

Technical Support:
Bob: 309-369-6208



FlashTiming FT-FAT

User Manual

Version 1.5

For FT-FATLS Plus, FT-FAT200, FT-FAT120(V2), FT-FAT90

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1 Introduction

FlashTiming FT-FAT is a radio linked, fully automatic timing system, which supports hosting quality track meets with accurate times and fast results. **FlashTiming FT-FAT** software supports **FlashTiming's** Digital Camera product line including the **FT-FAT LS Plus, FT-FAT200, FT-FAT120 (version 2 cameras) and FT-FAT90** systems. The **FT-FAT LS Plus** system provides both line scan and video images of the finish line with frame rates up to 1000FPS. The other systems provide full frame video at 200, 120 and 90 frames per seconds.

FT-FAT software captures time stamped video of the finished line and provides a unique, easy-to-access file naming system for each heat recorded. Playback of captured results is easy, and the results can be transferred to a meet management application with a click of a mouse.

1.1 Minimum System Requirement

Computer used for capturing videos, running *FlashTiming FT-FAT*:

- CPU with benchmark value of 5000 or greater for **FT-FATLS Plus** and **FT-FAT200**
3500 or greater for **FT-FAT120** and **FT-FAT90**.
- 8 GB of RAM
- 200 GB Hard Drive
- 1024 X 768 resolution monitor (1980 x 1080 recommended). **
- Windows 10 Operating System, 64bit
- USB 2.0 port
- **1 Gigabit Network adapter (Ethernet)*****

Computer needed for reviewing videos only:

- CPU with benchmark value of 2000 or greater
- 4 GB of RAM
- 80 Gigabytes HD
- 1024 X 768 resolution monitor (1980 x 1080 recommended). **
- Windows 10 or 11 Operating System, 64bit
- Network adapter (Ethernet)

* There are many variables that determine the computer's speed. Use www.cpubenchmark.net/cpu_list.php to determine your CPU's capability.

Find your CPU Name by typing in "About your CPU" in the Windows search box.

** Computers with screen resolution at or near the minimum size need to have the text size set to normal (DPI = 96pt). Otherwise, portions of the user interface may not fit on the screen.

***May substitute recommended 1Gbit to USB-C adapter.

1.2 Installation

The installation program, **SetupFT-FAT.exe** is available for download on our website:

<http://flashtiming.com/updates/>

Run **setupFT-FAT.exe** on the computers you will use for capturing and reviewing videos. Do not plug in the **FT-FAT** camera or the USB radio until instructed to do so.

To install the software:

1. Run **SetupFT-FAT**.
2. Accept all defaults in the Installation Wizard. The Installer loads the *FlashTiming FT-FAT* software, device drivers for the camera and the USB radio, and .Net Framework 6.0 (if needed).

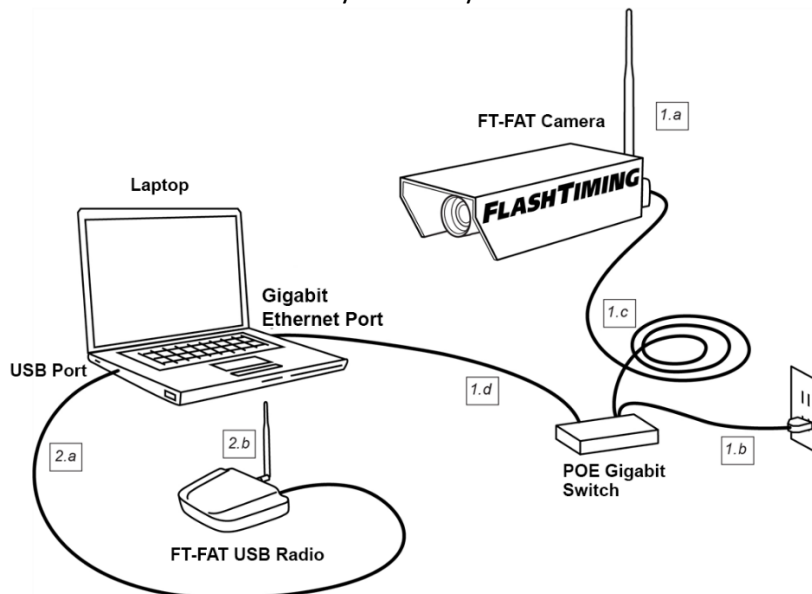
2 System Setup

2.1 Startup Instructions

These instructions will guide you through the initial setup of your **FT-FAT** system and give a quick summary on how to use the system.

1. Connect the camera to the capture computer.

- a. Attached the right-angle antenna to the back of the camera cover.
- b. Attach the power cord with the power supply to the black Trendnet POE Switch. Plug the power cord into a standard wall outlet.
- c. Connect the camera to the Trendnet POE Switch with a Cat6 Ethernet cable. The system comes with an extra Cat6 Ethernet cable for testing purposes. Plug one end of the cable into the Ethernet port on the back of the camera cover. Plug the other end of the cable into *one of the 4 ports on the back of the switch labeled POE*. Do not use port 5 for the camera.
- d. Connect the POE switch to the computer with one of the provided Ethernet cables. Plug one end of the cable into any port on the back of the POE Switch. Plug the other end of the cable into the Ethernet port on your computer. Your computer must have a 1Gbit Ethernet port for the camera to capture at the maximum frame rate for your FAT system.



You can connect your other computers to any of the ports on the POE Switch.

The capture computer is the only computer that needs to have a 1Gbit Ethernet port. The other computers can have a 100Mbit Ethernet port.

2. Connect the USB radio to the computer

- a. Use the USB cable to connect the USB radio to the computer.
- b. Attached the right-angle antenna to the USB. Use the external antenna if in a metal press box or in another setting that may impede the radios from communicating.

3. Setup the FT-FAT starter unit.

- a. Insert 3 AA batteries in the back of the starter unit. The starter unit beeps 3 times when you install the battery.
- b. Attach the Straight antenna to the top of the starter unit.

The next step is to run the application, start a race and capture a trial video. Turn off Windows Firewall and any 3rd party security application. Shut down all other applications before starting the application.

Launch the *FlashTiming* program and select **Capture and Review** from the start screen.

The Configure Windows automatically displays when you launch the program. In the Configure Window:

1. Click **Select Video Folder**.
2. Enter a Meet Name, such as "Test", click **Create Meet** and then click **Next**.
3. In the Scoring Folder tab, select **None** as your Meet Management Software and then click **OK** to close the Configure Window.

The program searches for the three radio devices and reports their status in the *FAT Devices* tab. The camera defaults to full frame video and the live feed is shown in the preview area. If the camera is not found, you may need to set the IP address of the camera. See the "Camera Settings, Advanced Setting, Camera IP Configurator" section in the manual to change the IP address of the camera.

Once all devices are detected, the Start Race tab appears and you're ready to start and capture video of a race.

1. Press the green button on the **FT-FAT** Starter Unit. This will send an "Are you ready?" signal to the computer. The green light on the starter and the green button on the computer will flash.
2. Press the green flashing button on the computer. This sends the "I'm ready" signal back to the starter and the green buttons will turn solid on both the computer and the starter unit.
3. The race is now ready to start. Fire a starting pistol or simulate the start with either a loud sound or a vibration, such as slapping the speaker holes on the starter unit.

Important: Hold the starting pistol at least 12 inches from the starting unit when firing the gun. Positioning the gun any closer may damage the starter unit's sensor.

The green light remains solid and the red light flashes on the starter. Notice the race times display above the preview area.

4. Click the **Capture** button above the preview area. Record some movement with the video camera. Click the **Stop/Save** button.
5. The **Select File Name** window appears. You may create a filename by selecting items from the menus or simply type a name in the text box at the bottom of the dialog. Click **Okay**. A standard Windows Save Dialog appears. Click **Save**.

The saved video appears in the Load Video tab. Double click the video to load the file. Use the control buttons underneath the preview area to play your video. Navigate through your video with the track bar, the left and right keyboard arrows or the mouse scroll wheel.

2.1.1 Line Scan Video

If you purchased the **FT-FATLS Plus**, you can set the camera to line scan mode by clicking the **FAT Devices** tab and then the **Camera Icon**. Click the Mode Drop down menu and select one of the **LS modes**.

2.1.2 Ethernet cables for Camera Stand

Camera stand orders contain two cables with waterproof connectors to use with the camera base. The 15ft cable with the black connector is for the camera pole. The black housing on the cable attaches to the opening in camera base and the other end is attached to the camera housing.

The second cable with the silver connector connects to the black housing after it's been attached to the camera base.

See the YouTube video for detailed instructions for installing the cable:

<https://youtu.be/QABRefWPYc>

2.2 Camera Setup

The camera can be placed inside or outside the track. A good starting point is 15-18 feet back from the nearest lane and 10-12 feet up. The stock lens has a zoom range of 4mm to 12mm which supports distances to the track between approximately 8 to 25 feet. Position the camera so the finish line is centered in the preview area. The higher the camera is positioned, the easier it is to determine the athlete's lane and position. Refer to the Start-Up Instructions for more details.

2.2.1 Lens Adjustment

The camera comes equipped with a manual zoom lens. There are 3 rings on the lens which adjust the zoom, aperture and focus. The inside ring controls zoom, the middle ring controls the aperture, and the outside ring controls the focus.

To adjust any of these settings:

- Launch the **FT-FAT** application with the camera connected.
- Click **Capture & Review**.
- Cancel the Configuration dialogue. The camera image should appear automatically
- Position the camera to show the finish line
- Loosen the thumbscrew on the zoom ring and rotate the ring.
- Tighten the thumbscrew when you are satisfied with the image.
- Repeat the previous two steps for focus.

When adjusting the zoom, it is also necessary to adjust the focus. With a runner standing in lane 1 and lane 8, adjust the zoom and focus so you can see the torsos of both athletes.

2.2.1.1 Len Aperture

The lens aperture, or iris, controls the amount of light reaching the camera sensor and it should be adjusted based on a variety of performance tradeoffs. For most purposes it is recommended that this position be set about 20% away from the Open position. The adjustment is made with the middle thumb screw on the lens. This adjustment has a range from Open to Close and is labeled O on the Open end and C on the Closed end.

Fully opening the aperture will soften the image (i.e., slightly degrade the lens resolution), but will allow for the lowest possible exposure time and reduce motion blur. It may be necessary to further open the iris in environments with very low light levels such as night meets or poorly lit areas. For extremely bright situations such as direct sunlight, the camera image may be saturated white unless the aperture is further closed. The camera's automatic exposure and gain settings are generally capable of compensating for these different conditions. See *Camera Settings* in Section 4 for information on controlling the camera's settings.

2.3 Computer Setup

The FlashTiming System can be set up to work with one, two, or three computers. One computer is sufficient when there is adequate time between races for the capture official to review the video and record the times. Determining the athletes' times in lane races takes very little time. Non-lane races take longer to review due to matching the finish order to the athlete numbers.

If using a meet management application, such as Hy-Teks's Meet Manager, and the meet is pre-seeded, updates to the heat sheets may be created in the meet management application before recording the results. This may take some time and using a second computer to review the video can help reduce the

time between heats. In this situation, one person is dedicated to capturing the race and saving the videos on the capture computer. Another person is responsible for reviewing the videos and recording times on the review computer.

FlashTiming interfaces with the following third-party meet management and scoring software packages:

- *AthleteNET's Run Meet*
- *Hy-Tek's Meet Manager*
- *Apple Raceberry JaM's ScoreMeetLynx*
- *DirectAthletics MeetPro*
- *Easyware's Easy Meet Manager*
- *Enduro Meet Event*
- *RaceTab*
- *Runner Card*
- *Sports Automation's TrackMate*

Some users opt to use a third computer dedicated to scoring the meet. This third computer is not required, and with two computers it is easy to switch between FlashTiming and the meet management application on the review computer. However, three computers are most efficient for larger meets or when recording field and track events simultaneously. The scoring official enters results from the field events into the meet management application. The review official notifies the meet management operator when all times from a race are recorded and saved. The scoring official loads the times into the meet management application and the race is scored.

The introduction of the line scan camera with live review allows the capture operator to review the race and determines the athlete's time while they are capturing the line scan image. This feature allows the operator to determine times more quickly and may eliminate the need for the review computer when using the line scan camera.

2.4 Networking Computers

The **FT-FAT** video camera requires a 1 Gigabit Ethernet connection. The system comes with a 1Gbit POE/Switch for powering your camera and connecting your computers. Your computers should be connected together on a local area network (LAN) isolated from other network traffic. We do not recommend using a wireless network (because of delays during playback) or a network with other computers that may be receiving network traffic during critical times during capture and playback. If the computers are connected to a larger network and any network traffic occurs while you are capturing, there is a potential that frames will be lost. Video Capture is CPU intensive and it is recommended that programs that might cause CPU usage during a capture be disabled (E.G.: adware, automatic updates, etc.). See the appendix for tips on networking computers.

2.5 The Capture Folder

It is recommended that video from a meet is recorded and stored on the capture computer. The review computer is used to retrieve the video from the capture computer, review the video, and record the results. By default, FlashTiming stores your videos by meets in subfolders under the folder *C:\FlashTimingVideos*. FlashTiming shares this folder and allows other networked computers to read the videos. If you want to save your videos in another folder, you need to create that folder on the capture computer. If you are reviewing the videos on a second computer, you must share the new folder and give the review computer read/write access to it.

It is a good idea to copy the captured videos to CD, DVD or external drive at the end of the season and delete the subfolders and video files from your hard drive. The video files are large and take up a lot of disk space. One minute of video requires 200MB of disk space. A typical meet requires 20-40 minutes of video, or 4-8 gigabytes of disk space.

2.6 Scoring Data Folder Setup (Optional)

The Scoring Data Folder is the location used to exchange data files between *FlashTiming* and one of the following compatible meet management software packages:

- *AthleteNET's Run Meet*
- *Hy-Tek's Meet Manager*
- *DirectAthletics MeetPro*
- *Sports Automation's TrackMate*
- *RaceTab*
- *Runner Card*
- *Apple Raceberry JaM's ScoreMeetLynx*
- *Easyware's Easy Meet Manager*
- *Enduro Meet Event*

These applications can be used to schedule your track and field events, seed your athletes, and score your meet. When configured to exchange data with *FlashTiming*, the meet management application generates a list of track events and their participants, referred to as the start list. *FlashTiming* uses the list of events to identify the upcoming races and name the resulting video file. It displays the names of the race participants when reviewing the video to determine the athletes' times. After all times for a race are recorded, *FlashTiming* writes a file containing the race results, which is read by the meet management application.

When using a meet management application, create or designate a scoring data folder on either the review or the scoring computer. If scoring the meet on a dedicated scoring computer, the scoring data folder must be set up for file sharing and allow other computers to write to it.

FlashTiming creates a folder, C:\FlashTimingResults, on the review computer and sets the file sharing permissions so other computers can read and write to it. This can be used as the scoring folder for most meet management packages. *Hy-Tek's Meet Management* and *Apple Raceberry JaM* create their own folders and it's best to use their default folders.

2.6.1 AthleteNet's RunMeet

FlashTiming can read the events lists and heat sheets from *RunMeet*. Time results from *FlashTiming* can be saved in the scoring folder and then read directly into *RunMeet* to score the meet. Specify your scoring folder in the *RunMeet* screen where you select your meet. Select the same folder for both the Start List and Results. Use the *FlashTimingResults* folder on the review computer as the scoring folder or create a folder with read/write permissions.

2.6.2 Hy-Tek's Meet Management

Hy-Tek's Meet Manager users need to purchase *Meet Manager's* Photo Interface Option to exchange data with *FlashTiming*. Check to see if the Photo Interface Option is included with your license of *Meet Manager* by doing the following:

1. Launch T&F *Meet Manager*.
2. Click **Help** in the main menu bar.
3. Click **About**.

4. **Photo Finish Interface** is checked if you have the option.

2.6.2.1 Initialize the Photo Interface

The first time you use the Photo Finish Interface in Meet Manger you need to set the appropriate options. You only need to perform this set-up once.

1. Launch T&F *Meet Manager*.
2. Click **Run** on the main menu bar.
3. Click **Interfaces** on the menu bar.
4. Click **Setup**.
5. Click **Photo Finish**.
6. Click **Flash Timing**.
(If running a college meet, or using an older version of Meet Manager and FlashTiming Interface is not an option, click **FinishLynx File Sharing**.)
7. Click **OK**.

2.6.2.2 Erase Previously Created Event Lists and Time Files

It's best to remove the previously created event lists and time files from previous meets before starting your meet. Remove any existing data files from either the *Meet Manager* or *FlashTiming* application. To delete the files from *Meet Manager*:

1. Launch T&F *Meet Manager*.
2. Click **File** on the main menu bar.
3. Click **Purge** from the drop-down menu.
4. Click **Remove Data Selectively**.
5. Check **Interface Files** located at the bottom of the Remove Data Window.
6. Click **OK**.
7. Click **OK** when asked if you are sure you want to delete the files.

This deletes the event list and time results files from the data folder designated in the next step.

