INTERCEPTOR

METAL DETECTOR WITH CONVEYOR APPLICATION

OPERATOR SET-UP MANUAL

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<u>INTRODUCTION</u>

Thank you for purchasing an Interceptor Metal Detector with Conveyor System from Fortress Technology Inc.

At Fortress we are committed to offering the most practical, functional and user-friendly metal detection solutions. Built to customer specifications, Interceptor Metal Detectors are available in a range of aperture sizes and configurations for a variety of industrial applications.

This Operator Setup Guide is intended to get you up-and-running within minutes covering the basic setup procedure in addition to the most commonly used system features.

Advanced Interceptor Features:

- Core DSP – high speed Digital Signal Processor technology provides the highest processing power.

- Ultra-Sense – detection of the smallest metal contaminants with the highest sensitivity levels.

- Auto-Test – automated system testing reduces the high costs associated with manual testing.

- Auto-Cal – single pass product learning and automatic calibration allow for quick setup.

- Auto Phase—learns and calibrates to product with both wet and dry characteristics.

- Flash RAM – Flash Memory technology prevents information loss.

- Modular Design – fewer product parts render improved power-efficiency within a compact housing.

- Password Protection – flexible multi level security protection for critical parameters preventing unauthorized use.

- Multiple Product Storage – quick changeover between production line runs with retained settings.

- Control Options – display terminal can be made portable or mounted remotely; one terminal can operate numerous Detector units.

- USB – allows quick method to collect reject, fault and event data and able to view on a PC based computer, can also be exported to excel and PDF documents.

- Automated Data Logging Option – CONTACT Software enables Detector communication with a PC; Wireless Ethernet connection available.

Service Support:

Fortress Technology provides the highest standards of customer service in the industry. You simply receive the best, most efficient response whenever you require help! We have a global service team to ensure our customers get the fasted and most reliable service.

We believe that through the implementation of regular and preventative maintenance, and by conducting effective training support and guidance, you can reduce break downs, eliminate waste and achieve maximum potential from your product. Call us to find out about our training programs and preventive maintenance packages.

For more information including product brochures and regional contact information, please visit our website:
www.fortresstechnology.com

For technical support, please contact numbers below or e-mail: **service@fortresstechnology.com**

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TABLE OF CONTENTS

SAFETY, CAUTIONS & CLEANING

Compliance with Safety Standards

The product has been designed to operate safely in accordance with the current technical and safety regulations, including the provisions of the Health and Safety at Work Act, relevant EU legislation and OSHA regulations in addition to any amendments that may become legal requirements.

While every precaution has been taken to ensure the operational safety of the system, it is the responsibility of the owner and/or end-user to ensure that the guarding, safety devices, installation, operation and maintenance of the system complies with all the requirements of the local health and safety regulation legislations and codes of practice. It is highly recommended that a formal risk analysis be performed on this equipment prior to its use.

NOTA: El presente Documento de Seguridad está disponible en español. Por comuníquese con service@fortresstechnology.com para obtener una copia.

REMARQUE : Ce document est disponible en Français. S.V.P. contactez service@fortresstechnology.com

Installation, Commissioning and Operation

- The metal detector system must be installed, connected, operated and maintained according to all local regulations and codes as well as the instructions stated in this manual and other specific operating instructions accompanying this manual. The safety warnings and instructions must be read, understood and all safety instructions followed by persons who are involved in the installation and use of the equipment.

- Persons supervising, performing maintenance or installation must be suitably qualified and competent. Operators, sanitation operators, maintenance personnel, engineers and supervisors should be given opportunity to study and discuss this manual prior to working with the system.

Electromagnetic Radiation

This device is an intentional radio frequency transmitter and emits a low power radio signal designed for use within an industrial environment. The product complies with Part 15 of FCC Rules (USA), and relevant legislation under CE Marking.

General Safety Guidelines

1. Read and understand the Operation Manual and all safety labels before operating this machine.

2. Only a trained person is to be permitted to operate this machine. Training should include instruction in operation under normal conditions and emergency situations.

3. This machine is to be serviced only by trained and authorized personnel. Follow lockout procedures before servicing.

4. Never reach into the machine for any reason unless the machine is at a COMPLETE STOP and LOCKOUT procedures have been followed.

5. Never leave the machine stopped in such a manner that another worker can start the machine while you are working on or within the machine and follow lockout procedures.

6. Never change or defeat the function of electrical interlocks or other machine "shutdown" switches.

7. Before starting this machine, check that: - All persons are clear of the machine. - No maintenance work is being performed on the machine. - All guards are in place. - Keep the floor around the machine clean and free of any scrap, sawdust, oil, grease etc. to minimize the danger of slipping. Maintain safe working distance and use personal protection equipment as authorized by your supervisor.

SAFETY, CAUTIONS & CLEANING continued

8. There is a potential hazard of entanglement in this machine caused by items such as long hair, loose clothing and jewelry. Make sure your clothing and hair fit closely to your body and that all jewelry, rings and watches are removed.

WARNING: Hazardous Voltages and Air power may be present! Hazardous voltages can cause severe injury or death. Disconnect all sources of power (electrical and air) before servicing. Multiple and/or remote sources of power may be present.

Cleaning and Maintenance

Always isolate the system from the electrical and air services before any cleaning and or maintenance.

LOCKOUT PROCEDURE:

1. Announce lockout to other personnel.

2. Turn power OFF at main panel and remove all power plugs

3. Lockout power in OFF position, lock out all power plugs. Put key in pocket.

4. Remove all sources of air supply and lock the shut off device in OFF position

5. Clear machine of all personnel

6. Test lockout by turning machine power switch to ON.

During normal operation:

WARNING AUTOMATED MACHINERY:

1. Machinery and devices may operate without warning at any time.

2. Keep away from the operating area of the reject device while power is applied.

3. Keep hands clear of moving parts.

4. Do not tamper with, modify or attempt to override guards or safety switches.

5. Equipment is heavy – use lifting devices according to the Handling instructions in the installation/ operation manual.

Cleaning Guidelines

The metal detector requires routine cleaning for optimal performance. Determine whether the system purchased utilizes a Stainless Steel or Painted Aluminum construction. For IP69K rated Stainless Steel units, the system can be cleaned using pressure wash-down. Aluminum units should be cleaned by wipe-down using a damp cloth. Make sure that the General Safety Guidelines are followed during cleaning and verify that all conduit entries are plugged before washing the metal detector.

Use of chemical cleaning agents: Contact Fortress prior to the use of aggressive, corrosive or petroleum based cleaning solutions. Chlorine based cleaning agents are likely to cause corrosion on stainless steel components. Petroleum based cleaners or thread locking agents are likely to damage food grade plastics.

CHAPTER 1: INSTALLATION

1.1   Installation Overview

The aim of this chapter is to outline the general fundamentals of Interceptor Conveyor Metal Detector system installation and present the key considerations that must be taken into account to ensure trouble-free operation.

1.2   Package contents

Your Interceptor Metal Detector kit includes the following:

Interceptor Metal Detector (actual unit received may differ from image shown)

Test Samples
3 Rods (and/or)
3 Spheres (and/or)
3 Cards

Mounting Kit
4 Spacers
3 Large Isolators
3 Small Isolators
1 Washer

USB Drive

Hex Key (Allen)

CHECK YOUR PACKAGE TO CONFIRM THAT YOU HAVE RECEIVEDTHE COMPLETE SYSTEM, INCLUDING ALL APPLICABLE COMPONENTS SHOWN ABOVE.

NOTE: If purchasing an integrated conveyor system from Fortress, the Mounting Kit is not applicable.

1.3   Installation Tools

The installation of your Interceptor Detector system will require only general tools – there are no special tools required.

1.4   Installation Location

The location of the Metal Detector is very important. The metal detector must be positioned on a solid surface/frame. The Metal Detector must be set up in an area free from radiated electromagnetic interference and must be connected to a power supply that is free from line (mains) borne interference.

Environmental Conditions: Temperature range -5 C to +50 C (23 F to 122 F)

1.5   Handling

The Interceptor system's weight depends on the application; the unit is designed to be robust and can be extremely heavy in some cases.

Where the unit has to be lifted, it is strongly recommended that suitable lifting devices be used; keep the unit low to the ground in order to avoid a dangerous topple-over effect.

WARNING!

Do not use the aperture as a means of lifting the Detector system via forklift. Use appropriate weight capacity straps to support the unit if lifting by forklift.
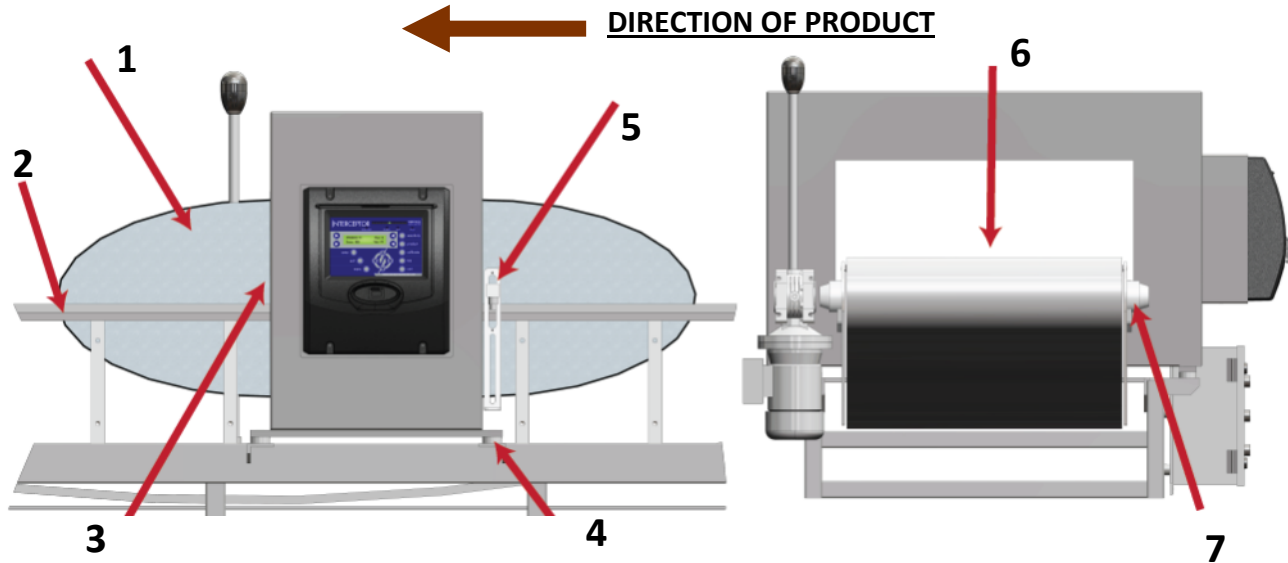
Correct Method of Lifting Detector

Incorrect Method of Lifting Detector

1.6 Installation Essentials

NOTE: If you have received a complete system from Fortress then all the basic installation issues have been addressed.

Below are the important installation guidelines for successful Conveyor Metal Detector system results.

DIRECTION OF PRODUCT

1. **Metal Free Area**

   No metal can be located in or near the Detector's aperture (the opening through which product travels). The Metal Free Zone required is equal to 1.5x the smaller dimension of the aperture. For large moving metal (such as rollers/covers) this zone should be at least 2x the smaller dimension.

2. **Non-Metallic Slider Bed/Decking**

   Use a non-metallic slider bed (decking) material to support the product through the metal free area; recommended materials are phenolic or micarta due to their low static generating characteristics.

3. **Clearance**

   The belt, slider bed (decking), and product must not come in contact with the aperture walls.

4. **Foot Isolation**

   Only one foot mount at the control end should make electrical contact with the mounting frame. The remaining mounting feet must be electrically isolated from the frame using the isolators supplied with the equipment. The supplied washer should be used for one-point grounding. Mounting connections should be firmly fastened or loose mounting points can cause false rejections.

5. **Photo Eye**

   Photo Eye is an optional sensor that can be installed on the infeed side of the Metal Detector for the purpose of ensuring the most precise accuracy of the reject device. Contact Fortress for information on recommended Photo Eye sensors. For more information on Photo Eye Setup, refer to Section 3.4.2.

6. **Metal Free Conveyor Belt**

   The belt should be suitable for Metal Detector use; avoid anti-static belts or colored belts which may contain carbon or metallic pigments. Where possible use plastic chain belting (eg: Intralox) in a natural color; do not use metal splices (a vulcanized finger splice is preferred for belts which require splicing). If in doubt contact Fortress for help in determining proper belting prior to installation; be sure to protect the belt from weld splatter etc. when working near the Detector system.

1.6   Installation Essentials– continued

7.   Roller Isolation

Rollers should be isolated at one end to avoid possible interference caused by loop effect. See below for details.

To properly isolate a roller, use one of the following concepts:

1. Insert a nylon bushing on reduced shaft.

2. Use a non-metallic bearing housing.

3. Install isolation material behind bearing and nylon bushings on mounting bolts.
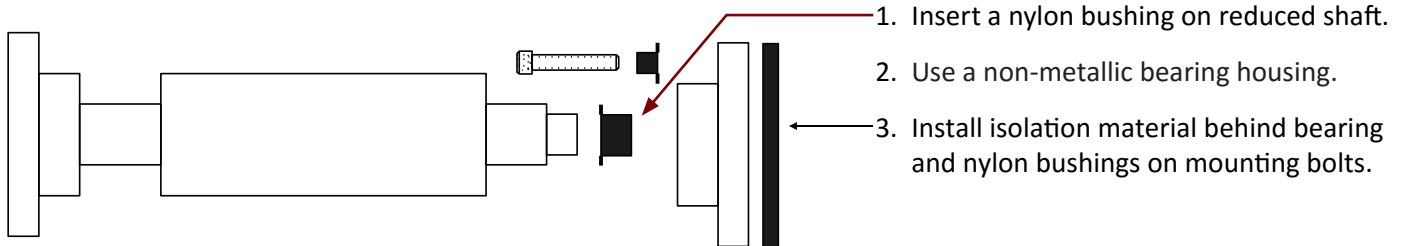
To avoid Loop Effect, ensure the following:

1.   Do not allow cross-members in the conveyor frame to form "loop shapes".

2.   Cross members need to be isolated or fixed by welding (not bolting).

3.   Be sure to isolate only one end of the rollers. Excessive static may be generated if both ends are isolated.

Why Rollers can cause Loop Effect

From the Detector's view, the roller and conveyor frame forms an antenna shape which is very similar to the shape of the aperture. This shape will produce a large field which is reflected back into the Detector. If it remains constant in position and intensity the Detector will not be affected. However, as the roller turns, the bearings will change their electrical characteristics and the loop field will collapse, generating a large error signal. Even moving a closed loop can cause interference. Loops react the same way regardless of whether they are grounded or not.

Electrical equivalent of roller and bearing isolation
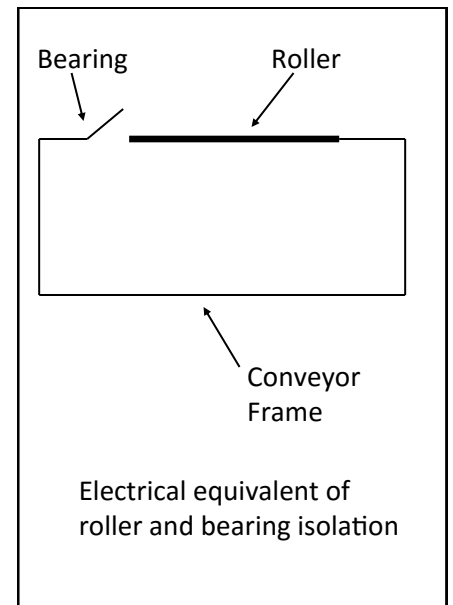
1.7   Removing & Installing Display Panel

NOTE: It is important to follow these instructions when removing or installing the display panel.

1. Loosen cover bolts (using 5mm Hex Key as supplied) in a diagonal pattern, 1-2-3-4 until all tension is removed.

2. Be sure to follow this pattern until all bolts have completely loosened. This will ensure that the bolt retaining O-Ring will stay in place and the cover bolts will remain will the cover.

3. To remove, unplug Ethernet connector cable attached to main board.

4. To re-install, plug display panel Ethernet connector cable to main board.

5. Tighten screws. Torque = 2.0NM or 17 inch pounds.

See diagram below for removing and installing the display panel.
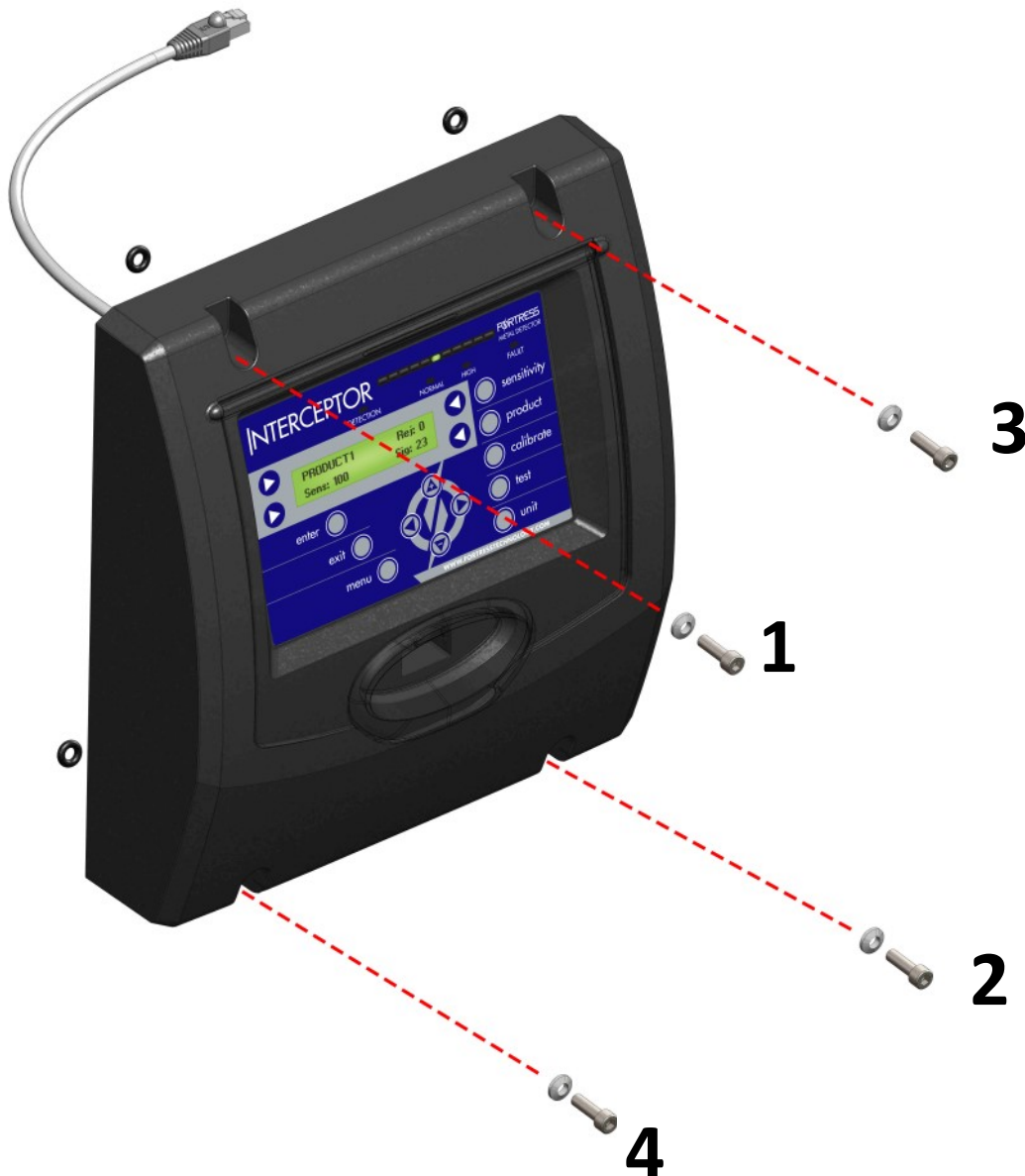
1.8   Electrical Installation

1.8.1 CSA Guideline

Pollution Degree, 2;

Installation Category, II;

