



## *Electronic Design Service*

# WS-010 Sensor Calibration and Settings Instruction

## Revision History

The Table below displays the revision history for the chapters in this User Guide

Date	Version	Change Made
April 24, 2022	1.0	Original release

## Contact Us

For the most up-to-date information about the Electronic Design Service product, go to the Electronic Design Service website at [www.eldesignservice.com](http://www.eldesignservice.com).

### Technical Support:

Phone: +1 319 553-6080

Email: [support@eldesignservice.com](mailto:support@eldesignservice.com)

[www.eldesignservice.com](http://www.eldesignservice.com)

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## BLE Scanner Application

The Bluetooth Scanner application (see Figure 1) needs to be installed on your iOS device (iPAD or iPhone) to perform SPM-010 settings and WS-010 sensor calibration.

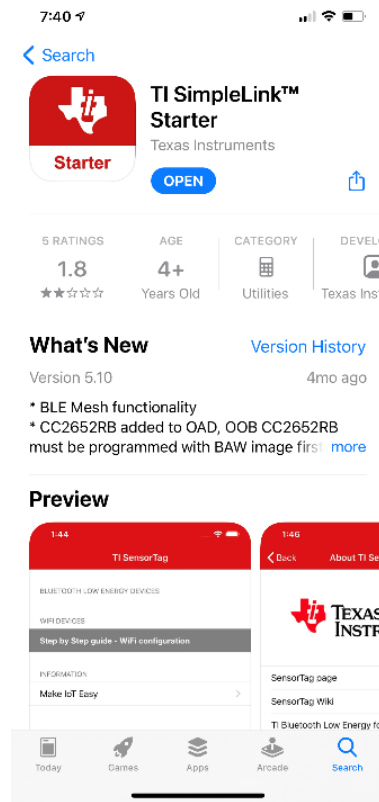


Figure 1 Recommended Bluetooth Scanner iOS Application

## TI SimpleLink Starter operation for SPM-010

1. If you have previously paired any SPM-010 device, go to Settings>Bluetooth and remove it from list (see Figure 2) by using Forget This Device option

