

# E1110

## multi-function weight indicator

### Description

#### General

This specification describes the E1110 advanced multi-function weight indicator, capable of stand-alone operation, or of integration into a larger system via serial, FieldBus and Ethernet interfaces.

It is a microprocessor-based industrial weighing system with up to 100,000 displayed increments for analysing, displaying, storing and transmitting gross and net weight information.

Up to 12 load cells to be connected with the indicator (16 with second scale). Analogue load cells may be used.

This indicator can display weight data from two scales . Both scales are active and are independently weighing at all times.

The E1110 can be matched to almost any analogue load cell system to achieve optimum accuracy, stability and repeatability.

The indicator can control its surrounding process using fully configurable I/O. Alternatively, control can be executed from a central system using an extensive range of available interfaces.

#### Configurable Features

The E1110 features a numeric keyboard with function keys, which allows any of the following functions to be configured during commissioning:



- Sensitivity to weight signal
- Scale capacity
- Number of divisions and increment size
- Weighing Unit
- Zero/back balance
- Decimal marker type - point or comma
- Position of decimal marker
- Calibration site gravity factor
- Customer site gravity factor
- Filtering using FIR or Harmonizer™ filtering systems
- Ten points for linearity correction to ensure maximum accuracy
- Tare availability and manner of operation
- Time and date (two or four digit year, battery backed)
- User-definable serial output strings
- Subtotal and grand total information
- Scale ID number
- Alarm index operation
- Recipe/filling I/O configuration

All these characteristics are stored in non-volatile memory so that once the ideal parameters for any given weighing system are established they can be retained with certainty for the future.

Once the scale is set up as required, a calibration report can be printed showing weighing details (useful for the installation engineer). This allows the state of the system to be monitored.

Up to 100 product look ups (PLUs) are available for instant recall of previously programmed product information.

## Applications

### Parts Counting

Sampling modes supported: fast; dribble; bulk

### Static Checkweighing

Set limits, either absolute or relative to target. Set check-weigh bar step size.

### In-Motion Weighing

The indicator can be used to control the in-motion process as required.

### Peak Hold

Records maximum weight measured. Clear button resets memory

### Weighbridge

An application offering the following functions.

Three core operating modes -

- Re-entered first weight
- Stored and printed
- Stored first weight

Additional modes:

- Two platform in/out operation

Database supports:

- Vehicles
- Outstanding vehicle report

### Single Level Pack Run Monitoring

Set all parameters to monitor and manage single level packing. Produce all labels as required for tracking.

### Recipe/Filling

Control of complete process using fully configurable trips.

In-flight compensation and dosing variables may be set to optimise the process. Batching mode allows repetition of the process for a defined quantity.

### Totalising Against Dedicated Product Look Ups (PLUs)

Link weighings to PLUs for complete stock control.

### Remote Display Mode

Connect to, or use as a remote display.

## Specification

### Electrical

#### Display

##### Type

Eight digit, yellow LED, 25 mm high.  
Two lines yellow LCD, 5 mm high.

##### Decimal Points

Configurable to any of seven positions.

##### Units Displayed

g, kg, lb, custom.

##### Annunciators

Balance (Gross Zero)  
Motion  
Pre-set Tare  
Semi-Automatic Tare  
Net  
lb or kg  
Print  
Three-off Trip Indicators  
Minus (below net zero)  
Under/target/over  
Scale 1  
Scale 2

#### Keypad

26 keys, addressing:  
Numeric entry  
Three soft Function keys  
Dedicated Function Keys  
Zero, Tare, Select, Print, Units, Totals, Scale, PLU, Standby, Escape, Enter, Clear.

## Load Cell Input

### Analogue Input

Combined minimum load cell impedance must be greater than  $22\Omega$ .

### Maximum Load Cells if $350\Omega$ (One Scale)

12.

### Total $350\Omega$ Load Cells if 2nd Analogue Input Fitted

16.

### Connection of Input

Direct wired (Buccaneer if supplied with scale).

### Excitation

Direct current.

### Voltage

10 V dc.

### Current

Up to 460 mA

### Remote Sense

Obtained from excitation, or Linked directly to reference input connectors at the indicator.

### Input Impedance

$1M\Omega$  paralleled with  $2.2nF$ .

### Signal

6-20 mV maximum.

### $\mu V$ / per Division

0.6

### Resolution

Approved 10,000  
Non- Approved 100,000

**Calibration**

Full digital multi-point (ten point) calibration.

