Vehicle Weighing
Industrial Weighing and Measuring

13 News

Longer Trucks Boost Productivity
Three Simple Reasons Why

Freight carriers everywhere are pushing the limits on truck size. By using longer trucks, they hope to increase productivity as much as 20 percent. For you to profit from longer trucks, you will need longer scales with advanced weighing technology.

In recent years, freight carriers have organized to lobby for changes in regulations that limit the length and weight of trucks. The global trend toward longer trucks is being driven by the need to transport more products at lower costs and by the shortage of skilled drivers.

One group is pushing to allow mega trucks on highways throughout the European Union. Mega trucks measure 25.25 meters long and weigh up to 60 metric tons (an increase in length of almost 40 percent). Some member states already allow these longer trucks on their roads.

A similar proposal in the United States would increase the length of double tractor-trailer trucks from 28 to 33 feet per trailer. A group advocating this change estimates that it will eliminate 6.6 million truck trips annually. Carriers also are pushing to increase the gross weight limit of single tractor-trailer trucks, allowing companies that transport heavy products to fit more into existing vehicles.

In neighboring Canada, the world's largest retailer already has longer trucks on the roads. The company developed special longer trailers as a major part of its efforts to double the efficiency of its fleet.

At 53.5 meters, Australia's road trains are already some of the world's longest over-the-road vehicles. Even longer road trains have been approved for a trial period in Western Australia. These super quads in-

METTLER TOLEDO

clude a prime mover and four trailers for a total length of 60 meters.

Benefits of longer trucks

Increased productivity is the goal of carriers who are pushing for longer trucks. They anticipate several benefits:

- Profitability–Increase revenue per load by fitting more into trucks
- Optimization–Deliver more products with fewer trucks, drivers, and fuel
- Flexibility–Meet delivery schedules by increasing payload space

Longer trucks require longer truck scales. On the surface, increasing scale length might not seem like a big concern. Nevertheless, it opens the door to costly problems for most weighing technologies.

Avoid costly failures

The length of a scale determines the number of load cells, the electronic components that measure the weight on a scale. METTLER TOLEDO has supplied scales as long as 220 feet (67 meters) for filling operations. Those scales require 24 load cells, three times the number used in a typical scale.

A single lightning strike can knock out every load cell in a scale. To prevent these costly failures, POWERCELL® PDX® load cells are equipped with proven lightning protection. The more load cells your scale has, the more valuable lightning protection is to your business.

Eliminate replacement costs

POWERCELL® PDX® load cells are built to last and come with a 10-year warranty that covers the full cost of replacing failed load cells. The longer a scale is, the greater its repair costs tend to be. If you operate a long truck scale, equipping it with reliable load cells is a priority.

Load-cell systems account for about 75 percent of maintenance costs for analog scales. Table 1 highlights the main areas in which POWERCELL® PDX® technology reduces maintenance costs as scales get longer.

Analog scales require junction boxes with sensitive electronics that are easily damaged by moisture. Longer scales multiply the potential for failure by requiring more junction boxes. A POWERCELL® PDX® network eliminates the problem by eliminating junction boxes. The result is lower maintenance costs and no weighing errors caused by failed junction boxes.

Manual adjustments

Legal-for-trade scales must be certified every 6 to 12 months. If a scale is out of tolerance, it will need to be shift adjusted before you can continue using it. For even the shortest analog scale, shift adjustment is a time-consuming, trial-and-error procedure. The more load cells a scale has, the longer it takes to shift adjust it.

Component	Analog Load Cell	POWERCELL® PDX® Load Cell	Percent of Analog Scale Failures
Junction Box	1 to 6 required	0	20%
Load Cell (Typical Life)	3.5 to 4 years	Up to 5 times analog life	25%
Load Cell (Lightning Protection)	Minimal	Up to 80 000 amps	
Shift Adjustment (Typical Time Required)	Full day	Less than 1 hour	-

Table 1: Comparison of analog and POWERCELL® PDX® load cells (analog maintenance costs increase for longer scales). Nearly half of all analog truck scale failures are caused by problems with load cells or junction boxes.

