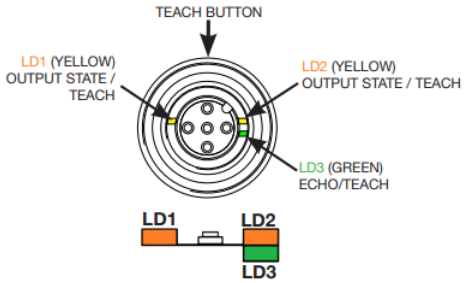
Knowledge Article

Product Family:	**MD Ultrasonic Sensor**	**Number:**	**KB-SEN-007**
Subject:	**Configure UT with 2 Digital Outputs**	**Date Issued:**	**February 12, 2021**

Part Numbers

UT1B-GW-0A	UT1B-GW-0E	UT1B-GW-1E	UT2F-GW-0E	UT5L-GW-1E

Button and LED locations



The teach button is always "active" meaning you can set P1 and/or P2 any time you momentarily press the button (minus the block feature). There is not a "teach" mode, it is always in teach mode, hence the reason for the Teach Block feature. Once you have your setpoints configured, it is best to enable the Teach Block to prevent someone from accidentally pressing the teach button and making new setpoints.

To enable Teach Block

Press the teach button for 12 seconds. After the first 8 seconds, the LD1 and LD2 LEDs will start blinking, keep holding the teach button until the blinking rate increases. Once the faster blinking rate happens, then you can release the button. The teach button will not allow new setpoints to be set.

To disable the Teach Block

Same as the enable. Press the teach button for 12 seconds. After the first 8 seconds, the LD1 and LD2 LEDs will start blinking, keep holding the teach button until the blinking rate increases. Once the faster blinking rate happens, then you can release the button. The teach button will allow new setpoints to be set.

There is no way to tell if you are turning the Block mode On or Off. If Block mode is enabled, then momentarily pressing the teach button will cause LD1 and LD2 to blink once, to tell you that the button press is locked out. If LD1 and LD2 start flashing, that means that a new P1 setpoint has been entered.

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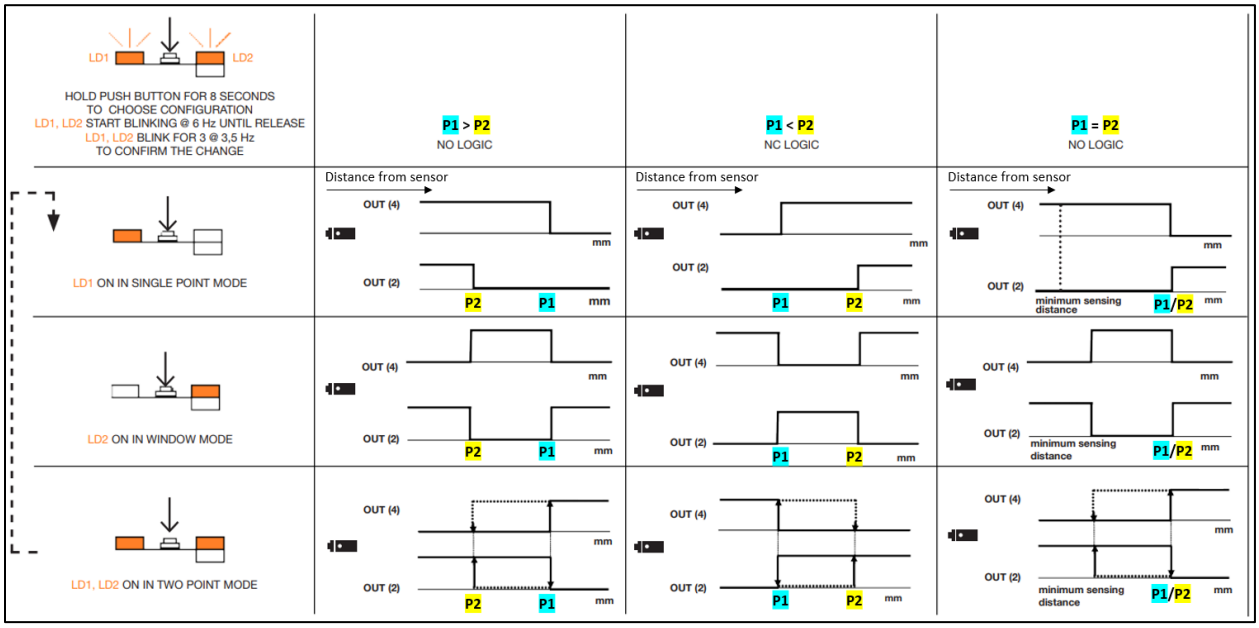
Changing Modes

