



Operator's Manual

ReactTime™

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ReactTime Training System Contents

Your ReactTime Training System consists of the following components:

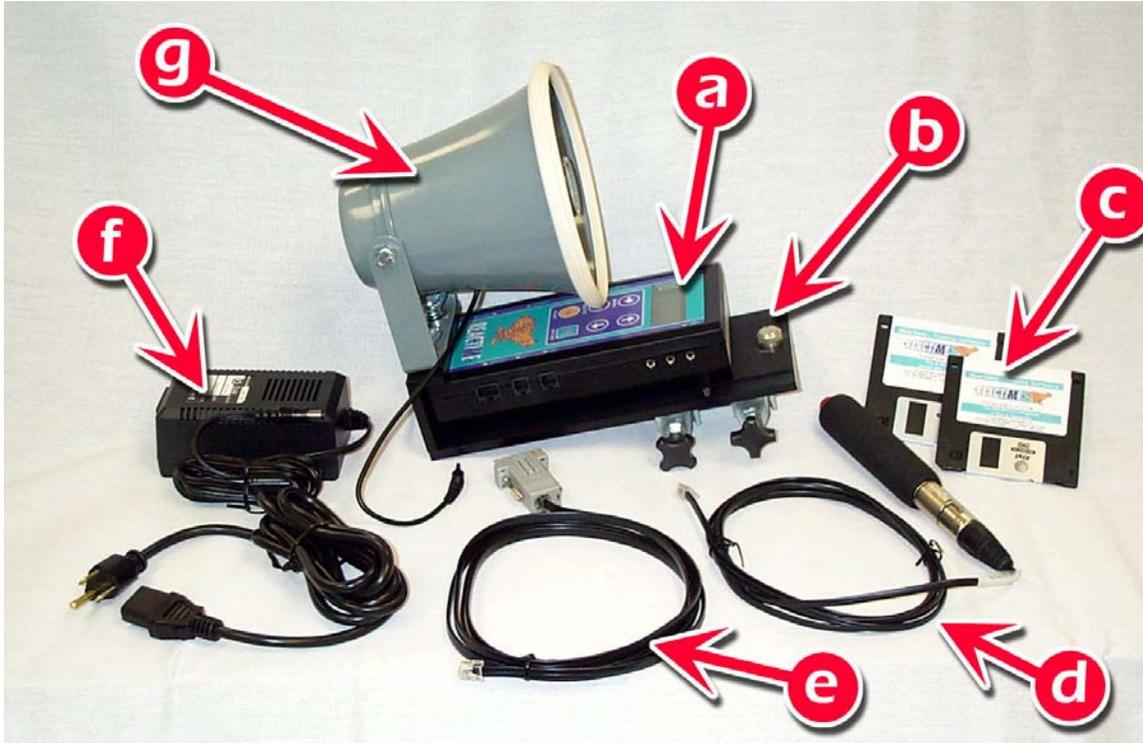


Figure 1: ReactTime Training System contents

- a. Block Sensor
- b. Mounting Plate with Mounting Clamps attached
- c. ReactTime Training Software – 2 floppy disks (license sold separately)
- d. Signal Input Cable with Start Button attached
- e. Serial Cable
- f. Power supply
- g. Loudspeaker

ReactTime Championship System Contents

Your ReactTime Championship System generally contains 8 Block Sensor components and one set of Command Center components. You may have ordered additional equipment not pictured here.

a. Block Sensor components

Each ReactTime Unit that came with your ReactTime Championship System consists of the components pictured here.



a.

b.

c.

- a. Loudspeaker
- b. Mounting Plate
- c. Block Sensor

Figure 2: Block Sensor components

b. Command Center components

Your ReactTime Championship System comes with a single Command Center and several components that connect to it. All of the Command Center components are pictured here.

Note: Some of the items pictured below may be optionally purchased and therefore may not be included with your ReactTime Championship System.



a.

b.

c.

d.



e.

f.

g.

h.

- a. Command Center and power supply
- b. Gun Sensor (connected to Signal Input Cable)
- c. Extra Gun Cable (optionally purchased)
- d. Headsets, including:
 - Official Starter (with two earpieces)
 - Recall Starter (with one earpiece)
 - Two headset cables
- e. Line Printer (optionally purchased), including:
 - power supply

- cable
- f. False Start Cable (for use with a Wired System only)
 - 5.5 meter cable (8 included)
 - 13 meter cable (purchased optionally)
 - 30 meter Command Center Cable (included)
- g. Serial Cable and ReactTime Championship Software (3 floppy disks, license optionally purchased)
- h. System Charger

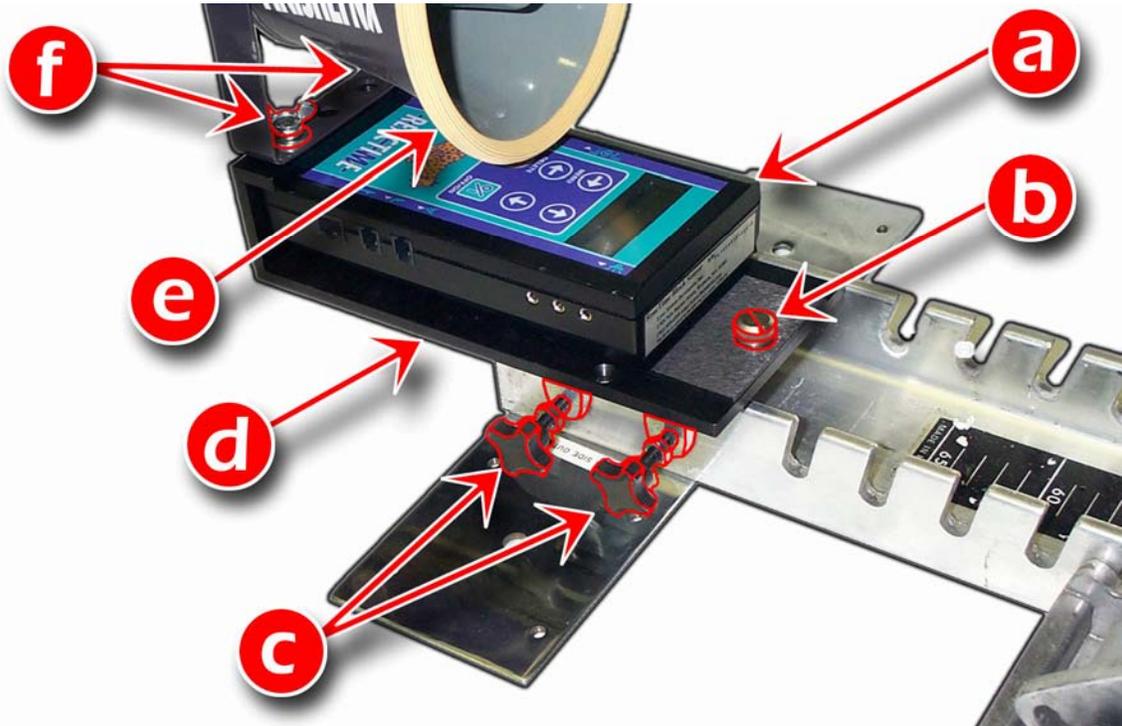
Figure 3: Command Center components

Chapter 1 Mounting Instructions

Before you can start training with your ReactTime Training or Championship System, you must first mount the unit to a starting block. This chapter explains how to mount a ReactTime Unit to a variety of starting blocks.

ReactTime Unit mounting components

A ReactTime Unit includes the mounting components pictured here (see Figure 4).



- a. Block Sensor
- b. Securing screw
- c. Thumbscrews
- d. Mounting Plate
- e. Loudspeaker
- f. Wingbolts and washers

Note: Not pictured are Mounting Clamps secured to Mounting Plate by flathead screws.

Figure 4: ReactTime Unit mounting components

Before you Begin

You need set of starting blocks before proceeding with these instructions. Depending on the starting block type, you may also need a Phillips head screwdriver.

Step 1: Attach the Loudspeaker (Championship System Only)

ReactTime Championship System assembly requires that you attach the Loudspeaker to the Mounting Plate by first removing the wingbolts and washers attached to it. As shown in Figure 5, secure the Loudspeaker to the Mounting Plate using the wingbolts and washers you just removed.



