.1 YEAR
WARRANTY

C E

⊕ **User's Guide**

Shop online at
omega.com®
ΩEOMEGA®
www.omega.com
e-mail: info@omega.com

ISO 9001	ISO 9002
QUALIFIED CORPORATE QUALITY	QUALIFIED CORPORATE QUALITY
STAMFORD, CT	MANCHESTER, UK

OMEGAETTE™
HHT-1500/HHT-1501
Economical Handheld
Digital Tachometer

Where Do I Find Everything I Need for Process Measurement and Control?
OMEGA...Of Course!
Shop online at www.omega.com

TEMPERATURE
- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE
- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL
- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY
- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION
- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS
- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL
- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M3663/0601

TABLE OF CONTENTS

1. SPECIFICATIONS

Speed (Non-contact):

	Range	Resolution	Accuracy
RPM	10.00 - 99999	0.01/0.1/1	0.04% ±2 dgts
rps(Hz)	0.200 - 2000.0	0.001/0.01/0.1	0.04% ±2 dgts

Speed (Contact)

	Range	Resolution	Accuracy
RPM / (/ symoblizes "Contact"	20.00 - 29999	0.01/0.1/1	0.04% ±2 dgts
m/min	2.000 - 2999.9	0.001/0.01/0.1	0.04% ±2 dgts
ft/min	6.00 - 10000	0.01/0.1/1	0.04% ±2 dgts
yard/min	4.00 - 3000	0.01/0.1/1	0.04% ±2 dgts

Event Counter:

Range	Max. Input Frequency
0 - 99999	10KHz. with 5% duty cycle

External TTL Input	High > 4.5V (RM1501)
Display:	5 digits 99999 counts
Sampling Rate:	0.7 second (> 60 rpm)
	> 1 second (10 to 60 rpm)
Measuring Distance:	50 to 300 mm
Time Base: 4.0 MHz Quartz Crystal	
Range Selection:	Automatic
Battery:	Four 1.5V batteries (AA, UM-3)
Power Consumption:	1.5mA (Idle)
	5mA (1000.0 - 99999 rpm)
	25mA (10.00 - 999.99 rpm)
	25mA (Max, Min or Ave Enabled)
	25mA (Event Counter)
Auto-Power-Off:	30 minutes.
Operating Temp.	0 to 50°C (32 to 122 °F)
Size:	172 mm x 63 mm x 36 mm (6.8" x 2.5" x 1.5")
Weight:	190 g(6.7 oz.) (including battery)
Accessories:	Carrying case x 1, Reflective tape x 1, Instruction Manual x 1

