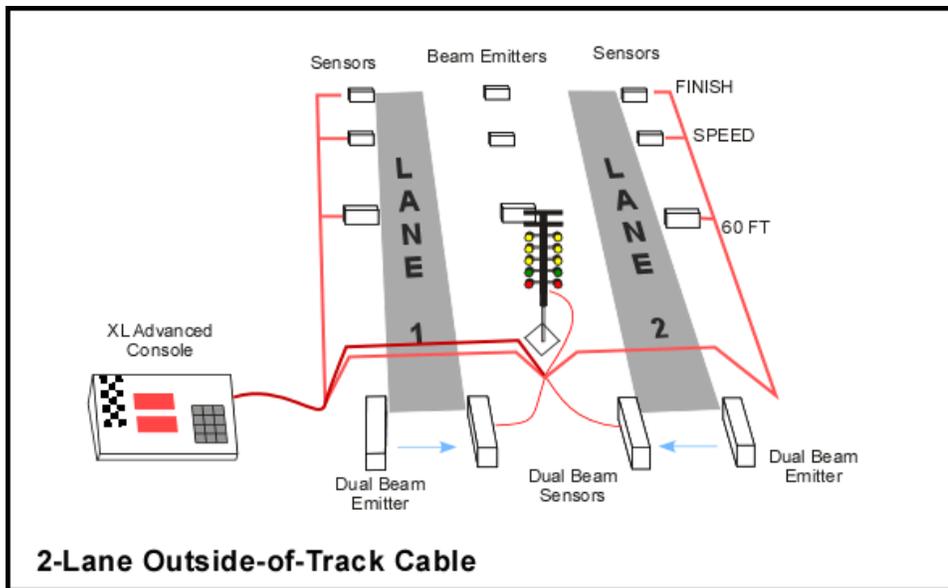


How can Wireless be as accurate as Hardwired?

Wireless timing systems manufactured by RaceAmerica are as accurate and reliable as hardwired timing systems. How can that be possible? Well, RaceAmerica's wireless systems operate in the same way as a hardwired system with the elimination of the long track cables replaced by industrial grade wireless with channel hopping technology.

Hardwired Timing Systems Operation

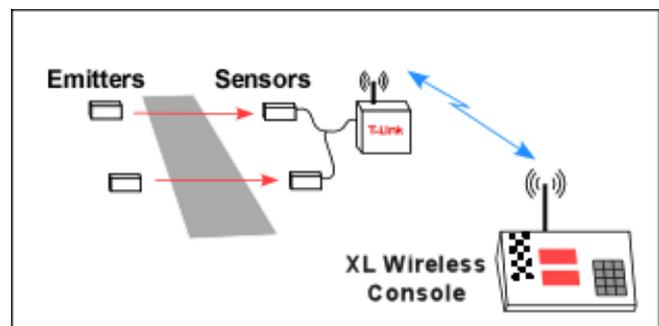
In a hardwired timing system, at the start line, finish line, speed trap, 60 foot and others, a beam emitter unit shoots a beam of infrared light aimed at a track sensor.



The track sensor continuously detects the presence of the beam and grounds out the output of the track sensor's signal to the timer. When the beam is blocked by a vehicle, the track sensor detects the absence of the beam and releases the grounded output to the timer. The track sensor is hardwired directly to the timer with cables running the length of the race track. The timer immediately detects the change in signal from the track sensor and records a beam 'trip' by stopping a running clock or saving a timestamp exactly when the beam was interrupted. By comparing the start timestamp with the finish timestamp, the timer can determine the elapsed time between the start and finish trips as well as all the other beams on the track.

