



SightLine

APPLICATIONS

EAN-File Recording

PN: EAN-File-Recording

11/13/2018

**Contact:**

Web: sightlineapplications.com

Sales: sales@sightlineapplications.com

Support: support@sightlineapplications.com

Phone: +1 (541) 716-5137

Export Controls

Exports of SightLine products are governed by the US Department of Commerce, Export Administration Regulations (EAR); classification is ECCN 4A994. The [export summary sheet](#) located on the support/documentation page of our website outlines customers responsibilities and applicable rules. SightLine Applications takes export controls seriously and works to stay compliant with all export rules.

Copyright and Use Agreement

© Copyright 2018, SightLine Applications, Inc. All Rights reserved. The SightLine Applications name and logo and all related product and service names, design marks and slogans are the trademarks, and service marks of SightLine Applications, Inc.

Before loading, downloading, installing, upgrading or using any Licensed Product of SightLine Applications, Inc., users must read and agree to the license terms and conditions outlined in the [End User License Agreement](#).


All data, specifications, and information contained in this publication are based on information that we believe is reliable at the time of printing. SightLine Applications, Inc. reserves the right to make changes without prior notice.

Alerts

The following notifications are used throughout the document to help identify important safety and setup information to the user:

 **CAUTION:** Alerts to a potential hazard that may result in personal injury, or an unsafe practice that causes damage to the equipment if not avoided.

 **IMPORTANT:** Identifies crucial information that is important to setup and configuration procedures.

 *Used to emphasize points or reminds the user of something. Supplementary information that aids in the use or understanding of the equipment or subject that is not critical to system use.*



Contents

1	Overview	1
1.1	File Recording Features	1
1.2	Associated Documents	1
1.3	SightLine Software Requirements	2
1.4	Application Bit Requirements	2
2	System Setup	2
3	Camera Order	3
4	File Naming	3
5	Configure Snapshot Settings	4
5.1	Save Snapshot	4
5.2	Save Snapshots to MicroSD Card (0x1E)	4
5.3	File Format Options	5
5.4	Big Snapshot	5
5.4.1	1500-OEM Snapshots (up to 1080 resolution)	5
5.4.2	1500-OEM Camera Configuration	5
5.4.3	3000-OEM Big Snapshot (up to 20MP resolution)	7
5.4.4	3000-OEM Big Snapshot Camera Configuration	7
5.5	Save Snapshots to FTP Server	9
5.6	Metadata Type (new for 2.25.xx)	9
5.7	Snapshot Command	10
6	Video Recording (0x1E)	11
7	HTTP Live Streaming (HLS)	12
8	Accessing On-Board Recorded Files	13
9	Setting Up the FileZilla Server	13
9.1	Setup Procedures	13
10	Troubleshooting	14
10.1	Questions and Additional Support	14
	Appendix A: Formatting MicroSD Cards	15
A1	MicroSD Card Types	15
A2	FAT32	15



A3 Ext3 (3000-OEM only) 17

 A3.1 Enable Write Barriers and Ordered Mode 18

Appendix B: Tested MicroSD Cards 19

List of Figures

Figure 1: MicroSD Card Slot 1500-OEM and 3000-mIO Board 2

Figure 2: Configure Snapshot Settings 4

Figure 3: Files on MicroSD Card 4

Figure 4: Big Snapshot Configuration Example 6

Figure 5: Big Snapshot Configuration Example 8

Figure 6: Recording to FTP Server Settings 9

Figure 7: Image Snapshot to FTP Server Settings 10

Figure 8: FileZilla FTP Setup 13

List of Tables

Table 1: Application Bits Requirement Table 2

Table 2: File Naming Conventions 3

Table 3: File Format Options 5

Appendix

Table B1: Tested MicroSD Cards 19



1 Overview

SightLine hardware can be used to record compressed video and high-resolution snapshots. These can be used for archiving, additional image analytics by GIS software, or numerous other applications in a post-operating environment.

Transferring files from the microSD card to the PC can be done by removing the card from the SightLine hardware and inserting it into the PC using a microSD card reader. Files may also be remotely accessed using FTP.

This document describes configuring the OEM hardware to record video or snapshots to either the on-board microSD card or to an external FTP drive. It also covers additional features related to onboard storage.

1.1 File Recording Features

- Snapshots and video can record additional metadata such as latitude and longitude, aircraft position and other related fields in their MISB defined Key-Length-Value (KLV) formats.
- Image quality and compression rates are adjustable.
- Snapshots can be recorded to microSD card or to an FTP server.
- Video can be recorded to microSD card.
- Snapshots can be either JPEG or PNG.
 - The original capture image or the final display image can be recorded.
 - JPEGs and PNGs are recorded with embedded metadata preserving vital geolocation information with each image.
- Additional data can be recorded to KML (Google Earth) or NITF files.
 - KML (Keyhole Markup Language) is an XML-based notation for capturing geographic information and allows for accurate importing of viewing of still images relative to 2D and 3D maps within software packages such as Google Earth.
 - NITF (National Imagery Transmission Format) is a common standard file format used within the U.S. DoD and domestic Police and Fire digital imaging community.
- Video files are recorded as .ts files (transport stream) and contain H.264 + KLV encapsulated in MPEG2-TS streams.

1.2 Associated Documents

[EAN-Startup Guide 1500-OEM](#): Describes steps for connecting, configuring, and testing the 1500-OEM video processing board on the 1500-AB accessory board.

[EAN-Startup Guide 3000-OEM](#): Describes steps for connecting, configuring, and testing the 3000-OEM video processing board on the 3000-IO interface board.



[EAN-Encoding](#): Outlines encoding options for the 1500-OEM and 3000-OEM. Covers supported encoding algorithms, IP address and port assignments, optional streaming protocols, and options for low bandwidth applications.