2. PANEL FUNCTIONS

2.1

2.2

2.3

2.11
2.10
2.9
2.8

2.4

2.7

2.5

START
HOLD ON/OFF

2.6
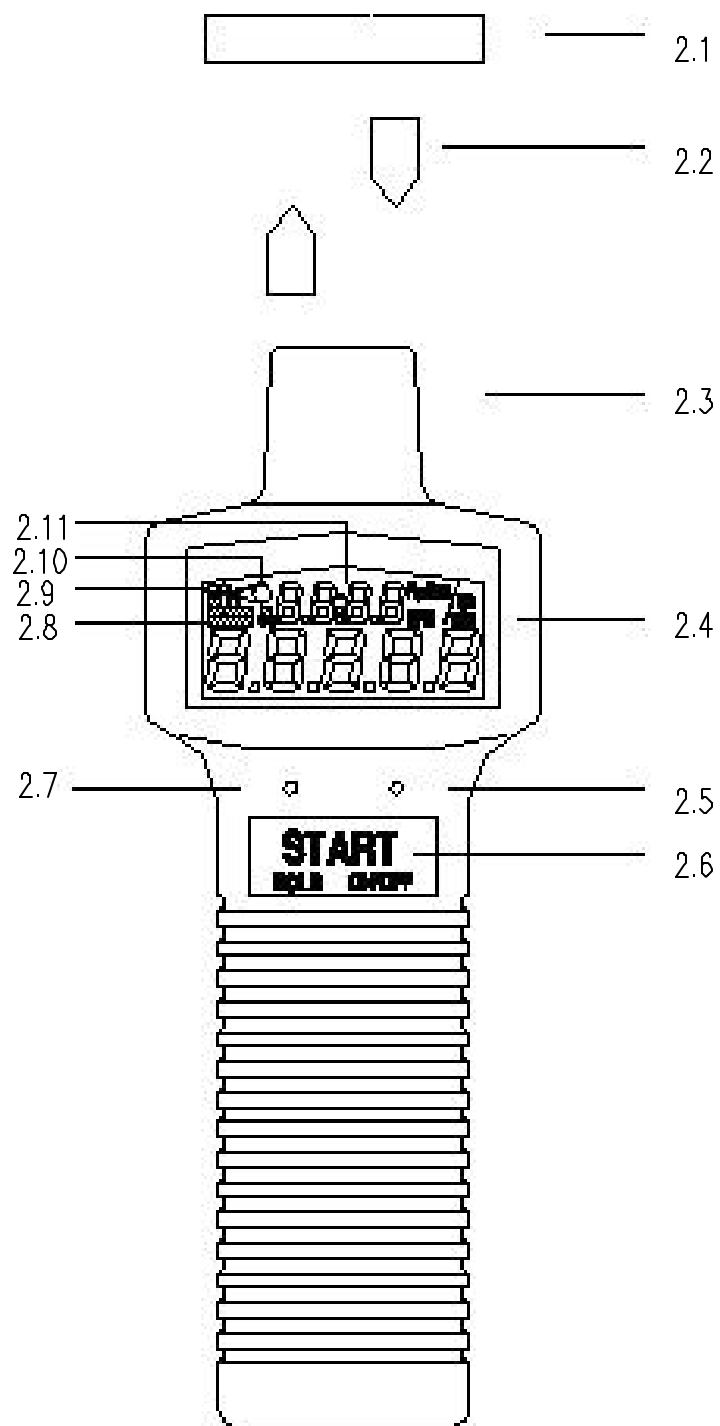
2.1. Reflecting tape

Attach a reflecting tape to the surface of the unit to be measured

2.2. Reflecting signal light beam

It is recommended that the reflecting surface is perpendicular to the emitting/receiving unit for best measurement.

2.3. Emitting/Receiving Unit

The red light emits from the left side of the tachometer. And a receiving sensor is installed in the right side to receive light signal from the reflecting surface.

2.4. LCD

The lower row of the LCD is a 5 digit number to display RPM, m/min, ft/min, yd/min or counts.

The upper row of the LCD is a clock. If only the minutes is displayed, tachometer is in the auto-power off mode. Power will be turned off in 30 minutes. To disable auto-power-off mode, press and hold the unit button (left button) for 2 seconds. Then the hours will be displayed.

2.5. Function Button

Press the button to select MAX, MIN or AVE function. To return to normal mode, press and hold the button for 2 seconds.

2.6. Start/Hold/On/Off

When the power is turned off, press this button to turn the power on. If the power is on, press this button to start measurement. Press again to hold the data and stop measurement. To turn the power off, press and hold button until "OFF" is displayed in the LCD (about 2 seconds). Release the button, then the power will be turned off.

2.7. Unit Button

Press this button to select different units, such as RPM, RPM / (/
Symbolizes "contact"), m/min, ft/min, yd/min, rps (Hz) or No. of counts. To measurement speed in RPM /, m/min, ft/min or yd/min, the option RM1502 mechanical adaptor must be attached.

When the No. symbol is displayed in the LCD, the unit becomes an event counter. The clock will be reset to zero, and start counting. To stop counting, press the HOLD (START) button once. To reset counts, press the function button(right button).
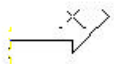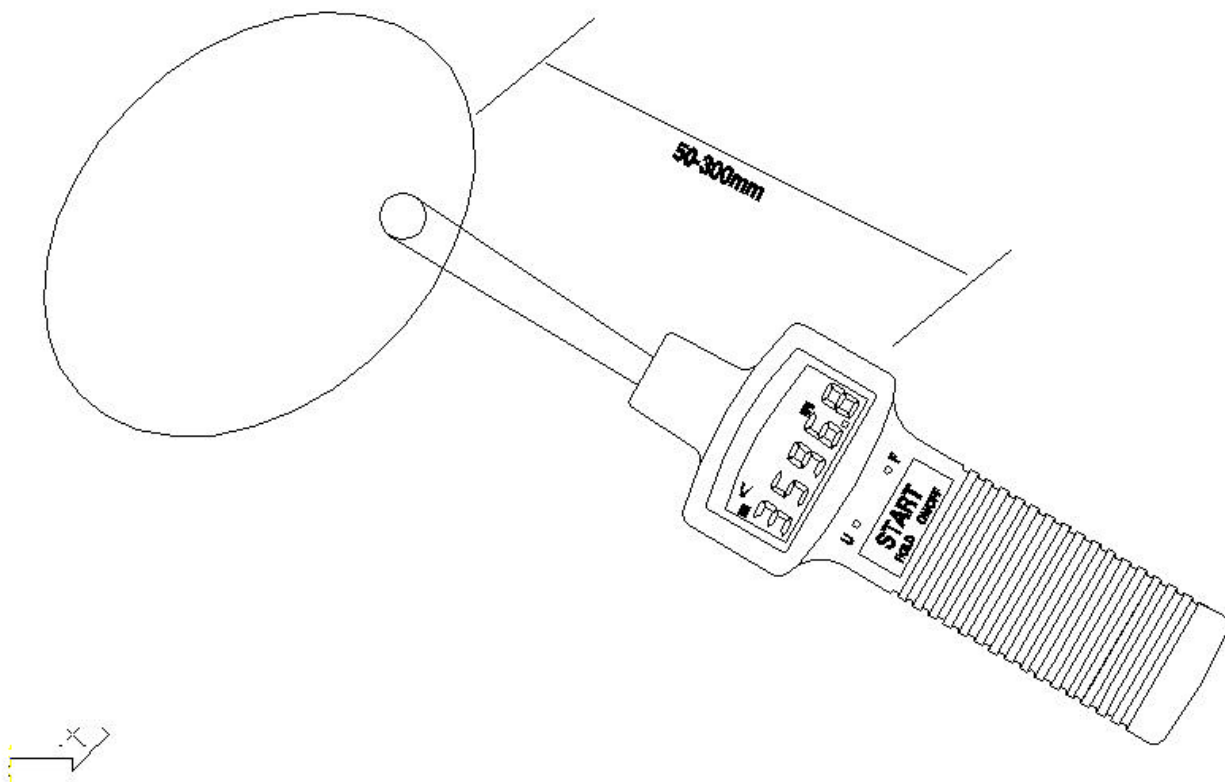
2.8. MAX/MIN/AVE symbols

