Operation Manual

NAC **MEMRECAM** fx RX-5



NAC Image Technology Corporation September 2003

Introduction

The **MEMRECAM** fx RX-5 sets new standards in flexibility and performance for high-speed digital imaging. These cameras provide the ideal solution for image capture in confined spaces.

The **MEMRECAM** fx RX-5 is a mega pixel high speed digital camera system. It is rugged and scalable allowing up to four compact camera heads to be attached to a single processor. This feature provides the user with multiple camera views while reducing the added weight of multiple instrumentation systems in an on-board impact test environment.

The **MEMRECAM** fx RX-5 utilize the compact RX and the pencil type Micro camera heads. These camera heads are connected to the Digital Recording Processor (DRP) using cables available in various lengths (3m, 5m, and 9m). The camera heads can be mounted up to eighteen meters from the DRP.

The **MEMRECAM** fx RX-5 simplifies the tasks associated with high speed digital image capture. Operation of the camera system can be accomplished in a variety of ways. The camera system can be operated using the rear panel on the DRP, the J-Pad 2 remote control panel and a personal computer. The live image display function allows for images stored in memory to be reviewed and edited using the optional viewfinder monitor without using a computer.

Using the RX camera head the **MEMRECAM** fx RX-5 records images at 1,000 pps at 1280 X 1024 pixel resolution (optional recording speeds up to 10,000 pps). Alternatively, while using the Micro camera head it records in extremely confined spaces at a maximum of 500 pps.

The **MEMRECAM** fx RX-5 is ideal for test applications conducted under rigorous environmental conditions. It is rugged, lightweight, compact and resistant to shock, vibration and electromagnetic environments.

This User's Manual contains operating methods, explanation of system features, technical specifications, and details on interfacing with external devices.

Please Read Carefully Before Use

Safety Precautions

Please read the following safety precautions carefully before operating the *MEMRECAM* fx RX-5 camera system. Depending on the device, particular safety precautions are required during handling. Please follow these guidelines carefully to ensure safe and proper operation of the camera system. As always there are instances where some unforeseen condition may exist which may not have been taken to account. As a result, operate the camera system only after sufficient understanding of the contents written in this manual. Contact your retail outlet if there are any questions regarding the operations of this system.

DANGER

If the indications shown are ignored, dangerous conditions could result in death or serious injury.

WARNING

If the indications shown are ignored, potentially dangerous conditions could result in death or serious injury.

CAUTION

If the indications shown are ignored, potentially dangerous conditions could result in slight or moderate injury. This is also a warning sign of unsafe operation and indicates the potential of damage to this device or connected devices.

Handling Precautions



Safety alert symbol

This symbol alerts you or others to the danger and/or items or operating concerns related to the use of this device. This symbol is also used when there is important information relating to operation methods. Read the message adjacent to this symbol carefully and follow the instructions for safe and proper use of this device



Grounding terminal symbol

This symbol indicates the location of a protective grounding terminal. If not grounded, electrical shock could result from metallic and other parts of this device. Due to this danger, please make sure it is properly grounded. When connecting to an electric outlet using a 3P-2P converter plug, connect the converter plug grounding wire to a common ground.



High voltage warning symbol

When replacing fuses, proceed only after the power cable is unplugged from the electric outlet. Do not open the cover. Depending on the device, there may be parts that generate high voltage internally so opening the cover could result in electrical shock.

Precautions for Use

Caution - Confirm Input Power supply

Before connecting electric power to the camera system, confirm that the voltage, frequency and polarity are correct. The camera system requires D C 2 0 ~ 3 2 V when using a DC power supply or battery. The optional AC power supply adapter requires an electric input of A C 9 0 ~ 2 4 0 V \checkmark 4 7 ~ 6 3 H z. The AC power supply adapter is designed to deliver D C 2 0 ~ 3 2 V to the camera system.

Caution - Ambient Environment

- For optimum performance operate the system where the ambient temperature is within $0 \sim + 4.0 \degree C$ and humidity is $3.0 \sim 8.0 \% R H$. Do not expose to dew.
- Do not operate or store where the ambient temperature is below -1 0 and above +60°C or the humidity is not within 20~80% R H.
- Avoid using in locations where there is smoke, where corrosive gases are generated or where there is a strong magnetic field.
- Do not place in direct sunlight or in locations near rain or salt water.
- Do not use where there is trash, dust, sand or high humidity.
- To prevent increasing the internal temperature, do not place in front of, or near ventilation openings.

Caution - Vibration and Shock

The *MEMRECAM* fx RX-5 is designed and built to survive strong vibration and shock. However, please be aware of the following conditions.

• Only the camera heads and the DRP are equipped to tolerate strong shock and vibration. There is no vibration and shock protection built into the J-Pad 2 remote control panel, standard lenses and the standard A C power supply adapter. Contact your retail outlet to acquire power supplies and lenses with built in vibration and shock protection.

• Only the DRP power, TRIG IN and REMOTE I/O connectors are equipped to tolerate strong shock and vibration. There is no vibration or shock protection on any other DRP connectors (D-VGA or J-PAD 2) or ports (compact flash).



Caution - Camera Head and DRP Handling

The internal components of the camera head and DRP are intricately manufactured and assembled in the unit. Keep the screws on the cover tight and do not for any reason (even if there is a malfunction), open the cover. Reassembly of the camera is difficult.

Caution - Lens Mount Handling

Handle camera heads and lenses with care. Always keep the camera head and lenses covered by protective caps. Do not allow the camera head sensor and rear of lenses to be exposed to dust and foreign matter. Do not put fingers or any other items inside. If the internal optics is damaged or foreign objects are present, image quality will deteriorate.

Marning - Connecting Cables

Confirm that the power is OFF before connecting or disconnecting camera cables. Damage to the device and potential of electrical shock could occur if the camera cable is connected or disconnected with the power ON. It is acceptable to leave the power ON when connecting or disconnecting the J-PAD2, D-VGA, and TRIG-IN or network cables.

🛆 Caution - Battery Use

Do not expose or store the optional Memory Backup Unit to high Temperatures. Avoid prolonged exposure to the sun, keep away from fire and heated surfaces. Exposure to high temperatures will cause the battery to leak and reduce battery performance and life. Do not use a Memory Backup Unit battery for other applications. Excessive current draw may cause battery leakage, excessive heat or rupture. Contact your retail outlet to acquire replacement of batteries used in the Memory Backup Unit.

Caution - Mounting

The camera heads and DRP should be securely mounted on tripods or by any other means available. Use caution when pulling cables which could tip tripods over.

Caution - Handling During Shipment and Transport

Use the special shipping case for shipping and transport this product.



The *MEMRECAM* fx series feature technology to address screen noise patterns due to sensor temperature. The sensor temperature rises when the system is set to **ARM** mode. At the time the system is set to **ARM** mode, the sensor is calibrated to its current temperature. As temperature changes it is necessary re-calibrate to the current sensor temperature.

To maintain proper sensor calibration and to obtain images with greater quality, follow these guidelines:

- Prepare to photograph in **VIEW** mode, and switch to **ARM** mode immediately prior to begin recording.
- Prepare to photograph in ARM mode and temporarily change the mode from ARM
 →READY→ VIEW → ARM immediately prior to begin recording.
- After the system has been set to ARM mode for more than an hour, re-calibrate by changing the mode from ARM → READY → VIEW → ARM. With this method, it is possible to continue recording without the need to re-calibrate.

NOTICE:

There may be problems, conditions and circumstances regarding use and operation this device not stated above. As a result, take time to sufficiently understand the general provisions noted in this Operation Manual before using. Please contact your retail outlet as soon as possible if there are any questions about this device.

Regular Replacement of Parts

It is recommended that the internal backup battery be replaced 5 years after purchase. This battery keeps the clock and menu setting in memory when power is disconnected. Disassembly of the system is required. Since the user cannot replace, please return system to your retail outlet to perform maintenance.

Warranty

NAC warrants products of its manufacture to be free from defects in design, workmanship and material under normal and proper use and service for a period of twelve (12) months after the date of NAC's shipment or delivery.

NAC agrees to repair or replace at the place of manufacture, without charge, all parts of said products which are returned for inspection, to NAC within the applicable warranty period, provided such inspection discloses that the defects are as above specified and provided also that the equipment has not been altered or repaired other than with authorization from NAC and its procedures, subjected to misuse, improper maintenance, negligence, accident, damage by excessive current, or had its serial number or any part thereof altered, defaced or removed.

Shipping expenses to and from NAC will be to the account of the customer. Consumer goods such as lamps, fuses, etc. are considered by NAC not to be covered under this warranty.

Application Standards

FCC

FCC Part 15 Class A. This device conforms to tests related to Class A computer devices, FCC regulation No. 15.

EMC Statement

This product conforms to EMC directive (89/336/EEC, 92/31/EEC) and has obtained CE marks for the following standards. EN55022 EN55024

1 *MEMRECAM* fx RX-5 Overview

1. MEMRECAM fx RX-5 Overview

1.1 **MEMRECAM** fx RX-5 Standard Components

The standard high-speed digital camera system *MEMRECAM* fx RX-5 is comprised of the following items:

Part Name	Model	Qty.
RX Camera Head	V-159	1
RX-5 DRP	V-334	1
Camera cable (5m)	582902-4	1
J-PAD2	4H2003	1
Carrying case	4H2078	1
FC Mount adapter	4H2021	1
Camera head attachment plate	4H2070	1
Trigger connector	J50500008	1
Operation Manual (this document)	TBD	1
Smart Capture CD-ROM	SP-614	1
Smart Capture Software User's Manual	82L025-W	1

Optional items for the *MEMRECAM* fx RX-5 are as follows:

Part Name	Model
AC Power Adapter	4H0596-3
RX Camera Head	V-159
RX-5 DRP	V-334
Camera cable (3m)	TBD
Camera cable (5m)	582902-4
Camera cable (9m)	582902-6
Micro Camera Head (Angle)	4H0988-1
Micro Camera Head (Straight)	4H0988-2
Micro Camera Head (Angle-Side)	4H0988-3
1 - CH PM Unit	TBD
4 - CH PM Unit	TBD

1.2 **MEMRECAM** fx RX-5 External Components

The exterior features of the *MEMRECAM* fx RX-5 are shown in Photos 1 and 2



Photo-1 MEMRECAM fx RX-5 (Shown with optional Hi-G lens)



Photo-2 MEMRECAM fx RX-5 (Cable Connections)

🕂 Caution

Confirm that the power is OFF before connecting or disconnecting camera cables. When connecting the RX camera head to the RX-5 DRP insert the connectors securely and turn the camera cable knob as tight as possible.

1.2.1 RX Camera Head

The front panel of the RX camera head is shown in Photos 3 and 4. Any C-mount lens available on the market can be used (excluding some specialty lenses). An optional F-mount adapter (not shown) is also available. There are four screw holes in the front panel for mounting lenses. Use four M 3 (7.5mm depth) screws to attach the optional lens support holder (not shown) directly to the RX camera head.



Photo-3 RX Camera Head (Optional Hi-G Lens shown)

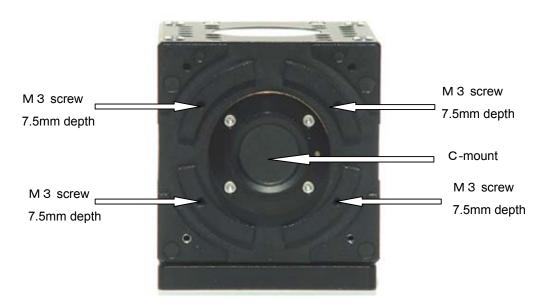


Photo-4 RX Camera Head Front Panel

Caution

When not using the RX camera head, replace the C-mount screw on cap (cover) and do not leave the mounting holes uncovered. Use caution not to let dust and dirt into the interior of the camera head.

1.2.2 **MEMRECAM** fx RX-5 DRP Front Panel

The front panel of the **MEMRECAM** fx RX-5 DRP is shown in Photo 5.



Photo-5 MEMRECAM fx RX-5 DRP Front Panel

1.2.3 MEMRECAM fx RX-5 DRP Side Panel

The *MEMRECAM* fx RX-5 DRP side panel. Location of the Memory Backup Switch and Indicator is shown in photo 6.