Theoretical calibration possible if parameters known.

Provides over load report.

**Increment Multiplier**

1, 2, 5, 10, 20, 50, 100, 200, 500.

**AVR**

Three stage.

**Gravity Compensation**

Set gravity for calibration and installation site.

**Analogue to Digital Convertor**

**Display Update Rate**

1, 2, 5, 10 per second.

**A to D Rate**

120 per second.

**A to D Type**

Delta Sigma.

**Filter**

**FIR & Dynamic Filtering**

Seven programmable Options

Filter Level	Associated Filter Attributes			
	Display Response Time (seconds)	Weight Sample Rate (Hz)	Noise Amplitude	Noise Frequency
0	0.20	8.13	Lowest	Highest
1	0.35	8.13		
2	0.53	8.13		
3	0.96	8.13		
4	1.45	8.13		
5	2.09	8.13		
6	2.85	8.13	Highest	Lowest

**Dynamic Filter**

Applied after the FIR filter. Set the filter window size in divisions (0 - 99). A high value will have a large damping effect on the weight display.

This significantly slows the scale response to a legitimate change in weight.

**Harmonizer™ Digital Filter**

Three programmable parameters:

**Samples to Average** - sets number of A-D conversions which will be averaged to give a weight reading.

**IIR Filter** - sets how much damping the Harmonizer™ applies to the weight reading. Typically between 1 (low) - 8 (higher).

**Threshold Level** - sets the minimum weight change (in calibration units) which the Harmonizer™ will not attempt to filter out as noise.

**Balance/Zero**

**Setting**

Keyboard push button.

**Operation**

Ignore or recall limit exceeded.

**Size of Balance Range**

Normally 4%, up to 100%.

**Zero Indication**

Within 4% of maximum capacity.

**Under Range Indication**

Displays '\_\_\_\_\_'.

**Zero Tracking**

Configurable

**Motion Detection**

Configurable.

**Range/Span**

**Range of Adjustment**

0 - 100,000 divisions.

**Over Range Indication**

Displays '- - - - -'.

**Tares**

Three types of tares are available. Each is 100% subtractive.

Note: Interlocks between the tare types are configurable at time of commissioning.

**Type A - Push-Button (Semi Auto) Tare**

Push-button operated, semi-automatic, with selectable negative weight display. Cumulative taring is possible.

**Initialisation and Operation**

When the item to tare on is applied, press the 'Tare' push-button.

**Indication**

'Net' annunciator is illuminated.

**Type B – Keyboard (Pre-set) Tare**

Keyboard-entered tare operated with negative weight display.

**Initialisation & Operation**

Enter pre-set tare value using the 0-9 keypad and press 'Tare' push button. Multiple pre-set tares are possible.

**Indication**

'Net' annunciator is illuminated together with pre-set tare annunciator (PT).

**Type C - Stored Tare**

Stored tare operated with negative weight display allowing 40 separate stored tares. Will be retained when power is off. Linked to any PLU.

**Initialisation & Operation**

Automatically activated when PLU activated.

**Indication**

'Net' icon is illuminated together with preset tare icon (PT).

**Trips**

The indicator has three internal trips as standard, and can support up to eight external trips via external Trips Interface Units (see accessories).

All trips (both internal and external) are rated at 240 V 10 A. Internal inputs are rated at TTL levels.

Two modes have independent control of the trip outputs, Alarm and Recipe. Alarm mode operates continuously. Recipe mode is dependant on the Recipe / Filling application being configured and in operation.

**Alarm Mode**

Alarm mode has 10 independent configurable indexes, and cannot be turned off. Each index can be programmed to operate any or all outputs based on a given target:

- None - index inactive
- Target Weight
- Status of indicator, e.g. weight steady, checkweigh accept
- Input (single or specific pattern)
- Output (single or specific pattern)
- Time

**Recipe /Filling Mode**

Recipe/Filling mode has 10 configurable sequential steps, and is active only in Recipe/ Filling mode. Each recipe (maximum 10) can be configured independently to the others. Each index can be programmed to operate any or all outputs based on a given target:

- None – index inactive
- Target Weight (includes tolerance, compensation and dosing parameters)
- Status of indicator, e.g. weight steady, checkweigh accept
- Input (single or specific pattern)
- Output (single or specific pattern)
- Time

Other variables that can be configured in Recipe / Filling mode are:

- Outputs at start of step
- Outputs at end of step
- Target action (e.g. print)
- PLU to accumulate totals data

All configuration information is retained when power is off.