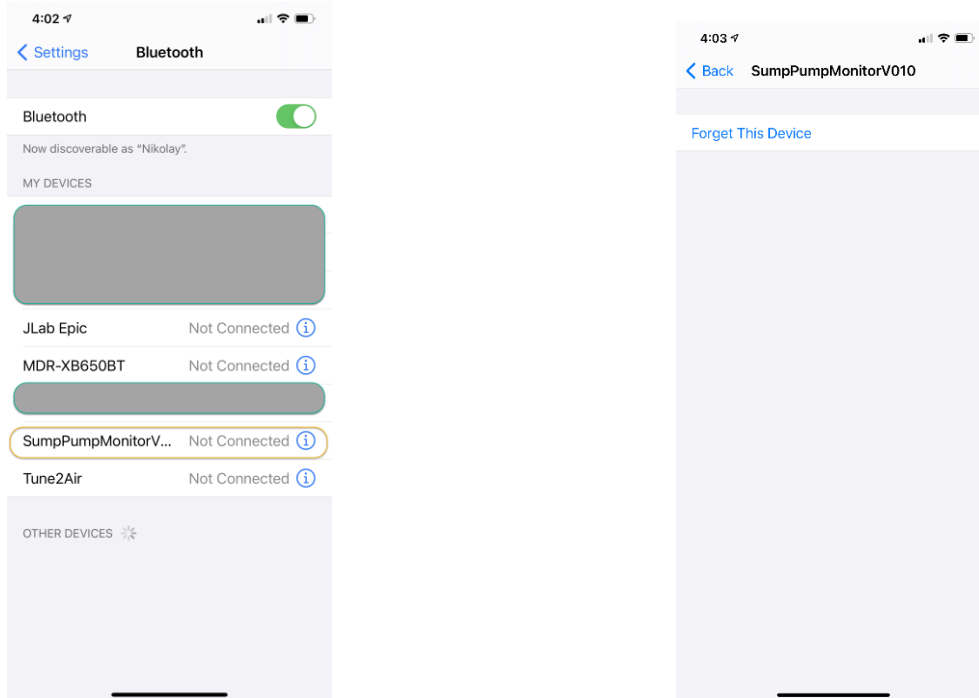


Figure 2 Screenshot Example

2. Start Bluetooth Scanner application on your iOS device.
3. Find SPM-010 device in list of scannable Bluetooth devices (see Figure 3) and click on it. Use **Service Explorer** to rich Services. The follow services will be accessible (see Figure 4**Error! Reference source not found.**). Choose "1 - TI Simple Key Service" and then "0 - Key Press State".
4. Write command in Enter Value popup menu to transfer command to SPM-010 device (see Figure 5)

*Note: see command sequence instruction in Settings and Water Level Sensors Calibration section.*