Photo-6 MEMRECAM fx RX-5 DRP Side Panel

1.2.4 *MEMRECAM* fx RX-5 DRP Rear Panel

The *MEMRECAM* fx RX-5 DRP rear panel is shown in photo 7. The rear panel includes the Power Panel, Camera Control Touch Pad and the Rear Connector Panel.



Photo-7 MEMRECAM fx RX-5 DRP Rear Panel

- 1 Power Panel
- 2 Rear Camera Control Touch Pad
- 3 Rear Connector Panel

1.2.4(1) Power Panel

The Power Panel is comprised of the power input connector and the power switch. The power switch has three positions as shown below.

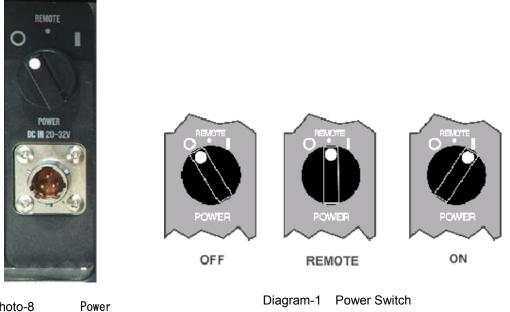


Photo-8

Diagram-1 Power Switch

The power input connector accepts DC voltage of 20~32V. Use the optional AC Power Adapter (DC24V) output. Use the optional battery system when AC power is not available. Contact your retail outlet for power supply options.

1.2.4(2) Rear Camera Control Touch Pad

The Rear Camera Control Touch Pad is located on the top of the *MEMRECAM* fx RX-5 DRP rear panel. There are 12 keys and 8 LED as follows:

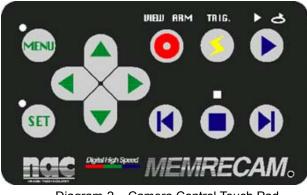


Diagram-2 Camera Control Touch Pad

Setup Mode keys

	LEFT/RIGHT keys (arrow keys)
	UP/DOWN keys (arrow keys)
MENU	MENU key
SET	SET key
Setup Mode keys	
	STOP key



■ LED (Near various keys)

0	MENU LED (Lit during MENU mode)
	STOP LED (Lit during READY mode)
VIEW ARM	VIEW / ARM LED (Lit during VIEW or ARM modes)
TRIG.	TRIGGER LED (Lit during recording after trigger signal is received)
₽₽	PLAY / LOOP LED (Lit during PLAY or LOOP modes)

The following diagrams depict the recording and playback operation of the Rear Camera Control Touch Pad.

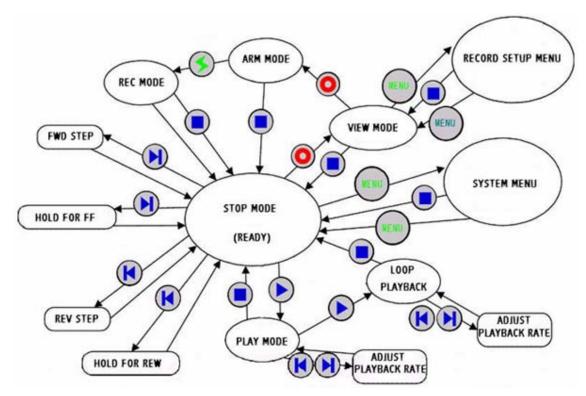


Diagram-3 Camera Control Touch Pad operation

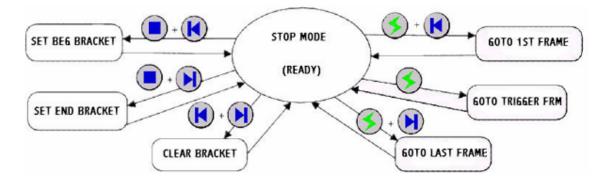


Diagram-3 Camera Control Touch Pad operation

Reset Switch

The Reset Switch is inside a small hole on the bottom right hand side of the Rear Camera Control Touch Pad . Use thin wooden stick. Gently insert and remove it from the hole to access the SYSTEM SETUP MENU.



Diagram-4 Rear Camera Control Touch Pad

The *MEMRECAM* fx SYSTEM SETUP MENU displays the current firmware version, serial number, CID and other system settings. The following settings can be modified in this menu.

IP address	To change the DRP IP address and subnet mask
Factory SET	To reload original factory settings. Reboot to complete.
CrashDump	In the event of a system crash, the error information is stored to CF
Reboot	Reboot to restart the system. Rebooting from the SYSTEM SETUP
	MENU prevents images stored in memory from being lost.

- SYSTEM SETUP	MENU
Model	MEMRECAM fx-K3
Version	1.10 2001/12/26 01:38:00
CID	1011
MEMORY SIZE	1.3 GB
MAC address	00:05:61:10:00:0b
FC NodeName	20:00:00:05:61:10:00:12
Network	FC-AL Ethernet
IP address	172.021.004.041 / 255.255.000.000
Factory SET	
CrashDump	
Reboot	
RIPL105	

SYSTEM SETUP MENU

1.2.4(3) Rear Connector Panel

There are eight types of input/output connectors in the Rear Connector Panel.

D-DER OUT	D-VGA OUT	connectors in the Rear Connector Panel. Digital VGA output signal
		Connects to a D-VGA compatible monitor, optional View Box or
		optional D-VGA Image Converter.
RUR	AUX	Strobe control and RS232C auxiliary port
CONTROL	CONTROL	Connect to the J-PAD2 remote control
1888-T	100B-T	Ethernet connectivity. Use 100Base-T crossover cable to connect to control PC. When connecting to a 100Base-TX hub (optional) use a straight cable.
FCAL	FCAL	Fibre Channel connectivity. Use a FCAL cable to connect to control PC or optional FCAL hub.
REMOTE L/D	REMOTE I/O	Use special copper cable for connectivity to optional M-HUB.
TRIG. IN	TRIG. IN	External Trigger input (voltage or contact closure)



CF

Compact Flash storage media slot

(000001) A

1.3 J-PAD2 Operation

The J-PAD2 remote control connects to the CONTROL port on the **MEMRECAM** fx Rear Connector Panel. There are twelve keys on the J-PAD 2; the same as the Rear Camera Control Touch Pad (refer to section 1.2.4(2) for key descriptions). The Rear Camera Control Touch Pad and the J-PAD2 cannot be used at the same time. When the J-PAD2 is connected, key operation is done from the remote control pad. When the J-PAD2 is disconnected, the Rear Camera Control Touch Pad keys become effective. The DRP power switch cannot be operated from the J-PAD2.

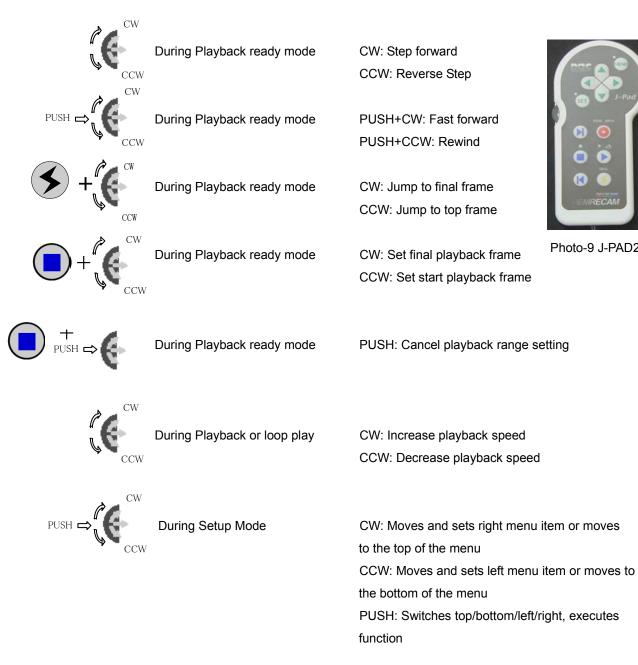




Photo-9 J-PAD2

1.4 Hi-G Lens

Use the optional Hi-G Lens when operating under conditions where strong vibration and shock is expected. It is a C-mount lens which screws directly to the FX camera head. The two set screws prevent focus and aperture changes due to camera movement. An optional adapter is available for use with F-mount lenses.



Photo-10 Hi-G Lens f=11.6mm, F2, C-mount (Optional)



Caution

Lenses that are not Hi-G rated can be damaged when exposed to strong vibration and shock.

Some wide angle lenses have protruding lens bulbs (CS-mount) which can damage the camera and optical filters.



Photo-11 C-mount Lens (left) and CS-mount Lens (right)



Caution

To avoid sensor damage use a lens with a protrusion that is less than 25mm towards the rear.

1.5 Trigger Connector (External Trigger Input)

The Amphenol MS3116F8-4S four pin circular MIL connector is used to terminate the external trigger signal input cable (refer to External Trigger Input, section 4.1.3 for details). Connect the external signal input cable to the TRIG IN connector in the DRP Rear Connector Panel.



Photo-12 Amphenol MS3116F8-4S circular MIL connector

1.6 AC Power Adapter (Optional)

The optional AC Power Adapter has been designed specifically for **MEMRECAM** fx series cameras. Do not use with other devices. It converts AC 100V~240V input to DC24V output. The DC power cable is terminated with a three pin circular MIL connector which connects to the DRP Power Panel. The AC input uses a standard power cable with a 3P plug.



Photo-13 AC Power Adapter

Warning



This device is dangerous due to the high voltage. Do not open the cover. When connecting to an outlet using a 3P-2P convertible plug, make sure the convertible plug is grounded. If used without it being grounded, electrical shock can be received from the *MEMRECAM* fx metal or other parts.

1.7 fxLink Software CD-ROM

Use the included fxLink software when operating the *MEMRECAM* fx from a control computer. For details on using the fxLink software, refer to the "fxLink Software User's Manual".

2

MEMRECAM fx Basic Operation

2. Basic Operation

This section describes basic connectivity and record/playback operation of the **MEMRECAM** fx.

The *MEMRECAM* fx supports five connection methods between the control computer and the DRP (Digital Recording Processor).

- 1. CF (Compact Flash) card storage media (Record function only)
- 2. Ethernet connectivity to a Single MEMRECAM fx DRP
- 3. Fibre Channel connectivity to a single **MEMRECAM** fx DRP
- 4. Ethernet connectivity to multiple **MEMRECAM** fx DRP's
- 5. Fibre Channel connectivity to multiple *MEMRECAM* fx DRP's

Note: Ethernet and Fibre Channel connections cannot be used simultaneously.

PC hardware requirements to operate fx Link software

PC	IBM PC compatible (DOS/V), single processor
CPU	Pentium III 750 MHz or higher (with MMX)
	(Recommended Pentium IV 2.5GHz or higher, compression and display processing
	speed depends on CPU capability)
Memory	256MB RAM or higher (recommended 512MB or higher)
Graphics	Full color, 1024×768 resolution or higher (recommended 1280×1024 or higher)
os	Windows NT 4.0 Service Pack 5 or higher, Windows 2000 Professional,
	Windows XP Professional, Internet Explorer 5.0 Service Pack 2 or higher
Hard Disk	Minimum 42MB of disk space for program, 512MB of disk space or higher
	recommended.
Network	Ethernet (IEEE8023u 100BASE-TX)
CD Drive	1 (for installation)

Compression and display processing speeds depend on CPU capability. There should be sufficient free disk space for data. Depending on the PC configuration and hardware version, fx Link may not operate well under conditions as listed above. (Consult your retail outlet for recommended PC systems).

Note: Refer to the fx Link software Operation Manuals for handling and operation of the control computer.

2.1 MEMRECAM fx System Connectivity and Applications

2.1.1 CF (Compact Flash) card storage media

Connect as shown in Diagram 1 before turning the *MEMRECAM* fx power on. The CF (Compact Flash) card is used after images have been recorded.

