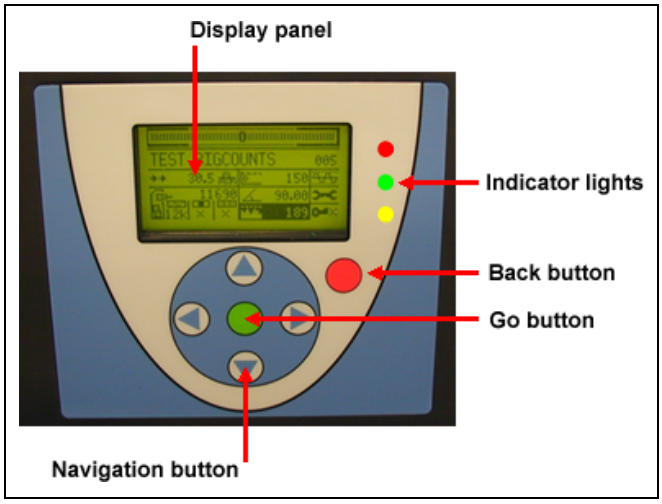
APEX Metal Detector Quick-Start Guide

Control Panel

The main components of the detector's control panel are as follows.

- The display panel.
- The three (red, green, and yellow) indicator lights.
- The green Go button.
- The red Back button.
- The four blue triangular-shaped navigation buttons.



The Indicator Lights

These give you a quick overview of how the detector is functioning.

- Red—Flashing once indicates excess product effect; steady indicates a fault.
- Green—Indicates a product is present in the detector's search head.
- Yellow—Indicates a contaminant has been detected in the product.

The Navigation Buttons

These allow you to navigate around the detector's menus and sub-menus and are used to increase or decrease numbers and select characters and settings in various menus and input screens.

The Go Button

Press the Go button to select or start one of the detector's functions.

The Back Button

Press the Back button to stop one of the detector's functions or to return to the previous menu screen. Press repeatedly to return to the Main Menu.

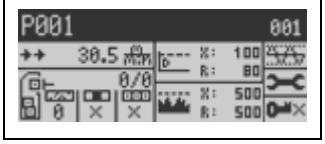
Main Menu

The APEX's Main Menu normally looks like this.

Product Name

However, if you have enabled the IXR function (see page 8), the Main Menu looks like this.

Product Name



Naming the Product

This allows you to name the product you are testing.

1) Make sure the Main Menu is displayed.

2) Press the Go button and the product-calibration menu appears.

3) Press the down-navigation button to highlight the "Edit Product Name" function.

Edit Product Name

4) Press the Go button and the keyboard screen appears.

5) Key in a name for the product you are testing using the keyboard screen.

6) Highlight the keyboard's exit-and-save key (in the bottom right corner) and press the Go button to exit the keyboard screen.

Changing Applications

The APEX can be configured to handle four basic types of applications.

- Conveyor applications
- Gravity-feed applications
- Pipeline applications
- Pharmaceutical (Rx) applications

When you received your APEX, it was configured at the factory to meet your particular working environment (for example, a conveyor application). However, if you now wish to use your APEX for a *different* application (for example, an Rx application), please contact Thermo (see "Contact Information" below) for instructions on how to configure the APEX to handle your new application.

Contact Information

You can telephone technical support at USA 1-800-227-8891 (press option 3), or see page 399 of the *APEX User's Guide* for more contact options.

Conveyor Applications

Listed below are the most commonly used functions for setting up a typical conveyor application.

Pack Length

This is the length (mm or inches) of the product you are testing.

1) Make sure the Main Menu is displayed.

2) Press the Go button and the full product calibration screen appears.

3) Navigate to page 2 of this menu.

(continued…)

4) Highlight the pack-length function.

Pack Length

5) Press the Go button and an input screen appears.

6) Key in the pack length (mm or inches).

No-Pack Distance

In most conveyor applications it is best to enter identical values for the pack length and no-pack distance (mm or inches).

1) Make sure the screen shown in the Pack Length section above is displayed.

2) Highlight the no-pack distance function.

Detection no-Pack distance

3) Press the Go button and an input screen appears.

4) Key in the no-pack distance (mm or inches).

Pack Gap

The pack gap is expressed as a percentage of the no-pack distance and is best set to 100%. Changing the pack gap allows you to fine-tune whether the detector rejects only one or *both* units of product based on product spacing, when there is uncertainty about which of the packs is contaminated.

1) Make sure the screen shown in the Pack Length section is displayed.

2) Highlight the pack-gap function.

Pack Gap

3) Press the Go button and an input screen appears.

