




**Suresh Chandra Bose**  
**Fraud Prevention & Vehicle Automation**  
Introduction to DataBridge software and Unattended Vehicle Weighing System



Introduction to Mettler Toledo

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC<sub>2</sub>**

**Knowing Mettler Toledo and Keynote by Herb Atens (GM VEH)**

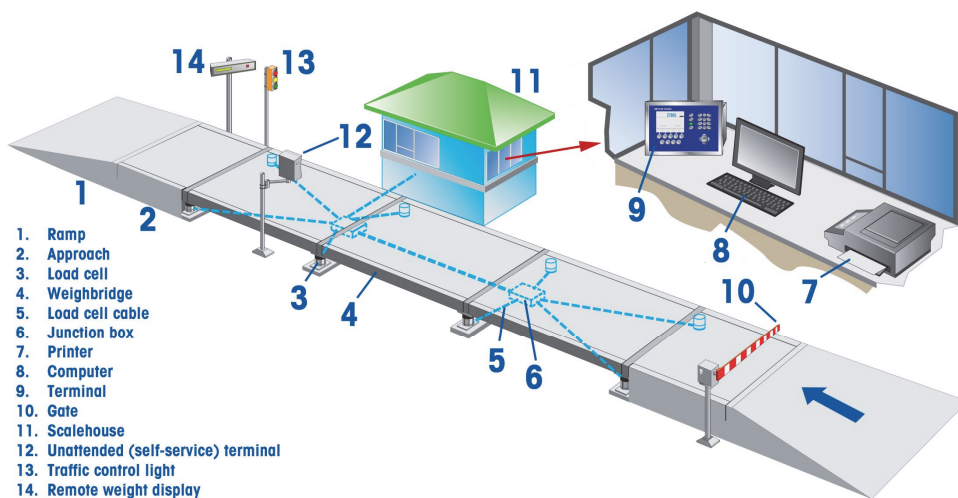
Pre-recorded

For internal use - Confidential



- **Mr. Suresh Chandra Bose**, Regional Product Manager for AP region. Worked with METTLER TOLEDO Asia Pacific regional office for over 10 years.
- Part of responsibility to establish effective project lifecycle management for all VEH related applications in AP/AMEA region.
- Continuously enhancing and improving support to regional Market Organizations not to mention promotion of sales and project timelines.
- Was previously Mettler-Toledo AP office Product Inspection X-Ray technical support trainer, field service engineer and product testing lead.
- Over 18 years in semiconductor lithography, process and equipment engineering, X-Ray tube manufacturing, sockets and switchgear process development.

**How does Weighbridge system look like?**



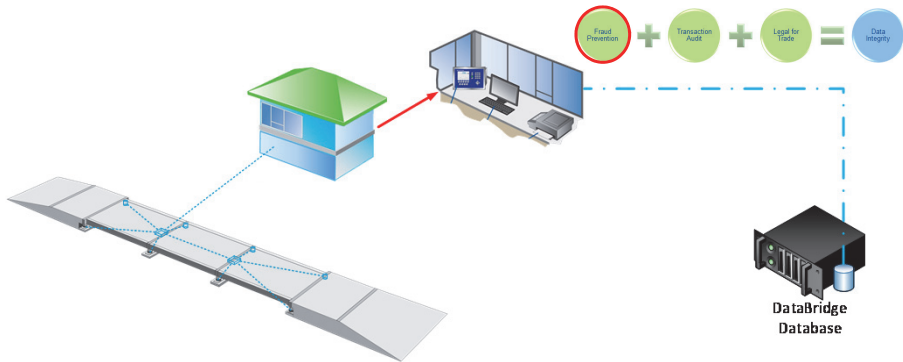


### What is Considered?

Key Considerations in achieving Data Integrity:



