

Additional analysis on collected data

If a user would like to make data analysis beyond tolerance limit checks the SPC Module is the right tool.

UCL/LCL – Control limits

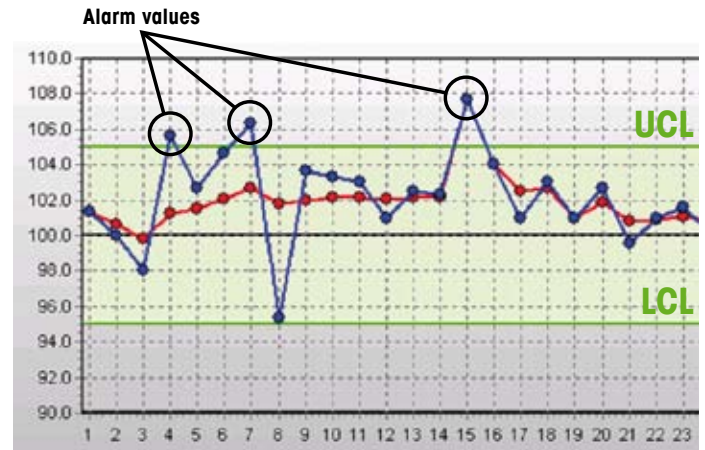
Control limits are absolute limitations, which can be applied to mean values, range or standard deviation. The assessment of a control limit violation can be done after each random sample or after a selectable period, such as hour, day, shift or batch. As soon as a violation occurs the system will create an alarm to permit immediate intervention.

CuSum – Cumulated Sum

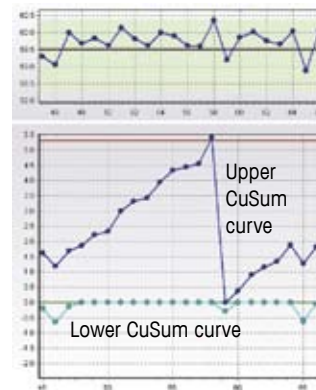
CuSum is especially useful when small deviations from the target value have to be detected. All individual deviations from the specified target value are automatically accumulated. If these accumulated values exceed a specified decision value the system will alert the user.

Cp/Cpk – Process capability

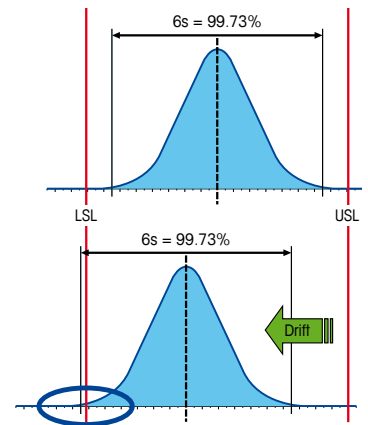
In order to monitor the entire process, it is useful to consider 3s (+/- 3 x standard deviation) so as to include 99.7% of the entire population. If 3s exceeds the specification limits in either direction the system will warn the user accordingly. Process capability is based on the standard deviation either of the sample series or the specified statistics period.



UCL/LCL



CuSum

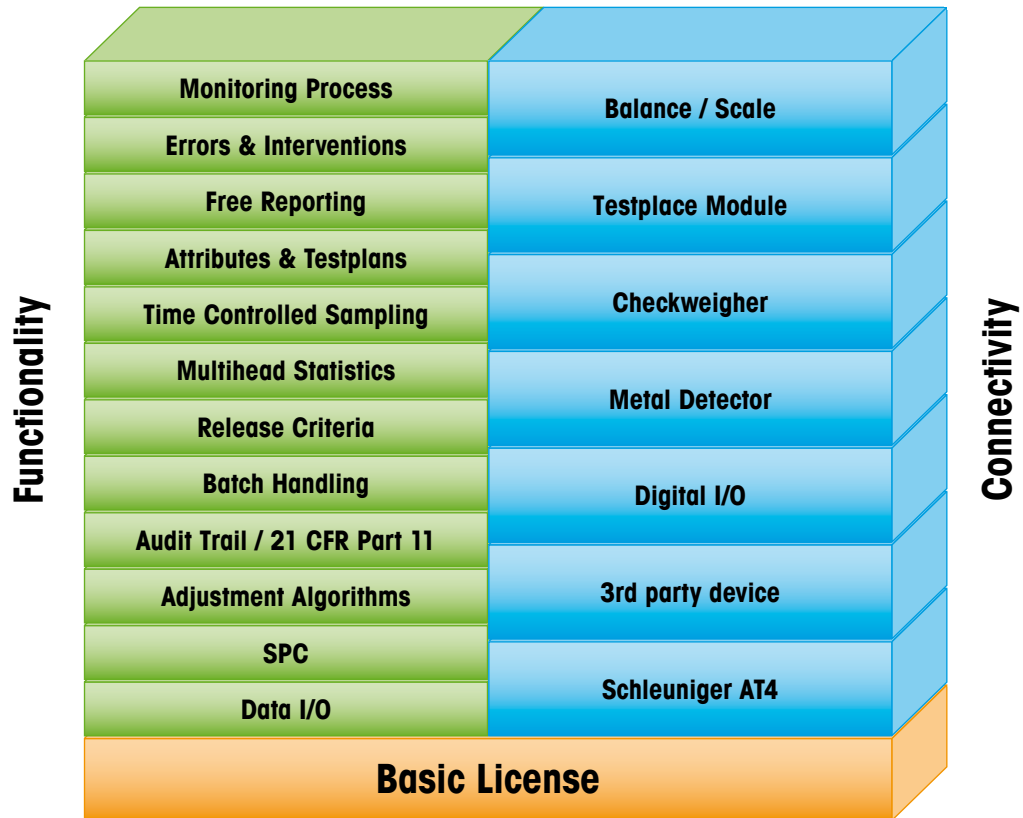


Cp/Cpk

Statistical Process Control with

- Control limits for mean value of random sample
- Control limits for std. deviation and range of random sample
- CuSum (Process mean deviation alert)
- Cp/Cpk (Process capability alert)

Available Optional Modules



Powerful basic license with optional function enhancements

The basic license provides enough functionality to satisfy a large range of applications. All statistical algorithms for mean value, standard deviation, range and much more are built into the basic package as well as the configurable alarm system, the activity logging, the comprehensive graphics and the legal reporting. This powerful package can be enhanced with additional functions without any installation of further software.

