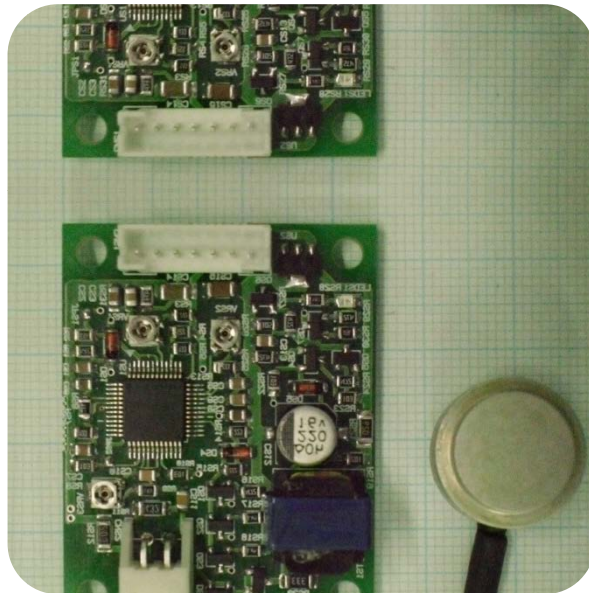
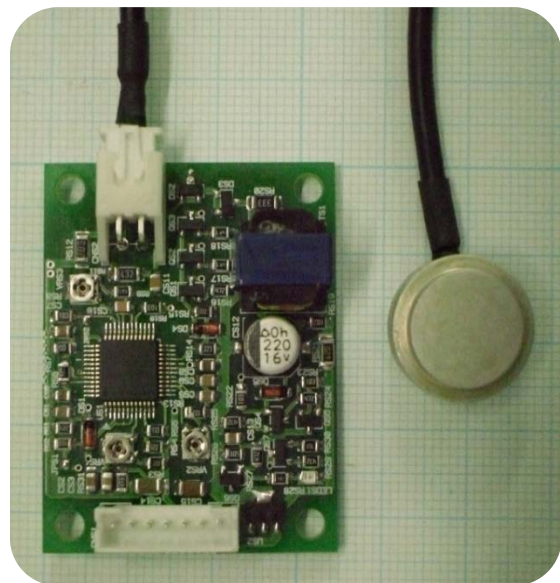


Ultrasonic Proximity Sensor/Module for Water Proof Types of Ultrasonic Sensors (HG-P40WP)



Ultrasonic Proximity Sensor/Module for Water Proof Types of Ultrasonic Sensors

■ Model : HG-P40WP



HG-P40WP

■ Features

- Multi-function transceiver model for water proof types of ultrasonic sensors
- Two types of transmit modes: Free Run/ External Trigger
- Free voltage in power supply (DC 6 V ~ 15 V)
- Four simultaneous output signals
 - Ultrasonic waveform of a received and amplified signal
 - Squared signal in TTL level corresponding to ultrasonic waveform
 - Squared signal that its pulse-width is proportional to distance
 - Current output signal for proximity detection
- Employing a high performance ASIC Chip
- Detection of obstacles located at a long distance

■ Specification

Input DC (V)	• 6 ~ 15 (12 V recommended)
Frequency (kHz)	• 40 (Nominal)
Detectable Range in Distance (m)	• 0.4 ~ 5 : For Distance Measurement • 0 ~ 6.5 : For proximity detection
Size (mm)	• PCB : 44 x 34 x 15 • Sensor : $\Phi 16$ x 10
Current Consumption (mA) for DC 12 V Input	• 11 : standby mode • 17 : when an object is detected within the detection range setting • 27 : when current out function of 10 mA is used
Operating Temperature	• -30 ~ +85

