

HT-6100

Instruction Manual (Function Reference)

Thank you for your selection of the HT-6100 Handheld Digital Tachometer. To ensure the performance of the HT-6100, please read this manual thoroughly.

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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.

- Warranty**
- This product is covered by a warranty for a period of one year from the date of delivery.
 - 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.
 - For free-of-charge repair during the warranty period, contact your dealer or your nearest Ono Sokki sales office nearby.
 - Even during the warranty period, the following failures will be handled on a fee basis.
 - Failures or damages occurring through misuse, misoperation, repairing without ONO SOKKI'S approval.
 - Failures or damages occurring through mishandling (dropping) during transportation after purchase.
 - Failures or damages occurring by an Act of God (fires, earthquakes, flooding, and lightning), environmental disruption, or abnormal voltage.
 - 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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Functions and Operations

1. Power Switch

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 "HT6" of the main unit in the SUB display. Then, the measurement mode is entered.

Each parameter condition used in previous measurement

	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	Recalls the memory value in sequence.	Changes the selection of the current setting. During numerical parameter setting, increments the numerical value of the relevant digit. When 9, returns to 0.
MENU switch	Selects the parameter setup mode. When pressed during memory value call, returns to the measurement mode.	Establishes the current setting and then change to the measurement mode.
MEMORY & switch	Memorizes up to 20 measurement values present when pressed.	During numerical parameter setting, moves the setting cursor to the right. When it is at the least significant digit, returns to the most significant digit.
MODE & NEXT switch	Changes the peak-hold mode (MAX, MIN, and normal) in order.	Establishes the current setting and then moves to the next setting.

is backed up. However, the "NORMAL" peak-hold mode is entered.