Humidity, 0% to 75% RH, non-condensing

Electrical Supplies, rated 100-120/200-240V, 50-60Hz, 1A
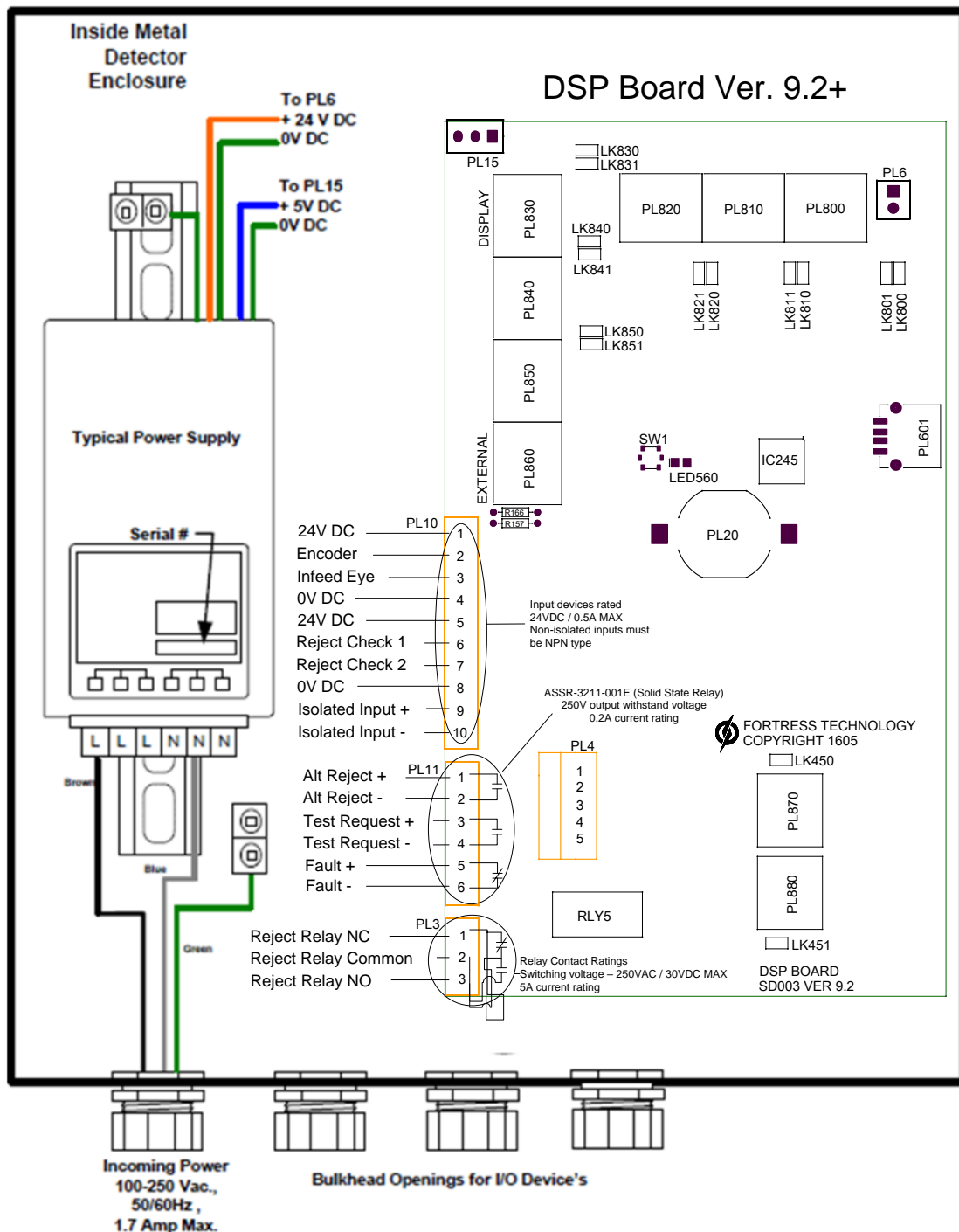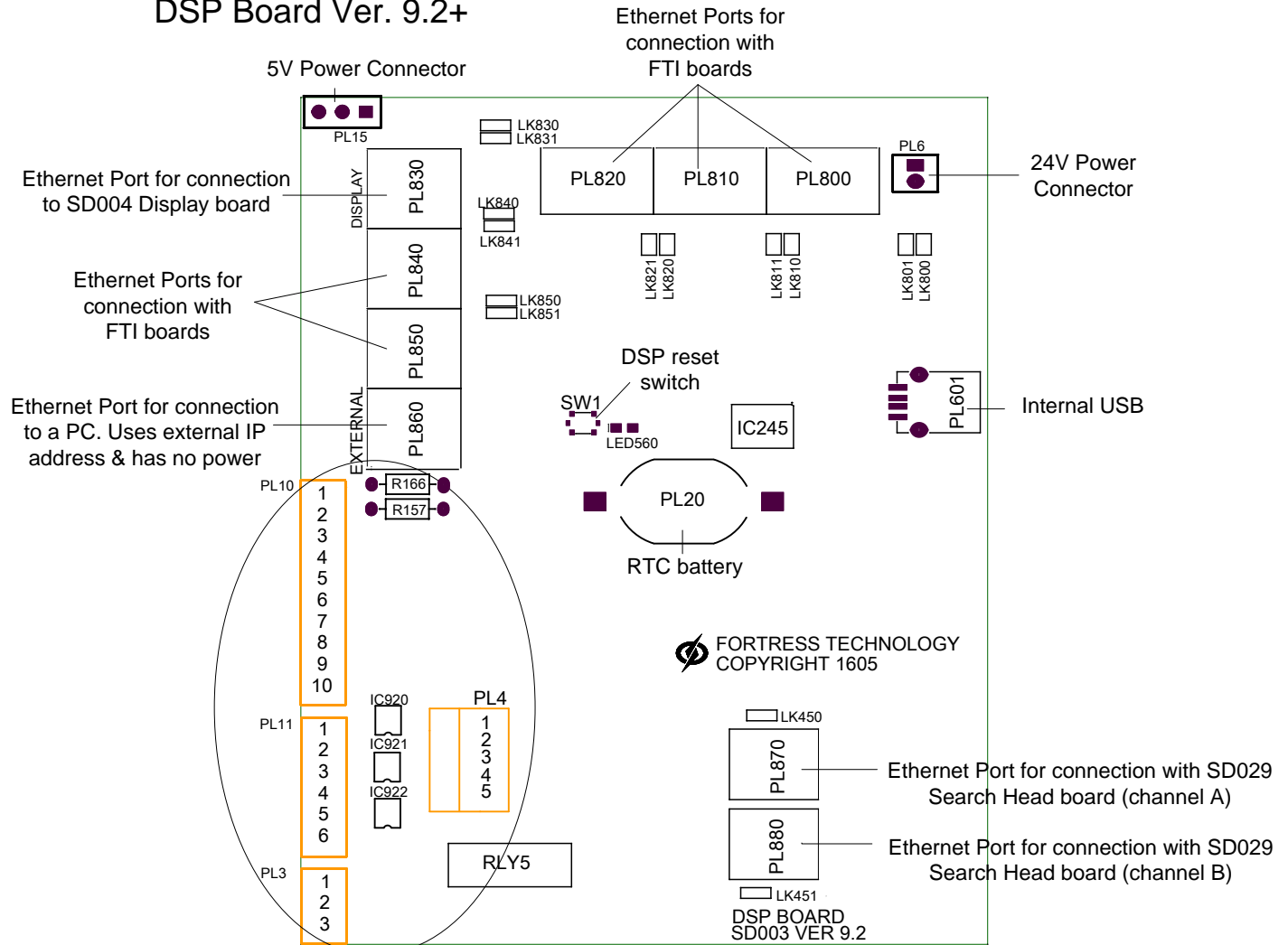
Ambient Temperature Range, -5C to 50C

1.8.2 Metal Detector Control Bay Layout

1.8.3 DSP Layout

DSP Board Ver. 9.2+

5V Power Connector

Ethernet Ports for connection with FTI boards

PL15

LK830
LK831

PL6

24V Power Connector

Ethernet Port for connection to SD004 Display board

DISPLAY

PL830

LK840
LK841

PL820   PL810   PL800

Ethernet Ports for connection with FTI boards

PL840

LK821
LK820

LK811
LK810

LK801
LK800

PL850

LK850
LK851

DSP reset switch

Ethernet Port for connection to a PC. Uses external IP address & has no power

EXTERNAL

PL860

SW1

LED560

IC245

PL601

Internal USB

PL10

1
2
3
4
5
6
7
8
9
10

R166
R157

PL20

RTC battery

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IC920

PL4

LK450

PL11

1
2
3
4
5
6

IC921

1
2
3
4
5

PL870

Ethernet Port for connection with SD029 Search Head board (channel A)

IC922

PL3

1
2
3

RLY5

PL880

Ethernet Port for connection with SD029 Search Head board (channel B)

LK451

DSP BOARD
SD003 VER 9.2

To use external 24V for I/O Connectors R166 & R157 must be removed.

PL10 – Inputs

1	24V DC
2	Encoder
3	Infeed Eye
4	0V DC
5	24V DC
6	Reject Check 1
7	Reject Check 2
8	0V DC
9	Isolated Input +
10	Isolated Input -

Input devices rated 24VDC / 0.5A MAX Non-isolated inputs must be NPN type

PL11 – Output Relays

1	Alt Reject +
2	Alt Reject -
3	Test Request +
4	Test Request -
5	Fault +
6	Fault -

ASSR-3211-001E (Solid State Relay)
250V output withstand voltage
0.2A current rating

PL4 – EZ-Lite Light Stack Connector

1	Red
2	Green
3	Yellow
4	24V DC Supply
5	Buzzer

PL3 – Main Reject Relay

1	Reject Relay NC
2	Reject Relay Common
3	Reject Relay NO

Relay Contact Ratings
Switching voltage – 250VAC / 30VDC MAX
5A current rating

1.8.4 Basic Power Connection
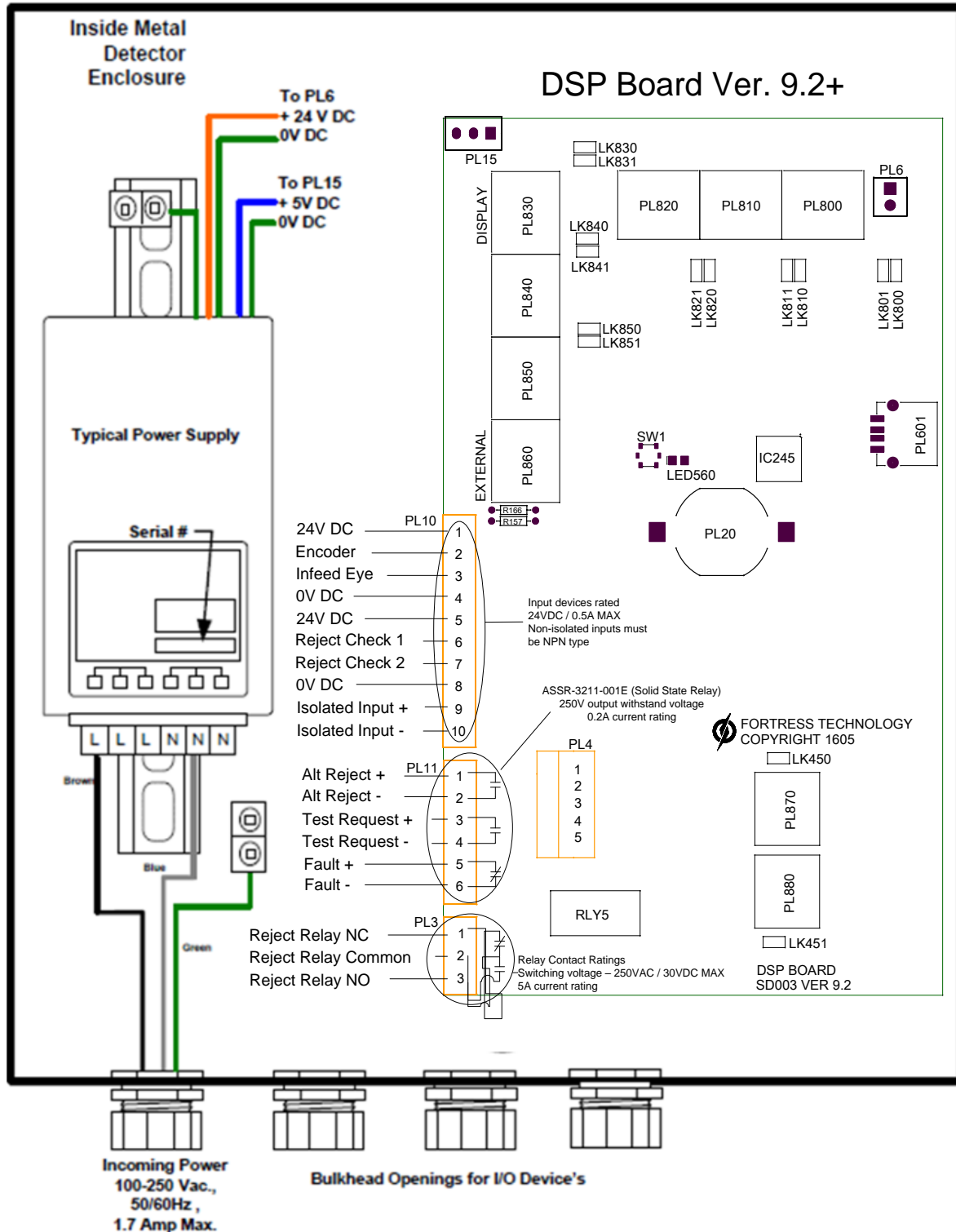
The Metal Detector's power supply is incorporated within the system's electronic enclosure; the Detector's internal power is universal (working voltage 95-260V AC, 47-63Hz). The power cable should be wired to a suitable plug or device with a circuit protection of 3 amps.
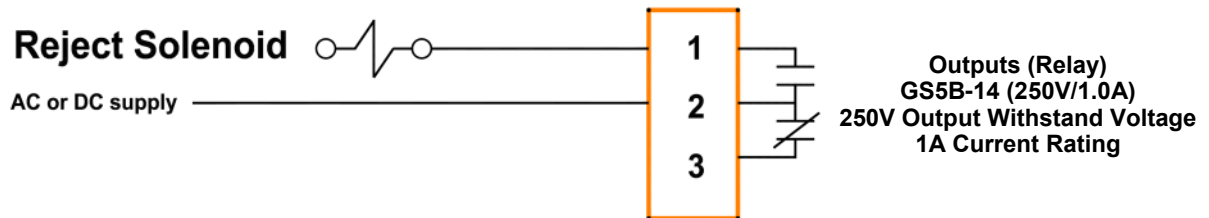
> **WARNING!**
>
> **Only a suitably qualified Electrical Technician should wire the power supply main cables.**

1.8.5 Basic Reject Connection

PL3 - Main Reject

Reject Solenoid

AC or DC supply

| 1 |
| 2 |
| 3 |

Outputs (Relay)
GS5B-14 (250V/1.0A)
250V Output Withstand Voltage
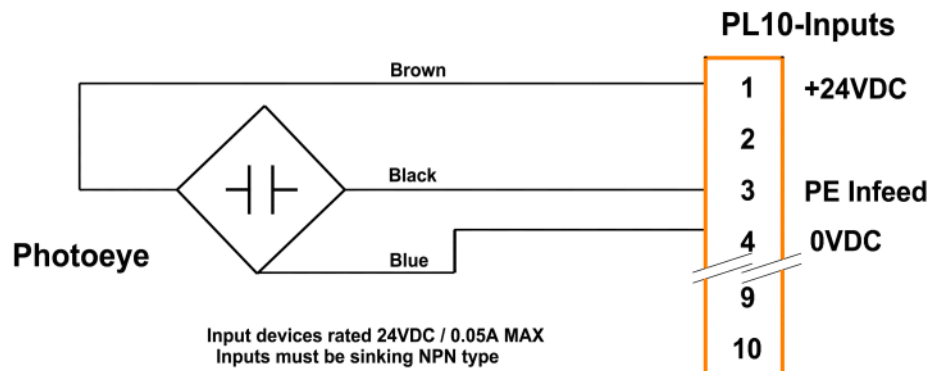**1A Current Rating**

Reject Outputs (Fail Safe Operation)

Outputs are shown in power-on, not rejecting state.

> State 1 & 2 will close
>
> State 2 & 3 will open

** For connection of reject devices requiring greater than 1AMP current supply; contact Fortress Technology for assistance: 1-888-220-8737 or 416-754-2898.

1.8.6 Photo Eye Connection

PL10-Inputs

Brown

Black

Blue

Photoeye

1	+24VDC
2	
3	PE Infeed
4	0VDC
9	
10	

Input devices rated 24VDC / 0.05A MAX
Inputs must be sinking NPN type

1.8.7 Reject Confirm—Optional & Input Wiring Diagram

Input devices rated 24VDC / 0.05A MAX
Inputs must be sinking NPN type

PL10-Inputs

1	+24VDC
2	ENCODER
3	PE Infeed
4	0VDC
5	+24VDC
6	Reject Check 1
7	Reject Check 2
8	0VDC
9	Iso. Input 1 +
10	Iso. Input 1 -

Black

Black

Brown

Blue
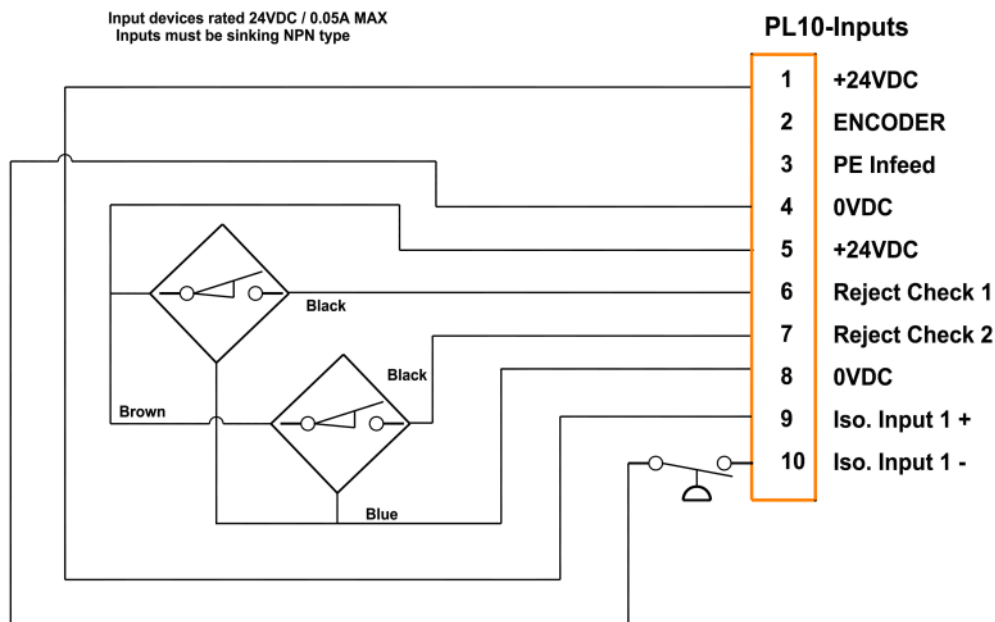
1.8.8 Indicator Light Connection—Optional
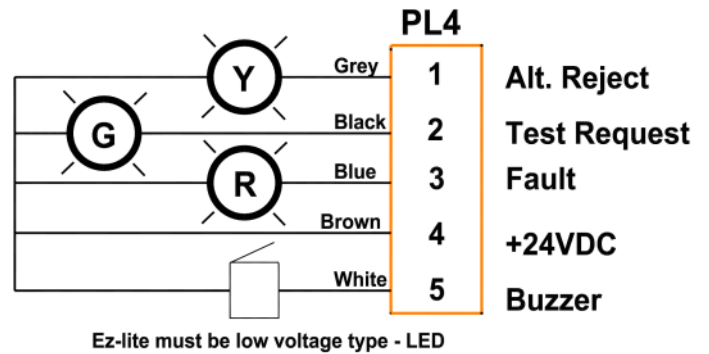
The Interceptor has a set of outputs intended to be connected to low power (LED) indicator light stack systems (Banner EZ-Lite for example). The light outputs are rated to 50 mA per output. Typical connection for a 3 color light system is shown below:

Indicators Connection for Light
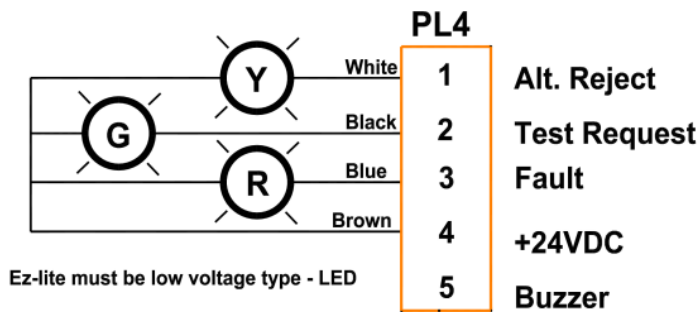
Indicators Connection for Light with Buzzer