### Data Integrity in Vehicle Weighing – Weak Points



Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>7</sup>

**Data Integrity in Vehicle Weighing – Weak Points**

Fraud Prevention + 
 Transaction Audit + 
 Legal for Trade = 
 Data Integrity

DataBridge Database

A → B → C → D → E

⚠ E.g. Improper Positioning, Tare Weight Manipulation  
⚠ E.g. LC Cheating Device  
⚠ E.g. Hi-jack COM Port or Software  
⚠ E.g. Modify Weight via Software  
⚠ E.g. Modify Weight in database

Actual Weight → Measured Weight @ Load Cells → Displayed Weight @ Terminal → Recorded Weight @ PC → Stored Weight @ Database

For Internal use - Confidential

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>8</sup>

**Data Integrity in Vehicle Weighing**

**Data integrity** is the maintenance of, and the assurance of the accuracy and consistency of, **data** over its entire life-cycle.

- Ensure data is securely transmitted from weighbridge to backend system
- Prevent or mitigate opportunities to manipulate data
- Provide tools to monitor data health
- Track and trace any changes made to data in the backend
- Secure the nodes where hardware and software interface

Data Integrity

Consistent Support      Operational Efficiency

For Internal use - Confidential

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022

**APEC**

Asia-Pacific Economic Cooperation

## What software is used to support the system?

**DataBridge™ SS**  
Scale House Software



**Start Weighing**

- Connect 1 or 2 scales
- Single Workstation Access
- Standard Weighing & Transaction Management

**DataBridge™ MS**  
Scale Management System



**Optimize Weighing**

- Connect up to 6 scales/seat
- Multiple Workstation Access
- Unattended Weighing
- Add-On Modules

**DataBridge™ ES**  
Scale Enterprise Solution



**Unleash Weighing**

- Multi-site data management
- Consolidated Central DB
- Custom System Design
- Centralized Web Reporting


Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022

**APEC**

Asia-Pacific Economic Cooperation

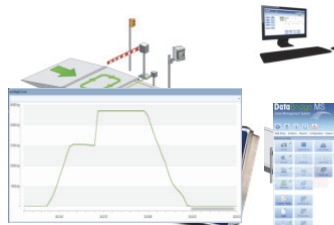
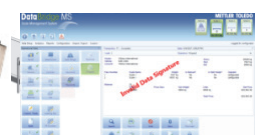

## Why DataBridge?

- DataBridge MS unattended enables drivers to complete their own weighing transactions
  - 2 driver terminals per scale for bi-directional weighing
  - Connectivity for up to 12 Outputs and 8 Inputs
  - Automatically reconnects after power and network outages
- DataBridge MS unattended collects all the weighing information your business needs
  - User definable driver prompts (questions) to guide each driver through a transaction
  - All text and tickets in the native language of the driver
  - English, French, Spanish, German, Swedish, Norwegian, Dutch, Chinese, and Vietnamese
  - More languages possible

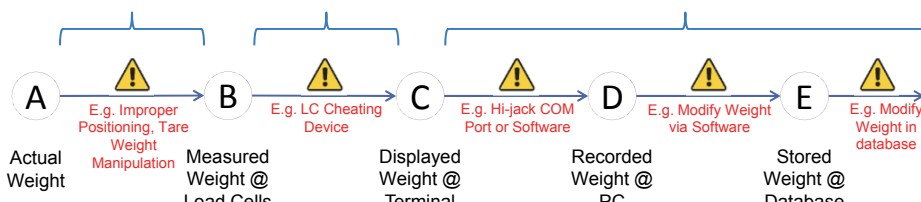


Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>11</sup>

**Data Integrity in Vehicle Weighing - Prescription**

Encrypted Communication with Live Weighing Process & Automation
Breach Detection Invalid Data Signature
Global Certifications
Avoided Weight History Automation



**A** Actual Weight → **B** Measured Weight @ Load Cells → **C** Displayed Weight @ Terminal → **D** Recorded Weight @ PC → **E** Stored Weight @ Database

A: E.g. Improper Positioning, Tare Weight Manipulation  
 B: E.g. LC Cheating Device  
 C: E.g. Hi-jack COM Port or Software  
 D: E.g. Modify Weight via Software  
 E: E.g. Modify Weight in database

For internal use - Confidential

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>12</sup>



**Transaction Audit**

**Altering Data : A simple way to lose millions!**

Fraud Prevention + Transaction Audit + Legal for Trade = Data Integrity

A major bulk goods manufacturer in the U.S. was **robbed of \$2 million worth of product over a period of a couple years—all at the hands of a scale-house attendant** working with several drivers to alter their weigh tickets. Company leaders thought their systems were secure, which serves to prove that truck-scale fraud can happen to anyone.

