SCADA & Automated Telemetry System Solutions
OVERVIEW

AEEC is a group of professional experts with proven track records of designing, installing, maintaining, and utilizing automation and real time data collection systems. These systems include Supervisory Control and Data Acquisitions (SCADA), Human Machine Interfaces (HMIs), advanced instrumentation, transducers and Programmable Logic Controllers (PLCs). Our team has helped our clients reduce waste, improve efficiency, and store important data utilizing automated processes throughout several different industries. Our familiarity and knowledge of various systems and software has lead to AEEC successfully installing systems not only used for process efficiency, but also for collecting high frequency data. The data provided to the end user is easy to understand and available to allocate to large databases or simply stored in a .csv file.

AEEC has been providing comprehensive Industrial Control Systems (hardware and software), to the Federal market since 1995. AEEC’s areas of expertise in Process Control and Statistical Process Control Systems include Programmable Logic Controllers (PLCs) and Remote Terminal Units (RTUs), Data Acquisition Systems (DASs), networked industrial automation, and remote telemetry and control. AEEC has used this expertise to successfully provide industrial automation assisting in remediating contaminated sites under RCRA, CERCLA and SARA, OPA, CWA, CAA, and NEPA requirements.

AEEC has expert knowledge of various SCADA software, troubleshooting, operations and maintenance of SCADA / HMI, PLC systems, and Telemetry systems at all levels.

Our Operations experience includes:

- Structured programming
- Communication protocols such as MODBUS, PROFIBUS, SDI12, and Ethernet IP amongst others
- Database Management
- Troubleshooting, diagnosing, and resolving servers, networked equipment, and other computer-related equipment problems to ensure functional operation
- Performing back-up procedures
- Instrumentation calibration and setup
- Solar powered systems using various transducers, instruments and RTU’s
- Radio communication setup and path studies
- Monitoring and tuning server and system resources
Maintenance & Recordkeeping

AEEC’s maintenance support includes:

- Monitoring users
- Monitoring system processes
- Monitoring daily CPU usage
- Examining log files
- Correcting OS errors
- Backing-up critical data
- Verifying routine fail-over
- Verifying that the backup system switches correctly before any unanticipated system crash
- Verifying data shadowing is working correctly between primary and backup systems
- Verifying that the backup databases are consistent with the primary databases
- Locating bottlenecks in productivity
- Instrument maintenance and calibration

AEEC has found that historical performance information is a secondary benefit from a well-executed maintenance program. The collection and tracking of accurate records has greatly assisted AEEC and project owners to resolve unexpected issues within minimal time. Periodic maintenance also increases the overall reliability of the system.

Meteorological Data:

- Wind Direction: 160.67 Degrees
- Wind Speed: 6.04 m/s
- Temperature: 2.69 °C
- Relative Humidity: 63.47%
- Solar Radiation: 0.13 kW/m²
- Snow Depth: 17.0 inches
- Barometric Pressure: 553.88 mmHg
- Total Evaporation: -1.32 inches
- Hourly Rain Total: 0.25 mm
- Volts: 13.96 VDC
Automated Data Collection Telemetry System

The former Rico-Argentine mine, 9,000 feet above sea level in the Colorado Rockies, is monitoring a demonstration wetlands area as a remedy for low pH-metals impacted water leaving the mine from underneath the mountain. Due to safety and logistical challenges associated with the site, including inaccessibility due to extreme weather conditions (snow, rain), seasonally unsafe site conditions (avalanches) and remoteness, our customer contracted AECC to help with process safety. The goal was to cut winter field labor hours as close to zero as possible. AEEC knew our customer faced significant challenges monitoring and transmitting mine site environmental data during harsh weather events and avalanche season when physical access was not practical. We experimented with different approaches and proposed an automated data collection system using telemetry to transmit and monitor data remotely. This solution met their objectives by automating the challenge of getting water quality data into a database, integrating live-feed webcams, and storing large amounts of historical data. Before installing the equipment at the site, the team tested the remote telemetry system and tailored equipment at the manufacturer’s lab. Utilizing Detcon H2S monitors and YSI sonde sensors, the system captures and provides continuous real-time data on water quality entering and exiting the demonstration wetlands project. Bluetooth is used to calibrate equipment before data is transmitted to the server.

The team is now able to continuously monitor water pH, temperature, dissolved oxygen, oxidation-reduction potential, flow rate, and H2S from the safety of the office, without setting foot on site and without losing monitoring days due to harsh weather or avalanche season. Components measure and transmit water quality information, bringing large amounts of data into a single web-based system and providing the ability to save historical data. Our solution increased personnel safety and reduced time in the field by 75%.

Horizontal Wetland Treatment Train:

![Diagram of wetland treatment train]

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