TrakMate DragPro Installation Manual
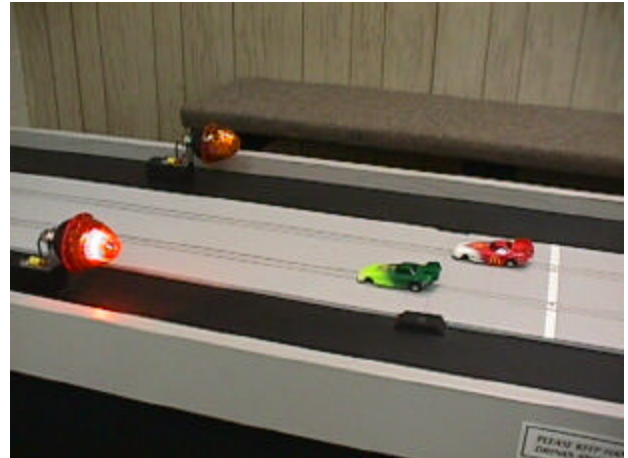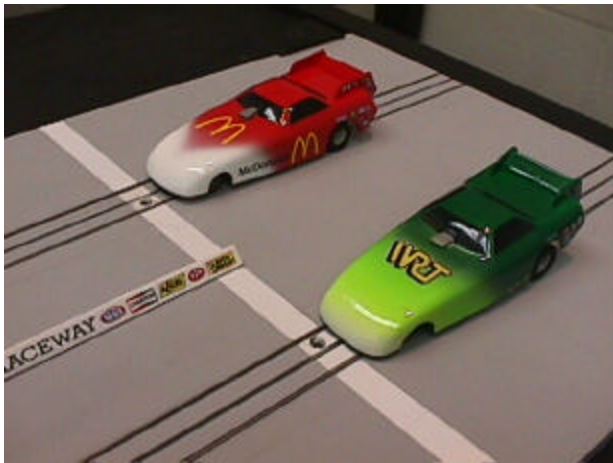
CONTENTS OF TRAKMATE DRAGPRO TIMING SYSTEM

QTY	DESCRIPTION	FUNCTION
1	3.5" Floppy	DragPro Software
2	I/O CARDS	Plugs inside of PC
2	Controller boards, which have 16 terminal screws	Connects to tree and sensors cables
2	3' cables	Connects controller boards to computer
1	30' sensor cable –	Speed trap and finish sensors
1	20' sensor cable – telephone type	Intermediate sensors
1	10' sensor cable –	Prestage and start sensors
1	8 conductor cable	Connects 16 Tree lights to controller (use two)
4	.1uf Capacitors (brown or Yellow)	Installed across track rails to remove interference
2	Sensors	Spare sensors
1	Tree Hook-Up Diagram	Attached at the end of this document

Please read all the instructions to get an overview before installing.   Do not use the demo version of the program with the hardware it will not work. If it says DEMO at the top of the screen then you are running the Demo program and it will not work with the hardware.   If you don't understand the diagnostic screen please contact me. The diagnostic sensor test is essential in troubleshooting and testing. Make sure all your sensors work in the sensor test before proceeding to connecting the tree or running a race.   If you have problems let me know which sensors work or don't work in the diagnostic screen.

STEP 1 Installing and Testing I/O Cards
1. Install the two I/O cards in the PC. (Use 386 or 486 computers or better) You can use any black slot in the PC. Installing software drivers is not necessary. The settings on the card have been preset and do not need to be changed.

2. Don't install anything else yet. Do not connect the 3' cables yet.
3. Run the Dragpro program and select diagnostic sensor test (hit D from the main menu)
4. All 10 dark counters should count on the 'Dark' side.
5. Do you see 10 dark counters counting rapidly?
6. Yes then continue with Step 2
7. No: Possible address conflict or board not seated properly in PC.   Contact support do not contiue with installation.

Step 2 Connecting Sensor Cables
1. Connect sensor cables to controller boards referring to chart in this manual.
2. DO NOT RUN SENSOR CABLES NEAR TRACK POWER CABLES.
3. Keep sensor cables at least one foot away from track power cables and track rails
4. Connect the controller boards to the two I/O cards you installed in Step1 using the 3' cables
5. DO NOT EXTEND THE 3' CABLES. It will cause problems or will not work at all.
6. Extend the keyboard and monitor cables instead and keep PC near start line
7. DO NOT CONNECT TREE LIGHTS YET
8. Controller Boards have terminal screws on them. These boards have no box, four holes are provided so they can be mounted. Looking at the board with the screws closest to you.   #1 is on the left side

Step 3 Testing Sensors

1. Run Dragpro to test sensors. From the main menu hit the D key for diagnostic
2. Do not rely on fluorescent lighting for the sensors.
3. Do you have enough light? A ceiling light may not be sufficient.
4. Note: THE LIGHT COUNTERS ARE DISABLED AND DO NOT WORK IN THE LATEST VERSION.
5. There are 10 dark counters, one for each sensor.
6. Dark counters should count rapidly when sensors are covered and stop counting when they 'see' light
7. Test all the sensors using the diagnostic. One at time cover a sensor, does its corresponding dark counter count?
8. When all the sensors are uncovered and see light then none of the dark counters should count
9. Contact support if you cannot get all the sensors to work in diagnostic mode, specify which ones don't work. Do not continue with tree installation.

