

RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

T-Link2 Wireless

Models 5810A/HD/EXR, 5810AX/HDX

Rev C



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LIMITED WARRANTY

To the original purchaser of this RaceAmerica product, RaceAmerica warrants it to be in good working order for a period of ninety (90) days from the date of purchase from RaceAmerica or an authorized RaceAmerica distributor. Should this product malfunction during the warranty period, RaceAmerica will, at its option, repair or replace it at no charge, provided the product has not been subjected to misuse, abuse, or alterations, modifications, and/or repairs not authorized by RaceAmerica.

Any product requiring Limited Warranty service during the warranty period should be returned to RaceAmerica with proof of purchase. If return of merchandise is by mail, the customer agrees to insure the product, prepay shipping charges, and ship the product to RaceAmerica, Inc., 280 Martin Avenue Unit 1, Santa Clara, CA 95050.

ALL EXPRESSED AND IMPLIED WARRANTIES FOR THIS PRODUCT ARE LIMITED IN DURATION TO THE ABOVE NINETY DAY PERIOD.

UNDER NO CIRCUMSTANCES WILL RACEAMERICA BE LIABLE TO THE USER FOR DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF, OR INABILITY TO USE, SUCH PRODUCT.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

PRODUCT OVERVIEW

T-Link2 Wireless replaces track cables normally used to connect track sensors to the timing system. Model 5810 T-Link2 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 5810A/HD/EXR T-Link2

Frequency	900MHz band
Internal Battery	9.6VDC Lithium-Ion
T-Port Connections	05-5825 to Sensor 06-TL02 to PC
Connection Type	RJ-45 Modular
Identifier Codes	Z to PC A-G to sensors
Max Operating Range	-20°F to 120°F

Model 5810AX/HDX/EXRX T-Link2

Frequency	2.4GHz band
Internal Battery	9.6VDC Lithium-Ion
T-Port Connections	05-5825 to Sensor 06-TL02 to PC
Connection Type	RJ-45 Modular
Identifier Codes	Z to PC A-G to sensors
Max Operating Range	-20°F to 120°F

AVAILABLE OPTIONS

5891A 9.6V Lithium-Ion Battery Charger
05-5825 Cable for Ext Sensor 25ft
06-TL02 Cable T-Link2 to PC 25ft
6070T3 Blow Molded Carry Case
06-58AX Spare Reconfigure Jumper Kit
4591A High gain antenna

T-LINK2 SETUP

Each T-Link2 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-Link2 ID codes are Z, 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-Link2 units.

Install the antennas on all T-Link2 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 the T-Link2 unit identified as ID Z. 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 or connect the T-Port to the Serial Port of a RaceAmerica Timer using the 06-TT02 Data Communications cable. Power on ID Z 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-Link2 will power off even if the power switch is ON. If ID Z is the only T-Link2 powered on, the LED will quick flash red each time it transmits. When other T-Link2s are powered on, the LED will flash green when a wireless signal is received. During normal operation, the LED on each T-Link2 will flash red during transmit and flash green each time signal is received from another T-Link2.

Position the T-Link2 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-Link2 unit using interconnect cable 05-5825. Power on all available T-Link2 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 ID Z powered off. The IDZ initiates the transmit/receive sequence, so the LED will not flash on IDA through IDG until IDZ is powered on.

USING SPARE T-LINKS

T-Link2 identifier codes are preset at the factory. Using an external Reconfig Jumper provided with the backup T-link2 unit, a T-Link2'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-Link2 unit, power the unit off. Select the Reconfig Jumper with the desired ID code and install into the T-Port of the T-Link2 unit to be reconfigured. Power on the T-Link2 unit. The left LED will flash three short times to confirm the T-Link2 unit has been reconfigured to the new ID code. Unplug the Reconfig Jumper and connect any cables to the T-Link2 unit for normal use. Do not power off the T-Link2 unit after a new ID code has been assigned. The change of ID is temporary. When the T-Link2 unit is powered off, the ID code will revert back to the preset ID shown on the bottom of the T-Link2 unit.