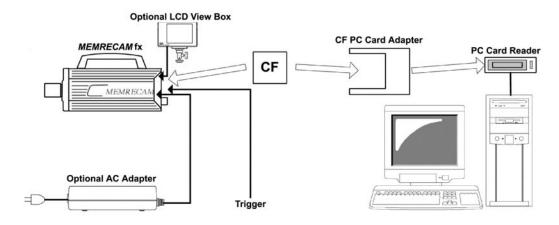


Diagram 1 CF Card application

The **MEMRECAM** fx supports CF (Compact Flash) card or a CF hard disk (micro drive) storage media to save previously photographed images and setup data (record and trigger settings). Depending on your particular control computer, an additional CF PC Card Adapter or PC Card Reader may be required. The **MEMRECAM** fx can be operated using the Rear Camera Control Touch pad or the J-PAD 2 remote control panel (Not shown in Diagram 1).

- The following optional accessories can be used to display menu settings and image record/playback operation:
 - LCD Viewfinder directly connected to **MEMRECAM** fx (standard D-VGA connector)
 - LCD View Box directly connected to **MEMRECAM** fx (standard D-VGA connector)
 - Use a readily available monitor compatible with NTSC, S Video or analog VGA signals converted from the *MEMRECAM* fx D-VGA signal by an Image Converter. (Not shown in Diagram 1)

Caution

The optional LCD Viewfinder, LCD View Box and the optional Image Converter (Not shown in Diagram 1) must be connected to the *MEMRECAM* fx rear panel D-VGA OUT connector.

2.1.2 Ethernet connectivity to a single *MEMRECAM* fx DRP

Connect as shown in Diagrams 2 and 3 before turning the *MEMRECAM* fx power on. For proper operation ensure that the *MEMRECAM* fx DRP is configured for Ethernet connectivity (Refer to Section 3, System Setup).

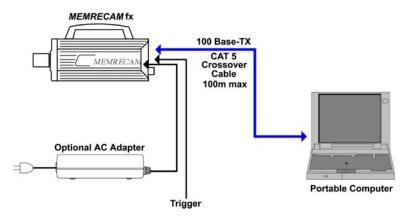


Diagram 2 Direct Ethernet Connectivity to a single **MEMRECAM** fx DRP

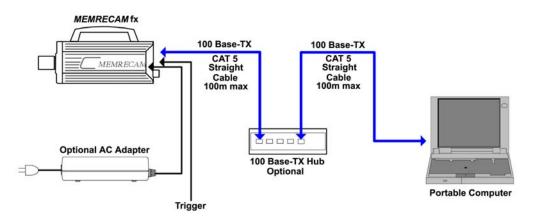


Diagram 3 Ethernet Connectivity via optional Ethernet Hub to a single MEMRECAM fx DRP

The **MEMRECAM** fx supports 100 Base-TX connectivity either direct to a control computer or via an optional 100 Base-TX Ethernet Hub. The control computer must have either Smart Capture or fx Link software installed to operate the DRP remotely. For direct connectivity a CAT 5 crossover cable is necessary. When the optional Ethernet Hub is used, straight CAT 5 cables are required. While connected to the control computer, the **MEMRECAM** fx can also be operated using the Rear Camera Control Touch Pad or the J-PAD 2 remote control panel (not shown).

2.1.3 Fibre Channel connectivity to a single **MEMRECAM** fx DRP

Connect as shown in Diagrams 4, 5 and 6 before turning the **MEMRECAM** fx power on. For proper operation ensure that the **MEMRECAM** fx DRP is configured for Fibre Channel connectivity (Refer to Section 3, System Setup).

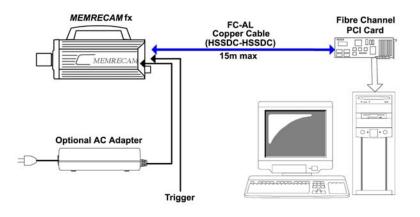


Diagram 4 Direct Fibre Channel Connectivity to a Single **MEMRECAM** fx DRP (Copper)

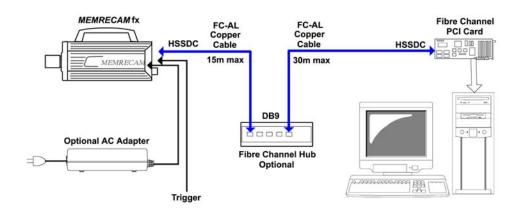


Diagram 5 Fibre Channel Connectivity via optional Fibre Channel Hub to a single **MEMRECAM** fx DRP (Copper)

The **MEMRECAM** fx supports Fibre Channel connectivity either direct to a control computer or via an optional Fibre Channel Hub. The control computer must have either Smart Capture or fx Link software installed to operate the DRP remotely. For direct connectivity use a FC-AL cable with HSSDC Connectors at both ends. The maximum cable length for a direct copper connection is 15m. When the optional Fibre Channel Hub is used, FC-AL cables with DB9 and HSSDC connectors at opposite ends are required. The combined maximum distance is 45m. While connected to the control computer, the **MEMRECAM** fx can also be operated using the Rear Camera Control Touch Pad or the J-PAD 2 remote control panel (not shown). (00001) A

The optional Media Interface Adapter (MIA) system can be used where distances are greater than 45m (using FC Hub).

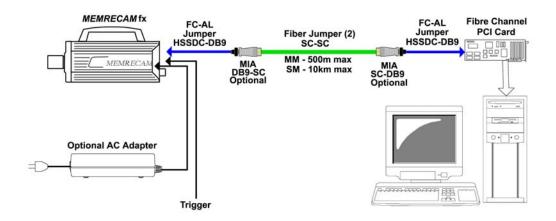
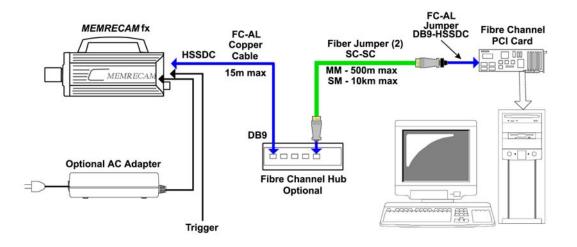
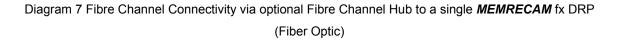


Diagram 6 Direct Fibre Channel Connectivity to a Single *MEMRECAM* fx DRP (Fiber Optic)





The MIA system can transmit data using either Single Mode (SM) or Multi Mode (MM) fiber with SC connectors. The MIA lasers are fiber type specific. Please specify either SM or MM when ordering. The maximum jumper length using MM fiber is 500m. When using SM fiber the maximum jumper length increases to 10km. The MIA's are connected to the control computer and the FC-AL Hub using short jumpers with HSSDC and DB9 connectors at opposite ends. When the optional Fibre Channel Hub is used, the MIA connects directly to the FC-AL Hub DB9 connector. While connected to the control computer, the *MEMRECAM* fx can also be operated using the Rear Camera Control Touch pad or the J-PAD 2 remote control panel (not shown).

2.1.4 Ethernet connectivity to multiple **MEMRECAM** fx DRP's

Connect as shown in Diagram 8 before turning the *MEMRECAM* fx power on. For proper operation ensure that the *MEMRECAM* fx DRP is configured for Ethernet connectivity (Refer to Section 3, System Setup).

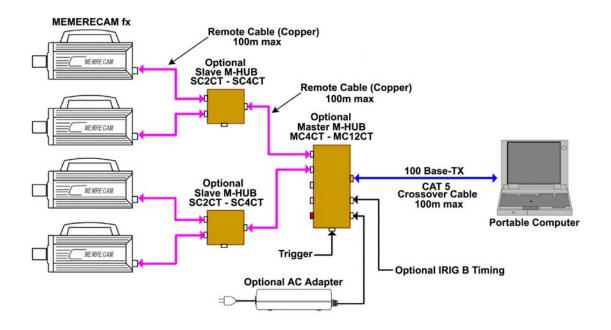


Diagram 8 Ethernet connectivity to four **MEMRECAM** fx DRP (AC Adapters for DRP's not shown)

Multiple **MEMRECAM** fx DRP's can be connected using the optional M-HUB system. The maximum number of DRP's that can be connected using the M-Hub system is 48. The M-HUB system features timing synchronization. The Master M-HUB internal clock sends a timing signal to all connected DRP's to lock on during image capture. Each DRP can be set to different recording speeds and still maintain synchronized image capture. When an external timing signal (e.g. IRIG B) is used, it takes precedence over the Master M-HUB internal clock.

Special copper Remote Cables (100m max) connect the Master M-HUB (up to 12 ports) directly to the *MEMRECAM* fx DRP's or to Slave M-HUB (up to 4 ports). If the Slave M-HUB is used, additional Remote Cables connect to the *MEMRECAM* fx DRP's. In the configuration shown the control computer has a single 100 Base-TX Ethernet connection to the Master M-HUB. The maximum cable length for a direct 100 Base-TX Ethernet copper connection to the control computer is 100m. For direct connectivity a CAT 5 crossover cable is necessary. When the optional Ethernet Hub (not shown) is used, straight CAT 5 cables are required. The control computer must have either Smart Capture or fx Link software installed to operate the DRP's remotely.

While connected to the control computer, the *MEMRECAM* fx can also be operated using the Rear Camera Control Touch Pad or the J-PAD 2 remote control panel (not shown). (00001) A 2-6

2.1.5 Fibre Channel connectivity to multiple *MEMRECAM* fx DRP

Connect as shown in Diagrams 9 and 10 before turning the **MEMRECAM** fx power on. For proper operation ensure that the **MEMRECAM** fx DRP is configured for Fibre Channel connectivity (Refer to Section 3, System Setup).

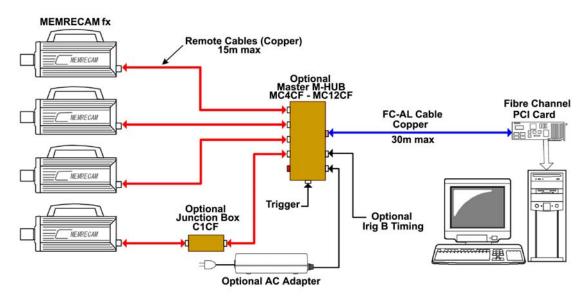


Diagram 9 Fibre Channel connectivity to four **MEMRECAM** fx DRP (AC Adapters for DRP's not shown)

Multiple **MEMRECAM** fx DRP's can be connected using the optional M-HUB system. The maximum number of DRP's that can be connected using the M-Hub system is 48. The M-HUB system features timing synchronization. The Master M-HUB internal clock sends a timing signal to all connected DRP's to lock on during image capture. Each DRP can be set to different recording speeds and still maintain synchronized image capture. When an external timing signal (e.g. IRIG B) is used, it takes precedence over the Master M-HUB internal clock.

Special copper Remote Cables (15m max) connect the Master M-HUB (up to 12 ports) directly to the *MEMRECAM* fx DRP's. If longer distance is needed, the optional Junction Box can be used to boost the signal. Using the Junction Box, the combined maximum distance is 30m. In the configuration shown the control computer has a single Fibre Channel connection to the Master M-HUB. The maximum cable length for a direct Fibre Channel copper connection to the control computer is 30m. When the optional Fibre Channel Hub (not shown) is used, FC-AL cables with DB9 and HSSDC connectors at opposite ends are required. With the optional Fibre Channel hub the combined maximum distance increases to 45m. The control computer must have either Smart Capture or fx Link software installed to operate the DRP's remotely.

While connected to the control computer, the **MEMRECAM** fx can also be operated using the Rear Camera Control Touch Pad or the J-PAD 2 remote control panel (not shown).

The optical Master and Slave M-HUB system can be used for distances greater than 30m between the Master M-HUB and the *MEMRECAM* fx DRP.

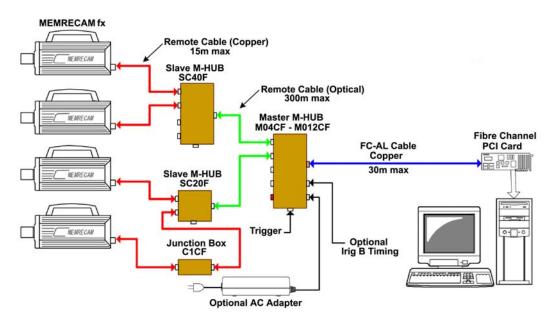


Diagram 10 Fibre Channel connectivity to multiple *MEMRECAM* fx DRP (AC Adapters for DRP's not shown)

The optical version of the Master M-HUB system transmits data using special optical cables to a maximum of 300m. The *MEMRECAM* fx DRP's can only connect to the special copper cables. When using the optical Master M-HUB, the optional Slave M-HUB is also needed to convert the signal from optical to copper. While connected to the control computer, the *MEMRECAM* fx can also be operated using the Rear Camera Control Touch pad or the J-PAD 2 remote control panel (not shown).

