

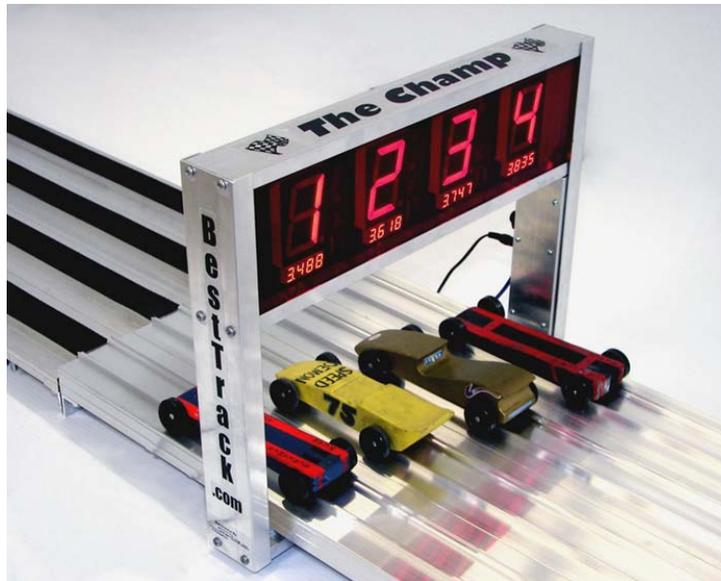
BestTrack®

Champ Timer

Finish Line Timer

Assembly Manual and COMMAND MANUAL

VERSION 4.0



Timer Manufactured By:

SRM Enterprises, Inc., Producers of BestTrack® Pinewood Derby® Tracks

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See
Troubleshooting
Tips on page 10

IMPORTANT! Unplug
any solenoid start gate
before using the
Linesetup program with
your timer.

IMPORTANT! Use only the 12V power supply
supplied with your timer! Wrong power supply
voltage will damage your timer & void the warranty!

The Champ Timer Finish Line Overview

We thank you for purchasing the *BestTrack*[®] Champ Timer Finish Line system. This manual will assist you with the communication between the Champ Timer Finish Line system and a computer.

The *BestTrack*[®] Champ Timer Finish Line produces consistent instant race results. The Champ Timer is designed to produce results with excellent precision and ease.

Special features of the Champ Timer include:

- 1 to 8 lanes supported.
- Large (2 ¼ inch) displays, readable across a large room.
- 6.5 inch clearance above track.
- Race results instantly displayed to race spectators.
- Useable with or without a computer connection.
- Computer interface standard.
- Race times resolved to .00005 seconds.
- Race times selectable to send 3, 4 or 5 decimals.
- Reset button and/or timed automatic reset. (settable time or disabled).
- Start gate switch.
- Built-in sensor IR illuminators (no lamps are required).
- Built-in test functions.
- Easy to install.

The Champ Timer lends itself to dynamic racing, since the on-board co-processor can complete timing calculations with results being passed to a computer.

Champ Timer system consists of:

- 1- Champ Timer system unit with 1 – 8 displays.
- 2- Champ Timer Setup Program (LINESETUP4.EXE) on CD.
- 3- AC Power Adapter.
- 4- 50 ft. RS-232 cable.
- 5- Reset/Start gate switch and mounting bracket
- 6- 50 ft. cable for Reset/Start Switch

2 General Operating Instructions

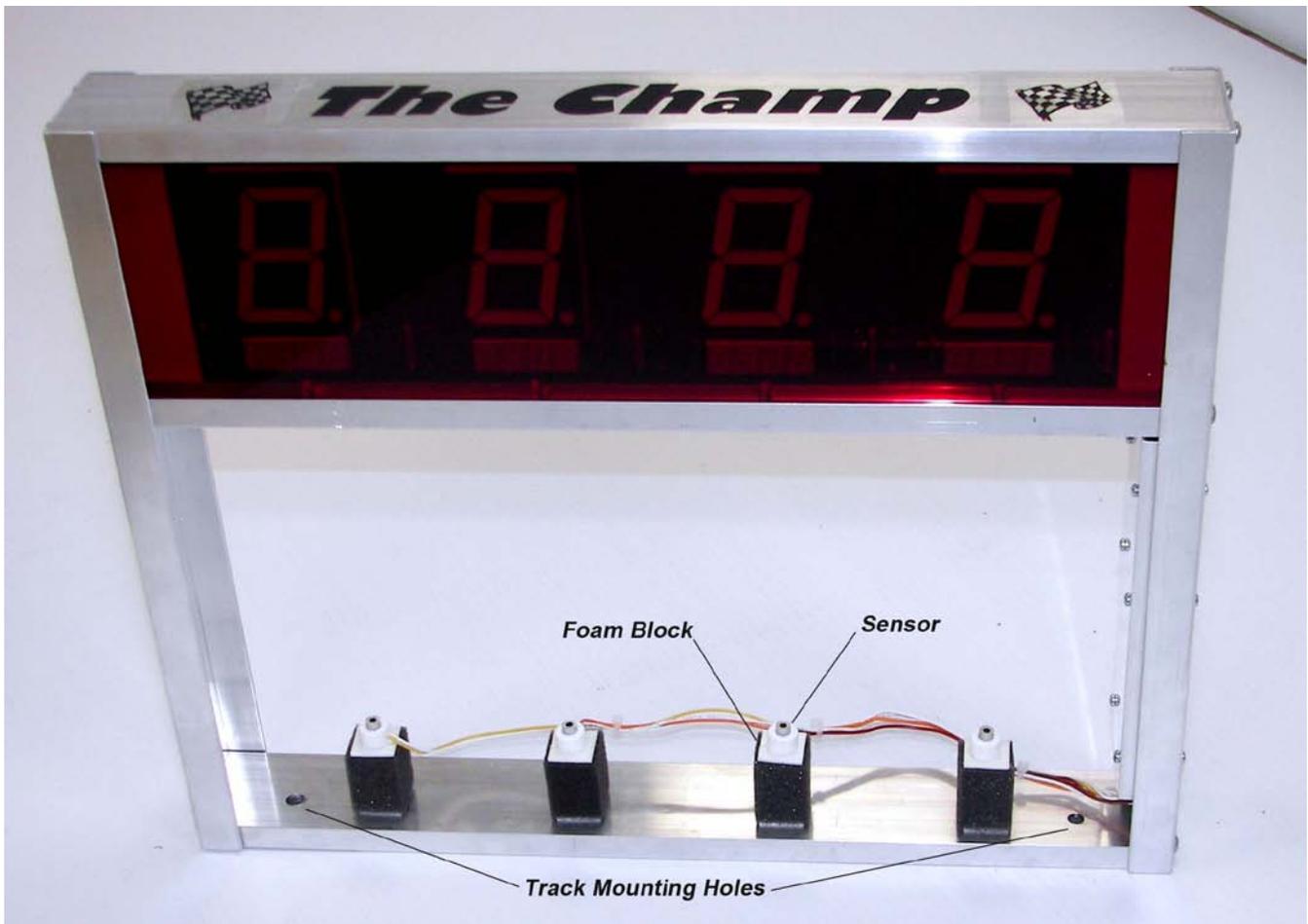
The Champ Timer Finish Line System may be set up for use as a race timer or it may be set to test mode to test the sensors.