Align Status
Solid RED - Not aligned

RF Receive Status
Blink GREEN - Receive
Blink RED - Transmit

Power
Blink RED/GREEN - Power ON

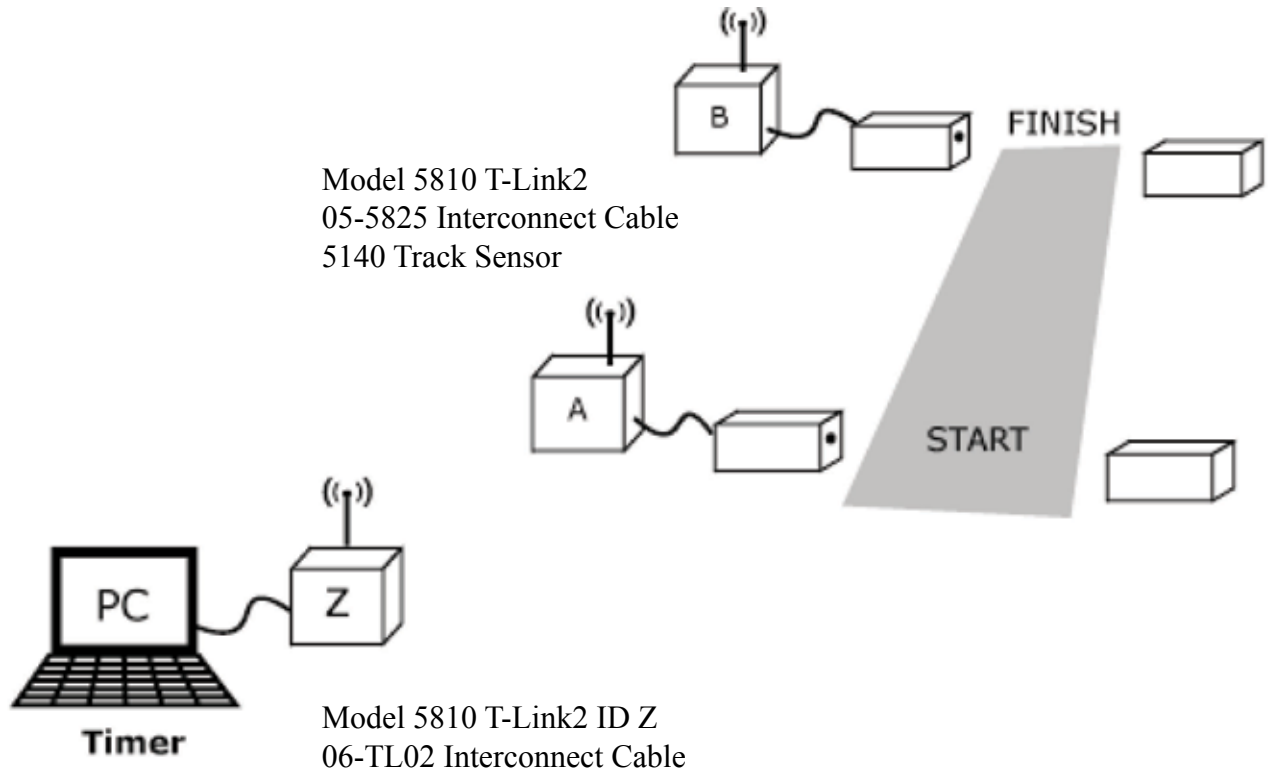
ID Code
e.g. 'Z'

Optimizer Code
e.g. C17



Figure 1 - T-Link2 power and external connections

TYPICAL TRACK SETUP



BATTERY CHARGE

Charge the batteries using only the 9.6V Lithium-Ion external charger unit provided by RaceAmerica pn 5891A. Charging T-Link2 with other chargers may cause damage to the internal batteries. All functional electronics are disabled during battery recharge to avoid damage. Typically battery charging will take 45 minutes to 1.5 hours depending on T-Link2 model. The charger indicator LED will turn from red to green when charging is complete.

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 2 is ground and pin one is data sent from the T-Link2 unit. All other pins should not be connected to avoid damage to the T-Link2 unit.

Data String Protocol:

Data strings are sent from the ID Z T-Link2 unit to provide timing timestamps from each track sensor, battery charge level in each T-Link2 unit, and RF Data Integrity level of the wireless communications between the T-Link2 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-Link2 - A thru G and Z 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-Link2
 <batA> is a single digit number of the Battery Charge Level of a T-Link2 unit
 <rfA> is a single digit number of the RF Integrity Level of a T-Link2 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-Link2 operation, an error message is sent by the ID Z T-Link2 unit. T-Link2 are self-correcting devices and can with stand 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.