CHANGING MEMORY SETTINGS

YOUR Vtrac HAS BEEN SUPPLIED PRE-SET WITH MEMORY 1 SET AS A 'NORMAL' THROTTLE CONTROL RESPONSE, MEMORIES 2 TO 5 INCREASE THROTTLE RESPONSE (PUNCHY), AND MEMORIES 6 TO 10 DECREASE IT (SMOOTH). TO CHANGE A MEMORY SETTING FROM THOSE SUPPLIED TO YOUR OWN 'CUSTOM' SETTINGS DO THE FOLLOWING:

PRESS AND RELEASE THE 'SET' BUTTON UNTIL THE MEMORY YOU WANT TO CHANGE IS THE SELECTED MEMORY.

PRESS AND HOLD THE 'SET' BUTTON UNTIL THE GREEN 'MODE' LED IS ON, THE CURRENTLY SELECTED DYNAMIC THROTTLE PROGRAM WILL BE SHOWN ON THE 'SETTING' LEDs 1 TO 10 AS LED OFF, LED FLASHING OR LED SOLID. LED OFF IS A 'NORMAL' THROTTLE, LED FLASHING ARE THE 'PUNCHY' SETTINGS AND LED SOLID ARE 'SMOOTH'.

PRESS AND RELEASE THE 'SET' BUTTON TO CYCLE THROUGH THE 20 DYNAMIC THROTTLE PROGRAMS AVAILABLE. WHEN YOU HAVE SELECTED THE ONE YOU WANT TO USE SWITCH THE Vtrac OFF TO EXIT 'SET-UP' MODE.

THE SAME SET-UP METHOD IS USED TO CHANGE THE START RESPONSE, BRAKE RESPONSE, BRAKE MINIMUM AND BRAKE MAXIMUM SETTINGS. (REFER TO THE 'VTRAC SET-UP GUIDE' SHEET FOR FURTHER DETAILS)

DYNAMIC THROTTLE RESPONSE (DTR)

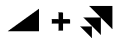
'DTR' IS THE BEST METHOD YET DEVISED FOR POWER HANDLING ON DIGITAL ELECTRONIC SPEED CONTROLLERS. DTR IS MUCH BETTER THAN CURRENT LIMITING WHICH CAN ONLY LIMIT CURRENT PEAKS AND IS LESS EFFICIENT. THE WAY DTR OPERATES MEANS THE 'FEEL' OF THE THROTTLE IS ALWAYS GOOD, ESPECIALLY AT LOW-MID SPEED. INSTEAD OF LIMITING CURRENT DRAW ABOVE A SET 'CURRENT LIMIT' WHEN ACCELERATING, DTR CONTINUOUSLY MODIFIES THE THROTTLE IN RESPONSE TO THE DRIVERS INPUT GIVING IMPROVED ON-TRACK PERFORMANCE.

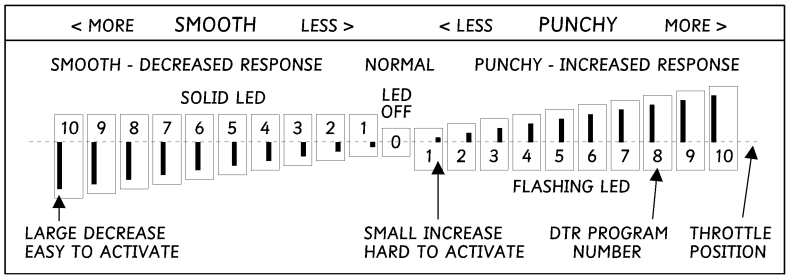
DTR WILL GIVE YOU AN ON-TRACK ADVANTAGE IN VARYING TRACK CONDITIONS AND ON MANY TRACK SURFACES. BY TESTING OUT SETTINGS TO FIND THOSE THAT WORK WELL FOR YOU AND SAVING THEM AS 'CUSTOM SETTINGS' YOU WILL SOON HAVE A USEFUL RANGE OF STORED SETTINGS AVAILABLE TO CALL UP WHEN REQUIRED.