1. A scale-house attendant works with one or more drivers **to alter data to the drivers' benefit, and the attendant then gets a cut of the profits**. Some small operations rely on hand-written tickets for transactions. These are especially easy to alter maliciously and by mistake.
2. Another variation of data altering can occur if the data-management software used is insecure and susceptible to hacking. Often, **free programs are less secure** and can easily be accessed from the backend by hackers, going undetected in most cases.



### Transaction Audit

#### How Can METTLER TOLEDO Help Combat Altering Data?

DataBridge™ MS Software by METTLER TOLEDO is the answer to all data-altering cheats at the scale. A secure system that is not vulnerable to hacking is critical for your business. Additionally, any data altering that is done within the system will be tracked. If a scale-house attendant alters data for malicious reasons, the software documents it. Knowing those actions could cost employees their jobs is an effective deterrent to these crimes.

The diagram shows a flow: Fraud Prevention (green circle) + Transaction Audit (red circle) + Legal for Trade (green circle) = Data Integrity (blue circle). Below this is a screenshot of the DataBridge MS Scale Management System software interface, showing various menu options like Data Setup, Analytics, Reports, Configuration, Import / Export, and Help.

3




### Prescription - Audit & Track Changes

#### Each transaction has its own Relevant Data Signature

The screenshot shows the DataBridge MS Scale Management System interface. At the top, there are three digital scales labeled 'Scale 1' with zero readings. Below is a transaction record for 'Transaction 77 - Complete' dated 4/4/2017 1:58:20 PM. The record includes details for the hauler (Wimac International), vehicle (BUN 2394), and account (Wimac International). It lists two passes with weights of 7837 kg and 16931 kg. A table of materials is shown with a net weight of 8994 kg and a net price of \$26,982.00. A large red watermark 'Invalid Data Signature' is overlaid on the transaction details. The interface also shows various operational data icons on the left and control buttons at the bottom.


For internal use - Confidential

7




Asia-Pacific  
Economic Cooperation

Capacity Building Workshop On Understanding Conformity  
Requirements For Software Controlled Weight And Measuring  
Instruments For Sustainable Trade 2022



## Prescription - Transaction Audits

Auditors can easily track all changes made to a transaction record.



|                    |                      |                      |          |
|--------------------|----------------------|----------------------|----------|
| Transaction Number |                      | 82                   |          |
| Vehicle            |                      | BJN 2394             |          |
| Hauler             |                      | Wilmar International |          |
| Load:              |                      | 1                    |          |
| Account            | Wilmar International | Contract             |          |
|                    |                      | Gross Tare           | 18519 kg |
|                    |                      | Net                  | 8466 kg  |
|                    |                      |                      | 10053 kg |

| Material | Price  | Per | Converted Units | Material Cost |
|----------|--------|-----|-----------------|---------------|
| 01       | 3.0000 | kg  | 10053 kg        | \$ 30,159.00  |


Note:

| Pass | Date               | Scale   | Weight   | Is Manual? | User         |
|------|--------------------|---------|----------|------------|--------------|
| 1    | 4/5/2017 9:41:33AM | Scale 1 | 18519 kg | No         | configurator |
| 2    | 4/5/2017 9:41:50AM | Scale 1 | 8466 kg  | No         | configurator |

