BROWER
TIMING SYSTEMS

Brower Timing Systems
TCi–System
2023
User's Manual

Quick Start Guide

Power On/Off

To power up the *TCi-Timer*, press and hold the *On/Off* button for 2 seconds. The *Manual Start* button will simulate a remote start, and is helpful in learning how the timer works.

Power On PhotoGates A & B

Press and hold the *On/Off* button until *TCi-PhotoGate A* beeps, then buzzes continually. For *TCi-PhotoGate B*, hold button until the desired distance is selected.
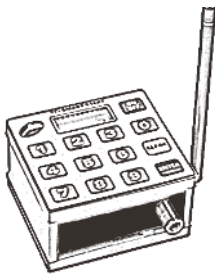
Line up PhotoGates A & B

Align *TCi-PhotoGate B* to *A* until it stops beeping. Find eye center by rotating *B* to one side until *A* starts beeping then repeat to the other side. Set *B* in middle of these two positions.

B   **IR Beam**   **A**
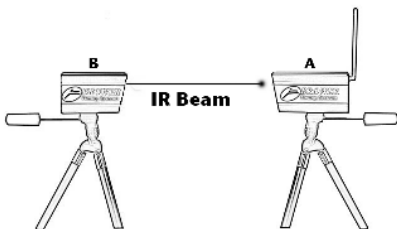
Power on TCi-Smart Start

Press and hold the *On/Off* button until one beep is heard. Enter an athlete number and press the *ENTER* button. Place a hand or foot in front of the *TCi-Smart Start*, the unit will beep twice. Move the hand or foot and the unit will beep and trigger the *TCi-Timer*.
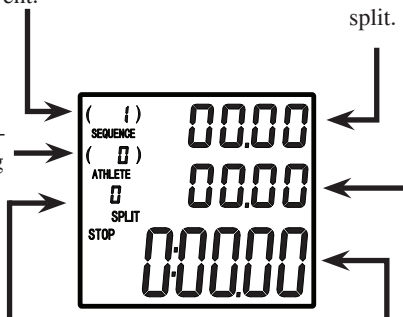
Contents

Operating Your TCi-Timer

SEQUENCE # displays the sequential order of each recorded event.

SEGMENT displays the time from split to split.

ATHLETE # displays the athletes identifying number.

SPLIT displays the time from the start to the split.

(1)
SEQUENCE

(0)
ATHLETE

0
SPLIT

STOP

00.00

00.00

0:00.00

SPLIT # displays which split time is being shown on the clock.

CUM displays the cumulative (total) time from the start to the finish.

(|) SEQUENCE

Sequence

Sequence # is a chronological counter. (1 to 999, any sequence over 200 will not show the first digit) It advances when the *New* button is pressed, this helps the user keep track of times when using *Memory Review*.

Power On/Off

To power up the *TCi-Timer*, press and hold the *Power On/Off* button for 2 seconds. The data from the last session is still in memory until memory is cleared. The clock is now ready to receive radio signals.

ON
OFF

Memory Clear

Press and hold both buttons at the same time for approximately four seconds. Memory will clear and the clock will be reset to *Sequence* #1.   **All past times will be lost.**

Clear

New Athlete

To start a new athlete, press the *New* button and a reset clock is shown. If in *Memory Review*, hold the *New* button to get to the latest sequence to show a reset clock. (This is the only time the *Athlete #* can be adjusted.) The *TCi-Smart Start* will automatically start a new athlete when in a mode that uses the keypad.

New

Athlete # Adjust

Athletes can be assigned an identifying number. Use *Split/Scroll* arrows to assign an *Athlete #*. This may only be assigned before the clock starts for that athlete. (If in **Memory Review,** hold the *NEW* Button to get to the latest sequence) After the desired number is reached, the start will lock the *Athlete #* to the time. If no adjustment is made for the next athlete, the same *Athlete #* will be assigned to the upcoming time. Press and hold the buttons to engage a high speed scroll.