Figure 5: Loudspeaker attachment to a Mounting Plate

Step 2: Clamp the Mounting Plate to a Starting Block

ReactTime Mounting Plates secure to a range of starting block types. Starting block varieties include:

- When clamping a ReactTime Unit to a starting block, it is most important that:
 - The ReactTime Unit clamps securely to the *back* of the starting block
 - The Block Sensor is level and therefore easy to read
 - The Loudspeaker is facing *toward* the athlete

Keeping these points in mind, follow the instructions below:

- a. Select the starting block model pictured in the figures below that is closest to the design of your starting block. If you are mounting a ReactTime Unit to a starting block that does not require that you change the configuration of the Mounting Clamps, skip to step e.
- b. If necessary, detach the Block Sensor from the Mounting Plate by loosening the securing screw.
- c. If necessary, use a Phillips head screwdriver to remove the flathead screws from the Mounting Plate.
- d. If necessary, use the flathead screws to secure the Mounting Clamps to the Mounting Plate in the positions indicated by the clamp configuration figures below.
- e. Securely clamp the Mounting Plate to the rear of the starting block by tightening the thumbscrews.

Note: These pictures do *not* show the Loudspeaker attached to the Mounting Plate.

a. U-Channel

Note: If you are mounting a ReactTime Unit to a U-Channel type starting block, you do *not* need to make any changes to the position of the Mounting Clamps as originally shipped with your ReactTime Training or Championship System.



Figure 6:
U-Channel starting block



Figure 7:
U-Channel Mounting Clamp configuration

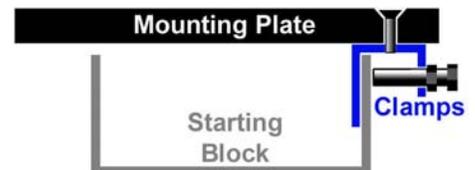


Figure 8:
U-Channel cross-section through Mounting Plate

Step 3: Re-Attach the Block Sensor (if necessary)

If you removed the Block Sensor to re-arrange the Mounting Clamp configuration, re-attach the Block Sensor by tightening the securing screw into the topmost, centered hole at the top of the Mounting Plate. Your properly mounted ReactTime Unit looks like Figure 21 below. This completes the Mounting Instructions for your ReactTime Unit.

To learn how to begin training with your ReactTime Training System, continue to Chapter 2. To learn how to set up your ReactTime Championship System, skip to Chapter 4.



Figure 21: Properly mounted ReactTime Unit

Chapter 2 Training System Setup

Now that you have mounted your ReactTime Training System to a starting block, you are ready to follow the instructions in this chapter to learn how to start training with your ReactTime Training System.

If you have purchased extra items such as a Gun Sensor or single or multiple Photoeyes, or if you want to learn how to link together two ReactTime Training Systems, refer to Step 8: Step 9: and Step 10: at the end of this chapter.

Before you Begin

When you are setting up your ReactTime Training System, you need to know where various cables connect to the Block Sensor. Also, you need to be familiar with the key functions on the Block Sensor keypad. Figure 22 shows the Block Sensor input and keypad labels you will use.

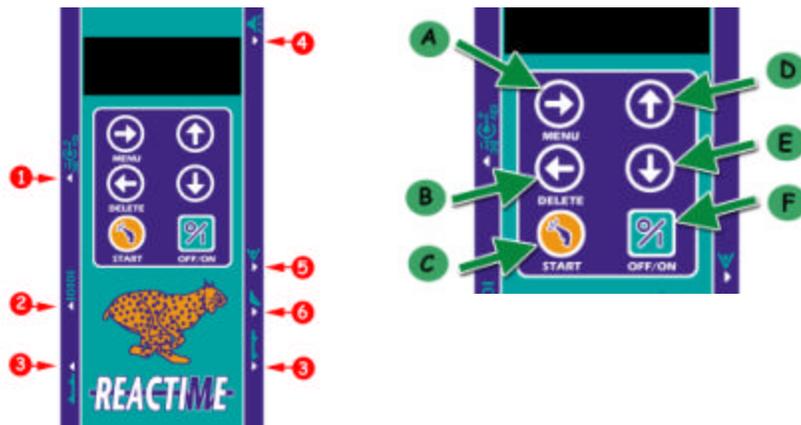


Figure 22: ReactTime Block Sensor inputs and keys

Inputs

1. Power supply
2. Serial Cable
3. False Start Cable (used with ReactTime Championship False Start Detection System *only*)
4. Loudspeaker
5. Photoeye
6. Signal Input Cable (for Start Button or Gun Sensor)

Keys

- A. Menu (scrolls forward to the next menu screen)
- B. Delete (goes back to the previous menu screen; also deletes most recent trial)
- C. Start (triggers the start sequence)
- D. Up arrow (scrolls up to the options within a menu)
- E. Down arrow (scrolls down to the various options within a menu)
- F. Off/On (turns the Block Sensor off and on)

Step 1: Connect the Start Button and Loudspeaker

The Start Button is connected to the Signal Input Cable. Connect the Signal Input and Loudspeaker Cables to the appropriate inputs on the Block Sensor. (See Figure 22.)

When connected, your ReactTime Training Unit looks like Figure 23.



Figure 23: Connected Signal Input and Loudspeaker Cables

Step 2: Power and Turn On the Block Sensor

Note: ReactTime Block Sensors are shipped completely charged, and will work for about eight hours. If you are eager to start training with your ReactTime Training System right away, skip this step and go directly to Step 3: . Follow the instructions in this section to learn how to re-charge the Block Sensor.

You can power your ReactTime Training System using the power supply provided or using built-in rechargeable batteries.

a. Run ReactTime using the power supply provided

Plug one end of the power supply into the input on the side of the Block Sensor (see Figure 22) and plug the other end into a power outlet. Turn on the Block Sensor by pressing and holding the OFF/ON key until the LCD reads, *ReactTime | Ready to Start*.

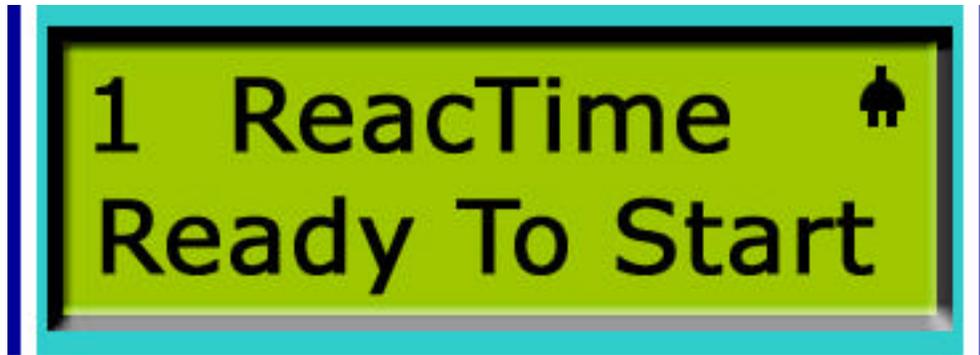


Figure 24: *ReactTime* / *Ready to Start* screen using power supply

b. Run *ReactTime* using built-in batteries

You may run the *ReactTime* Training System using built-in rechargeable batteries when you are not using the power supply. A *ReactTime* Training System running a trial every 4-5 minutes can last for 8 hours on batteries. (**Note:** If you are downloading trials from the Block Sensor onto a computer using the *ReactTime* Training Software, the batteries last less than eight hours.)

Make sure the power supply is unplugged from the power outlet. Then, turn on the Block Sensor by pressing and holding the OFF/ON key until the LCD turns on and reads, *ReactTime* | *Ready to Start*.



Figure 25: *ReactTime* / *Ready to Start* screen using fully charged batteries

c. Recharge the Block Sensor

When the Battery Mode Indicator on the LCD becomes mostly unshaded, the Block Sensor needs to be re-charged. You need about four hours to completely re-charge the Block Sensor. To recharge the Block Sensor, turn the unit off. With the Block Sensor turned off, reconnect the power supply. The LCD reads, "Fast Charging" and after 3 hours changes to "Slow Charging." After about four hours, the LCD dims completely. You will know that the Block Sensor is fully charged when you turn the unit back on and notice that the Battery Mode Indicator is completely shaded (as in Figure 25).

