process weighing

- Hardy delivers productivity solutions to manufacturers and processors
- Hardy developed the first PLC integrated weighing system
- We are a Rockwell Automation Global Encompass Partner
- We were founded as Hardy Scales in 1918
- Hardy is part of Roper Industries, a $2B+ public company

Date
Oct 2011

Rodger Jeffery
Director Strategic Marketing

process weighing

business discussion

Goals:
Gain an understand YOUR business and manufacturing needs.
Provide overview of HARDY's capability and value.

our value...more productivity

BUILD
- Reduction in startup commissioning effort
- Reduction in startup integration effort

OPERATE
- Reduction in operating cost less material waste, more throughput

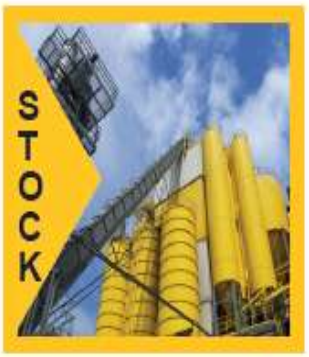
MAINTAIN
- Reduction in scale calibration cost

REPAIR
- Reduction in scale diagnostics effort
- Reduction in repair/recalibration time

IMPROVE
- Improved visibility to process improvement opportunities

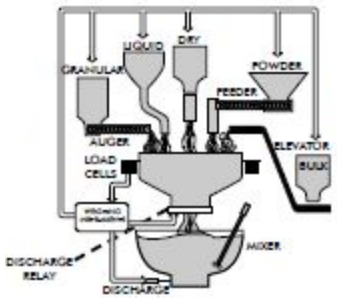
your manufacturing supply chain...more productivity

	OPERATING COSTS (MRO)	OPERATING COSTS (MRO)	OPERATING COSTS (MRO)
WORKING CAPITAL	WORKING CAPITAL	WORKING CAPITAL	WORKING CAPITAL
	FIXED CAPITAL	FIXED CAPITAL	
We improve inventory management accuracy.	We optimize batching and blending throughput.	We tighten tolerances on packaging lines.	We enhance capability of product inspection.
Silo, Tank & Reactor measurement solutions	**Material Feed & Rate control solutions**	**Filling & Dosing control solutions.**	**Check Weighing measurement solutions**

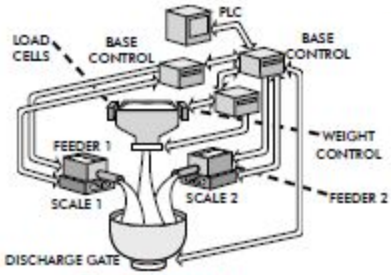


www.hardysolutions.com | 800.821.5831

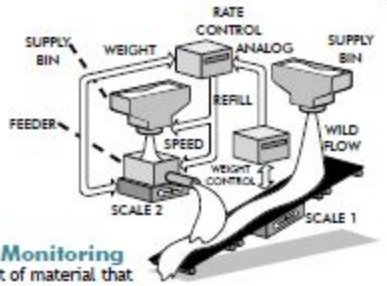
your manufacturing systems...our process solutions



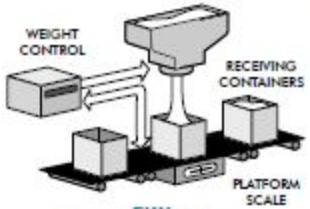
Sequential Batching
Adding material to a container from several feeders on their own scales



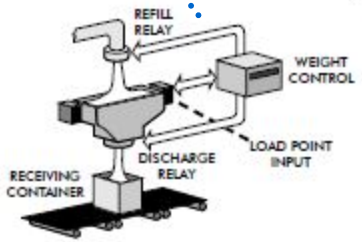
Simultaneous Batching
Adding material to a container on one single scale from several feeders



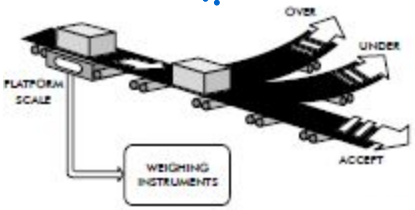
Rate Control and Monitoring
Measurement of an amount of material that enters into (gain-in-weight) or is despensed from (loss-in-weight) a vessel over a period of time (master slave configuration)



Filling
Adding material to a container on a scale (gain-in-weight)



Dispensing
Adding material to a container from recipient on a scale (loss-in-weight)



Check Weighing (Static or Dynamic)
Selection or sorting of products depending on the measured weight

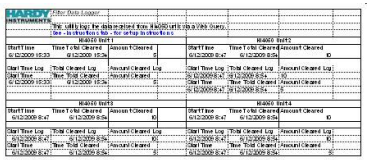
our 6 unique technologies...deliver the value

– Embedded web server	No software required to connect your PC
– C2® electronic calibration	Reduces time and cost to calibrate
– INTEGRATED TECHNICIAN®	Reduces time and cost detect scale issues
– WAVERSAVER®	Eliminates vibration, weigh accurately & quickly
– SMM Secure Memory Module	Automatically backups and restores configuration
– Choose a Form Factor	Use a plc module or a panel mounted instrument

the fit... your erp & mes systems and our technology

ERP

MES



Embedded CONTROL ALGORITHMS and WAVERSAVER® eliminate the need for plc programming and the effects of vibration – increases accuracy and improves yields

Webserver

C²® load cell cable enables remote diagnostics using IT integrated technician – saves time

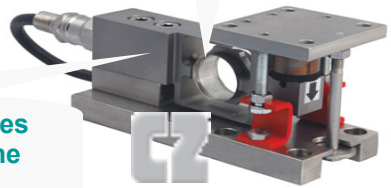
SMM-SD

WAVERSAVER

Hermetically sealed IP68 rated -provide long sensor life, even in harsh environments

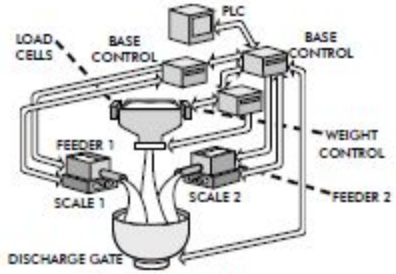
Plug-In Modules or Panel and Din Rail Instruments with optional connectivity: EthernetIP, ControlNet, Devicenet, RIO, MobusRTU, ModbusTCP, ProfibusDP and Ethernet TCPIP – saves time, guarantees functionality

Embedded IT® integrated technician delivers easy diagnostics of load cells – saves time



C²® electronic calibrating load points enables fast calibration without weights – saves time

key value propositions



Simultaneous Batching

Adding material to a container on one single scale from several feeders

BUILD

- Reduction in startup (commission) (up to ~50% _ typically 4 hrs)
- Reduction in startup (integration) (up to ~50% _ typically 3 hrs)

OPERATE

- Reduction in ops cost (raw mats waste) (UCL/LCL process dependant)

MAINTAIN

- Reduction in scale calibration cost (up to ~75% _~$8K in 10 years)

REPAIR

- Reduction in scale diagnostics effort (up to ~90% _ typically 3 hrs)
- Reduction in repair/recalibrate time (up to ~50% _ typically 4 hrs)

IMPROVE

- Improved visibility to process improvement opportunities

CZ

Rockwell Automation Encompass Product Partner

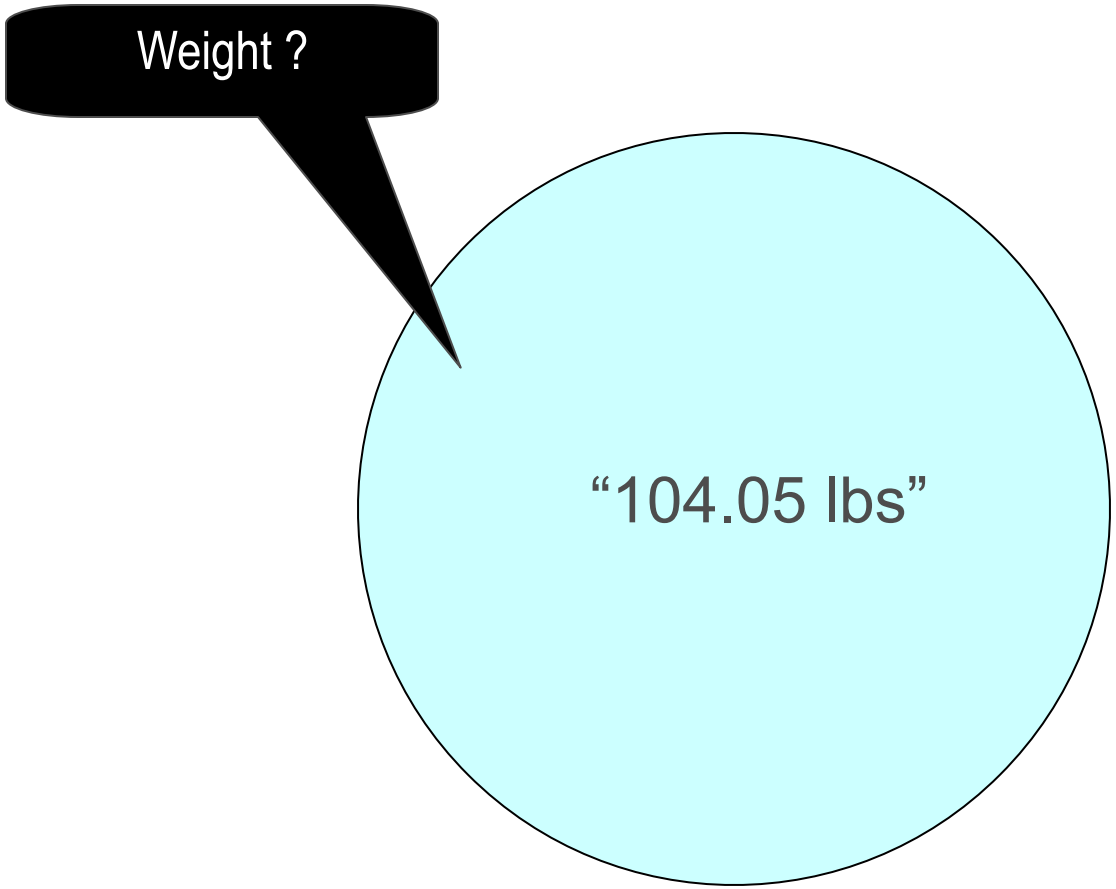
WAVERSAVER

CZ

Webserver IT

SMM-SD CZ

Yesterday it might have been OK to have this…



Today you really should have this...