2.6.2.3 Save the Start List

It is recommended that you use the default Meet Manager folder for your data folder. The default folder is *C:\tfmeets#*, where # is the version number (e.g., *C:\tfmeets6* for version 6.0. Once athletes and events are entered in *Meet Manager*, set the data folder location in *Meet Manager* and save the start list. From the *Meet Manager* application:

1. Click **Run** on the main menu bar.
2. Click **Interfaces** on the menu bar.
3. Click **Photo Finish - Flash Timing** (or **Photo Finish - FinishLynx File Sharing Mode**.)
4. Click **Update Start Lists** to bring up the Update Start List Window.
5. Select a session in the Session List.
6. Check **Activate update of start lists**.
7. If you want to save the data to a folder other than the default:
 - a. Click **Change Data Location**.
 - b. Browse to the data folder and *double click* the folder name. Be sure the name of the selected folder is displayed at the top of the dialog).
 - c. Click **OK to** return to the Update Start List Window.
8. Click **OK** to return to the Run Scene. A message appears, "Schedule and start list successfully copied to <data folder>".

Once the Photo Finish option is initialized, click the **Update Start List** button or type <Ctrl-U> to save changes to the start list.

2.6.3 Sports Automation's TrackMate

FlashTiming can read the events lists and heat sheets from *TrackMate*. Time results from *FlashTiming* can be saved in the scoring folder and then read directly into *TrackMate* to score the meet. Use the *FlashTimingResults* folder on the review computer as the scoring folder or create a folder with read/write permissions.

To set up *TrackMate* to work with *FlashTiming*:

Click the **Timing System** button in the main window.

1. Click the **Timing System** button in the main window.
2. Click **Configure** in the Timing System window. This brings up the Configure Timing System Window.
3. Select **FlashTiming** from the *Select Timing System* List.
4. Browse to the folder that is used to exchange data with *FlashTiming*.
5. Select **Hundredth of a second**.
6. Click **OK**.

Next, sort your events in the order they will be run. Click the **Event Schedule** tab in the Timing System Window. Click and drag the events to their correct position. A start list and schedule are automatically created when you create races/heats/flights in *TrackMate* and is stored in the designated folder.

2.6.4 Direct Athletics MeetPro

FlashTiming can read the events lists and heat sheets from *MeetPro*. Time results from *FlashTiming* can be saved in the scoring folder and then read directly into *MeetPro* to score the meet. Use the *FlashTimingResults* folder on the review computer as the scoring folder or create a folder with read/write permissions.

To setup *MeetPro* to exchange data with *FlashTiming*:

1. Set up your track meet in *MeetPro*.
2. Click on **Interfaces, F.A.T** and then **Setup**.
3. Select **FlashTiming** as the vendor.
4. Browse and select the folder that will be used to exchange data with *FlashTiming*.
5. Select Auto-Update Start Lists if you want *MeetPro* to automatically update your start list when changes are made to the heat sheets or event list. Otherwise, you can manually recreate the start list by continuing to step 6.
6. Click **Interfaces, F.A.T** and then **Update Start List** to save the list of events and heats sheets. *MeetPro* will not create the start list if there are no races seeded.

2.6.5 EasyWare Easy Meet Manager

FlashTiming can read the events lists and heat sheets from EasyWare's *Easy Meet Manager*. Time results from *FlashTiming* can be saved to the scoring folder and then imported into *Easy Meet Manager* to score the meet. The default scoring folder for *Easy Meet Manager* is *C:\EasyMeetManager\Data1*. Be sure to share this folder if you keep the default and are using multiple computers. Alternatively, use the *FlashTimingResults* folder on the review computer as the scoring folder or create a folder with read/write permissions.

Save the start list after the meet is set up and the athletes are seeded in Easy Meet. Run *Easy Meet Manager*.

1. Click **File** in the main menu bar and then **Create FAT Photo Timing Files** from the dropdown menu.
2. In the standard window file dialog, browse to your meet management data folder and click **Save**. Do not rename the file.

2.6.6 RaceTab

FlashTiming can read the events lists and heat sheets from *RaceTab*. Time results from *FlashTiming* can be saved to the scoring folder and then read directly into *RaceTab* to score the meet. Use the *FlashTimingResults* folder on the review computer as the scoring folder or create a folder with read/write permissions.

To setup *RaceTab* to exchange data with *FlashTiming*:

For RaceTab version 3:

1. Set up your track meet in *RaceTab*.
2. Click the **Events** tab.
3. Click the **Get Times** button on the right.
4. Browse and select the folder that will be used to exchange data with *FlashTiming*.
5. In the Timing System Interface window, select **FT-FAT** under *What brand is your FAT System*.
6. Select **Race Results** under *Automatic Import*
7. **Events, Teams, Schedule** and **Athletes** under *Automatic Export*.
8. Click **Save and Done**. Your event list and heat sheets are automatically saved and updated every time you change the event list or heat sheets.

Press the **Get Times** button after a race has been timed to bring in the times from *FlashTiming*.

For RaceTab version 4:

1. Set up your track meet in *RaceTab*. Be sure to select **Yes** for *Fully Automatic Timing* under the *Setup* tab
2. Click the **RaceTab** logo at the top left of the screen.
3. Click the **Sources** button that appears in the dropdown.
4. Select **FAT Camera** on the right-hand side under *Add a Source*
5. Select **FlashTiming** as the *Vendor*:
6. Click **Browse** next to *Data Folder*:
7. Browse and select the folder that will be used to exchange data with *FlashTiming*.
8. Select **Automatic** to have *RaceTab* automatically update the event list and heat sheets when each heat is seeded
9. Click **Save and Done**.

Right click the **Camera Icon** in the top left and select **Get Times** after a race has been timed to bring in the times from *FlashTiming*.

2.6.7 Apple Raceberry JaM's ScoreMeetLynx

Apple Raceberry JaM users need to purchase the *FinishLynx/FlashTiming* interface option to exchange data with *FlashTiming*. The upgrade is called *ScoreMeetLynx*.

Once the meet is created, run *ScoreMeetLynx* and open the *Roster.Tex* file in the *Seeded* directory. Check the **Records must be F.A.T.** box in the *Meet Parameter* dialog.

Save the start list after the heats are set up and late entries are added:

1. Click **File** in the main menu.
2. Click **Create Lynx/FlashTiming Input Files**. *ScoreMeetLynx* displays the standard file dialog opened to the Seeded directory.
3. Save the lynx.evt file in the seeded meet directory. Do not rename the file.

ScoreMeetLynx assigns event numbers to the men and women's event. It asks for a numeric offset for event numbers to distinguish the men's from the women's event. FlashTiming uses the event number and description to name the video files and the resulting time results files.

ScoreMeetLynx creates a lynx.sch file after saving the lynx.evt file. Save the lynx.sch file in the same folder as the lynx.evt file. Click **Yes** when asked if you want to finalize the schedule.

It's necessary to resave the lynx.evt and lynx.sch files if your schedule of events or heat assignments are changed.

3 Getting Started

Exit all other applications before starting *FlashTiming FT-FAT*. The **FT-FAT** application must be allowed through the Windows and third-party firewalls. Alternatively, all firewalls must be disabled to successfully access your **FT-FAT** camera.

If using anti-virus software, be aware that the software may scan the video on capture and reduce the CPU usage allocated to *FlashTiming* resulting in dropped frames and loss of video data. Running other programs in the background while *FlashTiming* is recording video can result in a similar loss of data. It is also necessary to set the network profile to Private for accessing other computers.

To launch *FlashTiming*, click the *FlashTiming FT-FAT* shortcut located on your computer's desktop, or click the Windows icon in the lower left of the screen and type "FT-FAT" in the search box. The *FlashTiming* startup screen appears.

Click either **Capture & Review** or **Review Only**

- **Capture & Review** initializes the FAT camera and allows you to capture and save time-stamped videos of your races. You may also review previously saved videos while capturing.
- **Review Only** allows you to play previously recorded race videos, record athlete's times, and transfer the race results to your meet management application.


Note: You must have administrative privileges to run FlashTiming. Depending on your user control settings, you may be logged in as administrator but may not have administrator privilege when running FlashTiming. If you receive an error message while running FlashTiming that you do not have sufficient privileges, exit the program and restart by right clicking on the FT-FAT icon and then clicking "Run as administrator."

The computers need to be on a private network, and network discovery and file and printer sharing needs to be turned on. *FlashTiming* checks these settings on start up. If not set, it requests permission to change them.

The system firewall needs to be turned off or you must allow *FlashTiming FT-FAT* through the firewall to be able to access the camera and other computers through the network. Windows Defender Firewall may ask to allow FT-FAT to communicate on the network. Check **Private** and click **Allow access** if this window appears.

3.1 Configuring the System

The Configure Window automatically appears the first time the program is launched. The Configure Window allows you to specify the location of the captured files and meet management data when using a third party meet management application. Alternatively, you may specify a preferred method for naming your captured videos when not using a meet management application.

*Note: Change your options at a later time by selecting **Configure Meet** in the main menu .*

3.1.1 Video Capture Folder

The video capture folder is the location where *FlashTiming* stores and retrieves captured videos. *FlashTiming* creates and shares the folder, *C:\FlashTimingVideos*, for this purpose.

Click the Capture Folder tab to select the capture folder.

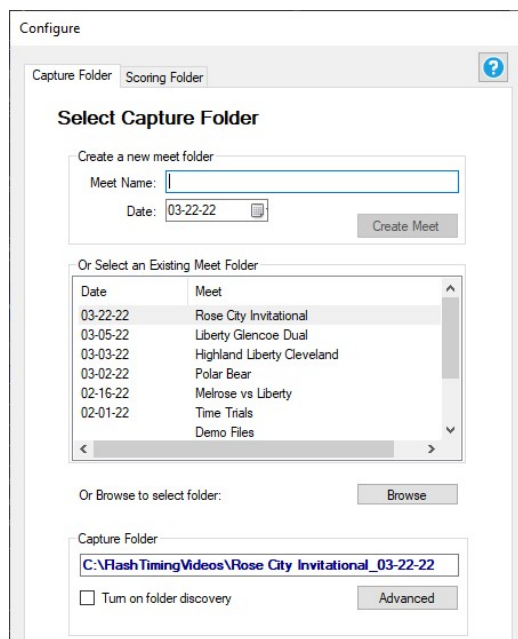
3.1.1.1 Capturing Videos

If capturing videos on the computer, you have the option to create a new meet folder or select an existing meet. To create a new meet, enter the name and date of your meet and click **Create Meet**. FlashTiming creates a folder on the computer's C drive under *C:\FlashTimingVideos*. This folder is shared and the folder permissions are set to allow other users to read the files.

If a folder was previously created, select it from the list of meets.

Click the **Browse** to select a folder when videos are not stored under the default folder, *C:\FlashTimingVideos*. In this case, you must share the folder if accessing the video from another computer.

If reviewing videos on a separate computer, check **Turn on folder discovery**. This will allow other computers on the same network to easily find the capture folder.



3.1.1.2 Reviewing Videos Only

If only reviewing video, and the videos are stored on the same computer, select the meet folder from the List of Existing Meet Folders.

Click **Discover** if the videos are stored on another computer in the same network and the folder discovery is turned on.

Alternatively, click **Browse** to use the system folder browser to locate a folder on this computer or the network.

3.1.2 Scoring Folder

The scoring folder is used to exchange heat sheets and results between FT-FAT and your meet management app. Click the **Scoring Folder** tab to specify your scoring software and folder.

3.1.2.1 Check **This computer is used for scoring** if scoring the meet on the same computer.

3.1.2.2 Meet Management Software

Next, specify which meet management application to use with the meet. Click on the drop-down menu in the Scoring Option section and select your meet management application from the list. Select **None** if you are not using a meet management application or if you are just reviewing video and are not recording times.

3.1.2.3 Number of lanes

Enter the number of lanes on the track where the meet is hosted. This is used to as the default number of entries in the results table.

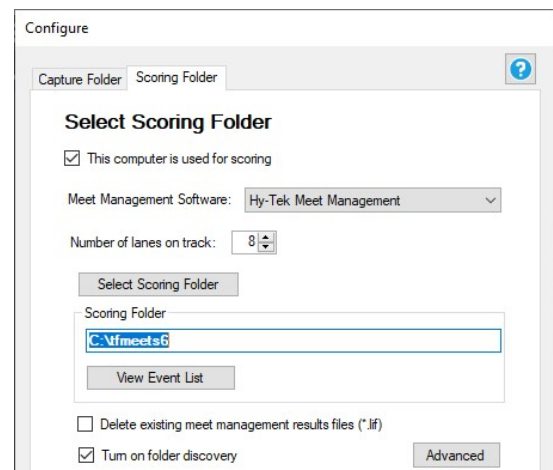
3.1.2.4 Scoring Folder

When using a Meet Management application, first save the start list to the folder designated in your meet management program. See *Scoring Data Folder Setup* in the previous section for more information.

3.1.2.4.1 Scoring the meet on this computer

If this computer is used to score the meet, click **Select Scoring Folder** to specify the location for saving your race results. Select the meet management data folder from the browser. This folder needs to be the same folder specified in your meet management application. The list of events appears when the folder is selected. Click **View Event List** any time after the folder is selected to see the events.

You may save your results to a text file (*.txt) if you selected **None** for your meet management software. The default scoring folder in this case is *C:\FlashTimngResults*. You may leave the folder as the default or select your own folder for saving the results.



Check **Delete existing meet management results files** to remove results files from a previous meet. If using the same scoring folder for each meet, remove all old race results files from the folder before reviewing videos and determining times for the current meet. Check the box when you first configure *FT-FAT* for your meet.

Check **Turn on folder discovery**. This will allow other computers on the same network to easily find the scoring folder. If the folder is not shared on the network, the program will ask permission to share it.

3.1.2.4.2 Scoring the meet on another computer.

Click **Discover Scoring Folder** if the scoring folder is on another computer in the same network and the folder discovery is turned on.

Alternatively, click **Browse to find manually** to locate the scoring folder. If the scoring folder is on another computer, the folder needs to be set for file sharing with write permission. If you mapped the folder to a network drive, the data path is listed in the browser as the drive letter. Otherwise, you can find the folder under Network in the folder browser.

The list of events appears once the folder is selected. Click **View Event List** any time after the folder is select to see the events.

3.1.3 Advance Settings for Folder Discovery

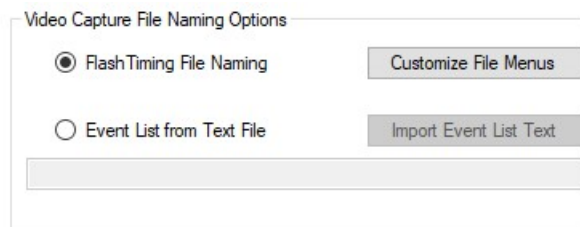
You can view your available networks and specify which ones to use when turning on discovery for either the capture or scoring folder. Click the **Advanced** button to view your available networks. Uncheck networks you don't want to be used for discovery.

If the computer is password protected and you don't want to share your username and password with others, click **Create User** to create a guest user account.

Note: Folder discovery is not support in Windows 7. Browse to find folders if the computer OS is Windows 7.

3.1.4 File Naming Options for Non-Meet Management Users

When capturing videos and not using a meet management software package, you must select a naming option for your captured videos. In the Scoring Folder tab, if you selected **None** as your meet management option, you have two choices for naming and saving your captured video: **FlashTiming File Naming** or **Event List from Text File**.



3.1.4.1 FlashTiming File Naming

This option provides a set of menus for gender, event, division, round, and heat when saving the captured video file. The menu choices create a descriptive filename for the captured video.

You may customize the event and division menus by selecting the option **FlashTiming File Naming** Option and clicking on the **Customize File Menus** button.

The list of Selected Events shows the items that will be available when saving your captured video. Customize the menu by:

1. Adding events from the list on the Available Events: Select the event in the available event list and click **Add**. The event is added to the selected events list.
2. Remove events from the Selected Event List: Select the event in the Selected Event List and click **Remove**. The event is deleted from the selected events.
3. Add new events to the list of available events: Type in a new event in the text box and click **Add Custom Event**. The event is added to your list of available events. You may now add the event to your selected event list.
4. Delete events from the available event list: Select an event in the available event list and click **Delete Above Selected Item**. This removes the item from the available event list, but not the selected list.

Click the Save button to store your new menu setting.

3.1.4.2 Event List from Text File

You can create your own list of scheduled events, read in the list and use the list to generate the filenames for your captured videos. Sample entries may include:

Girls Varsity 4X100
Boys Varsity 4X100
Boys JV 4X100
Girls Varsity JV 1500
Boys Varsity JV 1500
Girls Varsity 100
Girls JV 100 Heat 1
Girls JV 100 Heat 2

The list is displayed in the Scheduled Events tab and shows the upcoming events. When saving a video, you can select an event from the list to generate a descriptive filename for your captured video.

The imported list must be a text (.txt) file and should contain all race events in the meet, sorted in the order they will be run. Each entry should be on a new line and the list should contain separate entries for each heat.

To import a text file:

1. Click the option named **Event List from Text File**
2. Click **Import Event List Text File**.

3. Browse to the folder containing the event list text file, select the file and click **Okay**.
Click **OK** to save your settings and close the configure window.

3.2 Network Information

Multiple computers are often used when running a meet. The computers must be networked, and firewall and network profile must be set correctly for the computers to communicate. FT-FAT allows you to check your network settings and change the firewall settings and network profile if you have administrator privileges.

Click **Network Information** at the bottom of the Configure window or select **View Computer and Setup** from the main screen to bring up the Network and Setup window to check settings.

The **Network** Tab displays the computer name, available networks, the networks' profiles and firewall status.

Network Status: shows the available networks including their IP address, Subnet Mask and network speed. Networked computers must be on the same network and have same sub-network to communicate.

Click **Show Network Connections** to bring up Windows' Network Connections Window. You may enable/disable networks and change their properties via this window. Click **Refresh** in FT-FAT's Network and setup Information window if you make any changes to the Windows' networks.