4) Key in the pack gap (as a percentage).

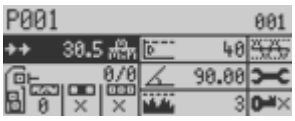
Product Speed

This function is used to enter the speed of your conveyor (for conveyor applications) and the flow rate of your product in the duct or pipe (for gravity-feed and pipeline applications).

1) Make sure the Main Menu is displayed.

2) Highlight the product-speed menu.

Product Speed



3) Press the Go button and an input screen appears.

4) Key in the belt speed (meters/minute or feet/minute).

Photo-Eye-to-Detector Distance

This is the distance from the photo eye (on the upstream or "in-feed" side of the detector) to the in-feed side of the search head.

1) Make sure the Main Menu is displayed.

2) Navigate to the system and tools menu.

3) Press the Go button.

4) Navigate to page 3 of the menu.

5) Highlight the photo-eye set-up menu.

6) Press the Go button and the "photo-eye distance and head width" menu appears.

(continued…)

7) Highlight the "in-feed photo-eye distance" function.

Infeed Photo-Eye Distance

8) Press the Go button and an input screen appears.

9) Key in the photo-eye-to-detector distance (mm or inches).

Polarity of the Photo-Eye Input

Because photo-eyes are either dark or light activated, this function tells the detector how to interpret the signals from your particular photo eye.

1) Make sure the Main Menu is displayed.

2) Navigate to the system and tools menu.

3) Press the Go button.

4) Navigate to page 2 of the menu.

5) Highlight the inputs and outputs menu.

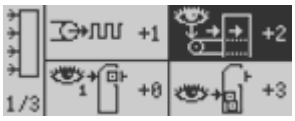
6) Press the Go button.

7) Highlight the inputs menu.

8) Press the Go button and the inputs set-up menu appears.

9) On page 1 of the menu, highlight the "In-feed Photo Eye Input" menu. The "+2" notation tells you that the photo eye is connected to Input 2 on the wiring board and has a positive polarity.

Infeed Photo Eye Input



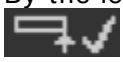
10) To change these settings, press the Go button and an input screen appears.

11) Use the navigation buttons to select the appropriate input (1–6) and polarity.

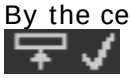
Photo Registration for Product Rejects

This function allows you to select which part of the product triggers your reject device. This function is usually used for products that exceed six inches in length. Rejects are triggered in three different ways, as follows.

- By the leading-edge of the product.



- By the center of the product.



- By the entire length of the product.

1) Make sure the Main Menu is displayed.

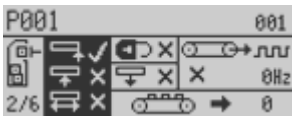
2) Highlight the rejects menu.

3) Press the Go button.

4) Navigate to page 2 of the menu.

5) Press the right-navigation button to select the photo-registration menu.

Leading Photo Registration



6) To change this setting, press the Go button repeatedly until a check mark appears beside the part of the product that will trigger your reject device.

Distance to the Reject Device

This function allows you to input the distance (mm or inches) from the *downstream* edge of the search head to the *center* of your main (Reject 1) device.

1) Make sure the Main Menu is displayed.

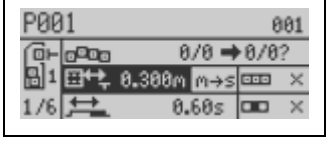
2) Highlight the rejects menu.

3) Press the Go button.

(continued…)

4) On page 1 of the rejects menu, highlight the "Reject 1 Distance/Delay" function.

Reject 1 Distance/Delay



5) Press the Go button an input-screen appears.

6) Key in the appropriate distance (mm or inches). If you want to set a delay *time,* first highlight the "m→s" (or "ft→s") function, and press the Go button to select "delay" (a time parameter), which you will set in minutes and seconds in step 5 above.

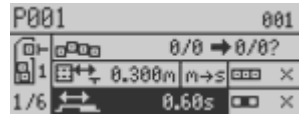
Signal Duration for the Reject Device

This function allows you to set the duration of the signal needed (expressed in seconds and hundredths of a second) to activate your Reject-1 device.

1) Make sure the screen shown in the "Distance to the Reject Device" section above is displayed.

2) Highlight the "Reject 1 Duration" function.

Reject 1 Duration



3) Press the Go button and an input screen appears.

4) Key in the appropriate duration time (minutes and seconds). If you want to set the duration parameter as a *distance,* highlight the "s→m" (or "s→ft") function, press the Go button to select a distance parameter, then go to step 3 above and key in a distance (mm or inches).