THE BLANK 'CUSTOM SETTINGS' TABLES ON THE VTRAC SET-UP GUIDE CAN BE COPIED AND USED TO KEEP A RECORD OF YOUR OWN CUSTOM SETTINGS. THESE COULD BE FOR DIFFERENT CARS, TRACKS, MOTORS ETC.

THE TABLE BELOW SHOWS THE DYNAMIC THROTTLE PROGRAMS, EACH PROGRAM HAS TWO PARAMETERS:
1 'THROTTLE RATE' HOW EASILY A THROTTLE CONTROL CHANGE WILL ACTIVATE 'POWER CONTROL'
2 'POWER CONTROL' THE AMOUNT OF THROTTLE INCREASE/DECREASE USED TO CONTROL THE POWER

DYNAMIC THROTTLE PROGRAMS





EACH DTR PROGRAM IS SHOWN AS A BOX, THE DASHED HORIZONTAL LINE SHOWS THE THROTTLE POSITION. THE THICK VERTICAL BAR IS THE AMOUNT OF THROTTLE INCREASE/DECREASE AND THE POSITION OF THE VERTICAL BAR IN EACH BOX (LEFT OR RIGHT) SHOWS WHEN THE POWER CONTROL WILL BE ACTIVATED. IF TO THE LEFT IN THE BOX IT IS EASILY ACTIVATED AND TO THE RIGHT IT IS MUCH HARDER TO ACTIVATE. WHEN SET TO EASY ANY MOVEMENT OF THE THROTTLE CONTROL WILL HAVE AN EFFECT ON THE POWER. WHEN SET TO HARD ONLY A QUICK 'JABBING' MOVEMENT OF THE THROTTLE WILL HAVE ANY EFFECT.

Vtrac-X98 EPS (FP) SPECIFICATIONS

Case Size	40x29x16mm	Brake On-Resistance	0.00375Ω
Weight (no wires)	Approx. 34g	†Brake Current	120A
Voltage Input	4 - 10 cells	Regenerative Braking	Yes
Drive On-Resistance	0.00075Ω	Brake Programs	10 Selectable
†Drive Current	480A	Brake Minimum Setting	Adjustable
PWM Throttle Resolution	800 Steps	Brake Maximum Setting	Adjustable
PWM Frequency	Optimised	Neutral 'Drag' Braking	Adjustable
Throttle Rate (Pro-Set)	Adjustable	Enhanced Power System	Yes
Power Control (Pro-Set)	Adjustable	Rx Supply Output Voltage	6.0V
Start Response	Adjustable	Rx Supply Output Current	3.0A
Dynamic Throttle Programs	20 Selectable	Rx Supply Priority/Protection	Yes
User Set-up Memories (1-10)	Programmable	Full FP Water/Dirt Protection	Yes

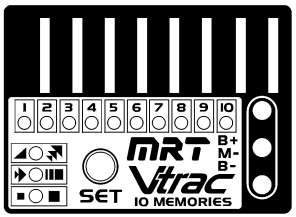
†MOSFET Transistor Rating at 25°C Junction Temperature.

MODEL RACING TECHNOLOGY

Vtrac-X98 EPS (FP)