Trial activation of optional modules

FreeWeigh.Net® options can be temporarily activated for a time limited trial.

Wide choice of connectable equipment

FreeWeigh.Net® provides built-in device drivers for a vast range of METTLER TOLEDO weighing and measuring equipment. No matter whether the customer uses analytical balances or precision scales, checkweighers or metal detectors, they can be easily connected into the system. With the optional Device Integration Utility FreeWeigh.Net® is able to process data from almost any kind of measuring device and third party equipment, and integrate it into quality assessment process. This makes FreeWeigh.Net® a strategic instrument to control production quality in almost any industry and product.

Time Controlled Sampling Module

Full control over the data acquisition rate

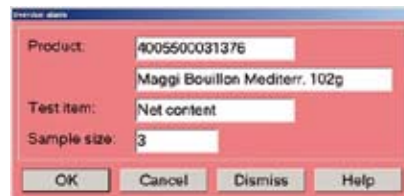
The optional Time Controlled Sampling Module permits the definition of a rate of sampling for each test item. In the case of the Testplace module it is possible to have multiple test items controlled by the defined sampling intervals. Due samples generate an on-screen message, from which the sample can be immediately initiated or postponed with the "Dismiss" function. This works on Testplace stations as well as on remote scales.

Visual or acoustic alert for sample due

If Time Controlled Sampling is combined with the Digital I/O option it is possible to combine a due and/or overdue situation with an electric signal, which could drive a warning light or a buzzer. This ensures that the alert for a sample is clearly recognized – even in a noisy environment.

Enforce sampling plan

Time Controlled Sampling enables the definition of the sampling rate together with all other product characteristics and enhances the quality control process with the enforcement of a sampling SOP in accordance with legal requirements.



Built-in control of sampling rate with online alert for due and overdue sample

- Definition of sample rate for single test items or for test item groups
- Online warning for due and overdue sample
- Immediate start of sample or dismiss function for later sampling
- Visual or acoustic warning when combined with Digital I/O*

* Requires Digital I/O option

Multihead Statistics Module

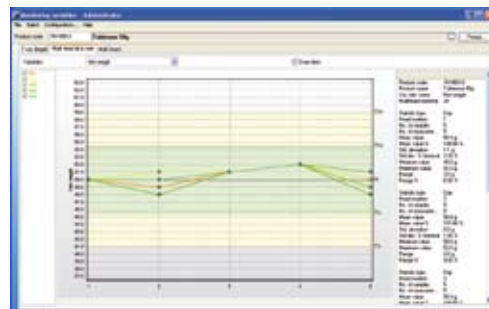
Online performance monitoring of individual filling heads

Producing on machines with multiple filling heads is a great advantage to throughput and productivity. As identical products are made with different (sub-) equipment it is important to constantly monitor the performance of each head or nozzle. This is crucial to prevent quality differences and also to recognize degradation or deviation of individual heads early enough to plan maintenance or replacement.



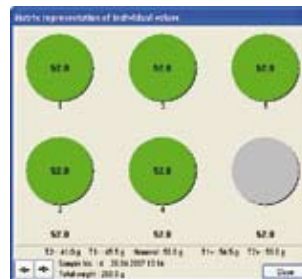
Pin-pointing for individual filling head monitoring

With a simple click it is possible to pin-point on individual filling heads and to compare them online. This function is ideal to monitor critical heads or nozzles.



Graphical matrix representation of individual values

A configurable matrix representation for individual values permits direct comparison of the heads in the shape they are installed in the filling machine.



To analyze trends of individual heads it is possible to simply flip forward and backwards between the sample series. Green, red or orange bullets indicate correct, under- or overvalues of each head.

Great benefit in plastics industry

Matrices are the typical shape of plastics injector molds. Therefore this function is a great benefit when using FreeWeigh.Net® for quality control in this industry.

Individual filling head statistics and graphical representation

- Monitors the performance of individual filling heads in multihead machines
- Pin-pointing of individual filling heads in online monitoring
- Graphical matrix display for individual values representing head layout
- Early recognition of filling head or injection mold degradation

Safeline® Metal Detector Interface

HACCP a key requirement for safety in food and pharma

Having a customer who found metallic parts in the food he bought is a nightmare for every producer. Not only could such an event endanger the life of the consumer, an expensive lawsuit could be the result. HACCP (Hazard Analysis and Critical Control Points) is an error prevention concept, originally defined for the food industry. Metal detection is one of the most important corner stones in this concept, making the metal detector a critical 'physical' control point (CCP) in a factory for consumer products.

Centralized control for Safeline® metal detectors

FreeWeigh.Net® performs the following main functions for connected Safeline® metal detectors:

- Online monitoring and alarming of metal detection
- Recording of metal detection events
- Alarming for due and overdue PVR (Performance Validation Routine)



Makes the metal detector an integral component of a comprehensive quality and safety system

- Supports the implementation of the HACCP concept in factories by FreeWeigh.Net® monitoring the connected metal detectors
- Ensures timely execution of PVRs with online alarms
- Alarms in case metal detection
- Records detection events and the related counter values

Audit Trail / 21 CFR Part 11 Module

Use FDA's 21 CFR Part 11 at your benefit

US FDA has implemented 21 CFR Part 11 on request of the pharmaceutical industry with the target to simplify drug approval, specifically to move away from the huge amount of paper based documents to electronic documents. With 21 CFR Part 11 the electronic documents become the original, while printouts on paper are non-binding copies. Companies wishing to comply with 21 CFR Part 11 will have to implement system supporting it. One of them is FreeWeigh.Net®. With the Audit Trail / 21 CFR Part 11 Module a major step towards compliance is achieved.

