

# Handheld Advanced Tachometer

# FT-7100

Instruction Manual (Function Reference)

Thank you for your selection of the FT-7100 Handheld Advanced Tachometer.

To ensure the performance of the FT-7100, please read this manual thoroughly.

# **Functions and Operations**

# 1.Power Switch

backed up

When you slide the power switch upward, the power of the main unit turns ON.

When you turn ON the power, the software version is displayed in the MAIN display and product code "FT7" of the main unit in the SUB display. Then, the measurement mode is entered.

Each parameter condition used in previous measurement is

When you perform measurement for the first time, set each parameter first.

## 2.Function of Each Switch

When you turn ON the power, each switch has a different function between the measurement mode and the parameter setup mode.

The function of each switch in each mode is shown below.

	Measurement Mode	Parameter Setup Mode
Power switch	Ends the measurement mode and then turns OFF the power.	Cancels the current setting and then turns OFF the power.
RECALL & switch	At the time of rotational acceleration/deceleration measurement (when Algorithm E of the ACT mode is selected), this switch is used to select a rotational speed at the start of measurement from sampled candidate values.	Changes the selection of the current setting. During numerical parameter setup, increments the numerical value of the relevant digit. When the value is 9, returns to 0.
MENU switch	Selects the parameter setup mode.	Applies the current setting and then changes to the measurement mode.
SAMPLE & switch	In the measurement mode, at the time of rotational acceleration/deceleration measurement (when the "ACT" mode is selected), this switch is used to sample rotational speed data before starting measurement and calculate candidate values of the rotational speed at the start of measurement.	During numerical parameter setup, moves the setting cursor to the right. When the setting cursor is at the least significant digit, returns to the most significant digit.
MODE & NEXT switch	At the time of rotational acceleration/deceleration measurement (when Algorithm E of the ACT mode is selected), this switch is used to determine a value selected by the RECALL & switch as a rotational speed at the start of measurement, and then starts measurement.	Applies the current setting and then moves to the next setting.

Note: When Algorithm D is selected, the function to select a candidate value of the rotational speed is not provided.

# 3.Setup Mode

When you press the MENU switch in the measurement mode, the parameter setup mode is selected.

Then, set parameters using the RECALL & and SAMPLE & switches. Apply parameters and select items using the MODE & Operate the sensor selector switch before setting parameters

in the setup mode.



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t Algorithm A	
t Algorithm B	
t Algorithm D	177
t Algorithm E	
t the time of shipment.	HLL

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Omission of Issuance of Certificate

This product has been tested under strict inspections for correct operation before shipment. Please note that the issuance of certificate is omitted.

#### Warrantv

- 1. This product is covered by a warranty for a period of one year from the date of delivery.
- 2. This warranty covers free-of-charge repair during the warranty period for defects occurred while the product is used under correct operating conditions according to descriptions in this manual and notices on the unit label.
- 3. For free-of-charge repair during the warranty period, contact your dealer or your nearest Ono Sokki sales office nearbv
- 4. Even during the warranty period, the following failures will be handled on a fee basis.
- (a) Failures or damages occurring through misuse. misoperation, repairing without ONO SOKKI'S approval.
- (b) Failures or damages occurring through mishandling (dropping) during transportation after purchase.
- (c) Failures or damages occurring by an Act of God (fires, earthquakes, flooding, and lightening), environmental disruption, or abnormal voltage
- (d) Replenishment of expendable supplies, spare parts, and accessories.

This guarantee covers only the performance of the product itself only. All inconvenience by the trouble of this product is not included \*Outer appearance and specifications are subject to change without prior notice. HOME PAGE: http://www.onosokki.co.jp/English/english.htm

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# NEXT switch Operation flow of the parameter setup mode is shown below.

### Selecting the analog monitor output (Monitor MON)

#### Select a signal to be output as an analog output



Setting the analog output full-scale value (Full Scale FS)

Set the rotational speed corresponding to the full-scale value (F.S. value: 1V) of the analog voltage output.

This item can be set only when "rEuO" is set as the analog monitor output.

Setup range: 1 to 99999 (If 0 is set, 1 is set automatically.)

Set to "99999" at the time of shipment



rEuü

MON

Setting analog output calibration (Calibration CAL)

Outputs calibration signal 0V or 1V for analog voltage output.

This item can be set only when "rEuO" is selected as the analog monitor output.

Note: The setup of this function is not retained. The default setting of this item is always "Ou."

> The selected analog output is enabled only while this item is selected.



Setting the lighting condition of LCD backlight (Light LGT)

Set the LCD backlight to On or OFF.



# Various Measurement Operations (Descriptions of Each Algorithm)

### 1.Steady Rotation Measurement Mode "CNS"

This mode is effective when the rotational speed of the object under measurement is fixed. In this mode, either of the following two algorithms can be selected according to the object under measurement in algorithm setup from the setup menu.

TYPE-A (Algorithm A/Maximum Power Spectrum Peak Detection Method)

The most basic algorithm suitable for measurement of rated rotational speed, etc.

TYPE-B (Algorithm B/Peak-Interval Mode Method)

This algorithm emphases the stability.

However, since this algorithm is inferior to TYPE-A in tracking performance, measurement may not be performed correctly if a rapid rotational variation occurs. Further, depending on the waveform of the sensor signal, measurement may not be performed correctly.

Because of the measurement principle of algorithms, the upper limit of the input frequency is about one third of the frequency range.