Symbols to indicate which of MAX, MIN or AVE function is enabled.

2.9. Low battery warning

3. OPERATING INSTRUCTION

50-300mm

START
HOLD ON/OFF

3.1. Normal Operation

a. Install four 1.5V AA size batteries.

b. Cut off a piece of reflective tape of size 1.0 cm x 1.4 cm (optimal size)

c. Wipe off oil or stains from the surface where reflective tape will be adhered.

d. Stick the self-adhesive reflective tape on the object whose rotational speed is to be measured. The reflective tape should be attached as close to the outer edge of the object to be measured as possible.

e. Press the START button to turn on tachometer.

f. Point the photoelectric probe at the object as Figure 2. Press the START button once and confirm that the red emitting LED lamp lights up. Then read the rotational speed on the LCD display.

g. If the rotational speed is less than 60 rpm, it may take about 1 to 6 seconds to measure (60 rpm takes 1 second, and 10 rpm takes 6 seconds).

h. The reading will be held for 6 seconds, if you aim the photoelectric probe at a 0 speed object right after one measurement.

Note: If the speed is less than 999.99 rpm, the red LED is turned on all the time to detect speed. If the speed is great than 999.99, the unit goes into power-saving mode. The LED is turned on for a very short period of time, then turned off for most of the time to save power.

3.2. Using the Mechanical Adaptor (Option RM1502)
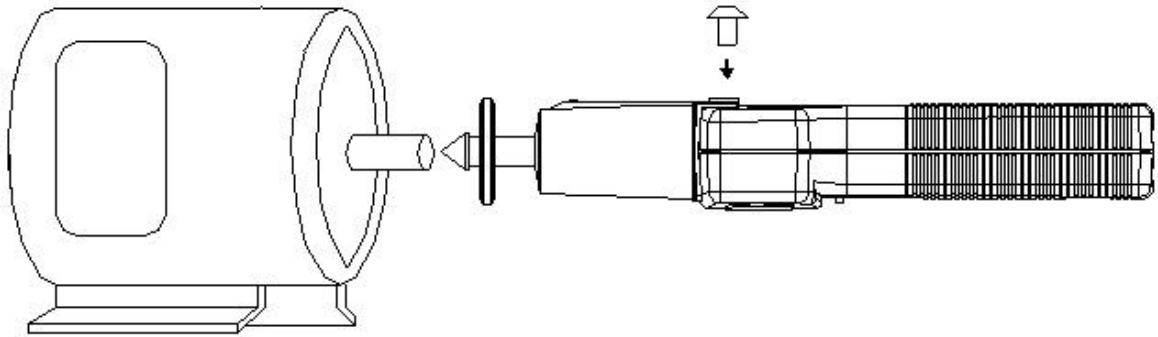
a. Select proper rubber head.
b. Attach the mechanical adaptor to the unit.**and fasten the screw.**
c. Press the unit button (left button) to select RPM / (instead of RPM only). The auxiliary LED will be turned on while the main LED will be turned off.
d. Press against the shaft of the object to be measured.
e. Do not press against the shaft too hard to avoid hazard.

WARNING: Do not exceed the speed limit of 29999 rpm when using mechanical adaptor.