PRO SERIES DIGITAL ELECTRONIC SPEED CONTROL

INSTRUCTIONS



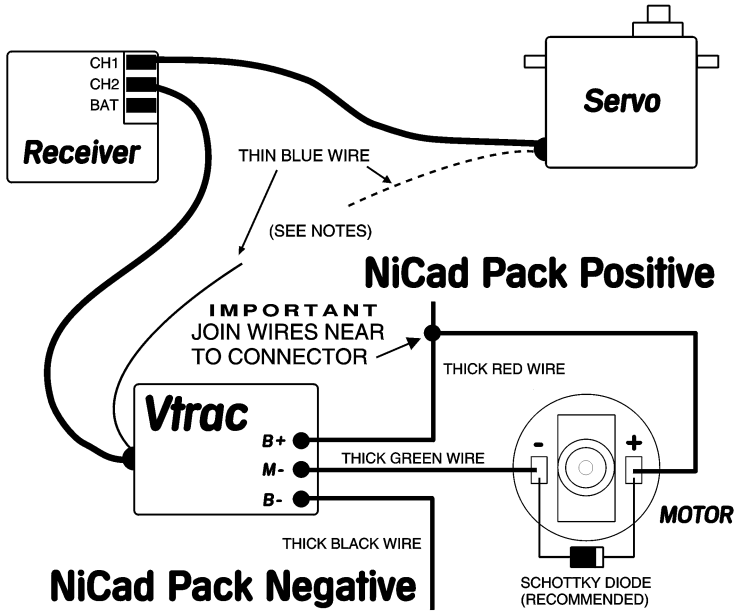
MODEL RACING TECHNOLOGY
258 DOVER ROAD, FOLKESTONE, KENT, CT19 6NS, ENGLAND.
TELEPHONE/FAX (UK) 01303 259196

IMPORTANT Please Read! . . . .

BEFORE WIRING UP YOUR Vtrac PLEASE READ THE INSTRUCTIONS CAREFULLY AND REFER TO THE WIRING DIAGRAM BELOW.

IT IS VERY IMPORTANT THAT YOU DO NOT SHORT OUT OR REVERSE CONNECT ANY OF THE WIRES ON YOUR Vtrac AS THIS COULD CAUSE DAMAGE TO YOUR SPEED CONTROLLER AND THE EQUIPMENT CONNECTED TO IT. IF YOU DO INCORRECTLY CONNECT THE POWER WIRES AND THE BRAKES STOP WORKING, DO NOT USE YOUR Vtrac AS FURTHER DAMAGE COULD OCCUR - RETURN TO MRT FOR REPAIR.

Vtrac WIRING DIAGRAM



a) If using a FET servo, connect the thin blue wire from the Vtrac to the thin blue wire from the servo and wire a 4.7uH choke into the lead. (choke should be supplied with FET servo)

b) If using a non-FET servo the thin blue wire from the Vtrac is not used and should be insulated.

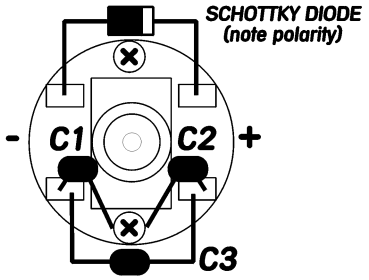
CONNECTION OF WIRES

BLACK WIRE - BATTERY NEGATIVE
RED WIRE - BATTERY POSITIVE
GREEN WIRE - MOTOR NEGATIVE
THIN BLUE WIRE - FET SERVO LEAD

CAPACITORS: C1, C2 AND C3 0.1uF

TIP: SCHOTTKY DIODES ON MOTORS IMPROVE OVERALL EFFICIENCY, SO USE THEM IF POSSIBLE.

INSTALLATION OF CAPACITORS AND SCHOTTKY DIODE



Vtrac INSTALLATION

WIRE UP YOUR Vtrac ACCORDING TO THE WIRING DIAGRAM AND REMEMBER TO FOLLOW THE ADVICE BELOW:

- **DO NOT** ALLOW SOLDER POSTS TO GET TOO HOT WHEN SOLDERING WIRES. USE AT LEAST A 25W SOLDERING IRON AND MAKE SURE A GOOD SOLDER JOINT IS MADE.
- ALWAYS USE A MOTOR WITH CAPACITORS FITTED TO HELP PREVENT ANY POSSIBLE RADIO GLITCHES.
- SCHOTTKY DIODES CAN BE USED ON THE MOTOR TO IMPROVE EFFICIENCY. (SEE DIAGRAM ON OPPOSITE PAGE)
- ALWAYS KEEP THE RECEIVER AND RECEIVER AERIAL AWAY FROM ALL THE POWER WIRES IN YOUR CAR.
- IF USING A SEPARATE RECEIVER BATTERY DISCONNECT RED RX WIRE FROM Vtrac RX PLUG AND INSULATE.
- INSTALL YOUR Vtrac SECURELY IN CAR WITH VELCRO OR SERVO TAPE - FIT Vtrac IN A SAFE DRY POSITION.
- KEEP POWER WIRE LENGTHS AS SHORT AS POSSIBLE TO MAXIMISE PERFORMANCE AND EFFICIENCY.
- KEEP ESC / MOTOR POSITIVE POWER WIRE JOINT AS CLOSE TO POSITIVE BATTERY CONNECTOR AS POSSIBLE TO HELP AVOID STEERING AND THROTTLE GLITCHES UNDER VERY HARD ACCELERATION.
- HEATSINKS CAN BE USED ON YOUR Vtrac BUT MUST NOT SHORT OUT ACROSS THE DRIVE AND BRAKE FETs.