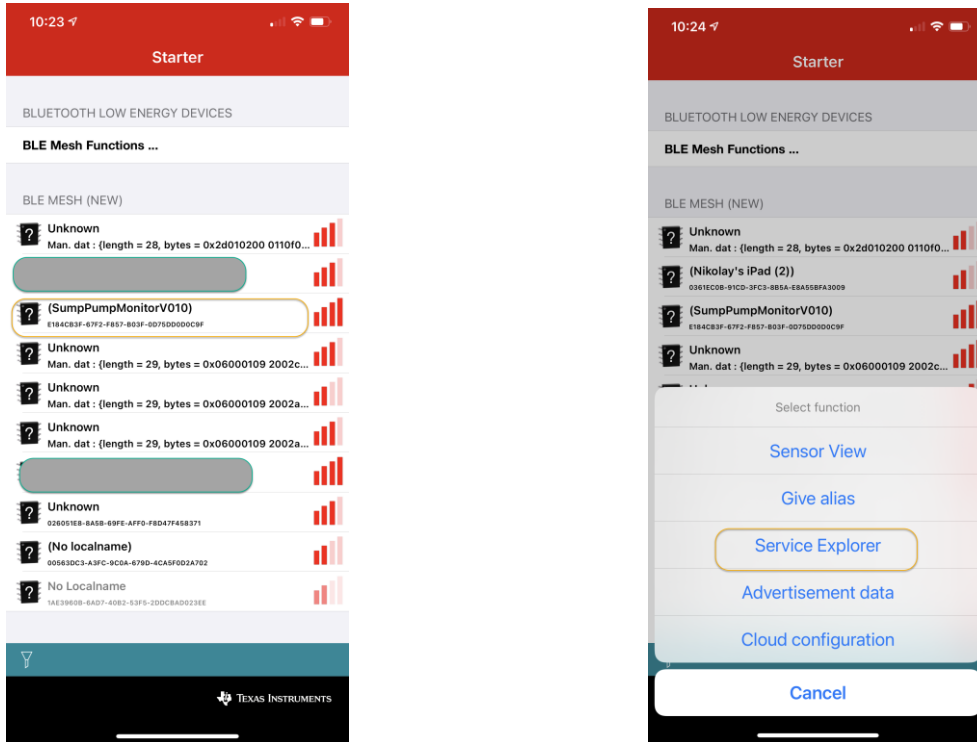


Figure 3 List of devices and Services

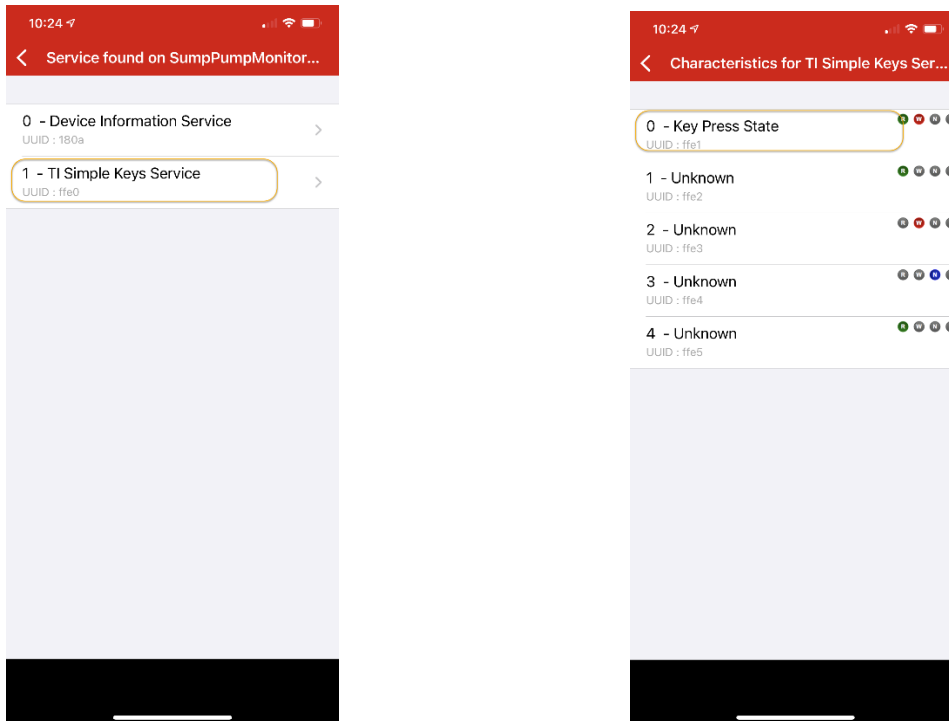


Figure 4 Services

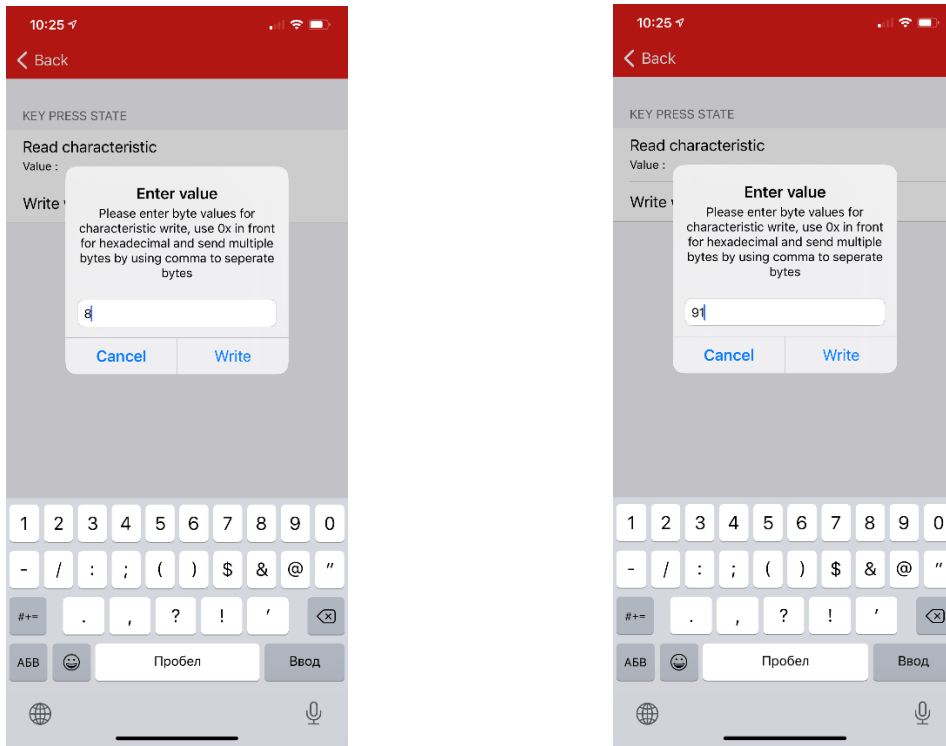


Figure 5 Command Write Example

## Settings and Water Level Sensors Calibration

If device is going to use AquaPlamb (APLUMBX-XX) water level sensor (SPM-010 v3), use calibration instruction from VEGETRONIX company site: <https://www.vegetronix.com/Products/AquaPlumb/>

WS-010 and Resistive type sensors are used beginning of SPM-010 v4.

