

# **User's Manual**

## **70 Series**

### **Two-Piece Camera**

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# TABLE OF CONTENTS

1. INSTALLATION
  - 1.1 General
  - 1.2 Precautions
  - 1.3 Electrical Connections
  - 1.4 Obtaining Picture/Set-up Instructions
  - 1.5 External Drive Lock
2. CONTROL UNIT FUNCTIONS
3. SPECIFICATIONS

# INSTALLATION

## 1.1 GENERAL

The 70 series camera system described herein is designed to meet the demanding needs of instrumentation applications requiring high performance and maximum dependability. The system consists of a separate camera head and remote control unit. The camera head is supplied with an adjustable focus carriage for optical focusing.

The best equipment available must be installed with care if it is to perform satisfactorily and give long service. Following the recommendations outlined will help assure long quality service from your camera.

Although these units have been designed for “instrumentation” use, it should be remembered they are complex electronic instruments and should be treated accordingly.

## 1.2 PRECAUTIONS

1. Do not point the lens end of the camera down when transporting.
2. Do not aim the lens toward the sun or bright lights. Permanent damage may occur.

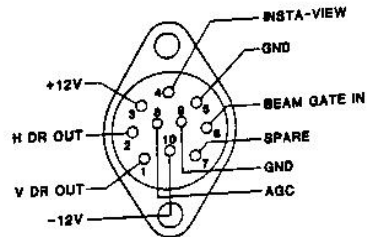
## 1.3 ELECTRICAL CONNECTIONS

**CAUTION: DO NOT** connect the AC power until all other system signal connections are made.

1. Connect the camera head to the control unit by means of the camera cable assembly.

**NOTE: DO NOT** turn power on before connecting the camera head to the control unit.

## 2. AUXILIARY CONNECTOR



### 1.4 OBTAINING PICTURE

The 70 series camera is factory set for optimum performance. Please ensure the switches are set in the following positions when first obtaining an image.

- |    |             |          |
|----|-------------|----------|
| 1. | Aperture    | Down     |
| 2. | Bandwidth   | Up       |
| 3. | Polarity    | Positive |
| 4. | Stretch     | Off      |
| 5. | Gamma       | 1.0      |
| 6. | Black Level | Preset   |
|    |             | Auto     |
| 7. | Gain        | Auto     |
| 8. | Gain Range  | Low      |
- (Switch on back panel of camera control unit)

For best signal-to-noise ratio, turn the light source up as high as possible before saturation.

If you need additional sensitivity, you can switch the gain range to “high” on the back of the camera control unit.

## 1.5 EXTERNAL DRIVE LOCK

The 70 Series camera is optionally supplied with external drive or sync lock provisions. Two input BNC connectors located on the rear panel are 75 ohm terminated and require standard negative going 2 to 4 volt drive signals. As an alternative, composite sync and/or video may be fed into the sync input connector (sync level .2 volts min). When a lock signal is not supplied the camera automatically reverts to internal sync operation.

NOTE: A letter "D" in the model number indicates drive model, a letter "L" indicates sync lock mode.

## 2.0 CONTROL UNIT FUNCTIONS

### CONTROL

### FUNCTION

A. Power

This switch turns camera power on and off. Pilot light indicates on/off condition.

B. Gain

Sets image whites to desired level to optimize contrast. When selection switches are set as follows:

AUTOMATIC - Camera automatically tracks and adjusts whitest portion of picture to an internally factory preset level.

MANUAL - Camera maintains a fixed gain that can be set to desired levels by adjusting the gain control.

TEST (on S/N 300 and above) - Provides internally generated staircase test signal for use in establishing proper contrast settings on monitor or other system components. (Gain pot inactive).

Gain Range - Normally set to low position. In applications where the input light level is low and a higher output noise level is tolerable, the range may be switched to HI position. NOTE: HI position should not be used in high light level applications as system overload will occur.

- C.      Black Level
- Varies contrast level for darkest portion of image. Control is a 10-turn potentiometer which can be locked at a desired setting to prevent movement. When selection switches are set for:
- AUTOmatic - Camera automatically tracks and sets darkest portion of image to a black reference level.
- MANual     - Camera maintains a fixed black reference regardless of variations in image contrast.
- PRESET     - Camera provides an internally factory-preset black reference for both automatic and manual operation. In this position black level control is not variable.
- VARIABLE - Front panel black level control is activated to allow user to set contrast levels as desired.
- D.      Stretch
- STRETCH “on” provides a six-fold amplification of user selected grey levels. Selection of grey levels is obtained by varying black level control until desired grey level receives maximum contrast improvement. Grey scales outside of stretch range are greatly compressed. For proper operation of stretch, GAIN should be in AUTO position.
- E.      Gamma
- Gamma in .5 position stretches signal in black and compresses whites to improve low contrast images. Gamma in 1.0 position provides linear grey scale reproductions for quantitative measurements.
- F.      Negative Pedestal
- Switch allows selection of Polarity normal (POS) or inverted (NEG) image. Negative pedestal controls picture black level in NEG polarity position only. Use black level control when in POSitive position.
- G.      Bandwidth
- Decrease (CCW) for low noise operation. Increase (CW) for best picture detail. Use bandwidth control in conjunction with aperture control to achieve optimum sharpness with minimum noise.
- H.      Aperture
- To sharpen picture detail, increase (CW) APERTURE control to maximum enhancement with acceptable noise.

