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## *T-Link 3.0 Wireless*

*Models 5840AW/AZ*

Rev A1



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## PRODUCT INFORMATION LINKS

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

## PRODUCT OVERVIEW

T-Link 3.0 Wireless replaces track cables normally used to connect track sensors to the timing system. Model 5840 T-Link 3.0 connects to an external track sensor using a short interconnect track cable.

**NOTE: THIS PRODUCT OPERATES ON HIGH FREQUENCY RADIO WAVES. DO NOT POWER ON THE T-LINK2 WITHOUT ATTACHING THE ANTENNA AND DO NOT OPERATE UNITS CLOSER TOGETHER THAN FOUR FEET. ADDITIONALLY, DO NOT PLUG ANY DEVICE IN THE CHARGER PLUG BUT THE CHARGER. PLUG ONLY DESIGNATED RACEAMERICA CABLES IN THE T-PORT CONNECTOR.**

## PRODUCT SPECIFICATIONS

### Model 5840AW T-Link 3.0

Frequency	900MHz band
Internal Battery	USB Battery Pack Lithium-Ion
T-Port Connections	05-5825 to Sensor
Connection Type	RJ-45 Modular
Identifier Codes	A-G to sensors
Max Operating Range	-20°F to 120°F

### Model 5840AZ T-Link 3.0

Frequency	2.4GHz band
Internal Battery	USB Battery Pack Lithium-Ion
T-Port Connections	05-5825 to Sensor
Connection Type	RJ-45 Modular
Identifier Codes	A-G to sensors
Max Operating Range	-20°F to 120°F

## AVAILABLE OPTIONS

05-5825 Cable for Ext Sensor 25ft  
6070T3 Blow Molded Carry Case  
4591A High gain antenna

## T-LINK2 SETUP

Each T-Link 3.0 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-Link 3.0 unit. Valid T-Link 3.0 ID codes are A, B, C, D, E, F, or G. The wireless optimizer code is also listed on the identity label for wireless communications optimization and compatibility with other T-Link 3.0 units.

Install the antennas on all T-Link 3.0 units. If the antenna has been 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.

Locate a 4520BU or 4520 UIDZ USB Wireless Unit and connect the USB cable, then connect the USB cable to any USB port on the PC. . When the 4520 is the only wireless unit powered on, the LED will quick flash red each time it transmits. When other T-Link 3.0s are powered on, the LED will flash green when a wireless signal is received. During normal operation, the LED on each T-Link 3.0 will flash red during transmit and flash green each time signal is received from another T-Link 3.0.

Position the T-Link 3.0 unit with ID A at the start line and ID B at the finish line. Connect the external Track Sensor to the T-Port of the T-Link 3.0 unit using interconnect cable 05-5825. Power on all available T-Link 3.0 IDs A through G. The LED will step through the startup sequence. If the external track sensor is aligned with the beam emitter, the LED will blink green when receiving data and red when responding. If the LED is on solid red, the track sensor is out of alignment. Re-position the track sensor until the LED goes out and begins to display the red/green transmit/

receive data indication. It may be easier to align ID A and ID B with 4520 powered off. The 4520 initiates the transmit/receive sequence, so the LED will not flash on IDA through IDG until the 4520 is powered on.

### USING SPARE T-LINKS

T-Link 3.0 identifier codes are preset at the factory. Using an external Reconfig Jumper provided with the backup T-link 3.0 unit, a T-Link 3.0's ID code can be changed enabling a single backup unit to replace any unit with the same optimizer code. To temporarily change the ID code of a T-Link 3.0 unit, power the unit off. Select the Reconfig Jumper with the desired ID code and install into the T-Port of the T-Link 3.0 unit to be reconfigured. Power on the T-Link 3.0 unit. The green LED will flash three short times to confirm the T-Link 3.0 unit has been reconfigured

to the new ID code. Unplug the Reconfig Jumper and connect any cables to the T-Link 3.0 unit for normal use. Do not power off the T-Link 3.0 unit after a new ID code has been assigned. The change of ID is temporary. When the T-Link 3.0 unit is powered off, the ID code will revert back to the preset ID shown on the bottom of the T-Link 3.0 unit.