The Champ Timer Setup Program (LINESETUP4.EXE) is supplied with the finish line so that operating parameters may be easily set or changed to your preference without having to know the commands.

IMPORTANT! Unplug any solenoid start gate while using the Linesetup program.

2.1 Setup Champ Timer Finish Line hardware

Follow these simple steps to install the Champ Timer Finish Line over the track



1. Your Champ Timer comes completely assembled, ready to be mounted on your BestTrack Pinewood Derby track

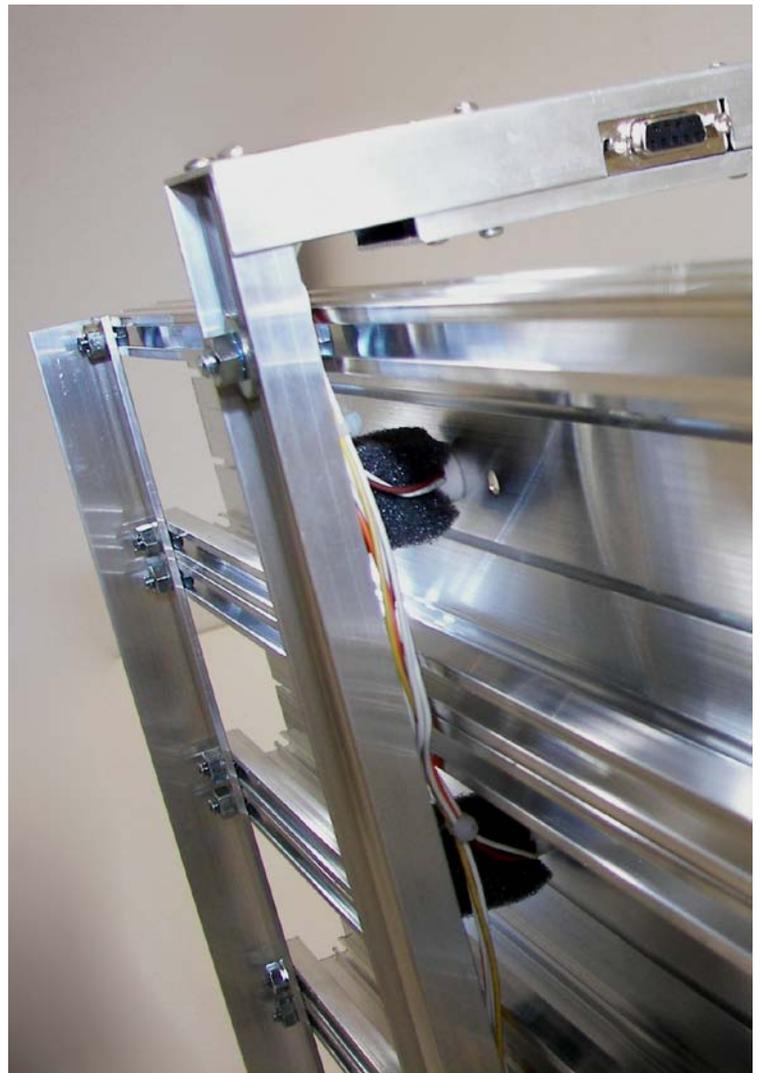


1/4 - 20 Hex Head Bolt

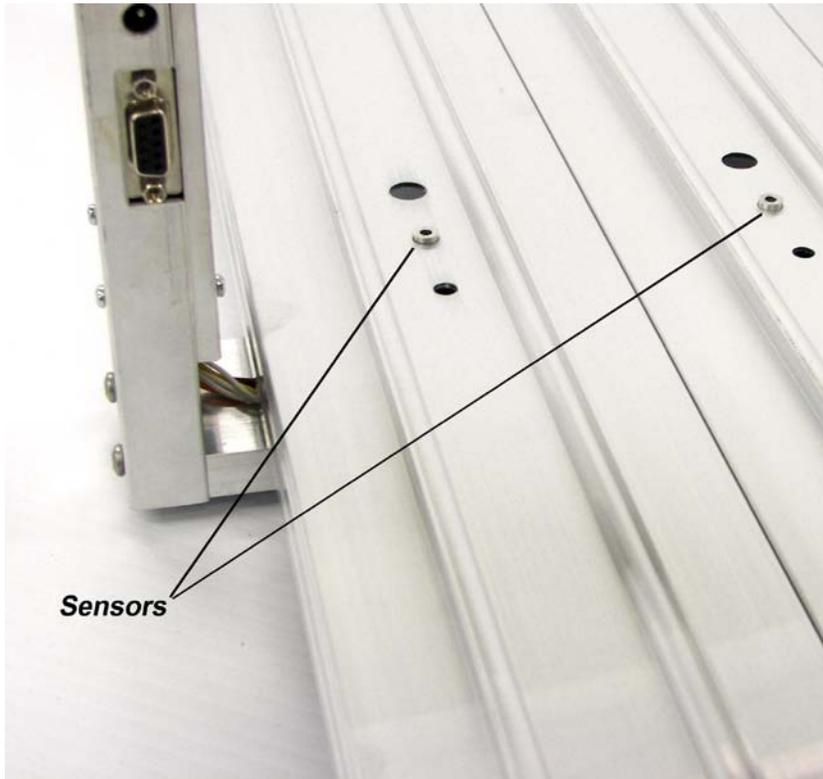
Washer

