Transparent mode for interfacing to smart instrumentation
State of the Art or "   Not Exactly" ??

Most data logger manufacturers provide a traditional data logger where analog and digital signals are connected from instrumentation to the data logger. Over a serial RS-232 port information in the logger can be retrieved or downloaded to a central processing facility. Data collection has been performed in this fashion for a good many years.

Now, all air quality instrumentation has been upgraded with embedded microprocessors to provide units that deserve a **more state-of-the-art data collection method**. All air quality instrumentation is smart and allows a user to collect data, status, calibrations and alarms as well as set up configurations, view operational parameters and conduct on line diagnostics over an RS-232 port.

In an attempt to use these features, *and not update their loggers*, some manufacturers have added another RS-232 port to their data logger for connecting to the instruments. Over the common polling RS-232 port, commands instruct the data logger to switch either to the internal data logger and retrieve data or to a pass through mode so a user can interrogate the instruments. This is a feeble attempt to adapt their existing data logger to utilize the features provided by new instrumentation.

This approach can only work properly with very limited instrumentation configurations.   If your instruments are from mixed manufacturers (for example, Thermo & API) then this approach will not work unless you throw more hardware at the solution. As all manufacturers provide different interface protocols, a multiplexing device will have to be added at each instrument so that differing instrumentation can be addressed. Even with all instrumentation from the same manufacturer, in most cases this approach will not work without additional hardware, because the instrumentation does not support multidropping connections.

In contrast, the CPP was designed to interface to all instrumentation over their serial ports, in their native language, to collect data, calibrations, status and alarms. **The CPP also allows the user direct access to the instrumentation in a real time mode,** *e.g.* **the CPP is still collecting data even when an operator is interrogating an instrument.** The instrumentation can be from different manufacturers each operating at different baud rates and with different protocols.

Newer instrumentation digitizes internal parameters and processes this information to provide a state of the art reading. Why convert this back to an analog voltage, then run it over twisted shielded pairs (where noise and ground loops can be coupled in), only to have a data logger convert the signal back into a digital signal. Rather redundant, costly and unnecessary.

Other complications exist in older data loggers as well. They convert the analog voltage into a binary signal for processing. This requires operator intervention to ensure that this binary signal can be reconverted back into the proper engineering units. In addition, mathematics and data storage in binary can lead to "conversion errors." Again in contrast, the value received from the instrumentation over the RS-232 port by the CPP is the correct reading, already in engineering units. H2NS has implemented **fully floating point routines** in the CPP. Data is accepted in engineering units, manipulated in engineering units, stored in engineering units and printed in engineering units. There are no "conversion errors" possible.

At todays state of the art, there is no good rational to purchase a logging device that provides only analog data collection capabilities, and uses binary and fixed point data manipulation. Newer State of the Art instrumentation deserves a new State of the Art logging device to take full advantage of the features inherent in such instrumentation. **The CPP was designed to fulfill this need, by providing serial interfacing to smart instrumentation with an optional analog to digital section for interfacing to not so smart instrumentation.**

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