TENMARS

TACHO Meter
TM- 4100 / TM- 4100D

User's Manual

HB2TM4100001

TENMARS ELECTRONICS CO., LTD

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1 Foreword

Thank you for purchasing this tacho meter. Please, read this user's manual before you operate it.

2 Features

- Measurement method: Using red visible spectrum light source and reflective tape or a reflector plate.
- Reflex indicators : When you receive the reflected signals the RING bright LCD screen locked. The buzzer.
- Features : Max / Min display, display hold, on average, automatic shutdown, buzzer, backlight.
- Contact measurement and non-contact, non-contact measuring the distance from the 50 ~ 500mm, allowing in this way would be dangerous to use the case of the measured object. Light weight, make the instrument easier to handle.
- Low battery detector "[−+]".
- Manual data memory storing : 200 data

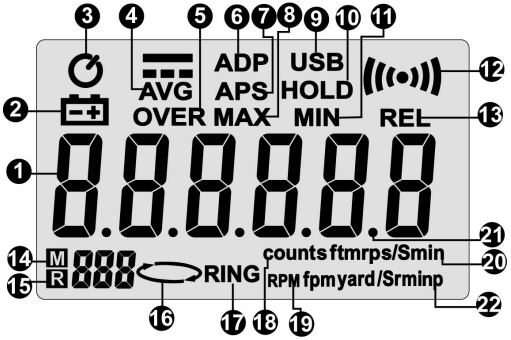
(tm-4100D memory storing : 20000 data)

- Connect the USB Cable： The Screen Display ”USB” (Stop the Auto Power Off function).
- With AC/DC power supply :
  The Screen Display ‘’ADP”
  (Stop the Auto Power Off function).
- Installation of Contact :
  The Screen Display ” ”.
- Reflected red light signal received :
  The Screen Display ” RING”.

3 Identifying Parts

1. Speed the Sensor.
2. Liquid-crystal LCD.
3. MAX / MIN Button.
4. Hold / Backlight Button.
5. Power Button.
6. REC/ MEM / Button.
7. UNIT Button.
8. RESET/CLR Button.
9. AVG/Buzzer/ Right
10. fixed tripod screw hole
11. Battery covers.
12. Contact adapter mounting nut.
13. Contact adapter.
14. Fixed screws
15. Contact type X0.1M
16. Contact-type shoulder
17. Power Supply DC 9V
18. USB Connecter
19. Analog /pulse output port

4 LCD Description



1. Primary Display.
2. Low battery symbol.
3. Auto power off .symbol
4. AVG symbol
5. OVER symbol
6. ADP symbol
7. APS: Analog /pulse output port connector indicate
8. MAX symbol
9. USB symbol
10. Hold symbol
11. Min symbol
12. Buzzer symbol
13. REL symbol.
14. M – Memory reading symbol
15. R - REC symbol
16. - Contactsymbol.
17. RING symbol.
18. counts unit
19. r/min RPM unit
20. ms r/ s m/min unit
21. Decimal point
22. m/ s m/min yard /s yard / min unit

5 Specifications

- Measurement method : Using red visible spectrum light source and reflective tape or a reflective plate.
- Display : Liquid-crystal (LCD), 6 digits
- Range switching: Automatic.
- Contactless measurement detection range : 50mm to 500mm (1.97" to 19.7")
- Sampling period : 62.5 ms to 2 s (depending on usage conditions).
- Measuring range :
  - Measuring range (non-contact, AVG = ON)
    [r/s]（0.5000~1.9999）~（200.0~1600.0）
    [ms]（0.6000~1.9999）~（200.0~1999.9）.
  - Measuring range (contact, AVG = ON)
    [m/m]（1.500~19.999）~（200.0~1999.9）
    [ms]（0.0250~1.9999）~（20.00~33.30）
- Only speed measurement :
  precision required for the above plus ±0.5%rdg.
- Display refresh rate : Approx. 0.5 to10 times/sec.
- Functions : MAX/MIN display, Display hold, Average, Auto power save, Buzzer, Backlight function.