Calibrate *X* and *R* Noise Thresholds

This calibration establishes a noise baseline for the detector, and must be done with the conveyor running and *no* product present in the search head.

1) Make sure the Main Menu is displayed.

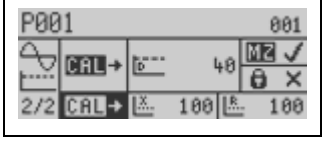
2) Highlight the frequency and gain menu.

3) Press the Go button.

4) Navigate to page 2 of the menu.

5) Navigate to the "Calibrate Noise Thresholds" menu. (Note: The *background* of the calibrate function should now be highlighted in black, as shown below.)

Calibrate Noise Thresholds



6) Press the Go button and a monitor screen appears. The calibration is complete when the screen above reappears showing the calibrated values for the *X* and *R* thresholds. Typical values for these thresholds are as follows.
   - *X* threshold < 300
   - *R* threshold < 100

Full-Product Calibration

A full-product calibration allows the detector to learn how to identify your *uncontaminated* product, and sets the following basic parameters for your product.

- Phase-angle setting
- Detection level

1) Make sure the product name is highlighted in the Main Menu.

2) Press the Go button and the "Full Product Calibration" function is automatically highlighted.

Full Product Calibration

3) Make sure the conveyor is running and uncontaminated product is passing through the search head.

4) Press the Go button and a monitor screen appears. During the calibration process a series of frequency/gain mini-screens may appear, which halts the calibration process as the detector searches for the optimum frequency/gain settings for your product. When this occurs, press the Go button to restart the calibration process. The Main Menu screen is displayed when the calibration is complete.

Gravity-Feed Applications

Listed below are the most commonly used functions for setting up a typical gravity-feed application.

Reject-Delay Time

This function is usually set to 0.00 seconds, and tells the gate to close immediately when contaminants are detected. If your gate is a long way from the search head, you may need to set a longer delay time.

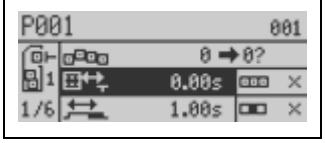
1) Make sure the Main Menu is displayed.

2) Navigate to the rejects menu.

3) Press the Go button.

4) On page 1 of the rejects menu, highlight the "Reject 1 Distance/Delay" function.

Reject 1 Distance/Delay



5) Press the Go button and an input screen appears.

6) Key in an appropriate value (in seconds and hundredths of a second) for the reject-delay time.

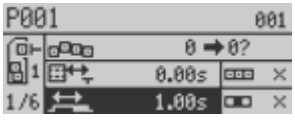
Reject Duration Time

This is the time that the gate remains closed to divert contaminated product, and is usually set to one second.

1) Navigate to the screen shown in the "Reject-Delay Time" section.

2) Highlight the "Reject 1 Duration" function.

Reject 1 Duration



3) Press the Go button and an input screen appears.

4) Key in the appropriate value (in seconds and hundredths of a second) for the reject-duration time.

Calibrate *X* and *R* Noise Thresholds

See the instructions on page 5.

Full-Product Calibration

See the instructions on page 5.

Pipeline Applications

Listed below are the most commonly used functions for setting up a typical pipeline application.

Reject-Delay Time

This function is usually set to 0.00 seconds, and tells the diverter valve to close immediately when contaminants are detected. If your diverter valve is a long way from the search head, you may need to set a longer delay time.

1) Make sure the Main Menu is displayed.

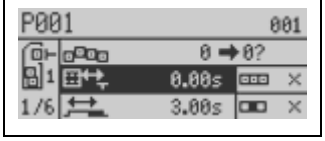
2) Navigate to the rejects menu.

3) Press the Go button.

(continued…)

4) On page 1 of the rejects menu, highlight the "Reject 1 Distance/Delay" function.

Reject 1 Distance/Delay



5) Press the Go button and an input screen appears.

6) Key in an appropriate value (in seconds and hundredths of a second) for the reject-delay time.

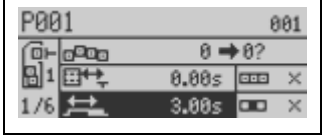
Reject Duration Time

This is the time that the diverter valve remains closed to divert contaminated product to the waste tank, and is usually set to 3.00 seconds.

1) Navigate to the screen shown in the "Reject-Delay Time" section.

2) Highlight the "Reject 1 Duration" function.

Reject 1 Duration



3) Press the Go button and an input screen appears.

4) Key in the appropriate value (in seconds and hundredths of a second) for the reject-duration time.

Calibrate *X* and *R* Noise Thresholds

See the instructions on page 5.

