RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

Wireless Speed Trap

Models 5843AW/5843AZ
with 6430/6630/6830 LED Speed Displays

Rev A1

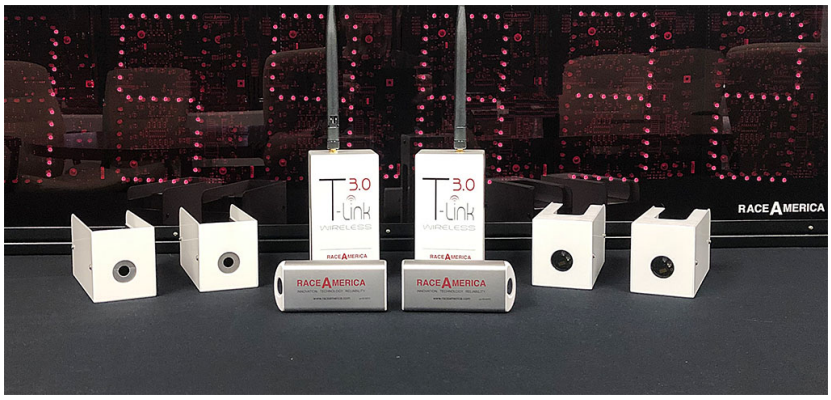

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Table of Contents

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PRODUCT INFORMATION LINKS

RaceAmerica Website	www.raceamerica.com
RaceAmerica Online Store	store.raceamerica.com
Raceamerica Online Forum	www.raceamerica.com/forum
Product Warranty	www.raceamerica.com/legal.html
Service & Repairs	www.raceamerica.com/service.html
Technical Assistance	www.raceamerica.com/techcall.html
Owner's Manuals	www.raceamerica.com/prodpdf.html
Mounting Diagrams	www.raceamerica.com/mountpdf.html
Product Catalog	www.raceamerica.com/catalog.html

PRODUCT OVERVIEW

The Wireless Speed Trap replaces track cables normally used to connect track sensors to the timing system. Model 5843 T-Link3 units manage the speed detection based on the trap length. The results are sent wirelessly to a Digital Display and/or a PC.

The wireless T-Link3 units operate over a wide range of conditions. Optimal conditions are line of sight between sending and receiving units and six feet of ground clearance. Range can exceed one mile. High gain antennas can be utilized for greater distances or noisy environments.

The speed trap can be activated from either direction; an automatic reset function occurs if both beams are not tripped within four seconds.

Diagnostics such as Beam alignment, RF signal integrity, and Battery Level are available from the display or PC.

PACKAGE COMPONENTS

Each Speed Trap package includes:

1 - 5843 T-Link3 Wireless Speed Trap Unit
2 - IR Beam Emitters (5040)
2 - IR Track Sensors (5140)
1 - Track Sensor Cable - 66ft trap (06-5830)
1 - Owners Manual

LOCAL REQUIREMENTS

6830DW or 6830DZ Digital Display and/or PC (with 4520BUSPD and 3123A Data Capture software) to collect and display results.

PRODUCT SPECIFICATIONS

Model 5843 T-Link3

Frequency (AW)	900MHz band
Frequency (AZ)	2.4GHz band
External Battery	pn 55-E670
T-Port Connections	
ID ‘C’	Track Sensors
Connection Type	RJ-45 Modular
Max Operating Range	-20ºF to 120ºF (Display)
	0ºF to 120ºF (T-Link2)
Battery Life	24 hours
Minimum Speed 132ft Trap	22.50 MPH
66ft Trap	11.25 MPH

AVAILABLE OPTIONS

5500 USB Battery Pack Charger
06-TL02 Cable T-Link3 to PC 25ft
6070B Blow Molded sensor case (2 ea)
6038P - Printer (connects to PC)
7540 Foam Stands (for emitters & sensors)
06-58T3 Spare Reconfigure Jumper Kit
04-0151 Optional 132ft speed trap cable
High gain antenna - increase range to miles