### Default Sensor type:

WS-010 / AquaPlamb (if SPM-010 v3 is used)

### Default Alarm Level:

0%

### Default Pump Limit:

60% with 10% Hysteresis

**Default setting for Resistive sensor set** (for example KUS SSS/SSL sensor and SPM-010 v3 and SPM-010 v4) is the following:

240 Ohms – 0% water level

33 Ohms – 100% water level

**Default settings for WS-010 sensor set** (WS-010 sensor and SPM-010 v4) is the following:

0mm – 0% water level (dry sensor)

30" (762mm) – 100% water level



## WS-010 Sensor Calibration

### WS-010 Sensor Calibration Setup and Preparation:

1. 15" (380mm) deep (or more) Water tank (filled with water).
2. SPM-010 with connected to power outlet and WS-010 sensor.
3. iOS device with installed Bluetooth Scanner application (see Figure 1).
4. Measuring tape.
5. Measure the L% value (see Figure 6) and mark L% length on WS-010 sensor from bottom side by using permanent marker. It will be "L% marker" point, which is equal 100% level.
6. Connect SPM-010 in accordance with Figure 7 **Error! Reference source not found.**
7. Sensor shall be fully dry before calibration start. *Note: if the sensor is wet, make sure to dry the sensor with a towel and wait at least 5 minutes before starting the calibration.*

