 m) plenum Cat. 5 cable with RJ-45
 connectors, 25' (7.62 m) S-video cable

Models

910-171-066
 910-171-066-PAL

Warranty

ClearOne Communications, Inc. (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this product be defective, the Manufacturer agrees, at its option, to:

- Repair or replace any defective part free of charge (except transportation charges) for a period of two years from the date the end user is invoiced for the product, provided the end user returns the product to ClearOne Communications or an authorized ClearOne dealer according to the Product Return and Repair statement set forth below;

This warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

Product Return and Repair

1. Return to Seller if Purchased Through an Authorized Dealer
 - a. Proof of purchase date from reseller within warranty period must be provided by the end user.
 - b. Seller may, at its discretion, provide an immediate exchange or repair or may return the unit to the Manufacturer for repair.
2. Return to Manufacturer
 - a. An RMA (return merchandise authorization) number must be issued to the end user from ClearOne technical support.
 - b. The end user must return the product to ClearOne with proof of purchase (showing purchase date) for a warranty claim, and display the RMA number on the outside of the shipping package.

THIS WARRANTY IS VOID IF:

- A. The product has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,
- B. The product has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,
- C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the product which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the product; or,
- D. The product's original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE PRODUCT. MANUFACTURER'S MAXIMUM LIABILITY HEREUNDER SHALL BE THE AMOUNT PAID BY THE END USER FOR THE PRODUCT. No person or entity authorized to assume any obligation or other liability in connection with the products. No action, regardless of form, arising out of or relating to the product or this warranty, may be brought by end user more than two (2) years after the cause of action has accrued.

Manufacturer shall not be liable for punitive, consequential, or incidental damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the end user due to a malfunction in the purchased product. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the end user shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the product, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the product during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

This warranty extends only to the original end user and is not assignable or transferable. This warranty is governed by the laws of the State of Utah, without regard to the conflicts of interests provisions thereof.

ClearOne Communications, Inc.
1825 Research Way
Salt Lake City, Utah 84119

FCC Part 15/ICES-003 Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference including interference that may cause undesired operation of the device.

Changes or modifications not expressly approved by ClearOne Communications could void the user's authority to operate the equipment.

European Compliance

This equipment has been approved in accordance with Council Directive 1999/5/EC "Radio Equipment and Telecommunications Equipment". Compliance of the equipment with the Directive is attested by the application of the CE mark on the equipment.



EC Declaration of Conformity

| | |
|--------------------------------------|---|
| Application of Council Directive(s): | 1999/5/EC Radio equipment and Telecommunications Terminal Equipment (R&TTE) Directive |
| Manufacturer's Name: | ClearOne Communications |
| Manufacturer's Address: | 1825 West Research Way Salt Lake City, Utah 84119 U.S.A. |
| Model No.: | Ceiling DocCam II 910-171-066-PAL, |

Standard(s) to which Conformity is declared:

89/336/EEC "Electromagnetic Compatibility (EMC) Directive":

| | |
|------------------------------|---|
| EN 55022: 1994 (Emissions) | Specification for limits and methods of measurement of radio interference characteristics of information technology equipment |
| EN 61000-3-2:1995/A1/A2:1998 | Part 3: Limits - Section 2: Limits for harmonic current emissions. |
| EN 61000-3-3:1995 | Section 3: Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current up to and including 16 A |
| EN 55024: 1998 (Immunity) | Information technology equipment - Immunity characteristic. Limits and methods of measurement |
| EN 61000-4-2: 1995/A1:1998 | Electrostatic Discharge |
| EN 61000-4-3: 1996/A1:1998 | Radiated RF Immunity |
| EN 61000-4-4: 1995 | Electrical Fast Transients |
| EN 61000-4-5: 1995 | Lighting Surge |
| EN 61000-4-6: 1996 | Conducted RF Immunity |
| EN 61000-4-11: 1994 | Voltage Dips and Voltage Interruptions |

73/23/EEC "Low Voltage Directive (LVD)":

| | |
|-------------------|---|
| IEC 60950-1: 2003 | Safety of Information Technology Equipment, Including Electrical Business Equipment |
|-------------------|---|

Manufacturer

Signature

Roger J. Midgley

Full Name

Project Manager

Position

Legal Representative in Europe

Signature

Martin Offwood

Full Name

Managing Director EMEA North

Position

RS-232 control information

 **Note:** For best performance of the VISCA commands, set DIP switches to the ClearOne configuration when the camera is connected to the control port of a codec.

Overview of VISCA

In VISCA a device that sends commands, such as a computer, is called the controller. The device that receives commands such as a camera is called the peripheral device. The parameters of RS-232C are as follows.

Communication speed: 9.6 kbps/19.2 kbps/38.4 kbps

- Data bits: 8
- Start bit: 1
- Stop: 1
- Non parity

Flow control using XON/XOFF and RTS/CTS, etc., is not supported.

VISCA Communication Specifications

Command and inquiry

- **Command**
Sends operational commands to the camera.
- **Inquiry**
Used for inquiring about the current state of the camera.

| | | |
|---------|-----------------------|--|
| | Command Packet | Note |
| Inquiry | 81 QQ RR ... FF | QQ ¹⁾ = Command/Inquiry RR ²⁾ = Category code |

¹⁾QQ = 01 (Command), 09 (Inquiry)

²⁾RR = (Interface), 04 (camera 1), 06 (Pan.Tilter), 07 (camera 2)

Responses for commands and inquiries

- **ACK Message**
Returned by the camera when it receives a command. No ACK message is returned for inquiries.
- **Completion message**
Returned by the camera when execution of commands or inquiries is completed. In the case of inquiry commands, it will contain reply data for the inquiry after the 3rd byte of the packet. If the ACK message is omitted, the socket number will contain 0.

| | |
|------------------------|---------------------|
| | Reply Packet |
| Ack | 90 41 FF |
| Completion (commands) | 90 51 FF |
| Completion (inquiries) | 90 51 FF |

- **Error message**

When a command or inquiry command could not be executed or failed, an error message is returned instead of the completion message.

| | |
|-------------|----------------------------------|
| 90 61 01 FF | Message length error (>14 bytes) |
| 90 61 02 FF | Syntax Error |
| 90 61 03 FF | Command buffer full |
| 90 61 04 FF | Command Cancelled |
| 90 61 05 FF | No socket (to be cancelled) |
| 90 61 41 FF | Command not executable |

Command execution cancel

To cancel a command which has already been sent, send the IF_Clear command as the next command. To cancel one of any two commands which have been sent, use the cancel message.

| | |
|--------|----------------------|
| | Cancel Packet |
| Cancel | 81 21 FF |

An error message will be returned for this command, but this is not a fault. It indicates that the command has been cancelled.

