Measures engine rotation speed via a cigarette lighter socket sensor!

Cigarette lighter socket sensor FT-0801
FT-7200 Advanced Handheld Tachometer

Rotation pulse not needed. Rotation speed measured via light, magnetism, vibration, sound, etc.

Overview
The FT-7200 is a handheld tachometer that measures rotation speed by performing frequency analysis using FFT calculations. It can perform non-contact measurement using sound, vibration, and others, without modifying the rotating shaft.

Features
- Enables rotation measurement by sound or vibration. Processing of a rotating shaft is not necessary.
- Improved following up performance of fluctuation, acceleration and deceleration
- Perfect for measuring engine rotation of finished cars, etc.
- Various types of sensors can be used, including cigarette lighter socket sensors
- Pulse output as rotation cycle signal and analog output for recording of rotation speed are provided as standard.
- Large size LCD with backlight for displaying the measured result.
- Equipped with averaging function

Pulse Counting Method
Because FFT calculation is used, measurement is not influenced by noise or changes in signal amplitude.

FT Series Method
Analog output waveform
Stable display values

Rotation speed measured via sound and vibration!
Measures engine rotation speed via a cigarette lighter socket sensor!
Advanced Handheld Tachometer FT-7200

Comparison of new Mode C of the FT-7200 with a previous model

Mode C can be used to measure rotating object that a previous model was unable to measure (see left).

The FT-7200 also has improved follow up performance of rapid accelerated and decelerated rotation (see right).

(compared analog outputs by oscilloscope)
Examples of Application

■ Rotation Speed Measurement of DC Motors

The FT-0501 detects the magnetic flux leakage of a DC motor, and calculates the frequency signal in proportion to rotation speed. This is able to measure the rotation speeds of built-in DC motors.

■ Rotation Speed Measurement of Finished Products

This product can measure the rotation speeds of motors in finished products where the motors are not visible, such as power drills and vacuum cleaners. Measurement is performed with a microphone, making it possible to perform measurement without modifying the measurement object.

■ Rotation Speed Measurement of Fans and Compressors

The vibration of a rotating object depends on the rotation movement. The rotation speed of a rotating object can be measured by measuring the vibration frequency.
The rotation speed of engines can be measured from noise and vibration caused by the movement of pistons.

The rotation speed of engines can be measured from the noise of intake and exhaust from a muffler.

The rotation speed of engines can be measured by clamping sensors to an automobile’s primary low-voltage and secondary high-voltage conductors.

Engine Measurement via the FT-0801 Cigarette Lighter Socket Sensor

Connect the FT-0801 to a power outlet equipped on an automobiles or construction machineries. It is possible to measure the rotation speed of engines using the FT-7200 by detecting the ignition noise in the voltage from the power outlet. Supports 12VDC and 24VDC batteries.
System Configuration

Rotation measurement from noise
Cigarette lighter socket sensor

Rotation measurement from sound
Microphone preamplifier
MI series
MI-3111
MI-1433

Rotation measurement from vibration
Accelerometer
Engine rotation detector
(vibration sensor)
NP-2000/3000 series
VP-202/1220

Rotation measurement from ignition pulse of engines
Ignition pulse detector/
Motor*gasoline engine
RPM detector
IP-292/296
IP-3000A/3100
OM-1500

Rotation measurement from ignition pulse of engines
Ignition pulse detector/
Motor*gasoline engine
RPM detector
OM-1200

DC motor rotation detector
FT-0501

MI series
MI-3111
MI-1433
NP-2000/3000 series
VP-202/1220
OM-1200
FT-0501

IP-292/296
IP-3000A/3100
OM-1500

Note: The suitable signal cable should be selected on the model of the selected accelerometers and measurement conditions.

NP-0021
CH-6130/6140

Note: MI series and NP series brochures are available separately.

Note: All the peripheral equipments described on this page are sold separately as options.

Direct connection

FT-7200
Advanced Handheld Tachometer

Note: All the peripheral equipments described on this page are sold separately as options.