Full-Product Calibration

See the instructions on page 5.

Rx Applications

Listed below are the most commonly used functions for setting up a typical pharmaceutical application.

Reject-Delay Time

This function is usually set to 0.00 seconds, and tells the chute to close immediately when contaminants are detected. If your chute is a long way from the search head, you may need to set a longer delay time.

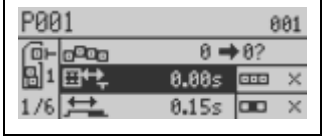
1) Make sure the Main Menu is displayed.

2) Navigate to the rejects menu.

3) Press the Go button.

4) On page 1 of the rejects menu, highlight the “Reject 1 Distance/Delay” function.

Reject 1 Distance/Delay



5) Press the Go button and an input screen appears.

6) Key in an appropriate value (in seconds and hundredths of a second) for the reject-delay time.

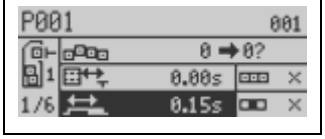
Reject Duration Time

This is the time that the chute remains closed to divert contaminated product, and is usually set to 0.15 seconds.

1) Navigate to the screen shown in the “Reject-Delay Time” section.

2) Highlight the “Reject 1 Duration” function.

Reject 1 Duration



3) Press the Go button and an input screen appears.

(continued…)

4) Key in the appropriate value (in seconds and hundredths of a second) for the reject-duration time.

Calibrate *X* and *R* Noise Thresholds

See the instructions on page 5.

Full-Product Calibration

See the instructions on page 5.

IntelliTrack XR™ (IXR)

The IXR function allows you to detect stainless steel in wet products, and metallic contaminants in wet and dry products having phase angles that vary from pack to pack. IXR is used, typically, in conveyor applications and is not available for pipeline applications.

Please note that you *must* have an in-feed photo-eye (or other triggering device) installed for the IXR function to work. IXR is not available for gravity-feed or Rx applications.

Before using the IXR function, you *must* set the following parameters.

- Pack length
- “Detection no-pack” distance
- In-feed photo-eye distance
- Photo-eye registration

Pack Length

See the instructions on page 2.

No-Pack Distance

See the instructions on page 2.

In-Feed Photo-Eye Distance

See the instructions on page 3.

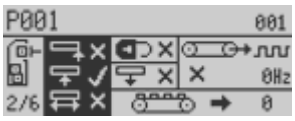
Photo Registration

For optimum performance, the photo registration should be set to detect the *middle* of your product.

1) Follow steps 1–5 of the "Photo Registration for Product Rejects" section on page 4.

2) Press the Go button to select "middle" for photo registration.

Middle Photo Registration



Enabling IXR

To enable the IXR function, do the following.

1) Make sure the Main Menu is displayed.

2) Highlight the system and tools menu.

3) Press the Go button.

4) Highlight the IXR menu.

5) Press the Go button.

6) Highlight the "Enable IXR" function.

7) Press the Go button. A checkmark appears (as well as other IXR options), indicating IXR in now enabled.

Enable IXR

8) Press the Back button repeatedly to return to the Main Menu, which now looks like this.

Product Name

Calibrating the IXR Function

During the calibration, you *must* run the conveyor at the same speed used in normal production runs.

There are two parts to the calibration process.

- Learn the *X* and *R* noise thresholds.
- Learn the detect levels (for both the *X* and *R* signals).

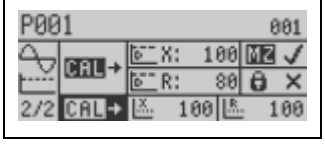
1) Make sure the Main Menu is displayed.

2) Highlight the frequency and gain menu.

3) Press the Go button and navigate to page 2 of the menu.

4) Highlight the "Calibrate Noise Thresholds" function.

Calibrate Noise Thresholds



5) Make sure the conveyor is running at normal production speed. Press the Go button, and a monitor screen appears (for about 20 seconds) while the APEX measures the *X* and *R* noise thresholds.

Auto-Calibrating the IXR Function

To optimize the auto-calibration procedure you should do the following.

- Run the conveyor at your normal production speed.
- Have a gap between packages that is at least as wide as the width of the search head.
- Pass about 30–50 uncontaminated packages through the search head.

1) Make sure the Main Menu is displayed and that "Product Name" (or the product name you entered previously) is highlighted.

2) Press the Go button and page 1 of the "Full Product Calibration" menu appears.

3) Highlight the auto-calibration function and start passing packages through the search head. Press the Go button and wait until the Main Menu reappears.