Publisher/Production
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Subject to technical changes

An effective solution

POWERCELL® PDX® load cells provide an effective solution. First, they use digital compensation to maintain weighing accuracy, so shift adjustments are rarely needed. Second, they automate the shift adjustment procedure so that it can be completed quickly and with higher accuracy, regardless of whether your scale has 4 load cells or 24.

Longer scales do not have to mean bigger problems. METTLER TOLEDO offers advanced weighing technology that works hand in hand with today's longer scales to increase your productivity and profits.

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Webinar: The Latest Weighing Technology

Recent advances in weighing technology make it possible to improve the performance of even the longest truck scales. Watch a free webinar about the latest weighing technology, and find out how you can make vehicle weighing a more profitable part of your business:

- Higher accuracy
- Greater reliability
- Less expensive service

www.mt.com/powercell-webinar-ve

Weigh 400 Tons Accurately

Heavy-Duty Truck Scales Get the Job Done

Mining trucks keep getting larger, with no highway regulations to slow their growth. These gigantic off-road vehicles haul loads that stagger the imagination. To weigh them, you need the world's strongest truck scales and most advanced weighing technology.

With payloads that can exceed 400 tons, today's mining trucks seem capable of crushing anything in their path. They are far too heavy for standard truck scales, which are designed to support only a small fraction of that weight.

Exceptional strength

METTLER TOLEDO supplies heavy-duty truck scales that are capable of handling huge off-road vehicles and the massive loads they carry. Our heavy-duty weighbridges are designed for exceptional strength, using thick steel deck plate reinforced with orthotropic ribs.

The weighbridge structure has the same type of orthotropic design that is used in many of the world's most heavily travelled suspension bridges. This proven design has the strength required to handle the punishing loads exerted by large off-road vehicles.

A strong weighbridge is just the beginning. It must be combined with advanced weighing technology that will stand up to heavy loads and deliver exceptional accuracy. POWERCELL® technology has proven its ability to weigh accurately under the most adverse conditions.

Maximum payloads

Accurate weighing is vital for managing and tracking a mine's productivity. It also enables you to haul maximum payloads without damaging your equipment. By staying within safe weight limits, you extend the life of vehicles and their tires.

For analog weighing technologies, maintaining accuracy is a big problem in heavy-duty applications. Figure 1 shows the average error measured during calibration tests on analog truck scales and how that error can be projected for heavier loads. Mines that weigh their heaviest payloads on analog scales can expect errors of more than a ton for each load.

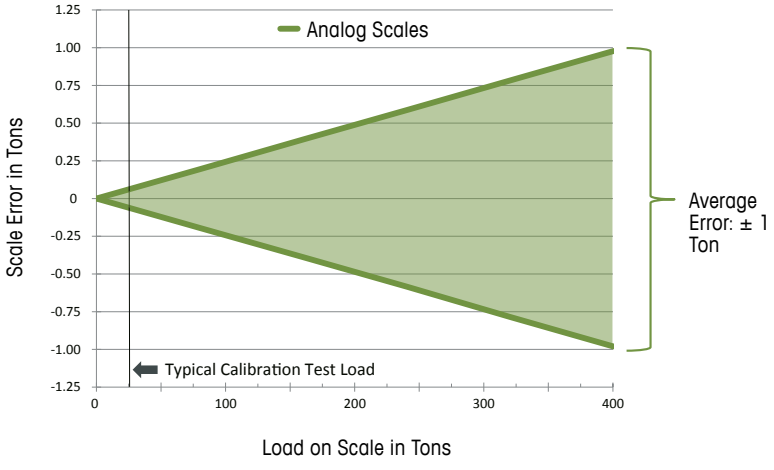

Figure 1: Average Error for Analog Scales
Scales that show an average error (< 0.05 ton) at a typical calibration test load will produce an error of about a ton for each 400-ton load you weigh.

