Avery Weigh-Tronix

ZT DIGITAL
LOAD CELL
Smart - Rugged - Accurate

Frequently Asked Questions

KEY FACTS

1. What are the applications of the ZT Digital Load Cell?

Like the T301X, ZT Digital Load Cells are factory pre-calibrated and have an industry standard height of 200 mm, making them ideal for many applications such as:
› Weighbridge
› Rail
› Process control
› Tank and hopper

2. Does the ZT Digital Load Cell need a junction box?

No, the ZT Digital Load Cells are connected directly to a secure bus network without the need of a dedicated junction box or termination connector.

3. Is the ZT Digital Load Cell approved?

Yes, OIML R60, approved to 6000 verification intervals (accuracy C6) with a capacity of 30 t or 45 t.

4. What indicators are compatible with the ZT Digital Load Cell?

The Avery Weigh-Tronix ZM510/615 Series Indicators support the ZT Digital Load Cell.

5. How many ZT Digital Load Cells can be linked together?

Up to 32 ZT Digital Load Cell can be connected together.

6. ZT Digital Load Cells are connected to a backbone network through a single connector. What are the advantages?
Unlike other systems, this design:
› Simplifies the cable routing and connection process (e.g. saving up to 79% of cabling if compared with an equivalent four T301X sensor platform).
› Keeps the connectors away from adverse environmental conditions (e.g. flood and sand dust) and protected from accidental damage.
› Makes each cell and connection always individually accessible for inspection.
› Allows each sensor to be preconfigured, even before installation.
› In addition, the weighbridge can be kept functioning in a limited capacity even when one sensor fails (Ghosting feature, non-trade approved mode).

7. Can the ZT Digital Load Cell be used to upgrade other manufacturer's load cells?
Yes, the ZT Digital Load Cells can be used to replace other manufacturer's load cells by using one of the available conversion kits.

8. Can the ZT Digital Load Cell System handle multiple and separate scales?

Yes, when configuring the indicator in Ztools, each of the ZT Digital Load Cells on the network can be grouped into logically independent platforms.
› The ZM510 can have up to four scales
› The ZM615 can have up to eight scales

9. Do you need test weights when installing the ZT Digital load Cells?

No, because the ZT Digital Load Cells are pre-calibrated, linearized and temperature compensated to the highest industry standards from our factory. Therefore, by simply zeroing off the deadweight of the weighbridge, you will have a functioning weighbridge.
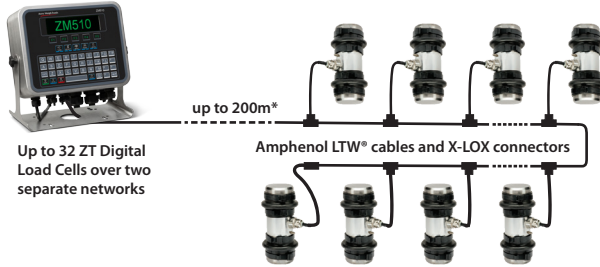
SERVICE AND INSTALLATION

10. What are the advantages of having the ZT Digital Load Cell with pre-fitted load buttons?
› Faster and uniform installation.
› Buttons are pre-greased at factory using the correct type and amount of grease.
› The load buttons properly coupled to the specially designed load bearing surfaces, i.e. rocker-column, guarantee the correct alignment full up to 6000d and help to reduce the cell motion.
› The sealed rubber gaiter bellows protect the weighing element from external factors and reduce the cell motion that can cause damage.
› The top and bottom load buttons are secured by a dual external rapid clamping/releasing 304 stainless steel cam lock system that reduces the cell rotation.

11. How are the ZT Digital Cells networked to each other?

The load cells are connected using Amphenol LTW® connectors as shown below. The connectors create a backbone network linked to a ZM510/615 Avery Weigh-Tronix indicator.

up to 200m*

Up to 32 ZT Digital Load Cells over two separate networks

Amphenol LTW® cables and X-LOX connectors

*Maximum length of the interface cable is subject to the number of cells connected

12. What is the maximum length of the home run cable?

Number of ZT Load Cells	Max Home Run Cable	Max System Cable Length
Up to 8	200 m	264 m
10	175 m	257 m
12	150 m	250 m
14	125 m	243 m
16	100 m	236 m

13. What is the "Weighbridge Balancing Check" feature?

To make sure that the decks are not only level but also standing on their static balance point, this feature displays the dead weight on each cell before performing the calibration.

If required, the ZT Digital Load Cell alignment can then be adjusted to evenly balance the platform dead weight and prevent any problems with repeatability and calibration errors.

14. What is the "Ghosting" feature?

Ghosting detects one faulty weight sensor output, isolates the weight sensor, and replaces the faulty sensor output with a simulated replacement. It can allow a scale to keep functioning in a limited capacity (not trade mode) until repairs can be made. The "Ghost" alert will pop up on the ZM510/615 screen and the "Non-Legal Weight" message will be printed on any tickets.

15. How accurate is the weighbridge in Ghosting mode?

The accuracy of a weighbridge working in Ghosting mode depends on:
› The current mechanical conditions of the platform and last calibration date.
› The module design and number of active sensors.
› The load distribution of each truck axle (shaft) across the deck sections.