Since Large Digital Displays will often be used with the Wireless Speed Trap, specifications are summerized below:

PRODUCT SPECIFICATIONS 6830

Display Type:	Red LED 7-Segment
Digit Height:	8in/20cm Inch Tall
Wireless Frequency:	900MHz
Dimensions:	14-1/4in x 46-3/4in x 3in
Mounting:	Top 1/4” Eyelets - 30” c
Housing:	Powder coated aluminum
View Filter:	Red Transparent acrylic
View Range:	320ft/100m in full sun

PRODUCT SPECIFICATIONS 6630

Display Type:	Red LED 7-Segment
Digit Height:	15in/38cm Inch Tall
Wireless Frequency:	2.4GHz
Dimensions:	22-1/4in x 64in x 4in
Mounting:	see Mounting Diagram
Housing:	Powder coated aluminum
View Filter:	Red Transparent acrylic
View Range:	660ft/200m in full sun

Both displays are powered by 12VDC and are available with an optional external rechargeable battery.

SPEED TRAP SETUP

Each Speed Trap T-Link3 unit is configured with a unique ID code and a wireless optimizer code. These codes are listed on the identity label located on the bottom of the T-Link2 unit. Valid T-Link3 ID codes are 'C' , 'D', 'E' & 'F' for Trap sensors. The wireless optimizer code is also listed on the identity label. The optimizer code identifies wireless communications optimization and compatibility with other T-Link3 and 4520BUSPD units.

Install the antennas on all T-Link3 units. If the antenna is to be bent down for transport, loosen the antenna slightly and rotate the upper portion of the antenna into position. Hold the upper portion of the antenna while tightening the knurled area on the bottom portion of the antenna.

Position the T-Link3 at the speed trap with the cable extended between the Speed and Finish sensors as shown in the diagram. Plug the Speed Trap into the T-Port connector on the 5843 T-Link3 unit.

NOTE: It is very important to set-up the speed trap electronics at exactly the designated spacing and in a perfect rectangle to make sure optimal accuracy will be attained. Positioning the infra red beams about six inches off the ground will minimize false trips.

Power on the T-Link3 and observe the LED illuminates alternating between red and green, then illuminates red if the battery charge level is below 30% of full charge or green if charge is above 30% of full charge. If the battery charge is at minimum charge, the T-Link3 will power off even if the power switch is ON. If the SPEED sensor is not aligned with the beam emitter, the LED will be solid on GREEN; if the FINISH sensor is not aligned, the LED will be solid on RED. When both sensors are aligned, the LED will flash green when receiving a polling request from a Speed Trap Display or 4520USPD unit connected to a PC. The LED will flash red when replying to a polling request If the LED is ON solid, the track sensor is out of alignment. Utilize the alignment functions included with the large display to monitor alignment.