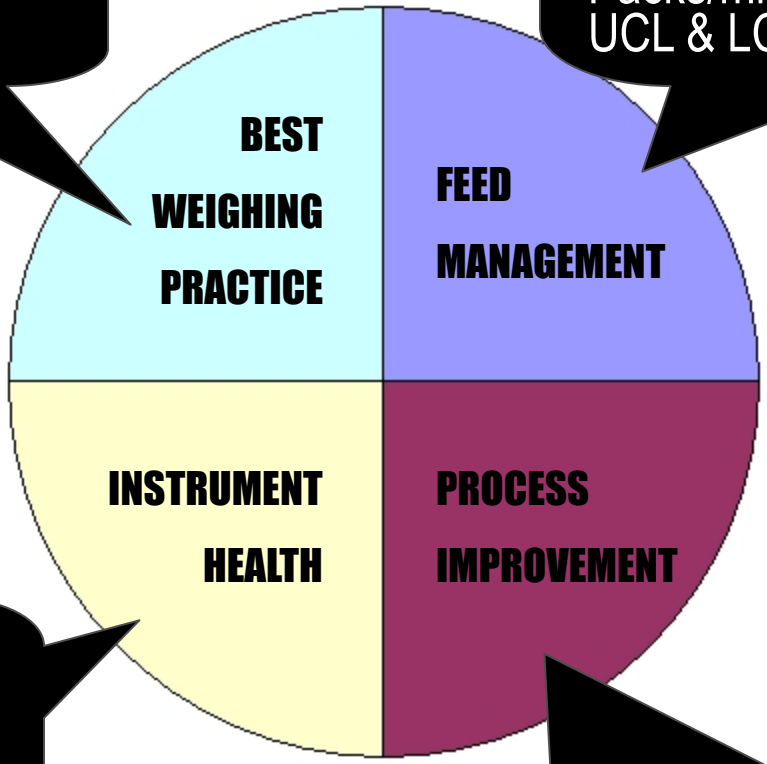
"104.05 lbs"
Accurate, Fast, Stable
Weight

Target (lbs)	: 200.0
Feed Weight	: 200.5
Flow Rate	: 10.6 lbs/sec
Feed time	: 18.91 secs
Packs/min	: 190.3
UCL & LCL	: 200.8 & 199.7

FactoryTalk Batch

FactoryTalk VantagePoint

FactoryTalk AssetCentre



FactoryTalk Alarms & Events

FactoryTalk Historian

FactoryTalk Metrics

✓System AOK
✓Sensor
✓Instrument
✓PLC Communication

Potential for OEE (overall equipment efficiency)
Material 1: current feed 10.6 / max 11.7
Material 2: feeding at ….

key contacts

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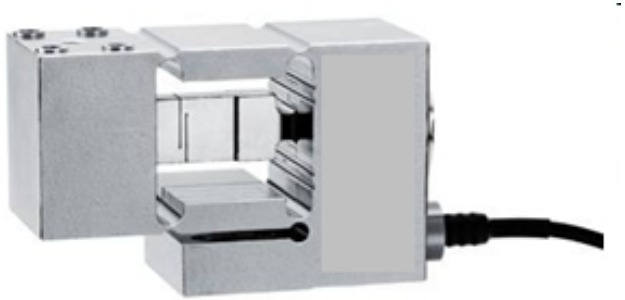
NEW TECHNOLOGY

NEW TECHNOLOGY

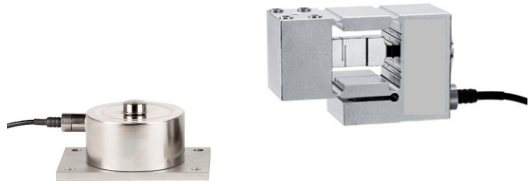
Reactance Force Measurement (RFM)



igital Load Cells

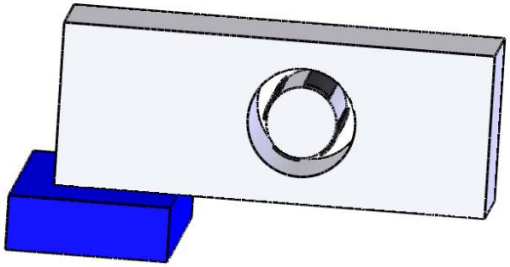
RFM Value Points

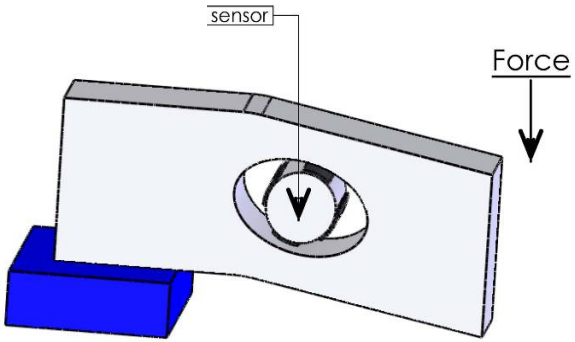
Higher overload	1000%
Faster response time	2 to 3 times faster than stain gauge load cells
Faster update rate	1000Hz (digitized signal)
Temp range	minus 40°F
Mechanical installation	simpler
Mount height	lower
Measurement integrity	less susceptible to side forces
Robustness	less susceptible to welding, emi and moisture
Regulatory	meets FDA sanitary & ATEX requirements



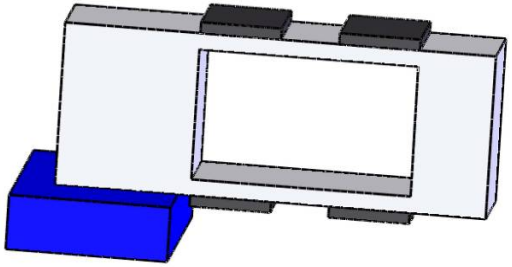
RFM & Strain Gauge technology differences

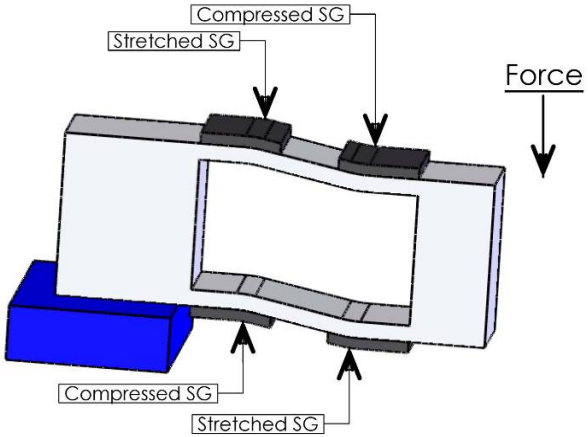
RFM LOAD CELL





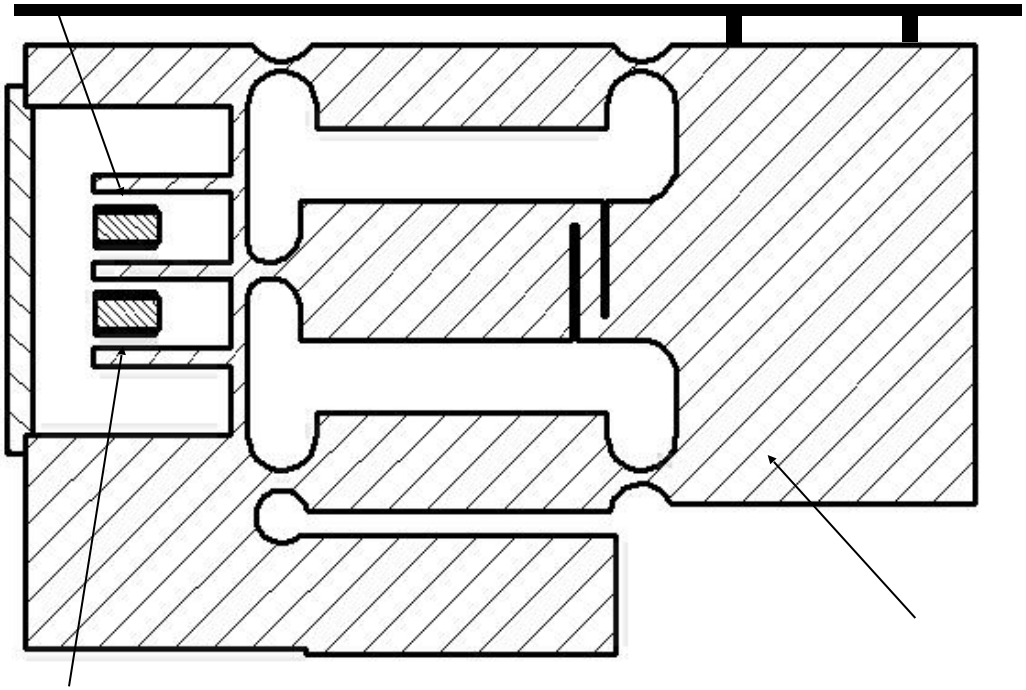
STRAIN GAUGE LOAD CELL

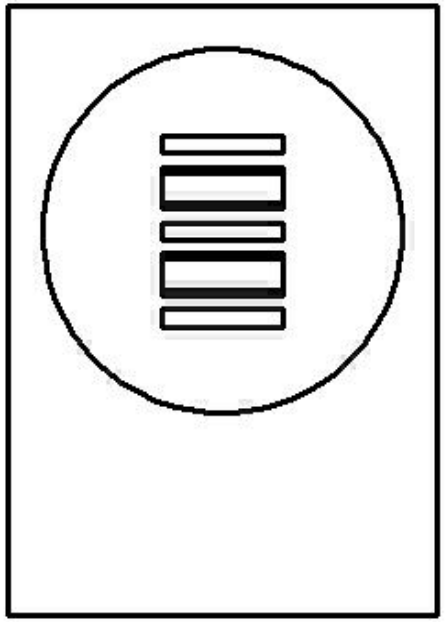




RFM technology – how it works (single point)

