Metal Detection

Profile, Profile LS
Profile Select, Profile Select LS

Increasing Productivity

Reducing Costs

Improving Competitiveness

Meeting Compliance Needs

Total Protection

For You and Your Customers

METTLER TOLEDO

Caring for You and Your Customers
Maximising Quality and Performance

When you really care about the quality of your products and the safety of your customers, there can be only one choice when it comes to selecting a metal detection solution – A METTLER TOLEDO Safeline Profile or Profile Select detector.

Advanced Metal Detection Technology at Your Fingertips

Profile and Profile Select metal detectors utilise sophisticated software technology to provide the most advanced metal detection systems on the market with total inspection flexibility for a wide range of applications and products.

A large, full colour touch screen interface with a Windows® style, icon driven menu provides easy, intuitive operator access. The interface simplifies procedures and places a host of valuable process information at the fingertips of your whole manufacturing team.

A Customisable Solution Now and into the Future

A choice of system types with the ability to configure feature sets to suit your processes means that you can be sure that your detector is totally future-proof with the ability to grow with your business needs. All detectors incorporate robust construction standards to provide reliable, consistent, on-line performance regardless of the working environment.

Supporting your Compliance Needs

When installed at critical control points in your processes, Profile and Profile Select metal detectors enable your business to comply with the requirements of HACCP (Hazard Analysis and Critical Control Points) and the broader needs of external food safety regulations and standards.

All detectors support compliance with the GFSI standards and external codes of practice including:

- BRC (British Retail Consortium)
- IFS (International Food Standard)
- SQF 2000 (Safe Quality Food)
- FSSC 22000
- All Major Retailer Standards

Benefits for You and Your Business

Metal detection systems utilising Profile and Profile Select software provide the means to deliver significant benefits for your business. Maximising product quality, enhancing manufacturing efficiency and delivering the ultimate level of protection for your customers is just the beginning of the story.

Harnessing these key benefits builds protection around your business enabling you to increase productivity, reduce overall manufacturing costs and improve competitiveness for maximum profitability.

● Increased Productivity

Profile and Profile Select metal detectors enable productivity to be optimised to ensure costly downtime is all but eliminated. This is realised through:

- Simple set-up and operation
- Reliable, consistent performance
- Low maintenance requirements
- Easy-clean system designs

● Reduced Manufacturing Costs

Profile and Profile Select technology enables overall lifetime costs to be managed and kept to an absolute minimum through:

- Eliminating false rejects & product waste
- Reducing performance validation requirements
- Improving the ability to demonstrate due diligence
- Utilising innovative, future-proof design

● Improved Competitiveness

The combination of increased productivity and reduced manufacturing costs enables your business to win more customers by providing:

- Compliance with regulatory, industry and retailer standards
- Improved hygiene standards
- Protection of your brand and your reputation
- Maximised product quality

Detecting More Metal
For Complete Customer and Brand Protection

Whether your products are wet, dry, hot, chilled or frozen, Profile technology provides the ultimate in metal contaminant detection capability. All metal contamination including ferrous, non-ferrous and even the most difficult to detect non-magnetic stainless steels are readily identified enabling them to be removed efficiently from the manufacturing process.

### Detecting the Most Challenging and Irregular Shaped Contaminants

Profile metal detectors utilise Multi, Ultra-High and Tuned frequency operation pioneered by Safeline to give greatly improved detection sensitivity, particularly when inspecting dry, non-conductive products and where the contamination in question is non-ferrous and/or non-magnetic stainless steel. Optimising the performance capability of the excitation coil of the metal detector at a particular frequency or group of frequencies enables the detection of the smallest metal contaminants to be achieved including those which are non-spherical and irregular shaped such as wire and swarf.

Advanced Boost Technology Raises Detection Levels to New Heights

Profile detectors utilise a unique 'Boost' mode which incorporates a configurable, intelligent sensitivity boosting software algorithm. The detector is able to discriminate between product and metal contaminant signals which provides enhanced detection capability and raises sensitivity to unprecedented levels. Stainless steel contaminants of less than 1.0mm in diameter* can be readily identified using Profile metal detectors.

