TRACKMATE SLOT CAR LAP COUNTER USER'S MANUAL

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1. Introduction

Trackmate Lap counter is an easy to use lap counter that works with any scale slot car track. Laps are timed with 1/1000 second accuracy. The trackmate hardware supports all kinds of sensors, infrared, reed swiches and dead strips. Supports up to 8 lanes and can control track power.

2. Features

- 1 to 8 lanes
- Any sensor type, Infrared, Reed, Dead strip
- 1/1000 second accuracy
- Lap races, Timed races
- Supports Lap and Timed Races and Lane Rotation
- Supports up to 60 racers in round robin format
- Works with Desk Tops and laptops
- Hardware insures accurate timing to .001 seconds even with background applications running or with program minimized
- Connects to Com port leaving your printer port free
- Sound -"Ready GO", "1 Lap remaining" etc.
- Supports 1- 8 Lanes
- Relay to control track power
- Sorts racers according to position during race
- Displays - Lap Times, Best Lap, Median, lag/interval time between racers
- Print summary and lap times
- Enter racers names only once
- Change type of data being displayed by clicking on heading. i.e.. MPH or Best Lap
- Timer between heats
- Championship mode
- Powerful Custom Rotation Editor
- Auto pop-up race results option to add or subtract laps from racer after heat.
- On the fly add or subtract laps
- Race Results includes average number of laps per heat
- Rotation race supports timed and lap heats
- Optional warning sounds on count down timer at 1 min, 30 seconds, 10 seconds
- Resizing screen is possible
- Two styles of count down, drag racing and Formula 1
- auto save data to text
- Break Out Feature - Disallow fast lap times below a predetermined lap time.
- Synthesized voice for lap times (see hot keys)

3. Getting Started

Please read *Installation Settings* before starting to make sure you have everything set correctly

Now that you have all the hardware installed and software installed.

Always have the interface board powered on before starting the program.

Click on *racers* on the top menu bar to add the names of those that will be racing. You can also remove the names that came with the program.
Click *Race format, select type of race* and disable DEMO mode.

4.1 Installing Interface

. Installing Interface

TrakMate SC Lap Counter

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www.TrackmateRacing.com
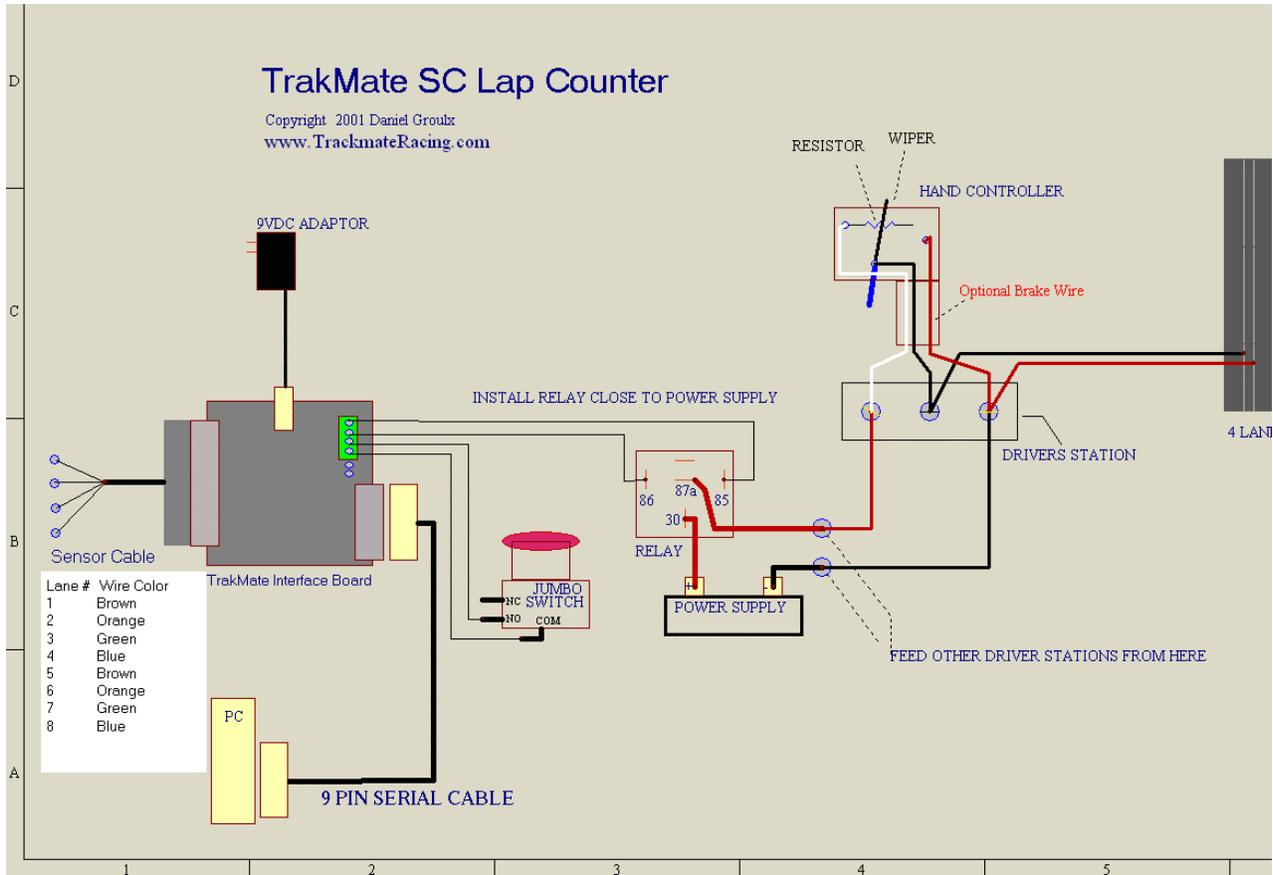
4.2 Installing Infrared Sensors

Installing Infrared Sensors

Infrareds are the most popular type of sensors in slotcars. They work with any scale of slotcars.

Follow these steps for the easiest way of installing sensors.
The advantages are perfect vertical installation of sensor and easy removal of sensor from track.
Shown is a Ninco track but the same technique can be used for all plastic tracks.
On HO tracks the sensor will be installed between the rail and the slot.

