Remote Monitoring of a Water Reservoir

Industry

Remote Monitoring

Companies

inCharge Control Solutions
Okorusu Fluorspar Mine

Hardware

Moxa W5312 Cellular RTU, Mitsubishi FR400 Variable Speed Drive, E&H ProMag Flow Meter, Ultra Sonic Level Transmitter

inCharge Company Background

inCharge Control Solutions is a Namibian owned company delivering automation, monitoring and management solutions for business facilities, equipment, and people. inCharge specializes in developing and deploying highly customized, stable, scalable and flexible hardware and software projects.

inCharge offers solutions in diverse areas:

• Industrial and Building Automation
• RFID-based Tracking and Tracing
• Network Monitoring and Management
• Device Monitoring and Management
• Software Development
• System integration

Challenges

The Kilo 40 reservoir is located 20 km from the Okorusu mine. After each power dip, the variable speed drive would need to be reset and started again. This meant the staff would have to drive 40 km to the reservoir and back to the mine to reset and start the pump. Information about the actual level of the reservoir and monthly water consumption was also unavailable.

inCharge Control Solutions needed to develop a Graphical User Interface to control the pump and display status of the pump and reservoir in the control room 20 km away. The control and status data had to be sent via a GPRS connection. We had to focus on getting all this information to and from the remote location with the minimum amount of data transfer to save costs as GPRS is charged per megabyte.
Requirements

Customer requirements were summarized to several automation tasks:

- Connection had to be established via GPRS
- Reservoir level had to be visible on a Graphical User Interface (GUI)
- Total water consumption should have been displayed on the GUI
- The pump had to be started and stopped from the GUI and the current state of the pump should have been visible
- Speed of the pump had to be adjustable from the GUI and confirmation of the new speed was supposed to be displayed on the GUI
- Variable speed drive had to be reset from the GUI
- Monthly water consumption report was also required

Solution

The solution required integration with the following devices:

- Ultrasonic level transmitter connected via a 4 – 20mA input signal to get the actual reservoir level
- Flow meter connected via a 4 – 20mA input signal to get the actual flow rate and a pulse Input to get the total water usage
- A variable speed drive connected via a 4 – 20mA input signal to get the actual speed of the pump, a 4 – 20mA output signal to control the speed of the pump, a digital output to start and stop the pump, a pulse output to reset the variable speed drive, a digital input for the pump alarm condition and a digital input for the pump running condition.
- A Moxa Cellular RTU the signals were connected to.

AggreGate-based remote monitoring system was developed for the local pump control to cater for condition like low water level interlock in order to protect the pump from running under dry conditions. The AggreGate solution is designed in such a way that data transmission is kept to an absolute minimum but it offers the same functionality as direct access to the input and output. This saves the customer’s monthly GPRS data transmission expenses.
Benefits

The major benefit of AggreGate deployment is that the electrical staff can now monitor the status of the system from the mine. If any unusual errors are present, the system can be reset and started remotely saving the costs of driving to the remote site and production downtime due to no water being available.

Okoruso can also see how much water is consumed monthly and compare this with Namwater’s consumption report.

About Tibbo

Located in Taipei, Taiwan, Tibbo Technology Inc. brings simplicity to the automation world defined by enormous complexity of operating systems, programming languages, and design tools. Tibbo’s programmable hardware and the AggreGate Platform offer a complete solution for delivering robust, distributed automation and monitoring systems.