NOTE: MOTOR MUST BE CONNECTED TO Vtrac FOR BEEPS TO BE HEARD.

ADJUSTING THE Vtrac TO YOUR TRANSMITTER

AFTER WIRING UP YOUR Vtrac, TURN YOUR TRANSMITTER ON AND SET THE THROTTLE TRIM TO NEUTRAL.

1. CONNECT YOUR Vtrac TO THE BATTERY PACK WITH THE Vtrac SWITCHED OFF.
2. PRESS AND HOLD THE Vtrac 'SET' BUTTON WHILE SWITCHING YOUR Vtrac ON.
3. AFTER 1 SECOND THE MOTOR WILL 'BEEP' AND THE AMBER LED WILL COME ON. THE NEUTRAL POSITION HAS NOW BEEN SET. THE GREEN AND RED LEDs WILL BE FLASHING.
4. HOLD THE TRANSMITTER THROTTLE CONTROL AT THE POSITION FULL POWER IS REQUIRED, THEN PRESS AND RELEASE THE 'SET' BUTTON, THE FULL POWER POSITION HAS NOW BEEN SET.
5. HOLD THE TRANSMITTER THROTTLE CONTROL AT THE POSITION FULL BRAKES ARE REQUIRED, THEN PRESS AND RELEASE THE 'SET' BUTTON, THE FULL BRAKES POSITION HAS NOW BEEN SET.

THE RADIO SET-UP IS NOW COMPLETE AND YOUR Vtrac IS READY TO BE USED!!

A QUICK GUIDE TO SETTING AND USING YOUR Vtrac

SETTING YOUR Vtrac IS VERY EASY, THE 20 'PRO-RESPONSE' X98 DYNAMIC CONTROL PROGRAMS WILL GIVE YOU PERFECT THROTTLE CONTROL JUST LIKE THE BEST DRIVERS IN THE WORLD, SIMPLY BY THE PRESS OF A BUTTON!!

CONNECT YOUR Vtrac TO A BATTERY PACK AND SWITCH THE Vtrac ON, AFTER POWER-UP THE AMBER LED IS ON.

YOUR Vtrac IS SUPPLIED SET ON MEMORY 1 AND IS READY FOR USE RIGHT AWAY.

MEMORY 1 IS SET AS A 'NORMAL' THROTTLE, THE RESPONSE IS PROPORTIONAL TO THE TX THROTTLE POSITION. IE. IF YOU MOVE THE TX THROTTLE CONTROL THE POWER/BRAKES WILL MATCH YOUR INPUT EXACTLY, THIS IS A SIMPLE METHOD OF CONTROL AVAILABLE ON ALL SPEEDOs. (YOUR Vtrac CAN DO A LOT MORE THAN THIS)

FIRST TRY A RUN SET ON MEMORY 1, AFTER THE RUN IF BATTERY DURATION IS OK AND YOU WANT TO IMPROVE YOUR CARS PERFORMANCE TRY A RUN ON MEMORY 2 UP TO 5 (LED FLASHING). REMEMBER THAT ON MEMORY 5 THE PERFORMANCE WILL BE A LOT BETTER THAN ON MEMORY 1 AND THAT BATTERY DURATION WILL BE REDUCED.