Split/Scroll

The Athlete # entered into the *TCi-Smart Start* keypad will override the number entered in the *TCi-Timer.*

Athlete Memory Review

To review times, press the *Memory Review* buttons. Holding down either button will engage the high speed scroll. The sequence will adjust accordingly. The *Athlete #* will be displayed also. Dashed lines appear in memory every time the TCi-Timer has been turned on to mark between timing sessions.

New

Memory Review

Split Review

Press *Split/Scroll* buttons to review an athlete's split times. (Up to 20 splits possible) The Split counter will adjust as each split is viewed. Splits can be reviewed while a time is running. When reviewing splits if a new time starts, it will cause the display to jump to the current time.

Split/Scroll

Manual Start

Press button to manually start, split or finish the timer. (Similar to a stopwatch) Using this function reduces the accuracy of an athletes time due to human error.

Manual Start

TCi-PhotoGate Setup

➤ Set up the *TCi-PhotoGate* units as displayed below at the *START, SPLIT* or *FINISH* location.

➤ Turn on *TCi-PhotoGate A* by pressing and holding the *On/Off* button for 2 seconds, release the *On/Off button* after the first beep. The unit will then buzz continually, the green LED will also flash.

➤ Point *TCi-PhotoGate B* in the direction of *TCi-PhotoGate A*.
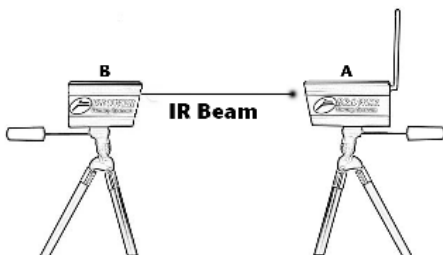
➤ Turn on *TCi-PhotoGate B* by holding down the *On/Off* button until the desired power level is selected.* The blinking green light indicates the unit is on. *TCi-PhotoGate B* emits an infrared (IR) light beam that is detected by *A*.

➤ Align *TCi-PhotoGate B* by directing it toward the *TCi-PhotoGate A* until it stops beeping. Center beam alignment by moving *B* in and out of alignment. The *A* unit will no longer sound when centered.

➤ To power down *TCi-PhotoGates A & B*, press and hold the *On/Off* button for two seconds. A low tone beep will indicate power off.

*The *TCi-PhotoGate B* has three IR power settings indicating the maximum possible distance between *TCi-PhotoGates A & B*.

Beeps	Power	Meters	Hours of Battery Life
1 Beep	Low	10	220
2 Beeps	Medium	22	140
3 Beeps	High	38	60

Application Tip

1. For the most accurate and repeatable results, set the IR light beam at the belt height of the athletes. This will be high enough so that the legs of the athletes do not break the IR light beam. This is also low enough that swinging arms and hands of the athlete will not prematurely break the IR beam.

2. To avoid unnatural hand reaching to break the beam, set *TCi-Photo-Gates A&B* 15-30 feet apart with the running lane in the middle. Set the finish beam so it is **not** on a visible finish line. This will make it difficult for athletes to know where to reach out and break the beam with a hand, which can result in a faster time.

TCi-PhotoGate 5-10-5 Setup

⚏ Hold the Power Button for 4 seconds until it beeps 2 times. The PhotoGate A is now set to "Start in Beam"

⚏ Once the *Gate A* and *Gate B* are setup, stand inside the beam. The Gate A will beep 2 long beeps and 2 short beeps to signal that it is armed.

⚏ The Gate will trigger the timer as soon as the athlete moves out of the beam. The *PhotoGate* will then trigger split times each time it is crossed as the athlete runs through the beam 2 more times.

⚏ Wait 10 seconds for the *PhotoGate* to reset before entering the beam again.
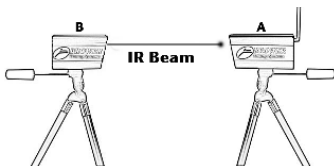
Setting Up Your TCi-Smart Start
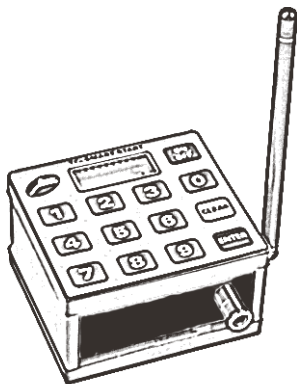
Selecting TCi-Smart Start Mode

To set the *TCi-Smart Start* mode, hold the *on/off* button until the unit beeps 2 times in a row and the display shows *Mod*. The mode number will continuously blink. Press the number of the desired mode then press *ENTER*.