#1 Put a big blob of hot glue on the underside of the track to build up the track thickness.	
	#2 Let it cool for several hours then drill the hole for the sensor using a 1/8" drill bit.
#3 Clean the edge of hole with a bigger drill bit.	

	#4 It will look like this On HO tracks the sensor is mounted between the rail and the slot
#5 Insert Sensor. It will fit snugly into the hole	
	#6 Done!! You don't need to glue it in place.
#7 Completed Secure the sensor cable under the table so weight of cable does not pull the sensors out of the holes	
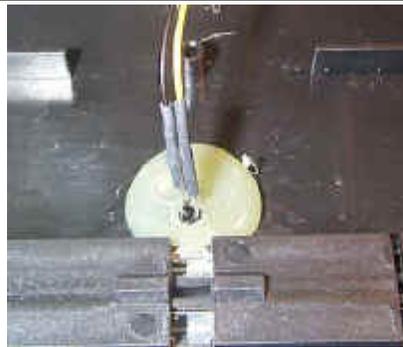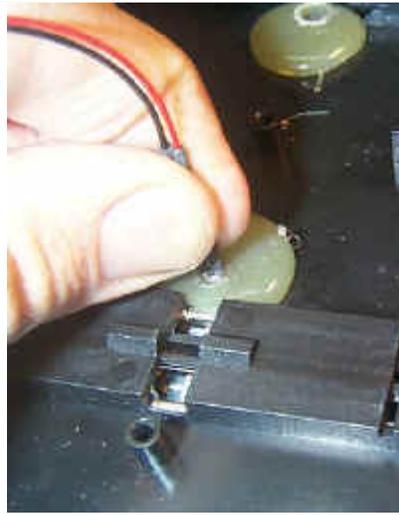
4.3 Installing Overhead Infrared Kit

Installing Overhead Infrared Kit

The adaptor wire with White stripe is Negative

Notice that the LEDs have a short and a long lead. Connect them as shown. If any one is connected backwards none of them will work. Resistors have no polarity and may be connected either way. Note that the LEDs emit light invisible to the human eye but the sensors will see it.

The LEDS should have a range of 3 to 5 inches.

4.4 Installing Reed Switches

Installing Reed Switches

Reed switches are small switches activated by the slot cars magnet.   Recommended for HO slotcars only.

Underside of an HO track. Notice placement of reed switch is in between the rail and the slot. You may use hot glue to hold it in place.

4.5 Installing Dead Strip

DEAD STRIP

Trackmate Dead Strip cables have custom electronics built into the connector for very reliable performance. Dead strip cables are available at www.TrackmateRacing.com

Dead strip is two to three inches of isolated track or up to 5 inches on commercial 1/24 scale tracks. Isolate both rails for each lane as shown in diagram

The dead strip works properly in one direction only. If you run your cars in both directions you will need to switch the wires around on the dead strip when you switch directions.

For proper operation the WHITE wire will be connected to the dead strips positive side. HO has the positive on the Drivers side (left side) for 1:32 and 1:24 scale the positive is on the passenger side (right side)

Cable Color Code

Color	Lane
Brown	1
Orange	2
Green	3
Blue	4
Brown (2nd Cable)	5
Orange	6
Green	7
Blue	8

TrackMate software setting
In the Installation settings change 'sensor type' to *Dead Strip / Reed Switch*

Trouble Shooting
IT only counts laps when the car goes very slow over the dead strip
This indicates that the wires to the dead strip are reversed.
It doesn't count at all or counts laps all the time
Make sure you selected dead strip version in settings
Do not convert an infrared type by removing sensors and connecting it to a Dead Strip.   This may damage the computer port because the car generates a voltage.

4.6 Installing Relay

Installing Relay

The Relay is a 12volt 30amp. Available at www.TrackmateRacing.com

Pin Out Bottom View

$$\underline{87}$$

$$85| \quad \underline{87a} \quad |86$$

$$30|$$
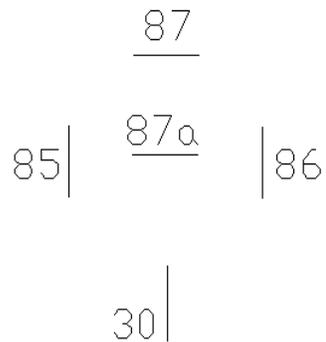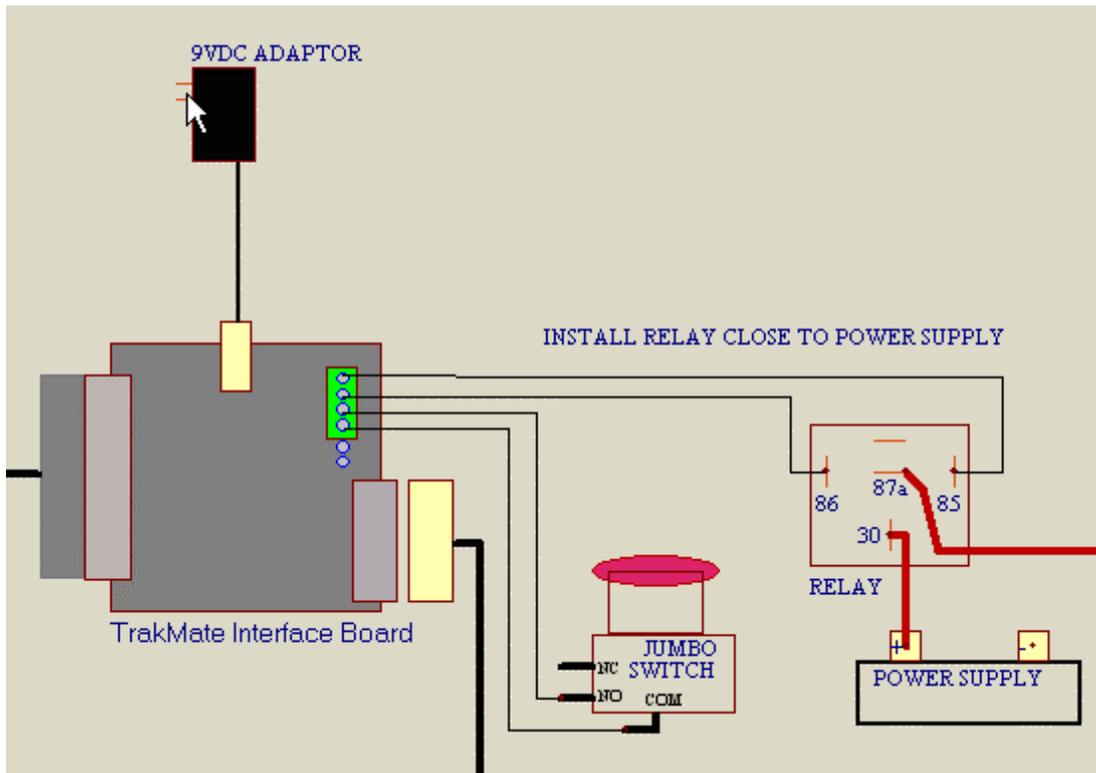
Step 1) Run two Wires from 85 and 86 to the two terminal screws marked RELAY

