

FlashTiming FT-FAT

User's Guide

FT-FAT is the first truly new innovation in Fully Automatic Timing for track in 25 years:



- **Wireless** – no need to wire the starter
- **Radio-Linked Communication** - No need to hang out the press box window or stand on a ladder to raise yourself above the crowd to point a device at the starter.
- **Built-in communication between starter and timing officials** - No need to wave flags or hands to indicate the timers are ready.
- **Reliable Starts** – No need to restart the race because of a poorly aimed device or lack of bright light from starting device
- **Affordable Video Base system** with resolution of 0.017 seconds, time reported in 1/1000 seconds.
- **Works with .22 or .32 caliber starting pistol** - No special ammunition required

Overview

It is crucial that the starter and timing officials communicate before the start of each race to indicate that they're both ready for the race to begin. Typically this is accomplished by whistles, hand waving or flags. **FT-FAT** is the first fully automatic timing system to have this essential communication integrated into its product. **READY** buttons and green lights are used to indicate the officials are ready to start the race. **STOP** buttons and flashing red lights alert the officials to hold off.

FlashTiming's latest innovation, **FT-FAT**, includes two radio-linked units, a starter unit and a timer unit, as well as the FlashTiming's easy to use Software.

The starter unit, located next to the starting official, detects the start of the race when the starting pistol is fired and starts the race clock. The timer unit is connected to the capture computer and video camera. It receives a live video feed from the video camera, encodes the time on each frame of the video and passes the video on to the computer for storage and review.

Buttons, Lights and Sounds

Communication between meet officials and the **FT-FAT** is done with push buttons, lights, and sounds. They indicate the starting and timing officials' readiness to start the race. There are two light/button combinations on each unit, the green light/ ready button and the red light/stop button. The officials communicate with each other by pressing the buttons.

- *Green/Ready Button:* is used by either official to signal to the other that they're ready to start the race.
- *Red/Stop Button:* is used by either official to signal to the other that they are not ready to start the race, to recall the race or to reset the race clock.

The lights and sounds on the units convey the message and indicate the current state.

- *Idle State:* The green light pulses every 5 seconds when the unit is in the idle state to indicate that the unit is on and waiting to receive a signal
- *Are You Ready? State:* This state is indicated by the green blinking light. This occurs when one official presses the green ready button to signal that they're ready to start the race. The unit beeps twice every 5 seconds on the unit that needs to acknowledge.
- *Ready to Start Race State:* This state is indicated by a steady green light. Both officials signaled their readiness to start the race
- *Race in Progress State:* The solid green and red lights indicate that the race is in progress.
- *Not Ready Signal:* This state is indicated by a flashing red light and busy tone.
- *Radios not Communicating Signal:* Indicated by a flashing red light and a rapid busy tone. The start of the race needs to be postponed until communication between the radios is established or a backup timer is in place and ready.

Powering the units - Power ON

Press the READY button to turn on the unit. When turned on, the radio searches for the other unit. The starter unit turns on and immediately sends an "Are You Ready?" signal to the starter. A flashing green light indicates success. A red flashing light accompanied by a rapid busy signal on either unit indicates that the other unit was not detected. Press the red button to turn off the flashing lights. The timer unit beeps twice when turned on.

Powering the units - Power OFF

Turn the radios off by pressing the red button and holding for 5 seconds. The unit beeps 4 times and then turns off.

The radios automatically turn off after a period of inactivity to conserve battery power. The starter unit turns off after being in the *Idle* state for 10 minutes. The timer unit turns off after 30 minutes in the *Idle* state. Note: *You lose the live feed on the capture screen when the timer unit powers off since the video feed passes through the timer unit.* Simply press the green ready button to turn on the timer unit and restore the video feed.

Battery Test

You may check the voltage of the batteries in the units by powering off the units and then pressing the Red Stop button. The number of chimes indicates battery strength:

- 4 - full battery charge
- 3 - good battery
- 2 - Check the battery again during a long race.
- 1 - Low battery. Change the batteries before the race.

The units require 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. You may

also choose to use rechargeable batteries. The unit performs a battery test whenever the batteries are replaced.

It is recommended that you check the battery level before each meet.