10. Once you have all the sensors working in diagnostic you can check to see if you have 'enough light' if you are near the threshold you may encounter problems. With light on the sensors measure the voltage. METERS NEGATIVE PROBE ON GROUND (screw #1 on board). Measure voltage for all sensors on screws 4-8 on each board. Voltage should read below 1 volt. If voltage is to high increase light intensity for sensors

Step 4- INSTALL CAPACITORS.

These are small brown or yellow components that came in a bag. Connect one in each lane across the track rails (one lead on the left rail the other lead on the right rail). Install one near each start sensors and finish sensors. These are needed to remove interference. Take the time to install these. If they are not installed you may experience weird ETs and MPH

STEP 5   Testing without External Tree
Run some races using the on screen tree. **Make sure everything works before proceeding**

STEP 5   Connecting Tree Lights
1. Connect Tree lights to appropriate screw using chart provided. Careful not to connect a tree light to a sensor input as it may damage board. It's ok to use network or telephone type cable to connect lights to controller. Using two 8-conductor cables for a total of 16 wires is enough to connect all the lights
2. All tree lights will have one common, which connects to the PLUS side of a 12volt supply
3. If you are using trailer lights connect all the brackets together and connect it to the +12volt supply/battery using of 16-gauge wire.
4. Using two wires you will connect the NEGATIVE of trees power supply to #3 screw of controller boards (See diagram attached at end of this document)
5. Connect negative of your tree supply/battery to screw #3 of controller board 1.
6. Repeat for 2nd controller board
7. Connect negative of your tree supply/battery to screw #3 of controller board 2.

SOFTWARE SETTINGS

Settings maybe password protected, the default password is: admin
Below is the list of adjustable settings.
You will need to change the speed trap distance setting if your speed trap is not 12" long
Scale speed multiplies the actual speed by x amount the default is 1x or actual speed
Setting Large Display to YES will display race results in Large characters on the screen.

1 - Timer resolution : LOW
2 - Pro tree time : 0.400
3 - Print results : NO
4 - Large Display : NO
5 - Speed trap distance in inches : 12.000
6 - Scale speed : 1x
7 - Start count down after 0 seconds and before 2 seconds
8 - Coin Box : NO
9 - CREDITS PER COIN : 2
P - Password for access to settings : daniel
A - Address of Port A (Normally 0x3bc) : 3bc   _____
B - Address of Port B (Normally 0x278) : 278   _____
C - Address of Printer (Normally 0x378) : 378   _____
X - Exit

**If you had to change any of the settings for PORT A or PORT B or printer write down the value in the space provided above for future reference.

TO RUN A RACE

Place car so it covers prestage sensor only. Prestage light (top light) on tree should come on and prestage indicater at the top of computers main menu screen will become brighter .... Select 1 from menu. Now full tree will appear on computer screen. Stage light (2nd light form the top) will come on then Tree will start after a random delay. You may change random delay range in settings.
Use the ESC key to display results immediately, useful when only one car is raced.

ETs times are start sensor to finish sensor and do not include Reaction time.
A perfect reaction time is .500 on a full tree and .400 on a Pro tree. A reaction time of 498 on a full tree would be red lighting by .002 seconds.

RT	Reaction Time	A perfect reaction time is .500 on a Full tree and .400 on a Pro tree
ET	Elapsed Time	Time from start sensor to finish sensor. It Does not include Reaction Time
DI	Dial In	See Bracket Racing
MPH	Miles Per Hour	Speed through Speed Trap

Viewing Logged Races
When viewing logged races you have an option to sort on RT, ET, etc. Select which one to sort on the select Display data.

What is Bracket Racing ?

Why?
 Bracket racing is a form of drag racing whereby vehicles of different performance levels can compete on a potentially even basis. The anticipated elapsed times are compared for each vehicle, with the slower car receiving a head start equal to the difference of the two. With this system, virtually any two vehicles can be paired in a competitive drag race.

How it works
 If car A chooses a dial of 16.00 seconds and car B chooses a dial of 14.50, car A will get a 1.5-second head start. The win will goes to the driver who crosses the finish line first. In TrakMate software simply enter the dial-in for both drivers and the tree will come down staggered giving one lane the appropriate head start. Bracket racing only works with the Full Tree.

