

Laboratory Balance Connectivity Streamlines Data Collection

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Connecting a balance to other devices and equipment is more than helpful; it's rapidly becoming a necessity for many laboratories. The ability to connect can speed up the entire research process, allowing faster recording of data and conversion of the data into tables, charts, graphs or other formats. Efficiency skyrockets when workers don't have to waste valuable time manually inputting their measurements and results into a computer.

It also can help minimise or even eliminate human error that can inevitably occur during the manual logging of data. These errors could lead to miscalculations or even result in failed tests, experiments and trials.

Laboratory balance manufacturers incorporate connection ports that enable the balance to transmit data to a computer. Balance-to-network connectivity has opened the door for companies to create software to accomplish the transfer of measurement data.

Many industries count on balance connectivity to record weight, mass and density. Some common applications in which balance connectivity is beneficial include science, manufacturing, industrial and medical.

When a balance is connected directly to another device, it decreases the chance of security being compromised. This is especially important in science research laboratories, where workers sometimes tap into highly classified information and formulas. Medical facilities strive to maintain patient privacy, and the ability to transmit data directly from a balance to a secure data logger or computers helps them achieve that goal.

Regulations may exist that can impact data collection processes or requirements in various industrials such as pharmaceutical, medical, or food processing, for example. Often, compliance with regulations or guidelines is necessary to receive or to continue to be accredited by organisations such as International Organization for Standardization, ISO, which offers accreditations on operational practices such as quality management systems and information security. Issues surrounding compliance usually impact security requirements, privacy, quality, etc.

Ways to Connect

The interface is a data pathway by which the information is transported from the balance to the computer. Types of interfaces used by balances and computers include RS-232, USB, Ethernet and wireless technology, such as Bluetooth.

Some balances include an interface as a standard, making them an affordable and attractive choice for laboratories on a budget. Others offer the interface as an option. It is important to ascertain which features are included on a balance when considering data collection in the laboratory.

Methods of Data Collection

Data collection can be accomplished by different devices including computers or data loggers solely dedicated to receive the information. A data logger is a separate instrument that connects to the balance for the sole purpose of collecting and recording the figures provided by the balance. (Figure 1)

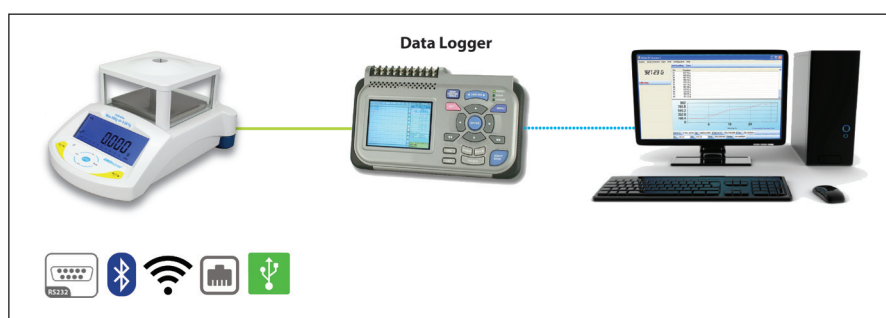


Figure 1. Data collection from a precision balance via a data logger is possible with various types of network connections. Later the data can be downloaded to a computer as needed.

Information collected by the data logger can be accessed and analysed at a later point, or it can be stored for compliance recording.

Alternatively, balances can be connected directly to other laboratory devices, allowing data from the balance to be incorporated into calculations made by that equipment. This type of data collection from the balance enables the examination and further analysis of results through other types of laboratory equipment.

Computer-based data collection provides the overwhelming benefit of being able to use and rely on the computer's processor, data storage, display and interfaces. (Figure 2)

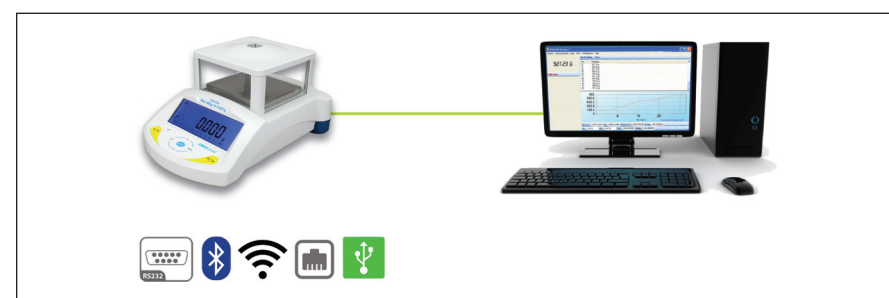


Figure 2. Data collection from a precision balance over a wired or wireless connection using data analysis software.