*Subject to application parameters
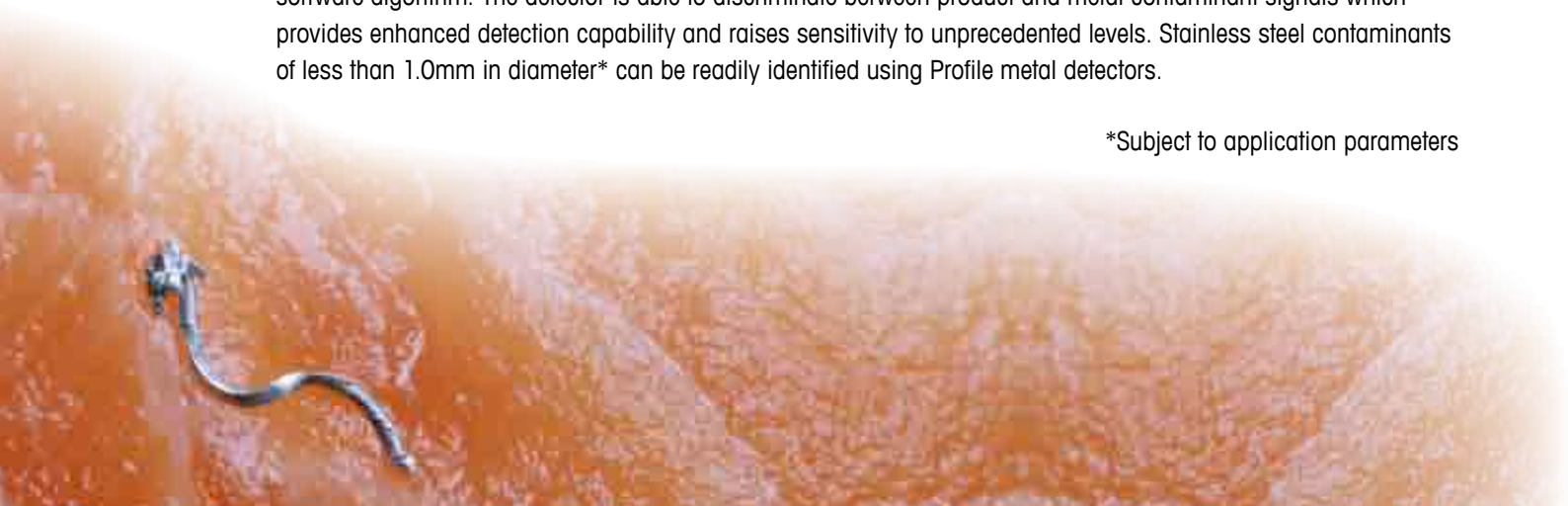
Variable Frequency Metal Detection for Maximum Versatility in a Wide Range of Applications

Profile Select metal detectors utilise Variable Frequency technology to provide unparalleled flexibility and future-proofing enabling widely differing products to be inspected with a single machine.

Profile Select detectors are particularly suited to applications where a "product effect" is encountered from the presence of moisture in the product or from metallic packaging materials including metallised films. Safeline's unique Opti-Select technology automatically chooses the ideal operating parameters for the product being inspected. Over 800 custom operating frequencies are available to ensure the performance of the metal detector is tailored to meet the highest levels of sensitivity.

Maximised Performance on Wet and Conductive Products

Wet or conductive products or those packed in metallised film materials can produce a large "product signal" making inspection a challenge for less sophisticated metal detection systems.

The development of Safeline's unique "Optimised Vector and Noise Control" (OVNC) software algorithm enables all unwanted signals including those generated from the product, plant vibration or from the actual working environment to be electronically filtered and eliminated. This allows the signals generated by metal contamination to be greatly enhanced making them more readily detectable, resulting in significantly improved detection performance levels whilst eliminating the costs associated with the rejection of good product.

Intelligent Multi-Channel Technology Delivers Greater Detection Capability

The detection capability of Profile and Profile Select metal detectors is optimised by the simultaneous operation of multiple detection channels which combine to reduce the overall size of the detection envelope. Detection sensitivity is further enhanced through the use of intelligent detection envelope profiling software which allows even the smallest pieces of metal to be detected providing even greater levels of protection.

Robust Mechanical Construction

Sealing standards in excess of IP69K when required and sophisticated environmental noise and vibration immunity systems ensure Profile and Profile Select metal detectors can operate reliably in the most demanding of applications.

Maximising Efficiency, Minimising Downtime
For Operational Excellence

Ensuring your manufacturing processes are robust, efficient and streamlined adds value to your business and enables you to develop the edge over your competition. Profile and Profile Select detectors provide a vital building block in helping to establish improved processes and manufacturing efficiency.