[EAN-Infrared Temperature](#): Describes features surrounding infrared camera temperature measurements. Also includes information used to acquire and process 14/16-bit data from IR cameras.

[Interface Command and Control \(IDD\)](#): Describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a local download on the [Software Download](#) page

Panel Plus User Guide: Provides descriptions of all the settings in the Panel Plus application. (Located in the Panel Plus application in the *Help* menu.)

1.3 SightLine Software Requirements

HTTP Live Streaming (HLS) - 2.24.xx

ⓘ IMPORTANT: The Panel Plus software version should match the firmware version running on the board.

1.4 Application Bit Requirements

The functions described in this EAN require Application Bits (app bits) purchased from SightLine. App bits reside on the hardware unit and are enabled with a license file provided by SightLine at initial unit purchase or during a license upgrade process. License files use a hardware ID that is applicable to a specific hardware serial number. For questions and upgrade support contact [SightLine Sales](#).

Table 1: Application Bits Requirement Table

Function	Minimum Software Version	Required Application Bit(s)
Recording	ALL	Recording / Snapshot. 0x400

2 System Setup

ⓘ IMPORTANT: The microSD card must be formatted before use. See the [Appendix](#) before recording files to the card. Power off the unit before inserting or removing the microSD card.

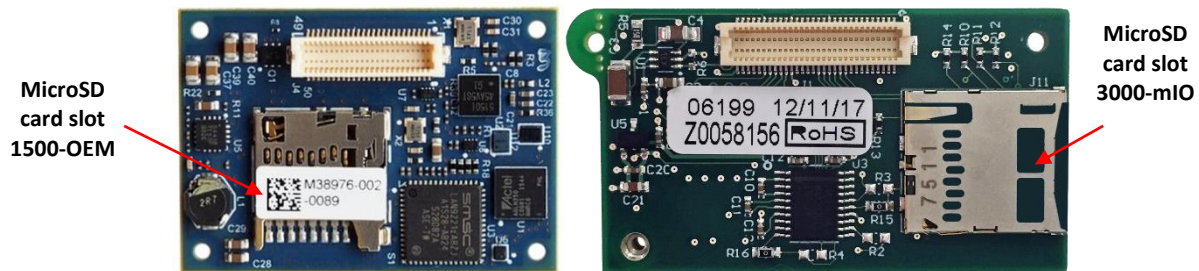



Figure 1: MicroSD Card Slot 1500-OEM and 3000-mIO Board




3 Camera Order

The system can be configured to record either the original unprocessed capture image or the processed display image.

 *Although the 1500-OEM can be connected to multiple cameras simultaneously, only the primary camera is used when recording. The primary camera is set from Panel » Video tab » Video Mode (0x1F) » Camera Order » Camera Index 0.*

4 File Naming

 **IMPORTANT:** Whenever files are being recorded, it is important to be vigilant during the process to prevent accidental erasure of critical data.

For both snapshots and video recording, the software can create new files with a unique suffix based on the syntax of the file, making it easier to identify files or reduce the risk of over-writing existing files.

File name length: The maximum filename length for video and snapshots are limited to 74 characters or less.

Auto numbering: File names are automatically appended with 4 digits to provide unique file naming. If the base file name ends in a numeral (0 to 9), auto-numbering will be disabled.

Camera numbering (3000-OEM only):

The camera number is automatically inserted into the file name unless the user specifies a file name ending in 0 to 9.

Example:

The file name is *Landing_0_0000.jpg* where the 0 is the camera number and the 0000 is the first number. The next snapshot would be *Landing_0_0001.jpg*. A snapshot on camera 2 would be *Landing_2_0000.jpg*.

Table 2: File Naming Conventions

If using Filename:	File name 1500-OEM:	File name 3000-OEM	Notes
Hello	Hello_0000.jpg	Hello_0_0000.jpg	Count starts at 0
Hello	Hello_0001.jpg	Hello_0_0001.jpg	Count increments
World	World_0000.jpg	World_0_0000.jpg	Count restarts when Filename changes
Hello42	Hello42.jpg	Hello42.jpg	Count is not appended for Filename ending in a numeric character.



5 Configure Snapshot Settings

In Panel Plus go to the *Record* tab » *Advanced Settings* to access the Configure Snapshot Settings dialog window.

IMPORTANT: Click *Send* when making any setting changes in the dialog window.

5.1 Save Snapshot

Determines how the image will be saved.

Captured Image: The original unprocessed image will be saved.

Display Image: Saves a processed image. If recording video, the processed video including all stabilization, digital zoom, overlay graphics, false coloring, image enhancement, etc.

Figure 2: Configure Snapshot Settings

5.2 Save Snapshots to MicroSD Card (0x1E)

When files are saved to the microSD card they can be viewed in the *Files on SD* window.

Click the *Refresh List* button to view the files.

Use the *Download Selected* button to save the files to a designated directory.

Click the *Delete* button to delete selected files.

Figure 3: Files on MicroSD Card



5.3 File Format Options

JPG and PNG file types can also contain metadata. An EXIF header is added to JPEG files. PNG files will have a custom EXIF-like header added on.


 *The JPEG file format is not supported for 14-bit or 16-bit digital cameras. Use the PNG file format or set the snapshot setting to Display Image.*

Table 3: File Format Options


File Format	Description	Compression
JPG	Joint Photographic Experts Group (JPEG)	Lossy compression
PNG	Portable Network Graphics	Loss-less compression
JPG Big (new in 2.24.xx)	Same as JPEG/JPG. Allows a larger snapshot to be taken of capture (source) image (see Big Snapshot).	Lossy compression

5.4 Big Snapshot

Big Snapshot is a feature used for higher resolution cameras to run normal video processing on a lower resolution stream but take a high-resolution snapshot. The 1500-OEM and 3000-OEM have different implementations and capabilities due to hardware and encoder differences. The 1500-OEM can take (up to) 1080 resolution snapshots while simultaneously streaming 480 or 720 resolution video. The 3000-OEM can take up to 20MP snapshots when streaming up to 1080 resolution video. When taking a 20MP snapshot the video display is stopped and then returns when the snapshot is complete.