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▣ Application

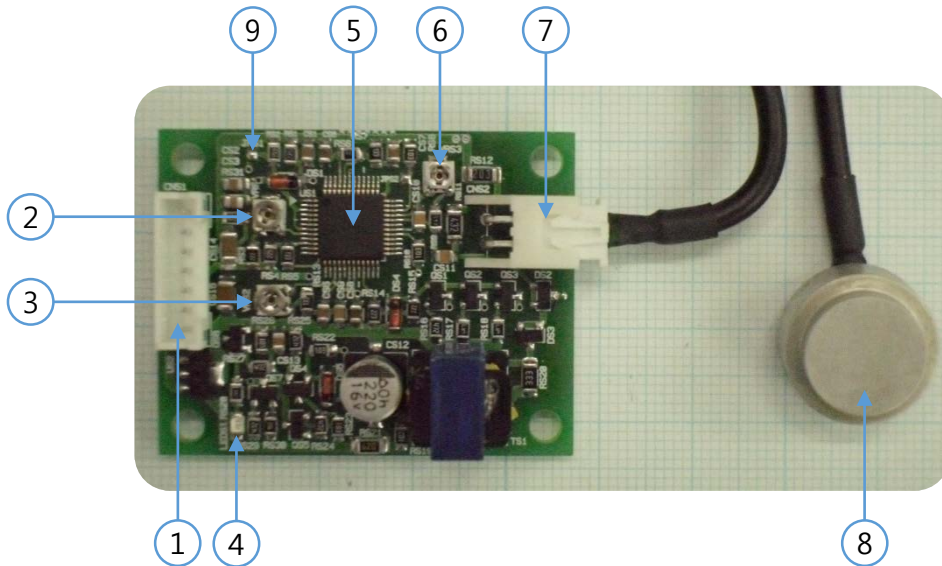
- Distance Measurement, Obstacle detection for AGV and robot, and industrial machinery etc., Outdoor parking lot management, Safety facility management and risk alerts, customers facilities, power saver, and automation equipment, etc.

▣ Description

- Using only a single sensor(transceiver sensor) unit for both transmittance and receiving ultrasonic waves
- Convenient for distance measuring and object detection.
- Two types of transmit mode for convenience
 - Free Run mode : with a power supply, sensor/module itself transmits trigger and burst signal – for basic & stand alone application
 - External Trigger : External system(a controller or processor circuit) controls the trigger signals – for advance application such as multi-sensor system
- Input DC voltage is applicable in the wide range from 6 V to 15 V
- Output signal of 5V TTL level is applicable to processor circuit usage or controllers of industrial system.
- Four simultaneous output signals
 - Ultrasonic waveforms of received and amplified signals
 - Squared signals in TTL level corresponding to detected ultrasonic waveforms
 - Squared signal that the pulse-width is proportional to distance
 - Current signal (10 mA) is outputted when object is detected in a preset range
 - The preset of a maximum detection range is adjustable in the range from 0.5 to 6 m (typically 3 m in factory release)
- ※ The setting of a special detection range in distance is available for volume orders
- High performance ASIC Chip is mounted in the module for stable transmission and sensitive reception (Maximum amplification is about 5,000 times)
- Long distance detection is available by optimized design