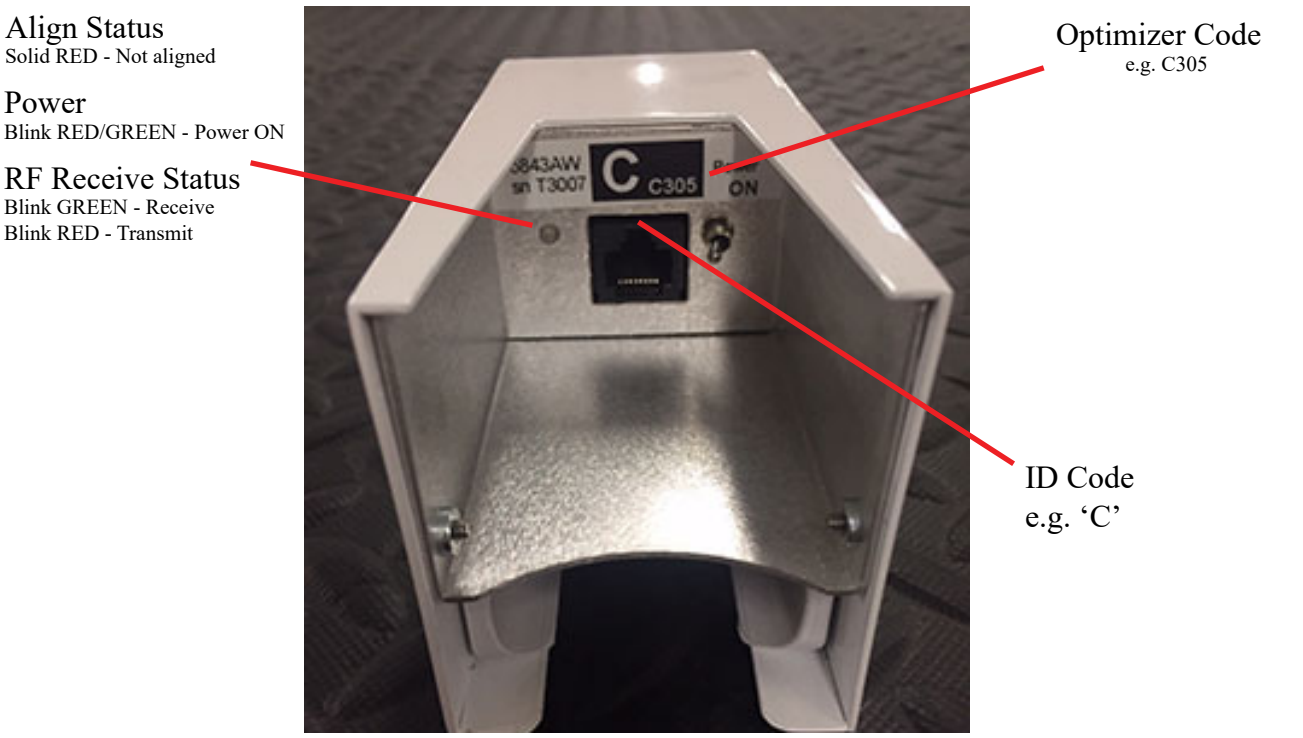
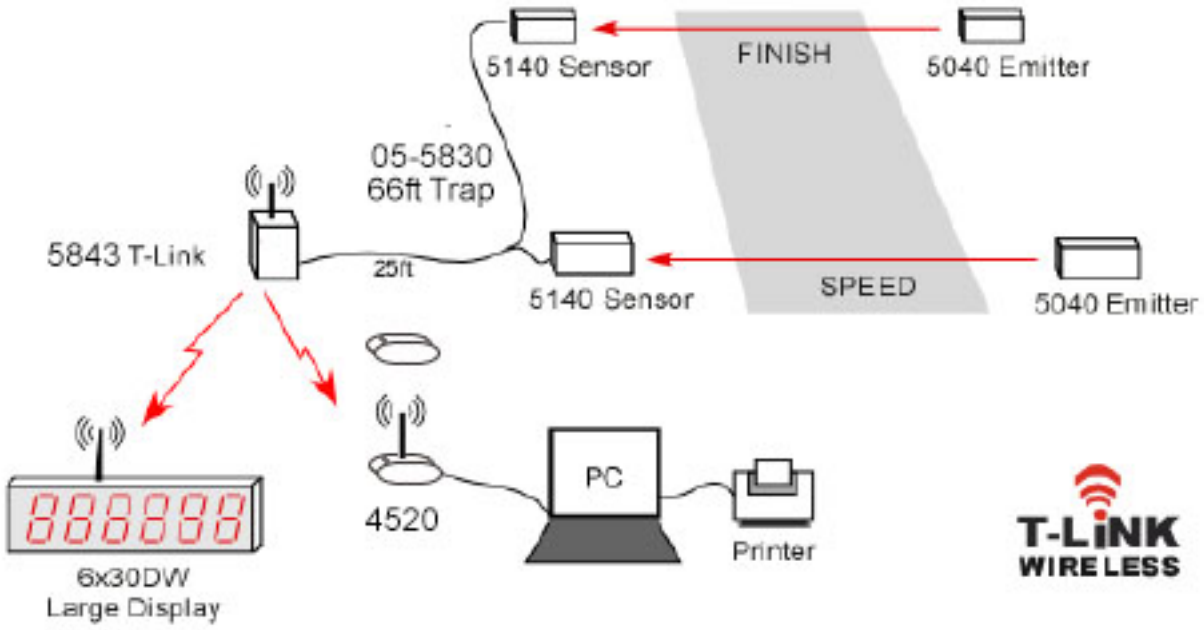


