Use Case S4: Detailed Description

Use Case Name: Calculate Dewpoint
Scenario: N/A
Brief Description: With the System running, the System requests the Temperature and Relative Humidity and calculates the Dew-Point by applying the **Magnus formula** [**Sonntag90**].
Actors: System
Related Use Cases:
Use Case S1: *The System Shall Monitor the Temperature Data.*
Use Case S2: *The System Shall Monitor the Humidity Data.*
Use Case S14: *The System Shall Save the Dew-Point data.*
Use Case S15: *The System Shall Monitor and Save Dew-Point Extreemes.*
Stakeholders: Local and National Weather Bureaus, other systems and users monitoring and relying on local weather data.
Preconditions: The System is running, the Temperature and Humidity Sensors are working properly and are connected to the network. The 1-Wire Network is setup and working properly.
Postconditions: The Dew-Point is caclculated from the Temperature and Relative Humidity data using the appropriate conversion formula.

Flow of Events

System	**Appropriate Sensors**
1. Periodically request temperature data from the One Wire Temperature Sensor **See Use Case S1: Monitor Temperature Data**	2. Returns the Temperature Data
3. Periodically request humidity data from the One Wire Humidity Sensor **See Use Case S2: Monitor Humidity Data**	4. Returns the Humidity Data
5. Calculates the Dew-Point from the Requested Temperature and Humidity data using the **Magnus formula** [**Sonntag90**]	

Exception Conditions
2a, 4a. If for any reason the One-Wire Network stops functioning properly and returns the default humidty and/or default temperature **(See Use Cases S1, S2)**, then the System shall report the default Dew-Point (-999.9), making no attempt at a Dew-Point calculation.
2b. If for any reason the One Wire Temperature Sensor stops working, and returns the defualt temperature **(See Use Case S1: Monitor Temperature Data)**, then the System shall report the default Dew-Point (-999.9), making no attempt at a Dew-Point calculation.
4b. If for any reason the One Wire Humidity Sensor stops working, and returns

the default humidity **(See Use Case S2: Monitor Humidity Data)**, then the System shall report the defualt Dew-Point (-999.9), making no attempt at a Dew-Point calculation.