2. Slide two 1/4-20 X 1" long hex head bolts (included) in the outer mounting slots of the first & last lanes of your timer section of track. (You will have to remove the connector angle at one end of the timer section if your track is already assembled.) Align these bolts with the center timer hole punched in your track. **Tighten a nut on this bolt to hold it in location. This nut also provides spacing so the sensor wires will not get pinched.**

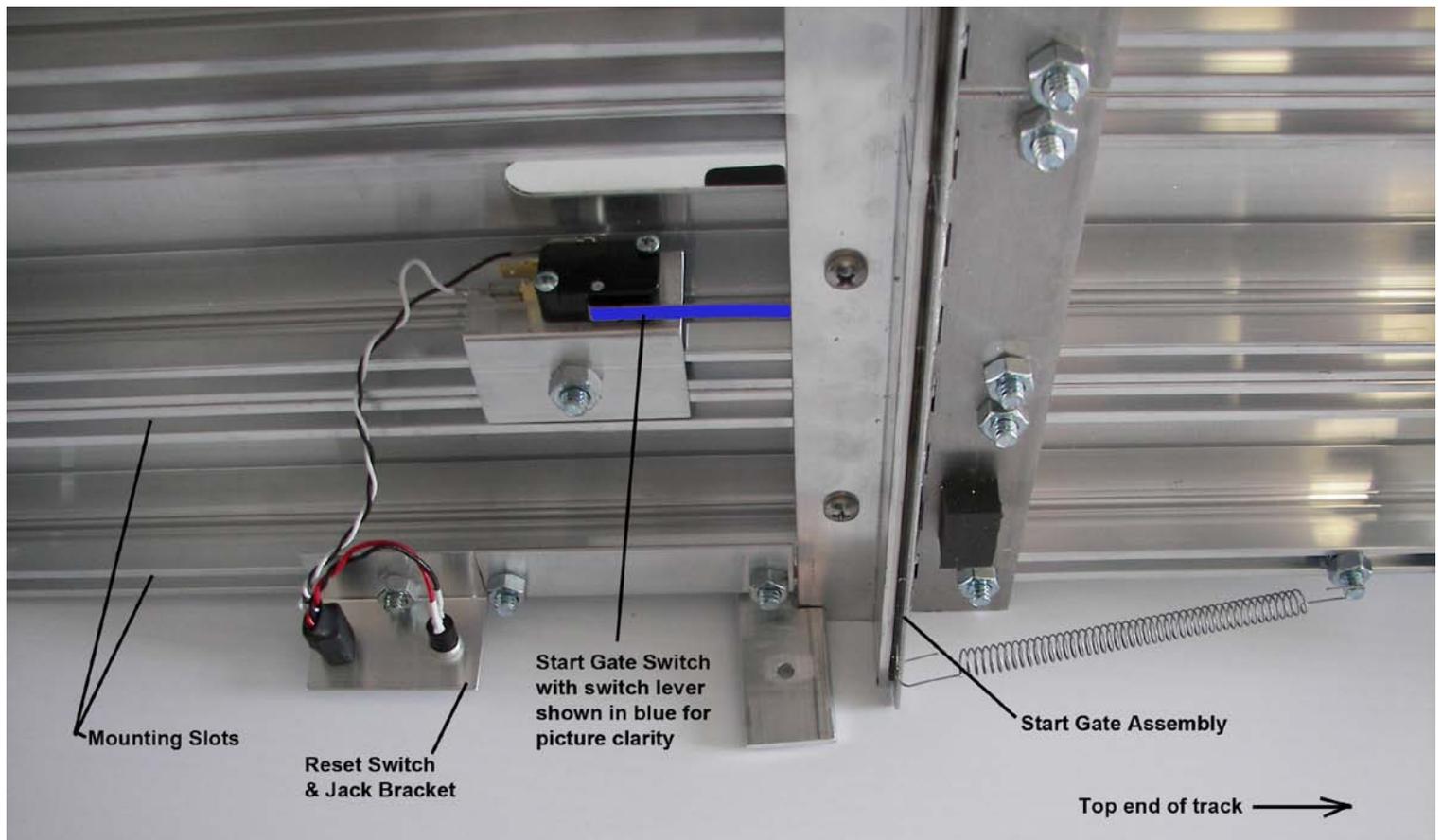
3. Slide the timer over the end of the track with the foam blocks holding the sensors beneath the track. Align the timer mounting holes with the bolts installed in step 2. Place a washer over each bolt and secure the timer with two additional nuts. **Do not over tighten.**

