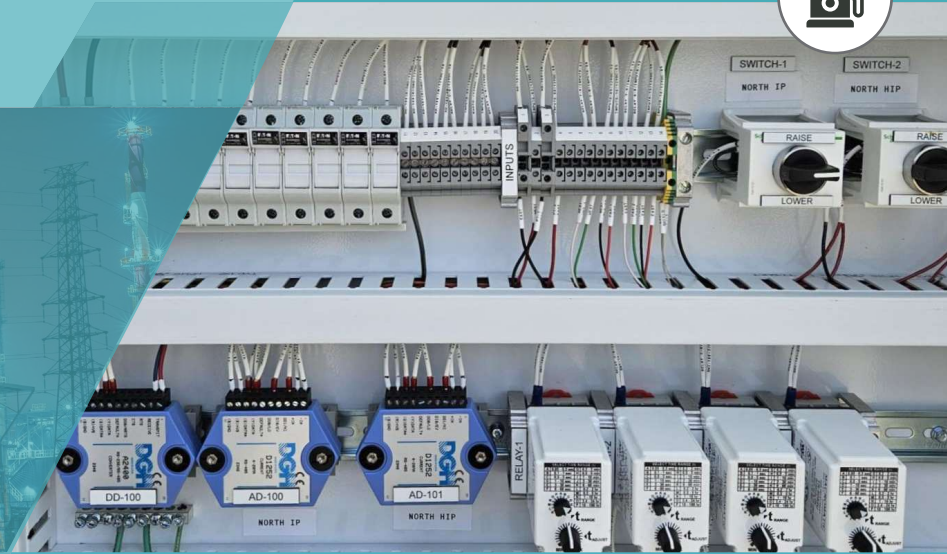


Natural Gas Pressure Monitoring



- **Objectives:** Monitor Natural Gas Pressure Distribution
- **Solution:** DGH I/O Modules
- **Benefits:** Cost savings and automated reliability
- **Results:** Guaranteed natural gas pressure for community

Overview

A natural gas utility required a gas pressure monitoring and control system that could be easily deployed throughout communities in their state. The systems required a centralized office location to communicate wirelessly to remote monitoring stations and regulator control stations within the community. Radio modems were used for communicating real-time data to and from the central office to the remote stations.

DGH was contacted to provide a hardware solution that would measure pressure sensors, control a valve and interface with their radio modems. DGH provided a solution using the [A2400 radio modem interface module](#) and a [D1252 4-20mA measurement modules](#) with digital output control signals.



DGH [A2400 radio modem interface](#)

Project

The natural gas utility company distributes gas to homes and businesses throughout communities using underground pipelines that require pressure monitoring. The amount of natural gas consumed in these communities varies based on the population, the time of day, and seasonally with outdoor temperature changes. Daily consumption often peaks during morning and evening hours when most people are at home, and it is often the lowest during the middle of the day while most people are away at school or work.

Seasonal natural gas consumption increases and decreases as outdoor temperature changes during the year. Residential homes, schools, and businesses require additional fuel to heat homes and buildings during the fall and winter months and they require minimal or no heat during the spring and summer months.

Utility companies must monitor these lines continuously, 24 hours per day, and increase or decrease the gas pressure based on demand. To accomplish this, a monitoring and control system was designed and installed throughout many communities and counties within their state.



Phone :
+1 (603) 622-0452



Email :
info@dghcorp.com



Web :
dghcorp.com



Monitoring and Control System

The natural gas monitoring and control system design consists of three main components. A centralized office location, a gas pressure regulator station, and a gas pressure low point monitoring station. Radio modems were used for communications between the central office, the regulator, and the monitoring stations.

The system components are strategically positioned across a community, starting with the central office location. The central office is located near the middle of the community in order to achieve good wireless communications with the remote stations. The regulator station is located on the underground pipeline where it enters the community. Last, the remote monitoring station(s) is located across the community at the farthest possible distance from the regulator station. Larger geographical communities may require multiple monitoring stations to ensure adequate pressure throughout the entire community.

The Regulator station contains a radio modem, an A2400 and D1252 module from DGH Corporation, and a motorized control valve that resides in the gas pipe. The motorized control valve is used to adjust the pressure in the underground pipeline. The A2400 and D1252 measurement module is used to monitor and communicate real-time gas pressure readings back to the central office computer.

Additionally, the D1252 provides digital control signals for controlling relays. These signals are each connected to timer relays that control the motorized control valve. When the real-time pressure readings from the monitoring station indicate that a pressure

adjustment is required then the central office computer will command the appropriate relay to turn on, increasing or decreasing the gas pressure into the community.

The monitoring station(s) are typically located across the community at the farthest distance from the regulator station to detect low gas pressure in the underground lines. The central office computer requests real-time gas pressure readings from the monitoring station(s) through the radio modems. When low pressure readings are detected, commands are transmitted to the regulator station to adjust the motorized control valve and increase the gas pressure.

Detecting low pressure during peak hours of usage is critical as the pressure must be increased to meet consumption requirements. When high gas pressure readings are detected, especially during off-peak hours, the office computer will transmit commands to the regulator station to adjust the motorized gas control valve and lower the gas pressure.

Changes in nominal daily gas pressure readings can vary seasonally during changes in outdoor temperature. As gas consumption increases during the colder months of the year, the pressure in the pipes may increase to nominal daily values of 50-55 psi to meet heating requirements. During the warmer spring and summer months, the nominal daily gas pressure values are lowered to around 20 psi. The gas pressure will vary above and below those nominal values throughout each day by a few pounds depending on time of day and consumption.

Results

This utility company has selected DGH as a measurement solution provider for their underground natural gas monitoring systems for over two decades. Relying on our products to make precision, real-time gas pressure measurements, control motorized valves, provide hand-shaking signals to their radio modems, and report the real-time measurements back to a central office computer. Based on the precision pressure measurements, their computer system can make the critical adjustments required to increase or decrease the gas pressure and ensure a proper supply of natural gas to all homes and businesses throughout their communities.

Combined with DGH modules, their monitoring and control system has reduced company costs by automating the real-time collection of gas pressure readings and making the necessary adjustments using motorized control valves. Working with this utility company for many years, DGH has a proven track record for product reliability, commitment to product quality and support.

About DGH Corporation

Established in 1985, DGH is an industry-leading manufacturer of data acquisition hardware for use in the process monitoring and control industry. Our products have been used worldwide in such industries as water & wastewater management, pharmaceutical, scientific laboratories, military, transportation, energy sectors, and power utilities.

As part of Jewell Instruments, LLC, DGH Corporation continues to innovate products for use in a wide range of data acquisition applications. Our products have been designed into OEM applications and used by systems integrators across many industries. Contact a member of our sales team today and see if DGH can provide a solution for you.



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Web :
dghcorp.com