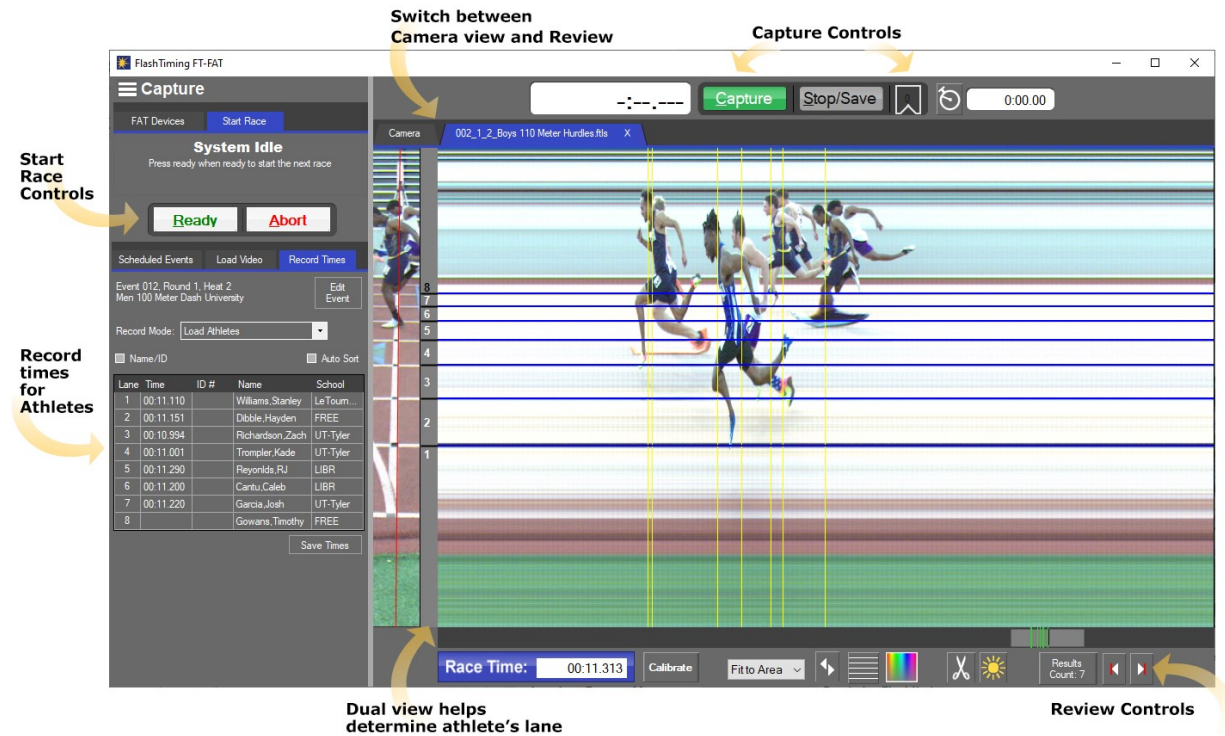
Network Profile shows the network name and profile type. If using the POE switch that is provided with the FlashTiming system, the network is listed as "Unidentified Network". Set this network to private.

Firewall – FlashTiming must be allowed through the firewall to access the camera and other computers on the network. The best practice is to allow just the application through the firewall. FT-FAT sets the access when starting the application. If this operation is not successful and you cannot see the cameras or other computers, change the firewall settings to **OFF**.

Folders – The folder tab shows your current video capture and meet management folders.

4 Overview

The main screen consists of the preview area, the capture controls above the preview area, and the review controls below the preview area. The two tabs in the upper left allow you to switch between the FAT Devices and the Start Race Controls. The Start Race tab is not available until after the FAT Devices have been initialized, and neither tabs are present if you are in Review Only mode. The three tabs below them allow you to switch between the list of schedule events, the list of recorded videos and the table for recording athletes' time. The record time tab appears once a video is opened for review.



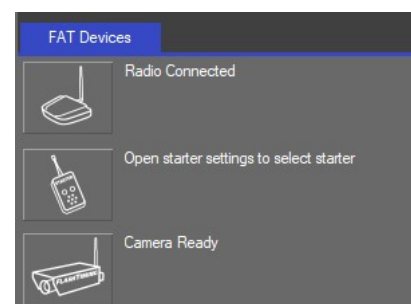
4.1 FT-FAT Radio Devices

The FAT system includes 3 radio devices: Camera, Starter Unit, and USB Radio. Before launching the program in capture mode, setup the camera by plugging it into one of the POE ports on the provided network switch and connecting the capture computer to another port on the switch. Plug in the USB Radio and turn on the Starter Unit by pressing the green button and ensuring that the batteries are installed correctly. When the program is launched, it attempts to initialize the FAT system. The Device tab in the upper left corner shows the status of each device as it is initialized. The **Start Race** tab is added when the system is initialized. This may take a few minutes.

If there is an issue with the initialization a message will appear next to the appropriate device. Click on the device button to determine the problem.

4.1.1 USB Radio

This will report a problem if the USB Radio unit is not plugged in or cannot be detected. Most problems can be fixed by plugging in the USB unit. If it is plugged in, try plugging the device into another USB port. Click the USB Radio button, check the auto discovery box and click OK. The system will reinitialize.



4.1.2 Starter Unit

The most common causes of not detecting the Starter Unit are:

- the Starter Unit does not have an antenna attached,
- the Starter Unit is not turned on,
- the Starter Unit is in low-power mode, or
- the batteries in the Starter Unit are low or dead.

The green ready light on the Starter Unit blinks every few seconds to indicate it has power. If the light is blinking, check the battery by holding the red abort button for 4 seconds until the unit beeps 4 times. This puts the starter in low power mode. Push the red button again and the numbers of chimes indicate the battery strength: 4 is strong, 1 is poor. Change the batteries if the reading is poor.

The Starter Unit has a power save mode to conserve the batteries and will go into low power mode after 10 minutes of non-use. Press the green button on the starter to take the starter out of power save mode.

Click the Starter Unit button in the FAT Device tab once the starter is turned on. Click the refresh button and the starter radio appears in the list below. This may take a few seconds. If there are multiple starters detected or the starter radio does not appear in the list, click the red button on the starter. The starter in the list appears with a red highlight.

Select the starter from the list and click OK.

4.1.3 Camera

Click the Camera button and select your camera from the drop-down menu. If the name of your camera does not appear, check the camera IP Address (See Camera IP Configurator).

If the camera name appears in the list as [In Use] but there is no image from the camera, or there is an image but the system cannot find the camera radio, unplug the camera from the POE/switch and plug it back in. After a few seconds, the camera name should reappear in the list. Select it and click OK.

4.2 Camera Settings

The camera settings window allows you to switch cameras, change between line scan and full-size video, adjust the image quality, and test the camera.

4.2.1 Switch Cameras

If multiple cameras are in use, click the dropdown menu to switch to another camera. The FAT System will reinitialize when the new camera is selected.

4.2.2 Camera Mode

This option is only available with line scan enabled cameras. Click on the down arrow to switch between:

- Full Frame Video – Displays and captures video of the finish line. The video resolution is 600X800 and the maximum frame rate is 200FPS.
- LS+ Fast – Displays and captures both video and line scan images. The video resolution is 80X800 and the maximum frame rate is 1000FPS.
- LS+ Wide Displays and captures both video and line scan images. The video resolution is 160X800 and the maximum frame rate is 500FPS.

Both the LS+ Fast and the LS+ Wide show a video strip of the finish line which can help determine the runner lanes.

4.2.3 Set the Brightness

The camera's brightness is automatically adjusted. Uncheck the Auto Brightness box to override the defaults and manually adjust the camera's gain and exposure settings.

The camera's exposure sets the shutter speed and determines how much light reaches the camera's sensor. High exposure results in a brighter image; low exposure results in a darker image, but reduces blur. The gain setting turns the brightness level of the image up or down once the camera receives the image. It allows you to get a brighter or darker image without changing the shutter speed. Be aware that the more you increase the gain, the grainier or noisier the image gets.

4.2.4 Set the Frame Rate

The Line Scan system is capable of capturing an image at 1000 frames per second in LS+ Fast mode and 500 FPS in LS+ Wide mode.

The **FT-FAT** video systems are capable of capturing video up to their designated frames rate at 800X600 resolution. A lower framerate will allow for higher exposure. For evening meets and dark settings it may be necessary to lower the frame rate and increase the exposure for a clearer image.

4.2.5 Video Quality

FlashTiming compresses the video strip to condense the size of the resulting video file. Low quality results in faster compression, but degrades the video quality.

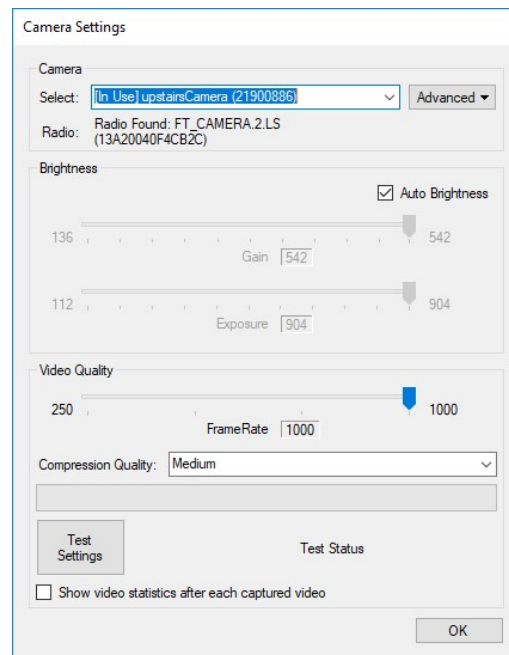
4.2.6 Test the System

Click Test Settings to check the frame rate and whether the computer is dropping any video frames. The test captures 1 minute of video and reports the status. If frames are being dropped, verify that your system is networked correctly and there are no other processes or applications running (See the Appendix Networking your Computers). Lower the Frame rate and/or the video quality if still dropping frames after verifying the network status.

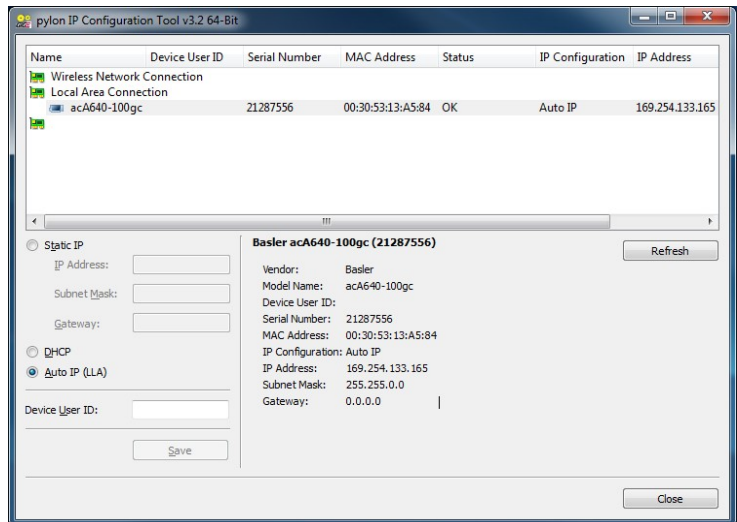
4.2.7 Advanced Settings

4.2.7.1 Camera IP Configurator

If you do not have an image, the IP address of the camera may be on a different network than the capture computer. An Internet Protocol address (IP address) is a numerical label assigned to each device (e.g., computer, camera) on a computer network. The first 2 or 3 sets of numbers of the IP Address identify the computer network. If the network address of the camera is different from the computer's network address, the program will not be able to detect your video camera when you enter the capture screen.



The IP Configuration Tool scans your computer for network connections and attached cameras. All discovered network connections are displayed in the top panel and information on the selected item is shown below. The FAT cameras are listed under Local Area Connection or Ethernet with the default name beginning in “ac800-“.



When you select a network connection, the information area displays the IP address and Subnet Mask of the network adapter. The camera and the computer must belong to the same sub-network for the computer to detect the camera. If the subnet mask of the network adapter is 255.255.0.0, then the first 2 sets of numbers of the camera’s and computer’s IP address must be the same. If the subnet mask is 255.255.255.0, then the first 3 sets of numbers of the camera’s and computer’s IP address must be the same. Make note of the IP Address and Subnet Mask of the Local Area Connection/Ethernet that lists the camera.

Click the camera in the upper panel. Any problem with the camera is shown in the status column and additional information is given below. If your device is not reachable, you need to change the IP Address of the camera with one of the following methods:

- DHCP – Select this method if the computers are networked with a router, which assigns IP addresses
- Static IP – Select this method if the computers are networked through an unmanaged switch. (The Trendnet POE Switch is unmanaged).

We do not recommend using Auto IP.

When you click **Save**, the new IP settings are saved with the camera and retained when the camera is switched off and back on. When the camera status is listed as “OK”, click **Close** to return to the Camera Settings. Click the camera drop down menu and the camera will be listed.

When attempting to change the camera’s IP address, you may be required to enter a temporary IP Address and the Assign Temporary IP Address Windows automatically appears. Enter an IP address in which the first 2 or 3 number sets are the same as the computer’s and the remaining set is different from the computer or any other computer on the network. Click **OK**. The camera retains this temporary address until you assign a new address or the camera is disconnected or powered off.

If the camera does not appear in the Pylon IP Configuration Tool:

1. Verify the camera is properly connected as described in Section 2.1 and that all connections are secure.
2. Make sure all firewalls are turned off, including Windows and any third-party security programs, such as Norton or McAfee. To turn off Windows Firewall:
 - a. Click on the Windows **Start Menu** and then **Control Panel**.
 - b. **View by:** is located in the upper right-hand corner of the Control Panel Window. If viewing by Categories, select **System and Security**.

- c. Select **Windows Firewall**.
- d. Turn off the firewall for all connected networks.

Click **Refresh** after making any changes to search for new cameras.

4.2.7.1.1 Camera Name

It may be best to change the name of cameras in the IP Configuration Tool to help identify a camera when there are multiple cameras around the track. To change the camera name:

1. Disconnect the camera in the camera setting window (the camera cannot be in use when changing the name).
2. Type in a new name in the text box labeled “Device User ID”, located in the bottom window.
3. Click **Save**.

4.2.7.2 Find Radios

The system should find the radios associated with each device on startup. In the instance that it does not find the radio, it’s best to exit the application, unplug and re-plug the ethernet cable to the camera and relaunch the application. If the system still cannot find the radio. Click on **Find Radios** and select the radio ID number from the list.

4.2.7.3 Temp File Location

Videos are saved to a temporary file on the hard disk during capture. Once the user enters a name for the video, the file is moved to the Capture Video folder with the new name. Click on Temp File Location and browse to a new folder to change where the videos are temporarily stored.

4.3 Setting up for a Meet

4.3.1 Before the Race

Check the camera focus, set the finish line and test the **FT-FAT** radio devices before each meet.

4.3.1.1 Focus the Camera

Line Scan System Only: Click the **Edit Lines** button located above the preview area to see a full frame video of the finish line.

Adjust the lens on the camera until the live feed displays a crisp image. Refer to the section above, *Lens Adjustment*. If the camera is positioned in the same position at each meet, this step only needs to be performed once when setting up the camera for the first time.

4.3.1.2 Set the Finish Line

The finish line should be located in the center of the preview area and as close to perpendicular to the bottom edge of the preview window as possible; however, the software can accommodate slight misalignments. Always check the camera feed and give yourself time to adjust the focus and position of the camera before each meet.

Line Scan System Only: Click the **Edit Lines** button above the camera preview area after you initialize the camera. The Finish Line Setup window appears with a full frame video preview area. Align the vertical line with the near plane of the finish line in the image by clicking and dragging the line. Click and drag the top or bottom portions of the line to rotate the line.

Click and drag the horizontal lines to align them with the lanes where they cross the finish line.

4.3.1.3 Test the Timing System

Best practice is to test the **FT-FAT** system before the meet to verify the communication between the radio devices is working properly. Select the **Start Race** tab in the upper left corner of the screen. This

tab provides information on the radio state and includes the **READY** and **ABORT** buttons, which are used to communicate with the starting official.

Follow these steps to test the **FT-FAT** timing system:

- Position the starter at a starting location on the track with the **FT-FAT** Starter Unit.
- Have the starter press the Green Ready Button on the Starter Unit. The green light flashes on the Starter Unit. On the capture computer, the **READY** button in the **Start Race** tab flashes and the status message indicates that the starter wants to start the race.
- Click the flashing green button on the capture computer to indicate that you are ready for the race. The green blinking light on the Starter Unit and the green flashing Ready button on the capture computer both turn solid green, indicating that the timing and starting officials are both ready to start the race.
- Have the starter fire the pistol or tap lightly on the speaker to simulate the gun blast. The red light flashes and the green light turns solid on the Starter Unit and the unit beeps for 8 seconds, indicating that the race is running. The **READY** and **ABORT** buttons on the capture computer turn green and red, respectively, and the race time appears in the Race Time box above the preview area.
- Press the **Abort** button in the **Start Race** tab on the capture computer to stop the race clock.

It's recommended that you repeat this test at each of the 4 starting positions around the track.

Important: Hold the starting pistol at least 12 inches from the starting unit when firing the gun.

Positioning the gun any closer may damage the Starter Unit's sensor.