Inspecting Multiple Products at a Single Setting

Consumer demands for greater product innovation and variety can leave manufacturers needing to accommodate frequent product and equipment settings changes. This can lead to increases in downtime and the risk of operational mistakes.

A unique "Change-Free" running mode provides a genuine single-setting function for multiple and diverse product types. The individual parameters for a number of different products are analysed and combined automatically into a single optimised product "Cluster" setting. This avoids the need for equipment re-setting or adjustment and reduces downtime. Most importantly, this is achieved without sacrificing performance and sensitivity.

Single-Pass Set-up reduces Downtime

Single-pass auto set-up routines enable the detector to be set rapidly with minimal requirements for operator training. Typically, only one pass of the product is required during set-up.

The needs of users preferring to have separate product settings with individual parameters is addressed through a product library with an in-built memory which enables up to 100 different settings to be defined and stored for future recall.

Single-pass product setup reduces downtime dramatically

Addressing Issues Before They Occur

The costs associated with a line stoppage due to inspection system failure can have a serious impact on business performance. Being forewarned of potential line-stopping issues before they happen enables you to make contingency plans to avert costly unscheduled downtime.
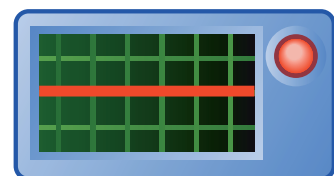
Many metal detectors include "fault monitoring" which will alarm should a fault occur. Detectors with Profile and Profile Select software technology go one step further by utilising advanced Condition Monitoring technology which constantly analyses the performance of major detector components. Adverse trends are identified and highlighted as an early warning of a potential problem in advance of actual failure. This enables production to continue uninterrupted until there is a convenient break in the manufacturing process when the issue can be addressed.
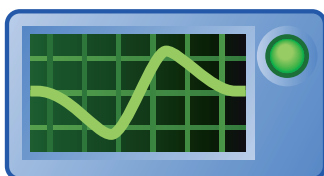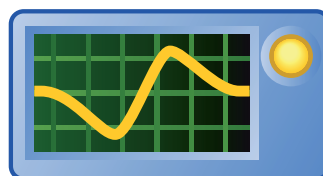
System Healthy   Early Warning   Fault Condition

Advanced warnings are communicated via highly visible on-screen messages which can be exported through multiple communication channels including advanced connectivity solutions linking to factory management systems and email or SMS messaging.

Staying in Control of Your Processes
Collecting Important Data

Unrivalled Communications - Delivering Information Where You Need it

Profile and Profile Select detectors can be configured with a range of data collection facilities to support decision making and Due Diligence needs. Options available include the connection of external devices through to full Ethernet network connectivity which could include wireless functionality.

Improving Methods of Data Collection

Profile and Profile Select detectors can be configured to incorporate sockets to enable external print devices to be plugged in to generate data tickets. USB ports can also be included to enable data to be collected via memory sticks and portable hard drives.

Factory Management System Integration

OPC DA is one of the world's fastest growing standards for the exchange of process control data. Detectors can be configured to communicate with a host of SCADA based systems and factory management software solutions.

ProdX
The Integrated Product Inspection
Data Collection Software Solution

Profile and Profile Select metal detectors can be fully integrated with METTLER TOLEDO's **Prod**X software solution which provides data collection for all Product Inspection equipment.

▶ **www.mt.com/prodx**

See separate **Prod**X and Data Collection brochures for more details.

Greater System Flexibility
To Grow With Your Business

Profile and Profile Select metal detectors are supplied with full software functionality pre-loaded and ready for installation. LS models provide the flexibility to tailor functionality to suit your specific production process needs through a range of optional software packages.

LS Software - Tailored to Meet Your Exact Requirements

Profile LS and Profile Select LS models enable manufacturers to configure metal detector functionality to meet exact business needs. This is achieved through employing a basic , high performance metal detector and a selection of optional hardware and software bundles which are available "ready installed" in new machines or as a "retro-fittable" upgrades to the basic machine at a later date.