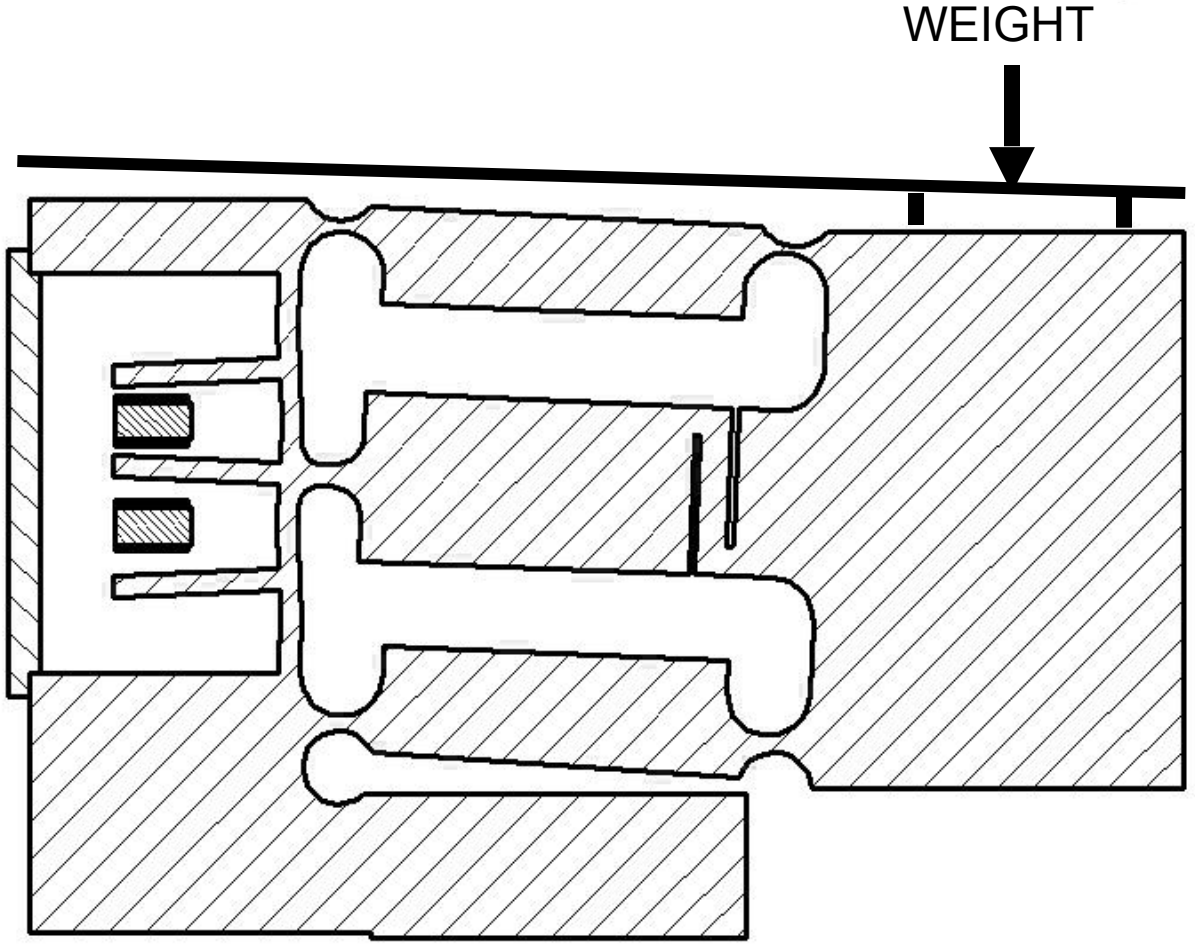
Sensor 1



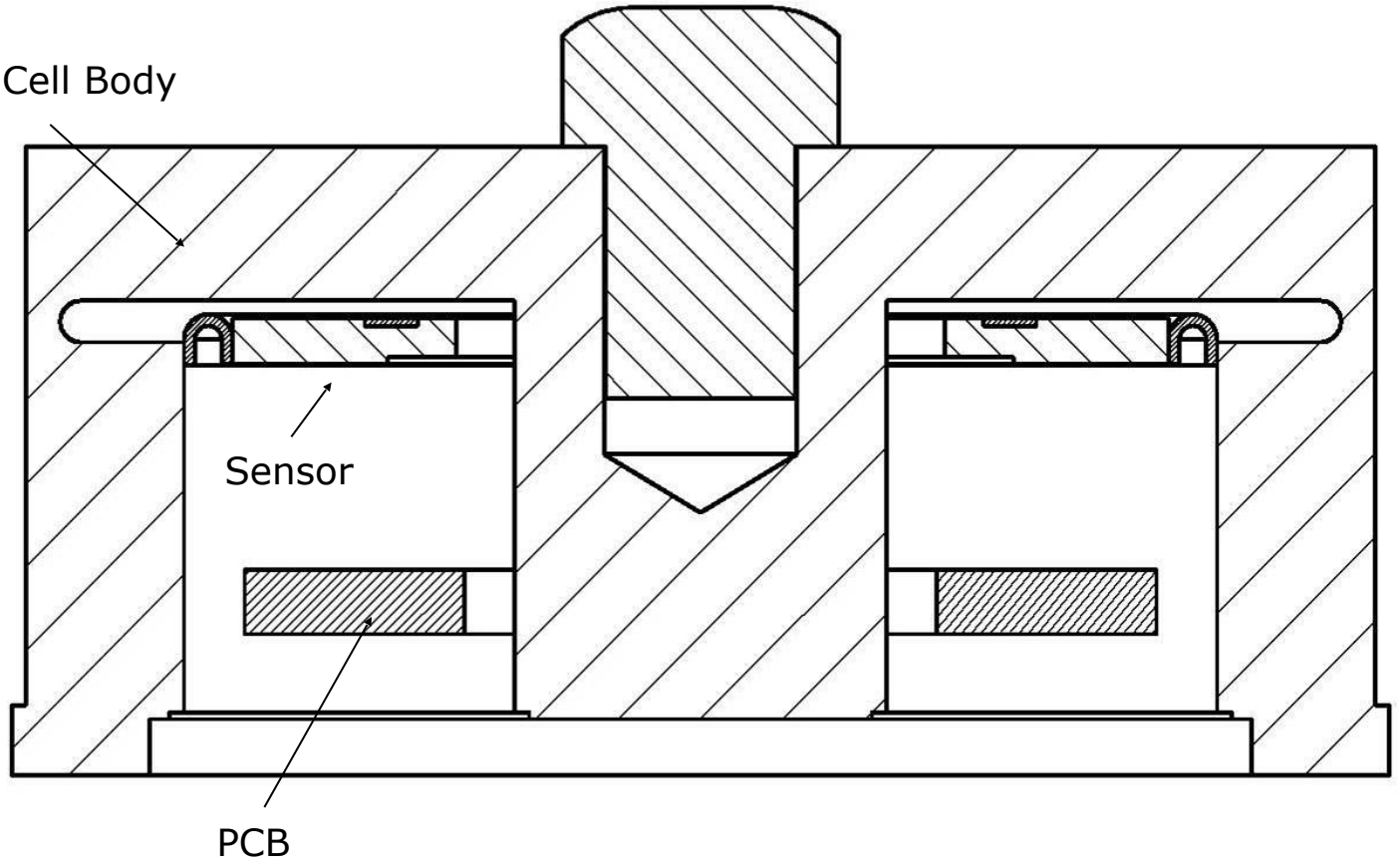


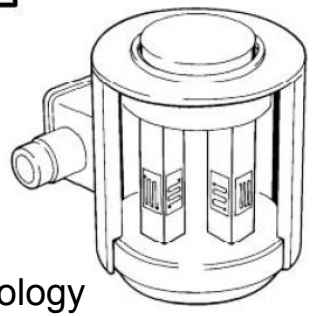
Sensor 2

RFM technology – how it works (single point)



RFM technology – how it works (load puck)