3.3. Measurement of Surface Speed(m/min, ft/min, or yd/min)
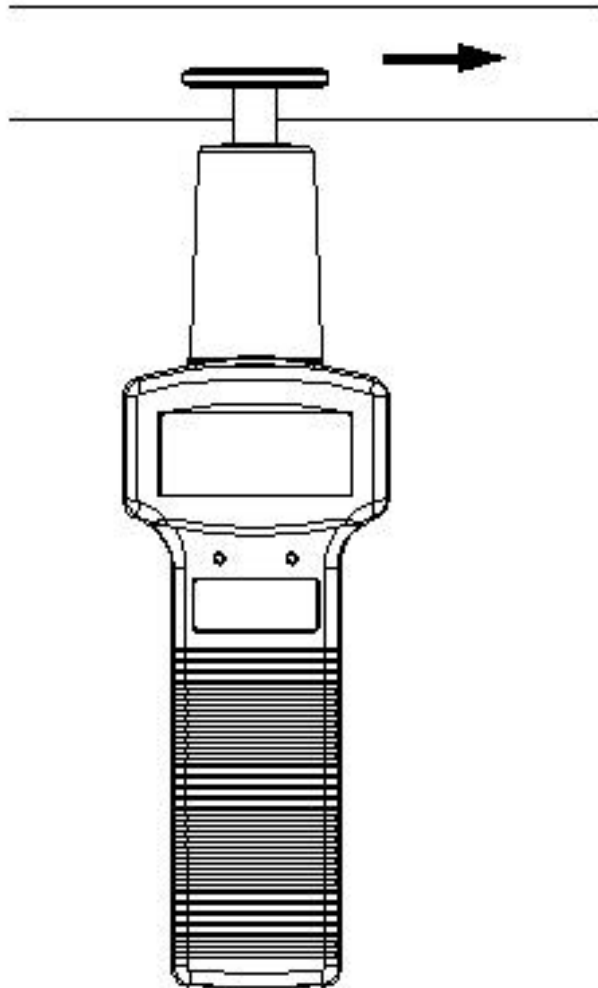
    a. Attach the mechanical adaptor (option RM-1502) to the unit.
    b. Press the unit button to select desired unit. The auxiliary LED will be turned on while the main LED will be turned off.
    c. Slightly touch against the surface to be measured.
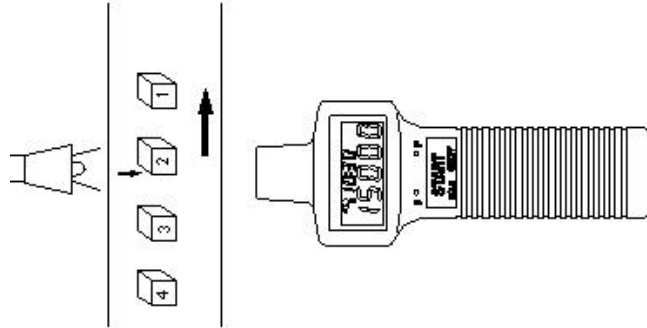
3.4. Use as an Event Counter with External Light Source

a. Press the unit button several times to select the unit of "No. O" (counts). The "O" symbol is used to instruct users that external light source is required.

b. When the symbol "No. O" appears, the tachometer reset the upper clock to 00:00 and start counting the pulses it detects. (Auto-power-off is automatically disabled)

c. To stop counting, press the START button once.

d. To reset counts to zero, press the function(right) button.

3.5. Use as an Event Counter with Internal Red LED

a. Press the unit button several times to select the unit of "No. " (counts).

b. When the symbol "No." appears, the tachometer reset the upper clock to 00:00 and start counting the pulses it detects (Auto-power-off is automatically disabled).

c. To stop counting, press the START button once.

d. To reset counts to zero, press the function(right) button.
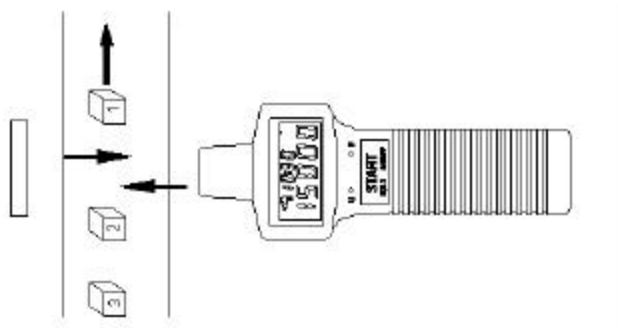
3.6. External Signal(TTL) Input (RM1501)

Instead of receiving signal from light source, users can input external TTL signal (High: > 4.5V, Low: 0V) through pin 8 of RS232C connector with pin 5 as signal ground.
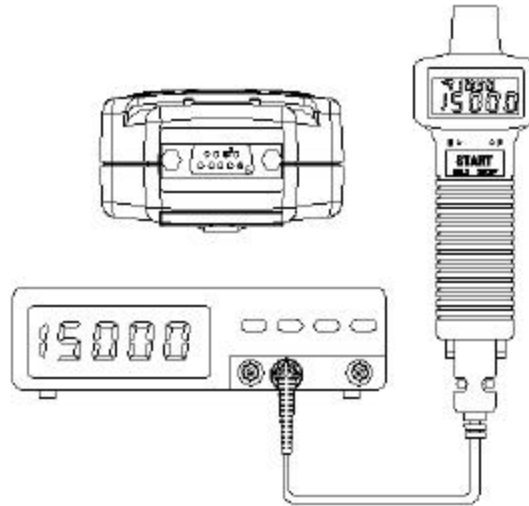
NOTE: It is strongly recommended that the emiting/receiving unit be covered to avoid undesired light signal coming in.

3.7. Digital Pulse Signal Output (RM1501)

Users can output digital pulse signal through pin 8 of RS232C connector with pin 5 as signal ground to oscilloscope.