Figure 1 - T-Link3 power and external connections

TYPICAL SPEED TRAP SETUP



Model 5843 Wireless Speed Trap can be operated with either a Large Display or a PC or both.

For initial alignment, start with both beams out of alignment (LED ON). The LED will go out when the speed or finish beam is in alignment; once the both beams are aligned, the LED will pulse when the Speed beam is aligned.

The wireless speed trap requires either a digital display or a PC with data capture software to publish the speed trap results. Either method will utilize a 4520BUSPD unit (internal to the display or external to the PC - see page 6).

USING DIGITAL DISPLAYS

A 6430/6630/6830 Digital Display will receive the data to its internal wireless unit and display the speed. Use the DIP switches to set the speed trap length, display alignment status, display the RF signal integrity and set the display hold time when a speed is displayed.

DIP SWITCH DEFINITIONS

The 6430/6630/6830 can operate in different modes dependent upon the DIP switch settings. The 8 DIP switches located on the back of the Large Display are numbered from 1 to 8 and can be switched ON or OFF. The ON position is indicated on the switch itself. Each switch function and setting are discussed below.

Display Hold Time

Switches 4 and 5 determine the length of time to display the speed before clearing the display. When race results are displayed, the display will continue to display the results for the set time. If the display is sent new race results prior to the set time expiring, the display will be updated with the new results and the display hold time timer is reset to the set time.

Display Hold Time	4	5
15 seconds	ON	ON
30 seconds	ON	OFF
45 seconds	OFF	ON
60 seconds	OFF	OFF

Display as Master or Slave

Switch number 3 determines whether the 6430/6630/6830 is used in conjunction with a PC. When using the Display without a PC, it functions as a Master; when using the Display with a PC, it functions as a Slave. Multiple Slave Displays can exist in the race area.

Display - Master/Slave	3
Master	ON
Slave	OFF

Speed Trap Length

Switch number 6 determines whether race results are displayed based on a 10 foot or a 66 foot speed trap.

Speed Trap Length	6
132 foot	OFF
66 foot	ON

The minimum speeds that can be recorded are 22.5 MPH for the 132ft trap and 11.25 MPH for the 66ft trap.

Diagnostic mode

Switch number 1 enables and disables the diagnostic capabilities of the Large Display. When enabled, the Large Display receives data and displays error codes when invalid data has been received. The following table is used to set switch number 1 to enable/disable the diagnostic feature:

Diagnostic Mode	1
Disabled	ON
Enabled	OFF

NOTE: IF SWITCH NUMBER 1 IS SET TO THE 'OFF' DURING THE POWER UP SELF-TEST, THE DISPLAY WILL CONTINUOUSLY LOOP ON THE SELF-TEST UNTIL SWITCH NUMBER 1 IS SET TO THE 'ON' POSITION.

The Display also has two diagnostic modes.

Alignment Mode - set DIP switches 1,4, 5 & 6 to the OFF position; turn on power and the display will show **#S--F#** where **S** is **Start**, **F** is **Finish** and the adjacent # is a number. Alignment is accomplished when the numbers stop counting.

RF Integrity/Battery Level Mode - set DIP switches 1, 4 & 5 OFF, switch 6 ON; turn on power and the display will show **-rF_b-** where **rF** integrity is displayed by the digit to the left and **b** indicates the battery level for the ID 'C' Speed Trap T-Link2 unit is the digit to the right. In both cases, a dash (-) indicates 100%, '9' indicates 90%, '8' indicates 80% and so on. The system should operate well at '7' or above for both parameters.