VISCA Command/ ACK Protocol

| Command | Command Message | Reply Message | Comments |
|---------------------|-----------------------------|---|--|
| General Command | 81 01 04 38 02 FF (Example) | 90 41 FF (ACK)+90 51 FF (Completion) 90 42 FF 90 52 FF | Returns ACK when a command has been accepted, and Completion when a command has been executed. |
| | 81 01 04 38 FF (Example) | 90 60 02 FF (Syntax Error) | Accepted a command which is not supported or a command lacking parameters. |
| | 81 01 04 38 02 FF (Example) | 90 60 03 FF (Command Buffer Full) | There are two commands currently being executed and the command could not be accepted. |
| | 81 01 04 08 02 FF (Example) | 90 61 41 FF (Command Not Executable) 90 62 41 FF | Could not execute the command in the current mode. |
| Inquiry Command | 81 09 04 38 FF (Example) | 90 50 02 FF (Completion) | ACK is not returned for the inquiry command. |
| | 81 09 05 38 FF (Example) | 90 60 02 FF (Syntax Error) | Accepted an incompatible command. |
| Address Set | 88 03 01 FF | 88 30 02 FF | Returned the device address to +1. |
| IF_Clear(Broadcast) | 88 01 00 01 FF | 88 01 00 01 FF | Returned the same command. |
| IF_Clear (for x) | 81 01 00 01 FF | z0 50 FF (Completion) | ACK is not returned for this command. |
| Command Cancel | 81 21 FF | z0 61 04 FF (Command Canceled) | Returned when the command of the socket specified is cancelled. Completion for the command cancelled is not returned. |
| | | z0 61 05 FF | Returned when the command of the specified socket has already been completed or when the socket number specified is wrong. |

VISCA Camera-Issued Messages

ACK/Completion Messages

| | Command Messages | Comments |
|------------|-----------------------------|--|
| ACK | z0 4y FF (y:Socket No.) | Returned when the command is accepted. |
| Completion | z0 5y FF (y: Socket No.) | Returned when the command has been executed. |

z=Device address +8

Error Messages

| | Command Messages | Comments |
|------------------------|-------------------------------|---|
| Syntax Error | 90 60 02 FF | Returned when the command format is different or when a command with illegal command parameters is accepted. |
| Command Buffer Full | 90 60 03 FF | Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received. |
| Command Cancelled | 90 6y 04 FF (1:Socket No.) | Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for command is not returned. |
| No Socket | 90 6y 05 FF (1:Socket No.) | Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified. |
| Command not executable | 90 6y 41 FF (1:Socket No.) | Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus. |

Network Change Message

| | Command Message | Comments |
|----------------|-----------------|------------------------------------|
| Network Change | z0 38 FF | Issued when power is being routed. |

Command List

| Command Set | Command | Command Packet | Comments |
|------------------|-----------------|----------------------------|---------------------------------|
| Camera Power | On | 81 01 08 01 01 FF | Power on |
| | Off | 81 01 08 01 00 FF | Power off |
| Laser Power | On | 81 01 08 02 01 FF | Power on |
| | Off | 81 01 08 02 00 FF | Power off |
| | Momentary | 81 01 08 02 02 XX FF | XX=time on from 1 to 10 seconds |
| Address Set | Broadcast | 88 30 01 FF | |
| IF_Clear | Broadcast | 88 01 00 01 FF | |
| CommandCancel | | 81 2p FF | p: Socket No.(=1or2) |
| CAM_Zoom | Stop | 81 01 04 07 00 FF | |
| | Tele (Standard) | 81 01 04 07 02 FF | |
| | Wide (Standard) | 81 01 04 07 03 FF | |
| | Tele (Variable) | 81 01 04 07 2p FF | p=0 (Low) to 7 (high) |
| | Wide (Variable) | 81 01 04 07 3p FF | |
| | Direct | 81 01 04 47 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_DZoom | On | 81 01 04 06 02 FF | Digital zoom ON/OFF |
| | Off | 81 01 04 06 03 FF | |
| | Combine Mode | 81 01 04 36 00 FF | Optical/Digital Zoom Combined |
| | Separate Mode | 81 01 04 36 01 FF | Optical/Digital Zoom Separate |
| | Stop | 81 01 04 06 00 FF | |
| | Tele(Variable) | 81 01 04 06 2p FF | p=0 (low) to 7 (high) |
| | Wide(Variable) | 81 01 04 06 3p FF | |
| | x1/Max | 81 01 04 06 10 FF | x1/Max Magnification Switchover |
| | Direct | 81 01 04 46 00 0p 0q FF | pq: D-Zoom Position |
| | CAM_Focus | Stop | 81 01 04 08 00 FF |
| Far (Standard) | | 81 01 04 08 02 FF | |
| Near (Standard) | | 81 01 04 08 03 FF | |
| Far (Variable) | | 81 01 04 08 2p FF | p=0 (Low) to 7 (high) |
| Near (Variable) | | 81 01 04 08 3p FF | |
| Direct | | 81 01 04 48 0p 0q 0r 0s FF | pqrs: Focus Position |
| Auto Focus | | 81 01 04 38 02 FF | AF ON/OFF |
| Manual Focus | | 81 01 04 38 03 FF | |
| Auto/Manual | | 81 01 04 38 10 FF | |
| One Push Trigger | | 81 01 04 18 01 FF | One Push AF Trigger |
| Infinity | | 81 01 04 18 02 FF | Forced infinity |
| Near Limit | | 81 01 04 28 0p 0q 0r 0s FF | pqrs: Focus Near Limit Position |
| AF Sensitivity | | Normal | 81 01 04 58 02 FF |
| | Low | 81 01 04 58 03 FF | |

