Begin

1. Read State of Mode Switch

If (Monitor Mode) — False → **3. Collection Mode**

True ↓

2. Monitor Mode

2.4 Read Coefficients Protocol
- 2.4.1 Detect Chosen Sensor
- 2.4.2 Open Coefficients File
- 2.4.3 Read Next Line
- If (Desired Sensor) — False ↗ (back to 2.4.3)
- True ↓
- 2.4.4 Close Coefficients File
- 2.4.5 Compile Transmission
- 2.4.6 Transmit "RR#Coef1#Coef2#Coef3#Coef4#"

2.5 New Coefficients Protocol
- 2.5.1 Detect Chosen Sensor
- 2.5.2 Open Coefficients File
- 2.5.3 Read Next Line
- If (Desired Sensor) — False ↗ (back to 2.5.3)
- True ↓
- 2.5.4 Delete Current Line
- 2.5.5 Write New Line
- 2.5.6 Close Coefficients File

2.6 Read Sensor Value Protocol
- 2.6.1 Detect Chosen Sensor
- 2.6.2 Read Raw Value
- 2.6.3 Process Raw Value
- 2.6.4 Compile Transmission
- 2.6.5 Transmit "SR#Raw#Processed#"

2.7 Monitor Protocol
- 2.7.1 Read Date and Time
- 2.7.2 Detect Battery Percentage
- 2.7.3 Detect SD Status
- 2.7.4 Read SD Capacity
- 2.7.5 Read SD Usage
- 2.7.6 Calculate SD Usage %
- 2.7.7 Calculate SD Usage %
- 2.7.8 Compile Transmission
- 2.7.9 Transmit "MW#DateAndTime#Battery#SDStatus#SDCapacity#SDUsed#SDUsed%#"

2.8 File Name Protocol
- 2.8.1 Read all file names on SD card
- 2.8.2 Compile Transmission
- 2.8.3 Transmit "FW#File1#File2#"

---

2. Monitor Mode

2.1 Wait for Serial

If (Serial Received) — False ↑ (back to 2.1)

True ↓

2.2 Read Serial →
- Case: "Penny is a freeloader." → 2.3 Send Back "No Spaces"
- Case: "R#" → 2.4 Read Coefficients Protocol
- Case: "C#" → 2.5 New Coefficients Protocol
- Case: "S#" → 2.6 Read Sensor Value Protocol
- Case: "MR#" → 2.7 Monitor Protocol
- Case: "FR#" → 2.8 File Name Protocol
- Case: "DR#" → 2.9 File Data Read Protocol
- Case: "CR#" → 2.10 Configuration Protocol
- Case: "CS#" → 2.11 New Config Protocol

2.9 File Data Read Protocol
- 2.9.1 Open Desired File
- 2.9.2 Read Line
- If (Empty) — False → 2.9.3 Compile Transmission (back to 2.9.2)
- True ↓
- 2.9.4 Close File
- 2.9.5 Transmit "DW#Line1#Line2#"

2.10 Configuration Protocol
- 2.10.1 Open Config File
- 2.10.2 Read Line
- If (Empty) — False → 2.10.3 Compile Transmission (back to 2.10.2)
- True ↓
- 2.10.4 Close File
- 2.10.5 Transmit "CW#FileName#Date#Location#SampleCount#Interval"

2.11 New Config Protocol
- 2.11.1 Delete Config File
- If (Empty Next Line) — False → 2.11.1 Write Next Line (back to 2.11.1)
- True ↓
- 2.11.4 Close File

---

3. Collection Mode

If (Required Samples == 0) — False → If (Sample#<=Required Samples)

True ↓ (If Required Samples) → 3.1 Flush

If (Sample#<=Required Samples) — True → 3.1 Flush; False ↓ → 3.5 Sleep

- 3.1 Flush
- 3.2 Measure
- 3.3 Collect
- 3.4 Increase Sample #
- 3.5 Sleep

3.1 Flush
- 3.1.1 Close Sump Servo
- 3.1.2 Move MultiPort Valve
- 3.1.3 Open Pump Valve
- 3.1.4 Clean line and container
- 3.1.5 Open Sump Servo
- 3.1.6 Wait for sump to drain
- 3.1.1 Close Sump Servo

3.2 Measure
- 3.2.1 Collect sample for measurements
- 3.2.2 Measure Turbidity
- 3.2.3 Measure Temperature
- 3.2.4 Get Time
- 3.2.5 Save to SD Card
- 3.1.5 Open Sump Servo

3.3 Collect
- 3.1.2 Move MultiPort Valve
- 3.3.1 Collect sample for storage
- 3.3.2 Close Pump Valve