IF AFTER THE RUN BATTERY DURATION IS NOT OK THEN TRY A RUN SET FROM MEMORY 6 UP TO 10 (LED SOLID). MEMORIES 6 TO 10 INCREASE IN 'SMOOTHNESS' FROM 6 UP TO 10 WITH MEMORY 10 BEING THE SMOOTHEST. SMOOTH SETTINGS WILL HELP TO MAKE YOUR CAR EASIER TO CONTROL AND WILL IMPROVE BATTERY DURATION.

TO CHANGE THE SELECTED MEMORY SETTING ON YOUR Vtrac, SIMPLY PRESS AND RELEASE THE 'SET' BUTTON. THE 3 'MODE' LEDs WILL FLASH AND ONE OF THE 'SETTING' LEDs NUMBERED 1 TO 10 WILL BE ON TO SHOW THE CURRENTLY SELECTED MEMORY. TO CYCLE THROUGH THE MEMORIES PRESS AND RELEASE THE 'SET' BUTTON. AFTER THE REQUIRED MEMORY HAS BEEN SELECTED SIMPLY SWITCH YOUR Vtrac OFF TO EXIT 'SET-UP' MODE.

REMEMBER . . .

MOTORS, GEARING AND BATTERIES HAVE THE BIGGEST EFFECT ON CAR PERFORMANCE.
PUNCHY THROTTLE RESPONSE SETTINGS (LED FLASHING) REDUCE BATTERY DURATION.
SMOOTH THROTTLE RESPONSE SETTINGS (LED SOLID) INCREASE BATTERY DURATION.
ALWAYS USE THE SMOOTHEST SETTING YOU CAN, THE BEST DRIVERS ARE VERY SMOOTH.

VTRAC SET-UP GUIDE

YOUR 10 Vtrac MEMORIES HAVE ALL BEEN PRE-SET WHEN SUPPLIED WITH A USEFUL RANGE OF POWER SETTINGS: 'NORMAL', 'PUNCHY' AND 'SMOOTH'. (THE BRAKE AND START RESPONSE FUNCTIONS ARE ALL PRE-SET THE SAME) YOU COULD SIMPLY LEAVE THE SUPPLIED SETTINGS AS THEY ARE AND USE THEM TO GOOD EFFECT, BUT IF YOU WANT ALL THE ADVANTAGES YOUR Vtrac CAN OFFER YOU SHOULD KNOW HOW TO SET ALL THE Vtrac FUNCTIONS.

EACH OF THE 10 MEMORIES CAN BE SET IN ANY WAY YOU WANT. SO IF YOU HAVE 10 MOTORS AND WANT TO SET UP A MEMORY FOR EACH ONE YOU CAN VERY EASILY. IF YOU RACE AT DIFFERENT TRACKS OR WITH DIFFERENT CARS YOU CAN SET UP A MEMORY FOR EACH TRACK, EACH CAR, OR EVEN SET ONE UP FOR WET WEATHER ETC!!

EACH OF THE 10 MEMORIES STORES THE SETTINGS FOR 'DTR PROGRAM', 'START RESPONSE', 'BRAKE RESPONSE', 'BRAKE MINIMUM' AND 'BRAKE MAXIMUM'. TO CHANGE ANY OF THESE FUNCTIONS DO THE FOLLOWING:

WITH YOUR Vtrac SWITCHED ON PRESS AND HOLD THE 'SET' BUTTON, KEEP IT PRESSED TO CYCLE THROUGH ALL THE FUNCTIONS. YOU WILL SEE EACH FUNCTION IN TURN DISPLAYED ON THE 3 'MODE' LEDs, AND THE SETTING OF EACH FUNCTION DISPLAYED ON THE ROW OF 'SETTING' LEDs NUMBERED 1 TO 10. (EITHER SOLID OR FLASHING)

WHEN THE FUNCTION YOU WANT TO CHANGE IS SHOWN ON THE 'MODE' LEDs RELEASE THE 'SET' BUTTON.
NOW ALL YOU HAVE TO DO IS PRESS AND RELEASE THE 'SET' BUTTON TO SELECT THE SETTING YOU WANT.
ONCE YOU HAVE SELECTED A SETTING SWITCH YOUR Vtrac OFF TO EXIT 'SET-UP' MODE.