- Operating temperature humidity range : 0°C to + 40°C. 25% to 75 % RH.
- Storage temperatures humidity range : -10°C to +60°C. 0% to 80% RH.
- Power supply : 9V alkaline battery×1.
- AC Adapter : 9V(1A) (Option).
- Maximum rated power : 0.5VA.
- Compatible jack diameter : 3.5mm.
- Output Level : 0 to 3.3V. (Active low, low level fixed at 300 μs) .
- Instrument output setting (analog output/pulse output).
- Continuous operating time : Approx. 24 hours (TM4100) .
- Dimensions : Approx. 186x70x36 mm （L x W x H）.
- Mass : Approx. 200g.
- Accessories : 9V alkaline battery ×1, Carrying case ×1, REFLECTIVE TAPE ×1 sheet per piece).
- Ranges and measurement ranges:

NOTE 1 : the lowermost digit is fixed at 0 at speeds of 20,000 r/min and over.

NOTE 2 : the lowermost digit is fixed at 0 when the averaging setting is off.

Rotational speed measurement:

Ranges and measurement range

Note 1 : The lowermost digit is fixed at 0 at speeds of 20,000r/min and over.

Note 2 : The lowermost digit is fixed at 0 when the averaging setting is off.

(1) Rotational speed measurement

MODE	RANG	Contactless measurement		Contact measurement	
		AVG= ON	AVG= OFF	AVG= ON	AVG= OFF
Rotation speed measurement (r/m)	1	30.00 to 199.99	–	15.00 to 199.99	–
	2	200.0 to 1999.9	300.0 to 1999.0	200.0 to 1999.9	150.0 to 1999.0
	3	2000 to 19999	2000 to 19990	2000 to 19999	2000 to 19990
	4	20000 to 99990	20000 to 99990	–	–
Rotational speed measurement (r/s)	1	0.5000 to 1.9999	–	0.2500 to 1.9999	–
	2	2.000 to 19.999	5.000 to 19.990	2.000 to 19.999	2.500 to 19.990
	3	20.00 to 199.99	20.00 to 199.90	20.00 to 199.99	20.00 to 199.90
	4	200.0 to 1600.0	200.0 to 1600.0	200.0 to 333.0	200.0 to 333.0
Period Measurement (ms)	1	0.6000 to 1.9999	0.6000 to 1.9990	–	–
	2	2.000 to 19.999	2.000 to 19.990	3.000 to 19.999	3.000 to 19.990

	3	20.00 to 199.99	20.00 to 199.90	20.00 to 199.909	20.00 to 19.90
	4	200.0 to 1999.9	—	200.0 to 3999.9	200.0 to 399.0
Count Measurement(count)	0 to 999999 (Input conditions Up to rotational speed measurement upper limit)				

(2)Circumferential speed measurement

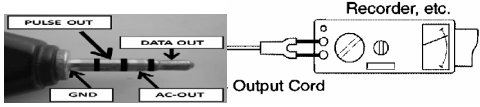
MODE	Range	Contact measurement	
		AVG=ON	AVG=OFF
Circumferential measurement (m/min)	1	1.500 to 19.999	—
	2	20.00 to 199.99	15.00 to 199.90
	3	200.0 to 1999.9	200.0 to 1999.0
Circumferential measurement (m/s)	1	0.0250 to 1.9999	0.2500 to 1.9990
	2	2.000 to 19.999	2.000 to 19.990
	3	20.00 to 33.30	20.00 to 33.30

Accuracy	AVG=ON	AVG=OFF
Up to 9.999 counts	±1dgt.	±10dgt.
10.000 counts or more	±2dgt.	±20dgt.
20.000 count or more(r/min mode only)	±20dgt.	±100dgt.
Period measurement only	±0.5%rdg. Is added to above-mentioned accuracy.	

