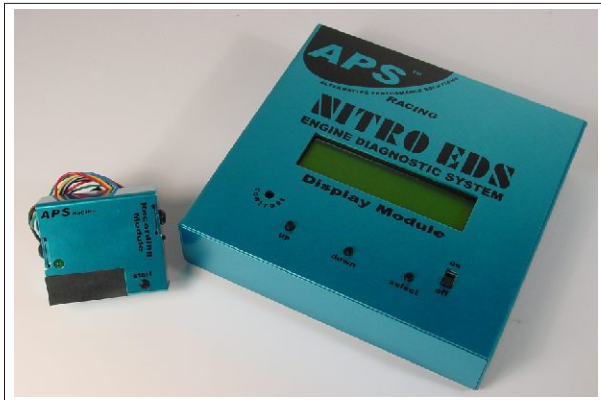


# APS RACING

## ALTERNATIVE PERFORMANCE SOLUTIONS



### Instruction Manual for APS3301 & APS3302

#### Features

- APS3301 compatible with all .12-.18 size engines and T-MAXX
- APS3302 compatible with .21 size engine

- Real time and on board display/data recording
- Measure RPM(max.) and temperature (°C/°F; max.)
- Up to 9 mins. on board data memory at 50 milliseconds recording interval
- Detachable Handheld LCD data viewing display module
- 2 line 16 character dot matrix LCD backlit display
- Compact on-board recording module
- Blue anodized casing on both EDS™ modules
- Non-volatile memory. Data retention capability
- False record prevention during engine start
- View data without the use of a computer
- Displays temperature in both Celsius and Fahrenheit

#### Specifications

##### Onboard recording Module

- Input Voltage: 6 - 8V (min. 5 cells)
- Temperature Range: 10-200°C or 50-390°F
- RPM Range: 0 - 90,000
- Recording time: up to 9 mins.
- Sampling Rate: 20Hz (50 milliseconds interval)
- Blue anodized compact case

##### LCD Display Module

- 2 line 16 character dot matrix LCD display
- Backlit LCD
- Battery Required: 9V (not included)
- Blue anodized case
- Connecting cable to on-board recording module incl.

#### Dimensions

##### Onboard recording Unit

- 1 1/2" x 1 1/4" x 5/8"
- 39mm x 33mm x 16mm
- 20g (0.8oz)

##### Display Unit

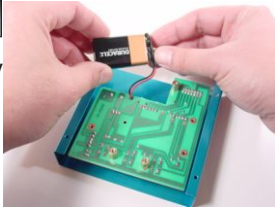
- 4 1/4" x 4 1/4" x 1"
- 110mm x 110mm x 25mm

## Installations

**Attention: Please read the instructions carefully before use.**

### Step 1

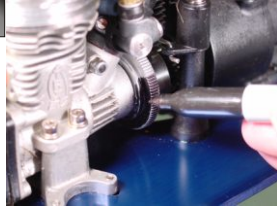
#### Power LCD Display



1. Open the back cover of the display module by removing the screws at the back.
2. Install a 9V battery (not incl.) into the battery slot and re-assemble the back cover.

### Step 2

#### Prepare Flywheel



1. Using paint to color approximately half of the flywheel black.

**Note:** The colored half must be completely covered to create a non-reflective surface for the RPM sensor to function properly.

### Step 3

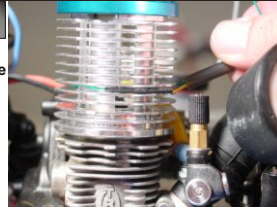
#### Install RPM Sensor



1. Secure the RPM sensor to the engine mount using 2 screws as shown above.

### Step 4

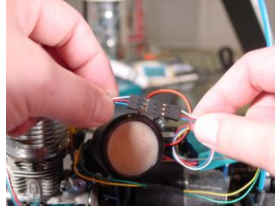
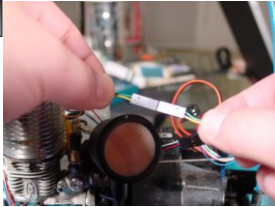
#### Install Temperature Sensor