Data-Analysing Software

Collect™ was designed by PerkinElmer, and is one example of software that connects and controls instruments with RS-232 serial interface ports, USB, Bluetooth or TCP/IP server. The software automates data transfer and testing, connecting balances directly to other instruments running in Windows.

Software such as Collect can improve accuracy and test efficiency, eliminate manual data entry errors, and decrease overhead with a common interface solution. These types of software come with a pre-configured interface and commands for various balance manufacturers, allowing the user to add new balances at any point.

An example of a more affordable software option is Adam Equipment's Adam DU™, which allows users to quickly and easily capture data from any Adam Equipment balance having RS-232 or USB connection (Figure 3). Adam DU collects information from up to eight balances simultaneously, while monitoring, configuring and customising the data to the user's requirements.



Figure 3. Data from multiple balances can be stored on a network, using a single PC and software installation, over a wired or wireless connection.

Adam DU can provide basic remote control of the balance, in addition to graphing data and exporting the readings to other applications, including Microsoft® Excel, Microsoft Word and Windows Clipboard. Laboratory users can perform statistical analysis on readings and capture custom data, since Adam DU supports up to six additional user-defined data fields. Adam DU also is capable of logging calibration reports, allowing complete tracking of calibration records.

Laboratory Information Management System (LIMS) is a software-based system that uses specific features, such as workflow tracking, data tracking and data exchange interfaces, to support labs that must adhere to specific guidelines and regulations during operation. This includes pharmaceutical, environmental or petrochemical research and analysis. Originally, LIMS was implemented solely for sample management, but has expanded to include assay data management, data mining, data analysis and electronic laboratory notebook integration.

National Instruments manufactures its LIMS-based LabVIEW® software to provide comprehensive tools for any regulated research environment. The software simplifies complex tasks with a powerful, intuitive graphical development environment. LabVIEW can be integrated with any measurement and control hardware including balances, and it allows rapid development of user interfaces and delivers extensive data analysis and advanced control.

Pharmaceutical Industry Advancements Through Data Transfer

One industry that is reaping the rewards of improved balance connectivity and the overwhelming benefits of data collection is the pharmaceutical industry. Facing stiff competition worldwide from rivals, pharmaceutical companies rely heavily on research and development to gain an edge in the drug manufacturing arena.

Speed, efficiency and accuracy are fundamental elements of effective research and development for drug manufacturers. By incorporating data collection techniques into their technology network, pharmaceutical companies equip themselves with an excellent and simple way to accomplish their research quickly and with fewer errors.

Adam Equipment is a balance manufacturer who produces balances used in the pharmaceutical development process. According to Tom Storey, marketing director for Adam Equipment, the process of researching and developing a new medication can take between 10-15 years.

“During that time, science technicians and scientists perform numerous tests and trials of hundreds of thousands of different compounds to pinpoint those that might prove effective against diseases,” Mr Storey said. “They monitor experiments, analyse data and record and interpret results with the help of technology and balance connectivity.”

Researchers can rely on automated data collection to expedite the process instead of sacrificing valuable hours manually logging information. This can lead to heightened productivity, as it allows a greater number of samples to be tested in a specific time frame.

Today’s scientists around the world collaborate on a regular basis in their research and development efforts, drastically reducing the amount of time it takes to introduce new drugs. The ability to reach fellow researchers with data allows specialists to assist with product development, regardless of location.

Summary

Balances are an essential component in laboratory activities and functions. By examining existing methods and then implementing measures to improve processes, laboratory workers can ensure consistent, accurate data collection and more efficient workflow.

In some industries, compliance with guidelines that are necessary to maintain or achieve accreditations may impact data collection consistency, privacy and security. Benefits of these accreditations include ensuring consistency of product, integrity of both employees and systems holding highly sensitive or personal data, minimised legal exposure, and increased credibility.

The simple act of connecting a balance to a computer or data logger can reap substantial rewards such as improving lab worker productivity, maintaining data integrity, speeding up time-to-market. Each benefit results in improved efficiencies and financial savings for the company.

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PMB Moisture Analysers Incorporate Speed and Intuitive Features

With smart features developed specifically for simple operation and quick response time, **Adam Equipment’s** PMB moisture analysers offer the top value in their class. Two PMB models are available: PMB 53 provides results at 0.01%/1mg with a capacity of 50g, while PMB 202 provides results at 0.1%/10mg with a capacity of 200g.