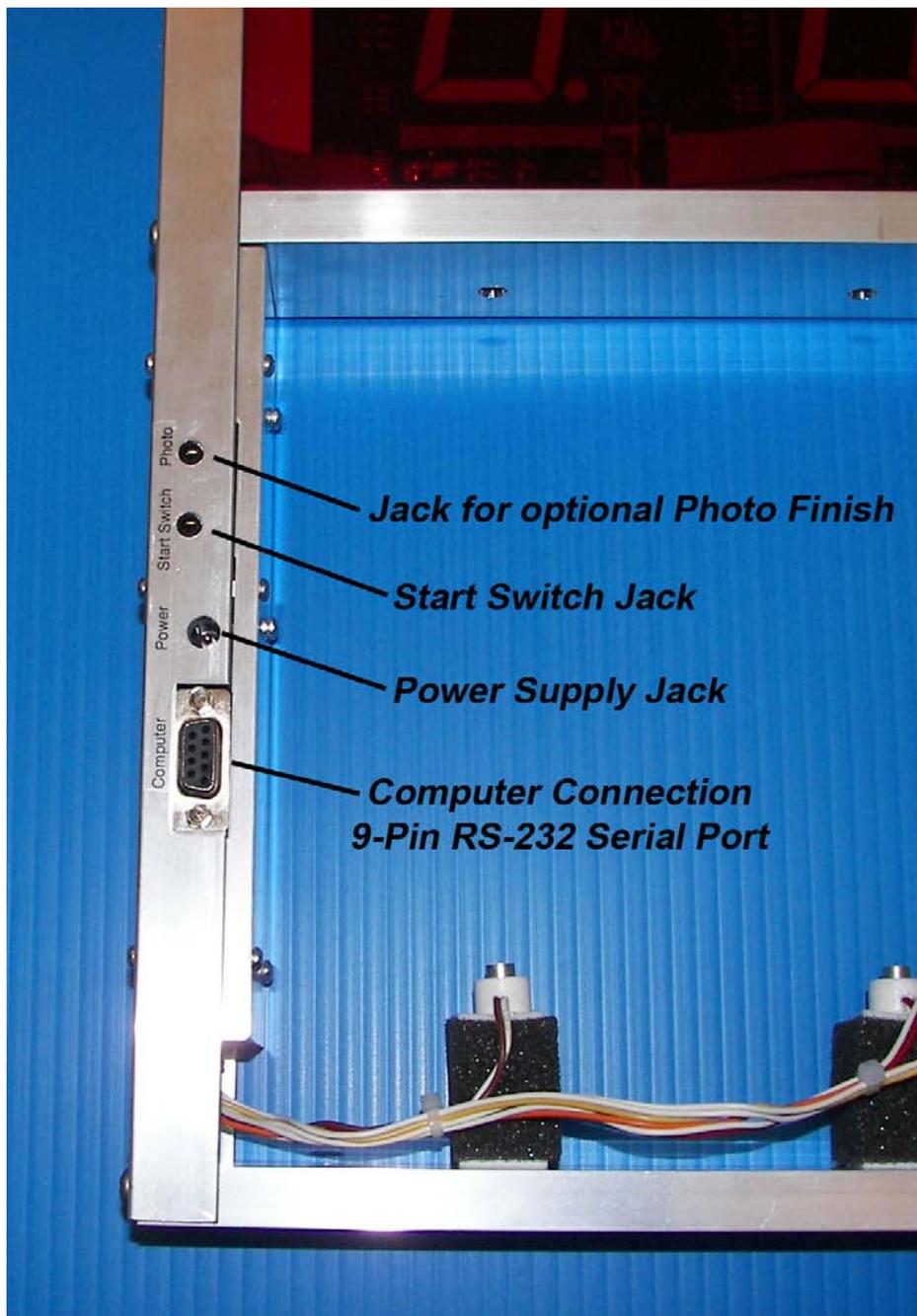


**Do Not Pinch
The Wires When
Attaching Your
Timer!**



4. Align the sensor housings on each foam block so they fit into the timer holes punched in the middle of each lane. The foam block acts as a spring to keep the sensor securely in place.
5. Slide a ¼-20 hex head bolt into the mounting slot at the edge of the track near the start lever and mount the Reset Switch Bracket as shown in the picture below. Use a hex nut to fasten the bracket to the track.
6. Attach the Start Gate Switch in the same manner using the 3rd mounting slot from the edge of the track. Slide the start lever (shown in blue for clarity) under the start gate as shown so that the switch is activated as the start gate drops. See below.



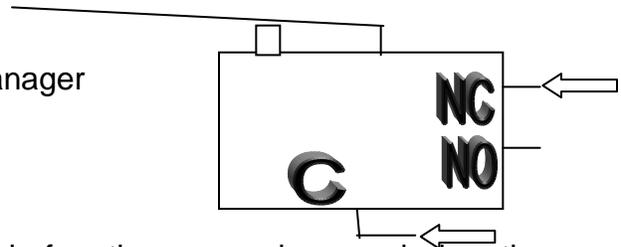


7. Plug the power supply into the mating connector on the Champ Timer unit.
IMPORTANT! Use only the 12V DC power supply supplied with your timer!
Wrong power supply voltage will damage your timer & void the warranty!
8. Plug the 9-pin RS-232 interface cable into the Champ Timer and any COM port on your PC. You may also use an RS-232(Serial) to USB conversion cable to use a USB connector on your computer. Use the CD that comes with the USB to Serial adapter to install the driver.
9. Plug one end of the Reset/Start Switch cable into the vertical post of the timer and the other end into the jack with the Reset/Start Switch. Make sure that it is fully inserted. You may mount the Start Switch onto your track or use the timer without it.

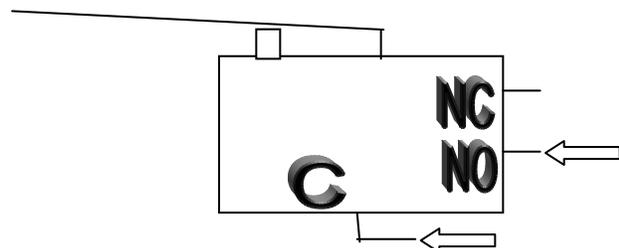
If you do decide to mount the start switch please note the following wiring information.

WIRING INFORMATION: The supplied sensor switch has three terminals marked C(Common), NC(Normally Closed) and NO(Normally Open). The preferred method is to have the switch pressed before the race and un-pressed when the race starts. This method requires the use of the C and NC contacts.

Use this method for GrandPrix Race Manager and Derby Master software.