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

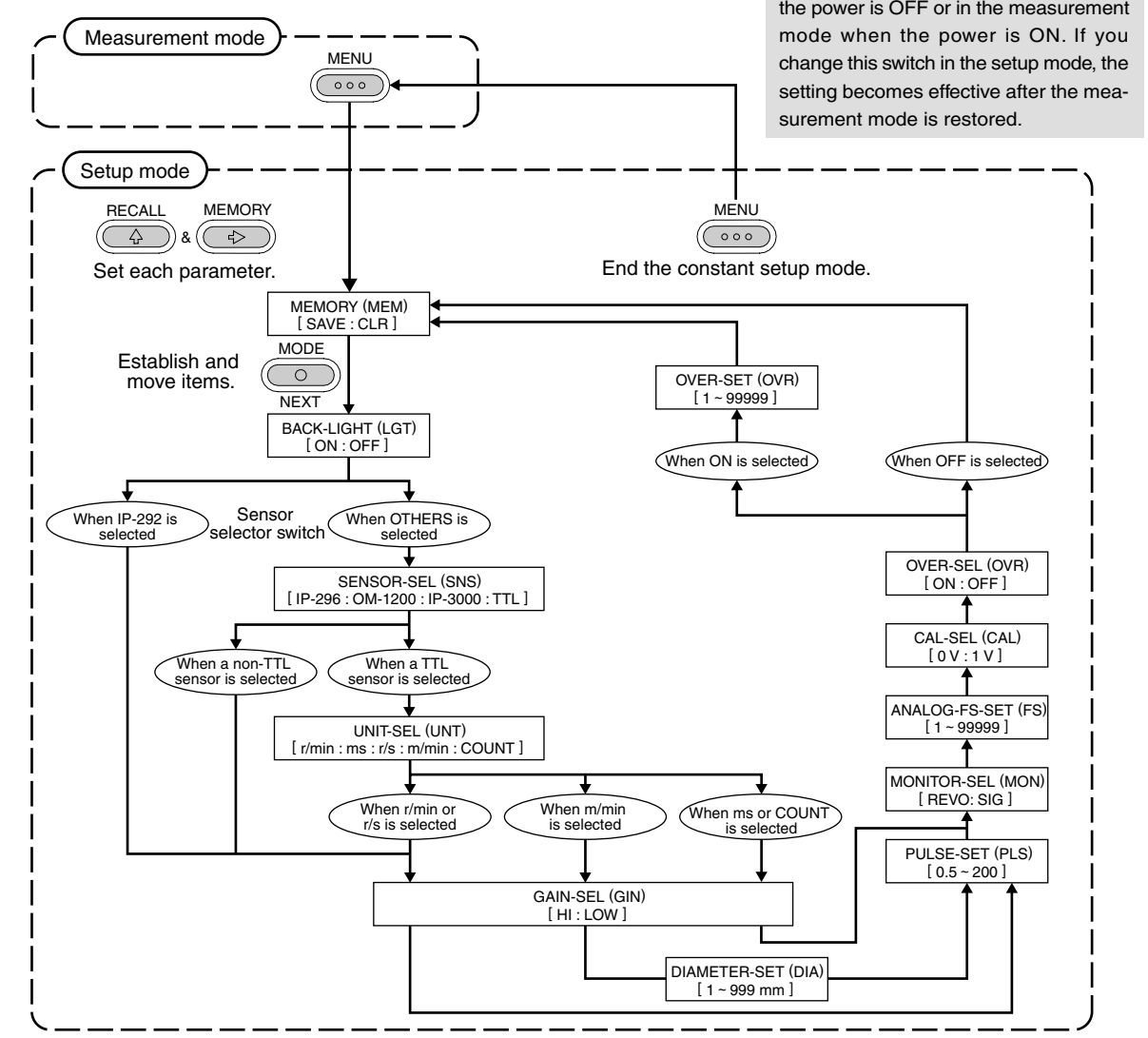
2. Function of Each Switch

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.

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 MEMORY & switches. Establish parameters and select items using the MODE & NEXT switch.

The operation flow in the parameter setup mode is shown below.



Operate the sensor selector switch when the power is OFF or in the measurement mode when the power is ON. If you change this switch in the setup mode, the setting becomes effective after the measurement mode is restored.

Setting the clearance of all memory values (Memory mEm)
When you press the MODE & NEXT switch when "CLr" is displayed in the MAIN display or press the MENU switch to return to the measurement mode, the memory values are all cleared.

Note: The setting of this function is not retained. When you select this item, "SAuE" is initially selected.

SAuE	Retains the memory values.	mEm SAuE
CLr	Clears all the memory values.	

Also for the following settings, when you press the MODE & NEXT switch to move items or press the MENU switch to return to the measurement mode, the setting is established.

Setting the lighting condition of the LCD back light (Light LGT)
Turn the LCD back light ON or OFF.

OFF	Back light OFF	LGT OFF
ON	Back light ON	

* Set to "OFF" at the time of shipment.

Selecting a connected sensor (Sensor SNS)
Select a sensor to be used.

When the IP-292 is used, select it using the sensor selector switch on the right-hand side of the main unit. When a sensor other than the IP-292 is used, select "OTHERS" using the sensor selector switch and then select a sensor to be used in the setup mode.

OTHERS	OTHERS	When a sensor other than the IP-292 is used	IP296 SNS
IP-292	IP-292	When the IP-292 is used	
IP296	Select when the IP296 IP-296 is used.		
on200	Select when the OM-1200 is used.		
IP300	Select when the IP-3000 is used.		
tTL	Select when a sensor with TTL signal output is used.		

* Set to "IP296" at the time of shipment.

Note: Inputting a TTL signal or other voltage signal with the IP-292 selected may cause damage to the external sensor. Therefore, be sure to select "OTHERS" before connecting the sensor.

Setting the measurement unit (Unit UNT)

Select the measurement unit for each measurement. The unit setting is effective only when a TTL sensor is selected.

The unit setting is fixed to "r/min" otherwise.

r/min	Rotation speed (No decimal point or 0.0)	UNT r/min
ms (*1)	Average period time (Decimal point position 0.0)	
r/s	Rotation speed (Decimal point position 0.00)	
m/min	Circumferential speed (Decimal point position 0.0)	
COUNT	Integration value (No decimal point)	

* Set to "r/min" at the time of shipment.

(*1) Set to 0.0 (ms) when there is no input signal.

Setting the gain of the sensor amplifier (GAIN GIN)

Set the gain of the sensor amplifier.

Hi	Set the gain of the sensor amplifier to the Hi level. Measurement is normally performed with the Hi level setting. However, if the rotation speed is not stable (or becomes higher than the normal value) when, for example, disturbance noise or a signal from other cylinders is detected, set the gain to the Lo level.	GIN Hi
Lo	Set the gain of the sensor amplifier to the Lo level. If the rotation speed is not stable (or becomes lower than the normal value) when the Lo level is selected, the amplitude of the sensor signal may possibly be small and therefore set the gain to the Hi level.	

* Set to "Hi" at the time of shipment.

Setting the diameter of the body of revolution (Diameter dIA)
(Enabled only when m/min is selected as the unit setting.)

Set the diameter of the body of revolution when obtaining the

circumferential speed from the rotation speed.

Setup range: 1 to 999 mm (When 0 is set, 1 is set automatically.)

* Set to "100" at the time of shipment.

dIA	100
-----	-----

Setting the number of pulses (Pulse PLS)

Set the number of pulses per rotation (P/R) according to the object under measurement.