**Product Look Ups (PLUs) & Totals****Information Stored per PLU**

Sub-totals and grand totals. Application specific info stored per PLU. Memory protection of PLUs.

**Maximum capacity of each PLU**

999,999,999.

**User Definable Text Fields per PLU**

One, 21 characters.

When a PLU is recalled, the indicator is automatically configured into the application programme of the PLU. All information on the PLU can be displayed as well as printed.

**Real Time Clock**

The E1110 is fitted with a real time clock which allows the user to display and print the time and date. This clock is battery-backed and will remain functional in the absence of mains power.

**Communications****Serial Interface**

One bi-directional asynchronous serial interfaces (RS232/485/422 and RS232/20mA current loop) as standard. Two additional via optional digital interface card.

**Networking**

Ethernet 10/100 TCP/IP interface as standard.

Fieldbus interfaces – optional – see Kits.

**Electrical Power Input****Voltage**

110 VAC - 230 VAC nominal, 50/60 Hz.

**Tolerance**

Voltage -15 to +10%. Frequency  $\pm 10\%$ .

**Power Consumption**

30 VA maximum when used with full configuration of load cells.

**Cable Length**

2 m.

**Power Supply**

Internally fitted, switched mode.

**Isolation Protection**

None. Mains earth lead must be connected to safety earth.

## Environment

**Resistance to Dirt and Moisture**  
Protected to IP65, in stainless steel enclosure.

**Electrical Disturbance**  
Immune to electrical disturbance, including RFI as detailed in EN 45501:1992

**Operating Temperature**  
-10° C to + 40° C.

**Service Temperature**  
-10° C to + 55° C.

**Storage Temperature**  
-40° C to +70° C.

## Finish

Enclosed in stainless steel 304 pressed case.

## Mounting Options

The indicator will desk, wall or pole mount.

For close wall mounting, stainless steel mounting bars are available as an option. Note these prevent changing the angle of the front panel.

Pole mounting requires optional adapter.

## Performance

**Internal Resolution**  
16,777,216.

**Repeatability**  
± 0.01% of full scale.

**Span Drift Time**  
± 50 ppm/year max.

**Span Drift Temperature**  
± 4 ppm/° C typical.

**Zero Drift Time**  
± 10 ppm ± 0.1% DL/year maximum.

**Zero Drift Temperature**  
± 2 ppm ± 40 ppm DL/ °C maximum.

**Warm Up Time**  
Immediate self test complete.

### Self Diagnostics

Main Display  
Two line display  
Keys  
A2D (x 2)  
Serial Test (3)  
Network interface  
Ethernet port  
BCD Out  
Analogue Out  
Pulse In  
Memory  
Tally Roll  
Internal I/O  
External I/O

## Approvals

All data relating to the performance of the machine meets and exceeds requirements of EN 45501:1992 European Approval ('E' Approval) Accuracy Class III Machines and OIML 76-1. The type approval certificate numbers being:

EU	- UK2694
South Africa	-
New Zealand	-
Australia	-
OIML	- R76/1992-GB1-04.03 Revision 1
NTEP	- 04-033

## Factory Options

Choice of mains power connector: UK, Euro, Australian, South African, American.

## Kits

The following kits are available to enable local configuration when required.

### 1. Analogue Card

Provides second analogue scale input and two analogue outputs 4-20 mA.

*E11050F00000000*

### 2. Digital Card

Provides two additional bi-directional asynchronous serial interfaces (RS232/485/422 and RS232).

Also includes BCD output (range 1 - 100,000) and pulse input.

*E11050G00000000*

### 3. Electronic Tally Roll Card

Securely stores and prints up to 72,000 transactions, with details of scale ID, gross/tare/net weights, time, date and consecutive number.

Also acts as carrier for FieldBus card.

*E11050H00000000*

### 4. ProfiBus Interface Kit

Enables interfacing to ProfiBus network. Includes Electronic Tally Roll card (*E11050H00000000*) as standard to provide interface.

*E11050J00000000*

### 5. ControlNet Interface Kit

Enables interfacing to ControlNet network. Includes Electronic Tally Roll card (*E11050H00000000*) as standard to provide interface.

*E11050K00000000*

### 6. DeviceNet Interface Kit

Enables interfacing to DeviceNet network. Includes Electronic Tally Roll card (*E11050H00000000*) as standard to provide interface.