Step 3: Use Randomized or Manually Controlled Intervals

The Virtual Starter feature is a recording of the "On your marks," "Set," and simulated gun sound sequence you trigger by pressing the Start Button or the Start key. By default, the Virtual Starter *randomly* varies the intervals between commands. If you are satisfied with using a randomly varied setting, skip to Step 4: .

If you want to manually control the intervals between commands, follow the steps below. (**Note:** To learn more about the Block Sensor's other menu options, including how to change the randomized interval settings, please refer to Appendix A at the back of this manual.)

- a. Turn on the Block Sensor. The *ReactTime | Ready to Start* screen appears.
- b. Press the Menu key once. Use the up or down arrow keys to scroll through the four menus until you arrive at the *Main Menu | Training* screen. Press the Menu key again.
- c. Scroll through the Training Menu sub-menus using the up or down arrow keys until you arrive at the *Training Menu | Intervals* screen. Press the Menu key once.
- d. Scroll to the *Intervals Menu | Ready->Set Min* sub-menu using the up or down arrow keys. Press the Menu key again. The *Ready->Set Min | 6.0* screen appears.
- e. Press and hold the down arrow key until the setting changes to *Manual*.
- f. Press the Delete key once to go back to the *Intervals Menu | Ready->Set Min* screen. Press the down arrow key twice to view the *Intervals Menu | Set->Gun Min* screen. Press the Menu key once. The *Set->Gun Min | 2.0* screen appears.
- g. Press and hold the down arrow key until the setting changes to *Manual*.
- h. Press the Menu key to arrive at the *ReactTime | Ready to Start* screen. Now you are ready to practice some starts.

Step 4: Practice Starts

Now that you have properly mounted, connected, and configured your ReactTime Training System, you are now ready to practice using it with starts out of the blocks. The instructions that follow can be used by a coach training an athlete (“Coach”) or by an athlete training alone (“Athlete”).

c. Coach

- a. Make sure the Block Sensor is turned on when the athlete settles into the starting blocks.
- b. Push the Start Button *or* the Start key to initiate the Virtual Starter. If you are using the randomized start feature, press once to trigger the entire sequence. If you are using the manually controlled start feature, press the button or key each time you want to trigger the next command or gun sound. After the gun sounds and the athlete leaves the starting blocks, the LCD displays various information about the start, called a trial. Continue to Step 5: to learn how to interpret trial data.

Athlete

We recommend that you use the randomized Virtual Starter feature if you are training alone.

- a. Make sure you have a Start Button connected to the Block Sensor.
- b. Make sure the Block Sensor is turned on before you settle into the blocks.
- c. Press the Start Button once to initialize the Virtual Starter. You will hear the “On Your Marks” and “Set” commands. After the electronic gun sounds and you leave the starting blocks, the Block Sensor LCD displays various information about your start, called a trial. Continue to Step 5: to learn how to interpret trial data.

Step 5: Interpret Trial Data

Information about a start is displayed on the Block Sensor LCD immediately after an athlete leaves the starting blocks.

a. Legal start

After a legal start (when the athlete leaves the blocks *after* the gun sounds), the LCD resembles:

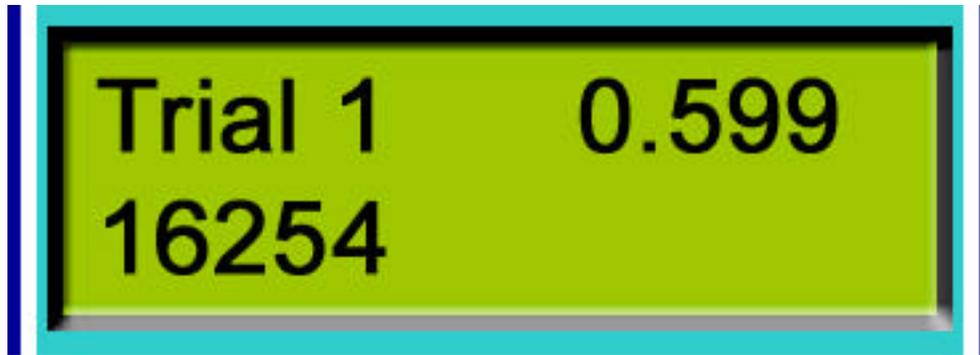


Figure 26: Legal start

- Trial 1: number of the trial just completed.
- 0.599 (number in the upper right corner): reaction time recorded, or the amount of time it took the athlete to leave the starting blocks.
- 16254 (number in the lower left corner): power exerted when the athlete left the starting blocks. A higher number indicates more power. (Note that the power value is *relative* and not absolute.)

b. False start

After a false start (when the athlete leaves the blocks less than .10 seconds after the gun sounds), the LCD resembles:

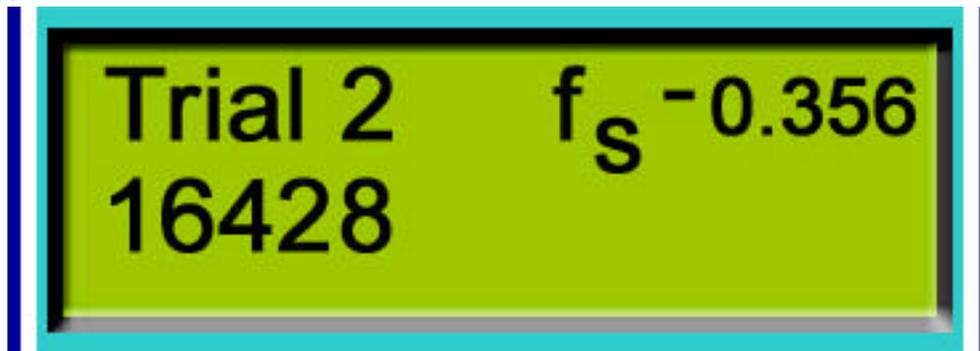


Figure 27: False start

- $f_s - 0.356$ (Decimal number in the upper right corner): false start reaction time recorded, or the time in which the athlete left the starting blocks before the gun sounded.

Step 6: Review trials

After you have practiced a few starts, scroll through each trial from the *ReacTime | Ready to Start* screen by pressing the up and down arrow keys.

Step 7: Delete trials

NOTE: When you delete trials from the Block Sensor, note there is no way to "undo" deleted trials.

- To delete the most recently recorded trial, scroll to make sure that trial appears on the LCD and then press the Delete key.
- To delete all trials stored in the Block Sensor, go to the *Training Menu | Delete Trials* screen. Press the Menu key once. The *Delete Trials Menu | Hit ?To Confirm* screen appears. Press the up arrow key once. The *Delete Trials | Trials Deleted* screen appears, confirming that all of the trials in the Block Sensor have been erased.

Step 8: (Optional) Use an External Gun Sensor

Follow the instructions in this section if you are using an external Gun Sensor instead of the Start Button with the Virtual Starter.

a. Connect the Gun Sensor to the Block Sensor

Remove the Start Button connected to the end of the Signal Input Cable, and replace it with the Gun Sensor. Plug the Signal Input Cable into the input on the Block Sensor (see Figure 22).

b. Change Block Sensor settings

After you have connected a Gun Sensor to the ReactTime System, you must configure the Block Sensor to work with the type of Gun Sensor you are using.

Note: When using a Gun Sensor, it is recommended that you set the *Intervals* menu in the Block Sensor to *Manual*. Follow the instructions in Step 3: earlier in this chapter to set the *Intervals* menu to manual.

- a. At the *Main Menu | Training* screen, press the Menu key.
- b. Scroll through the Training Menu sub-menus using the up or down arrow keys until you arrive at the *Training Menu | Gun Source* screen. Press the Menu key once.
- c. If you are using a normally closed Gun Sensor, scroll to the *Gun Source | Norm. Closed* screen. If you are using a normally open Gun Sensor, scroll to the *Gun Source | Norm. Open* screen. Once you have made your selection, press the Menu key once to return to the *ReactTime | Ready to Start* screen.