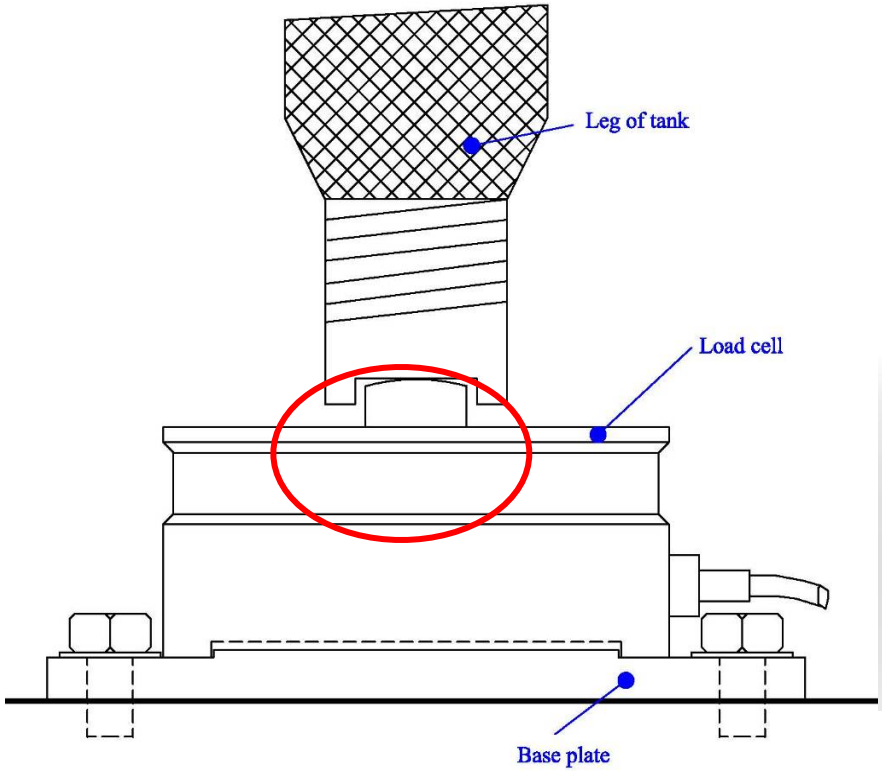


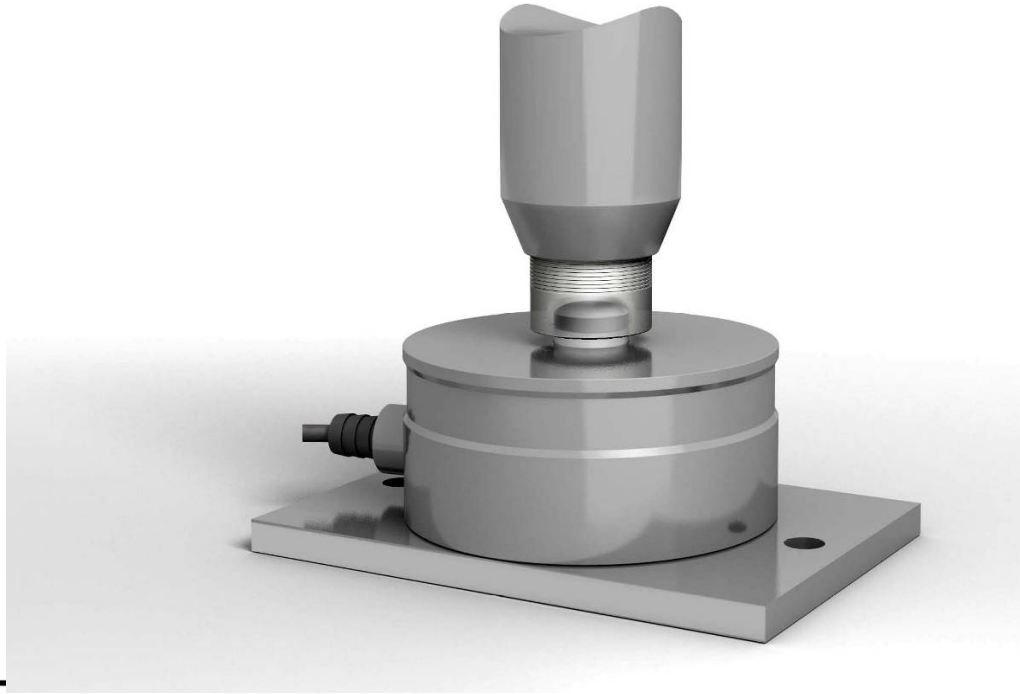


Traditional Strain Gauge Technology

Simpler Mechanical Installations

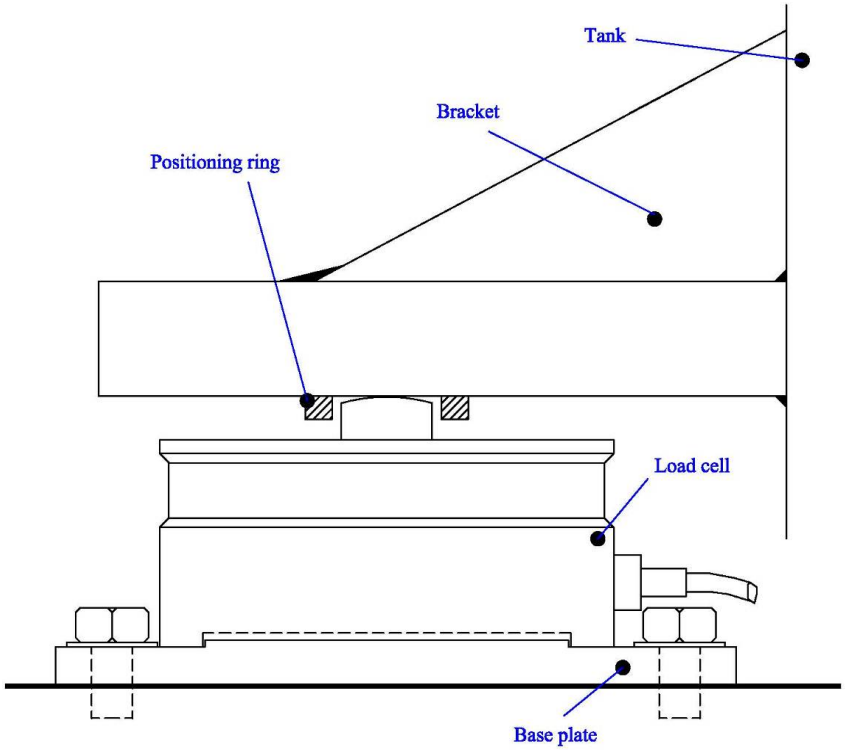
- Air around loading point
- Tank (leg) is only touching loading point