Setup range: 0.5 to 200

* Set to "000.5" at the time of shipment.

PLS	000.5
-----	-------

Selecting the analog monitor output (Monitor moN)

Select a signal to be output as an analog output.

rEuO	Voltage output proportional to the rotation speed	moN rEuO
Sig	Output for monitoring the sensor signal Signal after waveform shaping (before pulse conversion)	

* Set to "rEuO" at the time of shipment.

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

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

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

Note: Set a value ignoring the decimal point. For example, when 100.0 corresponds to 1V, set 1000.

* Set to "99999" at the time of shipment.

FS	99999
----	-------

Setting analog output calibration (Calibration CAL)

Output the calibration signal (0V or 1V) for analog voltage output.

Note: The setting of this function is not retained. When you select this item, "0u" is selected initially.

The selected analog output is enabled only while the same item is selected.

0V	0V output	CAL 0u
1V	1V output	

Setting the upper limit value against measurement value (Over oVR)

Turns the measurement value upper-limit function ON or OFF.

OFF	Measurement value upper-limit function OFF	oVR OFF
ON	Measurement value upper-limit function ON	

* Set to "OFF" at the time of shipment.

Setting the upper measurement value (Over oVR)

(Can be set only when the measurement value upper-limit function is set to ON.)

Set the upper measurement value.

If the measurement value exceeds the specified value, OVER mark "↑" lights up.

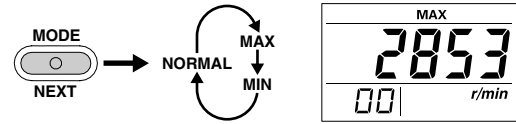
Setup range: 1 to 99999 (When 0 is set, 1 is set automatically.)

Measurement Operations

1. Measuring Peak-hold Value

To measure the peak-hold value, select the desired peak-hold measurement mode (MAX or MIN) by pressing the MODE & NEXT switch in the measurement mode.

When measurement of the peak-hold value starts, "MAX" or "MIN" lights up in the CONDITION display section of the LCD.



If "MAX" or "MIN" is not lit, the peak-hold mode is suspended. (The current measurement value for the body of revolution is displayed.)

Each peak-hold value is updated only when the peak-hold measurement mode is selected.

To clear the peak-hold value, select "CLr" for setting "mEm" (Memory) in the setup mode and then return to the measurement mode.

The measurement value present when cleared is set to "MAX" and "MIN."

Note: If the peak-hold measurement mode is entered when the body of revolution stops, the "MIN" value becomes zero. Therefore, the value is not updated even if the body of revolution rotates, disabling measurement of the "MIN" value. Therefore, if the peak-hold measurement mode is entered or if the "MIN" value becomes zero when the body of revolution is rotating, once clear the peak-hold value before starting measurement.

Note: When the peak-hold value is cleared, the memorized measurement values are also cleared. The peak-hold value is also cleared when you turn OFF the power.

2. Memorizing Measurement Values

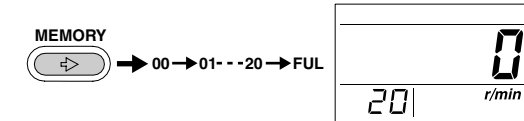
To memorize the current measurement value, press the MEMORY & switch during measurement.

When the measurement value has been memorized, the numerical value in the SUB display is incremented.

Therefore, the number "00" in the SUB display indicates that there is no measurement value memorized.

Up to 20 measurement values can be memorized. When the number of the memory values reaches 20, no more values can be memorized.

When you press the MEMORY & switch at this time, "FUL" is displayed.



Since memory values are stored in non-volatile memory, they are retained even after the power is turned OFF.

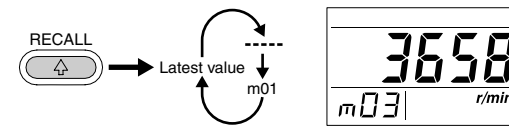
3. Recalling Memory Values

Memory values can be called by pressing the RECALL & switch in the measurement mode.

The memory No. is displayed as "mXX" (for example, m05) in the SUB display.

Memory values are called from the latest memory No. and then in order of the memory No. m01, m02, m03, and so on.

If there are three memory values, the value of memory No. m03 is displayed first. Then, the SUB display displays m04 and the MAIN display displays "-----" indicating that there is no measurement value memorized. Therefore, if there is no memory value, "-----" is displayed for m01.

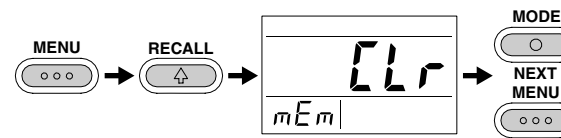


To return to the measurement mode, press the MENU switch.

