DANAK
PROD Reg. nr 7026

FORCE Certification

EVALUATION CERTIFICATE

No. 0200-WL-05858

Object name **ZM505 / ZM510 / ZM605 / ZM615 Series**

Object type **Weighing indicator for an automatic check-/catchweighing instrument**

Issued by **Force Certification A/S**

Issued in accordance with the requirements in WELMEC Guide 8.8:2017 "Guide on General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments".

In accordance with OIML R51:2006, OIML D11:2013, WELMEC Guide 2.8:2012, WELMEC Guide 7.2:2018 and WELMEC Guide 8.8:2017.

Issued to **Avery Weigh-Tronix**
Foundry Lane
Smethwick
West Midlands B66 2LP
UNITED KINGDOM

Manufacturer **Avery Weigh-Tronix**

In respect of A weighing indicator tested as a module for an automatic check-/catchweighing instrument.

Characteristics The ZM505 / ZM510 / ZM605 / ZM615 indicators have the following characteristics:

Weighing range:	Single-interval
Accuracy class:	XIII(1), Y(a),
Number of VSIs:	$n \leq 10{,}000$ using 10 V_{EXC}
	$n \leq 6{,}000$ using 5 V_{EXC}
Minimum input voltage per VSI:	0.5 µV using 10 V_{EXC},
	0.8 µV using 5 V_{EXC}

The essential characteristics are described in the annex.

Description and documentation The weighing indicator is described and documented in the annex to this this certificate.

Remarks Summary of tests involved: see annex.

This evaluation certificate cannot be quoted in an EU type examination certificate without permission of the holder of this certificate mentioned above.

The annex comprises 12 pages.

Jens Hovgård Jensen
2019-03-22

Digitally signed by Jens Hovgård Jensen
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Issued on **2019-03-22**

FORCE Certification references:
Task no.: 119-23235.90.15 and ID no.: 0200-WL-05858

Signatory: J. Hovgård Jensen

Descriptive annex

1. Name and type of instrument

The weighing indicator (weighing controller) is designated ZM505 / ZM510 / ZM605 / ZM615. It is designed to be used in conjunction with appropriate conveyors, pack detection device, pack flow management device (PLC) and optional printing/labelling device to form an automatic catchweighing instrument.

2. Description of the construction and function

2.1 Construction

The indicator construction is dependent on the model number, the designation follows the following format: "Prefix-XYZ", with

- Model Number Prefix:
  ZM505, ZM510, ZM605 or ZM615 = Standard Indicator
- First Digit X – Enclosure material
  S = Stainless enclosure
- Second Digit Y – Mounting orientation
  D = Desktop
  P = Panel Mount
- Third Digit Z – Display Type
  3 = IBN with dot graphic – Black background with Green Digits
  4 = Dot graphic – Green background with Black Dots (capable of negative image)
  5 = Large dot graphic – Green backlight with Black Dots (capable of negative image)

The ZM505, ZM605 and ZM615 feature 29 operational keys, including a numeric keypad and 5 "soft keys" (F1 to F5), the current functions of which are shown above them on the display.

The ZM510 features 48 operational keys, including a QWERTY keypad and 5 "soft keys" (F1 to F5), the current functions of which are shown above them on the display.

2.2 Devices

The ZM505 / ZM510 / ZM605 / ZM615 Weighing controller is provided with the following,

Operational features:

- Net or Gross weighing
- Semi-automatic zero setting device (≤ 4% of Max)
- Zero tracking (≤ 4% of Max)
- Automatic tare weighing (when part of automatic weighing process)
- Preset Tare
- Semi-automatic tare weighing device (subtractive)
- Memory for storing target weights
- Digital outputs for controlling external devices
- Printing
- PLUs
- Alibi storage device
- Event counters

- Gravity compensation
- Real time clock
- Command via external device (PC)
- Gross, Net, Tare, Preset tare, Print, Zero, Motion, Accumulation, Over/Under weight, Network and Battery indicators
- Connection to up to 4 load receptors, with load receptor number indicator
- Connection to digital load cells

Features or interlocks:

- Preset Tare value can be displayed temporarily during automatic operation (by pressing the SELECT key)
- Semi-automatic zero setting not operable during automatic operation
- Tare and Preset Tare devices not operable during automatic operation
- Preset Tare values rounded to the nearest scale interval
- Printing below Min is not allowed
- Conveyor speed setting, not accessible to the user
- Totalised weight is clearly identified and is algebraic sums of printed/stored values
- When no labeller is in use, the recorded data (DSD) must include: date, time, pack weight, Tare or Preset tare if Net is recorded, instrument ID, pack ID (or batch ID when it is impractical to store individual pack IDs, provided the batch can be physically identified), units of measurement
- When no labeller is in use, the instrument must stop when the DSD is full, unless if at verification it can be shown that the DSD capacity and machine throughput ensure only records that are old enough will ever be deleted / overwritten – otherwise records cannot be overwritten unless they are older than x days, with x being a secured parameter to be determined at verification, manual deletion of data must be prevented unless records are older than x days.
- The ZM505 and ZM510 instruments (including 10V EXC load cell option card) shall be set to zero at least every 7 hours 27 min, while the ZM505 and ZM510 instruments if fitted with a 5V EXC load cell option card shall be set to zero at least every 1 hour 55 min, via semi-automatic zero-setting, zero-tracking or tare devices.
- The ZM605 and ZM615 instruments (including 10V EXC load cell option card) shall be set to zero at least every 5 hours 03 min, while the ZM605 and ZM615 instruments if fitted with a 5V EXC load cell option card shall be set to zero at least every 1 hour 55 min, via semi-automatic zero-setting, zero-tracking or tare devices.

2.3 Operation

The functions to implement an automatic catchweighing instrument using the Avery Weigh-Tronix ZM505 / ZM510 / ZM605 / ZM615 are configured on an application-specific basis, and using a combination of Alarms, Trips and Setpoints, within the constraints of section 2.2.2 above and OIML R51-1:2006. A user manual specific to each application should be produced explaining the configuration and operation of the instrument to the end user.

2.4 Software

The software complies with Welmec Guide 7.2, Risk Class B, Type P, Extensions L and T.

2.4.1 Program segregation

The ZM505 / ZM510 / ZM605 / ZM615 software comprises of two segregated programs, the firmware operating system (OS) and a user application (written in LUA or GSE Macros or Weigh-Tronix Basic).

The OS is a self-contained system that stores the NAWI mode of operation. All legally relevant scale functionality is included in the OS and cannot be modified.

The user application, downloaded at installation, comprises non-legally relevant data and functionality, which calls on the legally relevant scale functionality from the OS.

2.4.2 Security

The software is held on the Flash Memory and the OS cannot be modified by the user. The calibration, legally relevant parameters and ability to download user applications are protected via physical or software means.

A jumper located on the main board prevents all access to the legally relevant parameters and prevents the download of user applications or firmware.

Alternatively, software sealing may be used to protect the calibration, legally relevant parameters and software. Two non-editable event counters, designated CAL and CONFIG, are incremented each time the calibration and legally relevant parameters respectively are modified, or if a new user application is downloaded with access to these parameters being password-protected. The counters' values and designations must be written on a tamper-evident label on or near the rating plate.

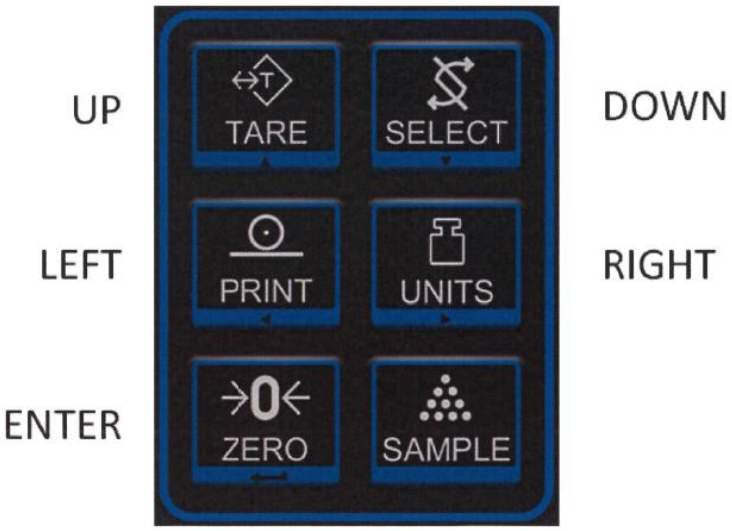
2.4.3 Verification information

Verification information may be accessed using the blue navigation keys, the layout of which depends on the indicator:

ZM510 Navigation Key Layout

Additionally the ↵ key on the QWERTY keyboard and the F1 to F5 "soft keys" may be used in some menus.

ZM505 / ZM605 / ZM615 Navigation Key Layout



Additionally the F1 to F5 "soft keys" may be used in some menus.