5.4.1 1500-OEM Snapshots (up to 1080 resolution)

The 1500-OEM can capture up to 1080 resolution snapshots while streaming SD or 720p video without interrupting the video stream. This is accomplished using the *Region of Interest* setting in the *Acquisition Settings* dialog window.

 *This method is not supported in 3000-OEM. It will produce a 640x480 snapshot.*

5.4.2 1500-OEM Camera Configuration

The following steps reference the Panel Plus software for camera setup.

1. Connect to the board using the Panel Plus application. See the [1500-OEM Startup Guide](#) for connection instructions.
2. From the main menu in Panel Plus » *Configure* » *Acquisition Settings*.
3. Set up the digital camera for full resolution capture. In the example shown in [Figure 4](#), the *Camera Index* is set to *Digital* and the *Camera Type* is Sony FCB-EH 1080P (1080x1920 resolution).
4. Set the *Region of Interest* to the resolution that will run in the normal video stream. In this case, 640x480 video.
5. Click the *Apply* button.



The screenshot shows a camera configuration window with the following settings:

- Camera Index: Digital
- Camera Type: Sony FCB-EH 1080P
- Frame Step: 0
- Apply button (red)
- Warning box: Hit Apply, then Save Parameters and cycle power. Check for errors in menu View >> User Warnings
- Generic Digital Settings (Applies to CameraType: Generic Digital Only):
 - AutoFill: (dropdown)
 - Height: 1080, Width: 1920
 - Resulting Flag Bits: 0x0
 - Vertical Front Porch: 0, Horizontal Front Porch: 0, Bit Depth: 8
 - Input: Gray Scale (selected), YUV color, G8 16bit in, Bayer, Laser, Interlaced, Byte Swap
 - Invert V-Sync Polarity, Invert H-Sync Polarity, UBO, Sync/Crop: None
 - Camera Init Code: None, Options: (text field)
 - Big: Height 0, Width 0, Vertical Blanking 0, Horizontal Blanking 0
- Region of Interest (Advanced Setting):
 - First Valid Row: 0, Valid Height: 480
 - First Valid Column: 0, Valid Width: 640

Figure 4: Big Snapshot Configuration Example

- In Panel Plus go to the *Record* tab » *Advanced Settings* to open the *Configure Snapshot Settings* dialog window.
- Set the fields *as shown*. Click the *Send* button.

The 'Configure Snapshot Settings' dialog window shows the following configuration:

- Save a snapshot of the: Captured Image
- Save to: Micro SD card
- File Format: Jpeg
- Metadata Type: None
- Image Quality: 80
- Downsample: No (selected), 2X, 4X
- IP Address: 192 . 168 . 1 . 10, Port: 21
- User: snapshot, Password: snapshot
- Send button (red)

- From the *Record* tab click the *Start* button under *Single Frame (Snapshots)* tab. A 1920x1080 resolution snapshot will be recorded on the microSD card.



5.4.3 3000-OEM Big Snapshot (up to 20MP resolution)


The 3000-OEM version of Big Snapshot allows the user to interrupt normal video processing and streaming to capture an up to 20MP resolution snapshot. When the camera is configured to use the 3000-OEM Big Snapshot feature, during a snapshot, acquisition is stopped and reset using the Big Snapshot settings. When the Big Snapshot is complete, acquisition is again stopped and reset to use the original acquisition settings. During Big Snapshot video display is stopped and then returns when Big Snapshot is complete.

 *This is not supported in the 1500-OEM.*

5.4.4 3000-OEM Big Snapshot Camera Configuration

Generic Digital is the only camera type that is compatible with the 3000-OEM Big Snapshot feature. The following steps reference the Panel Plus software for camera setup.


1. Connect to the board using the Panel Plus application. See the [EAN-Startup Guide 3000-OEM](#) for connection instructions.
2. Using the camera GUI or serial commands, set the camera to the resolution that will be used for taking large snapshots.

 *The maximum resolution for large snapshots is 20MB. For an 8-bit gray scale or Bayer camera, this corresponds to 20MP. For a YUV or 16-bit gray scale camera, the maximum pixel resolution is reduced by the bytes per pixel.*

3. From the main menu in Panel Plus » *Configure* » *Acquisition Settings*.

 *The Apply button will turn red indicating input field changes have been detected.*

4. Set the camera resolution to a lower resolution that will be used in the display. In the example shown in [Figure 5](#), the *Camera Index* is set to *Cam 0* and the resolution is set up to capture at 1080x1920.