Step 9: (Optional) Use a Single or Multiple Photoeyes

With each ReactTime Training System, you may train with as many as 10 Photoeyes. Follow the instructions in this section to do the following:

- a. Set up a Photoeye
- b. Connect multiple Photoeyes together
- c. Change Block Sensor settings

a. Set up a Photoeye

- a. Choose a place on the track where you want to record the athlete's time out of the starting blocks to the first beam break. (For example, the 10-meter mark.)
- b. Unfold both Photoeye tripods, extending the legs so that the top of each tripod is as high as the athlete's torso.
- c. Lock the legs by flipping the levers at the feet of the tripod.
- d. Place the tripod with the reflector on one side of the lane, with the front of the reflector facing the Photoeye tripod.
- e. Place the tripod with the Photoeye on the other side of the lane, facing the reflector tripod. Make sure each tripod is at approximately the same height.
- f. Connect the extra Signal Input Cable that came with the Photoeye to the Photoeye Cable. (You are already using the Signal Input Cable that came with your ReactTime Training System for the Start Button or Gun Sensor.)

Note: You may extend the Photoeye Cable by connecting it to a standard Lynx Gun Cable or to any 3-pin XLR cable.

- g. Connect the other end of the Signal Input Cable to the Block Sensor Photoeye input (see Figure 22).
- h. Angle the Photoeye toward the reflector until the red light on the side of the Photoeye appears constant.

- i. Have someone run through the beam once. Watch to see that the red light turns off briefly that person breaks the beam. Your Photoeye is now properly set up. If you are using more than one Photoeye, go to b. Otherwise, go directly to c.

b. Connect multiple Photoeyes together

If you are using more than one Photoeye with your ReacTime Training System, you need to use a Y Splitter Cable to connect the Photoeyes together.

- a. Connect each female end of the Y Splitter Cable to each Photoeye Cable.
- b. Connect the Signal Input Cable to the male end of the Y Splitter Cable.
- c. Connect the open end of the Signal Input Cable to the Block Sensor Photoeye input.

Note: If you are working with two athletes, it is recommended that you leave one lane of length in between each athlete so that you have enough room for the Photoeye tripod setup. For example, train your athletes out of lanes two and four, leaving lane three open.

c. Change Block Sensor settings

When you are using the ReacTime Training System and one or more Photoeyes, you must configure the Photoeye menu on the Block Sensor. Follow these instructions:

- a. At the *Main Menu | Training* screen, press the Menu key.
- b. Scroll through the Training Menu sub-menus using the up or down arrow keys until you arrive at the *Training Menu | Photoeye* screen. Press the Menu key once.
- c. Scroll through the Photoeye sub-menus until you arrive at the *Photoeye Menu | Type* screen. Press the Menu key once.
- d. Scroll to choose *Type | Norm. Open* or *Norm. Closed*. (**Note:** If you are using a Lynx Photoeye, Normally Open is the correct type.) After making your selection, press the Delete key once.
- e. Scroll through the Photoeye sub-menus using the up or down arrow keys until you arrive at the *Photoeye Menu | Number* screen. Press the Menu key once.
- f. Use the up and down arrow keys to set the number of Photoeyes you are training with (between 1-10).
- g. Press the Menu key once to arrive back at the *ReacTime | Ready to Start* screen.

Now you are ready to practice starts using your ReacTime Training System with one or more Photoeyes. The Block Sensor LCD lists in the lower right corner the time it took the athlete to travel from the starting block to the first beam break. If you are using more than one Photoeye, all of the beam breaks are shown in a paging, sequential display in the LCD's lower right corner (see Figure 28). Each number represents the time it took the athlete to travel from the starting blocks to the corresponding beam break.

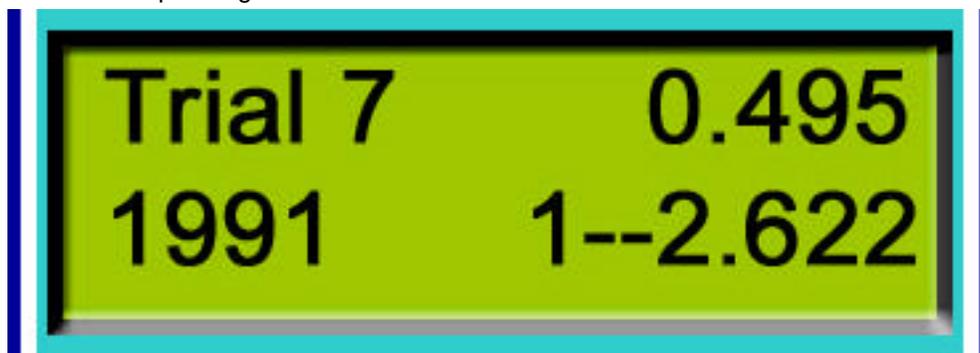


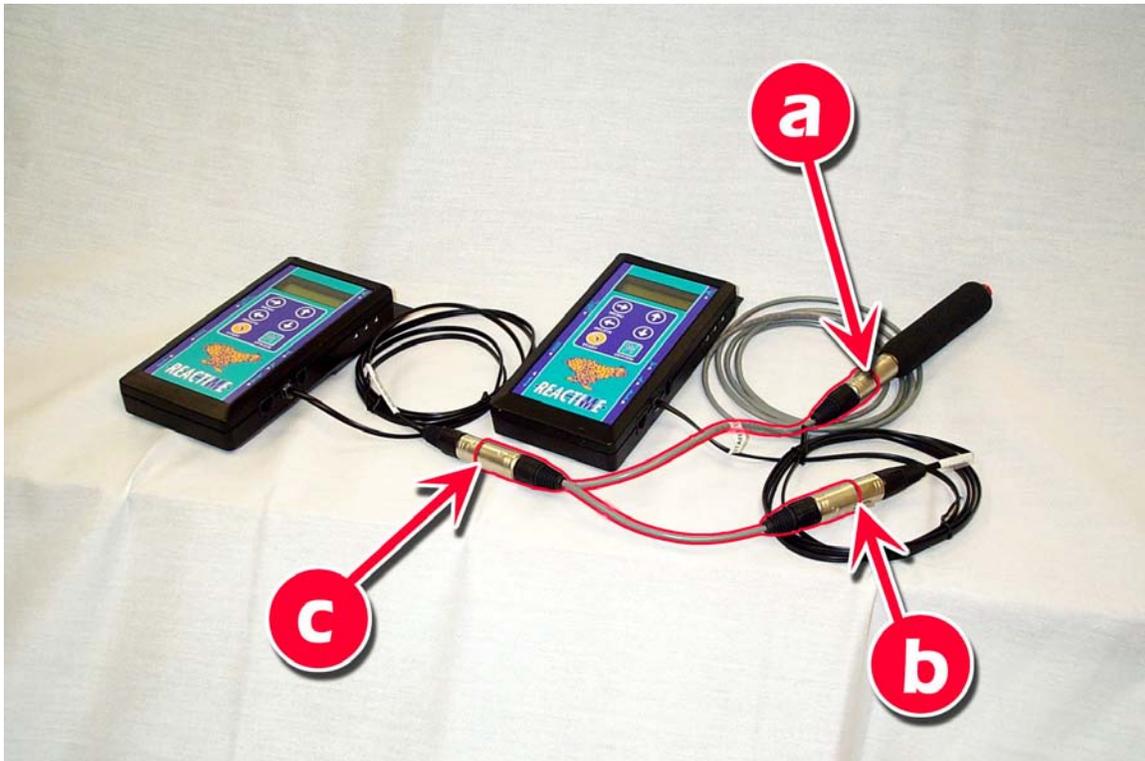
Figure 28: LCD showing a beam break reading

- 1--2.622 = first beam break value

Step 10: Link Two ReactTime Training Systems Together

Link two ReactTime Training Systems together when you want to compare the reaction times of two athletes. When two ReactTime Systems are linked, it is recommended that you manually trigger the start sequence or use an external gun with a Gun Sensor to simultaneously start the two Block Sensors.

(For instructions on connecting an external Gun Sensor, please refer to Step 8: .)



- a. Insert a Start Button or Gun Sensor to the only female end of the Input Splitter Cable.
- b. Attach one Signal Input Cable to one male end of the Input Splitter Cable.
- c. Attach the other Signal Input Cable to the remaining male end of the Input Splitter Cable.
- d. (Not labeled) Connect the Signal Input Cables to the gun inputs on the Block Sensors (label 6 on Figure 22).

Figure 29: Two ReactTime Training Systems linked together

What next?