Step 2) Remove Power Wire from track power supply + Terminal

Step 3) Connect this end to 87a of Relay

Step 4) Add wire between 30 and power supply + Terminal

4.7 Installing Track Call Button

Installing Track Call Button

Buttons like this available at www.trackmateracing.com Product#   Jumbo

Install one or more track call buttons can be installed
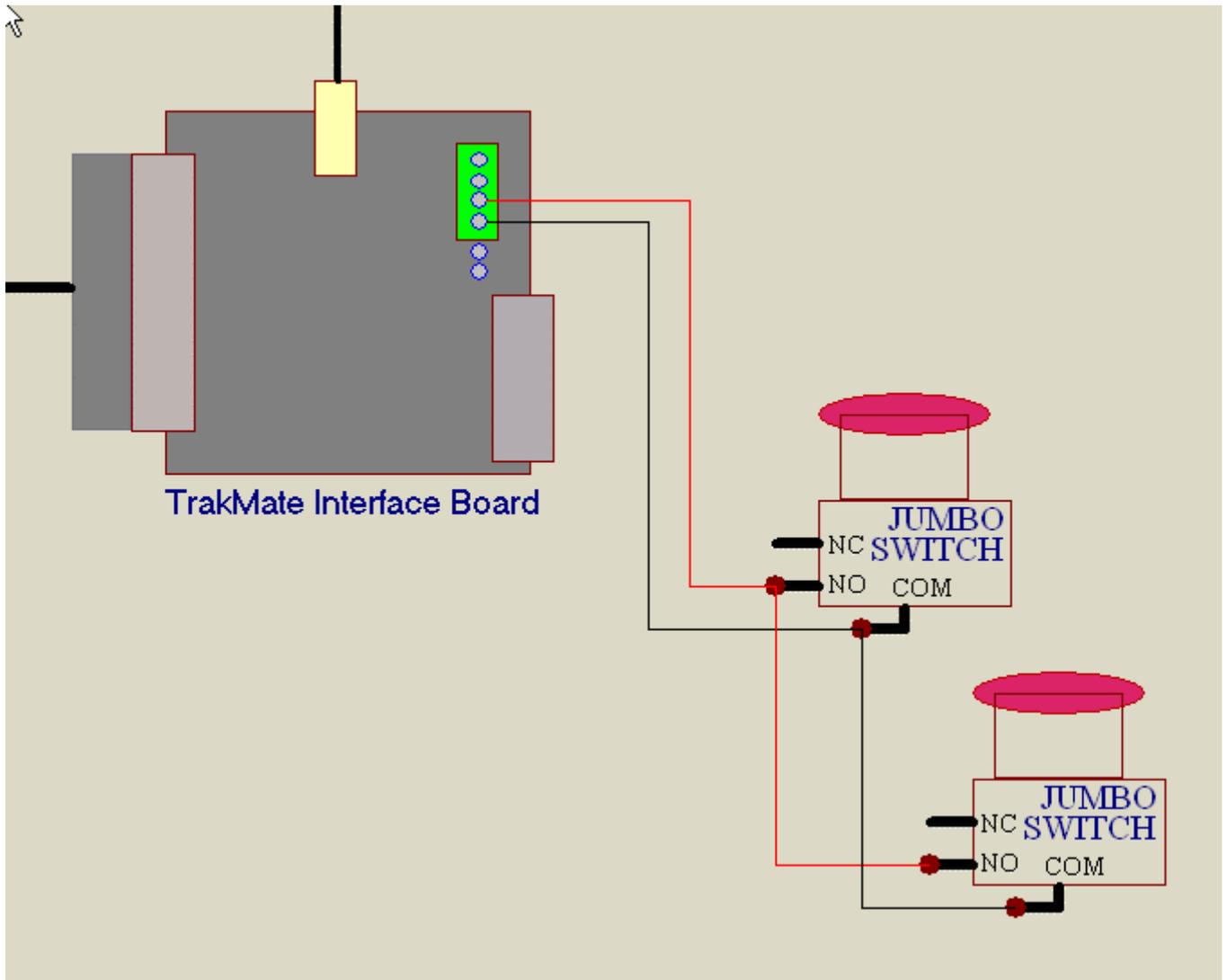
4.8 Sell Time Relay Installation

Sell Time Relay Installation

 Now comes with a prebuilt relay module which plugs into the 15pin connector of the module.
Sell Time only available with integrated sell time blue modules

Building your own Relay Panel

The 15 pin connector on the module is used to drive the relays. Each pair of wires will drive the relay coil which are pins 85 and 86 on the relay.   IT does not matter which of the two wires go to 85 or 86.

If you already have a bank of Relays with a common for all the Relay coils (either pin 85 or 86). Connect all the wires with white stripe to the common.

Do NOT connect any of the solid colored wires together, doing so will smoke the module.

Do NOT connect any power supply to pins 85 or 86 of the Relays.

Relay cable color code

Lane	Wire Color Pair
Lane 1	Brown + Brown/White
Lane 2	Orange + Orange/white
Lane 3	Green + Green/White
Lane 4	Blue + Blue/White
Lane 5	Brown + Brown/White (cable 2)
Lane 6	Orange + Orange/White(cable 2)
Lane 7	Green + Green/White(cable 2)
Lane 8	Blue +Blue/White(cable 2)

Testing

Test by plugging in the 12v 1 amp Power Pack. If wired properly you should hear all relays click one after another when module is powered on. If you don't hear clicking review wiring or call for support.

5. Software Installation

Installing Software from CD

1) Run the *setup* program on the CD.

2) If the installing on Windows 95 or 98 the dirextx7 drivers used for sound should be installed. The file can be found in the directx7 directory of the CD.