4.3.2 Zero Control Test

The zero-control test, as defined by most ruling bodies (NCAA, IAAF, USATF), involves capturing the starting device and verifying the zero FAT time corresponds to the flash produced when the starting pistol is fired. To do this with the FT-FAT software, place the starting device in the view of the camera and capture the video before firing the gun. Put the system in the "Ready" State and fire the gun. Stop the capture after firing and review that file. Race time displayed when the flash is visible should be within .001 seconds of the visible flash with the **FT-FATLS Plus** or .005 with the **FT-FAT200**.

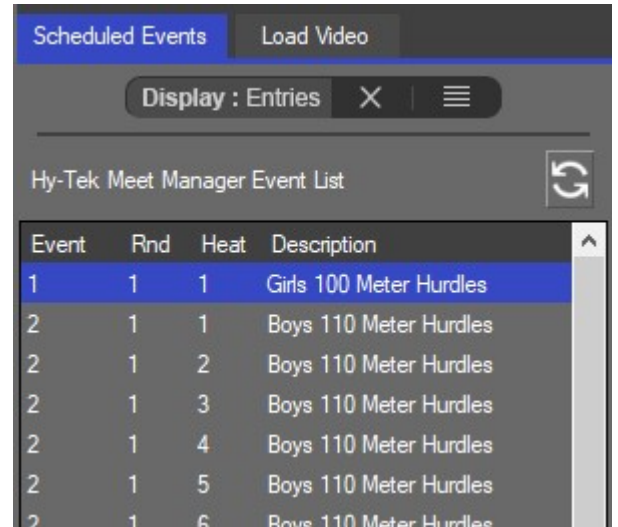
4.4 Scheduled Events

The scheduled events tab shows either the list of events created by the meet management application or the contents of the event text file. The list is imported when you set the scoring folder or import the text file in the Configure window. The meet management application or the text file name is displayed at the top of the list.


4.4.1 Meet Management Events

The list contains the scheduled events created in the meet management application when a meet management option was selected in the Configure Window. The Event List includes the event number, the round number, the heat number and a description. Rounds are numbered 1 through 4 and indicate preliminaries, quarterfinals, semi-finals and finals. If using Hy-Tek's *Meet Manager* Combined Event Option then the round number indicates the sub-event in a combined-event, such as a decathlon, and has a value 0 through 9.

Right click an entry to see the list of athletes seeded in a heat.



Event	Rnd	Heat	Description
1	1	1	Girls 100 Meter Hurdles
2	1	1	Boys 110 Meter Hurdles
2	1	2	Boys 110 Meter Hurdles
2	1	3	Boys 110 Meter Hurdles
2	1	4	Boys 110 Meter Hurdles
2	1	5	Boys 110 Meter Hurdles
2	1	6	Boys 110 Meter Hurdles

 The **Reload Event List** button is located above the event list in the upper right of the event tab. Click this to update the event list between rounds such as preliminaries and finals to import the latest event list into FlashTiming or any changes made to the event list during the meet.

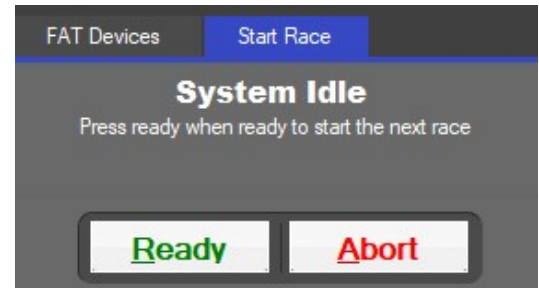
The display toolbar is shown at the top of the list if you set up a display to show Entries. Click on an event in the list and then the list icon to display the entries for the selected event. Click the **X** to clear the display.

5 Capturing Video

5.1 Starting a Race

The **FT-FAT** system has built in communication between the starter and timing official. Either the starter or timing official may initiate the race by sending an “Are you Ready?” message to the other official.

- The starter presses the Green Ready button on the Starter Unit. The ready button on the Starter Unit blinks and the ready button in the Start Race Tab on the screen blinks. The timing official clicks the Ready button to indicate that the timer is also ready.
- Or, the timing official clicks the Ready button in the Start Race Tab. The ready button on the screen and Starter Unit’s ready button blinks. The starter presses the ready button on the unit to acknowledge.



The light on the Starter Unit turns solid green and the “Ready to Start Race” message appears in the Start Race Tab when both officials are ready and the system is armed and calibrated.

The starter has 5 minutes to start the race once the system is in the “Ready” state. Otherwise, the system returns to the Idle State. When the starter fires the gun, the race clock starts and the time is displayed above the preview area.

Either official may abort the start procedure at any time before the gun is fired.

- The timing official clicks the **ABORT** button in the Start Race Tab. This alerts the starter by flashing the red light and sounding a busy alarm on the Starter Unit.
- Or, the starter presses the red Stop button on the Starter Unit. This displays a message in the Start Race Tab on the capture computers and plays an audible warning beep.

See Section 10 for details on using the FAT Starter Unit.

5.2 Capturing Video

The capture controls are located above the preview area. Click the **Capture** button when the first runners are approximately 25 meters from the finish line. It is not necessary to capture the entire race. It’s best to start capturing when the first runner approaches the finish line and stop when the last athlete crosses the line. Otherwise, the resulting video will be large and contain useless footage.



When the Capture button is clicked, the button changes to **Pause**. It then toggles between **Resume** and **Pause** whenever clicked. Click the **Pause** button to suspend capturing. This is useful when there are large gaps between runners in distance races. Click **Resume** when the next finisher approaches the finish line.

5.2.1 Live Review

Line scan only. Live Review is available with the **FT-FAT LS Plus** camera and when the camera is in line scan mode. This feature allows you to review the video while you record. You may trim the video during live review to show only the portion of the image with movement.



You can set the trim filter to either outdoor/bright light or indoor/low light by clicking the sun icon prior to capturing. The filter cannot be changed while capturing. *The camera continues to record the entire line scan image. No data is lost if motion does not show in Live Review due to poor lighting or low light.*

5.2.2 Bookmarks



Tag a runner in the video by clicking the bookmark button or pressing the space bar when capturing a video. The bookmark counter will increment whenever you add a bookmark. Bookmarks are especially useful for long non-lane races when recorded as full frame video. Add a bookmark whenever an athlete finishes the race. This will make it easy for the reviewer to quickly locate a frame where the runner is close to the finish line.

5.2.3 Manual Capture

Manual Capture only records video when the space bar key is held down. To enable manual capture, click the main menu and select **Preferences**. In the Preference Window, check the **Manual Capture** box.

Press and hold the space bar when a runner approaches the finish line. Release the space bar to pause the capture. Press and hold the space bar again to resume capturing.

Bookmarks are not available in this mode.

5.2.4 Backup Timer

There may be instances when the timing system does not capture the start of the race and the FAT race clock does not start. Most of these situations can be avoided by reviewing the **FT-FAT** start procedures with the starter and timing official before the start of the meet. Regardless of the procedures put in place, it is prudent to have a back-up timer or establish a method to recall the runners if the race clock does not start.

The calibrate feature in *FlashTiming* allows you to record hand times of all runners with one backup timer. In the event that the FAT race clock does not start when the race commences, always capture the video. The backup timer records the time of a runner with a stop watch. When reviewing the video, calibrate the frame of the runner crossing the finish line with the recorded hand time. *FlashTiming* then computes the times of all other runners based on that hand time.

5.2.5 Stop Watch



FlashTiming has a built-in stopwatch, which may be used to obtain a backup hand time for a race. If the capture official clicks the **Stop Watch** button when the starting pistol is fired, the stopwatch starts and the times are displayed in the box to the right. In the few instances when the **FT-FAT** race clock does not start, the stopwatch can be used to calibrate the video or line scan image.

See Calibrate Video in the Video Review section for more details on calibrating the video and the stopwatch.

It's possible to set a start time for the stop watch by clicking the stopwatch time box.

5.3 Save the Video

Click **Stop/Save** when the last runner crosses the finish line. This stops the race clock and allows the user to save the video file.

The Select File Name window appears when you stop capturing

- If you selected a meet management option the meet management Event List appears. Select the captured event from the list. If you selected an event in the Scheduled Event list, the same event is automatically selected in the Meet Management list.
- If you are using an imported text file for your event list, the event list text file appears. Select the name of the captured event. If you selected an event in the Scheduled Event list, the same event is automatically selected in the File Name list.
- If you are using neither a meet management nor an imported event list, a set of menus appears. Create the file name by selecting the options for gender, event, division, round and heat.

The selected name appears in the filename text box at the bottom of the dialog. You can edit the filename in addition to selecting the name from the list. *

Click **Save** and Windows standard system save file dialog appears. Click **Save** to store the video and dismiss the dialogs.** The saved file will appear in the Load Video List. If you have previously selected an event in the scheduled events list before saving the video, the highlight advances to the next event in the list.

If capturing and reviewing videos on the same computer, check **Review after Save** box if you want to immediately review the video.

*** Meet Management Users:** The first 8 characters of the meet management filenames are the event #, round # and heat # separated by an underscore (_). This information is used by FlashTiming to retrieve the list of athletes for the event and should not be modified. The one exception is the heat #. If a heat was added for an event and is not included in the event list, you can change the heat number in the box above the file name.

**You can opt to not show the Windows Save Dialog in the Preferences. See Section 8.1.

Select File Name

Event	Rnd	Heat	Description
1	1	1	Girls 100 Meter Hurdles
1	1	2	Girls 100 Meter Hurdles
1	1	3	Girls 100 Meter Hurdles
1	1	4	Girls 100 Meter Hurdles
1	1	5	Girls 100 Meter Hurdles
1	1	6	Girls 100 Meter Hurdles
2	1	1	Boys 110 Meter Hurdles
2	1	2	Boys 110 Meter Hurdles
2	1	3	Boys 110 Meter Hurdles
2	1	4	Boys 110 Meter Hurdles
2	1	5	Boys 110 Meter Hurdles
2	1	6	Boys 110 Meter Hurdles
3	1	1	Girls 3000 Meter Run
3	1	2	Girls 3000 Meter Run
4	1	1	Boys 3000 Meter Run
4	1	2	Boys 3000 Meter Run
5	1	1	Girls 100 Meter Dash

Change Heat Number: 1

Filename: 1_1_1_Girls 100 Meter Hurdles

Review after Save

Save Cancel

Select File Name

File Name

Gender: Mens Womens Combined

Event:

Races: 100M

Hurdles:

Relays:

Others:

Division: Varsity

Round: Finals

Heat #: 2

Clear Filename

Filename: Mens_100M_Varsity_Finals_2

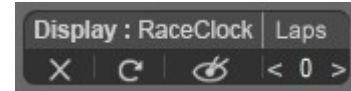
Review after Save

Save Cancel

5.4 Race Clocks

FlashTiming can display the race time on the **FT-Display**, **FT-Scoreboard**, Daktronics Galaxy Matrix Displays or All Sports Scoreboard, and any display that can accept HDMI, DVI, or SVGA formats. See *Display Section* below for setting up your displays to show the race clock.

Once the race clock is initialized, a toolbar appears at the top of the screen to the right of the capture controls. Use the toolbar controls to clear the race time, reset the time and arm the photo beam for the **FT-Display**.



The race time appears on the display when the start is detected by the **FT-FAT system**. The race clock will continue running until the race is stopped by either stopping the video capture or clicking the **Abort** button. A race clock can also be started and stopped with the built-in stopwatch.

The buttons in the Race Clock toolbar, from left to right are:

- Clear the clock
- Reset the clock
- Arm/disarm the photo beam for the FT-Display.
- Laps – Click the left and right arrows to decrement and increment the lap counter. If laps is 0, the lap counter does not show on the display. Lap

The display clock cannot be cleared or reset when the **FAT** clock is running. If both the **FAT** clock and the stopwatch are running, the display shows the **FAT** time. The lap counter may not display on all scoreboards.

6 Video Review

Once a video is saved, it can be open for review to determine the athletes' times.

6.1 Load Video

The *Load Video* tab on the left side lists all videos and line scan images in the capture folder. The name of the capture folder is displayed at the top of the list. The video list is usually empty at the start of a meet. Filenames appear in the list after capturing and storing race videos.

Click the Load Video tab and then double click on the file name to open the video. The video or line scan image is displayed in the preview area and the filename is shown on the tab above. The video controls appear below the preview.

If results were previously saved for a race, a dialog appears asking if you want to load the previously saved results. Click **Yes** to retrieve the previously saved results. If you have not saved any results for a race and this dialog appears, it is an indication that there are old results in the capture folder and/or the shared scoring folder. It is recommended to always start with an empty capture folder and delete any previous results files in the shared scoring folder before starting the meet. You can delete old time result files in the configure dialog.

There is a check box preceding each filename in the video list. This box is automatically checked whenever you review a video and save the times of the athletes. You can click the check box at any time to manually keep track of reviewed videos.

Right click a filename in the list and a menu appears with the following items:

- **Open Video File** – This opens the selected video in the preview area.
- **Rename File** –The Select Filename dialog appears. Type in a new file name or select an event from the list and click **Rename**. You are not able to rename the video if it is currently opened or if the file is stored on another computer and you do not have write permissions to the folder.
- **Delete File** – This deletes the current file. You cannot delete the video if it is currently opened or if the file is stored on another computer and you do not have write permissions to the folder.
- **Close Video** – This option is available if the selected video is loaded in the preview area. It will close the video.
- **Check/Uncheck Video** – This will place/remove the checkmark before the file name. It is the same as clicking the check box.

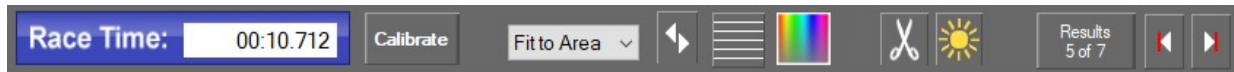
6.2 Line Scan Video

The preview area contains the lines scan image and a video strip of the finish line. Click and drag the trackbar located below the image to scroll the line scan image. The light grey bar within the trackbar represents the portion of the line scan visible in the preview area. The black line in the grey bar indicates the position of the video frame shown in the video strip. The race time associated with the cursor position on the line scan and video frame in the preview strip is displayed below the trackbar.

The mouse wheel will also move the image left and right.

You may choose to not show/show the video strip by clicking "<" or ">" to the left of the trackbar.

6.2.1 Line Scan Controls



The controls from left to right are:

Race Time: Displays the current race time of the cursor position and video frame.

Calibrate: See the section below, *Calibrate the Video*.

Zoom: Zoom options include:

- **Fit to Area:** Scales the line scan height to fit in the preview area.
- **100%:** Displays the line scan at the recorded resolution height.
- **200%:** Displays the line scan at twice the resolution height.

Reverse: Reverse the direction of the line scan image.

Finish Line and Lanes:

- **Edit Lines:** Click to edit the lane position on the line scan and video strip.
 - Set the number of lanes at the top of the screen.
 - Reverse the lanes position if necessary
 - Click and drag the horizontal lines to align with lanes on the image where they cross the finish line.

Lanes cannot be changed during live review.

The finish line defines the line scanned and its position may not be edited once the line scan image has been saved.

Line Colors: Select colors for the following lines. It is best to select different colors for the first three lines.

- **Finish Line:** Color of the finish line in the video strip and time line cursor in the preview area.
- **Results:** Color for lines representing an athlete's recorded time.
- **Selected Result:** Color for the selected athlete.
- **Lanes:** Color for the horizontal lane lines.

Trim: Remove the dead space in the line scan image or restore the line scan to the original image.

Daylight Trim Filter: Set the trim filter for outdoors/bright light or indoors/low light.

This filter cannot be changed during live review. Set the trim filter for live review in the capture control panel above the preview area before capturing a video.

Markers: Markers can be either bookmarks placed during capture or saved results.

- **Results/Bookmarks:** Click this to switch between showing bookmarks or results. This button is enabled only if both bookmarks and results exist. Bookmarks are shown as red lines on the trackbar and results are shown as green. Pauses in the video are indicated by blue lines. Bookmarks are not displayed when imaged is trimmed.
- **Previous Marker:** Click this to move to the marker to the left of the track bar indicator. Shortcut key: '<' or ','
- **Next Marker:** Click this to move to the marker to the right of the track bar indicator. Shortcut Key: '>' or '.'

Markers are not available during live review or when Trim is enabled.

6.3 Full Frame Video Controls

The preview area displays the video frame. Click and drag the position indicator on the track bar to move quickly to any frame in the video. Also use the mouse wheel to advance and rewind the video. Use the video controls to change the image size, finish line and navigate through the video.



The controls from left to right are:

Race Time: Displays the current race time of the cursor position and video frame.

Calibrate: See the next section.

Video Playback Controls

- **Play/Pause:** Click to start playing the video. Click while the video is playing and the video pauses. Clicking the preview area when the video is playing also pauses the video. Shortcut key: 'P'
- **Video Start:** Click to position the video on the first frame.
- **Step Back:** Click to move the video to the preceding frame. Shortcut key: Left Arrow Key
- **Step Forward:** Click to advance the video one frame. Shortcut key: Right Arrow Key
- **Video End:** Click to go to the last frame of the video.

Markers:

Markers can be either bookmarks placed during capture or the frame corresponding to an athlete time.

- **Results/Bookmarks:** Click this to switch between showing bookmarks or results. This button is enabled only if both bookmarks and results exist. Bookmarks are shown as red lines on the trackbar and results are shown as green. Pauses in the video are indicated by blue lines.
- **Previous Marker:** Click this to move to the marker to the left of the track bar indicator. Shortcut key: '<' or ','
- **Next Marker:** Click this to move to the marker to the right of the track bar indicator. Shortcut Key: '>' or '.'