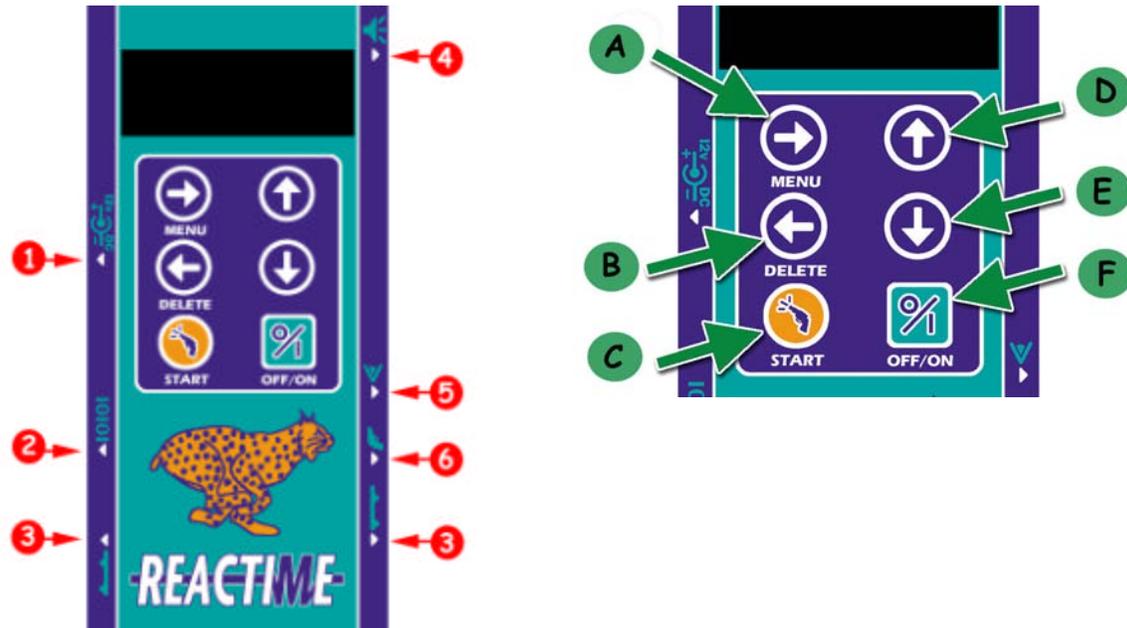
After you have practiced a few starts with your ReactTime Training System, refer to Chapter 3 for the following:

- To learn how to use the complete version of the ReactTime Training Software if you have purchased a software license
- To learn how to use the demo version of the ReactTime Training Software if you have *not* purchased a software license

Chapter 4 Championship System Setup

In this chapter, you will learn how to set up your ReactTime Championship False Start Detection System.

The images below diagram the inputs and keys for the Block Sensors and Command Center. You'll need to be familiar with these diagrams when you follow the setup instructions in this chapter.



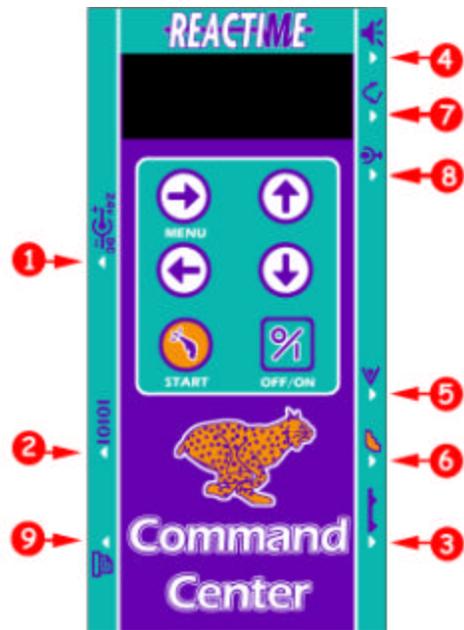
Inputs

1. Power supply (Used only with ReactTime Training System)
2. Serial Cable
3. False Start Cable
4. Loudspeaker
5. Photoeye (Used only with ReactTime Training System)
6. Gun Sensor

Keys

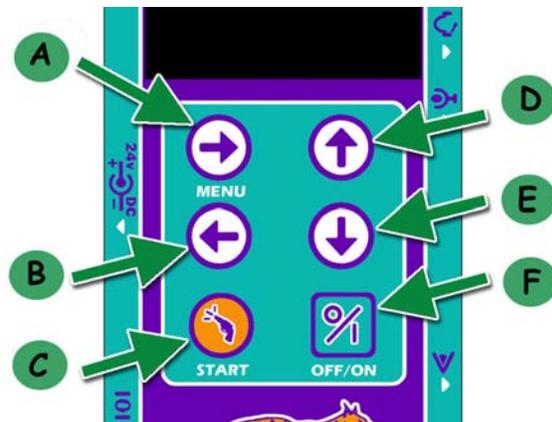
- A. Menu (scrolls forward to the next menu screen)
- B. Delete (goes back to the previous menu screen)
- C. Start (used only with ReactTime Training System)
- D. Up arrow (scrolls up to the options within a menu)
- E. Down arrow (scrolls down to the various options within a menu)
- F. Off/On (turns the Block Sensor off and on)

Figure 37: Block Sensor inputs and keys



Inputs

1. Power Supply
2. Serial Cable (to computer)
3. Command Center Cable (from Lane 1)
4. Recall Starter's Headset
5. Signal Input Cable connected to a Start Button (optional)
6. Gun Sensor
7. Official Starter's Headset
8. Blank Input (reserved for future use)
9. Line Printer (optional)



Keys

- A. Menu (scrolls forward to the next menu screen)
- B. Back arrow (goes back to the previous menu screen)
- C. Start (triggers the start sequence)
- D. Up arrow (scrolls up to the options within a menu)
- E. Down arrow (scrolls down to the various options within a menu)
- F. Off/On (turns the Command Center off and on)

Figure 38: Command Center inputs and keys

Step 1: Set Up the ReactTime Units on the Track

- a. After you have mounted the ReactTime Units to the starting blocks you will use during your competition, lay out the starting blocks in their proper places on the track.
- b. On each Block Sensor, connect each Speaker Cable to the appropriate Block Sensor input (label 4 in Figure 37).
- c. If you are using a Wired ReactTime Championship System, connect each Block Sensor together with a False Start Cable (label 3 in Figure 37).

Step 2: Set Up the Command Center on the Side of the Track

This section describes the setup of the required components as well as optionally purchased components.

a. Required setup

- a. Place the Command Center on the inside of the track, close to Lane 1.

- b. Connect the Signal Input Cable attached to the Gun Sensor to the appropriate input on the Command Center (label 6 in Figure 38).
- c. Connect the Command Center Cable to the Block Sensor in Lane 1 (label 3 in Figure 37) and the appropriate input in the Command Center (label 3 in Figure 38).
- d. Connect a Headset Cable to the Official Starter's Headset (the Headset with two ear pieces) and connect the other end to of the Headset Cable to the appropriate input on the Command Center (label 7 in Figure 38).
- e. Connect a Headset Cable to the Recall Starter's Headset (the Headset with one ear piece) and connect the other end of the Headset Cable to the appropriate input on the Command Center (label 4 in Figure 38).

b. Optional set up

If you have purchased any of the following items, follow the instructions in this section to connect them.

Extra gun cable

You may want to connect extra gun cable to your Championship System to give the Official Starter greater range.

- a. Connect the Signal Input Cable to the extra gun cable.
- b. Connect the other end of the Signal Input Cable to the input on the Command Center (label 5 in Figure 38).
- c. Connect a Gun Sensor to the open end of the gun cable.

Line Printer

Please consult the manufacturer's operation manual that came with your Line Printer if you have specific questions not covered in this section.

- a. Connect the printer cable to the Line Printer.
- b. Connect the Line Printer power supply to the Line Printer.
Note: The Line Printer can also run with battery power.
- c. Connect the open end of the printer cable to the input on the Command Center (label 9 in Figure 38).

Step 3: Power On the Block Sensors

You can run the Block Sensors on their own battery power or using the Command Center power supply.

a. (Optional) Run the Block Sensors with battery power

Your ReactTime Championship System comes with all eight Block Sensors and the Command Center fully charged. When not uploading trials to a computer using the Championship Software, a fully charged ReactTime Championship System lasts about:

- 2 hours when used with a **wireless** system running a race about every five minutes.
- 8 hours when used with a **wired** system running a race about every five minutes.