3) For synthesized speech to work you must run spchapi.exe and tv_enua.exe programs included on the CD found in the Voice Driver directory

5.2 Installation Settings

Installation Settings

Number of Lanes - Select number of lanes
Select Lane Color - Black is not available, If you have a black lane use Grey instead
Track Name - The name here will appear in print outs
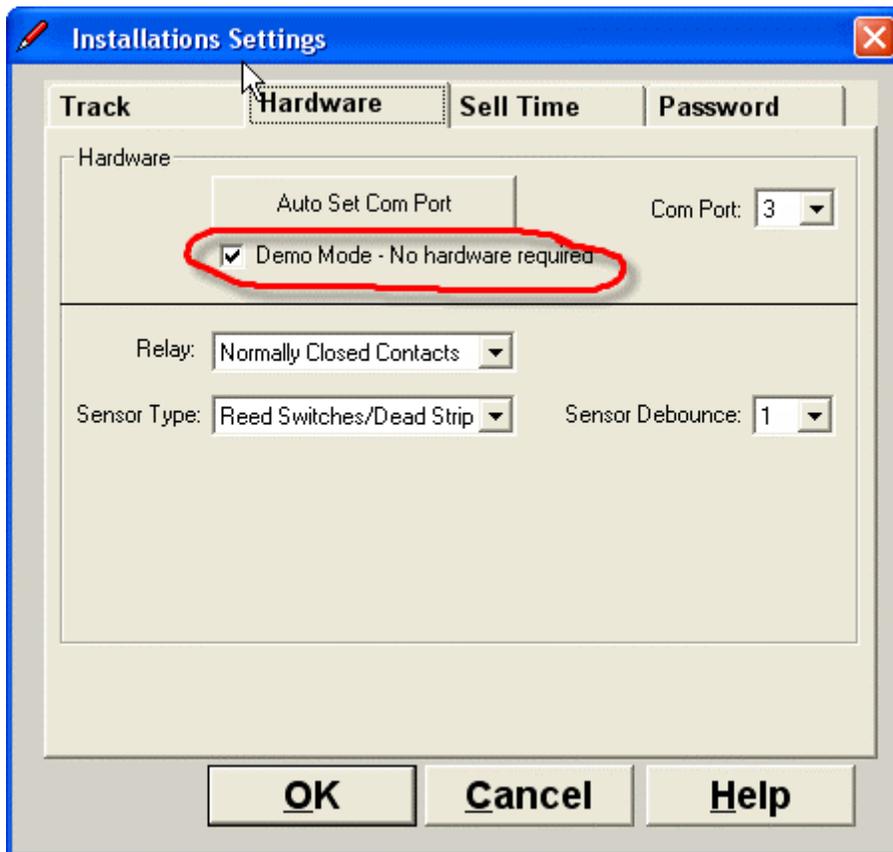
These are important settings

Sensor Type - Select correct sensor type, Laps will not count if incorrect sensor type is selected.

Sensor Debounce - Leave it at 1

Relay type - If contacts 87a and 30 are used select *Normally Closed Contacts.* If track power is On when it should be off and Off when it should be on; change the setting.

Com port - Com ports 1 to 16 are supported.
Have your interface plugged into the computer and powered on and Use the *Auto Set Com Port* button to automaticaly select the COM port. In some cases you may need to do it manually, follow the instructions below.
To find out what com ports are available on your computer click *start ->control panel- >system->hardware->device manager->ports*

Here is a sample screen
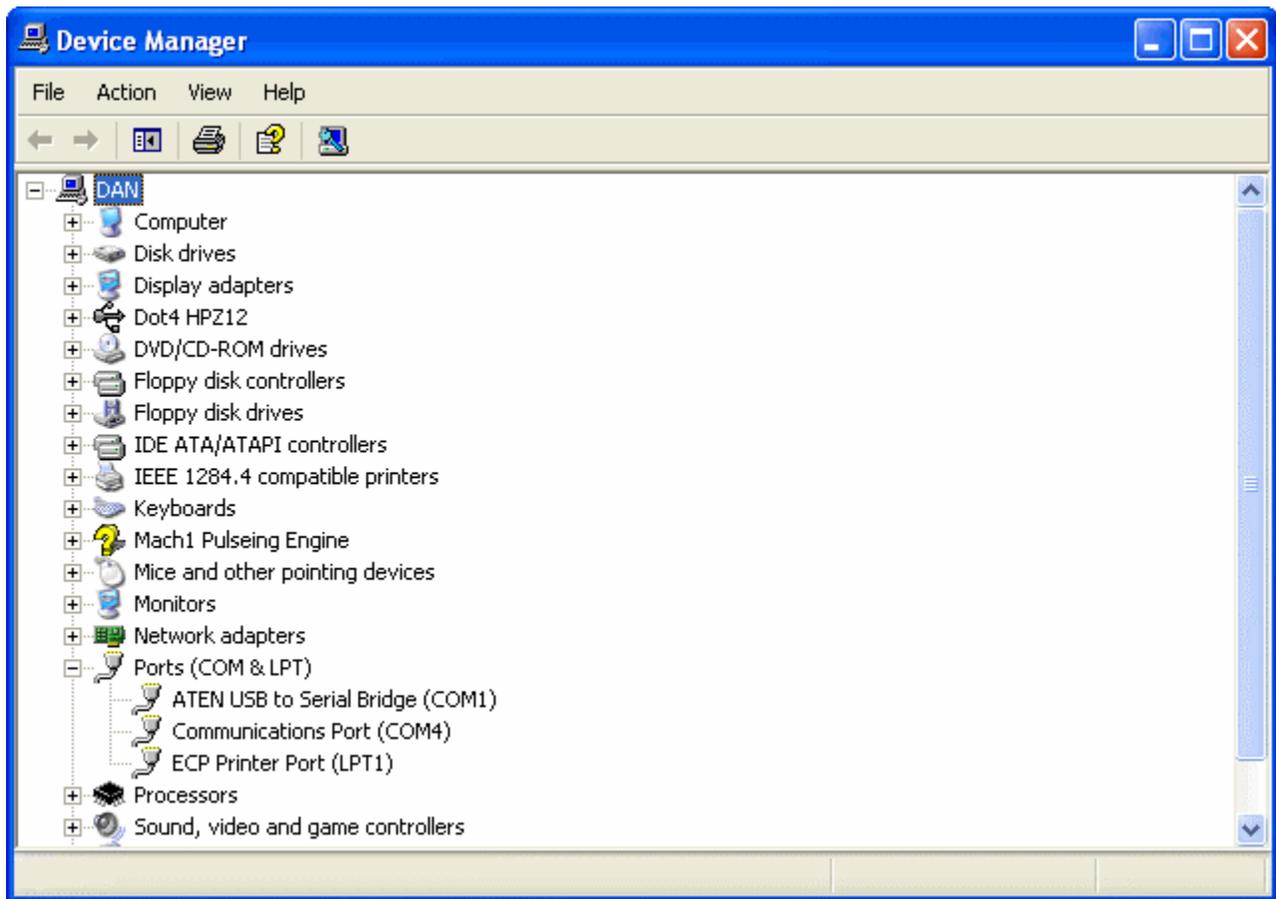
Notice com ports 1 and 4 are available