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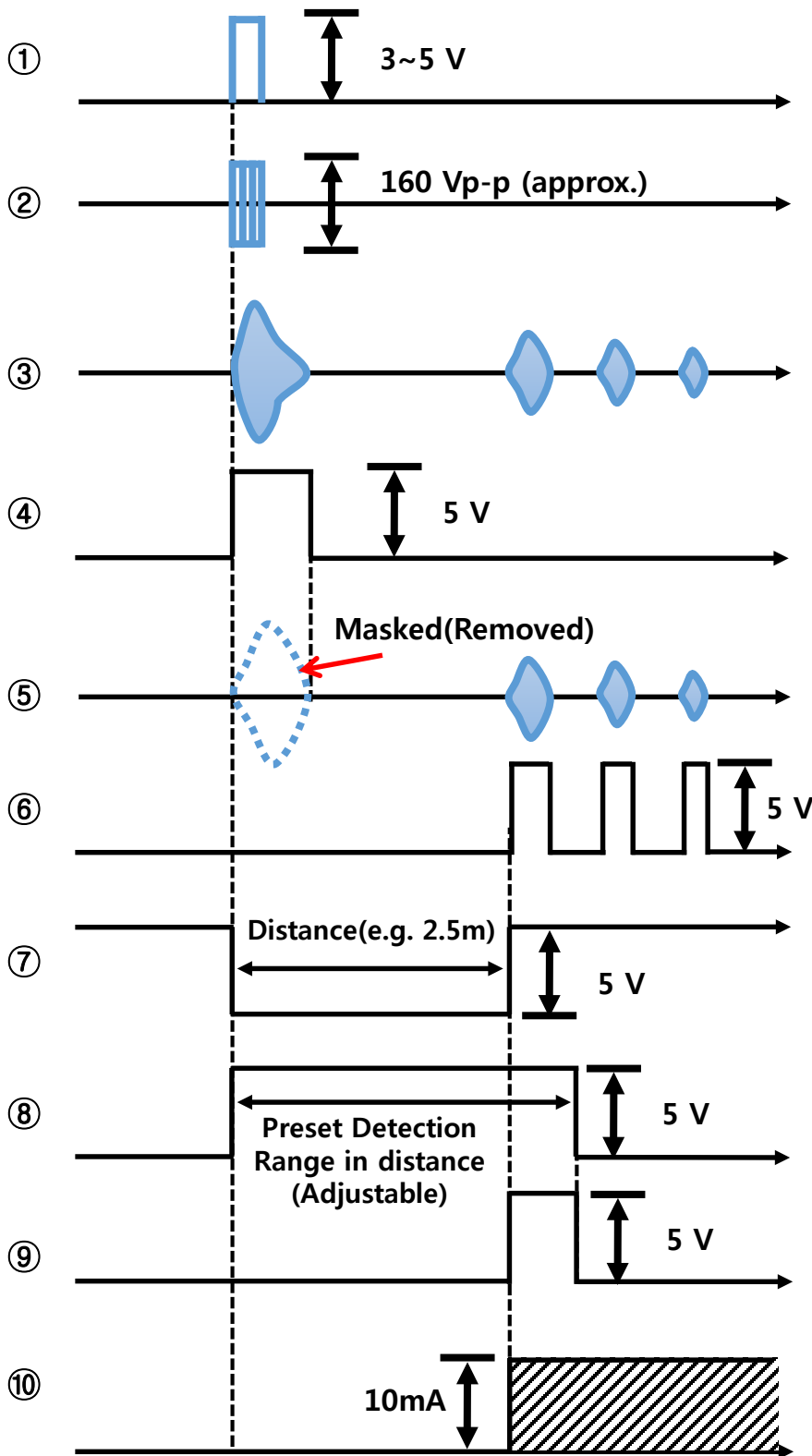
■ Part Name

- ① **Input/Output Terminal** : Power, External Trigger input, and output signal
- ② **Volume resistance adjusting a detection range in distance, VR** : 0.5 to 6 m range.
- ③ **Ultrasonic frequency adjusting** : Factory tuned for unit for the best performance (Do not adjust it because it was optimized when released!)
- ④ **LED lighting for proximity detection** : When object enters the preset range, LED light is on and 10mA current output signal is generated.
- ⑤ **ASIC Chip** : 48 pin Chip with many useful functions. (Hagisonic Product)
- ⑥ **Volume resistance for sensitivity(Gain) control, VR** : The gain is ranging from 1,000 to 5,000 times. It is 3,000 times when released.
- ⑦ **Sensor Connection Terminal** : Coaxial cable is recommended (when longer than 10 Cm)
- ⑧ **Ultrasonic sensor unit** : the water proof type of sensor has conventional directivities (approx. 65~75°) and the diameter is 16 mm
- ⑨ **Transmit Mode selection PAD** :
 - Free Run Mode : With soldering; approx. 8 Burst per second is generated.
(factory option : Soldered)
 - External Trigger Mode : Without soldering; External TTL level Pulse is needed for transmittance
(1~100 times per second is available / Pulse width : 0.5 ~ 1 ms recommended)