1.8.9 Shaft Encoder
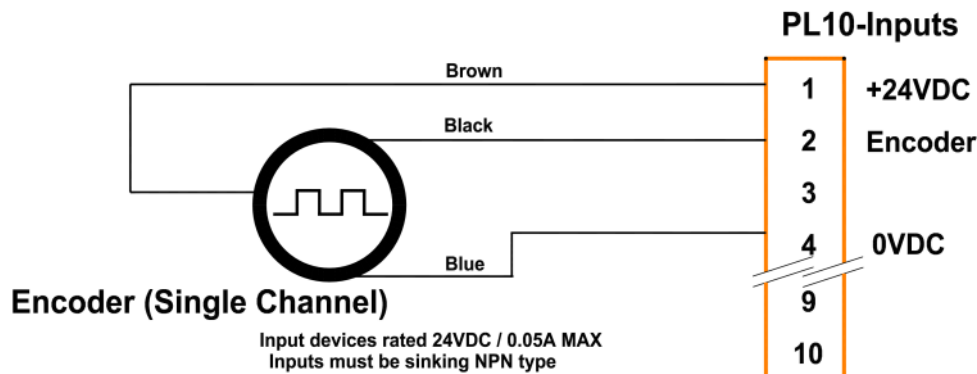
1.8.9 Alternate Reject
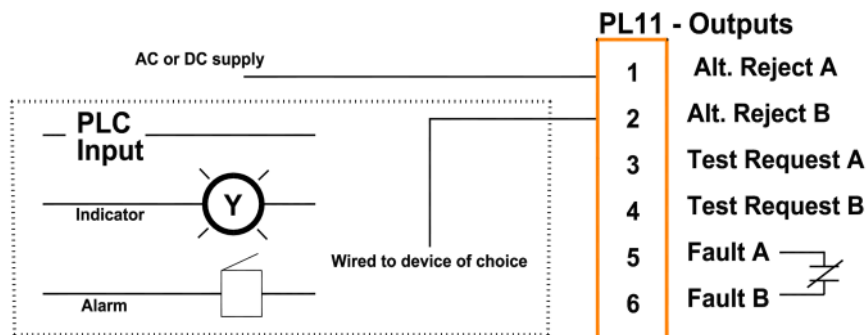
1.8.10 Fault Output Typical Connection

PL11 - Outputs

1	+ Alt. Reject
2	- Alt. Reject
3	+ Test Request
4	- Test Request
5	+ Fault
6	- Fault

**

Fault polarity Normally Closed by default, can be inverted in software settings, see fault setup menu

Outputs (Solid State Relay)
ASSR-3221 (250V/0.2A/10oHm)
250V Output Withstand Voltage
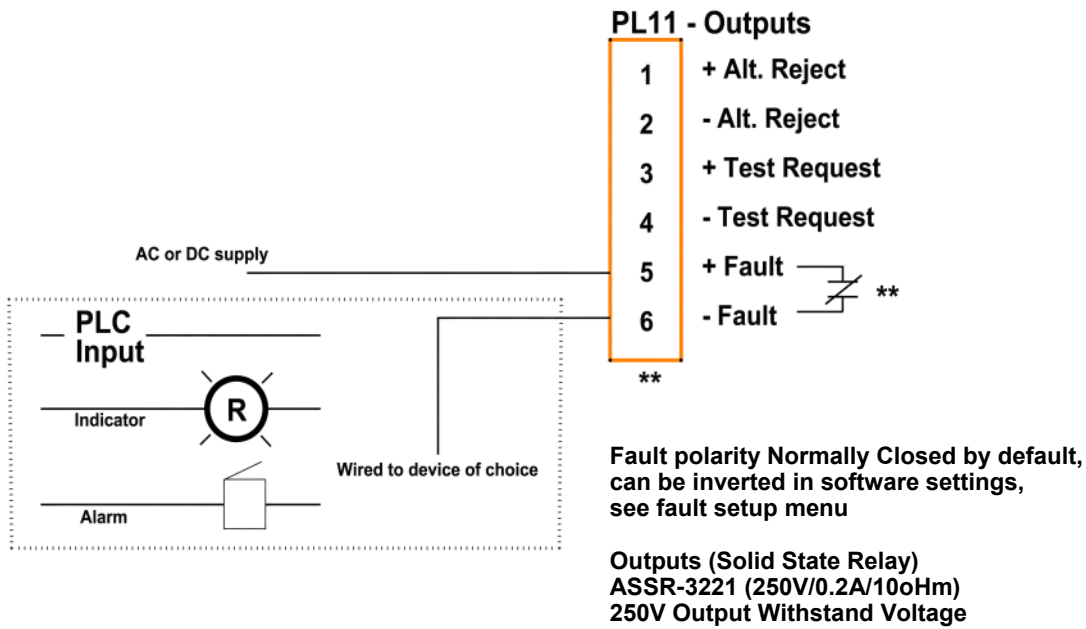
CHAPTER 2: GETTING ORIENTED

2.1   Introduction

The Interceptor metal detector is designed to operate at multiple frequencies of transmission simultaneously. This allows improved detection performance for all metal types over a wide range of product applications. This manual describes the setup and use of the dual transmitter system and the frequencies are described as channel A for the high frequency system, and channel B for the low frequency system.

System menus versus Channel Specific Menus:
Most menus in the user software are common to both channels and are referred to as System Menus or parameters. System menus are common to both channels will not have a channel indicator displayed.
System Menus are:

- Reject
- Product Select
- Password
- Fault

- Language
- I/O Setup
- Pack Count
- Date / Time
- IP, Network settings, Serial Number and Detector Name

Menus and parameters that are channel specific will have the channel indicator displayed on both sides of the LCD (A or B). In any of these menus pressing the Select Unit key will jump to display the other channel.

Channel Specific Menus are:
- Sensitivity (some sub-menus are system parameters)
- Calibrate (some sub-menus are system parameters)
- Test (some sub-menus are system parameters)
- Digital Filter

Note: All parameters, both system and channel specific are stored as a complete product record and once stored can be recalled through the Select Product menu.

2.2   Menu Maps

Sensitivity

Sensitivity Menu

	Sensitivity: 100
FM	Signal: 0

S2

Detection Mode

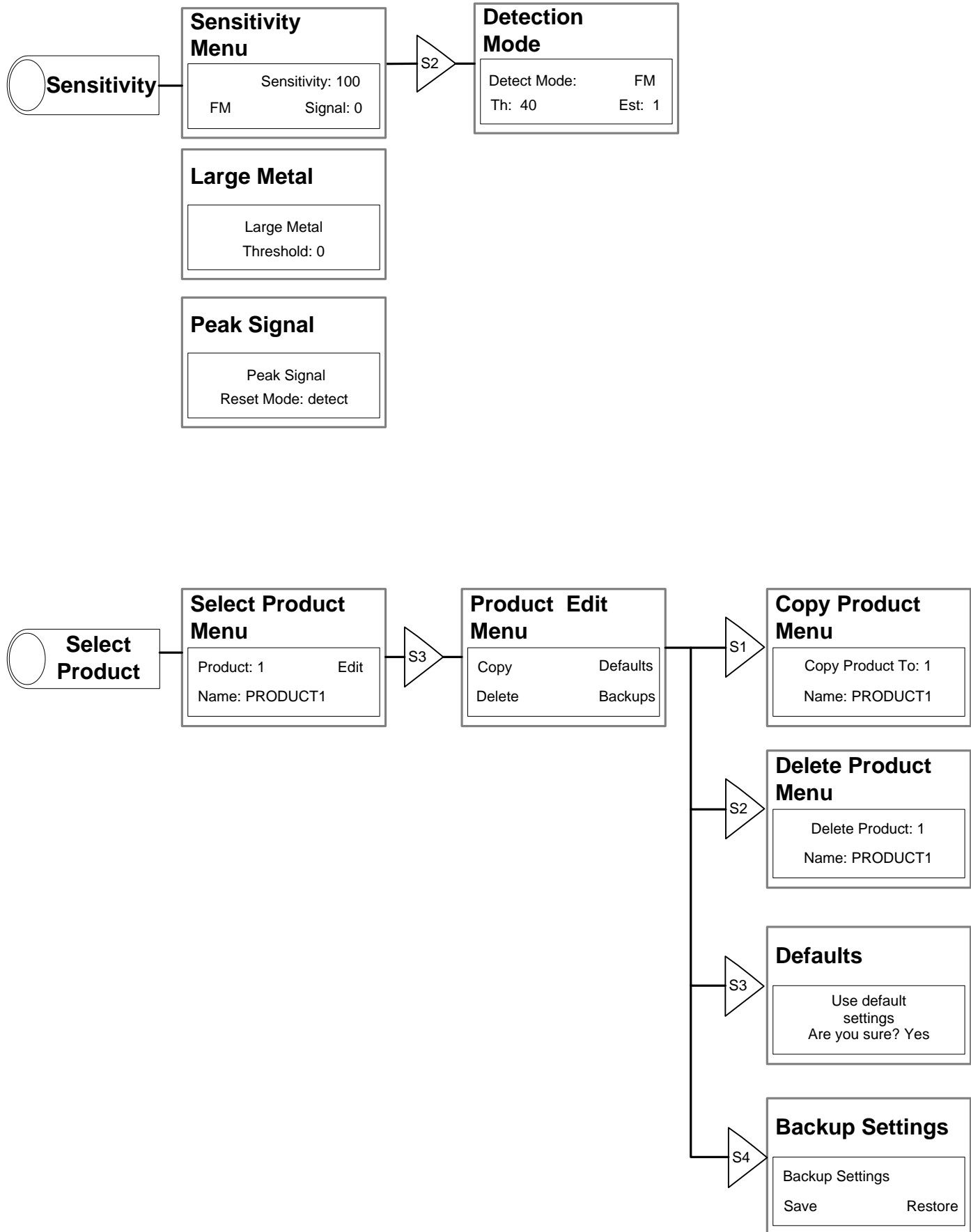|	
Detect Mode:	FM
Th: 40	Est: 1

Large Metal

Large Metal
Threshold: 0

Peak Signal

Peak Signal
Reset Mode: detect

Select Product

Select Product Menu

Product: 1	Edit
Name: PRODUCT1	

S3

Product Edit Menu

Copy	Defaults
Delete	Backups

S1

Copy Product Menu

Copy Product To: 1

Name: PRODUCT1

S2

Delete Product Menu

Delete Product: 1

Name: PRODUCT1

S3

Defaults

Use default
settings
Are you sure? Yes

S4

Backup Settings

Backup Settings

Save   Restore

Calibrate — **Calibrate Menu**

Setup   Fixed
Phase: 90   Dry

S1

Detector Power Setting

Detector Power : high

Phase Mode Hold Setup

Phase Mode Hold: off
Photo - Calibrate: off

Phase Trigger Setup

Phase Trigger
3 of: 6

Dry Phase Limit Setup

Dry Phase Limit
90.00   Spread : 45

Wet Phase Limit Setup

Wet Phase Limit Setup
0.00   Spread : 45

Auto Phase

Auto Phase
Packs: 5

Product High Reject

Reject on Prod High
:off

Product Threshold Setup

Product High : 28000
R:18000   X:18000

Test — **Test Menu**

Setup   Test: off
Rej: 0   Sig: 10

S1

Test Mode

Test Mode: Manual
Interval(min):   60

Test Signals

Test   Sig: 10
R: 0   X: 0

Test Req. Samples

Test Request   FE: 0
NFE: 0   SS: 0

Select Unit

Channel A

A		A
PRODUCT1	Reg:	0
Sens:100	Sig:	0

Channel B

B		B
PRODUCT1	Reg:	0
Sens:100	Sig:	32767

Menu

Reject Menu

Reject	Setup
Del: 0	Dur: 0

S3

Reject Mode

Reject Mode: Normal

Belt Speed

Belt Speed	Learn
	60 ft/min

S3

Belt Speed Est.

Belt Speed Est:	0.0
Pkg Length(in):	10

Password Menu

Password:	Off
Logout	Setup

S4

Passwords

Change Password 1
0000

Reject Setup

Photo Reject:	Mid
eye: 0	Setup

S4

Photoeye Distance

Photoeye Distance:
9.5 in

Digital Filter

Digital Filter:	Med
Sens: 100	Sig: 0

Password - Sensitivity

Hard Key Access
Sensitivity   3

Reject Check

Reject Check:	Off
Time: 200	Setup

S4

Package Length

Package Length:
10.0 in

Freq / Bal / Ref

Frequency: 000	
Ref: 1200	Bal: 200

Password - Sel Prod.

Hard Key Access
Select Product   3

Rej Latch / Man. Rej

Manual Reject:	Low
Reject Latch:	off

DSA

DSA
Size: 1.0

Language

Language: English

Password - Calabrate

Hard Key Access
Calabrate   3

Alt Reject Setup

Alt. Reject	Setup
Del: 0.00	Dur: 0.25

Peye Block Limit

Photoeye Block Limit
10.0Times Pkg Length

Pack Count

Pack Count
00000000000

Password - Test

Hard Key Access
Test   3

Reject Clock

Reject Clock:	0
Source: int	Setup

S4

Minimum Pack Gap

Minimum Package
Gap: 0.2 in

Password - Sel Unit

Hard Key Access
Select Unit   3

Detector

Detector (in)	Setup
Depth: 12.0	Win: 3.9

Time Correction

Time Correction
Del: 0   Dur: 0

Password - Clear Faults

Password Access
Clear Faults   3

Reject with no running Product

Reject with no
Running product: Off

Password - Clear Rej Count

Password Access
Clear Rej Count 3

Reject Check Pol

Polarity	Rej: main
R:1	R:1

Password - Clear Reg Latch

Password Access
Clear Rej Latch 3

Bin Door Timeout

Reject Bin Door Timeout(sec)	60

Password - Sync

Password Access
Data Synchronize 3

Reject Exit Window

Reject Exit(in)	
Window	0.0

Continued

Password - Date/Time

Password Access
Date and Time   3

Reject Exit

Reject Exit (in)	
Est: 0.0	Dist: 0.0

Faults

Faults	Setup
	Log

S4

S3

Rej on Fault

Reject on Fault	
Main: Off	Alt: Off

Fault Latch

Fault Latch:	Off

Excess Rejects

Excess Rejects:	0
Interval(min):	5

Fault Mask

Fault:	Enabled
Cause:	24V

Fault Log

Log0:	No faults
Age: 0	Clear

Date Code

Version:	2014/909
	Select Unit

S3

Noise Estimate

Noise Estimate	
R: 0	X: 0

Thresholds

Thresholds	
R: 40	X: 200

S4

I/O Setup

	Input Setup
	Output Setup

S3

Input Setup

Use:	
In:	Pol: +

Reject Power-Up / Disable

Reject Disable:	Off
Power-up Reject	Off

Date / Time

Date and Time	
2014/12/17 10:10:00	

DC Filter

DC Filter	Med
Coeff:	50

Freq / Bal / Ref

Frequency: 000	
Ref: 1200 Bal: 200	

S4

Output Setup

Out:	Pol: +
Src:	

Internal Scope

ID: 0	Capture : off
Clear	Metal: 0.0

Network Settings

IP: XXX.XXX.XXX.XXX	
M: F8-99-55-XX-XX-XX	

Lightstack Setup

LED Light Stack	
Rej: Main	Buz: Main

Product Writes

Product Writes:	0

Serial

Serial Number:	
XXXXXXXXXXXXX	

Detector Name

Detector Name	
"Detector 0001"	

2.3   Interceptor Interface

Regardless of the Detector application, the same user-friendly Interceptor control interface is utilized; the aim of this chapter is to become familiarized with the terminology and basic operation of the control panel.

The buttons, LED indicators, and display can be categorized as follows:

1. Detect – illuminates with a red LED upon detection.

2. LED Bar Graph – center-reading meter contains a green and red zone to visually quantify the signal of product, metal, or background noise. The larger the signal the more significant the effect/contamination being detected.

3. Fault – flashes upon system fault.

4. LCD Display – digital screen shows system status and enables programming via menus.

5. Soft Keys – used to edit menu options. Refer to Section 2.4 for further details.

6. Enter – used to confirm changes to menu options.

7. Exit – cancels any changes and returns to the previous menu.

8. Menu – navigates through submenus. Refer to Section 2.2 for further details.

9. Product – indicates with a green LED whether a product is running through the Detector; a red LED represents a high product effect reading.

10. Hard Keys – dedicated shortcut keys provide quick access to the most commonly used features. Refer to Section 2.4 for further details.

11. Arrow Keys – used to navigate within menu options, and increase/decrease values when editing.

2.4   Hard vs. Soft Keys

The keypad has a series of 'Hard' and 'Soft' Keys which can be defined as follows:

Hard Keys:

The Hard Keys perform the same function irrespective of where you are within the menu structure. These convenient "shortcut" keys (arranged on the right of the keypad) represent the most commonly used functions including: CALIBRATE (refer to section 3.5), SENSITIVITY (refer to section 3.7), SELECT PRODUCT (refer to section 3.9), TEST (refer to section 4.2), and SELECT UNIT (refer to section 2.5.1).

Less common functions are accessed through the MENU key.

Soft Keys:

The Soft Keys change their function according to the menu display, these four keys arranged around the LCD display are used to edit the function being displayed on the LCD next to that Soft Key.

2.5   Menu Navigation

To move from one menu screen to the next, simply press the MENU key; alternatively, while no entry field is being edited (i.e. no flashing cursor is visible) press UP/DOWN (+/-) arrow keys.

2.5.1 Select Unit Key

This key allows the tag operator to toggle between Channel A and Channel B in any menu where there are individual settings. This is indicated by A or B on both sides of the LCD Display.
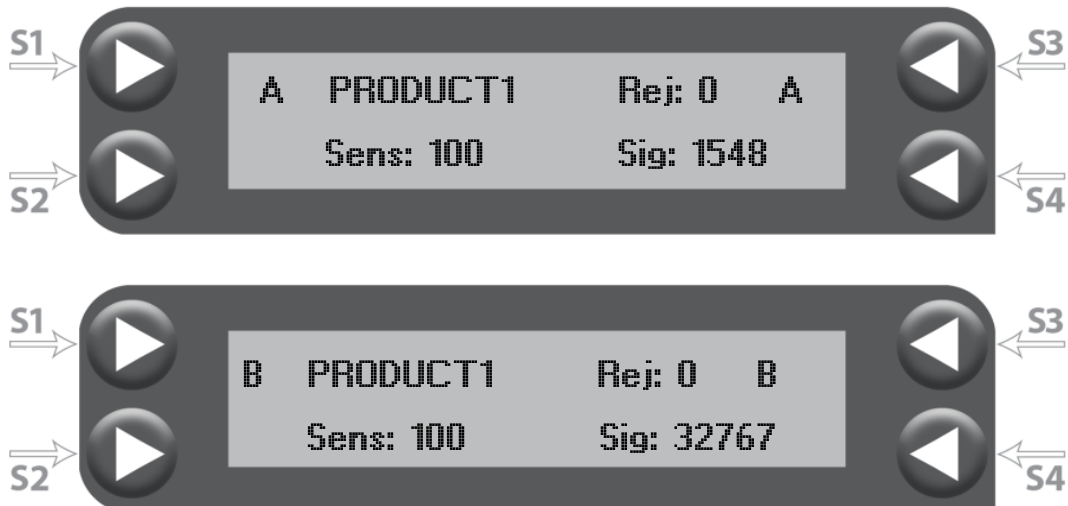
2.6   Editing Menu Options

After pressing the Soft Key associated with an option field, a flashing cursor will appear.

To cycle through or edit the value of the option press the same Soft Key again or use the UP and DOWN arrow keys located in the circle keypad. The LEFT and RIGHT arrows are used to move the cursor across the entry field. To accept the new selection press the ENTER key; to cancel the new selection and revert to the old one press the EXIT key.

> NOTE: For a few submenu options (such as Polarity) pressing the associated Soft Key will actually change the setting without the need to confirm via the ENTER button; however, this is not the typical process.

2.7   Main Menu

Upon powering up your Interceptor Metal Detector, you will see the following Main Menu:
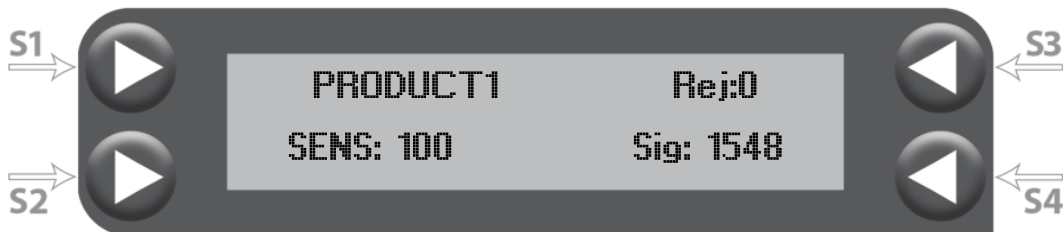
The four menu items can be defined as follows:

S1 - PRODUCT1: The Current Product Name.

This field shows the name of the currently selected product (multiple products can be entered into the system). Product information can be edited and products can be deleted via the Select Product Menu. Refer to Section 3.8 for further details.

S2 - SENS: Sensitivity Numerical Setting.