Wireless Timing Systems Operation

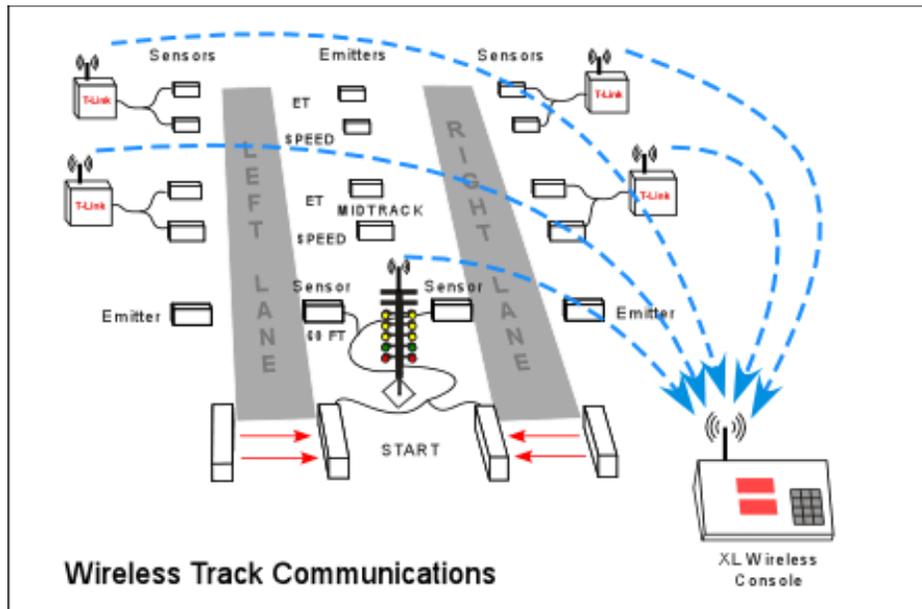
In a RaceAmerica wireless timing system, the beam emitter is the same product used in the hardwired system and functions exactly the same as it does in a hardwired system. The track sensor is the same product as the hardwired system and also functions exactly the same. The difference is the track sensor is hardwired to a wireless timing unit similar to the way it is hardwired to the timer in a hardwired timing system. The wireless timing unit is RaceAmerica's T-Link Wireless technology.



The sensor grounds out its output to the T-Link Wireless unit until the beam is blocked. The sensor releases the output from ground and the T-Link Wireless unit detects the signal change and records a trip by saving a timestamp when the trip occurred. The trip timestamp is stored in RAM in the T-Link Wireless unit for transmission to the timer located in the tower. Since the sensor trip has been recorded and stored in the T-Link Wireless unit, there is no chance of missing a trip or the time it occurred. When the main control timer in the tower wirelessly communicates with the T-Link Wireless unit, the T-Link Wireless unit selects a transmitting channel and sends the stored timestamp information to the main control timer in the tower. In the event the signal is interfered with by electrical or other RF signals, the timer retries continuously until it receives the timestamp from the T-Link Wireless unit. This process eliminates a missed trip due to RF interference and results in a highly reliable wireless timing system. Once the timer in the tower receives the timestamp information from all the wireless units on the track, the timer evaluates start, 60 foot, speed, and finish timestamps to determine the race results.

Complete Wireless Timing Systems

In a full wireless timing system, each T-Link Wireless unit on the track individually functions as an independent timer dedicated to monitoring the sensors connected hardwired to them. Even the drag tree is wirelessly controlled by the main control timer.



Timestamps are continuously recorded and wirelessly sent to the main control timer in the tower by each of these wireless timing boxes. The timer has a complicated job of keeping track of all the wireless timing units on the track and correcting for physical differences in the internal clocks in each unit. Timestamps are compared and adjusted using advanced error correction techniques insuring the timestamps are highly accurate and match the accuracy requirements of a hardwired system. A wireless unit can be powered off and on again and its internal clock is immediately synchronized with all other wireless timing units on the track.

Summary

In reality, RaceAmerica's wireless timing systems consist of multiple hardwired timing systems communicating to one central timer in the tower. Wirelessly communicating the timestamp information and not the actual sensor trip, combined with industrial grade wireless designed for miles of communications, the wireless system becomes highly reliable freezing time by storing the timestamp and using higher powered long range wireless on shorter distance race track facilities.