2.2 Basic MEMRECAM fx Operation

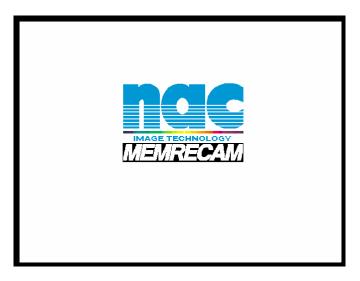
2.2.1 Power

As shown in Diagram 11, connect the AC adapter, J-PAD2 remote control and the optional LCD Viewfinder (or optional Image Converter with compatible monitor) to the **MEMRECAM** fx DRP and turn the power switch to the **ON** position.



Diagram 11

During the *MEMRECAM* fx startup sequence a long beeping sound will be heard as the auto diagnostics are conducted. The startup sequence will be completed in approximately 30 seconds and the Startup Screen 1 will appear in the center of the LCD View Box screen.



Startup Screen 1

READY Mode

Next, the Startup screen 2 will appear in the LCD Viewfinder screen. The **MEMRECAM** fx displays a test image and the IBOX will appear in **READY** mode. The IBOX operation will be described later. It displays the current **MEMRECAM** fx record/playback settings. These settings can also be changed with using the IBOX.



Startup Screen 2 (**READY** mode)

The IBOX **READY Status** appears indicating that the *MEMRECAM* fx is in **READY** mode. In addition, the Rear Camera Control Touch Pad and the J-PAD2 remote control **STOP** LED (green) is lit.

■ The IBOX Status box displays the current DRP mode as follows,

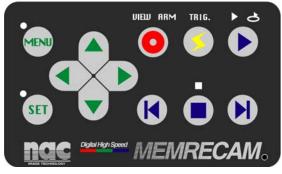
READY Status	READY Status – DRP in READY mode
VIEW Status	VIEW Status – DRP in VIEW mode
ARM Status	ARM Status – DRP in ARM mode
REC Status	REC Status – DRP in RECORD mode
PLAY Status	PLAY Status – DRP in PLAY mode
LOOP Status	LOOP Status - DRP in LOOP PLAY mode

2.2.2 Initial Recording

Operation of the *MEMRECAM* fx DRP is done using the Rear Camera Control Touch Pad or the J-PAD2 remote control keys. The Rear Camera Control Touch Pad and the J-PAD2 cannot be used at the same time. When the J-PAD2 is connected, key operation is done from the remote control pad. When the J-PAD2 is disconnected, the Rear Camera Control Touch Pad keys become effective. Refer to the Smart Capture/fx Link software Operation Manuals for operation with a control computer.

For key movement descriptions refer to 1.2.3(1) Operation Panel.





MEMRECAM fx rear panel (operation panel)

J-PAD2 (operation panel)

■ The following keys are used to operate the record and playback functions of the **MEMRECAM** fx,



VIEW Mode

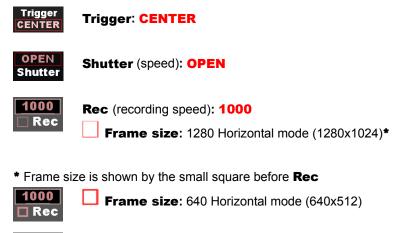
To enter the **VIEW** mode, the **MEMRECAM** fx DRP must be in **READY** mode. Press the **VIEW/ARM** key once to enter the **VIEW** mode. A confirmation beep will sound. The Rear Camera Control Touch Pad and the J-PAD2 remote control **VIEW** LED (continuous blue) will light. After approximately three seconds, the IBOX **Status** display will change from **READY** to **VIEW**.



VIEW mode display

While in **VIEW** mode, a live image is displayed in the LCD View Box. At this time adjustments to the **MEMRECAM** fx camera location, lens adjustments (focus, aperture, zoom) and record settings can be performed.

The **MEMRECAM** fx DRP stores the record settings from the previous session. When operating the **MEMRECAM** fx for the first time the IBOX displays the original factory settings as follows.



Frame size: VGA mode (640x480)

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1000

🗹 Rec

ARM Mode

From the **VIEW** mode press the **VIEW/ARM** key once to enter the **ARM** mode. A confirmation beep will sound. The Rear Camera Control Touch Pad and the J-PAD2 remote control **ARM** LED changes from continuous blue to flashing red. After approximately three seconds, the IBOX **Status** display will change from **VIEW** to **ARM**.



ARM mode display

Once in **ARM** mode, the buffer begins to be updated by input from the camera. The percentage of memory used as a buffer is determined by the Trigger setting (e.g. **CENTER Trigger** equals 50% memory buffer). Any previous recording stored in memory is immediately deleted and replaced by the new recording. Simultaneously the live image continues to be displayed in the LCD View Box. At this time the **MEMRECAM** fx awaits a trigger signal input. The IBOX **Frame** (frame counter) box shows the value of remaining frames (recordable frames) available for recording after the trigger signal is received.



Trigger input and completion of recording

From the **ARM** mode press the **TRIGGER** key once. A confirmation beep will sound and recording will begin. The Rear Camera Control Touch Pad and the J-PAD2 remote control **ARM** LED stops flashing and the **TRIG** LED (yellow) will remain lit while recording. Simultaneously, the IBOX **Status** display changes from **ARM** to **REC** and the **Frame** (frame counter) box begins to count the recorded frames.

The IBOX **Status** display changes from **REC** to **READY** and the **Frame** box stops counting when recording is complete. A long beep will sound and the LCD View Box will display the image captured when the trigger input was received. The Rear Camera Control Touch Pad and the J-PAD2 remote control **STOP** LED (green) is lit. The image is now ready for playback (as a default, the image will begin to play from the trigger frame).

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2.2.3 Playback of Recorded Images

PLAY Mode

When recording is complete, the *MEMRECAM* fx returns to **READY** mode and the image is ready for playback (as a default, the image will begin to play from the trigger frame). Press the **PLAY** key once to enter the **PLAY** mode. A confirmation beep will sound and playback will begin. The Rear Camera Control Touch Pad and the J-PAD2 remote control **STOP** LED (green) turns off and the **PLAY** LED (green) is lit. The IBOX **Status** display changes from **READY** to **PLAY**. When final frame is reached, playback will stop and the *MEMRECAM* fx returns to **READY** mode.

LOOP PLAY Mode

The LOOP PLAY mode plays the image in a continuous loop. While in PLAY mode press the PLAY key once again to enter LOOP PLAY mode (If the PLAY key is held down while in READY mode, it will automatically enter LOOP PLAY mode.) A confirmation beep will sound and loop playback will begin. The Rear Camera Control Touch Pad and the J-PAD2 remote control PLAY LED (green) turns off and the LOOP PLAY LED (green) is lit. The IBOX Status display changes from PLAY to LOOP. To stop loop playback press the STOP key and the MEMRECAM fx returns to READY mode.

Navigation of Recorded Image

Step Back to Previous Frame

In **READY** mode, press the **REV STEP** key.

Step Forward to Next Frame

In **READY** mode, press the **FWD STEP** key.

Fast Scroll Back

In **READY** mode, hold down the **REV STEP** key.

Fast Scroll Forward

In **READY** mode, hold down the **FWD STEP** key.

Jump to Trigger Frame

In **READY** mode, press the **TRIGGER** key.

Jump to Top Frame

In **READY** mode, while pressing the **TRIGGER** key, then press the **REV STEP** key.

Jump to Final Frame

In **READY** mode, while pressing the **TRIGGER** key, then press the **FWD STEP** key.

Decrease Playback Speed

In **PLAY** mode, press the **REV STEP** key.

Increase Playback Speed

In **PLAY** mode, press the **FWD STEP** key.

Setting Playback Range

To save time during playback and disk space when storing images, set the playback range to select only the area of interest. In **READY** mode, navigate to the first frame of the desired playback range. While holding down the **STOP** key, press the **REV STEP** key. A bracket [will appear on the left side of the IBOX **Frame** box.



Then navigate to the last frame of the desired playback range. Hold down the **STOP** key, press the **FWD STEP** key. A bracket] will appear on the right side of the IBOX **Frame** box. The area of interest is now selected and is represented by the bracketed frame box [Frame].



Cancellation of Playback Range Set

While in **READY** mode, press the **REV STEP** key and **FWD STEP** key simultaneously. The brackets will disappear from the IBOX **Frame** box.



2.2.4 **Turning Power Off**

While in **READY** mode, turn the **MEMRECAM** fx POWER switch to the OFF position (if not in **READY** mode press the **STOP** key). The current record/playback settings are saved for the next session.





Caution

When using a control computer with Smart Capture or fx Link software, close the programs first before turning the DRP power off. System errors in the control computer may occur when the connection is severed by the power loss.



Caution

Turning the power off deletes any image data recorded in RAM. If necessary, download image data to Compact Flash or control computer before turning power off. The optional Memory Backup Module can protect images from being deleted because of accidental power loss. Contact your retail outlet to inquire about the Memory Backup Module option.

3

MEMRECAM fx

Setup

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3. MEMRECAM fx Setup

Before beginning to setup the **MEMRECAM** fx DRP record and playback options, ensure that the AC adapter, the J-PAD2 remote control and the optional LCD View Box, LCD Viewfinder or Image Converter (with compatible monitor) are connected to the **MEMRECAM** fx DRP. The power switch should be in the ON position, after a few seconds the Startup Screen 2 appears and the IBOX **Status** box indicates that the DRP is in **READY** mode (Refer to Section 2.2.1, Basic **MEMRECAM** fx Operation, Power).

3.1 IBOX (Information Box) and Screen Display

The IBOX is represented by the two menu bars above and below the image. The top bar contains the **ID**, **Scene**, **Trigger**, **Trigger Time** and **Frame** boxes. The bottom bar contains the **Zoom**, **Scroll**, **Status**, **Play**, **Rec**, **Shutter** and **Logo Graphic** boxes. The IBOX displays the current setting of the most common record and playback functions. After a recording these settings are stamped to the raw image file for future reference.



Startup Screen 2 (**READY** mode)

After initial startup of the **MEMRECAM** fx, the IBOX will display four asterisks (********) in boxes where record settings have not been entered (e.g. **Scene**, **Trigger**, **Frame**, **Rec** and **Shutter**). During the setup operation, these asterisks will be replaced by the record setting values.

The *MEMRECAM* fx setup settings can be done using the Rear Camera Control Touch Pad or the J-PAD2 remote control keys. The Rear Camera Control Touch Pad and the J-PAD2 cannot be used at the same time. When the J-PAD2 is connected, key operation is done from the J-PAD2. When the J-PAD2 is disconnected, the Rear Camera Control Touch Pad keys become effective.

3.1.1 IBOX and Popup Menu

The *MEMRECAM* fx record and playback settings can be changed using the IBOX main display or the Popup Menu. The color of the IBOX display boxes changes depending on the DRP mode.

■ The following keys are used to navigate and change the *MEMRECAM* fx IBOX settings,



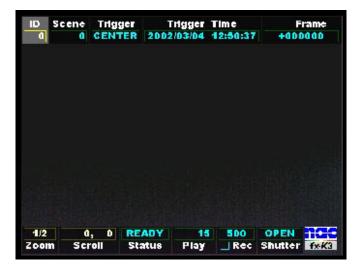
The IBOX display boxes are accessed by using the **LEFT/RIGHT** keys while in **READY** or **VIEW** modes. Once the particular box is selected, use either of the following methods to change the settings,

- Press the MENU key and the Popup Menu appears. Use the UP/DOWN keys to select the item to be modified. Press the SET key to access the item to be modified. The UP/DOWN and LEFT/RIGHT keys are used to change the settings. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display.
- 2) Press the SET key to modify the settings within the selected IBOX display box. Use the UP/DOWN keys to make the settings change. Once finished making changes press the SET key twice (when pressing it once, a white border surrounds the box allowing for it to be repositioned on the screen using the arrow keys) to exit back to the IBOX main display.