If you want the switch to be un-pressed before the race and pressed when the race starts, then the push-on terminal needs to be on the NO contact as indicated below.



10. Plug in the Photo Finish Device if you have one. This optional interface is available from Smartline Derby Timers at: www.etekgadget.com
11. Lastly, using the AC adapter, plug the Champ Timer Finish Line timer into a source of power.

IMPORTANT! Use only the 12V DC power supply supplied with your timer!

12. Please note: Check to make sure the start gate switch is fully depressed when the start gate is in the up position. If not, you may need to slightly bend the lever on the switch down towards the floor.

2.2 Run the Champ Timer Setup Program

IMPORTANT! Unplug any solenoid start gate while using the Linesetup program.

We supply the Champ Timer Setup Program (LINESETUP4.EXE) on a CD to establish the initial communication and also for updating any settings that you may wish to change.

You may use the LINESETUP4 program directly from the CD or copy it to any directory of your choice. You only need the one file: LINESETUP4.EXE to run this program.

Before you start the LINESETUP4.EXE program make sure that the Champ Timer Finish Line Timer is plugged into the computer and turned on.

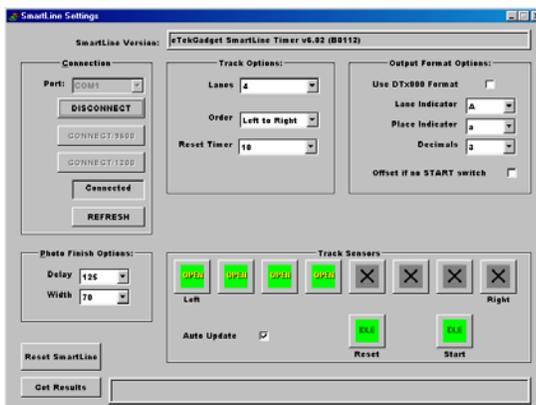
Make sure that you do NOT have any other programs running that use the same COM port, such as a race manager program.

To start the Champ Timer Setup Program, simply double-click on the LINESETUP4.EXE program name.

Select the COM port you will be using for communication in the Connection box.

Click the “CONNECT/AUTO” button. The “CONNECT” button is currently displaying “DISCONNECT” in the picture below because it has already been pressed and the status is “Connected”.

The Champ Timer Version should appear at the top of the box. The Track Sensors area will show the state of the sensors and switches.



This is the display as it appears when there are 4 lanes and communication has been established successfully. Waving a hand under the sensors triggered the timer and the ‘Get Results’ button was pressed in order to see the result string from the timer.

2.3 Setup the Champ Timer for use with various race management software packages.

GrandPrix Race Manager V5.0 and above–

Select the Champ or Smartline Timer in the GrandPrix Race Manager's Hardware Setup Options screen. Select the COM port that will be used.

You may test the communications at this point by pressing the Start Test button. The GrandPrix Race Manager V5.0 and above will send the appropriate commands to the Champ Timer to get the readings from the next race. You may trigger the sensors, simulating a race, and the results will be displayed. You may also send individual commands to the timer.

When you select the Champ Timer or Smartline Timer in the Hardware Setup screen, a new tab will appear for setting the Photo Finish values. You may set the photo finish delay times at any time during the race. This option is available only in the GrandPrix Race Manager V5.0.1 and above.

DerbyMaster Software

For DerbyMaster version 8 & higher, select the Champ/Smartline Timer in the hardware setup. If you have version 7 or lower we suggest upgrading to version 8 or higher.

Do not run the Champ linesetup.exe at the same time with any racing software as the programs will interfere with each other.

2.3.1 An optional method of setting up the timer parameters.

You may use a terminal program such as Tera Term Pro if you are familiar with communications protocols. This program is free and may be found as a link through the web site <http://www.eTekGadget.com> .

2.4 Champ Timer Finish Line Test Mode

The test mode is useful for testing the sensors. To enable the test mode, hold the reset button down until you see a capital L on the displays. You may then release the reset button.

The L will display for a short time (approximately 2 seconds) and then the lane number will be displayed in the display above the respective lane for approximately 2 seconds. The display will then show either a lower case c or an underscore. The c indicates that the sensor is covered as if a car were sitting on the sensor. The underscore (lowest segment on the display) indicates that the sensor is open (nothing is on the track). **To return to the normal racing mode simply tap the reset button.**

Notes on using a Serial to USB Adapter

If you are using a Serial to USB adapter to hook up your Champ timer to a laptop or other computer, be sure to install the drivers on the miniature driver disc that came with your USB adapter. Your timer will not communicate with the computer if you do not have the drivers installed for a Serial to USB adapter. If you have misplaced the driver disc that came with your Serial to USB adapter you can download a new version from the manufacturer's web site. If you bought the Serial to USB adapter from us, we link to the driver downloads for the adapters that we have sold at the bottom of our Champ Timer web page.

TROUBLESHOOTING:

If you have a “c” in one or more lanes, this means that the lower sensor cannot see the infrared LED light shining down on the track from the upper part of the timer. Check to see if the lower sensor is completely set into the hole on the track and pointing straight up. Check to make sure that no debris is blocking the sensor. Look at the LED light that shines down on to the track and make sure it is pointing straight down and did not get pushed up into the aluminum housing; the LED can be gently repositioned if needed. The LED light should be about flush with the bottom surface of the extrusion that it is shining through.

Check to see that no wires were pinched when the timer was mounted. Was a nut put on the 1” long mounting bolt before the timer was attached? This nut provides clearance for the sensor wires (see page 4).

If the first car is showing a “0.000” elapsed time on a race, the timer is not receiving the start signal from the start switch. Check to make sure the start switch/reset cable is plugged in all of the way. Also, check to make sure the start switch lever is fully depressed and that you can hear it “click” when the start gate is put up into the “ready to race” position. You may need to slightly bend the metal lever of the start switch down towards the floor so that it contacts the start gate sooner. The middle connector of the start switch should not be connected, see first diagram shown on page 7.