Push and hold the teach button for 8 seconds. LD1 and LD2 will start blinking to tell you that you have entered the configuration mode. When you release the teach button, the current mode will be displayed on LD1 and LD2. To change the sensor mode, you can press the teach button to cycle through the 3 modes:

- Single Point Mode (LD1 on, LD2 off)
- Window Mode (LD1 off, LD2 on)
- Two Point Mode (LD1 on, LD2 on)

After the teach button has not been pressed for 3 seconds, the new mode is enabled and you would need to set P1 and P2.



Selecting Setpoints

Place the object for the first setpoint location (P1), press the teach button. LD1 and LD2 will start blinking, waiting for P2 to be set. Move the object to the second setpoint location (P2) and press the teach button again. That will set P1 and P2. LD1 and LD2 will blink 5 times to acknowledge that the setpoints have been set. If P2 was closer to the sensor than P1, then P1 > P2. If P1 was closer to the sensor than P2, then P1 < P2. This is important because that will change the output from Normally Open to Normally Closed.

Sensor Outputs

Out(4) is pin 4 on the M12 connector, which is typically the Black wire.
Out(2) in pin 2 on the M12 connector, which is typically the White wire.

Single Point Mode

- If P1 > P2 then at the minimum sensing distance, Out(4) and Out(2) are both ON. As the sensed object moves > P2, Out(2) will turn OFF. As the sensed object moves > P1, Out(4) will turn OFF.

- If P1 < P2 then at the minimum sensing distance, Out(4) and Out(2) are both OFF. As the sensed object moves > P1, Out(4) will turn ON. As the sensed object moves > P2, Out(2) will turn ON.

- If P1 = P2 then at minimum sensing distance, Out(4) will be ON and Out(2) will be OFF. As the sensed object moves > then P1/P2 set point, Out(4) will turn OFF and Out(2) will turn ON.

Window Mode

- If P1 > P2 then at the minimum sensing distance, Out(4) will be OFF and Out(2) will be ON. As the sensed object moves past P2, Out(4) will turn ON and Out(2) will turn OFF. As the sensed object moves past P1, Out(4) will turn OFF and Out(2) will turn ON.

- If P1 < P2 then at the minimum sensing distance, Out(4) will be ON and Out(2) will be OFF. As the sensed object moves past P1, Out(4) will turn OFF and Out(2) will turn ON. As the sensed object moves past P2, Out(4) will turn ON and Out(2) will turn OFF.

- If P1 = P2 then then at the minimum sensing distance, Out(4) will be OFF and Out(2) will be ON. As the sensed object moves past P1/P2, Out(4) will turn OFF and Out(2) will turn ON.

Two Point Mode

- If P1 > P2 then at minimum sensing distance, Out(4) will be OFF and Out(2) will be ON. The sensed object will have to move to > P1. At that point, Out(4) will turn ON and Out(2) will turn OFF. The object must move back to < P2 for Out(4) to turn OFF and Out(2) to turn ON.

- If P1 < P2 then at minimum sensing distance, Out(4) will be ON and Out(2) will be OFF. The sensed object will have to move to > P2. At that point, Out(4) will turn OFF and Out(2) will turn ON. The sensed object must move back to < P1 for Out(4) to turn OFF and Out(2) to turn ON.

- If P1 = P2 then at minimum sensing distance, Out(4) will be OFF and Out(2) will be ON. The sensed object will have to move to > P1/P2. At that point, Out(4) will turn ON and Out(2) will turn OFF. The sensed object must move back to < minimum sensing distance for Out(4) to turn OFF and Out(2) to turn ON.

Clear Sensor back to Default

With the sensed object within the sensor operating range, press the teach button once to set P1 setpoint. LD1 and LD2 will start to blink constantly. Then move the sensed object outside the sensing range of the sensor. Press the teach button again. LD3 (green) will blink 5 times, to signal that the sensor has been returned to default settings. The default mode is Single Point.