Changes since completion


| Table | Date           | Type | Field Name         | Old Value          | New Value          | Workstation Id | User Id       | Sql User ID |
|-------|----------------|------|--------------------|--------------------|--------------------|----------------|---------------|-------------|
| Load  | 4/5/17 9:41 am | U    | RelevantDataSign   | DABCCF28           | 8CCAF94D           | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | NetWeight          | 18519              | 10053              | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | ConvertedUnits     | 18519.000000000000 | 10053.000000000000 | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | TareWeight         | 0                  | 8466               | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | NetWeight_zh       | 壹万捌仟伍佰壹拾玖          | 壹万零伍拾叁             | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | TareWeight_zh      | 捌仟肆佰陆拾陆            |                    | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | TareWeightVehicle  | 0                  | 8466               | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | TotalMaterialPrice | 55557.00           | 30159.00           | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | TotalPrice         | 55557.00           | 30159.00           | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:41 am | U    | Status             | 2                  | 1                  | MY00W-PHUIAN-1 | configurator  | DataBridge  |
| Load  | 4/5/17 9:43 am | U    | GrossWeight        | 18519              | 20000              | MY00W-PHUIAN-1 | Microsoft SQL | sa          |

For internal use - Confidential




Asia-Pacific  
Economic Cooperation


Capacity Building Workshop On Understanding Conformity  
Requirements For Software Controlled Weight And Measuring  
Instruments For Sustainable Trade 2022



## Prescription – Transaction Audit

Auditing transactions with confidence while simplifying the operator's job.







- Providing true visibility on each and every transactions that the operator have accepted/completed.
- Identify edited transactions and its changes for auditing.

For internal use - Confidential









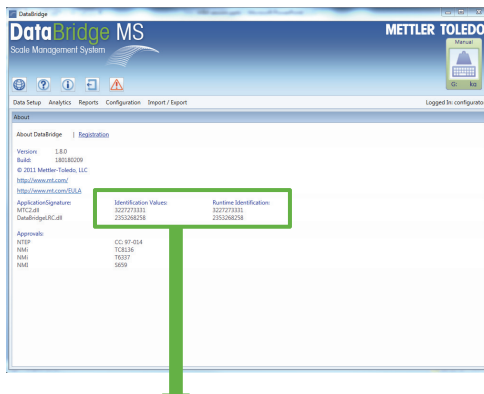
Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022



## Legal for Trade


+

+

=



### Why Legal for Trade?




| Identification Values: | Runtime Identification: |
|------------------------|-------------------------|
| 3227273331             | 3227273331              |
| 2353268258             | 2353268258              |

- Confidence to the customer that the data integrity is ensured.
- Assurance of a certified weight for their transactions based on government's approval.
- DataBridge™ MS™ is certified globally as a legal for trade software.
- Approved by :
  - NTEP
  - OIML
  - Nmi
- Every install has a checksum for verification. If the checksum is different, then it signifies the application has been tampered with, breaking the legal for trade approval.

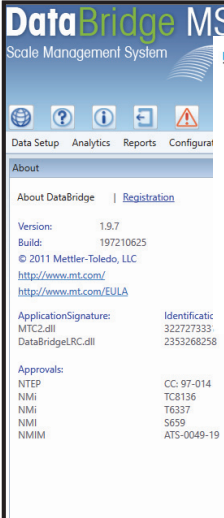
For internal use - Confidential





Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022



## A software you can trust – NTEP/OIML Approved




| Approvals: | CC: 97-014  |
|------------|-------------|
| NTEP       | TC8136      |
| NMi        | T6337       |
| NMI        | S659        |
| NMIM       | ATS-0049-19 |


| Approvals: | CC: 97-014  |
|------------|-------------|
| NTEP       | TC8136      |
| NMi        | T6337       |
| NMI        | S659        |
| NMIM       | ATS-0049-19 |

For internal use - Confidential

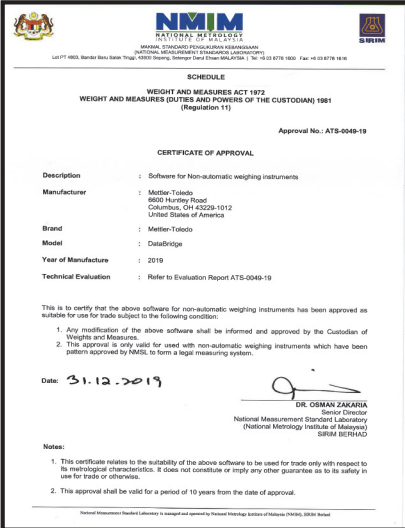


Asia-Pacific  
Economic Cooperation

Capacity Building Workshop On Understanding Conformity  
Requirements For Software Controlled Weight And Measuring  
Instruments For Sustainable Trade 2022



