

**TECH WEIGH**

# ScrapMaster

Onboard Crane Scrap Weigh System



# 35K & 70K Load Cell:

## *Magnet Application*

### **DURABILITY**

BUILT TO HANDLE SCRAP YARD ENVIRONMENT AND CRANE USAGE

### **CUSTOM**

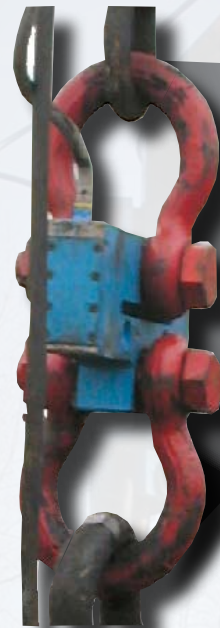
CUSTOM SOFTWARE TO FIT CUSTOMER BATCHES AND LOADING PRACTICES

### **ACCURACY**

CAPABLE OF 1% ACCURACY RATES

### **UNIQUE**

SIMPLIFIED CONSTRUCTION AND INTUITIVE FEATURES CREATE A SYSTEM THAT IS EASY TO OPERATE AND GREATLY REDUCES THE NUMBER OF COMPONENTS TO MAINTAIN



### **APPLICATION:**

The load cell is designed to replace the existing lifting yoke at the point where the grapple or magnet is attached. The scrap is weighed in motion as it is loaded into a RR car, truck or bucket.

The system is perfect for scrap loading and blending, allowing the crane operator to get precise weight information instantly. The scale can be complimented with several instrumentation packages that are available through TWS Scrap Management Systems.

### **35K & 70K LOAD CELL SPECIFICATIONS:**

- Load Cell Model #DSB-CA
- Capacities up to 500,000 lbs.
- Rated 3 mV/V
- 700 ohm bridge
- High Alloy
- Temperature range 0 to 150 deg. F



### **TYPICAL OPERATION:**

1. The operator enters his ID number
2. The operator will pick the type of scrap he will be loading into either a RR car, truck or scrap bucket.
3. Choose either railcar, truck or bucket
4. Enter the railcar, truck or bucket ID number
5. The crane operator will press a button while loading the scrap that will capture and record
6. The individual lifts will record and accumulate
7. The crane operator will have the ability to stop a blend (load), id a second blend (load) and complete that transaction. He can then come back to the first load and complete that blend by ID.
8. Once finished the operator will hit store and the information will be stored.
9. The system has the capability of loading seven buckets, cars or trucks at the same time with ID numbers.
10. At the end of a shift the operator can print a record or send to a computer all the day's transactions:
  - Time & Date
  - Railcar, Truck or Bucket
  - Grade of Scrap
  - Number of lifts per batch
  - Total value of accumulated weights

Note: Each system will be customized to fit your specific loading requirements.

# 500K Load Cell:

## *Grapple Application*

### **SYSTEM COMPONENTS:**

- One (1) ScrapMaster Load Cell
- Interface Cable to Crane Cab
- One (1) Instrumentation Package
- ScrapMaster Software
- Motion CPU Board
- Motion Light System
- One (1) Printer with Interface
- Operator Selectable Option of Weighing in Automatic or Manual Mode

### **PATENT:**

The ScrapMaster is patented under the United States Patent and Trademark Office.

U.S. Patent Number: 7,514,639



### **500K LOAD CELL SPECIFICATIONS:**

- Load Cell Model #DSB-CA
- Capacities up to 500,000 lbs.
- Rated 3 mV/V
- 700 ohm bridge
- High Alloy
- Temperature range 0 to 150 deg. F