### BATTERY CHARGE

Charge the batteries using any USB battery charger. A PC USB port will charge but is a low power output device and will not charge the T-Link 3.0 to full charge. All functional electronics are disabled during battery recharge to avoid damage. Typically full battery charging will take up to 6-8 hours if fully discharged. The charger indicator LED will turn from red to yellow to green when charging is complete.

#### Align Status

Solid RED - Not aligned

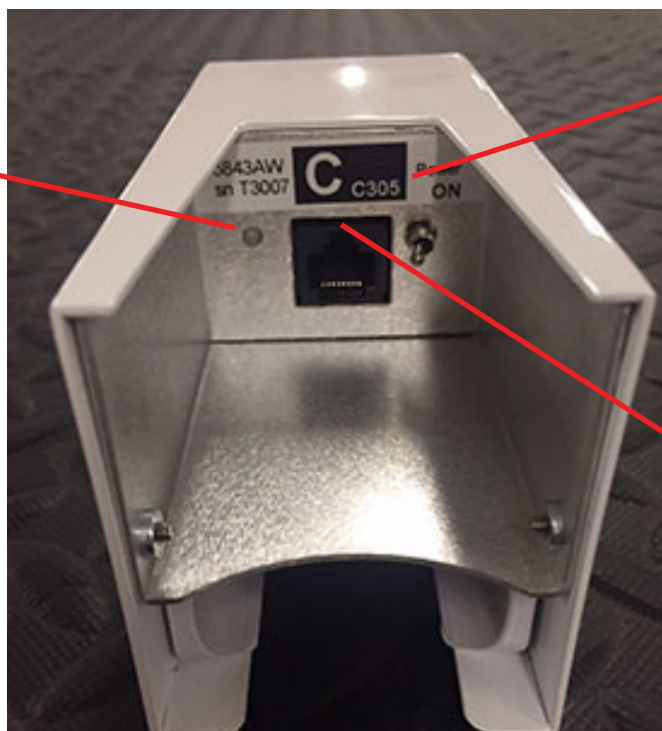
#### Power

Blink RED/GREEN - Power ON

#### RF Receive Status

Blink GREEN - Receive

Blink RED - Transmit



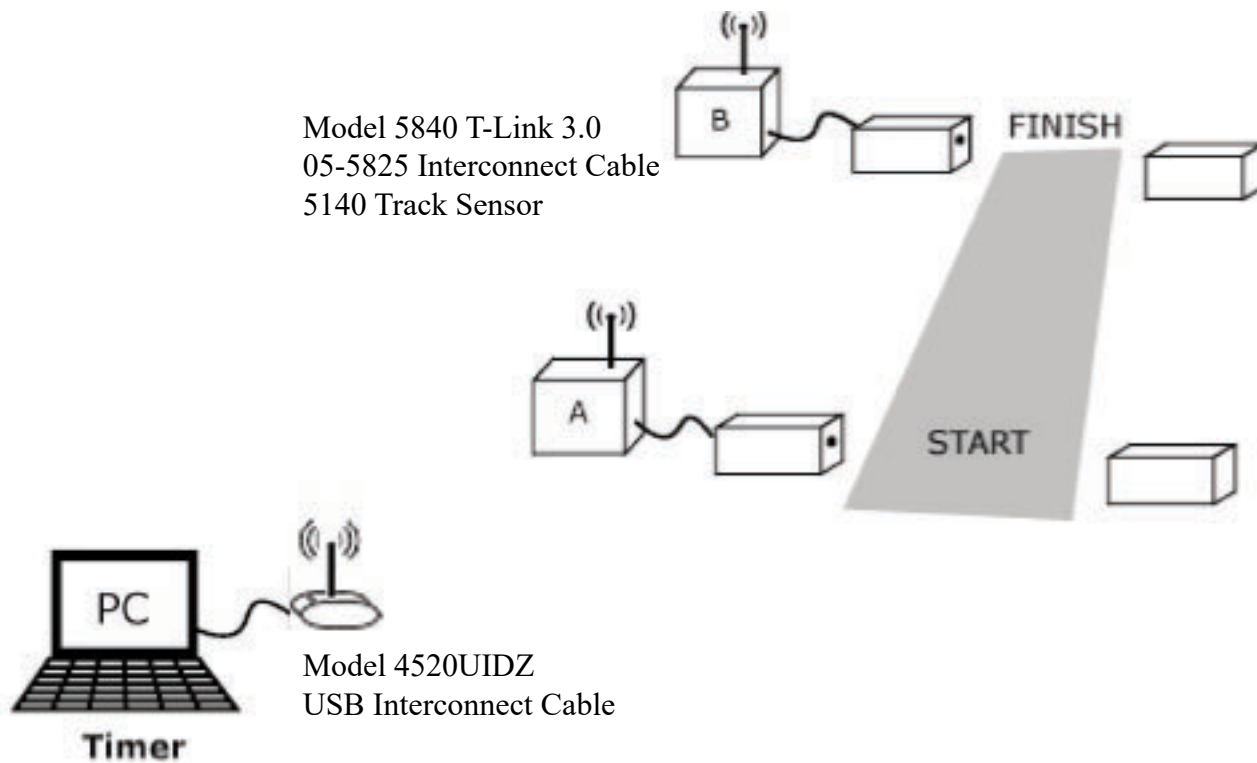
#### Optimizer Code

e.g. C305

ID Code  
e.g. 'C'

Figure 1 - T-Link 3.0 power and external connections

## TYPICAL TRACK SETUP



## TECHNICAL DETAILS

### Connection to a PC or Timer:

The output of the 4520UIDZ USB Wireless unit has the following:

### Data String Protocol:

Data strings are sent from the 4520UIDZ unit to provide timing timestamps from each track sensor, battery charge level in each T-Link 3.0 unit, and RF Data Integrity level of the wireless communications between the T-Link 3.0 units. The data strings are always terminated by a 'carriage return' (cr) character and are 11 characters in total length.

<id> is the ID code of the T-Link 3.0 - A thru G are valid

<timestamp> is a 9-digit number for timing use

<error code> is a single digit number explained under Error Codes

<rev level> is a 3-digit number of the Revision Code of the T-Link 3.0

<batA> is a single digit number of the Battery Charge Level of a T-Link 3.0 unit