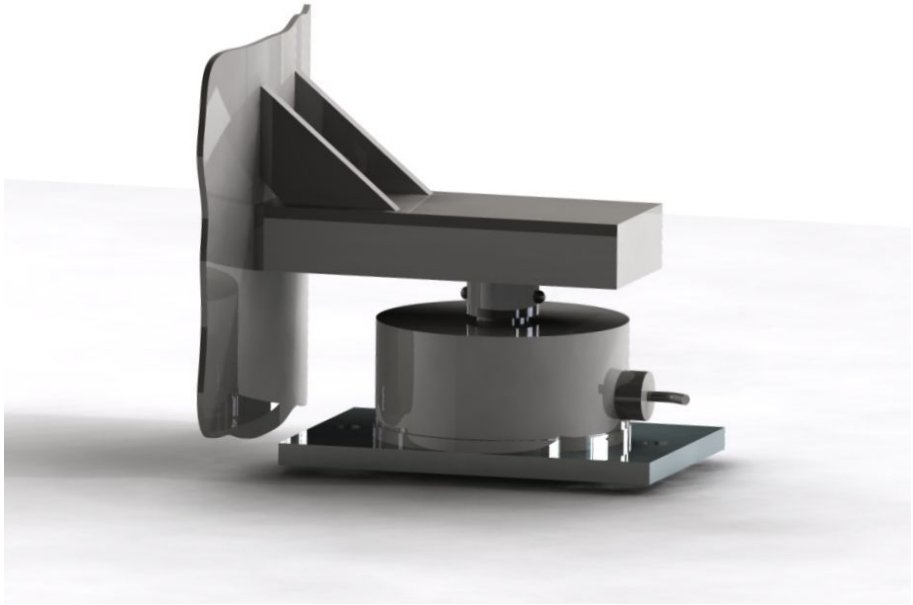




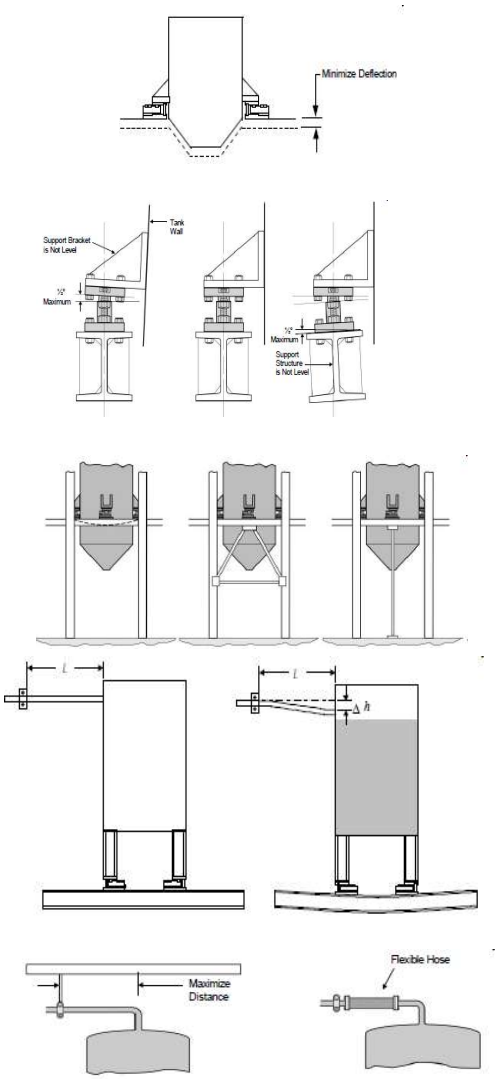
Simpler Mechanical Installations

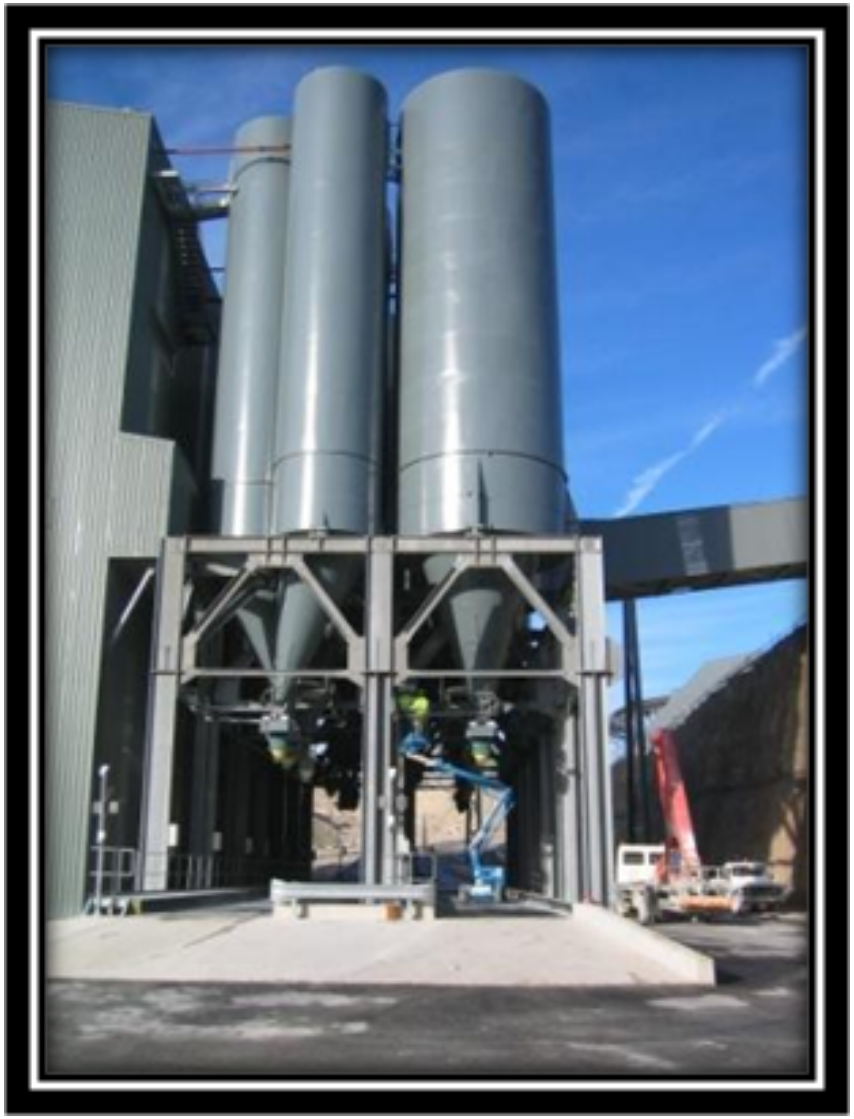
- Tank with lugs instead of legs



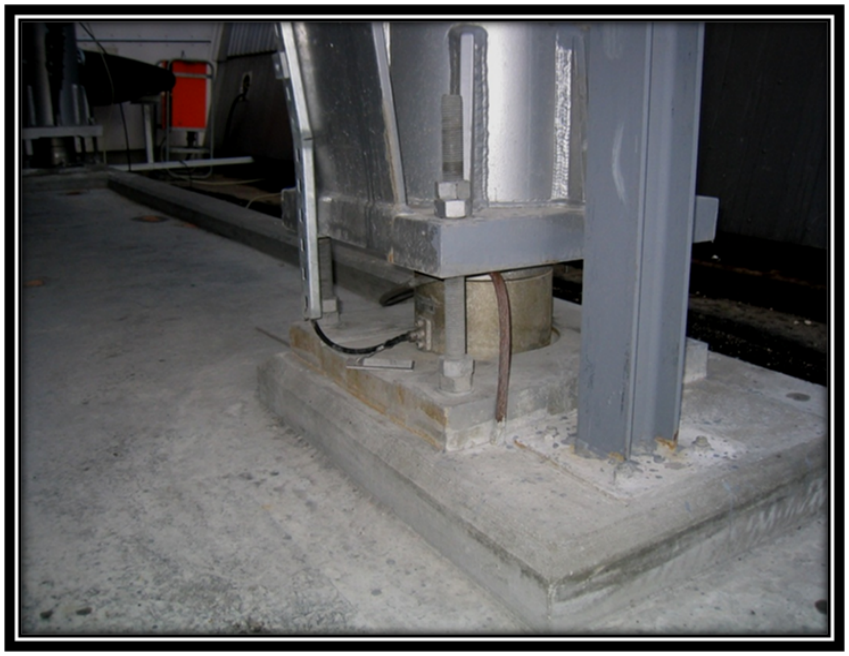


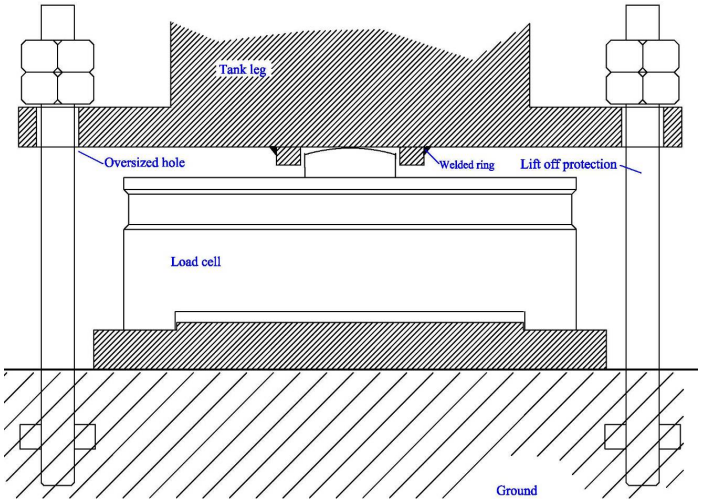
Simpler Mechanical Installations





Simpler Mechanical Installations





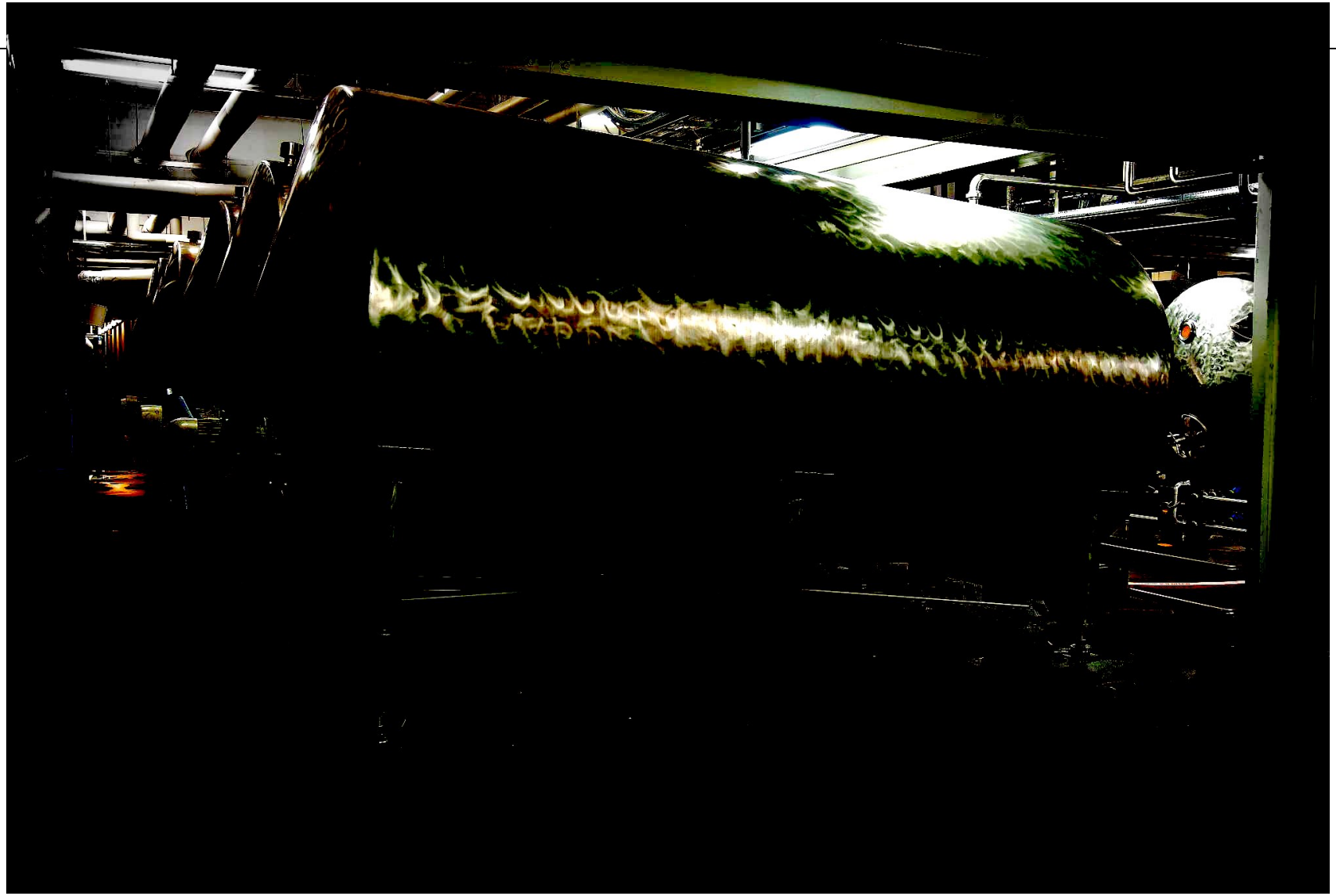
Lift-off protection for outdoor installations or big agitators

