**IOT**

**TEMPERATURE MONITORING SYSTEM**

1. **Temperature Sensor (e.g., Thermocouple)**:
   * **Usage**: Measures temperature directly at specific points in the industrial process (e.g., boiler surface, pipes).
   * **Specifications**: Types include K-type thermocouples suitable for high temperatures (up to 1,200°C), with sheathed probes for durability.
2. **Data Acquisition System (DAS)**:
   * **Usage**: Collects temperature data from sensors and prepares it for transmission and analysis.
   * **Specifications**: Typically includes signal conditioning for sensor signals, analog-to-digital conversion, and compatibility with industrial communication protocols (e.g., Modbus).
3. **Communication Module (e.g., Modbus RTU)**:
   * **Usage**: Transmits temperature data from DAS to a central monitoring system or control room.
   * **Specifications**: Supports Modbus RTU protocol for reliable data transmission over RS-485, suitable for industrial environments.
4. **Central Monitoring System (SCADA Software)**:
   * **Usage**: Processes temperature data, displays real-time readings, and stores historical data for analysis.
   * **Specifications**: User-friendly interface, alarm management, data logging, and remote access capabilities.
5. **Alarm System (Audible and Visual Alarms)**:
   * **Usage**: Alerts personnel to critical temperature deviations or unsafe conditions.
   * **Specifications**: Includes audible sirens, flashing lights, and sometimes integrates with SCADA for automated notifications (e.g., emails, SMS).
6. **Backup Power Supply (UPS)**:
   * **Usage**: Provides uninterrupted power to critical monitoring components during power outages.
   * **Specifications**: Capacity to sustain operations for a specified duration, often includes surge protection.
7. **Calibration Equipment**:
   * **Usage**: Ensures accuracy of temperature sensors through regular calibration checks.
   * **Specifications**: Includes handheld calibrators for on-site verification and certified calibration services for traceability.

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