Radio Channels

The radio units communicate over a preset radio channel. In some cases, the preselected channel may interfere with other radio operations in the area and the radios may not be able to communicate with each other.

To verify that the units are communicating:

- Place the units within a short distance (1-400 feet) of each other with no obstacles in between the two.
- If units are off, press the red button on both units and check that the battery charge is good.
- Press the green button on the timer unit to turn it on, and then press the green button on the starter unit.

The Green Ready light blinks green on both units if the units are communicating. Press the red button on both units to turn off the lights and reset.

The blinking Red Stop light and rapid busy signal sound alerts the user if the unit does not detect the other radio. If the units are not communicating, you need to switch radio channels on both units. The channel dial is located under the black plug on the front of the units. You need a small flat head screwdriver to change the channel and may need a flashlight to view the channel dial. There are 16 channels numbered 0-9 and A-F.

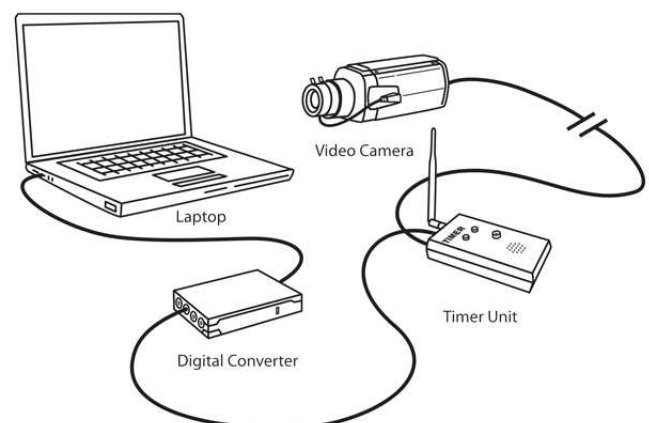
Turn the units off and remove the plugs. Insert the screwdriver head into the slot on the channel dial and turn to select a new channel. Set the channel switch to the same setting on the other radio unit. Turn the radios back on and check if they communicate. Replace the plug if the green lights flash on both radios.

You may verify the channel number by removing and replacing a battery. The units beep the 'channel number plus one' whenever you replace to batteries. For example, if a radio is set to channel 0 and a battery is removed and replaced, the radio will beep one time.

Setup

The starter unit is positioned next to the starting official on the starting line. The radio unit should be located 1 to 2 feet from the starting pistol when the gun is up. It can attach to the starter stand or a tripod, or be held in the starter's other hand.

The timer unit is attached to the timing/capture computer. A video camera is located at the finish line and is connected to the timer unit with a standard video cable. The unit acquires the video signal from the finish line video camera and passes it to the computer through a digital



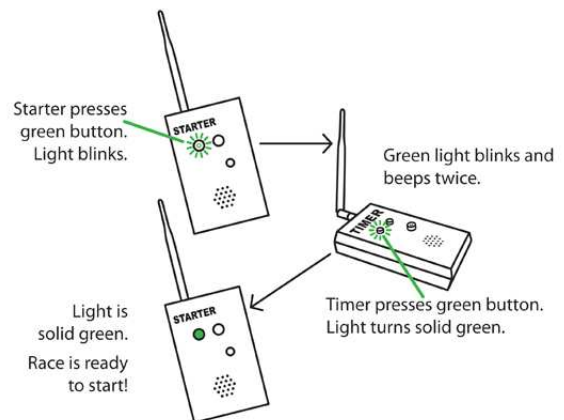
converter. (Wireless links are also sold that accomplish this connection without a cable. However they require good control over the line of site between the camera and wireless control unit.)

The two **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.

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 timer unit. The green lights on both the units blink, indicating that the starter is ready and is waiting for the timing official to acknowledge the signal. The timer unit also beeps twice every 5 seconds to attract the attention of the official.

The timing official confirms that the FAT timing system is ready to capture video of the next race by pressing the flashing green button on the unit. This sends a "Yes, I'm ready" signal back to the starter and the ready lights turn solid green on both units, indicating 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, 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 once the units are in the *Ready-to-Start* state and the Ready Light is solid green. The race clock starts when the starter fires the starting pistol. Once the race clock starts, the red and green lights are illuminated on both the **FT-FAT** units, indicating the race is in progress and the timer is running. The lights on the timer's unit remain on for the duration of the race. The lights on the starter unit remain on for 15 seconds after the race begins. The starter may recall the race in this time frame and reset the units to their ready state. After the 15 seconds, 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 Red Stop button on the timer unit when the last runner crosses the finish line. This stops and resets the race clock and sets the unit to the *Idle* state.

