

# ST-1100 Stroboscope Tachometer

## Operation Manual

**Nidec**



### Warning

To Avoid Injury, do not point the light beam of the instrument or have it reflected into the eyes of people or animals.

Do not leave the device close to water or any other liquid to avoid damage.

-If not using this instrument for extended periods of time, remove the batteries to prevent potential battery leakage from causing product damage.



The Shimpo Series ST-1100 is a Stroboscope-Tachometer with LED flash technology. This velocity analyzing and measuring device is ideal for rotational machine inspection. The stroboscope is capable of flashing the light in a synchronous frequency to the operating machinery, creating the illusion of viewing stopped or slowed images. Utilizing this phenomenon of slowing or stopping the motion with the adjusted rate of the ST-1100's flashing light, machine parts and processes may be inspected for defects. Plus, the rotational speed of the machinery and systems may be recorded for further performance analysis.

The ST-1100 is adjustable in either coarse or fine step flash-rate tuning. The backlit display shows the current flash rate, 10 user-stored pre-set flash rates, as well as a low battery warning. The backlit feature can be switched off to save battery life if desired. The ergonomic, hand held device is made of sturdy ABS plastic and comes with batteries and protective carrying case. The LED technology extends operation due to the low energy requirement of the light diodes compared with xenon stroboscopes. Typical applications for using the ST-1100 is to inspect rotors, meshing gears, vibration diagnostic equipment, textile equipment, printing production lines, power tools, speaker acoustical analysis, fan balancing and many more.

### SPECIFICATIONS

**Range:** 60-40,000 Flash Rate Per Minute (RPM)

**Accuracy:** +/-0.05% FS

**Lux Rating:** 950 Lux @ 3000 FPM & 3.9 in (10 cm), 600 Lux @ 3000 FPM & 7.9 (20 cm), 370 Lux @ 3000 FPM & 11.8 (30 cm)

**Display:** 5 digits with backlight.

**Resolution:** <40,000: 1 RPM; <4000: 0.1 RPM; <400: 0.01 RPM

**Rate Storage:** 10 stored user-defined flash rates.

Factory Defaults: (RPM): 200,400, 1000, 2000, 3000, 4000, 10000, 20000, 30000, 40000.

**Power Supply:** 4 x 3.7V (14500) AA Lithium ion rechargeable batteries

**Battery Life:** Approximately 20 hrs.

**Housing:** ABS Plastic

**Dimensions:** 7.7 x 2.9 x 1.5" (195 x 73 x 38 mm)

**Product Weight:** Approx. 7.8 oz. (220 g)

**Package Weight:** Approx. 2.1 lb (952 g)

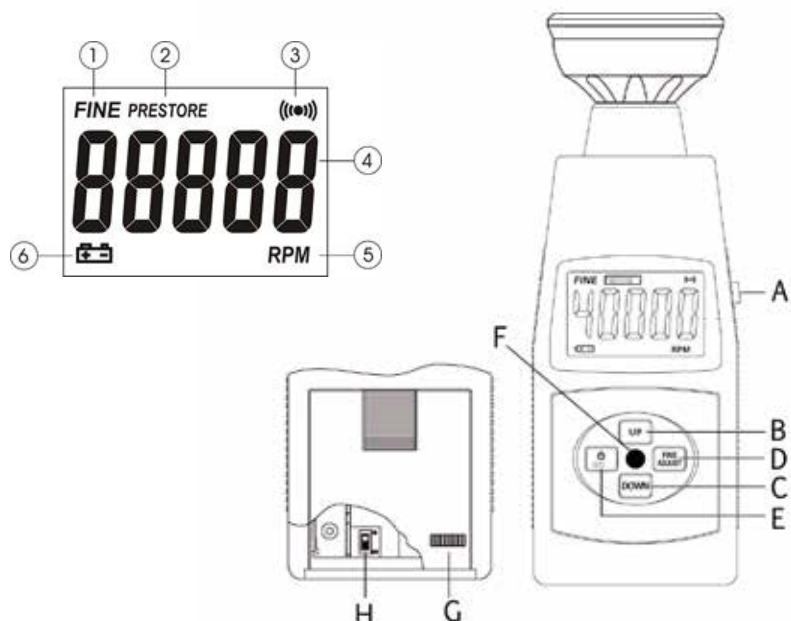
**Warranty:** 1 Year

**Included Accessories:** Case, 4 Lithium Batteries, Battery Charger

### PRODUCT DIAGRAM

- A. LED Flash Switch
- B. Flash Rate Value Increase Button
- C. Flash Rate Value Decrease Button
- D. Coarse/Fine Tuning Button
- E. Power/Stored Rate Retrieval Button
- F. Flash Rate Storage Button
- G. Battery Compartment Cover
- H. Backlight ON/OFF Switch

- 1. Fine tuning symbol.
- 2. Pre Set flash rate indication.  
Press "E" Rate Retrieval Button to Scroll through saved Presets.
- 3. Light activation symbol.
- 4. Flash per minute value.
- 5. RPM unit symbol
- 6. Low battery indication.



