Metal Detection

PowerPhasePRO

PowerPhasePRO LS

PowerPhasePRO Select

PowerPhasePRO 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
Maximizing 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 PowerPhasePRO or PowerPhasePRO LS detector.

Advanced Metal Detection Technology at Your Fingertips

PowerPhasePRO and PowerPhasePRO LS metal detectors utilize 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 color 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 Customizable 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

PowerPhasePRO metal detectors can be installed at all critical control points (CCP) of your production processes. This enables your business to comply with HACCP requirements and the broader needs of external food safety regulations and standards.

All PowerPhasePRO and PowerPhasePRO LS 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)
- ISO 22000
- Major Retailer Standards

Benefits for You and Your Business

Metal detection systems utilizing PowerPhasePRO software provide the means to deliver significant benefits for your business. Maximizing 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

PowerPhasePRO metal detectors enable productivity to be optimized to maximize uptime and all but eliminate costly downtime. This effectiveness is realized through:

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

● Reduced Manufacturing Costs

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

- Eliminating false rejects & product waste
- Reducing performance validation requirements and costs
- Improving the ability to demonstrate due diligence
- Utilizing innovative, futureproof 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
- Maximized product quality

Detecting More Metal
For Complete Customer and Brand Protection

Whether your products are wet, dry, hot, chilled or frozen, PowerPhasePRO 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

PowerPhasePRO metal detectors utilize Multi, Ultra-High and Tuned frequency operation pioneered by METTLER TOLEDO 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. Optimizing 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

PowerPhasePRO detectors utilize 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 PowerPhasePRO metal detectors.

*subject to application parameters

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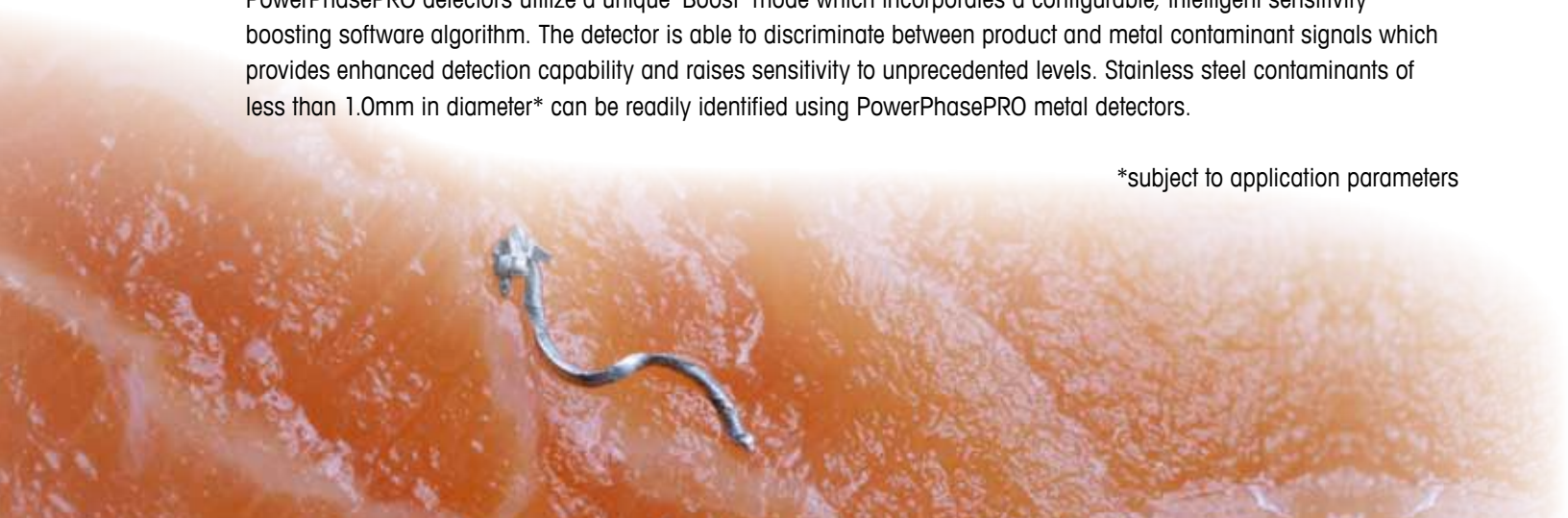
Variable Frequency Metal Detection for Maximum Versatility in a Wide Range of Applications

Advanced PowerPhasePRO Select metal detectors utilize Variable Frequency technology to provide unparalleled flexibility and future-proofing enabling widly differing products to be inspected with a single machine.