Installations Settings

| Track | Hardware | Sell Time | Password |

Sell Time

☐ Sell Time Hardware Installed   ☐ Sell Time by Lane

OK   Cancel   Help
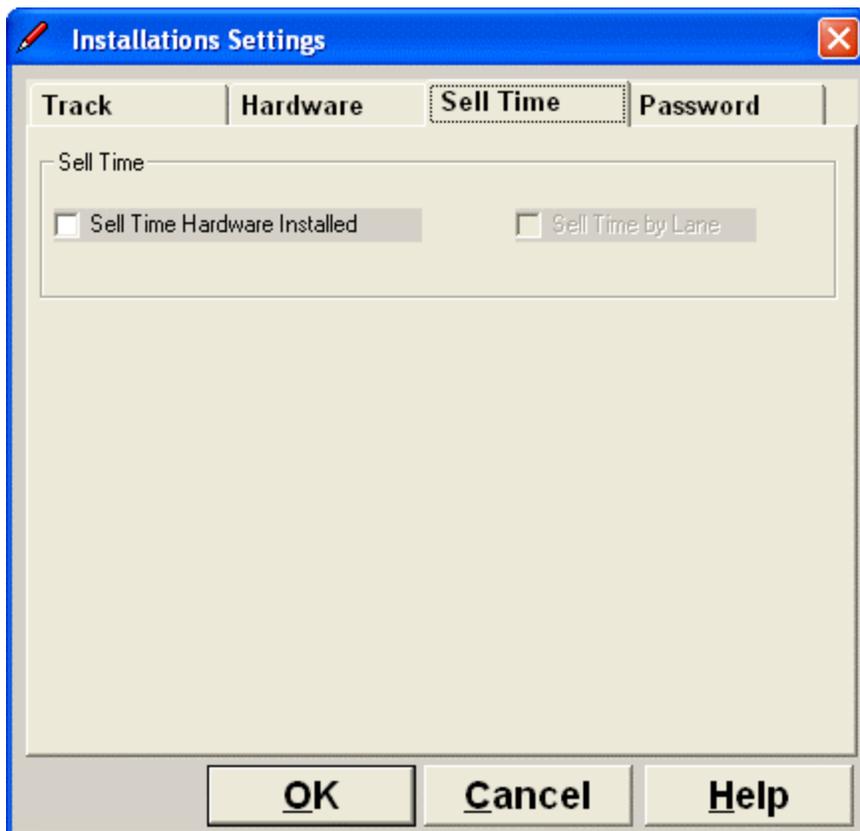
Sell Time Hardware Installed - You must have this checked if you have the time sell hardware installed . It must remain checked even when not selling time.

Sell time by lane - Check this box when you want to sell time by lane. A $ sign will appear in the top left corner of the screen when it time sell mode.

Installations Settings

| Track | Hardware | Sell Time | Password |

Password

☐ Password Protect Settings   Password: [   ]

OK   **Cancel**   **Help**
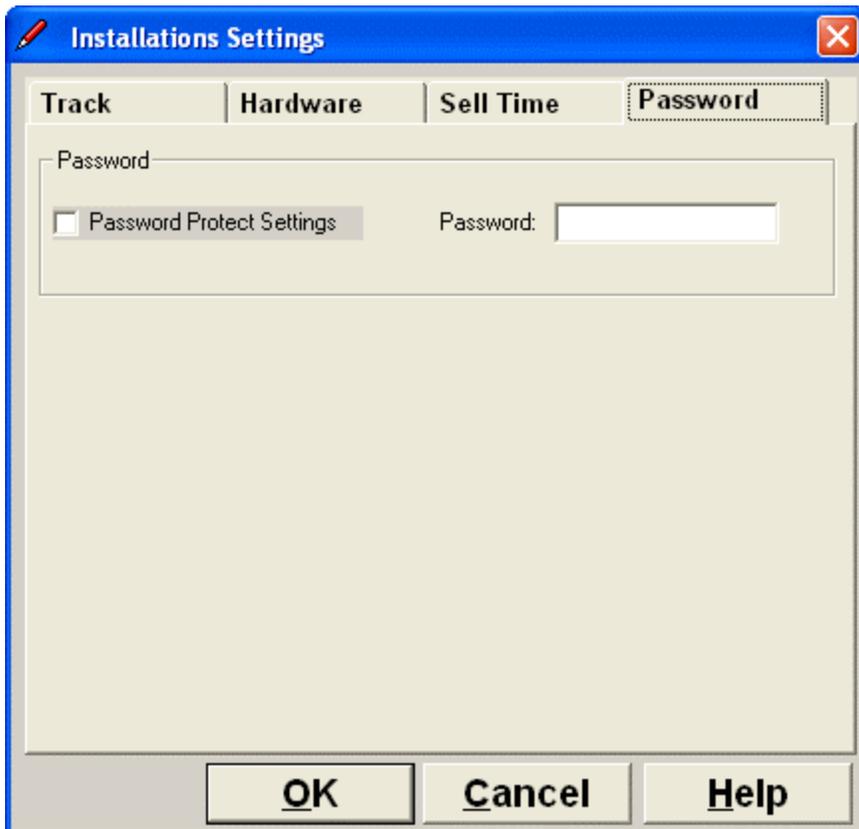
Password protect settings - You can enable password so users can not change installation settings as wrong settings can create problems. You should also enable password if you do time sell.