Note: When Algorithm B is selected, the filter function is disabled

#### 2.Rotational Acceleration/Deceleration Measurement Mode "ACT"

This mode is effective when measuring the rotational speed of an object under measurement, which is accelerating or decelerating. In this mode, either of the following two algorithms can be selected according to the object under measurement in algorithm setup from the setup menu.

TYPE-D (Algorithm D)

This algorithm is suitable for measurement when the rotational speed accelerates or decelerates.

Performs measurement by changing the measurement time according to variation of the rotational speed.

TYPE-E (Algorithm E)

This algorithm maintains a balance between the tracking performance and the stability of the rotational speed.

# Outputs

# 1.Analog output

[When REVO is selected]

- Analog voltage with the setting of the analog output "F.S." (full scale) in the setup mode is output from the analog output iack.
- The analog output becomes 1V when the value of the MAIN display agrees with the full-scale setting. The minimum load resistance of the analog output is 100 k $\Omega$ .



Performs measurement focusing on a selected power spectrum. However, since this algorithm is inferior to TYPE-D in tracking performance, measurement may not be performed correctly if the rotational speed changes rapidly.

#### 3."ACT" Mode Measurement Procedures

: Algorithm: TYPE-D

When the power is turned ON or the setup mode is terminated, "rEAdY" is displayed in the MAIN display.

Set the object under measurement to the rotational speed at the start of measurement (make the rotational speed as stable as possible). When measurement is ready, press the "SAMPLE" switch

Measurement starts.

\* Measurement does not start if the rotation signal is not input.

To stop (cancel) measurement and then perform measurement again, press the "SAMPLE" switch during measurement.

Control returns to step . Proceed with step

#### : Algorithm: TYPE-E

When the power is turned ON or the setup mode is terminated, "rEAdY" is displayed in the MAIN display.

Set the object under measurement to the rotational speed at the start of measurement (make the rotational speed as stable as possible). When measurement is ready, press the "SAMPLE" switch

Candidate values (up to eight values) of the rotational speed at the start of measurement are displayed. Select a candidate value that is closest to the current rotational speed using the "RECALL" switch and then apply it using the "MODE & NEXT" switch.

Measurement starts

To stop (cancel) measurement and then perform measurement again, press the "SAMPLE" switch during measurement.

Control returns to step . Proceed with step

#### [When SIG is selected]

· A sensor signal after waveform shaping (signal before pulse waveform conversion) is output.



# **Description of CONDITION Display Section** 1.ERROR Display 2.LOW Display

If the "ERROR" mark lights up, one of the following error has If the "LOW" mark lights up, the battery has been consumed occurred and the low battery condition occurred. Relation between the cause of error and the error code displayed This mark lights up if the battery voltage drops to 4.2V or in the SUB display is shown below. lower • If this mark lights up, immediately replace the four batteries with new ones. Error Code Cause of Error Using the consumed batteries may disable measurement. E01 A backed up parameter is not set correctly. · If the batteries are further consumed under this condition, E02 The FT-7100 could not normally be activated. measurement is disabled and the MAIN display displays E11 The amplifier sensitivity for sensor is " - - - - ." excessive. · If the battery voltage drops to about 4.5V or lower, the back-E12 A detected rotational speed exceeded the light becomes dark (with no problem). maximum display range, i.e., "99999 r/min." E13 When the drive mode is the rotational LOW display ERROR display acceleration/deceleration measurement dLOW ERROR mode (when the "ACT" mode is selected), the rotational speed cannot be measured correctly (tracked rotational speed is lost). LOW ERROR E14 The rotational speed becomes out of the 88888 range set with the filter. When the drive mode is the rotational E15 acceleration/deceleration measurement 愛愛愛 mode (when the "ACT" mode is selected), the rotational speed at the start of measurement cannot correctly be sampled. E21 With filter settings, the lower-limit setting is equal to or greater than the upper-limit setting.

# Troubleshooting

If you perceive any abnormal condition, first check the following points. If the instrument does not operate normally after check, contact your dealer (Ono Sokki agency) or Ono Sokki sales office nearby.

Symptom	Check Point	Solution
No display	Are batteries set?	Set batteries.
	Is the battery polarity correct?	If the polarity is wrong, the batteries have been con-
		sumed and therefore replace the batteries with new ones
		with the correct polarity. *1
	Are batteries consumed?	Replace all batteries with new ones.
	When using the AC adapter, is the dedi-	Plug the dedicated AC adapter to an outlet and then
	cated AC adapter connected to an outlet and	connect the DC plug to the DC input terminal of the
	the DC input terminal of the main unit?	main unit.
	Is the dedicated AC adapter used?	Use the dedicated AC adapter.
Unstable display	Is sensor selection appropriate?	Select the sensor used with the setup menu or sensor
		selector switch.
	Is amplifier sensitivity adjustment appropri-	Adjust the sensor amplifier sensitivity adjustment vol-
	ate?	ume so that the indicator stably blinks. If adjustment is
		not completed using the volume, change the input volt-
		age level using the setup menu.
Abnormally high	Is the setting of the number of pulses ap-	Set correctly the number of pulses per rotation (P/R)
or low rotational	propriate?	according to the body of revolution under measurement.
speed		

\*1 If normal operation cannot be restored even after performing solution or , the internal protection circuit may have operated and the fuse may have blown. Contact Ono Sokki sales office.