The numerical value in the SUB display changes to "XX" which indicates the number of values memorized (without leading "m").

4. Clearing All Memory Values

To clear all memory values, select "CLr" for setting "mEm" (Memory) in the setup mode and then press the MODE & NEXT switch or press the MENU switch to return to the measurement mode.



When the memory values are cleared, the numerical value in the SUB display becomes "00."

Note: When you perform the memory clear operation (all clear), the memory values are all cleared. When there is the peak-hold value, it is also cleared at the same time.

Description of CONDITION Display Section

1. ERROR Display

If the "ERROR" mark lights up, one of the following error has occurred.

If the measurement value exceeds "99999", a display digit over error occurs.

* The display value is averaged. Therefore, even if the display value is smaller than "99999" (except for the decimal point), this mark lights up when the result of one measurement is larger than "99999."

If the input frequency exceeds the upper-limit frequency corresponding to the revolution of the measurement range, a frequency over error occurs.

* Although the display value is averaged, this mark lights up if the result of one measurement exceeds the upper-limit frequency.

Frequency range: 0.1 to 1666.66 Hz

2. LOW Display

If the "LOW" mark lights up, the battery has been consumed and the low battery condition occurred.

- This mark lights up if the battery voltage drops to 4.5V or lower.
- If this mark lights up, immediately replace the four batteries with new ones.

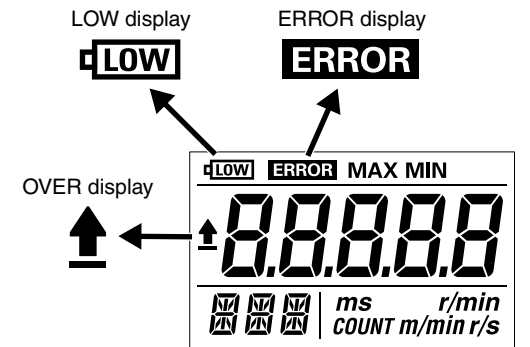
Using the consumed batteries may disable measurement.

- If the batteries are further consumed under this condition, measurement is disabled and the MAIN display displays "-----."
- If the battery voltage drops to about 4.5V or lower, the back light becomes dark (with no problem).

3. OVER Display (Blink)

With the measurement value upper-limit function set to ON in setup mode, if the display value exceeds the upper limit setting, the "↑" mark blinks.

* The display value is averaged. Therefore, even if the display value is smaller than the upper-limit setting, this mark blinks when result of one measurement exceeds the upper-limit value.



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 ? Is the battery polarity correct ? Are batteries consumed ? When using the AC adapter, is the dedicated AC adapter connected to an outlet and the DC input terminal of the main unit ?	Set batteries. Change the battery polarity correctly. Replace all batteries with new ones. Plug the dedicated AC adapter to an outlet and then connect the DC plug to the DC input terminal of the main unit.
Unstable display	Is sensor selection appropriate ? Is the trigger level appropriate ? Is the amplifier gain appropriate ?	Select the sensor used with the setup menu or sensor selector switch. Adjust the trigger level adjustment volume so that the indicator blinks stably. If the rotation display is higher than the normal value, set the amplifier gain to "Lo"; otherwise, set it to "Hi." Then, adjust the trigger level again.
Abnormally high or low rotation speed	Is the setting of the number of pulses appropriate ?	Set correctly the number of pulses per rotation (P/R) according to the body of revolution under measurement.

* If the problem cannot be solved with the above troubleshooting, perform the following operation to restore all the settings to the conditions at the time of shipment (initial conditions).

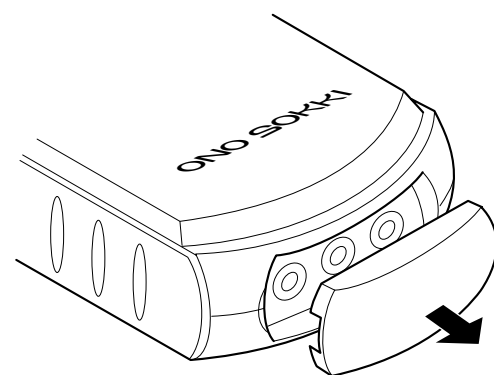
Press and hold the RECALL & switch and MENU switch, and then turn the power ON. The unit is initialized. However, memory values are retained.

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 jack.
- 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 kΩ.



2. Pulse output

[When SIG is selected]

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

- A pulse waveform shaped according to the detected rotation signal is output from this jack.
- As for the output level, the Hi level is 4.5 to 5V and the Lo level 0 to 0.5 V. The minimum load resistance is 100 kΩ.

