

Feedback Control Function

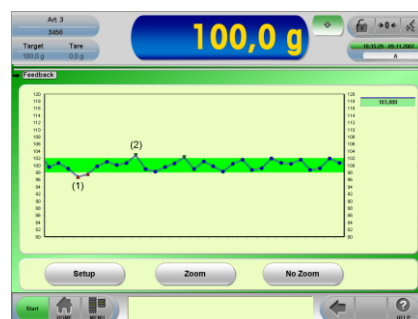
Overfilling Does Not Pay

The challenge:

- Aim 1: Net content laws define that the mean of the total production run must be equal or above the labelled weight – protect your brand and fulfil Weights and Measures guidelines
- Aim 2: Every gram overfilling should be avoided to save raw materials and therefore reduce product giveaway – profits can be increased by more efficient use of raw materials

The feedback control function minimises product weight errors and product giveaway through proactive feedback, keeping filler heads properly adjusted. Checkweighers can be integrated directly with the filler control or networked to existing factory floor automation systems for complete and seamless feedback control. Feedback control from a checkweigher can minimise product weight errors and product giveaway introduced by filler drift. The drift may be caused by slow changes in the environment, the product characteristics or a filler problem. The accuracy of the checkweigher with the feedback function compensates for these changes, but does not improve the filler performance. The above statements i.e. aims are the base for this function.

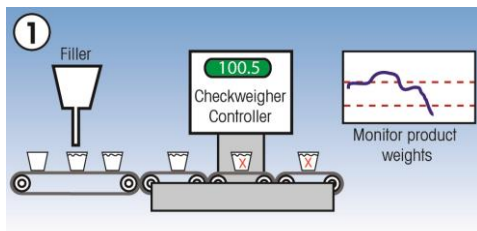
The filler feedback control function is based on the calculation of a mean weight value of a preset number of weighings during a set period. If a deviation is detected between the target weight and this mean value then the deviation value is translated into a control signal which is sent to the filler to adjust the fill levels. This mean weight calculation, comparison with the target weight and feedback to the filler is a continuous process.



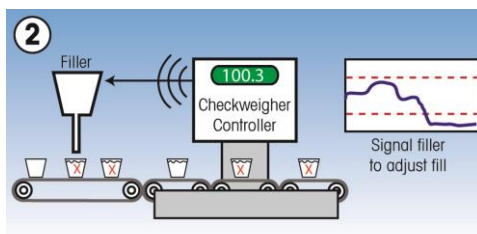
- Filler feedback interfaces to fulfil a large variety of filler systems:
- Timed feedback using a single duration pulse width signal using two potential-free contacts
 - Pulse feedback uses two potential-free contacts for "plus" and "minus" adjustment
 - Frequency feedback through a change in frequency between 250 to 2500 Hz
 - Voltage feedback through a change in voltage from 0 to 10 VDC
 - Current feedback through a change in amperage from 4 to 20 mA

How does the feedback control function work?

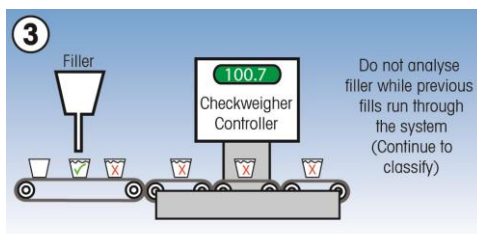
The checkweigher and filler are in constant communication ensuring that if a weight drift is detected, it can be rectified before it has a negative influence on the production.



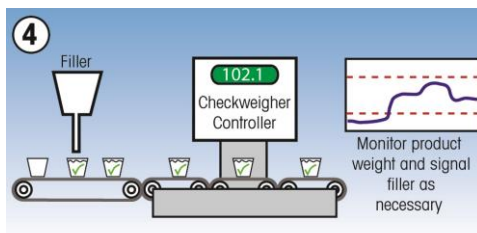
Step 1 shows a downward filler drift detected by the checkweigher. If this trend continues, the fill weight variation will increase and items may be filled underweight.



Step 2 shows the checkweigher sending a signal to the filler to adjust the fill levels. There will then be a time delay during which the checkweigher will not signal the filler to adjust.



Step 3 shows that the time delay is equal to the time it takes to weigh those packages which had already been filled before the checkweigher signalled a change in fill levels.



In Step 4 the downward filler drift has automatically been corrected by the feedback function

The longer the distance between the filler and the checkweigher, the more packages there will be between the filler and checkweigher and the greater the time delay between feedback signals. Ideally, the checkweigher should be located right next to the filler for the most immediate response to changes in fill weight.

Customer benefits:

- **Optimisation of filling processes**
- **Reduction of over and underfilling**
- **Reduction of unnecessary product giveaway**
- **Reduction of rejects and product scrap**
- **Compliance with net content laws and regulations**
- **Higher and more consistent product quality**

Mettler-Toledo Garvens GmbH

Kampstrasse 7
31180 Giesen
Germany

Telephone +49 (0) 5121 933-0
Facsimile +49 (0) 5121 933-456
e-mail garvens@mt.com

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