Pulse output

Analog output

Analog output for monitor

Analog output

Advantages:
- Lightweight and portable
- Easy to use with one-hand operation
- Accurate measurement
- Various measuring modes
- High resolution
- Large display
- Multi-language support

Applications:
- Automotive diagnostics
- Machine maintenance
- Industrial monitoring
- Construction site
- Research and development

Features:
- LCD display
- Data logging
- USB connectivity
- Low power consumption
- Waterproof design

Specifications:
- Measuring range: 0 to 20,000 RPM
- Resolution: ±0.1 RPM
- Accuracy: ±2.0% of reading
- Measuring modes: Tachometer, RPM, frequency
- Operating temperature: 0 to 40°C
- Operating humidity: 0 to 80% non-condensing
- Power source: 2xAAA batteries (not included)
- Dimensions: 150 x 75 x 35 mm
- Weight: 180 g (without batteries)

Accessories:
- Carrying case
- Battery pack
- User manual
- Calibration certificate

Note: For more detailed information, please refer to the Instruction Manual.
**FT-7200 Specification**

### Measurement section

<table>
<thead>
<tr>
<th>Measurement objects</th>
<th>DC motors, compressors, engines, and general rotating objects</th>
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</thead>
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<tr>
<td>Calculation method</td>
<td>FFT calculation</td>
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<tr>
<td>Measurement time</td>
<td>250ms or less</td>
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</tbody>
</table>
| Input frequency range | 2000Hz range: 30 to 2000Hz (1,800 to 99,999r/min) **1**  
|                     | 500Hz range: 7.5 to 500Hz (450 to 30,000r/min) **2**  
|                     | 250Hz range: 3.75 to 250Hz (225 to 15,000r/min) **1**  |
| Measurement unit    | t/min (rotation speed)           |
| Rotation speed resolution (r/min) | Frequency range (Hz) x 6,400 x 60 + the number of set pulses  
|                     | Frequency range: 250, 500, 2000 Hz  
|                     | Set pulse count: 0.5, 1, 1.5, etc. (P/R)  
|                     | 6400: FFT resolution Resolution drops when rotation speed is accelerating or decelerating. |
| Measurement accuracy (r/min) | ±2 x rotation speed resolution (t/min) ±1  
| Filter function     | Limits the target frequency range (rotation speed range) within the selected frequency ranges. |
| Averaging function  | Moving average processing Number of averages: OFF, 2, 4, 8, 16 |
| Filter sensitivity adjustment dial | The sensor amplifier’s sensitivity can be adjusted via the rotary dial on the right side of the main unit. |

### Detection section

| Applicable detectors | For engine rotation measurement FT-0801, OM-1200, OM-1500, VP-1220, VP-202, IP-292, IP-296, IP-3000A, IP-3100  
|                     | NP-3000 series (built-in amplifier), FT-0501, Mi-1433 + Mi-3111 (microphone), magnetic flux leakage sensor |
| Input voltage level  | 5V: Max.+5V, 0.5V: Max.+0.5V, 0.05V: Max.+0.05V  
| Input coupling      | AC coupling |
| Power supply for NP series sensor | Constant current power supply (2.4 ±0.5mA) |

**Note for measurement:** Correct detection may not be possible depending on the type of an engine or an object under measurement.

### Display section

| Number of display digits | 5 |
| Character height        | 10.2mm |
| Display device          | 7-segment LCD with backlight |
| Display update time     | 0.5 ±0.2s |
| Display resolution      | 1/r/min |

### Measurement Mode

| CNS (Constant) | Use when there is low fluctuation in the rotation speed of the measurement object. (when measuring rated rotation speed or similar) | Modes A, B |
| ACT (Active)   | Use when the rotation speed of the measurement object is accelerated and decelerated. (However, it may not be possible to measure correctly if the changes are sudden.) | Modes C, D, E |

### Output section

| Signal output | Outputs the rotation speed displayed value |
| Voltage range | 0 to 1 V / 0 to F.S. (F.S. can be specified optionally.) |
| Conversion method | 10-bit D/A conversion |
| Linearity     | ±1% of F.S. |
| Output update time | 250ms or less |
| Temperature stability | ±0.05% of F.S. / °C (ZERO & SPAN) |
| Setting error | ±0.5% of F.S. (Factory default of setting error; ZERO & SPAN) |
| Load resistance | 100kΩ or more |
| Output connector | Ultra-mini jack (φ2.5) |

**Note for measurement:** Correct detection may not be possible depending on the type of an engine or an object under measurement.