TCi-Smart Start Modes	
1	Start on Motion with Keypad
2	Start on Motion no Keypad (same as previous Motion Start)
3	Start on Detection with Keypad
4	Start on Detection no Keypad
5	Ready Set Go

A Touch Pad, Microphone or any mechanical switch (normally open) can be plugged into the front of the *TCi-Smart Start* and used to trigger the *TCi-Timer.*

1: START ON MOTION WITH KEYPAD

THREE OR FOUR POINT STANCE:

Place the *TCi-Smart Start* on the starting line. Position the unit 2-12 inches (5-30 cm) directly to the side of the athlete's hand position. The black window should be facing the athlete's hand. Enter an athlete number (0-999) and press *ENTER*. The *TCi-Smart Start* will beep twice when it detects that a hand is on the starting line; this means the unit is armed. When the hand lifts the unit will beep once and trigger the *TCi-Timer*.

STANDING START:

Place the *TCi-Smart Start* 2-12 inches (5-30 cm) directly to the side of the athlete's rear foot position. The black window should be facing the athlete's foot. Make sure the unit is aligned with where first motion occurs. Enter an athlete number (0-999) and press ENTER.
The unit will beep twice when it detects a foot; this means the unit is armed. When the foot moves the unit will beep once and trigger the *TCi-Timer*.
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2: START ON MOTION NO KEYPAD

The *TCi-Smart Start* can be used without the keypad. It works just like Mode 1 except the sensor will arm and trigger without pressing buttons on the keypad and no Athlete # is sent to the *TCi-Timer*. This mode works the same as the previous *TC-Motion Start*

3: START ON DETECTION WITH KEYPAD

After entering an Athlete number, the *TCi-Smart Start* will trigger the *TCi-Timer* and beep when a hand or foot is first detected. This mode is useful when timing tests that start or finish on stairs or bleachers.

4: START ON DETECTION NO KEYPAD

Same as Mode 3 except the sensor will trigger without pressing buttons on the keypad and no Athlete # is sent to the *TCi-Timer*.

5: Ready Set Go

Enter an athlete number (0-999) and press *ENTER*. When a foot or hand is detected the unit will beep three times at random intervals: "Ready", "Set", and "Go". The *TCi-Smart Start* triggers the *TCi-Timer* once when the "Go" beep is heard and again when the athlete starts. The second signal captures the athletes reaction time and will show as a split time on the *TCi-Timer*. If the athlete false starts the unit will beep rapidly and no signal is sent.

Application Tip

1. Electronic start sprint times are always slower than hand times. This is due to the reaction time of the stopwatch operator. Studies have shown reaction times to be between 16-24 hundredths of a second. The general conversion for "start on movement hand timing" to "electronic start timing", is to subtract 20 hundredths of a second from the electronic total time.

2. The *TCi-Smart Start* will result in a slightly faster overall sprint time in comparison to the Touch Pad start. This is because the *Smart Start* is slightly less sensitive and allows for a small amount of movement or shifting before it starts the time. The difference is between 0.04 and 0.06 seconds.

TCi-Timer Modes
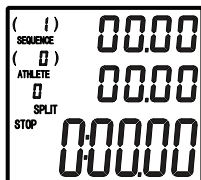For both *TCi-Timer* and *TCi-Timer SMARTPHONE*

Use the **Mode** button to scroll through the mode options. When on the desired mode press **Enter**. The *TCi-Timer* is now setup to time the event.
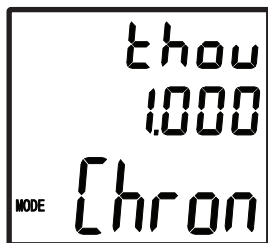
Chronograph Mode
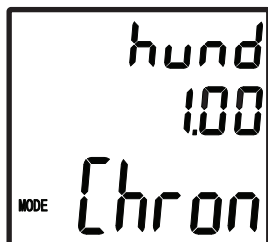
Chron mode has a resolution of a 1/Hundredth of a second. This is the standard mode used for the majority of timing applications.
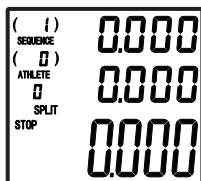
1/Thousandth Mode