EMC

This meter was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-1 (2006).

- Ac / The pulse output wiring diagram:

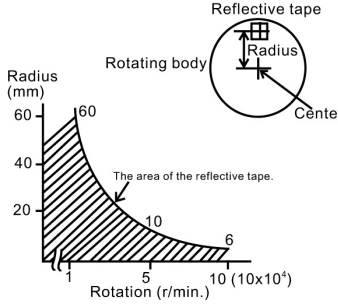


6 Measurement Procedures and Preparation

Precautions in Measurement of High-Rotation Objects Detection of reflected light uses modulated light is input for a fixed period of time (about 0.2ms) or longer, a single pulse is detected. For this reason, if the light pulse generated by the passing reflective tape is less than 0.2ms detection is not possible.

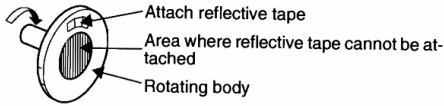
The range that can be detected with a 12mm square target of reflective tape is indicated below.

※Radius is the distance between the center of the rotating object and the center of the tape.

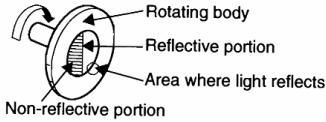


Chapter Measurement Procedures

If the reflective tape cannot be attached within this detection range, increase the area of the reflective tape so that the generated pulse is 0.2ms to higher.



For measurement of 30,000r/min. or higher, uses the following method:



For measurement of 30,000 r/min. or higher, use the following.
Method :
Chapter Measurement Procedures
If the reflective tape cannot be attached within this detection range, increase the area of the reflective tape so that the generated pulse is 0.2ms to higher.

6.1 Battery Loading:

Remove the battery cover on the back and put a 9V battery inside.
Battery replacement: When the symbol of "- +" appears on the LCD display, the battery should be replaced with a new one.
The battery symbol will be displayed on the LCD, this symbol "- +" is a battery low indicator.

6.2 Power Button：

- Press "⏻" button to power on.
- Again Press "⏻" button to power off.

6.3 Data Hold /Backlight Button:

Press the “DH/☼”button, LCD display“**HOLD**”, Lock reading, and then a“DH/☼” lifting "lock.

Press the “DH/☼” button for more than 2 seconds to turn on or turn off the backlight function

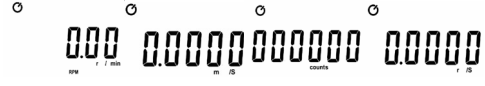
- Backlight light turns off automatically after 30 seconds.

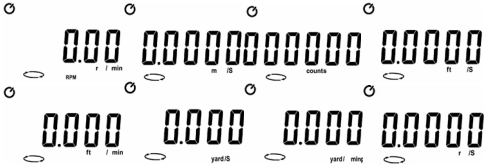
6.4 Units Button:

Press “UNIT” button to change the unit. Possible Units :

Non-contact : **RPM r/min➔ ms.➔ counts➔ /s**
Contact :
RPM r/min➔ms➔counts>>ft/s➔ft/min➔ yard/s➔yard/min➔r/s

RPM r/min ➔ ms ➔counts➔ m/s➔m/min➔ r/s





6.5 MAX/MIN Button:

Configuration meshed : Repeated MAX/MIN key

input Operation description :

Normal value→Maximum value (MAX/MIN lights up)

→Minimun value (MAX/MIN lights up)

※ This function is not available during count measurement (the key is disabled).

6.6 RESET/CLR Button:

Operation method : RESET CLR key input

Operation description : The current value, maximum value, minimum value, count measured value, and circumferential speed value are reset to zero.

Notes :
The measured value is also cleared when switching measurement modes and changing the averaging setting.

6.7 AVG and Ring call ON/OFF Button：

Operation method : RESET CLR key input

Operation description:

The current value, maximum value, minimum value is reset to zero.