### General Specification

| Applicable standard | CE Marking |
| Power supply        | Four type AAA batteries or exclusive AC adapter (PB-7090, sold separately) |
| Continuous operating time | Approx. 6 hours (with backlight OFF)  
|                     | Approx. 5 hours (with backlight ON) Using alkaline batteries at 20°C, excludes when an NP-3000 series accelerometer is in use**2** |
| Battery LOW display | The “LOW” mark lights up at approx. 4.2V. |
| Operating temperature range | 0 to +40°C |
| Storage temperature range | -10 to +50°C |
| Operating humidity range | +35 to +85% RH (with no condensation) |
| Storage humidity range | +35 to +85% RH (with no condensation) |
| Weight               | Approx. 230g (main unit only; not including batteries) |
| Outer dimensions     | 180.5(H) × 66.5(W) × 47.5 (D) mm (main unit only) |
| Accessories          | Type AAA alkaline battery × 4, three kinds of instruction manuals (one copy each), carrying case |

### FT-0801 Specification

| Connector shape | Cigarette lighter socket |
| Input voltage  | 12/24 VDC (battery voltage) |
| Filter         | High-pass filter |

### General Specification

| Cable length    | 2m |
| Operating temperature range | 0 to +40°C |
| Storage temperature range | -10 to +50°C |
| Weight          | Approx. 75g |
| Outer dimensions | φ22.3 x 69mm |

* The FT-0801 is performed AC coupling processing, protecting the FT-7200 from overvoltage.
Applicable sensors and options (sold separately)

Main unit
- **FT-7200** Advanced Handheld Tachometer

Detectors
- **FT-0801** Cigarette lighter socket sensor
- **FT-0501** DC motor rotation detector
- **IP-292** Ignition pulse detector (primary side)
- **IP-296** Ignition pulse detector (secondary side)
- **IP-3000A** Ignition pulse detector
- **IP-3100** Ignition pulse detector
- **OM-1200** Ignition pulse detector/Motor+gasoline engine RPM detector
- **OM-1500** Ignition pulse detector/Motor+gasoline engine RPM detector
- **VP-202** Engine rotation detector
- **VP-1220** Engine rotation detector (high-sensitive type)
- **NP-2000/NP-3000 series** Accelerometer
- **MI series** Microphone + preamplifier

Accessories
- **HT-0522** Magnetic stand
- **HT-0521A** Stand jig
- **LA-0203C** Tripod for sound level meter
- **PB-7090** AC adapter (input :100 to 240VAC output :5.9VDC/3.5A)
- **AX-501** Signal cable (2m) (Can be used for analog and pulse outputs.) φ2.5 pin plug – CO2 (BNC)

*1: Made by Slik Corporation (splint PRO II GM)
*2: Made by Adapter Technology

Please specify the specification of an AC cord if needed. AC cord provided as standard is a cord for use in Japan.

Outer Dimensions

**U.S.A.**
Ono Sokki Technology Inc.
2171 Executive Drive, Suite 400, Addison, IL, 60101 U.S.A.
Phone : +1-630-627-9700
Fax : +1-630-627-0004
E-mail : info@onosokki.net
http://www.onosokki.net

**THAILAND**
Ono Sokki (Thailand) Co., Ltd.
1293-4 Moo.9 T.Bangphud A.Pakkred, Nonthaburi 11220, Thailand
Phone : +66-2-584-6735
Fax : +66-2-584-6740
E-mail : sales@onosokki.co.th
http://www.onosokki.net

**INDIA**
Ono Sokki India Private Ltd.
Plot No.20, Ground Floor, Sector-3, IMT Manesar Gurgaon-122050, Haryana, INDIA
Phone : +91-124-421-1807
Fax : +91-124-421-1809
E-mail : osid@onosokki.co.in

**P.R.CHINA**
Ono Sokki Shanghai Technology Co., Ltd.
Room 506, No.47 Zhengyi Road, Yangpu District, Shanghai, 200433, P.R.C.
Phone : +86-21-6503-2656
Fax : +86-21-6506-0327
E-mail : admin@shonosokki.com

*Outer appearance and specifications are subject to change without prior notice.

**URL:** http://www.onosokki.co.jp/English/english.htm

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