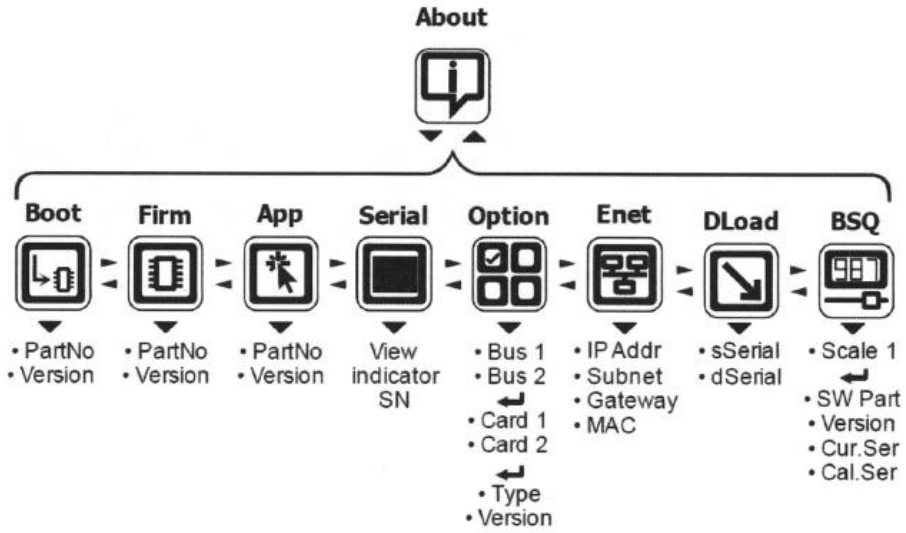
To access the menus, with the indicator powered up and in normal operating mode, press and hold the SETUP key until the password entry screen appears.

Key in 111 by using the numeric keys, and press the ZERO ↵ to accept it. **Busy** and a scrolling flashing * will be displayed initially, followed by the following screen:

2.4.3.1 Software identification of indicator

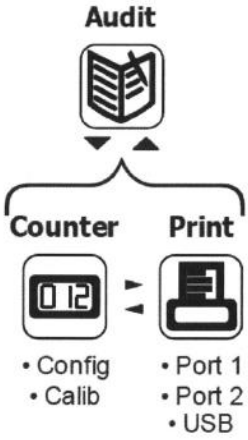
The Indicator software is designated AWT30-500208 version 2.x.x.x (where x.x.x refers to the identification of non-legally relevant software, which may be modified by the manufacturer).

To display the software part number and version number, scroll through the options using the ► or ◄ key, until **About** is displayed. Select this option by pressing the ▼ key, then navigate through the menu structure below, to display either the software part number (**PartNo**) or version number (Version), under the **Firm** submenu:



2.4.3.2 Event counters

To display the CALIB and CONFIG event counters' values, scroll through the options using the ► or ◄ key, until **Audit** is displayed. Select this option by pressing the ▼ key, then navigate through the menu structure below, to display either the CALIB or CONFIG event counter values:



Pressing ZERO ↵ while **Config** is displayed shows the value for the CONFIG counter
Pressing the **Esc** soft key returns to the "Config" menu.

Pressing ZERO ↵ while **Calib** is displayed shows the value for the CAL counter.
Pressing the Esc soft key returns to the "Calib" menu.

2.4.3.3 Returning to normal weighing mode

To exit back into normal weighing mode press the **SETUP** key until "**SAVE no**" is visible, then press the **ZERO** ↵ key.

3. Technical data

3.1 Weighing indicator

Type:	ZM505 / ZM510 / ZM605 / ZM615
Accuracy class:	XIII(1), Y(a)
Weighing range:	Single-interval
Weighing mode:	Static
Maximum capacity (Max):	= n × e
Excitation voltage:	5 VDC or 10 VDC
Maximum number of Verification Scale Intervals (n):	≤ 10000 (class III) using 10 V_{EXC}, ≤ 6000 (class III) using 5 V_{EXC}
Verification scale interval (e):	≥ 0.5 g
Minimum input voltage per VSI:	0.5 µV using 10 V_{EXC}, 0.8 µV using 5 V_{EXC}
Initial zero-setting range:	20 % of Max
Maximum subtractive tare effect:	-Max
Fractional factor (p_i):	0.5
Circuit for remote sense:	Active (see below)
Minimum input impedance:	10.9 ohm, ZM6xx indicator using 10 V_{EXC}, 14.5 ohm, ZM5xx indicator using 10 V_{EXC}, 58.3 ohm, using 5 V_{EXC}
Maximum input impedance:	1100 ohm
Connecting cable to load cell(s):	See Section 3.1.1
Maximum time between automatic zero-setting:	37 minutes for 0.7 µV > e ≥ 0.4 µV 75 minutes for e ≥ 0.7 µV
Electromagnetic class:	E2
Humidity:	Non-condensing
Mains power supply:	110-240 VAC, 50/60 Hz, (Desktop models) 12-36 VDC via mains adapter or external battery pack (Panel mount models)
Operating temperature range:	-10 °C / +40 °C
Peripheral interface(s):	See Section 4