ID box

In the **ID** box, the *MEMRECAM* fx identification number can be set. It can be any number between 0 and 127. This identification number setting allows the user to easy identify the source DRP after the images are recorded.

To set the identification number select the ID box using the LEFT/RIGHT keys while in **READY** or **VIEW** modes.



IBOX display screen

1) To access the ID box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the ID row and press the SET key to enable editing. Using the UP/DOWN keys enter any unique number between 0 and 127. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The ID box now reflects the new value. The ID box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



ID box Popup Menu

2) To modify the settings from within the **ID** box press the **SET** key. Use the **UP/DOWN** keys to enter any unique number between 0 and 127.



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Scene box

The **Scene** box displays the current scene number. It can be any number between 0 and 65535 and automatically increments on each recording. The scene number can be set to begin counting at any particular number or reset to zero.

and the second second	Scane	Trigg		Trigger			rame
٥	1	GENT	rer 20	02/03/07	10:30:10	4 +001	daab
1/2	a	, D	VIEW	1	1000	OPEN	10-0

To set the scene numbers select the Scene box using the LEFT/RIGHT keys while in VIEW mode.

IBOX display screen

 To access the Scene box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the SCENE No. row and press the SET key to enable editing. Using the UP/DOWN keys enter any unique number between 0 and 65535 (by holding down the UP/DOWN keys the number changes by increments of 10). Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Scene box now reflects the new value. The Scene box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



Scene box Popup Menu

2) To modify the settings from within the **Scene** box press the **SET** key. Use the **UP/DOWN** keys to enter any unique number between 0 and 65535.



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Trigger box

The **Trigger** box displays the current trigger setting. The percentage of memory used as a buffer during recording is determined by the trigger setting. There are five trigger settings,

START	The trigger point is about 5% after the top of memory
CENTER	The trigger point is at the center of the memory. (Factory default setting)
END	The trigger point is about 5% before the end of memory
BURST	No Memory Buffer. (Records only when trigger signal is present)
CUSTOM (%)	Any percentage of the Memory may be set as Buffer Ring and Delay Start.
	-100% DELAY Start
	0% START Trigger
	+50% CENTER Trigger
	+100% END Trigger

To modify the trigger settings select the **Trigger** box using the **LEFT/RIGHT** keys while in **VIEW** mode.

ID	Scane	Trigge		1gger			rame
a	Q	GENTE	R 2002/	03/06	10:23:47	+000	aab
1/2	0 1 Sci		VIEW	15 Play		OPEN Shutter	nœ

IBOX display screen

 To access the Trigger box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the TRIGGER row and press the SET key to enable editing. Using the LEFT/RIGHT keys select the desired trigger setting. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Trigger box now reflects the new value. The Trigger box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.

Refum	
TRIOGER	START CENTER END +890 %
DISPLAY	DN DN SE READY OFF
POSITION	137, 002

Trigger box Popup Menu

 To modify the settings from within the Trigger box press the SET key. Use the UP/DOWN keys to select the desired trigger setting.



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Note: When selecting the **CUSTOM** trigger setting use the **LEFT/RIGHT** keys to change the percentage value (by holding down the **LEFT/RIGHT** keys the percentage changes at increasing speed). Once finished making changes press the **SET** key twice to lock the value and return to the IBOX main display.



Zoom box

The **Zoom** box displays the current magnification setting (x1/2, x1, x2, and x4).

To modify the magnification settings select the **Zoom** box using the **LEFT/RIGHT** keys while in **READY** or **VIEW** modes.



IBOX display screen

1) To access the Zoom box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the ZOOM row and press the SET key to enable editing. Using the LEFT/RIGHT keys select the desired zoom setting. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Zoom box now reflects the new value. The Zoom box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



Zoom box Popup Menu

2) To modify the settings from within the Zoom box press the SET key. Use the UP/DOWN keys to select the desired magnification value. Once finished making changes press the SET key twice (when pressing it once, a white border surrounds the box allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. The Zoom box display options can only be set using the Popup Menu.



x1 Zoom

x2 Zoom

x4 Zoom



Scroll box

The **Scroll** box displays the horizontal and vertical position of the magnified section of the image shown while using **Zoom**. The X and Y coordinate originate from the upper left hand corner of the display. By changing the coordinates in the Scroll box the user can navigate around the image.

To modify the coordinate settings select the **Scroll** box using the **LEFT/RIGHT** keys while in **READY** or **VIEW** modes.



IBOX display screen

1) To access the Scroll box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the Scroll row and press the SET key to enable editing of the Y (horizontal) coordinate. Use the LEFT/RIGHT to select the digit to be modified and the UP/DOWN keys to change its value. Press the SET key once to select the X (vertical) coordinate. Again use the LEFT/RIGHT to select the digit to be modified and the UP/DOWN keys to change its value. Press the SET key again to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Scroll box now reflects the new coordinates and the image display changes to this new location. The Scroll box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



Scroll box Popup Menu 3-11

2) To navigate the image from within the Scroll box press the SET key. Use the UP/DOWN and LEFT/RIGHT keys to navigate around the image (by holding down arrow keys the coordinates change at increasing speed). Once finished making changes press the SET key twice (when pressing it once, a white border surrounds the box allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.





Use the **UP/DOWN** keys to change the Y (horizontal) coordinate.



Play box

The **Play** box displays the current playback speed in frames per second. The image playback can be forward or reverse.

Forward playback increments in frames per second,

1.0, 1.8, 3.7, 7.5, 15, 30, 60, 120, 240, 480, 960, 1920

Reverse playback increments in frames per second,

-1920, -960, -480, -240, -120, -60, -30, -15, -7.5, -3.7, -1.8, -1.0

To modify the playback speed settings select the **Play** box using the **LEFT/RIGHT** keys while in **READY** or **VIEW** modes.

ID	Scane	Trigg	ger	Trig	ger	Time		Fra	me
٥	Q	GENT	FER 2	2002/03	104	12:50:3	7 4	Fabba	00
1/2		· D	REAL	DY	15	500	OPI	EN j	

IBOX display screen

 To access the Play box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the Play Rate row and press the SET key to enable editing. Using the LEFT/RIGHT keys select the desired playback speed setting. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Play box now reflects the new playback speed. The Play box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.

- Relum	
Play Rate	4 1.8 3.7 7.5 15 ►
DISPLAY	DN DN at READY OFF
POSITION	301, 422

Scroll box Popup Menu

 To set the playback speed from within the Play box press the SET key. Use the UP/DOWN keys to set the desired playback speed.



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Rec box

The Rec box displays the current recording speed and image resolution.



To modify the record settings select the **Rec** box using the **LEFT/RIGHT** keys while in **VIEW** mode.

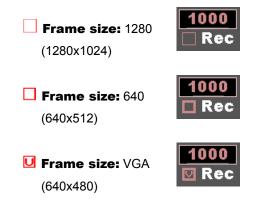
IBOX display screen

1) To access the Rec box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the Frame Rate row and press the SET key to enable editing. Using the LEFT/RIGHT keys select the desired recording speed. Press the SET key to lock the value and return to the Popup Menu. Repeat the process on the Frame Size row to set the image resolution. Once finished making changes press the MENU key to exit back to the IBOX main display. The Rec box now reflects the new recording speed and image resolution. The image resolution is represented by the small square left of the Rec label. The Zoom box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



Scroll box Popup Menu

2) To modify the record settings from within the Scroll box press the SET key. Use the UP/DOWN keys to modify the recording speed. The LEFT/RIGHT keys change the image resolution (notice changes in the small square located left of the Rec label).



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Shutter box

The **Shutter** box displays the current electronic shutter setting.

To modify the electronic shutter settings select the **Shutter** box using the **LEFT/RIGHT** keys while in **VIEW** mode.

ID	Scane	Trigg		Trigger		Frame
۵	Q	GENT	TER (\$99	\$10\$10\$	*****	****
1/2	0	, 0	VIEW	1 1	5 1000	OPEN 1

IBOX display screen

 To access the Shutter box Popup Menu press the MENU key once. In the popup menu, use the UP/DOWN keys to select the Frame Rate row and press the SET key to enable editing. Using the LEFT/RIGHT keys select the desired shutter setting. Press the SET key to lock the value and return to the Popup Menu. Once finished making changes press the MENU key to exit back to the IBOX main display. The Shutter box now reflects the new shutter speed. The Shutter box Display options (ON, ON at READY, OFF) and screen Position (in pixels) can also be modified while in the Popup Menu.



Scroll box Popup Menu

 To modify the electronic shutter settings from within the Shutter box press the SET key. Use the UP/DOWN keys to modify the shutter speed.



Once finished making changes press the **SET** key twice (when pressing it once, a white border surrounds the box [as shown below] allowing for it to be repositioned on the screen using the arrow keys) to lock the value and return to the IBOX main display. Display options can only be set using the Popup Menu.



Use the **LEFT/RIGHT** keys to change the micro-second (μ s) shutter speed setting.



3.2 Setup Menu

The *MEMRECAM* fx setup menus allow the user to fully customize the record, playback and system settings. There are three setup menus as follows.

RECORDING MENU (Record settings)

Used to fully customize the record settings including frame rate, frame size and trigger settings. Enter the **RECORDING MENU** by pressing the **MENU** button while in **VIEW** mode.

RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 >
FRAME SIZE	1280×1024 640×512 640×489
SHUTTER	OPEN 2K 5K 10K 20K 50K >
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000

RECORDING MENU

■ TOP MENU (Playback settings)

Used to fully customize the playback settings including GAIN and ENHANCE settings. Enter the **TOP MENU** by pressing the **MENU** button while in **READY** mode.

GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU >	
CF save MENU ►	

TOP MENU

SYSTEM MENU (Overall system settings)

Overall system options like ID number, Date/Time settings and whether or not to display the IBOX are set at the **SYSTEM MENU**. Enter the **SYSTEM MENU** from the **TOP MENU**.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:23:22
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings >	
TRIGGER MENU .	
SYSTEM SETUP >	
INFORMATION >	

SYSTEM MENU

3.2.1 RECORDING MENU Setup

The **RECORDING MENU** administers settings related to recording. Enter the **RECORDING MENU** by pressing the **MENU** button while in **VIEW** mode.



Startup Screen 2 (VIEW mode)

The **RECORDING MENU** lettering is red in color. Use the **UP/DOWN** keys to select the desired row and press the **SET** key to enable editing. The **LEFT/RIGHT** keys are used to change the settings. Press the **SET** key to confirm the setting. Once finished making changes, press the **MENU** or **STOP** key to exit the setup menu and return to **VIEW** mode.

- < RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2K 5K 10K 20K 50K >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
EXIT MENU	

RECORDING MENU

SCENE No.

The **Scene No.** row displays the current scene number. It can be any number between 0 and 65535 and automatically increments on each recording. The scene number can be set to begin counting at any particular number or reset to zero.

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **SCENE No.** row and press the **SET** key to enable editing. Using the **UP/DOWN** keys enter any unique number between 0 and 65535 (by holding down the **UP/DOWN** keys the number changes by increments of 10). Press the **SET** key to lock the value and return to confirm the setting.

< RECORDING MENU	>
♦ SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2K 5K 10K 20K 50K >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Enter SCENE No.	

RECORDING MENU - SCENE No.

TRIGGER

The **TRIGGER** row displays the current trigger setting. The percentage of memory used as a buffer during recording is determined by the trigger setting. There are five trigger settings,

START	The trigger point is about 5% after the top of memory
CENTER	The trigger point is at the center of the memory. (Factory default setting)
END	The trigger point is about 5% before the end of memory
BURST	No Memory Buffer. (Records only when trigger signal is present)
CUSTOM (%)	Any percentage of the Memory may be set as Buffer
	-100% START Trigger
	0% CENTER Trigger
	+100% END Trigger

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **TRIGGER** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired trigger setting. When selecting the **CUSTOM** trigger setting use the **LEFT/RIGHT** keys to change the percentage value (by holding down the **LEFT/RIGHT** keys the percentage changes at increasing speed). Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select Trigger Mode / Press SET to e	nter TRIGGER Timming

RECORDING MENU - TRIGGER

FRAME RATE

The **FRAME RATE** row displays the current recording speed in frames per second.