PowerPhasePRO 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 metallized films. METTLER TOLEDO Safeline unique Opti-Select technology automatically chooses the ideal operating parameters from 8 primary frequencies. Over 800 additional custom operating frequencies are also available to enable the performance of the metal detector to be tailored to the exact parameters of the product being inspected to ensure the highest levels of sensitivity are always achieved.

Maximized Performance on Wet and Conductive Products

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

The development of METTLER TOLEDO Safeline unique "Optimized 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 while eliminating the costs associated with the rejection of good product.

Intelligent Multi-Channel Technology Delivers Greater Detection Capability

The detection capability of PowerPhasePRO and PowerPhasePRO Select metal detectors is optimized 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 PowerPhasePRO and PowerPhasePRO Select metal detectors can operate reliably in the most demanding of applications.

Maximizing Efficiency, Minimizing 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. PowerPhasePRO and PowerPhasePRO LS 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. With detectors using PowerPhasePRO technology, these issues become a thing of the past.

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 analyzed and combined automatically into a single optimized 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 built-in memory which enables up to 100 different settings to be defined and stored for future recall.

Single-pass product set-up 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 avoid costly unscheduled downtime.
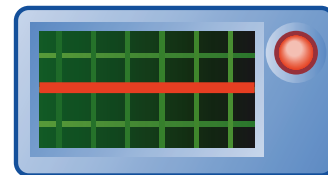
Many metal detectors include "fault monitoring" which will alarm should a fault occur. Detectors with PowerPhasePRO software technology go one step further by utilizing advanced Condition Monitoring technology which constantly analyzes the performance of major detector components. Adverse trends are identified and highlighted as an early warning of a potential problem in advance of actual failure.
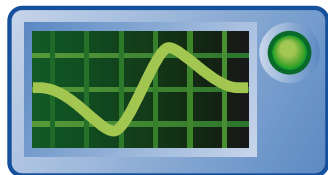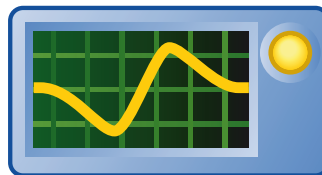
System Healthy   Early Warning   Fault Condition

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. This enables production to continue uninterrupted until there is a convenient break in the manufacturing process when the issue can be addressed.

Staying in Control of Your Processes
Making Informed Decisions

Unrivalled Communications Capabilities - Delivering Detailed Information to Your Desktop
Detectors using PowerPhasePRO technology can be configured with data access sockets enabling manual data collection. When more sophisticated data collection is required, detectors can incorporate advanced connectivity technology. This can be achieved by a simple 'one-to-one' serial connection via an RS232 interface or by utilizing optional full Ethernet network connectivity which could include wireless functionality.

Improving Methods of Data Collection
PowerPhasePRO and PowerPhasePRO 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
PowerPhasePRO and PowerPhasePRO Select metal detectors can be fully integrated with METTLER TOLEDO ProdX software solution which provides data collection for all Product Inspection equipment.