Designed for compliance from beginning

The design and specific functions of FreeWeigh.Net® support companies to fulfill 21 CFR Part 11 compliance requirements. From the start FreeWeigh.Net® was developed under the stringent rules of GAMP, thus entirely documented and traceable according to the V-Model. Furthermore the specifically implemented functions of the Audit Trail / 21 CFR Part 11 Module permit seamless implementation of FreeWeigh.Net® into a validated and compliant environment.

| Log ID | Date/Time | Component | Module | Product | Profile | Function | Category | Field/Message/Operation | Previous value | New value/Comment | User |
|--------|---------------------|------------|----------------------|---------|---------|----------|----------|-------------------------|-----------------|-------------------|-----------------|
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E signature: Herbie GUENTHER

Reason: Release (Production) Release (QA)

Meaning: Approval

Comment:

User name:

Password:

The Audit Trail / Part 11 module provides all necessary functions needed for compliance with the FDA 21 CFR Part 11 regulations.

- Electronic Signatures
- Audit Trail
- User profiles and access control
- Device control

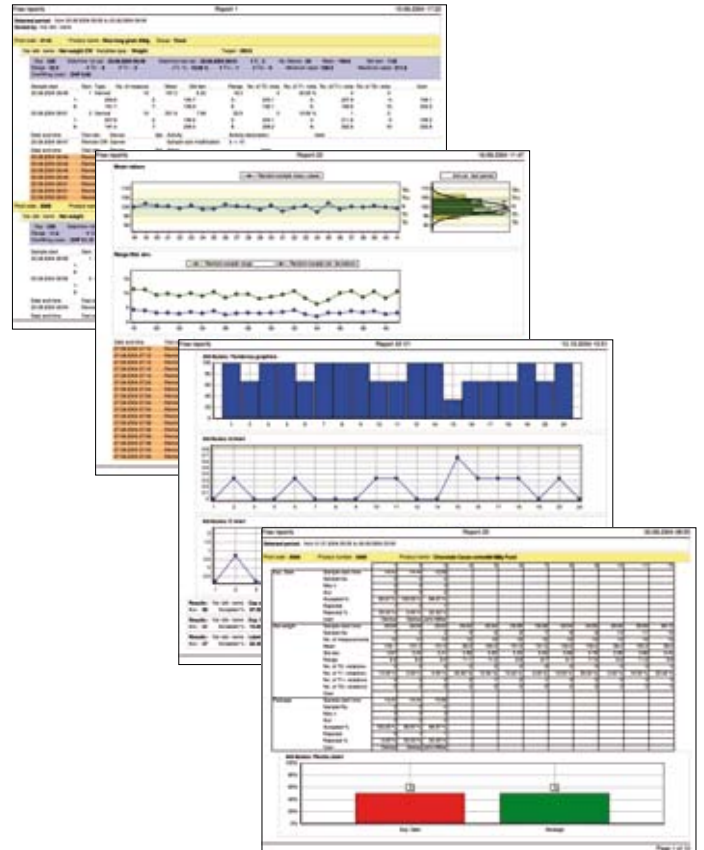
Free Reporting Module

Define your own report based on statistics or raw data

For many customer the reporting functionality available in the standard version of FreeWeigh.Net® is sufficient. However, sometimes it is required to define a special set of documentation mixing data with graphics, alarms or any other information available in the vast collection of data in the FreeWeigh.Net® database. The FreeWeigh.Net® Free Reporting Module opens a wide field of report configuration including data representation in matrices. Furthermore the Free Reporting Module allows to directly access the raw data from the database and to freely define time periods.

Data pin-pointing and data segregation

While legal reporting requires representation of all collected data, the Free Reporting Module provides a data pin-pointing feature allowing the selection of a particular set of data for a report. Segregation of production phases can easily be realized with Sample Tags, which can be assigned to sample data. All these features greatly enhance the value of the FreeWeigh.Net® reporting, especially in the pharmaceutical industries.



| Variables | | Attributes | |
|-------------------------------------|--------------|----------------|--|
| Selected | Product code | Product number | |
| <input type="checkbox"/> | 1461 | 7610090014 | |
| <input checked="" type="checkbox"/> | 1461 | 7610090014 | |
| <input checked="" type="checkbox"/> | 1461 | 7610090014 | |
| <input type="checkbox"/> | 1461 | 7610090014 | |
| <input checked="" type="checkbox"/> | 1461 | 7610090014 | |

Simultaneous display of related product information in one report

- Activities / alarms
- Combined variable / attribute-samples / statistics
- Variables: mean value, standard deviation, range control charts, histograms
- Attributes: pareto, trend graphic for individual attributes, c-charts, u-charts
- Freely selectable time period
- Data pin-pointing allows filtering of failed samples from the report