Zoom:

Select the preferred zoom mode from the drop-down menu:

- **Fit to Area:** Scales the video to fit in the preview area.
- **100%:** Displays the video at the recorded resolution.
- **200%:** Displays the video at twice the resolution.

Use the scroll bars to reposition the viewable area if the resized image is larger than the preview area.

Finish Line:

Click the finish line color button to show the finish line and set the color. A finish line is superimposed on the video and helps determine the athletes' times. Align the superimposed line in

the video with the near plane of the finish line in the preview area by clicking and dragging the line. Click and drag the top or bottom portion of the line to rotate the line.

6.4 Calibrate the Video

The **FT-FAT** system encodes the race time on each line scan or video frame during capture. When reviewing the video file, *FlashTiming* retrieves and displays the times from the captured image. If the timing device did not activate at the start of the race, you can calibrate the video by assigning a time to any line scan or video frame. *FlashTiming* can then compute the time for each line scan or video frame based on the calibrated time. This feature allows you to record hand times of all runners with only one backup time.

If you have the finishing time for any runner, calibrate the video by either:

- **FT-FATLS Plus:** Move the line cursor to the edge of the timed athlete's torso.
- **FT-FAT Video Systems:** Advance the video to the frame showing the torso of the timed athlete crossing the near plane of the finish line.

Click the **Calibrate** button at the bottom to bring up the Calibrate Window.

- **Calibrate:** Type the athlete's hand time in the text box and press **Enter** to set the calibrated time for the line scan or frame.
- **Clear Calibration:** Click if you want to clear the calibration.
- **Stopwatch Calibrate:** Click to calibrate the image to the built-in Stopwatch. This option is grayed out if the stopwatch feature was not used during capture (see Stop Watch in the Capture Section).

Once the video is calibrated, the calibrated time appears in the **Race Time** box.

6.5 Determining Athletes Times

NFHS rule 5-8, article 1 states that the runner's time is the moment when his or her torso crosses the near plane of the finish line. NCAA rule 3.1 states "The runners shall be placed in the order in which any part of their torso (as distinguished from an appendage such as the head, neck, arms, legs, hands or feet) reached the perpendicular plane of the nearer edge of the finish line."

The time encoded on the line scan or the video frame with the runner's torso on or over the finish line is the athlete's fully automatic time, also known as **FAT**.

Line Scan - The line scan image is a timeline composed of one-pixel wide images of the finish line. Any vertical line drawn on the image has a time associated with it and shows what occurred at the finish line at that time. Simply, click on the edge of the athlete's torso and the time the athlete crossed the finish line is displayed in the Race Time box below the preview area.

Full-Frame Video – Each frame of the video has a timestamp. Advance the video to the frame that shows the athlete's torso on or passed the near edge of the finish line. The time the athlete crossed the finish line is displayed in the Race Time box below the preview area.

6.6 Record Times

The Record Times Tab becomes active once you load a line scan image or video file. To record an athlete's time for a race, do the following:

1. Verify the event information if using a meet management scoring package.
2. Select a method for recording times.
3. Record times for each athlete.
4. Save the results.

6.6.1 Verify the event

Verify the event information if sending results to a scoring program. This information is generated by your meet management application and extracted from the video filename. Verify that the event, round, and heat numbers are correct for the event you are recording. Click Edit Event if the event shown is incorrect.

The screenshot shows the 'Record Times' interface. At the top, it displays 'Event 2, Round 1, Heat 1' and 'Boys 110 Meter Hurdles'. There is an 'Edit Event' button. Below this, the 'Record Mode' is set to 'Load Athletes'. There are checkboxes for 'Name/ID' and 'Auto Sort'. A table with 5 columns (Lane, Time, ID #, Name, School) and 8 rows is shown. At the bottom right, there is a 'Save Times' button.

Lane	Time	ID #	Name	School
1		5839	Nipp, Deven	WSLM
2		4780	Carter, Thomas	SUMM
3		2909	Gatley, Quin	LINC
4		220	Gehrke, Nathan	SBHS
5		2231	Czysz, Enzo	JHS
6		5426	Clay, Carter	UNON
7		3111	Kinion, Jesse	MCMI
8		1585	O'Brien, Jonathan	GLNC

6.6.2 Record Mode

You have four options for loading the athletes and determining their times. Select one of the following options from the drop-down menu:

- **Do Not Show Athletes:** This option is popular with all-comers meets and unseeded lane races. It allows you to record the times for a lane race without regard to who the participants are. Select this option and the result table shows lanes only.
- **Load Athletes:** This option loads participating athletes' names, competitor numbers and team affiliations into the results table. It allows the reviewer to extract race times for athletes and assign times for their performances. Any changes to the race start list/heat sheets must be made in the meet management program and saved before loading the athletes and recording their times. Select this option if the results table is seeded with the race participants.
- **Load Athletes from Multiple Events:** Events, such as the boys' varsity and JV 3200M, are sometimes combined into one race but still scored separately. This option allows you to easily run multiple events together and score them separately. Changes to the start lists for all events must be made in the meet management program and saved before loading the athletes and recording their times. Select the events that were run together from the List of Scheduled Events which appears when this option is selected. The results table shows participants from all selected events. Click on one of the events listed above the table and the athletes from that event are highlighted in the table. Select this option when combining multiple events into one race.
- **Place by Times:** This method is used mainly for non-lane, unseeded heats, cross-country, and road race events where times are recorded and later matched with an athlete name. There are no rows in the results table when this option is first selected. Click Load Bookmark to bring in the recorded bookmarks times during capture. Loading bookmarks is a quick way to get times for a cross country event where the exact time is not

crucial.

Select this option for non-lane races if you are not ready to match the athlete to the finish time.

Note: Load Athletes and Load Athletes from Multiple Events are only available for seeded events and when using a scoring package.

6.6.3 Recording an Athlete's Time

1. Position the athlete on the finish line:

Line Scan: Click and drag the finish line cursor to the edge of the athlete's torso. Use the arrow keys to fine tune the cursor position.

Full Frame Video: Advance the video to the frame showing the athlete's torso on or over the leading edge of the finish line:

2. Record the time. For record mode:

- **Do Not Show Athlete** (choose one of the following):
 - Click the row in the result table that corresponds to the athlete's lane.
 - Type in the lane number. For a ten-lane track, type in '0' to enter a time for lane 10.
 - *Line Scan only:* click on the lane number to the left of the preview area.
- **Load Athletes** (choose one of the following):
 - Use the same method as "Do Not Show Athletes"
 - Enter the athletes name or ID/Competitor number.
Check the Name/ID box and enter either the athlete's last name or Competitor number in the text box. It will search the list for the athlete and enter the name.
- **Select Multiple Events** (choose one of the following):
 - Click the row in the results table with the athlete's name.
 - Type in the ID/Name in the text box.
- **Place by Time:**
 - Line Scan:* The time is added to the table whenever you position the timeline on the runner's torso.
 - Full Frame Video:* The time is added when you click the video frame in the preview area.Times are sorted in ascending order.

Line Scan: Once the time is entered in the table, a corresponding line is drawn in the preview area. You can edit a time by clicking and dragging a result line or by recording over an existing time.

6.6.4 Entering Names from the Athlete's Roster

You may add athlete's information into the results table in either **Do Not Show Athletes** or **Place by Times** modes when using a scoring package. In these modes, the Name/ID check box is present if an athlete's roster is available. The athlete roster is created by the scoring package and saved in the file, lynx.ppl, in the scoring folder. If the box is checked, you may type in a name or competitor's number in the text box after entering the time. It will search the roster for the athlete. You may not enter athletes who are not registered for the meet.

Your meet management program may not read in the results when the athletes are added outside of the program. It's best to test this feature with your meet management application to see if it will accept the results.

6.6.5 Auto Sort

Check this box to sort the results table by times. This is useful when there is a long list of athletes in the **Load Athletes** and **Select Multiple Events** modes and you need to see which athletes to not have a time. It will place the athletes with no times at the top of the list.

6.6.6 *Athlete's Menu*

Right click on any row in the results table and the athlete's menu appears. The athlete's menu allows you to select the status of seeded athlete, delete or manually edit an existing time, or go to the video frame/line scan showing the athlete's time.

The menu contains the following status codes for the athletes.

SCR for Scratch

DNS for Did Not Start

DNF for Did Not Finish

DQ for Disqualified

NT for No Time

FS for False Start

Select one of the codes and it will be entered in place of the time.

6.6.7 *Determining Athletes in Non-Lane Races*

It is not always possible to identify a runner or read a hip number on the video or line scan. Therefore, we strongly recommend that the finish line official records the finish order of the athletes in all races that do not finish in lanes. The official reviewing the video can then match the name with the athlete and time in the video.

Athletes may lap the slower runners in longer races such as the 3000M or 3200M races and it's difficult to distinguish the slower athletes from the finishers. Use the bookmark feature when capturing full frame video or line scan to place a marker in the video when an athlete finishes the race. You can use these markers in the review screen to quickly advance to the video frame showing the athlete near the finish and then record the FAT time by positioning the torso on the finish line.

A useful method for both line scan and full frame video is to have a chute, or place a cone in an outer lane. Instruct the runners coming off the last curve of the race to run for the cone. This makes it more obvious when reviewing the video in identifying the finishers from the athletes that have more laps to run.

6.6.8 *Save the Times*

Click the **Save Times** button after the times for all the athletes have been recorded. This saves a result file in the scoring data folder. If you are using a meet management scoring package, the results are saved in a file with a ".lif" extension. If you are not using a meet management scoring package, then the result file will be saved in the scoring folder with a filename the same as the video file and a .txt extension. (E.G., if the video file is named "Girls 100M JV.avi", the results are saved in "Girls 100M JV.txt").

Times may also be printed from the main menu. Click the menu icon in the upper left corner and then click **Print**. Options are available to print the results or current video frame or line scan image.

6.6.9 Display Race Results

The display toolbar is shown at the top of the Record Time tab if you set up a display to show results.



The buttons in the toolbar, from left to right, are:


- **Clear** – Clears the display
- **Results** – Post the race results on the displays. This will display the results for athletes whose times are recorded in the result table.
- **Auto Results** – Turn **On** auto results to display the athletes' times as they are being determined in the review screen. This will update the results on the display every time an athlete's time is entered in the results table.

7 Displays

Race times, results and entries can be displayed on multiple displays including FT-Displays, FT-Scoreboard, AthleticLIVE website and most external monitors and matrix displays. Additionally, you can display race times on Daktronics All-Sports scoreboards.

External monitors and matrix displays must be visible as a display in the Windows Display Setting and the display must be set to “Extend desktop to this display” in order for FlashTiming to access them.

To set up a display:

1. Click the main menu 
2. Select **Displays**.
3. Select a display type from the drop-down menu in the Display Setup Window.
4. Configure the display – see below for each display type.
5. Check the items that you want to show on the display: race clock, entries, and/or results.
6. Click **Options** to set the display layout and attributes.
7. Check **Show Results on Save** if you want results to automatically appear on the displays when you save the results.

7.1 FT-Display

7.1.1 Setup

FT-Display can be set to display race time, entries and/or results. The USB Radio must be connected to the computer to use the FT-Display. If operating from the capture computer, use either the USB that came with the FAT system or with the FT-Display.

The Display Setup window lists all FT-Display in radio range. Click the display in the list and then **OK** to add the display. If there are multiple FT-Displays, click the **Test** button to identify the display. Enter a **User-Friendly Name** to distinguish the displays in the list.

7.1.2 Options

Click the **Options** tab to change for the options for the FT-Display:

- **Race Clock** – Displaying race times always has precedence over results and entries. Results and entries will stop showing when a race begins if the race clock is enabled.
 - Check **Show Split Time on first bookmark** to stop or pause the clock when the first bookmark is entered to show the unofficial winning time.
 - Enter the time to pause the clock on the first bookmark or when the photo beam is broken. Enter “0” to stop the clock.
- **Results/Entries** - Results and entries are displayed one athlete at a time.
 - Enter the number of seconds to show each athlete
 - Enter the number of times to cycle through the results. Enter 0 to continually cycle through the results until either the race clock starts or new results/entries are displayed.
- **Display Brightness** – Use the slider to adjust the brightness of the display.
Note: The display will auto-dim if the battery level is low.
- **Check Battery** – Click to show the percentage of battery life remaining on the display.

Click the **Network Settings** tab to enter a new **Network Name** and **Password** for the display. The network name is used to access the Wi-Fi network on a smartphone and the password is required to connect to the display. Click **Save** to store the new name and password on the display.

7.2 FT-Scoreboard

Send race times, results and entries to the **FT-Scoreboard** either directly from the capture or review computer, or through another computer running the **FT-TrackScoreboard** application.

- Select the resolution of your FT-Scoreboard, either 192x96 or 288x144
- Select **Direct Connection** if the FT-Scoreboard is wired to the computer through the Nova Star controller. Select the display from the drop-down **View On** menu. The drop-down menu shows a list of all monitors connected to the computer. Click **Test** if more than one monitor shows in the list to verify that you have the correct monitor.
- Select **UDP Ethernet** if using the Scoreboard with the **FT-TrackScoreboard** software running on the same or another computer. **FT-TrackScoreboard** can show messages, images and results and score from Hy-Tek's Meet Manager or Direct Athletics' MeetPro in addition to the data from FlashTiming. Enter the Computer IP address and socket number for the computer **FT-TrackScoreboard**. This is found in the Network Interface tab of **FT-TrackScoreboard**.

Click **Test** to see if you are communicating with the display. See the **FT-Scoreboard** user guide for more information on setting up the scoreboard either directly or through UDP.

7.3 Second Monitor or Window

FlashTiming can display the race times, results and entries on a second monitor or detached window. Select the monitor from the **View On** drop-down menu. The detached Window option will bring up a window that can be clicked and dragged to any area on the screen.

Most matrix scoreboards can be configured to show as a second monitor attached to the computer. Check with your scoreboard manufacturer.

Enter a User-Friendly Name to distinguish the windows/monitors when multiple ones are in use.

7.4 Daktronics Matrix and All Sports Displays

FlashTiming can display race times, entries, and results on Daktronics Galaxy Matrix Displays controlled by a Venus 4600, Venus 5000, Venus 6000, Venus 6500, or Venus 7000 console. You may display race times on All-Sports Scoreboards.

7.4.1 Set the communication protocol for sending data to the display.

Daktronics Communications Server (DCS) is software that receives and sends out Real Time Data (RTD) from your timing system to your display. DCS must be running on the computer that operates your display and the computer must be connected to the timing system via serial port or Local Area Network. See Daktronics support for instructions on how to make these connections and utilize the software.

In the setup window, select the method for sending data to the Daktronics Display:

- **Serial Port:** Click the **Com/Serial Port** option and select the com port and baud rate.
- **UDP:** Click the **UDP Ethernet** option. Enter the IP address and socket number of the scoreboard computer.

Refer to your Daktronics manual for more information on setting up the scoreboard.

Daktronics Matrix Displays may also be set up a second monitor.

7.5 Options for Matrix Displays.

The following are options for **FT-Scoreboard**, Second Window/Monitor, and Daktronics Matrix Displays:

- **User Friendly Name:** Enter a name to distinguish for other displays of the same type.
- **Lines of Text:** Enter the number of lines of text to be displayed on each screen.
- **Characters per Line (Daktronics only):** Enter the maximum number of characters your board can display across one row. The number of characters across on a window is determined by the width.
- **Cycle Time:** The display will cycle through the “pages” of text if the results or entries contain more lines of text than will fit on the screen. Cycle Time is the amount of time in seconds that a page will remain on the screen before the next page is displayed.
- **# of Times to Cycle:** Enter the number of times the display should cycle through multi-page results or entries. Enter ‘0’ to continue cycling through the results until the next set of data is sent to the display.
- **Note:** If all data for the entries or results fit on the display, the data will remain on the screen for the *Cycle Time* multiplied by the *# of times to cycle*. If *# of times to cycle* equals 0, the data will remain on the display until new data is sent to the display.
- **# of Lines for Race Description:** You may specify the number of lines to be used for the race description (0, 1 or 2 lines). This is useful if your display can only show a few lines of text. 1 line will show the race description. The second line shows the heat #.
- **Show Team/School Affiliation with Results:** Check the box to include the abbreviated team name with the entries and results.
- **Display Race Description on all screens:** Check the box if you want the race description to be displayed on all screens of a multi-page results or entries. Again, this is useful on smaller displays.
- **Show Last Name Only:** Check the box to only show the last name of the athlete.
- **Show Competitor’s ID Number:** Check to show the competitor ID number. This is the preferred option for road races.

7.6 AthleticLIVE

AthleticLIVE allows spectators to view track and field results on their smart phone, tablet or laptop. Results and entries from **FlashTiming** are posted on their websites for spectators to view free of charge. The meet organizers pay a fee for the service. See <https://live.athletic.net/> for information on how to enlist.

AthleticLIVE provides an IP address, Results Port Number, and Key when you sign up for their services. Enter these values in AthleticLIVE Setup Windows.

Note: Clock Port is for showing yhr running race clock on AthleticLIVE site. This feature is currently unavailable. There are no options available for AthleticLIVE.

8 Menu and Short-Cuts

8.1 Menu



Click the 3 bars in the upper left to open the Menu.