The sensitivity number ranges from 0 to 999 and determines the size of metal that can be detected; smaller pieces of metal can be detected with a higher sensitivity setting. Typically, the sensitivity is optimized between 30 and 200. Press S2 to change the sensitivity or press the SENSITIVITY Hard Key to access the Sensitivity Menu. Refer to Section 3.6 for further details.

S3 - REJ: The Reject Count.

The reject count increments with every reject occurrence (a signal reading of over 100) –press S3 to reset the Reject Count.

S4 - SIG: Signal Reading.

The signal number displayed represents the relative size of the detection signal; to become detection, a signal must exceed 100. The Signal Number can be reset by pressing S4. Refer to Section 3.3 for further details.

2.8   Serial Number

Each Metal Detector is assigned a serial number to represent the unit. To view the serial number of the Metal Detector:

1.   Press the Hard Key, "SELECT UNIT" button.

2.   Press UP/DOWN Arrow Keys until you see "Serial Number". The number stated there is the serial number for the metal detector.

CHAPTER 3: QUICK SETUP TUTORIAL

3.1 Start Up Tests—Overview

With the Detector assembled and installed, it is now ready for use. The aim of this chapter is to outline the initial tests that must be carried out before introducing the Interceptor Detector into production. These preliminary tests ensure system functionality and configure the Interceptor Detector for usage with your unique product.

This simple setup procedure only takes minutes to complete.

NOTE: It is strongly recommended that you complete an entire setup of one product before introducing additional products

3.2 Power Up Sequence

WARNING!

Keep away from the operating area of the reject device upon powering up the unit.

Upon applying power to the detector, the unit will power up and go through the following start-up process:

1. The LED bar graph will go full scale left and right and then return to the normal operating mode of the centre LED in the Green Zone.

2. The display will indicate the main menu window.

3. The reject device may operate and then return to the normal operating position depending on the settings of your system.

The power up sequence will take approximately 5 seconds. Once complete, the Detector will be ready for the initial test and you will see the Main Menu screen as shown below:
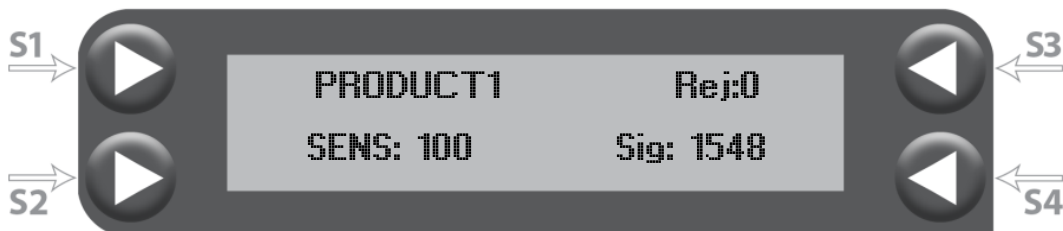
3.3   Initial Signal Check

Before moving forward it is important to ensure that the Detector has a quiet and stable starting point. After the Power up sequence is complete, the LED bar graph should appear in the centre.

The detector will always pick up a small signal reading from its surrounding environment; however, in the absence of product passing through the aperture, the signal should not show a value higher than 30.

NOTE: *The Signal reading will display the highest value registered and maintain this value on screen until another detection occurs or until the signal is manually reset.*

To test the initial signal follow these steps:

1.   Make sure that the Detector's aperture and the product tube are clean; verify that no metal is located within the aperture.

2.   Turn ON the surrounding machines for a simulation of the true operating environment.

3.   Reset the signal by pressing S4.

4.   Check to see if the detector is in a stable position with no detections falsely triggering and a steady signal under 30 and display LED in the centre.

If the starting point signal is less than 30 you can proceed.

If the detector is showing signal of over 30 without any product running, it is advised that you stop and examine the cause before proceeding further. Refer to the Troubleshooting Guide (FAQ's) for possible causes and corrective solutions.

3.4 Reject Systems

3.4.1 Reject System and Functional Testing

Belt Stop / Alarm: Automatic stop and manual removal of contaminated products. Typically used for large bags or boxes, hand fed or bulk material. Use of a photo eye is recommended for larges packs so that the stop point is consistent regardless of the contaminant position. Due to the manual removal requirement this system should be avoided if possible. It is also not suitable for high production rates.

Air Blast: Simple and fast reject suitable for light weight packages typically under 1kg (2.2lbs), and belt width not exceeding 350mm (14"). Use of a photo eye will allow more accurate rejection especially for longer products.
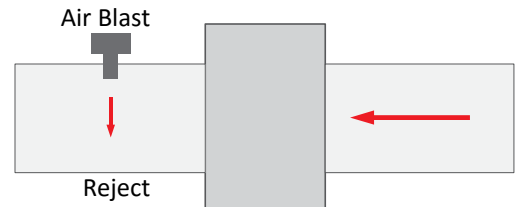
Diverter Arm: Suitable for packages up to 5 kg (11lbs) and belt width not exceeding 350mm (14"). Use of a photo eye will allow more accurate rejection especially for longer products. Not as accurate as a kicker style device.
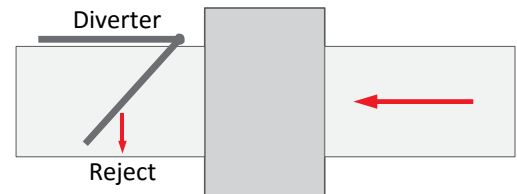
Kicker / Pusher: Suitable for packages up to 5 kg (11 lbs) and belt widths not exceeding 350 mm (14"). Heavy duty versions can be used with products up to 50 kg (110 lbs) and belt widths up to 710 mm (28"). A photo eye is a mandatory requirement of this style of device.
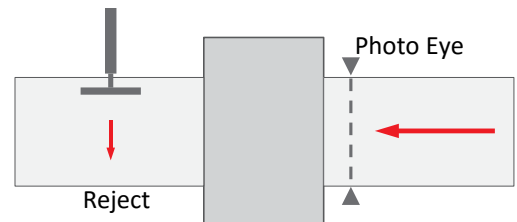
Flap Gate: Suitable to bulk products that have excellent flow characteristics (powders, granules, etc).
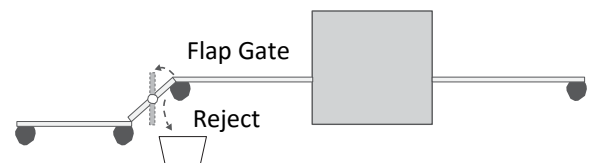
Retracting Belt: Can be used with a wide range of products both bulk flow and individual products. A photo eye can be used to improve accuracy if the application is for single file, individual products.
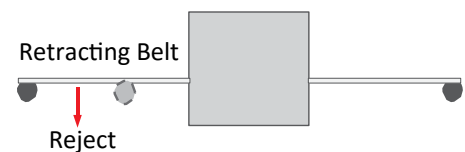
3.4.2 Photo Eye Option

The Interceptor metal detector has an input to add a photo eye sensor that can assist in improving accuracy of the re-ject system when inspecting single file, individual products. A photo eye must be used when a kicker style reject device is to be used or if the automatic phase (product tracking) feature will be used. The photo eye must be installed at the in-feed side of the detector and a set up procedure must be followed so that the control system knows the position of the eye relative to the center of the detector in direction of travel. The detector uses the data of the package length, belt speed, and the relative location of the sensor, in order to calculate and keep track of the product's exact position on the conveyor.

The Photo eye informs the detector of product position and length, and it will vary the reject timing so that contaminated product is accurately rejected regardless of the location of the containment in the product (ex. front or back). In applications where product is fast moving or long, a photo eye is highly recommended.

The sensor is situated at the point where product is entering the detector. Ensure that the sensor is perfectly aligned with the reflector on the opposite side; see below for a connection diagram and a photo of a typical installation. Refer to Section 1.8.6 for a wiring diagram that shows a photo eye powered from the detectors' +24 VDC supply. Only approved photo eyes should be powered from the detectors' supply, contact Fortress for assistance. If supplying the eye signal from another source, a dry contact must be provided to the infeed photo-eye input. One side will be wired to PL10-3 input and the other to 0v (PL10-4).

The system can be set to reject contaminated product at its midline (mid) for a kicker, leading edge (lead) for a diverter or for the entire length of the package (retract).

3.4.2 Photo Eye Option—continued

Photo Reject Setup:

In order for the detector to accurately use the photo eye information, it must 'know' where the photo eye is installed relative to the center of the detector in direction of travel and the belt speed. Therefore a few values must be entered in the photo eye set up menu (under Reject – Setup). The measurements can be entered in imperial or metric measurements.

1. Photo eye distance measured from the eye to the middle of the detector (see below).

2. Head Depth which is the measurement of the distance through the detector.

3. Belt Speed must be entered. If the belt speed is not known then the detector can calculate this using the procedure detailed in section 3.4.2.
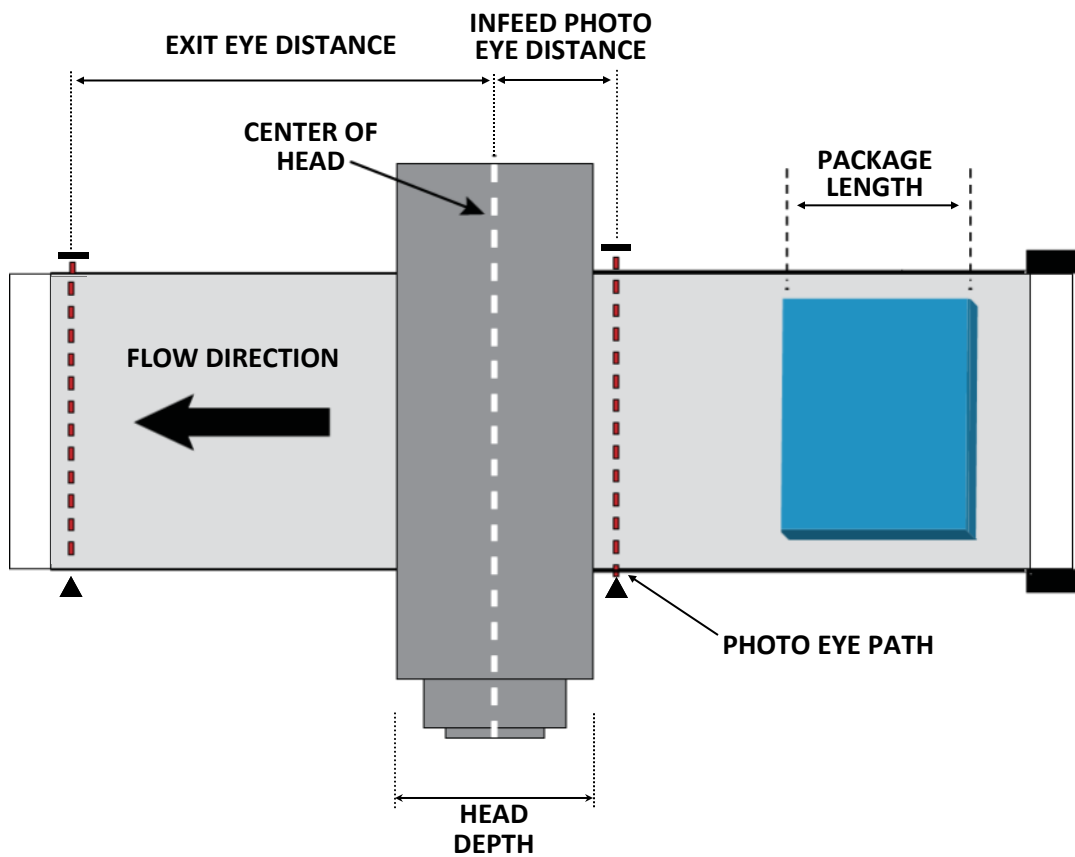
NOTE: Flanges are not considered part of "Head Depth".

3.4.2 Photo Eye Option—continued

To configure the Photo Reject System:

1. From the Main Menu press the MENU button to display the Reject System Menu.

2. Press S3 to display the Reject Mode Menu.

3. Press S3 to toggle the Reject Mode, press the ENTER key when the "photo" option is displayed. This puts the Detector in Photo Reject Mode.

```
S1  ▶        Reject Mode:      photo        ◀  S3

S2  ▶        Polarity:         Fail Safe    ◀  S4
```
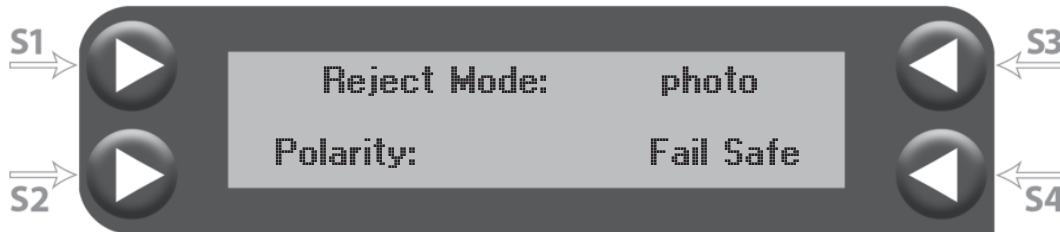
4. After setting the Reject Mode to "photo" press MENU once to display the Photo Reject Setup Menu.

```
S1  ▶        Photo Reject       mid         ◀  S3

S2  ▶        Eye: 1             Setup       ◀  S4
```
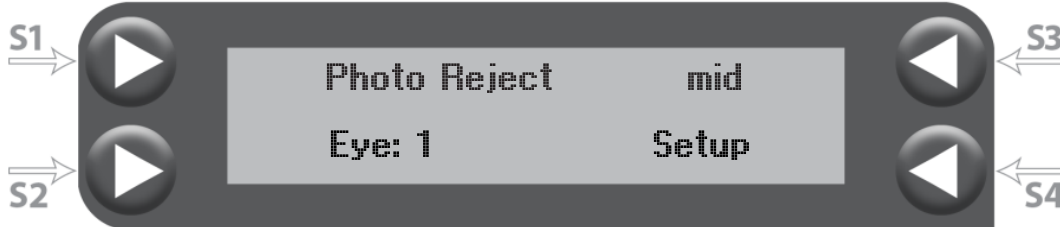
The "mid" option of Photo Reject means that the reject device will hit the middle of the package regardless of the package size (kicker rejects) – it can be changed to "lead" (leading edge for diverter rejects) or "width" (entire length of package for retracting rejects) by pressing S3.

The "eye" field refers to the polarity setting of your Photo Eye, it should read "low" when the sensor is not blocked and "hi" when being blocked. If the opposite occurs then the polarity needs to be inverted by pressing S2.

5. Next, press S4 'Setup' to arrive at Photo Reject Learn Menu.

6. Learn first requires manual entry of the 'Photo Eye Distance', package length and 'Head Depth' which is measured manually. Press MENU once to display 'Photo Eye Distance'

7. Press the DOWN Arrow (-), then S2 to enter. The measured photo eye distance (photo eye distance = middle of   head depth to photo eye), press ENTER after editing the value.

> *NOTE: The S4 key can be used to toggle the measurements to/from metric and imperial units*

8. Press MENU until display shows 'Head Depth' (head depth= while facing the display, the head depth is the width of the detector.) Press S2 to enter head depth, press ENTER after editing the value.

9. Press Menu until display shows 'Belt Speed'. Press S2 to edit the belt speed value and press ENTER after editing the value. This completes the photo eye setup. If the belt speed is not known then a learn procedure can be used to have the detector measure the belt speed. See belt speed procedure.

3.4.2 Photo Eye Option—continued

Optional Belt Speed Learn Procedure:

If the belt speed is not known and cannot be measured manually, the following procedure can be used to have the detector calculate the belt speed.

10. From the Photo Reject menu, press S4 'Setup'. Press MENU until display shows 'Belt Speed Learn'. Press S3 – 'Learn' to display 'Belt Speed Est' menu. Using a pack (or simulated pack), measure the pack length in direction of travel. Press S4 and enter the measured pack length.

> NOTE: *Package Length depends on the product orientation when passing through the Detector.*

Example: the loaf of bread shown could be either 4" (100mm) or 12" (300mm) in Length.

Package Length: 4" (100 mm)   Package Length: 12" (300 mm)

11. Once the Package Length is entered, pass the measured test pack so that it passes through the photo beam at normal belt speed to automatically learn the belt speed. Before running the test pack, make sure that the conveyor is running at its regular speed. After the pass is complete, the value displayed as 'Belt Speed Est' should change to a new value. You may repeat the procedure to ensure a consistent value is learned. Note the learned value.

12. Press 'Exit' to display the 'Belt Speed Learn' Menu , press S2 to enter the belt speed value learned in the above procedure and press 'ENTER' to store this value.

> NOTE: *If you are using external (Encoder) timing, be sure the belt is still running at the same speed that was learned when you enter the speed number.*

3.4.3 Delay & Duration

If you are finding that the reject device is not successfully removing the test samples from the production line in the testing scenarios described, an adjustment to the Reject Delay and/or Duration is required.

Reject Delay is the number of seconds from the moment of detection before the reject device activates. Reject Duration is the number of seconds for which the reject device will be activated.

Diagram of Reject Delay and Duration is shown below:

Delay & Duration Timing Diagram
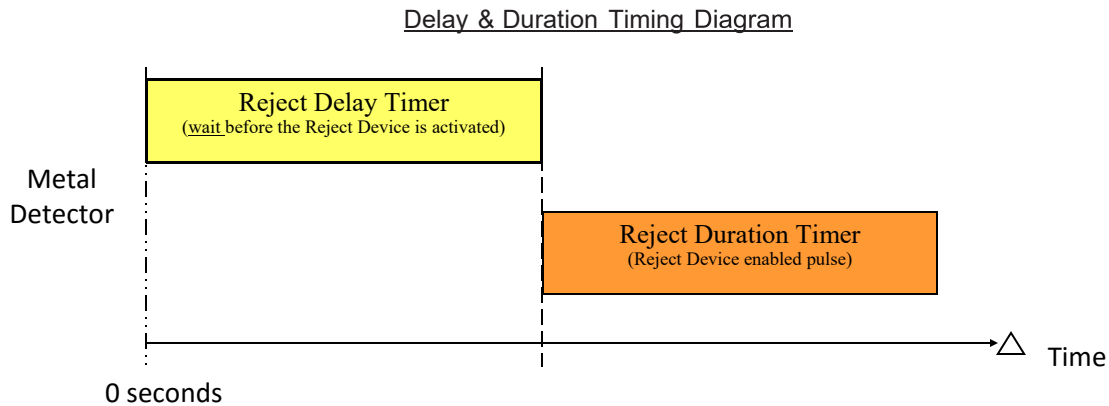
Reject Adjustment Procedure:

Follow these steps in order to correct the reject accuracy:

1. From the Main Menu press the MENU key once to get to the Reject Menu

2. To adjust the Reject Delay press S2, a flashing cursor will appear; use the LEFT/RIGHT arrow keys to scroll between the characters and UP/DOWN (+/-) arrow keys to adjust the values followed by ENTER to confirm.

3. To adjust the Reject Duration press S4, a flashing cursor will appear; use the LEFT/RIGHT arrow keys to scroll the cursor between the characters and UP/DOWN (+/-) arrow keys to adjust the values followed by ENTER to confirm.

4. Press EXIT to return to the Main Menu.

5. Run the test procedure again using "Reject Packs" (a pack of product containing a test sample) to ensure that you get the right reject timing.

3.4.4 Reject Confirm

The Interceptor Metal Detector has the ability to ensure that the reject device has operated correctly during every reject actuation. The reject confirm option requires a signal from a sensor that will be activated by a reject event. This can be a sensor on the actuator itself (a magnetic sensor on the reject air cylinder) for example. Or, it may be a photo eye sensor that will be activated by a product passing through its beam during rejection.

The proper connection for a typical reject confirm sensor is shown in Section 1.8.7. The drawing shows the sensor being powered by the detector which is only allowed for approved low power sensors – contact Fortress for assistance with sensor selection. The detector requires only that Pin 6 of PL 10 changes state when a correct reject action occurs. The default polarity requires this pin to be connected to common normally and opens when a reject action occurs, but the polarity can be reversed in the Reject Confirm menu (see below). Once configured, every reject signal will be monitored for the correct response from the reject confirm sensor. Failure of the confirmation signal to be received within a time window will result in a Fault condition (Reject Confirm Fault) and the fault output will change state. In addition, if at any time the reject device fails to return to its 'home' position after a reject, then a fault will also occur.

Reject Confirm Sensor Positions:

Actuator Position Monitoring: By connecting a position sensor on the reject mechanism, the full movement of the reject can be accurately confirmed. Refer to the diagram beside for an example of typical kicker reject system sensing the movement of the reject cylinder.