## 4.0 SPECIFICATIONS

### ELECTRICAL

Input Voltage	98 to 135 volts 50/60 Hz standard or 195 to 260 volts 50/60 Hz optional
Input Power	18 watts @ 120 volts AC
Vertical Sweep Rate	60 Hz standard or 50 Hz 625 line option
Horizontal Sweep Frequency	12 kHz to 35 kHz
Scanning:	2:1 Interlace, 525/60 or 625/50 standard
Type of Sync and Blanking Waveform	EIA RS-170 standard; RS-330, RS-343 optional
Camera Tube Type	Systems available with Vidicon, Silicon Diode, Newvicon, Lead Sulfide
Sensitivity	75 nanoamps of average tube signal current for 1 volt composite output
Resolution	Greater than 1200 lines when using a high resolution Vidicon
Automatic Gain Control	Over 12db at full bandwidth
Automatic Target Control	Illumination range of 4000:1 (Vidicon only)
Resolution Stability vs Temperature	Less than 5% change up 60 degrees C ambient
Resolution Stability vs Input Voltage Variation	No measurable change over stated operating range
Gray Scale Rendition	Greater than 10 shades using EIA TV Resolution Chart
Video Output	Composite 1Vpp black to white .65 volts .3v sync, black negative polarity; source terminated 75 ohm output up to 2.5Vpp composite video available. Dual isolated video outputs.
Vide Polarity Reversal	Switchable
Geometric Distortion	Within major circle: 0.05% Overall: 1.0%
Linearity Distortion	Horizontal: 0.25% Vertical: 0.25%
Beam Regulation	Active
High Voltage	Fully regulated
External Lock (optional)	Lockable to external H&V drives or composite sync

Scan Failure Protection	Solid State with H.V. shutdown
Horizontal Scan Frequency	Developed from Master Oscillator, AFC to power line
Vertical Scan Frequency	Derived from Master Oscillator by binary countdown
DC Component Transmission	DC coupled
Video Amplifier	6, 12 or 18 mHz bandwidth DC coupled output, black reference at ground potential, white clipper, variable bandwidth control, automatic black level, automatic video level, gamma correction – switchable between 1 and .5 when using Newvicon or Silicon
Options	Crystal operation, external sync lock, 220 volt power input, insta-view

## **MECHANICAL**

### **Camera Head**

Size (less lens)	2-7/8" H, 2-3/4" W, 9-5/16" L
Weight	2 lbs. 4 oz. (1 Kg)
Type of Lens Mount	C mount 16 mm
Camera Mount	Two 1/4" x 20 tapped holes

### **Control Unit**

Size	3-3/4" H, 8-5/8" W, 12-3/4" L
Weight	7.2 lbs. (3.28 Kg)
Coaxial Connector	BNC

## **ENVIRONMENTAL**

Ambient Temperature Limits	-20 to 65 degrees C
Air Pressure Limits	Full performance 0 degrees to 45 degrees C
Vibration Limits	Sea Level to 10,000 ft.
Shock Limits	15 to 55 Hz, .015" excursion, 45 min. each axis
Humidity Limits	5 g's
	0 to 95% humidity

## WARRANTY

The 70 series camera is warranted to be free of defects in material and workmanship in normal use for a period of one year from the original date of purchase from Dage-MTI.

This warranty does not apply to units which have been subject to abuse, neglect, accident, improper installation, or on which the serial number has been removed or damaged. Units that have been altered with permission of Dage-MTI are not covered by this warranty.

This warranty does not apply to other equipment furnished by Dage-MTI, which is listed or otherwise identified as manufactured by another and therefore shall be covered by the "other manufacturers" applicable warranty.

### LIMITATIONS

1. This warranty is valid only if the malfunctioning unit is returned to Dage-MTI service depot. This warranty does not cover on-location service. If warranty work is needed, the following should be contacted:

Dage-MTI  
Service Department  
701 N. Roeske Ave.  
Michigan City, IN 46360  
PH: 219-872-5514  
FX: 219-872-5559  
[service@dagemti.com](mailto:service@dagemti.com)

2. This warranty does not cover:
  - a. Problems caused by or inflicted upon associated equipment such as digitizing systems, video tape recorders, cameras, microscopes, etc.
  - b. Damage caused by accident, misuse, improper power source, fire, flood, lightning, other acts of God, war and repair or alteration by other than a Dage-MTI authorized service organization.
  - c. Labor or incurred charges required in removing or installing the Product, down time, failure of the Product to perform properly, and any consequential damages.
  - d. Transit damage.
3. Unit must be properly packaged (in original packing, if possible) when being returned under warranty.