3 Command Summary

This is a complete list of the commands that are available in the Champ Timer. All commands are Character strings ending with a carriage return<cr>. The Champ Timer will execute the command and respond as required. All responses returned from the Champ Timer Finish Line include a carriage return<cr> and a linefeed<lf>.

If any commands are unacceptable or not understood the Champ Timer Finish Line will send a question mark (?<cr><lf>).

3.1 Brief List of commands:

3.1.1 Race Result Commands

- ra Force end of race, return results, then reset
- rg Return results when race ends
- rp Return results from previous race
 - See Appendix A for a detailed description of the result string.

3.1.2 Reset

- r Reset

3.1.3 Read Version

- v Report code version

3.1.4 Read Switches

- rr Read reset switch
 - 0(inactive) or 1(active) returned
- rs Read Start Switch
 - 0(inactive) or 1(active) returned
- rl Read finish line
 - 0(inactive) or 1(active) returned for each lane

3.1.5 Set or Read Variables

- **on** Set/Read number of lanes
The total physical number of lanes on your track.
 - **on<cr>** Reads the current setting.
 - **on4<cr>** Set to 4 lane track

- **ol** Set/Read lane character
Indicates lane 1 in the response to the ra, rg and rp commands.
 - **ol<cr>** Reads the current setting.
 - **ol0<cr>** Set to 'A'
 - **ol1<cr>** Set to '1'
 - **ol2<cr>** Set to 'a'
 - **ol3<cr>** Set to 'A' (Refer to details for reasoning of this.)

- **op** Set/Read place character
Indicates place in the response to the ra, rg and rp commands.
 - **op<cr>** Reads current setting of placement character.
 - **op0<cr>** Set to 'a'
 - **op1<cr>** Set to 'A'
 - **op2<cr>** Set to '1'
 - **op3<cr>** Set to '!

- **om** Set/Read lane mask
Mask off the lane specified until reset with om0,on or power cycle.
 - **om<cr>** Reads the current setting.
 - **om3<cr>** Mask lane 3
 - **om0<cr>** Resets mask to use all lanes

- **od** Set/Read number of decimal places in the result values.
 - **od<cr>** Reads current number of decimals
 - **od3<cr>** Set to 3 decimals
 - **od4<cr>** Set to 4 decimals
 - **od5<cr>** Set to 5 decimals

- **or** Set/Read automatic reset delay
Set the delay up to 255 seconds.
 - **or<cr>** Reads current setting of reset delay in seconds
 - **or10<cr>** Set to 10 seconds
 - **or30<cr>** Set to 30 seconds
 - **or0<cr>** Auto reset off

- of Set./Read photo finish trigger delay
Set the delay up to 255 milliseconds.
- ow Set/Read photo finish trigger length
Set the trigger length up to 255 milliseconds.
- ox Set the finish line to DTX000 mode
This changes the Champ Timer finish line to use the DTX000 format.
 - ox1<cr> Go into DTX000 mode
 - ox0<cr> Return to Champ Timer lower and upper case mode
- ov Set/Read reverse lane numbering
 - ov<cr> Reads value of 0 or 1 for normal or reverse.
 - ov0<cr> normal, Lanes displayed left to right [1 2 3 4]
 - ov1<cr> reverse, Lanes displayed right to left [4 3 2 1]
(Refer to details for more complete information).

3.1.6 DTX000 mode supported

This is a simple protocol that is supported when you send an ox1<cr> command to the timer. The Champ Timer will change the communication parameters and reset into the DTX000 mode until a ox0<cr> command is sent.

The communication parameters for DTX mode are:

This protocol is supported so that you may use the Champ Timer finish line with software such as GrandPrix, DerbyMaster and RaceView.

- Race results are sent immediately after the race is completed.
- <SPACE> Reset timer

3.2 Detailed List of commands:

3.2.1 od#<cr>:Set/Read number of decimal places

Computer → Finish Line

<u>Sends</u>	<u>Description</u>
od<cr>	Read number of decimals currently set.
od3<cr>	Sets the number of decimals;
od4<cr>	allowable range is 3 to 5.
od5<cr>	

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
4<cr><lf>	Value read is the number of decimals set.
<cr><lf>	Carriage return sent when setting a new value.
?<cr><lf>	Invalid command.

3.2.2 of[#]<cr>:Set/Read photo finish trigger delay

This command sets the duration of the delay from the first car crossing the line to the start of the photo finish signal. The number in this command is the number of milliseconds the trigger signal will be delayed. When this delay is set to zero, the photo finish pictures will be taken before the displays indicate the winning lane. You may need to “fine tune” the delay time to capture the picture just after the first place is indicated on the display.

Computer → Finish Line

<u>Sends</u>	<u>Description</u>
of<cr>	Reads current photo finish trigger delay from unit.
of24<cr>	This value may range from 1 to 255 milliseconds.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
024<cr><lf>	Value set for photo finish trigger delay is returned when reading current setting only.
<cr><lf>	Carriage return sent when setting a new delay value.
?<cr><lf>	Invalid command.

3.2.3 ol[#]<cr>:Set/Read lane character

This command sets the character sequence type that will be used to indicate the lane numbers in the response to the ra, rg and rp commands. The lane indicators sent in response string will be subsequent values of the same sort such as upper case letters: A,B,C,D,E,F,G,H (Depending on how many lanes you have.)

Computer → Finish Line

<u>Sends</u>	<u>Description</u>
ol<cr>	Reads current character type(A,1,a) from unit.
ol0<cr>	Set to A; Upper case letters for lanes
ol1<cr>	Set to 1; Numbers for lanes)
ol2<cr>	Set to a; Lower case letters for lanes
ol3<cr>	Set to A; Upper case letters.