Reject Path Monitoring:

Alternatives to actuator position sensing; the photo eye sensor can be used to monitor the path of rejected product. For example a sensor located on entry to the reject bin.
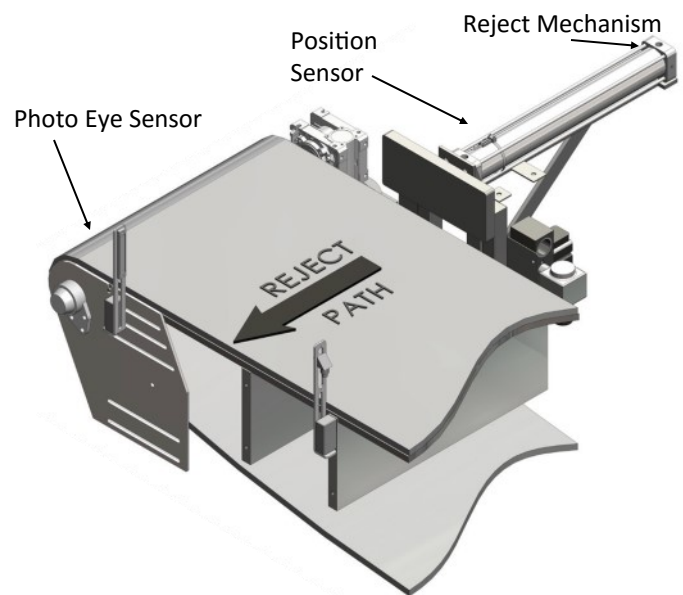
Configuring the Reject Confirmation System:

To enable the Reject Confirmation option in the software follow these steps:

1. From the Main Menu press the MENU key once to navigate to the Reject Menu.

2. Press S3 to enter Reject Setup.

3. Press the MENU key till you reach 'Reject Check' menu.
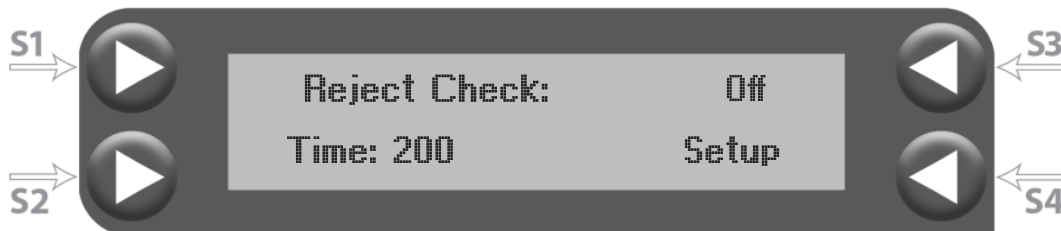
3.4.4 Reject Confirm—continued

4. Press S3 to select '1' for reject confirmation.

5. Press S2 to select and edit the reject confirmation time. (Detector uses an internal clock which has 200 pulses per second). Press ENTER to confirm. The number represents the amount of time it takes for the reject device to extend and retract; exceeding this threshold will result in a fault.

6. Press S4 to enter the Reject Confirmation Device Polarity Menu where you can toggle the polarity of the reject confirm sensors.

Reject Bin Full Sensor:

To turn on the optional Reject Bin Full Sensor, wired to R2 input (see Section 1.8.7), and configure as follows:

1. From Main Menu press UP (+) key.

2. Press S3 for fault set up.

3. Press UP(+) twice to get to Fault Menu.

4. Press S4 then UP/DOWN (+/-) to go through the options till you see REJ BIN FULL.

5. Press ENTER then S3 to enable the option.
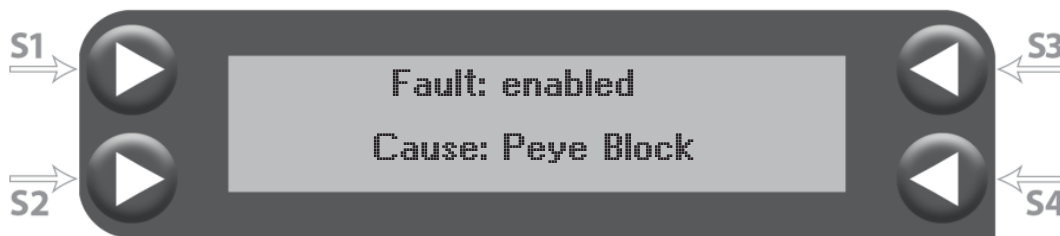
3.5   Product calibration

Every product has unique characteristics; the purpose of Product Calibration is to "teach" the Metal Detector these product attributes known as "product effect". The detector then "learns" the product in order to ignore or "phase out" the inherent product effect at a particular phase point and mode (wet or dry).

3.5.1 Product Effect

Metal Detectors detect metal based on measuring electrical conductivity and magnetic permeability. Many products inspected inherently have one or both of these characteristics within their makeup. For example: any products that are iron enriched, such as cereals, create a large magnetic signal for which the Detector must compensate in order to detect small pieces of metal. Products with high moisture such as bread, meat, and cheese are electrically conductive and produce large conductive signals – these are referred to as "wet" products. During a "fast" learn process, the Interceptor Detector automatically sets its phase point to ignore the product effect signal; the following table shows typical

Typical "Wet" Products	Typical "Dry" Products
Food: Meat, Cheese, Bread & Bakery Products, Fish, Dairy Products, Salad Packaging: Metallic Films Other: Plastic and Rubber Products with high carbon black content.	Food: Cereal, Crackers, Cookies, Frozen Food Products (<20° F/- 7°C), Peanut Butter and Margarine (Vegetable oil is not conductive) Other: Wood Products, Plastics and Rubber (Products with high carbon black content may be considered 'wet'), Textiles, Paper Products

3.5.1 Product Effect—continued

The Detector will be set with factory settings which may not necessarily match those needed to run your product (although Fortress strives to preset the Detector settings to meet the product application).

1. Reset the Signal by pressing S4.

2. Pass a typical product through the Detector aperture while checking the Signal reading and a Product LED illumination. If the Detector does not "see" the product (signal below 60) then the product effect may not affect detection; or, the factory settings already match the product.

> *NOTE: Normally the Product LED will appear Green upon passing the product through; however, sometimes it may not illuminate at all due to*

3. If the product generates a detection signal you are likely to have a product effect that needs to be calibrated and, you should proceed with the Quick Product Calibration.

3.5.2 Quick Product Calibration Procedure

To "learn" a new product or re-calibrate at any time simply press the Calibrate key twice and let the good product pass through the Detector; the Detector will automatically learn the correct phase number of the product and determine whether it is "wet" or "dry". Below is a step-by-step breakdown:

1. Press the CALIBRATE hard key on the right side of the Interceptor control panel.

2. Press CALIBRATE Hard Key again and the display will show a "fast" learn mode.

3. Run a typical product through the Detector at normal speed and orientation.

4. The menu display will change "Fast" to "Fixed" and the Phase number should change to a new value.

5. If the Product LED is green proceed to step 6, if the Product LED is red you may be prompted with the following screen:

3.5.2 Quick Product Calibration Procedure—continued

A red Product LED indicates that product effect is excessive and may result in an erroneous phase number when calibrating. The software will provide you with the option to switch to "Low Power" or "Ignore". Switching to "Low Power" will lower signal strength to account for the high product effect. Press Soft Key (S4) to automatically switch to Low-Power mode. After switching to Low-Power mode, the product needs to be recalibrated. Refer to the beginning of this section for details. If your system was already present to "Low-Power" mode, lowering the power is not an option. You will need to call Fortress Technology to troubleshoot: 1-888-220-8737 or 416-754-2898.

3.5.3 Confirm Proper Product Calibration

To ensure that Calibration was successful, try the following:

1. Return to the Main Menu by pressing the EXIT key.

2. Press S4 to reset the signal.

3. Pass the Product through the Detector.

4. If calibrated correctly, the signal should be under '60' (20-30 typical).

> *NOTE:* *It is possible that Sensitivity may need to be adjusted in order to reduce the effect of difficult product (get signal under 60). Please refer to Section 3.7 for further details.*

3.5.4 Auto Phase

The Auto Phase option can be used to have the detector automatically track slow product effect changes and product type changes (new flavor for example). It is used to phase out product effect as the product changes through the production line. For example, a facility that runs various types of bread and doesn't want to re-calibrate to product when production changes product, or to compensate for product temperature changes that affects the product signature over time. This feature is designed for packaged or single file products that can be monitored by a photo eye. Please contact Fortress for assistance or questions regarding the proper conditions for using this feature.

> *NOTE:* *Do not proceed with Auto Phase Configuration without setting up Photo Eye section 3.4.2*

Configuring Auto Phase:

1. Press the CALIBRATE Hard Key on the right side of the Interceptor control panel followed by S1 to enter Set-up.

2. Press the Calibrate Hard Key again and toggle to "auto".

3.6   Establish Sample Detection

Now that the Detector is set and calibrated for the product to be run, a manual test is highly recommended to see how well the system is working.

The Detector's response in the event of metal contamination can be simulated using the supplied Test Samples. The testing procedure is intended to confirm the Detector's performance as well as the operation of the Reject system thus ensuring that contaminated product will be correctly handled.

3.6.1 Functional Testing

For the next steps you will need to utilize the Test Samples (spheres, cards, or rods) included with your Interceptor Metal Detector. Follow these steps to test the Detector and Reject device.

1. Affix a test sample (sphere/ card/ rod) to your product. Fortress recommends using several methods to simulate a variety of situations:

    a.   Placing the test piece at the leading edge of the product;

    b.   Placing the test piece at the trailing edge of the product;

    c.   Passing successive test packs;

    d.   Passing alternate test packs.

> *NOTE: Test samples should be passed through the center of the aperture (the least sensitive area of detection). For more information, please refer to "Metal Detector Basics".*

2. Pass the product with the affixed test sample through the Detector.

3. Check to see if the Signal reading exceeds 100, indicating a correct detection.

4. Monitor the operation and accuracy of the Reject Device in removing the contaminated product from the production flow. If more reject adjustment is required refer to Section 3.4.3.

The Sensitivity will need to be adjusted given the following Signal reading scenarios:

1. If the signal shows a very high result (over 1000) it is advisable to lower the Sensitivity.

2. In the unlikely event of the Detector not detecting the test sample, try increasing the Sensitivity to the point where background Signal for good product is approximately 60.

3.7   Set Sensitivity Level

The Detector's sensitivity level determines the size of metal that can be detected. Smaller fragments of metal are detectable at higher sensitivity levels; however, higher sensitivity levels also make the Metal Detector more susceptible to outside interference and product effect.

The goal is to optimize the Sensitivity so that it is maximized at a safe level without compromising overall system performance.

- The factory default for Sensitivity is 100

- The Sensitivity number value can range from 0 to 999

- The typical Sensitivity setting used ranges between 30 to 200

General Rule: Sensitivity may be increased as long as Signal from product is under "60".

3.7.1 Sensitivity Adjustment

To adjust the Sensitivity follow these steps:

1. Press the SENSITIVITY Hard Key on the right side of the Interceptor control panel.

2. Press S3 and a flashing cursor will appear.

3. Press the UP/DOWN arrow keys (+/-) to adjust the Sensitivity, the LEFT/RIGHT arrow keys can be used to scroll the cursor between digits.

4. Press ENTER to confirm.

3.7.2 Confirm Sensitivity Level

To ensure that a proper Sensitivity level was successfully applied try the following:

1. Return to the Main Menu by pressing the EXIT key.

2. Press S4 to reset signal.

3. Pass a typical product through the Detector.

4. Check the signal reading – if it is below 60, you may increase the Sensitivity further (a signal between 40 to 60 is acceptable). If the Signal reading is above 60, you should try lowering the Sensitivity.

3.8   Password Security

Password protection prevents an unauthorized user from tampering with the Metal Detector; the Interceptor allows you to configure password protection. You are able to set passwords at three levels:

Level 0 =   Factory Setting, no password protection

Level 1 =   Very limited access; i.e.: operator

Level 2 =   Some access including functions open to level 1; i.e.: QA

Level 3 =   Access to all the functions, able to change passwords; and assign functions to other levels; i.e.: supervisor/manager

NOTE: In order to turn on or configure the password protection the level 3 password holder must be present.

3.8.1 Activate Password Protection

To enable or disable password security follow these steps:

1. From Main Menu press the Menu key and scroll to Password Menu.

2. To turn Password Protection ON press S3, you will be prompted to enter the password, and the display below will appear.
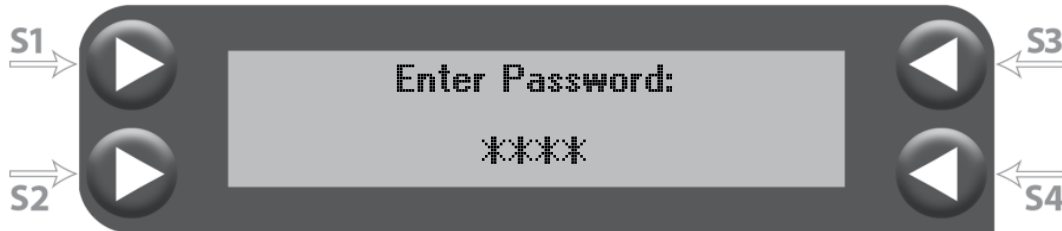
3. The system is set up with default passwords that can be changed:

    Level 1 -   1000

    Level 2 -   2000

    Level 3 -   3000

3.8.2 Change Password

To change your passwords follow these steps:

1. From Main Menu press the Menu key twice to access the Password Menu.

2. From the password menu press S4 to enter the password Setup.
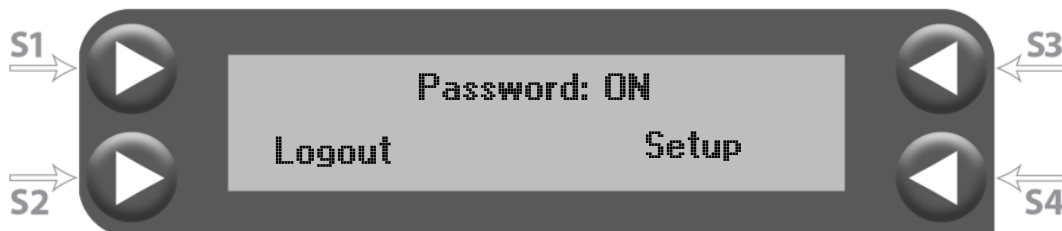
3. Press S3 to select the level for which the password needs to be changed.

4. Press one of the lower Soft Keys (S2 or S4) to modify the password – a password is made up of numeric characters.

5. Press the UP/DOWN arrow keys (+/-) to change each character; LEFT/RIGHT arrow keys are used to scroll the cursor between characters.

6. Press ENTER to confirm the new password and EXIT to return to the Password Menu.

Info: Record the new password in a safe place.

3.8.3 Password Hard Key Access and Function Setup

To set up Password access levels for functions follow these steps:

1. From the password menu press S4 to enter the password Setup.

2. Press the UP/DOWN arrow keys (+/-) to scroll through the functions. To change access level for a function press S3 then press UP (+) to change to 1, 2 or 3.

3. Press ENTER to confirm the new setting.

4. Press UP/DOWN keys to continue or EXIT to return to the Password Menu.

3.8.4 Logout

The logout function found in the S2 position of the Password Menu reinstates password protection after you have completed adjustments to the Metal Detector settings. Password protection will be reinstated automatically if no key is pressed for 10 minutes.

3.8.5 Wrong/ Forgotten Password

If you enter an incorrect password the following menu screen will appear:
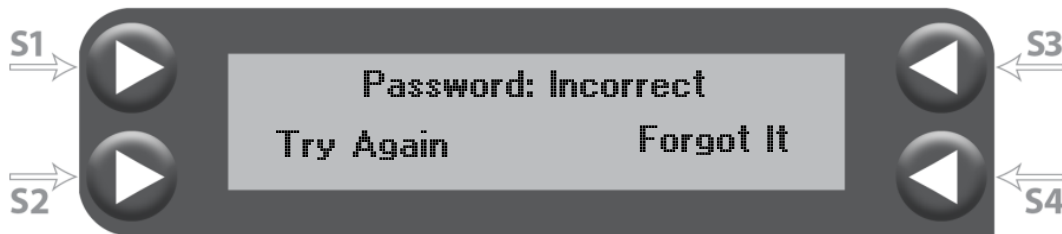
Press S2 to "try again". If you have forgotten your password, press S4 and the detector will display a Seed Number which Fortress engineers can decode for you. Please be prepared to offer proof of your authority when calling in to obtain the correct code.

3.9   Product Setup

The Interceptor allows you to store settings for up to 99 different products in its memory. Product settings (including sensitivity and calibrated phase point) are instantly retrieved upon changing from one product to another.

3.9.1 Renaming Products

The Main Menu displays the name of the product currently being run; by default the Product Name is set to PRODUCT1 and no additional products are set up. To change the default product name to a more suitable or descriptive one, follow these steps:

1. Press the SELECT PRODUCT key on the right side of the Interceptor control panel.

2. Press one of the lower Soft Keys (S2 or S4) alongside the product name to edit the name.

3. A flashing cursor will appear on the first letter; press the UP/DOWN arrow keys (+/-) to change the alphanumeric characters. The LEFT/ RIGHT arrow keys are used to scroll the cursor between characters.

4. Press ENTER to confirm.

3.9.2 Saving Master Product

After you have followed all the Quick Start procedures and renamed your product, it is strongly recommended that you save the settings. With the Backup you can easily restore the saved product setup configuration at any time. This capability proves to be valuable in cases where operator changes have a negative effect on the system's performance as it is easy to revert back to the stored settings.
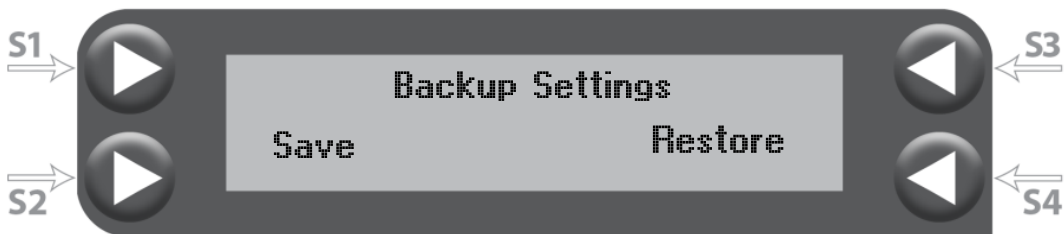
To save a Master product record follow these steps:

1. Press the SELECT PRODUCT key on the right side of the Interceptor panel.

2. Press S3 to enter the Product Edit submenu.

```
S1                                                S3
   ▶    ┌─────────────────────────────────┐    ◀
        │  Product: 1            Edit      │
        │  Name:  PRODUCT1                 │
   ▶    └─────────────────────────────────┘    ◀
S2                                                S4
```
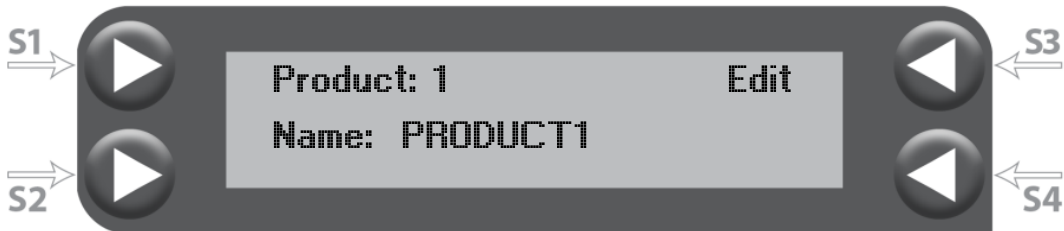
3. Press S4 to enter the Backup Submenu.

```
S1                                                S3
   ▶    ┌─────────────────────────────────┐    ◀
        │  Copy               Defaults     │
        │  Delete             Backup       │
   ▶    └─────────────────────────────────┘    ◀
S2                                                S4
```

4. Press S2 to save the current product settings as the Master settings (also known as the Factory Settings).

```
S1                                                S3
   ▶    ┌─────────────────────────────────┐    ◀
        │        Backup Settings           │
        │  Save               Restore      │
   ▶    └─────────────────────────────────┘    ◀
S2                                                S4
```

To restore the back up at any time, simply press S4 in the menu shown above.

> NOTE: Default and Restore should not be confused – the Default function changes the current product settings back to the Fortress standard default settings; whereas Restore returns the current product settings to your saved Master configuration.

3.9.3 Create a New Product

To create a new product you are actually "copying and pasting" an existing product already stored in your Interceptor's memory into a new product slot. The first time that you create a new product you are copying the information from Master product that is already set up. When creating subsequent new products you may copy from any product record; adjustments to new products do not affect the settings of the product that was initially copied. Follow these steps to setup a new product:

1. Press the SELECT PRODUCT key on the right side of the Interceptor panel.

2. Press S3 to enter the Product Edit submenu.

3. Press S1 to enter the Copy Product submenu.

4. To create a new product press either of the upper Soft Keys (S1 or S3) to select the "slot" number of the new product – (remember to always choose a slot number that is not currently in use because the information in an existing slot will be replaced by the copied contents). A flashing cursor will appear. Press the UP/DOWN arrow keys (+/-) to adjust the slot number. Press ENTER to confirm.