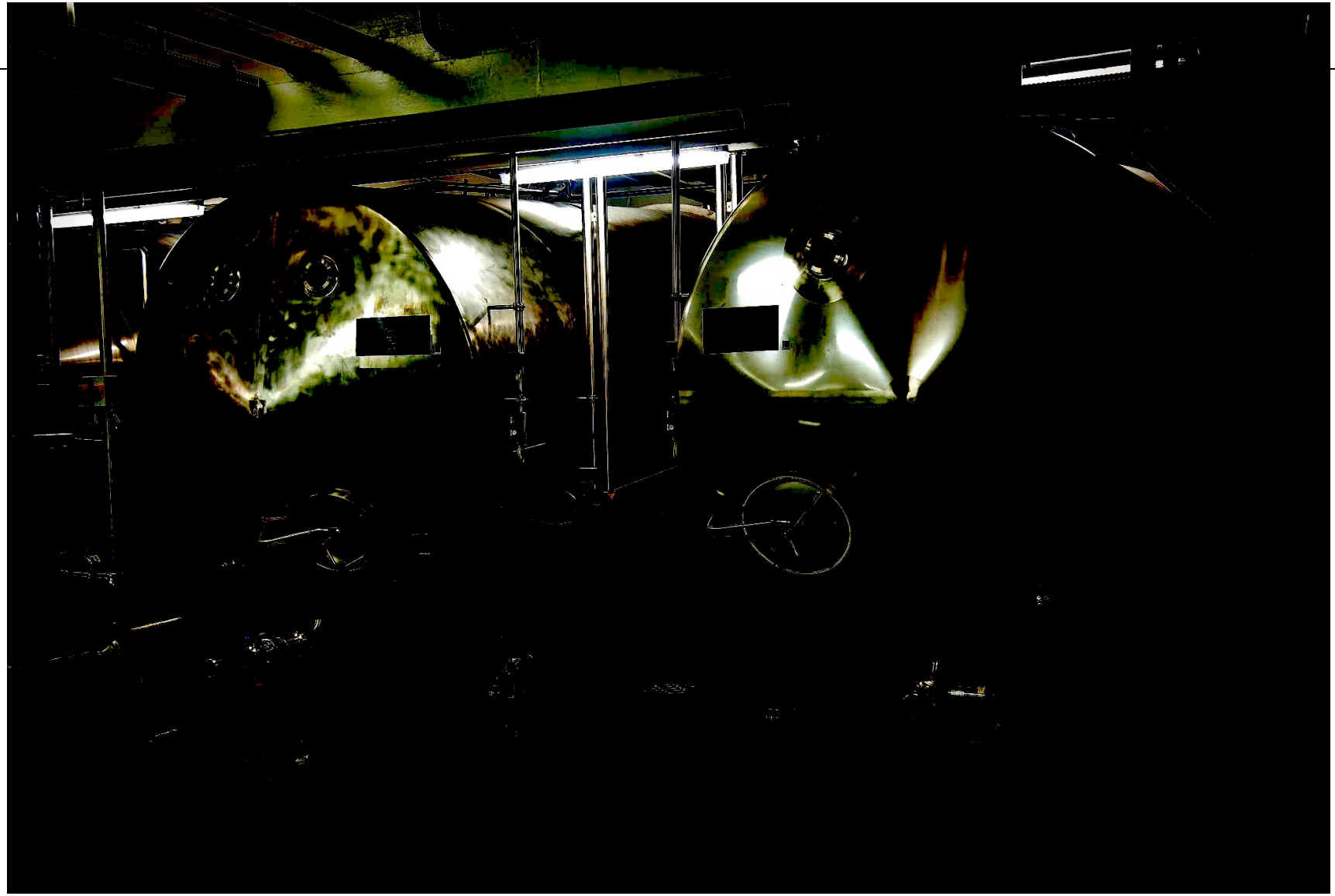
NEW TECHNOLOGY

Reactance Force Measurement (RFM)

In Silo, Tank & Reactor Weighing

Simpler Mechanical Installations





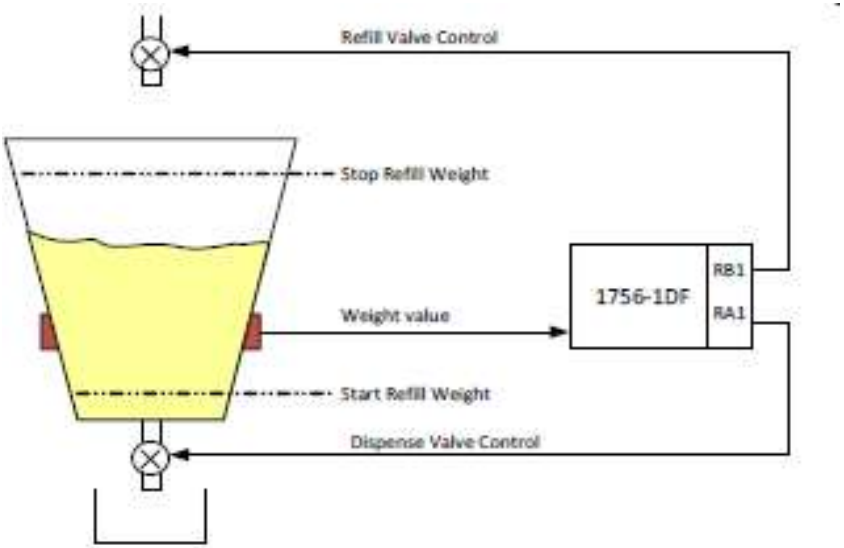
NEW TECHNOLOGY

PLC Plug In Modules

for High Speed Dispensing & Filling

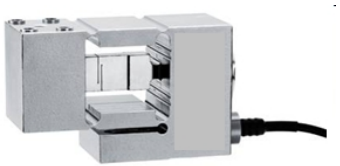
filling & dispensing

User's Guide



NEW TECHNOLOGY

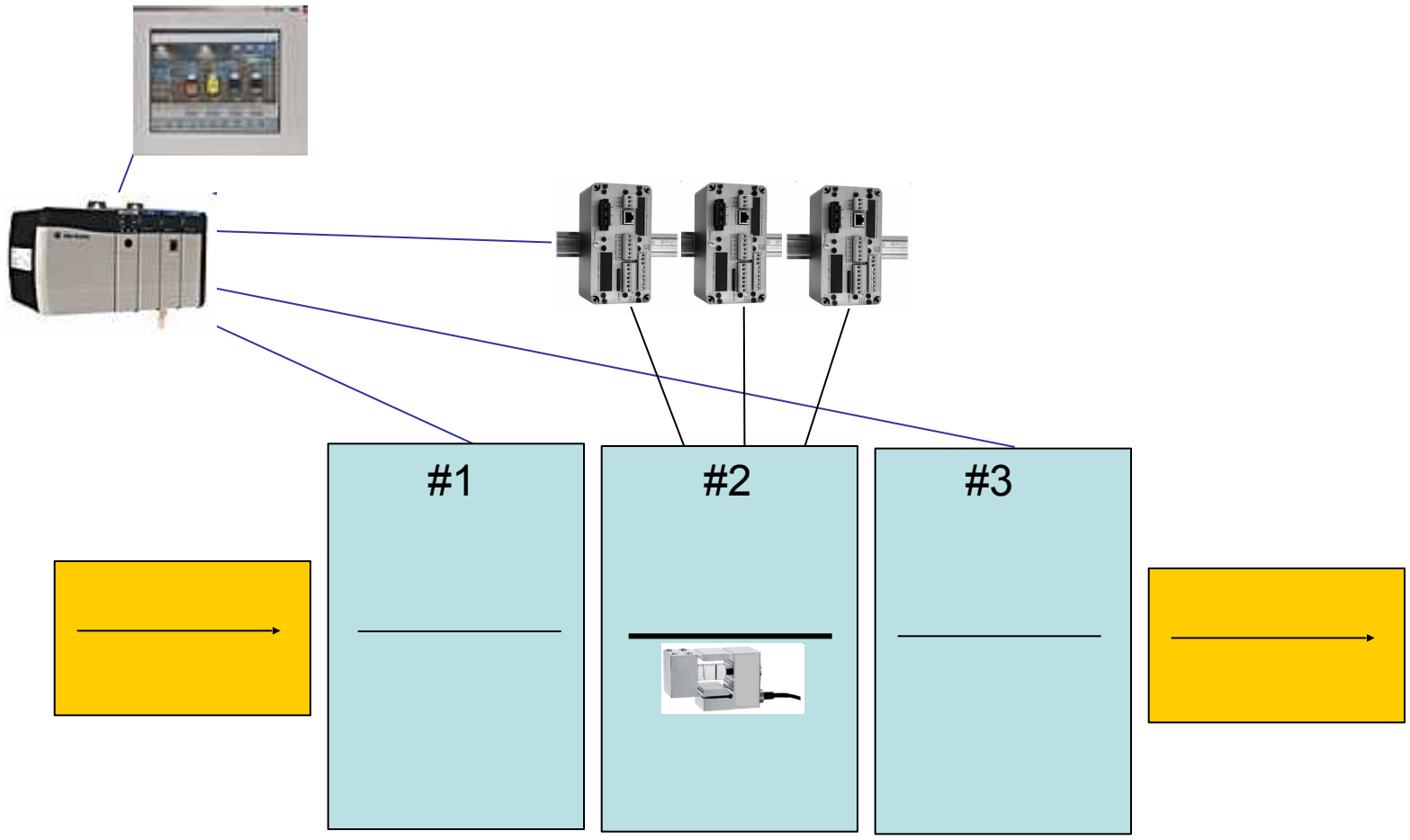
Reactance Force Measurement (RFM)

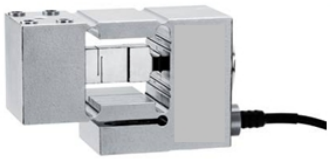


in High Speed Check Weighing

single-lane or multi-lane.
checkweigh up to 250 pieces per minute, per lane.

checkweigher MODULAR DESIGN, OFF-THE-SHELF COMPONENTS





Commercial Off The Shelf (COTS) Tools

IMPACTS PRODUCTIVITY & ENGINEERING

- Reduced product give away
- Easy to use, modify & fix
- Uses know, open source technology
- Will retrofit into existing system
- Meets speed spec (<400 msec)
- Meets resolution spec (<0.25g)

checkweigher INTEGRATED with EXPERIENCED MATERIAL HANDLING

checkweigher SINGLE LANE (~$35K)

The checkweigher quickly and accurately ensures packages meet fill weight requirements by checking the final weight of the filled product.

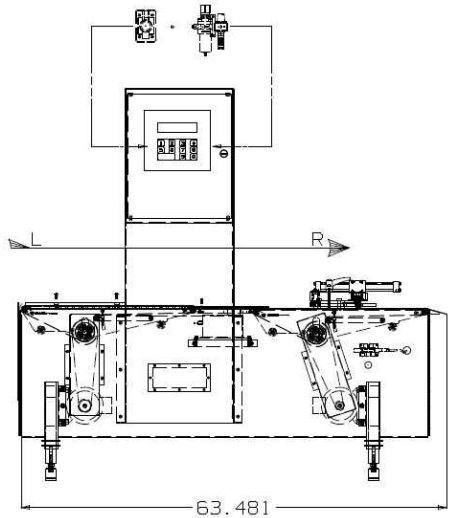
How it works

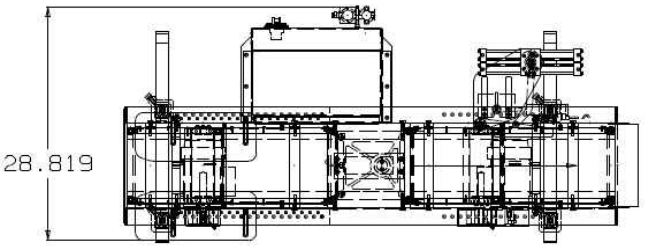
Filled containers flow over the weighing scale. The scale checks the weight of the containers to the specified weight. Out of weight-range containers trigger an indicator light and are removed from the line. Feedback is provided to the filler for single or multi-head over/under fill adjustment.

