Use Case S5: Detailed Description
Use Case Name: Calculate Barometric Pressure
Scenario: N/A
Brief Description: With the System running, the system will calculate the Barometric Pressure given the Voltage output as well as the Voltage input (5.0 VDC).
Actors: System
Related Use Cases: None
Preconditions: The System is running, the measurement rate is set, the network is up and running.
Postconditions: The Barometric Pressure is measured/calculated.

Flow of Events

System	One Wire Sensors
1. Queries for the input voltage (Vdd)	2. Returns the input voltage (should be 5.0 VDC constant)
3. Queries for the output voltage (Vad)	4. Returns the output voltage (non-constant)
5. Applies the appropriate (and predetermined based on altitude) formula for barometric pressure calculation.	
6. Returns the barometric pressure calculated.	

Exception Conditions:

1. If an Exception Condition returned, then the System shall return a default barometric pressure (-99.0).
3. If an Exception Condition returned, then the System shall return a default barometric pressure (-99.0).

The formula used for the barometric pressure calculation is rather picky and needs a:

1. **Slope**
2. **Offset (intercept)**
3. **Output voltage**

These values are predetermined empirically based on the altitude and set at the factory. The barometer may need additional calibration via correct and/or adjusted voltage measurement (the voltage may need adjustment based on literature printed by the factory given the altitude at which the barometer is to measure). In addition, the slope and offset may need adjustment via several continual measurements over time and comparison of that data with an accurate and previously pre-calibrated barometer.

Since the sensor used to measure the barometric pressure is the same as the one used to calculate the humidity, it is important the system keeps track of which sensor is the humidity sensor and which sensor is the barometer.