It takes more than a strong weighbridge to weigh off-road vehicles. POWERCELL® technology provides accurate and reliable weighing for even the heaviest loads.

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Low Maintenance Costs
Heavy loads strain equipment to the breaking point. Stop paying for downtime and premature replacement of truck scales. POWERCELL® load cells have a proven history of reliable performance in the harshest environments. They maximize your profits by giving you the lowest cost of ownership of any weighing technology.

Proven Strength
METTLER TOLEDO takes the worry out of filling your heaviest trucks to the maximum. We test our weighbridge designs by applying the equivalent of millions of fully loaded trucks. This life-cycle testing ensures that our weighbridges are able to stand up to the real-world demands of heavy-duty weighing.

Mobile Weighing
A portable scale makes your weighing operation mobile. Just set the self-contained scale on level ground and form an earthen ramp at each end. There are no delays for assembly or concrete curing.

- Quick and easy relocation
- No concrete foundation
- No field assembly

Proven Durability
The Strength to Weigh a Million Trucks

Will your truck scale give you the 20 years of service that you expect? Most truck scale manufacturers answer that question with promises they cannot back up. Only one manufacturer gives you real proof that your truck scale can handle more than a million vehicles.

A truck scale is a big investment that will affect your business for decades. If the weighbridge fails after a few years of use, your budget will be hit with replacement costs that are both unexpected and expensive. To get the best return on your investment, demand a weighbridge with proven longevity.

Like many weighbridge manufacturers, METTLER TOLEDO uses computer calculations and finite-element analysis to evaluate weighbridge designs. While this testing can provide valuable information about areas of high stress, it is strictly theoretical. It does not indicate how well a weighbridge will meet the real-world demands of vehicle weighing.

When you buy a scale that has not passed life-cycle testing, you risk having to pay to replace a weighbridge due to premature failure.

When other manufacturers talk about the longevity or durability of their weighbridges, they are using guesswork. They have no data to back up their guesses. With a new weighbridge design, the best they can do is install it at a customer's site and wait years to see how long it survives. In essence, their customers test weighbridges for them.

Proven performance

METTLER TOLEDO is the only manufacturer that tests how well its weighbridges perform. Every design is subjected to the weight of 1 to 2 million fully loaded trucks.

For each new design, an actual module undergoes accelerated-life-cycle testing on our "module masher" test stand. The first "module masher" was designed and built in 1992 by the engineering and manufacturing teams at our heavy-capacity manufacturing plant in the United States. No other manufacturer has anything like it.

The test stand uses hydraulically operated feet to apply forces up to 120 000 pounds (54 430 kilograms). Attached to the bottom of each foot are two rubber pads that approximate the footprint of a pair of truck tires. For a typical test, the hydraulic feet are positioned to simulate the load applied by a dual-tandem truck axle. Each time the feet press down on the weighbridge, they exert the same force as a fully loaded truck.

Real-world testing

The standard procedure involves two stages: stress testing and life-cycle testing. During stage one, strain gauges are attached at key locations on the weighbridge. Then loads are applied in different locations to check the stress levels across the entire module.

Stage two simulates the amount of traffic that would pass over a weighbridge during its expected service life. The "module masher" repeatedly applies the maximum load for which the scale is rated. One load/unload cycle requires 3 seconds.

It takes about 2 months to complete 2 million cycles, the equivalent of 2 million fully loaded trucks driving across the weighbridge. The size of the load and the number of times it is applied will depend on which weighbridge model is being tested.

No weighbridge leaves our plant unless the design has passed a rigorous life-cycle testing program. Using the "module masher," we verify that each weighbridge we make meets design standards. It is your assurance that your truck scale is durable enough to stand up to the real-world demands of vehicle weighing for a full service life.