1. Wrap the temperature sensor loop around the base of the engine heat sink.

### Step 5

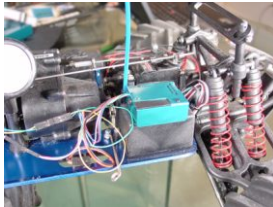
#### Test RPM Sensor



1. Connect the RPM sensor wire to the onboard recording module.
2. Connect the display module to the recording module using the cable provided.
3. Switch on the display module and scroll down the menu by pressing "down" to "RPM SENSOR TEST" and press "select" to enter the menu.
4. Rotate the flywheel and verify that the sensor status shows "reflective" when the sensor is pointed at a reflective part of the flywheel and "non-reflective" when the sensor is pointed at the black part of the flywheel.
5. Adjust by repositioning the RPM sensor if sensor status does not match.
6. Turn off and disconnect the display module once completed.

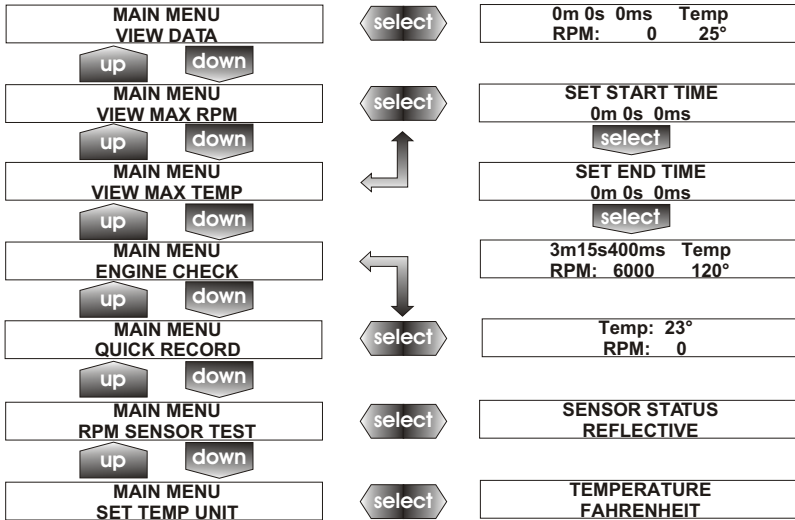
### Step 6

#### Install Recording Module



1. Install the onboard recording module onto the chassis using double sided tape.  
It is recommended to locate the onboard recording module as far away from fuel spills as possible to avoid possible damage. (not warranted)
2. Connect the power cable from the onboard recording module to the receiver by plugging into one of the channel outlets and make sure the polarity is correct.
3. Connect the RPM Sensor and Temperature Sensor loop to the onboard recording module.

## Menu Flow



## Display Module

### Using the Display Module:

With the Recording Module turned off, connect the Display Module to the Recording Module using the cable provided. Turn on the Display Module and the system will power up. The Recording Module LED will flash twice to indicate the system is now in Data Display Mode. The display will then show the start up screen and software version. Follow the Menu Flow to select desired operation.

**Note:** Power to the Recording Module is provided by the Display Module when they are connected.

## Menu Descriptions and Usage

### **View Data:**

This menu displays the time of the record, engine temperature and RPM. Press or hold “up” / “down” to scroll through all available records.

### **Set the start and end time for a search:**

The start and end time specify the time range of the search for the Maximum RPM and the Maximum Temperature recorded. Press or hold “up” / “down” to increase or decrease the time unit. Press “select” to set specified value and continue to next menu.

### **Max. RPM and Max. Temperature menu:**

After specifying the start and end time, a search will be performed to find the maximum RPM or temperature according to the function chosen. When the search is complete, the result will display time of the record, RPM and temperature. Press “select” to return to the main menu.

### **Engine Check:**

This function displays the engine RPM and temperature in real time for engine diagnosis. Press “select” to return to main menu.

### **Quick Record:**

This function displays the same data as “Engine Check” but also records it to system memory for detailed analysis. Press “select” to stop recording and return to main menu.

### **View Sensor status:**

This menu displays the RPM sensor status for diagnosis of sensor and flywheel status. Status is displayed as “reflective” or “non-reflective”. Press “select” to exit and return to main menu.

### **Setup Temperature unit:**

The temperature unit can be set to display degrees in Fahrenheit or Celsius by pressing “up” / “down”. Press “select” to save setting and return to main menu.