3.1.1 Connecting cable between the indicator and analogue load cell / junction box for analogue load cell(s)

3.1.1.1 4-wire system

Cable between indicator and load cell(s):	4 wires (no sense), shielded
Maximum length:	The certified length of the load cell cable, which shall be connected directly to the indicator.

3.1.1.2 6-wire system

Cable between indicator and a junction box (J-box) for load cell(s): 6 wires (sense), shielded.

Maximum cable length between indicator and junction box, if any: 212 m/mm² ZM6xx with 10 V_{EXC}
143 m/mm² ZM5xx with 10 V_{EXC}
196 m/mm² using 5 V_{EXC} (limited to 30m)

4. Interfaces

4.1 Load cell interface

Refer to Section 3.1.1.

4.2 Peripheral interfaces

The indicator is equipped with the following communication and I/O interfaces,

- 3 × RS-232
- 2 × USB Host
- 10/100 Ethernet
- 3 × logic level inputs
- 3 × open collector outputs

4.3 Optional Interface & PCBs

The instrument may be fitted with up to four of the following optional boards, providing additional protected interfaces:

i. Analogue output card, providing 0-10 VDC and 4-20mA outputs

ii. Current loop card, providing 4-20mA loop and RS485 / RS422

iii. Internal Wireless LAN card, providing an 802.11b/g wireless link

iv. USB Device card, providing USB interface to PC

v. Load cell interface board, with 5V Excitation (to allow the connection of a second platform, maximum 6 load cells). Refer to section 3.1 for full technical data.

vi. Load cell interface board, with 10V Excitation (to allow the connection of a second platform, maximum 16 load cells). Refer to section 3.1 for full technical data.

vii. Bluetooth card, providing a Bluetooth wireless link

viii. DeviceNet card, providing one DeviceNet Fieldbus interface.

ix. Profibus card, providing one Profibus Fieldbus interface

x. Ethernet to PoE Supply side card, providing an Ethernet pass-through interface, with Power over Ethernet available on the output port.

xi. Quad DC input card, providing four 4-30VDC Opto-Isolated inputs

xii. Quad DC output card, providing four 3-60VDC Solid State Relay outputs

xiii. Quad AC input card, providing four 120-240VAC Opto-Isolated inputs

xiv. Quad AC output card, providing four 20-240VAC Solid State Relay outputs

xv. External I/O Expansion Card, providing interfaces to legacy installations previously fitted with External I/O or SSCU8 cards

xvi. Programmable Digital I/O card with eight programmable logic level inputs or outputs, providing pulse counter, frequency measurement, Quadrature decode, and PWM output functionality.

4.4 Peripheral devices

The instrument may be connected to any peripheral device that has been issued with a Parts Certificate by a Notified Body responsible for Annex II, Module B under Directive 2014/32/EU and bears the CE marking of conformity to the relevant directives; or

A peripheral device without a Parts certificate may be connected under the following conditions:

- it bears the CE marking for conformity to the EMC Directive;
- it is not capable of transmitting any data or instruction into the measuring instrument, other than to release a printout, checking for correct data transmission or validation;
- it prints measuring results and other data as received from the measurement instrument without any modification or further processing; and
- it complies with the applicable requirements of Paragraph 8.1 of Annex I

5. Marks and inscriptions

The instrument shall bear the following legends:

- Evaluation Certificate number
- Manufacturer's mark or name

6. Location of seals and verification marks

Components that may not be dismantled or adjusted by the user (e.g. load cell connections) will be secured by a wire and seal solution, a tamper evident label and securing mark or common serial numbers. The securing mark may be either:

- a mark of the manufacturer and/or manufacturer's representative, or
- an official mark of a verification officer.

7. Pictures

Figure 1 ZM505-SD3 indicator

Figure 2 ZM505-SP3 indicator

Figure 3 ZM510-SD4 indicator

Figure 4 ZM510-SP4 indicator

Figure 5 ZM605-SD4 indicator

Figure 6 ZM605-SP4 indicator

Figure 7 ZM615-SD5 indicator

Figure 8 ZM615-SP5 indicator