See the Module Masher in Action

Watch this short video to see how METTLER TOLEDO verifies the durability of its truck scales. The module masher applies the equivalent of 20 years of vehicle traffic to actual scale modules, giving you the confidence that your scale will stand up to the real-world demands of vehicle weighing.

www.mt.com/weighbridgetesting-ve

In-Motion Weighing
Accurate Weights in Seconds

Every minute spent coupling and uncoupling railroad cars holds up traffic. To move material efficiently, a manufacturing facility needed to eliminate those delays. The solution was an in-motion weighing system that saves time and money by keeping traffic moving.

Located in Hungary, the facility produces fiberboard for use in flooring, furniture, and building materials. It weighs inbound shipments of logs that serve as raw material and outbound shipments of finished fiberboard. Using the weights of the material, the company calculates prices for shipments and keeps track of its inventory.

Logs are delivered by both truck and rail. During a typical week, the facility handles three trains, each with as many as 15 railroad cars. With no railroad scale on site, the company needed to transport every train nearly 40 kilometers to have it weighed at a remote location. To eliminate this unnecessary expense, the owners decided to install a railroad scale at the facility.

Traffic restrictions

Before the project could go forward, the company needed to solve a problem that affected the local community. At the entrance to the facility, the railroad track crosses a highway. Stopping trains to weigh them would block the highway, delaying traffic for unacceptable lengths of time.

A conventional static scale was not a practical solution. To weigh a train on a static scale, workers must position a railroad car on the scale and uncouple it from the adjoining cars. After weighing the car, they reconnect it to the train and then move the train to position the next car on the scale. Weighing an entire train this way can take hours.

The coupled in-motion scale makes it possible to weigh trains without stopping them and blocking traffic on the highway outside the facility's entrance.

In-motion solution

METTLER TOLEDO worked with the company to develop a custom coupled in-motion (CIM) railroad scale for the application. The engineering team designed the weighbridge to accommodate the local rail size, special rail hardware, and a custom anti-creep solution.

Downtime was a major concern. Pouring a concrete foundation would have prevented trains from entering the facility for a month while the concrete cured. A custom foundation design allowed the installers to minimize disruption to the

plant's production schedule by setting a fully cured concrete foundation in place.

The CIM scale is equipped with wheel detectors that identify the type of railroad car as well as the car's speed and the direction it is traveling. To automate the weighing procedure, the facility uses an IND9R86 weighing controller that records weights and speeds for each car.

With the new railroad scale, transporting logs by rail is a more efficient and economical option. The ability to weigh railroad cars on site makes it viable for the company to ship more material by rail and less by truck. That change reduces the large tolls paid for highway truck traffic and makes the facility's operations more environmentally friendly.

www.mt.com/ind-rail-scales-ve

Providing a fully formed foundation eliminated the downtime associated with pouring concrete on site.

An IND9R86 controller manages the in-motion weighing process and stores weights for all railroad cars.

All-in-One Software Solution
Takes the Pain out of Invoicing

Accurate invoicing is vital to any business. Whenever you transfer data to an invoicing system, you risk costly delays and errors. Now you can automate the process with a vehicle-scale software application that handles your invoicing needs quickly and accurately.

DataBridge™ MS software simplifies vehicle weighing and manages transaction data that is critical to your business.

Now DataBridge™ MS software is available with an optional invoicing feature. It simplifies billing by generating invoices for the weighing transactions that the system processes. There is no need to export data for use in a separate invoicing application. This new feature streamlines your operation by handling all steps of each weighing transaction, from recording vehicle weights to generating invoices and compiling reports.

Eliminate costly errors

Using a separate invoicing application involves extra expenses and extra work. If you export data files from other systems to an invoicing application, you have to deal with software compatibility issues. Manual data entry can be even worse, requiring workers to spend late nights processing a week's worth of invoices. Either way, there is a real potential for costly errors.