VTRAC FUNCTIONS

THE FOLLOWING INSTRUCTIONS DEAL WITH EACH FUNCTION IN TURN. THE 'THROTTLE RATE' AND 'POWER CONTROL' FUNCTIONS ARE FOR MORE ADVANCED USE OF THE DTR PROGRAMS AND CAN ONLY BE ACCESSED WHEN IN THE 'PRO-SET' MODE. THE SECTION COVERING DTR PROGRAMS SHOULD BE READ BEFORE THE INSTRUCTIONS BELOW. DTR PROGRAMS COMBINE THE 'THROTTLE RATE' AND 'POWER CONTROL' FUNCTIONS SO THEY ARE EASIER TO SET.

SELECTING 'PRO-SET' MODE (ENABLES ADVANCED SET-UP OF DYNAMIC THROTTLE)

TO SELECT 'PRO-SET' MODE SIMPLY SWITCH ON THE Vtrac WITH THE TX OFF WHILE PRESSING THE 'SET' BUTTON. PRESS AND RELEASE THE 'SET' BUTTON, THE GREEN 'MODE' LED ON FLASHING INDICATES 'PRO-SET' MODE IS ON.

THROTTLE RATE - MODE DISPLAY: GREEN FLASHING (PRO-SET MODE ONLY)

'THROTTLE RATE' SETS A THRESHOLD RATE OF THROTTLE INCREASE ABOVE WHICH THE 'POWER CONTROL' IS ACTIVATED. THE SETTINGS RANGE FROM, 0: NO RATE (LEDs OFF) - ANY THROTTLE INCREASE ACTIVATES THE POWER CONTROL. THEN FROM 1: WHERE A SLOW THROTTLE INCREASE IS REQUIRED TO ACTIVATE THE POWER CONTROL, UP TO 10: WHERE A QUICK THROTTLE INCREASE IS REQUIRED TO ACTIVATE THE POWER CONTROL.

POWER CONTROL - MODE DISPLAY: GREEN SOLID (PRO-SET MODE ONLY)

THE 'POWER CONTROL' FUNCTION IS ACTIVATED IF THE RATE OF TX THROTTLE CONTROL INCREASE EXCEEDS THE THRESHOLD RATE SET ON THE 'THROTTLE RATE' FUNCTION AND WILL EITHER INCREASE OR DECREASE THE CURRENT TX THROTTLE CONTROL POSITION DEPENDING ON THE SETTING OF THE POWER CONTROL FUNCTION. THE SETTINGS RANGE FROM, 0: NO EFFECT (LEDs OFF) AND THEN 1: MINIMUM EFFECT UP TO 10: MAXIMUM EFFECT. THE 'SETTING' LED SHOWING THE VALUE CURRENTLY SET IS: LED ON SOLID IS A DECREASING EFFECT AND LED ON FLASHING IS AN INCREASING EFFECT. A DECREASING EFFECT IS SMOOTH AND AN INCREASING EFFECT IS PUNCHY.

START RESPONSE - MODE DISPLAY: AMBER FLASHING

THE 'START RESPONSE' FUNCTION IS MADE ACTIVE BY HOLDING THE TX THROTTLE CONTROL IN THE FULL BRAKE POSITION FOR 4 SECONDS. THE 'MODE' LEDs INDICATING FULL BRAKES (AMBER AND RED ON SOLID) WILL THEN TURN OFF AND BACK ON TO SHOW START RESPONSE IS SET READY FOR USE. START RESPONSE IS BEST MADE READY WHEN ON THE START GRID. THE THROTTLE RESPONSE WILL BE SET TO THE START RESPONSE VALUE UNTIL FULL POWER IS HELD ON FOR 1/2 SECOND, AFTER WHICH THE THROTTLE RESPONSE WILL RESET BACK TO ITS ORIGINAL PROGRAMMED SETTING. THE SETTINGS RANGE IS 0: NORMAL, 1: MIN. DECREASED RESPONSE, UP TO 5: MAX. DECREASED RESPONSE (LED SOLID) THEN 6: MIN. INCREASED RESPONSE, UP TO 10: MAX. INCREASED RESPONSE (LED FLASHING). IE USE SETTINGS 1 TO 5 TO STOP WHEEL SPIN AND 6 TO 10 FOR BURNING RUBBER!!