## Recording Module

### Recording Data

1. Disconnect the Display Module from the Recording Module if they are connected.
2. With the Recording Module connected to the sensors and power from the receiver, turn the receiver on.
3. Turn on the Recording Module. The green LED on the recording module will come on.
4. Press the **"Start/Stop"** button on the Recording Module.  
The green LED will start to flash signaling the system is getting ready to record data. The LED's flash rate will increase for approximately 30 seconds until it stays on for one second. It will then flash at a medium rate steadily indicating that the Recording Module is standing by to record. Recording will begin once the module detects a RPM of 15,000 or more. This prevents false record reading during engine start. Once recording begins, the LED will flash at a fast but steady rate.  
The Recording Module has capacity to hold 9 minutes of recorded data. Recording will automatically stop when 9 minutes has elapsed after recording begins.  
Recording can be stopped before the 9 minutes mark by pressing the "start/stop" button once while it is recording. The green LED will stay on indicating that recording has ended.  
**Note:** If power is interrupted before the recording ends, data will be retained up to the point before the power interruption. However, the last sample of the recording may be inaccurate.  
Once recording is complete, the recording module can be turned off and the data can be viewed using the display module.

## Tips & Tricks: How to maximize your engine & race performance

### Setting the engine idling speed

1. Connect the display module to the recording module using the cable provided.
2. Turn on the system and go into the **"ENGINE CHECK"** menu.
3. Set the chassis off the ground, turn on the radio and receiver then start the engine.
4. With the throttle in neutral position, adjust the carburetor to set the desired idling speed using the RPM and temperature readouts from the display module.

### Getting the 2-speed shift point (method 1)

1. Turn on the radio and receiver.
2. Connect the Display Module to the Recording Module with the cable provided and turn on the system.
3. With the chassis off the ground, start the engine.
4. Scroll down to **"Quick Record"** and press **"select"** to enter, when the display starts showing the engine RPM and temperature, throttle up very slowly until the engine rotates at maximum RPM for 3 seconds then release throttle and shut off the engine.
5. Press **"select"** to return to main menu
6. Scroll to **"VIEW MAX RPM"** press **"select"** and search from the start of the recording to the end. Note down the time displayed. This will be the time that your engine is running at maximum RPM.
7. Press **"select"** to return to the main menu and scroll up to "VIEW DATA"
8. Press **"select"** to enter and scroll to the time noted from the previous step and press **"select"**.
9. Now scroll back slowly looking for a RPM increase of at least 3,000 in a single time step. The RPM being displayed is the point where the 2nd speed engages.

### Getting the 2-speed shift point (method 2)

1. Turn on the radio and receiver.
2. With the Display Module disconnected, turn on the Recording Module.
3. Start the engine and press the **"Start/Stop"** button to start recording.
4. Wait for the recording sequence to indicate the unit is standing by to record.
5. Run the car on the straight once to engage the 2nd gear and return slowly. (DO NOT REV THE ENGINE TO MAXIMUM RPM UNLESS WHEN ON THE STRAIGHT)
6. Stop recording by pressing the **"Start/Stop"** button on the Recording Module and shut off the engine, Recording Module, receiver and radio.
7. Connect the Display Module to the Recording Module with the cable provided and turn on the system.
8. Follow steps 6 to 9 of "Getting the 2-speed shift point (method 1)"  
**NOTE:** If you can not find an RPM raise of at least 3,000 in a single time step when scrolling backwards in time but you can hear the 2nd gear engage on the straight, try going forward a few time steps from the time noted in the VIEW MAX RPM menu. If you find a RPM drop of at least 3,000 in a single time step, then the RPM shown in MAX RPM is when 2nd gear engages at. (This could happen if your engine reaches its maximum RPM only when it is in 1st gear while running on the track)

## Trouble Shoot

### Display Screen is Blank:

1. Check the connecting cable making sure it is plugged in correctly and securely.
2. Check the battery in the Display Module and replace if necessary.

### Recording Unit does not respond:

1. Make sure the receiver battery is charged.
2. Check the power cord that connects the Recording Unit and the receiver. If the green LED is flashing in short pulses, that indicates an under-voltage has occurred. Charge or replace the battery immediately.

