Temperature Transmitter: Use-cases and Requirements

The proposed system should be a cost-effective solution able to accurately calculate the power transferred into a test load of water by measuring the temperature change and flowrate using digital sensors. Multiple sites will implement the specified hardware and all readings must be transmitted to a central datastore where they can be monitored.

# Functional requirements

1. Gather thermocouple readings from sensors
2. Gather flow-rate reading from the flow-rate sensors
3. Power should be calculated from the sensor data
4. On-site hardware should be able to be individually calibrated
5. On-site hardware should be secure
6. On-site hardware should transmit sensor readings/calculations securely
7. Sensor readings should be stored securely
8. A remote user should be able to view stored sensor readings for each transmitter
9. The visualisation software should be secured against unauthorised access
10. Thermocouples should be able to withstand temperatures of up to 100˚C.
11. Thermocouples should have a differential accuracy of 0.05˚C.
12. Hardware should cost no-more than £200 per test load.

# Non-functional requirements

1. Visualise the sensor readings for each transmitter
2. Display historical sensor data for each transmitter
3. Thermocouples should be able to be simulated for testing purposes.
4. There should be a test harness
5. The system should detect and raise alerts for anomalies in power/temperature readings, including response timeouts.

# Stakeholders

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| Temperature Monitoring Attendant | The end user who will monitor the incoming messages through the provided visualisation software. |
| On-Site Engineer | An engineer who may be required to recalibrate the hardware on-site. |
| System Administrator | An administrator who will need unrestricted access to any component of the system including data storage. |
| Governing Body | An organisation that requires the system to adhere to safety guidelines and policies. |

# Use-cases

1. View all stored data readings for individual antenna
2. Monitor power readings for all antennas on site
3. View alerts
4. Acknowledge alerts
5. login to all systems