Introduction to Data Logging Systems

computer interface systems. A data logger is a self-contained unit, that does not require a host to operate. It can be installed in almost any location, and left to operate unattended. Data loggers have a distinct advantage over conventional interface devices, in that they operate in this stand-alone mode, and yet have the capability to "dump" or transfer the data to a host system, if required. Most data loggers have the ability to work similarly to standard recorders, in that they provide the user with a hard copy printout of the data recorded. This data can be immediately analyzed for trends, or stored for historical archive purposes.

Data loggers can also monitor for alarm conditions, while recording a minimum number of samples, for economy. If the recording is of a stead-state nature, without rapid changes, the user may go through rolls of paper, without seeing a single change in the input. A data logger can record at very long intervals, saving paper, and can note when an alarm condition is occurring. When this happens, the event will be recorded and any outputs will be activated, even if the event occurs in between sample times. A record of all significant conditions and events is generated using a minimum of recording hardcopy.

What are the advantages of using a data logger for collecting my data?

A data logger is an attractive alternative to either a recorder or data acquisition system in many applications. When compared to a recorder, data loggers have the ability to accept a greater number of input channels, with better resolution and accuracy. Also, data loggers usually have some form of on-board intelligence, which provides the user with diverse capabilities. For example, raw data can be analyzed to give flow rates, differential temperatures, and other interpreted data that otherwise would require manual analysis by the operator.

The major difference between a data logger and a recorder, however, is the way the data itself is stored, analyzed and recorded. A common recorder accepts an input, and compares it to a full scale value. The pen arm is then deflected across the recording width, to produce the appropriate ratio of the actual input to the full scale input. For example, using a recorder with a 1 Volt full scale, an input of 0.5 Volts would move the pen 0.5/1 or 50% of the distance across the recording width. In comparison, a data logger accepts an input which is fed into an analog-to-digital converter prior to analysis and storage. This method has advantages in accuracy and resolution, while only a recorder can provide a truly continuous trend recording.

Data loggers can also offer advantages over dedicated,

What are the different types of data loggers, and how do they operate?

The differences between various data loggers is based on the way that data is recorded and stored. The basic difference between the two data logger types is that one type allows the data to be stored in a memory, to be retrieved at a later time, while the other type automatically records the data on paper, for immediate viewing and analysis. Many data loggers combine these two functions, usually unequally, with the emphasis on either the ability to transfer the data or to provide a printout of it.

How can networking be used for extensive acquisition requirements?

For users who must acquire data over many locations, and wish to have a single collection/recording point, networking is a truly viable solution. With a network, one central location is responsible for data storage and recording; data is collected by remote units in various locations, and then fed to this "master" unit for storage/recording. This is a great convenience, in that an operator can retrieve the data from one location, rather than having to go to each individual site for collection.

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The advantages of the local hard copy data loggers are that 1, the operator has a permanent recording on paper, 2, no other external or peripheral equipment is required for operation, and 3, many data loggers of this type also have the ability to record data trends, in addition to simple digital data recording.

In comparison, units with internal data storage tend to be more compact, due to the fact that no paper and recording equipment are required, and because they are much simpler electronically and mechanically. Data storage units are usually more economical. These units can also be operated in a stand-alone mode, with the ability to feed or download data to a host computer system.

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