

Case studies



AUTOMATED FUEL TANK MONITORING AND CONTROL ▾

A recent installation of the ADAM 5550KW Programmable Automation Controller (PAC) solved a fuel supply and engine monitoring problem for an automotive company.

SYSTEM REQUIREMENTS ▾

Test and characterise a variety of engines at their engine manufacturing plant. It was important that the whole process would run continuously, and back-up fuel tanks were provided in case the main tanks ran dry. A system was required that would raise alarms in the event of problems occurring during the characterisation process. An integrated solution with local control of both main and back-up fuel tanks, along with remote monitoring of a variety of engines in a SCADA environment was essential.

This had previously been performed using a computer attached to data acquisition modules on an RS485 serial bus; however, this solution had two major limitations.

1. If the computer crashed, or the serial and power cables to the attached modules were damaged, the system would lose its control function
2. The computer was old and had no way of being connecting to the company network for remote monitoring.

The system needed to monitor or control the following types of signal:

- 24 pressure sensors on 4~20mA process loops
- 14 temperature inputs
- 16 digital inputs
- 12 digital outputs.

SOLUTION ▾

A PAC system provided all the necessary signals and communications required for reliable operation and remote monitoring.

The benefits of using a PAC include:

- On-board processing of input and control signals plus alarm handling
- A wide choice of I/O modules for use in the eight slots of the ADAM-5550KW.
- Current loops are configured using on-board jumpers, eliminating the need for any external shunts which are often needed.
- The slice I/O module design eliminates the serial bus, because all signals and power are transmitted on the PAC's integrated backplane.
- A flexible programming environment which is IEC 61131-3 compliant lets you use different languages for each task e.g. Ladder Logic to control isolation valves; or Block Diagrams to manage email and alarms.
- On-board Ethernet connectivity to a SCADA system such as DAQFactory

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SOLUTION ▾

- VGA port for a local display with a web server connection to the SCADA system
- Integrated watchdog timers and programmable fail-safe states ensuring reliability in case of an emergency.

The whole project was implemented using existing signal wiring. The compact size and DIN Rail mount design allowed the existing panel to be used. The only addition to wiring was an Ethernet cable to connect the PAC system to the company LAN.

This resulted in a complete Measurement and Control system where operation was assured because control is performed on the PAC as opposed to a separate computer. The whole system could be monitored from a central location using Modbus/TCP which allowed key parameters such as tank level and fuel consumption to be logged and trended. This also meant efficiency and costs could be recorded. The Ethernet connection also allowed emails to be sent straight from the PAC giving 'live' reporting of events independently of the SCADA system.

EQUIPMENT USED ▾



ADAM-5550KW
8 slot Programmable Automation
Controller



ADAM-5017P
8 Channel analogue input module



EQUIPMENT USED ▾



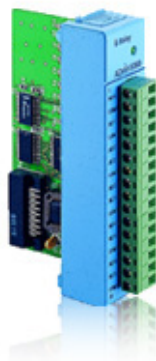
ADAM-5018P

7 Channel temperature input module



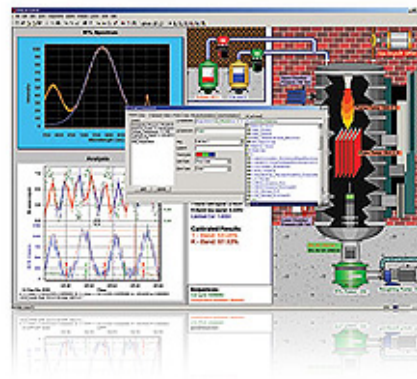
ADAM-5051D

16 Channel digital input module



ADAM-5056D

16 Channel digital output module



DAQFactory

SCADA software development environment