The option settings are given with the following reasoning in mind. Generally you will want to select a lane number and a place indicator that are compatible but not the same. If you choose to set the lane character to upper case letters using the ol0<cr> command it would make sense to use the op0<cr> command to set the place indicator to lower case letters. These are the settings that we prefer to make the parsing of the string more dynamic. You would be able to scan the line and draw out the race time more easily if the upper and lower case letters are used. The ol3<cr> is offered as a paired value with op3<cr> that will set the lane to upper case letters and the placement character to the !"#%&'(sequence. (The hex values for this sequence begin at 21H). You may, however, set these values to any combination that you prefer.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
A<cr><lf>	Value read is the lane character set.
<cr><lf>	Carriage return sent when setting a new value.
?<cr><lf>	Invalid command.

3.2.4 om[#]<cr>:Set/Read number of lanes to be used

This command masks off the lane specified until it is reset by either an 'om0' command, 'on' command or power is cycled on the unit.

As an example, you may want to mask out the second and fourth lanes because the cars are being disqualified for any reason. You would send an "om2<cr>" and then an "om4<cr>" to mask out the lanes. The Finish Line will then respond with a string that includes results for every lane, however the masked lane will be sent as a 9.9999 (decimals are set to 4) and the placement will be a space (' ') such as:

"A=1.3453a B=9.9999 C=1.4324b D=9.9999 E=1.5443c F=1.6355d".

To reset the number of lanes used, you may either set it back to the number of lanes available, for example with the 'on6' for a 6 lane track, or reset it with the 'om0' that will reset the masks so that all lanes are active. All of the other parameters are persistent across a power cycle because they are stored in non-volatile memory. The mask lanes parameter is NOT persistent. Upon power up, using the 'on' or the 'om0' command the mask will be reset to use all lanes.

Computer→Finish Line

Sends

om<cr>

om3<cr>

om0<cr>

Description

Reads current setting for the number of lanes.

Sets number of lanes to 3; allowable range is 1 to total number of physical lanes on track. You will probably never use 1.

Special case that resets to the number of lanes available. Disables the mask.

Finish Line → Computer

Returns

3<cr><lf>

<cr><lf>

?<cr><lf>

Description

Reads the current setting for the mask.

Carriage return sent when setting a new value.

Invalid command.

3.2.5 on[#]<cr>:Set/Read number of lanes

This command sets the number of lanes there are physically installed on the track. This command should be used only if changing the number of lanes because of an upgrade or change in the total number of lanes.

As an example you may change the number of lanes from a 6-lane track to a 4-lane space derby track with this command. It is not meant to be used as a masking command. This number is used in the finish line timer for many different purposes and must indicate the total number of lanes and displays that exist. To facilitate the masking of lanes use the command om[#].

Computer → Finish Line

Sends

on<cr>

on4<cr>

Description

Reads current setting for the number of lanes.

Sets number of lanes to 4;
allowable range is 1 to 8.

Finish Line → Computer

Returns

4<cr><lf>

<cr><lf>

?<cr><lf>

Description

Reads the current setting for the number of lanes.

Carriage return sent when setting a new value.

Invalid command.

3.2.6 op[#]<cr>:Set/Read place character

This is the character that will be used to indicate first place in the response to the ra, rg and rp commands. The place indicators sent in response string will be subsequent values of the same sort such as upper case letters: A,B,C,D,E,F,G,H (Depending on how many lanes you have.) If the exclamation point is used the placement values will be the following characters starting with the !: !"#\$\$%&'(

Computer→Finish Line

<u>Sends</u>	<u>Description</u>
op<cr>	Reads current setting of placement character.
op0<cr>	Sets to 'a'
op1<cr>	Sets to 'A'
op2<cr>	Sets to '1'
op3<cr>	Sets to '!'

The option op3<cr> is given only as a convenience and is not recommended for use unless absolutely necessary. This may seem unusual representation, however, it is what some of the current race management software recognizes and so it is made available. The hex representation for these characters begins at 21H.

Generally you will want to select a lane number and a place indicator that is compatible but not the same. If you choose to set the lane character to upper case letters using the ol0<cr> command it would make sense to use the op0<cr> command to set the place indicator to lower case letters. These are the settings that we prefer to make the parsing of the string more dynamic. You would be able to scan the line and draw out the race time more easily if the upper and lower case letters are used. The ol3<cr> is offered as a paired value with op3<cr> that will set the lane to upper case letters and the placement character to the !"#\$\$%&'(sequence. The hex values for this sequence begin at 21H. You may, however, set these values to any combination that you prefer.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
A<cr><lf>	Value read is the placement character set.
<cr><lf>	Carriage return sent when setting a new value.
?<cr><lf>	Invalid command.

3.2.7 **or[#]<cr>:Set/Read automatic reset delay**

This command allows you to disable the automatic reset so that it must be reset manually or set the reset time to anything from 1 to 255 seconds (which is a very long time).

Computer → Finish Line

Sends

or<cr>

or30<cr>

Description

Reads the current setting of the reset delay.

Sets the reset delay to 30 seconds;

Allowable range is 1 to 255.

Finish Line → Computer

Returns

30<cr><lf>

<cr><lf>

?<cr><lf>

Description

Value read is the current delay.

Carriage return sent when setting a new value.

Invalid command.

3.2.8 **ov[#]<cr>:Reverse lane numbering**

This command allows you to change the direction that the results are displayed over the track.

Computer → Finish Line

Sends

ov<cr>

ov0<cr>

ov1<cr>

Description

Reads the current setting for direction.

Normal numbering, ie Left to Right [1 2 3 4]

Lanes begin at the opposite side from the wires.

Reverse numbering, ie Right to Left [4 3 2 1]

Finish Line → Computer

Returns

0<cr><lf>

<cr><lf>

?<cr><lf>

Description

Value read is the current direction.

Carriage return sent when setting a new value.

Invalid command.

3.2.9 ow<cr>:Set./Read photo finish trigger length

This command sets the duration of the photo finish signal. Some frame capture devices will take more than one picture if their triggering signal is too long. The number in this command is the number of milliseconds the trigger signal will last.