System Flexibility
To Grow With Your Business

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

PowerPhasePRO LS - Tailored to Meet Your Exact Requirements

PowerPhasePRO LS models enable manufacturers to configure metal detector functionality and feature sets 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 maximizing 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
- Maximizing operational efficiency

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

# HACCP Reporting Program
For Maximized Quality

When working within a formal HACCP program, 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 so that you can make informed decisions to ensure 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 unauthorized 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 color coded to highlight a login-in to carry out a scheduled performance verification test. All other log-ins are color coded red. Having a highly visible activity report detailing all log-in details leads to a reduced potential for costly mistakes.
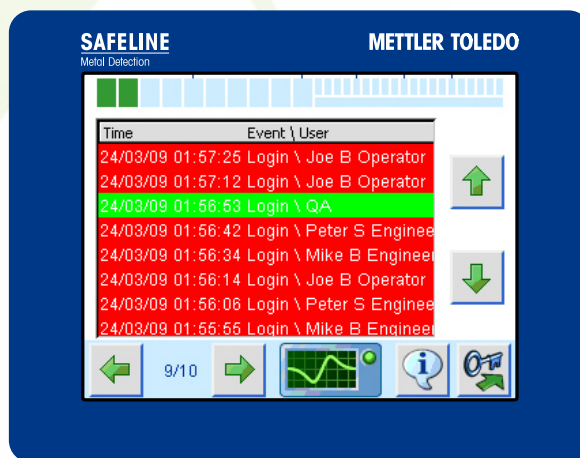

Advanced Color Coded Operator Access Log
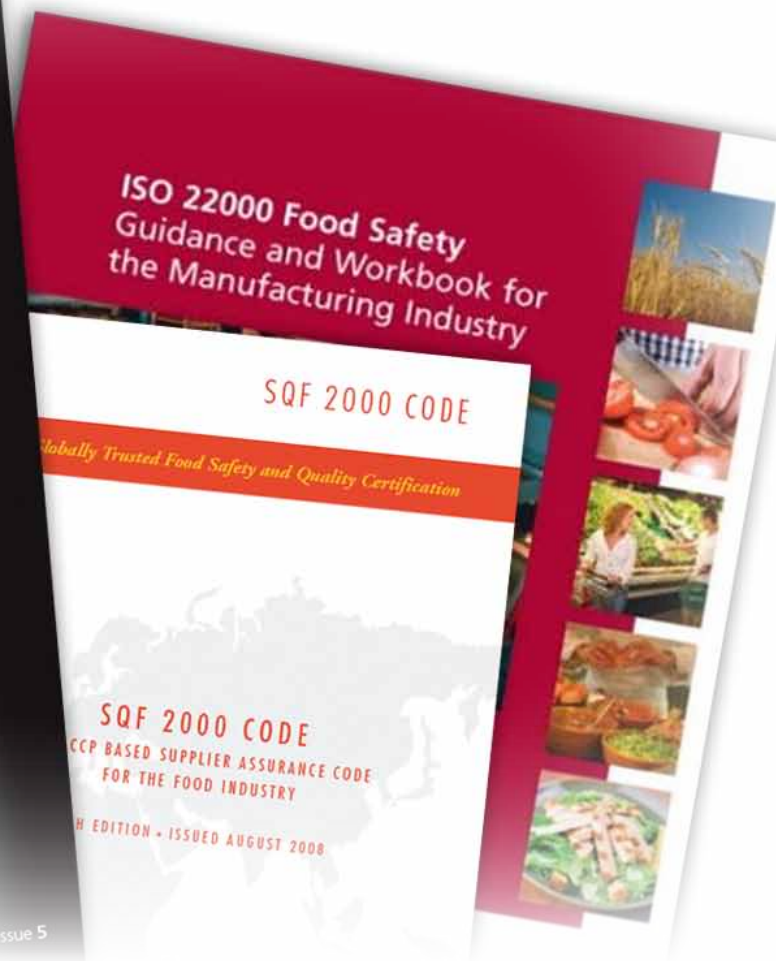
Reducing Test Requirements
to Reduce Costs