Note:

The measured value is also cleared when switching measurement modes and changing the averaging setting.

Push“AVG BUZZER” button to enable or disable AVG mode.

Press “AVG BUZZER” key more 2 seconds to enable or disable the buzzer. When the “((•))” symbol is on the LCD Display which means the buzzer is on.

6.8 Manual Data Memory Storing

Push“REC/MEM” button, this meter will save the current measured result, and REC with a number 001~200 will appear.

Manual data memory Storing: 200 data sets.Over load Indication: “**OL**”.

6.9 Viewing Data Record

Press and hold “⏻” first, and then press “REC/MEM” button together to enable record reading function, the LCD will display “M“ ,Press “MAX/MIN” or “AVG/BUZZER” button to read the next or previous records ,Press and hold “⏻” button first, and then press “REC/MEM” button together to disable the this function.

7 Setup Mode

Press and hold “ ⏻ ” button first ,and then press“ MAX/MIN ” button to enter the Setup Mode set1. Press “ UNIT ” button to change the setup function from set1 to set7 mode, LCD will display from set1 to set7.

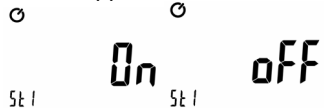
Press“ REC/MEM ” button to exit the setup mode.

Set 1: Automatic shutdown on / off setting.
Set 2: Adjust auto-shutdown time setting.
Set 3: Record time: time. Points second set.
Set 4: Screen backlight on / off setting.
Set 5: backlight Seconds and setting
Set 6: Buzzer sounds on / off setting.
Set 7: ft. and m setting.
Setting method, see the 7.1 ~7.7 paragraphs.

7.1 St1 Automatic Power On/off:

After entering st1 screen then click " MAX/MIN " to switch from "On" to "oFF" then click " REC/MEM " button to confirm the action, on behalf of not automatically shut down. Test mode LCD screen

no longer displays " " symbol.
Will be appeared on the LCD display.



To reply to automatic shutdown feature, please follow the steps to cancel automatic shutdown st1, LCD screen, select the "On" symbol, then click " REC/MEM " button to confirm the test status LCD screen on the " " symbol to restore light, for automatic shutdown.
Press " REC/MEM " key to save and exit.

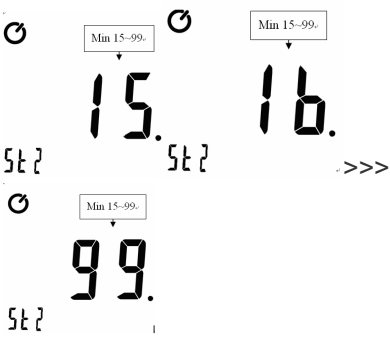
7.2 St2 Auto Power off Time Setting:

After entering to St2 automatic shutdown time setting function, then the LCD screen will display the time, st2, and symbols together to adjust minutes.
Press " MAX/MIN " button or " AVG/BUZZER " button to enter the value to adjust the duration of the auto power off time.

Setting Auto Power Off time from：15 to 99 minutes.

Press "REC/MEM" button and enter the settings from the setting mode.

The auto power off time default setting is 15 minutes.



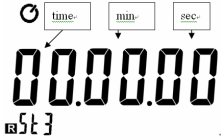
7.3 St3 Record Interval Time Setup

Entered into the records of each storage interval st3 time setting

By the press "MAX/MIN" button or " AVG/BUZZER " button to modify the time value of the duration.

Press "DH/☼" button or "RESET/CLR" button to shift the

cursor to move from hour to minute, then to second for the setup.



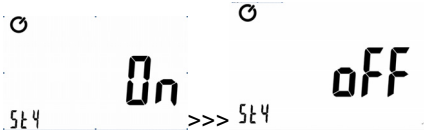
Press "REC/MEM" button to determine the set of the time, and from the setting mode.