Ultrasonic Proximity Sensor/Module for Water Proof Types of Ultrasonic Sensors

■ Model : HG-P40WP

■ Timing Chart

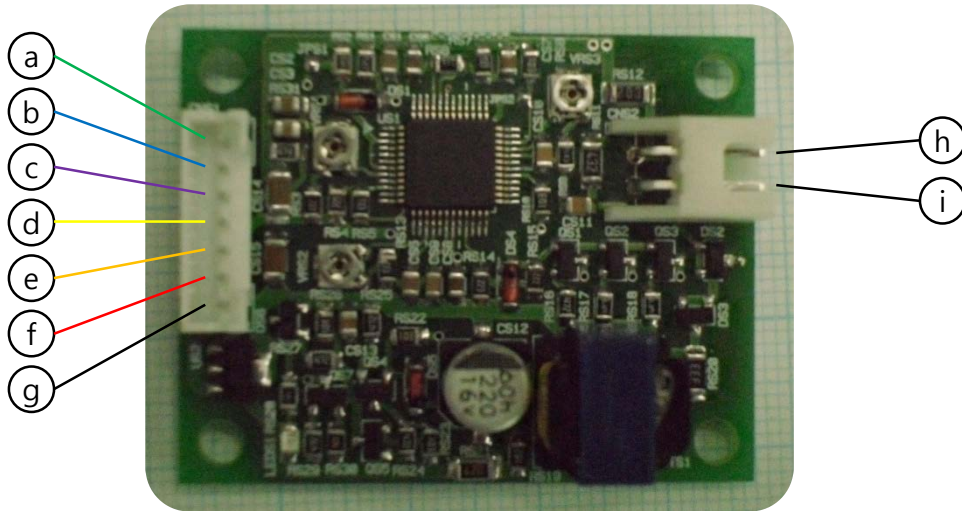


- Trigger Pulse : generated internally or externally
 - Recommend Period:
 - ; 10~30 times per second for distance measuring
 - ; 10 times per second for general use
- Ultrasonic burst signal generated corresponding to the width of the trigger pulse
- The received and amplified signal according to transmitted and received ultrasonic waves.
- Masking signal (Internal) to remove the first received interrupt signal.
- Amplification signal output of only the reflected(received) signals except the masked one
- Signal output acquired by converting the signals (5) to the squared signals
- Time pulse signal output with the pulse-width proportional to distance from the nearest object
- Setting(Presetting) of detection range in distance: The squared preset range is adjustable
- Extraction of only the signal from object detected within the preset range
- Continuous current signal output (10 mA) acquired by converting the extracted signal of (9) to current signal