OSCILLOSCOPE
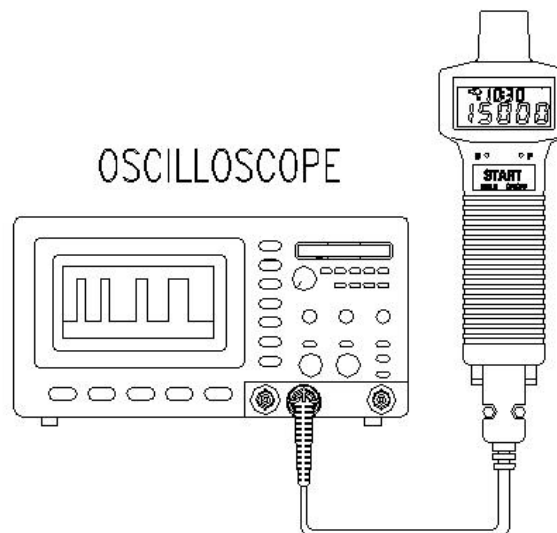
3.8. Measuring Slow Rotating Objects
If the rotating speed of the object which you are measuring is very slow, it is recommended that you use a tripod to hold the tachometer in place and use multiple pieces of tape for more accurate result.

If multiple pieces of tape are used, each piece of tape should be located at a equal distance to each other on the object. Any number of pieces of tape are acceptable. But you need to divide the reading by the number of pieces to obtain the correct result.
Correct RPM = Reading / (number of pieces of tape)

Example: 4 pieces of tape and reading is 12 RPM.
Correct Speed = 12 / 4 = 3 rpm

3.9. Using the MAX/MIN/AVE Functions
These functions allow users to analyze the stability of rotational speed. These value are actually peak (MAX), valley(MIN), and true average(AVE) values.
MAX: Press the function button to select maximum function. The MAX function can be used to find the peak value of speeds measured.
MIN: Press the function button to select minimum function. The MIN function can be used to find the valley value of speeds measured.
AVE: Press the function button to select average function. The average function is a true average value.

$$RPM_{AVE}=\frac{1}{n}\mathring{a}(rpm)_n \; ; \; \mathring{a}(rpm)<2^{32} \; , \; n<65535$$

If summation of average value overflow, or n > 65535, the last average RPM will be used as initial value for successive calculation. And n will be reset to 1.
When users press the HOLD button (same as START button), the max/min/ave values are still stored in memory. Users can press the function button (right button) to review the values. To return to normal mode, press and hold the function (right button) for 2

11
11

seconds,
and the max/min/ave symbols will disappear in LCD.

3.10. Turning On/Off Tachometer

Press any button will turn on the power of tachometer. To turn off the power of tachometer, press and hold the START button until word "OFF" is displayed in LCD. Then release the START button.

3.11. Disable Auto-Power-Off Function

If tachometer is in auto-power-off mode, only the minutes will be displayed. And tachometer will be turned off in 30 minutes. To disable the auto-power-off function, press and hold the UNIT button (left button) for 2 seconds until the hours is displayed.

3.12.   🔋 REPLACING THE BATTERIES

a.   When   the   symbol (low battery) appears in the LCD, it is time to replace the batteries.

b.   Remove the screw of the battery cover and remove the battery cover.

c   Replace the old batteries with 4 new batteries. Do not mix different type of batteries together.

d.   Replace the battery cover and fasten the screw.

4. Protocol of RS-232C Serial Interface (RM-1501)

Ten bytes are sent out through RS-232C connector to PC. The definitions of each byte are as followings:

Byte 1:   Leading byte 0x0D

Byte 2:   Decimal point of LCD display
        bit0: dp1 (0000.0), if 1
        bit1: dp2 (000.00), if 1
        bit2: dp3 (00.000), if 1

Byte 3:   Flags for current status
        bit0: low battery, if 1
        bit1: Max. value overflow, if 1
        bit2: Counter overflow, if 1
        bit3: Auto-power-off disable, if 1
        bit4: Min. value overflow, if 1
        bit5: Ave. value overflow, if 1

Byte 4:   Unit
        bit0: rpm, if 1
        bit1: m/min, if 1
        bit2: ft/min, if 1
        bit3: yd/min, if 1
        bit4: rps, if 1
        bit5: counter with external light source, if 1
        bit6: counter without external light source, if 1

Byte 5:   Function
        bit0: normal, if 1
        bit1: max, if 1
        bit2: min, if 1
        bit3: average, if 1

Byte 6:   Flags for current status
        bit4: LCD reading over load (OL)
        bit7: Hold

