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TROUBLESHOOTER CAMERA QUICK START GUIDE

RECORD TIME MATRIX

The event record time and maximum number of frames recorded are determined by the camera frames per second record setting, camera image sensor resolution, and amount of onboard camera memory.

TROUBLESHOOTER CAMERA

Frames per Second	Sensor Resolution	Standard Memory 512 MB		Enhanced Memory 1 GB	
		Total Frames	Record Time (Sec)	Total Frames	Record Time (Sec)
125	640 x 480	2,184	17.5	4,368	34.9
250	640 x 480	2,184	8.7	4,368	17.5
500	640 x 480	2,184	4.4	4,368	8.7
1000	640 x 480	2,184	2.2	4,368	4.4
125	320 x 240	8,736	69.9	17,472	139.8
250	320 x 240	8,736	34.9	17,472	69.9
500	320 x 240	8,736	17.5	17,472	34.9
1000	320 x 240	8,736	8.7	17,472	17.5

TROUBLESHOOTER HR CAMERA

Frames per Second	Sensor Resolution	Standard Memory 1 GB		Standard Memory 2 GB	
		Total Frames	Record Time (Sec)	Total Frames	Record Time (Sec)
125	1280 x 1024	1,024	8.2	2,048	16.4
250	1280 x 1024	1,024	4.1	2,048	8.2
500	1280 x 1024	1,024	2.0	2,048	4.1
1000	1280 x 512	2,048	2.0	4,096	4.1
2000	1280 x 256	4,096	2.0	8,192	4.1
4000	1280 x 128	8,192	2.0	16,384	4.1
8000	1280 x 64	16,384	2.0	32,768	4.1
16000	1280 x 32	32,768	2.0	65,572	4.1
125	640 x 480	4,368	34.9	8,736	69.9
250	640 x 480	4,368	17.5	8,736	34.9
500	640 x 480	4,368	8.7	8,736	17.5
1000	640 x 480	4,368	4.4	8,736	8.7
125	320 x 240	17,476	139.8	34,952	279.6
250	320 x 240	17,476	69.9	34,952	139.8
500	320 x 240	17,476	34.9	34,952	69.9
1000	320 x 240	17,476	17.5	34,952	34.9
2000	320 x 240	17,476	8.7	34,952	17.5

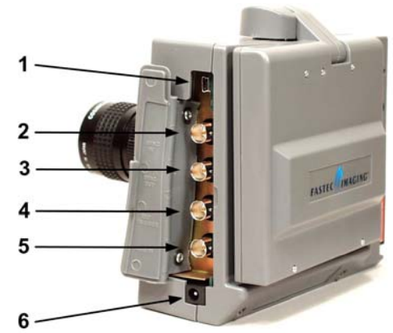
Frames per Second	Sensor Resolution	Standard Memory 3 GB	
		Total Frames	Record Time (Sec)
125	1280 x 1024	3,072	24.5
250	1280 x 1024	3,072	12.3
500	1280 x 1024	3,072	6.1
1000	1280 x 512	6,144	6.1
2000	1280 x 256	12,288	6.1
4000	1280 x 128	24,576	6.1
8000	1280 x 64	49,152	6.1
16000	1280 x 32	98,304	6.1
125	640 x 480	13,104	104.8
250	640 x 480	13,104	52.4
500	640 x 480	13,104	26.2
1000	640 x 480	13,104	13.1
125	320 x 240	52,428	419.3
250	320 x 240	52,428	209.7
500	320 x 240	52,428	104.8
1000	320 x 240	52,428	52.4
2000	320 x 240	52,428	26.2

FIGURE 1: CAMERA BUTTONS AND LED



1 POWER
2 SELECT
3 FUNCTION
4 SETUP
5 DOWNLOAD
6 RECORD/STOP
7 POWER ON/CF ACTIVE LED
8 PLAY Fwd/Rev

FIGURE 2: CONNECTOR PANEL



1 USB 2.0
2 Sync In
3 Sync Out
4 External Trigger
5 IRIG
6 DC Power Input

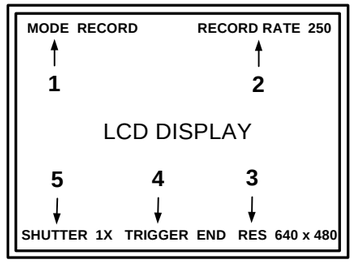
FIGURE 3: EXTERNAL MEMORY



1 Compact Flash Card Slot

The camera comes standard with 512 MB of SODIMM (volatile memory). A user supplied compact flash card can be used to save images indefinitely for later viewing.
Insert the flash card with the manufactures label facing the camera back panel.