On-Screen HACCP Reporting Software
- Assisting in audits and maximising product quality

Due Diligence Enhancement Software
- Protecting your business and meeting standards

Product Data & Environmental Display Software
- Monitoring products and the environment
   to improve performance

Enhanced System Supervision Software
- Maximising operational efficiency

Extended Programmable Inputs and Outputs Software
- Improving system control and operations

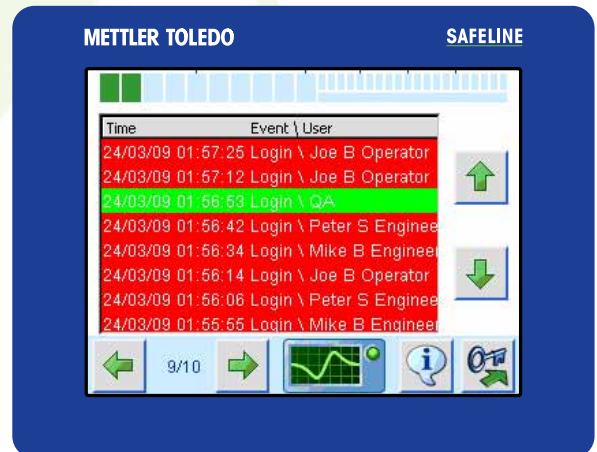# HACCP Reporting Programme
For Maximised Quality

When working within a formal HACCP programme, many metal detectors are employed to monitor a Critical Control Point (CCP). Having the ability to monitor and control the performance of the metal detector is of equal importance. The On-Screen HACCP Reporting Software Package ensures effective control through the provision of two optional data logging routines.

The Detection Event Log and the Metal Detector Access Log provide vital control and application data to enable informed decisions to be made ensuring the highest levels of compliance and due diligence are met.

Greater Control of Log-in Processes

A commonly reported failure mode of all plant and process equipment is operator error or unauthorised access to the controls of the equipment. The Discriminated Metal Detector Access Log compiles a report which can be viewed showing all logins made to the controls of the metal detector. This log will display the name of the operator making the change and the time and date of the occurrence for all change events.

In order to make management of the QA function more accessible, logins made by QA personnel are colour coded to highlight a login-in to carry out a scheduled performance verification test. All other log-ins are colour coded red. Having a highly visible activity report detailing all log-in details leads to a reduced potential for costly mistakes.

METTLER TOLEDO **SAFELINE**

Time	Event \ User
24/03/09 01:57:25	Login \ Joe B Operator
24/03/09 01:57:12	Login \ Joe B Operator
24/03/09 01:56:53	Login \ QA
24/03/09 01:56:42	Login \ Peter S Enginee
24/03/09 01:56:34	Login \ Mike B Enginee
24/03/09 01:56:14	Login \ Joe B Operator
24/03/09 01:56:06	Login \ Peter S Enginee
24/03/09 01:55:55	Login \ Mike B Enginee

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Advanced Colour Coded Operator Access Log

Reducing Test Requirements to Reduce Costs

The requirement for metal detector users to perform scheduled performance checks is well documented. However, the cost to a business to conduct these tests is often overlooked. The On-Screen HACCP Reporting Software Package captures and displays every detection event regardless of whether they are occurrences of real contamination or an event created during a scheduled test.

Data generated can be used to give an indication as to how large the piece of metallic contamination was. It can also be used to compare one set of test data with another and subsequently allows decisions to be made regarding the repeatability of each test undertaken, the safety margin and the ease of detection the unit is operating at. This subsequently allows for decisions to be made as to the frequency between scheduled tests. Reducing the frequency of testing can deliver significant cost savings for the business.
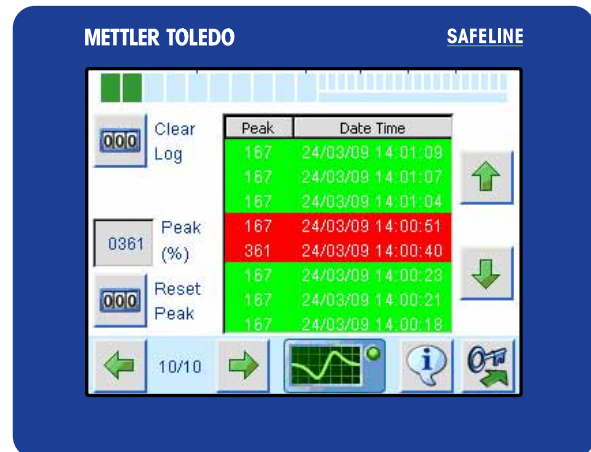
Peak Log Display Confirms All Detection Events