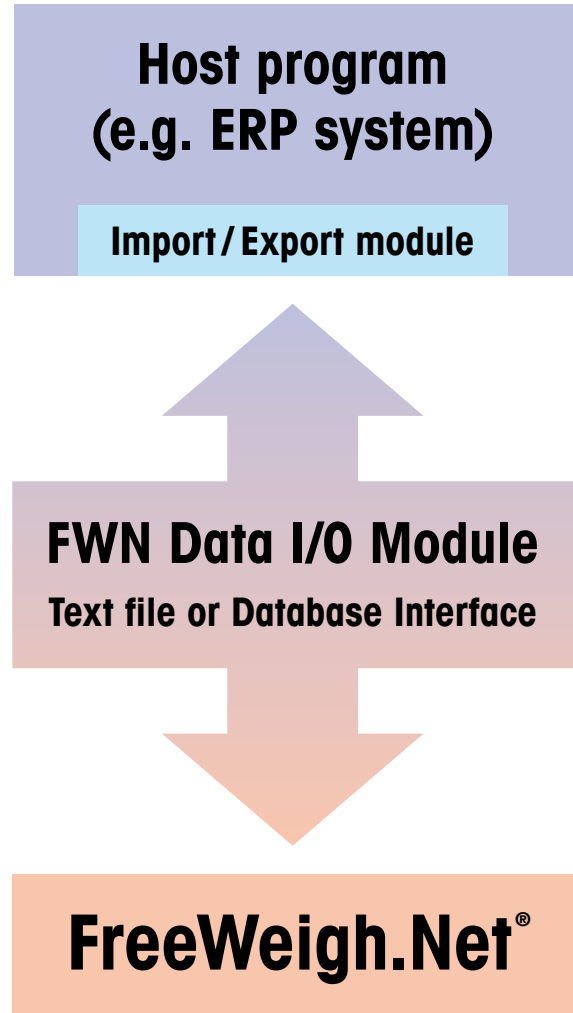
FreeWeigh.Net® Data I/O Module

Share data between FreeWeigh.Net® and your ERP system

Many companies maintain important data about their products in their own management computer system. This data – or parts of it – is also the basis for FreeWeigh.Net®. Therefore in order to reduce redundant data and also to automate as many processes as possible it is desirable that FreeWeigh.Net® makes use of the same data set. In addition many customers would like to store quality data created by FreeWeigh.Net® in the management system for further processing for management reporting purposes. The FreeWeigh.Net® Data I/O Module is a very flexible and configurable interface, which automates the exchange of this data. The data transfer takes place by means of a synchronized and shared data file on a common storage or direct by SQL access.

Less errors and cost savings

This configurable interface prevents input errors as data is entered once and then securely transferred between the linked systems. Furthermore it saves considerable time as entire datasets are transferred within fractions of a second instead of tiring re-typing of data.



Seamless data import and export between FreeWeigh.Net® and other systems

- Automatic and manual exchange of product data, statistics data, user data, activities log and alarms / warnings
- Data access through text file or database

Basic License Module

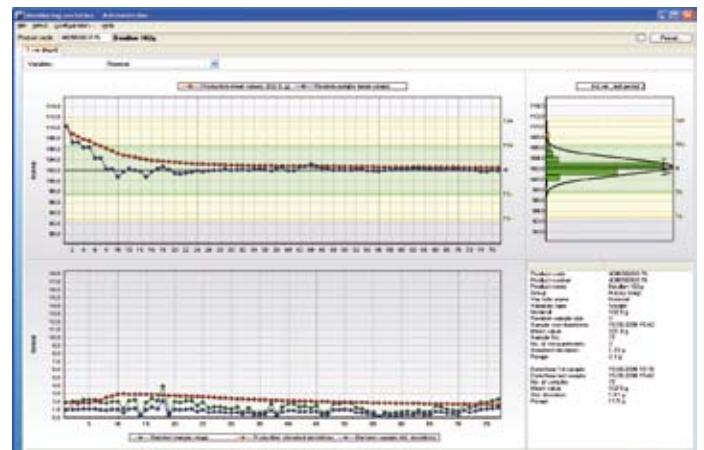
Comprehensive quality assurance with the basic license

For many customers using FreeWeigh.Net® for net content control, including the associated reporting, the basic license with the associated device licenses is all that is required. All important functions are already included making it a very powerful quality assurance system. Even the license-free SQL Express database is included in the installation package making the system setup straightforward. According to growing customer needs FreeWeigh.Net® can be continuously enhanced without software installation.

Enhancement according to customer needs

For customers who want to enhance their quality control FreeWeigh.Net® offers a wide range of optional functional modules:

- Remote Testplace Module
- Batch Handling Module
- Attributes & Testplans Module
- Adjustment Algorithms Module
- Free Reporting Module
- SPC Module
- Audit Trail / Part 11 Module
- Errors & Interventions Module
- Monitoring Process Module
- Time Controlled Sampling Module
- Release Criteria Module
- Multihead Statistics Module
- Data I/O Module



The FreeWeigh.Net® basic license provides the power for a comprehensive quality control system

- 3 concurrent users
- Weight data acquisition
- Net content graphic monitoring
- Alarm and activity monitoring
- Automatic and manual test site allocation
- Standard reporting for legal needs
- User profiles and electronic signatures

Adjustment Algorithms Module

Use the data from random sampling for machine adjustment

The optional Adjustment Algorithms Module in FreeWeigh.Net® automatically generates an adjustment message at the time when the fill quantity deviates from the specified nominal. Two adjustment algorithms are available:

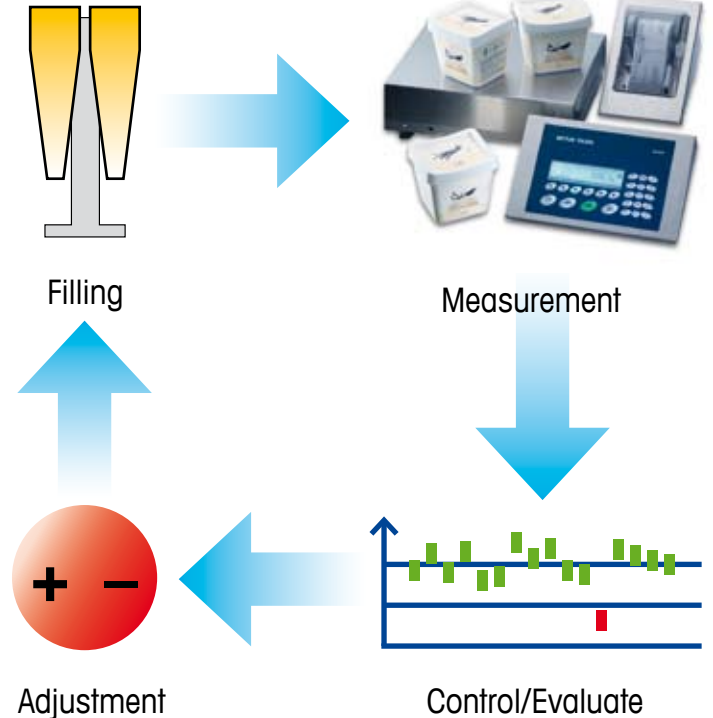
- METTLER TOLEDO proprietary
- Based on CuSum

METTLER TOLEDO proprietary algorithm

This algorithm – according to user selection – considers either 50, 100 or 200 individual values for the calculation of the needed adjustment. The built-in Double T-Test filters scatter of the filling machine. With the configurable minimum adjustment value the adjustment message can be customized for the filling machine.