Disqualifications
If a driver runs quicker than his or her dial, he or she is said to break out and is disqualified. If both drivers run quicker than their dials, the win goes to the driver who breaks out by the least. A foul start, or red-light, takes precedent over a breakout, so a driver who red-lights is automatically disqualified even if his or her opponent breaks out. If both red-light the driver who red-lighted first loses. TrakMate Drag software takes care of all this and will display appropriate winner

Choosing a Dialin
For example: car "A" has recorded times of 17.78, 17.74, and 17.76, and the driver feels that a "dial-in" of 17.74 is appropriate. Meanwhile, driver "B", has recorded times of 15.27, 15.22, and 15.26 on the same track, and has opted for a dial-in of 15.22. Accordingly, car "A" will get a 2.5 second (17.75-15.25=2.5) head start over car "B" when the Tree counts down to each car's starting green light.

Strategy
Picking a Dialin that is too slow and you are more likely to break out. Pick a Dial-in that is too quick and you will receive less of a head start or your opponent will receive more of a head start. Having a car that runs consistent ETs will help.

Pro Tree Time for Slot Cars

On a Pro tree all 6 amber lights come on for .4 seconds then the green lights come on. In full scale drag racing drivers will react as soon as they see the ambers come on.   Human reaction time takes about .2 seconds,   that's the time it takes to respond to a visual.   There's another .020 seconds before the light is perceived as on. 0.2 + .02 = .220 seconds, that leaves .180 seconds. It will take at least .180 seconds for the car to roll out of the stage beam. The driver never has to worry about Red lighting if he reacts when the amber lights come on.   Now for slotcars it's a different story. A slot car will move forward a ¼" in about .010 seconds from a stand still, this means you will be Red lighting every time if you react as soon as the ambers come on.   This is why TrakMate Dragpro software has made the Pro Tree adjustable. It has been requested by customers who race full scale drag racing cars. They believe and I agree that it should not be possible just as it is in full scale drag racing to red light on a Pro Tree if you react on soon as the ambers come on. I recommend adjusting the pro tree to .200 seconds if you're using external tree lights(for on-screen or LED trees you will need to adjust the Pro Tree time to a lower value) you will experience better racing because both cars will be coming off the line within a fraction of a second. It's easy as soon as you see the ambers come on pull the trigger. Changing the Pro Tree time will not effect ET times as ET times do not include reaction time. Try using a .200 second Pro Tree you just might like it!!!!

MPH Accuracy in TrakMate Timing System
The DragPro program has a resolution setting which can be set at Low, Med, High and Highest. Faster computer systems may use higher resolution setting for a more accurate speed trap. Using a Resolution that is too high for your computer may cause tree to come down slow and compute ETs that are quicker then they should be.   Most 486 or Pentium computers should be able to use the High setting. There is also less of a chance of a tie happening when it is set at a High resolution as the internal clock is working at 1/10000 of a second as oppose to a 1/1000 of a second on Low resolution .

Below is a table comparing Resolution Settings based on a 12" speed trap. Double the speed trap length and you will half the +/- error

12" Trap	LOW setting	HIGH Setting
@ MPH	+/-MPH	+/-MPH
10	0.1	.01
20	0.5	.05
30	1.3	.13
40	2.3	.23
50	3.5	.35
60	5.4	.54
70	7.0	.70
80	8.8	.88
90	11.2	1.12

Resolution settings may be set from the Settings menu in the Dragpro software.

Sensor Positioning in track

Sensors in track…
```
__1__2_____3_____4_____5___Shut Down
__1__2_____3_____4_____5___Shut Down
```

Ref.	Sensor	Placement	Comments
1	Prestage	.5" before start sensor	
2	Start		
3	Intermediate	Scale 60' from start Or Scale 1/8 mile	
4	Speed	Minimum 12" before finish Or Scale 60' before Finish	Speed traps up to 4' have been used on long tracks for more accuracy
5	Finish	Scale ¼ or 1/8 mile after start sensor.	You may if you wish set this to anything you like, it will not require any changes to the program

Scale Table

1 mile = 5280'	HO (1/64)	1/32	1/24	1/10
¼ mile	20' 7.5"	41'3"	55'	132'
1000 feet	15' 7.5"	31'3"	41'8"	100'
1/8 mile	10'3.75"	20'7.5"	27'6"	66'
60 feet	11.25"	1'10.5"	2'6"	6'

Cables

If you are making your own sensor cables use UTP – unshielded 4 twisted pair multi-stranded cable commonly used in computer networks. Connect the white (or white stripe) wire to the long lead of the sensor. Connect the colored wire to the short lead of the sensor. One cable will be required for the prestage and start sensors and one cable for the speed trap and finish line sensors.   One cable for the intermediate sensors