1/Thousandth mode is similar to the *Chron* mode but displays 1/1000th of a second resolution. In this mode the display will only time to 9.999 seconds. This mode is useful in timing short spans between the start and finish where extra resolution is needed for differentiation. All of the functions work the same as the "Chron" mode.

Rule: You must have at least 0.12 seconds of time between start *PhotoGate* and finish *PhotoGate*.

KPH/MPH Mode
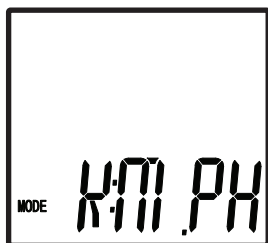
KPH/MPH mode calculates kilometers per hour and miles per hour.
Rule: You must have at least 0.2 seconds of time. And .5 seconds for high accuracy

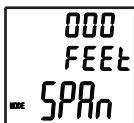At 20 mph the span needs to be 4 feet or more. At 100 mph it is 18 feet or more.

Enter

SEt
MPH

Use *Up Split/Scroll Arrow* to alternate between KPH and MPH.

↑ Split/Scroll

Enter

000
FEEt
SPAn

Scroll to set the number of **feet** or **meters** between the two *Photo-Gates*.

↑ Split/Scroll
↓

Enter

000
0.000

When passing through the start and finish gates, MPH will be seen on the top display and elapsed time on the bottom display. When adding a split, the *TCi-Timer* will show MPH on the top display and advancing *CUM* times on the bottom display. Standard *Memory Review* functions will apply.

BLE ON/Off

On
bLE

If the *TCi-Timer* was purchased with the *Smartphone Interface* the *BLE* mode will allow "On" or "Off". Select "On" to allow the *TCi-Timer* to connect with a Smartp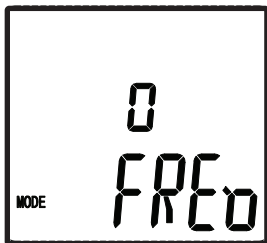hone using the *Brower Timing Test Center App*. Select "Off" to block Smartphone from connecting to the Timer. If the *TCi-Timer* does not have the *Smartphone Interface* installed the mode will display "no BLE." Contact Brower Timing for information on upgrading to the *Smartphone Interface*.

↑ Split/Scroll
↓

Frequency Select Mode

FREQ mode allows the user to change the radio frequency of the timing system. This allows two or more *TCi Systems* to work in the same location. After setting the *TCi-Timer* radio frequency (0-4), the frequency must also be changed to match in *TCi-PhotoGate A* and *TCi-Smart Start*. For the *PhotoGate A* this is done by removing the aluminum case. Locate the blue switch panel and shift a lever to select a frequency. More than one switch cannot be down at the same time. (All switches up is FREQ 0)

On the *TCi-Smart Start,* hold the On/Off button until the unit beeps 3 times and the display shows "FrE," select the frequency number and press **ENTER.**

RSSI Mode
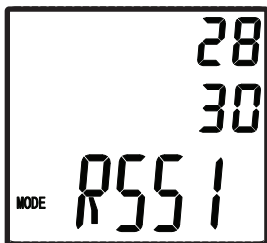
Relative Signal Strength Indicator RSSI Test Mode allows you to self diagnose the distance capability of reception or problems with signal reception.

Problem I occasionally miss a start or stop signal.
Solution Check RSSI to see if their is radio interference at your location. Indoor Interference could come from equipment i.e. machines and computers, or Bluetooth. This may be the case if your RSSI reads 30/40 or higher without your *TCi-PhotoGate A* transmitting.

Problem I need to time distances over 1000 feet, and I want to know if I will get reliable reception.
Solution Set up your *TCi-PhotoGates* and have someone break the beam every three seconds. Go to the desired distance, the RSSI needs to read at least 29/35.