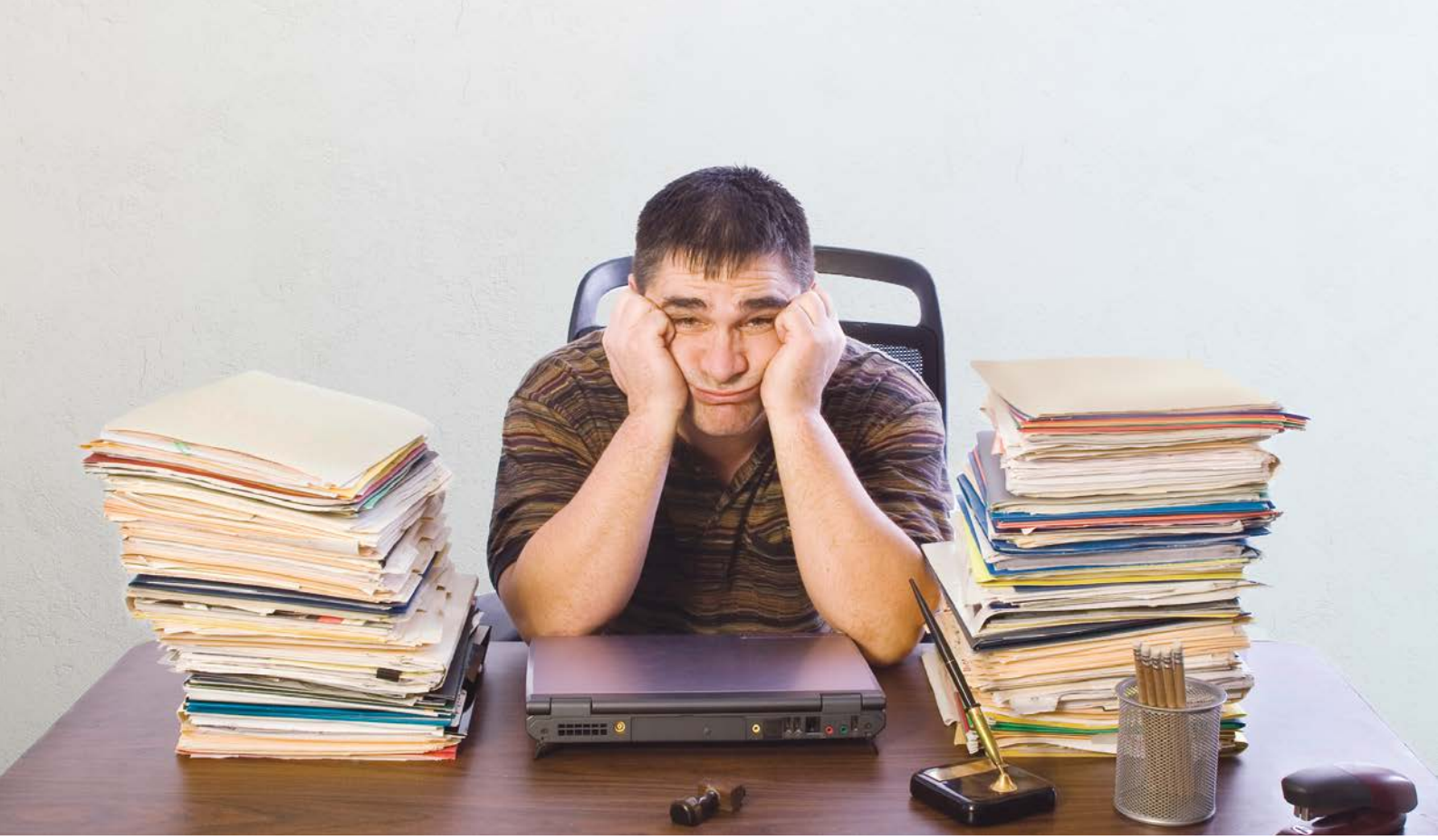
DataBridge™ MS software eliminates errors by handling the entire invoicing process. Its built-in invoicing system has direct access to the database. There is no need to export/import files and no need to enter data manually.