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 metal contamination was. It can also be used to compare one set of test data with another. Subsequently decisions can be made regarding the repeatability of each test undertaken, the safety margin, or ease of detection the unit is operating at. This subsequently enables decisions to be made as to the frequency between scheduled testing required. Reducing the frequency of testing can deliver significant cost savings for the business.
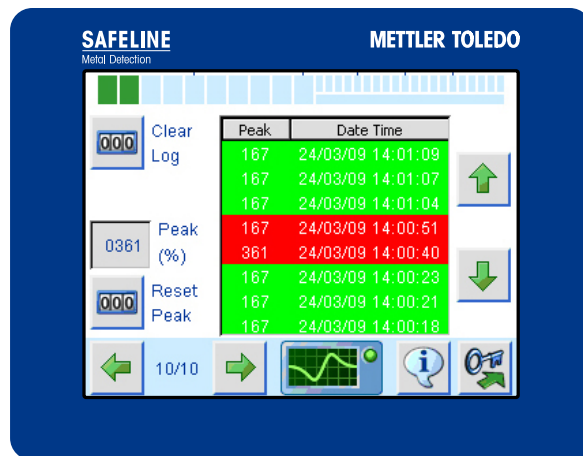
Peak Log Display Confirms All Detection Events

**Due
Diligence**

Enhanced Due Diligence
To Meet Industry Standards

Today's 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 but still managed to reach the customer.
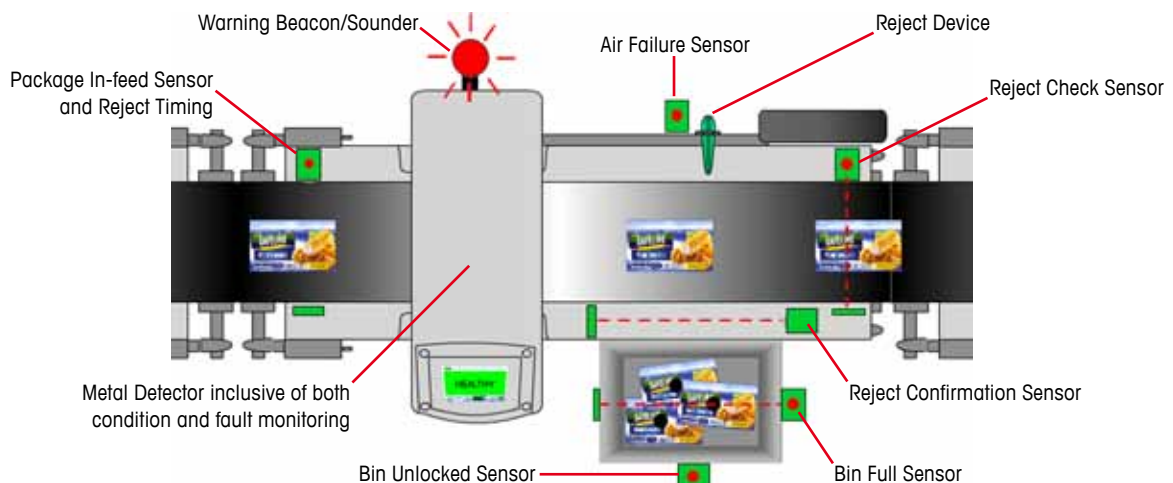
System failure can be attributed to many causes from a simple photo-cell failure to a reject system failure and more critically, a detector head fault.

PowerPhasePRO and PowerPhasePRO LS metal detectors incorporate advanced Condition Monitoring as standard. When fitted with the Due Diligence Enhancement Software Package, this 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 package 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 reject bin becoming too full and preventing a contaminated package from 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