| Command Set | Command | Command Packet | Comments |
|-----------------|----------------------|---|---|
| CAM_AF Mode | Normal AF | 81 01 04 57 00 FF | AF Movement Mode |
| | Interval AF | 81 01 04 57 01 FF | |
| | Zoom Trigger AF | 81 01 04 57 02 FF | |
| | Active/Interval Time | 81 01 04 27 0p 0q 0r 0s FF | pq: Movement Time rs: Interval |
| CAM_ZoomFocus | Direct | 81 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF | pqrs: Zoom Position tuvw: Focus Position |
| CAM_Initialize | Lens | 81 01 04 19 01 FF | Lens Initialization Start |
| | Comp Scan | 81 01 04 19 02 FF | Correction of CCD pixel blemishes |
| CAM_WB | Auto | 81 01 04 35 00 FF | Normal Auto |
| | Indoor | 81 01 04 35 01 FF | Indoor Mode |
| | Outdoor | 81 01 04 35 02 FF | Outdoor Mode |
| | One Push WB | 81 01 04 35 03 FF | One Push WB Mode |
| | ATW | 81 01 04 35 04 FF | Auto Tracing White Balance |
| | Manual | 81 01 04 35 05 FF | Manual Control mode |
| | One Push Trigger | 81 01 04 10 05 FF | One Push WB Trigger |
| CAM_RGain | Reset | 81 01 04 03 00 FF | Manual Control of R Gain |
| | Up | 81 01 04 03 02 FF | |
| | Down | 81 01 04 03 03 FF | |
| | Direct | 81 01 04 43 00 00 0p 0q FF | pq: R Gain |
| CAM_BGain | Reset | 81 01 04 04 00 FF | Manual Control of B Gain |
| | Up | 81 01 04 04 02 FF | |
| | Down | 81 01 04 04 03 FF | |
| | Direct | 81 01 04 44 00 00 0p 0q FF | pq: B Gain |
| CAM_AE | Full Auto | 81 01 04 39 00 FF | Automatic Exposure Mode |
| | Manual | 81 01 04 039 03 FF | Manual Control Mode |
| | Shutter Priority | 81 01 04 39 0A FF | Shutter Priority Automatic Exposure mode |
| | Iris Priority | 81 01 04 39 0B FF | Iris priority Automatic Exposure mode |
| | Bright | 81 01 04 039 0D FF | Bright mode (Manual Control) |
| CAM_SlowShutter | Auto | 81 01 04 5A 02 FF | Auto Slow Shutter On/Off ^{a)} |
| | Manual | 81 01 04 5A 03 FF | |
| CAM_Shutter | Reset | 81 01 04 0A 00 FF | Shutter Setting ^{a)} |
| | Up | 81 01 04 0A 02 FF | |
| | Down | 81 01 04 0A 03 FF | |
| | Direct | 81 01 04 4A 00 00 0p 0q FF | pq: Shutter Position |
| CAM_Iris | Reset | 81 01 04 0B 00 FF | Iris Setting |
| | Up | 81 01 04 0B 02 FF | |
| | Down | 81 01 04 0B 03 FF | |
| | Direct | 81 01 04 4B 00 00 0p 0q FF | pq: Iris Position |

a) Some models do not support slow shutter.

| Command Set | Command | Command Packet | Comments |
|-------------------|----------|----------------------------|--------------------------------------|
| CAM_Gain | Reset | 81 01 04 0C 00 FF | Gain Setting |
| | Up | 81 01 04 0C 02 FF | |
| | Down | 81 01 04 0C 03 FF | |
| | Direct | 81 01 04 4C 00 00 0p 0q FF | pq: Gain Position |
| CAM_Bright | Reset | 81 01 04 0D 00 FF | Bright Setting |
| | Up | 81 01 04 0D 02 FF | |
| | Down | 81 01 04 0D 03 FF | |
| | Direct | 81 01 04 4D 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpComp | On | 81 01 04 3E 02 FF | Exposure Compensation ON/OFF |
| | Off | 81 01 04 3E 03 FF | |
| | Reset | 81 01 04 0E 00 FF | Exposure Compensation Amount Setting |
| | Up | 81 01 04 0E 02 FF | |
| | Down | 81 01 04 0E 03 FF | |
| | Direct | 81 01 04 4E 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_BackLight | On | 81 01 04 33 02 FF | Back Light Compensation On/Off |
| | Off | 81 01 04 33 03 FF | |
| CAM_SpotAE | On | 81 01 04 59 02 FF | |
| | Off | 81 01 04 59 03 FF | |
| | Position | 81 01 04 29 0p 0q 0r 0s FF | |
| CAM_Aperture | Reset | 81 01 04 02 00FF | Aperture Control |
| | Up | 81 01 04 02 02 FF | |
| | Down | 81 01 04 02 03 FF | |
| | Direct | 81 01 04 42 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_LR_Reverse | On | 81 01 04 61 02 FF | Mirror Image On/Off |
| | Off | 81 01 04 61 03 FF | |
| CAM_Freeze | On | 81 01 04 62 02 FF | Still Image On/Off |
| | Off | 81 01 04 62 03 FF | |
| CAM_PictureEffect | Off | 81 01 04 63 00 FF | Picture Effect Setting |
| | Neg. Art | 81 01 04 63 02 FF | |
| | B&W | 81 01 04 63 04 FF | |
| CAM_PictureFlip | On | 81 01 04 66 02 FF | Picture Flip On/Off |
| | Off | 81 01 04 66 03 FF | |
| CAM_ICR | On | 81 01 04 01 02 FF | Infared Mode On/Off |
| | Off | 81 01 04 01 03 FF | |
| CAM_Auto ICR | On | 81 01 04 51 02 FF | Auto Infared Mode On/Off |
| | Off | 81 01 04 51 03 FF | |