USING PC CAPTURE SOFTWARE

Locate the 4520BUSPD Wireless Unit. Locate the T-Port connector on the back of the T-Link2 unit. Connect this T-Port to a 9-pin serial PC port using the 06-TL02 data communications cable. Power on the 4520BUSPD and observe the right LED illuminates and blinks off, then on very quickly appearing as a flicker. If only the 4520BUSPD if powered on, no other LEDs will illuminate. When other T-Links are powered on, the LED will flash when a wireless signal is received from a T-Link3 unit. The left LED will flash very quickly indicating the 4520BUSPD is receiving a good signal from other T-Links.

Install the PC Capture Software, configure the software for the PC COM port receiving the data; use the software 'Help' sections as required.

OPERATION

When the speed trap is set up and aligned with either a Large Display or PC to capture data, it is time to make a pass. The vehicle can pass through the speed trap in either direction. As the vehicle breaks the first beam, a '_' dash appears in the first position indicating a sensor trip. The system allows four seconds (4 sec) to complete the pass before resetting; if both beams have not been broken, the dash will disappear after four seconds and reset the trap. Upon completion of the pass, the speed will show on the display (_XXX.XX) and/or the PC.

After each pass, the trap is locked out for nine seconds to allow dirt and dust to settle. The dash turns OFF when the trap is reset for the next pass. New data will update the display with each successful pass.

USING SPARE T-LINKS

T-Link3 identifier codes are preset at the factory. Using an external Reconfig Jumper provided with the backup T-Link3 unit, a T-Link3's ID code can be changed enabling a single backup unit to replace any unit with the same optimizer code. With the 5843 T-Link3, a spare ID 'D' unit can be reconfigured as a ID 'C' unit. To temporarily change the ID code of a T-Link3 unit, power the unit off. Select the Reconfig Jumper with the desired ID code and install into the T-Port of the T-Link3 unit to be reconfigured. Power on the T-Link3 unit. The left LED will flash three short times to confirm the T-Link3 unit has been reconfigured to the new ID code. Unplug the Reconfig Jumper and connect any cables to the T-Link3 unit for normal use. Do not power off the T-Link3 unit after a new ID code has been assigned. The change of ID is temporary. When the T-Link3 unit is powered off, the ID code will revert back to the preset ID shown on the bottom of the T-Link3 unit.

BATTERY CHARGE

Charge the batteries using the charging cable provided by RaceAmerica. All functional electronics are disabled during battery recharge to avoid damage. Typically battery charging will take 8 hours for a completely exhausted USB Battery Pack.

TECHNICAL DETAILS

Connection to a PC or Timer:

The T-Port is a RJ45 connector with 8 conductors. Viewing the T-Port, pin 1 is on the left side and pin 8 is on the right side of the connector. For RS232 serial data communications, pin two is ground and pin one is data sent from the T-Link3 unit. All other pins should not be connected to avoid damage to the T-Link2 unit.

MAINTENANCE

To insure uninterrupted operation on race day, it is suggested to keep track of battery usage hours so as to have fully charged batteries. To maintain the highest level of timing accuracy and minimize false trips, annual preventive maintenance and calibration should be performed on all system track sensors and beam emitter units.

SPARE PARTS

Further to minimize race program interruptions, RaceAmerica recommends some spare parts. A spare emitter/sensor pair should be available in the event of an unfortunate accident during a program. Contact RaceAmerica for availability and pricing of spares items.

SUPPORT AGREEMENTS

Support agreements are available from RaceAmerica providing Telephone Assistance on technical issues and operational questions, repair and/or replacement of hardware failures, Software and Firmware updates and bug reporting, and Annual Preventive Maintenance on all system track sensors and beam emitter units. Contact RaceAmerica for more information and pricing of Support Agreements.

REVISION HISTORY

07/14 - Initial release
02/15 - 132 foot trap replaces 10 foot option