Package In-feed Sensor and Reject Timing

Air Failure Sensor

Reject Device

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 any 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 it possible to reduce the test frequency resulting in a considerably reduced cost of ownership.
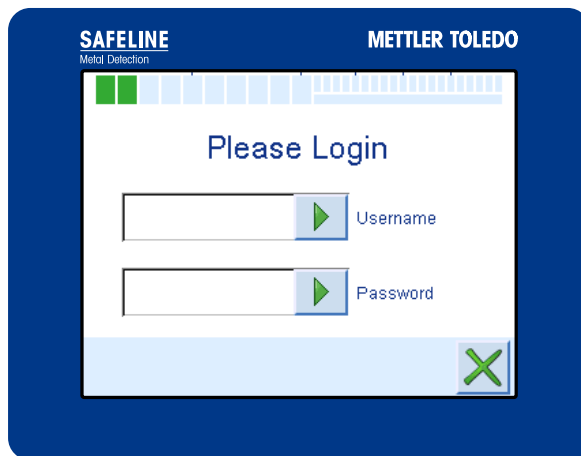
Password Access Login Screen
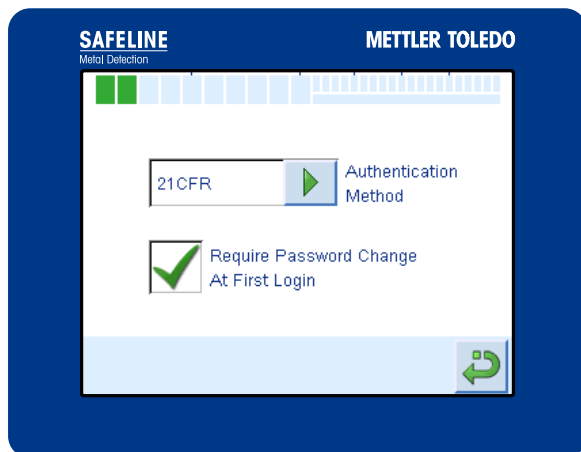
Dedicated 21 CFR part 11 Access Mode

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 eliminate false rejects and maintain maximum performance. The Product Data and Environmental Display Software package provides detailed understanding of the set-up parameters and allows new levels of operating precision.

### On-Screen Histograms for Greater Control

Built-in 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 allowing far more meaningful decisions to be made about detector set-up 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 avoid false rejects.

Monitoring the Working Environment During Set-up

Displays can be used during initial set-up to indicate the level of background noise and interference to achieve optimum accuracy during the set-up 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.
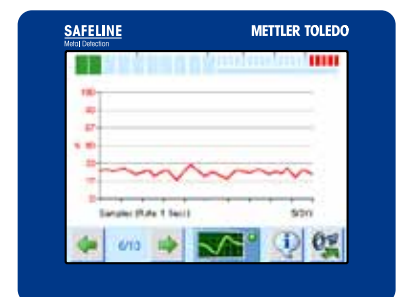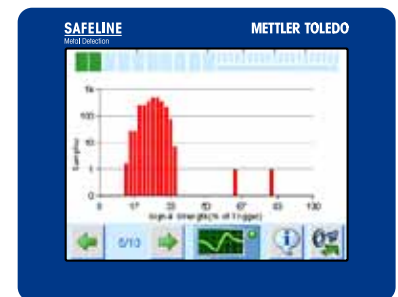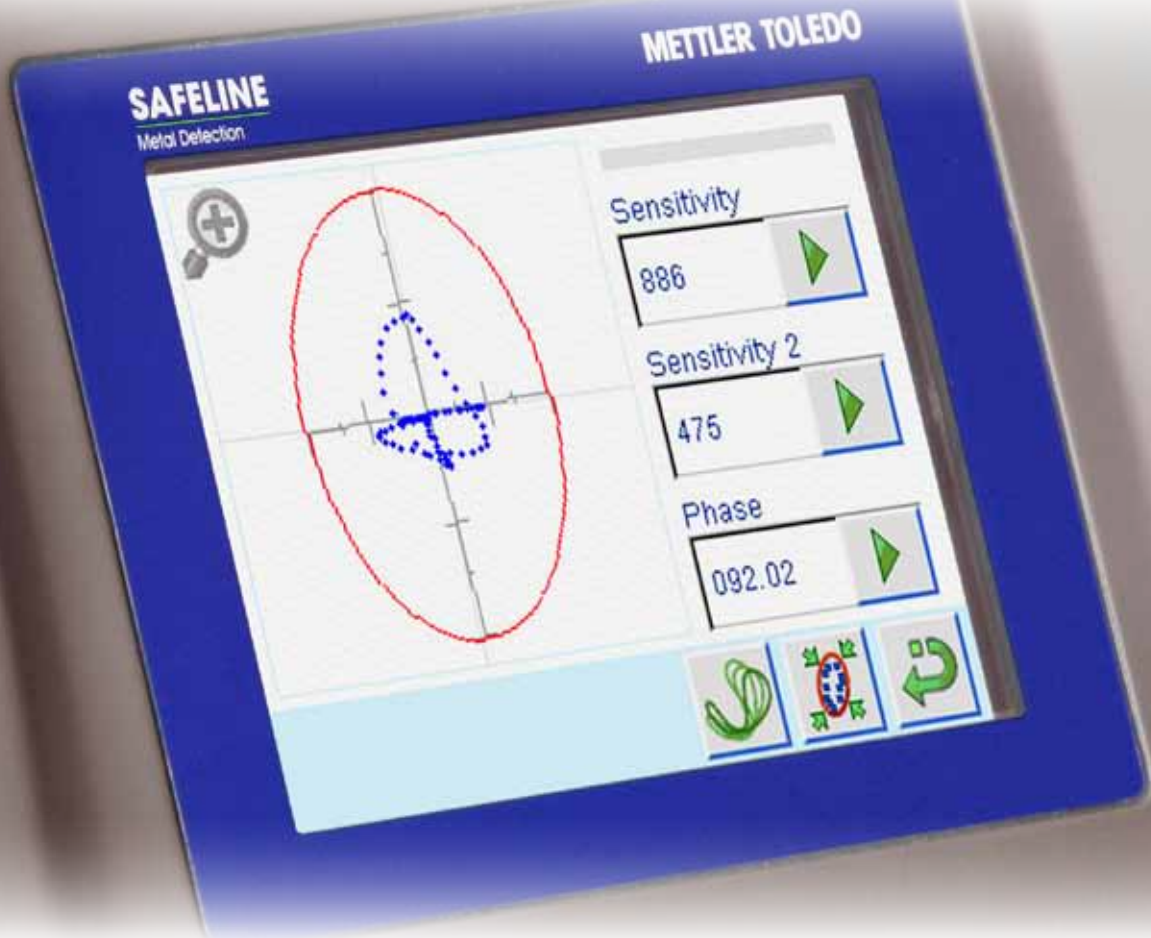
Pictorial Vector-Diagram Display Shows Key Signals