| Command Set | Command | Command Packet | Comments |
|---------------|-------------------|--|---|
| CAM_Stablizer | On | 81 01 04 34 02 FF | Vibration Correction On/Off |
| | Off | 81 01 04 34 03 FF | |
| CAM_Memory | Reset | 81 01 04 3F 00 0p FF | p: Memory Number (=0 to 5) |
| | Set | 81 01 04 3F 01 0p FF | |
| | Recall | 81 01 03 3F 01 0p FF | |
| CAM_Custom | Reset | 81 01 04 3F 00 7F FF | Starts in this mode at Power on |
| | Set | 81 01 04 3F 01 7F FF | |
| | Recall | 81 01 04 3F 02 7F FF | |
| CAM_Display | On | 81 01 04 15 02 FF (81 01 06 06 02 FF) | Display On/Off |
| | Off | 81 01 04 15 03 FF (81 01 06 06 03 FF) | |
| | On/Off | 81 01 04 15 10 FF (81 01 04 06 06 10 FF) | |
| CAM_Title | Title Set 1 | 81 01 04 73 00 mm nn pp qq 00 00 00 00 00 FF | mm: Vposition, nn: Hposition, pp: Color qq: Blink |
| | Title Set 2 | 81 01 04 73 01 mm nn pp qq rr ss tt uu vv ww FF | mnpqrstuvw: Setting of Display Characters 1st to 10th Character |
| | Title Set 3 | 81 01 04 73 02 mm nn pp qq rr ss tt uu vv ww FF | mnpqrstuvw: Setting of Display Characters 11st to 20 th Character |
| | Title Clear | 81 01 04 74 00FF | Title Setting Clear |
| | On | 81 01 04 74 02 FF | Title Display On/Off |
| CAM_Mute | Off | 81 01 04 74 03 FF | Mute On/Off |
| | On | 81 01 04 75 02 FF | |
| | Off | 81 01 04 75 03 FF | |
| | ON/Off | 81 01 04 75 10 FF | |
| CAM_VPhase | Stop | 81 01 04 05 00 FF | |
| | Up | 81 01 04 05 02 FF | |
| | Down | 81 01 04 05 03 FF | |
| | Up (Step) | 81 01 04 08 2p FF | p=step (1-7) |
| | Down (Step) | 81 01 04 05 3p FF | |
| | Reset | 81 01 04 05 40 FF | Restore factory settings |
| | Direct | 81 01 04 45 00 00 0p 0q FF | pq: V-Phase (00-FF) |
| | 0 degree | 81 01 04 25 00 FF | No Phase Turnover |
| 180 degree | 81 01 04 25 01 FF | Phase Turnover | |

| Command Set | Command | Command Packet | Comments |
|------------------|------------------|---|---|
| CAM_PrivacyZone | SetMask | 81 01 04 76 mm nn 0p 0p 0q 0q 0r 0r 0s 0s FF | mm: Mask Settings nn 00: Modify, 01: New pp: X, qq: Y, rr: W, ss: H |
| | Display | 81 01 04 77 pp pp pp pp FF | Mask Display On/Off pp pp pp pp : Mask Settings (0: Off, 1: On) |
| | SetMask Color | 81 01 04 78 pp pp pp pp qq rr FF | pp pp pp pp: Mask Color Settings qq: Color Setting when 0 is selected rr: Color SETting when 1 is selected |
| | SetPan TiltAngle | 81 01 04 79 0p 0p 0p 0q 0q 0q FF | Pan/Tilt Angle Settings ppp: Pan qqq: Tilt |
| | Move Pan Tilt | 81 01 04 7A 0p 0p 0q 0q rs FF | pp: Pan Speed qq: Tilt Speed r 0: Stop, 1: Right, 2: Le ft s 0: Stop, 1: Up, 2: Down |
| | Set PTzMask | 81 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r FF | Pan/Tilt/Zoom Settings for Mask ppp:Pan, qq: tilt rrr: zoom |
| | GridOn | 81 01 04 7C 02 FF | Grid Display On/Off |
| | GridOff | 81 01 04 7C 03 FF | |
| CAM_KeyLock | Off | 81 01 04 17 00 FF | Camera Control Enable/Disbale |
| | On | 81 01 04 17 02 FF | |
| CAM_IDWrite | | 81 01 04 22 0p 0q 0r 0s FF | pqrs: Camera ID (=0000 to FFFF) |
| CAM_ExternalLock | INT | 81 01 04 55 00 FF | Internal Mode |
| | Line Lock | 81 01 04 55 01 FF | Line Lock mode |
| CAM_Alarm | On | 81 01 04 6B 02 FF | Alarm On/Off |
| | Off | 81 01 04 6B 03 FF | |
| | SetMode | 81 01 04 6C pp FF | PP: Mode Settings 00 Focus Move Detection (The rest position is fixed.) 01 Focus Move Detection (The rest position is reset.) 02 AE Move Detection (The rest value is fixed.) 01 AE Move Detection (The rest value is reset.) |
| | SetTime | 81 01 04 6D 0p 0p FF | pp: Reset Time Setting |
| | Alarm (Reply) | 90 07 04 6B 01 FF | Detect Level "Low" to "High" |
| | | 90 07 04 6B 00 FF | Detect Level "High" to "Low" |
| CAM_ExternalLock | INT | 81 01 04 55 00 FF | |
| | LIne Lock | 81 01 04 55 01 FF | |

