

WEIGHBRIDGE TECHNOLOGY



Integration, integration, integration- **New technologies further enhance weighbridge versatility**

Introduction

Weighbridges are often seen as the unsung heroes of solids and bulk handling operations, expected to work remorselessly in the most arduous conditions. They act as vital control points for vehicles entering and leaving site and any bottlenecks at busy times cause unnecessary delays, frustration and pollution. The integration of new technologies, combined with advances in engineering, continues to improve the operational flexibility of these crucial weighing systems, bringing increased security, efficiency and effective use of weight data. Weightron Bilanciai's Sales Director Emlyn Roberts outlines how the advances are improving weighbridge versatility.



Driver-operated weighbridges are playing an increasingly important role in today's solids and bulk handling industries, offering a number of operational advantages, especially in terms of vehicle throughput, extended working hours and improved data accuracy. Two well established technologies, automatic number plate recognition systems and electronic signature pads, are now bringing further benefits to these already efficient weighbridge systems.

Automatic number plate recognition systems

Automatic number plate recognition systems (ANPR) are an important asset to any driver-operated



system and recent advances in camera technology are leading to the increased integration of this technology within weighbridge applications. ANPR systems can be used to operate traffic lights and control security barriers, thereby introducing a high level of site control and security by only allowing pre-registered vehicles to carry out weighing procedures in a highly efficient manner. They further remove the need for drivers to carry pre-programmed smart cards or keys.

Number plate details can be programmed directly into the designated weight terminal without the need for a separate PC whilst related information can include haulier details, product descriptions and

vehicle tare weights. The use of stored tare weights removes the need for double weighing in many applications, thereby speeding up collection or delivery procedures.

The latest systems include an integrated illuminator, high resolution digital camera, digital analyser and on-board relays, all contained in one standard security housing. The onboard electronics continually adjust the exposure, gain and integrated on-board IR lighting to maximise the contrast and readability of the registration plate. Unlike CCTV/PC systems, the latest generation cameras can read dirty plates and compensate for variations in plate reflectivity, strong headlamps and adverse weather conditions making them ideal for quarrying applications.

Electronic signature pads

Until recently electronic signature pads have primarily been used in the logistics and parcel delivery industry sectors. Now the technology has been developed to integrate with driver-operated weighing instrumentation. The electronic signatures act as a permanent record for each weighing and the signatures can be printed on paper receipts and also displayed on a local or central PC. The specific weighing procedure determines where the pads are located and drivers may be required to sign so that they can gain entry to and/or exit from any particular weighbridge. The signing process gives added security and traceability to the weighing process, whilst triggering an output to control traffic lights or barriers. The robust pads are designed to be fully compatible with weighbridge software packages and can either be integrated into the driver-operated terminal or, for manned installations, located in the weighbridge office.



Wireless connectivity

Wireless (WiFi) technology is rapidly expanding in the commercial world and is now starting to be used



to very good effect in weighbridge in applications such as quarries. In many applications weighbridges are located at some distance from the main offices and traditionally hard wiring was necessary to provide a suitable communications link. However, quarries are by definition harsh working environments and minimising the need for inter-wiring brings important benefits in terms of reliability, flexibility and cost. Robust wireless technology makes it far easier to establish this communication link between the weight terminal and office based PC system.

Depending on the location, wireless connectivity can be either point to point or via wireless area network (WAN) The use of solar panels to power weighbridge instrumentation brings further advantages and the combination makes it easier to relocate weighbridges if required.

Software developments

Important developments are continuing to expand in cost effective weighbridge management software, especially for multi-installation, multi-site applications. The ability to collect data and manage weighbridge installations from a central location brings obvious advantages, especially when users can configure and amend key operational aspects of the software themselves. For instance, designated vehicle access for driver-operated systems can be updated or changed remotely, removing the need to visit individual sites. Connectivity can be via LAN, WAN, GSM GPRS or phone line and added benefits may include usage activity log files, PC file back-up and the capability to view weight displays from several weighbridges on a single PC screen at any one time.

Engineering improvements

Although significant advances are being made in weighbridge data collection and management, it must not be forgotten that accurate and reliable weighing is still totally dependent on sound



engineering principles relating to weighbridge design, installation and ongoing maintenance. Despite their well established pedigree, innovative improvements in weighbridge design and build are still continuing to emerge.

Modular designs for example allow for cost effective transportation anywhere in the world via standard shipping containers. On arrival at site the

half-width sections are simply removed from the container and bolted side by side to form the requisite standard size deck modules.

Most weighbridges operate on a drive through basis. However for installations in space-restricted locations it may be convenient for vehicles to enter and leave from one end of the weighbridge only. In such installations an integral back- box provides the requisite support and stop end for the deck.

Sloping weighbridge technology

Another restriction for weighbridges may be the terrain where they have to be installed. There is now a proprietary technology which allows weighbridges to be installed on sloping sites without any adverse affects on accuracy. Weightron's sloping weighbridge concept, which is suitable for gradients of up to 1 in 20, is ideal for space restricted installations or where it is impractical or too expensive to carry out civil engineering works to establish a suitable



level area. The weighbridge can be installed to accommodate the slope either from end to end, side to side across the width of the bridge, or a combination of both. The system uses special load cell

mounting assemblies in conjunction with the weighbridge design to ensure correct load introduction. A non-slip surface prevents vehicles slipping backwards.

Weighbridge upgrades

Replacing aging mechanical and electro-mechanical pit weighbridges can be expensive, especially if they are of imperial dimensions. Weightron have developed a highly effective technique for replacing these weighbridges without expensive civil engineering work. Special adaptations are made to the pit floor to allow the fitting of load cell based decks. Modular weighbridge designs together with flexible manufacturing techniques mean special sized bridges can readily be provided to fit non-standard pit dimensions.

Radiation detection systems

Radiation detection systems can now be integrated with weighbridges to ensure radioactive material



does not enter or leave reprocessing or waste recycling plants. Sensitive detection plates are mounted at the entrance to the weighbridge and scan the vehicles and their loads for traces of radioactivity. The system automatically raises the alarm if problems are detected.

Conclusion

Sound engineering practices combined with the integration of innovative technologies continue to increase weighbridge versatility, improving vehicle throughput and site security. In parallel, developments in user configurable software and data management are bringing important advantages across a broad spectrum of industries.

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