Byte 7:   Least significant byte of reading in binary format

Byte 8:   2nd byte of reading in binary format

Byte 9:   3rd byte of reading in binary format

Byte 10:   Most significant byte of reading in binary format

5. Installation of Window™ Application Software (RM-1501)
  5.1. **For Windows 3.1**
      A. Start **Microsoft™ Windows™**
      B. Insert disk in drive A (or B)
      C. From **Program Manager**, select **File** menu and choose **Run**
      D. Type a:\setup (or b:\setup) and press **Enter** key
  5.2. **For Windows 95**
      A. Start **Windows™** 95
      B. Insert disk in drive A (or B)
      C. Press **START** button, then select **Run**
      D. Type in a:\setup (or b:\setup) and press **Enter** key
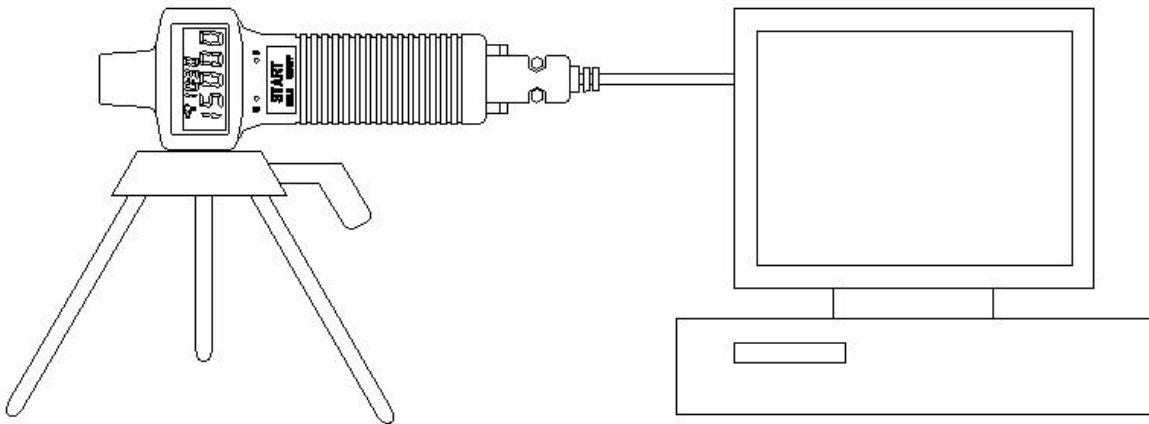
6. Description of Windows™ Application Program (RM-1501)
Main Window:
When the program is executed, the program automatically search for connected tachometer or available serial port. If no serial port is available, then a message of "No communication port" will be displayed, and the program exits . Once communication port is setup, a main window will be displayed on the screen as below:

Sample: Sampling time.
Option: Display option of anemometer. Normal, MAX, MIN, AVE
Unit: rpm, m/min, ft/min, yard/min, counter 0, counter
Value: The value under VALUE is the reading from the tachometer
Range: The text displayed under RANGE is the range of the unit selected at
             the tachometer
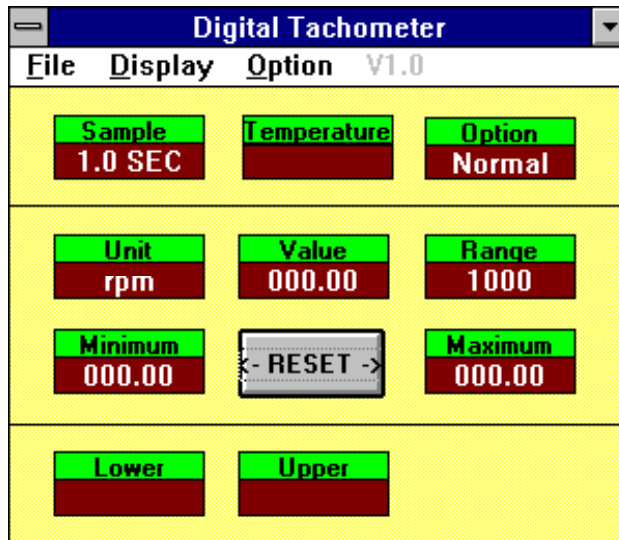Minimum: The minimum value ever recorded by PC.
Reset: Clear minimum and maximum value recorded.
Maximum: The maximum value ever recorded by PC.
Lower: The minimum value of the range specified.
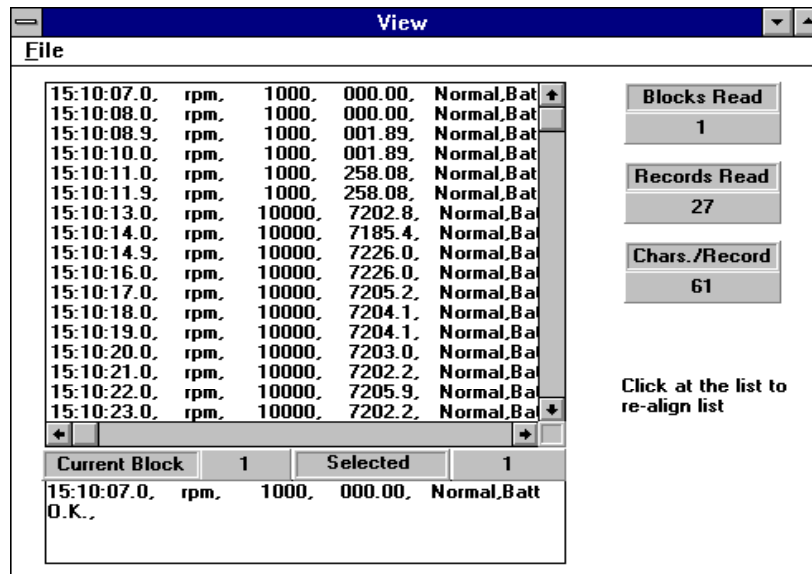Upper: The maximum value of the range specified.
File: If you select File, a pull down menu will show six options: Name,
       Start Recording, End Recording, VIEW, Plot Data from File, and Exit.
Name: Enter file name to store data dispalyed in LCD at specified interval.
Start Recording: Start recording when selected
End Recording: End recroding when selected.