 **IMPORTANT:** The *Camera Type* must be *Generic Digital* for the Big Snapshot feature to work correctly.

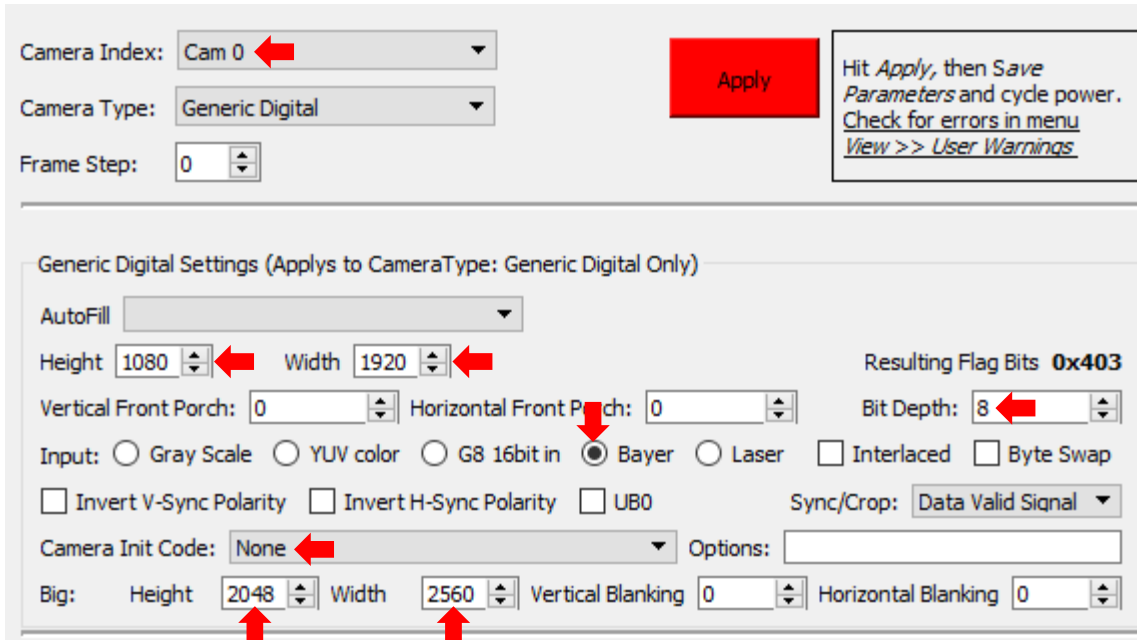
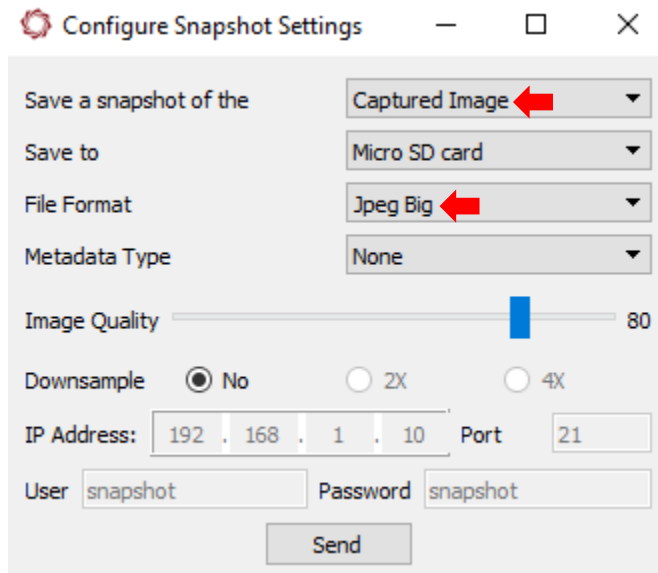


Figure 5: Big Snapshot Configuration Example

5. In Panel Plus go to the *Record* tab » *Advanced Settings* to open the *Configure Snapshot Settings* dialog window.
6. Set the *Save a snapshot of the* field to *Captured Image*. Set the *File Format* to *Jpeg Big*.
7. Click the *Send* button.



8. From the *Record* tab click the *Start* button under *Single Frame (Snapshots)* tab. A 20MP snapshot will be recorded on the MicroSD card.



Camera Configuration Notes:

- For SLA-3000 Camera Link cameras, single and dual tap Base Camera Link is supported.
- For SLA-1500 Camera Link camera, only single tap Base Camera Link supported.
- Maximum image size for 3000-OEM big snap shot:
 - Bayer and 8-bit gray scale: 20MP image
 - YUV: 13MP image.

5.5 Save Snapshots to FTP Server

Save to: FTP Server

IP Address: IP address of the remote server machine

Port: Network port the FTP server listens for connections

User and Password: User name and password required for login.

Figure 6: Recording to FTP Server Settings

5.6 Metadata Type (new for 2.25.xx)

None: No Metadata file is saved.

Single KML File: One single KML file is saved when taking snapshots. If taking multiple snapshots, the Metadata for all the snapshots will be contained in a single file.

Multiple KML Files: Every snapshot creates a new KML file.

NITF File: Snapshot with metadata is stored in an NITF file (National Imagery Transmission Format).



5.7 Snapshot Command

On the *Record* tab, set up the *Single Frame (Snapshots)* tab.

- Number of snapshot to save:* Number of frame snapshots to take (default set to 1).
- Frame step between snaps:* Step between frames, e.g., 2 = every other (default set to 1).
- Max files per folder (new for 2.25.xx):* Allows users to control the number of snapshots stored in each folder. This is a maximum number of files per folder, the folder may auto increment sooner under certain conditions such as snapshots being taken too fast.
- Auto Folder (new for 2.25.xx):* Without breaking the data up into additional folders, system performance will start to slow down at ~2000 files and the maximum file capability is limited to ~22,000 files. The *Auto Folder* option enables more files to be taken with minimal impact to performance. SightLine has tested to up to 500,000 snapshots.
- Resume file numbering from highest on SD card:* During auto-numbering, if the file name is changed the system will automatically scan the SD card to find the highest number and will continue autonumbering from that number forward. This helps from overwriting files that were previously written.
- File Name:* Base file name of saved files (see [File Naming](#)).
- Start:* Sends the SnapShot (0x60) command that prompts the hardware to take snapshots using the parameters provided.

