

# Silo Weigh IIoT

Silo and vessel inventory system

By **SCALE-TRON**



Network based silo inventory system with Cloud access

# SiloWeigh IIoT (Industrial Internet of Things)

The network based inventory and monitoring system designed specifically for silos, tanks and other vessels

SiloWeigh IIoT offers you the ability to measure onsite and view from anywhere, the weight of materials contained in remote vessels with unparalleled accuracy. SiloWeigh IIoT streamlines your operational efficiency and enhances your resource management by allowing you to view weights from any location using a PC, tablet or smartphone.

## Different types of sensor for different applications



Installation of sensors on round silo legs using weld tabs



Load cell supports give highest accuracy

## Never run out of material again

At the local level, hardware alarms can sound horns and light warning lamps. The system can also be configured to send messages via email or SMS for each of the alarm levels.

## Eliminate the risk of overfilling

Local alarms warn refill operators. Optional lights and horns along with automatic pinch valves can be used to positively stop the flow of material.

## Check every delivery

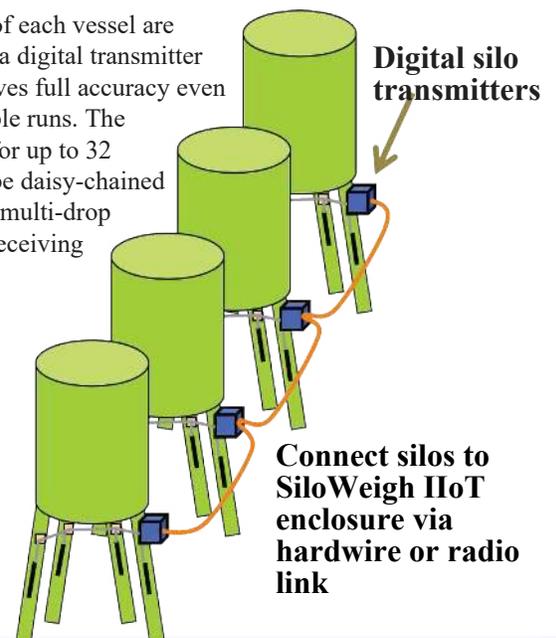
History is graphed and saved allowing verification of deliveries against the ticket, to identify and eliminate potential shortages and confirm which silo has been refilled.

## Why weight measurement is better

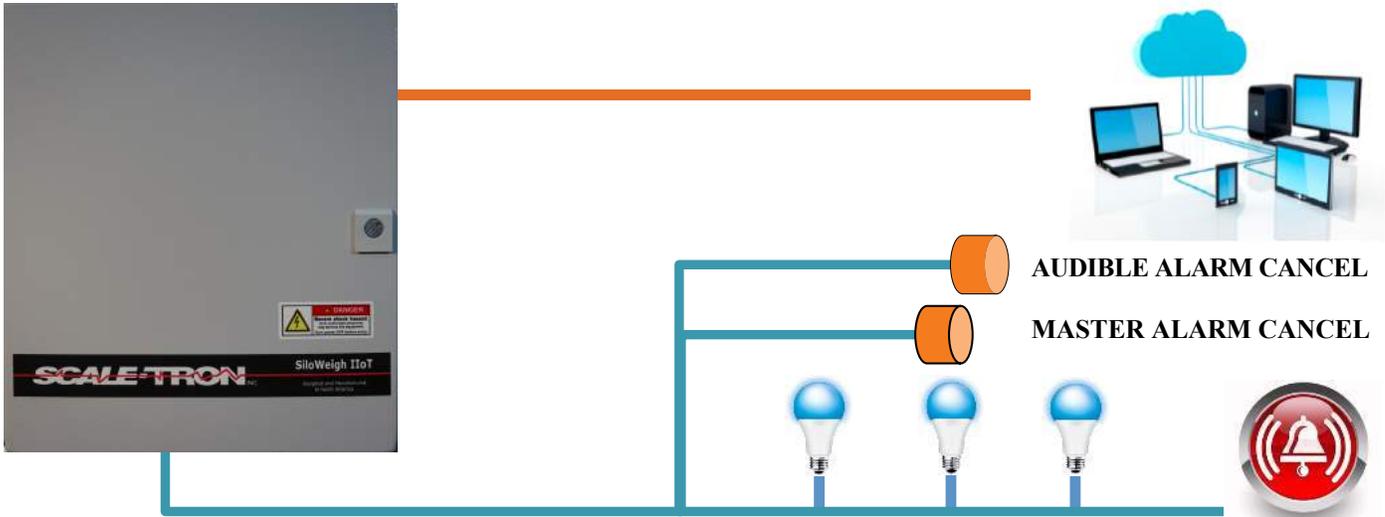
Level measurements drops by as much as 20% as the material packs, while weight is unchanged. Material can build up on one side of the vessel, creating further errors. Some systems have moving parts that can get clogged or wear out, and all level sensors require you to climb the silo for installation and service. Our sensors are bolted to the vessel's legs or skirt, eliminating all these issues.

## Digital signal transmission

The sensors of each vessel are connected to a digital transmitter which preserves full accuracy even with long cable runs. The transmitters for up to 32 vessels can be daisy-chained with a single multi-drop cable to the receiving location.