Ultrasonic Proximity Sensor/Module for Water Proof Types of Ultrasonic Sensors

■ Model : HG-P40WP

■ Input / Output Terminal Configuration



■ Parts Details

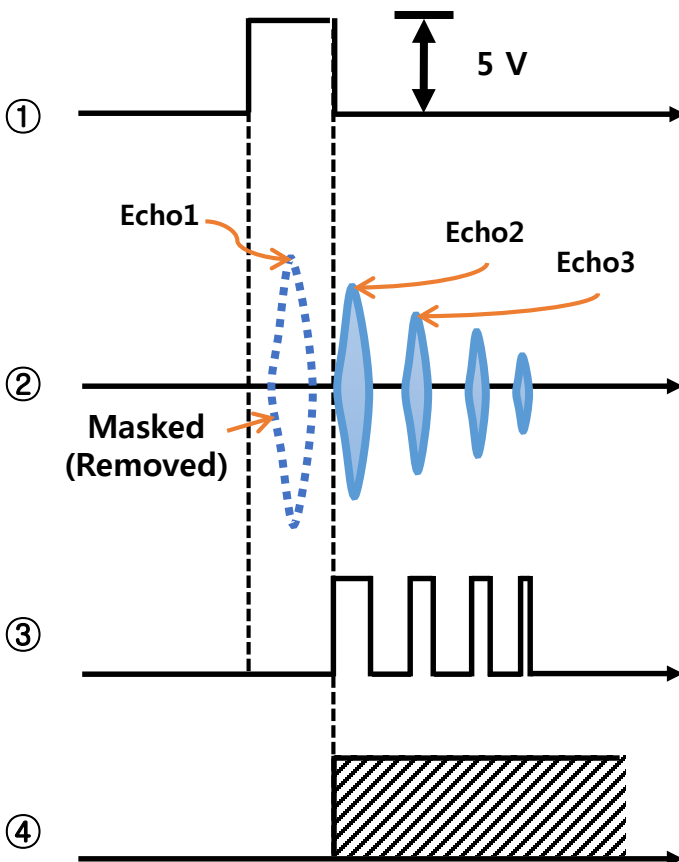
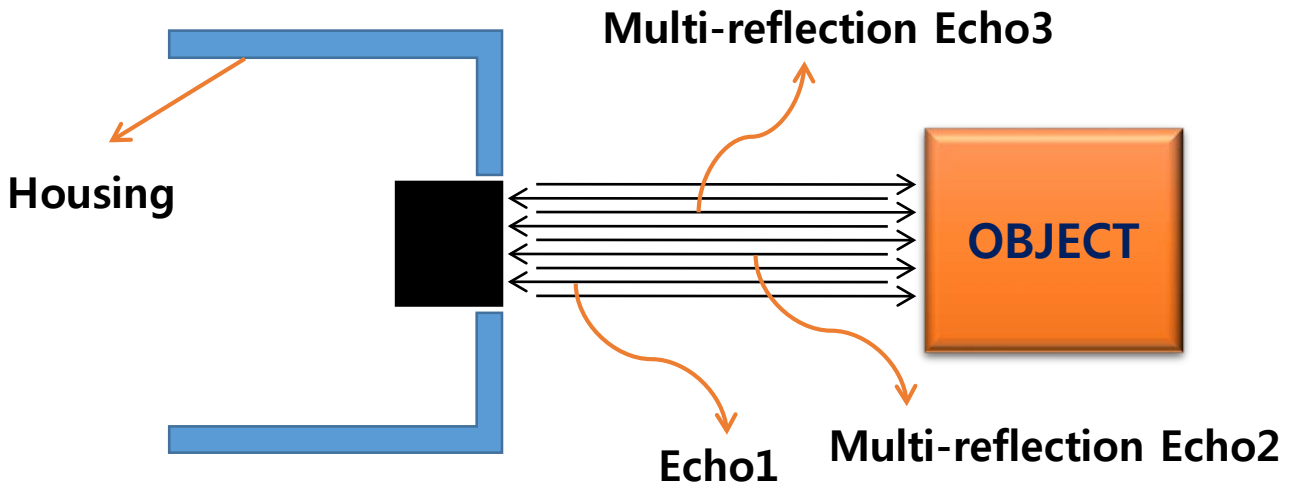
- Ⓐ The amplified signal output of received ultrasonic waves (#⑤ signal in Timing Chart)
- Ⓑ The squared signal output given by converting the signals #⑤ (#⑥ signal in Timing Chart)
- Ⓒ Time pulse signal output with the pulse-width proportional to distance from the nearest object(#⑦ signal in Timing Chart)
- Ⓓ Continuous current signal output (10 mA) by object detection (#⑩ signal in Timing Chart)
 - ※ If a user want voltage output, it is possible to converting to voltage by only using a shunt resistance.
- Ⓔ External Trigger / Monitor Terminal
 - Signal input terminal for External Trigger Mode (the pulse width from 0.5 ms to 1 ms and TTL level recommended)
 - Monitor terminal for Free Run Mode to see the Trigger Timing. Internal trigger signal is automatically generated.
- Ⓕ +Power : 6V~15V range input
- Ⓖ GND
- Ⓗ Ultrasonic Sensor Terminal (Input terminal to and output terminal from a sensor)
- Ⓘ Ultrasonic Sensor Terminal (GND and shield line)

