
To PLC or not to PLC

We are quite often asked if we will supply a PLC Instead of a data acquisition system (DAS). This is a legitimate question as most companies depend on PLC's to operate or monitor their process. Almost all have settled on one brand or another of PLC, and have personnel on staff trained on these units. Some systems houses will provide environmental monitoring systems with a PLC, but most are not major players in this industry. Most experienced, major players have learned that a DAS is required to ensure monitoring compliance with monitoring mandates.

When using a PLC, the responsibility and integrity of the monitoring system is placed in the personal computer (PC), the least reliable unit in the system. The PLC (Programmable Logic Controller) is used specifically as it was designed, basically as an I/O device. Under PC control the PLC sets and resets relays, inputs contact closures and digitizes analog inputs. If the PC is down, then the environmental monitoring process is compromised and in some cases data is being irretrievably lost. Those of us that use PC's have all been there, when in a relatively simple program such as Microsoft Word, after spending several hours preparing a document and clicking on save, the PC asks "save what." The only recovery is the old three fingered fix -Control/Alt/Del. There are even times when this does not work and the only remedy is the single finger toggle - toggle power off - toggle power back on.

This problems are even worse when an A/D converter and I/O cards or either installed in a PC or hung on an I/O port of the PC. The complete monitoring process is dependent on the least reliable unit in the system. As the name PC implies (Personal Computer) these units were designed for controlled environments interfacing with users. When these units are used in uncontrolled environments, large gaps of missing data will occur.

Even in a control room an idle PC can present an appearance of working and may go several hours before the three fingered fix can be administered. If the PC is remotely located, then longer times of missing data can easily be experienced. The programs running on the PC are much more complex and I/O interacting than Microsoft Word, thereby providing many more potential lock up modes.

In contrast, when using a DAS, the DAS normally controls the monitoring activities. A properly designed DAS is the most reliable unit in the system. It routinely conducts instrument calibrations, averages data, verifies data validity, provides alarming features, and periodically sends data to a central PC upon command. The PC provides needed, data laborious, but not time critical functions, such as archiving, reporting, networking editing capabilities. Should the PC stop, the environmental monitoring process continues to operate with collected data being stored in long term memory in the DAS, for later retrieval when the PC is again operational. When a data acquisition system is used in conjunction with a computer system a data acquisition and handling system (DAHS) is provided.

Equally important in a monitoring application is the remote access that a properly designed DAHS provides to a maintenance activity. From a remote location a technician can enter the system and have full access to the computer, the DAS and to each instrument. PC's lock up, but hardware failures are the exception rather than the rule. What normally occurs is that suddenly a parameter is being flagged bad. This is quite often traced back to extraneous events, such as a bad span because the gas cylinder was empty, or digital input lines broken by service personnel, or a user inadvertently enabling some feature not being used. In other words, these on board trained PLC technicians, are never needed to repair a unit. Should a DAS fail, it is best to have the proper support team to conduct the repair to ensure continued compliance with monitoring requirements.

At H2NS we take high percentages of valid data collection and ease of system review seriously. Unlike a PLC, the products designed and offered by H2NS were designed specifically for environmental applications. Experience has shown that the features offered by these systems are required to collect, process, report and support the complexity of an environmental monitoring system. We can not ensure this same level of data capture and can not provide this same level of support with a PLC, and therefore, do not offer systems with a PLC substituting as a data acquisition system.