Problem I have noise or other users on my frequency. (38/50)
Solution Try frequency 1, 2, 3 or 4. (Must also be changed in *TCi-Photo-Gate A* and *TCi-Smart Start*.)

TCi-Display

MEMORY/MODE
Button

ON/OFF
Button

The *TCi-Display* is a hands free timer that will display a time until a new time starts. To power on and off the *TCi-Display* hold the **ON/OFF** button

The *TCi-Display* has 10 different modes. To select a mode:

☞ Hold down *MEMORY/MODE* button until the mode number blinks
☞ Press the *MEMORY/MODE* button to scroll through each mode
☞ Hold down *MEMORY/MODE* button to select mode
For modes with a selectable distance:
☞ Scroll to the number of feet or meters between two PhotoGates by pressing the *MEMORY/MODE* button repeatedly
☞ Hold the *MEMORY/MODE* for 3 seconds to select distance

Mode 0: Start and finish.
Mode 1: Start, split and finish.
Mode 2: Continual lap times.
Mode 3: Miles Per Hour (Select distance between 1 and 99 Feet)
Mode 4: Kilometers Per Hour (Select distance between 1 and 30 Meters)
Mode 5: Meters Per Second (Select distance between 1 and 30 Meters)
Mode 6: Displays two split intervals (Curling)
*Mode 7:* Times in 1/1000ths of a second
Mode 8: Times up to 9 Minutes. (Minutes, Seconds, 1/10ths of a Second)
Mode 9: Automatic Mode. Allows for unlimited split times. Time will reset to zero after 5, 10 or 15 seconds

Press the *MEMORY/MODE* button to scroll through the last 10 times. A start will automatically set the *TCi-Display* back to the latest time.

The *TCi-Display* will show **b-Lo** to signal a low battery after power up.

The *TCi-Display* is capable of 5 different radio frequencies (0-4). When powering on, hold the **ON/OFF** button until the *TCi-Display* shows "**CH**" and the channel number. Press the *MEMORY/MODE* button to scroll through the channels. Hold *MEMORY/MODE* to select the channel.
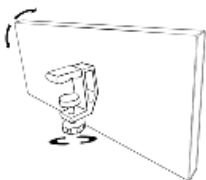
The *TCi-Display* uses 2 AA batteries. To change the batteries remove the 2 silver screws and press on the side label to remove the battery cover.
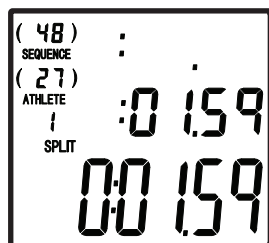
The included mounting clamp attaches to the back of the TC-Display as an adjustable tilt stand.
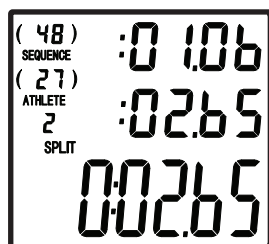
Split Interval Diagram

The following diagrams define, *Split, Segment* and *Cumulative* times.

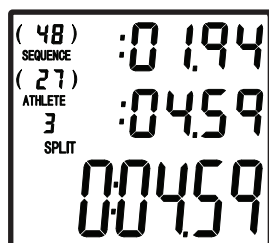| LIVE VIEW	MEMORY REVIEW VIEW
The following examples show what the user will see during a live timing.	The following examples show what the user will see in *Memory Review*.

Split #1

Split #2

Finish
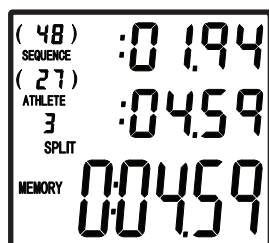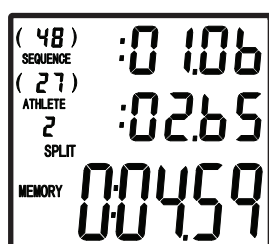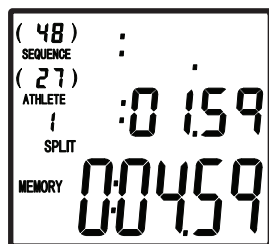
The user is able to navigate the *TCi-Timer's* memory using the *Up* and *Down* arrows. To review split times use *Split/Scroll* arrows. Hold "New" to exit *Memory Review*.