FIGURE 4: RECORD DISPLAY (DEFAULTS)

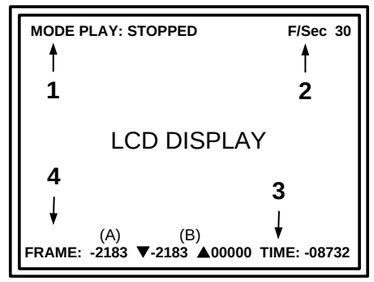


1 Mode of Operation: RECORD
2 Frame Rate: 250 Frames/Sec
3 Resolution: 640 x 480
4 Image Trigger: END, Discontinue recording when **STOP** button is pressed
5 Shutter Speed: 1X, .004 Sec/Frame

- Standard onboard memory stores 2184 frames
- Enhanced onboard memory stores 4,368 frames
- Record Time = Number of Frames in Memory divided by Frame Rate
- Active menu item is highlighted green
- **SELECT** button changes the value of the active menu item
- **FUNCTION** button advances the active menu

NOTE: Refer to the camera User Guide for directions on how to change factory default setting.

FIGURE 5: PLAYBACK DISPLAY (DEFAULTS)



1 Mode of Operation: PLAYBACK
2 Playback Speed: 30 Frames/Sec
3 Time: Elapsed frame playback time milliseconds
4 Current Frame and Save Limits:
(A) Frame: Frame number currently displayed
(B) Beginning (▼) and end (▲) points of the frame interval saved to CF card when the DOWNLOAD button is pressed (Default: All frames)

ACCESSORIES

The camera comes with MotionMeasure/CamLink and Camera Quick Start Guides, Software CD, and AC/DC Power Supply.
A user supplied Lens, Power Adapter Cable (AC operation), and USB Download Cable, and CF card are required for operation.

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ABOUT TRIGGERS

Images stored in memory are organized around the frame that's recorded the moment the stop trigger is detected.
Triggers Options:

- End – Store all memory frames recorded up to the moment the trigger is detected
- Start – Fill frame memory after trigger is detected.
- n% – Retain n% of frame memory after trigger is detected. Record new frames in remaining memory.

External trigger signals are connected through the External Trigger BNC connector located on the side of the camera. An external trigger event is initiated by grounding the BNC center connector to the BNC shell.

I. CAMERA SETUP (STANDALONE OPERATION)

1. Unpack the camera.
2. Remove the lens receptacle cover and install a C Mount lens.
   - Shorter focal length lens = greater field of view and depth of field (image sharpness)
3. Set the lens iris to the fully open position.
   - Smallest number on the lens aperture ring
4. Connect power to the camera.
   - AC/DC power supply (Fig. 2: 6), or
   - Four D Cell Batteries (bottom of camera)
5. Raise the LCD display.
6. Press the **POWER** button (Fig. 1: 1).
   - After a few seconds, the camera wakes up in record mode
   - Images are stored in a circular memory buffer
   - The camera stays in record mode until a stop signal is received

II. CAPTURE AN EVENT (DEFAULT SETTINGS)

1. After performing camera setup, position the camera to capture an event.
2. Focus the lens and adjust the lens aperture setting.
   - Smaller aperture setting = greater depth of field
   - Greater lens-to-object distance = greater depth of field
3. After an event occurs, press the **STOP** button (Fig. 1: 6) to capture the event and exit the record mode.
   NOTE: Default settings:
   - Shutter speed = 1X
   - Record rate = 250 Frames per second
   - Standard camera memory (2184 frames) stores 8.7 seconds of video
   - Enhanced camera memory (4368 frames) stores 17.4 seconds of video
   - Trigger = End
4. If you need to recapture the event, press the **RECORD** button (Fig. 1: 6) and repeat step 3.