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **FRAME RATE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired recording speed setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
♦ FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	1k 2k 5k 10k 20k 50k 100k Þ
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select Frame Rate	

RECORDING MENU - FRAME RATE

FRAME SIZE

The **FRAME SIZE** row displays the current image resolution in pixels.

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **FRAME SIZE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired image resolution setting. Press the **SET** key to confirm the setting.

< RECORDING MENU :	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
◆ FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select Frame Size	

RECORDING MENU - FRAME SIZE

SHUTTER

The **SHUTTER** row displays the current electronic shutter setting.

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **SHUTTER** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired shutter speed (when selecting the micro-second (μ s) shutter speed press the **SET** key again to enable editing and use the **UP/DOWN** keys to change value). Press the **SET** key to confirm the setting.

< RECORDING MENU	
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	◀ 250 500 1000 2000 3000 ►
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG ►
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select Shutter Speed	

RECORDING MENU - SHUTTER

GAIN

The **GAIN** feature enhances light sensitivity electronically. This is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

0dB	Factory Setting
6dB	Increases light sensitivity by one lens stop compared to 0dB
12dB	Increases light sensitivity by two lens stops compared to 0dB

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **GAIN** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 <u>2000</u> >
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k ►
≑ GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select GAIN for RECORD MODE	

RECORDING MENU - GAIN

WHITE BALANCE

The **WHITE BALANCE** row displays the current white balance setting of a color image. This is a postprocessing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

Αυτο	Automatic tracking mode (Factory Setting)
3100	Set at 3100K
5000	Set at 5000K
9000	Set at 9000K
REG	Register mode
SET	Current white balance register entry, automatically returns to REG when
	completed.

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **WHITE BALANCE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	∢ 250 500 1000 2000 3000 ►
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	∢ 50k 100k 200k 0000 μs
GAIN	0dB 6dB 12dB
♦ WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select WHITE BALANCE for RECORD	MODE

RECORDING MENU - WHITE BALANCE

ENHANCE

The **ENHANCE** row displays the current edge sharpness setting. This is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

OFF	No sharpness enhancement	
NORMAL	Standard sharpness enhancement (Factory setting)	
HIGH	High sharpness enhancement	

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **ENHANCE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

<pre>< RECORDING MENU :</pre>	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 >
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2K 5K 10K 20K 50K >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
≑ ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select ENHANCE for RECORD MODE	

RECORDING MENU - ENHANCE

GAMMA

The **GAMMA** row displays the current gamma correction (gradation) setting. This is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

OFF	No gamma correction (Gamma is about 1)	
NORMAL	Low gamma correction	
HIGH	Standard gamma correction (Factory setting)	

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **GAMMA** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>	
SCENE No.	00000	
TRIGGER	START CENTER END +000 %	
FRAME RATE	100 250 500 1000 2000 >	
FRAME SIZE	1280x1024 640x512 640x480	
SHUTTER	OPEN 2k 5k 10k 20k 50k >	
GAIN	0dB 6dB 12dB	
WHITE BALANCE	AUTO 3100 5000 9000 REG >	
ENHANCE	OFF NORMAL HIGH	
≑ GAMMA	OFF LOW NORMAL	
CHROMA	0 50 100 150 200	
KNEE	OFF ON	
LOW LIGHT MODE	OFF 100 250 500 1000	
Select GAMMA for RECORD MODE		

RECORDING MENU - GAMMA

CHROMA

The **CHROMA** row displays the current color intensity (brilliance) setting. The higher the adjustment, the greater is the color intensity. This is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

0	Set at 0% (Black/White image)
50	Set at 50%
100	Set at 100% (Standard color intensity)
150	Set at 150%
200	Set at 200%

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **CHROMA** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
¢ CHROMA	0 50 100 150 200
KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select CHROMA for RECORD MODE	

RECORDING MENU - CHROMA

KNEE

The **KNEE** feature suppresses bright areas enhancing image definition. This is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback.

OFFBright areas exceeding the fixed level will be clipped (No knee correction)ONBright areas up to about 1-2 times the fixed level will be suppressed

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **KNEE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 ►
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
♦ KNEE	OFF ON
LOW LIGHT MODE	OFF 100 250 500 1000
Select KNEE for RECORD MODE	

RECORDING MENU - KNEE

LOW LIGHT MODE

The **LOW LIGHT MODE** allows for lens adjustments (e.g. focus) when using high frame rates and high shutter speeds. It may also be used to make such adjustments with supplemental lighting turned off. When in **LOW LIGHT MODE** the shutter is normally open. Depending on the brightness of the subject, the recording speed can be adjusted to 100, 250, 500, 1000 frames per second. Once the DRP is set to ARM mode the **LOW LIGHT MODE** is disabled and resumes recording in the previously set shutter and recording speed.

OFF	Normal mode instead of low light mode (image display for set shutter time)
100	1/100sec exposure
250	1/250sec exposure
500	1/500sec exposure
1000	1/1000sec exposure

In the **RECORDING MENU**, use the **UP/DOWN** keys to select the **LOW LIGHT MODE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< RECORDING MENU	>
SCENE No.	00000
TRIGGER	START CENTER END +000 %
FRAME RATE	100 250 500 1000 2000 -
FRAME SIZE	1280x1024 640x512 640x480
SHUTTER	OPEN 2k 5k 10k 20k 50k >
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG >
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
^ LOW LIGHT MODE	OFF 100 250 500 1000
Select LOW LIGHT MODE	

RECORDING MENU - LOW LIGHT MODE

3.2.2 **TOP MENU** Setup

The **TOP MENU** administers settings related to playback. Enter the **TOP MENU** by pressing the **MENU** button while in **READY** mode.



Startup Screen 2 (**READY** mode)

The **TOP MENU** lettering is blue in color. Use the **UP/DOWN** keys to select the desired row and press the **SET** key to enable editing. The **LEFT/RIGHT** keys are used to change the settings. Press the **SET** key to confirm the setting. Once finished making changes, press the **MENU** or **STOP** key to exit the setup menu and return to **READY** mode.

→ < TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU 🕨	
CF save MENU ►	
EXIT MENU	

TOP MENU

∎ GAIN

The **GAIN** feature enhances light sensitivity electronically. This is a post-processing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

0dB	Factory Setting
6dB	Increases light sensitivity by one lens stop compared to 0dB
12dB	Increases light sensitivity by two lens stops compared to 0dB

In the **TOP MENU**, use the **UP/DOWN** keys to select the **GAIN** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

3 GGB 12dB TO 3100 5000 9000 REG F Normal High F Low Normal 0 100 150 200 F ON
F NORMAL HIGH F Low Normal 0 100 150 200
F LOW NORMAL 0 100 150 200
0 100 150 200
CONTRACTOR OF THE PROPERTY OF THE STORE OF
FON

TOP MENU - GAIN

WHITE BALANCE

The **WHITE BALANCE** row displays the current white balance setting of a color image. This is a postprocessing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

AUTO	Automatic tracking mode (Factory Setting)
3100	Set at 3100K
5000	Set at 5000K
9000	Set at 9000K
REG	Register mode
SET	Current white balance register entry, automatically returns to REG when
	completed.

In the **TOP MENU**, use the **UP/DOWN** keys to select the **WHITE BALANCE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< TOP MENU >	
GAIN	OdB 6dB 12dB
\$ WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Select WHITE BLANCE for PLAYBAC	K MODE

TOP MENU - WHITE BALANCE

ENHANCE

The **ENHANCE** row displays the current edge sharpness setting. This is a post-processing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

OFF	No sharpness enhancement	
NORMAL	Standard sharpness enhancement (Factory setting)	
HIGH	High sharpness enhancement	

In the **TOP MENU**, use the **UP/DOWN** keys to select the **ENHANCE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
♦ ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Select ENHANCE for PLAYBACK M	DDE

TOP MENU - ENHANCE

GAMMA

The **GAMMA** row displays the current gamma correction (gradation) setting. This is a post-processing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

OFF	No gamma correction (Gamma is about 1)	
NORMAL	Low gamma correction	
HIGH	Standard gamma correction (Factory setting)	

In the **TOP MENU**, use the **UP/DOWN** keys to select the **GAMMA** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
+ GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Select GAMMA for PLAYBACK MODE	

TOP MENU - GAMMA

CHROMA

The **CHROMA** row displays the current color intensity (brilliance) setting. The higher the adjustment, the greater is the color intensity. This is a post-processing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

0	Set at 0% (Black/White image)	
50	Set at 50%	
100	Set at 100% (Standard color intensity)	
150	Set at 150%	
200	Set at 200%	

In the **TOP MENU**, use the **UP/DOWN** keys to select the **CHROMA** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

< TOP MENU >	
GAIN	
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
♦ CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Select CHROMA for PLAYBACK MOD	3

TOP MENU - CHROMA

KNEE

The **KNEE** feature suppresses bright areas enhancing image definition. This is a post-processing enhancement. When the image was recorded, the raw data in memory was not affected by this setting. The setting can now be changed at playback.

OFF	Bright areas exceeding the fixed level will be clipped (No knee correction)
ON	Bright areas up to about 1-2 times the fixed level will be suppressed

In the **TOP MENU**, use the **UP/DOWN** keys to select the **KNEE** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

1	
< TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
♦ KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Select KNEE for PLAYBACK MODE	

TOP MENU - KNEE

SYSTEM MENU

Enters the **SYSTEM MENU**, refer to section 3.2.2 for more details.

< TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
CF save MENU ►	
Press SET for SYSTEM MENU	

TOP MENU - SYSTEM MENU

SYSTEM MENU

Enters the **CF save MENU** (Compact Flash), refer to section 3.4 for more details.

< TOP MENU >	
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
SYSTEM MENU ►	
^CF save MENU ►	
Press SET for CF save MENU	

TOP MENU – CF save MENU

3.2.2 **SYSTEM MENU** Setup

Overall *MEMRECAM* fx system options are administered in the **SYSTEM MENU**. Enter the **SYSTEM MENU** by pressing the **RIGHT** key while in the **TOP MENU** – **SYSTEM MENU** row.

< TOP MENU >	
GAIN	OdB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
♦ SYSTEM MENU ►	
CF save MENU 🕨	
Press SET for SYSTEM MENU	

TOP MENU

The **SYSTEM MENU** lettering is yellow in color. Use the **UP/DOWN** keys to select the desired row and press the **SET** key to enable editing. The **LEFT/RIGHT** keys are used to change the settings. Press the **SET** key to confirm the setting. Once finished making changes, press the **MENU** or **STOP** key to exit the setup menu and return to **READY** mode.

TOP MENU < SYSTEM	MENU >
≑ ID	000
DATE,TIME	2002/02/27 15:23:22
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings >	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Enter ID	

SYSTEM MENU

∎ ID

In the **ID** row, the *MEMRECAM* fx identification number can be set. It can be any number between 0 and 127. This identification number setting allows the user to easily identify the source DRP after the images are recorded.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **ID** row and press the **SET** key to enable editing. Using the **UP/DOWN** keys enter any unique number between 0 and 127. Press the **SET** key to confirm the setting.

TOP MENU < SYSTEM	MENU >
≑ ID	000
DATE,TIME	2002/02/27 15:23:22
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP >	
INFORMATION >	
Enter ID	

SYSTEM MENU - ID

■ DATE, TIME

In the **DATE, TIME** row, the normal date and time stamp can be set.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **DATE**, **TIME** row and press the **SET** key to enable editing. Use the **UP/DOWN** keys to enter the current year and press the **SET** key to confirm the setting. Repeat the process for the remaining (day, hour, minute, second) fields and press the **SET** key to confirm each setting.