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. This sends a "Not Ready" signal to the

other unit causing it to sound a busy signal and flash the red light. The flashing light and sound stop after 10 seconds or when the Red Stop button is pushed on the unit.

No Response/Time Out

An official has 5 minutes to respond after the other official presses the green button, otherwise the units time out and return to the *Idle* state. When an official presses the Green Ready button, the green lights blink on both units. If the other official does not acknowledge the signal by pressing a button within 5 minutes, both units will sound the "Not Ready" signal (I.E. flashing red light and busy tone) and then return to the *Idle* state. Either official must reinitialize the "Are you ready?" signal before continuing.

Likewise, the starter has 5 minutes to start the race once the green light turns solid green and the units are in the *Ready to Start Race* state. The green light blinks rapidly and the unit starts beeping for the last 30 seconds of this 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.

Recall the race

After the race starts, the starter may press the Red Stop button to recall the race up to 15 seconds after the race begins when both the red and greens lights are on. This resets the race clock and restores the **FT-FAT** units to the *Ready to Start Race* state. (i.e. Lights are solid green on both units). The starter then has 5 minutes to restart the race before the units time 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 units timeout before the restart.

Whenever the timing official presses the stop button the race clock resets and units are set to the *Idle* state. If the timing official presses the stop button within the first 5 seconds of the start, the starter unit sounds a warning signal. This indicates a possible issue with the timing device and the starter may recall the race

If the timer does not start, 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 from 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.

Race Clock Inadvertently Starts

The race clock starts once the units are in the *Ready to Start Race* state and the starter unit detects the vibrating sound waves from the starting pistol. The starter unit may mistakenly pick up the vibration of other sounds or from the unit being bumped and start the race clock. The unit beeps and the green and red lights both turn on when this occurs. The starter can press the Stop Button within 15 seconds of this occurring and the unit will go back to the *Ready to Start Race* state. Otherwise, the timer needs to press the stop button to reset both units.

Radios Do Not Communicate

If a unit is unable to send a signal to its mate when a green button is pressed, the red light flashes along with a rapid busy signal. This is similar to the busy signal that occurs when an official presses the abort button. The distinction is that the tones are played closer together and the signal usually occurs immediately after pressing a button.

It is recommended that the starter test the radio communication whenever the starter moves to a new starting position on the track and before the next race. Simply press the green GO button. If the green light flashes, then the radios are good to go. Press the red stop button to let the timer know it was only a test. If the red light on the starting unit flashes accompanied by a rapid busy signal, the radios are not communicating and you must resolve the situation before the next race.

There are several reasons why the radios may not communicate:

1. *The receiving unit is turned off.*
Verify both units are turned on. The units turn themselves off after a period of inactivity to conserve power. Press any button to turn on the units.
2. *The batteries are low on either unit.*
Perform a battery check on each unit. This test should be done at the start of each meet.
3. *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 or the timer units a few inches may correct the problem. Something as narrow as a goal post can interfere with the radio communication if it is exactly on a line between the two units.

The next set of causes are less likely to occur during a meet, but should be checked if communication is not established after checking the above 3 items.

4. *There is interference on the radio channel.*
Someone is operating a radio on the same channel. Even if the radios were successfully tested before the start of the meet, there is a possibility that another device is using the same radio channel and causing interference. Select a new radio channel; change channels on both radios and test. Refer to the section, *Radio Channels*, for more information on setting channels.
5. *The units are not set to the same radio channels.*
This situation only happens if someone manually sets the radios to different channels and should not occur once the channels are set and tested.
6. *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.

Test the Units

It is recommended that you test the radio communication at each of the start positions before your track meet. There is no need to setup the computers and video cameras to do the tests. Position a person with the timer unit where the timing system is to be located during your track meet. Perform the green light test at each of the 4 starting lines around your track. 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.