Therefore, depending on whether you are using a wireless or wired ReactTime Championship System, you can run a system on battery power for either 2 or 8 hours, respectively. Please refer to Chapter 5 to learn how to recharge the Block Sensors and Command Center.

To run the Block Sensors with battery power:

- a. Turn on all Block Sensors by pressing and holding the OFF/ON key (label F in Figure 37).
- b. Each LCD turns on and looks like Figure 39.

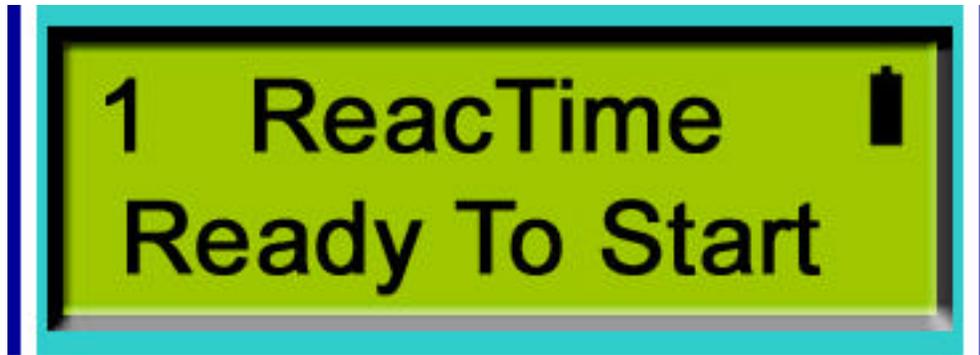


Figure 39: *ReacTime* / *Ready to Start* screen using fully charged batteries

b. (Optional) Run the Block Sensors with the Command Center power supply

If you have access to power at the track using a **wired** system, you can use electrical power rather than relying on the battery charge. With a **wired** system, you can power all eight Block Sensors using a single Command Center power supply.

- a. Connect the Command Center power supply to the appropriate input (label 1 in Figure 38).
- b. Plug the power supply into an electrical outlet. All eight Block Sensors are powered automatically.
- c. Turn on all Block Sensors by pressing and holding the OFF/ON key (label F in Figure 37).
- d. Each LCD turns on and looks like Figure 40.

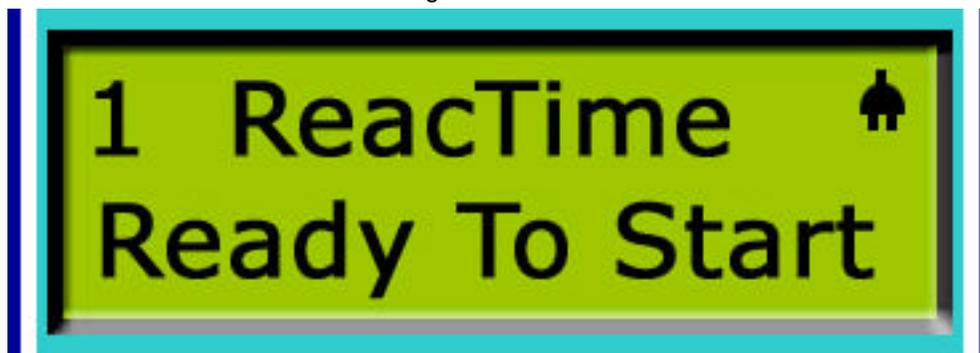


Figure 40: *ReacTime* / *Ready to Start* screen using power supply

Step 4: Configure the Block Sensors

After you have decided how to power your Block Sensors (either with battery or electrical power) and after you have turned on all of the Block Sensors, you must configure each Block Sensor to work during the competition. Repeat the steps listed below for each Block Sensor you have set up in a lane on the track.

- a. Assign **lane numbers** to each Block Sensor.
 1. Press the Menu key once.
 2. Press the up and down arrows until you arrive at the *Main Menu* | *System* screen.
 3. Press the Menu key once.
 4. Scroll until you arrive at the *System Menu* | *Lane Number* screen.
 5. Press the Menu key once.
 6. At the *Lane Number* | *1* screen, press the up arrow key to increment the lane number.
 7. After you have chosen the desired lane number, press the Menu key once more to arrive at the *ReacTime* | *Ready to Start* screen. Note that the lane number you just selected appears in the upper left corner of the LCD (see Figure 40).

- b. Assign the **network type** to each Block Sensor.
 1. Press the Menu key once.
 2. Press the up and down arrow keys until you arrive at the *Main Menu | System* screen.
 3. Press the Menu key once.
 4. Scroll until you arrive at the *System Menu | Network Type* menu. Press the Menu key once.
 5. Scroll to choose *Network Type | Wired* or *Network Type | Wireless*.

Step 5: Configure the Command Center

After you have configured the Block Sensors, configure the Command Center by following these steps.

- a. Turn on the Command Center by pressing and holding the OFF/ON key.
- b. Change the **lane number** configuration.
 1. Press the Menu key once.
 2. Press the up and down arrow keys until you arrive at the *Main Menu | System* screen.
 3. Press the Menu key once. The *System Menu | Number of Lanes* screen appears.
 4. Press the Menu key once. Scroll to choose the correct number of lanes.
 5. Press the Menu key again to return to the *ReactTime | Ready to Arm* screen. The upper left corner of the Command Center LCD shows the number of lanes being used.
- c. Review the Command Center's **default settings**. The list below describes the default settings that were programmed into your Command Center. If you need to change any of these settings, please refer to Appendix B at the back of this manual.
 - *Network Type*: Wired
 - *Remote Volume*: 6
 - *Headset Squelch*: 5
 - *Headset Volume*: 5
 - *Fire Recall*: No
 - *Detection*:
 - *Active Time*: -0.3 From Gun
 - *Threshold*: Normal
 - *Gun Sensor*
 - *Type*: Norm. Closed
 - *Armed In Ready*: Yes
- d. When you have finished configuring the Command Center, continue on to Chapter 5.

Chapter 5 Championship System Operation

The instructions below are written for two individuals to follow during a competition: an **Official Starter** and a **Fire Recall Starter**, who also operates the ReactTime Command Center and the Championship Software, if used. (Please refer to Chapter 6 for Championship Software operating instructions.)

The Official Starter's Headset has microphone audio ability but the Fire Recall Starter's Headset does not. Note that in the absence of a Fire Recall Starter, there may be a **Starter's Assistant** operating the ReactTime Championship System, or the Official Starter may be following all of the steps below without assistance.

Note: You can use a Start Button connected to a Signal Input Cable plugged into the Photoeye input on the Command Center to perform the same functions as the Start key in the instructions below. The Start Button and extra Signal Input Cable this requires may be purchased optionally.

Step 1: Operate the Competition

- a. **Fire Recall Starter:** Confirm that the Command Center and all Block Sensors are powered on and the LCD is visible in all screens.
- b. **Fire Recall Starter:** Confirm that the lane numbers indicated on the Block Sensors are correct.
- c. **Fire Recall Starter:** Note that the LCD on the Command Center indicates the number of Block Sensors configured in the top left corner.
- d. **Fire Recall Starter:** Press the Start button on the Command Center once to enter Standby phase.
- e. **Official Starter and Recall Starter:** Hear in the Headset a single beep, indicating Standby phase. This tone is *not* relayed over the athletes' Loudspeakers.

The Official Starter's microphone and athlete Loudspeakers are now enabled.

Note: The microphone will stay active until two seconds after the gun is fired.

- f. **Official Starter:** Bring the athletes to their blocks.
- g. **Official Starter:** Bring the athletes to the Set position.
- h. **Fire Recall Starter:** Press the Start button again to enter the Active phase.

Official Starter: Hears a double-beep in the Headset, indicating a "Set" tone. Again, this tone is not relayed over the athletes' Loudspeakers.

At this point, if the gun is not fired within three (3) seconds, a warning tone (rapid warning beeps) sounds. If the gun is fired after the warning tone, reaction times will be recorded, but no traces will be stored. To avoid this, the Fire Recall Starter may return the system to the "Standby" phase by pressing the Start key again.

- i. **Official Starter:** Fire the gun.

Reaction times are displayed on each Block Sensor's LCD immediately after a start.