- **Enable Capture** – Switches from review only mode to capture mode. Switching to Capture mode initializes the FAT system.
- **Disable Capture** – Switches from capture mode to review only. This closes the camera and removes the device and capture controls from the screen.
- **Configure Meet** - Bring up the configure window to change the capture video and scoring folders.
- **Preferences**
 - Capture options include:
 - **Manual Capture** – Check to enable manual capture. In this mode, video is only recorded when the space bar is pressed and held.
 - **Verify user wants to stop capture** – if checked, a confirmation message appears every time you stop capture.
 - **Show Window Save Dialog after selecting filename** – if checked, the standard window save dialog appears after stopping the video and selecting a filename. You can change the filename and directory location in the save window. If not checked, the captured video is automatically saved in the capture folder.
 - Review options:
 - **Default Record Mode** – This sets the record mode for every video/line scan file that is opened. The options are **Do Not Show Athletes**, **Load Athletes**, **Place by Times**, and **Last Selected Mode**
- **Open Video** – Open a video file in a folder other than the designated capture video folder. This brings up the standard Windows Open dialog and allows you to browse to open a video or line scan.
- **Displays** - Add a display to show race times, entries, and/or results.
- **Print** – Print either the current video frame or the viewable portion of the line scan and the race results.
- **Save Video Image** – Save the current video frame or the viewable portion of the line scan image as a JPEG file.
- **View Computer and Setup** – Display the capture and scoring folder locations, and the computer's information, including name, IP address, workgroup, firewall status and network profile. Change the firewall status and set the network profile to private from this dialog.
- **About** – Shows the version number of the current application.
- **Exit** – Exits the application.

8.2 Keyboard Shortcuts

The following shortcuts are available when communicating with the starter

- **R** – Sends a Ready signal to the Starter Unit.
- **A** – Sends an Abort signal to the Starter Unit.

The following keyboard shortcuts are available when capturing videos:

- **C** – Capture Video
- **S** – Stop the Video Capture
- **U** – Pause or resume Capture
- **W** – Starts and stops the Stopwatch
- **Spacebar or B** – Add bookmark.

The following keyboard short cuts are available when reviewing a video:

- **O** – Opens the selected video when the Load Video screen is active.
- **T** – Save Times
- **P** – Play or Pause the video (full screen video only)
- **> or, –** Next Bookmark
- **< or, –** Previous Bookmark
- **0-9** – Enter a number when the record tab is opened and the results table is displayed. This will enter the time from the current video frame into the table with the lane number. Pressing **0** enters the time into lane 10.

Shortcut keys are not active when the cursor is positioned in a text entry box, such as the calibrate box.

9 Reading Times into the Meet Management Application

You need to import the results into your meet management application after the times for a race have been recorded and saved by *FlashTiming*.

9.1 Hy-Tek's Meet Manager

Click **Run** in the main menu of *Meet Manager*. In the Run the Meet scene, click the race in the event list and press the **Get Times** button (hotkey F3). Your *FlashTiming* results are read in and recorded. If an event had multiple heats, you must get the times for all heats before scoring the event.

9.2 AthleticNET's Run Meet

Run Meet will automatically detect a new results file and import the results to Run Meet and upload the results to AthleticNET.

As soon as you see the message that an event was pushed to the database, the results will appear in Run Meet under the **Results** tab and indicate the results were brought from a FAT system. Once the event has times or other results (i.e., DNS, DNF, DQ, etc.) for every participant, you can click **Mark Complete** to publish the results to your AthleticNET meet page immediately.

9.3 Apple Raceberry JaM's ScoreMeetLynx

The *FlashTiming* results files are automatically named using the event number, round number and heat number. The numbers are separated by '-' and the filename has the extension "lif". For example, the results file for event 12, round 1, heat 3 is named "012-1-03.lif. *ScoreMeetLynx* users must select the corresponding result file for each heat when importing the times from *FlashTiming*. Be sure to note of the filename when you save the times in *FlashTiming*.

To read the results into *ScoreMeetLynx*:

1. Click the **Enter Results** button.
2. Select the event in the event list and click **Okay**
3. Enter the heat number, check **Get times from Lynx/FlashTiming/MacFinish file** and then click **Okay**.
4. You are asked to locate the file with a standard File Open dialog. Locate the results file in your meet management data folder. Click **Okay** and the results are imported.

9.4 DirectAthletics MeetPro

Click the **Enter Results** Tab to score your meet. Click **Get Event Results** button (above the entries grid) and your *FlashTiming* results are read in and recorded. If an event has multiple heats, you must get the times for all heats before scoring the event. To import just the currently selected heat, toggle the **Get Event Results** button to **Get Heat Results**.

9.5 EasyWare Easy Meet Manager

The *FlashTiming* results files are automatically named using the event number, round number and heat number. The numbers are separated by '-' and the filename has the extension "lif". For example, the results file for event 12, round 1, heat 3 is named "012-1-03.lif. *Easy Meet Manager* users must select the corresponding result file for each heat when importing the times from *FlashTiming*. Be sure to note the filename when you save the times in *FlashTiming*.

1. Click **Enter Results** from the *Easy Meet Manager's* main menu bar.
2. Select **FlashTiming** from the **Type of Electronic Timer** drop down menu and then **Ok**.
3. Select the event and heat to score.

4. In the lower right corner, select **Match by Time Order** if the event did not finish in lanes and you did not show the athletes when recording the times in *FlashTiming*. Otherwise, select Match by **Lane/Bib/Position**.
5. Click **Retrieve from File** and the Import Text File of Times Window appears.
6. Browse to your meet management data folder and select the lif file for the heat.
7. Click on **Import File** and your times are read into the athlete's table.

9.6 RaceTab

Click the **Event** tab and select the event from the list on the left side. Click the **Get Times** buttons and the times from *FlashTiming* will be imported for the select event.

9.7 Sports Automation's TrackMate

TrackMate monitors the data folder and flashes the **Timing System** button red and yellow in the main window whenever it detects a new results file. Click the flashing **Timing System** button and the Pending Results window appears. Select the events for which you want to get the times and then press the **Assign** button to import the times to the proper events.

Note that you can also read in times for each individual heat from the *Enter Results* window. When results are available for a particular heat, a flashing button appears on the heat page. When you press this button, you can "assign" the results for the heat.

10 FT-FAT System

10.1 Overview

It is crucial that the starter and timing official at the capture computer communicate before the start of each race to indicate that they're both ready for the race to begin. The **FT-FAT** system has this essential communication integrated into the Starter Unit and the **FlashTiming** software. On the Starter Unit, the READY button is used to alert the timing officials of a request to start a race and the green light on the Starter Unit is used to indicate that the timing official is ready to start the race. (The timing official can also initiate the communication sequence.) The STOP button is used to abort a race due to a false start or other reason. The flashing red light alerts the starter to hold off. The READY and ABORT buttons on the computer screen let the timing official communicate with the starter and the Start Race tab notifies the official of the radio status.

The **FT-FAT** system includes three radio-linked units, a Starter Unit, a USB Radio and a radio linked Camera. The Starter Unit, located next to the starting official, detects the start of the race when the starting pistol is fired and establishes the start time. The camera receives the start time from the Starter Unit and encodes the race times on the video. The USB Radio reports the status of the radios and allows the computer operator to communicate with the starter to coordinate the race start.

10.2 The Starter Unit

Communication at the Starter Unit is done with push buttons, lights, and sounds. They indicate the official's readiness to start the race. There are two light/button combinations on the unit: the green light/ready button and the red light/stop button. The starting official communicates with the timing official at the capture computer by pressing the buttons.

- *Green/Ready Button*: is used to signal that the starter is ready to start the race.
- *Red/Stop Button*: is used to signal that the starter is not ready to start the race or to recall the race.

The lights and sounds on the Starter Unit convey messages and indicate the current state.

- *Idle State*: The green light pulses every 5 seconds when the unit is in the idle state. This indicates that the unit is on and waiting to receive a signal.
- *Are You Ready? State*: This state is indicated by the green blinking light and it can be initiated by either the starter or timing official when the radios are in their idle state. The starter initiates the sequence by pressing the green button on the radio. The green button blinks on the Starter Unit and the READY button on the computer flashes green and beeps every few seconds to notify the timing official that the starter is ready to start a race. Alternatively, the timing official may initiate the start sequence by clicking the READY button. The Starter Unit will flash green and beep twice every 10 seconds to indicate that the starter needs to respond to the timer's *Are you Ready?* Request.

- *Ready to Start Race State:* This state is indicated by a steady green light and occurs when either official acknowledges the *Are You Ready* signal. The starter presses the blinking green button in response to the timing official request, or the timing official clicks the READY button in response to the starter request to start the race. In both cases, the ready light on the Starter Unit and the READY button on the computer turn solid green.
- *Race in Progress State:* The green light remains solid and the red light blinks on the Starter Unit for 8 seconds to indicate that the race is in progress. The Start Race tab on the computer displays the race running message and the race time is displayed above the preview area.
- *Not Ready Signal:* This state is indicated by a flashing red light and busy tone on the Starter Unit. The ABORT button on the capture computer flashes red and plays an audible warning sound. This indicates that an official is not ready to start the race.
- *Radios not Communicating Signal:* This is indicated by a flashing red light and a rapid busy tone on the Starter Unit. The ABORT button on the capture computer flashes red and the error is shown in Start Race Tab.

10.3 Powering the Unit

10.3.1 Power Save Mode

The Starter Unit goes into power save mode after 10 minutes of inactivity to conserve battery power. Pressing the READY button returns the starter to full power mode.

The Starter Unit can manually be put in power save mode by holding the STOP button for five seconds.

The capture computer receives a signal when the Starter Unit goes into power save mode and displays a message in the Start Race tab. The capture computer cannot communicate with the Starter Unit while the unit is in power save mode.

10.3.2 Battery Test

You may check the voltage of the batteries in the Starter Unit when the unit is in power save mode by pressing the red STOP button. The number of chimes indicates battery strength:

- 4 - full battery charge
- 3 - good batteries
- 2 - Batteries are near the end of their life
- 1 - Low battery. Change the batteries before the race.

It is recommended that you check the battery level before each meet. Communication between the radio units is unpredictable when the voltage is low and the batteries need to be replaced.

The Starter Unit requires 3 AA batteries. Replace all the batteries at the same time. Do not mix used batteries with new batteries. All batteries should be of the same type.

10.4 Setup

The Starter Unit is positioned next to the starting official on the starting line. The unit should be located about 12 inches from the starting pistol when the gun is up but no closer to avoid powder burns on the unit and damage to the sound sensor. It can be attached to the starter stand or a tripod, or be held in the starter's other hand.

The USB Radio unit is attached to the capture computer through a USB port. The **FT-FAT** camera is located at the finish line and is connected to the Trendnet POE switch and capture computer with a shielded Cat 6 network cable.

The three **FT-FAT** radios may need to be in sight of each other to communicate. The radio signals travel up to 1000 feet reliably and up to 1 mile in ideal conditions. Glass windows of a press box should not impede communication. The signals may travel through a wood structure, but should be thoroughly tested before the meet. Metal structures may obstruct the radio signals. An external antenna with a magnetic base and a 13-foot cable is provided to allow the USB radio to extend its antenna outside a structure or to raise it above obstacles.

10.5 Starting a Race

Once the runners are ready, the starter and timing officials must check with each other to establish that they are both ready to start the race. The starter usually initiates this exchange by pressing the green READY Button on the Starter Unit. This sends an *“Are you ready?”* signal to the capture computer. The green light on the Starter Unit blinks and a message is displayed in the Start Race tab on the capture computer indicating that the starter is ready and waiting for the timing official to acknowledge the signal. The capture computer also beeps every 5 seconds to attract the attention of the timing official.

The timing official confirms that the timing system is ready to capture video of the next race by clicking the flashing green READY button on the screen. This sends a *“Yes, I’m ready”* signal back to the starter and the ready light on the Starter Unit turns solid green. The Start Race tab on the capture computer indicates that both the starter and timer are ready for the race to begin.

This example shows the starter initiating this *“handshake procedure”*, but the timer may also send the *“Are you ready?”* signal to the starter by clicking the READY button, in which case the starter responds by pressing the flashing green button when the starter is ready for the race to start.

The starter has 5 minutes to start the race after the READY light turns solid green. The race clock starts when the starter fires the starting pistol. Once the race clock starts, the red light flashes and the green light is illuminated the Starter Unit, indicating the race is in progress and the timer is running. The Start Race tab on the capture computer indicates that the race is running and the race time appears in a red box above the preview area after a few second delay. The lights on the Starter Unit remain on for 8 seconds after the race begins. The starter may recall the race in this time period by pressing the red STOP button. This resets the units to their ready state.

If the race is not aborted during the 8 second reset period, the lights on the Starter Unit turn off to conserve the batteries and only the timing official can stop the race clock. The timing official presses the CAPTURE button when the first runner approaches the finish line. The timing official may stop the clock by either clicking the ABORT button in Start Race tab or the STOP button above the preview area. Both buttons stop the race clock and sets the radio units to the Idle State. The STOP button also stops the video capture and allows the timing official to save the video. The Abort button will stop the race without saving the video.

10.5.1 Abort the Start Procedure

Both the starter and the timer may abort the process at any time before the starting pistol is fired by pressing the red STOP button on the Starter Unit or the ABORT button on the capture computer. This sends a *“Not Ready”* signal to the other unit. The Starter Unit sounds a busy signal and flashes the red light. The flashing light and sound stop after 10 seconds or when the red STOP button is pushed on the unit. The capture computer displays a message in the Start Race tab and plays an audible warning beep.

10.5.2 No Response/Time Out

An official has 5 minutes to respond after the other official's request to start the race. The units time out if an official does not respond to an "Are you ready?" request within 5 minutes, or the race does not start within 5 minutes of a ready acknowledgement. The Starter Unit will sound the busy signal and flash the red light. The Start Race tab displays a message indicating that there was no response. Either official must reinitialize the "Are you ready?" signal before continuing.

The green light blinks rapidly and the unit starts beeping for the last 30 seconds of the 5 minute time period to indicate the system is about to abort. This is a signal that the starter only has a few seconds to start the race. If this occurs, it is recommended that the starter aborts the process by pressing the red STOP button. This ensures the starter has enough time to adequately start the race and the timing official is ready. It's also a safeguard against the units timing out just as the starter pulls the trigger.

10.5.3 Recall the Race

After the race starts, the starter may press the red STOP button to recall the race up to 5 seconds after the race begins when both the red and green lights are on. This resets the race clock and restores the **system** to the "Ready to Start Race" state. (I.e., READY light is solid green on the Starter Unit). The starter then has 5 minutes to restart the race before the system times out. The officials must reinitiate the "handshake" procedure if the starter does not press the red STOP button within the recall period or if the unit times out before the restart.

Whenever the timing official clicks the ABORT button on the capture screen the race clock resets and units are set to the *Idle* state. This also occurs if the STOP capture button is clicked. If the timing official resets the clock within the first 5 seconds of the start, the Starter Unit sounds a siren warning signal. This indicates a possible issue with the timing device and the starter may recall the race.

If there is a malfunction and the race clock does not start on the capture computer, the *FlashTiming* software can calculate the times of all the runners from the video based on one hand time. The resulting times will not be FAT but the video will determine the order position and all runners' times will be based on the one hand time. The protocol for the timer to recall the race should be discussed before the race. If FAT times are not necessary, you may decide not to recall the race and use the calibrated hand times from the video.

10.6 Race Clock Inadvertently Starts

The race clock starts after the units are in the *Ready to Start Race* state and the Starter Unit detects the loud bang from the starting pistol. The race clock may inadvertently start due to a loud sound, from the unit being bumped, or high winds. The Starter Unit beeps and the green and red lights both turn on when this occurs. The starter can press the STOP button within 5 seconds of this occurring and the unit will go back to the "Ready to Start Race" state. Otherwise, the timing official may stop the race clock from the capture computer and the units are reset to the idle state.

10.7 Radios Do Not Communicate

The Start Race tab notifies the timing official at the capture computer if the radio units are unable to communicate and the red light flashes on the Starter Unit along with a rapid busy signal. It is recommended that the timing official test the radio communication whenever the starter moves to a new starting position on the track and before the next race.

There are several reasons why the radios may not communicate:

1. *Metal Stadiums may deflect or interfere with radio communication.*
The **FT-FAT** system includes an external antenna with a 13-foot extension cable and magnetic base for use in metal spectator stands and/or press box. To use:
 - a. Unscrew the antenna on the USB Radio and replace it with the 13ft cable connected to the magnetic base.
 - b. Remove the black cap on the magnetic base and screw the external antenna to the base.
 - c. Attached the magnetic base to the exterior of the press box and in line of sight of the Starter Unit. Ideally, the antenna should be placed outside the press box or high enough to avoid human traffic in the radio path, and the antenna should be in the vertical orientation.
2. *The receiving unit is in power save mode.*
Verify that the Starter Unit is turned on. The Starter Unit turns itself off after a period of inactivity to conserve power. Press the green button to turn on this unit.
3. *The batteries are low on the Starter Unit.*
Perform a battery check on the Starter Unit. This test should be done at the start of each meet and part way through a long meet.
4. *There is an object interfering with the radio communication.*
Be sure there is line of sight between the radios. Sometimes, just moving the position of either the Starter Unit or the USB Radio a short distance may correct the problem. Something as narrow as a goal post can interfere with the radio communication if it is exactly in line of sight between the two units.
Body mass is another source of interference. If you are operating your computers at the finish line, do not let a crowd gather in the line of sight between the USB Radio antenna, Starter antenna or Camera antenna.
5. *The radios are out of range.*
The radios are able to communicate over 1000 ft. under most conditions. This distance should be sufficient for most track events.

10.8 Test the Units

It is recommended that you test the radio communication at each of the start positions before your track meet. Try several positions at each starting line to identify any “dead” radio zones. Let your starter know if they exist to minimize problems during the meet.