Enhanced Due Diligence
To Meet Industry Standards

Todays modern digitally controlled metal detectors are more sensitive and more reliable than older machines but users still receive customer complaints and retailer non-conformance reports where metal has reached the consumer. Research has shown that in the majority of cases, the contaminant in question was large enough to be detected by the metal detector in use, however, it still managed to reach the customer.
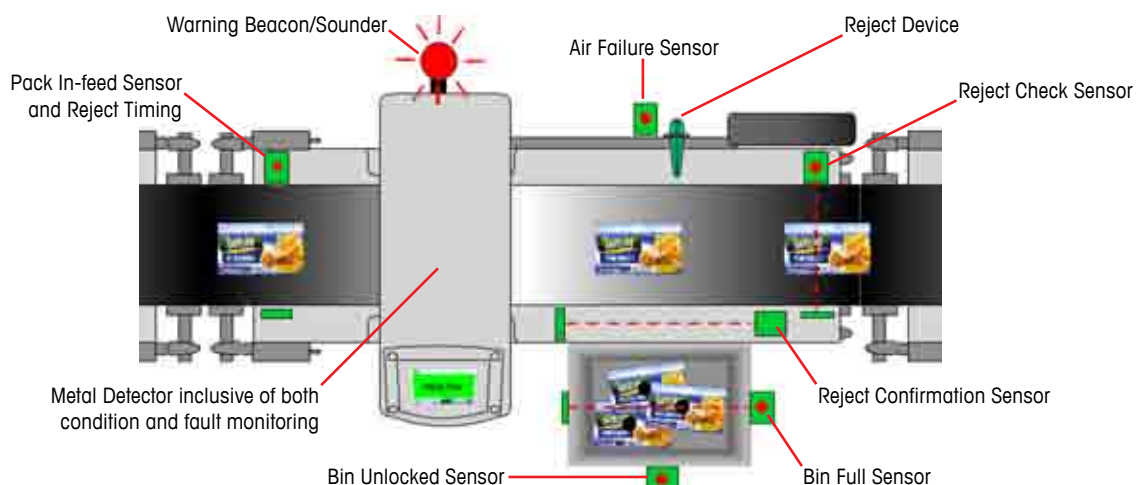
System failure can be attributed to many causes from a simple photo-cell failure through to reject system failure and more critically a detector head fault.

Profile and Profile Select metal detectors incorporate advanced Condition Monitoring as standard and when fitted with the Due Diligence Enhancement Software Package can provide a level of system integrity that guarantees total system performance to ensure not only the highest level of metal detection sensitivity is achieved but also the highest level of failsafe system operation.

Failsafe Systems to Improve Processes

The Due Diligence Software pack facilitates control of numerous failsafe systems in conjunction with relevant hardware enhancements. These include:-

• Conveyor speed in relation to the reject timing

• Confirmation of the presence of the pneumatic supply for air operated reject devices

• Bin full monitoring to prevent the reject bin becoming full and thus preventing a contaminated pack being successfully rejected

• A foolproof reject confirmation system that employs simple hand shake logic to continually monitor the status of the photo sensors employed within the reject confirmation circuit.

• A reject bin integrity system to monitor the status of the reject bin (locked or unlocked).

Warning Beacon/Sounder

Air Failure Sensor

Reject Device

Pack In-feed Sensor and Reject Timing

Reject Check Sensor

Metal Detector inclusive of both condition and fault monitoring

Reject Confirmation Sensor

Bin Unlocked Sensor

Bin Full Sensor

Increased Login Access Security

To provide users with an increased level of access security, a high level access software routine is provided which complies with the requirements of FDA 21 CFR Part 11. Access to all of the metal detector controls is password protected via a dual level user name and individual password login.