New — Memory Review

Split/Scroll

Start

Segment 1 / Split 1

Split #1

Split 2

Segment 2

Split #2

Cumulative / Split 3

Segment 3

Finish

TCi– Timer Smartphone App

➤ The *TCi-Timer* must have been purchased with the *Smartphone Interface* in order for the *TCi-Timer* to communicate with a Smartphone. To order the *Smartphone Interface* contact Brower Timing at sales@browertiming.com
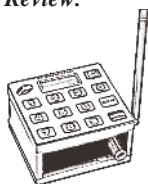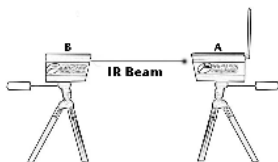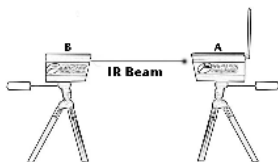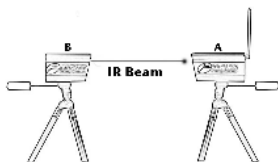
➤ Download the app on a Smartphone at either the iOS App Store or the Google Play Store. The app is free and unlimited to any amount of users.

➤ Create a start list in the app using existing contact or by adding athlete names. Assign an athlete number to each athlete name. The start list can be printed or shared through email, text, or data transfer to athletes or coaches by clicking on Export in the Edit Start List screen.

➤ Make sure the BLE mode is set to "on" in the *TCi-Timer* modes. Turn BLE off to disable Smartphone data transfer and control

➤ From the app, select "Scan for Systems." BROWER TC CH ## will appear, select the system that matches the channel number the *TCi-Timer* is set to.

➤ If there are times already on the *TCi-Timer,* they will be automatically transferred from the *TCi-Timer* to the Smartphone. If not press MANUAL START and watch the athlete number show up on the Smartphone

➤ The Smartphone app creates a Session header for each time the *TCi-Timer* is powered on. Click on the gray session header to assign a start list to the session, name the event, set the date, or make notes about the session.

➤ The Smartphone displays the athlete number and name corresponding to the assigned start list. It also displays the time, rank and the event name and number of the athlete in the session.

➤ Clicking on the athlete reveals up to 20 split times, and the time of day the time. Click again to close the splits.

TCi– Timer Smartphone App

➤ Once the Session has been completed, clicking on the Session Header and selecting EXPORT will allow the user to email, text or data transfer the session result to other Smartphone users with the Brower Timing App or to a PC for further analysis.

➤ The times in a Session can be sorted by Start order, Overall, Event, or Athlete Number

➤ The "NEW ATHLETE" button is a way to run the *TCi-System* completely from a Smartphone. Clicking on NEW ATHLETE brings up a keypad to enter the number of the desired Athlete. A new entry will be created on the Smartphone and the athlete number will be auto updated on the *TCi-Timer*.

➤ The "NEW ATHLETE" button allows athlete numbers to be used without the *TCi-Smart Start* keypad. This is useful when starting times with the *TCi-PhotoGate*.

➤ Press on the Split times to toggle between Segment and Split times

Troubleshooting

Problem One of my timing units does not power up.

Solution 1 All units require you to press and hold the power button for at least 2 seconds to initiate the power up sequence.

Solution 2 Check the battery. The units will warn of a low battery by a red flashing LED on the *TCi-PhotoGate A* or *B*. The *TCi-Smart Start* will show "Lo" on power up . The *TCi-Timer* has a low battery symbol on the LCD. The units work for up to 20 more hours and 5 for the *TCi-Timer* with a low battery. If the unit will not turn on, check for dead battery. See page 20 on how to replace batteries.

Problem My timing system is setup correctly, but the *TCi-Timer* won't receive a signal.

Solution 1 Check to see if all the system components are on the same radio frequency. See FREQ on page 12.