Ultrasonic Proximity Sensor/Module for Water Proof Types of Ultrasonic Sensors

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▣ The principle to detect the object located within 40cm distance

- ※ Distance measurement is available only in the range longer than 40 cm. However, it is possible to get the on/off(existence or non-existence) signal even in the range shorter than 40 cm if multi-reflection wave signals are detected .

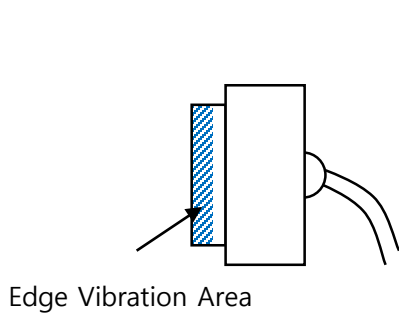


- Masking signal(Internal) to remove the first received interrupt signal.
- The multi-reflection echoes such as Echo2 and Echo 3 in figures can be detected even though the first echo is masked. Multi-reflection Echo signals generally appears when the object is close to sensors if the object is not too small.
- The echo signals of Echo2 or Echo3 are converted to the squared signals.
- Continuous current signal is outputted corresponding to the extracted squared signal(3). That means the object was detected in a short distance.

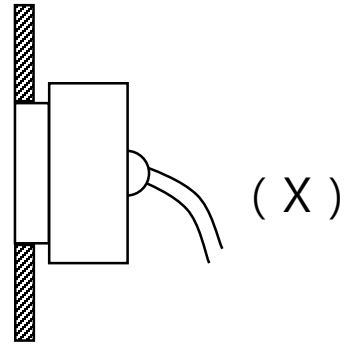
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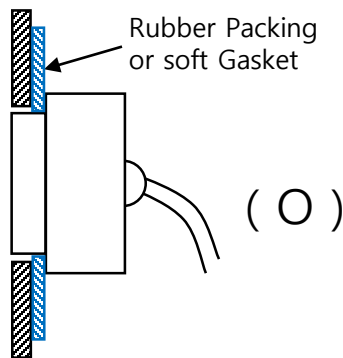
▣ Note: Sensor Mounting(Basic Type)



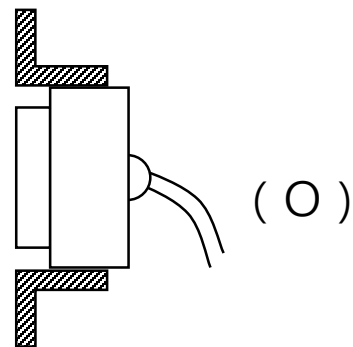
- Vibration area is extended to the side face as well as the top of a sensor



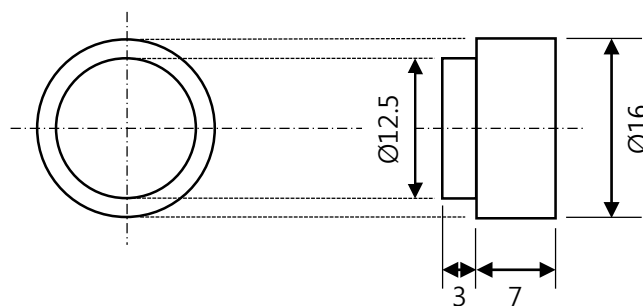
- The tight mounting of the side face in the top side of a sensor could interrupt normal vibration of the sensor.



- Use of a rubber packing or a soft gasket: Note not to interfere the vibration(acoustic sealing effect)



- In case of injection mold type platform, This structure is also good.



The drawing of sensor appearance