Industrial process data validation and reconciliation or short **data validation and reconciliation (DVR)** is a technology which is using process information and mathematical methods in order to automatically correct measurements in industrial processes. The use of DVR allows for extracting accurate and reliable information about the state of industry processes from raw measurement data and produces a single consistent set of data representing the most likely process operation.

ISA-95 is the international standard for the integration of enterprise and control systems. It asserts that DVR is a serious issue for enterprise-control integration. The data have to be valid to be useful for the enterprise system. The data must often be determined from physical measurements that have associated error factors. This must usually be converted into exact values for the enterprise system. This conversion may require manual, or intelligent reconciliation of the converted values. Systems must be set up to ensure that accurate data are sent to production and from production. Inadvertent operator or clerical errors may result in too much production, too little production, the wrong production, incorrect inventory, or missing inventory.

The conventional approach to DVR assigns errors to all the measured parameters of a process so as to satisfy models of the process while minimizing the assigned errors as much as possible. Subtracting the assigned errors from the measurements gives estimates of what the actual parameter values are, assuming that the models are correct and the sensors give fluctuating readings due to a random component in their measurements. This produces a somewhat blurred image of the process state as a result of the distributed errors that are attributed to the measurements. By contrast, FALCONEER's methodology presents a somewhat sharper image of the process state because it assumes that measurements made by properly working sensors are the best guess of the actual parameter values; there is no second-guessing of random variables. The methodology provides a way to detect when the sensors are not properly working and prevents the errors introduced by such sensors from propagating to the other measurements.

Assuming that large measurement errors should be distributed as evenly as possible over all measurements is not the best way to analyze process data and draw conclusions about what state the process is in. Judiciously using model equations and allowing the possibility that most of the error is in one measurement or assumption is a better way to validate the data and estimate the true values of process parameters. FALCONEER IV provides such a methodology to judiciously evaluate data and models and to draw more accurate conclusions about the process state.