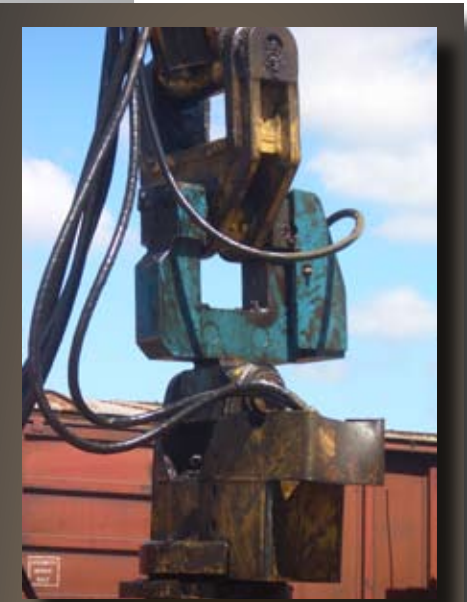


# True, the ScrapMaster is innovative and different.




Different, but not difficult. Actually, the brilliance of the ScrapMaster lies in its simplicity. Truly the first on board, crane weigh system to weigh accurately in motion, the ScrapMaster employs a simplified construction and intuitive features to create a system that is easy to operate and greatly reduces the number of components to maintain. The entire system consists of only one load cell and one instrument. Appropriate from basic weighing to advanced blending applications, the ScrapMaster delivers customized software to meet the customer's specific needs at a fraction of the cost of traditional weigh systems. Operating at prominent speeds to decrease loading time, the ScrapMaster still performs with unprecedented efficiency. In a time when companies expect more from their equipment, the ScrapMaster delivers.

## Design & Operation

Throughout the past several years, numerous modifications have been made to the load cell and software, which have resulted in the final product currently dominating the scrap yards today. In perfecting the system, the load cell was designed to withstand the abuse of a scrap crane using a grapple or magnet. This unique one-piece construction load cell is made of high strength alloy steel to withstand the abusive environment of a scrap yard. It has capacities ranging from 25,000lbs. to 500,000lbs. and can accurately weigh "picked" loads of 500lbs. The scrap crane with a grapple is able to induce very high compression loads as the operator drives the grapple into the scrap pile. When the system is calibrated, the grapple is tared out, allowing only the actual weight of the scrap load to be measured while in motion. Easily integrated into new and existing crane systems, the load cell and pin directly replace the adaptor at the point where the grapple or magnet is attached to the crane. Installation requires no mechanical modification to the existing crane, allowing it to be completed in one day. Although the general construction of the system is the same for all cranes, the software is customized to each end user. The 920i indicator is the second component comprising the system, which is mounted in the cab of the crane along with the printer. The customized software and indicator allow each customer to manage critical information and use the ScrapMaster for their specific applications. Battery-backed memory allows the customer to customize database fields to store information like ID numbers, transactions and formulas. In a typical blending operation the melt shop is able to create the "recipe" they want for each heat. They can then program the ingredient amounts and send them directly to the cab of the crane. As the operator runs the grapple into the scrap pile, the weight will fluctuate in traveling from the pile to the bucket. Once the weight is stable, the operator will be given a prompt and can accept the load without having to stop or slow down. In the automatic mode the weight will automatically be taken when a preset motion stability is recognized. This results from the motion compensation system and software, eliminating inaccuracies caused by G-forces when the crane is in motion. The information given at the end of the heat is transmitted to #2 management and shows how close the operator came to the desired weights. These numbers are significant not only for the quality of steel but for cost control as well. Identification of which crane operators are most efficient can also be determined by these results. Until now, traditional weigh systems have been limited to loading one vessel at a time. With the innovative technology of the ScrapMaster, operators can identify, prioritize and execute multiple load outs simultaneously. The operator has the opportunity to stop one blend, id a second blend and complete that transaction. The system will hold the weight of the first blend, allowing the operator to return and complete it by id. In an age when multi-tasking has become a basic instinct, the in motion system flourishes with the ability to load seven blends at the same time with id numbers.