Users opting to install and run the Due Diligence Enhancement Software which includes the added security derived from the 21 CFR Part 11 login have a real opportunity to reduce the frequency of the scheduled performance verification tests. The system provides the greatest level of system integrity and security possible and working in conjunction with the on-board Condition Monitoring system makes a reduction in the test frequency a real possibility resulting in a considerable reduction in the cost of ownership.
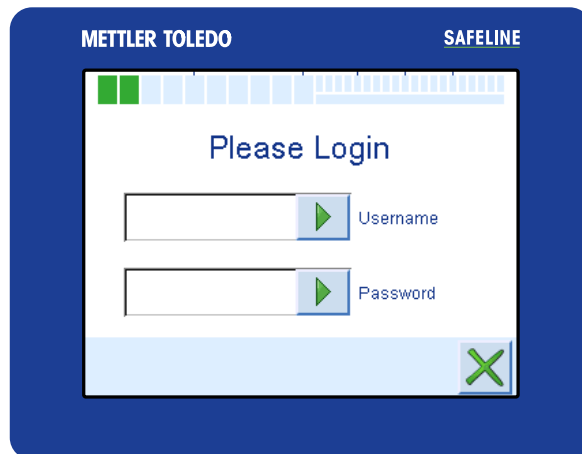
Password Access Login Screen
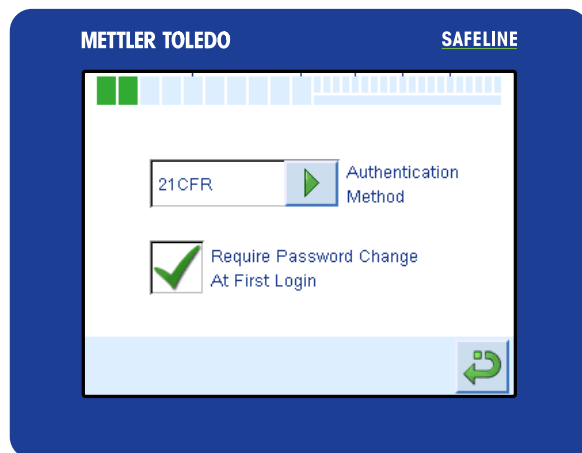
Dedicated 21 CFR part 11 Access Mode

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Maximising Performance

Monitoring Products & the Environment
For Improved Detector Performance

Having the ability to understand the way products interact with a metal detector and to understand the relationship between the product signals and the metal detectors settings can provide greater control of settings. This can be used to improve performance, achieve greater levels of compliance and lead to increased market competitiveness for your business.

Monitoring the working environment of the metal detector can ensure false rejects are eliminated and maximum performance is maintained. The Product Data and Environmental Display Software package provides detailed understanding of the setup parameters and allows new levels of operating precision to be attained.

On-Screen Histograms for Greater Control
In-built Product Signal Strength and Product Phase Angle histogram displays give a graphical representation of all inspected products. Up to 50 million data packets can be stored within the software. This data can be collected over prolonged periods allows far more meaningful decisions to be made with regard to detector setup and operational settings.


Changes in ongoing collected data can be signaled allowing remedial action to be taken to either the process or the metal detector settings to ensure standards are maintained and false rejects are avoided.

Monitoring the Working Environment During Set-Up
Displays can be used during initial setup to indicate the level of background noise and interference enabling optimum accuracy to be achieved during the setup process.