Inquiry Command

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|------------------------|----------------|----------------------|---------------------------------|
| Camera Power | 81 09 08 01 FF | 90 50 00 FF | Off |
| | | 90 50 01 FF | On |
| Laser Power | 81 09 08 02 FF | 90 50 00 FF | Off |
| | | 90 50 01 FF | On |
| | | 90 50 02 XX FF | On Momentary with XX s left |
| CAM_PowerInq | 81 09 04 00 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ZoomPosInq | 81 09 04 47 FF | 90 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_DZoomModInq | 81 09 04 06 FF | 90 50 02 FF | D-Zoom on |
| | | 90 50 03 FF | D-Zoom Off |
| CAM_DZoomC/SModInq | 81 09 04 36 FF | 90 50 00 FF | Combine Mode |
| | | 90 50 01 FF | Separate Mode |
| CAM_DZoomPosInq | 81 09 04 46 FF | 90 50 00 00 0p 0q FF | pq: D-Zoom Position |
| CAM_FocusModeInq | 81 09 04 38 FF | 90 50 02 FF | Auto Focus |
| | | 90 50 03 FF | Manual Focus |
| CAM_FocusPosInq | 81 09 04 48 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Position |
| CAM_FocusNearLimitInq | 81 09 04 28 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Near Limit Position |
| CAM_AFSensitivityInq | 81 09 04 58 FF | 90 50 02 FF | AF Sensitivity Normal |
| | | 90 50 03 FF | AF Sensitivity Low |
| CAM_AFModInq | 81 09 04 57 FF | 90 50 00 FF | Normal AF |
| | | 90 50 01 FF | Interval AF |
| | | 90 50 02 FF | Zoom Trigger AF |
| CAM_AFTimeSettingInq | 81 09 04 27 FF | 90 50 0p 0q 0r 0s FF | pq: Movement Time rs: Interval |
| CAM_WBModeInq | 81 09 04 35 FF | 90 50 00 FF | Auto |
| | | 90 50 01 FF | In Door |
| | | 90 50 02 FF | Out Door |
| | | 90 50 03 FF | One Push WB |
| | | 90 50 04 FF | ATW |
| CAM_RGainInq | 81 09 04 43 FF | 90 50 00 00 0p 0q FF | pq: R Gain |
| | | 90 50 01 00 0p 0q FF | pq: B Gain |
| | | 90 50 02 00 0p 0q FF | pq: G Gain |
| | | 90 50 03 00 0p 0q FF | pq: Blue Gain |
| Cam AEModeInq | 81 09 04 39 FF | 90 50 00 FF | Full Auto |
| | | 90 50 03 FF | Manual |
| | | 90 50 0A FF | Shutter Priority |
| | | 90 50 0B FF | Iris Priority |
| | | 90 50 0D FF | Bright |
| CAM_SlowShutterModeInq | 81 09 04 5A FF | 90 50 02 FF | Auto |
| | | 90 50 03 FF | Manual |
| CAM_ShutterPosInq | 81 09 04 4A FF | 90 50 00 00 0p 0q FF | pq: Shutter Position |
| CAM_IrisPosInq | 81 09 04 4B FF | 90 50 00 00 0p 0q FF | pq: Iris Position |
| CAM_GainPosInq | 81 09 04 4C FF | 90 50 00 00 0p 0q FF | pq: Gain Position |
| CAM_BrightPosInq | 81 09 04 4D FF | 90 50 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpCompModInq | 81 09 04 3E FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ExpComPosInq | 81 09 04 4E FF | 90 50 00 00 0p 0q FF | pq: ExpCopl Position |
| CAM_BacklightModeInq | 81 09 04 33 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |

| Inquiry Command | Command Packet | Inquiry Packet | Comments |
|--------------------------|------------------------------------|-------------------------------------|---|
| CAM_SpotAE PosInq | 81 09 04 29 FF | 90 50 0p 0q 0r 0s FF | pq: X position rs: Y position |
| CAM_ApertureInq | 81 09 04 42 FF | 90 50 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_LR_Reverse ModeInq | 81 09 04 61 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_FreezeModeInq | 81 09 04 62 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_PictureEffectModeInq | 81 09 04 63 FF | 90 50 00 FF | Off |
| | | 90 50 02 FF | Neg.Art |
| | | 90 50 04 FF | B&W |
| CAM_PictureFlipModeInq | 81 09 04 66 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ICRModeInq | 81 09 04 01 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_AutoICRModeInq | 81 09 04 51 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_StabilizerModeInq | 81 09 04 34 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_MemoryInq | 81 09 04 3F FF | 90 50 pp FF | pp: Last Recall Memory No. |
| CAM_DisplayModeInq | 81 09 04 15 FF (81 09 06 06 FF) | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_TitleDisplayModeInq | 81 09 04 74 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_MuteModeInq | 81 09 04 75 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_PrivacyDisplayInq | 81 09 04 77 FF | 90 50 pp pp pp pp FF | pp pp pp pp : Mask Settings (0:Off, 1: On) |
| CAM_PrivacyPanTiltInq | 81 09 04 79 FF | 90 50 0p 0p 0p 0q 0q 0q FF | ppp: Pan qqq: Tilt |
| CAM_PrivacyPTZInq | 81 09 04 7B mm FF | 90 50 0p 0p 0p 0q 0q 0q 0r 0r 0r FF | mm: Mask Settings ppp: Pan qqq: Tilt rrr: Zoom |
| CAM_KeyLockInq | 81 09 04 17 FF | 90 50 00 FF | Off |
| | | 90 50 02 FF | On |
| CAM_IDInq | 81 09 04 22 FF | 90 50 0p 0q 0r 0s FF | pqrs: Camera ID |
| CAM_ExternalLockModeInq | 81 09 04 55 FF | 90 50 00 FF | Internal Mode |
| | | 90 50 01 FF | Line Lock Mode |
| CAM_VPhaseSetInq | 81 09 04 25 FF | 90 50 00 FF | 0 degree |
| | | 90 50 01 FF | 180 degree |
| CAM_VPhasePosInq | 81 09 04 45 FF | 90 50 00 00 0p 0q FF | pq: V-Phase Position |
| CAM_VersionInq | 81 09 00 02 FF | 90 50 00 20 mn pq rs tu vw FF | mnpq: Model Code(04xx) rstu:ROM Version vw: Socket Number (=02) |
| CAM_AlarmInq | 81 09 04 6B FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_AlarmModeInq | 81 09 04 6C FF | 90 50 pp FF | pp: Alarm Mode |
| CAM_AlarmTimeInq | 81 09 04 6D FF | 90 50 0p 0p FF | pp: Rest Position/ Value Reset Time |
| CAM_AlarmDetectLevelInq | 81 09 04 6E FF | 90 50 01 FF | Detect Level "High" |
| | | 90 50 00 FF | Detect Level "Low" |
| CAM_SpotAEModeInq | 81 09 04 59 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |

Block Inquiry Command List

Lens Control System Inquiry Commands ... Command Packet 8x 09 7E 7E 00 FF

| Byte | Bit | Comments |
|------|-----|----------------------------|
| 0 | 7 | Destination Address |
| | 6 | |
| | 5 | |
| | 4 | |
| | 3 | Source Address |
| | 2 | |
| | 1 | |
| 0 | | |
| 1 | 7 | 0 Completion Message (50h) |
| | 6 | 1 |
| | 5 | 0 |
| | 4 | 1 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 2 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Zoom Position (HH) |
| | 2 | |
| | 1 | |
| 0 | | |
| 3 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Zoom Position (HL) |
| | 2 | |
| | 1 | |
| | 0 | |

| Byte | Bit | Comments |
|------|-----|--------------------|
| 4 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Zoom Position (LH) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|---|---|--------------------|
| 5 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Zoom Position (LL) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|---|---|---------------------|
| 6 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus NearLimit (H) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|---|---|----------------------|
| 7 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Near Limit (L) |
| | 2 | |
| | 1 | |
| | 0 | |

| Byte | Bit | Comments |
|------|-----|---------------------|
| 8 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (HH) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|---|---|---------------------|
| 9 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (HL) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|----|---|---------------------|
| 10 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (LH) |
| | 2 | |
| | 1 | |
| | 0 | |

| | | |
|----|---|---------------------|
| 11 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (LL) |
| | 2 | |
| | 1 | |
| | 0 | |

| Byte | Bit | Comments |
|------|-----|--|
| 12 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 13 | 7 | 0 |
| | 6 | 0 |
| | 5 | DZoomMode 1: Separate 0:Combine |
| | 4 | 0: Normal 0: Interval 1: Zoom Trigger |
| | 3 | 0: 1: 0: |
| | 2 | AF Sensitivity 1: Normal 0: Slow |
| | 1 | Digital Zoom Mode 1: On 0: Off |
| | 0 | Focus Mode 1: Auto 0: Manual |
| 14 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Low Contrast Detection 1: Yes 0: No |
| | 2 | Camera Memory Recall 1: Executing 0: Stopped |
| | 1 | Focus Command 1: Executing 0: Stopped |
| | 0 | Zoom Command 1: Executing 0: Stopped |
| 15 | 7 | 1 Terminator (FFh) |
| | 6 | 1 |
| | 5 | 1 |
| | 4 | 1 |
| | 3 | 1 |
| | 2 | 1 |
| | 1 | 1 |
| | 0 | 1 |

Camera Control System Inquiry Commands ... Command Packet 8x 09 7E 7E 01 FF

| Byte | Bit | Comments |
|------|----------------------------|---------------------------|
| 0 | 7 | Destination Address |
| | 6 | |
| | 5 | |
| | 4 | |
| | 3 | Source Address |
| | 2 | |
| | 1 | |
| 0 | 0 Completion Message (50h) | |
| 1 | 7 | 0 |
| | 6 | 1 |
| | 5 | 0 |
| | 4 | 1 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 2 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | R Gain (H) |
| | 2 | |
| | 1 | |
| 0 | | |
| 3 | 7 | 0 |
| | 6 | Stabilizer (1:on, 0: off) |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | R Gain (L) |
| | 2 | |
| | 1 | |
| 0 | | |

| Byte | Bit | Comments |
|------|-----|---------------|
| 4 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | B Gain (H) |
| | 2 | |
| | 1 | |
| 0 | | |
| 5 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | B Gain (L) |
| | 2 | |
| | 1 | |
| 0 | | |
| 6 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | WB Mode |
| | 1 | |
| 0 | 0 | |
| 7 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Aperture Gain |
| | 2 | |
| | 1 | |
| 0 | | |

| Byte | Bit | Comments |
|------|-----|---------------------|
| 8 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (HH) |
| | 2 | |
| | 1 | |
| | 0 | |
| 0 | | |
| 9 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (HL) |
| | 2 | |
| | 1 | |
| | 0 | |
| 0 | | |
| 10 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (LH) |
| | 2 | |
| | 1 | |
| | 0 | |
| 0 | | |
| 11 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Focus Position (LL) |
| | 2 | |
| | 1 | |
| | 0 | |
| 0 | | |

| Byte | Bit | Comments |
|------|-----|---------------------------------------|
| 12 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 13 | 7 | 0 |
| | 6 | 0 |
| | 5 | DZoomMode 1: Separate 0: Combine |
| | 4 | 0: Normal 0: Interval 1: Zoom Trigger |
| | 3 | AF Sensitivity 1: Normal 0: Slow |
| | 2 | Digital Zoom Mode 1: On 0: Off |
| | 1 | Focus Mode 1: Auto 0: Manual |
| | 0 | 0 |
| 14 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Low Contrast Detection 1: Yes 0: No |
| | 2 | |
| | 1 | Focus Command 1: Executing 0: Stopped |
| | 0 | Zoom Command 1: Executing 0: Stopped |
| 15 | 7 | 1 Terminator (FFh) |
| | 6 | 1 |
| | 5 | 1 |
| | 4 | 1 |
| | 3 | 1 |
| | 2 | 1 |
| | 1 | 1 |
| | 0 | 1 |