6. Main Screen

Lag First, Lag Behind, Median, Best Lap
The screen is divided into five columns. You may change what type of data can be displayed in the last two columns. Simply click on the column header before or during the race the race. For example you may change 'Lag First' to 'Lag Behind' or 'Median'. You may also use the F4, F5 function keys. (also see hot keys)

Reset Best Lap
You can reset best lap for any racer by clicking on their best lap field.

Track Name
You can toggle between Track Name and Race Fromat by clicking on it

7.1 Sound

Sound
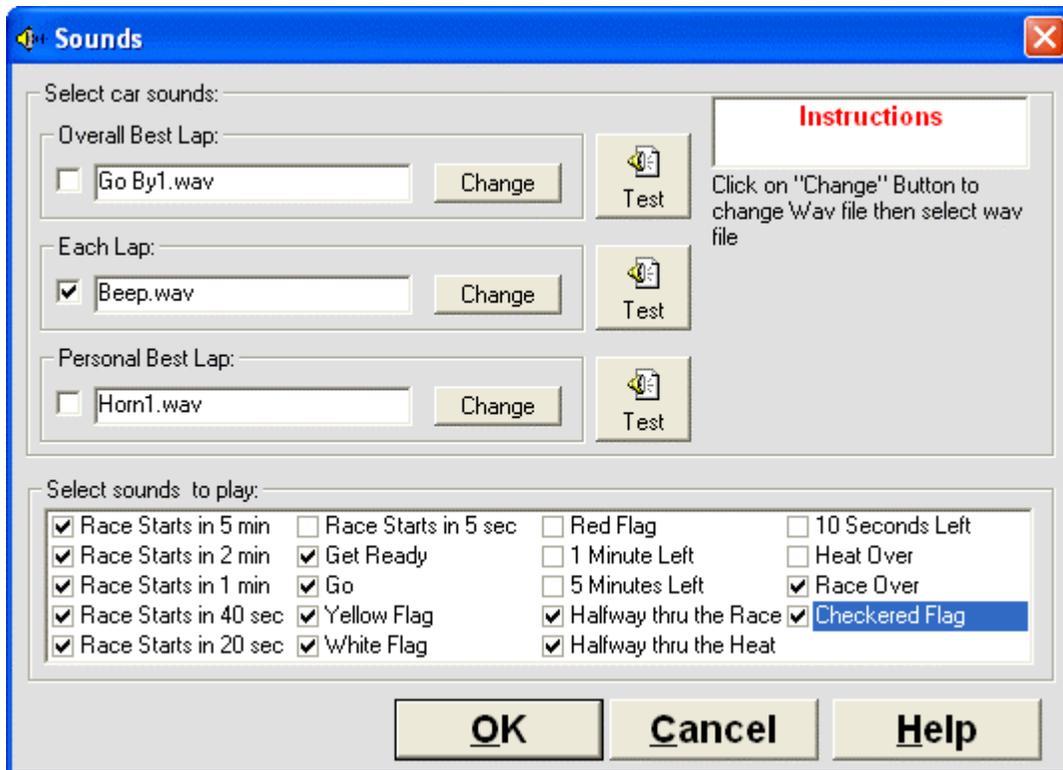
There are many sounds available you can select which sounds to enable or disable. Click on *setting->sound* to access this form.   se the test button to make sure the sound you selected is appropiate

7.2 Track Power

Track Power
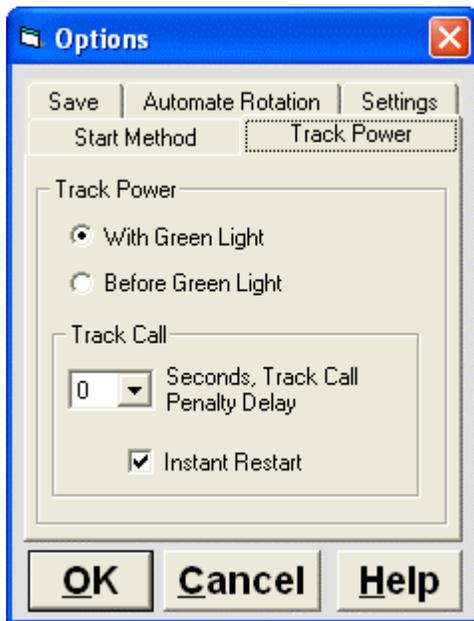
With Green Light - Track power comes when green light comes on, which makes it impossible to false start.
Before Green Light - Track power comes on a few seconds before Green light, If racer leaves to early his first lap will not count.

Track Call seconds - Normally left at 0, but some racers prefer to penalize a racer for hitting the track call button so .5 to 3 seconds of delay can be added before the track shuts power off

Instant Restart - check this box if you want instant restart with no count down after a track call.

7.3 Automation

Automate Rotation

A very liked feature is the automated rotation. This allows to run a complete race with up to 60 racers with out having to touch the computer. Another huge advantage is the race is completed in a much shorter time as racers know their time is limited between heats.

In the screen shot below Auto print after each heat was selected, a 10 second delay after the heat is over is used to view the screen after each heat, then the screen will automaticaly rotate the racers to their new lanes and wait another 50 seconds before automaticaly powering on the track for the next heat.
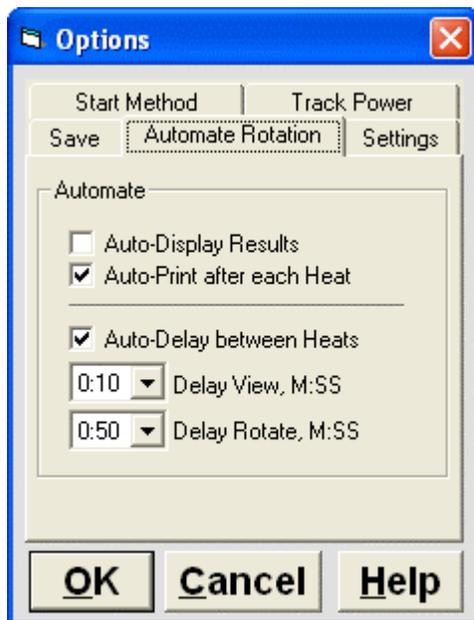
7.4 Settings
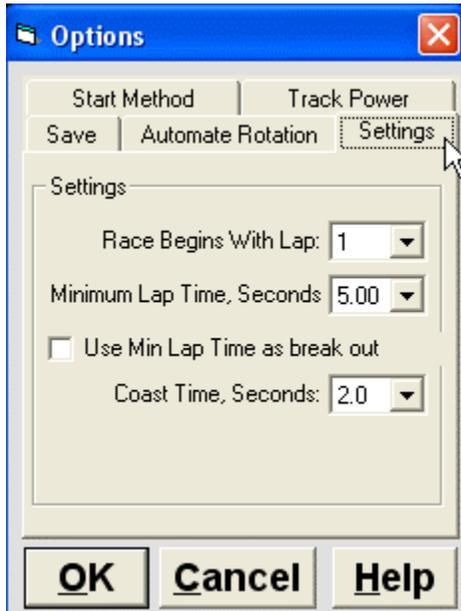
Race Begins With Lap 0,1
This setting only effects Lap or timed races.
Rotation or Round Robin races always start with Lap 1