10.9 FCC Notice

The following notice applies to the Starter Unit, the USB Radio and Camera:

Contains FCC ID: MCQ-XBPS3B

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

11 Appendix A: Tips for Hy-Tek Meet Manager Users

Times are loaded into *Meet Manager* from the **Run the Meet** scene in the *Meet Manager* application. Click the race in the event list and simply hit the **Get Times** button. Your FlashTiming results are recorded. Here are some tips for importing times from FlashTiming into *Meet Managers*

Before the Start of the Meet:

Set up your **Meet Manager Data Location**. From the Run scene:

1. Select **Interfaces** from the Menu Bar.
2. Click **Photo Finish - FlashTiming**. For *Meet Manager* users with release prior to version 2.Bg, click **Photo Finish - FinishLynx File Sharing Mode**.
3. Select **Update Start Lists**.
4. Check the **Activate update of start lists**.
5. Click **Change Data Location** and select the folder to store the *Meet Manager* Data.
NOTE: Be sure to double click the folder in the list and verify that the folder name is displayed at the top of the dialog before you hit okay. (If you just single click and hit okay, it doesn't accept the new folder. It looks like it accepted the change because the folder name is highlighted.)
6. Click **Ok** in the Update Start List dialog.

These steps need to be completed before you configure FlashTiming to use *Meet Manager*. Be sure that the **Activate update of start list** box is checked (step 4). This allows you to update the start list from the run scene.

Make Corrections to the Heat Sheets

You must update the race participants in *Meet Manager* before you record the times in *FlashTiming* if you select **Load Athletes** in *FlashTiming's* Record Time tab. If you select **Do Not Show Athletes**, you must update the athletes before importing the times into *Meet Manager*.

1. *Get the heat/finish line sheets from the clerk of the course*. If there are no scratches, changes to lane positions or addition of athletes, you can go ahead and record the times in *FlashTiming*.
2. *Make changes to the Athlete's list*. From the **Run the Meet** scene:
 - a. Click the race in the event list. If you need to add a heat, type <Ctrl-H>.
 - b. Click the **Adjust Button** in the middle section of the screen - the preview/adjust screen is displayed and shows all heats of the events.
 - To scratch an athlete, double click the athlete's name and select **Yes** in the confirmation dialog.
 - To change the lane position of an athlete, click and drag the athlete's name to a new lane. If the new lane is empty, the athlete is moved to the lane. If there is someone in the new lane, the athletes' positions are switched.

- To add an athlete, click the **Show Eligible Athletes** button. (For relay races, click **Show Schools**.) Click and drag a name from the Eligible Athletes List to an empty lane position in the event.
If the athlete's name is not in the **Eligible Athletes List**, click the **Athlete Menu** button and add the athlete.

When all the updates have been made, click **Accept**. This returns you to the **Run the Meet** scene with your updated athlete list.

You can scratch and reposition athletes within a heat without going to the Adjust Menu. Simply follow the same steps on the athlete list in the Run Menu as you did in the Adjust menu.

- To scratch an athlete, double click the athlete's name and select **Yes** in the Confirmation dialog.
- To change the lane position of an athlete, click and drag the athlete's name to a new lane. If the new lane is empty, the athlete is moved to the lane. If there is someone in the new lane, the athletes' positions are switched.

If the only changes to a race are scratches, you can record the times in *FlashTiming* and leave the times blank for any athletes who did not run. You can delete the athletes in *Meet Manager* after you import the times for the race.

3. *Save your changes for FlashTiming*. Type **<Ctrl-U>** from the Run scene to save your changes to the *Meet Manager* Data Location Path. There is a confirmation message "**Photo Schedule and start lists successfully copied to <folder>**".

NOTE: You may get a similar message that states, "Schedule successfully created". This is an indication that the **Activate update of start lists** box is not checked in the Update Start List dialog and your changes are not saved.

4. *Record your results in FlashTiming* – Once all changes have been made to the athlete list in *Meet Manager* and the changes have been saved you can record the times in *FlashTiming*. On the review computer, load the video and the athletes. If the video and athletes were loaded before the updated athlete list was saved from *Meet Manager*, simply click the **Load Athlete** button to load the new list.

Import Results into Meet Manager

Once all the updates have been made to the list of participants, select the event from the event list, and click the **Get Times** button. Your *FlashTiming* results are automatically entered for the event.

If the list of athletes and lane assignments from *FlashTiming* do not match the *Meet Manager* list, *Meet Manager* displays the edited list when you attempt to get the times. Make the adjustments to the *Meet Manager* list and then click the **Get Times** button again. If you accept the list without making the adjustments, only the times for the matching athletes are loaded.

12 Appendix B: Networking your Computers

The ideal setup when running your meet is to have two or three computers networked together: the capture computer, the review computer and the scoring computer. The operator of each computer is responsible for the following tasks:

- Capture Computer – Reads list of scheduled events from the scoring computer. Captures video of the finish line for the events and saves the video files on the capture’s computer hard drive.
- Review Computer –Retrieves video from the capture computer and a list of race participants from the scoring computer. Reviews the video, determines the athlete’s times and saves the results on the scoring computer.
- Scoring Computer – Maintains the list of events and heat sheets from your meet management software and shares those lists with FlashTiming on the capture and review computers. Retrieves the time results and scores the event.

If only using two computers, it’s recommended that you dedicate one computer for capturing and the second computer is used to review videos and score the meet.

The computers must be networked together and folders must be set for sharing to enable the above tasks. We recommend that you turn off your wireless when using FlashTiming and connect your computers with a switch or router.

The following items must be set in order for your computers to communicate and to obtain a reliable image from the camera:

- Camera and computers must be set to a static IP or DHCP
- Network should be wired and have a 1Gbit connection between the camera and capture computer.
- The **FT-FAT** application must be allowed through the firewall.
- Network must be set to a private profile.
- If a wireless network is in use, it must use a different network address.

You need admin privileges to perform these tasks. If using a school computer, you may need assistance from your IT staff.

You can check these settings from **FT-FAT**. Click on the menu bar and then **View Computer and Setup Information** to view your computer’s name, IP address, workgroup, firewall status and network profile. The firewalls may be turned on and off and the computer may be set to a private network within the dialog.

Note: The appearance of the windows on your computer may be slightly different than the images below. Look for the corresponding text on your computer if the image does not exactly match.

12.11 Static IP Address

12.11.1 Router vs Switch

Both routers and switches connect various devices on a computer network and pass data from one device to another. A router will create and maintain a local area network, where a switch will not.

The **FT-FAT** system ships with a Trendnet 1Gbit POE Switch. This switch powers the camera and allows Ethernet computers to communicate with each other. By default, Windows will assign an Auto IP

address, starting with the numbers 169.254.x.x. It runs a CPU intensive process in the background to manage the network traffic, which results in dropped frames when capturing video. Therefore, it is necessary to assign static IP addresses to your computer to avoid this problem.

If you connect a router to the switch, the router will assign the IP addresses to the devices on the network and will manage the network traffic.

12.11.2 IP addresses

IP addresses are divided into the network address and the device number. The subnet mask determines which part of the IP address is the network address and which is the device number. A subnet mask of 255.255.255.0 indicates that the first 3 sets of numbers is the network address and the last number is the device number. A subnet mask of 255.255.0.0 indicates that the first 2 sets of numbers is the network address. For the devices on a network to communicate when the subnet is 255.255.255.0, the first three numbers of a device's IP address must be the same and the last number must be different than any of the other devices on the network.

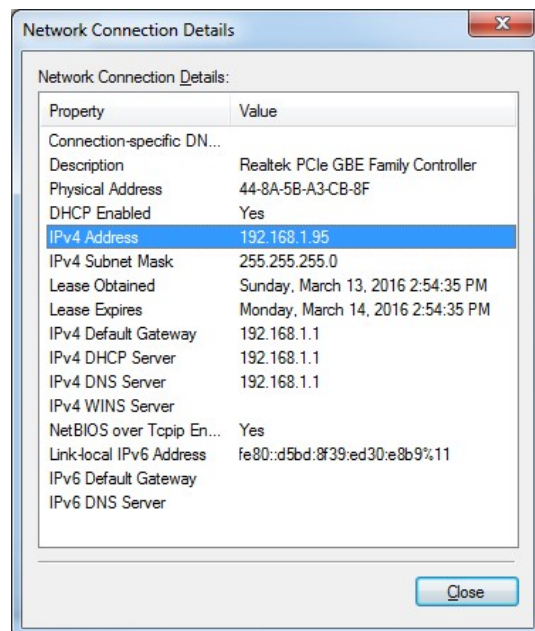
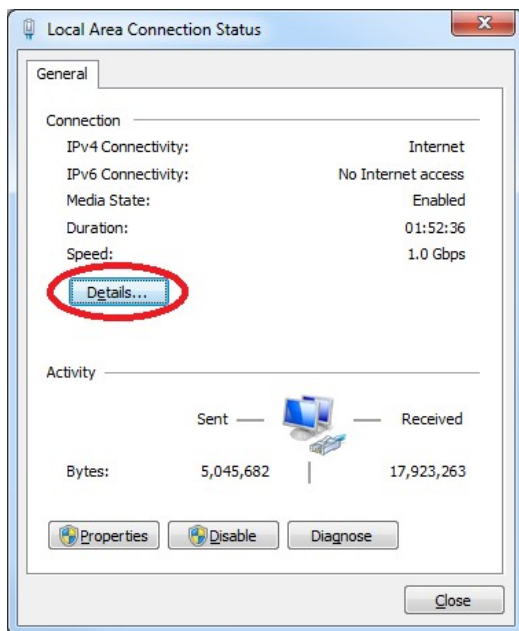
Most routers will assign an IP address of 192.168.0.X or 192.168.1.X with a subnet of 255.255.255.0.

12.11.2.1 Check the computer's IP address.

You can check the computer's IP address from either Windows or from the **FT-FAT** application.

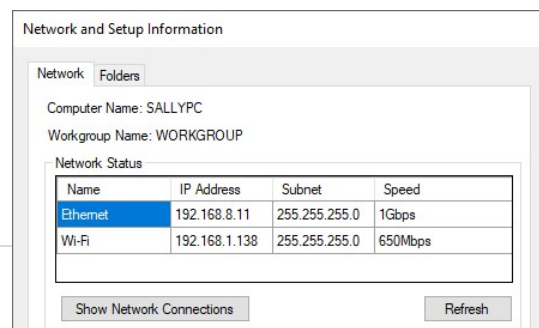
From Windows:

1. Type in the "View Network Connections" in the Windows search box.
2. In the Network Connection windows, double click the Ethernet network connection. The Network Status appears:
3. Click **Details**. Your computer's IP address appears in the Value column, next to IPv4 Address.



From the FT-FAT application:

1. Click on the menu bar in the upper left corner



2. Click **View Computer and Setup Information**. This shows the active networks and their IP addresses.

Check the IP address and subnet mask of all networked devices. You will not be able to communicate with other computers if:

- the leading group of numbers of the IP addresses is different, or
- any of the computers have the identical IP address.

12.11.2.2 Set the Computer's IP Address

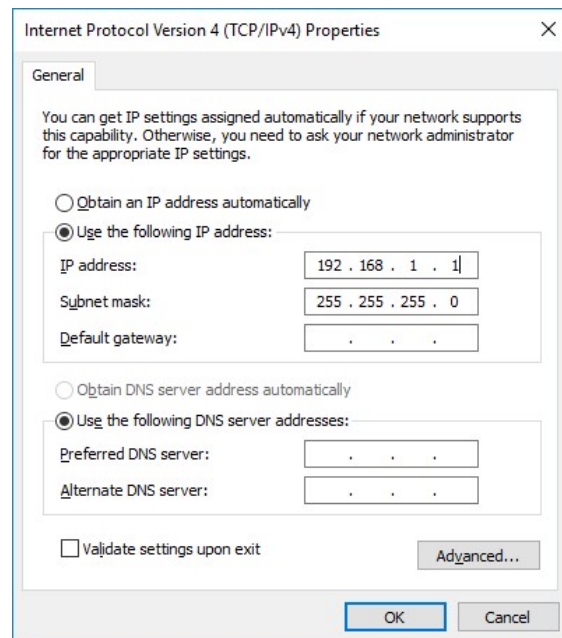
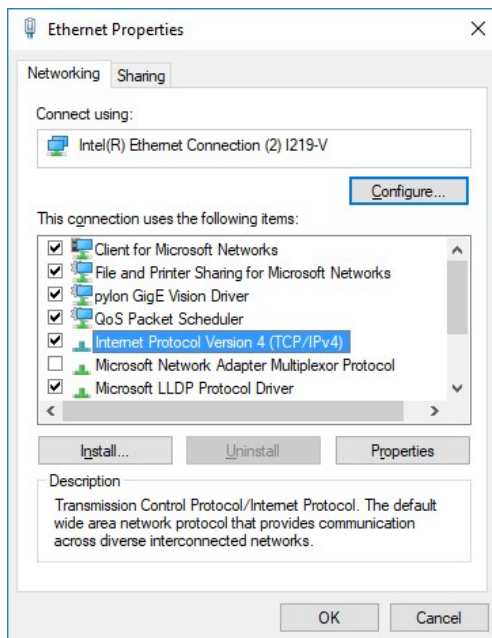
Go to the Network Connection window:

From Windows: Type in the “View Network Connections” in the Windows search box.

From FT-FAT’s Network and Setup Information: Click “Show Network Connections”.

In the Network Connection Properties.

1. Right click on **Ethernet** and then **Properties**.
2. In the Networking Tab, click the box labeled **File and Printer Sharing for Microsoft Networks** if it is not checked. This enables you to share files on the network.
3. Click on **Internet Protocol Version 4 (TCP/IPv4)**.
4. Click on the **Properties** button.



6. If you are using a router, click on **Obtain an IP address automatically**, and then **OK**.
If you are using the Trendnet POE switch that comes with the system without a router, assign a static IP address:
 - a. Click on **Use the following IP address**.
 - b. Enter **192.168.1.1** for the **IP Address** on first computer.
 - c. Enter and **255.255.255.0** for the **Subnet mask**.
 - d. You can ignore the other fields. Click Okay.
 - e. Repeat these steps on each computer, incrementing the IP address. Assign the second computer an IP address of 192.168.1.2. If you are using a third computer, set the IP

address to be 192.168.1.3.

It is recommended that you turn off your WIFI network when using **FT-FAT**. If you to use WIFI or a hot spot for live results, be sure that the Ethernet's network address is different. E.G. Set the first 3 numbers of the IP address for the Ethernet to 192.168.2.X.

Note: A red X next to Ethernet in the Network Connection Window indicates you are not connected to the network router or switch. This disappears once you connect to the switch or router. A yellow exclamation mark indicates that the IP address is incorrect.

See Appendix X for setting the IP address of the camera.

12.12 1Gbit Ethernet Adapter.

The FT-FAT system requires a 1Gigabit Ethernet adapter. Otherwise, the system does not have the bandwidth to receive the video stream and will drop frames. Many laptops today do not have an Ethernet port and you'll need to provide an USB to 1Gbit adapter.

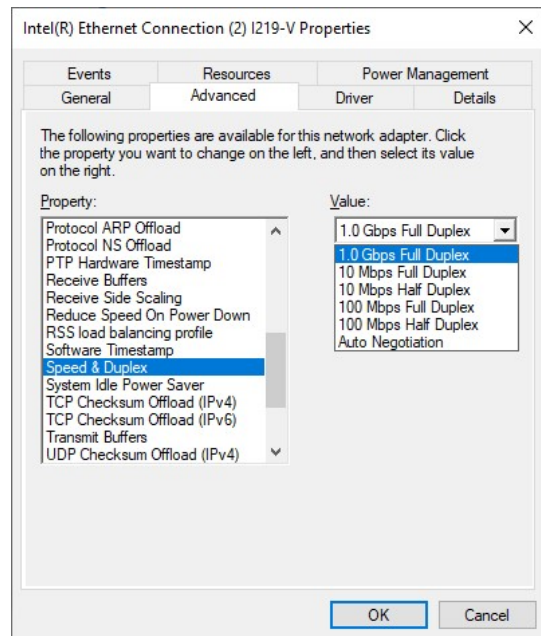
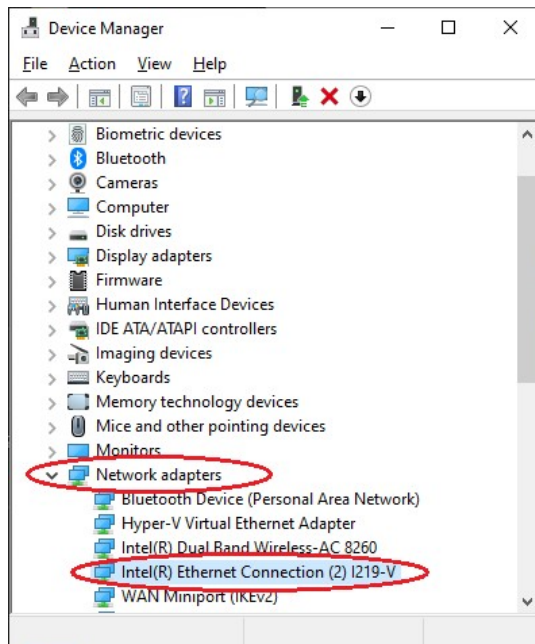
12.12.1 Ethernet Port

Verify that the Ethernet port on your computer supports 1Gbit.

Right click on the Windows' Icon and click on **Device Manager**.