Other Inquiry Commands ... Command Packet 8x 09 7E 7E 02 FF

| Byte | Bit | Comments |
|------|----------------------------|---------------------------|
| 0 | 7 | Destination Address |
| | 6 | |
| | 5 | |
| | 4 | |
| | 3 | Source Address |
| | 2 | |
| | 1 | |
| 0 | 0 Completion Message (50h) | |
| 1 | 7 | 0 |
| | 6 | 1 |
| | 5 | 0 |
| | 4 | 1 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 2 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | R Gain (H) |
| | 2 | |
| | 1 | |
| 0 | | |
| 3 | 7 | 0 |
| | 6 | Stabilizer (1:on, 0: off) |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | R Gain (L) |
| | 2 | |
| | 1 | |
| 0 | | |

| Byte | Bit | Comments |
|------|-----|---------------|
| 4 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | B Gain (H) |
| | 2 | |
| | 1 | |
| 0 | | |
| 5 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | B Gain (L) |
| | 2 | |
| | 1 | |
| 0 | | |
| 6 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | WB Mode |
| | 1 | |
| 0 | | |
| 7 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Aperture Gain |
| | 2 | |
| | 1 | |
| 0 | | |

| Byte | Bit | Comments |
|------|--------------------------------|-----------------------------|
| 8 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | Exposure Mode |
| | 3 | |
| | 2 | |
| | 1 | |
| 0 | 0 | |
| 9 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Spot AE 1: On 0: Off |
| | 2 | Back Light 1: On 0: Off |
| | 1 | Exposure Comp. 1: On 0: Off |
| 0 | Slow Shutter 1: Auto 2: Manual | |
| 10 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | Shutter Position |
| | 3 | |
| | 2 | |
| | 1 | |
| 0 | 0 | |
| 11 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | Iris Position |
| | 3 | |
| | 2 | |
| | 1 | |
| 0 | 0 | |

| Byte | Bit | Comments |
|------|-----|-------------------------|
| 12 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Gain Position |
| | 2 | |
| | 1 | |
| 0 | | |
| 13 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | Bright Position |
| | 3 | |
| | 2 | |
| | 1 | |
| 0 | 0 | |
| 14 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Exposure Comp. Position |
| | 2 | |
| | 1 | |
| 0 | | |
| 15 | 7 | 1 Terminator (FFh) |
| | 6 | 1 |
| | 5 | 1 |
| | 4 | 1 |
| | 3 | 1 |
| | 2 | 1 |
| | 1 | 1 |
| 0 | 1 | |

Enlargement Function Query Command ... Command Packet 8x 09 7E 7E 03 FF

| Byte | Bit | Comments |
|------|-----|----------------------------|
| 0 | 7 | Destination Address |
| | 6 | |
| | 5 | |
| | 4 | |
| | 3 | Source Address |
| | 2 | |
| | 1 | |
| | 0 | |
| 1 | 7 | 0 Completion Message (50h) |
| | 6 | 1 |
| | 5 | 0 |
| | 4 | 1 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 2 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Digital Zoom Position (H) |
| | 2 | |
| | 1 | |
| | 0 | |
| 3 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Digital Zoom Position (L) |
| | 2 | |
| | 1 | |
| | 0 | |

| Byte | Bit | Comments |
|------|-----|------------------------|
| 4 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | AF Activation Time (H) |
| | 2 | |
| | 1 | |
| | 0 | |
| 5 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | AF Activation Time (L) |
| | 2 | |
| | 1 | |
| | 0 | |
| 6 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | AF Interval Time (H) |
| | 2 | |
| | 1 | |
| | 0 | |
| 7 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | AF Interval Time (L) |
| | 2 | |
| | 1 | |
| | 0 | |

| Byte | Bit | Comments |
|------|-----|--|
| 8 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | SpotAE Position (X) |
| | 2 | |
| | 1 | |
| | 0 | |
| 9 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | Spot AE Position (Y) |
| | 2 | |
| | 1 | |
| | 0 | |
| 10 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | Alarm (1:on, 0: Off) |
| | 0 | Picture Flip (1:On, 0: Off) |
| 11 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | Advanced Privacy (1: Provided 0: Not Provided) |
| | 1 | Alarm (1: Provided 0: Not Provided) |
| | 0 | Picture Flip (1:Provided, 0: Not Provided) |

| Byte | Bit | Comments |
|------|-----|--------------------|
| 12 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 13 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 14 | 7 | 0 |
| | 6 | 0 |
| | 5 | 0 |
| | 4 | 0 |
| | 3 | 0 |
| | 2 | 0 |
| | 1 | 0 |
| | 0 | 0 |
| 15 | 7 | 1 Terminator (FFh) |
| | 6 | 1 |
| | 5 | 1 |
| | 4 | 1 |
| | 3 | 1 |
| | 2 | 1 |
| | 1 | 1 |
| | 0 | 1 |

VISCA Command Setting Values

Exposure control

| Shutter Speed | NTSC | PAL |
|---------------|------|-------|
| | 15 | 10000 |
| 14 | 6000 | 6000 |
| 13 | 4000 | 3500 |
| 12 | 3000 | 2500 |
| 11 | 2000 | 1750 |
| 10 | 1500 | 1250 |
| 0F | 1000 | 1000 |
| 0E | 725 | 600 |
| 0D | 500 | 425 |
| 0C | 350 | 300 |
| 0B | 250 | 215 |
| 0A | 180 | 150 |
| 09 | 125 | 120 |
| 08 | 100 | 100 |
| 07 | 90 | 75 |
| 06 | 60 | 50 |
| 05 | 30 | 25 |
| 04 | 15 | 12 |
| 03 | 8 | 6 |
| 02 | 4 | 3 |
| 01 | 2 | 2 |
| 00 | 1 | 1 |