*E11050L00000000*

### 7. Ethernet IP Interface Kit

Enables interfacing to Ethernet Industrial Protocol (IP) network. Includes Electronic Tally Roll card (*E11050H00000000*) as standard to provide interface.

*E11050M00000000*

### 8. ModBus TCP Interface Kit

Enables interfacing to ModBus TCP or Ethernet (over Modbus TCP) network.

Includes Electronic Tally Roll card (*E11050H00000000*) as standard to provide interface.

*E11050N00000000*

### 9. Load Cell Connector With Internal Loom

When fitted, provides ability to disconnect load cell inputs from indicator without opening the unit.

*70735-247*

## Accessories

### 1. Stainless Steel Wall Mounted Brackets

Mounts the indicator fixed to the wall, with no angle adjustment. Replaces stand included with indicator.

*E11050A00000000*

### 2. External Lightning Protection Box

When fitted between the load cell/ junction box, and load cell input, provides additional protection from lightning.

*E11050B00000000*

### 3. Trips Interface Unit (TIU8)

Provides eight external I/O in place of three internal I/O included as standard.

Inputs rated at 12 V, outputs rated at 240 V 10 A.

### 4. 300 mm Pole

Stainless steel mounting pole with top mounting plate for indicator.

*E11100U00000000*

### 5. 1000 mm Pole

Stainless steel mounting pole with top mounting plate for indicator

*E11100V00000000*

### 6. Interface Leads for Platform to Indicator

See price list.

### 7. Interface Leads for Indicator to Printer

See price list.

### 8. Y808

Large push button unit (up to four buttons).

**Weight**

3.2 kg

**Shipping Specification**

**Net**

3.2 kg

**Gross**

5.7 kg

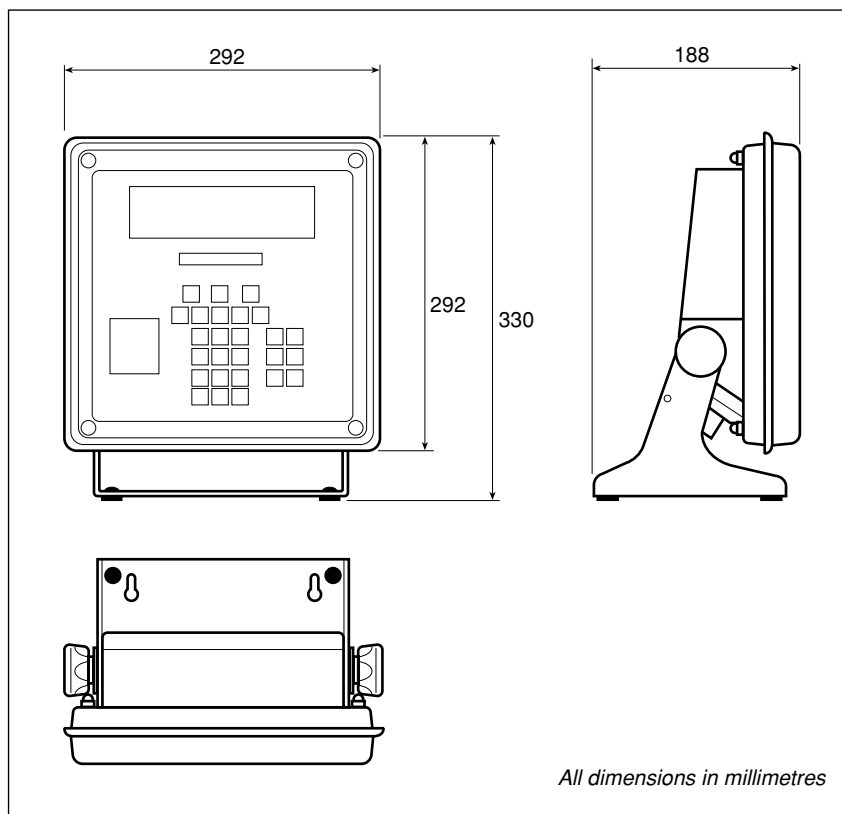
**Measurement**

340 mm x 280 mm x 350 mm

**Harmonised Commodity Code**

842390 00 0.

**Dimensions**



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Your local distributor:

**Avery Weigh-Tronix**

**E mail:** [info@awtxglobal.com](mailto:info@awtxglobal.com)  
**Internet:** <http://www.averyweigh-tronix.com>

Foundry Lane, Smethwick,  
West Midlands, England B66 2LP.  
Tel: +44 (0)870 90 34343 Fax: +44 (0)121-224 8183