5. You can quickly edit the product name for your newly created product by pressing one of the lower Soft Keys (S2 or S4) and then press ENTER to confirm.

After exiting, the newly created product will appear as the currently selected product in the Main Menu.

3.9.4 Select a Product

To switch from one product to another, follow these steps:

1. Press the SELECT PRODUCT key on the right side on the Interceptor panel.

2. From the Select Product Menu, press the SELECT PRODUCT Hard Key again to scroll through the list of products and press ENTER to confirm a selection.

3.9.5 Delete a Product

> *NOTE:* *You CANNOT delete the current running Product and you can never delete PRODUCT1.*

To erase a stored product record, follow these steps:

1. Press the SELECT PRODUCT key on the right side of the Interceptor panel.

2. Press S3 to enter the Product Edit submenu.

3. Press the DELETE option (S2) from the Edit submenu of Select Product.

4. Press one of the upper Soft Keys (S1 or S3) to edit the Delete entry field.

5. Select the number of the product you want to delete. (Not the current running product)

6. Press the ENTER key – the name of the product will revert to the current product to confirm the delete process.

CHAPTER 4: AUXILIARY FUNCTIONS

4.1 Auxiliary Functions—Overview

Now that your Interceptor Metal Detector has been calibrated and tested successfully, you are ready to integrate the system into production. The aim of this chapter is to highlight and explain the optional features you have with the Interceptor Metal Detector – the functionality of these features elaborated upon in the Reference Manual along with other features that are not covered in this Guide.

4.2 Auto Test/ Test Request/ Halo®

It is highly recommended that the sensitivity of the Detector is checked routinely as part of the quality control procedure, using manual testing with test samples. However the Interceptor offers two distinct methods of automated testing to confirm the Detector's performance as well as the response of the reject mechanism.

Auto Test: performs short interval testing of the Detector's sensitivity and valve reaction without any operator involvement; thus reducing the high cost of frequent manual testing. Auto Test works by injecting a simulated metal signal (identical to test metal sphere sample) that acts as a rejection. You can set the simulation to occur at either the touch of a button (Manual option) or at regularly scheduled time periods of your choice (Auto option).

Test Request: you may set the Detector to automatically request a test procedure utilizing the test samples supplied at regular intervals (Request option).

> NOTE: AutoTest and Halo® are optional setups. Test Request is recommended for Conveyor application as test samples can be easily inserted into the production flow. Contact Fortress Technology for information regarding Auto-Test and Halo® options.

4.2.1 Configuring AutoTest/ Test Request

To set up the AutoTest/ Test Request function follow these steps:

1. Press the TEST Hard Key on the right side of the Interceptor control panel.

2. From the Test Menu, press S1.

3. From the Test Setup submenu, press S3 repeatedly to select between AutoTest modes: Manual/ Auto/
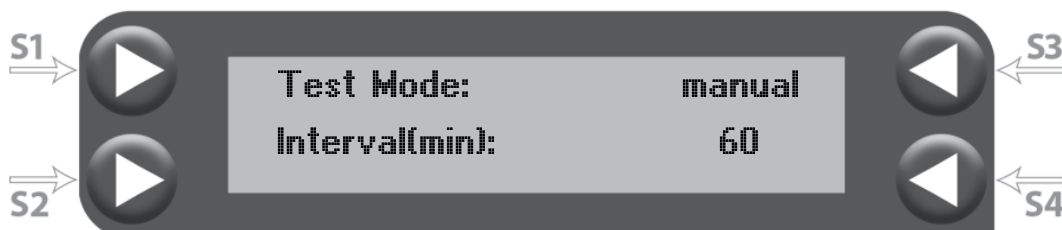
4.2.1 Configuring AutoTest/ Test Request—continued

> Request.

4. Press the ENTER key to confirm the selection.

5. If you selected Manual mode, Test setup is complete and you may Exit.

If you selected Auto/Request press the S4 key to adjust the setting of the Interval (either increasing or decreasing the test timing via the Arrow Keys), then press ENTER to confirm.

4.2.2 AutoTest Operations—Manual / Auto Mode

To execute AutoTest under Manual mode, follow these steps:

1. Press the TEST Hard Key on the right side of the Interceptor control panel.
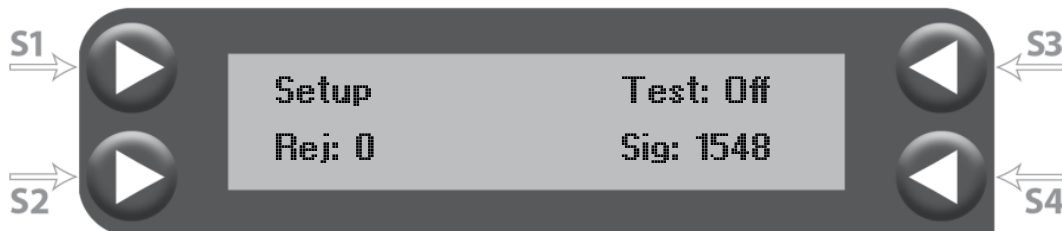
2. From the Test Menu press S3.

3. A simulated metal signal is instantly injected; check to confirm that a detection Signal and Reject increment occurred and that the reject device was properly triggered.

> *NOTE: If an AutoTest execution does not cause detection, a Fault is generated.*

4.2.3 Test Request Setup

Test Request prompts the user to conduct testing using the supplied test samples at specified time intervals.

You can change the number of test passes that are required per test sample (Ferrous/Non-Ferrous/ Stainless Steel). To setup the Test Request Passes follow these steps:

1. Press the TEST Hard Key on the right side of the Interceptor control panel.

2. From the Test Menu press S1.

3. From the Test Setup Menu press the MENU key once.

4. The Required Passes submenu will appear as shown:

5. Use the corresponding Soft Keys to edit the values of Ferrous (FE), Non-Ferrous (NFE) and Stainless Steel (SS) test sample passes.

4.2.3 Test Request Setup—continued

Test Request Operation:

1. For the purposes of this tutorial set the Test Request time interval to a low value of 1 minute via the Test Setup Menu – this modification will allow you to quickly access the Test Request features (you can later change the interval to a more appropriate value).

2. When the Test Request time interval comes up the Test Required screen will automatically appear.

3. Press S4 to enter the Operator Code – a value between 0–99 that represents the identity of the Test Operator.

S1 S2 Test Required   Enter Operator Code: 0 S3 S4
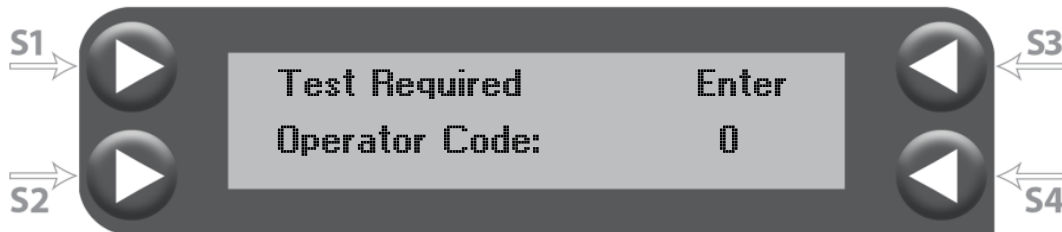
4. Press ENTER after editing the Operator Code.

5. You will be presented with a series of three Test Pass screens starting with Run Ferrous. Run the Ferrous test sample through the aperture per the number of passes selected in Required Passes.

6. After each test sample run, press S4 to move on to the next phase:

S1 S2 Run Ferrous Metal   1 Sig: 150   OK S3 S4
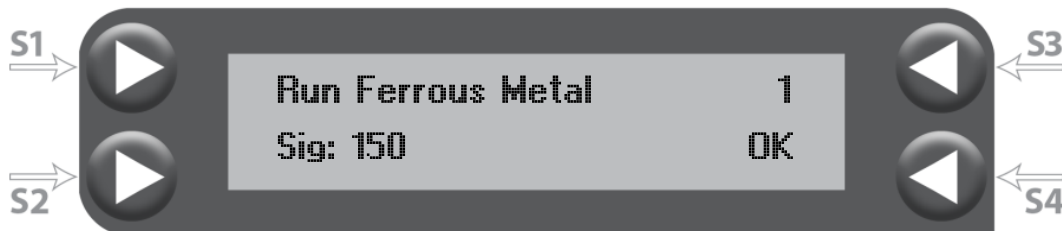
7. At the end of the three test passes you will see a Test Complete screen showing the result.
A "Pass" indicates that all required passes generated a detection Signal above 100.
A "Fail" occurs when at least one of the test passes did not render a detection Signal above 100 and a Test Signal Fault will subsequently appear.

4.3   Special Reject Option

4.3.1 Alternate Reject Option

The Alternate Reject option allows you to connect a second reject device with separate reject timing settings. When configured, the secondary ALT Reject output of PL11 will function independently of the main PL3 reject replay. Refer to the wiring diagram in Section 1.8.10 for setup instructions.

The Alternate Reject can remain activated for a longer period of time than the main reject; for example, if the main reject is a fast-operating reject device (such as kicker or retract), the Alternate Reject might be a beacon light that should remain activated for a longer duration so that it is more noticeable.

4.3.1 Alternate Reject Option—continued

Configuring the Alternate Reject

To enable the Alternate Reject option in the software, follow these steps:

1. From the Main Menu, press the MENU key once to navigate to the Reject Menu.

2. Press S3 to enter Reject Setup.
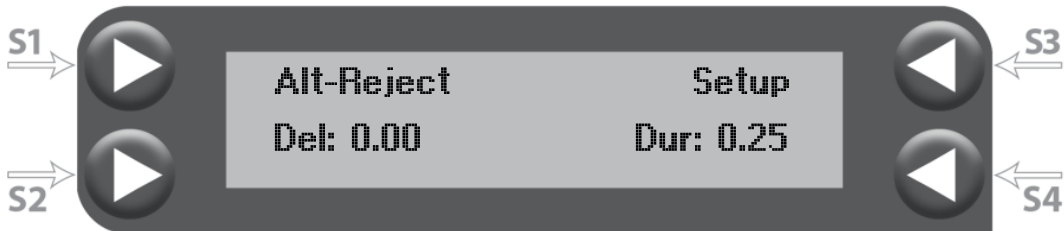
3. Press the UP Arrow key twice to find the Alternate Reject Menu.

4. Once you adjust either the Delay or Duration to a number above the default setting of zero, the system will automatically enable the Alternate Reject as an independent reject output.

4.3.2 Shaft Encoder

For applications where the belt speed will vary and where the belt may randomly stop and start during production, a shaft encoder will be required to allow the detectors reject system to track belt movement rather than time. A shaft encoder should be mounted in such a way that the belt movement will be detected and a pulse train sent to the correct input of the detector. See Section 1.8.9 for the connect diagram of a typical shaft encoder. Contact Fortress for recommendations regarding shaft encoder model types.

Once the encoder is correctly installed and connected to the encoder input, the reject menu can be set to allow the detector to use the encoder pulses as a time base:

Configuring the Shaft Encoder:

To enable to the shaft encoder option in the software follow these steps:

1. From the Main Menu press the MENU key to access the Reject Menu

2. Press S3 to enter Reject Setup

3. Press the MENU key till you reach 'Reject Clock' menu.
   With the encoder running, the top right of this display should show a clock rate. The value should change if the belt speed is changed and should be '0' if the belt is stopped. This confirms that the encoder signal is being received by the detector (if the number does not change, then the encoder signal is not present and therefore the encoder installation should be examined).
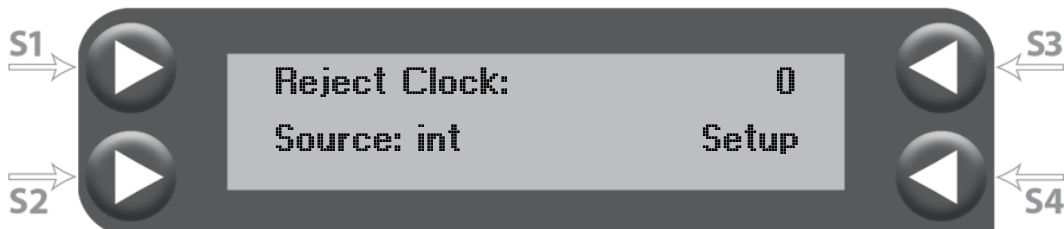
4.3.2 Shaft Encoder—continued

4. Press S2 'Source then the UP Arrow Key to edit the field to 'Ext' for external clock source and press 'Enter' to accept.

5. The detector is now using the encoder signal as the reject timing clock source. Return back to the main reject menu and adjust the delay and duration numbers (now clock pulses versus seconds) until the reject timing is correct.

> *NOTE: Under the 'Reject Source' – 'Setup' menu a delay and duration number can also be adjusted. This is not normally required but in cases where the reject device response time is slow (perhaps a retracting belt), then this menu allows for device response time compensation by adding a fixed time to the variable reaction when using an encoder signal.*

4.4 Date and Time Change

To edit the date and time:

1. At the Main Menu press "Select Unit"; then the DOWN (-) arrow key to get to the Date and Time menu.

2. Press S2, a flashing cursor will appear; use the LEFT/RIGHT arrow keys to scroll the cursor between the characters and UP/DOWN (+/-) keys to change the characters.

3. Once the date and time are updated, press ENTER to confirm and EXIT.

> *NOTE: Do Not Forget to change the time when Daylight Saving Time begins or ends.*

4.5 IP Address

Detector is shipped with Default address of 192.168.1.51, if connecting to a network consult CONTACT Software manual.

To change the IP address:

1. At the Main Menu press the SELECT UNIT button.

2. Press the UP/DOWN Arrow Keys until you see IP address
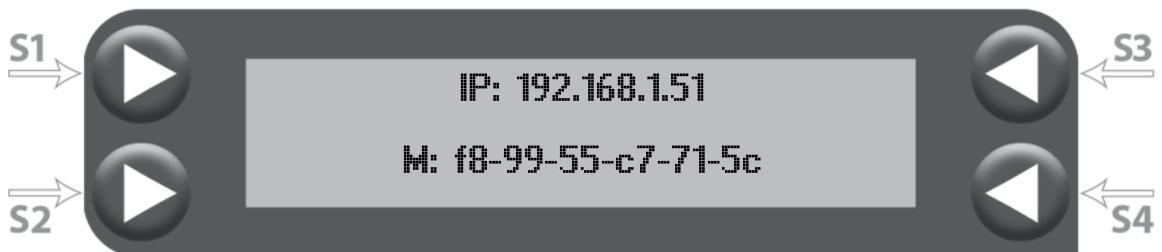
3. Press S3 to change the IP address.

4. A flashing cursor will appear on the first letter; press the UP/DOWN arrow keys (+/-) to change the numeric characters. The LEFT/RIGHT arrow keys are used to scroll the cursor between characters.

5. Press Enter to confirm.

4.6   Naming the Detector

This name will be visible in CONTACT Reporter software to identify then Detector. The name of the Metal Detector can be made more suitable or descriptive to production, line or plant.

Follow these steps:

1. At the Main Menu press the SELECT UNIT button.

2. Press the UP/DOWN Arrow Keys until you see Detector's Name.
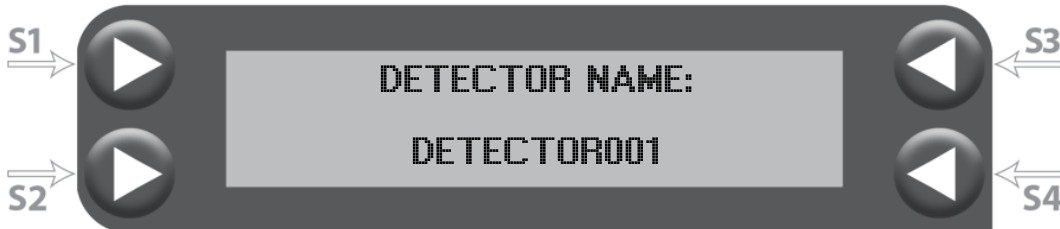
3. Press one of the lower Soft Keys (S2 or S4) alongside the Detector's name to edit the name.

4. A flashing cursor will appear on the first letter; press the UP/DOWN arrow keys (+/-) to change the alphanumeric characters. The LEFT/RIGHT arrow keys are used to scroll the cursor between characters.

5. Press Enter to confirm.

4.7   FM Detect Mode

FM detection mode analyzes the detection signal and uses an algorithm to calculate the signal strength based on a function of time and amplitude. This can significantly improve performance in certain applications.

To use FM mode the detector needs to have information about the application (speed and detector size) to define the signal spectrum. To set these two parameters follow these steps:

1. From the Main Menu, press the MENU key once to navigate to the Reject Men.

2. Press S3 to enter Reject Setup.

3. Press the DOWN Arrow (-), then S4 to enter Setup.

4. Press S2 to enter the calculated or measured belt speed (median if the application is variable), then UP/DOWN (+/-) to go through the options till you see DETECTOR DEPTH & WIN.
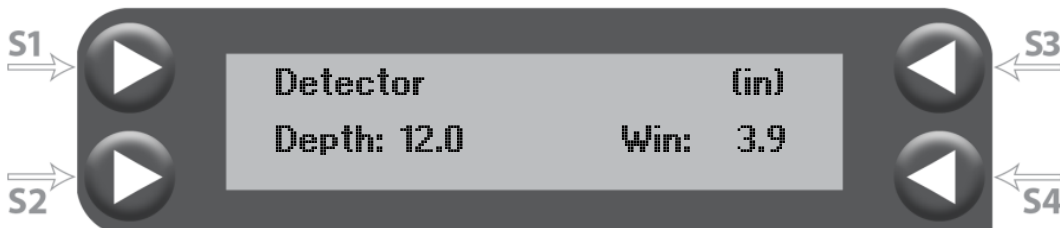
NOTE: If you are using external (Encoder) timing, be sure the belt is still running at the same speed that was learned when you enter the speed number.

4.7   FM Detect Mode—continued

5. Press S4 to set the Window (Win). Fortress can supply the accurate number for this but calculating approximately 75% of the smaller aperture dimension will suffice (for an aperture of 300mm x 150mm, use 75% of 150 = 112 as the Win value).

Before setting up FM detection it is assumed that the digital filter has been set and product effect has been calibrated. In addition, test and record the signals from product and metal test samples in the 'peak' detection mode so a clear comparison can be made later. A threshold number should also be assigned in order to scale the sensitivity number to a reasonable value (near 100).

To set FM detection follow these steps:

1. Press the SENSITIVITY Hard Key on the right side on the control panel.

2. Press S2 to go to Detect Mode Menu.

3. Press S3 to toggle the Detect Mode, press ENTER key when the "FM" option is displayed. This puts the De-tector in FM Mode.
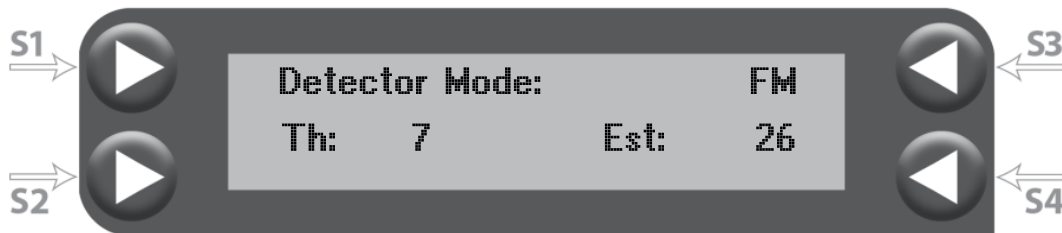
NOTE: The value in the "Det." field, this is a representation of the background signal from the product, belt and any noise sources.

4. With the system running, press S4 to clear the value and pass normal sample product through the detector (try to pass product as it would be passed in production). The value in the "Det" field will change.

5. The "Th:" value (threshold) should be set 1 above the "Det" value. This value will be used to scale the sensitivity adjustment range to a reasonable value.

6. Press EXIT to return to the Sensitivity Menu and run clean product through. Adjust the Sensitivity so the signal is below 60.

7. Run product with test samples to ensure the metal detector is rejecting the desired samples and adjust the sensitivity number as required.

8. Compare the result using FM Detection Mode versus the results previously obtained using the peak detection mode. Use the mode that provides the best result.

4.8   Interceptor Input Configuration

4.8.1 Selecting Inputs

The software allows the inputs to be configurable to the desired uses.