The specific accuracy achieved at a location can be confirmed on installation. For reference only, the tests conducted by Avery Weigh-Tronix demonstrate that, for a weighbridge of 1 or 4 modules (6 x 3 m and 3500 kg weight each), the accuracy of a uniformly distributed load may vary from ±4% to ±1% respectively.

16. What diagnostics specific to the ZT Digital Load Cells are available in the indicator diagnostics menus?

The parameters monitored are:
› Communication status
› Temperature
› Overloads counter and peak weight
› Live weight and counts
› ZT firmware version

17. What are the errors logged in the ZM510/615 Indicators internal database?

If the ZT Digital Load Cell detects an error, the following messages will be shown on the upper right of the indicator display.

The ZM log is a SQLite database file that can be accessed by the indicator application (Diagnostic Menu) and copied from the flash drive to another, like a FTP, USB memory stick or sent to a printer.

The errors logged are:
› Scale over/under load
› ZT cell over load
› Communication status
› Ghosting activation

18. Is the ZT Digital Load Cell backward compatible?

Yes, the ZT Digital Load Cell sensor can also be installed in a T301X weighbridge system.

PROTECTIONS

19. What is the ZT Digital Load Cell IP rating?

The ZT Digital Load Cell is hermetically sealed to IP68, 1 m - 7 days submersion (IEC 60529) and designed to survive the world's most extreme weather conditions with operating temperature range from -40°C to +65°C.

The cell-cable entry is featured with a Glass-to-Metal header that makes it hermetic to IP69K (DIN 40050-9 certified) while the proven industry leading cable and connectors (Amphenol LTW®) are conformed to the EIA364 and IP68 standards to ensure maximum protection against external agents.

20. Can the ZT Digital Load Cell be used in a hazardous area?

No, the ZT Digital Load Cell does not have any ratings for hazardous areas and must be located in a safe area.

21. Is the ZT Digital Load Cell immune from high voltage surges and RFI interference.

Yes, the system has been tested to and passes IEC 61000-4-5 simulating lighting surge at Level 4: Severe harassment environment such as civil aerial, high-pressure power substation without protection.

22. Is the ZT Digital Load Cell fraud-protected?

Yes, as part of the continuous monitoring diagnostic features, the ZT digital communication protocol is designed to recognise only the ZT Digital Load Cells which serial number has been linked to a unique address generated by the indicator. The watchdogs inside the indicator and each cell monitor the ZT network status contributing to prevent any attempt of fraud.

23. How is the ZT Digital Load cell protected from mechanical shock and operating stress?

› The 2.35 mm thick stainless steel outer wall protects the internal elements (e.g. the eight strain gauges and 24-bit ADC) from accidental damage.

› The stainless steel aircraft-quality alloy column guarantees a safe load limit 150% of the rated capacity and outstanding weighing performance (6 million internal divisions)even when weighing loads up to 3° off centre loads.

› The Amphenol LTW® cables have an extra electrically – mechanically – chemically tough polyurethane sheath for maximum protection. A stainless steel braid outer cover can be supplied to order.

› The Amphenol LTW® X-LOK connectors comply with the EIA364 environmental performance requirements and meet the highest industrial standards by using UL94V-0 and UL-f1 rated thermoplastic materials for flammability and UV exposure protection.

PROGRAMMING

24. What version of Ztools and indicator firmware does the ZT Digital Load Cell need?

› Ztools version 2.3.4.0 or newer is required
› ZM Firmware version 2.5.0.0 or newer is required

25. What information can a Lua application pull from the ZT Digital Load Cell?

Version 2.5.0.0 of the ZM firmware adds the following LUA keyword to the 'awtx.protocol' namespace. See the API for full descriptions:

›› getScaleCellPercentage
›› getScaleCellWeights
›› getScaleCellStatus
›› getScaleCellZero

A custom Lua application can be written to register the event and use the information for any purpose:

› Email, webpage, printer output, etc.
› Custom system initialization
› Advanced applications and monitoring: connection and sensor status change, motion, out of balance (ratio metric error), sensor over capacity, multiscale, etc.

DOCUMENTATION

ZT Digital Load Cell Technical Specifications	AWT35-100043
ZT Digital Load Cell Brochure	AWT35-100042
MANUALS	
BridgeMont Series Truck Scales ZT Installation Instructions	AWT35-500618
ZT Digital Load Cell Installation Instructions & Parts List	AWT35-100031
ZT/ZM Interface Card Installation Instructions	AWT35-100053
ZT Digital Load Cell Configuration and Calibration	TG.E-ZT/1
ZT Digital Load Cell Diagnostics and Error Log Menus	TG.E-ZT/2 and TG.E-ZT/3
ZM500/600 Series Indicator	Service and User Manuals
LUA API Reference Manual	1.0.5.3 or newer
APPROVALS	
OIML Certificates of Conformity	R60/2000-A-GB1-21.01
EU DoC and UKCA	Certificate on file
Surge Immunity Class	IEC 61000-4-5: Class 4 test reports on file
IP69K Rating	DIN 40050-9 and IEC 60529 test reports on file

Avery Weigh-Tronix

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