Minimum Lap Time
Set this below best possible lap time.   This feature is useful in avoiding invalid lap times caused by slot cars accidently jumping into another lane and tripping the lap counter.   The minlap.wav file will play when it is below minimum lap time

Use Minimum Lap Time as break out
You may limit how fast a racer can go by not counting the lap if it is below a certain time. The minlap.wav file will play when it is below minimum lap time.   No Lap will count even if racer is below the minimum lap time many times in a row.

Coast Time
Since slot cars keep traveling a few feet for a few seconds after power is shut off, we still want the lap counter to count a lap after slot car crosses sensor. Coast time is the amount of time sensors are active for lap counts after power is shut off to track. Note that coast time is included in the heat time. Keep coast time as short as possible.

8. Race Formats

8.1 Practice

Practice

In practice mode up to 3000 laps can be counted. You can also reset your best lap time by clicking on it.
New in version 6 is the Voice option. Hear your lap times as you go over the sensor. To toggle voice
on/off use the ALT and Lane number. ie ALT1

Practice with rotation

Don't let one racer hog a lane, make them rotate through the lanes

8.2 Lap Races

Lap Race

The most popular race format for casual racing.   Like real full scale racing, race ends
after leader completes all laps and remaining racers complete their current lap.

If you have the relay option. See *options->track power* you may want to try the *option-track power on before green light* .

8.3 Timed Races

Timed Races

Race ends after time ends and all cars finish current lap.   If a car takes too long to complete current lap it will time out and end race.

8.4 Championship Race

Championship Race

Championship Race is usually well suited for crash and burn racing, meaning when you crash you are out of the race.   It works just like rotation race with lap heats but points are assigned depending on where you finish in the race.   Each racer races in each lane once.

ID	Racers	Lane 1	Lane 2	Lane 3	Lane 4	Points	Avg
2	Daniel	0	7	15	15	37	12.33
4	Debbie	10	10	0	15	35	11.67
1	Allan	10	7	7	0	24	8
3	John	0	0	0	0	0	0

click View->Race Results to see points

You can also assign point system click Race Format->Select Championship Race then click Championship Point System

8.5 Rotation

Rotation

There are two types of rotation. Rotation with lap heats and Rotation with timed heats.   If you have more racers then number of lanes use Round Robin format.

Rotation Race Lap Heats - Heat ends immediately and power is shut off when car completes number of laps.

Rotation Race Timed Heats - Heat ends immediately and power is shut off when time expires. This is the preferred method for most clubs.
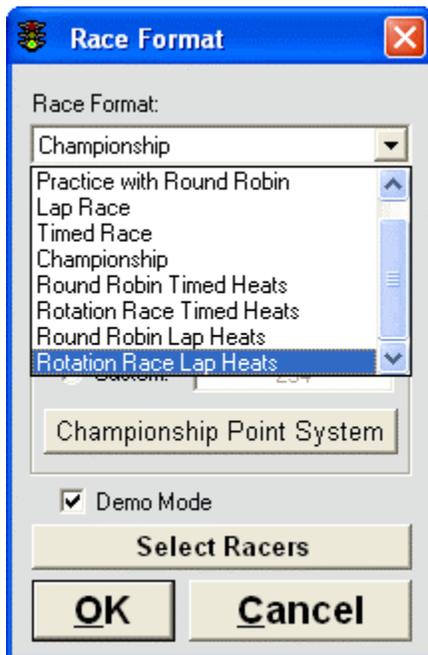
If you have more racers then number of lanes use Round Robin race format.

8.6 Round Robin

Round Robin

Round Robin is identical to rotation races but used when there are more racers then number of lanes. You cannot change name by clicking on it as in Rotation Races, you must change names using the Racers Menu

There are two types of Round Robin. Rotation with lap heats and Rotation with timed heats.   If you have more racers then number of lanes use Round Robin format.

Rotation Race Lap Heats - Heat ends immediately and power is shut off when car completes number of laps.

Rotation Race Timed Heats - Heat ends immediately and power is shut off when time expires. This is the preferred method for most clubs.
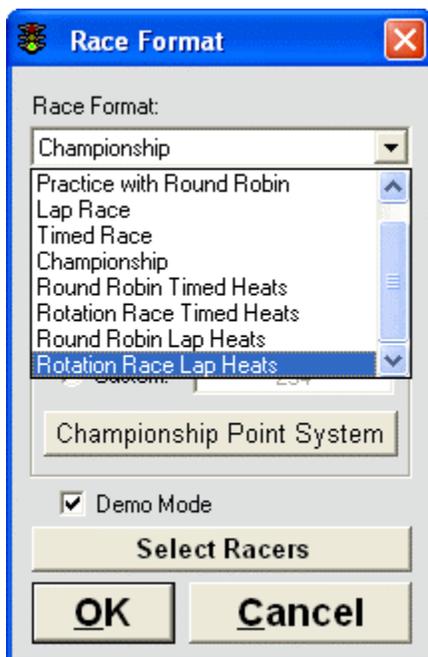
8.7 Custom Rotation

Custom Rotation Editor

So what's the big deal about the rotation editor?

The rotation editor allows you to go through the lanes in any sequence. Lets say you have a 8 lane track and 16 racers. With custom rotation editor you could create 2 groups of 8 racers but there all in the same race. The first group would race then the next group and so on. I'll show you how.

1) select custom rotation

2) enter   102030405060708   That's it, a 0 represents a sit out.

