**Monitoring: Natural Gas Compressors**

One of the most common applications for Monico Gateways is monitoring Natural Gas Compressors used in Midstream Gathering and Pipelines. The majority of compressors are Natural Gas fueled reciprocating engines driving reciprocating compressors. Our Gateways have not only the ability to monitor the engines directly without need for intermediary devices, but can also act as a Modbus Master to gather data from the Compressor controller.

We have worked with nearly all industrial engine manufacturers in the gas compression market, but our experience began with Caterpillar® equipment. The CDL Gateway™ was actually developed using G3606 natural gas compressors as the prototype application. Since that development in 2007, we have approximately 5000 gateways installed on natural gas compressors worldwide. Our gateways provide a singular interface between the engine and the customers’ control and Supervisory Control and Data Acquisition (SCADA) systems. In most cases, we will pull data from the engine and push it to the compressor control system. Simultaneously, we will also pull critical compressor information and provide a unified interface for the remote monitoring SCADA system. Our ability to communicate with many different engine protocols, all the major PLC manufacturers’ protocols, and many different SCADA system protocols make our product uniquely qualified for these applications. In short, we make it easy for our customers by providing pre-configured gateways that are as close to “Plug & Play” as possible. Our long-term success in this application is a testament to our products and, more importantly, our Support Team.

The most widely used non-PLC compressor controllers are from Altronics and FW Murphy. The Gateways commonly act as a Modbus Master to the FW Murphy Centurion or Millennium products as well as to the DE-2500 and DE-3000 products from Altronics. The most common PLC based compressor controllers are from Allen Bradley, GE Fanuc, and Siemens, and the Gateways have the unique ability to establish two-way communications with all of these brands without any need of special drivers or modules. This allows for some very powerful communications and monitoring networks. One of the more exciting applications is the FW Murphy Centurion PLUS, which uses the Monico Gateway color touch screen HMI as the primary operator interface for the compressor system.

# A Basic Gateway has the ability to integrate all of these devices and then provide a consolidated interface to a SCADA system. A common example would be where the Gateway gathers information from the engine and the Compressor controller and provides all this information as a unified Modbus Slave to the SCADA system. Many times we will integrate a station-level PLC into the mix as well. In this case, we will provide engine and compressor data to the PLC and also pull station data from the PLC and provide a unified interface to the SCADA system. One benefit of this architecture is significantly increased speed due to the elimination of two devices over the largely serial networks.A Gateway PLUS™ adds additional benefits, and one of the most valuable is real-time data logging. Since the Gateway is primarily a Data Concentrator, the data logging feature offers the ability to log real-time data from all connected devices for detailed forensic analysis. Most serial SCADA networks cannot provide real-time data collection because of network limitations due to the number of devices. An average serial SCADA system for a

#  large gathering operation only polls each device every 2-15 minutes and a lot can happen inside that window. Therefore, SCADA is best suited for long-term trending, but real-time data logging can provide valuable data to analyze failures. Many of our customers are able to pull log files that simultaneously log engine data, compressor data, and station data such as suction pressures in one integrated file for maximum analytic capability.

# In one installation, our customer's SCADA system was only able to poll each compressor every 2-3 minutes, but was experiencing cylinder liner failures on two engines every 1-2 weeks. The data from the SCADA system was not showing any possible cause and at $14,000 per repair, this was causing a lot of pain. A Monico Gateway PLUS™ was installed to gather data from the engine and then acted as a Modbus master to an Altronics DE-2500. A log file was created to record 20 compressor parameters and 60 engine parameters every three seconds. Each CSV file contained one day of data and 200 daily files were contained in a FIFO file on the 2 GB Compact Flash card. With this real-time data, the customer was able to see the coolant temperature spikes that were causing the eventual failures. This customer then installed Gateway PLUS™ units on all Compressors in their 100+ engine fleet.