VIEW FILE:

```
┌─────────────────────────────────────────────────────────────────┐
│ ⊟                            View                        ▼ ▲ │
├─────────────────────────────────────────────────────────────────┤
│ File                                                            │
│ ┌─────────────────────────────────────────┐  ┌──────────────┐  │
│ │15:10:07.0,  rpm,  1000,  000.00,  Normal,Bat│▲│ Blocks Read  │  │
│ │15:10:08.0,  rpm,  1000,  000.00,  Normal,Bat│ │      1       │  │
│ │15:10:08.9,  rpm,  1000,  001.89,  Normal,Bat│ │              │  │
│ │15:10:10.0,  rpm,  1000,  001.89,  Normal,Bat│ │              │  │
│ │15:10:11.0,  rpm,  1000,  258.08,  Normal,Bat│ │ Records Read │  │
│ │15:10:11.9,  rpm,  1000,  258.08,  Normal,Bat│ │     27       │  │
│ │15:10:13.0,  rpm, 10000,  7202.8,  Normal,Ba │ │              │  │
│ │15:10:14.0,  rpm, 10000,  7185.4,  Normal,Ba │ │ Chars./Record│  │
│ │15:10:14.9,  rpm, 10000,  7226.0,  Normal,Ba │ │     61       │  │
│ │15:10:16.0,  rpm, 10000,  7226.0,  Normal,Ba │ │              │  │
│ │15:10:17.0,  rpm, 10000,  7205.2,  Normal,Ba │ │              │  │
│ │15:10:18.0,  rpm, 10000,  7204.1,  Normal,Ba │ │              │  │
│ │15:10:19.0,  rpm, 10000,  7204.1,  Normal,Ba │ │              │  │
│ │15:10:20.0,  rpm, 10000,  7203.0,  Normal,Ba │ │              │  │
│ │15:10:21.0,  rpm, 10000,  7202.2,  Normal,Ba │ │ Click at the list to│
│ │15:10:22.0,  rpm, 10000,  7205.9,  Normal,Ba │ │ re-align list │  │
│ │15:10:23.0,  rpm, 10000,  7202.2,  Normal,Ba │▼│              │  │
│ └─────────────────────────────────────────┘  └──────────────┘  │
│ ┌──────────────┬───┬──────────────┬───┐                        │
│ │ Current Block │ 1 │  Selected    │ 1 │                        │
│ ├──────────────┴───┴──────────────┴───┤                        │
│ │15:10:07.0,  rpm,  1000,  000.00,  Normal,Batt│                │
│ │O.K.,                                          │                │
│ └───────────────────────────────────────────────┘              │
└─────────────────────────────────────────────────────────────────┘
```

If the View option under FILE in the Main Window is selected, a view window will be shown as above, and the users can review your ASCII data file. If a printer is connected to the PC, users can print out content selectively.

File: Open users data file by selecting this menu. Users will be asked to enter file name. After the name being entered, program will read in one block of data. Number of records in one block depends on the memory size of PC. The bigger memory, the more records in one block.

Blocks Read:
    Indicate how many blocks of records have been read.

Records Read:
    Indicate how many records have been read.

Chars./Record:
    Indicate how many characters in one record.
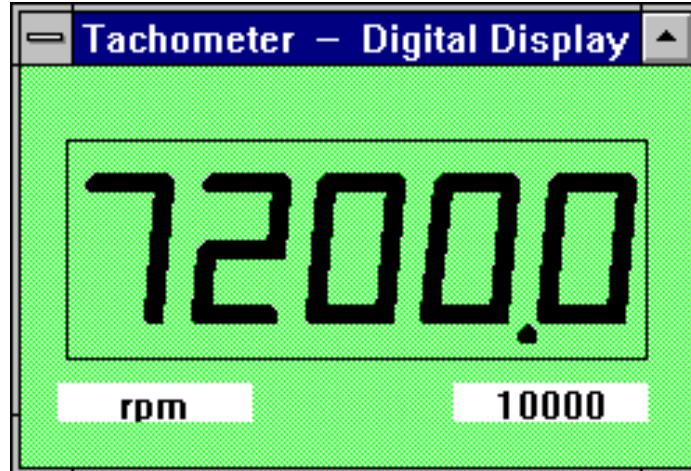
Current Block:
    Indicate the current block number being reviewed.