Note: As soon as the Fire Recall Starter presses the Start key again, these times disappear from the LCD's.

If a false start (as defined by IAAF rules) occurs, the Official Starter and the Fire Recall Starter hear three strong tones.

Note: The ReactTime Championship System emits an electronic gun tone automatically if the Fire Recall setting is turned on. The electronic gun tone will sound from all of the athletes' Loudspeakers in the event of a false start. (Please refer Appendix B at the back of this manual to learn how to enable the Fire Recall option.)

If the Line Printer is connected to the Command Center printer input, reaction times for all of the athletes are printed automatically just after the gun.

System errors and warning tones

The Starters may hear certain warning tones during a competition. This section describes the various warning tone indications.

- **Repeated beeps:** If the Starter hears repeated beeps, a Block Sensor or cable connection failure is indicated. The Starter should check all Block Sensors that they are correctly configured with the proper lane number, and that all cables are connected.
- **Single warning tone:** The controls on the Block Sensors are locked out to prevent athlete interference. Any attempt to disconnect the Block Sensor is signaled by a warning tone in the Starter's Headset.
Note: When the Block Sensors are in "Athlete Lockout Mode," you can get out of this mode by holding the Delete key and the Off/On key simultaneously for 5 seconds and the Block Sensor will turn off.
- **Three strong beeps:** A false start is indicated by three strong beeps in the Starter's Headset.

Step 2: Recharge the ReactTime Championship System

After the competition, you should recharge your Block Sensors and Command Center if you were running the ReactTime Championship System with battery power. You can do this using the System Charger that came with your ReactTime Championship System (see Figure 41).

- a. Turn OFF all Block Sensors and the Command Center.
- b. Plug the System Charger power supply into an electrical outlet.
- c. Connect all Block Sensors and the Command Center to the System Charger.
- d. Wait at least four hours until all Block Sensors and the Command Center are completely charged. (You will know when a unit is fully charged when you disconnect it from the System Charger and turn it on, and the battery icon in the top right corner of the LCD is completely shaded.)



Figure 41: System Charger connections

Appendix A: Block Sensor Menu Reference

Below are the most frequently asked questions about changing Block Sensor settings. This section is followed by a Block Sensor Menu Reference section, which displays the function and path of every menu in the Block Sensor.

Block Sensor Menu Frequently Asked Questions

How do I change the volume of the Loudspeaker?

- Start at the *ReactTime | Ready to Start* screen. Press the Menu key once.
- Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen. Press the Menu key once.
- Scroll until you arrive at the *Training Menu | Volume* screen. Press the Menu key once.
- Press the up arrow key to increase volume; press the down arrow key to decrease volume.

What do I do if I want to manually control the Virtual Starter feature?

- Start at the *ReactTime | Ready to Start* screen. Press the Menu key.
- Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen. Press the Menu key.
- Scroll until you arrive at the *Training Menu | Intervals* screen. Press the Menu key.
- Scroll until you arrive at the *Intervals Menu | Ready→Set Min* screen. Press the Menu key.
- Press and hold the down arrow key until *Manual* appears on the screen. Press the Delete key.
- Scroll until you arrive at the *Intervals Menu | Set→Gun Min* screen. Press the Menu key.
- Press and hold the down key until *Manual* appears on the screen.

How do I delete all of the trials on the Block Sensor?

- Start at the *ReactTime | Ready to Start* screen. Press the Menu key.
- Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen. Press the Menu key.
- Scroll until you arrive at the *Training Menu | Delete Trials* screen. Press the Menu key.
- At the *Delete Trials | Hit ?to Confirm* screen, press the up arrow key.

What do I need to change in the Block Sensor settings if I am using a Gun Sensor instead of a Start Button?

- Start at the *ReactTime | Ready to Start* screen. Press the Menu key.
- Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen. Press the Menu key.
- Scroll until you arrive at the *Training Menu | Gun Source* screen. Press the Menu key.
- At the *Gun Source | Internal* screen, press the up arrow key once for *Norm. Open*; press the up arrow key twice for *Norm. Closed*.

What do I do to enable a second electronic gun sound to be fired in the event of a false start?

- At the *ReactTime | Ready to Start* screen, press the Menu key.
- Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen. Press the Menu key.
- Scroll until you arrive at the *Training Menu | Fire Recall* screen. Press the Menu key.

- d. At the *Fire Recall | No* screen, press the up arrow key once to change to *Yes*.

How do I see what version of firmware I am running on my Block Sensor?

- a. At the *ReactTime | Ready to Start* screen, press the Menu key.
- b. Press the up and down arrow keys until you arrive at the *Main Menu | About* screen. Press the Menu key.
- c. Press the up and down arrow keys until you arrive at the *About | S/W: [version number]* screen.

Block Sensor Menu Reference

Your ReactTime Block Sensor contains four main menus:

- Training
- About
- Settings
- System (used only for operation with a ReactTime Championship False Start Detection System)

The functions for the settings in each menu and steps for how to change each setting are described in the tables below.

Training Menu

Most of the Block Sensor settings you will change are part of the Training Menu. The path for each setting begins at the *Training Menu | [Sub-Menu]* screen. To get there:

- a. From the *ReactTime | Ready to Start* screen, press the Menu key once.
- b. Press the up and down arrow keys until you arrive at the *Main Menu | Training* screen.
- c. Press the Menu key once.
- d. Press the up and down arrow keys until you arrive at the sub-menu in the table below. Then follow the path to change each setting.

The default for each setting appears in the last column of each table. The default settings are recommended settings. If you are not sure whether or not to change a setting, leave it at its default.

Sub-Menu	Function	Path	Default
Training Menu Volume	Changes volume of the Virtual Starter out the Loudspeaker.	Press the Menu key once. Press the up and down arrow keys to choose a number between 1 (softest) and 10 (loudest).	7
Training Menu Delete Trials	Deletes all of the trials on the Block Sensor. Cannot be undone.	Press the Menu key once. Press the up arrow key once to delete all trials.	N/A
Training Menu Photoeye	Allows configuration of the Block Sensor for use with a Photoeye.	Press the Menu key once. Press the up and down arrow keys to scroll to one of the following selections: Type , Debounce and Number .	N/A
	Photoeye Menu Type:	Press the Menu key once. Press	Norm. Open

Sub-Menu	Function	Path	Default
	Select Norm. Open or Norm. Closed , according to your Photoeye type.	the up and down arrow keys to scroll to the selection.	
	Photoeye Menu / Debounce: Allows the degree of debounce to be changed when an athlete runs through a Photoeye.	Press the Menu key once. Press the up and down arrow keys to raise or lower the debounce setting. (The minimum setting is 0.2 .)	0.3
	Photoeye Menu / Number: Allows you to set the number of Photoeyes you are using with each Block Sensor.	Press the Menu key once. Use the up and down arrow keys to choose a number between 1 and 10 .	1
Training Menu / Fire Recall	Allows you to enable the automatic "firing" of a second gun sound in the event of a false start.	Press the Menu key once. Use the up and down arrow keys to select Yes (enabled) or No (off).	No
Training Menu / Detection	Allows you to set the aggressiveness with which a false start is detected.	Press the Menu key once. Press the up and down arrow keys to set the Active Time or Threshold .	
	Detection Menu / Threshold	Press the Menu key once. Press the arrow keys to choose Normal (recommended for most athletes) or Aggressive (recommended for lightweight athletes, such as high school girls).	Normal
	Detection Menu / Active Time	Press the Menu key once. Press the up and down arrow keys to change the amount of time an athlete may move in the blocks (from -2.0 seconds before the gun fires to a minimum of 2.0 seconds after the set command).	-0.3 From Gun
Training Menu / Gun Source	Allows you to set the source of the gun command.	Press the Menu key once. Press the up and down arrow keys to select Internal	Internal

Sub-Menu	Function	Path	Default
		(when using the Start Button), Norm. Open or Norm. Closed (depending on your Gun Sensor type).	
Training Menu / Intervals	Allows you to set minimum and maximum lengths of time between pieces of the start sequence used by the Virtual Starter feature.	Press the Menu key once. Press the up and down arrow keys to arrive at the Intervals Menu selections (Ready→Set Min, Ready→Set Max, Set→Gun Min, Set→Gun Max.)	
	Intervals Menu / Ready→Set Min. Allows you to set the minimum amount of time that will occur between the Virtual Starter's Ready and Set commands.	Press the Menu key once. Use the up and down arrow to select a number (2.0 is the lowest). If you are using <i>manually controlled intervals</i> , hold down the down arrow until you arrive at the Manual setting.	6.0
	Intervals Menu / Ready→Set Max	Press the Menu key once. Press the up and down arrow keys to set the maximum amount of time between the Ready and Set commands. (2.0 seconds is the minimum.)	8.0
	Intervals Menu / Set→Gun Min	Press the Menu key once. Press the up and down arrow keys to set the minimum amount of time between the Set and Gun commands. (1.0 seconds is the minimum.) If you are using <i>manually controlled intervals</i> , hold down the down arrow until you arrive at the Manual setting.	2.0
	Intervals Menu / Set→Gun Max	Press the Menu key once. Press the up and down	3.0

Sub-Menu	Function	Path	Default
		arrow keys to select the maximum number of seconds between the Set and Gun commands (1.0 seconds is the lowest).	