BRAKE RESPONSE - MODE DISPLAY: AMBER SOLID

THE 'BRAKE RESPONSE' FUNCTION HAS 10 BRAKING PROGRAMS WHICH RAMP UP THE BRAKES FROM THE BRAKE MIN. SETTING UP TO THE BRAKE MAX. SETTING. THE PROGRAMS ARE 1: NORMAL PROPORTIONAL BRAKES WITH NO RAMP UP, THEN 2: FASTEST RAMP UP RATE TO 5 SLOWEST RAMP UP RATE (LED SOLID). PROGRAMS 6 TO 10 ALL GIVE NEUTRAL 'DRAG' BRAKING. 6: NORMAL PROPORTIONAL BRAKES WITH BRAKE MIN. SETTING USED ON NEUTRAL. 7: FASTEST RAMP UP RATE TO 10: SLOWEST RAMP UP RATE (LED FLASHING). ON ALL PROGRAMS EXCEPT 1 AND 6 WHEN THE THE TX THROTTLE CONTROL IS IN ANY BRAKE POSITION THE BRAKING WILL RAMP UP AT THE RATE SET AND WHEN FULL BRAKING IS APPLIED THE RAMP UP RATE WILL BE MUCH QUICKER.

BRAKE MINIMUM - MODE DISPLAY: RED FLASHING

THE 'BRAKE MINIMUM' FUNCTION SETS THE MINIMUM AMOUNT OF BRAKING THAT CAN BE APPLIED WHEN THE TX THROTTLE CONTROL IS IN THE MINIMUM BRAKE POSITION. THE SETTINGS RANGE IS 0 : LOWEST BRAKE STRENGTH (LEDs OFF) TO 10: HIGHEST BRAKE STRENGTH. THIS SETTING IS ALSO USED AS THE NEUTRAL BRAKE STRENGTH.

BRAKE MAXIMUM - MODE DISPLAY: RED SOLID

THE 'BRAKE MAXIMUM' FUNCTION SETS THE MAXIMUM AMOUNT OF BRAKING THAT CAN BE APPLIED WHEN THE TX THROTTLE CONTROL IS IN THE FULL BRAKE POSITION. THE SETTINGS RANGE IS 0 : LOWEST BRAKE STRENGTH (LEDs OFF) TO 10: HIGHEST BRAKE STRENGTH. SETTING BRAKE MINIMUM AND BRAKE MAXIMUM THE SAME WILL PRODUCE A CONSTANT BRAKE STRENGTH, WHICH CAN BE USEFUL FOR BRAKING IN SLIPPERY TRACK CONDITIONS.

Vtrac MEMORY SETTINGS (AS SUPPLIED)

MEMORY No.	1	2	3	4	5	6	7	8	9	10
DTR PROGRAM	0	☼ 2	☼ 4	☼ 6	☼ 8	2	4	6	7	8
START RESPONSE	0	0	0	0	0	0	0	0	0	0
BRAKE RESPONSE	1	1	1	1	1	1	1	1	1	1
BRAKE MINIMUM	3	3	3	3	3	3	3	3	3	3
BRAKE MAXIMUM	10	10	10	10	10	10	10	10	10	10

ALL SETTINGS ARE FOR SOLID LED EXCEPT THOSE SHOWN AS ☼ FLASHING

Vtrac CUSTOM SETTINGS

MEMORY No.	1	2	3	4	5	6	7	8	9	10
DTR PROGRAM										
START RESPONSE										
BRAKE RESPONSE										
BRAKE MINIMUM										
BRAKE MAXIMUM										

Vtrac CUSTOM SETTINGS (PRO-SET)

MEMORY No.	1	2	3	4	5	6	7	8	9	10
THROTTLE RATE										
POWER CONTROL										
START RESPONSE										
BRAKE RESPONSE										
BRAKE MINIMUM										
BRAKE MAXIMUM										