17

Selected:
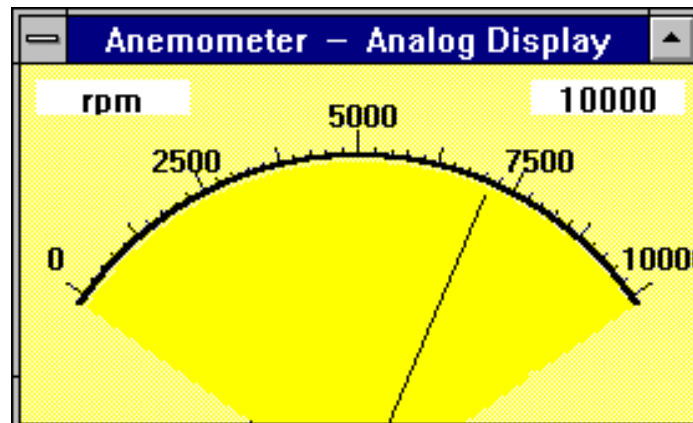   Indicate the current record number being selected.
DISPLAY: DISPLAY menu has four options: DIGITAL, ANALOG, LIST, and GRAPHIC.

DIGITAL:

If this option is selected or CTRL+D is pressed, a window, which emulates multimeter's LCD display, shall appears on the screen.
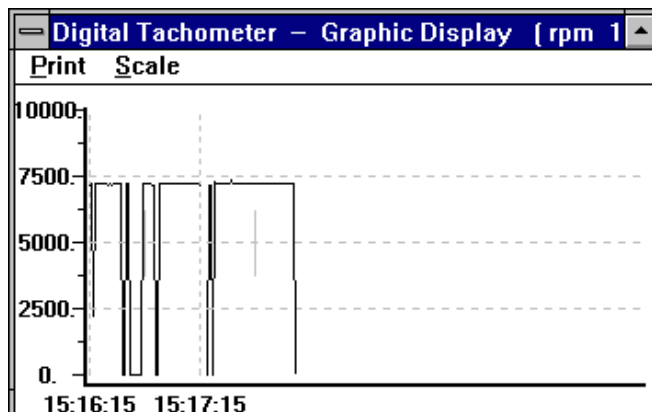
ANALOG:

If this option is selected or CTRL+A is pressed, a window, which emulates an analog meter, shall appear on the screen.

LIST:

If this option is selected or CTRL+L is pressed, a window, which lists the date, function, range, and value every sampling, shall appear on the screen.

GRAPHIC:

If this option is selected or CTRL+G is pressed, a window, which emulates strip chart recorder, shall appear on the screen. The graphic window has two menu, PRINT and SCALE. Select the PRINT menu, the graphics will be printed through any printer connected to the PC. The SCALE menu allows user to set

the minimum and maximum value for the Y (vertical) axis.

Option: If you select Option, a pull down menu will show three options: Sample Rate, Baud Rate.

Upper Limit: Enter upper limit. If upper limit is exceeded, a OVER message will be displayed in screen.

Lower Limit: Enter lower limit. If displayed value is less than lower limit, a UNDER message will be displayed in screen.

Graphic Mode: Select way of display in the graphic windows. Dot or BAR.

Sample Rate: Select this option to enter PC sampling time, or click at the SAMPLE on screen to enter sampling time.

Baud Rate: 9600.

omega.com®
ΩEOMEGA®

OMEGAnet® Online Service www.omega.com	Internet e-mail info@omega.com

Servicing North America:

USA:
ISO 9001 Certified

One Omega Drive, Box 4047
Stamford CT 06907-0047
Tel: (203) 359-1660   FAX: (203) 359-7700
e-mail: info@omega.com

Canada:

976 Bergar
Laval (Quebec) H7L 5A1
Tel: (514) 856-6928   FAX: (514) 856-6886
e-mail: info@omega.ca

For immediate technical or application assistance:

USA and Canada: Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA®
Customer Service: 1-800-622-2378 / 1-800-622-BEST®
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN®
TELEX: 996404   EASYLINK: 62968934   CABLE: OMEGA

Mexico:

En Español: (001) 203-359-7803   e-mail: espanol@omega.com
FAX: (001) 203-359-7807   info@omega.com.mx

Servicing Europe:

Benelux:

Postbus 8034, 1180 LA Amstelveen, The Netherlands
Tel: +31 (0)20 3472121   FAX: +31 (0)20 6434643
Toll Free in Benelux: 0800 0993344
e-mail: nl@omega.com

Czech Republic:

Rudé armády 1868, 733 01 Karviná 8
Tel: +420 (0)69 6311899   FAX: +420 (0)69 6311114
Toll Free: 0800-1-66342   e-mail: czech@omega.com

France:

9, rue Denis Papin, 78190 Trappes
Tel: +33 (0)130 621 400   FAX: +33 (0)130 699 120
Toll Free in France: 0800-4-06342
e-mail: france@omega.com

Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: +49 (0)7056 9398-0   FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 639 7678
e-mail: germany@omega.com

United Kingdom:
ISO 9002 Certified

One Omega Drive, River Bend Technology Centre
Northbank, Irlam, Manchester
M44 5BD United Kingdom
Tel: +44 (0)161 777 6611   FAX: +44 (0)161 777 6622
Toll Free in United Kingdom: 0800-488-488
e-mail: sales@omega.co.uk

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:	FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,	1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product under warranty, and	2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.	3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.