| Gain | | |
|------|-------|-------|
| | 0F | 28 dB |
| 0E | 26 dB | |
| 0D | 24 dB | |
| 0C | 22 dB | |
| 0B | 20 dB | |
| 0A | 18 dB | |
| 09 | 16 dB | |
| 08 | 14 dB | |
| 07 | 12 dB | |
| 06 | 10 dB | |
| 05 | 8 dB | |
| 04 | 6 dB | |
| 03 | 4 dB | |
| 02 | +2 dB | |
| 01 | 0 | |
| 00 | -3 dB | |

| Iris | | |
|------|-------|------|
| | 11 | F1.6 |
| 10 | F2 | |
| 0F | F2.4 | |
| 0E | F2.8 | |
| 0D | F3.4 | |
| 0C | F4 | |
| 0B | F4.8 | |
| 0A | F5.6 | |
| 09 | F6.8 | |
| 08 | F8 | |
| 07 | F9.6 | |
| 06 | F11 | |
| 05 | F14 | |
| 04 | F16 | |
| 03 | F19 | |
| 02 | F22 | |
| 01 | F28 | |
| 00 | CLOSE | |

Exposure control

| Bright | IRIS | GAIN |
|--------|-------|-------|
| | 1F | F1.6 |
| 1E | F1.6 | 26 dB |
| 1D | F1.6 | 24 dB |
| 1C | F1.6 | 22 dB |
| 1B | F1.6 | 20 dB |
| 1A | F1.6 | 18 dB |
| 19 | F1.6 | 16 dB |
| 18 | F1.6 | 14 dB |
| 17 | F1.6 | 12 dB |
| 16 | F1.6 | 10 dB |
| 15 | F1.6 | 8 dB |
| 14 | F1.6 | 6 dB |
| 13 | F1.6 | 4 dB |
| 12 | F1.6 | 2 dB |
| 11 | F1.6 | 0 |
| 10 | F2 | 0 |
| 0F | F2.4 | 0 |
| 0E | F2.8 | 0 |
| 0D | F3.4 | 0 |
| 0C | F4 | 0 |
| 0B | F4.8 | 0 |
| 0A | F5.6 | 0 |
| 09 | F6.8 | 0 |
| 08 | F8 | 0 |
| 07 | F9.6 | 0 |
| 06 | F11 | 0 |
| 05 | F14 | 0 |
| 04 | F16 | 0 |
| 03 | F19 | 0 |
| 02 | F22 | 0 |
| 01 | F28 | 0 |
| 00 | CLOSE | 0 |

| Exposure Comp. | IRIS | GAIN |
|----------------|------|---------|
| | 0E | 7 |
| 0D | 6 | 9 dB |
| 0C | 5 | 7.5 dB |
| 0B | 4 | 6 dB |
| 0A | 3 | 4.5 dB |
| 09 | 2 | 3 dB |
| 08 | 1 | 1.5 dB |
| 07 | 0 | 0 dB |
| 06 | -1 | -1.5 dB |
| 05 | -2 | -3 dB |
| 04 | -3 | -4.5 dB |
| 03 | -4 | -6 dB |
| 02 | -5 | -7.5 dB |
| 01 | -6 | -9 dB |
| 00 | -7 | 10.5 dB |

Zoom Ratio and Zoom Position (for reference)

| Zoom Ratio x25 Lens | Optical Zoom Position Data | x25-NTSC | | x25-PAL | |
|------------------------|-------------------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| | | Digital Zoom Ratio | Digital Zoom Position Data | Digital Zoom Position Data | Digital Zoom Position Data |
| x1 | 0000 | x1 | 4000 | 4000 | |
| x2 | 1781 | x2 | 5E00 | 5E80 | |
| x3 | 213B | x3 | 6800 | 6880 | |
| x4 | 2752 | x4 | 6D00 | 6DC0 | |
| x5 | 2BB3 | x5 | 7000 | 70C0 | |
| x6 | 2F03 | x6 | 7200 | 72C0 | |
| x7 | 315D | x7 | 7380 | 7440 | |
| x8 | 3364 | x8 | 7480 | 7540 | |
| x9 | 34FF | x9 | 7580 | 7600 | |
| x10 | 362C | x10 | 7600 | 76C0 | |
| x11 | 373D | x11 | 76C0 | 7740 | |
| x12 | 386A | x12 | 7700 | 77C0 | |
| x13 | 3929 | | | | |
| x14 | 3A20 | | | | |
| x15 | 3AfA | | | | |
| x16 | 3BBA | | | | |
| x17 | 3C5E | | | | |
| x18 | 3CCB | | | | |
| x19 | 3D70 | | | | |
| x20 | 3DF8 | | | | |
| x21 | 3E66 | | | | |
| x22 | 3Ed3 | | | | |
| x23 | 3F25 | | | | |
| x24 | 3F93 | | | | |
| x25 | 4000 | | | | |

Lens Control

| | | | |
|---------------------|---|--|------------------|
| Zoom Position | 0000 to 4000 to 7700 (77C0) a) | | |
| | Wide End | Optical Tele End | Digital Tele End |
| Focus Position | 1000 to C000 | | |
| | Far End | Near End | |
| Focus Near Limit | 1000: Over Inf 2000: 7.2 m 3000: 3.3 m 4000: 2.0 m 5000: 1.3 m 6000: 1 m 7000: 80 cm 8000: 40 cm 9000: 20 cm A000: 11 cm B000: 6 cm C000: 3.5 cm | As the distance on the left will differ dur to temperature characteristics, etc., use as approximate vaules. * The lower 1 byte is fixed at 00. | |

a) PAL

Others

| | |
|----------|-------|
| R,B gain | 00~FF |
| Aperture | 00~0F |

Title Setting

| | | |
|-----------|--------------------|--------|
| Vposition | 00 to 0A | |
| Hposition | 00 to 17 | |
| Blink | 00: Does not blink | |
| | 01: Blinks | |
| Color | 00 | White |
| | 01 | Yellow |
| | 02 | Violet |
| | 03 | Red |
| | 04 | Cyan |
| | 05 | Green |
| | 06 | Blue |