CuSum algorithm

This algorithm is especially useful when the products are difficult to fill or when short production runs are made. It uses the calculated CuSum and the defined decision line as basis for the adjustment.



Use quality data for machine adjustment

- Automatic monitoring of overfilling and display of messages for adjustment of the filling head without violation of legal tolerances
- Algorithm evaluates process variation and calculates a configurable adjustment message
- Possibility for closed-loop adjustment feedback to filling machine*

* Requires Digital I/O option

FreeWeigh.Net® Testplace Module

Enhanced user-feedback and convenient operation

The FreeWeigh.Net® Testplace Module is PC software, which is designed for use on the METTLER TOLEDO ID30 Industrial Terminal or on a standard PC. Ergonomic design of the screen layout makes it especially suitable for use with touch-screen technology. The FreeWeigh.Net® Testplace module allows control of connected balances and measuring instruments and provides immediate graphical feedback after the random sample is completed. Furthermore it is the ideal equipment to collect attributes quality data (option) and enables use of Testplans (option).



Wide range of connectable devices

As standard the FreeWeigh.Net® Testplace Module allows control of a very large range of METTLER TOLEDO balances, which support the METTLER TOLEDO SICS communication protocol. Non-METTLER TOLEDO balances or measuring devices can be connected by means of the optional FreeWeigh.Net® Device Integration Utility. If the FreeWeigh.Net® Testplace module is used on an ID30 Industrial Terminal it supports also the high precision IDNet weighing platforms, such as KA3s or KA6s.



The convenient – PC based – user interface for samples and Testplans

- Product selection for simple balances
- Convenient design for touch-screen operation
- Applicable to Personal Computers or PC based terminals
- Online graphics for current production
- Customizable help screens in text or PDF format
- Implementation of Testplans*

* Requires Attributes & Testplans option

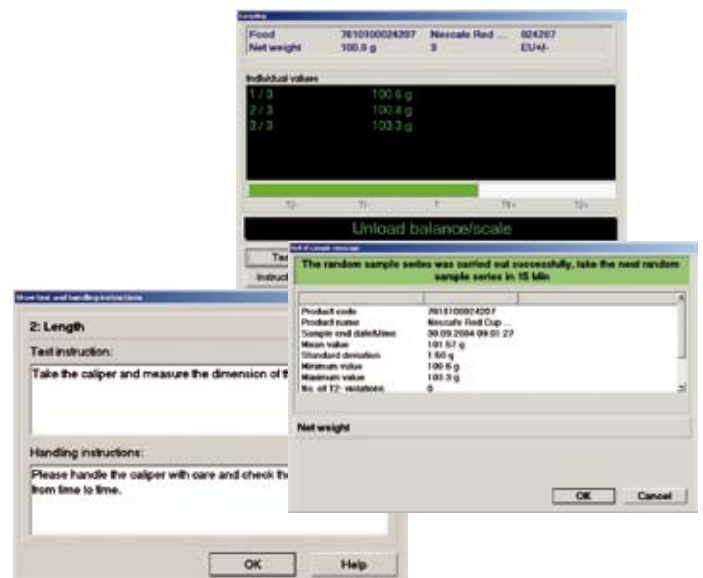
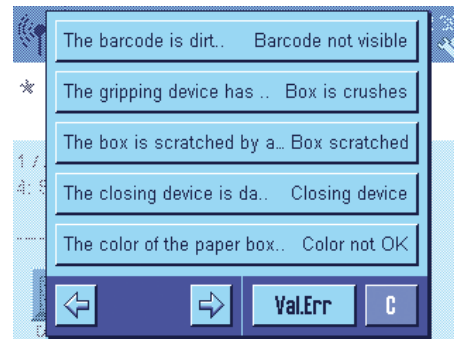
Errors & Interventions Module

Message catalogue for handling instructions

Frequently a product requires special instructions when taking a random sample. In some cases it is necessary to specify how to perform the measurement, in other cases some precautions have to be made (e.g. wearing gloves). FreeWeigh.Net® permits setting up test item oriented messages, which clearly define how the random sample needs to be performed. Once the sample is taken FreeWeigh.Net® is able to display predefined messages indicating whether a random sample was successful or not, defining the next action.

Input of error reason and type of intervention

If a random sample has failed it is crucial to know why. It is also important to know what action the person at the test site has taken in order to solve the problem. Using the FreeWeigh.Net® Errors & Interventions Module it is possible to predefine possible errors and available actions. Thanks to the highly configurable user access control system of FreeWeigh.Net® it is even possible to assign the responsibility for errors and interventions to different individuals. This makes sure that no valuable quality information gets lost.



Extend Quality Control with reasons and actions

- Complements thorough quality control with an assessment of why quality problems occur with "weighting" according to the seriousness of the failure
- Generates predefined handling instructions for appropriate actions in order to overcome quality problems in production

FreeWeigh.Net® Digital I/O Module

Digital signal interface for FreeWeigh.Net®

The Digital I/O option allows FreeWeigh.Net® to signal information, such as alarms and events, through electric signals. These signals can be used to activate external devices like lamps, buzzers or to drive inputs of PLCs. Typical applications are automatic sampling requests in combination with the Time Controlled Sampling option or to adjust filling machines when the optional Adjustment Algorithm module is used. Inputs are used to control sampling permissions, to acknowledge alarms or adjustments. Test sites running on the same Device Engine can share the I/O controller. Each Testplace Module requires its own controller.