To select the input function and map it to a physical input, follow these steps:

1.   Press the SELECT UNIT Hard Key, press the DOWN Arrow (-) until you reach the input screen.

2.   Press S1 and the UP/DOWN Arrow (+/-) to cycle through the different input functions.
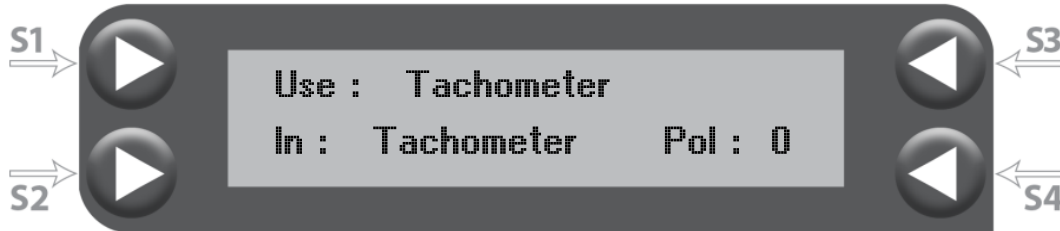
3.   Press ENTER to select the function you wish to edit (eg – Air Pressure).

4.   Press S2 to select the input that this device is wired to (eg – iso 1).

5.   Press ENTER when correct input is displayed. Polarity can be flipped (default = 0). Check that a change in sensor state results in an * being displayed or not just in front of the input (eg - * iso 1 when the sensor is blocked). This ensures the correct sensor is attached and is functioning.
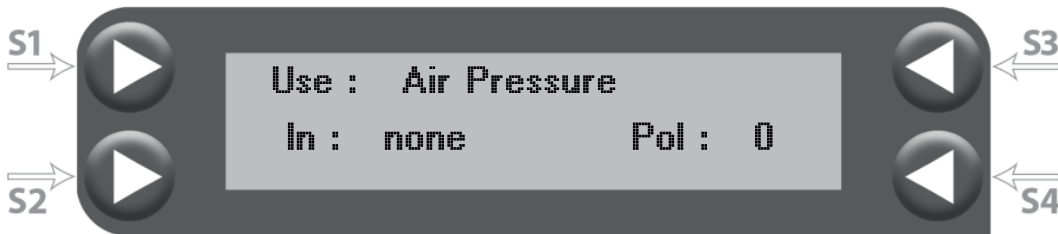
The available functions are as follows:

Input Function	Description
Tachometer	Input for the Tach (Encoder)
SS-test	Used with fortress test puck system - SS holster sensor
Nfe-test	Used with fortress test puck system- NFe holster sensor
Fe-test	Used with fortress test puck system- Fe holster sensor
Prod-select	Input to select between product 1 and 2 (Product toggle)
Bin door	Bin door sensor. Will trigger a fault depending on time set for an open reject bin door
Bin full	Sensor to monitor if the reject bin is full
Rej-latch	Will clear a reject latch when actuated from an external switch
Air pressure	Triggers a fault when air pressure sensor changes state
Rej-exit	Reject exit sensor. Photo eye at conveyor exit after reject - refer to setup section.
Rej-conf-1	Reject confirm input 2 sensor used to confirm reject return
Rej-conf-2	Reject confirm input 1 sensor used to confirm reject action
Infeed-eye	Input for the Infeed Photo Eye

4.8.1 Selecting Inputs—continued

The Physical Inputs and their suggested use are:

Physical Input	Pins	Type	Suggested Use
Tachometer	PL10-2	NPN	Tachometer / encoder
Rej-conf-1	PL10-6	NPN	Rej confirm 1
Rej-conf-2	PL10-7	NPN	Rej confirm 2 or Bin full
Infeed-eye	PL10-3	NPN	Infeed Eye
ISO-1	PL10-9/10	Isolated	Air Pressure Switch
ISO-2	PL10B-3/4	Isolated	Exit Eye
ISO-3	PL10B-5/6	Isolated	Door Switch
ISO-4	PL10B-7/8	Isolated	Remote Latch Reset
ISO-5	PL10B-9/10	Isolated	Other

4.8.2 Reject Exit Sensor

The Reject Exit Sensor option will confirm when a pack leaves the reject area, monitor product back up and act as a secondary reject confirm sensor. To use this option, an in-feed photo eye will be needed (and set up properly). The same type of eye should be for both the infeed eye and the exit eye. These should both be polarized retro-reflective photo eyes mounted on a common side of the conveyor (both mounted on the controls side for example).

The Reject Exit Sensor (eye) can monitor following conditions:

- Fault if a package is removed from the conveyor prior to reaching the reject system (Fault: Exit No Pack).

- Fault if a package is introduced to the conveyor flow anywhere between the infeed eye and the reject Exit eye (Fault: Exit New Pack).

- Fault if a pack fails to be rejected properly and passes the exit eye (Fault: Reject Exit).

- Fault if downstream issues causes product to back up and blocks the exit eye (Fault: Exit New Pack and Reject Exit).

- Ensure that the in-feed eye is working correctly.

- Ensure that the Tachometer (if used) is working correctly.

NOTE: Ensure the unit is in photo reject mode and the belt speed is already learned and accurately set before proceeding. (See Section 3.4.2)

To set up a Reject Exit Sensor follow these steps:

1. Wire the photo sensor into an available input.

2. Press the SELECT UNIT Hard Key on the right side of the Interceptor control panel followed by DOWN (-) arrow key to enter Input Configuration Menu.

3. Press S1 and the UP/DOWN Arrow (+/-) till you see the "rej-exit" Menu.

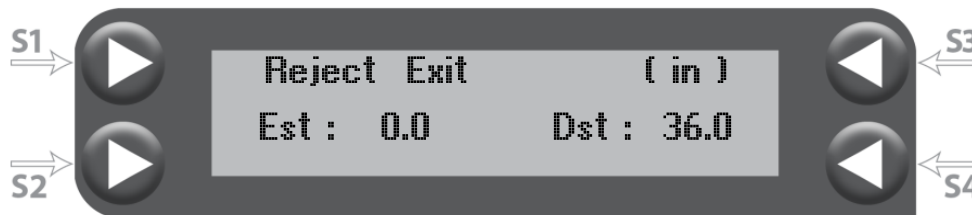**4.8.2 Reject Exit Sensor—continued**

4. Press ENTER to select the function.

5. Press S2 to set the "rej-exit" input function to the input that the sensor is wired to is displayed.

6. Once the correct input is displayed, press ENTER to confirm and EXIT.

After the Reject Exit Sensor is set up, Exit Eye position parameters need to be entered.

1. From the Main Menu press the MENU key once to navigate to the Reject Menu.

2. Press S3 to enter Reject Setup.

3. Press the MENU key till you reach 'Reject Check' menu, then S4 to enter Reject Check Setup

4. Press the UP/DOWN arrow keys (+/-) till you reach Reject Exit menu.

> NOTE: If an encoder is being used, ensure it has reasonable resolution
> (approximate 200-300 displayed rate at 75-100fpm or 20-30 M/m).


```
S1                                             S3
         Reject  Exit          ( in )
         Est :   0.0     Dst :  36.0
S2                                             S4
```

5. Measure the distance from the center-line of the detector to the exit sensor. Press S4 and enter this distance.

6. Pass a clean package through the detector the conveyor and retrieve after the pack passes the exit eye. The "Est" value will update. This value is the distance that the detector calculated to the reject exit eye. If running small (length) packs, it's easier to perform the estimate test with a pack larger than 150mm (6") long. The fine tune this with a small pack (25-50mm long or 1-2").

7. The estimated value and measured value should be quite close. If they are, then enter the estimated value in the Dst field.

8. A tolerance window is available to compensate for cases where the pack may slip or turn in normal production causing unnecessary faults. From the Reject Exit menu, press the DOWN arrow key to display the Reject Exit Window menu. The default window is 0.4(in) or 10(mm). This can be increased where required to eliminate excess faults due to pack movement errors.

4.8.3 Bin Door Sensor

The Bin door sensor is used to monitor the position of the reject bin door or access cover. It is intended to create a fault if the bin door has been open longer than a predetermined time. This will require a sensor (typically a door interlock switch) to be installed on the bin access and connected to an appropriate input of the Interceptor main board. Then the input used for this function must be mapped in the input menu, the 'normal' polarity set and a time entered that will represent the allowed after the bin is opened until a fault will occur.

To configure the Reject Bin Door Sensor:

1. Wire a sensor into an available input.

2. Press the SELECT UNIT Hard Key on the right side of the Interceptor control panel followed by DOWN (-) arrow key to enter Input Configuration Menu.

3. Press S1 and the UP/DOWN Arrow (+/-) till you see the "bin door" Menu.

4. Press ENTER to select the function.

5. Press S2 to set the "bin door" input function to the input used for the bin door sensor.

6. Once the correct input is displayed, press ENTER to confirm and EXIT.

7. From the Main Menu press the MENU key once to navigate to the Reject Menu.

8. Press S3 to enter Reject Setup.
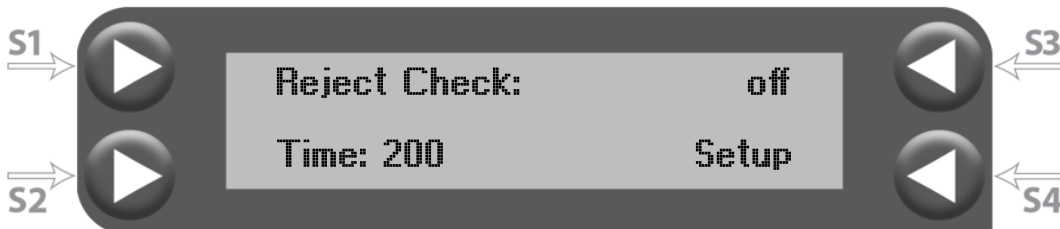
9. Press the MENU key till you reach 'Reject Check' menu, then S4 to enter Reject Check Setup

10. Press the UP/DOWN arrow keys (+/-) till you reach Reject Bin Door menu.

11. Press S4 to set desired Reject Bin Door timeout.

NOTE: NPN versus PNP Sensors—PL10b (isolated inputs 2,3,4,5) can be configured for either NPN (sinking) or PNP (sourcing) devices. Refer to section 5.3.2 & 5.3.3 for device wiring information

4.9 Interceptor Output Configuration

4.9.1 Selecting Outputs

The software allows the outputs to be configurable to perform desired functions.

To configure outputs, follow these steps:

1. Press the SELECT UNIT Hard Key, press the DOWN Arrow (-) until you reach the input/output screen. Press S4 to enter output setup. Select the output function and map it to a physical input.
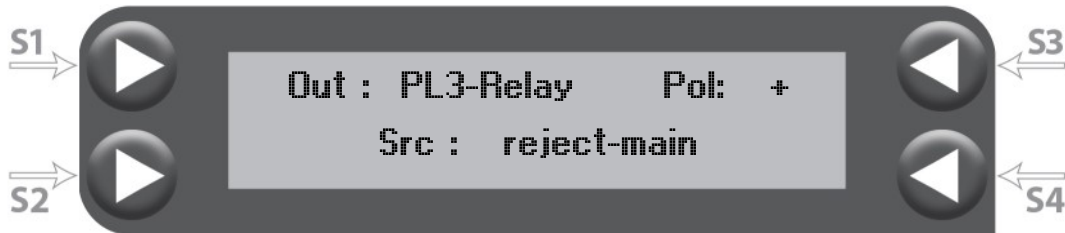
2. Press S1 and the UP/DOWN Arrow (+/-) to cycle through the different output functions. See Chart B for a list of available functions.

3. Press ENTER to select the function you wish to select or edit.

4. Press S3 to change the polarity. The options are "+" for normal operations, "-" to invert the output, "0" to turn off the output and "1" to make the output always on. These polarities are saved in the product memory so under different product numbers you can enable or disable different outputs, and set individual polarities if required.

5. An example of holding an output always on (1) or off (0) would be if using a belt stop reject for a large product but also using an air blast reject for a small product. The two rejects would be connected to separate outputs and both selected as 'reject' and held on or off as the device requires when not in use.

6. Press S2 to change the new output source to link to the physical output. This output source is able to be linked to multiple outputs. For example, if you need 3 reject outputs, you can tie the reject-main function to any 3 of the outputs through the menu.

Chart A: The Physical Outputs and their suggested use are:

Physical Output	Pins	Suggested Use
PL3-Main Reject	Reject-main	-
PL11-1/2	Reject-alt	-
PL11-3/4	Test-request	+
PL11-5/6	Fault	-
PL4-1	Light-red	+
PL4-2	Light-yellow	+
PL4-3	Light-green	+
PL4-5	Buzzer	+
PL5-1/2	Halo-fe (optional)	+
PL5-3/4	Halo-nfe (optional)	+
PL5-5/6	Halo-ss (optional)	+

4.9.1 Selecting Outputs—continued

NOTE: Halo Functions require Halo auto-test hardware option.

Chart B: The available functions are as follows:

Output	Description
Reject-main	Output will follow the main reject timing
Reject-alt	Output will follow the alt reject timing
Fault	Fault output
Test-request	Will activate on a test request
Light-red	Control for red banner light
Light-yellow	Control for yellow banner light
Light-green	Control for green banner light
buzzer	Control for an external buzzer or banner light with buzzer
Halo-fe	FE output for halo board
Halo-nfe	NFE output for halo board
Halo-ss	SS output for halo board
none	Will do nothing

4.10 USB Data Collection & Contact Reporter

The Interceptor metal detector series all have the ability to collect operational data that can be collected in two ways:

1. Network collection through the built in Ethernet port, which will require proprietary software from Fortress (Contact) to manage the collection and display of data. Contact Fortress for further information regarding network data collection system options.

> NOTE: The detector must have the time set for the data collection to work properly. See Section 4.4 for details.

4.10.1 Collecting Data using the USB Port

1. Insert USB key into the USB port located on the display of the metal detector, accessed by lifting the clear dust cover.

2. When the USB key is inserted the data will begin to sync automatically. The time of this sync will vary depending on the amount of new data being transferred.

3. You can cancel the synching at any time by pressing S2.
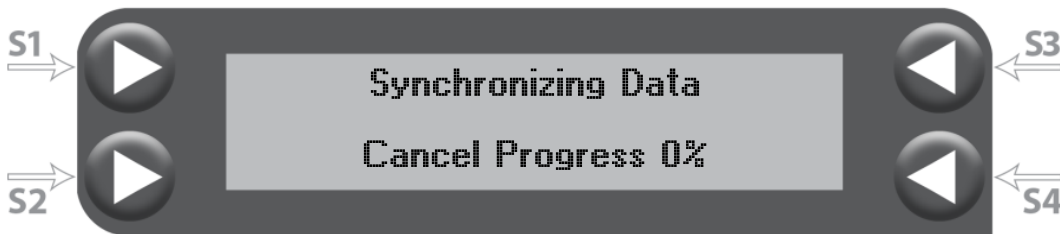
4. When complete you will be prompted that the sync is finished. At this point you can remove your key and continue on to sync another metal detector or bring your USB key to the computer to view the data.

> NOTE: If the USB key is removed during the sync, damage to the USB key may occur.

4.10.2 Installing and using Contact Reporter Software

> NOTE: The computer must be running Windows 7 or newer operating system and have version 4 of the .net framework installed (free download from Microsoft).

Installing Contact Reporter software:

The installer of the Contact Reporter software is provided on the USB key.

1. Connect the USB to your computer.

2. Click on "Open Folder to view files" and select "ContactReporter" and then "ContactReporterSetup"

3. Follow onscreen instructions to install Contact Reporter.

4.10.2 Installing and using Contact Reporter Software—continued

Navigating detectors:

1. Open Contact software.

2. Insert the USB key into an available USB port. Contact will automatically check the USB key and load a list of detectors that have been synced to the key.

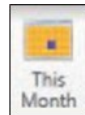3. Select detector to view specific data from the list on the left.
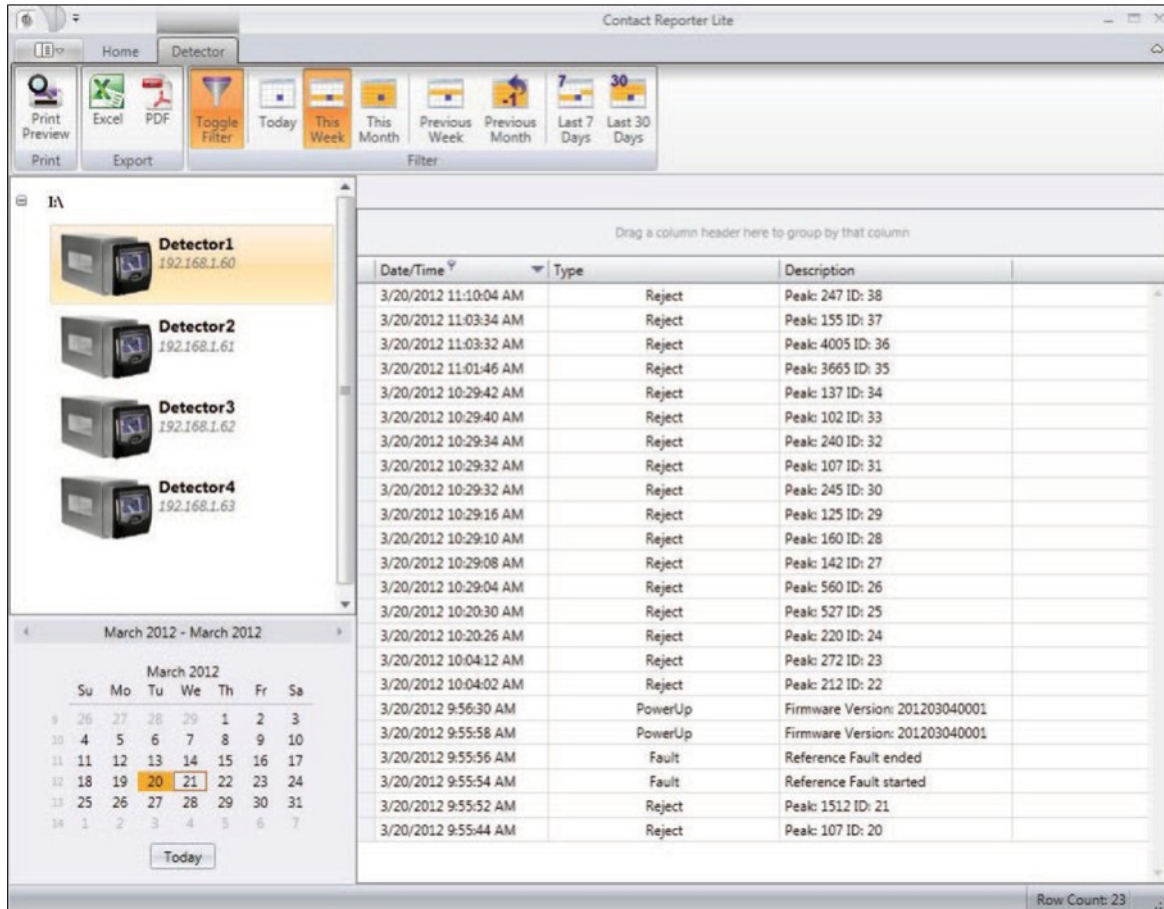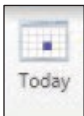

Filtering data—Quick Filters:

The quick filters are located in the ribbon across the top of the application. These allow you to filter the data in a click for a selected detector.

 Toggle Filter – Will turn the filter on and off. When turned off all of the data will be displayed in the window in chronological order (newest first).

 Today – Will display all the data for the current day.

 This Week – Will display all the data from the current week (Sunday to Saturday is considered a week).

 This Month – Will display all the data for the current month.
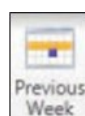
 Previous Week – Will display all the data for the previous calendar week.
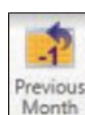
 Previous Month – Will display all the data for the previous calendar month.

4.10.2 Installing and using Contact Reporter Software—continued

Last 7 days - Will display all the data for the last 7 days.

Last 30 days - Will display all the data for the last 30 days.

Filtering data – Calendar Filter:

When using the quick filters you can visually see the days selected in the calendar. As well as viewing this calendar will allow you to visually refine the filter.

Selecting Days - Clicking and dragging over days will select multiple days. If you click and drag again your previous selection will be lost. If you would like to add to the selection you can hold the shift key and select additional dates.

Selected by clicking and dragging.

Selected by clicking and dragging while pressing "SHIFT".

To select or deselect an individual day you can click on the day while holding the "control" or "ctrl" key.

Selected by clicking.

Selected by clicking while pressing "CTRL".

Filtering and sorting by Type:

By clicking any of the columns you will sort the list by that column, and by clicking again will invert the list order. When hovering over the column a small filter graphic will appear, clicking this will allow you to filter to one type of event. Rejects, Faults, etc.