Controller Boards

Screw #	Controller which is connected to I/O Card labeled 3BC
1	GROUND (NEGATIVE) WHITE WIRES SENSOR CABLE
2	GROUND (NEGATIVE) WHITE WIRES SENSOR CABLE
3	NEGATIVE FROM TREE POWER SUPPLY MUST BE CONNECTED TO THIS SCREW
4	LEFT LANE INTERMEDIATE SENSOR RED WIRE
5	RIGHT LANE STAGE/START SENSOR (2ND SENSOR)
6	LEFT LANE STAGE/START SENSOR (2ND SENSOR)
7	RIGHT LANE FINISH SENSOR
8	LEFT LANE FINISH SENSOR
9	RIGHT SIDE GREEN LIGHT
10	RIGHT SIDE BOTTOM YELLOW LIGHT
11	RIGHT SIDE MIDDLE YELLOW LIGHT
12	RIGHT SIDE TOP YELLOW LIGHT
13	LEFT SIDE GREEN LIGHT
14	LEFT SIDE BOTTOM YELLOW LIGHT
15	LEFT SIDE MIDDLE YELLOW LIGHT
16	LEFT SIDE TOP YELLOW LIGHT

Screw #	Controller which is connected to I/O Card labeled 278
1	GROUND (NEGATIVE) BLACK & GREEN WIRES FROM INTERMEDIATE SENSORS
2	GROUND (NEGATIVE) WHITE WIRES FROM SENSOR CABLE
3	NEGATIVE FROM TREE POWER SUPPLY MUST BE CONNECTED TO THIS SCREW, USE A 16GAUGE WIRE
4	RIGHT LANE INTERMEDIATE SENSOR YELLOW WIRE
5	RIGHT LANE PRESTAGE SENSOR
6	LEFT LANE PRESTAGE SENSOR
7	RIGHT LANE SPEED SENSOR
8	LEFT LANE SPEED SENSOR
9	RIGHT SIDE WIN LIGHT
10	RIGHT SIDE RED LIGHT
11	RIGHT SIDE STAGE LIGHT
12	RIGHT SIDE PRESTAGE LIGHT
13	LEFT SIDE WIN LIGHT
14	LEFT SIDE RED LIGHT
15	LEFT SIDE STAGE LIGHT
16	LEFT SIDE PRESTAGE LIGHT

POSITIVE FROM TREE POWER SUPPLY WILL GO TO THE COMMON OF ALL THE TREE LIGHTS. SEE TREE DIAGRAM

TrakMate Price Sheet

Drag Racing (start and finish sensors)	$ 119.00	
Drag Racing Pro prestage, start, intermediate, speed, finish sensors Supports external tree	$ 450.00	
PC 486 computer with hardware and software installed (monitor not included)	$100.00	
12 Volt 10 amp Power Supply for Tree Lights	$60.00	
Coin box option	$149.00	

TrakMate	US Funds	CDN Funds
2 Lane	$ 55.00	$ 83.00
4 Lane	$ 68.00	$ 99.00
6 Lane	$ 108.00	$ 162.00
8 Lane	$ 128.00	$ 192.00
Longer Cable for above add ...	$5.00	
Relay Option	$ 49.00	$ 73.00
Jumbo Switch for track call button	$5.00	
Optional I/O card Required if TrakMate is not compatible with existing Printer Port Allows easy printer connection	$12.00	$18.00
Optional Infrared LED kit for overhead light source Without adaptor / With power adaptor	$8.00 / $13.50	
Optional Bridge to mount infrared LED kit for 4 lane HO track	$10.00	
Power adapter		
Drag Racing (start and finish sensors)	$ 119.00	$ 178.00
Drag Racing Pro prestage, start, intermediate, speed, finish sensors Supports external tree	$ 450.00	
Shipping To any where in the world (some restrictions may apply)	$ 6.00	$ 9.00

POWER SUPPLIES	Voltage	Amps	Comments	US FUNDS
Power Supply	0 - 30 Volts	10amps	with meters	$120
Power Supply				
Power Supply	11 Volts - 13.5 volts	10amps		$70

MISC	US FUNDS
Y-CABLE - Connect Two monitors to a PC	$12
Video Splitter (electronic) Connect two monitors to a PC	$70
Video Splitter Connect four monitors to a PC	$95
VGA monitor extension cables . 6' / 10' / 15' / 25'	$9 / $12 / $16/ $22
Keyboard extension cable AT type 6' / 12' / 25'	$4 / $6 / $10
Track Building Hardware	
Fuse Holder - inline AGC type	$2
4PDT SWITCH 15amp ON - OFF - ON	$3
Ninco controller 6' ext ension cable 3.5mm	$4
1/4" PLUG	$4
Terminal Strip	$3

For Orders Call Toll free 1-877-756-8227 (North America only) or Phone: 604-582-1946
.... ask for Daniel 9:00am - 9:00pm Pacific Time. 7 days a week

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