## OPERATION

**Power ON/OFF:** Open the battery compartment cover on the back of the unit and place the batteries in the battery holder properly. Then press and hold the Power Switch . The display will turn on and show the initial lowest factory default flash rate of 4000 RPM. If a Pre-Stored rate has been stored during a previous use, the last Pre-Stored rate will be shown. Coarse tuning is the default. Press and hold  again to turn the instrument off.

Turn on the LED's with the LED Flash Switch (A). The LED's will remain flashing at the rate set on the display for as long as the button is held. Once released, the LED's will turn off.

To alter between Coarse and Fine tuning, select the (D) FINE ADJUST button  to change from Coarse to Fine adjustment. Press again to switch back to Coarse. When in Fine adjustment mode, "FINE" icon will appear on the display. Adjust the flash speed with the  &  buttons (B & C). In tuning each single press of the  &  buttons the value of the flash speed will increase/decrease by the following: <400 RPM, Coarse tuning: 1 RPM, Fine tuning: 0.01 RPM <4000 RPM, Coarse tuning: 10 RPM, Fine tuning: 0.1 RPM <40000 RPM, Coarse tuning: 100 RPM, Fine tuning: 1 RPM. Hold the  or  buttons to continue to increment continuously. Note: Once the maximum of 40000 or minimum of 60 RPM is met while adjusting the rate, the device will automatically stop at those thresholds.

To retrieve and utilize the 10 Pre-Set flash rates (RPM's), push the Power/READ button . Each press of the button will cycle to the next successive Pre-Set value.

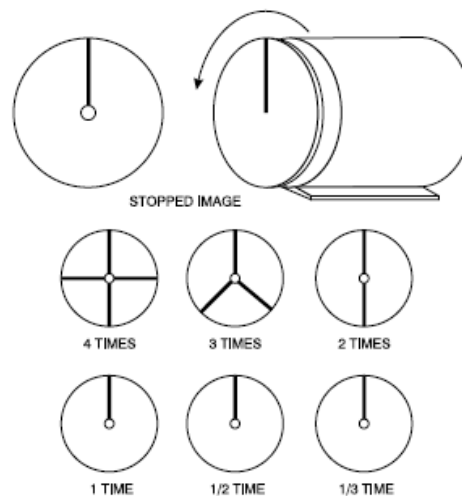
To save new Pre-Set Flash Rates into storage, adjust the speed to the desired setting, then press the Pre-Set rate storage button (F) in the center of the button panel. That rate setting will now be stored into position 1 (4000) of the factory presets. To store values in locations 2-10, press the  button to view a factory Pre-Set rate. Adjust to a new desired rate with the  &  adjustment buttons. Then, press the Flash Rate storage button (F) to override the selected Pre-Set Storage rate position. Repeat to adjust the remaining Pre-Set rate storage locations. The next time the unit is turned on, the last rate stored will be displayed and ready for use.

To measure rotation speed, direct the light source onto the rotating surface of an object, observe the light spot and adjust the flash rate. If the flashing frequency is adjusted to the same rotation speed of the object, the target object will appear to be static or motionless when in actuality the equipment is still moving. With a slight adjustment of the flash rate, movement can also be viewed in an apparent slow motion. The operator can study the process in action in either a slowed or static state to review for proper performance.

If the surface being viewed is uneven or contains asymmetric texts, images or marks, the persistence of a pattern will become obvious when the texts, images etc begin to slow down and become static. When the image or device moving appears static, view the RPM on the display. This is the speed to record of the system being viewed.

To utilize the ST-1100 as a Tachometer and measure the true revolutions per minute (RPM):

1. Mark the object to be measured by either visually noting an inherent distinguishing character, such as a label, scratch, etc., or physically mark the object with a pen, tape or similar.
2. Turn on Power
3. Adjust RPM on display to highest setting
4. Push LED Flash Switch
5. Adjust the Flash Rate Value (RPM) downward
6. The true revolutions per minute (RPM) can be noted once the action appears frozen and the first single image of the mark appears (see chart and diagram below for further explanation)
7. To verify the revolution (RPM) reading, adjust the rate to half the rate found in #6. If the image is again static after dividing the rate in half, the RPM found in #6 is confirmed.



| Shaft Rotation (RPM) | Flashes (RPM) | Flashes/ RPM Shaft | Stopped Images |
|----------------------|---------------|--------------------|----------------|
| At 1,500 RPM         | 6,000         | 4 times            | 4              |
|                      | 4,500         | 3 times            | 3              |
|                      | 3,000         | 2 times            | 2              |
|                      | 1,500         | 1 time             | 1              |
|                      | 750           | 1/2 time           | 1              |
|                      | 500           | 1/3 time           | 1              |