This environmental check monitors the production area relative to the position of the metal detector and gives an indication of the condition of the environment and its potential impact on effective metal detection. Airborne interference and noise can hinder metal detection sensitivity creating the potential for false triggering and reduced on-line performance. Measuring the environment and understanding its effect enables corrective action to be undertaken to identify or suppress the source of interference and ensure long term superior performance.
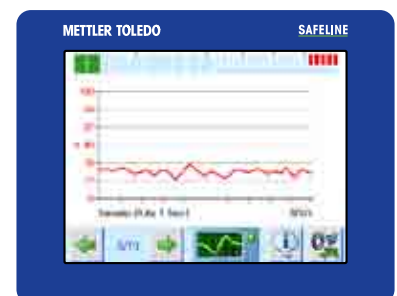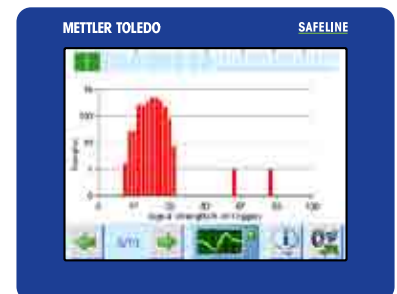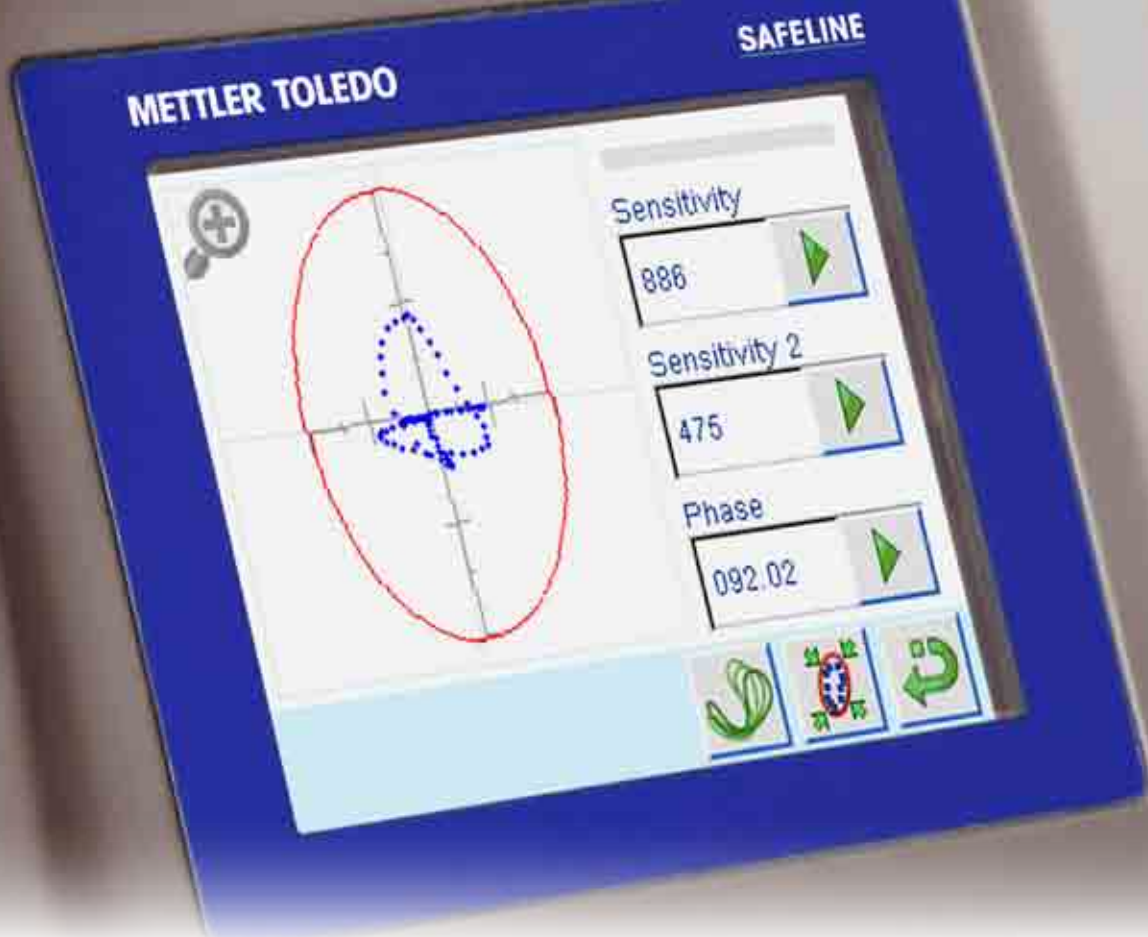
Pictorial Vector-Diagram Display Shows Key Signals

To aid initial setup, a unique Product Vector Diagram can be displayed which shows the signal generated by the product in conjunction with the active product settings for the product in question. This is useful for applications where the product exhibits a "product effect" which is common where the product has high inherent moisture content. Signals generated from this type of product are more complex than those from dry products and by generating an image of the signals, it is possible to improve performance in the set-up process.

During the setup routine the metal detector captures the size and angle of the active product signal and displays this pictorially in conjunction with the operational settings derived from the auto setup routine. Adjustment routines allow users to tune the settings to deliver the optimum in performance.

Advanced System Supervision
Taking Control of Processes

Having access to process data and being able to make informed decisions can make a difference to how effective in-plant equipment performs. Users opting for the Enhanced System Supervision Software pack greatly increase their ability to manage their processes and make informed decisions based on actual line data transmitted to them in a way that suits the individual.

In many situations, the user interface of process equipment tends to be located on or close to the equipment it controls which can often be a considerable distance from those concerned with making key decisions. Profile LS and Profile Select LS metal detectors including the Enhanced Supervision Software Package can inform interested parties of overdue test schedules, send early warning messages of potential equipment issues and report any line faults via SMS messaging or Email technology.

