



### DW0050 Detector

**Ultrasonic 40kHz  
High sensitivity detector**

### DW0050 Detector

DW0050 Detector is a digital electronic module that, using an ultrasonic technology, is able to recognise the presence of a surface in front of it in a range of some decimetres.

The DW0050 digital sensor was designed maximizing sensitivity, in fact it is able to detect very small bodies.

Moreover, many DW0050 can be used together sharing the digital bus interface. In this scenario they cooperate in order to detect the presence of a body (see DW0050 Detector application note).

### Interface description

The interface consists of two 5 pins Molex 180° fem ale connectors (PN 0022035055). One connector should link a DW0050 with the external master application board that receives the detection signal. The other connector, that have the same pinout, can be used to easily connect another DW0050 device. Multiple DW0050 modules can be connected and they can collaborate to detect the presence of an obstacle.

When the detection pin, open-collector with internal 30kΩ pull-up, is driven LOW it means that a detection occurred. The detection pin can be also used as slave full duplex LIN bus for a more complex communication between the master application board and the DW0050 device. For LIN usage a master 1kΩ pull-up is required.

The master application board could drive the optional trigger signal to trigger the detection measure. To be considered valid, the trigger signal should be active at least 250us while the minimum measure period is 30ms.

### Detection Measure

Detection measurement is performed transmitting an ultrasonic burst and acquiring the reflected/transmitted energy. The DW0050 device supports both thru-beam and single sensor reflective modes. For each trigger signal, if used, a single measure is done. A signal flag is raised if at least three consecutive detections are granted. For this reason the module can be used in high electromagnetic noise environment.

The device embodies the calibrating algorithm.

### Module specifications

Specifications	Description
Mechanical	Dimensions 65mm (L) x 25mm (W) x 19mm (H) IP65 ready
Frequency	40kHz ± 1kHz
Directivity	35 degrees ± 7 degrees respect sensor's azimuth
Temperature	Operating -40°C to 80°C Storage -40°C to 85°C
Sensitivity	In single sensor reflective mode recognises a glass board 10cm x 10cm x 1cm at 1 meter distance
Voltage level	Nominal Vcc = 12V ± 10%
Power	Typical 400mW with Vcc = 12V
Trigger levels	Typical threshold 6V with hysteresis 1.3V Active between 250us and 2ms Minimum period 30ms (see application note)

### APPLICATIONS

- Agricultural machinery;
- Industrial;
- Automation;
- Domotics;
- On road barriers detecting the presence of an obstacle.

### DETECTION DISTANCE

Detection distance can be changed using a on module dip switch.

Dip-switch status DP1; DP0	Detection distance range
ON; ON	10 cm to 94cm
ON; OFF	10cm to 84.0cm
OFF; ON	10cm to 79.0cm
OFF; OFF	10cm to 74.0cm

### PIN-OUT DESCRIPTION

PIN	Description	Direction
1	Supply voltage (Vcc=+12V)	IN
2	Supply reference (0V)	IN
3*	Detection	OUT
3*	LIN bus	IN/OUT
4	Trigger	IN
5	EARTH connection	IN

\* mutually exclusive