7.4 St4 Screen Backlight ON / OFF Setting Note:

After entering st4 screen then click "MAX/MIN" to switch from "On" to "oFF" then click "REC/MEM "button to confirm the action, performed without backlight.

To reply to st4 backlight ON, please follow the steps to cancel without backlight unit, select the LCD screen on the "On" symbol, then click" REC/MEM "button to confirm, on the implementation of a backlight.

Auto Power off Time function



7.5 St5 Backlight off Time to Select the Setting

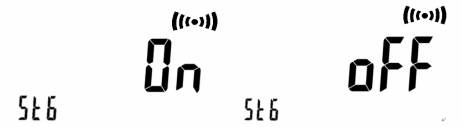
After entering st6 screen then click " MAX/MIN " to switch converted to a 5.00>> 0.30>> 1.00>> 1.30>> 2.00>> 2.30>> 3.00>> 3.30>> 4.00>> 4.30>> 5.00 cycle

Select the time you want and then click " REC/MEM " button to confirm

7.6 St6 Buzzer Sound ON / OFF Note

After entering st6 screen then click " MAX/MIN " to switch from "On" to "oFF " then click " REC/MEM "

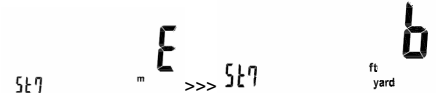
button to confirm the action.



7.7 St7 ft. / m Unit Conversion Options:

Into the ST7 screen displayed on the" m E"switch " MAX/MIN."button for the conversion unit, the screen displays" ft yard b "Press" REC MEM "button to confirm the selection unit.

Such as to be altered in accordance with the above instructions, and then operate a return to the original unit



8 Battery replacement

	warring
⚠	If the symbol “ ” appears on the LCD, please replace the battery immediately

- Turn off the instrument.
- Remove the battery cover.
- Replace the battery.
- Install the battery cover.

※ **Please take out the battery in case of using adapter.**

9 Safety Precaution

For cleaning the instrument use a soft dry cloth.
Never use a wet cloth, solvents or water, etc...
Operation Altitude : Up to 2000M.
Operating Environment : Indoors use.
This instrument has been designed for being used in an environment of pollution degree 2.

10 Safety Information

DANGER

In some cases, work in the vicinity of powerful radiation sources can be a risk of your life.
Be aware that persons with electronic implants (e.g. cardiac pacemakers) are subject to particular dangers in some cases.
Observe the local safety regulations of the facility operation.

Observe the operating instructions for equipment, which is used to generate, conduct, or consumer electromagnetic energy.
Be aware that secondary radiators (e.g. reflective objects such as a metallic fence) can cause a local amplification of the field.
Be aware that the field strength in the near vicinity of radiators increases proportionally to the inverse cube of the distance. This means that enormous field strengths can result in the immediate vicinity of small radiation sources (e.g. leak in wave guides, inductive ovens)
Field strength measuring device can underrate pulsed signals. Particularly with radar signals, significant measurement errors

can arise.
All field strength measuring devices have a limited specified frequency range. Fields with spectral components outside of this frequency range are generally incorrectly evaluated and tend to be underrated. Before using field strength measuring devices, you should thus be certain that all field components to be measured lie in the specified frequency range of the measuring device.

11 End of life

Caution :
This symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal

TENMARS

YFE

Professional Electrical and Environment Test & Measurement Instruments:

Battery Capacity ,Impedance Tester, TACHO Meter ,LED light meter ,Temperature & Humidity meter ,Infrared Thermometer ,Sound level meter ,Light meter ,EMF meter ,UV Light meter ,RF mete r ,Hot wire Anemometer ,CO meter ,Anemometer ,Lan cable tester ,CO_2 meter ,Solar power meter ,Radiation meter, Clamp meter ,Multimeter ,Phase Rotation test, Digital Insulation tester.

Our products of high quality are selling well all over the world

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