# Data Acquisition (DAQ) Unit connects to local network & the Cloud



## Securely view vessels anywhere in local network

Running on a Linux platform which was chosen for its security and stability. SiloWeigh IIoT has all the utilities built directly into the software, eliminating the need for companion apps. Designed for use on up to 32 silos per location with metrics being stored locally on your network and/or being pushed to our secure Cloud based server.

## Optional alarms

8 to 24 optional relay alarm setpoints can be programmed to light visible indicators, sound audible alarms or operate pinch valves to prevent overflow. Additionally, chosen inputs can accept alarm cancel buttons or overpressure switches to prevent filter damage. Relays are 'Opto-22' type.

## Secure Cloud database gives company view

Use of our secure Cloud based server allows you to group all your locations together and view all your company's metrics from any convenient location using a PC, smartphone or tablet, making inventory control by shared services or operational support centers efficient and accurate. Unlike other systems on the market, SiloWeigh IIoT has no annual subscription fee for access to its secure Cloud based server.

## Instant overview and graphic details

All vessels at each location are shown as graphics, plus the actual weight in tons or kilopounds. Vessel symbols change from green to yellow and red as alarm limits are passed, giving you a high visibility warning of impending problems.

The detail view shows the current vessel level and weight at the right, with a history trend graph to the left. The graph can be changed to show the last 24 hours, week or month, or you can select a date range for display. The graph shows the four alarm settings; Overfill, High, Reorder and Low, and an alarm log displays the most recent alarms.



## SYSTEM FEATURES

- The only weighing system that handles divided and shared-frame silos.
- SiloWeigh IIoT runs on a Linux platform, chosen for its security and stability.
- SiloWeigh IIoT has all the set up, calibration and filter tools built straight into the software, no more companion apps.
- All systems come with remote desktop login software as standard, allowing support from our trained staff to be fast and efficient.
- Configuration and calibration can be done from your regular PC, from the optional touchscreen or remotely by our trained staff.
- Use of our secure Cloud based server allows you to group all your locations together and view all your company's metrics from any convenient location using a PC, smartphone or tablet.
- SiloWeigh IIoT sensors are temperature compensated; they cancel the effects of the structure's expansion with temperature, while measuring the compression due to load.
- Use tank mount load cells for higher accuracy (0.1%)
- Sensors, wiring and junction boxes meet NEMA-4, IP66.
- Dust and splashproof industrial panel can be mounted in a convenient indoor location.
- No moving parts for long life and reliability.
- Optional In-plant hard wired programmable alarms.
- Software alarm log viewable at plant and company level.
- Email and SMS alerts.
- Because digital transmission retains full accuracy and reduces wiring, you can run a single cable to all storage vessels.
- Unlimited number of silos/vessels, groups and locations.
- Designed for use on regular legged silos, along with divided and skirted silos.
- Unlike other systems on the market, SiloWeigh IIoT has no annual subscription fee for its Cloud based database.

## SENSOR TYPES

**L-Strain or Silex extensometers** uses metal film strain gauges to accurately measure the compression in the vessel's supports as it is loaded. With no moving parts, it performs reliably for many years. Fully compensated and can be used on steel, stainless steel or aluminum to give a stable signal with typical accuracy of 2% of full scale for legged silos and 5% for skirted silos.

Load cells can be used when accuracy of 0.1% is required.



*Vessel support methods vary immensely. Our engineers are always available to advise on what is possible and what should not be attempted. We welcome your calls until you are confident in your own knowledge.*

## SYSTEM SPECIFICATIONS

<b>Vessel size:</b>	No limit, since measurement depends on stress in vessel supports. Successful applications range from 20 to 4000 ton.
<b>Stress range:</b>	10-100 Mpa (1500 to 15,000 lb/sq. in.)
<b>Number of silos :</b>	32 digital transmitters (1 per silo) max for each DAQ.
<b>Support types:</b>	All leg types including skirted
<b>Number of sensors</b>	8 per transmitter, 48 max per DAQ.
<b>DAQ output:</b>	Ethernet to network. Data is stored in DAQ if link is broken.
<b>Software:</b>	Resides on computer built into SiloWeigh IIoT enclosure Includes database, setup and calibration software.
<b>Power:</b>	100-250 volt universal power supply.
<b>Cloud access:</b>	Commercial database server with guaranteed uptime and data backup.
<b>Data table:</b>	Shows latest 20 readings. Data is downloadable as .csv file (for Excel) .
<b>Email/SMS alerts:</b>	Any number of clients receive messages based on selection of alarm type.

## OPTIONS

<b>Installation kits for L-Strain sensors:</b>	Through-hole (for H-beam etc.) Tapped hole (large "O" section) Weld tabs. All kits contain template, punch, drill bits, step drill bit.
<b>Local alarm I/O:</b>	8, or 24 "Opto-22" style replaceable solid state relays, 120VAC standard.
<b>Built-in touchscreen:</b>	Enclosure mountable touchscreen when a local display is required. Different sizes of screens are available depending on your needs.
<b>Alternative communications:</b>	Radio connection is available between vessels and DAQ; WiFi between DAQ and local network. For remote locations, cellular modems can be used.

# SCALE-TRON

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