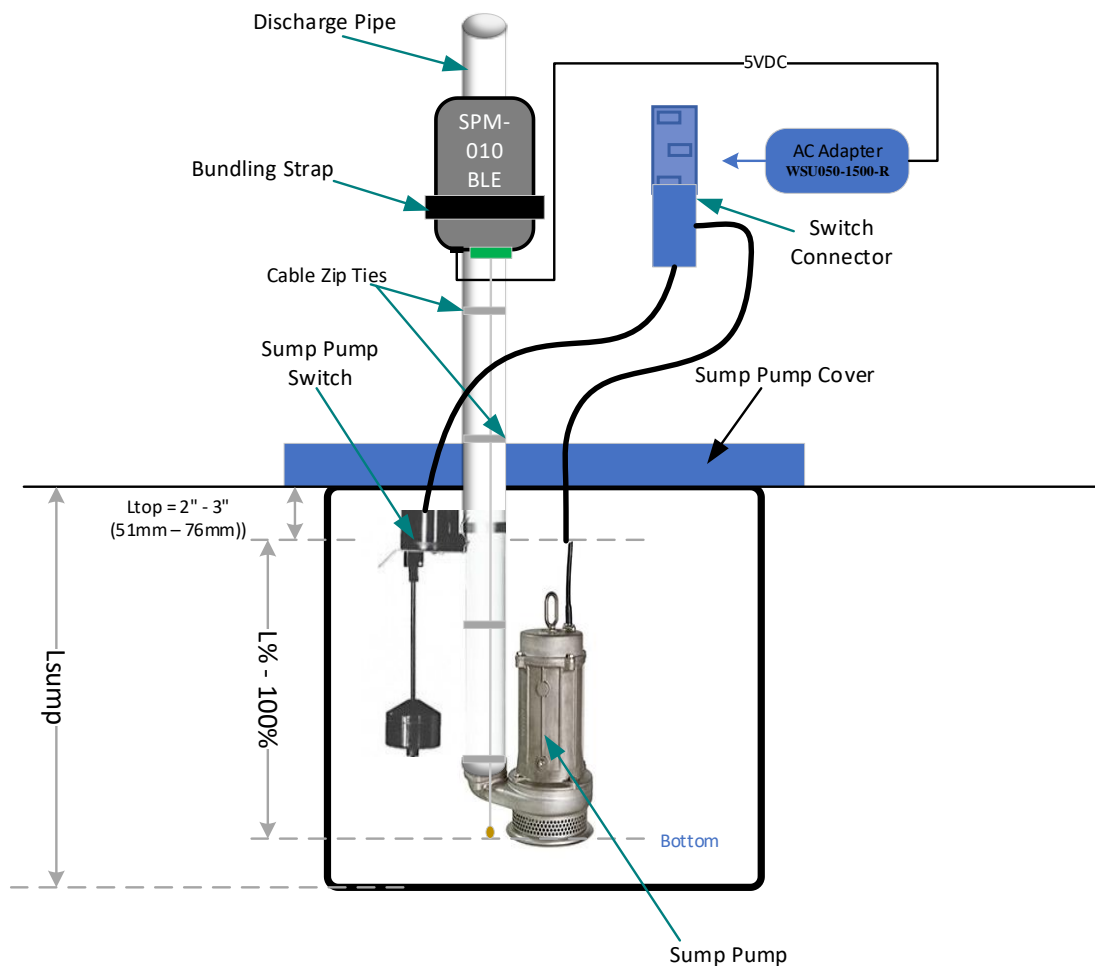


Figure 6 WS-010 Sensor Calibration Sump Depth Measurement

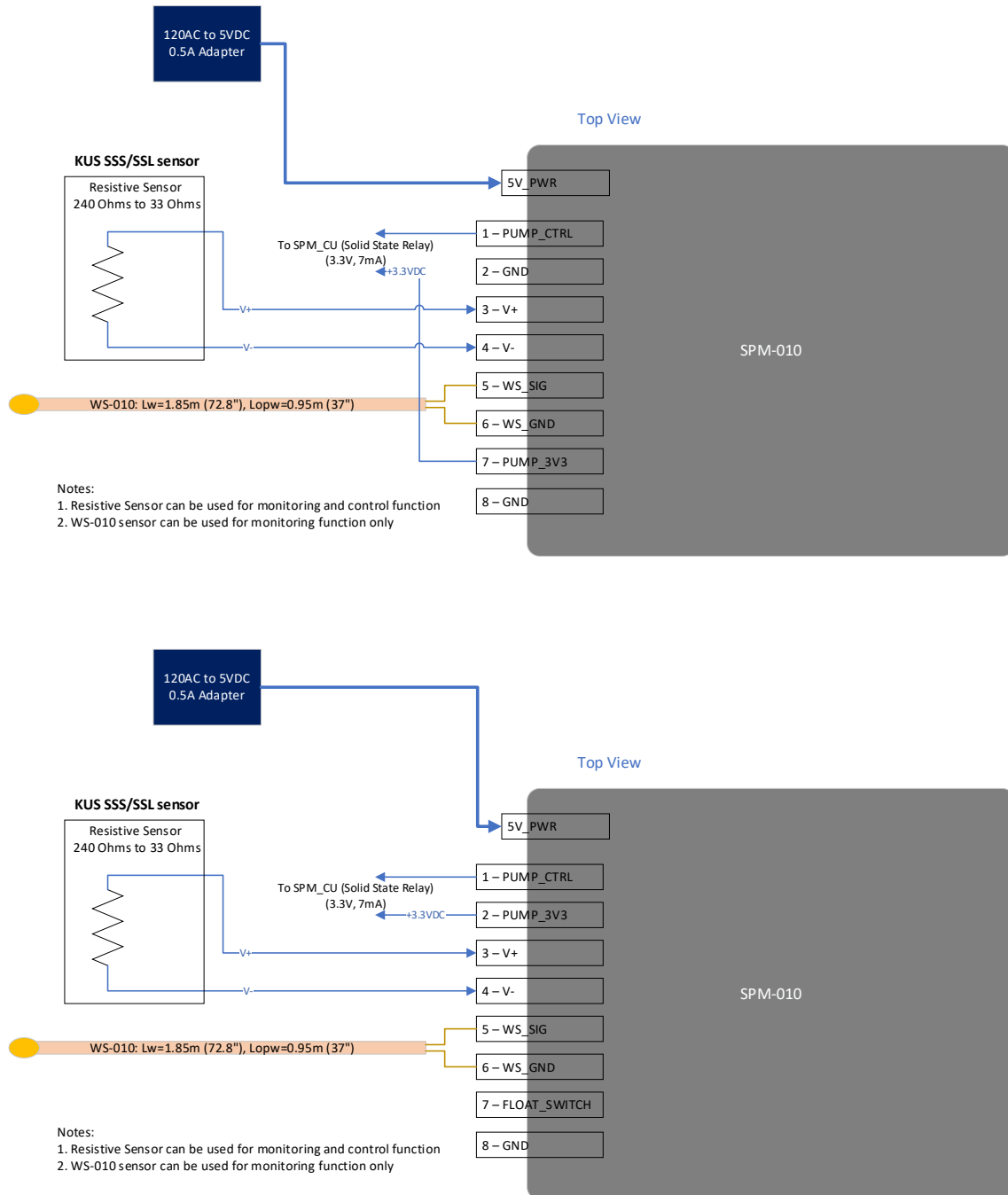


Figure 7 Connection Diagrams SPM-010 v4 (top) and SPM-010 v5 (bottom)