### A software you can trust – NMIM and Nmi Aus



**SCHEDULE**  
**WEIGHT AND MEASURES ACT 1972**  
**WEIGHT AND MEASURES (DUTIES AND POWERS OF THE CUSTODIAN) 1961**  
(Regulation 11)

Approval No.: ATS-0049-19

**CERTIFICATE OF APPROVAL**

**Description** : Software for Non-automatic weighing instruments

**Manufacturer** : Mettler-Toledo  
6000 Hunting Road  
Columbus, OH 43229-1012  
United States of America

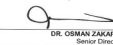
**Brand** : Mettler-Toledo

**Model** : DataBridge

**Year of Manufacture** : 2019


**Technical Evaluation** : Refer to Evaluation Report ATS-0049-19

Date: 31.12.2019


  
 DR. SEMAN ZAKARIA  
 Senior Director  
 National Measurement Standard Laboratory  
 (National Metrology Institute of Malaysia)  
 NMI (NMIHQ)

Notes:

- This certificate relates to the suitability of the above software to be used for trade only with respect to its metrological characteristics. It does not constitute or imply any other guarantee as to its safety in use for trade or otherwise.
- This approval shall be valid for a period of 10 years from the date of approval.



NMI S659  
Rev 1

  
 Australian Government  
 National Measurement Institute  
 Bradfield Road, West Lindfield NSW 2070

**Supplementary Certificate of Approval**

**NMI S659**

Issued by the Chief Metrologist under Regulation 60  
of the  
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

METTLER TOLEDO Model DataBridge™ Point of Sale (POS) System  
submitted by Mettler-Toledo Limited  
220 Turner Street  
Port Melbourne VIC 3207

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.


This approval has been granted with reference to document NMI MT, Pattern Approval Specifications for Point of Sale Systems, dated June 2012.

This approval becomes subject to review on 1/03/19, and then every 5 years thereafter.

DOCUMENT HISTORY


| Rev | Reason/Details                                                          | Date     |
|-----|-------------------------------------------------------------------------|----------|
| 0   | Pattern & variant 1 provisionally approved – interim certificate issued | 26/02/14 |
| 1   | Pattern & variant 1 approved – certificate issued                       | 30/04/14 |

For internal use - Confidential



Asia-Pacific  
Economic Cooperation

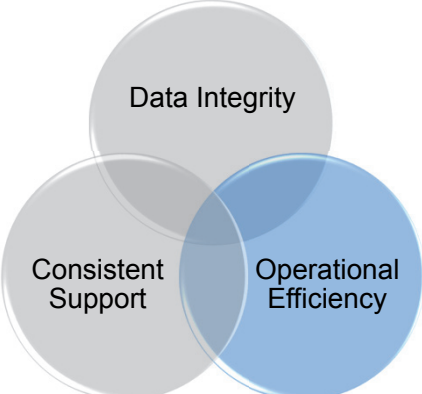
Capacity Building Workshop On Understanding Conformity  
Requirements For Software Controlled Weight And Measuring  
Instruments For Sustainable Trade 2022



### Operational Efficiency in Vehicle Weighing

**Operational efficiency** is the capability of an enterprise to deliver products or services to its customers in the most cost-effective manner, while ensuring quality.