3) Select names
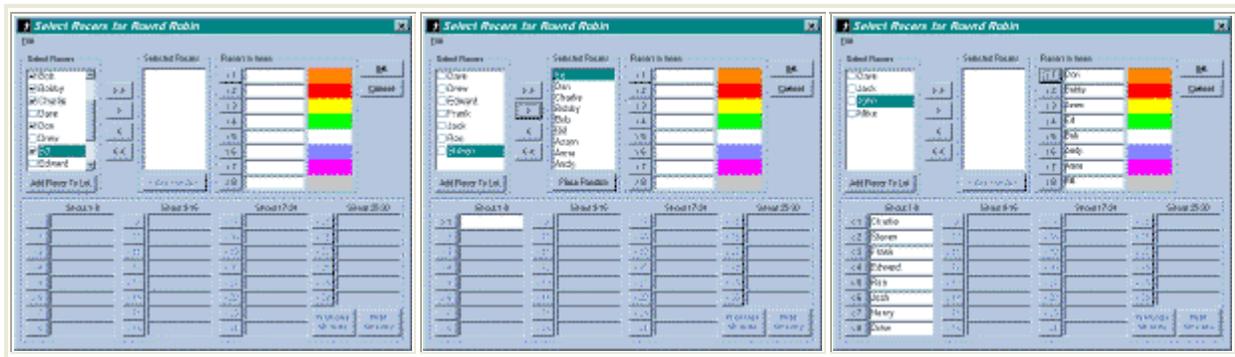
4) click View -> Rotation Sequence

Heat Sequence

Print Grid	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
	Orange	Red	Yellow	Green	White	Blue	Purple	Grey
Heat 1	Bobby	Ron	Azam	Frank	Andy	Bob	Drew	Edward
Heat 2	Jack	Bill	Anne	Ed	Don	Charlie	Dave	Steven
Heat 3	Edward	Bobby	Ron	Azam	Frank	Andy	Bob	Drew
Heat 4	Steven	Jack	Bill	Anne	Ed	Don	Charlie	Dave
Heat 5	Drew	Edward	Bobby	Ron	Azam	Frank	Andy	Bob
Heat 6	Dave	Steven	Jack	Bill	Anne	Ed	Don	Charlie
Heat 7	Bob	Drew	Edward	Bobby	Ron	Azam	Frank	Andy
Heat 8	Charlie	Dave	Steven	Jack	Bill	Anne	Ed	Don
Heat 9	Andy	Bob	Drew	Edward	Bobby	Ron	Azam	Frank
Heat 10	Don	Charlie	Dave	Steven	Jack	Bill	Anne	Ed
Heat 11	Frank	Andy	Bob	Drew	Edward	Bobby	Ron	Azam
Heat 12	Ed	Don	Charlie	Dave	Steven	Jack	Bill	Anne
Heat 13	Azam	Frank	Andy	Bob	Drew	Edward	Bobby	Ron
Heat 14	Anne	Ed	Don	Charlie	Dave	Steven	Jack	Bill
Heat 15	Ron	Azam	Frank	Andy	Bob	Drew	Edward	Bobby
Heat 16	Bill	Anne	Ed	Don	Charlie	Dave	Steven	Jack

Notice how everyone in heat 1 races together again in heats 3,5,7,9,11,13,15

How about taking a break after 2 or 3 heats. No problem

Race Format

Race Format:

Round Robin

Number of Minutes 0.25

Rotation Sequence
- ○ Straight: 12345678
- ○ European: 13578642
- ● Custom: 13570008600042

Championship Point System

☑ Auto-Delay between Heats

5 Delay View, sec.

5 Delay Rotate, sec.

☑ Demo Mode

Select Racers

OK   **Cancel**

Heat Sequence

Print Grid	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
	Orange	Red	Yellow	Green	White	Blue	Purple	Grey
Heat 1	Bobby	Ron	Azam	Frank	Andy	Bob	Drew	Edward
Heat 2	Jack	Frank	Bobby	Dave	Azam	Edward	Andy	Ed
Heat 3	Steven	Dave	Jack	Charlie	Bobby	Ed	Azam	Anne
Heat 4	Ron	Charlie	Steven	Don	Jack	Anne	Bobby	Bill
Heat 5	Frank	Don	Ron	Bob	Steven	Bill	Jack	Drew
Heat 6	Dave	Bob	Frank	Edward	Ron	Drew	Steven	Andy
Heat 7	Charlie	Edward	Dave	Ed	Frank	Andy	Ron	Azam
Heat 8	Don	Ed	Charlie	Anne	Dave	Azam	Frank	Bobby
Heat 9	Bob	Anne	Don	Bill	Charlie	Bobby	Dave	Jack
Heat 10	Edward	Bill	Bob	Drew	Don	Jack	Charlie	Steven
Heat 11	Ed	Drew	Edward	Andy	Bob	Steven	Don	Ron
Heat 12	Anne	Andy	Ed	Azam	Edward	Ron	Bob	Frank
Heat 13	Bill	Azam	Anne	Bobby	Ed	Frank	Edward	Dave
Heat 14	Drew	Bobby	Bill	Jack	Anne	Dave	Ed	Charlie
Heat 15	Andy	Jack	Drew	Steven	Bill	Charlie	Anne	Don
Heat 16	Azam	Steven	Andy	Ron	Drew	Don	Bill	Bob

Tip: Always check view rotation sequence before starting a race. You can also print it, the button is in the top left corner.

Wait you can do more.....

Lets say you have a 6 lane track and you only have 5 guys that showed up. You decide you only want to race the middle lanes 2,3,4,5 and have 1 guy marshalling the track. You also want to do European style not straight rotation that way you won't be racing next to the same guy all the time. No problem.

The custom sequence would be 3542 that's it, pretty easy.

Click on View Rotation and this is what you get

Heat Sequence

Print Grid	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
	Orange	Red	Yellow	Green	White	Blue
Heat 1	Empty	Bobby	Azam	Ed	Bob	Empty
Heat 2	Empty	Ed	Don	Bob	Azam	Empty
Heat 3	Empty	Bob	Bobby	Azam	Don	Empty
Heat 4	Empty	Azam	Ed	Don	Bobby	Empty
Heat 5	Empty	Don	Bob	Bobby	Ed	Empty

Notice the gutter lanes 1 and 6 are always empty just like you wanted.
Notice you never race beside the same guy, that's European rotation