

Built to CELL -

Custom truck/rail scales use CPD-M digital load cells

By Tracy McCracken



Innovation comes out of necessity. Over the years, that phrase has presented many industries with new challenges and created new opportunities.

Seizing these new opportunities, B-TEK has teamed up with Coop Bilanciai International of Modena, Italy. The *inventive* alliance puts B-TEK in a strong position to, not only offer their standard scales, but to offer creative, customized solutions to any project in a variety of industries.

One such collaborative effort led to the development of the CPD-M digital load cell, which through internal calculations within the load cell itself, has eliminated the need for external junction boxes. There have been over 100,000 field installations worldwide, with consistent performance reported.

What follows, is the story of one of those “field tested” installations.

This challenging application came from a fertilizer company in Tampa, Fla.

They were already familiar with B-TEK through an earlier install of the Centurion™ truck scale. Controls & Weighing Systems (C&WS) is the dealer that helped install that truck scale. Since then, a great relationship formed through the customer service that followed. Steve Wooten, president of C&WS, worked with the customer and B-TEK Scales to relay the information,



design requirements and job site specifications.

The main objectives that had to be addressed for the customer were the multiple railcar sizes that had to load from a centrally located chute. Also, the weight of the cars needed to be read at all times. The most challenging though, was that the buildings’ footers were on both sides. It was a confined space that would require a custom solution.

The client went with the triple double deck solution, which works well for the different size railcars. For the confined space—the solution was to create a narrow width deck. This *custom* solution saved time and prevented a complete overhaul of the site that would

have cost the customer thousands of dollars.

The install was completed with three D410



indicators that stream data to the clients existing interface equipment. B-TEK provided a

state-of-the-art technical solution, turning the client’s weight readings into viable information. This information will not only see the precise weights of the cars, but provide calculations that translates into real cost savings.

Steve’s commitment to making his customers happy is what keeps them coming back—that and quality products. Steve says “the secret to my success is providing B-TEK’s superior products as solutions to my clients needs.”

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More than Indicators and Load Cells . . . Designing the “unmanned” Rail/Truck Scale



B-TEK Scales has created numerous custom weighbridge designs that meet AAR (Association of American Railroads) and AREMA (American Railway Engineering and Maintenance-of-Way Association) requirements, as well as, NTEP approval. Their rail scale designs also meet or exceed Cooper E-80 loading requirements and have 360 degree positive self-checking characteristics to

eliminate the need for flexure plates. Reaching up to 400,000 pounds total gross capacity and maintaining sectional capacity of 170,000 pounds. These rail scales have delivered accurate measurements and performed in the harshest environments. It has not gone unnoticed by the railroad industry; including those businesses that continue to use railroad transportation.

One opportunity in the Belpre, Ohio, was to implement an “unmanned” weighing system for railroad cars and over-the-road trucks on two rail lines. The client—a manufacturer of “Carbon Black” which is a key component of the tire manufacturing process, and numerous other rubber products, needed each rail to be completed in 14 days.

One of the challenges of the job required that each weigh transaction be sent via RF (radio frequency) to the shipping office located more than a mile away. Another challenge was that both scales utilize full deep-pit foundations. The construction work took place in



December and January.

The railroad charges shippers a per car fee and the client calculated that this system would pay for itself in three to five years, and nearly eliminate future overweight fines. The system consists of several hardware devices that work in conjunction with a custom software package from ScaleSoft Development. The goal was to devise a customized process solution for the client and their rail car and truck/trailer weighing needs.

The start of any system is the indicator. In this case, two Bilancai D450s stainless steel indicators were used. The indicators were custom mounted to the system panel box. The indicator itself comes standard with two separately configurable serial communication ports



that will work in RS-232, 422 or 485 modes. Adding an extra Ethernet and serial communications option card; the Ethernet card was available for continuous weight transmission over a TCP/IP network to a laptop computer, which was mounted inside the system box, the second RS-232 serial card was for a remote Super Bright LED display. The first standard port was being used for remote commands so the customer could remotely zero the scale in case of a weight buildup. The second one is reserved and utilized if there is an

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Unmanned Rail/Truck Scale ...

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Ethernet card installed.

Another important piece of hardware used was the Digi TS8 serial-to-TCP/IP conversion device which takes all RS-232 data and converts it

to Ethernet data for faster transmission times and ease of software configuration. It has room for eight total devices that utilize a TCP/IP port number related to the physical RJ-45 jack it's plugged into. The conversion box can be configured using a web interface that has several different serial-to-TCP/IP conversion options, as well as diagnostic capabilities from several tools not normally available when component troubleshooting.

Since a line of communication to the railroad company was necessary for weigh transaction acknowledgment and weigh car progression, a traffic light control system was utilized. It included the long-life super bright LED bulbs, which is controlled by the Measure-



ment Computing E-PDISO16.

This device has plenty of inputs and outputs for everything from a traffic light system, to photo-eyes, to just about any standard I/O device. It also converts this data and sends it over a TCP/IP connection that is interfaced with the free software provided called InstaCal.

Since tags could not be changed for every one of the rail cars for rail car weighing, a solution was needed for the existing RFID tags that would read older tags, newer tags and everything in between. In the process of investigating the proper hardware, the TransCore's

AI1620 SmartPass Reader was found. Not only did it read several types of tags but it was an easily configurable device that would output a standard RS-232 data string which would then convert with the Serial-to-TCP/IP converter

to be seen over the network. For truck weighing, the QSI QTERM-P40 is used for the operators to enter all of the correct information in the weighing process. It is an ASCII input operator interface terminal for the software, that inputs trailer number, yard truck being used and several other "process questions" for storing and retrieving in the database.

For power protection two 1500VA APC battery backups for every single device attached to the system was used. This protects against power surges, drops, brownouts and blackouts when used in conjunction with proper grounding techniques that the scale engineers follow when installing the scales.

This system is enmeshed with all of the latest communication technologies, which allow most changes to be made within a few minutes time, because of the remote administration software and broader high-speed internet availability. Everything from customized reports to new hire training, can be accomplished with these solutions.

B-TEK has excelled for years at providing built-to-fit vehicle scales as well as standard sizes. With the current number of grass-root projects greatly diminished, B-TEK can help dealers in their service areas by providing custom truck scale solutions. Worn out truck scales will continue to need replacing, and B-TEK can provide scale dealers with retrofit solutions. Our unique Hybrid and Centurion motor truck scale design allows the weighbridge length, width and scale height to be modified very easily.

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