Expand Network Adapters

Double-click on your Ethernet Adapter (most



common adapters are Realtek, Intel or Qualcomm)

In the Ethernet Connection Property Window:

In the Property Box, scroll down and select Speed and Duplex.

In the Value Box, verify that 1.0Gbps Full Duplex is an option. If it is not listed, then the network adapter does not support 1Gbit speed and you'll need to use an adapter.

Set the value to 1.0Gbps Full Duplex.

12.12.2 Ethernet Adapter

Use a **USB3.0** (or greater) to **1Gbit** Adapter if your computer does not have a 1Gbit Ethernet adapter. The computer needs a USB 3.0 or a USB Type C port. Our testing showed that not all USB 3.0 to Gbps Ethernet adapters produce gigabit speed. The original USB3.0 to 1GB adapters are the most problematic. We had better success with USB3.1 and thunderbolt adapters. We found that the Realtek and Aquantia network chipsets worked, but more importantly the ASIX chipsets do not always provide Gbit speed.

12.12.3 Check if the Ethernet speed

Verify that the Ethernet adapter is delivering the bandwidth needed for you FT-FAT system, regardless if you are using the computer's Ethernet port or an adapter. Built-in Ethernet adapter may fail over time and only product 100Mbit. USB to 1Gigabit adapters may not deliver the speed advertised. To Verify:

Launch **FT-FAT** with the camera connected and live feed in the preview area:

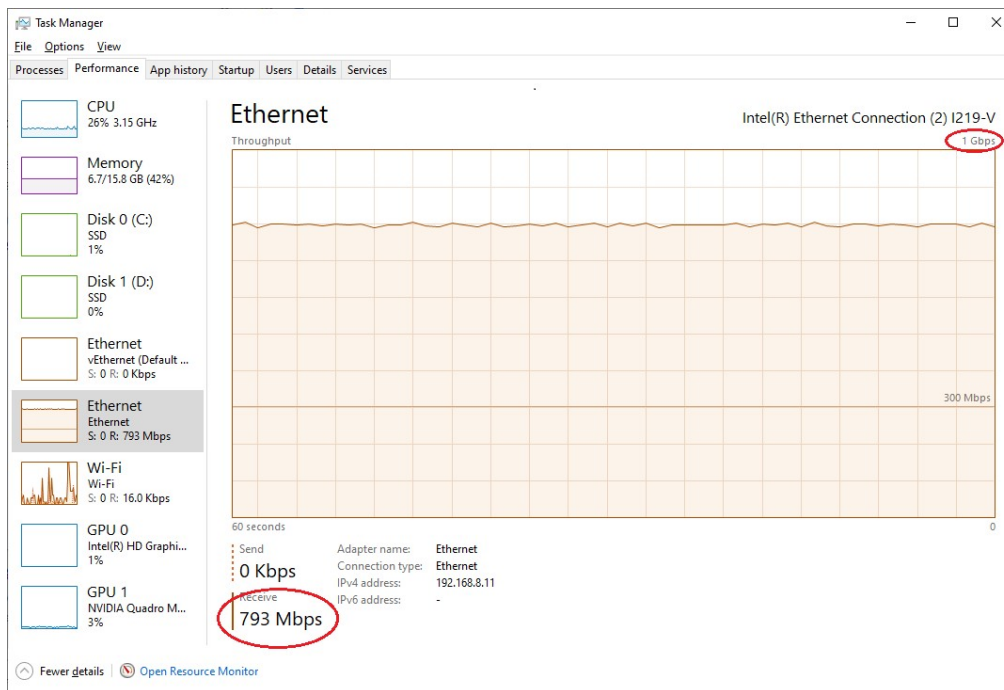
Right Click on the Window Icon and click **Task Manager**.

If the tabs are not showing in the Task Manager, as in the figure below, click **More details** in the lower left corner.

Click the **Performance** tab.

Click **Ethernet**. If using an adapter, the Ethernet may be listed as Ethernet2 or 3.

The graph shows the Ethernet usage. It may take up to 30 seconds for the graph to reflect the actual bandwidth.



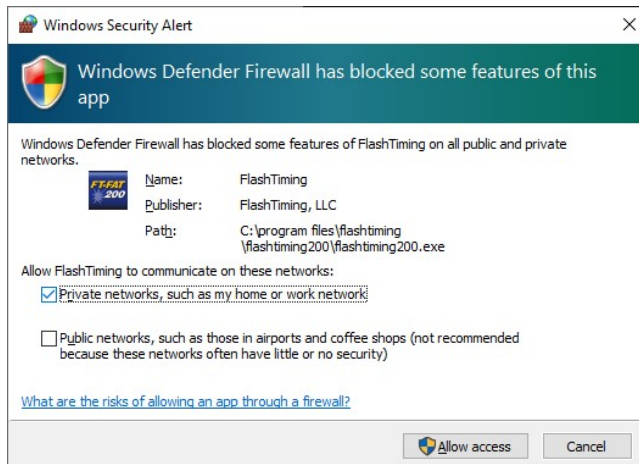
The upper left corner shows the bandwidth of which the adapter is capable of deliver. The number under the graph shows the current bandwidth. The following table shows the bandwidth speeds needed to avoid dropped frames for the various FT-FAT configurations:

FT-FAT Configuration	Bandwidth Range
FT-FATLS Plus 1000FPS	660-670
FT-FATLS Plus 500FPS	530-540
FT-FAT200 @200FPS	790-800
FT-FAT100 @200FPS	390-400

The FT-FAT system comes with a 1Gbit POE switch. If you are using a different switch or router, verify that the device is capable of 1Gbit speeds.

12.13 Allow the FT-FAT app through the firewall

The FT-FAT application checks if the app is allowed through the firewall and gives permissions if not set. There may be instances when the operation is not successful, such as when using a school computer or you do not have admin rights. The program may also display the following Windows' Security Alert;

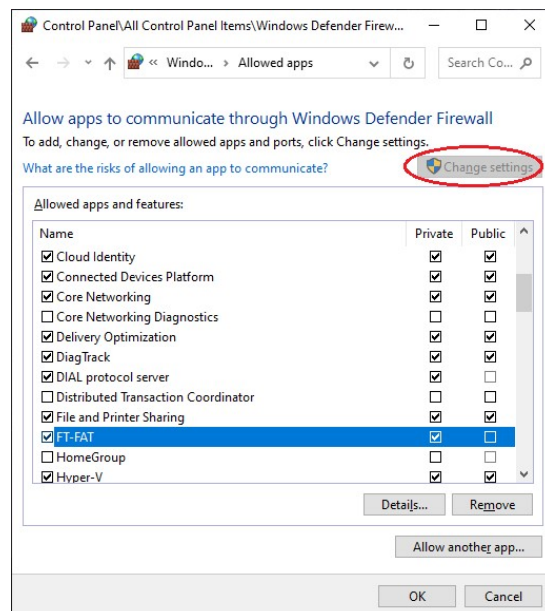
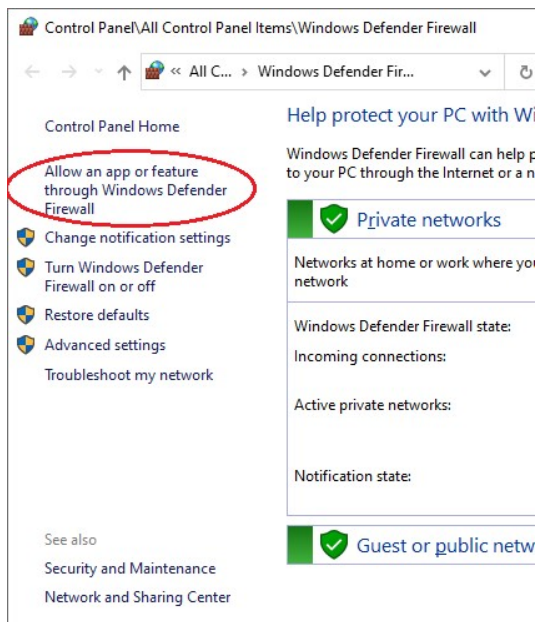


Check **Private networks** and click **Allow access**.

12.13.1 Manually allow an app through the firewall.

Type "Windows Defender Firewall" in the Windows Search Box.

Click **Allow an app or feature through Windows Defender**



Firewall.

Search for **FT-FAT** In the Allow app window. Verify that the boxes to the left and right of the names are checked. If not, click **Change Settings** and check the boxes. Click **OK**.

You may also turn the Windows Firewall on or off from the Windows Defenders Firewall, although this is not recommended practice.

12.13.2 Third party firewalls

Third part firewall apps, such as MacAfee and Norton, may prevent **FT-FAT** from accessing the camera or files on other computes. Allow FT-FAT through these firewalls or disable them.

12.14 Set network profile to private

A private network profile allows other computers on the network to more easily see and connect to your computer. Generally speaking, when you set a network profile to public, the settings are more restrictive. Your PC won't be visible to other devices on the same network. Other devices won't be able to access your files or printers on the network.

The FT-FAT application checks the current network profile at start up and switches it to private if not set. As with the firewall setting, there may be instances when the operation is not successful, such as when using a school computer or you do not have admin rights.

12.14.1 Manually change from public network to private network.

12.14.1.1 Within the FT-FAT application

Click on the Menu Bar in the upper left and then View Computer and **Setup Information**. In the Network Profile Section, click the network and then **Set to Private**.

12.14.1.2 Using a Router

If you are connected to a router which assigns IP address:

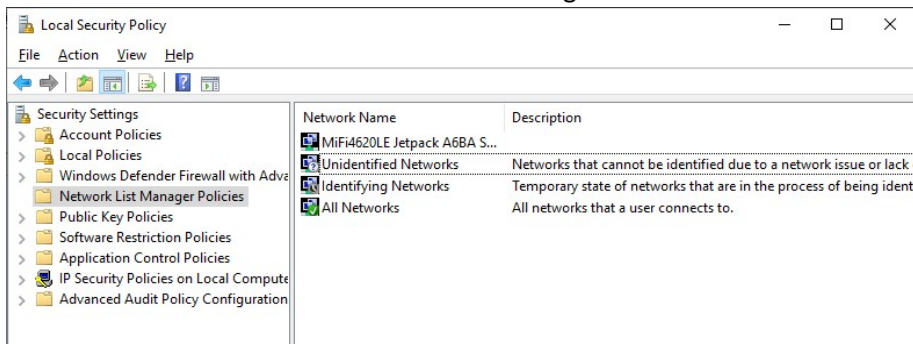
1. Right Click the Window Start Icon in the lower left of the screen.
2. Click **Network Connection**
3. In the Status Window, click **Ethernet** in the left-hand column.
4. Click on the network name.
5. Click **Private** under Network profile.
6. Click **X** in the upper right to dismiss the window.

12.14.1.3 Windows Pro

You can permanently set the Ethernet's network to private if using a computer with Window10 or 11 Pro Operating System.

1. Type in **secpol.msc** In the Windows search box. This will bring up the Local Security Policy Window.
2. Click Network List Manager Policies in the left column.

3. Double click on Unidentified Networks in the right side.



4. Change Location Type to **Private** in the Unidentified Network Properties Window.
5. Click OK.

12.14.1.4 Windows Home

If you are running Windows Home on an unmanaged network or you don't see the option to change to private in the Network Status window, follow the steps below.

1. Click the Window start menu in the lower left of the screen.
2. Search for **Windows PowerShell** in the menu and click the down arrow.
3. Right click on **Window Power Shell** in the expanded menu and click **Run as Administrator**.
4. Type in: **Set-NetConnectionProfile -NetworkCategory Private**
(You may copy and paste the string in to window)
5. Click X in the upper right corner to close the PowerShell

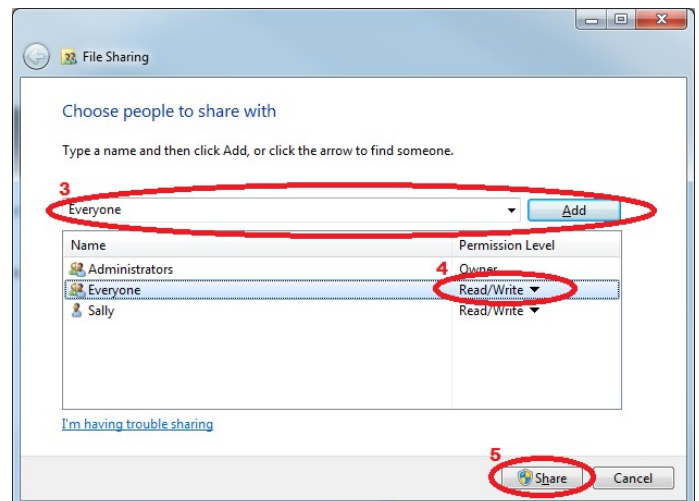
12.15 Set Folders for Sharing

The video capture folder and the scoring folders must be set for sharing if you are accessing them on a separate computer. **FT-FAT** shares the default capture folder, *c:\FlashTimingVideos*, on the capture computer and the scoring folder.

12.15.1 Manually share folders

If **FT-FAT** is unable to share these folders you may do so manually:

1. Right click the folder you wish to share.
2. *Win10*: Right click on the filename,
Click **Give access to**
Click **Specific people**.
Win11: Right click on the filename.
Click Show more options,
Click **Give access to**
Click **Specific People**.
The **Network access** window appears
3. Click on the pull-down arrow and select **Everyone** then click **Add**.
4. **Everyone** will appear in the bottom window.
Click in the column arrow under **Permission Level** and change to **Read/Write**.
5. Click **Share** then **Done**.



12.15.2 Verify that the computers are networked once all these steps are completed, Bring up a file browser and select **Network** from the left panel. A list of networked computers appears on the right side under "Computers". On the Review computer:

- Click on the Capture Computer and you should see the folder "FlashTimingVideos".
- If using a third computer for scoring, click on the Scoring Computer and you should see the scoring folder. E.G. "tfmeets6 if running Hy-Tek Meet Manager Version 6.

On the Capture Computer, click on the Scoring Computer and you should see the scoring folder.

If the other computers do not appear, type in the either the computer name or the IP address in the address bar preceded by "\\". E.G. [\\CAPTURECOMPUTER](#). Or [\\192.168.1.19](#). See if the share folders appear.

Appendix C. Statement of Warranty

THIS AGREEMENT CONTAINS THE LIMITED WARRANTY AND TERMS AND CONDITIONS THAT APPLY TO **FLASHTIMING** PRODUCTS PURCHASED DIRECTLY FROM **FLASHTIMING** OR **FLASHTIMING'S** REPRESENTATIVES.

For a period of three (3) years from the date of purchase FLASHTIMING will, at no charge, supply new or rebuilt replacements for parts determined by FLASHTIMING to be defective. After the warranty period, the Purchaser must pay all parts charges. Warranty is nontransferable and applies to original Purchaser only.

During the labor warranty period, to repair the Product, Purchaser will either return the defective Product; freight prepaid, or deliver Product to FLASHTIMING's main office. The Product to be repaired is to be returned in either its original carton or a similar package affording an equal degree of protection. FLASHTIMING will take on normal shipping costs to return repaired unit to Purchaser. Expediated return freight cost is the responsibility of the Purchaser. All freight costs associated with replacement of warranty parts after expiration of the original warranty period are the responsibility of the Purchaser. FLASHTIMING is not obligated to provide Purchaser with a substitute unit during the warranty period or at any time. The limited warranty stated on this card is subject to all of the following terms and conditions.

TERMS AND CONDITIONS

- 1. NOTIFICATION OF CLAIMS: WARRANTY SERVICE:** If Purchaser believes that the Product is defective in material or workmanship, then written notice with an explanation of the claim shall be given promptly by Purchaser to FLASHTIMING but all claims for warranty service must be made within the warranty period. No repair or replacement of any Product or part thereof shall extend the warranty period as to the entire Product. The specific warranty on the repaired part only shall be in effect for a period of ninety (90) days following the repair or replacement of that part or the remaining period of the Product parts warranty, whichever is greater.
- 2. EXCEPTIONS TO LIMITED WARRANTY:** FLASHTIMING shall have no liability or obligation to Purchaser with respect to any Product requiring service during the warranty period which is subjected to any of the following: abuse, improper use, negligence, accident, modification, failure of the end-user to follow the operating procedures outlined in the user's manual, failure of the end-user to follow the maintenance procedures in the service manual for the Product where a schedule is specified for regular replacement or maintenance or cleaning of certain parts (based on usage) and the end-user has failed to follow such schedule; attempted repair by non-qualified personnel, without the guidance of FlashTiming personnel; operation of the Product outside of the published environmental and electrical parameters, or if such Product's original identification (trademark, serial number) markings have been defaced, altered, or removed. FLASHTIMING excludes from warranty coverage Products sold AS IS and/or WITH ALL FAULTS and excludes used Products which have not been sold by FLASHTIMING to the Purchaser. FLASHTIMING also excludes from warranty coverage consumable items such as fuses and batteries. All software and accompanying documentation furnished with, or as part of the Product is furnished "AS IS" (i.e., without any warranty of any kind), except where expressly provided otherwise in any documentation or license agreement furnished with the Product.
- 3. CUSTOMER DATA** Customer shall be solely responsible for maintaining backup data necessary to replace Customer data lost or damaged from any cause.

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Appendix D: Technical Support

We are committed to providing high quality fully automatic timing systems with excellent customer service. FlashTiming support personnel are available for assistance to help ensure your success. Telephone us Monday through Friday, from 8AM until 8 PM Pacific Time.

FlashTiming Support:

- email: support@flashtiming.com
- phone:
 - (309) 369-6208 CST
 - (971) 998-2349 PST
- fax: (503) 647-2090