- Complete transactions quickly and efficiently
- Minimize opportunities for errors
- Simplify complex processes to ensure ease of use and training in high turn-over environments
- Integrate between disparate systems seamlessly to eliminate data loss
- Manage traffic flow to reduce bottlenecks at the weighbridge



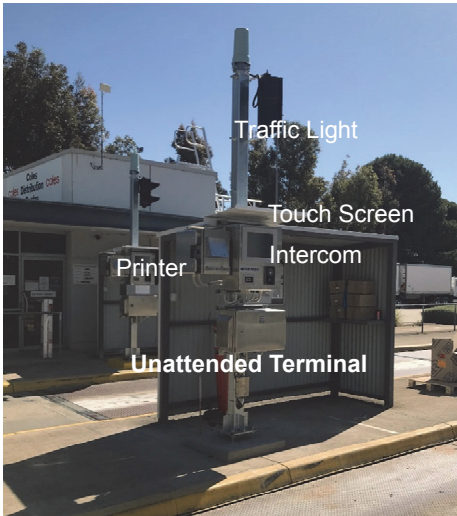
For internal use - Confidential

### What is Unattended Vehicle Weighing?

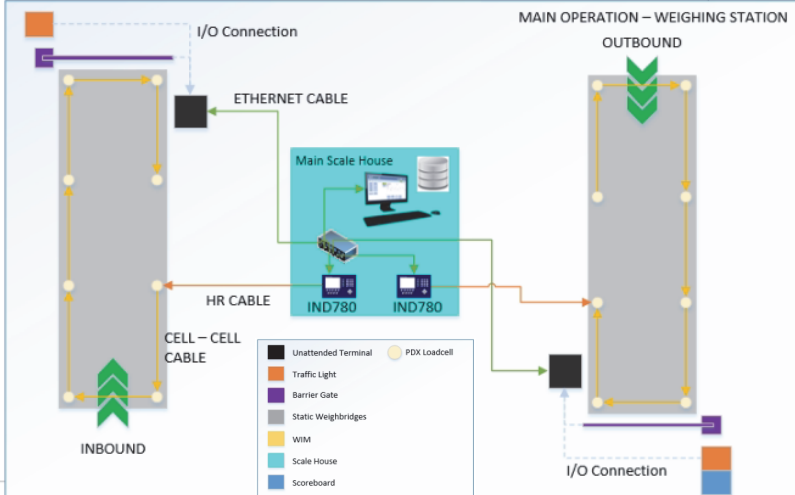
- A vehicle weighing application where the customer wants the driver to independently operate the scale and complete the transaction
- Weighing data are automatically stored and secure in a local or networked SQL database