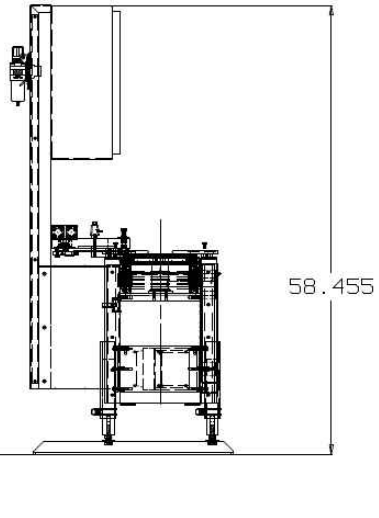
Features

- Weighs up to 250 containers per minute
- Adjustable weight ranges (2kg; 5kg)
- Electronic calibration delivers accuracy < or = 3g up to 2kg
- Adjustable in-feed and out-feed speed & height
- Compact length (5ft) enables close filler/checkweigher location
- Bright screen displays last weight and set-point functions
- Stainless steel wash down design
- Production ID; Product ID; Date/Time; Jar#;
- Target Weight; Checked Weight; Deviation Weight; Reject (Y/N)
- Remote and On-Site Service. Off-The-Shelf Spares.

checkweigher SINGLE LANE (~$35K)





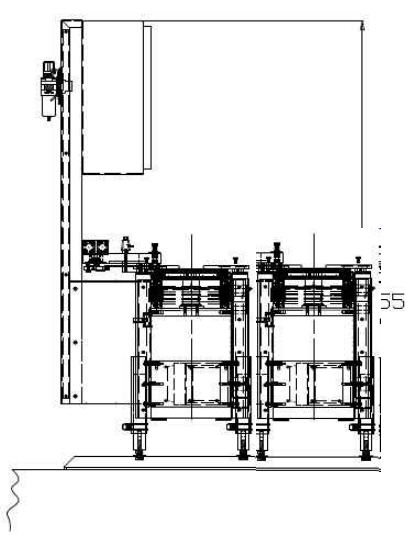


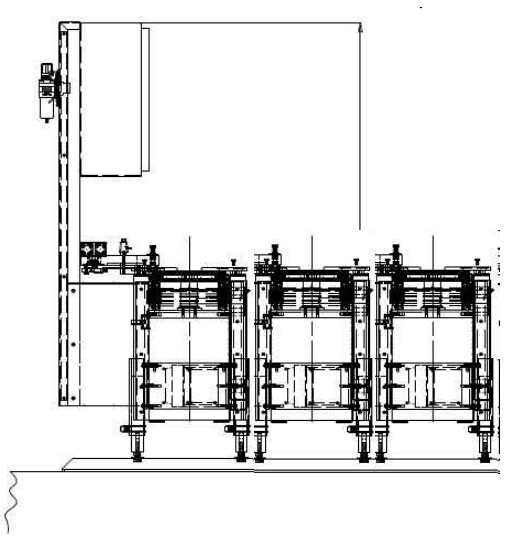
SOFTWARE

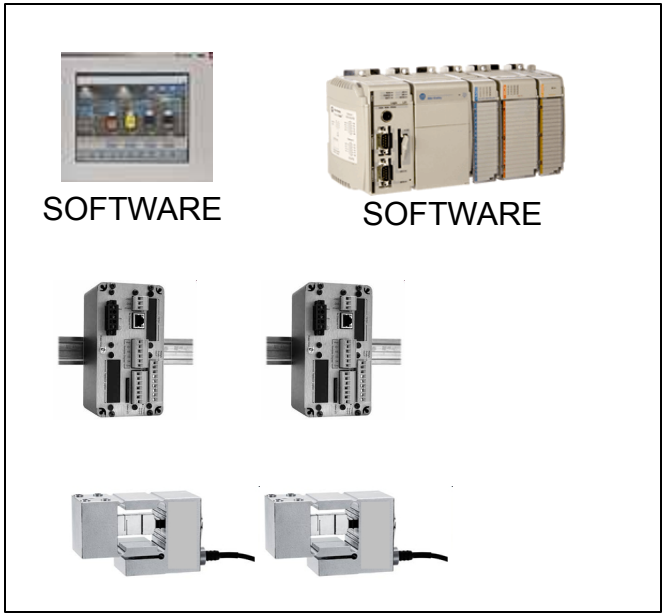
SOFTWARE

1 Lane Bundle

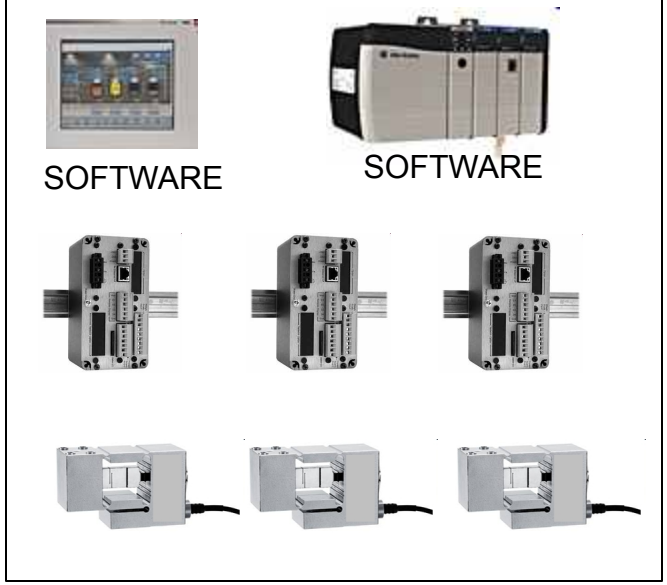
optional 2 & 3 LANE (add ~35K per lane)







2 Lane Bundle



3 Lane Bundle

Case studies

we deliver solutions

Chemical production company improves reliability & increased accuracy by 70%

THE SITUATION
A chemical production company was experiencing load cell failures and poor weighing accuracy of polyethylene pellets in five silos. The silos were located outside in a wash down area and their load cells were not hermetically sealed.

THE REQUIREMENTS
- Improve weighing accuracy
- Reduce failures
- Eliminate negative effects of humid environment

THE SOLUTION
- HI 4050 weight controller
- HI 215IT-SS1 summing junction box
- ADVANTAGE® high capacity, hermetically sealed load cells
- C2® electronic calibration
- INTEGRATED TECHNICIAN® for remote diagnostics
- Connectivity to PLC, HMI, SCADA & Historian

THE BENEFITS
- ***Improved weighing system reliability & accuracy 70%***
- ***Eliminated overfill***
- ***Increased production***
- ***Reduced operating costs***

we deliver solutions

Bakery saves 30% more energy and increases dough consistency

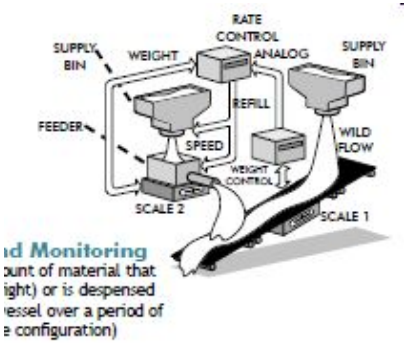
THE SITUATION
The bakery was using a batch process. They were struggling to deliver good dough homogeneity in order to save cost and keep quality consistent.

THE REQUIREMENTS
Convert to a continuous process
Everything in the recipe must added at the right rate
Ingredients must added by exact weight

THE SOLUTION
Hardy HI 1756-2WS plug in weigh scale modules
Ethernet infrastructure
Secure VPN access for remote support
Connectivity to PLC, HMI, SCADA & Historian

THE BENEFITS

- *Device matching saves 30% more energy*
- *More accurate kneading and mixing*
- *Fewer additive required due to good control of distribution*
- *Continuous process means all dough on the line is the same age*
- *Open and transparent system, unlike market alternatives*
- *Capacity for up to 200,000 buns or tortillas per hour*



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Diaper manufacturer expectations exceeded with 0.5% accuracy in production

THE SITUATION

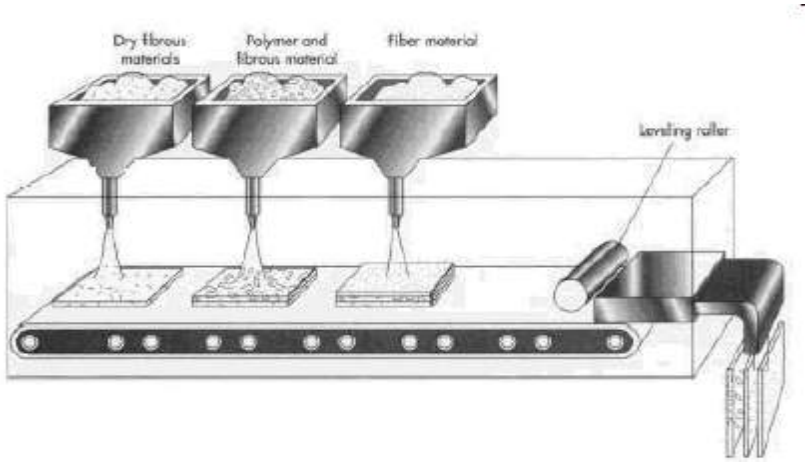
A diaper production facility was regularly experiencing problems with their feeder system including inaccuracy in the amount of super absorbent pellets the feeder was applying to the diapers during the manufacturing process.