<rfA> is a single digit number of the RF Integrity Level of a T-Link 3.0 unit

<id> <timestamp> cr

ZB <bA><bB><bC><bD><bE><bF><bG><bZ> cr

ZW <rA><rB><rC><rD><rE><rF><rG> 0 cr

<id> E <error code> 0000000 cr

<id> R <rev level> 00000 cr

### Error Codes:

When a condition occurs interrupting normal T-Link 3.0 operation, an error message is sent by the 4520UIDZ unit. T-Link 3.0 are self-correcting devices and can withstand continuous interruption of up to 10 seconds with 100% timing accuracy.

The error codes are sent in the format of:

<id> E <error code> 0000000  
(example: AE3000000)

E1 - Bad trigger data on ID B, C, D, E, F or G

E2 - Greater than 10 sec since last good data received from ID B, C, D, E, F or G

E3 - Nothing received from ID A during the last request

E4 - Greater than 10 sec since last good data received from ID A

E5 - Math overflow during calculation on ID B, C, D, E, F or G

All error messages are realtime during normal operation with different levels of urgency. Errors E1, E3, and E5 indicate local interference effecting the wireless communications or loss of signal. These are error messages to alert the user of intermittent interference and do not effect the accuracy of the timing system unless the error codes continue for more than 10 seconds of operation. Errors E2 and E4 also indicate local interference effecting the wireless communications or loss of signal unless these error codes are preceded by 10 seconds of continuous error codes.

## 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**

01/13 - Initial release

07/14 - Logo update

03/15 - T-Link 2 with Power Safety Lock picture