Getting Information to Those That Count

Quality managers may wish to receive email and SMS messages that relate to Performance Validation issues whereas Maintenance Managers may wish to receive alarms and warnings regarding the functionality of the unit. It is also possible that local METTLER TOLEDO service engineers could be configured to receive fault warning and alarm messages to undertake the management of a breakdown or potential failure before it happens on behalf of users.

Standard Profile and Profile Select technology includes a sophisticated yet simple to use PVR (Performance Validation Routine) as standard, configurable to suit the needs of customers. The standard PVR system guides operators through mandatory test regimes and can be set up to remind users when a test is due or overdue raising alarms if necessary.

TEXT MESSAGE

From   Profile Detector

Message Alert received from
SAFELINE Metal Detector Serial
Number: 123456
Line ID: 0001
Alert: PVR OVERDUE
Status: ACTIVE

Improving Quality and Reducing Test Frequency to Reduce Costs

Enhanced PVR is included when the Enhanced System Supervision software pack is purchased. This package provides an enhanced test routine allowing users to gain a greater degree of confidence in the performance of the system by measuring the size of the signal created during a test and comparing this to a pre-determined level. By measuring the margin of safety a metal detector is working to, an informed decision can be made as to the interval required between scheduled test. Reducing the frequency of testing can provide considerable cost saving for manufacturers.

PVR Test Due

Improving Process Control
Maximising Operational Efficiency

The Profile LS and Profile Select LS Process Control Software Pack provides additional detector input and output signal functionality which can be used for operating control systems, process warning equipment and failsafe devices. Better control of these systems leads to potential improvements in production efficiency and greater control over processes.

Maximised Failsafe System Control
The Process Control Software Pack provides the ability to integrate the control and operation of all failsafe devices through the metal detector user interface simplifying processes and improving compliance with quality standards.

Improved Notification of Detection Events
Input/Output signals can be utilised to give greater control of high visibility warning devices such as warning beacons and audible alarms in the event of system malfunction or detection events.

Multiple Reject Alarms for Improved Product Quality
The Multiple Reject Alarm feature will provide an alarm output if a pre determined number of reject events has occurred during a pre-determined time or if a successive number of detection events occur. This feature allows an investigation to take place when a high occurrence of detection events takes place.

Second Threshold Pre-Detection Warning Alarm Reduces False Rejects

The second threshold (pre-detection) warning feature can be of use where the product being inspected is prone to change over time, and if left unchecked, could lead to either a number of false detection events occurring or the product being manufactured out of specification. A good example of this is the thawing of a frozen product on a production line caused by an upstream line stoppage. As the product thaws, its conductivity increases due to the increase in moisture. If allowed to thaw excessively, the product signal will increase to a point where the metal detector triggers resulting in a false detection and rejection of a metal free product which also may be outside the temperature specification for packing.

The second threshold alarm can be set to alarm at a pre determined level which is before the trigger point of the metal detector. In this way, it is possible to identify that the product is changing without suffering from false rejects.

Summary of Input/Output Functions Available

There are two programmable relay outputs and three programmable inputs available in the software package.
The full range of Input/Output signals available can be summarised as follows: -

Input Signals
- Air failure
- Conveyor running
- Metal detector disabled
- Remote lock/unlock facility
- Remote product changeover
- Reject bin full
- Remote reject inhibit
- Photo sensor warning
- Reject confirmation unit control
- Bin secure - monitor
- Customisable - user option

Output Signals
- Early warning
- Reject bin full
- Metal detect
- Detector active
- QA Test due/overdue
- QA Test fail
- Multiple rejects alarm - successive or accumulated
- Second threshold (pre detection) warning
- Pack count
- Performance Verification alarm
- Warning
- Status check
- Bin secure - alert
- Customisable - user option

Total Flexibility
Conveyorised Systems to Maximise Efficiency

Series 40

A range of standardised solutions to provide robust and efficient inspection.

Series 80

Flexible inspection solutions which can be tailored to suit a wide range of applications.

Bespoke Solutions

Whatever the application, our bespoke, customised conveyors will provide a reliable, high performance solution.

IPac – Creating the documentation to Support Compliance

Profile and Profile Select metal detectors are supplied with a METTLER TOLEDO IPac installation and performance verification package to support ongoing compliance with internal and external standards. This comprehensive package provides full documentation for the installation, commissioning and verification process to ensure audit requirements are met every time.

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For more information