Date/Time	Type	Description
3/18/2012 12:42:32 PM	Fault	Test Fault ended
3/18/2012 12:42:32 PM	(Blanks)	Large Metal Fault ended
3/18/2012 12:42:32 PM	(Non blanks)	Test Fault started
3/18/2012 12:45:00 PM	Fault	Large Metal Fault started
3/18/2012 12:45:32 PM	PowerUp	Large Metal Fault started
3/18/2012 12:45:08 PM	Reject	Large Metal Fault ended
3/18/2012 12:45:54 PM	Test Request Operator Code	Large Metal Fault ended
3/18/2012 12:42:28 PM	Test Request Result	Firmware Version: 201203030001
3/18/2012 12:45:36 PM	Test Request: FE	Peak: 3740 ID: 3
3/18/2012 12:45:34 PM	Reject	Peak: 882 ID: 2
3/18/2012 12:45:56 PM	Reject	Peak: 8808 ID: 6
3/18/2012 12:45:38 PM	Reject	Peak: 155 ID: 4
3/18/2012 12:45:48 PM	Reject	Peak: 22140 ID: 5
3/18/2012 12:44:58 PM	Test Request Operator Code	User entered code: 0
3/18/2012 12:42:32 PM	Test Request Result	Fail
3/18/2012 12:45:06 PM	Test Request Result	Pass
3/18/2012 12:45:00 PM	Test Request: FE	Peak: 1197 ID: 1

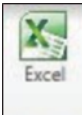## 4.9.2 Installing and using Contact Reporter Software—continued

If you grab the "Type" column heading and drag it into the box above you will get the events sorted by type.

Exporting and printing data:

Pressing this will show a preview of the selected data. From this screen you can print the report.

Prompts to name and save the data to an excel (.xls) file.

Prompts to name and save the data to a PDF.

CHAPTER 5: FAQ'S & APPENDICES

5.1   FAQ's (Frequently Asked Questions)

5.1.1 Troubleshooting Guide

When a malfunction occurs it may not be serious and could be corrected easily. The following describes the most common problems and solutions; please refer to the following before calling Technical Support.

WARNING!

Shock Hazard: Only qualified service personnel should remove the Detector cover.

- Machinery and devices may operate without warning at any time.

- Keep away from the operating area of the reject device while power is applied.

- Keep hands clear of moving parts.

- Do not tamper with, modify or attempt to override guards or safety switches.

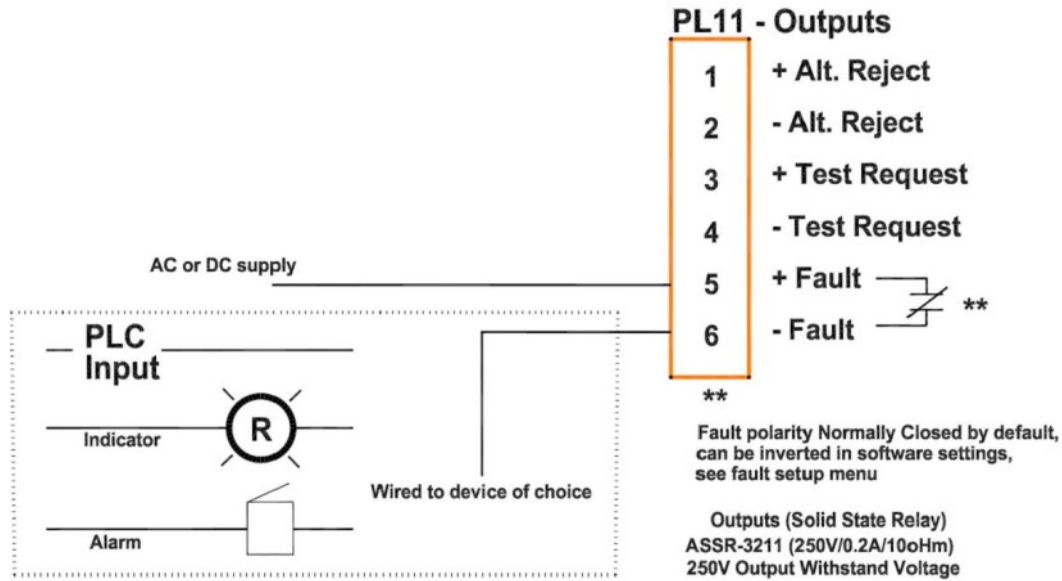| Problem	Check
Upon initial power-up the display does not light up.	Remove the display cover and follow the respective check list below: • Make sure there is power going to the Detector per the Power Supply connection instructions in Section 1.8. • Fasten any loose cable connections. • Confirm that the Display Cable connector is plugged into the Digital Board. • The Green LED on the top center of Digital Board should be flashing; if the green LED is not flashing, check if the Ethernet communication lights are blinking. Try disconnecting and then reconnecting the power to the detector.
The Detector is falsely triggering. Continued on next page	• Inspect the rejected product with a off line metal detector to confirm the presence of metal contamination. • Investigate various symptoms of false triggers to determine the source. Perform the Initial Signal Check described in Section 3.3 to determine whether false triggering is coming from the conveyor, outside environment, or product. • Make sure all moving cross members or metal transfer plates are electrically isolated, see Section 1.6.

5.1.1 Troubleshooting Guide—continued

Problem	Check

The Detector is falsely triggering.	• Look for any large pieces of metal around the aperture opening such as metal guides, covers, wire cables, etc. that may move when the system is on. Refer to the installation section for more information.
	
	 • The Detector may be detecting outside interference from the surrounding area. Possible sources of such interference are:
	
	     1. Airborne electrical interference – static, radio (RF), earth loops, variable frequency drives.
	
	     2. Vibration – moving metal in the metal free area.
	
	 The Detector is capable of filtering any one of these types of interference to a large extent through the digital filter settings; but, if at all possible, it is recommended to identify and fix the source of interference to achieve optimal performance from the Metal Detector.
	
	 If the product is the source of false triggering, try re-calibrating the system as described in Section 3.5 and then adjust the Sensitivity if required (Section 3.6).
	
	 Note: if you change the Sensitivity level, always ensure that your test samples can still be detected.

The reject device is malfunctioning.	On the Display Panel confirm that the Signal level is exceeding 100 and the red detection light is turning ON in the event of reject activation. ⚠️ **Warning: Keep away from operating area of the reject device.** • Check if the solenoid and actuator/cylinder is changing state upon a Signal of 100 or greater. If not, check whether the reject cable is properly wired to the Digital Board reject output (refer to Wiring Diagrams in 1.10) • If actuator/cylinder valve is changing state, confirm there is adequate air pressure to the device (typically 60 psi/4 bar).

If problems still persist contact Fortress Technology's Technical Support for assistance.

Tel: 1-888-220-8737 or 416-754-2898   Email: service@fortresstechnology.com
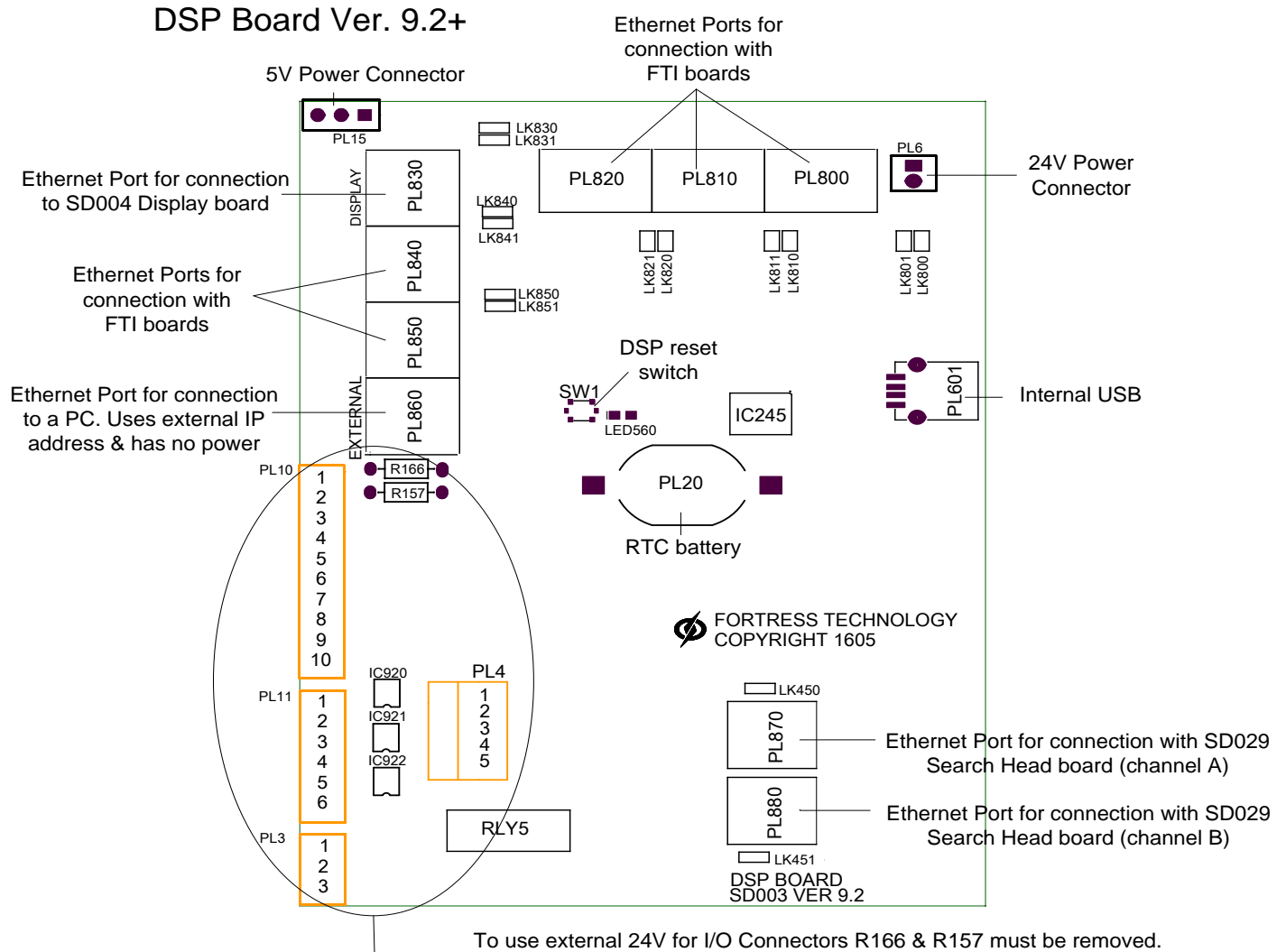
5.2   Faults

PL11 - Outputs
1   + Alt. Reject
2   - Alt. Reject
3   + Test Request
4   - Test Request
5   + Fault
6   - Fault   **

AC or DC supply

PLC Input
Indicator   (R)
Alarm

Wired to device of choice

**
Fault polarity Normally Closed by default, can be inverted in software settings, see fault setup menu

Outputs (Solid State Relay)
ASSR-3211 (250V/0.2A/10oHm)
250V Output Withstand Voltage

Fault	Possible Cause	Corrective Action
24V	• Power supply not functioning properly	• Power supply needs to be checked and/ or replaced.
Air Pressure	• The air pressure sensor connected to the isolated input of the DSP board (PL10 pins 9 & 10) is indicating a low pressure which may impair the proper function of the reject device. • Air pressure sensor not functioning properly.	• Verify air pressure going to the sensor with the reject device set to factory default; typically about 60-80 P.S.I. • Verify air pressure sensors are installed. • Verify air pressure proper functionality. • Faults can be cleared and masked in the software, until a technician has verified and corrected the causes of the fault
Balance	• There is metal located within the Detector aperture. • The Detector balance is excessive.	• Verify that no metal is located within the Detector aperture. • Check if LD3 (yellow LED) on DSP board is on.
Date Time	• Indicates the time is not set.	• Set the correct date and time.
Excess Reject	• The number of rejects has exceeded the limit set within the software Feature is enabled via Fault Setup Menu.	• Check rejected product for metal contaminants. • Make sure the Detector is calibrated for the running product • Can be cleared via the Clear soft key (S3)

5.2   Faults—continued

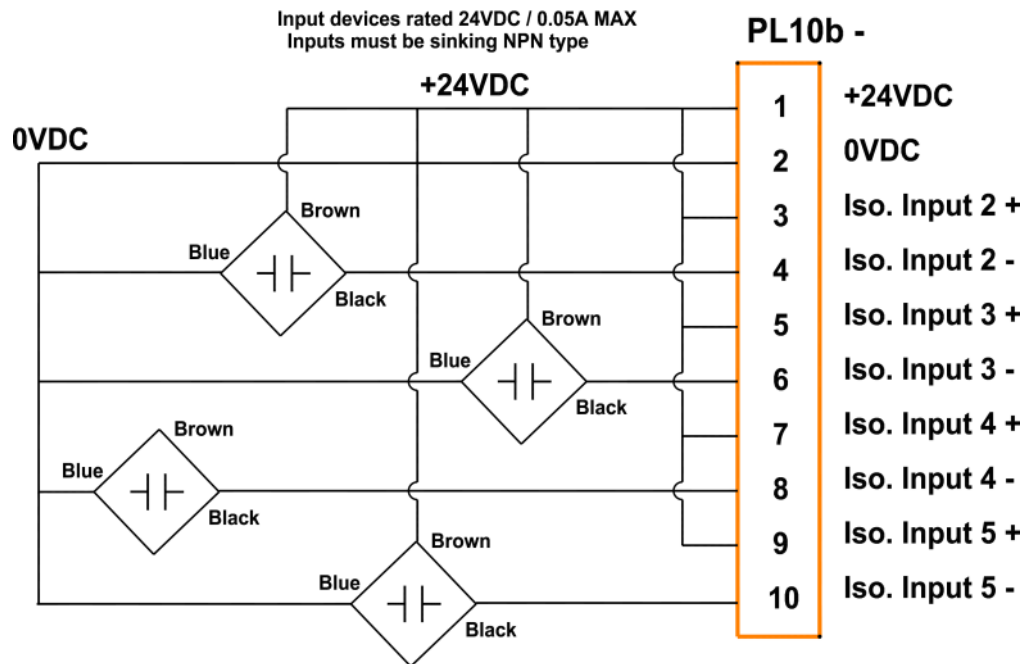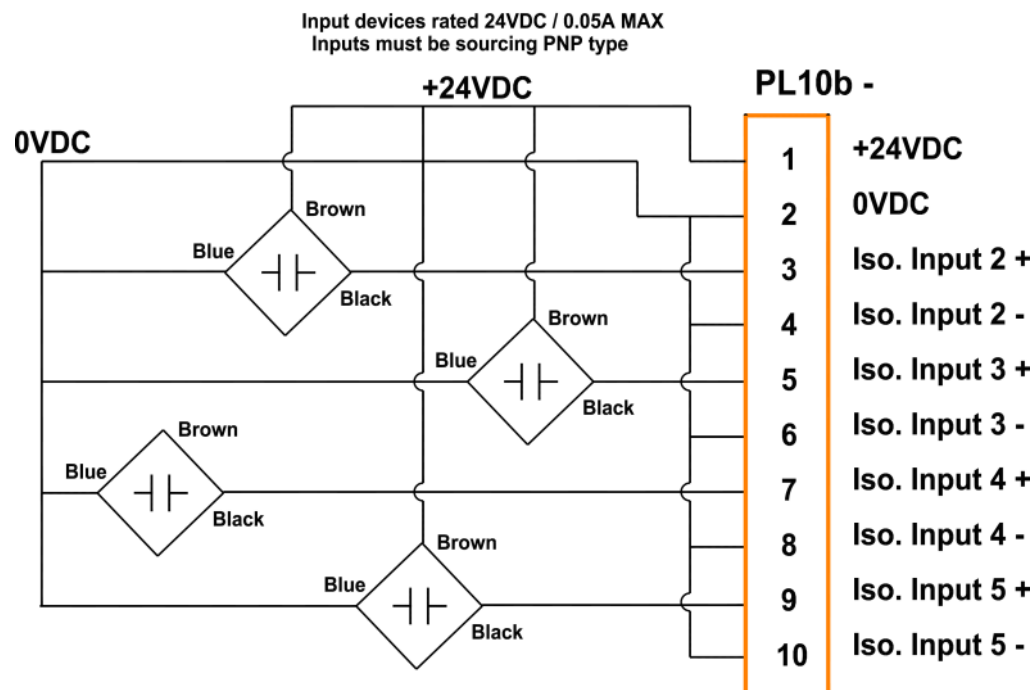| Fault	Possible Cause	Corrective Action
Internal USB	• There is an issue with the internal USB storage.	• Contact Fortress Service Dept. 1-888-220-8737 or 416-754-2898
Large Metal	• The large metal threshold limit has been exceeded. • The large metal threshold has been set too low Feature is enabled within Sensitivity submenu.	• Verify that no metal is located within the Detector aperture. • Increase the large metal threshold. • Can be cleared via the Clear Soft key (S3) and masked in the software's Fault Menu
Low Battery	• This fault will be generated when battery PL20 is low.	• Replace with a CR2032 battery.
Peye Block	• Photo Eye function is turned on.	• Check reject settings, reject setup should be normal. • Turn photo reject off.
Phase Limit	• A phase limit was exceeded during a calibration or auto phase update.	• Can be cleared via the Clear soft key (S3). • Check the phase point and perform a fast phase calibration.
PROD Memory	• Product memory may be corrupted	• Cycle power to clear memory or reset the product record via Reset in the Product, Edit Menu
Rej Bin Full	• The reject bin is full (this may prevent product from being successfully rejected into the bin)	• Check the bin and empty rejected product – handle according to operational procedures • Check that the sensor in the bin is not misaligned • Check the polarity of the input
Reject	• Reject confirmation device(s) failed to verify that the contaminated product was properly rejected	• Check that the reject device is functioning properly and that the confirmation devices are positioned correctly • Check if the polarity setting and the time delay within the software is set
Reference	• DSP PL1 Wire not connected properly • SH Board circuitry may be faulty	• Check if DSP PL1 board interconnection cable/plug are fully located with no loose connections • Call Fortress for assistance to check if SH Board is faulty
Test Signal	• Test signal was not detected during a test procedure	• Check the sensitivity and perform a manual test • Call Fortress for assistance to check if SH Board is faulty

5.3   Appendices

5.3.1 DSP Board

DSP Board Ver. 9.2+

5V Power Connector

Ethernet Ports for connection with FTI boards

PL15

LK830
LK831

PL6

24V Power Connector

Ethernet Port for connection to SD004 Display board

DISPLAY
PL830

LK840
LK841

PL820   PL810   PL800

Ethernet Ports for connection with FTI boards

PL840

LK821
LK820

LK811
LK810

LK801
LK800

PL850

LK850
LK851

DSP reset switch

Ethernet Port for connection to a PC. Uses external IP address & has no power

EXTERNAL
PL860

SW1
LED560

IC245

PL601   Internal USB

PL10

1
2
3
4
5
6
7
8
9
10

R166
R157

PL20

RTC battery

FORTRESS TECHNOLOGY
COPYRIGHT 1605

PL11

1
2
3
4
5
6

IC920
IC921
IC922

PL4

1
2
3
4
5

LK450

PL870   Ethernet Port for connection with SD029 Search Head board (channel A)

RLY5

PL880   Ethernet Port for connection with SD029 Search Head board (channel B)

PL3

1
2
3

LK451

DSP BOARD
SD003 VER 9.2

To use external 24V for I/O Connectors R166 & R157 must be removed.

PL10 – Inputs

1	24V DC
2	Encoder
3	Infeed Eye
4	0V DC
5	24V DC
6	Reject Check 1
7	Reject Check 2
8	0V DC
9	Isolated Input +
10	Isolated Input -

Input devices rated 24VDC / 0.5A MAX Non-isolated inputs must be NPN type

PL11 – Output Relays

1	Alt Reject +
2	Alt Reject -
3	Test Request +
4	Test Request -
5	Fault +
6	Fault -

ASSR-3211-001E (Solid State Relay)
250V output withstand voltage
0.2A current rating

PL3 – Main Reject Relay

1	Reject Relay NC
2	Reject Relay Common
3	Reject Relay NO

Relay Contact Ratings
Switching voltage – 250VAC / 30VDC MAX
5A current rating

PL4 – EZ-Lite Light Stack Connector

1	Red
2	Green
3	Yellow
4	24V DC Supply
5	Buzzer

5.3.2 Typical NPN Configured Connections

Input devices rated 24VDC / 0.05A MAX
Inputs must be sinking NPN type

+24VDC

0VDC

PL10b -

1	+24VDC
2	0VDC
3	Iso. Input 2 +
4	Iso. Input 2 -
5	Iso. Input 3 +
6	Iso. Input 3 -
7	Iso. Input 4 +
8	Iso. Input 4 -
9	Iso. Input 5 +
10	Iso. Input 5 -

Brown
Blue
Black

5.3.3 Typical PNP Configured Connections

Input devices rated 24VDC / 0.05A MAX
Inputs must be sourcing PNP type

+24VDC

0VDC

PL10b -

1	+24VDC
2	0VDC
3	Iso. Input 2 +
4	Iso. Input 2 -
5	Iso. Input 3 +
6	Iso. Input 3 -
7	Iso. Input 4 +
8	Iso. Input 4 -
9	Iso. Input 5 +
10	Iso. Input 5 -

Brown
Blue
Black

INTERCEPTOR
Metal Detector

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