### How does Weighbridge system look like?

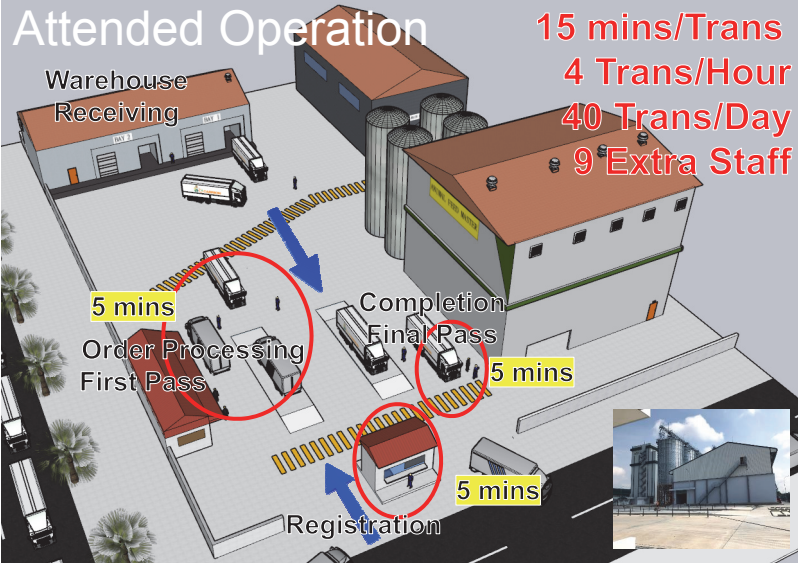


### Unattended Weighing Architecture



For internal use - Confidential

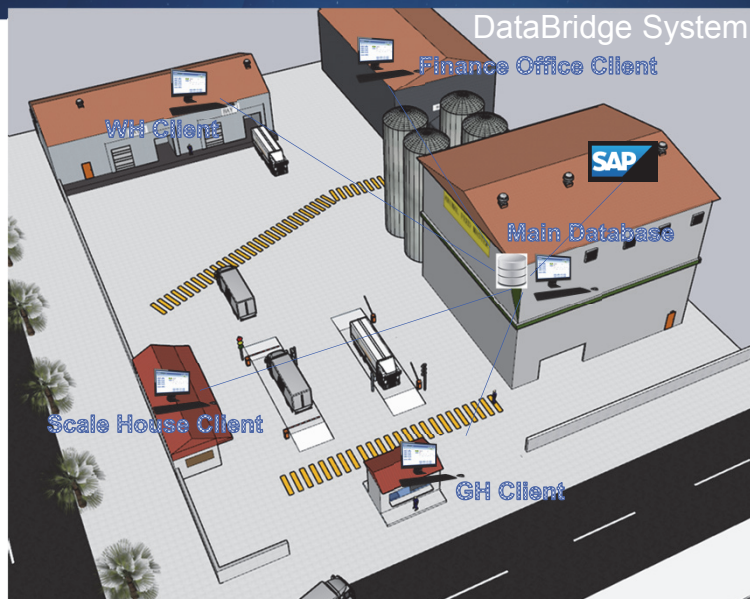
### Attended Operation



For internal use - Confidential

## Why Unattended Vehicle Weighing?

- Benefits of an Unattended Weighing System
  - Avoid need for weighing attendant – personnel cost reduction
  - Avoid need for building near the scale – reduce construction and operating costs
  - Improve data accuracy – use preprogrammed information on proximity cards
  - Improve facility security – integrate facility access gates into weighing system
  - Faster weighing throughput – transaction is completed without driver leaving the cab
  - 24 hour per day operation – greater facility operational flexibility



## POWERCELL PDX



- Stainless enclosure.
- Fully laser welded.
- Hermetically sealed.
- Enclosure filled with Helium gas.
- Every load cell vacuum tested during production.
- Suitable for submersion and high pressure washdown.
- A breach sensor continuously monitors the enclosure's seal.



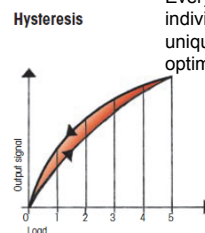
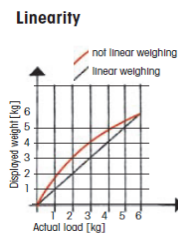
## Digital Load Cell with Active Compensation

Inaccuracy factors are **continuously** corrected by the microcontroller in each load cell:

- Temperature
  - Zero
  - Span
- Linearity plus and minus
- Humidity
- Hysteresis
- Zero balance
- Creep
- Motion and vibration



Every MT POWERCELL load cell is individually load-tested to compensate for the unique characteristics of the sensor. This optimizes weighing accuracy.





Eliminates the most common

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022

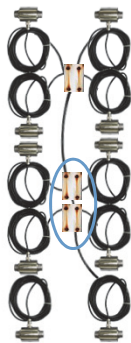


**Other load cell systems use junction boxes**

- Hard to seal against moisture
- Complicated installation and troubleshooting
- Expensive to maintain and very failure prone

**POWERCELL PDX**

- Has NO junction boxes
- Easy to install and troubleshoot
- Fast, reliable, and accurate operation



Manual wiring of junction box



Eliminates the primary source of vehicle system failures—the junction box




Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022




**Unattended Weighing Architecture**

The Unattended Process Demo


**DataBridge™ MS**  
Scale Management System




**DEMO**

 Asia-Pacific Economic Cooperation


Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>31</sup>



For internal use - Confidential

 Asia-Pacific Economic Cooperation

Capacity Building Workshop On Understanding Conformity Requirements For Software Controlled Weight And Measuring Instruments For Sustainable Trade 2022 **APEC**<sup>32</sup>



For internal use - Confidential