III. OBSERVE A STORED EVENT

1. After capturing an event, press the **PLAY** button (Fig. 1: 8) to observe the stored event.
   - ▶ = Increment frames, start with the earliest frame stored in memory (-2183 or -4367)
   - ◀ = Decrement frames, start with the most recent frame stored in memory (-0000)
2. Use the **SELECT** buttons (Fig. 1: 2) to increase (▲) or decrease (▼) the Frames/Second displayed.
   NOTE: Default setting:
   - Frames/Second = 30
3. Images in memory are displayed in a continuous loop until the **STOP** button (Fig. 1: 6) is pressed.

IV. SAVE A STORED EVENT TO CF CARD

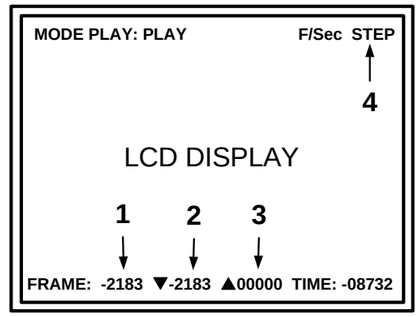
1. After capturing an event, open the CF (compact flash) access door (Fig. 3: 1) and insert a CF card.
   - When the CF card is inserted correctly, the Power On/CF Active LED (Fig. 1: 7) will flash red
2. Using the **SELECT** buttons (Fig. 1: 2), set F/Sec to STEP mode (Figure 7: 4).
3. Press the **FUNCTION** button (Fig. 1: 3) once to select the FRAME: menu (Fig. 5: 2).
4. Using the **PLAY** buttons (Fig. 1: 8), display the first frame (Fig. 6: 1) of the recorded event of interest.
   - In many cases, only a small subset of memory frames will contain the event of interest
   - Toggle the PLAY buttons to step one frame at a time
   - Hold down the PLAY buttons to fast forward or reverse frames
5. Press the ▼ **SELECT** button (Fig. 1: 2) to mark the first frame (Fig. 6: 2) to be saved to the CF card.
6. Using the **PLAY** buttons (Fig. 1: 8), display the last frame (Fig. 6: 1) of the recorded event of interest.
7. Press the ▲ **SELECT** button (Fig. 1: 2) to mark the last frame (Fig. 6: 3) to be saved to the CF card.
8. Press the **DOWNLOAD** button (Fig. 1: 5) to save marked frames as an AVI file on the CF card.
   - The saved AVI file is named according to the event number of the recorded data

The Power ON/CF Active LED stays red while the images are being downloaded to the CF card

V. VIEW A STORED EVENT ON THE CF CARD

1. While in the Record mode, press the **DOWNLOAD** button (Fig. 1: 5) to open the File menu.
   - Toggle the **DOWNLOAD** button (Fig. 1: 5) to hide or display the File menu options
   - Toggle the **SETUP** button (Fig. 1: 4) to hide or display all non-highlighted event files
   - Press the **FUNCTION** (Fig. 1: 3) button to delete the highlighted file
   - Use the ▲ or ▼ **SELECT** buttons (Fig.1: 2) to choose a stored event file to display
   - Use the ▶ or ◀ **PLAY** buttons (Fig.1: 8) to increment or decrement displayed frames
2. To close the FILE menu, press the press the **STOP** button (Fig. 1: 6).

FIGURE 6: SETTING SAVE LIMITS



1 Current displayed frame number
2 First frame of recorded event of interest
3 Last frame of recorded event of interest
4 Frame rate

NOTE:

- Frames can be stored in AVI or MPEG (Optional) formats
- MotionMeasure software does not open MPEG files
- MPEG frame = 25KB of memory
- AVI frame = 300KB of memory
- Available memory space on the CF card can be checked in the Setup Menu

SCREEN MENUS

All user configurable camera settings are managed by four screen menus (accessed by toggling the **SETUP** button).

1. SETUP – Change record mode settings
2. INFO – Display camera information
3. SET DATE/TIME – Set saved AVI file header date and time values
4. DEFAULT SETTINGS – Set camera power-up default settings
5. FILE REVIEW – Display or delete stored events on the CF card from the camera

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This Quick Start Guide is intended for use as a supplement to the MotionMeasure User's Guide located on the CD provided with your camera.

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