TOP MENU < SYSTEM	MENU >
ID	000
	2002/02/27 15:23:22
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Enter DATE & TIME	

SYSTEM MENU - DATE, TIME

IBOX DISPLAY

In the **IBOX DISPLAY** row, the IBOX can be turned on or off.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **IBOX DISPLAY** row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to turn the IBOX on or off. Press the **SET** key to confirm the setting.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
+ IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Select IBOX DISPLAY MODE	

SYSTEM MENU – IBOX DISPLAY

CAFM DISPLAY

In the **CAFM DISPLAY** row, the CAFM (Camera Alignment Fiducial Mark) can be turned ON or OFF. The CAFM is used for adjusting the camera before recording. The CAFM cross is not displayed in a previously recorded image.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **IBOX DISPLAY** row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to turn the IBOX ON or OFF. Press the **SET** key to confirm the setting.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
+ CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Select CAFM (Camera Alignment Fidue	cial Mark) DISPLAY MODE

SYSTEM MENU - CAFM DISPLAY

When the **CAFM DISPLAY** is set to the ON position a cross is displayed in the center of the image.



Startup Screen 2 (READY mode) – CAFM

FRAME DISPLAY

The IBOX **Frame** counter can be set to display its contents in frame numbers, time or percentage of memory used / remaining. The desired setting can be selected in the **FRAME DISPLAY** row.

Frame	Counter set to display frame numbers
Time	Counter set to display minutes and seconds
Memory %	Counter set to display percentage of memory used

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **FRAME DISPLAY** row and press the **SET** key to enable editing. Using the **LEFT/RIGHT** keys select the desired setting. Press the **SET** key to confirm the setting.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Select FRAME DISPLAY MODE	

SYSTEM MENU – FRAME DISPLAY

D-VGA VIDEO

In the **D-VGA VIDEO** row, the D-VGA video output port can be turned ON or OFF.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **D-VGA VIDEO** row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to turn the D-VGA video output port ON or OFF. Press the **SET** key to confirm the setting.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
+ D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP >	
INFORMATION >	
Select D-VGA VIDEO Enable.	

SYSTEM MENU – D-VGA VIDEO

IBOX Settings

The **IBOX Settings** row opens the IBOX Settings Sub Menu. In the IBOX Settings Sub Menu each display box can be individually turned ON or OFF.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **IBOX Settings** row and press the **LEFT** key to enter the Sub Menu.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
♦ IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP >	
INFORMATION >	
Press SET for IBOX Settings MENU	

SYSTEM MENU – IBOX Settings

In the **IBOX Settings** Sub Menu, use the **UP/DOWN** keys to select the desired row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to turn the display box ON or OFF. Press the **SET** key to confirm the setting. Once finished making changes press the **LEFT** key to return to the **SYSTEM MENU**.

- TOP MENU < SYSTEM	MENU < IBOX Settings >
ID	ON ON at READY OFF
Scene	ON ON at READY OFF
Trigger Mode	ON ON at READY OFF
Trigger Time	ON ON at READY OFF
Frame	ON ON at READY OFF
Zoom	ON ON at READY OFF
Scroll	ON ON at READY OFF
Status	ON ON at READY OFF
Play Rate	ON ON at READY OFF
Rec Rate	ON ON at READY OFF
Shutter	ON ON at READY OFF
Comment	ON ON at READY OFF
Return to SYSTEM MENU	

IBOX Settings Sub Menu

TRIGGER MENU

The **TRIGGER MENU** row opens the trigger settings Sub Menu (Refer to External Trigger Input, Section 4.1.3). The TRIGGER I/F defines the external trigger signal type.

TRIGGER I/F	Voltage: Contact or 5V CMOS (Schmidt trigger) input Current: Current loop trigger input		
EVENT FRAME When feature is ON, an event mark is recorded at every externation			
	signal		

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **TRIGGER MENU** row and press the **LEFT** key to enter the Sub Menu.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
◆ TRIGGER MENU ►	
SYSTEM SETUP ►	
INFORMATION >	
Press SET for TRIGGER MENU	

SYSTEM MENU – IBOX Settings

In the **TRIGGER MENU**, use the **UP/DOWN** keys to select the desired row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to select the desired setting. Press the **SET** key to confirm the setting. Once finished making changes press the **LEFT** key to return to the **SYSTEM MENU**.

-	ТОР	MENU	< SYS	TEM MEN	U < 1	RIGGER	MENU	٧
	TRI	GGER	l/F	Volta	ge Cu	rrent		
	EVE	ENT FR	AME	0N 0	FF			
R	eturn to	SYSTEM MI	ENU					

IBOX Settings Sub Menu

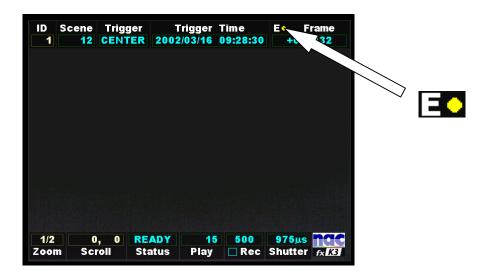
The **EVENT FRAME** feature records a mark at the particular frames where an external trigger signal is received. The first trigger signal is recorded as the original trigger frame. All trigger signals following the original are marked as event trigger frames for future reference.

When the **EVENT FRAME** feature is ON a capital **E** is shown in the IBOX between **TRIGGER Time** and **FRAME**.

ID 1	Scene 11		er ER 2002		Time 09:22:56		rame	
								7
								Ξ
1/2			READY	15		975µs		
Zoon	n Sci	roll	Status	Play	🗌 Rec	Shutter	fx K3	

Startup Screen 2 (READY mode)

When the recorded image is being reviewed, a yellow mark appears to the right of the capital **E** identifying this particular frame as an event trigger frame. The original trigger frame is not marked; instead the IBOX **Frame** counter is set to zero. Every external trigger input after the original trigger will cause a yellow mark to be recorded. While in **READY** mode press the **TRIGGER** key to jump to the original trigger frame. Every time the TRIGGER key is pressed the image jumps to the next event trigger frame.



Startup Screen 2 (**READY** mode)

SYSTEM SETUP

The **SYSTEM SETUP** row opens the SYSTEM SETUP Sub Menu. Here the network connection type can be specified to be either Fibre Channel (FC-AL) or Ethernet (100Base-T)

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **SYSTEM SETUP** row and press the **RIGHT** key to enter the Sub Menu.

TOP MENU < SYSTE	M MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
♦ SYSTEM SETUP ►	
INFORMATION >	
ress SET for SYSTEM SETUP MENU	

SYSTEM MENU – SYSTEM SETUP

In the **SYSTEM SETUP** Sub Menu, use the **UP/DOWN** keys to select the **Network** row and press the **SET** key to enable editing. Use the **LEFT/RIGHT** keys to select the desired connection setting. Press the **SET** key to confirm the setting. Use the **UP/DOWN** keys to select the **REBOOT** row and press the **SET** key to reboot and apply changes. (For information on the **CAMERA DATA** row see section 3.5, Camera Head Exchange)

- TOP MENU	× SYSTEM MENU < SYSTEM SETUP >
CAMERA DA	TA
Network	FC-AL Ethernet
REBOOT	
Return to SYSTEM MEN	U

Network Connection Sub Menu

INFORMATION

The **INFORMATION** row opens the information Sub Menu. Here additional system information such as model type, CID, IP address, and memory size of the MEMRECAM fx DRP is shown.

In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **INFORMATION** row and press the **LEFT** key to enter the Sub Menu.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
↑ INFORMATION ►	
Press SET for Information MENU	

SYSTEM MENU – INFORMATION

- TOP MENU < SYSTEM	MENU < INFORMATION >
Model	MEMRECAM fx-K3
Version	1.20 K4 2002/03/15 15:23:06
CID	1010
MEMORY SIZE	4.0 GB
Hardware Revision	DCD-BBB-BBC-AC0
Network	Stand alone
IP address	172.21.4.40 / 0.0.0.0
MAC address	00:05:61:10:00:0a
FC NodeName	20:00:00:05:61:10:00:09
Return to SYSTEM MENU	

INFORMATION Sub Menu

3.3 User Settings Storage

The user settings entered in the *MEMRECAM* fx **RECORDING MENU**, **TOP MENU** and **SYSTEM MENU** are saved in the internal memory. All settings from the previous session are loaded when the *MEMRECAM* fx power is turned ON.

3.4 Saving Images to Compact Flash (CF) Storage Media

After an image is recorded and reviewed, it can be stored using Compact Flash (CF) Storage Media. Images stored in CF cards can be loaded to a computer for analysis and processing.



Caution

Images recorded by the **MEMRECAM** fx can be saved to CF Storage Media. These images cannot be uploaded back to **MEMRECAM** fx memory from the CF Storage Media.

1. After recording, review the image and select the area of interest by setting the playback range. (refer to Setting Playback Range, Chapter 2)



Startup Screen 2 (PLAY mode)

 Enter the TOP MENU by pressing the MENU button while in READY mode. Using the UP/DOWN keys, select the CF save MENU row and press the SET key to enter the Sub Menu.



TOP MENU – CF save MENU

Enter the **TOP MENU** by pressing the **MENU** button while in **READY** mode. Using the **UP/DOWN** keys, select the **CF save MENU** row and press the **LEFT** key to enter the Sub Menu.

MCFF SAVE	To save the raw image data to CF (Displays available storage space in MB
	and frames)
PLAY FRAME	Displays the range of frames to be saved to the CF card
REC FRAME	Displays the frame range of the recorded image
YC TIFF SAVE	To save still images to CF
CF FORMAT	Formats the CF card (ALL DATA SAVED IN CF CARD IS ERASED)



CF save MENU

3. In the CF save MENU Sub Menu, use the UP/DOWN keys to select the MCFF SAVE row



and press the **SET** key to start saving.

CF save MENU – MCFF SAVE

4. Please wait while the image data is saved to CF.



CF save MENU – MCFF SAVE

- TOP MENU < CF save MENU >

 + MCFF SAVE
 MCFF00000.MCF

 PLAY FRAME
 +000000 ~ ±000002

 REC FRAME
 -001228 ~ ±001228

 YC TIFF SAVE
 CF FORMAT >

 CF FORMAT >
 -00120 ~ ±000000

 Press SET for save Image Data to Compact Flash
- 5. Once the data is saved to CF the filename is shown in the **MCFF SAVE** row.

CF save MENU – MCFF SAVE

3.5 Camera Head Exchange

The *MEMRECAM* fx RX DRP is calibrated to a particular RX camera head for Shading Correction. When the power is turned ON, the DRP communicates with the RX camera head that is connected to it for identification. If the DRP is already calibrated to that particular RX camera head then no changes are made and normal start up resumes. If a different RX camera head is connected and the DRP does not have camera data for it, calibration will begin automatically. It takes several minutes to save the camera data to the internal RAM or flash ROM. In order to navigate the calibration menu, ensure that either the LCD View Box, LCD Viewfinder or the D-VGA Image Converter is connected before exchanging camera heads.

Caution

Always exchange camera heads with the power turned OFF. Damage could occur if replaced with the power ON. Follow the instructions on the screen when replacing the camera head. Otherwise, normal images may not be obtained.

🚹 Caution

Always cover the camera head sensor with a lens cap before exchanging camera heads. When the DRP calibrates the Shading Correction Look Up table, the sensor must not be exposed to light.

Manual Shade Correction Calibration

To manually calibrate the MEMRECAM fx DRP to a new RX camera head follow these steps.

 Enter the TOP MENU by pressing the MENU button while in READY mode. Use the UP/DOWN keys to select the SYSTEM MENU row and press the LEFT key to enter the Sub Menu.

< TOP MENU >	
GAIN	0dB 6dB 12dB
WHITE BALANCE	AUTO 3100 5000 9000 REG
ENHANCE	OFF NORMAL HIGH
GAMMA	OFF LOW NORMAL
CHROMA	0 50 100 150 200
KNEE	OFF ON
♦ SYSTEM MENU ►	
CF save MENU ►	
Press SET for SYSTEM MENU	

TOP MENU – SYSTEM MENU

2) In the **SYSTEM MENU**, use the **UP/DOWN** keys to select the **SYSTEM SETUP** row and press the **LEFT** key to enter the Sub Menu.

TOP MENU < SYSTEM	MENU >
ID	000
DATE,TIME	2002/02/27 15:24:33
IBOX DISPLAY	ON OFF
CAFM DISPLAY	ON OFF
FRAME DISPLAY	Frame Time Memory%
D-VGA VIDEO	ON OFF
IBOX Settings ►	
TRIGGER MENU >	
SYSTEM SETUP ►	
INFORMATION >	
Press SET for SYSTEM SETUP MENU	

SYSTEM MENU - SYSTEM SETUP

3) In the **SYSTEM SETUP** Sub Menu use the **UP/DOWN** keys to select the **CAMERA DATA** row and press the **SET** key to open the Shading Calibration **DIALOGUE**.