Computer→Finish Line

<u>Sends</u>	<u>Description</u>
ow<cr>	Read current value of trigger (in milliseconds)
ow20<cr>	Set photo finish trigger length; allowable range is 1 to 255 milliseconds.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
020<cr><lf>	Value set for photo finish trigger length is returned.
<cr><lf>	Carriage return sent when setting a new value.
?<cr><lf>	Invalid command.

3.2.10 ox<cr>:Set the Champ Timer Finish Line to DTX000 mode

This command sets the Champ Timer Finish Line into DTX000 mode. The Champ Timer will use the DTX000 format to reset when a <SPACE> character is received and to send the response string when the last car finishes. The response string will be in the following format:

1 1.1234 2 2.2345 3 3.3456 and so on.

The placement is determined by the order in which they are returned. For example,
2 0.8984 1 1.2326 4 1.3283 3 1.5339

Computer→Finish Line

<u>Sends</u>	<u>Description</u>
ox1<cr>	Go into DTX000 format mode.
ox0<cr>	Return to Champ Timer lower and upper case mode.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
	No response is sent. Timer is reset to new mode.
?<cr><lf>	Invalid command.

3.2.11 **ra<cr>:Force end of race, immediately return results, then reset**

Computer → Finish Line

<u>Sends</u>	<u>Description</u>
ra<cr>	Force end of race immediately.

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
A=0.851c B=0.497b C=0.266a D=9.999<cr><lf>	
See Appendix A for a detailed description of the result string.	

3.2.12 **rg<cr>:Return results when race ends**

Computer → Finish Line

<u>Sends</u>	<u>Description</u>
rg<cr>	The Finish Line will respond when any of the following conditions occur: <ul style="list-style-type: none">○ A car finishes in each lane○ The auto reset time is reached○ The reset switch is pressed

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
A=0.851c B=0.497b C=0.266a D=0.976d<cr><lf>	
See Appendix A for a detailed description of the result string.	

3.2.13 **rl<cr>:Read the finish line photo sensors**

Computer → Finish Line

rl<cr>

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
0000<cr><lf>	Not covered (example for 4 lane track.)
1111<cr><lf>	Covered
0 or 1 returned for each lane.	
<cr><lf>	Carriage return sent when setting a new value.
?<cr><lf>	Invalid command.

3.2.14 **rp<cr>:Return results from previous race**

Computer→Finish Line

rp<cr>

Finish Line → Computer

A=0.851 # B=0.497 " C=0.266 ! D=0.976 \$<cr><lf>

See Appendix A for a detailed description of the result string.

3.2.15 **rr<cr>:Read the reset switch**

Computer→Finish Line

rr<cr>

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
0<cr><lf>	Not Pressed
1<cr><lf>	Pressed

3.2.16 **rs<cr>:Read the start switch**

Computer→Finish Line

rs<cr>

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
0<cr><lf>	Not Pressed
1<cr><lf>	Pressed

3.2.17 **r<cr>: Reset**

Computer→Finish Line

r<cr>

Finish Line → Computer

Returns
<cr><lf>

3.2.18 **v<cr>: Report code version**

Computer→Finish Line

v<cr>

Finish Line → Computer

<u>Returns</u>	<u>Description</u>
Version<cr><lf>	Current version of Champ Timer Finish Line software

Appendix A: Race Result String

If the rg command is sent to the Champ Timer Finish Line, a result string will be returned after the race has been completed. The race is not completed until all cars have passed through the finish line or the force finish command is used.

There are several different variations to the result string depending on the values you selected for the lane, placement and number of decimals. Some examples of these are:

```
A=0.851c B=0.497b C=0.266a . . . H=0.976h<cr><lf>
A=0.851C B=0.497B C=0.266A . . . H=0.976H<cr><lf>
A=0.8513 B=0.4972 C=0.2661 . . . H=0.9768<cr><lf>
A=0.851# B=0.497" C=0.266! . . . H=0.976(<cr><lf>

1=0.851c 2=0.497b 3=0.266a . . . 8=0.976h<cr><lf>
1=0.851C 2=0.497B 3=0.266A . . . 8=0.976H<cr><lf>
1=0.8513 2=0.4972 3=0.2661 . . . 8=0.9768<cr><lf>
1=0.851# 2=0.497" 3=0.266! . . . 8=0.976(<cr><lf>

a=0.851c b=0.497b c=0.266a . . . h=0.976h<cr><lf>
a=0.851C b=0.497B c=0.266A . . . h=0.976H<cr><lf>
a=0.8513 b=0.4972 c=0.2661 . . . h=0.9768<cr><lf>
a=0.851# b=0.497" c=0.266! . . . h=0.976(<cr><lf>
```

The letters (A . . H) indicate the lanes, beginning at the lane opposite the wires if normal direction is selected. The race times are displayed after the lane designator using the number of decimals set with the od command. The default value is 3 decimals. The next character indicates the placement of the car.

The placement characters for the hex 21 values are as follows:

```
First Place:    !
Second Place:  "
Third Place:   #
Fourth Place:  $
Fifth Place:   %
Sixth Place:   &
Seventh Place: '
Eighth Place:  (
```

Immediately after the force end of race (ra) command is sent to the Champ Timer Finish Line, a result string is returned such as:

```
A=0.851c B=0.497b C=0.266a D=9.999 <cr><lf>
```

As above, the letters (A..H) indicate the lanes, beginning at the lane opposite the wires if normal direction is selected. The race times are displayed after the lane designator using the number of decimals selected with the od command. The race placement character is displayed next.

If some cars did not go through the finish line before the ra command was sent then the finish line will send back 9.999 for each car that did not finish and the placement character will be a space.

The result string that is sent back in DTX000 mode is as follows:

1 0.8984 2 1.2326 3 1.3283 4 1.5339

The placement is determined by the order in which they are returned. For example,

2 1.2326 1 0.8984 4 1.5339 3 1.3283