### WS-010 Sensor Calibration:

1. Connect sensor and power to SPM-010 (see **Error! Reference source not found.**). Start SPM-010 device by pushing front button. **Note: The power supply shall be connected to SPM-010 during calibration process**
2. Start Bluetooth Scanner application on your iOS device (see TI SimpleLink Starter operation for SPM-010 section).
3. Use SPM-010 Service Commands, set type of sensor which planned to be used. Write command “8” for WS-010.
4. Turn off power of SPM-010 and **close BLE scanner application**. Then turn on SPM-010 power and start BLE scanner application again. *Note: this procedure is used for sensor type setting before calibration.*
5. Write command “91” and wait for as minimum 20 seconds (time is needed to complete calibration).
6. Write command “6” for reset commands – Dry calibration is completed.
7. Put sensor in water tank up to the “L% marker” and write command “92” for wet sensor calibration and wait for as minimum 20 seconds. *Note: do not hold sensor by hand during calibration. It will cause inaccurate reading data.*
8. Write command “6” (reset command) – Wet calibration is completed.
9. Turn off power of SPM-010 and **close BLE scanner application**. Then turn on SPM-010 power and start BLE scanner application again.
10. Set Alarm level. For example, write command “70” for setting of 70% alarm level or “50” for 50% alarm level. Note: 10% is step for setting beginning from 10% to 90%.
11. Write command “6” (state reset command).
12. Turn off power and **close BLE scanner application**.

### KUS SSS Sensor Setting

1. Start Bluetooth Scanner application on your iOS device (see TI SimpleLink Starter operation for SPM-010 section).
2. Use SPM-010 Service Commands, set type of sensor which planned to be used. Write command “7” for KUS SSS type sensor.
3. Turn off power of SPM-010 and **close BLE scanner application**. Then turn on SPM-010 power and start BLE scanner application again.
4. Set Alarm level. For example, write command “70” for setting of 70% alarm level or “50” for 50% alarm level. Note: 10% is step for setting beginning from 10% to 90%.
5. Write command “6” (state reset command).
6. Turn off power and **close BLE scanner application**

### Pump Control Parameters Setting

1. Start Bluetooth Scanner application on your iOS device (see TI SimpleLink Starter operation for SPM-010 section).
2. Use SPM-010 Service Commands, set the pump control parameter. Write command “X” for setting (see *Pump Parameter Commands: section*).
3. Turn off power of SPM-010 and **close BLE scanner application**. Then turn on SPM-010 power and start BLE scanner application again.

#### *Pump Parameter Commands:*

- “141” - sump pump turn on 40% with 10% turn off hysteresis
- “142” - sump pump turn on 40% with 20% turn off hysteresis
- “143” - sump pump turn on 40% with 25% turn off hysteresis
- 
- “151” - sump pump turn on 50% with 10% turn off hysteresis
- “152” - sump pump turn on 50% with 20% turn off hysteresis
- “153” - sump pump turn on 50% with 25% turn off hysteresis
- 
- “161” - sump pump turn on 60% with 10% turn off hysteresis
- “162” - sump pump turn on 60% with 20% turn off hysteresis
- “163” - sump pump turn on 60% with 25% turn off hysteresis
- 
- “171” - sump pump turn on 70% with 10% turn off hysteresis
- “172” - sump pump turn on 70% with 20% turn off hysteresis
- “173” - sump pump turn on 70% with 25% turn off hysteresis
- 
- “181” - sump pump turn on 80% with 10% turn off hysteresis
- “182” - sump pump turn on 80% with 20% turn off hysteresis
- “183” - sump pump turn on 80% with 25% turn off hysteresis