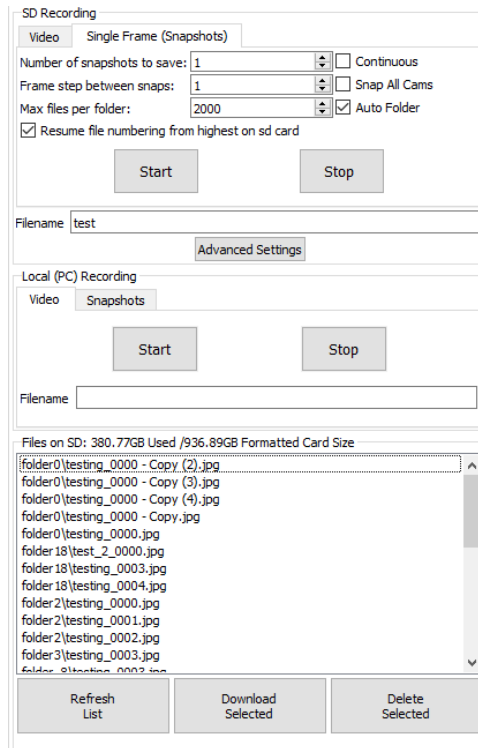


Figure 7: Image Snapshot to FTP Server Settings



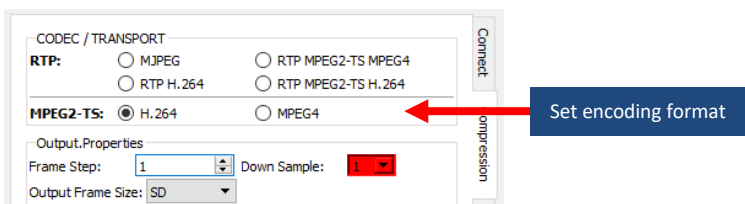
6 Video Recording (0x1E)

IMPORTANT:

- The video recording is limited to MPEG2-TS video. Only the same encoding format that is being transmitted over Ethernet can be recorded, e.g., streaming H.264 video while recording H.264 video.
- Recording RTP transport stream video is not supported. RTP streaming is only used for real-time video over IP networks. Record and playback are not supported on most video players. RTP streams are typically converted and recorded by a ground station utilizing a video management system.

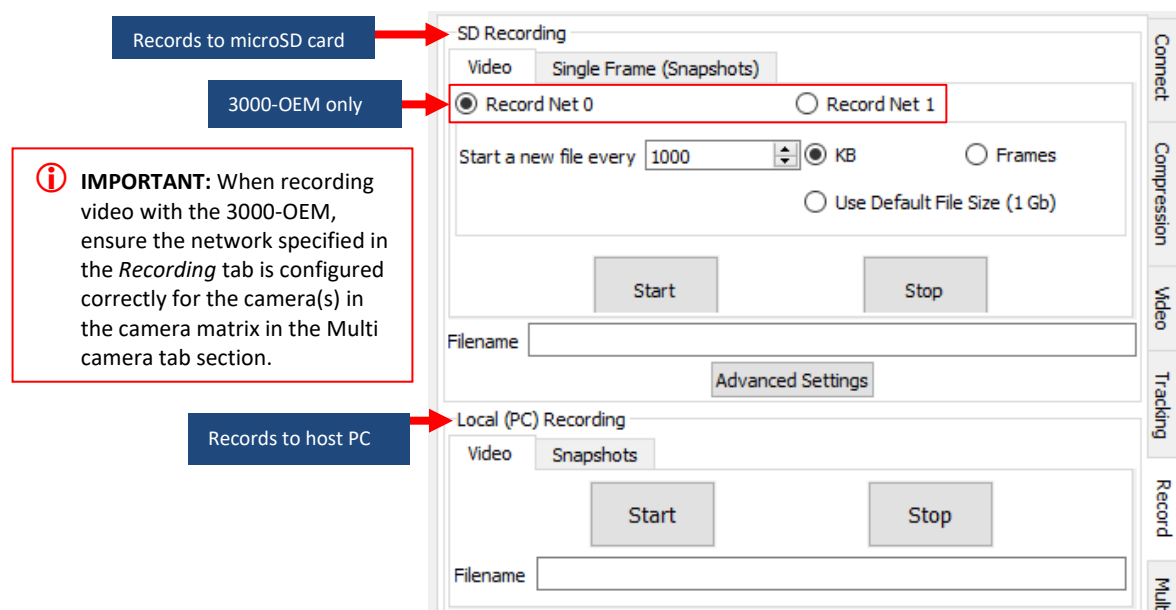
The default setting for video file recording is ~1GB. This setting can be adjusted as needed.

1. To start video recording, go to the *Compression* tab in Panel Plus and set the encoding format.



2. Click the *Record* tab. Choose where to save the recording (click the *Video* tab under *SD Recording* or *Local (PC)Recording*). Click the *Start* button to start recording.

IMPORTANT: The 3000-OEM can record two video streams simultaneously over Net 0 and Net 1. This function must be setup in the Compression tab. See the Output Separate Streams section in [EAN-Encoding](#) for more information.



When the recording is started and stopped, file names that do not end with a number are automatically appended with a suffix with consecutive numbers. Video files are recorded with the .ts suffix (transport stream) and can be played back with Windows Media Player, VLC, or others.