Adam Equipment sets a new standard for data collection in moisture analysis. The automatic test-setting function lets users quickly repeat tests without added input. USB and RS-232 interfaces provide effortless computer, data logger and printer connections. There is no need for additional software to take readings, giving users total freedom to collect data on a production floor or in the field. The PMB also allows use of a flash drive to store test programs and unlimited results for future analysis.

A single 400-watt halogen bulb heats samples in 1°C selectable increments. Three heating options give users the flexibility to customise test methods and temperatures for different materials. The PMB provides rugged metal housing, a pan lifter to easily remove samples, automatic external calibration, capacity tracker and levelling bubble. Its rapid response time and intuitive features make this moisture analyser ideal for a range of applications.

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New Lab Balance Redefines the Meaning of Easy for Standard Applications

Sartorius has launched a user-friendly, highly accurate standard laboratory balance on the market: Quintix®. Its intuitive operating design guides users fast with fail-safe confidence through the many weighing applications built into the balance, helping to enhance laboratory workflows. The new Sartorius lab balance is available in a choice of 12 models with weighing capacities ranging from 120 g to 5,100 g and readabilities extending from 0.1 mg to 1 g.

The user interface of the Sartorius Quintix® balance was developed by Sartorius in teamwork with experienced lab users. All applications are shown as self-explanatory icons on the Quintix® touch screen and can be precisely selected even when the user is wearing lab gloves. The balance guides the user step by step through each weighing process, thus preventing operating errors. Quintix® features built-in applications that include weighing in %, weighing under unstable conditions and weighing components; counting, mixing, checkweighing; peak hold to determine the highest measurement in a series; density determination; statistics and conversion.

Temperature fluctuations affect the accuracy of weighing results. This is why balances must be calibrated and adjusted at regular intervals as soon as ambient conditions change. The isoCAL combined calibration and adjustment function on the Quintix® alerts the user whenever a defined time or temperature limit has been exceeded and adjusts the balance automatically using an internal weight. Moreover, the Cal Audit Trail function documents every calibration and adjustment operation for 100% traceability in quality assurance. All advanced laboratories today must provide GLP- and/or GMP-compliant documents and further process weighing data quickly and reliably. The Quintix® balance transfers its data directly over its built-in USB port to any computer in the lab, without requiring any additional software. As a result, weighing data can be easily and rapidly read into Excel or into any other program for further processing. The Sartorius Quintix® balance has been put through its paces in more than 1,000,000 stress tests involving repeatability, linearity and temperature drift. Therefore, the balance guarantees the highest metrological quality and reliability of its weighing results.



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Launch of a New Analytical Balance Line

Mettler Toledo has released a new line of Excellence Analytical Balances focused on providing users with a high level of process security whilst making weighing workflows error-free, ergonomic, and efficient. The new balances ensure worry-free weighing for users, with advanced intelligent features that secure reliable weighing results and also support quality assurance demands for error-free processes and full traceability. The green StatusLight™ indicator gives users full visibility that all balance tests are up to date and guarantees that it is safe to start weighing; thereby ensuring results are accurate and reliable. The innovative new StaticDetect™ sensor technology provides reassurance that weighing results are not influenced by electrostatic charge by automatically checking samples and containers as they are placed on the balance.

Further technology advancements, such as radio-frequency identification (RFID) read-write capabilities, integrated routine test functionality, and the newly developed graphical levelling guide simplify daily tasks and help users to comply with relevant industry regulations. By fixing SmartSample™ RFID tags to titration beakers, sample information entered at the balance can be securely transferred to Mettler Toledo’s Titration Autosampler. RFID tagged pipettes can also be scanned at the balance via EasyScan™ to check calibration and test dates, guaranteeing that pipettes are valid for use. Test dates on the tag can be updated when the pipette check is carried out using the built-in balance application. The new RFID capabilities not only eliminate transcription error but also offer users a higher level of process security.

The new balances are fully compatible with Mettler Toledo’s LabX laboratory software which guarantees process security and manages measurement uncertainty. Full traceability is assured thanks to flexible Standard Operating Procedure (SOP) user guidance on the balance touchscreen, automatic calculations and comprehensive data handling. LabX fulfils the highest process security requirements and, with all data stored securely in a central database, fully supports the move towards establishing a paperless lab.

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