### Problem with the RPM Sensor:

1. Use the RPM SENSOR TEST menu to check sensor status
2. Check that half of the flywheel is colored completely black. Any reflective spot on the black region may interfere with RPM readings.
3. Using the "RPM SENSOR TEST" menu, make sure the unit displays the correct flywheel position when rotated.
4. Adjust the position of the RPM sensor.
5. Try cleaning the RPM sensor and flywheel as dirt could interfere with the accuracy of the reading

## SAFETY & WARRANTY MANUAL

Thank you for your purchase of **APS** products. **APS** products incorporates a host of features designed to give you excellent performance.

**THIS GUIDE CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS, PLEASE READ CAREFULLY BEFORE USING**

### SAFETY PRECAUTIONS

Your **APS** products have been designed with your safety in mind. Please read all safety precautions carefully to insure the most effective and safe use of all features of your **APS** Products.

If you have any questions, please contact your local hobby shop or stop using immediately. (905)886-1808

• Never leave your **APS** product(s) unattended during operation especially with children. Children should not be allowed to handle, touch, or use any **APS** product(s) without proper supervision of an adult.

- Avoid strong shock and dropping
- Do not operate the unit in or around water. Never allow water, moisture of other foreign materials to get inside the unit.
- Always disconnect the unit when not in use.

### LIMITED PRODUCT WARRANTY

**PRODUCT FAILURE!** Consult with your dealer(hobby shop) if you have any questions or problems concerning the **APS** product upon purchase. **DO NOT ATTEMPT TO REPAIR THE PRODUCT. ALL REPAIR IS TO BE CONDUCTED BY OUR COMPANY. WARRANTY IS VOID IF THE UNIT IS NOT SERVICED BY MAGMA INTERNATIONAL LTD.**

MAGMA INTERNATIONAL LTD. warrants the **APS** product(s) to be free from manufacturing defects in materials and workmanship for a period of 90 days from original date of purchase. (original sales receipt strictly required for verification) This warranty does not cover improper use or alteration of the unit; components worn by normal use; special, incidental or consequential in connection with such defective product; damage resulting from (1) string shocks and dropping or (2) use of improper battery type or (3) failure to follow operating instructions. The warranty is restricted to repair of the defective unit only.

This warranty shall be the sole warranty granted by MAGMA INTERNATIONAL LTD. and there are no other warranties written or oral, expressed or implied, statutory or otherwise provided in respect of the product. In no case shall our product liability exceed product's original cost. We reserve the right to modify warranty provisions without notice. As MAGMA INTERNATIONAL LTD. has no control over the connection and usage of the product, no liability may be assumed nor will liability be accepted for damaged resulting from the use of this product. By the act of connecting and operating our **APS** products, the user accepts all resulting liability.

## LIMITED WARRANTY

MAGMA INTERNATIONAL LTD. warrants the EDS unit against defects in material and workmanship for a period of **90 days from original date of purchase**. See details on Service Request Form.

APS™ is a trademark owned by MAGMA INTERNATIONAL LTD. ([www.aps-racing.net](http://www.aps-racing.net)) All Rights Reserved.  
APS is a division of MAGMA INTERNATIONAL LTD.

### WARRANTY CLAIM!

#### Please follow these steps:-

MAGMA INTERNATIONAL LTD. offers free repair service of **APS** products with valid warranty claim only. To speed up warranty claim, indicate "WARRANTY CLAIM" on the **APS SERVICE CARD**. Please read and follow the instructions below to expedite our services to you. All **APS** products will be repaired and returned approx. 14 business days upon receipt of the unit.

**NOTE!** Any **APS** product that (1) operates normally upon receipt or (2) with expired or void warranty is subjected to a minimum service fee and return shipping costs.

1. Obtain RETURN AUTHORIZATION(RA) No. from our company. CALL (905) 886-1808 or e-mail for a RA number. No return for repair accepted without this RA number. **APS REPAIRS MUST BE SENT DIRECTLY TO MAGMA INTERNATIONAL LTD.**
2. Complete APS SERVICE REQUEST FORM and describe in details the problems of your unit.
3. Valid cash register receipt with purchase date, or invoice of previous service work by MAGMA INTERNATIONAL LTD.
4. Mail the unit with the SERVICE REQUEST FORM to our company. We recommend insuring your return to assure our receipt of your unit.