7 HTTP Live Streaming (HLS)

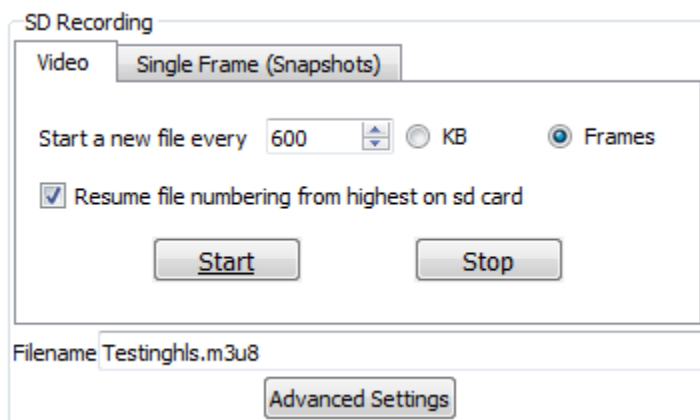
i IMPORTANT:

Viewing video with HLS introduces a large amount of latency (~30 seconds or more). The exact amount depends on current network and system settings.

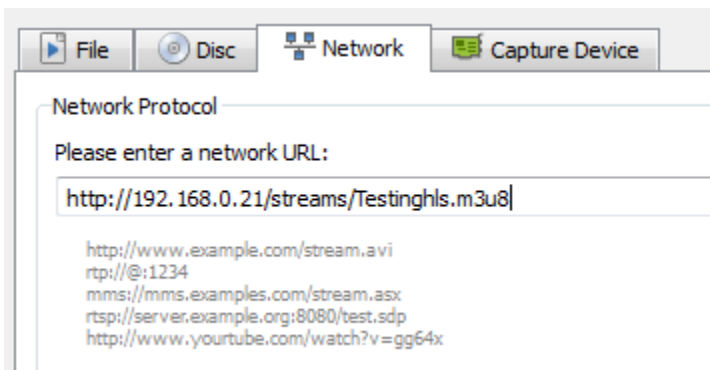
HTTP Live Streaming (HLS) requires software version 2.24.xx and higher.

To start HLS recording:

1. Follow the steps for recording in section in section 7. Use a filename with extension `.m3u8`.
2. Select how often to start a new file. The example below is set at 600 frames (approximately 20 seconds standard video input).



3. Click the *Start* button.
4. To view the stream in VLC, open a Network stream `http://SLA_IP/streams/filename.m3u8`. The SLA_IP is the IP address of the 1500-OEM board or 3000-OEM board. The filename is replaced with the filename specified in step 1.





8 Accessing On-Board Recorded Files

Files recorded to microSD card can be accessed in several ways. Once the hardware is powered off, the microSD card may be removed and connected into the PC using a microSD card reader or similar device. The files can also be accessed remotely using an FTP client or SCP. See the [EAN-Infrared Temperature](#) document for information on 14-bit images and PNG files.

It is important to understand the following system fundamentals:

- The system can stall for several seconds while writing video file to microSD card when the *Stop Recording* command is issued (*byte 4*).
- The system can stall for several seconds when files are deleted (*byte 5*).
- Do not attempt to access the files while the system is recording.
- Snapshots can be taken at the same time as video is being recorded.

9 Setting Up the FileZilla Server

The OEM hardware can save snapshots to an FTP server that is hosted on an external machine. This example uses FileZilla Server to support FTP access.

9.1 Setup Procedures

1. Setup and run FileZilla FTP Server (or similar FTP server) on the host PC at IP address (192.168.1.10).
2. Use Windows Explorer to create a folder where the files will be recorded. Example:
D:\ftp\snapshot
3. Got to *Menu » Edit » Users*.
4. Select the *General* page.
5. In the *Users* group, click the *ADD* button.
6. Enter the *User ID* (e.g., *snapshot*), and then click *OK*.
7. Select the *User ID* in the list box.
8. Enable the *Password* checkbox. Enter a password (e.g., *snapshot*).
9. Select the *Shared Folders* page.
10. Click the Shared Folders *ADD* button. Select the *D:\ftp\snapshot* that was created in Step 1.
11. Click the *Set as home dir* button. An *H* should appear to the left of the folder name.
12. Use the check boxes set the permissions to the folder.