To aid initial set-up, 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 set-up 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 set-up routine. Adjustment routines allow users to tune the settings to deliver the optimum in performance.
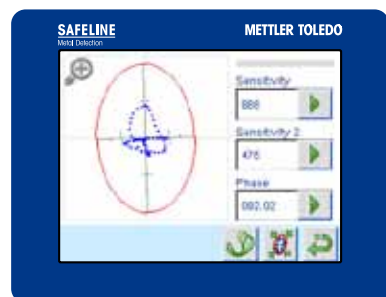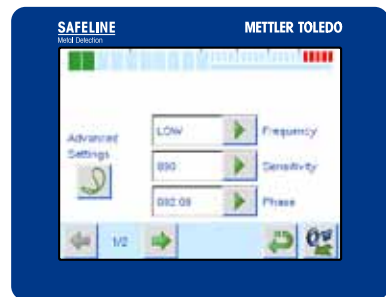
Advanced System Supervision
Taking Control of Processes

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 package 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. PowerPhasePRO 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 Safeline service engineers could be configured to receive fault warning and alarm messages to manage a breakdown or potential failure before it happens on behalf of users.

Standard PowerPhasePRO 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   PowerPhasePRO 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 package 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.

Improving Process Control
Maximizing Operational Efficiency

The PowerPhasePRO LS Process Control Software Package 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.

Maximized Failsafe System Control

The PowerPhasePRO LS Process Control Software Package 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 utilized 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 predetermined 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 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 predetermined level which is before the trigger point of the metal detector. 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 summarized 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
- Customizable – 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
- Package count
- Performance Verification alarm
- Warning
- Status check
- Bin secure - alert
- Customizable – user option

IPac – Creating the Documentation to Support Compliance

PowerPhasePRO 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.

www.mt.com/pi

For more information