SYSTEM SETUP Sub Menu



Caution

Before proceeding to step 4 ensure that the image data has been downloaded. All image data will be lost when calibrating for a new camera head.

 Use the LEFT/RIGHT keys to select the desired action and press the SET key. To proceed to step 5 select the UPDATE option. Select CANCEL to exit and return to READY mode.





5) Use the LEFT/RIGHT keys to select the desired action and press the SET key. To confirm and proceed to step 6 select the CREATE option. Select CANCEL to exit and return to READY mode.



DIALOGUE 2

 Use the LEFT/RIGHT keys to select the desired action and press the SET key. Select CANCEL to exit and return to READY mode.

The **PERMANENT** option will save the new camera data to Flash ROM. It will be necessary to turn the power OFF and restart the DRP to complete **PERMANENT** camera head exchange. Once the data is in ROM it will be the default calibration in subsequent sessions.

Select the **TEMPORARY** option to save the new camera data to RAM and not to Flash ROM. When the DRP power is turned OFF it will return to the previous **PERMANENT** camera head calibration.

📐 Caution

Should the **TEMPORARY** option be selected, DO NOT forget to exchange back to the old camera head since the DRP returns to the previous **PERMANENT** calibration when the power is turned OFF



DIALOGUE 3

7) Before proceeding ensure that the lens is not exposed to light and the lens cap is secure. Use the LEFT/RIGHT keys to select the desired action and press the SET key. To proceed to step 8 select the OK option. To change the saving options select the BACK option. Select CANCEL to exit and return to READY mode.



DIALOGUE 4

8) Use the LEFT/RIGHT keys to select the desired action and press the SET key. To confirm and proceed to step 9 select the CREATE option. To change the saving options select the BACK option. Select CANCEL to exit and return to READY mode.



DIALOGUE 5

9) Please wait while the camera data is updated.

Creatin	ng Data	for	Camera#2006.
		43 %	6

PROGRESS BAR 1

4 *MEMRECAM* fx Recording

4. MEMRECAM fx Recording

4.1 Memory Ring Buffer

The *MEMRECAM* fx semiconductor memory is structured as a ring buffer. In general, the images are saved to the ring buffer in series from the initial step to final step. Since the memory is comprised of a single ring, it greatly enhances its performance.

The storage of images to memory starts when the DRP is set to **ARM** mode. While in **ARM** mode, the images are sent sequentially to memory at the frame rate selected by the user. After circling the ring buffer, new images are updated in sequence. The updating of the ring buffer continues while in **ARM** mode until a trigger input is received.

In addition to the images being stored to the buffer ring, record settings are also stored to memory when the trigger input is received. This information is stored separately but displayed jointly. The information captured includes scene number, trigger mode setting, frame rate, frame size, shutter, image quality setting during recording, recording comments and trigger date/time.

4.1 Triggering

4.1.1 Trigger Settings

The percentage of memory used as a buffer during recording is determined by the trigger setting. There are five trigger settings,

START	The trigger point is about 5% after the top of memory
CENTER	The trigger point is at the center of the memory. (Factory default setting)
END	The trigger point is about 5% before the end of memory
BURST	No Memory Buffer. (Records only when trigger signal is present)
CUSTOM (%)	Any percentage of the Memory may be set as Buffer Ring and Delay Start
	-100% DELAY Start
	0% START Trigger

+50% **CENTER** Trigger

+100% END Trigger

■ The **START**, **CENTER** and **END** are predefined trigger settings. The trigger setting determines how much of the Buffer Ring is being refreshed while in **ARM** mode. When the trigger input is received the images are saved to the remainder of the memory Buffer Ring. Recording stops once the Buffer Ring has circled. There is a 5% offset to ensure that important image data is not lost in the **START** and **END** trigger settings.

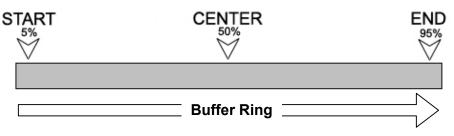


Diagram 1 START, CENTER and END trigger locations in Buffer Ring

■ The **CUSTOM** trigger setting allows for any percentage value to be entered for the trigger setting or trigger delay. The percentage value can be any value from -100% to 100% and is based on the memory installed. To set a trigger setting, enter a positive percentage value. The negative percentage values delay the recording start time. At the -100% setting, recording will be delayed for a period of time equal to the recording time available in memory.

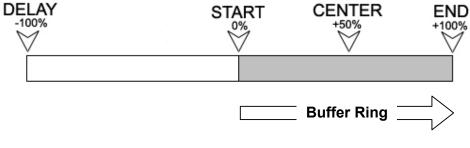


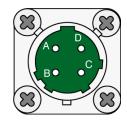
Diagram 1 **CUSTOM** trigger locations in Buffer Ring

🕂 Caution

When the DRP is set to **ARM** mode, even before a trigger input is received, writing to memory begins. Any previously recorded images are lost and cannot be played back.

4.1.2 External Trigger Input

Use pins A and B for Contact Closure, 5V CMOS (Schmidt / Negative) or Current Loop trigger input. For Photo Isolate (Positive) trigger input use pins C and D.



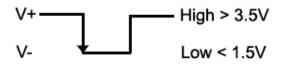
Contact Closure

A contact closure circuit triggers the DRP to complete the recording session.



■ 5V CMOS (Schmidt / Negative)

A 5V voltage transition from High-Low triggers the DRP to complete the recording session.



Current Loop

When the current draw is greater than 0.5mA the DRP is triggered and completes the recording session.

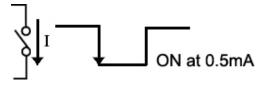
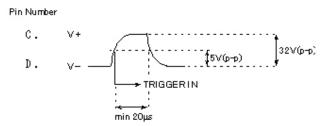
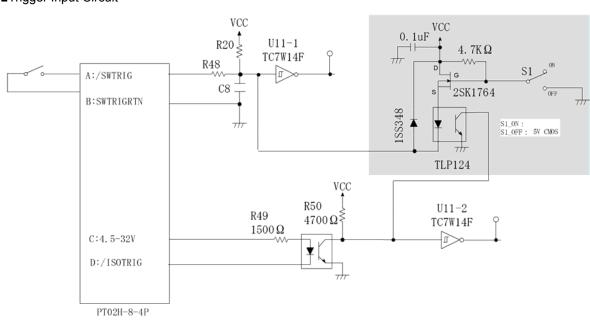


Photo Isolate (Positive)

The input impedance between pins C and D is approximately 1500Ω . A voltage value between 5 and 32V will trigger the DRP and complete the recording session.





■Trigger Input Circuit

4.1.3 Trigger Connector

The Amphenol MS3116F8-4 four pin circular MIL connector is used to terminate the external trigger signal input cable. Use pins A and B for Contact Closure, 5V CMOS (Schmidt / Negative) or Current Loop trigger input. For Photo Isolate (Positive) trigger input use pins C and D.

1) Disassemble the trigger connector included as follows.



2) Use pins A and B for Contact Closure, 5V CMOS (Schmidt / Negative) or Current Loop trigger input. For Photo Isolate (Positive) trigger input use pins C and D.





 Insert the cables through the Rear of the connector and the cable separation collar. Solder the cables to the appropriate pins. Use pins A and B for Contact Closure, 5V CMOS (Schmidt / Negative) or Current Loop trigger input. For Photo Isolate (Positive) trigger input use pins C and D.



4) Reassemble the connector and tighten securely.



4.2 Color Balance Operation

4.2.1 White Balance

Whit Balance is a post-processing enhancement. When an image is recorded, the raw data in memory is not affected by this setting. The setting can be changed later at playback. There are six White Balance settings.

■AUTO TRACKING

The corresponding color temperature is determined from the image signal. The proper white balance and the color temperature are automatically maintained in a range of approximately 3000~9000K. Proper white balance might not be maintained if the image is saturated with excessive color (such as only red). To set the proper white balance, select a white area (without coloring) as large as possible on the screen.

a3100

Select this setting when the light source has a color temperature of 3100 Kelvin. This corresponds to tungsten type lamp illumination.

5000

Select this setting when the light source has a color temperature of 5000 Kelvin. This corresponds to strobe or metal halide lamp illumination.

∎9000

Select this setting when the light source has a color temperature of 9000 Kelvin.

■SET REG

Select when a more precise color white balance setting is desired, or when there is a possibility of modifying the color temperature during recording. Choose this menu to access the internal AUTO TRACKING mode for white balance. Next, press the **SET** key to confirm the proper white balance on the screen. This saves the white balance data for that instance. This data can be played back by selecting REG mode.

∎REG

To use the color temperature setting selected in SET REG mode.

4.2.2 Auto-Track White Balance (AWB)

The Automatic White Balance function of the **MEMRECAM** fx employs a method where the corresponding color temperature is detected based on the signal of the image received. To match the proper white balance, it is necessary to extract the colorless data from the image signal. This is accomplished by integrating the entire image until it becomes colorless. This the method allows for variations to be corrected. Theoretically there is the potential of error when there is a large area of the screen with a specific color. Our control algorithm has been developed to the point where problems with the Automatic Whit e Balance application are minimal.

5 *MEMRECAM* fx Troubleshooting

5. MEMRECAM fx Troubleshooting

5.1 When Not Functioning Normally

The following are common troubleshooting practices when components are not functioning normally. Contact your retail outlet to perform maintenance when normal operation does not occur after following these instructions (refer to section 5.3 "Repair and Contact Information").

5.1.1 Does Not Startup

Restart by reverting to factory settings. Press and hold the **STOP** key and turn the power switch **ON**. Hold the **STOP** key until the firmware version startup screen is displayed. If startup does not occur, repairs are needed.

5.1.2 J-PAD2 Does Not Work

When connecting the J-PAD2, or during MEMRECAM fx startup, confirm that the J-PAD2 LED lights up in sequence. If the LED lights up and the J-PAD2 does not work properly, then there may be a J-PAD2 or MEMRECAM fx malfunction.

5.1.3 MEMRECAM fx TRIG IN Connector Does Not Recognize the External Trigger (M-HUB Application) The external trigger cable is connected to the MASTER M-HUB TRIG IN connector when using multiple cameras. The DRP TRIG IN connector is deactivated when connecting to an M-HUB.

5.2 Handling a System Crash

A system crash occurs when display continues but there is no operation. If many alphanumeric and exception patterns are displayed on the screen, there is a problem detected by the internal software and operation has been suspended. The cause varies according to the specific malfunction of the device.

When there is a system crash, make notes (memo or photograph) of all of the characters displayed on the screen. When recording is complete, run a test to see if the loss of images in the memory can be prevented.

When the optional memory backup is operational

Turn the switch **OFF** and after several seconds turn the power switch **ON**. It should revert to the state it was immediately after recording. Save the images to CF as soon as possible. If it does not startup normally, the images will be lost.

When the optional memory backup not available

To prevent loss of the image in the memory, restart without turning the power off to memory. Enter the SYSTEM SETUP MENU by pressing the Reset Switch in the Rear Camera Control Touch Pad. Use the **UP/DOWN** keys to select the **Reboot** row and press the **SET** key to reboot the system. The system should startup normally and if the image remains, playback can be conducted in the same manner as immediately after recording. Save the images to the CF as soon as possible. If it does not startup normally, the images will be lost.

5.2 Repair and Contact Information

Contact your retail outlet with the following information during a system crash or when normal operation does not occur.

- For system crash, make a note of the characters displayed on the screen
- For other problems, make a note of the items displayed
- Status of panel LED lighting
- MEMRECAM fx model name and serial number
- Specifics of problem, operation immediately prior to problem, frequency of problem
- Components
 - J-PAD2
 - Color LCD Viewfinder
 - Memory Backup Option
 - Master M-HUB (serial number, number and type of other MEMRECAM)
 - Slave M-HUB (number)
 - Smart Capture Software (version, OS of PC, type of PC)
 - CF
 - Type of Power input (AC / DC)
 - Other specifics