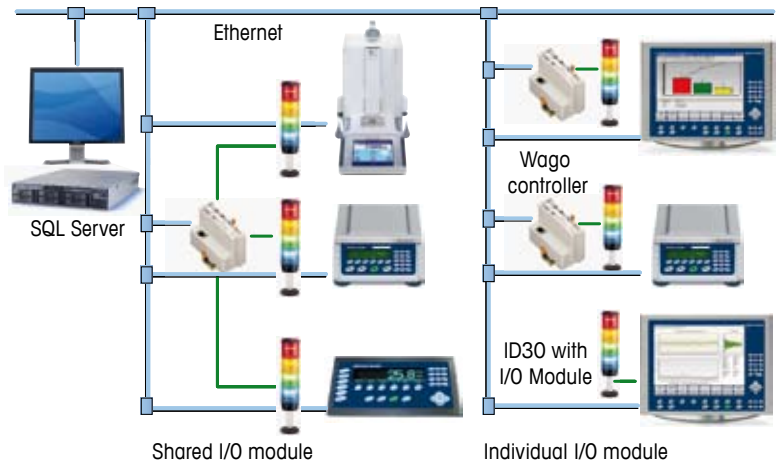
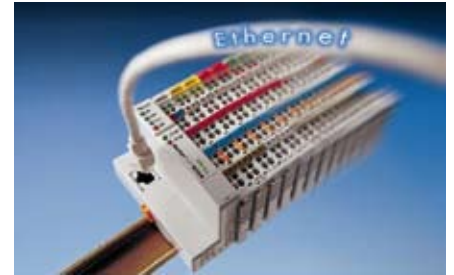
Wago Ethernet TCP/IP fieldbus controller

As standard Digital I/O supports the Wago Ethernet TCP/IP fieldbus controller 750-841 with a special FreeWeigh.Net® firmware. This controller is directly connected to the Ethernet LAN of the customer and easy to configure thanks to the built-in web server. Different types of input and output modules are available according to the electric requirements of the connected devices.

See also: www.wago.com

4I/O for ID30

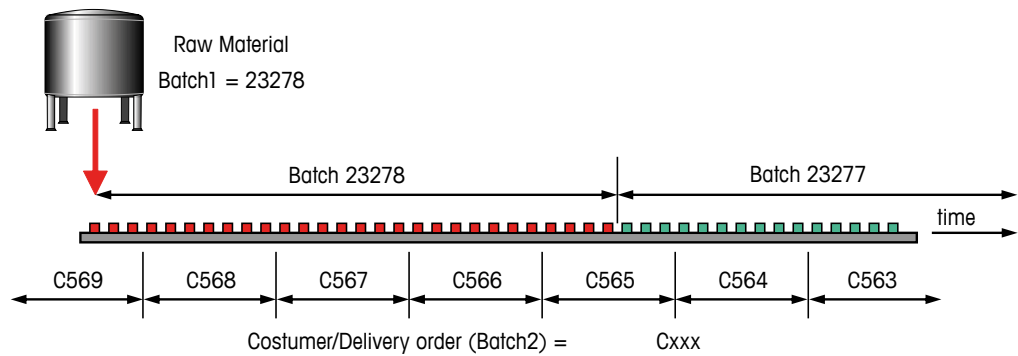
Alternatively to the Wago Ethernet fieldbus controller, Test sites with ID30 terminals can be equipped the METTLER TOLEDO 4I/O option.



Intelligent interfaces for electric inputs and outputs for signaling and automation

- Wago I/O controllers with built-in Ethernet interface
- One controller for multiple test sites
- Large choice of contacts
- Configuration through the Web-browser
- 4I/O relay box for ID30
- Usable for any kind of signaling device

Batch Handling Module

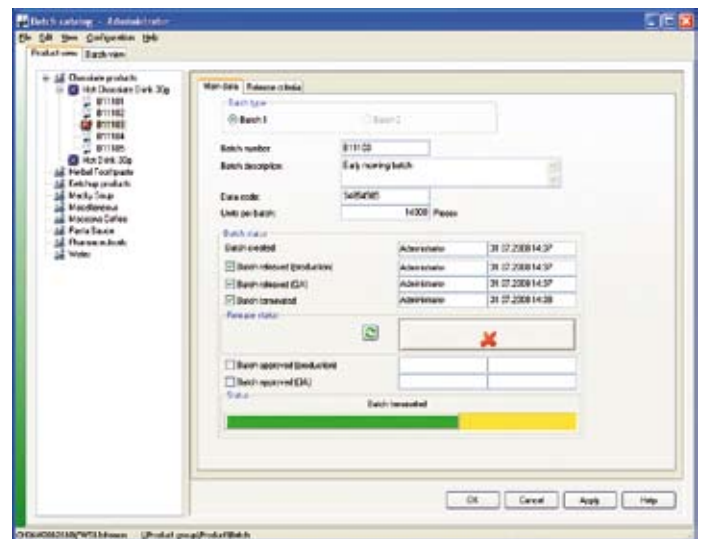


Working with two concurrent batches

Working in batches is increasingly the standard way of production. Whilst in the past this was only a duty in the pharmaceutical industries, new regulations such as IFS (International Food Standard) require producers of food products to keep batches separate and to make their processing fully traceable. As every production has a material input and output and since their quantities are not equal it is crucial to have access to two concurrent batch statistics. The FreeWeigh.Net® Batch Handling Module enables the user to assign two batch numbers to each random sample, thus providing the batch statistics at a key stroke.