THE REQUIREMENTS

- Achieve accuracy in amount of pellets being applied to product
- Improve controls performance
- An open system with faster application rates
- Reduce downtime; local support

THE SOLUTION

- HI 4060 Loss-in- Weight Rate Controller
- Hardy ADVANTAGE® load cells with C2® Electronic Calibration
- Hardy Junction Box



THE BENEFITS

- ***Achieved dosage accuracy of 0.5%***
- ***Obtained the performance level desired***
- ***Better access to system with more information provided about the process***

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Sequential batching vastly improves process and accuracy

THE SITUATION

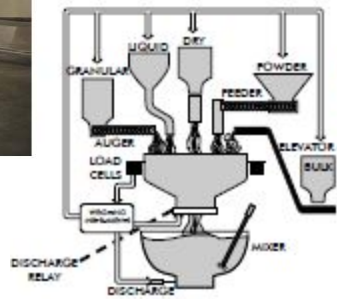
An organic cereal plant wants to install a multiple-ingredient batching system where all of the batch recipes and commands are stored in the PLC. To save on installation costs, they want a single vessel suspended from load cells to be used in the batching process.

THE REQUIREMENTS

- Single weigh hopper for use in multiple recipe batching system
- Electronic calibration
- Seamless integration of the load cell signal into the PLC

THE SOLUTION

- HI 1756-WS ControlLogix® Weigh Scale Module
- Advantage® Load Cells
- Stainless Steel Junction Box with INTEGRATED TECHNICIAN®
- Connectivity to PLC, HMI, SCADA & Historian



Sequential Batching
Adding material to a container from several feeders on their own scales

THE BENEFITS

- ***Fully integrated automated batching system***
- ***Greatly improved automation process, accuracy and system diagnostics***

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City Municipality reduces costs by automating water treatment process

THE SITUATION

A city municipality was using a system for processing the effluent that flows into the water treatment facility, and determined the process to be costly and inefficient. The system Involved channeling material, containing a variety of solids, on a continuous basis into grit separators, shredder pumps, and up approximately 15 vertical feet through a six-inch diameter pipe into the digesters.

THE REQUIREMENTS

- Eliminate continuous running of compressors used in processing
- Reduce costs and wear and tear on processing equipment

THE SOLUTION

Three systems, each consisting of:

- HI 2151/30WC weight controller
- HI 215-IT series junction box with C2® and INTEGRATED TECHNICIAN®
- ADVANTAGE ® Load Cells
- Connectivity to PLC and HMI,

THE BENEFITS

- ***Drastically reduced cost to run system; lowered wear and tear of the processing equipment***
- ***Reduced need for maintenance***
- ***Automatic shutdown when material reaches threshold***

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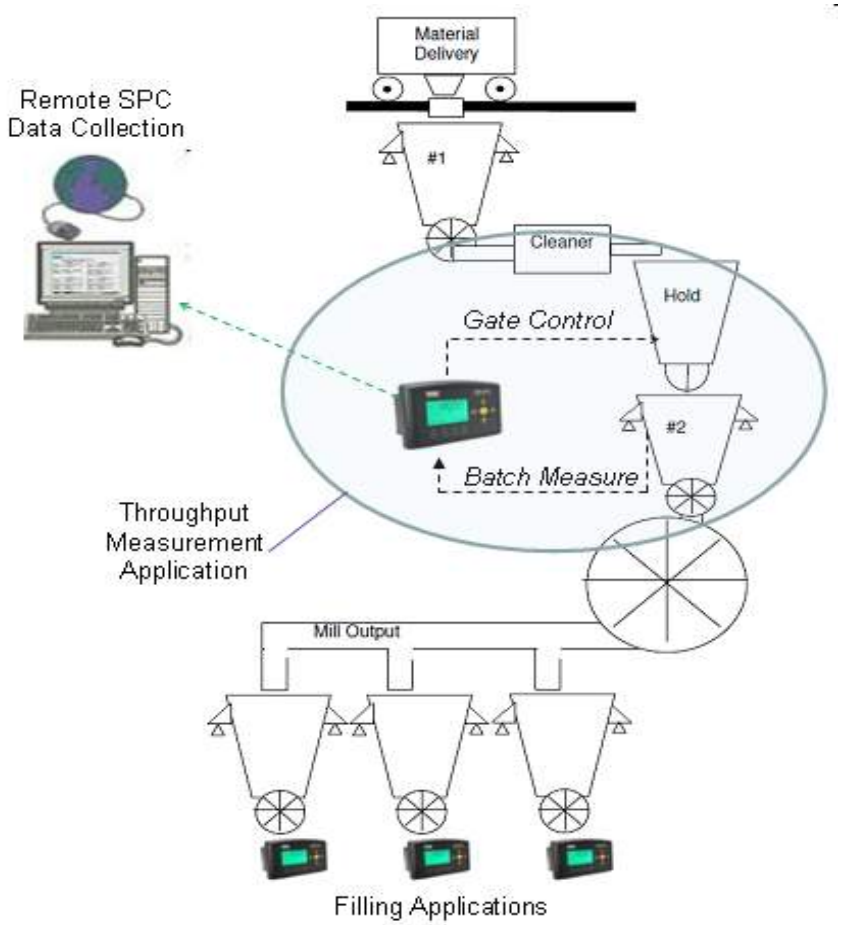
Flour mill increases production with improved flow and feed rate

THE SITUATION
A large global processor and exporter of grains and oilseeds was experiencing inconsistencies in timing for discharging wheat from a scale hopper, which resulted in an inconsistent flow rate.

THE REQUIREMENTS
- Achieve consistent flow and feed rate
- Increase production
- Reduce waste
- Eliminate variations in weight

THE SOLUTION
- Five HI 4050 Weight Controllers
- WAVERSAVER®
- C2® electronic calibration
- Connectivity to PLC, HMI, SCADA & Historian
- Process parameters exported to Excel

THE BENEFITS
- ***Better access to system with more information provided***
- ***Consistent flow and feed rates***
- ***Improved production***
- ***Minimized waste***
- ***Accurate weight readings***



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Checkweigher eliminates proprietary hardware, easily collects & moves data

THE SITUATION

A large manufacturer of food products was having difficulty with upgrades and support on many of their proprietary chechweighers which used custom networks proprietary embedded programming and custom HMI's.

THE REQUIREMENTS

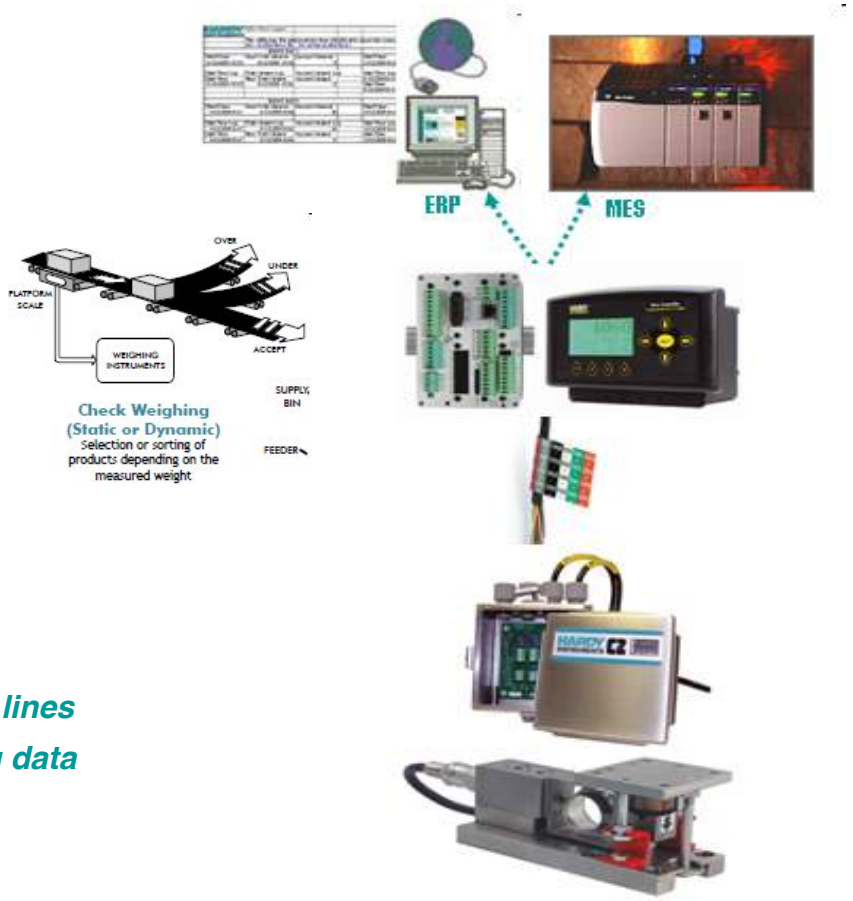
- Easy to use
- Easy to repair
- Solutions that uses known and readily available technology
- Ability to retrofit into existing equipment

THE SOLUTION

- Off the shelf, robust components
- Ten HI 4050 Weight Controllers
- WAVERSAVER®
- Ethernet & EthernetIP communications
- Weight & process parameters exported to PLC & PC

THE BENEFITS

- ***Packing line fill accuracy met (maximum yield)***
- ***Checkweighing speed met (required packs per min)***
- ***Highest reliability & lowest life cycle cost***
- ***One HMI displays all QUALITY data for all ten packing lines***
- ***High speed mapping of control & statistical packaging data sent to the PLC, HMI & PC***



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Automation of coal transfer to railcars drives down operating costs

THE SITUATION

A mining company loads coal into railcars for transport to ships or stockpile. They use a conveyor belt to bring the coal from storage into a weighing hopper. The railcar had to be stopped in order to dispense the coal into the weighing hopper.

THE REQUIREMENTS

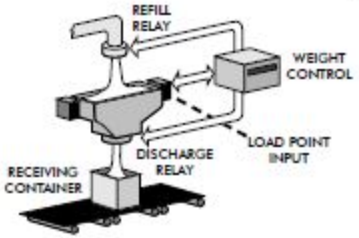
- Ability to dispense, weigh and load coal into a weighing hopper while the railcar is in continuous motion

THE SOLUTION

- HI 3010 Filler/Dispenser Controller
- HI 3030 Multi-Scale Weight Controller
- ADVANTAGE® Load Cells
- WAVERSAVER® Technology
- C2® Electronic Calibration
- Connectivity to PLC, HMI and Historian

THE BENEFITS

- ***Improved railcar utilization***
- ***Reduced transportation costs***
- ***Precise control in transfer of product***
- ***Reduced capital and operating costs***



Dispensing

Adding material to a container from recipient on a scale (loss-in-weight)