About Menu

The About Menu is not configurable. It is used to tell you what version of software (firmware) and hardware your Block Sensor is currently running.

- From the *ReactTime | Ready to Start* screen, press the Menu key once.
- Press the up and down arrow keys until you arrive at the *Main Menu | About* screen.
- Press the Menu key again. Scroll until you arrive at one of two screens telling you which version of hardware and software (firmware) you are running:
 - About | H/W: 4.10*
 - About | SW: 1.20*

Settings Menu

The Settings Menu is used to change the contrast of the Block Sensor LCD and to tell you how much battery power remains.

- From the *ReactTime | Ready to Start* screen, press the Menu key once.
- Press the up and down arrow keys until you arrive at the *Main Menu | Settings* screen.
- Press the Menu key once. Scroll until you arrive at:
 - the *Settings Menu | Contrast* screen. Press the Menu key once. The default Contrast setting is 6. Press the up and down arrows to change the contrast (0=dimmiest, 10=darkest).
 - the *Settings Menu | Battery Level* screen. Press the Menu key once to see where your battery level is (100% = completely charged battery).

System Menu

The System Menu is only used with a ReactTime Championship False Start Detection System to specify the network type (Wired or Wireless) or to assign a lane number to a Block Sensor.

- From the *ReactTime | Ready to Start* screen, press the Menu key once.
- Press the up and down arrow keys until you arrive at the *Main Menu | System* screen.
- Press the Menu key once. Scroll until you arrive at the *System Menu | Lane Number* screen.
- Press the Menu key once. Scroll to choose the correct lane number (1-10).
- Press the Delete key once. Scroll to choose the *System Menu | Network Type* screen.
- Press the Menu key once. Scroll to choose the correct network type (Wired or Wireless).

Appendix B: Command Center Reference (Championship System Only)

Below are the most frequently asked questions about the Command Center functions and changing its settings.

How do I adjust the volume in the Starters' Headsets?

- a. Start at the *ReactTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | System* screen.
- c. Scroll until you arrive at the *System Menu | Headset Volume* screen.
- d. Press the Menu key once.
- e. Scroll to adjust the volume to a number between 0-10 (0=softest, 10=loudest).

How do I adjust the volume in the competitors' Block Sensors?

- a. Start at the *ReactTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | System* screen.
- c. Scroll until you arrive at the *System Menu | Remote Volume* screen.
- d. Press the Menu key once.
- e. Scroll to adjust the volume to a number between 0-10 (0=off, 10=loudest). This adjusts the volume on *all* of the Block Sensors connected to the Command Center.

How do I enable the Fire Recall setting?

The Fire Recall setting, which fires a second (internal) gun sound when a false start is detected, can be enabled by following these steps:

- a. Start at the *ReactTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | System* screen.
- c. Press the Menu key once.
- d. Scroll until you are at the *System Menu | Fire Recall* screen.
- e. Press the Menu key once.
- f. Scroll until the screen says *Fire Recall | Yes*.

Why can't I turn off my Block Sensors?

When you cannot turn off your Block Sensors, it is because the Command Center has put them into Athlete Lockout Mode to prevent competitors from tampering with the Block Sensors. To turn off the Block Sensor when it is in this mode, hold the Delete key and the Off/On key simultaneously for 5 seconds.

Why is my Wireless ReactTime Championship system not working even though all my sensors seem to be on and functioning?

If you have any extra Block Sensors that are not being used (for example, if you have 8 Block Sensors but have set up only 6), the extra Block Sensors must be OFF (or charging). If they are on and in the vicinity and have the same lane ID's as Block Sensors in use, the system will get very confused (for example, they will think there are two lane sixes).

What is Headset Squelch and how do I change it?

Headset squelch adjusts the level of electronic noise damping in the Starters' Headsets. Change it by doing the following:

- a. Start at the *ReactTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | System* screen.

- c. Press the Menu key once.
- d. Scroll until you arrive at the *System Menu | Headset Squelch* screen. Press the Menu key once.
- e. Scroll until you find a comfortable level of squelch you can hear through your Headset.

I just noticed that my Command Center is set to Armed In Ready/Yes. What does this mean?

When “Armed in Ready” is set to “Yes,” data will still be captured in the event that the Starter operating the Command Center forgets to put the system into “Set” mode. The gun goes off and data is captured (without a set time).

What is the Active Time setting used for?

The Active Time default setting is *-0.6 From Gun*. This means that the ReacTime Championship System is set to detect a false start if there is movement equal to or less than .6 seconds *before* the gun. If you change the setting to a positive number (for example, *0.3 From Set*), a false start will *not* be detected if there is movement .3 seconds *after* the set command is issued.

How do I change the contrast level on the LCD?

- a. Start at the *ReacTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | Settings* screen.
- c. Press the Menu key once.
- d. Scroll until you are at the *Settings Menu | Contrast* screen.
- e. Press the Menu key once.
- f. Scroll to select the desired contrast level (0=dimmiest, 10=darkest).

How do I display how much battery power I have left on my Command Center?

- a. Start at the *ReacTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | Settings* screen.
- c. Scroll until you arrive at the *Settings Menu | Battery Level* screen.
- d. Press the Menu key once to display how much of the charge in your batteries remain (100% = fully charged Command Center).

Note: The percentage of power remaining is at this time not very accurate. Block Sensors and the Command Center will run for over an hour after the LCD shows 0% remaining.

How can I tell what hardware and software versions my Command Center is running?

- a. Start at the *ReacTime | Ready to Arm* screen. Press the Menu key once.
- b. Press the up and down arrow keys until you are at the *Main Menu | About* screen.
- c. Press the Menu key once. Scroll to display the software version (S/W) or the hardware version (H/W)

Appendix C: Technical Specifications

Power

ITEM	SPECIFICATION
Power Supply (Battery)	Built-in rechargeable NiMH batteries
Power Supply (AC – Training System)	12V/1.2A (auto-switching)
Power Supply (AC – Championship System)	24V/3.3A (auto-switching)
Charging/Operating Voltage	12-24 VDC
Charging Time	Approximately 4 hours (from full battery depletion)
Battery Life (Training System)	Approximately 8 hours (running 1 trial every 5 minutes, using Loudspeaker volume at 6)

General

ITEM	SPECIFICATION
Display	LCD maximum about 32 characters (2 lines x 16 characters)
Headsets	Dual and single-sided headsets with attached microphone
Loudspeaker	15 Watt, 4 Ohm rating
Photoeye	Normally open or normally closed (user configurable). Must be self-powered.
Gun Sensors	Normally open or normally closed (both are supported)
False Start Cable	24 gauge, 8 connection, male RJ45 connectors
Block Mounting	Compatible with various starting block designs
Maximum # of Lanes (FSS)	10
Trial Capacity (Training System)	20 – 100, depending on trace characteristics
Dimensions	4" x 7 3/4" x 1 3/4" (10cm x 19.5cm x 4.5cm)
Weight	1 pound (0.425kg)
Wireless Option	Wireless option complies with US/Canada - FCC parts 15B and 15C, IC RSS-210 ETSI - FCC part 15B, CE, ETS 300 328, ETS 300 826, C-Tick (Australia)

Data Output

ITEM	SPECIFICATION
Printer	Compatible serial printer
Format	RS232 compatible
Serial Settings	1200, N, 8, 1