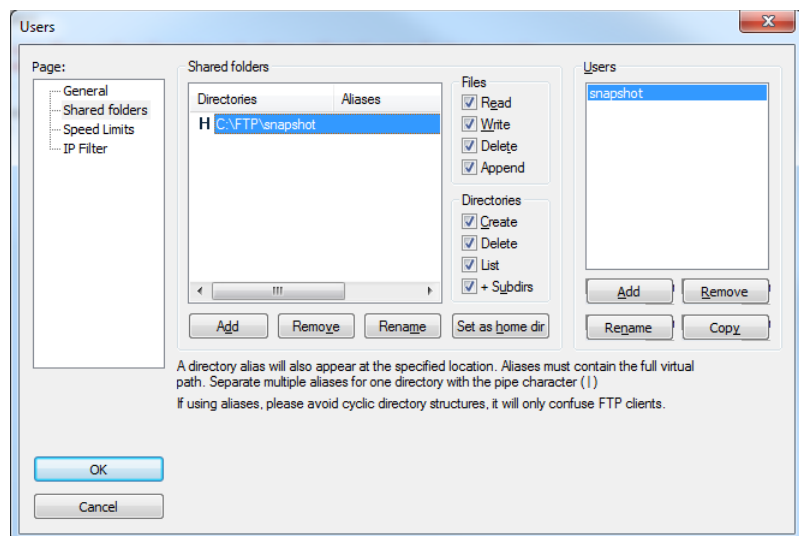


Figure 8: FileZilla FTP Setup



10 Troubleshooting

Problem	Recommendation
System does not appear to save JPEG files.	Make sure that 14-bit digital source images are not being captured. Snapshot of the display image should work.
PNG file appears black in image viewer program.	Most image viewer programs only show the lower 8-bits of a 16-bit PNG. See the EAN-Infrared Temperature document.
Snapshot feature does not appear to be working.	Make sure recording has been enabled in the APP BITS.
JPEG or PNG files are not on the microSD card.	Check the following: <ul style="list-style-type: none"> • Card is read/writeable • Card has been installed correctly • Card is formatted correctly • Files are not being saved to an FTP Server
JPEG or PNG files are not on the FTP server.	<ul style="list-style-type: none"> • Make sure files are not being save to the microSD card. • Verify the IP address of the FTP server • Verify the Username and Password • Make sure the Set Snapshot (0x52) command was sent to configure the OEM hardware.
Can snapshots be recorded at the same time as recoding a video?	Yes, but there may be some performance loss or skipped frames.
Can KLV metadata be recorded to the JPEG/PNG files without the KLV metadata encoding app bit?	Yes. Metadata to the OEM hardware can still be sent. The fields will be extracted and added to the EXIF header of the snapshot.
What types of microSD cards can be used?	SightLine recommends the following cards: <ul style="list-style-type: none"> • Kingston SDC10/32GBCP • Kingston 32GB Micro SD / Class 10.
Should the microSD card be formatted?	Yes. SightLine recommends all microSD cards be formatted before being used in the OEM hardware. See the EAN-Firmware Upgrade Utility for more information.

10.1 Questions and Additional Support

For questions and additional support, please contact [Technical Support](#). Additional support documentation and Engineering Application Notes (EANs) can be found on the Support pages of the SightLine Applications [website](#).



Appendix A: Formatting MicroSD Cards

IMPORTANT: All microSD cards should be formatted before being used with OEM hardware regardless of card size.

The microSD card can be formatted using MiniTool Partition Wizard available on the MiniTool [website](#). Before starting this procedure, download and install the MiniTool Partition Wizard software.

A microSD card reader is needed for this procedure. If your PC does not have a built-in reader, use an external USB microSD card reader or similar.

A1 MicroSD Card Types

The part numbers listed in [Appendix B](#) have been verified to work with the 1500-OEM and 3000-OEM processors.

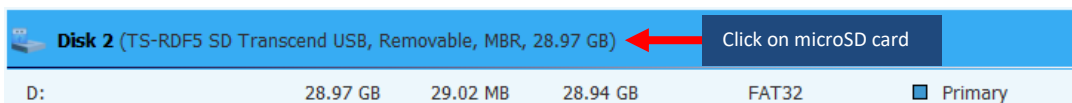
SightLine recommends Class 10 microSD cards. Class 10 cards are rated for a minimum sequential write speed of 10 MBps or greater.

A2 FAT32

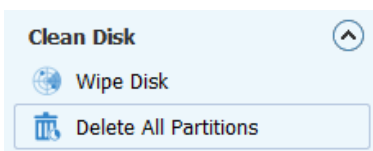
FAT32 (File Allocation Table) is the most commonly used filesystem for removable flash media. FAT32 provides excellent interoperability with other devices is supported by all modern operating systems.

IMPORTANT: FAT32 is susceptible to power loss induced file corruption during write operations. Consider using smaller file sizes or the [Ext3 filesystem](#) if the board is expected to lose power during video recording.

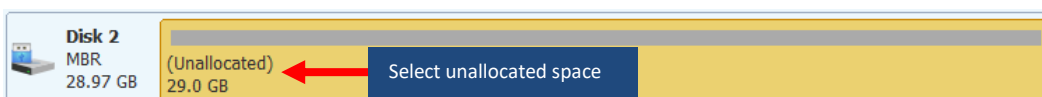
1. Insert the microSD Card into the card reader on the PC.
2. Open the MiniTool application.
3. From the list of drives, click on the microSD card.



4. From the *Clean Disk* list, click *Delete All Partitions*.



5. From the list of volumes, highlight (*Unallocated*) on the microSD card by clicking on it.





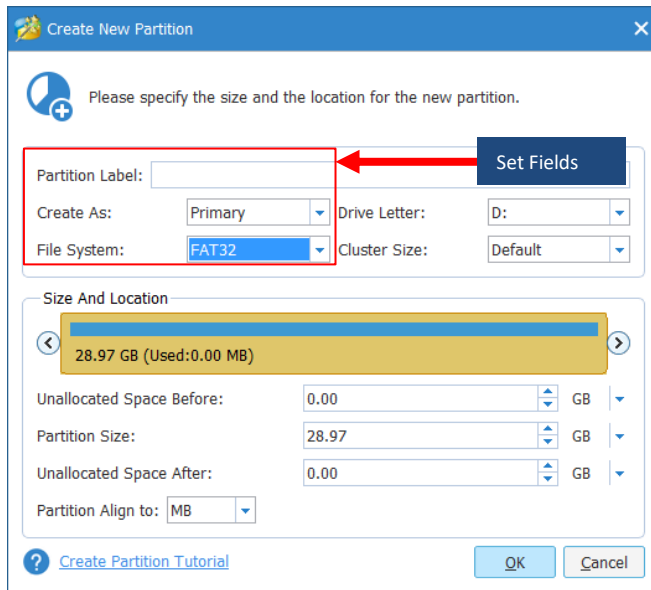
6. From the *Partition Management* list, click *Create Partition*.



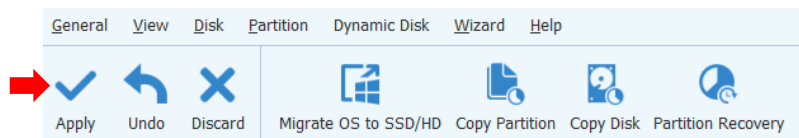
7. In the *Create New Partition* window, set the following fields:

- Optional: Partition Label (leave blank for none)
- File System: *FAT32*
- Create As: *Primary*

Leave partition size at the card's default value.