**COSTS!** For product under warranty, MAGMA INTERNATIONAL LTD. will repair free of charge, except for shipping cost of product to our company. For non-warranty, repair, all work will proceed unless repair charge exceeds 40% of retail price of the unit. VISA card information is required for all non-warranty repairs. C.O.D available for repairs in Canada only.

**FOR ALL REPAIR RETURNS, SEND ONLY THE UNIT DO NOT SEND OTHER ACCESSORIES OR CORDS.**

### CUSTOMER SERVICE:

TEL: 905-886-1808

FAX: 905-886-1830

Website: [www.aps-racing.net](http://www.aps-racing.net)

E-mail: [sales@magmarc.com](mailto:sales@magmarc.com)

E-mail for Technical Support: [support@magmarc.com](mailto:support@magmarc.com)

175 West Beaver Creek Road, Unit 8, Richmond Hill, Ontario, Canada L4B 3M1

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**APS - SERVICE REQUEST FORM**

Complete the service form for repair of your **APS** product. Repair will be free with valid warranty condition (see "product warranty"), otherwise, repair service will be charged.

**A 90days(from date of purchase) manufacturer's warranty applies to all APS units.** All returned unit will be repaired and returned approximately 14 business days from date of receipt.

**PLEASE NOTE:** If the returned unit works normally when received, a minimum service fee will be charged in addition to all shipping charges and applicable tax(es). Consult with your dealer(hobby shop) first should you have any questions or problems with your unit at the point of purchase or during usage.

**FOR ALL RETURNS FROM U.S.A., PLEASE STATE "RETURN CHARGER FOR REPAIR" ON CUSTOMS DECLARATION.**

**Do not ship by UPS Ground. Backcharge will apply to you for custom duties & brokerage fees.**

*Please complete all required information. Thank you!*

**1. CUSTOMER'S RETURN SHIPPING ADDRESS**

Date: \_\_\_\_\_  
RA #: \_\_\_\_\_; Call or e-mail our company to obtain RA # for return  
NAME: \_\_\_\_\_  
ADDRESS:(NO P.O. Box, please) \_\_\_\_\_

:

PHONE # (daytime phone): \_\_\_\_\_  
E-Mail: \_\_\_\_\_  
Purchased from (Hobby Shop): \_\_\_\_\_

**2. DESCRIPTION OF PROBLEM(s) Very important for use to know...**

**Special Note:** If you are returning via UPS Ground or other courier, any related charges. E.g. brokerage fees to our company or duties will be billed to you. It is recommended to send your APS unit via your local post office.

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**APS - SERVICE REQUEST FORM**

1. Complete the information required on reverse. Note all information must be completed to avoid delays in repair.
2. Mail the unit (without any accessories) to: MAGMA INTERNATIONAL LTD. (REPAIR DEPT)  
175 WEST BEAVER CREEK ROAD, UNIT 8  
RICHMOND HILL, ONTARIO, CANADA L4B 3M1

**WARRANTY REPAIRS**

For APS products that meet warranty conditions(90 days from date of purchase)

1. Obtain **RETURN AUTHORIZATION(RA) No.** From our company. Call 905-886-1808 or e-mail us at sales@magmarc.com. No return for repair accepted without a **RA No.**
2. Include your original dated sales receipt as proof of purchase. Provided all warranty conditions are met, your unit will be repaired **FREE OF CHARGE**. We charge a flat fee of CAD \$35/US 30 for diagnostic, shipping and handling if the returned unit requires no repair. **ALL WARRANTY REPAIR RETURNS ARE SENT THROUGH 3rd CLASS POSTAL MAIL.** MAGMA INTERNATIONAL LTD. will not be responsible for in transit lost of damage on returned unit. Insured mail available upon request.
  - I want insured mail when returning my repaired unit.
  - I want faster shipping option(s). Please call me at \_\_\_\_\_.

**VISA/MC Cardholder name:** \_\_\_\_\_ **Card No:** \_\_\_\_\_

**Exp. Date:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

**NON-WARRANTY REPAIRS**

**Method of Payment:** (please check one and complete the information as required)

- **C.O.D.** (Applicable only to Canadian Customers) C.O.D. Charges applies.
- **VISA/MC Cardholder name:** \_\_\_\_\_ **Card No:** \_\_\_\_\_

**Exp. Date:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

All repairs will be proceeded unless repair charge exceeds 40% of the unit's suggested retail price.

Policy information subject to change without notice