## Maintenance & Durability:




“It makes my job so much easier,” proclaims Johnny Jenkins, Maintenance Electrical Leadman at Nucor-Yamato Steel. As Johnny is in charge of all maintenance work for weigh systems in the scrap yard, he says the ScrapMaster out performs all other on-board weigh systems. The reason is its mechanical simplicity. The ScrapMaster greatly reduces the number of components to maintain in an on-board system, as it uses only one load cell, as opposed to multiple load cells and hardware used in other onboard systems. In the traditional onboard weigh system; there are two sets of three load cells positioned in triangular formations located in the weigh car. They are required to weigh the platform deck, the car itself and an additional shock load factor added to compensate for dropping the scrap into the bucket. Overall, an estimated 300,000lb dead load has to be tared before the weight of the scrap can be measured, causing the sensitivity of the load cells to be decreased. Typical systems also require the bucket be properly secured to the car, involving additional mechanical structures. The car itself also has to be constructed to allow for the flexure of the bucket, making it less durable. The ScrapMaster eliminates these components all together. Using the in motion system, the car itself would not require any load cells because the scrap is weighed in motion before it reaches the bucket.

Constructing and maintaining weigh cars for traditional on board systems, costs an average of \$300,000.00 per car. The ScrapMaster costs \$45,000.00 per crane, but allows the car to be built more durable, eliminating the need for load cells and flexure compensation, greatly reducing maintenance costs. In most scrap yards, there is a two to one car to crane ratio, meaning the in motion system is not only cheaper, but also applicable to more than one car.

The ScrapMaster offers not only brains, but brawn as well. Its high strength alloy steel construction is extremely durable, built to battle the harsh scrap yard environment. In the event of a crane smashing into the side of the bucket, traditional systems can easily be damaged causing increased inaccuracy. In perfect working order, a typical system only performs within 1% accuracy. Any damages to the car or load cells will decrease that accuracy. To boot, there are many components to troubleshoot when problems arise with transfer car weigh systems. Utilizing the in motion system, the scrap is weighed by the time it reaches the bucket, and the strategic location of the load cell prevent it from being affected by intense blows, allowing it to achieve up to .25% accuracy rates. If problems should arise, one load cell and components that are field changeable and readily available minimize troubleshooting the in motion system.

## Testimonials:

### Nucor-Yamato Steel:



When melting 2 ½ million tons of steel per year, and reaching forty to fifty million dollar profits, there is no room for mistakes or inefficiencies at Nucor-Yamato Steel. That may be why when asked about the ScrapMaster’s performance in his yard, Johnny Jenkins just smiles and nods his head in approval. Jenkins has been part of the team that has worked on perfecting the ScrapMaster throughout its development. After installing his first in motion, on board crane scale, Jenkins claims he is reaping more benefits than originally expected. Not only has his maintenance time and costs decreased, but his inventory control has become more accurate as well. Johnny has set up his operation to radio off the crane to a remote location, Level 2 (computer software used to keep inventory.) He now has more accurate calculations for his yield of scrap used, to steel out the door. He gets a more accurate count of tons melted, and a more precise yield when comparing that to tons of steel produced. Nucor is also seeing cost decreases in the area that fewer mistakes are being made in overloading expensive scrap. When loading as many 500,000lb buckets as Nucor does, overusing an expensive scrap increases costs more than a few pennies. Customized software of the in motion system, allows the operator to have an exact “recipe” for each heat directly sent to his crane cab, reducing the overloading of incorrect scrap that could potentially cost the steel mill much more than expected. Overall, decreasing costs have led to increased confidence in the Nucor scrap yard. With printouts that show exact amounts of scrap loaded into each heat, the management at Nucor-Yamato is confident they are producing the quality steel they promise their customers. As for the opinion of the man who took the chance on purchasing the ScrapMaster, Jenkins says, “It’s a great system that makes everything easier. I’m pleased with it’s performance and have a second one ordered and on the way.”