8. Click *Apply* from the top menu bar. The operations status screen shows the progress.



9. When complete, Click *OK* and close the application. This concludes the formatting process. The card is now ready for recording.

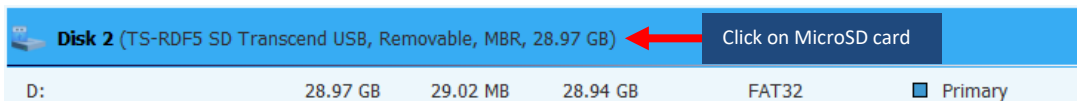


A3 Ext3 (3000-OEM only)

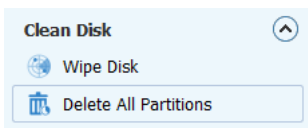
Ext3 (third extended filesystem) is a journaled filesystem supported by the 3000-OEM Linux kernel. Ext3 is resistant to power loss induced file corruption with equivalent performance to FAT32.

ⓘ IMPORTANT: Ext3 is not supported under Microsoft operating systems. Snapshot and video recordings on Ext3-formatted cards can be copied over the network using Panel Plus, SCP, or FTP. See [EAN-Network-Configuration](#) for more information.

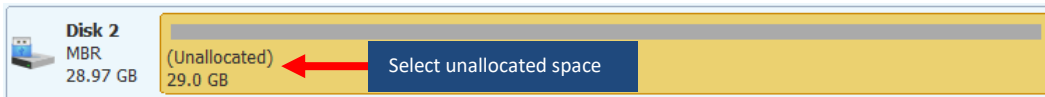
1. Insert the microSD Card into the card reader on the PC.
2. Open the MiniTool application.
3. From the list of drives, highlight the microSD card by clicking on it.



4. From the *Clean Disk* list, click *Delete All Partitions*.



5. From the list of volumes, highlight (*Unallocated*) on the microSD card by clicking on it.



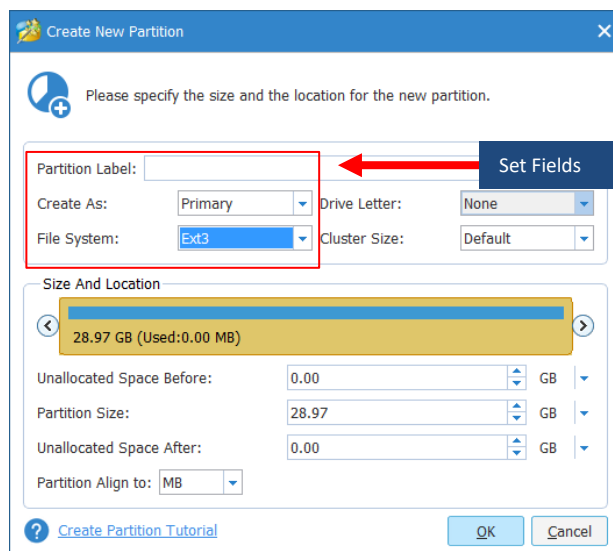
6. From the *Partition Management* list, click *Create Partition*.



7. In the *Create New Partition* window, set the following fields:

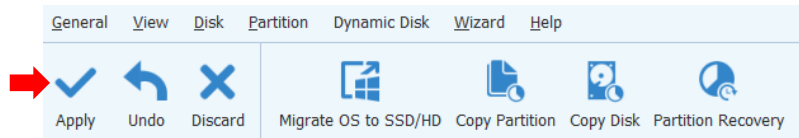
- Optional: Partition Label (leave blank for none)
- Create As: *Primary*
- File System: *Ext3*

Leave partition size at the card's default value.





- Click *Apply* from the top menu bar. The operations status screen shows the progress.



- When complete, Click *OK* and close the application. This concludes the formatting process. The card is now ready for recording.

A3.1 Enable Write Barriers and Ordered Mode

Ext3-formatted cards are mounted in *writeback* mode with write barriers disabled by default.

A *write barrier* is a kernel mechanism used to ensure that file system metadata is correctly written and ordered on nonvolatile storage.

In writeback mode, file data and Ext3 journal metadata may be written to disk asynchronously. This increases the risk that recently written files may be corrupted or contain stale data if the system loses power. *Ordered* mode defers journal commits until data blocks have been written to disk.

Edit the 3000-OEM initialization script (*sla3000_init.sh*) to enable write barriers and ordered mode:

- Open a terminal emulator and establish an SSH session to the target.
- Remount the filesystem as R/W. From the command line, type: `mount -w -o remount /`
- Open *sla3000_init.sh* in the vi editor. From the command line, type: `vi sla3000_init.sh`
- Navigate to the following line using *Page Down* or the down arrow ↓ key:


```
if [ -e /dev/mmcblk0p1 ]; then mount /dev/mmcblk0p1 /media/mmcblk0p1; fi
```
- Press the (I) key to enter insert mode.
- Type or insert the following text in the line as shown between `mount` and `/dev/mmcblk0p1`.


```
-o data=ordered,barrier=1
```

- Press the Escape key, then type: `wq`
- Press the *Enter* key to save the file and exit the vi editor.
- At the command line, type: `reboot`



Appendix B: Tested microSD Cards

SightLine has tested the following microSD cards with the 1500-OEM and 3000-OEM processors shown in [Table B1](#).

Table B1: Tested microSD Cards

Manufacturer	Model	Capacity	Speed Class
SanDisk	SDSDQ-2048	2 GB	n/a
SanDisk	SDSDQ-4096	4 GB	4
SanDisk	SDSQXCG-032G	32 GB	10
Kingston	SDC10G2/32GB*	32 GB	10
Kingston	SDCS/32GB	32 GB	10
Kingston	SDCG2/32GB	32 GB	10
Samsung	MB-MC256GA	256 GB	10