Individual approval of batch status

A batch normally has the stages "created", "released", "terminated" and "approved". In most companies these stages require approval by different individuals. In addition, batch release and batch approval requires authorization by two departments – production and quality assurance. All these features are available in FreeWeigh.Net® and can be controlled through access rights and, if needed, by electronic signatures. These important functions ensure that no batch proceeds into the next stage without being checked and no batch leaves the factory without satisfying the quality requirements.



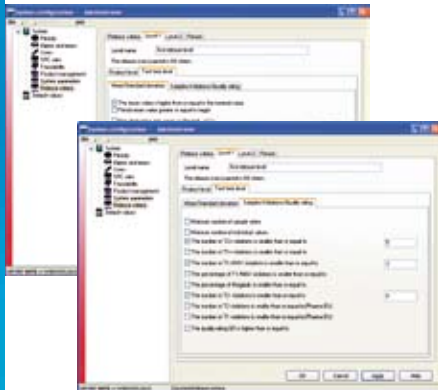
Ideal for customers working with batch oriented processes

- Authorization of batch release in the batch catalogue
- Batch oriented statistics
- Facility for two concurrent batches

Release Criteria Module

FreeWeigh.Net® supports batch release decision

A clearly definable set of release criteria in FreeWeigh.Net® supports the decision as to whether a batch may be released for shipment or not.



The choice of selectable release criteria includes assessment of quality rating (QR) as well as individual criteria based on sampling and statistics.

Release Criteria summary as well as detailed assessment results

At any stage of the batch processing it is possible to display the current release status of the batch

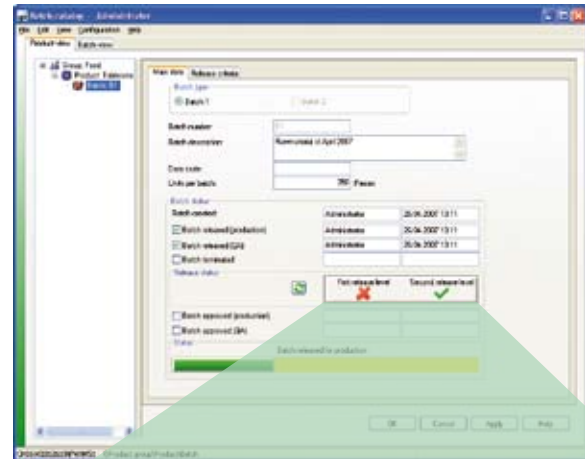
- End-of-sample message
- Testplace graphics screens
- Monitoring screens
- Batch catalogue



This provides early recognition in the case that a batch tends to become **non-releasable** and permits taking **corrective action** before the batch is finished.

Clearly documented

Batch release status - included in the FreeWeigh.Net® reports - ensures that the produced quality is clearly documented.



| | Level 1 | Level 2 | Level 3 |
|--|------------------------------|------------------------------|---------|
| Batch 1: 81 Product: 75145213 / 1 Tablette 50g From 26.04.2007 13:12 To 21.05.2007 11:25 | ✗ | ✓ | |
| The mean value is higher than or equal to the nominal value | Value ✓ 50.61 Limit 50.00 | Value ✓ 50.61 Limit 50.00 | |
| Non destructive test: mean >= Nominal - s2 * s | Value ✓ 50.61 Limit 49.40 | | |
| Destructive test: Mean >= Nominal - s4 * s | Value ✓ 50.61 Limit 48.69 | | |
| Mean >= Nominal - s6 * s | Value ✓ 50.61 Limit 48.45 | | |
| Period mean value smaller than or equal to upper control limit | Value ✗ 50.61 Limit 0.00 | | |
| Period standard deviation/range smaller than or equal to upper control limit | Value ✗ 0.000 Limit 0.000 | | |
| The number of T2+ violations is smaller than or equal to | Value ✓ 0 Limit 0 | | |
| The number of T1-MAV violations is smaller than or equal to | Value ✓ 0 Limit 0 | | |
| The number of T2- violations is smaller than or equal to | Value ✓ 0 Limit 0 | | |

Computer aided release decision for production batches

- Definition of criteria for batch assessment
- Clear message whether a batch can be released or not
- Up to three levels of Release Criteria can be defined
- Quick summary in Batch Catalogue and monitoring screens
- Large choice of criteria selectable

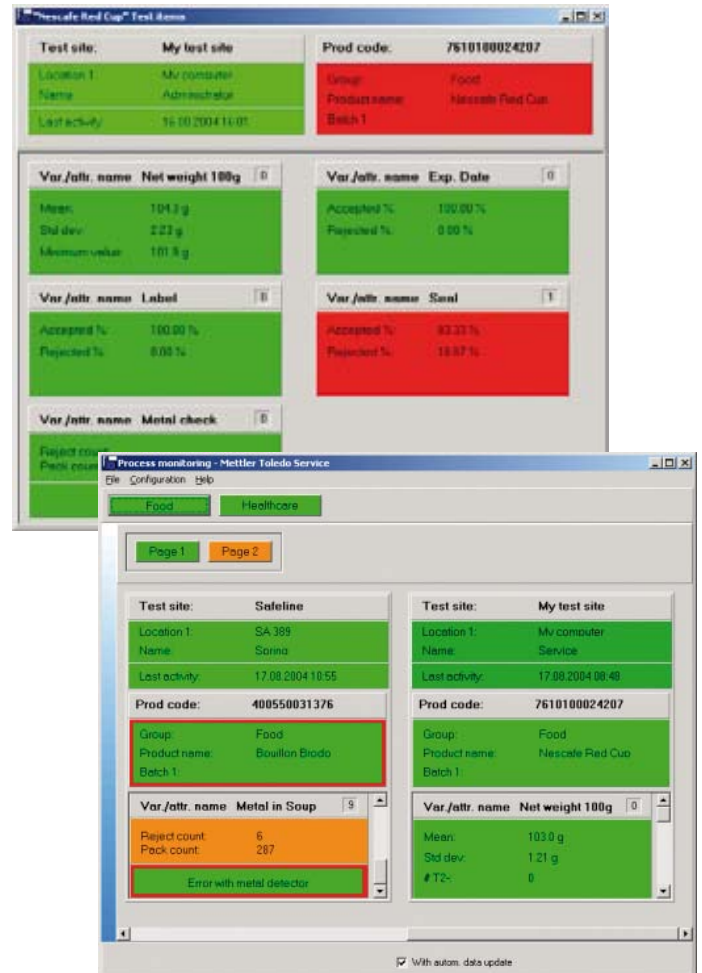
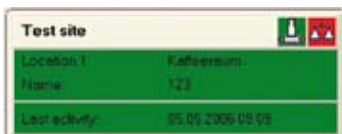
Monitoring Process Module