Quick and easy billing

With the DataBridge™ invoicing feature, your billing department has the freedom to set up billing schedules that meet your needs. Specify which customers will be invoiced and how often: daily, weekly, monthly, etc.

Generating invoices is quick and easy. At the end of a billing period, select a date range and invoice cycle. The system automatically retrieves all weighing transactions that match the criteria. You can generate invoices for all the transactions that were retrieved or use filters to select specific transactions. A security feature allows you to lock the final version of each invoice, ensuring that the files stored in the database match the invoices that are sent to the customer.

The DataBridge™ MS invoicing screen allows you to generate all the invoices for an entire billing period within a matter of minutes.



Flexible billing

DataBridge™ MS software simplifies all your billing tasks:

- Print paper invoices to mail to customers
- Email electronic invoices to customers
- Create reports from the invoice database

DataBridge™ MS software also enables you to export transaction data for use with financial and inventory systems. Export batches of data or export data in real time as transactions are processed.

With its built-in invoicing capabilities, DataBridge™ MS software makes business operations more efficient. By letting this versatile application do it all, your company can handle its billing quickly and reliably.

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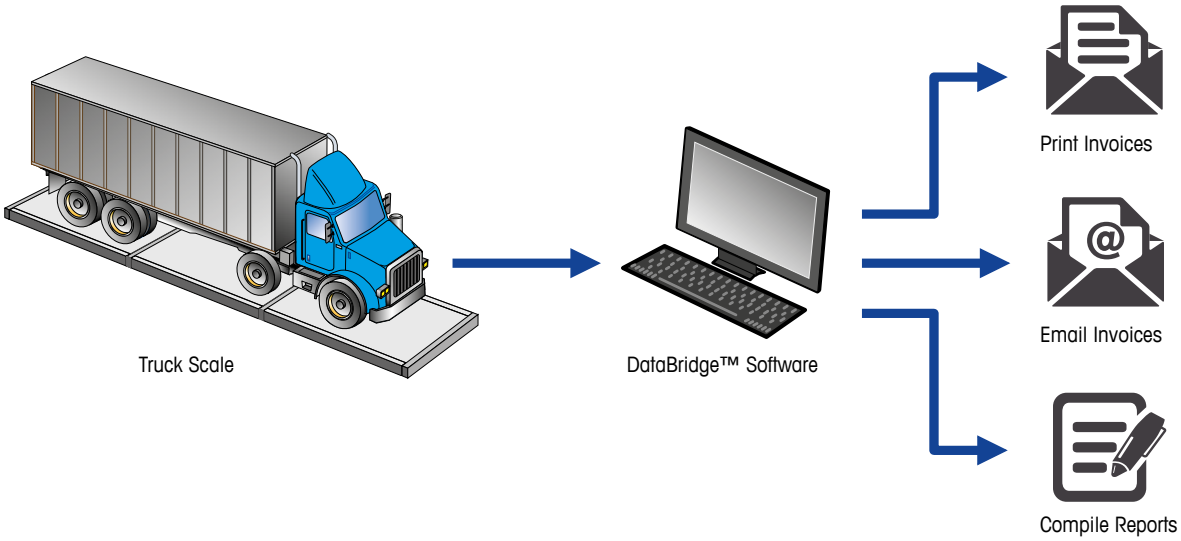

What You Need to Do
to Comply with SOLAS

Transport Your Products Safely

If you transport products by sea, you face strict new weighing requirements. The International Convention for Safety of Life at Sea (SOLAS) mandates that every shipping container must be weighed accurately before it can be loaded onto a cargo ship. The company shipping the container is as responsible as the freight forwarder. Find out what steps you need to take to meet the new requirements.

Download the free SOLAS compliance guide.

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For more Information