“It makes my job so much easier!”  
- Johnny Jenkins, Nucor-Yamato Steel

## Hummelstein Recycling:

It may be a different environment and application, but the performance and benefits are still the same...outstanding. Located in Jonesboro, AR, Hummelstein Recycling was the first Hummelstein plant to have an in motion system installed on their crane. They are a smaller scrap yard that loads trucks and railroad cars. The problem they had before the ScrapMaster was overloading their trucks and cars. Chris Scercy, manager of the scrap yard, says the nearest scale to weigh his railroad cars is located 150 miles away in Pine Bluff, AR. If, after sending his loaded cars to be weighed, they were overweight, he was fined thousands of dollars. To buy a rail scale for his yard to weigh the cars on sight would cost him close to quarter million dollars. The same problem existed for loading his trucks. Though he has a truck scale in his yard, he was wasting a great amount of time filling the truck only to find it was overfilled, then taking too much scrap out and having to refill again. Not only was time wasted, but also attitudes of the operators and yard workers were negative and tempers were tested. In the event a truck arrived at the state truck scale still overweight, Scercy incurred cost between \$1,000 and \$2,000. Plus, he was required to pay a contractor to unload the scrap and then sell the overloaded scrap to the contractor for a lesser price than would be expected. The answer to all of these problems came when Scercy decided to buy an in

motion scale. The ScrapMaster installed at the Hummelstein yard was the first one to go into operation. It has been running for over a year now, and even though Scercy cringes when he walks into the yard and sees his operators banging and beating it up, it has had no problems to date. Scercy expresses, "It's one of the best purchases I've ever made!" His operators are able to change projects and load several different trucks/cars at the same time without losing the weights of each load. They can accurately load a car in about one hour as opposed to the lengthy process they used to go through. "It gives you a piece of mind when sending a car out," explains Scercy of his newfound confidence in the ScrapMaster. And confident he should be. Since purchasing the in motion system, his cars and trucks have never once been overweight. To load a 50,000lb truck, it takes about 25-30 picks. After being weighed on a state certified scale, his trucks come within a 100lb difference. The 197,000lb rail cars (which hold 130,000lbs of scrap) are loaded using approximately 40 picks and they come within a 300lb difference. Based on these calculations Scercy is averaging better than .25% accuracy on all his weights. After reviewing all these aspects, Scercy says the ScrapMaster has already more than paid for itself.

**"It's one of the best purchases I've ever made!"**  
~ Chris Scercy, Plant Manager,  
Hummelstein Recycling

## Specifications

- Load Cell Model # DSB-CA
- Capacities 25,000 lb. to 500,000 lb.
- Capable of 1% Accuracy Rate
- Rated 3mV/V
- 700 ohm bridge
- Stainless Steel & High Alloy
- Temperature Range 0 to 150 deg F.
- Customized Software
- Patented by the United States Patent and Trademark Office
- Patent No. 7,514,639

## System Includes:

- In-motion scale
- Instruments and Software
- Printer
- Power Inverter
- Upper and Lower Adaptors (mounting)
- All Cable and Summing Box

## On-Site Locations

- WMG, Cleveland, OH
- Hummelstein Recycling, Jonesboro, AR
- Acme Refining, Joliet, IL
- Acme Refining, South Chicago, IL
- Wallstreet Recycling (2), Cleveland, OH
- Scrap Metal Services (4), Burns Harbor, IN

Since 1986, Technical Weighing Services, Inc. has engineered, manufactured and installed Weighing Systems, Roll Force Measurement Systems and Strip Tension Systems for the steel industry, aluminum plants and paper mills throughout the United States. Our Process Control Systems Group was formed to compliment the mechanical weighing aspects of our business. In 2001, our products became available to the international market.

The effective application of weighing science technology demands more than a piece-meal approach. TWS can provide tightly coordinated services such as mechanical design, fabrication, installation, controls design and build, and turnkey project management, thus assuring a successful project.

TWS success is credited to our ability to provide quality systems at competitive prices worldwide. Quality programs [such as ISO 9000 and 17025] assure our customers that they receive quality as well as on-time delivery.

**TECH WEIGH**

# A WORLD LEADER IN SCALE TECHNOLOGY

"The ScrapMaster"  
Patent No. 7,514,639

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