Solution 2 Make sure the *TCi-PhotoGate A* is not in START IN BEAM mode. Turn off the *TCi-PhotoGate A* and when turning back on relase the "ON" button after the first beep.

Problem I occasionally miss signals.

Solution 1 For long range setups see RSSI on page 12.

Solution 2 Setup the *TCi-PhotoGate A* or *B* and set the *TCi-Timer* to the RSSI mode. Trigger the *TCi-PhotoGate* while the *TCi-Timer* is in close range. The RSSI reading should be about (95-114). If the RSSI reading is close to 65 then the frequency channels are not matched correctly. See page 12. If the RSSI reading is below 65 then the radio might be bad or an antenna is broken.

If you are still not sure the system is functioning correctly, call us at 801-572-5540

"I have found a problem, what do I do now?"
If the system has a defect go to:
www.browertiming.com, click repair, and complete instructions to return defective unit.

Multiple System Setup

Up to five TCi systems can be used in the same area by using one of five different radio frequency channels.

The *TCi-Timer, TCi-Display, TCi-Smart Start,* and all *TCi-PhotoGates* must be set to the same frequency.

TCi-Timer: Use the *Mode* button to scroll to the *FREQ* option. Select 0-4

TCi-PhotoGates: Remove the aluminum case.
Locate the blue switch panel and shift a lever.

TCi-Smart Start: when turning the system on, hold the on/off button until "FrE" displays on the screen. Select 0-4 then press *Enter*

TCi-Display: When powering on, hold the **ON/OFF** button until the display shows "**CH**" and the channel number. Press the **MEMORY/MODE** button to scroll through the channels. Hold **MEMORY/MODE** to select the channel.

Note: To avoid confusion mark each component on the outside with it's frequency.

Battery Replacement

TCi-Timer: Remove the battery cover on the lower back of the unit. Install three fresh AAA alkaline batteries. Replace the battery cover. Battery life: 50 hours/40 hours for Smartphone Version

TCi-PhotoGates A & B: Remove the set screw from the base of the unit. Apply pressure to the front of the unit between the lens and buzzer to slide the unit out of its case. Replace three batteries (AAA). Place the unit back into the case and replace the set screw. Battery life: 220 hours

TCi-Smart Start: Remove the set screw on the bottom of the unit. Pull the bottom cap off and replace three AAA batteries. Replace the bottom cap and set screw. Battery life: 50 hours

TC-Display: Remove two small screws from the side of the display. Pull the end cap out of the metal casing to expose a battery pack. Pull the battery pack out of the metal casing. Replace three batteries (AA). Slide the battery pack back into the metal casing with the batteries facing the back side of the Display. Replace the end cap and two small screws. Battery life: 100 hours

Caring For Your System

The TCi system is water resistant but not waterproof. The general rule is if you can train in the weather conditions, the system can function. If it is raining too hard to train, take the system out of the rain. If components get wet, let them air dry before putting them back into the foam holder. If components get really wet, remove batteries until dry. If not using the system for an extended period, remove batteries to prevent leakage and corrosion.

Using the Touch Pad with your feet will accelerate wear

Specifications

Radio: Radio transmission distances up to 850 feet can be received in line of sight applications. Distances can be reduced if *TCi-Timer* is in close proximity to electric motors and computers or *TCi-Timer* is close against a body.
Frequency: 432.8
Timing Accuracy: 1/1000 of a second.
Radio Switch Accuracy: 0.0005 of a second.

Warranty

The BROWER TIMING SYSTEM is backed by a 1 year warranty covering manufacturing defects. Service, whether covered by the warranty or not can be performed and returned quickly. (Express incoming and return shipping charges are not covered by warranty.)

Touch-Pads and Tripods wear out with use and are only covered for 60 days by the warranty.
When returning a BROWER component, go to **www.browertiming.com** and click "Repair"

FCC Regulatory Compliance Information

FCC ID: XVABTS
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

CAUTION: Any changes or modification not expressly approved by Brower Timing Systems could void the user authorization to operate this equipment.

TCi-PhotoGate A **compliance labeling**
This device complies with Part 15 of the FCC Rules:
Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device may accept any interference received, including interference that many cause undesired operation.

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