Simple Overview of Process

The Monitoring Process Module provides important information about the connected FreeWeigh.Net® test sites. Fields on the screen remain green when the situation is under control. These will turn red for alarms and orange for metal detection. Consequently the user of this module has his FreeWeigh.Net® system under complete visual control. If detailed information about a particular product is needed a double-click will zoom into the details.

Fast data drill-down and device status control

The shade of green background of the test sites ensures that it is easy to understand how recently the sample was taken. For this visualization, the green in the Monitoring Process Module fades from light-green to dark-green. Icons at the top of each test site indicate whether the connected devices are online or unavailable.



Complete overview – at a glance!

- Online monitoring
- Quick overview of current activities in each department and filling line,
- Alarms on quality characteristics and number of metal detections
- Fast access to monitoring screens

Attributes & Testplans Module

Quality attributes data from visual checks and sensory testing

Besides the measurement of physical product data it is increasingly important to also monitor quality attributes of the product, which require visual or sensory assessment. Correctly applied product label, correct product expiry data or good taste are crucial. The results of these checks are entered in preconfigured masks of FreeWeigh.Net®, allowing subsequent graphical representations with bar- or pareto charts. This comprehensive quality control system gives the data for clear identification of quality gaps beyond physical variable measuring.

Testplans ensure thorough quality control

In order to ensure that all necessary quality data is properly collected, FreeWeigh.Net® Testplace module can be enhanced with the support of Testplans. Testplans allow grouping of several test items into a testing sequence. Once a Testplan is started it requires measurements and data input until the sequence is completed. Thus ensuring completeness of data.

| Test item | Type | Value |
|-------------------|---------|-------|
| Sweetness | Classes | 4 |
| Fruit Flavor | Classes | 3 |
| Visual Appearance | Classes | 4 |
| Smoothness | Classes | 4 |
| Melting Point | Value | 37.5 |



Input of product quality attributes from visual inspection and implementation of Testplans – linking individual measurements and checks together to a sequence of data entries

- Ensures completeness of quality data
- Simple operation
- Quick data acquisition for fast operation
- Graphical representation with Pareto charts showing the frequency of errors

Device Integration Utility Module

Configurable device interface

Many customers wish to connect devices from other manufacturers or METTLER TOLEDO devices for which no dedicated device driver is available in FreeWeigh.Net®. The FreeWeigh.Net® Device Integration Utility is a generic device driver, which can be configured for 3rd party measuring equipment with a communication interface. This permits including these devices into the same data acquisition procedures as supported METTLER TOLEDO devices and enhancing the available quality data and their assessment far beyond the standard.

Sample loop and time controlled sampling

In addition to the manual execution of random samples with Testplace Module, Device Integration Utility provides two important functions for automated data acquisition:

- **Sample Loop** allows automatic collection of data, which is controlled by the connected device. This means that FreeWeigh.Net® receives measurement data unsolicited from the device as it is available.
- **Time controlled sampling** allows the definition of a polling cycle to the connected device ensuring regular measurements at a predefined rate.



High degree of flexibility

- Allows connection of measurement instruments to FreeWeigh.Net® which are not otherwise supported with a dedicated device driver
- The optional FreeWeigh.Net® Device Integration Utility provides a configurable string parser for devices with communication interfaces (RS232 or Ethernet)
- Enhances FreeWeigh.Net® to complete quality assurance beyond weighing

Return on Investment

| Parameter | Value | Unit |
|---------------------------------------|------------------|------------------|
| Cost of raw materials | 8.– | EUR/kg |
| Number of packages produced per day | 100'000 | Packages per day |
| Nominal fill quantity | 100 | g |
| Number of production days per year | 250 | Days per year |
| Production mean value | 101 | g |
| Overfill per package | 1 | g |
| Overfill per day | 100 | kg |
| Overfill per year | 25'000 | kg |
| Overfill cost (=loss) per year | 200'000.– | EUR/Year |

Reduced overfill – a simple example

The cost impact of overfilling is directly related to the cost of the raw material. The more expensive the product – the bigger the loss from unwanted giveaways. A producer has to ensure compliance with the product quantity claim, i.e. with net content legislation. On the other hand no producer has an interest to deliver more than this. A simple calculation based on the customer's product helps to show a huge saving potential. Thus also to illustrate how fast the investment in FreeWeigh.Net® turns into real earnings.

Return on investment – Key for the customer

Improved product quality and legal compliance helps a producer to reach the following targets:

- Legal compliance ensures there are no obstacles to successful distribution
- Better acceptance of the products by the end-users
- Optimized production and packaging
- Streamlined and enforced procedures
- Predictable product quality

All of them support the target of guaranteed business success.

FreeWeigh.Net® covers many of these aspects already in the standard.

METTLER TOLEDO

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 Ζύγιση
 Σήμανση
 Συμμόρφωση

Νέων Τεχνολογιών ΑΒΕΕ
 Γέρακα 113, Τ.Θ. 67934
 15344 Γέρακας
 Τηλ: 210 6654544
 Fax: 210 6654545
 marketing@nefton.gr
 www.nefton.gr